



HISTORICAL REVIEW OF
NORTH AMERICAN AEROSPACE DEFENSE (U)

1946 - 1970

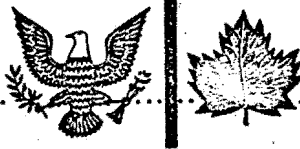
HISTORICAL REFERENCE PAPER NO. 15
1 OCTOBER 1970

COMMAND HISTORY DIVISION
SECRETARY, JOINT STAFF
HEADQUARTERS NORAD



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FOREWORD

This paper summarizes the main line of development and changes in North American aerospace defense from 1946 to early 1970. The main purpose of the paper is to provide an orientation history for newly-assigned personnel. It also provides all readers a reference to key activities over the years.

Obviously, in so brief a study of so vast a subject, many activities of importance could not be covered. Detailed annual histories of NORAD/CONAD are available to readers who wish further information.

This paper is an updating and revision of Historical Reference Paper No. 14, 15 May 1968, which it replaces.

Colorado Springs, Colorado
1 October 1970



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CHAPTER ONE

THE FOUNDATIONS 1946 - 1951

PRIOR TO KOREA - AIR DEFENSE IN NAME ONLY

(U) An ADC officer wrote in 1946 that it seemed the War Department feared another Pearl Harbor in the U.S., but was unwilling to do anything about it and had "passed the buck on down the line so that a scape-goat will be convenient if necessary." Whatever the merits, this view shows the frustration that ADC officers felt in 1946 trying to carry out the mission of defending the U.S. with almost no forces.

(U) The AAF Air Defense Command was activated at Mitchel Field, N.Y., in March 1946 under Lieutenant General George E. Stratemeyer. It was given two fighter squadrons, a few radars, and an organization of six numbered air forces, only two of which were active. There was about the same size force in Alaska. The AAF had organized the Alaskan Air Command in December 1945 at Davis Airfield under Brigadier General Edmund C. Lynch. AAC inherited two radar squadrons and three interceptor squadrons.

(U) Post-war demobilization made all resources scarce. But also, the U.S. felt secure behind its atomic monopoly and long-range bombers so that air defense got little attention at first. But it is apparent in retrospect that while the defenses were weak, there was really no great threat. Air defense was just starting out, but Russia was just starting to build an offense. Of course, the threat picture



soon changed. By 1 January 1949, it was estimated that the Soviets had 250 TU-4 Bulls, an aircraft approximately equal to the USAF B-29A,* and in the fall of that year Russia exploded an atomic bomb.

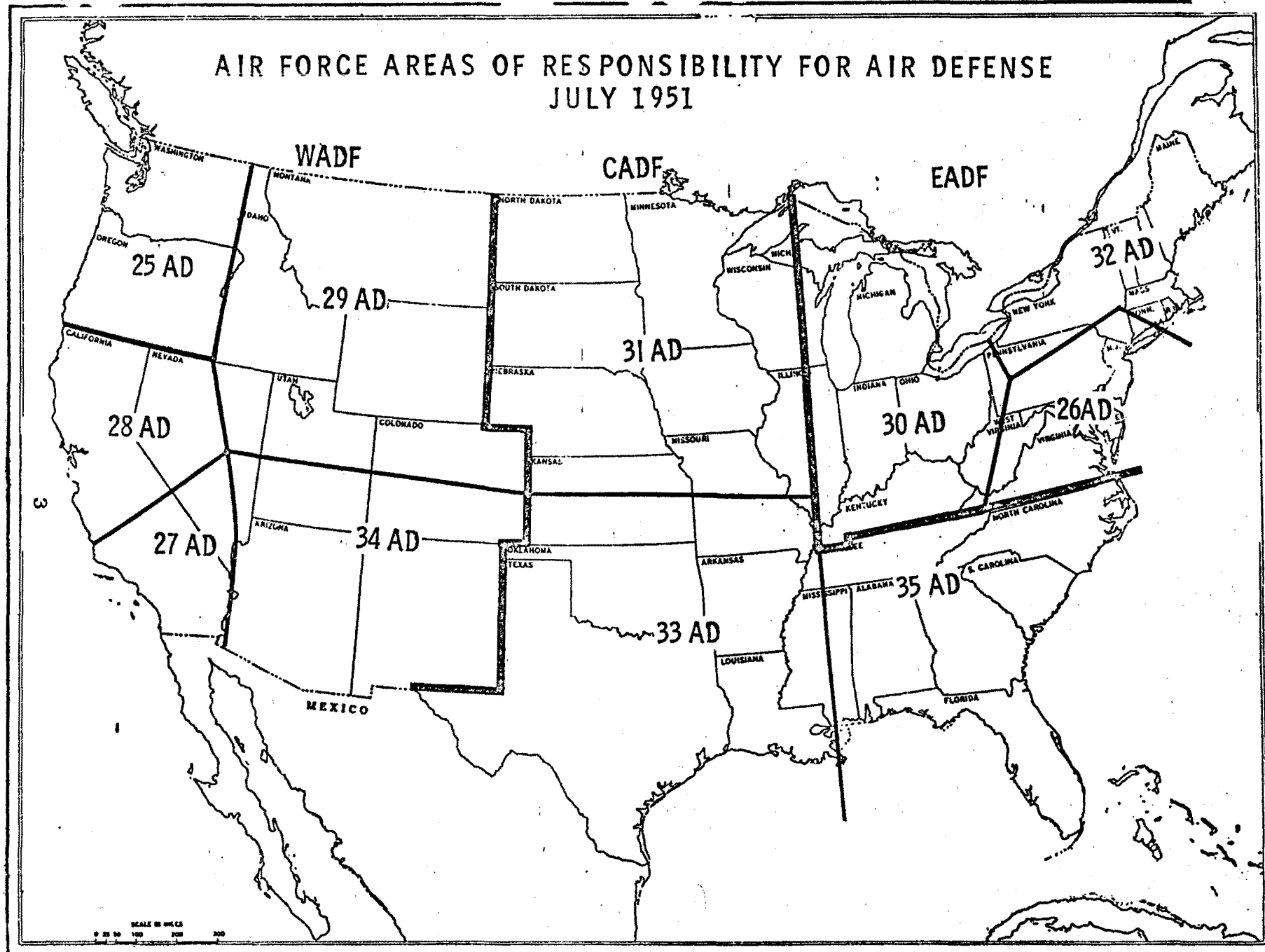
(U) In 1948, Air Force Headquarters, spurred by crises in the world, erected a temporary radar network with World War II equipment. By the time of the Korean War, June 1950, ADC had 44 stations operating. In Alaska, AAC had a five-station temporary system by the latter date. In Canada, an Air Defence Group was set up on 1 December 1948 as a separate organization within Headquarters RCAF at Ottawa. This group moved to RCAF Station St. Hubert the following year. There were three radars operating in Canada in the middle of 1950.

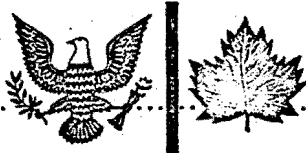
(U) In all, thus, there were a total of 52 radars operating in North American air defense at mid-1950.

(U) Meanwhile, in March 1949, Congress approved an Air Force request to build a new radar system for the U.S. and Alaska. This project was to provide 75 stations and ten control centers in the U.S. and ten stations and two control centers in Alaska. These radars were called Permanent (P) System stations to distinguish them from the temporary

* (U) The TU-4 was so similar to the B-29 that a worry was that if an attack were made, the Russians might put U.S. markings on their bombers to confuse the defenses. ADC pilots were saying that if one went up to identify a B-29-type bomber, identification could be made by looking in the window. If someone in there was pouring coffee out of a thermos, the bomber was American, but if he was pouring tea out of a samovar, it was Russian.

AIR FORCE AREAS OF RESPONSIBILITY FOR AIR DEFENSE JULY 1951





stations built earlier. The "P" designation for stations in the U.S. was used until July 1963.*

(U) ADC also tried to solve the problem of poor surveillance at low altitude with a civilian observer system. Approval was given by USAF on 1 June 1950 to set up in the U.S. a Ground Observer Corps of 26 filter centers and their associated observation posts.

(U) Interceptor strength rose slowly alongside the growth of the radar net. In the U.S., ADC's force grew to 23 squadrons by mid-1950. Alaskan Air Command had four squadrons by that time. The aircraft in use were propellor-driven types and day jets mostly. There were also a few F-94As, an early radar-equipped jet. Canada's first post-war interceptor squadron was formed in December 1948. A second squadron was added the next year. This made a total of 29 regular interceptor squadrons on the North American continent at the start of the Korean War.

* (U) Until July 1963, there was a profusion of designations for radar sites in the CONUS. The sites were designated in accordance with the program under which they were built, e.g., P for Permanent Program, M for Mobile, SM for Second-Phase Mobile, TM for Third-Phase Mobile, etc. All ADC CONUS stations were redesignated "Z" in July 1963.



(U) Army antiaircraft forces were not significant in air defense before the Korean War. Until early 1950, there were no units assigned primarily to air defense in the continental U.S. And at that time, the only AA units on site were at the Soo Locks and the Hanford AEC installation. In Alaska, the U.S. Army Alaska (USARAL) had three gun battalions by mid-1950.

(U) In the meantime, in the U.S. in 1948, USAF tried pooling resources to increase the force available by placing the Tactical Air Command and ADC under a new command, the Continental Air Command. The latter eventually took over direction of the air defense effort. In 1949, ADC was reduced to record status and on 1 July 1950 was abolished.

AFTER KOREA - AIR DEFENSE BUILDUP

(U) The start of the Korean War marked a sharp turning point in air defense buildup as it did military preparedness in general. The Korean War followed a long series of crises and threats to peace that included the Berlin Blockade and the Russian explosion of an atomic bomb. And then suddenly there was a hot war and the lid on preparedness came off.

(U) On 27 June 1950, both the Continental Air Command and the Alaskan Air Command began 24-hour operations. Around-the-clock operation of the air defense system in the U.S. and Alaska dates from this time. ADC was re-established on 1 January 1951 and opened at Colorado Springs, Colorado, on the 8th. Shortly thereafter, 21 Air National Guard fighter squadrons were federalized and assigned to ADC, doubling its interceptor strength. A second major radar program for ADC was approved by USAF in 1951. Given the name Mobile Program (because



the idea at first was to deploy mobile radars), it provided for 44 radars to start with.

(U) The Army formed the Army Antiaircraft Command (ARAACOM) on 1 July 1950 at the Pentagon under Major General Willard W. Irvine. The following January, ARAACOM Headquarters moved to Colorado Springs. The Army command got 23 gun battalions in April 1951 and increased in strength to 45 battalions by the end of that year, half the increase (ten battalions) coming from the National Guard.

(U) In Canada, the Air Defence Group formed in 1948 was redesignated the Air Defence Command on 1 June 1951 and placed under then Air Vice Marshal C. R. Dunlap.* By this time, the U.S. and Canada had worked out arrangements for a radar extension plan (later termed the Pinetree Plan) to build 33 radar stations in Canada. Formal agreement was concluded with an exchange of notes on 1 August 1951. The 33 stations were to run across southern Canada and up the east coast. The U.S. was to finance 22, Canada 11. Manning and operation were also to be divided. The Northeast Air Command (see below) was to man nine of the stations in its area, USAF ADC was to man eight along the southern Canadian border and RCAF ADC was to man the other 16. To provide coverage until the Pinetree radars began operating, Canada set up a five-station temporary system.

(U) RCAF ADC's interceptor force was brought to a total of six squadrons by the end of 1951. Its force was equipped with Vampire, Mustang and Sabre aircraft.

* (U) Later to reach air marshal rank and to become RCAF Chief of Staff and, in 1964, Deputy Commander-in-Chief of NORAD.



(U) A final part of this emergency-inspired effort to get a defense in being was made in the area termed the Northeast. This included Newfoundland, Labrador, Northeastern Canada, and Greenland. On 1 October 1950, the JCS established the U.S. Northeast Command (USNEC) at Pepperrell AFB, St. Johns, Newfoundland. Part of USNEC's mission was to defend the U.S. from attack through the arctic regions in the Northeast area. Also on 1 October, USAF established the Northeast Air Command (NEAC) at the same base, as the Air Force component of USNEC. Major General Lyman P. Whitten was named commander of both organizations.

