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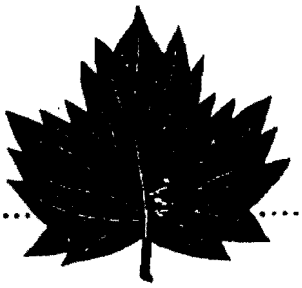

norad/conad

HISTORICAL SUMMARY

(UNCLASSFIED)

Pages 37-59 -
67-71
72, 73, 74
Declass per
21 Sep 06 memo
Declassified copy file

JANUARY-JUNE 1959

UNCLASSIFIED

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Review: 1 November 1989

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NORTH AMERICAN AEROSPACE DEFENSE COMMAND

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MEMORANDUM FOR HQ NORAD/USSPACECOM/HO

FROM: HQ NORAD/J3

SUBJECT: Declassification Review of Histories

1. The CONAD histories for the January – June 1959 and July – December 1959 periods have been reviewed and are now declassified except for the following sections:

January – June
Pages 67 –71, reason – similar to current rules of engagement
Pages 72,73,74, reason – issues concerning nuclear capabilities/procedures

July – December
Pages 55 – 57, reason – issues concerning nuclear capabilities/procedures
Pages 57 – 58, reason – DEFCONs are still classified at the SECRET level
Pages 59 – 61, reason – similar to current rules of engagement
Page 62, reason – similar to current procedures

2. If you have any questions, please contact my POC, Maj Bob Sneath, 4-5471.

DAVID W. BARTRAM
Major-General, CF
Director of Operations

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NORTH AMERICAN AEROSPACE DEFENSE COMMAND

RELEASABLE TO CANADA-U.S.

MEMORANDUM FOR HQ NORAD/J3 25 June 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 6 August 1998.

a. NORAD/CONAD, Historical Summary, January-June 1959

b. NORAD/CONAD, Historical Summary, July-December 1959

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

JEROME E. SCHROEDER
Assistant Historian

THIS MEMORANDUM IS UNCLASSIFIED WHEN ATCHS 1 & 2 ARE WITHDRAWN

RELEASABLE TO CANADA-U.S.

~~CONFIDENTIAL~~

FOR THE COMMON DEFENCE *POUR LA DEFENSE COMMUNE*

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
[redacted]

SECURITY NOTICE

CLASSIFICATION

This document is classified SECRET in accordance with paragraph 30b (2), AFR 205-1, and Canadian Air Publication 425. It will be transported, stored, safeguarded, and accounted for as directed by AFR 205-1, AR 380-5, OPNAV Instruction 5510.1A, CAP 425, CAO 255-1, and CBCN 5101.

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* This page is marked SECRET in accordance with paragraph 45b (1), AFR 205-1. However, its actual classification is UNCLASSIFIED.

* [redacted]
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N9-17732
N9-17732

NORTH AMERICAN AIR DEFENSE COMMAND and CONTINENTAL AIR DEFENSE COMMAND

HISTORICAL SUMMARY

JANUARY-JUNE 1959

Directorate of Command History
Office of Information Services
Headquarters NORAD/CONAD

PREFACE

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

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

Colorado Springs, Colorado
1 November 1959

L. H. BUSS
Director of Command History

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CONTENTS

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THREE -- COLLOCATION OF ARMY - AIR FORCE FACILITIES

FOUR -- THE SURVEILLANCE SYSTEM

FIVE -- NORAD WEAPON FORCE

SIX -- OPERATIONAL REQUIREMENTS AND PROCEDURES

SEVEN -- PLANS AND PROGRAMS

MAPS & TABLES

[redacted]

CHAPTER 1

Reorganization of NORAD/CONAD Headquarters

NORAD/CONAD PLAN FOR REORGANIZATION

Just before the Department of Defense Reorganization Act of 1958 became law in August, action was started in Colorado Springs to draw up a NORAD/CONAD reorganization plan.* On 24 July 1958, CINCNORAD directed the establishment of an ad hoc committee of NORAD/CONAD and component command representatives for this purpose. The work of this and another group resulted in the completion on 20 October of the first reorganization plan.

This plan divided the headquarters staff into a NORAD and a CONAD side. Each side was to have its own chief of staff, under each of which there were to be four deputies.

This plan was almost immediately dropped as too cumbersome and was never submitted to the Joint Chiefs of Staff. A plan for a staff structure was adopted that provided for a combined Headquarters NORAD/CONAD. There was to be a single staff that would handle both NORAD and CONAD functions. The U. S. members of the staff would handle the CONAD business. There were still to be two chiefs of staff, one for administration and logistics and one for operations. But they were to be brought together to have authority flow through both. The number of deputies were to be reduced to seven by consolidating operations sections. Under the first plan, each side had an operations section.

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* For details of this act and DOD and JCS implementing directives, such as the DOD Functions Directive, Unified Command Plan, and CONAD Terms of Reference, see NORAD/CONAD Historical Summary, July-December 1958, pp 1-8.

[redacted]

[redacted]

A second reorganization plan was prepared, embodying this staff structure idea, by 15 December 1958 and submitted to the JCS.

The seven-deputy staff proposed by this plan was modeled after the Joint Staff of the JCS. For example, the JCS Joint Staff had six "J" staff sections and a joint programs office. The NORAD/CONAD staff would have, under this plan, six "J" staff sections and a Deputy for Programs. NORAD/CONAD Headquarters adopted this plan as the best suited to its needs and as a means of facilitating NORAD/CONAD-JCS interstaff contact. The pattern of the Joint Staff was closely followed also to establish a "selling" point for the reorganization plan.

NORAD was the predominant command in this plan. In it, NORAD stood out as the important part of the organization having all the authority, taking all the actions, and making all the plans.

NORAD's predominance was made clear to the JCS in the cover letter to the second plan. Following are a few excerpts from this letter:

> NORAD will be predominant specifically the NORAD commander will have unquestioned authority over all assigned forces....
>
> Certain specific functions in the areas of operations, plans and requirements, communications and electronics, intelligence and systems integration ... will be consolidated and absorbed by NORAD.
>
> U. S. Service responsibilities ... will be handled by appropriate Service elements in a manner responsive to the needs of NORAD commanders at all levels.

The JCS did not approve this plan so that a new organization could be implemented on 1 January 1959. A big stumbling block was that CONAD was all but ignored in the plan and it was CONAD that came under the DOD

Reorganization Act and the implementing directives that followed.

A third plan was prepared, therefore, which was submitted on 27 March 1959. The staff structure proposed was almost identical to that proposed in the preceding plan. This was true also of the responsibilities and functions to be handled by Headquarters NORAD/CONAD. The only noticeable difference was the greater emphasis placed on CONAD and the downgrading of NORAD.

The plan was submitted by CONAD rather than NORAD as had been the previous plan. The cover letter noted that the DOD Reorganization Act was concerned solely with U. S. unified and specified commands and that the exercise of operational command was restricted to CINCONAD. In the places where NORAD was used in the December cover letter, either CONAD or NORAD/CONAD was now used. This was true also, insofar as applicable, of functional statements under the various deputies. For example, there were numerous places in the earlier plan where the statement that deputies would advise CINCNORAD on a certain matter that were changed to advising CINCONAD, or where it had been stated that a section would have cognizance of a NORAD matter was changed to a NORAD/CONAD matter.

Otherwise, the basic plan remained essentially the same. There were to be seven deputies and an office of information services (see chart on page 10). The plan provided for 30 directorates. The current organization had three deputies, a secretariat, an office of information services, and 18 directorates.

The Headquarters explained its plan in the foreword.* The guidelines which were used as a basis for preparing the organization and functions were listed as follows:

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* All changes directed by the JCS in approving the plan on 23 June are incorporated here.

a. CINCNORAD/CONAD will have full authority to direct, control and coordinate the operational activities of all forces assigned as well as the logistics essential to the accomplishment of the missions, acting within the framework of whichever authority is appropriate to the task at hand.

b. Operational and planning functions now being conducted by the components will be reviewed and evaluated with a view toward their realignment, consolidation and absorption by NORAD/CONAD Headquarters to preclude unwarranted duplication and to enhance their cohesive accomplishment.

c. To the extent practicable, requirements for manpower spaces to accomplish the functions realigned and absorbed should remain within the current space authorizations accorded to the component and NORAD/CONAD Headquarters.

d. Manpower spaces absorbed from the components should be consistent with the magnitude of the functions absorbed.

The plan stated that it had been determined after a review of pertinent documents that the NORAD/CONAD functional responsibilities included:

a. The establishment of qualitative and quantitative requirements for all forces, weapons and equipment for air defense of the North American continent.

b. Planning for the deployment and redeployment of assigned forces and forces to be made available.

c. The establishment of tactics, procedures and methods for exercising operational control of forces assigned, attached or

otherwise made available and for directing the engagement and disengagement of weapons; recommending plans for the operational use of all allocated forces, weapons and equipments and making recommendations concerning present and/or proposed North American air defense concepts.

d. Making recommendations concerning the technical compatibility of all air defense systems and the proper time-phased integration of new or modified weapons into the air defense environment

As for the actual organization itself, the NORAD/CONAD plan explained that:

a. In addition to the normal staff elements of Intelligence, Operations, Plans, and Communications and Electronics, we have provided CINCONAD with the capability for maintaining cognizance and for providing necessary guidance in the areas of personnel, logistics, programming and budget.

b. Purely U. S. matters will be processed by CONAD personnel of appropriate staff elements in compliance with directives applicable to CINCONAD as commander of a U. S. unified command

c. The staff structure has been intentionally patterned after the staff of the JCS Joint Staff, with the exception of the inclusion of the Office of Information Services.

APPROVAL BY THE JOINT CHIEFS OF STAFF

A JCS memo dated 23 June 1959 approved, subject to certain changes and guidance provided, the March 1959

Reorganization Plan. Only a partial build-up of personnel was authorized, however. The JCS authorized an initial increase of fifty per cent over the currently authorized personnel strength of the combined NORAD/CONAD Headquarters of 445 (which included 35 Canadians). This meant an increase of 223 to bring the total to 668.

The Reorganization Plan had called for an increase of 521 to bring the headquarters to a total of 966.* Of this total, the plan had proposed that 455 spaces be absorbed from the components within the Ent complex along with a transfer of functions. The other 66 were to come from the outside. These were spaces that were either not available from the assets at Ent or were additive because functions would not be transferred.

The JCS directed that the transfer of personnel from the components and the assumption of additional functions were to be accomplished in phases and in coordination with the Services. They emphasized that every effort should be taken to save manpower by consolidation or elimination of functions. The JCS offered the services of a survey team to help in this. Finally, the JCS provided that when appropriate, NORAD/CONAD could reexamine the organization and recommend desired modifications and adjusted personnel ceilings.

The Reorganization Plan had shown CINCNORAD as having operational command over the U. S. component commands and their subordinate units. The JCS pointed out that CINCNORAD exercised operational control over the U. S. component commands, the air defense forces of these commands, and the air defense forces in Alaska. They directed that command relationships be changed to reflect only an operational control channel from NORAD

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* USAF - 723
USA - 163
USN - 41
RCAF - 39
966

to the U. S. component commands and their subordinate units.

Among other changes or guidance laid down by the JCS were the following. They stated that personnel functions of CONAD, with respect to the components, were limited to the establishment of policies to insure uniform standards of military conduct. Direct training responsibility, the JCS stated, should be limited to joint training. NORAD/CONAD functions in weapons and environment systems development and testing should be limited to preparing qualitative and quantitative requirements, making recommendations for resolution of unsatisfactory situations to the JCS, and working with the Service with development responsibility to include representation at operations test conferences, provision of observers during test operations, and review of test reports. The JCS also directed that there be one chief of staff from the Army and an Assistant Chief of Staff from the Air Force. This changed the NORAD/CONAD concept of having two chiefs of staff -- one for operations and one for administration and logistics.

IMPLEMENTATION OF THE REORGANIZATION

Following approval of the Reorganization Plan, NORAD/CONAD formed an ad hoc committee to carry it out. This committee was established on 2 July 1959 and included representatives from NORAD/CONAD, ADC and ARADCOM. Among the tasks given to it in its charter were to specify the functions and manpower spaces to be absorbed and to recommend a time-phased plan for taking the people and functions.

In carrying out its responsibilities and instructions from the JCS and interpreting responsibilities assigned to CINCNORAD/CINCONAD, the committee agreed on these guidelines. In the areas of personnel (J-1), logistics (J-4), and programs, the headquarters should concern itself only with monitoring and providing broad command guidance and policy. This was not true in the remaining J staff areas, however, of intelligence (J-2),

operations (J-3), plans and policy (J-5), and communications and electronics (J-6). The latter areas were of primary concern to NORAD/CONAD.

The committee presented its program to General Partridge on 17 July 1959.* Included in the presentations were manning requirements and the phased build-up of personnel. General Partridge approved the plan and set 3 August 1959 as the date for implementation of the reorganization.

The additional personnel authorized at this time, as noted above, totalled 223. The committee plan provided that this would be broken down into 153 officers, 30 enlisted men, and 40 civilians. Of the total of 223, the Air Force was to provide 145, the Army 64, the Navy 13, and the RCAF one.

The assignment of personnel was to be phased over a 90-day period (i.e., to be completed by 31 October 1959). According to the schedule, the initial assignment on O-Day (organization day), 3 August 1959, was to be 113 people, O plus 45 an additional 30 people, and O plus 90 another 50 people.

On 23 July 1959, USAF ADC, ARADCOM, and NAVFORCONAD were sent copies of the personnel assignment plan. Each was told to "arrange for the provision of the manpower authorizations and assignment of personnel to NORAD/CONAD," accordingly.** The personnel assignment plan

---

* General Laurence S. Kuter assumed command of NORAD/CONAD on 1 August 1959. He advised in a letter to General Partridge at the end of June that the staff need not delay any reorganization actions on the premise that his (Kuter's) views might differ from those of General Partridge.

** Not all 113 people scheduled for the first increment came in on 3 August, but they had arrived within about 30 days according to personnel records of the headquarters.

specified the positions by service, grade, career field, and staff to which the positions were to be assigned.

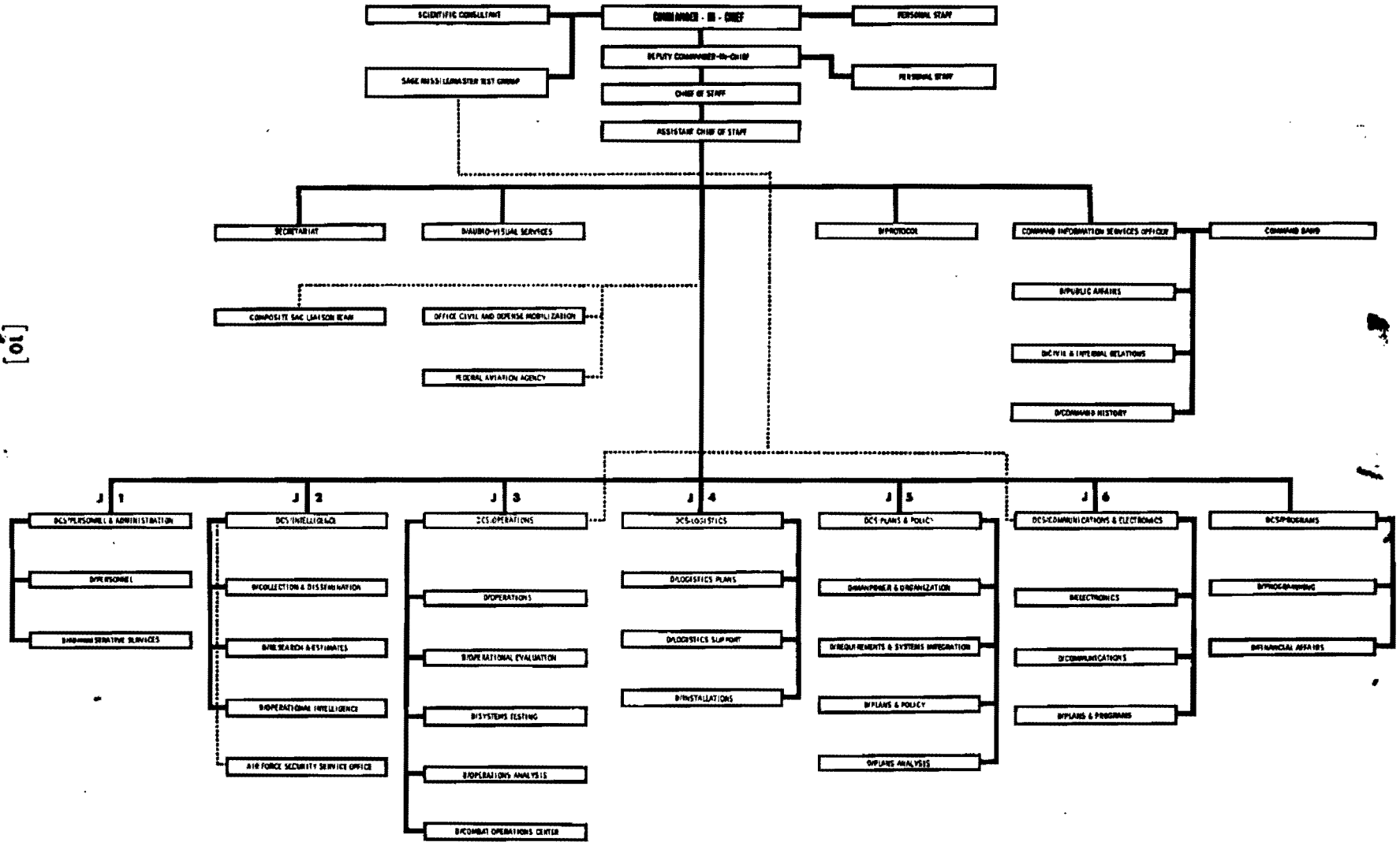
The March 1959 Reorganization Plan showed the functions that NORAD/CONAD would perform and this plan was approved by the JCS, subject to the changes enumerated earlier. But other than this, the components were not told what functions NORAD/CONAD would absorb and the components would stop doing or reduce in scope. The adjustment of functional responsibilities, i.e., the gradual relinquishment of a function in a component and the full performance of the same function in NORAD/CONAD or some in-between arrangement, was a matter that would take some time to work out. The JCS had stated, in approving the reorganization plan on 23 June, that CONAD should make every effort to consolidate functions and eliminate non-essential activities. Considerable review would be necessary.

It had been noted by the Reorganization Ad Hoc Committee at its meeting on 10 July that one problem in building up the J-3, J-5, and J-6 sections was that what the components were doing in these areas was required by Service directives. The component activity could be stopped only by elimination of these directives.

At any rate, the new staff structure for Headquarters NORAD/CONAD was established on 3 August 1959 in the form shown on the following page. Separate general orders established the staff structure for NORAD and CONAD. They were identical except for the position of Deputy Commander-in-Chief on the NORAD staff. This position was held by Air Marshal C. Roy Slemon, RCAF.

During the process of assigning personnel, the problem came up of whether more than one Service would provide required civilian spaces. The personnel assignment plan sent to the components on 23 July asked for ten civilian spaces from the Army. The Army replied that since the Air Force had been assigned by OSD as the Service to provide administrative and logistical support, it should provide all civilian positions. This, the Army said, was in consonance with the procedure at all other unified commands.

