# CHAPTER 5

# Fire Commands and Engagement Techniques

This chapter discusses fire commands (including terminology, definitions, and the various formats), crew duties in response to fire commands, direct-fire adjustment techniques, and range card engagement.

## Fire Commands

A fire command is given to deliver effective fire on a target quickly and without confusion. Fire commands increase kill ratio and crew survivability, as proven in previous conflicts.

### ELEMENTS OF FIRE COMMANDS

Fire commands for all direct-fire weapons follow a pattern that includes similar elements. There are four elements in the fire command for the machine gun: alert, description, direction, and execution. TOW fire commands differ from the machine gun fire command; the weapon/ammunition element may also be given.

#### Alert

This element alerts the crew to an impending engagement and tells who will be firing it. This ensures that the crew is ready to receive further instructions; the vehicle commander announces "GUNNER."

#### Weapon/Ammunition

This element tells the crew what type of weapon or ammunition will be used for this engagement (“MISSILE”).

#### Description

The target description is used to create a picture of the target in the minds of the crew. To properly apply fire, the crew must know the type of target they are to engage. The vehicle commander should use the briefest possible term to clearly describe the target. Most targets may be designated by one of the following terms.

| Type of Target | Term |
|---|---|
| Tank or tank-like target | TANK |
| Infantry fighting vehicle or APC | PC |
| Unarmored vehicle | TRUCK |
| Helicopter | CHOPPER |
| Fixed-wing aircraft | PLANE |

If there are several similar targets, this element also tells the gunner which target to engage first ("TWO TRUCKS—LEFT TRUCK").

**Direction**

This element indicates the general direction to the target and maybe given in one or a combination of the following methods:

- Orally. The vehicle commander gives the direction to the target in relation to the position of the gun.

- Pointing. The vehicle commander can designate a small or obscure target by pointing with his arm or aiming with a gun. When he points with his arm, the gunner, standing behind him, should be able to look over his shoulder and sight along his arm and index finger to locate the target. When a gun has been aimed at a target, the gunner should be able to see the target through the sight.

- Using tracer ammunition. Tracer ammunition is a quick and sure method of designating a target not clearly visible. When using this method, the vehicle commander should first give the general direction to direct the crew's attention to the target area. To prevent the loss of surprise when using tracer ammunition, the vehicle commander does not fire until he has given all of the elements except the execution element. The vehicle commander may fire his individual weapon or fire one or more bursts from a machine gun. Firing the tracer(s) then becomes the last element of the fire command and is the signal to open fire ("TROOPS—WATCH MY TRACER—FIRE").

- Using reference points. Another method of designating obscure targets is to use easy-to-recognize reference points. All vehicle commanders and crews must be familiar with terrain features and the terminology used to describe them. To avoid confusion when using a reference point, the word "REFERENCE" precedes its description. The general direction to the reference point should be given ("GUNNER—TROOPS—FRONT—REFERENCE: LONE PINE TREE").

  - Successive reference points. Sometimes a target must be designated by using successive reference points (''GUNNER—TRUCK—RIGHT FRONT—REFERENCE: RED-ROOF HOUSE, LEFT TO HOUSE, LEFT TO HAYSTACK, LEFT TO BARN").

- Finger measurements. To direct the crew's attention to the right or left of reference points, use finger measurements ("GUNNER—LEFT FRONT—REFERENCE: CROSSROADS, RIGHT FOUR FINGERS").

- Mils. When the guns are mounted on tripods, lateral distance from reference points may be announced in roils. Lateral distance is assumed to be in roils so the word *mils* is not necessary ("GUNNER-TRUCK-FRONT-REFERENCE: KNOCKED-OUT TANK, LEFT FOUR ZERO").

### Execution

Once the crew responds to the first elements of the initial fire command, the vehicle commander will announce the execution. Before announcing the execution command, the vehicle commander will mentally run through the confirmation process. As a minimum, he will reconfirm the target as hostile before firing. If immediate fire is required, the command "FIRE" is given without pause and the gunner fires as soon as he is ready. If the vehicle commander wants to delay firing, he may preface the command with, "AT MY COMMAND" or "AT MY SIGNAL." When the gunner is ready to engage the target, he reports "UP"; the vehicle commander then gives the command "FIRE" at the specific time desired ("GUNNER—TROOPS—FRONT—AT MY COMMAND [AT MY SIGNAL] [pause until crew members are ready and fire is desired] FIRE [or prearranged signal]").