(U) As noted above, NEAC's permanent radars were part of the Pinetree System, with the exception of three radars in Greenland. As in other areas, while a permanent net was being built, a temporary system was set up. This consisted of five stations in NEAC, none of which became operational before 1952. NEAC had no other air defense forces before 1952 when its first interceptor squadron arrived.



CHAPTER TWO

MANNED BOMBER DEFENSE 1951 - 1959

DEVELOPMENT - AT A GLANCE

(U) From 1951 to about 1959, manned bomber defense grew and improved nearly continuously. Having only a small force of World War II equipment to start with, air defense had much room for expansion and improvement. Growth during these years spread the defenses from around a few targets to cover the whole continent and there was continuous modernization. New weapons replaced the old twice during this time. But the threat also changed, going from the TU-4 propellor-driven bomber to jet bombers and the intercontinental ballistic missile. Space weapons were on the horizon.

(U) The growth of the manned bomber defenses during the 1950s can be illustrated by a few comparisons. At the end of 1951, the forces on the North American continent consisted of 51 interceptor squadrons, 48 antiaircraft gun battalions, and 65 radar stations. At the end of 1959, the regular forces amounted to 67 interceptor squadrons (down from a peak of 86 in 1957), 61 Nike Ajax/Hercules missile battalions, two Bomarc A squadrons, three Skysweeper gun battalions and over 300 radar stations plus the DEW and Mid-Canada Lines and extensions.

(U) Numbers by themselves mean little, of course. In comparison with the 1959 force, the 1951 force was in the horse and buggy days. For example, the interceptors in 1951 were mainly propellor-driven planes or day jets. A few all-weather jets, F-89B or F-94A, were available. But the F-94s had no de-icing equipment. Interceptors carried fixed guns, either .50 caliber machine guns or 20mm

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cannons. The antiaircraft weapons were 40mm, 90mm, and 120mm guns. The radars were World War II types, almost entirely, clustered around only the most vital target areas.

(U) At the end of 1959, over half of the interceptor force were all-weather super-sonic jets. The others were advanced models of earlier all-weather jets, such as the F-89J and F-86L. Interceptors were armed with rockets or missiles and over a third of the U.S. aircraft could employ nuclear weapons. Every important area of the U.S. and Alaska was defended with Nike missiles. The 300-plus radar stations provided coverage over and around the populated areas. The DEW Line with its extensions and sea barriers and the Mid-Canada Line provided early warning.

GUIDING CONCEPTS

(U) Two basic concepts guided U.S. and Canadian air defense officials in planning and developing the manned bomber defense system. One was the "polar-orientation" concept. This concept was that the defenses should face or be oriented northward -- the direction from which an attack was considered most likely to come. This concept prevailed right from the start of post-war air defense. Expansion of the system, therefore, was generally in a northerly direction.

(U) The other concept was that there should be a progressively concentrated "defense in depth." According to this concept, an enemy should be attacked as far out as possible initially and the pressure on him increased as he neared his objectives by the employment of increasing numbers and varieties of weapons (hence was added a "family of



weapons" concept). This defense in depth concept can be seen in very early plans and was fully developed in USAF ADC's requirements plan for 1954 to 1960 issued in mid-1953. CONAD and NORAD adopted this concept.

THE RADAR NET

(U) In keeping with the above, the radar net was developed in two ways -- growth and improvement of coverage over and around the target areas and extension northward from the target areas. The former is covered below under land-based systems and seaward extension and the latter under early warning.

LAND-BASED SYSTEMS

(U) As shown in the first chapter, the foundations were laid for the basic radar systems in the U.S., Canada and Alaska by the start of 1951. These were the Permanent System of 75 stations in the U.S. and ten in Alaska, and the Pinetree System of 33 stations in Canada. The basic system was operating in the U.S. by 1952, and in all other areas by 1954. But even before these systems were completed the USAF and RCAF were extending coverage and filling gaps.

(C) To beef up coverage in general and protect SAC bases, in July 1951, a second major program, the Mobile Program was approved by USAF. A third land-based program for the U.S. was approved by USAF in January 1954. This provided radars for low-altitude coverage, called Gap Filler radars. Initially, ADC proposed 323 gap-filler stations but soon dropped its goal to 235 sites. Many revisions followed, however, and at the end of 1959, 195 stations were programmed, 108 operational.



(U) Before the gap-filler system was operating, ADC expanded its Ground Observer Corps for low altitude surveillance. By 1954, the GOC was operating in every state of the nation. The high-water mark of the GOC was reached in December 1956 when over 18,000 posts were organized. The GOC was discontinued on 31 January 1959.* It was no longer needed by this time because of better radar coverage and increased capability of the threat.

█ Additions were also being made to the systems outside the continental U.S. To plug gaps in the Alaskan net of ten stations, eight more radars were programmed by 1953. NEAC got approval in 1955 to add six gap fillers to its system. Two of Canada's original stations were removed by 1959 but three others were added as part of the USAF ADC Mobile Program, making a total of 34 stations.

█ Agreement for a much more extensive program that was to be jointly financed was reached in 1959. This program, termed Continental Air Defense Integration North (CADIN), was to provide seven prime radars, 45 gap fillers, a SAGE CC/DC, and two Bomarc squadrons. It was also planned to tie the Pinetree radars into the SAGE system. None of the CADIN radars was operational by the end of 1959.

* (U) The Canadian GOC continued to 31 January 1964 when it was disbanded.



SEAWARD EXTENSION

(U) During these years, ADC also extended coverage out to sea off both coasts. Radar was put on every conceivable platform -- ships, planes, blimps, and towers.

(U) Navy picket ships were the first to carry surveillance out to sea. In 1950, following an air defense request for ten stations, the Navy was able to provide the emergency use of two ships off the East Coast. As the Navy's capability increased, so did its support. It placed one picket ship on duty full time off the East Coast in September 1952. The next year, it agreed to provide picket ships and blimps. By July 1955, five picket ship stations were manned off the East Coast and one station off the West Coast. Five off each coast were manned at the end of 1959.

(U) The second radar platforms used were Lockheed Super Constellations, designated originally RC-121s.* An RC-121 airborne early warning and control station was manned off the Pacific Coast in August 1954 and off the Atlantic Coast in September 1955. Three eastern and four western stations were manned by the end of 1959. A Navy blimp early warning squadron, ZW-1, began manning one East Coast station on 1 July 1957. This was the extent of blimp operations.

(U) Texas Tower radar platforms were suggested by the Lincoln Laboratory of M.I.T. in 1952. USAF approved three towers. The first one was placed on Georges Shoal off Cape Cod and began operating in May 1956. Two other towers were operating by end-1959.

* (U) Later, these aircraft were designated EC-121s.



EARLY WARNING

● In 1954, the U.S. and Canada approved the building of a distant early warning line in the far north. Early the next year, the JCS approved two segments of the line -- the land-based portion and a western sea extension. The land route was to run from Cape Dyer, Baffin Island, generally within about two degrees of the 69th parallel, to Cape Lisburne, Alaska. The sea extension was to run from Kodiak Island to Hawaii. The latter was changed to run from Umnak in the Aleutians to Midway Island. Six land-based radars were to extend coverage from the last Alaskan radar at Naknek out to Umnak. An eastern extension route was approved by the JCS in 1956. Termed the G-I-UK Line, it was to cross Greenland, then Iceland and then go on to the UK.

● Meanwhile, in 1954, Canada decided to build another early warning line at about the 55th parallel. This Mid-Canada Line (MCL) had been recommended the previous year by the joint U.S.-Canada Military Study Group. The line was to run from Hopedale, Labrador, to Dawson Creek, British Columbia. The first MCL stations began limited operations in May 1957. The line was declared fully operational on 1 January 1958.

● By 15 July 1957, the DEW Line (Cape Dyer to Cape Lisburne) was declared technically ready. Limited operations on the first eastern sea extension, Argentia, Newfoundland, to the Azores, began on 1 July 1956. A fully operational barrier was established one year later between these points. The Pacific Barrier became fully operational in July 1958. It ran from Kodiak Island to Midway until March 1959 when the six Aleutian radars became operational. The northern terminal of the sea



barrier was then moved to Umnak. Both the Atlantic and Pacific barriers were manned by Navy DERs and AEW aircraft.

THE WEAPONS

INTERCEPTORS

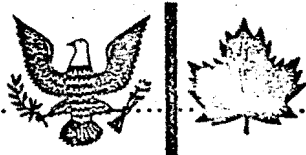
(U) Until 1953, the interceptor forces were equipped mainly with piston-engine planes and day jets. The U.S. force began to get radar-equipped F-94As in 1950 and the first truly all-weather jet, the F-89B, in 1951. Less than half of the total squadrons had F-94s or F-89s at the end of 1952. Modernization and a great increase in effectiveness came in 1953 and 1954 with the conversion to improved all-weather jet interceptors armed with rockets. USAF ADC got F-86Ds, F-94Cs, and F-89Ds armed with 2.75" rockets. AAC's units converted to F-89Ds by the end of 1954 and RCAF ADC had nine squadrons of CF-100s by the latter date.

(U) A new round of conversions for the U.S. force began in 1956. Of greatest significance was the arrival in ADC of the long-awaited F-102A, the first of the "Century-series" aircraft. Besides its other advantages, the F-102A was armed with the Falcon air-to-air guided missile. A Falcon-armed modification of the F-89 was also placed in ADC in limited numbers. And at the start of 1957, still another advance in armament -- to nuclear-armed missiles -- was achieved with the arrival of the MB-1-carrying F-89Js.



(U) DATES OF USAF ADC INTERCEPTOR AIRCRAFT

<u>AIRCRAFT</u>	<u>ASSIGNMENT</u>	<u>PHASE OUT</u>
F-47 (Reg)	Mar 1946	Nov 1947
F-47 (Fed ANG)	Feb 1951	Dec 1953
F-61	Mar 1946	Dec 1949
F-84	1947	Jun 1954
F-80 (Reg)	Nov 1948	1950
F-80 (Fed ANG)	Feb 1951	Dec 1953
F-86 (Day Jet)	1949	1954
F-82	1949	Jan 1952
F-51	Feb 1951	Dec 1953
F-94A	Mar 1950	Jul 1954
F-94B	Apr 1951	Jul 1954
F-89B	Jun 1951	Mar 1953
F-89C	Jan 1952	Oct 1954
F-86D	Mar 1953	Apr 1958
F-94C	Mar 1953	Feb 1959
F-89D	Jan 1954	Jul 1958
F-102A	Apr 1956	
F-89H	Jun 1956	Sep 1959
F-89J	Jan 1957	Dec 1960
F-86L	Oct 1956	Jun 1960
F-104	Jan 1958	Sep 1960
F-104	Apr 1963	Dec 1969
F-101B	Jan 1959	
F-106A	May 1959	



(U) F-102As and F-89Js went to the Alaskan Air Command and to the U.S. squadrons in the Northeast Air Command the following year. The RCAF had planned to replace its CF-100s with the super-sonic CF-105, but in 1959 the latter was cancelled.

(U) USAF ADC got three other new aircraft in the next two years. First, in 1958, it received F-104s (removed in 1960 because they could not operate with SAGE). In 1959, ADC was assigned F-101Bs and F-106As.

GUNS AND MISSILES

By the end of 1954, the Army Antiaircraft Command had reached its original goal of 66 battalions. There were also four gun battalions in Alaska and one gun battalion at Thule, Greenland. The first Nike Ajax missile came in late 1953 and by September 1955, Ajax batteries outnumbered gun batteries in the U.S. Sixty-one Nike battalions was the goal. This was met by mid-1957 (244 fire units on site). Gun units had been eliminated for all practical purposes.

A great improvement began in 1958 with the start of conversion of all Army units to Nike Hercules. The first Hercules battery became operational in mid-1958. One Hercules battery became operational at Thule by the end of that year and eight batteries were operational in Alaska by mid-1959.

