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# FM 17-12-8

## LIGHT CAVALRY GUNNERY

Headquarters, Department of the Army



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## LIGHT CAVALRY GUNNERY

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## Preface

This manual provides a systematic way to train light cavalry weapon system proficiency. It describes light cavalry gunnery principles, methods, and techniques and includes an application of combined gunnery skills in basic and intermediate gunnery tables and advanced gunnery tables. The tasks, conditions, and standards outlined in the tables should be used to evaluate individual, crew, and section gunnery proficiency. These tables present a more complete way to train light cavalry crews and sections in gunnery.

This manual is designed for vehicle commanders, platoon sergeants, and unit staff of light cavalry units to develop gunnery programs to attain and sustain combat readiness. It is a ready reference for unit commanders, vehicle commanders, and gunners. It may also be used by combat support and combat service support units, and armor and mechanized infantry HMMWV scout platoons.

The proponent of this publication is HQ TRADOC. Send changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward it to Commander, United States Army Armor Center, ATTN: ATZK-TDD-G, Fort Knox, Kentucky 40121-5212. E-mail: CGD@ftknox-dtdd-emh5.army.mil.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

## Chapter 1

# Introduction

Future battles will be mobile and violent, with emphasis on rapid fire capability, increased speed, and maneuverability. To defeat the threat and survive on the battlefield, light cavalry crews must be well trained and prepared to take maximum advantage of these capabilities.

To defeat the threat force, light cavalry crews must have a thorough knowledge of their functional capabilities, use of indirect fire, techniques of acquiring targets, and effective use of all crew-served weapons. Additionally, light cavalry crews must develop and sustain tactical crew skills that will allow them to maneuver effectively and survive on the battlefield. This combination of crew gunnery and tactical skills is essential for total weapon system proficiency.

## Purpose

The gunnery tactics, techniques, and procedures in this manual are unique to light cavalry units. This manual describes system features, engagement techniques, preliminary gunnery training, gunnery skills tests, gunnery tables, and qualification standards. When the procedures in this manual conflict with technical manual procedures, the technical manuals should be followed.

This manual is intended to be a guide; units may modify the gunnery program to meet local training constraints. Gunnery tables are prepared for live fire, MILES, engagement skills trainers (EST), and other training devices. Training devices may not be used on qualification tables. Units must evaluate training to make sure it follows the building-block principles and adheres to sound training policy.

## Scope

This manual outlines light cavalry gunnery tables designed to attain and sustain gunnery proficiency at crew through section levels. It consists of 13 chapters and 4 appendixes.

The first 11 chapters provide combat training principles, techniques, and exercises for light cavalry crews. Light cavalry gunnery and tactical skills are discussed in detail to promote uniformity and maintain high standards of proficiency. Proper application of these techniques will ensure the most effective use of the weapon system in training or in combat. Descriptions include how to—

- Detect, acquire, identify, and classify targets.
- Select the correct round of ammunition to match the target.
- Use direct-fire techniques.
- Operate machine guns (an explanation of their functions and role during direct-fire engagements is included).
- Develop a light cavalry gunnery training program.
- Establish new training sites for light cavalry combat training.

The remaining chapters include the light cavalry gunnery tables for the M2 HB caliber .50 machine gun, the MK 19 40-mm grenade machine gun, and the TOW weapon system; the scout section tables; the tasks, conditions, and standards for the scout section gunnery skills test and the TOW section gunnery skills test; scout section gunnery tactical tasks; and information about the engagement skills trainer.



The tactical tasks outlined in Appendix C are used with the scout section tables (advanced gunnery tables) in Chapter 13. Integration of the tactical and gunnery tasks maximizes the training effectiveness of the tables. The relationship between gunnery and tactics is shown in the following table:

<b>GUNNERY AND TACTICS</b>	
<p><b>Gunnery tables provide¾</b></p> <ul style="list-style-type: none"> <li>• Manipulation training.</li> <li>• Crew duties.</li> <li>• Standard fire adjustment.</li> <li>• Day and night firing.</li> <li>• Ammunition selection.</li> <li>• Fire commands.</li> <li>• Realistic target signatures.</li> </ul>	<p><b>Tactical tables provide¾</b></p> <ul style="list-style-type: none"> <li>• Tough acquisition problems.</li> <li>• Realistic targets and target signatures.</li> <li>• Shoot-back targets.</li> <li>• Evasive targets (OPFOR).</li> <li>• Tactical maneuvering.</li> <li>• Potential to vary vulnerability.</li> <li>• Full 360-degree range.</li> </ul>

## Chapter 2

### Weapon Systems and Ammunition Capabilities

Through its lethal weapons and maneuverability, the HMMWV provides the cavalry crew the means to survive as an effective reconnaissance element. This chapter discusses the weapon systems on the HMMWV and the capabilities of ammunition used by those weapon systems.

#### M60 7.62-mm Machine Gun

The M60 machine gun is used to engage dismounted infantry, crew-served weapons, ATGM teams, thin-skinned vehicles, and aircraft. This fully automatic machine gun fires from the open-bolt position and is belt fed, gas operated, and air cooled with fixed headspace and timing (see Table 2-1, Weapon Systems Characteristics on page 2-5).

The preferred combat ammunition mix for the M60 machine gun is four ball (M80) and one tracer (M62).

#### M240B 7.62-mm Machine Gun

The M240B machine gun is the latest version of the 7.62-mm machine gun. As units are fielded with the M240B, the M60 will be phased out.

The M240B machine gun is designed as a tripod-mounted or bipod-supported 7.62mm machine gun for use by ground forces. Like the M60, the M240B is a fully automatic machine gun, fires from the open-bolt position, and is belt fed, gas operated, and air cooled with fixed headspace and timing. The M240B has a butt stock and can be ground mounted on the M122A1 tripod mount (refer to TM 9-1005-245-13&P) or integral bipod. (See Table 2-1, Weapon Systems Characteristics on page 2-5.)

M60/M240B 7.62-MM MACHINE GUN	
AMMUNITION	USE
M61 Armor-piercing	Against light-armor targets.
M62 Tracer	For observation of fire, incendiary effects, signaling, and training.
M80 Ball	Against light, materiel targets and personnel, and for range training.
M172 Dummy	During mechanical training.
M82 Blank	During training when simulated live fire is desired. (A blank firing attachment must be used to fire this ammunition.)

## M2 HB Caliber .50 Machine Gun

The M2 HB machine gun is used to engage dismounted infantry, crew-served weapons, ATGM teams, light-armor vehicles, and aircraft. The M2 fires from the closed-bolt position and is belt fed, recoil operated, air cooled, and crew operated. The gun is capable of single shot and automatic fire (see Table 2-1, Weapon Systems Characteristics on page 2-5).

The preferred combat ammunition mix for the M2 HB machine gun is four (API-M8) and one (API-T-M20). Maximum effective range is 1,830 meters.

M2 HB CALIBER .50 MACHINE GUN	
AMMUNITION	USE
M2 Ball	In marksmanship training against personnel and light, materiel targets.
M1 Tracer	To aid in observing fire. Secondary purposes are for incendiary effect and signaling.
M2 Armor-piercing	Against armored aircraft, light-armor vehicles, concrete shelters, and other bullet-resisting targets.
M1 Incendiary	Incendiary effect, especially against aircraft.
M8 Armor-piercing	Combined armor-piercing and incendiary effect.
M20 Armor-piercing	Combined armor-piercing and incendiary effect, with the additional tracer feature.
M903 SLAP	Saboted, light-armor penetrating.
M962 SLAP	Saboted, light-armor penetrating, with tracer.
M1 Blank	For simulated fire (contains no bullet).
M2 Dummy	For training (completely inert).

## MK 19 40-mm Grenade Machine Gun

The MK 19 is used against slow-moving, hovering, or low-flying hostile rotary-wing aircraft; dismounted infantry; and light-armor vehicles. The MK 19 automatic fires from the open-bolt position and is belt fed, blowback operated, and air cooled (see Table 2-1, Weapon Systems Characteristics on page 2-5).

The MK 19 fires the following cartridges: M430/M430A1 high-explosive, dual-purpose grenades, M383 high-explosive grenade, M385/M918 training practice, and M922/M922A1 dummy rounds (see the table below for a description of the characteristics of these cartridges).

<b>MK 19 40-MM GRENADE MACHINE GUN</b>	
<b>AMMUNITION</b>	<b>CHARACTERISTICS</b>
M430/M430A1 High-Explosive Dual-Purpose Grenades	<p>The M430 and M430A1 are designed to penetrate armor and inflict personnel casualties.</p> <ul style="list-style-type: none"> <li>• Identification: Olive drab with yellow-olive and yellow markings.</li> <li>• Fuse: PIBD M549.</li> <li>• Filler: Composition B.</li> <li>• Arming distance: 18 to 30 meters.</li> <li>• Kill radius: Approximately 7 meters.</li> <li>• Wound radius: Approximately 15 meters.</li> <li>• Maximum range: 2,200 meters.</li> <li>• Maximum effective range: 1,200 meters.</li> </ul>
M383 High-Explosive Grenade	<p>The M383 is designed to inflict personnel casualties. It is packed in linked, 48-round belts.</p> <ul style="list-style-type: none"> <li>• Fuse: PD M533.</li> <li>• Filler: Composition A5.</li> <li>• Arming distance: 18 to 36 meters.</li> <li>• Blast radius: 15 meters.</li> <li>• Maximum range: 2,200 meters.</li> </ul>
M385/M918 Training Practice	<p>The M385 is an inert round with a propellant charge. The M918 is a flash-bang round with a propellant charge.</p> <ul style="list-style-type: none"> <li>• Propellant: M2.</li> <li>• Maximum range: 2,200 meters.</li> <li>• Maximum effective range: 1,500 meters.</li> </ul>
M922/M922A1 Dummy Rounds	<p>The M922/M922A1 rounds are totally inert. They are used to check gun functioning and train gun crews. They are issued only to armorers.</p>

## Tube-Launched, Optically Tracked, Wire-Guided (TOW) Weapon System

The TOW weapon system consists of a launcher with tracking and control capabilities, and a missile encased in a launch container. The launcher is equipped with self-contained, replaceable units (see Table 2-1, Weapon Systems Characteristics on page 2-5).

The TOW weapon system can be employed in all weather conditions, if the gunner can see his target through the optical sight or night sight. The TOW is primarily an antitank weapon system, used to provide long-range engagement of all known armored targets. It also provides a long-range assault capability against heavily fortified bunkers, pill boxes, and gun emplacements.

There are six missiles available for the TOW:

- BGM-71A Basic TOW (range 3,000 meters).
- BGM-71A-1 Basic TOW Extended Range (range 3,750 meters).
- BGM-71C Improved TOW (range 3,750 meters, and larger warhead).

- BGM-71D TOW 2 (range 3,750 meters, warhead standoff).
- BGM-71E TOW 2A (range 3,750 meters, extended warhead standoff).
- BGM-71F TOW 2B (range 3,750 meters, top attacking warhead).

**Note.** All missiles have a minimum arming range of 65 meters, with the exception of the BGM-71F TOW 2B, which has a minimum arming range of 150 to 300 meters.

The TOW missiles listed below may be fired from an unprotected system. These systems include helicopters, HMMWVs, and ground-launched systems.

TOW WEAPON SYSTEM	
MISSILE	DODIC
<b>Standard:</b>	
BGM-71A-2A	PE03
BTM-71A-2B	PV04
<b>Extended Range:</b>	
BGM-71A-3A	PE04
BTM-71A-3A	PE64
BTM-71A-1B	PV05
BTM-71A-3B	PV39
<b>Improved:</b>	
BGM-71C-2B	PV03
BGM-71C-1A	PE05
BGM-71C-4B	PV45
<b>TOW 2:</b>	
BGM-71D-1B	PV01
BGM-71D-38	PV26
BTM-71D-1B	PV02
<b>TOW 2A:</b>	
BGM-71E-1B	PE96
BGM-71E-3B	PV47
<b>TOW 2B:</b>	
BGM-71-F	PV18
BGM 71-F-1	PV82

## Weapon Systems Characteristics

The following table depicts the characteristics of the weapon systems discussed in this chapter.

<b>WEAPON SYSTEMS CHARACTERISTICS</b>					
<b>WEAPON</b>	<b>M240B</b>	<b>M60</b>	<b>M2 HB</b>	<b>MK 19</b>	<b>TOW</b>
Weight (pounds)	27.6	23	84	76	93 (with overpack)
Length (inches)	49	43.5	65.13	43	57.3 (with overpack)
Maximum Range (meters)	3,725	3,725	6,767	2,212	3,750
Arming Range (meters)	NA	NA	NA	18 to 30	65
Minimum Safe Range (meters)	NA	NA	NA	310	NA
<b>RATE OF FIRE</b>					
Cyclic (rpm)	650 to 950 (firing at 950 rpm will cause damage to the weapon)	550* approximate	500	375	NA
Rapid (rpm)	200* (2 to 3 sec between bursts) (change barrel every 2 min)	200* (6 to 9 rds per burst at 2 to 3 sec intervals)	40* (6 to 9 rds per burst at 5 to 10 sec intervals)	60	NA
Sustained (rpm)	100* (4 to 5 sec between bursts) (change barrel every 10 min)	100* (4 to 5 sec between bursts)	40*	40	NA
Slow (rpm)	NA	NA	<40* (6 to 9 rds per burst at 10 to 15 sec intervals)	NA	NA
Single Shot	NA	NA	(One round every 2 to 3 seconds, as dictated by target)	NA	NA
<b>EFFECTIVE RANGE</b>					
Area (meters)	1,800	1,100	1,829	2,212	NA
Point (meters)	800	900+	1,200	1,500	3,750
Moving (meters)	NA	NA	NA	NA	3,750
<b>AMMUNITION</b>					
Example Load (rounds)	600	600	NA	NA	NA

\* With barrel change.

**Table 2-1. Weapon Systems Characteristics.**

## **Chapter 3**

### **Target Acquisition**

Target acquisition is the timely detection, location, and identification of targets in enough detail to attack accurately by either direct fire or supporting weapons. The target acquisition process is a series of progressive and interdependent actions by which the crew acquires targets. These actions are: crew search, detection, location, identification, classification, and confirmation. All crew members observe continuously. Effective target acquisition for a light cavalry crew requires the combined effort of all crew members.

### **Crew Search**

Crew search (observation) is the act of watching the area of operations carefully. Crew members use the unaided eye, as well as optics, to search or scan the predetermined sector to acquire targets.

### **SECTORS OF OBSERVATION**

Sectors of observation are areas assigned to each crew member for target acquisition. The vehicle commander is responsible for 360-degree security of his vehicle. To ensure that all-around coverage of the battlefield is maintained, the vehicle commander assigns each crew member a specific sector of observation. The vehicle commander must understand the limitations of NBC operations and adjust the sectors of observation to compensate for them.

### **DISMOUNTED OBSERVER**

The use of a dismounted observer is the best way to cover the assigned sector of observation and maintain the smallest vehicle signature possible. The dismounted observer should be used when the vehicle is in the hide position, to observe deadspace and provide local security while halted. Depending on the area(s) of responsibility, more than one dismounted observer position may be required.

### **GROUND-SEARCH TECHNIQUES**

Crew members must scan their areas of observation at all times to detect targets or possible target locations. Three ground-search techniques (rapid scan, slow scan [50 meter], and detailed search) enable crew members to locate targets quickly. Crew members may use all three techniques, simultaneously, using the unaided eye, binoculars, or other optics, during good and limited visibility conditions. These techniques are modified at night by using the off-center vision method.

### RAPID-SCAN TECHNIQUE

The rapid-scan technique is used to detect obvious signs of enemy activity quickly (see Figure 3-1). It is usually the first method used, whether stationary or moving. The vehicle commander may use optics or the unaided eye; the gunner may use TOW sights (day or thermal mode), if available, in low magnification, or the unaided eye. To search using the rapid-scan technique—

- Start in the center of the sector, and rapidly scan from the nearest to the farthest visible point.
- Then, orient left or right, and conduct a rapid scan, near to far. (This sweep must overlap the center area of the previously scanned sector.)
- Once one side (front center) is completed, scan the remaining side in the same manner.

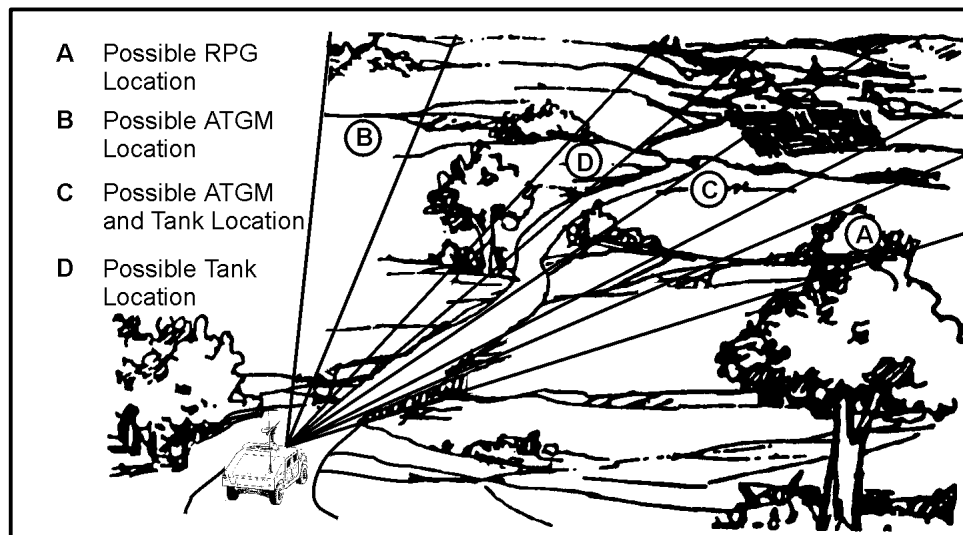


Figure 3-1. Rapid-Scan Technique.

### SLOW-SCAN (50-METER) TECHNIQUE

If no obvious targets are identified while using the rapid-scan technique, crew members will conduct a more deliberate scan of the terrain by using the optics (day or night mode) or binoculars—the slow-scan (50-meter) technique is used for this task (see Figure 3-2). Slow scan is best used by the vehicle commander or gunner when in a defensive position or from a short halt. To search using the slow-scan technique—

- Search a strip of the target area 50 meters deep from right to left, pausing at short intervals to give the eyes time to focus.
- Then, search a strip farther out from left to right, overlapping the first area scanned.
- Continue this method until the entire assigned sector has been searched.

**Note.** Thoroughly search suspicious areas or possible target signatures using the detailed-search technique. High magnification is used for an intense observation of potential targets when using the UAS12 or AN/TAS 4A.





Figure 3-2. Slow-Scan (50-Meter) Technique.

### DETAILED-SEARCH TECHNIQUE

If no targets are found using the rapid-scan or slow-scan techniques, and time permits, crews should use the optics (day and night) to make a careful, deliberate, or more detailed search of specific areas in their assigned sector. This detailed-search technique is also used to search small areas or locations with likely or suspected avenues of approach (see Figure 3-3). To search using the detailed-search technique—

- Concentrate on one specific area or location, and study that area intensely.
- Look for direct and indirect target signatures, scanning clockwise around the focal point (terrain feature) of the area. The following are examples of target signatures:
  - Dust created by movement of vehicles.
  - Tracks or tire marks.
  - Reflections (flash) from glass or metal.
  - Angular objects that do not conform to the surrounding area.
  - Vegetation that appears out of place.
  - Flash or smoke from a weapon or missile.
  - Entrenchments or earthworks.

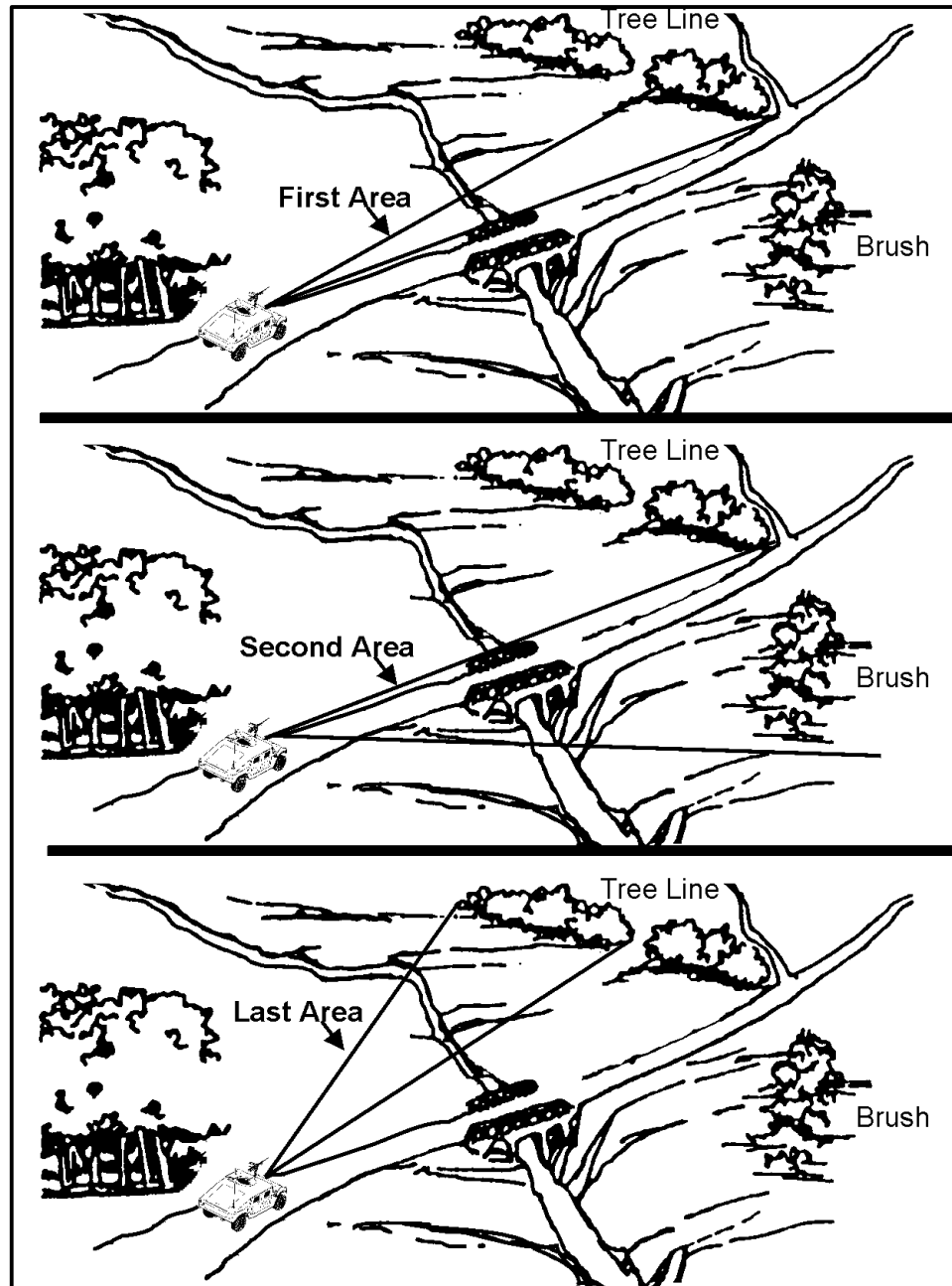


Figure 3-3. Detailed-Search Technique.

#### OFF-CENTER VISION METHOD

Day and night scanning techniques (rapid, slow, and detailed) are similar, with one exception. Do not look directly at an object using daylight optics or the unaided eye at night; look a few degrees off to the side of the target object. When scanning with off-center vision, move the eye in short, abrupt, irregular movements. Pause a few seconds at each likely target area to detect a target or any movement. If a possible target is detected, use off-center vision to observe it. Frequent eye movement is necessary to prevent object fade-out while observing the object. Cupping the hands around the eye will also increase night vision.

## AIR-SEARCH TECHNIQUES

While scanning their assigned sector for ground targets, crew members must also be aware of air targets. To aid in the detection of air targets, crews should use the flat-terrain scan and hilly-terrain scan techniques (see Figure 3-4). Both of these techniques are based on the slow-scan (50-meter) technique. When using an air-search technique, crew members should always search far to near.

### FLAT-TERRAIN SCAN TECHNIQUE

In flat terrain, search the horizon by moving the eyes in short movements from object to object (see Figure 3-4).

### HILLY-TERRAIN SCAN TECHNIQUE

In hilly terrain, search the sky beginning just below the horizon and moving upward (see Figure 3-4). Use prominent terrain features as points of reference to ensure overlapping areas of search.

**Notes.** When using the air-search technique, concentrate just below the tops of the trees or vegetation to detect helicopters in hide positions.

Ground- and air-search techniques may be combined to allow crew members to scan for targets in the air and on the ground at the same time. Combinations used will depend on the area of operations and METT-T.

Air search at night is similar to searching for ground targets at night.

Threat aircraft operate in pairs. If aircraft are acquired, a second pair of aircraft should be expected, and possibly another pair. There may be one to four pairs of aircraft.

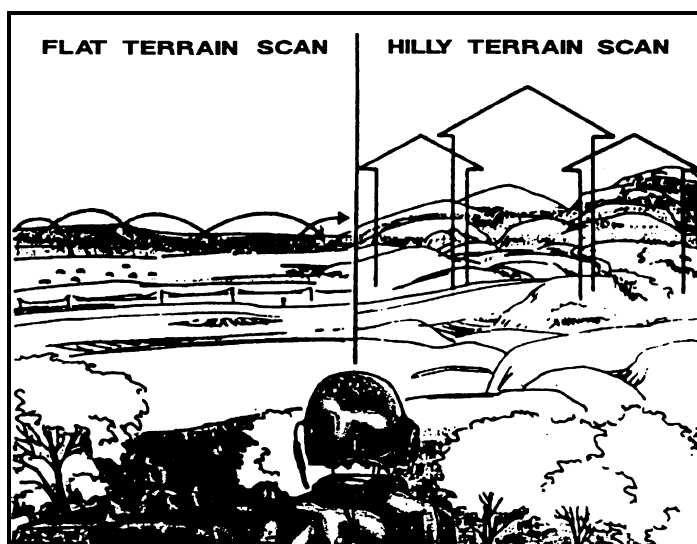


Figure 3-4. Air-Search Techniques.

## CREW SEARCH TIPS

Crew search, or observation, is the act of carefully viewing or watching the area of operation, using search and scan techniques and sectors of observation, to acquire targets. Target search is continuous. Any target(s) missed on the first or second scan may be seen on the third or fourth scan.

Initial scanning is always done without optics first, then with optics (such as binoculars or sights). All of the STANO devices on the vehicle can be used to acquire targets. These devices include binoculars, night-vision goggles, starlight scopes, AN/TAS-5, and the TOW sights in either the day or night mode.

While on the move, the gunner should use the rapid-scan technique, constantly scanning his sector limits from the right limit to the left limit. The search should be concentrated in areas where targets are more likely to appear (such as identified avenues of approach, wood lines, and reverse slope firing positions).

Targets on the edge of the peripheral field of view are harder to detect and locate. The field of view is greatly narrowed while the crew members are wearing protective masks; therefore, the crew's ability to acquire targets during NBC conditions is limited.

## Target Detection

Target detection is the discovery of any target or object on the battlefield (such as personnel, vehicles, and equipment) of potential military significance. Target detection occurs during crew search, as a direct result of observation.

### TARGET SIGNATURES

Target signatures are indicators or clues that aid an observer in the search to detect the presence of potential targets. Most weapons and vehicles have identifiable signatures. These signatures may be the result of the design of the equipment or the environment in which the equipment is operating. For example, firing a vehicle's main weapon system could produce blast, flash, noise, smoke, and dust. The movement of vehicles through a built-up area causes more noise than the movement of the same vehicle in an open field. Different types of aircraft have different signatures (the signature of a hovering helicopter is not the same as that of a fixed-wing aircraft). Other factors (such as visibility, temperature, and weather conditions) also affect target signatures.

Look for targets where they are most likely to be employed. Tracked vehicle signatures are most likely to be detected in open areas and rolling terrain. For threat antitank positions, visually cover primary avenues of approach where tanks and APCs are likely to be used. Look for helicopters on the reverse side of woodlines, ridgelines, and significant folds in the terrain. These are only a few examples of signatures with which crews must be familiar. Sight, hearing, and smell can all assist in detecting signatures that will lead to target location and identification. Target signatures include—

- Soldier signatures:
  - Foxholes.
  - Broken vegetation.
  - Footprints.
  - New and old fires.
  - Small-arms weapons noise and flash.
  - Noise.
  - Trash.
- Tracked vehicle signatures:
  - Vehicle tracks on the ground.
  - Engine noise.
  - Exhaust smoke.
  - Dust clouds from movement.
  - Weapon-firing report and smoke.
  - Bright white flash at night.

- Disturbed areas of vegetation.
- Open-hatch silhouettes.

**Note.** Normally, when weather conditions permit, a tracked vehicle is more visible than the surrounding area and readily visible through passive and thermal sights.

- Antitank signatures:
  - Missile launch *swish* sound.
  - Long, thin wires from fired ATGMs.
  - Sharp crack of the ATGM being fired.
  - Destroyed armored vehicles.
- Artillery signatures:
  - Loud, dull sound.
  - Grayish-white smoke cloud.
  - Bright, orange flash and black smoke from air bursts.
  - Rushing noise several seconds before round impacts.

**Notes.** Towed artillery signatures vary according to the towing vehicle.

Self-propelled artillery has the same thermal infrared signature as tracked vehicles.

- Aircraft signatures:
  - Glare of sun reflecting off canopies, wings, and fuselages of fixed-wing aircraft, and windows and rotor blades of helicopters.
  - Aircraft noise.
  - Vapor trails from engine exhaust and fired missiles.
  - Dust and movement of foliage from hovering helicopters.
- Obstacles and mine signatures:
  - Loose or disturbed dirt in a regular pattern.
  - Destroyed or disabled vehicle that appears to have struck a mine.

## DETECTION CHALLENGES

Some targets are more difficult to detect than others. Increased crew sustainment training and greater concentration are needed to detect and locate targets. Some examples of these more difficult targets and challenges are—

- Peripheral targets (targets on the edge of the field of view).
- Targets that are camouflaged or in shadows.
- Targets that can be heard but not seen.
- Targets under less than ideal indirect fire illumination. (If the illumination is in front of the target, the resulting shadow will be darker than the target. If the illumination is behind the target [and not in position to wash out the crew's optics], the target should stand out distinctly from the background.) Always keep one eye closed during illumination search, and never look directly into the illumination source.
- Small, single targets such as lone, dismounted ATGM or RPG positions.
- Natural obstacles (weather and terrain).
- Man-made obstacles (smoke and battlefield clutter).
- Mirage effects caused by high temperatures and heat waves near the ground.

**Note.** Behavioral or physical deficiencies (fatigue, eye reaction to gun flashes) also make target detection more difficult.

## REDUCED VISIBILITY CONDITIONS

In winter, about 12 hours are spent in the dark. The threat makes the most of these conditions by moving his forces in the dark. He also digs in or continues the attack during the night. Even during the day, the threat uses every means possible to cover his intentions. Camouflaged targets in wood lines or behind buildings are difficult to acquire with day optics. These targets can sometimes be detected more easily with thermal sights or other night-vision equipment (see the Thermal Sights and Night-Vision Equipment table below); for example, a vehicle in a woodline will be seen as an irregular shape compared to surrounding vegetation. A vehicle behind a building with its engine running may give off a heat plume from the exhaust, thus alerting the crew to the target. The gunner must be able to use thermal sights, if available, to acquire targets during limited visibility and daylight. Thermal sights operate by sensing heat radiation or temperature changes. Thermal sights can sense any source of heat that is at least one degree above the surrounding temperature. Thermal sights may detect the following primary heat sources:

- Solar heat. Energy from the sun is absorbed by the exterior surface of an object. The thermal sight then senses the heat radiated from the object. During daylight, targets are hotter and easier to detect. It is necessary, as the sun goes down and the temperature drops, to note how the object's form changes.
- Fuel combustion. Heat is created through the operation of a vehicle engine. Most vehicles will show one or more image(s). Vehicles will show a plume of heat from the exhaust and another around the engine compartment.
- Friction. The moving parts of a vehicle will cause friction, which causes heat. These areas will then appear as images in the sight: tracks, road wheels, drive sprockets, and support rollers. (Vehicles driving through mud or snow will not show as sharp an image.)
- Thermal reflections. Glossy, smooth surfaces may reflect radiated heat.
- Body heat. The thermal sight also senses body heat.

THERMAL SIGHTS AND NIGHT-VISION EQUIPMENT				
EQUIPMENT	WEIGHT (pounds)	RANGE (meters) Starlight/ Moonlight	BATTERY	FIELD OF VIEW (degrees)
PVS-7A/B Goggles	1.5	150/300	BA 5567 (1 ea.) or AA (2 ea.)	40
PVS-4 Individual Sight	3.5	400/600	BA 5567 (2 ea.)	15
PAS-13 Thermal	4.13 to 4.85	Equal to or greater than weapon	BA 6847 (2 ea.)	15 15/9 9/3
TVS-5 Crew Sight	7.5	1,000/1,200	BA 5567 (2 ea.)	9
GVS-5 Range Finder	5.0	200 to 9,900	BA 6515 or BB 516	7
PVS-6 Range Finder	3.5	50 to 10,000	BA 6515 or BB 516	7
<p><b>Note.</b> There are three versions of the PAS-13, which replaces the PVS-4 and TVS-5:</p> <ul style="list-style-type: none"> <li>• Light—4.13 pounds.</li> <li>• Medium—4.33 pounds.</li> <li>• Heavy—4.85 pounds.</li> </ul>				

## Target Location

Target location is the determination of where a potential target is on the battlefield. A target is located as a result of observation and detection during crew search. Once a crew member locates a potential target, the target location must be communicated to all other personnel. Target location methods used to announce a target depend on the individual's specific position, unit SOP, and time available.

### TRACER ON TARGET METHOD

Machine gun tracers can be used effectively to designate targets for other vehicles in the area, such as, artillery forward observers or air fire support.

Limited use of this technique is recommended because it reveals the crew's position.

### CLOCK METHOD

The clock method is commonly used to get the vehicle commander or gunner on target. Twelve o'clock is based on the direction of vehicle movement while traveling, and the front of the vehicle when stationary. The vehicle commander or gunner can use the vehicle front direction to assist in accurately announcing target location. (Example: "BMP—NINE O'CLOCK.")

### SECTOR METHOD

The sector method is similar to the clock method; it is quick and easy to use. It is best used to indicate a direction from the direction of movement (moving) or vehicle orientation (stationary) using the terms center, left, right, and rear. Center sector is always to the direct front. (Example: "THREE TANKS—LEFT REAR.")

### REFERENCE POINT METHOD

The reference point method is used in conjunction with optics. The vehicle commander uses optics to determine the mil value from a terrain feature or known position. He then announces the mil value to the gunner. The gunner uses the mil reticle relationship to traverse onto the target. The key to this location method is the vehicle commander and gunner's knowledge of the mil sight relationship. (Example: "ATGM—TRP ONE FOUR—RIGHT FIVE MILS.")

The quick reference point method is used to hand over targets near a TRP. (Example: "TWO PCs—TRP ONE FOUR.")

The precise reference point method is used to locate targets accurately in relation to a known reference point.

### GRID METHOD

The grid method is the least desired technique because of the length of time it takes to bring the gunner on target. The vehicle commander receives the location of a target by map grid (usually from an observation post). He then uses his map to orient the vehicle toward the target area for the gunner.

## Target Identification

Target identification is the recognition of a potential military target as being a particular target (such as a specific vehicle by type).

As a minimum, identification must determine the target as friendly or threat (friend, foe, or neutral). Crews must know what to engage and what not to engage. The crew's only method of positive vehicle identification is visual. The crew's ability to visually identify targets greatly decreases as engagement ranges increase, camouflage techniques become more effective, and battlefield obscuration increases.



Target identification training is an essential part of any weapon system proficiency training program. Crews must be able to identify targets quickly to have the advantage of engaging first when necessary and destroying the threat at the weapon system's maximum engagement range; therefore, crews must be continuously trained and evaluated on target identification. (See the unit S2 for more information on identifying specific or additional vehicles, aircraft, and equipment likely to appear on the battlefield.)

## Battlefield Combat Identification System (BCIS)

The BCIS is a ground-to-ground, multifunctional, all-weather, day or night, question-and-answer system that provides positive identification of friendly targets equipped with BCIS. The BCIS was designed to minimize fratricide while maximizing combat effectiveness under rapidly changing and intense tactical scenarios.

**Note.** Keep in mind that, in many parts of the world, our allies and the threat employ both allied- and threat-made vehicles.

## Target Classification

Target classification is categorizing potential targets by the level of danger they represent. To defeat multiple targets on the battlefield, the *most dangerous* targets must be engaged first. This requires a quick determination of which target is the *most dangerous*. All crew members must know the engagement priorities of their unit and be able to classify priority targets; however, the vehicle commander is responsible for classifying targets and deciding what and when to shoot.

### MOST DANGEROUS TARGET

When the crew observes a threat target with HMMWV-defeating capabilities that appears to be preparing to engage them, the target is classified as *most dangerous*. This type of target is the greatest threat and must be engaged immediately. When faced with multiple *most dangerous* targets, the vehicle commander must further classify the targets based on which one of the *most dangerous* targets is the greatest immediate threat.

Generally, helicopters, tanks, and BMPs within their effective ranges have a greater kill probability against HMMWVs than handheld HEAT weapons (for example, RPGs).

Stationary targets can fire more accurately (and are therefore more dangerous) than moving targets. If two or more targets are of equal threat, engage the closest one first. When engaging more than two *most dangerous* targets from a stationary (weapons-down) position, the crew should use an alternate firing position. Smoke (indirect fire or on-board) may also be used to keep the enemy from observing the vehicle. Minimizing the number of rounds fired from any one position (primary or alternate) aids in confusing the enemy and avoiding detection caused by a firing signature.

### DANGEROUS TARGET

When the crew sees a target with HMMWV-defeating capabilities, but the target is not preparing to engage them, the target is classified as *dangerous*. This type of target should be engaged after all *most dangerous* targets have been destroyed, unless otherwise specified by the priority of engagements. Multiple *dangerous* targets are engaged in the same manner as *most dangerous* targets—engage the target that presents the greatest threat; if the targets are of equal threat, engage the closest one first.

## LEAST DANGEROUS TARGET

A target that does not have a weapon system capable of defeating a HMMWV is classified as a *least dangerous* target. Engage this type of target after all *most dangerous* and *dangerous* targets have been destroyed, unless it has a higher priority of engagement.

## ENGAGEMENT PRIORITIES

Engagement priorities are used to classify targets for specific unit objectives. Unit OPORD or SOPs will usually designate certain types of targets as priority targets for destruction. These targets are selected by the chain of command, using the following criteria, regardless of the threat to the individual vehicle, to enhance the overall success of the unit mission:

- Special targets. Targets are selected based on their impact on the total threat force (command and control vehicles, engineer assets, reconnaissance vehicles, and artillery).
- Weapon system. Targets are prioritized by specific weapon (TOW trucks would engage tank targets before trucks or BMPs).
- Unit. Targets would be assigned to specific elements (for example, “D CO DESTROY LEAD TANK PLATOON”).

Information to assist light cavalry crews in classifying targets includes—

- The most likely threat vehicles to be engaged by light cavalry.
- Threat vehicle primary and secondary armament capable of penetrating HMMWVs.
- The armor penetration data, with no angle of slope at 1,000 meters (except where noted as 500 meters).

## Target Confirmation

Target confirmation is the rapid verification of the initial identification and discrimination of the target. Confirmation is the final step in the target acquisition process, and is completed during conduct of fire. Confirmation takes place after the vehicle commander has initiated the fire command, but before the execution element as the gunner is completing his lay. (Gunnery also go through a confirmation step—as the gunner makes his final lay, he assures himself that the target is hostile.) On vehicles equipped with BCIS, the gunner interrogates the target to determine if the return signal is friend, unknown, or friend in sector.

The vehicle commander completes his evaluation of the nature of the target based on the target’s appearance and his knowledge of the tactical situation. If the vehicle commander determines that the target is hostile, he continues the engagement. If he determines the target is friendly or neutral, he commands “CEASE FIRE.” If he cannot confirm the nature of the target, he continues to observe until he can confirm the target.

If the gunner confirms the target is hostile, he completes his final lay and engages the target, on order. If the gunner determines the target is friendly or neutral, he announces his confirmation to the vehicle commander (“CONFIRMATION FRIENDLY” OR “CONFIRMATION NEUTRAL”). If he cannot determine the nature of the target, he announces “CONFIRMATION UNKNOWN.” On BCIS-equipped vehicles, the gunner announces “FRIENDLY,” or “FRIEND IN SECTOR.” The vehicle commander then determines whether to continue or terminate the engagement. (Crew duties during conduct of fire are discussed in this manual, Chapters 5 and 6.)

It is vital that the vehicle commander is kept informed on the tactical situation so that he can assist in target confirmation. For example, he must be aware of friendly element movement within or between battle positions, the forward passage of lines, status of the withdrawal of any covering force, or the movement of civilian vehicle traffic in the area of operations.

## **Acquisition Reports**

Targets acquired by a crew member must be reported to the vehicle commander immediately by crew acquisition report. This target handover technique must take place before the classification step of the target acquisition process continues. An acquisition report consists of three elements: alert (optional), description, and location (for example, “DRIVER REPORT—TWO MOVING PCs—LEFT FLANK”). The acquisition report is given internally between the crew members who can identify each other by voice recognition. Therefore, the description element of the report usually serves as the alert element also (for example, “TWO MOVING PCs—ELEVEN O’CLOCK”).

## Chapter 4

### Range Determination

Range determination significantly affects target engagement accuracy. Errors in range determination will cause more first-round misses than errors in deflection. Range errors that cause the first round to go over the target are particularly serious because the round travels over the target, and the strike of the round is obscured by the target, making subsequent adjustments extremely difficult.

The vehicle commander is responsible for navigation and command and control. He uses his knowledge of the terrain, the tactical situation, and the friendly control measures on his map and on the ground, and his experience to determine range. He can determine range using the naked eye, binoculars with mil-relation formula (the assisted method), a map, or one of the other methods of range determination; these methods can be used separately or combined.

## Primary Range Determination Methods

### NAKED EYE METHOD

The vehicle commander, with practice, can estimate distances out to about 1,000 meters. This is particularly useful in close-in, immediate engagement situations where no time is available for using sights, binoculars, or maps. A technique for accomplishing this is the football field method. The vehicle commander counts 100-meter increments, estimating the number of football fields that could fit between him and the target.

**Note.** The driver and gunner can also use this method to determine ranges to close-in targets.

The vehicle commander must be aware that light, weather, and terrain conditions can make a target look nearer or farther than it is. Conditions that make a target appear to be nearer are—

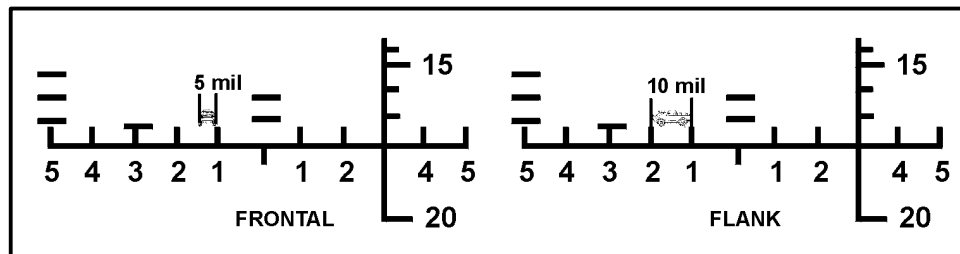
- A bright, clear day.
- Sun in front of the target.
- High elevations.
- Large targets.
- Bright colors (white, red, and yellow).
- Contrast.
- Looking across ravines, hollows, rivers, and depressions.

Conditions that make a target appear to be farther are—

- Fog, rain, haze, smoke, dusk, and dawn.
- Sun behind the target.
- Low elevations.
- Small targets.
- Dark target colors (brown, black, and green).
- Camouflaged targets (paint, netting).

## ASSISTED METHOD (BINOCULARS WITH MIL-RELATION FORMULA)

The binoculars and mil relation are used in the assisted method of range determination. To use this method, the width or height of the target must be known. Using the known threat vehicle width or height with the binocular mil scale, substitute the mil relation and compute the range. When measuring the frontal width, measure only the vehicle front slope (from left front corner to right front corner). When measuring flank width, measure the entire vehicle. Accuracy of this method depends on the target dimensions and the vehicle commander's ability to make precise measurements with the binoculars (see Figure 4-1).



**Note.** The distance between tick marks on the horizontal scale is 10 mils.

**Figure 4-1. Target Measurement Using Binocular Reticle.**

The mil is a unit of angular measurement equal to 1/6400 of a circle. There are 18 mils in one degree. One mil equals the width (or height) of 1 meter at a range of 1,000 meters. This relation is constant as the angle increases from one mil to two mils, and the range increases from 1,000 meters to 2,000 meters. Because the mil relation is constant, other units of measurement (such as yards, feet, or inches) can be substituted to express width or range; however, both width and range must be expressed in the same unit of measurement. For example, if the sides of a one-mil angle are extended to 1,000 yards, the width between the ends of the sides is 1 yard.

Since the relationship of the target width in mils ( $\text{m}$ ) to the target width ( $W$ ) in meters is constant at varying distances, accurate range determination is possible. The mil relation holds true whether the  $W$  factor is length, width, or height; therefore, the range can be determined if the target dimensions are known.

To determine the range ( $R$ ), the  $\text{m}$  and  $W$  factors must be known.

The  $\text{m}$  comes from reading the target width (height or length) on the mil scale in the binoculars. The  $W$  comes from Table 4-1, *Mil Relation for Various Targets* on page 4-3, or other vehicle identification aids (GTA 17-2-13 or FM 23-1), and is expressed in meters.

The known target width ( $W$ ) is then divided by the mil ( $\text{m}$ ) width; this equals the range ( $R$ ) factor. Multiply  $R$  by 1,000 to determine the target range. For example, a BMP is 6.75 meters long ( $W$ ). Using binoculars, the vehicle commander determines that a BMP measures 5 mils in length ( $W \div \text{m} = R$ ). Substitute the two known values for  $W$  and  $\text{m}$  and round to the nearest tenth ( $6.75 \div 5 = 1.35 = 1.4$ ). Since  $R$  is expressed in thousands of meters, multiply by 1,000 ( $1.4 \times 1,000 = 1,400$  meters, the range to the BMP).

Table 4-1 shows the results of the computation for threat vehicles at various ranges. Determine the width of the target in mils. The range to the target is listed in the column below the mil measurement. Be sure to use the correct range, depending on whether the vehicle is viewed from the front or flank.

<b>MIL RELATION FOR VARIOUS TARGETS</b>									
This table is a quick reference for determining the range to threat vehicles. Threat vehicles have been grouped, and the sizes of the vehicles have been averaged.									
<b>Group 1 (BMP, Tank, BTR, ZSU, OT MT-LB, and TAB)</b>									
Target width (mils)	5	4.5	4	3.5	3	2.5	2	1.5	1
Flank 5.5m	1,400	1,600	1,800	2,000	2,300	2,800	3,400	4,600	6,900
Front 3.0m	600	700	800	900	1,000	1,200	1,600	2,000	3,000
<b>Group 2 (BMD and BRDM)</b>									
Target width (mils)	5	4.5	4	3.5	3	2.5	2	1.5	1
Flank 5.5m	1,200	1,300	1,400	1,600	1,800	2,200	2,800	3,800	5,500
Front 2.35m	400	500	600	700	800	1,000	1,200	1,600	2,400
<b>Group 3 (HIND-D Helicopters)</b>									
Target width (mils)	22.5	20	17.5	15	12.5	10	7.5	5	2.5
Flank 17.255m	800	900	1,000	1,200	1,400	1,800	2,400	3,600	7,000
Target width (mils)	5	4.5	4	3.5	3	2.5	2	1.5	1
Front 6.9m	1,400	1,600	1,800	2,000	2,400	2,800	3,600	4,600	6,900

**Table 4-1. Mil Relation for Various Targets.**

## MAP METHOD

The map method can be used to determine range; however, it is the slowest method and should only be used during defensive operations, when time is available. To use the map method, the vehicle commander measures the distance from his known location to the target's location on the map to determine range within 200 meters. This method requires the vehicle commander to constantly track his location and rapidly determine the location of the target vehicle using six-digit grid coordinates. The map method should be used during planning by predetermining the location of engagement areas and suspected enemy positions, providing the vehicle commander reference points to determine range. This method is most commonly used in defense for determining range for sector sketches and platoon fire plans.

## Other Methods

### TARGET REFERENCE POINTS

TRPs are used as fire control measures for both direct and indirect fire, and are entered in the sector sketch to help the vehicle commander determine range and control his fires.

### RANGE CARDS

The primary use of the range card is to assist the crew in engaging targets during limited visibility. The vehicle commander may also use the range card to determine range, since ranging data is recorded on the range card.

### LASER RANGE FINDER

Laser range finders, such as the AN/GVS-5 and PVS-6, are the quickest and most accurate devices available to determine range.

## Chapter 5

### Fire Commands

Fire commands are given to coordinate crew efforts and deliver effective fire on a target. Fire commands reduce confusion and deliver all required information necessary to engage the target.

This chapter discusses the various elements of a fire command, other types of fire commands, and crew duties in response to a fire command.

### Elements of a Fire Command

The six elements of a fire command are: alert, weapon/ammunition, description, range, direction, and execution. These elements provide the crew with the essential information to engage the target.

**Note.** All elements of the fire command, except for the command of execution, may be given by the vehicle commander or gunner.

#### ALERT

The alert element of the fire command alerts the crew to an impending engagement. It consists of the following terms:

- M2, MK 19, and M60/M240B crews announce “GUNNER.” (This element is omitted if the gunner initiates the engagement.)
- TOW crews announce “SQUAD.”

#### WEAPON/AMMUNITION

The weapon/ammunition element of the fire command tells the crew and gunner the type of weapon and ammunition to use for the engagement. It is omitted if only one weapon system is available. Weapon/ammunition terms are:

- “MACHINE GUN.”
- “MISSILE.”

#### DESCRIPTION

The description element of the fire command tells the gunner what type of target to identify and engage. If there are multiple targets, the commander designates which target is to be engaged first (for example, “TWO TRUCKS—LEFT TRUCK”). Most targets may be designated by one of the following terms:

FIRE COMMANDS	
TYPE OF TARGET	TERM
Tank or tank-like target.	“TANK.”
IFV or APC.	“PC.”
Nonarmored vehicle or wheel vehicle.	“TRUCK.”
Dismounted infantry.	“TROOPS.”
Helicopter.	“CHOPPER.”

## DIRECTION

The direction element of the fire command tells the crew and gunner the general direction to the target. This element may be given using one or a combination of the following methods.

### CLOCK METHOD

The clock method is based on which way the vehicle is facing, the front of the vehicle being twelve o'clock. Example: "ONE O'CLOCK."

### SECTOR METHOD

The sector method is best used to indicate a direction from the direction of movement or vehicle orientation using the terms center, left, right, and rear. Center sector is always the direct front. Example: "RIGHT FRONT."

### REFERENCE POINT METHOD

The reference point method is used to hand over targets near a TRP. It can also be used to pinpoint targets at long ranges using a mil shift from a known point or terrain feature (this requires the vehicle commander and gunner to be familiar with the mil reticle relationship of the optics in use). Example: "TRP TWO."

## RANGE

The range element of the fire command tells the crew and gunner what range to set on the weapon site. Machine gun crews should use this element if the gunner cannot accurately determine the range to the target. This element is not used with the TOW. The following are examples of range terms:

FIRE COMMANDS	
RANGE	TERM
1,000 meters.	"ONE THOUSAND."
1,200 meters.	"ONE TWO HUNDRED" or "TWELVE HUNDRED."

## EXECUTION

The execution element of the fire command gives the final authorization to engage the target. Only the vehicle commander can give the execution command. Examples: "FIRE" and "AT MY COMMAND."

## TERMINATION OF ENGAGEMENT

Although this is not an element of a fire command, every engagement must be terminated. The vehicle commander announces "CEASE FIRE" to end an engagement. The vehicle commander has overall responsibility of the vehicle and is still responsible for terminating the engagement.



## COMMON TERMS OF FIRE COMMAND ELEMENTS

The following common terms are used to provide instruction to crew members not directly involved with the engagement, or to lessen confusion during the engagement:

FIRE COMMANDS	
IDENTIFIED	The gunner announces "IDENTIFIED" when he has the target in sight and is preparing to engage. This term is required when the vehicle commander initiates the fire command, and should occur prior to the execution command.
ON THE WAY	The gunner must announce "ON THE WAY" prior to firing.
CEASE FIRE	The vehicle commander or gunner must announce "CEASE FIRE" when they observe target destruction or when the vehicle commander wishes to terminate or interrupt the engagement.
CEASE TRACKING	"CEASE TRACKING" is announced to terminate a TOW engagement during a multiple target engagement. The crew prepares for an immediate reload drill.
CEASE TRACKING, OUT OF ACTION	"CEASE TRACKING, OUT OF ACTION" is announced to terminate a TOW engagement for the final time. This tells the crew that an immediate reload will not be necessary.
BACKBLAST AREA CLEAR	Any crew member, to ensure that the backblast area is clear prior to giving the execution command, announces "BACKBLAST AREA CLEAR."
TRAVERSE, SEARCH, Z, OR Z-PATTERN	If the vehicle commander wants the gunner to use a specific method of engagement, he announces "TRAVERSE, SEARCH, Z, OR Z-PATTERN" prior to the execution command.
MISCELLANEOUS COMMANDS TO THE DRIVER	Other commands to the driver, used to facilitate vehicle movement before, during, and after an engagement, include: <ul style="list-style-type: none"> <li>• "DRIVER MOVE UP."</li> <li>• "DRIVER BACK."</li> <li>• "DRIVER STOP."</li> <li>• "DRIVER SEEK HULL DOWN."</li> <li>• "DRIVER MOVE OUT."</li> </ul>

## Types of Fire Commands

### INITIAL FIRE COMMAND

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

### INITIAL FIRE COMMAND FOR MACHINE GUN CREWS

For the machine gun crews, the vehicle commander must alert the crew and give the target description, direction, and execution. He should add the range element if he feels it is necessary to achieve first round hit and if time permits for accurate range estimation. (The range element is usually added during defensive engagements.)

SAMPLE MACHINE GUN COMMAND		
Element	Commander	Gunner
Alert.	"GUNNER."	
Weapon/Ammunition.	(omitted)	
Description.	"PC."	
Range.	(optional)	
Direction.	"ONE O'CLOCK."	
		"IDENTIFIED."
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE FIRE."	

### REDUCED FIRE COMMAND

If the gunner identifies a threat target, he can initiate a reduced fire command by giving an acquisition report, consisting of the target description and direction. Once the gunner gives the acquisition report, the vehicle commander must confirm the target and give the execution command before the gunner can engage the target. If the vehicle commander is manning the weapon, he may use a reduced fire command. The vehicle commander does not have to announce "FIRE," but he must announce "ON THE WAY," subsequent to firing.

SAMPLE REDUCED FIRE COMMAND BY GUNNER		
Element	Commander	Gunner
Alert.	(omitted)	
Weapon/Ammunition.	(omitted)	
Description.		"PC."
Range.		(optional)
Direction.		"ONE O'CLOCK."
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE FIRE."	

### REDUCED FIRE COMMAND FOR MULTIPLE TARGETS

When engaging multiple targets, some of the elements of the fire command will not have to be repeated for the remaining target(s). The vehicle commander or gunner issues an initial or reduced fire command, including the description for all targets in the order they will be engaged. Once the first target has been destroyed, the vehicle commander or gunner needs to give only the description and execution elements for the remaining target(s). (To engage the remaining target(s) effectively; however, the range or direction may need to be added.)

SAMPLE REDUCED FIRE COMMAND FOR MULTIPLE TARGETS		
Element	Commander	Gunner
Alert.	"GUNNER."	
Weapon/Ammunition.	(omitted)	
Description.	"TWO PCs—NEAR PC."	
Range.	(optional)	
Direction.	"ONE O'CLOCK."	
		"IDENTIFIED."
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE FIRE."	
Description.	"FAR PC."	
		"IDENTIFIED."
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE FIRE."	

### TOW FIRE COMMAND

The vehicle commander must make sure the backblast area is clear, and that the vehicle is properly aligned for the missile engagement.

**CAUTION**  
The Tow missile should not be fired over the side of the HMMWV.

SAMPLE TOW FIRE COMMAND		
Element	Commander	Gunner
Alert.	"SQUAD."	
Weapon/Ammunition.	"MISSILE."	
Description.	"TANK."	
Direction.	"ONE O'CLOCK."	
		"IDENTIFIED."
	"BACKBLAST AREA CLEAR."	
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE TRACKING, OUT OF ACTION."	

### TOW MULTIPLE FIRE COMMAND

The TOW multiple fire command is conducted in the same manner as the machine gun fire command, with one exception. After destroying the first target, the vehicle commander announces "CEASE TRACKING;" when the final target is destroyed, he must announce "CEASE TRACKING, OUT OF ACTION."

SAMPLE TOW MULTIPLE FIRE COMMAND		
Element	Commander	Gunner
Alert.	"SQUAD."	
Weapon/Ammunition.	"MISSILE."	
Description.	"TWO TANKS—STATIONARY TANK."	
Direction.	"ONE O'CLOCK."	
		"IDENTIFIED."
	"BACKBLAST AREA CLEAR."	
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE TRACKING."	
Description.	"MOVING TANK."	
		"IDENTIFIED."
	"BACKBLAST AREA CLEAR."	
Execution.	"FIRE."	
		"ON THE WAY."
	"CEASE TRACKING, OUT OF ACTION."	

## CORRECTIONS

If the vehicle commander makes a mistake, he announces "CORRECTION," corrects the mistaken element, then repeats all elements after the corrected element. Example: "GUNNER — TROOPS — ONE O'CLOCK — CORRECTION — TRUCK — ONE O'CLOCK."

## REPEAT

If a crew member does not hear or understand an element of a fire command, he repeats the element in question; the vehicle commander will repeat the element in question. Example: Gunner: "RANGE." Vehicle commander: "FOUR HUNDRED."

