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SERVICE OF
INFORMATION AND COMMUNICATION
FOR FIELD ARTILLERY.



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THE CENTRAL SERVICE SCHOOLS
Notes on the Instruction and Employment of
Special Details.

20379

SCHOOL OF FIRE FOR FIELD ARTILLERY.
Fort Sill, Oklahoma. 1913.

20679

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GENERAL PROVISIONS.

In addition to the general service of security and information which is furnished by the cavalry and other designated portions of the mobile army and the communication furnished by field companies of the Signal Corps, the effective employment of Field Artillery is largely dependent upon the efficiency of its own special service of information and communication and upon the use made of it. It is also important that the employment of this service be generally uniform throughout the Field Artillery so that officers may know what to require and men may know what is to be demanded of them.

For this special service of information and communication certain officers and men are made available for the use of regiments, battalions and batteries by drill regulations and general orders. In selecting men for this work officers should choose men of good character, natural intelligence and who are active physically and mentally. Other qualifications being equal, men who have followed out of door lives, requiring some knowledge of woodcraft will make good agents of communication and scouts; and men who have had the advantage of at least a common-school education will most readily become signallers and chiefs of the 5th section. Battery Commanders will often be called upon to furnish their best men for battalion or regimental headquarters and they should do this cheerfully for the good of the whole command; and adjutants should utilize every man thus detailed to the fullest extent and so train and instruct their headquarters detachments that the service of information and communication may at all times be relied upon to increase the efficiency of the command. Adjutants have no duty more important than the instruction and employment of these men.

Battery Commanders are responsible for the instruction and employment of battery details; and adjutants are responsible for their respective headquarters

details. It is desirable that at least one other officer at each headquarters be familiar with the work and the character of the instruction in order that he may act as instructor during the absence of the adjutant. It is important that one supernumerary for each position be designated by name in order that the details may be complete at all times and also that an adequate number of substitutes may receive as much of the instruction as possible.

The instruction of any given detail quite often naturally begins at the opening of the season of theoretical work, but it may be begun at any period of the year. Once established it should be made continuous and should never be limited to any particular season. After the detail has fair knowledge of the theoretical portion of the instruction it will at once begin to be of some practical use and should be utilized at every opportunity. Nothing keeps up the interest of men in any kind of work so much as seeing that it has some practical value.

The climate, the time of year, the amount of previous instruction which may have been had and the nature of the duty required of the organization, all effect the sequence in which the work may be taken up and the amount of time which can be devoted to any given portion of it. For example, long periods of bad weather may make it convenient to devote several weeks at a time to theoretical work; and maneuvers or target practice may require that all the work shall be practical. For this reason no sequence of the instruction can properly be laid down. The essential thing is never to let the instruction cease. It must be kept up throughout the year, each portion being touched upon from time to time after it has once been mastered.

The work required of agents and scouts is so similar that their instruction is identical. Signal men should be

taught map reading and the receiving, carrying and delivery of messages at the same time that these matters are studied by the agents and scouts. Afterwards they should be separated and required to become proficient in all branches of telephoning and signalling. In the meantime the agents and scouts will have mastered their own particular duties and the detail will be ready to be united and its instruction carried on in a practical way by utilizing what has already been learned. There will always be intervals in practical work in which theoretical matters can be reviewed by the older men or explained to substitutes or men just joining the detail. Agents and scouts should also be trained in the duties of the signal detail so that all the men in any battery or headquarters detail may be interchangeable.

INSTRUCTION OF AGENTS OF COMMUNICATION AND SCOUTS.

EQUIPMENT AND ITS USE.

1 Each man should be assigned a serviceable horse well shod and properly saddled and bridled. Saddle bags should ordinarily be used to hold maps and special equipment. The most suitable horse is one between four and eight years old, close-coupled, compactly built and not over fifteen hands high. He should be active and have plenty of bottom. At present such horses are seldom available; but much can be accomplished by the intelligent care and use of the horses which can be obtained for the work.

As soon as he is assigned, the horse should be taught if possible to be quiet when mounted, to leave company freely, to take an even gait and to stand without being held or hitched.

The following points in the use and care of horses when not present with an organization should be impressed upon each man undergoing instruction.

Examine the horse carefully before saddling. Note if he has eaten his food, especially his grain. Refusal of grain is one of the first indications of fever or of being "out of sorts." Clean out the feet and look for small rocks and nails. See that all shoes are tight. Trot the horse up and down a few steps to see if he is lame. See if there are indications of a tendency toward a sore back. After this examination, if the horse is not fit for the work, report to the stable sergeant, requesting another horse. If it is impossible to get a horse in good condition, report the facts when the details report. Don't wait until the detail has started out.

Saddle very carefully. See that the blanket is clean, folded smoothly and laid on from front to rear so that the hairs on the horse's back are not ruffled up. Don't cinch too tightly to start with and see that there are no wrinkles in the skin under the cinch. After riding about ten minutes, dismount and re-cinch. Water before starting and at every opportunity on the road except when the horse is too much heated, when the ride is not to be continued at once and when the water is very cold. Ordinary river water in summer time will never injure your horse. Always take out the curb bit before watering.

As a general rule ride to and from the point to be reconnoitred at a moderately rapid gait. Reconnaissance itself is likely to be rather slow work and thus restful to the horse. On soft roads and good turf vary the trot by a collected gallop. Walk down all hills and on macadam and asphalt whenever possible.

At all halts dismount. It is bad horsemanship to sit on a horse when you can rest him by getting off. If in command of a patrol or detachment, require the other men to dismount whenever practicable.

When possible allow the horse to graze at all halts. If there is time, loosen the cinch and take out the curb bit.

If the horse is heated or shows signs of exhaustion by decreasing his gait, lowering his head or stumbling, halt, unsaddle, throw water over him if possible and rest in the shade until recovered.

If thumps (spasm of the diaphragm,) which is caused by exhaustion, is suspected, watch the heaving of the flanks. If it is irregular, quite violent and accompanied by short, jerky breathing, rest the horse at once, keep him in the shade where there is fresh air until after sunset if possible. Then lead him back at a walk to the detachment or the battery. If near troops, go at once for a veterinarian or stable sergeant.

Learn to tell the difference between heatstroke and sunstroke. Heatstroke is the more common and comes on gradually. The horse becomes weak and requires urging and his breathing is hurried. Sunstroke is caused by the direct rays of the sun and comes on suddenly. The breathing is marked by great snoring and the pulse is very slow. In either case, bathe with cold water if possible, place the horse in the shade and keep him there until night-fall. If near troops, find a veterinarian or stable sergeant.

If the horse cuts himself or is wounded and the amount of bleeding is serious, plug the wound with a strip of handkerchief and then wrap some sort of bandage over it as tightly as you can draw it. If the wound is deep be careful to pack to the bottom by means of a clean stick or pencil. Keep the horse quiet until the blood clots. If you can see the end of the bleeding vessel, take two strands from the tail and tie them tightly around it.

If your horse goes suddenly lame, examine the foot at once. If you find a nail or snag, remove it and push a piece of handkerchief into the hole to keep out the dirt until you can get better treatment.

If your horse should start scouring badly, try to get

some flour and put it in the water he drinks until he improves. Do not let a horse in this condition graze.

Pull off loose shoes and make sure that all nails are removed. Then ride on soft ground or at a walk only. If loose shoes are not pulled off, they may turn under the foot and puncture the sole.

Take pride in doing the most work, covering the most ground and yet keeping your horse in the best condition of any of the horses of the detail. In all work of this kind your horse is not only indispensable to your success but is also your companion and your friend.

If you are to be away from the battery four hours or more, or if you do not know how long you are to be away, take a feed of oats in the nosebag. Feed at the noon halt after the horse has been watered and cooled off.

Except in an emergency, always start at a walk. This is especially important if the road is hard. This precaution increases gradually the circulation in the feet and thus makes the horse less liable to laminitis (founder) from pounding on a road.

After a long ride do not unsaddle at once. Loosen the cinch and allow the saddle to remain on the horse for fifteen minutes. This allows the circulation of the back to become normal gradually. After unsaddling, if lumps appear, try to rub them down with the hand and put cold water on them, keep a sponge wet with cold water on them until necessary to saddle again.

