

b. Each gunner lays his gun on the selected point by placing the zero lead line of his sight on it.

c. The platoon commander estimates the range to the aiming point and determines the lateral distance between the No. 1 gun and each of the others. By applying the mil formula he computes the number of mils that guns Nos. 2, 3, and 4 must be shifted to make them parallel to No. 1.

Example:

The range to the aiming point is estimated to be 5000 yards. The lateral distance between No. 1 and No. 2 guns is 30 yards, between No. 1 and No. 3 is 80 yards, and between No. 1 and No. 4 is 100 yards. (Note the term lateral distance (fig. 55) which is measured along a line perpendicular to the line of fire. No. 2 gun might be so far to the rear of No. 1 that the actual distance between them would be 60 yards; the lateral distance is that which would separate them if No. 2 were brought up on a line with No. 1. Substituting in the mil formula, the platoon commander gets $30/5$, or 6 mils, as the amount No. 2 gun must shift to the left.

d. When the necessary shifts have been made the four gun tubes are approximately parallel.

e. Each gunner then sets his deflection scale at zero by loosening the wing nuts and sliding the scale until the pointer is exactly above zero. The platoon is now on a base deflection of zero.

f. As deflection shifts are ordered, each gunner applies them by using the pointer and scale.

g. When the command RECORD BASE DEFLECTION is given, each gunner shifts the scale until the zero mark coincides with the pointer. If the slots in the deflection scale do not allow a shift of this size the actual reading on the scale is used as base deflection and this reading is marked on the gun shield. This is actually a new base deflection, different from the one established when the platoon was laid parallel in an arbitrary direction. Once the command RECORD BASE DEFLECTION is given, the original base deflection is forgotten. The scale is set on the new deflection and all subsequent shifts are made from there.

h. Deflection shifts are measured right and left from base deflection as they are ordered.

169. AIMING STAKE METHOD.--a. When the platoon is in position, facing in the general direction of fire, place two aiming stakes in front of the No. 1 destroyer--one stake about 50 yards from the destroyer, and the other about 50 yards beyond and in line with the first.

b. Have the gunner sight on the stakes and set his deflection scale at zero.

c. Determine the distance between destroyers perpendicular to the line of fire (fig. 56).

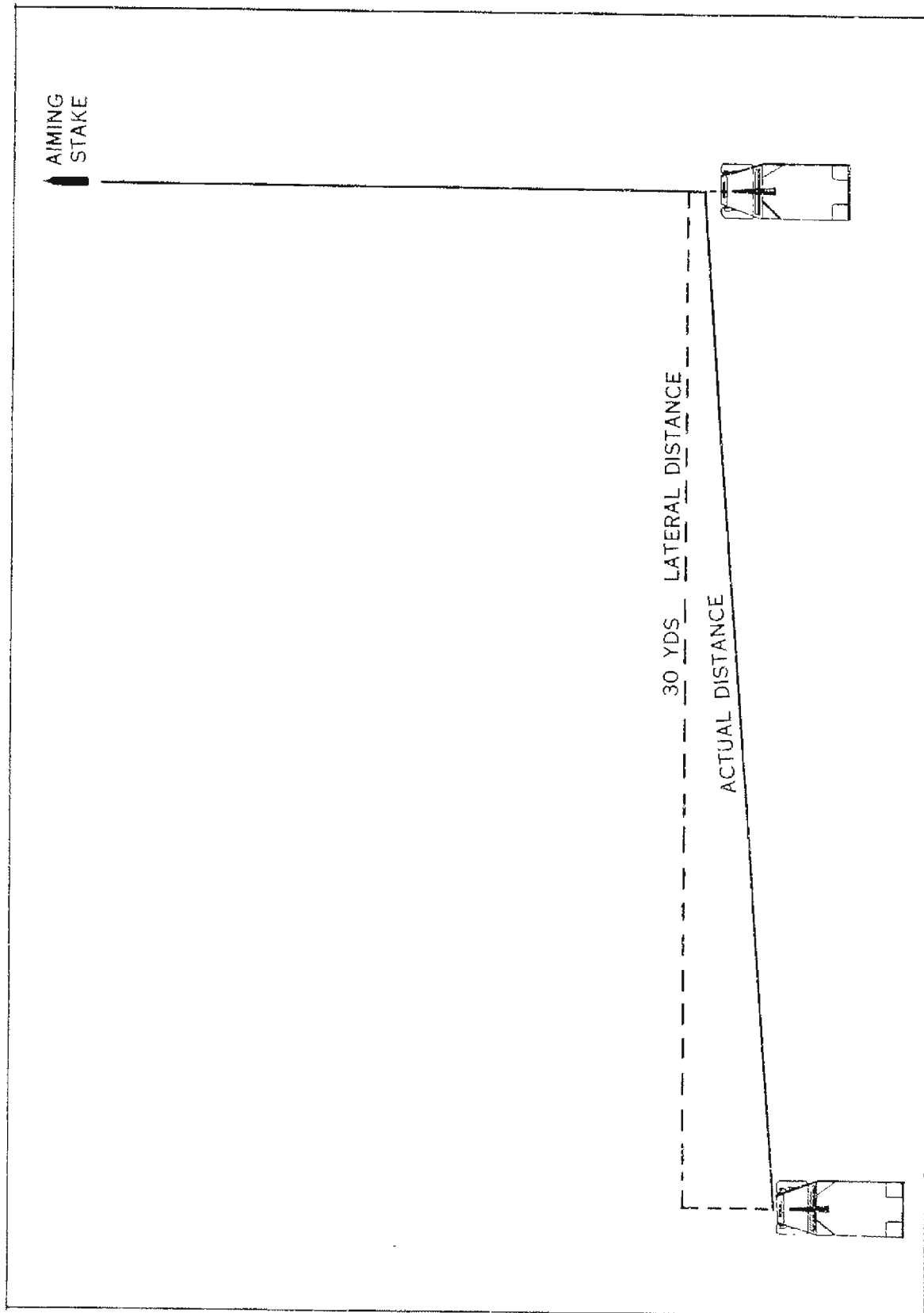


Figure 55

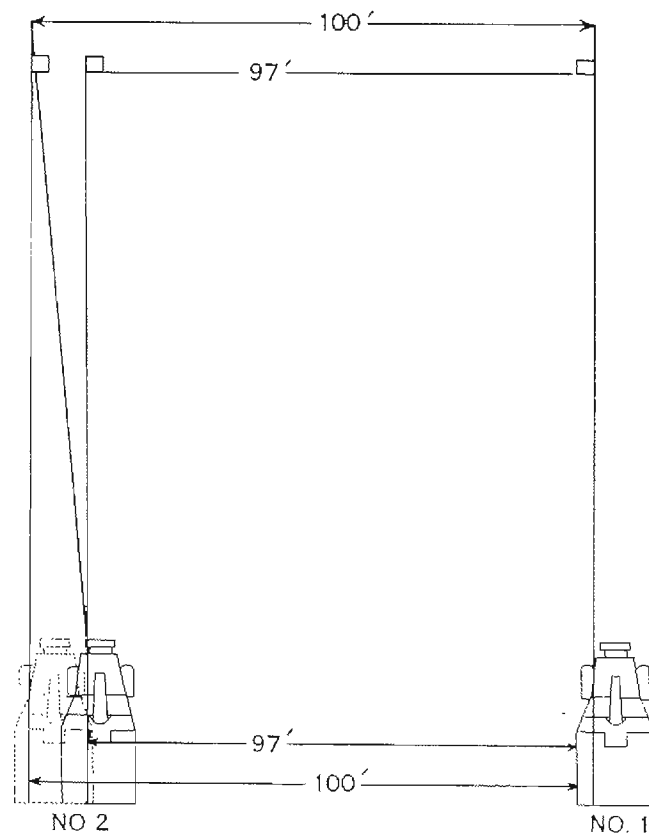


Figure 56

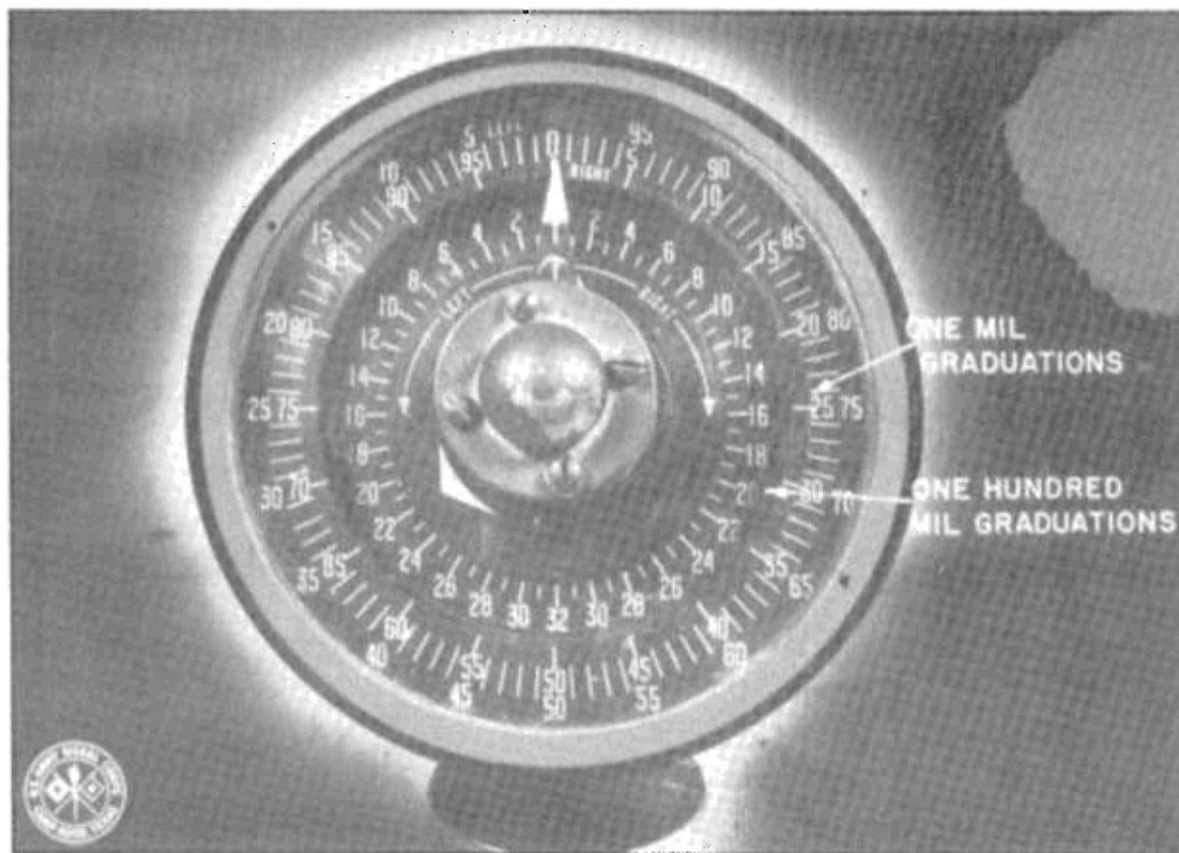
d. From the position of the stake nearer the destroyer, sight with a compass, or aiming circle, on the No. 1 gun's sight and turn off an angle of 1600 mils to the right.

