15

RESTRICTED

The information given in this document is not to be communicated, [illegible] to the Press, or to any [illegible] not authorized to receive it

W.O. Code No. 8773

[illegible] Trg Pub[illegible]946

Infantry Training

Volume I

INFANTRY PLATOON WEAPONS

PAMPHLET No. 9, PART 1

THE ANTI-TANK GRENADE, No. 94 (ENERGA)

1953

This pamphlet supersedes the Provisional Pamphlet for the Section Anti-tank Weapon (Energa Grenade) 1952 (Code No. 8746)

By Command of the Army Council,

G. W. [illegible].

THE WAR OFFICE,
20th April, 1953.

CONTENTS

LIST OF PLATES

PLATE 1.—GRENADE, ANTI-TANK, NO. 94 (ENERGA)

Prepared for carriage

Prepared for firing

PLATE 2.—FITTING THE NOSE FUZE

PLATE 3.—FITTING THE DETONATOR

PLATE 4.—FIRING—STANDING

PLATE 5.—FIRING—KNEELING

PLATE 6.—FIRING—THE BACK POSITION

PLATE 7.—FIRING FROM A FIRE TRENCH

INFANTRY TRAINING

VOLUME I

INFANTRY PLATOON WEAPONS

PAMPHLET No. 9, PART 1

ANTI-TANK GRENADE No. 94 (ENERGA)

SECTION 1.—INTRODUCTION

1. The grenade has been introduced to provide the infantry section with a powerful and effective anti-tank weapon. It is discharged from a projector attached to the No. 4 rifle, and fired by means of a special grenade cartridge.

General characteristics

2. The weapon's chief characteristics are its great power and lightness. It is highly efficient against armour, concrete, etc, and can be used against "thin-skinned" targets.

3. *Performance.*—The grenade will penetrate the sides and rear of the heaviest known tank. The effect of the explosion is to burn a small hole through the armour. Through this hole a high velocity jet of burning gases and molten metal from the grenade is projected into the tank. This, besides causing casualties to the crew, may set fire to the fuel and ammunition.

4. *Accuracy.*—The grenade is a first-class and efficient [illegible]. For an unrotated projectile its accuracy is of high standard. A trained soldier should, after very little practice, group to approximately 30 inches at 75 yards. The shock of discharge on firing is not unduly great and the firer, or any observer, can easily follow the flight of the grenade to the target.

5. *Effective range.*—[illegible] ranges are from 25 to 50 yards. Moving targets can be engaged with reasonable accuracy at any range up to 75 yards.

6. *Carriage.*—The projector, when not on the rifle, is carried in a case which is attached to the waist belt. Grenades are carried in containers holding two grenades each.

Scale of issue

7. The weapon is issued to Infantry units on the following scale:—

Projectors.

1st line: 2 projectors per section. Reserve holding: 10 projectors per battalion.

Ammunition.

1st line: 3 grenades for each 1st line projector.
2nd line: 1 grenade for each 1st line projector.

Nomenclature

8. The following nomenclature has been allotted to the projector, and grenade and its components:—

(*a*) Projector grenade, No. 4 rifle, Mark 4.
(*b*) Grenade, anti-tank, No. 94, Mark 1 and Mark 2 (Energa).
(*c*) Fuze percussion DA No. 9, Mark 1 and Mark 2 for No. 94 anti-tank grenade (Energa).
(*d*) Detonator No. 107 Mark 1 and Mark 2 for No. 94 anti tank grenade (Energa).
(*e*) Cartridge, SA rifle grenade, ·303-inch H Mark 7Z.

SECTION 2.—TACTICAL HANDLING

1. The primary role of the section anti-tank weapon is the destruction of tanks. In its secondary role it can be used against thin-skinned vehicles and other targets, such as personnel, houses and concrete emplacements.

2. When the weapon is sited for use in its primary role, the following points must be considered:—

(*a*) It needs a field of fire of only just over 100 yards.
(*b*) Surprise and concealment are most important.
(*c*) Any obstruction in its path is likely to detonate the grenade before it reaches its target (*see* Lesson 1, para 2).
(*d*) It must cover likely tank approaches, such as gaps in minefields.
(*e*) It is best to engage the side or rear of a tank.
(*f*) It is normal to fire it from a fire trench.
(*g*) Few grenades are carried, and fire must be held till a kill is certain with each grenade.
(*h*) Some defilade from the front is desirable.

3. The uses of the weapon in its secondary role are manifold. Some suggestions are:—

(*a*) House clearing and street fighting.
(*b*) Ambushes.
(*c*) Concrete emplacements and fortified houses.
(*d*) Assault boats crossing rivers, and beach landings.
(*e*) Enemy concealed in trees, hedges, etc.
(*f*) Soft-skinned vehicles.

4. When it is decided to use the anti-tank weapon in its secondary role it must never be forgotten that the weapon is primarily *anti-tank*, and that sufficient grenades must be kept for this purpose.

5. In addition to his anti-tank duties, the Energa rifleman is a member of the rifle section; if the tank threat is remote, his section commander will site him as a rifleman rather than a tank killer.

SECTION 3.—TRAINING AND INSTRUCTIONAL LESSONS

The syllabus

1. The aim of the syllabus should be:—

"To train all ranks to hit a tank either on the move or stationary at all ranges up to 75 yards".

2. Subjects necessary to achieve this aim are:—

(*a*) The instructional lessons laid down in this section.
(*b*) Practice in the accurate judging of distance to tanks up to 150 yards, and in estimation of speed.
(*c*) Advanced handling exercises.
(*d*) Firing practice with both practice and live grenades from all positions in the open and from cover, at stationary and moving targets, as often as supplies of grenades will allow.

3. All ranks of a rifle company should be trained in the use of the section anti-tank weapon.

LESSON 1.—DESCRIPTION, FUZING, CARE AND CLEANING

A. INSTRUCTOR'S NOTES

Aim

1. To teach the description of the grenade and projector; how to fit and remove the projector; fuzing grenades; care and cleaning of the projector, and safety precautions.

Stores

2. Rifles, drill cartridges, one projector, drill grenade and drill grenade cartridge for each man and instructor, cleaning rags, grenade containers.

Instructional knowledge

3. Three models of sight have been made. The first was a separate component, fitting into a slot. The second was hinged to fold. The third also folds but is about half the width of the other models. The basic principle of all sights is the same. Instructors should teach the model with which they are issued.

4. Grenade cartridges of an early issue are not blackened on the lower half of the case, nor is the letter "H" stamped on the base; they may have a purple ring round the base of the cap.