The Air Force's Bomarc missile first became operational in 1959. In September, the first missile squadron (at McGuire AFB, N.J.) became operational with IM-99As. A second squadron was ready by year's end.



COMMAND AND CONTROL

SAGE

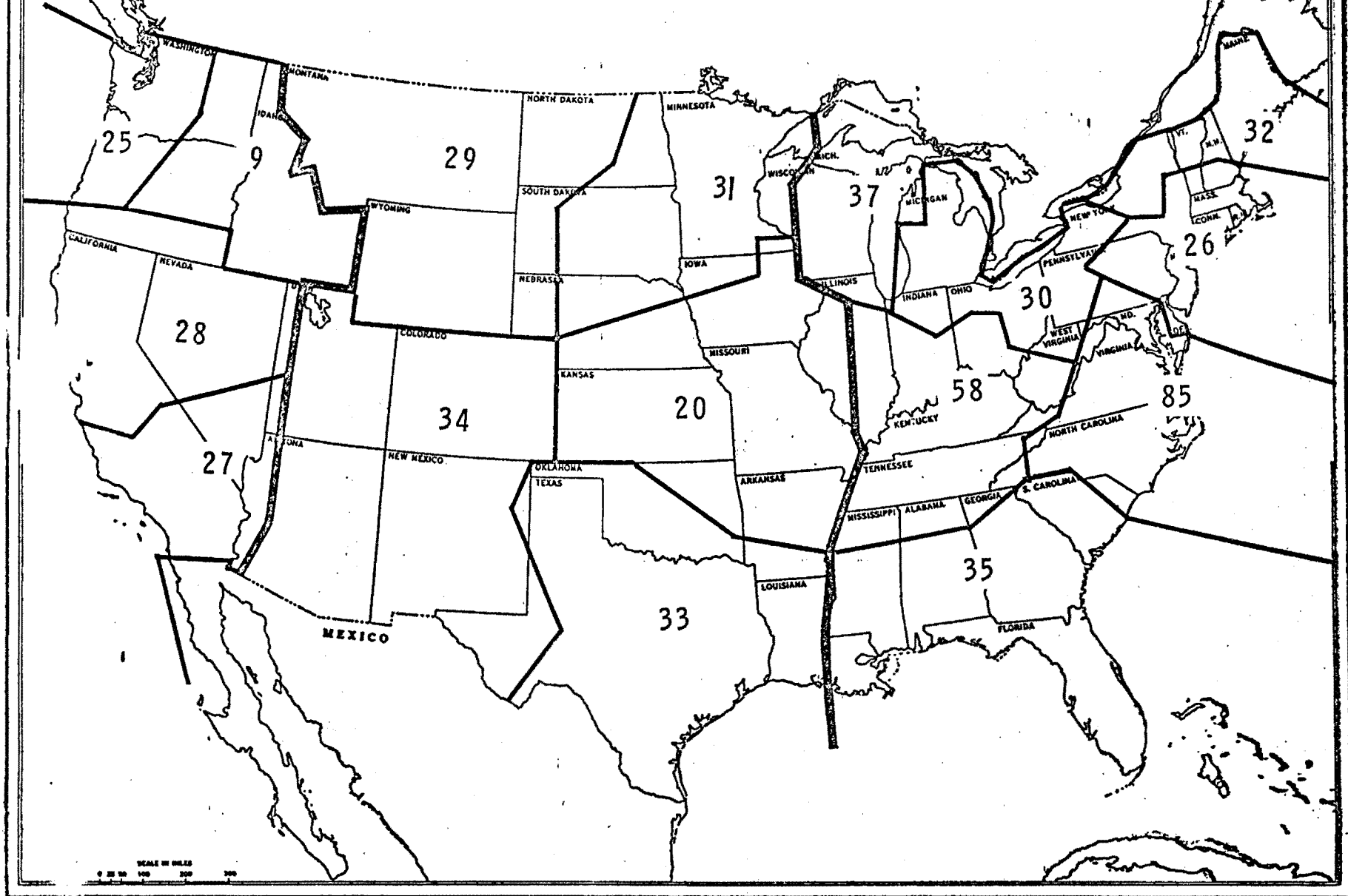
(U) By mid-1951, USAF ADC had established an organization of 11 air divisions and three defense forces. As its system grew beyond the 75 stations of the "P" system, and its fighter forces increased, ADC decided it needed five more divisions for a proper span of control.

(U) In the meantime, work was going on to develop a system to automatize the ground control functions. It had been recognized very early that the manual system of observing, telling and plotting was inadequate. In mid-1950, the Continental Air Command had proposed to USAF a development program for an automatic system. USAF agreed and a number of agencies worked on the problem. The Lincoln Laboratory of M.I.T. developed the system adopted by the Air Force in April 1953, known first as the Lincoln Transition System and later as the Semi-Automatic Ground Environment (SAGE) System.

(U) Under SAGE, not as many divisions would be needed as ADC had thought necessary. But because SAGE was some time off, ADC decided to build up to its planned 16 divisions and then cut back to seven divisions, the number decided upon for SAGE. The increase to 16 divisions was accomplished by October 1955.

(U) The first SAGE sector, New York, became operational on 26 June 1958; the first SAGE region/division, the 26th at Syracuse, New York, became operational on 1 January 1959. To provide for SAGE, ADC and NORAD/CONAD began reorganizing their structures in the U.S. at mid-1958. Boundaries had to be realigned, manual regions/divisions discontinued,

ADC AREAS OF RESPONSIBILITY FOR AIR DEFENSE
8 OCTOBER 1955





and new SAGE regions/divisions and sectors established. As planned, ADC reduced its structure from 16 to seven divisions by July 1960 which replaced its defense forces. 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. The Army Air Defense Command (the new designation of ARAACOM as of 21 March 1957) replaced its three geographically-designated commands with five regional commands.

(U) The CADIN program, mentioned earlier, provided for SAGE in Canada. One SAGE sector was to be located in Canada and others extended into Canada. The SAGE sector, Ottawa, with headquarters at North Bay, Ontario, was to be hardened and serve also as the combat center for Northern NORAD Region Headquarters.

NORAD COMBAT OPERATIONS CENTER

(U) From 1951 to 1954, ADC operated from a tiny, crude combat operations center it installed in one of its office buildings at Ent AFB by combining one room, a latrine with the plumbing removed, and part of the hallway. The first nation-wide air defense exercise, held in July 1952 (Sign Post), convinced ADC that it was impossible to monitor and supervise the air battle from such small quarters. Before the end of 1952, ADC had gotten authorization from USAF to build a new COC.

(U) During late 1952 and early 1953, the functions and design for the new COC were developed on the basis of current and foreseen requirements to meet ADC's mission of defending the U.S. against air attack. To house the new COC, built in an amphitheater arrangement, a blockhouse-type structure was erected next to the headquarters office buildings. On 15 May 1954, operation began in the new center.



(U) It was not long, however, before this COC was considered inadequate. The air defense system was enlarging, the threat was changing, and the new areas of Alaska and the Northeast were coming under the control of the center in Colorado Springs (see Chapter Three). Much more data had to be processed and displayed much faster and the center had to be made safer from attack. General Earle E. Partridge, CINCONAD, said that his COC was of such light construction and so exposed that "a man with a bazooka passing in a car could put the establishment out of commission."

(U) Early in 1956, General Partridge started his staff working on requirements for a new, underground COC. In 1956, 1957, and 1958, first ADC and then CONAD and later NORAD, sent requirements to USAF and the JCS for an underground COC. Impetus was given to the new COC project by the decision in early 1958 by DOD for the Air Force to establish a Ballistic Missile Early Warning System. The BMEWS would require a central computer and display facility. NORAD recommended integration of this facility with the new, underground COC. In the background too, was consideration of assigning a space detection system to NORAD.

After some months of study, the Corps of Engineers selected Cheyenne Mountain south of Colorado Springs as the site for the new COC. It was to be put under this granite mountain. On 18 March 1959, the JCS approved the location. USAF was made responsible for the COC project in collaboration with NORAD. Work on developing it was halted by USAF, however, in November 1959 pending a complete review. The only work done at the site was the building of an access road from the highway to the mountain.



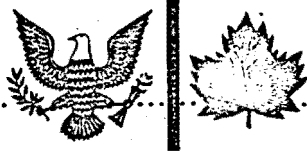
MANNED BOMBER DEFENSE REDUCTIONS

As has been shown, during the 1950s, there had been an almost continuous expansion and improvement of the manned bomber defense system. But by 1959, a shifting emphasis from the manned bomber to the ballistic missile threat, budget limitations and a matching of funds against changing priorities cut expansion and improvement. In 1959 and early 1960, numerous changes were made in the programs. Mainly, these cut back or cut out new air defense equipment.

First off, in June 1959, the Secretary of Defense reduced program levels far below what had been asked by NORAD in its objectives plan for 1959-1963 and considerably below what had been programmed by the services. The new levels were these: 44 interceptor squadrons by FY 1963, 16 Bomarc squadrons (29 were previously programmed), and 139 Nike Hercules batteries.

Other cuts followed, however. By the end of 1959, USAF had cancelled the F-108 long-range interceptor, deferred all work on the new COC, cancelled improvements to DEW Line radars, cancelled the requirement for an advanced AEW&C aircraft, and eliminated gap fillers from the Alaskan program. The Navy deferred modernization of its AEW barrier aircraft and announced withdrawal of its picket ships from the barriers in early 1960.

1960 brought more cuts. The major items: Bomarc was reduced to eight squadrons in the U.S., USAF interceptor squadrons were to be cut to 42 by the end of 1964, a new SAGE computer was cancelled, SAGE integration equipment for AEW&C aircraft (ALRI) was limited to 35 aircraft, and the frequency diversity and gap filler radar programs were drastically cut back.



[REDACTED] NORAD's Commander-in-Chief at this time, General Laurence S. Kuter, objected strongly. Discouraged with the severity of the cuts, in 1960, he asked that his mission be changed from defending the continental U.S., Canada and Alaska against air attack to state that he would defend to the extent possible with the forces provided the most vital areas of the U.S. and Canada. Nothing came of this, however, and as is shown in Chapter Seven, these cuts were but the beginning of a dismantling of the old system.



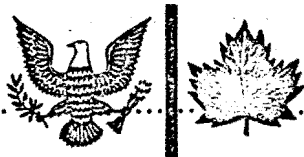
CHAPTER THREE

ESTABLISHMENT OF CONAD 1954 - 1956

EMPLOYMENT OF U.S. AIR DEFENSE FORCES - EARLY ARRANGEMENTS

(U) To bring the whole picture of air defense development together, it is necessary at this point to turn to an examination of command arrangements. As the air defense forces proliferated and became more advanced and the offensive weapons of the enemy improved, the need for more integrated employment of the air defense forces increased. When the Air Force became a separate service it was given the mission of air defense. The Key West Agreement, which resulted from a conference between the Secretary of Defense and the Joint Chiefs in the spring of 1948, assigned the USAF the mission of providing air defense in accordance with policies and procedures of the JCS.

(U) Air Force officials saw 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. 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 for the employment of other-service forces. Thus, employment and integration of forces was achieved through means of bi-lateral agreements, i.e., Air Force-Navy, Air Force-Army, ADC-other USAF command, ADC-Navy command, etc.

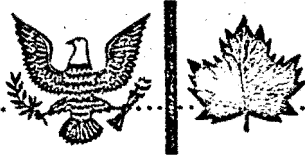


(U) Of importance was the creation on 1 July 1950 of the Army Antiaircraft Command and the agreement completed a month later between the Army and Air Force for employing AA in air defense. This agreement provided that the Air Force air defense commander could establish the states of alert and basic rules of engagement. It stipulated also that operational control, insofar as engagement was concerned, was to be exercised by the air defense commander.

(U) In 1950, USAF prepared a plan for a unified air defense command. The original ADC had been abolished by this time and the mission taken over by the Continental Air Command (ConAC). The latter opposed the USAF plan and proposed a specified command instead. 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 set up because of the growth of air defense. USAF agreed and on 1 January 1951 re-established ADC.

