Scene of a Signal Corps Center operating during the Civil War

Civil War Signal logistics

by Capt. Mary L. Fay

The logistics of signal communications during the American Civil War are interesting and instructive for today's logistics managers because of the similarities between the supply and maintenance problems of that period and those of today. This essay will investigate the operations of the Signal Corps during the Civil War period, focusing on the equipment used and its logistical support.

The American Civil War introduced three innovations into the art of war: the railroad, the rifle, and the telegraph. Although the telegraph did play a novel part in the war, one historian contends that,

> Communication on the battlefield itself remained primitive, and because officers found it difficult to maintain contact with each other and with their men in combat, the tendency was to retain close order tactics even when — the rifle made them horrendously murderous.[1]

However, recognizing the importance of military communications, the United States became the first nation to appoint a chief signal officer to its Army — Maj. Albert J. Myer in 1860. Myer, an Army surgeon, had advocated a system of visual signalling (developed during his research into a sign language for deaf-mutes) which had received preliminary approval for testing and evaluation by a board of officers headed by Lt. Col. Robert E. Lee in 1859.[2] Myer proceeded to train selected personnel in the intricacies of his flag signalling system, including a Lt. E. Porter Alexander, later to make a reputation in the Army of Northern Virginia. Myer satisfactorily completed his first actual field testing of his flag system during the Navajo Expedition, 1860-1861.

After his appointment, Myer established a training camp at Georgetown, near Washington.[3] Some signal support was given to the first naval expedition against Port Royal in 1861, but the first battle, Manassas in 1861, revealed the Federal signals to be woefully inadequate. Myer had no trained personnel ready to perform visual signalling during the battle. Telegraph lines were so distant from the battlefield that couriers were used to bring messages to the telegraph stations for transmission to the War Department. Tactical signal communication was nonexistent.

The Confederates, on the other hand, attributed part of their success to the visual signalling system. Alexander, who accepted a commission in the Confederate Army, had immediately been employed in training signalmen in the system he had learned from Myer. His signal stations proved their worth at Manassas by warning of Federal advances, and by keeping the higher command advised of Federal movements. The latter service resulted in the timely call of reinforcements, which turned a potential Federal victory into a disastrous route. As a result of this success, Alexander might have become the Chief Signal Officer of the Confederate Army, but his preference for artillery made him an indispensable lieutenant to the commander of the Army of Northern Virginia, Robert E. Lee.

The Confederate Signal Corps was established 19 April 1862, with Maj. William Norris as its head.[4] Included in its duties were those of the Secret Service, what today would be termed military intelligence. Although the Confederate Signal Corps continued to perform admirably during 1863-1865, more attention was focused on the clandestine activities of the Corps. General Thomas J. "Stonewall" Jackson was much interested in visual signalling, and may have proved a strong advocate of an increased role for the Confederate Signal Corps if his death at Chancellorsville had not intervened.

