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Continental
Air Defense Command

HISTORICAL SUMMARY

JULY 1956 - JUNE 1957

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OTHER PUBLICATIONS OF THE DIRECTORATE OF COMMAND HISTORY

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History of the Continental Air Defense Command, Jul-Dec 1954 *

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HISTORICAL STUDIES

The Identification Problem in the Air Defense of the United States, 1946-1954 by Denys Volan **

Army Antiaircraft in Air Defense, 1946-1954 by Robert L. Kelley **

Emergency Air Defense Forces, 1946-1954 by Lydus H. Buss **

Electronic Countermeasures in the Air Defense of the United States, 1948-1955 by Geo. L. Montagno **

Organization and Responsibility for Air Defense, 1946-1955 by Thomas A. Sturm **

Seaward Extension of Radar, 1946-1956 by Lydus H. Buss **

A Decade of Continental Air Defense, 1946-1956 by Staff **

HISTORICAL REFERENCE PAPERS

U.S. Air Defense in the Northeast, 1940-1957 by Lydus H. Buss

Air Defense of Alaska, 1940-1957 by Thomas A. Sturm

* Combined with the History of the Air Defense Command for the periods.

** Product of the Combined CONAD/ADC Historical Staffs (1954-1956)

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CONAD
HISTORICAL SUMMARY

July 1956 - June 1957

UNCLASSIFIED

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

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PREFACE

This is an historical summary of the year from 1 July 1956 to 30 June 1957. Future issues of this summary will cover a six month period. Material for this summary was taken from a wide collection of documents. Readers desiring more detailed information than is given in the text are invited to use any of the documents cited in the reference notes to this history.

This historical summary is one of a number of publications issued by the Directorate of Command History. Included are brief historical papers on subjects of relatively small scope and comprehensive historical studies of subjects of broad scope. Together these publications make up the over-all command history.

In addition, the historical office maintains an archives of important documents on air defense dating back to World War II. By means of this archives, this office can answer queries for information on a wide variety of subjects. Members of the staff are invited to make use of this information service.

This history was prepared jointly by Mr. Lloyd H. Cornett, Jr., Miss Elsie L. Joerling, Staff Sergeant Derril E. Howell, and the undersigned.

Colorado Springs, Colorado
15 September 1957

L. H. BUSS
Director of
Command History

[redacted]

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ONE

NEW TERMS OF REFERENCE FOR CONAD

UNIFIED COMMAND PLAN - USAF and CONAD STUDIES

CONAD was established by the Joint Chiefs of Staff as a joint command on 1 September 1954. The original terms of reference gave CONAD the mission of (1) defending the continental United States against air attack and (2) supporting CINCPAC, CINCLANT, CINCARIB, COMSAC, CINCAL, and CINCNE in their missions to the maximum extent consistent with its primary mission. Under these terms, CONAD consisted of the USAF Air Defense Command, the U. S. Army Air Defense Command (USARADCOM)*, and the Naval Forces CONAD (NAVFORCONAD). USAF was named executive agency for CONAD and the terms stipulated that CINCONAD would be an Air Force general. The USAF ADC Headquarters was additionally designated as Headquarters CONAD and the Commander of ADC was named Commander-in-Chief of CONAD.

This was the arrangement for two years -- until September 1956 when CONAD's mission was broadened and the organization overhauled. Many months before this, a number of actions began that necessitated and/or led to these changes.

First among these was the Joint Chiefs of Staff revision of the Unified Command Plan. Their aim in this was to produce a more efficient military structure world-wide and to reduce cost. Early in 1956, when each service was making recommendations for this revision, USAF Headquarters proposed abolition of the Alaskan and Northeast Commands and assignment of air defense of the areas of these commands to CINCONAD.[1] Under the USAF plan, CONAD was to be designated a unified command -- an arrangement that CONAD opposed.

CONAD officers went to Washington to object to the unified command idea for CONAD and to present the views of General Earle. E.

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* The U. S. Army Antiaircraft Command was redesignated the U. S. Army Air Defense Command on 21 March 1957. The latter term is used throughout this history, however, for clarity.

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Partridge, CONAD's Commander-in-Chief (and ADC's Commander). In a memo dated 13 February 1956, delivered by these officers, General Partridge advised USAF Headquarters that:[2]

> The air defense of North America is a single problem. Therefore, any United States change in organization at this time must be pointed toward an eventual combined organization for an integrated air defense with a centralized operational control of the Air Defense Force of all countries and services in and adjacent to North America.
>
> As a first step to accomplish [this] objective, I consider that the physical separation of Headquarters CONAD and Headquarters ADC is in order, with all component Headquarters remaining at Ent Air Force Base. CONAD must be given the mission of air defense of the United States, including the plans and requirements therefor, and the operational control of all weapons useful in the air defense mission. All component commands, including ADC, must be given the mission of providing trained forces to CINCONAD for his operational control.

As to the plan for making CONAD a unified command, the CONAD officers pointed out that the organization and operational procedures for a unified command would not be suited to air defense. Specifically, they objected to the fact that the commander of a unified command exercised operational control through his component commanders.

The USAF planners accepted these views and reinstated a joint command arrangement for CONAD in their proposal.

Shortly thereafter, USAF presented its proposal to the Joint Strategic Planning Committee. The Navy and Marine Corps agreed to it entirely and the Army agreed to disestablishment of the Northeast Command.[3] The Army objected, however, to doing away with the Alaskan Command. The Army maintained that the organization and command structure should remain the same.

In March 1956, USAF asked General Partridge to review the proposal before it was sent to the JCS. USAF had accepted the Army's views and proposed now that the Alaskan Command be kept. It still proposed that the air defense responsibility in this area be given to CONAD in addition to that of the Northeast. Also, it still recommended that the Northeast Command be abolished.

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General Partridge agreed, reiterating his views that "CONAD responsibilities, initially, should be limited to planning, requirements, operational control and deployment of air defense forces and to insure compatibility of air defense systems now under construction in all areas."[4] In addition, he reminded USAF that "All our actions should be guided by the ultimate aim of integrating the operational control of the air defense of Canada and the U. S."[5]

The JCS finished the revision by mid-1956 and the Secretary of Defense approved it. The new Unified Command Plan gave CINCONAD the responsibility of defending Alaska and the Northeast Area against air attack as well as the United States, and of assisting in the air defense of Canada and Mexico. It also provided for the disestablishment of the U. S. Northeast Command on 1 September 1956.

Study of Separation of CONAD and ADC

In the meantime, a joint study was underway in Colorado Springs on reorganization of CONAD. In December 1955, CINCONAD had directed that a joint study group be formed of component and CONAD officers to study the feasibility and means of separating the CONAD and ADC staffs.[6] The reason for wanting to separate the staffs and appoint a separate commander for ADC was that the ADC Headquarters had not been able to function effectively as a joint headquarters. The combined, two-hat arrangement was not effective. It had been extremely difficult for the Air Force officers serving in dual capacities to adequately handle both positions. It had not been possible to clearly separate the functions of CONAD and its component commands and to recognize command channels.

Separation was necessary to increase CINCONAD's capability to exercise his major functions of planning and establishing air defense requirements and of operationally controlling the air defense forces. General Partridge saw that the agency responsible for air defense, the agency having operational control of the forces, had to be a clearly defined, separate organization. And the channels or means for exercising operational control had to be separate, i.e., they had to be through CONAD's channels and not ADC's or ARADCOM's.

The joint study group completed its work in March 1956. Its study proposed a separate staff consisting of a commander; chief of staff; secretariat; an information services; and deputies for plans and operations, communications and electronics, and intelligence.[7] A staff of 351 was proposed in the original study -- consisting of 118 officers, 160 enlisted men, and 73 civilians. Of the 118 officers, 23 were Army,

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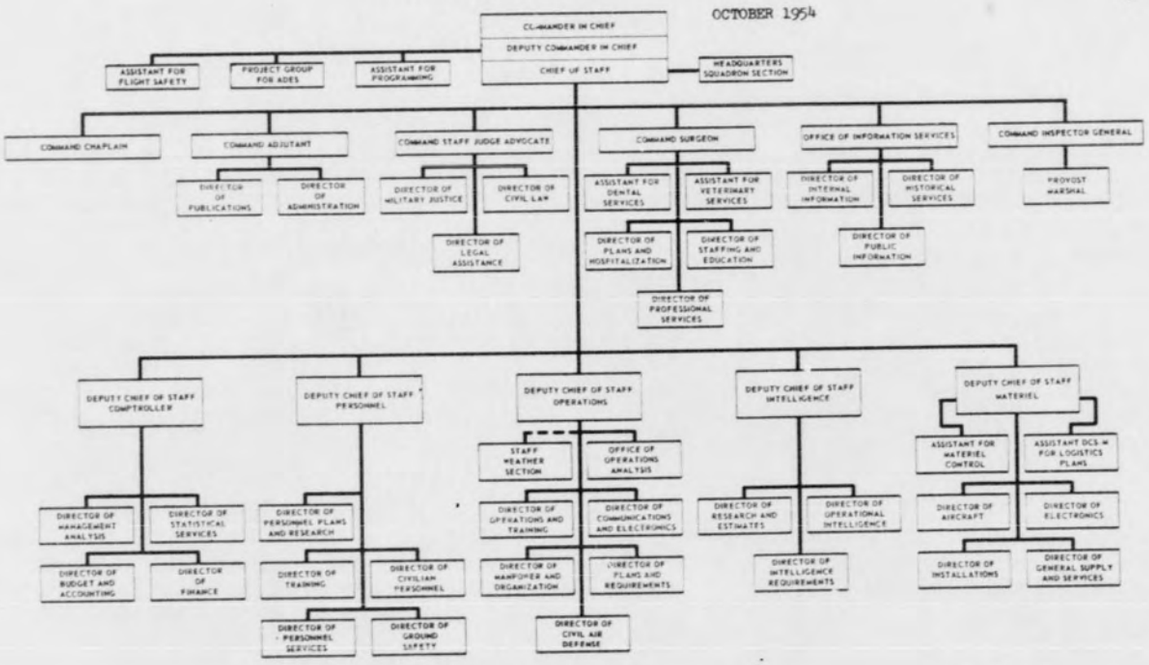
HEADQUARTERS CONAD

OCTOBER 1954



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41 Navy, and 1 Marine; 83 were Air Force. In addition to the Air Force commander, all deputy chiefs of staff were Air Force officers. An Army general was proposed for the chief of staff position.

Both the Army and Navy component commanders objected to the proposed size and composition of the CONAD staff. Lieutenant General Stanley R. Mickelsen, Commanding General of ARADCOM, said that while he agreed with the need for a separate staff, he disagreed with the proposal on three counts:[8]

> (1) the size and rank structure of the staff; (2) stemming from the first, the apparent intent to involve the CONAD staff in details which are properly component command responsibilities; and (3) the assignment of almost all of the key staff positions of responsibility to USAF officers.

He added that he believed a small CONAD Headquarters was proper and adequate for the task. But, he said, if the large staff was approved, there should be adequate Army representation. "...it is considered essential that at least a few of the directors be Army officers, particularly in view of the major contribution that AARACOM is making in the CONUS air defense effort."[9]

In general, these were also the views of the Navy component. Captain Dennis J. Sullivan, Acting COMNAVFORCONAD, stated that he did not agree with the proposed staff "in regard to total size, rank structure, assignment of key positions, or representation from the services concerned."[10] His estimate was that about 30 to 40 officers were all that would be required to perform the CONAD function.

In April 1956, CONAD sent its proposal for new terms of reference which included separation of the headquarters and for the functions of the separate headquarters to the JCS for approval (through the Chief of Staff, USAF). In July, the latter advised CONAD that on 19 June 1956, the Secretary of Defense had reached a favorable decision on the concept of operational control and command relationships and for separation of the headquarters as recommended by the JCS (see discussion next page). USAF also advised that the joint staff had been directed to revise the CONAD terms of reference.

CONAD sent its proposal for manning of the headquarters to the JCS on 6 August. The strength proposed -- a total of 357, including 124 officers, 159 enlisted men, and 74 civilians -- was essentially the same as had been recommended by the joint study group in March 1956.[12] The

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proposed UMD was approved on 22 August.[13]

The Army Chief of Staff did not concur with the staffing of CONAD Headquarters. He objected specifically to the placing of Air Force officers in key positions. USAF referred the matter to General Partridge for reply. His reply stated in part that:[14]

> In determining the composition of the Headquarters staff under the Terms of Reference, due consideration was given to each of the military services and their basic functions. Since air defense planning and operation for the North American continent requires during this time era an intimate knowledge of offensive and defensive aerial warfare, I selected initially Air Force personnel for certain key staff positions. It is my intention to utilize the personnel made available by the three services to the limit of their capabilities with due consideration to rank, experience and forces assigned.

He pointed out further that the manning and organization were subject to change as the situation warranted.*

JOINT CHIEFS OF STAFF RECOMMENDATIONS ON CONAD TERMS OF REFERENCE

Two of the main actions underway in the first six months of 1956 that led to changes in the CONAD mission and organization have been shown: the JCS revision of the Unified Command Plan and the CONAD proposals for change in organization. A third important action began in May. On the third of that month, the Armed Forces Policy Council was briefed on the Army and the Air Force positions on the control of air defense weapons. Following the formal presentations, the JCS were requested to make recommendations on command relationships and operational control for air defense and to clarify the authority of CINCONAD. This was completed by 5 June. The JCS felt that many of the difficulties CONAD was experiencing were caused by the organizational arrangement and to the wording of the existing terms of reference. Among the recommendations in the JCS memorandum was separation of the headquart-

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* Francis F. Urbane, a U. S. Army Brigadier General, reported to CONAD Headquarters on 16 May 1957 to take the position of Deputy Chief of Staff Communications and Electronics.

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ers of ADC and CONAD. The recommendations were approved by the Secretary of Defense on 19 June 1956 as noted above. These recommendations were reflected in the new terms prepared after Mr. Wilson's approval of the JCS memorandum.

NEW TERMS OF REFERENCE

The new terms of reference were sent to CONAD on 4 September 1956. They provided for the change in mission directed by the Revised Unified Command Plan and for the change in organization recommended by the JCS.

CINCONAD's mission was broadened in two areas: (1) responsibility for air defense of Alaska and the Northeast and (2) responsibility for assisting in air defense of Canada and Mexico according to approved plans and agreements.[15] CINCONAD was also charged with supporting CINCAL, CINCPAC, CINCLANT, CINCARIB, and CINCSAC in their missions.

CINCONAD was given operational control over the USAF Air Defense Command, the U. S. Army Air Defense Command, and the Naval Forces CONAD and all forces assigned, attached or otherwise made available to these commands. CINCONAD's authority in this respect was defined in broader terms than before (more in line with the definition given for the commander of a joint task force by the Joint Action Armed Force Manual).

His authority, the terms stated, included those functions of command involving composition of subordinate forces, assignment of tasks, designation of objectives and direction necessary to accomplish the mission. It specifically included determination of procedures for conducting the air battle, for exercising operational control of all assigned forces, and for directing engagement and disengagement of weapons. Finally, it included authority to centralize operational control of forces, including the assignment of individual antiaircraft batteries to designated targets.

The new terms again provided that the forces and operations of the seaward extensions of the early warning systems were to be under CINCLANT and CINCPAC.

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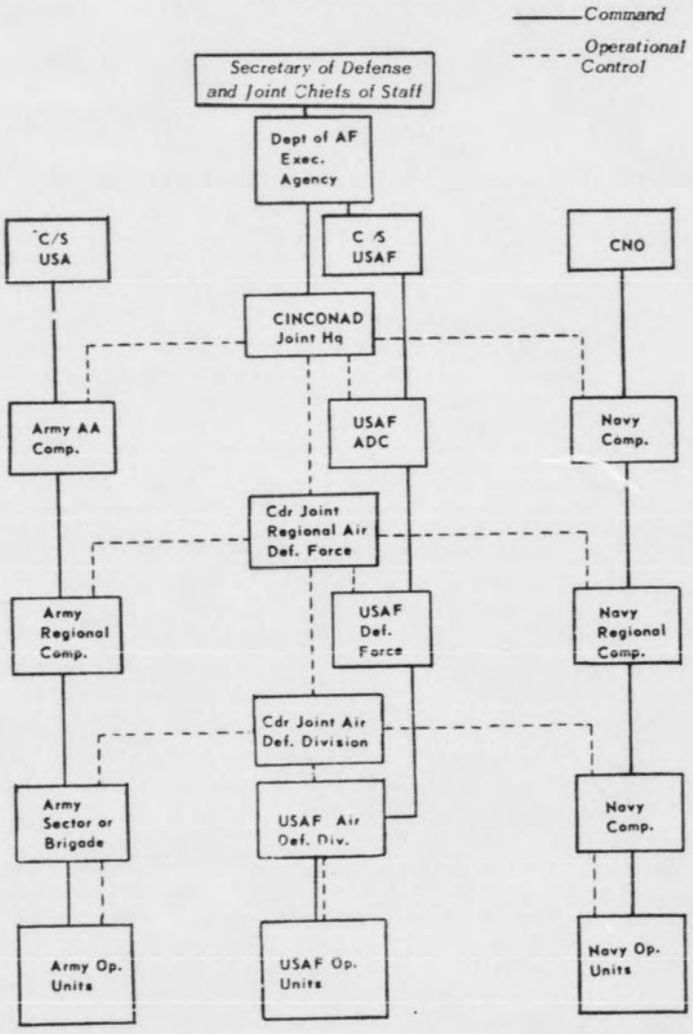
ORGANIZATION

CONTINENTAL AIR DEFENSE COMMAND

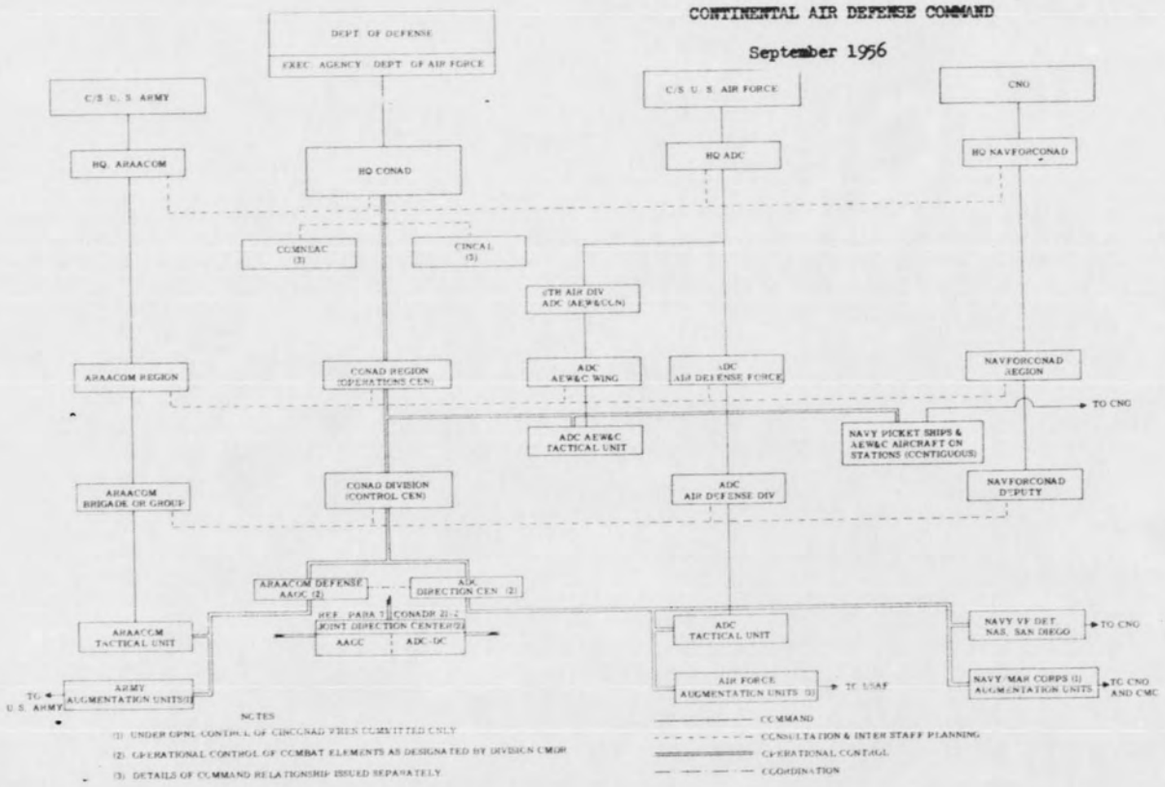
SEPTEMBER 1954



ORGANIZATION

CONTINENTAL AIR DEFENSE COMMAND

September 1956



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The responsibilities of the component commands were clarified and standardized to a great extent. It was specifically stated that the component commanders had no specific service combat missions. Their responsibility under CINCONAD was to equip, administer, train, and provide combat ready forces. CINCONAD's joint commanders were responsible for combat operations.

CONAD was made a joint command with the Air Force as executive agency. But the statement that CINCONAD would be an Air Force general who would be designated as commander of ADC was deleted. Instead, it was provided that CINCONAD would not be a component commander. CINCONAD was given the authority to set up a separate joint headquarters with a separate staff. In addition, he was authorized to set up such separate subordinate joint organizations as he deemed necessary.

On 17 September 1956, the new staff structure for the separate CONAD Headquarters was established.[16] The CONAD Commander-in-Chief, General Partridge, was relieved of command of ADC on this date and Lieutenant General Joseph H. Atkinson (who had been Commander-in-Chief Alaskan Command) was appointed Commander of ADC.[17] But it was not until 1 October that the CONAD staff actually separated physically, insofar as space permitted, and began functioning separately. By the end of June 1957, the CONAD staff totalled 366 (116 officers, 178 enlisted men, and 72 civilians) against an authorization of 399.

		Off	Enl	Civ	Total
Hq ADC	Auth	481	431	432	1,344
30 June 1957	Asgd	541	499	481	1,621
ADC	Auth	12,928	85,159	12,944	111,031
30 June 1957	Asgd	12,624	87,952	12,999	112,875
Hq ARADCOM	Auth	117	151	55	323
15 July 1957	Asgd	110	156	52	318
ARADCOM	Auth	4,121	38,328	105	42,554
15 July 1957	Asgd	3,952	41,803	102	45,857
Hq NAVFORCONAD	Auth	24	17	2	43
30 June 1957	Asgd	22	15	2	39

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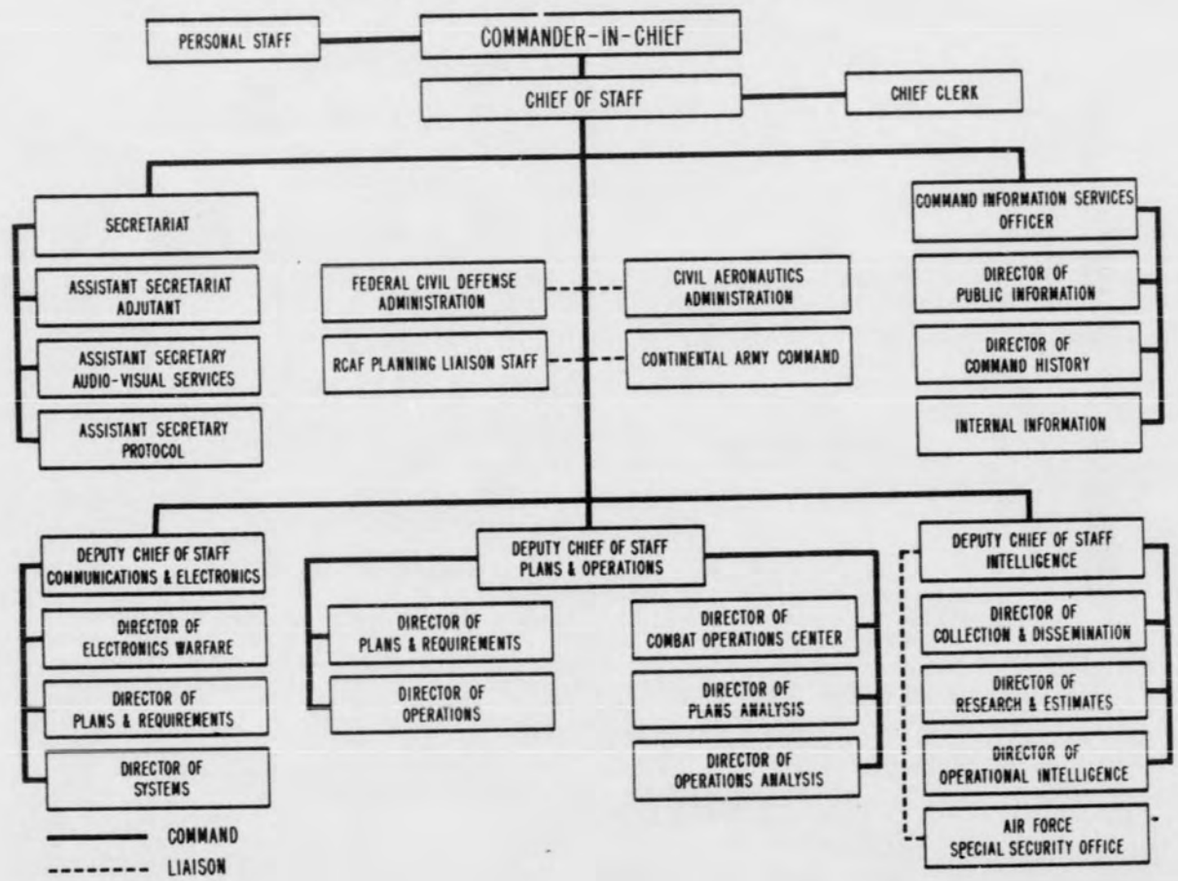
CONTINENTAL AIR DEFENSE COMMAND
ORGANIZATIONAL CHART



13 JUNE 1957

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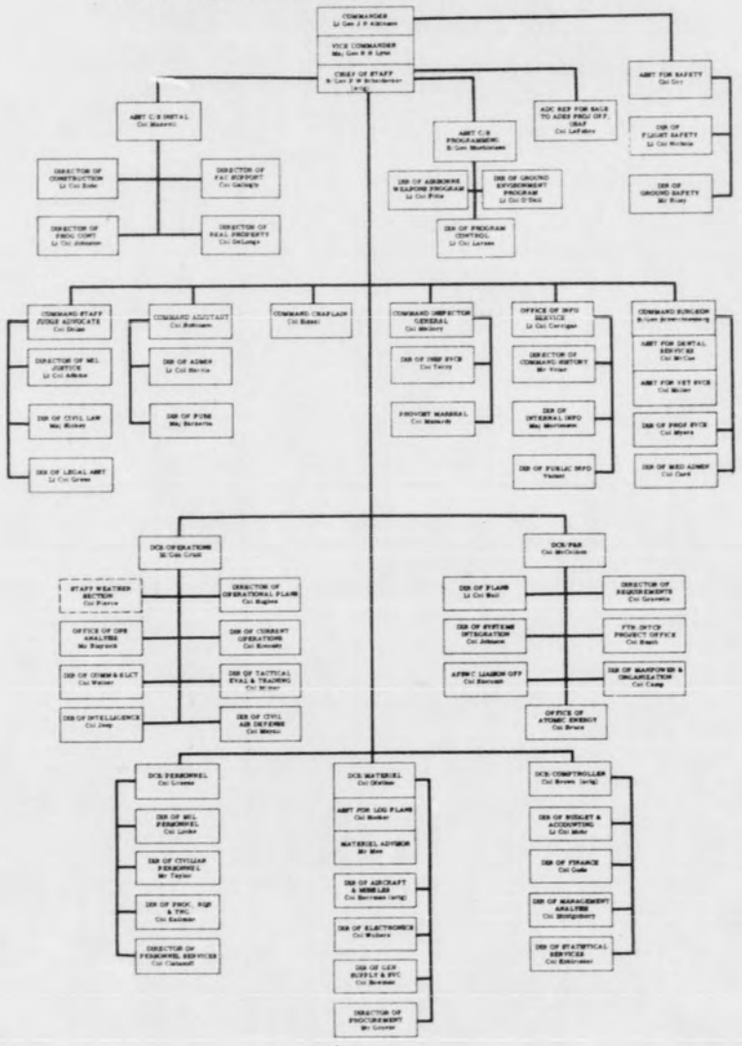
HEADQUARTERS AIR DEFENSE COMMAND



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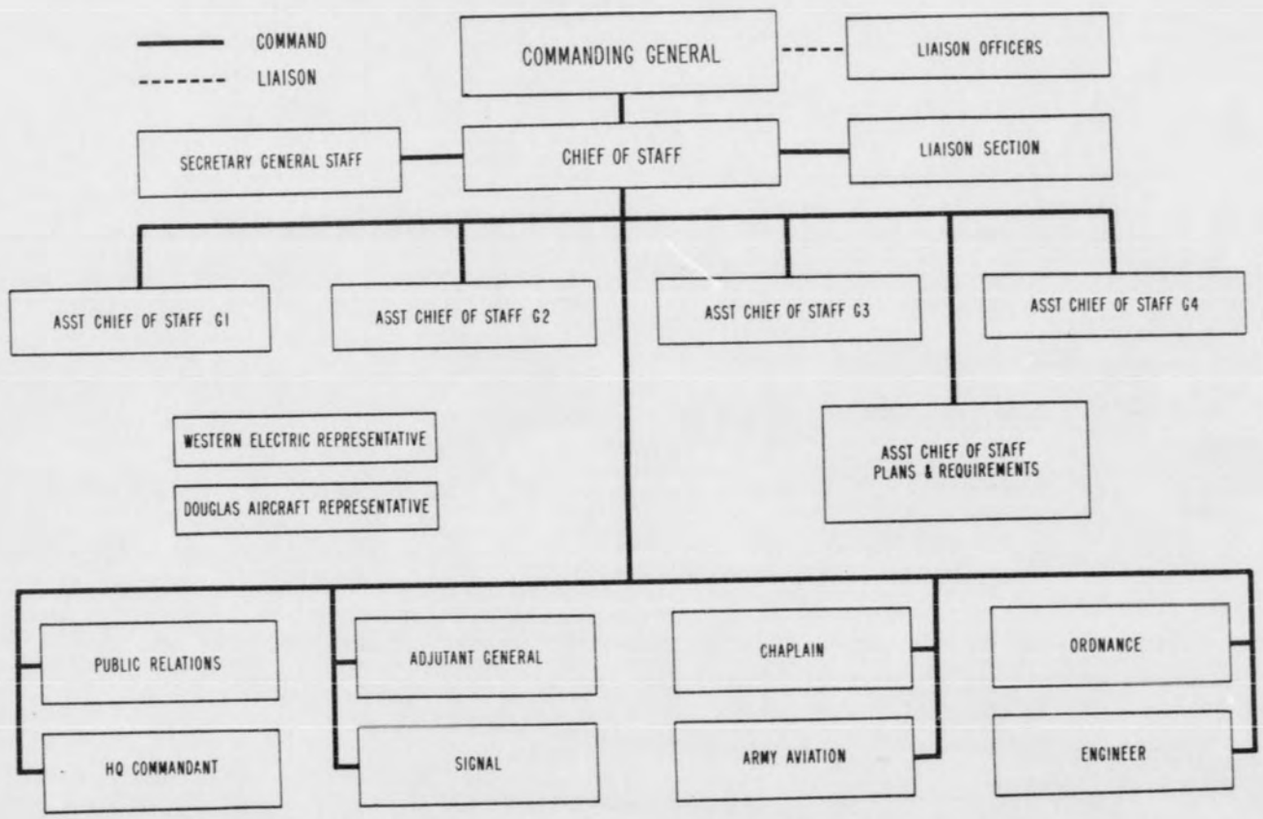
UNITED STATES ARMY AIR DEFENSE COMMAND
ORGANIZATIONAL CHART



13 JUNE 1957

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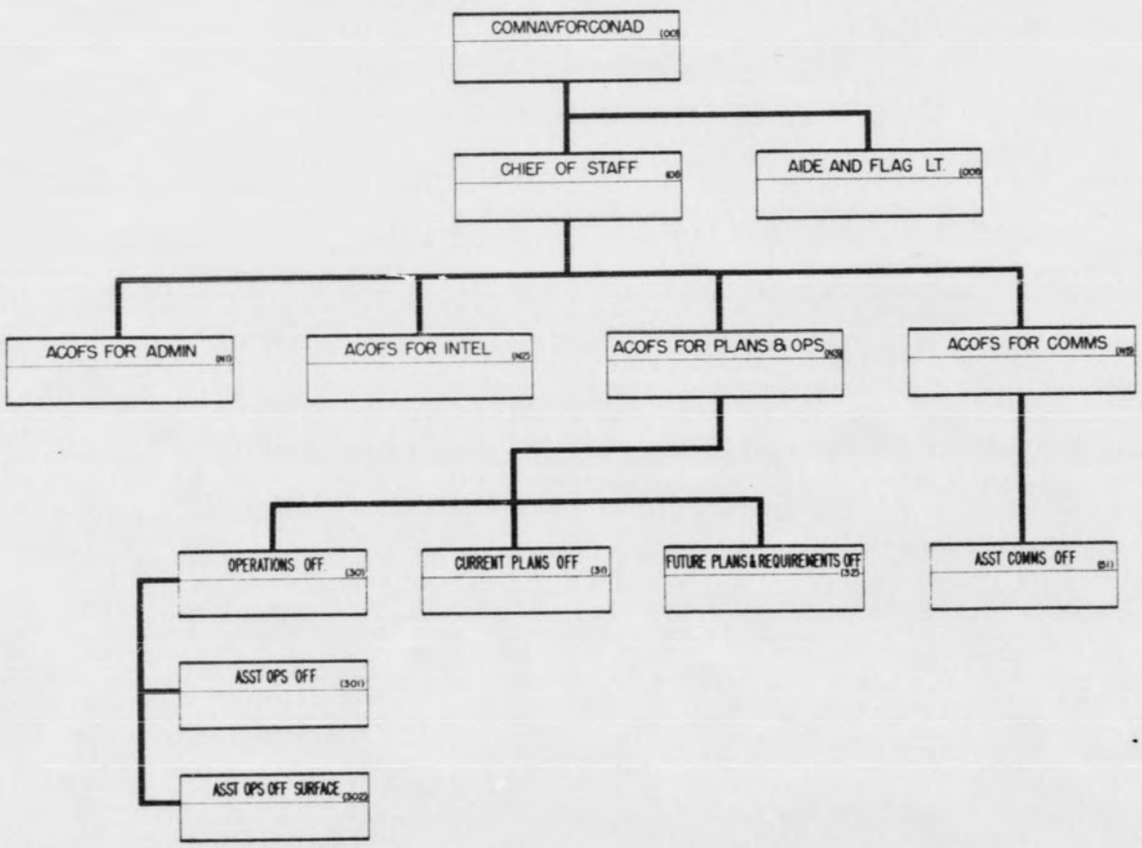
HEADQUARTERS, NAVAL FORCES, CONAD

STAFF ORGANIZATION CHART



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TWO

TAKING OVER NORTHEAST AND ALASKA AIR DEFENSE

NORTHEAST AREA

The U. S. Northeast Command, a JCS unified command, was disestablished on 1 September 1956 in accordance with the JCS Revised Unified Command Plan. On this same date, CINCONAD took over responsibility for air defense of the Northeast.