### INITIAL FIRE COMMAND

All engagements begin with an initial fire command. When the vehicle commander decides to engage a target that is not obvious to the gunner, he must provide him with the information needed to engage the target effectively.

For a machine gun fire command, he must alert the crew, and give the target description, direction, and execution.

| Element | Gunner | Commander |
|---|---|---|
| Alert | | "GUNNER— |
| Description | | TROOPS— |
| Direction | | FRONT— |
| | "IDENTIFIED" | |
| Execution | | FIRE— |
| | | CEASE FIRE." |

**Note.** Defensive and offensive fire commands are the same.

The TOW fire command differs from a machine gun fire command. Once the target is identified, the vehicle commander aligns the vehicle for direction and announces the fire command.

| Element | Gunner | Commander |
|---|---|---|
| Alert | | "GUNNER— |
| Weapon/ammunition | | MISSILE— |
| Description | | TANK— |
| Direction | | RIGHT FRONT—REFERENCE: HILL SEVEN SIX TWO, FROM HILL, LEFT TWO HUNDRED— |
| Execution | "IDENTIFIED | FIRE." |
| | ON THE WAY." | |

If an engagement is fired from a short halt, the vehicle commander commands "DRIVER—STOP" before giving the execution element. When the engagement is completed, the vehicle commander commands "DRIVER—MOVE OUT," if necessary.

Whenever weapons-down positions are available, the vehicle commander commands "DRIVER—SEEK WEAPONS-DOWN" and initiates the fire command.

He must then direct the driver into the unmasked position while ensuring the gun has clearance. Once the vehicle is in position and the gunner has identified the target, the vehicle commander issues the execution command.

When the vehicle is in a weapons-down defensive position, the vehicle commander initiates the fire command to unmask the weapon "DRIVER—MOVE OUT." Upon destruction of the target, the vehicle commander terminates the engagement by commanding "CEASE FIRE-DRIVER—BACK UP." The driver moves back to the weapons-down position.

## MULTIPLE TARGETS

In combat, light cavalry crews maybe required to engage multiple arrays of targets. These engagements require speed and accuracy to suppressor destroy all targets.

When engaging multiple targets, some of the elements of the fire command for the first target will not have to be repeated for the second target. Although each target engaged requires essential parts of the fire command, depending on the type of fire command used (machine gun, TOW), the fire commands will become shorter as the battle progresses.

Note. The vehicle commander acquires two trucks to the front. While *laying the vehicle for direction*, he issues a machine gun fire command. To complete the engagement, only the description and execution elements are needed for the second target.

| Element | Gunner | Commander |
|---|---|---|
| Alert | | "GUNNER— |
| Description | | TWO TRUCKS—LEFT TRUCK— |
| Direction | | FRONT— |
| | "IDENTIFIED | |
| Execution | | FIRE— |
| | ON THE WAY— | TARGET—CEASE FIRE— |
| Description | | SHIFT—RIGHT TRUCK— |
| | IDENTIFIED— | |
| Execution | | FIRE— |
| | ON THE WAY." | |
| | | TARGET— |
| | | CEASE FIRE." |

**Note.** The vehicle commander acquires one tank and one BMP to the front and issues a TOW fire command.

| Element | Gunner | Commander |
|---|---|---|
| Alert | | "GUNNER— |
| Weapon/Ammunition | | MISSILE— |
| Description | | TANK AND PC—TANK— |
| Direction | | FRONT— |
| | "IDENTIFIED— | |
| Execution | | FIRE— |
| | ON THE WAY— | |
| | | TARGET—SHIFT LEFT PC— |
| | IDENTIFIED— | |
| Execution | | FIRE— |
| | ON THE WAY." | |
| | | TARGET—CEASE TRACKING, |
| | | OUT OF ACTION." |

**Note.** When a range card has been prepared, the vehicle commander can place fire on targets the gunner cannot see using only the alert, description, and execution elements. The vehicle commander describes the target by its number, saying the word "TARGET" before the number of the target ("GUNNER—TARGET NUMBER THREE—AT MY COMMAND—FIRE").

