Record Traffic From The Past

The flying telegraph

By Capt. George C. Matoy

War has always brought about technological innovations and the Civil War was no exception. But none was to so revolutionize the course of battles as the employment of the electric telegraph by armies in the field. The electric telegraph provided the commander a means of summoning reserves, directing artillery, coordinating widely separated troop movements and requesting supplies all from one location.

The history of the Signal Corps and the Union Army's telegraph service is a story of two personalities, their rivalries, a confederate general, Comanche Indians and the postponement of the development and effective employment of tactical communications until after the Civil War.

The growth of the Signal Corps and the development of combat communications in the US Army are inseparably linked to the career of Albert Myer, the "father" of the Signal Corps. Myer graduated from Hobart College (1847), Geneva, New York and Buffalo Medical College (1851); he entered the Army as an assistant surgeon in 1854 and was posted to duty in the southwest. Myer, inspired by the Comanche Indian lance signaling system, developed a flag system of military signaling called wigwag and an Army evaluation board in 1859 found Myer's flag system applicable to the needs of the Army. The system, in fact, was destined to be the principal means of field communications for both the Union and Confederate Signal Corps throughout the Civil War.

On 21 June 1860, Congress authorized the addition of one signal officer to the Army staff (at the rank of major) and appropriated $2,000 for the purchase of signal equipment. On 27 June 1860, Myer became the Army's first signal officer, a post Congress created as a reward for his accomplishments. Myer was charged with the supervision of "all signal duty and of all books, papers and apparatus connected therewith." He was called to Washington on 17 July 1861 to organize and train signalmen for the Union Armies. Following his arrival, Myer wrote a letter to Secretary of War Simon Cameron stating his intentions in regards to the electric telegraph. Myer cited as his precedent the Congressional act creating his post and giving him jurisdiction over *all* signal functions and apparatus:

> Under this law I am entitled to the general charge of the telegraph duty of the Army, whether such signal duty is performed by means of signals transmitted by electricity or by aerial signals.
>
> A practical knowledge of electric telegraphy and a conviction of its utility in military operations was the leading inducement to my acceptance of my position.
>
> I would respectfully suggest that such orders may issue as will place me in control of this duty and secure to me the facilities for its proper discharge.

The letter drew no formal response from Secretary Cameron.

The idea of employing the electric telegraph to the needs of troops in the field was not new. Several European powers had experimented with the telegraph during the 1850s. The Crimean War saw the limited use of military telegraphy, the capabilities and potentials impressing the US Army observer George B. McClellan. The telegraph likewise assisted the British army in quelling the Sepoy rebellion of 1857-1858 in India.

Myer envisioned a unique role in the *tactical* employment of "flying" field telegraph trains. His system advocated the control from a central command post, of artillery fires and the movement of troops using the electric telegraph. In a letter dated 6 August 1861, he sought permission from Secretary Cameron for his proposal, asking "to organize a telegraphic and signal train to accompany the Army on the march." Signal supplies and equipment were to be transported in light wagons, "carefully prepared, packed, numbered and arranged for instant use." Myer wanted "four flying field telegraphs" to be carried in the train. There the matter rested until the War Department could study Myer's plan.

On 17 August 1861 Assistant Secretary of War Thomas A. Scott reluctantly authorized Maj. Myer to purchase "a small telegraphic train" for experimental purposes.

While Myer was pushing his project through the War Department, a civilian telegraph engineer, Henry I. Rogers of New York, demonstrated field telegraph equipment before official observers in hopes of its being adopted by the military. Rogers hailed his "newly invented telegraphic cordage or insulated line, for field operations," which could be deployed by