HEADQUARTERS
NORTH AMERICAN AIR DEFENSE COMMAND
CONTINENTAL AIR DEFENSE COMMAND
Ent Air Force Base, Colorado Springs, Colorado



CONAD objected to the JCS, pointing out that one Service should not have to provide all the civilian spaces, that CONAD was unique in that an integrated headquarters would be established at all CONAD levels, and that as many as 100 civilian authorizations might be required from the Army when the organization was fully implemented. The JCS replied that it had been the practice to provide all civilians for the senior headquarters of each unified command from one Service. The Air Force was, therefore, taking action to provide the ten civilian spaces asked of the Army for NORAD/CONAD Headquarters. The JCS did not comment on the situation in regard to integrated headquarters at subordinate CONAD/NORAD echelons.

CHAPTER 2

Region/Division Organization

SAGE GEOGRAPHIC REORGANIZATION

Introduction. By mid-1959, five SAGE direction centers (New York, Boston, Syracuse, Washington, and Bangor) and one SAGE combat center (the 26th Division at Syracuse) had become operational. For the next few years, SAGE direction centers and combat centers would continue to be phased into the air defense system until the manual system was replaced. To go from the manual to the ultimate SAGE system would require great changes in the geographic organization of the air defense system.

This reorganization was planned in phases. For NORAD/CONAD, there would be a gradual change, in accordance with SAGE phasing, from the current organization to a seven-region structure and then to a nine-region structure in the continental U. S. The final configuration would also include a tenth SAGE region in Canada. USAF ADC had similar reorganization plans which would bring first a seven-division structure and later a nine-division structure in the continental U. S. ARADCOM's plans were not definite at mid-1959, but it probably would establish a seven-region structure along with NORAD/CONAD and USAF ADC.

The reason NORAD/CONAD and USAF ADC were to increase their region/division structure from seven to nine in the U. S. was to accommodate an improved SAGE computer, the AN/FSQ-7A. This new computer was to be installed in ten combat centers (nine in the U. S. and one in Canada), referred to as Super Combat Centers.

NORAD/CONAD Organizational Changes and Status (to 1 August 1959). In the progress toward the SAGE configuration, by the end of calendar year 1958, USAF ADC had

inactivated four manual divisions (the 9th, Geiger Field; 32d, Syracuse; 35th, Dobbins; and 85th, Andrews) and reduced a fifth division to a one and one status (the 58th, Wright-Patterson, which was inactivated on 1 February 1959). ADC had activated the 32d Air Division (SAGE) to take the place of the 35th manual division at Dobbins and established the 26th Air Division (SAGE) to take the place of the 32d manual division at Syracuse. The latter was a redesignation of the 26th manual division located at Roslyn AFS, New York. Division boundaries were appropriately changed.

NORAD/CONAD followed suit by disestablishing five of their divisions (9th, 32d, 35th, 58th, and 85th). These commands also re-established the 26th Division at Syracuse and the 32d Division at Dobbins.

At the end of December 1958, NORAD was left with a total of 19 divisions, 12 of which were within the continental U. S. CONAD had the same number of divisions within the continental U. S. and one outside (the 64th).*

On 1 April 1959, ADC redesignated its 30th Air Division (Defense) as a SAGE division and moved it from Willow Run AFS, Michigan, to Truax AFB, Wisconsin. It inactivated its 37th Air Division (Defense) which had been at Truax and made the 30th responsible for the area of both divisions. ADC also redesignated the 25th Air Division (Defense) as a SAGE division on 1 March 1959. At mid-year, USAF ADC had four SAGE divisions and seven manual divisions in the U. S.

NORAD/CONAD relocated their 30th Divisions from Willow Run AFS to Truax AFB on 1 April 1959 and discontinued their 37th Divisions. The 30th Divisions were then made responsible for the area formerly encompassed by the 30th and 37th. No action was necessary by NORAD/CONAD on the 25th Division.

---

* CONAD divisions and regions and NORAD divisions and regions had identical boundaries.

On 1 August 1959, NORAD/CONAD took the first action to redesignate divisions as regions which was part of the plan to establish the seven-region structure. Effective this date, the Eastern NORAD/CONAD Region was discontinued.* On the same date, the 26th, 30th, and 32d NORAD/CONAD Divisions were redesignated Regions. These new regions assumed responsibility for the Eastern Region area and began reporting directly to NORAD/CONAD Headquarters. The geographical area formerly encompassed by the divisions remained the same for the regions.

NORAD/CONAD also established a sixth sector at Custer AFS, Michigan, on 1 April 1959, the Detroit Sector. The SAGE direction center at this location was scheduled to become operational in August 1959. As noted previously, five SAGE DC's had become operational earlier. At each, NORAD/CONAD had established sectors.

In separate action having nothing to do with the SAGE reorganization, CONAD established the Alaskan CONAD Region and the 10th and 11th CONAD Divisions in Alaska effective 10 June 1958. NORAD had taken this action in 1958.

The status as of 1 August 1959 was as follows. NORAD had eight divisions within the continental U. S., and seven outside (10th, 11th, 1st, 2d, 3d, 5th, and

---

* Actually, the operational phase-out date of Eastern was 1 July 1959. On this date, for example, the operational responsibilities for the Atlantic Seaward Element were transferred to the 26th NORAD/CONAD Division. Because of these changes, the Navy disestablished its NAVFOR Eastern CONAD Region on 15 August 1959 and four naval billets were transferred to the staff of the 26th NORAD/CONAD Region (as it was designated on 1 August 1959). The additional month between the operational phase-out date on 1 July and the effective date of discontinuance of the Eastern Region was for cleaning up administrative matters.

64th), for a total of 15. CONAD also had eight divisions within the continental U. S. and had three outside (10th, 11th, and 34th), for a total of 11. NORAD had five regions within the U. S. and two outside (Alaskan and Northern). CONAD also had five regions in the U. S. and one outside (Alaskan).

According to current planning, on 1 January 1960, the Central NORAD/CONAD Region would be discontinued. Two of the divisions within Central, the 29th and 33d, were to be redesignated as regions and divide the area of responsibility. Of the other three divisions currently within the Central area, two were to be discontinued and one was to be redesignated as a sector.

On 1 July 1960, Western NORAD/CONAD Region was to be discontinued. Its area of responsibility was to be divided between the 25th and 28th Divisions which were, at the same time, to be redesignated as regions. A third division within Western would be redesignated as a sector. Thus, there would be by 1 July 1960 seven numerically-designated regions within the continental United States.

Tentative planning at NORAD Headquarters also called for redesignating the Northern NORAD Region in Canada as the 35th NORAD Region about 1 July 1960.

INTEGRATION OF THE 25TH AND 5TH DIVISIONS

In November 1958, Western Region forwarded a joint proposal of the 5th and 25th NORAD Divisions for a shift in control of radar units. Their proposal was to place the 917th (C-19), 918th (C-20), 919th (C-21) and 825th (SM-153) ACW Squadrons under the command and operational control of the 25th NORAD Division. These were USAF-manned-and-operated units in Canada, currently under the 5th NORAD Division.

RCAF ADC/NNR concurred on 19 December 1958 and NORAD approved the plan and directed implementation on 16 January 1959.

[redacted]

Following this, because of this shift in control and a later requirement to expand the 25th Division to its SAGE boundaries, Northern and Western Regions recommended that the 5th NORAD Division be disbanded and its area of responsibility and control of forces be transferred to the 25th NORAD Division. NORAD concurred.

This change was planned in phases. It could not be accomplished all at once because of insufficient communications facilities. However, operational control could be taken in steps. The first step would be for the 25th to assume operational control of the four USAF-manned radars, using existing circuitry. The second step called for the 5th NORAD Division to be phased out and the 25th NORAD Division to assume operational control of the RCAF air defense forces.

The first step was taken on 2 March 1959.

In the meantime, NORAD requested formal approval of the over-all plan from the JCS and COSC. Included was a requirement for joint manning. At this time and in amendments in May and July, the RCAF positions required on the staff of the 25th, which included the Deputy Commander position, were submitted. The JCS withheld approval pending consideration of the over-all regional plan. On 17 August 1959, NORAD was advised by the Executive Agent for the COSC that the Canadian Cabinet Defence Committee had approved in principle the Canadian participation in the Region and Sector headquarters located in the U. S. (see below for additional details). It was further stated that Canada was endeavoring to man the 25th Division in accordance with NORAD submissions in May and July.

MANNING OF NORTHERN NORAD REGION AND CANADIAN/U. S. DIVISIONS

In 1958, preliminary manning proposals were submitted to the JCS and COSC for the Northern NORAD Region Headquarters. NORAD then heard informally that the

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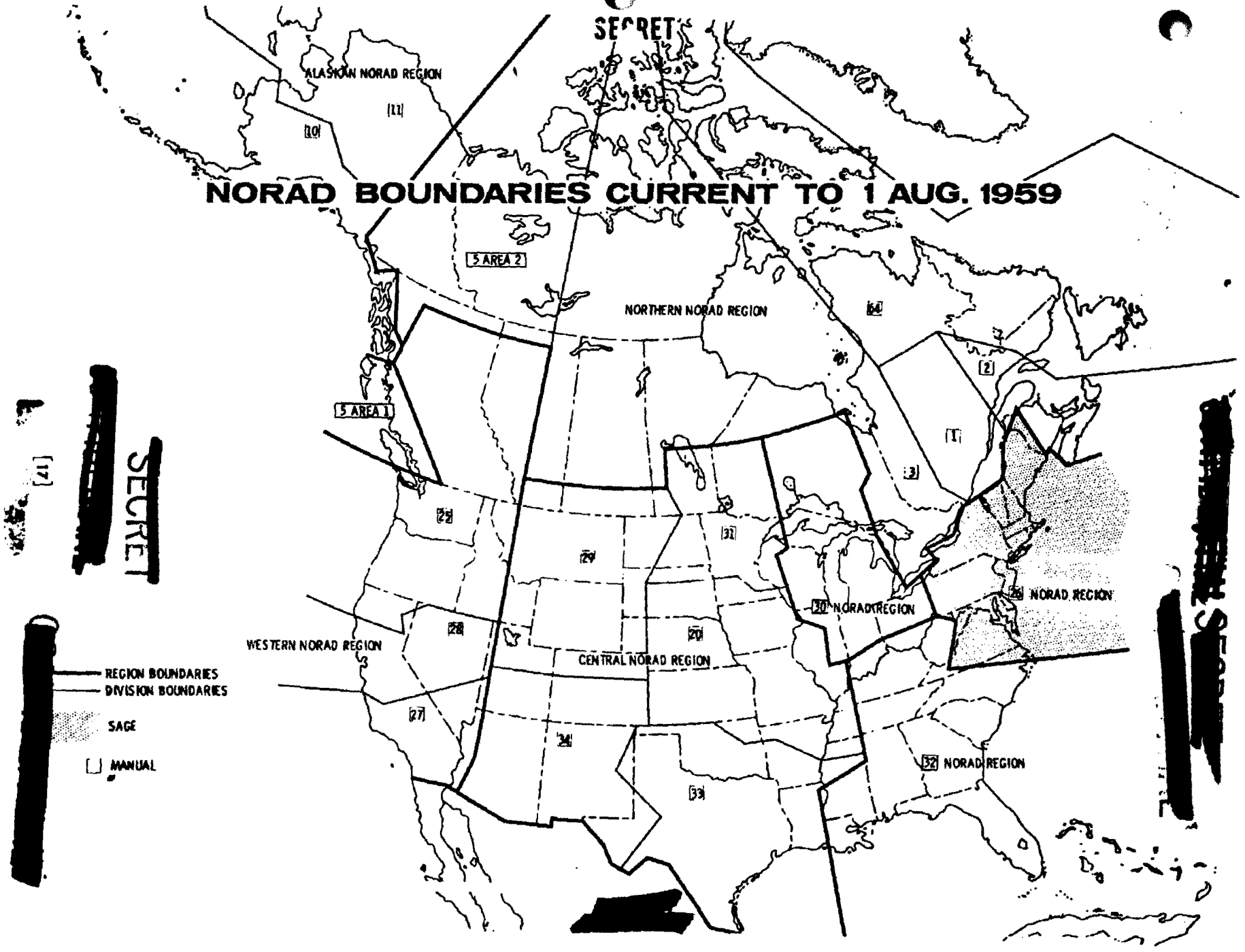

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JCS was delaying consideration of the manpower requirement until a proposal for all NORAD subordinate units was submitted. NORAD wired the JCS that provision of U. S. personnel for the Northern Region staff was urgently required and that approval should not be delayed.

On 24 December 1958, the JCS concurred in NORAD's need for the U. S. manpower spaces at NNR Headquarters (although they with-held approval of the overall proposal). Accordingly, the Army and Air Force were asked to provide the spaces.

A total of 16 spaces were authorized, 14 officers (including two brigadier generals) and two enlisted men. Thirteen of the officers and the two enlisted men were to come from the Air Force; one officer was to come from the Army. These personnel were to be provided to a U. S. element at Headquarters NNR, arriving on a phased basis beginning 15 May 1959.

In the meantime, on 25 February 1959, NORAD advised the COSC of the JCS action and urged early approval of the Canadian manpower spaces for NNR. At the same time, NORAD submitted its proposal for manning of joint U. S./Canadian divisions. The NORAD concept for the latter was as follows. Those geographical areas lying wholly in one country and containing forces of only that country should have a commander and staff from that country; however, if forces of another country were to be employed over the area, the commander should have adequate staff assistance from the other country. In those geographical areas including territory and/or forces of both countries, the commander and his deputy should not normally be from the same country. The staff should be joint. And national representation in the NORAD organization should generally be based on the composition of forces and territory involved.

NORAD proposed the following commanders and deputy commanders for border divisions:

25th Division -- U. S. commander, Canadian deputy
29th Division -- U. S. commander, U. S. deputy

30th Division -- U. S. commander, Canadian deputy
35th Division -- Canadian commander, U. S. deputy
26th Division -- U. S. commander, U. S. deputy

On 21 May 1959, NORAD advised the COSC that the proposals submitted on 25 February were firm, at least until the reorganization and boundary realignment required by the super combat center plan. NORAD said that there would be some delay in final implementation of the complete organization and manning of all of its subordinate organizations in the U. S. and Canada. But there was a pressing need for Canadian representation at certain subordinate organizations. For this reason, NORAD asked that as an interim arrangement Canadian liaison officers be authorized for certain organizations. Personnel were needed immediately at the 26th Division, Syracuse Sector, Bangor Sector, 29th Division, and the Detroit Sector; on 1 July 1959 at the 30th Division; on 15 August 1959 at the Duluth Sector; on 10 September 1959 at the Grand Forks Sector; and on 15 March 1960 at the Sault Ste Marie Sector.

On 17 August 1959, as noted above, NORAD was advised that on 4 August the Canadian Cabinet Defence Committee had approved in principle the Canadian participation in the joint region and sector headquarters. It had also approved U. S. participation in the NNR Headquarters and the 35th Region Headquarters (as NNR was later to be redesignated).

A few changes were requested. The executive agent letter stated that this committee felt that Canadian interests would be better served if Canadian officers were appointed to the Deputy Commander position at the 29th Division Headquarters and at the Detroit and Grand Forks Sector Headquarters (this would be in addition to Deputy Commander positions at the Seattle and Syracuse Sector Headquarters proposed by NORAD).

Complete manning requirements were being prepared, it was stated. In the meantime, the need for co-manning at organizations already activated or soon to be activated was appreciated. Therefore, arrangements were

[redacted]

30th Division -- U. S. commander, Canadian deputy
35th Division -- Canadian commander, U. S. deputy
26th Division -- U. S. commander, U. S. deputy

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Complete manning requirements were being prepared, it was stated. In the meantime, the need for co-manning at organizations already activated or soon to be activated was appreciated. Therefore, arrangements were

being made to provide RCAF officers in a liaison capacity to the positions asked in NORAD's 21 May letter.

THE SUPER COMBAT CENTER PLAN

Approval of the USAF ADC plan to employ the new solid state computer, AN/FSQ-7A, by NORAD on 20 December 1958 and USAF on 5 February 1959 necessitated great changes in the transition to SAGE.* The ADC plan provided that the solid state computer would be employed in nine division combat centers in the U. S. and in one in Canada.

In the months following publication of the original ADC plan on 5 November 1958, a number of changes became necessary and a requirement was added for aligning air defense and air traffic control boundaries (see separate section below). A new plan was prepared (NORAD participated to insure inclusion of its operational requirements and concepts).** This plan was dated 19 June 1959. Following agreement on air defense and air traffic control coincident boundaries, the SAGE Project Office consolidated the old SAGE Schedule 7 (Improved) and the coincident boundary schedule into a new SAGE Implementation Schedule, which was dated 1 July 1959.

There were to be ten Super Combat Centers (SCC's), one for each of ten divisions. Each was to employ a solid state computer. One additional AN/FSQ-7A computer was planned for a direction center at the Albuquerque SAGE Sector. Five of the division SCC's were to perform a dual function, i e., in addition to operating as an SCC, they were to operate as a direction center (the 30th, 32d, 33d, 27th, and 35th).

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* For background, see NORAD/CONAD Historical Summary, Jul-Dec 1958, pp 23-29.

** Other participating agencies: RCAF, SDC, FAA, MITRE, IBM, ADSID, USARADCOM, and SAGE Project Office.

Each division was to encompass two to four sectors In all there were to be 27 air defense sectors. Of these, 21 were to be equipped with an AN/FSQ-7 computer in a "soft" structure. Five of the sectors were to be controlled by the direction center portion of the SCC. And one sector, Albuquerque, as noted above, was to have an AN/FSQ-7A.

The operational employment plan provided that each of the ten SCC structures was to be "hardened" to a minimum of 200 pounds per square inch overload. However, the Department of Defense-prepared Continental Air Defense Program (see Chapter Seven), approved by the Secretary of Defense on 19 June 1958, reduced the number of hardened sites to six in the U. S. and one in Canada. The three other SCC's planned for the U. S. (in the southcentral and central areas) were to be built in a soft configuration.

