

NOT TO BE PUBLISHED

The information given in this document
not to be communicated, either directly
- indirectly, to the Press or to any person
not holding an official position in His
Majesty's Service.

27
G.S. Publications
176



Notified in
A.C. Is for the
week ending
18th October,
1939.

Small Arms Training

Volume I, Pamphlet No. 8

Mortar (2-inch)

1939

Crown Copyright Reserved

Printed under the Authority of HIS MAJESTY'S STATIONERY OFFICE
by William Clowes & Sons, Ltd., London and Beccles.

1939

NOT TO BE PUBLISHED

The information given in this document is not to be communicated, either directly or indirectly, to the Press or to any person not holding an official position in His Majesty's Service.

26

G.S. Publications

146



*Notified in
A.C.Is for the
week ending
18th October,
1939.*

Small Arms Training

Volume I, Pamphlet No. 8

Mortar (2-inch)

1939

Crown Copyright Reserved

Printed under the Authority of HIS MAJESTY'S STATIONERY OFFICE
by William Clowes & Sons, Ltd., London and Beccles.

1939

By Command of the Army Council,

H. J. Creedy
. J. .

THE WAR OFFICE,
18th October, 1939.

CONTENTS

	PAGE
Distribution	3
General notes	4
Lesson 1. Introduction of mortar and bombs	5
Lesson 2. Stripping and cleaning	7
Lesson 3. Loading, aiming, firing, action on misfire	8
Lesson 4. Handling	10
Lesson 5. Smoke	11
Lesson 6. H.E.	13
Training with live H.E. and smoke bombs	14
Tests of elementary training	16

DISTRIBUTION

This pamphlet is issued on a pool basis. The further distribution within the unit is left to the discretion of the commanding officer.

The scale of distribution is as follows :—

Infantry—

Infantry and motor battalions	75
Motor cycle battalions	50

Training Units—

Officer Cadet Training Units (Infantry)	500
Guards Depot	} 75
Guards Training Centre	
Infantry Training Centres	
Motor Depot	
Motor Training Centres	

GENERAL NOTES

1. The tactical handling of the 2-inch mortar is dealt with in Infantry Training and Section Leading.

2. The chief characteristics of this weapon are, firstly, its ability to make a smoke screen to hide movement, and, secondly, its high trajectory, which enables it to engage with H.E. targets which are immune to small arms fire.

3. The number of bombs which can be carried into action is strictly limited owing to their weight. They should be used sparingly and only as part of a definite plan.

4. Rates of fire depend on wind and circumstances. The maximum rate with accuracy is from three to four bombs a minute. The distance within which the H.E. bomb is practically certain to be effective against personnel in the open is about 8 yards in all directions from the point of burst. Large fragments may, however, have sufficient velocity to inflict wounds up to 150 yards or more, particularly if the burst is on stony ground.

5. The mortar can be fired either high angle or low angle. The former gives the bomb a steep angle of descent, but a considerable allowance must be made for any wind. The latter is much less affected by wind as the trajectory is comparatively flat. The range in either case is 100 to 500 yards.

6. The firer is responsible at all times that he does not endanger his own troops, but all troops must be trained not to mask the fire of the mortar unnecessarily.

7. General description of the mortar.—

Weight of mortar and sight 23½ lb.

Type of sight—Collimator, graduated 100 to 500 yards;
high angle (red), low angle (black).

Weight of bomb—H.E., 2½ lb. approx.

Smoke, 2 lb. approx.

Weight of container (filled with six bombs) :—

H.E., 18 lb.

Smoke, 15 lb.

Six filled containers in special boxes are carried on the platoon truck.

LESSON 1.—INTRODUCTION OF MORTAR AND BOMBS

Instructor's Notes

Stores :—

Mortar, sight in case, dummy bomb ; two filled sandbags or mortar aiming rest for setting up mortar.

1. Explain briefly paragraphs 1 to 7 on page 4.

2. **Mounting.**—Place mortar muzzle to rear ; undo barrel strap ; loosen traversing and elevating clamps ; raise barrel and swing it to the front ; clamp up, naming all parts as shown in Fig. 1. Show sight and name parts (Fig. 2). Fit sight to mortar. Remove sight and dismount mortar in reverse order.

