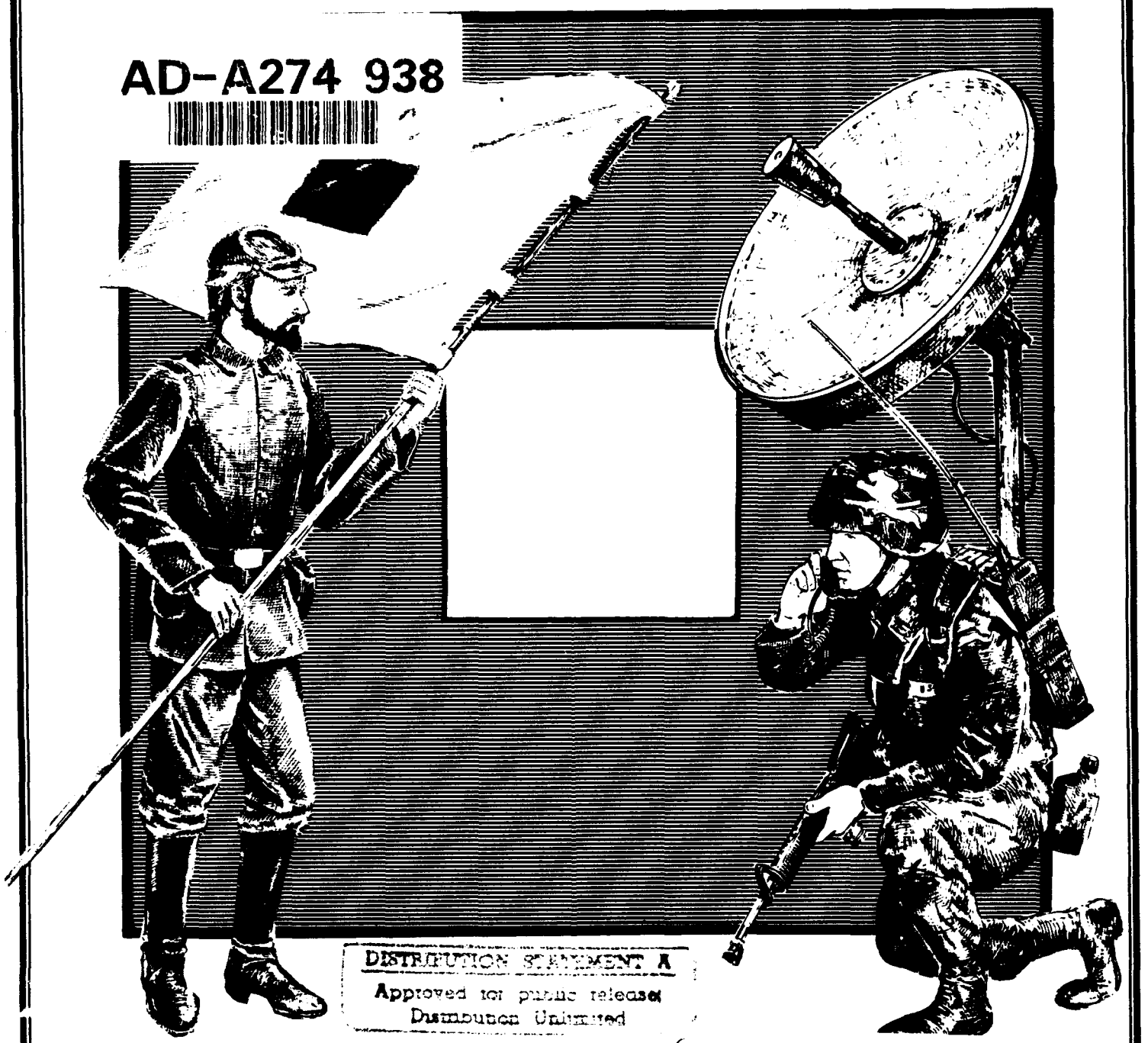
A Concise History of the U.S. Army Signal Corps



A Concise History of the U. S. Army Signal Corps

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Office of the Command Historian
U. S. Army Signal Center and Fort Gordon

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PREFACE

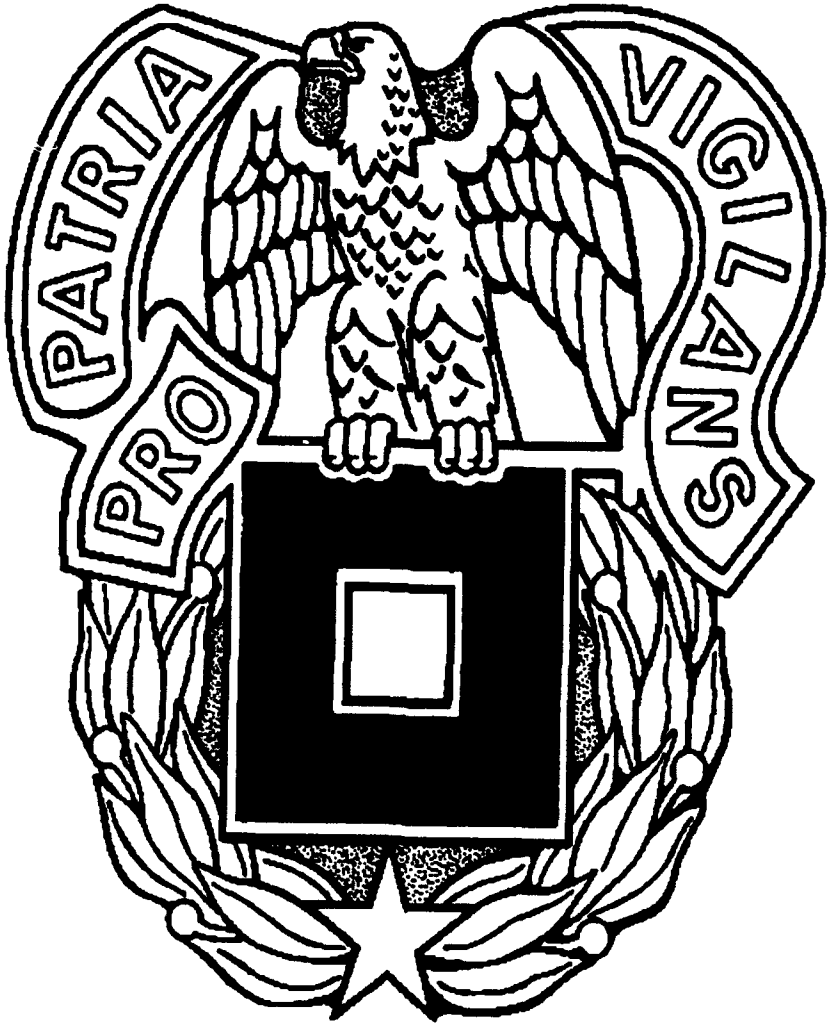
The Office of the Command Historian, recognizing, the need for an authoritative source of information on the history of the Signal Corps for official speeches, press releases, newspaper articles, etc., has prepared this summary of Signal Corps history.

Originally published in 1988, this second revised volume includes information on the Regimental System, an overview of Signal Corps history, a more in depth history, biographical sketches of Chief Signal Officers from BG Albert J. Myer to MG Peter A. Kind, biographical profiles of Signal Corps Medal of Honor recipients, a photographic section, and an expanded and updated selective chronology. The photographs are part of the United States Army Signal Center and Fort Gordon (USASC&FG) Archives located in the Command Historian Office. This volume should serve as the source of any statements made about the history of the Signal Corps. Any deviations should be reviewed by the Office of the Command Historian.

Office of the Command Historian
US Army Signal Center and Fort Gordon
February 1991

ILLUSTRATIONS AND PHOTOGRAPHS

Signal Corps Distrinctive Insignia



Signal Corps Coat of Arms

U.S. ARMY SIGNAL CORPS REGIMENT

On 3 June 1986, the U.S. Army Signal Corps was once more commanded by a Chief Signal Officer. The title had not been used since it was redesignated in 1964 to that of Department of Army Staff, Chief of Communications Electronics.

For a few brief moments, MG Thurman D. Rodgers became Chief Signal Officer before turning over both the title and command of the Signal Center and Fort Gordon to MG Bruce R. Harris.

In that ceremony, generals Rodgers and Harris became respectively, the 21st and 22nd persons in the succession of chief signal officers that includes a medical doctor and the Corp's founder (Albert J. Myer), an explorer (Adolphus W. Greely), and an inventor (George O. Squier), to mention only a few of the men who have so ably led the branch through its years of service to the country.

The June change of command ceremony also marked the activation of the Signal Corps under the Army's Regimental System when MG Rodgers and the post's command sergeant major, CSM Cecil B. Miles unfurled the Corps' coat of arms. This placed the Signal Corps under the U.S. Army Regimental System, effective 1 June 1986.[2]

According to the Regimental System implementation plan, the commander of the USASC&FG is the Army's Chief Signal Officer. The Office Chief of Signal serves as the operational headquarters for the Corps' regimental activities. The Signal Center is the regimental home of the Signal Corps. The Signal Center commander and command sergeant major act as the regimental commander and command sergeant major, respectively. The Signal School's brigades are flagged under the regimental plan.

Distinctive Insignia

Description

The Signal Corps regimental insignia is the symbol of Corps affiliation for Signal soldiers worldwide. The insignia consists of a gold eagle grasping a horizontal baton from which is suspended a red Signal flag with a white center, enclosing the flag from a star at bottom, a wreath of laurel all gold and at top left and right a white scroll inscribed "PRO PATRIA" at left and "VIGILANS" at right in gold.

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[2]Carol E. Rios, "Chief Signal Officer returns to the corps," Signal, 20 August 1986.

Symbolism

The gold eagle holds in his talons a golden baton, from which descends a signal flag. The design originated in 1865 from a meeting in Washington, D.C. of Signal Corps officers, led by Major Albert Myer, the Chief Signal Officer. The badge was a symbol of faithful service and good fellowship for those who served together in war and was called the "Order of the Signal Corps." The motto "Pro Patria Vigilans" (Watchful For The Country) was adopted from the Signal School insignia and serves to portray the cohesiveness of Signal soldiers and their affiliation with their regimental home. The gold laurel wreath depicts the myriad achievements through strength made by the Corps since its inception. The battle star centered in the wreath represents formal recognition for participation in combat. It adorned a Signal flag and was first awarded to Signal soldiers in 1862. The battle star typifies the close operational relationship between the combined arms and the Signal Corps.

Coat of Arms

The Signal Corps' Coat of Arms consists of a blazon shield, crest, and motto. The Signal flag suspended from a baton is adopted from the "Order of the Signal Corps" badge. The bronze "battle star" represents formal recognition for participation in combat. It adorned a Signal flag and was first awarded to Signal soldiers in 1862. Orange and white are the traditional colors of the Signal Corps. The hand personifies that the Corps has grasped the lighting from the heavens and is applying it to military communications. The motto is Pro Patria Vigilans.[3]

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[3]Letter from Colonel Gerald T. Luchino, Director, The Institute of Heraldry, United States Army to Commander, USASC&FG, subject: Distinctive Insignia for the Signal Corps, 20 March 1986 and Letter from Colonel Gerald T. Luchino, Director, The Institute of Heraldry, United States Army to Commander, USASC&FG, subject: Coat of Arms for the Signal Corps, 20 March 1986.

AN OVERVIEW OF SIGNAL CORPS HISTORY

Albert James Myer, an Army doctor, first conceived the idea of a separate, trained, professional military signal service. He proposed that the Army use his visual communications system called "wigwag" while serving as a medical officer in Texas in 1856. When the Army adopted his system on 21 June 1860, the Signal Corps was born with Myer as the first and only Signal Officer.

Major Myer first used his visual signaling system on active service in New Mexico during the 1860-1861 Navajo expedition. Using flags for daytime signaling and a torch at night, wigwag was tested in Civil War combat in June 1861 to direct the fire of a harbor battery at Fort Calhoun (Fort Wool) against the Confederate positions opposite Fort Monroe. Until 3 March 1863, when Congress authorized a regular Signal Corps for the duration of the war, Myer was forced to rely on detailed personnel. Some 2900 officers and enlisted men served, albeit not at any one time, in the Civil War Signal Corps.

Myer's Civil War innovations included an unsuccessful balloon experiment at First Bull Run and, in response to McClellan's desire for a Signal Corps field telegraph train, an electric telegraph in the form of the Beardslee magnetoelectric telegraph machine. Even in the Civil War the wigwag system, dependent upon line-of-sight, was waning in the face of the electric telegraph.

The electric telegraph, in addition to visual signaling, became a Signal Corps responsibility in 1867. Within 12 years, the Corps had constructed, and was maintaining and operating some 4,000 miles of telegraph lines along the country's western frontier.

In 1870, the Signal Corps established a congressionally mandated national weather service. With the assistance of Lieutenant Adolphus Greely, Chief Signal Officer Brigadier General Myer, by the time of his death in 1880, commanded a weather service of international acclaim. The weather bureau became part of the Department of Agriculture in 1891, while the Corps retained responsibility for military meteorology.

The Signal Corps' role in the Spanish American War of 1898 and the subsequent Philippine Insurrection was on a grander scale than it had been in the Civil War. In addition to visual signaling, including heliograph, the Corps supplied telephone and telegraph wire lines and cable communications, fostered the use of telephones in combat, employed combat photography, and renewed the use of balloons. Shortly after the war, the Signal Corps constructed the Washington-Alaska Military Cable and Telegraph System (WAMCATS), introducing the first wireless telegraph in the Western Hemisphere.

On 1 August 1907 an Aeronautical Division was established within the office of the Chief Signal Officer. In 1908, the Wright brothers made test flights of the Army's first airplane built to Signal Corps' specifications. Army aviation remained within the Signal Corps until 1918 when it became the Army Air Service.

The Signal Corps lost no time in meeting the challenges of World War I. Chief Signal Officer Major General George O. Squier worked closely with private industry to perfect radio tubes while creating a major signal laboratory at Camp Alfred Vail (Fort Monmouth). Early radiotelephones developed by the Signal Corps were introduced into the European theatre in 1918. While the new American voice radios were superior to the radiotelegraph sets, telephone and telegraph remained the major technology of World War I.

A pioneer in radar, Colonel William Blair, director of the Signal Corps laboratories at Fort Monmouth, patented the first Army radar demonstrated in May 1937. Even before the United States entered World War II, mass production of two radar sets, the SCR-268 and the SCR-270, had begun. Along with the Signal Corps' tactical FM radio, also developed in the 1930s, radar was the most important communications development of World War II.

The Signal Corps' Project Diana, in 1946, successfully bounced radar signals off the moon paving the way for space communications. On 18 December 1958 with Air Force assistance, the Signal Corps launched its first communications satellite, Project SCORE, demonstrating the feasibility of worldwide communications in delayed and real time mode by means of relatively simple active satellite relays. Meanwhile the Korean conflict cut short an all too brief peace.

Korea's terrain and road nets along with the distance and speed with which communications were forced to travel limited the use of wire. The Signal Corps' VHF radio became the "backbone" of tactical communications throughout the conflict.

The Vietnam War's requirement for high quality telephone and message circuits led to the Signal Corps' deployment of tropospheric scatter radio trunks that could provide many circuits between locations over 200 miles apart. Other developments included the SYNCOM satellite communications service and a commercial fixed-station system known as the Integrated Wideband Communications System, the Southeast Asian link in the Defense Communications System.

With the recent development of Mobile Subscriber Equipment, the Single Channel Ground and Airborne Radio System, the Joint Tactical Information Distribution System and other innovations, today's Signal Corps continues to safeguard our peace and ensure our preparedness by "getting the message through."

BG Albert J. Myer, Founder of the US Army Signal Corps

Enclosure VI. (Original of this)

Head Quarters Armies of the United States
Washington D. C. July 30. 1866.

Hon. E. M. Stanton
Secretary of War.
Sir.

I would respectfully recommend the appointment of Albert J. Myer to the place of Chief of the Signal Corps as provided for by act of Congress - Col. Myer is the inventor of the system used both in the Army and Navy which would seem to give him a claim to the position of Chief which he once held and which the Senate have refused to confirm any other person in

I have the honor to be
very respectfully
Your Obt. Svt
U. S. Grant
General

"Official Copy
Geo. K. Leech
Asst. Adjt. Genl.

U. S. Grant recommends Myer to be Chief Signal Officer, 1866

A BRIEF HISTORY OF THE SIGNAL CORPS

In the Beginning

Communications have always been vital to the military. Ancient armies used a number of communication systems including, for instance, flags, streamers, lights, fires, and trumpets. Some of these were employed by American Indians. The Greeks adopted a system using torches in two series to signal numerical combinations representing letters of the alphabet. This system is usually attributed to Greek historian, Polybius (203?-c.120 B.C.). One authority considered the Polybian signaling system to comprise "the fundamental principle of the best systems of signaling which were developed in the centuries to come." Indeed, the wigwag system used by the early United States Army Signal Corps, based on left and right movements of one flag or torch, was a two element system.[4]

Birth of the Signal Corps

The Signal Corps' wigwag system was the innovation of Albert James Myer, the Corps' founder. Myer, born in Newburgh, New York, on 20 September 1828, studied medicine as an office student under Dr. Frank Hastings Hamilton in Buffalo and attended a course of lectures at the University of Buffalo. While a medical student, Myer worked part time in the Buffalo office of the New York Telegraph Company and there became familiar with Alexander Bain's electrochemical telegraph system. In 1851 Myer used his experience with the electric telegraph to design "A New Sign Language for Deaf Mutes," the title and subject of his doctoral dissertation. In the dissertation Myer proposed a "system of sign writing" based upon the Bain telegraphic alphabet. The system earned him his Doctor of Medicine degree awarded on 26 February 1851.[5]

Myer's interest in military signaling evolved from the work on his dissertation. Early in 1851 he wrote Dr. James Webster, a member of the Buffalo and Geneva College medical faculties, of this interest. Webster replied in March, 1851. He told Myer that he had discussed the signals used by the Navy with Lieutenant Stoddard. The Navy employed lights, powder flashes, lanterns, rockets, thirteen flags, colored balls, and guns. Stoddard believed a simpler and quicker system was in real need. Although

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[4]Paul Schieps, ed., Military Signal Communications, 2 vols. (New York: Arno Press, 1980), I: 1.

[5]Paul Schieps, "Albert James Myer, Founder Of The Army Signal Corps: A Biographical Study," (Ph.D. dissertation, The American University, 1966), pp. 5, 63-77 and Paul Schieps, "Albert James Myer: Leader and Innovator," unpublished paper, Center of Military History, Washington, D.C., September 1985, pp. 1-2.

Myer was no doubt encouraged by this news, there is nothing in the records to indicate his concern in military signaling continued beyond this inquiry.

Meanwhile, Myer pursued his medical career. In January 1854 he passed the Army medical board examination and subsequently received an appointment as an assistant surgeon in the Medical Corps. While serving as a medical officer in Texas, Myer's interest in military signaling resumed. In a letter dated 1 October 1856 to Secretary of War Jefferson Davis, Myer proposed for the War Department's consideration a system of military and naval signals stemming from his 1851 doctoral dissertation. Although Davis was uninterested, his successor, John Floyd, wanted Myer to present his visual system of communications to an Army board. On 3 March 1859 Myer appeared before the board headed by Lieutenant Colonel Robert E. Lee. Nine days later on 12 March the board reported that it found Myer's system useful but in need of testing. Beginning on 6 April 1859 Myer conducted months of testing in which he experimented with different flags, torches, poles, and platforms before deciding on the basic equipment and details for his wigwag system. One of Myer's assistants was E. Porter Alexander, who a short time later was to use Myer's system for the Confederacy. These tests together with lobbying by Myer led to an act of 21 June 1860 providing for the appointment of one signal officer at the rank of major and $2,000 for signaling equipment. Myer's medical career ended with his appointment to the signal officer post.

Major Myer used his visual signaling system on active service first in New Mexico during the 1860-1861 Navajo expedition commanded by Brevet Lieutenant Colonel Edward R. S. Canby. Actually it was Canby's idea that signaling should be preformed by a corps of specialists. Myer, who considered signalmen as combatants as well as signalmen and who wanted all Army officers trained in signaling, soon accepted Canby's idea.[6]

Civil War

With the coming of the Civil War, Major Myer's signaling operations with the Navajo Expedition came to an end. He was ordered to Fort Monroe where he began a signal camp of instruction. Myer's system received its first test in combat during the Civil War when it was used in June 1861 to direct the fire of harbor battery on the Rip Raps at Fort Calhoun (later Fort Wool) against the Confederate positions at Sewell's Point opposite Fort Monroe. On June 26 communications by signals began between Fort Monroe and a post at Newport News, thereby, establishing the Civil War's

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[6]Schieps, "Albert James Myer, Founder Of The Army Signal Corps," pp. 79, 81, 104-106, 115-125, 156-158, 177-178, 183-221, 236-240, 271, 276-277, 306 and Schieps, "Albert James Myer: Leader and Innovator," pp. 2-4.

"first permanent line of communication by flag and torch." When standardized the system used flags for daytime signaling and a torch for nighttime signaling. The standardized flags consisted of one red and one white flag, a white center in the red flag and a red center in the white flag. Depending upon the color of the background, one flag was used at a time. Glasses were employed to read the messages. The typically three-word-a-minute system could be sent an average distance of ten miles between stations.[7]

Until 1863 Myer was forced to rely upon details for personnel. Then on 3 March of that year legislation was passed authorizing a regular rather than acting Signal Corps for the duration of the war. The act provided for a Chief Signal Officer with the rank of colonel and other officers and enlisted personnel. Some four hundred officers and about 2,500 enlisted men served, albeit not at any one time, in the Civil War Signal Corps.

During the Civil War, Myer experimented at least on one occasion (First Bull Run) with a balloon. In 1864 he wrote A Manual of Signals, the first of several editions. In response to McClellan's desire for a Signal Corps field telegraph train, Myer introduced the electric telegraph into the Signal Corps in the form of the Beardslee magnetoelectric telegraph machine. By 1863 the Signal Corps operated thirty telegraph trains. Myer's attempt, however, to control all military telegraph led to his temporary removal in November 1863 as Chief Signal Officer. Even in the Civil War the wigwag system, a visual signaling system dependent upon line of sight, was waning in the face of the electric telegraph, a fact well known to Myer.[8]

Post Civil War

Following the Civil War, in 1866 legislation was passed providing for the postwar military establishment followed by another act in 1878. Myer, who in 1866 had been restored to his position as Chief Signal Officer, used the legislation to rebuild the Signal Corps. One of the officers detailed to Signal duty was Second Lieutenant Adolphus Washington Greely. Unknown to Myer and Greely, that was just the beginning of Greely's illustrious and long career with the Signal Corps, which spanned thirty-nine years

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[7]Schieps, "Albert James Myer, Founder Of The Army Signal Corps," pp. 316, 339-340; Schieps, "Albert James Myer: Leader and Innovator," pp. 4-5; and J. Willard Brown, The Signal Corps, U.S.A. In The War Of The Rebellion, with an introduction by Paul Schieps, reprint (New York: Arno Press, 1974), pp. i-iii, 41-42.

[8]Schieps, "Albert James Myer: Leader and Innovator," pp. 5-17; Schieps, "Albert James Myer, Founder Of The Army Signal Corps," pp. 340, 343-348; and Brown, The Signal Corps, U.S. A., In The War Of The Rebellion, pp. 7-13.

and included nineteen years (1887-1906) as Chief Signal Officer.[9]

In 1867 electric telegraphy became a responsibility of the Signal Corps in addition to its visual signaling duties. Myer met the challenge and supervised the development of a flying or field telegraph train utilizing batteries and sounders.

Myer then turned his attention to meteorology. In 1870 a congressional resolution called for a national weather service under the administration of the Secretary of War. After President Grant signed the resolution, Secretary of War, William Belknap, assigned this new duty to the Signal Corps. With the assistance of Greely, who had been detailed for a second time to the Signal Corps, Myer organized and equipped the weather service and trained signalmen to operate it. The Signal Corps operated a weather reporting system and assumed other related responsibilities including, the establishment of weather stations from which atmospheric studies were made. One such station was located in Augusta, Georgia (the present home of the Signal Corps and Fort Gordon). In 1870 there were twenty-five regular stations, sixty the next year, and more on the way. By the time Brigadier General Myer died as Chief Signal Officer in 1880, the weather service was world renowned.