e. Along this line place aiming stakes at intervals corresponding to the previously determined distances between the destroyers.

f. Have each gunner sight on the stake in front of his destroyer and then shift his deflection scale until the pointer is on zero. The platoon is now laid parallel on a base deflection of zero. Subsequent steps are as described in the preceding paragraph

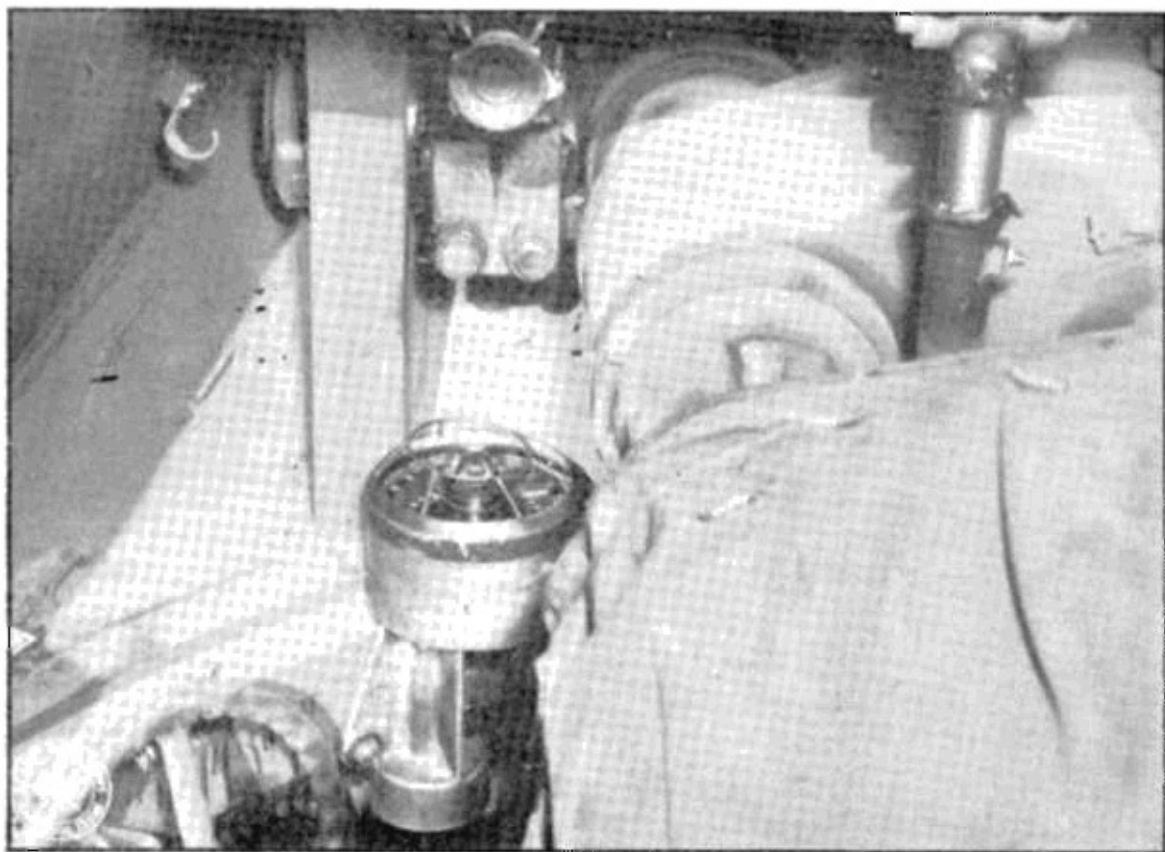
170. LAYING WITH THE AZIMUTH INDICATOR.--a. Description.--The azimuth indicator is an angle-measuring device that operates directly with the turret of the gun motor carriage (figs. 57 and 58). It is used on motor carriages M10 and T70. There are two pointers on the instrument, one that denotes 1-mil graduations and one that denotes 100-mil graduations. When the pointer denoting 1-mil graduations completes one revolution, or 100 mils, the 100-mil pointer moves one graduation. When the turret completes one revolution, the 100-mil pointer has completed one revolution of 6400 mils.

b. Use.--Laying with the M10 or T70 on a known compass and paralleling the platoon is the same as described for the M33 sight and



AZIMUTH INDICATOR FOR DESTROYERS M10 & T70

Figure 57



AZIMUTH INDICATOR FOR MOTOR CARRIAGES
M10 & T70. (SHOWN HERE IN M10)

Figure 58

deflection scale. As soon as the guns are parallel, set both pointers of the azimuth indicator at zero. This is done by pressing down on the knob in the center of the dial and turning until the pointers read zero. Turn this knob without pressing down and only the 1-mil pointer moves; press down on the knob and turn, and both pointers move. After the pointers are on zero, the gunner is ready to make his shifts. To make a shift of RIGHT 75, the gunner traverses the gun until the 1-mil pointer reaches 75 on the scale marked RIGHT. As soon as the shift is made, the gunner turns the knob until the 1-mil pointer is back on zero, being careful not to press the knob, which would move the 100-mil pointer. Now to make a shift to left. e g., LEFT 135, the gunner traverses the gun to the left until the 1-mil pointer makes one complete revolution (100 mils), and continues traversing until the 1-mil pointer reads 35 on the scale marked LEFT. After the shift is made, the gunner turns the 1-mil pointer back to zero. To return the tube to the original deflection, traverse the gun until the 100-mil pointer reads zero and set the 1-mil pointer on zero. To record base deflection, set both pointers on zero. Two aiming stakes will be lined in with the sight as a check for lateral displacement.

171 LAYING WITH THE M33 SIGHT.--a. The M33 sight, found on the M3 destroyer, is a 1-power telescope with an 80-mil reticle graduated horizontally in 5-mil units. Being a direct fire sight, it cannot be used for laying and shifting the guns in the manner described for the panoramic sight.

b. The following method is suggested for use with destroyers not equipped with a deflection scale. It is not only impracticable for night firing, but has the added disadvantage of requiring the gunner to depress the gun tube every time a deflection shift is ordered. Steps in the procedure are as follows:

(1) When the platoon has been laid parallel by one of the methods already described, the platoon commander commands: AIMING STAKES OUT (fig. 59).

(2) Each gunner sends out a man with four aiming stakes to a point 50 yards in front of the gun. (Each destroyer should carry at least six such stakes; they should be about 5 feet long and each painted a different color. In an emergency any stake about this size will do.)

(3) Each gunner directs the setting of the first two stakes so that one appears at each end of his sight reticle. That is, the stakes are set up 80 mils apart, at the two ends of his sight reticle when viewed through the sight.

(4) By traversing his gun, each gunner directs the third stake to be set 80 mils to the left of the left-hand one mentioned above, and the fourth stake 80 mils to the right of the right-hand one. Each gunner now has four stakes, covering a 240-mil field of view, which he can use as reference points for setting off deflections. (If enough stakes were carried the whole 700-mil traverse of which the gun is capable could be marked off in the same manner; however, this will seldom be necessary for TD missions.)

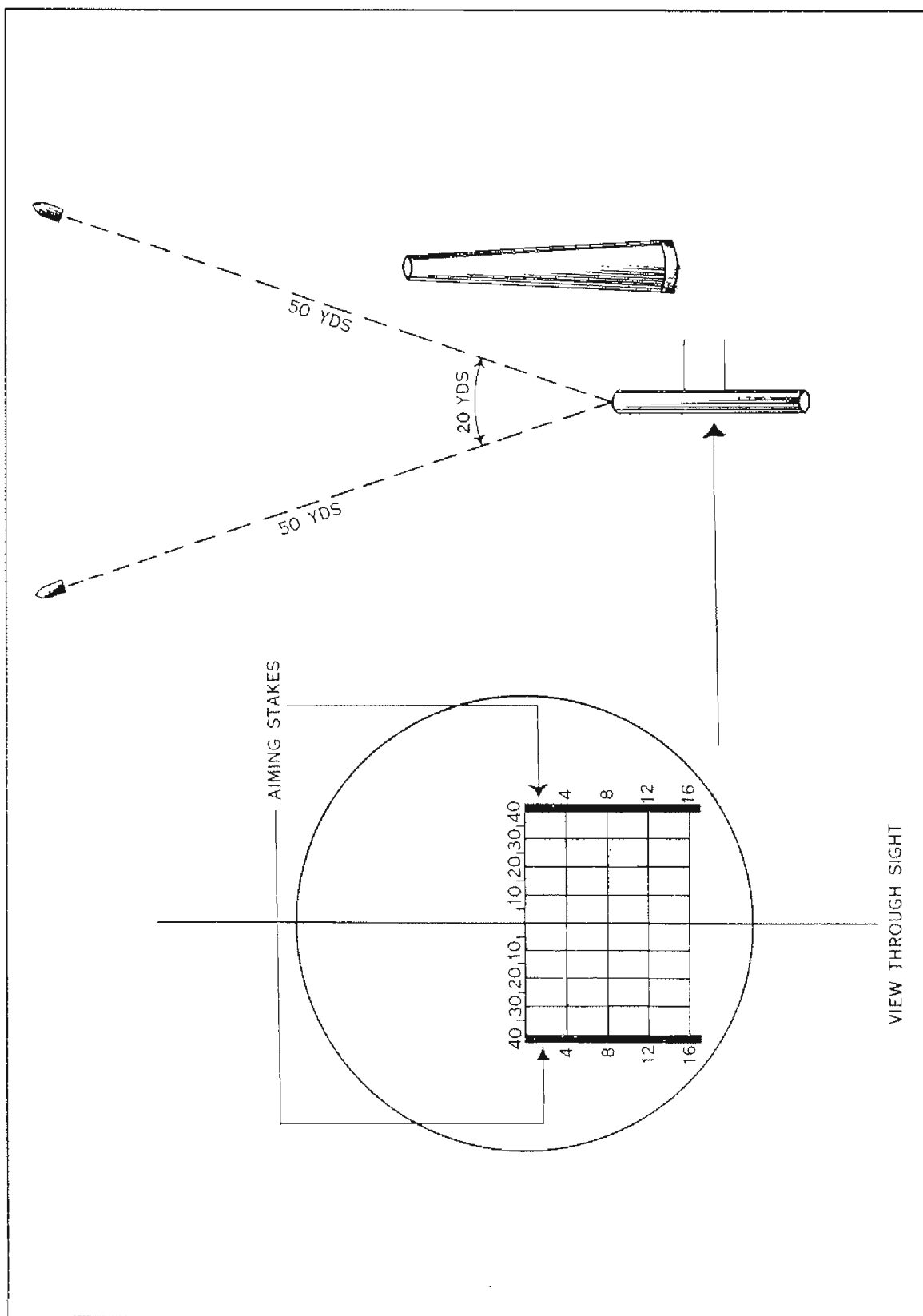


Figure 59

(5) Next, each gunner traverses back until the two original stakes stand at the two ends of his sight reticle. When his sight is back in this position the gun is on base deflection.

