

[Issued with Army Orders for January, 1923.]

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MORTAR DRELL
FOR - 7. OCT. 1920
**6-INCH MEDIUM MORTAR,
MARKS I, II AND III.**

1923.

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THE WAR OFFICE,
January, 1923

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GENERAL INSTRUCTIONS.

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 Practical instruction in the equipment should be given to each recruit before any attempt is made to instruct him in gun drill. In teaching the duties of each man at the gun, the instructor should try to impart the instruction by reasoning rather than by a long explanation. By means of questions he should try to draw from the recruit the correct answers as to the performance of his duties, being careful to lead the man's mind into the desired channel of thought. Should this attempt fail, the instructor should give a demonstration emphasizing the points the recruit has not grasped. Such demonstrations should deal with the work of each man in the detachment; and all men under instruction should, in turn, carry out the work of each particular man.

Instruction in gun drill should begin as soon as the recruits are conversant with all parts of the equipment, and can handle in the best and quickest manner each of the working parts of the gun. Once the work of each man has been thoroughly mastered, it should not take long for the recruit to learn the actual drill.

It is most important that a marked distinction should be drawn between instruction and drill.

During the former the language used should be as simple as possible, and the meaning of all technical terms which are necessary must be carefully explained. A conversational tone should be adopted, and under no circumstances whatever should anything in the nature of long quotations from drill books be allowed. The men should be permitted to assume an easy attitude and their interest should not be allowed to flag. They should be encouraged to ask questions.

At drill, on the contrary, rigid discipline must be maintained, orders must be clear and decisive, and the detachments made to work steadily, smartly and rapidly. At the same time the utmost accuracy is essential and any deviations from the methods laid down must at once be checked.

NOMENCLATURE OF LOADS.

The equipment is divided into two loads, which are called by the following names :—

1. The Bed.
2. The Gun.

CHAPTER I.—GENERAL DUTIES.

This chapter summarizes the duties of the section commander and of each man in the detachment. It is only intended as a guide for the instructor, who should use his own words in explaining the various duties to the men.

The detachment is composed of seven men. The service of the gun is divided between them as follows :—

- | | | | | |
|---|-----|-----|-----|---|
| 1 | ... | ... | ... | in command and lays. |
| 2 | ... | ... | ... | the bore. |
| 3 | ... | ... | ... | the loading. |
| 4 | ... | ... | ... | the charges and primers. |
| 5 | ... | ... | ... | } ammunition supply. |
| 6 | ... | ... | ... | |
| 7 | ... | ... | ... | the exploders and fuzes, and in charge of ammunition. |

The duties of the section commander and of each man are as follows :—

DUTIES OF SECTION COMMANDER.

NOTE.—*The normal fire unit for mortars is the section. On service it will rarely be possible for section commanders to be with their sections in action, and it may be inadvisable to withdraw a No. 1 from his gun to act as section commander. In this case such of the following duties as affect both guns will be performed by the G.P.O. (gun position officer) and such as affect individual guns by the Nos. 1.*

1. He **COMMANDS** his section and is responsible for the serviceability of its **EQUIPMENT** and the correctness of its **DRILL**.

2. He places himself where he can best see and hear the **B.C.** (battery commander) or **G.P.O.** and will only move about when necessary for the supervision of his section. In ordinary circumstances he should be on the flank of his section nearest the command post.

3. He will acknowledge orders from the command post by saluting with the hand nearest the **G.P.O.**, finishing with the hand vertically above the head.

He only passes **ORDERS** when he sees that his **Nos. 1** or the neighbouring section commander have failed to acknowledge.

4. He supervises the **TESTING** of the sights of his section.

5. He keeps a **RECORD** of the bearing of the zero line, and of the **ZERO LINE READINGS** of his guns. He will not keep any record of orders during a shoot.

6. He is **RESPONSIBLE** that, before fire is opened on any target, his guns are layed in the **DIRECTION ORDERED**.

This is best done, not by inspection of the sights, but by comparing the line of his two guns and the flank guns of

the neighbouring sections, by looking along the line of each with reference to some distant object either in front or rear.

7. He **CONTROLS** his section in action.

This control is best carried out by watching and listening rather than by personal inspection of sights, &c.

8. When his section is **RANGING**, if one gun miss-fires, he will fire **BOTH ELEVATIONS** from the other gun, the lower elevation first.

9. At **BATTERY FIRE** he will report to the G.P.O. when one of his guns **MISSES ITS TURN**.

10. He will **REPORT** to the G.P.O. when either of his guns goes **OUT OF ACTION** or when he finds that an **ERROR** has been made which is likely to have **AFFECTED THE SHOOTING**.