If you camp away from your battery, choose if possible a camp protected from cold night winds, especially if the horse has been worked hard and has been hot and covered with sweat all day. Groom and clean out the feet carefully night and morning. If you are a non-commissioned officer, insist on the other men doing the same for their horses.

Regulate the gait by the distance to be covered, the heat, the condition of the road and the urgency of the

errand, which should always be stated in your instructions. If the officer giving you instructions omits this information, ask him for it.

2 Improvised B. C. rulers are indispensable if scouts and agents are to be required to report upon artillery positions. As it is impossible to obtain the regular battery commander's ruler, it will be necessary either to improvise one made out of wood or cardboard or to request the commanding officer of the nearest arsenal to make a simple one out of strips of brass, graduated every five mils with the twenty-five, fifty and one hundred mil divisions plainly indicated. Three hundred mils is a suitable length. The graduations should not be numbered, because the ruler is short it is easier for the men to measure from right to left at will without becoming confused if no numbers are marked.

The construction and purpose of the improvise rulers should first be carefully explained. Agents and scouts are constantly being sent ahead to locate targets and other troops; and unless they can have some accurate method of describing the location of obscure objects in terms of their distance in mils from prominent ones, much valuable time will be wasted and the chance of error greatly increased.

All the strings having been knotted at twenty inches provisionally, a battery commander's telescope should be set up and then each man required to measure an angle with it and to check up the length of string attached to his ruler. This is an excellent opportunity to describe the present artillery method of measuring angles, and in a general way, the construction and use of the battery commander's telescope. At first, angles of less than three hundred mils should be measured; but it will be found that the men are very quick to comprehend the method of measurement and that after a few trials at short angles they can go on to the measurement of as large angles as they will ever be required to

measure practically. They can then be shown the simplest way of describing the location of objects in terms of mils measured from more prominent objects. Later the detail can be shown an object which is hard to see and each man required to locate it in the manner referred to. It will be found that many of the men attempt the measurement of a large angle when a small one would have done as well.

In addition to the measurement of angles the ruler will be found useful as a straight-edge, six inches long, with prominent divisions at half-inch, inch and two inch points. This can be used to great advantage in map making and map reading.

After the use of the ruler is understood, instruction in the measurement of angles by use of the hand should be given. The average values, as given in the drill regulations, with the hand held vertically, palms outward, are fully extended to the front, are: width of first finger at second joint, 40 mils; width of third finger at second joint, 35 mils; width of little finger at second joint, 30 mils; width of first, second and third fingers at second joint, 115 mils; width of first, second, third and little fingers at second joint, 150 mils. Each man should be required to test these average values with reference to his own hand, checking up the measurements with his ruler.

3. The type "B" glass now issued is not suitable for finding war targets and every effort should be made to obtain the new type "E" glass which has excellent optical qualities. It should be impressed upon men that field glasses, although strongly built, are delicate instruments and should always be handled with care. They should be forbidden to lend their glasses to any one except by proper authority, to wipe them with any cloth which will scratch the lenses, or to attempt to dismount them.

As soon as the Type "E" glass is issued it should

be focused for the left eye with the center screw and then if objects are not absolutely clear for the the right eye the separate adjustment for that eye should be turned slowly until it is focused. The reading should then be noted and the right eye-piece set at that reading before being used. In this way, the glass can be quickly focused by the center screw. The center screw, although convenient, has the disadvantage of preventing the glass from being water-tight; and men should be warned not to expose their glasses to moisture unnecessarily.

Each man should be required to measure and remember the field of view of his glasses in mils in order that he may be able to measure deflection without the use of any instrument or ruler.

Field Glasses should always be worn on the person and never carried in the fifth section limber or the reel-cart.

The intelligent use of field glasses is of the greatest importance and can best be encouraged and tested by frequent exercises in finding war targets which, for this purpose, should be made more and more difficult as facility in finding them is obtained. It is often interesting to divide the detail and have one half the men search the terrain for the other half.

(4) As many men as possible of those being instructed should be equipped with compasses as issued by the Signal Corps and the others encouraged to provide themselves with small pocket compasses. The principle of the compass should be explained and practical exercises held in orientation by means of the compass and also by means of the sun, sun and watch and by stars.

These exercises should be followed by others requiring the ability to follow a compass course through broken and, if possible, unfamiliar country.

(5) Watches are now issued for battalion and regiments. In batteries members of the battery detail should be encourage to purchase suitable watches.

(6) Every man can reasonably be expected to supply himself with a pocket knife to sharpen pencils with.

(7) In the Philippines Division batteries are supplied with bolos; and agents and scouts should be required to carry them habitually on their saddles. They are very useful in cutting brush and cogon grass.

(8) Wire cutters are seldom needed in the Philippines Division; but are indispensable in most parts of the United States. They should, however, be used with great caution and with consideration for the property rights of others.

(9) Ordinary foresight will make men carry matches and take care of them, especially if operating away from the batteries.

(10) A note-book small enough to fit in the pocket of the flannel shirt should be furnished each man. There should be pasted inside the covers an epitomy of facts useful to agents and scouts but hard to remember. The loose leaf system should be used.

Early in their instruction the men should be required to take neat, concise notes and to adopt a uniform method of doing so. The correct spelling of all words should be insisted upon from the start. It is very important that, in making notes, the exact time of each occurrence or notation should be included.

(11) Sketching cases or boards should be carried in instrument limbers or reel-carts for issue when necessary.

(12) The use of the Battery Commander's Telescope and all other observing instruments issued to the organization should be required of all men in the special details. The use of the Battery Commander's Telescope should include the proper leveling, focusing and adjustment of the instrument and the measurement of horizontal and vertical angles. In leveling it will be found convenient to have two of the leveling screws on line with the target, so that if there is no time to level the instrument completely it can at least be quickly leveled sufficiently to measure a correct angle of site.

MAP READING

Theoretical map reading properly begins with a brief description in plain language of the various kinds of maps used in military work, their importance and their relation to the duties of artillery scouts and agents.

The meaning and use of the more common forms of scales should be explained; and, after the matter is understood, each man should be required to measure distances on maps of varying scales both directly from point to point and also along the roads. It is important in this preliminary work not to permit the success of the men with good educations to discourage their less fortunate comrades.

The authorized conventional signs should be very thoroughly explained, both on the blackboard and on specimen maps. It is advisable to use a large scale map at first, such as the 12 inch war map and gradually to make the detail familiar with the signs as found in maps of smaller scales. The detail should be well grounded in this work and tested frequently by quizzes in which each man is required from memory to give the correct name for conventional signs selected at random.

The different standard methods of indicating hill forms on maps should next be taken up, particular attention being paid to the contour system. It must be remembered that at first this entire subject is likely to seem rather confusing to men who have never before studied it, and that great patience and ingenuity must be exercised in order to simplify it. It will be found necessary to spend at least ten days or two week on this subject in order that every man may be competent to describe the lay of the ground by looking at a contoured map and to determine accurately by means of profiles the relative heights and mutual visibility of given points.

After the above subjects have been discussed and reviewed, and the instructor has satisfied himself that his

detail can read a map, it will be found advisable to put this theoretical knowledge to practical use and tests.

A good map of the vicinity of the post or station should be obtained. The best maps for the purpose are the progressive military map sheets which are of large scale and well drawn.

The principle and practice of orientation are first taken up. Each man is required to orient the map while on the ground both by means of the compass and also by means of resection from recognized points.

About five miles of first class road should then be shown to each man and afterwards followed by the detail as a whole under charge of the instructor. Later, other roads are shown on the maps and the details from each battery separately should be required to follow them under the direction of the agent of communication or senior scout. At the very beginning of this work the agents and senior scouts should be encourage to develop those qualities of patrol leadership which all the later work will require. After first class roads can be followed correctly more obscure routes are given as practical tests until confidence may be placed in every man in regard to following any route shown to him on the map.

This work quite naturally leads up to the converse of the method described in which roads and trails are first followed without reference to the map and then indicated upon the map by all the men separately.

After the men are qualified in following given roads and in indicating on the map roads which have been followed, they should be taken successively to various prominent points in the vicinity of the post and there shown how to locate the point in question both by compass bearings and by resection. Points which are easily distinguishable should be taken first and the proficiency of the detail tested by going on to more obscure places. Afterwards the method should be reversed and the men sent separately and by

battery details to find points previously indicated upon the map.