## SUBSEQUENT FIRE COMMANDS

A subsequent fire command is used to make adjustments in direction and elevation, or change the rate of fire after an engagement is in progress. It can be given by the vehicle commander or gunner and includes the alert, correction, and execution commands.

## ALERT

The alert portion of a subsequent fire command is nothing more than the vehicle commander or gunner announcing his sensing (the strike of the round in relation to the target) (see Figure 5-1).

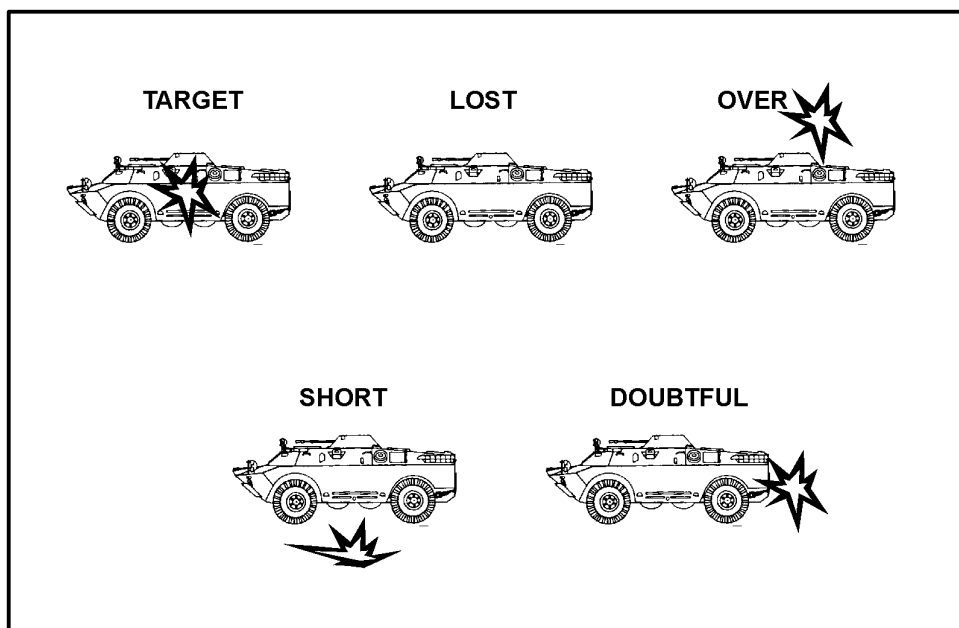


Figure 5-1. Sensing.

## CORRECTION

Corrections in direction are made first, then range. The gunner may omit this element if he can sense the strike of the round and make his own corrections. These corrections can be made using the following methods:

<b>Mil Method</b>	The mil method is usually used to make corrections in direction. The commander or gunner announces the number of mils to move the gun left or right to make the rounds strike the target. To use this method, the gunner must be able to convert the correction in mils to clicks on the T&E mechanism.
<b>Target Form</b>	The target form method is the simplest to use. One <i>form</i> is the visible height or width of the target. The visible height is used to adjust the elevation, and the visible width is used to adjust the azimuth. Corrections are announced in numbers of target forms left, right, up, or down.
<b>Meter Method</b>	The commander or gunner announces the correction in meters left, right, add, or drop. To make this correction, the gunner adjusts his sight picture to reflect the requested correction.
<b>T&amp;E Adjustments</b>	The commander or gunner announces the correction in number of clicks left, right, up, or down. The gunner moves the deflection and elevation wheel on the T&E mechanism. The vehicle commander must understand the T&E mechanism and be able to convert corrections in direction and range into clicks in deflection and elevation.

## EXECUTION

If the gunner is making the correction, he announces “ON THE WAY,” and continues to engage until the target is destroyed or he receives the command to cease fire. If the commander is making the correction he announces “FIRE.”

Example of subsequent fire commands:

The vehicle commander gives the correction: "SHORT—RIGHT ONE-HALF TARGET FORM—ADD TWO TARGET FORMS—FIRE."

The gunner gives the correction: "SHORT—ON THE WAY."

## Crew Duties in Response to a Fire Command

The vehicle commander, gunner, and driver have specific crew duties to perform in response to each element of a fire command. 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 and destroy or suppress, as necessary, while giving subsequent commands to shift targets, organizing other targets, and planning the vehicle's next activity. If the engagement is fired while on the move, the driver must maintain a steady platform and move as quickly as possible to a covered and concealed position.

## Crew Ready Reports

Ready reports are not required, but are highly recommended. They are used before and after an engagement. The following is an example of a ready report.

### SAMPLE READY REPORT

The vehicle moves in and occupies a BP (in training or war), and the vehicle commander initiates a ready report.

- The driver monitors his gauges, places the GEAR SELECT in the proper gear, and reports "DRIVER UP" or "DRIVER—VOLTS GAUGE AMBER, FUEL RED."
- The gunner announces the weapon status; for example, "GUNNER BATTLECARRY HEDP" or "GRENADÉ" for the MK 19, "APIT" or "BALL" for the M2, or "TOW ALPHA," "BRAVO," or "MACHINE GUN" for the TOW.
- The vehicle commander makes his adjustments, then reports to higher, "BLUE 1, THIS IS BLUE 2 REDCON," which means he is at the ready condition.

**Note.** The word battlecarry means that a specific range has been set on the sights for the MK 19 or M2, and a specific range of observation has been designated to the TOW gunner.

The vehicle commander also initiates a ready report at the end of his engagement. He—

- Looks for changes in his vehicle status (such as, battle damage, ammunition expenditure, and target effects).
- Forwards this information in his status report or spot report, depending on the unit's SOP.
- Resets his vehicle.

## Chapter 6

### Engagement Techniques

Engagement techniques are those actions taken by the gunner to place effective fire on the target. The gunner must be able to place effective fire on moving, stationary, point, and area targets. This chapter discusses various machine gun engagement and range card techniques to aid the crew in acquiring the target during limited visibility conditions and orient replacement personnel or units.

### Machine Gun Engagement Techniques

The crew's goal is to hit a target and destroy it as fast as possible. Proper engagement techniques will allow the crew to place enough fire on the target to destroy it. Machine gun techniques are generally the same for the M2 HB, M60/M240B, and MK 19 machine guns.

#### METHODS OF ENGAGEMENT

The method of engagement chosen (searching, traversing, or z-pattern) depends on the terrain, target presentation, type of target, and tactical situation. To be effective, fire must be distributed over an entire target. Improper distribution results in gaps between beaten zones and allows some of the enemy to escape or use guns without effective opposition.

#### SEARCHING METHOD

The searching method of engagement is used to engage targets arrayed in depth. The gunner moves the beaten area through the target area by increases and decreases in range. The searching method is used to engage area targets moving toward or away from the firer.

#### TRAVERSING METHOD

The traversing method of engagement is used to engage area targets along their front or length. The gunner moves the beaten area across the length of the target. The traversing method is also used to engage area targets moving across the sector of fire (see Figure 6-1).

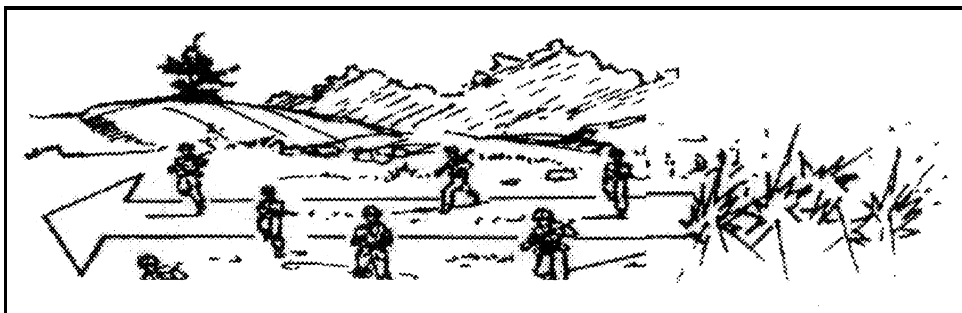


Figure 6-1. Traversing Method of Engagement.

## Z-PATTERN METHOD

The z-pattern method of engagement is preferred for dismounted troops. Use both the searching and traversing engagement techniques to cover large or dispersed area targets (see Figure 6-2).

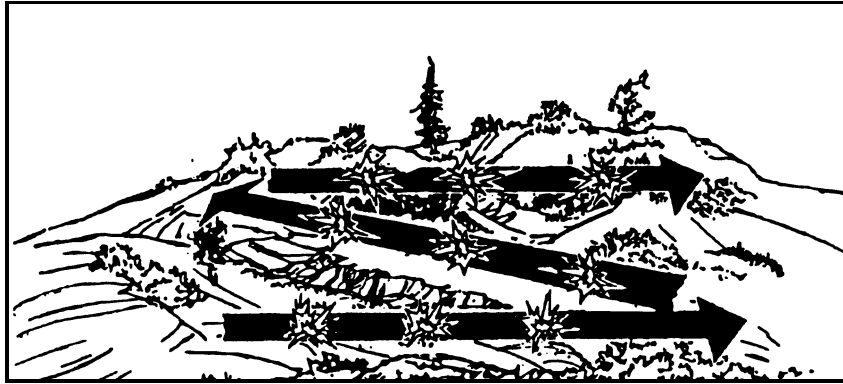


Figure 6-2. Z-Pattern Method of Engagement.

## METHODS OF ADJUSTMENT

Adjustments may be made before or after firing. Machine gun fire is adjusted by observing the strike of the round, observing the flight of tracers, re-laying frequently, or by a combination of these. The use of tracer ammunition provides a means of adjusting fire. At night, it aids in illuminating the objective area and has a demoralizing effect on the enemy. Observation and adjustment of fire is the most important and is continuous throughout the action. The gunner is trained to observe and adjust fire without command and to check the lay of the gun frequently.

### BURST-ON-TARGET (BOT) METHOD OF ADJUSTMENT

The BOT method is the fastest method of adjustment. The gunner moves the strike of the round to the target by adjusting the sight picture (see Figure 6-3). BOT is primarily used with the MK 19 machine gun. To use the BOT method, the gunner fires his sensing rounds or burst, observes the strike of the round while maintaining his initial point of aim, makes the adjustments to his point of aim necessary to move the strike of the round to the target, and then fires a killing burst. The gunner continues to adjust and fire killing bursts until the target is destroyed or the commander announces "CEASE FIRE."

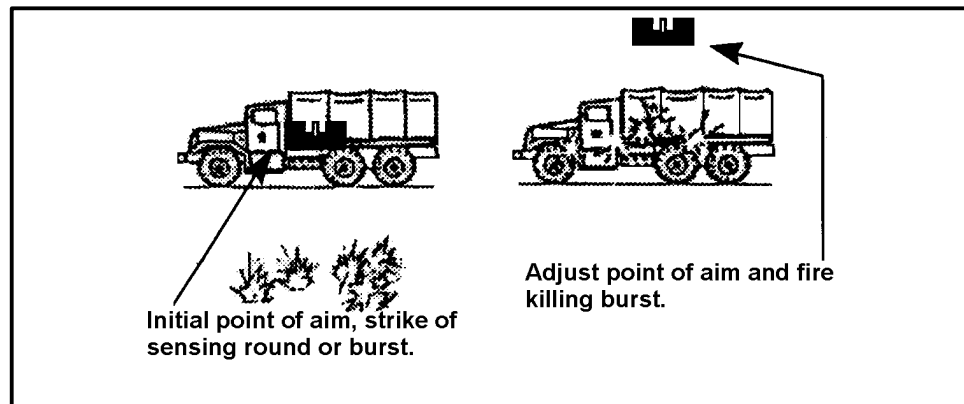


Figure 6-3. Burst-on-Target (BOT) Method of Adjustment.



### TRACER-ON-TARGET (TOT) METHOD OF ADJUSTMENT

The TOT method is the easiest method of adjustment for the machine gun crew. The gunner walks the strike of the round onto the target, then fires a killing burst (see Figure 6-4). TOT is extremely effective against stationary targets. To use the TOT method, the gunner fires an initial burst, observes the strike of the round in relation to the target, fires a second long burst while simultaneously moving the weapon until the rounds impact on the target, and then fires a killing burst until the target is destroyed or the commander announces "CEASE FIRE."

**Note.** The TOT method of adjustment is not used when engaging targets with the MK 19 machine gun.

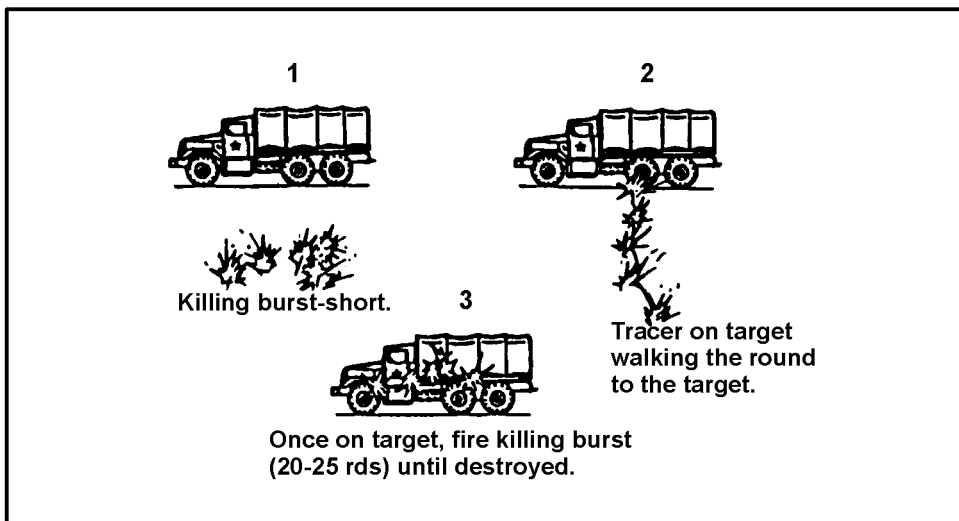


Figure 6-4. Tracer-on-Target (TOT) Method of Adjustment.

### TARGET FORM METHOD OF ADJUSTMENT

Target form is a simple method of adjustment. One form is the visible height or width of the target. Since the visible size in width and height differ, the visible height is used to adjust elevation and the visible width is used to adjust azimuth. Target form can be used with all weapons (except the TOW). The word *form* may be added after an announced change, or the change may stand alone if target form is the standard adjustment technique in the unit SOP. Form changes are always given in full- or half-form increments.

### MIL CHANGE METHOD OF ADJUSTMENT

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

### ENGAGEMENT TECHNIQUES FOR AREA TARGETS

The size and shape of the target and the engagement technique should dictate the pattern of fire used to engage an area target. Engage area targets with a killing burst (the initial burst on target, designed to kill as many as possible before the enemy goes to ground). Sweep through the forward edge of the target area with a killing burst, then switch to suppressive fires using intermittent bursts (20 to 30 rounds for light machine guns, 10 to 15 rounds for heavy machine guns, and 6 rounds for the MK 19) to suppress the target.

Area targets use the burst-on-target or tracer-on-target method of adjustment (see Figures 6-3 and 6-4) to obtain a killing burst. Once a killing burst has been fired, the gunner must suppress the target area using the searching, traversing, or Z-pattern method of engagement. These methods of engagement require different burst techniques.

ENGAGEMENT TECHNIQUES	
Weapon System	Burst Technique
M60/M240B	<ul style="list-style-type: none"> <li>• 6- to 9-round killing burst.</li> <li>• Suppress the area with 20- to 30-round bursts, (searching, traversing, or Z-pattern method).</li> </ul>
M2 HB	<ul style="list-style-type: none"> <li>• 5- to 7-round killing burst.</li> <li>• Suppress the area with 10- to 15- round bursts (searching, traversing, or Z-pattern method).</li> </ul>
MK 19	<ul style="list-style-type: none"> <li>• 1- to 2-round sensing burst.</li> <li>• Suppress the area with 6-round bursts.</li> </ul>

### ENGAGEMENT TECHNIQUES FOR POINT TARGETS

Engage point targets using direct-fire adjustment techniques for both stationary and moving targets.

The methods of direct-fire adjustment are BOT, TOT, target form, and mil change. The machine gun crew can quickly adjust, hit, and destroy the target using any of these adjustment techniques.

### ENGAGEMENT TECHNIQUES MOVING TARGETS

Engage moving targets using the BOT method of adjustment. The gunner fires the sensing burst, continuing to track the target and maintain the point of aim until he senses the rounds impacting. Once he has observed the strike of the sensing round, he makes his adjustment and fires a killing burst, maintaining his adjusted point of aim until the round impacts. He then continues to adjust and track the target until the target is destroyed.

When engaging a target that is moving in a lateral direction of the gun, the gunnery must lead (aim in front of) the target to compensate for the movement. The amount of lead depends on the velocity of the ammunition, target speed, and target angle. Applying the proper lead to a moving target will dramatically increase the chance of getting target effects with the first burst (see Figure 6-5).

- M2 HB and M60/M240B.
  - Lead slow or fast moving targets at less than 700 meters by one target form.
  - Lead fast moving targets at 700 meters or greater by two target forms.
- MK 19.
  - Lead slow moving targets less than 600 meters by one target form.
  - Lead slow moving targets at 600 meters or greater by two target forms.



**Figure 6-5. Leading Moving Targets.**

When engaging targets moving toward or away from the position, the gunner may need to make a small vertical adjustment. If the target is approaching, the gunner aims at the center base of visible mass. If the target is fleeing, the gunner aims at the top center of visible mass.

When a moving HMMWV is firing over its flank (side) at a stationary target, lateral motion affects the projectiles as they leave the muzzle. This lateral motion must be compensated for, and the gunner must apply lead. When firing over the left side of the vehicle, the gunner must aim to the left of the target's center of mass. When firing over the right side of the vehicle, the gunner must aim to the right of the target's center of mass.

If the HMMWV and the target are parallel and moving in the same direction, no lead is required. The lateral motion of the projectiles compensates for any lead requirements. If the HMMWV and the target are parallel but moving in opposite directions, target lead is required.

## ENGAGEMENT TECHNIQUES FOR AERIAL TARGETS

Aerial targets should be engaged only in self-defense or on order. If an aerial target must be engaged, the gunner should aim slightly above the nose of the approaching aircraft, and fire a continuous burst. The gunner does not track the target, but continues to fire until the target passes through the cone of fire. The MK 19 should be used to engage only *hovering* helicopter targets.

## FOOTBALL FIELD METHOD

The football field method is used to engage fast-moving, low-altitude aircraft with all small caliber weapons (see Figure 6-6). The gunner aims approximately two football field lengths in front of the target and fires a long burst until the target leaves the effective range.

**Note.** The football field method is not to be used with the MK 19.

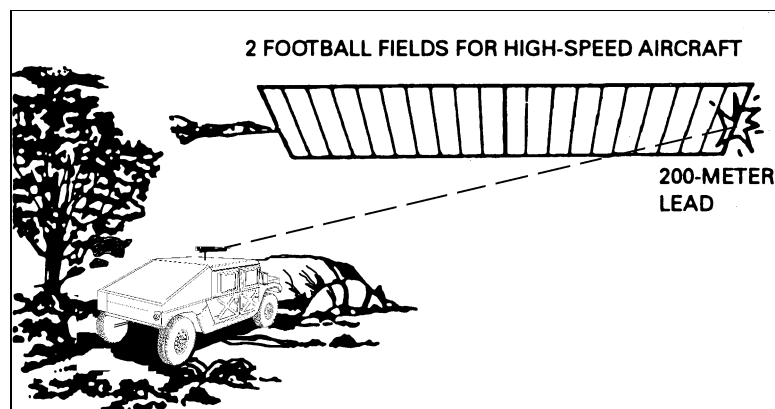


Figure 6-6. Football Field Method.

## REFERENCE POINT METHOD

The reference point method is used to place a high volume of fire on a single point, normally used as a section or platoon method of engagement (see Figure 6-7). The gunner aims at a specific reference point and, on order, fires a long, continuous burst until the target passes through the reference point or is destroyed.

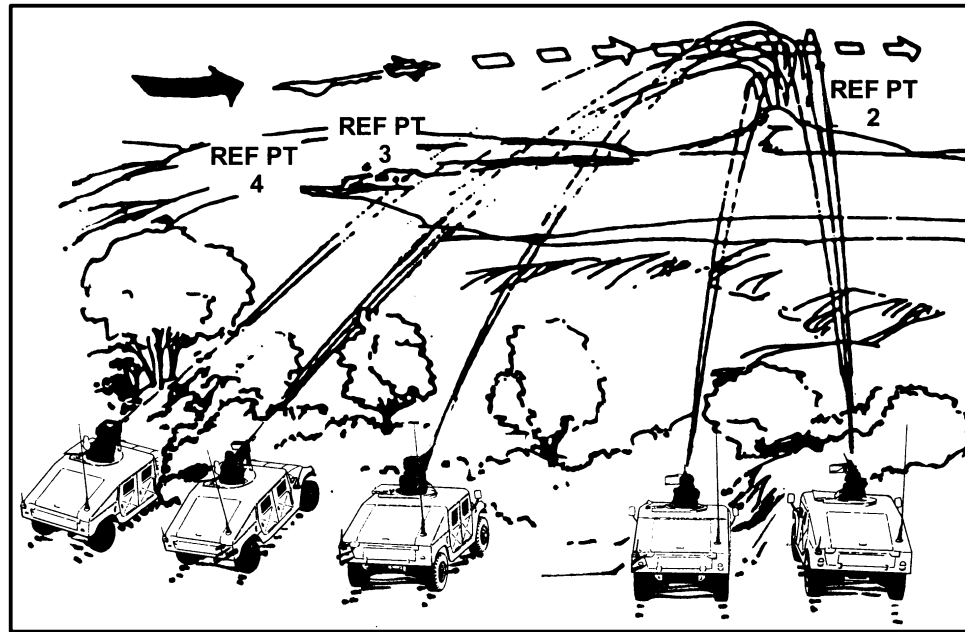


Figure 6-7. Reference Point Method.

### AIRBORNE TROOPS

Lead the paratrooper by two body lengths, and fire a long burst, allowing the target to pass through the cone of fire (see Figure 6-8).

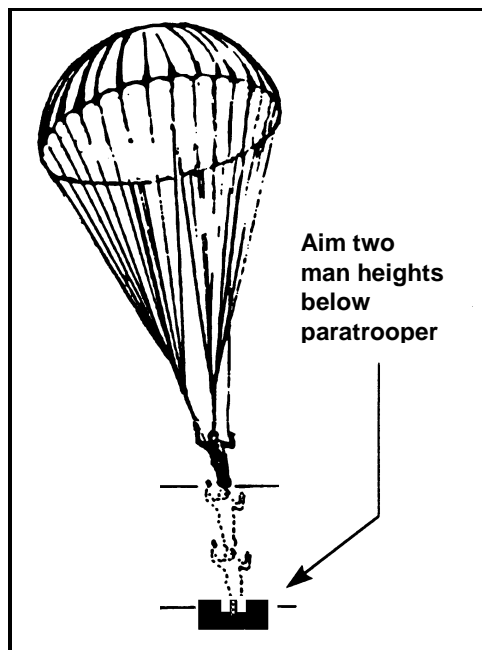


Figure 6-8. Airborne Troops.

**Notes.** The Geneva Convention of 1949 and our *Rules of War* prohibit engaging crewmen parachuting from a *disabled* aircraft.

For additional information on TOW engagement techniques, see FM 23-34, Chapter 6.

## Range Card Techniques

DA Form 5517-R (Standard Range Card) is used to make a rough topographical sketch of a designated sector of an assigned weapon system. A range card aids in planning for and controlling fires. The crew uses the range card to acquire targets during limited visibility and to orient 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 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 RPs (areas where targets are likely to appear).
- Dead space (areas that cannot be observed or covered by direct fire).
- WRPs (easily recognizable terrain features to locate the firing position).
- MELs.
- Magnetic north symbol (direction of magnetic north when the range card is oriented).
- Identification data.
  - Unit identification (no higher than troop).
  - Firing positions (primary, alternate, and supplementary).
  - Vehicle type and 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 PDF and 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 AND 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.

The commander using the standard target symbol and target number issued by the FIST or FSO usually designates a TRP. 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 (†) 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. An RP is 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. 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, and 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 may be locally reproduced on 8½-inch by 11-inch paper. Figures 6-9 through 6-11 are samples of completed range cards. (See FM 7-7J for more detailed discussion on how to prepare a range card.)

**STANDARD RANGE CARD**  
For use of this form see FM 7-72. The proponent agency is TRADOC

SGO 2  
PLT AR  
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°		2225		BRIDGE

REMARKS:

DA FORM 5517-R, FEB 66

Figure 6-9. Completed Standard Range Card (TOW).

**STANDARD RANGE CARD**  
For use of this form see FM 7-72. The proponent agency is TRADOC

SGO 2B  
PLT AB  
CO \_\_\_\_\_

May be used for all types of direct fire weapons.

MAGNETIC NORTH

**DATA SECTION**

POSITION IDENTIFICATION FL93668141 DATE 11 NOV

WEAPON M60 EACH CIRCLE EQUALS 100 METERS

NO.	DIRECTION/DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	LOS5	0/24	400		PDF (ROAD JUNCTION)
2	R375	-90/15	625		BARN
3	R175	-90/40	725		HEDGE ROW

REMARKS: ① THE BARN IS  
② THE ROAD IS  
③ THE HEDGE ROW

DA FORM 5517-R, FEB 66

Figure 6-10. Completed Standard Range Card (PDF).

STANDARD RANGE CARD					
For use of this form see Para 7-7.2. The precision agency is TRADOC.					
BOG <u>2</u>		May be used for all types of direct fire weapons.			MAGNETIC NORTH
PLY <u>2</u>					
CO _____					
DATA SECTION					
POSITION IDENTIFICATION				DATE <u>20 APRIL</u>	
WEAPON <u>M 60</u>			EACH CIRCLE EQUALS <u>100</u> METERS		
NO.	DIRECTION/DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
<u>1</u>	<u>-</u>	<u>+90/3</u>	<u>590</u>		<u>FPL</u>
<u>2</u>	<u>R275</u>	<u>+90/45</u>	<u>585</u>		<u>BARN</u>
<u>3</u>	<u>L102</u>	<u>0/28</u>	<u>425</u>		<u>ROAD JUNCTION</u>
<u>4</u>	<u>L370</u>	<u>0/12</u>	<u>375</u>		<u>BOULDER</u>
REMARKS: <u>① -4</u> <u>② TRADOC/LS</u>					
DA FORM 8517-R, FEB 66					

Figure 6-11. Completed Standard Range Card (FPL).

## 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.

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 corners 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.



## Chapter 7

### Fire Control and Distribution

The HMMWV and scout platoons must be able to conduct reconnaissance and security missions. Scout and antitank crews must be able to provide direct-fire support for maneuvering scout vehicles and dismounted patrols. Effective fire control measures are required to avoid fratricide and allow the platoon to retain its freedom of maneuver.

Depending on the situation, fire control and distribution may be accomplished by individual vehicles, sections, or platoons. On many occasions, particularly in defensive operations, the platoon leader will be in a position to direct the fires of the entire platoon. On other occasions, particularly in offensive operations, fire control and distribution may begin at section level; as the situation develops, the platoon leader controls the platoon fires and distributes them effectively.

This chapter provides a standardized way of controlling and directing fires within the HMMWV section, and platoon. It includes the procedures used from the time targets are acquired, through the placement of fires on those targets.

### Principles of Fire Control and Distribution

To maximize a platoon's ability to engage the enemy, leaders must synchronize the fires of all direct-fire weapons and direct-fire assets. The HMMWV scout platoon achieves fire control and distribution through fire plans and fire commands. When developing, refining, and executing fire plans, leaders must apply the following principles:

- Destroy the most dangerous target(s) first. Targets should be engaged in relation to the danger they present. If two or more targets are equal threats, the closest one should be engaged first.
- Avoid target overkill. Engage targets one-on-one and for one-shot kills with the TOW. Avoid continuous engagement of disabled or destroyed vehicles.
- Concentrate on long-range targets. Use dismounted elements to complement the HMMWV along more restrictive approaches when fields of fire are limited, allowing the gunner manning the vehicle-mounted weapons to acquire targets at greater distances.
- Control fires to achieve the best shots and expose only those vehicles needed for the engagement. Use only those vehicles or weapon systems that have the best chance of destroying the enemy. All other vehicles/weapons systems should remain hidden until additional targets are within the engagement area, the firing vehicle needs additional help in destroying the enemy, or they are needed to assist in the withdrawal of the engaged element.
- Use the appropriate weapon for the target. Each weapon system has its own capabilities and limitations. The fire plan should use the weapon systems to complement each other.
- Conserve ammunition, when possible. Continuously monitor the ammunition supply. Reload and cross-level immediately after each engagement. Do not wait until the ammunition is depleted to request resupply.
- Avoid fratricide. When possible, avoid engagements that are close to friendly elements. Control movement and fires using easily identifiable control measures, and rehearse actions for all phases of the operation.

## Standing Operating Procedures

Platoons must establish fire control and distribution SOPs. Squad leaders must remain aware of the tactical situation, maintain contact with dismounted elements at all times, and coordinate with adjacent elements.

A well-rehearsed platoon SOP ensures quick reaction times. The SOP should include area coverage responsibilities and weapons-ready postures for different situations (such as road marches, halts, and various battle drills). Battalion, squadron, or troop SOPs should prescribe the combat load of ammunition, by type and amount. The section leader should prescribe the weapons-ready posture (battlecarry) that makes the best use of available firepower in the present situation.

Situations the section leader should plan for when forming his section SOPs (see ARTEP 17-57-10-MTP) are:

- Actions on contact.
- Reaction to ambush.
- Reaction to air attack.
- Deliberate ambush.
- Reaction to artillery strike.

The section should be prepared to engage PCs, suppress ATGMs with machine guns, and engage tanks with TOWs. (TOWs can also be used on BMPs at long ranges.) TOWs are fired from covered and concealed positions. The weapons-ready posture may have to be adjusted, or ammunition redistributed, after an engagement to make sure that vehicles have the ammunition or missiles needed.

## Fire Control Measures

Fire control measures are used to coordinate and mass direct and indirect fires in the most efficient manner possible. These measures include: sectors of fire, engagement areas, terrain reference points, phase lines, and engagement priorities. Their use must be routine, with no need for detailed or lengthy instruction.

### SECTORS OF FIRE

Sectors of fire are areas that are covered by observation and fire, starting at the weapon system and extending to its maximum effective range. Sectors of fire must overlap with adjacent element's sectors of fire. Plans must be made to cover dead space within and between sectors to maintain coverage.

- The primary sector of fire is the main area on which the leader wishes the weapon system to concentrate its firepower, usually overlooking a main engagement area. The primary sector of fire is covered by the primary and alternate fighting positions.
- The secondary sector of fire is assigned to engage a secondary avenue of approach or cover another vehicle's sector, if it is required. The secondary sector of fire is covered by the supplementary fighting position.

### ENGAGEMENT AREAS

Engagement areas are enclosed areas that are located away from the weapon system. They are specifically designed to mass fires from several different weapon systems simultaneously. The area should be supported by direct and indirect fires. Obstacles should be used to channel the enemy into the areas of engagement and trap him there.

## TARGET REFERENCE POINTS

A TRP is an easily recognizable point on the ground (natural or man-made) used for identifying enemy targets or controlling direct fires. TRPs are used to designate targets of opportunity, shift fire, or assign sectors of fire.

In the defense, TRPs are assigned for vehicles along mounted avenues of approach. In the offense, TRPs are assigned on likely enemy locations or on prominent terrain features. To avoid confusion, the number of TRPs should be limited to the number required to distribute and control fire.

When using a TRP to hand off targets, compass directions (north, east, south, west) are used rather than right or left, because each vehicle may be viewing the TRP from a different direction.

TRPs are indirect-fire targets. The FIST will assign each TRP a target identification number. The target identification number consists of two letters and four numbers (for example, AB5010). These identification numbers are recorded on range cards in the data section for easy reference and control. To simplify fire commands, TRPs may be referred to by the last three digits (for example, TRP AB5010 may be referred to as TRP 010).

## PHASE LINES

A phase line is a simple and effective linear control measure normally used to control movement; it can also be used to control and distribute the fire of several widely separated vehicles. The section leader uses phase lines to indicate to his crews when to fire and when to displace to an alternate position. Any prominent (natural or man-made) linear terrain feature (ridgeline, river or stream, road, or railroad track) can be used as a phase line.

In either offensive or defensive operations, phase lines can be used to start or stop firing simultaneously, shift fire to another sector, or indicate when vehicles are to move to alternate or supplementary positions.

## ENGAGEMENT PRIORITIES

Engagement priorities are high-value targets that, if destroyed, could break an attacking enemy's momentum or destroy the enemy's cohesion in the defense.

## Fire Distribution

Fire distribution is a combination of fire patterns and control methods used to effectively distribute direct fire from multiple weapon systems on several targets.

## FIRE PATTERNS

There are three basic fire patterns that can be used to distribute fire when engaging multiple targets: frontal fire, cross fire, and depth fire.

- Frontal fire is used to engage targets arrayed laterally in front of the platoon or section. The left most vehicle fires on the left most target; the right most vehicle fires on the right most target. As targets are destroyed, fires are shifted toward the center of the enemy formation.
- Cross fire is used when targets are positioned laterally and obstructions prevent vehicles from firing to their front. The left-most vehicle engages the right-most target; and the right-most vehicle engages the left-most target. As targets are destroyed, fires are shifted toward the center of the enemy formation and from far to near.

- Depth fire is used when targets are arrayed perpendicular to the platoon or section in depth. The left-most vehicle engages the farthest target; and the right-most vehicle engages the closest target. As targets are destroyed, fires are shifted to the center of the enemy formation.

## **CONTROLLING PLATOON OR SECTION FIRES**

There are four basic methods that may be used to control fires: simultaneous fire, massed fires, observed fire, and alternating fires.

- Simultaneous fire occurs when all vehicles of a platoon or section are firing into their assigned sectors at the same time. The simultaneous-fire method is used when moving while unprotected or when surprised by many enemy vehicles, requiring immediate massed return fires.
- Massed fires occur when all vehicles and dismounted weapons are concentrated on a specific target or a selected area. The massed-fires method is used to produce a high volume of fire.
- Observed fire occurs when the firing vehicle engages targets while his wingman observes the effects of the fire and helps to spot and call fire corrections. The wingman provides local security while the firing vehicle concentrates on the engagement area. The observed-fire method is normally used when TOW vehicles are engaging long-range targets, or when engaging dismounted elements at long range.
- Alternating fires allow one vehicle to shift firing positions while the other engages targets. The alternating-fires method provides constant fire into the engagement area, while hindering the enemy's attempts to acquire and suppress firing vehicles. This method can be conducted within section and by section.

## **Platoon Fire Planning**

Platoon fire planning begins when the platoon leader receives his mission. Fire planning is a continuous process; it does not stop until the platoon's mission is accomplished. Fire planning prescribes fire control and distribution for all available weapons to support the scheme of maneuver. Fire planning must also include planning for indirect fires.

### **DEFENSIVE FIRE PLANNING**

Defensive fire planning is normally deliberate and detailed because time is available. To develop a defensive fire plan, the platoon leader—

- Determines where the enemy will most likely attack, based on enemy doctrine and terrain.
- Designates control measures to initiate, shift, mass, and cease fires.
- Assigns primary, alternate, and supplementary fighting positions for each vehicle.
- Receives information from subordinate leaders (sector sketches from each vehicle).
- Completes the platoon fire plan and gives a copy of the sector sketch to the troop/company commander and all vehicle commanders.

## OFFENSIVE FIRE PLANNING

It will not be possible to develop fire plans for offensive operations in the same degree of detail as for defensive operations. Extensive use of map and leader reconnaissance, TRPs, platoon targets, and platoon SOPs will assist the platoon leader in developing his plan. When developing offensive fires, the platoon leader must consider many aspects of the operation, such as:

- Mission to be accomplished.
- Enemy strengths and weaknesses.
- Likely or known enemy locations.
- Indirect fire support and smoke employment.
- Control measures (phase lines, checkpoints, limits of advance, and TRPs).
- Route of movement.
- Movement techniques.
- Sectors of responsibility (platoon and section).
- Operational readiness status of equipment.
- Friendly forces' situation.
- Movement information.

## Platoon and Section Fire Commands

The platoon or section leader must quickly analyze a situation and issue concise and complete fire commands without delay. The standard platoon or section fire command consists of the following elements:

- Alert.
- Weapon or ammunition (optional—may be given when troops and armored threats appear together).
- Description.
- Location (optional).
- Range (optional—may be given if it is necessary and time is available).
- Control (optional—may be given to designate the fire pattern and control).
- Execution.

SAMPLE STANDARD PLATOON OR SECTION FIRE COMMAND	
<b>Alert.</b>	"RED—THIS IS RED ONE"
<b>Weapon/Ammunition.</b>	"MACHINE GUNS"
<b>Description.</b>	"TRUCK AND TROOPS"
<b>Location.</b>	"TRP 0034"
<b>Range.</b>	"EIGHT HUNDRED"
<b>Control.</b>	"FRONTAL"
<b>Execution.</b>	"AT MY COMMAND"

## Chapter 8

### Training Management and Unit Training Plans

Once the commander has developed his METL and made a thorough assessment of training proficiency, he begins the detailed process of developing a training plan. When planning the gunnery aspect of the training plan, the master gunner is the most valuable asset to aid the commander.

This chapter identifies the master gunner's responsibilities in aiding the commander, as well as the commander's responsibilities in managing crew turbulence and conducting long-range, short-range, and near-term planning.

### Master Gunner

The primary mission of the master gunner is to aid and assist commanders at all echelons in the planning, development, execution, and evaluation of all crew-served weapons related training (individual, crew, and collective).

The master gunner's specific duties are directed by the commander. Examples of his duties are:

- Develop or conduct training and certification of crew evaluators.
- Assist all elements within the unit concerning gunnery training.
- Forecast all ammunition for training.
- Manage gunnery records, GST records, and turbulence rosters.
- Coordinate and control training devices.
- Train crews on MILES gunnery peculiarities (zeroing and maintenance).
- Execute gunnery training. Supervise live-fire ranges to ensure all standards are followed; specifically—
  - Confirm zero techniques.
  - Coordinate target arrays, exposure times for all targets, and maneuver box verification. Set up all ranges to make sure they meet the standards set forth in this manual.
- Set up and conduct GST training, and evaluate the results.
- Advise the commander of the tactical capabilities of the MK 19, M2 HB, and TOW weapon systems against threat systems, in coordination with the S2.

The master gunner's main responsibilities are listed above, but may change in scope, depending on the level that he is assigned. The master gunner should not be assigned additional duties other than those listed here. Unit gunnery training programs need a great deal of attention to be effective.

The specific duties of the regimental, squadron, troop/company, and platoon master gunner are listed in the table below.

<b>MASTER GUNNER DUTIES</b>	
<b>Regimental Master Gunner</b>	<ul style="list-style-type: none"> <li>• Works closely with the master gunners at lower echelons to ensure standards are uniform throughout the training programs.</li> <li>• Develops the crew evaluator certification program.</li> <li>• Provides any new information on ways to improve training.</li> <li>• Helps develop and upgrade range facilities.</li> </ul>
<b>Squadron Master Gunner</b>	<ul style="list-style-type: none"> <li>• Ensures continual education of the master gunners in the squadron.</li> <li>• Helps the squadron commander and command sergeant major select master gunner school candidates.</li> <li>• Develops new training techniques to improve crew training.</li> <li>• Coordinates with the regiment for training assets.</li> <li>• Certifies crew evaluators in accordance with the TCEPT training plan.</li> <li>• Certifies GST evaluators in accordance with this manual.</li> <li>• Certifies range safety personnel.</li> </ul>
<b>Troop/Company Master Gunner</b>	<ul style="list-style-type: none"> <li>• Coordinates with the squadron S3 to secure troop/company gunnery training assets.</li> <li>• Trains crew evaluators in accordance with the TCEPT training program.</li> <li>• Assists in troubleshooting and maintenance of weapons.</li> </ul>
<b>Platoon Master Gunner</b>	<ul style="list-style-type: none"> <li>• Is primarily responsible for the platoon's weapon maintenance program.</li> <li>• Updates the troop/company master gunner on the platoon's crew training.</li> <li>• Assists the troop/company master gunner in unit training.</li> </ul>

## Crew Stability Management

The greatest problem a commander faces when developing a training plan is the cause and effect of crew turbulence (personnel changes). Commanders must develop a plan to reduce and control crew turbulence before developing and executing his training plan. Turbulence is unavoidable, but may be reduced by planning ahead. Some possible solutions for reducing turbulence are:

- Short-term solutions:
  - Change personnel as a crew not as a single crewman (for example, when a staff sergeant vehicle commander is promoted to platoon sergeant, his entire crew moves with him). This causes only one crew change, instead of two.
  - Train alternates for each position.
- Long-term solutions:
  - Continually cross-train personnel for replacements. Experienced soldiers are easier to train than new soldiers.
  - Form complete crews as personnel come into the unit. Match the loss dates (ETS and PCS) within the same crew.

## Long-Range Planning

Long-range planning is resource-oriented; commanders identify training needs from the METL task proficiency assessment. Goals are established, and resources are forecasted and allocated to reach these goals. (See FM 25-101 for additional information on long-range planning.)

Commanders must consider the following when conducting long-range planning:

- What is the current platoon proficiency level? This is based on—
  - Crew turbulence.
  - Performance during previous gunnery, maneuver exercises, and squad and platoon STXs and FTXs.
- What are the performance goals for the platoons? What proficiency level must crews reach to accomplish METL tasks?
- What resources are necessary, and where is the command emphasis?
- What schools are necessary to certify and train trainers?

## Short-Range Planning

Resources identified during long-range planning are allocated and prioritized during short-range planning. Command training guidance is published to provide trainers with detailed information on the training objective.

- Short-range gunnery scheduling considerations are:
  - Vehicle services.
  - Mandatory training events prescribed from higher.
  - Nontraining events, such as holidays, leaves, and installation support.
- Short-range guidance considerations are:
  - Crew and dismounted training priorities, and expected outcome.
  - Leader, individual, and collective tasks associated with the training event.
  - Steps required to prepare trainers and evaluators.
- Gunnery resource considerations are:
  - Ammunition.
  - Fuel and repair parts.
  - Range and maneuver area.
  - Availability of training devices.

## AMMUNITION

Commanders and master gunners must carefully manage ammunition allocations, especially when dealing with 40-mm TP resources. Once the yearly ammunition authorization is known, ammunition should be allocated in specific priority.

- Mounted crew training.
  - First: crew qualification.
  - Second: crew practice.
  - Third: qualification refires and additional training.
- Dismounted training.
  - First: weapons qualification.
  - Second: squad and platoon LFX.
  - Third: LFX refires and additional training.
- Platoon training
  - First: platoon qualification.



- Second: platoon practice.

Ammunition is forecasted no later than 120 days before the training event. There are many reasons why the ammunition authorization may fall short of the forecasted training requirement. When this happens, commanders must develop a strategy to train with less ammunition. Several considerations are:

- Reduce the number of crew practice tasks for crews who are stabilized and have qualified previously; give their ammunition to the new crews.
- Reduce rounds per engagement on training and practice exercises.
- Increase device-based training.
- Use MILES in crew practice scenarios. MILES is not suitable for moving target engagements because the gunner does not have to apply lead to engage the target. BOT and TOT cannot be trained with MILES.

## Near-Term Training Plan

Near-term planning is conducted primarily at squadron, company, and platoon level. Its primary purpose is to conduct final coordination and provide specific guidance to the units.

Training meetings should be held at squadron, company, and platoon level so that detailed information is understood by all key personnel.

Squadron meetings focus on training management. Considerations include—

- Final coordination of ranges, training areas, and ammunition.
- Coordination between units for maintenance, medical, logistical, and personnel requirements.
- Locking in and publishing unit training schedules.

Company and platoon meetings discuss the details of executing the training event; specifically—

- When the training will be conducted, to include movement times to the training area.
- Personnel involved in the training event (highlight key individuals responsible to conduct training).
- Training location, uniform, and special equipment required to conduct training.
- Specific personnel performance measures to be evaluated.

**Note.** See Chapter 9 for additional information on range set-up, execution, and key individual responsibilities.

The formal training plan culminates with the training schedule; however, commanders, key leaders, and all trainers must continue to informally plan and coordinate training with a series of pre-execution checks. Additionally, trainers, soldiers, and support personnel must thoroughly prepare for training.

Pre-execution checks systematically prepare soldiers, trainers, and resources to ensure training starts properly. These checks are developed, and responsibility is fixed during short-range planning.

Commanders prepare trainers to conduct performance-oriented training by providing time, guidance, resources, and references. These trainers rehearse their preparations and review the tasks and subtasks to be conducted. This preparation gives the trainer confidence in his ability to perform the task and teach soldiers the correct skills.

## Chapter 9

### Range Operations

A complete training program includes the use of ranges and training sites. It provides an opportunity to acquire targets in a realistic environment and to use the weapon systems to engage targets. This chapter outlines the procedures, duties, and responsibilities for establishing and operating ranges and training sites.

### Range Operations

A plan must be developed for conducting gunnery training. This plan will vary with the tables to be trained. The plan should include the use of assets, requirements for opening the range and occupying the training site, duties and responsibilities during the exercise and while closing the range, and training tips for the OIC.

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**Environmental Note:** Whenever possible, choose gunnery training sites that minimize damage to vegetation and waterways.

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#### THE USE OF ASSETS

Training can be conducted by the squadron or by the troop/company.

- Squadron. The squadron signs for, administers, and clears the range or training site. The training troop/company assists in range police and administrative duties. This allows the administering troop/company to concentrate on gunnery, tactics, and maintenance. Advanced gunnery tables require support from outside the squadron because of the magnitude of the target array and number of personnel needed to control the range. The tactical tables should not require assets from sources other than the squadron.
- Troop/company. The troop/company signs for, administers, and clears the range or training area. The squadron provides the necessary support in details, safety officers, range guards, and administrative personnel.

#### OPENING THE RANGE OR OCCUPYING THE TRAINING SITE (SEQUENCE OF EVENTS)

The range is opened and occupied according to local range and squadron SOPs. The following personnel are responsible for the sequence of events used to open the range and occupy the training site:

- The OIC—
  - Arrives at the range or training site before the unit.
  - Checks communications and, for live-fire exercises, ensures that backup communications are available.
  - Briefs the safety officer, the evaluators, and the units that will be trained.
  - Ensures that range equipment is present and operational.
- The NCOIC—
  - Sets up additional training areas.
  - Supervises ammunition, targets, and administrative details.
- Environmental: Ensure that absorbent materials are available for spills.

- The safety officer or NCO—
  - Ensures that barriers are closed or range guards are posted and briefed on their duties.
  - Ensures that no live ammunition is present on a nonfiring range.
  - Supervises placing vehicles in the correct firing order for firing or training.
  - Inspects storage, handling, and lot numbers for restricted or suspended ammunition.
  - Inspects medics and vehicles.
  - Inspects DA Form 2408-4 for each weapon that requires it.
  - Gives a safety briefing before all live-fire exercises.
- The master gunner—
  - Gives a final briefing to TCEs.
  - Ensures that the concurrent training is set up.
  - Arrives at the range or training site before the firing unit.

## **DURING THE EXERCISE**

The following personnel are responsible for certain events during the conduct of the exercise:

- The OIC—
  - Controls the firing of live-firing exercises.
  - Maintains efficient throughput within units and between units going through the course.
  - Maintains all required communications.
- The NCOIC—
  - Supervises all details.
  - Controls the movement of personnel from the firing positions to additional training and other administrative areas.
- The safety officer or NCO—
  - Ensures that misfires are handled in accordance with the safety regulations.
  - Watches for any safety violation.
  - Clears each vehicle or firer upon completion of the exercise.
- The master gunner—
  - Ensures that range firing is conducted in accordance with the appropriate gunnery table.
  - Ensures zeroing is accomplished correctly.
  - Conducts remedial training on site, as needed.
  - Supervises the TCEs.
  - If required, assists safety personnel in clearing weapons.
  - If required, assists maintenance personnel in troubleshooting weapon malfunctions.
  - Assists the commander in determining or verifying alibi conditions.

## **CLOSING THE RANGE**

The following personnel are responsible for certain events while closing the range:

- The OIC—
  - Notifies range control that firing has terminated.
  - Debriefs unit personnel.

- Ensures that the range or training area is cleared in accordance with local regulations and SOPs.

- The NCOIC—
  - Supervises ammunition and target details.
  - Ensures that range facilities have been policed.
  - Environmental: Ensure that POL spills are cleaned up either by the using unit, or a supporting unit, and reported to post authorities, depending on the size of the spill.
- The ammunition NCO—
  - Ensures that no munitions are removed from the range by anyone other than authorized personnel.
  - Prepares residue certificates required by the ammunition supply point.

## TRAINING TIPS

The following tips will aid the OIC in conducting training on the range:

- *Brief key personnel.*
  - Before moving to the training site, brief key personnel in setting up the site and in reacting to unusual circumstances. This will keep down time to a minimum.
  - Brief bunker personnel on safety regulations and requirements. Bunker personnel must be given definite control measures, such as entering and exiting the bunker and bunker area. Bunker personnel must have two means of communication with the tower.
  - Brief OPFOR personnel on the role they will play in tactical training. Make sure they know what to do and when to do it. Stress that their actions must be the same for each unit going through the course.
- *Start on time.* Have the training site ready and communications set up early so that crews can begin firing on time. Plan operations so that training is not interrupted for maintenance of the course until a prearranged time or normal shut down time (posted in the daily range bulletin). Make sure there are enough targets to complete all training before the scheduled break.
- *Plan illumination.* Register weapons providing indirect illumination before dark. For ease of control and reduction of support requirements (ammunition pads, OIC, safety officers, transportation, and communications), locate indirect-fire weapons on the same range with firing vehicles.
- *Use range marker lights (live fire).* Do not fire at night without a light (and thermal range marker on TOW ranges) on the range safety markers. If the range marker lights fail, all the ranges that use the same impact area must be closed. To prevent this, consider placing two lights together on each range safety marker, making sure that a backup light is available. Lights in good operating condition and fresh batteries will add an additional measure of confidence.
- *Keep a log.* Maintain an accurate log to help keep better informed of dry- and live-firing times and other important events. As a minimum, the log should contain:
  - When the unit occupied the range or training site.
  - For live fire, when permission to fire was received from range control.
  - Who gave permission to fire.
  - When the range was in a cease-fire status.
  - Compass azimuth to any stray impact points and time of impact.
  - When the unit cleared and departed the range.

- *Brief guards.* Have a plan to check and change guards frequently. Also, make sure the guards are briefed on their job and its importance, and that they understand their instructions.
- *Check safety markers.* Make sure range safety markers are present before any live firing begins.
- *Make sure the ammunition is correct.* Coordinate closely with the support elements responsible for supplying live ammunition or pyrotechnics to ensure you have the correct type of ammunition in the correct amounts at the right time and place. Make sure that the ammunition to be fired has been checked against TB 9-1300-385 for restricted or suspended ammunition lot numbers.
- *Position recovery vehicle.* Quickly remove disabled vehicles from the course to prevent loss of training time. A manned recovery vehicle must be in position to support the unit.
- *Prepare for fires.* During dry seasons, there is always a danger of tracer illumination causing grass and forest fires. Be prepared to control the situation quickly. It may be necessary to reduce the number of tracer rounds in linked ammunition if fires persist.
- *Police the area.* A clean training site reduces the chance of injury, especially at night. Police as you go to avoid spending valuable time cleaning up after firing.
- *Brief visitors.* Have a plan for briefing visitors, and designate a briefing NCO or officer. Brief visitors before escorting them to the primary training site.
- *Conduct other training.* Stress those areas in which the unit needs additional training, such as—
  - Target acquisition.
  - Range determination.
  - Movement techniques.
  - Crew tasks.
  - Section tasks.
  - Fire commands.
  - Methods of adjustment.
  - Prepare-to-fire checks.
  - Misfire procedures.
  - Target identification.
  - Maintenance of vehicles and weapons.

## Range and Training Area Reconnaissance

The OIC, master gunner, and NCOIC should personally conduct a reconnaissance and coordinate with range control before their unit occupies a range or training area. The reconnaissance should provide answers to the following questions:

- What route to the range or training area will be used?
- How many stationary or moving vehicles can fire on the course simultaneously?
- Are hull-defilade and defilade positions available?
- What control facilities (tower) are available? What is their condition?
- What communication hookups are available to operate the range? Is there communication from existing bunkers to the range towers? Is the range tower equipped with FM communication equipment?
- Are range limit markers visible during the day, during reduced visibility conditions, and during night firing?

- Which barriers and guard posts need to be closed or manned?
- Who furnishes the targets, target supplies, or training devices used on the range?
- What requirements are necessary for target operators or target details? Where are targets stored? Are the targets the correct type, size, shape, and color? What is the condition of target mechanisms?
- What ammunition can be used on the range?
- Has the range or training area been cleared of duds?
- Where are the following areas?
  - Ammunition pad.
  - Firing line and maneuver areas.
  - Barriers and guard posts.
  - Range limit markers.
  - Helipad.
  - Aid station.
  - Parking areas.
  - Maintenance area.
  - Latrine.
  - Briefing and debriefing areas.
  - Tower.

## **Range and Training Area Personnel, Equipment, and Layout**

Good planning and execution of range or tactical training allows progressive training and evaluation of the unit. Administrative requirements are in AR 385-63, local training regulations, and unit SOPs. A range book containing all applicable regulations and reference materials (such as, range schedules, firing tables, gunnery tables, maps, range logs, range certification list) aids the OIC in operating the range efficiently.

### **REQUIRED PERSONNEL**

The OIC is responsible for the entire range or training site. This includes planning, preparing, coordinating, and executing the training exercise. AR 385-63, Chapter 4 lists an overview of the duties to be completed or supervised by the OIC. The OIC also designates assistants to be responsible for specific areas of operation. All personnel involved in conducting the training exercise report to the OIC regarding their respective duties.

The following personnel are required for conducting range training and must be certified on operation of a range by the local range control office.

#### **RANGE SAFETY OFFICER**

The RSO is a commissioned officer, warrant officer, or NCO (staff sergeant or higher) who is weapon systems qualified. He is a direct representative of the officer in charge of firing. The RSO will—

- Conduct a safety briefing before all live-fire exercises.
- Enforce all safety regulations.
- Make sure all ammunition is handled correctly.
- Enforce smoking restrictions near the vehicles, ammunition, and POL.



- Make sure misfires are handled as stated in AR 385-63 and the appropriate operator's manual.
- Investigate and report accidents in accordance with all regulations.
- Make sure weapons on live-fire ranges are pointed toward the impact area at all times.
- Make sure personnel are clear of the danger area (except as authorized in AR 385-63).
- Check all ammunition for suspended or restricted lots, using TB 9-1300-385.
- Make sure barriers and guards are in place before the exercise begins.
- Check for identification and qualification of medical personnel, and make sure they have transportation, if required.
- Inspect and clear all weapons once firing is complete.

### **MASTER GUNNER**

The master gunner is the commander's gunnery technical advisor. He helps the commander and staff plan, develop, and conduct the gunnery training. The master gunner will—

- Prepare a surface danger area diagram and range overlay.
- Prepare scaled ranges, if required.
- Organize range firing exercises.
- Set up range firing exercises.
- Make sure range firing exercises are properly conducted.
- Supervise the crews to ensure the proper zeroing procedures are used.
- Coordinate target arrays and layout for range firing and qualification.
- Conduct remedial training on site, as needed.
- Make sure a standard TCE program is implemented.

### **NCOIC**

The NCOIC coordinates and supervises details and assists the OIC and RSO in operating the range or training area.

### **AMMUNITION NCO**

The ammunition NCO will—

- Make sure all ammunition is accounted for by type and lot, IAW applicable SOPs.
- Make sure the correct type of ammunition is available for the scheduled firing.
- Make sure the ammunition is properly stored and secured on the ammunition pad at the training area.
- Check any ammunition resupply to make sure it is not restricted or suspended (checks with RSO and TB 9-1300-385).
- Issue the correct type and number of rounds, as instructed by the OIC.
- Keep a running inventory to cross-check daily expenditures turned in to the OIC by vehicle commanders.
- Make sure the ammunition pad is continually policed of links, brass, and packaging materials.

### **TARGET NCO**

Target NCOs are not needed on many of the automated ranges. Target NCOs, when required, will—

- Make sure the targets are the type, color, and scale (if applicable) required by the OIC.
- Make sure the targets are in the proper location on the range.
- Make sure the target detail is properly trained to operate and troubleshoot the target mechanisms used.
- Make sure the target detail has the required equipment and supplies.
- Make sure pre-positioned targets are available when needed.
- Make sure there are enough spare targets, target mechanisms, batteries, patches, and other related equipment available to support training.
- Report to the OIC if any mechanical malfunctions require prompt replacement to continue firing.

### **TRUCK CREW EVALUATOR**

The truck crew evaluator will—

- Enforce the required safety precautions.
- Act as an instructor during practice.
- Conduct an AAR after completion of firing.
- Debrief crews after completion of firing.
- Discuss scoring discrepancies with the OIC.

### **FIRE-FIGHTING DETAIL**

A fire-fighting detail is required at some range facilities during dry seasons. The following should be considered when a fire-fighting detail is required:

- Availability of fire fighting equipment.
- Designated vehicles for soldiers and equipment.
- Access routes to the impact or target areas.

### **RADIOTELEPHONE OPERATORS**

RTOs maintain communications during an exercise.

### **MEDIC**

The medic must—

- Know how to get to the nearest aid station or hospital.
- Know radiotelephone operating procedures for use during an air evacuation.
- Have an identification card (medical) or a memorandum from his commander stating that he is a qualified medic.
- Be equipped for the mission.

### **RANGE EQUIPMENT**

The OIC and NCOIC should make sure that the following equipment is on hand.

- For gunnery and tactical exercises:
  - Current gunnery standards for the table being conducted.
  - Targets and target operating and control mechanisms.
  - Target repair equipment.
  - Range regulations.
  - Flashlights for scorers.
  - Batteries for lights and radios.
  - Vehicle recovery assets.
  - Evaluator communications.