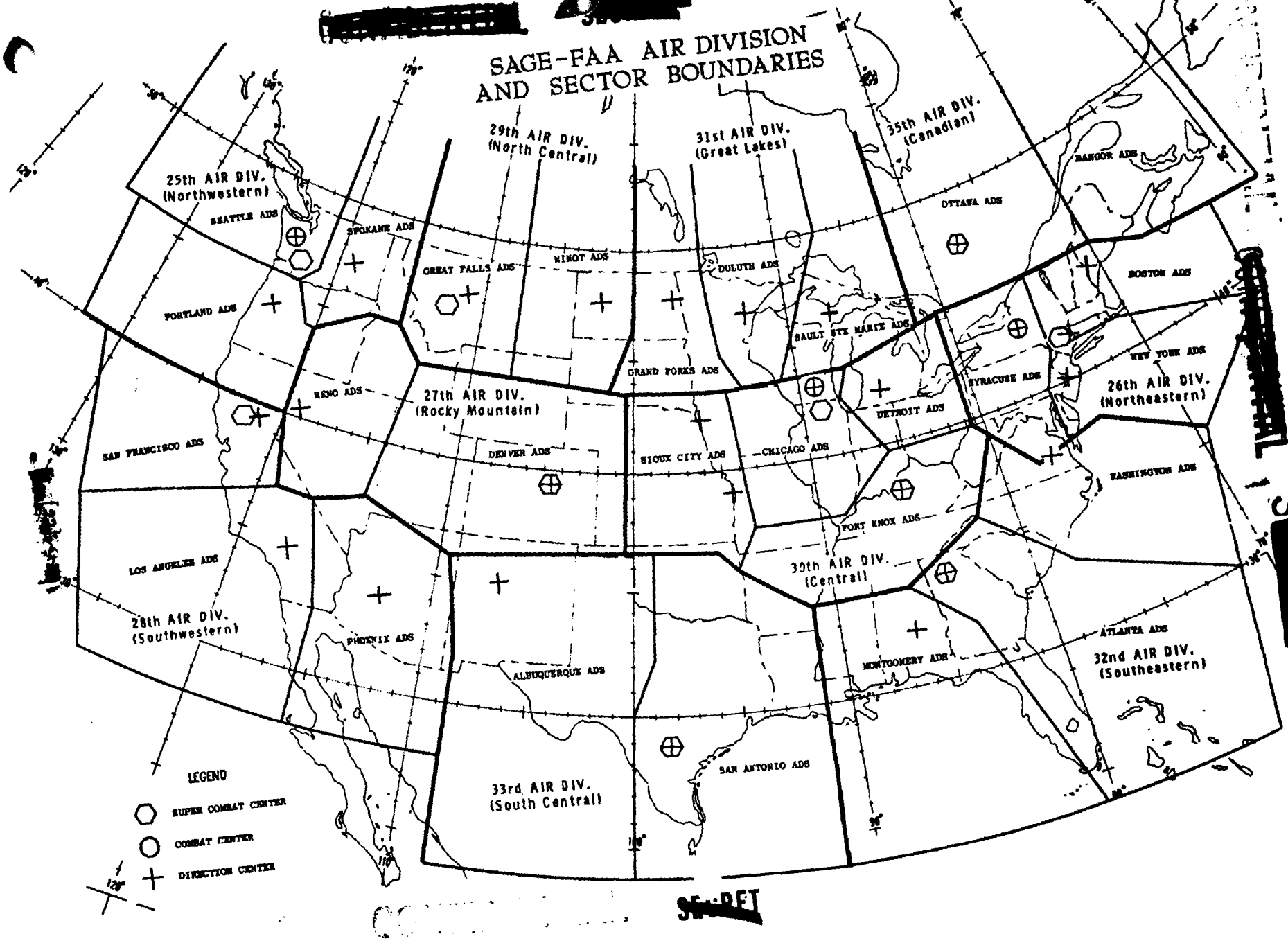
The new SAGE Implementation Schedule set the operational date of the first SCC, which would be in the 35th NORAD Region, in June 1963; the last two SCC's, which would be in the 28th and 33d Regions, in July 1964. The Albuquerque Sector AN/FSQ-7A was scheduled to become operational in September 1962.

The boundaries planned for the SCC configuration are shown on the map on the following page. As of mid-year, the exact locations for the ten SCC's had not yet been determined.

AIR DEFENSE AND AIR TRAFFIC CONTROL INTEGRATION

Background. At each of the nine super combat centers in the U. S. there would be collocated Federal Aviation Agency air traffic control facilities. Each AN/FSQ-7A computer would be jointly used for air defense and air traffic control functions. In addition, the SCC boundary configuration would be coincident air defense/air traffic control boundaries.

Back in January 1958, the Secretary of Commerce and



the Secretary of Defense signed an agreement on joint use of certain facilities in the performance of common functions in air traffic control and air defense. This agreement was formalized in a White House document dated 9 January 1958.

The agreement provided that the Airways Modernization Board would conduct a program to determine how integration could be accomplished. On 22 July 1958, the Air Defense Systems Integration Division was designated the Air Force agency to work with AMB. On 29 July 1958, the ADSID was further designated as the Department of Defense agency on this program. Following this, on 22 August 1958, USAF, CAA, and AMB agreed that plans should be made to collocate air route traffic control centers and air defense facilities where practicable, consider a hardened air traffic control facility within each air division, and readjust air traffic control and air defense boundaries so as to be coincident at the air division level.

Both CAA and AMB were incorporated within a new agency, the Federal Aviation Agency which officially began functioning on 31 December 1958.* FAA, therefore, took over the air traffic control part of integration.

Request for Canadian Participation. In January 1959, in commenting on an interim boundary alignment plan, NORAD told ADSID that among the considerations that had to be taken into account in developing a final plan was air traffic control in Canada. ADSID replied in February that FAA was aware of the necessity for Canadian participation and was in the process of

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* The Federal Aviation Act of 1958 provided that except for the creation, staffing and organizing of the FAA, and for the transfer to its Administrator of certain functions of other Government agencies, the Act would become effective "on the 60th day following the date on which the Administrator .. takes office." The Administrator's date of appointment was 1 November 1958.

getting Canadian Department of Transport and RCAF representation on its staff.

In the meantime, in October 1958, NORAD recommended to the JCS that the studies on integration of functional activities common to air traffic control and air defense be expanded to include Canadian considerations and participation. The JCS agreed in January 1959 to recommend to the Secretary of Defense that an invitation be extended to the Government of Canada to participate in these studies.

In April 1959, NORAD was informed that the FAA had requested the State Department to consider inviting Canada to participate and in February 1959 the State Department had sent an invitation to the Canadian Embassy.

Boundary Alignment. On 22 May 1959, USAF, DOD, and FAA signed a new agreement which reconfirmed earlier agreements and clarified the direction to be taken. Among the provisions of this agreement were these: en-route air traffic control facilities should be located in the hardened structure of the nine U. S. SCC's, the boundaries of air traffic control and air defense should be identical, and ADSID would represent USAF and the Bureau of Research and Development would represent FAA in the development of additional plans for integration.*

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* Another part of this integration was joint use, where possible, of air defense and air traffic control radars. A program for such had been underway for some time. In March 1958, the Air Force had advised ADC that it had established as a matter of policy the need for joint use of Air Force and CAA radars and designated ADC as the agency to implement a joint use program. The following September, ADC and CAA formed a Joint Radar Planning Group to carry out this program. Exactly how this JRPG would work with or under ADSID was not made clear as of mid-1959.

The exact and final details of system operation could be developed only through an extensive period of experimentation, evaluation, and testing to find exact capabilities, limitations, and desirable modifications. Initial studies of the joint use of the computer for air traffic and air defense functions indicated the feasibility and desirability of integration.

In the meantime, while studies were under way on joint computer use, it was necessary to make final commitment on two critical areas -- boundaries and buildings -- because of lead times and the difficulty of substantially modifying an underground structure once construction was underway. A building working group reached agreement on building design which was being staffed at USAF and FAA at mid-year.

The boundary alignment working group developed a final plan which was contained in a report dated 30 April 1959. The agreed-upon coincident boundaries were as shown on the SAGE/FAA map on page 22. On 2 July 1959, USAF approved these boundaries for implementation.

ALASKAN NORAD REGION

Alaskan Command issued a new regulation on 30 April 1959 prescribing the organization for air defense of the Alaskan Command and outlining the policies and procedures for exercising operational control of forces made available for air defense of the Alaskan NORAD Region. It continued instructions in previous regulations that CINCAL, as commander of the Alaskan NORAD Region (ANR), was responsible to CINCNORAD for all air defense activities within the region and exercised operational control of all air defense forces made available to him. It also continued the arrangement whereby the Commander Alaskan Air Command exercised operational control for the Commander ANR and conducted the active air defense of ANR.

Among the operational air defense responsibilities of the Commander Alaskan NORAD Region listed by the new regulation were:

a. Responsible to CINCNORAD for all air defense activities within his assigned region.

b. Implements NORAD operations plans and directives and exercises such emergency powers as may be delegated, when so directed by proper authority.

c. Acts as advisor to CINCNORAD on all matters pertaining to air defense operations in his region.

Among the responsibilities assigned by the regulation to Commander Alaskan Air Command were:

a. Exercises, for the CANR, operational control of the Alaskan NORAD Region Air Defense Force.

b. Conducts active air defense of ANR.

c. Provides early warning information to CINCNORAD.

d. Designates the conditions of readiness to be maintained in the ANR, or implements the conditions designated by CANR or higher authority.

e. Provides and maintains facilities as required for the ANRCC.

And the responsibilities listed for the Commander, Alaskan NORAD Division included:

a. Responsible to the Commander, Alaskan NORAD Region or his designated representative for all air defense activities within his assigned sector.

b. Conducts the active air defense of his sector.

c. Provides early warning information to the CANR or CINCNORAD.

d. Exercises operational control of all air defense forces within his NORAD divisional sector.

CHAPTER 3

Collocation of Army-Air Force Facilities

COLLOCATION OF MISSILE MASTER AND AN/GPA-37

Background. Back in 1956, in seeking to achieve centralized control of air defense weapons systems, CONAD saw the necessity of integrating the Army's Missile Master, AN/FSG-1, into the SAGE system. However, SAGE would not be implemented for some time and Missile Master would be available in the near future. Therefore, CONAD saw that the first requirement was integration of Missile Master with the manual system. This would provide early integration of weapons systems and control capability, and provide experience that would be helpful in the later SAGE integration.

In September 1956, CONAD proposed to the JCS the collocation of the Missile Master and the Air Force's AN/GPA-37 in ten areas. The Office of the Secretary of Defense concurred on 30 October 1956. These ten areas, the sites eventually selected for location of the collocated facility, and the radars chosen for the collocated facility (NORAD Control Centers) were as follows:

Defense Area	Facility Site	Radar
New York	Highlands, N.Y. (P-9)	FPS-7
Niagara-Buffalo	Lockport AFS, N.Y. (P-21)	FPS-7
Detroit	Selfridge AFB, Mich. (P-20)	FPS-20
Philadelphia	Gibbsboro-Pedricktown, N. J. (split site) (RP-63)	FPS-20
Chicago	Arlington Hts, Ill. (RP-31)	FPS-20

Defense Area	Facility Site	Radar
Washington-Baltimore	Ft. Meade, Md. (RP-54)	FPS-20
Boston	Ft. Heath, Mass. (MM-1)	ARSR-1A
Pittsburgh	Oakdale, Penn, (RP-62)	ARSR-1A
Seattle	Ft. Lawton, Wash. (RP-1)	ARSR-1A
Los Angeles	Ft. MacArthur-San Pedro Hill (split site) (RP-39)	ARSR-1A

Implementation Schedules and Problem Areas. The original implementation schedues provided to NORAD early in 1958 by USAF ranged from May 1960 for the first site to April 1961 for the last site. NORAD complained that these were much too late and that all ten should be operating by calendar year 1960.

During 1958, as implementation progressed, many improvements were made. And on 30 January 1959, new dates were presented to CINCNORAD by the Joint Collocation Technical Steering Group which showed a considerable speed-up.* The forecast dates for Missile Master/ AN/GPA-37 capability ranged from November 1959 for Fort Lawton (Seattle) to October 1960 for Gibbsboro (Philadelphia). NORAD would have an operational capability at the NCC's when the Missile Master and AN/GPA-37 became operational.

On 6 April 1959, NORAD advised the Army and Air Force that it concurred with these schedules if the JCTSG provided for certain items. These included providing for simultaneous installation of Missile Master and AN/GPA-37 equipment and a manual capability for control of manned interceptors while SAGE was being installed and conversion being made from one system to the other, and assuring

* The JCTSG was formed by the Army and Air Force in July 1957 to support implementation of collocation.

that NORAD would have an automatic data transmission system by timely procurement and installation of automatic data converters. NORAD also asked that continuous action be taken to obtain better construction time for the Air Force operations buildings so as to provide an earlier capability.

Each of these matters had been agreed to and solved or was being worked on by mid-year. As implementation progressed during this six-month period, problem areas and discrepancies arose on various sites as was typical in carrying out a large project with a great many agencies involved.

An example of these problems was a delay in release of construction funds for the Philadelphia site and a resulting delay in installation of the Air Force radar. This was still not settled at mid-year. At the Niagara-Buffalo site, the Missile Master operations building would be completed by August 1959. As things stood at mid-year, the Missile Master contractor, Martin Company, could not begin installation of the equipment until 1 November 1959, thus causing at least a two month delay. For the Detroit site, an independent telephone company was asking for an overly-long period to install the communications which, if the extended time was actually taken, would delay the operations date of the center.

NORAD Control Center Coordinators. On 17 June 1959, the JCTSG briefed the NORAD staff on progress of the NCC's. It was brought out at this meeting that agencies working on the NCC's had indicated that many of the problems at the sites arose because there was insufficient guidance and supervision by one central agency. These agencies had stated that an operational plan and concept for NCC's were essential and a NORAD commander for each site to resolve problems on the spot was required.

In order to rectify this situation, it was recommended that:

a. NORAD assume management direction of the

NORAD Control Center program and assume chairmanship of the JCTSG.

b. A NORAD-approved operational plan for NORAD Control Centers be disseminated to the field commanders as soon as possible.

c. A NORAD commander be designated prior to the operational dates of the NORAD Control Centers.

NORAD agreed and planned to issue an operational plan as soon as possible and to have NCC commanders appointed six months prior to the target date for operational capability of each facility. To handle problems in the meantime, on 14 July 1959, NORAD directed each region in the continental U. S. to appoint a NORAD coordinator for each NCC.

NORAD proposed to Army and Air Force that it assume chairmanship of the JCTSG. Neither concurred, however.

COLLOCATION OF AADCP's AND ADDC's IN THE CONTINENTAL U.S.

Besides collocating ADDC's with Missile Master, NORAD sought to collocate ADDC's with other AADCP's wherever feasible. Consideration of this and preliminary surveys by NORAD were started in 1957. During 1958, a number of conferences were held with USAF ADC and ARADCOM, sites were proposed, and surveys were made. The only actual collocation by the end of 1958, however, was at Geiger Field, Washington. On 15 May 1958, operations of the first NORAD Control Center began at this location.

Collocation of the AADCP at the ADDC's in three other locations was approved, however, and implementation was underway. These were:

ARADCOM Defense	ADDC
Dallas-Fort Worth	Duncanville AFS, Texas

ARADCOM Defense	ADDC
Kansas City	Olathe AFS, Kansas
St Louis	Belleville AFS, Illinois

During 1959, studies and surveys of other sites continued. On 1 July 1959, NORAD issued a statement of policy on the collocation of AADCP's and ADDC's as follows:

a. That the operational functions of the AADCP's and ADDC's be collocated in those areas where at least two years operational benefits could be derived prior to SAGE.

b. That AADCP's and ADDC's not be collocated in those areas where less than two years operational benefits will be derived prior to SAGE.

NORAD provided a list of 20 defenses which it recommended for collocation under this policy. These included the three city defenses listed above. Shortly after this letter was issued, the JCS deleted seven of these sites.

On 22 July 1959, ARADCOM submitted collocation plans for the 13 remaining defenses. Two types of collocation were planned. At eight ADDC's, where the defenses were sufficiently close to the appropriate ADDC for the Army commander to be physically present at the ADDC when necessary, operations personnel and in some cases the complete battalion, were to be permanently stationed. Three of these were the city defenses listed above. At the other five ADDC's, only the necessary operating personnel were to be permanently stationed.

NORAD approved this collocation plan on 3 August 1959.

COLLOCATION AT THULE

CONAD directed USAF ADC and ARADCOM on 2 August

1957 to report on the feasibility of collocating the Thule AADCP and ADDC. ADC recommended collocation in a new facility to be built near Thule AFB, with the radar data remoted from Pinguassuit Mountain. ARADCOM agreed that this was feasible. On 8 October 1957, CONAD approved the ADC recommendation and directed implementation.

The 64th Air Division submitted two plans to ADC, which were forwarded to CONAD on 21 April 1958. The 64th's Plan "A" provided for a collocated AADCP-ADDC. Plan "B" provided for a collocated AADCP-ADDC, plus a joint command post which would include the SAC commander, and operational and administrative space for the SAC wing. CONAD approved Plan B on 30 June 1958 and directed ADC and ARADCOM to implement it.

SAC objected to Plan B on 1 October 1958, stating that because of a planned reduction in SAC activities at Thule, it considered available facilities adequate for its mission. SAC thought Plan A was suitable and would include the items in the FY 1960 MCP.

CONAD concurred, directing on 3 November 1958 that ADC and ARADCOM implement Plan A.

On 7 January 1959, USAF informed SAC that the Thule collocation project, in competition with other high priority Air Force requirements, was not approved for inclusion in the FY 1960 MCP. CONAD sent a reclama to the JCS on 24 February 1959. The USAF decision would seriously impair the operational efficiency of the air defenses in the Thule area, CONAD said.

The JCS referred CONAD's letter to the Air Force. On 1 June 1959, USAF directed ADC to investigate the possibility of modifying an existing on-base facility and any other possible course of action, short of new construction, to fulfill the CONAD requirement.

ADC then asked CONAD for guidance. CONAD replied on 29 June that the collocation of facilities at Thule was still a valid and urgent requirement. CONAD said

it had no objection to using an available building if it could be used for collocation without waiting for the SAC departure. ADC was asked to go ahead with the survey to find a suitable building. CONAD also told SAC that it had no objection to using an existing building, provided that it would make an adequate control center.

SUMMARY OF COLLOCATION PLANS AND STATUS

As planned at mid-1959, within the continental U. S. there were to be 24 collocated facilities. Ten of these would be the collocated Missile Master/ADDC facilities. Operations at the first of these was set for November 1959 and all others within the following year. Thirteen of the total would be at the other collocated AADCP/ADDC sites. Operations at three of these, the city defenses listed previously, were scheduled for late 1959 or early 1960. Dates for the other sites had not been set. Lastly, one NCC had begun operating on 15 May 1958 at Geiger Field, Washington.

Outside the continental U. S., there were to be three collocated centers. Two of these, in Alaska, had become operational -- Fire Island on 1 March 1959 and Murphy Dome on 10 May 1959. The third center was planned for Thule AFB, Greenland.

SAGE-MISSILE MASTER INTEGRATION TESTS

Background. Collocation of Missile Master and AN/GPA-37 was one problem, integration of Missile Master with the SAGE system was another. CONAD's September 1956 proposal for collocation, noted above, also contained a proposal for integration in the SAGE era. The OSD concurrence of 30 October 1956 to collocation of Missile Master and AN/GPA-37 at ten sites also stated that a technical plan for integration of Missile Master in the air defense system, both Manual and SAGE, was being prepared.

A Secretary of Defense memo to the Secretaries of the Army and Air Force, dated 28 January 1957, advised that this technical plan was completed and directed the Air Force to ask CONAD to submit an overall test plan. The purpose of the test was to be a determination of the feasibility and operational desirability for centralized control of AA weapons through economical implementation of SAGE and Missile Master, or some modification thereof, for the more effective use of AA units. CONAD was to monitor the studies, programs, and contract actions and tests outlined in the OSD technical plan. The memo was forwarded to CONAD by the Air Force on 11 March 1957.

A plan for testing SAGE/Missile Master integration was completed by CONAD on 5 September 1957 and sent to the executive agency. DOD approved the plan for implementation in a memo to the Army and Air Force dated 2 May 1958.

NORAD formed a special test group to manage the tests on 24 February 1958. Its membership consisted of a chairman and assistant chairman from NORAD, and one member from USAF ADC, ARADCOM, CONARC and ARDC. CINCNORAD issued a letter of instructions to the group on 4 March 1958 requiring it to undertake immediately the necessary implementing action for the SAGE/Missile Master test program.

