

PREFATORY NOTE

Military Training Pamphlet No. 40, Mines and Booby Traps, will consist of the following parts:—

Part I (All Arms).—How to deal with individual mechanisms, Part I Supplement (All Arms).—Enemy methods of minelaying (illustrated).

Part II (All arms).—Laying and recording of British mines.

Part III (All arms).—The breaching of minefields.

Part IV (All arms).—In course of preparation.

CONTENTS

SEC	PAGE
1. Introduction	1
CHAPTER 1.—POLICY WITH REGARD TO BRITISH MINEFIELDS	
2. Nomenclature	2
3. Laying of mines	3
4. Marking of minefields... ..	5
5. Recording of minefields	7
6. Replenishment... ..	9
CHAPTER 2.—DETAILS OF LAYING AND RECORDING	
7. General	10
8. Laying a hasty protective minefield... ..	11
9. Laying single mine panels	12
10. Laying a minebelt or series of panels	14
11. Ends of panels and corners in minebelts	18
12. Gaps	18
13. Recording	19
14. Organization of working parties	23
15. Depth and density of minefields	23
16. Use of different types of mines	26
17. Concealment of mines and minefields	28
18. Fencing of the field	31
19. Timing	34
20. General safety precautions in minelaying	35
21. Carriage in the field	36
22. Deliberate clearance of minefields	36
23. Inspection of anti-tank minefields	37

(Continued on p. 38 cover)

MILITARY TRAINING PAMPHLET No. 40

MINES AND BOOBY TRAPS

PART II (ALL ARMS).—LAYING AND RECORDING OF BRITISH MINES—1944

SECTION I.—INTRODUCTORY

1. In view of the fact that all arms are now involved, the policy for laying and recording of mines has been modified so that the laying and recording can be done as easily and simply as possible without extra technical knowledge being necessary.

2. Part I of this pamphlet tells you how to arm individual mines; Part II aims at telling you how to lay the mines on the ground in the best pattern and how to record their position so that our troops can be warned of their presence and later someone, who perhaps was not present when you laid the mines, can come out and pick them up with a minimum of danger to himself and his men. It is your responsibility therefore to see that you provide the essential minimum information, as set out in this pamphlet, to enable him to do so. If circumstances permit, or if you have superior technical knowledge, it is also your responsibility to provide this, or fuller information, in such a manner as to make the task of those lifting the field easier. Engineers laying and recording minefields will always be expected to produce fuller information than this pamphlet demands, with large scale diagrams.

3. It is necessary that there should be uniformity between and within all theatres of war in the policy for naming, laying, marking, and recording our own minefields. This policy is set out in Chapter 1. Commanders-in-Chief will issue instructions appropriate to the theatre of war concerned, based on this policy and amplifying it where necessary. Passages set in black type indicate radical changes from the previous policy issued in ATM 45.

4. Chapter 2 gives practical details of laying mines and suggested instructions on the best methods of using the minelaying drills given in Appendices A, B, and C. It also gives practical examples of how to fill in the minefield record *pro forma* mentioned in Chapter 1.

CHAPTER 1

POLICY WITH REGARD TO BRITISH MINEFIELDS

SECTION 2.—NOMENCLATURE

5. The following terms will be used and other terms or variations will not be introduced.

- (a) *Minepanel*—consists of a number of mines laid in a definite pattern in straight rows from one datum line at right angles to the rows.

Our own anti-personnel mines and anti-lifting devices fitted to anti-tank mines will be laid as part of the pattern inside the panel.