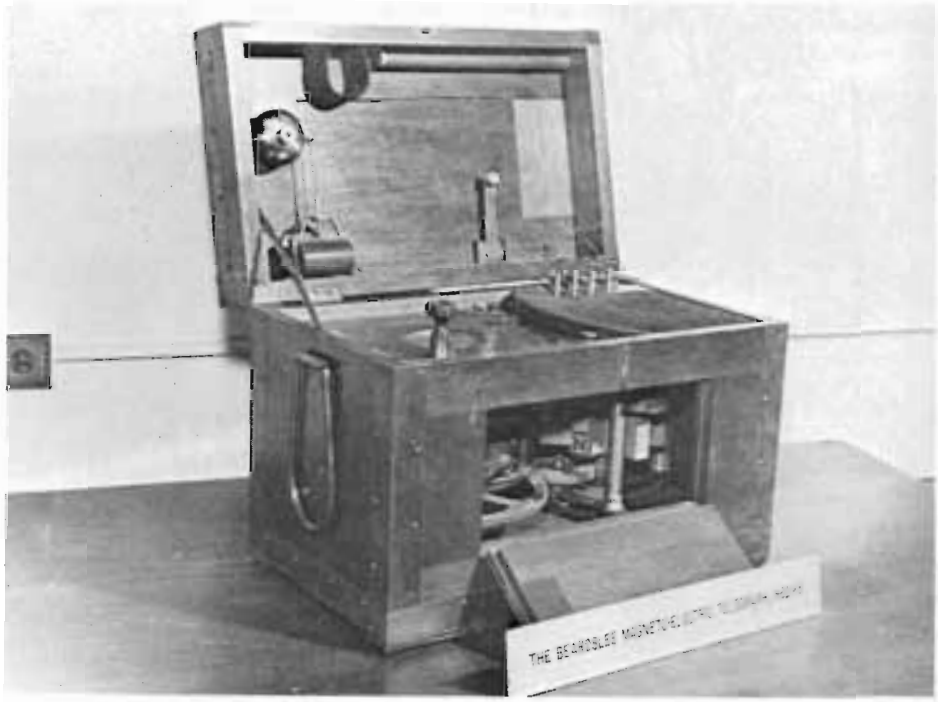
The linesman to the far left in this flying telegraph team is using a crowbar to open holes to receive lance poles. The wagon contains batteries and instruments. The wire — probably bare copper since it is being strung on insulated poles — is being run out from a reel carried by two men.

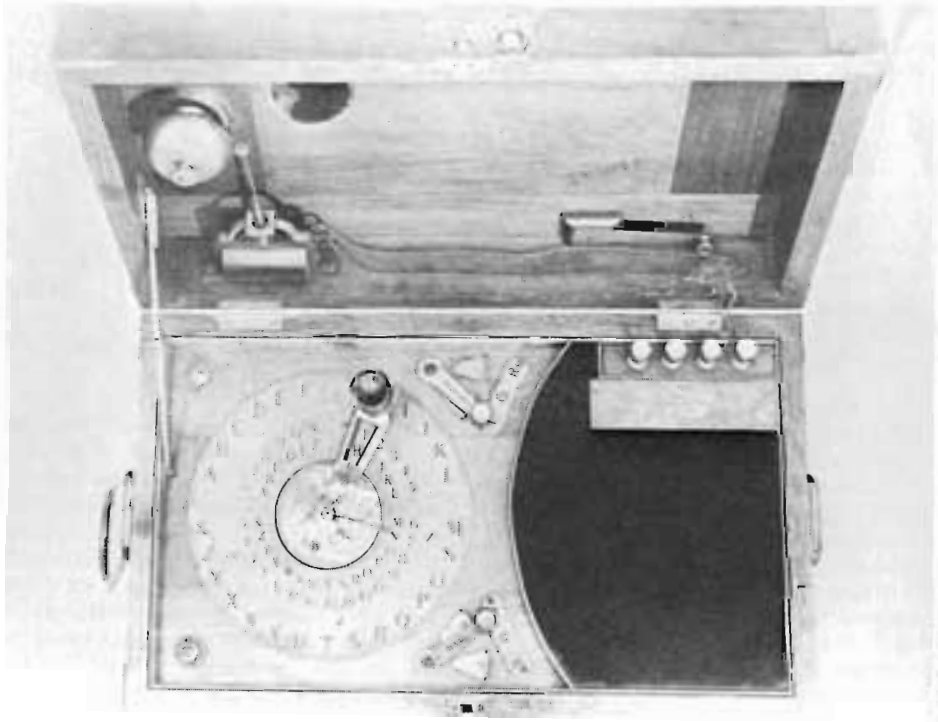
troops from portable reels at a rapid rate across all types of terrain. The field trial in June 1861 further established that "the heaviest artillery may run over the Rogers' cordage without damaging its effectiveness in the least." Myer was extremely interested in Rogers' experiment and in August personally met with the technical expert. The two men began to develop the "flying" signal telegraph train for the Army.

