

REPORT

OF THE

CHIEF SIGNAL OFFICER

TO

THE SECRETARY OF WAR,

FOR

THE YEAR 1869.

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Annual Report of the Chief Signal Officer, U.S. Army Signal Corps

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REPORT
OF
THE CHIEF SIGNAL OFFICER.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., October 20, 1869.

SIR: The general instruction and supply of the army for some of the duties of the signal service, referred to in the last annual report, has continued under the supervision of this office during the past year. The end had in view has been to diffuse such information, and to so distribute apparatus and equipments, that ultimately each separate command or company shall have within itself the knowledge and the means to avail itself of telegraphic communication by modes of sign language, common to all, in any necessity or danger to happen in the duties of the army.

It has been the part of this office to indicate the course of instruction, to furnish the necessary supplies and equipments, and to secure the temporary organization, tuition, and services of a number of qualified officers and men to properly carry out the one, and to distribute and care for the other. It has not been contemplated to render every officer of the army an expert signal officer; but it has been a constant purpose to so arrange, that no officer of the army need be otherwise than willfully without so much knowledge of the signal service as the duties of his command are likely to call for; and to so provide, if disaster should come, ignorance may not be justly pleaded by any in extenuation of a neglect of duty. So little an acquaintance with the simpler forms of the signal service as will permit intelligent men to communicate words whenever in sight of each other, or in telescopic view, at a distance of, say, five miles, is so easily attained and preserved that the Chief Signal Officer has regarded this much of skill as readily to be made common in the army, and has considered some practical knowledge of the subject to be as properly expected of any officer as that of any other duty. A little knowledge of a part of the signal service, such as can be had by every officer, and even selected enlisted men, may on any day save life in the commands in which they are serving. It may insure the success of a campaign, or save the United States from loss of valuable property. It is useful in an hundred ways which suggest themselves to those who possess it. The experience of the past year has confirmed these views. The practice has been had without difficulty at the posts wherever it has been properly taught. The execution of the prescribed drills will retain it in recollection. To the reasons which led to the recommendations on the part of the Chief Signal Officer of that plan of instruction of the army, now in part carried out, has been added during the past year additional cogency in the formal adoption by the navy of the army plans for aerial and electric telegraphy, and the institution of the signal service of the navy by the Navy Department, with an organization of especially qualified officers, and a plan of instruction to be general and similar in effect to that existing in the army. The propriety of carrying to success such plans that our forces on land shall be

so prepared that they may, at any time, supplement their efforts by the aid of the naval forces afloat in their vicinity, or in their turn aid the actions undertaken by the navy—each thus increasing its effectiveness by the intelligent co-operation of the other—is evident. Nor, when it is considered that the communication proposed amounts, in fact, to a slow conversation in words, in which messages of any import may be conveyed, and may be used to prevent threatened disaster to naval vessels on our coast in storms, or to tell to any vessel near them the dangers of the smallest detachment exposed on land, will it be deemed less necessary to practice the modes of conducting it in either service, in peace than in war. The Chief Signal Officer of the army has not been willing to fail to recommend this practice. It has had the approval of the highest authorities in both services, and there are very few in command in either, now willing to take the responsibility of neglecting to attempt to carry it out.

At the date of the last annual report of the Chief Signal Officer of the army to the Secretary of War, a class of selected officers detailed on the recommendation of the Chief Signal Officer, to be instructors and property officers, one for each of the geographical military departments, was under the necessary tuition and drill at Fort Greble, Maryland. A certain number of enlisted men were at the same time under practice to serve with these officers as assistants. The course of instruction heretofore described to the department was rigidly carried out in the case of these officers, and no one was reported as qualified to be an instructor, until he was able to communicate by visual signals, in words, by day and at night, at a distance of fifteen miles, to go accurately through the forms of drills established, to maneuver the field telegraph train, to manipulate complicated telegraphic instruments, and to transmit and receive messages over electric lines by sound. As the course of study and practice was completed, the assignment of one officer as instructor, with two enlisted men to each of the several geographical military departments, was recommended; and each officer assigned, ordered by the War Department to act under special instructions from this office, was furnished with full directions in writing as to the course to be pursued, and with such numbers of sets of signal equipments, telescopes and glasses as the distribution of troops in the departments to which they were assigned required for their supply. The officers designated as acting signal officers proceeding under a general form of order, and with letters from the War Department, of which specimens (papers A and B) are herewith, upon their duties, found everywhere an interest in the progress of the signal service; the officers of the companies and posts availing themselves of the opportunity to add to their military knowledge, a knowledge of this branch, in proportion to their advantages, and as their duties have been or are likely to be active.

The plan of instruction, and the provision made for it, have demonstrated themselves sufficiently effective. They accomplish the work, so far as it has been carried out, with an organization less in number, and at an expense to the United States less in amount than that with which any undertaking of similar extent has been attempted. The full success of the plan has been impeded somewhat by various movements and delays, in part rendered necessary by the reduction of the army occurring in March last; and sometimes, it is possible, resulting from incorrect conceptions of the design of instruction, as originally approved by the department, or the satisfactory manner in which the work had progressed under it. Some months of experience and the concurrent actions of general command departments, under the authority of the General of the Army, have, however, so demonstrated the propriety of the plan sought to be pur-

sued, that the distribution of acting signal officers for departments is, at the date of this report, very nearly identical with that at first recommended. That those so serving have been in great part assigned for the duty by the department commanders from the number reported qualified, evidences the appreciation of the service in the army. The original recommendation was carefully considered. Tuition in any branch of duty is properly given, and the subject explained by those officers, only, who have been carefully taught themselves. The labor of one officer with two enlisted men is as little as it is possible to contemplate, as required for the duties of instruction and the care of property, in any department in which instruction is to be had at numerous posts, and so many posts are to be supplied. The care of both property and instruction, placed by law in this office, cannot be assured or such constant knowledge of the service had as will enable it to be wisely conducted or properly reported to the Secretary of War, or to the General of the Army, when occasion may require, with less than this assistance. It adds no permanent organization to the army of the United States. It improves for future usefulness the officers detailed upon it. No change of the extent or plan of instruction is now recommended. Instruction and supply have been had in the different geographical departments as exhibited in the memorandum of instruction and supply (paper C) herewith.