After this preliminary practical work all the country within the radius of three miles should be divided into sections of such a size that each one may be readily covered by the detail in two or three hours. Each section is then subdivided into as many parts as there are battery details present and the agent or senior scouts placed in charge of their own details assigned to a subdivision with instructions to become thoroughly familiar with the country covered. This work will naturally lead up to the making of reports both verbal and written; and preliminary simple directions as to the various points to be observed and the correct manner of reporting them should be given in order that, later, when the subject of reconnaissance and reconnaissance reports is taken up the men may be already grounded in the essential points of the work; but it must not be forgotten that the primary object of this work is practical map reading and the art of becoming familiar with any given country by means of a map. If each detail cannot be given a copy of the map, it should be studied carefully both before starting out and upon returning.

RECEIVING, CARRYING AND DELIVERING MESSAGES.

The instructions herein laid down for agents and scouts are suitable for all enlisted men detailed to carry messages; and it is believed that the efficiency of any organization will be increased if musicians and all other messengers are given similiar instructions.

1. Verbal Messages.

Upon receiving a verbal message, the messenger will make sure that he understands it. He will then repeat it, and will not leave until he has done so. The urgency of the errand should be clearly stated and the messenger should ride fast enough to comply with his instructions. Upon reaching his destination, if necessary to attract

attention, he should call out, "Order from the Battalion Commander," "Message from Reconnaissance Officer," or the like. This practice will assist the messenger in attracting quickly the attention of the officer concerned.

Having located the officer to whom he is sent, the messenger should approach him and salute. If the messenger is mounted and the officer is dismounted, the messenger should dismount unless otherwise directed. The message will then be delivered exactly as it was given. Any acknowledgement or answer will be repeated by the messenger before he starts back. Time and efficiency will be gained if the requirements as to dismounting and saluting are omitted; but this cannot be done without the approval of regimental commanders.

Upon returning to the officer who sent him out, the messenger will either deliver the reply or else simply report "Message delivered, sir." as the case may be.

As a good understanding of the meaning of a message is often essential to its proper delivery, the meaning and correct spelling of technical terms frequently used in artillery messages should be explained to all agents, scouts and signal-men. Some of the more common terms are explained below:

POSITION. The place occupied or about to be occupied by artillery or other troops.

FOR IMMEDIATE ACTION. Artillery is posted for immediate action when the guns are unlimbered and fire is opened as soon as possible upon indicated targets.

IN OBSERVATION. Artillery is posted in observation when the guns are unlimbered and preparations are made to open fire at any desired moment upon targets seen or expected.

IN READINESS. Artillery is posted in readiness when the guns are not unlimbered but held under cover ready to go into position.

UNMASKED POSITION. A position which does not offer any protection from the view of the enemy.

MASKED POSITION. A position in which the guns are hidden from the view of the enemy.

DEFILADE. The protection from the view of the enemy which is given by any given position.

SIGHT DEFILADE. Sight defilade is obtained when the enemy's position or the targets can just be seen through the sights.

DISMOUNTED DEFILADE. Dismounted defilade is obtained at that point where a dismounted man can just see the enemy's position or the target.

MOUNTED DEFILADE. Mounted defilade is obtained at that point where a mounted man can just see the enemy's position or the target.

FLASH DEFILADE. Flash defilade is obtained by posting the guns far enough in rear of the crest so that the flash cannot be seen from the enemy's position or the target. It is usually obtained at a point where the crest is five yards above the guns. To obtain flash defilade, post one man at the point for dismounted defilade, another at the point for mounted defilade, pace the distance between the two men, and flash defilade will be obtained at a point in rear of the mounted men equal to the distance between the two men.

DIRECT FIRE. Fire during which the gunner lays for direction and range directly upon the target.

INDIRECT FIRE. Fire during which the gunner lays for direction only on an aiming point, and No. 1 lays for range by means of the quadrant.

AIMING POINT. The point on which the gunner lays in indirect fire and from which deflections are measured.

MILS. The unit used for measuring artillery angles. It is 1-6400 of the circumference, and 1-1000 of the range.

DEFLECTION. In direct fire, the correction in mils made to allow for drift, wind and the travel of the target. In indirect fire, the angle in mils measured from the aiming point to the target.

DEFLECTION DIFFERENCE. The correction made

deflection for each piece to allow for the distance between the pieces.

ANGLE OF SITE. The correction in mils made to allow for the number of yards the piece is above or below the target.

CORRECTOR. The correction made in the fuze setting to adjust the height of burst.

RANGE. The distance in yards from the gun to the target.

SALVO. One round from each piece fired at three seconds interval.

VOLLEY. A designated number of rounds fired from each piece without regard to interval.

FIRE FOR ADJUSTMENT. Fire (usually platoon or battery salvos) used for the purpose of making sure of the correct firing data.

FIRE FOR EFFECT. Fire used for the purpose of destroying the target.

HEIGHT OF BURST. The height in mils above the target at which shrapnel bursts.

INTERVAL OF BURST. The distance in yards in front of the target at which shrapnel bursts.

FIRING DATA. The information necessary to lay the pieces on the target for effective fire. It consists of the deflection, the deflection difference, the angle of site, the corrector and the range.

REPORTS.

Before sending men on any duty which requires a report to be submitted they should be informed of the exact nature of the report required to whom it should be made and where that person can be found. Nothing is so disheartening to men as to be sent aimlessly to gather information without being told just what to do with it.

NOTE: In the above explanations no attempt has been made to make them complete definitions: They are intended merely as hints to assist the men in remembering the meaning of the terms which should be fully explained to them by the instructor.

No terms have been included that are specifically covered by ordinary cannoneer's instruction or by preparation for the gunners' examination.

A verbal report should be brief, and the person making it should be certain that the person to whom it is made understands clearly what is rumor or estimate and what is fact.

A written report should follow in general this form:

From: Place:

To: Date:

At: Hour:

Body of Report:

Signature:

The following points should be impressed upon the men under instruction.

In inquiring the way or in gaining information from the inhabitants of a country it is advisable to frame questions in such a way that the person under examination will be required to volunteer information and not simply acquiesce in a statement embodied in the question. For example, it is better to ask, "Where does this road lead?" than, "Is this the road to Caloocan?" The first form will probably be productive of a useful answer, whereas the second may simply produce a meaningless or misleading assent.

Always divide report into paragraphs corresponding to the natural divisions of the road or country reported on, viz:

1 From point of origin to point where nature of road changes, or to a river, city or town, artillery position or anything else important enough to be reported upon separately.

2 From point (2) to the next natural division as described above.

3, 4, 5 etc. From (3) to (4), (4) to (5) and (5) to (6) and so on to meet the conditions of the case.

In each division give the facts required by existing instructions as to roads, towns, streams, fords, artillery positions etc. If a division is concerned with a road, always give the length of the section and always state in

parenthesis (estimated,) (measured by —————,) or (taken from map.)

When possible number the map to correspond to the points referred to in the numbered paragraphs of the report.

Always sign the report, giving name and rank. If in charge of a detail, give the names of the other men.

In making verbal reports, be guided by the above form when possible.

Always print names of places and rivers in capitals. If the spelling of a proper name is doubtful put (?) after it, thus BAMBAN (?).

Report facts as far as you are able to determine them. Do not report rumors, opinions or estimates without noting that they are rumors, opinions or estimates.

Write plainly, but do not be needlessly elaborate.

For reference the following points which are often important to report on in several given kinds of reports are enumerated. They should be included in the notes pasted in the cover of the note-books already referred to:

Artillery positions.

- (1) Size.
- (2) Field of View.
- (3) Field of Fire.
- (4) Aiming Points.
- (5) Approaches and Exits.
- (6) Protection of Flanks.
- (7) Position for Limbers and Combat Train.
- (8) Presence of Friendly Troops.
- (9) Indications of the enemy.

Roads.

- (1) Practicability for artillery.
 - (a) At any gait.
 - (b) At walk only.
 - (c) With slight difficulty and delay.
 - (d) With great difficulty and delay.
 - (e) Only after pioneer work has been done. (In this case give character and amount of work.)