3. Practise and question squad, mounting and dismounting.

4. Describe :—

i. *Smoke bomb*

- (a) Fired by a cartridge in the base covered by a brass cap. This is unscrewed only to remove a misfire.
- (b) The tail is surrounded by vanes to make it drop head first.
- (c) The body is made of light metal containing composition. When the cartridge is fired the flash passes through the vents in the tail piece, melts the sealing discs and ignites the smoke composition.

ii. *H.E. bomb*

- (a) Fired by a cartridge in the base, covered by a brass cap. This is unscrewed only to remove a misfire.
- (b) The tail is surrounded by vanes to make it drop head first.
- (c) The body is made of cast iron containing H.E., which is exploded by a percussion fuze in the nose ; this has a pin and cap for safety before use.

5. Question squad.

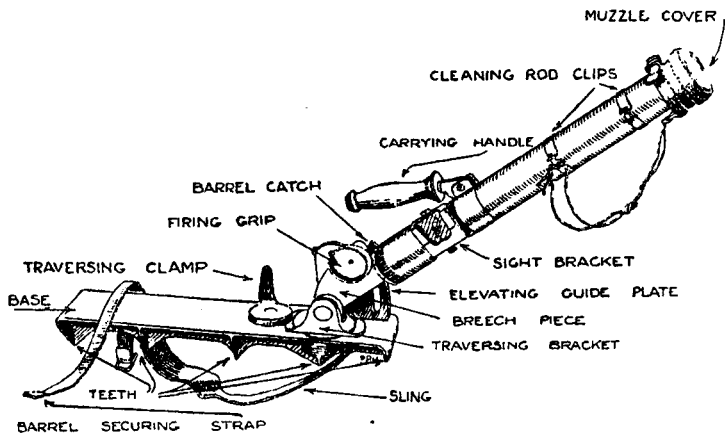


Fig. 1

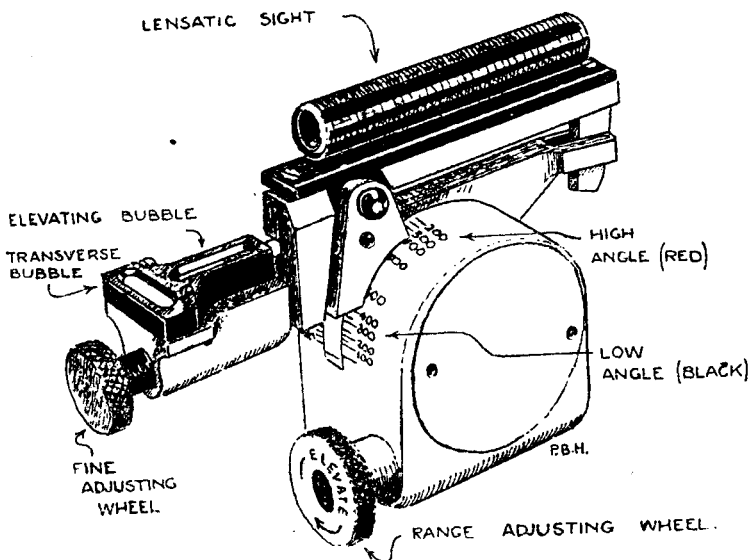


Fig. 2

LESSON 2.—STRIPPING AND CLEANING

Instructor's Notes

Stores :—

Mortar, sight in case, mortar chest, cleaning rod and brush, oil container, sponge cloth and cotton waste.

Demonstrate and explain :—

1. **Stripping.**—Press down barrel catch ; unscrew barrel ; remove firing pin and spring ; replace in reverse order. Do not work firing mechanism unless a bomb is in the mortar.

2. **Cleaning.**—

Before firing.—Dry barrel with rod, sponge cloth and cotton waste ; dry steel pad ; slightly oil all clamps.

During firing.—Unscrew and clean barrel and steel pad after every 10–20 bombs.

After firing.—Remove all dirt and fouling ; clean and oil all over.

After gas attack.—Similar to that for the rifle as laid down in Pamphlet No. 3, 1937, Lesson 4.

Note.—A special oil (C. 70) is to be used.

3. Practise squad.

4. Show mortar chest and method of packing.

LESSON 3.—LOADING, AIMING, FIRING, ACTION ON MISFIRE

Instructor's Notes

Stores :—

Mortar, sight in case, dummy bomb ; two filled sandbags or mortar aiming rest for setting up mortar ; diagram showing correct and incorrect aim.

Demonstrate and explain :—

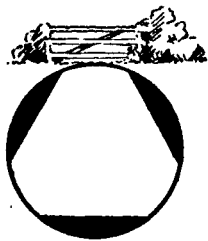
1. Mounting.—As in Lesson 1. No. 2 draws sight from case and fixes it in sight bracket.