To implement this responsibility, CINCONAD designated the Commander, Northeast Air Command (COMNEAC) his subordinate joint commander responsible for air defense in the Northeast.[1] He placed all U. S. air defense forces in the Northeast under the operational control of COMNEAC.* CINCONAD advised the latter that the air defense responsibilities assigned to NEAC were the same as formerly held by the Northeast Command and that there would be no change in the arrangements with Canada and Denmark for air defense operations.**

The RCAF Air Defence Command was responsible for operational control of U. S. air defense forces in the Canadian portion of the NEAC area. An agreement to this effect was made in April 1953 by CINCNE and the Air Officer Commanding the RCAF ADC. This agreement and subsequent renewals provided that the AOC RCAF ADC would exercise operational control through CINCNE. COMNEAC now took the latter's place. CINCONAD and the AOC RCAF ADC agreed that the arrangements in force at the time

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* The Northeast Area as used here meant both the Canadian and the Greenland Areas.

** An agreement was completed by Denmark and the U. S. on 27 April 1951 (it went into force on 8 June 1951). This agreement was made at the request of the North Atlantic Treaty Organization. The agreement provided for the mutual use of bases and other facilities in Greenland and guaranteed that sovereignty of the Kingdom of Denmark would not be prejudiced. The agreement, being in implementation of the North Atlantic Treaty, was to remain in effect for the duration of the North Atlantic Treaty.

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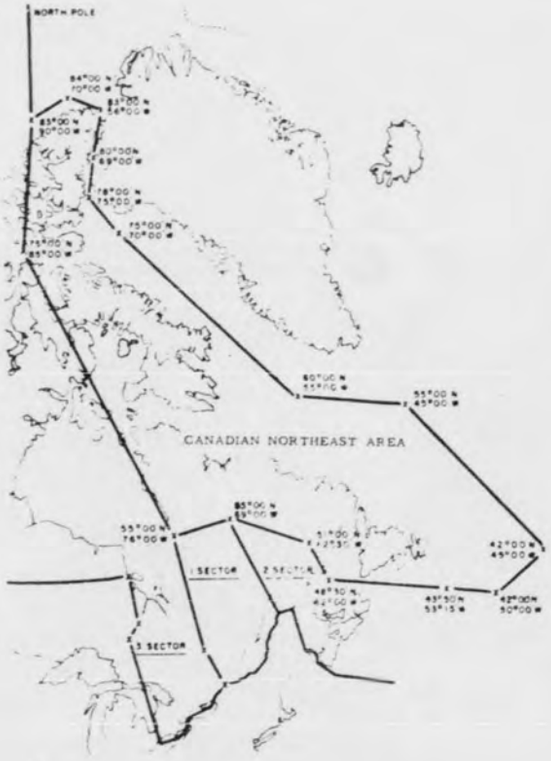
would remain in effect until a new agreement could be signed.[2]

A new agreement, dated 1 January 1957, was signed by General Partridge and Air Vice Marshal L. E. Wray, Commander of the RCAF ADC. It provided that the AOC RCAF ADC would exercise operational control over all U. S. air defense forces in what was termed the Northeast Area (see inset) through CINCONAD's subordinate commander in the area.[3] The air defense forces listed in the agreement were squadrons, bases, aircraft, ACW units, GOC units, antiaircraft units, and communications units. Operational control was defined as the power of directing, coordinating, and controlling the operational activities of deployed units. Redeployment of units was specifically excluded.



CINCONAD's arrangements with COMNEAC were interim only, for it was planned by USAF that NEAC would also be abolished as soon as possible.[4] This date was set for 1 April 1957.

On this date, USAF discontinued NEAC. ADC took over the USAF air defense forces in the area including the one division, the 64th Air Division (Defense) and possession of Pepperrell AFB and all U. S. ACW stations. ADC also succeeded NEAC in the responsibilities it held for supporting and running the DEW line stations in eastern Canada and Greenland.[5]

The Army antiaircraft group in the area, the 7th at Thule, was relieved from assignment to the First Army and

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assigned on 1 September 1956 to the U. S. Army Air Defense Command.[6] First Army retained responsibility for logistic and administrative support.

CONAD established the 64th Continental Air Defense Division on 1 April 1957 as its subordinate joint air defense command in the Northeast to take NEAC's place.[7] Its area of responsibility was still referred to as the Northeast Area and was the same as established for the 64th Air Division (Defense).[8] It included the Northeast Area as defined by the CONAD-RCAF ADC Agreement; the portion of the DEW line which NEAC had had responsibility; and Greenland in accordance with the terms of the 1951 Danish-U. S. Agreement. The commander of the 64th Air Division, Colonel Carroll W. McColpin, was named commander of the 64th CONAD Division.

As CINCONAD's joint commander, Colonel McColpin was responsible for conducting the air defense of the Northeast Area (outside the limits of the Canadian air defense areas) and exercising operational control of all air defense weapons systems assigned or otherwise made available for air defense.[9] He was also responsible for complying with instructions of the AOC RCAF ADC on operational control of U. S. air defense forces in the Canadian part of the Northeast Area and exercising operational control of air defense forces in this area. Finally, he was to exercise operational control of the Eastern portion of the DEW line, exclusive of the seaward extensions.

ALASKA

On 1 September 1956, CINCONAD also assumed operational control over all air defense forces assigned or otherwise made available for air defense of Alaska.[10] At the same time, he designated Commander-in-Chief Alaska (CINCAL) as the commander responsible to him for all air defense activities in the area and delegated to CINCAL the authority to exercise operational control of air defense forces in Alaska.* His control was to continue to be exercised through the Commander Alaskan Air Command (the Air Force component commander). CINCAL was also responsible for operational control of the Western part of the DEW line, exclusive of the seaward extension.

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* The Alaskan Command was a JCS unified command. The Department of the Air Force was executive agency. Components of ALCOM were Alaskan Air Command, U. S. Army Alaska, and Alaskan Sea Frontier.

[redacted]

These arrangements were incorporated in a memorandum of agreement between CINCAL, Lieutenant General Joseph H. Atkinson, and CINCONAD, dated 28 August 1956. The mission of CINCAL was established as (1) to maintain the security of the Alaskan Command being guided by special agreements made between the U. S. and Canada in the planning for and conduct of pertinent operations, (2) to support CINCONAD, CINCPAC, and CINCSAC in their missions, and (3) to report to the JCS through CINCONAD on all air defense matters.[11]

The agreement specified that CINCAL would participate with CINCONAD in the development of plans and requirements for air defense of Alaska; such plans to be reflected in JCS approved CONAD documents. It was noted that while there was no official relationship between like component commands of CONAD and ALCOM (such as U. S. Army Air Defense Command and the U. S. Army Alaska), close coordination between these components was necessary.

The antiaircraft forces in Alaska remained assigned to U. S. Army Alaska (USARAL). The Department of the Army instructions to Lieutenant General Stanley R. Mickelsen, USARADCOM Commanding General, and Major General James F. Collins, USARAL Commanding General, was that their commands "maintain the close and continuous coordination with relation to AAA matters in Alaska referred to in [the] Memorandum of Agreement."[12] CG USARADCOM was to keep CG USARAL informed on the latest thoughts and developments on AAA matters and plans. CG USARAL was to develop AAA forces requirements and plans for his area, use ARADCOM policies and directives to the extent practicable, provide AAA plans and requirements for ARADCOM review and coordination, and discuss with ARADCOM any unresolved AAA problems for determination of a recommended Army position. The coordination between the two was to insure that, insofar as possible, training and operations met ARADCOM standards. ARADCOM would make operational readiness and training inspections as mutually agreed upon between the two.

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THREE

THE NORTH AMERICAN AIR DEFENSE PARTNERSHIP

GENERAL SITUATION

Combining responsibility for air defense of Alaska and the Northeast Area with that of the United States under CINCONAD was a major step toward integration of the air defense of the North American Continent. But there still remained four separate commanders with air defense responsibility in their particular theaters. These were: CINCONAD for the United States, Alaska, and the Northeast Area; the AOC ADC (RCAF) for Canada; CINCLANT for the Atlantic Command; and CINCPAC for the Pacific Command. Each of these commanders was responsible for cooperating with and supporting one another to produce the best joint air defense capability.* For example, CINCPAC and CINCLANT were responsible for providing naval augmentation forces in an emergency for the operational control of CINCONAD. In addition, they provided the seaward extensions of the DEW line and were responsible for insuring that operations of these extensions were responsive to CINCONAD's needs.

CANADA

A close air defense partnership had long been maintained by Canada and the United States. Both countries recognized the singleness of the problem of air defense of the two nations. This concept was expressed by the 1956 issue of the Canadian-United States Military Cooperation Committee Plan (300/8): 1**

> Air defense plans should be based upon the concept that the air defense of Canada and the United States is

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* See Appendix One for a statement of the missions of these commanders.

** The MCC 300 series was published yearly to cover the period 1 July to 30 June. It was issued about 1 October.

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a single problem and that plans for the use of the air defense resources of Canada and the United States must be developed on a combined basis so as to provide the most effective defense possible for agreed vital targets.

In general, this concept had long been held by Canada and the U. S. and had guided post-war planning and development. As far back as 1949, the Military Cooperation Committee (MCC) had drawn up a joint emergency defense plan to outline the major actions necessary and the agreed principles of common defense operations. The MCC followed this with a directive to the U. S. air defense organization, the Continental Air Command, and the RCAF Air Defence Group (the Canadian organization that preceded the RCAF Air Defence Command) to prepare detailed emergency air defense plans. The first of these was prepared in 1950. New plans were made each year thereafter.

By 1957, the emergency air defense plan covered the agreed to concept for air defense operations, critical areas to be defended, combined operational arrangements, and the necessary policies and procedures for carrying out the concept of operations. The latter included cross border interception and engagement procedures, rules of engagement, and the agreement for operational control of U. S. forces in Canada.

Another major part of the joint planning was the Continental Air Defense Objectives Plan, 1956-1966, dated 15 December 1956. This plan was prepared on the basis of the above quoted requirement of the MCC and CONAD's responsibility to recommend requirements for the continental air defense system to the JCS. The preface of this plan noted that:[2]

> In the absence of any authorized combined planning agency, but in accordance with the intent of the /MCC Directive/, CINCONAD has produced this document to set the objectives for the air defense of Canada and the United States within a mutual air defense system. In formulating these objectives, the AOC ADC (Canada) has been consulted frequently, and the RCAF Planning Liaison Staff at Headquarters CONAD has participated fully.

In addition to this joint planning and coordination of procedures, the two countries had shared in the building and manning of the Pinetree radars in Canada. Finally, the number of officers

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exchanged had increased greatly over the years. USAF officers filled a number of key positions in the Canadian system by 1957 and RCAF officers were in key positions in the U. S. portion of the system extending from the DEW line to the Combat Operations Center in Colorado Springs.

The next logical step in this development was integration of the operational elements of the two forces into a single command structure. This too was something that had been discussed at various times since the end of World War II. In 1955, with the two systems linking, the matter came up again. It was recognized that the most effective defense, the one that could react most quickly and most flexibly would be one that combined the operational control of the air defense forces of both countries under one command.

Between this time and the summer of 1957, the numerous problems and details of integration were worked out in general by the two countries. On 1 August 1957, an announcement was made jointly by the Canadian Minister of National Defense and the U. S. Secretary of Defense that the two governments had agreed to an integrated command:[3]

> The two governments have agreed to the setting up of a system of integrated operational control of the air defense forces in the continental United States, Alaska and Canada under an integrated command responsible to the Chiefs of Staff of both countries. An integrated headquarters will be set up in Colorado Springs and joint plans and procedures will be worked out in peacetime, ready for immediate use in case of emergency. Other aspects of command and administration will remain the national responsibility. This system of integrated operational control and the setting up of a joint headquarters will become effective at an early date. This bilateral arrangement extends the mutual security objectives of the North Atlantic Treaty Organization to the air defenses of the Canada-U. S. Region.

MEXICO

It was also CINCONAD's responsibility to assist in the air defense of Mexico in accordance with approved plans and agreements. But unlike the situation with Canada, there were no

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approved plans or agreements by which CINCONAD could fulfill his responsibility.

A defense plan, the Mexico-United States Emergency Defense Plan (MEXUS 100/1), had been approved by the Joint Mexican-U. S. Defense Commission (JMUSDC) on 19 November 1952 and by the JCS on 19 February 1953.[4] This plan outlined in very general terms the measures required for the common defense. But it did not have specific agreements or rights on air defense of the border areas.

At the next session of the JMUSDC held in July 1954, the Chairman of the U. S. Section pointed out the inadequacies of this plan and proposed its revision. A draft revision was presented. At the following session of the JMUSDC in September 1955, the group considered the revision -- MEXUS 100/2. By the end of the meeting, agreement had been reached on about 85 per cent of MEXUS 100/2.

But CONAD learned in late 1956 that the attempts of the U. S. Section to revise the defense plan to provide for adequate continental defense arrangements had not been successful. USAF had advised earlier (July 1956) that:[5]

> The factors which have deterred agreements by Mexico result primarily from constitutional limitations and an acute awareness of the probable reaction of Mexican pressure groups against any proposed military agreement or pact with the U. S. However, it is possible that Mexico will accede to U. S. requirements provided some tangible benefit will accrue to Mexico from such action. Upon resolution of certain aspects of this matter now being considered by the JCS it is anticipated that efforts will be renewed toward reaching mutually satisfactory agreements with Mexico.

In the meantime, CONAD included in its 1956-1966 requirements plan the radars that it felt would be required in Mexico by 1961 to provide adequate defense. CONAD put in a requirement for both prime radars and gap fillers to provide contiguous coverage south of the border at all altitudes.[6] Also for adequate air defense (but not included in the above plan), CONAD planners wanted border overfly agreements to the limit of radar surveillance and fighter capability, rules of engagement in line with those of the U. S., exchange of aircraft movement information for identification purposes, and exchange of combat intelligence.

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FOUR

CONAD REGIONS AND DIVISIONS

AUTHORITY

The original terms of reference of September 1954 provided that each USAF Headquarters from ADC down to air division level would be additionally designated as a joint headquarters. Accordingly, joint defense forces and joint air divisions were established at (or superimposed on) every USAF defense force and division.

One of the important facets of the 1956 reorganization was separation of the CONAD and ADC structures. General Partridge felt that the most effective system would be a separate system. He believed that operational control should be exercised through CONAD's channels and not through component command channels.[1]

The new terms of reference provided authority for CINCONAD to establish a separate headquarters and such subordinate joint organizations as he deemed necessary to accomplish his mission, including those necessary to permit centralized control and employment of all air defense weapons available.

Effective 15 January 1957, CONAD disestablished the joint defense forces and divisions and established CONAD regions and CONAD divisions (a total of three regions and 16 divisions).[2]* The CONAD regions (e.g. CONAD Forces, Eastern CONAD Region) and CONAD divisions (e.g. 9th CONAD Division) were responsible for the same geographical area as the organizations they replaced; their headquarters were at the same location and they carried the same numerical designation.

ORGANIZATION

The region was defined in a regulation issued in December 1956 by

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* A seventeenth division, the 64th CONAD Division, was established on 1 April 1957.

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CONAD (21-1) as a geographical subdivision of the CONAD air defense area.[3] The division was defined as a geographical subdivision of a region and those forces within the division area. The region operations center was to serve as the commander's command post and the center for coordinating the combat effort of all forces available for air defense of the region; the division control center was to be used for supervising and coordinating the combat effort of all aircraft, antiaircraft, guided missiles, and radar available to the division for air defense. Region and division commanders were defined as senior officers designated by CINCONAD to exercise operational control over CONAD forces within the region or division as delegated by CINCONAD.

The CONAD division commander, the regulation provided, exercised operational control of weapons and/or assigned targets to all weapons through the ADC direction centers and ARADCOM antiaircraft control centers. ADC direction centers were responsible to CONAD division commanders for surveillance, identification and warning activities within assigned areas.

The regulation noted that in order to provide for fully integrated control of all weapons within a specified geographical area, individual weapons control systems were to be co-located at CONAD direction centers whenever operationally and economically feasible. None of these were yet established, however. It was stated that CINCONAD would designate such CONAD direction centers and prescribe operating procedures for them by separate directives.

A CONAD direction center was defined as a specified subordinate joint information, communications and operations center which would be used for coordinating and supervising air surveillance and identification activities within an assigned area and for exercising tactical direction of all combat weapons assigned by the division commander.

The size and structure of the staffs of the regions and divisions were not established at the time of their formation. CONAD laid down the guide lines that the size would be limited to the minimum number of personnel required and the physical facility limited to that required to permit the CONAD commander to exercise operational control and conduct operational planning.[4]

Immediately, however, as an interim measure until CONAD could get its own separate commanders, CONAD asked ADC to designate the commanders of its defense forces and air divisions as commanders of the CONAD

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regions and divisions at the same location.[5] This was, of course, a two-hat arrangement for the commanders. They were responsible to their component superior for all uni-service command matters and to CONAD for all CONAD command matters. But they were to have separate staffs and were not to assign to either staff any responsibility that was in the functional area of the other.

The region and division commanders could appoint only a provisional staff, however. As of mid-1957, no unit manning document had been approved for any subordinate CONAD headquarters.[6] This had one advantage in that it provided a means of establishing, on the basis of operational experience, realistic manning requirements. A proposed staff structure for regions and divisions was sent to the JCS for approval on 7 June 1957. The size of the proposed staff varied. But in round figures, about 130 people were proposed for the region headquarters and 115 for division headquarters.[7]

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FIVE

CONAD (JOINT) DIRECTION CENTERS

CONAD CENTRALIZED CONTROL CONCEPT*

During an Army-Air Force briefing for the Armed Forces Policy Council on 3 May 1956 on concepts of air defense weapons control, General Partridge said he believed that the air defense battle was a single battle and therefore it was necessary to fight an integrated battle from the point of engagement until the enemy was destroyed.[1] He stated that he believed that the air defense system for CONAD had to be a system based on the integration of firepower of all air defense weapons; a system which employed a single operational control channel down to the lowest level where sufficient intelligence was available to permit a coordinated integrated effort; a system which eliminated unnecessary duplication at substantial savings; and a system which would provide the American people with the most air defense for their tax dollar.

General Partridge's means for achieving these ends were expressed in a letter to USARADCOM and ADC on 6 December 1956:[2]

> Optimum employment of air defense weapons and their ground environment system requires centralized control of all air defense elements under a single air defense commander responsible for the air defense of a designated area. This system must also provide means for the immedi-

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* Because this history is a summary of a relatively brief time period only and because the subject of weapons control and co-location of facilities is very broad and covers a greater time period, only the essential actions of the period are covered here. A comprehensive historical study of the subject of co-location of facilities and the Army-Air Force-CONAD concepts of weapons control is being prepared by the CONAD Directorate of Command History. In addition, a file of pertinent documents on the subject is available for loan to staff members.

[redacted]

ate decentralization of control to any or all subordinate levels upon decision by the air defense commander. Centralized control can best be effected when the control functions of different weapons systems are centrally located and fully integrated. Side benefits from co-location and integration include economy of personnel and equipment.

In this letter, he directed that the Army's weapons control system, the AN/FSG-1 Antiaircraft Defense System (Missile Master), and ADC's pre-SAGE semi-automatic intercept system, the AN/GPA-37 Radar Course Directing Group, be co-located and the operations functions integrated in the same operations room at facilities to be designated as Joint Direction Centers.

The immediate events leading up to this directive began on 21 June 1956. On this date, the Secretary of Defense sent a memorandum to the Secretary of the Air Force in which he concurred with the views of the Chairman of the JCS.* This was in regard to CONCONAD's authority to determine air defense weapons control and assignment, including assignment of targets to AA batteries. Mr. Wilson asked that CINCONAD submit a program for:[3]

> testing the feasibility and operational desirability for the centralized control of antiaircraft batteries through an economical implementation of the SAGE system and Missile Master system, or some modification thereof, for the more effective utilization of the antiaircraft units of the Army in Continental Air Defense.

Upon receipt of this memorandum, CINCONAD directed that a group consisting of CONAD, USARADCOM, and ADC officers work out a test program and find the best method for employing the Army's NIKE missile with SAGE.[4] In ensuing conferences between this group and representatives of a number of interested agencies, two documents were prepared: one on the working of Missile Master with SAGE, the other on a CONAD testing program.

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* These views are contained in TOP SECRET JCS Paper 1899/264.

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CONAD PLAN FOR EMPLOYMENT OF AA WEAPONS IN SAGE ERA

The first document described the employment of AA weapons under the concept of centralized control by the SAGE Direction Center. Assignment of targets to individual AA batteries would be by the SAGE direction center through the AN/FSG-1 according to this document which covered the operations under various conditions of degraded centralized control capability. These latter were listed as Modes I, II, III, and IV.[5] Mode I would be the primary method of operation with all facilities working normally. The SAGE direction center would make target assignment for all air defense weapons. The FSG-1 would be used in Mode I as a switching and communications central. Monitoring, supervising, and coordinating antiaircraft weapons would be done at a SAGE direction center by the antiaircraft officer and the antiaircraft weapons directors and assistants.

Under Mode II, AA weapons located in a disabled subsector would be controlled by an adjacent subsector. The AA directors of the adjacent subsector would assume responsibility for target assignment to AA weapons in the disabled subsector. Assignment of targets to batteries would be through the AN/FSG-1, serving as a switching relay between the adjacent SAGE direction center and the batteries.

Under Mode III, the Joint Manual Direction Center would assume responsibility for weapon control. This condition would result from loss of the automatic data link between SAGE direction centers and Manual direction centers or complete ineffectiveness of the SAGE direction center to control.

Under the last Mode (IV), there would be autonomous operation by the AA batteries. The battery commanders would make the target-weapon assignment.

The CONAD test program was for a test of the centralized concept described in the above employment document and a determination of the most effective method of employing AA weapons under centralized control.

When the CONAD concept was presented to USAF, Air Secretary Donald Quarles directed that it be expanded.[6] He directed that the CONAD concept cover not only the operational and technical compatibilities of the two systems, but also recommendations for AN/FSG-1 modifications, specifically in the areas of duplication. The CONAD group later met in Washington with a group from the Office of the Assistant Secretary of Defense for Research and Development. The latter was considering the technical aspects of the problem. The OSD group concurred in the CONAD centralized control concept and stated that technically the Missile

Master and SAGE systems could be made compatible. There remained the need to determine modifications of the Missile Master and the two groups agreed to restudy the problem.

CO-LOCATION OF MISSILE MASTER AND AN/GPA-37's AT TEN SITES

Back in Colorado Springs, a disagreement arose within the CONAD group. The ARADCOM members felt that they could not conscientiously agree to a modification of the Missile Master and therefore withdrew from the group itself. The ARADCOM officers honestly felt that the original Army concept for design and use was adequate. The project continued but without direct Army assistance.

In a review of the whole project, CONAD came to the realization that because the Missile Master would be coming in ahead of SAGE, the immediate problem was to find a method of integrating the AN/FSG-1 into the manual air defense system. They found that the operation of the ADC interceptor control system, the AN/GPA-37, could be integrated with the Missile Master at the same location. A concept for co-location and integrating the two was then developed.

This concept was approved by General Partridge and sent to the JCS on 19 September 1956 with an accompanying letter that stated in part:[7]

> A complete review of Missile Master (FSG-1) as a CONAD weapon control system under a centralized control concept has been made. It was concluded that the Missile Master (FSG-1) with minor modification can be utilized in the air defense system for more effective employment of AA weapons. The Missile Master capability can be used prior to SAGE to provide a better AA weapons capability, and during the SAGE era to support and back up the SAGE system.
>
> The Missile Master integration with the manual environment poses the immediate problem to be resolved. The optimum method of integrating the Missile Master with SAGE will be determined by the decisions made and precedents established for use of the FSG-1 in the manual system.
>
> In considering the methods of resolving the radar requirements of the FSG-1, CONAD determined that separate

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surveillance, height finding, gap filler and IFF radars were not necessary for the FSG-1. The FSG-1 surveillance requirement can be met by locating all FSG-1 sites at ADC Manual Direction Centers and readjusting ADC gap filler deployments. This concept of joint utilization will require the establishment of a few additional ADC manual direction centers and relocation of possibly six others. This increases operational capability and clarifies command responsibilities, both in the pre-SAGE era and when the SAGE system is operational.

It was noted in this letter that the Army had committed 96.5 million dollars for ten Missile Masters. It was stated that because of this commitment and because these ten FSG-1's could be operational prior to SAGE, that they would be used in the Continental Air Defense Command. A study of requirements for additional FSG-1's was being made by CONAD which asked that procurement be held up on any additional Missile Masters until this study was completed.

The proposed locations for the ten AN/FSG-1's had been considered and in its study CONAD recommended establishment of joint manual direction centers for the following areas: Washington-Baltimore, New York, Detroit, Niagara-Buffalo, Seattle, Boston, Chicago, Philadelphia, Los Angeles, and Pittsburgh.

In addition to the above, the study contained a concept for integration in the SAGE era and a plan for testing implementation of SAGE and Missile Master integration. The proposal for operation in the SAGE era was basically the same as described earlier.

Both the Army and the Air Force accepted the CONAD plan and on 30 October 1956, the Deputy Secretary of Defense concurred.[8] He directed the Army to coordinate with CINCONAD in selecting sites for co-location of facilities in the areas listed above. He also directed the Army to start action for construction and installation of facilities, to withhold procurement of additional Missile Masters beyond the first ten pending CINCONAD determination of requirements, and as determined and requested by CINCONAD to buy radars for joint use at sites where there was to be no ADC or CAA radar.

He directed the Air Force to ask CINCONAD to determine the requirement for new or relocated surveillance radars for joint use and to

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determine the requirement for additional Missile Masters or modified Missile Masters.

The Deputy Secretary also noted that a technical plan for integration of Missile Master into the continental air defense system (both manual and SAGE) was being prepared by the OSD Research and Development Office. This plan would be based on the concepts and plans proposed by CINCONAD. But installation of Missile Master was not to be held up in the meantime.

A Secretary of Defense memo to the Secretaries of the Air Force and the Army on 28 January 1957 advised that this technical plan had been completed.[9] The Air Force was directed to request CINCONAD to (1) submit for approval of the Secretary an overall test plan for determining the feasibility and operational desirability for centralized control of AA weapons through economical implementation of SAGE and Missile Master or some modification thereof, (2) monitor the studies, programs, and contract actions and tests outlined in the OSD technical plan, and (3) complete a study on radar coverage on joint requirements for co-located and integrated Missile Master and direction centers. This memo, which was forwarded to CONAD by the Air Force in a letter dated 11 March 1957, also directed the Army and Air Force to take specific study and contract actions on technical matters on SAGE-Missile Master integration and to support CINCONAD in providing a test program.