## SUBSEQUENT FIRE COMMANDS

Subsequent fire commands are used to make adjustments in direction and elevation, change rates of fire after an engagement is in progress, interrupt fires, or terminate the alert.

### Direct Fire Observations and Adjustments

If the gunner fails to engage a target properly, the vehicle commander must promptly correct him by announcing or signaling the desired changes (using subsequent fire commands). When these changes are given, the gunner makes the corrections and resumes firing without further command. Only the elements necessary to continue the engagement are announced.

***Alert.*** The vehicle commander announces his range observation ("SHORT") as the alert. This notifies the gunner that a subsequent fire command follows.

***Direction.*** Direction and elevation corrections are based on the vehicle commander's observation.

Direction corrections are given first. If the round went left of the target, the correction would be to the right ("RIGHT ONE ZERO—LEFT FIVE"). Direction corrections maybe given in roils or target forms (see *Other Adjustment Techniques,* page 5-9). Adjustment for elevation is given next ("ADD FIVE—DROP ONE FIVE").

**Note.** Direction and elevation corrections may also be given using arm-and-hand signals.

The vehicle commander bases his range correction on his observation. If the round went over the target, he subtracts range. If the round landed short of the target, he adds range. If he determines that the necessary correction is less than 200 meters, he may use the target form method. To execute a range correction, the gunner must index a different range or change range lines.

**Note.** Adjustments in direction and elevation with the biped or vehicle-mounted gun are always given in meters by using one finger to indicate 10 meters. Adjustments in direction and elevation on the tripod-mounted gun are always given in roils; one finger indicates one mil.

***Execution.*** The vehicle commander completes the subsequent fire command with the execution command "FIRE."

Changes in the rate of fire are given orally or by arm-and-hand signals. To interrupt firing, the vehicle commander announces "CEASE FIRE" or signals to cease fire. The crew remains on alert and resumes firing when given the command "FIRE."

To terminate the alert, the vehicle commander announces, "CEASE FIRE—END OF MISSION."

### Doubtful Elements and Corrections

When the gunner is in doubt about any element of the fire command, he replies, "SAY AGAIN—TARGET (or element in doubt)." The vehicle commander then announces, "THE COMMAND WAS—(repeats the element in question)" and continues with the fire command.

When the vehicle commander makes an error in the initial fire command, he corrects it by announcing "CORRECTION" then giving the corrected element ("GUNNER—TROOPS—FRONT; CORRECTION—TRUCK—FRONT—AT MY COMMAND").

When the vehicle commander makes an error in the subsequent fire command, he may correct it by announcing "CORRECTION" then repeating the entire subsequent fire command ("LEFT FIVE—DROP ONE; CORRECTION—LEFT FIVE—DROP ONE ZERO").

## Crew Duties in Response to the Fire Command

In response to each element of a fire command, the vehicle commander, the gunner, and the driver have specific crew duties to perform. Crew duties common to light cavalry crews are shown in Table 5-1. Even though commands for the driver are not essential elements of the fire command, his actions are very important during an engagement.

Once the vehicle commander has given the fire command, his primary focus must be on retaining control and observing the sector. The gunner should take over the engagement, destroy or suppress the target, and report when he has completed the engagement. The vehicle commander assists only as necessary, giving subsequent commands to shift targets, organizing other targets, and planning the vehicle's next activity.

If an engagement is fired while on the move, the driver attempts to provide the gunner with a stable platform. When the situation and terrain permit, the front of the vehicle should be oriented toward the target.