2. Loading.—Adopt lying position with chest on base ; hold barrel with left hand. No. 2 draws bomb from pouch. If H.E., he removes cap and pin. He then takes off muzzle cover, and puts bomb down barrel, tail first, withdrawing his hand immediately. Smoke bombs require no preparation.

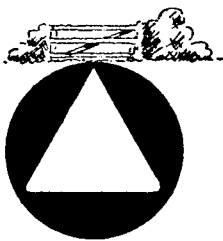
Notes.—i. If the firer does not hear the bomb fall on the steel pad, he will gently shake the barrel.

ii. In the absence of No. 2, No. 1 will have to carry out all actions single-handed.

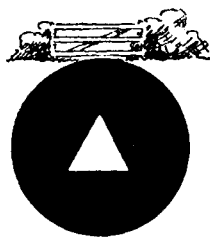
3. Aiming.—Set elevation by turning adjusting range wheel ; judge strength and direction of wind and choose an aiming point ; loosen clamps ; look through sight ; swing barrel until triangle is near aiming point ; look at the two bubbles and move barrel gently until both are central ; tighten clamps ; look again through sight and turn fine adjusting wheel to get triangle exact on aiming point so that aim can be checked or corrected after each shot ; show diagram (Fig. 3) and let squad view aim.



EYE TOO FAR AWAY.



CORRECT.



EYE TOO NEAR.

Fig. 3

4. Firing.—Holding mortar steady, ensure that both bubbles are central and turn firing grip to rear. This may only be done when a bomb is in the mortar.

5. Action on misfire.—To ensure that the bomb is resting on the steel pad, loosen elevating clamp, raise barrel to perpendicular, re-lay, clamp up and fire again. If still a misfire, remove sight, unscrew barrel and catch bomb at breech.

Note.—This must be done with great care with a H.E. bomb, as it will explode if dropped. Cap and pin will then be replaced.

Examine cartridge. If cap is struck, put bomb aside and carry on firing ; if not struck, change firing pin in mortar. In both cases remove fouling from steel pad and clean threads before replacing barrel.

6. Practise squad.

7. Warn squad that muzzle cover must be replaced after each shot in wet weather, unless firing rapid, as water in the barrel has a cushioning effect ; the bomb may travel only a yard or two and then go off, to the detriment of the firer.

LESSON 4.—HANDLING

Instructor's Notes

Stores :—

Mortar, sight in case, pair of utility pouches containing dummy bombs.

Previous reconnaissance is necessary ; positions should be chosen where the height of the cover forces the firer to use some object close at hand as his aiming mark. Positions should also be chosen where the firer can use an aiming mark near the target.

Demonstrate and explain :—

1. Prepare for action.—

No. 1

Examine sight and try it on barrel.

See that barrel is dry and screwed tight.

See that clamps work easily.

No. 2 (if absent, No. 1)

Count bombs, see that each has a cartridge in base.

See that each H.E. bomb has safety cap and pin.

2. Practise squad.

3. Crawl into position.—Explain that the method of crawling with the mortar is similar to that with the rifle or L.M.G., according to circumstances.

4. Handling.—Mount mortar on various types of ground ; lay aims in relation to targets with all types of wind, considering safety in each case (General Notes, paras. 6 and 7).

5. Practise squad.

LESSON 5.—SMOKE

Instructor's Notes

Stores :—

Mortar, sight in case, smoke bombs or fatigue men with smoke candles.

1. Explain :—

- i. The object of using smoke is to screen movement from aimed fire or from observation.
- ii. Only a limited number of bombs is carried, so they must be used sparingly and systematically as part of a definite plan.
- iii. The firer must know :—
 - (a) The enemy position to be screened.
 - (b) The position of his own troops and the position for which they are making.
 - (c) How long the screen must last.
 - (d) Whether the strength and direction of the wind makes the use of smoke practicable.