- (b) *Minebelt*—consists of a linear series of panels.
- (c) *Minefield*—consists of an area that contains one or more minebelts sited one behind the other, and may also contain several areas of scattered mines. A minefield may thus be of considerable depth.
- (d) *Landmark*—consists of an existing permanent point of known map reference. Should no such point exist within reasonable distance, an artificial landmark will be erected.
- (e) *Datum lines*—these will be marked during laying by tape at right angles to the start of the rows of mines in each panel, but will be permanently defined on the ground by major datum points or datum points at one end of the line and a picket driven flush with the ground at the other end.
- (f) *Major datum point*—consisting of a permanent point at the inner end of the datum line of the reference panel, tied in to the landmark and the datum point of the panel by compass bearing and distance. Major datum points should be inside the boundary fence and within 10 yds of the corner mine.
- (g) *Datum point*—consisting of the point on the datum line from which the inner row of mines starts. It is marked on the ground by a picket driven flush with the ground, and tied in with the previous datum point by compass bearing and distance.
- (a) *Density*—is defined as the number of mines per yard of front. In the standard panel of six rows at 6 yds spacing, the density is one mine per yard of front.
- (f) *Suspect area*.—A suspect area is an area that contains both minebelts and minefields, the boundaries of which have not been accurately determined.

- (j) *Breaching*.—Breaching a minefield is the operation of clearing one or more lanes to allow the passage of vehicles through the minefield.
- (k) *Clearing*.—Clearing a minefield implies the recovery and collection of all the mines over the whole area concerned.
- (f) *Protective minefield*.—Protective minefields are those laid to prevent penetration by the enemy of a defended locality, post, or roadblock.
- (m) *Defensive minefields*.—Defensive minefields are those laid with the object of preventing penetration between forward defended localities or into an outpost position.
- (n) *Tactical minefields*.—Tactical minefields are those laid with the object of canalizing penetration within a defended area or enemy movement round the flank of such an area.
- (o) *Nuisance or scattered mines*.—Nuisance or scattered mines are small pockets of mines laid with a view to delaying the enemy approach to a position, for example, in defiles or along approach roads. While their presence will impose great caution on the enemy, it must be remembered that they may interfere with the withdrawal of our own covering troops or counter-attacks. Since they are not necessarily covered by fire, they must be well concealed, unmarked, laid in considerable depth, and, if possible, accompanied by anti-lifting devices.
- They will only be laid on the orders of the commander of a formation not lower than a division.
- (p) *Dummy minefields*.—Dummy minefields are areas in which the ground has been disturbed and all other steps have been taken to produce the appearance of a real minefield, including normal marking.

SECTION 3.—LAYING OF MINES

General.—All minefields will as far as possible be laid so as to supplement, or join up, natural obstacles. Concealment, and the inclusion of anti-personnel mines or other devices, when available, are essential deterrents to lifting of minefields. Minefields that are not covered by fire have merely a delaying effect, often not commensurate with the labour and resources expended in their laying. For this reason, protective minefields will invariably be covered by small arms and anti-tank fire. The extent to which the same rule applies to defensive minefields depends upon the distances between localities, but during darkness and fog, cover by such fire will be provided by patrols and posts specially detailed for this purpose. Where tactical minefields are at a distance from any defended locality positions will be reconnoitred and prepared so that the minefields can be covered by fire when the enemy approaches.

SECTION 9.—LAYING SINGLE MINE PANELS

36. The procedure will normally be as follows :—

- A setting-out party (as shown in Appendix A) lays a tape to mark the inner edge of the panel. The siting of this tape is chosen so that the panel will block the most likely approach and so that it can best be covered by the weapons of the defenders.
- The same party lays out the datum line at right angles to, and at the start of the tape above, and drives a picket to mark the datum point. The major datum point is erected at a suitable distance at the inner end of this datum line, and a picket is driven at the outer end of it for recording and subsequent picking-up purposes.
- This party now lays out the laying tapes at right angles to the datum line to the right when facing outwards (see Fig 1). The tape, laid to mark the inner edge of the field, can be used as one of the laying tapes.

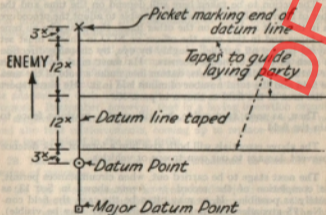


Fig 1. Layout of tapes for laying a panel of six rows of mines at 6 yds spacing by pacing method.

- The commander of the laying party who will normally also be in charge of setting out, is responsible for carrying out the necessary reporting back and recording as shown in Sec 13.

