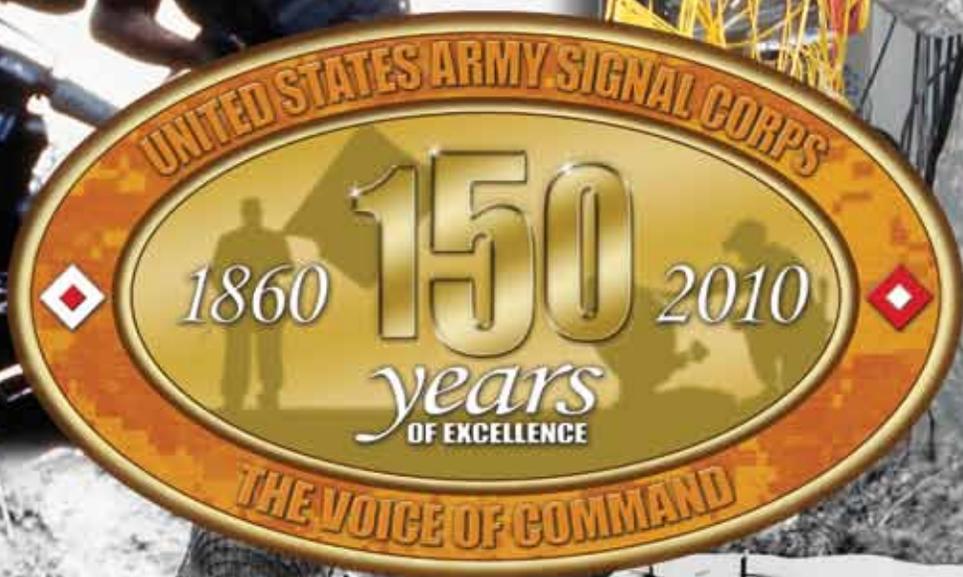


# NETCOM JOURNAL

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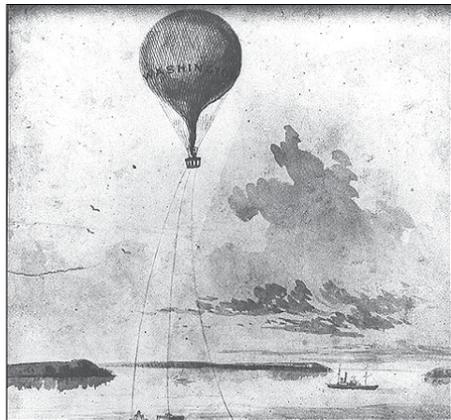


VOICE OF THE ARMY

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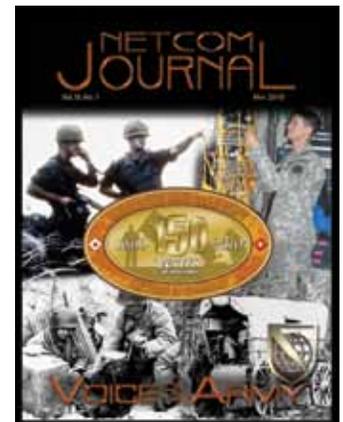


## SPECIAL INSERT

This edition of the NETCOM Journal contains a pull-out insert, containing brief information on the 9th Signal Command (Army) and its global network of subordinate organizations.

## ON THE COVER

**Cover Image:** Since before the Civil War, the U.S. Army Signal Corps has been a part of the Army's and America's history. From the telegraph train of the early 1860s to today's Command Post Nodes, the Signal Corps has become a global service provider. (U.S. Army Signal Corps 150th Anniversary graphic by William Cheney, U.S. Army Signal Center. Images courtesy of NETCOM/9th SC(A) Command Historian and 160th Signal Brigade.)



## NETCOM JOURNAL

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# CG's Corner

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**A**s we celebrate Signal Corps' 150 years of innovation and leadership, I'd like to take this opportunity to talk about our first Chief Signal Officer, BG Albert J. Myer, who was the first to conceive of the idea of a separate, trained professional military Signal service. Originally a surgeon in the 1850s, BG Myer used the knowledge of sign language he had gained working with deaf-mutes to develop a system of battlefield communication using a single signal flag, called "wig-wag." While this method of signaling across long distances was first met with reservations within military circles, he refused to be deterred and his idea eventually gained traction, and on June 21, 1860, less than a year before the outbreak of the Civil War, a letter from the War Department ordered Myer to organize and command the new U.S. Army Signal Corps.



Maj. Gen. Susan Lawrence

The result of BG Myer's innovation in military communications had direct results on the battlefield. At the Battle of Gettysburg the mere sight of a unit of BG Myer's Signaleers on the crest of Little Round Top caused a Confederate general to stop his column's advance and retreat, giving the Union Army the advantage on that day, changing the course of the battle and our nation's history. After the war, under BG Myer's leadership, the Signal Corps constructed, maintained and operated some 4,000 miles of telegraph lines along the country's western frontier. In 1870 BG Myer established a congressionally-mandated national weather service, and by the time of his death in 1880, commanded a weather service of international acclaim. Our country was truly fortunate to have such a daring, intellectually curious, and determined Chief Signal Officer such as BG Albert J. Myer, and those of us who are Signaleers can be proud to call this man, "The Father of the Signal Corps."

From wig-wag to telegraph, from radios to radar, occupying the high ground and communicating vital information has been the hallmark of the Signal Corps for the last 150 years. While our history is rich with timely innovation and remarkable Signaleers who always found a way to get the message through, what lies in the future for the Signal Corps is equally critical to maintaining our Army's position as the greatest military force on the face of the Earth. The implementation of GNEC, which will provide centralized, economical and efficient network communications from command posts to Soldiers on the ground, is essential for the U.S. Army in the 21<sup>st</sup> century. The Signal Corps will also be deeply involved in the creation of ARFORCYBER, combating intruders seeking to disrupt our network and interfere with our communications, another future mission crucial to our success on the battlefield.

The contributions and support of all our Signaleers are needed more than ever in this time of persistent conflict. In 150 years, the efforts of the Signal Corps have always led the way, whatever the challenges. I know our great tradition of getting the message through will continue.

Army Strong! Signal Strong!

**Voice of the Army!**

# CSM's Corner

---

**T**oday's Signal Soldier has served as the essential communications link for the United States Army since the inception of the Signal Corps over 150 years ago. It was then, at the beginning of the Civil War, that the Soldiers of the Signal Corps first instituted and mastered the techniques of modern military communications, assuring commanders success on the battlefield through timely and secure messaging, a great tradition which continues to this very day.

If someone were to ask what it takes to be a Signal Soldier, the answer is simple: flexibility, versatility, bravery, selfless sacrifice, and most of all, dauntless character. They are consummate professionals, both as Soldiers and technicians. They understand the importance of the essential role they play in Army operations, and while they may not be able to move mountains as individuals, they have the experience and ability to think out of the box and conquer any challenges they come across, confident in the knowledge that they can indeed move mountains as a team.

The Signal Soldier embodies a bold spirit, often having to "learn by doing" in the most difficult circumstances. Whether in the desert, the mountains or in the jungle, they have always done whatever it takes to get the message through. Today's Army asks a lot of its Soldiers, and the members of the Signal Corps are always up to the task. The complex missions they undertake often require the Signal Soldier to be able to engineer, install, operate, maintain, and defend the communication network against physical attacks, electronic countermeasures, and cyber threats.

Since 1860, whenever and wherever the United States Army has been sent in defense of our country, no matter what danger or hardship, the Signal Corps was there, answering time and again the Call to Duty. This year, as we celebrate the 150<sup>th</sup> anniversary of the United States Army Signal core, we can reflect on the character - and the awesome achievements - of the many generations of brave Signal Soldiers who have put their boots on the ground, always displaying the willingness and expertise to get the message in defense of this great nation.

I'd like to share with you the opening stanza of "The Signal Soldier's Creed," which I believe says it all:

***I am Signal, the voice of command. Hear me.  
I will defend my country in the face of any danger.  
Nothing can deter me; I will get the job done, and I will win.  
I believe in my training, my equipment, my comrades, and my leaders.  
I depend on them, and they depend on me.  
I am Signal. Hear me.***

As we celebrate the Signal Corps' 150th anniversary, we can rest assured that the Signal Soldier's proud tradition of always getting the message through will continue well into the future.