In 1880 and 1881 the United States participated with other nations in establishing and maintaining circumpolar stations for the study of Arctic weather and climate. The Signal Corps headed by Chief Signal Officer Brigadier General William B. Hazen dispatched two parties. One party led by Lieutenant Phillip H. Ray went to Point Barrow, Alaska. Greely led the second party. Interested in climatology along with other aspects of scientific geography, Lieutenant Greely volunteered for the expedition to the station planned for Lady Franklin Bay. Although by 1884 the Greely expedition was reduced to a few survivors, the scientific data collected was valuable in increasing the knowledge of the earth's climate and tidal patterns. The Signal Corps operated the weather service for another seven years until it was transferred in 1891 to the Department of Agriculture. The Signal Corps, however, retained responsibility for military meteorology. Another post Civil War responsibility was assigned to the Signal Corps in 1874. The Corps assumed the task for constructing, maintaining, and operating telegraph lines along the southwestern frontier and later along the northeast. The Corps already had completed some five hundred miles of telegraph line along the east coast. In 1875 Greely completed a line across Texas, in 1877 rebuilt telegraph lines from Cape Hatteras to Cape Henry, and in 1877 rebuilt a line from Santa Fe to San Diego. Greely became known as the Signal Corps' "trouble-shooter" in the area of military telegraph line

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[9]Schieps, "Albert James Myer: Leader and Innovator," pp, 17-18; Brown, The Signal Corps, U.S.A., In The War Of The Rebellion, pp. 14-18; and Charles R. Shrader, "Adolphus Washington Greely," in Dictionary Of American Military Biography, 3 vols., (Westport, Connecticut: Greenwood Press, 1984), I: 404-406.

construction. By 1879 the Signal Corps had completed some 4,000 miles of telegraph lines.[10]

With the death of Brigadier General Hazen in 1887, Captain Greely was promoted to Brigadier General and Chief Signal Officer. Greely placed strong emphasis on combat signaling. In the face of inadequate training, reduced funds, and a congressional effort to abolish the Signal Corps, Greely managed to introduce new modes of communication into the Army. In 1890 he equipped some Signal Corps units with the first heliographs in the Army. (The Signal Corps had tested the heliograph in the 1870s.) Greely sponsored experiments leading to the Signal Corps' first field telephones, which were poorly received. But, forging ahead by 1890 he placed telephones in lighthouses and lifesaving stations along the Atlantic coast. By 1892 approximately one half of the country's Army posts were equipped with telephones. An avid scientist, Greely supported Captain James Allen's experiments and announced in 1897 the development of a new field telephone.

Photography was another peacetime interest of Greely and the Signal Corps. In fact, the Army's first photographer, Sergeant George W. Rice, had accompanied Greely on his Arctic expedition. From that experience Greely realized the informational value of photography. He added a course in photography to the Signal Corps curriculum at Fort Riley. In 1896 the Government Printing Office published the Signal Corps' initial Manual of Photography. nI 1891 Greely supervised the transfer of the weather service from the Signal Corps to the Department of Agriculture. By then the Signal Corps operated five hundred observatories.

Greely put his experience and reputation as the Signal Corps' "trouble-shooter" to work in 1893 when trouble erupted along the Mexican border. The Army wanted a telegraph line built from Brownsville to Loredo, Texas. The Signal Corps was given two months to complete the awesome task. Greely responded by quickly dispatching a field telegraph train with nine wagons. After two weeks, telegraph service between Brownsville and Loredo was a reality.

Having lost the weather service function, the Signal Corps resumed its interest in military balloons. In 1896 Brigadier General Greely established at Fort Logan, Colorado the Signal Corps' first balloon company. In a related development, in January 1898 Greely was appointed to the War Department's joint Army-Navy board investigating the military usefulness of the heavier-than-air-flying machine and especially the experiments of Professor Samuel Pierpont Langley, Secretary of the Smithsonian Institution

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[10]Schieps, "Albert James Myer: Leader and Innovator," pp, 19-25; Schieps, Military Signal Communications, I: 4-6; Shrader, "Greely," pp. 404-405; Carol Rios, "The weather...Augusta style," The Signal, 22 July 1987; and David J. Marshall, "Adolphus Washington Greely," in LTC Max L. Marshall (Ret.), The Story of the U.S. Army Signal Corps, (New York: Franklin Watta, Inc., 1965), pp. 90-105.

and previously a civilian weather specialist for the Signal Corps. In 1896 Langley's steam-powered flying machine was airborne for half a mile. Greely recommended the Army build a flying machine. In 1899 and 1900 he presented the Army's grants to Langley for his research. The Army charged Chief Signal Officer Greely with monitoring Langley's progress. Although the Langley project failed, the experiments with the flying machine were a harbinger of events to come and the Signal Corps' role in those events.

Spanish American War

Meanwhile the Spanish American War had begun. With only eight commissioned officers in the Signal Corps as of April 1898 and limited funds, problems shared by the Regular Army, Greely and the Signal Corps responded to the challenge. Two acts authorized the creation of a voluntary Signal Corps. Greely ordered its development, which in time consisted of seventeen companies each with four officers and fifty-five men, including a balloon company and one field telegraph train.

The Caribbean expedition's chief signal officer was Colonel James Allen. Allen along with the steamship Adria loaded with submarine cable landed off Santiago on 1 June 1898. Allen's first mission was to cut the cables, thereby, debilitating the enemy's communications. Allen later received the Distinguished Service Cross for cutting one of the cables while under fire from the Spanish batteries in Morro Castle. The Signal Corps mounted 2500 miles of wire in Cuba including nine lines running north and south and one east to west trunk. The Corps installed an underwater cable from Sibony to Playa del Este.

It was the Signal Corps which on 19 May 1898 telegraphed the location of the Spanish fleet to Washington, key information in defeating the Spanish. Signal Corps units participated in the capture of Manila and the assault on Fort San Antonio and Fort Malate. The First Colorado Regiment took the lead on 13 August while a Signal unit advanced on the beach on the left flank of the troops. Sergeant George S. Gibbs (later Chief Signal Officer) and Sergeant Henry F. Jurs used wigwag flags to signal Admiral Dewey's fleet, adjust naval gunfire, and denote the advancing infantry's position. Other signalmen rolled in wire while Sergeant Harry Chadwick photographed the events. The Americans took Fort Malate. Sergeant Gibbs signaled the news to the fleet. Throughout the battle the Signal Corps maintained communications between the Army's divisions.

The Spanish American War was a testing ground for the Signal Corps' new endeavors. The advancing troops required the speedy supply of wire lines. With an improvised telegraph switchboard the Signal Corps switched messages through one of the Corps' offices in Puerto Rico and established communications between Washington and the front lines in Cuba. Greely had foreseen the military value of telephones. The Spanish American War, where the Army used telephones in combat for the first time, proved him right. The Army's reliance on the wire lines required signalmen

to install them and establish stations often exposing themselves to perilous conditions. Another first was the use of combat photography. Although an Engineer Corps colonel misused the Signal Corps' only balloon resulting in its early demise, it did see limited action at San Juan Hill.

Philippine Insurrection

Following the Spanish American War, the Signal Corps' mission in the guerilla war-torn Philippines became even more hazardous. The Corps' mission was to construct, maintain, and operate a communication system linking the major islands of the archipelago. By the end of 1899 the Corps had connected the islands of Leyte, Cebu, and Samar. Cognizant of his men's precarious duty in the Philippines, Greely observed that Signal Corps casualties (5.7%) were higher in comparison to the Army as a whole in the operation.

The Signal Corps' role in the Spanish American War and in the Philippine Insurrection was on a grander scale than it had been in the Civil War. In addition to visual signaling, including heliograph, the Signal Corps had supplied telephone and telegraph wire lines and cable communications. The Corps also had fostered the use of telephones in combat, employed combat photography, and renewed the utilization of balloons.[11]

Alaska Communications System

On another front and in the wake of the Alaska gold rush and the strategic location of Alaska, in 1899 the War Department created the Military Department of Alaska. It was the Signal Corps' mission to build telegraph lines connecting the headquarters at Fort St. Michael with five garrisons and the garrisons with each other. Congress appropriated $450,000 for the project adding that the military lines could also be used for commercial business.

Greely began the demanding task of providing a communication system to benefit both military and civilian needs. His experience some twenty years earlier in pole line construction in North Dakota and Texas was invaluable. This was especially true given the fact that in 1900 due to the transfer of the Signal officer in Alaska and the illness of his only assistant, Greely left Washington for Alaska to direct personally the beginning of the work on the Washington-Alaska Military Cable and Telegraph System (WAMCATS). Greely arrived in the summer and by September had supervised the completion of a telegraph line from Nome twenty-five miles east through Fort Davis at Port Safety. After laying almost one hundred and thirty miles of submarine cable, on 17 October 1900

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[11]David J. Marshall, "General Greely Turns to Telephone, Aviation, Radio," in Marshall, The Story of the U.S. Army Signal Corps, pp. 106-110; and "The Signal Corps in the Spanish-American War," in Marshall, The Story of the U.S. Army Signal Corps, pp. 136-141.

communications were established between Fort St. Michael and Fort Davis via Port Safety, a distance of one hundred and fifty-eight miles. That was only the start. Combating the Alaskan winters, by 1903 the Signal Corps had constructed a network of telegraphs and cables connecting all the principal garrisons. Department headquarters at Fort St. Michael was placed in contact with several other posts and via Canadian wires with Fort Seward, Skagway, Juneau, and Washington.

But, the Alaskan climate played havoc with the system often burying pole lines in snow, crushing cable lines with polar ice, washing away poles and repairmen's cabins, and severing cable and telegraph lines as the ice cracked and the floods came sending them out to sea. The answer was a wireless telegraph, which in the summer of 1903 replaced the seven week old Alaskan land wire system.

Ever the innovator, Greely had recognized the possible value of experiments being conducted by Guglielmo Marconi. In 1898 he had assigned Captain James Allen and Lieutenant George O. Squier (later Chief Signal Officer) to monitor Marconi's work. In addition to watching Marconi, Allen and Squier conducted their own experiments. As a result, by April 1899 the Signal Corps operated the first wireless telegraph in the western hemisphere over a distance of twelve miles between Fire Island and the Fire Island Lightship in New York harbor. Allen and Squier did not stop there but continued to link other stations. Benefitting from their work, on 7 August 1903 the Signal Corps connected Fort St. Michael and Port Safety with the new wireless telegraph. Through the ingenuity of signalmen like Captain L.B. Wildman and others who made modifications and improvements on the Alaskan wireless telegraph, transmitting 2,000 words an hour between Port Safety and Fort St. Michael became the norm. The station, which also transmitted commercial traffic, became the first American public wireless telegraph system.

But, there was no direct link between the Alaskan telegraph system and commercial telegraph in the Unites States. Official messages between Juneau and Washington had to be routed over the Canadian Telegraph System. In the spring of 1903 Congress appropriated funds for a submarine cable to link Juneau and Sitka with Seattle. The cable was to be 1300 miles long. On 28 August 1904 Greely and the Signal Corps had met the challenge. On 3 October the Corps connected Sitka with Valdez, thereby, establishing direct communication between the military stations in the Tanana and Yukon valleys and Washington. The Signal Corps' cable and telegraph system placed Washington in connection with each military post in Alaska. Greely referred to the accomplishment as "unique in the annals of telegraphic engineering...." Greely reported that the system was comparable to one extending from Wyoming to the Bahamas, the cable extending from Newfoundland to Ireland, and the wires running from Washington

to Texas. It was quite a monument to Greely and the Signal Corps.[12]

Early Aviation

The Signal Corps pioneered in many areas, including aviation. In 1892 Greely formed a balloon section. A balloon section was to be part of each telegraph train. The first balloon obtained for these plans was named the General Myer in honor of the Signal Corps' founder. Early zeal, however, waned. By the Spanish American War the Signal Corps had only one balloon, which was used in the attack on San Juan Hill. Balloon activity was almost static until the Signal Corps purchased a new balloon in 1907. It was the ninth balloon since the Civil War and, therefore, dubbed Signal Corps Balloon No. 9. Chief Signal Officer Brigadier General James Allen directed the establishment of a balloon house and hydrogen plant at Fort Omaha in 1908. But, once again ballooning activities became almost dormant. When the United States entered World War I the Army had a total of three free functional balloons and two captive ones. By 15 April 1918 two balloon companies were in operation. That number had increased by Armistice Day to eighty-nine companies. With the advent of the airplane, balloons paled as did the airship or dirigible.

Although Dr. Samuel Langley's experiments in aviation conducted under the watchful eye of Greely and the Army failed, Wilbur and Orville Wright achieved success on 17 December 1903. On that date they made their maiden airplane flight at Kitty Hawk, North Carolina. Reeling from the Langley experience, the Army, however, was reluctant to initiate another experiment. It became Chief Signal Officer Allen's job to introduce airplanes into the Army.

1907 was an crucial year in Army aviation. In 1907 the Army awarded a contract to construct its first dirigible. An Aeronautical Division led by Captain Charles deForest Chandler was established within the office of the Chief Signal Officer. In December the Signal Corps called for bids on a military airplane.[13] On 23 December 1907 Allen issued Specification Number 486 and advertised for bids for a flying machine that could fly at a speed of forty miles per hour and could carry two people a distance of 125 miles. It must be managed in flight from any direction, stay aloft for a one hour endurance demonstration, and land at the

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[12]David J. Marshall, "The Building of Alaska's Communication System," in Marshall, The Story of the U.S. Army Signal Corps, pp. 112-126 and Alaska Communication System, 48Th Anniversary Alaska Communication System Bulletin, (Alaska: Alaska Communication System, 1948), p. 13.

[13]R.K. Tierney, "Offspring of the Signal Corps-The Balloon, Dirigible, and Airplane," in Marshall, The Story of the U.S. Army Signal Corps, pp. 137-132.

takeoff point undamaged. It must be easily disassembled and transportable. Although the Army received forty-one bids by 1 February 1908, only three met the specifications. Of those three, the Wright brothers' bid was the only one under which an airplane was delivered. On 10 February 1908 the Wright brothers and the government entered a formal contract. The contract provided for the delivery of "One (1) heavier-than-air flying machine, in accordance with Specification No. 486...."[14] The date scheduled for delivery of the machine at Fort Myer was August 1908.

On 20 August 1908 Orville Wright delivered the airplane. The Army's review board consisted of Majors George O. Squier and Charles S. Wallace and Lieutenants Frank Lahm, Benjamin D. Foulois, and Thomas E. Selfridge. Test flights began on 3 September and continued successfully until tragedy struck. On 17 September Lieutenant Selfridge became the first airplane crash fatality. Flights were not resumed until June 1909.

The Wright's made minor modifications to their 1909 flyer. After more test flights, the official tests began on 27 July. On that day Orville Wright flew for one hour and twelve minutes, thereby, fulfilling the endurance specifications. On 30 July the speed requirement was surpassed. Three days later on 2 August the Army accepted the Wrights' airplane at a cost of $30,000 designating it Signal Corps No. 1. The Signal Corps retained control of the Army's military aircraft until the Air Service was created on 20 May 1918. In World War I the Army deployed thirty-nine air squadrons in combat.[15]

World War I

Although poorly organized, trained, and equipped at the beginning of the war, the Signal Corps once again met the challenge. Under his leadership as Chief Signal Officer, Major General George Owen Squier's office expanded from a staff of one hundred and twenty-four to 3,547 people. The Corps' Land Section grew from fifty-five officers and 1,570 enlisted men to 2,712 officers and 53,277 men. At the beginning of the war, the Aviation Section included fifty-two officers and 1,100 men. By the time the section was removed from the Signal Corps on 20 May 1918, it had grown to 16,084 officers and 147,932 men. When the Armistice was signed the Corps' American Expeditionary Forces comprised 50 field

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[14]Ibid., p. 132 and Charles Worman, "Signal Corps No. 1: The World's First Military Aircraft," Military Collector and Historian, 23 (Spring 1971), p. 2.

[15]Worman, "Signal Corps No. 1," pp. 2-10; Tierney, "Offspring of the Signal Corps," pp. 133, 135; and Edwin L. Williams, Jr., "Legislative History Of The Air Arm," Military Affairs, 20 (1956), pp. 81, 83, 84.

Signal battalions and nineteen service companies totaling 1,462 officers and 33,038 enlisted men.

To train the sudden and ongoing influx of signalmen, training and mobilization camps were established in 1917 at Camp Alfred Vail, Camp Samuel F.B. Morse, Fort Leavenworth, and Monterey, California. Special military schools followed, such as, the Signal Corps Radio School at College Park, Maryland and the Signal Corps Buzzer School at Fort Leavenworth. In addition, special technical courses, radio communications courses, and training courses in topics, such as, radio, telephony, telegraphy, photography, and meteorology were offered at civilian colleges and technical schools. By the end of the war, more than 2,400 soldiers had graduated and some 3,300 were in training.

World War I was a trench war fought at close range making visual signaling of limited use in the combat zone. Field wireless sets were inadequate. The open spark gap radio and the crystal receiver could not be fine tuned in the transmission-glutted combat zone. As a result, Colonel Edgar Russel, Chief Signal Officer of the American Expeditionary Forces (AEF), was forced to install and operate a network of telegraph and telephone wires. The Signal Corps had until July 1919 to complete this massive wire system extending from the seacoast to the American battle zone. The Signal Corps constructed a total of 2,000 miles of pole lines using 28,000 miles of wire, 32,000 miles of French poles, installed about 40,000 miles of combat lines, leased 22,000 miles of French wire, and established one hundred and thirty-four permanent telegraph offices and two hundred and seventy-three telephone exchanges, excluding combat zone stations. Multiplex printing telegraph equipment linked Tours, Chaumont, Paris, and London.

While laying the extensive telegraph and telephone network, the Signal Corps experimented with radio. Before America entered the war, radio transmission for the most part was limited to Morse code, either by means of spark transmitters or by continuous wave oscillations generated by triode tubes. The first spark sets were heavy and cumbersome. When the United States entered the war, the Signal Corps provided two types of field radios. They were large high-powered quenched-spark transmitters. The SCR-49 pack radio set could be disassembled into several components and transported by two or three Army mules. The SCR-50 was an even larger motor truck or tractor set. In combat since 1914, our European Allies were replacing the spark equipment with radiotelegraph equipment using tubes. The radiotelegraph transmitted in dots and dashes.

Some in the Signal Corps were convinced even before the United States entered the war that tubes were the key to superior military radio. Among them were Major General Squier, whose doctorate was in electrical engineering. As Chief Signal Officer, Squier led the Signal Corps in cooperating with the communications industry to perfect radio tubes. Six months after the military radio tube program began, American factories were producing standardized, interchangeable, and rugged tubes. Striving for even better equipment, Squier established a major laboratory at Camp Alfred Vail and increased the Corps' radio program from a few personnel

(including radio pioneer Lieutenant Colonel Joseph O. Mauborgne) in 1917 to several hundred by 1918. This research and development effort reached across the ocean in the form of the Signal Corps' Research and Inspection Division, American Expeditionary Forces. In 1917 the Signal Corps developed small aircraft radiotelephones. These voice or telephone operated sets were freed from the limitations of telegraph. Two early sets were the SCR-68, an airborne radiotelephone, and the ground set, the SCR-67. By the middle of 1918 these sets were in France. Although not without their problems, the new American voice radios marked a revolution in radio communications.

Other World War I developments in radio included the master-oscillator power amplifier circuit (MOPA), and Captain E. H. Armstrong's superheterodyne circuit. The latter came too late for use in World War I but made a pivotal contribution to radio in the postwar period.[16]

The Signal Corps also expanded into other areas. On the orders of General John J. Pershing, Colonel Russel established four new organizations within the Corps' Land Section. They were combat photography, pigeons, meteorology, and radio intelligence. Although photography had been a Corps responsibility since 1881, Pershing's order made photography an official mission. Field photography consisted of both ground and aerial. Ground photography, comprised of still and motion picture, was assigned to the Signal Corps in August 1917. Pershing's directive for combat motion pictures was a first. Aerial photography was of paramount importance to the intelligence service. A total of fifty-four officers and four hundred and eighteen enlisted men constituted the photography personnel in France. Following the war, all aerial photography and ground photography relating to aviation activities was transferred to the Air Corps. The Signal Corps' function was to maintain the historical files of still and motion pictures, produce training films, and manage ground photography not already under another service's control.[17]

The Pigeon Service's main mission was to create and maintain a frontline communications system. By November 1917 two

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[16]George Raynor Thompson, "Radio Comes of Age in World War I," in Marshall, The Story of the U.S. Army Signal Corps, pp. 157-166; David J. Marshall, "The Signal Corps in World War I," in Marshall, The Story of the U.S. Army Signal Corps, pp. 142, 145; Eastern Signal Corps Schools, United States Army, Fort Monmouth, Historical Sketch of the Signal Corps, 1860-1941, Eastern Signal Corps Schools Pamphlet No., 32 (Fort Monmouth: Eastern Signal Corps Schools, 1942), pp. 60, 62-63,67, 77; and Dulany Terrett, The Signal Corps: The Emergency (To December 1941), (Washington, D.C.: Office Of The Chief of Military History, 1956), pp. 16-21.

[17]Marshal, "The Signal Corps in World War I," pp. 147-148 and Eastern Signal Schools, Historical Sketch of the Signal Corps, 1860-1941, pp. 80, 110.

detachments of pigeoneers were in France. Pigeons were used in several engagements including, for example, the St. Mihiel and Meuse-Argonne offensives. During the later campaign, the pigeon Cher Ami earned the Distinguished Service Cross by delivering a message to the 77th Division concerning the location of the "Lost Battalion." Pigeons successfully delivered some ninety-five percent of the messages assigned them. After World War I, the Pigeon Service was demobilized but remained a unit of the Signal Corps until dissolved in 1957.[18]

The Meteorological Service was responsible for providing meteorological and aerological support for aviation, Coast Artillery, Ordinance Proving Grounds, the Gas Warfare Service, and for the AEF. With training and equipment assistance from the U.S. Weather Bureau, the Meteorological Service was established. Major W.R. Blair, a former member of the Weather Bureau, travelled to France in September 1917 to organize the AEF Meteorological Service. In May 1918 the first American meteorological station was established in France. By October 1918 twenty-two stations were operating. Among other activities, they supported aviation and artillery training stations, combat units, railway guns, a French Army corps, propaganda ballooning, and depots. Front line stations transmitted radio reports of weather conditions opportune for gas attacks and supplied information critical to aerial and artillery warfare. The service also provided weather information to the Navy. The AEF Meterological Service was the first to "apply the laws of dynamics of gases to upper-air data with the objective of serious forecasting." By the war's end the AEF Meteorological Service was unequaled in providing military meteorological assistance. In 1937 operation of the service was transferred to using arms. Many signalmen were relocated to the Air Corps. However, the Signal Corps continued providing for the development, procurement, supply, and maintenance of the meteorological equipment.

The Radio Intelligence Service was responsible for locating enemy transmitters, monitoring Allied transmissions, intercepting and decoding enemy transmissions, and breaking the enemy's code.[19]

Casualties suffered by signalmen were second only to the Infantry. Among the citations earned by signalmen were fifty-five

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[18]Ibid., p. 148 and Captain Terry M. Mays, "A Signal company for the birds," Army Communicator 12 (Summer 1987), pp. 26-29; Eastern Signal Schools, Historical Sketch of the Signal Corps, 1860-1941, pp. 79-80, and Terrett, The Signal Corps: The Emergency, p.16.

[19]Marshal, "The Signal Corps in World War I," p. 148; Karl Larew, "Meteorology In The U.S. Army Signal Corps, 1870-1960," (U.S. Army Military History Institute, Signal Corps Historical Division, 1960), pp. 25-35; and Eastern Signal Schools, Historical Sketch of the Signal Corps, 1860-1941, pp. 80-82, 110.

Distinguished Service Crosses and forty Distinguished Service Medals in addition to numerous foreign decorations. Pershing commended the Signal Corps when he remarked: "...I desire to congratulate the officers and men of the Signal Corps in France on their work, which stands out as one of the great accomplishments of the American Expeditionary Forces...."[20]

Post World War I Era

The Signal Corps was not content to rest on its World War I achievements. In the postwar era, under the leadership of Chief Signal Officers Major General Charles MCK. Saltzman, Major General George S. Gibbs, Major General Irving J. Carr, Major General James B. Allison, and Major General Joseph O. Mauborgne, the Corps struggled against reductions in personnel and funds to meet the escalating demand for telephone and other signal services.

One of those services was the Washington-Alaska military cable and telegraph system. By 1924 the Signal Corps had replaced some 1,607 miles of cable with a more durable gutta percha cable. With forty-four officers, in 1925 the Signal Corps operated within this system twenty radio stations and eight hundred and forty miles of land telegraph. By 1930 radio circuits had replaced all telegraph stations, except a telegraph line along the Alaskan Railroad. With the conversion from cable and telegraph to radio, in 1936 the system was renamed the Alaska Communications System.

Another postwar development was the Signal Corps' operation beginning in 1923 of the War Department's message center. Routing all radio, telegraph, and any other formatted messages became the message center's responsibility. Until this time and excepting field purposes, the War Department had not utilized the Corps' telegraph, radio, and cable facilities.

One of the most significant postwar developments was in radar. Among its staunchest defenders was Chief Signal Officer Major General Mauborgne. With Mauborgne's support in May 1937 Colonel William Blair, Director of the Signal Corps laboratories at Fort Monmouth, patented the first Army radar. Before the United States entered World War II, mass production of two radar sets had begun. The SCR-268 was designed to direct searchlight beams upon aircraft while the SCR-270 was a mobile long-range aircraft detector or early warning set. In fact, it was an SCR-270 on Oahu which detected the approach of Japanese aircraft on the morning of 7 December 1941.