**Table 5-1. Crew Duties.**

| Element | Commander | Gunner | Driver |
|---|---|---|---|
| Alert: "GUNNER" | Lays vehicle for direction. | Starts searching for target as driver moves vehicle.<br><br>Readies the weapon. | If moving, attempts to orient front of vehicle toward target; gives gunner as stable a platform as possible; looks for an unmasked position. |
| Description: "TRUCK" | Informs gunner of type of target. | Observes through sights and tries to identify target. | Orients front of vehicle toward target (helps to identify targets if stationary). |
| Direction: "RIGHT FRONT" (optional) | If needed, talks gunner into target area. | If issued, traverses turret in search of target. On identifying target, says "IDENTIFIED." | |
| | Commands "DRIVER—STOP." (Command to stop may be given by the gunner.) | | Stops on command and attempts to sense rounds. |
| Execution: "FIRE" | Commands "FIRE."<br><br>Assumes position to sense round and prepares to give subsequent fire command.<br><br>Announces "TARGET—CEASE FIRE."<br><br>Commands "DRIVER—MOVE OUT." | Uses correct sight picture, announces "ON THE WAY," and fires. | |

## Direct-Fire Adjustment

The crew's goal is to hit a target and destroy it as fast as possible. If the first round is not on target, an observation and an adjustment is made to hit the target. There are many techniques of direct-fire adjustment: burst on target (BOT), TOT, and other adjustment techniques.

## BURST ON TARGET

BOT is the fastest method of adjustment. BOT is moving the burst of the round impacting on the ground onto the target. It is most effective when engaging from a stationary firing vehicle or a firing vehicle that is moving toward the target.

After the gunner has made his initial lay on the target and fired, to apply BOT, he must—

- Observe down the weapon sight.
- Re-lay after firing to maintain his correct sight picture.
- Concentrate on the target, noting the aiming point of the sight where the tracer round(s) appears as it passes, strikes short of, or hits the target.
- Announce his observation and BOT.
- Immediately adjust the aiming point of the sight, based on the impact of the previous round or burst, to bring the next round or burst on target. He must adjust quickly and accurately to make additional adjustments unnecessary.
- Announce "ON THE WAY" and fire a burst.

The gunner continues to fire, adjusting each burst onto the center of mass until the target is destroyed, the vehicle commander orders "CEASE FIRE," or the vehicle commander takes over adjustment of fire.

When the gunner applies BOT, the vehicle commander acts as an observer, observing the first round fired and subsequent burst of fire for deflection and range.

Accuracy of the BOT method of adjustment depends on the ability of the gunner to maintain correct sight pictures and make precise observations. To engage moving targets accurately using BOT, the gunner must continuously track before, during, and after the engagement.

## TRACER ON TARGET

As the name implies, the gunner adjusts the strike of the rounds, based on observed tracers, onto the target area.

## OTHER ADJUSTMENT TECHNIQUES

The gunner and vehicle commander can announce adjustments using any of the following adjustment techniques:

- Target form is the simplest method of adjustment. One form is the visible height or width of the target. Since the visual size in width and height differ, the visual height is used for adjusting in elevation and the visual width is used in azimuth adjustments. Target form can be used with all weapons (except TOW). The word "form" may be added after the announced change or the change may stand alone if target form is the standard adjustment technique in the unit's SOP. Form changes are always given in full- or half-form increments.

- Mil change-simple and accurate at all ranges, but requires the gunner to remember the mil relation of his reticle (TOW).

- Meter—vehicle commander's range correction based on his range observation. When this technique is used, meters must be converted into roils; this takes much longer to calculate.

## Range Card Engagement

- DA Form 5517-R *(Standard Range Card)* is a rough topographical sketch of a designated sector of an assigned weapon system. A range card aids in planning for and controlling fires. It aids the crew in the target acquisition process during limited visibility and in the orientation of replacement personnel or units. During good visibility, the gunner should have little difficulty monitoring his orientation. During poor visibility, lateral limits may not be detectable. When the gunner becomes disoriented and cannot find or locate reference points or sector limit markers, he can use the range card to locate the limits of the sector. The gunner should prepare the range card so he becomes more familiar with the terrain in his sector. He should continually assess the sector and, if necessary, update his range card. Each range card contains, as a minimum, the following information:

- The appropriate symbol for the vehicle and weapon systems covering the sector.