CONAD ESTABLISHED

(U) In August 1953, the JCS asked the Air Force Chief of Staff, General Nathan Twining, to examine the possibility of a JCS command for air defense. Both General Twining and Admiral Arthur W. Radford, Chairman of the JCS, believed that air defense had become too extensive for the Air Force to continue to manage alone. Early in 1954, Admiral Radford proposed a JCS command for U.S. air defense. The JCS approved, in principle, and directed preparation of terms of reference. After some wrangling over the organizational structure, the upshot was that the JCS directed establishment of the Continental Air Defense Command (CONAD) to manage U.S. air defense. CONAD was established on 1 September 1954 at Ent Air Force Base.



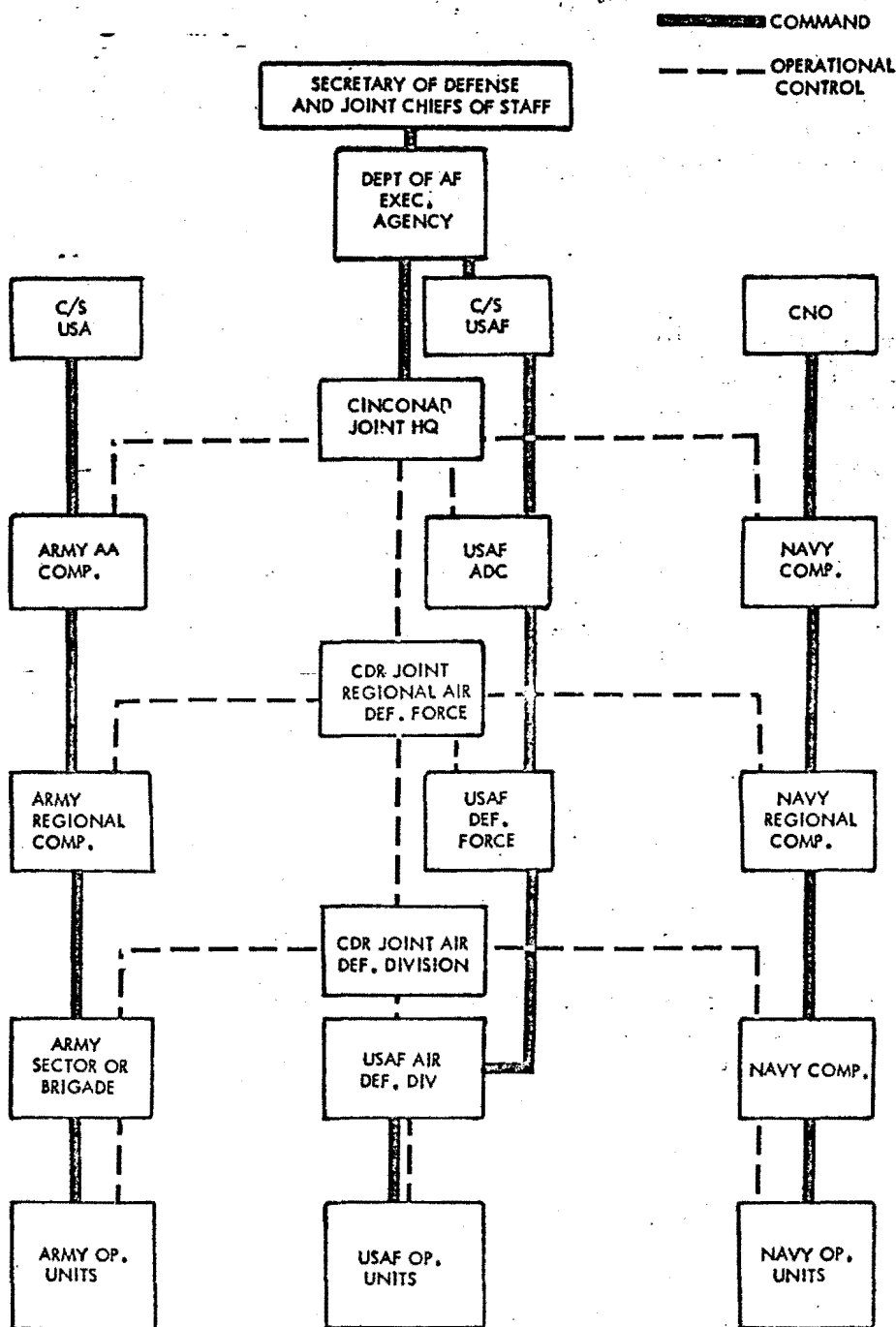
(U) CONAD's mission was to "defend the continental United States against air attack." The Air Force was made executive agency and it was stipulated that CINCONAD would be an Air Force officer. The ADC commander at the time, General Benjamin W. Chidlaw, was given the additional job of being CINCONAD. Three components were designated -- ADC, ARAACOM, and Naval Forces Continental Air Defense Command (NAVFORCONAD), established at this time. CINCONAD was given operational control of all forces assigned or otherwise made available by the JCS or other authority.

(U) CONAD was superimposed on the existing ADC structure. Each ADC Headquarters from command down through division level was additionally designated a joint headquarters. The commander and staffs of the command headquarters, the defense forces, and the air divisions of ADC all assumed dual roles.

INEFFECTIVENESS OF CONAD

(U) This set up lasted just two years, during which time CONAD proved to be ineffective. CONAD had very little authority. Its terms of reference were too vague. Too much was left unsaid in the matter of control and integration of forces and what was said was too general. Too many areas were left open to interpretation. What forces were under CONAD operational control? Who was to determine the procedures for conducting the air battle, who was to determine the organizational arrangement for exercising control, and how was operational control to be exercised? These and a hundred other such questions plagued CONAD.

ORGANIZATION CONTINENTAL AIR DEFENSE COMMAND SEPTEMBER 1954





(U) Another, but related, weakness was in the organizational setup whereby CONAD was not really a separate entity. CONAD was nothing more than an additional designation for the Air Defense Command. As an example of how "joint" CONAD was, in June 1955, CONAD Headquarters had 405 Air Force officers and two Navy officers, two Army officers, and one Marine officer.

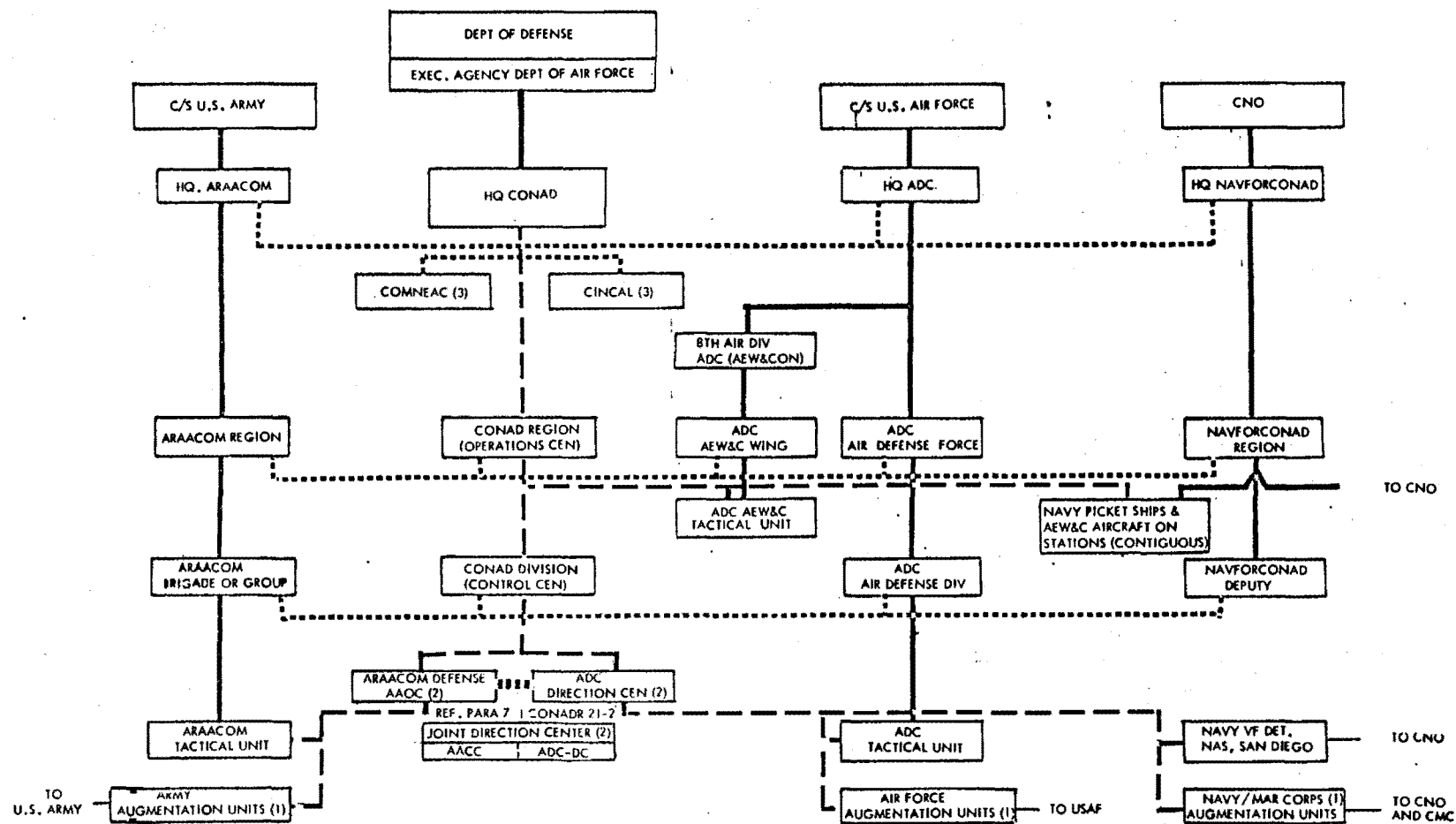
(U) At any rate, early in 1956, the JCS recommended new terms of reference for CONAD which would include a new definition of operational control and separation of the headquarters of ADC and CONAD. Just prior to this, in April, CONAD had submitted a recommendation for separation from ADC. CONAD proposed a staff of around 350 (120 officers).

(U) On 19 June 1956, the Secretary of Defense approved the JCS recommendations. The joint staff was directed to revise the terms accordingly. The Secretary of Defense also approved a new Unified Command Plan. Among its provisions was assignment of responsibility for air defense of Alaska and the Northeast Area to CONAD.

NEW TERMS OF REFERENCE

(U) The first of two major changes to CONAD came in the new terms of reference on 4 September 1956. These terms broadened CONAD's mission, strengthened and clarified its authority, and remodeled its organization. The second major change to CONAD (and NORAD) came in 1959 as a result of the DOD Reorganization Act of 1958 (Chapter Five).

ORGANIZATION
CONTINENTAL AIR DEFENSE COMMAND
SEPTEMBER 1956



NOTES

- (1) UNDER OPNL CONTROL OF CINCONAD WHEN COMMITTED ONLY
- (2) OPERATIONAL CONTROL OF COMBAT ELEMENTS AS DESIGNATED BY DIVISION CMDR
- (3) DETAILS OF COMMAND RELATIONSHIP ISSUED SEPARATELY.

■■■■■■ COMMAND
 ■■■■■■ CONSULTATION & INTER STAFF PLANNING
 ■■■■■■ OPERATIONAL CONTROL
 ■■■■■■ COORDINATION



(U) 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.

(U) 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 had defined operational control as 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 command combat elements. The new terms defined CONAD's authority as those functions of command involving composition of subordinate forces, assignments of tasks, designation of objectives, and direction necessary to accomplish the mission. CONAD's authority included the responsibility to determine procedures for conducting the air battle, for exercising operational control of all assigned forces, and for directing engagement and disengagement of weapons.

(U) The other change made to strengthen CONAD and clarify command relationships 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.