- Briefing tent.
- Scoresheets.
- Stopwatches.
- Binoculars.
- Night-vision devices with enough batteries.
- Field telephones, as required.
- Vehicles for target and scoring detail, fire-fighting detail, backup aid vehicle, and safety officers (moving range).
- Generators to power lights.
- Equipment for concurrent training.
- TOE and expendable supplies.
- All required regulations, SOPs, maps, and overlays.
- FM radio sets and antenna GRC-292.
- For gunnery exercises:
  - Range flag.
  - Range lights or lantern.
  - Flag sets for vehicles and tower.
  - Compass for marking rounds out of impact area.
  - Ballistic firing tables.
- For tactical exercises:
  - MILES equipment.
  - OPFOR equipment.
  - OPFOR personnel.

## **RANGE AND TRAINING AREA LAYOUT FOR GUNNERY EXERCISES**

A well-organized gunnery range provides maximum firing time. If ranges are planned and organized in advance and all items are gathered before moving to the range, firing can start on time and finish in time to allow an orderly move off the range.

A good squadron-level range operation SOP saves time and energy for the firing unit. The SOP should include guidelines for occupying the range and describe actions to be taken for specific tasks:

- Coordinating with maintenance contact teams.
- Operating moving targets.
- Replacing targets.
- Repairing target mechanisms.
- Fighting range fires.
- Conducting range scenario.
- Firing orders.
- Policing the range.
- Departing the range.
- Breaking down ammunition.
- Moving vehicles to the ammunition point and ready line.

### **STATIONARY RANGES**

Stationary ranges usually use moving and stationary targets. Crews engage targets from a defensive position or berm. OICs and RSOs coordinate with local range control for assistance in planning these exercises.

### **MOVING RANGES**

Moving ranges have a maneuver box. If course roads exist, they should be used for movement. The vehicle commander should use available terrain for masking the vehicle's position. Maneuver boxes are used to allow the vehicle crew to acquire, range, and destroy targets arranged in a realistic array as outlined on appropriate gunnery tables. Maneuver boxes must be clearly defined and adhered to (start and stop points). The maneuver box will not extend or surpass the exposure and engagement times.

## **RANGE AND TRAINING AREA LAYOUT FOR TACTICAL TRAINING**

Tactical training is conducted either on ranges or in training areas, whichever is available. Most of the preparation that goes into a gunnery exercise also applies in tactical training.

The configuration of the course depends on the local terrain. Each task must be adjusted to fit a specific piece of terrain, so tasks probably will not be encountered in the order in which they appear in a particular table.

As in the gunnery tables, tactical tables need a range operation SOP that will save time and energy for the firing unit. The SOP should include guidelines for setting up the tactical range or training area, and should describe actions to be taken for specific tasks:

- Coordinating with maintenance contact team (MILES devices).
- Testing MILES equipment.
- Briefing OPFOR and controller personnel of duties for each engagement.
- Test firing weapons (machine guns with blank adapters).
- Moving vehicles to the start point and issuing fragmentary orders to initiate movement down the course.
- Conducting after-action reports after each engagement, and assembling crews (resetting MILES equipment).
- Controlling movement on the course to prevent congestion.
- Policing the range or training area.
- Departing the range or training area.

## **TARGETS**

Full-scale targets should be the same shape, size, and color as the threat targets they represent. TC 25-8 describes targets, target mechanisms, and target control in detail. A visual cue must be used to indicate target kills (for example, target drops, indicator lights, and red and black smoke).

## **FLAGS**

On all ranges, vehicles display flags to show the vehicles' weapon status. The following list explains each flag's use:

- Red. The vehicle is engaged in firing. Weapons are loaded, pointed at the target area, and off SAFE.
- Green. All weapons are cleared, elevated, and on SAFE. All ammunition on board the vehicle is either in the ready or stowed.
- Yellow (and red or green). There is a malfunction on the vehicle. The yellow flag is used in conjunction with a red or green flag:
  - Yellow and red. The vehicle has a malfunction or misfire; weapons are pointed at the target area and are not clear. (Weapon is on SAFE, if possible; if not, range safety personnel are notified.)

- Yellow and green. The vehicle has a malfunction, all weapons are clear, and weapons are on SAFE.
- Red and green. The vehicle is preparing to fire or the crew is conducting a nonfiring exercise. The weapon may be loaded, but is on SAFE.

**Note.** At night, a red and green light will replace the red and green flags.

## **RANGE CONTROL**

The range control officer is responsible for the coordination and safe conduct of range activity for all units. Normally, unit leaders are required to receive a range briefing from the range control officer before occupying a range. Schedule this briefing promptly to prevent any delay in training. Range control should also provide a set of local range regulations and policies.

## **RANGE COMMUNICATIONS**

The installation range officer controls all ranges by wire and radio communication to obtain clearance to fire, report, coordinate, and call cease fires. The OIC controls all training activities, including firing, by the best means available. Wire is the preferred means of communication for target operators and personnel in the impact area or with the OPFOR (for tactical training). In all cases, the OIC plans for a backup communication system.

## **Scaled Ranges**

The preparation and use of scaled ranges require only minor changes from procedures used to conduct live fire. Scaled-range firing helps prepare crews and sections for live fire and qualification, and allows units to train themselves in range operation during home-station training. Unit leaders, gunners, and local range control officers may assist OICs in planning, executing, and evaluating scaled ranges.

The rising cost of ammunition, fuel, and spare parts makes it difficult to produce and maintain skilled light cavalry crews and sections. To overcome these training limitations, more gunnery training must be done at the home station using simulators, training devices, and innovative training techniques.

## **RANGE USE**

The commander chooses the range scale that best suits his training needs and facilities. Scaled ranges allow units to realistically simulate day and night firing by single vehicles and sections against single, multiple, stationary, and moving targets. Targets representing friendly equipment can be placed in the target area to give the crew practice in distinguishing friend from foe. Overseas units can set up terrain and target arrays to resemble anticipated threat targets and actual terrain in front of prepared battle positions.

The crew, moving down the course, engages a series of machine gun targets. Although all targets are within battlesight range, crews should practice precision and battlesight gunnery techniques on the half-scale range. The crew also runs the course at night using available illumination (flare, infrared, or white light) or thermal sights.

## **TYPES OF SCALED RANGES**

There are two types of scaled ranges:

- Small scale, moving vehicle.
- Half-scale, stationary or moving vehicle.

### **SMALL-SCALE (1/10), MOVING VEHICLE**

A moving vehicle range requires a larger area than a stationary vehicle range. The 1/30-scale range can be used; however, the scale is so small that terrain changes too swiftly for a moving vehicle to use proper adjustment techniques. For example, in a course run simulating 1,200 meters on a 1/30-scale range, a moving vehicle traverses only 113 feet. A vehicle moving at three miles per hour travels this distance in 27 seconds. The suggested scale, therefore, is 1/10. The exact configuration of the 1/10-scale range varies, depending on local area assets and type of terrain.

The 1/10-scale range can easily be constructed on an existing small-arms or machine gun range. The direction of vehicle movement can be parallel to the firing line or through the impact area, depending on the size and shape of the area available. To retain the desired scaled target range when firing, emplace simulated machine gun impact targets or laser targets with appropriate target mechanisms within distance constraints of the scaled ranges.

Vehicles moving along a designated route engages a series of activated machine gun targets, from marked firing locations. The vehicles keep moving during engagements; however, their speed is considerably slower than normal because of the short distances between targets. Crews should practice crew duties for battlesight and precision engagements. Night firing and battlefield obscuration can be accomplished, as in the stationary scaled course.

### **HALF-SCALE**

Half-scale ranges are used for stationary or moving vehicle exercises. Training is more realistic on half-scale ranges. Additionally, ranging on the target can be practiced.

The length of the range depends on the area available (for example, for the 7.62-mm coax, the impact area must be at least 4,800 meters).

**Note.** If berms are added, the impact areas may be waived to a lesser distance. The local range control can grant approval for this.

### **TARGETS**

The scaled-impact target is available in scales of 1/60, 1/30, and 1/10. The target is mounted on a stationary, scaled, pop-up target mechanism. The target is a two-dimensional silhouette made from plastic and is easily replaced when destroyed. Targets are available in an assortment of threat vehicle silhouettes, as well as some friendly equipment silhouettes for target identification practice.

## TARGET MECHANISMS

The following types of mechanisms are used with small-scale targets:

<b>TARGET MECHANISMS</b>	
<b>Small-Scale, Moving Targets and Scaled, Molded-Rubber Targets</b>	<ul style="list-style-type: none"> <li>• Used on the 1/10-scale ranges.</li> <li>• Made locally.</li> <li>• Targets for use with this mechanism can be obtained locally.</li> </ul>
<b>Small-Scale, Stationary Targets</b>	<ul style="list-style-type: none"> <li>• Wire-operated target mechanism for popping 1/10-scale impact or laser targets.</li> <li>• Powered by any 24-volt electrical source.</li> <li>• When an impact weapon strikes the target, the target falls.</li> <li>• Comes with wire attached to the control box. The wire and the target mechanism are buried in sand or in the ground to protect them from projectile impacts.</li> <li>• When not in use, the mechanism should be removed or covered to protect it from the weather. Quick-connect plugs are used for easy removal.</li> </ul>
<b>M31A1 Target-Holding Mechanism for Small-Scale, Stationary Targets</b>	<ul style="list-style-type: none"> <li>• Used for popping up impact targets of 1/20 scale.</li> <li>• Normally operated on 110-volt AC.</li> </ul>

## Training Devices

Because of the high cost of ammunition and overcrowding of training areas, the use of training devices at home station is becoming increasingly more important. The use of training devices can enhance full-caliber gunnery by training personnel in their weak areas before they advance to the intermediate gunnery tables.

The MILES TOW equipment is the most realistic device available for simulating tactical engagements; it is valuable in maneuver training exercises and ARTEPs. However, MILES TOW is not a precision gunnery trainer and should not be used to train gunner tracking skills.

MILES allows vehicles and crews to participate in realistic combat training exercises. Although MILES is basically a tactical maneuver simulation device, it contributes significantly to crew interaction. Actual firing conditions of all vehicle weapons are simulated using laser beams. Blank ammunition and an antitank weapons effect simulator system (ATWESS) firing device adds to the system's realism (see TC 25-6-1).

The laser target interface device (LTID) is a MILES laser receptor that attaches to a target. It limits the target hit area and requires a more precise gunner sight lay. The interface is connected to the hit sensing connector of the target holding mechanism and will cause a target to fall when it receives a MILES target kill code. (See FM 17-12-7 for additional information.)

The precision gunnery system (PGS) is a group of training devices used to train precision gunnery. The TOW gunnery trainer (TOW GT) is a part of the PGS group. This crew-portable trainer simulates the sights, controls, switches, and indicators of the TOW II guided missile system. The battlefield scenes presented include both threat and friendly vehicle targets. The gunner selects, tracks, and engages targets just as he would on the battlefield; he hears the commands from the instructor station and the battlefield sounds of small arms and guns firing.



The TOW field tactical trainer (TOW FTT) is also part of the PGS group. This device is used to teach precision gunnery skills to TOW II gunners in the field. It may be used on designated ranges, general outdoor areas, or initial gunner familiarization in an outdoor environment and for gunner skill enhancement and progression. The TOW FTT trains gunners to adopt a correct firing position, to assess target engageability, and engage and track the target. Missile launch, flight, and impact effects are realistically simulated by the TOW FTT.

The M70-series training set may be used to train TOW gunnery. It measures the precision of a gunner's tracking over time, approximating missile flight times. Although it does not measure tracking ability or teach target engagement skills, it can determine if a gunner possesses the necessary foundation for successful gunnery. The M70-series training set can duplicate targets out to 3,000 meters. TOW launch characteristics are simulated by having the gunner fire and track with the M80 blast simulator and missile simulation round (MSR), which prepares the gunner for an actual missile launch by simulating the time delay after trigger depression (1.5 seconds), the noise (160 decibels, and the backblast (75 meters).

## Chapter 10

### Prepare to Fire

Prefire checks of the HMMWV weapon systems are important crew tasks. A prefire check must be made on the HMMWV weapon systems to eliminate all deficiencies associated with cleaning, maintenance, and functioning, and to make sure the weapon is safe to operate. A postfire check must be made after firing the weapon system, to detect any maintenance problems.

### Prefire Checklist

The following prefire checklist is used for the weapon systems of the HMMWV, along with the appropriate operator's manuals: M60 7.62-mm machine gun (TM 9-1005-224-10), M240B 7.62-mm machine gun (TM 9-1005-313-10), M2 HB caliber .50 machine gun (TM 9-1005-213-10), MK 19 40-mm grenade launcher machine gun (TM 9-1010-230-10), and TOW weapon system (FM 23-34).

<b>PREFIRE CHECKLIST</b>	
<b>Ammunition</b>	<ul style="list-style-type: none"><li>• Check all ammunition against TB 9-1300-385.</li><li>• Inspect the link alignment.</li><li>• Check for long or short rounds.</li><li>• Check the cleanliness. (Report and turn in any corroded or damaged rounds.)</li></ul>
<b>M60/M240B Machine Gun</b>	<ul style="list-style-type: none"><li>• Make sure the machine gun is cleaned and lubricated IAW TM 9-1005-224-10 (M60) or TM 9-1005-313-10 (M240B).</li><li>• Make sure the machine gun is installed and secured to the mount.</li><li>• Make sure the machine gun is clear of ammunition.</li><li>• Make sure the bore is wiped dry.</li><li>• Conduct a function check of the machine gun.</li></ul>
<b>M2 HB .50 Caliber Machine Gun</b>	<ul style="list-style-type: none"><li>• Make sure the M2 HB machine gun is cleaned and lubricated IAW TM 9-1005-213-10.</li><li>• Make sure the M2 HB machine gun is secured to the mount.</li><li>• Make sure the headspace and timing are set.</li><li>• Make sure the bore is wiped dry.</li><li>• Conduct a function check of the M2 HB machine gun.</li></ul>
<b>MK 19 40-mm Grenade Launcher Machine Gun</b>	<ul style="list-style-type: none"><li>• Make sure the MK 19 machine gun is cleaned IAW TM 9-1010-230-10.</li><li>• Make sure the MK 19 machine gun is secured to the mount.</li><li>• Make sure the bore is wiped dry.</li><li>• Conduct a function check of the MK 19 machine gun.</li></ul>

<b>TOW Weapon System</b>	<ul style="list-style-type: none"><li>• Conduct the following missile checks:<ul style="list-style-type: none"><li>– Check the outside for soil, dirt, grease, dents, gouges, punctures, and cracks.</li><li>– Make sure the humidity indicator is blue.</li><li>– Make sure the electrical connector dust cover is present.</li><li>– Make sure the forward handling ring and quick-release clamp are present and secured.</li><li>– Make sure the indexing lugs are not damaged.</li></ul></li><li>• Launcher checks:<ul style="list-style-type: none"><li>– Inspect the assembled TOW launcher for obvious damage.</li><li>– Conduct a system self-test (to include collimation) to determine if the launcher will function properly (correct or report any malfunctions). (Refer to FM 23-34 for boresighting and collimation procedures.)</li><li>– Check DA Form 2408-4 (Weapon Record Data) to make sure the number of rounds fired is recorded.</li></ul></li></ul>
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## Chapter 11

### TOW Training Program

This TOW training program is a comprehensive program beginning with individual training (gunnery skills test [GST] and Tables I through IV), progressing through squad training (Tables V through VIII), and culminating in section-level testing and verification (Tables IX and X). All mandatory TOW training and testing are included in the program. Additional TOW training, such as situational training exercises (STX) and company exercise evaluations (CO EXEVAL), will be performed with the frequency prescribed by the Standards in Training Commission (STRAC).

### Training Assessment and Planning

The heart of an effective training program is the METL and the soldier, leader, and collective tasks that support the METL. Battle focus drives the METL development process, the METL is based on the wartime mission, and the unit must train as it plans to fight. The METL is developed according to doctrine established in FM 25-100. FM 25-101, Chapter 2 illustrates this development process in clear, practical terms. When developing the unit training program, refer to FM 25-101; it shows how to apply the doctrine established in FM 25-100 and assists leaders in the development and execution of training programs.

Each unit must meet the standards outlined in DA Pam 350-38 to be certified in the training status C1 (fully trained). STPs and ARTEP battle drills for the TOW provide tasks, conditions, and standards for combat-critical skills.

All aspects of the training program must be coordinated to ensure the unit training program is effective. Differences between resources required and resources available affect both the time required to conduct and sustain training and the unit's ability to meet the required standards. Required resources and maintenance should be planned and requested well in advance. If left to chance, resources will be wasted and training opportunities lost.

**Note.** A good program must have provisions for direct-support units to conduct routine inspection of TOW weapon systems.

### COMMANDER'S RESPONSIBILITY

The commander must conduct an accurate assessment of TOW training in his unit to determine the weak spots and the additional training necessary to correct them; then, he must adjust the training program to meet the changing needs of the unit. Training should be concentrated in areas where it is most needed. Time should not be wasted by training skills the unit and soldiers have already mastered. The commander should start early and be thorough, flexible, and creative.

### TRAINING EVENTS

The TOW training program consists of the GST and ten gunnery tables. Table 11-1 shows the frequency of training events for the different levels of training.

FREQUENCY OF REQUIRED TOW TRAINING EVENTS			
EVENT/TABLE	TRC A Gunner	TRC C Assistant Gunner	TRC D USAR/ARNG
GST	4	2	1
TABLE I	4	2	1
TABLE II	4	2	1
TABLE III	4	2	1
TABLE IV	4	2	1
TABLE V	4	1	1
TABLE VI	4	1	0
TABLE VII	2	1	0
TABLE VIII	2	1	0
TABLE IX	2	1	0
TABLE X	2	1	0

**Notes.** Tables I and II should be conducted with the TOW GT, if available. If the TOW GT is not available, the M70-series training set may be used.

Tables III and IV must be conducted using the TOW GT (if a unit does not have the TOW GT, it cannot conduct Tables III and IV).

Tables V through X should be conducted with the TOW FTT. If the TOW FTT is not available, Tables V through X may be conducted using MILES.

**Table 11-1. Frequency of TOW Training Events.**

## TRAINING GUIDELINES

Training should be conducted under realistic conditions. To develop combat skills, training must be conducted in a tactical environment with emphasis on the type of threat the crew can expect to face in combat.

When possible, tactical training should be conducted with the type of units to be supported in combat (cavalry, mechanized infantry, and armor). TOW units must be able to interface with the units they support.

Multi-echelon training should be conducted to save time and resources. For example, while squads are training in crew tasks, leaders should train to execute their tactical command and control responsibilities.

When a crewman becomes skilled in his crew position, he should be cross-trained in the other crew positions to ensure that the loss on one crew member does not make the squad combat ineffective. Sections and squads will not always be at full strength. The mission in combat and in training can be accomplished if under-strength units are organized with the following rules in mind:

- Key leader positions should always be filled (for example, the gunner may have to fill the position of the squad leader).

- The primary weapon system should always be manned. If the loader becomes a casualty, the squad leader may have to load the TOW and control the squad at the same time. If the gunner becomes a casualty, the squad leader must operate and fire the TOW.

**Note.** As individual TOW crewmen, squads, and sections become qualified, the commander should maintain that status by sustainment training and evaluation, and by crew stabilization. Personnel changes are inevitable; however, before TOW squads lose crew integrity and combat readiness, personnel changes should be examined in detail and alternate solutions sought when possible.

## Collective Training

Collective tasks are those tasks performed by two or more soldiers working as a team. The critical squad and section collective tasks are called battle drills. Battle drills are mostly independent of METT-T and require minimal leader actions to execute. They are standardized throughout the army. Battle drills for antiarmor sections are in ARTEP 7-91-DRILL.

Common crew tasks are also collective tasks performed by a TOW crew in the same manner as battle drills. Common crew tasks are crucial to applying tactics to enhance survival and to accomplish the TOW crew's mission of providing antiarmor direct fire support to destroy the enemy. These tasks require the basic technical skills used to accomplish the crew's wartime mission. Training these tasks shows the crewman *how to* and allows each soldier to perform his tasks.

Collective training of common crew tasks and battle drills trains all actions the crew must perform. The squad leader, gunner, driver, and loader combine their individual technical skills to perform as a crew on their vehicle. ARTEP training exercises are used to practice, evaluate, and sustain collective tasks and mission proficiency. They have specific goals and are modified based on METL. Exercises are structured according to the availability of resources, time, and training areas.

## TOW Training Phases

TOW training involves individual and collective training divided into three phases: individual training, squad training, and section training. Each unit must complete each phase.

### PHASE 1, INDIVIDUAL TRAINING

Phase 1 covers all tasks that are performed by a single TOW crewman. These tasks include Skill Levels 1 and 2 soldier's manual tasks and individual gunnery. These individual skills are the building blocks that form the foundation of TOW training. Individual training includes—

- Refresher training on STP tasks, as necessary to prepare for the GST.
- Sustainment training with the TOW GT or the M70-series training set, as necessary to prepare for TOW Gunnery Tables I through IV.
- Gunnery Skills Test.
- TOW Gunnery Table I, Individual Gunnery Practice.
- TOW Gunnery Table II, Individual Gunnery Qualification.
- TOW Gunnery Table III, Advanced Gunnery Practice.
- TOW Gunnery Table IV, Advanced Gunnery Qualification.

## PHASE 2, SQUAD TRAINING

Phase 2 covers collective tasks that are performed by a squad. Squad training includes—

- Refresher training on the installation and operation of MILES or TOW FTT equipment, as necessary to prepare for TOW Gunnery Tables V and VI.
- TOW Gunnery Table V, Baseline Gunnery Practice.
- TOW Gunnery Table VI, Baseline Gunnery Qualification.
- Squad-level sustainment training, as necessary to prepare for TOW Gunnery Table VII and VIII.
- TOW Gunnery Table VII, Squad Gunnery Practice.
- TOW Gunnery Table VIII, Squad Gunnery Qualification.

## PHASE 3, SECTION TRAINING

Phase 3 covers collective tasks that are performed by a section. Section training includes—

- Section-level sustainment training, as necessary to prepare for TOW Gunnery Table IX and X.
- TOW Gunnery Table IX, Section Gunnery Practice.
- TOW Gunnery Table X, Section Gunnery Qualification.

## TOW Gunnery Trainer

The TOW GT is part of the PGTS group. This crew-portable trainer simulates the sights, controls, switches, and indicators of the TOW II guided missile system. The battlefield scenes presented include both threat and friendly vehicle targets. The gunner selects, tracks, and engages targets just as he would on the battlefield; he hears the commands from the instructor station and the battlefield sounds of small arms and guns firing.

The TOW GT may be used for TOW gunner training, practice, and qualification/verification. The following skills may be trained on the TOW GT:

- Determining the correct firing position.
- Identification of a target.
- Determining if a target can be engaged.
- Engaging targets (including tracking and firing).

The TOW GT attaches to a TOW II weapon system (will not operate on basic TOW) and replaces components of the TOW II. (A properly operating TOW II weapon system is required to use the TOW GT.) Only the narrow field of view is seen through the night sight. This system—

- May be used either tripod-mounted or vehicle-mounted (HMMWV) (stationary only—should never be mounted on a moving HMMWV).
- Requires electrical power to operate; setup and operation of the TOW GT is limited to the length (96 inches) of the power cables. Extension cords must be grounded.
- Is an indoor system. It must be protected from extremes of temperature, humidity, and blowing dust. It is not designed to operate outside.
- Is easy to operate and install (should be assembled and operated according to the instructions in TM 9-6920-452-10).

**Note.** Normally, only the gunner and trainer will be involved in training with the TOW GT. The trainer is usually either the squad or section leader. Other members of the squad should be occupied with concurrent training. Other gunners should not be allowed to watch as the event is conducted.

When training on the TOW GT, the trainer must construct a planned group for each table (different missions should be used for each table). (See TM 9-6920-452-10 for specific instructions on constructing a planned group.)

The trainer should have the TOW GT inspected and warmed up, and the planned group constructed before the gunner is brought into the trainer. During training, battle sounds should be ON, target size should be set at 100 percent, and obscuration should be set to last for one second. When everything is ready, the trainer should bring the gunner in and brief him. The briefing should include the following items:

- Safety considerations.
- Breath control—remind student of proper procedures.
- Obscuration—tell student obscuration setting used.
- Sight—tell student sight he will use.
- Special conditions—tell student special conditions that apply (multiple targets and so forth).

The mission score is displayed at the end of each mission. A mission may be replayed or stored for future use.

Units that have the TOW GT are required to conduct monthly sustainment training. This training should not be confused with the quarterly tables. The trainer may choose the missions for monthly sustainment training from any of the video discs; however, the missions used on the quarterly tables should not be used for sustainment training.

## TOW Field Tactical Trainer

The TOW FTT is another member of the PGTS group. This device is used to teach precision gunnery skills to TOW II gunners in the field; it may be used on designated ranges, general outdoor areas, or other representative tactical environments. The TOW FTT may be used for initial gunner familiarization in an outdoor environment and for gunner skill enhancement and progression. The TOW FTT trains gunners to adopt a correct firing position, assess target engageability, and engage and track the target. Missile launch, flight, and impact effects are realistically simulated by the TOW FTT. (See TM 9-6920-453-10 for further information.)

The TOW FTT attaches to a TOW II weapon system and replaces some of the TOW II components. A properly operating TOW II weapon system is required to use the TOW FTT. The TOW II may be tripod-mounted or mounted on the pedestal in an M151 truck or an M966 HMMWV.

The TOW FTT uses a retroreflector to sense targets. The retroreflector is designed for mounting on a variety of target vehicles, enabling it to be maneuvered, as required, during a training mission. The retroreflector acts like a mirror and returns a portion of the laser beam generated by the laser transceiver in the trainer missile tube. This laser beam enables precise measurement of target range and location relative to the gunner.

The TOW FTT transmits the MILES TOW code and can, therefore, kill targets equipped with a MILES harness. (The MILES target must be equipped with the proper retroreflector. Similarly, panel targets must also be fitted with a proper retroreflector for use with the TOW FTT.) The TOW FTT replicates the flight and performance



characteristics of the TOW better than MILES; therefore, it should be used for precision gunnery training, whenever possible.

The TOW FTT operator loads the M80 blast simulator, sets the duration of obscuration that simulates the smoke produced at missile launch, and selects the relative size of the target, as seen by the TOW FTT. After the missile is launched, the operator monitors the gunner's performance during missile flight. At the end of each mission, the operator is provided with a readout of mission results. During TOW FTT operations, the operator is notified of any current or impending failures of TOW FTT equipment.

The TOW FTT—

- Can operate in all weather conditions, except for limitations described in TM 9-6920-453-10.
- Can operate during day and night.
- Can operate in temperatures between -4 to +120 degrees Fahrenheit.
- Can operate at altitudes up to 10,000 feet (3,000 meters).
- Has a built-in self-test capability.
- Can operate without the remote control unit. (In this mode, obscuration time and target size cannot be changed, and mission results are not available to the operator).
- Can operate in dry-fire mode without an M80 blast simulator.
- Has a built-in automatic power-down feature.

## M70-Series Training Set

The M70-series training set measures the precision of a gunner's tracking over time, approximating missile flight times. Although it does not measure tracking ability or teach target engagement skills, it can determine if a gunner possesses the necessary foundation for successful gunnery.

The M70-series training set can duplicate targets out to 3,000 meters. TOW launch characteristics are simulated by having the gunner fire and track with the M80 blast simulator and missile simulation round (MSR). This prepares the gunner for an actual missile launch by simulating the time delay after trigger depression (1.5 seconds), the noise (160 decibels), and the backblast (75 meters).

The trainer should make sure that a system checkout has been conducted before setting up the carrier and training equipment. The carrier and training equipment must be working properly. A gunner engaging a stationary target in LOW RATE QUALIFY should consistently score about 90 percent. Failure to do so could indicate either poor tracking performance or a fault in the equipment.

**Note.** A qualified gunner should engage the stationary target board to verify that the system is working properly.

Battery power should be checked as part of troubleshooting or if scores are excessively high. Weak batteries invalidate the gunner's score. The battery in the missile guidance set (MGS) discharges faster than the battery in the instructor console. If the MGS battery fails self-test position 1 (TOW) or battery fail (TOW II) and only a few tracking runs remain to be completed, the batteries in the instructor console and the MGS may be rotated. (After rotation, batteries must be checked before continuing the tracking runs.)

Qualification and practice are fired on a standard tracking range. Requirements for this range include a target vehicle tracking road, a firing line, and a backblast area.

**Note.** Because the TOW GT is replacing the M70 in the force, no new M70 tracking ranges should be constructed.

The target vehicle tracking road must be as smooth as possible. A rough road causes the target vehicle to vibrate, making it difficult for a gunner to keep the sight cross hairs on the target board. The tracking road should be long enough for the target vehicle to reach the needed tracking speed, maintain that speed for the necessary tracking time, and stop safely.

The firing line should be level and allow for movement of the TOW and TOW II to and from the firing line. It should be long enough to allow about five meters between systems or carriers. The distance from the firing line to the tracking road should be at least 450 meters for TOW and 550 meters for TOW II, but not more than 1,000 meters. The training set operates at greater ranges, but the vehicle speeds needed to simulate the tracking rates in the firing tables are unsafe at greater ranges or too slow for a driver to maintain a steady speed at closer ranges.

Table 11-2 is used to determine target vehicle speeds for qualification and practice firing. If the training situation requires tracking at ranges greater than 500 meters, the target vehicle must maintain a steady speed or the task becomes too difficult for the gunner. The driver of the target vehicle should be briefed thoroughly. He must maintain a constant speed throughout each tracking run. A variation of up to 10 percent from the speeds listed is acceptable; however, slowing down and speeding up affects a gunner's ability to maintain a steady track.

TARGET VEHICLE SPEEDS		
TARGET RANGE	TARGET SPEED	
meters	MPH	KMPH
450	5	8
500	6	10
600	7	11
700	8	13
800	9	14
900	10	16
1,000	11	18

**Table 11-2. Target Vehicle Speeds.**

The area between the firing line and the tracking road must be free of trees, brush, or other objects that might break the infrared signal transmitted by the target set to the tracker. Even a short loss of signal causes a big drop in the gunner's score.

A backblast area of 75 meters is recommended so gunners become accustomed to the backblast area of the TOW. The gunner does not engage the target vehicle at traversing angles greater than 45 degrees left or right of the carrier (vehicle-mounted). At traversing angles greater than 45 degrees, the target lamp source becomes weaker and the backblast becomes a danger to other systems.

If the tracking road and firing line are level, the system (tripod mounted) or carrier (vehicle mounted) should be canted about 10 degrees to force the gunner to track in the vertical as well as the horizontal plane (sandbags or wooden blocks may be used to cant the vehicle).

During qualification and practice, gunners are required to track for 16 seconds and traverse at a slow rate. The instructor console RANGE switch should be placed in the LOW RATE position to accomplish this. (After a gunner becomes proficient at the slow rate, he may practice at a high rate.)

To allow the soldier to practice identifying and correcting faults on the M70, the trainer inserts a variety of faults into the system and discusses faults that cannot be inserted into the system (for example, discharged or weak battery assembly, power supply/modulator LAMP MOD indicator does not stay on, OPERATING RANGE meter with no IN-BAND). Table 11-3 may be used to help determine gunner faults and corrective action. Only through detection of faults and their correction can a gunner master the tracking techniques needed for qualification.

<b>GUNNER FAULTS AND CORRECTIVE ACTIONS</b>		
<b>LOS INDICATOR</b>	<b>FAULT</b>	<b>CORRECTIVE ACTION</b>
Increasing azimuth error last half of tracking exercise.	Wrong point of aim on target board.  Trying to catch up to, or wait for, target board.	Assume correct body position. Place cross hairs on center of target.  Execute smooth transition back to aiming point.
Sudden elevation or azimuth error during otherwise good track.	Loss of concentration and flinching caused by distraction or eye fatigue.  If true with all firers, track road may be rough, target vehicle speed not steady.	Rotate firers.  Reduce air in target vehicle tires; replace driver if he cannot maintain steady speed.
Constantly off target.	Wrong point of aim.  Boresight out of adjustment.  Collimation out of adjustment.  V-ways not aligned.	Verify point of aim.  Verify boresight.  Verify collimation.  Remove and reinstall optical sight; check V-way alignment.
Launch excursion.	Flinching at launch.	Execute smooth track to keep cross hairs on aiming point during launch.

**Table 11-3. Gunner Faults and Corrective Actions.**

During gunner qualification and verification, all soldiers may not be able to fire at once; therefore, trainers should try to conduct round-robin type training.

**Example:**

**Station 1**—operation of M70-series training set.

**Station 2**—dry firing (tripod-mounted and vehicle-mounted).

**Station 3**—refresher training on individual tasks.

The trainer—

- Monitors the LOS indicator and observes the gunner during each engagement.
- Critiques the gunner after each engagement, if a fault is detected in the gunner's firing position or technique of fire.
- Operates the instructor console, ensuring the RANGE switch is turned to the correct setting (HIGH RATE/LOW RATE) for the engagement being fired.

**Note.** Do not use the RAPID FIRE switch on the M70 instructor console at any time. When the RAPID FIRE switch is in the ON position, the MGS may overheat, causing BATTERY power to drain quickly.

- Resets the SCORING switch after each engagement and records the score.
- Announces "READY," when the READY FLAG appears in the LOS indicator.
- Checks the battery power in the instructor console by rotating the MODE switch to battery and observing the score meter.
- Ensures the cables from the training set do not get snagged anywhere on the system (tripod-mounted) or the vehicle (vehicle-mounted).

The loader keeps the backblast area under observation and announces "CLEAR" to the gunner and trainer. When using M80 blast simulators, the loader loads and arms the system.

## DA Form 5107-R

DA Form 5107-R is used to record both gunner qualification and practice firing. (See Figure 11-1 for a sample completed DA Form 5107-R.)

On DA Form 5107-R—

- Complete items 1 through 10 for each gunner.
- Enter the date for the event.
- When using the TOW GT, use the launch excursion column to mark hits and misses. When using the M70-series training set, mark the YES column for a hit or the NO column for a miss.
- Enter a check mark for launch excursions (yes or no for each run).
- Enter gunner's score for each run.
- Total the scores for each event.



## Gunnery Skills Test

The GST comprises two parts:

- Part 1 consists of Skill Level 1 tasks for the TOW weapon system (STP 17-19D1-SM, STP 17-19D23-SM, and STP 21-1-SMCT) and tasks derived from FM 23-34. All 19D soldiers must receive a GO on all tasks on this portion of the test.
- Part 2 consists of vehicle-specific (HMMWV) tasks taken from STP 17-19D23-SM. All 19D soldiers must receive a GO on all tasks that apply to the vehicle with which his unit is equipped. Some of the tasks are combined individual/crew tasks. Since every member of the crew must be cross-trained, the combined individual/crew tasks will be performed in rotation, and every member of the crew will be tested on each part.

Part 1 tasks are derived from the following tasks:

- Assemble the M220-Series Launcher (FM 23-34, Chapter 2, no task number).
  - Maintain an M220-Series Launcher System (STP 17-19D1-SM, 071-056-0004).
  - Load an M220 -Series Launcher System (STP 17-19D1-SM, 071-056-0007).
  - Unload an M220-Series Launcher System (STP 17-19D1-SM, 071-056-0008).
  - Engage Targets with an M220-Series Launcher System (STP 17-19D1-SM, 071-056-0009).
  - Perform Immediate Action for an M220-Series Launcher System Malfunction (STP 17-19D1-SM, 071-056-0010).
  - Conduct a System Checkout on an M220A1 Launcher System (STP 21-1-SMCT, 071-056-0005, for units with M220A1).
- or**
- Conduct a System Checkout on an M220A2 Launcher System (STP 17-19D1-SM, 071-056-0013, for units with M220A2).
  - Determine M220-Series Launcher System Firing Limitation (STP 17-19D23-SM, 071-056-0030).
  - Recognize Friendly and Threat Armored Vehicles and Aircraft (STP 21-1-SMCT, 878-920-1002).
  - Conduct a Preoperation Inspection of an Encased Missile (FM 23-34, Chapter 1, no task number).
  - Determine if a Target can be Engaged by a TOW (FM 23-34, Chapter 1, no task number).
  - Prepare a TOW Antiarmor Range Card (FM 23-34, Chapter 1, no task number).

Part 2 tasks for M966 HMMWV-equipped units include—

- Conduct Dismounting and Remounting of an M220A1 Launcher System on an M966 Vehicle (STP 17-19D23-SM, 071-056-0032, for units with M220A1).
- or**
- Conduct Dismounting and Remounting of an M220A2 Launcher System on an M966 Vehicle (STP 17-19D23-SM, 071-056-0034, for units with M220A2).
  - Load, Arm, and Unload an Encased Missile on an M966 (FM 23-34, Chapter 3, no task number).
  - Place the M966 HMMWV in the Ready-to-Fire Configuration (FM 23-34, Chapter 3, no task number).

**Note.** The tasks, conditions, and standards for the GST are in Appendix A.

## Field Tracking

Field tracking (tracking in a field environment) provides practice and experience in tracking evasive targets and should be performed in conjunction with FTXs. This is not an element in the ten required TOW gunnery tables, but is very useful in preparing for them, especially tables VII through X. Other tactical employment tasks, such as occupying a firing position or completing a range card, should be performed at the same time. Careful planning by unit commanders will result in effective training that makes the best use of time, equipment, and personnel.

The tracking range should include an area more than 3,000 meters deep and at least 500 meters wide with hills and valleys, dead space, and covered terrain. Battlefield target conditions should be simulated as follows:

- Targets should be a variety of tanks, APCs, and other tactical vehicles. Many training installations now have various types of threat vehicles. These vehicles should be used, when possible.
- Target vehicles should behave, as much as possible, like enemy vehicles on the battlefields. They should change direction constantly and quickly (including backing up for short distances) and should vary their speed. They should move within the gunner's sight picture from left to right, top to bottom, and bottom to top. The vehicles should move at angles to and from the weapon position as well as directly toward and away from the weapon.
- Gunners should see tanks and APCs in full and partial frontal, flank, and rear exposures.

Gunners must be able to engage the targets at all ranges with both the daysight tracker and the thermal sight. To do so, they must be able to determine if a target is in range. Targets should move in and out of range so gunners gain experience in range determination.

Armored vehicles should try to reduce their exposure and evade ATGM fire by moving quickly from one covered area to another. The squad leader must have the gunner acquire and fire at the target while it is exposed. During field tracking, target vehicle exposure time is reduced to the minimum by having targets use a covered area during halts. This gives the gunner experience in tracking targets that disappear, then reappear.

Field tracking should be performed under conditions that normally occur on the battlefield. These conditions include limited visibility (darkness, smoke, or fog), the discomfort of MOPP gear, and the noise and distraction caused by indirect and small-arms fire around the firing positions.

Battlefield tracking conditions should be simulated. TOW crew members should train to engage targets during reduced visibility using both the daysight tracker and the thermal sight. Training should be conducted during daylight using the AN/TAS-4A (the AN/TAS-4A is a thermal sight, not just a nightsight). It offers many advantages in searching for and tracking targets in all kinds of weather and at any time of day. The AN/TAS-4A should be used extensively in conjunction with the daysight to maximize the abilities of the system.

Enemy capabilities include the use of nuclear, biological, and chemical munitions. These munitions may not affect the weapon, but a gunner's ability to track will be degraded if he has never tracked while wearing a protective mask and protective clothing. Training is more realistic when the entire crew wears protective masks and clothing during part of the field tracking exercises.

The enemy will try to suppress TOW fires with artillery and mortar fires. A gunner's ability to keep the sight cross hairs on a target may be affected under these conditions, especially if he has not been properly trained. Distracters should be used in training to accustom gunners to such conditions and to minimize flinching. Grenade and artillery simulators are effective distracters. Small-arms fire can also be expected, but gunners should not be seriously distracted by its noise. Therefore, the simulation of small-arms fire is not required.

Gunners should be allowed to use any means available to practice tracking targets that vary target speeds and directions of movement. If facilities and equipment are not available to conduct a field tracking exercise, gunners should be allowed to track evasive targets, such as military or civilian vehicles traveling on a nearby highway. This should be done often and may be accomplished in any location that has vehicular traffic.

TOW crews must be proficient in combat vehicle identification to gain the most benefit from field tracking. Combat vehicle identification skills have been standardized by GTAs 17-2-13, 30-3-14, 30-3-20 and 44-2-10.



## Chapter 12

### Light Cavalry Tables

The light cavalry gunnery tables are designed to develop and test the proficiency of individual, crew, and section gunnery techniques at the basic, intermediate, and advanced levels. The series of engagements on each table is intended to duplicate (within the safety and resource constraints of live-fire gunnery ranges) typical battlefield tasks under realistic conditions against likely target arrays. This chapter discusses the light cavalry gunnery tables for the M2 HB caliber .50 machine gun, the MK 19 40-mm grenade machine gun, and the TOW weapon system. It also discusses the qualification requirements for crews and sections, scoring procedures, standards, and allowable variations for these tables.

The light cavalry gunnery tables standardize the gunnery program for light cavalry units. These tables are consistent with the gunnery tables for heavier scout weapon systems, thus maintaining a consistent training standard between the light and heavy weapon systems.

## Machine Gun Gunnery Program

### OBJECTIVES

The machine gun gunnery program is designed to train scout crews, sections, and platoons to employ their weapon systems effectively in a combat environment. The program consists of four levels of training: preliminary, basic, intermediate, and advanced gunnery, which standardizes crew, section, and platoon qualification requirements.

### PRELIMINARY GUNNERY TABLES

Preliminary gunnery trains and sustains individual tasks. Before conducting the basic, intermediate, or advanced gunnery tables, the TC and gunner must be proficient in individual and crew tasks. This proficiency is gained through specified elementary gunnery tasks and procedures, then demonstrated by the Gunnery Skills Test (GST) (see Appendix A, *Test Administrative Guides and Criterion Scoring Checklists for the GST* and Appendix B, *TOW Gunnery Skills Test*). Preliminary gunnery reinforces the skills necessary to determine range and lay on and track targets during good and limited-visibility conditions. Preliminary gunnery should consist of classroom instruction, target acquisition and range determination exercises, and a gunnery skills test.

### PRELIMINARY GUNNERY CLASS

The preliminary gunnery class consists of—

- Weapons/ammunition characteristics and capabilities.
- Target acquisition.
- Range determination.
- Fire commands and crew duties.
- Engagement techniques.
- Gunnery tables and standards.
- Range operations.

## TARGET ACQUISITION AND RANGE DETERMINATION EXERCISES

Target acquisition and range determination exercises are exercises in manipulation training designed to teach the gunners and TCs to rapidly lay on and track targets over any type of terrain. They develop the crew's ability to acquire and estimate range to a target.

SAMPLE EXERCISE	
<b>Task, conditions, and standards.</b>	<p><b>Task:</b> Acquire and determine the range to a target.</p> <p><b>Conditions:</b> Given binoculars, night sights, and scaled targets arranged in a tactical array.</p> <p><b>Standards:</b> Using the target acquisition process, the crew must acquire and identify the targets (by nomenclature), then determine the range (using both assisted and unassisted methods) to within 200 meters of actual range for eight of ten targets.</p>
<b>Conduct of the exercise.</b>	<ul style="list-style-type: none"> <li>• Ten 1/30-scale stationary threat targets and a moving target are arrayed in front of each vehicle.</li> <li>• The targets are presented for 40 seconds. The crew must acquire, identify, and determine the range before the target engagement time expires.</li> </ul>
<b>Scoring procedures.</b>	<ul style="list-style-type: none"> <li>• Target engagement time starts when the target is up.</li> <li>• Crews must correctly identify and determine range to eight of ten targets to receive a GO for this exercise.</li> </ul>

## GUNNERY SKILLS TEST

The GST evaluates the crew member's ability to perform gunnery-related tasks. It does not replace tasks in the soldier's manuals.

The GST is an evaluation tool with which the unit can determine readiness to move toward crew tasks and conduct live-fire gunnery to meet prescribed training levels. As a minimum, the appropriate tasks of the GST must be administered—

- Semiannually.
- When crew members change positions.
- Before gunnery qualification, unless the crew members qualified in their current vehicle positions within the past three months.

The GST is administered using tasks, conditions, and standards, as well as training evaluation guidelines and performance checklists. At no time will tasks be deleted from the GST; however, the commander may add tasks for a more comprehensive evaluation.

All members of the scout squad should take the test. The commander and gunner must achieve a GO on all tasks (appropriate for their weapon systems).

The GST should also be used as a diagnostic tool to determine the level and effectiveness of cross-training throughout the section.

### GST Tasks

(See Appendix A, *Test Administrative Guides and Criterion Scoring Checklists for the GST*):

1. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun.
- 1A. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun.
2. Clear, disassemble, assemble, set headspace and timing, perform a function check, load, and perform immediate action on an M2 HB machine gun.
3. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on a MK 19 machine gun.
4. Prepare a sector sketch, and engage targets using the sector sketch data.
5. Mount, place into operation, and dismount the AN/TVS-5 night-vision sight (using the M2 HB machine gun).
6. Mount, place into operation, and dismount the AN/TVS-5 night-vision sight (using the MK 19 machine gun).
7. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M60 machine gun).
- 7A. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M240B machine gun).
8. Identify combat vehicles.

### TOW GST Tasks

(See Appendix B, *TOW Gunnery Skills Test*):

1. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun.
- 1A. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M24B machine gun.
2. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M60 machine gun).
- 2A. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M240B machine gun).
3. Load, arm, and unload an encased TOW missile.
4. Perform immediate action procedures for a hangfire or misfire of an M220-A2 TOW missile launcher (mounted on an M966 HMMWV).
5. Conduct a system check-out procedure and preoperational inspection on an M220-A2 TOW launcher system and encased missile.
6. Identify combat vehicles.
7. Determine if a target can be engaged by an M220-series TOW launcher system.
8. Prepare an antiarmor range card.
9. Assemble the M220-A2 TOW launcher system.
10. Install an M220-A2 TOW launcher system and an encased missile on an M966 HMMWV.
11. Place an M966 HMMWV in the ready-to-fire configuration.

## LIGHT CAVALRY EVALUATION TABLES

The basic and intermediate light cavalry gunnery tables are used to train and evaluate a single firing crew. These tables take a single vehicle crew from the basic gunnery engagements on Table I through crew qualification on Table VIII. Basic gunnery trains crews to engage targets during good and poor visibility conditions and in NBC environments. The intermediate gunnery tables are natural extensions of the basic gunnery tables; these tables train vehicle teams to engage stationary and moving, single and multiple targets with HMMWV weapon systems during daylight and limited visibility, from stationary and moving vehicles.

Firing Tables I through IV is not mandatory, but is encouraged. These tables are conducted as the commander deems necessary for sustaining skills or training crews before firing the intermediate tables.

Vehicle teams must qualify on Table VIII A and B before moving to the advanced tables.

**Note.** The intermediate (marksmanship and engagement) gunnery tables are used to train crews to acquire and engage targets properly through various target or firing vehicle conditions. They are not fired in tactical scenarios, therefore, are not fired using wingman techniques.

Tables IV, VIII, and X are qualification tables; all other tables are recommended for training in sequence.

The specific purpose for each gunnery table is as follows:

- Table I trains the gunner in the basic skills, such as zeroing the weapon and manipulating the weapon system. The M2 HB table uses paster targets. The MK 19 table uses the EST.
- Table II uses timed events (fired from a tripod) to train the gunner to apply all the fundamentals of gunnery, including zeroing, immediate action (if necessary), and burst control against stationary targets. Some tasks are fired under NBC conditions.
- Table III uses timed events to train the gunner to engage stationary targets under NBC conditions.
- Table IV is the basic qualification table. The gunner acquires and engages stationary and moving targets from a stationary platform for record fire.
- Table V trains the gunner to acquire and engage stationary and moving targets, both day and night. It also transitions the gunner from tripod firing to vehicle firing.
- Table VI is the first table that requires the HMMWV crew to fire full caliber ammunition from a stationary firing vehicle. These exercises are fired during the day and at night.
- Table VII teaches the HMMWV crew to engage moving and stationary targets during daylight and reduced visibility conditions from a stationary and moving firing vehicle.
- Table VIII is a marksmanship single-vehicle qualification table. This table evaluates the crew's ability to properly acquire and engage targets during various firing conditions. This is not a tactical table.
- Table IX transitions the training from individual crews and gunners to sections. Crews are trained to acquire and engage targets with another crew (as a section). Use live ammunition, if available; use MILES if live ammunition is not available.
- Table X is the qualification exercise for sections. Table X is the same as Table IX, except that it must be fired using live ammunition.

<b>Basic Tables</b>	
<b>Table I.</b>	Ten Meter Firing (M2 HB Caliber .50). Manipulation Exercise (MK 19). Individual Practice (TOW).
<b>Table II.</b>	Transition Firing (M2 HB Caliber .50). Tripod Exercise (MK 19). Individual Qualification (TOW).
<b>Table III.</b>	Night Firing (M2 HB Caliber .50). Adjustment of Fire (Stationary) (MK 19). Advanced Practice (TOW).
<b>Table IV.</b>	Basic Qualification (M2 HB Caliber .50). Basic Crew Qualification (MK 19). Advanced Qualification (TOW).
<b>Intermediate Tables</b>	
<b>Table V.</b>	Crew Proficiency Course (M2 HB Caliber .50). Crew Proficiency Course (MK 19). Baseline Practice (TOW).
<b>Table VI.</b>	Crew Baseline (M2 HB Caliber .50). Crew Baseline (MK 19). Baseline Qualification (TOW).
<b>Table VII.</b>	Crew Practice (M2 HB Caliber .50). Crew Practice (MK 19). Squad Practice (TOW).
<b>Table VIII.</b>	Crew Qualification (M2 HB Caliber .50). Crew Qualification (MK 19). Squad Qualification (TOW).
<b>Advanced Tables</b>	
<b>Table IX.</b>	Section Training Course (M2 HB Caliber .50 and TOW).
<b>Table X.</b>	Section Qualification Course (M2 HB Caliber .50 and TOW).

**Notes.** All basic gunnery tables for the MK 19 must be device-based tables, due to ammunition constraints.

Because of maneuvering constraints required by safety standards when firing MK 19 practice ammunition, these section tables cannot be fired on all ranges using the MK 19 weapon system.

Units may *free-gun*, if deemed necessary by the unit commander and if range safety approved.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

## GUNNERY PHASES AND VARIATIONS

There are two phases and two variations of the tables that may be used in a well-rounded light cavalry gunnery program.

### Phases

*Day firing* (A tables) trains and tests the crew and section in rapid engagement and destruction of targets during daylight.

*Night firing* (B tables) trains and tests the crew and section in rapid engagement and destruction of targets at night and during other reduced visibility conditions.

**Note.** Day firing should precede night firing, when possible.

### Variations

*Device-based* (day/night) firing trains gunnery procedures and crew duties without expending live ammunition.

*Dry firing* is used to develop teamwork before live fire. It is also used to sustain skills when live fire is restricted. All tables except the qualification tables (Tables IV, VIII, and X) may be fired dry.

**Notes.** If the scenario calls for a moving target and none are available, full-scale stationary targets of the same type may be substituted; however, moving targets are preferred.

At the commander's discretion, Tables III and IV may be fired from vehicle-mounted weapons.

## AFTER-ACTION REVIEWS

An evaluator critiques the entire crew and conducts an AAR after each table (day and night) for each crew. After-action feedback includes a discussion of actions executed during the conduct of the table. The crew evaluator must record engagement times for each task fired (even when computers are used).

## TIMING PROCEDURES

The following explains the procedures for recording engagement times for each table, as well as for offensive and defensive engagements:

- Tables I through IV. For Tables I through IV, time starts when the evaluator announces "COMMENCE FIRING," and stops when all targets have been engaged or the evaluator announces "CEASE FIRE."
- Tables V through X. Performance (time) standards for each engagement on Tables V through X are based on an assessment of the simulated threat capability to kill the HMMWV. Time is determined as outlined; no variations are permitted.
- Target Exposure Time. Target exposure time for each task is listed on the scoresheet. Exposure time for day tasks is 50 seconds. Exposure time for night tasks is 60 seconds. Exposure time begins when a target is fully exposed.
- Target Engagement Time. Target engagement time begins when a target is fully exposed. Engagement time ends when a target is killed.

- **Defilade Time.** Defilade time is the time it takes the truck crew to move to a hull-down firing position during defensive engagements. Defilade time starts when the targets are fully exposed. Defilade time stops when the weapon system of the firing truck is unmasked, the truck stops, or the vehicle fires. During darkness, defilade time stops on the command “DRIVER STOP” or when the first round is fired. Maximum defilade time is 25 seconds. If the vehicle crew has not begun to move to the hull-down position after 25 seconds, record the actual time it takes the crew to reach a hull-down position. A maximum of 25 seconds will be subtracted from the last target engagement time. Crews may pull forward or back down more than once. Only a total of 25 seconds of defilade time will be subtracted. Target exposure time and target engagement time will continue to run if a vehicle returns to the defilade and the targets are still exposed. If a target malfunctions, defilade time will not be counted against the crew. When the target that malfunctioned is presented again, defilade time resumes.
- **Offensive Engagements.** In an offensive engagement (the firing vehicle is exposed in the open, on the move, or at a short halt), engagement time starts when a target is fully exposed. When the target array consists of more than one target, the targets must be presented simultaneously. Time begins when the first target is exposed. Time (total engagement time) stops when all targets are killed.
- **Defensive Engagements.** Engagement time starts when a target is fully exposed. Stop timing when all targets are destroyed or when target exposure time has elapsed. Defilade time is subtracted in the scoring procedures to reward the crew for the time they were not exposed.

**Note.** On ranges where prepared positions are not available, simulated positions should be established using stakes, engineer tape, flashlights, or chemical lights to depict the limits of the defilade and unmasked firing positions. An additional marker must be placed to signify the point on the ground where the firing vehicle becomes exposed.

If the firing vehicle starts the engagement from an unmasked position, time starts when a target is fully exposed. Target engagement time continues through each engagement, even if the firing vehicle does not move into the firing position and unmask to engage the target. Total engagement time stops for the engagement when all targets are killed.

**Note.** During NBC engagements, the crew will be told to prepare for NBC conditions before the engagement starts.

## **ALIBIS**

Battalion/squadron commanders are the deciding authority on alibis. All alibi engagements will be re-fired. Alibis will be given for the following conditions only:

- Range failures.
- Equipment failures that are not the result of crew error.
- Unsafe conditions not related to the firing vehicle or crew.

**EVALUATION PROCEDURES—TABLES II THROUGH V FOR THE M2 HB AND MK 19**

When evaluating Tables II through V for the M2 HB and MK 19, the evaluator rates crew duties as satisfactory or unsatisfactory. The evaluator will circle SAT or UNSAT in the crew duties column on the scoresheet. If a firing crew commits more than one crew error, the crew duties for that task are rated UNSAT. This rating will be discussed with the crew during the AAR; however, it will not affect the GO/NO-GO evaluation.

Crew errors include the following:

- 5 points—Improper fire command.
- 5 points—Incorrect engagement techniques (for example, engaging a least dangerous target before a most dangerous target).
- 5 points—Incorrect driving techniques (anything the driver does that impedes the firing task).
- 10 points—Firing before receiving the command to fire.
- Automatic 0-points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

**EVALUATION PROCEDURES<sup>3</sup>/<sub>4</sub> TABLES VI THROUGH VIII FOR THE M2 HB AND MK 19**

Task 1 of Table VI for the M2 HB and MK 19 is not scored. The remaining scored tasks for Tables VI and all tasks for Tables VII and VIII for the M2 HB and MK 19 have their own specific scoresheet; you must use the scoresheet for that specific task. The time/points column on the scoresheet for each task is based on the expected results of the engagements between the HMMWV, selected enemy targets, and the performance of the crew. The instructions below explain how to use the scoresheet for defensive and offensive tasks. Pages 12-10 and 12-11 show two examples of completed scoresheets for defensive tasks, and page 12-12 shows an example of a completed scoresheet for an offensive task.

***Scoring Instructions for Defensive Tasks***

1. Record the defilade time, engagement time, and target number on the appropriate space for each target engaged (the target number corresponds to the target number in the *Conditions* statement).
2. Record the last target engagement time on line (a).
3. Record the defilade time on line (b) (maximum 25 seconds).
4. Subtract the defilade time (b) from the last target engagement time (a), and record the results on line (c).
5. Record the number of targets killed on line (d).
6. Divide (c) by (d), round this number up or down to the nearest whole second (for example, 12.4 is rounded to 12 and 12.5 is rounded to 13), and enter the number on line (e); this is your target kill time.



7. Using the result from line (e), read down the “time” column to get the points for each kill (misses = 0).
8. Circle the target effect (K/M), and record the points on the line for each target killed (record a 0 for targets missed) for the task.
9. Add the points for all targets, and record the total points.
10. Divide the total points by the number of targets presented and round off to the next whole number (for example, 75.4 is rounded to 75 and 75.5 is rounded to 76).
11. Subtract crew duty penalties (crew cuts); the result is the crew score for that task.

### **Scoring Instructions for Offensive Tasks**

1. Record the engagement time and target number on the appropriate space for each target engaged (the target number corresponds to the target number in the *Conditions* statement).
2. Record the last target engagement time on line (a).
3. Record the number of targets killed on line (b).
4. Divide (a) by (b), round this number up or down to the nearest whole second (for example, 12.4 is rounded to 12 and 12.5 is rounded to 13), and enter the number on line (c); this is your target kill time.
5. Using the result from line (c), read down the “time” column to get the points for each kill (misses = 0).
6. Circle the target effect (K/M), and record the points on the line for each target killed (record a 0 for targets missed) for the task.
7. Add the points for all targets, and record the total points.
8. Divide the total points by the number of targets presented and round off to the next whole number (for example, 75.4 is rounded to 75 and 75.5 is rounded to 76).
9. Subtract crew duty penalties (crew cuts); the result is the crew score for that task.

### **Scoring Considerations for Target Miss**

If a crew fires at a target and misses, record that time in the engagement time block. If the crew reengages the same target without engaging another target, record that time in the next engagement time block for that target. If the second round was a target kill, record the target number and continue with the scoring procedures discussed above.