- The left and right limits of the assigned sector to be covered by observation.

- The circle value shown in the sketch and data portions.

- TRPs and reference points (RP) (areas where targets are likely to appear).

- Dead space (areas that cannot be observed or covered by direct fire).

- Weapon reference point (WRP) (an easily recognizable terrain feature to locate the firing position).

- Maximum engagement lines (MEL).

- Magnetic North symbol (direction of magnetic north when the range card is oriented).

- Identification data.
  - Unit identification (no higher than troop).
  - Firing position (primary, alternate, supplementary).
  - Vehicle type and vehicle bumper number.
  - Date and time of preparation.

- Description.

- Direction and elevation.

## SECTORS OF FIRE

A sector of fire is a piece of the battlefield for which a gunner is responsible. A sector of fire is assigned to ensure that weapon systems cover all possible enemy avenues of approach. Vehicle commanders should strive to overlap sectors to provide the best use of overlapping fire and to cover areas that cannot be engaged by a single weapon system. The vehicle commander assigns left and right limits of a primary sector of fire (including principal direction of fire [PDF] and final protective line [FPL] of fire using prominent terrain features or easily recognizable objects (such as rocks, telephone poles, fences, or emplaced stakes). The vehicle commander may also assign the gunner more than one sector of fire, designating each sector as primary, alternate, or supplementary.

### Target Reference Points/Reference Points

Vehicle commanders choose natural or man-made terrain features to be designated as RPs to assist the gunner in target acquisition and range determination during limited visibility. There will also be predesignated TRPs.

A TRP is usually designated by the commander using the standard target symbol and target number issued by the fire support team (FIST) or fire support officer (FSO). If TRPs are located within the sector of fire, the vehicle commander points them out and tells the gunner their designated reference numbers.

The gunner depicts TRPs by a cross ($\frac{|}{|}\frac{001}{}$)with an abbreviated designation reference number in the upper right quadrant of the cross (in the sketch portion of his range card). The reference numbers are listed in the description column of the data portion of the range card.

The vehicle commander should assign additional RPs for his vehicle, to assist in the target acquisition and range determination process. RPs are depicted as a number within a circle. Normally, a gunner has at least one TRP, but should not have more than four. The range card should show only pertinent data for RPs or TRPs.

### Dead Space

Dead space is any natural or man-made terrain feature (such as hills, draws, buildings, or depressions) that cannot be observed or covered by direct-fire systems within the sector of fire.

All dead space within the gunner's sector of fire must be determined to allow the vehicle commander and section leader to plan other weapon systems or other types of fire (mortars or artillery) to cover the area.

Dead space is indicated in the sketch portion of the range card by an irregular circle with a series of diagonal lines.

Dead space within the MELs for the weapon systems is circled with diagonal lines drawn in the circle. Dead space that extends out to or past the farthest MEL is drawn as an encased area with diagonal lines.

### Maximum Engagement Line

The depth of the sector of fire is normally limited to the maximum engagement range of the vehicle's weapon systems; however, it can be less if there are any natural or man-made objects or features that prevent the gunner from engaging targets at maximum engagement range (for example,

hills, ridgelines, trees, urban areas). MELs are shown in the sketch portion of the range card by a heavily drawn line for each weapon system.

MELs are not drawn through dead space. MELs are drawn behind dead space when the terrain beyond the dead space is of a higher elevation. This represents terrain that can be covered by direct-fire weapon systems. MELs are drawn along the side and in front of dead space extending out to the farthest MEL. This represents terrain that cannot be covered by direct-fire weapon systems beyond the nearest point of dead space, in relation to the position for which the range card is drawn.

To assist in determining the distance of each MEL, the gunner or vehicle commander should use a map to make sure the MELs are shown correctly on the sketch portion of the range card.

### Weapon Reference Point

The WRP is an easily recognizable terrain feature on the map. The WRP is used to assist vehicle commanders in plotting the vehicle's position, and to assist replacement personnel and units in finding the vehicle's position. The WRP location is given as a six-digit grid.

When there is no terrain feature to be designated as the WRP, the vehicle's location is shown as an eight-digit grid coordinate in the remarks block of the range card.