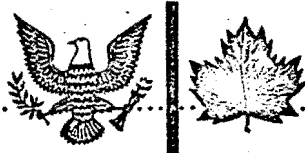


SEPARATE CONAD HEADQUARTERS

(U) CONAD Headquarters lost little time in separating itself from ADC Headquarters. On 17 September, a CONAD staff structure was established and by 1 October CONAD was physically separated and functioning separately. The CONAD commander-in-chief, General Partridge, was relieved of command of ADC on 17 September.

(U) CONAD had proposed 350 manpower spaces for its headquarters. This was approved. The January 1957 strength report shows 353 assigned. ARAACOM and NAVFORCONAD had opposed a large CONAD staff and also had 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.



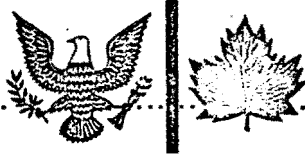
CONAD SUBORDINATE ORGANIZATIONS

(U) 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 replaced its joint defense forces and joint divisions with CONAD regions and CONAD divisions. A total of three regions and sixteen divisions was created at this time.

(U) 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 units a more separate identity. In other words, it set them apart from the ADC defense forces.

(U) Then CONAD stated in a regulation that each region and division was to be organized as an operating agency, separate from the headquarters of each component command. The regulation directed that the commander of each unit was to have a separate joint staff, limited to the number of personnel 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.

(U) But, while it directed that separate staffs be formed, CONAD had no manning authorization to provide its subordinate units. All that CONAD could do for the meantime, was to direct ADC to give its defense force and division commanders the additional job of commanding the CONAD regions and divisions. These commanders had then to appoint their ADC personnel to CONAD positions as an additional duty. Each of the regions did have a few Army and Navy representatives.



CONTROL OF ALASKAN AND NORTHEAST AIR DEFENSE

(U) While this activity was underway, CONAD was taking over 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. On this date, CINCONAD took over responsibility for air defense of the Northeast area. CINCONAD designated the Commander, Northeast Air Command (NEAC), as his subordinate joint commander responsible for air defense in this area. This arrangement lasted only until 1 April 1957 when NEAC was also abolished. CONAD then established the 64th CONAD Division on this date and designated its commander as the CONAD subordinate commander in the area. This was simply an additional designation given to the 64th Air Division which had been established under NEAC in 1952. With the abolition of NEAC, ADC took over command of the USAF forces in the area and the 64th Air Division. Earlier, on 1 September 1956, the antiaircraft group in the area, the 7th at Thule, was transferred from First Army to ARAACOM.

(U) Meanwhile, on 1 September 1956, also, CONAD 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. The antiaircraft forces in Alaska remained assigned to U.S. Army Alaska (USARAL).



CHAPTER FOUR

ESTABLISHMENT OF NORAD - 1957

PRE-NORAD PLANNING

(U) Close air defense coordination had long been maintained by Canada and the United States. In 1949, the Canada-U.S. Military Cooperation Committee (MCC) prepared a plan for emergency defense that outlined the major joint actions necessary and principles of common defense operations. The plan, approved by the JCS and the Canadian Chiefs of Staff Committee, called for preparation of detailed emergency air defense plans by the air defense commands of both countries. The first of such joint plans prepared by RCAF ADC and USAF ADC was issued in 1950. New ones followed each year.

(U) A later MCC plan authorized exploratory planning beyond the limits of the MCC plan. As a result, a combined air defense planning group was formed with the aim of arriving at the best North American air defense. It met for the first time in May 1954. The commanders of the two ADCs agreed a short time later to establish this group with a permanent staff and it was moved to Colorado Springs.

(U) The need for integrated planning had been given a boost in May 1954 by the appearance of high-performance Soviet jet bombers. The planning group declared that Soviet jet bombers and thermonuclear capability made it apparent that "consideration of the defense of Canada and the United States separately was unrealistic."

(U) Early in the fall of 1954, the two ADC commanders directed the joint 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. The completed plan was presented to Canadian and U.S. military authorities. While no direct action was taken on this plan, it was important in the overall considerations at this time.

NORAD ESTABLISHED

(U) 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. The JCS approved, in principle, the need for peacetime integration of the two air defense forces and asked the Canadian military chiefs for their views.

(U) 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 the study.

(U) The U.S. agreed and the job was given to the Canada-U.S. Military Study Group. The latter created an ad hoc group to make the study. Near the end of 1956, this group completed its work, recommending air defense integration. The MSG approved the recommendations and in its Eighth Report recommended that the JCS and Canadian Chiefs get approval of their governments for integration.

(U) The JCS approved the MSG Eighth Report in February 1957 with the understanding that integration of operational control be limited to the continental elements of air defense of both countries.



This was followed by approval by the Secretary of Defense. The Canadian Chiefs advised in May that they had completed action on the report and that the matter awaited governmental approval.

(U) 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.

(U) 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 RCAF ADC would be assumed by the integrated headquarters at Colorado Springs. He also recommended the name North American Air Defense Command, abbreviated NORAD.

(U) The Canadian Chiefs agreed to these recommendations on 3 September, the JCS on 6 September. As of 12 September 1957, therefore, NORAD was established; all North American air defense forces were now integrated under one command. 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 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;

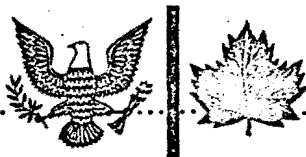
(3) the appointment of CINCNORAD and his Deputy, who were not to be from the same country, was to be approved by both governments; and

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

(U) 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 terms of reference for NORAD which became effective 10 June 1958.

(U) 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 ADC, ARADCOM, NAVFORCONAD, and USAF ADC. CINCNORAD was to be responsible to the JCS and the Canadian COSC. NORAD was to operate within an agreed Canadian-U.S. concept of air defense and in accordance with agreed joint intelligence.

(U) CONAD remained in existence to serve as a U.S. national command. It was needed, the JCS advised, to handle U.S. responsibilities outside of NORAD's jurisdiction. The JCS also put into effect new terms of reference for CONAD on 10 June 1958.



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



CHAPTER FIVE

NORAD/CONAD HEADQUARTERS REORGANIZATION - 1959

DOD REORGANIZATION ACT OF 1958

(U) A strengthening and clarification of CONAD/NORAD authority resulted from legislation that reorganized the U.S. Department of Defense. This act, which became law on 6 August 1958, had been requested by President Dwight Eisenhower.

(U) The President told Congress it was essential 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 be with the Secretary of Defense and his operational advisors, the JCS. The President asked that command channels be cleared so that orders could go directly from the President and the Secretary of Defense to the commanders of the unified commands. The current set-up was cumbersome and ineffective, he said. Accordingly, he directed the Secretary of Defense to discontinue use of military departments as executive agencies for unified commands.

(U) The DOD Reorganization Act provided that unified and specified combatant commands 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 the Secretary of Defense for the strategic missions assigned to them. The forces of these commands 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.

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS;
DOD DIR 5200.10

Group 4



(U) A new DOD 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 (it had been called a joint command up to that time).

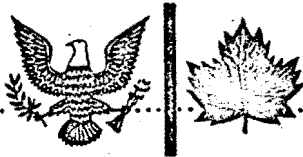
■ New terms of reference for CONAD, made effective 1 January 1959, provided that CINCONAD was the senior U.S. officer in Headquarters NORAD.* CINCONAD's mission was essentially the same as prescribed in the preceding terms: defending U.S. installations in Greenland against air attack, assisting in the defense of Mexico in accordance with approved plans and agreements, and handling purely national matters pertaining to air defense. CINCONAD was to exercise operational command over all U.S. forces assigned, attached or otherwise made available.

(U) The military department executive agency arrangement was discontinued as directed by the President. On 1 January 1959, executive agency control by USAF over CONAD was ended and control was transferred to the JCS. On this same date also, the first assignment of forces to CONAD was made.

1959 HEADQUARTERS REORGANIZATION

(U) Following issuance of these directives, a plan was prepared in Colorado Springs to reorganize NORAD/

* (U) The CONAD terms were rescinded in February 1961 as no longer necessary and guidance and instructions provided after that by the JCS Unified Command Plan and other periodically-issued JCS directives and instructions.



CONAD Headquarters to assume the new responsibilities,--such as in logistics. The first plan divided the headquarters into a NORAD and a CONAD staff, 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.

(U) 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.

(U) This plan was approved by the JCS in a memo dated 23 June 1959. But they authorized a personnel increase of only half the number requested. At that time, NORAD/CONAD was authorized 445 spaces (which included 35 Canadian spaces). A total authorization of 966 was asked, or an increase of 521. The JCS authorized an increase of 223 for a total of 668.* Most of the additional people were to come from the component commands.

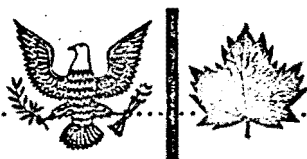
* (U) Manning remained fairly close to this level (668 spaces) for the next five years, reaching 761 by mid-1964, an increase of 93 spaces. But with greatly increased responsibilities and requirements in space defense, operation of the new combat operations center, intelligence, command and control, etc., manpower requirements went up. In the next five years, from 1964 through 1969, 241 more spaces were added, bringing the total increase since 1959 to 334 spaces for a total of 1,002 authorized.



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

1. The establishment of qualitative and quantitative requirements for all forces, weapons, and equipment for air defense of the North American continent.
- .. 2. Planning for the deployment for redeployment of assigned forces and forces to be made available.
3. The establishment of tactics, procedures and methods for exercising operational control of forces . . . 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.
4. 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.

[REDACTED] 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 limited to joint training. NORAD/CONAD functions in weapons and environment systems development and testing were 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.



(U) 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 -- 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.

(U) The Commander-in-Chief, General Partridge, approved the committee's plan including the phased build-up 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 on the NORAD staff.

* (U) DCS/Programs was eliminated on 1 April 1966 on the basis of a JCS Management-Manpower Survey Team's recommendation. Programs was made a directorate and placed under DCS/Plans, renamed DCS/Plans and Programs.



CHAPTER SIX

MANNED BOMBER DEFENSE 1960 - 1970

(U) It was shown in Chapter Two that during the 1950s a large and elaborate manned bomber defense was built. In the 1960s, a changing threat, budget limitations, shifts in priorities and so on brought a phase down of these defenses. Alongside this, a ballistic missile early warning system and a space surveillance system were brought into operation, and an anti-ballistic missile defense system and a modernized manned bomber defense system were approved for the 1970s.

(U) One of the best statements on the changes in the 1960s in air defense was made at mid-decade by Secretary of Defense Robert S. McNamara. He told the House Armed Services Committee on 18 February 1965 that our:

present system for defense against the manned bomber attack was designed a decade ago when it was estimated that our opponent would build a force capable of attacking the U.S. with many hundreds of long-range bombers. This threat did not develop as estimated. Instead, the major threat confronting the United States consists of ICBM and submarine-launched ballistic missile forces. . . . During the last four years, we have made some progress in reorienting the anti-bomber defenses to the changing character of that threat. The vulnerability of the system is being reduced by providing improved

EXCLUDED FROM AUTOMATIC
REGRADING; DOD DIR 5200.10
DOES NOT APPLY



backup to the SAGE system and by dispersing the manned interceptors. Marginal and obsolete units have been eliminated from the forces and new and more effective systems are being introduced. This effort will continue during the FY 1966-70 program period.

(U) Three years later, in February 1968, Secretary McNamara told a Senate committee of his decision to replace the current air defense system with a new system. The plans at that time envisaged a force that would include an Airborne Warning and Control System (AWACS), over-the-horizon (OTH) backscatter radar, and an improved F-106 interceptor aircraft (termed F-106X). He stated that much of the existing U.S. surveillance, warning and control network could be phased out when the new AWACS and OTH backscatter radar became available.

RADAR SYSTEMS

■ Dismantling of the systems built in the 1950s started at the beginning of the new decade. In the case of the systems built to give early warning of an attack through the northern approaches and around the flanks, cut-backs began even before completion. The early warning system was completed in 1961. The Eastern or Greenland, four-station, DEW Line extension came into operation in August. The Greenland-Iceland-United Kingdom barrier was established in 1961 and the old barrier from Argentia to the Azores discontinued.



