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FIFTEEN YEARS OF AIR DEFENSE

(UNCLASSIFIED)

HISTORICAL
REFERENCE PAPER
NO. 5



NORTH AMERICAN AIR DEFENSE COMMAND
Ent Air Force Base, Colorado

JUL

1961

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JUN

1962

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FIFTEEN YEARS OF AIR DEFENSE

AIR DEFENSE SINCE 1946

Historical Reference Paper
No. 5

Directorate of Command History
Office of Information
HEADQUARTERS NORAD

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PREFACE

This is a brief, general history of air defense from about the end of World War II through 1961, a period of some 15 years. This paper is an up-dated version of Historical Reference Paper No. 3, Fifteen Years of Air Defense, issued on 1 December 1950. Its purpose, as that of its predecessor, is to provide an orientation history for officers newly assigned to air defense.

This paper is organized to show the growth of the physical systems and the growth of unity of direction in air defense. It is divided into two parts. Part one covers the story of the building of the systems; part two covers the story of the work toward unity of direction.

Colorado Springs, Colorado
1 March 1962

L. H. BUSH
Director of
Command History

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CONTENTS

PART ONE: BUILDING THE AIR DEFENSE SYSTEM

I	THE START OF POST-WAR AIR DEFENSE, 1945-1951.....	1
II	BUILDING THE AIR DEFENSE, 1951-1957.....	13
III	COMPLETING THE MANNED BOMBER AIR DEFENSE SYSTEM, 1958-1961.....	30
IV	BALLISTIC MISSILE AND SPACE DEFENSE.....	38

PART TWO: ESTABLISHING UNITY OF DIRECTION

V	CONAD AND ITS BACKGROUND.....	41
VI	REORGANIZATION OF CONAD.....	59
VII	EXPANSION OF INTEGRATION UNDER NORAD/CONAD.....	63

APPENDICES:

I	IMPORTANT EVENTS IN AIR DEFENSE....	79
II	ROSTER OF COMMANDERS.....	99

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MAPS & CHARTS

Areas of Responsibility for Air Defense, July 1948-March 1949.....	5
Air Force Areas of Responsibility for Air Defense, July 1951.....	7
ARADCOM Geographical Sub-divisions, July 1951.....	9
Alaskan Radar Net, August 1951.....	12
Allocation of Assigned Battalions as of 31 Dec 1953.....	24
ADC Areas of Responsibility for Air Defense, 8 October 1955.....	26
ARADCOM Geographical Sub-divisions, June 1957.....	28
USAF ADC Interceptor Force.....	33
Organization, Continental Air Defense Command, September 1954.....	47
Headquarters CONAD, September 1956.....	55
Organization, Continental Air Defense Command, September 1956.....	57
Headquarters NORAD/CONAD, August 1959.....	73

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PART ONE

Building the Air
Defense System

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CHAPTER I

THE START OF POST-WAR AIR DEFENSE

1946-1951

IN THE CONTINENTAL UNITED STATES

THE AIR DEFENSE COMMAND

The Army Air Force came out of the war convinced that it should have primary responsibility for air defense of the United States. Also, it had concluded from its war experiences that the functions of an air force were air defense, strategic air and tactical air.

Accordingly, in the spring of 1946, the AAF reorganized its continental forces along these functional lines. On 21 March 1946, it established the Air Defense Command at Mitchell Field, New York. Lieutenant General George E. Stratemeyer was named commander.

This was a period of vast demobilization and retrenchment in the U.S. and AAF resources were inadequate to man and equip its commands. Strategic Air Command got the highest priority and the bulk of the resources, Tactical Air Command the next largest share, and ADC what was left -- almost nothing. It got four fighter squadrons, a few radars, and an organization of six numbered air forces, only two of which were active.

Because he had no forces of his own, General Stratemeyer sought authority to get commitments from the other AAF commands and the Navy for the use of their radars and fighters in an emergency. AAF Headquarters sympathized but gave him no backing. Help of sorts was given for the first time when the air forces were put into a separate

control centers in Alaska. These stations were called Permanent System stations to distinguish them from the temporary net mentioned above. The target date for having these stations in operation was set at mid-1952.

The Air Force had also turned its attention to the problem of poor coverage at low altitude and took steps in 1949 to set up a civilian spotter system. In September, the command charged with air defense (temporarily the Continental Air Command*) tested a prototype Ground Observer Corps and was impressed enough to ask for a network of 26 filter centers and their associated observation posts in the Northeast, Northwest, and California. USAF gave its formal approval on 1 June 1950. By the end of that year, the 26 filter centers were in operation.

Until the start of the war in Korea, in mid-1950, the radar stations were manned only a part of the day. At the outset of the war, the system was placed on 24-hour operations. The start of around-the-clock operation of the air defense system dates from this time. Earlier, however, ConAC had directed its commanders to operate their systems to the limit of their resources. ConAC also armed its interceptors for the first time in 1949 and gave its pilots authority to shoot down aircraft in the Atomic Energy Commission prohibited air spaces if a hostile act was committed.

USAF revoked the latter authorization in January 1950, however, for it wanted to assure that ConAC's procedures adequately safeguarded

* On 1 December 1948, USAF put TAC and ADC under this new command in order to pool the resources and increase the force available. General Stratemyer moved from command of ADC to ConAC. He was succeeded by Lieutenant General Ennis C. Whitehead in April 1949.

friendly planes. USAF removed its restrictions in April 1950. At first, intercept operations with armed fighters were limited to the prohibited air spaces over AEC installations, certain sections of coastal areas, and the Albuquerque defense area. Soon after, arrangements were completed with the Canadian Government to receive flight plans on aircraft entering the defended areas from the north and USAF authorized ConAC to intercept during daylight anywhere in the defended areas.

Air defense interceptor strength was not much to speak of until about 1951. It rose gradually from four squadrons in 1946 to 23 squadrons in mid-1950. Then, early in 1951, it doubled in strength due to the addition of 21 Air National Guard squadrons which had been federalized because of the Korean War. The ANG units stayed until 1952 when they were replaced with regular force squadrons.

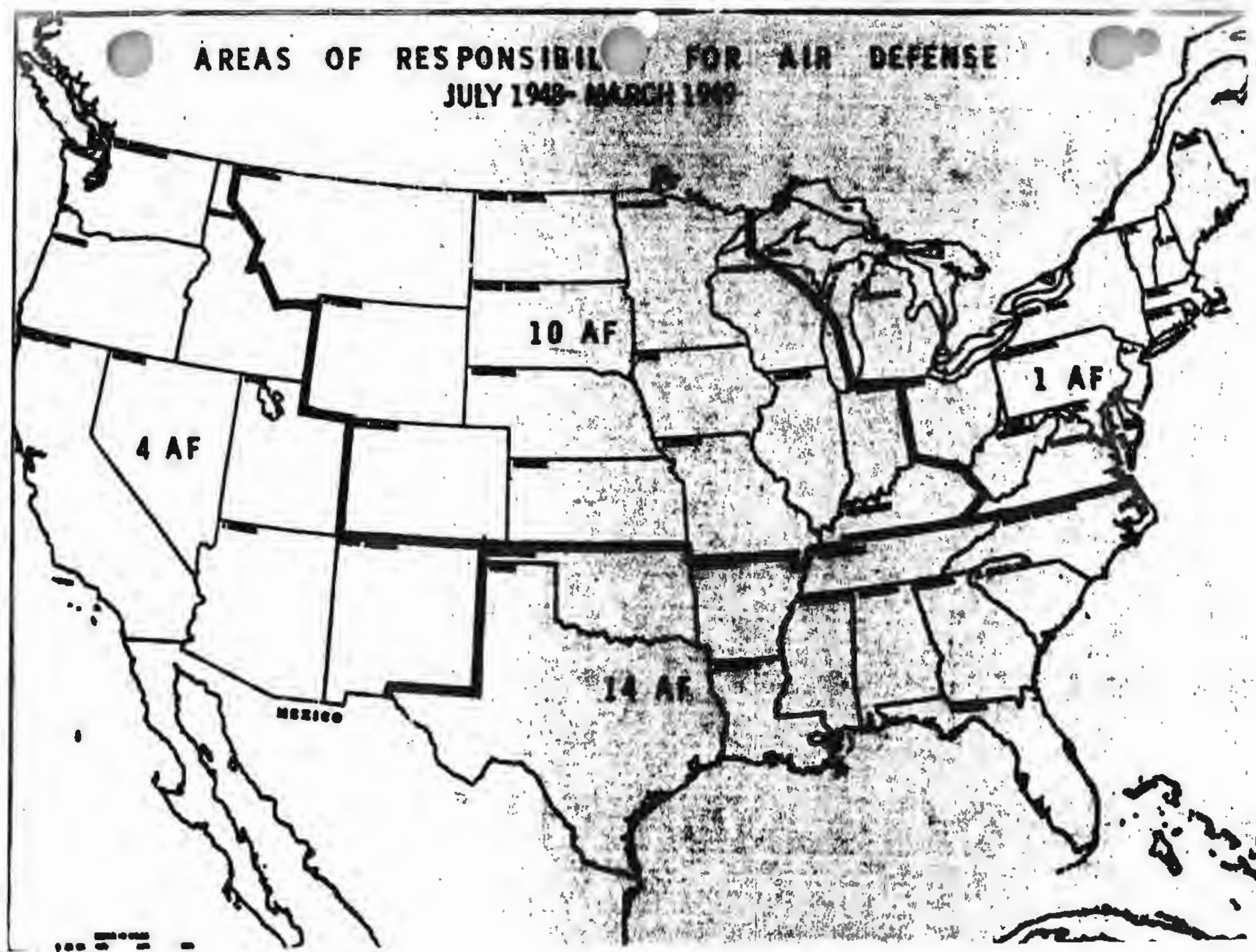
The first all-weather-type jets started coming into the air defense system in 1950. This was the F-94A (an F-80 with radar attached to its nose). The second all-weather-type, the F-89B, began arriving in June 1951.

A final area worked on during these early years was organization. Prior to the fall of 1948, there were no organizations between the air forces and the tactical units. Air defense fighters and radars were in the Northwest and Northeast only at this time. To provide intermediate command echelons, ADC formed the 25th Air Division in October 1948 at Silver Lake, Washington, and the next month, a second division, the 26th at Mitchel Field, New York.

At this time, as pointed out earlier, the Continental Air Command was formed by USAF. ConAC took over direction of the air defense effort. ADC itself was reduced to record status in September 1949 and abolished on 1 July 1950.

AREAS OF RESPONSIBILITY FOR AIR DEFENSE

JULY 1948 - MARCH 1949



ConAC continued the building of the air defense structure started by ADC. On 1 September 1949, ConAC formed an Eastern and a Western Air Defense Force, as the command echelons immediately subordinate to it and responsible for a large territory that would have several divisions. By December 1949, build-up of the radar net warranted adding three more divisions. The sixth and seventh divisions were added in the fall of 1950.

By the latter date, the various world crises that had been festering seemed to be coming to a head, the Russians had exploded an atomic bomb, and the Korean War had started. Air defense and its problems began receiving more attention. USAF Headquarters decided to re-establish air defense under a major command with no other missions. On 1 January 1951, ADC was reactivated. On 8 January 1951, ADC Headquarters opened at Colorado Springs, Colorado. General Whitehead moved from command of ConAC to ADC. He served until August 1951 when General Benjamin W. Chidlaw succeeded him.

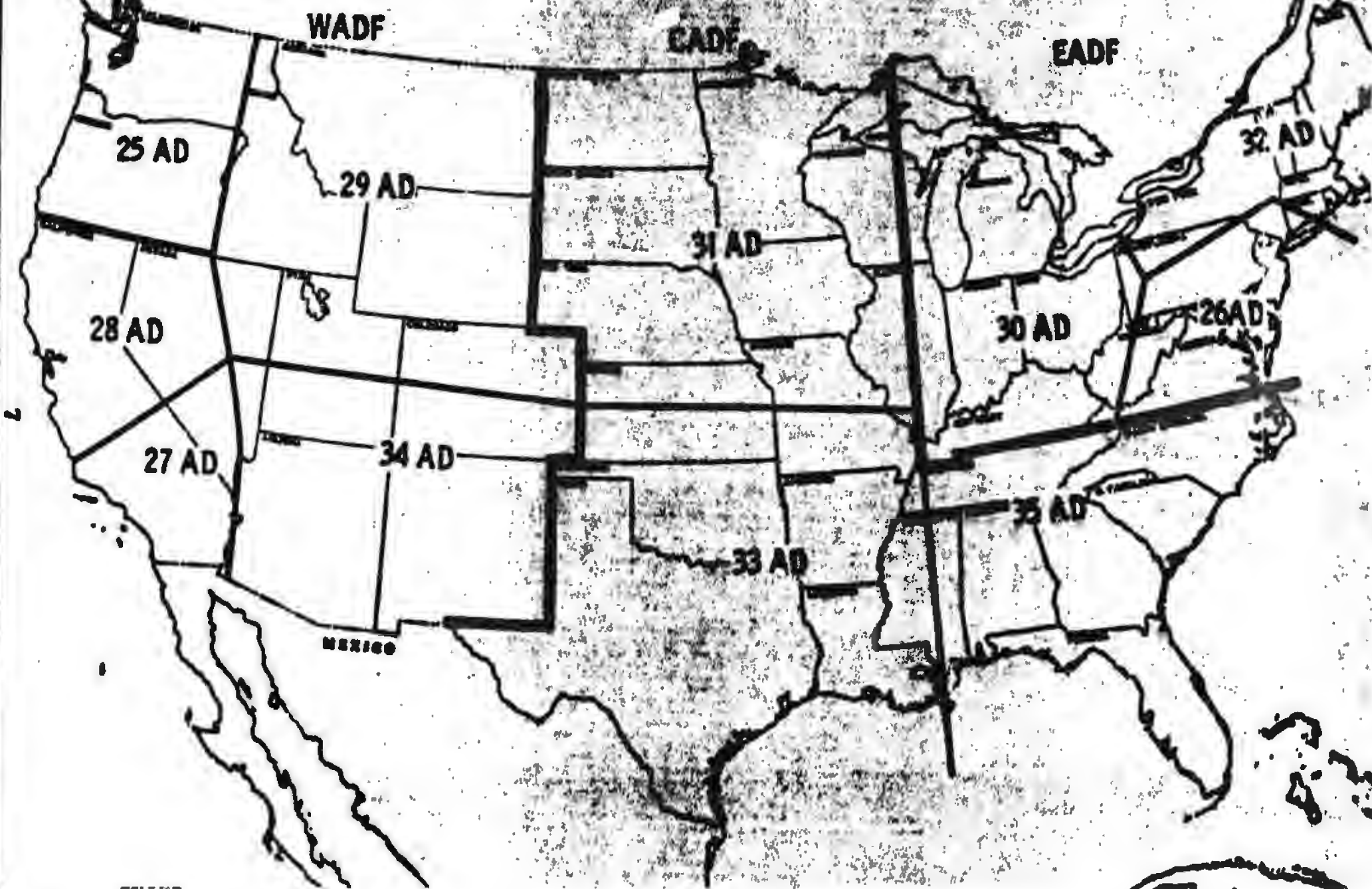
By early 1951, the Air Force air defense organizational structure had been completed for the time being. Four more divisions were activated, bringing the total to eleven. A third air defense force, Central, was activated in March for the center of the nation.

THE ARMY ANTIAIRCRAFT COMMAND

Army antiaircraft was not significant in air defense prior to 1951. Until early 1950, there were no units assigned primarily to continental air defense. And then the only AA units on site were at the Soo Locks and the Hanford AEC installation.

However, the Army had for some time been working on the establishment of a national organization for employment of AA in air defense. A study completed in March 1950 concluded that creation of an AA command was necessary. It pointed

AIR FORCE AREAS OF RESPONSIBILITY FOR AIR DEFENSE JULY 1951



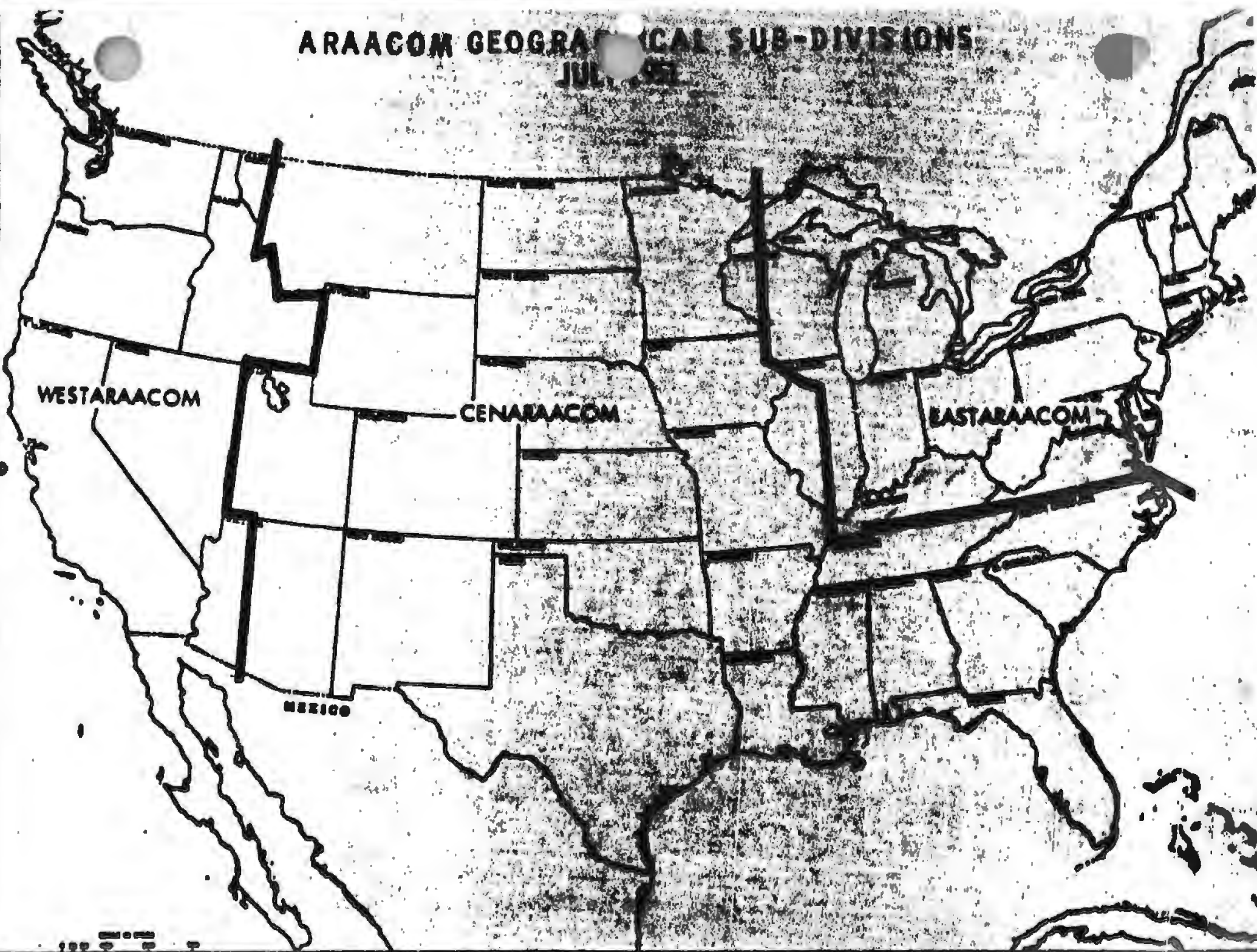
out that the current system provided no means to exercise command over AA units when they were in air defense. They operated as individual units looking to the Air Force for operational control and to the Continental Armies for logistical and administrative support.