(6) When a deflection shift is ordered the gunners merely use the stakes as guides, counting off the required number of mils as the lines on the reticle pass across the stakes.

(7) When the platoon commander commands RECORD BASE DEFLECTION, each gunner sends a man forward with two aiming stakes and has one stake set in so that it is aligned with the zero lead line of his reticle. He then directs the setting up of the other stake about 50 yards beyond the first and lines it in on the same line. The purpose of the two stakes is to enable the gunner to discover and correct lateral displacement.

172. MEASURING THE COMPASS.--a. We now come to the last step in the opening procedure at the destroyer position--measuring the compass.

b. This is a means of determining the direction of the gun tubes with respect to a known direction, namely, magnetic north. The horizontal angle measured clockwise from magnetic north to any line is known as the compass of that line.

c. The compass of a gun equipped with a panoramic sight is measured as follows (fig. 60):

(1) Move to a point in the direct rear of the gun, keeping at least 50 yards from any metal, and have the gunner orient you on the 0-3200 line of his sight. That is, have him set his sight at zero, and, looking back at you through the sight, direct you by hand signals until you are exactly on his line of sight.

(2) If possible, place your lensatic compass on a stump or some improvised rest, and sight through it onto the sight of the gun. The reading is the compass on which the gun is laid.

d. The procedure for measuring the compass when the gun is not equipped with a panoramic sight is the same as the one described above, except that the gunner cannot line you up directly behind his sight. Therefore, you simply sight through your lensatic compass along the gun tube. Another method is to set two aiming stakes in line with the zero lead line of the sight reticle and at a convenient distance in front of the gun. Measure the back azimuth along these stakes and convert to azimuth.

e. An aiming circle will simplify the above procedure.

173. CONDUCT OF FIRE.--We now move from the destroyer position, where the platoon is ready to deliver fire at the forward observer's request, to the observation post. First we shall see how the observer gets hold of the "business end" of the trajectory and then how he moves it onto the point he wishes to hit. Following this there will be a detailed explanation of the conduct of fire.

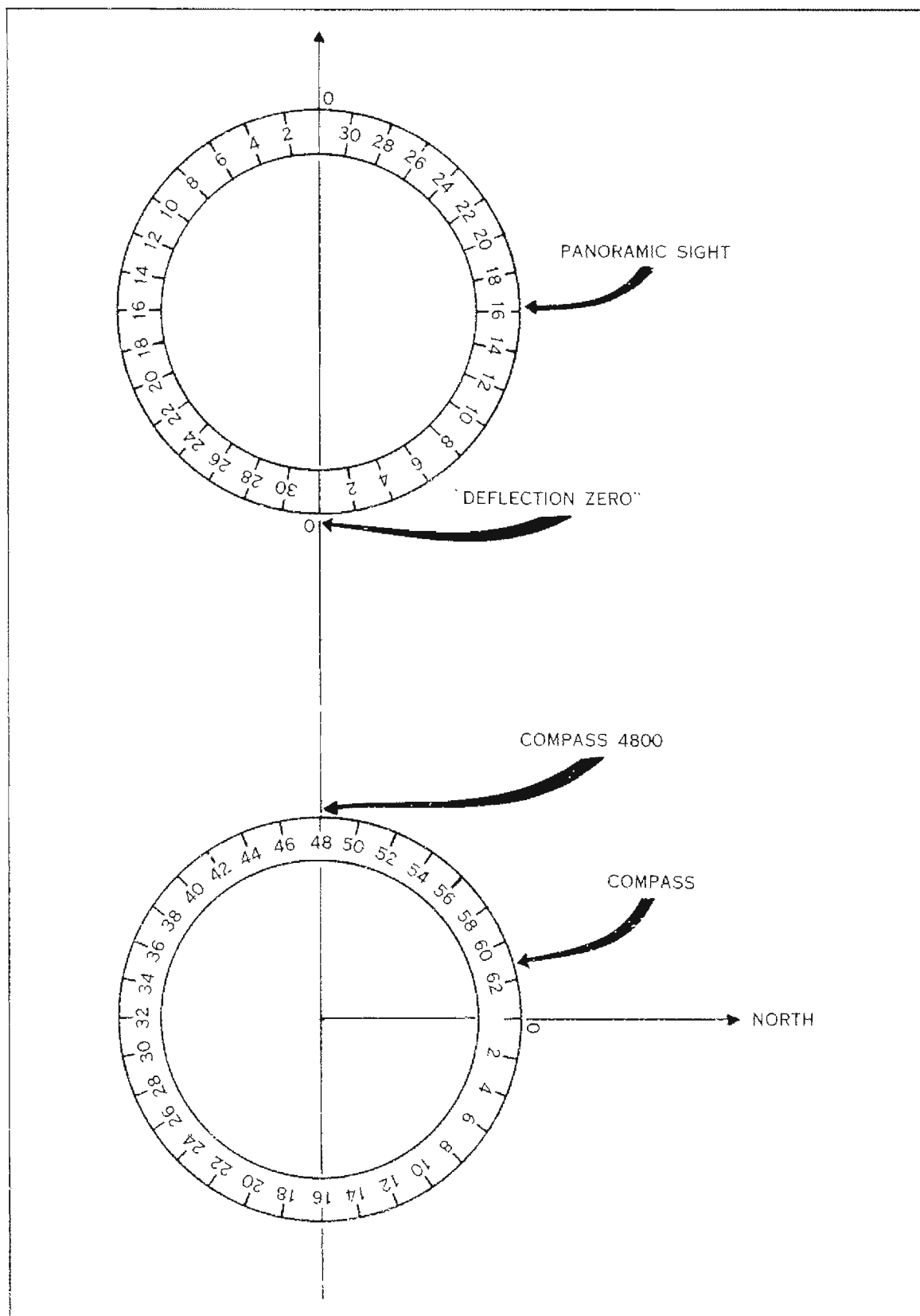


Figure 60

174. THE FIRST ROUND.--a. The first thing the observer must do is to have a round fired so that the burst will be where he can see it. Two methods in common use are to send to the guns either:

(1) MARK CENTER OF SECTOR, RANGE _____.

(2) COMPASS _____, RANGE _____.

b. Whichever method is used, the range may be measured accurately to a particular point, or the observer may merely select a range that will put the burst in his field of view and yet not endanger friendly troops.

175. MARK CENTER OF SECTOR.--At this command a designated destroyer (usually No. 1) fires a round halfway between the right and left limits of its traverse and at the range given by the observer.

176. COMPASS.--a. If the observer wishes to send a compass to the guns, he may estimate it, measure it from a map or aerial mosaic, or compute it.

b. He may estimate the compass by plotting the locations of the guns, the target and the OP on a map, an aerial photo or even a blank sheet of paper which he has oriented by use of his compass. If the plotting is accurate enough, the compass could actually be measured with a protractor instead of merely estimated.

c. In computing a compass for the guns, the observer must take into account the fact that he isn't directly on the GT (gun-target) line. Hence, if he measured the compass of the line between his position and the target, and had the guns use that figure, they would be wide of the mark. Since the observer is set off to the side, so to speak, a line from the OP to the target will form an angle at the target with the GT line. This angle is called the target offset (fig. 61).

177. TARGET OFFSET.--a. The target offset is the horizontal angle, with its vertex at the target, between the guns and the OP.

b. To compute the target offset, the observer proceeds as follows (fig. 62):

(1) Estimates the range from the OP (where he is) to the target.

(2) Estimates the length of a perpendicular line from the OP to the GT line.

(3) Computes the size of the target offset by the mil formula, using the estimate obtained in (1) above as R, and the estimate obtained in (2) as W.

c. Here is an example of computing the target offset:

(1) The distance from the OP to the target is estimated at 2000 yards.