■ In early 1960, the Navy took its picket ships off DEW Line barrier patrol with air defense as a primary mission. In July 1963, the 28 DEW Line Intermediate Stations were shut down. Changes in the threat and modifications to other radars made the low altitude coverage of these stations unnecessary. The following January, Canada shut down the western part of the Mid-Canada Line consisting of five section control stations and 51 doppler detection stations. This was for economy reasons on the basis that the low altitude requirement had lessened and because of coverage from new long-range radars installed in Western Canada. On 31 March 1965, the remainder of the Mid-Canada Line ceased operation. Between January and June 1965, all Navy picket ships were withdrawn from their stations on the offshore patrol. All Navy radar aircraft were taken off the Pacific barrier in May 1965 and off the G-I-UK barrier in September 1965. ✓

■ This left by this time only the Air Force AEW&C aircraft patrolling off the coasts. These had been cut to manning at random 30 per cent of the time in 1962 except for the southern Florida station. The three Texas Towers were gone. One collapsed in a storm in January 1961, another was deactivated in January 1963 because of possible danger of collapse, and the third was closed in March 1963 with the coming into operation of the first ALRI station. The Navy blimp AEW squadron that had begun manning an East Coast station in 1957 was pulled out of the force in 1960.

RADARS

■ Radars received similar attention. In the first part of the 1960s, many new long-range radar sites were added and the system was improved with frequency diversity radars or ECCM modifications. But



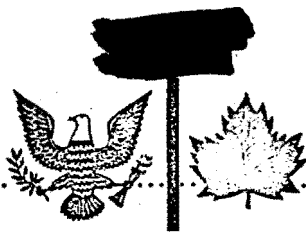
also many sites were closed down. Because of the program revisions of 1959 and early 1960 (covered in Chapter Two), fourteen sites were deleted. Then late in 1962, the Secretary of Defense directed the cut of seventeen prime radars by the end of FY 1964 to save funds and manpower. Sixteen were cut between January and May 1963 and one in June 1964. Earlier, in March 1964, Canada closed four sites to save funds.

Eleven more stations were phased out in FYs 1965 and 1966. These were part of sixteen sites identified as excess by a NORAD/ADC group that developed a "hard core" list of radars to be kept. In 1966 also, two Canadian sites were closed.

Then came the DOD decision to phase down the current system for transition to a new system, as discussed earlier, and DOD directed the elimination of 26 USAF long range radars and two ANG long-range radars (LRRs). Eight of these were removed from operation on 1 April 1968, seven more on 14 May 1968, and 13 on 1 July 1968. Twenty-five of the radars were in the CONUS, almost all of which were in the central, interior portion of the country which would force NORAD into a perimeter type of defense.

Thus, after the first round of reductions, NORAD had lost 28 military radars, and ties to 16 FAA radars. The force had shrunk from 170 prime radars contributing to NORAD surveillance at the start of 1968 to 126 sites at mid-1968. Remaining were 81 sites in the CONUS, 30 in Canada (27 Canadian, 3 USAF) and 15 Alaskan.

The 1969 reductions program called for closing eight long-range radar sites, three of which were to be transferred to the FAA, and 27 height finder radars. In Alaska three LRRs and five DEW Line



radars were to be closed. However, one additional DEW Line radar was converted to a long-range radar site for a net decrease there of two LRRs and six DEW Line radars.

One LRR ended operations on 19 June 1969 and four more closed on 1 July. One additional LRR, Z-18 at Chandler AFS, Minnesota, was turned over to the FAA. On 1 July, the 27 height finder radars were closed. In October, two ADC/FAA joint-use sites were turned over to the FAA. These two sites continued to provide radar inputs to the NORAD system.

In the Alaskan NORAD Region three long-range radars and five DEW Line sites were closed on 1 June 1969. The sixth DEW Line site ended operations on 27 August 1969. That was to be converted to a long-range radar site so that ANR would experience a net loss of two LRRs and six DEW Line radars.

On 4 November 1969, six more LRRs in the CONUS were lost due to Project 703 fund cuts. At the beginning of CY 1969, there were 126 long-range radar sites contributing to NORAD surveillance. The loss of 15 sites in 1969 -- 12 in the CONUS and three in Alaska reduced the number to 111 sites by the end of 1969. The remaining sites included 69 in the CONUS, 12 in Alaska, and 30 in Canada.

GAP FILLERS

At the end of FY 1967, 88 gap fillers were operational. Twenty were closed in the second quarter of FY 1968 as a result of fund cuts. PCD Z-7-096 directed the phase-out of 51 additional sites on 1 April 1968, leaving 17 sites only for coverage in the Florida area. One additional gap filler was closed on 31 December 1969.



WEAPONS

REGULAR INTERCEPTOR FORCE

Alongside the radar system, the number of interceptor squadrons also decreased. By the end of 1960, USAF ADC had completed conversion to supersonic aircraft (leaving it with F-101s, F-102s, and F-106s). Two squadrons of F-104s were added in 1963, one in Texas and one in Florida, to meet the requirement for a high performance plane to combat the MIG-21 threat from Cuba. From 1960 on the number of squadrons programmed for ADC and the number available continued to drop.

At mid-1960, ADC was programmed for 41 squadrons by FY 1963. This was cut to 38 squadrons by end FY 1965, then to 20 squadrons by FY 1970, and then to 18 squadrons in FY 1969. ADC's actual force was reduced to fourteen squadrons in 1969.

The Alaskan Air Command phased out the one F-89 squadron it had in late 1960, leaving one F-102 squadron. To bolster Alaskan defenses, following Russian overflight of part of the Alaskan Region, eight F-106s from ADC were temporarily deployed to Alaska beginning in July 1963. In 1969, the Alaskan Air Command lost its only interceptor squadron (F-102s). Early in 1970 the JCS decided to provide an F-4 squadron to ALCOM. When this squadron was operational, the JCS stated, the F-106 rotation was to be terminated.

The RCAF ADC's nine CF-100 squadrons, which it had at the end of 1959, were replaced with five squadrons of CF-101s, all of which were operational by the end of 1962. Sixty-six F-101s were transferred from the USAF to the RCAF under the terms of a June 1961 agreement. Two of the CF-101 squadrons were disbanded in 1964 at the direction of the



Canadian government. In August 1963, the U.S. and Canada reached agreement for provision of nuclear warheads to Canadian forces, thus making it possible for the CF-101s and Bomarc CIM-10Bs to be armed with nuclear weapons.

ADC ANG INTERCEPTOR FORCE

■ In addition to the regular force, Air National Guard interceptor squadrons provided a first-line, Category I, augmentation force. Beginning in mid-1961, this force, consisting at that time of 25 squadrons, went on 24-hour alert. Four of the Category I squadrons were converted to other missions and taken from NORAD control in 1964.

■ At the time of the establishment of the Category I ANG force, the ANG squadrons were equipped with a variety of aircraft from F-86s to F-104s. Six had F-102s. The plan was to eventually equip all of them with F-102s. In 1963, to equip the two regular ADC squadrons with F-104s, the aircraft were taken from two ANG squadrons and replaced with F-102s from ADC. By November 1967, 19 of the 21 ANG squadrons were equipped with F-102s. F-89s were left in two squadrons for two more years so as to furnish F-102s on a MAP program.

■ In 1969, the F-89 aircraft were removed as had been planned. One of the two F-89 squadrons was converted to F-102s and converted again later, to F-101s. The other F-89 squadron was deactivated. Three F-102 squadrons were also deactivated resulting in a loss of four ANG squadrons by end CY 1969. Three of the ANG F-102 squadrons were converted to F-101s. This left a total of 17 ANG squadrons (14 F-102 and 3 F-101) by end CY 1969.



MISSILE FORCES

Hercules. Both the Army Hercules and the Air Force Bomarc programs were completed during the first years of the 1960s. By November 1961, all Regular Army missile units were converted from the Nike Ajax to the improved, nuclear-capable Nike Hercules. At that time there were 139 batteries (126 in the CONUS, nine in Alaska, and four at Thule). The Ajax missile was given to the National Guard. Then, in 1962, a program was started to phase out the Ajax from the Guard and replace it with 48 Hercules batteries from the RA units. Phase-out of the Ajax was completed in May 1964.

NORAD recommended in 1962 the redeployment of 18 Hercules units from nine SAC bases and four batteries from Thule AFB. NORAD wanted to redeploy the 22 batteries to unprotected urban/industrial areas. At mid-1965, at the direction of the Secretary of Defense, the four batteries at Thule were removed from operation. Then the following December, the Secretary directed the inactivation of all 22 batteries in FY 1966 to save funds. By March 1966, the 18 additional (over the four at Thule) had been removed from operation. A small addition of Hercules batteries was also made to ARADCOM's force. Four batteries were added during the Cuban crisis and permanently assigned after it ended for Florida defense. Thus, at the end of 1967, there were 121 Hercules batteries -- 73 RA and 48 ARNG. Alaska still had nine batteries.

Also during the Cuban crisis, eight Hawk batteries were transferred temporarily to Florida to provide low-level defense. On 1 April 1963, they were permanently assigned to ARADCOM.



Reductions in 1968 and 1969. Hercules force reductions through FY 1970 decreased the force available to NORAD from 121 batteries (73 RA and 48 ARNG) to 82 batteries (44 RA and 38 ARNG) -- a cut of 39 batteries. Of this cut of 39 batteries 36 were from ARADCOM's force and three from USARAL's force.

Bomarc. As noted in Chapter Two, the first two Bomarc squadrons, equipped with "A" missiles, were organized in 1959. Bomarc had been planned by the Air Force to reach 40 squadrons with 4,800 "B" missiles, but the program was cut to 29 squadrons with 1,740 missiles by 1959 (not including the two squadrons programmed for Canada). A June 1959 DOD program called for 16 U.S. squadrons with 1,080 missiles. A June 1960 program cut Bomarc to eight U.S. and two Canadian squadrons with a total of 210 A missiles and 252 B missiles. As CONAD pointed out in protest, the Bomarc program had in a piecemeal fashion been cut over 90 per cent and only half of the remaining missiles would be B models.

The last of the eight U.S. squadrons was formed in December 1961. The previous June, the first of the advanced B missiles became operational. The two Canadian squadrons had been formed by the end of 1962, equipped with B missiles. After the U.S.-Canadian nuclear agreement in August 1963, nuclear warheads were furnished and the two Canadian squadrons were declared operational on 16 January 1964.

Due to funding cuts in 1969, one Bomarc squadron was phased out. This was the 35th ADMS, Niagara Falls IAP, which was released from NORAD alert on 31 October 1969 and deactivated on 31 December 1969.



COMMAND AND CONTROL

SAGE

■ SAGE first became operational on 26 June 1958 in the New York Sector direction center. The first SAGE region combat center, the 26th at Syracuse, New York, became operational on 1 January 1959. A second region combat center (Truax) became operational with SAGE in 1959 and a third (McChord) in 1960. SAGE direction centers were also coming into operation, reaching a total of 21 by the end of 1961, the high-water mark.

■ Two more region combat centers gained SAGE capability in 1962 by being tied to nearby SAGE direction centers. The combined Northern NORAD Region combat center and Ottawa Sector direction center became operational with SAGE on 1 October 1963, marking the end of additional SAGE installations. Changes, such as deletions and movement of locations, already being made, continued, however. At the end of 1963, there were four SAGE CCs and two remoted CCs, and 16 SAGE DCs.

■ As a result of a 1 April 1966 reorganization stemming from a DOD-directed cut of two direction centers and two combat centers (see Chapter Seven) wholesale changes were made. Two of the first operating combat centers (Truax and McChord) were eliminated. One of the remoted CCs (Richards-Gebaur) was converted to standard operation and the other (Hamilton) began operating an AN/GSA-51 computer and the DC to which it had been tied was closed down. The region combat center at Gunter AFB, Alabama, was also converted to SAGE operation. This still left the same number of SAGE combat centers as at the end of 1963, four. This was the same status at the end of 1967. SAGE direction centers had been reduced to 12, however. As



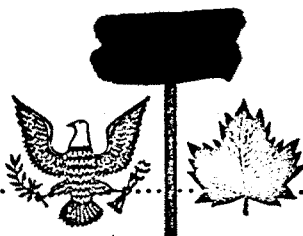
discussed in the following chapter, numerous additional changes were coming.