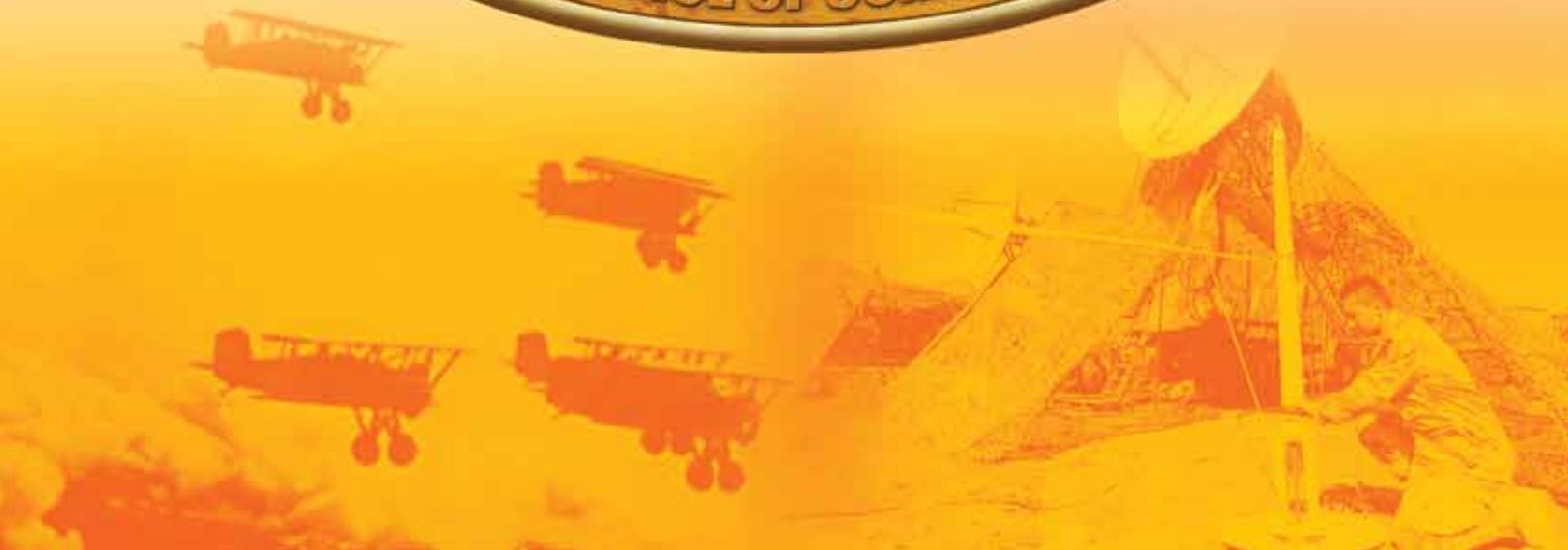
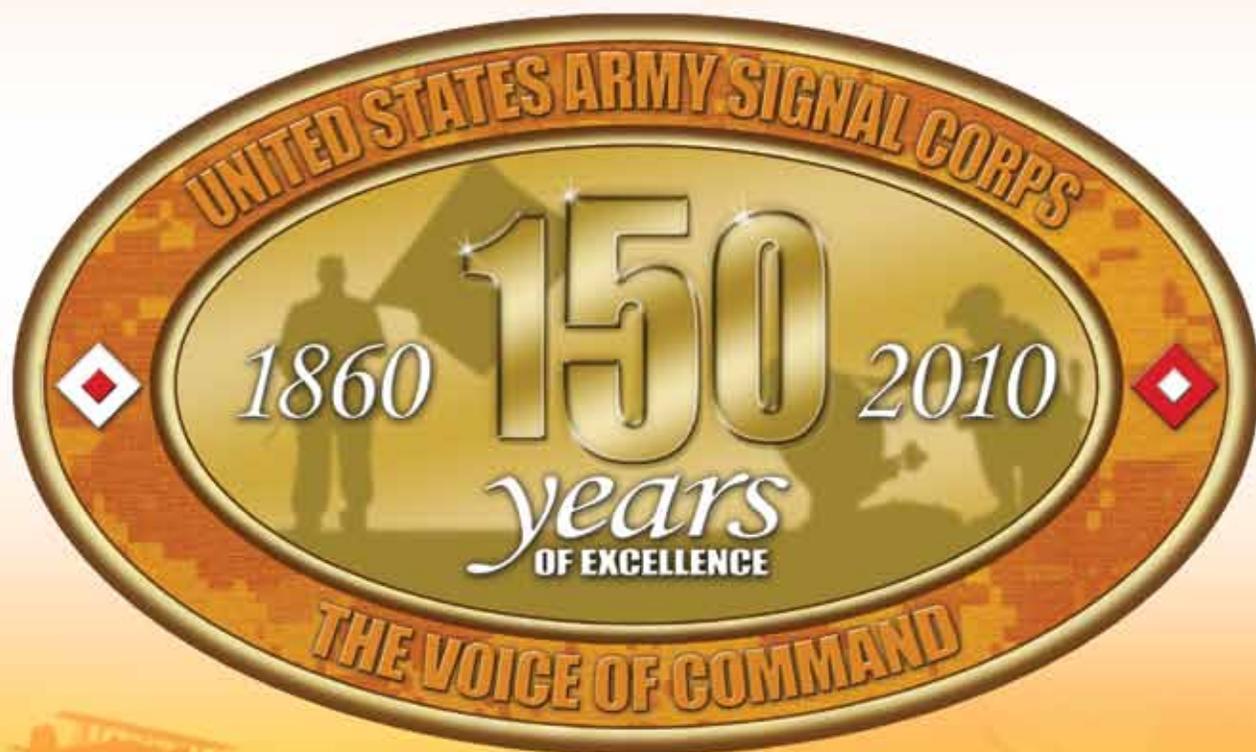
**Voice of the Army! Army Strong!**



Command Sgt. Maj. Gerald Williams

***This edition of the NETCOM Journal is dedicated to all past and present Signal Soldiers and Civilians, and in honor of the 150th Anniversary of the Signal Corps.***

***The following pages recount portions of the history of Army Signal and 9th Signal Command (Army).***



# Bringing Signal to the battlefield

By Vincent C. Breslin

NETCOM/9th SC(A) Command Historian

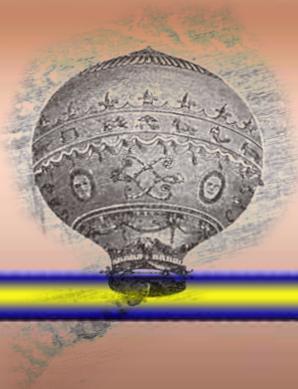
In late 1861, Albert Myer (recently appointed as the Army's first Chief Signal Officer) commissioned Henry J. Rogers, a telegraphic engineer from New York City, to construct a model

train. When using the term train, Myer was not referring to a vehicle that ran along tracks, but to light wagons drawn by horses. These wagons carried telegraph sets and other necessary items, such as reels of insulated copper wire and iron lances, for stringing temporary field lines-called "flying



The telegraph trains used during the Civil War changed the way commanders received and sent their orders.

1785: Stagecoaches start carrying mail between towns in the United States.



1780

1790

1783: Joseph and Jacques Montgolfier invent the first practical hot-air balloon in Annonay, France.

1794: Brothers Claude and Ignace Chappe establish first commercial semaphore system near Paris, France.

telegraph lines.” Each train was to be equipped with five miles of wire and two wagons, each with a telegraph instrument. In battle, one wagon remained at the starting point as a receiving station, while the other traveled into the field with the sending instrument.

Rogers was no stranger to the development of telegraphs. He previously assisted Samuel E.B. Morse in building the first commercial telegraph line between Washington, D.C. and Baltimore in 1844, and his arrangement with Myer began a tradition of civilian-military cooperation in the development of signal equipment that continues to this day.

In early 1862, Rogers delivered his first model telegraph train to the signal training camp at Red Hill in Georgetown, Washington, D.C. He had adapted the conventional Morse telegraph instrument for field use by replacing the sending key and the sound receiver with a dial indicator. The indicator consisted of a circular index plate bearing the letters of the alphabet and a pointer that was turned to the letter to be transmitted. A similar pointer spelled out the message at the receiving end. This adaptation eliminated the need for skilled operators to employ Morse code and required of them only the ability to read and write. To provide power, Rogers had designed a galvanic battery that eliminated the danger of acid spills from conventional batteries during transit.

Shortly after the train’s arrival in Georgetown, a board of three signal officers examined it and issued a generally favorable report. The examiners tested

two miles of wire laid by the train and found that it “transmitted the galvanic current uninterrupted.” Even the passage of heavily laden wagons over the wire did not damage it.