5. Early issues of grenades are packed in boxes of 50, sub-packed as follows:—

(*a*) Grenades.
(*b*) Fuzes.
(*c*) Detonators.
(*d*) Grenade cartridges.

6. The intention is that grenades and their components will be packed as laid down in para 32 of this lesson. As a temporary measure grenades are being packed in boxes containing four grenades, each grenade in a cardboard cylinder. Grenades will be packed with the cartridge in the cork tail plug and *detonators assembled in the grenade*; the paper washer will not be fitted (*see* para 24 (*b*) of this lesson). Fuzes will be packed either in a small tin containing four fuzes, which will be packed in one of the cylinders (this cylinder will be marked FUZE), or each fuze will be packed in a metal cylinder which will be clipped to the tail of each grenade. Practice grenades will be packed four to a box together with one spare tail and two spare rings to each grenade. Cartridges for practice grenades will be issued separately.

B. CONDUCT OF THE LESSON

Preliminaries

7. Normal safety precautions with rifles and drill cartridges. Inspect practice grenades and drill grenade cartridges. Issue stores.

Approach

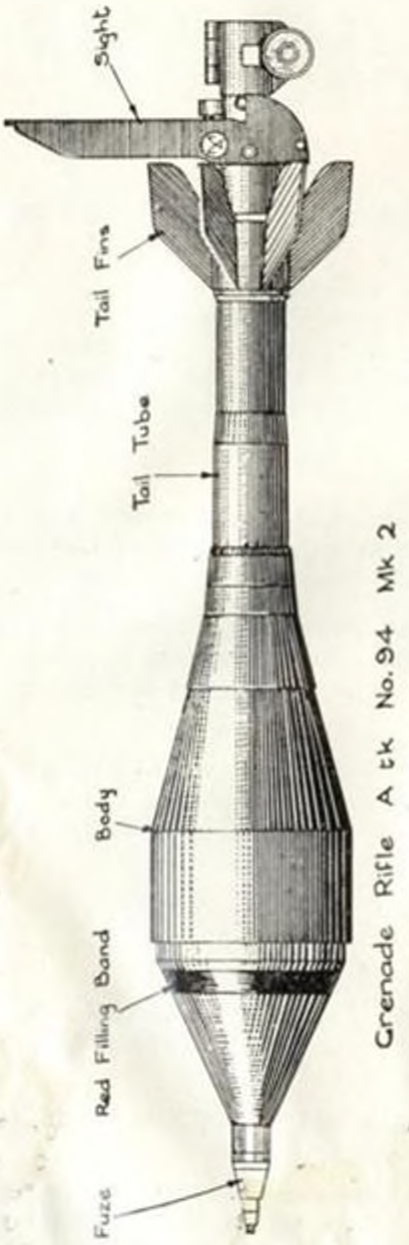
8. The grenade has been produced to provide the section with a powerful and effective anti-tank weapon.

Introduction to the weapon

9. The section anti-tank weapon consists of a projector fitted to the ordinary service rifle, which fires a light and powerful grenade by means of a grenade cartridge. Although the grenade will penetrate the sides and rear of the heaviest known tank up to its extreme range, the ideal fighting range is between 25 and 50 yards. Two men in each Infantry section will be armed with projectors and will normally each carry two grenades in a container. The grenade weighs 21 oz.

Description of projector and sights (*see* Fig 1)

10. The projector fits onto the rifle and supports the grenade. At one end it has a hinge, and a milled nut to secure it to the



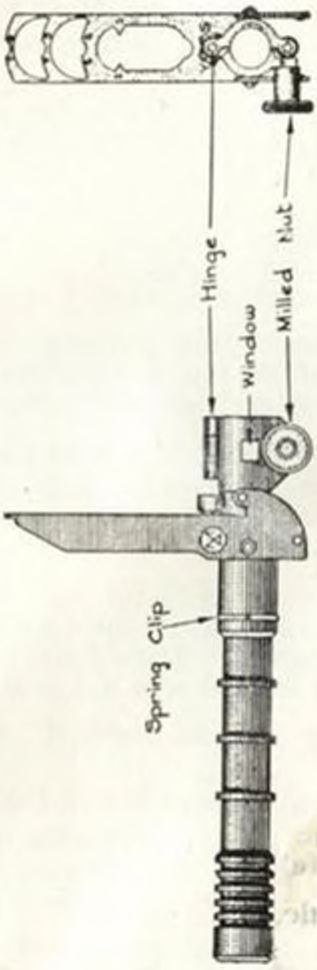


Fig 1.—Projector Grenade, Rifle No. 4 with Sight, Mk 5

rifle. At the lower end of the projector is a spring clip which fits into the tail tube of the grenade and prevents it from slipping off.

11. The sight is attached to the projector and can be raised and lowered as required. It is provided with three semi-circular rings to give ranges of 50, 75 and 100 yards. In addition there are two triangular pointers for aiming at 25 yards. The lowest ring is for the lowest range and so on. The large hole in the sight is to allow the firer to use the normal rifle sights when firing ball ammunition. The projector and sight are carried in a case attached to the belt.

Fitting the projector to the rifle

12. Explain and demonstrate with squad imitating. To fit the projector to the rifle:—

(*a*) Raise the sight as far as it will go.
(*b*) Unscrew the milled nut and open the hinge.
(*c*) With the milled nut underneath, force the projector onto the barrel until it touches the foresight protectors.
(*d*) Close the hinge, making sure that the bayonet lug fits into the window.
(*e*) Engage the milled nut and screw up.

13. Remove the projector by unscrewing the milled nut and sliding it off the barrel. Replace the hinge, and screw up the milled nut. Lower the sight and replace the projector in its case.

14. Explain.—It is safe to fire ball ammunition through the projector when the grenade is removed. *Stress that the firer will be killed should he be foolish enough to fire ball when the grenade is on the projector.*

15. It has been found that rifles fire approximately 10 inches low at 100 yards with the projector fitted, and the size of the group almost doubled. These facts should be taken into consideration when ball is fired with the projector attached.

16. Practise and question the squad.

Description of grenade (*see* Fig 2 and Plate 1).

17. Teach that the grenade is designed on the shaped or hollow charge principle. By this means the force of the explosion is concentrated on one small point of the tank.

18. The grenade consists of a thin metal body which holds the charge and detonator, a tail tube and fins.

19. There is a percussion fuze in the nose which is protected by a hard rubber cap. This cap is removed before firing. Should the grenade be fired in an emergency or by accident with the cap on, the grenade will still explode against armour, if the angle at which it strikes is not too small.