## PREPARATION PROCEDURES

The gunner prepares two copies of the range card. If alternate and supplementary firing positions are assigned, two copies are required for those positions. A copy is kept with the vehicle and the other copy is given to the section leader for the section sector sketch. (DA Form 5517-R maybe locally reproduced on 8- by 11-inch paper. Figures 5-1 through 5-3 are samples of completed range cards. (See FM 7-7J for more detailed discussion on how to prepare a range card.)

## FIRING POSITION

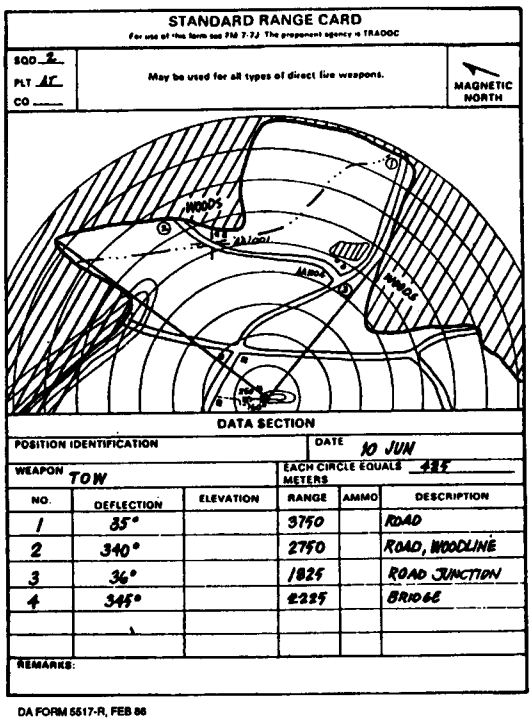
After a range card has been completed for a firing position, mark the position with ground stakes to enable the vehicle or another vehicle from a relief unit to reoccupy the position and use the data from the range card prepared for the position.

### Stake the Position

Once the range card is completed and before the vehicle is moved to a hide position or to an alternate or supplementary position, stake the position. Three stakes are required to mark the position effectively.

Place one stake in front of the vehicle so it is centered on the driver's station and just touching the front of the vehicle. This stake should be long enough for the driver to see when the vehicle gets close. Place the other two stakes parallel to the left tire and lined up with the hub on the front and rear wheels. Place these stakes close to the vehicle with only enough clearance to allow the driver to move the vehicle into the position.

*Figure 5-1. Completed Standard Range Card (TOW).*



STANDARD RANGE CARD

SQD 2 PLT AT CO ____ | May be used for all types of direct fire weapons. | MAGNETIC NORTH

DATA SECTION

POSITION IDENTIFICATION | DATE 10 JUN

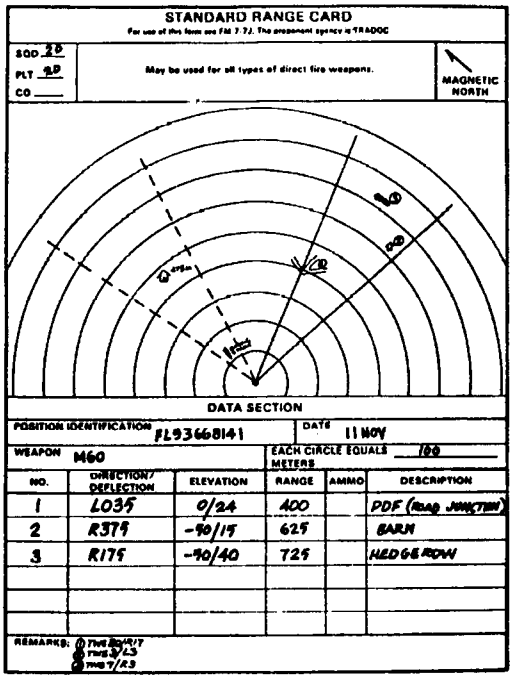
WEAPON TOW | EACH CIRCLE EQUALS 425 METERS

| NO. | DEFLECTION | ELEVATION | RANGE | AMMO | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | 35° | | 3750 | | ROAD |
| 2 | 340° | | 2750 | | ROAD, WOODLINE |
| 3 | 36° | | 1825 | | ROAD JUNCTION |
| 4 | 345° | | 2325 | | BRIDGE |
| | | | | | |
| | | | | | |

