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A.C.J.s.
15th July,
1942



Small Arms Training
Volume I, Pamphlet No. 8
Mortar (2-inch)
1942

(This pamphlet supersedes the 1939 edition and that reprinted with amendments (Nos. 1 and 2), 1942)

By Command of the Army Council,

THE WAR OFFICE,
15th July, 1942

L. Borsone

Printed under the Authority of HIS MAJESTY'S STATIONERY OFFICE
by Kellier, Hudson & Kearns, Ltd., London, S.E.1.

DISTRIBUTION

	Scale
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GENERAL

1. Object

The sole object of weapon training is to teach all ranks the most efficient way of handling their weapons in order to kill the enemy. Instructors will always bear this fact in mind, and will continually impress it upon those whom they instruct.

2. Characteristics, range, rate of fire, etc.

The chief characteristics of this weapon are, first, 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.

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

Rates of fire depend on wind and circumstances. The maximum rate with accuracy is from seven to eight 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 yds. in all directions from the point of burst. Large fragments may, however, have sufficient velocity to inflict wounds up to 150 yds. or more, particularly if the burst is on stony ground.

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

The best way of carrying the mortar is so to adjust the barrel that it forms an angle of 90° with the baseplate. It can then be carried across the back supported by both hands.

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.

3. Recruit instruction

Instructors must appreciate that, while the lessons are designed to be taught in one period, more time will be necessary to allow for sufficient practice to obtain proficiency.

4. Trained soldier instruction

The exercising of the trained soldier will be concentrated :—

- i. on "handling of the mortar", making the best use of cover ;
- ii. on the laying of effective smoke screens under varying conditions of wind (Lesson 3) ;
- iii. on ensuring that, when ammunition is available, live rounds shall be fired as part of a simple tactical scheme (field firing).

5. Safety precautions

Before the beginning of any lesson the instructors will inspect bombs and utility pouches. For special precautions with live bombs *see* page 15.

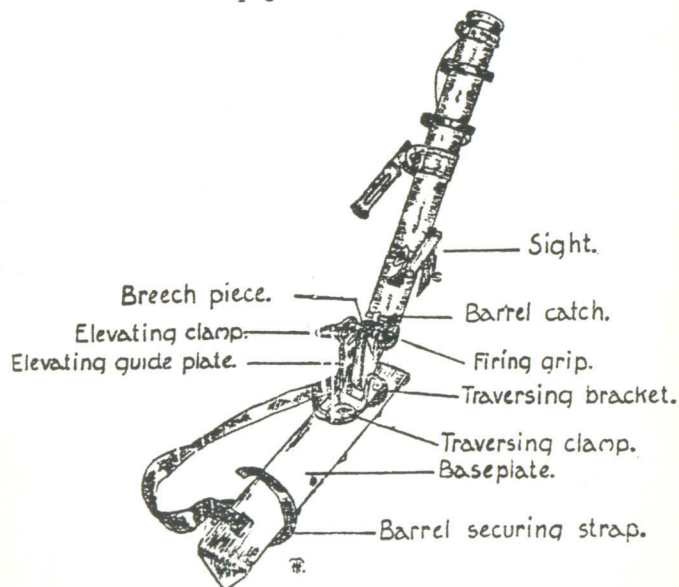


FIG. 1.—(Diagram of mortar—new sight attached)

6. The 2-in. mortar sights

This pamphlet is written for the No. 3 open sight. A line should be scribed on the barrel of the mortar and

on the band of the sight, with a zero mark on the breech piece. By making these coincide it can be seen at once whether the sight is correctly positioned. When units are in possession of the No. 1 or 2 (lensatic) sight it will be necessary to fit it to the sight bracket in Lessons 1 and 2. It is normally carried in a special case.