With the help of a number of Army and Air Force agencies, CONAD went to work on the above tasks. A radar coverage study was being made by ARADCOM and ADC for Missile Master and direction centers.[10] The tremendous task of preparing a test plan for SAGE-Missile Master was nearing completion at the end of the period of this history. On 15 July 1957, CONAD sent a draft plan to ADC and ARADCOM for final coordination.[11] CONAD hoped to have the plan in the hands of the Secretary of Defense by 15 September 1957.

In the meantime, on 6 December 1956, CONAD issued the letter mentioned earlier that directed co-location of Missile Masters and radar direction centers at joint direction centers. Following this, the requirements for the ten sites were reviewed jointly by CONAD, ARADCOM and ADC. On 4 February 1957, CONAD outlined its requirements to the JCS.[12]

At three sites where ADC radar was suitably located, the Missile Master building was to be built next to the ADC direction center.

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The operations room in the Missile Master building was to be enlarged and the ADC operating positions placed in this room. The Air Force technical equipment was to remain in the ADC buildings. These sites were:

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

New co-located and integrated Missile Master-direction centers were to be constructed at six sites. The Missile Master building was to be modified to permit installation of ADC equipment and operating positions in a joint operations room. These sites were:

Defense Area	Site
Boston	Fort Heath, Mass.
Chicago	Arlington Hts, Ill.
Philadelphia	ADC Site P-9A
Los Angeles	San Pedro Hill
Pittsburgh	South Park Mil. Res.
Seattle	Fort Lawton

The final one of the ten sites was to be placed at Fort George B. Meade, Maryland, under the same plan as for the above six. But this was to be left for a later date and treated independently as it was required for technical testing of the Missile Master initially.

On 15 March 1957, CONAD was advised that the Army would procure land and build a Missile Master operations building next to the ADC buildings at P-9, P-20, and P-21.[13] At the other sites, the Army would build a new facility. To avoid any delay on the latter, the specific land requirements and site locations and the space and technical requirements for these were requested as soon as possible. A complete plan for the ten joint direction centers was provided jointly by ARADCOM and ADC on 30 April.[14] The latter was approved by CONAD and sent to the JCS on 2 May.[15] On the 23rd of May, CONAD was informed by the executive agent for the JCS that the Army had concurred on the ADC-ARADCOM plan and that the Air Force and Army were proceeding to implement it.[16] The Army and Air Force established a joint technical and steering committee for this purpose.

[redacted]

CONAD estimates placed the date for operation of the combined Missile Master-direction center facilities at least two years off.[17] The joint installations at P-9, P-20, and P-21 were figured to start first -- in May 1959. The remainder would come into operation in late 1959 and early 1960. Fort Meade would be the last of the ten, set at about June 1960.

CO-LOCATION OF REMAINING AAOC's WITH ADDC's

Meanwhile, CONAD turned to the problem of co-locating and integrating the remaining AAOC's with their associated direction centers. In all, there were 22 primary AAOC's in the continental United States (see map following). Ten of these, as has been discussed, had been approved for co-location. This left twelve to be decided upon.* On 12 April, CONAD directed each of its regional commanders to survey their areas and recommend co-location and integration wherever operationally and economically feasible.[18] Of these 12, seven were in the Eastern Region. The Eastern commander recommended co-location of only three -- Loring AFB, Sault Ste Marie, and Savannah.[19] Four were in the Western Region, which recommended co-location of one -- Fairchild.[20] Central had one, but did not recommend its co-location.[21] Operations or economy factors were the primary reasons given for not co-locating. These recommendations were being considered at mid-1957.

CO-LOCATION IN ALASKA

CONAD's co-location concept was also applied to Alaska, where the Air Force had programmed the intercept system BADGE (Base Air Defense Ground Environment) and the Army had programmed the weapon control system AN/MSG-4. The CONAD requirement for Alaska was stated to the JCS as follows:[22]

> A requirement exists for two Army Defense Control System sets in FY 1960 (AN/MSG-4). One system should be installed to control the fire of antiaircraft units in

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* On 2 August, CONAD asked ADC and ARADCOM to report on feasibility of co-locating the AAOC and ADDC at Thule, Greenland -- which would make a total of 13 sites to be decided upon. There had been 26 AAOC's; three were inactivated this period.

[redacted] **PROPOSED PROGRAMMING -**

Missile Master Location	Missile Master		Ops Date Comb Fac	SAGE		Long Range Search Radar
	B.O.D.	Radar Ops		Radar Ops	Sector Ops	
Wash-Balt Def (Ft Meade, Md)	Comp.	1 Jun 60	1 Dec 57 (MM Only) 1 Jun 60 Comb Fac	1 Mar 58	1 Feb 59	Ship AN/FPS-20 from P-54 to Ft Meade after Phla Defense becomes operational
Boston Defense (Ft Heath, Mass)	1 Jan 59	1 Mar 59	1 Sep 59	15 May 57	15 Sep 58	Reschedule AN/FPS-7 from P-10
Pittsburgh Def (So Pk Mil Res)	1 Jan 59	1 Mar 59	1 Sep 59	1 Jul 58	1 Apr 59	Reschedule AN/FPS-3 from SM-134 Reschedule AN/GPA-57 from SM-134
Chicago Defense (Arlington Hts)	1 Jan 59	1 Mar 59	1 Sep 59	1 Sep 58	15 May 59	Reschedule AN/FPS-3 from TM-178 Reschedule AN/GPA-57 from TM-178
Seattle Defense (Ft Lawton, Wash)	1 Jan 59	1 Mar 59	1 Sep 59	15 May 59	1 Feb 60	Reschedule AN/FPS-3 from P-1. Reschedule AN/GPA-27 from P-1
Philadelphia Def (P-9A)	1 May 59	1 Jul 59	1 Jan 60	15 Mar 57	1 Jul 58	Reschedule AN/FPS-3 from TM-179 Reschedule AN/GPA-57 from TM-179
Los Angeles Def (San Pedro Hill)	1 Jul 59	1 Sep 59	1 Mar 60	1 May 60	1 Oct 60	Ship AN/FPS-20 from P-62 Ops date Pittsburgh Defense

1. Following AC&W Sites will have a slippage in operational dates.
   a. TM-178 from 12/58 to 1/60
   b. TM-179 from 3/59 to 1/60
   c. SM-134 from 4/59 to 1/60

2. Equipment for above sites coming from indicated sources.
   a. TM-178 - AN/FPS-20 from P-63, (1) AN/FPS-6 from P-63, (1) AN/FPS-6 from P-62, AN/GPA-37 from P-63
   b. TM-179 - AN/FPS-3, GPA-27 from P-31, (2) AN/FPS-6's from P-31, AN/GPA-37 from P-31
   c. SM-134 - AN/FPS-20 from P-39, (2) AN/FPS-6's from P-10, AN/GPA-37 from P-62

3. AN/FST-2 Disposition
   a. P-10 to M-[redacted]
   b. P-54 to M-128

4. Following AC&W sites will revert to gap filler status
   a. P-10
   b. P-31
   c. P-39
   d. P-54
   e. P-62
   f. P-63

5. P-1 will move to Ft Lawton

[redacted]

MISSILE MASTER PROGRAM [redacted]

Height Finders		AN/GPA-37	AN/FST-2	Remarks
1st AN/FPS-6	2nd AN/FPS-6			
Ship from P-54 with AN/FPS-20	Ship from P-54 with AN/FPS-20	Ship from P-54 with AN/FPS-20	Ship from P-63	
Reschedule 2nd FPS-6 from P-62	Reschedule 2nd FPS-6 from P-31	Ship from P-10 after Ops date Boston	Reschedule from P-62	
Reschedule from SM-134	Reschedule from SM-134	Reschedule from SM-134	Reschedule from P-31	Stop Installation of 2nd AN/FPS-6 at P-62 Stop SAGE Annex at P-62
Reschedule from TM-178	Reschedule from TM-178	Reschedule from TM-178	From Storage or step up in production	Stop Installation of 2nd AN/FPS-6 at P-31 Stop SAGE Annex at P-31
Reschedule 2nd AN/FPS-6 from P-1	Ship from P-1 ops date MM	Ship from P-1 ops date MM	Reschedule from P-1	Stop SAGE Annex at P-1
Reschedule from TM-179	Reschedule from TM-179	Reschedule from TM-179	From storage or step up in production	
Reschedule 2nd AN/FPS-6 from P-39	Ship from P-39 ops date MM	Ship from P-39 ops date MM	Reschedule from P-39	Stop SAGE Annex at P-39

6. AN/FSA-10's and AN/FPS-18's cannot be programmed until such time as gap filler coverage and requirements for Missile Master Program are known.

7. Site Locations.

P-1 McChord AFB, Wash.
P-10 No. Truro, Mass.
P-31 Williams Bay, Wisc.
P-39 San Clemente I., Cal.
P-54 Palermo, N. J.
P-62 Brookfield, Ohio
P-63 Claysburg, Pa.
SM-134 Pickstown, S. D.
TM-178 Lewistown, Mont.
TM-179 Kalispell, Mont.

* Source: ARADCOM, ADC to CONAD, "Plans for CONAD (Joint) Direction Centers at Ten (10) Locations," 30 April 1957, Incl., Tab N.

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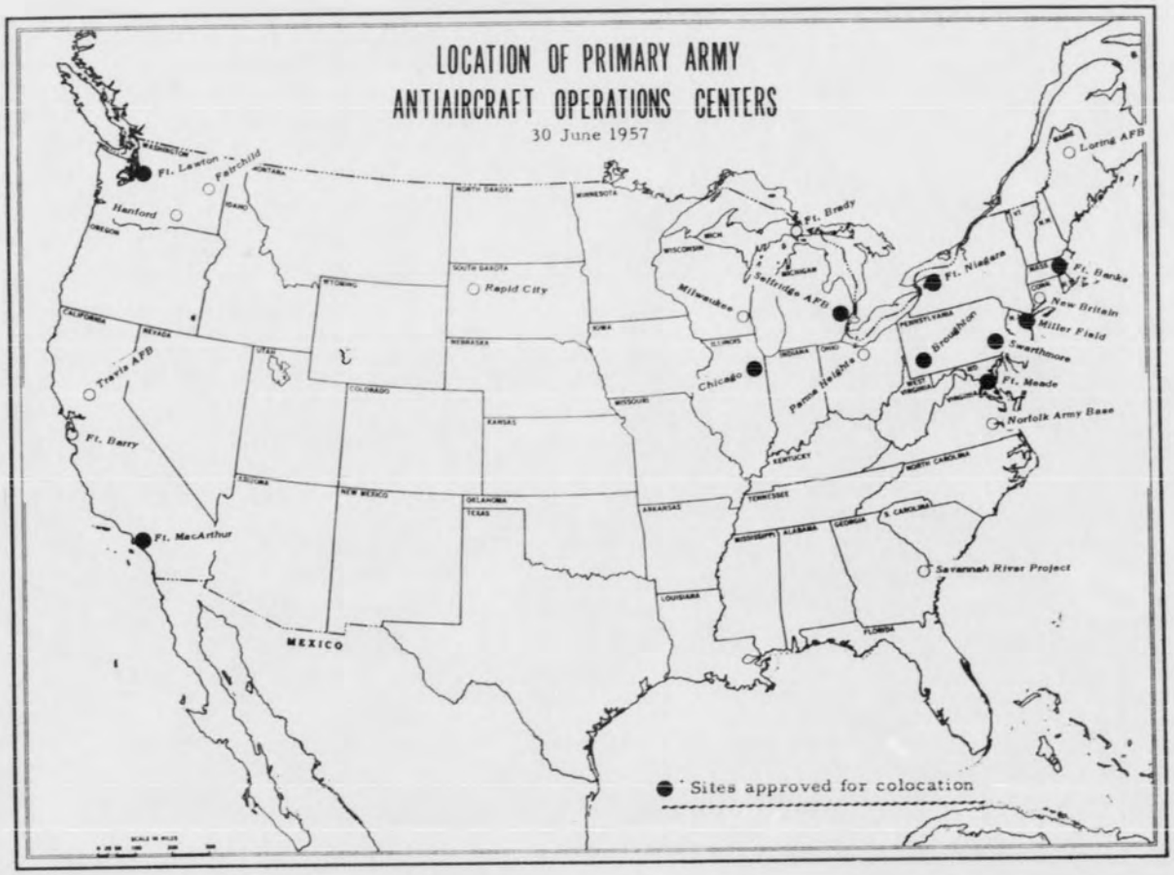

LOCATION OF PRIMARY ARMY
ANTIAIRCRAFT OPERATIONS CENTERS
30 June 1957
Ft. Lawton
Fairchild
Hanford
Rapid City
Travis AFB
Ft. Barry
Ft. MacArthur
MEXICO
Ft. Brady
Selfridge AFB
Milwaukee
Chicago
Pepsa Heights
Ft. Niagara
Broughton
Loring AFB
Ft. Banks
New Britain
Miller Field
Swarthmore
Ft. Meade
Norfolk Army Base
Savannah River Project
Sites approved for colocation

[redacted]

defense of the Ladd/Eielson bases (Fairbanks), and the other system to control antiaircraft units in defense of Elmendorf-Fort Richardson (Anchorage) and the IRBM sites at Willow Run and Hidden Lake. Each of the AN/MSG-4's will be interconnected with the BADGE system. Colocation of the AN/MSG-4 and the associated ADDC is established policy.

Alaskan Air Command and U. S. Army Alaska reviewed possible site locations in the Fairbanks and Anchorage areas. They tentatively selected Murphy Dome in the former and Mount Susitna in the latter for joint direction centers.[23] Murphy Dome would require only expansion of current facilities, but the Mount Susitna site would require new facilities. They hoped to get these sites in the FY 1959 MCP.

CONAD approved selection of Murphy Dome on 31 May 1957, but withheld approval of Mount Susitna.[24] The latter was difficult to reach and would require that a road be built from sea level to over 4,000 feet altitude. CONAD felt that the cost and construction difficulties would be too great. On 18 June, CONAD recommended to the JCS that colocation at Murphy Dome be approved.[25] CINCAL was advised that JCS approval of a site in the Anchorage area would be requested when a suitable site was chosen.[26]

[redacted]

SIX

STATUS OF COMBAT WEAPONS JULY 1956 - JUNE 1957

ADC INTERCEPTORS

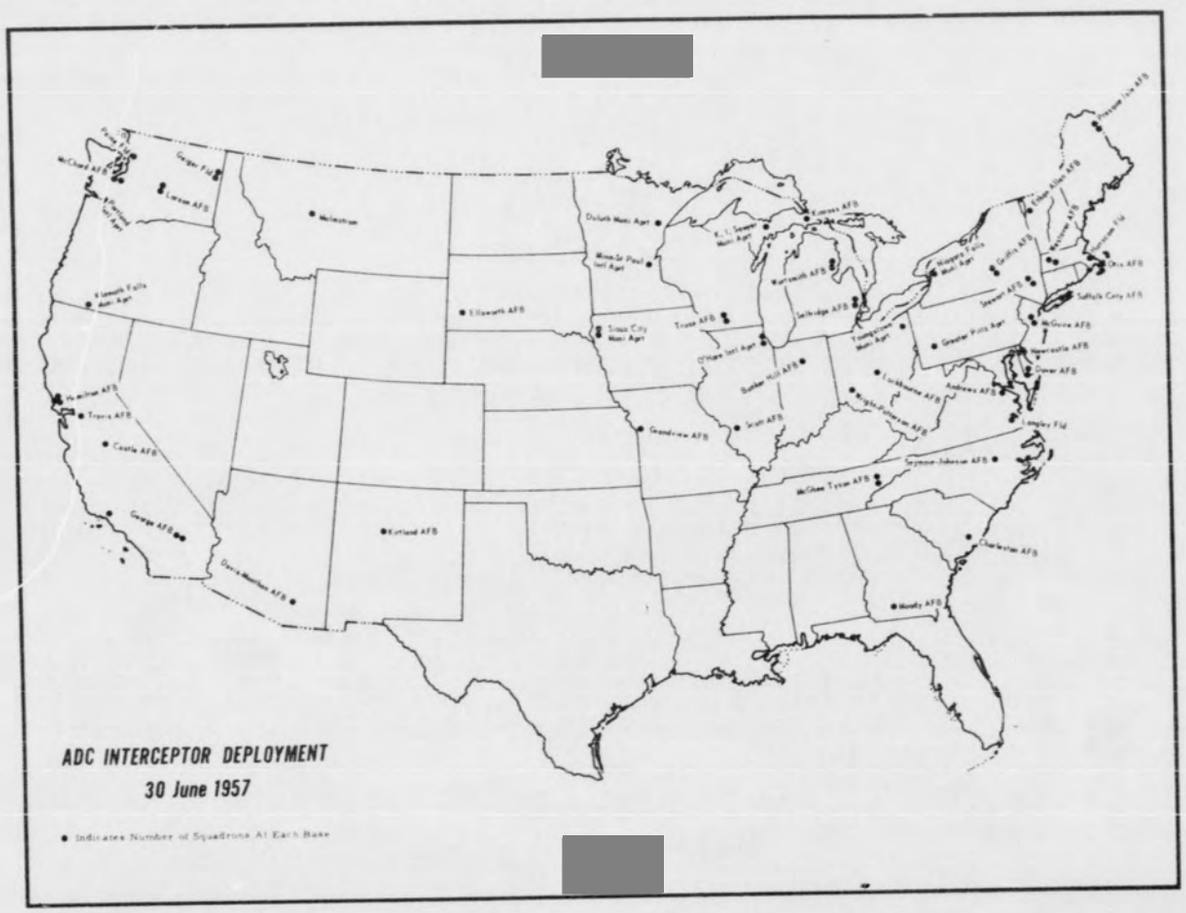
At mid-1956, ADC had a total of 68 all-weather interceptor squadrons assigned. However, four of these squadrons (31st, 482nd, 484th and 518th) had no aircraft. At mid-1957, the ADC interceptor force within the continental limits of the U. S. had grown to 69 -- three of which (398th, 484th and 518th) remained without aircraft or crews. Now also there were three squadrons located in the Northeast area to make a total of 72 under ADC ownership. These squadrons, acquired on 1 April 1957, were located at Goose (59th), Harmon (61st) and Thule (74th).

ADC Interceptor Force*

TYPE AIRCRAFT	SQUADRONS June 1956	June 1957
F-86D	42	13
F-86L	0	10
F-86D/L	0	11**
F-89D	8	5
F-89H	1	4
F-89J	0	1
F-89D/H	4	0
F-89H/J	0	5
F-94C	8	5
F-102A	1	13
F-94C-F-102A	0	1
F-89D-F-102A	0	1
Sqdns No Aircraft	4	3
TOTAL	68	72

* For source, see Reference Note One at back of book.

** Includes the three squadrons located in the Northeast Area. See Appendix Two for complete listing of squadrons.


ADC INTERCEPTOR DEPLOYMENT
30 June 1957
• Indicates Number of Squadrons At Each Base

[redacted]

As the above table indicates, the ADC force was in a state of flux because of extensive conversion and modification. These programs had taken their toll on CONAD combat potential through 1956 in both crews and aircraft. At mid-1957, the ratio of crews and aircraft over mid-1956 had shown only slight improvement. On 30 June 1956, 1,485 mission aircraft were assigned ADC, with 844 operationally ready. To man this fleet 1,939 crews were assigned ADC of which 999 were operationally ready. These totals had by mid-1957 reached the following proportions: 1,501 aircraft assigned with 830 ready; 2,112 crews assigned and 1,184 ready.[2]

The improvement, though slight, was important because it foretold added combat potential with improved and/or new fighting machines. The F-86D had been the primary weapon throughout 1956. It was supported by the F-94C and the F-89D. At mid-1957, these three models were either being modified or replaced with a new aircraft -- the F-102A -- and three improved models -- the F-89H, the F-89J and the F-86L.

The F-89H was a new version of the F-89D which could fire the GAR-1 (Falcon) air-to-air missile. A second advanced model of the F-89D was the F-89J which could fire the MB-1. This latter model made it possible for CONAD to incorporate atomic weapons into the air defenses. AMC's Project FOLLOW-ON* provided the third improved model -- the F-86L -- which was an F-86D with modernized electronic gear and wings with slatted leading edges. The major increase shown in the aircraft inventory came with the introduction of a truly new aircraft -- the F-102A. This latter plane was a delta-wing, single-place interceptor which held the promise of giving CONAD a much greater defensive capability.[3]

However, the increased combat potential did not come as soon as expected. The lag resulted from a number of factors, the most serious being the conversion and modification programs. Fifteen squadrons** (approximately 23 per cent) of ADC's fighter force had lost their combat capability because of a USAF directed conversion from operational F-86D's to non-operational F-102A's.

---

* Project FOLLOW-ON was to make the F-86D compatible with the new AN/GPA-37.

** See Appendix Two.

[redacted]

[redacted]

The entire F-102A program was jeopardized by the length of time it was taking to reach combat readiness because of an unreliable missile launch mechanism and fire control system (MG-10) and poor results with the Falcon (GAR-1D) missile. On 28 June 1957, only 91 of the 301 assigned F-102A aircraft were operationally ready. Corrective measures were being studied by AMC and ARDC. But doubt remained in the minds of the CONAD staff that the flaws could be ironed out before introduction of the F-104B -- a program which would engulf six more squadrons -- in July 1957.[4]

Further lowering the combat potential was the conversion to F-89J aircraft. As pointed out above, the F-89J was introduced into the weapons inventory to provide the command with an atomic capability. But of the six squadrons converting, only two had the facilities to use the primary armament -- the MB-1. Also significant was the modification required on the F-86D to convert to the F-86L. Eleven squadrons were meeting Project FOLLOW-ON schedules by 30 June 1957.

In all, a total of 31 squadrons were involved in the modification and conversion programs at mid-1957 -- which spread CONAD combat capability fairly thin.[5]

Another serious problem caused by operation of the newer aircraft was that of providing adequate firing systems. A closely related problem was that of providing the weapons system with missiles that could be effectively controlled.

In testing the firing systems (E-9 and MG-10) of the F-89H and F-102A with their primary armaments (the GAR-1 and GAR-1D), it was found that they were not reliable. It was not entirely the fault of the weapons systems, however, for the missiles themselves failed to guide properly. Apparent fixes to the problem had been discovered by June 1957, although extensive testing was needed before they could be accepted whole-heartedly.

But no solution was expected to reduce the vulnerablility of the firing systems to ECM for some time. No fighter equipped with the E-series fire control system (FCS) could adequately overcome jamming under IFR conditions. The newer MG-10 of the F-102A offered some advantages, but it was still vulnerable. A capability was expected with the introduction of the MG-13/40 series FCS programmed for FY 1960. But no immediate improvement, if any, was planned for the equipment currently employed.[6]

[redacted]

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ALASKAN AIR COMMAND INTERCEPTORS

The following table shows the number and location of the Alaskan Air Command interceptor units as of 31 March 1957.[7]

SQUADRON	LOCATION	TYPE AIRCRAFT
64th	Elmendorf	F-89D
65th	Elmendorf	F-89D
66th	Elmendorf	F-89D
18th	Ladd	F-89D
433rd	Ladd	F-89D
449th	Ladd	F-89D

At mid-1956, the AAC fighter program called for three squadrons to convert to F-102A's beginning in June 1957, two squadrons to convert to F-89J's starting in January 1957, and the sixth squadron to convert to the F-104B by early 1960.[8] All of these actions were to be completed by March 1960.

This planning guide underwent considerable change by mid-1957, however. In February, USAF programmed a two squadron cut of the AAC interceptor force. The new plan provided for a total of four squadrons -- three to convert to the F-102A (64th, 65th and 18th) and one (the 449th) to operate with the F-89J.

CINCAL, Lieutenant General Frank A. Armstrong, proposed cutting the force even further. He recommended reducing the six squadrons in existence to two squadrons of F-102A's, the level at which he felt Alaska could best support the defense effort. His reasons were as follows: no more than two squadrons could be effectively employed or controlled with the ground environment equipment either programmed or in existence; AAC could more effectively serve as an early warning command; and the reduction would be beneficial in saving large amounts of construction funds previously allocated in the Military Construction Program (MCP) of FY's 1958 and 1959 for MB-1 facilities.[9]

General Partridge accepted CINCAL's recommendation and in May, he directed General Armstrong to plan on a cut from six to two squadrons in FY 1958. However, CINCONAD suggested that the MB-1 facilities be deferred rather than deleted pending JCS approval.[10]

[redacted]

[redacted]

JCS approval of the two squadron proposal had not been received by mid-1957 and the AAC fighter program was left in a state of flux. The table below outlines the status of the AAC program in July 1957:[11]

Sqdn	Date of Standown	Sqdn Replacement	Date of Replacement	Type Aircraft
	CONVERSION			
64th*	1 Jul 57	317th(McChord)	1 Aug 57	F-102A
65th**	1 Oct 57	11th(Duluth)	1 Nov 57	F-102A
66th	1 Nov 57 - 30 Nov 57	None(Move to Oxnard)	--------	------
18th*	1 Aug 57	31st(Wurtsmith)	1 Sep 57	F-102A
433rd	1 Oct 57 - 30 Oct 57	None(Move to Glascow)	--------	------
449th	Training Status in July	1957		F-89J

FIGHTER AUGMENTATION FORCES

At mid-1956, this force was composed of approximately 6,000 aircraft, of which about 1,000 were equipped for all-weather operations. By mid-1957, the augmentation force had been cut to a little over 4,000 planes to be employed either "in-place" (i.e., at their home base) or at pre-planned deployment bases. The drop in numerical strength resulted from CONAD's changing operational concepts described below.[12]

USAF Augmentation. Approximately 1,700 of the mid-1956 force were furnished by SAC, TAC and ATC. Under the operational concept followed throughout 1956, most of these aircraft would have to deploy great distances to the Northeast and Northwest sections of the country. This concept had proven almost valueless because of the time required to deploy and the difficulties involved in controlling these movements.

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* Squadron exchange: name and personnel

** The movement was being held in abeyance pending JCS action.

[redacted]

[redacted]

By mid-1957, long deployment moves had been eliminated. Pre-planned deployments were still in use, but they were limited to the IFR range of the aircraft without enroute refueling and to bases where support was available.

A new employment plan based on this concept was issued in July 1957. USAF augmentation units were concentrated for the defense of SAC bases and the southern border regions rather than for the Northeast and Northwest. Deployment assignments were limited to the fighters of ATC and 224 aircraft were programmed for the defensive shifts.[13]

On 1 July 1957, the total number of USAF augmentation fighters available to CONAD amounted to 688 planes of ATC and TAC (224 ATC, 464 TAC). SAC no longer furnished aircraft because its fighter units had been given to TAC.

An agreement between CONAD, ADC and TAC gave CONAD operational control of all tactical fighter day units scheduled for general war deployment during D-Day through D plus two months for the first 30 days after D-Day. Fighter-bomber units scheduled for general war deployment during the first month after D-Day were to be returned to TAC operational control ten days before scheduled deployment or no later than D plus 20 days, whichever came first. However, there was also the possibility that some or all of the TAC fighter-bomber units might be deployed immediately after D plus 48 hours.[14]

Navy Augmentation. The Navy augmentation force remained comparatively stable between June 1956 and June 1957. The status reports showed around 2,300 fighters available in mid-1956 and some 2,112 for June 1957. Navy planes available for emergency defense (reserve training, training and fleet aircraft) included only those aircraft that were operating from land bases. However, the actual number of aircraft that could be counted on for any one time hinged largely upon fleet and carrier commitments and the almost daily change in the reserve and training forces status.[15]

Air National Guard. At mid-1956, the Air National Guard had approximately 1,500 fighters in the 69 squadrons available to ADC. About a third of the squadrons had all-weather aircraft -- primarily F-89B's and C's and F-94A's and B's.

By 1 July 1957, the total ANG capability wasl,247 fighters in the 69 squadrons which consisted of 23 all-weather squadrons and 46 day

[redacted]

[redacted]

squadrons.[16] It was difficult to estimate the actual number of aircraft that could be depended upon at any one time, however, for the Guard was scheduled for a large scale conversion program in FY 1958. Nevertheless, the mobilization objective of the ANG was still to make 65 per cent of its assigned aircraft and personnel available within two hours after receipt of warning.

Air Force Reserve. The operational plan in effect throughout 1956 called for the Reserve units allocated for air defense to support CONAD from D through D plus 30 days. After the first 30 days, the Reserve forces were to support TAC -- their primary mission in the event of war.

As of 30 June 1956, the Air Reserve had 22 fighter squadrons active. From these squadrons approximately 300 fighters could be counted on in an emergency. Ten of the squadrons were equipped with obsolescent F-80's, eight had F-84E's, three had F-84G's and the last squadron was equipped with the T-28 -- a propeller driven training aircraft.

The picture at mid-1957 had changed little with respect to air defense capability. CONAD estimated that eight squadrons were sufficient to accomplish the intended air defense role. Of the eight squadrons chosen to support CONAD on 1 July 1957, three were equipped with the F-80 (88 aircraft), three had F-84E's (53 aircraft), one had the F-86H (16 aircraft), and one had a combination of F-84E/G's (44 aircraft).[17]

With respect to operational control, CONAD's hand had been strengthened. Operational control of the Reserve squadrons was to remain with CONAD as long as the units were needed.

ANTIAIRCRAFT WEAPONS STATUS, CONTINENTAL UNITED STATES*

The U. S. Army Air Defense Command had a total of 46 assigned Nike missile battalions against a programmed strength of 50 battalions at mid-1956. Its goal was to obtain 61 on-site Nike battalions by the end of FY 1957, which was also the number needed to meet CONAD's requirements for the same date.

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* See Appendix Three for USARADCOM Station List of 15 April 1957.

[redacted]

[redacted]

For all practical purposes, this goal was met, for the last of the batteries in the Nike Ajax program was on site by June 1957. As of 30 June 1957, ARADCOM had 58 Nike battalions on site -- in fire power the equivalent of 61 battalions. Although a two month period was required for the batteries to become fully operational after being placed on site, an operational capability could have been reached on short notice.[18]

ARADCOM was not so successful in meeting its planned requirements for gun (90-120mm) and Skysweeper (75mm) battalions. On 30 June 1956, there were 39 battalions with these weapons (ten Skysweeper, twenty-five 90mm, and four 120mm). By 30 June 1957, there were programmed to be 56 gun and six Skysweeper battalions for the United States, or a total of 62 (this included both Regular Army and National Guard battalions).