It was decided at the first meeting that there would be four categories of tests: (1) Implementation Testing, (2) Experimental Testing, (3) Operational Testing, and (4) Live Fire Testing.

SAGE/Missile Master Implementation Test. The first (Implementation) test was conducted between the SAGE Direction Center at Fort Lee, Virginia, and the Missile Master at Fort Meade, Maryland. It was started on 8 September 1958 and completed on 29 January 1959. The test was designed to provide data for certifying that the inter-connected equipment was technically compatible.

The NORAD report stated that, on the basis of the

findings of the test, "it can be said that the equipments are technically compatible on an integrated systems basis."

The conclusions supporting this finding, as expressed in the report, were as follows:

> (1) reference data originated by SAGE can be transmitted to Missile Master,
> (2) upon receipt Missile Master can process and disseminate this data to designated Fire Units,
> (3) Fire Units can accept and display track and command data,
> (4) repeat back data initiated at the Fire Unit can be received at Missile Master and subsequently processed and transmitted to SAGE with appropriate track and channel information, and
> (5) SAGE can properly receive and process this repeat back data.

The NORAD report also detailed a number of deficiencies uncovered in the interconnected operation of the two systems.

The report also contained the comments of appropriate Army and Air Force agencies involved. Important among these were the ARADCOM comments which stated a disagreement with certain of the conclusions. In regard to the conclusion of technical compatibility, ARADCOM commented that this:

> draws only technical conclusions and in so doing leaves the impression that except for some matters the SAGE Missile Master systems can operate together effectively. This, in fact, is not the case. While the Ft Lee/Ft Meade complex represents a vast improvement over the manual system, it is a far cry from being an adequate air defense capability.

On the other hand, USAF ADC concurred with the NORAD report.

On 2 July 1959, CINCNORAD submitted the report, including the ARADCOM, ADC, and other agency comments, to the Secretary of Defense for approval. The letter accompanying the report restated the basic conclusion that: "Based on the test results, it is concluded that these systems are compatible." It also stated that CINCNORAD concurred in the report as written.

CHAPTER 4

The Surveillance System

STATUS

On 30 June 1959, the operational land-based portion of NORAD's surveillance system (excluding the DEW Line and extensions and Mid-Canada Line) consisted of 186 heavy and 89 gap filler radars. Thirty-five of the heavy radars and six gap fillers were in Canada. Alaska had 18 heavy radars and the U. S. had 132 heavy and 83 gap filler radars. The remaining heavy radar was at Thule, Greenland. Augmentation radar was reported available to NORAD in an emergency in four Navy units, two ANG AC&W Squadrons, two Air Training Command fighter wings, two Tactical Air Command AC&W squadrons, and one ARDC Test Group.

In addition to these land-based sites, NORAD forces operated ten picket ship stations (Five off each coast), seven AEW&C stations (four off the West Coast and three off the East Coast) and one airship station and three Texas Towers off the East Coast. Supporting NORAD also were nine picket ship stations (four in the Atlantic and five in the Pacific) and eight aircraft stations in sea barriers (four in each barrier) operated by the Navy as extensions to the DEW Line.

The DEW Line, less its extensions, was a line of 57 radar stations extending from Cape Dyer, Baffin Island, to Cape Lisburne, Alaska. The Aleutian Extension, which became operational during the first six months of 1959, contained an additional six stations. Further south, the Mid-Canada Line had 90 doppler detection and eight section control stations.

Disregard RJ Joint Inventory

37-39 (Revised) too close to current capability

TABLE I

THE SURVEILLANCE NETWORK
30 June 1959

PROGRAM	PROG SITES	OPRL SITES	OPERATIONAL PRIME SEARCH	
			Equipment	No.
Permanent (P-sites)	74	74	CPS-6B/FPS-10	24
			MPS-7/FPS-3	15
			FPS-20	35
1st Ph Mobile (M-sites)	31	31	MPS-11/FPS-8	10
			MPS-7/FPS-3	8
			FPS-20	13
2nd Ph Mobile (SM-sites)	20	16	MPS-11/FPS-8	5
			MPS-7/FPS-3	6
			FPS-20	5
3d Ph Mobile (TM-sites)	21	13	FPS-3	8
			FPS-20	5
ZI Gap Fillers	236	83	FPS-14	58
			FPS-18	25
Pinetree (USAF Funded)	22	22	FPS-3	14
			FPS-20	3
			CPS-6B	5
Pinetree (RCAF Funded)	10	10	FPS-3	7
			CPS-6B	2
			FPS-502	1
CADIN Heavy Radars	7	0		
CADIN Gap Fillers	45	0		
Thule Greenland	1	1	FPS-20	1

PROGRAM	PROG SITES	OPRL SITES	OPERATIONAL PRIME SEARCH	
			Equipment	No.
Alaska	20	18	FPS-20 FPS-3/3A's FPS-8	11 3 4
Texas Towers	3	3	FPS-20	3
East Coast AEW&Con Stations	5	3	AN/APS-20	
West Coast	5	4		
East Coast Picket Ship Sta	5	5	AN/SPS-17 or 28	
West Coast	5	5		
AEW Airships East Coast	1	1	AN/APS-20E	
DEW Line	57	57	FPS-23 FPS-19	57 29
Aleutian DEW Extension	6	6	FPS-19	6
Greenland DEW Extension	4	0		
Mid-Canada Line	90	90	Doppler Detection Equipment	
	3	3	Surveillance Radars at Section Control Stations	
Atlantic Barrier	4 DER's and 4 AEW aircraft operating between Argentia and the Azores			
Pacific Barrier	5 DER's and an average of 4.5 AEW aircraft operating between Umnak and Midway Island			

INTEGRATION OF AN/FPS-36 RADARS

In October 1957, ARADCOM proposed to relocate some of its AN/FPS-36's so as to get better coverage against low altitude targets. CINCNORAD replied that they should be used in places recommended by the Army, but also that they should be placed where they would contribute to the overall surveillance system. NORAD issued guidance in June 1958 for the location of FPS-36's and integration into the system. Among the provisions: FPS-36's would be sited to temporarily fill gaps in the surveillance system and when USAF ADC radar covered the gaps, the FPS-36's would be withdrawn; other FPS-36's might be required to assist Nike acquisition radar but not augment the system; and FPS-36 back-up capability might be kept for Nike defenses, if feasible, within the resources allocated to ARADCOM, after the programmed surveillance system was completed.

By the end of 1958, NORAD had approved integration of these radars into the NORAD system at 14 locations, two of which were in Canada. However, on 13 March 1959, NORAD rescinded its approval of the two Canadian sites (Hamilton, Ontario, and Grand Falls, New Brunswick), in favor of recommending to Canada that installation of gap fillers be expedited.

In the meantime, study was being made of additional FPS-36 sites in the U. S. and by 30 June 1959, NORAD had approved an additional eleven sites for integration, bringing the total to 23.

Nine of the radars were already properly located and could be integrated immediately:

Site	Location
CM-1	Argyle, Wisc.
CM-2	Dixon, Ill.
CM-3	Wenona, Ill.
CM-4	Rosseville, Ill.

Site	Location
CM-5	Bunker Hill, Ind.
CM-8	Tisch Mills, Wisc.
CM-9	Ludington, Mich.
CM-10	Princeton, Wisc.
CL-4	Erie Ordnance Depot, Ohio

The remaining 14 were to be relocated.

NB-1	Barker, N. Y.
CL-2	Widowville, Ohio
E-1	Terry Peak, So. Dak.
E-2	Parker Peak, So. Dak.
L-1	Indio, Calif.
NY-6	High Point State Park, N. J.
WB-2	Hanging Rock, W. Va.
PI-2	Round Mountain, Pa.
PI-3	Uniontown, Pa.
D-3	Lansing, Mich.
D-4	Morenci, Mich.
SF-1	Point Reyes, Calif.
SF-3	Fort Ord, Calif.
H-3	Okanogan, Wash.

While NORAD and the components were evaluating the sites, ARADCOM told NORAD that it had learned informally from DA that funding for the re-location program had run into a snag. ARADCOM stated that it had received information that all funds for support of the relocation program and for FPS-36's at five new city defenses were being deleted from the FY-1960 Budget Execution Program because of a lack of support by the Bureau of the Budget. Further, it pointed out that DA had requested funds and was attempting to justify 22 FPS-36 sites, one for each of the SAC base defenses, and that there was no indication that this request would receive favorable consideration.

On 1 May 1959, NORAD asked the JCS to support the FPS-36 relocation program. NORAD explained its integration program and stated that some of the radars had to

be moved to avoid duplicating coverage from Air Force radars and to provide optimum coverage.

In Alaska, on 4 December 1958, the decision was made to install one AN/FPS-36 radar at Nike site "Jig" in the Fairbanks area. It was felt that this radar would substantially improve low altitude coverage for this area.

ALASKAN RADAR

Improvement Program. All 18 radar stations in Alaska were to be converted to the AN/FPS-20 (either by modification of existing radar or installation of an AN/FPS-20). This program was planned in two phases. The first phase, conversion of 11 of the sites, was completed by 8 May 1959. At that time, three of the remaining sites were operating FPS-8's and four were operating FPS-3's. These seven were to be converted to FPS-20's in the second phase by 1961.

Gulkana Radar. In 1958, CINCAL proposed adding a radar (an AN/FPS-8) at Gulkana to fill a gap in coverage in the area east of Anchorage. NORAD concurred in this.

Alaskan Air Command then submitted it to USAF for emergency programming. USAF turned down the emergency action, but said that it had approved it for funding in the FY 1960 MCP. This would produce an operational date in the second quarter of FY 1961, USAF stated.

CINCAL followed up with a protest to NORAD that this date was unsatisfactory. NORAD wrote to USAF on 12 March 1959 that it agreed with CINCAL and recommended construction and installation during the 1959 construction season. USAF replied on 11 April 1959 that it would not change its position.

CANADIAN RADAR

Comox Radar. Early in 1959, RCAF ADC changed the

role of its radar at Comox, C-35, from a direction center to a gap filler. Then on 18 June 1959, Northern NORAD Region asked NORAD's permission to drop the gap filler role and give the Comox radar the mission of approach control and recovery. NNR said that Comox did not provide low altitude coverage of sufficient quality to warrant continuing this function.

On 7 July 1959, NORAD approved the change. However, NORAD said that a capability had to be maintained at Comox to provide low altitude coverage.

CADIN Gap Fillers for Nike Defenses. Upon reviewing its surveillance requirements for Nike defenses, ARADCOM had found that there was insufficient low-altitude coverage around the Loring and the Niagara-Buffalo defenses. ARADCOM had proposed deploying AN/FPS-36's to these areas. NORAD had first approved this and then later rescinded its approval. NORAD proposed instead that there be a speed-up in the installation of certain gap fillers programmed for Canada under the Continental Air Defense Integration North program (see Chapter Five), which could provide coverage for these areas.

On 27 April 1959, NORAD asked USAF ADC to establish a high priority for four CADIN gap fillers which, currently, were not to come in until 1962. The sites were: P-20F, London, Ontario; C-4-C, Brampton, Ontario; C-5-C, Mt Carleton, New Brunswick; and C-6-D, Les Etroits, Quebec.

ADC requested the Air Defense Systems Integration Division to make a study of the program, covering cost, construction time, and availability of equipment.

RCAF, which had been informed of the NORAD proposal, replied on 28 May 1959 that the CADIN gap filler schedule was based on the assumption, agreed to at an ADSID meeting on 16 April 1959, that gap fillers would not be required in any environment other than the Super Combat Center complex. RCAF said it would wait for the ADSID study initiated by USAF ADC before giving a final answer to the NORAD proposal.

NORAD REQUIREMENT FOR OVER-THE-HORIZON RADAR

NORAD had included a requirement for a long-range, land-based, over-the-horizon radar to extend the contiguous ground environment outward from the periphery of the main North American target areas in its requirements plan, North American Air Defense Objectives 59-69 (NADO 59-69). On 12 March 1959, NORAD re-emphasized its requirement for such a radar to the JCS and advised of NORAD's interest in equipment under development by the Naval Research Laboratories. This was Project MADRE (Magnetic Drum Radar Equipment).

NORAD said that although MADRE would not have the precise data capability for employing BOMARC, as would a follow-on AEW&C aircraft, it would provide information of sufficient accuracy to permit employment of the F-108 interceptor at its maximum range and also provide a significant increase to the depth of the combat zone. NORAD added that the alternative to MADRE was more AEW&C aircraft which would cost more than the MADRE project. NORAD recommended that sufficient funds be provided to determine the capabilities of MADRE.

On 16 April 1959, the CNO advised NORAD that funds had been requested to complete development of Project MADRE prototype equipment.

NIKE HERCULES IMPROVEMENT PROGRAM

Department of the Army wanted certain improvements in the basic Nike Hercules system. These included: (1) a new, long-range, high-powered L-band acquisition radar (HIPAR); (2) a new Ku-band, range-only radar; (3) improvements to the target tracking radar to give increased capability against small targets; and (4) changes in the operating consoles.

The improvements were expected to provide the Hercules system with a capability against small, high-speed targets of the Rascal and Hound Dog type and to enable the Hercules to work in a "heavy" ECM environment. The

improvements were to be provided in retrofit improvement kits.

When asked by DA for recommendations on the minimum number of improvement kits needed, ARADCOM stated that it wanted 79 complete kits, 17 kits less the HIPAR, and sufficient communications for the latter 17 so that they could receive HIPAR data.

CONAD would not concur in the ARADCOM requirements because of reservations it held on potential mutual radar interference of the HIPAR with the Air Force Frequency Diversity (FD) program and on the quantities proposed. CONAD stated that it was in favor of improving the Hercules, but it felt that much of the improvement could be met within the approved FD program. Further, it felt that any requirement for Army HIPAR radars should be determined only after a site-by-site survey to show just where the FD program would not meet the Hercules surveillance requirements. This position was forwarded to the JCS and DA in the latter part of 1958.

DA replied that it felt that the duplication and interference problems brought up by CONAD were over-emphasized. It agreed, however, that a need existed for a detailed site survey to determine requirements. WSEG was directed by OSD to study the questions of interference between the Army HIPAR and the Air Force FD program and the feasibility of using remoted data from Air Force radars for Hercules acquisition purposes.

On 24 February, WSEG published its first report on the radar requirements for the Hercules system. It concluded that the HIPAR's would not introduce significant interference problems. It stated further that in some cases remoting radar data would support full exploitation of the improved Hercules system, but in others it would not. Before it could be decided where the HIPAR could be omitted from the kits and where new acquisition radars were needed, a detailed site-by-site survey should be conducted.

ARADCOM had, in the meantime, prepared a new

statement of requirements for the improvement kits. This new list proposed kits for batteries around 22 SAC bases, adding 44 kits. The ARADCOM requirement, forwarded to NORAD on 4 March 1959, was for kits for a total of 140 batteries. Of these, it wanted 97 complete (HIPAR included) kits and 43 partial kits. For FY 1960 procurement, it wanted 36 of the 97 complete kits.

On 17 March 1959, NORAD forwarded the ARADCOM list to the JCS stating that it would not concur in the specific number of kits proposed or the battery sites to be modified. NORAD said it would not commit itself to the program until a site-by-site study was conducted.

NORAD recommended that: (1) DA initiate production of the improvement kits with funds programmed in the Army FY 1960 budget; (2) a competent agency under the control of, or contracted by, the DOD conduct a site-by-site study; (3) the long-term total number of kits required and the specific batteries to receive complete kits be determined as a result of the site-by-site study; and (4) no diversion or reduction of funds be made from the already approved Air Force FD radar program.

ADC would not coordinate on NORAD's position. It contended that NORAD had assigned it the responsibility for providing the primary electronic environment for the air defense system and that a more thorough and cautious consideration of the improvement program was needed. ADC asked that NORAD consider all aspects of the program, rather than limited technical features.

On 20 April 1959, WSEG published a second report on acquisition radar requirements for the improved Hercules system. It repeated that no significant problems of mutual interference between HIPAR's and FD radars would result from any practical deployment of the radars. It recommended that a feasibility study be conducted for remoting corrected acquisition data to the Nike batteries by modifying the existing system and that other equipment for remoting be investigated.

On 12 May 1959, the JCS directed CINCNORAD to conduct a joint site-by-site survey of Nike Hercules fire units to determine the total number of improvement kits required and the specific batteries to be improved. NORAD in turn directed ADC and ARADCOM to appoint representatives to a study group to participate in the site evaluations. The first meeting was set for 31 July 1959.

PROPOSED RELOCATION OF AEW AIRSHIP SQUADRON

On 2 February 1959, ENR proposed to NORAD the relocation of the Navy's Airship Airborne Early Warning Squadron One (ZW-1) from Lakehurst, New Jersey, to Glynco, Naval Air Station, Georgia. It pointed out that the ZW-1, in operating from Lakehurst, was located some 400 miles from the primary airborne contiguous stations and could not be used to man any of these. Instead, ZW-1 was manning, on alternate days, a station inside of the picket barrier which was part of the emergency stations to be manned only upon the declaration of a Maximum Readiness (Air Defense Emergency) condition. ENR proposed that ZW-1 man a station just south of the picket line. This station was about 250 miles out from Glynco.

NORAD replied that movement to Glynco did not appear to be a valid operational requirement because in all probability Sentinel aircraft when reequipped with newer radar would cover the proposed airship station and require further relocation.

ENR felt that the move could be justified. It pointed out that of all the deployment concepts that had been seriously considered, none had indicated a need for the airship station at Lakehurst. ENR concluded that there was a valid operational requirement to move the squadron to Glynco to provide coverage for the 32d Division area and that such coverage would be used at least through the period 1959-1963.

On 19 May 1959, at a seaward extension conference held at Headquarters NORAD to examine the numerous

problems, it was proposed that two of ENR's picket ships be moved to Western NORAD Region. NORAD proposed substituting the airship squadron for the picket vessels. The factors favoring this proposal were (1) the existing airship station provided radar coverage that was duplicated by other facilities; (2) overcrowded conditions at Lakehurst would require either new construction there or movement to some other location; (3) the San Diego area offered a more suitable environment for airship operations; and (4) the CNO decision on whether to deploy airships or picket vessels would be based mainly on the costs involved.

On 30 June 1959, NORAD told ENR that war-gaming exercises conducted at NORAD Headquarters indicated a lack of off-shore radar coverage from Los Angeles southward. And on 14 July, NORAD asked the CNO to consider moving the airships, based on the factors discussed at the 19 May conference.

WESTERN DEW EXTENSION AND THE PACIFIC BARRIER

Pacific Barrier. The extension of early warning coverage in the Pacific was based on a plan that called for land-based radars along the Aleutian Chain from Naknek to Umnak and with a sea barrier of WV-2 aircraft and DER's from Umnak to Midway Island.

On 31 December 1958, the sea barrier was operating in a so-called "Bent Line" rather than directly between Midway and Umnak. This deployment was being used because the Aleutian land-based radars were not operating and some method was needed to cover the exposed area.

On 5 April 1959, NORAD was informed that the barrier force had been reoriented effective 0001Z 1 April 1959 between Midway and Umnak. The line between the two locations covered some 2,840 miles. There were five DER stations along the line, each with a circle one-hundred miles in radius. Within each station was a circular patrol area thirty miles in radius. The ships were to leave Pearl Harbor and proceed to the northernmost station. Then at stated times, they were to work their way

down the line to each succeeding station from north to south and finally leave the southernmost station for Pearl Harbor. The aircraft operated from Midway and flew the 2,840 mile track in approximately 14½ hours.