When the war in Korea started, the Army moved quickly to buttress the nation's defenses. Missile programs were speeded up, new AA units were activated, and forty National Guard battalions were brought into federal service. On 1 July 1950, the Army Antiaircraft Command (ARAACOM) was established at the Pentagon under Major General Willard W. Irvine. ARAACOM established an Eastern and Western Army Antiaircraft Command on 1 September 1950. The Central ARAACOM was established in April 1951.

The command headquarters and its regional headquarters were all that there was to ARAACOM until 10 April 1951. On this date, however, ARAACOM was assigned all AA units in the U.S. allocated to air defense. This created in short order an organization approximating that of ADC. Brigades, groups, battalions, and batteries moved into the air defense system on a regular basis alongside the divisions, wings, groups, and squadrons of ADC. On 15 January 1951, ARAACOM moved its headquarters to Colorado Springs to operate alongside ADC Headquarters.

At the time ARAACOM assumed command of all AA units, there were 23 battalions. These consisted of six automatic weapons, nine 90mm, and eight 120mm battalions. Fourteen of the battalions were in the East, the others in the West. In the next eight months, the number of battalions was doubled. Much of the increase (ten battalions) came from the National Guard. By December 1951, ARAACOM had 45 battalions.

ARAACOM GEOGRAPHICAL SUB-DIVISIONS JULY 1961



WESTARAACOM

CENARAACOM

EASTARAACOM

MEXICO

IN ALASKA

During World War II, an air defense system had been set up in Alaska. But it had shrunk to almost nothing by 1945. At the end of the war, Army Air Forces reorganized what was left of its men and equipment in Alaska into the Alaskan Air Command, formed on 21 December 1945 at Davis Airfield (it moved to Elmendorf in 1946). Brigadier General Edmund C. Lynch was commander of AAC until October 1946. He was succeeded by Brigadier General Joseph H. Atkinson. He served until February 1949 when he was succeeded by Brigadier General Frank A. Armstrong.

In January 1947, the Joint Chiefs of Staff established the Alaskan Command at Elmendorf as a unified command under their jurisdiction. From this time, the responsibility for air defense of Alaska rested with the Commander-in-Chief, Alaskan Command (CINCAL). However, he delegated the tasks of planning and executing the mission to Commander, Alaskan Air Command. AAC was the Air Force component of ALCOM. The Army and Navy components, U.S. Army Alaska (USARAL) and Alaskan Sea Frontier, were formed on 15 November 1947. The AAC commander was authorized, under this air defense arrangement with ALCOM, to exercise operational control over all air defense forces, including those of USARAL.

Army Major General Howard A. Craig was the first ALCOM commander-in-chief. He was followed by Air Force Lieutenant General Nathan A. Twining, who served until 1950.

Alaskan Air Command divided its area into two sectors for air defense, the Aleutian and the Yukon, and deployed its forces accordingly. But in 1946, AAC closed down the Aleutian Sector and reoriented its defense into a system based on northern and southern sectors centered at Ladd and Elmendorf. On 1 November 1950, two air divisions, patterned after those already in operation in the U.S., were activated to handle air defense in the

two sectors. These were the 10th at Elmendorf and the 11th at Ladd.

The first two post-war AC&W squadrons were formed in Alaska in August 1946 at Shemya and Davis. The Shemya squadron, the 628th, was later moved to Ladd. The radar program approved by Congress in 1949, which gave the USAF ADC a system of 75 radar stations, provided ten radar stations and two control centers for Alaska. The control centers were placed at Ladd and Elmendorf.

While this permanent system was being built, AAC established a temporary system as had USAF ADC. When the Korean War started, AAC had five temporary stations operating. On 27 June 1950, these stations were placed on around-the-clock operations. Continuous operation of the Alaskan air defense system dates from this time.

The AAC interceptor force started out in August 1946 with three interceptor squadrons of the 57th Group. A fourth squadron was added the next year.

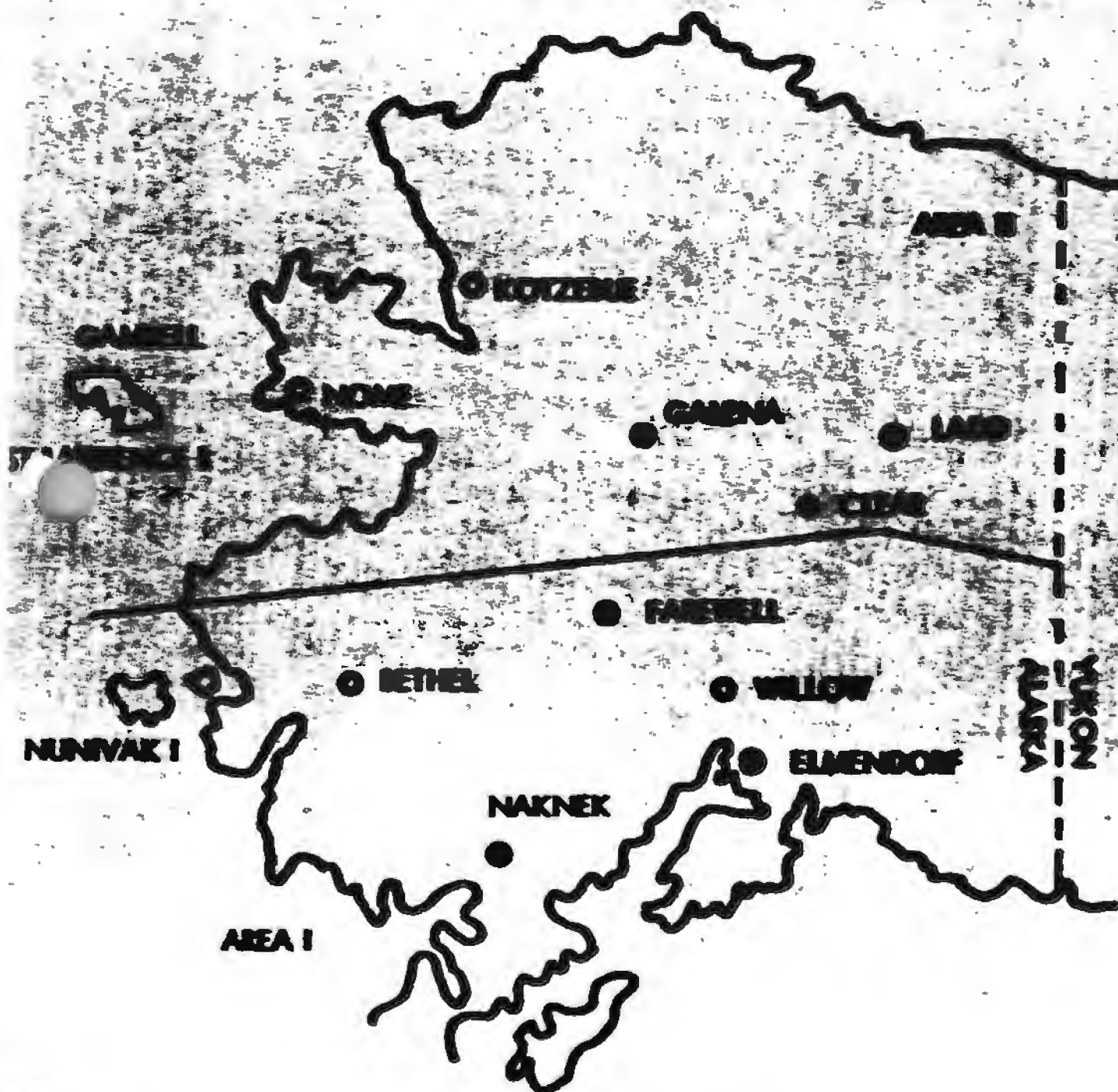
USARAL got the first AA battalion in 1948. Two more battalions had been added by mid-1950.

IN THE NORTHEAST

In the area termed the Northeast, which includes Newfoundland, Labrador, Northeastern Canada, and Greenland, the U.S. first erected an air defense system early in World War II. Bases in these areas were obtained in 1940 and 1941 as Nazi Germany over-ran Europe and looked toward the new world.

The U.S. got a ninety-nine-year lease to bases in Newfoundland in March 1941 under the Leased Bases Agreement with Great Britain. Canada adopted the provisions of this agreement when Newfoundland became its tenth province in March 1949.

ALASKAN RADAR NET AUG 1951



- CONTROL CENTER
- OUTER WARNING
- INTERMEDIATE, GCI
- MASTER GCI

Rights to build bases in Greenland were secured early in 1941 in a pact signed with the Danish minister in Washington. Denmark ratified the pact in 1945. The U.S. put forces in Labrador, a dependency of Newfoundland, through an agreement made by Canada.*

Two organizations were established during the war to operate the defenses, the Newfoundland Base Command and the Greenland Base Command. By mid-1945, the War Department decided that active defense of the Northeast was no longer necessary. The Greenland Base Command was placed under the Newfoundland Base Command and both were assigned to the Air Transport Command, which in 1948, became the Military Air Transport Service. NBC's defense mission was dropped.

Between mid-1945 and 1 October 1950, there was no U.S. organization charged with air defense in this area. On the latter date, a whole new U.S. defense build-up began.

On 1 October 1950, the Joint Chiefs of Staff established the U.S. Northeast Command (USNEC) as a unified command in this area. USNEC's mission was to defend the U.S. from attack through the Arctic regions in the Northeast Area, defend the USNEC area, and support other agencies using Northeast bases. The headquarters was placed at Pepperrell AFB, St. Johns, Newfoundland.

Also on 1 October, USAF relieved the Newfoundland Base Command from assignment to MATS and redesignated it the Northeast Air Command as a major command of the Air Force and component of USNEC. All units of NBC and GBC were assigned to NEAC.

* On 5 December 1952, a 20-year lease agreement was signed for Goose Air Base by the U.S. and Canada.

The last commander of the NRC, Air Force Major General Lyman P. Whitten, was named commander of both USNEC and NEAC. He served until March 1952 when Major General Charles T. Myers took over.

NEAC's Permanent heavy radar system, with the exception of radars in Greenland, was a part of the system built in Canada under the Canada-United States Radar Extension Plan (later termed the Pinetree Plan). In January 1950, the U.S.'s Continental Air Command (ConAC) presented a plan to USAF for extension of the U.S. Permanent Radar System northward. ConAC's Lieutenant General Ennis C. Whitehead stated that "our highly industrialized, highly populated border, which just so happens to be that border facing the threat to our national security, is wide open and will continue to be so until we extend our presently programmed radar net northward."

Following USAF agreement and considerable negotiating, the arrangements were finally worked out and in February 1951, the Canada-U.S. PJBD gave its approval. An agreement with Canada was concluded with an exchange of notes on 1 August 1951.

The approved program was for a total of 33 radar stations in Canada. Ten of these went in the NEAC area, of which the U.S. manned nine, the RCAF the other. NEAC also built three stations in Greenland. Preliminary work on these 13 stations began in August 1950 when a ConAC survey party began locating sites. USAF authorized the Army Engineers to proceed in March 1951 with design and construction. While work went ahead on the permanent system, a five-station temporary net was erected.

IN CANADA

As happened elsewhere, the Canadian air defense system of World War II was dismantled at the end of the war. From this time until after the start of the Korean war, air defense languished in Canada. There was no separate organization with air defense as its primary responsibility until 1 December 1948. An Air Defence Group was set up on this date as a separate organization within Headquarters RCAF at Ottawa. The group was moved to RCAF Station St. Hubert the following year.

As of April 1948, there were only two radar stations operating in Canada. Two years later, April 1950, there were three operating.

In the meantime, ConAC, as stated earlier, proposed an extension of radar northward into Canada, and this had been agreed to. The 33 radars in the approved program were to stretch in a line across southern Canada and up the eastern coast. America was to finance 22 of the stations, Canada 11. Manning and operation was divided among three commands. NEAC was to man nine of the stations in its area, USAF ADC was to man eight stations located along the southern Canadian border, and RCAF ADC was to man the other 16 stations.

To provide coverage until the Pinetree radars started operating, Canada erected a temporary network of five stations with Ames II radars.

Canada's first post-war interceptor squadron was formed on 1 December 1948, the same date that the Air Defence Group was organized. A second squadron was formed the following year. In 1951, five squadrons were formed to bring the total to seven, but one moved overseas so that there were six left for Canadian defense. Initially, the squadrons were equipped with either Vampires or Mustangs.

In the meantime, on 1 June 1951, the Air Defence Group was redesignated the Air Defence Command. Group Captain W. R. MacEwen commanded the group from the time of its formation until it was redesignated ADC. Air Vice Marshal C. R. Darling was the first commander of ADC. He served only a short time, being succeeded on 3 August 1951 by A/VN A. L. James.

CHAPTER 2

BUILDING THE AIR DEFENSES

1951-1957

THE RADAR SYSTEMS

As shown, the foundations were laid for the basic radar systems in the U.S., Canada, and Alaska by the beginning of 1951. These were the so-called Permanent System of 75 stations in the U.S. and ten stations in Alaska, and the Pinetree System of 33 stations in Canada. In the U.S., ADC got its P-system stations operating by the end of 1952. Alaskan Air Command had phased over from its temporary stations to its permanent stations by early 1953, but it was about a year before all stations were operating fully. At about the same time, 1954, all of the Northeast Air Command's permanent stations reached fully operational status. The remaining stations of the Pinetree System in Canada started coming into operation by the end of 1952 and all but two had reached fully operational status by mid-1954.

Thus, the basic radar system was operating in the U.S. by 1952, and by 1954 in all other areas. But even before these systems were completed, the USAF and the RCAF had given attention to extending the coverage and to filling gaps both in geographical area and in altitude coverage.

To beef up coverage and provide protection to SAC bases, in July 1951, a second major radar program was approved by USAF Headquarters. Given the name Mobile Program (because the initial idea, later dropped, was to deploy mobile ground radars), it first was for 44 radar stations. In July 1952, USAF approved 35 more stations and in 1954, 29 additional. The total was not, however, the sum

of these figures, for the program was revised many times. By the end of 1957, a total of 73 stations was planned. Forty were operating.

A third land-based radar program for the U.S. was approved by USAF in January 1954. This provided radars that would give coverage at low altitudes and were called Gap-Filler radars. Initially, ADC proposed 323 gap-filler stations, but revised its criteria and set the total at 235. It was seen at the end of 1957, however, that this total would not be possible because of fund limitations. At any rate, at that time, 41 gap-fillers were operating.

ADC also expanded its Ground Observer Corps. By 1954, ADC had the GOC operating in every state of the nation. Earlier, on 14 July 1952, the GOC had been put on 24-hour operation in the eastern area, in the north, and on the West Coast. This was called Skywatch. In 1954, Skywatch was extended throughout most of the nation. As of December 1956, the high-water mark of the GOC, over 18,000 posts were organized.

In the meantime, ADC was also extending coverage off both coasts. The principal means used were: Lockheed Super Constellation aircraft designated EC-121's, Navy picket ships, and radar platforms fixed to Atlantic shoals.

The first EC-121's were assigned at the end of 1953. By August 1955, ADC's original program of two wings of three squadrons each -- a wing at McClellan AFB, California, and a wing at Otis AFB, Massachusetts -- was completed. The first AEW&C station was manned off the Pacific Coast in August 1954 and off the Atlantic Coast in September 1955.

The Continental Air Command had proposed use of Navy picket ships in 1950. ConAC had recommended six stations in the Atlantic, four in the Pacific. At the time, the best the Navy

could offer was the emergency use of two ships off the East Coast. As the Navy's capability increased, so did its support. On 23 September 1952, it placed one picket ship on duty full time off the East Coast. Then at the end of 1953, it made an agreement with the Air Force to provide both picket ships and blimps for off-shore patrol. By July 1955, five picket ship stations were manned off the Atlantic Coast. The first West Coast station was manned in July 1955.

The Navy commissioned a blimp early warning squadron, ZW-1 in January 1956 at NAS Lakehurst, New Jersey. It became fully operational on 1 July 1957 and began manning one station off the East Coast.

The final element of the off-shore coverage was the Texas Tower radar platforms (so named because of their resemblance to off-shore oil drilling rigs). The idea was suggested by the Lincoln Laboratory of the Massachusetts Institute of Technology in the summer of 1952. USAF approved five towers for the East Coast where there were shoals for emplacement. The total was later cut to three. The first tower was placed on Georges Shoal about 100 miles off Cape Cod. It became operational in May 1956.

The Northeast Air Command got approval in 1955 to add six gap-filler radars along the East Coast of Canada, from Hopedale, Labrador, to St. Johns, Newfoundland. There were seven heavy radars in this area. A gap-filler was to be placed in between each one. The reason was that this section of radars was to be a continuation of a new line of detection devices under construction across Canada called the Mid-Canada Line (see discussion below).