- (2) Practicability as indicated in (1.)
 - (a) In all seasons.
 - (b) At beginning or end of wet season.
 - (c) In dry season only.
- (3) Defiles.
- (4) Bridges.
- (5) Fordable and unfordable streams.
- (6) Watering facilities.

Towns and Villages.

- (1) Population.
- (2) Camping and quartering facilities.
- (3) Telephone, telegraph and mail service.
- (4) Railroad facilities.
 - (a) Number of tracks in yard.
 - (b) Capacity of platform.
 - (c) No. of ramps for loading animals.

Camp Sites.

- (1) Distance from last camp.
- (2) Distance to nearest town where supplies can be purchased.
- (3) Size (Number of artillery troops it will accomodate.)
- (4) Water. (Source, quality and facilities for watering animals.)
- (5) Wood.
- (6) Soil.
- (7) Railroad, telephone, telegraph and post-office facilities.

Rivers and Streams.

- (1) Width.
- (2) Depth.
- (3) Bottom.
- (4) Banks.
- (5) Current.
- (6) Bridges.
- (7) Ferries.
- (8) Fords.
- (9) Means at hand for construction bridges and ferries.

Swamps and Marshes.

- (1) Extent.
- (2) Roads across.
- (3) Roads around.
- (4) Condition in varying seasons.

PATROLLING.

Patrolling will more often be required of battalion and regimental scouts than of other members of field artillery information and communication details; but all men should be instructed in it.

The general duties of patrols are:

- (a) Gaining information.
- (b) "Tracking."
- (c) Taking advantage of cover.
- (d) Estimating heights and distances.
- (e) Taking advantage of "signs."

Before sending out or taking charge of a patrol the officer or non-commissioned officer in charge should:

- (1) Explain all that is known of the situation;
- (2) Give the general direction to be taken;
- (3) State the information desired;
- (4) State where a report is to be made;
- (5) Give definite orders as to how far to go and how long to stay out.

(6) Inspect the patrol, both men and horses, before sending them out.

Proficiency in patrolling is largely a matter of natural ability and experience; but the following instructions should be impressed upon the men.

In the presence of the enemy, either in active service, maneuver campaigns or target practice;

- (1) Never wear anything which shines.
- (2) Never go on the sky line if it can be avoided.
- (3) Never let a horse appear on the sky line.
- (4) Always try for a background the color of your clothes.

- (5) If you have to cross an open space, gallop.
- (6) Work with all men in sight if possible.
- (7) Post a look-out when a halt is made.
- (8) Approach with caution a village, a clump of trees, a defile or anything which may conceal an enemy.

Learn to be observant:

- (1) Keep conspicuous objects constantly in mind.
- (2) If necessary make your own landmarks in order to get back.
- (3) Note all tracks and "signs," number and character of hoof prints, or foot prints, number and character of wheel marks, nature and freshness of droppings.

(4) Learn the significance of dust, viz:

- (a) High and thin—Cavalry.
- (b) Thick and low—Infantry.
- (c) Dense and broken—Artillery and wagons.

(5) Adopt a code of signals, viz:

- (a) Do you see anything? wave hand across face.
- (b) Yes. Raise and lower arm vertically several times.
- (c) No. Extend arm horizontally twice.
- (d) Enemy or target in sight. Raise both arms vertically.
- (e) Report or come to my assistance. Raise arm and make the signal for countermarch.

(6) Observe camp signs:

- (a) No. of fires equal No. of organizations.
- (b) Look for abandoned clothing and equipage for distinguishing marks.

(7) Observe marching troops with a view to determining number from a distance.

- (a) In one minute, there will pass
175 Infantry.
110 Cavalry, walk.
200 Cavalry, trot.
5 Guns or Caissons.

The appearance of troops of all arms in all field service

formations should be explained to the details and should, wherever practicable, be emphasized by actual observation of troops. The targets ordinarily used in service practice should be explained and frequently used in instruction.

The ability of an artillery scout to estimate distances and heights is important. Facility in this part of the work can be obtained by posting men at 100, 200, 300, 500, and 1000 yards and observing them carefully while they are standing, kneeling or lying down; and by determining accurate ranges to objects 1500, 2000, 2500, 3000, 4000 and 5000 yards distant and then observing them carefully. Estimations should be checked up by referring them to facts, and the men should be frequently tested to determine their relative proficiency and their improvement. It should be impressed upon them that:

- (1) Objects are over-estimated;
 - (a) When observer is kneeling or lying down.
 - (b) When background and objects are of a similar color.
 - (c) On broken ground.
 - (d) When object is in the shade.
 - (e) When object is only partially seen.
- (2) Objects are underestimated;
 - (a) In excitement.
 - (b) Over level ground or water.
 - (c) When sun is behind observer.
 - (d) In very bright light.
 - (e) When looking up or down.
 - (f) When object is very large.

After a detail has become proficient in the work of patrolling, it may be made more profitable and more interesting if the men are taken out at night and made to gain information and make reports and also if a portion of the detail is practised in ambushing the other men under varying conditions.

SKETCHING.

Artillery scouts are not map-makers; and it is not

necessary to carry their instruction in mapping beyond the point where they can make an accurate panorama sketch from a position and an accurate road sketch to a position.

In making panorama sketches only the main outlines of the terrain in the sector should be included, and all attempts at pictorial effect should be discouraged. Men who are not naturally expert with a pencil should not be allowed to become discouraged and should be told again and again that accuracy is what counts. Each sketch should have a scale of miles drawn across the top for reference and should contain all troops or targets seen in the sector, together with notations as to the approximate ranges. Sketches should be graded according to the number of targets found compared with the number actually in the sector.

In making road sketches, either the sketching case or the sketching board should be used. As artillery road sketches are usually for immediate use, the method with note-book and compass is generally not applicable and there is no reason for instructing men in its use. In using the sketching board the Battery Commander's Ruler will be found very useful, not only as a scale and a straight edge but as a means of measuring angles and courses. Unless the horses are trained to stand without holding, men should always sketch roads in pairs. The use of elaborate conventional signs should be discouraged and the simple signs given in Field Service Regulations should be used. After the men have become proficient, they should not be allowed to become rusty, but should be required to make sketches frequently during drills and field exercises.

THE EMPLOYMENT OF AGENTS OF COMMUNICATION AND SCOUTS.

Agents.

Although in time of peace agents of communication are not permanently detailed, they should always be designated, instructed and employed as contemplated by Drill Regulations. In a battery all of the caisson corporals and at least one of the sergeants should be made available for this duty.

Agents from the batteries and battalions report to the next higher commander at the formation of the battalion or the regiment and remain at battalion or regimental headquarters until dismissed except when sent away on duty. It should never be necessary for the major or the colonel to send for the prescribed agents: it is the duty of subordinate commanders to detail them and to see to it that they report promptly and are suitably equipped for their duty. Even when there has been no battalion or regimental formation, a battalion or regimental commander supervising the drill or instruction of batteries may require agents at times and should, in such cases, send for them. In the field agents should mess and be quartered with headquarters.

Agents, in alphabetical or numerical order from right to left, should ride immediately in rear of the musicians and orderlies and in front of the non-commissioned staff so that they may be called readily. In calling for them their names should never be used, but they should be spoken of as, for example, "Agent, 'A' Battery," or "Agent, Second Battalion." The practice of calling for "All Agents" when the same message or order is to be sent to all batteries or both battalions will always save time because the order or message will have to be stated but once.

When an agent is required, the word should be passed to the man designated by all who hear it. This will make it unnecessary to shout when calling for an agent. The agent required should move promptly at a trot, salute, and report, for example, "'C' Battery Agent reports, Sir!" He will then be given a message and told where he is likely to find the person to whom it is addressed and instructed what to do in case the person designated cannot be found. He will be required to repeat the message before starting

away and expected to report upon his return. If the message is a written one, it should be plainly addressed and its urgency stated in writing. The agent should be instructed to bring back the initialed envelope as a return receipt.

While with headquarters, agents are not subject to the orders of other officers and all officers should be cautioned not to delay them by asking questions. In this respect they differ from scouts who are expected to give information to any officer who may properly call for it.

Agents are primarily for the purpose of carrying messages between headquarters and the organization from which they are detailed. In exceptional cases they may be used by headquarters as scouts or signal men.

Battery Scouts.