In submitting this memorandum the attention of the department is invited to an injustice inadvertently done those officers serving in military departments for which instructors are not provided, or where none are now on duty. Some knowledge of the signal service has come to be regarded among military and naval men as as necessary to be had as that of any other branch of military acquirement. Of officers to be selected for any occasion of special service, other things being equal, one skilled as a signalist would probably be chosen in preference to the ignorant. Without fault on their part, the officers of military departments without instructors find themselves inferior in tuition to those of contiguous departments, men not more energetic or more zealous of duty than they, and to serve in the same army with less chance of promotion, as compared with those more fortunate in this respect, and with less ability to avail themselves, for their commands, of a knowledge made common to others. It is but just that similar provision be made for each geographical department. The same process of reasoning exhibits the propriety of not limiting the instruction to the graduates of particular military schools to the exclusion of other officers.

The departments not provided with instructing officers are those of the Columbia, of Alaska, of the Lakes, and the first and fifth military districts; those in which instruction is not actively pursued are the departments of the East and of Louisiana.

The attention of the Navy Department was attracted early in the war of the rebellion to the advantages to accrue to the navy by the adoption of a signal service with an organization and modes of instruction similar to those in use in the army. The services of officers of the signal corps, detailed upon naval vessels, afforded a facility for communication not theretofore known, and which was found desirable. As early as 1861, an officer of the navy, now Commander S. P. Luce, was detailed at the request of the Navy Department, and with the authorization of the War Department, for instruction by the signal officer of the army. A course of practical instruction was adopted at the Naval Academy, then at Newport, and has been continued since with varying degrees of thoroughness. This course was greatly improved and extended, under the superintendence of Vice-Admiral D. D. Porter, at the Naval Academy removed to Annapolis. During the past year the subject of the sig-

nal service has received the especial attention of the Navy Department, and the result has been the designation of a naval chief signal officer and the formation for the signal service of the navy, which is to extend to all its vessels and divisions, of an organization for instruction, similar to that had in the army; the formal adoption of the manual of signals as a text-book in the navy, and of the use of the army modes and equipments for the purposes of communication. By the joint action of the War and Navy Departments, the duty has been devolved upon the chief signal officers of the respective services, to so provide that in all contingencies, hereafter, the communication between the land and naval forces shall be by modes similar in their use and known to the officers of both. By them also will be arranged the ciphers necessary to be used for secret communication between the two services, to be distributed to the officers entitled to receive them; and upon them will rest the duty of recommending to the proper authorities, from time to time, such improvement of the signal service, on land or at sea, as circumstances may make necessary. (Papers D and E.)

In furtherance of this plan and in compliance with a request of the Navy Department, a class of naval officers and officers of the marine corps has been under instruction at a school of telegraphs and signals at Fort Whipple, Virginia. These officers fitting to be acting signal officers of the navy, under the organization adopted, are qualified by tuition in the rigorous course adopted for instructors in the army, and are announced as competent, only after passing such tests as have been required of acting signal officers of the army. The report of Brevet Captain H. W. Howgate, acting signal officer, (paper F,) herewith, sets forth the course in detail and the names and rank of the officers who have been or are under instruction.

The formal and complete adoption by the Navy Department, and with the concurrence of the highest authorities of both services, of an organization and of plans which have had their origin in the army, under the direction of the War Department, cannot fail to be regarded with satisfaction. The co-operation so often to come from such a joint service cannot fail to add to the cordiality which has existed between the army and navy, by the fact that for purposes of mutual assistance and defense, the separate arms, thrown together by duty, will act as one.

The course of instruction in the duties of the signal service embracing the use of visual signals and field electric telegraphs adopted by the order of the War Department at the Military Academy at West Point, has been continued during the past year better systematized, in some respects, than in the year preceding, and with improved apparatus for practical illustration. The general course has been, as hitherto, under Brevet Lieutenant Colonel Michie, United States engineers, as instructor. The thorough practical tuition of a class of officers at Fort Greble, Maryland, to fit them to be instructors, has permitted one to be recommended, as had been the understanding, as acting signal officer to assist in the instruction of the cadets. Lieutenant J. E. Hosmer, acting signal officer, was recommended for that purpose, and after being assigned to duty at the academy, in February last, became assistant to the instructor in military signals and telegraphy, being at the same time on duty in the department of tactics. The academy has during the year been furnished, by this office, with a field telegraphic train, complete, and with the improved apparatus for the ordinary flag and torch signals. Forms of drill for the manual of flag and torch and for the maneuvers and use of the field telegraphic trains, have been placed in such form as to be regularly used in the instruction of classes, and have been practiced at the academy with good results. The cadets of the first and second classes

have acquired, under the course pursued, a fair proficiency in the service, and are well grounded in the principles of the different modes by which signals may be made.

The signal service drill, as given before the board of visitors to the Military Academy, at the annual examination in June last, and which embraced a drill of the field telegraph train, combined with lines of flag-signals, illustrating at once the erection of the telegraphic lines and the location of signal stations with flags, the transmission of messages in words, over both, by the cadets on duty; and finally at its close, the repacking and movement of the telegraphic train together with the recalling and breaking up of the signal stations which had been established some miles distant, elicited the commendation of the board at the time, and, as this office is informed, was made the subject of an especial mention in the board report to the honorable Secretary of War.

At the outlying encampment made by the cadets in August last, a temporary line of electric telegraph was erected by enlisted men, connecting the encampment with the post, at a distance of about five miles. This line was worked, after it had been erected, by cadets detailed for the purpose, and was constantly used for the transmission of messages.