The Aleutian Chain. On 5 January 1959, the Aleutian land-based segment began limited operations. It was manned and operated at that time primarily by personnel of Western Electric Corporation. During the months of January, February, and March, Air Force personnel were gradually brought in and assumed control of the line.

The land-based segment had a total of six AN/FPS-19 radar stations between Nikolski on the west and King Salmon on the east. This total included one Main station at Cold Bay and five lateral auxiliary stations (Driftwood Bay, Sarichef, Nikolski, Port Moller, and Port Heiden).

On 2 April, AAC informed NORAD that the Aleutian Segment began full operations within the Alaskan NORAD Region as of 0001Z, 1 April 1959.

PROPOSAL TO ABANDON THE SEA BARRIERS

In September 1958, the JCS asked CINCONAD, CINCLANT, CINCPAC and WSEG to comment on a proposal for improving the early warning system with particular emphasis on abandoning the seaward extensions of the DEW Line and using the resources in the contiguous system.

CONAD had replied that it was in favor of redeploying the barrier forces to augment the contiguous system. It felt that distant early warning against manned bombers would become less important when the ballistic missile threat became equal to or greater than the manned bomber threat. At that time, the resources of the sea barriers would be best employed in the contiguous system.

CINCLANT, WSEG and CINCPAC did not concur in

redeploying the seaward extensions. They stated that there would continue to be a requirement for distant early warning of manned bombers at least for the "foreseeable future."

On 4 May 1959, the JCS informed CONAD that it had been decided that: (1) the seaward barriers would not be reoriented into the contiguous radar coverage "at this time," (2) when the Greenland-Iceland-United Kingdom line became operational the requirement for maintaining the Argentia-Azores barrier would be re-evaluated; and (3) improvement and new developments recommended in the basic study would be incorporated into the early warning systems as feasible.

CHAPTER 5

NORAD Weapon Force

STATUS

On 1 July 1959, there were available to NORAD, 68 fighter-interceptor squadrons, 256 Nike missile batteries, and six 75mm Skysweeper batteries. In addition, there was an augmentation force that consisted of 117 aircraft squadrons, or their equivalents, with 2,665 aircraft, and aircraft of six training wings (three owned by ATC and three by TAC) possessing 965 aircraft.

TABLE 2

THE WEAPONS STRUCTURE - 1 JULY 1959

INTERCEPTORS	
NUMBER OF UNITS	EQUIPMENT
26 Sqdns	F-102A
4 Sqdns	F-101B
4 Sqdns	F-104A/B
11 Sqdns	F-89J
7 Sqdns	F-86L
9 Sqdns	CF-100
2 Sqdns	F-106A(F-102A)
1 Sqdn	F-101B(F-89J)
1 Sqdn	F-101B(F-86L)
1 Sqdn	F-106A(F-86L)
1 Sqdn	F-89J(F-89H)
1 Sqdn	F-4D
68 Sqdns TOTAL	

MISSILES/GUNS	
202 Batteries	Nike Ajax
54 Batteries	Nike Hercules
256 TOTAL	

MISSILES/GUNS	
NUMBER OF UNITS	EQUIPMENT
6 Batteries	75mm guns (Skysweeper)

TABLE 3

AUGMENTATION FORCE - 17 JUNE 1959

OWNING AGENCY	NUMBER OF UNITS	EQUIPMENT
ANG	65 Sqdns	F-84F F-86A/D/E/F/H/L F-89B/H F-100A/F F-94C
Navy/Marine Corps	29 Sqdns (Approximate)	F-4D-1 F11F F3H-2 FJ's F8U/1 F9F
TAC	22 Sqdns (Tactical fighters)	F-100C/D/F F-105B F-86F F-84F
RCAF ADC	1 Sqdn	F-86 Sabre
ATC	3 Wings (Training aircraft)	F-86L F-89D
TAC	3 Wings (Training aircraft)	F-100A/C/D/F F-86F F-84F

REGULAR FIGHTER-INTERCEPTOR FORCE

USAF ADC. As of 31 December 1958, USAF ADC had 60 fighter-interceptor squadrons. Four of these were

inactivated by or on 1 July 1959, leaving 56. One of the remaining squadrons was more like an augmentation unit than a part of the regular force, however. It was not standing alert and was available only for emergencies. This was the 49th FIS at L. G. Hanscom Field, Massachusetts, which, at USAF's direction, was supporting an ARDC-Lincoln Laboratory project and was carried in the ADC inventory as an overage.

The peculiar status of this squadron and the inactivation of two others was related to a USAF-directed budget cut in ADC funds. ADC had set a requirement for 463 million dollars in its FY-1960 O&M Financial Plan. USAF had directed a reduction to 409 millions. As one of the ways to meet this ceiling, ADC proposed inactivating certain F-86L squadrons. On 22 May 1959, USAF approved the inactivation of three: the 49th; the 85th at Scott AFB, Illinois; and the 330th at Stewart AFB, New York. ADC then asked NORAD to lift the alert requirement from these squadrons as of 1 June 1959. NORAD approved this request on 29 May.

On 1 July 1959, two of the three squadrons -- the 85th and the 330th -- were inactivated. The 49th was left as an overage in the ADC inventory, as noted above.

Two other squadrons were inactivated also in separate actions. One, the 484th at K. I. Sawyer Airport, Michigan, was inactivated on 16 February 1959. The other, the 518th at Kingsley Field, Oregon, was inactivated on 1 July 1959. Neither had crews or aircraft at the time of their inactivation.

RCAF ADC Program. Until late 1958, the RCAF had been planning to replace its CF-100's with an aircraft being developed -- the CF-105 "Arrow." On 23 September 1958, Canada's Prime Minister, John Diefenbaker, announced that Canada would not put the CF-105 into production. It would continue the development program until about March 1959, at which time the program would be reviewed and a final decision made.

On 20 February 1959, the Prime Minister announced to the House of Commons that the government had carefully

examined and re-examined the probable need for the CF-105 and had decided that development should be "terminated now." He stated further that formal notice of termination was being given to the contractors. He told the Commons that the government had made no decision to acquire other aircraft to replace the CF-100 which was still considered an effective weapon against the manned bomber threat. He stated, however, that various alternatives for improving Canadian defenses were under study.*

Alaskan Program. In 1958, Commander-in-Chief, Alaska, learned that USAF planned to replace the Alaskan F-89J squadron (the 449th) with F-101B's in FY-1962. The remaining Alaskan squadron, the 317th, would keep its F-102A's. CINCAL did not like the program and proposed that both squadrons be re-equipped with F-106A aircraft in FY-1962. By having one type aircraft, support and training would be simplified. USAF would not agree to this proposal, however.

In July 1958, CINCAL learned that F-101B's would be available earlier, by the fourth quarter of FY-1961, than expected. CINCAL then asked USAF to consider a new proposal. He pointed out that his main concern was obtaining two squadrons of the same type aircraft having an atomic capability at the earliest possible date. He stated that his original choice of the F-106A over the F-101B had been based on what he considered superior performance and the comparative availability of both types of aircraft. However, because he had found that the availability date of the F-101B had been improved, he wanted USAF to replace the F-89J's with F-101B's during the fourth quarter of FY-1959, or as soon thereafter as possible, and convert the F-102A squadron to F-101B's the following quarter. However, he asked that he be given F-106A's if the F-101B's were not available at the time wanted.

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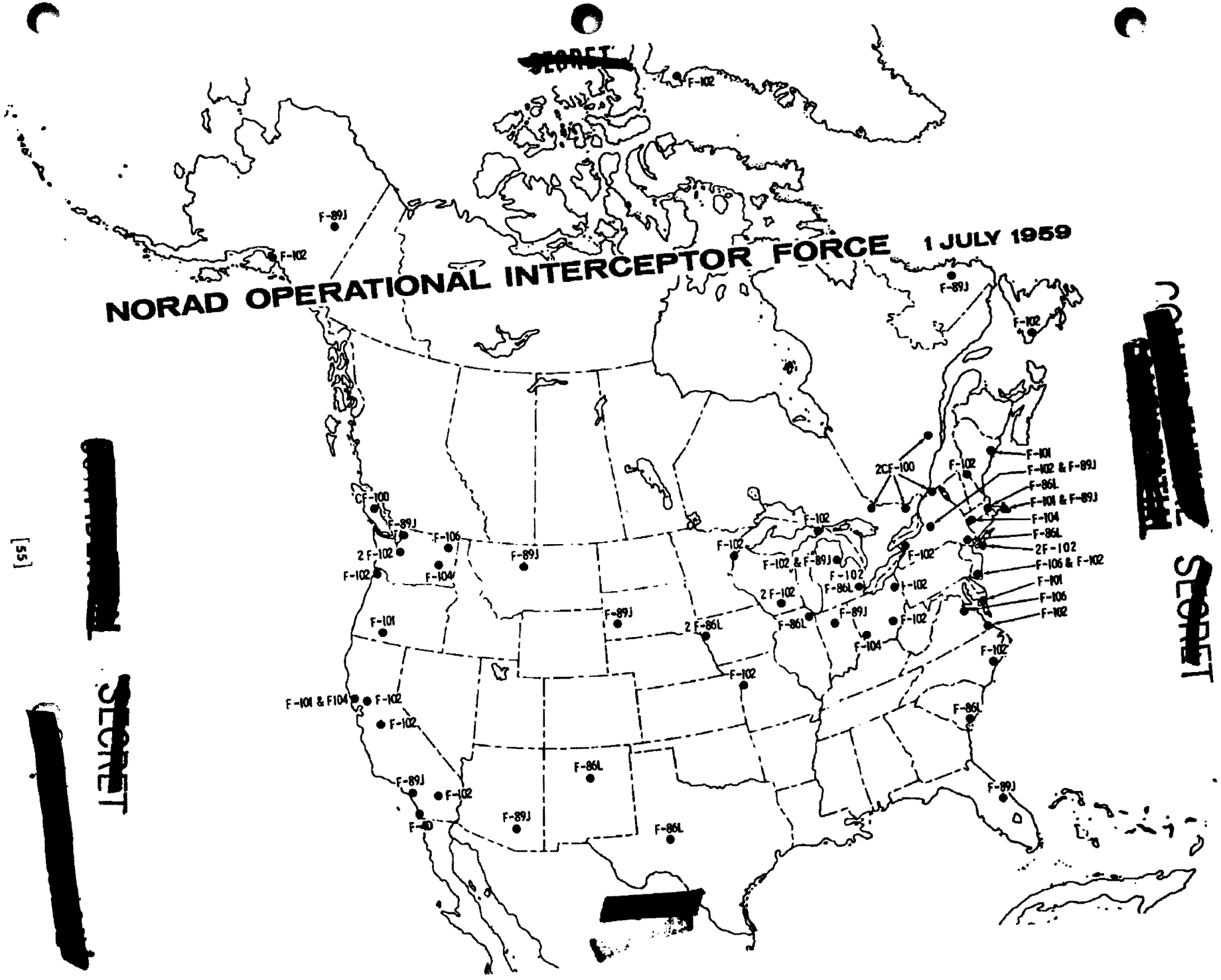
* See the CADIN Program, this chapter.


SECRET
NORAD OPERATIONAL INTERCEPTOR FORCE 1 JULY 1959
F-89J
F-102
CF-100
F-106
2 F-102
F-104
F-101
F-101 & F104
F-40
F-86L
2 F-86L
2CF-100
F-101
F-102 & F-89J
F-86L
F-101 & F-89J
F-104
2F-102
F-106 & F-102
F-106
2 F-86L
SECRET
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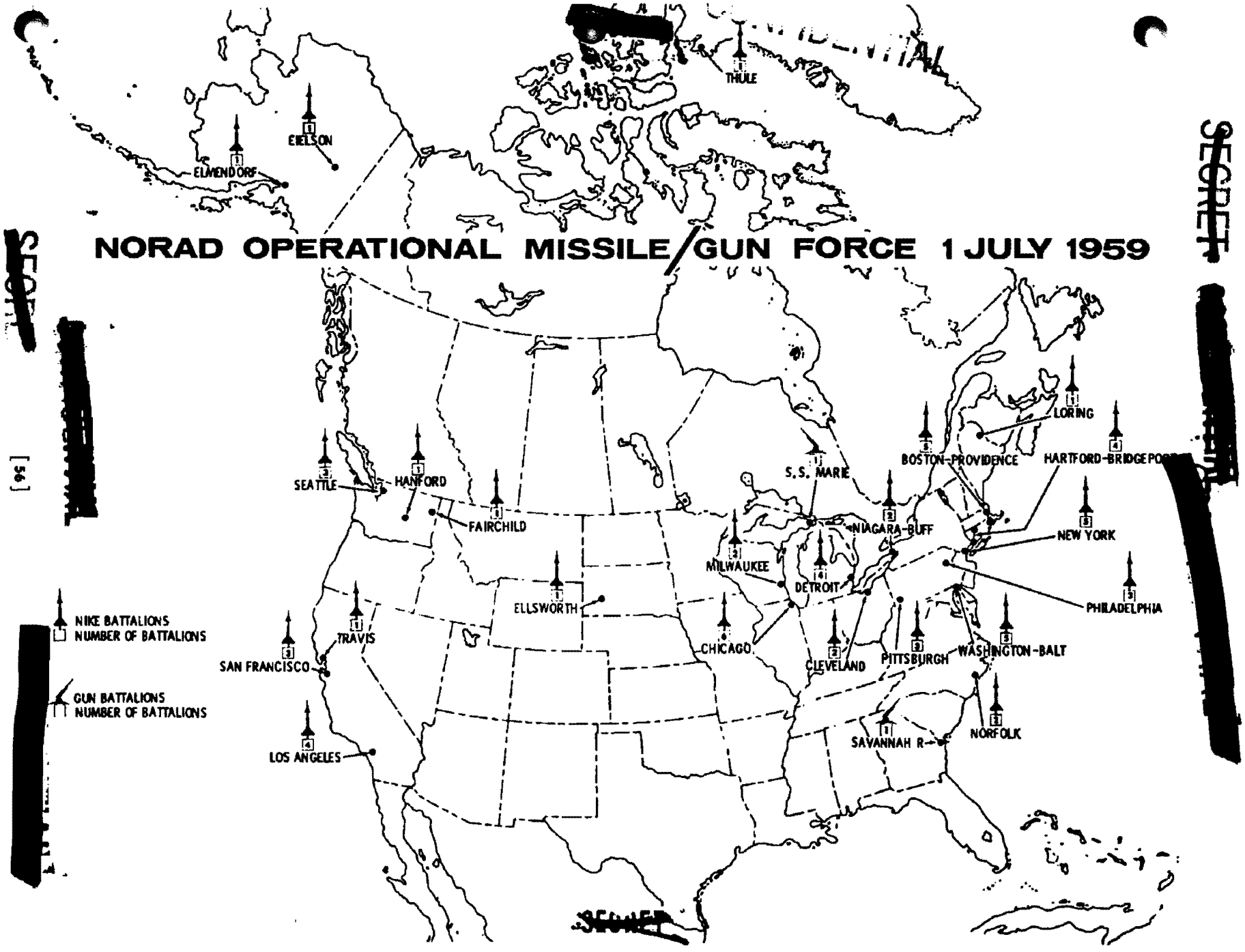
NORAD OPERATIONAL MISSILE/GUN FORCE 1 JULY 1959



Air Force replied that a squadron of F-101B's would arrive in the first quarter of FY-1961 and that the UE strength would be only 18 aircraft. A second squadron of F-101B's, to replace the F-102A squadron, could not be provided. But USAF planned to provide the F-102A squadron with a GAR-11 atomic capability by the fourth quarter of FY-1961.

On 11 March 1959, CONAD asked USAF for current programming data. USAF replied that 18 F-101B's would be sent to Ladd AFB beginning the fourth quarter of FY-1960.

In June 1959, CINCAL approached NORAD with a new idea on his aircraft program. He wanted to know how NORAD felt about F-102 modifications, such as improved engines, slotted wings, and providing additional internal fuel. These modifications, CINCAL continued, plus those already programmed (i.e., extended range radar and missile bay modernization to accommodate the atomic capable GAR-11) would satisfy Alaskan interceptor requirements through FY-1964, if augmentation to the planned F-101B squadron was not approved.

NORAD replied that an evaluation of the F-102 modernization program would be required before NORAD committed itself. USAF ADC, it continued, would request ARDC to make a study which would provide complete performance evaluation as well as cost information.

NORAD stated that its position on all improvements to air defense systems was that expensive improvements, which provided only marginal increase in effectiveness, would not be supported. If the F-102 modernization program fell within this category, it would not be supported.

THE MISSILE/GUN FORCE

General. The 256 operational Nike units on 1 July 1959 represented an increase of 11 fire units over the 245 operational on 31 December 1958. This figure by itself was not indicative of the change to the Nike force, however.

On 31 December 1958, 236 of the 245 batteries were Nike Ajax units. The other nine were Hercules, eight of which were in the continental U. S. and one was at Thule, Greenland. The 256 total on 1 July 1959 included 54 Hercules units or a gain of 45 Hercules batteries. Eleven of the 45 batteries were new units: three at Thule and eight in Alaska (see below). The remaining 34 were converted Ajax units.

Another change made to the Nike force during the first six months of 1959 was in manning of Ajax batteries by National Guard personnel. By 31 December 1958, only one National Guard unit -- the 720th -- had assumed its role in the active defense. This unit had assumed an operational mission in the Los Angeles defense on 12 September 1958. On 24 June 1959, an additional two National Guard battalions assumed an operational role. On this date, the 2nd and 3d Battalions of the 205th Artillery, began operating two Ajax batteries each (the equivalent of one battalion) in the Seattle defense.

On 31 December 1958, there were also five operational gun battalions: two in Alaska (120mm), two in the U. S. (75mm), and one (90mm) in Greenland. By 1 July 1959, three of these gun battalions had been inactivated leaving only two operational Skysweeper (75mm) units. One was at Sault Ste Marie, the other at Savannah River.

Greenland. ARADCOM had kept four 90mm gun batteries (one battalion) at Thule to augment the 4th Missile Battalion (Nike Hercules), 55th Artillery, during the transition from guns to missiles. As of 31 December 1958, only one of the four Hercules batteries -- "B" -- was operational.

A second Nike battery ("A") became operational on 5 January 1959. These two were followed by "D" and "C" batteries on 7 and 9 February respectively. On 28 March 1959, the guns were inactivated.

Alaskan Hercules Defense. On 31 December 1958,

Alaska had two 120mm gun battalions (less one battery) operating in its defenses. Both battalions were to be replaced by Nike Hercules units. To prepare for the arrival of the Nike unit, USARAL relieved one battery of the 96th Gun Battalion in the Elmendorf defense from its active defense mission on 30 September 1958. The battery was to be used in preparing the Nike sites in the Elmendorf area.

Nine Hercules batteries were programmed -- four for Elmendorf and five for Eielson. The units, with the exception of the fifth battery for Eielson, were expected to become operational by June 1959. This schedule was met. Eight of the nine had become operational by June and the two gun battalions had been inactivated. The fifth battery planned for the Eielson area was expected to become operational in March 1960.