All the caisson corporals are instructed as scouts and two of them are designated for this duty daily. For purposes of instruction all the caisson corporals available may be used at drill in addition to the two prescribed by drill regulations.

Scouts report to the Battery Commander at the formation, for action or at any prearranged signal, as prescribed for the Chief of the Fifth Section.

They remain with the Battery Commander until they are dismissed, or until they are assigned some specific duty. Upon completion of any duty they should be required to return and again report.

In general Scouts are employed:

- a To obtain information concerning the enemy and friendly troops.
- b As route markers and guides.
- c In reconnaissance to find and identify targets.
- d To keep targets or sectors under observation.
- e To assist in reconnoitering gun positions and to mark the position of one of the flank guns in the position selected.
- f To carry messages.
- g To act as members of an observation patrol on unprotected flanks.
- h To act as horseholders.

To go more into detail they are employed under these heads as follows:

- a Battery scouts are seldom required to be used to

obtain information concerning the enemy and friendly troops because these duties pertain to the functions of battalion, regimental and higher commanders but in rare cases when batteries are acting alone, especially in advance and rear guard duty, such employment may be required and they should then be used as prescribed for patrols by Field Service Regulations.

b They are used as route markers and guides when the Battery Commander precedes the battery for the purpose of making a reconnaissance or reporting to a higher commander.

It should be generally understood amongst the officers of a command that no markers are required:

1 When march is to be continued along the highway and there is no possibility of mistaking a minor road for the main highway.

2 When the march is to be continued along a straight road or in any direction previously agreed upon without turning to the right or left and when there can be no reasonable doubt as to what is the straight road or proper direction. It should be understood that an officer is justified in keeping straight ahead unless a marker is seen.

Markers are especially required:

1 At night.

2 When any reasonable doubt as to the correct road could arise.

3 In entering or leaving a city of any size. It is easier to lose the road in leaving a city than in entering it.

4 Wherever there is a difficult piece of road, a bad ford or a suitable watering place for the command.

When a marker is left at a point, he should be informed:

1 The route to be followed and the gait desired by higher authority.

2 The organization to be guided.

3 The exact message to be delivered.

4 Whether he is to rejoin his command when the message is delivered, or remain and guide the organization to the next marker.

It is important that an officer, having received information from a marker, should himself leave another marker at the same place in order to guide organizations in rear of his own.

c In reconnaissance, upon approaching the general locality of the position, the Battery Commander should inform the scouts as to the general situation, what is known of the enemy or the targets and what his instructions or plans are. If the Battery Commander is reporting to a higher commander, the scouts should go with him and remain in a group, mounted, behind the crest until sent for. In sending for scouts they should be designated "1st scout," "2nd scout" etc., and not by name.

As soon as the Battery Commander has been assigned and identified a target, he should send for a scout and require him to keep the target under observation at all times unless he is assigned to other duty.

If the Battery Commander is not reporting to higher authority but is himself conducting a reconnaissance he should direct his scouts to spread out over the available crest and look for targets. If a scout finds a target, he should signal to another scout to join him, point out the target found and leave the second scout to observe in his place while he himself reports at once to his Battery Commander.

d After a target has once been identified by a Battery Commander he should require at least one of the men with him to keep it under observation continually, reporting change, disappearance, reappearance, movement or destruction. While the Chief of the Fifth Section is busy setting up his instrument, the Battery Commander should require one scout to watch the target and point it out again to the Chief of the Fifth Section when he is ready.

e By the time the Battery Commander is ready to designate gun positions it is assumed that the scouts with him have been told:

- 1 The location of the enemy and friendly troops.
- 2 The problem assigned the Battery Commander; and
- 3 The target and its approximate range.

The scouts will then be prepared to assist him in finding a position for the guns:

- 1 In which the necessary amount of defilade can be obtained.
- 2 Which will not encroach upon the ground assigned other batteries or troops.

3 From which aiming points can be seen if possible and

4 From which fire can be delivered upon the target or in the sextor at the minimum assumed range without danger of obstruction from the height of the mask.

The gun position having been decided upon, the exact location of one of the flank guns is usually indicated by posting a scout at that location facing in the direction of fire with one arm extended in that direction and the other in the direction towards which the line of guns is to be prolonged. The gun indicated is usually the flank gun nearest the Battery Commander's station, but if the battery is acting in battalion or if for any other reason the extent of the position is limited or there is a possibility of encroaching on the ground assigned to other batteries or troops it is advisable to post the scout at the position occupied by the flank gun which is to limit the position of the battery. In this case the battery should always be brought in from this flank in order that the gun in question may be unlimbered when it reaches the point marked by the scout. If it were brought in from the other flank, before the carriages straightened out the battery might easily extend past the scout and on to the ground occupied or assigned to other batteries or other troops. As soon as the executive officer (see "Note") in command of the guns reaches him the scout should be prepared to give the following information or such of it as may be considered by the Battery Commander as appropriate to the occasion:

- 1 The direction of fire.
- 2 The location of one flank gun and the prolongation of the line.
- 3 The location selected for the limbers.
- 4 The aiming point selected by the Battery Commander, or if none had been designated, the location of suitable ones. If no common aiming point is available, the Battery Commander's instructions as to reciprocal laying.

Note: The term "Executive Officer" as used in these notes means the senior officer or when no officer is present the senior non-commissioned officer actually present with the battery. He is responsible that the commands sent to the battery are promptly and accurately executed. His function ceases when the Battery Commander is so close to the battery that he can actually command it by word of mouth.

5 In addition to the above, ordinarily all the firing data should be given in writing to the scout for transmission to the executive officer as soon as he arrives in the position, but the scout should not be required to keep in his mind or to transmit verbally anything more than is indicated by 1, 2, 3 and 4, of the above sub-heads.

f Messages carried by battery scouts are usually limited to those sent to the executive officer to the limbers and to the combat train.

Scouts used as messengers are guided by the same instructions and should be employed in a similar manner as prescribed for agents of communication.

By co-operation and "team play" between the Battery Commander and the executive officer, the length and number of messages passing between them can be reduced to a minimum.

For example, before leaving the battery, the Battery Commander should furnish the executive officer and the other lieutenants with the battery with all the information concerning the situation which he himself has received. Upon going forward from the battery on reconnaissance or to report to a higher commander it is feasible to have a general understanding with the executive officer that he will form and prepare for action and follow the route taken by the Battery Commander and if possible at a gait one degree slower than that taken by the Battery Commander. Upon reaching a point from which he can see the Battery Commander's station and the gun position as indicated by a scout, the executive officer can usually tell at a glance whether or not the position is ready for occupancy. If it is he should at once occupy it, depending upon the information previously received from the Battery Commander, the special information received from the scout and the method of occupation generally adopted in the battery. If it is evident that the position is not ready for occupancy, the executive should halt and wait for instructions. If the Battery Commander sees that for any reason it is not advisable to have the battery follow closely, if it is in sight he should sound his drill whistle and signal "Halt;" if it is not in sight he should send appropriate instructions to the executive officer by a messenger scout. In any event the method here suggested will always save time and is for many reasons preferable to leaving the executive officer and the battery far in the rear waiting instructions which

are usually almost identical in every case. This method has the added advantage of giving the executive officer an interesting duty which requires initiative and judgement.

g A battery is generally a technical rather than a tactical unit and a battery commander is responsible for the protection of his flanks only when he is acting alone without supports or when especially directed by higher authority to send men to an unprotected flank. Scouts are then sent out with instructions to act as an observation patrol and to give immediate warning by visual signals or messages of the approach of any body of the enemy and also of the arrival in position of any friendly troops which will protect the flank formerly unguarded.

h Musicians and mounted orderlies should ordinarily be employed as horseholders in preference to scouts who are specially instructed men intended to be used for the specified duties herein laid down. No scout should be used as a horseholder when a musician or mounted orderly is available and no musician or mounted orderly should be used as a scout or messenger when a scout or messenger is available. No musician or mounted orderly should be permitted to decline to hold the horse of an enlisted man detailed on information or communication service, although a sense of military propriety will usually prevent the turning over of horses to the musicians or orderlies on duty with higher commanders.

Battalion and Regimental Scouts.