Over in Alaska, as shown, the basic permanent radar system of ten stations came into operation by early 1954. Two stations had been added to plug gaps. In 1953, six more stations were approved to bring the total for Alaska to 18.

Canada's Pinetree System of 33 stations was reduced by one by the end of 1957. C-36 at Vancouver Island had been closed down as unnecessary. Three new stations were under construction, however. These were part of the USAF ADC Mobile Radar Program. Agreement had been reached by the two governments in June 1955 to build these stations.

Up to this point, only the radar coverage that was provided for the populated areas of the U.S. and Canada has been discussed. The remainder of Canada to the Arctic had thousands of square miles of thinly populated area. Obviously, unless warning lines were also placed across this area, the first warning of an attack might be when enemy planes reached the radar cover of the populated areas.

As early as 1948, air defense planners had considered an early warning line across Canada. By 1952, the Air Force and a number of agencies had proposed a distant early warning line. It was February 1954, however, before the President approved a recommendation of the National Security Council that a distant early warning line be built. By the end of 1954, approval had been obtained from the Canadian government to build the line. In January 1955, the JCS approved two segments of the line -- a western sea extension and a major portion of the land-based route. The land portion was to run from Cape Dyer, Baffin Island, generally within about two degrees of the 69th parallel, to Cape Lisburne, Alaska.

Meanwhile, in 1953, a joint Canadian-U.S. Military Study Group recommended an early warning line along at about the 55th parallel. In June 1954, Canada decided to build this line, the Mid-Canada Line, at its expense. It was to run from Hopedale, Labrador, to Dawson Creek, British Columbia. The first Mid-Canada Line stations began limited operations in May 1957, the last in October 1957. The line was declared fully operational on 1 January 1958.

By 15 July 1957, the Distant Early Warning (DEW) line (Cape Dyer to Cape Lisburne) was declared technically ready. But many more months were required to bring the performance of the line to required standards.

As noted above, the JCS approved a western DEW extension from Kodiak Island to Hawaii in January 1955. At the end of the year, they decided to relocate this extension to run from Adak to Midway because this was shorter and also would give warning to Hawaii and Alaska, rather than making them outposts of the line. Finally, in June 1956, the northern terminal was moved from Adak to Umanak. A series of land-based radars was planned from the Alaskan radar at Nukunuk to Umanak.

In February 1956, the JCS approved two routes for the eastern sea extension. One was to cross Greenland, go by water to Iceland, then by water to the Faeroes, and finally by water to Scotland. The other route was to go down Greenland to Cape Farewell and then by water to the Azores.

Limited operations on the first eastern sea extension, which ran from the Navy base at Argentia, Newfoundland, to the Azores, began on 1 July 1956. A full barrier, operated continuously, was established between these two points one year later. Also on the latter date, the Navy started a partial barrier in the Pacific. On 1 July 1958, the Pacific barrier became fully operational. It ran from Kodiak Island to Midway until March 1959 when the Aleutian radars became operational. The terminal was then moved to Umanak. An extension across Greenland was also being built along the 66th parallel.

THE WEAPONS

USAF ADC was flying World War II-type piston-engine planes, day jets, and make-shift all-weather jets, none of which was adequate for the job, until 1953. The first real modernization of ADC's force was in 1953 and 1954 when the F-86D, F-94C and F-89D rocket-firing all-weather interceptors came into the system. By February 1955, the ADC force was completely all-weather jet equipped.

The first super-sonic "century-series" aircraft, the F-102A, arrived in April 1956. A newer F-89, the F-89H, began arriving in March 1956. Another modification, the F-89J, could carry the MB-1 and provided an atomic capability.

By the end of 1957, ADC had a grand total of 74 interceptor squadrons. This was the high-water mark in numbers of manned interceptor squadrons in the ADC inventory. Three of these squadrons were in the Northeast area under the 64th Air Division. ADC had assumed responsibility for this area the preceding April.

Besides this regular force, ADC had a sizeable augmentation force all these years. When ADC was reactivated in 1951, it began making agreements with other commands for the use of their forces in an emergency. ADC's first augmentation plan, dated 1 December 1951, showed a total of 322 aircraft on nine bases as being available. By the end of 1957, there were over 4,000 aircraft reported as available. These came from the Air Training Command, Tactical Air Command, Navy, and Air National Guard.

Beginning on 15 August 1954, an ANG air defense alert program began. Eight squadrons began placing two aircraft on five minute alert during daylight hours each day. On 1 October, nine more units began putting two aircraft on daily alert. Two more squadrons were added to the alert duty in 1955, bringing the total to 19. By

this time, they were standing 24-hour alert.

On 1 October 1955, Air Training Command began placing two fighters on five minute alert at Perrin AFB, Texas. A few months later, on 1 December 1955, the Navy began placing two fighters on alert at San Diego, California.

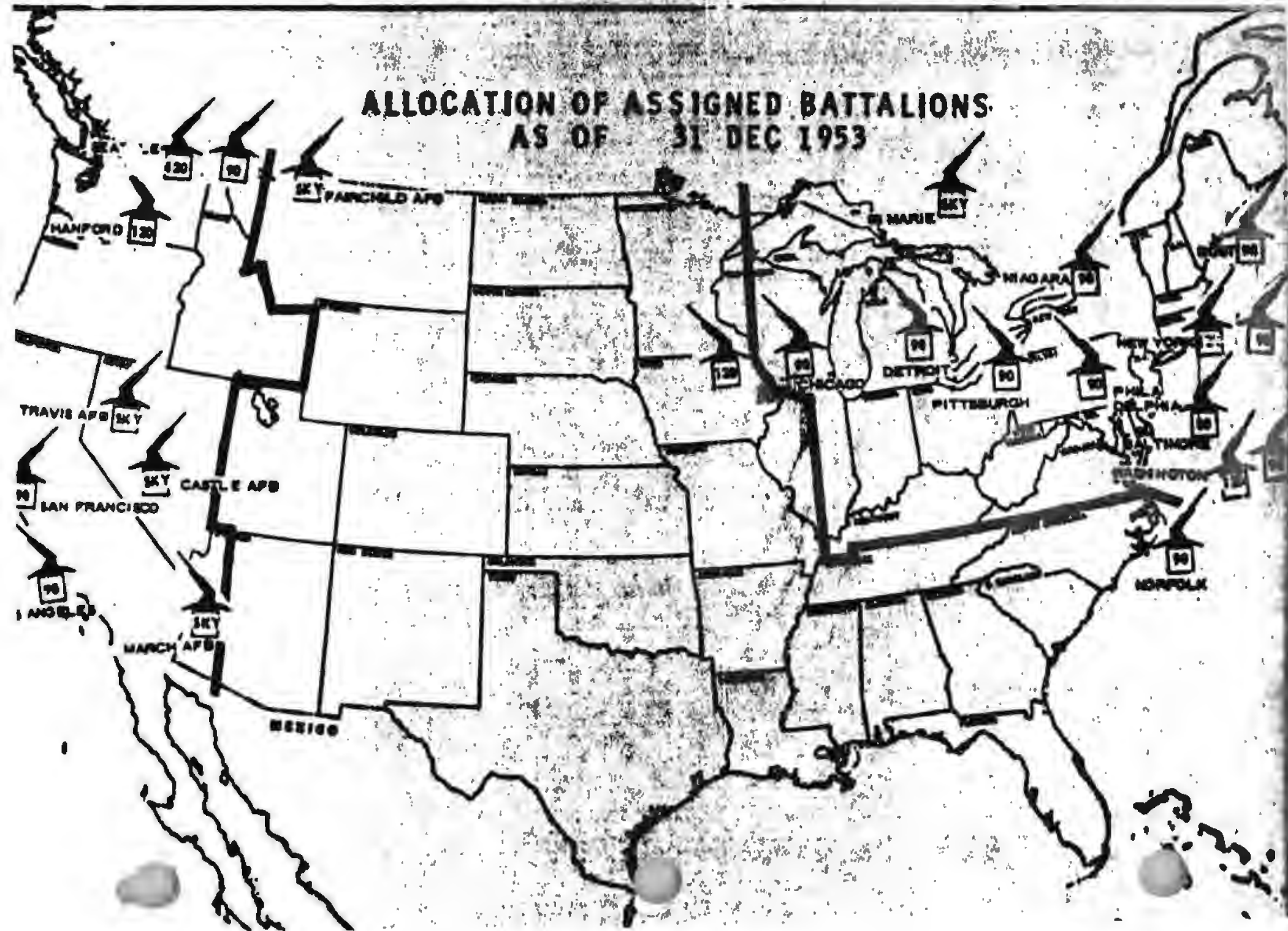
The Army Antiaircraft Command was assigned initially, in April 1951, 23 battalions. It built up to 45 battalions by the end of the year, part of which were federalized National Guard battalions. ARAACOM's build-up proceeded at a slower pace after that. By the end of 1953, it had 61 battalions, all part of the regular force. The National Guard units had all returned to state control.

By the end of 1954, ARAACOM strength had reached the original goal of 66 battalions. And by this time, part of the force consisted of Nike missile battalions. The first Nike unit entered the active inventory in late 1953. By September 1955, Nike batteries outnumbered gun batteries. Sixty-one Nike battalions was the goal. This was met by mid-1957. There were 58 battalions (244 fire units) on site, which was equivalent to 61 battalions in firepower.

Up in the Northeast Area, NEAC's first interceptor unit arrived in September 1952. It went to Thule, Greenland, with four F-94B's. Two more squadrons arrived in July 1953, both with F-94B's. There were never more than three squadrons in the Northeast. NEAC's squadrons later got F-89D's.

The only AA defense unit went to Thule. The first men and equipment arrived there in July 1953, part of the 549th AAA Gun Battalion. It was assigned to the U.S. First Army and attached to NEAC for operational control. In 1955, the 7th AAA Group was activated at Thule and the 549th was placed under it. The next year, the Northeast area was reorganized (see Part II). The 7th was assigned

ALLOCATION OF ASSIGNED BATTALIONS AS OF 31 DEC 1953



to the Army Antiaircraft Command at Colorado Springs.

Alaskan Air Command began receiving F-94A's in August 1950, about the same time that they were supplied to USAF ADC squadrons. AAC had four squadrons at mid-1951, all equipped with these aircraft. This remained the status of Alaskan squadrons until 1954 when they began converting to F-89D's. In 1954, two more squadrons of F-89D's arrived, bringing the total to six. Cuts were made in 1957, however. Five squadrons moved to the mainland to be replaced by two squadrons of F-102's.

At the outbreak of the Korean War, the U.S. Army Alaska (USARAL) had three AA battalions. By mid-1954, two more battalions had been added. All but two battalions were gone by the end of 1957. Both were preparing to convert to Nike.

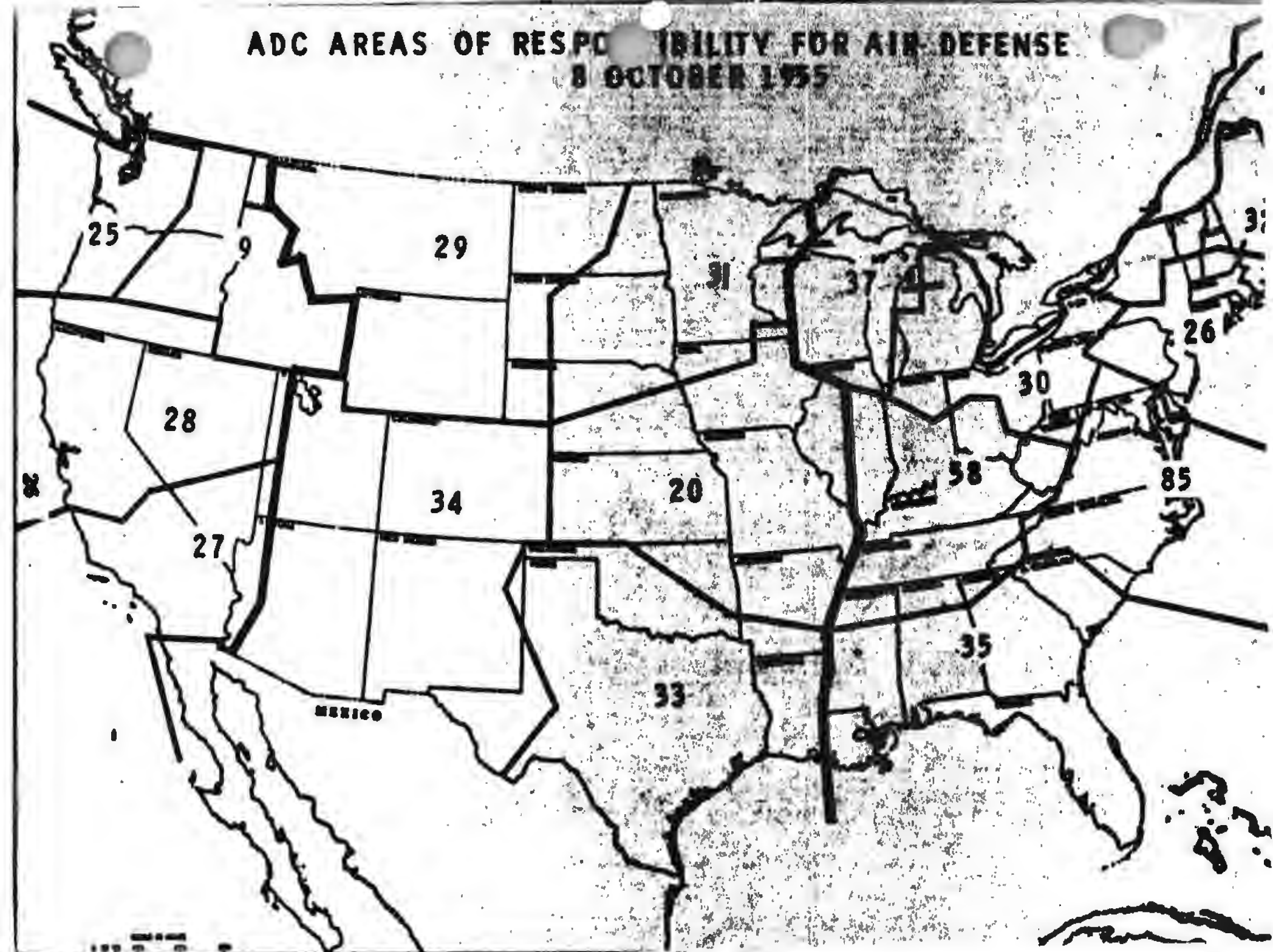
Canada's ADC had six interceptor squadrons at the end of 1951, equipped with Vampires or Mustangs. Later, they converted to Sabres. The first CF-100 squadron was formed in April 1953 and ADC had nine CF-100 squadrons by the end of the following year. This remained the strength of the interceptor force. In addition to these regular forces, emergency augmentation aircraft would have been provided from the training stations at Chatham and Cold Lake and by the Royal Canadian Navy.

ORGANIZATION AND SAGE

By mid-1951, the USAF ADC had established a national organization of eleven air divisions and three defense forces. As its system grew beyond the 75 radar stations of its Permanent System and as its fighter forces increased, ADC decided that it eventually needed five more divisions for a proper span of control.

In the meantime, work was going on to develop a system to automatize the ground control functions. It had been recognized very early that

ADC AREAS OF RESPONSIBILITY FOR AIR DEFENSE 8 OCTOBER 1955



the manual system of observing, telling, and plotting was inadequate. In mid-1950, the Continental Air Command had asked USAF to start a program to develop equipment for automatizing the ground control system as much as possible. USAF agreed and a number of agencies worked on the problem. Among these was the Lincoln Laboratory of the Massachusetts Institute of Technology. This agency developed what it called the Lincoln Transition System which could perform all the functions of data processing, threat evaluation, and weapon assignment and control. In April 1953, the Air Force decided to adopt the Lincoln System, which became known as the Semi-Automatic Ground Environment (SAGE) System.

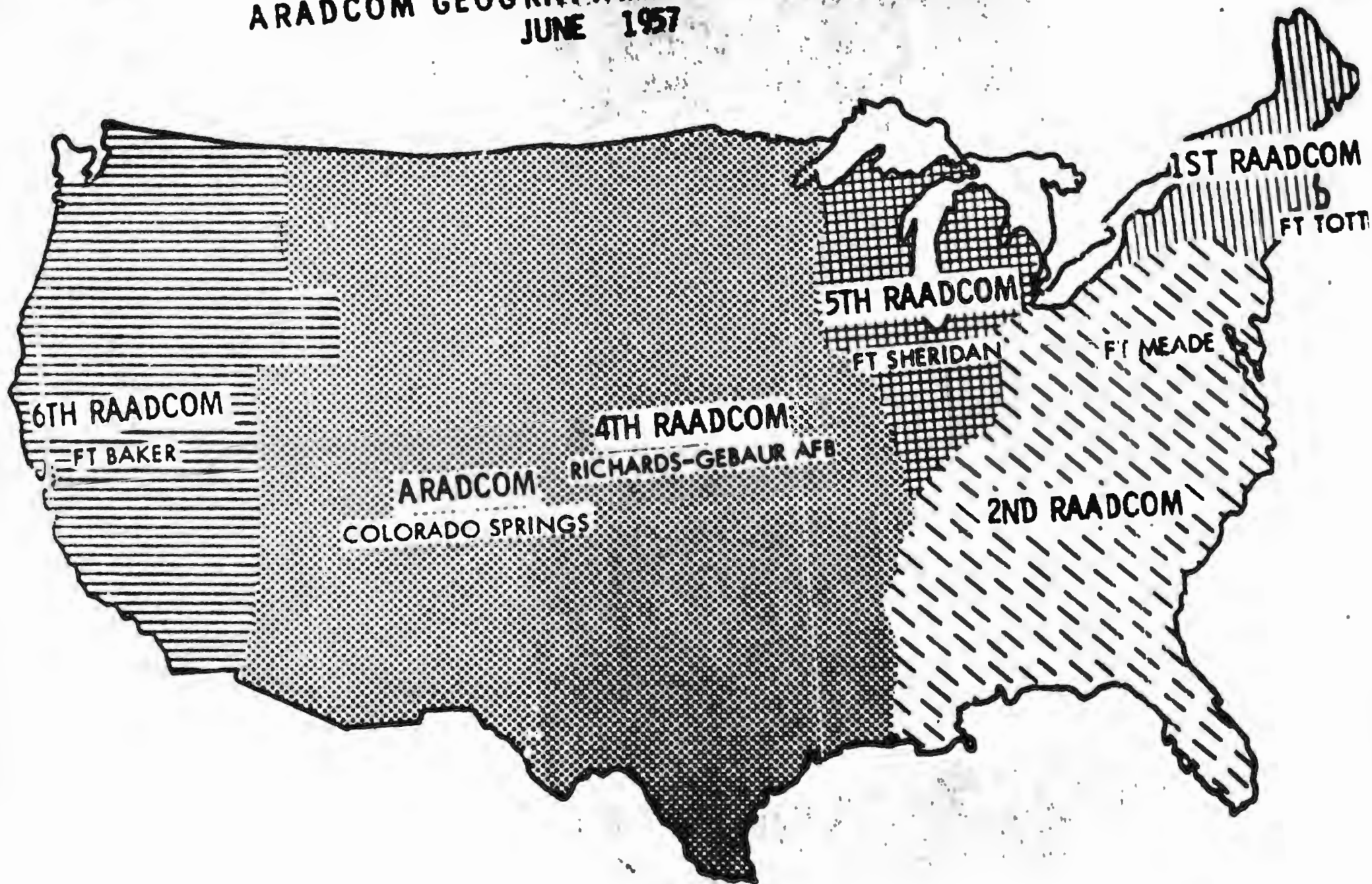
Now ADC's job was to fit SAGE into the air defense organization. ADC thought at first, in a plan made early in 1954, that under SAGE the nation could be divided into 16 air divisions, the same number that it had planned to go to originally.