Myer stressed the importance of portability and ease of operation and maintenanee by soldiers unskilled in telegraphy; Rogers was left with the technical details of fabricating such a system. Rogers integrated a dial telegraph instrument of his own design with portable galvanic batteries for use in the field. Two light, two-wheeled wagons were employed to transport the system and to serve as the field telegraph stations. This experimental signal train was completed at a cost of $1,600 in December 1861. With the delivery in January 1862 of the train to the Signal Camp of Instruction at Red Hill, Georgetown, D.C., the initial development ended.

While Myer and Rogers were involved in solving their technical problems during late 1861, a potential crisis was developing. At the start of the Civil War, the War Department asked the American Telegraph Company and the Western Union Telegraph Company to provide military communications in the East. The former company had already established a telegraph system along the eastern seaboard and Western Union was extending a system through the Allegheny Mountains westward. On 19 April 1861, after news of Fort Sumter reached Washington, the Lincoln administration embarked upon a program whose goal was the integration of the strategic communication needs of the widely separated Federal armies and departments using the existing commercial telegraph lines.

The US Military Telegraph Corps was officially organized on 25 February 1862 to facilitate this process by order of the new Secretary of War, Edwin M. Stanton, himself a former director of the Atlantic and Ohio Telegraph Company. Anson Stager, general superintendent of Western Union and a war-time colonel by direct commission headed the new organization and was appointed to oversee the operation of all military telegraph lines. Edward S. Sanford,





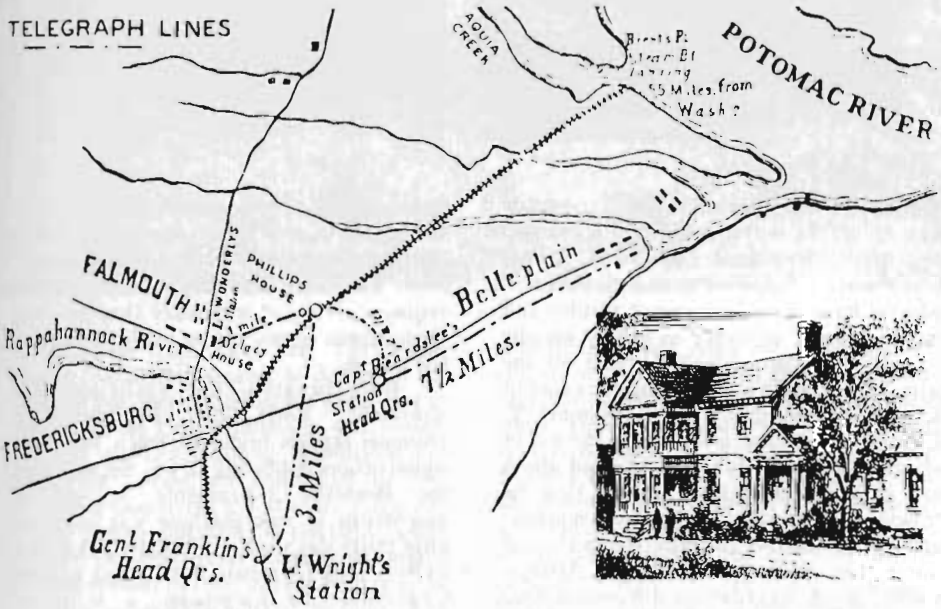
(Right) The Beardslee Magneto-Electric Telegraph performed successfully at Fredericksburg — a success, unfortunately, that was short-lived. Ultimately, the system failed repeatedly and by June 1863 the instruments were almost totally abandoned. (Right, below) The face of the Beardslee: by hand-cranking, a current was generated by the magneto providing the pulses necessary to move the indicator needle to the desired letter or number on the telegraph dial.