DUTIES OF 1.

1. He **COMMANDS** and is responsible for the entire service of his gun.

2. He gives the **WORDS OF COMMAND** detailed for him in Chapter II and repeats all **ORDERS** affecting his detachment which have not been heard by the men concerned. His orders must be clearly given but no louder than is necessary to enable his detachment to hear.

He assists in passing orders when necessary.

He acknowledges all orders by saluting. He will salute with the hand nearest the section commander, finishing with the hand vertically above the head.

When he cannot acknowledge orders by saluting (owing to the guns being in trenches, &c.) he will repeat back the orders that affect his gun, just loud enough to be heard by the section commander.

3. He is responsible :—

- i. That the **BED** and **PLATFORM** are correctly laid.
- ii. That the **GUN** is correctly mounted.

- iii. That the CLINOMETER is in correct adjustment.
 - iv. That the GUN is laid at the line and elevation ordered.
4. He selects the GUN PLATFORM, which should be on level and firm ground. If the ground is not level he must arrange to level it from the higher end.
 5. He records the ZERO LINE reading of the clinometer.
 6. He applies—
 - (a) The POSITION CORRECTION, which, if required, is given in the form—"Position Correction. No. plus (or minus) degrees" and is applied to all elevations ordered, but is cancelled when a fresh target is ordered.
 - (b) Corrections during fire for effect, which are ordered in the form "No. add (or drop) degrees." These are cancelled when a fresh elevation is ordered.

7. IN ACTION he LAYS for LINE and ELEVATION. At INDIRECT LAYING he sets the clinometer at the line and elevation ordered and manipulates the guys till the line and elevation bubbles of the clinometer are central.

The GUYS must be TAUT when the laying is completed, but excessive force must not be used.

At DIRECT LAYING FOR LINE he stands in rear of the gun and directs 2 to traverse as required. He moves his position as the gun is traversed so that it always appears to be vertical. When the target appears vertically over the muzzle, the gun is laid for line. He lays for elevation by revolving the clinometer about the gun until the line bubble is central and then by manipulating the guys until the elevation bubble is central.

8. He supervises the preparation and supply of AMMUNITION and occasionally, before the bomb is loaded, checks the CHARGE.

9. He gives the order to FIRE. The gun will never be fired without his order. Before giving the order he sees that it is in all respects ready.

10. He is responsible that the INTERVAL between rounds is properly kept as regards his own gun.

When a salvo or a quick rate of battery fire (less than five seconds) is ordered, he steps clear and extends his right arm above his head as a signal when his gun is ready to fire.

11. At intervals he examines the equipment and re-arranges it if necessary.

12. He watches the action of RECOIL on the bed and, if required, adjusts the supports.

13. When RAPID and PROLONGED FIRING takes place he takes every opportunity of cooling the gun with water, applied to sandbags wrapped round it.

14. He must never allow anyone to pass in front of, or remain near, the muzzle at the moment of firing or during the pause for a miss-fire, on account of the gas blast.

15. In the case of a MISS-FIRE he attends to the miss-fire plug and inserts the igniter and lights the safety fuze. He assists to UNLOAD, and REMOVES FUZE when necessary.

DUTIES OF 2.

1. He assists 3 in carrying the gun.
2. With 3 he MOUNTS and DISMOUNTS the gun.

To MOUNT the gun—

- 2 and 3 place the breech of the gun in the socket of the base block of the bed, the muzzle being inclined to the rear.

They then bring the muzzle to the front till the guide stud is engaged. 3 holds the gun while 2 hooks the elevating and traversing guys.

To DISMOUNT the gun—

3 supports the muzzle while 2 eases and unhooks the traversing and elevating guys, the right-hand guy first. They then bring the muzzle to the rear and lift out the gun.

3. IN ACTION he clears the BORE after every round by forcing the gas ejector down to the BOTTOM of the bore, but he will not use the gas ejector if the stop plug is not in the gun.

4. He assists 1 in traversing, if required.

DUTIES OF 3.

1. He assists 2 in carrying and mounting the gun.

2. He LOADS and FIRES the gun.

TO LOAD.—He turns half-right and receives the bomb from 5 (or 6), grasping the vanes from above with the right hand and supporting the front of the bomb with the left hand.

He checks the charge and places the bomb so that the primer is about 3 inches down the bore, holding the bomb firmly with the left hand. He then reports "Ready."

TO FIRE.—At the order Fire he removes the safety pin and cap with the right hand and, supporting the bomb with the left, allows it to slide down the bore.

He stands clear of the blast and receives another bomb.