- While the setting-out party has been carrying out these operations, the laying party can be getting ready, removing the top slat from the mine crates, making dumps of mines at intervals along the field (see Appendix B), or doing whatever else is necessary.
- If a marking fence is to be erected (and this must be done unless tactical considerations forbid) then a separate party should be detailed who will erect the complete fence independently of the progress of the laying.
- The remainder of the laying is carried out as laid down in Appendix B see C. Once laying is completed, all that remain in the field are the marking fence, the cairn or picket marking the major datum point, the datum point picket, and the picket at the far end of the datum line, both driven flush with the ground, and the mines themselves (see Fig 2).

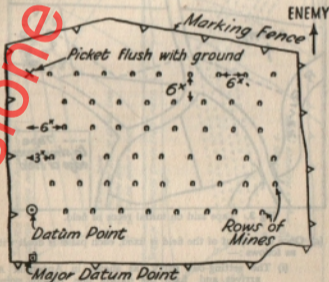


Fig 2. Diagram to show completed panel laid by pacing method.

SECTION 10.—LAYING A MINEBELT OR SERIES OF PANELS

Sequence of reconnaissance and laying

37. The following sequence should be taken as a guide to the method in which a minebelt should be laid.

- (a) An initial reconnaissance should be carried out by representatives of the laying party and by a tactical representative to decide on the layout of the field. This layout will depend on the general tactical object of the field, the siting of the weapons of the defence and the suitability of the ground for laying.
- (b) On this reconnaissance, a tape will be laid to represent the inner edge of the field. In all probability the layout can be altered slightly without disturbing the tactical siting to allow the tape to run, for ease of laying, between distinguishable features such as a certain tree to a hedge corner, etc. After this reconnaissance, the field is represented by a single tape running in a series of legs as shown in Fig. 3.

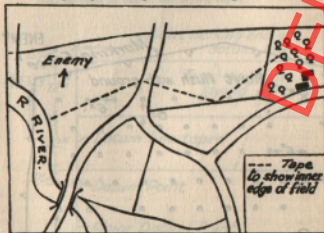


Fig. 3. Tape laid on initial recon of field.

- (c) Once the layout of the field is fixed, each panel is dealt with as follows:—

- (i) The setting-out party (as shown in Appendix A) arrives and fixes the datum line, datum point, major datum point, and lays the laying tapes;

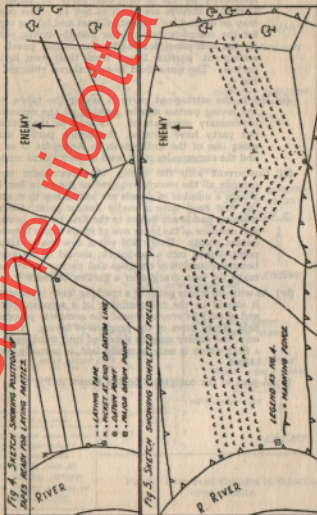


Fig. 4. SKETCH SHOWING POSITION OF TAPES READY FOR LAYING MINES.

— LAYING TAPE

A. — DATUM AT END OF DATUM LINE

B. — DATUM POINT

C. — DATUM AT OTHER END

D. — DATUM AT OTHER END

E. — DATUM AT OTHER END

F. — DATUM AT OTHER END

G. — DATUM AT OTHER END

H. — DATUM AT OTHER END

I. — DATUM AT OTHER END

J. — DATUM AT OTHER END

K. — DATUM AT OTHER END

L. — DATUM AT OTHER END

M. — DATUM AT OTHER END

N. — DATUM AT OTHER END

O. — DATUM AT OTHER END

P. — DATUM AT OTHER END

Q. — DATUM AT OTHER END

R. — DATUM AT OTHER END

S. — DATUM AT OTHER END

T. — DATUM AT OTHER END

U. — DATUM AT OTHER END

V. — DATUM AT OTHER END

W. — DATUM AT OTHER END

X. — DATUM AT OTHER END

Y. — DATUM AT OTHER END

Z. — DATUM AT OTHER END

LEGEND AS FIG. 4.

— MINEBELT FORCE

these will run up to the datum line of the next panel and if this is not already laid, it must be taped or spitlocked by the setting-out party of panel 1. Details of corners are given in Sec 11. This party may go on and lay the datum lines and laying tapes for the complete belt or may join the laying party for the first panel, leaving the succeeding panels to setting-out parties found from their own laying parties. The same field is now shown enlarged in Fig 4.