However, before Pearl Harbor the Signal Corps became involved in the development and production of exceptional microwave radars. The British cavity magnetron transmitter tube, brought secretly to the United States in 1940, made this feasible. The British wanted the engineering and manufacturing assistance of microwave radar. This was a catalyst to other radar research and the establishment

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[20]Eastern Signal Schools, Historical Sketch of the Signal Corps, 1860-1941, pp. 91-92.

of research facilities. Under the Signal Corps' supervision, numerous Army ground and airborne radar types were developed. These included the microwave SCR-584, a precise gun director. The SCR-584 was first used in combat in 1944 to direct antiaircraft artillery at Anzio, Italy. It later proved decisive in deterring the buzz-bomb attacks on England.

Another pre-World War II innovation that would prove vital in the war effort was Dr. Edwin H. Armstrong's invention of frequency modulation (FM) radio. With Armstrong's volunteer assistance, in the late 1930s the Signal Corps laboratories under Colonel Roger Colton produced the first pushbutton crystal-controlled FM tactical radios, thereby, avoiding fastidious dial tuning. Their reliability, user friendliness, and relative ease of understanding made them commensurate to wire telephone communications. Other developments in radio included the introduction of the portable set radio series, SCR-130. SCR-130, SCR-131, and SCR-132 were ground forces radios. The SCR-133 was for pursuit airplanes, the SCR-134 for observation planes, the SCR-135 for night bombers, the SCR-136 was a ground-to-air set, and the SCR-125 was for bombardment planes.

Advancements were made in navigational radio, communication and air navigation equipment, meteorological research (e.g. radiometeorograph,) telegraphy and telephones (e.g. lightweight field telegraph, the EE-8 telephone), in other wire communication equipment, in defense strategy-signaling, tactical signal communications equipment (e.g. walkie talkies), and in numerous other fields.[21] Many of these peacetime achievements were tested in World War II.

World War II

Under the leadership of Chief Signal Officers Major General Dawson Olmstead and Major General Harry C. Ingles, the Signal Corps employed these prewar innovations in radar and radio among others in responding to the Axis threat. World War II was on a larger scale than the previous war and, therefore, more demanding. The Corps mushroomed from 27,000 to some 350,000 soldiers supporting the U.S. Army in not one theater, like World War I, but in theaters around the world. Accompanying the physical expansion were continued developments in and testing and production of wire and cable, radio, and radar, and the ever increasing sophisticated elements of modern warfare and its communications-electronics needs. Armstrong's tactical FM radio proved its worth not only in ground warfare but also in tank warfare, in amphibious assaults, and for ship-to-shore use. FM radio relay, AN-TRC-1, 3, and 4 (known as antrac in Europe and VHF in the Pacific) maintained

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[21]Terrett, The Signal Corps: The Emergency, pp. 22-52, 57-58 and Thompson, "The Signal Corps in World War II, pp. 174-176; and the Eastern Signal Schools, Historical Sketch of the Signal Corps, 1860-1941, pp. 118-121, 126.

communications during Patton's Third Army 1944 assault into France following the Saint-Lo breakout. Patton's signal officer, Brigadier General E. F. Hammond, directed the critical radio relay circuits provided by utilizing twenty-eight radio-relay truck units.

In tactical combat, Armored Force and Artillery operators benefitted from the static-and-interference-free FM sets that plagued the amplitude modulation (AM) sets and their users. Infantrymen profited too from the walkie talkie SCR-300. A veteran of Siegfried Line combat reportedly wrote: "I know the fighting would have lasted longer if we hadn't had FM on our side. We were able to shoot fast and effectively because we could get information quickly and accurately by voice, on FM. FM saved lives and won battles because it speeded our communications and enabled us to move more quickly than the Germans, who had to depend upon AM." He and other soldiers owed a debt of gratitude to Signal Corps laboratories director Colonel Roger Colton, who had made the precarious decision to commit Army tactical radio to FM and crystal control in the face of uncertainty concerning the mass production of FM radio.

The worldwide nature of this war necessitated worldwide strategic communications encompassing long-range, transoceanic, multichannel circuits handling mammoth and continuous flows of communications traffic. The Signal Corps' Army Communications Service working with commercial communications companies developed single sideband radio facilities, spiral four-field cable, and carrier equipment applicable to radio or wire lines. This made it possible to transmit several telephone or teletype communications simultaneously over a single circuit. Quick teletypewriter techniques replaced slower hand-keyed operations. The Signal Corps developed new enciphering and deciphering machines which were synchronized with the teletypewriters at both ends of the circuits. The suspension of hand ciphering or coding methods marked a significant advance in World War II strategic communications.

In addition to these achievements, the Signal Corps' Army Communications Service constructed the Army Command and Administrative Net (ACAN), a vast semiautomatic global system, headquartered in the Pentagon. Eastward and westward ACAN stations extending from London and eventually to Tokyo formed a worldwide belt of powerful long range multichannel radioteletypewriter circuits. The Army Communications Service also established a second global net for the Army Air Forces known as the Army Airways Communications System (AACS). The AACS served as a beacon to aircraft crossing the North and South Atlantic, Africa, the Near East, the Pacific, and the Far East. ACAN facilities together with the AACS comprised a communications system unsurpassed in World War II.

This system and other Signal Corps operations required some 350,000 men and assistance from the Women's Army Corps. The Signal Corps had to train most in the very rudiments of communications. Over 30,000 officers graduated from some fifty courses while almost 400,000 enlisted men were trained in communications-electronics.

The hundreds of Signal units activated included companies and battalions for operations and construction, the new aircraft-warning companies and battalions providing radar-warning services to the Army Air Forces, radio-intelligence companies, Signal Intelligence and Monitoring (SIAM) companies supporting the Corps' radio security and intelligence mission, and Joint Assault Signal Companies (JASCO) sustaining the Army's and Navy's joint amphibious assault communications needs.

By the end of World War II, the Signal Corps had grown from a relatively small, poorly equipped and trained body to a vast organization of skilled soldiers capable of providing global communications systems. The Signal Corps produced, furnished, installed, and maintained specialized equipment for all the Army's ground forces and the Army Air Forces. The Signal Corps' radio and radar equipment was unsurpassed. Its wartime achievements ushered in a new age in electronics technology setting the stage for the postwar communications-electronics industry.[22]

The Brief Peace

During the all too fleeting peace between World War II and the Korean Conflict, the Signal Corps shrank from a high of 350,000 to some 50,000 personnel. But, this did not curtail the Corps' scientific studies. On 10 January 1946 Signal Corps scientists, using a modified SCR-271 long range radar antenna (the Diana Tower), succeeded in bouncing radar signals off the moon. The experiment demonstrated that very high frequency radio waves could penetrate the ionosphere encircling the earth and evidenced the feasibility of space communications. Following Project Diana, the Signal Corps broadened its space-related activities and participated in postwar atomic bomb tests. In 1949 the Signal Corps provided electronic support for guided missiles, an effort which grew into the United States Army Signal Missile Support Agency. With the development of Army missiles came the Signal Corps' mission of providing combat surveillance and target acquisition.

The Signal Corps made advances in other areas. The Corps developed a walkie talkie weighing one half the amount of wartime models. Progress was made in rear and intermediate area radio-relay equipment, in the development of military intelligence equipment, in vehicular, tank, and ground portable radio sets for artillery, armored and infantry use; in manpack radio sets for frontline use, in the development of wire communications (e.g. lightweight, rugged, and immersion-proof teletypewriters and field telephone switchboards), in ground radar, and in other areas of

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[22]George Raynor Thompson and Dixie R. Harris, The Signal Corps: The Outcome (Mid-1943 Through 1945), (Washington, D.C.: U.S. Government Printing Office, 1970), pp. 629-632 and George Raynor Thompson, "The Signal Corps in World War II, in Marshall, The Story of the U.S. Army Signal Corps, pp. 174-182.

communications-electronics. As the all too brief peace gave way to war, once again the Signal Corps was called upon to use these and other innovations in wartime.[23]

Korean Conflict

Under the leadership of Chief Signal Officer Major General George I. Back, the Signal Corps again underwent wartime expansion and change. Signalmen were needed in the beginning to operate communications from Japan to Korea and to maintain the Mukden cable. Following the arrival of the Eighth Army in Korea, the Signal Corps provided essential tactical communications. Signal units, such as the 8035th Signal Service Company (Very High Frequency), established the Eighth Army's communications system and connected it with the Far East Command's (FEC) Signal troops operating near the 24th Division.[24]

Communications problems encountered in Korea prompted one journalist to label it as a war "fought outside the rule book." For the most part the signal equipment and type of communications installed were similar to that used in World War II. But, the war was unique. Signalmen had to fight as Infantry in order to preserve their communications and lives. One infantryman commented: "Here they [the enemy] are shooting all over, and those crazy Signal Joes are going on laying lines like nothin's happening."[25]

Distance, speed, the difficult terrain, and Korea's road nets restricted the use of wire. Telephone circuits were not practical. The rugged hills hampered radio relay teams from sending signals between stations. Relay trucks were targets of guerilla warfare and sabotage. The answer was very high frequency (VHF) radio. VHF radio became more dependable than wire as the primary method of communication. In fact, one signalman believed it to be the "backbone" of the communications system. This method of transmission, he continued, "was so flexible that it could keep up with the infantry in the rapid moves that characterized the

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[23]Kenneth Clifford, A Concise History of Fort Monmouth, New Jersey, (Fort Monmouth, New Jersey: Historical Office, US Army Communications-Electronics Command, 1985), pp. 32-33, 41-43 and MG Ralph T. Nelson, "Signals In Space," in Marshall, The Story of the U.S. Army Signal Corps, pp. 267-271.

[24]LTC George Lieberberg, "Developing a Signal Organization," in Combat Support In Korea, edited by John G. Westover (Center of Military History, U.S. Army, Washington, D.C.: U.S. Government Printing Office, 1987), p. 87.

[25]Bill Chapman, "Communications Troubles Overcome By Seventh Signal People," Hourglass, 25 November 1950 and Colonel Kenneth E. Shiflet, "Communications Hill in Korea," in Marshall, The History of the US Army Signal Corps, pp. 188, 191.

fighting in 1950-1951." VHF operating on the line of sight principle required the positioning of equipment on high, frequently secluded areas. VHF provided communications over mountains, across rivers, ship to shore, and could carry teletype. VHF radio communications in Korea often surpassed expectations. For example, the 304th Signal Operations Battalion using sets AN/GRC-3 and 4 operated them at ranges beyond the twenty-five mile line of sight specifications. That was particularly helpful during rapid advances and while Korea's Mukden cable was being rehabilitated.

It was a Signal Corps responsibility to ensure the operation of the Mukden cable, Korea's primary telephone-telegraph system. This was quite a challenge given the destruction of signal equipment during the war. Often signalmen were forced to work on sections of the cable during an advance keeping just beyond the Infantry.

The Signal Corps met the challenge of the Korean conflict with VHF radio, improvements in radar, particularly in the location of enemy mortar emplacements; new training facilities, such as San Luis Obispo; expanding established schools like Camp Gordon's Signal Corps Training Center, and the derring-do of those "crazy signal joes."[26]

Post Korean Conflict

The advent of nuclear and unconventional warfare together with increased fire power and mobility mandated more effective command control. A more speedy, reliable, protected, and stable communications system was needed, one that would withstand single breakdowns and still supply rapid communications to all units regardless of their wide dispersion. The Signal Corps was forced to abandon the Single Axis Communications System used on the battlefield. In the event of an atomic attack and destruction of any signal center on the axis, communications would be severed. Responding to the lessons learned in Korea and to the deficiencies in the single axis system, the Signal Corps developed the Army Area Communications System. System features included mobility, total self containment, operational capacity in the event major communication centers became inoperable, adequate user required channels, alternate routings capability, and broad coverage even to widely dispersed units. This system provided a reliable multiaxis, multichannel network which enhanced effective command control.

The post Korean conflict years were ones of rapid progress in

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[26]Captain John W. Pierce, "Answers Not in Textbooks," in Combat Support in Korea, pp. 89-90; Captain Frank D. Secan, "Flexibility of VHF," in Westover, Combat Support in Korea, pp. 90-91; Captain Wayne Striley, "The Mukden Cable," in Westover, Combat Support in Korea, pp. 95-96; Colonel Thomas Pitcher, "Signal Operations in Korea," in Westover, Combat Support in Korea, p. 97; and Carol Rios, "Crazy single joes were fighters," The Signal, 25 June 1986.

the area of research and development. Among the achievements were a personal atomic radiation dosimeter, a lightweight field television camera with a back-pack transmitter, a highly precise mortar locator, an ultrasonic quartz saw, miniature experimental field radios, light, portable computers to assist battlefield commanders in decision making, silent radar sentries, infrared detection, photographic devices, and seismic and acoustic systems for battlefield surveillance.

The Signal Corps was a pioneer in the satellite and space age. With the launch of Vanguard I on 17 March 1958, the Signal Corps' Research and Development Laboratory achieved a major satellite payload contribution. Vanguard I marked the first use of solar cell power in satellites. Vanguard II followed on 17 February 1959. Equipped with infrared scanning devices, it provided a rough mapping of the earth's cloud cover. The first communications satellite, Project SCORE (Signal Communications via Orbiting Relay Equipment), launched on 18 December 1958 carried a Signal Corps-developed communications package. SCORE, a project of the Signal Corps' Advanced Research Project Agency, demonstrated that voice, teletypewriter, and multiple teletypewriter signals could be received, stored, and then retransmitted by an orbiting satellite. These and other accomplishments expanded the Signal Corps' electronics mission area.[27]

Vietnam

Commenting on Signal operations in Vietnam, Lieutenant General Thomas M. Rienzi, former commander of the 1st Signal Brigade, Assistant Chief of Staff for Communications-Electronics, and Deputy in the NATO Integrated Communications System Management Agency, remarked: "The magnitude of Army communications in the war in Vietnam has exceeded the scale of their employment in any previous war in history. These communications have increased in the same proportion as has the extraordinary mobility of troops and of firepower...." The Signal Corps again responded to the challenge. The first regular U.S. Army ground unit to enter Vietnam was the 39th Signal Battalion. "[F]rom this modest beginning," continued Rienzi, "there followed a steady buildup of Signal troops to match the initially slow but later accelerated growth of U.S. Army forces in Vietnam."

One of those Signal units was the 9th Signal Battalion. The 9th Signal Battalion, 9th Infantry Division arrived in Vietnam in 1967. The 9th Infantry Division was the first American combat unit to operate on a full time basis in Vietnam's Mekong basin. The 9th

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[27]Colonel G.D. Gray, "Getting the Message Through," in Marshall, The History of the U.S. Army Signal Corps, pp. 215-216; Kenneth Clifford, A Concise History Of Fort Monmouth, pp. 40-43; and Public Affairs Office, Fort Huachuca, A History of the Signal Corps, 1860-1975 (Fort Huachuca: Public Affairs Office, 1975), pp. 14-16.

Signal Battalion had to cope with the Mekong Delta's monsoon-ridden soil, a poor foundation for communications equipment. Like signalmen of the past, they adapted to local conditions. The infrequent roads and climatic conditions forced the signalmen to operate largely from helicopters and boats.

One of the 9th Signal Battalion's most significant operations was supporting the Mobile Riverine Force, a joint waterborne endeavor comprising an assault squadron of U.S. Navy ships carrying the Second Brigade, 9th Infantry Division. The 9th Signal Battalion's mission was to establish multichannel communications from the Navy's command post, the USS Benewah, to the Riverine Force's base at Dong Tam. When the ship was in route, the radio operators on board continuously turned a hand crank orienting the directional VHF antenna to maintain the strongest signal with Dong Tam. At Dong Tam two men atop a two hundred and four foot tower, linked to the ground by field telephone, manually turned the antenna on the command of radio operators monitoring the ship's signal. In full view of Viet Cong snipers, the signalmen worked closely to antennas radiating high signal voltages. Eventually the 9th Signal Battalion obtained heavy duty commercial rotors to crank the antennas from the ground. Lieutenant General Rienzi believed the Mobile Riverine Force was a "highly successful U.S. combat unit....The innovations of the 9th Infantry Division signalmen tied this potent amphibious force together by means of solid communications, while the force elements freely operated in waterways that were previously controlled, for the most part, by the Viet *Cong*."

The Riverine operation, which challenged the 9th Signal Battalion, was only one of many campaigns and manuevers in which the Signal Corps was called upon in Vietnam to provide personnel and reliable communications systems. By the end of 1968 the supervising Signal headquarters in Southeast Asia, the 1st Signal Brigade of the U.S. Army Strategic Communications Command, comprised six Signal groups, twenty-two Signal battalions, and a total strength of over 23,000 soldiers, the largest Signal organization ever deployed to a combat area by the U.S. Army.[28] In a 1966 message to all communicators in South Vietnam, General William C. Westmoreland, commanding general of the Military Assistance Command, Vietnam, remarked:

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[28]LTG Thomas M. Rienzi, "Rienzi" The Army Communicator, 5 (Fall 1980), pp. 42-45; MG Thomas Matthew Rienzi, Communications-Electronics 1962-1970, Vietnam Studies, (Department of the Army, Washington, D.C.: U.S. Government Printing Office, 1972), pp. v, 120, 153; Carol Rios, "Vietnam Challenges," The Signal, 4 June 1987; Carol Rios, "Operating in the Mekong Delta," The Signal, 27 May 1987; and Carol Rios, "Mai Loc Signal Site," The Signal, 27 January 1987.

> ...The communications system, despite the handicap of having to provide more service than in any previous war and of operating under severe geographical and tactical equipment limitations, has responded brilliantly to the burgeoning requirements of a greatly expanding fighting force. No combat operation has been limited by lack of communications. The ingenuity, dedication, and professionalism of the communications personnel are deserving of the highest praise."[29]

In addition to personnel, the Signal Corps employed in Vietnam new technology. As the United States increased its assistance to the Vietnamese, there was a compelling need for a modern, dependable, large-capacity communications system providing high quality telephone and message circuits. The communications system developed, code named BACK PORCH, used tropospheric scatter radio trunks able to provide numerous circuits between locations more than two hundred miles apart. Unlike conventional microwave relay links requiring a line of sight between sets, tropospheric scatter trunks passed over extensive distances of enemy terrain linking major operations in Vietnam north of Saigon. A Signal support battalion deployed to Vietnam began operating the system in 1962. It was the first use of that type of sophisticated equipment in a combat zone.

Technical problems and escalating communication needs led to additional communications service in the form of the Integrated Wideband Communications System. (A wideband communications system "provides numerous channels of communications on a highly reliable basis; included are multi-channel telephone cable, troposcatter, and multi-channel line of sight radio systems such as microwave.") The wideband system became a part of the global Defense Communications System.

The 1964 Gulf of Tonkin incidents made it clear that the radio circuits connecting Vietnam with Hawaii and Washington were inadequate and unreliable. The WET WASH cable project, which would later bring highly dependable services to Southeast Asia, was incomplete. The immediate answer was an experimental satellite ground terminal. The terminal provided one telephone and one teletype circuit to Hawaii. Signals were transmitted from Saigon to Hawaii through a communications satellite launched into a stationary orbit over the Pacific. The experimental synchronous communications satellite system known as SYNCOM operated by signalmen marked the first use of satellite communications in a combat zone. The U.S. Army's Strategic Communications Command operated the satellite ground terminal in Vietnam. It supplied the first reliable communications of high quality into and out of Vietnam. For three years the SYNCOM system provided the critical link between the combat zone and Washington.

One of many communications improvements made in Southeast Asia

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[29]LTG Rienzi, Communications-Electronics, 1962-1970, p. 43.

by the Army and in particular by the 1st Signal Brigade was the Automatic Secure Voice Communications System. The initial stage of this automatic dial exchange, which served fifty of the planned one hundred an fifty secure voice subscriber lines, became operational on a limited basis in July 1967. By 1968 signalmen were operating fully automatic digital message and data switches, yet another first in a war zone.

In assessing the communication developments of Vietnam Lieutenant General Rienzi commented: "...the mobility and firepower of our Army would themselves have been unmanageable without the hitherto unheard of mobile and fixed combat communications facilities and the skilled communicators that have evolved in this conflict."[30]

Today and Tomorrow

Communications systems and facilities are still evolving as the Signal Corps continues the commitment to its regimental insignia's motto, "Watchful For The Country." According to Lieutenant General Thurman D. Rodgers, Director of Information Systems for Command, Control, Communications, and Computers and former commander of the United States Army Signal Center and Fort Gordon, "The future combat environment is predicted to be technologically intensive. The success of our Signal soldiers and indeed the entire combat-arms team will depend to a large degree on the automation and communications-electronics systems provided by the Signal Corps."[31]

Among the many recent developments is the Mobile Subscriber Equipment System (MSE). The MSE system is a non-developmental system being acquired by the Army Materiel Command to replace the existing switched communications system in the corps and division areas. The system integrates the functions of the user terminal equipment, switching, radio transmission, communications security (COMSEC), and control into one composite communications system. This new advanced communications system is expected to improve significantly battlefield command and control. The integrated mobile communications network will provide corps commanders with a "secure digital communications system...designed to move and operate without interruption as a commander and troops maneuver throughout the battlefield." Fielded first in February 1988 to the 13th Signal Battalion, 1st Cavalry Division, the system is

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[30]Rienzi, Communications-Electronics, 1962-1970, pp. 3, 7-9, 18-21, 25-26, 92-94, 153.

[31]Letter from MG T.D. Rodgers to General William R. Richardson, January 86.

expected to be fielded throughout the U.S. Army by 1994.[32]

This new advanced division and corps level communications system is envisioned to significantly improve battlefield command and control. MSE will supplant the present switchboard, multichannel and communications center system at division and corps. It will provide digital secure communications to mobile and stationary users. As one signalmen described it, "MSE is the equivalent of an advanced telephone system with stationary telephones and mobile radio terminals, as well as facsimile devices and the capability to accommodate data terminals." By dialing a phone number using fixed directory numbers, the MSE system automatically locates the called party on the battlefield and connects the call. In the event of damaged or busy systems, MSE redirects the call using flood search routing. Automation replaces the need to know the switchboard system. Other features of the system include user owned and operated facsimile and data terminals, call forwarding, preprogrammed conferencing, compressed dialing, digital nonsecure voice terminal telephones for static users, and mobile subscriber radiotelephone terminal telephones for mobile users.

Basic to the MSE system are the node centers, which are interchangeable throughout the battlefield. The node centers, linked by the line of sight (LOS) multichannel systems, will comprise the grid network or backbone system. A node center switch, LOS multichannel systems, down-the-hill radios, a radio-access unit (RAU), and system management facilities constitute the node centers. "From these backbone nodes, extension nodes establish communications in CP's [command posts] and headquarters. LOS multichannel systems connect these extension nodes, either large or small, depending on optimum subscriber density, to one or more node centers. Switchboards at the extension nodes provide service to static users and allow them to enter the total area communications system." This system can support the type of operations visualized in AirLand Battle.[33]

Lieutenant General Bruce R. Harris, former commander of the United States Army Signal School and Fort Gordon, believes that the "MSE concept represents a very dramatic change in the way we provide communication service to tactical units, since it gives the user a great deal more flexibility in selecting communications means.

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[32]Report, Rios, Coker, and Williams, USASC&FG 1988 AHR, p. 124 and Newspaper Article, "Dignitaries, first students gather to open MSE school," The Signal, 17 May 89, p. 1.

[33]MG Bruce R. Harris, "Commander's Comments," Army Communicator, 12 (Winter/Spring 1987), p. i; Major Fred Dierksmeier, "The Impact of MSE," Military Review (August 1987), pp. 40-47; and William E, Kelly, "Mobile Subscriber Equipment (MSE)," Army Communicator, 11 (Summer 1986), pp. 6-16. Also see other articles on MSE in the Summer 1986 issue of the Army Communicator.

In addition to flexibility, it provides a high level of protection because we have dispersed the Signal elements over a much wider area. The changes will be dramatic in the field as well as in the school [the Signal School]."[34] The school has and continues to play a pivotal role in MSE. In May 1989 the Signal Center hosted the opening ceremony for the Mobile Subscriber Equipment Resident School. The first three classes at the Mobile Subscriber Equipment Resident School attended the Nodal Operations Management Course, the Transmission Systems Operator course, and the Network Switching Systems Operator course. In 1989, GTE trained 512 students at the MSE Resident School. Over 1,000 students were scheduled to receive training at the school in 1990 followed in 1991 by another 1,500 soldiers. After the school reaches in 1993 its expected "sustainment level -- enough graduates to meet skill attritions from the Army each year---" some 5,000 soldiers are expected to graduate annually.[35]

Technical and contract monitors reported that the contractor, General Telephone and Electronics, generally provided satisfactory training.[36] However, problems did arise in the area of training at the MSE Resident School. The most significant issues involved training strategy changes requiring the establishment of a new course to provide extensive hands-on experience for large extension node switch operators. These changes required extensive revision of the training materials and GTE's plans to develop a communications network simulator (CNS) scheduled to be use for

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[34]MG Bruce R. Harris, "Commander's Comments," Army Communicator, 11 (Summer 1986), p. i.

[35]Newspaper Article, "Dignitaries, first students gather to open MSE school," The Signal, 17 May 89, p. 1 and Report, COL James P. McMakin, Director, DOTD, to Command Historian, USASC&FG, subj: 1989 AHR, 24 Jan 90.