president of American Telegraph, assumed the post of Chief of Ciphers and military dispatches. Throughout the war, the US Military Telegraph Corps remained a semi-official organization of the Quartermaster Department, which employed civilian operators answerable to no one but the secretary of war and jealously sought to control all military telegraphic functions and equipment. This then was the potential for conflict between the emerging Army Signal Corps and the US Military Telegraph Corps.

The Signal Corps was concerned for the most part with its own affairs. In February 1862, a board of signal officers observed trials of the Rogers telegraph train at Georgetown. Their report to Myer was for the most part favorable, but expressed concern over several problems, significantly the difficulties they anticipated in field transport and maintenance of the heavy galvanic batteries powering the system. Concerned over these objections, Myer was uncertain as to how the War Department would receive the mixed results of the experiments. Requests for appropriations had been flatly disapproved and now he was finding it difficult "to induce a wise or even careful consideration of the subject" of telegraph trains in Stanton's tightly controlled department. Myer was fortunate to have as his only supporter Maj. Gen. George B. McClellan, commanding the Army of the Potomac. McClellan, recalling his impression of military telegraphy in the Crimean, gave orders authorizing the work of Myer.

With McClellan's support Myer put Rogers to work solving the problems cited in the signal officers' report regarding the power source. Rogers contacted George W. Beardslee of New York City. Beardslee was the inventor of a magneto-electric generator patented in 1859. Beardslee had been commercially manufacturing his magneto machines for several years at College Point, Long Island, with financial backing provided by the New York firm of Poppenhausen and Konig. Rogers reported to Myer on 23 March 1862 that after collaborating with Beardslee, he had "successfully applied to the train at the signal camp, the magneto-electric machine to work the letter indicating telegraph, thus eliminating the galvanic battery and

(Far left) Brig. Gen. Albert J. Myer, who was the Chief Signal Officer for the US Army, entered into a conflict of "roles and missions" with Anson Stager (left), head of the US Military Telegraph Corps during the Civil War. (Left, below) When Burnside faced Lee before Fredericksburg on 13 Dec. 1862, telegraph lines were rapidly extended from general headquarters to link the extreme right and left of the Army of the Potomac (one mile to the right, three to the left). A third line was run the seven and one-half miles to the Army's logistical base at Belle Plain.



rendering the equipment more simple, portable and efficient in the field." The objections raised to battery power seemed to be solved with the Beardslee magneto.

Believing his dial telegraph equipment could be made more compact and portable for field use, Rogers sought to encase it together with its power source in a single unit. The result of further consultation and development with Beardslee was the self-contained "Beardslee United States Magneto-Electric Signal Telegraph," emboding the desired characteristics. By hand-cranking, a current was generated by the magneto providing the pulses necessary to move the indicator needle to the desired letter or number on the telegraph dial. Thus, entire messages could be transmitted, relying solely upon manual power furnished by the operator.

In April 1862, as signalmen were preparing the experimental train for field service with the Army of the Potomac on the James Peninsula, George Beardslee arrived in Washington with two of the new magneto-electric telegraph instruments. In May, following a demonstration for President Lincoln, the units were shipped to Myer at McClellan's field headquarters. Following field tests conducted on 7 May, Myer wrote, "Although I have not sufficiently tested the instrument to be perfectly assured of its strength and reliability, it appears to me so far superior in requisites for a military telegraph, that I would like to have with this Army a portable lance line equipped with these instruments and have no doubt that on many occasions such a line might be used with valuable results."