3. HE UNLOADS by replacing the CAP AND SAFETY PIN and removing the bomb from the bore.

DUTIES OF 4.

1. He assists 5, 6 and 7 in carrying the BED.
2. He attends to the CHARGES.
3. He assists 7 to prepare AMMUNITION.
He places the CHARGE, as ordered by 1, and the PRIMER in the recess in the vanes of the bomb. The portions of the charge will be evenly distributed in the vane angles.
4. At CEASE FIRING he removes CHARGES and PRIMERS from any unexpended ammunition and replaces them in their tins.

DUTIES OF 5 AND 6.

1. They assist 4 and 7 in carrying the BED.
2. They attend to AMMUNITION.
3. IN ACTION they (alternately) supply a BOMB to 3. They come up on the right of 3 with the bomb horizontal, supported on the right arm and steadied with the left hand on the vanes.

DUTIES OF 7.

1. He assists 4, 5 and 6 in carrying the BED.
2. IN ACTION he is in charge of the DISPOSAL of the AMMUNITION in the place selected by 1 and of its PROTECTION from hostile fire and from weather.
He is responsible for the PREPARATION and SUPPLY of AMMUNITION as ordered by 1.
He inserts the EXPLODER and FUZE into the bomb.
3. When FUZING bombs he removes the fuze-hole plugs with "Key, No. 40."
4. At CEASE FIRING, unless otherwise ordered, he UNFUZES all bombs, removes DETONATORS or IGNITERS from fuzes, withdraws EXPLODERS from bombs and replaces them in their tins.

He replaces the fuze-hole plugs.

When preparing a bomb with "Fuze, Percussion, No. 110 Mk. III" he withdraws the fuze cap with the liner attached, and inserts the igniter or detonator into the body of the fuze, as ordered.

He replaces the liner, pressing it home, and replaces the cap and safety pin.

The igniter or detonator must on no account be inserted in the fuze while the fuze is in the bomb.

He then inserts the exploder into the bomb and screws the fuze in, using "Key, No. 60A" (with Mk. I and Mk. II fuzes he uses "Key, No. 60").

CHAPTER II.—GUN DRILL.

Artillery Training lays down the principles of battery tactics, which vary little with different equipments. This chapter details the orders given and the procedure by which these orders are carried out in batteries armed with the 6-inch M.L. Mortar, Mks. I, II or III.

The procedure must be memorized and strictly adhered to.

The executive order is shown throughout as being given by the section commander, as will normally be the case during training. When orders can be heard throughout the battery, they will be acted upon without repetition. Instructors will invariably employ the orders detailed for the section commander, even when drilling a single detachment.

Note:—

When the gun is "LIMBERED UP" it is ready to move by some means of transport (*e.g.* in a cart, &c.).

When the gun is at "PREPARE TO LIMBER UP" the portions are laid down in order from front to rear at 2 yards distance :—

1. The Bed.
2. The Gun (muzzle to the rear).

1. Positions at Detachment Rear.

The detachment falls in two deep, one pace between ranks, 1 on the right of the front rank. 1 is not covered.

When the gun is limbered up, the front rank is three paces in rear of the vehicle, 1 covering the off wheel.

When the gun is prepared to limber up, the front rank is three paces in rear of the gun, 1 covering the right edge of the bed.

When the gun is in action, the front rank is three paces in rear of the bed, 1 covering off the right edge.

2. To Tell Off.

Section commander.

".....section—*Tell off.*"

1 numbers himself 1, the right-hand man of the rear rank 2, his front-rank man 3 and so on.

3. To Change Round.

Section commander.

".....section—*Change round.*"

1 takes a pace to the rear with his right foot and a pace to the left with his left foot. The left-hand man of the rear rank takes a pace to the front. At the same time the remainder of the front rank take a pace to the right and the rear rank a pace to the left.

(The detachment is then again told off.)

4. To Form Order of March from Detachment Rear when the Gun is prepared to Limber Up.

Section commander.

".....section—*Form order of march.*"

1 orders "Left turn, double-march."

The detachment double to their places as follows :—

1 two yards in front of the bed.

2 and **3** at the gun, **2** on the right of the muzzle **3** on the left of the breech.

4, 5, 6 and **7** at the bed, **4** and **5** at the front, **6** and **7** at the rear; **4** and **6** on the right side, **5** and **7** on the left.

5. To Form Detachment Rear from Order of March.

Section commander.

".....section—*Detachment—Rear.*"

1 doubles to his place and gives the order "No. Double-march." At the order from **1** the remainder double to their places and halt.

6. To Move the Gun by Man Carriage.

(The gun should be at "Prepare to Limber up," and the detachment in "Order of March.")