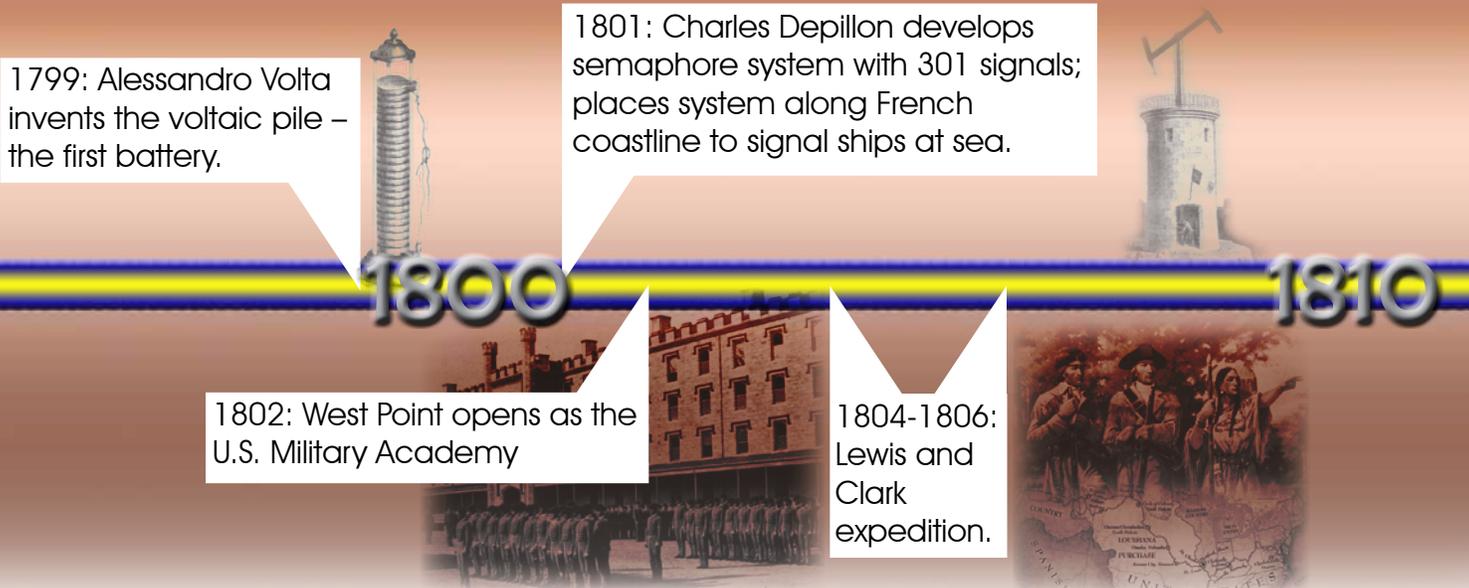
The officers concluded that the train was satisfactory for experimental purposes but that Rogers needed to make the mechanical portions more durable for field service. Overall, they believed that such a train would be of great use as wartime auxiliary to the nation’s permanent telegraph lines.

The telegraph train received its first field test during the American Civil War, beginning in the spring of 1862 during the Peninsula campaign. In May 1862, a detachment from the Red Hill signal training camp took a modified train to Albert Myer in the field.

For this model, Rogers had substituted a new type of telegraph instrument, the invention of George W. Beardslee of New York City. The Beardslee magneto-electric telegraph required no heavy, acid-filled batteries; rather, the turning of a crank generated current by revolving a set of magnets. Rogers had retained the dial indicator, however. In its final form, the Beardslee telegraph was housed in a wooden chest with handles and weighed about one hundred pounds. ❖

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Information compiled from “*Getting the Message Through, A Branch History of the U.S. Army Signal Corps,*” by R. Raines.



1799: Alessandro Volta invents the voltaic pile – the first battery.

1801: Charles Depillon develops semaphore system with 301 signals; places system along French coastline to signal ships at sea.

1802: West Point opens as the U.S. Military Academy

1804-1806: Lewis and Clark expedition.

# Signal turns tide of Gettysburg

Compiled by Vincent C. Breslin

NETCOM/9th SC(A) Command Historian

The largest military conflict in North American history began July 1, 1863, when Union and Confederate forces collided at Gettysburg, Penn. The epic battle lasted three days and resulted in a retreat to Virginia by Gen. Robert E. Lee's Army of Northern Virginia.

Two months prior to Gettysburg, Lee had dealt a stunning defeat to the Army of the Potomac at Chancellorsville, Va. He then made plans for a Northern invasion in order to relieve pressure on war-weary Virginia and to seize the initiative from the Yankees. His army, numbering about 80,000, began moving June 3. The Army of the Potomac, commanded by Brig. Gen. Joseph Hooker and numbering just under 100,000, began moving shortly thereafter, staying between Lee and Washington, D.C. Frustrated by the Lincoln administration's restrictions on his autonomy as commander, Hooker resigned June 28, and was replaced by Maj. Gen. George G. Meade.

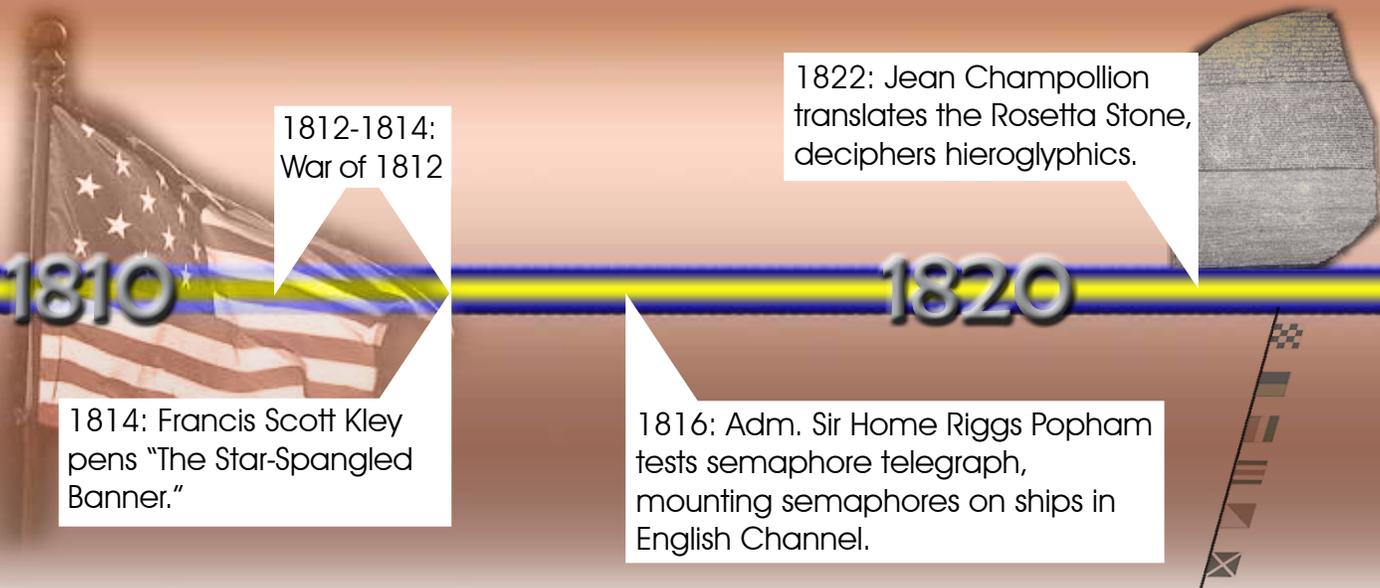
Meade took command of the Army of the Potomac as Lee's army moved into Pennsylvania. On the morning of July 1, advance units of the forces came into contact with one another just outside of Gettysburg. The sound of battle attracted other units, and by noon the conflict was raging. During the first hours of battle, Union Maj. Gen. John Reynolds was killed, and the Yankees found that they were outnumbered. The battle lines ran around

the northwestern rim of Gettysburg. The Confederates applied pressure all along the Union front, and they slowly drove the Yankees through the town.

By evening, the Federal troops rallied on high ground on the southeastern edge of Gettysburg. As more troops arrived, Meade's army formed a three-mile long, fishhook-shaped line running from Culp's Hill on the right flank, along Cemetery Hill and Cemetery Ridge, to the base of Little Round Top. The Confederates held Gettysburg, and stretched along a six-mile arc around the Union position. For the next two days, Lee would batter each end of the Union position, and on July 3, he would launch Pickett's disastrous charge against the Union center.

During the fighting on the first day, a Union Signal officer, Lt. Aaron B. Jerome, successfully occupied several prominent Gettysburg locations. From these positions he observed the enemy's approach and reported their movements to Maj. Gen. Oliver O. Howard, commander of the earliest Army of the Potomac units to arrive in the town. He informed Howard that, "over a division of the rebels is making a flank movement on our right; the line exceeds over a mile and is advancing, skirmishing. There is nothing but cavalry to oppose them."