During the Peninsular Campaign of 1862 the magneto-electric telegraph instrument saw satisfactory if rather limited service. Interestingly enough, it was during this shakedown service that the Beardslee telegraph was used by T. S. C. Lowe in conjunction with aerial observations from fixed balloons. McClellan had authorized a joint venture of the Signal and Balloon Corps and signalmen improvised a numerical short-hand code to facilitate rapid transmission of telegraph messages from aloft. Telegraph operators were assigned to Lowe on a temporary status as needed for his ascents.

Impressed by the success of the Beardslee telegraph during the Peninsular Campaign and its future potential, McClellan approved Myer's request for two additional telegraph trains on 21 July 1862. Aside from the equipment regularly found in each train, they were to be equipped with five miles of vulcanized rubber-insulated wire; 200 lances to be used as field telegraph poles; two wagons, each equipped with a Beardslee telegraph instrument; reels and carriers for wire; and grounding rods. Also furnished were tools for splicing and repairs at total cost to the government of $2,500 per train. The trains were assembled at Beardslee's factory on Long Island through the summer of 1862. By mid-September the two telegraphic signal trains were at last complete and awaiting delivery.

Rogers proposed that Frederick E. Beardslee, the son of the inventor, accompany the trains to the field with the Army of the Potomac since the latter was thoroughly familiar with the instruments and their operation and capable of making field repairs. Anticipating difficulties with the young Beardslee's civilian status, Rogers

(Left) US Military Telegraph operators at HQs Army of the Potomac, July 1863. (Below) Gen. Myer (with beard) poses with two of his officers in front of his headquarters. (Right) A Civil War wire stringing team at work.

requested that Myer obtain a military commission for him, thus giving Beardslee authority to supervise the telegraph trains. This Myer did and on 19 November 1862 Frederick Beardslee was commissioned a second lieutenant, Signal Corps. As a lieutenant and later as a brevet captain, Beardslee served with distinction, mustering out of Federal service on 12 August 1865.

During October 1862 the new signal trains were to receive the first crucial tests of their effectiveness under battlefield conditions with the Army of the Potomac in Maryland. The Army, shaking off the lethargy which had immobilized it since Antietam, moved against Lee's Army of Northern Virginia. Myer's flying telegraph trains went with it. The signal telegraph was used tactically for the first time on the battlefield when General Burnside faced Lee before Fredericksburg on 13 December 1862. Under Frederick Beardslee's supervision, telegraph lines were rapidly extended from general headquarters to link the extreme right and left of the Army of the Potomac (distances of one and three miles, respectively). A third line was run the seven and one-half miles to the Army's logistical base at Belle Plain. The electric telegraph performed throughout the battle, sometimes under fire. As smoke and fog settled over the battlefield obscuring flag signals, performance of the telegraph became vital.

During the Fredericksburg Campaign, the only real problem encountered by the Signal Corps telegraphers was repeated damage to the wires, sometimes accidental but often intentional. One signal officer complained, "Teamsters and soldiers in general have occasioned much trouble and inconvenience, in order to satisfy an idle curiosity, by cutting and carrying off the wire." Once, when searching for the cause of a repeated disruption, Capt. Samuel T. Cushing discovered a soldier in the act of severing the wire. When questioned about his motive, the soldier replied that he "quessed it was some rebel infernal machine and he was cutting off little pieces to send home for curiosities, like the Atlantic Cable." Such depredations diminished once the troops were told the purpose of the "string." Labels reading, "Don't Cut! Signal Telegraph," were attached to the lines and cavalry patrols were assigned to guard against vandalism. The number of volunteers performing these patrols increased among skulkers in direct proportion to the activity of battle and the duty became increasingly popular.

Myer rode a crest of success after the performance of the signal telegraph at Fredericksburg. He now had proof that the system was an instrument of tactical control. Myer recommended that fifteen additional flying signal trains be purchased from Poppenhausen and Konig for use with all Union armies in field. Surprisingly, the recommendation was approved by Secretary of War Stanton on 22 December 1862. A further cause for satisfaction occurred when Congress passed the Sundry Civil Act of 3 March 1863. With this legislation, the US Army Signal Corps was legitimized. Aside from outlining the organization in detail of the Signal Corps, it promoted the Chief Signal Officer to colonel's rank. Optimistic, Myer was certain that the new law gave his requests a ring of legitimacy that the War Department might not so readily ignore in the future.