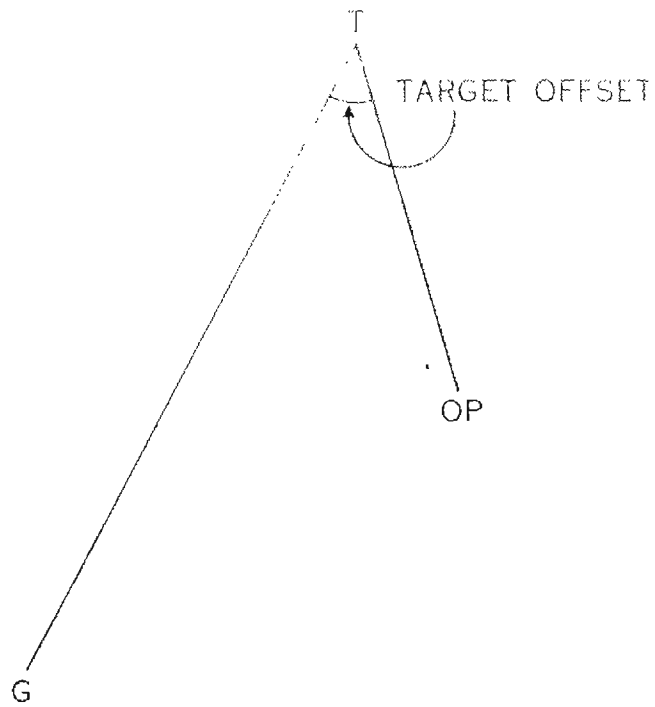


Figure 61

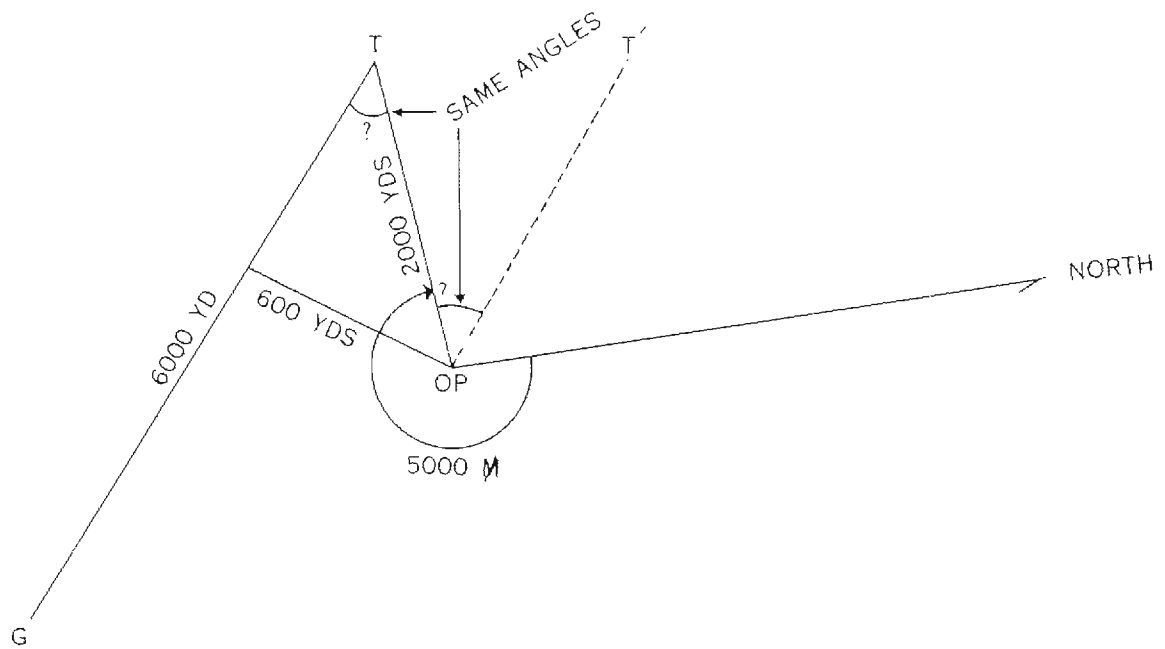


Figure 62

(2) The length of a perpendicular line between the OP and the GT line is estimated to be 600 yards.

(3) We now have R (2000 yards) and W (600 yards) for use in the mil formula, W/RM . Striking out the M leaves W/R . Substituting gives us $600/2$, or 300 mils.

d. Now that the observer knows the target offset is 300 mils, what does he do about it?

(1) He measures the compass of the target--from where he is. This figure, as we have explained, cannot be used at the guns. Let us say he finds the compass to be 5000 (μ).

(2) If the guns are on his left as he faces the target, the observer ADDS the target offset to the compass he measured.

(3) If the guns are on his right as he faces the target, he SUBTRACTS the target offset from the measured compass. (A good way to remember this is by the keyword LARS--Left, Add; Right, Subtract).

(4) He sends to the destroyer position the figure he arrived at by the operation in (2) or (3) above. (In the case illustrated, the guns are to the left of the observer, so he would add 300 to 5000, and send COMPASS 5300.) This figure is the compass of the target from the gun position.

e. Do not forget that the observer must send a range as well as a compass to the guns. He gets this by simple estimation or, of course, by maps if they are available.

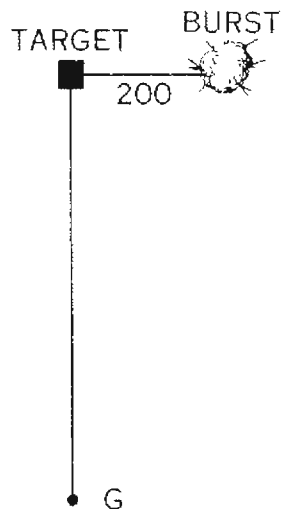
178. SUBSEQUENT ROUNDS.--a. The observer now starts adjusting the fire; that is, he tells the guns the location of each round in relation to the point he wishes to hit, so that the direction and elevation of the guns may be changed after each round to move the next one nearer to the point. The point in question may be either:

(1) An enemy target, or

(2) Some prominent object of no present tactical significance which he wants to use as a base point for firing on future targets in the vicinity. Such an object might be just a bush, an old house, or a shell hole.

b. The observer moves the fire onto the desired point as follows:

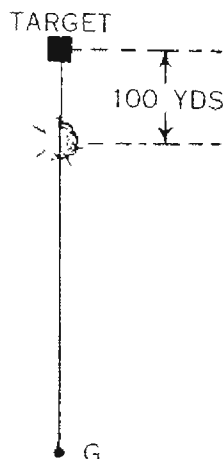
(1) He estimates the distance in yards that the round landed right or left of the GT line (fig. 63). If the observer does not visualize his GT line he will fire two rounds at different ranges in order to establish it, before attempting to adjust.



He sends this to the guns as:
200 RIGHT

Figure 63

(2) He estimates the distance in yards that the round landed over or short of the target with respect to the GT line (fig. 64).



He sends this to the guns as:
100 SHORT

Figure 64

(3) He sends these estimates to the destroyer position in the order named; for example, 200 RIGHT, 100 SHORT.

(4) Whenever possible, both elements (deflection and range) should be sensed, in order to save time and ammunition. Generally speaking, an experienced observer will do this; but if he is unable to visualize the GT line clearly, or if the terrain is such that a change in both elements might cause a burst to be lost (not seen by the observer), even a seasoned observer might choose to change only one element at a time.

(5) Although it is not always necessary to send a sensing to the guns in regard to direction, a sensing MUST be sent for range, because this sensing is the order to the gun to fire the next round. If a change in range is not required, the observer merely says REPEAT RANGE.

179. GROUND ORIENTATION.--a. If when the observer notes the burst of the first round he is not sure of the location of the guns, he may sense 400 SHORT. (See figure 65.) The second burst gives him not only the direction of the guns but also a yardstick of 400 yards on the ground.

b. If the observer desires to obtain a similar yardstick perpendicular to the line of fire, he senses the next burst for deflection only; for example, 400 LEFT, REPEAT RANGE (See figure 65.) He has now seen what a 400-yard range shift looks like and what a 400-yard deflection shift looks like, and may intelligently continue with his sensings.

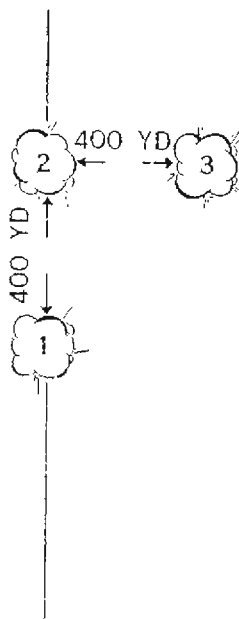


Figure 65

c. If the observer is in a position where he does not wish to expose his head continually while waiting for the platoon to fire, he gets down under cover as soon as he has announced his sensing.

When the round is fired the platoon leader sends NUMBER _____ ON THE WAY.

The observer then raises his head to observe the burst.

180. SUBSEQUENT TARGETS.--a. Let us suppose that by the adjustment described in par. 178 the observer has registered on a lone tree as a base point. When he hit the tree (or came near enough for practical purposes), he commanded RECORD BASE DEFLECTION. Down at the destroyer position, each gunner then writes the base deflection (the one that hit the base point) on his gun shield or sets it off on his deflection scale. (Although registration on a base point is normally done with only one gun, all the guns in the platoon follow the commands for deflection and range changes, thus keeping the platoon parallel.)

b Some time later the observer sees enemy machine gun fire coming out of a clump of bushes in the general target area. To bring fire on this target, the observer proceeds as follows:

(1) Estimates the distance in yards which the base point (the lone tree) is right or left of the target (the machine gun nest) with respect to the GT line, and how much over or short it is of the target (fig. 66).

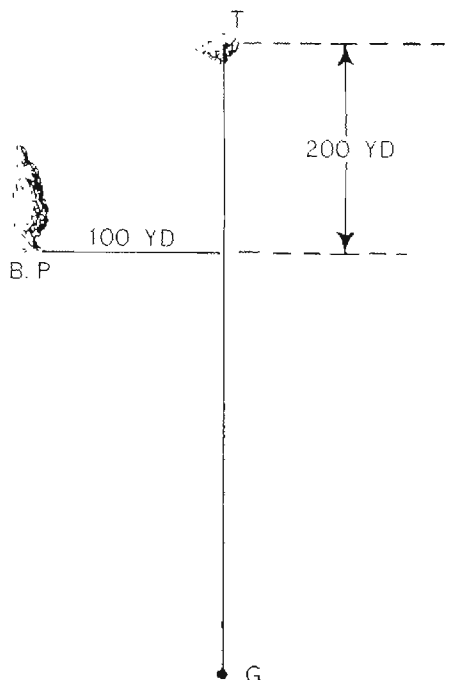


Figure 66

(2) Sends a command to the destroyer position. In the case illustrated, it would go like this:

BASE POINT IS

100 LEFT

200 SHORT

MACHINE GUN (nature of target)

WILL ADJUST

The observer always gives the nature of the target so that the officer in charge of the guns will know what kind of ammunition and fuze to use. He says WILL ADJUST to tell the guns that he will remain there to adjust their fire.

c. After the first round is fired at the target the observer

continues to adjust in the manner already described for registration on the base point. His next command might be:

50 RIGHT

100 SHORT

181. GENERAL RULES FOR THE FORWARD OBSERVER.--Proficiency in forward observation, as in anything else, comes only with practice. However, the following rules must be observed:

- a. Make bold shifts, and do not underestimate distances.
- b. Study the terrain; it will assist in estimating distances.
- c. Identify the GT line in your mind clearly as soon as possible.
- d. Always give your commands in the prescribed sequence.
- e. Remember that the "nature of the target" element in the fire order (e.g., MACHINE GUNS) tells your platoon commander what type of ammunition and fuze should be used.
- f. Keep the destroyer position in mind while going forward to the OP; this will assist in computing the compass and identifying the GT line.
- g. Keep oriented in regard to objects in the target area as you go forward, as their appearance from the OP is very different from that at the guns.
- h. Have as complete information as possible in regard to the situation before going forward.
- i. Keep in mind potential destroyer positions for forward displacement.
- j. Restrict the size of the party at the OP to the observer and the radio operator.
- k. Do not forget to take field glasses, compass, and maps or map substitutes.
- l. Give fire commands clearly and at a rate which the radio operator can transmit without confusion.
- m. Do not cancel fire commands once they have been transmitted; make corrections by sending new data. Example: If you sent 100 SHORT and meant 100 OVER, your next sensing would be 200 OVER, which should be given before the guns fire with the wrong data.
- n. Make sensings promptly: the beginner must learn to base his

sensings on what he sees while it is before his eyes, and not on his recollections. A short delay is permissible when a sensing may be aided by drifting smoke; but remember, smoke may be deceptive as well as helpful.

o. Study the terrain in the vicinity of the target to locate ravines or hollows which might hide the burst and cause erroneous sensings.

p. When adjusting on a new target that is in a wooded area or other difficult terrain, move the burst to open ground near the target and adjust on the target from there in order not to lose the burst.