The course at the academy will improve with longer experience and as it becomes more perfectly systematized. The best modes for the tuition and practice of classes are yet necessarily subjects for consideration. A regulation which shall place the course under the charge of an instructor, as a specialty, and which shall give proficiency in this branch, a value affecting the merit and general standing of the cadet, precisely as is given in other studies of the academic course, is desirable. The changes in a service so constantly developing as the signal service has been, has made it difficult hitherto to define exactly the lessons for classes. This difficulty is disappearing, and the course may be now arranged with as much of precision, perhaps, as for any other study. The study has continued to receive the favorable attention of the inspector of the academy, Brevet Major General Edmund Schriver, and of the superintendent, Brevet Brigadier General T. G. Piteber, with whom the Chief Signal Officer has conferred from time to time in reference to it.

Lieutenant Hosmer was relieved from duty at the academy July 18, 1869. His place as acting signal officer and assistant to the instructor has been supplied by Lieutenant J. P. Story, who discharges at the same time the duties of assistant professor of mathematics.

The course of instruction in the signal service at the Naval Academy, at Annapolis, has varied but little from that pursued in the preceding year. The want of an established signal service in the navy, and of instructors for this duty, fitted by the rigid course which has been found necessary in the army, has rendered it difficult hitherto to secure as thorough a course of tuition as has been desirable. It has been apt to vary with the varying information of the instructing officer in whose charge it might come.

The courses at the Military and Naval Academies should be studied under the same forms and regulations, in so far as is practicable; and proficiency in them should have a similar effect upon the general standing of the student at either. It has been the aim of this office, with the approval of the War and Navy Departments, to secure this uniformity. The recent establishment of the signal service of the navy and the preparation now making for its successful conduct by the thorough instruction at Fort Whipple, Virginia, in the modes insisted upon for acting signal officers of the army, of naval officers designed to be instructors, and of some in particular for service at the Naval Acad-

emy, will secure at once the perfection of the academic course and the practice of similar modes of tuition at the two academies. The co-operation assured by the regulations of the departments, which place the chief signal officers of the respective services in communication, will have an important bearing on the subject.

Within the few months past requests have been made at this office for the means of supply for instruction in some of the duties of the signal service for the artillery school of practice at Fortress Monroe, Virginia, and for the school of practice of engineers at Willetts Point, New York.

The schools of practice afford an opportunity for reaching officers there gathered for instruction and to be afterwards scattered throughout the service. It is respectfully recommended that the temporary services of a suitably instructed officer from those who have passed the full course of instruction and practice of acting signal officers, or of one designated from the school to be instructed, be authorized for each of the schools of practice, and that they be supplied with the apparatus and equipments necessary for such parts of the course as can properly be taught at either.

In the last annual report of this office, mention was made of the instruction, at the request of the Swedish government, of two officers designated by that government and authorized by the Secretary of War to be instructed in some portions of the signal service. In acknowledgment of this service the communication (paper G) was addressed to the State Department and the thanks of the Swedish government were courteously conveyed to this office by the Swedish minister near this government, acting under additional instructions.

The post of Fort Whipple, Virginia, has been maintained as a post of practice and instruction.

The duties of the signal service offer the widest field for continued experiment and improvement, while the often occurring need for the instruction of officers and enlisted men requires that the best forms of service and for drill and the best devices for apparatus be secured. The spread of the service from its general adoption by our land and naval forces necessitates a constant care that the forms to be furnished shall be as complete as they can be made and the apparatus proved by continual practical tests. The advances everywhere making in the science of military signaling and telegraphy, in the armies of foreign powers, and the mode in which it is pressed at schools of instruction set apart for the purpose, permit of no rest in the work of improvement in our own. For all the purposes of such experiment, drill, and practice, the little force stationed at Fort Whipple has offered valuable facilities, while it has served as the nucleus of a larger organization, to be developed at any time that threatened war may call for its extension. The results secured for the United States by its service have been, perhaps, equal in extent, with not more of expenditure than those which have followed the employment of the same number of men in any branch of military duty. The detachment has consisted of general service recruits, selected after examination. The number is proposed to be kept recruited to fifty, to permit of the drills of the field telegraphic train and to exhibit a specimen organization for the signal service. Each soldier of the force is instructed in the duties of field signaling, and when numbers permit, in electric telegraphy, as relates to the drill of the trains, and each is practiced with arms in the ordinary duties of the soldier. A force is thus secured, without additional cost, from which the army can be gradually supplied with skilled enlisted men, by details under

proper regulations, to different regiments or companies, if this is desirable, and which at the same time exemplifies for improvement, in time of peace, a form of corps organization such as would be needed in war.

In the present condition of the service in the army and navy its uses are important. The varied duties of the signal service, embracing those of aerial and electric telegraphy, of communication in cipher and with field telegraphic trains, with the complete and frequent drills both branches require, will probably at all times devolve, like that of any other service requiring special knowledge, upon a small number of thoroughly instructed officers with especially drilled enlisted men. These can devote their time to the speciality in all its different branches and to the perfection of the duty. For this purpose the post has proved its especial usefulness. The good effect of practice there is felt throughout both the army and navy. No improvement upon this plan suggests itself as at this time to be recommended; nor does any method now occur by which the necessary duty can be better rendered. It has been a cause of complaint on the part of the men that little hope of promotion has been offered them, and there has been no provision for the pay of those serving as non-commissioned officers. There is reason to hope these objections may be obviated. The detachment has been reduced, by details to departments, to twenty-five men, a number sufficient to permit of some parts of the course of instruction, but too small to allow it to be completed.

The post is well located for the purposes for which it is occupied, on the heights overlooking the valley of the Potomac, whence ranges for near and distant practice may be had, varying from five to thirty miles. The ground in the vicinity is suited for the drills of telegraphic trains and for experiments with electric lines erected and left standing. The post is now a school for the officers and men of both the land and naval service, and from the studies had here will be traced much of the progress to be made in this branch in the army and navy. The special duties had at Fort Whipple are those peculiar to the signal service. They have drills in the manual of the flag and torch, the trials of the field telegraph, and practice in the forms of inspection of field telegraphs and signal equipments. The experiments conducted have been for long range practice in signaling and the practical test of such portable telegraph lines as are used in the army. The report of Brevet Captain H. W. Howgate, acting signal officer, in reference to the naval officers under tuition, exhibits the course of instruction adopted.