[36]Memorandum w/attachment, William R. Roach, Contracting Officer's Representative (COR), USASC&FG, for Contracting Officer, ATTN: AMSEL-PC-C-C-MM (WLD), US Army, CECOM, Ft Monmouth, subj: Report of Contract Training (FY89), 23 Oct 89; Memorandum w/attachment, William R. Roach, Contracting Officer's Representative (COR), USASC&FG, for Contracting Officer, ATTN: AMSEL-PC-C-C-MM (WLD), US Army, CECOM, Ft Monmouth, subj: Report of Contract Training, 5 Dec 89; and Memorandum w/attachment, William R. Roach, Contracting Officer's Representative (COR), USASC&FG, for Contracting Officer, ATTN: AMSEL-PC-C-C-MM (WLD), US Army, CECOM, Ft Monmouth, subj: Report of Contract Training, 3 Jan 90.

training beginning in 1991.[37]

In spite of problems encountered in the fielding of MSE, the Army's Operational Test Evaluation Agency (OTEA), concluded in 1989 after a follow-on operational test and evaluation (FOTE), that MSE "was far superior to the current system in its ability to support the command and control needs of the AirLand Battle."[38]

Improving and strengthening the Army's capability to command and control comprised a fundamental requirement of AirLand battle doctrine. One of the more significant combat development projects are those involving the Single Channel Ground and Airborne Radio System (SINCGARS),[39] the next generation of combat net radio. SINCGARS will equip combat forces with dependable secure voice and data communications capability in the jamming and electromagnetic interference (EMI) circumstances of the modern battlefield. SINCGARS is designed as a "frequency hopping (FH), frequency modulation (FM), spread spectrum system covering the 30 to 88 megahertz (MHz) frequency band in 25 kilohertz (kHz) discrete channels for both frequency hopping and single channel operation. An FH, spread spectrum technique is used to achieve the desired electronic countermeasures (ECCM) capability required for operation in a jamming environment." It provides "secure voice and data operation in jamming environments."[40]

Fielding of the SINCGARS, a new family of VHF-FM combat net radios designed to provide the primary means of command and control for combat, combat support and combat service support units, has begun. The Second Infantry Division in Korea was the first unit equipped with the SINCGARS, which featured a resistance to jam (ECCM) capability using single channel offset or frequency hopping. All forces in Korea should receive SINCGARS by the end of 1990, with Hawaii and the rest of the Army's Western Command next on the

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[37]Engineering Change Proposal (ECP) to Contract # DAAB07-86-C-K022, GTE, subj: Mobile Subscriber Equipment (MSE) MSS-1, ECP E6GK022225, 26 Apr 89.

[38]Report, Col John F. Back, Jr.,TSM-MSE, to DAC, subj: TRADOC System Manager Quarterly Report for 1 QTR FY-89, 20 Jan 90. For other information concerning MSE, see Carol E. Stokes and Kathy R. Coker, US Army Signal Center and Fort Gordon Annual Historical Review, 1 January 1989 - 31 December 1989 (USASC&FG Print Plant: Fort Gordon, GA), pp. ii, iv, vii, 1-5, 8-10, 15, 18, 30, 32-33, 36-39, 46-47, 54, 58, 63-64, 69-71, 79-88, 116-118, 121-122, 145-146, 170, 172, 186 and earlier issues of the Annual Historical Review as appropriate.

[39]Report, Col Michael W. Ackerman, Director, Directorate of Combat Developments, to Command Historian, subj: 1989 AHR, Director's Overview, Jan 90.

[40]K.L. Graf, "SINCGARS; The New Generation Combat Net Radio System," Signal (August 1987), pp. 43-45.

list.[41]

Another development in tactical communications is the Joint Tactical Information Distribution System (JTIDS). This interservice (Army, Navy, and Air Force) effort provides jam resistance and a secure integrated communication, navigation, and identification (CNI) system for use in combat. "JTIDS improves surface command and control allowing more effective identification and destruction of enemy air, surface and subsurface targets, while simultaneously increasing survivability of equipped platforms." JTIDS' features include "pseudonoise, nodeless information distribution, high data rate, frequency hopping and crypto-secure communication." The objective of JTIDS is to maintain "supremacy in electronic warfare technology by aiding flexible, secure and jam resistant communication among dispersed and mobile units." It drastically "improves avoidance, evasion, countermeasures and destruction powers, providing a great combat advantage."[42]

Automation and communications integration continued to spark high levels of interest throughout the US Army and at the US Army Signal Center and Fort Gordon. The Signal Center's proponency for the Army's Information Mission Area (IMA) on the AirLand battlefield began with the creation of a TRADOC IMA charter on 25 November 1985. In 1988 IMA became a mission of the Signal Corps as a result of Chief of Staff of the Army, General Wickham's decision to consolidate the automation and communications of the US Army. The Signal Center encountered significant obstacles in attempting to separate the battlefield support IMA functions from those of its peacetime and garrison role. Most of the problems and issues were related to the IMA disciplines of records management and printing and publications. In 1989, HQ DA reaffirmed the Signal Center's responsibility for integrating IMA doctrine, organization, training, materiel and leadership for TOE units in the theater/tactical environment. In response, the Signal Center's Directorate of Combat Developments (DCD) expanded its IMA cell into a semi-autonomous IMA Integration Office in August. Its staff, whose collective experience encompassed IMA's five disciplines (communications, automation, visual information, records management and printing/publications), ensured that IMA was integrated into all Army doctrine.

In keeping with its responsibility for IMA training,

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[41]Memorandum, Col Jochen H. Ewing, TRADOC System Manager, Combat Net Radio, to Command Historian, subj: 1989 TSM-CNR Historical Report, 2 Feb 90; Report, TRADOC System Manager, Combat Net Radio, subj: TRADOC Systems Manager - Combat Net Radio, 2d Quarter FY 89, undated. For additional information, see Stokes and Coker, 1989 Annual Historical Review, pp. iii, iv, 1, 10-12, 20, 30, 33, 38, 60, 87, 89, 90, 94, 101, 109, 146, 181 and earlier issues as appropriate.

[42]Joseph W. Toone and Susan Titmas, "Introduction to JTIDS," Signal (August 1987), pp.55, 59.

specifically that the battlefield application was in keeping with Signal support doctrine, the Integration Office developed FM 24-1, outlining the Signal Corps' IMA functional responsibilities. The manual elucidated the conceptual and doctrinal ideals of Signal support for IMA in the theater/tactical environment and laid the foundation for integrating the five IMA disciplines into support for battlefield command and control (C2) requirements. Revision of Signal support doctrine for IMA underwent constant revision during 1989, reflecting the difficulty in defining the relationships and responsibilities of the Signal Corps and other TRADOC functional proponents for their battlefield IMA duties.

Especially perplexing was the issue of trying to place responsibility for records management and printing/publications on the battlefield. Although the current IMA philosophy seemed to make the Signal Corps responsible for all information needs on the battlefield, records management and printing/publications traditionally were performed by the Adjutant General Corps. In spite of such unresolved issues, doctrine developed in 1989 increased the user's obligation for implementing its own information systems and services. It placed the user in charge of installing, operating and maintaining its own terminal equipment. It described the Signal officer's expanded role in support of user information system requirements and responsibility for the staff supervision of the IMA disciplines. Finally, FM 24-1 included Combat Camera (COMCAM) as a Signal Corps responsibility.

Visual information (VI) on the battlefield was categorized as COMCAM and Functional VI. Emerging Signal support doctrine required users to perform VI functions in support of their own mission requirements. COMCAM was performed by Signal units organic to the theater Signal command. Units, such as psychological operations, medical and public affairs, owned and operated their own VI equipment and systems in support of battlefield operations. COMCAM teams provided support for units not having their own VI capability. COMCAM also augmented the organic VI capabilities of overextended, degraded or destroyed units. FM 24-1 provided that COMCAM's VI teams, at the commander's request, create an operational record of units' activities on the battlefield.

No force structure existed in 1989 to provide COMCAM capabilities for AirLand battle. However, if the Combined Arms Combat Development Activity (CACDA) and TRADOC approve a Signal Center initiative, a COMCAM capability (force structure) will be developed. COMCAM teams, organic to the Theater Signal Command only, could be attached at a lower echelon to provide theater wide support as required. VI personnel were added to the Theater Signal Command's staff to manage and operationally control COMCAM. As the IMA Integration Office and CACDA continued to examine the issue of responsibility for information services functions on the battlefield, alternatives explored included the headquarters commandant/HHC commander, assistant division (echelon) Signal officer and the G1/AG. The advantages and disadvantages of each would have to undergo considerable scrutiny before a final decision could be made.

Becoming responsible for IMA led the Signal Center's combat developers to address the life-cycle management of electronic records on the battlefield. The life-cycle management of electronic records from creation and collection through final disposition was a federal requirement that applied to Battlefield Automated Systems (BAS) as well as to sustaining base systems. In November 1989, the IMA Integration Office recommended to the Army Tactical Command and Control System (ATCCS) Steering Committee (ASC) that a standardized electronic records management capability be developed and embedded within ATCCS. This would enhance the automatic life-cycle management of data, information, and records created/collected by ATCCS. BAS profusion in the tactical environment and the related requirement to share concurrently records while adhering to federal electronic record management requirements justified the need. Although major strides were made in identifying IMA responsibilities, the development of IMA doctrine was expected to continue as a significant issue for the next several years.[43]

IMA, JTIDS, SINCGARS, and MSE along with other innovations and developments, such as, the Army Command and Control System (ACCS) Common Hardware Program, and artificial intelligence applications in Lieutenant General Harris' words: "exemplify the dynamics of....[the Signal Corps'] ever increasing mission and responsibilities in supporting our Army. The professional challenge that these initiatives represent is not new to our Signal Corps. Our history is dominated by rapid change...." As in the past, the Signal Corps "will continue to...[meet] these challenges with distinction."[44] As Major General Peter A. Kind said in his remarks when assuming command of the USASC&FG on 17 July 1990: "It's a challenge and opportunity to learn...and achieve and continue that theme of excellence for which the Signal Corps has always been known for."[45]

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[43]Stokes and Coker, 1989 Annual Historical Review, pp. ii, iii, vi, 1, 6, 7, 72, 99, 110, 111, 125, 144, 145, 190, Stokes and Coker, 1988 Annual Historical Review, pp. xv, 47, 48, 121, 134, 180, 190, 241 and earlier issues as appropriate.

[44]MG Harris, "Commander's Comments," Army Communicator, 12 (Winter/Spring 1987), p. i.

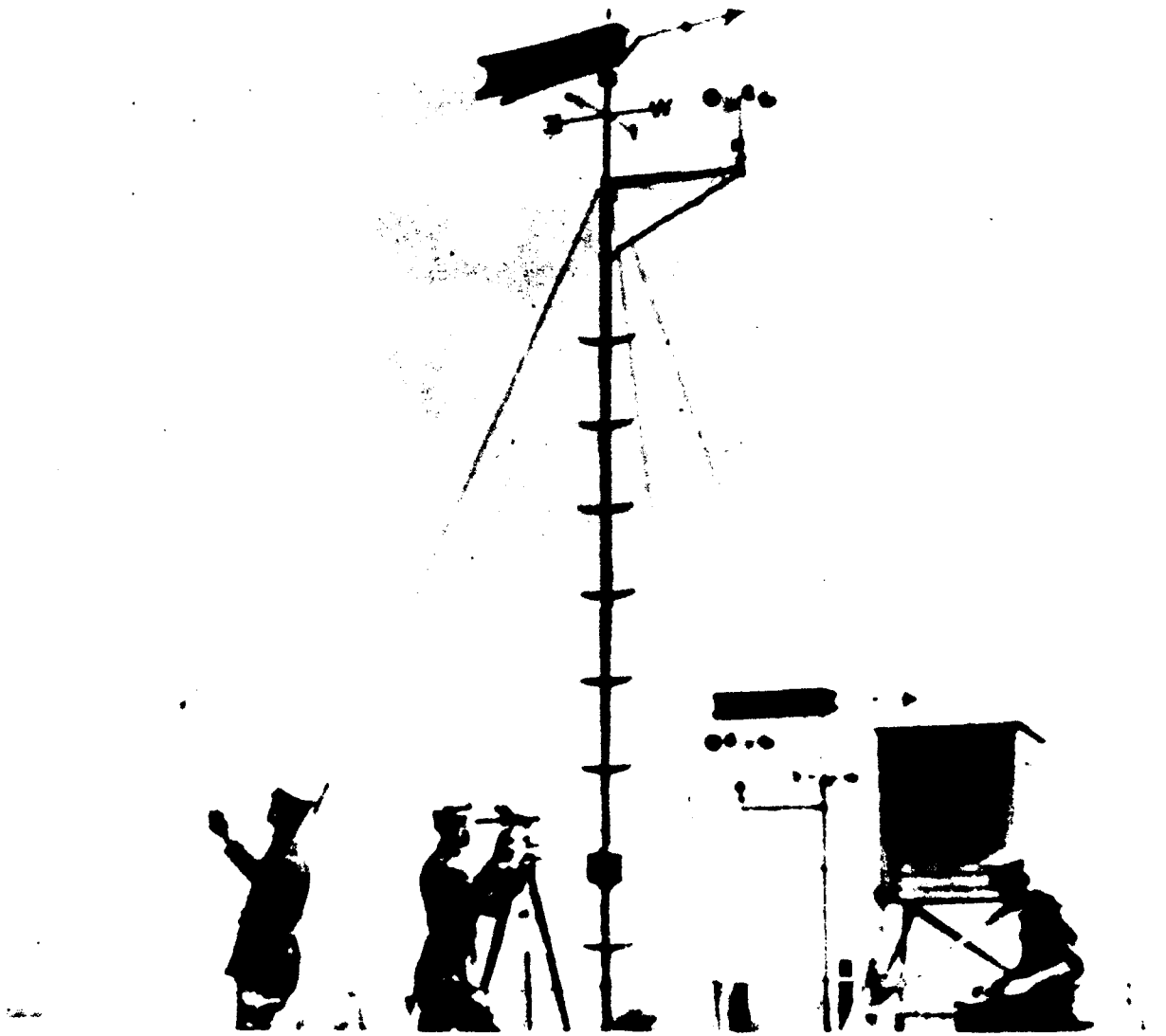
[45]Newspaper article, PVT. V. Rae Johnson, "Fort Gordon changes command," The Signal, 20 July 1990, p. 1.

Major Myer's attempt to use a balloon at First Bull Run

A Union Signal Corps officer operates a telegraph in the field in 1861

A telephone and telegraph station at Camp Meade during the Spanish American War, 1898

Signalman wigwags for US Army reserves to advance after the retreat of the Spanish at Manila, August 1898

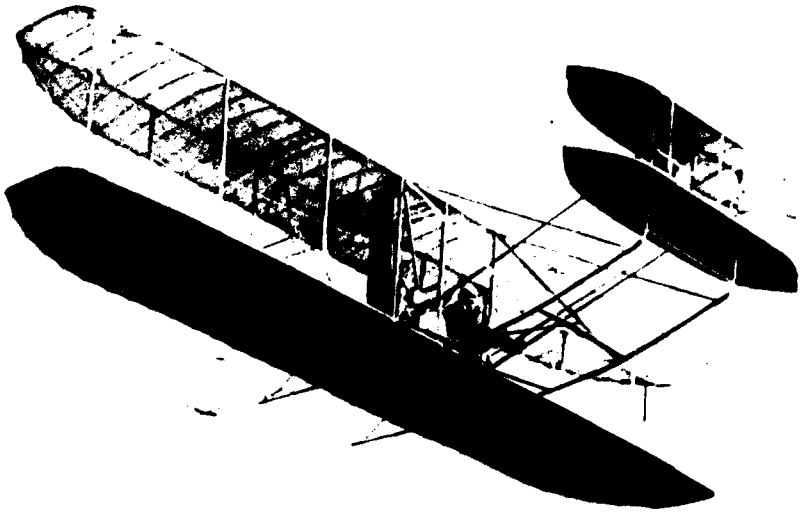


Signalmen taking meteorological observations at Fort Monmouth, New Jersey

SIGNAL CORPS EQUIPMENT
OLD and NEW

Pictured above is a Signal Corpsman, circa 1900, using a visual battery-operated signalling device.

U. S. Army Photo

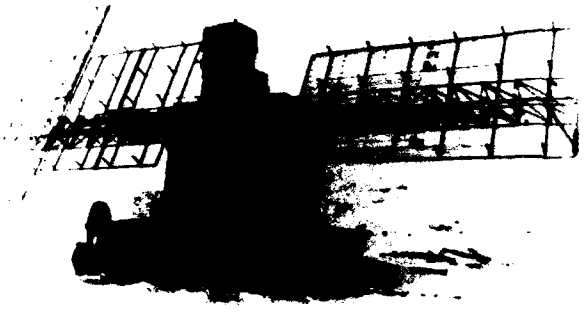


The Wright Flyer, 1908

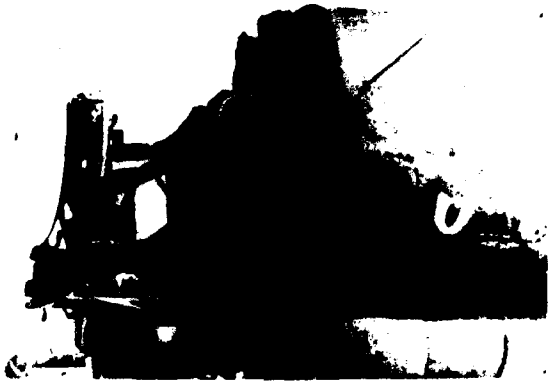
An officer of World War I is depicted using a foreign field telephone of that war.
U. S. Army Photo

Mareuilen-Dole, France. **A Signal Corps soldier photographs among ruins in August** *1918. Note camouflaging on camera.* **Outfit was a Photo Unit of the** *77th Division*

A telephone switchboard of the 117th Field Signal Battalion in France, 19 September 1918



(a)



(b)

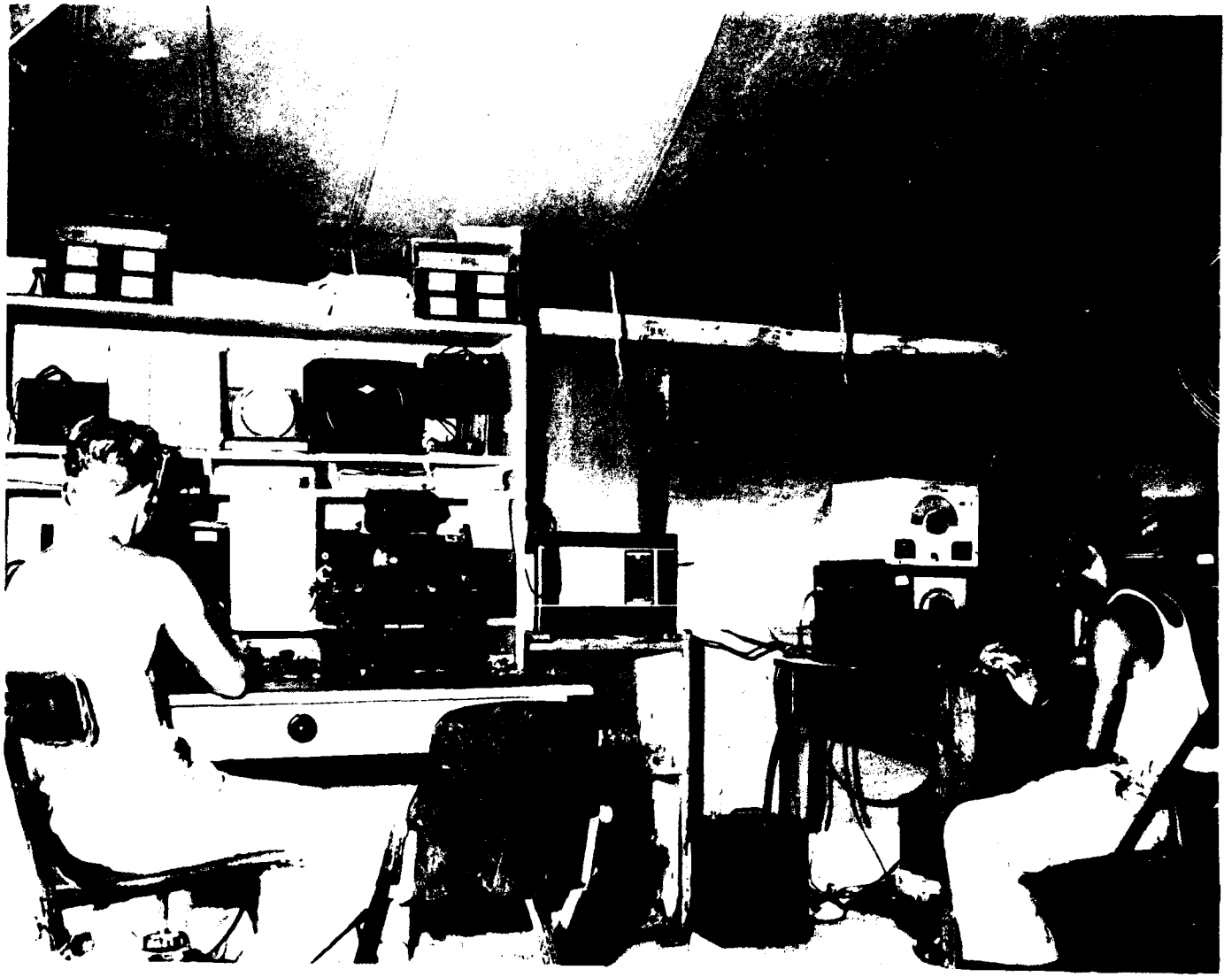
(c)

(a) The SCR-268 Aircraft Warning Radar, World War II

(b) Airborne AI-10 Radar, SCR-520

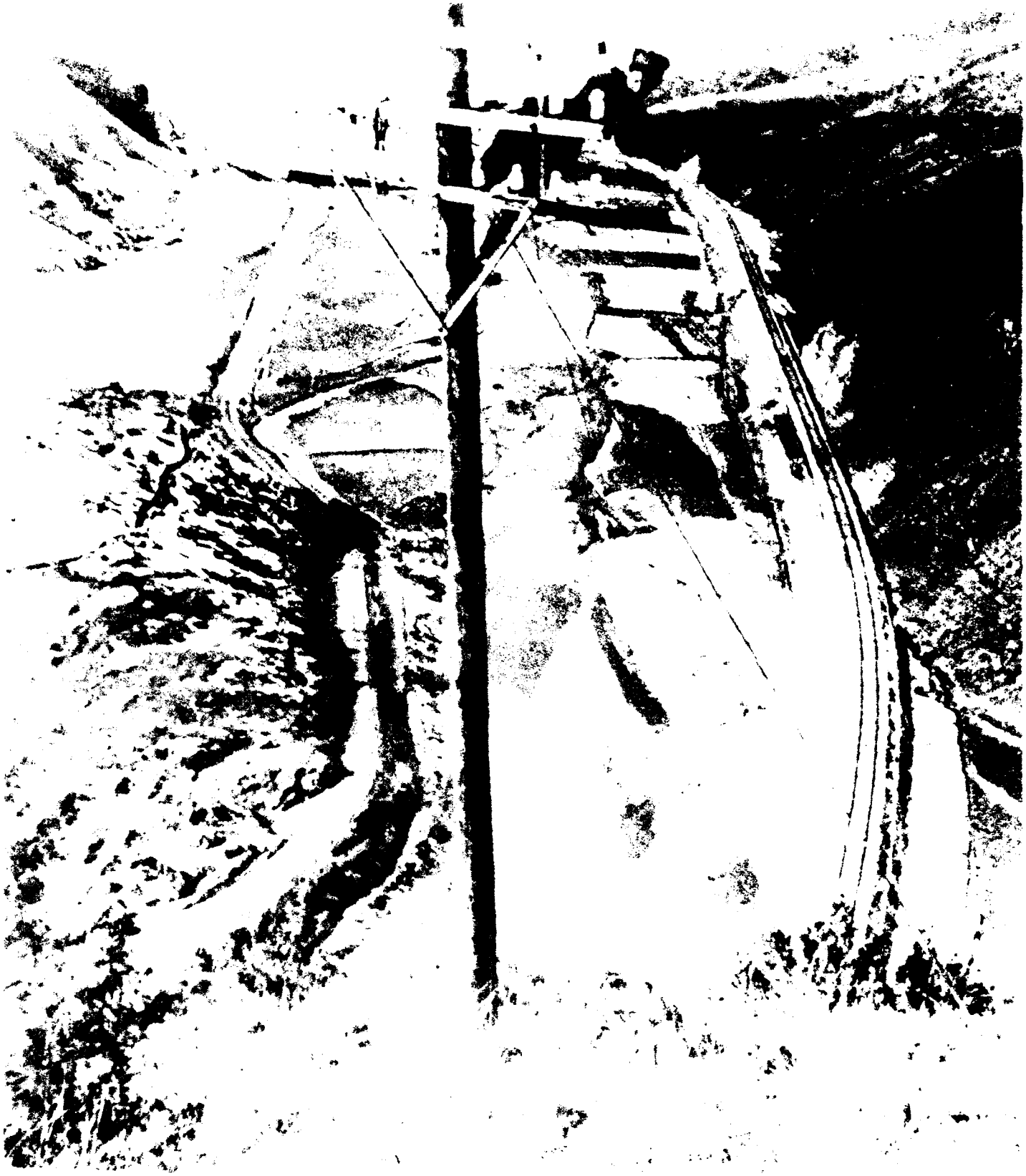
(c) A radio operator, 28th Infantry, 3 January 1945