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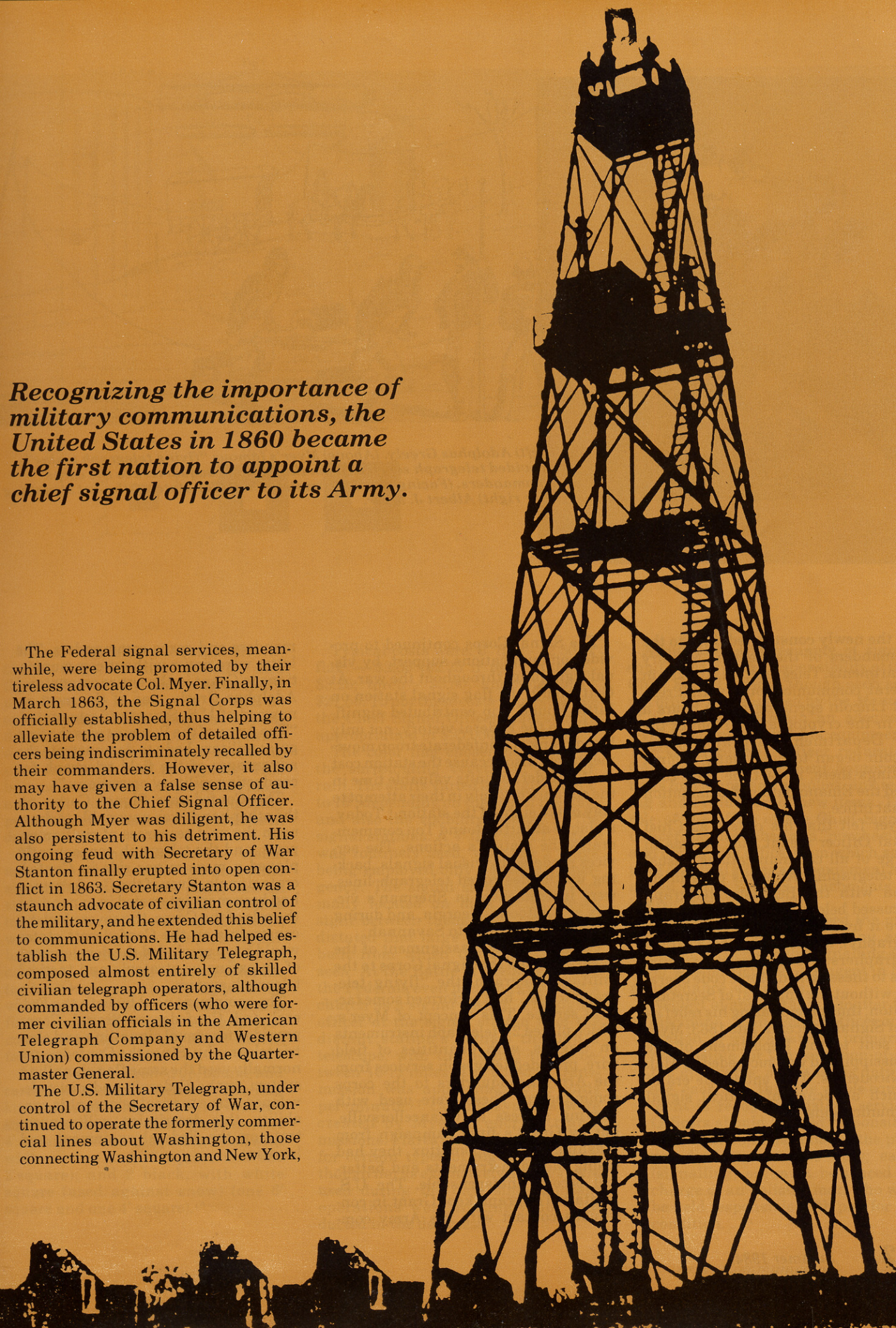
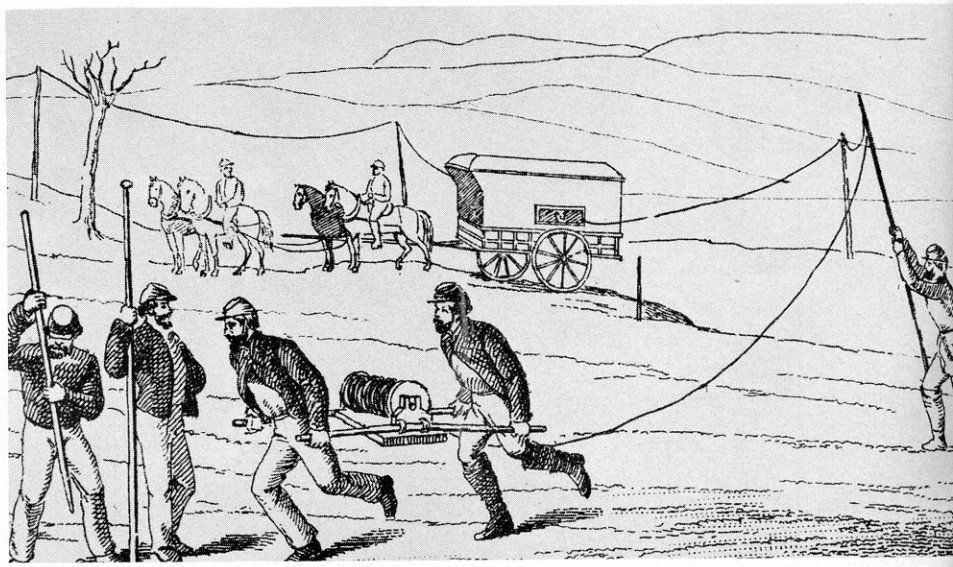
The Federal signal services, meanwhile, were being promoted by their tireless advocate Col. Myer. Finally, in March 1863, the Signal Corps was officially established, thus helping to alleviate the problem of detailed officers being indiscriminately recalled by their commanders. However, it also may have given a false sense of authority to the Chief Signal Officer. Although Myer was diligent, he was also persistent to his detriment. His ongoing feud with Secretary of War Stanton finally erupted into open conflict in 1863. Secretary Stanton was a staunch advocate of civilian control of the military, and he extended this belief to communications. He had helped establish the U.S. Military Telegraph, composed almost entirely of skilled civilian telegraph operators, although commanded by officers (who were former civilian officials in the American Telegraph Company and Western Union) commissioned by the Quartermaster General.