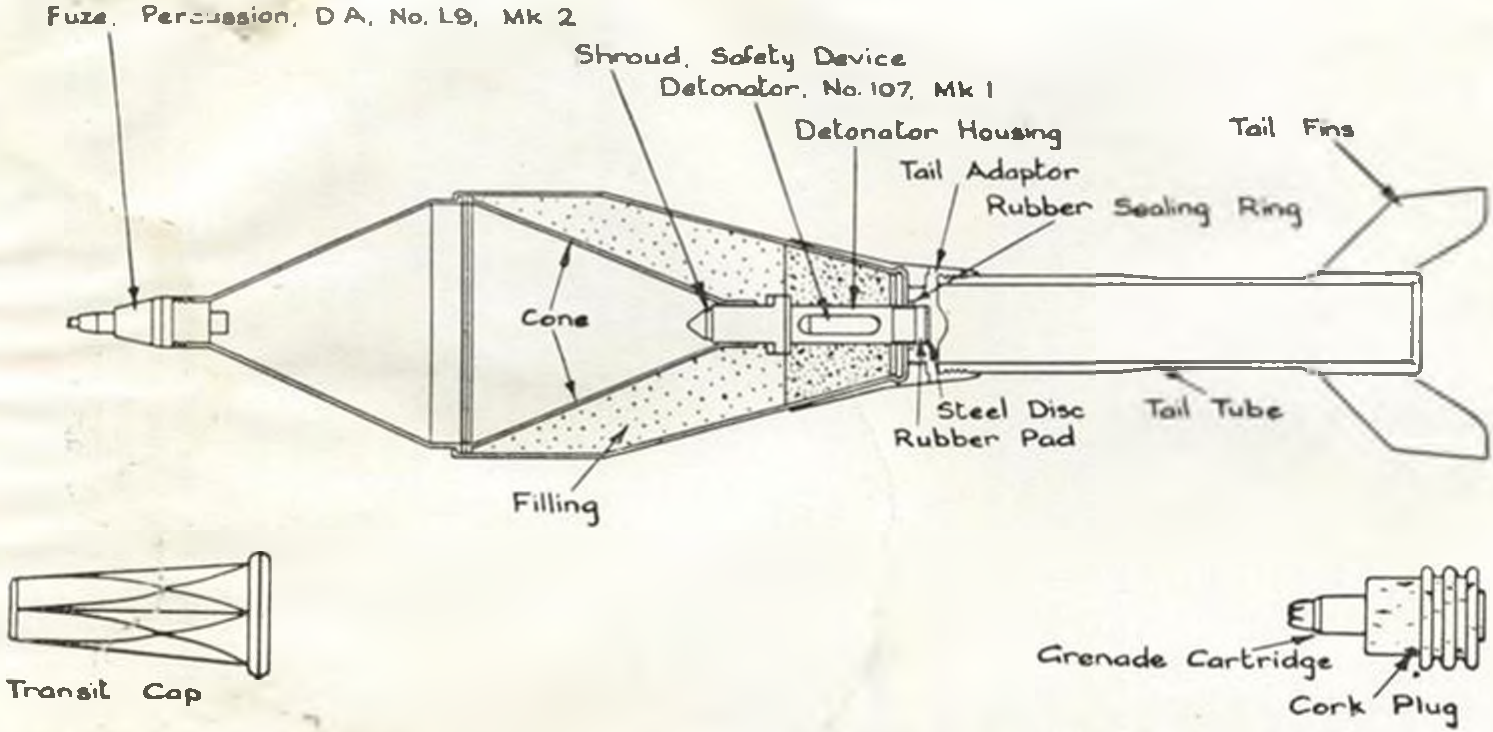


Fig 2.—Grenade, No. 94 (Energa) mechanism

20. At the rear of the body there is the main detonator assembly.

21. Each grenade is provided with a grenade cartridge which is fitted into a cork plug in the base of the tail tube.

22. Mark 1 or Mark 1 modified grenades are painted black with a yellow band, or olive drab with a red filling ring bearing the stencilled words "GRENHEAT" or "GREN HEAT Mk 1". Mark 2 grenades are painted olive drab with a red filling ring, and are stencilled "GREN No. 94 Mk 2". Practice and drill grenades are normally painted black with a yellow band, but may be painted white to assist recovery. Grenade cartridges have the lower half of the case blackened, and have the letter "H" stamped on the base. The mouth is crimped. Only special ballistite cartridges issued for use with the No. 94 (Energa) grenade will be used. Use of ballistite cartridges issued for No. 36 grenade dischargers will lead to serious accidents and is forbidden.

23. Question the squad.

Fuzing grenades

24. Explain and demonstrate.—Grenades are issued unfuzed. Fuzing consists of fitting the nose fuze and detonator. To fuze them when required, proceed as follows:—

(*a*) *Fitting the nose fuze* (*see* Plate 2):—

(i) Remove the protective cap, which is a push on fit, from the nose of the grenade.

(ii) Unscrew the transit plug from the nose. Keep

(iii) Hold the grenade to the light and look inside to see if the shroud (*see* Fig 2) is in position. If it is, the nose of the shroud will reflect the light. If it is not, nothing will be visible. If nothing can be seen, or if, when the grenade is moved gently from side to side, a rattle is heard in the body, the grenade will NOT be fuzed and will be destroyed as a blind.

(iv) Screw on the nose fuze by turning the milled portion of the body of the fuze.

(v) Replace the protective cap.

(*b*) *Fitting the main detonator* (*see* Plate 3). (If not already fitted—*see* para 6):—

(i) Unscrew the tail tube, taking care that it is unscrewed at the point where the paper washer is fitted. Remove and keep the paper washer. If the tail is unscrewed in the correct place a rubber pad is exposed. DO NOT REMOVE IT, as the job of this rubber pad is to hold the

detonator in its housing. (This is emphasized because it is possible on occasions to unscrew the tail tube at a point about half an inch below the paper washer).

(ii) Put a detonator, with its OPEN end towards the nose of the grenade, into the detonator housing at the rear end of the body. Great care must be taken that the detonator is inserted correctly, or the grenade will not explode on impact.

(iii) Screw on the tail tube, keeping the nose of the grenade pointing downwards. Do not replace the paper washer as the *absence* of a washer indicates that the detonator has been fitted.

(iv) Three types of grenades have so far been manufactured:—

Mark 1 grenade
Mark 1 modified grenade
Mark 2 grenade

Both the Mark 1 and the Mark 1 modified take the short Mark 1 detonator. The Mark 2 takes a longer detonator with a fitted distance piece. In no circumstances may the long detonator be assembled in Mark 1 or Mark 1 modified grenades, or the short detonator in a Mark 2 grenade.