2. Demonstrate where bombs must fall :—

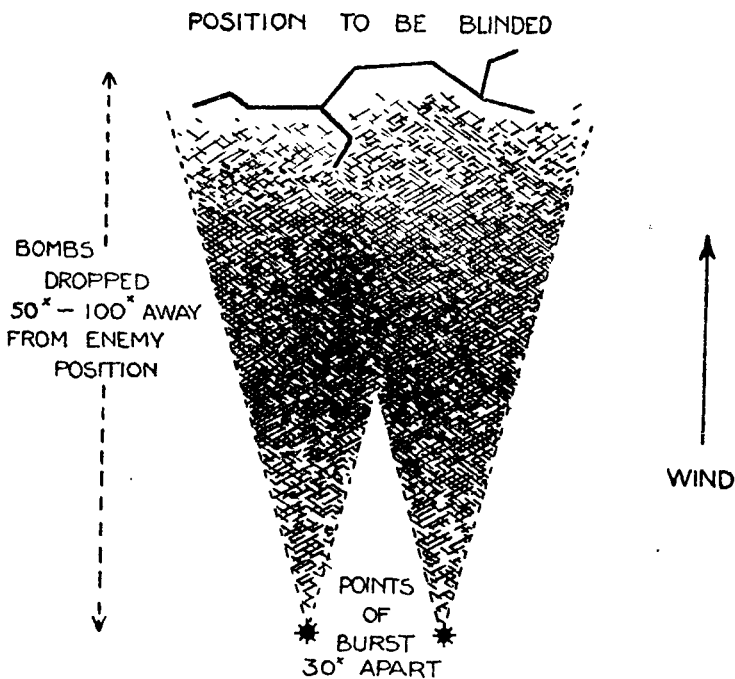
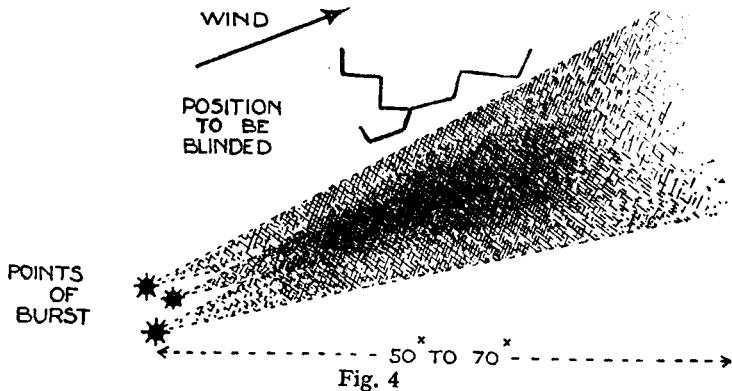
- i. With a cross wind (Fig. 4).
- ii. With a following wind (Fig. 5).

Note.—Do not fire with a head wind. With a mild cross-wind one bomb a minute gives 50 to 70 yards of screen. With a mild following wind bombs should be dropped 50 to 100 yards from the enemy position and 30 yards apart, thus using double the number for the same result. One bomb lasts 2 minutes.

3. Practise squad either with bombs or with fatiguemen carrying smoke candles. This will be carried out as follows :—

The instructor will indicate a position to be blinded to the firer and imaginary position of own troops. The firer will inform the instructor what point or points of origin he has chosen and, in the case of smoke candles, a fatiguer will light them on the points selected. The instructor will comment on the point or points of origin chosen and the allowance made for wind. Practice in "feeding" a screen will not be carried out.

(For the rules of safety to our own troops in war see Lesson 6, para. 1. iii. For special instructions regarding the firing of smoke bombs in peace see pages 14 and 15.)



EMPLOYMENT OF SMOKE BOMBS (FOLLOWING WIND)

Fig. 5

LESSON 6.—H.E.

Instructor's Notes

Stores :—

Mortar, sight in case, H.E. bombs.

1. Explain :—

- i. The object of using the H.E. bomb is to kill or drive out the enemy from positions against which its steep angle of descent or its wide bursting area render it more effective than other platoon weapons.
- ii. Only a limited number of bombs is carried, so they must be used only as part of a definite plan.
- iii. *Rule 1.*—When firing over the heads of our own troops, high angle fire will be used, unless the ground is very favourable when it may be possible to use low angle fire.

Rule 2.—Fire will not be opened if any of our own troops are within 200 yards of the point where the bomb is intended to fall.

In the case of overhead fire, with a head wind of more than 15 miles per hour, the distance will be increased to 250 yards.

Rule 3.—When the range to be put on the mortar sight has been found by ranging, fire may continue until our own troops are within 100 yards of the point where the bombs are intended to fall.

iv. The firer must know :—

- (a) The enemy position.
- (b) The position of his own troops and the position for which they are making, if moving.
- (c) How long he is to go on firing.
- (d) How much to allow for wind over, short, right or left.