- (ii) While the setting-out party is laying the tapes, etc. the laying parties can be making all the necessary preliminary preparations. As soon as the setting-out party have finished, the laying parties start using one of the drills given in Appendix B or C, and the commander must send in the tactical report.
- (iii) Concurrent with the laying, the commander must compile all the records required as shown in Sec 13. Where a number of panels are joined together, only the first need have a major datum point, the remaining panels are linked to the first by the bearing and distance of the inner row of mines taken between datum points. Every 500 yds a new major datum point, linked into a landmark, should be recorded, because cumulative compass and pacing errors may make for inaccuracy over a greater distance.
- (iv) As with the single panel, if a marking fence is required, it should be the responsibility of a separate party and should be erected round the complete proposed field, irrespective of the progress of laying. In this way, the enemy may be deceived into thinking that a field which is only partially laid, is actually completed.
- (v) A plan of the completed field is shown in Fig 5.

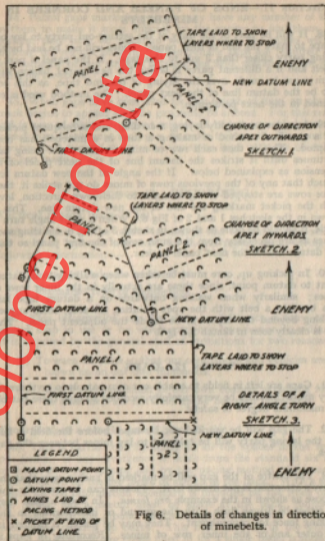


Fig 6. Details of changes in direction of minebelts.

MINEBELT RECORD.

1. **LINE BYZ/ALANCH/REETS** with 500 Inv Reg 24TH. Obide 101 being U. P. SMITH. Authority for laying 500 Inv Reg.

2. **DATE OF LAYING / MAR 4 4** Time 23.30. Tirs. Map Sheet No. 27 Scale 1" TO 1 MILE. Description NORTHERN. END. UP/IRLRM. PARADET. OF. BRIDGE.

3. **LANDMARK TO MAJOR DATUM POINT.** Description of Mark. Major Datum Point 5 G ANGLEDEM. PICKET WITH. RED. 699. TIED TO TOP.

4. **DATUM LINE.** Length 493 yds. Magnetic bearing from Major Datum Point 334 degrees.

5. **NOTES.** Distances from Major Datum Point to Datum Point at start of mine row 15 yds. Number of rows 6. Distances between rows, commencing from the inner row, A yds., B yds., C yds., D yds., E yds., F yds. March of mine row at 1st point 121.

7. **A T W MINES LANE.** Total No. 319. Type G. S. MK. F.

NOTE. Changes in direction of the mine row are shown on sketch, giving bearings and distances between Datum Points.

8. **MAPS.** Width of gap 6 yds. Length of gap (BETWEEN PICKETS) 65 yds. Bearing through gap 358 degrees from PICKET. FLUSH WITH GROUND, which is 45 yds on a bearing of 63 degrees from MAJOR. Datum Point 500 Inv Reg. Centre of gap marked by PICKET. AT EACH. END. Locations of 20 mines mines in close gap (if any) at WESTERN NORTH END OF BRIDGE. AT 261.218.

9. **NUMBERS AND DETAILS OF A PER MINES OR BOMB TRAPS.** (To be shown in red.)

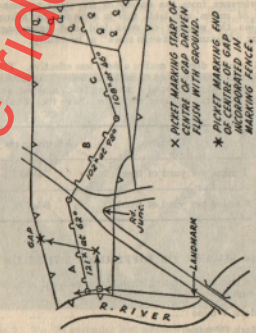
10. **Signatures.** P. Smith Lt. Unit 2. BLANKS Date 3 MAR 44 Location Major Datum Point, Datum Point, Inner Mine Row, and the mine row. Remarks British Marking Process, Chain and hole positioned. Special features to help recognition, must be shown on sketch.

Remember. The accuracy of these particulars will depend on the accuracy and truth of the mine row. It is the mine row which makes a gap or mine belt through it.