But the Department of the Army decided to limit United States active on-site gun battalions to 42 -- 17 Army and 25 National Guard -- and active Skysweeper battalions to three Army, or a total of 45. The Army's action in making the reduction resulted from a slash in its budget. The first effects were felt on 15 April 1957 when seven 90mm gun battalions were deactivated at the following defense areas: Washington-Baltimore, Philadelphia, New York, Detroit, Chicago and San Francisco. In this same month, three 75mm (Skysweeper) battalions at Castle, March and Carswell Air Bases were also deactivated.* The revised on-site program goal was met and on 30 June 1957, USARADCOM had three Skysweeper battalions, 13 90mm and four 120mm gun battalions in the United States.**

The units being inactivated were, for the most part, in defense areas where Nike or other gun battalions were located. Neither guns nor Skysweepers constituted CINCONAD's primary defensive weapons and therefore, no serious degradation of the defense system was expected.

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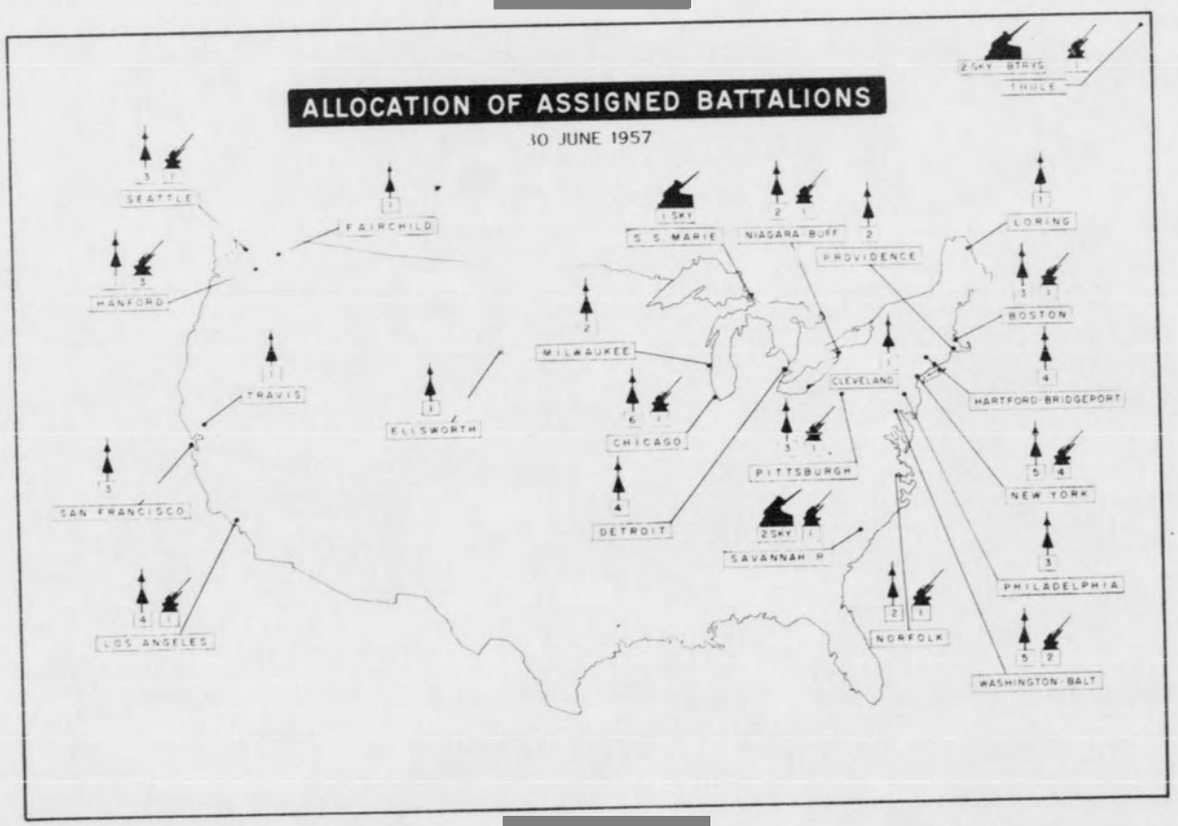
* The 90mm gun battalions inactivated were: the 14th and 601st in the Washington-Baltimore area; the 19th at Philadelphia; the 98th at New York; the 99th at Detroit; the 734th at Chicago and the 752d at San Francisco. The deactivated Skysweeper units were the 52d at Castle, the 451st at March and the 546th at Carswell.

** Not included in the above totals are the forces in the Northeast Area -- two batteries of Skysweepers and one battalion of 90mm guns.

[redacted]


ALLOCATION OF ASSIGNED BATTALIONS
30 JUNE 1957
2 SKY BTRYS
THULE
SEATTLE
FAIRCHILD
1 SKY
S. S. MARIE
NIAGARA FALLS
PROVIDENCE
LORING
HANFORD
BOSTON
MILWAUKEE
TRAVIS
ELLSWORTH
CLEVELAND
HARTFORD-BRIDGEPORT
CHICAGO
PITTSBURGH
NEW YORK
SAN FRANCISCO
DETROIT
2 SKY
SAVANNAH
PHILADELPHIA
NORFOLK
LOS ANGELES
WASHINGTON-BALT

[redacted]

Long before the Department of the Army had to remove the 75mm battalions from the three air bases, SAC had attempted to get CINCONAD's approval of such a move. Seven SAC bases in the United States had gun battalions only. CINCSAC felt that the AA battalions defensive capabilities were negligible and that the cost of supporting this defense was prohibitive. SAC proposed removing those battalions whose programs did not call for conversion to Nike.

SAC's stand on this matter was supported by USAF. In August 1956, General Thomas D. White, USAF Vice Chief of Staff, wrote his Army counterpart that:[19]

> Presently there are a number of AA gun battalions located in air defense of USAF bases. A thorough study of all AA guns in the present United States inventory was accomplished and they appear wholly deficient to cope with the threat. The cost of retaining these weapons is felt to be disproportionate to the air defense obtained. The Air Force is unable and unwilling to spend any additional funds in direct or indirect support of these battalions.

An answer to General White was not long in coming. The Army replied that it was cognizant of the limitations of AA guns and that its ultimate objective was conversion of all gun units to surface-to-air missile units. However, the answer continued:[20]

> ...the Army does not agree that they [AA guns] appear wholly deficient to cope with the threat. The Army would point out, instead, that 'AA Guns' in general have a limited capability to meet the potential threat...requirements...are established either through JCS action or by commanders of unified commands...no unilateral action can be taken by Department of the Army to withdraw Army AA units fulfilling...[defense] missions on USAF bases.

The matter was eventually brought to the attention of CINCONAD who supported the Army. Some defense, CINCONAD felt, was better than no defense. General Partridge wrote General Curtis E. LeMay, then CINCSAC, that: "Everything possible will be done...to expedite the conversion of all AA gun units to missile units. In the meantime, presently assigned Skysweeper battalions should be retained pending their replacement by suitable guided missile units."[21] Four of the seven bases (Fairchild, Travis, Loring and Ellsworth) were programmed

[redacted]

[redacted]

to receive their missile units by the end of FY 1958. The remaining three, as pointed out above, were deactivated, thus settling the problem.

National Guard Units. The Department of the Army cut-back in forces also had its effect on USARADCOM's National Guard on-site program. At mid-1956, 121 National Guard batteries -- the equivalent of about 30 battalions -- were programmed for the end of FY 1957. Seventy-nine National Guard antiaircraft artillery batteries were on-site in June 1956 and of this number 53 had been designated to the Special Security Force. Highly skilled, they could move quickly to their on-site emergency positions and provide effective and sustained fire against an aggressor.

The revised on-site program called for a total of 25 National Guard gun battalions or a decrease over the mid-1956 program of five battalions. At mid-1957, 100 batteries of the Guard were on-site compared to the 101 programmed. Ninety had been designated to the Special Security Force. In addition to the 25 National Guard Gun battalions in the revised on-site program, 32 National Guard (90mm) and 13 Skysweeper (75mm) battalions had M-Day missions to augment and/or replace active Army gun units.[22]

Operational status of active Army batteries in June of 1956 and 1957 is shown on the following table (June 1957 figures include Thule):[23]

June 1956				June 1957		
NIKE	GUN	SKYSWEEPER		NIKE	GUN	SKYSWEEPER
182	116	30	Av. No. Assigned	236	74	14
151	110	27	Av. No. On-Site	221	71	13

ANTIAIRCRAFT WEAPONS STATUS, ALASKA AND NORTHEAST AREA

The CONAD FY 1957 program called for three gun (90mm-120mm) battalions and two Skysweeper (75mm) battalions in Alaska and one gun battalion and two-thirds of a Skysweeper battalion in the Northeast.

[redacted]

[redacted]

The number and location of the deployed units were as programmed (see below) [24]

ALASKA (March 1957)*			NORTHEAST (April 1957)*		
UNITS	LOCATION	WEAPON	UNIT	LOCATION	WEAPON
96th Bn	Elmendorf(Ft. Richardson)	90mm	549th Bn	Thule	90mm
867th Bn	Elmendorf	75mm(Sky)	428th Btry(L)	Thule	75mm(Sky)
502d Bn	Eielson	120mm	429th Btry(L)	Thule	75mm(Sky)
450th Bn	Eielson	75mm(Sky)			
93d Bn	Ladd	120mm			
C Btry 450th Bn	Ladd	75mm(Sky)			

The subject of re-arming the Alaskan and the Greenland AA forces with the Nike missile was under study. Plans by mid-1957 were to equip the three non-Skysweeper battalions in Alaska with Nike in the June 1958-June 1960 time-period and the Thule 90mm gun battalion with a Nike Hercules battalion in FY 1960.[25]

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* The antiaircraft units in the Northeast were assigned to USARADCOM on 1 September 1956. Antiaircraft units in Alaska were assigned to U. S. Army, Alaska, a component command of Alaska Command.

[redacted]

[redacted]

SEVEN

STATUS OF THE RADAR SYSTEMS JULY 1956 - JUNE 1957

UNITED STATES LAND BASED RADAR

On 30 June 1957, ADC had a network of 120 land-based radar stations in the United States. This total represented an increase of nine stations over the mid-1956 status. The operational radar stations in the ADC network consisted of the following according to radar program:[1]

PROGRAM	1956	1957
"P" Stations	75	75
First Phase Mobile Stations	28	28
Second Phase Mobile Stations	4	9
Third Phase Mobile Stations	0	0
Gap Filler Stations	0	8
Lash-up Stations	4	0

The CONAD goal was for 133 radar stations in the U. S. for the end of FY 1957. However, a shortage of maintenance and operation (M&O) funds allotted by USAF to ADC forced the latter to defer activation of 13 Mobile Program stations originally funded in the FY 57 budget.

The action taken by ADC to remain within its budget presented a three-fold problem: it meant delay in completing the ZI perimeter surveillance network, particularly in the Gulf Coast area where most of the stations had been deferred; it left gaps in the overall detection network; and it raised the total number of stations to be funded for FY 1958 to 24. CONAD's ACW objective for the end of FY 1958 was 144 radars in the continental U. S. or an increase of 11 stations over the FY 1957 goal. Thus, to meet the requirements it would be necessary for ADC to fund for the 13 deferred stations as well as the 11 stations originally planned for FY 1958 completion. As one CONAD official put it: "Failure to meet current fiscal year construction programs obviously has a 'snow-balling' effect on future programs."[2] It was feared that CONAD's plans for a rapid increase in surveillance facilities would be jeopardized by such actions.

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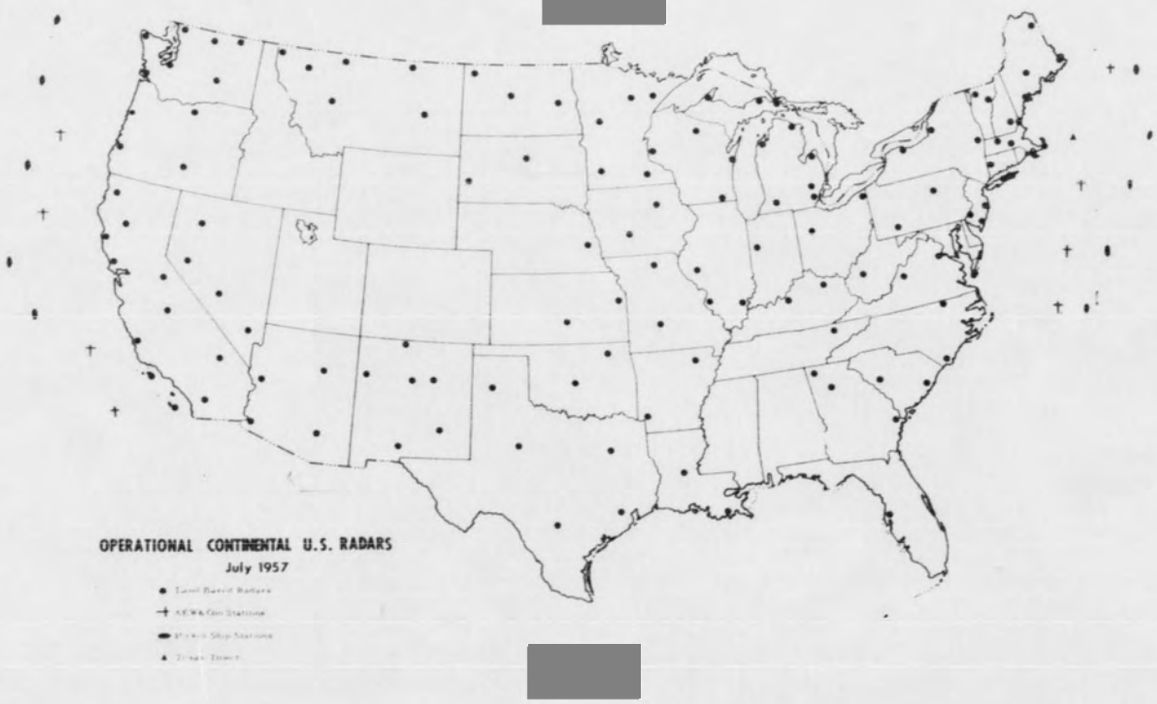
OPERATIONAL CONTINENTAL U.S. RADARS
July 1957

[redacted]

At mid-1957, CONAD was confronted not only with quantitative deficiencies but also with qualitative problems. The air surveillance system -- composed largely of AN/FPS-3 and AN/CPS-6B type radars -- had neither the range nor altitude to effectively cope with high speed bombers flying above 45,000 feet. Also, the system was vulnerable to a mass ECM supported attack at any altitude.* Both deficiencies were expected to be corrected by modification of the existing radars with the AN/GPA-27 and the acquisition of newer AN/FPS-7 and AN/FPS-20 radars. However, at the end of June, only a few stations had the AN/GPA-27 operational and the AN/FPS-7 was not expected to enter the ADC inventory until July 1958.[3]

The Mobile Radar Program. A total of 84 radar stations were planned for the three phases of the mobile program. This total was divided as follows: 39 stations in the first phase, 21 in the second, and 24 in the third. These goals had been established by the end of July 1956 and remained unchanged at mid-1957.

As of July 1956, a total of 32 first and second phase stations were operational -- 28 first phase and four second phase stations. Of these stations, 18 (16 first phase and two second phase) were "fully" operational, the remainder were either "sustained" or "limited."

At mid-1957, a total of 37 stations were operating -- an increase of five over the July 1956 figure. Twenty-eight of the stations were first phase and nine were second phase. A "fully" operational status had been attained by 26 of the first and seven of the second phase stations. The remaining four stations were at a "sustained" status. As has been told previously, 13 of the stations originally planned for FY 1957 had to be deferred into FY 1958 because of a shortage in maintenance and operations funds.** It was anticipated that by the

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* See Chapter Eight, Exercise Section.

** The deferred stations were: two first phase stations: M-130 (Winston Salem, N.C.) and M-122 (Dallas Center, Ia.); Three second phase: SM-145 (Joelton, Tenn.), SM-150 (Cottonwood, Idaho), and SM-151 (Geiger Field, Wash.); Eight of the deferred stations were in the third phase: TM-186 (Pyote, Tex.), TM-187 (Ozona, Tex.), TM-188 (Eagle Pass, Tex.), TM-189 (Zapata, Tex.), TM-191 (Rockport, Tex.), TM-192 (Killeen, Tex.), TM-193 (Lufkin, Tex.), and TM-194 (Lake Charles AFB, La.)

[redacted]

[redacted]

end of FY 1958, a total of 64 stations in the mobile program would be operational.[4]

The Gap Filler Program. Supplementing the permanent and mobile radars were the small, unattended radars known as gap-fillers. A total of 235 radars were planned for the system to provide low-altitude coverage. ADC planned to install the AN/APS-14 in the first 64 stations with the remainder to receive an improved model -- the AN/FPS-18.

At the end of June 1956, none of the gap filler radars were operational. By mid-1957, eight stations were operational: three were "sustained" and five were "limited." A total of 107 stations had been funded for construction by June 1957 and at 64 stations installation of the electronic components had begun. It was estimated that by the end of FY 1958, 138 gap filler radars would be in operation.[5]

NORTHEAST AREA

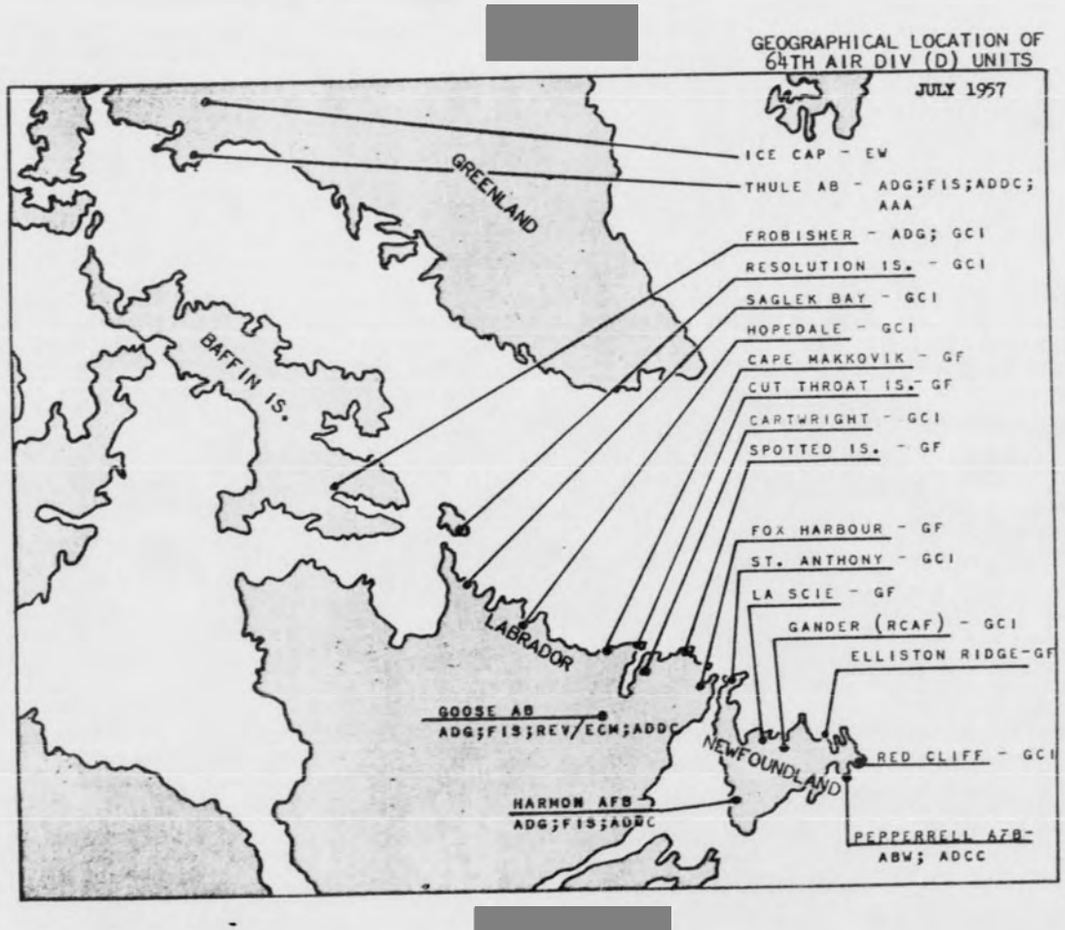
When CONAD assumed operational control of the Northeast Area (1 September 1956), a total of 13 permanent radar stations were operating. In addition, NEAC had six gap-filler radars scheduled for operations between Hopedale and St. John's.

The only change by mid-1957 was the elimination of one permanent station -- N-33 -- located at Etah, Greenland. With respect to the gap-filler radars, five (Cape Makkovik, and Spotted Island, in Labrador, and Fox Harbour, La Scie and Elliston Ridge, Newfoundland) had been accepted and were operating. The sixth, N-27A, located on Cut Throat Island in Labrador, was slated to become operational in August 1957.[6]

ALASKA

By December 1956, the Alaskan radar system was scheduled to consist of two control centers (Ladd and Elmendorf) and 21 radar stations. Twelve of the stations were operational at the end of 1956, nine were still under construction. The stations under construction were located at: Middleton Island, Gulkana, Bethel, Kotzebue, Unalakleet, Fort Yukon, Chiniak, Homer, and Sitkinak Island.[7]

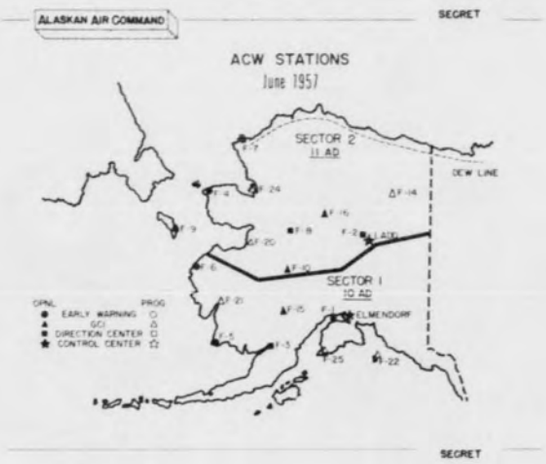
[redacted]


GEOGRAPHICAL LOCATION OF
64TH AIR DIV (D) UNITS
JULY 1957
ICE CAP - EW
THULE AB - ADG;FIS;ADDC; AAA
FROBISHER - ADG; GCI
RESOLUTION IS. - GCI
SAGLEK BAY - GCI
HOPEDALE - GCI
CAPE MAKKOVIK - GF
CUT THROAT IS. - GF
CARTWRIGHT - GCI
SPOTTED IS. - GF
FOX HARBOUR - GF
ST. ANTHONY - GCI
LA SCIE - GF
GANDER (RCAF) - GCI
ELLISTON RIDGE - GF
RED CLIFF - GCI
PEPPERRELL AZB - ABW; ADCC
GOOSE AB
ADG;FIS;REV/ECM;ADDC
HARMON AFB
ADG;FIS;ADDC
GREENLAND
BAFFIN IS.
LABRADOR
NEWFOUNDLAND

[redacted]

At mid-1957, two of the stations had been eliminated from the building program, while a third had been deferred indefinitely. A review by AAC of the ACW network revealed that the operational value of the stations scheduled for Sitkinak, Chiniak and Gulkana would be limited to high altitude back-up protection of Project STRETCH-OUT* -- the DEW extension along the Aleutian chain -- once STRETCH-OUT was completed. Since the only justification for completing the three stations was their capability to provide radar coverage until the DEW extension was finished, AAC recommended that Sitkinak and Chiniak be eliminated entirely and that the station at Gulkana be deferred. CINCAL and CINCONAD agreed with the recommendation which subsequently received USAF's approval.[8]

In June 1957, the radar network in Alaska remained much as it had in December 1956: 12 stations operational and six stations under construction. The radar system at mid-1957, including both the operational and programmed stations, is shown on the following map.



* STRETCH-OUT was the code name applied to the DEW line extension running along the Aleutian Chain for some 500 miles. This extension was to tie into the AAC radar network at King Salmon.

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CONTIGUOUS RADAR

AEW&C. At mid-1956, CONAD's Airborne Early Warning and Control (AEW&C) force was composed of six tactical squadrons -- three at McClellan AFB, California, and three at Otis AFB, Massachusetts. This force remained unchanged at the end of June 1957. The squadrons at McClellan were assigned to the 552d AEW&C Wing, those at Otis to the 551st Wing. Both wings were under the supervision of the 8th Air Division -- which was activated to watch over the wings during their formative period -- until 1 July 1957 when it was inactivated. At this time, the 551st was assigned to EADF, the 552d to WADF.[9]

In June 1956, both wings were in a training status. The 552d was manning two stations full time and one part time off the West Coast, while the 551st was able to man only one full time station. The 551st was scheduled to become operationally ready on 15 October 1956 and the 552d on 15 December 1956. The goal of both wings, established by CONAD Operations Plan 9-56 in April 1956, was to provide three full-time stations and one part-time station along each coast after becoming operationally ready.

The readiness dates for the AEW&C wings were achieved ahead of schedule, however. Brigadier General Kenneth H. Gibson, 8th Air Division Commander, reported on 3 October 1956 that both wings could soon be considered operationally ready. The 551st had attained this distinction, he continued, in July 1956, while the 552d was to be considered ready on 15 October. It was pointed out that the declaration of readiness was somewhat premature because neither wing possessed its full resources. However, General Gibson continued, "... we will still accomplish our objectives.... In terms of detection effectivness...we are seeing approximately 85% of all traffic while we are on station with an operational weapon."[10]

By the first of the year, the 551st was manning three full time stations (2, 4, and 6) and station eight was being manned part-time. The 552d was able to man three stations (3, 5, and 7) full time and two stations (1 and 9) part time. A severe reduction in the maintenance and operations funds provided for ADC's flying hour program soon disrupted the schedule adopted by both wings.[11]

USAF informed ADC that its Fourth Quarter FY 1957 flying hour program was being reduced by 4.2 million dollars. In order to live within the resources provided, ADC imposed severe restrictions on its air elements. One of the many programs curtailed was that of airborne early warning.

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The effect of the budget slash on the AEW&C program was first felt in March 1957. On the 22d of this month, the flying hours allocated to the AEW&C wings were reduced approximately 50 per cent which necessitated a cut in on-station time to approximately eight hours per day. CONAD informed ADC that the reduction was unacceptable. And, almost immediately, the former sent a message to the JCS protesting USAF's unilateral action and requesting reconsideration of the AEW&C program.

In its message, CONAD pointed out that effective counter actions could be taken only on the basis of early warning information and that the AEW&C program should be increased rather than decreased. "In the event this capability cannot be restored immediately," CONAD wrote, "it is considered that /the/ CONAD Terms of Reference requires acceptance of the resulting increased calculated risk by the JCS."[12]

Shortly after the protest left CONAD, ADC reported that it had realized an additional $542,941 which would be used to supplement the AEW&C flying program. The increased program provided the 8th Air Division with some 5,884 additional hours, increasing the amount of station time to approximately 14 hours per day effective 16 April. Although the increase was appreciated by CONAD, it was still desirous of obtaining 24-hour coverage.

Hope for 24-hour coverage vanished in late April when USAF replied that it would be unable to provide additional flying hours for ADC. USAF stated that the action taken by ADC on 16 April provided CONAD with enough hours to man six AEW&C stations 16 hours each day and two stations with an eight hour capability. "The significance of the AEW&C in the contiguous surveillance, detection and control system is appreciated," the executive agency stated, "nevertheless, this flying hour allocation cannot be further increased without jeopardizing other priority functions."[13]

The effect of the reduction on the AEW&C program was best illustrated by the actions of the 551st Wing in attempting to provide CONAD with as much coverage as possible. Of the four stations previously manned, only three were projected for coverage. From 16 April until FY 1957 ended, stations two and four were to be manned 24 hours a day and station six 16 hours per day. Coverage on this latter station was to be shared with the Navy's blimps (ZPG-2W's). The 551st's RC-121's and the Navy's ZPG-2W's were to alternate on the station. On those days that the Navy covered station six, the 551st shifted its support to station eight.

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Actual operational activity of the two AEW&C wings during the budget crisis is shown in the following table:[14]

AEW&C AIRCRAFT ON-STATION TIME

JANUARY 1957				APRIL 1957			
STATION	SCHED	ACTUAL	EFFECTIVE	STATION	SCHED	ACTUAL	EFFECTIVE
			551st WING				
2	744	577:00	574:10	2	357:22	343:06	335:51
4	744	678:15	668:25	4	365:46	329:15	323:37
6	744	628:05	586:30	6	356:10	329:15	323:37
8	248	153:10	126:55	8	360:00	322:21	313:40
10	-	-	-	10	-	-	-
			552d WING				
1	120	125:17	124:32	1	24:00	24:00	24:00
3	744	727:17	711:34	3	240:00	235:17	231:15
5	744	741:49	728:32	5	478:00	473:13	463:38
7	744	735:19	725:01	7	474:00	469:11	453:50
9	128	140:32	133:51	9	236:00	237:40	231:40

The two wings (551st and 552d) at mid-1957, were manning the eight stations required by CONAD's 1956-1966 Objectives Plan (CADOP 56-66). Three full-time and one part-time station were being manned by the 551st in conjunction with the Navy Airship Squadron (ZW-1). Manning of stations two and four was carried out by the 551st alone. Station six was being manned alternately by the Navy's ZPG-2W's and the Air Force RC-121's, while Station eight was manned by the wing on those days the Navy patrolled station six. On the West Coast, the 552d manned four stations -- three full-time and one part-time.[14A]

The CONAD Objectives Plan, 56-66, called for no immediate changes in the AEW&C force. Future expansion of the AEW&C network was dependent upon a great many factors. Before additional squadrons were to be activated, an aircraft with increased performance characteristics had to be procured to replace the RC-121. Also, a suitable replacement for the APS-20 radar had to be developed; however, the APS-70 -- a replacement model tested between March and June of 1956 -- was thought to be the answer to the latter problem.

Plans at mid-1957 were for a force of 13 AEW&C squadrons patrol-

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ling 21 stations by 1961. The increase in stations provided for nine stations on both the East and West Coasts and three stations in the Gulf of Mexico.[15]

Lighter-Than-Air. The first Navy AEW&C squadron scheduled to augment the CONAD contiguous system was commissioned at Lakehurst NAS, New Jersey, on 3 January 1956. This was Airship Airborne Early Warning Squadron One (ZW-1).