(v) Lot numbers run from 1 to 5 for Mark 1 grenades, and begin at 1 for Mark 2 grenades. The Mark 1 and Mark 2 grenades are easily distinguished by differences in the front ends of the tail tubes. On the Mark 1 grenade the rubber cushion is cemented to the front end of the tail tube in a shallow recess. On the Mark 2 grenade there is a rubber washer in a shallow recess, and the rubber cushion is sunk below the surface of the tail tube.

(vi) When correctly fitted in a Mark 2 grenade, the detonator should project about ¼ inch outside the detonator sleeve. If it projects more than this amount it is dangerous to screw the tail unit on top of it, and the detonator will be returned to Ordnance for inspection. In the Mark 1 grenade the detonator should not project beyond the end of the sleeve.

Fuzes and detonators are sensitive. They should be handled with great care in order to avoid risk of accidents.

(c) *Fitting of the cartridge*:—

(i) If the cork holder for the grenade cartridge is not already in the end of the tail tube, put it there.

(ii) Place the grenade cartridge in the cork holder.

Unfuze in reverse order, taking care to replace the transit plug, protective cap, paper washer and cork plug.

25. Practise the squad in fuzing and unfuzing grenades.

Care and cleaning

26. Teach that the projector will be cared for and cleaned like the rifle. Care must be taken that grenades, whether packed or unpacked, are handled with great care. They must not be dropped or roughly handled. A fuzed grenade found to have a damaged tail, or a grenade taken from a badly damaged container, will not be used and will be destroyed.

27. Question the squad.

Function of the grenade

28. Explain.—The grenade is designed to explode on, and penetrate, armour plate and other very hard surfaces, only if the nose fuze obtains an efficient strike; the most efficient strike is when the nose fuze hits a surface at right angles, and this is what the firer should always try to achieve.

29. The grenade has two safety devices. One prevents the arming of the fuze until the grenade has been fired, thus avoiding the risk of explosion if the fuzed grenade is dropped while being handled. The other screens the main detonator until the grenade has travelled five or six feet after firing. After the grenade has travelled this distance the main detonator is exposed, and therefore the fuze having been armed on firing, the grenade is sensitive and may explode on slight impact. Care must be taken when firing through trees, bushes, etc, when our own troops are in forward positions.

30. *Grenade mechanism* (*see* Fig 2).—When the grenade is fired, the fuze in the nose becomes armed, and after a delay (during which the grenade has travelled about five or six feet) the protective cap (shroud), which covers the main detonator in the body of the grenade, is released and ejected from its housing, unscreening the detonator. On impact the detonator in the Mark 1 fuze moves forward onto the striker, and sends a flash to the main detonator, thus exploding the main charge; the Mark 2 fuze has a movable striker and firing pin, and on impact the firing pin is driven in and there is a simultaneous movement of the

detonator towards the striker. The interior shape of the grenade forces the gases of the explosion into a narrow jet of very high temperature which melts a hole through the armour.

31. Question the squad.

Packing and carriage

32. Grenades are service packed in a wooden, tin lined, airtight sealed box containing 12 grenades and cartridges, and two tin boxes each containing six fuzes and detonators. The box is opened by unfastening the quick release buckles, opening the lid and then pulling the metal handle which will be found on top of the tin liner. Boxes are coloured brown with yellow markings.

33. *Carriage.*—Grenades are carried in containers holding two grenades and the following instructions will be carried out when these are used:—

(*a*) *Live material.*—Bombs will be placed in the container inside the cardboard cylinder in which they are bulk packed. The rubber cap will be on the bomb whether fuzed or not. The propelling cartridge will be in the cork plug in the tail tube.

(*b*) *Inert material.*—Bombs will be placed in the container inside the cardboard cylinder in which they are bulk packed.

The bottom of the container will be packed with sufficient paper, cotton waste, etc to ensure that the nose of the bomb is held securely against the felt pad in the lid. The propelling cartridge will be in the cork plug in the tail tube.

34. Question the squad.

Conclusion

35. Questions to and from the squad.

36. Test on vital points.

37. Sum up.

LESSON 2.—LOADING, UNLOADING AND AIMING

A. INSTRUCTOR'S NOTES

Aim

To teach loading the grenade, unloading without firing, and aiming.

Stores

2. Rifles, drill cartridges, drill grenade cartridges, one projector and practice grenade for each man and instructor, suitable tank targets, aiming rests and diagrams of correct aims.

Instructional knowledge

3. Use of the aiming rest when demonstrating and checking aims is as for aiming practice with the rifle. The position of the head will vary according to the angle on the rifle.

4. During aiming instruction it is important that the man views the instructor's aim and the instructor checks the man's aim from the same position.

5. Representative tank targets must be of the correct representative size. A simple formula for finding the correct representative size of targets at a reduced range is:—

$$\frac{\text{Actual size of target (in inches)} \times \text{Range (in yards) to the representative target}}{\text{Range (in yards) that is to be represented}}$$

Example.—For a tank 20 feet long, ten feet wide and ten feet high at 75 yards range the formula to determine the size of a representative target which is required for practice at a distance of ten yards is as follows:—

$\frac{20 \times 12 \times 10}{75}$ for length (side view)

$\frac{10 \times 12 \times 10}{75}$ for height and width (front view)

6. Words of command when practising loading and unloading will be "*Grenade—Load*" and "*Without firing—Unload*".

B. CONDUCT OF THE LESSON

Preliminaries

7. Normal safety precautions with rifles and drill cartridges. Inspect practice grenades and drill grenade cartridges.

Revision

8. Practise the squad in fitting and unfitting the projector and sight. Leave projectors on at end of practice and load with drill cartridges.

Approach

9. Quick loading, accurate aiming and judging distance are vital importance. They must be practised until they become instinctive.

Loading and unloading

10. Explain and demonstrate with squad imitating. Squad to be in any comfortable position:—

(*a*) Unload ball, leaving the breech open.
(*b*) Remove the protective cap from the nose fuze, and the cartridge holder from the tail tube. Keep both.
(*c*) Slide the tail tube of the grenade over the projector, and push fully home until the spring clip is forced into the tail tube.
(*d*) Remove the grenade cartridge from the cork holder, load it and apply the safety catch.

11. *Unloading without firing*:—

(*a*) Unload the grenade cartridge.
(*b*) Remove the grenade.
(*c*) Load with ball SAA.
(*d*) Replace the protective cap, grenade cartridge and cork plug.

12. Explain that in action men armed with the section anti-tank weapon may be ordered to have the projector permanently fitted to their rifles, especially in defence.

13. Practise the squad.

Aiming

14. Explain.—The normal point of aim is the centre of the target, but should the range be very close a vulnerable part of the target should be selected. The parts of a tank which are most vulnerable to the grenade are:—

(*a*) The sides and rear of the engine compartment.
(*b*) The sides under the turret where ammunition is stored.