If the crew fires at a target and misses, then acquires and engages a different target prior to reengaging the missed target, record the engagement time and target number in the appropriate blocks for the target missed. Record the engagement time and target number for the second round. Continue with the scoring procedures as discussed above.

If the crew then reengages a missed target and achieves a target kill, record the engagement time and target number in the appropriate blocks. Continue with the scoring procedures as discussed above.

**Note.** Refer to page 12-6, Timing Procedures, for additional evaluation information.

TABLE VIA, TASK 4 (DEFENSE), M2 HB		Unit/Bumper Number <u>G-36</u>
<p><b>TASK</b></p> <p>Engage multiple targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 50 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Stationary truck, 600 to 800 meters.</p> <p><b>Target 2:</b> Dismounted troops, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	<p>Time/Points</p> <p>1 100</p> <p>2 100</p> <p>3 100</p> <p>4 100</p> <p>5 100</p> <p>6 100</p> <p>7 100</p> <p>8 98</p> <p>9 96</p> <p>10 94</p> <p>11 92</p> <p>12 90</p> <p>13 88</p> <p>14 85</p> <p>15 83</p> <p>16 81</p> <p>17 79</p> <p>18 77</p> <p>19 75</p> <p>20 73</p> <p>21 70</p> <p>22 67</p> <p>23 64</p> <p>24 61</p> <p>25 58</p> <p>26 55</p> <p>27 52</p> <p>28 49</p> <p>29 46</p> <p>30 43</p> <p>31 40</p> <p>32 37</p> <p>33 34</p> <p>34 31</p> <p>35 28</p> <p>36 25</p> <p>37 22</p> <p>38 19</p> <p>39 16</p> <p>40 13</p> <p>41 10</p> <p>42 7</p> <p>43 4</p> <p>44 1</p> <p>45 0</p>	<p>1. Defilade Time <u>11</u> Eng Time <u>18</u> Target # <u>1</u></p> <p>2. Defilade Time _____ Eng Time <u>33</u> Target # <u>2</u></p> <p>3. Defilade Time _____ Eng Time _____ Target # _____</p> <p>4. Defilade Time _____ Eng Time _____ Target # _____</p> <hr/> <p>Record last target engagement time (a) <u>33</u></p> <p>Record defilade time (25 sec or less) (b) <u>11</u></p> <p>Subtract (a - b = c) (c) <u>22</u></p> <p>Record number of targets killed (d) <u>2</u></p> <p>Divide (c ÷ d = e) for target time (e) <u>11</u></p> <hr/> <p><b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).</p> <p style="text-align: center;">(Circle One)</p> <p><b>Target 1</b> (Stationary Truck) <input checked="" type="radio"/> M Points <u>92</u></p> <p><b>Target 2</b> (Dismounted Troops) <input checked="" type="radio"/> M Points <u>92</u></p> <p style="text-align: right;">(add points for all targets) <b>Total Points</b> <u>184</u></p> <p style="text-align: right;">Divide <b>Total Points</b> <u>184</u> by  <b>Total Targets Presented</b> <u>2</u> = <u>92</u></p> <p style="text-align: right;">Subtract crew cuts <u>0</u>  <b>Task Score</b> <u>92</u></p> <hr/> <p style="text-align: center;">AUTOMATIC 0 POINTS</p> <p style="text-align: center;"><input type="radio"/> A</p> <p style="text-align: center;">10-POINT CREW CUT</p> <p style="text-align: center;"><input type="radio"/> A</p> <p style="text-align: center;">5-POINT CREW CUT</p> <p style="text-align: center;"><input type="radio"/> A    <input type="radio"/> B    <input type="radio"/> C</p> <hr/> <p>Remarks/Reason for crew cuts:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

Figure 12-1. Sample Completed Scoresheet Example 1.

TABLE VIIIA, TASK 2 (DEFENSE), M2 HB		Unit/Bumper Number <u>G-36</u>
<b>TASK</b> Engage multiple targets from a stationary HMMWV.  <b>AMMUNITION</b> .50 Cal: 50 rounds  <b>CONDITIONS</b> <i>Total Targets: 2</i> <b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.  <b>Target 2:</b> Stationary frontal truck, 400 to 600 meters.  <b>EXPOSURE TIME</b> 50 seconds.  <b>STANDARDS</b> Must score at least 70 points to qualify engagement.	Time/Points 1 100 2 100 3 100 4 100 5 100 6 100 7 100 8 100 9 98 10 96 11 94 12 92 13 90 14 88 15 85 16 83 17 81 18 79 19 77 20 75 21 73 22 70 23 67 24 64 25 61 26 58 27 55 28 52 29 49 30 46 31 43 32 40 33 37 34 34 35 31 36 28 37 25 38 22 39 19 40 16 41 13 42 10 43 7 44 4 45 1 46 0	1. Defilade Time <u>21</u> Eng Time <u>27</u> Target # <u>2</u> 2. Defilade Time <u>6</u> Eng Time <u>47</u> Target # <u>1</u> 3. Defilade Time _____ Eng Time _____ Target # _____ 4. Defilade Time _____ Eng Time _____ Target # _____  Record last target engagement time (a) <u>47</u> Record defilade time (25 sec or less) (b) <u>25</u> Subtract (a - b = c) (c) <u>22</u> Record number of targets killed (d) <u>1</u> Divide (c ÷ d = e) for target time (e) <u>22</u>  <b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).  (Circle One) Target 1 (Stationary BRDM)    K <input checked="" type="radio"/> M    Points <u>0</u> Target 2 (Stationary Truck) <input checked="" type="radio"/> K    M    Points <u>70</u> (add points for all targets) <b>Total Points</b> <u>70</u>  Divide <b>Total Points</b> <u>70</u> by <b>Total Targets Presented</b> <u>2</u> = <u>35</u>  Subtract crew cuts <u>5</u> <b>Task Score</b> <u>30</u>  <hr/> <p style="text-align: center;">AUTOMATIC 0 POINTS</p> <p style="text-align: center;"><input checked="" type="radio"/> A</p> <p style="text-align: center;">10-POINT CREW CUT</p> <p style="text-align: center;"><input checked="" type="radio"/> A</p> <p style="text-align: center;">5-POINT CREW CUT</p> <p style="text-align: center;"><input checked="" type="radio"/> A    <input type="radio"/> B    <input type="radio"/> C</p> <hr/> Remarks/Reason for crew cuts: <u>ENGAGED LEAST DANGEROUS TARGET FIRST</u> _____ _____ _____

Figure 12-2. Sample Completed Scoresheet ¾ Example 2.

TABLE VIIA, TASK 2 (OFFENSE), M2 HB		Unit/Bumper Number <u>G-36</u>
<b>TASK</b>	Time/Points	1. Eng Time <u>24</u> Target # <u>2</u>
	1 100	2. Eng Time <u>38</u> Target # <u>1</u>
Engage multiple targets from a moving HMMWV.	2 100	3. Eng Time _____ Target # _____
	3 100	4. Eng Time _____ Target # _____
	4 100	
	5 100	
	6 100	
	7 100	
<b>AMMUNITION</b>	8 100	Record last target engagement time (a) <u>38</u>
	9 100	Record number of targets killed (b) <u>2</u>
	10 100	Divide (a ÷ b = c) for target time (c) <u>19</u>
	11 100	
.50 Cal: 50 rounds	12 99	<p><b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).</p> <p style="text-align: center;">(Circle One)</p> <p><b>Target 1</b> (Stationary BRDM) <input checked="" type="radio"/> M Points <u>90</u></p> <p><b>Target 2</b> (Stationary Truck) <input checked="" type="radio"/> M Points <u>90</u></p> <p style="text-align: right;">(add points for all targets) <b>Total Points</b> <u>180</u></p> <p style="text-align: right;">Divide <b>Total Points</b> <u>180</u> by  <b>Total Targets Presented</b> <u>2</u> = <u>90</u></p> <p style="text-align: right;">Subtract crew cuts <u>10</u></p> <p style="text-align: right;"><b>Task Score</b> <u>80</u></p> <hr/> <p style="text-align: center;">AUTOMATIC 0 POINTS</p> <p style="text-align: center;"><input type="radio"/> A</p> <p style="text-align: center;">10-POINT CREW CUT</p> <p style="text-align: center;"><input type="radio"/> A</p> <p style="text-align: center;">5-POINT CREW CUT</p> <p style="text-align: center;"><input checked="" type="radio"/> A    <input checked="" type="radio"/> B    <input type="radio"/> C</p> <hr/> <p>Remarks/Reason for crew cuts:</p> <p><u>ENGAGED LEAST DANGEROUS TARGET FIRST</u></p> <p><u>IMPROPER FIRE COMMAND</u></p> <p>_____</p> <p>_____</p>
	13 98	
	14 97	
	15 95	
	16 94	
	17 93	
	18 91	
	19 90	
	20 89	
	21 87	
	22 86	
	23 85	
	24 84	
	25 82	
26 81		
27 80		
28 78		
29 77		
30 76		
31 74		
32 73		
33 72		
34 70		
35 67		
36 64		
37 61		
38 58		
39 55		
40 52		
41 49		
42 46		
43 43		
44 40		
45 37		
46 34		
47 31		
48 28		
49 25		
50 22		
<b>CONDITIONS</b>		
<b>Total Targets: 2</b>		
<b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.		
<b>Target 2:</b> Stationary frontal truck, 500 to 700 meters.		
NBC environment.		
<b>EXPOSURE TIME</b>		
50 seconds.		
<b>STANDARDS</b>		
Must score at least 70 points to qualify engagement.		

Figure 12-3. Sample Completed Scoresheet Example 3.

## M2 HB Caliber .50 Basic Gunnery Tables

The M2 HB caliber .50 basic gunnery tables are used to train crews with the M2 HB caliber .50 machine gun.

### SCORING

One point is given for each round impacting in each space for Table I. For tables II, III, and IV, one point is allowed for each target killed, with an additional bonus of two points when the target is killed with the first burst. The maximum score for Tables II, III, and IV is 33 points each; a minimum score of 23 points each must be obtained.

DA Form 7007-R (*Machine Gun Scorecard for the M2*) is used to record the gunner's performance on Tables I through IV. Maximum total score possible for Tables I through IV is 218 points. Gunnery are classified according to their overall points earned:

- Expert—193 to 218.
- First Class—171 to 192.
- Second Class—151 to 170.
- Unskilled—150 and below.

An example of a completed scorecard is shown in Figure 12-4.

MACHINE GUN SCORECARD FOR M2 For use of this form, see FM 23-65; the proponent agency is TRAOC.													See back of this form for instructions.					
NAME: <i>SFC BILLY GREER</i>			SSAN: <i>123-45-6789</i>			UNIT: <i>C 2/34 INF</i>			DATE: <i>6 NOV 90</i>			LANE: <i>3</i>						
TABLE I			TABLE II				TABLE III				TABLE IV							
TSK	Range (Meters)	HIT PTS	RANGE (Meters)	TIME	HIT	PTS	BON	RANGE (Meters)	TIME	HIT	PTS	BON	RANGE (Meters)	TIME	HIT	PTS	BON	
1	10	No Score	550	None	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	550	None	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	50	None	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	
2	10	No Score	800	20 Sec	<i>X</i>	<i>1</i>	<i>2</i>	800	20 Sec	<i>X</i>	<i>1</i>	<i>2</i>	800	20 Sec	<i>X</i>	<i>1</i>	<i>2</i>	
3	10	No Score	400	20 Sec	<i>X</i>	<i>1</i>	<i>2</i>	400	20 Sec	<i>X</i>	<i>1</i>	<i>2</i>	400	20 Sec	<i>X</i>	<i>1</i>	<i>2</i>	
4	10	No Score	700	25 Sec	<i>X</i>	<i>1</i>	<i>2</i>	700	25 Sec	<i>X</i>	<i>1</i>	<i>2</i>	700	25 Sec	<i>X</i>	<i>1</i>	<i>2</i>	
5	10	<i>X</i>	20	1,000	25 Sec	<i>X</i>	<i>1</i>	2	1,000	25 Sec	<i>X</i>	<i>1</i>	2	1,000	25 Sec	<i>X</i>	<i>1</i>	2
6	10	<i>X</i>	30	400	700	35 Sec	<i>X</i>	<i>1</i>	2	400	700	35 Sec	<i>X</i>	<i>1</i>	2	<i>X</i>	<i>1</i>	2
7	10	<i>X</i>	45	550	800	35 Sec	<i>X</i>	<i>1</i>	0	550	800	35 Sec	<i>X</i>	<i>1</i>	0	<i>X</i>	<i>1</i>	2
8			400	550	1,000	45 Sec	<i>X</i>	<i>1</i>	0	400	550	45 Sec	<i>X</i>	<i>1</i>	2	<i>X</i>	<i>1</i>	0
TOTAL		<i>95</i>					<i>29</i>				<i>29</i>					<i>31</i>		
TABLES		I	II	III	IV	TOTAL SCORE												
		<i>95</i>	<i>29</i>	<i>29</i>	<i>31</i>	<i>184</i>												
OIC Signature: <i>CPT Melton A. Young</i>			Grader: <i>SFC Carly Roona</i>			Rating: <i>GUNNER FIRST CLASS</i>												
<small>AUTHORITY: 10USC30129(g) Executive Order 9397 PRINCIPAL PURPOSE(S): Records individual's performance on record fire range. ROUTINE USE(S): Evaluation of individual's proficiency and basis for determination of award of proficiency badge. SSN is used for positive identification purposes only. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION: Voluntary, individuals not providing information cannot be rated/scored on a mass basis.</small>																		
<small>DA Form 7007-R, Jun 91 Replaces DA Form 3867-R, Jun 72, which is obsolete.</small>																		

Figure 12-4. Sample Completed DA Form 7007-R (*Machine Gun Scorecard for the M2*).

## M2 HB CALIBER .50 TABLE 1¼ TEN-METER FIRING

Ten-meter firing exercises allow the gunner and commander to develop skills in the delivery of initial burst on target. They are also used to train the gunner and commander in the basic skills of zeroing, controlling bursts, traversing, and traversing and searching techniques. This table uses paster targets.

### RANGE LAYOUT

The standard ten-meter range can accommodate a unit of 200 to 250 soldiers at a time (concurrent training may be required). This range (see Figure 12-5) may be used to—

- Zero the M2 machine guns.
- Fire the ten-meter portion of the tables.
- Familiarize soldiers with the characteristics, noise, and recoil of the weapon.
- Practice target observation, adjustment of fire, and traversing and searching.
- Develop speed and an accurate burst technique.

The ten-meter range should meet the following requirements:

- The firing line should be long enough to accommodate 20 machine guns with 3 meters between positions. Each position should be numbered.
- The target line should be 10 meters in front of the firing line. Paper targets should be pasted onto target cloth stretched over wooden frames. One target should be set up for each position and numbered to correspond with the position.
- The bleachers (to the rear of the firing line) should be set up for instruction of crews.
- The control tower should be located to the immediate rear and center of the firing line.

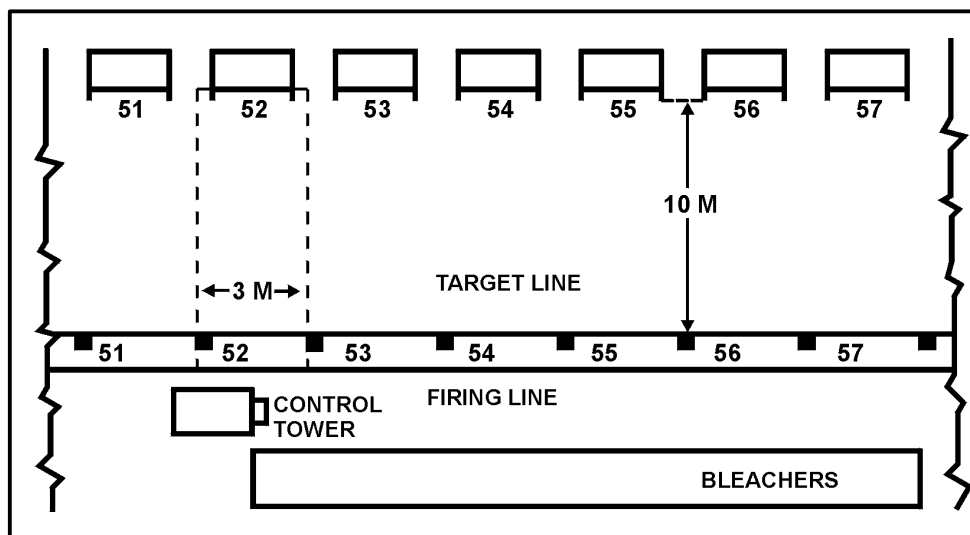


Figure 12-5. Ten-Meter Range Layout.

Each range should be staffed with the following personnel:

- OIC.
- Range safety officer (RSO).
- Primary instructor (PI).
- Assistant instructor (AI) for every ten students.
- MEDIC.
- Ammunition NCO.
- Tower operator.

Although more equipment may be required by local range regulations, safety regulations or unit SOPs, the minimum equipment required to operate the range is as follows:

- Public address system.
- Machine gun for each firing lane, and a backup for every five lanes.
- Cleaning rod for every AI.
- Scorecard per firer.
- Heat protective mitten for every two weapons (NSN 8415-01-092-0039).
- Tripod for each lane.
- Pindle for each lane.
- Traverse and elevation mechanism for each lane.
- Medical evacuation capability.
- Communication equipment (wire or radio as required by local range regulations or SOP).

## TARGET ANALYSIS

Table I exercises use the basic machine gun target (FSN 6920-078-5128) (see Figure 12-6). This target consists of four sections lettered A, B, C, and D. Each section has four point targets numbered 1, 2, 3, and 4, and two sets of area targets numbered 5 and 6 and 7 and 8. Each space is 4-cm wide and 5-cm high. The black aiming pasters within the numbered scoring spaces are 1-cm square.

Firing at targets 1 through 4 allows the gunner to use the traverse fire technique; target groups 5 and 6 and 7 and 8 allow practice in traversing and searching techniques.

Target group 5 and 6 exposes the gunner to traverse and elevation manipulation when using the tripod mount and body position changes to engage targets in depth (elbow position changes). It causes the gunner to use a series of aiming points to disperse fire across the target when using the tripod. Target group 7 and 8 exposes the gunner to position changes to engage linear targets with depth. It causes him to control the burst length from the weapon, use a series of aiming points, and disperse fire across the target.

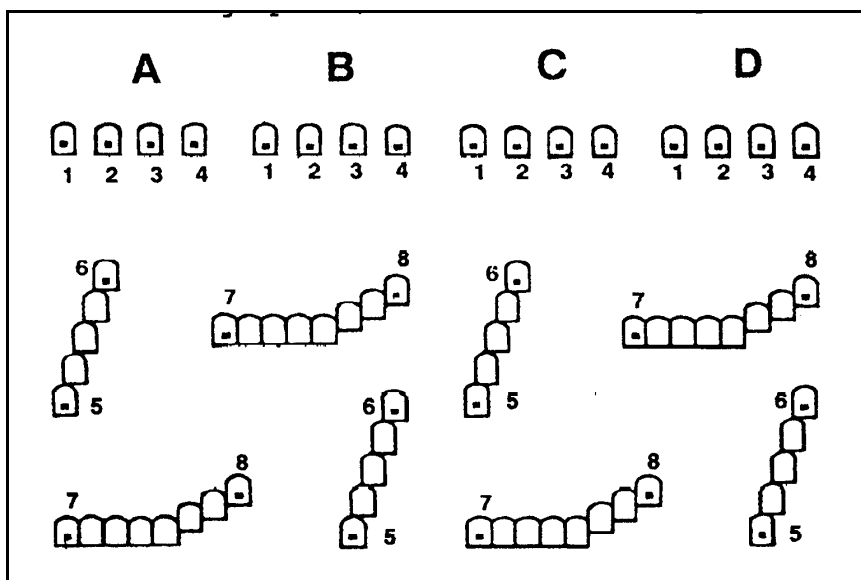


Figure 12-6. Basic Machine Gun Target.

**SCORING PROCEDURE FOR TABLE I**

Tasks 1 through 4 are not scored.

Tasks 5 through 7 are scored. When scoring the ten-meter target, one point is given for each round impacting within a scoring space. Rounds touching the boundary of a scoring space are considered kills and are counted in one scoring space. (When firing with 28 rounds, the maximum score is 28 points.) The maximum score possible for Table I is 119 points.

Targets are analyzed and scored to determine the gunner's proficiency and to see if more training is needed in any of the fundamentals of machine gun gunnery. When firing with a properly zeroed weapon, a target is best analyzed by considering the common errors of gunnery (see Figure 12-7).

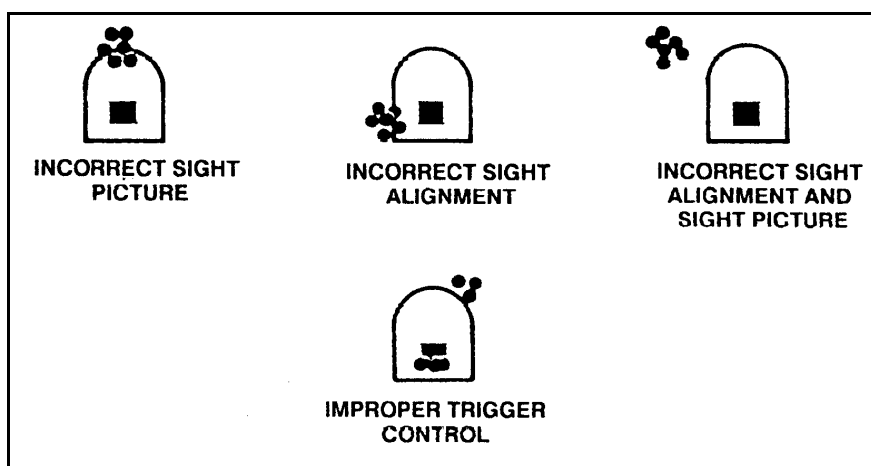


Figure 12-7. Common Errors on Machine Gun Targets.

**Notes.** Adjustment does not apply to weapons with fixed rear sights.

Large shot groups are usually caused by incorrect position and grip. Small shot groups outside the scoring space are usually caused by incorrect sight alignment, sight picture, or zero.



A minimum of 29 points is required to pass the ten-meter course. Soldiers failing to achieve minimum standards should be retrained and retested in a dry-fire mode until proficiency is demonstrated.

Scores are recorded on DA Form 7007-R (see Figure 12-4, page 12-13, for an example of a completed scorecard).

Soldiers who fail Table I should refire the table with close supervision and coaching to ensure they understand the fundamentals of live fire before progressing to Table II (Transition Firing).

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point and issued to each assistant gunner as he is assigned a firing point. The total ammunition for this exercise is 236 rounds (117 for practice [Tasks 1 through 4] and 119 for gunner classification [Tasks 5 through 7]):

- Task 1—Twelve single rounds.
- Task 2—Two 7-round belts.
- Task 3—One 35-round belt.
- Task 4—One 56-round belt.
- Task 5—One 28-round belt.
- Task 6—One 56-round belt.
- Task 7—One 35-round belt.

**Note.** Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### CONDUCT OF FIRE

For ten-meter exercises fired on a multipurpose transition range, groups will be broken down to fit firing lanes. The course is designed to fire tripod-mounted machine guns. The basic machine gun target is used for all ten-meter firing. It allows four gunners to use it for practice, or two gunners for practice and two gunners for gunner classification.

The unit is organized into groups of ten. Each group is assigned a firing order number. One order becomes gunners and the other assistant gunners. The gunners and assistant gunners are then assigned lanes and required to set up their guns and perform pre-fire checks (in accordance with FM 23-65).

- Task 1—Zero an M2 HB machine gun.
  - The gunner will fire three rounds, single shot, at Paster A1, then move down range to observe the shot group and triangulate it. No adjustments will be made at this time.
  - The gunner will then fire another three single rounds at Paster A1, and go down range to observe the shot group, triangulate it, and make necessary adjustments to his weapon.
  - The gunner will repeat these steps shooting at Paster A2.

**Note.** The gunner should zero his weapon using 9 rounds, and use the remaining 3 rounds to confirm his zero. If he is unable to confirm his zero with 12 rounds, remove him from the firing line and administer remedial training.

- Task 2—Engage a target (controlled burst).
  - The gunner will fire the first burst of five to seven rounds at Paster 3, then go down range to observe the target, mark the projectile holes, and analyze the burst.
  - The gunner will then fire at Paster 4 of the same section, and repeat the procedure.
- Tasks 3 and 4—Engage a target (traverse and search).
  - Using the traverse and search technique, the gunner will engage Pastors A5 and 6, firing a five- to seven-round burst for each paster, then move down range to observe and analyze the targets.

**Note.** These tasks are fired from a tripod firing position. If the gunner has difficulty manipulating the weapon, remove him from the firing line and give him remedial training.

- Using the traverse and search technique, the gunner will engage Paster A7 and 8, firing a five- to seven-round burst at each paster, then move down range to observe and analyze the targets.
- Task 5—Engage a target (traverse).
  - Using the traverse technique, the gunner will engage Pastors B1 through 4, firing a five- to seven-round burst at each paster, then move down range to observe and analyze the targets.
- Tasks 6 and 7—Engage a target (traverse and search).
  - Using the traverse and search technique, the gunner will engage Paster B7 and 8, firing a five- to seven-round burst at each paster, then move down range to observe and analyze the targets.
  - Using the traverse and search technique, the gunner will engage Pastors B5 and 6, firing a five- to seven-round burst at each paster, then move down range to observe and analyze the targets.

<b>TABLE I. TEN-METER FIRING (M2 HB)</b>				
<b>Task</b>	<b>Conditions/ Target/ Situation</b>	<b>Ammo</b>	<b>Standard</b>	<b>GO/ NO-GO</b>
1. Zero the M2 HB machine gun.	Pasters 1 and 2, 10 meters.	12 single rounds (ball)	The gunner must engage each target with six single rounds. Paster 1 must be engaged first. Four of the six rounds fired at Paster 2 must impact on the target.	NA
2. Engage a target (controlled-burst).	Pasters 3 and 4, 10 meters.	Two 7-round belts (ball)	The gunner must engage each target using controlled bursts (five- to seven-round bursts). Paster 3 is fired first, then Paster 4; one round must impact on each target.	NA
3. Engage a target (traverse and search).	Pasters 5 and 6, 10 meters.	One 35-round belt (ball)	The gunner must engage the targets using the traverse and search technique (five- to seven-round bursts); one round must impact on each target.	NA
4. Engage a target (traverse and search).	Pasters 7 and 8, 10 meters.	One 56-round belt (ball)	The gunner must engage the targets using the traverse and search technique (five- to seven-round bursts); one round must impact on each target.	NA
5. Engage a target (traverse).	Pasters 1 through 4, 10 meters.	One 28-round belt (ball)	The gunner must engage the targets using the traverse technique (five- to seven-round bursts); four rounds must impact on each target.	GO NO-GO
6. Engage a target (traverse and search).	Pasters 7 and 8, 10 meters.	One 56-round belt (ball)	The gunner must engage the targets using the traverse and search technique (five- to seven-round bursts); one round must impact on each target.	GO NO-GO
7. Engage a target (traverse and search).	Pasters 5 and 6, 10 meters.	One 35-round belt (ball)	The gunner must engage the targets using the traverse and search technique (five- to seven-round bursts); one round must impact on each target.	GO NO-GO
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Gunnery Points _____ Tasks Scored _____ Evaluator's Signature _____				

**Figure 12-8. Sample Ten-Meter Firing Table (M2 HB Table I).**

## **M2 HB CALIBER .50 TABLE II<sup>3/4</sup> TRANSITION FIRING**

Table II teaches the gunner and commander to incorporate the different techniques of fire learned in preparatory gunnery training and ten-meter firing. Some exercises will be conducted in an NBC environment. The gunner will first field zero his weapon.

**Note.** Instructors should encourage gunners to perform immediate action if a stoppage occurs while firing, unless local policies require gunners to notify range personnel first.

The objective of Table II is to make sure the gunner—

- Understands the characteristics of fire.
- Field zeros the machine gun.
- Uses range estimation to determine the distance to targets.
- Engages targets at long ranges with the tripod-mounted machine gun.
- Applies the method of adjusted point of aim.

### **RANGE LAYOUT**

Tables II through IV are fired on a multipurpose machine gun transition range (see Figure 12-9).

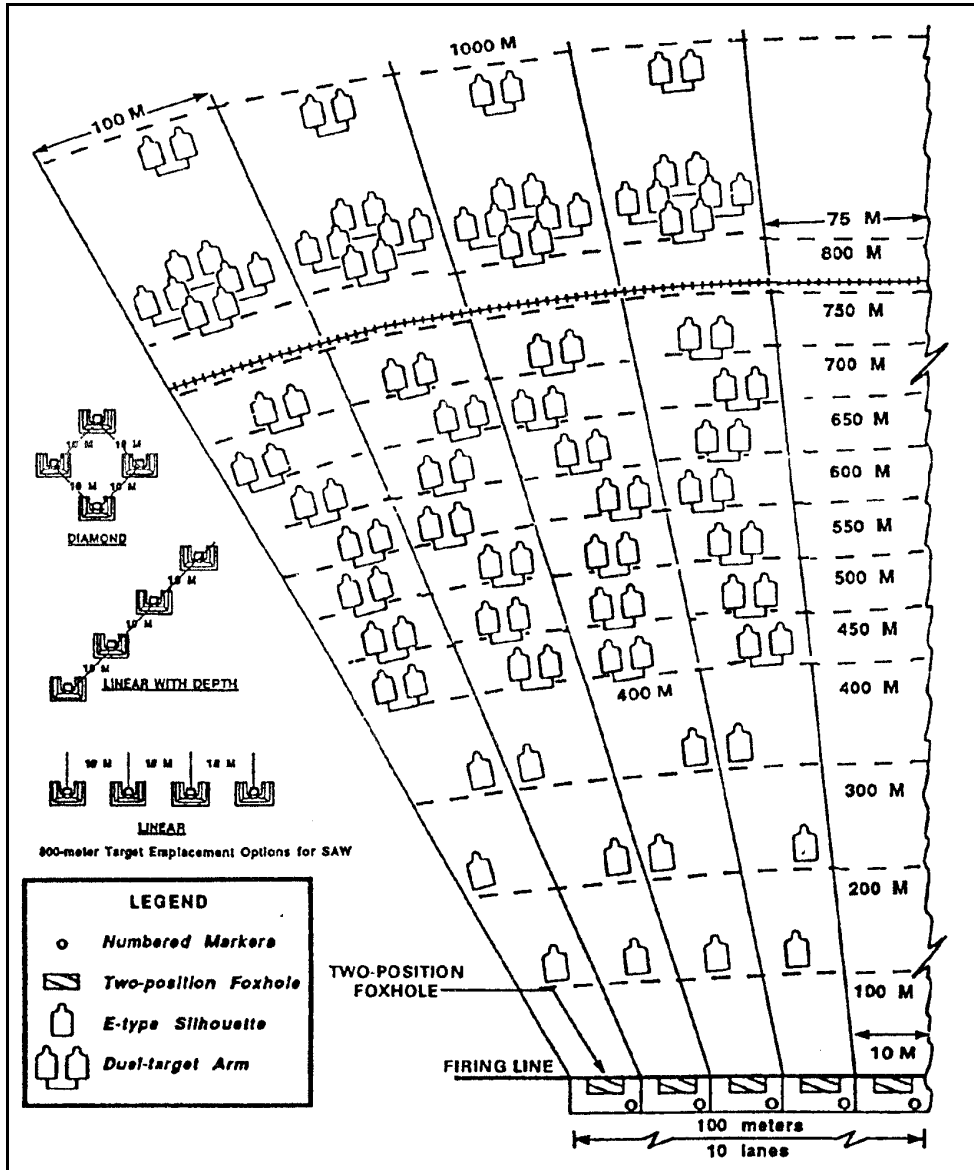


Figure 12-9. Multipurpose Machine Gun Transition Range.

**SCORING PROCEDURE FOR TABLE II**

Task 1 is not scored.

Tasks 2 through 8 are scored. One point is given for each target killed, and an additional bonus of two points is given if the target is killed with the first burst. The maximum score possible for this table is 33 points.

Scores are recorded on DA Form 7007-R (see Figure 12-4, page 12-13, for an example of a completed scorecard).

**AMMUNITION ISSUE**

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 182 rounds:

- One 28-round belt.
- One 154-round belt.

**Note.** Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### CONDUCT OF FIRE

The unit is organized for transition firing the same as for ten-meter firing. Field zeroing is the first firing task of the transition day-fire course. All vehicle targets will be frontal BRDMs. Table II will be conducted with a single gunner using a tripod-mounted machine gun.

- Task 1—Zero an M2 HB machine gun.
  - The gunner must first center the rear sight in the same manner as the sight setting for the ten-meter firing. He selects the appropriate range mark with his elevation knob.
  - The gunner will load one 28-round belt of ammunition and fire a 5- to 7-round burst at the 550-meter, double silhouette.

**Note.** If the impact of the rounds (beaten zone) is over the target, the gunner has probably fired with an incorrect sight picture (too high on the target). He needs to re-lay the gun on the original aiming point and fire again. If the gunner cannot zero with a proper sight picture, he should have the unit armorer inspect the weapon before continuing the zero procedure.

- The gunner will observe the beaten zone and make adjustments to the sight so that the rounds will impact on the target.
- After adjustments are made, the gunner will re-lay on the center base of the target and fire another five- to seven-round burst.
- The gunner will repeat the steps with the remaining rounds.

**Note.** If the gunner is unable to zero with 28 rounds, he is removed from the firing line and given remedial training.

- Tasks 2 through 8—Engage single and multiple targets at various ranges.
  - The gunner will load a 154-round belt of ammunition and fire 5- to 7-round bursts at single and multiple targets (double-E silhouettes and vehicle targets) at various ranges.
  - The gunner will observe the beaten zone and make adjustments, as necessary, to kill the targets.
  - After the gunner completes firing, he will clear the weapon. The AI will critique the gunner's performance.

TABLE II. TRANSITION FIRING (M2 HB)

<b>Task</b>	<b>Conditions/ Target/ Situation</b>	<b>Ammo</b>	<b>Standard</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
1. Zero an M2 HB machine gun.	One double-E silhouette, 550 meters. Stationary tripod firing position.	One 28-round belt	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target.	NA	NA
2. Engage a double-E silhouette target.	One double-E silhouette, 800 meters. Stationary tripod firing position.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 20 seconds.	SAT UNSAT	GO NO-GO
3. Engage a double-E silhouette target.	One double-E silhouette, 400 meters. Stationary tripod firing position. NBC environment.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 25 seconds.	SAT UNSAT	GO NO-GO
4. Engage a double-E silhouette target.	One double-E silhouette, 700 meters. Stationary tripod firing position. NBC environment.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 30 seconds.	SAT UNSAT	GO NO-GO
5. Engage a vehicle target.	One vehicle target, 1,000 meters. Stationary tripod firing position.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 25 seconds.	SAT UNSAT	GO NO-GO
6. Engage multiple targets (double-E silhouettes).	Two double-E silhouettes, 400 to 700 meters. Stationary tripod firing position.	28 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on the target within 35 seconds.	SAT UNSAT	GO NO-GO

continued

<b>Task</b>	<b>Conditions/ Target/ Situation</b>	<b>Ammo</b>	<b>Standard</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
7. Engage multiple targets (double-E silhouettes).	Two double-E silhouettes, 550 to 800 meters. Stationary tripod firing position. NBC environment.	28 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on each target within 35 seconds.	SAT UNSAT	GO NO-GO
8. Engage multiple targets (double-E silhouette and vehicle targets).	One double-E silhouette, 400 meters and two frontal BRDMs, 550 to 1,000 meters. Stationary tripod firing position.	42 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on each target within 45 seconds.	SAT UNSAT	GO NO-GO
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Gunnery Points _____ Tasks Scored _____ Evaluator's Signature _____					

**Figure 12-10. Sample Transition Firing Table (M2 HB Table II).**



## M2 HB CALIBER .50 TABLE III $\frac{3}{4}$ NIGHT FIRING

On the modern battlefield, each soldier must be prepared to accomplish the mission during limited visibility and in degraded mode; therefore, limited visibility and degraded mode gunnery is an important part of our training and preparation for war.

This training is designed to make sure gunners and commanders know how to—

- Zero a night-vision device to the M2 HB machine gun.
- Detect targets using a night-vision device.
- Engage targets at different ranges using a night-vision device.

### RANGE LAYOUT

Table III is fired on a multipurpose machine gun transition range (see Figure 12-9 on page 12-21).

### SCORING PROCEDURE FOR TABLE III

Task 1 is not scored.

Tasks 2 through 8 are scored. One point is given for each target killed and an additional 2-point bonus is given if the target is killed on the first burst. The maximum score possible for this table is 33 points.

Scores are recorded on DA Form 7007-R (see Figure 12-4, page 12-13, for an example of a completed scorecard).

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 180 rounds:

- Twelve single rounds.
- Two seven-round belts.
- One 154-round belt.

**Note.** Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### CONDUCT OF FIRE

Organizing a unit for night fire is the same as for day fire. Table III will be conducted with a single gunner using a tripod-mounted machine gun. All vehicle targets will be frontal BRDMs.

- Task 1—Zero a night-vision device to the M2 HB.
  - The gunner must first mount the night-vision device and place it into operation. Once the device is mounted, the gunner will fire a five- to seven-round burst to seat the device, then fire another five- to seven-round burst to make sure the device is seated.
  - The gunner must then center the reticle pattern in the field of view, place the reticle aiming point on the 50-meter target aiming point, and fire three single rounds.
  - The gunner will observe the beaten zone and make adjustments to the sights so that the round will impact on the target.
  - After adjustments are made, the gunner will fire another round at the target until zero is obtained.

**Notes.** Each click of the azimuth or elevation adjustment actuator moves the strike of the round one-half inch at 50 meters. One click of adjustment moves the reticle one square off the target at 50 meters.

If the impact of the rounds (beaten zone) is over the target, the gunner has probably fired with an incorrect sight picture (too high on the target). He needs to re-lay the gun on the original aiming point, and fire again. If the gunner fails to zero with a proper device sight picture, he should have the unit armorer inspect the device before continuing the zero procedure.

If the gunner is unable to zero with 12 rounds, he is removed from the firing line and given remedial training.

- Tasks 2 through 8—Engage single and multiple targets at various ranges.
  - The gunner will load a 154-round belt of ammunition and fire five- to seven-round bursts at single and multiple targets (double-E silhouettes and vehicle targets) at various ranges.
  - The gunner will observe the beaten zone and make adjustments, as necessary, to kill the targets.
  - After the gunner completes firing, he will clear the weapon. The AI will critique the gunner's performance.

<b>TABLE III. NIGHT FIRING (M2 HB)</b>					
<b>Task</b>	<b>Conditions/ Target/ Situation</b>	<b>Ammo</b>	<b>Standard</b>	<b>Crew Duties</b>	<b>GO/ NO- GO</b>
1. Zero a night-vision device to the M2 HB.	One M16A1/A2 zero target, 50 meters. Stationary tripod firing position.	12 single rounds and two 7-round belts	The gunner must use two bursts to seat the device, then engage the target using single shots; four of six rounds must impact within a 4-cm circle, IAW FM 23-9.	NA	NA
2. Engage a double-E silhouette target.	One double-E silhouette, 800 meters. Stationary tripod firing position. Use night sight.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 20 seconds.	SAT UNSAT	GO NO-GO
3. Engage a double-E silhouette target.	One double-E silhouette, 400 meters. Stationary tripod firing position. Use night sight.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 20 seconds.	SAT UNSAT	GO NO-GO
					continued

<b>Task</b>	<b>Conditions/ Target/ Situation</b>	<b>Ammo</b>	<b>Standard</b>	<b>Crew Duties</b>	<b>GO/ NO- GO</b>
4. Engage a double-E silhouette target.	One double-E silhouette, 700 meters. Stationary tripod firing position. Use night sight.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 25 seconds.	SAT UNSAT	GO NO-GO
5. Engage a vehicle target.	One frontal BRDM, 1,000 meters. Stationary tripod firing position. Use night sight.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 25 seconds.	SAT UNSAT	GO NO-GO
6. Engage multiple targets (double-E silhouettes).	Two double-E silhouettes, 400 to 700 meters. Stationary tripod firing position. Use night sight. NBC environment.	28 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on the target within 35 seconds.	SAT UNSAT	GO NO-GO
7. Engage multiple targets (double-E silhouettes).	Two double-E silhouettes, 550 to 800 meters. Stationary tripod firing position. Use night sight.	28 rounds	The gunner must engage targets with 5- to 7-round bursts; 1 round must impact on each target within 35 seconds.	SAT UNSAT	GO NO-GO
8. Engage multiple targets (double-E silhouette and vehicle targets).	One double-E silhouette, 400 meters and two frontal BRDMs, 550 to 1,000 meters. Stationary tripod firing position. Use the night sight.	42 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on each target within 45 seconds.	SAT UNSAT	GO NO-GO
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Gunnery Points _____ Tasks Scored _____ Evaluator's Signature _____					

Figure 12-11. Sample Night Firing Table (M2 HB Table III).

## M2 HB CALIBER .50 TABLE IV<sup>3/4</sup> BASIC QUALIFICATION

Table IV (Basic Qualification) tests the gunner's and commander's ability to use different techniques of fire learned and practiced in the preliminary gunnery tables (Tables I through III). The gunner must field zero his weapon and incorporate the appropriate techniques for the conditions of each task. Some tasks will be conducted during limited visibility conditions or in an NBC environment.

**Notes.** Table IV is set up for the gunner to engage targets out to 1,000 meters. However, if visibility is limited by other conditions, the commander may alter the ranges for better visibility.

The instructor should encourage the gunner to perform immediate action if a stoppage occurs during fire, unless local policies require the gunner to notify range personnel first.

### RANGE LAYOUT

Table IV is fired on a multipurpose machine gun transition range (see Figure 12-9 on page 12-21).

### SCORING PROCEDURE FOR TABLE IV

Task 1 is not scored.

Tasks 2 through 8 are scored. One point is given for each target killed, and an additional bonus of two points is given if the target is killed on the first burst. The maximum score possible for this table is 33 points (11 targets at 3 points each); a minimum score of 23 points is required for basic qualification.

Scores are recorded on DA Form 7007-R (see Figure 12-4, page 12-13, for an example of a completed scorecard).

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 182 rounds:

- One 28-round belt.
- One 154-round belt.

**Notes.** The ranges for Table IV may be modified to accommodate local range facilities. Commanders are authorized to fire Table IV from FM 23-65 for basic qualification, if ranges cannot be modified.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

## CONDUCT OF FIRE

Organizing a unit for transition firing is the same as for night firing. Field zeroing is the first task of the day-fire phase. All vehicle targets will be frontal BRDMs. Table IV will be conducted with a single gunner using a tripod-mounted machine gun.

- Task 1—Zero an M2 HB machine gun.
- Tasks 2 through 8—Engage single and multiple targets at various ranges.
  - The gunner will load a 154-round belt of ammunition and fire five- to seven-round bursts at single and multiple targets (double-E silhouettes and vehicle targets) at various ranges.
  - The gunner will observe the beaten zone and make adjustments, as necessary, to kill the targets.
  - After the gunner completes firing, he will clear the weapon. The AI will critique the gunner's performance.

**TABLE IV. BASIC QUALIFICATION (M2 HB)**

<b>Task</b>	<b>Conditions/ Target/ Situation</b>	<b>Ammo</b>	<b>Standard</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
1. Zero an M2 HB machine gun.	One double-E silhouette, 550 meters. Stationary tripod firing position.	One 28-round belt	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target.	NA	NA
2. Engage a double-E silhouette target.	One double-E silhouette, 800 meters. Stationary tripod firing position.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 20 seconds.	SAT UNSAT	GO NO-GO
3. Engage a double-E silhouette target.	One double-E silhouette, 400 meters. Stationary tripod firing position.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 20 seconds.	SAT UNSAT	GO NO-GO
4. Engage a double-E silhouette target.	One double-E silhouette, 700 meters. Stationary tripod firing position. NBC environment.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 25 seconds.	SAT UNSAT	GO NO-GO

continued

Task	Conditions/ Target/ Situation	Ammo	Standard	Crew Duties	GO/ NO-GO
5. Engage a vehicle target.	One frontal BRDM, 1,000 meters. Stationary tripod firing position. NBC environment.	14 rounds	The gunner must engage the target with 5- to 7-round bursts; 1 round must impact on the target within 25 seconds.	SAT  UNSAT	GO  NO-GO
6. Engage multiple vehicle targets.	Two frontal BRDMs, 400 to 700 meters. Stationary tripod firing position.	28 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on the target within 35 seconds.	SAT  UNSAT	GO  NO-GO
7. Engage multiple double-E silhouettes.	Two double-E silhouettes, 550 to 800 meters. Stationary tripod firing position.	28 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on each target within 35 seconds.	SAT  UNSAT	GO  NO-GO
8. Engage multiple targets (double-E silhouette and vehicle targets).	One double-E silhouette, 400 meters and two frontal BRDMs, 550 to 1,000 meters. Stationary tripod firing position.	42 rounds	The gunner must engage the targets with 5- to 7-round bursts; 1 round must impact on each target within 45 seconds.	SAT  UNSAT	GO  NO-GO
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Gunnery Points _____ Tasks Scored _____ Qualified/Unqualified _____ Points for Gunner Classification: Table I _____ Table II _____ Table II _____ Table IV _____ Evaluator's Signature _____ Gunner's Classification _____					

Figure 12-12. Sample Basic Qualification Table (M2 HB Table IV).

## M2 HB Caliber .50 Intermediate Gunnery Tables

These intermediate gunnery tables are natural extensions of the basic gunnery tables for the M2 HB caliber .50 machine gun. Vehicle teams must qualify on Tables VIIIA and B before moving to the advanced tables.

### SCORING

On area target engagements (infantry squad, and RPG team), full credit is given when one round impacts in the target area within the time indicated in the task. On point target engagements (lightly armored vehicle targets, such as BRDMs, BTR-70s, and trucks), full credit is given when one round impacts on the target within the time indicated. The target array may be placed on line or in a wedge formation. Targets should not be more than 5 meters apart and will not extend beyond 30 meters in width or 20 meters in depth.

**Note.** Target area is the ground within a 5-meter radius of a target.

### M2 HB CALIBER .50 TABLE V<sup>3/4</sup> CREW PROFICIENCY COURSE

Tables VA and B begin training on a stationary and moving vehicle. The crew develops teamwork while training the gunner to engage targets with speed and accuracy, and acquire and engage targets under NBC and normal conditions on a stationary and moving vehicle. These exercises are fired during the day and at night, using MILES with LTIDS.

#### SCORING PROCEDURE FOR TABLE V

Tasks 1 through 4, Tables VA and B are scored. Within the allotted time per exercise, the gunner must engage and destroy each target to score GO on each task.

The crew must score GO on six of the eight graded tasks on Tables VA and B, combined.

Crew duties will be critiqued as SAT or UNSAT. Crew errors include the following:

- 5 points—Improper fire command.
- 5 points—Incorrect engagement techniques (for example, engaging a least dangerous target before a most dangerous target).
- 5 points—Incorrect driving techniques (anything the driver does that impedes the firing task).
- 10 points—Firing before receiving the command to fire.
- Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

**Note.** Refer to page 12-6, Timing Procedures, for additional scoring information.

#### CONDUCT OF FIRE

The gunner acquires and engages moving and stationary targets from a stationary and moving vehicle. Target arrays are placed at ranges between 300 meters and 1,000 meters.

- Tasks 1 through 4, Tables VA and B—Engage moving and stationary targets from a stationary and moving vehicle.



**ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of the tasks and may change the positioning of stationary PC targets from frontal to flank views. If MILES and LTIDS are not available, commanders may dry fire these tables.

<b>TABLE VA. CREW PROFICIENCY COURSE (DAY) (M2 HB)</b>						
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Standards</b>		<b>Crew Duties</b>	<b>GO/ NO-GO</b>
			<b>Eng Tech</b>	<b>Time (Seconds)</b>		
1. Engage a stationary target (defense).	One RPG team, 600 to 800 meters.	MILES with LTIDS	Area	50	SAT UNSAT	GO NO-GO
2. Engage a stationary target (defense).	One stationary truck, 800 to 1,000 meters. NBC environment.	MILES with LTIDS	Point	50	SAT UNSAT	GO NO-GO
3. Engage a stationary target (offense).	Dismounted troops, 300 to 500 meters.	MILES with LTIDS	Area	50	SAT UNSAT	GO NO-GO
4. Engage multiple targets (defense).	One moving BRDM, 400 to 600 meters and one RPG team, 600 to 800 meters.	MILES with LTIDS	Point Area	50	SAT UNSAT	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Moving Flank BRDM 1 Stationary Frontal Truck 2 Sets of 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

**Figure 12-13. Sample Crew Proficiency Course Table (Day) (M2 HB Table VA).**

<b>TABLE VB. CREW PROFICIENCY COURSE (NIGHT) (M2 HB)</b>						
			<b>Standards</b>			
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
1. Engage a stationary target (defense).	One stationary frontal BRDM, 600 to 800 meters.	MILES with LTIDS	Point	60	SAT UNSAT	GO NO-GO
2. Engage a stationary target (offense).	One stationary frontal truck, 600 to 800 meters.	MILES with LTIDS	Point	60	SAT UNSAT	GO NO-GO
3. Engage a stationary target (defense).	One RPG team, 300 to 500 meters. NBC environment.	MILES with LTIDS	Area	60	SAT UNSAT	GO NO-GO
4. Engage a stationary target (defense).	Dismounted troops, 600 to 800 meters.	MILES with LTIDS	Area	60	SAT UNSAT	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Stationary Frontal Truck 1 Stationary Frontal BRDM 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Tasks Scored GO: Table V A _____ Table V B _____ Evaluator's Signature _____ Total Tasks Scored GO _____						

**Figure 12-14. Sample Crew Proficiency Course Table (Night) (M2 HB Table VB).**

**M2 HB CALIBER .50 TABLE VI—CREW BASELINE**

This table transitions the M2 HB gunner and commander from tripod firing to vehicle firing. It also trains the gunner to zero the M2 HB (both day and night), and acquire and engage single and multiple, moving and stationary targets from a stationary vehicle. These exercises are fired during the day and at night. Some exercises are fired in an NBC environment.

**RANGE LAYOUT**

Tables VI through VIII are fired on an MPTR, as depicted in Figure 12-15.

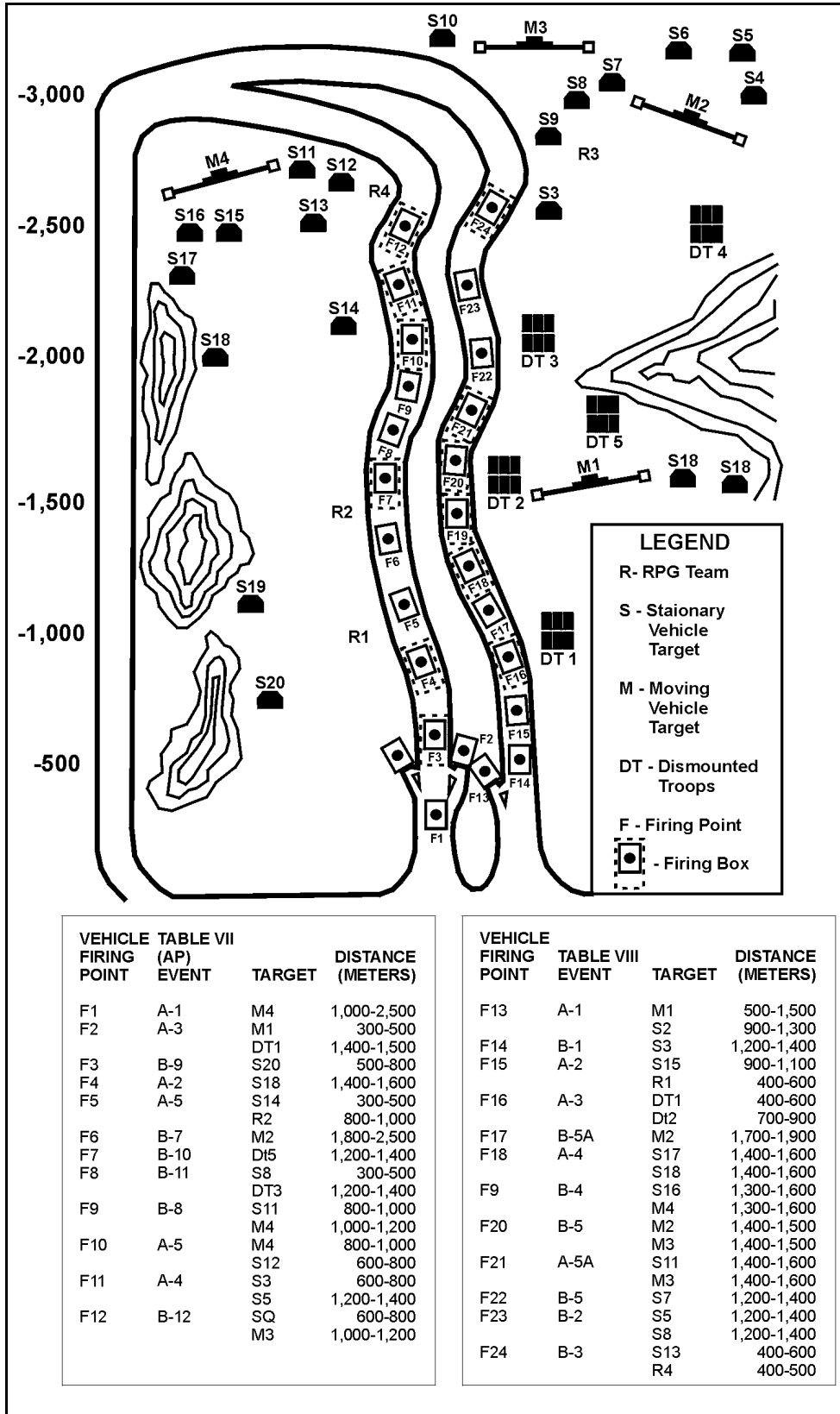


Figure 12-15. Multipurpose Training Range.

## SCORING PROCEDURE FOR TABLE VI

Task 1 on Tables VIA and VIB is not scored.

Tasks 2 through 4, Table VIA and Tasks 2 and 3, Table VIB are scored using separate scoresheets. Refer to page 12-8 for scoresheet scoring instructions. Within the allotted time per exercise, the gunner must obtain the minimum kills per target to pass each task. A crew duty penalty is subtracted for each crew error; there are three possible 5-point penalties, one 10-point penalty, and one automatic zero-point penalty. A maximum crew duty penalty point deduction of 30 points can be assessed per engagement. Additional crew errors will not be deducted, they will be critiqued.

Crew duty penalty points are as follows:

- **A**—5 points—Improper fire command.
- **B**—5 points—Incorrect engagement techniques (for example, engaging a *least dangerous* target before a *most dangerous* target).
- **C**—5 points—Incorrect driving technique (anything the driver does that impedes the firing task).
- **A**—10 points—Firing before receiving the command to fire.
- **A**—Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

To qualify, the crew must score 70 points or greater on four of the five graded tasks on Tables VIA and B, one of which must be an NBC engagement.

## AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 191 rounds of mix:

- Table VIA: 115 rounds of mix.
- Table VIB: 76 rounds of mix.

**Notes.** Units with illumination assets may use them during the night portion of the table.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

## CONDUCT OF FIRE

Table VIA will be fired during the day, and Table VIB should be fired at night. Using four and one mix ammunition, the gunner acquires and engages single, multiple, moving, and stationary targets from a stationary vehicle. Targets will be placed at ranges between 400 meters and 1,000 meters. An additional BRDM target is centered at 600 meters for weapon zero.

- Task 1—Zero an M2 HB machine gun (day and night engagements).
  - The gunner must first center the rear sight in the same manner as the sight setting for the ten-meter firing. He selects the appropriate range mark with his elevation knob.
  - The gunner will load one 15-round belt of ammunition and fire a 5- to 7-round burst at the BRDM target at 600 meters.

**Note.** If the gunner is unable to zero, he is removed from the firing line and given remedial training.

- Tasks 2 through 4, Table VIA and Tasks 2 and 3, Table VIB—Engage single and multiple, moving and stationary targets.

**ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may use MILES, and change the sequence of tasks. The commander may change the positioning of stationary PC targets from frontal to flank views.

**Note.** For more information on the use of MILES with the M2 HB, see FM 23-65.

TABLE VIA. CREW BASELINE (DAY) (M2 HB)						
Task	Conditions/ Target/Situation	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Zero an M2 HB caliber .50 machine gun.	One stationary frontal BRDM, 600 meters.	15 rds	NA	NA	NA	NA
2. Engage a target (defense).	One RPG team, 300 to 500 meters. NBC environment.	25 rds	Area	50	_____	GO NO-GO
3. Engage a moving target (defense).	One moving flank BRDM, 600 to 800 meters.	25 rds	Point	50	_____	GO NO-GO
4. Engage multiple targets (defense).	One stationary truck, 600 to 800 meters and dismounted troops, 600 to 600-800 meters.	50 rds	Point  Area	50	_____	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Moving Flank BRDM 1 Stationary Frontal Truck 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)		
Table _____		Date _____		Vehicle Number _____		
Gunner _____			Assistant Gunner _____			
Evaluator's Signature _____				Tasks Scored GO _____		

**Figure 12-16. Sample Crew Baseline Table (Day) (M2 HB Table VIA).**

<b>TABLE VIB. CREW BASELINE (NIGHT) (M2 HB)</b>						
			<b>Standards</b>			
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
1. Zero an AN/TVS-5 night-vision device to the M2 HB.	One stationary frontal BRDM, 600 meters.	26 rds	NA	NA	NA	NA
2. Engage a target (defense).	One RPG team, 300 to 500 meters. NBC.	25 rds	Area	60	_____	GO NO-GO
3. Engage a target (defense).	One stationary frontal BRDM, 600 to 800 meters.	25 rds	Point	60	_____	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Stationary Frontal BRDM 3 IRETS (RPG Team)		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Tasks Scored GO: Table VI A _____ Table VI B _____ Evaluator's Signature _____ Total Tasks Scored GO _____						

**Figure 12-17. Sample Crew Baseline Table (Night) (M2 HB Table VIB).**

**TABLE VI (M2 HB)  
ROLL-UP SHEET**

**BUMPER #** \_\_\_\_\_ **UNIT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**CREW:** TC \_\_\_\_\_ GNR \_\_\_\_\_ DVR \_\_\_\_\_

**DAY:** START \_\_\_\_\_ FINISH \_\_\_\_\_ **NIGHT:** START \_\_\_\_\_ FINISH \_\_\_\_\_

**TCE SIGNATURE (DAY)** \_\_\_\_\_

**TCE SIGNATURE (NIGHT)** \_\_\_\_\_

TASK	TOTAL TGTS	RDS FIRED	KILLS	MISSES	NE	PENALTY POINTS	SCORE	QUAL (Y/N)
A2								
A3								
A4								
<b>TOTALS</b>								
B2								
B3								
<b>TOTALS</b>								
<b>OVERALL</b>								
<b>TOTAL PENALTY POINTS</b>								
<b>TOTAL QUALIFIED ENGAGEMENTS</b>								

**UNQUALIFIED      QUALIFIED      SUPERIOR      DISTINGUISHED**

Figure 12-18. Sample Roll-up Sheet, Table VI (M2 HB).