Section commander.

".....section—*Prepare to advance.*"

The men raise their loads and on the order "March" the section moves off.

On the order "Halt" the men halt and lower their loads to the ground.

Section commander.

".....section—*March.*"

The subsection moves to the front.

Section commander.

".....section—Halt."

The men halt and lower their loads to the ground.

7. To Examine Equipment.

Examination of the assembled equipment will be carried out before leaving the gun park. When in action, the procedure should be carried out at least once in every 24 hours, and advantage should be taken of any interval to examine, test and arrange the equipment.

Section commander.

".....section—Examine equipment."

1 examines and tests the clinometer, and examines the matches and emergency igniters.

He supervises the work of the other men and sees that his detachment and equipment are in all respects ready for action. (He examines the Spare Stores Box, and striker, stud, wrench, if they are in his charge.)

2 examines the gas ejector, which is carried in the bore except when in action. He examines the gun and tool box. He sees that the bore is clean and free from oil and that the clinometer collar protecting band and muzzle cover are in position and secured.

3 examines the bed and platform.

4 sees that the charges and primers required are correct.

5 and **6** examine bombs and see that they are clean, free from oil and undamaged.

7 sees that the fuzes and exploders required and Nos. 40, 60, 60A keys are correct. He supervises the work of **4**, **5** and **6** and sees that the ammunition is in all respects ready for action.

As soon as the examination is completed, the detachment form detachment rear.

1 collects reports, and reports to the section commander "No. ready for action" or otherwise.

8. To Prepare for Action.

Preparation for action will be carried out before moving into action.

Section commander.

".....section—*Prepare for action.*"

Each man examines the parts of the equipment for which he is responsible.

1 supervises the work of the other men and satisfies himself that the detachment and equipment are in all respects ready for action.

As soon as he has completed his duties, each man reports to **1** and resumes his place.

1 then reports to his section commander "No. ready for action" or otherwise.

9. To Come into Action.

Whenever possible before the guns are brought on to the position, **1** chooses the gun platform, marks the line of fire as indicated by the section commander and has any necessary preparation of the ground carried out.

Section commander.

"..... section—*Action front.*"

When the bed is in the required position **1** orders "Halt. Action Front" and directs **4**, **5**, **6** and **7** where to place the bed. **4**, **5**, **6** and **7** then go to prepare the ammunition in the place pointed out by **1**.

2 and **3** place the mortar on the ground and, under the direction of **1**, lay the bed so that its centre line is in the line

2 and **3** then unhitch and lengthen the guys and mount the gun.

3 removes the clinometer collar protecting band and lays it on the left of the gun.

2 removes the muzzle cover and gas ejector and lays them on the right of the gun.

1 arranges for the driving of pickets to support the bed as required. He fixes the clinometer, elevates the gun to about 60° elevation and lays it in the line of fire by direct laying. He reports the reading of the traversing arc to the section commander.

When the men have completed their duties they take up the positions in action, and **1** reports to the section commander "No. Ready to load."

When ordered, **7** sends back for the tool and spare store boxes, and striker stud wrench.

10. Positions in Action.

1 in rear of the bed.

2 on right of and facing the muzzle.

3 on left of and facing the muzzle.

4, 5, 6 and **7** with the ammunition.

All men kneel down except when actually serving the gun.

11. To Form Detachment Rear in Action.

Section commander.

".....section—*Detachment rear.*"

1 doubles to his place (three paces in rear of the right edge of the bed) and gives the order "No. Double-march." At the order from **1** the remainder double to their places and halt.

12. To Take Post from Detachment Rear.

Section commander.

".....section—*Take post.*"

The detachment double to their positions in action.

13. To Lay the Gun.

Section commander.

".....section—..... *degs. more Right (or Left)*.
(*Elevation*) *degs.*"

or

".....section—..... *degs. Right (or Left) of zero*
line. (Elevation) degs."

1 repeats and acknowledges the order. He sets the clinometer at the elevation ordered and clamps it to the gun at the deflection or angle from zero line ordered, and lays, assisted by **2** if necessary. When he has finished laying he reports "Set."

14. To Load.

Section commander.

".....section—*Fuze..... Charge.....*""..... *Ranging*" (or *Method of Fire*).

1 repeats the ammunition order to **7** and at the correct moment orders "Load."

5 and **6** alternately supply a prepared bomb to **3**.

3 sees that the charges are correct, loads the bomb and reports "Ready."

After the first round **1** orders "Load" and only repeats any alteration in the ammunition that may be ordered.

15. To Unload.

Section commander.