182. SHIFTS AT THE GUNS.--We now move back to the destroyer position to see how the guns make the corrections based on the observer's sensings and how fire is actually delivered.

183. SHIFTING TO ANOTHER COMPASS.--a. The platoon having been laid parallel on, let us say, compass 4800, it is now quite possible that the forward observer might request fire on some other compass, such as 4840.

b. Since the compass is always read in a clockwise direction from zero to 6400, and since the requested compass is larger than the one on which we are laid, the requested compass (4840) must be to the right of the compass on which the guns are laid (4800).

c. By subtraction, the difference is 40 mils. The command RIGHT 40, with its resulting shift, will cause the guns to point along the desired compass.

d. Had the observer requested fire on compass 4740, the command LEFT 60, with the resulting shift, would have produced the desired result.

184. SHIFTING ONTO THE TARGET.--a. Having fired the first round along some compass line such as that requested above, it might be sensed by the observer as 200 RIGHT, 300 OVER.

b. Both these units are in YARDS. By use of the mil formula, we can transpose the 200 yards (the distance the projectile hit to the right of the target) into mils.

(1) Suppose we were firing at a range of 5000 yards. In the formula, then W would equal 200, and R would be 5. $M = W/R$, or $200/5$, or 40m.

(2) Since the burst was to the right of the target, a shift to the left is indicated. The command LEFT 40, with its resulting shift, should place the next round on the target, as far as deflection is concerned.

c. This operation can be simplified and delivery of fire expedited by working out in advance the value of $100/R$ at the base point range. In the case cited above, for instance, the range is 5000 yards: $100/R$, therefore, is 20m. That means that for every 100 yards of deflec-

tion change the guns should be shifted 20m. In the above example, 200 RIGHT would call for a change of 2 (the number of hundreds of yards in the sensing) times 20m, or 40m. This 100/R factor may be used for sensings of bursts up to 500 yards short and 500 yards over the base point range.

d. In the example above, the round also was sensed as being 300 over, so the range must be reduced by 300 yards, or 3 c's.

Note: A "c" may be defined as the change in the angle of elevation in mils which will produce a change of 100 yards in range at the range at which you are firing. The value of "c" varies with the range, and may be found in the appropriate firing tables. Example: Let us assume the elevation for 5000 yards is 176m. C at range 5000 is 5m. Since the burst was 300 over, the next elevation should be 161.

$$(3 \times 5 = 15; 176 - 15 = 161.)$$

185. SHIFTS FROM A BASE POINT.--a. The forward observer sends the following command:

BASE POINT IS
200 RIGHT
300 SHORT
MACHINE GUN NEST
WILL ADJUST

b. The base point is to the right of the target, so a shift to the left is required. Assuming the range to the base point to be 4700, the range to the target must be 5000.

(1) By the mil formula, the shift for direction should be LEFT 40. ($M = 200/5$, or 40.)

(2) The base point is short of the target, so the range must be increased by 300 yards. (Using the quadrant or elevation scale, the angle of elevation would be increased by 3 c's.)

186. FIRE ORDERS.--a. The elements of an initial fire order and examples of each are as follows:

<u>Elements</u>	<u>Commands</u>
(1) Adjustment of platoon--merely a warning to crews that a fire command will follow	PLATOON ADJUST
(2) <u>Projectile</u>	SHELL HE
(3) <u>Charge</u>	CHARGE NORMAL
(4) <u>Fuze</u>	FUZE QUICK

CONTINUED

<u>Elements</u>	<u>Commands</u>
(5) <u>Direction</u>	BASE DEFLECTION RIGHT 60
(6) <u>Method of fire</u>	PLATOON RIGHT
(7) <u>Quadrant or elevation</u>	QUADRANT
(8) <u>Amount</u>	170

b. If the chambers of the guns are hot or if for any other reason the platoon commander wishes to hold fire, he commands DO NOT LOAD just before giving the quadrant or elevation. The gun crews comply with all the rest of the order. When the platoon leader finally desires to fire he commands QUADRANT 170, FIRE.

c. There are many other fire commands, such as LADDER FIRE, ZONE, BY PIECE AT MY COMMAND, and so on, to fit various combat situations. Because of their limited use in TD missions, they are not included here. They may be found in FM 6-40.

d. For an extract from 75-mm. gun firing tables, with elements inapplicable to TD firing deleted, see fig. 67.

e. Subsequent fire orders --(1) After the first round has been fired it is necessary to give only the shifts for direction and the new range or elevation, unless there is a change in the method of fire.

(2) A typical order might be: RIGHT 25, QUADRANT 155.

187. METHOD OF FIRE--a. Adjustment.--(1) Adjustment on a base point is normally fired with one gun; in the fire order the whole platoon is adjusted so that all guns will follow the shifts. The other guns do not load until the method of fire has been changed from NO. 1 ONE ROUND to PLATOON ONE ROUND, or some similar command.

(2) All other types of adjustment are normally fired by salvo; in salvo fire one of the flank guns fires first, and the others fire in order toward the opposite flank--at 2-second intervals, unless otherwise specified. The command might be PLATOON RIGHT, QUADRANT 175, NO. 1 FIRE.

(3) When the wind is from the right, fire platoon left.

(4) When the wind is from the left, fire platoon right.

b. Fire for effect.--(1) Fire for effect is always by volley.

(2) Volley fire is fired at the command of the platoon commander; if he wishes the fire to be delivered as soon as possible, he

75-MM. GUN
SHELL, H.E., M48
FUZE: M48, M5A4
NORMAL CHARGE
M.V. 1500 F/S

[illegible]

Figure 67

gives a command such as 175, FIRE.

(3) The number of rounds to be fired by each piece is defined in the command such as PLATOON THREE ROUNDS, 175, FIRE.

188. GENERAL RULES FOR CONDUCT OF FIRE.--a. Check constantly the operation of the materiel, paying particular attention to the recoil mechanism.

b. When firing is to be continued over an extended period, a bucket of water should be kept near each piece. At intervals pieces should cease firing alternately to be swabbed and cooled.

c. Note how numbers are announced:

10 is ONE ZERO
25 is TWO FIVE
300 is THREE HUNDRED
4000 is FOUR THOUSAND
5075 is FIVE ZERO SEVEN FIVE
245.4 is TWO FOUR FIVE POINT FOUR

When firing, deflection shifts are given only to the nearest 5 mils; and when firing by quadrant or elevation scale, it is not customary to go closer than 1 mil to any figure.

d. In determining the range for use in the mil formula, common sense is the governing factor. Generally speaking, when firing at medium ranges the approximate base point range may be used for computing all shifts up to 500 yards in either direction. The same rule applies in the selection of "c" when firing by quadrant or elevation scale.

e. Selection of fuzes.--(1) Against materiel use a delay fuze. This will permit penetration before detonation and in case of a miss it may have effect on personnel in the vicinity through ricochet.

(2) Against personnel in the open use superquick fuze; delay fuze may be used to obtain an air burst if ricochet adjustment is feasible.

(3) Against personnel under cover use delay fuze. A hit short of the target should ricochet, producing an air burst that is highly effective against this type of target.

f. When a gunner does not understand a command calling for a shift for deflection, always preface the repetition by: THE COMMAND WAS.....

g. Upon occupying a position always measure the minimum elevation as follows (fig. 68):

(1) Lower the tube of each piece until by sighting along the bottom of the bore you can just see the top of the highest object or crest in the direction of fire. Measure the elevation at this point.