DEMO
 dimensione ridotta

MINEBELT SKETCH.

NOTE. Changes in direction of the mine row are shown on sketch, giving bearings and distances between Datum Points.



X PICKET MARKING START OF CENTRE OF GAP DRIVEN FLUSH WITH GROUND.
 * PICKET MARKING END OF CENTRE OF GAP INCORPORATED IN MARKING FENCE.

Total No. of Mines in each Parcel.

A	134
B	82
C	106

Insert Arrows.



LEGEND.

- Major Datum Point.
- Datum Point.
- ▽ Position of Mine Row.
- Mine Row Direction.

laying tapes have been spaced farther apart, only the distances left blank will vary and these must be filled in correctly.

56. The density of a minefield means the number of mines per yard of front. The standard belt of six rows at 6 yds has a density of one mine per yard of front. If a density of two mines per yard of front is required, this is obtained by laying two belts, one behind the other.

57. However, if there are only a limited number of mines available, the best use must be made of them, either by spreading them thinly over the whole area or by spreading them thickly across the most likely approaches. This must be a tactical decision. If due to interference from the enemy or for other reasons fewer than 6 rows of mines are laid, this is recorded by filling in on the *pro forma* the number of rows laid and amending the detail following "Distances between rows" as necessary.

58. A smaller density makes a field less effective. Trials indicate the effectiveness of various densities as below. In actual battle the mere presence of mines or of a marking fence may act as a sufficient deterrent to enemy vehicles, until they have reconnoitred the area.

Density	Effectiveness %
1 mine per yard of front ...	75-86
2 mines per yard of front ...	80-100

SECTION 16.—USE OF DIFFERENT TYPES OF MINES

59. The minimum spacing of mines to prevent accidental setting off of one mine by another is as follows:—

- (a) Mark V mine 2 yds
- (b) Mark IV mine 5 yds
- (c) No. 75 grenades laid side by side 2 yds
- (d) No. 75 grenades laid end to end 1 yd

However, in minefields the practicable minimum spacing is 6 yds.

60. The Mark IV and Mark V GS mines are always laid singly in fields since they contain sufficient explosive to do extensive damage and have a fairly wide area to trap the tank track. No. 75 grenades are effective laid singly against all but the Mark VI tank: they are, however, normally laid in pairs, because this arrangement increases the amount of explosive and damage caused, and also increases the area which the tank must avoid. Whether the mines are laid singly or in pairs must be a decision made by the commander on the spot and dependent on the numbers of mines available. In the consideration of a position where few mines are likely to be available, they will normally be laid singly. Later, if more mines become available, the mines in the belt laid can be doubled up or a second belt with mines laid in pairs can be sited in support.

61. The No. 75 grenade is laid with the filler cap pointing towards the enemy so that the spuds on the tank track cannot bridge it. If laid in pairs, a second grenade is laid beside the first, as shown in Fig 7.



Fig 7. No. 75 grenades laid unburied in pairs.

SECTION 17.—CONCEALMENT OF MINES AND MINEFIELDS

62. The concealment of the actual mine is carried out by burying it or concealing it under natural debris or growth. If buried, the ground round the mine must on no account be able to take the weight of the wheel or the track off the mine so that it does not explode.

63. Mines laid in water will only remain effective for 24-48 hours unless the fuse assembly is above water level.

64. Examples of methods of laying different types of mines are given below.

(a) *GS mines.*

- (i) *Unburied.*—A cavity is cut in the ground to take the base of the mine. The top is left $1\frac{1}{4}$ ins above the surface. This is shown in Fig 8.

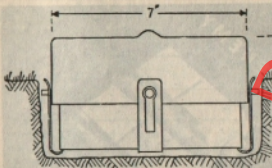


Fig 8. GS Mk IV mine unburied.

If time permits, the turf can be replaced over the top of the mine to help conceal it.

(ii) *Buried.*

1. *The carpet roll method.*—A rectangular strip of turf 20 ins \times 4 ins is cut on its two long sides and one short side and rolled back. An excavation is made, shaped as in Fig 9, to ensure that the weight of a passing vehicle will explode the mine. The mine is inserted with its top 1 in below ground level and the turf is rolled back into position.