With obvious modifications the employment of battalion and regimental scouts is similar to that laid down for battery scouts but their duties are more varied and general than those of battery scouts. They do not require the detailed knowledge of gun positions which battery scouts must have; but in their employment they are more often used to find the way through unknown country, to use and prepare maps, road position and panorama sketches and to reconnoiter and report upon roads, streams, fords, campsites, towns and artillery positions. They are frequently used as road markers as prescribed for battery scouts. They are not used as messengers to organizations when agents of communication from those organizations are present and available.

INSTRUCTION AND EMPLOYMENT OF TELEPHONE AND SIGNAL DETAILS. EQUIPMENT.

Although every effort should be made to keep the prescribed equipment as issued in working order, nevertheless constant use will usually develop certain faults which must be met by making certain modifications in the authorized equipment and authorizing certain departures from the method of employment laid down. Among the faults and modifications which have developed during actual use, are the following:

a. Metallic circuits can be relied upon only when wire is new and has not even been carried about to any extent. It has been found that the heavy wire will not remain a satisfactory twin-conductor after it has been repeatedly laid and taken up over rough ground and that the small battery buzzer wire will become unserviceable even without use simply by being carried about in a 5th section limber on the prescribed spool. A leather cover for spool and hand reel can easily be made by battery saddlers and will be found to be of great value in protecting the wire, but due to the necessarily thin insulation of this small wire, it is believed that time and trouble will nearly always be saved by starting in at once with ground return.

b. It is further believed that the small buzzer wire is in general unreliable and that it is advisable to improvise a small reel to be carried on the 5th section caisson so that the heavy wire may be used for ordinary battery service. This would permit the buzzer wire being kept on protected spools ready for use in emergencies only. If the heavy wire is used for battery service a permanent connection at each end can be made by the use of a substantial binding post on the connectors so that it is necessary only to plug in the cords in order to establish communication.

c. When the small wire is used the connection made by the steel points in the connectors is often faulty. This is another reason for doing away with the regular use of the

small wire and is also a reason for modifying the connectors so that binding post instead of steel points are used. If binding posts are not used it will be found advisable to double the wire so that there will be more surface for the points to pierce. These steel point connections belong to that class of devices which are satisfactory only when used under the most advantageous circumstances. Telephone service in Field Artillery, when it is needed, is needed badly; and no device which depends upon advantageous circumstances for its successful use should be retained. Binding posts consume more time but they are sure means of obtaining a good connection.

d. It is important that signalmen realize that battery cells deteriorate while in storage and they should not depend on the successful working of a cell simply because it has recently been issued to them. A cell should be tested as soon as it is received by the telephone detail. For this purpose at least one volt-ammeter should be provided in every artillery command and put at disposal of signal details for testing purposes.

e. The signal flags as issued are in pairs, one red with a white center, the other white with a red center. This of course makes one flag or the other appropriate for use with certain backgrounds; but a pair of flags of this kind is not entirely suitable for semaphore signalling at any distance because if the background is suitable for one flag it will not be suitable for the other. Both the sender and receiver should be equipped with both colors of flags and should use a pair of the same color, depending upon the background.

TECHNICAL INSTRUCTION.

The instruction of details in telephoning and visual signalling is covered completely in Lieutenant Dawson Olmstead's pamphlet on "Battery Lines of Communication and the theory and practice of telephone communication as therein laid down should be gone over carefully until all the men under instruction can make the prescribed con-

nections and tests and can trace telephone troubles.

(The following additional test is suggested: insert one plug in the telephone, hold the plug at the opposite end of the cord against the brass spring of the first plug in such a way that both metallic elements make a connection, then move the transmitter arm up and down and blow into the transmitter; if the blowing and the moving up and down can be heard through the receiver, the telephone as a whole is in good order. If it is not the trouble may be located by one of the prescribed tests.)

It is advisable to turn over a complete set of equipment in good order to a temporary telephone detail made up of men undergoing instruction and require them to keep the equipment in working order, make the necessary inspections and use the telephone daily at all drills and special hours of instruction until they are proficient. The first temporary detail can then be relieved and others detailed until all the men undergoing instruction are proficient and those best qualified for the work can be permanently detailed.

Instruction in visual signalling with flag, heliograph and acetylene lantern is best accomplished by pairing the men off so that an experienced man works with each beginner. This is usually possible because signal men are ordinarily men who have had some previous experience and it is only necessary to keep substitutes in training. In using the heliograph and the acetylene lantern it will be found necessary to make the pauses between flashes noticeably longer than in other forms of signalling. Proficiency in this work depends largely upon constant practice and some visual signalling should be required of signal details daily. If enough interest can be stimulated to make the men voluntarily signal to one another in barracks and during rest at drill, great proficiency will result.

EMPLOYMENT.

Battery Service:

In selecting positions for the actual delivery of fire,

every effort should be made to get near the battery and so do away with the necessity for telephone communication or visual signals. No matter how well the telephones may be working their use always implies a certain amount of delay in the transmission of commands, a chance for error and a possibility of interruption.

But whenever there is the slightest possibility of their being required, telephone lines should be laid and communication established. For purposes of drill and instruction they should be used at least once daily during drill. This will give the signal detail constant instruction and will be a daily check upon the condition of the equipment. In a similar way commands should be sent by visual signals at least once daily.

In general the battery signal detail is organized and employed as prescribed in Paragraph 790 Field Artillery Drill Regulations.

In detail the duties and employment of the signal detail are as follows:

Signal Corporal.

1 Under the general supervision of the Chief of the Fifth Section he has charge of and is responsible for all the signal equipment of the battery. He should be required to inspect this equipment before and after each drill, to make such tests and repairs as he is authorized to make and to report all trouble which he cannot remedy to the Battery Commander personally at the first opportunity. He should make timely report to the quartermaster sergeant concerning the expenditure of wire and dry cells and the need for requisitioning for such expendable material.

2 Equipped with field glass, one telephone and one megaphone he reports to the Battery Commander at the subdivision for action or at any prearranged signal as prescribed for the chief of the 5th Section. It is important that all telephones are carried at all times on the person. It is impossible to keep them in order if they are carried in

the 5th Section limber. When not in use it is better to keep them in the battery office or office tent.

3 If no telephone or signal communication is required he acts as an additional observer at the Battery Commander's station and if required, transmits the Battery Commander's orders by megaphone. This method has the advantage of allowing the Battery Commander to keep his field glasses almost constantly on the target during the delivery of fire and to transmit his commands without shouting and without pausing to turn around. It should not be used during direct fire at decisive ranges when the personal control of the battery is important.

4 If telephone communication with the battery is desired, as soon as the Battery Commander's station and the gun position are located he directs No. 2 to carry the end of the wire rapidly to the gun position, leave it with the scout who marks the position of the flank gun and return to the Battery Commander's station. While No. 2 is gone, the signal corporal makes the necessary connections so that No. 2 can plug in his telephone as soon as he returns. After communication is established he reports the fact to the Battery Commander and supervises the service. If the communication is interrupted he makes such inspections and repairs as he can. If he is unsuccessful, he reports the break in communication to the Battery Commander and gets his instructions as to visual signals.

5 When a reel of field wire on the Fifth Section caisson is being used instead of the prescribed equipment, he indicates the position of the Battery Commander's station and the kind of communication desired as soon as it is possible for him to communicate with the privates of his detail, both of whom, in this case, remain with the 5th Section until after the battery has reached the gun position. The telephone corporal then supervises the paying out and reeling up of the wire and the establishment of communication and performs his other duties as herein prescribed.

6 If battalion telephone communication is desired and

there is no battery telephone communication required, he directs No. 2 to connect with the battalion line as soon as laid. He himself supervises the service, reporting the establishment of communication and all interruptions to the Battery Commander.

If battalion communication is desired in addition to battery communication the signal corporal connects with the battalion line as soon as laid and acts as operator at the Battery Commander's station.

7 If telephone communication is interrupted or if for any other reason visual signals are required, he receives messages from the Battery Commander, delivers messages to him and acts as receiver and recorder while directing and supervising the signalling done by No. 2.

8 When telephone service is no longer required he gives the necessary directions for closing the stations, reeling up the wire, and joining the battery commander. During the intervals in which he is not otherwise employed he makes such tests and repairs as are possible in the field.
No. 1 Signaler.

1 Equipped with one telephone, one flag kit field glasses, and one megaphone, he rides as a cannoneer on the first caisson limber of the 5th section.