The subject of field electric telegraph trains has continued to receive attention, the duties of this office requiring it to provide for their equipment and management. The experience of the past year, in which, for the first time, systematized experiment has been conducted, for long periods, with field lines, has demonstrated how easily organized telegraph trains may become a part of the equipment of an army, keeping up with its marches and as easily maneuvered as its artillery. Experiments with portable lines, kept standing for a period of some months, serve to show that it is entirely practicable, with officers and men well instructed, to connect commands by electric lines, to cost, after their erection, hardly more for their maintenance than the horses of couriers to carry messages over the same distance would require for their forage and the care of them. The lines can be very easily put in use.

A model section train has been constructed on the plans described in the last annual report of this office, all the parts of which are of the size and structure proposed for active service in the field in time of war. It is comparatively inexpensive in its cost. The style of its equipment

is based upon what experience in actual campaigns has shown to be necessities in the field. The lines carried by these trains, the modes of insulating them, the batteries, the instruments, the appliances, the ways of using them, have been devised to fit it, to accompany an army in its marches and battles.

The drills of telegraphic trains are those of military organizations, with systematized forms of command and execution. They require all the duties, to the final act of transmitting the messages, to be done by the officers and men serving with them. They have been similar to those described more at length in the last annual report from this office. The soldiers of the train are armed for its escort or for its defense.

It has been found practicable, with proper train organizations, to erect portable lines of telegraph at the rate of three miles an hour. The organization proposed for a full train, of which a section train is but a part, provides for the erection, simultaneously, of four lines of telegraph in as many different directions. The drill adopted for these trains can be used, increasing the number of men, for the erection of permanent lines, to follow the course of an army with a speed which, before its arrangement, had not been contemplated. The study on the part of this office has been to secure, in the equipment of the field telegraphic trains prepared under its direction, the simplest and cheapest forms by which to carry in the train itself all the articles needed for the quick establishment and use of the portable telegraphic lines, and to arrange, in the organization of the force to serve with the trains, the most rapid method of applying, with the smallest number of men, the articles so carried. The form is yet, and must continue to be, the subject of experiment and practice. Experiments have been made with the portable telegraphic lines, carried in the trains, to test the expense of working them, their weakness at any point, the accuracy with which they can be managed by officers and enlisted men, and the rate at which messages can be transmitted over them. These trials have been over lines ten miles in length, similar in all respects to those carried in the trains and erected in the manner prescribed for train lines. They have been left standing for six months. The results have been satisfactory as to the speed with which the lines could be established, their strength and durability, and their capacity for such uses as are likely to be needed in the field. (Paper H.)

Contemplating the results already obtained and the power field telegraphic trains, capable of rapid movement, will place in the hands of generals commanding, to have at once before them, by telegraphic report, the whole field of operation and to move their forces at the moment the motion may be most effective, it is considered advisable that experiments in this direction be continued with every facility that can be given.

The powers of the electric telegraph, as relates to their use in the army, are yet in the infancy of their application. There is no field in which study promises a better reward, and none in which it can be encouraged by the hope of more useful and ultimately more appreciated results.

In reviewing the duties of the year, the Chief Signal Officer finds cause for satisfaction in the general interest with which the service has been received throughout the army, its formal and extended adoption by the navy, and in the progress of improvement, the result of experiment and practice, in the modes of operation by either aerial or electric telegraphy, and in the manner of teaching them by regular drills and courses of instruction. The service, extending over a wide field in the army, has required but a trivial expense. It has been conducted by officers who, only temporarily upon it, have labored as zealously and as much for the interest of the United States as if they constituted a corps.

The total expenditure of this office, on account of the signal service, since the date of the last annual report, has been twelve thousand and ninety-six dollars and seventy-six cents.

A year ago the general knowledge of the duty had throughout the army was little and vague. Already this is so changed that the time is not far distant, probably, when acquaintance with the simpler signal codes will be common in both the army and navy. The plans so long contemplated by the department, and so steadily pressed, approach their consummation. The little hinderances and annoyances incident to an unaccustomed service, and more often the result of inadvertence than intention, are disappearing, with better conceptions of the duty and of the results to be expected from the plans in execution. The service has opened before it the way to a general application and a utility fully established.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

Brev. Brig. Gen. and Chief Signal Officer of the Army.

The ADJUTANT GENERAL of the Army.

A.

[Special Orders, No. 40—Extract.]

HEADQUARTERS OF THE ARMY, ADJUTANT GENERAL'S OFFICE,
Washington, February 17, 1869.

* * * * *

5. By direction of the Secretary of War, the following named officers, acting signal officers, are, upon the recommendation of the Chief Signal Officer, relieved from duty at the office of the Chief Signal Officer, and will each proceed, with two enlisted men of the Signal Detachment, with as little delay as is practicable, to the headquarters of the commands set opposite their respective names, and report to the general commanding for duty. The officers will receive special instructions from the Chief Signal Officer of the army.

The quartermasters' department will furnish the necessary transportation for the enlisted men.

* * * * *

By command of General Grant.

E. D. TOWNSEND,
Assistant Adjutant General.

B.

WAR DEPARTMENT, ADJUTANT GENERAL'S OFFICE,
Washington, February 19, 1869.

SIR: I have the honor to inclose herewith a copy of a Special Order from this office, directing First Lieutenant ——— to report to you for signal duty, and to inform you the Secretary of War desires that you will extend to him such facilities as may be in your power consistently with the interests of the public service.

The Chief Signal Officer of the army has recommended that the instruction be carried so far as will enable each post, and, if possible, each company, to have within itself the practice and the means for transmitting any simple message, on the ground that such knowledge will be always of benefit, and may, at some times, prevent disaster to troops otherwise cut off from communication.

Very respectfully, your obedient servant,

E. D. TOWNSEND,
Assistant Adjutant General.

The COMMANDING GENERAL, *Department of* ———.

Official copy, respectfully furnished for the information of the Chief Signal Officer of the army.

E. D. TOWNSEND,
Assistant Adjutant General.

C.

Memorandum of Instruction and Supply in Geographical Military Departments.

DEPARTMENT OF THE CUMBERLAND.