Alternate or backup methods of operation for use if the primary SAGE direction centers were put out of commission had long been part of air defense procedures. The building of a backup system, however, came as a result of a June 1961 Secretary of Defense decision. This had followed USAF and DOD studies that indicated that a fairly small missile attack on SAGE and other vital elements of the system could destroy NORAD's ability to carry out its mission. The Secretary approved a concept of backup control. He also directed that SAGE improvement and expansion be stopped and the money saved and other funding be used to provide a survivable backup control system.

BUIC

From this came the establishment of a program for a SAGE backup system termed BUIC (Backup Intercept Control), implemented in phases. The first phase, BUIC I, essentially completed by the end of 1962, provided manual control. BUIC II, the second phase, provided semi-automatic control at NORAD Control Centers. BUIC II consisted of 13 centers, each equipped with an AN/GSA-51 radar course directing group. This system was limited in intercept control capability and division coverage. BUIC II was phased into operation between September 1965 and April 1966.

In November 1964, the Secretary of Defense approved a third and final phase, BUIC III. The latter used an improved GSA-51. As initially approved, there were to be 19 BUIC III centers, phased in during the FY 1968-1969 period, backing



up 12 SAGE direction centers. BUIC II would be phased out. In August 1965, Canada approved the installation of BUIC III at two sites (included in the total of 19 centers).

■ DOD-directed reductions lowered the number of BUIC III centers programmed to 15. By 5 January 1970, all 13 BUIC III facilities in the CONUS and two in Canada had become operational. One CONUS BUIC III was closed on 15 January 1970.

ARADCOM CONTROL EQUIPMENT

■ By mid-1963, ARADCOM had ten Missile Masters (AN/FSG-1) and 18 BIRDIE systems (AN/GSG-5 or 6) in its system. To meet DA-directed cuts to provide manpower spaces, two Missile Masters were phased out in September 1963 and replaced with BIRDIES from other defenses. In late 1964, two more Missile Masters were deleted by combining defenses.

■ In December 1963, DOD approved the procurement of a new control system for ARADCOM, the AN/TSQ-51 Fire Distribution System, to replace the Missile Masters and some BIRDIE sets. The first of the new systems started coming into operation in late 1966 and by the end of that year, five were operating. Four Missile Master and two BIRDIE systems were deactivated. The remaining four TSQ-51s came into operation by March 1967. ARADCOM then had nine TSQ-51s, eight BIRDIES and one TSQ-38 at Key West. By 1 February 1969, the TSQ-38 at Key West had been replaced by a TSQ-51 bringing the total to ten. By that time, three more BIRDIES had been deactivated (at Dallas-Ft. Worth, Kansas City, and St. Louis) bringing the number down to five. Throughout this period the Alaskan Region



had continued to operate two AN/FSQ-34s. But by 1 June 1969, the Alaskan Region had completed the switchover to BIRDIES. By 1 February 1969 the number of CONUS BIRDIES had fallen to three, with the loss of the installations at Niagara-Buffalo and Cincinnati-Dayton.

NORAD COMBAT OPERATIONS CENTER

(U) The new NORAD COC was approved by the JCS in March 1959 for location in Cheyenne Mountain south of Colorado Springs. In November of that year, USAF deferred all work on it pending a review. This deferral lasted about a year and a half. Excavation finally began on 19 June 1961 and was essentially completed by the end of 1962. In March 1963, work on the eleven internal buildings began.

By mid-1965, the construction program in the technical buildings was completed and joint occupancy effected. The two Philco 212 computers that had been operating in the old COC at Ent AFB were moved to the new COC. A third Philco 212 computer was moved in from L. G. Hanscom Field in January 1966.

The 425L system portion of the COC reached initial operational capability on 1 January 1966 as scheduled. On 20 April 1966, this system became fully operational.

In the meantime, the Space Defense Center was established as an integrated NORAD/CONAD-ADC center in the COC. The SDC initial operational date, originally set for 1 January 1966, was not met, however, because of computer program problems. Finally, the SDC became operational on 6 February 1967. NORAD reported to DOD that as of this date the NORAD COC was fully operational in Cheyenne Mountain.



CHAPTER SEVEN

MISSION AND ORGANIZATION

RENEWAL OF THE NORAD AGREEMENT

(U) As discussed in Chapter Four, the NORAD agreement was concluded on 12 May 1958 in an exchange of notes between the United States and Canada. One of the principles of the Agreement was that the command would be maintained in operation for a period of ten years. There was no provision for automatic renewal or extension of the Agreement. It was necessary, therefore, that a new agreement be concluded or the old one extended.

(U) It was the latter procedure that was decided upon. By an exchange of notes on 30 March 1968, the Governments of Canada and the United States agreed to extend the NORAD Agreement for a period of five years from 12 May 1968. Among the stipulations was that the renewed Agreement could be reviewed at any time by either party and the Agreement ended after notice of one year. It was also stipulated that the Agreement would not involve in any way a Canadian commitment to participate in an active ballistic missile defense.

DISESTABLISHMENT OF NAVFORCONAD

Because of the phasing out of the Navy forces from the DEW Line extensions and the off-shore barriers (last chapter), the JCS suggested disestablishment of the Navy component command, Naval Forces, Continental Air Defense Command. CONAD agreed because there were no naval forces assigned to NAVFORCONAD and because of the elimination of advisory responsibilities on off-shore and barrier

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS;
DOD DIR 5200.10

Group 4



forces. There would be continued Navy participation at NORAD Headquarters and subordinate units and the only significant change would be in the administrative channels for NORAD Navy personnel. Liaison on matters concerning Navy ASW, augmentation forces, and SPASUR were to be handled by CONAD/NORAD with the commands concerned or the CNO.

(U) NAVFORCONAD was disestablished on 1 September 1965, eleven years to the day after it had been established.

NORAD/CONAD SUBORDINATE STRUCTURE

(U) When CONAD was formed in 1954, it was superimposed on the existing USAF ADC structure from command headquarters down through division (the second) level. CONAD established subordinate organizations on paper, terming them joint defense forces (the first level) and joint divisions. In January 1957, CONAD changed these designations to regions and divisions. CONAD Headquarters was separated from ADC Headquarters in 1956, but this did not change the situation below command level, i.e., ADC subordinate organizations served as the CONAD organizations and later the NORAD organizations as well.

(U) CONAD submitted a proposed manning and organization plan for its subordinate units in mid-1957. But this plan was recalled because of a reorganization of the structure to provide for SAGE. A second plan was submitted in February 1960. It covered only the regions in the CONUS and did not mention the next level (called sectors by this time). Alaskan Region was left to the desires of the Commander-in-Chief Alaska and Northern NORAD. Region was organized separately.*

* (U) An Alaskan NORAD/CONAD Region Headquarters was organized on 1 February 1962, staffed on a dual-capacity basis.



(U) Again a reorganization of the command intervened. A month after this plan was submitted, USAF announced a large reduction in programmed air defense equipment (Chapter Two). Because of this, NORAD again revised its plan. Among the changes was reduction to six regions in the CONUS.

(U) A new plan, which included the sectors, was submitted in October 1960. It covered six regions and 21 sectors planned for the CONUS. The JCS approved this plan and the new headquarters were established on 1 August 1961 as what might be described as semi-separately-organized commands. NORAD/CONAD regions had integrated joint staffs, but a number of dual-role (component-NORAD/CONAD) positions remained. For one thing, because of the shortage of general officers, there remained a dual-role arrangement for the region command positions. The region commander could be additionally-designated as the commander of his service component. The deputy commander positions at the regions 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 sector headquarters, the dual-role arrangement was carried out for most of the staff. USAF ADC sector officers were used extensively in additional duty designations from commander on down.

(U) As of the 1 August 1961 date noted above, when the CONUS regions and sectors were organized, NORAD had an overall total of eight regions and 28 sectors. The six regions in the CONUS were numerically designated (e.g., 25th Region). There were two geographically-designated regions, Northern and Alaskan. Sectors carried the names of nearby cities.



As had been the case in the past, changes in the structure began almost immediately. Some changes were made because units were eliminated as unnecessary or boundaries redrawn for operational reasons, etc. But mainly changes resulted from a series of Secretary of Defense decisions to phase down or reorient the manned bomber system as has been discussed earlier.

First off, in late 1962, the Secretary of Defense directed the Air Force to close six SAGE direction centers (sectors) by the end of FY 1964. The six were eliminated during calendar year 1963. At the end of that year, NORAD had 19 sectors under eight regions.

Next, in late 1963, the Secretary directed the closing of four more SAGE direction centers and two SAGE combat centers (regions). He approved phasing out the combat centers and two of the direction centers in FY 1966 and the other two direction centers in FY 1968. Elimination of these organizations prompted a reorganization by NORAD/CONAD which included practically an entire restructuring of the subordinate organization. It was planned to reconfigure the CONUS structure under the four remaining regions, giving them once again a geographical designation and to once again designate the next echelon as divisions with numerical titles.* The reason for the latter was that it was

* (U) Prior to 1 July 1960, NORAD's CONUS regions had carried geographical designations. There had been three CONUS regions - Western, Central and Eastern. The CONUS structure was then changed to seven numerically-designated regions. Also up to this time, the next level had been termed divisions with numerical designations. The latter were changed to city names.



felt that "division" was a more standard, better understood term, and the city-names had become meaningless in the many cases where the sector headquarters were far removed from the cities of their names.

(U) In a parallel reorganization, USAF ADC changed its CONUS structure. ADC went from numbered air divisions (which had been equivalent to NORAD's regions) to numbered air forces and from city-named sectors to numbered air divisions.

(U) These changes took place on 1 April 1966. Two regions were eliminated (25th at McChord AFB and the 30th at Truax Field). The direction centers at Los Angeles and Reno were discontinued. NORAD reorganized its CONUS structure into four geographical regions: Eastern, Central, Western and Southern, and 15 numbered divisions. In all, as of 1 April 1966, there were six regions, including the two in Alaska and Canada, and 17 divisions.

(U) The other two direction center cuts ordered by DOD in 1963 were made in FY 1968. Two divisions were closed in November 1967 and discontinued on 1 January 1968.

(U) More cuts resulted from the phase down of the current air defense system. On 1 July 1968, the Southern NORAD Region, Gunter AFB, Alabama, and the 30th Division, Sioux City, Iowa, were discontinued.

(U) 15 September 1969 Reconfiguration. Following this, another combat center and two more direction centers were closed on 15 September 1969 as part of this phase down of the old system. The Western NORAD/CONAD Region Headquarters was relocated from Hamilton AFB to Richards-Gebaur AFB (the Hamilton combat center was closed), the Central NORAD/CONAD

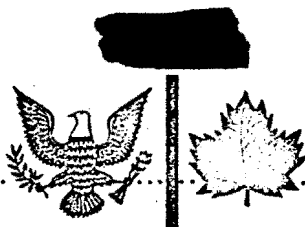


Region Headquarters was discontinued; and the 26th and 36th NORAD/CONAD Divisions were discontinued. NORAD had then, four regions (three SAGE and one manual combat center) and eleven divisions (nine SAGE and two manual DCs).

(U) ADC and ARADCOM Changes. At the same time, ADC inactivated its Fourth Air Force Headquarters at Hamilton AFB on 30 September 1969 and its 26th and 36th Air Division Headquarters on the same date. ARADCOM continued its three region structure but moved its 2nd Region from Richards-Gebaur AFB to Selfridge AFB, Michigan, effective 1 September 1969 and shifted boundaries.