Unfortunately, Howard was badly outnumbered and could do little with this accurate intelligence apart from conducting a tactical retreat. Howard's forces retreated to a line of hills south of Gettysburg where they were



1812-1814:  
War of 1812

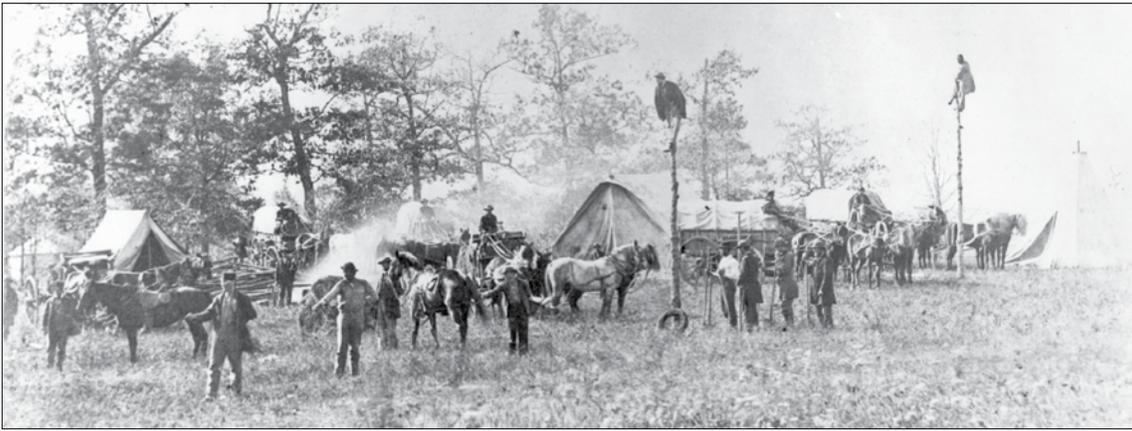
1822: Jean Champollion  
translates the Rosetta Stone,  
deciphers hieroglyphics.

1810

1820

1814: Francis Scott Key  
pens "The Star-Spangled  
Banner."

1816: Adm. Sir Home Riggs Popham  
tests semaphore telegraph,  
mounting semaphores on ships in  
English Channel.



**The Army of the Potomac strings telegraph wires.**

joined by heavy reinforcements and the new commander (Meade) of the Army of the Potomac.

By mid-morning of the second day, Union signal officers had established communications between Meade and his corps commanders. They had located signal stations along the Union line at Cemetery Hill, Culp's Hill, Power's Hill, Little Round Top, and the Leicester House where Meade made his headquarters. Little Round Top proved a particularly important location because of its panoramic view of the battlefield, and signalmen were the first Union troops to occupy the strategic hilltop.

Just before noon, Jerome (now serving on this rocky promontory) signaled to Maj. Gen. Daniel Butterfield at Army headquarters: "The rebels are in force and our skirmishers give way. One mile west of Round Top signal station, the woods are full of them." Later that afternoon Capt. James S. Hall, a signal officer with II Corps, detected an attempt by Lt. Gen. James Longstreet's corps to outflank the Union left. Longstreet, aware that they could be seen from the station, had ordered his men

to countermarch, and it was this movement that Hall observed. Hall signaled to Butterfield that, "a heavy column of enemy infantry, about 10,000 strong, is moving from opposite our extreme left toward our right." The delay caused by the countermarch gave Meade time to send troops to meet the threat.

The Confederate effort that day to seize Little Round Top resulted in failure, but only after a long and bloody struggle. During the contest, the signal station became a target of such intense fire that it was temporarily abandoned. Another signal detachment later reoccupied the station, and it remained in service throughout the rest of the battle. On reflection, Brig. Gen. Edward P. Alexander, corps artillery commander to Longstreet at Gettysburg, later referred to "that wretched little signal station," and remarked that he "was particularly cautioned, in moving the artillery, to keep it out of sight of the signal station on Round Top."

Today, a Signal Corps monument on the hill commemorates the dedicated men who served there. ❖



1829: William Burt gets the first U.S. patent for a typewriter.

1830

1827: Joseph Niépce produces the first successful photograph.



1836: Samuel F.B. Morse develops the first electric telegraph.

1840

1836: Sir Charles Wheatstone and Sir William Cooke patent an electronic telegraph in England.

# U.S. aerial recon leads to victory

Compiled by  
**Vincent C. Breslin**

*NETCOM/9th SC(A) Historian*

Perhaps the Signal Corps' most famous incident in Cuba during the Spanish-American War involved its use of the captive hot air balloon July 1, 1898, in the battle of Santiago. Because the jungle concealed both troop movements and terrain features, such as trails and streams, aerial reconnaissance could be of great advantage.

Lt. Joseph Maxfield made the first ascent on 30 June, during which he noted terrain features and observed Cervera's ships in Santiago harbor. When the battle opened the next morning, the balloon was ready for action. Maxfield, accompanied by Lt. Col. George F. Derby, ascended about a quarter of a mile to the rear of the American position at El Pozo. Derby, however, wished to get closer to the fighting and ordered that the balloon be moved toward the front. Maxfield objected, but he obeyed the command of his

superior officer, and the balloon detachment hauled the sphere forward. Maxfield's concerns soon proved justified. The balloon floating overhead not only marked the location of the American troops but also gave the Spaniards an excellent target. Disaster followed.

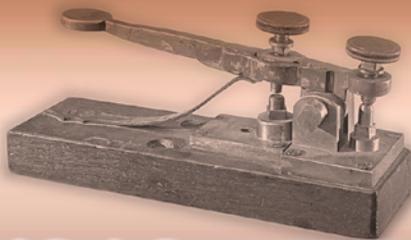
In the hands of an inexperienced crew, the guide ropes became entangled in the brush, completely immobilizing the craft. When the Spanish opened fire at the balloon, shrapnel and bullets rained down upon the troops below, resulting in numerous casualties. Maxfield and Derby escaped injury, but one member of the detachment received a wound in the foot. The balloon, meanwhile, was torn apart.

Despite the damaged balloon, the aerial reconnaissance had not failed. The officers had observed the Spanish entrenchments on San Juan Hill and found them to be heavily defended. They then passed this information to the commanding general, with a recommendation to reopen artillery fire upon them. More important, Derby discovered

a previously unknown trail through the woods that helped to speed the deployment of troops toward San Juan Hill.

Although the Americans suffered heavy casualties during the July 1 fighting, the Spanish had been more seriously harmed. The subsequent destruction of Spanish Adm. Pascual Cervera's squadron July 3, in a desperate dash for freedom signaled the conclusion of the Santiago campaign. Maj. Gen. William R. Shafter and his V Corps laid siege to the city and, after threatening to attack, forced the Spanish to surrender on July 17.

Following the end of the fighting in Cuba, troops under Maj. Gen. Nelson A. Miles undertook the capture of Puerto Rico, Spain's other major colony in the Caribbean. The invasion force landed on Puerto Rico's southern coast July 25, and encountered only weak Spanish resistance as it moved toward the capital of San Juan. By July 28, Miles had captured Ponce, Puerto Rico's largest city.



1844: "What hath God Wrought?"  
The first message sent by  
Morse Code from Baltimore to  
Washington, D.C.

1854: First use of the telegraph  
during combat. (Crimean War)

1840

1850



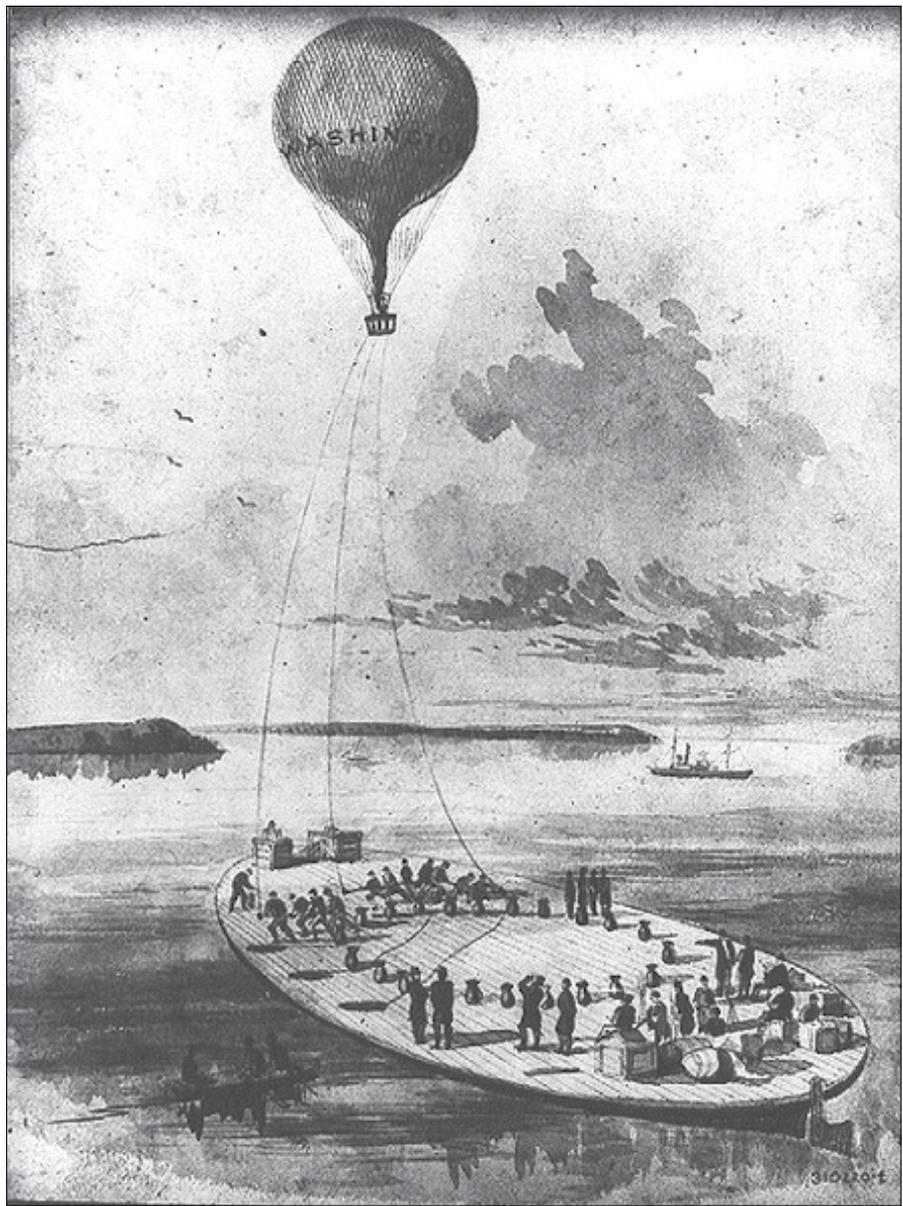
1851: Telegraph cable is laid  
across the English Channel.