Captain F. H. Ross, twenty-fifth United States infantry, instructed under direction of this office as an acting signal officer, was, by paragraph 2, Special Orders No. 11, headquarters of the army, dated January 14, 1869, assigned to duty, with two instructed signalmen, as department instructor.

The course of instruction was interrupted and has been delayed by the reduction of the army and the changing of regiments, under the provisions of General Orders No. 16, headquarters of the army, dated March 11, 1869. The plan finally pursued has been for the instructor to visit each post, and to instruct all available officers.

Instruction has been given at two (2) posts to eight (8) officers and twelve (12) men. The officers at the post of Louisville are now under instruction.

DEPARTMENT OF THE COLUMBIA.

First Lieutenant William M. Wallace, eighth United States infantry, instructed under direction of this office as an acting signal officer, was, by paragraph 2, Special Orders No. 11, headquarters of the army, dated January 14, 1869, assigned to duty, with two instructed signalmen, as department instructor.

Before leaving this city under this order, he was, by Special Orders No. 66, headquarters of the army, dated March 22, 1869, in view of the reduction of the army, relieved from duty as acting signal officer, and ordered to join his regiment in the Department of the South. No provision has since been made for supplying an instructor for this department.

DEPARTMENT OF THE EAST.

Second Lieutenant A. H. Merrill, First United States Artillery, instructed under direction of this office as an acting signal officer, was, by paragraph 2, Special Orders No. 11, headquarters of the army, dated January 14, 1869, assigned to duty, with two (2) instructed signalmen, as department instructor.

The plan for instruction adopted was that the instructor should visit each post in person, and instruct all available officers. Instruction was interrupted to some extent by the reduction of the army, and was finally almost entirely discontinued by paragraph 7, Special Orders No. 99, headquarters Department of the East, dated May 14, 1869. Prior to this order instruction had been given at four (4) posts to eighteen (18) officers and twenty (20) enlisted men. The posts of Forts Hamilton and Wadsworth, New York Harbor, were permanently united by signal communication, and Fort Schuyler was enabled to communicate with the naval and revenue vessels in the harbor. This communication has proved practically useful in combining operations to prevent the escape of filibustering expeditions from points in the harbor and on the Sound.

DEPARTMENT OF THE SOUTH.

First Lieutenant R. P. Strong, Seventh United States Infantry, and brevet major United States Army, having been instructed under direction of this office as an acting signal officer, was, by paragraph 2, Special Orders No. 11, headquarters of the army, current series, assigned to duty, with two instructed signalmen, as department instructor.

The duties of the instructor were at first interrupted by the reduction of the army and the changing of regiments. At a later date a plan of having two instructors, (First Lieutenant William M. Wallace, United States Army, instructed at this office as an acting signal officer, being assigned to this duty by General A. H. Terry,) each to instruct one-half of the posts in the department, was put in execution. This plan was also interrupted before the instruction had been completed at the first posts at which it was begun, by Major Strong being relieved from signal duty by paragraphs 1 and 3 of General Orders No. 59, headquarters of the army, dated July 14, 1869; and the class under the instruction of Lieutenant Wallace was broken up by the detail of its officers and himself for other duty by the post commander.

Lieutenant Wallace has been recently assigned to duty as acting signal officer for the department by General Orders No. 73, current series, headquarters Department of the South.

The instruction at two (2) posts of seven (7) officers and twenty (20) enlisted men has been completed.

DEPARTMENT OF WASHINGTON.

First Lieutenant Robert Craig, Fourth United States Artillery, instructed under direction of this office as an acting signal officer, was, by paragraph 2, Special Orders No. 11, headquarters of the army, current series, assigned to duty, with two instructed signalmen, as department instructor.

The plan adopted in this department was for the instructor to visit each post and instruct all available officers. It was interrupted by the discontinuance of the department, under the provisions of General Orders No. 18, headquarters of the army, dated March 16, 1869, and by the relief of the instructor by paragraph 12, Special Orders No. 75, headquarters of the army, dated March 31, 1869. On the application of the commander of the post of Fort McHenry, Lieutenant Craig was subsequently ordered by the commanding officer Department of the East to complete the instruction of that post. Though not to be regarded as complete or conducted under guidance of this office, it has been made of practical benefit in artillery practice.

Instruction to some extent has been given at two (2) posts and to eighteen (18) officers and fourteen (14) enlisted men. Two (2) posts of the former department remain at which no instruction has been given—Sedgwick Barracks, in this city, and Fort Foote, on the Potomac, at each of which there is stationed a battery of artillery.

FIRST MILITARY DISTRICT.

First Lieutenant V. M. C. Silva, Twenty-first United States Infantry, instructed under the direction of this office, was, by paragraph 2, Special Orders No. 11, headquarters of the army, dated January 14, 1869, assigned to duty, with two (2) instructed signalmen, as district instructor. In view of the consolidation of regiments by General Orders No. 16, headquarters of the army, dated March 11, 1869, instruction was postponed by order of the commanding general, and has been since interrupted by the relief of Lieutenant Silva, at his own request, to avoid the operation of paragraph 4 of the same order.

FOURTH MILITARY DISTRICT.

Second Lieutenant Nat. Wolfe, Thirty-fourth United States Infantry, instructed under the direction of this office as an acting signal officer, was, by paragraph 2, Special Orders No. 11, headquarters of the army, dated January 14, 1869, assigned to duty, with two (2) instructed signalmen, as district instructor.

Instruction in this district was delayed by the consolidation and changes in regiments, and by the relief of the acting signal officer by General Orders No. 23, headquarters Fourth Military District, dated April 6, 1869, in pursuance of section 3 of paragraph 1, General Orders No. 17, headquarters of the army, dated March 15, 1869, that officer electing to be placed on "waiting orders."

Captain Thomas E. Rose, brevet lieutenant colonel United States Army, (supernumerary,) was, in General Orders No. 25, headquarters Fourth Military District, dated April 7, 1869, announced as acting signal officer and department instructor. The instruction of the various posts of the district has been pursued by Colonel Rose, with some unavoidable interruptions, since May 17, 1869, and has been given at three different posts to nine (9) officers and eighteen (18) enlisted men, and is still in progress.