CONAD Operations Plan 9-56 scheduled one lighter-than-air airship station to be manned continuously off the East Coast by 1 July 1957. On the West Coast, the plan called for a station to be manned full-time by 1 July 1959. The Navy was to do this with one lighter-than-air squadron on each coast, each equipped with four blimps.[16]

At mid-1957, ZW-1 had 52 officers, 200 enlisted personnel and four ZPG-2W airships. Until 1 July 1957, the first lighter-than-air squadron was in a training status. Its earliest missions were confined to training stints on station six located 180 nautical miles from Lakehurst. On 1 July 1957, the squadron was declared operationally ready and assumed air defense commitment in the middle of the AEW line. The ZPG-2W's were scheduled to man station six from 1 July until 24 July on alternate days in conjunction with ADC's 551st Wing. In effect, this meant manning station six on a sustained basis of 50 per cent of the time required, each month, for continuous coverage.[17]

ADC had objected to the blimp employment plan. Station six, it stated, was a number two priority station in the East Coast system and, as such, should be manned continuously. Comprehensive and continuous coverage could best be provided by the 551st Wing. Coverage by the ZPG-2W's was limited by the altitude at which they operated (3,000 to 5,000 feet), which reduced the amount of effective low altitude radar range and coverage.

To correct these deficiencies, ADC had proposed that Navy airship training be conducted on station eight -- a fourth priority station in the system. Also, it proposed that the operating base of the blimps be moved from Lakehurst to Weekswille NAS, North Carolina. From the latter base, the ZPG-2W's could provide coverage for station ten. The ADC proposal had neither been completely accepted nor rejected by mid-1957 and ADC was taking steps to get Navy concurrence of its ideas.[18]

The Picket Ship Force. At mid-1957, the manning of picket ship

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stations remained unchanged from the mid-1956 level. Five picket ship stations were being manned around-the-clock off both coasts of the United States. The ten stations being manned met CONAD's programmed requirements for FY 1957. The Atlantic stations had been fully manned since July 1955 and the Pacific stations since July 1956.

Off the West Coast, three converted liberty-type transports (YAGR's) and two destroyer escorts (DER's) were manning the stations. Out in the Atlantic, eight YAGR's and two DER's were assigned as picket patrols. Future plans for the patrol stations called for eight YAGR's and two DER's manning the Atlantic stations until around 1960. In the Pacific, four YAGR's and seven DER's were to man the contiguous system until July 1958. In the latter month, the operating force was to be changed to eight YAGR's and two DER's, a level to remain until 1960.

CONAD plans called for 19 picket ship stations.[19] The future program called for six additional stations off the East Coast and three off the West Coast. Manning and operating the nine additional stations was dependent upon JCS approval of the CADOP requirements and the capability of the Navy to provide sufficient picket ships.

By mid-1957, the existing communications network for picket ship operations remained unreliable. The problems were low power output of the picket ships and poor frequencies that suffered from interference. At mid-1956, it was proposed that the Navy take over operation of ship-to-shore communications. The picket ships would broadcast to Naval radio stations on shore and they, in turn, would transmit by teletype to the ADC directions centers.

At mid-1957, responsibility for operating the communications network was unchanged. In September 1956, the Navy agreed to assume the responsibility, but it reversed its decision in early 1957 because of the cost involved. The Chief of Naval Operations was asked to reconsider his decision; no answer had been received by August 1957, however.[20]

Texas Towers. A final element of the contiguous system was the off-shore radar platforms dubbed Texas Towers. At mid-1957, as in mid-1956, only one of the five towers originally programmed for the system was operational. This tower, designated tower number Two, was located on Georges Bank, a North Atlantic shoal, approximately 100 miles east of Cape Cod. The tower had begun limited operations on 7 May 1956, a

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status it maintained on 30 June 1957.[21]*

A second tower, designated number Three, had been towed to Nantucket Shoals, 100 miles southeast of Rhode Island in August 1956. ADC assumed control in November and it was anticipated that the tower would become operational by August 1957. The third tower destined for the system was tower Four which was to be built on an unnamed shoal about 80 miles southeast of New York City. It was expected that this tower would become operational by June 1958.[22]

Two of the towers were deleted from the Air Force construction program because of a limited budget. USAF informed ADC that the coverage to be provided by towers One and Five -- scheduled for Cashes Ledge (100 miles east of New Hampshire) and Brown's Bank (approximately 75 miles south of Nova Scotia) -- over adjacent coastal radar was deemed insufficient to justify construction costs. It recommended dropping towers One and Five from the Military Construction Program. After reexamining the tower program, ADC agreed with USAF's findings. Also, a shortage of maintenance and operations funds weighed heavily in making the decision to eliminate both towers.[23]

The discovery of an underwater plateau off the West Coast caused CONAD to consider the possibility of building an off-shore platform in the Pacific. The underwater shelf named "Cobb's Sea Mountain" was located some 300 miles off the coast of Washington. News of the plateau was forwarded to CONAD to determine the feasibility of building a tower to replace the picket patrol. A shortage of funds, CONAD replied, coupled with the long lead time required to replace the picket ship station made it impractical to consider the tower further.[24]

A second means of ocean radar coverage investigated during 1956 was the moored sea platform. It was thought that these platforms would be less expensive and more effective than the Texas Towers. USAF recommended that ADC study the possibility of using these platforms in the seaward extension program.

By mid-1957, the concept of using radar platforms had been rejected, however. ADC informed CONAD that it considered floating radar

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* A tower was considered "limited operational" when either due to a shortage of personnel and/or equipment it could not be operated continuously but could operate for a minimum of 24 hours on an emergency basis.

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platforms impractical because of their cost and also because AEW&C vehicles seemed to offer the best means of obtaining sufficient radar coverage and the control capability needed. This view was supported by CONAD and the matter was dropped.[25]

DISTANT EARLY WARNING LINE

At mid-1957, the land-based section of the DEW Line running from Cape Dyer, Baffin Island, generally within about two degrees of the 69th parallel, to Cape Lisburne, Alaska, was in what might best be described as a semi-operational status. Originally, an operational deadline of 1 July 1957 had been set for the Line to begin operations. This date, erroneously based on what was thought to have been the expiration date of Western Electric's contract, was subsequently corrected to 31 July 1957, the true expiration date.[26]

On 1 July 1957, the civilian contractors said the line was in an "operational state," which they defined as meaning: "The Line... /would/ function as an operational system from 1 July exactly as it... /would/ when it /became/ an Air Force responsibility. During the 1 July-31 July period, it /would/ remain the responsibility of WEC, except in the event of an emergency, and both WEC and FEC /could/ make modifications without reference to the Air Force."[27] Actually, the period was an extensive test.

By 15 July, the line was considered technically ready: the radars at all the sites were working, the sites were manned, and the communications systems, both lateral and rearward conformed operationally to the specifications the civilian contractors were required to meet. The line, however, could not perform its assigned mission and was not expected to attain that capability for months to come.[28]

Even though the contractors work was finished, the operational limitations of the sectors were numerous: landline tie-ins to CONAD's combat operations center were not installed; the rearward UHF and VHF scatter communications systems still required considerable testing along various links; information on the DEW Line facilities, needed to implement interim identification procedures, was yet to be published; communications circuits to the AMIS facilities had not been connected to their ARTC centers, nor were the AMIS facilities in the ARTC centers ready; the supply depot being constructed at Frobisher had not been completed because of a shortage of funds which made logistical support of the line both difficult and costly; and, lastly, operational

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personnel for the line were untrained. Nevertheless, the Air Force formally accepted responsibility for the line on 13 August 1957.[29]

Testing. The time-table for the two-phase DEW test program was also disrupted by the operational limitations. Part I (the contractors test cycle) of the test program was completed 31 July 1957. Part II (the SAC penetration tests) had to be postponed until March 1958 because of the various discrepancies outlined above.[30]

Manning. Manning of the DEW Line was about the only project completed on-schedule. In June 1957, it was reported that all military personnel were in-place. On 12 June, some 675 people were on the line with 705 expected to be in-place by 1 July 1957. The personnel were receiving OJT with the assistance of WEC. Although the manning status was considered good, the personnel were expected to remain in a training status for some time to come. The technicians on the line had barely begun concentrating on the technical aspects of the equipment and would be unable to begin operational training until operational procedures were published. Even then the efficiency of the "radicians" was expected to be poor until they had gained sufficient experience and training.[31]

Operational Procedures. As late as March 1957, some thought was still being given to making the DEW Line an action as well as a warning line. In this latter month, however, CONAD placed itself in opposition to such a concept, stating:[32]

> While the employment of air defense weapons along the DEW Line may have some tactical feasibility, it is believed that political, budgetary and operating conditions at this time override the desirability of such action.
>
> Therefore, the conclusion can be drawn that, with the incorporation of qualitative improvements, the DEW Line will continue to serve as a warning rather than an action line.

CONAD was also opposed to the identification procedures outlined in the USAF-RCAF Operations Plan of 1 June 1956. The June plan established an identification system based upon flight plan correlation combined with the use of code words and/or maneuvers. CONAD was made responsible for the development, establishment and administration (in coordination with appropriate RCAF agencies) of the identification

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code and maneuver program for the line.

By November 1956, CONAD had come to the conclusion that the system approved by the EWOWG was impractical. Many reasons were advanced for its decision: the use of code words and maneuvers was considered too complicated; the system would not be compatible with operations on the seaward extensions; the cost of such a system in terms of personnel and money were excessive; it would require the support of foreign nations, some of which were reluctant to cooperate and set up stations to distribute envelopes for the flights; and it would not be ready for use in time to meet the operations date of the line.[33] In place of the envelope system, CONAD requested a system of simple flight plan correlation. The EWOWG did not concur, and the matter was referred to the JCS for resolution.

On 24 May 1957, CONAD received approval from the Joint Chiefs for the use of its flight plan procedure as an interim measure. However, the Joint Chiefs continued, "...it is desired that you study the entire identification problem and take positive action to bring into operation...an improved identification system...comparable to the detection characteristics established for the DEW Line...an initial objective will.../be/ the capability to identify as friendly 95 to 98% of all friendly traffic detected."[34]

CONAD's proposed identification system required a ground filed flight plan and compulsory reporting by all inbound aircraft to the DEW stations. Time and distance tolerances for aircraft penetrating the DEWIZ were plus or minus one hour and 100 nautical miles from the ground filed estimated time and point of DEWIZ penetration.[35]

The question of identification procedures resolved for the time being, the problem of publishing and disseminating DEWIZ information to all operating agencies in order to implement the system still remained. CAA and the DOT were not expected to publish the needed information before 1 September 1957.[36]

SEA EXTENSIONS

Eastern Sea Extension. By mid-1956, the Joint Chiefs had approved two extension locations for the Atlantic. The first, favored by CONAD, was to run from Cape Dyer, Baffin Island, to Cape Farewell, Greenland, and then by water to the Azores. A second line, recommended by the Navy, was to run from Cape Dyer across Greenland, then by

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water to Iceland, from Iceland by water to the Faeroes, and then once again by water to a point to be selected in Scotland.[37]

On 1 July 1956, limited operations began on a line from Argentia, Newfoundland, to the Azores, and was manned prior to 1 July 1957 by two picket ships and two AEW aircraft. On 1 July 1957, a full barrier, operated continuously, was established between the above two points with four DER's and four AEW aircraft. Plans at mid-1957 were to swing the Western end of the line up to Cape Farewell by 1960.[38]

The second extension was still in the planning stage, however. By June 1957, the Greenland portion of the extension was programmed to include four stations extending from Holsteinsborg to Ikateq. A fifth station at Kangek Island was to provide a link with the Azores barrier. The Ikateq station was to connect either with a radar at Keflavik, Iceland (H-1) or with H-4 (located on the Straumnes Penninsula in southwest Iceland), the latter site being favored if connections with Greenland proved feasible. A target date for site survey completion was set for 1 September 1957, with early 1958 anticipated as the earliest date construction contracts might be awarded.[39]

Low altitude coverage over the Denmark Straits was to be provided by either AEW aircraft or picket ships. Danish approval for radar siting in the Faeroes was obtained in the latter half of 1956 and siting parties had begun initial surveys in January 1957.[40]

Western Sea Extension. At mid-1956, the JCS approved Pacific extension of the DEW Line was a line running from Naknek to Umnak by land-based radar and then by sea to Midway.

A total of eight stations -- one main and seven auxiliary -- had been programmed for the Aleutian segment by mid-1956. The main station, located at Cold Bay, was to connect with the AAC radar station at King Salmon. The latter station would also be connected with Project WEST WALL (the DEW extension moving down the Bering coast between Lisburne and King Salmon). Upon completion of WHITE ALICE (the relay improvement project in Alaska), penetration data would be transmitted from King Salmon to CONAD's COC, AAC's COC, the 10th Air Division and RCAF/ADC. The target date for operation of the Aleutian segment was September 1958.[41]

This date was soon changed, however. In March 1957, Headquarters USAF informed CONAD that the operational date had been re-scheduled to 1 March 1959. Meeting the September 1958 deadline required spending

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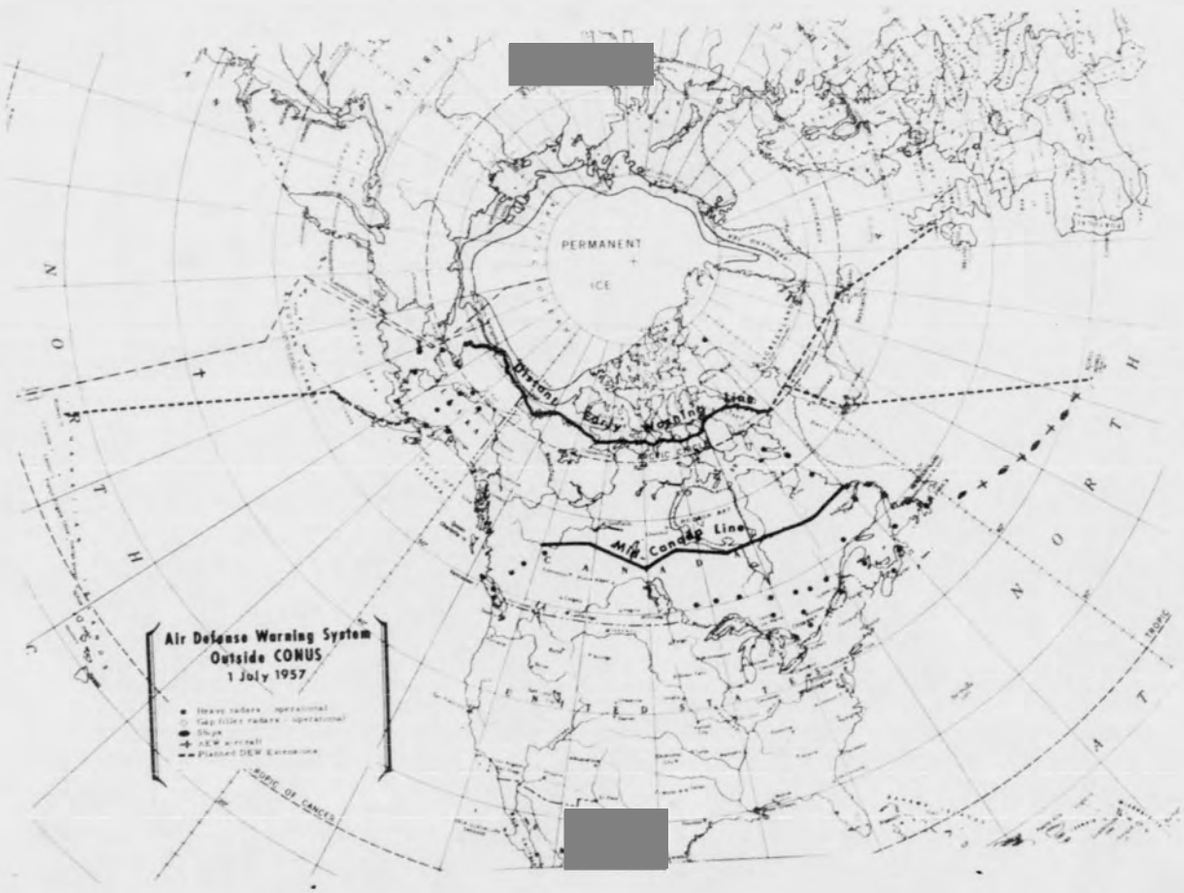
PERMANENT
ICE
Distant Early Warning Line
Mid-Canada Line
Air Defense Warning System
Outside CONUS
1 July 1957

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excessive funds, it stated, which would jeopardize other priority air defense electronic projects. A limited capability, it continued, could be anticipated by January 1959.[42]

AMC, in the meantime, wrote USAF that the DEWPO (Distant Early Warning Project Office) had asked for a six month deferment of the Aleutian Segment deadline in February. At this time, it had been given to understand that the operational date was to be 31 March 1959 and all contractual negotiations had been based on this date.[43] USAF accepted 31 March.

CONAD objected to the new date on the grounds that a serious gap would exist for approximately eight months between it and the operations of the Pacific flank extension scheduled for operations on 1 July 1958. Turning to the JCS, CONAD urged a return to the original September 1958 date if at all possible.[44]

While awaiting a reply from the JCS, CONAD explored the possibility of adjusting the Pacific seaward extension to fill in for the Aleutian segment during the 1958 period, a course of action suggested by Headquarters USAF.

The suggestion was studied by CINCAL and CINCPACFLT. CINCAL recommended an interim line from Oahu to Naknek. CINCPACFLT, however, disapproved on the grounds of lack of funds and forces. "The WV-2 aircraft cannot fly a longer round-trip than Midway-Umnak," CINCPACFLT continued, "[and] basing aircraft in the Alaskan area appears infeasible...CNO comment is being sought."[45]

The JCS reply, on 22 May 1957, offered little consolation. The 1959 date was not changed although two solutions to CONAD's problem were offered. The first solution was to place picket ships between Midway and Umnak and use the radar coverage from King Salmon. AEW flights could also be flown from Midway to the extent of their capability as additional assistance. As the Aleutian facilities became operational the picket ships could be returned to the Midway-Umnak route. The second solution was to locate picket stations between Hawaii and Kodiak with random operation of AEW planes from Hawaii on round-robin flights along the picket route. CONAD could plan on occasional AEW turn-around assistance in Alaska, the JCS continued, as long as it did not necessitate construction in the area.[46]

Thus matters stood at mid-1957, with the new operational date for the Aleutian segment remaining at 31 March 1959.[47]

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The sea extension between Midway and Umnak received its initial manning in March 1957. On 1 July 1957, the Navy placed a partial barrier in operation. The barrier consisted of one AEW aircraft operating from Midway to Adak (to be shifted at a later date between Midway-Umnak) of one and one-half flights a day (22 out of 24 hours) for training purposes. A progressive build-up to full operation was planned by 1 July 1958, when five DER's and six to seven AEW aircraft were scheduled for operations.[48]

In early 1957, the JCS approached CONAD with the possibility of extending the Pacific DEW extension south from Midway to Oahu. CONAD turned thumbs down on the suggestion. It felt that priority should first be given to strengthening those portions of the early warning system that would contribute most to the defense of North America and it recommended that any extension south of Midway not be considered[49]

MID-CANADA LINE

By 30 June 1957, operations on the Mid-Canada Line (MCL) were in a state of flux. The line had been scheduled to begin operations on 1 January 1957.

The operational deadline could not be met, however. Difficulties with the Doppler detection (fluttar) radar equipment developed, making sustained operations impossible. As a result, on the 1 January target-date none of the eight doppler sections were operational.[50]

By mid-1957, four sections had achieved a limited operational status. The dates that these sections commenced limited 24-hour operations are shown below:[51]

SECTION	OPERATIONAL DATE
Dawson Creek	1 May 1957
Stoney Mountain	3 June 1957
Cranberry Portage	24 May 1957
Bird	21 June 1957
Winisk	----
Great Whale River	----
Knob Lake	----
Hopedale	----

Although these four sections were considered to be limited operational by 30 June, their capability was only marginally satisfactory.

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It was expected that they would be required to shut-down at varying intervals in an effort to correct the problems experienced with the doppler equipment. A new operational date of 1 October 1958 was established for the entire Line to become fully operational.[52]

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EIGHT

OPERATIONS AND PROCEDURES

ALERT REQUIREMENTS

ADC Interceptors. The CONAD alert requirements established in May 1956 remained in force until March 1957. The interceptor alert requirement during this time was that 24 hours per day there be two aircraft on five minute readiness at all bases.[1] Four aircraft at one squadron and eight aircraft at two squadron bases were to remain on one hour readiness. The remaining aircraft at all bases that could be operationally ready within three hours were to remain on three hour reserve.

ADC interceptor units were finding it increasingly difficult to meet these requirements, however, by late 1956. A shortage of aircraft caused by conversion programs and Project FOLLOW-ON (the F-86D modification program) made it difficult for the squadrons to carry out the required alert, train crews, and meet proficiency requirements. The hardships were best illustrated by Eastern Air Defense Force's position. By the end of 1956, 16 of its 39 squadrons were undergoing "follow-on" modification while four additional units were undergoing or programmed for conversion to the F-102.[2]

Headquarters ADC was in no position to offer aid. Shortages of manpower and money made it virtually impossible to meet its CONAD defense commitments. As early as July 1956, General Partridge, CINCONAD and Commander ADC, had been forced to consider a revision of CONAD commitments levied on his Air Force component. "The United States Air Force," General Partridge wrote the JCS in September 1956, "has... been unable to provide the Air Defense Command with the resources necessary to carry out the current agreed /defense/ program."

The revised ADC plan, accepted by General Partridge, proposed several actions to overcome the manpower and money limitations. One such proposal was to lower the fighter alert requirements. Lowering the alert, ADC stated, would (1) allow more time for training thus assuring better qualified pilots, (2) provide field commanders greater freedom in using personnel and facilities, and (3) reduce maintenance and operations costs while providing better defense per dollar. CONAD

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accepted these views and began revising its regulation 55-8, the alert requirements.[3]

In revising it, three assumptions were made: (1) the current alert standards were wasteful in terms of available manpower, aircraft, funds and time; (2) under the normal state of preparedness regional commanders were more cognizant of their own positions and could therefore set more realistic standards; and (3) sufficient warning time made it possible to lower the alert without damaging the capability of the units to counter an attack.

CONAD adopted the position that a calculated risk should be taken and a reduced alert status was necessary. To accomplish this reduction, it proposed to provide the CONAD regional commanders with an established set of alert minimums. Using these CONAD guidelines, the force commanders could specify the alert requirements within their own areas.[4]

On 1 March 1957, CONAD issued a new regulation 55-8.[5] The guidelines laid down by CONAD made it possible to cut the number of interceptor units needed to maintain a normal state of alert. This was accomplished by establishing the conditions for a squadron to be on alert. These conditions were that only those squadrons based near enough to an ADIZ to allow interception of ADIZ violators and under the scramble control of a direction center (DC) having an identification responsibility for an ADIZ were to be scheduled for alert. Also, an additional reduction was possible since the regional commander was authorized to select the bases within this area as the alert force.

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

Squadrons outside the alert areas and those units within the area but not assigned to the alert were to get their requirements from the CONAD regional commanders. Any squadron could be designated for five-minute and one-hour duty as back-up air defense aircraft or for training purposes. Aircraft at these bases, other than those on five-minute and one-hour alert, were expected to meet the three-hour reserve also.

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CONAD regional commanders were also authorized to allow as many as 20 per cent of all three-hour reserves to be away on navigational flights providing the alert commitments up to and including one-hour had been met and that the planes were capable of returning in three hours. This latter ruling was unacceptable to the regional commanders. It was pointed out by them that limiting navigational flights to three hours made it impossible to get quality training. CONAD agreed and issued an amended version of the regulation (3 June 1957) providing that a regional commander could allow as many as 20 per cent of all three-hour alert planes to be absent from their home base on navigational flights.[6]

Air National Guard fighter-interceptor squadrons on active air defense operations were to keep two planes on five minute alert 14 hours per day. The normal schedule established was one hour before sunrise to one hour after sunset. If this schedule went over 14 hours, an alternate was to be followed which stipulated the aircraft were to begin one hour before sunrise and continue to 14 hours later. By 1 July 1957, 19 ANG squadrons were standing the alert, an increase of one during the preceding year. Also, the 319th Fighter-Bomber Wing, an Air Force Reserve unit located at Memphis, Tennessee, was standing the same alert schedule as the ANG units.

Two additional units, not covered by the CONAD regulation, standing alert were the Navy unit at San Diego and an Air Force Training Command unit at Perrin AFB, Texas. Both kept two aircraft on five-minute alert around-the-clock.[7]

Antiaircraft Missiles and Guns. The readiness requirements during 1956 were as follows: (1) Nike units: 25 per cent on 15 minutes; 25 per cent on 30 minutes, and the remainder on three hours; (2) 90/120mm units: 66 2/3 per cent on 30 minutes, and the remainder operational within three hours; (3) 75mm Skysweeper units: 50 per cent on 30 minutes, and the remaining guns operational within three hours.

In its new regulation of 1 March 1957 (55-8), CONAD reduced the 15 and 30 minute alert force almost by half and increased the forces on three hour readiness by a proportionate amount. CONAD required that army antiaircraft fire units have the capability of assuming battle stations within the time limits shown in the chart on the following page:[8]

[redacted]

[redacted]

NIKE FIRE UNITS	90/120mm FIRE UNITS	75mm FIRE UNITS
25% on 15 minute alert at Loring, Boston-Providence, Hartford-Bridgeport, New York, Philadelphia, Washington-Baltimore, Norfolk, Fairchild, Hanford, Seattle, San Francisco, Travis and Los Angeles. 25% on 30 minute alert at: Niagara-Buffalo, Pittsburgh, Cleveland, Detroit, Chicago, Milwaukee, and Ellsworth. Remaining operational within three hours.	25% within 30 minutes. Remaining operational within three hours.	33 1/3 within 30 minutes. Remaining operational within three hours.

ACW Squadrons. ACW squadrons, with the exception of those on limited operational status, were required as of 1 March 1957 by 55-8 to maintain continuous radar surveillance and control capability in accordance with the regional commanders directives. Squadrons on limited operational status were to operate at least eight hours per day: during a four hour period beginning two hours before sunrise and a four hour period starting two hours before sunset, provided they were directly supporting or augmenting perimeter radars.[9]

Alaska. The authority to establish alert requirements for Alaska was left to the discretion of CINCAL. By December 1956, CINCAL had established the normal state of alert to be maintained by the units of his two interceptor bases. There were three conditions: 1) a normal state of alert at Ladd and Elmendorf with all aircraft present; 2) an alert when as many as eight aircraft were deployed from the home base to provide an alert force at surrounding deployment bases; and 3) the state of alert to be maintained at deployment bases.

The alert requirement for the two three-squadron bases was that 24 hours per day there be four aircraft on five-minute readiness, four on 30 minute, four on one-hour, and the remaining aircraft that could be

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operationally ready within three hours on three hour reserve. Whenever as many as eight aircraft from Ladd or Elmendorf were deployed, CINCAL authorized the following alert standards: two aircraft on five-minute readiness, two on 30 minute, eight on one hour, and the remaining aircraft that could be operationally ready on a three hour reserve.[10]

RULES OF ENGAGEMENT

Interceptors. The procedures for intercepting and engaging an enemy attack in force during 1956 and early 1957, were contained in a regulation issued on 8 October 1955 and amended in February 1956. No change was made until May 1957, although much thought had been given to a revision prior to that time.

Changes in the command structure, the addition of the Alaskan and Northeast air defense missions, and a new group of special weapons coming into the weapons inventory made new rules essential.

A new set of rules, CONAD Regulation 55-6, bearing the Departments of State and Defense approval, was issued on 13 May 1957.[10] These rules provided instructions for interception and engagement of hostile aircraft in the United States, Alaska, and the coastal ADIZ's. They were based upon the concept of centralized operational control of all air defense weapons by CINCONAD with maximum decentralization of tactical authority to meet the needs of any battle situation.

(b) (1)

[redacted]

[redacted]

[redacted]

(b) (1) [redacted]

(b) (1) [redacted]

Surface-to-Air Weapons. The regulation mentioned above, 55-6, as noted, also provided for antiaircraft weapons. It stipulated four states of fire for antiaircraft weapons: "Weapons Free," any target not identified as friendly could be fired upon; "Weapons Tight," only targets identified or declared hostile, or those targets committing hostile acts could be fired at; "Discreet Fire," when the tactical situation permitted it, CONAD commanders could assign specific targets (i.e., individual tracks, multiple tracks or raids) to air defense weapons; and "Hold Fire-Do Not Open Fire-Cease Fire[12]" Under normal conditions, ground-to-air weapons were to remain on Weapons Tight until an Air Defense Warning Yellow with SCATER implemented was declared. Hold Fire was to be imposed only on a temporary basis to permit friendly aircraft operations in or through predetermined corridors, altitudes or sectors in cases where any other conditions would prove impractical.

CONAD division commanders or their authorized representatives could impose this latter condition. A division commander could also delegate his authority to order Hold Fire to Senior directors at an ADDC. However, a Hold Fire ordered by a director had to be relayed to and confirmed immediately by the division commander. If confirmation was not received, the surface-to-air weapons units were automatically released from the ~~condition~~.

The CONAD division commander, who had operational control over all ground-to-air weapons in his sector, was to designate the AA status as the tactical situation dictated. All information and orders were to be issued directly to the AA commander, communications permitting, at the AAOC; otherwise, such orders were to be issued through the ADDC. Complete failure of communications in the sector would leave the authority to designate the weapons control status to the AA defense commander.

[redacted]

[redacted]

CANADIAN RULES OF ENGAGEMENT

From 1954, air defense interceptors of Canada and the United States could cross the border for purposes of interception and engagement (there had been limited authority to overfly for identification since 1951).

In 1956, Canadian aircraft over U. S. soil had to follow the rules of engagement outlined in CONAD Regulation 55-6. American planes over Canada had to operate under Canadian rules as outlined in the RCAF Air Defence Command Air Staff Instructions (ASI) 2/5.[13]

(b) (1) [redacted]

(b) (1) [redacted]

A limiting factor to the instructions was that they provided guidance to the forces prior to the declaration of a state of emergency. No rules were written for engagement subsequent to an air defense emergency. This was corrected by a new ASI, dated 15 June 1957. Canada's new rules provided for engagement both before and after an emergency.

(b) (1) [redacted]

[redacted]

[redacted]

(b) (1) [redacted]

(b) (1) [redacted]

(b) (1) [redacted]

ANTIAIRCRAFT RULES FOR CANADIAN OPERATION

Temporary procedures for the use of American surface-to-air missiles over Canada were also set up in June 1957*. The two countries agreed that operational control over surface-to-air units was to be exercised by or through the CONAD division commander, in whose sector the weapons were located, with the concurrence of the Canadian division/sector commander, over whose territory the weapons were to be employed.

The operations of the five border defense areas in the United States were to be controlled in the following manner: (1) the defenses at Port Huron and Detroit, Michigan, and Niagara Falls-Buffalo, New York, were to be controlled by the commander of the 30th CONAD division. To engage a target over Canada, the commander of the 30th Air Division was to obtain permission from the sector commander of the 3d ADCC in Canada. The Canadian sector commander, under normal conditions, was to authorize engagement of specifically designated targets -- a condition of Discreet Fire. When the tactical situation dictated either more or less fire than that provided by the Discreet Fire state, the sector commander was to permit either a Weapons Tight or Weapons Free condition. A similar arrangement was to exist between the 32nd CONAD Division Commander (i.e., the Loring AFB, Maine defense)

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* These rules were to be followed until new border defense agreements could be written.