2 Upon arriving at a gun position, he finds out from the scout marking the position if telephone communication is to be established and, if it is, receives the end of the wire from him, makes his connection promptly and reports the establishment or interruption of telephone service to the executive officer. He then acts as operator at the guns, being governed in the use of the telephone by the provisions of paragraph 796, field artillery regulations. The use of the word "Hello" is forbidden. When called, he should answer, "Battery" and, when calling the Battery Commander's station, should ask for "B.C." It is important to shield the transmitter from the wind.

3 When a reel of field wire on the fifth section is being used instead of the prescribed equipment he has charge

of the reel, connects his telephone as soon as possible after the battery has reached the gun position, and reels up the wire as soon as orders are received to close station. With assistance of No. 2 it will be found practicable to reel up while the battery is moving away from the position, provided the gait is not too rapid nor the change of direction too abrupt.

In other respects his duties are similar to those prescribed when the authorized equipment is used.

4 If visual signals are to be used, he sends and receives messages for the executive officer.

5 If the megaphone is to be used, he hands the megaphone to the executive officer and takes it from him when it is no longer required. He is responsible that it is not left when the position is changed.

No. 2 Signaler.

1 He is equipped with one hand-reel and spool of buzzer wire, one telephone, one flag kit and field glasses, and reports to the Battery Commander at the same time as the signal corporal. He is always mounted.

2 Under the direction of the signal corporal, he runs out wire to the gun position, returns, plugs in his telephone and acts as operator at the Battery Commander's station as prescribed above for No. 1. The use of word "Hello" is forbidden. When calling he should ask for "Battery" and when called should answer "B. C."

3 When a reel of field wire on the fifth section caisson is being used instead of the prescribed equipment, he remains with the fifth section until the battery has reached the gun position. At an indication from the telephone corporal that telephone communication is desired, he takes the end of the wire from No. 1 and rides with it as rapidly as possible toward the Battery Commander's station taking advantage of cover and dismounting before reaching the crest. He then connects his telephone and acts as operator as prescribed. Upon receiving orders to close sta-

tion he disconnects his telephone and follows the wire as it is reeled up. If the battery moves before the wire is all reeled up, he picks up the wire near the 5th section caisson and prevents any twisting or kinking due to changes of direction. In other respects his duties are similar to those laid down when the prescribed equipment is used.

4 When acting as an operator on a battalion line, when calling he should ask "Headquarters" and when called should answer for example, "A' Battery."

5 When visual signals are used he sends and receives messages at the Battery Commander's station under direction of the signal corporal.

Battalion Service:

The battalion reel-cart marches at the head of the column at all times after the subdivision for action. Before the subdivision it is advisable to post it at the rear of the leading battery in order that the gait may be set by the leading team of the leading battery rather than by the reel-cart team.

The signal corporal accompanies the battalion commander during the reconnaissance and at all other times except when laying or operating a line. The private detailed as his assistant rides on the cart and is responsible for proper operation.

The battalion signal corporal is responsible that the same inspections and test are made as are prescribed for battery telephone corporals and also that his entire reel of wire is tested before it is taken out.

When telephone service is desired the sergeant-major receives his orders from the adjutant and notifies the signal corporal of the location of the headquarters station and the proposed positions for the batteries. The signal corporal returns at once to the reel-cart, brings it up and causes it to be unlimbered as near as possible to headquarters, taking every possible precaution that neither the horses, the reel-cart or any of the men are exposed at this time or any

other time during the laying or operation of the line. If it is absolutely necessary to take the cart over an exposed place it should be done at as rapid a gait as possible.

As soon as the cart is unlimbered the sergeant-major opens it and takes out and sets up such of the observing instruments as may be required. He then connects the headquarters telephone and acts as operator until the return of the signal corporal. After the signal corporal returns, the sergeant-major supervises the service of communication. If telephone communication is interrupted he takes the necessary steps to provide communication by visual signals.

In laying the line the signal corporal gives explicit directions to the reel-cart drivers as to directions and gaits and rides in rear of the reel facilitating in every possible way the proper laying of the line, removing it from damp or wet places when possible, hanging it on trees and whenever it is possible to raising it above heavily travelled roads and straightening out kinks. If time permits it is advisable to drive the reel rapidly to the position to be occupied by the battery furthest removed from headquarters in order that when the line is laid, the reel may be at headquarters and available to extend the line in case the Battalion Commander desires to change his station. If this is not practicable the line should be laid at once, beginning at headquarters and going to the nearest battery first. If it can be done without exposing the reel, the line should be laid in front of the gun positions where it will not be interfered with by the limbers.

As soon as the battalion line reaches the vicinity of a battery it becomes the duty of the battery signal corporal to have it brought to his Battery Commanders station and to establish communication promptly as prescribed in "Battery Service."

As soon as the line is laid the battalion signal corporal returns to headquarters, relieves the sergeant-major and acts as operator. If visual signals are required he acts as sender and the sergeant-major as receiver.

In calling for batteries they are designated as "'A' Battery." In acknowledging calls the Battalion Commander's station is known as "1st Battalion." When two or more battalions are working together the regimental headquarters are the only headquarters which should be referred to over the line as "Headquarters." If all batteries are to receive the same message "All Batteries" is called and each battery acknowledges in turn by reporting for example "C' Battery." All operators should be required to keep the receiver on at all times. The use of the buzzer to call a battery should be unnecessary. Operators should pay no attention to messages not intended for them. The word "Hello" is unnecessary and should be forbidden.

At the command "Close Stations" the battalion signal corporal supervises the reeling up of the wire and the sergeant-major is responsible that all instruments are replaced in the cart. It is advisable to carry all telephones on the person to avoid their being jolted in the cart.

Regimental Service:

With obvious modifications, regimental service conforms to battalion service. The regimental signal sergeant performs the duties herein laid down for the battalion signal corporal. The regimental signal sergeant is responsible for the same inspections and test of his materiel as are prescribed for battalion signal corporals. When connected with a regimental line, each battalion sergeant-major is the operator at his own battalion headquarters. If no lines from battalion headquarters to batteries are laid the signal corporal may be used as operator on the regimental line. Stations are designated as in battalion service. If the same message or order is intended for both battalions, "Both Battalions" is called and each one acknowledges the call by reporting for example, "2nd Battalion."

THE CHIEF OF THE FIFTH SECTION.

Co-operation between the Battery Commander and a well instructed Chief of the 5th Section contributes greatly to the speedy and successful occupation of position and to the prompt and effective delivery of fire.

While the battery is in position no non-commissioned officer is closer to the Battery Commander or of more assistance to him than the Chief of the 5th Section, provided that he is the right sort of man, well instructed and properly employed.

The non-commissioned officer selected as Chief of the 5th Section should preferably be a young man with good character, eye-sight and judgement. A man who has bad habits or any tendency toward absenteeism or whose eyes are old or weak should not be considered for the position. An ambitious man, eager for advancement and interested in his work, is naturally to be preferred.

The non-commissioned officer selected should receive thorough, pains taking instruction from the Battery Commander personally. Once instructed his value and ability will increase rapidly through daily experience and the actual performance of his varied duties.

To be of the greatest assistance the Chief of the 5th Section should be employed in a uniform and rational manner, in order that he may be able to anticipate what is to be required of him and that the Battery Commander and the man may each know what to expect from the other. If the Chief of the 5th Section is employed in an erratic manner, never knows what is to be required of him or receives vague directions he can be of little value.

Chiefs of Platoon should be instructed as to the method of employment adopted by the Battery Commander in order that when they are acting as battery commander, they may obtain full value from the work

of the Chief of the 5th Section and also in order that the Chief of the 5th Section may be able to co-operate with them as intelligently as with the Battery Commander.

INSTRUCTION.

The Chief of the 5th Section should be well instructed in the general duties as Chief of Section, in the care of men, horses and materiel pertaining to his section in the battery. In addition he is charged with the special care of the instruments and equipment carried in one of the limbers of his section. The telephone corporal should be attached to the 5th Section and have charge of the telephone and signal equipment, but is under the general supervision of the Chief of Section.