2. Practise squad firing, discussing wind and safety of own troops.

(For general safety precautions in firing H.E. bombs, *see* para. 4, following.)

TRAINING WITH LIVE H.E. AND SMOKE BOMBS

1. The following paragraphs deal with the safety precautions to be observed in firing live H.E. and smoke bombs.

All instructors who are required to handle H.E. bombs will be taught Lesson 10 of Pamphlet No. 13, 1937 (Grenade)—the preparation of a demolition set and the destruction of blinds.

2. Demonstrations with H.E. bombs will not take place inside any building. Dummy bombs only will be used at lectures.

3. A book will be kept in which the number of bombs, both H.E. and smoke, drawn from store will be recorded. Numbers expended and returned will be similarly recorded and the totals balanced. Each person taking live bombs will sign a receipt in the column which will be provided for this purpose.

4. General safety precautions.—The following precautions will be observed in firing H.E. and smoke bombs:—

- i. A qualified officer or warrant officer will always be in charge when firing is taking place. No firing will take place without his direct order.
- ii. A N.C.O. will be detailed to each mortar to watch the actions of the firers, to ensure that the safety cap is removed from each H.E. bomb before it is loaded into the mortar, and that the bomb is placed tail first into the barrel. As each H.E. or smoke bomb is fired, the N.C.O. will watch for blinds and, should one occur, he will carefully note the position and report immediately to the officer or warrant officer in charge.
- iii. Firing will be stopped if any aircraft is observed flying on a course likely to take it over the danger area at a height estimated to be less than 1,000 feet.

5. Special instructions regarding the firing of H.E. bombs.—

- i. *The range.*—Only an approved range may be used. Details of the lay-out of 2-inch mortar ranges will be given eventually in S.A.T., Vol. II. (For the present these instructions are contained in War Office letter 118/General/2781 (Q.M.G. 7) dated 28th April, 1939.)
- ii. *Targets.*—Natural or artificial features, such as bushes, mounds, tree stumps, etc., are suitable targets.
- iii. No target will be engaged at a range of less than 250 yards.
- iv. No target will be engaged unless it lies within the demarcated target area.

v. *Blinds.*

- (a) *On a range with a closed target area.*—Blinds will be left "in situ" and no attempt will be made to destroy them. Should, however, a bomb be observed to fall outside the closed area, the officer or warrant officer in charge of the firing will act as in (b), below.
- (b) *On a range with no closed target area.*—The officer or warrant officer in charge will personally destroy the bomb in the manner laid down for destroying H.E. grenades (Pamphlet No. 13, 1937, Lesson 10). Should he be unable to locate it, he will report the occurrence to Higher Authority after firing is completed.
- (c) A demolition box will always be on the range during H.E. firing.

6. Special instructions regarding the firing of smoke bombs.—No special range is required, and any suitable part of an existing range area may be utilized, provided that the following precautions are observed :—

- i. The line of fire up to 550 yards, with a reasonable safety area on either side for possible errors in line, must be clear of any person, animal or object that might sustain damage from a direct hit.
- ii. Bombs should not be fired into dry heather, long grass or other vegetation likely to catch fire. The bomb does not burst, but there is a risk of fire, as great heat is generated by the burning smoke composition.
- iii. Should a blind occur, the metal sealing discs should be pierced and the smoke composition ignited.

TESTS OF ELEMENTARY TRAINING

(1) Test and stores required	(2) Conditions before test	(3) Timing	(4) Remarks
1. Oral Test. Mortar, sight, cleaning kit.	—	Nil	Four questions to be asked from Lessons 1 and 2. Three out of four must be correctly answered.
*2. Action. Mortar, sight in case slung over firer's shoulder.	Mortar folded up, barrel strap fastened. Firer in lying position 5 yards in rear of action position.	30 seconds from command "Action" until firer has mounted mortar, fixed sight in bracket and adopted correct firing position.	This test will be carried out behind natural cover where possible.
*3. Sight setting and laying. Mortar mounted on mortar aiming rest or sandbags. Sight fixed in bracket.	Barrel at approximately 45 degrees. Sight set at zero.	1 minute from command "Lay" until firer has set sight and laid on target indicated.	Instructor gives fire order:— "Range—High or low angle —Target—Lay". Instructor will check bubbles and range. Firer then moves aside and instructor takes his place. Should this movement disturb mortar, instructor will make certain that bubbles are central before checking aim.

* In these tests the man will be allowed three attempts, and, to pass, two must be correctly carried out within the time limit.