

**UNITED STATES MARINE CORPS**  
School of Infantry  
Training Command  
PSC Box 20161  
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AM1003  
13 SEPT 2005

**STUDENT OUTLINE**

**SMAW RANGE CARD**

**1. TERMINAL LEARNING OBJECTIVE**

a. Given a designated location, a sector of fire, target reference points, an anticipated target engagement area, lensatic compass, paper, and a pencil, prepare a range card by developing a card which contains each of the required items in accordance with FM 23-34. (51TR.02.15)

**2. ENABLING LEARNING OBJECTIVES**

a. Given a designated position, paper, and pen, develop a terrain sketch in accordance with FM 23-34. (51TR.02.15a)

b. Given a designated position, lensatic compass, paper, and pen, illustrate the weapon position in accordance with FM 23-34. (51TR.02.15b)

c. Given a designated position, a sector of fire, lensatic compass, paper, and pen, illustrate distance and back azimuth to a known point in accordance with FM 23-34. (51TR.02.15c)

d. Given a designated position, a sector of fire, lensatic compass, paper, and pen, illustrate left and right lateral limits in accordance with FM 23-34. (51TR.02.15d)

e. Given a designated position, a sector of fire, lensatic compass, paper, and pen, illustrate minimum and maximum engagement lines in accordance with FM 23-34. (51TR.02.15e)

f. Given a designated position, a sector of fire, lensatic compass, paper, and pen, illustrate dead space in accordance with FM 23-34. (51TR.02.15f)

g. Given a designated position, a sector of fire, an anticipated target engagement area, lensatic compass, paper, and pen, illustrate an anticipated target engagement area in accordance with FM 23-34. (51TR.02.15g)

h. Given a designated position, a sector of fire, an anticipated target engagement area, target reference points, lensatic compass, paper, and pen,

illustrate target reference points in accordance with FM 23-34. (51TR.02.15h)

i. Given a designated position, a sector of fire, an anticipated target engagement area, target reference points, lensatic compass, paper, and pen, annotate marginal data in accordance with FM 23-34. (51TR.02.15i)

j. Given a designated position, lensatic compass, paper, and pen, illustrate magnetic north in accordance with FM 23-34. (51TR.02.15j)

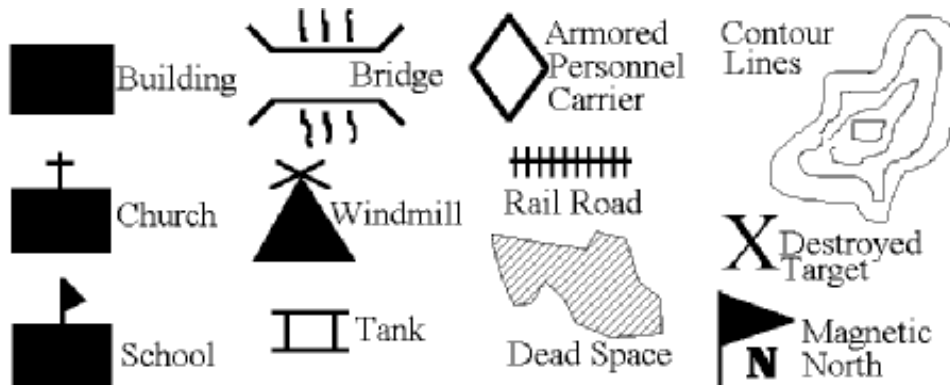
**1. PURPOSE OF A RANGE CARD.** The purpose of a range card is to enable the gunner to quickly and accurately determine the information necessary to engage targets. It is an oriented sketch of your assigned sectors of fire. It shows the position of the weapon, magnetic north, range, elevations and directions to prominent terrain features, and probable targets. It may also display pre-planned call for fire targets for suppressive fires from supporting arms, if necessary.

a. A range card makes it possible to fire during periods of poor visibility because you already have an excellent understanding of your engagement area. It also allows you to pass on your extensive knowledge of the area to Marines relieving you. The commanding officer of your unit will use all range cards to coordinate the fires of all his supporting weapons. This is why two copies of a range card will always be made. One stays in the weapon position, and the second is given to your squad leader to pass up the chain of command. Your squad leader will make a copy for his squad sketch. A range card also allows someone who does not have an intimate knowledge of the capabilities of your weapon, to understand how you intend to engage the enemy from that particular position. Finally, a range card allows higher headquarters the opportunity to see the "lay of the land" as seen through the eyes of the local unit.

b. Once your squad leader places you in your firing position, he will assign you a sector of fire. Once he has done this, it is your responsibility to prepare your range card. As you begin your range card, work should commence on your fighting position.