In certain soils it may be only necessary to loosen the earth around the mine instead of excavating it.

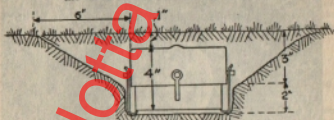


Fig 9. GS Mk IV mine buried using "carpet roll" method.

Photographs of a buried Mk IV mine in cross section and in plan with the earth scraped off the top are shown in Fig 10.

2. *The "hot cross bun" method.*—This method is particularly used with the Mk V mine. The turf is cut in the form of a cross 24 ins long, and the four triangles are rolled back. The earth is excavated to the same shape as in Fig 9 and the mine inserted. The turf is then rolled back to coincide with the angles of the spider cover as shown in Fig 11.

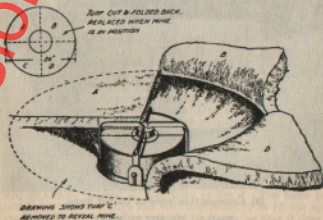
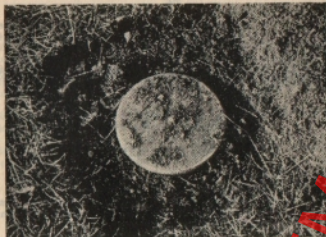
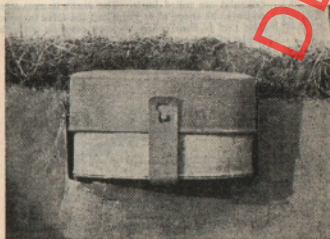


Fig 11. GS Mk V buried using "hot cross bun" method.



(a) Plan view of buried mine with camouflage removed.



(b) Cross-section view of buried mine.

Fig 10. GS MK IV MINE

Fig 12 contains two photographs showing the cross-section of a Mk V mine buried and a plan view with the earth scraped off the top. Great care must be taken with this mine to see that earth or pebbles do not get between the spiders and the top of the mine and thus prevent it from operating.

(b) No. 75 grenade.

- (i) *Unburied*.—The grenade is laid on top of the ground; it can be concealed with leaves or rubbish.
- (ii) *Buried*.—The grenade is buried as shown in the cross-section photograph in Fig 13. The striker plate is left 1/2 inch above the original ground level. The other photograph in Fig 13 shows the buried grenade with the earth scraped off its top.

65. As well as the individual mines, the complete field must be concealed so that if a withdrawal is ordered and the marking fences are removed, no trace of the field will be left. Debris from crates, the adhesive tape used in packing the fuze, etc., must not be left about and should never at any stage be placed on the ground. All excavated earth must be removed or concealed.

66. If vehicles are used to distribute the mines, all packing must be kept in them. If hand distribution is used, the layers must keep all debris in their pockets until they can place it in an empty crate. At the end all empty crates must be counted up and removed.

67. Tracks must be kept to a minimum. For this reason as well as for their own safety all members of the working party must go only where the drills lay down.

68. If possible, one man should always be detailed to follow up each party with an improvised broom or rake to rough up the tracks made. It must be remembered that the vehicle method of distribution will leave tracks which will be more difficult to conceal or disguise.

SECTION 18.—FENCING OF THE FIELD

69. In order to avoid casualties to our own troops, minefields should be clearly marked as laid down in Sec 4. The fence posts should be at least 4 ft high and not more than 10 to 15 yds apart, as shown in Fig 14. The fence should be strong, so that it does not collapse and leave the field unmarked.



(a) Plan view of mine showing camouflage removed.

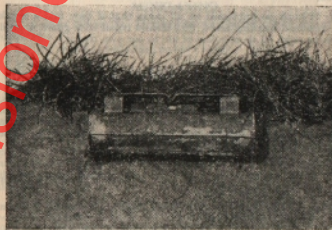


(b) Cross-section view showing mine buried.

Fig 12. GS MK V MINE



(a) Plan view of buried grenade showing camouflage removed.



(b) Cross-section view showing grenade buried.

Fig 13. No. 75 GRENADE