The Signal Corps promptly took charge of the city's telegraph office, which became the center of the Army's communication system on the island. Moreover, from Ponce two cable lines ran to the United States. Before abandoning the office, however, the Spanish had destroyed nearly all the equipment, and signal officers, short of repair material, had to improvise with the items at hand. Col. Samuel Reber, for example, fashioned a telephone switchboard from a brass sugar kettle.

Although the Spanish still held San Juan when the signing of a peace protocol ended the fighting August 12, the island, for all intents and purposes, was in American hands. By the time the Spanish evacuated Puerto Rico in mid-October the Signal Corps was operating nearly two hundred miles of lines there. ❖

Information compiled from "Getting the Message Through, A Branch History of the U.S. Army Signal Corps," by R. Raines.



Aerial balloons were literally man-handled into position.

1858: First aerial photograph taken (from a hot-air balloon).

1860: U.S. Army Signal Corps established.

1862: Abbe Giovanni Caselli invents the Pantelegraph and transmits the first still image over wires.

1864: In Virginia, wireless electromagnetic waves are transmitted 14 miles.

# Signal uses planes to track fighters

By Vincent C. Breslin

*NETCOM/9th SC(A) Command Historian*

**M**exican revolutionary Francisco “Pancho” Villa led a band of several hundred guerrilla fighters across the American border March 9, 1916, to raid the town of Columbus, N.M., in opposition to American support for the newly elected president of Mexico, Venustiano Carranza. In that

raid, 17 Americans were killed by Mexican fighters.

Within a week, Brig. Gen. John J. “Blackjack” Pershing and a 7,000 strong Punitive Expeditionary force had crossed the border into Mexico under President Woodrow Wilson’s orders to capture Villa “dead or alive.” Pershing’s mission to capture Villa featured the first use of mechanized vehicles by U.S.

forces, including automobiles and the airplanes of the First Aero Squadron, which were used to scout enemy activity and relay messages between American units in the field. The Signal Corps’ First Aero Squadron, organized in 1914 after the outbreak of World War I, flew its first combat reconnaissance support mission March 19, 1916.

Despite numerous mechanical



The American 148th Squadron readies for take-off from Dunkirk, August 1918.



1870

1876: Alexander Graham Bell invents the telephone.

1875: Sir Henry Christopher Mance, British Army Signal Corps, develops the first heliograph.



1880

1883: The Linotype – the first mechanized printing typesetter invented.

and navigational problems, American fliers flew hundreds of missions for Pershing and gained important experience that would later benefit the American Air Service over the battlefields of Europe. During this 11-month Punitive Expedition, however, U.S. forces failed to capture the elusive revolutionary, and Mexican resentment over U.S. intrusion into their territory led to a diplomatic crisis.

Meanwhile, the aggressive U.S. pursuit of Villa and the popular support Villa enjoyed in Mexico had led Germany's foreign minister, Arthur Zimmermann, to think Mexico might welcome the opportunity to launch a full-scale invasion of Texas. This thought led directly to the famous Zimmermann Telegram, a secret message sent by Zimmermann in January 1917 to the German ambassador to Mexico proposing a Mexican-German alliance in the case of war between the United States and Germany and promising Mexico financial aid and territory – including Texas, New Mexico and Arizona – in return for its support.

In late January 1917, President

Wilson under pressure from the Mexican government and more concerned with the war in Europe than with bringing Villa to justice, ordered American forces home from Mexico. The Zimmermann Telegram, intercepted and decoded by British intelligence, reached the U.S. government in February; Wilson authorized the State Department to publish it in early March. Americans were outraged, and public sentiment began to move ever closer to support of the country's entrance into World War I on the side of the Allies. Furthermore, Villa's aggression in the Southwest had aroused safety fears among the region's inhabitants, leading many Western states to support defense bills that would become necessary to support the U.S. war against Germany, which Congress formally declared April 6, 1917.

In September 1918, Pershing commanded the first U.S. led attack of the war against the salient of St. Mihiel not far from Verdun. His Chief of Air Service at this battle was Signal Corps' intrepid Brig. Gen. Billy Mitchell. Mitchell was an early enthusiast of aviation and

was briefly stationed in Europe as a military attaché in early 1917, before America's entry into the war. During this period he was befriended and influenced by Sir Hugh Trenchard (commander of the Royal Air Force (RAF) from 1919-1929).

For the upcoming battle Mitchell gathered together the largest concentration of aircraft of the entire war. He had more than 1,400 planes at his command. More than 300 of them were day bombers and almost 100 were night bombers. American pilots made up about 40 percent of this force, while French, British, and Italian aviators composed the balance of the bomber fleet. Mitchell's plans were thwarted, however, as the crucial first two days of the battle were fought in bad weather, preventing the kind of mass air support that he had intended.

In the immediate aftermath of the war, Trenchard, Mitchell, and the Giulio Douhet (commander of Italy's first aviation unit from 1912 to 1915) all published influential papers pushing the idea that the bomber would change warfare forever. ❖



1887: Heinrich Hertz produces the first radio wave.

1900: Russian scientist Constantin Perskyi made the first known use of the word "television," at the World's Fair in Paris, where the first International Congress of Electricity was held.

1890

1889: George Eastman produces roll film, designed for a new camera called the Kodak.



1899: Valdemar Poulsen invents the telegraphone, precursor to the tape recorder.

1900

# Army carries combat camera mission

By Vincent C. Breslin

NETCOM/9th SC(A) Command Historian

Although the Signal Corps had been taking pictures since the 1880s, World War I marked the first time that photography had been assigned to the branch as an official function. In 1917, the Corps established a Photographic Section responsible for both ground and aerial photography at home and abroad. A school for land photography opened at Columbia University in January 1918. Four months later, Signal Corps photographers began the important photo documentation of the Great War.

As the American Expeditionary Force under Gen. John "Blackjack" Pershing sailed for Europe aboard the British steamship "Baltic," Signalmen documented coverage of the war taking still and motion pictures of the general and his staff.

The Army controlled all combat photography, and civilian photographers were not permitted to operate within the zone of the AEF. A photographic unit served with each division and consisted of one motion-picture operator, one still photographer, and their assistants. Each army and corps headquarters had a photo detachment of one officer and six men. Photographic technology had progressed considerably since the days of Mathew Brady, and a combat

photographer in World War I could develop a picture in fifteen minutes using a portable darkroom.

By November 1918, the Signal Corps had taken nearly 30,000 still pictures and 750,000 feet of motion pictures that were used for training, propaganda, and historical purposes. While wartime censorship kept the public from seeing the most graphic images, the Signal Corps' invaluable photographic collection resides today in the National Archives.



World War I Army photographer.

Some 85 years after World War I, the 55th Signal Company (Combat Camera) carried the Army's combat camera mission to the battlefields of Southwest Asia, documenting all phases of Operation Enduring Freedom and Operation Iraqi Freedom (including major combat operations, liberation of all major Iraqi cities, Civil Affairs and Humanitarian assistance, and rebuilding of the Iraqi economic, political and social infrastructure). In Iraq alone, Combat Camera teams documented more than 300 combat missions, submitting more than 10,000 images and 100 hours of video.

Sources: "Getting the Message Through, A Branch History of the U.S. Army Signal Corps," by R. Raines, and 55th Signal Company historical reports.



1900: First mass-market camera – the Kodak Brownie.

1906: The first radio broadcast of speech and music from Bryant Rock, Mass.

1900

1901: The first successful transatlantic radiotelegraph message sent to Guglielmo Marconi in New Foundland, Canada, from Cornwall, England.

1910



1912: "S-O-S" adopted as the universal distress signal.