TABLE 4

ALASKAN HERCULES

ELMENDORF AREA (4th Missile Battalion, 43 Artillery)		
SITE NO/NAME	BATTERY	OPERATIONAL DATE
6W/Point West	"A"-One half of a double battery	1800Z, 12 Mar 1959
6S/Point South	"A"-Second half of the double battery	0300Z, 10 Apr 1959
90/Bay	"C"	2000Z, 16 Apr 1959
15/Summit	"D"	2300Z, 6 May 1959
EIELSON AREA (2nd Missile Battalion, 562d Artillery)		
24/Tare	"A"	1800Z, 10 May 1959

EIELSON AREA
(2nd Missile Battalion, 562d Artillery)

SITE NO/NAME	BATTERY	OPERATIONAL DATE
21/Jig	"D"	1800Z, 11 May 1959
23/Peter	"B"	1800Z, 27 May 1959
22/Mike	"C"	1800Z, 3 Jun 1959

On 15 March 1959, the 120mm gun batteries in the Elmendorf area were declared non-operational and began turning in their guns and equipment. This had been completed by 11 April 1959. The 120mm guns in the Eielson area were declared non-operational on 11 May 1959, the same date that the first Hercules unit became operational.

AUGMENTATION FORCES

On 5 February 1959, NORAD directed the regions to review the capabilities, roles and mission of all designated augmentation forces to determine future requirements. NORAD stated that after the review was completed, it would prepare an augmentation operations plan.

NORAD told the regions to place the augmentation forces into one of three categories and outlined detailed criteria for each. In general, these criteria were that Category I units had to (1) meet the altitude, range and armament requirements of the Regular air defense forces, (2) be capable of reacting and assuming defense positions the same as the Regular force, and (3) have enough trained personnel available to maintain sustained 24-hour operation. Category II units were those which were not quite eligible for Category I, but still did not fall into the criteria of Category III. Units failing to qualify as either Category I or II were placed automatically in Category III and were not to be assigned an air defense augmentation mission.

Units were Category III if (1) they were so dispersed that they could not assume a defense position until D plus 4 hours after mobilization, (2) they could not maintain 24-hour operations because of insufficient trained personnel, (3) ammunition storage facilities or ammunition was not available, and (4) due to location, type of equipment, or level of proficiency of its members, the unit might impede air defense operations.

Review results were furnished NORAD by April 1959. However, the reviews were incomplete in that the regions failed to consider all designated augmentation forces while making the survey. The reviews pointed up one fact. The regions wanted to keep as many of the augmentation forces in Categories I and II (i.e., to be retained) as possible. Of all the aircraft units considered, only six were recommended for removal from the force structure (i.e., Category III). Also recommended for removal were seven radar squadrons/units and one missile battalion.*

Shortly after the review was finished, NORAD forwarded its proposed operation plan to the regions and components for their comments. The regions were told to check the force annexes (developed from their reviews) and to classify interceptor units as either "Ready" (i.e., those that could be effectively controlled) or "Back-up." NORAD stated that in deciding which classification to use, the regions should follow criteria similiar to that laid down for their reviews. In addition, they were given the additional criteria that (1) the war would be of short duration (24-48 hours), (2) the number of augmentation fighters that could be used effectively in the time period specified had to be based on the control capability within an area, and (3) the number of augmentation fighters listed in the annexes far exceeded the number that could be properly used.

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* It was possible, however, that this missile battalion would be placed in Category I. This depended upon approval of a plan for its use.

Reception of the plan varied. ADC was of the opinion that the plan was a duplication of its efforts. It stated that it felt that detailed planning for the preparation and support of augmentation forces should be a component task. ALCOM concurred in the plan. ARADCOM suggested minor changes but in general approved the plan. NAVFORCONAD re-wrote the section pertaining to its forces. On 30 June 1959, the plan was still being worked on.

Meanwhile, NORAD consolidated the region reviews mentioned above and on 1 June 1959 sent each component command a copy of the applicable forces recommended for retention and/or removal. NORAD directed each of the components to take appropriate action to retain those units shown as Category I and II and to remove Category III units from an air defense augmentation role.

NATIONAL GUARD ROLE IN AIR DEFENSE

In December 1958, CINCNORAD had written the Chairman of the JCS that he was concerned with the trend toward using National Guard rather than Regular units to man first line air defense weapons. He noted that DA was starting to man the Nike Ajax with National Guard personnel. Also, he had learned that there was consideration of using Guard personnel to man BOMARC, Hercules, and Hawk units. He urged that immediate action be taken to establish the policy that the equipping, manning, and operation of North American air defense units needed on a full-time basis be made a responsibility of the Regular military establishment and that National Guard units be used as augmentation forces only.

On 17 April 1959, General Partridge sent memorandums to the USAF ADC and ARADCOM commanders asking them to try to establish his policy with their Service Chiefs.

On this same date, General Partridge also wrote General Thomas D. White, USAF Chief of Staff, of his concern about turning over BOMARC to the Air National Guard. He said that experience in the air defense system

indicated that operations were so complicated that even those people working full-time had tremendous difficulty in keeping their squadrons fully ready. He believed it was wishful thinking to expect ANG units, which had less time to devote to training and operations, to be as good as the regular squadrons. He felt that any plan to convert surface-to-air missile units from Regular manning to Guard manning constituted a reduction in force.

On 5 May 1959, General White replied that, from a strictly operational viewpoint, he agreed that it was desirable to have the air defense forces equipped and operated by the Regular Services. However, other aspects of the problem had to be considered. He pointed out that Congress and the President expected the Reserves to perform a useful and active role in U. S. defense. Also, he could not overlook possible use of the Guard resources to meet some of the increased demands on Air Force resources.

In view of these factors, General White stated that he had directed a "pilot" operation of a BOMARC unit by the ANG. Further use of the ANG in the BOMARC program, would be predicated upon the outcome of this test operation.

Meanwhile, General Hart and General Atkinson approached their Service chiefs with General Partridge's views. Both service chiefs were sympathetic, but neither offered much encouragement.

Later General Atkinson told General Partridge of his efforts and stated that he had gone as far as he could. All that was left, he concluded, was for NORAD to work through the JCS.

CINCNORAD had already written to the JCS in December, as noted above. The JCS replied on 15 April 1959 that existing plans did not provide for manning of BOMARC, Hercules, and Hawk with Guard personnel through FY-1962 except at certain test sites. A final decision to use Guard units on a full-time basis would not be

made until the results were evaluated. The U. S. Services, they stated, would continue to meet CINCNORAD's readiness objectives as practicable with existing U. S. national and service procedures.

The matter did not end with the JCS answer, however. On 2 July, General Partridge wrote directly to Mr. Neil McElroy, Secretary of Defense. He pointed out that he was opposed to turning over first line weapons to Guard units and had presented his views to the Chairman of the JCS and USAF's Chief of Staff. ARADCOM and ADC, he continued, had voiced their objections to their Service chiefs also. Still, plans were proceeding to turn BOMARC over to the ANG, and the Army program for manning Ajax units by the Guard continued. He concluded, "It is my firm recommendation that a Department of Defense policy be established clearly assigning to the Regular military establishment, responsibility for the manning and operation of all first line air defense weapons. Any Army and Air Force National Guard units having an air defense capability must be clearly established and considered only as augmentation forces."

CONTINENTAL AIR DEFENSE INTEGRATION NORTH

On 5 January 1959, USAF informed NORAD that the Governments of the U. S. and Canada had agreed in principle to a cost sharing arrangement for a joint air defense program in Canada. This program was to provide two thirty-missile BOMARC squadrons, seven heavy radars (two in the Ottawa-North Bay area and five in the Pinetree system), a SAGE SCC/DC in the Ottawa area, and 45 gap fillers (12 in the Ottawa-North Bay area and 33 in the Pinetree system). Canada was to be responsible for all construction and unit (TO&E) equipment, the U. S. for all technical equipment. The breakdown of capital cost was two-thirds U. S., one-third Canada. The RCAF was to man and operate the seven heavy radars and the SAGE and BOMARC units. USAF said that it and the RCAF had agreed to the formation of a joint task group to study the various activities involved in implementing the program (which became known as the Continental Air Defense Integration, North (CADIN) program).

On 11 March 1959, USAF directed, with RCAF concurrence, the Air Defense Systems Integration Division, in conjunction with RCAF and other USAF agencies, to write a master integration schedule for funding and implementing CADIN. The ADSID document was published on 19 May 1959.

ADSID (and the other preparing agencies) concluded that it would be impossible to finish systems testing of the SAGE SCC before 1 July 1963. However, it would be possible for RCAF personnel to man the SCC at the beginning of the systems testing late in 1962. If an emergency arose before the end of the testing, whatever air defense capability that existed at the time could be used.

It was concluded that it was not advisable to establish an interim direction center at the Ottawa Sector SCC (which was to be located at North Bay, Ontario) for use until the SCC became operational. ADSID recommended that the BOMARC bases of LaMacaza and North Bay become operational on 1 February and 1 March 1962. To control the BOMARC before the SCC became operational, ADSID recommended extending the areas of adjacent U. S. SAGE sectors. To control manned interceptors until the SCC became operational, ADSID recommended continued use of the Canadian manual system.

On 13 July 1959, a new CADIN document, approved by USAF and RCAF and containing essentially all of the ADSID conclusions and recommendations, was issued as an RCAF-USAF CADIN Integration Program. All actions in the document were said to be directive in nature.

The plan provided that RCAF would be responsible for constructing the Ottawa SCC building and for insuring a beneficial occupancy date of 15 September 1961. The AN/FSQ-7A computer would be installed by IBM and by late 1962 RCAF personnel would man the SCC under the direction of the responsible test agencies. The SCC was scheduled to become fully operational on 1 July 1963.

The dates set for the BOMARC bases to become

operational remained at 1 February 1962 for LaMacaza and 1 March 1962 for North Bay. Until the Ottawa SCC became operational, the missile bases would be placed under SAGE control by expanding the U. S. SAGE sector Mode I boundaries of Sault Ste Marie, Syracuse, and Bangor to cover the major portion of the Ottawa ADS. The missile bases would be tied into the Syracuse DC and a cross-tell link added between Syracuse and Sault Ste Marie to provide a handover capability. Surveillance and communications coverage of all three U. S. sectors would be tied into appropriate Canadian radar and radio sites. Mode II capability would remain essentially the same except that Syracuse would not be expanded into the Washington ADS and its display area would be extended further northward.

The first of the new seven heavy radars was scheduled to become operational in September 1962; all seven were to be operational by March 1963. The first of the gap fillers was scheduled for operations in April 1962, the last by December 1962. Schedules were also established for tying into SAGE 32 heavy radars (25 existing and the seven programmed) and the 45 gap fillers and 32 ground-to-air radio sites. The cost of the CADIN Program was figured at $440.088 millions; $304.607 millions being USAF's share, $135.481 millions RCAF's share.

CHAPTER 6

Operational Requirements & Procedures

RULES OF ENGAGEMENT

67-71
Reason:
ROE,
rules of
engagement

classified fm p 67

Surface-to-Air Weapons Alert. The alert requirements for surface-to-air weapons fire units remained the same, with one exception, as stipulated in NORAD Regulation 55-3 -- 25 per cent on 15 minutes and 75 per cent on three hours under Normal Readiness conditions.* The one exception was a lowering of the requirement on 28 January 1959 for 75mm gun units to one-third on 30 minutes and two-thirds on three hours.

However, a change was under consideration to increase the alert for surface-to-air weapons. Eastern NORAD Region proposed a change in March 1959 to bring the requirement for the latter more in line with the requirement for interceptors. On 6 April, NORAD asked ARADCOM to comment on a study made of increasing alert requirements. NORAD said it wanted to keep the Hercules fire units on a state of alert that would make their

* Increased Readiness conditions required increased alert for all forces, see NORADR 55-3, 3 November 1958.

capability available in a minimum of time in an emergency.

ARADCOM opposed an increase and wanted to drop the 15 minute requirement to one hour for Normal Readiness conditions. This would, ARADCOM felt, offer optimum training and maintenance opportunities consistent with the threat and tactical mission.

The subject was being staffed at NORAD at mid-year.

NORAD's Alert Force. On 30 June 1959, the following forces were on alert at 0001Z.

TABLE 5

FORCE	ALERT					
	5-min	15-min	30-min	1-hr	3-hr	Total
Interceptors	134	8	24	184	657	1007
Missile Fire Units	1	66	--	2	161	230
Gun Fire Units*	3	22	6	---	56	87

*Includes Navy

ATOMIC EMPLOYMENT MATTERS

Arming and Scrambling MB-1 Equipped Aircraft in Alaska. In February 1959, the JCS took exception to a NORAD directive (NORADR 55-3, dated 3 November 1958) that provided for arming and scrambling nuclear-equipped aircraft in Alaska during a condition of Increased Readiness. The JCS informed NORAD that nuclear-capable aircraft would not be scrambled anywhere except during Air Defense Readiness or a higher condition of readiness.

ALCOM objected to this restriction, stating that it would impose such a delay on the use of MB-1 equipped aircraft as to preclude their use against surprise attacks.

Same as previous page (Nuclear capabilities)

On 18 March, the JCS replied that the matter was under consideration and a decision would be made after a safety controls and procedures study was completed. Later, NORAD was told that the matter had gone before the Secretary of Defense on 18 June 1959 for a decision.

Cross-Border Nike Hercules Employment Policy. On 30 January 1959, USARADCOM asked CONAD to provide guidance on the employment of nuclear-armed surface-to-air missiles over Canadian territory. CONAD issued a statement of guidance on 2 March 1959 to Component and Region commanders. This stated that until Canada was able to consider CONAD's Air Defense Atomic Employment Policy, which had not yet been released to Canada, interim procedures would have to be followed. CONAD commanders should, CONAD stated, in the event of an Air Defense Emergency, order engagements in accordance with the CONAD Atomic Employment Plan. However, if time permitted, interim clearance was to be requested from Headquarters CONAD to fire the Hercules across the border.

On the same date, CONAD told the JCS of these instructions. CONAD urged that the Atomic Employment Policy be released to Canada as soon as possible so that it might be approved or disapproved. Also, CONAD urged that an agreement be made with Canada to permit the firing of Hercules across the border, if such an agreement was required.

An agreement with Canada had been signed on 27 June 1957 which was slated to expire on 30 June 1953. In 1958, NORAD asked the executive agent to obtain an extension.

USAF replied that a draft agreement for long-term rights to overfly Canada with the MB-1 was in the final stages of negotiations. It would remove all geographical restrictions during a period of Air Defense Readiness. Pending completion of this new agreement, USAF had obtained a one year extension of the 27 June 1957 agreement through 30 June 1959.

NORAD heard nothing more. In June 1959, NORAD asked the JCS to advise it of the status of the long-term agreement. If this agreement would not be completed before 1 July, NORAD wanted another extension of the old agreement.

On 8 June, the JCS replied that the long-term agreement was still under consideration by Canada and that the JCS would take action to extend the interim arrangements if the long-term agreement was not signed by 1 July. NORAD then heard informally that the MB-1 agreement had expired, but that renewal negotiations were in progress. Until these were completed, an informal agreement with Canada existed.

NORAD/OFFICE OF CIVIL AND DEFENSE MOBILIZATION MEMORANDUM OF UNDERSTANDING

An OCDM/NORAD "Memorandum of Understanding" was issued as NORAD Regulation 55-23 on 19 February 1959. It set forth the responsibilities, functions, and working relationships between NORAD and the OCDM to insure that the civilian warning mission was accomplished in accordance with existing laws and directives. The regulation applied to all NORAD echelons and military agencies under the operational control of CINCNORAD except the

Northern NORAD Region, and was for the guidance of other commands having collateral responsibilities in the conduct of air defense.

DISCONTINUANCE OF BROFICON

On 10 December 1958, ADC proposed to CONAD that the BROFICON (BRoadcast FIghter CONtrol using commercial radio facilities) program be discontinued. This program had been started some years past as a back-up to low power VHF/UHF and as a countermeasure to communications jamming. ADC pointed out that the F-86L's and F-89J's were the only interceptors equipped with receivers capable of receiving BROFICON transmissions and that these interceptors were being phased out of the inventory. If the program were to continue, it would require retrofitting early model F-101's and F-106's and modifying the F-102's. ADC stated further that new jamming techniques made BROFICON vulnerable and that UHF communications were being improved.

CONAD favored dropping BROFICON, except in those areas where the F-89J was operating. In March 1959, ADC asked USAF to keep BROFICON facilities in those areas where the F-89J was operating and to phase the remainder out. USAF, however, felt that BROFICON had outlived its usefulness. It asked ADC for further justification to retain any part of the system.

When told of USAF's reply, CONAD maintained its position and asked that USAF be so informed. But in July 1959, USAF stated that the proposal to retain BROFICON in areas where the F-89J was deployed was not approved. The limited capability to be kept did not justify the costs involved. It added, however, that contracts made between the Air Force and the broadcast stations would remain in effect and that the equipment of the program would be kept for possible use with a future system.

NORAD/SHAPE EXCHANGE OF EARLY WARNING INFORMATION

In December 1958, Supreme Headquarters Allied Powers

Europe (SHAPE) proposed to NORAD that the two commands exchange early warning information. SHAPE said that it planned to replace its voice-communicated "condition" messages with a semi-automatic data transmission system. SHAPE stated that this system would not provide detailed track information, but only "broadbrush" information on selected raids with the "condition" status of each of its 14 areas and the reasons for the condition status. Before going ahead with this system, it needed to know if this type of EW information would meet NORAD's requirements in the 1960 time-period and if the types of equipment and standards of data transmission were acceptable to NORAD. Further, SHAPE was interested in knowing if NORAD would provide EW information in the same form so that the proposed equipment could receive it.

NORAD replied that it felt that there was a requirement for the exchange of EW information. The degree or level of information needed and the methods of transmission would have to be determined after a joint conference.

Representatives of SHAPE and NORAD met at NORAD Headquarters in April 1959. Among the more important conclusions reached by the conferees were the following. Exchange of EW information was desirable. Detailed studies would be conducted by both commands to determine the exact information that should be exchanged and the desired communications and display facilities. SHAPE should explore with SACLANT, through NATO channels, the possibility of establishing communications between Iceland Air Defense Force and the NATO element on the Faeroes. The two commands also agreed to continue current procedures for transmitting EW information when normal conditions were exceeded.

In July 1959, SHAPE informed NORAD that it was investigating the possibility of setting up a trial transmission to NORAD. October and November 1959 would be considered as a possible time for the trial.

Meanwhile, the JCS had been monitoring this activity between SHAPE and NORAD and in June 1959 stated that

they were planning to convene a second conference to complete requirements for communications needed between the JCS, SHAPE, NORAD, SACLANT, USAF, and EUCOM. It was anticipated that this meeting would take place in July or August 1959.

NORAD PLAN FOR CONTINUITY OF OPERATIONS

A new NORAD plan was issued on 25 May 1959 establishing an alternate command post and providing for continuity of operational control over NORAD forces during periods of emergency. The plan was called "Continuity of Operations Plan North American Air Defense Command," or "COPNORAD", and superseded the NORAD ALCOP plan, dated 12 November 1957.

Central NORAD Region was designated the NORAD alternate command post. The commander of CNR was to activate the ALCOP when ordered to do so by CINCNORAD, or when all communications (direct and indirect, military and civil), had been severed between NORAD Headquarters and the NORAD regions. Control was to revert to the primary COC when control facilities had been restored and when CINCNORAD so directed. The plan provided that in the event both primary and alternate command posts were knocked out, the regions would operate independently.