TABLE VIA, TASK 2 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><i>Total Targets:</i> 1</p> <p><i>Target 1:</i> Stationary RPG team, 300 to 500 meters.</p> <p>NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify for engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	
	4	95	3. Defilade Time _____ Eng Time _____ Target # _____
	5	90	
	6	85	4. Defilade Time _____ Eng Time _____ Target # _____
	7	80	
	8	75	Record last target engagement time (a) _____
	9	70	Record defilade time (25 sec or less) (b) _____
	10	67	Subtract (a - b = c) (c) _____
	11	64	
	12	61	Record number of targets killed (d) _____
	13	58	
	14	55	Divide (c ÷ d = e) for target time (e) _____
	15	52	
	16	49	
	17	46	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	43	(Circle One)
	19	40	<b>Target 1</b> (RPG Team) K M Points _____
	20	37	(add points for all targets) <b>Total Points</b> _____
	21	34	
	22	31	Divide <b>Total Points</b> _____ by
	23	28	<b>Total Targets Presented</b> _____ = _____
	24	25	Subtract crew cuts _____
	25	22	<b>Task Score</b> _____
	26	19	
	27	16	
	28	13	
	29	10	
	30	7	
	31	4	AUTOMATIC 0 POINTS
	32	1	<b>A</b>
33	0	10-POINT CREW CUT	
		<b>A</b>	
		5-POINT CREW CUT	
		<b>A B C</b>	
		Remarks/Reason for crew cuts:	
		_____	
		_____	
		_____	
		_____	

Figure 12-19. Sample Scoresheet—Table VIA, Task 2 (Defense) (M2 HB).

TABLE VIA, TASK 3 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a moving target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Moving flank BRDM, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____	
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____	
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____	
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____	
	4 100	<hr/>	
	5 100	Record last target engagement time (a) _____	
	6 100	Record defilade time (25 sec or less) (b) _____	
	7 98	Subtract (a - b = c) (c) _____	
	8 96	Record number of targets killed (d) _____	
	9 94	Divide (c ÷ d = e) for target time (e) _____	
	10 92	<hr/>	
	11 90	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).	
	12 88	(Circle One)	
	13 86	<b>Target 1</b> (Moving BRDM) K M Points _____	
	14 84	(add points for all targets) <b>Total Points</b> _____	
	15 82	Divide <b>Total Points</b> _____ by	
	16 80	<b>Total Targets Presented</b> _____ = _____	
	17 78	Subtract crew cuts _____	
	18 76	<b>Task Score</b> _____	
	19 74	<hr/>	
	20 72	AUTOMATIC 0 POINTS	
	21 70	<b>A</b>	
	22 67	10-POINT CREW CUT	
	23 64	<b>A</b>	
	24 61	5-POINT CREW CUT	
	25 58	<b>A B C</b>	
	26 55	<hr/>	
	27 52	Remarks/Reason for crew cuts:	
	28 49	_____	
	29 46	_____	
	30 43	_____	
	31 40	_____	
	32 37	_____	
	33 34	_____	
	34 31	_____	
	35 28	_____	
	36 25	_____	
	37 22	_____	
	38 19	_____	
	39 16	_____	
	40 13	_____	
	41 10	_____	
	42 7	_____	
	43 4	_____	
	44 1	_____	
45 0	_____		

Figure 12-20. Sample Scoresheet—Table VIA, Task 3 (Defense) (M2 HB).

TABLE VIA, TASK 4 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<b>TASK</b>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
Engage multiple targets from a stationary HMMWV.	1 100	
	2 100	2. Defilade Time _____ Eng Time _____ Target # _____
	3 100	
	4 100	3. Defilade Time _____ Eng Time _____ Target # _____
	5 100	
	6 100	4. Defilade Time _____ Eng Time _____ Target # _____
<b>AMMUNITION</b>	7 100	
.50 Cal: 50 rounds	8 98	Record last target engagement time (a) _____
	9 96	
	10 94	Record defilade time (25 sec or less) (b) _____
	11 92	
<b>CONDITIONS</b>	12 90	Subtract (a - b = c) (c) _____
<b>Total Targets:</b> 2	13 88	
	14 85	Record number of targets killed (d) _____
	15 83	Divide (c ÷ d = e) for target time (e) _____
<b>Target 1:</b> Stationary truck, 600 to 800 meters.	16 81	
	17 79	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18 77	
	19 75	(Circle One)
	20 73	<b>Target 1</b> (Stationary Truck) K M Points _____
	21 70	<b>Target 2</b> (Dismounted Troops) K M Points _____
<b>Target 2:</b> Dismounted troops, 600 to 800 meters.	22 67	(add points for all targets) <b>Total Points</b> _____
	23 64	
	24 61	Divide <b>Total Points</b> _____ by
	25 58	<b>Total Targets Presented</b> _____ = _____
<b>EXPOSURE TIME</b>	26 55	Subtract crew cuts _____
	27 52	
	28 49	<b>Task Score</b> _____
<b>STANDARDS</b> Must score at least 70 points to qualify engagement.	29 46	
	30 43	
	31 40	
	32 37	
	33 34	AUTOMATIC 0 POINTS
	34 31	<b>A</b>
	35 28	10-POINT CREW CUT
	36 25	<b>A</b>
	37 22	5-POINT CREW CUT
	38 19	<b>A B C</b>
	39 16	
	40 13	
	41 10	
	42 7	
	43 4	
	44 1	
	45 0	
		Remarks/Reason for crew cuts: _____ _____ _____ _____ _____

Figure 12-21. Sample Scoresheet—Table VIA, Task 4 (Defense) (M2 HB).

TABLE VIB, TASK 2 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary RPG team, 300 to 500 meters. NBC.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	
	4	95	3. Defilade Time _____ Eng Time _____ Target # _____
	5	90	
	6	85	4. Defilade Time _____ Eng Time _____ Target # _____
	7	80	
	8	75	Record last target engagement time (a) _____
	9	70	Record defilade time (25 sec or less) (b) _____
	10	67	Subtract (a - b = c) (c) _____
	11	64	
	12	61	Record number of targets killed (d) _____
	13	58	
	14	55	Divide (c ÷ d = e) for target time (e) _____
	15	52	
	16	49	
	17	46	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	43	(Circle One)
	19	40	<b>Target 1</b> (RPG Team) K M Points _____
	20	37	(add points for all targets) <b>Total Points</b> _____
	21	34	
	22	31	Divide <b>Total Points</b> _____ by
	23	28	<b>Total Targets Presented</b> _____ = _____
	24	25	Subtract crew cuts _____
	25	22	<b>Task Score</b> _____
	26	19	
	27	16	
	28	13	
	29	10	
	30	7	
	31	4	AUTOMATIC 0 POINTS
	32	1	<b>A</b>
33	0	10-POINT CREW CUT	
		<b>A</b>	
		5-POINT CREW CUT	
		<b>A B C</b>	
Remarks/Reason for crew cuts:			
_____			
_____			
_____			
_____			

Figure 12-22. Sample Scoresheet—Table VIB, Task 2 (Defense) (M2 HB).

TABLE VIB, TASK 3 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	
	6 100	
	7 97	
	8 93	Record last target engagement time (a) _____
	9 89	Record defilade time (25 sec or less) (b) _____
	10 85	Subtract (a - b = c) (c) _____
	11 82	
	12 78	Record number of targets killed (d) _____
	13 74	Divide (c ÷ d = e) for target time (e) _____
	14 70	
	15 66	
	16 62	
	17 58	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18 54	(Circle One)
	19 50	<b>Target 1</b> (Stationary BRDM) K M Points _____
	20 46	(add points for all targets) <b>Total Points</b> _____
	21 42	
	22 38	
	23 34	
	24 30	Divide <b>Total Points</b> _____ by
	25 26	<b>Total Targets Presented</b> _____ = _____
	26 22	Subtract crew cuts _____
	27 18	<b>Task Score</b> _____
	28 14	
	29 10	
	30 6	
	31 2	
32 0		

AUTOMATIC 0 POINTS

Ⓐ

10-POINT CREW CUT

Ⓐ

5-POINT CREW CUT

Ⓐ   Ⓑ   Ⓒ

---

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-23. Sample Scoresheet—Table VIB, Task 3 (Defense) (M2 HB).

## M2 HB CALIBER .50 TABLE VII<sup>3/4</sup> PRACTICE FOR QUALIFICATION

This table trains the gunner and commander to acquire and engage single and multiple, moving and stationary targets from a stationary and moving vehicle. These exercises are fired during the day and at night. Some exercises are fired in an NBC environment. This table also prepares the crew for Table VIII qualification.

### SCORING PROCEDURE FOR TABLE VII

Tasks 1 through 4, Tables VIIA and B are scored using separate scoresheets. Refer to pages 12-8 and 12-9 for scoresheet scoring instructions. Within the allotted time per exercise, the gunner must obtain the minimum kills per target to pass each task. A crew duty penalty is subtracted for each crew error; there are three possible 5-point penalties, one 10-point penalty, and one automatic zero-point penalty. A maximum crew duty penalty point deduction of 30 points can be assessed per engagement. Additional crew errors will not be deducted, they will be critiqued.

Crew duty penalty points are as follows:

- **A**—5 points—Improper fire command.
- **B**—5 points—Incorrect engagement techniques (for example, engaging a *least dangerous* target before a *most dangerous* target).
- **C**—5 points—Incorrect driving technique (anything the driver does that impedes the firing task).
- **A**—10 points—Firing before receiving the command to fire.
- **A**—Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

To qualify, the crew must score 70 points or greater on six of eight graded tasks on Tables VIIA and VIIB combined, one of which must be an NBC engagement.

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 275 rounds of mix:

- Table VIIA: 125 rounds of mix.
- Table VIIB: 150 rounds of mix.

**Notes.** Units with illumination assets may use them during the night portion of the table.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### CONDUCT OF FIRE

Table VIIA will be fired during daylight. Table VIIB should be fired at night. Using four and one mix ammunition, the crew acquires and engages single and multiple, moving and stationary targets from a stationary and moving vehicle. Targets will be placed at ranges between 400 and 1,000 meters.

**ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may use MILES, and change the sequence of tasks. The commander may change the positioning of stationary PC targets from frontal to flank views.

**Note.** For more information on the use of MILES with the M2 HB, see FM 23-65.

TABLE VIIA. CREW PRACTICE (DAY) (M2 HB)						
Task	Conditions/ Target/Situation	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Engage a stationary target (stationary).	One RPG team, 600 to 800 meters.	25 rds	Area	50	_____	GO NO-GO
2. Engage multiple targets (moving).	One stationary frontal BRDM, 600 to 800 meters and one stationary frontal truck, 500 to 700 meters. NBC environment.	50 rds	Point  Point	50	_____	GO NO-GO
3. Engage a moving target (stationary).	One moving flank BRDM-2, 600 to 800 meters.	25 rds	Point	50	_____	GO NO-GO
4. Engage a moving target (moving).	One stationary truck, 400 to 600 meters.	25 rds	Point	50	_____	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Stationary Frontal BRDM 1 Moving Flank BRDM 2 Stationary Frontal Truck 3 IRETS (RPG Team)		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

**Figure 12-24. Sample Crew Practice Table (Day) (M2 HB Table VIIA).**

TABLE VIIB. CREW PRACTICE (NIGHT) (M2 HB)						
Task	Conditions/ Target/Situation	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Engage a moving target (stationary).	One stationary frontal truck, 600 to 800 meters.	25 rds	Point	60	_____	GO NO-GO
2. Engage multiple targets (moving).	One stationary frontal BRDM, 600 to 800 meters and one stationary frontal truck, 500 to 700 meters. NBC environment.	50 rds	Point  Point	60	_____	GO NO-GO
3. Engage multiple targets (stationary).	Dismounted troops, 300 to 500 meters and one stationary frontal BRDM, 600 to 800 meters.	50 rds	Area  Point	60	_____	GO NO-GO
4. Engage a stationary target (moving).	One RPG team 500 to 700 meters.	25 rds	Area	60	_____	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM-2 (for Zero) 2 Stationary Frontal BRDM-2s 7 IRETS (Dismounted Infantry) 3 IRETS (RPG Team) 2 Stationary Frontal Truck		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

Figure 12-25. Sample Crew Practice Table (Night) (M2 HB Table VIIB).



**TABLE VII (M2 HB)  
ROLL-UP SHEET**

**BUMPER #** \_\_\_\_\_ **UNIT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**CREW:** TC \_\_\_\_\_ GNR \_\_\_\_\_ DVR \_\_\_\_\_

**DAY:** START \_\_\_\_\_ FINISH \_\_\_\_\_ **NIGHT:** START \_\_\_\_\_ FINISH \_\_\_\_\_

**TCE SIGNATURE (DAY)** \_\_\_\_\_

**TCE SIGNATURE (NIGHT)** \_\_\_\_\_

TASK	TOTAL TGTS	RDS FIRED	KILLS	MISSES	NE	PENALTY POINTS	SCORE	QUAL (Y/N)
A1								
A2								
A3								
A4								
<b>TOTALS</b>								
B1								
B2								
B3								
B4								
<b>TOTALS</b>								
<b>OVERALL</b>								
<b>TOTAL PENALTY POINTS</b>								
<b>TOTAL QUALIFIED ENGAGEMENTS</b>								

UNQUALIFIED      QUALIFIED      SUPERIOR      DISTINGUISHED

Figure 12-26. Sample Roll-up Sheet, Table VII (M2 HB Caliber .50).

TABLE VIIA, TASK 1 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMVV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> RPG team, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	3. Defilade Time _____ Eng Time _____ Target # _____
	4	95	4. Defilade Time _____ Eng Time _____ Target # _____
	5	90	
	6	85	
	7	80	
	8	75	Record last target engagement time (a) _____
	9	70	Record defilade time (25 sec or less) (b) _____
	10	66	Subtract (a - b = c) (c) _____
	11	62	Record number of targets killed (d) _____
	12	58	Divide (c ÷ d = e) for target time (e) _____
	13	54	
	14	50	
	15	46	
	16	42	
	17	38	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	34	(Circle One)
	19	30	<b>Target 1</b> (RPG Team) K M Points _____
	20	26	(add points for all targets) <b>Total Points</b> _____
	21	22	Divide <b>Total Points</b> _____ by
	22	18	<b>Total Targets Presented</b> _____ = _____
	23	14	Subtract crew cuts _____
	24	10	<b>Task Score</b> _____
	25	6	
	26	2	
27	0		

AUTOMATIC 0 POINTS

Ⓐ

10-POINT CREW CUT

Ⓐ

5-POINT CREW CUT

Ⓐ   Ⓑ   Ⓒ

---

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-27. Sample Scoresheet—Table VIIA, Task 1 (Defense) (M2 HB).

TABLE VIIA, TASK 2 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple targets from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 50 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p><b>Target 2:</b> Stationary frontal truck, 500 to 700 meters.</p> <p>NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	Record last target engagement time (a) _____
	8	100	Record number of targets killed (b) _____
	9	100	Divide (a ÷ b = c) for target time (c) _____
	10	100	
	11	100	
	12	99	
	13	98	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	97	(Circle One)
	15	95	<b>Target 1</b> (Stationary BRDM) K M Points _____
	16	94	<b>Target 2</b> (Stationary Truck) K M Points _____
	17	93	(add points for all targets) <b>Total Points</b> _____
	18	91	Divide <b>Total Points</b> _____ by
	19	90	<b>Total Targets Presented</b> _____ = _____
	20	89	Subtract crew cuts _____
	21	87	<b>Task Score</b> _____
	22	86	
	23	85	
	24	84	
	25	82	
	26	81	
	27	80	
	28	78	
	29	77	
	30	76	
	31	74	
	32	73	
	33	72	
	34	70	
	35	67	
	36	64	
	37	61	
	38	58	
	39	55	
	40	52	
	41	49	
	42	46	Remarks/Reason for crew cuts:
	43	43	_____
	44	40	_____
	45	37	_____
	46	34	_____
	47	31	_____
	48	28	_____
	49	25	_____
50	22	_____	

Figure 12-28. Sample Scoresheet—Table VIIA, Task 2 (Offense) (M2 HB).

TABLE VIIA, TASK 3 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a moving target from a stationary HMMVV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Moving flank BRDM-2, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 98	Subtract (a - b = c) (c) _____
	8 96	Record number of targets killed (d) _____
	9 94	Divide (c ÷ d = e) for target time (e) _____
	10 92	
	11 90	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 88	(Circle One)
	13 86	<b>Target 1</b> (Moving BRDM-2) K M Points _____
	14 84	(add points for all targets) <b>Total Points</b> _____
	15 82	Divide <b>Total Points</b> _____ by
	16 80	<b>Total Targets Presented</b> _____ = _____
	17 78	Subtract crew cuts _____
	18 76	<b>Task Score</b> _____
	19 74	
	20 72	AUTOMATIC 0 POINTS
	21 70	Ⓐ
	22 67	10-POINT CREW CUT
	23 64	Ⓐ
	24 61	5-POINT CREW CUT
	25 58	Ⓐ Ⓑ Ⓒ
	26 55	
	27 52	Remarks/Reason for crew cuts:
	28 49	_____
	29 46	_____
	30 43	_____
	31 40	_____
	32 37	_____
	33 34	_____
	34 31	_____
	35 28	_____
	36 25	_____
	37 22	_____
	38 19	_____
	39 16	_____
	40 13	_____
	41 10	_____
	42 7	_____
	43 4	_____
	44 1	_____
45 0	_____	

Figure 12-29. Sample Scoresheet—Table VIIA, Task 3 (Defense) (M2 HB).

TABLE VIIA, TASK 4 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a moving target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><i>Total Targets:</i> 1</p> <p><i>Target 1:</i> Stationary truck, 400 to 600 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	Record last target engagement time (a) _____
	8	100	Record number of targets killed (b) _____
	9	100	Divide (a ÷ b = c) for target time (c) _____
	10	100	
	11	100	
	12	99	
	13	98	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	97	(Circle One)
	15	96	<b>Target 1</b> (Stationary Truck) K M Points _____
	16	94	(add points for all targets) <b>Total Points</b> _____
	17	93	Divide <b>Total Points</b> _____ by
	18	92	<b>Total Targets Presented</b> _____ = _____
	19	91	Subtract crew cuts _____
	20	90	<b>Task Score</b> _____
	21	88	
	22	87	
	23	86	
	24	85	
	25	84	
	26	82	
	27	81	AUTOMATIC 0 POINTS
	28	80	<b>A</b>
	29	79	
	30	78	10-POINT CREW CUT
	31	76	<b>A</b>
	32	75	
	33	74	
	34	73	
	35	72	5-POINT CREW CUT
	36	70	<b>A B C</b>
	37	68	
	38	66	
	39	64	
	40	62	Remarks/Reason for crew cuts:
	41	60	_____
	42	58	_____
	43	56	_____
	44	54	_____
	45	52	_____
	46	50	_____
	47	48	_____
	48	46	_____
	49	44	
50	42		

Figure 12-30. Sample Scoresheet—Table VIIA, Task 4 (Offense) (M2 HB).

TABLE VIIB, TASK 1 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal truck, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 100	Subtract (a - b = c) (c) _____
	8 100	Record number of targets killed (d) _____
	9 100	Divide (c ÷ d = e) for target time (e) _____
	10 99	
	11 98	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 96	(Circle One)
	13 95	<b>Target 1</b> (Stationary Truck) K M Points _____
	14 93	(add points for all targets) <b>Total Points</b> _____
	15 92	Divide <b>Total Points</b> _____ by
	16 90	<b>Total Targets Presented</b> _____ = _____
	17 89	Subtract crew cuts _____
	18 88	<b>Task Score</b> _____
	19 86	
	20 85	AUTOMATIC 0 POINTS
	21 83	Ⓐ
	22 82	10-POINT CREW CUT
	23 80	Ⓐ
	24 79	5-POINT CREW CUT
	25 78	Ⓐ Ⓑ Ⓒ
	26 76	
	27 75	Remarks/Reason for crew cuts:
	28 73	_____
	29 72	_____
	30 70	_____
	31 68	_____
	32 66	_____
	33 64	_____
	34 62	_____
	35 60	_____
	36 58	_____
	37 56	_____
	38 54	_____
	39 52	_____
	40 50	_____
	41 48	_____
	42 46	_____
	43 44	_____
	44 42	_____
	45 40	_____
	46 38	_____
	47 36	_____
	48 34	_____
	49 32	_____
	50 30	_____
	51 28	_____
	52 26	_____
	53 24	_____
	54 22	_____
	55 20	_____
	56 18	_____
	57 16	_____
	58 14	_____
	59 12	_____
60 10	_____	

Figure 12-31. Sample Scoresheet—Table VIIB, Task 1 (Defense) (M2 HB).

TABLE VIIB, TASK 2 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple targets from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 50 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p><b>Target 2:</b> Stationary frontal truck, 500 to 700 meters.</p> <p>NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Eng Time _____ Target # _____
	1 100	2. Eng Time _____ Target # _____
	2 100	3. Eng Time _____ Target # _____
	3 100	4. Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record number of targets killed (b) _____
	7 100	Divide (a ÷ b = c) for target time (c) _____
	8 100	
	9 100	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	10 100	(Circle One)
	11 100	<b>Target 1</b> (Stationary BRDM) K M Points _____
	12 99	<b>Target 2</b> (Stationary Truck) K M Points _____
	13 98	(add points for all targets) <b>Total Points</b> _____
	14 97	Divide <b>Total Points</b> _____ by
	15 95	<b>Total Targets Presented</b> _____ = _____
	16 94	Subtract crew cuts _____
	17 93	<b>Task Score</b> _____
	18 91	
	19 90	AUTOMATIC 0 POINTS
	20 89	Ⓐ
	21 87	10-POINT CREW CUT
	22 86	Ⓐ
	23 85	5-POINT CREW CUT
	24 84	Ⓐ Ⓑ Ⓒ
	25 82	
	26 81	Remarks/Reason for crew cuts:
	27 80	_____
	28 78	_____
	29 77	_____
	30 76	_____
	31 74	_____
	32 73	_____
	33 72	_____
	34 70	_____
	35 67	_____
	36 64	_____
	37 61	_____
	38 58	_____
	39 55	_____
	40 52	_____
	41 49	_____
	42 46	_____
	43 43	_____
	44 40	_____
	45 37	_____
	46 34	_____
	47 31	_____
	48 28	_____
	49 25	_____
	50 22	_____
	51 19	_____
	52 16	_____
	53 13	_____
	54 10	_____
	55 7	_____
	56 4	_____
	57 1	_____
58 0	_____	

Figure 12-32. Sample Scoresheet—Table VIIB, Task 2 (Offense) (M2 HB).

TABLE VIIB, TASK 3 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 50 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Dismounted troops, 300 to 500 meters.</p> <p><b>Target 2:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 95	Record defilade time (25 sec or less) (b) _____
	7 90	Subtract (a - b = c) (c) _____
	8 85	Record number of targets killed (d) _____
	9 80	Divide (c ÷ d = e) for target time (e) _____
	10 75	
	11 70	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 66	(Circle One)
	13 62	<b>Target 1</b> (Dismounted Troops) K M Points _____
	14 58	<b>Target 2</b> (Stationary BRDM) K M Points _____
	15 54	(add points for all targets) <b>Total Points</b> _____
	16 50	Divide <b>Total Points</b> _____ by
	17 46	<b>Total Targets Presented</b> _____ = _____
	18 42	Subtract crew cuts _____
	19 38	<b>Task Score</b> _____
	20 34	
	21 30	AUTOMATIC 0 POINTS
	22 26	Ⓐ
	23 22	10-POINT CREW CUT
	24 18	Ⓐ
	25 14	5-POINT CREW CUT
	26 10	Ⓐ Ⓑ Ⓒ
	27 6	
	28 2	Remarks/Reason for crew cuts:
29 0	_____	
	_____	
	_____	
	_____	

Figure 12-33. Sample Scoresheet—Table VIIB, Task 3 (Defense) (M2 HB).



TABLE VIIB, TASK 4 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> RPG team, 500 to 700 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	95	
	7	90	Record last target engagement time (a) _____
	8	85	
	9	80	Record number of targets killed (b) _____
	10	75	
	11	70	Divide (a ÷ b = c) for target time (c) _____
	12	66	
	13	62	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	58	(Circle One)
	15	54	<b>Target 1</b> (RPG Team) K M Points _____
	16	50	(add points for all targets) <b>Total Points</b> _____
	17	46	
	18	42	Divide <b>Total Points</b> _____ by
	19	38	<b>Total Targets Presented</b> _____ = _____
	20	34	
	21	30	Subtract crew cuts _____
	22	26	<b>Task Score</b> _____
	23	22	
	24	18	
	25	14	
	26	10	
	27	6	
	28	2	
29	0		

AUTOMATIC 0 POINTS

● A

10-POINT CREW CUT

● A

5-POINT CREW CUT

● A ● B ● C

---

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-34. Sample Scoresheet—Table VIIB, Task 4 (Offense) (M2 HB).

## M2 HB CALIBER .50 TABLE VIII<sup>3/4</sup> INTERMEDIATE CREW QUALIFICATION

Table VIII is a marksmanship, single-vehicle qualification table. This table tests the crew's ability to zero a M2 HB caliber .50 machine gun, and employ direct fire to acquire and engage stationary and moving, area and point targets during various firing conditions. These tables are fired during the day and at night. This is not a tactical table; however, normal combat-oriented procedures, such as reporting, should be used. Some tasks are conducted in an NBC environment.

Truck crews must have qualified on the GST within the previous three months. The crew must fire Table VIIIA and B for qualification. As a minimum, the crew must achieve 420 points, and score at least 70 points on 6 of the 8 graded tasks to achieve a qualified rating. At least one task must be in an NBC environment.

### SCORING PROCEDURE FOR TABLE VIII

All tasks are scored. Refer to pages 12-8 and 12-9 for scoresheet scoring instructions. Within the allotted time per exercise, the gunner must obtain the minimum kills per target to pass each task. A crew duty penalty is subtracted for each crew error; there are three possible 5-point penalties, one 10-point penalty, and one automatic zero-point penalty for crew errors. A maximum crew duty penalty point deduction of 30 points can be assessed per engagement. Additional crew errors will not be deducted, they will be critiqued.

Crew duty penalty points are as follows:

- **A**—5 points—Improper fire command.
- **B**—5 points—Incorrect engagement techniques (for example, engaging a *least dangerous* target before a *most dangerous* target).
- **C**—5 points—Incorrect driving technique (anything the driver does that impedes the firing task).
- **A**—10 points—Firing before receiving the command to fire.
- **A**—Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

Crew ratings are determined using the following conditions:

- Distinguished: Combined score of at least 674 points on Tables VIIIA and B, and 6 of 8 tasks must have at least 70 points.
- Superior: Combined score of 547 to 673 points on Tables VIIIA and B, and 6 of 8 tasks must have at least 70 points.
- Qualified: Combined score of 420 to 546 points on Tables VIIIA and B, and 6 of 8 tasks must have at least 70 points.
- Unqualified: Combined score of 419 points or less on Tables VIIIA and B, or 3 of 8 tasks have 69 points or less.

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 250 rounds of mix:

- Table VIIIA: 125 rounds of mix.
- Table VIIIB: 125 rounds of mix.

**Notes.** Units with illumination assets may use them during the night portion of the table.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

**CONDUCT OF FIRE**

Table VIIIA will be fired during daylight and Table VIIIB should be fired at night. Using four and one mix ammunition, the crew will acquire and engage single and multiple, moving and stationary targets. Targets will be placed at ranges between 400 and 1,000 meters.

**ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of tasks and the positioning of stationary PC targets from frontal to flank views.

TABLE VIIIA. CREW QUALIFICATION (DAY) (M2 HB)						
Task	Conditions/ Target/Situatio n	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Engage a stationary target (moving).	Dismounted troops, 400 to 600 meters.	25 rds	Area	50	_____	GO NO-GO
2. Engage multiple targets (stationary).	One stationary frontal BRDM, 600 to 800 meters and one stationary frontal truck, 400 to 600 meters.	50 rds	Point  Point	50	_____	GO NO-GO
3. Engage a moving target (stationary).	One moving flank BRDM-2, 600 to 800 meters. NBC environment.	25 rds	Point	50	_____	GO NO-GO
4. Engage a stationary target (moving).	One stationary frontal truck, 600 to 800 meters.	25 rds	Point	50	_____	GO NO-GO
				Target Requirements: 1 Flank BRDM 1 Stationary Frontal BRDMs 7 IRETS (Dismounted Infantry) 2 Frontal Truck		
Table _____ Date _____ Vehicle Number _____						
Gunner _____ Assistant Gunner _____						
Evaluator's Signature _____ Tasks Scored GO _____						

**Figure 12-35. Sample Crew Qualification Table (Day) (M2 HB Table VIIIA).**

TABLE VIII.B. CREW QUALIFICATION (NIGHT) (M2 HB)						
Task	Conditions/ Target/Situatio n	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Engage a stationary target (stationary).	One stationary frontal BRDM-2, 600 to 800 meters. NBC environment.	25 rds	Point	60	_____	GO NO-GO
2. Engage a stationary target (stationary).	One stationary frontal truck, 600 to 800 meters.	25 rds	Point	60	_____	GO NO-GO
3. Engage multiple targets (moving).	Dismounted troops, 400 to 600 meters and one stationary frontal BRDM, 600 to 800 meters.	50 rds	Area  Point	60	_____	GO NO-GO
4. Engage a stationary target (moving).	One RPG team, 400 to 600 meters.	25 rds	Area	60	_____	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM-2 (for Zero) 2 Stationary Frontal BRDM-2s 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry) 1 Frontal Truck		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Tasks Scored GO: Table VIII A and B _____ Qualified/Unqualified _____ Evaluator's Signature _____						

Figure 12-36. Sample Crew Qualification Table (Night) (M2 HB Table VIII.B).

**TABLE VIII (M2 HB)  
ROLL-UP SHEET**

**BUMPER #** \_\_\_\_\_ **UNIT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**CREW:** TC \_\_\_\_\_ GNR \_\_\_\_\_ DVR \_\_\_\_\_

**DAY:** START \_\_\_\_\_ FINISH \_\_\_\_\_ **NIGHT:** START \_\_\_\_\_ FINISH \_\_\_\_\_

**TCE SIGNATURE (DAY)** \_\_\_\_\_

**TCE SIGNATURE (NIGHT)** \_\_\_\_\_

TASK	TOTAL TGTS	RDS FIRED	KILLS	MISSES	NE	PENALTY POINTS	SCORE	QUAL (Y/N)
A1								
A2								
A3								
A4								
<b>TOTALS</b>								
B1								
B2								
B3								
B4								
<b>TOTALS</b>								
<b>OVERALL</b>								
<b>TOTAL PENALTY POINTS</b>								
<b>TOTAL QUALIFIED ENGAGEMENTS</b>								

UNQUALIFIED      QUALIFIED      SUPERIOR      DISTINGUISHED

Figure 12-37. Sample Roll-up Sheet, Table VIII (M2 HB).

TABLE VIII A, TASK 1 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Dismounted troops, 400 to 600 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Eng Time _____ Target # _____
	1 100	2. Eng Time _____ Target # _____
	2 100	3. Eng Time _____ Target # _____
	3 100	4. Eng Time _____ Target # _____
	4 100	Record last target engagement time (a) _____
	5 100	Record number of targets killed (b) _____
	6 100	Divide (a ÷ b = c) for target time (c) _____
	7 95	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	8 90	(Circle One)
	9 85	<b>Target 1</b> (Dismounted Troops) K M Points _____
	10 80	(add points for all targets) <b>Total Points</b> _____
	11 75	Divide <b>Total Points</b> _____ by
	12 70	<b>Total Targets Presented</b> _____ = _____
	13 66	Subtract crew cuts _____
	14 62	<b>Task Score</b> _____
	15 58	AUTOMATIC 0 POINTS
	16 54	<b>A</b>
	17 50	10-POINT CREW CUT
	18 46	<b>A</b>
	19 42	5-POINT CREW CUT
	20 38	<b>A B C</b>
	21 34	Remarks/Reason for crew cuts:
	22 30	_____
	23 26	_____
	24 22	_____
	25 18	_____
	26 14	
	27 10	
	28 6	
	29 2	
30 0		

Figure 12-38. Sample Scoresheet—Table VIII A, Task 1 (Offense) (M2 HB).

TABLE VIIIA, TASK 2 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 50 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p><b>Target 2:</b> Stationary frontal truck, 400 to 600 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 100	Subtract (a - b = c) (c) _____
	8 100	Record number of targets killed (d) _____
	9 98	Divide (c ÷ d = e) for target time (e) _____
	10 96	
	11 94	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 92	(Circle One)
	13 90	<b>Target 1</b> (Stationary BRDM) K M Points _____
	14 88	<b>Target 2</b> (Stationary Truck) K M Points _____
	15 85	(add points for all targets) <b>Total Points</b> _____
	16 83	Divide <b>Total Points</b> _____ by
	17 81	<b>Total Targets Presented</b> _____ = _____
	18 79	Subtract crew cuts _____
	19 77	<b>Task Score</b> _____
	20 75	
	21 73	AUTOMATIC 0 POINTS
	22 70	<b>A</b>
	23 67	10-POINT CREW CUT
	24 64	<b>A</b>
	25 61	5-POINT CREW CUT
	26 58	<b>A B C</b>
	27 55	
	28 52	Remarks/Reason for crew cuts:
	29 49	_____
	30 46	_____
	31 43	_____
	32 40	_____
	33 37	
	34 34	
	35 31	
	36 28	
	37 25	
	38 22	
	39 19	
	40 16	
	41 13	
	42 10	
	43 7	
	44 4	
	45 1	
46 0		

Figure 12-39. Sample Scoresheet—Table VIIIA, Task 2 (Defense) (M2 HB).

TABLE VIII A, TASK 3 (DEFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a moving target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Moving flank BRDM-2, 600 to 800 meters.</p> <p>NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	3. Defilade Time _____ Eng Time _____ Target # _____
	4	100	4. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	
	7	98	
	8	96	Record last target engagement time (a) _____
	9	94	Record defilade time (25 sec or less) (b) _____
	10	92	Subtract (a - b = c) (c) _____
	11	90	Record number of targets killed (d) _____
	12	88	Divide (c ÷ d = e) for target time (e) _____
	13	86	
	14	84	
	15	82	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	16	80	(Circle One)
	17	78	<b>Target 1</b> (Moving BRDM-2) K M Points _____
	18	76	(add points for all targets) <b>Total Points</b> _____
	19	74	Divide <b>Total Points</b> _____ by
	20	72	<b>Total Targets Presented</b> _____ = _____
	21	70	Subtract crew cuts _____
	22	67	<b>Task Score</b> _____
	23	64	
	24	61	
	25	58	
	26	55	
	27	52	
	28	49	
	29	46	
	30	43	
	31	40	
	32	37	AUTOMATIC 0 POINTS
	33	34	<b>A</b>
	34	31	
	35	28	10-POINT CREW CUT
	36	25	<b>A</b>
	37	22	
	38	19	5-POINT CREW CUT
	39	16	<b>A B C</b>
	40	13	
	41	10	
	42	7	
	43	4	
	44	1	
45	0	Remarks/Reason for crew cuts: _____ _____ _____ _____	

Figure 12-40. Sample Scoresheet—Table VIII A, Task 3 (Defense) (M2 HB).



TABLE VIIIA, TASK 4 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal truck, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	Record last target engagement time (a) _____
	8	100	Record number of targets killed (b) _____
	9	100	Divide (a ÷ b = c) for target time (c) _____
	10	100	
	11	100	
	12	99	
	13	98	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	97	(Circle One)
	15	96	<b>Target 1</b> (Stationary Truck) K M Points _____
	16	94	(add points for all targets) <b>Total Points</b> _____
	17	93	Divide <b>Total Points</b> _____ by
	18	92	<b>Total Targets Presented</b> _____ = _____
	19	91	Subtract crew cuts _____
	20	90	<b>Task Score</b> _____
	21	88	
	22	87	
	23	86	
	24	85	
	25	84	
	26	82	
	27	81	
	28	80	AUTOMATIC 0 POINTS
	29	79	<b>A</b>
	30	78	10-POINT CREW CUT
	31	76	<b>A</b>
	32	75	5-POINT CREW CUT
	33	74	<b>A B C</b>
	34	73	
	35	72	
	36	70	
	37	68	
	38	66	
	39	64	
	40	62	Remarks/Reason for crew cuts:
	41	60	_____
	42	58	_____
	43	56	_____
	44	54	_____
	45	52	_____
	46	50	_____
	47	48	_____
	48	46	_____
	49	44	_____
50	42	_____	

Figure 12-41. Sample Scoresheet—Table VIIIA, Task 4 (Offense) (M2 HB).

TABLE VIII B, TASK 1 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary BRDM-2, 600 to 800 meters.</p> <p>NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Eng Time _____ Target # _____
	1 100	2. Eng Time _____ Target # _____
	2 100	3. Eng Time _____ Target # _____
	3 100	4. Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record number of targets killed (b) _____
	7 97	Divide (a ÷ b = c) for target time (c) _____
	8 93	
	9 89	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	10 85	(Circle One)
	11 82	<b>Target 1</b> (Stationary BRDM-2) K M Points _____
	12 78	(add points for all targets) <b>Total Points</b> _____
	13 74	Divide <b>Total Points</b> _____ by
	14 70	<b>Total Targets Presented</b> _____ = _____
	15 66	Subtract crew cuts _____
	16 62	<b>Task Score</b> _____
	17 58	
	18 54	AUTOMATIC 0 POINTS
	19 50	<b>A</b>
	20 46	10-POINT CREW CUT
	21 42	<b>A</b>
	22 38	5-POINT CREW CUT
	23 34	<b>A B C</b>
	24 30	
	25 26	Remarks/Reason for crew cuts:
	26 22	_____
	27 18	_____
	28 14	_____
	29 10	_____
	30 6	
	31 2	
32 0		

Figure 12-42. Sample Scoresheet—Table VIII B, Task 1 (Offense) (M2 HB).

TABLE VIII B, TASK 2 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal truck, 400 to 600 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Eng Time _____ Target # _____
	1 100	2. Eng Time _____ Target # _____
	2 100	3. Eng Time _____ Target # _____
	3 100	4. Eng Time _____ Target # _____
	4 100	
	5 100	
	6 100	Record last target engagement time (a) _____
	7 100	Record number of targets killed (b) _____
	8 100	Divide (a ÷ b = c) for target time (c) _____
	9 100	
	10 99	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	11 98	(Circle One)
	12 96	<b>Target 1</b> (Stationary Truck) K M Points _____
	13 95	(add points for all targets) <b>Total Points</b> _____
	14 93	Divide <b>Total Points</b> _____ by
	15 92	<b>Total Targets Presented</b> _____ = _____
	16 90	Subtract crew cuts _____
	17 89	<b>Task Score</b> _____
	18 88	
	19 86	AUTOMATIC 0 POINTS
	20 85	<b>A</b>
	21 83	10-POINT CREW CUT
	22 82	<b>A</b>
	23 80	5-POINT CREW CUT
	24 79	<b>A B C</b>
	25 78	
	26 76	Remarks/Reason for crew cuts:
	27 75	_____
	28 73	_____
	29 72	_____
	30 70	_____
	31 68	_____
	32 66	_____
	33 64	_____
	34 62	_____
	35 60	_____
	36 58	_____
	37 56	_____
	38 54	_____
	39 52	_____
	40 50	_____
	41 48	_____
	42 46	_____
	43 44	_____
	44 42	_____
	45 40	_____
	46 38	_____
	47 36	_____
	48 34	_____
	49 32	_____
	50 30	_____
	51 28	_____
	52 26	_____
	53 24	_____
	54 22	_____
	55 20	_____
	56 18	_____
	57 16	_____
	58 14	_____
	59 12	_____
60 10	_____	

Figure 12-43. Sample Scoresheet—Table VIII B, Task 2 (Offense) (M2 HB).

TABLE VIII B, TASK 3 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple targets from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 50 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Dismounted troops, 400 to 600 meters.</p> <p><b>Target 2:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	Record last target engagement time (a) _____
	8	100	Record number of targets killed (b) _____
	9	100	Divide (a ÷ b = c) for target time (c) _____
	10	98	
	11	96	
	12	94	
	13	91	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	89	(Circle One)
	15	87	<b>Target 1</b> (Dismounted Troops) K M Points _____
	16	84	<b>Target 2</b> (Stationary BRDM) K M Points _____
	17	82	(add points for all targets) <b>Total Points</b> _____
	18	80	Divide <b>Total Points</b> _____ by
	19	77	<b>Total Targets Presented</b> _____ = _____
	20	75	Subtract crew cuts _____
	21	73	<b>Task Score</b> _____
	22	70	
	23	66	
	24	62	
	25	58	
	26	54	
	27	50	
	28	46	
	29	42	AUTOMATIC 0 POINTS
	30	38	<b>A</b>
	31	34	10-POINT CREW CUT
	32	30	<b>A</b>
	33	26	5-POINT CREW CUT
	34	22	<b>A B C</b>
	35	18	
	36	14	
	37	10	
	38	6	
	39	2	
40	0		

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-44. Sample Scoresheet—Table VIII B, Task 3 (Offense) (M2 HB).

TABLE VIII B, TASK 4 (OFFENSE), M2 HB

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>.50 Cal: 25 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> RPG team, 600 to 800 meters.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	95	
	7	90	Record last target engagement time (a) _____
	8	85	Record number of targets killed (b) _____
	9	80	Divide (a ÷ b = c) for target time (c) _____
	10	75	
	11	70	
	12	66	
	13	62	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	58	(Circle One)
	15	54	<b>Target 1</b> (RPG Team) K M Points _____
	16	50	(add points for all targets) <b>Total Points</b> _____
	17	46	Divide <b>Total Points</b> _____ by
	18	42	<b>Total Targets Presented</b> _____ = _____
	19	38	Subtract crew cuts _____
	20	34	<b>Task Score</b> _____
	21	30	
	22	26	
	23	22	
	24	18	
	25	14	
	26	10	
	27	6	AUTOMATIC 0 POINTS
	28	2	<b>A</b>
29	0	10-POINT CREW CUT	
		<b>A</b>	
		5-POINT CREW CUT	
		<b>A B C</b>	
		Remarks/Reason for crew cuts:	
		_____	
		_____	
		_____	
		_____	

Figure 12-45. Sample Scoresheet—Table VIII B, Task 4 (Offense) (M2 HB).

## MK 19 40-mm Grenade Basic and Intermediate Gunnery Tables

The MK 19 40-mm grenade basic and intermediate gunnery tables are used to train crews with the MK 19 40-mm grenade machine gun.

### SCORING

On area target engagements (infantry squad, truck, and RPG team), full credit is given when suppression (one round impacts within ten meters of the target) is achieved within the time standards indicated in the task. On point target engagements (lightly armored vehicle targets, such as BRDMs and BTR-70s), full credit is given when the gunner scores one kill on the target. Area target arrays may be placed on line or in wedge formations. Area targets should not be more than 5 meters apart, and will not extend beyond 30 meters in width or 20 meters in depth.

### MK 19 TABLE I ¼ MANIPULATION EXERCISE

Table I exercises are device based and trains the gunner to zero the MK 19, develops the gunner's coordination skills, and familiarizes the gunner with the weapon system. The gunner practices moving from one target to another in a random fashion, thus developing his skills to manipulate the weapon. These exercises are fired during day conditions only.

### SCORING PROCEDURE FOR TABLE I

Task 1 is not scored.

Tasks 2 through 4 are scored. Time for these engagements starts when the evaluator announces "COMMENCE FIRING," and stops when all targets have been engaged or the evaluator announces "CEASE FIRE," whichever occurs first.

Within the allotted time per exercise, the gunner must obtain the minimum kills per target to score GO on each task. The gunner should score GO on all graded tasks before progressing to Table II.

### CONDUCT OF FIRE

Using the EST, the gunner (moving from one target to another) fires the manipulation exercises using the proper techniques. Stationary BRDM targets and dismounted troop targets are set in target arrays in front of each weapon system at ranges between 400 meters and 1,000 meters. An additional BRDM target is set at 400 meters for weapon zero.

- Task 1—Zero a MK 19 40-mm grenade machine gun. The gunner will—
  - Move the leaf sight plate to the midpoint between the two studs.
  - Move the rear sight slide to the meter mark representing the distance to the target.
  - Set the windage knob at the zero index line.
  - Align the sights on the base of the target using the traverse and elevation mechanism.
  - Fire a single round, and spot the impact of the round. If it is on target, fire a short burst to confirm zero. If the round is not on target, estimate the round (how short or long, right or left).
  - Adjust the elevation knob to move the sights onto the target. (If the round was short, move the elevation knob clockwise; if the round was long, move the elevation knob counterclockwise.)

- Adjust the windage knob to move the impact right or left. (To adjust to the right, turn the windage knob counterclockwise; to adjust to the left, turn the windage knob clockwise.)
- Before firing the next round, realign the sights and adjust the gun back on target using the traverse and elevation mechanism.

**Note.** If the adjustment was correct, the second round should be on target; fire the rest of the rounds to confirm the zero. If the second round is not on target, repeat all steps. If the impacts are not observed, bold adjustments may be needed.

- Once the zero is complete, align the range plate scale at the exact range of the zero, and tighten it.
- Tasks 2 through 4—Engage stationary targets from a tripod-mounted weapon.
  - The gunner will observe the beaten zone and make adjustments, as necessary, to kill the targets.
  - After the gunner completes firing, he will clear the weapon. The AI will critique the gunner's performance.

### **ALLOWABLE VARIATIONS**

The commander may change the positioning of stationary PC targets from frontal to flank views.

TABLE I. MANIPULATION EXERCISE (MK 19)						
Task	Conditions/ Target/Situation	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Zero a MK 19 40-mm grenade machine gun (tripod-mounted).	One stationary frontal BRDM, 400 to 600 meters.	NA	NA	NA	NA	NA
2. Engage a stationary target (tripod-mounted) (manipulation exercise).	One stationary frontal BRDM, 800 to 1,000 meters.	NA	Point	NA	NA	GO NO-GO
3. Engage a stationary target (tripod-mounted) (manipulation exercise) (traverse and search).	One stationary frontal BRDM, 800 to 1,000 meters.	NA	Point	NA	NA	GO NO-GO
4. Engage a stationary target (tripod-mounted) (manipulation exercise) (traverse and search).	One infantry squad, 600 to 800 meters.	NA	Area	NA	NA	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for Zero) 2 Stationary Frontal BRDMs 7 IRETS (Dismounted Infantry)		
Table _____ Date _____ Vehicle Number _____						
Gunner _____ Assistant Gunner _____						
Evaluator's Signature _____ Tasks Scored GO _____						

Figure 12-46. Sample Manipulation Exercise Table (MK 19 Table I).



## **MK 19 TABLE II<sup>3/4</sup> TRIPOD EXERCISE**

Table II trains the gunner and commander to zero the MK 19, engage targets with speed and accuracy, and acquire and engage targets under NBC conditions. These exercises are fired during the day only.

### **SCORING PROCEDURE FOR TABLE II**

Task 1 is not scored.

Tasks 2 through 5 are scored. Engagement time starts when the target is fully exposed and stops when the command "CEASE FIRE" is given.

Within the allotted time per exercise, the gunner must obtain the minimum kills per target to score GO on each task.

### **CONDUCT OF FIRE**

Using the EST, the gunner acquires and engages stationary targets from a tripod-mounted weapon system. Target arrays are placed at ranges between 400 meters and 1,000 meters. An additional BRDM target is placed at 400 meters for weapon zero.

- Task 1—Zero a MK 19 40-mm grenade machine gun.
- Tasks 2 through 5—Engage stationary targets from a tripod-mounted weapon.

### **ALLOWABLE VARIATIONS**

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views.

TABLE II. TRIPOD EXERCISE (MK 19)						
Task	Conditions/ Target/Situation	Ammo / Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Zero a MK 19 grenade machine gun (tripod-mounted).	One stationary frontal BRDM, 400 to 600 meters.	NA	NA	NA	NA	NA
2. Engage a stationary target (tripod-mounted).	One stationary frontal BRDM, 400 to 600 meters. NBC environment.	NA	Point		SAT UNSAT	GO NO-GO
3. Engage a stationary target (tripod-mounted).	One stationary frontal truck, 800 to 1,000 meters.	NA	Area		SAT UNSAT	GO NO-GO
4. Engage a stationary target (tripod-mounted).	One stationary frontal BRDM, 600 to 800 meters.	NA	Point		SAT UNSAT	GO NO-GO
5. Engage a stationary target (tripod-mounted).	One infantry squad, 600 to 800 meters. NBC environment.	NA	Area		SAT UNSAT	GO NO-GO
			Target Requirements: 1 Stationary Frontal BRDM (for Zero) 2 Stationary Frontal BRDMs 1 Stationary frontal Truck 7 IRETS (Dismounted Infantry)			
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

Figure 12-47. Sample Tripod Exercise Table (MK 19 Table II).

## **MK 19 TABLE III<sup>3/4</sup> ADJUSTMENT OF FIRE (STATIONARY)**

Table III trains the gunner and commander to zero the MK 19, engage targets with speed and accuracy, and acquire and engage targets under NBC conditions. These exercises are fired during the day only.

### **SCORING PROCEDURE FOR TABLE III**

Task 1 is not scored.

Tasks 2 through 5 are scored. Engagement time starts when the target is fully exposed, and stops when the command "CEASE FIRE" is given.

Within the allotted time per exercise, the gunner must obtain the minimum kills per target to score GO on each task.

### **CONDUCT OF FIRE**

Using the EST, the gunner acquires and engages stationary targets from a stationary vehicle. Target arrays are placed at ranges between 400 meters and 1,000 meters. An additional BRDM target is placed at 400 meters for weapon zero.

- Task 1—Zero a MK 19 40-mm grenade machine gun.
- Tasks 2 through 5—Engage stationary targets from a stationary vehicle.

### **ALLOWABLE VARIATIONS**

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views.

<b>TABLE III. ADJUSTMENT OF FIRE (STATIONARY) (MK 19)</b>						
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Standards</b>		<b>Crew Duties</b>	<b>GO/ NO-GO</b>
			<b>Eng Tech</b>	<b>Time (Seconds)</b>		
1. Zero a MK 19 grenade machine gun.	One stationary frontal BRDM, 400 to 600 meters.	NA	NA	NA	NA	NA
2. Engage a stationary target (stationary).	One infantry squad, 800 to 1,000 meters.	NA	Area		SAT UNSAT	GO NO-GO
3. Engage a stationary target (stationary).	One stationary frontal BRDM, 600 to 800 meters. NBC environment.	NA	Point		SAT UNSAT	GO NO-GO
4. Engage a stationary target (stationary).	One stationary frontal BRDM, 700 to 900 meters.	NA	Point		SAT UNSAT	GO NO-GO
5. Engage a stationary target (stationary).	One RPG team, 800 to 1,000 meters. NBC environment.	NA	Area		SAT UNSAT	GO NO-GO
			Target Requirements: 1 Stationary Frontal BRDM (for Zero) 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry) 2 Stationary Frontal BRDM			
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

**Figure 12-48. Sample Adjustment of Fire Table (Stationary) (MK 19 Table III).**

## **MK 19 TABLE IV<sup>3/4</sup> BASIC CREW QUALIFICATION**

Table IV tests the gunner and commander to make sure he can zero the MK 19, engage targets with speed and accuracy, and acquire and engage targets under NBC conditions. These exercises are fired during the day and at night.

### **SCORING FOR TABLE IV**

Task 1 (day and night engagement) is not scored.

Tasks 2 through 5, Table IVA and Tasks 2 through 5, Table IVB are scored. Engagement time starts when the target is fully exposed, and stops when the command "CEASE FIRE" is given.

Within the allotted time per exercise, the gunner must obtain the minimum kills per target to score GO on each task.

The crew must score GO on a total of six of the eight graded tasks on Tables IVA and IVB, combined.

### **CONDUCT OF FIRE**

Using the EST, the gunner acquires and engages moving and stationary targets from a stationary vehicle. Target arrays are placed at ranges between 300 meters and 1,000 meters. An additional BRDM target is placed at 400 meters for weapon zero.

- Task 1—Zero a MK 19 40-mm grenade machine gun.
- Tasks 2 through 5, Table IVA and Tasks 2 through 5, Table IVB—Engage moving and stationary targets from a stationary vehicle.

### **ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views.

<b>TABLE IVA. BASIC CREW QUALIFICATION (DAY) (MK 19)</b>						
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Standards</b>		<b>Crew Duties</b>	<b>GO/ NO-GO</b>
			<b>Eng Tech</b>	<b>Time (Seconds)</b>		
1. Zero a MK 19 grenade machine gun.	One stationary frontal BRDM, 400 to 600 meters.	NA	NA	NA	NA	NA
2. Engage a moving target (defense).	One moving flank truck, 600 to 800 meters.	NA	Area		SAT UNSAT	GO NO-GO
3. Engage a moving target (defense).	One moving flank BRDM, 600 to 800 meters. NBC environment.	NA	Point		SAT UNSAT	GO NO-GO
4. Engage a moving target (defense).	One moving flank BRDM, 600 to 800 meters.	NA	Point		SAT UNSAT	GO NO-GO
5. Engage a stationary target (defense).	One infantry squad, 400 to 600 meters.	NA	Area		SAT UNSAT	GO NO-GO
				Target Requirements: 1 Stationary Frontal BRDM (for zero) 2 Moving Flank BRDMs 7 IRETS (dismounted infantry)		
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

**Figure 12-49. Sample Basic Crew Qualification Table (Day) (MK 19 Table IVA).**

TABLE IVB. BASIC CREW QUALIFICATION (NIGHT) (MK 19)						
Task	Conditions/ Target/Situation	Ammo/ Rds	Standards		Crew Duties	GO/ NO-GO
			Eng Tech	Time (Seconds)		
1. Zero a MK 19 grenade machine gun.	One stationary frontal BRDM, 400 to 600 meters.	NA	NA	NA	NA	NA
2. Engage a moving target (defense).	One moving flank truck, 600 to 800 meters.	NA	Area		SAT UNSAT	GO NO-GO
3. Engage a moving target (defense).	One moving flank BRDM, 600 to 800 meters. NBC environment.	NA	Point		SAT UNSAT	GO NO-GO
4. Engage a moving target (defense).	One stationary frontal BRDM, 600 to 800 meters.	NA	Point		SAT UNSAT	GO NO-GO
5. Engage a stationary target (defense).	One infantry squad, 400 to 600 meters.	NA	Area		SAT UNSAT	GO NO-GO
			Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Moving Flank Truck 1 Moving Flank BRDM 1 Stationary Frontal Truck 7 IRETS (Dismounted Infantry)			
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

Figure 12-50. Sample Basic Crew Qualification Table (Night) (MK 19 Table IVB).

## **MK 19 TABLE V<sup>3</sup>/<sub>4</sub> CREW PROFICIENCY COURSE (MOVING)**

Table V begins training on a moving vehicle. The crew develops teamwork while training the gunner and commander to engage targets with speed and accuracy, and acquire and engage targets under NBC conditions on a moving vehicle. These exercises are fired during the day and at night, using MILES with LTIDS.

Table V should be run twice, once with the TC and once with the gunner.

### **SCORING PROCEDURE FOR TABLE V**

Tasks 1 through 4, Tables VA and B are scored. Within the allotted time per exercise, the gunner must obtain the proper lay or lead for each target to score GO on each task.

The crew must score GO on six of the eight graded tasks on Tables VA and B combined.

Crew duties will be critiqued as SAT or UNSAT. Crew errors include the following:

- 5 points—Improper fire command.
- 5 points—Incorrect engagement techniques (for example, engaging a least dangerous target before a most dangerous target).
- 5 points—Incorrect driving techniques (anything the driver does that impedes the firing task).
- 10 points—Firing before receiving the command to fire.
- Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

**Note.** Refer to page 12-6, Timing Procedures, for additional scoring information.

### **CONDUCT OF FIRE**

The gunner acquires and engages moving and stationary targets from a stationary and moving vehicle. Target arrays are placed at ranges between 300 meters and 1,100 meters. An additional BRDM target is placed at 400 meters for weapon zero.

- Tasks 1 through 4, Tables VA and B—Engage moving and stationary targets from a stationary and moving vehicle.

### **ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views. If MILES and LTIDS are not available, commanders may dry fire these tasks.