This plan was soon dropped, however. Not as many divisions would be needed as before. After a number of revisions, the plan eventually decided upon was to build up to 16 divisions temporarily and then to reduce gradually to seven under SAGE.

Build-up to 16 divisions in the U.S. from the previous eleven was accomplished by October 1955. No changes had been made as of the end of 1957 and no SAGE sector or division had become operational.

The Army Antiaircraft Command also made some changes in its organization in 1955. It replaced its East and West Army Antiaircraft Commands with regional commands. In what was generally the eastern area, ARAACOM established the 1st, 2d, and 5th Antiaircraft Regional Commands. In the western area, ARAACOM established the 6th AA Regional Command. The following year,

ARADCOM GEOGRAPHICAL SUB-DIVISIONS
JUNE 1957



ARAACON replaced its Central Command with the 4th
AA Regional Command.

ARAACON was redesignated the U.S. Army Air
Defense Command (ARADCOM) on 21 March 1957. Its
regional commands were redesignated Region Army
Air Defense Commands as of 15 April 1957.

CHAPTER 3

COMPLETING THE MANNED BOMBER AIR DEFENSE SYSTEM

1958-1961

SAGE

The four years 1958 through 1961 saw the coming into use of a number of systems and weapons that had been planned and programmed far back. Among these was the Semi-Automatic Ground Environment (SAGE) system, which the Air Force decided to adopt in April 1953. The first SAGE sector, New York, became operational on 26 June 1958; the first SAGE division/region, the 26th at Syracuse, New York, became operational on 1 January 1960. The system was nearly complete by the end of 1961. There were 21 SAGE sector direction centers and three fully SAGE-configured region combat centers operating. NORAD also had three manual region combat centers in the continental U.S.

To accommodate SAGE, at mid-1958, NORAD/CONAD and USAF ADC began a reorganization of their structures within the continental U.S. Boundaries had to be realigned, regions/divisions discontinued, and new SAGE regions/divisions established or designated. ADC reduced its structure from sixteen to seven divisions by July 1960. NORAD/CONAD established seven regions in the U.S. by that time by eliminating its geographically-designated regions and redesignating seven of its divisions as regions.

In the meantime, in late 1958, ADC had proposed adoption of a new SAGE computer, the AN/FSQ-7A (later redesignated the AN/FSQ-32V). Both NORAD and Air Force Headquarters approved ADC's proposal. ADC planned to install the new computer at nine division combat centers in the U.S. and at one in Canada. ADC wanted to "harden"

each of the combat centers, which would be termed Super Combat Centers (SCC's). With adoption of this plan, ADC planned to set up nine divisions in the U.S. by 1964; NORAD/CONAD planned to follow suit with nine regions.

But in early 1960, the Air Force cancelled the SCC program and NORAD/CONAD and ADC had to change their plans again for reorganization. It was decided to establish a structure of six regions/divisions within the continental U.S. Since, as of 1 July 1960, there were already seven regions/divisions, one had to be eliminated. On 1 July 1961, the 33d Region, Richards-Gebaur AFB, Missouri, was discontinued. ADC also discontinued its 33d Division the same date. The 33d area was divided between the 29th and 32d Regions/Divisions and the 29th headquarters was moved to Richards-Gebaur AFB from Malmstrom AFB, Montana.

On 1 August 1961, the 32d Region/Division Headquarters was moved to Oklahoma City. ARADCOM moved its 2d Region Headquarters to Oklahoma City on the same date and also readjusted its boundaries. Thus, as of 1 August, NORAD/CONAD, USAF ADC, and ARADCOM had six major subordinate commands each in the U.S. and common boundaries.

SAGE in Canada was part of a joint air defense program which had been discussed off and on since 1954. Finally, in 1959, the two governments agreed to a cost sharing arrangement for the program which became known as the Continental Air Defense Integration, North (CADIN) program. In addition to 2 SAGE CC/DC, it would provide two BOMARC squadrons, seven prime radars, and 45 gap-fillers.

INTERCEPTORS

The first of the century-series interceptors, the second generation of jet interceptors for USAF ADC, arrived in April 1956. This was the F-102A. Back in 1948, a board of Air Force officers had recommended the design of a new all-

weather interceptor and recommended that it be operational by 1954. The design competition was held in 1950. The "1954 interceptor," as it was first called, was the F-102. From out of this same period came the other ADC century-series interceptors: the F-104, first delivered in January 1958 (and removed in 1960 because it could not operate with HAGE); the F-101, first delivered in January 1959; and the F-106, first delivered in May 1960.

The RCAF had planned until 1958 to replace its CF-100 interceptors with the supersonic CF-105. But the CF-105 was cancelled in 1959. Finally, in 1961, the Canadian and U.S. governments agreed on a transfer of 66 F-101B aircraft from USAF ADC to RCAF ADC. This would provide the Canadian force with five squadrons of F-101's (CF-101's) to replace the nine squadrons of CF-100's.

In numbers of squadrons, the NORAD interceptor force reached a peak figure of 86 in late 1957. By the end of 1961, the force had been cut by nearly one-half to 48 squadrons.

In December 1960, the JCS approved a NORAD plan for establishing an augmentation interceptor force ready for immediate employment with weapons suited to the air defense mission. NORAD selected 25 Air National Guard squadrons as its Category I force (those non-regular and regular forces which could be responsive to NORAD control 24 hours a day).

MISSILES

The Army Air Defense Command had, by the end of 1957, 58 Nike-Ajax missile battalions on site. Gun units, for all practical purposes, had been eliminated. During the next six months, ARADCOM began conversion to Nike-Hercules, a missile of greater range, speed and altitude. The first Hercules battery was operational by mid-

USAF ADC INTERCEPTOR SQUADRONS

1958. By November 1961, the last Ajax unit was phased out of the regular force. Also in November, the Nike-Hercules program (which called for 139 fire units by June 1962) was fulfilled ahead of schedule.

Four fire units were deployed in defense of the Thule area, nine in Alaska, and the remaining 126 in the continental U.S.

Integration of Army National Guard units into ARADCOM defenses and conversion from guns to missiles was approved by Department of the Army in 1958. The ARNG was to get Nike-Ajax missiles being phased out of the Regular Army defenses. As finally settled, the ARNG missile force was set at 76 Ajax fire units.

In September 1958, the first ARNG unit began conversion from guns to missiles. In March 1961, the last ARNG unit traded its guns for Ajax. The same month, the programmed force of 76 Ajax ARNG fire units was reached.

The Air Force's BOMARC missile became operational first in 1959. In September, the 46th Air Defense Missile Squadron at McGuire AFB, New Jersey, was declared operational with IM-99A's. In June 1961, the first IM-99B squadron became operational. By the end of 1961, eight BOMARC squadrons were operational: four with IM-99's; three with B's; and one with both A's and B's. All were in the eastern section of the U.S. These eight squadrons, plus two slated for Canada, comprised the total BOMARC program.

RADAR

When NORAD was established in 1957 it had assumed operational control over 162 prime radar stations. By the end of 1961, NORAD had 182 prime radar stations operating under its control. Eleven stations formerly manned by USAF in Canada

were being taken over by RCAF ADC at the end of the year.

The FPS-3 and CPS-6B prime radars used in the pre-NORAD era were highly vulnerable to ECM and inadequate against high speed, very high altitude targets. By mid-1957, programs were underway to modify these sets. Also, there were programs to install improved radars of the frequency diversity (FD) type.

Progress was slow during the following years because of fund limitations and program cuts. By December 1961, 20 FPS-7, 1 FPS-24, and 3 FPS-35 FD radars were operational. Meanwhile, the FPS-3 (in various combinations) continued to serve as the basic search radar in the majority of the remaining stations.

All three Texas Towers had come into operation by 1958. One, TT-4, collapsed in January 1961 and was not to be replaced. The Navy blimp squadron, ZW-1, was removed from its air defense role as a primary mission on 1 July 1960.

A final change in the surveillance system was the discontinuance of the U.S. Ground Observer Corps on 31 January 1959. Improvement in radar coverage and the increased capability of the threat by this time made the GOC of no further need in proportion to the cost.

The portion of the Canadian GobC located south of the 56th parallel was disbanded on 1 June 1960. Posts north of this line were kept to supplement the DEW Line and WOL and to assist in search and rescue operations.

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CHAPTER 4

BALLISTIC MISSILE AND SPACE DEFENSE

BMEWS

In January 1958, the Secretary of Defense authorized the Air Force to implement a ballistic missile early warning system of three stations -- one each in Alaska, Greenland, and the United Kingdom -- and a XI central computer and display facility and connecting communications. But in May 1958, USAF announced that the U.K. station was to be deferred. Also, to meet a fund ceiling, a reduced or interim configuration was necessary which would provide four detection radars (AN/FPS-50) and two tracking radars (AN/FPS-49) at Site 1, Thule, Greenland; three detection radars and two trackers at Site 2, Clear, Alaska; and three trackers only at Site 3, U.K.

Following this, in May 1959, USAF cut back even further on the configuration for Sites 1 and 2 by deferring the tracking radars. However, deferral of Site 3 in the U.K. was lifted the following September.

Meanwhile, by October 1959, USAF had finally approved an interim BMEWS central computer and display facility (CC&DF) at NORAD Headquarters. The facility had been approved earlier in the year, but cancelled at mid-year. No new construction was authorized -- only modification to the current NORAD COC building. And only a simplex processing facility was approved.

On 30 September 1960, Site 1 at Thule, Greenland, attained an initial operational capability (IOC). On the same date, IOC was achieved for the CC&DF at NORAD Headquarters. During the

IOC period, data from Thule was transmitted manually to NORAD COC by voice and teletype links and manually inserted into the CC&DF. On 31 January 1961, fully automatic operation of both Site 1 and the CC&DF began.

The system achieved a two-site detection capability on 30 June 1961 with the attainment of IOC at Site 2 at Clear, Alaska, as scheduled. Clear began fully automatic operation by 30 September 1961, again as scheduled.

Site 3, located at Fylingdales, England, was scheduled to reach operational capability in April 1963.

As stated above, tracking radars for Sites 1 and 2 were deferred in May 1959. However, by August 1960, USAF had approved immediate implementation of a tracker for Site 1, Thule. Operational capability for this radar was achieved 1 January 1962, as scheduled.

SPACE DETECTION AND TRACKING SYSTEM

NORAD long sought operational control of space warning systems and regularly urged JCS action. A CONAD letter in June 1960 again pointed out the requirement to the JCS. CONAD emphasized that "it is mandatory that all air and space be under continuous surveillance, reporting to a single commander who can correlate, evaluate, and establish the credence of complementary sensor and intelligence information...." CINCCONAD and CINCNORAD should be charged with the responsibility for air and space defense, CONAD declared; in other words, the mission should be conceived to be in space as well as in the sensible atmosphere.

On 7 November 1960, a first step in this was achieved. The JCS advised that CINCNORAD was assigned operational control and CINCCONAD operational command of the Space Detection and Tracking

System (SPADATS). This system consisted of the Air Force Spacetrack system and the Navy SPASUR (SPace SURveillance) system.

In September 1960, the Secretary of Defense had stated that operation and further development of these systems were to be in consonance with user requirements as defined by CINCONAD and the operational procedures as developed by CINCNORAD. Also, CINCONAD was to be responsible for integrating Spacetrack and SPASUR in the SPADATS.

The JCS told NORAD on 5 April 1961 that the assignment of SPADATS was not to be restricted to the two existing systems -- Spacetrack and SPASUR. NORAD could plan for, and request operational control of, additional sensors and systems necessary for the SPADATS mission. The JCS further stated that the central control facility of the SPADATS would be manned and operated as an integral part of the existing NORAD COC.

NORAD planned to integrate the control functions of the SPADATS into the NORAD COC at Ent AFB, and finally into the hardened COC when it became operational. However, until the COC achieved a computer capability, NORAD had to use the existing USAF facility at Hanscom Field as a temporary SPADAT Center. Finally, on 12 June 1961, the installation of a computer and communication facilities at Ent AFB was completed, and the central SPADAT function was assumed by the SPADAT center at Ent AFB.

MISSILE DEFENSE ALARM SYSTEM

In April 1958, NORAD recommended acceleration of the development of an infrared-sensing system for use as a means of ICBM detection. NORAD again urged development of this system in December 1958. In March 1959, NORAD reaffirmed the requirement and sought assignment of operational control. In June 1960, NORAD once again stated its requirement for this system, now called MIDAS, and for

operational control.

MIDAS was, for a time, under the Advanced Research Projects Agency, but in November 1959 was transferred to the Air Force. The Secretary of Defense directed the Air Force to prepare an operational plan for it. By January 1961, the Air Force plan had been approved by the JCS and the Secretary of Defense. It provided that MIDAS, when developed, would be assigned to USAF ADC. Upon assignment, MIDAS would be operated by USAF ADC under the operational control of CINCNORAD and operational command of CICAORAD.

NIKE-ZEUS

Over the years, NORAD had repeatedly urged that Nike-Zeus, as the only ballistic missile defense system on the horizon, be put into production and operation. But NORAD had not been successful and the Department of Defense had kept Zeus in a research and development stage only.

However, by mid-1961, NORAD was encouraged to learn that the Army, for the first time, had included Nike-Zeus production in its program/budget estimates. The Army's Program Estimate 1962-1970, 26 June 1961, called for Zeus production funds starting FY 1963. In this document the Army recommended "a program for the production and deployment of Nike-Zeus to fulfill the stated requirements of CINCNORAD."

In September 1961, the Secretary of Defense approved production funds for \$137.2 million in the FY 1963 budget for a limited defense of six cities. There were: Washington, New York, Los Angeles, Chicago, Philadelphia, and Detroit. However, in order to balance the defense budget, this program was cancelled, and Nike-Zeus remained in the R&D stage.

CHAPTER 5

CONAD AND ITS BACKGROUND

EARLY INTEGRATION

As shown, at the end of World War II, the Army Air Force reorganized along functional lines and established three major commands: SAC, TAC, and ADC. ADC was given the mission of organizing and administering the integrated continental air defense system. ADC got almost no forces, however: four fighter squadrons, a handful of radars, and an organization of six numbered air forces of which only two were active.

ADC thus had a mission but no forces to carry it out. And almost immediately a dispute arose over which agency, the AAF or the Army Ground Forces, the air defense mission belonged to and what air defense meant. The AGF challenged the concept that had come out of the war that the air force commander should be responsible for air defense of an area and that antiaircraft artillery employed in air defense should come under the control of the air commander.

In May 1946, the War Department confirmed the ADC mission and added that ADC should control and train such antiaircraft units as might be assigned to it. Following this, the AAF proposed that AA forces be integrated with it. This caused the Army Ground Forces to make a counter proposal that the air defense mission be divided, with it taking over local air defense and the AAF providing air defense beyond the range of ground weapons. The AGF wanted to redefine air defense as defense by air, essentially a border defense, and antiaircraft defense.

AAF countered that the speed of modern aircraft and the fact that an attack would be sudden and without warning made it necessary to have a coordinated, defense-in-depth system under one commander.

In late September 1946, the War Department agreed with the AAF that the air defense mission should be unitary. It provided that while AA employed with the ground forces was of primary concern to the Ground Forces, AA assigned to air defense would come under the control of the Air Force.

During these early years, this problem of control was largely academic, for there were few units assigned to continental air defense. However, from the start there were agreements and provisions for the use of AA forces in an emergency. Early in 1947, AAF and AGF agreed that in an emergency AA forces would follow procedures set up by ADC governing assignment of targets, opening and ceasing fire, and conditions of alert. Detailed arrangements were worked out by the numbered armies and numbered air forces.

In the meantime, ADC's commander, General Stratemeyer, was seeking authority to use the aircraft and radar of other Air Force commands and services in an emergency because he had so few forces of his own. AAF Headquarters agreed that he should work with other commands to set up an integrated air defense system, but did not back him up with any authority.

This continued to be the state of air defense in the U.S. until after the Air Force became a separate service in 1947. In December 1947, as shown in Chapter One, the new Headquarters USAF advised ADC that in an emergency, it would be given fighter forces from SAC, TAC, and the Air National Guard.

ADC also made attempts in these early years to arrange for use of Navy fighters in an emergency. Nothing very satisfactory was achieved, however. There was no high level authority for such until after the Key West Conference of the Secretary of Defense with the Joint Chiefs of Staff in the spring of 1948.