SAFE PASSAGE OF SAC EMERGENCY WAR ORDER TRAFFIC THROUGH THE AIR DEFENSE SYSTEM

For some time, SAC and NORAD had been studying the problem of how to get SAC aircraft through the defense system safely during an emergency. In July 1958, a joint SAC, NORAD, ADC, and ARADCOM committee drew up a "SAC-NORAD Memorandum of Agreement for Emergency Air Traffic Control and Identification." It established common procedures for the NORAD-SAC forces to use to get SAC traffic through the system. The two commands agreed to exchange liaison personnel for 24-hour monitoring of the NORAD COC and the SAC Command Post to

insure immediate identification and control of SAC traffic.* SAC EWO liaison personnel would be sent to the NORAD regions to develop local identification and control procedures. Further, the commands agreed to the setting up of a SAC-NORAD Coordinating Committee to review and revise the procedures established. SAC agreed to furnish strike route information to NORAD for prepositioning at appropriate NORAD units. The agreement was approved by General Partridge for NORAD on 25 July 1958 and by General Thomas Power, CINCSAC, on 30 July 1958.

Before final procedures could be issued, the Middle East crisis forced issuance of interim procedures (which were based on this agreement). The interim procedures required NORAD units to continuously flight follow all SAC aircraft by radar from take-off to destination or to beyond the area of surveillance. During normal conditions, SAC command posts were to use existing communications to notify NORAD of scheduled take-off times and direction of flight.** Also after take-off, SAC aircraft would contact the radar station and transmit Mode II Mark X IFF codes continuously unless otherwise instructed.

The interim procedures were left in effect until April 1959 when NORAD Manual 55-4, "Procedures for Safe Passage of SAC EWO Traffic," was issued. This manual was concerned solely with SAC EWO aircraft and their passage through the system during an emergency. The requirement for day-to-day flight following of SAC peacetime air traffic was dropped.

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* A SAC Liaison Team had been at NORAD since 1 February 1958. NORAD sent no team to SAC, but agreed that a USAF ADC officer stationed at SAC Headquarters would act for it.

** In 1958 also, NORAD and SAC had agreed that a direct land-line should run from SAC facilities to ADDC's. This program was discussed in CONAD/NORAD Historical Summary Jan-Jun 1958, pp 94-95.

The requirement to evaluate the air defense system's capability to continuously maintain flight surveillance of SAC tactical traffic had not been dropped, however. On 23 June 1959, NORAD directed ADC to recommend an area where testing of procedures could be conducted.

Meanwhile, a series of tests had been conducted on the West Coast in 1958 to determine if interceptor AI radar equipment could be used to interrogate the X-band AN/APN-69 radar beacons installed in the SAC bomber/tanker fleet. If so, an air-to-air identification system could be worked out for the identification of SAC EWO traffic.

The tests proved that the APN-69 would reply to interrogation from a fighter AI radar and that the coded reply was easily recognized on the fighter scope. The test people -- SAC and ADC's System Integration Office -- felt that this was as much as could be accomplished at base level. They recommended that a continuing series of air-to-air exercises be conducted to develop operational techniques to increase this identification capability.

In February 1959, SAC wrote NORAD that it concurred in this recommendation. A conference was held between NORAD, SAC and ADC on 19 March at Headquarters NORAD. It was agreed that additional testing was justified. It was proposed that this testing take place in South Dakota since there were B-52's, an ADC fighter squadron, and a Nike unit available.

By July 1959, a test directive had been agreed to by all parties. The joint SAC-NORAD directive -- codenamed Shining Light -- specified that test programs would be developed no later than 1 September 1959.

DESTRUCTION OF NON-HOSTILE AIRBORNE OBJECTS

On 17 February 1959, CINCNORAD/CINCONAD established a command policy for engaging non-hostile airborne objects.

(i.e., balloons, derelict aircraft, drones, and other types of unmanned vehicles). This stated that NORAD/CONAD subordinate commanders would not authorize or direct destruction of any aerial object not being employed in a recognized weapons training program unless the object presented a threat to the air defense system as defined in NORADR 55-6 (Rules of Engagement). Responsibility for recovery or destruction of non-hostile airborne objects was considered a function of the agency which launched and owned the object. However, NORAD/CONAD commanders could request approval from NORAD/CONAD Headquarters to destroy an object whenever they felt such destruction was necessary or were asked to destroy an object by an outside agency.

RESPONSIBILITY FOR PROTECTION OF FRIENDLY FLYING OBJECTS

On 12 March 1959, NORAD recommended to the JCS and COSC that they establish a policy to provide that all launchings of objects within the air space over the NORAD area of responsibility be coordinated with NORAD Headquarters. This was needed, NORAD felt, to insure that such objects did not produce false alarms in the air defense system or in other agencies and commands to which NORAD provided warnings.

The COSC notified CINCNORAD on 21 April that the recommendation had been approved in principle. It requested that a draft regulation covering the matter be forwarded for final approval. USAF advised that the matter had been referred to it by the JCS. USAF asked NORAD for specific requirements and notification procedures.

INDIRECT BOMB DAMAGE ASSESSMENT SYSTEM

In 1955, CONAD established a requirement with USAF for an Indirect Bomb Damage Assessment System (IBDAS). The system wanted was one capable of providing data on bomb yield, ground zero, and time and type of burst.

On the 23rd of March 1959, CONAD re-stated its

requirement for an IBDAS to the JCS. CONAD stated that it needed bomb detonation information to assess the pattern of the enemy's attack and to determine damage to the defense system. Further, the system was needed to meet the JCS requirement of 1956 which made CONAD responsible for setting up a system to collect nuclear detonation information and pass this information to interested agencies.

It was pointed out that the initial request from CONAD had been passed to ARDC where experimental work had been conducted. USAF had, in 1958, set up a requirement with ARDC for a means of automatic detection of a nuclear explosion and the immediate relay of detection to central display systems. This had been followed on 15 January 1959 by a directive from USAF to ARDC to establish a ZI Bomb Alarm network to become operational by 1 July 1960.

CONAD told the JCS that the USAF system would use thermo detectors and land-line communications and would probably be limited to reporting only the initial enemy attack. CONAD felt that the system could not be expected to survive initial bomb damage and, therefore, was not suitable.

On 3 April 1959, the JCS informed CONAD that action on the request for an IBDAS had been transferred to the Chief of Staff, USAF. On 29 April, USAF informed CONAD that it recognized CONAD's need, but had been unable to satisfy that need. It pointed out that considerable research had been done on a system, but that so far it could not discriminate between the signals from an exploding bomb and lightning. It was anticipated, USAF continued, that another three or four years would be required before suitable circuits could be developed to accomplish the discrimination desired.

NUCLEAR DETONATION REPORTING SYSTEM

A problem closely aligned with the IBDAS was that of Nuclear Detonation reporting (NUDET). The JCS had

assigned CONAD the responsibility for the establishment and operation of an atomic detonation and fall-out reporting system. In carrying out this assignment, CONAD, and later NORAD, had set up an interim collection system consisting primarily of observation reporting by installations and units under its jurisdiction. Establishment of a permanent system awaited development of an adequate remote-reading indirect bomb detonation detection system.

By early 1959, certain discrepancies in the directives establishing the system and its working arrangements had become apparent. In April 1959, CONAD proposed to the JCS a realignment of directives so as to abolish some of its obligations and bring others in line with its current operational techniques.

One matter was the responsibility for establishment and operation of the atomic detonation and fall-out reporting system. CONAD pointed out that the two JCS directives assigning these responsibilities were in conflict. One gave CONAD the over-all responsibility for both tasks; the other made CONAD responsible only for the reporting of nuclear detonations. Fall-out reporting was assigned to the USAF Weather Service.

CONAD did not want the job of fall-out reporting, however, for two reasons: (1) it felt that the fall-out plots produced by the currently-available detonation collection system produced practically worthless intelligence, and (2) CONAD did not have the required communications to perform such an assignment.

A second item brought to the JCS's attention was the requirement for and method of disseminating NUDET reports to other commands. The JCS directive stated that such reports would be sent over the alert status teletypewriter network. CONAD said that this implied that only subscribers to the Alert No. 1 network would receive these reports. This was a very restricted list with no Army organizations and only one Navy organization (CINCLANT). CONAD wanted to stop using Alert No. 1 network for the NUDET reports. One thing brought out by CONAD was that there was little benefit to be gained by advising units

on the West Coast that a detonation occurred on the East Coast. It would be better if the NORAD division, in whose area the detonation occurred, notified the subscribers on its warning net and the adjacent division combat centers. The latter, in turn, could notify the key points on their warning nets.

CONAD proposed that this be the procedure adopted for dissemination of NUDET reports. CONAD said that NUDET reports would be sent to the NORAD COC over the normal surveillance circuits with a flash precedence. The NORAD COC would notify the Joint War Room (USAF, USA, and Navy) and RCAF for the Chief of the Air Staff. NORAD facilities having OCDM representatives assigned would advise them of all detonations.

U. S. - CANADIAN CONELRAD, CONILLIM AND SCATER PROGRAMS

On 10 March 1959, Headquarters USAF asked NORAD to provide it with NORAD's position on the military requirement for CONELRAD (Control of Electromagnetic Radiations) to use in a meeting with FCC and OCDM personnel to review the program. NORAD replied that "...CONELRAD is a requirement and will remain a requirement for the foreseeable future." NORAD stated, however, that it was planning a joint conference with Canadian officials to work out a common policy and that after this meeting there might be changes.

This joint conference was convened at Headquarters NORAD in April 1959. It was found that there was a difference of opinion on what CONELRAD should do. Everyone agreed that CONELRAD was an air defense requirement. But the conferees could not agree on the portions of the frequency spectrum that should be subjected to control. NORAD felt that to be effective, CONELRAD should be applied to any facility that would cause interference to its own weapons systems and/or provide navigational assistance to enemy aircraft or missiles. The Canadian conferees felt that part of the frequency spectrum had to be left open to pass civil defense information.

The conferees agreed that the subject should be studied by a scientific group, similiar to the Canada-United States Scientific Advisory Team, to determine the over-all objectives of CONELRAD. It was further agreed that, based upon the outcome of the evaluation, a study group should be established to formulate a NORAD position on CONELRAD.

With respect to CONILLUM, the conferees agreed that this subject should be reopened since illumination might provide assistance to infra-red detectors and manned bombers making low-level attacks. Also, the subject needed more study, for NORAD's Terms of Reference made it responsible for various aspects of CONILLUM. It was agreed that NORAD would refer this problem to the JCS for resolution, recommending a study be made to determine the validity of the requirement.

The talks on security control of air traffic (U. S. - SCATER, Canada - ESCAT) found both countries' representatives agreeing that a NORAD plan was needed. The RCAF representative stated that RCAF had no objection to including Canada's CONELRAD requirement on navigational aids in the ESCAT plan to coincide with the U. S. SCATER plan. The RCAF also said that authority for implementation of ESCAT would be changed to provide for implementation by CINCNORAD. It was concluded that until a NORAD plan was written, the RCAF would continue to operate under the ESCAT procedures. The plan would be amended, however, to conform to NORAD directives regarding authority and procedures for implementing SCAT.

To produce a workable NORAD SCATER plan, it was agreed that a group consisting of representatives from NORAD, RCAF, USAF, Federal Aviation Agency, Department of Transport, and other appropriate agencies, would be organized. This group would make recommendations to the JCS and COSC.

In June 1959, NORAD sent a copy of the conference report to the RCAF Chief of the Air Staff, pointing out that the problem of unifying and/or standardizing Canadian - U. S. plans for CONELRAD was not solved. NORAD

stated that a technical study had been initiated and would provide the basis for determining operational objectives for CONELRAD, particularly those regarding the areas of the spectrum to be controlled. As for SCATER, NORAD stated that if the RCAF agreed with the findings in the report it should designate an RCAF member for the working group and make arrangements for DOT representation. NORAD would, it continued, request similiar membership from USAF, FAA, and USAF ADC. As for CONILLUM, NORAD stated that it had forwarded a letter to the JCS reflecting the views of the conferees.

U. S. CONELRAD

While the Canadian - U. S. policy on CONELRAD was being decided, NORAD was also working on U. S. CONELRAD matters. One of these was a new alerting system.

NORAD and ADC had for some time been studying an AT&T proposal for a new CONELRAD alerting network known as the "Bell and Light" system. In March 1959, USAF asked NORAD for its comments on the adequacy of the current system in use and the requirements, justification, and recommendations for an improved system. NORAD, in turn, forwarded the request to ADC for its comments.

ADC replied that the "Bell and Light" system appeared inadequate to meet the CONELRAD alerting requirement. It said that the proposed system was subject to false alarms, did not provide a record of communications, and did not provide for authentication. ADC felt that NORAD's requirements could best be met by a teletype system. It suggested that NORAD consider expanding the existing Military Air Defense Warning teletype network to include key CONELRAD radio stations.

On 3 June 1959, NORAD furnished USAF with the information received from ADC.

Another matter brought up was the validity of CONELRAD directives. On 28 July 1959, NORAD told the JCS that it had reviewed the CONELRAD directives and found

many sufficiently outdated as to make their validity questionable. It pointed out that the DOD CONELRAD plan was dated 24 December 1952 and that the organizational structure of air defense had changed since then.

NORAD also wanted the responsibilities of its divisions in the CONELRAD program reduced to that of coordinating on CONELRAD plans and insuring that NORAD elements accomplished their CONELRAD responsibilities. As matters stood with the existing plan, the divisions had to review detailed plans of numerous government and military units, sites, facilities, and plants to insure that such factors as alerting procedures, extent of control, and key alerting facilities were carried in the plans. It was pointed out that the divisions actually had no control over such factors. The extent of control and type of operation were responsibilities of the owning or operating agencies. Therefore, NORAD concluded, the logical ones to consider these factors were the preparing agencies.

U. S. CONILLUM

As noted above, at the joint Canadian - U. S. conference held in April, the NORAD representatives stated that they would reopen the matter of Control of Illumination (CONILLUM) with the JCS since illuminated areas might provide assistance to infra-red detectors and low-level attackers.

On 26 May 1959, NORAD wrote to the JCS, pointing out that its Terms of Reference included a requirement for CINCNORAD to coordinate with appropriate U. S. and Canadian agencies in the development of policy and broad plans for CONILLUM, and, when appropriate, to initiate implementing actions. But the requirement for the program was in doubt, for the latest guidance available was a message from USAF to ADC in 1956 that stated: "...the Department of Defense considers that further implementation of the CONILLUM plan is unwarranted....Accordingly, it has been decided to retain the CONILLUM plan in a stand-by status, and its further implementation will be held in abeyance."

NORAD recommended that a study be made to determine the validity of the CONILLUM requirement. If the study indicated that it was valid, NORAD wanted appropriate guidance. If the study showed that the program should be discontinued, it wanted the requirement deleted from the NORAD Terms of Reference.

NORAD POLICY ON PRIORITIES FOR AIR MOVEMENT OF MILITARY AIRCRAFT

On 25 May 1959, CINCNORAD's policy on priorities for the air movement of military aircraft was issued to the field. It was pointed out that the JCS had established this policy at CINCNORAD's request. They had also authorized him to resolve conflicts in the movement of U. S. tactical air traffic during conditions of imminent or actual war, including Air Defense Emergency, in accordance with established priority listings.

The priorities established by the JCS and forwarded through the DOD to FAA were for the air movement of: (1) tactical aircraft during imminent or actual general war conditions including air defense emergency; (2) tactical and non-tactical military aircraft during limited war or other emergencies; and (3) tactical and non-tactical military aircraft during normal peacetime military operations. NORAD stated that these movement priorities would be used by the JCS, CINCNORAD, the services, commands, and FAA.

NORAD delegated its authorities and responsibilities in the policy letter to its region commanders who were authorized to delegate them in turn, to their NORAD division commanders. NORAD directed that any appeal of decisions of the NORAD commanders which could not be resolved at their levels was, if time permitted, to be referred to the next higher NORAD commander.

Shortly after the policy had been promulgated, CNR pointed out that the letter implied that CINCNORAD had the authority to approve or disapprove certain tactical flights during an air defense emergency, but that the

method for exercising this authority by the NORAD commanders was not clear. It asked for guidance and recommended that the provisions of the letter be incorporated in the CONAD/CAA SCATER plan. NORAD replied that its letter did delegate the authority to regulate air space during an air defense emergency and specifically provided the authority to "control" the air space concerned. Such regulation, NORAD continued, would be in accordance with the priorities listed and at the discretion of the region and division commanders, depending upon the tactical situation at the time.

NORAD stated further that NORAD division commanders should exercise control of air traffic through the FAA. Authority for control of civil and non-tactical military flights would be exercised in accordance with SCATER plans of 7 May 1957 and 1 February 1958. As for including the provisions of the policy in the SCATER plans, NORAD stated that it was taking action to amend these documents.

DIVISION WARNING NETWORKS

On 29 December 1958, NORAD issued a new policy governing alerting procedures throughout the air defense system in NORADR 55-12. The system established was designed to notify the NORAD operational forces and other civil and military agencies.

The major difference in this system over that in use before was the change in the Division Warning Networks. The regulation re-defined the networks and reduced the number of key points to be alerted. NORAD felt that its past procedure of alerting a large number of posts, camps, stations, and bases throughout the U. S. was unsatisfactory because the commitments for alerting far exceeded capabilities under battle conditions. To prevent the alerting responsibilities from obstructing operations, the regulation provided that warnings and readiness conditions were to be passed initially to a limited number of key points which would be responsible for further dissemination of the information.

On 7 January 1959, NORAD directed the region commanders to submit lists of recommended subscribers no later than 15 February 1959. In addition, the regions were told to indicate those stations on the current MADW network that could be deleted.

The three U. S. regions submitted their revised lists in February. NNR stated that it could not meet the deadline because the RCAF ADC Sectors had never been required to warn other agencies. This was a function of RCAF Headquarters. The matter had been referred to that headquarters for a decision. Later, NNR's recommended list was submitted in a NNR Supplement to NORAD 55-12, dated 23 March 1959.

NORAD approved the revised subscriber lists in March with few exceptions. One change made in the lists was the retention of SAC Air Forces on the networks.

In the meantime, NORAD forwarded copies of its regulation to the Air Force and Army Chiefs of Staff, the CNO, and the Coast Guard Commandant. DA replied that it wanted implementation of the new networks delayed until 1 May 1959. This would give it time to issue the necessary instructions to all elements of the Army affected by the regulation. Air Force agreed with the concept expressed in the regulation and the reduction in key points. It stated that it understood that NORAD was to make further revisions to the key list and it would wait until such action was completed. At that time, USAF would take action through ADC to assure further dissemination throughout appropriate Air Force commands and installations. NORAD replied that it did not want ADC to become involved in the dissemination to Air Force installations. If USAF wished to add other agencies to the networks or to designate agencies other than the Military Flight Service Centers to act as key points, it should forward such recommendations to NORAD. The Navy and Coast Guard made no comments.

CHAPTER 7

Plans & Programs

NADO AND NADOP

In December 1958, NORAD submitted to the Canadian COSC and the U. S. JCS a two-volume objectives plan: North American Air Defense Objectives 1959-1969 (NADO 59-69) and North American Air Defense Objectives Plan 1959-1963 (NADOP 59-63). NADO 59-69 stated the concepts, philosophies, and qualitative objectives for a ten-year period. NADOP 59-63 set forth the qualitative and quantitative force structures for a five-year period.