(U) 14 November 1969 Reconfiguration. New changes followed very shortly, however, because of fund reductions imposed on all the Services. This became a restructuring of major proportions. The existing regions (combat centers) were eliminated. Six of the divisions (direction centers) in the CONUS were redesignated as NORAD/CONAD regions. The remaining divisions (direction centers) in the CONUS were eliminated. Thus, one level below command headquarters was cut out completely. Twelve BUIC III centers were kept in the CONUS (one was eliminated). NORAD/CONAD gave its six new regions in the CONUS numerical designations. NORAD also discontinued the Northern NORAD Region, North Bay, Ontario, and established the region with a numerical designation (22nd). The Alaskan Region remained in existence as before.

(U) ADC and ARADCOM Restructuring. ADC inactivated its numbered air forces and air divisions and activated new air divisions in the CONUS at the same locations and with the same numbers as the NORAD/CONAD regions. ARADCOM retained its structure basically as it was, but redesignated the areas of responsibility for its three regions.



CHAPTER EIGHT

MISSILE AND SPACE DEFENSE

BALLISTIC MISSILE EARLY WARNING SYSTEM

■ The Ballistic Missile Early Warning System of three stations was initiated back in January 1958. DOD authorized the Air Force to develop a system of three stations -- one each in Alaska, Greenland, and the U.K. -- and a ZI computer central and display facility and interconnecting communications. USAF informed ADC of its responsibilities the following month and noted that development of the system was to be an allout program.

■ Despite the latter, the program ebbed and flowed. Late in 1958, DOD said to go ahead with only the Greenland site, Site I (Thule was chosen as the specific location). Then a few months later, DOD told the Air Force to proceed with the Alaskan site, Site II (Clear was chosen as the location), but that the third site, in the U.K. was deferred. At first, Sites I and II were to have both detection and tracking radars. In May 1959, trackers were deferred from both, however. USAF said that Site III in the U.K. would have trackers only. In September 1959, DOD authorized the Air Force to go ahead with Site III, to be at Fylingdales Moor, England. An agreement was signed 15 February 1960 for installing this site -- a joint U.S.-U.K. venture.

■ In June 1960, DOD approved one tracker each for Sites I and II. The Clear tracker was delayed, however, because of fund limitations. It was not until September 1963 that a tracker for Clear was finally authorized. In the meantime, an interim display facility was being set up at Ent AFB until the new COC was ready.

EXCLUDED FROM AUTOMATIC
REGRADING; DOD DIR 5200.10
DOES NOT APPLY



30 September 1960 was a landmark -- the first operation of a defense system against the ballistic missile threat. On this date, the detection radars at Thule attained initial operational capability. A manual IOC was also achieved on this date in the interim BMEWS display facility. Two-site detection capability was achieved on 30 June 1961 when Site II, Clear, reached IOC with its detection radars.* A tracking radar became operational at Site I at the end of 1961 and at Site II in July 1966. The third site, in England, gained limited operation in September 1963 and became fully operational on 15 January 1964. NORAD and RAF Fighter Command had joint operational control of this site.

BMEWS ATTACK ASSESSMENT

In August 1967, the JCS informed CONAD of a USAF proposal to improve BMEWS so that it would give attack assessment information. The JCS said this information was needed to help in determining if North America was under attack, which country was attacking, and the scope of the attack. The JCS asked for comments and recommendations.

CONAD replied in October 1967 that the proposal appeared to be the most promising method for getting a high degree of missile launch and impact accuracy using the present BMEWS equipment. After further analysis of the matter, on 11 April 1968, NORAD told the JCS that attack assessment

* Full operational capability with detection radars was achieved at Site I on 31 January 1961 and at Site II on 30 September 1961. FOC for the tracker at Site II was achieved on 15 September 1966.



information could be gotten by adding a relatively simple and inexpensive program routine to the missile warning computers in the NORAD COC. The JCS directed NORAD to make these changes so that operations could begin by 1 January 1969.

The changes were made by NORAD for processing missile attack assessment data in time for testing during Exercise High Heels 1968. The results of this test were disappointing and on 13 December 1968, NORAD told the JCS that this technique should not be used. NORAD said it would give the data further analysis and inform the JCS of the results.

In the meantime the JCS had considered another method and, on 24 July 1968, directed USAF to modify computer programs at BMEWS Sites I and II. This method, one of four proposed by ADC, was the most economical in that it did not require any modifications to the BMEWS radars.

After discussions at NORAD Headquarters in April 1969 to solve details of interface and dissemination requirements, the new method was tested in mid-1969. Finally, on 15 September 1969, BMEWS attack assessment became operational.

OTH MISSILE DETECTION SYSTEM (440L)

An Over-the-Horizon Forward Scatter Missile Detection System (440L) began interim capability operations on 1 March 1968. At that time, the system had three transmitter sites in operation in the Far East and five receiver sites and a data correlation center in Europe. A fourth transmitter site became operational in December 1968. Initial operational capability of the 440L System was set for late 1970.



SAFEGUARD ABM SYSTEM

(U) Sentinel System. One of the most significant developments in aerospace defense was the go-ahead given by the Secretary of Defense on 18 September 1967 for production and "thin" deployment of an ABM defense termed the Sentinel System. In his statements before the Senate committees in February 1968, quoted from earlier, McNamara said that there was mounting evidence that the Red Chinese were devoting substantial resources to developing nuclear warheads and missile delivery systems. He detailed their progress and then continued:

In the light of this progress in nuclear weapons and missile delivery systems, it seemed feasible and prudent to us last September to initiate the deployment of an austere Chinese-oriented ABM defense. We knew from our continuing study of this system that it could be deployed at an investment cost of about \$5 billion and could be highly effective against the kind of threat a Chinese force might pose in the 1970s.

As presently defined, the Sentinel ABM System . . . would consist of Perimeter Acquisition Radars (PARs), Missile Site Radars (MSRs), long range Spartan area defense missiles and, later, some Sprint local defense missiles for certain special purposes.

(U) In addition to the early Chinese threat, McNamara stated that this initial deployment would serve as a foundation to which "we could add a defense for our Minuteman force if that later becomes desirable. Finally, it could



protect our population against . . . accidental launch of a few ICBMs by any one of the nuclear powers."

1969 Program Revisions. Early in 1969, the new Secretary of Defense made a complete review of the Sentinel Program. From this review came a decision announced by the President on 14 March 1969 to greatly alter the deployment. On 25 March the system was officially redesignated the Safeguard Ballistic Missile Defense System. A two-site system defending Minuteman sites was approved at this time. This deployment was termed Phase I of the Safeguard System.

SPACE DETECTION AND TRACKING SYSTEM

The year 1960 saw NORAD's and CONAD's responsibilities also expanded into space. On 7 November 1960, the JCS assigned CINCNORAD operational control and CINCONAD operational command of the Space Detection and Tracking System (SPADATS). Initially, this system consisted of the Air Force Spacetrack and the Navy Space Surveillance (SPASUR) systems. Many other systems later also provided data to SPADATS. Among these was the Baker-Nunn camera operated by the RCAF. This facility began supplying data in mid-1962 and was placed under NORAD operational control at the end of 1962. A new camera was installed early in 1967. Also included was a radar at Diyarbakir, Turkey. Manning and operation of this site was transferred from the Security Service to USAF ADC on 1 July 1963.

The SPADATS control facility was manned and operated as an integral part of the NORAD COC. Until the Ent AFB COC achieved a computer capability



NORAD used the USAF facility at L. G. Hanscom Field, Massachusetts, for SPADATS control. This function was transferred to Ent AFB in June 1961. As noted in Chapter Seven, the Space Defense Center, an integrated NORAD/CONAD-ADC center, became operational in the underground COC on 6 February 1967.



ROSTER OF COMMANDERS

AAF/USAF AIR DEFENSE COMMAND

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

CONTINENTAL AIR COMMAND

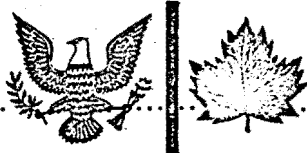
Lt Gen George E. Stratemeyer . . . Dec 48-Apr 49
Lt Gen Ennis C. Whitehead . . . Apr 49-Dec 50

USAF 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, Jr. . . 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-Jul 63
Lt Gen Robert H. Terrill . . . Jul 63-Aug 63
Lt Gen Herbert B. Thatcher . . . Aug 63-Jul 67
Lt Gen Arthur C. Agan . . . Aug 67-Feb 70
Lt Gen Thomas K. McGehee . . . Mar 70-

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-Aug 63
Maj Gen James C. Jensen Aug 63-Nov 66
Maj Gen T. E. Moore Nov 66-Jul 69
Maj Gen Joseph H. Cunningham . . Aug 69-

ALASKAN COMMAND

Maj Gen Howard A. Craig Jan 47-Aug 47
Lt Gen Nathan F. Twining 47- 50
Lt Gen William E. Kepner 50- 53
Lt Gen Joseph H. Atkinson 53-Jul 56
Lt Gen Frank A. Armstrong Jul 56-Jul 61
Lt Gen George W. Mundy Jul 61-Jul 63
Lt Gen Raymond J. Reeves Aug 63-Jul 66
Lt Gen Glen R. Birchard Jul 66-Jun 67
Lt Gen Robert A. Breitweiser . . Jul 67-Jul 69
Lt Gen Robert G. Ruegg Sep 69-

RCAF AIRDEFENCE GROUP

G/C W R. MacBrien Dec 48-May 51

RCAF AIRDEFENCE COMMAND/CANADIAN FORCES AIR DEFENCE COMMAND

A/V/MC. R. Dunlap Jun 51-Jul 51
A/V/MA. L. James Aug 51-Sep 54
A/C (L. Annis Sep 54-Jan 55
A/V/ML. E. Wray Jan 55-Aug 58
A/V/IW. R. MacBrien Aug 58-Sep 62
A/V/IM. M. Hendrick Sep 62-Aug 64
A/V/IM. D. Lister Aug 64-Apr 66
A/C . C. Hull Apr 66-Jul 66
A/V/M. E. Pollard Jul 66-Jan 69
Maj Gen M. Lipton Jan 69-

ARMY ANAIRCRAFT 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. Mickelsen . . . Oct 54-Oct 57
Lt Gen Charles E. Hart . . . Nov 57-Jul 60
Lt Gen Robert J. Wood . . . Aug 60-May 62
Lt Gen William W. Dick, Jr. . . May 62-Aug 63
Lt Gen Charles B. Duff . . . Sep 63-Jul 66
Lt Gen Robert Hackett . . . Aug 66-Jun 68
Lt Gen G. V. Underwood, Jr. . . Jul 68-

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-Jun 63
Radm James H. Mini . . . Jun 63-Dec 63
Capt Virgil A. Irwin . . . Dec 63-Aug 64
Capt Hoyt D. Mann . . . Sep 64-Sep 65

CONTINENTAL AIR DEFENSE COMMAND

Gen Benjamin W. Chidlaw . . . Sep 54-May 55
Lt Gen Stanley R. Mickelsen . . . May 55-Jul 55
Gen Earle E. Partridge . . . Jul 55-Jul 59
Gen Laurence S. Kuter . . . Aug 59-Aug 62
Gen John K. Gerhart . . . Aug 62-Apr 65
Gen Dean C. Strother . . . Apr 65-Jul 66
Gen Raymond J. Reeves . . . Aug 66-Jul 69
Gen Seth J. McKee . . . Aug 69-



NORTH AMERICAN AIR DEFENSE COMMAND

Gen Earle E. Partridge	Sep 57-Jul 59
Gen Laurence S. Kuter	Aug 59-Aug 62
Gen John K. Gerhart	Aug 62-Apr 65
Gen Dean C. Strother	Apr 65-Jul 66
Gen Raymond J. Reeves	Aug 66-Jul 69
Gen Seth J. McKee	Aug 69-Oct 73

DEPUTY COMMANDER, NORTH AMERICAN AIR DEFENSE
COMMAND

A/M C. Roy Slemon	Sep 57-Aug 64
A/M C. R. Dunlap	Aug 64-Aug 67
A/M W. R. MacBrien	Aug 67-Jan 69
Lt Gen F. R. Sharp	Jan 69-Sep 69
Lt Gen E. M. Reyno	Sep 69-