[redacted]

[redacted]

and the 1st or 2nd Sector Commander in Canada, depending upon the air space needed.

Separate provisions were established for the Sault Ste. Marie, Michigan, defense (under the 37th CONAD Division). This defense was capable of engaging targets some distance within Canada. Air defense actions by this unit were to be authorized and conducted solely in accordance with instructions of the AOC ADC (RCAF).[15]

MILITARY AND CIVIL WARNING

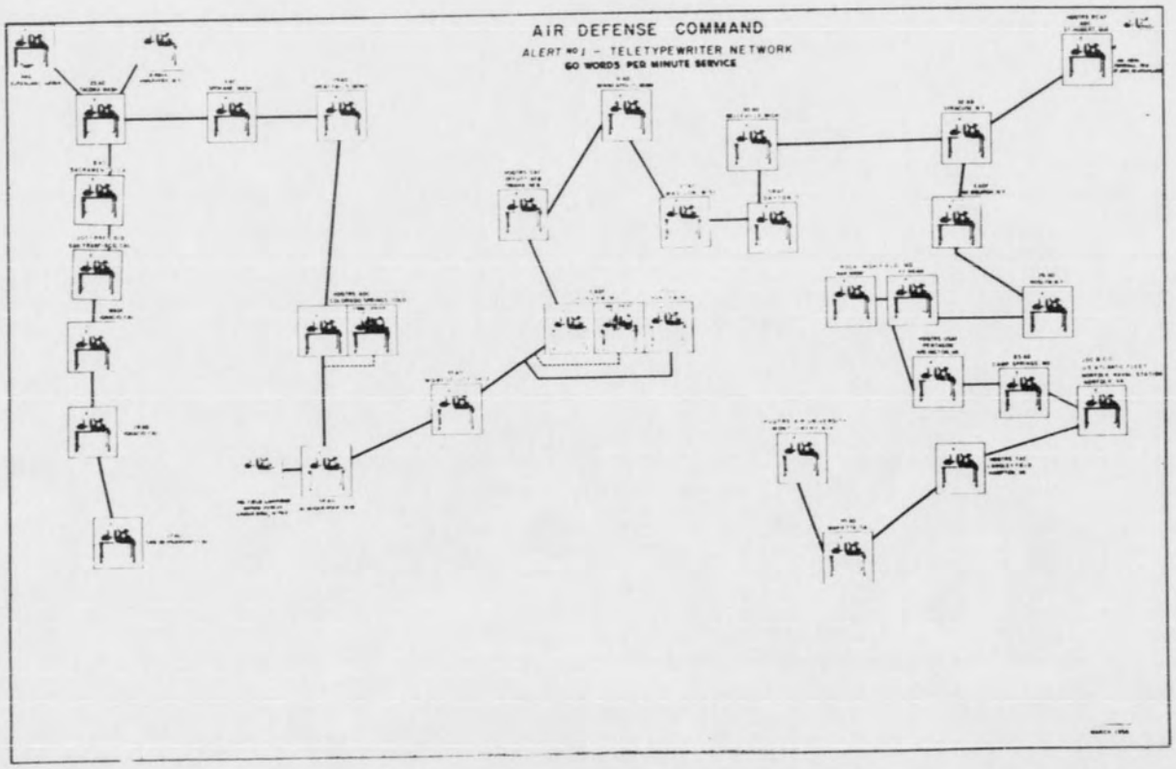
Military. CONAD's responsibility for providing a military air defense warning (MADW) included: determining the conditions of warning and preparedness; and transmitting these conditions to CONAD echelons, other commands and agencies having collateral air defense responsibilities, and to representatives of the Federal Civil Defense Administration (FCDA) as appropriate.

The three degrees of warning in force at mid-1957 were: Air Defense Warning Yellow, attack probable; Air Defense Warning Red, attack imminent, or taking place; and Air Defense Warning White, attack improbable. In addition, CONAD set up three states of preparedness which were: Normal Preparedness, the normal condition specified in current operations orders to provide sustained air defense potential; Increased Preparedness, a temporary increase over the normal condition to provide a defensive potential against an unknown or doubtful threat; and Air Defense Readiness, which would place the entire system in a state of maximum immediate operational preparedness for relatively short periods.[16]

The states of preparedness and warning were to be passed from CONAD Headquarters over a special warning network (Alert #1) to CONAD echelons. Almost simultaneously, over a MADW network from the CONAD division control centers the information was to be transmitted to key point air warning centers set up throughout the United States. The key points, in turn, were responsible for sending the warning to their surrounding local areas.

The primary means of transmission over these networks were multipoint teletypewriters, except between the control centers and military flight service (MFS) centers. The latter centers were to correspond over interphone. Back up for the teletypewriters was the tactical long distance telephone circuits between the key points and control centers.

[redacted]


AIR DEFENSE COMMAND
ALERT NO 1 - TELETYPEWRITER NETWORK
60 WORDS PER MINUTE SERVICE

And, when all else failed, the centers were authorized to use commercial facilities.[17]

Civil Warning. The civil air defense warning (CADW) system continued to operate under the FCDA as it had since July 1952. However the procedure of placing FCDA liaison officers (Attack Warning Officers) at CADW switchboards in CONAD division control centers to disseminate air defense warnings changed in May 1957.

The change in the FCDA procedures came in an attempt by that agency to streamline its warning methods. To protect the public, FCDA officials reasoned, the earliest warning information was needed. This information could best be obtained from three sources -- CONAD Headquarters and the CONAD Western and Eastern Region Headquarters. From this reasoning, the new National Warning System (NAWAS), a combination of the previous CADW and the National Warning Control System (NAWAC), was developed.

The new NAWAS, adopted on 1 May 1957, provided for the abolition of all attack warning centers at division level. To do the same work, three centers -- one each at CONAD, and Western and Eastern Region Headquarters -- were set up. From the center at Colorado Springs, all FCDA key points, state CD centers, and FCDA offices were to receive initial warning. After the declaration of a Warning Yellow, subsequent warning and position reports were to be furnished to the FCDA key points from all attack centers.[18]

EXERCISES

Command Policy. CONAD set forth its policy on exercising and evaluating the air defense system in a regulation issued on 19 June 1957. The machinery set up by the regulation provided for conducting exercises at four levels -- division, region, national and international. Included in the machinery was an outline of the types of exercises to be conducted at each level and the responsibility of each commander to CINCONAD.

Under the provisions of the new regulation, component commanders were responsible for conducting the training necessary to bring individuals and units of the system to a combat ready state and to maintain them at peak efficiency. Such training was to include individual and/or unit exercises which would increase proficiency and intra-unit exercises designed to maintain peak efficiency. In addition, the commanders

[redacted]

could, after coordination with the appropriate CONAD headquarters, set up exercises with forces of more than one component service. Exercises at the component level were to include but were not limited to training, tactical evaluation, operational readiness or similar inspections, employment and suitability tests, and service conducted weapons firings.

Operation and evaluation of the integrated air defense system was set up as a function of the CONAD commanders. The scope of these exercises was to include joint tests involving elements of the components and/or exercises between CONAD forces and forces not under CONAD control. At the division and region levels, the commanders could schedule joint training and/or evaluation exercises that normally were to be held with training missions flown by SAC*.

CONAD headquarters kept the authority to hold exercises of the broadest scope. The exercise areas marked out for its supervision included actual firing exercises, specific controlled exercises, national exercises (two or more regions participating), and international exercises.[19]

CONAD-SAC ECM Exercises. The threat of electronic countermeasures against the CONAD air defense system was never more forcefully demonstrated than in October 1956 and January 1957. During these two months, SAC aircraft, fitted with multiple jammers and employing random chaff drops, flew through the three defense force areas disrupting the surveillance, identification and control capability of much of the system. How well the missions succeeded was brought out by the commanders of the defense area. Major General Jarred V. Crabb, CADF commander, wrote: "They completely jammed our radar. All the normal rules of ECM were exercised by our people. We were unable to read through the jamming."[20] EADF reported that its ability to run close control intercepts was "virtually eliminated."[21]

Although the joint CONAD-SAC missions were not designed for evaluation of the air defense system, the fact that all S-Band radars (approximately 20 per cent of the CONAD radar system) could be rendered ineffective by ECM was a serious problem. The radar had some anti-jamming features, but they were inadequate. In essence, this meant that until newer radars incorporating built-in ECCM features -- equipment thus far in the distant future -- were delivered to the field, CONAD

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* Missions scheduled with SAC were to conform to CONADR 51-1.

[redacted]

[redacted]

would have to rely upon experienced ECM operators who could "read through" jamming in so far as possible. The CONAD staff turned its attention to helping ADC in its efforts to provide such experience and to gain additional knowledge of ECM characteristics.

To enable the staff to more effectively cope with the ECM threat, CONAD proposed that the previously impromptu exercises provided by SAC be made a regularly scheduled event. A series of these scheduled tests would, it was hoped, provide the radar operators with the needed experience. Such missions could be used also to provide ECM training to and evaluation of the entire defense network (including Nike batteries, picket ships, Texas towers, blimps and AEW&C aircraft -- parts of the system previously untested).*

SAC eventually agreed to the CONAD proposal. The exercises could be worked into its rotation schedule and would provide an excellent opportunity for testing penetration and ECM tactics of its bomber forces.[22]

Shortly thereafter, joint CONAD-SAC ECM monthly missions were set up for the evaluation and training of the system. The first exercise was scheduled for April 1957. By 1 July 1957, two of the monthly exercises had been run. Although neither offered conclusive evidence on which to evaluate the air defense system, both served their purpose of providing maximum ECM-ECCM training and experience in evaluating and collecting data on which to base a series of controlled ECM tests for the immediate future.[23]

CONAD-Navy Exercises. Associated radar problem areas which handicapped the air defense system were emphasized in two Navy West Coast exercises (HOP SCOTCH and HOME RUN) held at mid-1956 and mid-1957. The two operations illustrated the fact that the radar currently employed for air defense was inadequate to detect either very low or very high altitude flights.[24]

In HOP SCOTCH, held in June 1956, 120 Navy AD, AJ, F2H, F9F and F7U aircraft were launched against targets in the 27th and 28th Divisions' areas of responsibility. The planes attempted to penetrate the areas at altitudes that varied from 40 feet to 42,000 feet.

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* SAC's capability to test the entire defense network on a continuing scale was hampered because of the limited number of jammers installed in its aircraft fleet sufficiently strong enough to jam "L"- and high "S" Band radars.

[redacted]

[redacted]

Forty-two carrier-based aircraft, employing very high and very low level attacks, entered the same areas a year later (June 1957) in exercise HOME RUN.

A summary of the CONAD combat air patrol (CAP) effectiveness in detecting the aggressor force appears in the table shown below:

	HOP SCOTCH On Pen. Trks Only	HOME RUN On Pen. Trks Only	HOME RUN Pen. and Outbound Trks
Nr Faker Acft Penetrating	120	42	42
Nr Faker Acft Detected	30	12	13
Percent Detected	25%	29%	31%
Nr Faker Acft Committed Against	28	10	11
Percent Committed Against	23%	24%	26%
Nr Faker Acft MA'd(Intcpt)	13	0	2
Percent MA'd	11%	0	5%
Fighters Committed per Faker Acft Detected	1.7	1.7	1.8

[redacted]

[redacted]

NINE

AIR DEFENSE PROGRAMS

CONTINENTAL AIR DEFENSE OBJECTIVES PLAN, 1956-1966

The terms of reference for CINCONAD directed that he would, after consultation with unified and specified commanders, recommend to the JCS the operational requirements for forces, weapons, and equipments of all elements of the continental air defense system. The terms further provided that the development and procurement of weapons would be responsive to CINCONAD's requirements as approved by the JCS and were to be accomplished by the various services.

In compliance with this directive, CONAD submitted to the JCS on 18 December 1956, the Continental Air Defense Objectives Plan for the ten years 1956 to 1966 (CADOP 56-66).[1]* A new plan was to be issued each year, e.g., 1957-1967. The plan covered objectives for the air defense of both Canada and the United States. In formulating it, the AOC RCAF ADC was consulted frequently and the RCAF Liaison Staff at CONAD Headquarters participated fully.

General Partridge conferred with the Canadians after the plan was finished and advised the JCS that the RCAF voiced no serious objection to any part of it.[2] They were in general agreement with the level of forces and ground environment. They did have some reservations on actual numbers of fighter squadrons, deployment, etc., but, General Partridge stated, it appeared that the differences were minor and could be worked out in the future. Everyone agreed, he said, that the JCS should not send the objectives plan to the Canadian Chiefs officially for comment until a decision on integration of operational control of the Canada-U. S. systems was made.

As noted above , CADOP 56-66 had been submitted on 18 December 1956. Lack of JCS approval by April 1957 brought a strong plea from CONAD. Approval by the JCS was a prerequisite to provision of required

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* Prepared with the support and assistance of ADC, ARADCOM, and NAVFORCONAD.

[redacted]

forces by any of the services. In its letter CONAD said that this lack of approval was having a harmful effect:[3]

> Without any recognized and approved CONAD program and goal, the air defense of North America can be, and is being, jeopardized by unilateral Service actions which, although valid insofar as the individual Service is concerned, frequently have a highly adverse effect on the Continental Air Defense System.

The JCS still had not given its approval by August 1957 and the CONAD requirements and the service programming were considerably at variance. Headquarters USAF had published a program document (PG-59-1) for the guidance of Air Force units in their planning.[4] This document was not submitted to CINCONAD and did not agree with CADOP. The Army submitted its program to CONAD in a piecemeal manner only. The Navy was not planning expansion of their forces as a result of CADOP and had not sent any program to CONAD.

FY 1959 PLAN

On 6 August, in response to a request from the USAF Chief of Staff, CONAD submitted all CONAD recommended air defense programs for FY 1959.[5] CONAD also sent along the forces programmed to be operational by the various services by the end of FY 1958 and the forces recommended or approved to be operational in FY 1959. The 1959 plan was as follows.

	I CONAD REQUIREMENTS FY 1959	II PROGRAMMED TO BE OPERATIONAL - FY 1959	III SERVICE RECOMMENDED OR APPROVED TO BE OPERATIONAL IN FY 1959
MANNED INTERCEPTORS			
United States	66 Sqdns	64 Sqdns	68 Sqdns
Northeast Area	3 Sqdns	3 Sqdns	3 Sqdns
Alaska	2 Sqdns	4 Sqdns	4 Sqdns
BOMARC			
United States	1 Sqdn	NONE	NONE

NOTE: In February 1957, the JCS approved construction of five BOMARC sites at: (1) McGuire AFB, N. J. (2) Suffolk AFB, N. Y., (3) Otis AFB, Mass., (4) Dow AFB, Me., (5) Plattsburg AFB, N. Y. The first Four sites were under construction (USAF PG-59-1 provided four units to be operational in FY 1960).

[redacted]

	I	II	III
NIKE/TALOS			
United States	77 Bn's NIKE	61 Bn's NIKE	73 Bn's (NIKE) (12 new Bn's at 16 new sites)
Alaska	2 Bn's	NONE	2 Bn's
		NOTE: In November 1956, the JCS approved 3 Nike battalions for Alaska, to be operational by FY 1960.	
HAWK	NONE	NONE	NONE
		NOTE: In February 1957, the JCS approved two Hawk sites: New York and Washington. The New York site was to be operational in FY 1960.	
GUNS (90 & 120mm)			
United States	59 Bn's	17 RA 25 1/2 NG 42 1/2 Total	3 RA 25 1/2 NG 28 1/2 Total
Northeast Area	1 Bn	1 Bn	1 Bn
Alaska	1 Bn	3 Bn's	3 Bn's (2 Bn's approved by CONAD in lieu of 2 Skysweeper Bn's planned for conversion to Nike).
SKYSWEEPER			
United States	6 Bn's	3 Bn's	3 Bn's
Northeast Area	1/2 Bn	2/3 Bn	2/3 Bn
Alaska	2	2	NONE
LAND BASED RADARS			
United States	148	144	144
Northeast Area	12	10	10
Alaska	21	18	18
Canada	35	11 U.S. Manned & Financed 4 U.S. Financed 11 Canadian 26 Total	26

	I	II	III
GAP FILLER RADARS			
United States	167	142	158
Northeast Area	6	6	6
Alaska	6	6	6
Canada	82	NONE	NONE
OFF SHORE RADARS			
Texas Towers	3	3	3
Picket Ship Stas	13	10	10
AEW&C Stations	13	8 Day to Day Basis 2 Increased Readiness Basis 10 Total	8 Day to Day Basis 2 Increased Readiness Basis 10
SAGE DIRECTION CENTERS			
United States	8	NONE	7
SAGE COMBAT CENTERS			
United States	1	NONE	1
BADGE			
Northeast Area	To be Determined	NONE	NONE
Alaska	Modified BADGE System	NONE	2 Colocated AAOC-ADDC's in modified BADGE System
DEW LINE			
Alaska & Canada	Not Included in CADOP 56-66	40 (Northern DEW line Proj.) 6 (Proj. Stretchout)	40 6
Canada-N. E. Area	Not Included in CADOP 56-66	11 (Northern DEW Line).	11

[redacted]

DEFENSE AGAINST MISSILES

A requirement for a defense against the intercontinental ballistic missile was contained in CONAD's CADOP 56-66. CONAD had repeatedly expressed concern over this threat. In March 1957, it told the JCS that an adequate and timely defense system against the intercontinental Ballistic missile was "the most urgent future CONAD requirement."[6] CONAD urged that full recognition and effort be put on this requirement in order to get a system in time to meet the threat.

National Intelligence Estimates and all other available intelligence, CONAD pointed out, indicated that Russia could have an ICBM as early as 1959 and almost certainly by 1961.*

Another requirement, not formally stated in CADOP 56-66, was for a defense against cruise and ballistic missiles launched from submarines or surface ships. On 14 June 1957, CONAD stated a requirement to the JCS for such a system.[7] CONAD pointed out that current systems were limited in their capability to acquire and react against small, high-speed targets. What was needed was a quick-reacting anti-missile capability that could detect and destroy short and intermediate range surface-to-surface and underwater-to-surface missiles.

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* On 26 August 1957, Russia announced that she had just completed successful tests of a missile that could hit any target in "any part of the world," including the United States.

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APPENDIX

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APPENDIX I

MISSIONS OF FRIENDLY FORCES

(As listed in CONAD, The Air Defense Plan, Continental United States, Alaska, and Northeast Area, (1-57), 1 January 1957, Title SECRET)

1. Commander-in-Chief Alaska

a. Maintains the security of the Alaskan Command.
b. Supports CINCONAD in the defense of the United States against air attack through Alaska and the Arctic regions within his command.
c. Supports CINCONAD in his mission.

2. Commander-in-Chief Pacific

a. Defends the United States against attack through the Pacific Ocean.
b. When there exists an imminent threat of air attack upon the continental United States or in case such an attack develops, provides, for the operational control of CINCONAD, those naval forces and facilities having an air defense capability and which can be made temporarily available for air defense operations.
c. Plans for and conducts operations required for the seaward extension of the early warning system within his area of responsibility and supports CINCONAD in accordance with plans approved by the Joint Chiefs of Staff and mutual agreements by the commanders concerned, to insure that plans for, and the operation of, these elements of the early warning system will be responsive to the needs of CINCONAD.
d. Conducts Naval operations (ASW) designed to destroy possible enemy capability to deliver submarine-launched guided missiles.
e. Supports CINCONAD in his mission.

3. Commander-in-Chief Atlantic

a. Defends the United States against attack through the Atlantic Ocean and the Caribbean Sea.
b. Same as b. under CINCPAC.
c. Same as c. under CINCPAC.
d. Same as d. under CINCPAC.
e. Same as e. under CINCPAC.

4. Commander-in-Chief Caribbean

a. Maintains the security of the Panama Canal and of the Caribbean Command, and defends the United States against attack through the Caribbean.
b. Supports CINCONAD in his mission.

5. Commander-in-Chief Strategic Air Command

a. Conducts strategic air operations with assigned forces and with such other forces as may be made available by the JCS.

[redacted]

[redacted]

b. When there exists an imminent threat of air attack upon the continental United States or in case such an attack develops, provides, for the operational control of CINCONAD, those SAC forces and facilities having an air defense capability which are in a position to be employed effectively and which can be made temporarily available for air defense operations.

c. Provides air defense training for the above forces to insure the effective integration of these forces into the continental air defense system.

d. Supports CINCONAD in his mission.

6. Designated U. S. Air Force Commanders

a. Supports CINCONAD to the maximum extent consistent with assigned primary missions.

b. When there exists an imminent threat of air attack upon the continental United States or in case such an attack develops, provides for the operational control of CINCONAD, those available forces and facilities having an air defense capability which are in a position to be employed effectively in air defense operations.

c. Provides air defense training for the above forces to insure the effective integration of these forces into the continental air defense system.

7. Designated U. S. Army Commanders

a. Same as a. under Designated USAF Commanders.
b. Same as b. under Designated USAF Commanders.
c. Same as c. under Designated USAF Commanders.

8. Designated U. S. Navy and U. S. Marine Corps Commanders

a. Same as a. under Designated USAF Commanders.

b. When there exists an imminent threat of air attack upon the continental United States or in case such an attack develops, provides, in accordance with coordinated plans, for the operational control of CINCONAD, those available Navy and Marine forces and facilities having an air defense capability and which are in a position to be employed effectively in air defense operations.

c. Same as c. under Designated USAF Commanders.

9. Canada

a. Through the Air Defence Command, RCAF, provides, for the air defense of Canada and coordinates the operation of the Canadian air defense system with the United States continental air defense system.

b. Participates in other operations for the security of the Western Hemisphere.

10. Mexico

Maintains internal security within her own borders but will be unable to make significant forces available for combined air defense missions. No bilateral air defense agreements have been completed with Mexico at the present time.

[redacted]

[redacted]

APPENDIX II

ADC FIGHTER-INTERCEPTOR FORCE

As of 28 June 1957

Air Div	Sqdn	Location	Base Asgmt	Type Acft	Acft Asgd	Acft Opr Rdy	Crews Asgd	Crews Opr Rdy
			EASTERN AIR DEFENSE FORCE					
26th	2	Suffolk	ADC	F-102A	28	4	16	0
	5	Suffolk	ADC	F-102A	24	4	6	0
	46	Dover	MATS	F-94C	22	18	34	21
	49	Hanscom	ARDC	F-86L	19	11	37	15
	58	Otis	ADC	F-89H	1	0	0	0
				F-89J	28	16	35	26
	60	Otis	ADC	F-94C	20	13	36	22
	96	Newcastle	ADC	F-94C	19	13	33	21
	97	Newcastle	ADC	F-94C	21	15	34	26
	98	Dover	MATS	F-89H	2	2	0	0
				F-89J	19	10	34	0
	324	Westover	SAC	F-86D	25	12	35	25
	330	Stewart	ADC	F-86L	16	7	35	20
	331	Stewart	ADC	F-86L	17	7	32	24
	332	McGuire	MATS	F-86L	23	11	31	12
	337	Westover	SAC	F-86D	6	1	29	14
				F-86L	13	7	0	0
	539	McGuire	MATS	F-86L	21	8	33	22
30th	31	Wurtsmith	ADC	F-102A	27	6	29	0
	42	Greater Pitt	ADC	F-86D	3	0	26	25
				F-86L	18	10	0	0
	47	Niagara Falls	ADC	F-86L	19	13	31	16
	71	Selfridge	ADC	F-86D	3	3	27	20
				F-86L	23	16	0	0
	86	Youngstown	ADC	F-86D	2	2	0	0
				F-86L	16	10	30	12
	94	Selfridge	ADC	F-86L	21	17	33	29
	445	Wurtsmith	ADC	F-89H	2	0	0	0
				F-89J	28	20	32	9
32nd	27	Griffis	AMC	F-94C	12	9	28	9
				F-102A	1	0	3	0
	37	Ethan Allen	ADC	F-86D	25	19	29	23
	75	Presque Isle	ADC	F-89H	16	7	33	10
	76	Presque Isle	ADC	F-89D	15	8	30	19
	465	Griffis	AMC	F-89H	11	7	10	0
				F-89J	14	11	22	22
35th	444	Charleston	MATS	F-86D	8	6	32	29
				F-86L	12	6	0	0

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Air Div	Sqdn	Location	Base Asgmt	Type Acft	Acft Asgd	Acft Opr Rdy	Crews Asgd	Crews Opr Rdy
			EASTERN AIR DEFENSE FORCE (CONT'D)					
37th	62	O'Hare	ADC	F-86D	4	3	0	0
				F-86L	23	19	35	15
	63	O'Hare	ADC	F-86D	1	0	0	0
				F-86L	17	11	31	16
	323	Truax	ADC	F-102A	23	7	24	0
	325	Truax	ADC	F-102A	22	8	19	0
	438	Kinross	ADC	F-89D	7	0	7	0
				F-102A	16	0	16	0
	484	K. I. Sawyer	ADC		0	0	0	0
58th	56	Wright-Patt	AMC	F-86D	7	3	30	30
				F-86L	17	6	0	0
	87	Lockbourne	SAC	F-86D	25	12	36	34
	319	Bunker Hill	TAC	F-94C	22	11	37	0
	354	McGhee-Tyson	ADC	F-86D	11	10	27	25
				F-86L	14	4	0	0
	469	McGhee-Tyson	ADC	F-86D	29	17	31	29
85th	48	Langley	TAC	F-102A	25	16	37	0
	95	Andrews	MATS	F-86L	22	11	31	21
	482	Seymour-Johnson	TAC	F-102A	8	4	14	0
			CENTRAL AIR DEFENSE FORCE					
20th	13	Sioux City	ADC	F-86D	26	16	36	29
	14	Sioux City	ADC	F-86D	22	8	34	31
	85	Scott	ATC	F-86D	23	6	37	36
	326	Richards-Gebaur	ADC	F-102A	10	8	25	0
29th	29	Malmstrom	SAC	F-89H	18	16	32	0
	54	Ellsworth	SAC	F-86D	25	10	33	11
31st	11	Duluth	ADC	F-102A	24	8	31	1
	432	Minn-St. Paul	ADC	F-89H	26	18	32	12
33rd		None						
34th	15	Davis-Monthan	SAC	F-86D	21	10	38	36
	93	Kirtland	ARDC	F-86D	21	14	31	30
			WESTERN AIR DEFENSE FORCE					
9th	322	Larson	TAC	F-86L	23	18	35	24
	497	Geiger	ADC	F-86D	30	24	31	30
	498	Geiger	ADC	F-102A	21	5	25	0
	538	Larson	TAC	F-86D	4	3	0	0
				F-86L	18	14	33	27
25th	317	McChord	ADC	F-102A	25	8	26	1

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Air Div	Sqdn	Location	Base Asgmt	Type Acft	Acft Asgd	Acft Opr Rdy	Crews Asgd	Crews Opr Rdy
			WESTERN AIR DEFENSE FORCE (CONT'D)					
	318	McChord	ADC	F-102A	24	8	30	0
	321	Paine	ADC	F-89H	12	10	15	12
				F-89J	13	10	16	16
	460	Portland	ADC	F-89D	27	14	32	25
27th	327	George	TAC	F-102A	23	5	26	20
	329	George	TAC	F-86L	23	16	42	33
	437	Oxnard	ADC	F-89H	19	13	35	31
28th	82	Travis	SAC	F-86D	6	4	29	28
	83	Hamilton	ADC	F-86D	6	3	0	0
				F-86L	18	13	29	6
	84	Hamilton	ADC	F-89J	22	17	30	6
	398	Hamilton	ADC		0	0	0	0
	456	Castle	SAC	F-86D	23	16	32	25
	518	Klamath Falls	ADC		0	0	0	0
			64TH AIR DIVISION (DEFENSE)					
	59	Goose	SAC	F-89D	20	15	36	24
	61	Harmon	SAC	F-89D	21	17	27	25
	74	Thule	SAC	F-89D	14	12	24	24

Source: RCS 1-AF-V14, 28 June 1957

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APPENDIX III

USARADCOM UNITS

15 April 1957

BATTALION	TYPE	LOCATION
1st AAA Missile Bn.	NIKE	Irwin, Pennsylvania
9th AAA Missile Bn.	NIKE	Fort Baker, Sausalito, California
10th AAA Missile Bn.	NIKE	Fairchild AFB, Washington
11th AAA Missile Bn.	NIKE	Manchester, Connecticut
13th AAA Missile Bn.	NIKE	Orland Park, Illinois
18th AAA Missile Bn.	NIKE	Detroit, Michigan
24th AAA Missile Bn.	NIKE	Fort Banks, Massachusetts
28th AAA Missile Bn.	NIKE	Kent, Washington
34th AAA Missile Bn.	NIKE	Plainville, Connecticut
36th AAA Missile Bn.	NIKE	Fort George G. Meade, Maryland
38th AAA Missile Bn.	NIKE	Norfolk, Virginia
44th AAA Missile Bn.	NIKE	Youngstown, New York
49th AAA Missile Bn.	NIKE	Skokie, Illinois
54th AAA Missile Bn.	NIKE	Army Chemical Center, Maryland
56th AAA Missile Bn.	NIKE	Fort Monroe, Virginia
66th AAA Missile Bn.	NIKE	Fort Totten, New York
71st AAA Missile Bn.	NIKE	Fort Belvoir, Virginia
74th AAA Missile Bn.	NIKE	West View, Pennsylvania
75th AAA Missile Bn.	NIKE	Andrews AFB, Washington D. C.
78th AAA Missile Bn.	NIKE	Fort Sheridan, Illinois
79th AAA Missile Bn.	NIKE	Gary Municipal Airport, Gary, Ind.
83d AAA Missile Bn.	NIKE	Camp Hanford, Washington
85th AAA Missile Bn.	NIKE	Fort Wayne, Detroit, Michigan
86th AAA Missile Bn.	NIKE	Arlington Heights, Illinois
176th AAA Missile Bn.	NIKE	Media, Pennsylvania
351st AAA Missile Bn.	NIKE	Lordstown Ordnance Depot, Ohio
401st AAA Missile Bn.	NIKE	Milwaukee, Wisconsin
433d AAA Missile Bn.	NIKE	Fort Lawton, Seattle, Washington
436th AAA Missile Bn.	NIKE	Travis AFB, California
441st AAA Missile Bn.	NIKE	Berkeley, California
465th AAA Missile Bn.	NIKE	Youngstown, New York
483d AAA Missile Bn.	NIKE	Camp Kilmer, New Jersey
485th AAA Missile Bn.	NIKE	Fort Sheridan, Illinois
504th AAA Missile Bn.	NIKE	Dearborn, Michigan
505th AAA Missile Bn.	NIKE	Fort Tilden, New York
506th AAA Missile Bn.	NIKE	Philadelphia, Pennsylvania
508th AAA Missile Bn.	NIKE	Lordstown Military Res. Warren, Ohio
509th AAA Missile Bn.	NIKE	Moon Run, Pennsylvania
513th AAA Missile Bn.	NIKE	Fort Ward, Washington
514th AAA Missile Bn.	NIKE	Quincy, Massachusetts
516th AAA Missile Bn.	NIKE	Selfridge AFB, Michigan
526th AAA Missile Bn.	NIKE	Fort Hancock, New Jersey
531st AAA Missile Bn.	NIKE	Ellsworth AFB, South Dakota
548th AAA Missile Bn.	NIKE	Loring AFB, Limestone, Maine
551st AAA Missile Bn.	NIKE	Van Nuys, California