In addition to these general duties he should be instructed especially along the following lines:

a The construction, care, operation and adjustment of the battery commander's telescope as laid down in the Handbook of the 3-inch Field Artillery Materiel, pages 123 to 130, the use, care and adjustment of field glasses, the use of the battery commander's ruler and the keeping of neat and concise notes.

b The measurement of angles by means of the telescope, ruler, field glasses or hands.

The system of angle measurement adopted by the Artillery Service and its employment should be carefully explained. The relation of the value of one mil at any given range should be understood thoroughly.

All the methods of measuring the following angles should be explained and frequently employed:

1 The angle between the Aiming Point and the Target.

2 The Angle of Site.

3 The front of the target and the relative interval in mils between sections or portions of the target.

4 The interval in mils to prominent points of reference for observing errors in deflection.

5 The height in mils of prominent points of reference for observing errors in height of burst.

c The Calculation of Firing Data including:

1 The "P minus T" method as laid down in the Field Artillery Drill Regulations, paragraphs 419-433.

2 The Graphical (or Parallel) method by means of the measurement of an angle whose sides are parallel to the angle at G¹ desired. At first this method will probably seem more difficult than the "P minus T" method on account of the feeling that by the use of actual calculations on paper, something tangible is obtained, which at the beginning seems to be lacking in the Graphical Method, but the frequent use of explanatory diagrams and practical examples, insisted upon until the method is clearly understood and its advantages appreciated, will in most cases result in a preference for it over the "P minus T" computation. It has the great advantage of precluding a cumulative error in the wrong direction.

3 The necessary corrections to adjust the sheaf after the initial error in deflection and deflection difference has been observed.

d The Observation of the Target.

It is important that the Chief of the 5th Section appreciates the importance of keeping the target under observation at all times, noting changes, movement, disappearance, reappearance and obvious effect of fire.

e The Chief of the 5th Section should be instructed in the observation of fire as follows.

1 Deflection.

Look for the first shot with the naked eye. Then with field glasses or telescope, if possible, measure the error in deflection either on the scale in the field of view or by turning the telescope in azimuth. If impossible to measure the error in the first shot, measure that of the

second and all subsequent shots until the deflection and the deflection difference are adjusted.

2 Height of Burst.

Measure and be prepared to report accurately upon the height of burst of all observable shots, classifying bursts in 3-inch Field Artillery practice as follows: "Below" (below target); "Graze" (actual percussion bursts in which no white smoke-ball can be seen); "Low" (0 to 1 mil high); "Normal" (2 to 4 mils high); "High" (4 to 6 mils high); "Very High" (above 6 mils high).

3 Range.

Although the Battery Commander is alone responsible for the sensing of shots for range, the Chief of the 5th Section should be trained in such observation in order that, in emergencies, he may furnish reliable information. To this end he should be instructed.

1 That, with respect to bursts of time shrapnel, it is impossible to sense shots

a That are not sufficiently correct in deflection to be on line with some portion of the target.

b That are more than 1 mil high.

c And that all such unobservable shots should be reported as "indeterminate" or "doubtful" and that nothing is more disastrous to proper adjustment than an attempt to sense such shots.

2 That in dry weather or with particularly favorable slopes in front or in rear of the target, it is sometimes possible to form an opinion as to the range of otherwise unobservable shots on account of the dust kicked up by fragments, fuses or shrapnel bullets, but that all such observations should be recorded as "Fragments over" or "Fragments short."

3 That, with respect to percussion bursts, it is also impossible to sense shots which are not sufficiently correct in deflection to be on line with some portion of the target, except that with exceptionally favorable slopes in front of the target a percussion burst may be sensed

as short when the shot obviously falls in a portion of the terrain known to be in front of the target.

4 That percussion bursts may otherwise only be sensed when smoke, dust or fragments are thrown up in front of the target by "Shorts" or behind the target by "Overs"; and that due to the similiarity often existing between the color of the target and the color of the percussion burst, they are usually more difficult to observe than time bursts.

5 That, of observable time bursts

a Shots are short when the smoke-ball appears in front of the target or immediately drifts in front of it. (The danger of being deceived by the drifting of the smoke-ball due to wind blowing up or down the range should be explained.) "Shorts" are also indicated by the appearance before the target of the shadow cast by the ball of smoke, when the sun is behind the observer.

b Shots are over when the smoke-ball appears behind the target and the target is silhouetted against the white smoke. Such an observation often discloses a target otherwise invisible.

c Salvos or volleys are "Bracketing" when shots in the same salvo or volley are observed as both "Short" and "Over." They indicate the range of the target, but usually too long a range for effective time fire.

6 That obvious effect on the target is indicated by the knocking down or blowing up of portions of it.

EMPLOYMENT.

The Battery Commander should be accompanied by the Chief of the 5th Section at all times after leaving the battery for the purpose of reconaissance or of reporting to a higher commander. To this end the Chief of the 5th Section, equipped with the battery commander's telescope, field glasses, battery commander's ruler, note-book and pencils should be instructed to report to the Battery Commander when the battery is

subdivided for action or at any prearranged signal and to remain with him until a station is established or he is dismissed. See Note.

When first approaching a crest the Chief of the 5th Section and the other battery details should halt behind it and remain mounted until sent for or assigned other duty. They are then ready to proceed promptly to another position if necessary.

As soon as the Battery Commander has found or been assigned his target or his sector of observation, he should at once call up the Chief of the 5th Section, point out the target or sector, designate an aiming point and indicate at least in general, the position of the battery. If this information is not furnished the Chief of the 5th Section he should ask the Battery Commander for it. As soon as he is sent for, the Chief of the 5th Section should dismount, turn his horse over to the nearest horse-holder and run forward with the instrument, taking advantage of all cover, and report to the Battery Commander.

Having received his instructions the Chief of the 5th Section at once sets his instrument, unless he is directed not to do so, selecting a position for it and setting it up at such a height that full advantage of all available cover is taken. He then rapidly gets the target under observation and keeps it under observation, at all times, thus leaving the Battery Commander free to select and designate definitely the position of the battery. If he is instructed not to set up the instrument he should observe the target with his field glasses and make the required angle measurements with the ruler, field glasses or hand.

Having got the targets under observation, the Chief

Note: Three blasts of the drill whistle has been found to be an excellent signal for summoning the Chief of the 5th Section and the other battery details.

of the 5th Section should be required without further instructions to perform the following duties, or such of them as time will permit.

a Measure and record the angle from the aiming point to the target.

b Measure and record the angle of site.

c Measure and record the interval from the target to any prominent marks in the terrain and the height in mils to any good reference points, thus establishing a graphical scale to which errors in deflection and height of burst may be referred.

e Calculate the deflection and deflection difference by any method prescribed by the Battery Commander.

f Make a panorama sketch of the enemy's position.

g Determine the gun position from which the crest can be cleared at the given range and angle of site by taking from the Battery Commander's ruler the angle of departure in mils and with proper correction for angle of site, subtracting it from 300, setting it off on the Battery Commander's telescope and finding the point in the gun position where the line of sight of the telescope cuts the ground. Any gun position in rear of this point will clear the crest at the assumed range.

The above duties should be performed by the Chief of the 5th Section regardless of whether or not the Battery Commander is to make use of them or not. The more the Battery Commander can rely upon the Chief of the 5th Section to perform these duties accurately, the freer he is to concentrate his own mind on his own observation of the target, the transmission of commands to the battery, the observation of fire, the correction to be made during adjustment and the prompt delivery of fire for effect.

During the delivery of fire the Chief of the 5th Section should observe the target at all times and should record his sensing of each shot.

The Battery Commander should never delegate to

any one the all important duty of sensing each shot for range, deflection and height of burst; but in order to provide for emergencies when the Battery Commander may be absent or disabled, the Chief of the 5th Section should be prepared to furnish information regarding previous fire or even temporarily assume direction of the fire himself.

The Chief of the 5th Section should at once report any obvious effect on the target.

When new targets appear or are assigned the Chief of the 5th Section should be at once notified and required to obtain and record the same data in respect to them as was obtained for the initial target.

When the Battery Commander's station is to be closed or moved the Battery Commander should notify the Chief of the 5th Section promptly in order that there may be no unnecessary delay in packing the telescope or getting the horses up.

If the Battery Commander is disabled or relieved, the Chief of the 5th Section should be prepared to furnish his successor with all the information previously obtained or recorded.

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