The least vulnerable part is the sloping plate (the glacis plate) on the front of the tank. Accurate judging of distance is vital.

15. Explain and demonstrate, using an aiming rest and diagrams, how to aim.

Stationary targets.

16. The sequence of action is:—

(*a*) Judge the range to the target.
(*b*) Select the sight ring which corresponds to the estimated range, and align the top surface of this ring, the centre of the upper edge of the grenade and the centre, or a selected point, of the target (*see* Fig 3).
(*c*) At 25 yards the target should be framed between the two triangular pointers.

17. Squad view and practise.

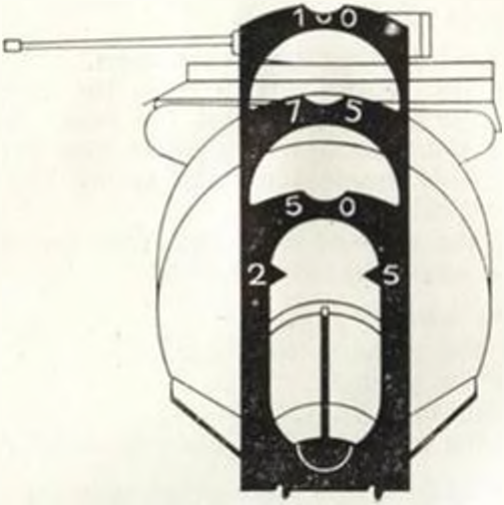


Fig 3.—Correct aim 75 yards— stationary target

Moving targets.

18. *Directly approaching and withdrawing targets.*—In both cases aim at the centre of the target.

19. *Crossing targets* (*see* Fig. 4).—It is necessary to aim off all targets crossing the front. The amount of "aim off" will depend on the range and speed. The best method is to aim off in target lengths for then the angle at which the target is moving need not be considered, because the narrower the angle of movement across the front, the smaller is the apparent length of the tank, and the less lateral speed it attains.

20. The following lead table may be used as a guide. (Leads to be taken from the centre of the tank.)

Range yards	Speed mph	Lead	Speed mph	Lead
25	10	Front edge of leading track.	20	1 tank's length.
50	10	½ tank's length.	20	1½ tanks' lengths
75	10	1 " "	20	2 " "
100	10	1½ tanks' lengths.	20	3 " "

21. Squad view and practise at actual tank or proportionate silhouette target.

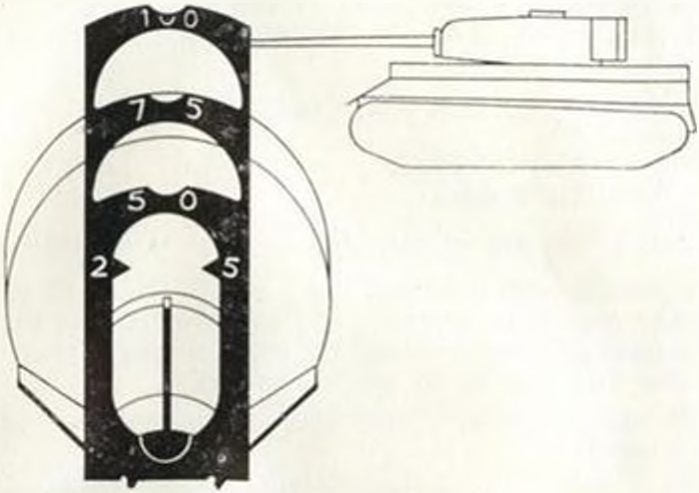


Fig 4.—Correct aim—moving target 75 yards—10 mph

Conclusion

22. Questions to and from the squad.

23. Test on vital points.

24. Sum up.

LESSON 3.—FIRING

A.—INSTRUCTOR'S NOTES

Aim

1. To teach the firing positions and firing the grenade.

Stores

2. Rifles, ball and grenade drill cartridges, a projector, two practice grenades and two live grenade cartridges each man and instructor, suitable targets.

Instructional knowledge

3. This lesson will be carried out on ground which is suitable for firing practice grenades (*see* Section 4).

4. The practice grenade has the same general characteristics as the HE, except that it is inert and cannot be fitted with a fuze or detonator. It can be recovered after use, especially if fired so as to [illegible] on grass, sand or soft earth, and used again, provided it

is cleaned and inspected for bulges and dents in the tail tube, and damage to the fins. When grenades are recovered, they should be thoroughly cleaned, the tail unit unscrewed by the armourer and both threads—on the inside of the body and the outside of the tail—thoroughly cleaned with spirit and then re-assembled. Spirits that are suitable are:—

White spirit (turpentine substitute).
Gasoline.
Carbon tetrachloride.
Methylated spirit.

The tail tubes must be kept slightly oiled when not in use.

5. A grenade with a bulged tail tube will NOT be used again, as the tube may burst on firing. Dents will be straightened out, and damaged tail fins replaced by the armourer from the spare sets of fins issued with the practice grenades.

6. The scale of issue of spares is one tail and two spring clips to each grenade.

7. The method of changing the tails of practice grenades is:—

(*a*) Open the circular spring-wire clip in front of the tail fins and slide it forward along the tail tube. Push the tail fins forward as far as possible.

(*b*) Remove the second spring-wire clip, which will now be exposed in rear of the tail tube.

(*c*) Slide off and remove the old tail fins and replace with a new set.

(*d*) Replace the spring-wire clip in rear of the tail fins and make certain it is engaged in its groove on the tail tube. Draw the fins to the rear to cover this spring-wire clip.

(*e*) Replace the spring-wire clip in front of the tail fins and so lock the tail into position. Draw the front spring-wire clip back until it re-engages the smaller part of the tail tube (in front of the tail fins), thus locking the fins into position.

8. Targets for practice grenades should be six-foot double hessian screens, securely wound round (not nailed to) stout poles. The outline of a tank may be marked on them. A moving target apparatus is shown in Infantry Training, Volume III, Pamphlet No. 33, Range Construction and Regulations, 1951, Plate 38 (*b*).

9. During the practice stage, members of the squad should first practise in their own time and then by word of command, *eg.* "*Tank—seventy five yards—fire*". It must be explained that on service men will normally have to fire without orders.

10. Live grenade cartridges must be kept in a separate container, away from the squad, until required.

B. CONDUCT OF THE LESSON

Preliminaries

11. Normal safety precautions with rifles and drill cartridges. Inspect practice grenades and drill grenade cartridges. Order squad to fit projectors, loosen slings and load with drill cartridges.