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BATTALION	TYPE	LOCATION
554th AAA Missile Bn.	NIKE	Fort MacArthur, San Pedro, Calif.
602d AAA Missile Bn.	NIKE	Army Chemical Center, Maryland
605th AAA Missile Bn.	NIKE	Fort Dawes, Massachusetts
737th AAA Missile Bn.	NIKE	Tappan, New York
738th AAA Missile Bn.	NIKE	Pedricktown, New Jersey
739th AAA Missile Bn.	NIKE	Rehoboth, Massachusetts
740th AAA Missile Bn.	NIKE	Fort Winfield Scott, San Francisco
741st AAA Missile Bn.	NIKE	Fairfield, Connecticut
751st AAA Missile Bn.	NIKE	Coventry, Rhode Island
852d AAA Missile Bn.	NIKE	Milwaukee, Wisconsin
865th AAA Missile Bn.	NIKE	Van Nuys, California
933d AAA Missile Bn.	NIKE	Fort MacArthur, San Pedro, Calif.
967th AAA Missile Bn.	NIKE	West Haven, Connecticut
12th AAA Bn.	90mm Gun, Mobile	Fort Wadsworth, Staten Island, N.Y.
* 14th AAA Bn.	90mm Gun, Continental	Fort Meyer, Arlington, Virginia
16th AAA Bn.	90mm Gun, Mobile	Fort Banks, Massachusetts
* 19th AAA Bn.	90mm Gun, Continental	Mount Ephraim, New Jersey
20th AAA Bn.	90mm Gun, Mobile	Bellevue, Washington
33d AAA Bn.	90mm Gun, Continental	Savannah River AEC Installation, Jackson, South Carolina
35th AAA Bn.	90mm Gun, Continental	Fort George G. Meade, Maryland
41st AAA Bn.	90mm Gun, Continental	Fort Totten, New York
69th AAA Bn.	90mm Gun, Continental	Fort Hamilton, New York
70th AAA Bn.	90mm Gun, Mobile	Silver Springs, Maryland
77th AAA Bn.	90mm Gun, Continental	Manhattan Beach, Los Angeles, Calif.
* 98th AAA Bn.	90mm Gun, Continental	Wallington, New Jersey
* 99th AAA Bn.	90mm Gun, Continental	Detroit, Michigan
549th AAA Bn.	90mm Gun, Mobile	Thule AFB, Greenland
550th AAA Bn.	90mm Gun, Continental	Norfolk, Virginia
*601st AAA Bn.	90mm Gun, Continental	Andrews AFB, Washington, D. C.
606th AAA Bn.	90mm Gun, Continental	Grand Island, New York
701st AAA Bn.	90mm Gun, Continental	So. Park Mil. Res., Broughton, Pa.
*734th AAA Bn.	90mm Gun, Continental	Oaklawn, Illinois
749th AAA Bn.	90mm Gun, Continental	Englewood, New Jersey
*752d AAA Bn.	90mm Gun, Continental	Fort Winfield Scott, San Francisco
496th AAA Bn.	120mm Gun, Continental	Chicago, Illinois
501st AAA Bn.	120mm Gun, Continental	Camp Hanford, Washington
518th AAA Bn.	120mm Gun, Continental	Camp Hanford, Washington
519th AAA Bn.	120mm Gun, Continental	Camp Hanford, Washington
8th AAA Bn.	75mm Gun	Camp Lucas, Michigan
* 52d AAA Bn.	75mm Gun	Castle AFB, California
425th AAA Bn.	75mm Gun	Savannah River AEC Installation, Jackson, South Carolina
*451st AAA Bn.	75mm Gun	March AFB, California
478th AAA Bn.	75mm Gun	Savannah River AEC Installation, Jackson, South Carolina
*546th AAA Bn.	75mm Gun	Carswell AFB, Texas

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BATTALION	TYPE	LOCATION
BATTERIES (75MM GUN)		
428th AAA Btry	75mm Gun	Thule AFB, Greenland
429th AAA Btry	75mm Gun	Thule AFB, Greenland

* Denotes units deactivated on 15 April 1957.

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OPERATIONAL LAND-BASED CONTINENTAL U.S. RADARS

Data as of 30 June 1957

PERMANENT PROGRAM RADARS

Site No.	Sq. No.	Location	Division	Force
1	635	McChord AFB, Washington	25th	WADF
2	775	Cambria, California	27th	WADF
6	638	Curlew, Washington	26th	EADF
7	769	Continental Divide, New Mexico	9th	WADF
8	767	Tierra Amarilla, New Mexico	34th	CADF
9	646	Highlands, New Jersey	34th	CADF
10	762	North Truro, Massachusetts	26th	EADF
11	680	Yaak, Montana	9th	WADF
12	761	North Bend, Oregon	25th	WADF
13	654	Brunswick NAS, Maine	32nd	EADF
14	764	St. Albans, Vermont	32nd	EADF
15	669	Santa Rosa, California	27th	WADF
16	665	Calumet, Michigan	37th	EADF
17	739	Wadena, Minnesota	31st	CADF
18	787	Chandler, Minnesota	31st	CADF
19	676	Antigo, Wisconsin	37th	EADF
20	661	Selfridge AFB, Michigan	30th	EADF
21	763	Lockport, New York	30th	EADF
24	681	Cutbank, Montana	29th	CADF
25	778	Havre, Montana	29th	CADF
26	779	Opheim, Montana	29th	CADF
27	780	Fortuna, North Dakota	29th	CADF
28	786	Minot, North Dakota	29th	CADF
29	785	Finley, North Dakota	31st	CADF
30	648	Benton, Pennsylvania	26th	EADF
31	755	Williams Bay, Wisconsin	37th	EADF
32	636	Condon, Oregon	9th	WADF
33	777	Klamath, California	28th	WADF
34	752	Empire, Michigan	37th	EADF
35	674	Osceola, Wisconsin	31st	CADF
37	776	Pt. Arena, California	28th	WADF
38	666	Mill Valley, California	28th	WADF
39	670	San Clemente I., California	27th	WADF
40	637	Othello, Washington	9th	WADF
42	663	Lake City, Tennessee	58th	EADF
43	783	Guthrie, West Virginia	58th	EADF
44	758	Neah Bay, Washington	25th	WADF
45	773	Montauk, New York	26th	EADF
46	757	Blaine, Washington	25th	WADF
47	793	Hutchinson NAS, Kansas	20th	CADF
49	655	Watertown, New York	32nd	EADF
50	656	Saratoga Springs, New York	26th	EADF
51	768	Moriarity, New Mexico	34th	CADF
52	746	Tinker AFB, Oklahoma	33rd	CADF
53	782	Rockville, Indiana	58th	EADF

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Site No.	Sq. No.	Location	Division	Force
54	770	Palermo, New Jersey	26th	EADF
55	647	Quantico Marine Base, Virginia	85th	EADF
56	771	Cape Charles, Virginia	85th	EADF
57	759	Naselle, Washington	25th	WADF
58	668	Mather AFB, California	28th	WADF
59	750	Boron, California	27th	WADF
60	760	Colville, Washington	9th	WADF
61	754	Port Austin, Michigan	30th	EADF
62	662	Brookfield, Ohio	30th	EADF
63	772	Claysburg, Pennsylvania	30th	EADF
64	790	Kirksville, Missouri	20th	CADF
65	765	Charleston, Maine	32nd	EADF
66	753	Sault Ste. Marie, Michigan	37th	EADF
67	781	Ft. Custer, Michigan	30th	EADF
68	797	Fordland, Missouri	20th	CADF
69	756	Finland, Minnesota	31st	CADF
70	798	Belleville, Illinois	20th	CADF
71	789	Omaha, Nebraska	20th	CADF
72	738	Olathe NAS, Kansas	20th	CADF
73	664	Bellefontaine, Ohio	58th	EADF
74	774	Madera, California	28th	WADF
75	741	Lackland AFB, Texas	33rd	CADF
76	751	Mt. Laguna, California	27th	WADF
77	796	Bartlesville, Oklahoma	20th	CADF
78	745	Duncanville, Texas	33rd	CADF
79	747	Ellington AFB, Texas	33rd	CADF
80	766	Caswell, Maine	32nd	EADF
81	788	Waverly, Iowa	20th	CADF
82	784	Fort Knox, Kentucky	58th	EADF
85	791	Hanna City, Illinois	20th	CADF
		MOBILE PROGRAM RADARS		
88	688	Amarillo, Texas	33rd	CADF
89	683	Sweetwater, Texas	33rd	CADF
90	686	Walker AFB, New Mexico	34th	CADF
91	703	Texarkana, Arkansas	33rd	CADF
92	684	Mt. Lemmon AFS, Arizona	34th	CADF
93	904	Winslow, Arizona	34th	CADF
94	687	West Mesa, New Mexico	34th	CADF
95	685	Las Cruces, New Mexico	34th	CADF
97	740	Ellsworth AFB, South Dakota	29th	CADF
98	902	Miles City, Montana	29th	CADF
99	903	Gettysburg, South Dakota	31st	CADF
100	689	Mt. Hebo, AFS, Oregon	25th	WADF
103	911	North Concord, Massachusetts	32nd	EADF
104	644	Rye, New Hampshire	26th	EADF
110	907	Bucks Harbor, Maine	32nd	EADF
111	908	Marietta AFS, Georgia	35th	EADF
112	702	Hunter AFB, Georgia	35th	EADF
113	792	N. Charleston, South Carolina	35th	EADF

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Site No.	Sq. No.	Location	Division	Force
115	701	Ft. Fisher, North Carolina	85th	EADF
117	632	Roanoke Rapids, North Carolina	85th	EADF
118	634	Burns, Oregon	9th	WADF
121	649	Bedford, Virginia	85th	EADF
122	650	Dallas Center, Iowa	20th	CADF
125	653	England AFB, Louisiana	33rd	CADF
126	657	Houma NAS, Louisiana	35th	EADF
127	658	Winnemucca AFS, Nevada	28th	WADF
128	659	Kingman, Arizona	27th	WADF
129	660	MacDill AFB, Florida	35th	EADF
138	707	Grand Rapids, Minnesota	31st	CADF
143	725	Walnut Ridge, Arkansas	20th	CADF
156	858	Fallon, Nevada	28th	WADF
157	859	Red Bluff AFS, California	28th	WADF
159	861	Aiken, South Carolina	35th	EADF
162	864	Vincent AFS, Arizona	27th	WADF
163	865	Las Vegas, Nevada	27th	WADF
164	866	Tonopah AFS, Nevada	28th	WADF
165	867	Flintstone AFS, Georgia	58th	EADF
		GAP FILLER RADARS		
P-9A	646	Gibbsboro, New Jersey	26th	EADF
P-10A	762	Westboro, Massachusetts	26th	EADF
P-10B	762	Ft. Dearborn, New Hampshire	26th	EADF
P-20A	661	Burnside, Michigan	30th	EADF
P-45A	773	Manorville, New York	26th	EADF
P-45B	773	Chilmark, Massachusetts	26th	EADF
P-50A	656	New Preston, Connecticut	26th	EADF
P-50E	656	New Salem, Massachusetts	26th	EADF

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APPENDIX V [redacted]

KEY PERSONNEL HEADQUARTERS CONAD

1 JUNE 1957

Commander-in-Chief
General E. E. Partridge, USAF

Chief of Staff
Maj. Gen. M. S. Carter, USA

Secretariat
Col. C. H. Scott, Jr., USAF

Asst. Sec. Adjutant
Lt. Col. W. J. Birmele, USAF

Asst. Sec. Audio-Visual Svs.
Lt. Col. R. A. Bassler, USAF

Asst. Sec. Protocol
Lt. Col. O. D. Simpson, USAF

Information Services Officer
Col. A. B. Oldfield, USAF

Asst. Director
Lt. Col. C. E. Towne, USA

Director of Public Information
Cdr. J. R. English, USN

Director of Command History
Mr. L. H. Buss

Director of Internal Information

DCS/Plans and Operations
Maj. Gen. H. T. Alness, USAF

Asst. DCS/P&O
Brig. Gen. T. V. Stayton, USA
Capt. E. Tatom, USN

Director/Plans and Requirements
Brig. Gen. A. J. Pierce, USAF

Asst. Director
Col. W. H. Murray, USA

Ch, Requirements Div.
Capt. G. W. Snider, USN

Dir. Plans and Requirements (cont.)
Ch, Policy and Programs Div.
Col. W. H. Murray, USA

Ch, Plans Division
Col. J. F. Kirkendall, USAF

Director of Operations
Col. J. H. Jeffus, USAF

Asst. Director
Col. L. R. Seibert, USMC

Ch, Training & Exer. Div.
Col. R. S. Dingle, Jr., USA

Ch, Tactics & Tech. Div.
Col. H. B. Allen, USAF

Director of Combat Opns. Center
Col. H. W. Shoup, USAF

Asst. Director
Lt. Col. L. H. Tyree, USA
Cdr. J. W. Lawyer, USN

Plans & Eval. Officer
Maj. M. D. Surratt, USAF

Ch, Combat Rptg. Center
Capt. K. O. Butler, USAF

Director of Plans Analysis
Col. E. H. Callahan, USAF

Executive Officer
Lt. Col. K. K. Howenstine, USAF

Ch, Feasibility Div.
Col. O. K. Marshall, USA

Ch, War Gaming Div.
Cdr. H. R. Nylund, USN

Director of Operations Analysis
Mr. P. S. Ball, Jr.

Asst. Director
Dr. R. H. Jordan

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Director of Operations Analysis (cont.)
Ch, Electronics Div.
Mr. R. E. Donegon

Ch, Ident. and Raid Recognition Div.
Dr. R. H. Jordan

Ch, Interceptor and Missile Div.
Mr. E. C. Helfrich

Ch, Systems Anal. Div.
Mr. R. H. Blythe, Jr.

DCS/Communications and Electronics
Brig. Gen. F. F. Uhrhane, USA

Asst. DCS/C&E
Col. P. H. Long, USAF

Director of Electronics Warfare
Col. O. W. Miller, USAF

Ch, Electronics Warfare Div.
Maj. J. W. Clancy, USAF

Ch, Emission Control Div.
CWO R. L. Westfall, USAF

Director of Plans & Requirements
Lt. Col. H. K. Anderson, USAF

Ch, Operational Rqmts. Div.
Maj. D. L. Faulkner, USAF

Director of Systems
Lt. Col. F. K. Nichols, USAF

Ch, Electronics Div.
Maj. W. R. Goodrich, Jr., USAF

Ch, Communications Div.
Maj. R. E. Livermore, USAF

DCS/Intelligence
Brig. Gen. R. Taylor, 3d, USAF

Asst. DCS/I
Col. R. Totten, USAF

Sp. Asst to DCS/I
Col. H. C. Brown, Jr., USAF

Executive
Lt. Col. E. C. Rowe, USAF

DCS/Intelligence (cont.)
Director Collection & Dissemination
Col. J. D. Hand, USA

Ch, Coll. Service Div.
Maj. R. P. Reinsch, USAF

Ch, Pub. & Dissemination Div.
Capt. W. N. Wilson, USAF

Director of Research & Est.
Col. M. R. Graham, USAF

Asst. Director
Lt. Col. A. Roman, USA

Ch, Strat. Analysis Div.
Lt. Col. J. M. Mooneyham, USAF

Ch, Tech. Analysis Div.
Lt. Col. J. N. Young, USAF

Ch, Domestic Vul. Div.
Maj. A. B. Adams, USAF

Director of Oper. Intelligence
Col. J. F. Setchell, USAF

Asst. Director
Cdr. T. C. Schaible, USN

Ch, Intell. Watch Div.
Lt. Col. W. F. Zeller, USAF

Ch, Combat Intell. Div.
Maj. A. B. Harper, USAF

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

Ch, Systems Anal. Branch
Capt. J. D. Fletcher, USAF

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HEADQUARTERS AIR DEFENSE COMMAND

COMMANDER
Lt. Gen. J. H. Atkinson

HEADQUARTERS ARMY AIR DEFENSE COMMAND

COMMANDING GENERAL
Lt. Gen. S. R. Mickelsen

HEADQUARTERS NAVAL FORCES CONAD

COMMANDER
Capt. J. G. Howell

RCAF PLANNING LIAISON STAFF

SENIOR PLANNING LIAISON OFFICER
Group Captain G. S. Austin

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REFERENCES

[redacted]

REFERENCE NOTES FOR PAGES 1-16

ONE

1. Memo for the Record, "Report of Staff Visit to Headquarters USAF," 27 Feb 1956, by Col. L. G. McCollom, CONAD/ADC P&R, with Memo, Gen. Partridge to Gen. Lindsay, "Organizational Planning for Air Defense," 13 Feb 1956 (Doc 1, CONAD/ADC Hist, Jan-Jun 1956).
2. Ibid., Memo, Gen. Partridge to Gen. Lindsay.
3. Ibid., Memo, "Report of Staff Visit to Hq USAF."
4. Msg., CINCONAD to C/S USAF, 5 Mar 1956 (Doc 2, CONAD/ADC Hist, Jan-Jun 1956).
5. Ibid.
6. CONAD to ARAACOM, "Study on CONAD Organization," 15 Dec 1956 (DOC 1).
7. Proposed Reorganization of Headquarters CONAD, 23 Mar 1956 (DOC 2).
8. ARAACOM to CONAD, "Proposed Reorganization of CONAD Headquarters," 11 Apr 1956 (DOC 3).
9. Ibid.
10. NAVFORCONAD to CONAD, "Proposed Reorganization of CONAD Headquarters," 11 Apr 1956 (DOC 4).
11. Msg., USAF to CONAD, 3 Jul 1956 (DOC 5).
12. Incl., Proposed UMD Headquarters CONAD, 31 Jul 1956, to CONAD to C/S USAF, "Proposed Manning Document for Headquarters CONAD," 6 Aug 1956, with 1 Ind (DOC 6).
13. Ibid., 1st Ind, USAF to CONAD, 22 Aug 1956.
14. CONAD to USAF, "Manning Requirements for Hqs CONAD," 30 Nov 1956 (DOC 7).
15. JCS SM-716-56, Memo for CINCONAD, "Terms of Reference for CINCONAD," 4 Sep 1956 (DOC 8).
16. CONAD GO 21, 24 Sep 1956 (DOC 9).
17. Msg., USAF to AMC, 17 Sep 1956 (DOC 10); Maj. Gen. M. S. Roth, Actg CONAD C/S, Memo for All Staff Agencies, "CONAD Problem Areas," 20 Sep 1956 (HRF 2).

TWO

1. Msg., CINCONAD to CINCNE, 28 Aug 1956 (DOC 11); DF, DCS/P&R to Staff, "Implementation of the Unified Command Plan," 11 Sep 1956, with 4 incls. (DOC 12).
2. Msg., CINCONAD to COMNEAC, 19 Sep 1956 (DOC 13).
3. Air Defence Agreement between AOC RCAF ADC and CINCONAD, 1 Jan 1957 (Doc 13, CONAD Hist. Ref Paper # 1, U. S. Air Defense in the Northeast, 1940-1957.
4. USAF to RCAF, "USAF Reorganization of the Northeast Area," 3 Oct 1956 (DOC 14); RCAF to USAF, "Proposed Reorganization of the USAF Northeast Air Command," 22 Oct 1956 (DOC 15).
5. ADC GO # 13, 26 Feb 1957 (Doc 16, Hist. Ref. Paper 1, U. S. Air Def in the N. E. 1940-1957); NEAC-ADC-SAC-MATS-AMC Agreement Pertaining to the USAF Reorganization of the

[redacted]

[redacted]

REFERENCE NOTES FOR PAGES 16-26

Northeast Area, 5 Dec 1956 (Doc 17, CONAD Hist. Ref. Paper # 1, U. S. Air Defense in the Northeast, 1940-1957).

6. Msg., ARAACOM to First Army, 31 Aug 1956 (ARADCOM Adj. Files).

7. CONAD GO # 2, 19 Mar 1957 (DOC 17).

8. CONADR 24-1, "Organization - 64th CONAD Div," 1 Apr 1957 (DOC 18); CONAD to C/S USAF, "Progress Report on Air Defense Planning in the Northeast Area," 25 Jan 1957 (DOC 19); Col. C. W. McColpin to Gen. E. E. Partridge, 5 Apr 1957 (DOC 20); CONAD to ADC, "Designation of Commander," 16 Apr 1957 (HRF 4).

9. CONAD, The Air Defense Plan Continental U. S., Alaska and Northeast Area (Title SECRET), Jan 1957, p 5, Basic Plan (HRF 656).

10. Msg., CINCONAD to CINCAL, 28 Aug 1956 (DOC 21).

11. Memorandum of Agreement between CINCONAD and CINCAL Concerning Air Defense Responsibilities and Arrangements in Alaska, 28 Aug 1956 (Appendix)

12. Msg., ARAACOM to USARAL, 2 Oct 1956 (DOC 22).

THREE

1. CONAD to C/S USAF, " Air Defense of Canada and the United States," 14 May 1957 (DOC 23).

2. CADOP 56-66, 15 Dec 1956, (Secret page of Top Secret document), p 1 (HRF 657).

3. Msg., OSD to CG Ent AFB, 2 Aug 1956 (DOC 24).

4. Briefing Prepared for DCS/I, CONAD, by Lt. Col. C. Kekoa, CONAD P&R, 12 Apr 1957 (DOC 25).

5. Msg., USAF to ADC, 9 Jul 1956 (DOC 26).

6. As in n 4.

FOUR

1. Msg., CONAD to JDF's, 13 Mar 1956 (DOC 27).

2. CONAD GO # 25, 21 Dec 1956 (DOC 28).

3. CONADR 21-1, 21 Dec 1956 (DOC 29).

4. Ibid.

5. CONAD to ADC, "Designation of Commanders," 12 Dec 1956 (DOC 30).

6. CONAD to C/S USAF, "CONAD Subordinate Hqs UMD," 7 Jun 1957 (DOC 21).

7. Ibid., Incls.

FIVE

1. ADC, DCS/C&E, Historical File Covering CONAD Method of Employing AA Weapons, 9 Jan 1957, pp 15-16 (HRF 50).

[redacted]

[redacted]

REFERENCE NOTES FOR PAGES 26-37

2. CONAD to ADC, ARAACOM, "Implementation of Missile Master (AN/FSG-1)," 6 Dec 1956 (DOC 32).

3. Memo for the Sec of the AF from Sec of Def, "Continental Air Def.," 21 Jun 1956, Incl to USAF to CINCONAD, "Continental Air Defense," 10 Jul 1956 (DOC 33).

4. As in n 1, pp 17-19.

5. Annex C to Study Pertaining to Integration of Missile Master into CONAD, Incl to CONAD to C/S USAF, "Integration of SAGE and Missile Master," 19 Sep 1956 (DOC 34).

6. As in n 1, pp 17-19.

7. Ibid., letter CONAD to C/S USAF.

8. Memo, Dep. Sec of Def to Secs. of Air Force and Army, 30 Oct 1956 (DOC 35).

9. Memo, Dep Sec of Def to Sec of Army, Air Force, 28 Jan 1957, Incl to C/S USAF to CINCONAD, "Technical Plan - SAGE Missile Master," 11 Mar 1957 (DOC 36).

10. COESS, Staff Study, "SAGE-Missile Master Integration," 22 Mar 1957, Incl to DF, DCS/C&E to DCS/P&O, "SAGE-Missile Master Integration," 27 Mar 1957 (DOC 37).

11. CONAD to ADC, ARADCOM, "Draft Plan for Testing SAGE/Missile Master Integration," 15 Jul 1957 (DOC 38).

12. CONAD to C/S USAF, "Implementation of Missile Master (AN/FSG-1) Program," 4 Feb 1957 (DOC 39).

13. Msg., USAF to CONAD, 15 Mar 1957 (DOC 40).

14. USARADCOM and ADC to CONAD, "Plans for CONAD (Joint) Direction Centers at Ten (10) Locations," 30 Apr 1957 w/1 Ind (DOC 41).

15. Ibid., 1st Ind, CONAD to C/S USAF, 2 May 1957.

16. Msg., USAF to CONAD, 21 May 1957 (DOC 42).

17. CONAD to ECR, "CONAD Organizational Concepts During SAGE Era," 26 Apr 1957 (DOC 43).

18. CONAD to CONAD Rgns, "Colocation and Integration of ADDC's and AAOC's," 12 Apr 1957, w/3 Inds., 2 Incls, and 3 DF's (DOC 44); CONAD to ADC, ARADCOM, "Colocation of ADDC's & AAOC's," 14 May 1957 (DOC 45).

19. Ibid., 1st Ind., ECR to CONAD, n.d.

20. As in n 18, 1st Ind, WCR to CONAD, 9 Apr 1957.

21. As in n 18, 1st Ind, CCR to CONAD, 19 Apr 1957.

22. Memo for the Record, Lt. Col. O. E. Griest, COOPR, to Msg., CINCONAD to C/S USAF, 18 Jun 1957 (DOC 46).

23. AAC to CONAD, 23 May 1957 (DOC 47).

24. Msg., CONAD to ALCOM, 31 May 1957 (DOC 48).

25. Msg., CONAD to C/S USAF, 18 Jun 1957 (DOC 49).

26. Msg., CONAD to ALCOM, 11 Jun 1957 (DOC 50).

[redacted]

[redacted]

REFERENCE NOTES FOR PAGES 38-45

SIX

1. RCS: 1-AF-V14, 28 Jun 1957 (DOC 51); RCS: 1-AF-V14, 25 Jun 1956 (Appendix III, CONAD/ ADC Hist, Jan-Jun 1956); Msg., COMNEAC to CONAD, 22 Jan 1957 (DOC 52).

2. Ibid.

3. Hist CONAD/ADC, Jan-Jun 1956, pp 41-43.

4. CONAD to ADC, "Re-equipping of Operational Units," 4 Apr 1956 (DOC 53); USAF to ADC, "(Uncl) Operational Concept of the F-102A," 3 Dec 1953 (DOC 54); Msg., COMADC to COMSAAMA, 17 Apr 1956 (DOC 55); Memo for the Record, "Discussions with General Putt Regarding LRIX and the TF-102," 23 May 1956 (DOC 56); DF, DCS/P&O to COHCS, "(U) Continental Air Defense Command Status End FY 57," 9 Apr 1957 (DOC 57).

5. As in n 1.

6. DF, DCS/P&O to COHCS, "(U) Continental Air Defense Command Status End FY 57," 9 Apr 1957 (DOC 57).

7. CONAD Hist. Ref. Paper No. 2, Air Defense of Alaska 1940-1957, pp 25-28; AAC, Command Data Book, Third Quarter, FY 1957 (HRF 704).

8. Ibid.

9. USAF, "F-102 Conversion Program," 14 Feb 1957 (COOOP-T Files); Msg., CINCONAD to C/S, USAF, 13 Nov 1956 (DOC 58); Msg., CINCAL to CINCONAD, 21 Jun 1957 (DOC 59); Msg., USAF to CINCONAD, 19 Jun 1957 (DOC 60).

10. Msg., CINCONAD to CINCAL, 14 May 1957 (DOC 61); Interview with Col. H. B. Allen, COOOP-T, 23 Jul 1957; Interview with Lt. Col. O. E. Griest, COOPR, 23 Jul 1957; Msg, COMAAC to C/S, USAF, 22 May 1957 (DOC 62).

11. Interview with Maj. C. W. Knott, COOOP-T, 23 Jul 1957; Msg., USAF to COMAAC and ADC, 19 Jul 1957 (DOC 63).

12. Hist CONAD/ADC, Jan-Jun 1956, p 58; CONAD, The Air Defense Plan: Continental United States, Alaska and Northeast Area 1-57,(Title SECRET), 1 Jan 1957 (HRF 656).

13. ADC, "(Unclassified) Air Defense Command Operations Plan (USAF Augmentation Forces) 4-57," 1 Jul 1957 (HRF 430); CONADR 55-7, "Criteria for Determining Operational Alert Ready Aircraft and Operational Alert Crews within CONAD Augmentation Fighter Units," 10 Jan 1956 (HRF 430); Msg., CINCONAD to COMFECR, et al, 7 Feb 1957 (DOC 64); Msg., 64th CONAD Div to CINCONAD, 2 May 1957 (DOC 65); Msg., CINCONAD to JEADF, et al, 3 Dec 1956 (DOC 66).

14. Msg., CINCONAD to TAC, 22 Apr 1957 (DOC 67); Msg., TAC to CONAD, 17 Apr 1957 (DOC 68); USAF to CONAD, "(Unclassified) Employment of ADC Augmentation Fighter Forces," 28 Feb 1957 (DOC 69); USAF to CONAD, "(Unclassified) CONAD Operations Plan 4-57 (Draft)," 16 Oct 1956 (DOC 70); 1st Ind (CONAD to TAC, "(U) CONADOP 4-56 (Draft), 25 Jul 1956), TAC to CONAD, 13 Aug 1956 (DOC 71); Msg., CINCONAD to CFECR, n.d. (HRF 430.1); 2d Ind (TAC to ADC, "(Unclassified) Letter of Agreement-Tactical Air Command Support of Air Defense Command," 12 Feb 1957), CONAD to ADC, 18 Mar 1957 (DOC 72).

15. CONAD OPLAN 1-57, 1 Jan 1957 (HRF 656); Interview with Lt. Col. C. E. Dobson, Jr, NAVFORCONAD, 18 Jul 1957; Dept of the Navy, "OPNAV Instruction C5410.3A," 11 Apr 1957 (DOC 73); COMNAVFORCONAD to Dist. "Operations of Naval Augmentation Aircraft in Continental Air Defense," 15 Jun 1957 (DOC 74).

16. Hist CONAD/ADC, Jan-Jun 1956, pp 58-59; ADC, "(Unclassified) Air Defense Command

[redacted]

[redacted]

REFERENCE NOTES FOR PAGES 45-54

Operations Plan (ANG) 5-57," 1 Apr 1957 (COOOP-T files).

17. CONAD OPPLAN 1-57, Annex B, 1 Jan 1957 (HRF 430.1); ADC, OPLAN 4-57, 1 Jul 1957 (HRF 430.1); ADC, Operations Plan 5-56, 1 Jul 1956 (HRF 430.1).