REMARKS:

DA FORM 5517-R, FEB 86

*Figure 5-2. Completed Standard Range Card (PDF).*



STANDARD RANGE CARD

SQD 2D PLT 2D CO ____ | May be used for all types of direct fire weapons. | MAGNETIC NORTH

DATA SECTION

POSITION IDENTIFICATION FL9366814 | DATE 11 NOV

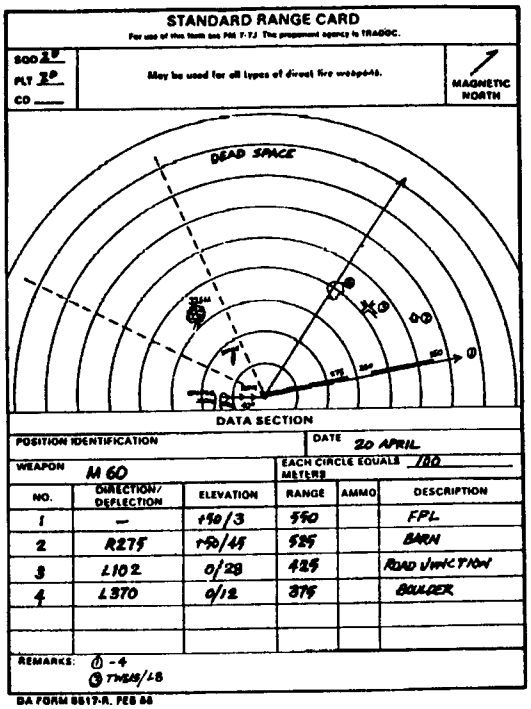
WEAPON M60 | EACH CIRCLE EQUALS 100 METERS

| NO. | DIRECTION/ DEFLECTION | ELEVATION | RANGE | AMMO | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | L035 | 0/24 | 400 | | PDF (ROAD JUNCTION) |
| 2 | R379 | -90/19 | 625 | | BARN |
| 3 | R175 | -90/40 | 725 | | HEDGEROW |
| | | | | | |
| | | | | | |
| | | | | | |

REMARKS: ① TWS 2D/17 ② TWS 3D/L3 ③ TWS 4D/R3

DA FORM 5517-R, FEB 86

*Figure 5-3. Completed Standard Range Card (FPL ).*



STANDARD RANGE CARD

SQD 2D PLT 2D CO ____ | May be used for all types of direct fire weapons. | MAGNETIC NORTH

DEAD SPACE

DATA SECTION

POSITION IDENTIFICATION | DATE 20 APRIL

WEAPON M 60 | EACH CIRCLE EQUALS 100 METERS

| NO. | DIRECTION/ DEFLECTION | ELEVATION | RANGE | AMMO | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | — | +90/3 | 550 | | FPL |
| 2 | R275 | +90/45 | 525 | | BARN |
| 3 | L102 | 0/28 | 425 | | ROAD JUNCTION |
| 4 | L370 | 0/12 | 375 | | BOULDER |
| | | | | | |
| | | | | | |

REMARKS: ① -4 ② TWS8/L8

DA FORM 5517-R, FEB 86

Drive the stakes firmly into the ground. Place engineer tape or luminous tape on the friendly side of the stakes to make it easier for the driver to see them during limited visibility. Place a rock at each of the front two comers of the vehicle to assist in reoccupation if the stakes are lost.

### Move into Position

If the situation permits, a ground guide can be used to assist the driver as he moves the vehicle into position.

If a ground guide cannot be used because of enemy fire, the driver moves the vehicle in parallel to the side stakes, with the front stake centered on the driver's station.

If the stakes are lost and the position is not otherwise marked, the vehicle is moved to the approximate location. The vehicle commander or gunner can use a compass to find the left or right limits. The vehicle should be moved until it is within eight inches of the exact position, if time allows.