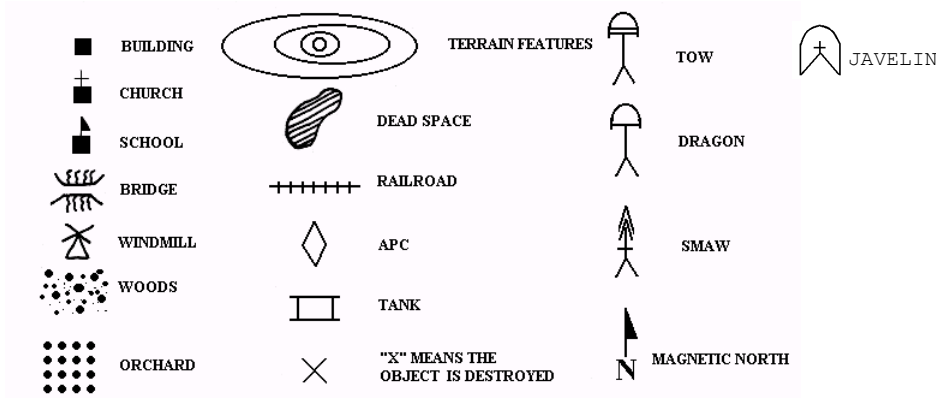
c. Being that your expedient range card is unique to a particular weapon, some symbols will not be readily apparent to those out the anti armor community. However, most symbols used are standard military symbols, so most Marines who look at your range card should be able to read most of it.

d. Common anti-armor weapons symbols designate which type of weapon is represented by the range card. Notice that they all look somewhat similar, but are different enough to readily distinguishes the type of weapon. Different symbols allow higher headquarters to effectively plan how they will conduct anti-armor operations.

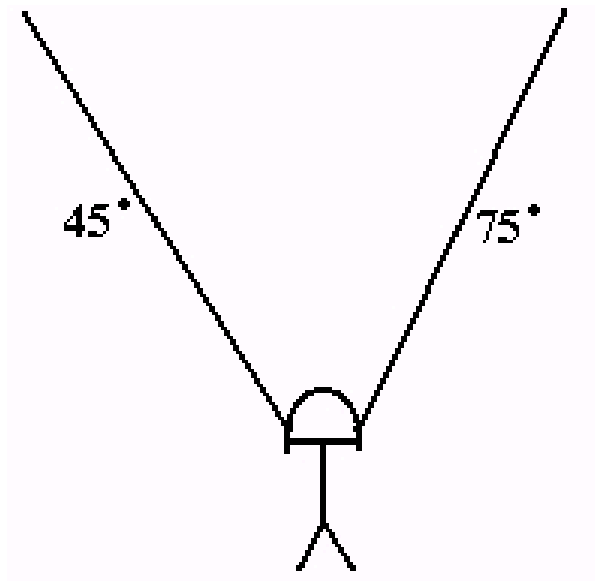


2. **RANGE CARD SYMBOLS.** There are several symbols that must be on an range card. These items make it easier to accurately depict the terrain that you are on.

a. **The Weapons Symbol and Back Azimuth to a Known Point.** The weapons symbol confirms the type of weapon system depicted in the range card. Your symbol will have the six digit grid of the position right below it. The back azimuth to a known point is a readily identifiable manmade or natural terrain feature. It consists of a multi-barbed arrow from that position to you weapons symbol. It is labeled with an azimuth and distance to your weapons symbol in degrees and meters. This allows someone to find your exact firing position.



b. **Right and Left Lateral Limits.** The lateral limits show the extreme right and left edges of your engagement area. These will usually overlap with weapons to your right and left. These are labeled with the azimuth (in degrees), of your sector of fire.



c. The Maximum/Minimum Engagement Lines. The maximum engagement line displays how far out into your engagement area you can effectively engage targets. The line is usually the maximum effective range of the weapon, but terrain and the tactical situation may dictate otherwise. Most minimum engagement lines display the closest range that the missile or rocket will automatically arm itself.