Unfortunately his optimism was shortlived. Soon after Fredericksburg ominous reports began to reach the chief signal officer indicating all was not well with the Beardslee instruments. A loss in magnetism in one machine was reported after thirty day's use, necessitating its return to New York for repair. With spring and the Chancellorsville Campaign, a series of misfortunes beset the Signal Corps and caused the dismal failure of the field telegraph trains.

Moving out of its winter quarters at Falmouth in April 1863, the Army of the Potomac signal telegraph detachments were ordered to establish and maintain electrical communications between General Hooker's advance elements and units remaining opposite Fredericksburg to keep Lee's Army under surveillance. Telegraph lines were no sooner extended from Banks' Ford near Fredericksburg to US Ford on the Rappahannock (a distance of nine miles), than lightning struck one of the flying telegraph stations, demagnetizing the Beardslee instrument and rendering the line inoperative. Compounding the problem was faulty wire and insulation which had

deteriorated from hard use. The Signal Corps found itself unable to deal with the massive volumes of dispatches being sent as the battle of Chancellorsville was joined. Captain Samuel Cushing, humiliated but desperate, surrendered control of the field telegraph lines to the US Military Telegraph Corps civilian operators in the field. Aided by their portable Morse instruments and the superior power of their storage batteries, the civilians successfully worked the lines. Here was evidence of a clear duplication of effort, a situation becoming intolerable to both sides. The Military Telegraph Corps had adopted the techniques of the Signal Corps carrying its batteries, field wire and Morse keys in converted ambulances. Tension began to mount between Myer and Stager.

In his after-action report Cushing blamed the Signal Corps failure at Chancellorsville on worn wire and the inexperience of signal telegraph operators at the start of the campaign. However, his explanation could not disguise the growing evidence that the Beardslee field telegraph was inferior to the Morse keys and sounder used by the Military Telegraph Corps in terms of speed, accuracy and range of transmission. Myer and the Signal Corps had, in short, gambled on the magneto-electric telegraph system and lost.

The enthusiasm for the Beardslee instruments within the Signal Corps was gone by June 1863. After only seven months' use, six sets were reported disabled and the aggravation among operators at the high rate of equipment failure was compounded by the necessity of continually returning disabled sets to New York for repair and adjustment. Field telegraph service became intermittent at best. Myer refused to openly admit defeat despite the extensive list of complaints regarding the flying telegraph. Instead he mounted a counterattack.