".....section—*Unload.*"

1 repeats the order.
3 replaces the cap and safety pin if they have been removed, and removes the bomb.

16. To Fire.

No. **1**.

"No.—Fire."

3 fires. As soon as the bomb begins to slide down the bore, **1**, **2** and **3** stand clear of the blast.

1 reports "Shot" and the number of his gun.

2 clears the bore with the gas ejector.

3 receives another bomb.

The gun will on no account be fired without the order from **1**.

17. Miss-fires.

If the gun fails to fire, 1 allows ONE minute to elapse and then removes the stop and miss-fire plug, removes the cap and screws the plug, reversed, into the adapter.

(In the case of guns fitted with separate miss-fire and stop plugs, he removes the stop plug, and screws in the miss-fire plug in its place.)

He inserts an emergency igniter into the plug, leaving at least one inch projecting.

When it is again his turn to fire he orders "No.—Fire" and lights the end of the igniter.

If the gun fires, the plug is replaced and normal drill continues.

If the gun again fails to fire, 1 allows TWO minutes to elapse and replaces the stop plug.

1, **2** and **3** dismount the gun and lay it on the ground clear of the bed. **1** stands at the muzzle and directs **2** and **3** to raise the breech slowly and receives the bomb as it slides

out. He removes the fuze and then unloads the bomb and places it aside.

2 and 3 remount the gun and 2 clears the bore with the gas ejector.

Normal drill now continues.

18. To Change the Line of Fire.

If it is necessary to lay the gun in a line outside the scope of its traverse, the section commander indicates a new line of fire. The gun is dismounted and 1 directs 2 and 3 in laying in this line. The gun is again mounted.

1 reports to the section commander the reading of the traversing arc when the gun is laid in the new line.

19. To Stop Firing.

Section commander.

".....section—*Stop.*"

The detachment continue their duties but the gun is not fired until the order "Go on" is given.

20. To Stand Fast.

Section commander.

".....section—*Stand fast.*"

All stand fast whatever they are doing.

At the order "Go on" work is continued.

21. To Stand Easy in Action.

Section commander.

".....section (or No.)—*Stand easy.*"

This order is given to indicate that firing is temporarily suspended.

Before opening fire again the order "Take post" will be given.

22. To Prepare to Move.

The section commander informs the Nos. 1 of the method of evacuating the position and whether a position of assembly is to be used.

Section commander.

".....section—*Prepare to move.*"

Ammunition and stores, as ordered by the section commander, are repacked and loaded up. Preparation for limbering up will be made as far as possible, but guns will remain in action until the order "Cease firing" is given.

23. To Cease Firing.

Section commander.

".....section—*Cease firing.*"

If the gun is loaded, 1 orders "Unload."

1 removes the clinometer from the gun.

2 replaces the gas ejector and muzzle cover.

3 replaces the clinometer collar protecting band.

4, 5, 6 and 7 remove fuzes, withdraw detonators or igniters and exploders from bombs and replace fuze-hole plugs. They remove charges and primers and repack them in their tins.

24. To Prepare to Limber up.

Section commander.

".....section—*Prepare to limber up.*"

2 and 3 dismount the gun and lay it down two yards in rear of the bed, muzzle to the rear. 2 and 3 then engage the hooks of the guys in their hooks on the bed and screw up.

The detachment now take up their positions in order of march.

25. Casualties to Detachments.

Men sent up to replace casualties report to their section commanders, who order such changes of duties as they may consider necessary.

Casualties are replaced as follows:—

Section commander	By the senior No. 1 of the section.
With 6 men ...	4 performs duties of 4 and 7.
„ 5 men ...	{ 4 „ „ 4 and 7. 5 „ „ 5 and 6.
„ 4 men ...	{ 4 „ „ 4 and 7. 3 „ „ 3 and 2. 2 „ „ 5 and 6.
„ 3 men ...	{ 3 „ „ 3, 5 and 6. 2 „ „ 4 and 7. 1 „ „ 1 and 2.

26. Casualties to Equipment—Instructions.

Clinometer. When no spare clinometer is available:—

Stand at the breech and plant a series of aiming posts to cover the zone at 5 degs. intervals, using the hand or other method to measure the angles. Lay for line by Direct Laying, using the posts to judge the angles.

For elevation, place the straight edge of a protractor along the under side of the gun and use the cord with a weight attached to indicate the angle of elevation of the gun.

27. Disablement.

The extent of disablement ordered will depend on the time available and the probability of recapture.

(1) *To disable the gun so that it can be brought into action immediately after recapture :—*

. Remove the stop plug, striker and clinometer.

(2) *To destroy the gun :—*

(a) Dismount the gun.