**MAXIMUM ENGAGEMENT LINE**



d. Anticipated Target Engagement Areas. This symbol represents the most likely enemy avenue of approaches or areas that you feel the enemy may occupy within your sectors of fire.

**69° 450 m**



e. Dead Space. Dead Space is any area within your left and right lateral limits that you cannot destroy with your line of sight weapon. All area past your maximum engagement line is dead space regardless of how flat the terrain is. The area immediately behind hills, buildings, and trees is dead space. Depending on the situation, shadows may be considered dead space for a short time. Additionally, everything between you and the minimum engagement line is also dead space. Do not draw a continuous line around your dead space.

f. Target Reference Points. Are obvious natural or man made features within your sectors of fire, which you or higher headquarters can use as a ready reference point to locate targets. Target reference points can also be used to control indirect fire missions. It is labeled with an azimuth in degrees, from your position and distance in meters, from your position. Target reference points maybe given an alphanumeric designation (i.e. AB1001) by higher headquarters if they decided to use it as an on call target. Depending on the type of terrain you are in, you may or may not be able to designate a TRP.

**TRP 69° 450 m LC001**

g. Magnetic North Seeking Arrow. The magnetic north seeking arrow points out Magnetic North and helps to orientate the range card.



h. Marginal Data. Indicates the type of position, and information pertaining to the unit that constructed the range card. Consists of the type of position (i.e. Primary, Alternate, Supplementary), gun team number, squad, platoon, company, time, and date. **NEVER** indicate any unit designator higher than company level.

**PRIMARY POSITION**  
**1<sup>ST</sup> TEAM ASSAULT SEC**  
**010913/1532**

**3. PREPARATION OF A RANGE CARD**. Take maximum advantage of the military aspects of standard terrain, key terrain, observation, cover and concealment, obstacles, and avenues of approach (KOCOAs). These are considered the fundamentals of the defense and are applicable to all tactical levels.

a. Draw your weapon symbol at the bottom of your paper. Orient the sketch to magnetic north. Locate a prominent terrain feature and shoot an azimuth to it and convert to a back azimuth. Draw a line with arrows to your position from that terrain feature and label it with the back azimuth and distance. This is your known point.

b. Positively locate the position by recording the six-digit grid for your position below the symbol. Next draw your left and right lateral limit with azimuths, magnetic North arrow, maximum and minimum engagement lines and the marginal data. Be sure to specify whether it is the primary, alternate, or supplementary position.

c. Identify the features that you will use for your target reference points. Label the target reference points with TRP and a number, the distance, and azimuth from your position.

d. Identify anticipated target engagement areas. Draw a bold, open-end arrow, along the assumed enemy route of march and label it as anticipated target engagement area (ATEA).

e. Draw in all dead space within your sector of fire. Ideally, arrangements should be made to cover these areas with indirect fire, such as mortars or artillery.

#### **4. SPECIAL CONSIDERATIONS**

a. Range cards prepared for the SMAW, Javelin, and TOW are very similar since they are all designed to stop armor with a direct fire, man portable weapon. The major differences in their range cards are the distances of maximum and minimum engagement lines. These will usually reflect the individual weapon's different maximum and minimum effective ranges.

b. Range cards are high on the list of priorities of things to do when occupying a firing position. The cards will often be drawn before you prepare and camouflage your fighting position. It should take you no more than 15 minutes to prepare the two copies of your range card. However, a range card is never "done". Once all other tasks concerned with preparing for the enemy are completed, you should return to your range card and improve it.

**REFERENCES. FM 23-34 TOW Weapon System page C-1 through C-10**