Service responsibility for air defense was established for the first time at this conference. The Key West Agreement, which was approved by the President and issued as an official directive on 21 April 1948, gave the Air Force overall air defense responsibility. The USAF was assigned the mission of providing continental air defense in accordance with the policies and procedures of the JCS. Air defense, thereby, became a unilateral Air Force responsibility, though the Army and Navy were assigned air defense roles as collateral functions.

Air Force officials recognized, however, that the resources of all the services would be required to defend the nation against air attack. It would be necessary to employ Army antiaircraft weapons and Navy fighter aircraft and radar equipment. The Key West Agreement provided that the Army and Navy would furnish these resources in keeping with JCS policies. But no JCS policies were issued, so ADC had to rely on inter-service agreements to get available air defense forces. In other words, employment and integration of forces was achieved through the means of bilateral agreements: Air Force-Army, Air Force-Navy, ADC-Air Force command, ADC-Navy command, etc.

Of major importance was the creation on 1 July 1950 of the Army Antiaircraft Command and the agreement completed a month later between the Army and the Air Force setting up arrangements for employment of AA in air defense. This agreement provided that the Air Force air defense commander could establish the states of alert and

the basic rules of engagement. And it stipulated that operational control, insofar as engagement and disengagement was concerned, was to be exercised directly by the air defense commander. These actions assured AA forces for air defense and began the integration of AA and air forces.

UNIFIED COMMAND CONSIDERED

In the meantime, the establishment of a unified organization for air defense in the U.S. was being considered in Washington. In late 1946, the War Department drew up a plan for a joint command. There was considerable difference of opinion, however, and the plan was shelved. In 1948, the Air Force considered establishment of the Air Defense Command as a specified command of the JCS. But there was much opposition from within the Air Force and from ADC to this.

The next serious consideration of reorganization came in 1950 when USAF prepared a plan for a unified air defense command. By this time, the original ADC had been abolished and the mission taken over by the Continental Air Command (ConAC). The latter opposed the USAF plan and proposed a specified command. USAF sent the unified command plan to the JCS anyway, but no action was taken. ConAC then recommended that a separate air defense command be established because of the growth of air defense. USAF agreed and on 1 January 1951, re-established ADC.

The question of command arrangements for air defense in the U.S. did not come up again until 1953.

CONAD ESTABLISHED

In August 1953, the JCS asked the Air Force Chief of Staff, General Nathan Twining, to prepare plans for establishment of a JCS command

for air defense. General Twining instructed the Air Staff to consider the air defense organization. The Air Staff, by this time, favored maintenance of the status-quo. It recommended adoption of a plan by which the Air Force Chief of Staff would report to the JCS on air defense matters or a plan for a specified command.

However, both Admiral Arthur W. Radford, Chairman of the JCS, and General Twining believed that air defense had become far too large and too important for the Air Force to handle alone. Early in 1954, Admiral Radford sent a memorandum to the JCS reminding them that it was required by law that they establish unified commands in strategic areas when such was in the interest of national security. He felt that it was in the interest of national security to set up a JCS command for U.S. air defense. The JCS then approved the idea, in principle, and directed the Joint Strategic Plans Committee to prepare terms of reference. The committee reported on 1 March 1954, with a difference of opinion as to the degree of responsibility to be given the commander of the new organization and a recommendation that the views of the Army, Navy, and Air Defense Command be obtained.

General Benjamin W. Chidlaw answered for ADC in May 1954 with a proposal for a joint command under the JCS with the Air Force as executive agency. "The operating command for air defense must be organized on a geographical basis," he explained, "with sub-commands, all having the same mission -- that of air defense of a geographical area." He proposed that joint headquarters be established at each echelon of the existing ADC structure through air division. The staffs would consist of the staffs of the current ADC headquarters, plus a small number of Army and Navy personnel, and would be commanded by the ADC commanders. He proposed that there be three components under the joint command -- Army Antiaircraft Command, Air Defense Command, and a Navy

Command yet to be formed. Responsibility for air defense would be given to the joint command, which would have operational control of the forces of the component commands and any augmentation forces. This operational control would be exercised through the joint command's own echelons.

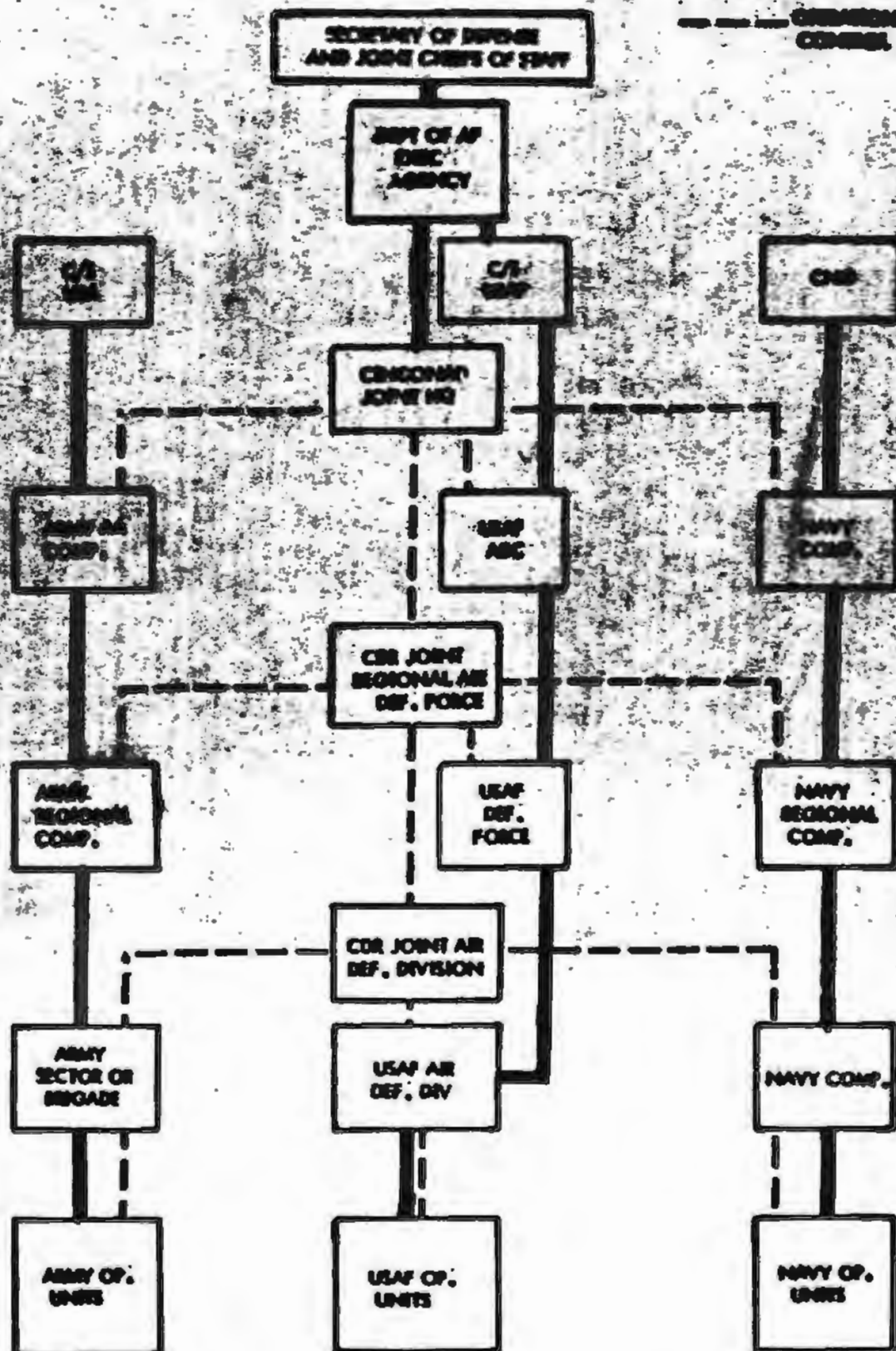
The Navy agreed with ADC in its reply. The Army felt that joint headquarters below command level were unnecessary and that operational control should be exercised through the component commands.

The difference of opinion was eventually resolved, however, and on 2 August 1954, the JCS directed establishment of the Continental Air Defense Command (CONAD). CONAD was established on 1 September 1954 at Ent AFB, Colorado Springs, Colorado.

As set up, CONAD was almost identical to the organization recommended by General Chidlaw. CONAD was given the mission "to defend the continental United States against air attack." The Air Force was made executive agency and it was stipulated that CINCONAD would be an Air Force officer. General Chidlaw was named CINCONAD in addition to his duties as ADC Commander. Three components were designated: ADC, ARAACON and Naval Forces Continental Air Defense Command (NAVFORCONAD), the Navy command established at this time.

The terms of reference gave CINCONAD operational control of all forces assigned or otherwise made available by the JCS or other authority. This included augmentation forces, in an emergency. Operational control, the terms said, consisted of directing the tactical air battle, controlling fighters, specifying conditions of alert, stationing early warning elements, and deploying the command combat units.

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CONAD was superimposed upon the existing ADC structure. Each ADC Headquarters from command down through air division level was additionally designated a joint headquarters, either a joint defense force or a joint division (e.g., Joint Western Air Defense Force, 32d Joint Air Defense Division). The commanders and staffs of the defense forces and air divisions of ADC all assumed dual roles.

INEFFECTIVENESS OF CONAD

The CONAD established on 1 September 1954, as outlined above, proved to be very ineffective and two years later was overhauled. It was important, however, as a start toward unity in planning and direction. A long process of trial and error and evolution in thinking on the part of all concerned would be required before clear unity was realized.

One large fault in the first organizational arrangement was the fact that CONAD had no separate entity, i.e., CONAD was nothing more than an additional designation for the USAF Air Defense Command. The commander, vice commander, and all deputies and directors were the same people for CONAD and ADC throughout the organization from command headquarters through joint defense forces and divisions.

What was expected was that ADC could function simultaneously as a joint headquarters and a component headquarters. This did not work. There was confusion. The staff officer had difficulty in determining whether a function belonged to ADC or CONAD, whether an ADC or CONAD channel should be used, or whether one should act as an ADC officer or a CONAD officer. This situation was true from command headquarters on down except that recognition of CONAD decreased the further down the echelon.

At any rate, there is not much to record in the way of accomplishment during CONAD's first two years other than the fact that a start was made. The ADC staff made a start toward putting operational policy and procedure matters in CONAD's name. After a year of existence, CONAD had a total of ten regulations, four of which were on publications matters. The remaining six covered states of preparedness, reporting of jamming, and funding for the headquarters. On the other hand, eighteen ADC regulations were made applicable to CONAD. Ten more CONAD regulations had been added by the time it was separated from ADC in September 1956. They covered the above subjects plus other operational matters in CONAD's sphere, such as rules of engagement and states of alert. Thirteen ADC regulations were still being used.

The CONAD letterhead was used quite extensively by the ADC staff in correspondence with Air Force commands on augmentation and with the Army and Navy and the component commands, as might be expected. The primary areas of CONAD activity were rules of engagement, readiness and alert states, operational procedures, and inter-service and inter-command agreements.

PROBLEM OF WEAPONS INTEGRATION

A major problem and a major consideration in the reorganization of CONAD was a conflict in views over integration of weapons systems and centralized control. The problem centered around employment of antiaircraft weapons in the SAGE era.

Early in 1955, Lincoln Laboratory studied the matter of employing antiaircraft weapons in the SAGE period at the request of the Army. Lincoln recommended that assignment of targets to antiaircraft batteries be accomplished by Army personnel located at the SAGE Direction Center. This idea was unacceptable to the Army Antiaircraft Command which wanted a decentralized control

system under which batteries could take any target under assignment within acquisition range of the battery. The Army was developing a weapon control system, the AX/FSG-1 (Missile Master), for control of the Nike missile. But this was to be used primarily as an aid in fire distribution among AA batteries, according to the Army concept. ADC, meanwhile, held the same concept as Lincoln Laboratory, i.e., centralized control. ADC wanted Nike to be controlled by the SAGE direction center,

Because the Army Antiaircraft Command and the Air Defense Command held conflicting views, a CONAD decision was required. Obviously, since ADC and CONAD were one and the same, CONAD's views were the same as ADC's. During the next several months, however, nothing concrete was accomplished. Numerous briefings and conferences were held and several proposed operations plans drawn up. But the CONAD/ADC-ARAACOM views remained far apart.

In the meantime, another action was underway which was to lead to a broadening of CONAD's mission. This was revision of the Unified Command Plan by the Joint Chiefs of Staff. Their aim was to produce a more efficient military structure world-wide and to cut costs. Early in 1956, when each service was making recommendations for this revision, USAF proposed abolition of the Alaskan and Northeast Commands and assignment of air defense of these areas to CINCONAD.

The ultimate revision to the Unified Command Plan gave Alaskan air defense to CONAD, but retained Alaskan Command, and gave air defense of the Northeast Area to CONAD and abolished the Northeast Command.

While these changes were being deliberated, on 3 May 1956, the Armed Forces Policy Council heard a briefing on the problem of CONAD centralized control versus Army decentralized control from CINCONAD, General Earle E. Partridge, and the Army and Air Force. General Partridge told the

Council 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. He said that he believed the air defense system for CONAD had to be 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 effort, and a system which eliminated unnecessary duplication.

Following the presentations, it was decided that the JCS should prepare recommendations on command relationships and operational control for air defense and to clarify the authority of CINCONAD. The JCS, it turned out, felt that many of the difficulties CONAD was experiencing were caused by the organizational arrangements and to the wording of the existing terms of reference, especially in regard to operational control. Among their recommendations was separation of the headquarters of ADC and CONAD.

Earlier, in April, CONAD had sent in a recommendation for separation of ADC and CONAD headquarters. CONAD proposed a separate staff of around 350 (120 officers). Both the Army and Navy component commands had objected to the proposed size of the CONAD staff. The Navy commander suggested that about 30 to 40 officers were all that would be needed. Both asked for increased representation for their services, objecting to the fact that nearly all key positions were proposed for Air Force officers.

At any rate, on 19 June 1956, the Secretary of Defense approved the JCS recommendations which included new organizational arrangements and a strengthening of the operational control provision for CONAD. The joint staff was directed to revise the terms. The Secretary of Defense also approved the JCS Revised Unified Command Plan.

CHAPTER 6

REORGANIZATION OF CONAD

NEW TERMS OF REFERENCE

As shown, the CONAD organization that took so many years to be established had to be overhauled after two years of existence. And a new, much-strengthened CONAD organization emerged. New terms of reference were sent to CONAD on 4 September and were effective upon receipt. They provided for the change in mission directed by the Revised Unified Command Plan and for a change in organization.

CINCONAD's mission was broadened in two areas: (1) responsibility for air defense of Alaska and the Northeast Area and (2) responsibility for assisting in air defense of Canada and Mexico according to approved plans and agreements.

Two changes were made to help strengthen and clarify CINCONAD's authority and responsibility. One was a new definition of operational control. The 1954 terms defined CONAD's operational control as consisting of the authority to direct the tactical air battle including engagement and disengagement of weapons, control of fighters, specify the conditions of alert, station the early warning elements, and locate and deploy the combat elements of the command in accordance with JCS-approved plans.

Operational control was now broadened and strengthened. The new terms defined CINCONAD's authority as those functions of command involving composition of subordinate forces, assignment of tasks, designation of objectives, and direction

necessary to accomplish the mission. CINCONAD's authority included the right to determine procedures for conducting the air battle, for exercising operational control of all assigned forces, and for directing engagement and disengagement of weapons. Finally, a point inserted because of the integration of weapons problem, operational control included authority to centralize operational control of forces, including the assignment of individual antiaircraft batteries to designated targets.

The second change that was made to help strengthen CONAD was separation of ADC and CONAD Headquarters. CINCONAD was authorized to set up a separate headquarters with a separate staff. Furthermore, the terms said he could establish 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. And the terms specifically stated that CINCONAD's joint commanders were responsible for combat operations.

CONAD Headquarters lost little time in separating itself from ADC Headquarters. On 17 September, a CONAD staff structure was established and by 1 October 1956, CONAD was physically separated and functioning separately. The CONAD Commander-in-Chief, General Partridge, was relieved of command of ADC on 17 September and Lieutenant General Joseph Atkinson was named ADC commander.

CONAD's proposed manning of 350 for its headquarters was approved. This included 124 officers (85 Air Force, 25 Army, 13 Navy, and 1 Marine Corps). The January 1957 strength report shows 353 assigned. ARAACOM and NAVFORCONAD, as shown above, had opposed a large CONAD staff. Both had also objected to the near absence of Army and Navy officers in key staff positions. Air Force dominance was defended by General Partridge

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 period, 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.

REGIONS AND DIVISIONS

CONAD's next effort was toward establishing subordinate organizations as separate as possible and with as much identity as possible. Effective 15 January 1957, CONAD disestablished all of its joint defense forces and joint divisions set up in 1954 and replaced them with CONAD regions and CONAD divisions. A total of three regions and sixteen divisions were created at this time. The CONAD regions and divisions were made responsible for the same geographical areas as the organizations they replaced, their headquarters were at the same place and they carried the same numerical designation.

The term "region" was adopted because it was the traditional term for the subdivision of an air defense territory and also it gave the major CONAD subordinate unit a little more separate identity. In other words, it set them apart from the ADC defense forces.

Then CONAD stated in a regulation that each region and division was to be organized as an operating agency, separate from the headquarters of

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each component command. The regulation directed that the commander of each unit was to have a separate joint staff, limited to the number necessary to perform the command's mission. CONAD division commanders were to exercise operational control over all air defense systems and CONAD forces and units in air defense within their assigned areas.

But while CONAD directed that separate staffs be formed, it had absolutely no manning authorization to provide its subordinate organizations. All that CONAD could do was direct ADC to give its defense force and division commanders the additional job of commanding the CONAD regions and divisions.