(b) Remove the STRIKER and stop plug and insert the miss-fire plug.

(c) Load a round [7th charge (without primer) and 110 fuze (with detonator)] and allow it to slide to the bottom of the bore.

(d) Prepare the gun for firing with a length of emergency igniter as in the case of a miss-fire.

(e) Plug the muzzle with a sandbag of earth, or put it against a bank or parapet, being careful not to touch the fuze.

(f) Light the igniter and get under cover.

(Note :—The length of emergency igniter used must be sufficient to allow the detachment time to get well clear and under cover.)

CHAPTER III.—LAYING TESTS.

(1) In every battery there should be at least four qualified layers in a subsection, exclusive of serjeants and lance-serjeants. A list of layers should be kept. All layers, section commanders, serjeants and lance-serjeants should be tested periodically.

(2) All officers and Nos. 1 must be thoroughly conversant with the tests for, and care of, the clinometer.

(3) The laying test will consist of 6 lays.

A maximum of 10 marks will be given for each lay.

In order to qualify, a layer must obtain 50 marks.

(4) The examiner will be assisted by an officer or senior non-commissioned officer with a stop watch and record book, and by a penciller who will take down all orders given, for reference when checking the lay.

(5) Layers will be examined singly acting as No. 1 for the time being.

(6) The orders for the lay must be given out clearly and distinctly, a short pause (about 2 or 3 seconds) being made after each separate order, thus :—

“ All guns 10 degs. right of zero line ”—pause—“ 65 degs.”

All orders will be acknowledged by the layer, repeated back and acted on at once.

Should the layer at any time be in doubt as to any particular order, he will refer to the examiner.

(7) The test will be as follows, the lays being taken in any order :—

(i) Two lays, the alterations of line and elevation not exceeding 5 degrees from the previous lay. Time allowed for each lay, 45 seconds.

(ii) Two lays, the alteration of line not exceeding 10 degrees (the elevation remaining constant). Time allowed for each lay, 30 seconds.

(iii) Two lays, the alteration of elevation not exceeding 10 degrees (the line remaining constant). Time allowed for each lay, 30 seconds.

(8) The layer will call out “ Set ” as soon as he has finished laying the gun. The time will be taken from the conclusion

of the orders for the lay until the word "Set" from the layer.

(9) Marks will be deducted as follows :—

- (i) For each mistake in the drill of the layer as laid down—1 mark.
- (ii) For every 5 seconds or fraction of 5 seconds beyond the time laid down for the particular lay—2 marks.
- (iii) For either bubble not being in the centre of its run—2 marks.
- (iv) If the last motion is not one of elevation—5 marks.

(10) No marks will be given for the lay—

- (i) If either bubble is wholly outside the marks on the level.
- (ii) If the clinometer is incorrectly set.
- (iii) If the guys are not taut.

EXAMPLE OF TEST.

The gun is laid on the zero line at 60 degrees elevation.

Orders.

- Lay 1. "All guns 8 degrees left of zero line. 60 degrees."
- Lay 2. "All guns 3 degrees more right. 63 degrees."
- Lay 3. "All guns. 70 degrees."
- Lay 4. "All guns 2 degrees more right. 67 degrees."
- Lay 5. "All guns 5 degrees right of zero line. 87 degrees."
- Lay 6. "All guns. 61 degrees."

In each case, the procedure will be as laid down under "To lay the gun."

CHAPTER IV.—CLINOMETER TESTS.

The clinometer should be tested from time to time. Any adjustment must be carried out by a qualified artificer.

Test 1. Comparative Test.

It is of the first importance that all clinometers in the battery should be interchangeable, *i.e.* they should give the same reading on a gun layed at a fixed line and elevation.

Method of carrying out the Test :—

- (i) Lay the gun at any fixed line and elevation with one of the clinometers.
- (ii) Substitute in turn the other clinometers and note the readings for line and elevation when the bubbles are central.
- (iii) Select a clinometer which gives readings approximately at the mean of the readings and repeat the process, using the selected clinometer as standard.
- (iv) If the clinometers cannot be adjusted, they should be marked with their individual errors (in quarters of degrees) and grouped at guns so that each section or gun has clinometers with approximately the same errors.

Test 2. Test for Standard Clinometer.

For predicted shooting it is necessary that the standard clinometer should give (within one degree) true line with reference to the centre line on the bed, and true quadrant elevation.

(a) *Line Test.*—Instructions :—

The gun, when layed by clinometer at zero traverse, should be pointing in the same line as the centre line on the bed.

Since, however, any error found may be due to the particular bed, no correction or adjustment to the clinometer should be made unless it shows the same error on another bed.