DEPARTMENT OF DAKOTA.

First Lieutenant E. H. Totten, Thirty-fourth United States Infantry, instructed under direction of this office as an acting signal officer, was, by paragraph 5, Special Orders No. 40, headquarters of the army, dated February 17, 1869, assigned to duty, with two (2) instructed signalmen, as department instructor.

Instruction was delayed in this department in consequence of consolidation and changes of stations of regiments. The plan has been finally adopted of having the instructor instruct two (2) selected supernumerary officers to act as district instructors; these and the department instructor to be assigned, one to each of the three (3) districts of the department, and instruct the posts therein. Signal equipments were forwarded in advance to each post. This plan is now being pursued, and gives promise of success. Instruction has been given at three (3) posts, and five (5) officers and twelve (12) enlisted men have been instructed.

DEPARTMENT OF THE MISSOURI.

Captain S. C. Plummer, Twenty-sixth United States Infantry, instructed under the direction of this office as an acting signal officer, was, by paragraph 5, Special Orders No. 40, headquarters of the army, dated February 17, 1869, assigned to duty with two (2) instructed signalmen as instructor for the district of New Mexico.

The duty has been retarded by the delay in transportation of signal equipments, and the other duties required of the officers under instruction. Instruction has been given at three different posts, six (6) officers and ten (10) enlisted men being instructed. Captain Plummer, having been transferred to the Seventh Cavalry, was directed in paragraph 9, Special Orders No. 192, headquarters of the army, dated August 9, 1869, to report to the commanding officer of his regiment.

First Lieutenant Henry Jackson, Seventh United States Cavalry, (instructed under the direction of this office as an acting signal officer,) was, in General Orders No. 39, headquarters Department of the Missouri, dated August 18, 1869, announced as acting signal officer of the Department of the Missouri, in which department the district of New Mexico is included.

DEPARTMENT OF CALIFORNIA.

Second Lieutenant A. W. Preston, Eighth United States Cavalry, and brevet captain United States Army, (who had previously been instructed under the direction of this office as an acting signal officer,) was, in General Orders No. 35, headquarters Department of California, dated June 1, 1869, announced as acting signal officer and instructor for this department.

The plan adopted has been to have the department instructor visit each post and instruct all available officers, including adjutants of regiments and posts, except the posts in the vicinity of headquarters of the department from which officers were to report for instruction at department headquarters. The instruction has been retarded by the delay in the transportation of equipments, but is now being energetically pursued. Instruction has been given at five (5) posts, and to six (6) officers and twelve (12) enlisted men, and communication by signals established between the headquarters of the department and the posts in the harbor of San Francisco. The commanding general has issued orders contemplating uniting all the posts of the department, as far as practicable, by signals.

DEPARTMENT OF THE LAKES.

Second Lieutenant George A. Garretson, Fourth United States Artillery, instructed under the direction of this office as an acting signal officer, was, by paragraph 1, Special Orders No. 54, headquarters of the army, dated March 8, 1869, assigned to duty with two (2) instructed signalmen, as department instructor.

On account of the delay in transportation of equipments, the changes in regiments effected by the reduction of the army, the absence of the instructor on leave, and his final resignation, there has been no instruction in this department.

DEPARTMENT OF THE PLATTE.

Second Lieutenant A. W. Greely, Thirty-sixth United States Infantry, instructed under the direction of this office as an acting signal officer, was, by paragraph 1, Special Orders No. 54, headquarters of the army, dated March 8, 1869, assigned to duty, with two (2) instructed signalmen, as department instructor.

The plan was adopted of having the instructor visit and instruct at each post, equipments being first supplied to the posts, and preliminary to the post instruction, orders were issued to the post commanders from headquarters of the department, each to select one officer and two enlisted men, and to cause them to memorize the general service code and the method of sending messages.

The instruction was pursued energetically until interrupted by the relief of the acting signal officer in pursuance of paragraphs 2 and 3, General Orders No. 59, headquarters of the army, dated July 14, 1869.

By authority of the General of the Army, Lieutenant Greely was reinstated in his position of acting signal officer in General Orders No. 50, headquarters Department of the Platte, dated September 10, 1869, and preparations made to resume instruction. Besides the organization of a signal party to accompany an expedition against the Indians, instruction has been given at three (3) posts, and to five (5) officers and seventeen (17) enlisted men.

DEPARTMENT OF LOUISIANA.

Three different officers have been appointed as acting signal officer in this department by the department commander, but no report of instruction has yet been received at this office.

First Lieutenant G. H. Radetzki, Twenty-fifth United States Infantry, is announced acting signal officer of the department, in paragraph 2, Special Orders No. 175, headquarters Department of Louisiana, dated August 25, 1869, and is now making preparations for giving instruction in the department.

SUMMARY.

Departments.	Number of officers instructed.	Number of men instructed.	Number of posts having instructed officers.	Number of sets of equipments sent to each department.	Number of posts supplied.
Of the Cumberland	8	12	2	10	5
Of the East	18	20	4	27	2
Of the South	18	20	2	38	3
Of Washington	18	14	2	12	3
Of Dakota	3	12	3	25	12
Of the Platte	3	17	3	42	20
Of the Lakes				15	1
Of the Missouri	6	10	3	54	3
Of California	6	12	5	17	3
Of Louisiana				8	3
First Military District			1	12	3
Fourth Military District	9	18	3	10	3
Fifth Military District				3	1
Western University			1	6	
Total	82	135	29	279	60

D.

NAVY DEPARTMENT,
Washington, D. C., July 23, 1869.

SIR: In view of the formal adoption of the army modes of signaling for general use in the navy, the appointment by this department of a Chief Signal Officer of the navy, and the detail of a corps of assistants for the purpose of extending instruction in these modes to the line officers of the navy, together with the fact that the study of army codes is part of the course at the Naval Academy, the attention of this department has been directed to the importance of having the practical tuition in the army and navy as nearly similar as practicable.