The U.S. Military Telegraph, under control of the Secretary of War, continued to operate the formerly commercial lines about Washington, those connecting Washington and New York,





(Left) Adolphus Greely. (Above) Myer's famous "flying telegraph trains" provided telegraph services from the Army headquarters to the corps commanders. (Facing page) A complete Civil War state-of-the-art signalling kit. (Far right) Albert J. Myer.

and the newly constructed lines to the commanders of the Federal Military Departments. Telegraph was the key in Federal communications, with President Lincoln spending many hours a day in the cryptographic room of the War Department telegraph office. Lincoln began to hold many cabinet meetings there; in fact, he even composed the Emancipation Proclamation in that office.[5]

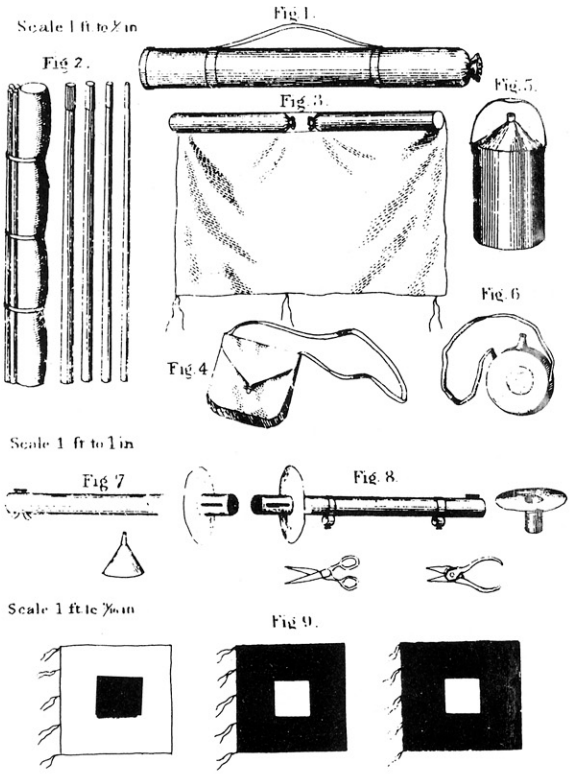
Myer felt that his orders as Chief Signal Officer meant that he was in charge of all communications, visual and telegraphic. After his experimentation with the Beardslee telegraph (discussed below), he attempted to improve it by adding keys (as in Morse telegraphy), which necessitated skilled telegraphers. He preferred commissions to these skilled Morse code operators, without the approval of Secretary Stanton, thus precipitating his relief as Chief Signal Officer in late 1863. Myer was sent to the Department of the Mississippi, and was succeeded by Maj. W. Nicodemus. This ended the era of staunch advocacy of tactical signal communications.

The Signal Corps continued to provide communications support, by visual signalling, throughout the war. At Gettysburg, the flag signal station on Little Round Top contributed significantly to the Federal victory, not only by advising of Confederate troop movements, but also because the station cost the Confederate units valuable time in the advance of 2 July in their attempt to stay out of sight of the station.[6] Today, a plaque at Little Round Top commemorates the station's actions. The services rendered by visual signals, backing up the destroyed telegraph lines, were instrumental in Sherman's victory at Allatoona, Georgia, and during his subsequent push to Savannah.

Previous to the reassignment of the telegraph from the Signal Corps to the military telegraph, the "flying telegraph trains" had performed some tactical service. This concept of Myer's, which placed 2-4 telegraph instruments on wagons, with quantities of field wire, provided telegraph services from the Army headquarters to the corps commanders. These were used with varying success at Chancellorsville, but by Grant's final campaign from Washington to Appomattox, they had (using Morse instruments and batteries) become indispensable. The U.S. Military Telegraph kept Grant in continuous contact with his Army commanders and corps commanders. The latter were never without communications to Grant in the entire campaign.[7] Adolphus Greely, one of the most renowned of U.S. Signal officers stated, "The Army of the Potomac was the first great military body to demonstrate the advantages of the field telegraph for conducting military operations."[8]

The Confederate Signal Corps, on the other hand, was never able to draw upon the vast resources of civilian experts, and the telegraph consequently played a more minor role in Confederate signals. Even if the Confederates had been more interested in expanding the role of the Corps, the severe logistic constraints on the Confederate states would have precluded the development of an extensive strategic and tactical telegraph system.