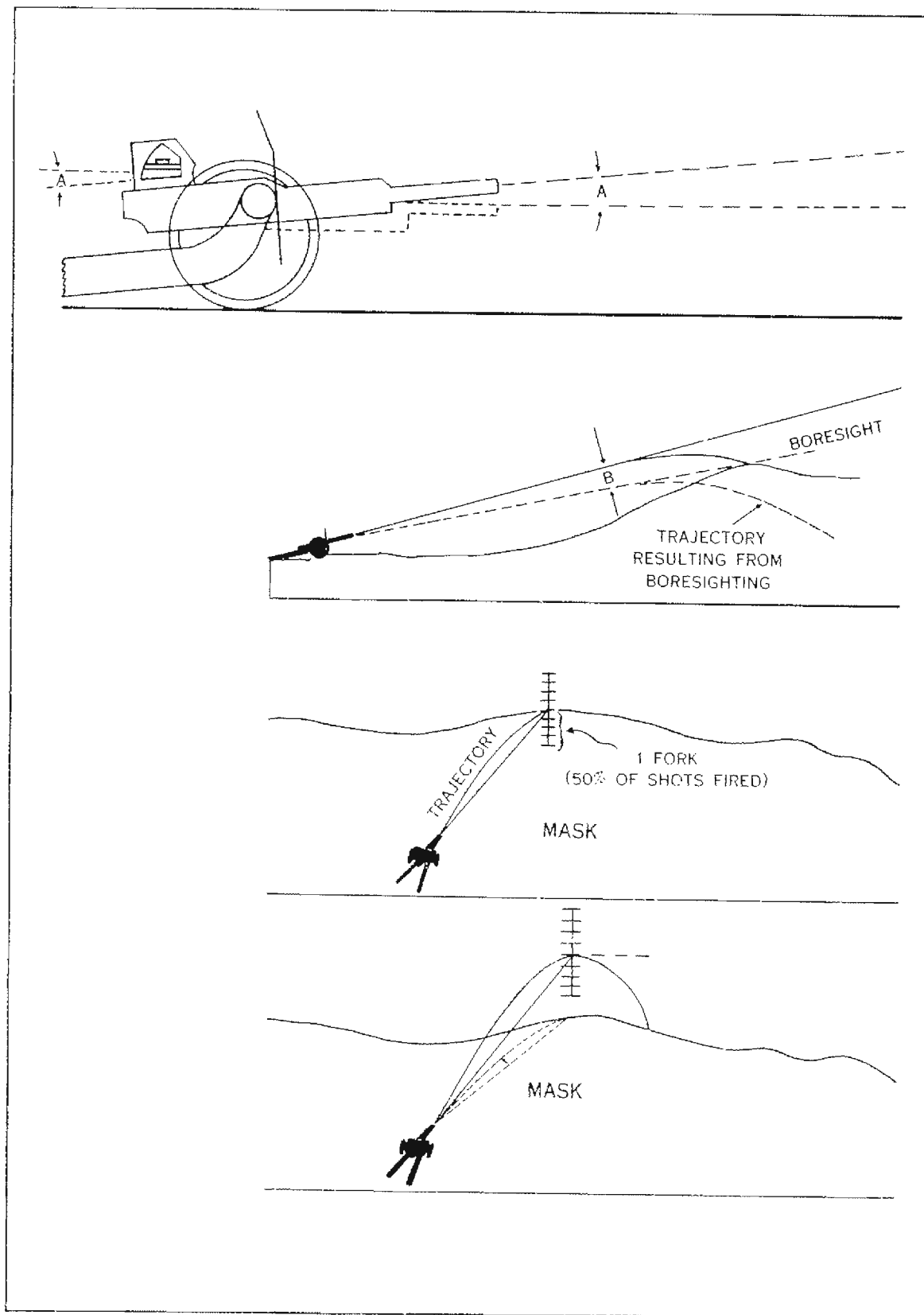


Figure 68

(2) Take the highest elevation of all the pieces. Generally, any object such as a tree which is in front of only one piece is not considered, since it can be cut down or the gun involved called out for certain fires.

(3) Estimate or measure the range to this crest or mask, and add to the figure arrived at in (2) above the elevation for that range.

(4) To the total arrived at in (3) above add two forks at the range involved if there are no friendly troops on the mask (crest). (Obtain the value of the fork from the appropriate firing tables.) If there are friendly troops on the mask, add two forks plus the number of mils required to give an extra 5 yards clearance at the mask

189. SUB-CALIBER FIRING.--a The purpose of sub-caliber firing is to give the platoon a practical test on the material they have been given in the classroom and simulated exercises. It also affords an excellent opportunity to give the platoon advanced instruction.

b. The observer selects an OP. The OP must afford maximum opportunity for observation of burst. There are two possible methods for determining direction for initial data sent to the platoon.

(1) The observer may compute the target offset, measure the compass, and estimate the range to the target. The resulting compass and estimated range are sent to the platoon. The burst is then sensed in relation to its location with reference to the target. Continued adjustment is made until the observer has a satisfactory bracket for deflection and range.

(2) The alternate method for getting an initial burst in target area is for the observer to command, MARK CENTER OF SECTOR, RANGE 6000. The base piece fires one round in the center of the sector assigned. Subsequent bursts are sensed in their relation to the target.

c. Prior to actual firing, observers should prepare a panoramic sketch. The instructor will designate the firing sector and the prominent terrain objects. Reference points will also be noted. A reference point is a well-defined terrain feature or landmark which may be used as a reference for designation of targets. The reference points are designated by number and are plotted on the sketch. The total deflection shifts and range shifts are then computed and plotted for each target. Initial shifts are made from the base point. Shifts from adjusted data afford an accurate yardstick to use in making sensings for new targets.

d. Designation of targets: new targets are designated by use of the fingers or by the mil scale in the reticle of field glasses. Example: take the last target fired on as a reference. Measure two fingers or 70 mils to the right and line short--there you see a large bushy tree. The tree represents an enemy machine gun nest. Instructor asks, "Is there anyone who hasn't identified the target?" After everyone has identified the target, the instructor assigns a student as the observer.

e. The observer makes appropriate sensings after the initial burst. The observer keeps making adjustments until he gets a satisfactory adjustment on his target. He then commands, MISSION ACCOMPLISHED, RECORD BASE DEFLECTION. All gunners record the deflection that they have on their pieces. The observer may, when he desires, select a new base point and have the gunners record the deflection that it took for their pieces to accomplish their mission on the new target. The command to record a new base deflection is: MISSION ACCOMPLISHED, RECORD BASE DEFLECTION.

f. New and profitable targets are selected for subsequent firing. the base point is sensed in its relation to the new target. Example: BASE POINT IS 200 LEFT, 200 OVER.

g. For instructional purposes the instructor then designates a new observer. The observer then has complete charge of the OP. He actually visualizes himself as being alone and he must make his own decisions. The observer will not be aided or stopped unless he continuously wastes ammunition or doesn't know procedure. A short critique will be held after each problem. The instructor will mention good points and note the bad points. Observers will be given a chance to ask questions.

h. Members of the gun squad alternate in their duties.

190. SERVICE FIRING.--a. Service firing is the final test of the platoon training; therefore the platoon should not be allowed to fire service ammunition until its members have proven themselves proficient.

b. Service firing will be conducted the same as sub-caliber firing with the exception of assistance from the instructor. The observer and platoon commander will conduct a critique of the problem and correct all mistakes observed.

191. A TYPICAL MISSION.--a. In reading the preceding information, you have covered the "how" of indirect fire. Now you will see how all this information is tied together; by reading this you should get the "when." This covers the action of a TD platoon firing an indirect fire mission.

b. The platoon pulls into the position area and the observer leaves to select his OP for the mission. During the time the observer is getting ready for his first shot, the platoon commander has certain duties to perform in order to be ready to fire when the observer reaches his OP:

(1) The platoon commander places his destroyer in position pointing in the direction of fire, the guns as near 30 yards apart as possible. This 30-yard interval is not a rigid rule. Actual location of good gun positions on the terrain will be the controlling factor.

(2) The No. 1 gun is centered in traverse, pointed toward the center of the sector, and the compass measured over the tube. This is the compass the gun is laid on. Assume for this illustrative example that this compass is 3300.

(3) Next step is to make Nos. 2, 3, and 4 guns parallel to No. 1. If panoramic sights are on the guns, they will be used to parallel. If the guns are equipped with deflection scales, the guns will be laid parallel by the use of a common aiming point and the mil relation, or by the use of aiming stakes placed in front of each destroyer.

(4) Next select an aiming point (if using panoramic sight) and have the gunners refer their sights to it. As soon as the situation permits, aiming stakes should be set out and sights referred to them and deflection recorded.

(5) Determine the minimum elevation of the platoon.

(6) Now the platoon is ready to receive the observer's first data.

c. After arriving at the OP, the observer will find his target and determine a compass and a range for the guns to fire the first round, or he will have the platoon mark center of sector for the first round. We will assume that he sends COMPASS 3500, RANGE 5000 to the guns. The platoon was laid initially on compass 3300; so, upon receiving the above data, the platoon commander must give the guns a shift to move them onto compass 3500, as the observer desires. That is, he must go right 200 mils, because compass 3500 is to the right of compass 3300. He determines the elevation for 5000 yards from the firing tables (let us say 150m for the gun and ammunition being used) and commands: PLATOON ADJUST, SHELL HE, FUZE QUICK, RIGHT 200, NO. 1 ONE ROUND, QUADRANT 150. When the guns are laid according to this command, the No. 1 gun fires one round and the observer is cautioned that the gun has fired by the platoon leader's sending NUMBER ONE ON THE WAY. When the observer observes this burst, he senses it with respect to the target; for example, 400 RIGHT, 400 OVER--which he sends to the guns just that way. The platoon commander, upon receiving this sensing, knows he must change the 400 RIGHT, which is in yards, to mils. He does this by use of the mil relation. He divides R (5) into W (400), which gives him 80m. The burst was right of the target, so he will shift the guns to the left. He must also correct for range (400 OVER). He looks in the firing tables and finds that the "c" for 5000 yards is 5 mils. The burst was 400 OVER, so he must come down 20m (4 c's) from the last quadrant. He gives the command: LEFT 80, QUADRANT 130. Again, as soon as the guns are laid, No. 1 gun fires one round and the platoon leader again sends NUMBER ONE ON THE WAY. The observer senses this burst as 200 LEFT, 200 SHORT. The platoon commander, by the same procedure as before, computes the data and commands: RIGHT 40, QUADRANT 140. The next round is fired. The observer senses this burst and sends 100 RIGHT, 100 OVER, FIRE FOR EFFECT. Upon hearing this, the platoon commander again computes the data and gives the command: LEFT 20, PLATOON ONE ROUND, QUADRANT 135. Up to this time the platoon has been following all shifts and range changes ordered but only one gun has actually fired. But when the observer requests FIRE FOR EFFECT, the whole platoon must be fired.

The decision to fire for effect rests with the observer who will request it when adjustment is sufficiently close.

If sufficient ammunition is on hand, and if the tactical situation, the terrain, and the nature of the target warrant it the platoon will fire on the center of the target, 100 yards beyond the center, 100 yards short, 50 yards short, and 50 yards over the center of the target. This is called Zone fire.

To deliver Zone fire in this example, the platoon would fire one round at quadrants 135, 140, 133, and 138.

If the ammunition supply is limited, the platoon commander will inform the forward observer the number of rounds that he can fire. For instance - "Will fire platoon at two (2) elevations."

If the observer only wants a small area covered, he will send a request similar to this, "100 short, Fire for effect at single range". The platoon would then fire one volley at the requested range.

If the observer sees that more fire is needed, he can send the request, "Repeat fire for effect" the platoon will again fire the zone or single volley depending on the original fire.

If the target has not been completely covered, the observer can send another sensing to the guns or treat the uncovered portion of the old target as a new target.

192. SINGLE DESTROYER, INDIRECT FIRE.—It is believed that TD's will be called upon to fire at stationary targets which can be seen from the gun position but which will be out of range of the direct fire sight reticle.

If the gunner attempted to fire at the target by means of the direct fire sight he would have to interpolate his range below the lowest range line (3000-yard line) of the reticle. This interpolation would, at best, be very inaccurate.

This difficulty can be easily overcome by using the panoramic sight and the gunner's quadrant as follows:

The destroyer commander standing on the rear of his turret where he can see the target, issues a "direct fire" fire order: HE, FUZE DELAY, (or QUICK, depending on the target) ANTI-TANK GUN AT BASE OF TREE, TRAVERSE RIGHT, STEADY.....ON, QUADRANT 124.