I have the honor to request, therefore, that the Chief Signal Officer of the army be authorized to cause to be instructed, in the same manner as have been instructed under his direction the acting signal officers of the army, such officers as may be designated by this department as instructors and ordered to report to him; thus insuring that absolute uniformity of practice and communication that cannot fail to be of great value to both army and navy.

I have the honor further to request that the Chief Signal Officer of the army be authorized to confer, as occasion may require, with the Chief Signal Officer of the navy in reference to such matters, and to arrange such plans as may be necessary to insure the co-operation of the signal service.

Very respectfully, your obedient servant,

GEO. M. ROBESON,
Secretary of the Navy.

Hon. JOHN A. RAWLINS,
Secretary of War.

Respectfully referred to the General of the Army for remark.

By order of the Secretary of War:

ED. SCHRIVER,
Inspector General.

JULY 31, 1869.

HEADQUARTERS OF THE ARMY,
Washington, D. C., August 2, 1869.

Respectfully referred to the Chief Signal Officer of the army, who is hereby authorized to act in conformity with the within application.

W. T. SHERMAN, *General.*

Approved:

JNO. A. RAWLINS,
Secretary of War.

E.

NAVY DEPARTMENT,
Washington, August 4, 1869.

SIR: In view of the frequent communication between the land and naval forces, for which there may be occasion and which is likely to arise from the adoption of the army mode of signaling for general use in the navy, I have the honor to transmit, for the information of the War Department, the accompanying order issued by this department.

I am, very respectfully, your obedient servant,

DAVID D. PORTER, *Vice-Admiral.*

HON. JOHN A. RAWLINS,
Secretary of War.

[Order—Inclosure.]

NAVY DEPARTMENT,
Bureau of Navigation, Washington, D. C., July 19, 1869.

The Navy Department having adopted the army code of signals for use in the navy in addition to the naval signal code, a suitable officer will be assigned to duty, under the Chief of the Bureau of Navigation, as Chief Signal Officer of the navy, with such assistants as occasion may require.

It shall be the duty of the Chief Signal Officer to keep the naval signal books corrected. He shall, through his assistants, instruct such of the line officers at the naval stations as the chief of the bureau may direct in the use of the army general service code, and in the use of cipher.

As soon as the officers are ordered to a ship, the commanding officer shall detail an officer to act as signal officer, who shall, after being thoroughly instructed himself in the use of the general service and cipher codes, instruct the line officers of the ship thoroughly in the practical use of each of those codes.

He shall also instruct the quartermaster's, coxswain's, and such others of the ship's company, as the commanding officer may direct, in the use of general service code only.

The signal officers of ships and stations shall keep a record of the names and rank of all persons under instruction, with the number of hours each has practiced, both with day and with night signals; also, a column of remarks showing the progress made by each person. The commanding officer will fill out the column of remarks opposite the names of officers.

A fair copy of this record to be forwarded at the end of each quarter to the Chief of the Bureau of Navigation, to be kept on the files of the signal office.

Each ship in commission shall be supplied with signal kits, in the proportion of one to each launch and cutter, and one for the signal quartermaster.

Each signal kit will contain staves, flags, and torches, and be becketed under the thwarts in boats at the davits or ready for service.

Four copies of the Army Manual of Signals will be supplied to each first or second rate, and three to each third or fourth rate vessel in commission.

The signal officer shall receipt for and be responsible for all signal apparatus, and will see that it is at all times in readiness for immediate use. Before a ship sails from the United States the Chief Signal Officer, or his assistant, shall inspect to see that all her signal apparatus is complete; and at the expiration of her cruise the Chief Signal Officer, or one of his assistants, shall inspect to see that the signal instructions have been complied with, and will make a written report to the Chief of the Bureau of Navigation as to the efficiency of the signal instruction on board, both of men and officers.

Constant practice being necessary, it is directed that, after the first three months of the cruise, each officer will instruct those men of his division who have been selected by the commanding officer for this instruction.

JAMES ALDEN,
Chief of Bureau of Navigation.

Approved:

GEO. M. ROBESON,
Secretary of the Navy.

F.

SIGNAL CAMP OF INSTRUCTION,
Fort Whipple, Virginia, October 20, 1869.

GENERAL: I have the honor to submit the following tabulated statement of the number of officers who have reported at this post since the 27th of July, 1869, for instruction in field signaling and telegraphy.

REPORT OF THE CHIEF SIGNAL OFFICER,

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The table shows the name, rank, and corps of each officer, with the date of reporting, date of relief, and progress made when relieved, with the estimated time necessary to complete the course.

Names.	Rank and corps.	Reported for instruction.	Relieved from instruction.	Time necessary to complete course.	Remarks.
Henry Wheeler...	Master, U. S. Navy.	July 27, 1869	July 30, 1869	Six (6) weeks	Instructed in signal drill and form of inspection only.
Chas. E. Calahan..	Midshipman, U. S. Navy.	July 27, 1869	July 30, 1869	Six (6) weeks.	Instructed in signal drill and form of inspection only.
H. De H. Manley..	Lt. comdr, U. S. Navy.	Aug. 2, 1869	Oct. 6, 1869	.....	Completed full course of instruction.
Geo. W. De Long..	Lieut., U. S. Navy.	Aug. 5, 1869	Oct. 6, 1869	.....	Completed full course of instruction.
J. E. Noel.....	Lieut., U. S. Navy.	Aug. 17, 1869	.....	One (1) week.	Still under instruction.
Chas. S. Cotton....	Lt. comdr, U. S. Navy.	Aug. 19, 1869	Sept. 23, 1869	Two (2) weeks.	Course incomplete.
A. D. Brown.....	Lt. comdr, U. S. Navy.	Aug. 19, 1869	Sept. 16, 1869	Two (2) weeks.	Course incomplete.
Geo. H. Wadleigh.	Lt. comdr, U. S. Navy.	Aug. 19, 1869	Sept. 23, 1869	Two (2) weeks.	Course incomplete.
Geo. A. Converse.	Lieut., U. S. Navy.	Aug. 23, 1869	Oct. 13, 1869	.....	Completed full course of instruction.
C. D. Sigbee.....	Lt. comdr, U. S. Navy.	Sept. 8, 1869	Sept. 23, 1869	Four (4) weeks.	Course incomplete.
G. C. Goodloe....	Second Lt. U. S. marine corps.	Oct. 12, 1869	.....	Eight (8) weeks.	Still under instruction.
Wm. B. Remyey....	First Lt., U. S. marine corps.	Oct. 13, 1869	.....	Eight (8) weeks.	Still under instruction.
Jas. M. L. Young..	First Lt., U. S. marine corps.	Oct. 13, 1869	.....	Eight (8) weeks.	Still under instruction.
Erasmus Dennison	Ensign, U. S. Navy.	Oct. 13, 1869	.....	Eight (8) weeks.	Still under instruction.