<b>TABLE VA. CREW PROFICIENCY COURSE (DAY) (MK 19)</b>						
			<b>Standards</b>			
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
1. Engage a stationary target (defense).	One RPG team, 600 to 800 meters.	NA	Area	50	SAT UNSAT	GO NO-GO
2. Engage a stationary target (defense).	One stationary truck, 800 to 1,000 meters. NBC environment.	NA	Area	50	SAT UNSAT	GO NO-GO
3. Engage a stationary target (offense).	Dismounted troops, 300 to 500 meters.	NA	Area	50	SAT UNSAT	GO NO-GO
4. Engage multiple targets (defense).	One moving BRDM, 400 to 600 meters and one RPG team, 600 to 800 meters.	NA	Point Area	50	SAT UNSAT	GO NO-GO
			Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Moving Flank BRDM 1 Stationary Frontal Truck 2 sets 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)			
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Evaluator's Signature _____ Tasks Scored GO _____						

**Figure 12-51. Sample Crew Proficiency Course Table (Day) (MK 19 Table VA).**

<b>TABLE VB. CREW PROFICIENCY COURSE (NIGHT) (MK 19)</b>						
			<b>Standards</b>			
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>	<b>Crew Duties</b>	<b>GO/ NO-GO</b>
1. Engage a stationary target (defense).	One stationary frontal BRDM, 600 to 800 meters.	NA	Point	60	SAT UNSAT	GO NO-GO
2. Engage a stationary target (offense).	One stationary frontal truck, 600 to 800 meters.	NA	Area	60	SAT UNSAT	GO NO-GO
3. Engage a stationary target (defense).	One RPG team, 300 to 500 meters. NBC environment.	NA	Area	60	SAT UNSAT	GO NO-GO
4. Engage a stationary target (defense).	Dismounted troops, 600 to 800 meters.	NA	Area	60	SAT UNSAT	GO NO-GO
			Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Stationary Frontal Truck 1 Stationary Frontal BRDM 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)			
Table _____ Date _____ Vehicle Number _____ Gunner _____ Assistant Gunner _____ Tasks Scored GO: Table V A _____ Table V B _____ Evaluator's Signature _____ Total Tasks Scored GO _____						

**Figure 12-52. Sample Crew Proficiency Course Table (Night) (MK 19 Table VB).**

## MK 19 TABLE VI ¼ CREW BASELINE

Table VI trains the gunner and commander to zero the MK 19, engage targets with speed and accuracy, and acquire and engage targets under NBC conditions from a stationary HMMWV. These exercises are fired during the day and at night.

### SCORING PROCEDURE FOR TABLE VI

Task 1 (day engagement) is not scored.

Tasks 2 through 4, Table VIA and Tasks 1 and 2, Table VIB are scored using separate scoresheets. Refer to page 12-8 for scoresheet scoring instructions. Within the allotted time per exercise, the gunner must obtain the minimum kills per target to pass each task. A crew duty penalty is subtracted for each crew error; there are three possible 5-point penalties, one 10-point penalty, and one automatic zero-point penalty. A maximum crew duty penalty point deduction of 30 points can be assessed per engagement. Additional crew errors will not be deducted, they will be critiqued.

Crew duty penalty points are as follows:

- **A**—5 points—Improper fire command.
- **B**—5 points—Incorrect engagement techniques (for example, engaging a *least dangerous* target before a *most dangerous* target).
- **C**—5 points—Incorrect driving technique (anything the driver does that impedes the firing task).
- **A**—10 points—Firing before receiving the command to fire.
- **A**—Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 45 rounds of 40-mm TP ammunition:

- Table VIA: 31 rounds 40-mm TP.
- Table VIB: 14 rounds 40-mm TP.

**Notes.** Units with illumination assets may use them during the night portion of the table.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### CONDUCT OF FIRE

Using 40-mm TP ammunition, the gunner acquires and engages stationary and moving targets from a stationary vehicle. Target arrays are placed at ranges between 300 meters and 1,000 meters.

- Task 1, Table VIA—Zero a MK 19 40-mm grenade machine gun.
- Tasks 2 through 4, Table VIA and Tasks 1 and 2, Table VIB—Engage moving and stationary targets from a stationary vehicle.

### ALLOWABLE VARIATIONS

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views.

<b>TABLE VIA. CREW BASELINE TABLE (DAY) (MK 19)</b>				
			<b>Standards</b>	
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>
1. Zero a MK 19 grenade machine gun.	One stationary frontal BRDM, 400 to 600 meters.	40-mm TP/3 rds	NA	NA
2. Engage a stationary target from a stationary HMMWV (defense).	RPG team, 300 to 500 meters. NBC environment.	40-mm TP/7 rds	Area	50
3. Engage a moving target from a stationary HMMWV (defense).	One moving flank truck, 600 to 800 meters.	40-mm TP/7 rds	Area	50
4. Engage multiple stationary targets from a stationary HMMWV (defense).	One stationary BRDM, 600 to 800 meters and dismounted troops, 800 to 1,000 meters.	40-mm TP/14 rds	Point Area	50
Target Requirements: 1 Stationary Frontal BRDM (for Zero) 1 Flank Truck 1 Frontal, BRDM 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)				
<b>TABLE VIB. CREW BASELINE TABLE (NIGHT) (MK 19)</b>				
			<b>Standards</b>	
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>
1. Engage a stationary target from a stationary HMMWV (defense).	RPG team, 300 to 500 meters.  Commander's engagement.	40-mm TP/7 rds	Area	60
2. Engage a stationary target from a stationary HMMWV (defense).	One stationary frontal truck, 600 to 800 meters.	40-mm TP/7 rds	Area	60
Target Requirements: 1 Frontal Truck 3 IRETS (RPG Team)				

Figure 12-53. Sample Crew Baseline Table (MK 19).

**TABLE VI (MK 19)  
ROLL-UP SHEET**

**BUMPER #** \_\_\_\_\_ **UNIT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**CREW:** TC \_\_\_\_\_ GNR \_\_\_\_\_ DVR \_\_\_\_\_

**DAY:** START \_\_\_\_\_ FINISH \_\_\_\_\_ **NIGHT:** START \_\_\_\_\_ FINISH \_\_\_\_\_

**TCE SIGNATURE (DAY)** \_\_\_\_\_

**TCE SIGNATURE (NIGHT)** \_\_\_\_\_

TASK	TOTAL TGTS	RDS FIRED	KILLS	MISSES	NE	PENALTY POINTS	SCORE	QUAL (Y/N)
A2								
A3								
A4								
<b>TOTALS</b>								
B1								
B2								
<b>TOTALS</b>								
<b>OVERALL</b>								
<b>TOTAL PENALTY POINTS</b>								
<b>TOTAL QUALIFIED ENGAGEMENTS</b>								

**UNQUALIFIED      QUALIFIED      SUPERIOR      DISTINGUISHED**

Figure 12-54. Sample Roll-up Sheet, Table VI (MK 19).

TABLE VIA, TASK 2 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary RPG team, 300 to 500 meters.</p> <p>Gunner's position. NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 100	Subtract (a - b = c) (c) _____
	8 100	Record number of targets killed (d) _____
	9 96	Divide (c ÷ d = e) for target time (e) _____
	10 92	
	11 88	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 83	(Circle One)
	13 79	<b>Target 1</b> (RPG Team) K M Points _____
	14 75	(add points for all targets) <b>Total Points</b> _____
	15 70	Divide <b>Total Points</b> _____ by
	16 67	<b>Total Targets Presented</b> _____ = _____
	17 64	Subtract crew cuts _____
	18 61	<b>Task Score</b> _____
	19 58	
	20 55	AUTOMATIC 0 POINTS
	21 52	<b>A</b>
	22 49	10-POINT CREW CUT
	23 46	<b>A</b>
	24 43	5-POINT CREW CUT
	25 40	<b>A B C</b>
	26 37	
	27 34	Remarks/Reason for crew cuts:
	28 31	_____
	29 28	_____
	30 25	_____
	31 22	_____
	32 19	
	33 16	
	34 13	
	35 10	
	36 7	
	37 4	
	38 1	
39 0		

Figure 12-55. Sample Scoresheet—Table VIA, Task 2 (Defense) (MK 19).

TABLE VIA, TASK 3 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a moving target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><i>Total Targets:</i> 1</p> <p><i>Target 1:</i> Moving flank truck, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	3. Defilade Time _____ Eng Time _____ Target # _____
	4	100	4. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	
	8	100	Record last target engagement time (a) _____
	9	100	Record defilade time (25 sec or less) (b) _____
	10	100	Subtract (a - b = c) (c) _____
	11	99	
	12	98	Record number of targets killed (d) _____
	13	96	Divide (c ÷ d = e) for target time (e) _____
	14	95	
	15	93	
	16	92	
	17	90	
	18	89	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	19	88	(Circle One)
	20	86	<b>Target 1</b> (Moving Truck) K M Points _____
	21	85	(add points for all targets) <b>Total Points</b> _____
	22	83	
	23	82	Divide <b>Total Points</b> _____ by
	24	80	<b>Total Targets Presented</b> _____ = _____
	25	79	Subtract crew cuts _____
	26	78	<b>Task Score</b> _____
	27	76	
	28	75	
	29	73	
	30	72	
	31	70	AUTOMATIC 0 POINTS
	32	68	<b>A</b>
	33	66	10-POINT CREW CUT
	34	64	<b>A</b>
	35	62	5-POINT CREW CUT
	36	60	<b>A B C</b>
	37	58	
	38	56	
	39	54	
	40	52	
	41	50	
	42	48	
	43	46	
	44	44	
	45	42	Remarks/Reason for crew cuts:
	46	40	_____
	47	38	_____
	48	36	_____
	49	34	_____
50	32	_____	

Figure 12-56. Sample Scoresheet—Table VIA, Task 3 (Defense) (MK 19).

TABLE VIA, TASK 4 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple stationary targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 14 rounds</p> <p><b>CONDITIONS</b></p> <p><i>Total Targets:</i> 2</p> <p><i>Target 1:</i> Stationary BRDM, 600 to 800 meters.</p> <p><i>Target 2:</i> Dismounted troops, 800 to 1,000 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____	
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____	
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____	
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____	
	4 100	<hr/>	
	5 100	Record last target engagement time (a) _____	
	6 100	Record defilade time (25 sec or less) (b) _____	
	7 100	Subtract (a - b = c) (c) _____	
	8 100	Record number of targets killed (d) _____	
	9 100	Divide (c ÷ d = e) for target time (e) _____	
	10 100	<hr/>	
	11 99	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).	
	12 97	(Circle One)	
	13 96	<b>Target 1</b> (Stationary BRDM) K M Points _____	
	14 94	<b>Target 2</b> (Dismounted Troops) K M Points _____	
	15 93	(add points for all targets) <b>Total Points</b> _____	
	16 91	Divide <b>Total Points</b> _____ by	
	17 90	<b>Total Targets Presented</b> _____ = _____	
	18 88	Subtract crew cuts _____	
	19 87	<b>Task Score</b> _____	
	20 85	<hr/>	
	21 84	AUTOMATIC 0 POINTS	
	22 82	Ⓐ	
	23 81	10-POINT CREW CUT	
	24 79	Ⓐ	
	25 78	5-POINT CREW CUT	
	26 76	Ⓐ Ⓑ Ⓒ	
	27 75	<hr/>	
	28 73	Remarks/Reason for crew cuts:	
	29 72	_____	
	30 70	_____	
	31 66	_____	
	32 62	_____	
	33 58	_____	
	34 54	_____	
	35 50	_____	
	36 46	_____	
	37 42	_____	
	38 38	_____	
	39 34	_____	
	40 30	_____	
	41 26	_____	
	42 22	_____	
	43 18	_____	
	44 14	_____	
	45 10	_____	
	46 6	_____	
	47 2	_____	
48 0	_____		

Figure 12-57. Sample Scoresheet—Table VIA, Task 4 (Defense) (MK 19).



TABLE VIB, TASK 1 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary RPG team, 300 to 500 meters. Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	
	4	100	3. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	4. Defilade Time _____ Eng Time _____ Target # _____
	7	95	
	8	90	Record last target engagement time (a) _____
	9	85	Record defilade time (25 sec or less) (b) _____
	10	80	Subtract (a - b = c) (c) _____
	11	75	Record number of targets killed (d) _____
	12	70	Divide (c ÷ d = e) for target time (e) _____
	13	66	
	14	62	
	15	58	
	16	54	
	17	50	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	46	(Circle One)
	19	42	<b>Target 1</b> (RPG Team) K M Points _____
	20	38	(add points for all targets) <b>Total Points</b> _____
	21	34	Divide <b>Total Points</b> _____ by
	22	30	<b>Total Targets Presented</b> _____ = _____
	23	26	Subtract crew cuts _____
	24	22	<b>Task Score</b> _____
	25	18	
	26	14	
	27	10	
	28	6	
	29	2	
30	0		

AUTOMATIC 0 POINTS

Ⓐ

10-POINT CREW CUT

Ⓐ

5-POINT CREW CUT

Ⓐ   Ⓑ   Ⓒ

---

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-58. Sample Scoresheet—Table VIB, Task 1 (Defense) (MK 19).

TABLE VIB, TASK 2 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><i>Total Targets:</i> 1</p> <p><i>Target 1:</i> Stationary frontal truck, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	Record last target engagement time (a) _____
	5 100	Record defilade time (25 sec or less) (b) _____
	6 100	Subtract (a - b = c) (c) _____
	7 100	Record number of targets killed (d) _____
	8 100	Divide (c ÷ d = e) for target time (e) _____
	9 99	<p><b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).</p> <p>(Circle One)</p> <p><b>Target 1</b> (Stationary Truck)      K      M      Points _____</p> <p>(add points for all targets)      <b>Total Points</b> _____</p> <p>Divide <b>Total Points</b> _____ by</p> <p><b>Total Targets Presented</b> _____ = _____</p> <p>Subtract crew cuts _____</p> <p><b>Task Score</b> _____</p>
	10 97	
	11 95	
	12 93	
	13 92	
	14 90	
	15 88	
	16 86	
	17 85	
	18 83	
	19 81	<p>AUTOMATIC 0 POINTS</p> <p><b>A</b></p> <p>10-POINT CREW CUT</p> <p><b>A</b></p> <p>5-POINT CREW CUT</p> <p><b>A      B      C</b></p>
	20 79	
	21 78	
	22 76	
	23 74	
	24 72	
	25 70	
	26 68	
	27 66	
	28 64	
	29 62	<p>Remarks/Reason for crew cuts:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
	30 60	
	31 58	
	32 56	
	33 54	
	34 52	
	35 50	
	36 48	
	37 46	
	38 44	
	39 42	
	40 40	
	41 38	
	42 36	
	43 34	
	44 32	
	45 30	
	46 28	
	47 26	
	48 24	
	49 22	
	50 20	
	51 18	
	52 16	
	53 14	
	54 12	
	55 10	
	56 8	
	57 6	
	58 4	
	59 2	
60 0		

Figure 12-59. Sample Scoresheet—Table VIB, Task 2 (Defense) (MK 19).

## MK 19 TABLE VII<sup>3/4</sup> CREW PRACTICE

Table VII tests the gunner and commander to make sure he can zero the MK 19, engage targets with speed and accuracy, and acquire and engage targets under NBC conditions, from a stationary and moving vehicle. These exercises are fired during the day and at night.

### SCORING PROCEDURE FOR TABLE VII

All tasks are scored. Refer to pages 12-8 and 12-9 for scoresheet scoring instructions. Within the allotted time per exercise, the gunner must obtain the minimum kills per target to pass each task. A crew duty penalty is subtracted for each crew error. There are three possible 5-point penalties, one 10-point penalty, and one automatic zero-point penalty for crew errors. A maximum crew duty penalty point deduction of 30 points can be assessed per engagement. Additional crew errors will not be deducted, they will be critiqued.

Crew duty penalty points are as follows:

- **A**—5 points—Improper fire command.
- **B**—5 points—Incorrect engagement techniques (for example, engaging a *least dangerous* target before a *most dangerous* target).
- **C**—5 points—Incorrect driving technique (anything the driver does that impedes the firing task).
- **A**—10 points—Firing before receiving the command to fire.
- **A**—Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 56 rounds of 40-mm TP:

- Table VIIA: 35 rounds of 40-mm TP.
- Table VIIB: 21 rounds of 40-mm TP.

**Notes.** Units with illumination assets may use them during the night portion of the table.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### CONDUCT OF FIRE

Using 40-mm TP ammunition, the gunner acquires and engages stationary and moving targets from a stationary and moving vehicle. Target arrays are placed at ranges between 300 meters and 1,000 meters.

- Tasks 1 through 3, Tables VIIA and B—Engage moving and stationary targets from a moving or stationary vehicle.

### ALLOWABLE VARIATIONS

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views.

<b>CREW PRACTICE TABLE (DAY) (MK 19 TABLE VIIA)</b>				
			<b>Standards</b>	
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>
1. Engage stationary targets from a stationary HMMWV (defense).	One stationary frontal BRDM, 300 to 500 meters and RPG team, 600 to 800 meters.	40-mm TP/14 rds	Point  Area	50
2. Engage a moving target from a moving HMMWV (offense).	One moving flank truck, 600 to 800 meters.	40-mm TP/7 rds	Area	50
3. Engage a stationary targets from a stationary HMMWV (defense).	One stationary frontal truck, 600 to 800 meters and dismounted troops, 800 to 1,000 meters. NBC environment.	40-mm TP/14 rds	Area  Area	50
Target Requirements: 1 Stationary Frontal BRDM 3 IRETS (RPG team) 1 Stationary Frontal Truck 1 Moving Flank Truck 7 IRETS (Dismounted Infantry)				
<b>TABLE VIIIB. CREW PRACTICE TABLE (NIGHT) (MK 19)</b>				
			<b>Standards</b>	
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Seconds)</b>
1. Engage a stationary target from a stationary HMMWV (defense).	Dismounted troops, 800 to 1,000 meters. NBC environment.	40-mm TP/7 rds	Area	60
2. Engage a stationary target from a stationary HMMWV (defense).	One stationary BRDM, 600 to 800 meters.  Commander's engagement (swing).	40-mm TP/7 rds	Point	60
3. Engage a stationary target from a moving HMMWV (defense).	One RPG team, 300 to 500 meters.	40-mm TP/7 rds	Area	60
Target Requirements: 1 Stationary Frontal BRDM 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)				

Figure 12-60. Sample Crew Practice Table (MK 19).

**TABLE VII (MK 19)  
ROLL-UP SHEET**

**BUMPER #** \_\_\_\_\_ **UNIT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**CREW:** TC \_\_\_\_\_ GNR \_\_\_\_\_ DVR \_\_\_\_\_

**DAY:** START \_\_\_\_\_ FINISH \_\_\_\_\_ **NIGHT:** START \_\_\_\_\_ FINISH \_\_\_\_\_

**TCE SIGNATURE (DAY)** \_\_\_\_\_

**TCE SIGNATURE (NIGHT)** \_\_\_\_\_

TASK	TOTAL TGTS	RDS FIRED	KILLS	MISSES	NE	PENALTY POINTS	SCORE	QUAL (Y/N)
A1								
A2								
A3								
<b>TOTALS</b>								
B1								
B2								
B3								
<b>TOTALS</b>								
<b>OVERALL</b>								
<b>TOTAL PENALTY POINTS</b>								
<b>TOTAL QUALIFIED ENGAGEMENTS</b>								

UNQUALIFIED      QUALIFIED      SUPERIOR      DISTINGUISHED

Figure 12-61. Sample Roll-up Sheet, Table VII (MK 19).

TABLE VIIA, TASK 1 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage stationary targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 14 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Stationary BRDM, 300 to 500 meters.</p> <p><b>Target 2:</b> RPG team, 600 to 800 meters. Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	Record last target engagement time (a) _____
	5 100	Record defilade time (25 sec or less) (b) _____
	6 100	Subtract (a - b = c) (c) _____
	7 100	Record number of targets killed (d) _____
	8 100	Divide (c ÷ d = e) for target time (e) _____
	9 100	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	10 100	(Circle One)
	11 99	<b>Target 1</b> (Stationary BRDM) K M Points _____
	12 97	<b>Target 2</b> (RPG Team) K M Points _____
	13 96	(add points for all targets) <b>Total Points</b> _____
	14 94	Divide <b>Total Points</b> _____ by
	15 93	<b>Total Targets Presented</b> _____ = _____
	16 91	Subtract crew cuts _____
	17 89	<b>Task Score</b> _____
	18 88	AUTOMATIC 0 POINTS
	19 86	Ⓐ
	20 85	10-POINT CREW CUT
	21 83	Ⓐ
	22 82	5-POINT CREW CUT
	23 80	Ⓐ Ⓑ Ⓒ
	24 78	Remarks/Reason for crew cuts:
	25 77	_____
	26 75	_____
	27 74	_____
	28 72	_____
	29 70	
	30 66	
	31 62	
	32 58	
	33 54	
	34 50	
	35 46	
	36 42	
	37 38	
	38 34	
	39 30	
	40 26	
	41 22	
	42 18	
	43 14	
	44 10	
	45 6	
	46 2	
47 0		

Figure 12-62. Sample Scoresheet—Table VIIA, Task 1 (Defense) (MK 19).

TABLE VIIA, TASK 2 (OFFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a moving target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Moving flank truck, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	Record last target engagement time (a) _____
	8	100	Record number of targets killed (b) _____
	9	100	Divide (a ÷ b = c) for target time (c) _____
	10	100	
	11	100	
	12	100	
	13	100	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	100	(Circle One)
	15	99	<b>Target 1</b> (Moving Truck) K M Points _____
	16	98	(add points for all targets) <b>Total Points</b> _____
	17	97	
	18	95	Divide <b>Total Points</b> _____ by
	19	94	<b>Total Targets Presented</b> _____ = _____
	20	93	
	21	92	Subtract crew cuts _____
	22	90	<b>Task Score</b> _____
	23	89	
	24	88	
	25	87	
	26	85	
	27	84	
	28	83	
	29	82	AUTOMATIC 0 POINTS
	30	80	A
	31	79	10-POINT CREW CUT
	32	78	A
	33	77	5-POINT CREW CUT
	34	75	A B C
	35	74	
	36	73	
	37	72	
	38	70	
	39	68	
	40	66	
	41	64	Remarks/Reason for crew cuts:
	42	62	_____
	43	60	_____
	44	58	_____
	45	56	_____
	46	54	_____
	47	52	_____
	48	50	_____
	49	48	
50	46		

Figure 12-63. Sample Scoresheet—Table VIIA, Task 2 (Offense) (MK 19).

TABLE VIIA, TASK 3 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage multiple stationary targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 14 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> Stationary truck, 600 to 800 meters.</p> <p><b>Target 2:</b> Dismounted troops, 800 to 1,000 meters.</p> <p>Gunner's position. NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	Record last target engagement time (a) _____
	5 100	Record defilade time (25 sec or less) (b) _____
	6 100	Subtract (a - b = c) (c) _____
	7 100	Record number of targets killed (d) _____
	8 100	Divide (c ÷ d = e) for target time (e) _____
	9 100	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	10 100	(Circle One)
	11 100	<b>Target 1</b> (Stationary Truck) K M Points _____
	12 99	<b>Target 2</b> (Dismounted Troops) K M Points _____
	13 97	(add points for all targets) <b>Total Points</b> _____
	14 96	Divide <b>Total Points</b> _____ by
	15 94	<b>Total Targets Presented</b> _____ = _____
	16 93	Subtract crew cuts _____
	17 91	<b>Task Score</b> _____
	18 89	AUTOMATIC 0 POINTS
	19 88	Ⓐ
	20 86	10-POINT CREW CUT
	21 85	Ⓐ
	22 83	5-POINT CREW CUT
	23 82	Ⓐ Ⓑ Ⓒ
	24 80	Remarks/Reason for crew cuts:
	25 78	_____
	26 77	_____
	27 75	_____
	28 74	_____
	29 72	_____
	30 70	_____
	31 67	_____
	32 64	_____
	33 61	_____
	34 58	_____
	35 55	_____
	36 52	_____
	37 49	_____
	38 46	_____
	39 43	_____
	40 40	_____
	41 37	_____
	42 34	_____
	43 31	_____
	44 28	_____
	45 25	_____
	46 22	_____
	47 19	_____
	48 16	_____
	49 13	_____
50 10	_____	

Figure 12-64. Sample Scoresheet—Table VIIA, Task 3 (Defense) (MK 19).



TABLE VIIB, TASK 1 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Dismounted troops, 800 to 1,000 meters.</p> <p>Gunner's position. NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	3. Defilade Time _____ Eng Time _____ Target # _____
	4	100	4. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	
	8	100	Record last target engagement time (a) _____
	9	100	Record defilade time (25 sec or less) (b) _____
	10	100	Subtract (a - b = c) (c) _____
	11	100	Record number of targets killed (d) _____
	12	99	Divide (c ÷ d = e) for target time (e) _____
	13	97	
	14	95	
	15	94	
	16	92	
	17	90	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	89	(Circle One)
	19	87	<b>Target 1</b> (Dismounted Troops) K M Points _____
	20	85	(add points for all targets) <b>Total Points</b> _____
	21	84	
	22	82	Divide <b>Total Points</b> _____ by
	23	80	<b>Total Targets Presented</b> _____ = _____
	24	79	Subtract crew cuts _____
	25	77	<b>Task Score</b> _____
	26	75	
	27	74	
	28	72	
	29	70	
	30	67	
	31	64	
	32	61	
	33	58	
	34	55	
	35	52	
	36	49	
	37	46	
	38	43	
	39	40	
	40	37	
	41	34	
	42	31	
	43	28	
	44	25	
	45	22	
	46	19	
	47	16	
	48	13	
	49	10	
	50	7	
	51	4	
	52	1	
53	0		

Figure 12-65. Sample Scoresheet—Table VIIB, Task 1 (Defense) (MK 19).

TABLE VIIB, TASK 2 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	3. Defilade Time _____ Eng Time _____ Target # _____
	4	100	4. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	
	8	100	Record last target engagement time (a) _____
	9	100	Record defilade time (25 sec or less) (b) _____
	10	100	Subtract (a - b = c) (c) _____
	11	100	Record number of targets killed (d) _____
	12	99	Divide (c ÷ d = e) for target time (e) _____
	13	98	
	14	97	
	15	96	
	16	94	
	17	93	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	92	(Circle One)
	19	91	<b>Target 1</b> (Stationary BRDM) K M Points _____
	20	90	(add points for all targets) <b>Total Points</b> _____
	21	88	
	22	87	Divide <b>Total Points</b> _____ by
	23	86	<b>Total Targets Presented</b> _____ = _____
	24	85	Subtract crew cuts _____
	25	84	<b>Task Score</b> _____
	26	82	
	27	81	
	28	80	
	29	79	
	30	78	
	31	76	AUTOMATIC 0 POINTS
	32	75	<b>A</b>
	33	74	
	34	73	10-POINT CREW CUT
	35	72	<b>A</b>
	36	70	
	37	66	5-POINT CREW CUT
	38	62	<b>A B C</b>
	39	58	
	40	54	
	41	50	
	42	46	
	43	42	
	44	38	
	45	34	Remarks/Reason for crew cuts:
	46	30	_____
	47	26	_____
	48	22	_____
	49	18	_____
	50	14	_____
	51	10	_____
	52	6	_____
	53	2	_____
54	0	_____	

Figure 12-66. Sample Scoresheet—Table VIIB, Task 2 (Defense) (MK 19).

TABLE VIIB, TASK 3 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary RPG team, 300 to 500 meters. Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	
	4	100	3. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	4. Defilade Time _____ Eng Time _____ Target # _____
	7	100	
	8	100	Record last target engagement time (a) _____
	9	100	Record defilade time (25 sec or less) (b) _____
	10	95	
	11	90	Subtract (a - b = c) (c) _____
	12	85	
	13	80	Record number of targets killed (d) _____
	14	75	
	15	70	Divide (c ÷ d = e) for target time (e) _____
	16	66	
	17	62	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	58	(Circle One)
	19	54	<b>Target 1</b> (RPG Team) K M Points _____
	20	50	(add points for all targets) <b>Total Points</b> _____
	21	46	
	22	42	Divide <b>Total Points</b> _____ by
	23	38	<b>Total Targets Presented</b> _____ = _____
	24	34	Subtract crew cuts _____
	25	30	<b>Task Score</b> _____
	26	26	
	27	22	
	28	18	
	29	14	
	30	10	
	31	6	
	32	2	
33	0		

Figure 12-67. Sample Scoresheet—Table VIIB, Task 3 (Defense) (MK 19).

## MK 19 TABLE VIII<sup>3/4</sup> CREW QUALIFICATION

Table VIII is a marksmanship, single-vehicle qualification table. This table tests the crew's ability to zero a MK 19 grenade machine gun, and employ direct fire to acquire and engage stationary and moving, area and point targets during various firing conditions. These tables are fired during the day and at night. This is not a tactical table; however, normal combat-oriented procedures, such as reporting, should be used. Some tasks are conducted in an NBC environment.

Truck crews must have qualified on the GST within the previous three months. The crew must fire Table VIIIA and B for qualification. As a minimum, the crew must achieve 420 points, and score at least 70 points on 6 of the 8 graded tasks to achieve a qualified rating. At least one task must be in an NBC environment.

### SCORING PROCEDURE FOR TABLE VIII

All tasks are scored. Refer to pages 12-8 and 12-9 for scoresheet scoring instructions. Within the allotted time per exercise, the gunner must obtain the minimum kills per target to pass each task. A crew duty penalty is subtracted for each crew error; there are three possible 5-point penalties, one 10-point penalty, and one automatic zero-point penalty for crew errors. A maximum crew duty penalty point deduction of 30 points can be assessed per engagement. Additional crew errors will not be deducted, they will be critiqued.

Crew duty penalty points are as follows:

- **A**—5 points—Improper fire command.
- **B**—5 points—Incorrect engagement techniques (for example, engaging a *least dangerous* target before a *most dangerous* target).
- **C**—5 points—Incorrect driving technique (anything the driver does that impedes the firing task).
- **A**—10 points—Firing before receiving the command to fire.
- **A**—Automatic 0 points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

Crew ratings are determined using the following conditions:

- Distinguished: Combined score of at least 674 points on Tables VIIIA and B, and 6 of 8 tasks must have at least 70 points.
- Superior: Combined score of 547 to 673 points on Tables VIIIA and B, and 6 of 8 tasks must have at least 70 points.
- Qualified: Combined score of 420 to 546 points on Tables VIIIA and B, and 6 of 8 tasks must have at least 70 points.
- Unqualified: Combined score of 419 points or less on Tables VIIIA and B, or 3 of 8 tasks have 69 points or less.

### AMMUNITION ISSUE

The ammunition for this exercise will be broken down at the ammunition point. The total ammunition for this exercise is 63 rounds of 40-mm TP:

- Table VIIIA: 35 rounds of 40-mm TP.
- Table VIIIB: 28 rounds of 40-mm TP.

**Notes.** Units with illumination assets may use them during the night portion of the table.

Ammunition saved during live-fire engagements may be used on later engagements, but may not be carried forward to another table.

### **CONDUCT OF FIRE**

Using 40-mm TP ammunition, the gunner acquires and engages stationary and moving targets from a stationary and moving vehicle. Target arrays are placed at ranges between 300 meters and 1,000 meters.

- Tasks 1 through 4, Tables VIIIA and B—Engage moving and stationary targets from a moving or stationary vehicle.

### **ALLOWABLE VARIATIONS**

The commander may swing night tasks to the day if he does not have adequate night vision devices to sense rounds.

The commander may change the sequence of the tasks and the positioning of stationary PC targets from frontal to flank views.

<b>TABLE VIIIA. CREW QUALIFICATION TABLE (DAY) (MK 19)</b>				
			<b>Standards</b>	
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Sec)</b>
1. Engage a stationary target from a stationary HMMWV (defense).	One RPG team, 600 to 800 meters.	40-mm TP/7 rds	Area	50
2. Engage a moving target from a stationary HMMWV (defense).	One moving flank truck, 400 to 600 meters.	40-mm TP/7 rds	Area	50
3. Engage a stationary target from a moving HMMWV (offense).	Dismounted troops, 300 to 500 meters. NBC environment.	40-mm TP/7 rds	Area	50
4. Engage stationary targets from a stationary HMMWV (defense).	One RPG team, 600 to 800 meters and one stationary BRDM, 600 to 800 meters.	40-mm TP/14 rds	Area Point	50
Target Requirements: 1 Stationary Frontal BRDM 2 sets 3 IRETS (RPG Team) 1 Stationary Frontal Truck 1 Moving Flank Truck 7 IRETS (dismounted infantry)				
<b>TABLE VIIIB. CREW QUALIFICATION TABLE (NIGHT) (MK 19)</b>				
			<b>Standards</b>	
<b>Task</b>	<b>Conditions/ Target/Situation</b>	<b>Ammo/ Rds</b>	<b>Eng Tech</b>	<b>Time (Sec)</b>
1. Engage a stationary target from a stationary HMMWV (defense) (swing task).	One stationary frontal BRDM, 600 to 800 meters.  Commander's engagement.	40-mm TP/7 rds	Point	60
2. Engage a stationary target from a moving HMMWV (offense).	One stationary frontal truck, 600 to 800 meters.	40-mm TP/7 rds	Area	60
3. Engage a stationary target from a stationary HMMWV (defense).	One RPG team, 300 to 500 meters. NBC environment.	40-mm TP/7 rds	Area	60
4. Engage a stationary target from a stationary HMMWV (defense).	Dismounted troops, 600 to 800 meters.	40-mm TP/7 rds	Area	60
Target Requirements: 1 Stationary Frontal BRDM 1 Stationary frontal Truck 3 IRETS (RPG Team) 7 IRETS (Dismounted Infantry)				

Figure 12-68. Sample Crew Qualification Table (MK 19).

**TABLE VIII (MK 19)  
ROLL-UP SHEET**

**BUMPER #** \_\_\_\_\_ **UNIT** \_\_\_\_\_ **DATE** \_\_\_\_\_

**CREW:** TC \_\_\_\_\_ GNR \_\_\_\_\_ DVR \_\_\_\_\_

**DAY:** START \_\_\_\_\_ FINISH \_\_\_\_\_ **NIGHT:** START \_\_\_\_\_ FINISH \_\_\_\_\_

**TCE SIGNATURE (DAY)** \_\_\_\_\_

**TCE SIGNATURE (NIGHT)** \_\_\_\_\_

TASK	TOTAL TGTS	RDS FIRED	KILLS	MISSES	NE	PENALTY POINTS	SCORE	QUAL (Y/N)
A1								
A2								
A3								
A4								
<b>TOTALS</b>								
B1								
B2								
B3								
B4								
<b>TOTALS</b>								
<b>OVERALL</b>								
<b>TOTAL PENALTY POINTS</b>								
<b>TOTAL QUALIFIED ENGAGEMENTS</b>								

UNQUALIFIED      QUALIFIED      SUPERIOR      DISTINGUISHED

Figure 12-69. Sample Roll-up Sheet, Table VIII (MK 19).

TABLE VIII A, TASK 1 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><i>Total Targets:</i> 1</p> <p><i>Target 1:</i> RPG team, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	Record last target engagement time (a) _____
	5 100	Record defilade time (25 sec or less) (b) _____
	6 100	Subtract (a - b = c) (c) _____
	7 100	Record number of targets killed (d) _____
	8 100	Divide (c ÷ d = e) for target time (e) _____
	9 98	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	10 96	(Circle One)
	11 94	<b>Target 1</b> (RPG Team) K M Points _____
	12 91	(add points for all targets) <b>Total Points</b> _____
	13 89	Divide <b>Total Points</b> _____ by
	14 87	<b>Total Targets Presented</b> _____ = _____
	15 84	Subtract crew cuts _____
	16 82	<b>Task Score</b> _____
	17 80	AUTOMATIC 0 POINTS
	18 77	<b>A</b>
	19 75	10-POINT CREW CUT
	20 73	<b>A</b>
	21 70	5-POINT CREW CUT
	22 66	<b>A B C</b>
	23 62	Remarks/Reason for crew cuts:
	24 58	_____
	25 54	_____
	26 50	_____
	27 46	_____
	28 42	
	29 38	
	30 34	
	31 30	
	32 26	
	33 22	
	34 18	
	35 14	
	36 10	
	37 6	
	38 2	
39 0		

Figure 12-70. Sample Scoresheet—Table VIII A, Task 1 (Defense) (MK 19).



TABLE VIIIA, TASK 2 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<b>TASK</b>	Time/Points	
	1	100
Engage a moving target from a stationary HMMWV.	2	100
	3	100
	4	100
	5	100
	6	100
	7	100
	8	100
<b>AMMUNITION</b>	9	100
	10	100
40-mm TP: 7 rounds	11	99
	12	98
	13	96
<b>CONDITIONS</b>	14	95
	15	93
<b>Total Targets:</b>	16	92
	17	90
<b>Target 1:</b>	18	89
	19	88
Moving flank truck, 400 to 600 meters.	20	86
	21	85
	22	83
	23	82
Gunner's position.	24	80
	25	79
	26	78
<b>EXPOSURE TIME</b>	27	76
	28	75
50 seconds.	29	73
	30	72
	31	70
<b>STANDARDS</b>	32	68
	33	66
Must score at least 70 points to qualify engagement.	34	64
	35	62
	36	60
	37	58
	38	56
	39	54
	40	52
	41	50
	42	48
	43	46
	44	44
	45	42
	46	40
	47	38
	48	36
	49	34
	50	32

1. Defilade Time \_\_\_\_\_ Eng Time \_\_\_\_\_ Target # \_\_\_\_\_

2. Defilade Time \_\_\_\_\_ Eng Time \_\_\_\_\_ Target # \_\_\_\_\_

3. Defilade Time \_\_\_\_\_ Eng Time \_\_\_\_\_ Target # \_\_\_\_\_

4. Defilade Time \_\_\_\_\_ Eng Time \_\_\_\_\_ Target # \_\_\_\_\_

---

Record last target engagement time (a) \_\_\_\_\_

Record defilade time (25 sec or less) (b) \_\_\_\_\_

Subtract (a - b = c) (c) \_\_\_\_\_

Record number of targets killed (d) \_\_\_\_\_

Divide (c ÷ d = e) for target time (e) \_\_\_\_\_

---

**Note.** Use result from (e) and read down "time" column to get points for each kill (misses = 0).

(Circle One)

Target 1 (Moving Truck)      K    M    Points    \_\_\_\_\_

(add points for all targets) **Total Points**    \_\_\_\_\_

Divide **Total Points** \_\_\_\_\_ by

**Total Targets Presented** \_\_\_\_\_ = \_\_\_\_\_

Subtract crew cuts    \_\_\_\_\_

**Task Score**    \_\_\_\_\_

---

AUTOMATIC 0 POINTS

● A

10-POINT CREW CUT

● A

5-POINT CREW CUT

● A    ● B    ● C

---

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-71. Sample Scoresheet—Table VIIIA, Task 2 (Defense) (MK 19).

TABLE VIII A, TASK 3 (OFFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Dismounted troops, 300 to 500 meters.</p> <p>Gunner's position. NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Eng Time _____ Target # _____
	1 100	2. Eng Time _____ Target # _____
	2 100	3. Eng Time _____ Target # _____
	3 100	4. Eng Time _____ Target # _____
	4 100	Record last target engagement time (a) _____
	5 100	Record number of targets killed (b) _____
	6 100	Divide (a ÷ b = c) for target time (c) _____
	7 100	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	8 100	(Circle One)
	9 100	<b>Target 1</b> (Dismounted Troops) K M Points _____
	10 100	(add points for all targets) <b>Total Points</b> _____
	11 100	Divide <b>Total Points</b> _____ by
	12 97	<b>Total Targets Presented</b> _____ = _____
	13 93	Subtract crew cuts _____
	14 89	<b>Task Score</b> _____
	15 85	AUTOMATIC 0 POINTS
	16 82	<b>A</b>
	17 78	10-POINT CREW CUT
	18 74	<b>A</b>
	19 70	5-POINT CREW CUT
	20 67	<b>A B C</b>
	21 64	Remarks/Reason for crew cuts:
	22 61	_____
	23 58	_____
	24 55	_____
	25 52	_____
	26 49	_____
	27 46	
	28 43	
	29 40	
	30 37	
	31 34	
	32 31	
	33 28	
	34 25	
	35 22	
	36 19	
	37 16	
	38 13	
	39 10	
	40 7	
	41 4	
	42 1	
43 0		

Figure 12-72. Sample Scoresheet—Table VIII A, Task 3 (Offense) (MK 19).

TABLE VIIIA, TASK 4 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage stationary and moving targets from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 14 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 2</p> <p><b>Target 1:</b> RPG team, 600 to 800 meters.</p> <p><b>Target 2:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>50 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 100	Subtract (a - b = c) (c) _____
	8 100	Record number of targets killed (d) _____
	9 100	Divide (c ÷ d = e) for target time (e) _____
	10 100	
	11 99	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 97	(Circle One)
	13 96	<b>Target 1</b> (RPG Team) K M Points _____
	14 94	<b>Target 2</b> (Stationary BRDM) K M Points _____
	15 93	(add points for all targets) <b>Total Points</b> _____
	16 91	Divide <b>Total Points</b> _____ by
	17 89	<b>Total Targets Presented</b> _____ = _____
	18 88	Subtract crew cuts _____
	19 86	<b>Task Score</b> _____
	20 85	
	21 83	AUTOMATIC 0 POINTS
	22 82	<b>A</b>
	23 80	10-POINT CREW CUT
	24 78	<b>A</b>
	25 77	5-POINT CREW CUT
	26 75	<b>A B C</b>
	27 74	
	28 72	Remarks/Reason for crew cuts:
	29 70	_____
	30 67	_____
	31 64	_____
	32 61	_____
	33 58	
	34 55	
	35 52	
	36 49	
	37 46	
	38 43	
	39 40	
	40 37	
	41 34	
	42 31	
	43 28	
	44 25	
	45 22	
	46 19	
	47 16	
	48 13	
	49 10	
50 7		

Figure 12-73. Sample Scoresheet—Table VIIIA, Task 4 (Defense) (MK 19).

TABLE VIII B, TASK 1 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal BRDM, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 100	Subtract (a - b = c) (c) _____
	8 100	Record number of targets killed (d) _____
	9 100	Divide (c ÷ d = e) for target time (e) _____
	10 100	
	11 100	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 99	(Circle One)
	13 98	<b>Target 1</b> (Stationary BRDM) K M Points _____
	14 97	(add points for all targets) <b>Total Points</b> _____
	15 96	Divide <b>Total Points</b> _____ by
	16 94	<b>Total Targets Presented</b> _____ = _____
	17 93	Subtract crew cuts _____
	18 92	<b>Task Score</b> _____
	19 91	
	20 90	AUTOMATIC 0 POINTS
	21 88	<b>A</b>
	22 87	10-POINT CREW CUT
	23 86	<b>A</b>
	24 85	5-POINT CREW CUT
	25 84	<b>A B C</b>
	26 82	
	27 81	
	28 80	
	29 79	
	30 78	
	31 76	
	32 75	
	33 74	
	34 73	
	35 72	
	36 70	
	37 66	
	38 62	
	39 58	
	40 54	
	41 50	
	42 46	
	43 42	
	44 38	
	45 34	
	46 30	Remarks/Reason for crew cuts:
	47 26	_____
	48 22	_____
	49 18	_____
	50 14	_____
	51 10	_____
	52 6	_____
	53 2	_____
54 0	_____	

Figure 12-74. Sample Scoresheet—Table VIII B, Task 1 (Defense) (MK 19).

TABLE VIIIB, TASK 2 (OFFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a moving HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Stationary frontal truck, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Eng Time _____ Target # _____
	2	100	2. Eng Time _____ Target # _____
	3	100	3. Eng Time _____ Target # _____
	4	100	4. Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	Record last target engagement time (a) _____
	8	100	Record number of targets killed (b) _____
	9	100	Divide (a ÷ b = c) for target time (c) _____
	10	100	
	11	100	
	12	99	
	13	97	<b>Note.</b> Use result from (c) and read down "time" column to get points for each kill (misses = 0).
	14	96	(Circle One)
	15	94	<b>Target 1</b> (Stationary Truck) K M Points _____
	16	93	(add points for all targets) <b>Total Points</b> _____
	17	91	Divide <b>Total Points</b> _____ by
	18	89	<b>Total Targets Presented</b> _____ = _____
	19	88	Subtract crew cuts _____
	20	86	<b>Task Score</b> _____
	21	85	
	22	83	
	23	82	
	24	80	
	25	78	
	26	77	
	27	75	
	28	74	AUTOMATIC 0 POINTS
	29	72	<b>A</b>
	30	70	10-POINT CREW CUT
	31	68	<b>A</b>
	32	66	5-POINT CREW CUT
	33	64	<b>A B C</b>
	34	62	
	35	60	
	36	58	
	37	56	
	38	54	
	39	52	
	40	50	Remarks/Reason for crew cuts:
	41	48	_____
	42	46	_____
	43	44	_____
	44	42	_____
	45	40	_____
	46	38	_____
	47	36	_____
	48	34	_____
	49	32	_____
	50	30	_____
	51	28	_____
	52	26	_____
	53	24	_____
	54	22	_____
	55	20	_____
	56	18	_____
	57	16	_____
	58	14	_____
	59	12	_____
60	10	_____	

Figure 12-75. Sample Scoresheet—Table VIIIB, Task 2 (Offense) (MK 19).

TABLE VIII B, TASK 3 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> RPG team, 300 to 500 meters.</p> <p>Gunner's position. NBC environment.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points	1. Defilade Time _____ Eng Time _____ Target # _____
	1 100	2. Defilade Time _____ Eng Time _____ Target # _____
	2 100	3. Defilade Time _____ Eng Time _____ Target # _____
	3 100	4. Defilade Time _____ Eng Time _____ Target # _____
	4 100	
	5 100	Record last target engagement time (a) _____
	6 100	Record defilade time (25 sec or less) (b) _____
	7 100	Subtract (a - b = c) (c) _____
	8 100	Record number of targets killed (d) _____
	9 96	Divide (c ÷ d = e) for target time (e) _____
	10 92	
	11 88	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	12 83	(Circle One)
	13 79	<b>Target 1</b> (RPG Team) K M Points _____
	14 75	(add points for all targets) <b>Total Points</b> _____
	15 70	Divide <b>Total Points</b> _____ by
	16 67	<b>Total Targets Presented</b> _____ = _____
	17 64	Subtract crew cuts _____
	18 61	<b>Task Score</b> _____
	19 58	
	20 55	AUTOMATIC 0 POINTS
	21 52	<b>A</b>
	22 49	10-POINT CREW CUT
	23 46	<b>A</b>
	24 43	5-POINT CREW CUT
	25 40	<b>A B C</b>
	26 37	
	27 34	Remarks/Reason for crew cuts:
	28 31	_____
	29 28	_____
	30 25	_____
	31 22	_____
	32 19	
	33 16	
	34 13	
	35 10	
	36 7	
	37 4	
	38 1	
39 0		

Figure 12-76. Sample Scoresheet—Table VIII B, Task 3 (Defense) (MK 19).

TABLE VIII B, TASK 4 (DEFENSE), MK 19

Unit/Bumper Number \_\_\_\_\_

<p><b>TASK</b></p> <p>Engage a stationary target from a stationary HMMWV.</p> <p><b>AMMUNITION</b></p> <p>40-mm TP: 7 rounds</p> <p><b>CONDITIONS</b></p> <p><b>Total Targets:</b> 1</p> <p><b>Target 1:</b> Dismounted troops, 600 to 800 meters.</p> <p>Gunner's position.</p> <p><b>EXPOSURE TIME</b></p> <p>60 seconds.</p> <p><b>STANDARDS</b></p> <p>Must score at least 70 points to qualify engagement.</p>	Time/Points		
	1	100	1. Defilade Time _____ Eng Time _____ Target # _____
	2	100	2. Defilade Time _____ Eng Time _____ Target # _____
	3	100	3. Defilade Time _____ Eng Time _____ Target # _____
	4	100	4. Defilade Time _____ Eng Time _____ Target # _____
	5	100	
	6	100	
	7	100	
	8	100	Record last target engagement time (a) _____
	9	98	Record defilade time (25 sec or less) (b) _____
	10	96	Subtract (a - b = c) (c) _____
	11	94	Record number of targets killed (d) _____
	12	91	Divide (c ÷ d = e) for target time (e) _____
	13	89	
	14	87	
	15	84	
	16	82	
	17	80	<b>Note.</b> Use result from (e) and read down "time" column to get points for each kill (misses = 0).
	18	77	(Circle One)
	19	75	<b>Target 1</b> (Dismounted Troops) K M Points _____
	20	73	(add points for all targets) <b>Total Points</b> _____
	21	70	
	22	66	Divide <b>Total Points</b> _____ by
	23	62	<b>Total Targets Presented</b> _____ = _____
	24	58	Subtract crew cuts _____
	25	54	<b>Task Score</b> _____
	26	50	
	27	46	
	28	42	
	29	38	
	30	34	
	31	30	
	32	26	AUTOMATIC 0 POINTS
	33	22	<b>A</b>
	34	18	10-POINT CREW CUT
	35	14	<b>A</b>
	36	10	5-POINT CREW CUT
	37	6	<b>A B C</b>
	38	2	
39	0		

Remarks/Reason for crew cuts:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 12-77. Sample Scoresheet—Table VIII B, Task 4 (Defense) (MK 19).

## TOW Basic and Intermediate Tables

### TOW TABLES I AND II

Tables I and II train the basic TOW gunnery skills. Table I (Individual Gunnery Practice) prepares the gunner for Table II (Individual Gunnery Qualification). These tables should be conducted using the TOW GT. The trainer must construct a planned group of basic skill exercises. (See TM 9-6920-452-10 for a complete list of exercises on the TOW GT.)

When the TOW GT is ready for operation, the planned group has been constructed, and the gunner has been briefed and is in place, the trainer will begin the first mission. At the beginning of each mission, the trainer will give the gunner a fire command, and tell him to fire when ready. The trainer does not coach the gunner in any way during the mission; the gunner must make a determination of when to fire and at which target. After each mission, the trainer will give the gunner the results, then proceed to the next mission.

**Notes.** The trainer can either thoroughly debrief the gunner on his performance at the end of each mission, or save all ten missions and review them after the table is complete. The trainer must remember that the TOW GT will save a maximum of 20 missions at one time.

Units that do not have the TOW GT may conduct Tables I and II using the M70-series training set, M80 blast simulators, and a target vehicle equipped with an M70 target board.

### SCORING PROCEDURE FOR TABLES I AND II

The gunner must fire at least two 10-shot events for each table. The trainer will record the results from each mission on DA Form 5107-R. To qualify on a table and progress to the next table, the gunner must receive a minimum of 55-points using tripod-mounted systems or 600 points using vehicle-mounted systems, for one 10-shot event. If the gunner does not obtain the minimum score on a table, he should refire that table before progressing to the next table.

### TOW TABLES III AND IV

Table III (Advanced Gunnery Practice) prepares the gunner for Table IV (Advanced Gunnery Qualification). The trainer must construct a planned group, consisting of a series of missions that train and test the gunner's ability to track and kill targets and perform the advanced gunnery skill. (See TM 9-6920-452-10 for a complete list of exercises on the TOW GT.) Only the assigned gunners in each squad are required to verify on Tables III and IV. Other members of the squad may perform the tables, if time permits.

Along with basic gunnery skills, Tables III and IV train the following advanced gunnery skills:

- Determine if a target can be engaged with the TOW.
- Identify targets (identify friend, foe, or neutral [IFFN]).
- Prioritize targets.
- Determine the correct fire control method.
- Engage targets that are evasive, obscured, hard to track, or at extreme ranges.

Tables III and IV must be conducted using the TOW GT; units that do not have the TOW GT cannot conduct Tables III and IV. The sequence of missions in each 10-shot



event should be changed continuously to prevent the gunner from becoming familiar with them.

The trainer constructs the planned group according to TM 9-6920-452-10. Before each mission, the trainer must present the gunner with a fire command that clearly states what the gunner must do. Some missions (determine if a target may be engaged by TOW, engage evasive or obscured targets, and identify targets) may not require specific fire commands; the trainer need only give general instructions such as "GUNNER—TARGETS TO YOUR FRONT—FIRE WHEN READY." Other missions (prioritize targets, for example, tanks as higher priority than APCs), the trainer gives the command "GUNNER—TARGETS TO YOUR FRONT—ENGAGE TANKS FIRST—FIRE WHEN READY."

### SCORING PROCEDURE FOR TABLES III AND IV

Tables III and IV are scored in the same manner as Tables I and II, except for target identification missions. If the gunner correctly identifies a target as friendly and does not fire on it, he receives 100 points. If he fires on a friendly target, he receives zero points whether he kills the target or not.

For each table, the gunner must fire at least two 10-shot events. The trainer must not only observe and record the gunner's tracking performance, but he must brief, observe, and score the particular advanced gunnery task presented in each mission. To progress to the next table, the gunner must achieve a GO on at least 6 of 10 missions and receive a minimum of 550 points using tripod-mounted systems or 600 points using vehicle-mounted systems, for one 10-shot event. If the gunner fails to meet the minimum qualification standards, he must retrain on Table III before firing Table IV. The trainer will record the gunner's performance on DA Form 5107-R.

On Table IV, the total tracking score (add scores from all ten missions) determines the gunner's classification as follows:

- Expert: 750 to 1,000 (tripod) or 800 to 1,000 (vehicle).
- First Class: 650 to 749 (tripod) or 700 to 799 (vehicle).
- Second Class: 550 to 649 (tripod) or 600 to 699 (vehicle).
- Unqualified: 0 to 549 (tripod) or 0 to 599 (vehicle).

The requirements for a mission to be scored as GO vary according to the advanced gunnery task that is presented in each mission. A successful mission is defined as follows:

- The gunner successfully engages (destroys) the correct target, as determined by the trainer's instructions for that particular mission.
  - In a mission, to determine if a target can be engaged with a TOW, a hit on any target presented that can be destroyed by TOW is scored as a GO.
  - In scenarios, to prioritize targets or determine the method of fire control, the gunner must engage the correct target according to the instructions given to him in the fire command.
- In a scenario, to identify a target, the gunner must not fire on friendly targets.

**Note.** Evasive and obscured targets do not require special actions from the gunner to be scored as GO; they are simply targets that are hard to kill. A kill on any target is scored as a GO.

### TOW TABLES V AND VI

Table V (Baseline Gunnery Practice) prepares the gunner for Table VI (Baseline Gunnery Qualification). Each table is performed, once during the day and once at night, under realistic (simulated) battlefield conditions. Some of the engagements will be performed with the crew in MOPP 4.

Tables V and VI allow the crews to troubleshoot the equipment (MILES or TOW FTT) and refresh crews on MILES/TOW FTT gunnery and target engagement techniques to prepare the crews for the practice and qualification tables that follow.

### RANGE LAYOUT

Tables V through VIII are fired on an antiarmor tracking and live-fire range, as depicted in Figure 12-78.

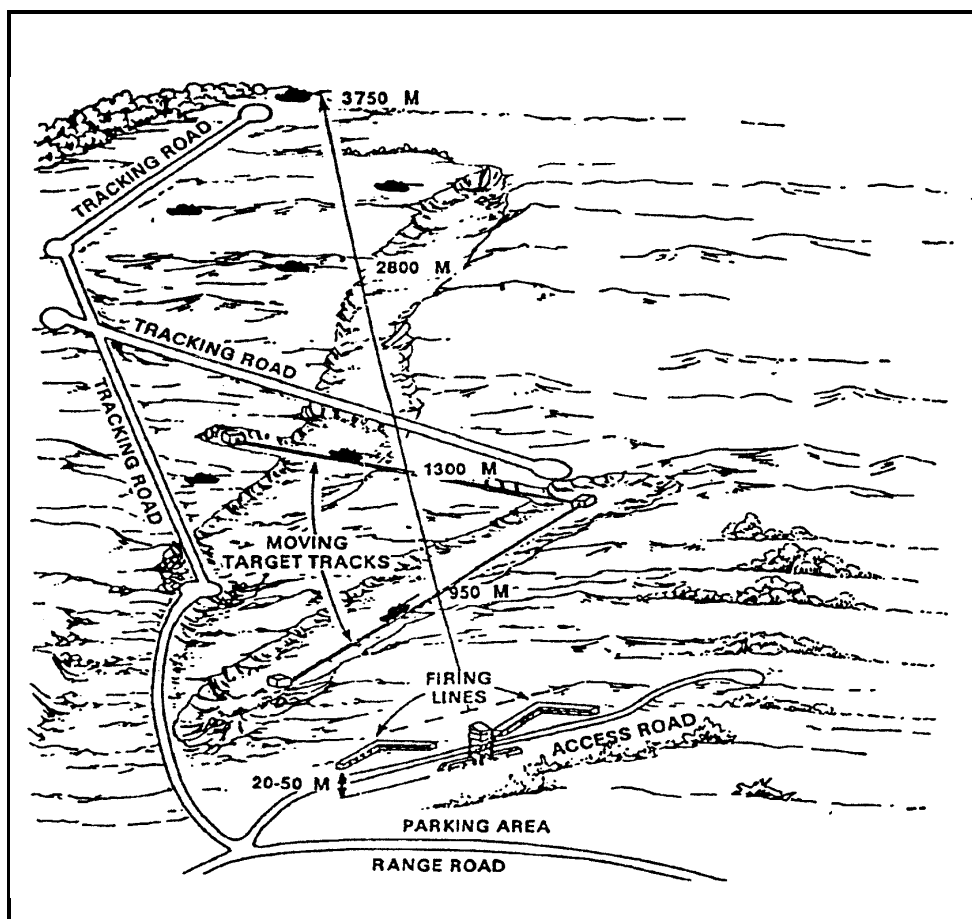


Figure 12-78. Antiarmor Tracking and Live-Fire Range.

### SCORING PROCEDURE FOR TABLES V AND VI

Task 1 is not scored.

Tasks 2 through 6 are scored. To count as a successful engagement, the target must be killed within 30 seconds after engagement. Engagement time begins when the target is exposed (for multiple targets from the same position, time begins each time the vehicle stops in the firing position). Each task counts as 100 points. (For tasks with multiple engagements, divide 100 by the number of targets presented to find the points for each target.) The scores for all engagements are then added.

Each table must be fired during the day and at night. The total maximum score for either day or night is 500 points, for a maximum total of 1,000 points. Squads should

achieve a minimum of 700 points on Table V (day and night combined) before progressing to Table VI.

### **CONDUCT OF THE RANGE**

Each task consists of one or more target engagements from one firing position. All firing will be conducted from an unmasked position. All reloads will be made from a hide position. The systems and carriers are set up in static positions on a baseline; the systems do not move, but engage a series of moving or pop-up targets from the baseline. All stationary targets should be mounted on pop-up mechanisms, to facilitate target acquisition and scoring. Moving targets should be presented at speeds from 5 to 40 kmph.