A GROUND OBSERVER, UP WITH FORWARD ELEMENTS OF THE INFANTRY, SCANS THE SKIES WITH HIS BINOCULARS, LOOKING FOR ENEMY PLANES WHICH HE WILL REPORT VIA THE [illegible]



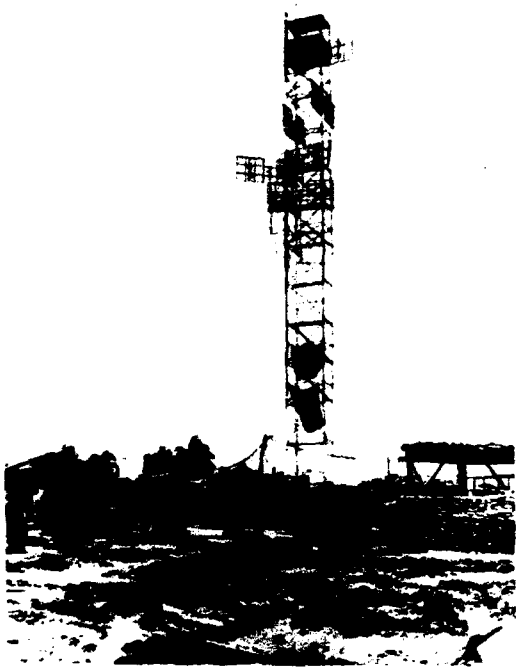
The receiving room of the Allied Intelligence Bureau Station, Australia, 21 March 1944

Men of the 304th Signal Battalion install a TC-10 at Taegu, Korean War



Combat Signalmen in action in Vietnam, 1968

(a)



(b)

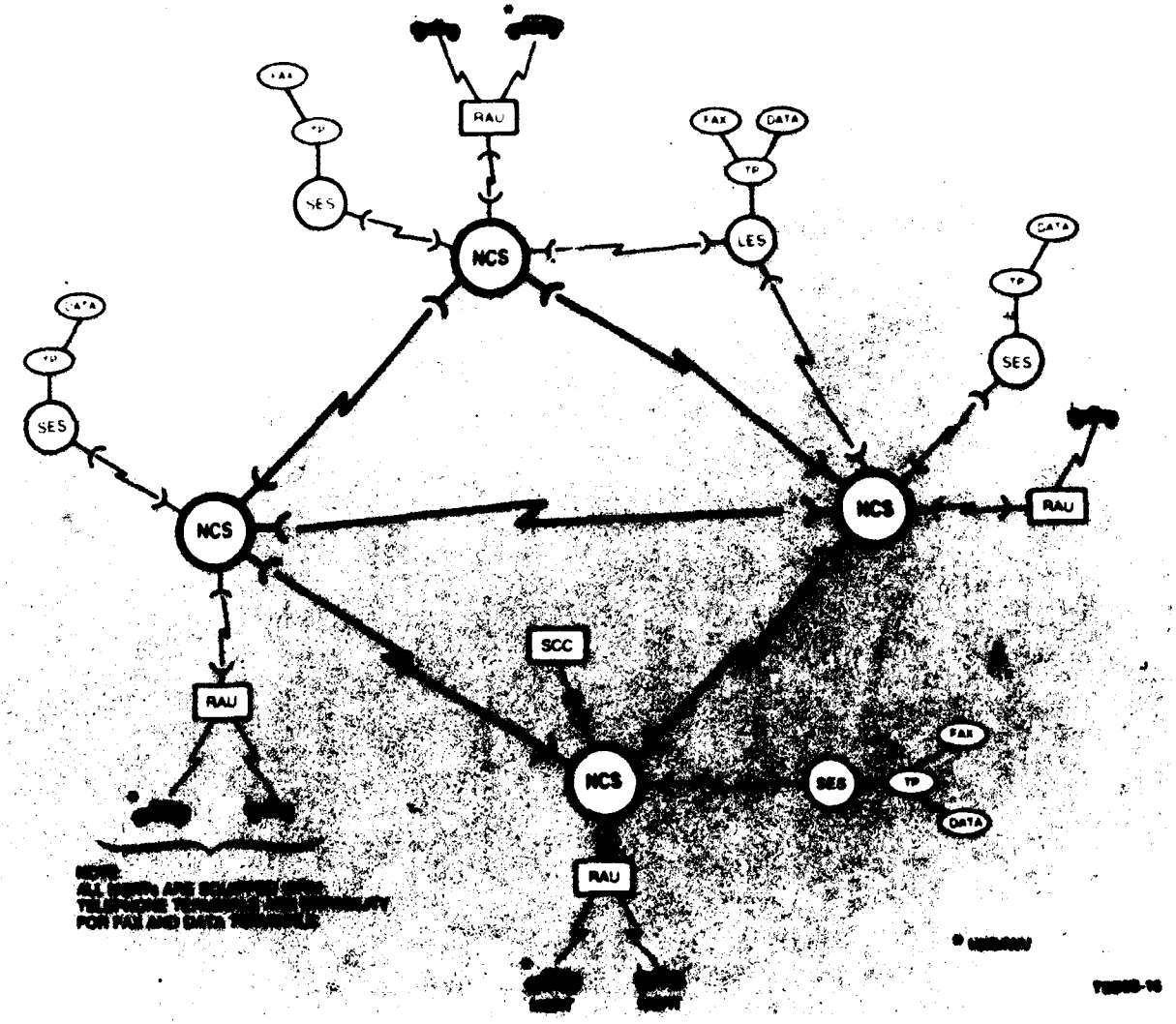
(c)

(a) 9th Signal Battalion operates switchboard in Vietnam

(b)(c) Signal sites in Vietnam

A soldier uses a field radio during Operation Urgent Fury in Grenada, 3 November 1983

A soldier in the field using the AN/PRC-119, the man-packed radio in the SINCGARS family


RAU
FAX
DATA
TP
SES
NCS
LES
SCC

Soldiers Deploy in Support of Operation Desert Shield

* On 28 February 1964, the Chief Signal Officer became the Chief of Communications-Electronics. The official name of the office changed several times before being redesignated as Chief Signal Officer on 3 June 1986. In 1988, MG Leo M. Childs redesignated the office as Chief of Signal.

CHIEF SIGNAL OFFICERS

BG Albert J. Myer	1860-1863, 1866-1880
LTC William J. L. Nicodemus (acting)	1863-1864
COL. Benjamin F. Fisher	1864-1866
BG William B. Hazen	1880-1887
BG Adolphus W. Greely	1887-1906
BG James Allen	1906-1913
BG George P. Scriven	1913-1917
MG George O. Squier	1917-1923
MG Charles MCK. Saltzman	1924-1928
MG George S. Gibbs	1928-1931
MG Irving J. Carr	1931-1934
MG James B. Allison	1935-1937
MG Joseph O. Mauborgne	1937-1941
MG Dawson Olmstead	1941-1943
MG Harry C. Ingles	1943-1947
MG Spencer B. Akin	1947-1951
MG George I. Back	1951-1955
LTG James D. O'Connell	1955-1959
MG Ralph T. Nelson	1959-1962
MG Earle F. Cook	1962-1963
MG David P. Gibbs	1963-1964

MG David P. Gibbs (Chief of Communications-Electronics)	1964-1966
MG Walter E. Lotz, Jr. (Chief of Communications-Electronics)	1966-1967
MG Walter E. Lotz, Jr. (Assistant Chief of Staff for Communications-Electronics)	1967-1968
MG George E. Pickett (Assistant Chief of Staff for Communications-Electronics)	1968-1972
LTG Thomas M. Rienzi (Assistant Chief of Staff for Communications-Electronics)	1972-1974
LTG Thomas M. Rienzi (Director of Telecommunications and Command and Control)	1974-1977
LTG Charles R. Myer (Director of Telecommunications and Command and Control)	1977-1978
LTG Charles R. Myer (Assistant Chief of Staff for Automation and Communications)	1978-1979
MG Clay T. Buckingham (Assistant Chief of Staff for Automation and Communications)	1979-1981
MG Clay T. Buckingham (Assistant Deputy Chief of Staff for Operations and Plans (Command, Control, Communications and Computers))	1981-1982
MG James M. Rockwell (Assistant Deputy Chief of Staff for Operations and Plans (Command, Control, Communications and Computers))	1982-1984
LTG David K. Doyle (Assistant Chief of Staff for Information Management)	1984-1986

MG Thurman D. Rodgers	3 June 1986
MG Bruce R. Harris	1986-1988
MG Leo M. Childs	1988-1990
BG Robert E. Gray	18 May 1990- 17 July 1990
MG Peter A. Kind[46]	17 July 1990-

[46]A major reorganization of the Department of the Army resulted on 1 August 1962 in placing the Chief Signal Officer under the general staff supervision of the Deputy Chief of Staff for Operations (DCSOPS). According to Department of the Army General Order 28 dated 28 February 1964, the Chief Signal Officer became the Chief of Communications-Electronics and remained under DCSOPS. In 1967, the Chief of Communications-Electronics became a separate staff agency. James E. Hewes, Jr., From Root to McNamara: Army Organization And Administration, 1900-1963 (Center of Military History, US Army: Washington, DC, 1975), pp. 364, 373.

As noted in the text, the official designation of the office has changed several times since then. DA General Order 42 dated 25 September 1967 redesignated the office as Assistant Chief of Staff for Communications-Electronics, a general staff agency, effective 16 September 1967. Effective 20 May 1974, DA discontinued that office, replacing it with the Director of Telecommunications and Command and Control. That office existed until 1 October 1978. DA then established the Office of the Assistant Chief of Staff for Automation and Communications as a general staff agency, discontinuing it on 1 October 1981. DA then redesignated it as Assistant Deputy Chief of Staff for Operations and Plans (Command, Control, Communications and Computers). On 15 May 1984, DA established the Office of the Assistant Chief of Staff for Information Management and reassigned to it the Command, Control, Communications and Computers Directorate. DA, General Order # 42, Section I, Office of the Chief of Communications-Electronics Redesignated, 25 September 1967, Chief Signal Officers, Ready Reference Files, USASC&FG Archives; DA, General Order # 10, Section V, Office of the Assistant Chief of Staff for Communications-Electronics Discontinued, 1974, Chief Signal Officers, Ready Reference Files, USASC&FG Archives; DA, General Order # 16, Section I, Office of the Assistant Chief of Staff for Automation and Communications Established and Section III, Telecommunications and Command and Control Directorate Transferred, 15 September 1978, Chief Signal Officers, Ready Reference Files, USASC&FG Archives; DA, General Order # 1, Section I, Office of the Assistant Chief of Staff for Automation and Communications Disestablished, 12 January 1982, Ready Reference Files, USASC&FG Archives; DA, General Order # 26, Section I Office of the Assistant Chief of Staff for Information Management Established, 25 July

Brigadier General Albert J. Myer

The Signal Corps' founder and first Chief Signal Officer, Albert James Myer, was born in Newburgh, New York, on 20 September 1828. While a medical student at the University of Buffalo, Myer worked part time in the Buffalo office of the New York Telegraph Company and there became familiar with Alexander Bain's electrochemical telegraph system. In 1851 Myer used his experience with the electric telegraph to design a sign language for deaf mutes, the subject of his doctoral dissertation. In January 1854 Myer passed the Army medical board examination and was appointed as an assistant surgeon in the Medical Corps.

Based on his early interest in a communications system for the deaf, Myer developed a system of visual communications transmitted by a flag or a torch. The War Department adopted Myer's system in 1859. With the outbreak of the Civil War, Myer was appointed the first Signal Officer in the United States Army with the rank of major. Myer's Signal Department was staffed by detailed personnel until 3 March 1863 when Congress authorized a regular U.S. Signal Corps for the duration of the war with a colonel as its head.

After the war, Myer and the Signal Corps constructed thousands of miles of telegraph lines and in 1870 created within the Signal Corps the country's first national weather service. Myer received many honors in the 1870s and became widely known in meterological circles. On 17 June 1880 Myer received a regular commission as a brigadier general which dated from 16 June, the date of the legislation that raised the Chief Signal Officer in rank.

Myer founded, organized, and directed the Signal Corps in its formative years. He died as Chief Signal Officer in Buffalo, New York on 24 August 1880.[47]

1984, Ready Reference Files, USASC&FG Archives; and DA, General Order # 49, Section III, Office of the Assistant Chief of Staff for Information Management Redesignated, 17 August 1987, Ready Reference Files, USASC&FG Archives.

On 3 June 1986 with the activation of the Signal Corps Regiment, the USASC&FG reinstated on the local level the title of Chief Signal Officer. That is, under the Signal Corps Regimental System, the commander of the USASC&FG also serves as Chief Signal Officer. In 1988, the commander of the USASC&FG, MG Leo M. Childs, directed that the title be changed to Chief of Signal.

[47]Carol Rios, "Myer Biography," Command Historian's files, USASC&FG and Scheips, "Albert James Myer: Leader and Innovator," pp. 1-29.

Colonel Benjamin F. Fisher

Colonel Benjamin F. Fisher served as Chief Signal Officer from 26 December 1864 to 1866. This was during the time that Secretary of War Stanton had dismissed Myer from the position. Colonel Fisher redesignated the Signal bureau as Office of the Signal Corps in the City of Washington, D.C. From his appointment until the end of the Civil War, Fisher served as Executive Officer of the Signal Corps.

When Fisher assumed the post there were one hundred and sixty-eight commissioned officers in the Corps and over one thousand non-commissioned officers and privates. The Corps actively supported the Army's twelve detachments. By 20 October 1865 the Corps had completed its wartime mission and virtually had been discharged from the service of the United States. All that remained were nine officers and thirty-seven enlisted men in the Military Division of the Mississippi and fifteen officers and ninety-nine men in the Military Division of the Gulf.[48]

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[48]Brown, The Signal Corps, U.S.A., pp. 87-88.

Brigadier General William B. Hazen

In 1870, the Signal Corps' founder, Albert J. Myer, committed the Signal Corps to operate a weather service for the United States. However, it was his successor, BG William B. Hazen, who excited the entire country by sending two Signal Corps teams to participate in an international polar project that would greatly increase the scientific knowledge about an unknown part of the world.

Hazen, a Civil War hero, faced formidable obstacles as he led the Corps through the decade following Myer's death. While the one expedition to Point Barrow, Alaska was carried out flawlessly, the other to Lady Franklin Bay near Greenland resulted in great tragedy. Nineteen of its twenty-five members died after bungled rescue attempts. Many blamed Hazen for the tragedy. In addition, Congress dealt the Corps an almost mortal blow in 1885 when it closed the Signal School at Fort Myer and turned over military signal instruction to individual branches of the service.

When Hazen died on 16 January 1887, the Corps had severe problems. It would be the job of Captain Adolphus W. Greely, nominated on 16 February 1887 as the new Chief Signal Officer, to bring the Signal Corps to prominence.[49]

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[49]Carol E. Rios, "Brig. Gen. William B. Hazen," Signal, 19 March 1986.

Brigadier General Adolphus W. Greely

Adolphus Washington Greely brought the Signal Corps into the age of modern technology. During his tenure as Chief Signal Officer (1887-1906), Greely introduced the radio, automobile, and the airplane into military use.

He wrote in his memoirs that his most important peacetime act was spending $50,000 in 1898 to convince Samuel P. Langley to produce a flying machine for the military. Although Langley was unsuccessful, his work encouraged the Wright brothers whose invention the Corps purchased in 1908.

Politically astute as well as an efficient administrator, Greely was instrumental in the survival of the Signal Corps in an era when Congress almost abolished it. Under Greely's command, the Corps strengthened its organizational structure and adapted the technology of the 19th century.

Greely's contributions to the Signal Corps were numerous. Among them were arctic exploration and overseeing the construction of thousands of miles of telegraph lines in the American southwest. But, most of all Greely's vision and courage made the Signal Corps an efficient, scientific arm of the United States Army.[50]

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[50]Carol E. Rios, "Greely modernized Signal Corps," Signal, 26 March 1986.

Brigadier General James Allen

Like his predecessor, Adolphus Greely, Chief Signal Officer James Allen (1906-1913) encouraged the technological growth of the Corps.

He not only continued Greely's aeronautical policies, such as, the Signal Corps' balloon and dirigible operations, but also advocated an air corps, observing in 1909, that other countries were "providing themselves systematically with aerial fleets" and that a sympathetic plan of development of this military auxiliary for [the United States] should be inaugurated without delay."

Allen's early contributions to the Signal Corps included the development of a buzzer-phone that replaced morse telegraphy in the field and later a field telephone.

He and George Squier (Chief Signal Officer from 1917 to 1923) conducted endless radio experiments and were responsible for the first wireless telegraph link in the western hemisphere. Allen's far-sightedness led him to advocate mobile signal equipment in 1906. He observed that equipment was needed to provide "instant communication by the side of the commander, wherever he may be required to go in the exercise of his duties."

When Allen retired in 1913, he left his successors with new communications technology that would be amply applied on the fields of France in World War I.[51]

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[51]Carol E. Rios, "Allen Encouraged tech growth," Signal, 2 April 1986.

Brigadier General George P. Scriven

When President Wilson ordered U.S. troops mobilized in the 1916 preparations for World War I, Chief Signal Officer BG George P. Scriven, with almost 40 years of service, was nearing the mandatory retirement age of 64. Still a vigorous man, Scriven's twenty-two years in the Signal Corps included acting as Chief Signal Officer of the American force in the China Relief Expedition (1900).

Advances in communications technology picked up momentum as Scriven physically expanded the Signal Corps. The word radio appeared for the first time in the American press. Heretofore, it was called wireless.

The telephone was a proven communications device, but a 1916 long distance demonstration astounded the Army's Chief of Staff General Scott when he talked directly to General Pershing in Texas.

World War I proved to be a turning point for the Signal Corps. It changed from a small band of individual experimenters into a large corporate organization, owing largely to the influx of civilians from the commercial communications industry.

Fortunately for the Corps, Scriven sent LTC George O. Squier, as military attache, to London where he observed Allied technology and prepared to replace Scriven as the first head of the Signal Corps with an earned Ph.D. in an applied science.[52]

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[52]Carol E. Rios, "BG Scriven expands the corps," Signal, 9 April 1986.

Major General George O. Squier

George Owen Squier's career spanned the Spanish American War and World War I. Because of him, the two most important technological developments of his era, the airplane and the radio, became integral parts of America's military arsenal.

After completing only the eighth grade and working for two years, Squier entered West Point. Graduating seventh in his class in 1887, Squier went on to complete his Ph.D. at Johns Hopkins in 1893.

With a first class education in electrical science, Squier was transferred to Fortress Monroe where he helped found the Artillery Journal and used photography and electromagnetism to measure the velocity of artillery shells. By 1897, Squier had proven the military application of radio through experiments that, for example, fired cannons and detonated mines by remote control.

After a tour of duty on the cable ship Burnside in the Philippines during the Spanish American War era, Squier established the first Signal School at Fort Leavenworth in 1905.

His interest in aeronautics was evidenced by its introduction into the school curriculum. That interest in aviation intensified when Squier came to Washington in 1907 as Assistant Chief Signal Officer. Upon his recommendation, the Aeronautical Division was formed. He not only wrote the specifications for the first military aircraft, but witnessed acceptance trials of the Army's first Wright Flyer.

Squier's interest in radio never faltered. During 1909 and 1910, he applied for four patents in multiplex telephony, whereby, several verbal messages could be transmitted and received over a single wire, the basis for modern communications systems.

As Chief Signal Officer during World War I, Squier was responsible not only for radio, but also was charged with the entire aviation and communications mission of the United States Army. During the war, Squier succeeded in opening two great Army laboratories, one at Fort Monmouth for radio and another at Langley Field, Virginia, for aviation. Squier can be credited with the Army's institutionalization of scientific research and development for military purposes.[53]

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[53]Carol E. Rios, "George Squier," Signal, 16 April 1986.

Major General Charles McK. Saltzman

After graduating from West Point Military Academy in 1896, Charles MCK. Saltzman served as a cavalry officer at several western posts, including Fort Apache and Fort Reno, Indian Territory.

While serving with the First Cavalry in Cuba during the Spanish American War (1898), Saltzman was awarded the Silver Star with Oak Leaf Cluster for gallantry in action against the Spanish at both Las Guasimas and Santiago.

After returning briefly to the United States, Saltzman fought in the Philippines (1902) under MG Leonard Wood in several campaigns against the Moro insurgents.

Saltzman then transferred to the Signal Corps, graduating with honors from the Signal School at Fort Leavenworth. During the next twenty-three years, he represented the Signal Corps in various ways including acting as a delegate to the International Board on Radio Telegraphy in Washington and as a delegate to the International Conference on Sea Safety.

After serving in various capacities in the Office of Chief of Signal (e.g. Chief of the Electrical Division, Executive Officer, Assistant to the Chief Signal Officer and in the Division of Military Aeronautics), Saltzman became Chief Signal Officer in 1924. Upon completion of the assignment, MG Saltzman retired in 1928, with thirty years of active duty.[54]

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[54]Carol E. Rios, "Maj. Gen. Saltzman," Signal, 23 April 1986.

Major General George S. Gibbs

George Sabin Gibbs was born in Harlan, Iowa, in 1875. He graduated from Harlan High School in 1892, from the State University of Iowa in 1897, and by 1901 had earned a Masters degree in engineering.

In 1898 Gibbs enlisted in the Iowa Volunteer Infantry as a private. During the Spanish American War and Philippine Insurrection, Gibbs served in the volunteer forces, mainly on Signal Corps duty, in ranks from private to first lieutenant. While a sergeant, Gibbs was cited for gallantry in action against the Spanish forces at Manila.

After being commissioned a first lieutenant in the Signal Corps, Regular Army, Gibbs' various duties included numerous surveys and construction of telegraph lines in Alaska and as chief Army signal officer of the Cuban Pacification. During World War I, Gibbs was the Assistant Chief Signal Officer of the American Expeditionary Forces. He was awarded the Distinguished Service Medal for his participation in the Aisne-Marne and Meuse-Argonne offenses.

His post World War I assignments included duty on the War Department General Staff and Executive Officer to the Assistant Secretary of War. In 1924, he supervised the completion of the new Washington-Alaska cable.

Promoted to Major General, Gibbs became Chief Signal Officer on 19 January 1928. He held this position until his retirement on 30 June 1931. After retirement, Gibbs was Vice President of the International Telephone and Telegraph Company and in October 1931 President of the Postal Telegraph Cable Company. Later in 1934 he served as Vice Chairman of the board and a director of the Federal Telephone and Radio Corporation. Gibbs died on 9 January 1947.[55]

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[55]Carol E. Rios, "Father-son team," Signal, 30 April 1986 and Biographical Sketch, George Sabin Gibbs Collection, USASC&FG Archives.

Major General Irving J. Carr

Irving J. Carr, the Signal Corps' tenth Chief Signal Officer, served in that capacity from 1931 to 1934. After graduating from the Pennsylvania Military College in 1897 with a degree in civil engineering, Carr began his Army career in the infantry. He participated in five battles and engagements in the Philippine Insurrection in 1899.

Carr's affiliation with the Signal Corps began with his graduation from the Army Signal School in 1908. He went on to participate in the Vera Cruz expedition in Mexico in 1914 and in France and Germany in World War I. In Europe his duties included serving as Chief Signal Officer of the IV Corps and Third Army. He participated in the Aisne-Marne and St. Mihiel offensives and in the Somme-Dieu defensive with the 2d Division.

During the 1920s Carr graduated from the General Staff School, Army War College, and Army Industrial College, staying on at the latter as both Assistant Director and Director. After his appointment as Chief Signal Officer, Carr presided over a relatively small Signal Corps of approximately 270 officers and 2,500 enlisted men.

In spite of depression era budgets, the Corps was instrumental in the development of communications technology including the teletypewriter, FM radio, and walkie talkie. In addition, the Corps provided the Army with the most comprehensive radio net in the world. Message traffic averaged almost 82 million messages per year from 1931 to 1934.[56]

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[56]Carol E. Rios, "Irving J. Carr was 10th Signal Officer," Signal. 7 May 1986.

Major General James B. Allison

An experimental model of the Army's first radar set was designed, developed, and successfully demonstrated by the Signal Corps at Fort Monmouth during the tenure of MG James B. Allison, the 11th Chief Signal Officer.

A native of York, South Carolina, Allison was one of many Army officers whose careers spanned the infantry-cavalry days and ended shortly before the material-machine era of World War II.

Allison graduated from the South Carolina Military Academy in 1895 and on 4 November 1898 was appointed a second lieutenant in the 7th Infantry, Regular Army. His career included duty in the Philippines, Alaska, and the 1914 Vera Cruz expedition into Mexico.

Allison's first encounter with the Signal Corps was at the Army Signal School around 1907. He commanded Company A, Signal Corps, at Fort Leavenworth until May 1909. Other Signal assignments included the preparation of signalers for World War I duty by commanding Signal Corps training camps at Monterey, California in 1917, Fort Leavenworth in 1918, and the Franklin Cantonment at Camp Meade, Maryland in 1919.