- (i) The bed must be on a level platform. Put the gas ejector down the bore with a plumb line attached to the handle. Arrange the line to pass over the lowest portion of the lip of the muzzle and to hang down in front of the gun.
- (ii) Traverse the gun until the plumb line passes through the prolongation of the centre line on the bed. (This can best be judged by kneeling in front of the gun so that the eye is in prolongation of the centre line.) The gun is now layed in the same line as the centre line.
- (iii) Level the line bubble by revolving the clinometer about the gun and clamping it. The traverse should now read zero.
- (iv) If, after verification on another bed, the same reading is obtained, the clinometer should be adjusted. When adjustment is not possible the reading should be noted as a correction to line for clinometer index error.

In the case, however, where the error is traced to a particular bed (or gun) the correction required should be noted on that bed (or gun).

(b) *Elevation Test.*—Instructions :—

Lay the gun at zero traverse, and 60° Elevation by the clinometer.

Put a straight edge in the muzzle, taking care that it rests truly along the bottom surface of the bore, and measure the elevation with a tested field clinometer placed on the straight edge.

When adjustment is not possible, the necessary correction to elevation for clinometer index error is obtained by noting the difference between the reading of the field clinometer and 60°.

CHAPTER V.—CARE OF EQUIPMENT AND AMMUNITION.

1. CARE OF EQUIPMENT.

The bed and platform must be laid upon a level surface and should be well supported. Pickets, or some other firm support, should be put at the back of the bed (see Handbook). This is particularly important because the accuracy for line depends largely on the line and the cross level of the bed remaining constant. For ranges over 500 yards a sub-base arrangement of timber of at least 6 inches in thickness is necessary to ensure the steady flight of bombs.

The bore of the gun must be kept clean and free from rust and débris and slightly oiled. If the gun is not to be used for some time, the bore should be cleaned and oiled with mineral oil. Thick lubricating oil should not be used for this purpose as it chars and tends to clog the bore.

The use of the gas ejector **AFTER EACH ROUND** is essential, especially when using long-range charges, as hot gases are left in the bore.

Should the bore become "STICKY" and miss-fires occur repeatedly, the surface should be cleaned with paraffin or petrol.

The **STRIKER STUD** should be examined occasionally, and if found to be so worn that it is likely to cause miss-fires it should be replaced.

The GUIDE STUD needs attention during action as it may work loose by vibration due to firing; it is also liable to break off if earth works into the cam groove in the socket of the base block. The socket of the base block and the base of the gun must be kept clean and free from grit.

The ELEVATING AND TRAVERSING GUYS must be absolutely tight during firing, as slack guys lead to inaccurate shooting and, as the stresses are not equally divided, to the breakage of guys.

During transit the "band, protecting, clinometer collar" should always be in position on the gun.

The CLINOMETER when not in use should be in the bag provided.

II. CARE OF AMMUNITION.

Bombs must be kept clean and free from oil. They should be examined to see that the vanes are straight and that they are uncracked. A cracked bomb should never be fired.

Charges and fuzes, &c., must be kept in their boxes in a dry place.

Igniters are for delay action and are marked with BLUE on the head of the case, and in a band round the body. At night they can be distinguished by touch as the mouth of the case is CRIMPED.

Detonators are for instantancous action and are marked with RED on the head of the case.

They can be distinguished at night by touch as the mouth of the case is TURNED over.

Detonators contain fulminate of mercury and must be handled with great care and never subjected to violence.

APPENDIX I.

1. The Equipment of one gun consists of :—		Weight.
Bed, M.L. 6-inch Mortar, Mark II	... 1	430 lbs.
(with 1 elevating and 2 traversing guys)		
Ordnance, M.L. 6-inch Mortar	... 1	164 "
Platform, ground	... 1	728 "
Ejector, gas	... 1	8 "
Cap, muzzle	... 1	1 "
Band, protecting, clinometer collar	... 1	1 "
Wrench, striker stud (each battery)	... 1	21 "
Box, tool, filled	... 1	32 "
Box, spare stores, filled (each battery)	... 1	78 "

List of Contents.