**Note.** If pop-up mechanisms are not available, exposed stationary targets will be placed in an appropriate array. If exposed targets must be used, the exercise should be designed so that targets are presented only to the position from which they should be engaged.

The crew must successfully install, troubleshoot, and operate the MILES/TOW FTT equipment in accordance with the appropriate TM. The crew must also successfully acquire, engage, and destroy 6 of 10 targets presented in each table (once during daylight and once at night).

**Note.** DA Form 5107-R will be used to record the crew's score (day or night).

TABLES V AND VI. BASELINE GUNNERY PRACTICE/QUALIFICATION			
Task	Conditions/ Target/Situation	Points Per Target	Task Score
1. Install MILES/TOW FTT.	NA	NA	NA
2. Engage a stationary target.	One stationary flank T72, 1,000 to 1,500 meters.	_____	_____
3. Engage multiple stationary targets.	One stationary frontal T72 and one stationary flank T72, 1,000 to 1,500 meters.	_____ _____	_____
4. Engage multiple targets.	One stationary frontal T72 and one moving flank T72, 1,600 to 2,000 meters.	_____ _____	_____
5. Engage multiple stationary targets.	Two stationary turret T72s, 800 to 1,500 meters. NBC environment.	_____ _____	_____
6. Engage multiple targets.	Two stationary frontal T72s and one moving flank T72, 2,100 to 3,750 meters.	_____ _____ _____	_____
Table _____ Date _____ Squad _____ Section _____ Platoon _____ Day Score _____ Night Score _____ Evaluator's Signature _____ Total Score _____ <b>Note.</b> Tables V and VI must be fired both day and night.			

**Figure 12-79. Sample Baseline Gunnery Practice/Qualification Table (TOW Tables V and VI).**

## TOW TABLES VII AND VIII

Table VII (Squad Gunnery Practice) prepares the squad for Table VIII (Squad Gunnery Qualification). These tables train and evaluate the TOW squad on its ability to engage stationary and moving targets in a simulated battlefield scenario. Tables VII and VIII (and all subsequent tables) are moving exercises; the firing vehicle moves from point to point and engages a series of targets.

**Notes.** All M60/M240B machine gun tasks will be wet fired on Tables VII and VIII.

A range with pop-up or moving targets equipped with MILES LTIDs or the TOW FTT equivalent should be used, if available. If such a range is not available, tactical vehicles equipped with MILES harnesses or the TOW FTT equivalent may be used.

### RANGE LAYOUT

Tables VII and VIII are fired on an antiarmor tracking and live-fire range. (See Figure 12-78 on page 12-112.)

### SCORING PROCEDURE FOR TABLES VII AND VIII

To count as a successful engagement, the target must be killed within the engagement time listed for each task. Each task counts as 100 points. (For tasks with multiple engagements, divide 100 by the number of targets presented to find the points for each target.) Any crew or leader cuts are deducted from this score.

Crew duty penalty points are as follows:

- 5 points—Improper fire command.
- 5 points—Incorrect engagement techniques (for example, engaging a least dangerous target before a most dangerous target).
- 5 points—Incorrect driving techniques (anything the driver does that impedes the firing task).
- 10 points—Firing before receiving the command to fire.
- Automatic 0-points—Failure to go to MOPP 4 during an NBC engagement.

**Note.** If the crew commits a safety violation, or a combination of safety violations, that make it unsafe to continue the course, the safety officer should disqualify the crew and remove them from the range.

Each table must be fired during the day and at night. Total maximum score for either day or night is 500 points, for a maximum total of 1,000 points. Squads must achieve a minimum of 700 points on Table VII (day and night combined) to progress to Table VIII.

The scores for the two events are added together (maximum possible score is 1,000 points) for the total score for each gunnery table.

### AMMUNITION ISSUE

Ten ATWESS cartridges per TOW, per iteration, and 75 rounds of 7.62mm.

### CONDUCT OF THE RANGE

For evaluation and training purposes, the senior trainer is normally to the rear of the leader's vehicle during move-out scenarios. An assistant evaluator is normally assigned to each additional vehicle evaluated as part of the same exercise. Scoring for night

engagements will be made by both evaluators. Evaluators must monitor crew conversations and fire commands.

The following support requirements are recommended when conducting TOW Gunnery Table VII:

- Evaluators (do not assist the gunner in finding or identifying targets):
  - One evaluator per squad.
  - One evaluator in the range tower to record scores on engagements.
- Vehicles/communications:
  - One PRC 77/68 per squad evaluator.
  - Two PRC 77/68s for the tower evaluator (one primary, one spare).
  - One AN/GRA 39 for the tower to record fire commands.
- Maneuver area:
  - Multipurpose range complex.
  - A route for the element to move from the assembly area to the first firing position without damaging the underground wiring.
- Firing area:
  - The TOW backblast area (75 meters by 90 degrees) will be clear.
  - Area in which smoke may be used.
  - Training aids, devices, and special equipment.
  - MILES equipment for the TOW squad (extended range TOW) or TOW FTT gear, if available.
  - Sufficient LTIDs or TOW FTT receivers to cover the targets.
- Ammunition: Ten ATWESS cartridges per TOW, per iteration, and 75 rounds of 7.62mm.
- References: FM 7-91 and FM 23-34.

**Note.** Because this table is conducted on an MPTR, marking the firing positions may be necessary. At night, the roads should be marked with luminous tape.

TABLES VII AND VIII. SQUAD GUNNERY PRACTICE/QUALIFICATION					
Task	Conditions/ Target/Situation	Engagement Time	Ammo/ Rds	Kills/ Crew Cuts	Points/ Total
1. Engage a single target.	Dismounted troops, 400-600 meters. (Offense)	35 sec	7.62mm/ 50 rds	_____	_____
2. Engage a single target.	One stationary T72, 1,500 to 2,000 meters. (Baseline)	27 sec for MILES; 27 sec for FTT		_____	_____
3. Engage multiple targets.	One stationary BMP and one moving T72, 1,200 to 2,500 meters. (Phase Line 1)	2.5 min for MILES; 2.28 min for FTT		_____	_____
4. Engage multiple targets.	One stationary BMP and two moving T72s, 3,000 to 3,750 meters. (Phase Line 1)	4.18 min for MILES; 2.28 min for FTT		_____	_____
5. Engage multiple targets.	One stationary BMP and one moving T72, 1,500 to 2,000 meters. (Phase Line 1) NBC environment.	2.07 min for MILES; 2.08 min for FTT		_____	_____
6. Engage a single target.	One moving T72, 2,500 to 3,000 meters. (Baseline) NBC environment.	2.55 min for MILES; 2.56 min for FTT		_____	_____
7. Engage a single target.	One RPG team, 300 to 500 meters. (Offense)	35 sec	7.62mm/ 25 rds	_____	_____
Target Requirements: 1 Stationary T72 One set of 7 IRETS (Dismounted Infantry) 3 Stationary BMP 7 Moving T72s 3 IRETS (RPG Team)					
Table _____ Date _____ Squad _____ Section _____ Platoon _____ Day Score _____ Night Score _____ Evaluator's Signature _____ Total Score _____					
<b>Note.</b> Tables VII and VIII must be fired both day and night.					

**Figure 12-80. Sample Squad Gunnery Practice/Qualification Table (TOW Tables VII and VIII).**



## Chapter 13

### Scout Section Gunnery

Tables IX and X are used to train and evaluate the scout section's ability to conduct reconnaissance and limited security missions, and engage stationary and moving targets. Table IX trains section gunnery, and Table X evaluates the scout sections.

Units may use device-based gunnery to train before a major gunnery density. Available resources (time, training area, range facilities, and ammunition) will determine the commander's method of training.

An AAR for the entire section will be conducted upon completion of each table. The evaluator will debrief each section on its strengths and weaknesses. Videotaped exercises provide visual feedback (of both positive and negative actions) to the section, and should be used whenever possible.

**Note.** Because of the maneuvering constraints required by safety standards when firing MK 19 practice ammunition, these section tables cannot be fired on all ranges, using the MK 19 weapon system.

### Tactical Training

The focus of the tactical scenario used for these tables must be on the scout's primary mission of collecting and reporting information. The scout's ability to effectively use his combat resources (direct- and indirect-fire assets) while remaining undetected on the battlefield must be evaluated.

#### TASK LIST

To maintain tactical emphasis throughout the scout section tables, a standard list of nine combat-critical tasks are mandatory in each table. Scenarios for each table will include the 9 critical tasks and a minimum of 3 commander-selected tasks (total of 12 tactical tasks per table). Using the information provided in this chapter as a guide, the commander designs his own tables, based on resources available and the unit's training needs (the scoresheets in this chapter are examples only). This flexibility ensures that each unit receives the training required for their scout sections to function effectively.

The following lists the required combat critical tasks for Tables IX and X:

- Task 1. Execute action on contact.
- Task 2. Report enemy information.
- Task 3. Call for and adjust indirect fire.
- Task 4. Conduct tactical movement.
- Task 5. Control scout section fires.
- Task 6. Conduct a screen.
- Task 7. Perform a passage of lines.
- Task 8. Cross an NBC contaminated area.
- Task 9. Perform a zone reconnaissance.

Based on the METL, the commander may choose from, but is not limited to, the following tasks for the tactical scenario (see ARTEP 17-57-10-MTP):

- Coordinate with adjacent platoon.
- Perform an area reconnaissance.
- Perform a route reconnaissance.
- Perform reconnaissance by fire.
- Prepare a route reconnaissance overlay.
- Emplace and retrieve a hasty protective minefield.
- Reorganize a squad following enemy contact while in the defense.

- React to indirect fire.

Terrain, weather, and distance between engagements dictate course time. Tactical tasks may be conducted at a nearby training area if range areas are not extensive enough to allow tactical maneuvering; however, total integration of gunnery and tactics is preferred to maximize the training effectiveness of these tables.

## Evaluation Procedures

To evaluate the tactical tasks, the evaluator may use the performance checklists provided in Appendix C. Commanders may add subtasks to the checklists to reflect their METL more accurately. To evaluate tasks not included in Appendix C, the evaluator may develop performance checklists using ARTEP 17-57-10-MTP.

These evaluation procedures allow sections to train and practice the skills normally performed in combat. Evaluators will use AARs to critique sections upon completion of the tables.

## RESOURCES

Live-fire gunnery requires a multilane range facility (such as an MPRC) that will allow at least two vehicles to maneuver as a section (local range SOPs will dictate support requirements).

Device-based gunnery requires the use of MILES. Equipping a scout section with MILES is simple; however, inattention to detail and failure to properly boresight or follow checkout procedures will cause a serious training degradation. Including MILES in the precombat inspection will help identify and correct shortcomings. Whenever MILES is used, make sure the mounting and checkout procedures are in accordance with TC 25-6-1.

Both device-based and live-fire gunnery tables require evaluator support. Evaluators will be identified, trained, and scheduled before the conduct of the table. A scoring packet with performance checklists and scoresheets, scenarios, OPORDs, and sequence of events will be provided to the evaluator. Internal evaluation is acceptable; however, external evaluation is preferred.

The following is a list of recommended equipment to assist the commander in identifying resources needed for table execution:

For live-fire gunnery:

- MPRC, or suitable facility allowing two or more vehicles to maneuver as a section.
  - TOW backblast area (75 meters by 90 degrees) will be clear.
  - Area in which smoke may be used.
- Class V, consisting of, but not limited to—
  - Four-and-one-mix caliber .50, four-and-one-mix 7.62mm, and 40-mm TP or ATWESS.
  - Artillery simulators.
  - Smoke pots.
  - Red smoke grenades.
  - White smoke grenades.
  - Green smoke grenades.
  - Red star clusters.
  - White or green star clusters.
  - Illumination.

For device-based training:

- Training area (1 kilometer by 2 kilometers or larger).
- MILES equipment for each vehicle consisting of—
  - TM 9-1265-375-10.
  - Laser transmitter.
  - Man-worn helmet and torso harness detector assemblies.
  - Combat vehicle kill indicator.
  - Control console.
  - Battery box assembly.
  - Target-holding mechanisms with MILES target interface devices or OPFOR with VISMOS and MILES.
  - MILES controller guns.
- Class V, consisting of, but not limited to—
  - Caliber .50 blank.
  - Caliber 7.62 blank.
  - Hoffman devices.
  - Artillery simulators.
  - Smoke pots.
  - Red smoke grenades.
  - White smoke grenades.
  - Green smoke grenades.
  - Red star clusters.
  - White or green star clusters.
  - Illumination.

Other resources needed for both live-fire gunnery and device-based training:

- Evaluators and support packages consisting of—
  - Scoresheets.
  - Performance checklists.
  - Sequence of events.
  - OPORD.
  - Scenario.
  - Dual-net radio capability.
  - Night-vision devices.
  - Vehicles for evaluators.
  - Medical support, as required by local SOP.
  - Any items required by the supporting range facility SOP.

## Table IX<sup>3/4</sup> Section Training Course

The section training course is used to train and evaluate scout section tactical and gunnery skills in preparation for Table X. It must be designed to evaluate, as a minimum, the nine combat critical tasks, three commander-selected tactical tasks, and the gunnery tasks. At least one NBC engagement will be planned within each table scenario. Day firing should precede night firing, whenever possible.

Each crew in the section must have successfully qualified Table VIII within six months of firing Table IX.

Each vehicle crew member must have passed the GST (appropriate tasks for his specific weapon) in the position he will occupy, in accordance with Appendix A.

## SCORING PROCEDURES

All tasks are scored (see Evaluation Procedures in Chapter 12).

Each table uses a 1,000-point scoring system (maximum points for tactics and gunnery combined is 1,000 points). Tactics are worth 60 percent (600 points).

Commanders may use the following formula to determine total tactical points or, at the commander's option based on METL importance, point values may be assigned for each task. Total cumulative tactical points must not exceed 600.

- To determine the number of tactical points awarded, establish a percentage by dividing the number of tactical tasks passed by the number of tactical tasks possible (day and night combined):  $\text{Tasks Passed} \div \text{Tasks Possible} = \text{Percentage}$  ( $9 \div 12 = .75$ ). Then, multiply by 600 (possible tactical points) ( $.75 \times 600 = 450$ ). The result is the points awarded for the tactical evaluation.
- Gunnery is worth 40 percent (400 points). To determine the number of gunnery points awarded, establish a percentage by dividing the number of targets destroyed by the number of targets presented (combining day and night phases)— $\text{Targets Destroyed} \div \text{Targets Presented} = \text{Percentage}$  ( $8 \div 10 = .80$ ). Then, multiply by 400 gunnery points ( $.80 \times 400 = 320$ ). The total points awarded is determined by adding the scores from the tactical and gunnery portions:  $450$  (tactical) +  $320$  (gunnery) =  $770$  total.
- Each scout is required to achieve a minimum qualifying score on Table IX prior to firing Table X. Minimum qualifying scores on tactics and gunnery are as follows:
  - 70 percent of tactical tasks—420 points out of 600 points.
  - 70 percent of targets presented (gunnery)—280 points out of 400 points.

## CONDUCT OF THE RANGE

A two-vehicle section uses reconnaissance and engagement techniques against threat targets. The section detects elements of an enemy force, identifies the elements, and acquires and engages targets as appropriate. Moving and stationary targets appear individually and simultaneously. The minimum recommended area for this training is one kilometer by two kilometers.

Target arrays should be consistent with the type of threat forces a section could expect to encounter in combat. Based on the METL, the commander determines the number and types of targets to be engaged. At no time will the number of targets exceed the number of rounds allocated by DA Pam 350-38. The number and type of targets must be based on the weapons and size of the scout section. Thermal targets should be used to represent accurate thermal signatures of threat vehicles. When appropriate to the scenario, hostile fire simulators may be used to simulate the threat vehicle(s) firing at the section.

## ALLOWABLE VARIATIONS

The commander may change the sequence of the tasks.

Table IX may be conducted in a live-fire or laser-fire mode, at the commander's discretion. Live-fire, full-caliber gunnery, integrated with tactical tasks is preferred; however, range and maneuver constraints may dictate conducting separate tactical and gunnery portions.

**Note.** Table IX is used to evaluate the section's ability to perform tactical operations, in accordance with ARTEP 17-57-10-MTP, FM 17-98, and unit SOP.

## Table X<sup>3/4</sup> Section Qualification Course

Table X is used to evaluate the scout section's tactical and gunnery proficiency in a realistic tactical and live-fire scenario. Day firing (Table XA) should precede night firing (Table XB), whenever possible.

The commander designs the tables for Table X; however, vehicles will fire a minimum of three live-fire tasks each. Table IX should be similar in task content to Table X. Table X is a full-caliber gunnery exercise designed for a multilane range facility (such as an MPRC). Where range facilities permit free maneuvering, the tactical phase of the table should be conducted simultaneously with the gunnery phase.

Each vehicle crew member must have passed the GST (tasks appropriate for the weapon system) in the position he will occupy, in accordance with Appendix A.

Each scout section should achieve a minimum passing score on Table IX within three months before firing Table X.

### SCORING PROCEDURES

All tasks are scored (see Evaluation Procedures in Chapter 12).

Each table uses a 1,000 point scoring system (maximum points for tactics and gunnery combined is 1,000 points). Tactics are worth 60 percent (600 points).

Commanders may use the following formula to determine total tactical points or, at the commander's option based on METL importance, point values may be assigned for each task. Total cumulative tactical points must not exceed 600 points.

- To determine the number of tactical points awarded, establish a percentage by dividing the number of tactical tasks passed by the number of tactical tasks possible (day and night combined):  $\text{Tasks Passed} \div \text{Tasks Possible} = \text{Percentage}$  ( $9 \div 12 = .75$ ). Then, multiply by 600 possible tactical points ( $.75 \times 600 = 450$ ). The result is the points awarded for the tactical evaluation.
- Gunnery is worth 40 percent (400 points). To determine the number of gunnery points awarded, divide the number of gunnery tasks passed by the number of gunnery tasks possible (combining day and night phases):  $\text{Targets Destroyed} \div \text{Targets Presented} = \text{Percentage}$  ( $8 \div 10 = .80$ ). Then, multiply the decimal by 400 gunnery points ( $.80 \times 400 = 320$ ). The total points awarded is determined by adding the scores from the tactical and gunnery portions:  $450$  (tactical) +  $320$  (gunnery) =  $770$  total.
- To qualify on Table X, the section must receive a minimum of—
  - 70 percent of tactical tasks (420 out of 600 points).
  - 70 percent of targets presented (gunnery) (280 out of 400 points).

Sections will be rated by the following standards:

- Distinguished: Combined score of 900 points or higher (420 tactical and 280 gunnery points).
- Superior: Combined score of 800 to 899 points (420 tactical and 280 gunnery points).
- Unqualified: Combined score of 699 points or less, or section fails to achieve 420 tactical points or 280 gunnery points.

### CONDUCT OF THE RANGE

The gunnery phase of Table X requires a multilane facility capable of allowing at least two vehicles to maneuver as a section. The gunnery phase will be conducted live-fire, full-caliber. Local range SOPs dictate the conduct of the range. Scenarios should be developed and approved for firing well in advance of the conduct of Table X.

The tactical phase of Table X requires a free-maneuver range facility or a separate training area, one kilometer by two kilometers. OPFOR or target-lift mechanisms may

be used in the training area to reinforce acquisition, reporting, and call-for-fire procedures.

Target arrays should be consistent with the type of threat forces a section could expect to encounter in combat. Based on the METL, the commander determines the number and types of targets to be engaged. At no time will the number of targets exceed the number of rounds allocated by DA Pam 350-38. The number and type of targets must be based on the weapons and size of the scout section. Thermal targets should be used to represent accurate thermal signatures of threat vehicles. When appropriate to the scenario, hostile fire simulators may be used to simulate the threat vehicle(s) firing at the section.

### **ALLOWABLE VARIATIONS**

Depending on the availability of maneuver area and range time, sections may conduct the tactical portion of Table X in a local training area with MILES. The commander must decide the most appropriate location to conduct the table, based on range time availability and his design of Table X. MILES-conducted exercises, using force-on-force engagements or target-lift mechanisms with LTID, represent realistic threat scenarios. The commander may add to the number of live-fire targets, but cannot fire less than the number indicated for a particular task.

**Notes.** MILES may be used for the tactical portion only; the gunnery portion must be fired live.

On Table X, the section is evaluated on its ability to perform tactical operations IAW ARTEP 17-57-10-MTP, FM 17-98, and unit SOP.

## Appendix A

### Test Administrative Guides and Criterion Scoring Checklists for the GST

The GST is an evaluation tool with which the unit can determine readiness to move toward crew tasks and conduct live-fire gunnery to meet prescribed training levels. It is used to evaluate the crew member's ability to perform gunnery-related skills. It does not replace tasks in the soldier's manuals.

### Administrative Procedures

As a minimum, the appropriate tasks of the GST must be administered—

- Semiannually.
- When crew members change positions.
- Before gunnery qualification, unless the crew members qualified in their current vehicle position within the past three months.

The GST is administered using tasks, conditions, and standards, as well as training evaluation guidelines and performance checklists. At no time will tasks be deleted from the GST; however, the commander may add tasks for a more comprehensive evaluation.

All members of the scout squad should take the test. The commander and gunner must achieve a GO on all tasks (appropriate for their weapon systems).

The GST should also be used as a diagnostic tool to determine the level and effectiveness of cross-training throughout the section.

### Prerequisites

Preliminary gunnery training must be conducted before administering the GST.

### Evaluation Procedures

#### ADMINISTRATIVE PROCESS

The evaluator logs each crew member in on a roster at all stations and provides him with all materials and equipment displayed in the manner outlined in this guide. The evaluator must use the criterion checklist for each task. He informs the crew member of his performance on the task and directs him either to move to the next station or to further training. Only one crew member may be tested at a time, unless stated otherwise in the guideline.

#### ADMINISTRATIVE PROCEDURES FOR PERSONNEL RECEIVING A NO-GO

If the crew member does not achieve the standard indicated on the checklist, he receives a NO-GO. When a crew member receives a NO-GO, he must be critiqued, to include an explanation of his mistakes and what he must do to correct them. The crew member will not be retested until his immediate supervisor has initialed the scoresheet indicating that the individual has been retrained and is ready to retest. If a crew member receives an additional NO-GO on the same task, he must return to be retested on another date.

## Evaluation Criteria

Either internal or external evaluators may evaluate the test; external evaluation is recommended.

The individuals performing the test must complete all actions outlined in the performance checklist within a specified time limit to achieve a GO for the task.

At the conclusion of each task, if the individual failed to meet the prescribed standards, he will be critiqued on those areas that caused him to fail the task and be directed to retake the test at a later date.

## Scoring

Personnel receive either a GO or NO-GO on each task. NO-GOs are scored for—

- Failing to complete the task.
- Incorrectly performing task steps (or performing steps out of sequence).
- Failing to meet time standards.

## Performance Checklists

The performance checklist for all stations must be updated when new soldier's manuals and technical manuals are issued, to ensure standardization in training and testing.



## TEST ADMINISTRATIVE GUIDE

### Station 1

- TASK:** Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun.
- CONDITIONS:** Given a loaded M60 machine gun, placed on a flat surface.
- STANDARDS:** Within eight minutes, the crew member will—
- Clear (in sequence) and disassemble the M60 machine gun.
  - Assemble the M60 machine gun.
  - Perform a function check (in sequence) on the M60 machine gun.
  - Load (in sequence) the M60 machine gun.
  - Perform immediate action (in sequence) on the M60 machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M60 machine gun.
- Dummy, linked, 7.62-mm ammunition (five rounds per machine gun).
- Table (one per M60).
- FM 23-67.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is removed from the vehicle.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO THE CREWMAN:**

*“At this station, you will be tested on your ability to clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun. You must clear, perform a function check, load, and perform immediate action in sequence on the M60 machine gun. The weapon is not clear. You have eight minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after eight minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 1**  
**Clear, Disassemble (Field Strip), Assemble,**  
**Perform a Function Check, Load, and Perform Immediate**  
**Action on an M60 Machine Gun**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	GO	NO-GO
1. Cleared (in sequence) the M60 machine gun.		
a. Moved the safety switch to the FIRE position.	_____	_____
b. Pulled back on the charging handle and locked the bolt to the rear.	_____	_____
c. Moved the charging handle to the forward position.	_____	_____
d. Moved the safety switch to the SAFE position.	_____	_____
e. Opened the cover and removed the ammunition and link belt.	_____	_____
f. Raised the feed tray and inspected the chamber.	_____	_____
g. Closed the feed tray.	_____	_____
h. Closed the cover.	_____	_____
i. Moved the safety switch to the FIRE position.	_____	_____
j. Pulled back on the charging handle and held it there.	_____	_____
k. Pulled the trigger and allowed the charging handle to move forward.	_____	_____
2. Disassembled the M60 machine gun.		
a. Removed the stock.	_____	_____
b. Removed the buffer, drive spring, and guide.	_____	_____
c. Removed the operating rod and bolt assemblies.	_____	_____
d. Separated the bolt assembly from the operating rod assembly.	_____	_____
e. Removed the trigger mechanism group.	_____	_____
f. Removed the barrel group.	_____	_____
g. Removed the cover, feed tray, and hanger group.	_____	_____
h. Removed the forearm assembly.	_____	_____
3. Assembled the M60 machine gun.		
a. Replaced the forearm assembly.	_____	_____
b. Replaced the cover, feed tray, and hanger group.	_____	_____
c. Replaced the barrel group.	_____	_____
d. Replaced the trigger mechanism group.	_____	_____
e. Joined the bolt to the operating rod.	_____	_____

	GO	NO-GO
f. Replaced the bolt and operating rod group.	_____	_____
g. Replaced the buffer assembly.	_____	_____
h. Replaced the stock.	_____	_____
4. Performed a function check (in sequence) on the M60 machine gun.		
a. Moved the safety switch to the FIRE position.	_____	_____
b. Pulled back on the charging handle and locked the bolt to the rear.	_____	_____
c. Moved the charging handle to the forward position.	_____	_____
d. Closed the feed tray and cover.	_____	_____
e. Moved the safety switch to the SAFE position and pulled the trigger.	_____	_____
f. Checked to make sure the weapon would not fire.	_____	_____
g. Pulled back on the charging handle.	_____	_____
h. Moved the safety switch to the FIRE position and pulled the trigger.	_____	_____
i. Allowed the bolt to ease forward.	_____	_____
5. Loaded (in sequence) the M60 machine gun.		
a. Placed the ammunition on the feed tray.	_____	_____
b. Closed the feed tray.	_____	_____
c. Moved the safety switch to the FIRE position.	_____	_____
6. Performed immediate action (in sequence) on an M60 machine gun.		
<b>Note.</b> Have examinee attempt to fire the M60 machine gun.		
a. Pulled back on the charging handle.	_____	_____
b. Checked the ejection port for the ejected cartridge.	_____	_____
c. Moved the charging handle forward, and attempted to fire again.	_____	_____
7. Completed all performance measures within eight minutes.	_____	_____

**Note.** Clearing and function checks are performed in sequence IAW FM 23-67.

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 1A

- TASK:** Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun.
- CONDITIONS:** Given a loaded M240B machine gun, placed on a flat surface.
- STANDARDS:** Within eight minutes, the crew member will—
- Clear (in sequence) and disassemble the M240B machine gun.
  - Assemble the M240B machine gun.
  - Perform a function check (in sequence) on the M240B machine gun.
  - Load (in sequence) the M240B machine gun.
  - Perform immediate action (in sequence) on the M240B machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M240B machine gun.
- Dummy, linked, 7.62-mm ammunition (five rounds per machine gun).
- Table (one per M240B).
- FM 23-67.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is removed from the vehicle.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>7 minutes</u>
Total:	12 minutes

**INSTRUCTIONS TO THE CREWMAN:**

*“At this station, you will be tested on your ability to clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun. You must clear, perform a function check, load, and perform immediate action in sequence on the M240B machine gun. The weapon is not clear. You have seven minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after seven minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 1A  
Clear, Disassemble (Field Strip), Assemble,  
Perform a Function Check, Load, and Perform Immediate  
Action on an M240B Machine Gun**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Cleared (in sequence) the M240B machine gun.		
a. Moved the safety switch to the F (fire) position.	_____	_____
b. Pulled back on the cocking handle and locked the bolt to the rear.	_____	_____
c. Moved the safety switch to the S (safe) position.	_____	_____
d. Opened the cover.	_____	_____
e. Removed the source of ammunition.	_____	_____
f. Raised the feed tray.	_____	_____
g. Looked into the chamber for ammunition.	_____	_____
h. Lowered the feed tray.	_____	_____
i. Moved the safety switch to the F (fire) position.	_____	_____
j. Pulled back on the cocking handle and held it there.	_____	_____
k. Pulled the trigger and allowed the cocking handle to move forward to the close and lock position.	_____	_____
l. Closed the cover.	_____	_____
2. Disassembled the M240B machine gun.		
a. Cleared the weapon (if not previously cleared).	_____	_____
b. Removed the barrel assembly.	_____	_____
c. Removed the trigger housing assembly.	_____	_____
d. Removed the buttstock and buffer assembly.	_____	_____
e. Removed the drive spring rod assembly.	_____	_____
f. Removed the bolt and operating rod assembly.	_____	_____
g. Removed the cover assembly.	_____	_____
h. Removed the feed tray.	_____	_____
3. Assembled the M240B machine gun.		
a. Installed the feed tray.	_____	_____
b. Installed the cover assembly.	_____	_____
c. Installed the bolt and operating rod assembly.	_____	_____
d. Installed the buttstock and buffer assembly.	_____	_____
e. Installed the trigger housing assembly.	_____	_____
f. Installed the barrel assembly.	_____	_____
g. Installed the drive spring rod assembly.	_____	_____

	GO	NO-GO
4. Performed a function check (in sequence) on the M240B machine gun.		
a. Moved the safety switch to the F (fire) position.	_____	_____
b. Pulled back on the cocking handle and locked the bolt to the rear.	_____	_____
c. Moved the cocking handle to the forward (locked) position.	_____	_____
d. Moved the safety switch to the S (safe) position and pulled the trigger.	_____	_____
e. Checked to make sure the weapon would not fire.	_____	_____
f. Pulled back on the cocking handle.	_____	_____
g. Moved the safety switch to the F (fire) position and pulled the trigger.	_____	_____
h. Allowed the bolt to ease forward to the close and lock position.	_____	_____
5. Loaded (in sequence) the M240B machine gun.		
a. Moved the safety switch to the F (fire) position.	_____	_____
b. Charged the machine gun.	_____	_____
c. Moved the safety switch to the S (safe) position.	_____	_____
d. Opened the cover.	_____	_____
e. Removed the source of ammunition, if present.	_____	_____
f. Raised the feed tray.	_____	_____
g. Looked into the chamber for ammunition.	_____	_____
h. Lowered the feed tray.	_____	_____
i. Moved the safety switch to the F (fire) position, pulled back on the cocking handle, and pulled the trigger.	_____	_____
j. Allowed the bolt to ease forward to the close and lock position.	_____	_____
k. Placed the link belt in the feed tray over the belt holding paws, open link down.	_____	_____
l. Closed the cover.	_____	_____
6. Performed immediate action (in sequence) on the M240B machine gun (cold gun).		
a. Announced "STOPPAGE" or "MISFIRE."	_____	_____
b. Charged the M240B machine gun.	_____	_____
c. Attempted to fire.	_____	_____
d. If the gun did not fire, cleared the weapon.	_____	_____

	GO	NO-GO
7. Performed immediate action (in sequence) on the M240B machine gun (hot gun).		
a. Announced "STOPPAGE" or "MISFIRE."	_____	_____
b. Charged the M240B machine gun.	_____	_____
c. Attempted to fire.	_____	_____
d. Waited 15 minutes, and cleared the weapon.	_____	_____
8. Completed all performance measures within seven minutes.	_____	_____

**Note.** Clearing and function checks are performed in sequence IAW FM 23-67.

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 2

- TASK:** Clear, disassemble, assemble, set headspace and timing, perform a function check, load, and perform immediate action on an M2 HB machine gun.
- CONDITIONS:** Given an M2 HB machine gun, placed on a flat surface, and loaded with dummy ammunition and a headspace and timing gauge.
- STANDARDS:** Within 16 minutes, the crew member will—
- Clear (in sequence) the M2 HB machine gun.
  - Disassemble and assemble the M2 HB machine gun.
  - Set headspace and timing (in sequence) on the M2 HB machine gun.
  - Perform a function check (in sequence) on the M2 HB machine gun.
  - Load (in sequence) the M2 HB machine gun.
  - Perform immediate action (in sequence) on the M2 HB machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above
- M2 HB machine gun.
- Dummy, linked, caliber .50 ammunition (five rounds per machine gun).
- Table (one per M2 HB machine gun).
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational and that the weapon is removed from the vehicle, placed on a flat surface, loaded, and has a headspace and timing gauge.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>16 minutes</u>
Total:	21 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to clear, disassemble, assemble, set headspace and timing, perform a function check, load, and perform immediate action on an M2 HB machine gun. You must clear, set the headspace and timing, perform the function check, load, and perform immediate action in sequence. You have 16 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after 16 minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”



**PERFORMANCE CHECKLIST FOR STATION 2**  
**Clear, Disassemble, Assemble, Set Headspace and Timing,**  
**Perform a Function Check, Load, and Perform Immediate**  
**Action on the M2 HB Machine Gun**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Cleared (in sequence) the M2 HB machine gun.		
a. Moved the bolt latch release lock to the unlocked position (single-shot mode).	_____	_____
b. Opened the cover.	_____	_____
c. Lifted the extractor and removed the ammunition belt from the feedway.	_____	_____
d. Lowered the extractor, and closed the cover.	_____	_____
e. Pulled back on the retractor slide handle, and locked the bolt to the rear.	_____	_____
f. Opened the cover.	_____	_____
g. Looked into both the chamber and T-slot for ammunition.	_____	_____
h. Maintained pressure on the retractor slide handle, and eased the bolt forward.	_____	_____
i. Closed the cover.	_____	_____
j. Pressed the trigger, and attempted to fire the weapon.	_____	_____
k. Did not close the cover with the bolt locked to the rear.	_____	_____
2. Disassembled the M2 HB machine gun.		
a. Cleared the weapon (if not previously cleared).	_____	_____
b. Removed the barrel.	_____	_____
c. Removed the backplate.	_____	_____
d. Removed the driving spring and rod.	_____	_____
e. Removed the bolt stud.	_____	_____
f. Removed the barrel buffer body, barrel extension, and bolt.	_____	_____
g. Disassembled to three pieces: barrel buffer body, barrel extension, and bolt.	_____	_____
h. Disassembled the barrel buffer.	_____	_____

	GO	NO-GO
3. Assembled the M2 HB machine gun.		
a. Reassembled the barrel buffer.	_____	_____
b. Reinstalled the barrel buffer, barrel extension, and bolt.	_____	_____
c. Installed the bolt stud.	_____	_____
d. Installed the driving spring and rod.	_____	_____
e. Installed the backplate.	_____	_____
f. Installed the barrel.	_____	_____
4. Adjusted the headspace (in sequence) on the M2 HB machine gun.		
a. Opened the cover.	_____	_____
b. Retracted the bolt until the locking lug on the barrel locking spring was centered in the hole of the right side plate of the receiver.	_____	_____
c. Held the bolt in position (as in 4b) and unscrewed the barrel two notches (clicks).	_____	_____
d. Allowed the recoiling parts to move forward.	_____	_____
<b>Note.</b> Disregard steps 4a-d if the barrel was backed off two notches (clicks) during assembly.		
e. Charged the machine gun.	_____	_____
f. Allowed the bolt to move forward.	_____	_____
g. Opened the cover, and ensured the firing pin was retracted.	_____	_____
h. Retracted the recoiling parts approximately 1/16 inch.	_____	_____
i. Raised the extractor.	_____	_____
j. Inserted the GO end of the gauge into the T-slot between the face of the bolt and the barrel.	_____	_____
k. If the GO end did not enter the T-slot—		
(1) Retracted the bolt.	_____	_____
(2) Unscrewed the barrel one notch (click).	_____	_____
(3) Allowed the recoiling parts to move forward.	_____	_____
(4) Checked the headspace IAW step 4h through 4j.	_____	_____
l. If the GO end entered the T-slot—		
Attempted to place the NO-GO end of the gauge into the T-slot.	_____	_____

	<b>GO</b>	<b>NO-GO</b>
m. If the NO-GO end did not enter the T-slot, went to step 5.	_____	_____
n. If the NO-GO end entered the T-slot—		
(1) Retracted the bolt.	_____	_____
(2) Screwed the barrel in one notch (click).	_____	_____
(3) Allowed the recoiling parts to move forward.	_____	_____
(4) Checked the headspace IAW step 4h and m.	_____	_____
5. Set the timing ( in sequence after adjusting headspace; charged weapon if necessary) on the M2 HB machine gun.		
a. Pulled the retractor slide handle to retract the recoiling parts about 1/4 inch.	_____	_____
b. Raised the extractor.	_____	_____
c. Inserted the NO-FIRE gauge between the barrel extension and the trunnion lock.	_____	_____
d. Made sure the NO-FIRE gauge beveled edge rested against the barrel notches.	_____	_____
e. Slowly released the recoiling parts, allowing them to move forward.	_____	_____
f. Depressed the trigger.	_____	_____
g. If the firing pin did not release, went to step 5i.	_____	_____
h. If the firing pin released—		
(1) Retracted the recoiling parts, and removed the NO-FIRE gauge.	_____	_____
(2) Retracted the bolt and recharged the machine gun.	_____	_____
(3) Inserted the FIRE gauge.	_____	_____
(4) Removed the backplate.	_____	_____
(5) Screwed the timing adjustment nut to the left until it rested on the trigger bar.	_____	_____
(6) Pushed up on the trigger bar and attempted to fire.	_____	_____
(7) Rotated the timing adjustment nut to the right one notch and attempted to fire.	_____	_____
(8) Repeated step 5h(7) and attempted to fire after each click, until the weapon fired.	_____	_____
(9) Turned the timing adjustment nut two additional notches (clicks) to the right.	_____	_____
(10) Placed the backplate on the back of the receiver, halfway, to cover the drive spring and rod.	_____	_____

	GO	NO-GO
(11) Retracted the bolt to remove the gauge.	_____	_____
(12) Installed the backplate.	_____	_____
(13) Charged the weapon.	_____	_____
(14) Checked the timing (twice) to make sure it was correct, then went to step 6 (timing complete).	_____	_____
i. Replaced the NO-FIRE gauge with the FIRE gauge.	_____	_____
j. Depressed the trigger.	_____	_____
k. If the firing pin released, went to step 6 (timing complete).	_____	_____
l. If the firing pin did not release, went to step 5h(4) (removed the backplate).	_____	_____
6. Performed a function check (in sequence) on the M2 HB machine gun.		
a. Moved the bolt latch release lock to the unlocked position (single-shot mode).	_____	_____
b. Pulled back on the retractor slide handle and locked the bolt to the rear (the bolt should lock to the rear).	_____	_____
c. Held the retractor handle, pressed the bolt latch release, and allowed the bolt to move forward.	_____	_____
d. Pressed the trigger (the weapon should have fired).		
e. Moved the bolt latch release lock to the locked position (automatic-fire mode).	_____	_____
f. Pulled the retractor slide handle to the rear and held it (the bolt should not have locked to the rear).	_____	_____
g. Released the pressure on the retractor slide handle and eased the bolt forward.	_____	_____
h. Pressed the trigger and released the firing pin.	_____	_____
7. Loaded (in sequence) the M2 HB machine gun.		
a. Moved the bolt latch release lock to the unlocked position (single-shot mode).	_____	_____
b. Opened the machine gun cover.	_____	_____
c. Lifted the extractor and removed the ammunition belt (if present) from the feedway.	_____	_____
d. Lowered the extractor, and closed the cover.	_____	_____
e. Pulled back on the retractor slide handle, and locked the bolt to the rear.	_____	_____
f. Opened the cover.	_____	_____

	GO	NO-GO
g. Looked into both the chamber and T-slot for ammunition.	_____	_____
h. Maintained pressure on the retractor slide handle and depressed the bolt latch release, allowing the bolt to move forward.	_____	_____
i. Placed the bolt latch release lock in the locked position (automatic-fire mode).	_____	_____
j. Lifted the extractor.	_____	_____
k. Inserted the double loop of the ammunition under the extractor and pushed the extractor down between the first and second rounds.	_____	_____
l. Closed the cover.	_____	_____

**WARNING**

If the caliber .50 has fired 150 rounds or more within 2 minutes, it is considered a *hot gun*. Immediate action must be applied within 10 seconds of a stoppage.

8. Performed immediate action (in sequence) on the M2 HB machine gun (cold gun).		
a. Announced "STOPPAGE" or "MISFIRE."	_____	_____
b. Charged the machine gun and observed the feeding and ejection.	_____	_____
c. Attempted to fire.	_____	_____
d. If the gun did not fire, announced "STOPPAGE" or "MISFIRE," and cleared the weapon.	_____	_____
9. Performed immediate action (in sequence) on the M2 HB machine gun (hot gun).		
a. Announced "STOPPAGE" or "MISFIRE."	_____	_____
b. Charged the machine gun and observed the feeding and ejection.	_____	_____
c. Attempted to fire.	_____	_____
d. If the gun did not fire, announced "STOPPAGE" or "MISFIRE," and kept the gun pointed down range.	_____	_____
d. Waited 5 minutes, and cleared the weapon.	_____	_____
10. Completed all performance measures within 16 minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 3

- TASK:** Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on a MK 19 machine gun.
- CONDITIONS:** Given a MK 19 machine gun, mounted on an M3 tripod, and ten rounds of linked, dummy, 40-mm ammunition.
- STANDARDS:** Within 11 minutes, the crew member will—
- Clear (in sequence) the MK 19 machine gun.
  - Disassemble the MK 19 machine gun.
  - Assemble the MK 19 machine gun.
  - Perform a function check (in sequence) on the MK 19 machine gun.
  - Load (in sequence) the MK 19 machine gun.
  - Perform immediate action (in sequence) on the MK 19 machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- MK 19 machine gun.
- Ten rounds of linked, dummy, 40-mm ammunition.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is removed from the vehicle and cleared.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on a MK 19 machine gun. You must clear, perform a function check, load, and perform immediate action in sequence. You have 11 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after 11 minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 3  
Clear, Disassemble (Field Strip), Assemble, Perform a  
Function Check, Load, and Perform Immediate Action on a  
MK 19 Machine Gun**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Cleared (in sequence) the MK 19 machine gun.		
a. Moved the safety switch to the S (safe) position.	_____	_____
b. Charged the weapon.	_____	_____
c. Left the charging handles to the rear and down.	_____	_____
d. Used the cleaning rod to force the live round/empty casing off the face of the bolt, catching the live round.	_____	_____
e. Opened the top cover.	_____	_____
f. Removed the rounds from the feed tray.	_____	_____
g. Inspected the chamber and bolt face.	_____	_____
h. Moved the safety switch to the F (fire) position.	_____	_____
i. Pressed the triggers and allowed the bolt to move forward.	_____	_____
j. Moved the safety switch to the S (safe) position.	_____	_____
k. Moved the feed slide assembly to the left.	_____	_____
l. Closed the top cover.	_____	_____
2. Disassembled the MK 19 machine gun.		
a. Removed the bolt and backplate assembly.	_____	_____
b. Removed the secondary drive lever.	_____	_____
c. Removed the feed slide assembly.	_____	_____
d. Removed the top cover assembly.	_____	_____
e. Removed the feed tray.	_____	_____
f. Removed the primary drive lever and vertical cam.	_____	_____
g. Removed the alignment guide assembly.	_____	_____
h. Removed the ogive plunger.	_____	_____
i. Removed the round-positioning block.	_____	_____
j. Removed the left and right hand charger assemblies.	_____	_____
k. Removed the sear housing assembly.	_____	_____
3. Reassembled the MK 19 machine gun.		
a. Assembled the sear housing assembly.	_____	_____

- |   | _____     | _____        |
|---|-----------|--------------|
|   | <b>GO</b> | <b>NO-GO</b> |
| b. Assembled the left and right hand charger assemblies.              | _____     | _____        |
| c. Assembled the round positioning block.                             | _____     | _____        |
| d. Inserted the ogive-plunger assembly.                               | _____     | _____        |
| e. Inserted the alignment guide assembly.                             | _____     | _____        |
| f. Attached the vertical cam.   | _____     | _____        |
| g. Attached the primary drive lever.                                  | _____     | _____        |
| h. Attached the feed tray.  | _____     | _____        |
| i. Attached the feed slide assembly.                                  | _____     | _____        |
| j. Attached the top cover assembly.                                   | _____     | _____        |
| k. Attached and engaged the secondary drive lever.                    | _____     | _____        |
| l. Inserted the bolt and backplate assembly.                          | _____     | _____        |
| 4. Performed a function check (in sequence) on the MK 19 machine gun. |           |              |
| a. Closed the top cover.  | _____     | _____        |
| b. Moved the safety switch to the S (safe) position.                  | _____     | _____        |
| c. Charged the weapon.  | _____     | _____        |
| d. Locked the charging handles forward.                               | _____     | _____        |
| e. Pressed the trigger (the bolt did not move forward).               | _____     | _____        |
| f. Moved the safety switch to the F (fire) position.                  | _____     | _____        |
| g. Pressed the trigger (the bolt should spring forward).              | _____     | _____        |
| h. Moved the safety switch to the S (safe) position.                  | _____     | _____        |
| i. Opened the top cover.  | _____     | _____        |
| j. Made sure the firing pin was exposed.                              | _____     | _____        |
| k. Moved the feed slide to the left.                                  | _____     | _____        |
| l. Closed the top cover.  | _____     | _____        |
| m. Pulled the bolt to the rear and opened the cover.                  | _____     | _____        |
| n. Moved the safety switch to the F (fire) position.                  | _____     | _____        |
| o. Rode the bolt forward.   | _____     | _____        |
| p. Moved the safety switch to the S (safe) position.                  | _____     | _____        |
| q. Closed the cover.  | _____     | _____        |
| 5. Loaded (in sequence) the MK 19 machine gun.                        |           |              |
| a. Moved the safety switch to the S (safe) position.                  | _____     | _____        |
| b. Opened the top cover.  | _____     | _____        |
| c. Made sure the bolt was forward.                                    | _____     | _____        |
| d. Inserted the rounds, female link first, through the feed throat.   | _____     | _____        |





	GO	NO-GO
e. Inserted the first round into the feeder and across the first pawl.	_____	_____
f. Moved the feed slide assembly to the left.	_____	_____
g. Closed the top cover.	_____	_____
h. Charged the weapon.	_____	_____
i. Locked the charging handles forward.	_____	_____
j. Moved the safety switch to the F (fire) position.	_____	_____
k. Pressed the triggers (the bolt should spring forward).	_____	_____
l. Charged the weapon.	_____	_____
m. Locked the charging handles forward.	_____	_____
n. Moved the safety switch to the S (safe) position.	_____	_____
6. Performed immediate action (in sequence) on the MK 19 machine gun.		
<b>Note.</b> Have examinee attempt to fire the MK 19.		
a. Announced "MISFIRE."	_____	_____
b. Waited ten seconds.	_____	_____
c. Pulled the bolt to the rear, catching the live round as it was ejected.	_____	_____
d. Locked the charging handles forward.	_____	_____
e. Pressed the trigger (the bolt should spring forward). If the weapon failed to fire—		
(1) Moved the safety switch to the S (safe) position.	_____	_____
(2) Waited ten seconds.	_____	_____
(3) Pulled the bolt to the rear, catching the live round as it was ejected.	_____	_____
(4) Opened the cover and cleared the weapon.	_____	_____
7. Completed all performance measures within eight minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_  
\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 4

- TASK:** Prepare a sector sketch, and engage targets using the sector sketch data.
- CONDITIONS:** Given a weapon system mounted on a vehicle, a designated firing position, a sector of fire, target reference points, a blank standard range card, a pencil, and a compass.
- STANDARDS:** Within 15 minutes, the crew member will prepare a sector sketch that illustrates a representative sketch of the terrain including—
- Weapon symbol.
  - Location of weapon system (a series of arrows drawn from a reference point to the weapon position, to include azimuth and distance).
  - Sector of fire:
    - Complete boundaries (left and right sector limits).
    - All deadspace.
    - Maximum engagement lines (MEL).
  - All prominent terrain features (natural and man-made).
  - All target locations and TRPs:
    - Deflection.
    - Elevation.
    - Range.
    - Ammunition.
    - Description.
    - TRP number.
  - Magnetic north arrow.
  - Marginal data or data section that shows—
    - Interval between circles.
    - Unit designation.
    - Time and date of preparation.
    - Firing position designation (primary, alternate, or supplementary).

Then engage two targets, using the sector sketch data.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- Complete vehicle-mounted weapon system.
- DA Form 5517-R (Standard Range Card).
- Compass.
- Stopwatch.
- Clipboard and pen.
- Two vehicle targets.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that an appropriate sector of fire is available.

**TEST PLANNING TIME:**

Administrative: 5 minutes  
Test: 15 minutes  
Total: 20 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to complete a sector sketch, and engage targets using the sector sketch data. You will be given the following information: type of position, type of weapon system, left and right limits, and any target reference points. (Give the information to the crew.) You have 15 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after 15 minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 4**  
**Prepare a Sector Sketch, and Engage Targets Using**  
**the Sector Sketch Data**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Completed a sector sketch.		
a. Used the correct weapon symbol.	_____	_____
b. Marked the location of the weapon system from a reference point.	_____	_____
c. Marked the sector of fire:		
(1) Left and right limits.	_____	_____
(2) Deadspace.	_____	_____
(3) MELs.	_____	_____
(4) Target information for all TRPs and deflection for mounted weapons other than TOW (can be given by clock position).	_____	_____
d. Used magnetic north indicator.	_____	_____
e. Completed the identification data:		
(1) Unit designation.	_____	_____
(2) Time and date of preparation.	_____	_____
(3) Type of firing position.	_____	_____
(4) Bumper number.	_____	_____
f. Marked the position properly (staked it in).	_____	_____
2. Engaged two targets using the sector sketch data.	_____	_____
3. Completed all performance measures within 15 minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 5

- TASK:** Mount, place into operation, and dismount the AN/TVS-5 night-vision sight (using the M2 HB machine gun).
- CONDITIONS:** Given an M2 HB machine gun mounted on the MK 64 weapon systems mount and the M3 tripod, an AN/TVS-5 night-vision sight, and TM 11-5855-214-10.
- STANDARDS:** Within five minutes, the crew member will—
- Mount the AN/TVS-5 on the M2 HB.
  - Place the AN/TVS-5 into operation.
  - Dismount the AN/TVS-5 from the M2 HB.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M2 HB machine gun.
- MK 64 mount.
- M3 tripod.
- Complete AN/TVS-5 and TM 11-5855-214-10.
- A 9/16-inch open-end wrench or 8-inch crescent wrench.
- Two BA-5567/U batteries.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is cleared and securely mounted on the tripod.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to mount the AN/TVS-5 on the M2 HB machine gun, place the M2 HB machine gun into operation, and dismount the AN/TVS-5 from the M2 HB machine gun. The weapon is clear. You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 5  
Mount, Place Into Operation, and Dismount the AN/TVS-5  
Night-Vision Sight (Using the M2 HB Machine Gun)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Mounted the AN/TVS-5 on the M2 HB machine gun.		
a. Mounted the M2 mounting bracket onto the M2 HB machine gun.	_____	_____
b. Mounted the AN/TVS-5 onto the M2 bracket.	_____	_____
2. Placed the AN/TVS-5 into operation.		
a. Installed the BA-5567/U batteries into the AN/TVS-5.	_____	_____
b. Pressed eye against the eye guard.	_____	_____
c. Turned the ON-OFF/TUBE BRIGHTNESS control to the ON position.	_____	_____
d. Adjusted the ON-OFF/TUBE BRIGHTNESS control, as needed.	_____	_____
e. Moved the ON-OFF/RETICLE BRIGHTNESS control to the ON position.	_____	_____
f. Focused the reticle, using the diopter focus ring.	_____	_____
g. Focused the target field of view, using the objective focus ring.	_____	_____
3. Took the AN/TVS-5 out of operation.		
a. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
c. Removed the batteries from the AN/TVS-5.	_____	_____
4. Dismounted the AN/TVS-5 from the M2 HB machine gun.		
a. Removed the AN/TVS-5 from the M2 bracket.	_____	_____
b. Removed the M2 bracket from the M2 HB machine gun.	_____	_____
5. Completed all performance measures within five minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 6

- TASK:** Mount, place into operation, and dismount the AN/TVS-5 night-vision sight (using the MK 19 machine gun).
- CONDITIONS:** Given a MK 19 machine gun mounted on the MK 64 weapon systems mount and the M3 tripod, an AN/TVS-5 night-vision sight, and TM 11-5855-214-10.
- STANDARDS:** Within five minutes, the crew member will—
- Mount the AN/TVS-5 on the MK 19.
  - Place the AN/TVS-5 into operation.
  - Dismount the AN/TVS-5 from the MK 19.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- MK 19 machine gun.
- MK 64 mount.
- M3 tripod.
- Complete AN/TVS-5 and TM 11-5855-214-10.
- A 9/16-inch open-end wrench or an 8-inch crescent wrench.
- Two BA-5567/U batteries.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is cleared and mounted on the tripod securely.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to mount, place into operation, and dismount the AN/TVS-5 on the MK 19 machine gun. The weapon is clear. You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”



**PERFORMANCE CHECKLIST FOR STATION 6  
Mount, Place Into Operation, and Dismount the AN/TVS-5  
Night-Vision Sight (Using the MK 19 Machine Gun)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Mounted the AN/TVS-5 on the MK 19 machine gun.		
a. Mounted the M2 mounting bracket onto the MK 19 machine gun.	_____	_____
b. Mounted the AN/TVS-5 onto the M2 bracket.	_____	_____
2. Placed the AN/TVS-5 into operation.		
a. Installed the BA-5567/U batteries into the AN/TVS-5.	_____	_____
b. Pressed eye against the eye guard.	_____	_____
c. Moved the ON-OFF/TUBE BRIGHTNESS control to the ON position.	_____	_____
d. Adjusted the ON-OFF/TUBE BRIGHTNESS control, as needed.	_____	_____
e. Moved the ON-OFF/RETICLE BRIGHTNESS control to the ON position.	_____	_____
f. Focused the reticle using the diopter focus ring.	_____	_____
g. Focused the target field of view using the objective focus ring.	_____	_____
3. Took the AN/TVS-5 out of operation.		
a. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
c. Removed the batteries from the AN/TVS-5.	_____	_____
4. Dismounted the AN/TVS-5 from the MK 19 machine gun.		
a. Removed the AN/TVS-5 from the M2 bracket.	_____	_____
b. Removed the M2 bracket from the MK 19 machine gun.	_____	_____
5. Completed all performance measures within five minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 7

- TASK:** Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M60 machine gun).
- CONDITIONS:** Given an M60 machine gun, an AN/PVS-4 night-vision sight, and TM 11-5855-213-10.
- STANDARDS:** Within eight minutes, the crew member will—
- Mount the AN/PVS-4 night-vision sight on the M60 machine gun.
  - Place the AN/PVS-4 night-vision sight into operation.
  - Dismount the AN/PVS-4 night-vision sight from the M60 machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M60 machine gun.
- Complete AN/PVS-4 and TM 11-5855-213-10.
- FM 23-67.
- Two BA-5567/U batteries.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is cleared.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to mount the AN/PVS-4 on the M60 machine gun, place the AN/PVS-4 into operation, and dismount the AN/PVS-4 from the M60 machine gun. The weapon is clear. You have eight minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after eight minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 7  
Mount, Place Into Operation, and Dismount the AN/PVS-4  
Night-Vision Sight (Using the M60 Machine Gun)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Mounted the AN/PVS-4 on the M60 machine gun.		
a. Pulled the bolt to the rear.	_____	_____
b. Moved the safety switch to the SAFE position.	_____	_____
c. Raised the feed tray cover.	_____	_____
d. Removed the hinge pin from the cover assembly.	_____	_____
e. Placed the hinge pin in the storage position on the left side of the mounting bracket.	_____	_____
f. Inserted the latch into the hinge pin to secure.	_____	_____
g. Placed the mounting bracket on top of the feed tray cover.	_____	_____
h. Inserted the longer hinge pin, supplied with the bracket, through the bracket and cover assembly.	_____	_____
i. Secured the mounting bracket by firmly tightening the wing nuts.	_____	_____
j. Closed the feed tray cover.	_____	_____
k. Mounted the sight to the bracket.	_____	_____
l. Tightened the screw to secure the sight.	_____	_____
2. Placed the sight into operation.		
a. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
c. Installed the batteries.	_____	_____
d. Pressed eye against the eyeguard.	_____	_____
e. Moved the ON-OFF/TUBE BRIGHTNESS control to the ON position.	_____	_____

	GO	NO-GO
f. Adjusted the ON-OFF/TUBE BRIGHTNESS control, as needed.	_____	_____
g. Moved the ON-OFF/RETICLE BRIGHTNESS control to the ON position.	_____	_____
h. Adjusted the ON-OFF/RETICLE BRIGHTNESS control, as needed.	_____	_____
i. Turned the diopter focus ring until a clear image of the reticle was obtained.	_____	_____
j. Turned the objective focus ring until a clear field of view was obtained.	_____	_____
3. Dismounted the AN/PVS-4 from an M60 machine gun.		
a. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
c. Removed the batteries.	_____	_____
d. Removed the sight from the mounting bracket.	_____	_____
e. Removed the mounting bracket from the feed tray cover.	_____	_____
4. Completed all performance measures within eight minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 7A

- TASK:** Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M240B machine gun).
- CONDITIONS:** Given an M240B machine gun, an AN/PVS-4 night-vision sight, and TM 11-5855-213-10.
- STANDARDS:** Within eight minutes, the crew member will—
- Mount the AN/PVS-4 night-vision sight on the M240B machine gun.
  - Place the AN/PVS-4 night-vision sight into operation.
  - Dismount the AN/PVS-4 night-vision sight from the M240B machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M240B machine gun.
- Complete AN/PVS-4 and TM 11-5855-213-10.
- FM 23-67.
- Two BA-5567/U batteries.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is cleared.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to mount the AN/PVS-4 on the M240B machine gun, place the AN/PVS-4 into operation, and dismount the AN/PVS-4 from the M240B machine gun. The weapon is clear. You have eight minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after eight minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 7A  
Mount, Place Into Operation, and Dismount the AN/PVS-4  
Night-Vision Sight (Using the M240B Machine Gun)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Mounted the AN/PVS-4 on the M240B machine gun.		
a. Loosened the mounting knob located on the left side.	_____	_____
b. Placed the bar of the mount in a slot on the rail (made sure the mount did not hang over the edge of the rail).	_____	_____
c. Hand tightened the knob on the mount until two snaps were heard.	_____	_____
d. Confirmed zero.	_____	_____
2. Placed the sight into operation.		
a. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
c. Installed the batteries.	_____	_____
d. Pressed eye against the eyeguard.	_____	_____
e. Moved the ON-OFF/TUBE BRIGHTNESS control to the ON position.	_____	_____
f. Adjusted the ON-OFF/TUBE BRIGHTNESS control, as needed.	_____	_____
g. Moved the ON-OFF/RETICLE BRIGHTNESS control to the ON position.	_____	_____
h. Adjusted the ON-OFF/RETICLE BRIGHTNESS control, as needed.	_____	_____
i. Turned the diopter focus ring until a clear image of the reticle was obtained.	_____	_____
j. Turned the objective focus ring until a clear field of view was obtained.	_____	_____
3. Dismounted the AN/PVS-4 from an M60 machine gun.		
a. Loosened the mounting knob located on the left side.	_____	_____
b. Tilted the sight to the right and lifted upwards to dismount the sight.	_____	_____
4. Completed all performance measures within eight minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 8

- TASK:** Identify combat vehicles.
- CONDITIONS:** Given pictures or slide presentation of 30 combat vehicles at ranges between 500 and 1,200 meters, day or night environment.
- STANDARDS:** Within 11 minutes, the crew member must identify, by nomenclature, 27 of 30 combat vehicles, using day or night sights.