After a tour of duty as Fort Monmouth's Commanding Officer and School Commandant from 1925-1926, Allison became Chief Signal Officer of the Army on 31 January 1935

He retired on 30 September 1937 and died in his hometown on 14 March 1957.[57]

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[57]Carol E. Rios, "MG Allison, 11th Chief Signal Officer," Signal, 14 May 1986.

Major General Joseph O. Mauborgne

Joseph O. Mauborgne, 12th Chief Signal Officer, pioneered, with others, the development of the aircraft radiotelephone, the device that would change World War I airplanes from solitary units into a cohesive fighting group. Prior to World War II, Mauborgne supported the development of a revolutionary device known as radar, the communications technology that would most affect the outcome of that war.

After his commissioning as a second lieutenant in the regular Army in 1903, Mauborgne's assignments were interspersed with Infantry tours in the Philippine Islands and stateside installations.

Prior to World War I, he served at the Signal School at Fort Leavenworth and in the office of the Chief Signal Officer. During the 1920s and 1930s his numerous research and development assignments included being chief of the Signal Corps' Engineering and Research Division and commanding officer of the Signal Corps' Laboratory in the Bureau of Standards.

During the early 1930s, Mauborgne was Signal Officer for the 9th Corps area and later Director of the Signal Corps' aircraft factory, Wright Field, Ohio. Major General Mauborgne became Chief Signal Officer in October 1937.

As a research-minded chief, Mauborgne supported the development of Army radar and oversaw the mass production of the SCR-268 and SCR-270. He retired on 30 September 1941, only a few months before the SCR-270 was used on the island of Oahu, Hawaii on 7 December 1941 to detect Japanese aircraft some 130 miles away.[58]

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[58]Carol E. Rios, "Joseph Mauborgne, 12th Chief," Signal, 21 May 1986.

Major General Dawson Olmstead

As Chief Signal Officer during the major portion of World War II, MG Dawson presided over a momentous buildup of the Signal Corps. With as budget that grew from nine million in 1941 to more than five billion in 1943, Olmstead turned to both the Signal Corps' laboratories and the private sector to meet the demands of total war.

Advancements in military technology led to the birth and phenomenal growth of the civilian communications-electronics industry. Mass production of electronic components became commonplace. In spite of radar being in its "billion dollar baby" stage, the Signal Corps needed massive amounts of wire and radio communications, the providers of the heavy-duty voice traffic that assured reliable communications for the war effort.

Innovations such as the crystal-controlled FM radio, with its thirty mile range extended by truck-mounted radio relay equipment and automatic coding devices, that ended time consuming hand enciphering and deciphering, made American communications far superior to those of its allies and enemies alike.

With the assistance of an advisory council of reserve officers and a civilian advisory board comprised of key figures in the communications industry, Olmstead brought the Signal Corps to wartime footing. Accomplishments included activating hundreds of Signal units and training thousands of officers and enlisted personnel in a reorganized Signal School.

Olmstead's illustrious career blossomed in the anti-war 1920s and flourished during the depression years of the 1930s. However, it was during World War II that Olmstead's talent and vision won him the Distinguished Service Medal. Shortly before his retirement on 16 January 1944, Olmstead was awarded this decoration. The citation sums up his wartime contributions to the Signal Corps: "...he directed the expansion and training of the Signal Corps with impressive speed and instituted radical improvements in communication equipment and methods of modern tactics."[59]

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[59]Carol E. Rios, "Corps' 13th leader," Signal, 28 May 1986.

Major General Harry C. Ingles

MG Harry C. Ingles likened communications, in the hands of the commander, to a rifle in the hands of an infantryman - each was a weapon used to accomplish certain objectives.

As Chief Signal Officer from 1 July 1943 until 31 March 1947, Ingles was responsible for providing every commander with the communications to control his forces. His years as Chief Signal Officer included some of the most challenging times of World War II.

During Ingles' tenure in the branch's highest position, Signal troops landed in France on D-Day by parachute with the 101st Airborne and afoot with the 294th and 286th Joint Assault Signal Companies on Omaha and Utah Beaches, respectively. The 165th Signal Photographic Company also landed with the first infantry elements at Omaha Beach. Its commanding officer, Captain Herman Wall, was the first Signal Corps casualty of the Normandy invasion.

Ingles, who was born in Pleasant Hill, Nebraska, on 12 March 1888, graduated from West Point in 1914, and served in World War II in both Panama and the European Theater of Operations before becoming Chief Signal Officer. After its phenomenal buildup for the war, he saw the Corps lose its aviation communications-electronics responsibilities to the Army Air Forces, in 1944, and radio-intelligence to the Army Security Agency, the following year. The loss of these activities reduced the Corps' personnel by one half. However, the expanding military communications-electronics field quickly restored its losses and greatly enlarged the Signal Corps.

Before Ingles retired in 1947, the Signal Corps was assimilating the new technology by, among other things, breaking all previous records by transmitting a nine-word radioteletype message around the world in 9.5 seconds (April, 1945). On 10 January 1946, Signal Corps engineers, in Project Diana, made the first radar contact with the moon, using a modified SCR-271 long range radar set.

Among the decorations and awards of MG Ingles were the Distinguished Service Medal, France's Legion of Honor, and England's Order of the British Empire. Ingles died on 15 August 1976.[60]

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[60]Carol E. Rios, "MG Ingles lands troops in France," Signal, 4 June 1986.

Major General Spencer B. Akin

MG Spencer B. Akin, Chief Signal Officer, 1947 - 1951, accompanied General Douglas MacArthur from Corregidor through the initial military government in defeated Japan at the close of World War II. Before Corregidor and Bataan fell, Akin's radio program, the "Voice of Freedom," broadcast to the world, three times daily, that the two islands were holding.

As MacArthur's Chief Signal Officer throughout World War II, Akin exercised strong control by being in the forefront of each operation. This sometimes irritated others. Sixth army troops, including their commander, LTG Walter Krueger, complained that mobile communications clogged Highway 3, with a long column of heavy Signal Corps' vehicles, during the recapture of Manila near the end of the war.

As Chief of Signal Intelligence in the Far East and of Army forces in the Pacific, Akin exploited the Japanese reliance on radio communications by keeping commanders appraised of pertinent information. In one instance, an intercepted enemy radio message revealed that, expecting bombing raids, the Japanese had issued orders to move airplanes from a vulnerable airfield to a safer location. The Army Air Force used the information to attack before the move could be made, destroying large numbers of enemy aircraft. Akin's intelligence services crossed service boundaries. At Admiral Halsey's request, a Signal intelligence detachment was placed on his flagship. Vice Admiral Raymond A. Spruance, as commander of the Fifth Fleet in the southwest Pacific, kept Signal specialists on duty with him at all times.

During 1944, radio relay equipment proved itself more vital in the Pacific then in Europe. By November of 1944, message traffic, in that theater of war, was more than a million groups per day. In addition to wire communications, Akin equipped a small Signal Corps' fleet, a flotilla of small vessels, including schooners, ketches and barges, with radio. At first they served as relay ships, but soon became forward command post communications sites, Army Command and Administrative Network (ACAN) stations, and communications supply depots. Their support was so coveted that Army elements continually competed to obtain their services.

When elevated to Chief Signal Officer of the U.S. Army in 1947, Akin had earned, among other awards, the Distinguished Service Cross and Silver Star, both for gallantry in action in 1942 and the Air Medal and Legion of Merit, both in 1946. MG Akin retired in 1951. He died on 6 October 1973 and is buried in Arlington National Cemetery.[61]

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[61]Carol E. Rios, "Voices of freedom proved strong," Signal, 11 June 1986.

Major General George I. Back

George Irving Back was born in Sioux City, Iowa, on 24 February 1894. He was commissioned as a Second Lieutenant in the Signal Officers' Reserve Corps on 27 November 1917. A year later Back was appointed as a first lieutenant in the Signal Corps, Regular Army. Back advanced through the ranks to Major General.

Highlights in Back's military career included: serving as an instructor in World War I, duty in the Training Section, Office of the Chief Signal Officer following the armistice in 1918; appointment in 1922 to Assistant Signal Officer in Headquarters, Hawaiian Department; assignment to the Research and Engineering Division, Office of the Chief Signal Officer; assignment as Technical Observer on the USAT cable ship Dellwood; duty from 1929 to 1933 at the Signal Corps Laboratories at Fort Monmouth; and appointment in 1941 as Assistant Signal Officer to General Headquarters, Army War College and in 1942 as Executive Officer, Signal Supply Services, Office of the Signal Officer. In 1944 Back was transferred to the Mediterranean Theater of Operations serving first as Deputy Chief Signal Officer, Allied Forces Headquarters and subsequently as the Chief Signal Officer. From 1951 to 1955 Back was the Chief Signal Officer, United States Army. He died in 1972.

Back was awarded the Distinguished Service Medal, Legion of Merit, Commander, Order of the British Empire; Grand Official and Order of the Crown of Italy, and the Brazilian War Medal.[62]

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[62]Carol E. Rios, ""Crazy signal joes' were fighters," Signal, 25 June 1986 and Memorialization files, Command Historian, USASC&FG.

Lieutenant General James D. O'Connell

Totally different from the static trench fighting of World War I, World War II involved rapid mobility across Europe, crossing mountains in the China, Burma, India theaters, and island hopping in the Pacific. With men like LTG James D. O'Connell, the Signal Corps provided the communications that regardless of mobility and terrain "got the message through."

Born in Chicago, Illinois, on 25 September 1899, O'Connell graduated from West Point and was commissioned a second lieutenant in the Infantry on 13 June 1922. After one infantry assignment, O'Connell attended Signal School at Camp Alfred Vail , New Jersey, graduating in June 1925. Assignments during the 1920s included Communications Officer of the 35th Infantry Regiment and a company command with the 24th Infantry.

Detailed to the Signal Corps in 1928, O'Connell served as an instructor at the Signal School. By 1930 he had earned a Master of Science degree in Communication Engineering at Yale University and returned to the school as an instructor until 1936. Once more, O'Connell pursued his own education, this time at Command and General Staff School. He graduated in 1937 and returned to Fort Monmouth, serving first as Project Officer and later as Executive Officer of the Signal Corps Laboratories.

During World War II, O'Connell's duties included a tour in the Office of the Chief Signal Officer as Chief of the General Development Branch, Executive Officer of the Signal Supply Service and with Headquarters, 12th Army Group in England France and Germany. When the war ended, O'Connell returned to the United States as Chief of Engineering and then Director of the Signal Corps Engineering Laboratories at Fort Monmouth.

O'Connell served as Signal Officer of the Eighth Army in Japan from 1947 to 1948, and after a tour as Chief Signal Officer of the Second Army, was once again assigned to the Office of the Chief of Signal. After serving there as Deputy Chief Signal Officer, he became the seventeenth Chief Signal Officer from 1955 to 1959.

LTG O'Connell's military honors include the Legion Of Merit with Oak Leaf Cluster, Eastern Campaign Medal with five Bronze Stars and France's Croix de Guerre Ordre de l'Armee with Palm. His civilian awards are equally impressive. After retiring O'Connell used his technological and leadership abilities with, among others, the General Telephone and Telegraph Company. Among his civilian distinctions were election as a Fellow, Institute of Electrical and Electronics Engineers and recognition in the 12th Edition of American Men and Women of Science.[63]

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[63] Carol E. Rios, "O'Connell 'gets the message through,'" Signal, 2 July 1986.

Major General Ralph T. Nelson

Adjacent to Fort Gordon's Signal Towers on Chamberlain Avenue, Nelson Hall honors the Signal Corps' eighteenth Chief Signal Officer. Dedicated on 31 March 1970, the building preserves the memory of Ralph T. Nelson, "Under ...(whose) leadership the Signal Corps progressed as a modern technically advanced service for providing communications all the way from the fighting soldier on the line to the strategist at the operation center."

Colonel Nelson arrived at Fort Gordon on 27 June, 1955. His job was to command the Signal Corps Training Center. About a month later, Nelson became a brigadier general. After leaving Fort Gordon in 1957, the general commanded the Army's Electronics Proving Grounds at Fort Huachuca, became Deputy Chief Signal Officer, and then head of the branch as Chief Signal Officer from 1959 to 1962.

MG Nelson (the rank he attained as Chief Signal Officer) was born in Lebanon, Indiana on 19 June 1902. After first attending Purdue University, he graduated from the U.S. Military Academy and was commissioned a second lieutenant in 1928. His early assignments were with the Infantry in both the United States and Hawaii.

As a Signal officer in Germany and Austria during World War II, Nelson served with the 4th and 9th divisions of XV Corps and as department Signal officer of the Fifteenth Army and U.S. Forces. His final assignment of the war was in Austria, where he remained until 1946. Nelson served at various U.S. installations before returning overseas, this time to Korea, in 1953, where he served with the 10th Corps and the Eighth Army.

Among MG Nelson's awards are the Distinguished Service Medal, the Legion of Merit, the Bronze Star, the Purple Heart, and the Ulchi Medal (Korea). Nelson's final resting place is among our nation's finest in Arlington National Cemetery.[64]

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[64]Carol E. Rios, "18th Chief Signal Officer is honored," Signal, 16 July 1986.

Major General Earle F. Cook

MG Earle F. Cook, the nineteenth Chief Signal Officer, witnessed the evolution of Signal Corps technology from the wire and AM radio technology of the 1930s to the satellite era of the 1950s and 1960s. His career in the Corps included intelligence, research and development, Army communications, electronic equipment and systems, meteorological devices, and finally activities involving the direction of Signal Corps efforts in space age developments.

After World War II assignments that included Director of Signal Intelligence Division, European Theater of Operations and Chief of the Army Security Agency, Europe, Cook served as Assistant Signal Officer of the Fourth Army, Headquarters, U.S. Army Pacific. From July 1950 to May 1951, he was Signal Officer of the Marshall Islands. He later took part in the atomic tests conducted by Joint Task Force Number Three.

As Commanding Officer of the White Sands Signal Corps Agency from 1952 to 1954, Cook began an early association with missile electronics work. When the Army's Electronic Proving Ground was activated at Fort Huachuca, Cook was deputy commander while many of the new communication-electronic and surveillance equipment were undergoing tests and evaluations.

Cook's jobs at the Department of Army level included command in 1955 of the U.S. Army Signal Research and Development Laboratory. It was during this time that he became a brigadier general. As Chief of the Research and Development Division, Office of the Chief Signal Officer, Cook directed Signal responsibilities in Project SCORE, the "talking satellite" developed by the Signal Corps for the Advanced Research Projects Agency of the Department of Defense.

On 1 July 1962, General Cook became the Chief Signal Officer of the United States Army. After his retirement in 1963, Cook joined the staff of Radio Engineering Laboratories as Director, Technical Operations, Eastern Area.[65]

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[65]Carol E. Rios, "The talking satellite directed by Cook," Signal, 23 July 1986.

Major General David P. Gibbs

The appointment of David Parker Gibbs as Chief Signal Officer, in 1963, made the position a "family affair." His father, George S. Gibbs, had served as head of the Corps some thirty-five years earlier (1928-1931). While the elder Gibbs had worked his way through the ranks from private to major general, David Gibbs graduated from West Point as a second lieutenant in 1933.

Prior to World War II, Gibbs served in several Signal units, including the 1st Signal Troop of the 1st Cavalry F Division at Fort Bliss, Texas and the 11th Signal Company, Hawaii Division.

His wartime assignments included Iceland, England, France, Germany and Czechoslovakia. During the 1950s, Gibbs commanded the 1st Signal Service Group at Camp Polk, Louisiana, the 51st Signal Operations Battalion at Fort Meade, Maryland, and served in various staff assignments in Washington, D.C. The next two years (1954-55) included various assignments in Korea and Japan.

Between 1955 and 1958, Gibbs, a brigadier general, was Chief Signal Officer at Headquarters, Continental Army Command (now the Training and Doctrine Command - TRADOC), Commanding Officer of the Signal Training Center at Fort Gordon, and Chief of Staff for Communications and Electronics, Headquarters, North American Defense Command Center.

Upon receipt of his second star, Gibbs was first assistant, then deputy and finally Chief Signal Officer. The Chief Signal Officer, effective 1 March 1964, was redesignated Department of the Army Staff, Chief of Communications-Electronics.

MG Gibbs died in 1987. Included among his honors are the Legion of Merit, the French Croix de Guerre (War Cross) and the Bronze Star with two Oak Leaf Clusters.[66]

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[66]Carol E. Rios, "Position family affair," Signal, 13 August 1986.

Major General Thurman D. Rodgers

Thurman Donell Rodgers was born in Cookeville, Tennessee on 1 December 1934. In 1957 he was commissioned a second lieutenant and awarded a Bachelor of Science degree in electrical engineering from Tennessee Technological University. Rodgers also holds an advanced degree in Public Administration from the University of Northern Colorado. His military education includes completion of the Signal School, the United States Army Command and General Staff College, and the United States Army War College.

Rodgers' major assignments have included Personnel Management Officer, Signal Branch, Officer Personnel Directorate, Office of Personnel Operations, United States Army, Washington, D.C.; staff member of the Satellite Branch, Communications Systems Directorate, J-6, Organization of the Joint Chiefs of Staff; and commander of the 51st Signal Battalion, I Corps, ROK/US Group, Korea.

In June 1976, he was assigned first as staff officer and then as Chief, Plans Branch, Plans and Operations Division, Office of the Chief Legislative Liaison, United States Army, Washington, D.C. In August 1977 he was assigned as Deputy Commander, 7th Signal Brigade, United States Army Europe, Germany. Then from March 1979 to April 1981, he served as Commander of the 7th Signal Brigade. He returned to Washington, D.C. in May 1981 where he assumed duties as Deputy Director for Systems Development, Integration and Engineering, Office of the Deputy Chief of Staff for Operations and Plans.

In April 1982 Rodgers became the Commander, United States Army Communications Systems Agency/Project Manager, DCS (Army), Fort Monmouth and the Commander, United States Army Communications-Electronics Engineering Installation Agency, Fort Huachuca. From 27 September 1983 until 3 June 1986 he was the Commanding General of the United States Army Signal Center and Fort Gordon. During a change of command ceremony on 3 June 1986 at Fort Gordon, MG Rodgers briefly assumed the position of Chief Signal Officer before relinquishing command to MG Bruce R. Harris and before his promotion to lieutenant general. He served as Assistant Chief of Staff for Information Management, Office of the Assistant Chief of Staff for Information Management, DA and Director, Information Systems for Command, Control, Communications and Computers, Office of the Secretary of the Army. In June 1988 LTG Rodgers assumed command of the USAISC.[67]

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[67]LTG Rodgers, Biographical Sketches, Command Historian's files, USASC&FG.

Major General Bruce R. Harris

Bruce Reed Harris was born on 13 August 1934 in New Castle, Indiana. In 1956 he graduated from Tennessee Technological University with a Bachelor's degree in business and a commission in the Army through ROTC. He also has earned a Master's degree in political science from Auburn University.

His military education includes the Signal Officer Basic and Advanced Courses, the Army Command and General Staff College, and the Air War College.

MG Harris's assignments are numerous. From 1972 to 1973 he commanded the 13th Signal Battalion, 1st Cavalry Division, Fort Hood. After attending the Air War College from 1973 to 1974, Harris served in 1974 and 1975 as an Operations Research Analyst, Manpower Analysis Team, Program Analysis and Evaluation Directorate, Office, Chief of Staff, US Army, Washington, D.C. From 1975 to 1978 he was the Executive Officer, later Chief of the Plans and Operations Division, Office Chief of Legislative Liaison , US Army. The following year he served as the Commander, Division Support Command, 2d Armored Division, Fort Hood. In 1980 and 1981 Harris was the Chief of Staff at Fort Gordon followed in 1981 with appointment as the Signal Center's Deputy Commanding General/Deputy Commandant. Between 1981 and 1982 he was the Deputy Assistant Secretary of Defense (Legislative Affairs) Office, Secretary of Defense. That assignment was followed by appointment from 1982 to 1983 as the Assistant Division Commander, 9th Infantry Division, Fort Lewis. The next year he served as the Commanding General, US Army Communications Systems Agency, Fort Monmouth, New Jersey and US Army Communications Electronics Engineering Installation Agency, Fort Huachuca. From 1984 to June 1986 Harris was the Deputy Commanding General, US Army Information Systems Command, Fort Huachuca. On 3 June 1986 he assumed command of the US Army Signal Center and Fort Gordon. On 3 June 1988 he relinquished command to MG Leo M. Childs and received a promotion to lieutenant general. In June 1988 LTG Harris was assigned as Director of Information Systems Command, Control, Communications and Computers, Office of the Secretary of the Army, Washington, D.C.

MG Harris' citations and awards include the Legion of Merit, Bronze Star Medal, Meritorious Service Medal with Oak Leaf Cluster, Air Medals, Army Commendation Medal, Parachutist Badge, and Master Army Aviator Badge.[68]

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[68]MG Harris, Biographical Sketches, Command Historian's files, USASC&FG.

Major General Leo M. Childs

Leo Matthew Childs was born on 20 September 1936 in Needham, Massachusetts. He earned a Bachelor's degree from Northeastern University and a Master's degree in International Relations from Georgetown University. MG Childs' military education includes the Signal School, the Army Command and General Staff College, and the Army War College.

In May 1960, Childs became the Communications Center Officer and later Officer in Charge, Facilities Control and later Traffic Branch, US Army Primary Signal Relay Center, US Army Europe. In October 1962 he was the Fixed Station Radio Officer, 4th Signal Group, US Army Europe. From November 1963 to March 1964 Childs served as Chief, Communications Center, US Army Europe Signal Center. In December 1964 he assumed command of Company B, 82d Signal Battalion, 82d Airborne Division, Fort Bragg. In March 1966 he became the Operations Officer, 362d Signal Company 41st Signal Battalion, 1st Signal Brigade, US Army Vietnam. In April 1967 Childs returned to Fort Bragg as Wire Officer, Signal Section, later Signal Operations Officer, XVIII Airborne Corps. Other assignments include: Assistant Signal Officer, 1st Infantry Division, later II Field Force, US Army Vietnam; Plans Officer, Communications Systems Directorate, later Assistant Executive Officer to the Assistant Chief of Staff for Communications-Electronics, Office of the Assistant Chief of Staff for Communications-Electronics, US Army; Chief of Professional Development, Signal Branch, US Army Military Personnel Center and Personnel Management Officer, Lieutenant Colonel's Division, Officer Personnel Directorate; Commander, 82d Signal Battalion, 82d Airborne Division and Commander, 35th Signal Group, Fort Bragg; Assistant Deputy Director for Engineering, Joint Tactical Communications Office, Fort Monmouth; Chief of Staff/Deputy Commander, later Deputy Commander/Assistant Commandant, USASC&FG; Deputy Controller, Central Operating Authority, Supreme Headquarters Allied Powers Europe; Commanding General, 5th Signal Command/Deputy Chief of Staff for Information Management, US Army Europe/Seventh Army; and Deputy Commanding General, USAISC. On 3 June 1988 MG Childs assumed command of the United States Army Signal Center and Fort Gordon. On 18 May 1990 he relinquished command of the Signal Center to BG Robert E. Gray.

MG Childs' awards include the Legion of Merit, Bronze Star with two Oak Leaf Clusters, Defense Meritorious Service Medal, Meritorious Service Medal with Oak Leaf Cluster, Air Medal, Army Commendation Medal with three Oak Leaf Clusters, Master Parachutist Badge, and Army General Staff Identification Badge.[69]

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[69]Office Chief of Signal, U.S. Army Signal Corps (Regiment) General Officer Biographies, (Office Chief of Signal, USASC&FG: USASC&FG, Fort Gordon, GA, 1 September 1988), pp. I-18-I-20.

Brigadier General Robert E. Gray

Robert E. Gray received his commission as a Signal Corps second lieutenant upon his graduation from Fort Gordon's Signal Corps Officer Candidate School in May 1966. He attended the Microwave Radio Officers course at For Monmouth and subsequently was assigned as communications officer to the 56th Field Artillery Group (Pershing) in Schwaebisch Gmuend, Germany. From 1967 to 1968 Gray served concurrently as HHB commander and brigade Signal officer for the reorganized Pershing Brigade Headquarters. He served from 1968 to 1969 as commander of Company C, 97th Signal Battalion, Mannheim, Germany

Then in July 1969, Gray joined the 101st Airborne Division (Air Assault) in Vietnam as a brigade communications officer. He later assumed command of Company A, 501st Signal, 101st Airborne Division (Air Assault). He returned from Vietnam in July 1970. Gray attended the Signal Officers Advanced Course at Fort Monmouth, graduating in June 1971. From June 1971 until his graduation in June 1973 Gray attended Ohio State University. Then assigned to the Defense Intelligence Agency (DIA) in Washington, DC, Gray served first as Plans and Operations Officer of the newly created Computer Security Branch in the Directorate of Security and later as the DIA Staff Communications Officer in the Communications Directorate.