Revision

12. Aiming, grenade loading and unloading. Leave rifles "Grenade loaded".

Approach

13. As the grenade is a short range weapon (the ideal range being from 25 to 50 yards), concealment of the firer before opening fire is of the utmost importance. The lesson will deal with various positions for firing, but on service the firer must decide what position to use according to the circumstances. THE GRENADE MUST NEVER BE FIRED FROM THE SHOULDER OR WITH THE BUTT PLATE IN CONTACT WITH ANY PART OF THE BODY.

The standing position (*see* Plate 4)

14. Explain that the standing position is taught in the open for ease of instruction in the basic principles of holding the rifle. It may have to be used in an emergency on service.

15. Explain and demonstrate, with squad imitating:—

(*a*) Place the feet and body as for the "on guard" position.

(*b*) Hold the rifle in the right hand and pass the left arm through the sling, placing the sling well above the left elbow; grip the rifle very firmly with the left hand, just in front of the outer band. (It is emphasized that the left hand grip must be firm and not too far forward of the outer band, otherwise, when the grenade is fired, the rifle will slide back and may cause slight injury to the forefinger of the left hand, which will come in contact with the piling swivel bracket. Correct adjustment of the sling will assist in holding the rifle firmly and correctly.)

(*c*) Draw the left elbow well back. This will bring the sling tight across the chest. Put the butt under the right armpit, and control it by pressing against it with the right arm.

(*d*) Hold the head up and inclined to the right in order to align the sights correctly.

(*e*) Push forward the safety catch, and place the first or second finger of the right hand on the trigger, keeping the remainder of the hand clear of the rifle. The left hand and arm should not be in contact with hard cover.

(*f*) To fire at targets above or below the firer, keep the butt in the armpit, and move the upper part of the body, backwards for targets above, and forwards for targets below.

16. Practise the squad.

17. *Firing at stationary targets*:—

(*a*) Estimate the range to the target.

(*b*) By moving the rifle, aim as taught.

(*c*) When the aim is correct, operate both pressures of the trigger with a straight-through action, keeping the rifle still.

(*d*) If a misfire occurs, load immediately with another grenade cartridge.

18. *Firing at moving targets*:—

(*a*) To fire at approaching or withdrawing targets, aim at the centre or a selected point of the target. If the target is approaching or withdrawing on rising or falling ground, retain the aim by moving the rifle, and fire without checking the movement.

(*b*) To fire at crossing targets, align the sights on the target, then by swinging the body at the hips, swing the rifle in the direction of the target's movement, and fire when the rifle is passing the required lead. Continue to swing until the grenade has left the projector.

19. Explain that when firing live or practice grenades, the next action would be to load with another grenade and grenade cartridge or with ball, but for instructional purposes practice in firing will continue until "*Without firing—Unload*" is ordered.

20. Practise the squad in holding and firing.

Kneeling and sitting positions (*see* Plate 5)

21. Explain.—The kneeling and sitting positions can be used in the open, in a shallow trench or behind a bank.

22. Explain and demonstrate, with squad imitating:—

(*a*) For kneeling or sitting, adopt the normal firing position. When kneeling, the body need not be resting on the heel, nor the left elbow on the knee.

(*b*) Holding and firing are as for the standing position.

23. Practise the squad in kneeling and sitting positions.

The back position (*see* Plate 6)

24. Explain that the back position is best if one has to fire in the open.

25. Explain and demonstrate, with squad imitating:—

(*a*) Make a small heel hole, or arrange a stop for the butt. The stop must be firm but not hard.

(*b*) Sit down, lean back, and take the weight of the body on the right elbow.

(*c*) Rest the butt against the stop and grip the rifle with the left hand as far forward as possible.

(*d*) Draw up the knees to allow the thighs to act as a support to the left arm and rifle.

(*e*) Place the right hand as for other firing positions.

(*f*) Stress that the butt MUST be against a stop.

26. Aiming and firing as for other positions.

27. Explain that it is not practicable to fire the grenade from the normal prone position.

28. Practise the squad.

Firing from a fire trench (*see* Plate 7)

29. Explain.—In defence the normal position from which the grenade is fired will be from a fire trench. As concealment before the grenade is fired is vital, the firer should remain concealed, then, as the target comes within range, quickly rise up, take aim, and fire before the target can shoot back. If the first grenade misses, then, provided the position has been properly prepared, a fresh grenade can be loaded and fired at the rear of the target, after it has passed.

30. Steadier holding, and therefore more accurate shooting, can be obtained if the butt is rested against a firm, but soft, stop such as the rear bank of a fire trench. Whatever type of stop is used it should not be hard and unyielding, such as a wall or tree, or the rifle will be damaged.

31. Demonstrate firing from a fire trench or bank with and without a stop for the butt.

32. Practise squad.

Team work

33. Explain that should it be necessary to fire grenades quickly, two men can work together, one loading grenade cartridges, aiming and firing, while the other loads the grenades onto the projector. The grenade cartridge must be taken from the grenade and loaded into the firer's rifle.

34. Explain and demonstrate (with one of the squad as the firer) in any position. (In order to reproduce actual conditions, a member of the squad will be told to remove the drill grenade from the projector when the firer operates the trigger):—

(*a*) The loader gets into a position from which he can load the grenades. On service this should be under cover.

(*b*) As soon as the grenade is fired, the assistant will load another grenade, and, when his hand is well clear of the rifle, call "*Up*". The firer will then load with a grenade cartridge and fire.

35. Practise the squad in pairs.

Firing practice grenades

36. Each member of the squad will fire at least two practice grenades, the first standing in a fire trench with a stop for the butt, the second standing in the open.

37. *Procedure*:—

(*a*) Target—A six-foot hessian screen at 75 yards.

(*b*) Instructor demonstrates firing two practice grenades, the first one from a fire trench, the second in the open.

(*c*) The squad will be organized in details of two.

(*d*) Instructor orders "1*st Detail—Grenade—Load*". "*No.* 1 —*Prepare to fire*". "*Fire*". "*No.* 2, etc—2*nd Detail up*", etc.

(*e*) The instructor must check each man carefully to see that he is holding the rifle firmly with the left hand, that the sling is fitted correctly, and that the firer's right hand, except the trigger finger, is clear of the rifle before ordering "*Fire*".

(*f*) Actions and accuracy to be criticized after each detail has fired.

(*g*) Details waiting to fire must be at least five yards behind the firing point.

38. Practical cleaning after firing, including cleaning and inspection of recovered practice grenades.

Conclusion

39. Questions to and from the squad.

40. Sum up.

LESSON 4.—HANDLING

Aim

1. To teach the employment of the section anti-tank weapon within the section.

Stores

2. Sections equipped as for section handling, two men in each section being armed with a projector and two practice Energa grenades in containers.