The gunner moves the tube in the correct direction as indicated by the destroyer commander. The piece is loaded and the proper quadrant elevation is put on the gun. Then, the loader picks out a convenient aiming point or has an aiming stake conveniently placed. He then refers the panoramic sight to the aiming point. That is, he moves the sight without moving the gun until the vertical zero lead line of the reticle is on the aiming point. The piece is fired on order of the destroyer commander.

After the first round is fired, the destroyer commander senses the round and issues subsequent fire orders to adjust the fire. For example,

if he senses the burst as 5 miles to the left and "over" the target his subsequent order might be RIGHT 5, QUADRANT 120. The piece is again fired upon his command.

At the command RIGHT 5, QUADRANT 120, the piece is reloaded; the loader, by looking through the panoramic sight, causes the gunner to traverse the tube until the vertical zero lead line of the panoramic sight reticle has been traversed 5 miles to the right of the aiming point. The new elevation is laid on the tube and the piece is ready to fire.

Note: The gunner should hold both handwheels once the proper elevation and deflection have been laid on the gun. This will result in more accurate firing.

If the destroyer is equipped with an azimuth indicator instead of a panoramic sight, the deflection changes can be set off by the gunner. In this case no aiming point is necessary.

GUNNER'S EXAMINATION, INDIRECT FIRE

193. GUNNER'S EXAMINATION, INDIRECT FIRE.--a. Object of proficiency test.--The object of this test is to provide a means of determining the proficiency of the individual crew members in indirect fire gunnery

Part I--Practical

b. General.--(1) The time for any test is the time from the last word of the command to the soldier's report or signal READY.

(2) The amount of grade cut for time should be proportioned to the amount of delay.

(3) Award no credit if the soldier's results are not precisely correct.

c. Use of panoramic telescope sight (M-5 A4, M-12 A3, M-12 A4).--(1) Laying for deflection (5 trials).--(a)--The soldier takes the gunner's position on the gun. The examining officer gives 5 deflection commands and checks the laying of the gun after each command.

(b) The time allowed for the execution of each command should not exceed 30 seconds.

(c) 3 points should be allowed for correct laying of the gun: 1 point for correct sight setting, 1 point for being on aiming point, and 1 point for having bubbles level.

(2) Example of commands and check list.

	Def. should	
(a) Aiming point--tele-	be	Def. A P. bubbles time
phone pole rear		
Deflection 178	178	
(b) Right 470	2908	
(c) Left 150	3058	
(d) Left 85	3143	
(e) Right 23	3120	

Give 1 point if correct, mark X if incorrect, and show time in seconds.

(3) This test should be followed by the command RECORD BASE

DEFLECTION and 5 points allowed for this operation. 3 points should be allowed for proper reading and recording of base deflection and 2 points for not moving the gun tube.

d. Use of deflection scale (for 75-mm. M3 destroyers).

(1) Laying for deflection (5 trials).--(a)--A soldier takes the gunner's position on the gun. The examining officer gives 5 deflection commands and checks the laying of the gun after each command.

(b) The time allowed for the execution of each command should not exceed 10 seconds.

(c) 3 points should be allowed for each correct laying of the gun.

(2) The officers conducting the test will lay the guns and adjust the deflection scale to "0" (see fig. 54) before the test.

(3) Example of commands and check list.

		Deflection should be	Deflection	Time
(a)	Right	240	R 240	
(b)	Left	360	L 120	
(c)	Right	60	L 60	
(d)	Right	30	L 30	
(e)	Left	10	L 40	

Give 3 points if correct, mark X if incorrect, and show time in seconds.

(4) This test should be followed by the command ADJUST DEFLECTION SCALE TO "0," RECORD BASE DEFLECTION. 5 points are allowed for this operation. 3 points should be allowed for adjustment of scale, and 2 points should be allowed for not moving the gun tube.

e. Use of azimuth indicator (on M10 or T70).--(1) Laying for deflection (5 trials).

(a) A soldier takes the position of the gunner. The examining officer gives 5 deflection commands, and checks the laying of the gun after each command.

(b) The time allowed for the execution of each command should not exceed 10 seconds.

(c) 3 points should be allowed for each correct laying of the gun.

(2) Example of commands and check list.

	<u>Def.</u>	<u>should be</u>	<u>Def.</u>	<u>Time</u>
R 460		460		
L 140		320		
L 80		260		
R 20		280		
L 10		270		

f. Use of gunner's quadrant (M-1916 - M-1).--(1) Laying for elevation (5 trials).--(a) A soldier takes the position of the destroyer commander. Another soldier assists by taking the position of the ass't gunner to elevate the gun. The examining officer gives 5 elevations and checks the laying of the gun after each command

(b) The time allowed for the execution of each should not exceed 30 seconds.

(c) 2 points should be allowed for each correct laying of the gun--1 point for the correct quadrant setting and 1 point for having quadrant bubble level.

(2) Example of commands and check list:

	<u>Setting</u>	<u>Bubbles</u>	<u>Time</u>
Quadrant	190		
Quadrant	124		
Quadrant	109		
Quadrant	88		
Quadrant	72		

Give 1 point if correct. mark X if incorrect, and show time in seconds.

(3) Measuring minimum elevation (1 trial).--(a) A soldier takes the place of the destroyer commander and another soldier takes the

position of the assistant gunner to elevate and depress the gun. The examining officer identifies the sector limits and then gives the command MEASURE MINIMUM ELEVATION.

(b) The time allowed for this operation should not exceed 3 minutes.

(c) 4 points will be allowed for the correct execution of the command: 1 point for laying gun on highest point of crest (for deflection and elevation), 1 point for leveling bubble, and 1 point each for reading and reporting correct minimum elevation.

(4) Example of commands and check list:

Def. Elev. Bubble Reading report Time

MEASURE MINIMUM ELEVATION

Give 1 point if correct mark X if incorrect, and show time in seconds.

g. Use of lensatic compass. M1.--(1) Measuring magnetic azimuth (5 trials).--(a) The examining officer will measure with great care the magnetic azimuth to 5 points on the terrain and then identify those points to the soldier. The soldier will use the same compass as used by the examining officer, and measure the azimuth to the 5 points.

(b) The time allowed for each measurement should not exceed 1 minute.

(c) 1 point should be allowed for measurement and a tolerance of plus or minus 10 mils should be allowed.

(2) Example of check list:

		True Mag Az.	Soldier's Mag. Az.	Time
Point	1	184	182	
"	2	etc.	etc	
"	3			
"	4			
"	5			

h. Laying platoon parallel (M5A4--M12A3 or M12A4 panoramic sights).--(1) Laying one gun in center of sector and measuring compass on which gun is laid. (1 trial) (a) One soldier will take the position of the platoon commander. Another soldier will assist by acting as gunner.

The examining officer will identify the center of sector to the soldier. The examining officer will tell the soldier to lay the gun in the center of sector and measure the compass.

(b) The time allowed for execution of this operation should not exceed 3 minutes.

(c) 8 points should be allowed for correct completion of this operation: 2 points for directing the gunner to traverse to the center of sector. 2 points for giving the command DEFLECTION "O" LINE ME IN. 2 points for reading the correct compass angle over the sight of the gun, and 2 points for having the compass far enough away from metal objects to avoid magnetic interference (50 yards from destroyer). The steps of the operation must be performed in this sequence or no credit will be given.

(1) Example of check list:

	Points Awarded
Directed gunner	2
Proper command	2
Proper compass reading	2
Location of compass	2

1. Laying platoon parallel (1 trial).--(1) A soldier will take the position of the gunner on the gun that was laid in the center of the sector in h above. Gunners will be placed on the other three guns of the platoon. The examining officer will give the command ON NUMBER ONE, LAY PARALLEL.

(2) The time allowed for the completion of this operation should not exceed 3 minutes.

(3) 10 points should be allowed for the successful completion of this operation: 2 points for giving correct commands DEFLECTION NO. 2 (SO MUCH), DEFLECTION NO. 3 (SO MUCH), DEFLECTION NO. 4 (SO MUCH), 2 points for accurate laying on other sight lens, 2 points for accurate reading of deflection, 2 points for re-checking until not over 1 mil (1 m) error exists, 2 points for reporting to the platoon commander that the platoon is laid. The steps of the test must be performed in the proper sequence or no credit will be given.

(4) Example of check list:

Points awarded

Initial command - deflection No. 2.

Proper laying on lens of No. 2 gun.

Proper reading of deflection of No. 2 gun.

(Repeat for No. 3 and No. 4.)

First re-check (repeat above.)

Second re-check (repeat above.)

Report PLATOON IS LAID.

j. Laying platoon parallel. (Azimuth indicator on M10 or T70 Destroyer).--(1) Laying one gun on center of sector and measuring compass on which gun is laid (1 trial).--(a) A soldier will take the position of the platoon commander (on rear of destroyer). Another soldier will assist by acting as gunner. The examining officer will tell the soldier to lay the gun in the center of sector and measure the compass.

(b) The time allowed for the execution of this operation should not exceed 3 minutes.

(c) 8 points should be allowed for the proper execution of this operation: 2 points for directing the gunner to lay the gun on center of sector (done from rear of destroyer), 2 points for moving to a proper point in front of destroyer and giving the command LINE ME IN, 2 points for compass angle to sight of gun, and 2 points for adding 3200 to or subtracting it from the compass angle.

(2) Example of check list:

Points
Awarded

Directed gunner to center of sector.

Took proper position in front of gun, and gave proper command.

Proper compass reading.

Proper computation of compass gun is laid on.

(3) Laying platoon parallel (1 trial) (a) The soldier will take the position of the gunner on the gun that was laid in the center of the sector in j above. Gunners will be placed on the other three guns of the platoon. The examining officer will give the command. ON NUMBER ONE LAY PARALLEL.

(b) The time allowed for the completion of this operation should not exceed 3 minutes.

(c) 10 points should be allowed for the successful completion of this operation: 2 points for setting movable scale to 3200;

2 points for giving correct commands. DEFLECTION NO. 2 (SO MUCH), DEFLECTION NO. 3 (SO MUCH), DEFLECTION NO. 4 (SO MUCH) 2 points for accurate laying on sights of other guns; 2 points for correct reading of azimuth for other guns, and 2 points for reporting, PLATOON IS LAID. The steps of the test must be performed in the proper sequence or no credit will be given.

(4) Examples of check list:

Points
awarded

Set movable scale to 3200.

Initial command, DEFLECTION NO. 2.

Proper reading of deflection for No. 2 gun.