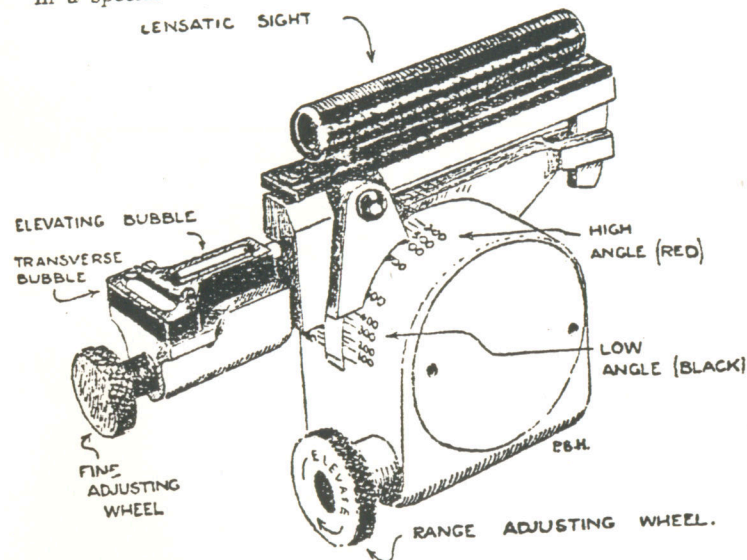


FIG. 2.—Lensatic sight

LESSON 1.—MAINTENANCE OF MORTAR, AND DESCRIPTION OF BOMBS

Instructor's notes

Name the parts of the mortar and the cleaning materials as they are dealt with. (See Fig. 1.)

Stores.—Mortar, mounted, with sight fixed ; two filled sandbags or improvised mortar aiming rest (see Fig. 3) ; drill bombs ; all cleaning materials and mortar chest.

1. Explain para. 2 of General—characteristics, range, rate of fire, etc.

2. Stripping and cleaning

Explain and demonstrate :—

- i. To strip the mortar, press down the barrel catch and unscrew the barrel. Remove the steel pad, firing pin, and spring.

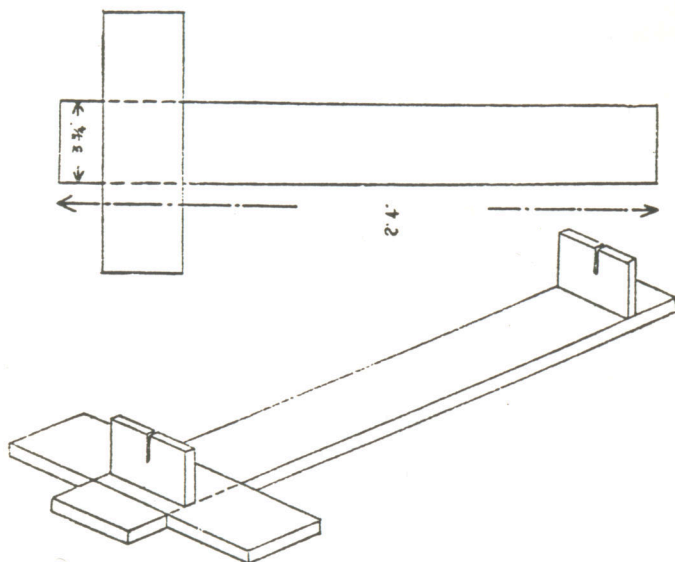


FIG. 3.—2-in. Mortar aiming rest (improvised).
(Can be made by unit pioneers)

- ii. To clean.—Using the rod with brush, sponge cloth, or cotton waste, clean out the barrel, using oil if necessary. Dry and examine it in the same way as the rifle barrel. When it is clean, oil it, using flannelette and special (C/70) oil; but if cleaning before firing, it should be left dry. Clean and oil the steel pad with oily cloth—for firing leave dry. Clean all the other parts, removing all dirt, then leave slightly oily, including the clamps. Particular attention must be paid to all crevices, and the threads.

- iii. To assemble mortar.—Replace firing pin and spring, steel pad and barrel.

NOTES

- (a) When stripping and assembling, also cleaning, great care must be taken to see that the clamps and the threads are not damaged.
- (b) During firing, the barrel should be removed at intervals and all dirt cleaned off the steel pad—this will prevent misfires.
- (c) After a gas attack, clean as for the rifle.
- (d) The muzzle cover will always be replaced when the mortar is not in use.

3. Practise and question squad.

4. Explain and demonstrate :—

Packing of mortar and cleaning kit in chest.

The sight must be correctly positioned on taking the mortar from the chest.