The equipment used by both the Federal and Confederate Signal Corps provided for visual signalling and electric telegraphy. Since the Confederates normally used the same flag signalling system as the Federals and never developed a true tactical telegraphic capability, this description will concentrate on the Federal equipment and logistics.



Visual signalling equipment included flags, torches, rockets, and flares. The supply and maintenance procedures for these items, as well as operational procedures and the tactical doctrine for their employment, were developed by Colonel Myer, and compiled in his *Manual of Signals*. This became essentially the technical manual for all equipment, prescribing daily preventive maintenance inspections in detail.

The most important of the visual means was the familiar red and white signal flag, of different sizes, and on staffs of varying lengths. Torches (metal lanterns), attached to staffs, were used at night. A complete signalling kit contained the following items: canteen (for carrying turpentine for the torches); haversack (carrying wicking, wind matches, pliers, shears, and a funnel); and a "kit" (canvas signal case containing the signal flags, staffs, torchcase and torches).

All this could be rolled up, bound, and carried in a canvas carrier.[9] The flag kit contained 7 flags: 3 white, with red square in the middle (one 6' square, one 4' square, and one 2' square); 2 red, with white square (one 4' square and one 2'square); and 2 black, with white square (used against snow) (one 6' square and one 4' square).[10]

Typical costs were: 6' flag - $2.50; 4' flag — $2.00 ($2.25 if red); canteen - $3.25; torch - $3.50; and telescope - $21.50. To put these costs in perspective the Chief Signal Officer requested an appropriation of $20,000 for 1862.[11]

The color flag chosen depended on the surrounding vegetation and terrain. The staffs varied in length from 4' to 16', depending on the size of the flag, and also the visibility desired by the signal stations. A 4' flag on a 12' staff was routinely used, with the 2' flags being employed only during an emergency. The signal stations were normally located on hills, with line-of-sight between them; often the terrain dictated that large wooden towers be built from which the flags could be seen. At the Battle of Fredericksburg, the Federals even used the steeple of a church as a signal station. The signal officer at the signal station read the distant station's signals through a telescope, with the normal range between 10-12 miles. The speed of transmission was approximately 3 words per minute.[12] Coding systems were created by Myer to encrypt transmissions. Flares and rockets were used for certain types of night signalling, though not as extensively as flags were used during the day, since military operations were routinely not conducted in the darkness.

Acquisition and resupply of signal equipment was the responsibility of the Chief Signal Officer, though each signal officer was enjoined by the *Manual of Signals* to maintain an adequate level of supplies with his equipment. The Chief Signal Officer requested from the War Department appropriations for equipment, supplies, and testing and evaluation of new items. The role of the office of the Chief Signal Officer was described as a "purchasing and disbursing office, from which supplies of signal stores and equipment are issued to the various detachments of the corps in the field."[13]

The *Manual* also described the procedures for inspecting, cleaning and repairing all items in the signalling set. Myer was particularly stringent in his maintenance standards:

> Neglect of apparatus is a matter for discipline. . . The senior officer on a station, or with a party, is primarily responsible for the condition of all the apparatus; and it is his duty to see, each day, that the whole equipment is ready for instant service. Officers should be held responsible with their commissions for the proper discharge of this duty; each (signalling) set must be placed in charge of an enlisted man who will be held responsible with pay for its condition. . .[14]

Colonel Myer also directed that any articles of equipment which were damaged beyond repair at the signal party or station level should be turned in to the depot. Depots during the Civil War were not specialized locations for an echelon of maintenance; rather, they were storage sites for supplies, which followed the armies in the field. The maintenance concept for visual signalling equipment was to repair, if possible, at the lowest level, and then to turn in damaged equipment to depot for replacement. Maintenance at the lowest levels for visual signalling equipment was a matter of repairing cloth flags, wooden staffs, and canvas and leather accessories. But the Federal Signal Corps, before 1864, also had to maintain wire and telegraph equipment.