# Signal growth presents opportunities

by Vincent C. Breslin

NETCOM/9th SC(A) Command Historian

Even before the United States entered the Second World War, the Signal Corps had opened an Enlisted Replacement Training Center at Fort Monmouth, N.J., in January 1941. The Center provided recruits with basic training, after which they enrolled in courses at the Center or received advanced specialist training at the Signal School. By December 1941, the Center had already turned out 13,000 enlisted specialists.

Once war began, the Signal Corps quickly outgrew the existing facilities at Monmouth and Maj. Gen. Dawson Olmstead, the Army's Chief Signal Officer, made arrangements to expand operations to other locations in the vicinity. Consequently, in January 1942, the Signal Corps leased the New Jersey State National Guard Encampment at Sea Girt, a few miles from Monmouth, which became known as Camp Edison.

To handle the wartime flood of personnel, the Signal Corps opened a second replacement training center in 1942 at Camp Crowder, Mo., near the town of Neosho in the southwestern corner of the state. Camp Crowder now received most of the Army's signal recruits, including those entering through the Affiliated Plan, who

traveled there to receive basic training. Recruits spent three weeks learning the basics of soldiering: drill; equipment, clothing, and tent pitching; first aid; defense against chemical attack; articles of war; basic signal communication; interior guard duty; military discipline; and rifle marksmanship. In mid-1942 the Midwestern Signal Corps School opened its doors at Camp Crowder, with a capacity of 6,000 students.



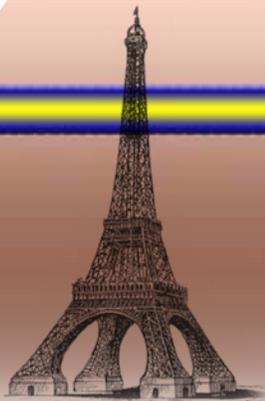
**Women Army Corps Soldiers operate a radio-teletype transmitter in England.**

By mid-1943 military mobilization was virtually complete, and the Army had nearly reached its authorized strength of 7.7 million men. The Signal Corps, in fact, had a surplus of officers by the summer of 1943, though this situation proved to be short-lived.

Beginning in January 1943 the Signal Corps had also begun to receive female soldiers, members of the Women's Army Auxiliary Corps (WAAC), later designated the Women's Army Corps (WAC). All told, the Signal Corps received at least 5,000 of these women, known as WACs. Both within the United States and overseas, WACs replaced men in such jobs as message center clerks and switchboard operators, releasing the male personnel for other duties. WACs also worked in

film libraries and laboratories and performed signal intelligence duties such as cryptography. ❖

1915: First simultaneous coast-to-coast and trans-Atlantic transmission of speech; from New York City to San Francisco, and Arlington, Va., to the Eiffel Tower in Paris.



1927: Bell Telephone and the U.S. Department of Commerce conduct first long distance use of television between Washington D.C. and New York City.

1920

1919: First commercial radio broadcast in Denmark.

1930



# Crisis leads to command's origins

Compiled by Vince Breslin

NETCOM/9th SC(A) Command Historian

In October 1962, President John F. Kennedy learned that the Soviet Union had installed nuclear missiles on the island of Cuba, just 90 miles off the coast of the United States, and he demanded their immediate removal. He also announced a naval "quarantine" against additional weapon shipments into Cuba while a frightened world waited to see whether the two superpowers would come to blows. U.S. armed forces went on immediate alert and the Strategic Air Command postured its forces for a possible nuclear attack. On Oct. 24, the American Public waited anxiously to learn whether Soviet ships, bound for Cuba and carrying additional missiles, would try to break the U.S. naval blockade around the island. At the last minute, the vessels turned around and returned to the Soviet Union.

Soviet leader Nikita Khrushchev responded Oct. 26, to the quarantine by sending a long and rather disjointed letter to Kennedy offering a deal: Soviet ships bound for Cuba would, "not carry any kind of armaments," if the United States vowed never to invade Cuba. He pleaded, "let us show good sense," and appealed to Kennedy to, "weigh well what the aggressive, piratical actions, which you have declared the U.S.A. intends to carry out in international waters, would lead to." He followed this with another letter the next day offering to remove the missiles from Cuba if the United States would remove its

nuclear missiles from Turkey.

Kennedy and his advisors debated the proper U.S. response to these offers. Attorney General Robert Kennedy ultimately devised an acceptable plan: take up Khrushchev's first offer and ignore the second letter. Although the United States had been considering the removal of the missiles from Turkey for some time, agreeing to the Soviet demand for their removal might give the appearance of weakness. Nevertheless, behind the scenes, Russian diplomats were informed that the missiles in Turkey would be removed after the Soviet missiles in Cuba were taken away. This information was accompanied by a threat: if the Cuban missiles were not removed in two days, the United States would resort to military action. For his part, Premier Khrushchev took Kennedy very seriously indeed and ordered the Soviet Ambassador to the United States to pursue a rapid peace agreement with the Kennedy Administration. Negotiations over the next few days rendered an amicable settlement and on Nov. 1, 1962, CIA photo reconnaissance revealed that all Soviet missile sites in Cuba had been bulldozed and that the missiles and associated launch equipment had been removed.

Several months earlier, the U.S. Army Communications Agency (ACA) merged with the U.S. Army Signal Engineering Agency (USSEA) April 1, 1962, to form the U.S. Army Strategic Communications Command (ASCC). This staff agency of the Office of the Chief Signal Officer, located in Washington,

1930: American inventor Charles Jenkins broadcasts the first TV commercial. In England, the BBC begins regular TV transmissions.

1940: Galvin Manufacturing Corporation engineers develop the Handie-Talkie SCR536 portable two-way radio – a World War II icon.

1930



1939: John Atanasoff and Clifford Berry invent the first electronic computer at Iowa State University.

1940



D.C., was charged with the engineering, installation, operation, and maintenance of the Army's portion of the Defense Communications Agency's global communications network.

Subsequent to that shift in the organization of Army Communications, a complete reorganization of the Department of Defense communications network was, in no small way, driven by the Cuban Missile Crisis of October 1962 and the exposure of serious flaws in communications between the U.S. State Department, American Embassies, American military commanders, and their Soviet Union counterparts. Post-crisis analysis of communication delays confirmed a need for a rapid upgrade of interdepartmental and international communication capabilities.

In early November 1962, President Kennedy ordered the establishment of the National Communications System (NCS) interconnecting the State Department, the Department of Defense, and several other federal agencies. The Secretary of Defense became the executive agent for the NCS and the director of the Defense Communications Agency (DCA) (later redesignated Defense Information Systems Agency (DISA)) was appointed NCS manager.

The establishment of the "hot line," as it would come to be known, followed the signing of a memorandum of understanding between the Soviet Union and the United States after the events of the Cuban missile crisis made it clear that reliable, direct communications between the two nuclear powers was imperative. During the crisis, it took nearly 12 hours to receive and decode Nikita Khrushchev's 3,000 word initial settlement message—a dangerously long time

in the chronology of nuclear brinkmanship. By the time the U.S. had drafted a reply, a tougher message from Moscow had been received demanding that U.S. missiles be removed from Turkey. White House advisors at the time thought that the crisis could have been more quickly resolved and easily averted if communication had been faster.

ASCC's mission, as the Army proponent of the NCS, expanded in December 1962 to encompass the management of strategic transportable communications, fixed signal communications, the Military Affiliate Radio System (MARS), frequency interference resolution, and communications equipment research and development. As that mission grew, so too did the command's physical appearance. The command became upgraded to major command status March 1, 1964, as U.S. Army Strategic Communications Command (USASTRATCOM) with full command and control over worldwide strategic communications.

Today, the Defense Information System Network (DISN) provides secure voice services using the Joint Staff Defense Red Switch Network (DRSN). This global, secure voice service provides the President, Secretary of Defense, Joint Chiefs of Staff, combatant commanders and selected agencies with command and control secure voice and voice-conferencing capabilities. The U.S. Army Network Enterprise Technology Command/9th Signal Command (Army), the organizational descendant of USASTRATCOM, maintains the Army's portion of the red switch network (at about a dozen network sites) while its 21st Signal Brigade attends to the White House "hot line" hub of the DISN network. ❖



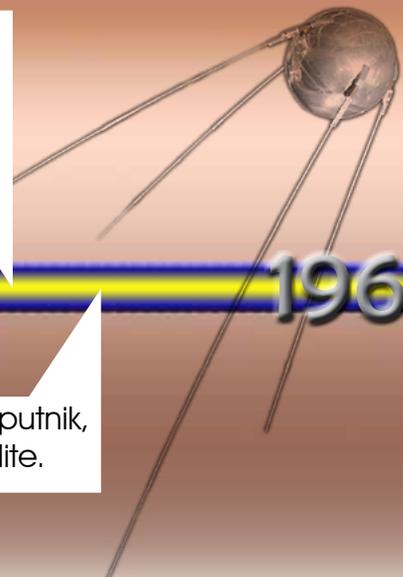
1956: Robert Adler invents the first practical remote control for television – the Zenith Space Commander.