These plans succeeded CONAD's 1956-1966 Objectives Plan (CADOP 56-66), the first over-all air defense plan ever prepared. CADOP 56-66 was returned by the JCS in May 1958, unapproved. The JCS estimated that implementation of this plan would cost over ten billion dollars annually. They stated that an average yearly expenditure of around five and one half billions should be used as the basis for planning for U. S. forces.

NADOP was scaled down from what CADOP asked. But the cost of recommended forces to be provided by Canada and the U. S. would total something under eight billions yearly. However, this total included, for the years 1961, 1962, and 1963, contingency funds of around one billion annually over and above the cost of the accelerated Nike Zeus program.

NORAD received formal agreement or comments only on NADO 59-69 (the plan covering concepts and philosophies). In May 1959, NORAD was advised that the JCS had reviewed this plan and found it to be generally in consonance with policy guidance issued by the JCS and COSC. The JCS agreed that it would be considered by them and the Services in the preparation of long-range

plans and programs. The annual submission of such a plan was not required. The COSC provided an identical statement on this plan on 12 June 1959.

In the meantime, in January 1959, NORAD formed an ad hoc committee to reconsider and revise NADOP 59-63. NORAD told the component commands that considerations in Washington indicated that the foces, manpower, and fissionable material proposed by NADOP might not be approved and that a lesser program might be required. The terms of reference for this group stated that they were to determine a five to six billion dollar yearly Canadian-U. S. air defense system beginning in FY 1960.

The work of this group was in mid-passage in June when new objectives for U. S. air defense forces were provided by the Secretary of Defense. These were contained in a new program, termed the Continental Air Defense Program (CADP). As of mid-1959, NADOP had not been commented upon formally by the JCS or COSC. Presumably, however, the CADP replaced applicable U. S. portions of NADOP and on the basis of the former, a new NADOP would be prepared.

CONTINENTAL AIR DEFENSE PROGRAM

On 19 June 1959, the Secretary of Defense provided the JCS with his approved objectives for certain air defense equipment to be employed in defense of the continental U. S. This program provided specific guidance on some air defense equipment, general guidance on other equipment. Therefore, until a new NADOP was prepared on the basis of this program, a figure-by-figure comparison with the proposed force structure in NADOP 59-63 could not be made. In general, however, the CADP directed a reduction.

The CADP emphasized a perimeter defense. It divided the continental U. S. into two areas: (1) the east and west coast and the U. S.-Canadian border area and (2) the south-central and central area. The former was to have an "Improved SAGE" environment in support of the

BOMARC deployment in that area; the latter area was to have an "Austere SAGE" environment.

This concept of an Improved and Austere SAGE deployment provided the following. The SAGE improvement program was to be carried out along the U. S.-Canadian border and the east and west coasts of the U. S. This program was to include Airborne Long Range Input Stations off the coasts, Frequency Diversity radars at prime sites, and enough gap fillers to provide, as an objective, radar coverage down to an altitude of 500 feet, for a minimum distance of 150 miles forward of the BOMARC launching sites. SAGE Super Combat Centers in a hard (underground) configuration were to be completed at six sites in the U. S. and at one in Canada (see Chapter Two). These site locations were to be determined later by appropriate agencies and were to serve the SAGE system along the border and coasts and to support the BOMARC deployment authorized.

In the Austere SAGE area, improvements were to be limited to those required to identify SAC bombers in flight, vector the currently operational family of interceptors, and provide capability for air traffic control. Gap fillers and FD radars were not to be installed except at sites programmed for experimental or prototype equipment. In this area, consideration was to be given to installing three Super Combat Centers in a soft configuration.

Necessary equipment was to be procured for sixteen BOMARC squadrons within the U. S. They were to be deployed along the northern border and east and west coasts. It was stated that this did not affect the two squadrons to be installed in Canada by the Canadians. Manned interceptors were to be phased down to 44 squadrons by the end of FY 1963. The NIKE Hercules program was set at 126 batteries, which included 76 batteries to be converted from Ajax. The ten sets of Missile Master (AN/FSG-1) equipment (see Chapter Three) were to be installed at the ten sites previously approved, but no further Missile Master, either AN/FSG-1 or AN/GSG-4, procurement was authorized. The Hawk missile was not to

be deployed in fixed site defenses within the continental U. S.

In regard to NIKE Zeus, the Department of the Army was authorized to proceed with research development at the maximum rate and to proceed with production feasibility studies and the engineering, tooling, and facilities necessary to prepare the Zeus program for production. FY 1960 funding of $137 million for this preparation for production, in addition to the funding previously programmed, was authorized, subject to Congressional action. The currently-approved BMEWS configuration was to be completed and made operational at three sites: Thule, Greenland; Clear, Alaska; and Fylingsdale, England. Also, research and development on promising methods of ballistic missile detection and warning was to be strongly supported.

INTERIM BMEWS DISPLAY FACILITY

The Thule, Greenland, BMEWS site was scheduled to reach initial operational capability in September 1960; the Clear, Alaska, site a year later. The NORAD hardened COC facility would not become operational until some time after the date set for the Clear site. To use this initial BMEWS capability, an interim BMEWS central display facility was needed.

When the decision was made by NORAD on what to accept in an interim facility, the hardened COC planning date was 1 January 1962. Because of this early date, a most austere and economical construction with a minimum of equipment was accepted. Following various studies and meetings with USAF ADC, BMEWS Project Office and others, NORAD concluded that the best solution was to add an annex to the current COC building at Ent AFB to house the interim facility. The technical installation was to be a simplex threat evaluation system with readout consoles.

However, NORAD required that the building have enough floor space to house a duplex system and a

satellite prediction computer, if necessary. Whether this equipment would be required depended upon the date of the hardened COC. If the latter slipped considerably beyond January 1962, then duplexing and adding the computer would be necessary.

These NORAD requirements, which were concurred in by USAF ADC and other agencies concerned, were provided to USAF by ADC in January 1959. On 18 March 1959, USAF told the BMEWS Project Office to proceed with the interim facility in all respects as NORAD required except one -- provision of floor space for a satellite computer. The interim facility was not to get a satellite computer. Computation was to be done initially by computers at each radar station. USAF stated that this was a departure from NORAD requirements, but this was in accordance with the latest program direction from the Department of Defense.

USAF directed that there be an annex constructed at the NORAD COC to provide initial capability with Site 1 (Thule) in September 1960 and integrated data link capability with this site in December 1960. The facility was to have a simplex system, but the building was to have enough space for duplexing.

Following this, on 20 April 1959, USAF ADC advised that USAF had informed it of changes in the BMEWS program. Among the changes were that tracking radars for Sites 1 and 2 (Thule and Clear) were to be deferred (scanning radars only were to be installed).

On 4 May 1959, USAF issued a new BMEWS development directive (No. 108) which confirmed that trackers might be added later to Sites 1 and 2, but were not to be procured at that time. On 28 May, CINCNORAD sent a message to the USAF Chief of Staff asking whether the system as now proposed would meet NORAD requirements. The Air Force replied that its approved plan called for a two-phase attainment of the interim BMEWS configuration. Phase I required installation of scanners only at Sites 1 and 2 and trackers only at Site 3 (UK). The second phase would complete the interim configuration.

NORAD protested to the JCS on 4 June 1959 that the minimum interim requirements approved by NORAD would not be met by this Air Force development directive. NORAD also protested the fact that a change of this scope had been made in a weapons system and NORAD, the ultimate user, had not been consulted.

Shortly thereafter, NORAD learned that it was the decision of the Department of Defense to indefinitely defer tracking radars at the Thule and Clear sites. On 7 July 1959, USAF advised NORAD that because of this decision it would be necessary to consider changes in the requirements for the interim display facility. Some of the requirements could not be achieved during the scanners-only period and should be deferred or eliminated, USAF said.

OSD representatives, briefed by USAF on the status of the program, raised the following areas of concern:

a. the requirement for a computer of any kind in the ZI,

b. a detailed impact display was not consistent with the capability of the detection equipment,

c. the possibility of locating the interim display in an existing building not necessarily at Ent AFB.*

It was the DOD position, USAF stated, to oppose the expenditure of a great amount of money for the interim BMEWS display.

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* OSD representatives raised the possibility of locating at Strategic Air Command Headquarters with the NORAD requirement being met by a closed circuit television system. SAC, it was stated, would be the main consumer of the information during the time period that the interim facility was used.

USAF called a conference to review the interim facility requirements. NORAD representatives stated that NORAD did not object to reviewing the planned interim complex, but that this, in itself, did not change the NORAD-stated requirements. NORAD's primary concern was the problem of false alarms and having a system that would provide sufficient information to allow practical experience for entry into the ballistic missile-spatial age.

On 17 July 1959, USAF directed the BMEWS Project Office to prepare an engineering proposal for an interim BMEWS display facility. It was preferably to be at Ent AFB, it was not to require any additional construction, and no threat evaluation equipment was to be installed. There was to be no provision for inputs from tracking radars at Sites 1 and 2 and no provision for inputs at all from Site 3. In addition, ARDC was directed to make a technical evaluation of the feasibility of using the Fenske, Federick and Miller Company display equipment to satisfy the display requirements of the interim BMEWS facility.

NORAD protested these plans to USAF in a message on 22 July. NORAD representatives attended a meeting called by the BMEWS Project Office and ARDC to discuss the interim facility and reiterated the NORAD requirements. NORAD also protested to the JCS on 28 July, both in regard to elimination of trackers at Thule and Clear and reduction of the interim facility.

NORAD HARDENED COMBAT OPERATIONS CENTER

During 1958, numerous studies and surveys were made to determine the most suitable location for a new NORAD hardened COC. Locations not only in Colorado Springs, but in other areas were checked. The choice finally narrowed down to two in the Colorado Springs area: Blodgett's Peak adjacent to the Air Force Academy (north of Colorado Springs) and Cheyenne Mountain just south of Colorado Springs. Selection of a site in the Colorado Springs area was favored by NORAD.

In March 1959, NORAD was informed that the Corps of Engineers had recommended a site in Cheyenne Mountain. The JCS approved, on 18 March, the Cheyenne Mountain location.

Prior to this time, on 14 October 1958, NORAD had written to the JCS that it believed one technically competent agency should assume responsibility for the development and production management of the entire new COC complex. This would result, NORAD said, in a properly integrated system.

NORAD said it was particularly concerned about having a properly integrated ballistic missile defense system. NORAD felt that the best way to get an integrated BMDS was to have the NORAD computation and display complex treated as a separate development and procurement project. This project should be concerned with all facilities required for the central ZI complex. These included the integrated ICBM/IRBM situation display, automatic air-breathing (SAGE) situation display, satellite prediction computers, master computer and data handling facilities, etc.

In a paper dated 11 February 1959, the JCS charged the Air Force Chief of Staff with responsibility for the COC project. He was to collaborate with CINCNORAD in carrying out these responsibilities.

The initial phase of the project was to examine the projected NORAD Command Control System (CCS) and determine COC requirements, including estimates of the development, procurement, installation, and operational costs, and the scope of the development and production management involved. When this was finished, a report on space requirements, upon which design and specific plans for implementation could be based, was to be submitted to the JCS for approval. Implementation was not to start until the JCS acted on the report. CINCNORAD, the JCS stated, could express his views on the adequacy of the report to the JCS.

On 27 February 1959, USAF directed its Air Research

and Development Command to assume full management responsibility for the NORAD COC. ARDC was directed to complete the study directed by the JCS by 1 July 1959. The JCS-required report was then to be prepared and submitted to USAF for submission to the JCS. In carrying out its responsibilities, ARDC was to collaborate with CINCNORAD.

On 20 May 1959, USAF told ARDC that the 27 February directive was intended to give ARDC responsibility for systems engineering of the NORAD COC and that ARDC was to develop COC requirements within parameters approved by higher authority. These parameters were as follows:

a. Type of Facility. A deep underground structure will be provided essentially as configured for site A, Cheyenne Mountain, in the "NORAD Site Investigation Feasibility Report," dated January 1959, prepared by the firm of Parsons, Brinckerhoff, Hall and MacDonald for the Army Corps of Engineers.
b. Hardening. The structure will be located under 800 to 1000 feet of cover in granite and will provide a bonus protection well in excess of 200 PSI. Entrances, however, will at this time be hardened for an over-pressure of 200 PSI only in accordance with current DOD directives.
c. Scope. The structure will provide a total building area of 266,400 square feet exclusive of the area reserved for the power plant and water and fuel reservoirs. The power plant will occupy an area of approximately 28,000 square feet, water and fuel storage will account for about 59,000 square feet.
d. Special Operational Requirement. The COC will be designed to operate under "buttoned-up" conditions for a period of five days.

e. Outside Support Facilities. No administrative or logistic support functions will be provided for within the COC structure. Support of this nature will be from above-ground facilities and for the present will be provided from Ent AFB.

f. Estimated Construction Cost. The estimated construction cost of the NORAD COC installation is $28,540,000.

USAF also stated that while it was intended that the scope of the COC installation remain within the limits of the approved configuration, consideration would be given to expansion of the scope by extension of the main 45-foot tunnels or by provision of an additional tunnel should the near-term operational requirements so dictate. Finally, USAF said that in order to avoid further slippage in the operational date, action was being taken to authorize initiation of design on the COC by 1 June 1959. It was imperative, therefore, that ARDC provide the functional layouts by 1 July.

Neither NORAD nor ARDC concurred with the degree of hardness provided by the above parameters -- 800 to 1,000 feet of cover and closures limited to 200 PSI.

ARDC submitted its report (which was prepared in collaboration with NORAD) to USAF on 19 May 1959 on requirements of the NORAD Command Control System. It covered functions, space requirements, and costs. The report stated that source selection board procedures would be initiated to select the prime system contractor to develop, design, procure, install, and test the NORAD CCS.

ARDC stressed that these procedures had to be started before August 1959 for an estimated beneficial occupancy date of 1 April 1962. Systems hardware installation would follow and system testing would be completed approximately one year later. The report also recommended additional hardening. NORAD informed the Air Force Chief of Staff of its concurrence of this report, including the requirement for additional hardening, on 16 June.

Prior to submission of this report, ARDC had asked

USAF for authority to start source selection board procedures to select a systems contractor for the NORAD CCS. USAF had said that it would not grant this until the JCS approved the Air Force report. On 26 May 1959, ARDC asked USAF to reconsider and also stated that it did not concur with the parameters provided by USAF (above) because they did not provide the maximum protection available within Cheyenne Mountain.

On 10 July 1959, USAF asked NORAD whether it wanted to go ahead as currently planned and scheduled or get additional hardening which would delay the project and increase the cost. USAF said that additional hardening would require more exploratory boring and feasibility studies, extension of the BOD by about 12 months, JCS approval of the revised concept, and Congressional approval of the increased costs.

CINCNORAD replied on 14 July that while he agreed with the soundness of the ARDC recommendation for maximum cover, he was mindful of the urgency of getting the earliest BOD. Therefore, his position was as follows:

> Recommend portal locations and general configuration of the COC as proposed by Parsons, Brinkerhoff feasibility study with the structure of the COC in the mountain at the greatest depth attainable with current funds approved.

On 17 July 1959, USAF reversed its earlier decision and authorized ARDC to select a systems contractor for the NORAD COC and award a contract. The contract was to be carried out in two phases. Phase I was to be a study phase to extend the current ARDC study, which would have to be presented to the JCS for approval. This study was to cover communications; coordination, integration, and technical compatibility of the electronic subsystems involved, including SAGE, BMEWS, MIDAS, and NIKE Zeus; and the technical parameters, characteristics and quantities of equipment to meet these requirements. Emphasis was to be on the near NORAD requirements, rather than on future requirements, such as satellite defense, but

appropriate consideration was to be given the latter. Phase II was to be an implementing phase, started after JCS approval.

As of mid-1959, it appeared that a contract for excavation would be awarded about 1 December 1959, a contract for the building would be let about 1 October 1960, excavation would be completed about 1 December 1960, construction would be completed about 1 April 1962, and systems checkout and testing would be conducted between July 1962 and July 1963.

If this schedule was followed, the new COC would become operational in July 1963.

NATIONAL SPACE SURVEILLANCE CONTROL CENTER

In July 1958, NORAD learned that the Advanced Research Projects Agency was trying to determine what organization should manage a soon-to-be established interim satellite detection and tracking system. The Air Force recommended that NORAD be given operational control of the interim, as well as the ultimate, system.

ADC advised NORAD in October that it had learned that a decision might be made soon in DOD on management of the system. ADC recommended that NORAD back up USAF's position with a letter to the JCS.

NORAD wrote to the JCS on 26 November 1958. NORAD stated that the ultimate space track system had to be as inherently a part of the NORAD organization as the conventional radar network in the current system. If the ultimate system was to be developed responsive to NORAD's requirements and properly integrated, there appeared to be no alternative to placing the whole project under NORAD control in the immediate future.

On 19 December 1958, the Advanced Research Projects Agency (ARPA) directed ARDC to perform studies to serve as the basis for recommendations to be submitted by 30 June 1960 on the functions of a national filter center.

Its responsibility was to be that of cataloging all earth satellites and space vehicles and providing information to appropriate agencies. In conjunction with the above, between the date of the order and 1 July 1960, experimental operations were to be conducted at Project Spacetrack to complete research and development of an interim national space surveillance control center.

The ARPA order stated that at the end of this period, it was envisioned that an appropriate command or other agency, as designated by the Secretary of Defense, would assume operational responsibility for the NSSCC at a location to be named by the Secretary. ARPA amended this order on 7 January with a directive to ARDC to build a research and development interim NSSCC at Hanscom Field, Massachusetts. It also provided that maximum participation by outside agencies with a need-to-know, such as NORAD, should be encouraged during the experimental operating period.

ARDC issued a development plan on 13 January 1959 in which it stated that the interim NSSCC was a supporting system whose purpose was to provide service to a large number of agencies. The system would be managed by a System Project Office (SPO) within Headquarters ARDC. The SPO would provide the focal point for all actions pertaining to the INSSCC.

At NORAD Headquarters, a space surveillance control center committee was established on 12 February 1959. It was to do everything possible to assure integration of the space surveillance control center into the NORAD system, especially in regard to construction of the new COC. It was to maintain close relations with the COC committee at NORAD and to pass recommendations on integration to the latter.

Among the objectives assigned to the SSCC committee by the NORAD Chief of Staff were these:

a. Develop and produce a concept of operations for a space detection and surveillance center within the NORAD system.

b. Determine the proper location and physical characteristics for a space surveillance control center responsive to CINCNORAD's mission.

c. Maintain liaison with the ARDC Space Detection and Surveillance Filter Center being established at Laurence G. Hanscom Field, Massachusetts for the purpose of: inserting NORAD requirements into the developmental phase of the Filter Center; insuring that the ARDC pilot model remains responsive to NORAD requirements; establishing personnel training programs for the operational use of the system; and determining the intelligence and operational requirements against which the system will collect.

d. Monitor the proposed space detection and surveillance systems in R&D and recommend action to assure integration of these systems and components of systems with other defense equipments to be operated by NORAD and with weapon systems.

On 21 May 1959, NORAD advised the JCS that in the "firm belief that NORAD should be designated as the military command to operate the National Space Surveillance Control Center, we are proceeding to plan for the future integration of this function into our new, hardened Combat Operations Center...." NORAD recommended that the JCS urge the Secretary of Defense to confirm that NORAD would be the command to operate the NSSCC so that more positive operational planning could be done.

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