Myer had advocated tactical telegraph communications to supplement the "strategic" commercial lines already in existence. These tactical lines would connect the corps' headquarters with the Army headquarters, and with each other, during field operations. Telegraphs for tactical use were carried in light wagons, along with reels of insulated and non-insulated wire and lance-poles (to overhead the wire). The non-insulated wire was mainly for semi-permanent, overheaded lines, whereas the insulated wire was used in emergencies and could be laid along fences or on the ground.[15] After signal parties ran these field lines, soldiers were detailed to patrol the wire and were instructed in the procedures for splicing the wire if broken.[16]

As mentioned previously, Myer had developed the "flying" (or mobile) telegraph trains, using the Beardslee Magneto-electric Telegraph. The process of its procurement, testing, evaluation, and acquisition is the best example of the type of logistics management prevalent in a small specialized branch during the Civil War. In 1861, a civilian engineer, Henry J. Rogers, invited Myer to New York to discuss the development of a rugged, compact, lightweight version of the Morse telegraph, which could be adapted to tactical use. Myer, however, wished to have a telegraph which the ordinary soldier could operate with little training (unlike the skill necessary to operate Morse keys). Myer and Rogers, therefore, developed a telegraph not with keys and sounders, but with a "plain language indicator device," a dial which could be turned to a letter, and which would record the same letter at the distant end.[17] A train with this type telegraph was tested by the manufacturer in late 1861: Rogers reported, "I took the instruments over a rough road 10 miles yesterday... and they are now in first-rate working order after the test."[18] While this train was being evaluated by a board of officers in January 1862, Rogers and Myer began to investigate the possibility of replacing the cumbersome batteries, necessary for the conventional telegraph, with a magneto-electric generator developed by the Beardslee Magneto-Electric Company. By March 1862, Rogers had convinced Myer that the Beardslee telegraph was more mobile and better adapted to rapid field telegraphy. Under the supervision of Capt. Beardslee, the manufacturer's son, the usefulness of the Beardslee telegraphs at Fredericksburg (where visual signalling was restricted by smoke and fog), convinced the Secretary of War to authorize the purchase of 15 of the trains at $2500 each. By April 1863, 9 of the 15 trains had been delivered.[19]

Initially, the telegraphs (each weighing approximately 100 pounds) were returned for repair to the manufacturer, who attempted improvements to increase reliability. The Beardslee Company eventually decided to redesign the instruments for easier field maintenance. Tool kits were sent to the field by the company, along with pamphlets outlining operational instructions.[20]

Teams like this one carried with them telegraphs for tactical use in light wagons, along with reels, insulated and non-insulated wire and lance poles. The non-insulated was mainly for semipermanent, overhead lines, and the insulated was usually used in emergencies and could be laid along fences or on the ground.

The major problem with the Beardslee was that its dial would often unpredictably produce an erroneous letter at the distant station, rendering many messages unintelligible. This deficiency prompted Myer to again redesign the Beardslee, adding keys and sounders. This, of course, entailed the procurement of skilled Morse operators (which the original Beardslee did not), leading to Myer's relief, and marking the end to Signal Corps responsibility for telegraphy during the Civil War. However, despite the shortcomings of the Beardslee, ". . . Myer's original concept of rugged, front-line, portable electric communication that an ordinary soldier could operate was certainly an innovation in the U.S. Army."[21]

From this overview of signal operations during the Civil War, certain conclusions may be drawn with regard to the signal logistics system. Firstly, both the Federal and Confederate Signal Corps were new branches of the service and thus suffered from lack of experienced staffs and proven procedures. The Confederate Signal Corps, was, as were all the Confederate forces, constrained severely by reduced manufacturing capability and gradually dwindling resources. Secondly, because of the small size of the Federal Signal Corps, procurement and acquisition were usually handled personally by the Chief Signal Officer. Colonel Myer's tireless advocacy of his ideas, and the Signal Corps itself, helped establish the Corps as an important branch of the service; but it also caused friction in the War Department and cost Myer his position. Lastly, maintenance of signal equipment in the field was not particularly difficult, but depended greatly on the supplies (procured by the Office of Chief Signal Officer) available with the field army.

The shortcomings of signal logistics during the Civil War, occurring in the procurement, acquisition, supply, and maintenance areas were serious at the time, and possibly rendered signal communications less effective than they could have been. The overall performance of the Corps, however, certainly improved command and control during the Civil War, and established the Signal Corps as an indispensable arm of the service.

ENDNOTES

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8. Brown, p.385.
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20. Scheips, Vol I, p.34.
21. Scheips, Vol I, p.2.

Capt. Fay is an assistant professor of military science at the University of Colorado. She has a B.A. in political science from the University of Connecticut and an M.A. from Boston University. Her military education includes Signal Officer Basic Course and Signal Officer Advanced Course.