Proper laying on sight of No. 2 gun

Reporting platoon is laid.

Part II--Written

k. Firing Commands (5 points).

Question: Rearrange the following list of commands in the proper sequence.

QUADRANT 180	CORRECT SEQUENCE
SHELL HE.	PLATOON ADJUST
PLATOON ADJUST	SHELL HE.
FUZE DELAY	CHARGE NORMAL
CHARGE NORMAL	FUZE DELAY
NO. ONE	RIGHT 140
1 ROUND	NO. ONE
	1 ROUND
	QUADRANT 180

1. Converting sensings to commands (5 points for each question).

(1) Situation No 1 --The guns are firing reduced charge ammunition and are laid with deflection 2315 and quadrant 180. The range corresponding to quadrant 180 is 3300, and the "c" is 8 The next sensing to come from the OP is 400 RIGHT, 200 OVER.

Question: What will be the next command sent to the guns?

Answer: LEFT 120 (121), QUADRANT 164.

(2) Situation No. 2. The guns are firing normal charge ammunition and are laid with deflection 79 and quadrant 95. The range corresponding to 95 is 3300 and the "c" is 4. The next sensing from the OP is 50 LEFT, 50 OVER.

Question: What will be the next command sent to the guns?

Answer: RIGHT 15 PLATOON ONE ROUND, QUADRANT 93.

m. Sensings (5 points for each question) --(1) Situation No 1: You are at a forward OP and want to register on a base point. The guns are on your left. You estimate the GT distance as 4500 yards the OT distance as 1500 yards, and the perpendicular distance for the OP to the GT line as 400 yards. The magnetic azimuth or compass of the OT line is measured and found to be 2340 g.

Question: What sensings would be sent to the guns to register on the base point?

Answer: COMPASS 2710, RANGE 4500, BASE POINT, WILL ADJUST.

(2) Situation No. 2: You are at a forward OP and want to shift your fire from a base point to a machine gun position, as shown in figure 69.

Question: What will be the sensing sent to the gun position?

Answer: BASE POINT IS 200 LEFT, 100 _____, MACHINE GUN POSITION, WILL ADJUST.

(3) Situation No. 3: During the adjustment you see one burst as indicated in figure 70.

Question: What will be the sensing sent to the guns?

Answer: 50 RIGHT, 50 _____ FIRE FOR EFFECT.

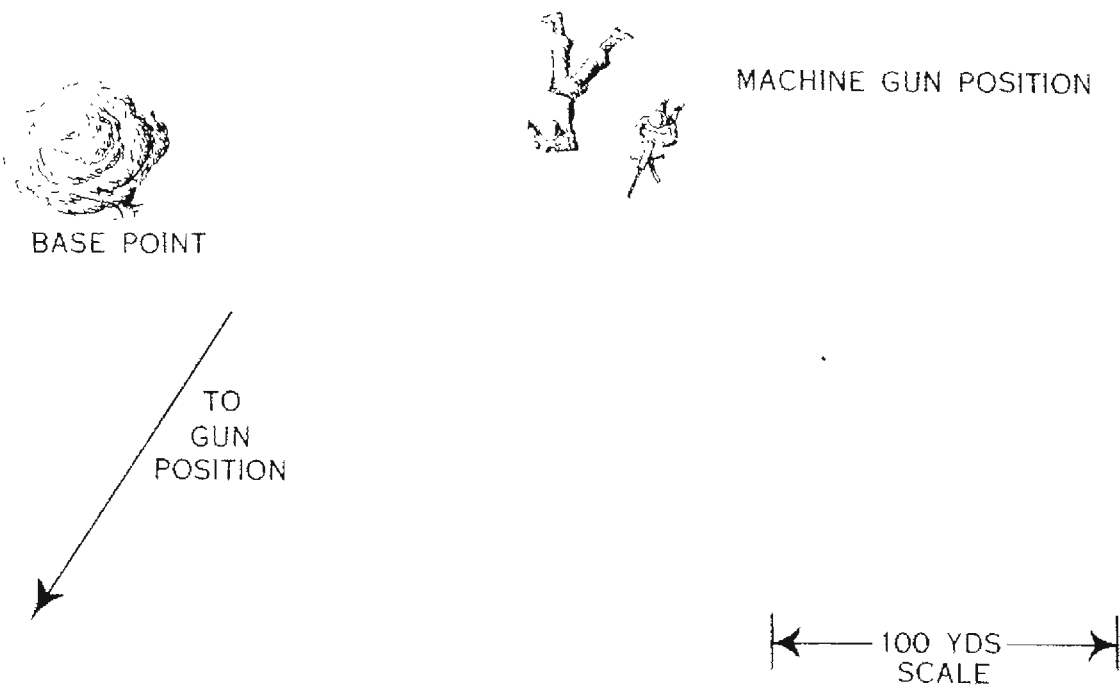


Figure 69

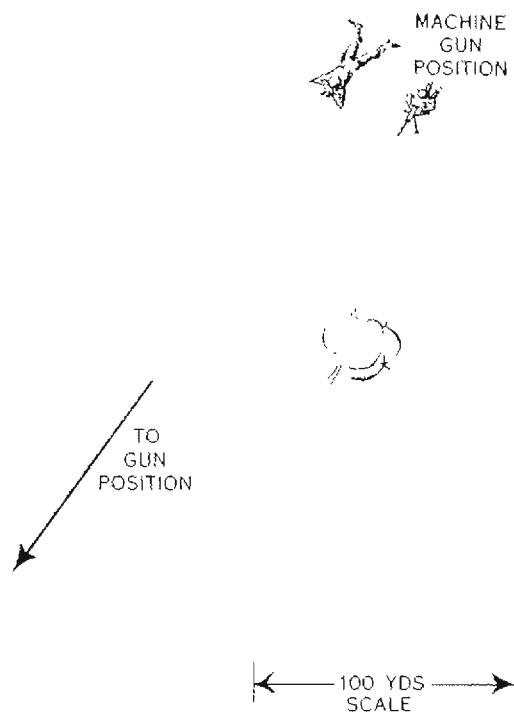


Figure 70

TABULATION. GUNNERS' TEST

PRACTICAL TEST	No. of Trials	Points Each	Maximum Credit
Use of sight	5	3	15
Use of gunners' quadrant	5	2	10
Use of lensatic compass	5	1	5
Laying platoon parallel I	1	8	8
Laying platoon parallel II	1	10	10
TOTAL			<hr/> 48
WRITTEN TEST*			
Firing commands	1	5	5
Converting sensings to commands	2	5	10
Sensings	3	5	15
GRAND TOTAL			<hr/> 78

* Gunners should be given only the practical test.

Destroyer commanders and platoon sergeants should be given both the practical test and the written test

Appendix I

List of References

FM	6-40	Firing
	17-12	Tank Gunnery
	22-5	Infantry Drill Regulations
	23-5	U.S. Rifle, Caliber .30, M1
	23-7	U.S. Carbine, Caliber .30, M1
	23-10	U.S. Rifle, Caliber .30, M1903
	23-35	Automatic Pistol, Caliber .45, M1911 and M1911A1
	23-40	Thompson Submachine Gun, Caliber .45, M1928A1
	23-45	Browning Machine Gun, Caliber .30, HB, M1919A4, Ground
	23-50	Browning Machine Gun, Caliber .30, HB, M1919A4 (Mounted in Combat Vehicles)
	23-55	Browning Machine Gun, Caliber .30, M1917
	23-60	Browning Machine Gun, Caliber .50, HB, M2, Ground
	23-65	Browning Machine Gun, Caliber .50, HB, M2 (Mounted in Combat Vehicles)
	23-70	37-mm. Gun, Antitank M3
	23-80	37-mm. Gun, Tank, M5 (Mounted in Tanks)
TM	9-322	3-inch gun, M5 and 3-inch gun carriage, M1
	9-743	Light Armored Car M8
TR	1395-A	(Cleaning, preserving and lubricating materials, etc.)
TC	96	(December 1, 1942--Radio Aerial Target Plane)
AR	775-10	(Ammunition allowances, etc.)
TDS	105-11	75-mm Gun, M1897A4 on Motor Carriage, M3A1 (Weapons Department, TD School, Camp Hood, Texas)
TDS	105-12	37-mm Gun, Antitank, M3 on Motor Carriage, M6 (Weapons Department, TD School, Camp Hood, Texas)

W280		3-inch Gun on Motor Carriage, M10 (Weapons Department, TD School, Camp Hood, Texas)
W313		3-inch, Gun, Antitank, M1, Towed
TM	9-308	76-mm. Gun Material M1 (Combat Vehicles)

Appendix II

THE GUN COMMANDER'S CATECHISM

(To be asked of himself before he is satisfied with a firing position.)

1. Have I studied the terrain with my field glasses for all possible tank approaches?
2. Have I estimated ranges and prepared my range card? Is my range card up-to-date?
3. Have I checked the boresighting of the gun?
4. Have I dug trenches for trail shifts?
5. Have I cleared my field of fire?
6. Have I checked my gun position for maximum depression? Does this leave dead space that I shall have to make short shifts to cover?
7. Have I reduced gun cant and facilitated traversing by placing my vehicle on level ground?
8. Have I fired a check round for range? (Time and secrecy permitting.)
9. Have I checked my ammunition for availability, type to be used, serviceability, and resupply?
10. Have I made a plan of action in the event of an infantry attack?
11. Where are the other guns in my section? Platoon? Company?
12. Have I determined routes that I may have to use in future action?
13. Have I selected alternate and supplementary positions and prepared range cards for them?
14. Have I informed the crew of the situation?
15. Keeping in mind my mission, have I taken advantage of natural camouflage, cover and concealment?
16. Have I made plans to counter an air attack?
17. Should I dig slit trenches?
18. Do my tracks give me away?
19. Is artificial camouflage necessary to better hide my gun and crew?

20. Will my night lighting devices function?
21. What can I do to reduce dust raised by muzzle blast?
22. What is my situation as to rations, water, and fuel?

Appendix III

THE GUNNER'S CATECHISM

(To be asked of himself before he is satisfied his gun is ready.)

1. Have I boresighted my gun?
2. Is my sight clean and seated properly in its mount?
3. Is the vehicle parked so the gun can be traversed easily?
4. Have I cleaned the working parts of my gun?
5. Is my interphone system working?
6. Will the firing mechanism work both manually and electrically?
7. Are the elevating and traversing mechanisms in working order?
8. Does the gun have the proper amount of recoil oil?
9. Do I know what range change to make if I shift from AP to HE?