5. Describe :—

i. Smoke bomb

- (a) Fired by a cartridge in the base, covered by a screw cap.
- (b) Vanes on the tail to make it drop head first.
- (c) Body filled with smoke composition: this is ignited by the flash from the cartridge.
- (d) Painted green with a red band.

ii. H.E. bomb

- (a) Fired by a cartridge in the base, covered by a screw cap.
- (b) Vanes on the tail to make it drop head first.
- (c) Body filled with high explosive. This is exploded by a percussion fuze in the nose. The fuze is covered by a screw-on cap, which must be removed before firing.
- (d) Painted yellow, with a red and a green band.

iii. Illuminating bomb

Marked " Illg. with parachute".

iv. Signal bomb

Single and multi star. Marked with coloured band to denote red or green.

- v. All bombs are packed in containers, each holding six bombs. Those with H.E. are marked with yellow band; smoke—green band. Containers are packed in green boxes, three to each box. When issued, the boxes are marked H.E., smoke, or illuminating.

6. Question squad.

LESSON 2.—HANDLING

Instructor's notes

Stores.—Mortar with sight fixed; drill bombs; utility pouches or container. Dress: battle order.

Position should be chosen where the height of the cover will normally force the firer to use auxiliary aiming marks close to his position. Previous reconnaissance is necessary.

The recruit should be taught and practised in paras. 1-3 inclusive; paras. 4 and 5 of the lesson being dealt with in later periods.

1. Explain:—

Normally there will be two men to fire and maintain the mortar in action. It is their duty to get the mortar into action when required and to carry the requisite number of bombs for the task allotted. Since the maximum range of the mortar is 500 yds. only, firing will normally be from behind bullet-proof cover, whether engaging a target with H.E. or laying a smoke screen. When behind cover it will not be possible for the firer to see the target using the sights, hence auxiliary aiming marks must be used. The method of use will be demonstrated during the lesson. It is the duty of the No. 2 to assist the No. 1 in every way possible. This duty includes positioning the auxiliary aiming marks and observing the fire. Should a third man be available for the mortar detachment, his duties will be to carry additional ammunition and to replace casualties.

2. Explain and demonstrate:—

- i. *Auxiliary aiming marks.*—Choose the approximate position for the mortar. Adopt a position which will enable the target to be seen. Judge the strength and direction of the wind and select a point (aiming mark) which will give the necessary allowance. No. 2, acting under the direction of No. 1, will place an auxiliary aiming mark just below the top of the cover. He will then place a second auxiliary aiming

mark nearer to the mortar position, No. 1 ensuring that both auxiliaries are in direct alignment with the target or aiming mark. The further the aiming marks can be placed apart, and the mortar from them, the greater will be the accuracy in laying.

ii. Squad view auxiliary aiming marks.

- iii. *Mounting.**—Keeping below the cover, place the mortar in the position selected, with the barrel pointing to the rear, baseplate in line with the auxiliaries. Undo the barrel securing strap. Loosen both clamps. Raise the barrel slightly and swing it round, so that it is pointing in the direction of the auxiliary aiming marks. Tighten both clamps. The angle of the barrel (high or low) will normally depend on the task, the wind, and the cover available.

* Dependent on method of carriage, this may be only partially applicable.

Auxiliary aiming marks.

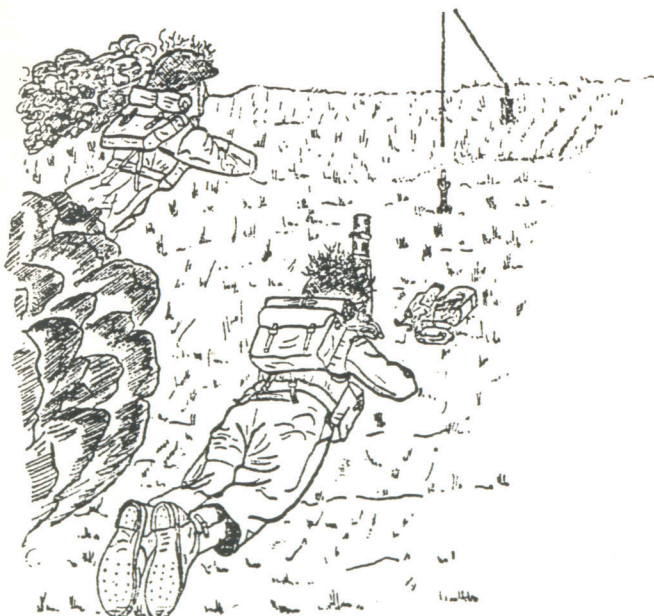


FIG. 4.—Showing mortar mounted behind cover.

iv. *Loading*.—The firer will lie with his chest on the baseplate, left hand holding the barrel above the sight. To load, remove the muzzle cover, take a bomb from the utility pouches or container, remove the safety cap if it is H.E., and place it in the barrel, tail first.