The course of instruction is similar to that followed last year for officers of the army, and comprises a thorough knowledge of signaling, both in theory and practice, and a sufficient knowledge of electricity, as applied in practical telegraphy for the intelligent construction and operation of field telegraphic lines and submarine cables.

Practice has been had with both day and night signals, at various ranges, from five (5) miles to fifteen (15) miles, and with several forms of apparatus, including those for homographic and chronosemic signals. Constant attention has been given to the importance of making the instruction so practical in its nature that an officer once instructed would never be at a loss for means of establishing communication with others similarly instructed unless prevented by some local accidents.

Lieutenant Commanders Cotton, Brown, Wadleigh, and Sigbee were ordered to duty as instructors at the Naval Academy, before completing their full course in signaling. This is to be regretted, as two weeks more would have carried them through satisfactorily.

Master Wheeler and Midshipman Calahan were simply ordered here to learn the forms of drill for use on board their ship the Juniata, and having acquired this information, returned to their proper station.

Lieutenants Remyey, Young, and Goodloe, of the United States Marine Corps and Ensign Dennison, United States Navy, have just reported for instruction, and will be required to go through the same course as their predecessors. Lieutenant Commander Manley and Lieutenants Converse and De Long, United States Navy, have completed the full course, and received certificates to that effect from the Chief Signal Officer of the army.

I am, general, very respectfully, your obedient servant,

H. W. HOWGATE,

Second Lieut. and Bvt. Capt. U. S. A., Acting Signal Officer, Instructor.

Brevet Brigadier General A. J. MYER,
Chief Signal Officer, United States Army, Washington, D. C.

G.

DEPARTMENT OF STATE,
Washington, December 28, 1868.

SIR: I transmit herewith for your information a transcript of a letter addressed to this department, on the 17th instant, by Baron de Wetterstedt, the Swedish minister, conveying the thanks of his government for the courtesy shown to the two Swedish officers, Lieutenants Nordström and Nyström, sent last summer to take cognizance of the field signal system adopted in the United States Army.

I am, sir, your obedient servant,

F. W. SEWARD, *Acting Secretary.*

Hon. J. M. SCHOFIELD, *Secretary of War.*

LEGATION OF SWEDEN AND NORWAY,
Washington, December 17, 1868.

SIR: At the request of the undersigned, made to you in May; last year, in conformity with instructions received from the Swedish government, two officers of the Swedish army, Lieutenants Nordström and Nyström were permitted to take cognizance last summer, under the guidance of the signal department in this city, of the field signal system adopted in the United States Army. These officers having returned to Sweden, and made their official report on the result of their mission in the United States, I find myself charged with the pleasant duty of conveying to you, sir, the grateful acknowledgment of his Majesty's government of the favor thus granted; also to request you to convey the thanks of my government for the good will and courtesy shown said officers to General A. J. Myer, Chief Signal Officer of the army, and to Captain H. W. Howgate, who had been specially assigned to impart instruction in the signal system to the two Swedish officers aforesaid.

I have the honor to repeat myself, with a very high consideration, sir, your obedient servant,

N. W. DE WETTERSTEDT.

Hon. WILLIAM H. SEWARD,
Secretary of State, Washington, D. C.

H.

FORT WHIPPLE, VIRGINIA, October 19, 1868.

GENERAL: I have the honor to report that the field telegraph line connecting the office of the Chief Signal Officer in Washington with this post, was put up on the 26th day of April, 1869, and has been in daily use since that date. The whole length of line worked in a single circuit is ten (10) miles, with a battery power, consisting of two (2) sections of the signal service field battery, one section being placed at each end of the line. The line is so arranged that it can be divided into two distinct circuits, one three and one-half, and the other six and one-half miles in length. Four varieties of wire are now in use on the line, viz: 1, plain iron wire; 2, galvanized iron wire; 3, steel wire; 4, American compound wire.

The galvanized wire is the most durable of these wires, the plain wire the cheapest, the steel wire the strongest, and the compound wire the best conductor.

Numerous experiments have been made with insulators to secure the best form and material, and have resulted in the adoption of the "bell" shape, made of vulcanized rubber.

Since the erection of the line it has been patrolled daily by a mounted man, who is instructed to make all necessary repairs and alterations.

The following table shows the whole number of repairs made, with their nature and extent:

Number of times wire broken	64
Number of lances broken and rendered useless	18
Number of lances broken but reset	20
Insulators destroyed	12
Number of feet of wire added	560
Number of times batteries renewed	3

Taking the prices of articles wholly destroyed, and estimating the damage of those slightly injured, the expense of maintaining the line in good condition has been as follows:

18 lances, at \$1 79	\$32 22
12 insulators, at 72 cents	8 64

REPORT OF THE CHIEF SIGNAL OFFICER.

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560 feet wire	\$2 00
3 removals of battery, at \$1	3 00
Damage to 20 lances broken—reset	10 00
	<hr/>
Total	55 86
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This shows the expense of repairs to have been only \$9 per month for the whole line, or less than \$1 a mile for each month.

The route selected for the line is well adapted to test its fitness for field use, as it is over broken and hilly ground, and contains numerous bends and angles, so that a heavy strain is thrown upon the wire in every direction, at different points on the line.

Very respectfully, your obedient servant,

H. W. HOWGATE,

Second Lieut. and Bvt. Capt., A. S. O., in Charge.

Bvt. Brig. General ALBERT J. MYER,
Chief Signal Officer, United States Army.