In July 1976 Gray was assigned as a student to the Command and General Staff College, graduating in June 1977. His next assignment was as Executive Officer to the 50th Signal Battalion (Airborne Corps) at Fort Bragg. In November 1978 Gray joined the staff of Headquarters XVIII Airborne as Chief, Readiness Command Plans Branch, in the Office of the Assistant Chief of Staff, G3. In June 1980 BG Gray took command of Fort Bragg's 82d Signal Battalion, 82d Airborne Division. Completing that command in June 1983, Gray became a student at the United States Army War College, Carlisle Barracks, Pennsylvania. After his graduation in June 1984, BG Gray was assigned to the C3I Directorate of the United States Army Combat Developments Activity, U. S. Army Combined Arms Center, Fort Leavenworth as the Chief, Command, Control and Communications Division and later as the Director of C3I.

Following an assignment as Commander of the 35th Signal Brigade, XVIII Airborne Corps at Fort Bragg, in November 1988 Gray assumed duties as the Deputy Commander and Assistant Commandant of the US Army Signal Center and Fort Gordon. On 18 May 1990 BG Gray assumed command of the Signal Center, serving in that position as Chief of Signal, until relinquishing command on 17 July 1990 to MG Peter A. Kind.

BG Gray's decorations and awards include the Legion of Merit, Bronze Star, Meritorious Service Medal with three Oak Leaf Clusters, Air Medal, Army Commendation Medal with one Oak Leaf Cluster, Good Conduct Medal, National Defense Service Medal, Vietnam Service Medal, and the Master Parachutist Badge.

Major General Peter A. Kind

Peter A. Kind, a native of Wisconsin, graduated in 1961 from the University of Wisconsin with a bachelor of science degree in economics and with a commission as a second lieutenant. Kind later earned a master of business administration degree from Harvard University. His military education includes the Signal Officer Basic Course at the US Army Signal School and Fort Gordon, the Communications Officer Course offered at the US Marine Corps Amphibious Warfare School, the US Army Command and General Staff College, and the US Army War College.

MG Kind served with the 97th Signal Battalion (Army) and the 10th Special Forces Group (Airborne) in Germany and as Signal Advisor to the 21st Infantry Division (Air Assault) in Vietnam. He also served as the Director of Services at Tobyhanna Army Depot in Pennsylvania and as Chief of Stock Control at the US Army Depot in Cam Rahn Bay, Vietnam.

While stationed at Fort Bragg, Kind was the Assistant Division Signal Officer of the 82nd Airborne Division and Executive Officer and S2/S3 (Intelligence/Operations and Training) for the 82nd Signal Battalion. He then served in the War Plans Division, Strategy, Plans and Policy Directorate, Office of the Deputy Chief of Staff for Operations and Plans, Headquarters, Department of the Army. Kind commanded the 1st Cavalry Division's 13th Signal Battalion at Fort Hood and attended the Logistics Management Center's School of Management Science. He then was assigned as Chief of the Concepts and Studies Division, Directorate of Combat Developments at the Signal Center before attending the Army War College.

MG Kind subsequently served as Commander of the 1st Signal Brigade and concurrently as the Assistant Chief of Staff, J6, US Forces in Korea and G-6, Eighth US Army. His other assignments include Director of Combat Developments and Deputy Commanding General of the Signal Center, Deputy Controller of the NATO Integrated Communications System Central Operating Authority, and Program Executive Officer, Command and Control Systems. On 17 July 1990 MG Kind assumed command of the US Army Signal Center and Fort Gordon.

MG Kind's awards include the Legion of Merit with one Oak Leaf Cluster, the Bronze Star Medal with two Oak Leaf Clusters, the Meritorious Service Medal with two Oak Leaf Clusters, the Air Medal with two devices, the Army Commendation Medal, the Senior Parachutist Badge, and the Army General Staff Identification Badge.

Medal of Honor

SIGNAL CORPS MEDAL OF HONOR RECIPIENTS

Morgan D. Lane

Charles Evans Kilbourne, Jr.

Gordon Johnston

Will Croft Barnes

Adolphus W. Greely

Morgan D. Lane

Morgan D. Lane was born in Monroe, New York in the mid-1840's. His military service began with his enlistment on 22 August 1862 in Company I, 5th Regiment of Michigan Cavalry, at Allegan, Michigan. In the Cavalry he rose to the rank of sergeant. In March 1864 Lane transferred to the Signal Corps and was appointed on 1 April 1864 a second-class private. His entire service was in the Army of the Potomac, from which he was honorably discharged on 24 June 1865. After November 1864, he served in the 5th Corps to whose headquarters he was attached in early April 1865 as the orderly of Lieutenant P. H. Niles, a Signal Corps officer.

On 6 April 1865, during the pursuit of Lee's army an event occurred that earned Lane the Medal of Honor. Lieutenant Niles' description of the event was quoted in the report of Captain Charles L. Davis, Chief Signal Officer, Army of the Potomac, 20 April 1865:

> On the 6th of April, 1865, near Jetersville, Virginia, in company with Captain Benyaurd, U. S. Engineers, and my orderly, Private Lane, and in advance of the army, we pursued and captured 7 rebels, viz, 2 naval officers, 1 engineer, 1 acting signal officer (all of the rebel gun-boat Nansemond), and 3 enlisted men. The flag of the gun-boat Nansemond was secured from one of these enlisted men by Second-Class Private Morgan D. Lane, U. S. Signal Corps.

In early 1866 Lane sent to Congressman Charles Upson of Michigan a slightly different account of the event. Lane claimed to have captured the Nansemond's commanding officer and the flag that "was on his person." Continuing, Lane said he was given thirty days leave and was promised a "Gold Medal" for his deed.

Upson forwarded Lane's letter to the War Department. The department sought to locate the "Nansemond's" flag to substantiate Lane's claim. But, the search was in vain. In March 1866, the letter reached the Chief Signal Officer, Colonel Benjamin F. Fisher. He endorsed it by quoting from Captain Davis' report, supporting Lane's assertion of having secured the flag, albeit from one of the enlisted men, not from the Nansemond's commanding officer as Lane recalled.

Upon Fisher's endorsement, the War Department awarded the Medal of Honor to Lane, forwarding it to him on 17 April 1866. Lane was the first member of the Signal Corps and the only member of the Civil War Corps to win the Medal of Honor.[70]

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[70]Carol E. Rios, "Lane gets first Medal of Honor," Signal, 4 December 1985 and Paul J. Scheips, "Private Lane's Gold Medal," Military Affairs 24 (Summer 1960), pp. 87-91. Also see Frank C. Lockwood, ed., Apaches & Longhorns, The Reminiscences Of Will C.

Charles Evans Kilbourne, Jr.

Charles Evans Kilbourne, Jr. was born on 23 December 1872 at Fort Whipple (later renamed Fort Myers in honor of the Signal Corps' founder, Albert J. Myer). As the son of a Signal Corps Officer, Kilbourne spent much of his boyhood years at numerous Army installations. When he reached fifteen, he entered Ohio State University's preparatory school but later left due to illness. In 1891 he was admitted to the Virginia Military Institute and graduated in 1894 with a degree in civil engineering. Following graduation, Kilbourne moved west and worked as a surveyor in New Mexico and the Pacific northwest. After serving for a time as an Indian school disciplinarian, he became an observer with the U.S. Weather Bureau until the war with Spain in 1898.

Kilbourne answered the call to arms and joined the Volunteer Signal Corps (VSC), an expansion of the regular Signal Corps assigned to provide tactical communications to the rapidly expanding Regular Army. In order to be accepted as an officer in the Volunteer Signal Corps the applicant was to be adept in an electrical vocation or telegraphy. Kilbourne was one of the few commissioned VSC officers appointed for his leadership potential rather than for his technical expertise.

Kilbourne was assigned to the First Company, VSC, 2nd Lieutenant. He shipped out with Major General Arthur MacArthur's expedition to the Philippine Islands where he participated in the campaign against Spanish forces climaxing in the seizure of Manila.

Following the end of hostilities with Spain, the Philippine Insurrection erupted on 4 February 1899. The following day 1st Lieutenant Kilbourne earned a place in history. "Within a range of 250 yards of the enemy and in the face of rapid fire [he] climbed a telegraph pole at the east end of [Paco Bridge] and in full view of the enemy coolly and carefully repaired a broken telegraph wire, thereby reestablishing telegraphic communication to the front." For his gallantry and courage Kilbourne was awarded the Congressional Medal of Honor, the only Signal Corps officer to win it in the performance of a combat communications mission and the second Signal Corps officer to be awarded the honor.

Before leaving the Philippine Islands, Kilbourne applied for a commission in the Regular Army. Due to a physical disqualification, his request was denied. Subsequently he returned to San Francisco where he reapplied and was accepted as an infantry officer in the 14th Infantry Regiment.

In late 1899, he was ordered back to the Far East. Kilbourne participated in the Boxer Rebellion at Peking where he led his platoon in the assault that captured the Imperial City Gates.

Barnes, reprint edition, (University of Arizona Press: Tucson, 1982).

After suppression of the rebellion, his regiment returned to duty in the Philippine Islands. There Kilbourne performed his duties with the Provost Marshal's office. It was during this tour that Kilbourne made an important career decision. In 1902 he requested and was granted a branch transfer to the Artillery Corps.

Transferred to Fort Monroe, Virginia to attend the Artillery School, he determined to learn all that he could about his new branch. Kilbourne was the honor graduate in his class and was assigned as the post district adjutant, a highly competitive and reputable position in his day. He served in this position for the next two years. Promoted to captain in 1905, Kilbourne assumed successive commands of coast artillery companies.

Kilbourne's tenures in command were always characterized by demanding, tough training, and distinguished maintenance. Inspection reports commented on the "perfect conditions" of his coast artillery batteries and of his unit's training, which resulted in setting new gunnery records and improved techniques for both range-finding and fire direction.

While commanding the 35th Company, Coast Artillery Corps, Kilbourne returned to the Philippine Islands. The company's mission was the defense of Manila Bay. Kilbourne began the construction of an elaborate defensive fortification system on Corregidor Island. This was to have significant affects on the course of world events. The British credited it with saving Australia by delaying the Japanese advances at the beginning of World War II. (His efforts were finally completed in 1932 when as a brigadier general he commanded the entire harbor defenses of Manila.)

In 1909 Kilbourne left Corregidor to assume his duties as the Inspector, and later as Superintendent, of the Philippine Constabulary Bureau and School. His outstanding performance was not limited to the training environment. When Moro guerrillas threatened the local area, he undertook several tactical operations against them. In 1911 he was assigned to the War Department General Staff during which time he developed plans for the defense of Guantanamo Bay, Cuba. Serving in several staff position for the following six years, Kilbourne established relationships with his superiors, peers, and subordinates based upon mutual respect and trust. While serving as the Chief of Staff, Southeastern Department, in Charleston, South Carolina, Major Kilbourne recognized the need for a regular army post in that section of the country. His foresight led to the establishment of Fort Jackson, South Carolina.

When the United States declared war on Germany in April, 1917, Major General Leonard Wood selected Kilbourne to be his Chief of Staff of the 89th Infantry Division. In preparing to move the division to France, Lieutenant Colonel Kilbourne made a pre-deployment, fact finding trip to the front in France. While learning of the new demands of trench warfare, a mortar shell seriously wounded him. As a result, Kilbourne returned to Camp Funston, Kansas, where the 89th Infantry Division was training for the European theater. Not deterred by his wounds and now a

colonel, he led the advance party of the division to France and prepared the way for the 89th Infantry Division's entry into combat. Once the division was in combat, the Chief of Staff set an example in leadership by "moving among the forward units, reorganizing them, and urging forward." Kilbourne earned the Distinguished Service Cross for his efforts during the St. Mihiel offensive. In October, 1918, he was promoted to brigadier general and was the commanding general of both the 36th Artillery Brigade and later the 3rd Infantry Brigade of the 2nd Division. Major General John A. Lejune, commanding general of the 2nd Division, wrote that Kilbourne executed his duties in an "excellent, able, conscientious and painstaking" manner. Once again Kilbourne had proven his flexible approach to his duties and his ability to master his job in a short period of time. Kilbourne's performance of duty in these last two assignments earned him the Distinguished Service Medal. He was the only soldier at that time to hold the nation's three highest awards.

Upon his return to the United States and the reduction of the military's size, Kilbourne reverted to his permanent rank of major in the Regular Army. Assigned as an instructor and student to the Army War College in Washington, D.C., he graduated with honors and later became a course director at the college. By 1928 he was promoted to brigadier general in the Regular Army and served another tour in the Philippines. He returned to Fort Sam Houston in 1936 as a major general where he commanded the 2nd Division until his retirement on 31 December 1936. He subsequently served as the superintendent of the Virginia Military Institute for nine years until he retired from that post for health reasons. Kilbourne died in 1963.[71]

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[71] Captain Paul D. Hughes, "Charles E. Kilbourne: A Study in Leadership," Army Communicator 10 (Summer 1985), pp. 7-8.

Gordon Johnston

Gordon Johnston was born in Charlotte, North Carolina, into a southern family of considerable prominence. He graduated from Princeton University in 1896. Johnston was an honor graduate of the Infantry and Cavalry School in 1903; attended the German Riding Academy in Hanover from 1906 to 1907; and graduated from the advanced course in the Cavalry School in 1925 and from the Army War College in 1926.

Johnston began his military service as an enlisted man during the Spanish-American War in the 2d Mississippi Infantry Regiment in 1898. He soon secured a transfer to the 1st U.S. Volunteer Cavalry Regiment, in which at that time Leonard Wood was a colonel and Theodore Roosevelt a lieutenant colonel. Both Wood and Roosevelt came to admire Johnston and were powerful friends. This transfer to the Cavalry was significant, for horsemanship and the Cavalry were dominating passions with Johnston throughout his military career. Although not all of his subsequent career was in the Cavalry, that was his branch for a number of years. Altogether he must have served in at least six different Cavalry regiments.

While apparently in civilian life for a short while in 1899, Johnston was offered and accepted a commission as a second lieutenant in the 43d Infantry Regiment upon Theodore Roosevelt's recommendation. His service took him to the Philippines and the Insurrection, where in February 1900 he performed an act that years later won him the Distinguished Service Cross. "While in command of a small detachment of scouts, "the 1924 citation read, "he displayed remarkable gallantry and leadership in charging a greatly superior force of entrenched insurgents in the face of cannon and rifle fire, driving the enemy from their position and capturing the town of Palo."

Johnston sought and won, with the determined support of Theodore Roosevelt, a commission in the Regular Army. In October 1902 Johnston became a 1st lieutenant in the Cavalry, but in September 1903 he was detailed to the Signal Corps. The law provided that officer vacancies in the Corps could be filled by line officers detailed for four years. Devoted to the Cavalry as he was, Johnston was not happy about this assignment, which, he said, came "without examination or application on my part."

While on temporary duty at the German Riding School in Hanover in 1906, where he had been sent before restoration to regular duty following his injury in the Philippines that later won him the Medal of Honor, Johnston for a second time sought release from the Signal Corps, this time successfully. Johnston's detail in the signal Corps was terminated in December 1906 and the next year found him back in the Cavalry.

Meanwhile, however, on 7 March 1906, while still assigned to the Signal Corps, Johnston distinguished himself at Mount Bud-Dajo, Jolo, Philippine Islands, as can be seen from the

following report of Major Omar Bundy, 6th Infantry, quoted by General F. C. Ainsworth, The Adjutant General, in 1907:

> 1st Lieutenant Gordon Johnston, Signal Corps, voluntarily joined me on the trail at daybreak on the 7th before the advance began, and accompanied me to the last trench below the cotta. While waiting here to complete the dispositions for the charge, he asked and obtained permission to advance to the base of the cotta. This he did under a hot fire from the Morro rifle pit to our left. He was among the first to reach the cotta, and when the charge was ordered, while gallantly raising himself up to gain a foothold to climb up in advance of the others he was severely wounded. For this especially brave action, which distinguished his conduct above that of his comrades, I recommend that he be given a medal of honor.

The recommendation that Johnston be awarded the Medal of Honor was approved by the officer commanding the expedition and by the commanding general of the Philippines Division.

In 1911 Johnston was awarded the Medal of Honor for the Bud-Dajo action. The citation stated that he "voluntarily took part in and was dangerously wounded during an assault on the enemy's works." His wound at Bud-Dajo probably earned Johnston the Purple Heart when this award was reestablished in 1932.

With the nation at war, Johnston was commissioned an infantry major in the National Army in August 1917, a lieutenant colonel in May 1918 (accepted, June 1918), and a colonel in October 1918. In July 1920 he became a lieutenant colonel in the Regular Army and in 1929 a colonel.

Evidently Johnston was assigned to the General Staff Corps and in 1919 was awarded the Distinguished Service Medal while serving as chief of staff of the 82d Division in the operations in the Argonne area.

At the time of his death from a polo accident on 7 March 1934, he also held the Silver Star with two Oak Leaf clusters. Johnston was buried in Arlington National Cemetery.[72]

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[72]Carol E. Rios, "Calvary Signal officer," Signal, 18 December 1895 and Paul Scheips, "Gordon Johnston, 1874-1934," in Biographical Sketches Of Former Signal Corps Personnel," Signal Corps Historical Division, Center of Military History, October 1957, pp. 12-21.

Will Croft Barnes

Between 1873 and 1883, the Signal Corps constructed some eight thousand miles of pole line connecting seventy-seven frontier telegraph and weather offices. Located at Army posts in the American west, these stations were interconnected by military and commercial lines to each other and to the Office of the Chief Signal Officer in Washington, D.C.

Among the three distinct Signal Corps telegraph systems that were to play an outstanding role in the Indian Wars and final expansion of the continental United States to its Pacific border, was the twenty-nine station line that connected isolated posts such as Fort Bliss, Santa Fe, and Fort Apache in the Arizona territory. It was at Fort Apache that first-class Private Will Croft Barnes honored himself and the Signal Corps as a recipient of the Medal of Honor.

Barnes' daily routine consisted of using the electric telegraph to dispatch administrative messages, collecting meteorological data in order to transmit weather reports to the Signal Office in Washington and repairing his equipment and pole line. The latter task became increasingly frequent as the Apaches grew restless in 1881. Barnes recollected in his book Apaches and Longhorns that the situation grew tense in 1881 when a medicine man called "Nock-aye-de-Klinny" began predicting the departure of the white man and the Indian's return to power.

After Nock-aye-de-Klinny convinced the local tribe that he had a magic shirt that protected him from the white man's bullets, trouble began in earnest. General Carr, Fort Apache's commander was then ordered to arrest the medicine man. Taking all available troops, about sixty in all, Carr set out to capture the trouble maker on 29 August 1881.

In an attempt to quell the fear of imminent Indian attack among those who remained behind at the fort, Barnes volunteered to climb to the two-thousand-foot height of a nearby mesa and use his signal flags to alert the post to Indian movements. Fortunately for them all, Barnes was able to report the return of General Carr's unit, which had completed the mission that resulted in the death of Nock-aye-de-Klinny.

But, it was sometime before peace was restored at Fort Apache. In a skirmish on 11 September 1881, Will Croft Barnes brought lasting recognition to himself and to the Signal Corps by displaying bravery in action against the Apaches, thereby, winning one of the Signal Corps' five Medals of Honor.[73]

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[73]Carol E. Rios, "Will Croft Barnes," Signal, 8 January 1986 and Paul J. Scheips, Will Croft Barnes, A Westerner of Parts, The Great Western Series, No. 15, (Potomac Corral of the Westerners: Washington, D.C., 1981), pp. 1-29.

Adolphus W. Greely

Adolphus W. Greely, the Signal Corps' fifth Medal of Honor winner began his life of service on some of the Civil War's bloodiest battlefields - Ball's Bluff, Antietam and Fredericksburg. After rising from private to sergeant in the 19th Massachusetts, Greely accepted a commission in the 81st Colored Troops in 1863.

Lieutenant Greely, Regular Army, saw frontier service in places like Wyoming and Utah. In his spare time, he studied telegraph and electricity. The training served him well when he was detailed to the Signal Corps in 1867.

After serving as a "trouble-shooter" in the construction of frontier telegraph lines, Greely volunteered in 1881, to lead an Arctic weather expedition. On a three year stint to Ellesmere Island near the North Pole, Greely's party amassed a great deal of data on Arctic weather and tidal conditions, but was almost wiped out when relief ships failed to reach them for two successive summers.

In 1887, President Grover Cleveland advanced Greely from the rank of Captain to Brigadier General with his appointment as Chief Signal Officer. In the following years, Greely's innovation led to the military use of wireless telegraphy, the airplane, the automobile and other modern devices

Greely retired for age in 1908. After a trip around the world, he helped found the National Geographic Society and the first free public library in Washington, D.C.

On his 91st birthday, March 27, 1935, Greely was presented with a special Medal of Honor for "his life of splendid public service." Greely died the following October and was buried with full honors at Arlington National Cemetery.[74]

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[74]Carol E. Rios, "Adolphus W. Greely, medal winner," Signal, 15 January 1986 and Charles R. Shrader, "Adolphus Washington Greely," in Dictionary Of American Military Biography, I: 403-408.

A SELECTIVE CHRONOLOGY OF SIGNAL CORPS HISTORY

26 February 1851	Albert James Myer earned his Doctor of Medicine degree. His doctoral dissertation, "A New Sign Language for Deaf Mutes," proposed a system of sign writing based upon the Bain telegraphic alphabet.
January 1854	Myer passed the Army medical board examination and subsequently received an appointment as an assistant surgeon in the Medical Corps.
1856	Assistant Surgeon Albert J. Myer patented a system of wigwag signalling.
21 June 1860	Congress authorized the appointment of a signal officer for the Army.
2 July 1860	Myer was appointed with the rank of Major as the first Army Signal Officer.
March-April 1861	Myer began training personnel in flag and torch signaling at Fort Monroe, Virginia.
12 June 1861	Combat Signal units were detailed at Fort Monroe, Virginia.
15 June 1861	Using signal flags, the fire from the battery at Fort Wool in Hampton Roads, Virginia was directed on the Confederate works at Sewell's Point.
26 June 1861	A permanent line of communication using flags and torches was established between Fort Monroe and Newport News, Virginia.
10 July 1861	Major Myer established the Signal school at Fort Monroe, Virginia.
21 July 1861	Union forces used a balloon at the Battle of Manassas, Bull Run. The Confederate Signal Corps successfully used flags at Bull Run.
August 1861	The War Department procured the first mobile communications unit, a flying telegraph train.
1 January 1862	Myer's code of signals was used in a combined land and sea attack on Port Royal Ferry, South Carolina.

3 March 1863	Legislation was passed authorizing a regular rather than acting Signal Corps for the duration of the Civil War.
3 July 1863	Union signaling at the Battle of Gettysburg from Big Round Top and Little Round Top was crucial in observing Confederate forces, helping to establish the significance of signal communications in warfare.
November 1863	Secretary of War, Edwin Stanton, replaced Myer as Chief Signal Officer, with LTC William Nicodemus, who served as acting Chief of Signal until succeeded on 26 December by Colonel Benjamin F. Fisher.
1864	Myer wrote A Manual of Signals.
28 July 1866	Colonel Myer was appointed Chief Signal Officer.
9 February 1870	The War Department, after receiving a Congressional mandate, made the Signal Corps responsible for weather forecasting.
August 1877	The military heliograph was developed at Fort Whipple (later Fort Myer), Virginia.
October 1877	The Signal Corps began using the military telephone.
July 1878	The Signal Corps experimented in the use of homing pigeons.
24 August 1880	BG Albert J. Myer died.
15 December 1880	BG William B. Hazen was appointed Chief Signal Officer.
1881-1884	The Signal Corps dispatched two arctic expeditions, one to Point Barrow under LT Phillip H. Ray and the other to Grinnell Sound under LT Adolphus W. Greely.
3 March 1887	BG Adolphus W. Greely was appointed Chief Signal Officer.
June 1889	The Signal Corps developed the military field telephone kit.
1 July 1891	The Weather Bureau was transferred to the Department of Agriculture.

April 1899	Radio-telegraph communication was established between Fire Island, New York and the Fire Island Lightship, a distance of twelve miles.
26 May 1900	The Alaska Military Cable and Telegraph System was established.
1 August 1901	The Aeronautical Division was created within the Office of the Chief Signal Officer.
10 February 1906	BG James Allen was appointed Chief Signal Officer.
4 August 1908	The Signal Corps tested a powered, gas-filled dirigible.
2 August 1909	The Signal Corps approved the purchase of the Wright flying machine.
5 March 1913	BG George P. Scriven was appointed Chief Signal Officer.
14 February 1917	BG George O. Squier was appointed Chief Signal Officer.
16 May 1917	Congress authorized the establishment of Signal training camps.
April 1918	Chief Signal Officer Squier established the radio laboratory at Camp Alfred Vail (Fort Monmouth), New Jersey.
May 1918	The activities of the Air Service were separated from the Signal Corps.
12 March 1921	The Signal Corps assumed the responsibility for the War Department Radio Net.
1 January 1924	MG Charles McK. Saltzman was appointed Chief Signal Officer.
9 January 1928	MG George S. Gibbs was appointed Chief Signal Officer.
1 July 1931	MG Irving J. Carr was appointed Chief Signal Officer.
1 January 1935	MG James B. Allison was appointed as Chief Signal Officer.