Ensure that the bomb has reached the bottom of the barrel, by shaking it if necessary.

v. *Aiming*.—Set range. Loosen the elevating clamp handle, ensure bubble is central and clamp up. Ensure transverse bubble is central. Loosen traversing clamp, look along sight and turn barrel until sights are in alignment with both auxiliary aiming marks, and clamp up. Ensure that both bubbles are central.

vi. *Squad view aim*.

vii. *Firing*.—Hold the mortar steady with the left hand above the sight, ensure that the aim is correct, and then turn the firing grip to the rear. (This will only be done when a bomb is in the barrel.) Re-load immediately. No. 2, from a position behind cover, must observe the fall of the bombs and inform No. 1, in order that he can make any alteration necessary in range or aiming point. Such an alteration is best made by "Up 50," "Down 100," "slightly right" or "left." Two bombs should be fired before alterations are made. Carry on firing in a similar manner until the task is completed.

viii. *Action on misfire*.—Turn the mortar on its side and shake out the bomb. If it is H.E., replace the safety cap. Examine the cartridge. If the cap is struck, put the bomb on one side, load, and carry on firing. If the cap is not struck, remove any fouling from the steel pad and threads, and change the firing pin if broken.

NOTE.—On completion of this demonstration, do not place a bomb in the barrel, thus leaving the mortar ready for the next part of the lesson.

ix. *Dismounting*.—Dismount in the reverse order.

3. Practise squad in pairs behind varying types of cover.

NOTE 1.—If teaching the Nos. 1 or 2 (lensatic) sight (see Fig. 2), it should be remembered that this is kept in the sight case. On mounting the mortar, the sight is taken from the sight case and placed in the sight bracket of the mortar.

Teach aiming as follows:—

Set range by turning range adjusting wheel. Loosen elevating clamp, ensure that the bubble is central, and clamp up. Ensure that the transverse bubble is central. Loosen traversing clamp, look through the sight and turn the barrel until the apex of the triangle is in the same vertical line as the auxiliary aiming marks, and clamp up. Ensure that both bubbles are central. Let squad view aim.

The sight will be removed before dismounting the mortar, and returned to the case.

NOTE 2.—It is an advantage if a degree scale is marked on the baseplate of the mortar. Sub-divisions of 5° only are necessary, to the maximum of 20° right and left. They can be read in conjunction with the corners of the traversing bracket.

Corrections in direction can then be readily made, the No. 1 giving the necessary correction by measurement with his hand. Moreover a quick switch to a fresh target can very quickly be made without the necessity of putting out fresh auxiliary aiming marks.

It must be remembered when corrections are given by the No. 1, the No. 2 must read the scale in the opposite direction, thereby bringing the barrel over in the required direction.



FIG. 5

4. Explain that, depending on the type of fire required and the nature of the task, cover, etc., it will not always be necessary to use auxiliary aiming marks. Examples are given as follows :—

- i. When there is some prominent object or mark, in line with the chosen aiming point and beyond it, which can be seen by the firer in the mortar position. In



FIG. 6

this instance this object or mark alone can be used for obtaining direction without the use of auxiliary aiming marks.

- ii. When firing smoke and great accuracy is not required, some object in the vicinity of the required direction may suffice.
- iii. When speed in firing is the main consideration, the mortar, if carried in such a way that the barrel forms an angle of 90 degrees to the baseplate, can be fired with the barrel so adjusted by raising or lowering the near end of the baseplate. This method is accurate for direction and elevation at close ranges. (See Figs. 5 and 6.)
- iv. When direct observation of the target is possible. This will be rare.

5. Give practice in the complete lesson, demanding the correct use of the mortar under varying conditions. Discuss the length of time both of getting into action and of obtaining fire effect. The occupation of alternative positions must also be practised.

LESSON 3.—SMOKE

Instructor's notes

Stores.—If using mortar : Mortar with sight fixed ; smoke bombs ; suitable cover. If using smoke candles : Smoke candles ; fatiguemen ; signalling flag.