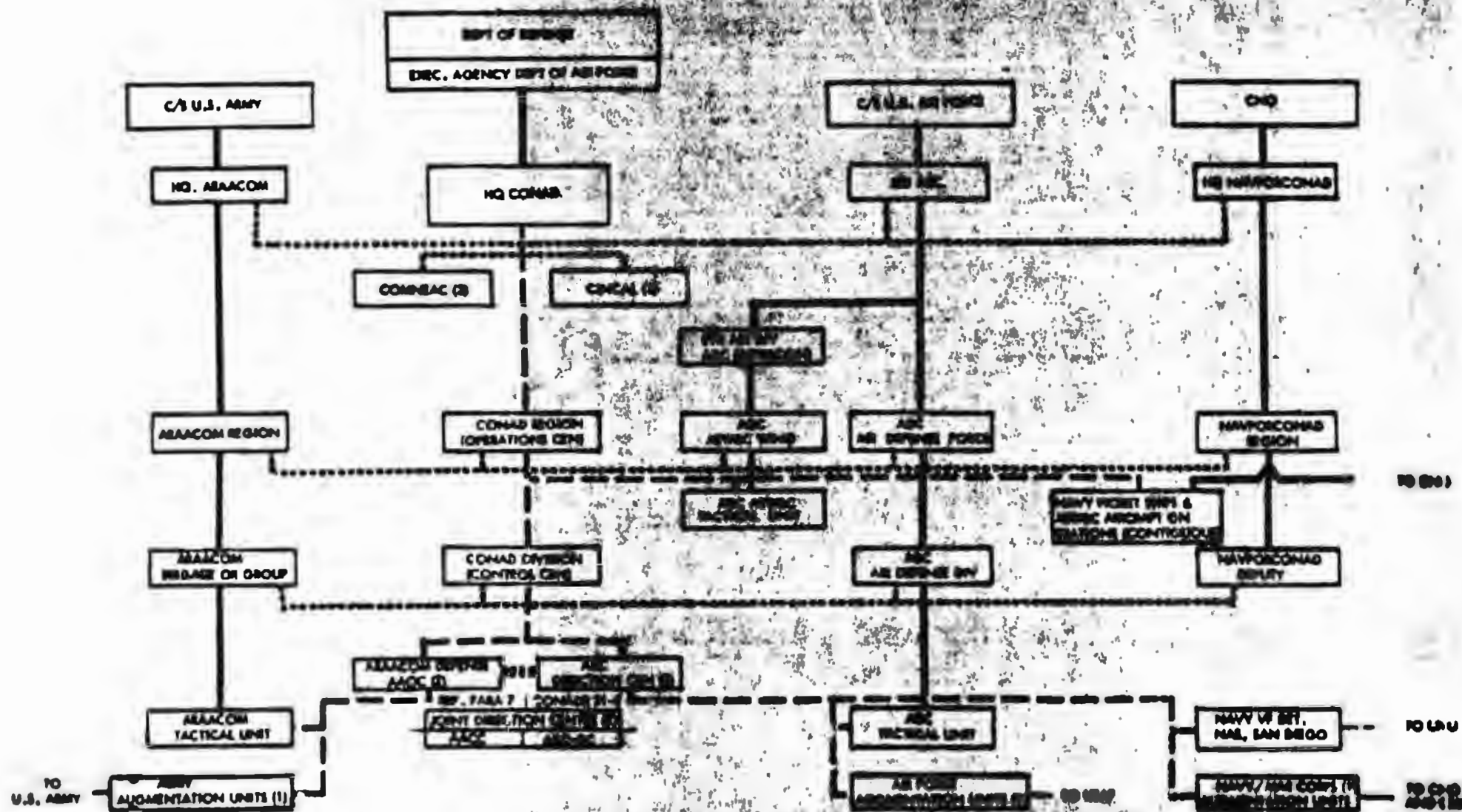
However, following receipt of CONAD's regulation, the Western CONAD Region drew up a staff organization and manning and appointed personnel. But when no manning authorizations were forthcoming, Western revoked its assignments and filled the positions with Western Air Defense Force personnel on a dual-role basis and with such Army and Navy personnel as were made available. Central Region established a staff, but with defense force personnel as an additional duty. Central Region also had one Army and Navy representative. Eastern Region went further than the others. It formed a physically-separate headquarters, manned by defense force personnel and a few Army and Navy representatives. This staff actually functioned separately with region duties as its primary responsibility.

The CONAD division commanders also had to appoint ADC division personnel to CONAD positions as an additional duty.

CONAD AUTHORITY

In the meantime, CONAD Headquarters was beginning to function as a separate, independent

ORGANIZATION
REAL AIR DEFENSE COMMAND
SEPTEMBER 1956



NOTES

- (7) OPERATIONAL CONTROL OF COMBAT ELEMENTS AS DESIGNATED BY DIVISION CASE

IN REPLY TO FOLLOWING: A. [REDACTED] B. [REDACTED] C. [REDACTED] D. [REDACTED] E. [REDACTED] F. [REDACTED] G. [REDACTED] H. [REDACTED] I. [REDACTED] J. [REDACTED] K. [REDACTED] L. [REDACTED] M. [REDACTED] N. [REDACTED] O. [REDACTED] P. [REDACTED] Q. [REDACTED] R. [REDACTED] S. [REDACTED] T. [REDACTED] U. [REDACTED] V. [REDACTED] W. [REDACTED] X. [REDACTED] Y. [REDACTED] Z. [REDACTED]

UNITED STATES
 DEPARTMENT OF COMMERCE
 BUREAU OF ECONOMIC ANALYSIS
 WASHINGTON, D. C. 20540

organization. It began slowly tightening its grip on the management of air defense, moving into one area after another to establish policy and guidance. As noted, at the end of CONAD's first two years, it had 20 regulations in effect. Another 20 were added in the first year after CONAD separated from ADC. These directives not only expanded guidance on areas previously covered, such as on augmentation forces, but provided guidance on new areas, such as on exercises and tests. Also as noted, as of 1 August 1956, just prior to the ADC/CONAD separation, there were still 13 ADC regulations and two manuals being used by CONAD. On 1 April 1957, CONAD announced that no ADC regulation or manual was applicable to Headquarters CONAD or CONAD field units. The cord was cut.

A significant manifestation of CONAD's authority was its ability to bring about collocation and integration of ADC and Army Antiaircraft control facilities. As shown previously, ARAACOM was getting the AN/FSG-1, Missile Master, and ADC had the AN/GPA-37 control system and would soon start getting the SAGE system. The problem of employing antiaircraft weapons in the SAGE period had plagued the first CONAD and had been one of the big considerations in the reorganization of CONAD.

A plan for antiaircraft weapons employment in SAGE, prepared by CONAD, ADC and ARAACOM prior to the CONAD reorganization, was acceptable in concept by the Office of the Secretary of Defense, but needed further expansion and testing. One big matter was testing SAGE-Missile Master integration.

In a review of the whole subject, CONAD saw that because the Missile Master would be coming in ahead of SAGE, the most immediate problem was to find a method of integrating the AN/FSG-1 into the manual air defense system. CONAD concluded 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 plan for such collocation at ten sites (the number of Missile Masters on order) was then developed by CONAD and submitted to the JCS.

Both the Army and Air Force accepted the CONAD plan and on 30 October 1956, the Office of the Secretary of Defense concurred in this collocation. CONAD could now proceed to carry out integration. Its first guidance was a letter in December 1956, directing collocation of the direction centers and Missile Masters at facilities to be designated joint control centers. It was to be 1961, however, before these collocated control centers were fully operational. Collocation and integration was later expanded to include non-Missile Master Army command posts with associated Air Force direction centers, as feasible and desirable. These became operational mostly in 1960, with one, the first collocated center, at Geiger AFB, Washington, becoming operational in May 1958.

CONAD's concept of operation was expressed in January 1957:

The CONAD system will exercise operational control and coordinate the air defense effort of all participating air defense units. The means for the CONAD system to discharge these responsibilities will be a joint center responsible to CIN-CONAD through the CONAD operational chain. This joint center will serve as a detection, identification, and control facility where the over-all air situation is displayed for a specified area and where control and coordination of all weapons operating in the area can be exercised. Optimum effective control is the prime operational objective and requires maximum flexibility.

CONTROL OF ALASKAN AND NORTHEAST AIR DEFENSE

While this activity was underway, CONAD was also busy assuming responsibility for air defense of the Northeast Area and Alaska as assigned in the 1956 terms. The U.S. Northeast Command, a JCS unified command, was disestablished by the JCS on 1 September 1956 in accordance with the Revised Unified Command Plan. On this same date, CINCONAD took over responsibility for air defense of the Northeast. CINCONAD designated the Commander, Northeast Air Command, his subordinate joint commander responsible for air defense in this area. CINCONAD told him that he would have the same responsibilities 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 BCAF Air Defence Command had operational control of U.S. air defense forces in the Canadian portion of the NEAC area. CINCONAD and the AOC BCAF ADC signed a new agreement, dated 1 January 1957, to redefine this control and bring it up to date. The AOC's responsibility was to be exercised through CINCONAD's subordinate commander in the area.

The latter was changed to Commander, 64th CONAD Division, on 1 April 1957. At that time, NEAC was abolished by the Air Force in keeping with the reorganization of the area. With this abolition of NEAC, USAF ADC took over command of the USAF air defense forces in the area. Earlier, on 1 September 1956, the antiaircraft group in the area, the 7th at Thule, was transferred from First Army to the Army Air Defense Command.

Meanwhile, on 1 September 1956, CONAD also assumed operational control of all air defense forces in Alaska. CINCONAD designated Commander-in-Chief Alaska (CINCAL) as the commander responsible to him for all air defense activities in the area. He delegated to CINCAL the authority to

exercise operational control of Alaskan air defense forces. CINCAL's control was to continue to be exercised through Commander, Alaskan Air Command (the Air Force component command). These arrangements were incorporated in an agreement between CINCAL and CINCOMAD, dated 28 August 1956. The antiaircraft forces in Alaska remained assigned to U.S. Army Alaska.

CHAPTER 7

EXPANSION OF INTEGRATION UNDER NORAD/CONAD

CANADA/U.S. COOPERATION

As shown, in 1956, responsibility for air defense of Alaska and the Northeast Area was combined with that of the United States under CONAD. The next logical step was to bring in the air defense forces of Canada.

A close air defense partnership had long been maintained by Canada and the United States. In 1949, the Canada-U.S. Military Cooperation Committee (established at the end of World War II) prepared a plan for emergency defense that outlined the major joint actions necessary and principles of common defense operations. Among other things, the plan, which was approved by the U.S. JCS and Canadian Chiefs of Staff Committee, called for the preparation of detailed emergency air defense plans by the air defense commands of the two countries. The first of these was prepared in 1950. New ones were issued each year.

One of the later MCC plans authorized exploratory planning beyond the limits of the MCC plan (which said that planning could be undertaken in support of the plan). As a result, a combined air defense planning group was formed and met for the first time in May 1954 with the aim of arriving at the best North American air defense. The commanders of the two ADC's agreed a short time later to establish this planning group with a permanent staff. It was later moved to Colorado Springs.

The need for integrated planning had been given a boost in May 1954 by the appearance, some

two years earlier than expected, of high performance Soviet jet bombers. Because of this, both ADC's considered that it was urgently required that programmed radars and fighters be accelerated, that immediate improvement of altitude capability be gained, and especially that the most effective early warning be had as expeditiously as possible. And as stated by the combined planning committee, the appearance of the jet bombers, coupled with Soviet thermonuclear capability, made it apparent that "consideration of the defense of Canada and the United States separately was unrealistic."

Early in the fall of 1954, the two ADC commanders directed the combined planning group to prepare a plan for the best single air defense of the two countries. The plan that resulted proposed an integrated air defense of Canada and the U.S., with forces of both countries operating under a single commander responsible to both governments.

In preparing this plan, the planning group answered for itself the question of what was wrong with the coordinated system of defense that there had been up to that time:

The answer is that forces deployed to defend against attack from one direction (for instance from the north) are not now under one commander, which imposes serious practical limitations in day-to-day training and in our capability to conduct a properly coordinated air battle in case of actual attack.

The completed plan was presented to Canadian and U.S. military authorities. No direct action resulted, however.

NORAD ESTABLISHED

~~SECRET~~
In December 1955, the U.S. Air Force Chief of Staff proposed to the other members of the JCS

that they approve in principle a statement of the desirability of establishing a combined Canadian-U.S. air defense command. This proposal was eventually to lead to the establishment of the North American Air Defense Command. The JCS approved, in principle, the need for peacetime integration of the two air defense forces, and they asked the Canadian Chiefs for their views.

The latter replied that it would be desirable to study methods of integrating the operational control of the air defense forces. They suggested that an ad hoc group of representatives of both countries be formed to make a study.

The U.S. agreed and the job was given to the Canada-U.S. Military Study Group (MSG). The latter was to create an ad hoc group to actually make the study. Near the end of 1955, the group set up by the MSG made its recommendations. The MSG approved the recommendations and in its so-called Eighth Report recommended that the JCS and CUSC get approval of their governments for integration.

Among the conclusions of the Ad Hoc Group Report were the following:

- (1) Air defense of the two countries is a single problem and should be carried out on a combined basis.
- (2) Integration should be of operational control only.
- (3) There should be centralized authority for exercising operational control.
- (4) The system set up should be adaptable to general war.
- (5) The system must be in being and continuously developed and exercised so that no transitional period will be required to go from peacetime to general war.

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(6) The exercise of operational control should be through joint subordinate commanders.

(7) The commander and his deputy should not be from the same country.

The JCS approved the MSG Eighth Report in February 1957 with the understanding that integration of operational control would be limited to the continental elements of air defense of both countries. This included the continental portions of the warning systems and the contiguous radar coverage. This was followed by approval of the Secretary of Defense. The COSC advised in May that they had completed action on the report and that the matter awaited governmental approval.

On 1 August 1957, an announcement was made jointly by the Canadian Minister of National Defence and the U.S. Secretary of Defense that the two governments had agreed to the setting up of integrated operational control of the air defense forces of the two countries under an integrated command.

CINCONAD then recommended that this command be set up immediately. General Partridge proposed that the Canadian Chiefs issue an order stating that effective 12 September 1957 operational control of the Canadian ADC would be assumed by the integrated headquarters at Colorado Springs. General Partridge pointed out that very soon there could be a Canada-U.S. command in name as well as in fact, for the Canadian officer who was to become Deputy Commander-in-Chief, Air Marshal C. Roy Slemon, was to arrive shortly and there were already several Canadian officers at CONAD Headquarters. General Partridge also recommended the name North American Air Defense Command, abbreviated NORAD.

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The Canadian Chiefs agreed to these recommendations on 3 September; the JCS on 6 September.

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CONAD then started action to form the new command. CONAD advised its component commands, the Canadian ADC, USAF and RCAF Headquarters, and CONAD subordinate commands that:

...operational control over the Canadian Air Defence Command and the air defense forces assigned, attached or otherwise made available to that command will be assumed by the Commander-in-Chief, North American Air Defense Command with headquarters at Ent AFB, Colorado, U.S.A., effective 0001 Zulu 12 September 1957.

On the same date, all interested commands were advised by CONAD that NORAD was to be established at Ent AFB effective 0001 Zulu 12 September. CINCNORAD would exercise operational control over Canadian and U.S. air defense forces in Canada through the Commander RCAF ADC and over all other U.S. air defense forces in the United States, Alaska, and Greenland, in accordance with the CONAD Terms of Reference.

The Department of the Air Force assigned General Partridge as CINCNORAD with no change in duty as CINCONAD effective 12 September 1957.

Thus, as of 12 September 1957, NORAD was established; the gigantic step of integrating the air defense forces of Canada and the U.S. had been taken. It was not until eight months later, 12 May 1958, that the U.S. and Canada concluded a formal agreement for NORAD through an exchange of notes. The Canadian note proposed certain principles for the organization and operation of NORAD, much in line with the concepts of the MSG Ad Hoc Committee Report mentioned above. Included were the following:

- (1) CINCNORAD would be responsible to the JCS and COSC and would operate within an air defense concept approved by the two governments;

(2) operational control was the power to direct, coordinate, and control the operational activities of forces available;

(3) the appointment of CINCHORAD and his Deputy, who were not to be from the same country, was to be approved by both governments;

(4) NATO was to be kept informed of arrangements for North American air defense through the Canada-U.S. Regional Planning Group; and

(5) NORAD was to be maintained for a period of ten years or such shorter period as agreed by both countries.

The U.S. note agreed to the principles in the Canadian note and stated that the U.S. reply constituted an agreement between the two governments effective 12 May 1958.

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

TERMS OF REFERENCE

The terms gave NORAD the mission of defending the continental U.S., Canada, and Alaska against air attack. NORAD was established as an integrated command and was to include as component commands the RCAF Air Defence Command, the U.S. Army Air Defense Command, U.S. Naval Forces CONAD, and the USAF Air Defense Command. CINCHORAD was to be responsible to the U.S. JCS and the Canadian COSC and was to operate within an agreed Canadian-U.S. concept of air defense and in accordance with agreed joint intelligence.

CINCHORAD was given operational control over the component commands and their assigned forces, the air defense forces in Alaska, and all other air defense forces made available by proper authority. Operational control was defined as the power of directing, coordinating, and controlling the operational activities of available forces (which was in accordance with the terms for operational control in the Canadian note agreed to by the U.S.).

CONAD remained in existence to serve as a U.S. national command. It was needed, the JCS advised CINCONAD, to handle U.S. responsibilities outside of NORAD's jurisdiction, such as certain atomic matters. The JCS put into effect new terms of reference for CONAD on the same date as those for NORAD, 10 June 1958.

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

NORAD established subordinate units throughout its area of responsibility. In Alaska, in the Northeast Area, and in the U.S., NORAD regions and divisions were established at the same locations and with the same boundaries and staffs as the CONAD units. A region in Canada was established, Northern NORAD Region, with the same territory and staff as RCAF ADC. In all, NORAD established five regions and 23 divisions.

DOD REORGANIZATION ACT

Shortly after the new terms were provided, a new strengthening of CONAD/NORAD authority was provided by legislation that reorganized the U.S. Department of Defense. This act, which became law on 6 August 1958, had been requested by the President the preceding April.