Instructional knowledge

3. This lesson consists of exercises designed to train the section in the use of the section anti-tank weapon against tanks.

4. After the initial opening talk, exercises should take the form of small section schemes, in which the section is called upon to take up defensive positions against tanks.

5. The ground should be carefully chosen to bring out the required lessons, and should be as varied as the circumstances will allow.

6. Men will be taught the carriage of grenade containers as follows:—

(*a*) With the sling passed round the back of the neck and under both arms, the container fits comfortably into the small of the back below the small pack. This is the best position; it is comfortable and allows free use of the hands, and grenades are easily removed if the container is pulled towards the front.

(*b*) An alternative method is to secure the sling to the belt, the container being pulled up tight against the bottom of the small pack. Though not as comfortable as (*a*) this method prevents the container rattling against the bayonet or entrenching tool.

(*c*) If necessary, two containers may be carried by slinging them one on top of the other in a similar manner to that described in (*a*). This method is not recommended except for normal marching. Bombs are difficult to remove without assistance and the containers rattle against each other.

Preliminaries

7. Inspect all weapons and equipment.

Approach

8. The lessons and firing taught so far have been elementary; now the men must be exercised in using the weapon within the section and on varying types of ground and cover.

Organization and handling

9. Explain.—Two men of each section are armed with projectors, and normally carry two Energa grenades each. There is a reserve of two grenades for each section in company transport. In a defensive position where attacks by tanks are likely, it is probable that the reserve of grenades will be with the section in addition to any others that may be available.

10. It will be the platoon commander's responsibility to co-ordinate the fire of his six projectors. The section commander, having been allotted his area and tasks, will site his own weapons, but each man in the section must know how to do this.

11. The primary role of the weapon is anti-tank, but it can be used against other targets, such as personnel, houses and concrete emplacements. Nevertheless, owing to the small number carried, grenades will not be wasted against such targets unless the likely results justify their use and a tank attack is not imminent.

Siting for anti-tank role

12. Explain and show on the ground the points to be considered when the weapon is sited against tanks:—

(*a*) A field of fire up to 100 yards only is required.

(*b*) The position must be carefully concealed, because, owing to the short effective range and the small number of grenades carried, it is important to get the tank well within range in order to make certain of a "kill" with the first shot.

(*c*) The weapon must be sited to cover likely tank approaches such as gaps in minefields.

(*d*) When possible the position should be defiladed from the front, thus giving a better chance of engaging enemy tanks from the flanks and rear.

(*e*) The normal firing position will be from a fire trench. The normal two-man fire trench can contain one man armed with the anti-tank weapon, as well as another man who can act as loader if required and be ready to take over the weapon.

13. Question the squad.

Method of conducting exercises

14. Exercises will be conducted similar to those laid down for section handling. The position can be prepared, *eg*, a series of fire trenches, or a position making use of natural cover.

15. The instructor points out the arc of fire, probable tank approaches, the section position to be occupied, and the position of the other sections of the platoon. He then gives the section about five minutes to decide where, within the section position, the anti-tank weapons should be sited.

16. Each individual of the section then gives his plan and the instructor selects a solution which he thinks will bring out the lessons he wants to teach.

17. The section then takes up positions.

18. The instructor then gathers the section round the anti-tank weapons and brings out by discussion whether they are sited so that they can properly carry out their allotted tasks.

19. Points for discussion:—

(*a*) All points of elementary weapon training.

(*b*) The anti-tank weapon:—

(i) Field of fire.

(ii) Can the weapon cover the tank approach?

(iii) Concealment.

(iv) The actual position in the fire trench or natural cover.

(v) Does the position chosen give the best chance of engaging the tank in the sides and rear?

(vi) Are there any obstructions to the line of flight of the grenade?

(vii) Where and when will the man open fire, and will "misses" endanger the other sections of th platoon?

20. Both anti-tank weapon positions should be viewed from the front at ranges up to 100 yards.

21. Further practice should take place on different ground.

Conclusion

22. Questions to and from the squad.

23. Sum up lessons learnt.

SECTION 4.—RANGES AND SAFETY PRECAUTIONS FOR PRACTICE FIRING

Ranges and targets

1. Any reasonably level piece of ground is suitable for the construction of an Energa grenade range, provided that:—

(*a*) There is a clear view between the firing point and targets.

(*b*) It is large enough to contain the necessary danger area.

2. Suitable targets for live grenades are old AFVs, pieces of armour plate, or concrete walls with tank outlines painted on them.

3. For use with practice grenades, both as stationary and moving targets, wooden frames covered with hessian are adequate.

4. A light or medium tank may be used as a target for practice grenades only. Tanks so used will be closed down.

5. The construction of a range on which moving targets can be engaged with live grenades is likely to be an expensive undertaking. Moving targets will therefore normally be engaged with practice grenades.

Range precautions

6. The extreme range of the grenade is 300 yards. It is therefore safe to fire practice grenades anywhere, provided that:—

(*a*) A piece of ground 350 yards long and 100 wide is clear of people, livestock, and anything likely to be damaged by a grenade.

(*b*) Reasonable care is taken at the firing point that men do not shoot wide.

(*c*) Red flags are put out to mark the limits of the range.

(*d*) A qualified officer, warrant officer or senior NCO supervises.

7. Precautions to be observed when live grenades are to be fired are:—

(*a*) Firing will take place from blast-proof firing bays or trenches. Only one firer and one instructor will be present in the firing bay or trench when a grenade is fired.

(*b*) Everyone in the danger area, including waiting details and spectators, will be behind blast-proof cover or in a trench, and will wear a steel helmet.

(*c*) No one within 150 yards of the point of impact of a grenade will watch it explode, but will remain behind cover.

(*d*) Firers will fuze their own grenades on the range in blast-proof fuzing bays or trenches, under the supervision of instructors. Each grenade will be fuzed with only one firer and one instructor present in the bay or trench. Any grenades that have been fuzed but not fired will be defuzed before they are taken off the range.

(*e*) After it has travelled five feet, a live grenade is liable to explode if it grazes the ground, or hits any obstruction, such as a hedge or the foliage of a tree; there must therefore be an absolutely clear line of fire from the firing point to the target.

(*f*) A medical orderly will be in attendance with first aid equipment and, if possible, an ambulance.

(*g*) Danger flags will be raised; look out men will be posted; and the whole of the danger area must be clear of people and livestock.

(*h*) A NCO will be detailed to supervise each firer.

(*j*) No weapon will be loaded, and no one will fire, without a direct order from the conducting officer, who will be present throughout the firing.