Diagrams will be used.

1. Explain :—

- i. The object of using smoke is to screen movement from aimed fire or observation. It may also be used to distract the enemy's attention.
- ii. Only a limited number of bombs is carried, so they must be used sparingly and systematically as part of a definite plan.

Before using smoke always consider whether it may not mask the fire of a neighbouring sub-unit.

The above remarks are merely warnings which should always be borne in mind. They are not intended to discourage the use of smoke when conditions are suitable. The usual tendency is to fail to use smoke when it should be used, rather than to use it unnecessarily.

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) The strength and direction of the wind.

2. Explain and demonstrate (using diagrams) :—

i. *Cross wind*

The bomb should be dropped slightly in front and upwind of the target. As soon as the firer has found his correct point of burst he should fire another bomb immediately, and then feed the screen as and when necessary. One bomb lasts about two minutes (see Fig. 7).

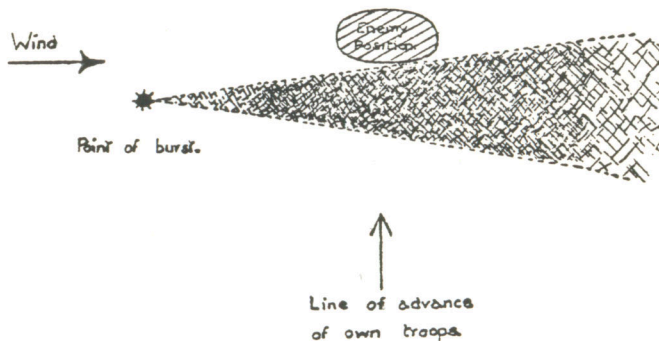


FIG. 7.—Diagram of smoke screen cross wind.

ii. *Following wind*

Diagram (Fig. 8) shows one method of using smoke in a following wind. Since *at least* two points of burst have to be fed, a considerable expenditure of bombs will be necessary. Firing and feeding are the same as for a cross wind.

An alternative method, when manoeuvre is possible, is illustrated in Fig. 9.

iii. *Headwind*

It is rarely practical to use smoke with a headwind, except to cover manoeuvre from a flank, as in Fig. 9. In this instance the point of burst must be behind the enemy position and on the required flank.

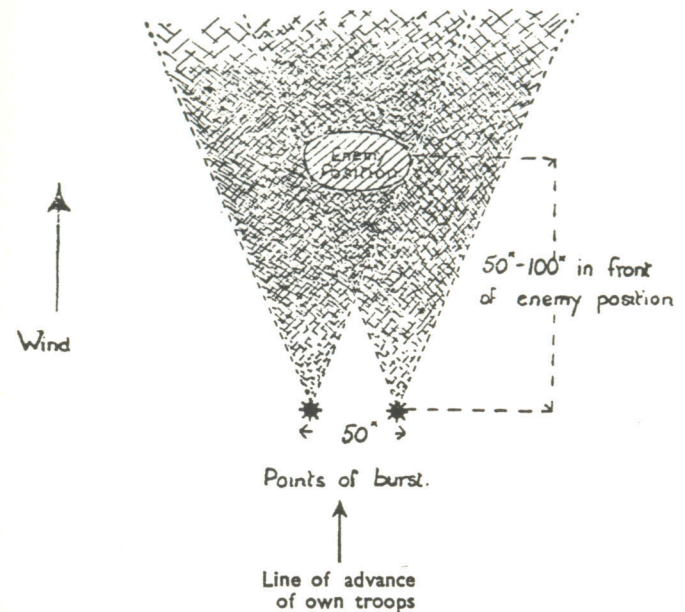


FIG. 8.—Diagram of smoke screen following wind.

3. Practise squad either with bombs or with fatiguemen carrying smoke candles. Practice 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 burst he has chosen and, with smoke candles, a fatiguer will light them on the points selected. The instructor will comment on the point or points of burst chosen and on the allowance made for wind. Practice in "feeding" a screen will not be carried out, until either bombs or smoke candles are plentiful.