18 May 1937	The Signal Corps' first radar set was demonstrated successfully at Fort Monmouth.
1 October 1937	MG Joseph O. Mauborgne was appointed Chief Signal Officer.
1 October 1941	MG Dawson Olmstead was appointed Chief Signal Officer.
7 December 1941	Signalmen using radar detected a large flight of unidentified aircraft approaching Hawaii.
30 March 1942	The Signal Corps Photographic Center was activated in Long Island, New York.
April 1942	The SCR-517, a microwave radar set, was used in aircraft to search for ships in the Atlantic.
January 1943	The Signal Corps built a combat radio-relay system.
1 July 1943	MG Harry C. Ingles was appointed Chief Signal Officer.
24 February 1944	The microwave, gun-laying, SCR-584 radar set was used in combat at Anzio, Italy.
6 June 1944	Twenty-eight men of the 101st Airborne Signal Company landed in the D-Day invasion of Normandy. Personnel of the 294th Joint Assault Signal Company landed at Omaha Beach. Men of the 165th Signal Photographic Company landed with the first infantry elements at Omaha Beach.
16-24 December 1944	During the Battle of the Bulge, Signalmen rerouted and installed in a week over 2,000 miles of new communications circuits.
10 January 1946	A modified SCR-271 long-range radar set was used to bounce radar signals off the moon paving the way for space communications.
1 April 1947	MG Spencer B. Akin was appointed Chief Signal Officer.
August 1948	The Signal Corps assumed responsibility for the Army's Electronic Countermeasures Program.
1 October 1948	The Signal Corps Training Center was established at Camp Gordon, Georgia.

1950-1953	Under the leadership of Chief Signal Officer MG George I. Back, the Signal Corps provided essential tactical communications in Korea. Very high frequency (VHF) radio was the backbone of the communications system.
1951	Signalmen provided a small advisory group in Vietnam.
2 May 1951	MG George I. Back was appointed Chief Signal Officer.
17 December 1952	The Signal Corps created the automatic teletypewriter relay system.
1 May 1955	LTG James D. O'Connell was appointed Chief Signal Officer.
15 January 1957	The U.S. Army Combat Surveillance Agency was established in Washington, D.C.
5 December 1957	An operational electronic system for coordinating and controlling antiaircraft missile batteries was placed in action defending the Washington-Baltimore area.
14 January 1958	The Space Sentry bounced signals from the moon insuring close tracking of satellites.
17 March 1958	Vanguard I was launched marking the first use of solar cell power in satellites.
17 February 1959	Vanguard II , equipped with infrared scanning devices, provided a rough mapping of the earth's cloud cover.
1 May 1959	MG Ralph T. Nelson was appointed Chief Signal Officer.
12 May 1960	The Defense Communications Agency was established.
1962	The Signal Corps underwent a major reorganization. The Chief Signal Officer became a Department of the Army Staff Officer.
January 1962	Secretary of Defense, Robert S. McNamara, approved the creation of a "backbone" communications system in Vietnam, code named BACK PORCH.

February 1962	The United States Military Assistance Command, Vietnam, established to control the increasing American effort, became responsible for all U.S. military policy, operations, and assistance in South Vietnam.
1 July 1962	MG Earle F. Cook was appointed Chief Signal Officer.
1964	SYNCOM, a synchronous communications satellite system in South Vietnam, marked the first use of satellite communications in a combat zone.
28 February 1964	The Chief Signal Officer was redesignated the Chief of Communications-Electronics. MG David P. Gibbs first served in this capacity.
August 1964	The Gulf of Tonkin incidents were the first direct engagements between North Vietnamese and U.S. forces.
1965	The Secretary of Defense ordered the creation of a Joint Tactical Satellite Communications (TACSAT) Research and Development Program.
1 December 1965	The Department of the Army placed the Strategic Communications Command's elements in Vietnam under the operational control ofthe Commanding General, U.S. Army, Vietnam.
July 1967	The first stage of the Automatic Secure Voice Communications System became operational.
1968	By the end of the year the supervising Signal headquarters in Southeast Asia, the 1st Signal Brigade of the U.S. Army Strategic Communications Command, comprised 6 Signal groups, 22 Signal battalions, and a total strength of over 23,000 soldiers, the largest Signal organization ever deployed by the US Army to date to a combat area.
Jun 1970	The Joint Tactical Communications Research and Development Program was terminated followed by activation of the U.S. Army Signal Detachment (TACSATCOM).

May 1971	The Joint Tactical Communications Program (TRI-TAC) Office was established providing entralized defense management for the action of tactical switched communications equipment.
1972	Combat Developments Command began the Integrated Tactical Communications Systems (INTACS) Study.
1973	A 1967 Army Logistics Faculty Manfunction Diagnosis Study (the Brown Board) led to the creation of a central Test Measurement and Diagnostic Equipment (TMDE) activity at Lexington, Kentucky.
27 January 1973	A peace treaty signed in Paris ended the Vietnam War.
June 1973	The Signal School at Fort Gordon initiated a new training concept, the Training Extension Course (TEC).
October 1974	Fort Gordon was redesignated the United States Army Signal Center and Fort Gordon (USASC&FG) and became the "home of the Signal Corps."
November 1974 Logistics Logistics	At the direction of DA, TRADOC established a Communication Security (COMSEC) (LOG) Review Group to analyze COMSEC Support within the Theater Army.
1975	TRADOC and the Communications-Electronics Command developed a Test Measurement and Diagnostic Equipment (TMDE) modernization structure.
February 1976	At the guidance of the USASC&FG, the second phase of the INTACS Study was completed.
October 1976	THE USASC&FG became the proponent for the COMSEC Log Review Study.
1977	The Defense Communications Agency began converting the Defense Communications System (DCS) from a conventional analog system to a sophisticated digital transmission system, phased to coincide with the conversion of the Defense Satellite Communications System (DSCS) to digitial operation.

1977	At TRADOC's direction, the USASC&FG became the US Army's focal point for C-E maintenance management.
1978	The USATRADOC approved the USASC&FG Letter of Agreement for the Automated Data Distribution System (ADDS).
1978	A task force formed at the USASC&FG began a communications assessment for the Battlefield Automation Master Plan (BAMP).
1978	CECOM created a program manager for test measurement diagnostic systems (TMDE).
16 January 1978	The office of TRADOC System Manager (TSM), Army Tactical Communication Systems (ATACS) was established at the USASC&FG.
April 1978	Advanced Development contracts were awarded for the Single Channel Ground and Airborne Radio Subsystems-V (SINCGARS-V) radio program.
27 June 1978	The commander of TRADOC signed the formal charter establishing the TSM-ATACS.
September 1978	Headquarters, TRADOC approved the initial charter for the TSM for Single Channel Ground and Airborne Radio Subsystems (SINCGARS).
1979	The VINSON COMSEC equipment was fielded in Europe.
1979	Preliminary Design Reviews were conducted of the three SINCGARS-V candidate systems.
September 1979	A contract was awarded for advance development models of a survivable low profile antenna for armored vehicles.
10 October 1979	The first internet (Packet Radio Network--PRNET--/Advanced Research Projects Agency Network) message was transmitted from a user terminal over Packet Radio from the 82nd Airborne Division's G-3 office.
November 1979	SINCGARS-V Basis of Issue Plan was boarded by Headquarters, TRADOC and forwarded for approval to the DA.

December 1979	The Steerable Null Antenna Processor (SNAP-I) program entered the engineering development phase.
1980	Phase I (System Definition) of the five-phase Position Locating and Reporting System/Joint Tactical Information Distribution System (PLRS/JTIDS) Hybrid development program was completed.
1980	Phase II (PLRS/JTIDS Interoperability) began.
1980	An Organizational and Operational concept was prepared for Mobile Subscriber Equipment(MSE).
1980	The SB-3614 Automatic Switchboard and associated transportable shelter configuration, AN/TTC-41, one major system in the Army Tactical Communication Systems(ATACS), was fielded to selected USAREUR units.
1980	As a result of determined obsolescence and non-supportability, the limited production of AN/TTC-25 Tactical Automatic Switchboard in the ATACS program was phased out.
1980	The second fielding of VINSON COMSEC equipment in Europe began.
1980	Headquarters, DA approved the BOIP for SINCGARS-V.
1980	First production of the OE-254 broadband antenna (SINCGARS) was completed.
1980	A TSM charter was issued for the Automatic Test Support System (ATSS) and Direct Support(DS) ATSS programs and formally designated as the TSM for Test, Measurement and Diagnostic Systems (TMDS).
1980	The AN/MSM-105 became the standard Army Automatic Test Equipment (ATE) for the GS/Depot level.
1980	The Division Level Data Entry Device (DLDED), once an interim device for the US Army Source Data Automation (SDA) program, became level I of the Army's SDA program.

1980	The USAREUR's 7th Signal Brigade was provided with two engineering development models of the AN/TYC-39 Automatic Message Switch, replacing the two AN/MYQ-2 TADS.
1980	Under Department of Defense direction, the DA and representatives from the Federal Republic of Germany's Ministry of Defense developed a Bilateral Operational Requirement (BOR) document for a Single Channel Radio Access/Mobile Subscriber Equipment system.
January 1980	An Agreement in Principle was made between the USA and the Federal Republic of Germany to enter into a MSE cooperative development program.
June 1980	First production of the AN/PRC-68 radio (SINCGARS) began.
10 June 1980	The Chief of Staff of the Army created the Army Standardization Program.
July 1980	TRADOC approved the PLRS/JTIDS Hybrid Operational and Organizational concept.
7 July 1980	The TSM-TMDS was established at the USASC&FG, resulting from the reorganization of the Directorate of C-E Maintenance Management.
29 August 1980	TRADOC approved the Tactical Communications Mission Area Analysis (INTACS).
1981	The AirLand Battle Doctrine was developed.
1981	The Small Unit Transceiver AN/PRC-68 radio was type classified standard and fielded to USAREUR and the Rapid Deployment Force (RDF).
1981	The Transceiver Multiplexers TD-1288 and 1289 were type classified standard and fielded to USAREUR and RDF.
1981	The AutomatedINTACS Implementation Management System (AIIMS) became a viable combat developments tool.
1981	The Division 86 Signal Battalion concept and force design was developed into a TOE and approved at TRADOC.

1981	The USASC&FG developed and managed a comprehensive transition plan to the Division 86 structure.
1981	The Airborne and Air Assault 86 Concepts and force designs were initiated.
1981	The Infantry Division 86 concepts and force designs were scrubbed while the development of the High Technology Light Division concepts and designs were introduced.
January 1981	Two engineering development models of the AN/TYC-39 Message Switch were deployed to Europe.
February 1981	The TSM-TMDS at the USASC&FG was redesignated as the TSM for Automatic Test Support System (TSM-ATSS).
November 1981	Fielding of the Communications Terminal, UGC-74A, was initiated.
1982	Field Manual 100-5 Operations, primarily embodying the AirLand Battle Doctrine, was published.
1982	The TSM for Tactical Satellite Communications (TACSATCOM) at the USASC&FG assumed responsibility for Regency Net (HF SCS) and MILSTAR.
1982	HQDA established the Army Force Modernization Coordination Office. TRADOC established the Force Modernization Directorate and tasked the schools and centers to examine their force modernization needs.
8 January 1982	HQDA directed acceleration of the SINCGARS-V program to realize an IOC of July 1985.
February 1982	A restructured program of alternatives, minimun necessary requirements, and acquisition strategies for the MSE program were presented to the HQDA General Officer panel, resulting in approval of the minimum essential requirements and tasking to pursue an acquisition strategy.
June 1982	The DCSOPS, DA, revalidated the MSE requirement and directed DCSRDA to appoint a project manager and develop a new acquisition strategy.

August 1982	The Program Manager for Multiservice Communications Systems (PM MSCS) assumed responsibility for MSE.
1 August 1982	The TSM for Tactical Satellite Communications (TACSATCOM) at the USASC&FG assumed responsibility for the NAVSTAR Global Positioning System.
4 August 1982	The commander of TRADOC approved the Operational and Organization Plan for SINCGARS-V.
1983	Reorganization at the USASC&FG began under School Model 83.
1983	An exportable training package for multichannel communications using videodisc simulation was in the fielding stage to USAEUR.
1983	Initial fielding of the AN/TRC-151 and AN/TRC-152 multichannel communications assemblages (ATACS) occurred in TRADOC, FORSCOM, and USAREUR.
1983	Two 300 line AN/TTC-39s were fielded to the 57th Signal Battalion at Fort Hood, Texas.
1983	AN/TYC-39s (Tactical Automatic Message Switch) were fielded to the 57th, 97th, 327th, 11th, 51st, 440th, and the 17th Signal Battalions.
1983	Fielding of the AN/GSC-40 began.
1983	The Battlefield Communications Review I task force determined that while basic communications architecture was sound, communications doctrine did not reflect the US Army's tactical doctrine changes.
March 1983	The Undersecretary of the Army directed the MSE to proceed with a non-developmental acquisition approach.
June 1983	The combat development proponency for the Automatic Test Support System was transferred from the US Army Logistics Center to the USASC&FG.

June 1983	The USASC&FG made changes in selected Advanced Individual Training (AIT) courses deemphasizing equipment specific training and emphasizing the training of common fundamentals and principles of related equipment (generic training concept).
July 1983	Source selection awarded the SINCGARS contract to ITT Aerospace Optical Division.
Sep-Oct 1983	The PLRS Engineering Development Model was deployed to White Sands Missile Range for electronic warfare testing.
September 1983	The MSE Source Selection Council and Board nominations were made and initial meetings held to develop evaluation strategies.
November 1983	A DA mandated task force at the USASC&FG was formed to work on the Battlefield Communications Review, Data Distribution.
15 November 1983	The commanding general of TRADOC directed that all US Army training centers and service schools to submit individual plans for converting from self-paced to group-paced instruction, a major shift in TRADOC training strategy and part of the School Model 83 concept.
December 1983	The plan of action to implement the MSE architecture was completed. The task force working at the USASC&FG was responsible for developing the MSE Force Integration Plan.
December 1983	The TSM-SINCGARS at the USASC&FG signed the production contract.
June 1983 the	The US Army Communicative Technology Office (ACTO) awarded three contracts for development of modular portable Electronic Information Delivery System (EIDS) hardware as part of TRADOC's desire for hardware/software standardization.
1984	The National Science Center for Communications and Electronics (NSCCE) received official recognition as a US Army institution.

1984	The TSM for Army Tactical Communications Systems (TSM-ATACS) at the USASC&FG was deactivated and reactivated as the TSM for Mobile Subscriber Equipment (TSM-MSE).
1984	During the Signal Corps Functional Area Assessment (FAA), the Vice Chief of Staff of the Army (VCSA), General Maxwell R. Thurman, directed the Signal Corps to develop an Army-wide distribution strategy for signal equipment.
1984	The USASC&FG initiated Battlefield Communications Review II to develop, program, and manage an integrated US Army strategy for communications for fiscal years 1985 to 1992.
1984	A BCR II Equipment Asset Task force was established at the USASC&FG.
1984	As part of the VCSA's Document Modernization Program, Army branch proponents were directed to develop "Living TO&E's" (the actual personnel and equipment groupings of a unit) for selected organizations.
1984	Research, development, test and evaluation of the Tactical Record Traffic System was completed with contractor development testing underway.
1984	The VCSA ordered a revision of all Officer Advanced Courses (OAC).
5 January 1984	The VCSA approved funding and procurement of the MSE architecture.
March 1984	The Commander of the US Army Combined Arms Center (CAC) tasked the USASC&FG's Directorate of Evaluation and Standardization (DOES) to serve as the central point of contact for the school's Subject Matter Expert Return to Field (SMERF) program.
5 March 1984	The TRADOC implementation Plan, based on CSA guidance, established within OACs a twenty week core with six week modules tailored to the officer's next assignment.

4 April 1984	The TRADOC commander directed implementation of a three to five day Field Training Exercise (FTX) program in as many Advanced Individual Training (AIT) courses as possible.
9 May 1984	The Chief of Staff of the Army approved the establishment of an Information Mission Area (IMA).
19 July 1984	The US Army and the NSCCE signed a Memorandum of Understanding.
28 November 1984	An/MSM-105(V)1 system was fielded to the 632nd Maintenance Company at Fort Stewart, Georgia.
December 1984	The 7th Signal Brigade received one Communications System Control Element (CSCE) set for field trials.
1985	The VCSA tasked the Combined Arms Center (CAC) to initiate the Battlefield Communications Review (BCR) III/Battlefield Automation Integration Review (BAIR I) with the USASC&FG as the executive agent for CAC.
1985	The BCR III/BAIR I and the Army Command and Control System (ACCS) Program merger, as approved by CAC, resulted in the Battlefield Command and Control System Review (BC2SR).
1985	Poor operational tests and a lack of support by users of the equipment resulted in the termination of the AN/TSQ-84 program.
1985	The Department of Defense approved a smaller, less expensive US Army ground terminal, the JTIDS Class 2M.
1985	Pilot programs began in selected courses at the USASC&FG using the generic training concept.
1985	Implementation of generic training in as many AIT courses as possible was made the USASC&FG's number one priority for FY 1986.
January 1985	The PLRS Engineering Development Model Team deployed to Reforger 85 in support of the 197th Infantry Brigade from Fort Benning, Georgia.

February 1985	After preliminary TRADOC and Army Materiel System Analysis Activity studies in February 1985, the PLRS JTIDS Hybrid (PJH) was granted full scale development.
19 September 1985	A full scale engineering development contract for Intermediate Forward Test Equipment (IFTE) was awarded to Grumman Corporation
1 October 1985	The publication of TRADOC circular 35-85-5 established the TRADOC/USAR School Affiliation Program.
5 November 1985	General Telephone and Electronics (GTE) won the MSE contract.
28 November 1985	The TRADOC commander signed a charter designating the USASC&FG the proponent for the Information Mission Area (IMA).
19 December 1985	The MSE contract was officially signed.
19 December 1985	The first students graduated from the 31E generic training program at the USASC&FG.
11-19 March 1985	GTE demonstrated a three node, backbone MSE system, with extension nodes near Nancy, France.
1986	The TRADOC directed Communicative Arts program was fully implemented at the USASC&FG in the Signal Officer Basic Course (SOBC), the Signal Officer Advanced Course (SOAC), and the Warrant Officer Advanced Course (WOAC).
17 January 1986	The Army Chief of Staff approved the entry of the Signal Corps into the US Army's regimental system.
12 March 1986	The VCSA approved the DA MSE Action Plan and directed that it be updated every six months.
April 1986	The DA Artificial Intelligence Center developed a proposal to form seven Artificial Intelligence Application Centers.
9 April 1986	The Director of the Office Chief of Signal at the USASC&FG presented the commander of TRADOC with the USASC&FG's implementation plan for the IMA.

1 June 1986	General Order 21 authorized the activation of the Signal Corps Regiment.
3 June 1986	The Signal Corps Regiment was activated at the USASC&FG.
July 1986	The Interim Network Command and Control(INC2), a hardware procurement effort, was initiated.
18 August 1986	The USASC&FG formed an IMA Training Task Force, which by the end of 1986 produced an IMA Primer and completed a feasibility study recommending that the US Army Computer Science School transfer from Fort Benjamin Harrison to Fort Gordon.
November 1986	The DA Artificial Intelligence Center approved the USASC&FG's request to be chosen as the Training Application Center for Artificial Intelligence.
15 December 1986	The DA MSE Action Plan (DAMAP) was published.
30 December 1986	TRADOC approved the MSE Operational and Organizational Plan.
1987	The PLRS and JTIDS, (PLRS/JTIDS Hybrid (PJH)), were separated.
1987	Over one hundred early production SINCGARS radios were deployed to Korea to support the Demilitarized Zone mission and to acquire operational usage data.
1987	Fielding of the Battlefield Electronic CEOI System Basic Generation Units began in Europe, Korea, and XVIII Airborne Corps.
January 1987	The contractor-taught MSE Instructor and Key Personnel Training Course began at the USASC&FG.
February 1987	Option two of the MSE contract was awarded.
4 February 1987	The commander of the USASC&FG tasked the Directorate of Evaluation and Standardization the responsibility of establishing procedures to document lessons learned during the MSE fielding at Fort Hood.
13 March 1987	TRADOC approved the IMA Concept Statement as developed by the USASC&FG.

10-22 June 1987	The Memorandum of Understanding was signed between CECOM and the USASC&FG for MSE resident training.
October 1987	The Second Infantry Division in Korea was the first unit equipped with SINCGARS.
2 May 1987	Proponency for the Army Tactical Command and Control Systems (ATCCS) Common Hardware and Software was transferred from CAC to the USASC&FG.
1988	The Signal Corps became the proponent for the US Army's Information Management Area (IMA), resulting from the Chief of Staff of the Army, General Wickham's decision to consolidate the automation and the communications of the US Army.
1988	Option year three of the MSE contract was awarded to GTE.
1 February 1988	The initial fielding of MSE began to the 13th Signal Battalion, 1st Cavalry Division at Fort Hood, Texas.
25 April 1988	The Directorate of Evaluation and Standardization at the USASC&FG published the first MSE lessons learned report for worldwide distribution.
8 July 1988	The Operational Test and Evaluation Agency received the SINCGARS Field Operational Test and Evaluation Final Draft Report.
August 1988	Revision of MSE training strategy followed lessons learned during the initial fielding of MSE.
8 August 1988	The initial fielding of MSE to the 13th Signal Battalion, 1st Cavalry Division ended at Fort Hood, Texas.
September 1988	Fielding of MSE began to D company, 57th Signal Battalion at Fort Hood, Texas.
13 September 1988	The Independent Evaluation Report concluded that SINCGARS met the issues and criteria established by TRADOC.

October 1988	The first MSE equipped unit, the 13th Signal Battalion, 1st Cavalry Division, completed the Follow on Test and Evaluation (FOTE).
October 1988	Fielding of MSE to the Fort Sill Training Base began.
28 October 1988	The US Army Noncommissioned Officer Academy at Fort Gordon withdrew its provisional status and was organized officially under the provisions of Army Regulation 10-8.
28 October 1988	The US Army Computer Science School moved from Fort Benjamin Harrison to the US Army Signal Center and Fort Gordon as part ofthe Signal Center's assignment as the training proponent for the Information Mission Area(IMA).
8 November 1988	The Operational Test and Evaluation Agency (OTEA) released its independent evaluation report following the MSE FOTE.
1989	MSE was fielded to III Corps, 2d Armored Division, which included the Corps' Signal Brigade, two active division Signal battalions, the field training exercise company at Fort Gordon (D Company, 442d Signal Battalion), and one National Guard division level Signal Battalion (212th Signal Battalion).
1989	HQDA reaffirmed the USASC&FG's responsibility for integrating IMA doctrine, organization, training, materiel, and leadership for TOE units in the theater/tactical environment.
1989	The IMA Integration Office at the USASC&FG developed FM 24-1, Signal Support in the AirLand Battle, outlining the Signal Corps' IMA functional responsibilities.
1989	Resident training on SINCGARS began at the USASC&FG.
1989	The Program Executive Office Communications Systems (PEO COMM) announced the indefinite delay in fielding the Manpack AN/PRC-19 to Korea.

1989	The USASC&FG implemented small group instruction and shared training, two significant developments in teaching methodology.
1989	Efforts were initiated to field the Single Channel Transponder Receiver (Special communications System).
1989	The Signal Corps became the third largest branch with 114 battalions, 22 brigades, 4 commands, a number of TDA agencies and organizations.
1989	The US Army Computer Science School at the USASC&FG became the US Army's executive agent for developing automation security and automation lifecycle training.
April 1989	TALK II SINCGARS was published, standardizing joint operational procedures for the SINCGARS VHF-FM frequency hopping system.
9 April 1989	A contract was signed for the MSE Packet Network, a major addition to the MSE system.
24 April 1989	US Army-conducted MSE training began at Fort Sill.
5 May 1989	TRADOC designated the USASC&FG as the combat developer for the Defense Satellite Communications System (DSCS) program.
10 May 1989	GTE began resident training at the USASC&FG with the opening of the MSE Resident School.
July 1989	The DA, Deputy Chief of Staff for Operations (DA DCSOPS) approved the Echelons Above Corps-Communications Improvement Program.
18 September 1989	The US Army conducted a MSE FTX at the USASC&FG.
October 1989	BCR II, Update 3 was published.
1990	MSE fielding was completed to III Corps, 3d Signal Brigade at Fort Hood.

1990	HQDA tasked TRADOC as the combat developer on the US Air Force developed MILISTAR Command Post Terminal. TRADOC directed the USASC&FG to assume combat development responsibilities for the system.
1990	MSE fielding was completed to the 49th AD/249th Signal Battalion (Texas National Guard) and to the 4th ID/124th Signal Battalion, Fort Carson, Colorado.
1990	The BECS Basic Generation Unit (BGU) was fielded to III Corps and Fort Hood.
19 January 1990	DOT&E (OSD) signed the SINCGARS ICOM Test Evaluation Master Plan (TEMP), the first OSD TEMP approved for SINCGARS.
26 January 1990	The DCSOPS signed the COIC, the first official DA approved SINCGARS COIC.
20 February 1990	TRADOC approved the final MSE Sustainment Training Plan.
May 1990	Fielding of MSE began to the 3d AD/143d Signal Battalion.
6 August 1990	Fielding of MSE was completed to the 8th ID.
December 1990	The fielding of SINCGARS to Korea is scheduled to be completed by the end of 1990.
1994	MSE is scheduled to be fielded throughout the Army.

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