The President told Congress that what he wanted to achieve and what was absolutely essential was that there be complete unity in strategic planning and basic operational direction. It was mandatory, he declared, that the initiative for this planning and direction not be with the separate services, but that it be with the Secretary of Defense and his operational advisors, the Joint Chiefs of Staff. This unified effort should apply, he said, not only to long range planning, but also to command over military operations. Among other things, the President asked that command channels be cleared so that orders could go directly from the Commander-in-Chief and the Secretary of Defense to the commander of the unified commands.

The current set-up was cumbersome and ineffective, he said. Accordingly, he had directed the Secretary of Defense to discontinue use of military departments as executive agencies for unified commands. Lastly, he asked that the fighting forces be organized into operational commands that were truly unified.

The Department of Defense Reorganization Act clarified and strengthened Secretary of Defense authority by the provision that each military department would be organized (rather than administered as had been previously provided) under its own secretary and would function under the direction, authority and control of the Secretary of Defense. The military chiefs of the services were to exercise supervision (rather than command) over such members and organizations of the services as the civilian secretary determined. And this supervision was to be exercised in a

manner consistent with the "full operational command"* vested in unified and specified commanders.

Finally, the act provided that unified and specified combatant commands would be established by the President with the assistance of the JCS through the Secretary of Defense. Such commands were to be responsible to the President and Secretary of Defense for the strategic missions assigned to them by the Secretary of Defense with the approval of the President. The President would also determine the force structure of these commands. The forces were to be assigned by the service departments. These forces were then to be under the full operational command of the unified or specified commander. No forces could be removed except as authorized by the Secretary of Defense with the approval of the President.

A new Department of Defense Functions Directive was issued on 31 December 1958 putting into effect the provisions of the reorganization act. A new unified command plan was issued by the JCS on 8 September 1958, which made CONAD a unified command. New terms of reference for CONAD, made effective 1 January 1959, provided that CINCONAD was the senior U.S. officer in Headquarters NORAD. CINCONAD's mission and tasks remained essentially the same as in the preceding terms. Finally, on 1 January 1959, the air defense forces were assigned to CONAD, and Air Force executive agency control was ended and control transferred to the JCS.

* This was defined by the Secretary of Defense in February 1959 as: "Those functions of command over assigned forces involving the composition of subordinate forces, the assignment of tasks, the designation of objectives, the over-all control of assigned resources, and the full authoritative direction necessary to accomplish the mission."

STAFF REORGANIZATION

Following passage of this act, a plan was prepared in Colorado Springs to reorganize the NORAD/CONAD headquarters to assume the new responsibilities and functions, such as logistics authority. The first plan divided the headquarters into a NORAD and CONAD side, each with a chief of staff and four deputies. This was dropped as too cumbersome and a new plan prepared that merged NORAD/CONAD into one headquarters with seven deputies. The U.S. members of the combined staff were to handle business that was strictly CONAD.

The seven-deputy staff proposed by this plan was modeled after the Joint Staff of the JCS. The JCS Joint Staff had six "J" staff sections and a joint programs office. The NORAD/CONAD staff was to have six "J" sections and a deputy for programs.

The final plan was submitted in March 1959. Besides the seven deputies, the plan called for an office of information, a secretariat, and a protocol office. The staff was further broken down into 30 directorates. The current organization had three deputies, a secretariat, an office of information, and was subdivided into 18 directorates.

The JCS approved the plan in a memo dated 23 June 1959. But they authorized a personnel increase of only half of the number requested. Currently, NORAD/CONAD was authorized 445 spaces (including 35 Canadian spaces). A total authorization of 966 was asked, or an increase of 521. The JCS authorized an addition of 223 for a total of 668. Most of the additional people were to come from the components. The JCS directed that the transfer of personnel and the assumption of additional functions were to be accomplished in phases and in coordination with the Services.

In the plan which was approved by the JCS, it was stated that the NORAD/CONAD functions included the following:

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

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

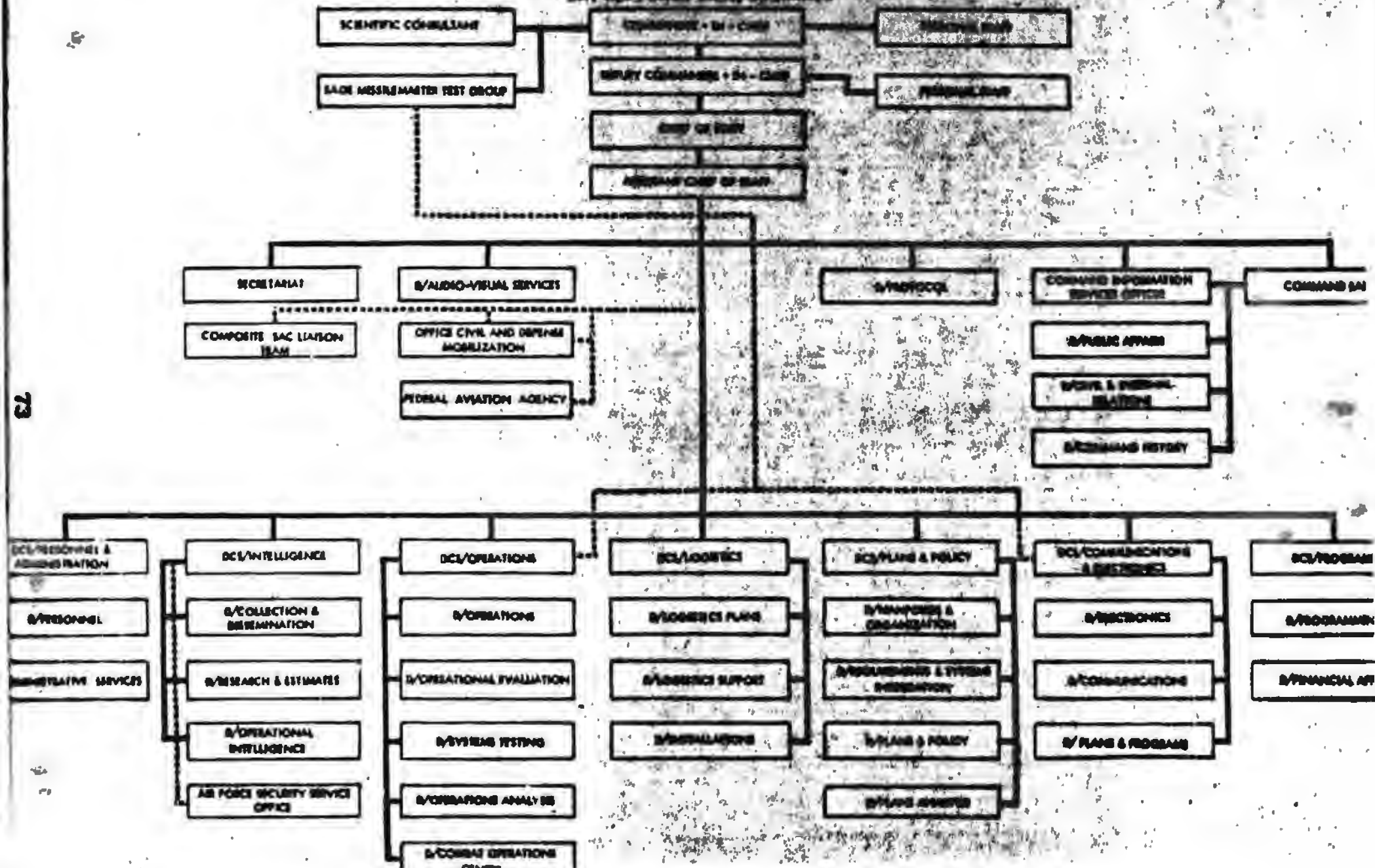
c. The establishment of tactics, procedures and methods for exercising operational control of forces assigned, attached or otherwise made available and for directing the engagement and disengagement of weapons; recommending plans for the operational use of all allocated forces, weapons and equipments and making recommendations concerning present and/or proposed North American air defense concepts.

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

The JCS advised that personnel functions of CONAD, with respect to the components, were limited to the establishment of policies to insure uniform standards of military conduct. Direct training responsibility was to be limited to joint training. NORAD/CONAD functions in weapons and environment systems development and testing was to be limited to preparing qualitative and quantitative requirements, making recommendations for resolution of unsatisfactory situations to the JCS, and working with the Service with development responsibility to include representation at operations test conferences, provision of observers during test operations, and review of test reports.

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A committee formed to put the reorganization plan into force agreed to the following guidelines. In the areas of personnel (J-1), logistics (J-4), and programs, the headquarters would concern itself only with monitoring and providing broad command guidance and policy. This was not true in the remaining J staff areas of intelligence (J-2), operations (J-3), plans and policy (J-5), and communications and electronics (J-6). The latter areas were considered to be of primary concern to NORAD/CONAD.

General Partridge approved the committee's plan including the phased buildup of personnel, and on 3 August 1959 the new seven-deputy organization went into effect. Separate general orders established the staff structure for NORAD and CONAD. They were identical except for the position of Deputy Commander-in-Chief included on the NORAD staff.

REGIONS AND SECTORS

Still needed were separate, independent, NORAD/CONAD-manned subordinate organizations. As stated before, when CONAD was established in 1954, it was superimposed on the existing USAF ADC structure from command headquarters down through division level. Later, CONAD Headquarters was separated from ADC Headquarters. But the situation remained essentially the same below the command headquarters level. ADC subordinate organizations still served as the CONAD organizations and the NORAD organizations as well.

In January 1957, CONAD renamed its joint defense forces "regions" and its joint divisions "divisions." Then in June, it sent a proposed manning plan for its regions and divisions to the JCS. In retrospect, it is obvious that this was an ill-conceived plan mainly because it was premature. It required a large number of people and provided for the three U.S. regions and 16 U.S. divisions then in existence. In all, about 2,000 spaces would have been required. CONAD was on the

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eve of reorganizing its structure to accommodate the SAGE system which would establish more regions, eliminate divisions, move headquarters and boundaries, etc.

The problem was recognized, however, and almost immediately NORAD recalled its plan. Then came the reorganization act of 1958 and attention was concentrated on reorganizing the NORAD/CONAD Headquarters. Not until this was completed did NORAD/CONAD turn back to the problem of manning its subordinate commands.

During 1959 this was worked on and in February 1960, a second organization and manning plan was submitted to the JCS. It covered only the regions on the U.S. mainland and did not mention sectors. Alaskan Region was left to the organization wishes of Commander-in-Chief Alaska and Northern Region was organized separately.

The manpower requirements were much less than those proposed in 1957. Now, for the seven region Headquarters, a total of 479 spaces was asked.

Again, a reorganization of the command structure intervened. A month after the plan was submitted, USAF Headquarters announced drastic reductions in programmed air defense equipment. Among these was cancellation of the SAGE super combat center. Because of these cuts, especially the latter, NORAD revised its plan for its subordinate organizational structure. Among the changes was reduction to six regions in the U.S.

Because of this, the JCS returned the region headquarters plan and asked for a revision in accordance with the planned changes and also for a sector headquarters plan.

A new plan, which included the sectors, was submitted on 28 October 1960, the third such plan to be provided in as many years. It covered

six regions and 21 sectors planned for the U.S. mainland.

On 3 April 1961, the JCS approved this plan. The new headquarters were established on 1 August 1961. Region headquarters now became integrated joint staffs. However, because of the shortage of general officers, there still remained a dual-role arrangement for the command positions. The region commander, by prior agreement with and approval by CINCNORAD, could be additionally designated as the commander of his service component. In one region, the 28th, an Army general officer was appointed commander. He also commanded the 6th Region ARADCOM. The other five regions were commanded by USAF general officers. The deputy commander positions at region were made additional-duty slots for component commanders of a service other than that of the commander and were not carried on the NORAD Joint Table of Distribution. In the 25th, 29th and 30th Regions, Canadian officers were appointed second in command and named vice commanders. A U.S. deputy commander position was then established under the vice commander in these regions.

The new NORAD region headquarters were small, containing only one major staff section -- that of the deputy for operations -- and offices for information and administration. The total manpower authorization for the six region headquarters was 362 -- 203 officers, 98 enlisted men, and 61 civilians. Of these, 63 were RCAF spaces, 77 Army, 11 Navy and 211 USAF. The number of personnel per region varied from 45 for the 32d to 75 for the 25th.

On the sector staffs, 366 NORAD personnel were authorized. Here, only 86 were U.S. spaces, consisting of 63 USAF, 11 Army and 12 Navy. The remaining 280 were RCAF spaces.

APPENDIX

IMPORTANT EVENTS

IN AIR DEFENSE

1945

21 December - Alaskan Air Command activated at Davis Field, Alaska.

1946

27 March - AAF Air Defense Command activated at Mitchel Field, New York.

18 August - First post-war interceptor unit assigned to Alaska, the 57th Fighter-Interceptor Group.

First post-war radar units formed in Alaska, the 626th ACW Squadron at Davis, and the 628th ACW Squadron at Shemya.

1947

1 January - Alaskan Command established by the JCS as a unified command at Elmendorf AFB.

21 May - First post-war ACW organization activated in the U.S. -- the 505th ACW Group at McChord AFB, Washington.

26 July - Air Force became a separate service.

15 November - U.S. Army Alaska and Alaskan Sea Frontier formed.

17 December - USAF granted authority to ADC to use fighter and radar forces of SAC, TAC, and the Air National Guard in an emergency.

1948

- 27 March** - ADC and Alaskan Air Command ordered by USAF to place their systems on around-the-clock operations. Order, rescinded shortly thereafter, revealed just how feeble air defenses were.
- 31 April** - Secretary of Defense order following Key West Agreement assigned Air Force primary responsibility for air defense.
- 23 April** - ADC directed to establish radar systems in the Northwest, Northeast, and Albuquerque, New Mexico area.
- 30 April** - First radar unit on East Coast of U.S. formed — the 503d ACAN Group at Roslyn AFB, New York.
- May** - First antiaircraft unit arrived in Alaska, the 867th AA Battalion.
- 25 October** - First air defense division organization established, the 25th Air Division, at Silver Lake (Everett), Washington.
- 16 November** - First division on East Coast formed, the 26th Air Division, at Mitchel Field, New York.
- 1 December** - RCAF Air Defence Group formed at Air Force Headquarters, Ottawa (moved to St. Hubert, P.Q., on 1 November 1949).

First post-war RCAF interceptor squadron formed, 410th Squadron.

USAF established the Continental Air Command and placed ADC and TAC under it as operational commands.

1949

- 21 March** - Congress approved a large radar program for the U.S. and Alaska, the Permanent Radar Program.
- 1-30 June** - Operation Blackjack held, first air defense exercise in the Northeast.
- 1 September** - Eastern and Western Air Defense Forces activated by ADC.
- 23 September** - President Truman announced that Russia had exploded an atomic bomb.
- 2-14 November** - Operation Drummerboy held, first large-scale air defense exercise in the Northwest.
- 29 December** - First agreement between an air defense force of ADC and a Navy sea frontier (RADF and Eastern Sea Frontier) for Navy participation in emergency air defense.

1950

- 1 February** - Continental Air Command directed by USAF to establish a Civil Air Raid Warning System.
- 8 April** - ConAC authorized to begin limited intercept for identification with armed fighters.
- 26 May** - First jet all-weather-type interceptor, the F-94A, assigned to an ADC squadron.
- 1 June** - ConAC directed to establish a Military Air Raid Warning System.

1950

- 1 June - ComAC authorized to establish a Ground Observer Corps (informally authorized the preceding February).
First Canadian-U.S. Emergency Air Defense Plan.
- 25 June - Start of war in Korea.
- 27 June - Air defense systems of U.S. and Alaska began around-the-clock operations.
- 1 July - Army Antiaircraft Command Headquarters formed by U.S. Army at the Pentagon.
USAF Air Defense Command was discontinued.
- 19 July - Regulations issued by Air Force, Army, and Navy established air defense identification zones (made applicable to civilian traffic by CAA regulation of 27 December 1950).
- 1 August - Collins-Vandenberg Agreement (Army and Air Force Chiefs of Staff) provided rules for operational control of Army antiaircraft forces.
- 24 August - President authorized interception and engagement of aircraft anywhere in the U.S.
- 1 September - ARAACOM regional commands, Eastern and Western, created.
- 1 October - U.S. Northeast Command established by JCS and Northeast Air Command established by USAF, with headquarters at Pepperrell AFB, Newfoundland.

1950

- 1 November - 10th and 11th Air Divisions formed in Alaska.
- 22 December - Navy began arrangements to have two picket ships available on 24-hour notice for duty in an emergency off the East Coast.

1951

- 1 January - Air Defense Command re-established at Mitchel Field, New York (opened at Ent AFB, Colorado, on 8 January 1951).
- 15 January - ARAACOM Headquarters moved to Colorado Springs, from Mitchel AFB, New York.
- 1 February - Fifteen ANG fighter squadrons federalized and assigned to ADC (six more ANG squadrons assigned on 1 March).
- 1 March - ADC activated its third defense force, Central, at Kansas City, Missouri.
- 10 April - ARAACOM assumed, for the first time, command of all antiaircraft forces allocated to air defense in the U.S.
- 21 April - First formal agreement made by ADC with another Air Force command for use of its forces in an emergency (signed with Tactical Air Command).
- 24 April - ARAACOM established its third regional command, Central.
- 1 June - ECAF Air Defence Group redesignated as the Air Defence Command.

1951

1 July

- RCAF ADC began establishment of a national organization with the formation of the 12th Air Defence Group at Vancouver, B.C.

USAF ADC completed its 11 air division structure with activation of the 35th Air Division at Dobbins AFB, Georgia.

10 July

- Second major radar program for U.S. approved by USAF, the Mobile Radar Program.

1 August

- Exchange of notes constituted formal U.S. and Canada agreement for the building of Pinetree Radar System in Canada.

December

- President ordered that procedures be set up for control of electromagnetic radiations in an emergency.

1952

10 March

- First Multiple Corridor System for identification of traffic coming in from overseas placed in operation, outside of San Francisco.

27 May

- Basic construction on the Permanent Radar System completed.

1 July

- Federal Civil Defense Administration took over the operation of the Civil Air Raid Warning System.

14 July

- Start of Ground Observer Corps Operation Skywatch -- 24-hour operation of posts.