18. Hist CONAD/ADC, Jan-Jun 1956, p 60; DF, DCS/P&O to COHCS, "(U) Continental Air Defense Command Status End FY 57," 9 Apr 1957 (DOC 57); Msg., C/S, USAF to CINCONAD, 27 Jun 1957 (DOC 75); Msg., C/S, USAF, to ADC, 24 Aug 1956 (DOC 76); Msg., CINCONAD to CANAIRDEF, 22 Apr 1957 (DOC 77); Msg., CINCONAD to CCFECR, et al, 9 Apr 1957 (DOC 78); Msg., CINCONAD to AOC, ADC/RCAF, 10 Apr 1957 (DOC 79).

19. Gen. Thomas D. White to Gen. E. E. Partridge, "AA Guns," 13 Nov 1956, w/3 Incls (DOC 80).

20. Ibid., Incl 3, DA, Memo to C/S USAF, "AAA Air Def. of the USAF Bases," 14 Sep 1956.

21. CINCONAD to CINCSAC, "(Unclassified) AA Weapons on SAC Bases," 17 Jan 1957 (DOC 81).

22. As in n 12.

23. USARADCOM, Weekly Summary, 12 Jul 1956; 10 Jul 1957; Interview with Mr. W. J. Meach, USARADCOM G-3, O&T Div, 14 Aug 1957; USARADCOM, Station List (U), 15 Apr 1957 (HRF 6.4).

24. CONAD Hist. Ref. Paper No. 1, U.S. Air Defense in the Northeast 1940-1957, p 18; CONAD Hist. Ref. Paper No. 2, Air Defense of Alaska 1940-1957, pp 28-29; Msg., C/S, USAF to CINCONAD, 13 Nov 1956 (DOC 82); USAF to CINCONAD, "(U) Interceptor Missile Planning Guide: Alaska," 11 Dec 1956 (DOC 83); Msg., JCS to CINCONAD, 19 Nov 1956 (DOC 84); 1st AA Regional Command to USARADCOM, "AA Weapons Readiness, Thule Air Base," 29 Jan 1957 (DOC 85); DF, G3 P&O to G4, et al, "Command Arrangements for AAA Units, Alaska & Greenland (U)," 20 Aug 1956 (DOC 86).

25. Interview with Lt. Col. O. E. Griest, COOPR, 29 Jul 1957; CONAD Hist. Ref. Paper No. 2, Air Defense of Alaska 1940-1957, p 28; Msg., CINCONAD to CINCSAC, 11 Jul 1957 (DOC 87).

SEVEN

1. Hist CONAD/ADC, Jan-Jun 1956, p 15; ADC, "Monthly ADC ACW Summary and Status Report, 2-AF-V20," 30 June 1957 (HRF 302).

2. DF, DCS/P&O to COHCS, "(U) Continental Air Defense Command Status End FY 57," 9 Apr 1957 (DOC 57); Personal, Gen. E. E. Partridge to Air Marshall C. R. Slemon, "[CONAD Objectives]," 3 May 1957 (DOC 88).

3. Ibid.

4. ADC, "Monthly ADC ACW Summary and Status Report (2-AF-V20)," 30 Jun 1957 (HRF 302); Hist CONAD/ADC, Jan-Jun 1956, pp 27-28; DF, DCS/P&O to COHCS, "(U) Continental Air Defense Command Status End FY 57," 9 Apr 1957 (DOC 57).

5. Ibid. In addition see: ADC to AOC/RCAF, "(Unclassified) U.S. Gap Filler Program," n.d. (DOC 89); ADC to USAF, "(Unclassified) Proposed Deferral of ADC Gap Filler Radars," 28 Sep 1956 (DOC 90); 2nd Ind (ADC to CONAD, "(U) Proposed Deferral of ADC Gap Filler Radars," 28 Sep 1956), ADC to CONAD, 8 Nov 1956 (DOC 91).

6. Msg., USAF to CINCSAC, 29 Oct 1956 (DOC 92); 1st Ind (ADC to CONAD, "(U) NEAC Radar Deployment," 30 Nov 1956), CONAD to ADC, 14 Dec 1956 (DOC 93); CONAD Hist. Ref. Paper No. 1, U.S. Air Defense in the Northeast 1940-1957, pp 8-15, 21-22; 64th ADiv, Commanders' Mission Progress Summary, June 1957 (HRF 705); Interview with Lt. Col. D. W. Camp, ADC, 13 Aug 1957.

[redacted]

[redacted]

REFERENCE NOTES FOR PAGES 54-61

7. CONAD Hist. Ref. Paper No. 2, Air Defense of Alaska 1940-1957, pp 29-33.

8. AAC, "Command Data Book FY 57 (Third Quarter)," pp B1-2 (HRF 704); Msg, CINCONAD to C/S, USAF and CINCAL, 16 May 1957 (DOC 94); Msg., AAC to CINCONAD, 4 Apr 1957 (DOC 95); Msg., AAC to USAF, 10 Apr 1957 (DOC 96); USAF to AAC, "(SECRET) Deletion of Sitkinak (F-19) and Chiniak (F-18) AC&W Stations from the Alaskan Air Command Program," n.d. (DOC 97); Interview with Lt. Col. O. E. Griest, COOPR, 5 Aug 1957.

9. Hist CONAD/ADC, Jan-Jun 1956, pp 33-34; ADC, GO # 39, 13 Jun 1957; ADC, GO # 49, 12 Jul 1957.

10. B/Gen. Kenneth H. Gibson to Lt. Gen. J. H. Atkinson, "/Progress Report AEW&C/," 3 Oct 1956 (DOC 98).

11. CONAD Operations Plan 9-56, 1 Apr 1956 (HRF 302.12); Hist CONAD/ADC, Jan-Jun 1956, p 33; ADC, Command Summary, Charts, as of 31 Jan 1957 and 30 Apr 1957 (ADC ADHIH files). For additional information see: Msg., CINCONAD to 8th ADiv, 5 Sep 1956 (DOC 99); CONAD to Dir of Requirements, USAF, "(UNCLASSIFIED) CONAD Concept of AEW&C Employment," 2 Aug 1956 (DOC 100).

12. Msg., CINCONAD to C/S, USAF, 27 Mar 1957 (DOC 101); DF, COOPO to COHCS, "Reduction in Early Warning Radar Coverage," 26 Mar 1957 (DOC 102).

13. Msg., USAF to CINCONAD, 24 Apr 1957 (DOC 103). See also: Msg., ADC to 8th ADiv, 11 Apr 1957 (DOC 104); 1st Ind (CONAD to ADC, "Intercept Capability of Picket Ships and AEW&Con Aircraft," 1 Apr 1957), ADC to CONAD, 12 Apr 1957 (DOC 105); ADC to CONAD, "(Unclassified) ADC Flying Hour Program, Fourth Quarter FY 1957," 16 Apr 1957 (DOC 106); CONAD to ADC, "Essential Early Warning Coverage," 29 Mar 1957 (DOC 107); CONAD to ADC, "(Unclassified) ADC Flying Hour Program Fourth Quarter FY 1957," 17 Apr 1957 (DOC 108).

14. ADC, Command Summary, Charts, as of 31 Jan 1957 and 30 Apr 1957, (ADC ADHIH files).

14A. ADC, "Monthly ADC ACW Summary and Status Report (2-AF-V20)," 30 Jun 1957 (HRF 302).

15. ADC to CINCONAD, "Presentation on AEW&Con Deployment," w/2 Incls, 19 Jun 1957 (DOC 109). See also: 1st Ind (ADC to CONAD, "Change to CONAD Ops Plan 9-56 (UNCL)," Feb 1957); CONAD to ADC, 29 Mar 1957 (DOC 110); CONAD to ADC, "Priority Flight Clearance for AEW&Con Operation," 16 May 1957 (DOC 111); 2nd Ind (WADF to ADC, "(U) AEW&Con Operations," 29 Jan 1957), ADC to CONAD, 27 May 1957 (DOC 112); 1st Ind (WADF to ADC, "(U) AEW&Con Operations," 29 Jan 1957), ADC to CONAD, 24 Apr 1957 (DOC 113); 1st Ind (8th ADiv to ADC, "Airborne Early Warning and Control Mobility," 24 Sep 1956), ADC to CONAD, 24 Oct 1956 (DOC 114); DF, COOOP-T to COOPO, "Trip Report (AEW&C Symposium)," 15 Jul 1957 (DOC 115).

16. Ibid.; Hist CONAD/ADC, Jan-Jun 1956, pp 36-37.

17. DF, COOOP-T to COOPO, "Trip Report (AEW&Con Symposium)," 15 Jul 1957 (DOC 115); 1st Ind (ADC to CONAD, "Navy AEW&Con Activities," 22 May 1957), CONAD to ADC, 13 Jun 1957 (DOC 116); Msg., CFECR to 8th ADiv, 15 May 1957 (DOC 117); Msg., CFECR to CINCONAD, 10 Apr 1957 (DOC 118); Msg., CFECR to 26th CADD, 27 Jun 1957 (DOC 119); Msg., CFECR to 26th CADD, 18 Apr 1957 (DOC 120).

18. 1st Ind (ADC to CONAD, "Navy AEW&Con Activities," 22 May 1957), CONAD to ADC, 13 Jun 1957 (DOC 116).

19. CNO to Dist. List, "Continental Defense," 27 Apr 1957 (DOC 121); Hist CONAD/ADC, Jan-Jun 1956, pp 32-33. See also: Msg., ADC to Comdr Nagoya Japan, 15 Oct 1956 (DOC 122); 3d Ind (CFWCR to CONAD, "Activation of Picket Ship Stations," 31 May 1957), CONAD to CFWCR, 12 Jul 1957 (DOC 123); COMNAVFORCONAD to CINCONAD, "Intercept Capability of

[redacted]

[redacted]

REFERENCE NOTES FOR PAGES 61-65

Picket Ships in the Contiguous System," 13 May 1957 (DOC 124).

20. Msg., CINCONAD to C/S, USAF, 22 Apr 1957 (DOC 125); COMNAVFORCONAD to CNO, "Contiguous Picket Ship Communications," 3 Jul 1956 (DOC 126); ADC to EADF, et al, "Minutes of Seaward Extension-Emergency Radio Conference," 25 Jul 1956 (DOC 127). See also: 1st Ind (ADC to CONAD, "(U) Navy Assumption of Picket Ship Communications at Shore Stations," 29 Oct 1956), CONAD to COMNAVFORCONAD, 8 Nov 1956 (DOC 128); CONAD to JWADF, "(Unclassified) Picket Ship Communications," 22 Aug 1956 (DOC 129); 2nd Ind (25th ADiv to JWADF, "Request for Radioteletype Frequencies," 20 Jun 1956), ADC to JWADF, 19 Jul 1956 (DOC 130); CONAD to C/S, USAF, "(U) Contiguous Picket Ship Communications," 22 Feb 1957 (DOC 131).

21. Hist CONAD/ADC, Jan-Jun 1956, pp 37-38; ADC, "Monthly ADC ACW Summary and Status Report (2-AF-V20)," 30 Jun 1957 (HRF 302). See also: CONAD to NAVFORCONAD, "(Uncl) Operations Data on Texas Tower No. 2," n.d. (DOC 132).

22. ADC, "Monthly ADC ACW Summary Status Report (2-AF-V20)," 30 Jun 1957 (HRF 302).

23. 1st Ind (USAF to ADC, "(UNCLASSIFIED) Texas Towers," 1 Aug 1956), ADC to USAF, 10 Oct 1956 (DOC 133); CONAD to JEADF, "Requirement for Texas Towers 1 and V," 22 Jun 1956 (DOC 134). Also see: CNO to C/S, USAF, "Navy Participation in Project Texas Towers," 27 May 1957 (DOC 135).

24. 25th ADiv to JWADF, "Possible Pacific Ocean Texas Tower Site," w/2 Incls, 7 Mar 1957 (DOC 136).

25. 2nd Ind (USAF to ADC, "(U) Buoyant Radar Platforms," 29 Mar 1957), CONAD to ADC, w/2 Incls, 29 Apr 1957 (DOC 137); Memo for Record, "Moored Seaborne Defense Platform," 3 Feb 1956 (DOC 138).

26. Interview with Maj. H. H. Fuss, COOOP-T, 11 Jul 1957.

27. Report, "Minutes of a Meeting to Discuss DEW Line Operations Held at Headquarters ADC 12-13 June 1957," n.d. (DOC 139)

28. DF, ADORQ-E to ADODO, "Employment and Suitability Test of the DEW Line," 15 Jul 1957 (DOC 140)

29. Ibid.; Msg., ADC to C/S, USAF, 16 Jul 1957 (DOC 141); Msg., SAFS to COMAPCS, 3 Jul 1957 (DOC 142); Interview with Lt. Col. L. W. Hough, Jr., COOPR 15 Aug 1957.

30. As in n. 29; See Also: Memorandum for File, 10 Jun 1957 (DOC 143); USAF to ADC, "DEW M&O Contractor-Air Force Relationship," n.d. (DOC 144).

31. As in n. 27.

32. 1st Ind, (ARDC to CONAD, "(U) Final Report DEW System Improvement Plan," 30 Jan 1957, CONAD to ARDC, w/1 Incl, 19 Mar 1957 (DOC 145).

33. As in n. 2; 1st Ind (USAF to ADC, "(U) Implementation of DEW Operational Plan," 14 Nov 1956), CONAD to ADC, w/1 Incl, 29 Nov 1956 (DOC 146); 1st Ind (USAF to EWOWG, "DEW Line and Mid-Canada Line Operations Plan," 11 Mar 1957), EWOWG to C/S, USAF, 11 Apr 1957 (DOC 147).

34. USAF to CONAD, "(UNCLASSIFIED) DEW Identification Requirements," 24 May 1957 (DOC 148); CONAD to ADC, "DEW Identification Requirements," 29 May 1957 (DOC 149); Msg., CONAD to CAS, CANAIRHED, 28 May 1957 (DOC 150). Also see: 3rd Ind (USAF to ADC, "(U) Implementation of DEW Operational Plan," 14 Nov 1956), CONAD to ADC, w/1 Incl, 30 Apr 1957 (DOC 151); EWOWG to CONAD, "(U) Minutes, Early Warning Operations Working Group," 8 Feb 1957 (DOC 152); Msg., CANAIRHED to ADC and CONAD, 10 Jun 1957 (DOC 153); Msg., C/S, USAF to ADC, et al, 3 Jun 1957 (DOC 154).

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REFERENCE NOTES FOR PAGES 65-70

35. CONAD, "CONAD's Proposed Change # 2 to Operations Plan for Distant Early Warning and Mid-Canada Lines," n.d. (DOC 155); Also see n. 27.

36. As in n. 28.

37. Hist CONAD/ADC, Jan-Jun 1956, p 40.

38. Ibid.; Interview with Comdr. King, NAVFORCONAD, 26 Jun 1957; Msg, CINCLANT to CINCSAC, 26 Apr 1957 (DOC 156); Msg., CINCLANTFLT to COMASDEFORLANT, 2 Jul 1957 (DOC 157). Also see: CINCLANTFLT to Comdr Atlantic Barrier, "Atlantic Barrier Picket Stations, Change in Geographic Location," 6 Jun 1957 (DOC 158); Msg., CONAD to CINCLANT, 26 Apr 1957 (D)C 159); Msg., JEADF to CONAD, 15 Nov 1956 (DOC 160); Msg., COMASDEFORLANT to COMCFECR, 3 Jul 1957 (DOC 161).

39. Msg., USAF to ADC, 7 Jun 1957 (DOC 162); Msg., NEACOM to IAOF, 23 Aug 1956 (DOC 163). See also: Msg., COMNEACOM to Comdr. Griffis AFB, 14 Aug 1956 (DOC 164); Msg, NEACOM to AFIR NAR, 4 Sep 1956 (DOC 165); Msg., CINCONAD to CINCLANT, w/1 Incl, 23 Jan 1957 (DOC 166); Msg., COMNEACOM to C/S, USAF, 19 Jan 1957 (DOC 167); Msg, CINCONAD to C/S, USAF, 15 Mar 1957 (DOC 168).

40. Msg., CINCONAD to COMNEAC, 16 Jan 1957 (DOC 169). For additional information see: CINCLANT to CINCONAD, "Operation of the Atlantic Seaward Extensions of The Distant Early Warning (DEW) Line," 27 Feb 1957 (DOC 170); CINCLANT to CINCONAD, "Atlantic Extension of the Distant Early Warning (DEW) Line," 19 Jul 1956 (DOC 171); Msg., CINCAL to CINCONAD, 7 Sep 1956 (DOC 172); Msg., CINCONAD to CINCPAC, 10 Dec 1956 (DOC 173); Msg., CINCONAD to CINCPAC, 10 Dec 1956 (DOC 174); Msg., CONAD to AMC and ADES Proj Off, 8 Aug 1956 (DOC 175); Msg., CINCONAD to C/S, USAF, 4 Feb 1957 (DOC 176); Msg., CINCONAD to CINCLANT, 18 Apr 1957 (DOC 177); CONAD to CINCLANT, "Operation of the Atlantic Seaward Extension of the Distant Early Warning (DEW) Line," 3 May 1957 (DOC 178); CINCLANT to CNO, "Atlantic Barrier Communications with Air Defense Commanders," 18 Sep 1956 (DOC 179); Msg., CINCONAD to CINCSAC, w/1 Incl, n.d. (DOC 180).

41. CONAD Hist. Ref. Paper No. 2, Air Defense of Alaska, 1940-1957, pp 34-37; Hist CONAD/ADC, Jan-Jun 1956, pp 39-40.

42. Msg., USAF to CINCONAD, 2 May 1957 (DOC 181).

43. Msg., AMC to C/S, USAF, 12 Apr 1957 (DOC 182).

44. Msg., CINCONAD to C/S, USAF, 10 Apr 1957 (DOC 183).

45. Msg., CINCPACFLT to CINCONAD, 22 May 1957 (DOC 184); Msg., CINCAL to CINCONAD, 22 May 1957 (DOC 185); Msg., CINCONAD to CINCPAC, 8 May 1957 (DOC 186).

46. Msg., USAF to CINCONAD, 28 May 1957 (DOC 187).

47. Interview with Lt. Col. L. W. Hough, Jr., COCPR, 21 Aug 1957.

48. CINCPACFLT to Distribution List, "/Barrier/," 20 Jun 1957 (DOC 188); Interview with Comdr. King, NAVFORCONAD, 26 Jun 1957. See also: Msg., CINCONAD to CFCCR and CFWCR, 25 Jun 1957 (DOC 189).

49. CONAD to C/S, USAF, "(SECRET) Continuation of the Pacific Extension of The Distant Early Warning (DEW) Line South From Midway," 14 Jan 1957 (DOC 190).

50. As in n. 26.

51. Interview with W/Comdr R. V. Manning, RCAF/ADC Liaison Group, 21 Aug 1957.

52. Ibid.; Msg., CANAIRDEF COC to CANAIRHED, 2 Jun 1957 (DOC 191); Msg., CANAIRDEF to ADC

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REFERENCE NOTES FOR PAGES 71-77

and CONAD, 20 Jun 1957 (DOC 192); Msg., CANAIRDEF to CONAD and ADC, 20 Jun 1957 (DOC 193).

EIGHT

1. CONADR 55-8, "States of Alert for Air Defense Units," 31 May 1956 (DOC 330, Hist CONAD/ADC, Jan-Jun 1956).

2. Msg., CONAD to CINCAL, 3 Dec 1956 (DOC 194); Hist CONAD/ADC, Jan-Jun 1956, p. 68; Msg., CINCONAD to CFECR, 21 Jan 1956 (DOC 195); Msg., CINCONAD to CFECR, 15 Jan 1957 (DOC 196); Msg., CONAD to JWADF, 7 Jan 1957 (DOC 197).

3. ADC to CONAD, "(Unclassified) Revised ADC Plan," 16 Oct 1956 (DOC 198); CONAD to C/S, USAF, "Revised Continental Air Defense Planning," 5 Sep 1956 (DOC 199); ADC to CONAD, "(Unclassified) ADC Revised Plan," 10 Oct 1956 (DOC 200); 1st Ind (ADC to CONAD, "(Unclassified) Revised ADC Plan," 15 Oct 1956) CONAD to ADC, 16 Nov 1956 (DOC 201); Draft ltr, n.d. (DOC 202); Memo for the Record, 6 Aug 1956 (DOC 203). See also: Msg., CINCONAD to CFECR, 15 Jan 1957 (DOC 196); CONAD to JEADF, "(Uncl) Proposed CONAD Regulation 55-8," 9 Jan 1957 (DOC 204); CONAD to AOC ADC/RCAF, "(Unclassified) Alert Requirements for Air Defense Units During Normal Preparedness," 1 Feb 1957 (DOC 205).

4. DF, COCOC to COOOP-T, "(Unclas) Proposed CONAD Regulation 55-8," 16 Jan 1957 (DOC 206); DF, COOOP to COOPO, "(Unclassified) Proposed CONAD Regulation 55-8," 2 Jan 1957 (DOC 207).

5. 1st Ind (CONAD to USARADCOM, "(Unclassified) Proposed CONAD Regulation 55-8 (U)," 9 Jan 1957), USARADCOM to CONAD, 21 Jan 1957 (DOC 208); 1st Ind (CONAD to ADC, "(U) Proposed CONAD Regulation 55-8," 9 Jan 1957), ADC to CONAD, 24 Jan 1957 (DOC 209); NAVFORCONAD to CONAD, "Comments on Proposed CONAD Regulation 55-8," 24 Jan 1957 (DOC 210).

6. CONADR 55-8, "(Unclassified) Alert Requirements for Air Defense Units During Normal Preparedness," 1 Mar 1957 (DOC 211); CONADR 55-8A, "Alert Requirements for Air Defense Units During Normal Preparedness," 3 Jun 1957 (DOC 212); Msg., CONAD to ADC, et al, 23 May 1957 (DOC 213); DF, COCOC to COOOP-T, "Proposed Message Change to CONADR 55-8," 6 May 1957 (DOC 214); DF, COOOP to COOPO, "Proposed Message Change to CONADR 55-8," 15 May 1957 (DOC 215).

7. Hist CONAD/ADC, Jan-Jun 1956, pp 68-69; Interview with Maj. C. W. Knott, COOOP-T, 2 Jul 1957.

8. CONADR 55-8, 1 Mar 1957 (DOC 211); Hist CONAD/ADC, Jan-Jun 1956, p 68.

9. Hist CONAD/ADC, Jan-Jun 1956, p 69; CONADR 55-8, 1 Mar 1957 (DOC 211).

10. CONADR 55-6, "Rules of Engagement," 13 May 1957 (DOC 217); Msg., CINCAL to CINCONAD, 19 Dec 1956 (DOC 216).

11. Msg., CINCONAD to C/S, USAF, 14 Mar 1956 (DOC 218); Msg., CINCONAD to C/S, USAF, 4 Jan 1957 (DOC 219); CONAD to USARADCOM and ADC, "Vandenberg-Collins and Chidlaw-Lewis Agreements," 28 Mar 1957 (DOC 220); Msg., CINCONAD to CFECR, et al, 11 Jun 1957 (DOC 221); CONADR 55-6, 13 May 1957 (DOC 217).

12. Msg., CONAD to CFECR, 19 Jun 1957 (DOC 222); Msg., CONAD to CFECR, et al, 24 Jun 1957 (DOC 223); 2nd Ind (15th AF to SAC, "Draft Regulation: Control of Ground-to-Air Weapons, Fairchild Air Force Base," 12 Feb 1957), CONAD to SAC, 25 Jun 1957 (DOC 224); CONADR 55-6, 13 May 1957 (DOC 217).

13. RCAF/ADC, Air Staff Instructions 2/5, "Fighter Aircraft Interception, Identification and Engagement Procedures of Unknown Aircraft for Use Over Canada Prior to a Declaration

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REFERENCE NOTES FOR PAGES 78-83

of a State of Emergency," 1 Dec 1956 (DOC 225).

14. Interview with Maj. T. C. Schiebel, COOOP-T, 27 Jun 1957; ASI 2/5, 15 June 1957 (DOC 226); 3d Ind (31st ADiv to ADC, "Rules for Interception and Engagement by Fighter Aircraft in Canada," 4 Oct 1956), CONAD to ADC, 9 Nov 1956 (DOC 227); CONAD to AOC RCAF/ADC, "(SECRET) Interception, Identification and Engagement of Unknown Aircraft over Canada-ASI 2/5," 16 Oct 1956 (DOC 228); Msg., CONAD to CFECR, et al, 5 Jun 1957 (DOC 229); Msg., CANAIRDEF to CONAD, 27 May 1957 (DOC 230); Msg., CONAD to CFECR, et al, 6 Mar 1957 (DOC 231); Msg., CONAD to C/S, USAF, 26 Jun 1957 (DOC 232).

15. CONAD to USARADCOM, "(Unclas) Coordination of Antiaircraft Defense Plans for Border Areas," 19 Nov 1956 (DOC 233); "Rules" RCAF, 14 Jun 1957 (DOC 234); CONADR 55-6, 13 May 1957 (DOC 217); Interview with Maj. T. C. Schiebel, COOOP-T, 5 Jul 1957.

16. CONADR 55-12, "Military Air Defense Warning System Operation," 31 Aug 1956 (DOC 235); CONADR 55-12, "Military Air Defense Warning System," 3 May 1957 (DOC 236); CONADR 55-3, 1 Nov 1956 (HRF); CONADR 55-3, 29 Feb 1956 (HRF).

17. CONADR 55-12, 3 May 1957 (DOC 236). For additional information see: Msg., CONAD to CINCSAC, 10 Jul 1956 (DOC 237); Msg., CINCONAD to COMFLDCOMD AF SWPH, 10 Jul 1956 (DOC 238); CONAD to EADF, "(U) MADW in the SAGE Era," 17 Jul 1956 (DOC 239).

18. C/S, USAF to CONAD, "Change in Civil Defense Attack Warning Organizations," 7 Jan 1957 (DOC 240); CFWCR to CONAD, "Change to CONAD Regulation 21-1, 21 December 1956, and CONAD Regulation 55-3, 1 November 1955," 20 Mar 1957 (DOC 241).

19. CONADR 55-16, "Exercises," 19 Jun 1957 (DOC 242).

20. Maj. Gen. Jarred V. Crabb to Gen. E. E. Partridge, w/1 Incl, 11 Jan 1957 (DOC 243).

21. DF, DCS/P&O to CINCONAD, "October Exercise," 9 Oct 1956 (COOOP-E Files); Msg., CINCONAD to JWADF, 9 Oct 1956 (COOOP-E Files); DF, COOPO to COELC, "'Party Line' Film Commentary," 12 Mar 1957 (DOC 244); Hist CONAD/ADC, Jan-Jun 1956, p 21.

22. DF, COOOP to DCS/P&O, "Report of Staff Visit," 14 Dec 1956 (DOC 245); Msg., SAC to COMAF 2, 13 Apr 1957 (DOC 246); Msg., COMAF 15 to COMEW 28, et al, 16 Jan 1957 (DOC 247); Msg., CINCSAC to COMAF 2, 25 Oct 1956 (DOC 248); Msg., CINCSAC to COMAF 2, et al, 7 Jan 1957 (DOC 249); Msg., CINCSAC to CINCONAD, et al, 30 Nov 1956 (DOC 250); Msg., CINCONAD to CINCSAC, 3 Jan 1957 (DOC 251); SAC to CONAD, "(Uncl) Operational Exercise of the Air Defense System," 2 Mar 1957 (DOC 252); Msg., CINCONAD to ADC, et al, 30 Nov 1956 (DOC 253); Msg., CINCSAC to CINCONAD, 28 May 1957 (DOC 254).

23. CONAD to SAC, "(Uncl) Exercises," 25 Jan 1957 (DOC 255); DF, COOPO to COHCS, "(Uncl) Summary Report on Exercise 'Bald Eagle'," 20 May 1957 (DOC 256); CFWCR to CONAD, "(Unclassified) Summary Report on Exercise 'Bald Eagle'," 29 Apr 1957 (DOC 257); 1st Ind (34th ADiv (Def) to CFCCR, "Report on Exercise 'Bald Eagle' (Uncl)," 11 Apr 1957), CFCCR to CONAD, 18 Apr 1957 (DOC 258); CFECR to CONAD, "(Uncl) Summary Report of Exercise 'Ball Hawk'," 24 May 1957 (DOC 259). For additional information on the ECM exercises see: DF, COOPO to COHCS, "(Uncl) Commanders Summary Report of Exercise 'Dawn Patrol'," 5 Apr 1957 (DOC 260); CFECR to CONAD, "(Uncl) Summary Report of Exercise 'Dawn Patrol' (EADF 'Green Field'), " 22 Mar 1957 (DOC 261); USARADCOM to CONAD, "SAC ECM Mission 'Green Field'," 3 Apr 1957 (DOC 262).

24. CONAD to NAVFORCONAD, "(Unclassified) Cancellation of Large Scale Exercises, 4th Quarter FY 1957," 11 Dec 1956 (DOC 263); JWADF to CONAD," (Unclassified) Report of JWADF Participation in Exercise HOP SCOTCH," 11 Jul 1956 (DOC 590 in JWADF Hist Jan-Jun 1956); CFWCR to CONAD, "Evaluation of Exercise HOME RUN," 5 Jul 1957 (DOC 264); Msg., CFWCR to 25th ADiv, et al, 30 May 1957 (DOC 265); 2nd Ind (Cmd. First Fleet to JWADF, "Joint Western Air Defense Force Participation in Naval Exercises; invitation for," 30 Jan 1957, CONAD to CCFWCR, 7 Mar 1957 (DOC 266).

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REFERENCE NOTES FOR PAGES 85-89
NINE

1. CONAD to C/S, USAF, "CONAD Objectives Plan 56-66," 20 Dec 1956 (DOC 267).

2. Ibid.

3. CONAD to C/S, USAF, "CADOP 56-66," 17 Apr 1957 (DOC 268); CONAD to C/S, USAF, "Request for Approval of Nike Deployment Plans for FY 1959," 5 Jun 1957 (DOC 269); Msg., CINCONAD to C/S, USAF, 28 Jan 1957 (DOC 270).

4. Memo for the Record, Lt. Col. O. E. Griest, CONAD P&R, to CONAD to C/S, USAF, "CONAD Deployment Plan 1959," 6 Aug 1957, w/1 Incl. (DOC 271).

5. Ibid., Incl., "CONAD Plans and Service Programs," to CONAD to C/S, USAF, " CONAD Deployment Plan," 6 Aug 1957.

6. CONAD to C/S, USAF, "Defense Against Ballistic Missiles," 7 Mar 1957 w/1 DF (DOC 272).

7. CONAD to C/S, USAF, "Continental Air Defense Requirements," 14 Jun 1957 (DOC 273).

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