1950

1948: Cable television introduced in Pennsylvania as a means of bringing television to rural areas. One million homes in the United States have television sets.

1957: USSR launches Sputnik, first artificial earth satellite.

1960



# Signal forces support first Gulf War

Compiled by Vince Breslin

NETCOM/9th SC(A) Command Historian

In late 1990, the U.S. Army Information Systems Command's (ISC) 11th Signal Brigade, from Fort Huachuca, Ariz., grew to incorporate five signal battalions and two companies. The brigade's two assigned battalions (the 40th and 86th) deployed to Saudi Arabia in November that year to support Operations Desert Shield and Desert Storm.

There, they were merged with the brigade's pre-positioned 19th Signal Company, absorbing that unit's electronic maintenance capability. In addition, the brigade was augmented by three other signal battalions: the 44th and 63d from Germany and the 67th from Fort Gordon. Rounding out ISC's communications support to echelons above corps (EAC) was the 653d Signal Company, a unit of the Florida Army National Guard; it arrived in Saudi Arabia in January 1991, to provide Troposcatter communications.

The Department of the Army activated the 6th Signal Command at Fort Huachuca on Dec. 4, 1990. Deploying to Saudi

Arabia later that month, its mission was to administer the Southwest Asia (SWA) theater communications network. The command helped to establish frequency management, which had proven problematic during previous joint operations.

In March 1991, the 54th Signal Battalion was formed to provide Information Mission Area (IMA) support for the theater. With headquarters in Riyadh, it comprised three subordinate companies: the 207th stationed in King Khalid Military City, the 550th in



Signal Soldiers were critical to the success of the first Gulf War.



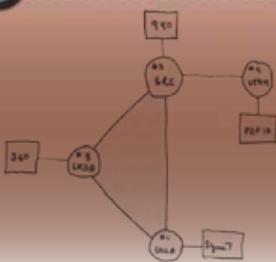
1962: AT&T launches Telstar, the first satellite to carry television broadcasts.

1969: July 20, first TV transmission from the moon; 600 million people watch.



1960

1970



1969: (Advanced Research Projects Agency) ARPANET commissioned by DoD for research into networking.

1973: Dr. Martin Cooper invents the first portable cell phone - the DynaTAC.



Dhahran, and the 580th in Riyadh.

To conduct offensive operations, the U.S. Army ultimately sent two corps to Saudi Arabia. The first units to be deployed belonged to the XVIII Airborne Corps, the Army's designated contingency force. Based at Fort Bragg, N.C., the corps was supported by the imbedded 35th Signal Brigade.

Both during and after deployment, this brigade maintained a permanent satellite link with Fort Bragg, allowing it to support corps assets at home as well as those in the combat theater. Providing communications coverage over an area of more than 120,000 square miles in northern Saudi Arabia and southern Iraq, the 35th installed 169 separate communications systems as well as 400 miles of wire and cable and approximately five hundred telephones.

The VII Corps began moving from Germany to SWA in November 1990. Its endemic 93d Signal Brigade encountered difficulties during deployment when its equipment was dispersed among twenty different ships. Unlike the 35th Brigade, the 93d was not trained or equipped for service in an austere environment. Once it became fully operational, however, the 93d proved fully capable of supplying communications between the corps headquarters, five divisions, and an armored cavalry regiment across an area covering more than 75,000 square kilometers. To accomplish this formidable task, the brigade was augmented by the 1st Signal Battalion, the 235th Signal Company, and the 268th Signal Company.

In a region with a limited telecommunications infrastructure, satellites proved essential to successful operations. They formed the backbone of both tactical

and strategic communication systems, providing the connections between widely dispersed units as well as furnishing circuits back to the United States. Plagued by a shortage of military satellites, the Army leased circuits linked to commercial satellites. Satellites were also used to provide information about weather, terrain, and location. A network of satellites (known as the Global Positioning System (GPS)) transmitted navigation, positioning, and timing signals – permitting orchestrated force maneuver in a featureless desert environment. Fortunately, the Iraqis did not, and perhaps could not, jam these vital space-based signals.

Rounding out the U.S. Army's high-tech communications architecture during the first Gulf War, the Information Systems Engineering Command (ISEC), based at Fort Huachuca, installed an electronic mail system that allowed Soldiers to correspond with family and friends. This first application of e-mail in a wartime environment enabled computer systems to process approximately 15,000 personal messages each day in addition to a heavy load of official traffic.

In addition, commercial communications systems augmented military networks, particularly for sending messages between Saudi Arabia and the United States. Corporations such as AT&T and MCI provided facilities that allowed Soldiers to phone home at reduced rates. Finally, the Military Affiliate Radio System (MARS) provided an international network of volunteer ham radio operators as a low-tech backup service to the Army's SWA signal infrastructure. ❖



1979: First emoticons are used on the ARPANET.



1980: CNN 24-hour news channel starts broadcast.

1980

1985: The first registered domain – symbolics.com – is assigned.

1976: Apple I previewed at a meeting of the Homebrew Computer club.



1983: Desktop workstations come into being; Time names the computer as "Man of the Year."



1990

# Supporting the Warfighters in Iraq

By Vincent C. Breslin

*NETCOM/9th SC(A) Command Historian*

Operating out of Fort Huachuca, Ariz, the U.S. Army Network Enterprise Technology Command orchestrated high-tech communications support for all echelons above corps (EAC) during the build-up to and execution of Operation Iraqi Freedom. In early March 2003, on the eve of the Coalition's invasion of Iraq, Company D, 86th Signal Battalion, arrived in Kuwait and installed a Promina 800 system, providing non-secure and secure networks, video teleconference (VTC), and Joint Worldwide Intelligence Communications System (JWICS) for the 1st Marine Expeditionary Force (IMEF) at Camp Commando. The Company also set up tactical satellite receivers (TSC-93C and TSC-85C), giving the Marines standardized tactical entry point (STEP) site access and a single shelter switch, while providing Camp Commando with a flood search switch. Soon thereafter, having moved the remainder of its

equipment from port, the 86th set up communications packages in Kuwait supporting all the major combatant headquarters assembled in the desert. Meanwhile, Companies A and C set up initial support at Camp Virginia, Kuwait, supporting the V Corps' main and rear command posts; and Company B moved to Camp Doha, Kuwait, where it prepared for its mission as part of Coalition Forces Land Component Command's (CFLCC's) early entry command post.

V Corps crossed the Iraq-Kuwait border March 20, 2003, west of the River Euphrates shortly after the Marines and other coalition forces crossed east of the River Tigris. This two-pronged ground force movement toward Baghdad and the subsequent Coalition Force expansion throughout Iraq compelled the Army to set up logistic support areas (LSAs) along the way to keep open the long supply and communication lines between forces at the front and headquarters at the rear. As Army and Marine units moved rapidly

north, the 63d Signal Battalion established 12 satellite terminals to expand V Corps long-range extension capabilities and to keep battlefield commanders in touch with headquarters elements as maneuver forces advanced on the Iraqi capital. The 63d also provided high-gain satellite antennas and data packages in support of various Corps commanders. These data packages enabled non-secure and secure network operations, JWICS connectivity, VTC, and Defense Red Switch Network (DRSN) services. The 63d Signal Battalion network matured in March 2003 as critical, strategic communications services were extended to LSAs and combat units under CFLCC, Combined Joint Task Force-180 and CJTF-7 via the battalion's arsenal of command, control, communications and computer (C4) tactical systems. In addition, the battalion assumed a fixed-station mission in southern Kuwait by providing and sustaining strategic communications.

The 7th Signal Brigade's 509th Signal Battalion fielded Deployable

1990: The World Wide Web is born; introduction of Internet Protocol and HTML.



1995: DVDs invented.

2001: iPod invented.



2004: Facebook launched by Harvard University students.

1990

2000

1990: The World (world.std.com) comes on-line, becoming the first commercial provider of dial-up Internet access.

2002: Natick Laboratories invent the Modular Integrated Communication Helmet.



Communications Package-Tactical (DCP-T) teams out of Vicenza, Italy to Bashur and Kirkuk, Iraq, March 27, 2003. Another DCP-T (Light) augmented the 151st Signal Battalion (from the South Carolina National Guard) at Camp Virginia, Kuwait. DCP-T requirements later expanded to include more support for the Polish-led Multinational Division (PMND), the Iraq Survey Group (ISG), the Coalition Provisional Authority (CPA), the Iraqi Assistance Center (IAC), and the Combined Joint Special Operations Task Force (CJSOTF).