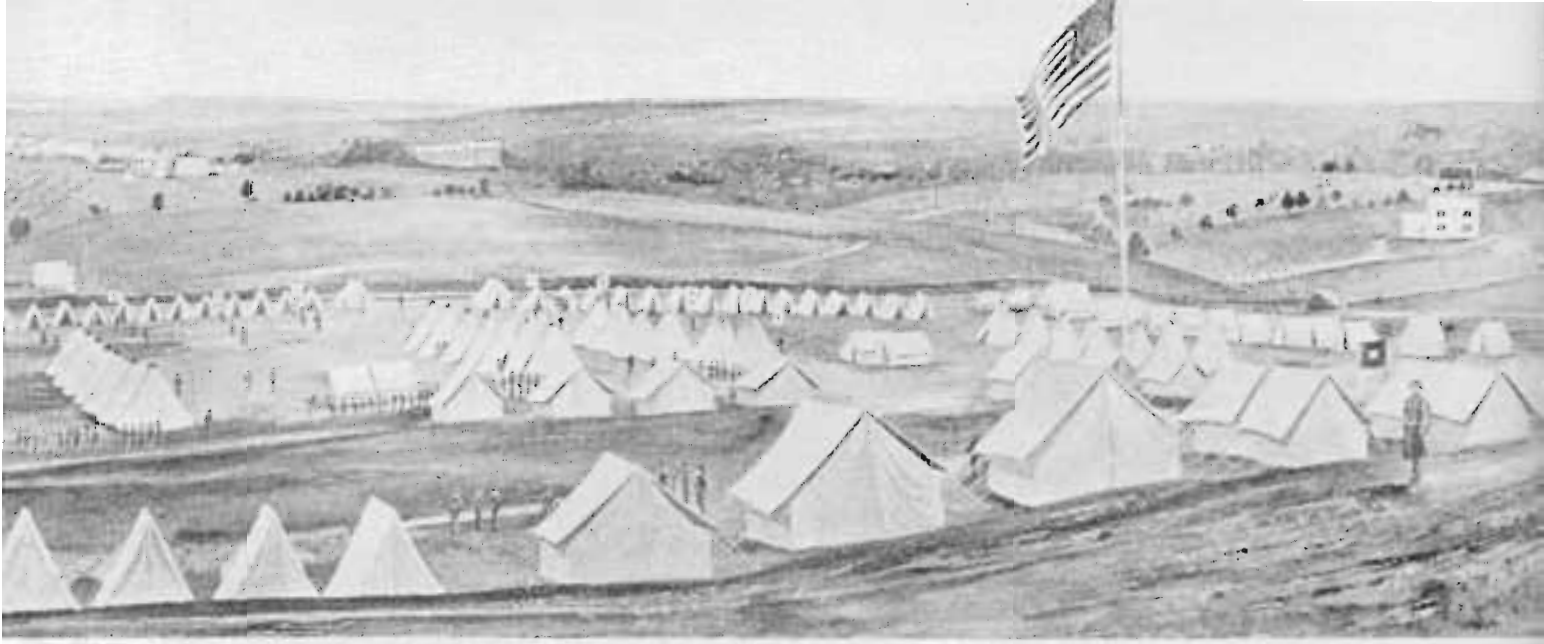
Myer again turned to George Beardslee and requested he design for the Signal Corps a sounder device to be operated using a code, in much the same manner as the Morse sounder thus allowing him to compete with the Military Telegraph Corps.

To use the Beardslee sounder, the Army Signal Corps would have to enlist trained Morse operators. It thus became necessary to raid the roster of the Military Telegraph Corps! Seeking this end, Myer solicited skilled telegraph operators by advertising in the *Army and Navy Official Gazette* during September 1863. Myer hoped that the lure of military rank, increased pay and pension eligibility as a member of the Army Signal Corps would induce civilian operators to defect from the Military Telegraph Corps.

The opposing camps were fortified for the fight to come. Fearing the competitiveness and increasing power enjoyed by the Military Telegraph Corps since Chancellorsville, Myer issued a general circular to his officers on September 18, 1863. This document warned, "The attempt seems to be making simultaneously in the different departments to take the signal telegraph lines, and in some instances the wire and instruments, from the control of the proper officers of the Signal Corps, for the purpose of throwing the management into the hands of the American Telegraph Company. *This is injurious to the Corps and is an interference with a part of their legitimate duties.*" Myer urged his officers to assert their "right" to their commanding generals to conduct field telegraph activities.

The plan to enlist Morse operators and the general circular elicited a strong protest from Superintendent Stager of the Military Telegraph Corps. Stager, on 27 October 1863, wrote the Secretary of War that:

> Two distinct organizations, employing the same machinery, the same class of experts and operating in the same Military Department cannot be conducted without clashing and confusion, nor without doubling the expense necessary for the performance of the telegraphic service. I, therefore, respectfully recommend that the



A "Signal Camp of Instruction," Georgetown, D.C., May 1864.

management of all field and military electric telegraphs be confined to the organization known as the United States Military Telegraph Department, or that that department be abolished and whole business placed under the control of the Signal Corps.