2. Box, spare stores (1 each battery).			No.
	Description of Stores.		
	Bags, clinometer, M.L. 6-inch Mortar	... 3	3
	Bed, M.L. 6-inch Mortar, Mark I—		
	Guy, elevating	... (spare)	1
	" traversing	... (")	2
	Brush, wire, M.L. 6-inch Mortar	... (")	1
	Clinometer, M.L. 6-inch Mortar	... (")	3
	Hammer, claw, 16 oz.	... 1	1
	Ordnance, M.L. 6-inch Mortar, Mark I—		
	Adapters, plug, miss-fire	... (spare)	3
	Plugs, miss-fire, and stop, with cap and chain	... (spare)	3
	Screwdrivers, G.S. :—12-inch	... 1	1
	" " 14-inch	... 1	1
3. Box, Tool (1 each gun).			
	Bags, clinometer, M.L. 6-inch Mortar	... 1	1
	Bags, sponge { inner	... 1	1
	} outer	... 1	1
	Brush, wire, M.L. 6-inch Mortar	... 1	1

Description of Stores.	No.
Bubbles, clinometer (in rubber tube) ... (spare)	3
Clinometer, M.L. 6-inch Mortar	2
Cloths, sponge	6
Files, smooth, half-round, 8-inch	1
Hammer, claw, 16-oz.	1
Handbook, instructional	1
Implements, ammunition :—	
Keys, No. 60 (or 60A)... ..	2
" No. 40	2
Mineral jelly, red (in box 1 lb.)	1
Ordnance, M.L. 6-inch Mortar, Mark I :—	
Adapter, plug, miss-fire (spare)	1
Plugs, miss-fire and stop, with cap and chain (spare)	1
Washers, spring, plug, miss-fire ... (")	1
Pliers, side cutting, 7-inch pair	1
Range tables	1
Screwdriver, G.S., 9-inch	1
Sponge	1

Note :—Ejector, gas, should be carried in the barrel and kept in place by the muzzle cover during transit.

APPENDIX II.

ADDITIONAL STORES FOR MOBILIZATION.

STORES FOR ONE SECTION OF TWO 6-INCH MEDIUM MORTARS.

Description of Stores.	No.
Axes, felling, with helves	2
Buckets, water, G.S.... ..	4
Mauls, G.S., Mark V, with helves	3
" " " heads spare	1
Posts, picket, 3½-ft.	16

Description of Stores.	No.
Axes, pick, 4½-lbs., with helvcs	4
Crowbars, 3½-ft.	2
Shovels, G.S.	8
Wedges, sawyers	2
Saws, hand, 20-inch, with case	2
Levels, spirit, rule	2
Spanners, adjustable, 15-inch	2
Oil, lubricating, G.S. pints	4
Cans, lubricating, No. 9	2
Periscopes, No. 14	1
Compass, prismatic, in case... ..	1
Posts, aiming, circular head	2
“ “ square head	2

APPENDIX III.

PACKING OF AMMUNITION.

LIST OF CONTENTS OF BOXES, &c.

There are two methods of packing the ammunition, viz. :—

- (1) Bombs. One in a “Case, packing, skeleton, bomb
M.L. 6-inch Mortar, Mark I or II.”

Fuzes, No. 110	20	} In “Box, ammunition components, M.L. 6-inch Mortar, B. 119, Mark II.”
Primers, propelling charge	20	
Igniters	20	
Detonators	20	
Exploders	20	
Firing clips	20	

The fuzes are packed loose. The igniters, detonators and primers are issued in 12 cardboard boxes; each box contains five. The cardboard boxes are packed in a tinned plate box. The exploders are packed in four tinned plate boxes and firing clips are issued on a card.

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Weight of box	{	filled	42 lbs. 0 oz.
		empty	14 lbs. 8 oz.
Charges, propelling	...	40	} In "Box, propelling charges and igniters, M.L. 6-inch Mortar, A. 2, Mark II."
Igniters, emergency	...	4	

The "Charges, propelling," are packed in 20 tinned plate cylinders; each cylinder contains two complete charges, *i.e.* eight 1 oz. guncotton and eight 1½-oz. cordite charges. The emergency igniters are packed two in a No. 187 cylinder.

Weight of box	{	filled	55 lbs. 8 oz.
		empty	23 lbs. 0 oz.

(2) Bombs. One in a "Case, packing, skeleton, bomb, M.L. 6-inch Mortar, Marks I or II."

Fuzes, No. 110	...	5	} In "Box, ammunition components, M.L. 6-inch Mortar, B. 152."
Primers, propelling; charge	...	5	
Igniters	...	5	
Detonators	...	5	
Charges, propelling	...	5	
Exploders	...	5	
Igniters, emergency	...	1	
Firing clips	...	5	

The fuzes are packed loose. The igniters, detonators and primers are each packed five in a tinned plate box. The complete charges are each packed in a No. 201 cylinder, the emergency igniter in a No. 202 cylinder and the exploders in a tinned plate box. The firing clips are issued on a card.

Weight of box	{	filled	20 lbs. 0 oz.
		empty	10 lbs. 8 oz.