At the start of the ground war, eight AN/TRC-170 troposcatter systems belonging to the 86th Signal Battalion also crossed the border into Iraq, extending the communications backbone from Kuwait to Baghdad. After several jumps to more secure locations (based on Allied analysis of enemy movement) signal teams installed the TROPO backbone components, providing redundant communications for all LSAs and major headquarters. Meanwhile, other 86th Signal Battalion teams established joint nodes at all the major headquarters for V Corps main and rear, Camp Commando,

and CFLCC-Forward. Joint nodes enabled the CLFCC commander to directly connect to his subordinate commands. Soldiers of the 86th Battalion leveraged joint nodes to provide redundant paths and redundant subscriber services and to provide additional capabilities to V Corps and IMEF such as DRSN and JWICS. As joint nodes became established, they became capable of linking to like nodes in support of expanding CENTCOM requirements, including service connection to Doha, Ramstein, and the Landstuhl STEP site. Meanwhile, Company D, 86th Signal Battalion convoyed a mobile gateway van to Umm Qasar, Iraq, to support the Office of Civil Affairs, providing that office with NIPRNet, SIPRNet, and voice capabilities – this was the only mobile gateway van used during the OIF invasion phase.

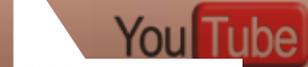
Signal Battalion's 385th Signal Company AN/TSC-93 team crossed the Iraq border March 19, 2003, with the Third Infantry Division. This team provided vital communications to the division on the road to Baghdad until the end of major combat operations; it was then attached to the 101st Airborne Division where it provided needed communications support at Mosul, Sinjar Mountain, and Tal-Afar as the division assisted in stabilizing the country. ❖



The 54th Signal forces stage in Kuwait prior to their march into Iraq.



2008: "Roadrunner," the fastest computer on Earth, breaks the petsflop barrier; more than one quadrillion calculations per second.



2005: YouTube launched.

2010

2010: Samsung invents a water-powered cell phone.



2020

# New LandWarNet solutions face rigorous reviews

By Mark P. Tattrie

*Enterprise Planning Division, NETCOM/9th Signal Command*

FORT HUACHUCA, Ariz. – The United States Army has already made rapid strides toward their goal of information superiority through the use of proven, cutting-edge information technology and information assurance resources. In working to achieve this goal, the security risks of IT connectivity and access to the Army's portion of the Global Information Grid (GIG) must be closely scrutinized and vigorously managed. With these goals in mind, the Army Global Network Operations and Security Center (AGNOSC) developed an operational requirements document (ORD) addressing the need for an Army Perimeter Sensor Grid.

Before implementing any solution onto the Army's LandWarNet, tools and software must be thoroughly vetted to make sure they meet security and compatibility requirements, and identify any shortfalls to the proposed solutions. Taking on the mission to perform the extensive review of the sensor grid ORD was a team within the Network Operations Planning Division, under the direction of Rod Trevino, chief, Enterprise Planning Division.

"The purpose of the review was to analyze the Army Perimeter Sensor Grid requirements and determine where they map to the LandWarNet NetOps Architecture (LNA)," Trevino said. "Based on that analysis, we identified the gaps between the requirements described in the ORD and those defined in the LNA operational, system, and technical requirements."

The LandWarNet NetOps Architecture, formerly known as AENIA (Army Enterprise NetOps Integrated Architecture), is the Army's approved and validated baseline Enterprise NetOps architecture. The LNA is a comprehensive NetOps management architecture, which applies to both the NIPRNet and the SIPRNet.

"LNA Version 1.0 addresses NetOps capabilities including Internet Protocol (IP)-Base Transport Management, Computing Platform Management, Security Management, Enterprise Support, Enterprise Service and Applications Management, and NetOps Modeling and Simulation," said Dave Fox, lead architect. "Within these broader categories, a total of 48 NetOps capabilities are identified, with new capabilities in development for future releases."

Based on the analysis and review, it was determined

that the solution is not necessarily accomplished by one system, but rather a group of integrated systems. The "Next 5" capabilities selected for enterprise implementation will be Network Access Control, Network Intrusion Prevention, Situational Awareness/Risk Management, Proxy Management, and IP Modeling and Simulation.

Once the capabilities were identified for implementation, functional requirements documents (FRD) were created and sent to the Network Enterprise Technology Command/9th Signal Command (Army) Plans and Operations staff (G-3). The FRDs for the Next 5 Capabilities were written without a formal requirements process in place and, though justified and accepted for validation, the process needed to be standardized. Juanita Fischer, contractor lead for the requirements process development and management task and vice assistant chief, Enterprise Plans Division, under the guidance of Laretta Hamlett, chief, Enterprise Plans Division, created a FRD template and developed a standard process.

"The objective of this formal requirements process is to be in-sync with Joint Capabilities Integration Development System products," said Fischer. "We want to provide easy-to-use vehicles to standardize documentation and formalize functional requirements of a required capability. We believe this will reduce the time to get a required capability through the requirements process."

This formal requirements process will provide a standardized method of analyzing functional requirements against acquisition documentation and will provide the G-3 standardized products to start the validation process.

"The first step in the validation process is for all IT capabilities requests to be presented to the Enterprise Guidance Board – Counsel of Colonels (EGB CoC)," said Chief Warrant Officer Richard Freeman, G-3 Operations. "The EGB CoC will vet all IT capabilities requests, and any disputes the EGB CoC cannot resolve will go before the Operations Oversight Board (OOB) for decision. Standardized FRDs will provide us with a full understanding of a required capability, to include relationships between operational, functional, and technical requirements."

The next step in the process is for the Engineering Review Board (ERB) to identify the appropriate technical solutions, and then the technical solutions

will go before the Enterprise Guidance Board (EGB), with the supporting technical feasibility and business case documents for decision. The technical solutions approved by the EGB will be presented to the Capability Set Management Board (CSMB) for validation.

Once validated by the CSMB, the IT technical solutions will be added to the Army's IT portfolio for oversight and management. The Army Chief Information Office/G-6 Information Resource Integration (IRI) Directorate will validate the appropriate funding source and identify the office of primary responsibility (OPR) to implement the solution. The OPR will execute the implementation plan and provide updates on costs, schedule and performance to the EGB as directed. The NetOps Change Control Board (CCB) will validate the formal acceptance test of the new IT technical solution being delivered by the OPR.

The "Next 5" LNA capabilities have been identified

to Project Manager Network Service Center (PM NSC) for work in FY10. These capabilities will provide increased LandWarNet visibility and situation awareness. NETCOM/9th SC(A) Enterprise Planning and Engineering, as the Enterprise NetOps Capability Manager, continues to work with PM NSC to align the additional LNA capabilities with the Global Network Enterprise Construct capability sets for FY11-12 and beyond.

Lt. Gen. Jeffrey Sorenson, Army Chief Information Officer/G-6, writing in the GNEC pamphlet, says, "Over the next three years, the Army will transform the LandWarNet to a centralized, more secure, operationalized, and sustainable network using the Global Network Enterprise Construct (GNEC)."

The AGNOSC recognizes that the need for network security has never been greater. Moving forward on these "Next 5" capabilities will ensure critical Army assets are protected. ❖

## Army & Defense News

### 5th Signal Command takes Army Journalism Awards competition

*Army News Service*

HEIDELBERG, Germany – Army print and broadcast media specialists from units and garrisons across Europe are being honored by the Department of the Army for their contributions to informing and entertaining audiences theater- and worldwide.

Public affairs specialists from USAREUR tactical units and from Installation Management Command-Europe garrisons earned top awards at the Army level of the 2009 Maj. Gen. Keith L. Ware Public Affairs Competition.

The annual Secretary of the Army-sponsored competition recognizes Army military and civilian print and broadcast specialists for "journalistic excellence in furthering the objectives of the Department of the Army internal-information program." Print and

broadcast products and individual professionalism and achievements in a total of 21 categories are evaluated.

*For full story, go to <http://www.army.mil/-newsreleases/2010/03/18/35980-army-names-europe-print-broadcast-specialists-among-best-for-2009/>.*

### Secretary of Army gives 'thumbs up' to resilience course

*Army News Service*

WASHINGTON – You are a Soldier, and your platoon is assigned to manning a highway checkpoint in Iraq. Yesterday, a car refused to stop despite your team's warnings.

According to the rules of engagement, your platoon opened fire on the vehicle, killing those inside. Upon investigation you found no evidence of insurgent affiliation or weapons inside the car. Now, laden with guilt, you are not sure you can continue doing your job.

What do you do?

Giving Soldiers tools to deal with realistic scenarios like this one are central to the Army's Master Resilience Trainer course, or MRT, in Philadelphia where Secretary of the Army John McHugh visited Tuesday.

During his first visit to the course, McHugh listened in on classes, spoke with students and instructors and got a taste of the Army's newest wellness initiative.

"Our Soldiers are under a tremendous amount of stress as are their families, but the skills they take away (from the course) will help them as Soldiers, and will help the Soldiers that they bring these skills to, not just in times of war, but for the rest of their lives," McHugh said in an interview. "To have the chance to make that kind of difference in someone is very exciting."

*For full story, go to <http://www.army.mil/-news/2010/04/14/37343-secretary-of-army-gives-thumbs-up-to-resilience-course/?ref=news-home-title9>.*

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