1952

- 15 July** - Plan for the Security Control of Air Traffic signed by the Secretary of Defense and Secretary of Commerce.
- 24-28 July** - Operation Signpost held, first nation-wide air defense exercise in the U.S. (RCAF ADC also conducted an exercise from 19-28 July).
- 23 September** - Navy picket ship placed on around-the-clock duty for first time -- off East Coast.
- 1 October** - First Canadian Ground Observer Corps units organized.

1953

- 7 March** - First rocket-bearing interceptor, the F-84C, assigned to an ADC squadron.
- 1 April** - First CF-100 squadron formed by the RCAF ADC.
- 10 April** - USAF adopted the Semi-Automatic Ground Environment (SAGE) System developed by M.I.T.'s Lincoln Laboratory.
- 13 April** - Last station of U.S. Permanent Radar System became operational.
- 21 April** - RCAF ADC and Northeast Command signed agreement giving operational control of U.S. air defense forces in Canada to AOC RCAF ADC.
- 3 July** - First antiaircraft unit arrived at Thule, Greenland.

1953

- 8 October** - Canada-U.S. Military Study Group recommended establishment of a warning line along the 55th parallel -- led to building of the Mid-Canada Line.
- 17 December** - First operational missile unit in ARAACOM moved on site at Ft. George G. Meade, Maryland, the 1st Missile Battalion, 562d Artillery.
- 24 December** - Air Force-Navy agreement completed on forces and control for seaward extension of radar for contiguous system and DEW Line barriers.

1954

- 11 January** - USAF approved a third major radar program for the U.S., the low-altitude gap-filler radar program. USAF also approved the building of five Texas Towers off the Atlantic Coast.
- 24 February** - President approved recommendation of National Security Council that a Distant Early Warning Line be built. Canada approved in late 1954.
- 1 May** - Russia displayed a jet bomber for the first time.
- 18 May** - First meeting of the Combined Canada-U.S. ADC's Planning Group.
- 30 June** - Canadian Government agreed to build the Mid-Canada Line.
- 6 July** - The last piston-engine interceptor removed from USAF ADC force.

1954

- 1 August - Airborne early warning operations began off the West Coast.
- 15 August - Air National Guard began placing aircraft on alert (eight locations at this time).
- 1 September - Continental Air Defense Command established by the JCS at Ent AFB, Colorado, as a joint command for air defense of the continental U.S.
- 1 September - Naval Forces CONAD established at Ent AFB -- the Navy component command of CONAD.
- 15 November - Last of nine CF-100 interceptor squadrons formed by USAF.

1955

- 15 January - All Pinetree System radar stations were operating.
- 15 February - USAF ADC interceptor force completely converted to jet all-weather interceptors.
- 20 July - General Earle E. Partridge assumed command of USAF ADC and CONAD, replacing General Benjamin W. Chidlaw.
- 30 July - First West Coast picket ship station manned full time.
- 8 October - USAF ADC structure increased to 16 divisions with activation of 20th Air Division at Richards-Gebaur AFB, Missouri; this organization remained until the start of SAGE operation and the necessary reorganization.

1953

- 17 November - ARAACON Nike-Ajax batteries deployed equalled its gun batteries.
- 1 December - Navy began placing fighter aircraft on air defense alert at San Diego, California.

1956

- 22 January - JCS approved in principle a recommendation of the USAF Chief of Staff that there was a need for peacetime integration of the operational control of the Canadian-U.S. air defense forces.
- April - First super-sonic, century series aircraft, the F-102A, assigned to a USAF ADC squadron, the 327th.
- 7 May - First Texas Tower, TT-2 on Georges Shoal off Massachusetts, started operating.
- 3 July - JCS Revised Unified Command Plan issue; provided for abolition of the U.S. Northeast Command and assignment of responsibility for air defense of the Northeast and of Alaska to CINCONAD, effective 1 September 1956.
- 1 September - CINCONAD assumed responsibility for air defense of Alaska and Northeast Area.

U.S. Northeast Command discontinued by JCS.

Antiaircraft forces in Thule assigned to Army Antiaircraft Command.

1956

- 4 September** - New terms of reference for CONAD provided for enlargement of responsibility and for a change in organization including separation of CONAD and ADC Headquarters.
- 17 September** - A new staff structure for a separate CONAD Headquarters was established.
- 30 October** - Office of Secretary of Defense concurred with CONAD's recommendation to collocate the Army Missile Master and Air Force direction center.
- 19 December** - Canada-U.S. Military Study Group recommended to JCS and COSC integration of operational control of Canada-U.S. air defense forces.

1957

- 1 January** - Date of AOC RCAF ADC/CINCONAD agreement on operational control of Canada-U.S. air defense forces in Canada.
- 21 March** - U.S. Army Antiaircraft Command was redesignated the U.S. Army Air Defense Command.
- 1 April** - USAF Northeast Air Command inactivated.

64th CONAD Division established at Pepperrell AFB, Newfoundland, became CONAD's subordinate command in Northeast area for exercising operational control of air defense forces.
- 1 July** - Atlantic DEW Line Sea Barrier became fully operational.

1957

- 1 July - Navy blimp squadron, ZW-1, began manning a station off the East Coast.
- 15 July - DEW Line from Cape Dyer, Baffin Island to Cape Lisburne, Alaska, declared technically ready.
- 1 August - Joint announcement of Canadian Minister of National Defence and U.S. Secretary of Defense of agreement by governments to integrate operational control of air defense forces and set up an integrated command.
- 13 August - DEW Line dedicated by the Air Force.
- 18 September - North American Air Defense Command established with headquarters at Ent AFB, Colorado.
- 4 October - Sputnik I, the first man-made earth satellite, launched by the U.S.S.R.
- 5 December - First Army Missile Master became operational, located in the Washington-Baltimore area under 35th Air Defense Artillery Brigade.

1958

- 1 January - U.S. Ground Observer Corps reduced from 24-hour to ready reserve status.
- Mid-Canada Line declared fully operational.

1958

14 January

- Secretary of Defense authorized the Air Force to proceed immediately with development of a ballistic missile early warning system.

3 May

- Office of the Secretary of Defense approved COMAD's plan for testing SAGE-Missile Master Integration (NORAD formed a test group on 24 February 1958).

12 May

- Exchange of notes constituted formal agreement on establishment of NORAD between Canada and U.S.

16 May

- First NORAD Control Center, located at Geiger Field, Washington, became operational.

10 June

- Terms of reference for NORAD assigning it the mission of defending the continental U.S., Canada, and Alaska against air attack.

26 June

- First SAGE sector, New York, became operational.

30 June

- First USARADCOM unit became operational with Nike-Hercules, Battery A, 2d Missile Battalion, 57th Artillery, near Chicago.

July

- Pacific Sea Barrier became fully operational.

at

- Department of Defense Reorganization Act signed by the President.

- USAF ADC designated its first SAGE division, the 26th, Syracuse, New York.

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1958

- 8 September** - New Unified Command Plan issued by JCS making COMAD a unified command responsible to the Secretary of Defense and JCS.
- 23 September** - Canada's Prime Minister announced that the CF-105 "Arrow" would not be put into production.
- 1 December** - Termination of executive agency control of Alaska command by Air Force and transfer to control of JCS.
- 31 December** - New terms of reference for CINCOMAD as commander of unified command (effective 1 January 1959).

1959

- 1 January** - Termination of executive agency control of COMAD by the Air Force and transfer of control to the JCS.
- First SAGE division became operational, the 26th, Syracuse, New York.
- 5 January** - USAF advised that governments of Canada and U.S. had agreed, in principle, to a cost sharing arrangement for joint air defense programs in Canada (which became known as the Continental Air Defense Integration, North (CADIN) Program).
- 31 January** - U.S. Ground Observer Corps inactivated.

1959

- 5 February** - USAF approved ADC plan for employment of the SAGE solid state computer, AN/FSQ-32V in nine division combat centers in the U.S. and one in Canada. The new centers in hardened facilities were termed "Super Combat Centers."
- 12 March** - First Nike-Hercules unit in Alaska became operational.
- 12 March** - JCS approved locating new NORAD Combat Operations Center in Cheyenne Mountain, south of Colorado Springs, Colorado.
- 12 June** - Secretary of Defense provided new air defense program, Continental Air Defense Program; it included cuts in BOMARC and SAGE programs.
- 23 June** - JCS approved NORAD/CONAD Headquarters reorganization plan, which was prepared in accordance with Defense Reorganization Act.
- 1 July** - USAF cancelled requirement for DEW Line radar improvements.
- 1 August** - General Laurence S. Kuter succeeded General Earle E. Partridge as Commander-in-Chief of NORAD/CONAD.

Eastern NORAD/CONAD Region discontinued and 26th, 30th, and 32d Divisions designated regions -- start of replacing of geographically designated regions with numerically-designated regions under SAGE reorganization.

1959

- 17 August** - Canadian Cabinet Defence Committee approved, in principle, the Canadian participation in NORAD region and sector headquarters.
- 1 September** - First BOMARC squadron, 46th Air Defense Missile Squadron (BOMARC), McGuire AFB, N.J., became operational.
- 14 September** - DOD authorized Air Force to implement third BMEWS site, to be located in the U.K.
- 17 September** - USAF cancelled requirement for follow-on ANWAC aircraft.
- 23 September** - USAF stopped all work on development of the F-108 long-range interceptor.
- 14 October** - USAF approved implementation of interim BMEWS display facility at Fort AFB, Colorado.
- 1 November** - Northern NORAD Region Headquarters in Canada organized, first region headquarters organized and manned.
- 24 November** - Work on new NORAD hardened combat operations center in Cheyenne Mountain stopped.

1960

- 1 January** - Central NORAD/CONAD Region discontinued and the 29th and 33d NORAD/CONAD Divisions redesignated as regions.
- 26 March** - Navy picket ships withdrawn from Atlantic DEF Line Barrier.

1960

- 30 March** - USAF advised of extensive cuts in the program for air defense equipment to meet the manned bomber threat, including reduction of BOMARC squadrons and cancellation of SAGE Super Combat Centers.
- 1 April** - NORAD/CONAD discontinued 64th Division at Pepperrell AFB, Newfoundland (because of Air Force decision to close down this base) and set up Goose Sector to handle operations, with headquarters at Melville AS, Labrador.
- Navy picket ships withdrawn from Pacific DEW Line Barrier.
- 15 May** - 25th and 5th NORAD Divisions merged; 25th assumed operational control of units in 5th's area; 5th Division was discontinued.
- 1 June** - Canadian Ground Observer Corps south of the 55th parallel were disbanded.
- 15 June** - Last gun battalion in ARADCOM inactivated, the 2d Gun Battalion, 68th Artillery.
- 16 June** - Office of Secretary of Defense authorized a tracking radar for BMEWS Sites 1 and 2.
- 20 June** - Office of Secretary of Defense approved NORAD recommendation to relocate programmed Nike-Hercules units from SAC bases in interior of U.S. to important populated areas.

96

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1960

1 July

- Navy blimp squadron, ZV-1, stopped manning a station in Atlantic contiguous system and dropped air defense as a primary mission.

Western NORAD/CONAD Region discontinued and 25th and 28th NORAD/CONAD Divisions redesignated as regions. This established a seven-region structure on the U.S. mainland -- the original goal of the SAGE reorganization.

USAF ABC reached a seven SAGE division structure.

26 July

- ARADCOM added a sixth region to its structure, the 7th Region, USARADCOM, with headquarters at McChord AFB, Washington.

10 September

- Exercise Skysield held, first continent-wide exercise under NORAD direction and first grounding of all non-exercise air traffic in U.S. and Canada.

16 September

- JCS approved NORAD recommendation for operational control of Air Force Bomb Alarm System.

1 October

- BMEWS Site 1, Thule, Greenland, detection radars reached initial operational capability -- first operation of BMEWS.

7 November

- JCS gave NORAD operational control and CONAD operational command of the Space Detection and Tracking System.

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97

1960

1 December

- Air National Guard squadrons picked by NORAD and ADC for a Category I (24-hour ready) role approved by the JCS.

1961

14 February

- The 1st Aerospace Surveillance and Control Squadron was established at Ent AFB by ADC to operate the SPADATS center.

1 March

- The last Army National Guard unit traded its guns for the Ajax missile -- making the ANGG completely missile-armed.

12 April

- Russian cosmonaut Yuri Gagarin made orbit around the earth once in first space flight by man.

18 May

- Excavation began for the NORAD hardened COC in Cheyenne Mountain south of Colorado Springs.

23 May

- The Office of the Secretary of Defense approved nuclear weapons for the ANG Category I squadrons.

1 June

- The first squadron with improved BOMARC ("B's") became operational.

12 June

- SPADAT operations center at Ent AFB became operational.

Canadian-U.S. governments agreed on a transfer of 66 F-101B aircraft from USAF ADC to RCAF ADC (first one delivered in October).

ROSTER OF COMMANDERS

AAF/USAF AIR DEFENSE COMMAND

Lt Gen George E. Stratmeyer....Mar 46-Dec 48
 Maj Gen Gordon P. Saville.....Dec 48-Sep 49

CONTINENTAL AIR COMMAND

Lt Gen George E. Stratmeyer....Dec 48-Apr 49
 Lt Gen Ennis C. Whitehead.....Apr 49-Dec 50

HARP AIR DEFENSE COMMAND

Lt Gen Ennis C. Whitehead.....Jan 51-Aug 51
 Gen Benjamin W. Chidlaw.....Aug 51-May 55
 Maj Gen Frederic H. Smith.....May 55-Jul 55
 Gen Earle E. Partridge.....Jul 55-Sep 56
 Lt Gen Joseph H. Atkinson.....Sep 56-Feb 61
 Lt Gen Robert M. Lee.....Mar 61-

ALASKAN AIR COMMAND

Brig Gen Edmund C. Lynch.....Dec 45-Oct 46
 Brig Gen Joseph H. Atkinson.....Oct 46-Feb 49
 Brig Gen Frank A. Armstrong....Feb 49-Dec 50
 Maj Gen William D. Old.....Dec 50-Oct 52
 Brig Gen W. R. Agee.....Oct 52-Feb 53
 Maj Gen George R. Acheson.....Feb 53-Feb 56
 Lt Gen Joseph H. Atkinson.....Feb 56-Jul 56
 Maj Gen Frank A. Armstrong.....Jul 56-Oct 56
 Maj Gen James H. Davies.....Oct 56-Jun 57
 Maj Gen Frank A. Armstrong.....Jun 57-Aug 57
 Brig Gen Kenneth H. Gibson.....Aug 57-Aug 58
 Maj Gen C. F. Necrason.....Aug 58-Jul 61
 Maj Gen Wendell W. Bowman.....Jul 61-

ALASKAN COMMAND

Maj Gen Howard A. Craig.....Jun 57-Aug 57
 Lt Gen Nathan F. Twining.....47- 50
 Lt Gen William E. Kepner.....50- 53

ALASKAN COMMAND

Lt Gen Joseph H. Atkinson..... 53-Jul 56
Lt Gen Frank A. Armstrong.....Jul 56-Jul 61
Lt Gen George W. Mundy.....Jul 61-

BCAF AIR DEFENCE GROUP/AIR DEFENCE COMMAND

G/C W. R. MacBrien.....Dec 48-May 51
A/V/M C. R. Dunlap.....Jun 51-Jul 51
A/V/M A. L. James.....Aug 51-Sep 54
A/C C. L. Annis.....Sep 54-Jan 55
A/V/M L. E. Wray.....Jan 55-Aug 58
A/V/M W. R. MacBrien.....Aug 58-

ARMY ANTIAIRCRAFT COMMAND/ARMY AIR DEFENSE COMMAND

Maj Gen Willard W. Irvine.....Jul 50-May 52
Lt Gen John T. Lewis.....May 52-Sep 54
Lt Gen Stanley R. Nickelsen.....Oct 54-Oct 57
Lt Gen Charles E. Hart.....Nov 57-Jul 60
Lt Gen Robert J. Wood.....Aug 60-Jan 62
Lt Gen William W. Dick, Jr.....Jan 62-

UNITED STATES NORTHEAST COMMAND and NORTHEAST AIR COMMAND

Maj Gen Lyman P. Whitten.....Oct 50-Mar 52
Maj Gen Charles T. Myers.....Mar 52-Jul 54
Lt Gen Glenn O. Barcus.....Jul 54-Sep 56

NORTHEAST AIR COMMAND

Lt Gen Glenn O. Barcus.....Sep 56-Apr 57

NAVAL FORCES CONTINENTAL AIR DEFENSE COMMAND

Radm Albert K. Morehouse.....Sep 54-Dec 55
Capt Dennis J. Sullivan.....Dec 55-Apr 56
Radm Hugh H. Goodwin.....Apr 56-May 57
Capt John G. Howell.....May 57-Jul 57
Capt George L. Kohr.....Jul 57-Sep 57
Radm Walter F. Rodee.....Sep 57-Apr 60
Radm Thomas A. Ahroon.....Apr 60-

CONTINENTAL AIR DEFENSE COMMAND

Gen Benjamin W. Chidlaw.....Sep 54-May 55
 Lt Gen Stanley R. Nickelsen.....May 55-Jul 55
 Gen Earle E. Partridge.....Jul 55-Jul 59
 Gen Laurence S. Enter.....Aug 59-Jul 62
 Gen John K. Gerhart.....Aug 62

NORTH AMERICAN AIR DEFENSE COMMAND

Gen Earle E. Partridge.....Sep 57-Jul 59
 Gen Laurence S. Enter.....Aug 59-Aug 62
 Gen John K. Gerhart.....Aug 62

DISTRIBUTION

NORAD Regions	3
NORAD Sectors	1
NORAD Hq	41
TOTAL	90

Hq NORAD Distribution:

NHCR	1
NMFO	1
NAPA	1
NINT	1
NITA	1
NIPO	1
NOPS	1
NOOP	1
NOHV	1
NOST	1
NOQA	1
NOGC	1
NLOG	1
NLOO	1
NLOI	1
NPAF	1
NPMO	1
NPSD	1
NPPP	1
NPPA	1
NELC	1
NELC-AP	1
NEEC	1
NECO	1
NGAM	1
NGPM	1
NGFA	1
NNCH	5
NASV-M (Stock)	9