TRAINING WITH LIVE SMOKE BOMBS

1. The value and effectiveness of the 2-in. mortar smoke bomb should be frequently demonstrated. No special range is

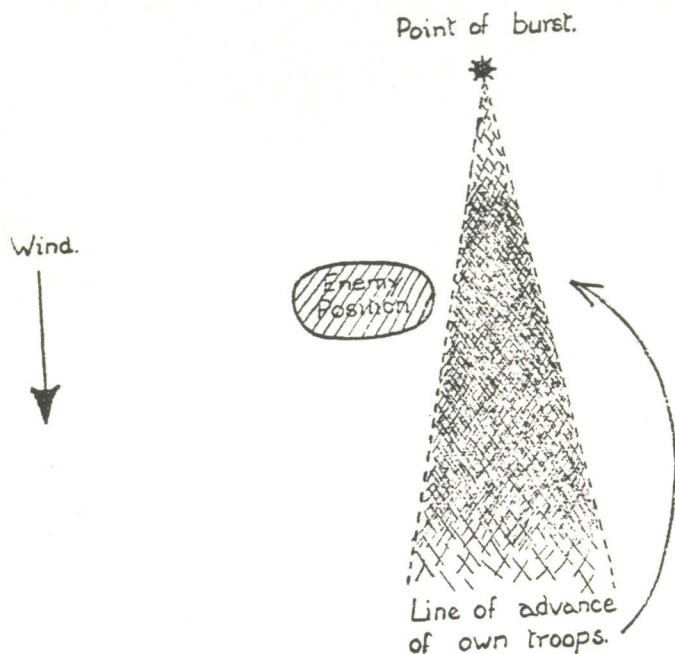


Fig. 9.—Diagram of smoke screen head or following winds. Flank manoeuvre.

required, and any suitable ground may be utilized, provided that the following precautions are observed:—

- i. The line of fire up to 550 yds., 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.

NOTE.—If overhead fire or laying a smoke screen close into a flank is to be practised, men may have to be inside the danger area.

- 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. A N.C.O. must be detailed to each mortar to watch for and mark the position of blinds.

TRAINING WITH LIVE H.E. BOMBS

1. The following paragraphs deal with the safety precautions to be observed in firing live H.E. bombs. All instructors who are required to handle H.E. bombs will be taught the preparation of a demolition set and the destruction of blinds, as detailed in S.A.T. Pamphlet No. 13, 1942 (Grenade), Lesson 10.

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

3. General safety precautions

The following precautions will be observed in firing H.E. bombs:—

- i. It should be noted that the bomb is "armed" on firing whether the safety cap is on or not. Should it be fired with the cap on, it must be treated as a "blind".

ii. During recruit instruction:—

- (a) A qualified officer will always be in charge when firing is taking place. No firing will take place without his direct order.
- (b) 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. 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 in charge.

4. Special instructions regarding the firing of H.E. bombs

Since fragments of the H.E. bomb may cause damage to personnel in the open within 150 yds. of the point of explosion, no person will be within this range. The bomb can be fired at ranges as close as 100 yds. provided that everyone is under cover, either in a ditch or trench, or lying down behind cover.

Officers controlling H.E. shoots must use their own common sense in this matter, and must not allow any firing to take

place until they are satisfied that everyone is sufficiently safe.

The greatest care must be taken, however, that every blind is located and destroyed. As far as possible, firing with H.E. bombs should not take place in areas containing long grass, etc.

5. *Blinds*

- i. *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 in charge of the firing will act as in ii, below.
- ii. *On a range with no closed target area.*—The officer in charge will personally destroy the bomb in the manner laid down for destroying H.E. grenades (S.A.T. Pamphlet No. 13, 1942, Lesson 10). Should he be unable to locate it, he will report the occurrence to higher authority after firing is completed.
- iii. A demolition box will always be on the range during H.E. firing.

TESTS OF ELEMENTARY TRAINING

1. *Action*

This test will be carried out behind natural cover, which necessitates crawling. The firer will be lying down 5 yds. in rear of the action position, with mortar folded up and barrel strap fastened. On the command "Action" the firer will mount the mortar and adopt the correct firing position.

Time limit—30 seconds.

Two out of three attempts must be carried out correctly within the time limit.

NOTE.—If the lensatic type of sight is being used, it will be in the case slung over No. 1's shoulder before the test begins. Time will be 40 seconds.

2. *Handling*

The firer will be tested in Lesson 2 complete, behind various types of cover. He will be assisted by a No. 2. Serious faults, e.g. in aiming, over exposure, remedying a misfire, etc., will entail failure.