Myer and Stager entered into a conflict of "roles and missions" strongly resembling the interservice rivalries of a later day. Myer felt he should be responsible for "tactical" or battlefield communication and Stager's organization should operate in the realm of "strategic" communications. The clash became increasingly noisy. Finally Secretary Stanton summoned Myer to his office and demanded an explanation of his recent actions. The outcome was predictable and on 10 November 1863, Myer was relieved from command of the Signal Corps and sent on holding orders to Cairo, Illinois. His career staked on developing tactical field communications, the action came as a crushing blow. The Signal Corps, now under Maj. William Nicodemus was ordered to surrender all its telegraphic equipment to Stager and was limited to visual signals. The Beardslee Telegraphic equipment which Myer had adopted and employed in his "Flying Telegraph Train" was discarded, although the insulated field wire continued to be used.

The Federal Military Telegraph System reported direct to the Secretary of War and the military commanders, including Grant, had no jurisdiction over it. The service employed approximately 12,000 civilian telegraphers; strung approximately 15,000 miles of wire; and during the 12 months, starting 1 July 1862, averaged 3,300 messages a day. Its code was never compromised.

Each organization continued to operate within its designated sphere for the duration of the war. The Military Telegraph Corps organized its field capabilities around the concepts of portability and speed pioneered by the Signal Corps. Soon wire was being deployed from the backs of mules and galvanic battery wagons were attached to every division, corps and Army headquarters in the field by the spring of 1864.

The telegraph as envisioned by Myer was never used again, as a portable system providing tactical control on the battlefield. Except for its moment of glory at Fredericksburg, the field telegraph was used throughout the war simply for logistical and strategic communications with Washington. The realization of Myer's vision would have to await development in the postwar period, predicated on a revolution in the thinking of commanders regarding the value of electrical field communications.

Following his relief, Myer became Chief Signal Officer in Canby's command and arranged the terms of surrender for Fort Gains. Secretary Stanton then relieved him of command when his appointment expired on 4 July 1864. His appointment was revoked 21 July 1864 and he reverted to his permanent grade of major.

The end of the war healed many wounds caused by the crisis over the telegraph. The US Military Telegraph Corps was disbanded in 1865 and its civilian operators returned to their jobs with the Western Union and American Telegraph Companies. On 28 July 1866 an act of Congress restored Myer to command of the reorganized Army Signal Corps with the rank of colonel. The reorganized Army Signal Corps was ironically given control over all military telegraph and communications functions. The wartime feud between Myer and Stager abated after 1865 and Stager returned to Western Union. Both men became conciliatory once their personal empire-building led them down separate paths. In a letter to Stager in November 1867, Myer made peace with the General Superintendent of Western Union. Myer wrote:

> . . . I shall have some interesting questions in telegraph to solve and I shall wish to avail myself of the skill of your experience . . . My department will be I think all I could wish it and if another war comes, we shall try to show what the Corps with light lines and good telegraphers can do.

The year 1867 witnessed the demise of the Beardslee Magneto-Electric Company. The firm had lingered on after the war hoping to gain a foothold in the commercial telegraph industry, but its close association with Myer and military contracts all but ruined the firm once the magneto-electric telegraph was abandoned by order of Secretary Stanton in 1863.

On 16 June 1880, Myer was breveted a brigadier general, shortly before his death on 24 August 1880, for action at Hanover Court House, Malvern Hill and war service, being particularly cited for the work of his signalmen at Allatoona, Georgia. Meanwhile, he had done significant work in the field of meteorology and had earned the nickname "Old Probabilities" for his persistent and scientific approach to technical problems.

The American Civil War saw the first use of a field telegraph system and was the first war in which the electrical telegraph was used extensively. The US Signal Corps, established 21 June 1860 under Myer, was the first corps of officers and men in any Army whose sole mission was communications. Another "first" was the use of air-to-ground telegraph.

Capt. Matoy, who earned his commission through ROTC at New Mexico Military Institute, is chief of the Training Support Division in the Officers Dept. in the Directorate of Training Developments at Ft. Gordon, GA.