(*k*) If a grenade cartridge misfires, the firer will load with another cartridge and go on firing. A supply of spare cartridges will be available on the range.

(*l*) A NCO will be detailed to count all grenades fired and the number of explosions that take place. He will carefully note the position of all blinds. He will do this from outside the danger area.

(*m*) Grenades found to have damaged tail tubes or fins, and grenades taken from badly damaged packages, will not be used, but will be treated as blinds and destroyed. All fuzes in badly damaged packages will be destroyed.

(*n*) Demolition equipment will always be taken on the range in order that blinds may be destroyed.

(*o*) During training no target will be engaged at a range of less than 75 yards.

Danger areas

8. The danger area for the firing of live Energa grenades is made up of three parts:—

(*a*) *The target area*:—

(i) This is the area in which targets may be set up and engaged.

(ii) Its length is constant and extends from a point 75 yards from the firing point (the shortest range at which it is permitted to engage a target) to 350 yards from the firing point (the maximum range of a grenade).

(iii) If only a single line of fire is to be used, the *target area* consists simply of a straight line 275 yards long. If an arc of fire is to be used, the *target area* takes the form of a segment of a circle whose centre is the firing point. That part of the segment which lies within 75 yards of the firing point is not part of the target area.

(*b*) *The impact area*:—

(i) This is the area in which rockets are liable to fall.

(ii) The length is constant and extends from the firing point for 350 yards.

(iii) Its area comprises the whole of the segment of a circle which is the *target area*, with five degrees added to each side of it.

(*c*) *The fragmentation or danger burst area.*—This consists of a belt of ground 150 yards wide, lying immediately outside the *impact area*.

9. A template for the danger area of a range that has only a single line of fire for use with stationary targets is shown in Fig 5.

10. To determine the danger area when targets are to be engaged within an arc of fire, it is necessary to apply the Fig 5 template with the line of fire along first one then the other flank line of the target area. All ground which has been covered by the template in this way comprises the danger area. An example of the result is shown in Fig 6.

11. The limits of the arc of fire should be marked on the ground by tall posts, each with the distinguishing letter "X" or "O" at the top.

Blinds

12. *See* Infantry Training, Volume III, Pamphlet No. 31, Range Work—General (All Arms), 1948, Appendix C.

13. It is important to remember that once a grenade has been fired it is armed and very sensitive; a slight touch may cause it to explode.

14. Any grenade which leaves or partially leaves the projector and fails to explode will be treated as a blind.

15. Blinds will be destroyed as they occur unless they are lying in a closed target area.

16. Everyone except the conducting officer will remain either outside the danger area or under cover while a blind is being destroyed.

17. Blinds will be destroyed in strict accordance with the following instructions:—

(*a*) The conducting officer will prepare a demolition set and a slab of guncotton (*see* Infantry Training, Volume III, Pamphlet No. 31, Appendix C).

(*b*) He will go alone to the blind. He must NOT TOUCH THE BLIND but will place the guncotton slab JUST CLEAR of it, and as near as possible to the tail cone, which is immediately in front of the tail tube and is where the charge and its detonator lie. He must make certain that his steel helmet and any other article of equipment that he wears are firmly secured.

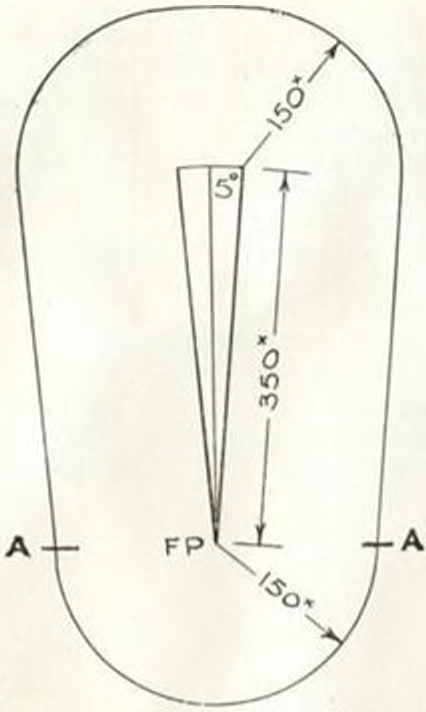


Fig 5.—Danger area—Single line of fire

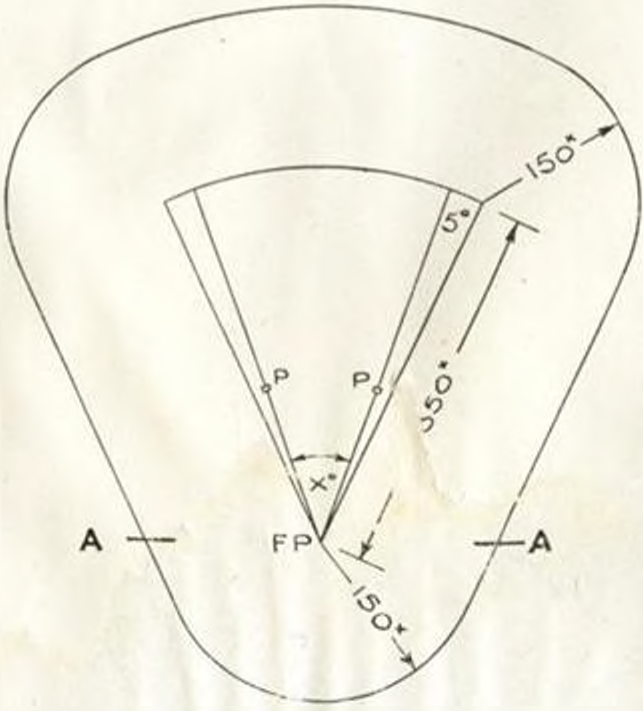


Fig 6.—Danger area—Arc of fire

(*c*) If a blind buries itself in the ground outside a closed target area, the conducting officer will:—

(i) Mark the point of entry of the grenade into the ground.

(ii) Set up a new target at least 20 yards away from the point of entry before he allows firing to start again.

(iii) Put up a notice "Danger—keep away".

(iv) Warn the police (if civilians have access to the area).

(v) Inform the Inspecting Ordnance Officer, who will destroy the blind.

(*d*) Blinds and any other unusual occurrence will be reported to the Inspecting Ordnance Officer, together with the batch or lot numbers of the grenades concerned.

AMENDMENTS

Amdt No.	By whom amended	Date of insertion

DISTRIBUTION

(See Catalogue of War Office Publications, Part II)

Scale

Infantry .. .. E

RAC, RA, RE, R Signals, RASC, RAOC and REME .. C

School of Infantry .. .. 250 copies