#### PERSONNEL, EQUIPMENT AND MATERIAL:

- Qualified CPL or above.
- Thirty vehicle pictures or slides.
- Twenty percent viewed through night sights.
- Twenty pictures will be taken from the proscribed list; the rest are at commander's discretion.
- Stopwatch.
- Clipboard and pen or pencil for each crew member.
- One helper (qualified E4 or below).

#### PRETEST PREPARATION:

Make sure the pictures include the 20 from the required list, 10 from the optional list, and that at least 6 are viewed through a night sight (see Table A-1).

#### TEST PLANNING TIME:

Administrative:	5 minutes
Test:	<u>11 minutes</u>
Total:	16 minutes

#### INSTRUCTIONS TO EXAMINEE:

*“At this station, you will be tested on your ability to identify combat vehicles. You must correctly identify 27 of 30 combat vehicles by nomenclature. You will have 12 seconds to view each vehicle and 10 seconds to write your answer on the performance checklist provided. Make sure you do not get out of sequence, or your answers will be incorrect. You have 11 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after 11 minutes, announce “STOP,” loud enough for the examinee to hear.

REQUIRED VEHICLES				
AMX40	ZSU23-4	T72M1	BRDM2	
Challenger	2S1	T80	BTR60PB	
Leopard 2	LAV-25	BMP1	M113	
M1 Abrams	T62	BMP2	Marder	
Merkava	T72	Bradley M2A2	Warrior	
OPTIONAL VEHICLES				
Main Battle Tanks				
T64	T64K	Type 62	Type 80	
T64A	T72 M84	Type 69	Type 90	
T64B	Type 59	Type 79		
Other Tanks				
AMX13	Centurion RE	M60A1	T34 Medium	
AMX30	Chieftain	M60A3	T54	
AMX30 SA	Leopard 1	PT76	T55	
Centurion	M48A5	PT76 Type 60	T55K	
Centurion 155	M551 Sheridan	T80U		
Antitank Systems				
ASU57	AT5 Spandrel	MT12	Type 52 75-mm	
ASU85	AT6 Spiral	RPG2	Recoilless Rifle	
AT1 Snapper	B10	RPG7	Type 56 RPG-2	
AT2 Swatter	PANHARD VCR HOT	SPG9	Type 70-1 62-mm	
AT3 Sagger	ITV M901	SS11 Harpoon ATGM	Rocket Launcher	
AT4 Spigot	Milan ATGM	Swingfire ATGM	Type 86	
Artillery (Self-Propelled/Towed)				
2S3	CGT F1	M109A6	M1985 MRL 240mm (SP)	
2S4	Dana 152-mm (SP)	M110A2	M1989 170-mm	
2S5	G-5 155-mm (towed)	M1972 122-mm	Majnoon 155-mm (SP)	
2S7	G-6 155-mm (SP)	M1973 152-mm	MKF3	
2S9	GCT 155-mm (SP)	M1974 152-mm (SP)	MLRS	
AL FAO 210-mm	GHN-45 155mm (towed)	M1975 130-mm (SP)	Type 54-1 122-mm	
Astros (MRL) 127-mm	M107	M1977 122-mm (SP)	Type 59 130-mm	
Astros (MRL) 180-mm	M109A1	M1978 170-mm (SP)	Type 85 122-mm	
Astros (MRL) 300-mm	M109A2	M1981 122-mm (SP)		
BM21	M109A3	M1985 MRL 122mm (SP)		
Antiaircraft				
AMX DCA 30-2	M163A1 Vulcan	ZPU4	ZU23	
Chaparral	Roland	2S6		
Gepard	S60	ZSU57-2		
Self-Propelled Mortar				
M106 107-mm	T54 160-mm	Type 85 120-mm	YW381 120-mm	
M125 81-mm	Type 85 82-mm	YW304 82-mm		
Miscellaneous				
Artillery Command and Reconnaissance Vehicle	AVLB Fox, NBC Reconnaissance	M728 CEV M88A1 M9 ACE	PRP-3	
Light Armor (APC/IFV/Reconnaissance)				
AML	Bradley M3A2	BTR70	Jaquar 2	Rooikat
AMX10	BRDM1	BTR80	Luchs	Saxon
AMX10P	BRDM2	BTRD	M113A3	Scimitar
AMX10RC	AT3BRDM2 AT5	Charrua	M3 APC (Fr)	Scorpion
BMD1	BRDM2 RKH	Condor	MCT (S)	Striker
BMD 1979/3	BRDM2 SA9	Cougar EE-9	Ferret MK1	VAB
BMD2	BRDM2 U	Cascavel	Ferret MK2	WZ523
BMP1K	BRM	EE-11	MTLB	WZ551
BMP1KSH	BRM 1	FOX	NFV-1NVH-1	YW531
Bradley M2	BTR152	FV432	OT64	YW534
Bradley M2A1	BTR152K	IPR	OT65	
Bradley M3	BTR50PK	IRM	PSZH-IV	
Bradley M3A1	BTR60PA Cmd	Jaquar 1	Ratel	

Table A-1. Combat Vehicle Slides.



**PERFORMANCE CHECKLIST FOR STATION 8**  
**Identify Combat Vehicles**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

- |           |           |
|-----------|-----------|
| 1. _____  | 16. _____ |
| 2. _____  | 17. _____ |
| 3. _____  | 18. _____ |
| 4. _____  | 19. _____ |
| 5. _____  | 20. _____ |
| 6. _____  | 21. _____ |
| 7. _____  | 22. _____ |
| 8. _____  | 23. _____ |
| 9. _____  | 24. _____ |
| 10. _____ | 25. _____ |
| 11. _____ | 26. _____ |
| 12. _____ | 27. _____ |
| 13. _____ | 28. _____ |
| 14. _____ | 29. _____ |
| 15. _____ | 30. _____ |

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## GUNNERY SKILLS TEST Overall Scoresheet

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

<b>TASK</b>	<b>GO</b>	<b>NO-GO</b>
1. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun.	_____	_____
1A. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun.	_____	_____
2. Clear, disassemble (field strip), assemble, set headspace and timing, perform a function check, load, and perform immediate action on an M2 HB machine gun.	_____	_____
3. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on a MK 19 machine gun.	_____	_____
4. Prepare a sector sketch, and engage targets using the sector sketch data.	_____	_____
5. Mount, place into operation, and dismount the AN/TVS-5 night-vision sight (using the M2 HB machine gun).	_____	_____
6. Mount, place into operation, and dismount the AN/TVS-5 night-vision sight (using the MK 19 machine gun).	_____	_____
7. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M60 machine gun).	_____	_____
7A. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M240B machine gun).	_____	_____
8. Identify combat vehicles.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## Appendix B

### TOW Gunnery Skills Test

The TGST is an evaluation tool with which the unit can determine readiness to move toward crew tasks and conduct live-fire gunnery to meet prescribed training levels. It is used to evaluate the crew member's ability to perform gunnery-related skills. It does not replace tasks in the soldier's manuals.

### Administrative Procedures

As a minimum, the appropriate tasks of the TGST must be administered—

- Quarterly.
- When crew members change positions.
- Before gunnery qualification, unless the crew members qualified within the past three months in their current vehicle position.

The TGST is administered using tasks, conditions, and standards, as well as training evaluation guidelines and performance checklists. At no time will tasks be deleted from the TGST; however, the commander may add tasks for a more comprehensive evaluation.

All members of the TOW squad should take the test. The commander and gunner must achieve a GO on all tasks.

The TGST should also be used as a diagnostic tool to determine the level and effectiveness of cross-training throughout the section.

### Prerequisites

Preliminary gunnery training must be conducted before administering the TGST.

### Evaluation Procedures

#### ADMINISTRATIVE PROCESS

The evaluator logs each crew member in on a roster at all stations and provides him with all materials and equipment displayed in the manner outlined in this guide. The evaluator must use the criterion checklist for each task. He informs the crew member of his performance on the task and directs him either to move to the next station or to further training. Only one crew member may be tested at a time, unless stated otherwise in the guideline.

#### ADMINISTRATIVE PROCEDURES FOR PERSONNEL RECEIVING A NO-GO

If the crew member does not achieve the standard indicated on the checklist, he receives a NO-GO. When a crew member receives a NO-GO, he must be critiqued, to include an explanation of his mistakes and what he must do to correct them. The crew member will not be retested until his immediate supervisor has initialed the scoresheet indicating that the individual has been retrained and is ready to retest. If a crew

member receives an additional NO-GO on the same task, he must return to be retested on another date.

## Evaluation Criteria

Either internal or external evaluators may evaluate the test; external evaluation is recommended.

The individuals performing the test must complete all actions outlined in the performance checklist within a specified time limit to achieve a GO for the task.

At the conclusion of each task, if the individual failed to meet the prescribed standards, he will be critiqued on those areas that caused him to fail the task and be directed to retake the test at a later date.

## Scoring

Personnel receive either a GO or a NO-GO on each task. NO-GOs are scored for—

- Failing to complete the task.
- Incorrectly performing task steps (or performing steps out of sequence).
- Failing to meet time standards.

## Performance Checklists

The performance checklist for all stations must be updated when new soldier's manuals and technical manuals are issued, to ensure standardization in training and testing.

## TEST ADMINISTRATIVE GUIDE

### Station 1

- TASK:** Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun.
- CONDITIONS:** Given a loaded M60 machine gun, placed on a flat surface.
- STANDARDS:** Within eight minutes, the crew member will—
- Clear (in sequence) and disassemble the M60 machine gun.
  - Assemble the M60 machine gun.
  - Perform a function check (in sequence) on the M60 machine gun.
  - Load (in sequence) the M60 machine gun.
  - Perform immediate action (in sequence) on the M60 machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M60 machine gun.
- Dummy, linked, 7.62-mm ammunition (five rounds per machine gun).
- Table (one per M60).
- FM 23-67.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is removed from the vehicle.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO THE CREWMAN:**

*“At this station, you will be tested on your ability to clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun. You must clear, perform a function check, load, and perform immediate action in sequence on the M60 machine gun. The weapon is not clear. You have eight minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after eight minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 1  
Clear, Disassemble (Field Strip), Assemble,  
Perform a Function Check, Load, and Perform Immediate  
Action on an M60 Machine Gun**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Cleared (in sequence) the M60 machine gun.		
a. Moved the safety switch to the FIRE position.	_____	_____
b. Pulled back on the charging handle and locked the bolt to the rear.	_____	_____
c. Moved the charging handle to the forward position.	_____	_____
d. Moved the safety switch to the SAFE position.	_____	_____
e. Opened the cover and removed the ammunition and link belt.	_____	_____
f. Raised the feed tray and inspected the chamber.	_____	_____
g. Closed the feed tray.	_____	_____
h. Closed the cover.	_____	_____
i. Moved the safety switch to the FIRE position.	_____	_____
j. Pulled back on the charging handle and held it there.	_____	_____
k. Pulled the trigger and allowed the charging handle to move forward.	_____	_____
2. Disassembled the M60 machine gun.		
a. Removed the stock.	_____	_____
b. Removed the buffer, drive spring, and guide.	_____	_____
c. Removed the operating rod and bolt assemblies.	_____	_____
d. Separated the bolt assembly from the operating rod assembly.	_____	_____
e. Removed the trigger mechanism group.	_____	_____
f. Removed the barrel group.	_____	_____
g. Removed the cover, feed tray, and hanger group.	_____	_____
h. Removed the forearm assembly.	_____	_____
3. Assembled the M60 machine gun.		
a. Replaced the forearm assembly.	_____	_____
b. Replaced the cover, feed tray, and hanger group.	_____	_____
c. Replaced the barrel group.	_____	_____
d. Replaced the trigger mechanism group.	_____	_____
e. Joined the bolt to the operating rod.	_____	_____

	GO	NO-GO
f. Replaced the bolt and operating rod group.	_____	_____
g. Replaced the buffer assembly.	_____	_____
h. Replaced the stock.	_____	_____
4. Performed a function check (in sequence) on the M60 machine gun.		
a. Moved the safety switch to the FIRE position.	_____	_____
b. Pulled back on the charging handle and locked the bolt to the rear.	_____	_____
c. Moved the charging handle to the forward position.	_____	_____
d. Closed the feed tray and cover.	_____	_____
e. Moved the safety switch to the SAFE position and pulled the trigger.	_____	_____
f. Checked to make sure the weapon would not fire.	_____	_____
g. Pulled back on the charging handle.	_____	_____
h. Moved the safety switch to the FIRE position and pulled the trigger.	_____	_____
i. Allowed the bolt to ease forward.	_____	_____
5. Loaded (in sequence) the M60 machine gun.		
a. Placed the ammunition on the feed tray.	_____	_____
b. Closed the feed tray.	_____	_____
c. Moved the safety switch to the FIRE position.	_____	_____
6. Performed immediate action (in sequence) on an M60 machine gun.		
<b>Note.</b> Have examinee attempt to fire the M60 machine gun.		
a. Pulled back on the charging handle.	_____	_____
b. Checked the ejection port for the ejected cartridge.	_____	_____
c. Moved the charging handle forward, and attempted to fire again.	_____	_____
7. Completed all performance measures within eight minutes.	_____	_____

**Note.** Clearing and function checks are performed in sequence IAW FM 23-67.

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_



## TEST ADMINISTRATIVE GUIDE

### Station 1A

- TASK:** Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun.
- CONDITIONS:** Given a loaded M240B machine gun, placed on a flat surface.
- STANDARDS:** Within eight minutes, the crew member will—
- Clear (in sequence) and disassemble the M240B machine gun.
  - Assemble the M240B machine gun.
  - Perform a function check (in sequence) on the M240B machine gun.
  - Load (in sequence) the M240B machine gun.
  - Perform immediate action (in sequence) on the M240B machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M240B machine gun.
- Dummy, linked, 7.62-mm ammunition (five rounds per machine gun).
- Table (one per M240B).
- FM 23-67.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is removed from the vehicle.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>7 minutes</u>
Total:	12 minutes

**INSTRUCTIONS TO THE CREWMAN:**

*“At this station, you will be tested on your ability to clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun. You must clear, perform a function check, load, and perform immediate action in sequence on the M240B machine gun. The weapon is not clear. You have seven minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after seven minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 1A**  
**Clear, Disassemble (Field Strip), Assemble,**  
**Perform a Function Check, Load, and Perform Immediate**  
**Action on an M240B Machine Gun**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	GO	NO-GO
1. Cleared (in sequence) the M240B machine gun.		
a. Moved the safety switch to the F (fire) position.	_____	_____
b. Pulled back on the cocking handle and locked the bolt to the rear.	_____	_____
c. Moved the safety switch to the S (safe) position.	_____	_____
d. Opened the cover.	_____	_____
e. Removed the source of ammunition.	_____	_____
f. Raised the feed tray.	_____	_____
g. Looked into the chamber for ammunition.	_____	_____
h. Lowered the feed tray.	_____	_____
i. Moved the safety switch to the F (fire) position.	_____	_____
j. Pulled back on the cocking handle and held it there.	_____	_____
k. Pulled the trigger and allowed the cocking handle to move forward to the close and lock position.	_____	_____
l. Closed the cover.	_____	_____
2. Disassembled the M240B machine gun.		
a. Cleared the weapon (if not previously cleared).	_____	_____
b. Removed the barrel assembly.	_____	_____
c. Removed the trigger housing assembly.	_____	_____
d. Removed the buttstock and buffer assembly.	_____	_____
e. Removed the drive spring rod assembly.	_____	_____
f. Removed the bolt and operating rod assembly.	_____	_____
g. Removed the cover assembly.	_____	_____
h. Removed the feed tray.	_____	_____
3. Assembled the M240B machine gun.		
a. Installed the feed tray.	_____	_____
b. Installed the cover assembly.	_____	_____
c. Installed the bolt and operating rod assembly.	_____	_____
d. Installed the buttstock and buffer assembly.	_____	_____
e. Installed the trigger housing assembly.	_____	_____
f. Installed the barrel assembly.	_____	_____
g. Installed the drive spring rod assembly.	_____	_____

	<b>GO</b>	<b>NO-GO</b>
4. Performed a function check (in sequence) on the M240B machine gun.		
a. Moved the safety switch to the F (fire) position.	_____	_____
b. Pulled back on the cocking handle and locked the bolt to the rear.	_____	_____
c. Moved the cocking handle to the forward (locked) position.	_____	_____
d. Moved the safety switch to the S (safe) position and pulled the trigger.	_____	_____
e. Checked to make sure the weapon would not fire.	_____	_____
f. Pulled back on the cocking handle.	_____	_____
g. Moved the safety switch to the F (fire) position and pulled the trigger.	_____	_____
h. Allowed the bolt to ease forward to the close and lock position.	_____	_____
5. Loaded (in sequence) the M240B machine gun.		
a. Moved the safety switch to the F (fire) position.	_____	_____
b. Charged the machine gun.	_____	_____
c. Moved the safety switch to the S (safe) position.	_____	_____
d. Opened the cover.	_____	_____
e. Removed the source of ammunition, if present.	_____	_____
f. Raised the feed tray.	_____	_____
g. Looked into the chamber for ammunition.	_____	_____
h. Lowered the feed tray.	_____	_____
i. Moved the safety switch to the F (fire) position, pulled back on the cocking handle, and pulled the trigger.	_____	_____
j. Allowed the bolt to ease forward to the close and lock position.	_____	_____
k. Placed the link belt in the feed tray over the belt holding paws, open link down.	_____	_____
l. Closed the cover.	_____	_____
6. Performed immediate action (in sequence) on the M240B machine gun (cold gun).		
a. Announced "STOPPAGE" or "MISFIRE."	_____	_____
b. Charged the M240B machine gun.	_____	_____
c. Attempted to fire.	_____	_____
d. If the gun did not fire, cleared the weapon.	_____	_____

	GO	NO-GO
7. Performed immediate action (in sequence) on the M240B machine gun (hot gun).		
a. Announced "STOPPAGE" or "MISFIRE."	_____	_____
b. Charged the M240B machine gun.	_____	_____
c. Attempted to fire.	_____	_____
d. Waited 15 minutes, and cleared the weapon.	_____	_____
8. Completed all performance measures within seven minutes.	_____	_____

**Note.** Clearing and function checks are performed in sequence IAW FM 23-67.

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 2

- TASK:** Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M60 machine gun).
- CONDITIONS:** Given an M60 machine gun, an AN/PVS-4 night-vision sight, and TM 11-5855-213-10.
- STANDARDS:** Within eight minutes, the crew member will—
- Mount the AN/PVS-4 night-vision sight on the M60 machine gun.
  - Place the AN/PVS-4 night-vision sight into operation.
  - Dismount the AN/PVS-4 night-vision sight from the M60 machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M60 machine gun.
- Complete AN/PVS-4 and TM 11-5855-213-10.
- FM 23-67.
- Two BA-5567/U batteries.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is cleared.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to mount the AN/PVS-4 on the M60 machine gun, place the AN/PVS-4 into operation, and dismount the AN/PVS-4 from the M60 machine gun. The weapon is clear. You have eight minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after eight minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 2  
Mount, Place Into Operation, and Dismount the AN/PVS-4  
Night-Vision Sight (Using the M60 Machine Gun)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	GO	NO-GO
1. Mounted the AN/PVS-4 on the M60 machine gun.		
a. Pulled the bolt to the rear.	_____	_____
b. Moved the safety switch to the SAFE position.	_____	_____
c. Raised the feedtray cover.	_____	_____
d. Removed the hinge pin from the cover assembly.	_____	_____
e. Placed the hinge pin in the storage position on the left side of the mounting bracket.	_____	_____
f. Inserted the latch into the hinge pin to secure.	_____	_____
g. Placed the mounting bracket on top of the feedtray cover.	_____	_____
h. Inserted the longer hinge pin, supplied with the bracket, through the bracket and cover assembly.	_____	_____
i. Secured the mounting bracket by firmly tightening the wing nuts.	_____	_____
j. Closed the feedtray cover.	_____	_____
k. Mounted the sight to the bracket.	_____	_____
l. Tightened the screw to secure the sight.	_____	_____
2. Placed the sight into operation.		
a. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
c. Installed the batteries.	_____	_____
d. Pressed eye against the eyeguard.	_____	_____
e. Moved the ON-OFF/TUBE BRIGHTNESS control to the ON position.	_____	_____

	<b>GO</b>	<b>NO-GO</b>
f. Adjusted the ON-OFF/TUBE BRIGHTNESS control, as needed.	_____	_____
g. Moved the ON-OFF/RETICLE BRIGHTNESS control to the ON position.	_____	_____
h. Adjusted the ON-OFF/RETICLE BRIGHTNESS control, as needed.	_____	_____
i. Turned the diopter focus ring until a clear image of the reticle was obtained.	_____	_____
j. Turned the objective focus ring until a clear field of view was obtained.	_____	_____
3. Dismounted the AN/PVS-4 from an M60 machine gun.		
a. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
c. Removed the batteries.	_____	_____
d. Removed the sight from the mounting bracket.	_____	_____
e. Removed the mounting bracket from the feedtray cover.	_____	_____
4. Completed all performance measures within eight minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 2A

- TASK:** Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M240B machine gun).
- CONDITIONS:** Given an M240B machine gun, an AN/PVS-4 night-vision sight, and TM 11-5855-213-10.
- STANDARDS:** Within eight minutes, the crew member will—
- Mount the AN/PVS-4 night-vision sight on the M240B machine gun.
  - Place the AN/PVS-4 night-vision sight into operation.
  - Dismount the AN/PVS-4 night-vision sight from the M240B machine gun.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- M240B machine gun.
- Complete AN/PVS-4 and TM 11-5855-213-10.
- FM 23-67.
- Two BA-5567/U batteries.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the weapon is cleared.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>8 minutes</u>
Total:	13 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to mount the AN/PVS-4 on the M240B machine gun, place the AN/PVS-4 into operation, and dismount the AN/PVS-4 from the M240B machine gun. The weapon is clear. You have eight minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after eight minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”



**PERFORMANCE CHECKLIST FOR STATION 2A  
Mount, Place Into Operation, and Dismount the AN/PVS-4  
Night-Vision Sight (Using the M240B Machine Gun)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Mounted the AN/PVS-4 on the M240B machine gun.		
a. Loosened the mounting knob located on the left side.	_____	_____
b. Placed the bar of the mount in a slot on the rail (made sure the mount did not hang over the edge of the rail).	_____	_____
c. Hand tightened the knob on the mount until two snaps were heard.	_____	_____
d. Confirmed zero.	_____	_____
2. Placed the sight into operation.		
a. Moved the ON-OFF/TUBE BRIGHTNESS control to the OFF position.	_____	_____
b. Moved the ON-OFF/RETICLE BRIGHTNESS control to the OFF position.	_____	_____
c. Installed the batteries.	_____	_____
d. Pressed eye against the eyeguard.	_____	_____
e. Moved the ON-OFF/TUBE BRIGHTNESS control to the ON position.	_____	_____
f. Adjusted the ON-OFF/TUBE BRIGHTNESS control, as needed.	_____	_____
g. Moved the ON-OFF/RETICLE BRIGHTNESS control to the ON position.	_____	_____
h. Adjusted the ON-OFF/RETICLE BRIGHTNESS control, as needed.	_____	_____
i. Turned the diopter focus ring until a clear image of the reticle was obtained.	_____	_____
j. Turned the objective focus ring until a clear field of view was obtained.	_____	_____
3. Dismounted the AN/PVS-4 from an M60 machine gun.		
a. Loosened the mounting knob located on the left side.	_____	_____
b. Tilted the sight to the right and lifted upwards to dismount the sight.	_____	_____
4. Completed all performance measures within eight minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 3

- TASK:** Load, arm, and unload an encased TOW missile.
- CONDITIONS:** Given an assembled, vehicle-mounted TOW launcher, an encased missile (forward handling ring and electrical connector dust cover in place), and a sector of fire.
- STANDARDS:** Within five minutes, the crew member will—
- Load an encased TOW missile.
  - Arm the TOW launcher.
  - Unload the TOW missile.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- Complete TOW system (vehicle mounted).
- Encased TOW missile simulation round.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the complete vehicle-mounted system is assembled.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to load, arm, and unload an encased TOW missile. You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

### PERFORMANCE CHECKLIST FOR STATION 3 Load, Arm, and Unload an Encased TOW Missile

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	GO	NO-GO
1. Loaded an encased TOW missile.		
a. Inspected the missile.	_____	_____
b. Picked up the missile properly.	_____	_____
c. Removed the forward handling ring and clamp.	_____	_____
d. Placed the missile into the TOW launcher correctly.	_____	_____
e. Lowered and locked the bridge clamp.	_____	_____
2. Armed an encased TOW missile.		
a. Made sure the backblast area was clear.	_____	_____
b. Raised the arming lever.	_____	_____
c. Announced "UP" to the gunner.	_____	_____
3. Unloaded an encased TOW missile.		
a. Followed the correct procedure for unloading a fired TOW missile.		
(1) Raised the locking handle.	_____	_____
(2) Raised the arming lever.	_____	_____
(3) Removed the launch container.	_____	_____
(4) Made sure the launch tube was clear of foreign matter.	_____	_____
b. Followed the correct procedure for an unloading an unfired TOW missile.		
(1) Lowered the arming lever.	_____	_____
(2) Raised the locking handle.	_____	_____
(3) Opened the bridge clamp.	_____	_____
(4) Removed the missile.	_____	_____
(5) Replaced the forward handling ring and clamp.	_____	_____
(6) Tagged the missile (included the date, unit, and name).	_____	_____

**GO**    **NO-GO**

4. Completed all performance measures within five minutes.    \_\_\_\_\_

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 4

- TASK:** Perform immediate action procedures for a hangfire or misfire of an M220-A2 TOW missile launcher (mounted on an M966 HMMWV).
- CONDITIONS:** Given an M220-A2 TOW launcher (loaded and ready to fire) mounted on an M966 HMMWV, an additional encased missile, one squad member to assist, and a sector of fire.
- STANDARDS:** Within five minutes, perform immediate action procedures for a hangfire or misfire.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- An M966 with BII.
- Complete TOW system.
- Two encased TOW missile simulation rounds.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the complete TOW system is installed.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to perform immediate action procedures for a hangfire or misfire of an M220-A2 (mounted on an M966). You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 4  
Perform Immediate Action Procedures for a Hangfire or Misfire  
of an M220-A2 TOW Missile Launcher (Mounted on an  
M966 HMMWV)**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

**GO      NO-GO**

**Note.** Have the examinee attempt to fire the weapon.

- |  |       |       |
|--|-------|-------|
| 1. Continued to track the target for one minute.                 | _____ | _____ |
| 2. Pressed the trigger a second time.                            | _____ | _____ |
| 3. Announced "MISFIRE" ("HANGFIRE").                             | _____ | _____ |
| 4. Checked the battery in the MGS.                               | _____ | _____ |
| 5. Checked the MGS coil cable connection.                        | _____ | _____ |
| 6. Checked the bridge clamp.                                     | _____ | _____ |
| 7. Made sure the missile was armed.                              | _____ | _____ |
| 8. Pressed the trigger.  | _____ | _____ |
| 9. Continued to track the target for one minute.                 | _____ | _____ |
| 10. Lowered the trigger protective cover.                        | _____ | _____ |
| 11. Lowered the arming lever.                                    | _____ | _____ |
| 12. Locked the elevation (eight degrees down) and azimuth.       | _____ | _____ |
| 13. Removed the missile and placed it the correct distance away. | _____ | _____ |
| 14. Reloaded the launcher.                                       | _____ | _____ |
| 15. Completed all performance measures within five minutes.      | _____ | _____ |

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 5

- TASK:** Conduct a system check-out procedure and preoperational inspection on an M220-A2 TOW launcher system and encased missile.
- CONDITIONS:** Given an M220-A2 TOW launcher mounted on an M966 HMMWV, an encased missile, and TM 9-1425-450-12.
- STANDARDS:** Within 15 minutes, the crew member will—
- Conduct the system check-out procedure to determine if the launcher will function properly, and correct or report any malfunctions.
  - Perform the preoperational inspection of the encased missile, and report any defects.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- An M966 with BIL.
- Complete TOW system.
- Encased TOW missile simulation round.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the complete TOW system is installed.

**TEST PLANNING TIME:**

Administrative: 5 minutes  
Test: 15 minutes  
Total: 20 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to conduct a system check-out procedure and preoperational inspection on an M220-A2 TOW launcher system and encased missile. You have 15 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after 15 minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”



**PERFORMANCE CHECKLIST FOR STATION 5  
Conduct a System Check-out Procedure and Preoperational  
Inspection on an M220-A2 TOW Launcher System and  
Encased Missile**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Conducted a system check-out procedure.		
a. Boresighted the weapon.	_____	_____
b. Reported or corrected any malfunctions.	_____	_____
2. Performed preoperational inspection of the encased missile.		
a. Inspected the humidity indicator.	_____	_____
b. Inspected the indexing indicator.	_____	_____
c. Reported all deficiencies.	_____	_____
3. Completed all performance measures within 15 minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

**TEST ADMINISTRATIVE GUIDE****Station 6**

- TASK:** Identify combat vehicles.
- CONDITIONS:** Given pictures or a slide presentation of 30 combat vehicles at ranges between 500 and 1,200 meters, day or night environment.
- STANDARDS:** Within 11 minutes, the crew member must identify, by nomenclature, 27 of 30 combat vehicles, using day or night sights.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- Thirty vehicle pictures or slides.
- Twenty percent viewed through night sights.
- Twenty pictures will be taken from the proscribed list; the rest are at commander's discretion.
- Stopwatch.
- Clipboard and pen or pencil for each crew member.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the pictures include the 20 from the required list, 10 from the optional list, and that at least 6 are viewed through a night sight (see Table B-1).

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>11 minutes</u>
Total:	16 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to identify combat vehicles. You must correctly identify 27 of 30 vehicles by nomenclature. You will have 12 seconds to view each vehicle and 10 seconds to write your answer on the performance checklist provided. Make sure you do not get out of sequence, or your answers will be incorrect. You have 11 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after 11 minutes, announce “STOP,” loud enough for the examinee to hear.

REQUIRED VEHICLES				
AMX40	ZSU23-4	T72M1	BRDM2	
Challenger	2S1	T80	BTR60PB	
Leopard 2	LAV-25	BMP1	M113	
M1 Abrams	T62	BMP2	Marder	
Merkava	T72	Bradley M2A2	Warrior	
OPTIONAL VEHICLES				
Main Battle Tanks				
T64	T64K	Type 62	Type 80	
T64A	T72 M84	Type 69	Type 90	
T64B	Type 59	Type 79		
Other Tanks				
AMX13	Centurion RE	M60A1	T34 Medium	
AMX30	Chieftain	M60A3	T54	
AMX30 SA	Leopard 1	PT76	T55	
Centurion	M48A5	PT76 Type 60	T55K	
Centurion 155	M551 Sheridan	T80U		
Antitank Systems				
ASU57	AT5 Spandrel	MT12	Type 52 75-mm	
ASU85	AT6 Spiral	RPG2	Recoilless Rifle	
AT1 Snapper	B10	RPG7	Type 56 RPG-2	
AT2 Swatter	PANHARD VCR HOT	SPG9	Type 70-1 62-mm	
AT3 Sagger	ITV M901	SS11 Harpoon ATGM	Rocket Launcher	
AT4 Spigot	Milan ATGM	Swingfire ATGM	Type 86	
Artillery (Self-Propelled/Towed)				
2S3	CGT F1	M109A6	M1985 MRL 240mm (SP)	
2S4	Dana 152-mm (SP)	M110A2	M1989 170-mm	
2S5	G-5 155-mm (towed)	M1972 122-mm	Majnoon 155-mm (SP)	
2S7	G-6 155-mm (SP)	M1973 152-mm	MKF3	
2S9	GCT 155-mm (SP)	M1974 152-mm (SP)	MLRS	
AL FAO 210-mm	GHN-45 155mm (towed)	M1975 130-mm (SP)	Type 54-1 122-mm	
Astros (MRL) 127-mm	M107	M1977 122-mm (SP)	Type 59 130-mm	
Astros (MRL) 180-mm	M109A1	M1978 170-mm (SP)	Type 85 122-mm	
Astros (MRL) 300-mm	M109A2	M1981 122-mm (SP)		
BM21	M109A3	M1985 MRL 122mm (SP)		
Antiaircraft				
AMX DCA 30-2	M163A1 Vulcan	ZPU4	ZU23	
Chaparral	Roland	2S6		
Gepard	S60	ZSU57-2		
Self-Propelled Mortar				
M106 107-mm	T54 160-mm	Type 85 120-mm	YW381 120-mm	
M125 81-mm	Type 85 82-mm	YW304 82-mm		
Miscellaneous				
Artillery Command and Reconnaissance Vehicle	AVLB Fox, NBC Reconnaissance	M728 CEV M88A1 M9 ACE	PRP-3	
Light Armor (APC/IFV/Reconnaissance)				
AML	Bradley M3A2	BTR70	Jaquar 2	Rooikat
AMX10	BRDM1	BTR80	Luchs	Saxon
AMX10P	BRDM2	BTRD	M113A3	Scimitar
AMX10RC	AT3BRDM2 AT5	Charrua	M3 APC (Fr)	Scorpion
BMD1	BRDM2 RKH	Condor	MCT (S)	Striker
BMD 1979/3	BRDM2 SA9	Cougar EE-9	Ferret MK1	VAB
BMD2	BRDM2 U	Cascavel	Ferret MK2	WZ523
BMP1K	BRM	EE-11	MTLB	WZ551
BMP1KSH	BRM 1	FOX	NFV-1NVH-1	YW531
Bradley M2	BTR152	FV432	OT64	YW534
Bradley M2A1	BTR152K	IPR	OT65	
Bradley M3	BTR50PK	IRM	PSZH-IV	
Bradley M3A1	BTR60PA Cmd	Jaquar 1	Ratel	

Table B-1. Combat Vehicle Slides.

**PERFORMANCE CHECKLIST FOR STATION 6**  
**Identify Combat Vehicles**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

1. \_\_\_\_\_ 16. \_\_\_\_\_

2. \_\_\_\_\_ 17. \_\_\_\_\_

3. \_\_\_\_\_ 18. \_\_\_\_\_

4. \_\_\_\_\_ 19. \_\_\_\_\_

5. \_\_\_\_\_ 20. \_\_\_\_\_

6. \_\_\_\_\_ 21. \_\_\_\_\_

7. \_\_\_\_\_ 22. \_\_\_\_\_

8. \_\_\_\_\_ 23. \_\_\_\_\_

9. \_\_\_\_\_ 24. \_\_\_\_\_

10. \_\_\_\_\_ 25. \_\_\_\_\_

11. \_\_\_\_\_ 26. \_\_\_\_\_

12. \_\_\_\_\_ 27. \_\_\_\_\_

13. \_\_\_\_\_ 28. \_\_\_\_\_

14. \_\_\_\_\_ 29. \_\_\_\_\_

15. \_\_\_\_\_ 30. \_\_\_\_\_

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 7

- TASK:** Determine if a target can be engaged by an M220-series TOW launcher system.
- CONDITIONS:** Given a TOW launcher system (mounted on an M966 HMMWV and positioned to fire) and ten scaled targets.
- STANDARDS:** Within one minute, using either the night sight, binoculars, or day sight tracker, determine whether each of the ten targets is within range and can be engaged.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- An M966 with BII.
- Complete TOW launcher system.
- Ten scaled targets.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the complete TOW system is installed. Target array consists of ten vehicles; a minimum of two targets must be placed out of range and two targets placed where they cannot be engaged due to obstacles.

**TEST PLANNING TIME:**

Administrative: 5 minutes  
 Test: 1 minutes  
 Total: 6 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to determine if a target can be engaged by an M220-series launcher system. You must correctly identify which targets can be engaged. You have one minute to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after one minute, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”



## TEST ADMINISTRATIVE GUIDE

### Station 8

- TASK:** Prepare an antiarmor range card.
- CONDITIONS:** Given a TOW system mounted on an M966 HMMWV, a designated firing position, a sector of fire, target reference points, a blank standard range card, a pencil, and a compass.
- STANDARDS:** Within 15 minutes, the crew member will prepare an antiarmor range card that illustrates a representative sketch of the terrain including—
- Weapon symbol.
  - Location of weapon system (a series of arrows drawn from a reference point to the weapon position, to include azimuth and distance).
  - Sector of fire:
    - Complete boundaries (left and right sector limits).
    - All deadspace.
    - Maximum engagement lines (MEL).
  - All prominent terrain features (natural and man-made).
  - All target locations and TRPs:
    - Deflection.
    - Elevation.
    - Range.
    - Ammunition.
    - Description.
    - TRP number.
  - Magnetic north arrow.
  - Marginal data or data section that shows—
    - Interval between circles.
    - Unit designation.
    - Time and date of preparation.
    - Firing position designation (primary, alternate, or supplementary).

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- Complete TOW launcher system (mounted on an M966 HMMWV).
- DA Form 5517-R (Standard Range Card).
- Compass.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that an appropriate sector of fire is available.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>15 minutes</u>
Total:	20 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to complete an antiarmor range card. You will be given the following information: type of position, type of weapon system, left and right limits, and any target reference points. (Give the information to the crew.) You have 15 minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after 15 minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”



**PERFORMANCE CHECKLIST FOR STATION 8  
Prepare an Antiarmor Range Card**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Completed an antiarmor range card.		
a. Used the correct weapon symbol.	_____	_____
b. Marked the location of the weapon system from a reference point.	_____	_____
c. Marked the sector of fire:		
(1) Left and right limits.	_____	_____
(2) Deadspace.	_____	_____
(3) MELs.	_____	_____
(4) Target information for all TRPs and deflection for mounted weapons other than TOW (can be given by clock position).	_____	_____
d. Used magnetic north indicator.	_____	_____
e. Completed the identification data:		
(1) Unit designation.	_____	_____
(2) Time and date of preparation.	_____	_____
(3) Type of firing position.	_____	_____
(4) Bumper number.	_____	_____
f. Marked the position properly (staked it in).	_____	_____
2. Completed all performance measures within 15 minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 9

- TASK:** Assemble the M220-A2 TOW launcher system.
- CONDITIONS:** Given a disassembled M220-A2 TOW launcher system, with all components.
- STANDARDS:** Within five minutes, assemble the M220-A2 TOW launcher system so it is safe to fire.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- Complete M220-A2 TOW launcher system.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the ground is solid and slopes less than 30 degrees.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to assemble the M220-A2 TOW launcher system. The weapon has been cleared. You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 9**  
**Assemble the M220-A2 TOW Launcher System**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Set up the tripod.	_____	_____
2. Installed the traversing unit.	_____	_____
3. Installed the launch tube.	_____	_____
4. Mounted the day sight tracker.	_____	_____
5. Mounted the night sight tracker.	_____	_____
6. Installed battery in the MGS.	_____	_____
7. Connected the coil to the MGS.	_____	_____
8. Connected the battery power conditioner to the night sight.	_____	_____
9. Completed all performance measures within five minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 10

- TASK:** Install an M220-A2 TOW launcher system and an encased missile on an M966 HMMWV.
- CONDITIONS:** Given an M966 HMMWV, a complete M220-A2 TOW launcher system that has passed the system check-out, an encased TOW missile, and a TOW crew.
- STANDARDS:** Within five minutes, install and secure (with available straps) an M220-A2 TOW launcher system on an M966 HMMWV.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- An M966 with BII.
- Complete M220-A2 TOW launcher system that has passed the system check-out.
- Encased missile simulation round.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that all equipment is removed from the M966 HMMWV.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to install an M220-A2 TOW launcher system and an encased missile on an M966 HMMWV. You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.”* (Start the time.)

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 10  
Install an M220-A2 TOW Launcher System and an Encased  
Missile on an M966 HMMWV**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Adjusted the gunner's platform.	_____	_____
2. Installed the MGS (with the TOW vehicle power cable or battery assembly).	_____	_____
3. Installed the battery or batteries.	_____	_____
4. Stowed the collimator on the right shelf.	_____	_____
5. Loaded the missile and secured all latches and straps.	_____	_____
6. Stowed the night sight tracker.	_____	_____
7. Stowed the traversing unit.	_____	_____
8. Stowed the launch tube.	_____	_____
9. Stowed the optical sight.	_____	_____
10. Stowed the battery power conditioner.	_____	_____
11. Stowed the AN/RAS-4 battery case or spare battery pack.	_____	_____
12. Stowed the tripod.	_____	_____
13. Completed all performance measures within five minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TEST ADMINISTRATIVE GUIDE

### Station 11

- TASK:** Place an M966 HMMWV in the ready-to-fire configuration.
- CONDITIONS:** Given an M966 HMMWV, a complete M220-A2 TOW launcher system installed on the M966, and a TOW crew.
- STANDARDS:** Within five minutes, prepare the M966 HMMWV and the M220-A2 TOW launcher system for firing.

**PERSONNEL, EQUIPMENT AND MATERIAL:**

- Qualified CPL or above.
- An M966 HMMWV with BII.
- Complete M220-A2 TOW launcher system installed.
- TM 9-1425-450-12.
- Stopwatch.
- Clipboard and pen.
- One helper (qualified E4 or below).

**PRETEST PREPARATION:**

Make sure the equipment is operational, and that the complete TOW launcher system is installed.

**TEST PLANNING TIME:**

Administrative:	5 minutes
Test:	<u>5 minutes</u>
Total:	10 minutes

**INSTRUCTIONS TO EXAMINEE:**

*“At this station, you will be tested on your ability to place an M966 HMMWV in the ready-to-fire configuration. You have five minutes to complete this test. Do you understand these instructions? (Answer questions.) You may begin.” (Start the time.)*

If the examinee has not completed the task after five minutes, announce “STOP,” loud enough for the examinee to hear.

**Note.** If it appears that the examinee is going to damage the equipment or injure himself, announce “STOP.”

**PERFORMANCE CHECKLIST FOR STATION 11**  
**Place an M966 HMMWV in the Ready-to-Fire Configuration**

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

	<b>GO</b>	<b>NO-GO</b>
1. Released the hatch cover latches.	_____	_____
2. Removed the MGS from the stowed position (removed the MGS cover).	_____	_____
3. Positioned the weapon station.	_____	_____
4. Installed the MGS on the tray.	_____	_____
5. Installed the traversing unit.	_____	_____
6. Installed the launch tube.	_____	_____
7. Connected the coil cable to the MGS.	_____	_____
8. Installed the optical sight.	_____	_____
9. Installed the night sight.	_____	_____
10. Connected all cables.	_____	_____
11. Completed all performance measures within five minutes.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_

## TOW GUNNERY SKILLS TEST Overall ScoreSheet

NAME \_\_\_\_\_ UNIT \_\_\_\_\_

GRADE \_\_\_\_\_ DUTY POSITION \_\_\_\_\_

<b>TASK</b>	<b>GO</b>	<b>NO-GO</b>
1. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M60 machine gun.	_____	_____
1A. Clear, disassemble (field strip), assemble, perform a function check, load, and perform immediate action on an M240B machine gun.	_____	_____
2. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M60 machine gun).	_____	_____
2A. Mount, place into operation, and dismount the AN/PVS-4 night-vision sight (using the M240B machine gun).	_____	_____
3. Load, arm, and unload an encased TOW missile.	_____	_____
4. Perform immediate action procedures for a hangfire or misfire of an M220-A2 TOW missile launcher (mounted on an M966 HMMWV).	_____	_____
5. Conduct a system check-out procedure and preoperational inspection on an M220-A2 TOW launcher system and encased missile.	_____	_____
6. Identify combat vehicles.	_____	_____
7. Determine if a target can be engaged by an M220-series TOW launcher system.	_____	_____
8. Prepare an antiarmor range card.	_____	_____
9. Assemble the M220-A2 TOW launcher system.	_____	_____
10. Install an M220-A2 TOW launcher system and an encased missile on an M966 HMMWV.	_____	_____
11. Place an M966 HMMWV in the ready-to-fire configuration.	_____	_____

EVALUATOR'S NAME: \_\_\_\_\_

TEST DATE: \_\_\_\_\_

OVERALL SCORE: GO/NO-GO

REMARKS: \_\_\_\_\_

\_\_\_\_\_



## Appendix C

### Scout Section Gunnery Tactical Tasks

The focus of tactical training must be on the scout's primary mission of collecting and reporting information. The scout's ability to use his combat resources (direct- and indirect-fire assets) effectively while remaining undetected on the battlefield must also be evaluated.

This appendix contains performance checklists that may be used to evaluate the tactical skills of a scout section. It is recommended that these checklists be used to evaluate the tactical portion of the scout section tables (see Chapter 13). Commanders may add subtasks to the checklists to reflect their METL more accurately. To evaluate tasks not included in this appendix, the evaluator may develop performance checklists using ARTEP 17-57-10-MTP. The references used to develop the checklists in this appendix are given at the beginning of each task. These references may be needed to perform the task.

**Note.** If a particular member (section sergeant) of the scout section performs a particular performance measure, it is stated in that performance measure; the section as a whole performs all other performance measures.

- TASK:** Execute actions on contact (17-3-1021) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** While moving, the section encounters the enemy. The section may or may not be engaged by the enemy.
- STANDARDS:** The section defines the enemy location and makes a recommendation.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Deployed and reported.			
a. The enemy engaged: The section returned fire, moved rapidly to a covered and concealed position, and sent a report to the platoon leader.	_____	_____	_____
b. The enemy did not engage: The section moved rapidly to a covered and concealed position and sent a report to the platoon leader.	_____	_____	_____
c. The section did not contact or see the enemy: The section did not send a report, but moved to a covered position or provided overwatch.	_____	_____	_____
2. Developed the situation.			
a. Moved to a position where the section sergeant could best observe the enemy.	_____	_____	_____
b. Gathered information about the enemy positions and equipment.	_____	_____	_____
c. Moved (if not in contact) to the flank of the enemy position and attempted to further refine information about the enemy.	_____	_____	_____
d. On order, provided continuous suppression on the enemy position (either direct or indirect fire).	_____	_____	_____
e. Determined enemy—			
(1) Location.	_____	_____	_____
(2) Composition.	_____	_____	_____
(3) Strength.	_____	_____	_____
(4) Weapon orientations.	_____	_____	_____
(5) Obstacles.	_____	_____	_____
(6) Flanks.	_____	_____	_____
(7) Supporting units.	_____	_____	_____
(8) Covered and concealed approaches into the enemy flank.	_____	_____	_____
3. Recommended a course of action to the platoon leader (section sergeant).	_____	_____	_____
4. Chose a course of action.	_____	_____	_____

- TASK:** Report enemy information (071-331-0803) (STP 21-1-SMCT).
- CONDITIONS:** The section can see enemy soldiers or vehicles with the naked eye or binoculars.
- STANDARDS:** The section makes a complete and accurate oral or written report to the platoon leader describing each point of interest expressed by the key word SALUTE.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
Reported all information quickly, completely, and accurately.			
a. Reported size.	_____	_____	_____
b. Described activity.	_____	_____	_____
c. Gave location.	_____	_____	_____
d. Described unit.	_____	_____	_____
e. Reported time.	_____	_____	_____
f. Described or identified equipment.	_____	_____	_____

**Example.** Spot Report.

**ALPHA:** Observer or source.

**BRAVO:** What is observed. (S-A-L-U-T-E)

S—Size (Number of sighted personnel and vehicles.)

A—Activity (What the enemy is doing.)

L—Location (May be descriptive; need not be grid or reference.)

U—Unit (Patches, signs, or markings.)

T—Time (Time the activity was observed.)

E—Equipment (All equipment associated with the activity.)

**CHARLIE:** Actions or recommendations.

**TASK:** Call for and adjust indirect fire (FM 17-98).

**CONDITIONS:** Given binoculars, a radio, an SOI, a compass, a pencil, a coordinate scale, a 1:50,000-scale map of the target area, the grid location of friendly troops, and a firing unit supporting with HE and quick firing into the impact area.

**STANDARDS:** The section determines the target location (within 250 meters of its actual location), makes the initial call for fire within 60 seconds after the target is identified, and adjusts the fire within 10 seconds after the round impacts. Observers adjust the indirect fire on the enemy personnel, weapons, or equipment to prevent fire affecting friendly forces. Rounds impact within 250 meters of the target.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Determined the target location by grid, shift, or polar method.	_____	_____	_____
2. Determined the direction to the target.	_____	_____	_____
3. Transmitted the call for fire in three parts.	_____	_____	_____
4. Announced "DANGER CLOSE," if applicable.	_____	_____	_____
5. Adjusted fire on the target using the bracketing method.	_____	_____	_____
6. Announced "END OF MISSION" and status of target.	_____	_____	_____

- TASK:** Conduct a tactical movement (17-3-1016) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** The section must move from one location to another. Enemy contact is possible or expected.
- STANDARDS:** The section executes the appropriate technique of movement (traveling, traveling overwatch, or bounding overwatch) and reaches its destination without significant loss of personnel or equipment, or breaches of security.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Selected the technique of movement (traveling, traveling overwatch, or bounding overwatch), depending on the enemy situation.	_____	_____	_____
2. Moved on designated axis or route.			
a. Moved in designated formation IAW designated techniques of movement.	_____	_____	_____
b. Moved on designated axis or route.	_____	_____	_____
c. Reported control measures.	_____	_____	_____
d. Maintained mutual support and security.	_____	_____	_____
3. Executed bounding overwatch (enemy contact is expected).			
a. Maintained orientation along the designated axis or route. Each vehicle commander knew—			
(1) The direction to the enemy.	_____	_____	_____
(2) The location of the overwatch position.	_____	_____	_____
(3) The route and destination of the bounding element.	_____	_____	_____
(4) The location of the overwatch element.	_____	_____	_____
(5) What he could expect to do next.	_____	_____	_____
b. Maintained visual contact between the bounding and overwatch elements, whenever possible, depending on terrain.	_____	_____	_____
c. Used terrain-driving techniques, to include—			
(1) Cover and concealment.	_____	_____	_____
(2) Good observation and fields of fire.	_____	_____	_____
(3) Stationary weapon platform.	_____	_____	_____
(4) Immediate and controlled reaction to any threat.	_____	_____	_____
d. Dismounted scouts, as necessary, to provide security.	_____	_____	_____
e. Maintained all-around security (vehicle commanders).	_____	_____	_____

- TASK:** Control scout section fires (171-121-3005) (STP 17-19D23-SM).
- CONDITIONS:** Given TOE equipment and personnel, and a mission that requires section fire control and distribution.
- STANDARDS:** To avoid target overkill, the section uses each weapon in its best role and—
- Engages only targets that offer a high probability of hit.
  - Exposes only the vehicles that have the best shots and need to fire.
  - Destroys the most dangerous targets first.
  - Maintains combat loads as long as possible.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Maintained weapons-ready posture.	_____	_____	_____
2. Maintained weapon orientations of section vehicles.	_____	_____	_____
3. Selected and occupied firing positions.	_____	_____	_____
4. Prepared section sketches and range cards (defense).	_____	_____	_____
5. Issued a fire command to include—			
a. Alert.	_____	_____	_____
b. Ammunition.	_____	_____	_____
c. Description.	_____	_____	_____
d. Location.	_____	_____	_____
e. Control (optional).	_____	_____	_____
f. Execution.	_____	_____	_____
6. Sensed rounds and adjusted fires.	_____	_____	_____
7. Terminated engagement.	_____	_____	_____

- TASK:** Conduct a screen (17-3-1023) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** As part of a platoon, the section is ordered to screen a larger force. The enemy situation is unknown.
- STANDARDS:** The section warns the larger force of enemy approach and provides information on enemy equipment, organization, and axis of advance. The section does not suffer significant loss of personnel or equipment.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Established a screen (occupied OPs).			
a. Reconnoitered and selected specific locations.	_____	_____	_____
b. Reported the actual OP location to the platoon leader or platoon sergeant.	_____	_____	_____
c. Established local security.	_____	_____	_____
d. Improved the position.	_____	_____	_____
2. Conducted screening operations.			
a. Maintained continuous surveillance of all named areas of interest or avenues of approach into the sector.	_____	_____	_____
b. Provided early warning of enemy approach.	_____	_____	_____
c. Covered dead space (conducted irregularly scheduled, mounted or dismounted patrols between OPs).	_____	_____	_____
3. Detected all enemy elements entering the platoon's section.			
a. Identified, reported, and maintained contact with reconnaissance patrols.	_____	_____	_____
b. Impeded and harassed the enemy by controlled use of artillery fires.	_____	_____	_____
c. Maintained contact with the enemy until ordered to break contact.	_____	_____	_____
4. Displaced to a subsequent screen line.			
a. Requested permission to displace.	_____	_____	_____
b. Displaced most-threatened OPs first.	_____	_____	_____
c. Continued to adjust indirect fires.	_____	_____	_____
d. Maintained contact with advancing enemy elements.	_____	_____	_____
e. Reported when set on the subsequent screen line.	_____	_____	_____
f. Kept the platoon leader (or platoon sergeant) informed.	_____	_____	_____

**TASK:** Perform a passage of lines (17-3-1014) (FM 17-98, ARTEP 17-57-10-MTP).

**CONDITIONS:** The section is required to pass through a stationary force. Enemy contact is possible.

**STANDARDS:** The section performs the passage without significant loss of personnel or equipment, or breaches of security.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Coordinated the passage (section sergeant).			
a. Sent a representative to the contact point with a stationary unit representative.	_____	_____	_____
b. Coordinated, at a minimum, the information listed in the SOP.	_____	_____	_____
2. Executed the passage.			
a. Issued a FRAGO.	_____	_____	_____
b. Arrived at the contact point at the time specified, and displayed the proper recognition signals.	_____	_____	_____
c. Picked up guides, and moved through the passage lanes without halting.	_____	_____	_____
d. Employed stationary force indirect fires (as necessary).	_____	_____	_____
e. Completed the passage by the time specified in the higher headquarters' OPORD.	_____	_____	_____
f. Used stationary force service support assets, as necessary.	_____	_____	_____
g. Did not cause friendly fire casualties during the passage.	_____	_____	_____
h. Reported completion of the passage to next higher headquarters.	_____	_____	_____



**TASK:** Select firing positions (171-123-1002) (STP 17-19D23-SM).

**CONDITIONS:** Given an operational scout vehicle with a crew.

**STANDARDS:** The section selects firing positions that are not on prominent terrain, have covered and concealed routes into and out of the positions, are as level as possible, and allow weapons-down firing without limiting the gunner's field of fire. In offensive operations (overwatch), the positions allow placement of suppressive fire on known or suspected enemy positions and ATGM early warning.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Selected a primary firing position.	_____	_____	_____
2. Selected an alternate firing position.	_____	_____	_____
3. Selected a supplementary firing position.	_____	_____	_____
4. Selected overwatch positions in the offense.	_____	_____	_____
5. Selected positions in the defense.	_____	_____	_____
6. Emplaced stakes at firing position.	_____	_____	_____
7. Completed range card and sent to higher.	_____	_____	_____

- TASK:** Perform a zone reconnaissance (17-3-1018) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** As part of a platoon, the section is ordered to conduct a zone reconnaissance. The enemy situation is unknown.
- STANDARDS:** The section provides the required information rapidly, accurately, and without significant loss of personnel or equipment.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Planned the mission IAW troop-leading procedures (section sergeant).	_____	_____	_____
2. Deployed in appropriate formation, and used the technique of movement specified in the OPORD.	_____	_____	_____
3. Conducted the reconnaissance.			
a. Retained freedom to maneuver.	_____	_____	_____
b. Dismounted scouts, as necessary, to gather information and provide security.	_____	_____	_____
c. Collected and recorded terrain information.	_____	_____	_____
(1) Determined trafficability of any major routes.	_____	_____	_____
(2) Determined cross-country trafficability of all terrain in the zone.	_____	_____	_____
(3) Gathered intervisibility information.	_____	_____	_____
(4) Located and evaluated all bridges in the zone.	_____	_____	_____
(5) Located suitable fording or crossing sites near all bridges in the zone.	_____	_____	_____
(6) Located and evaluated all overpasses, underpasses, and culverts.	_____	_____	_____
(7) Located mines, obstacles, and barriers in the zone.	_____	_____	_____
(8) Located a bypass around built-up areas, obstacles, and contaminated areas.	_____	_____	_____
(9) Located and reported all enemy in zone.	_____	_____	_____
d. Reported terrain information.			
(1) Submitted a route classification overlay (if required).	_____	_____	_____
(2) Submitted obstacle, bypass, and ford reports.	_____	_____	_____

**PERFORMANCE MEASURES**

**GO NO-GO NA**

<p>e. Identified all enemy forces within the zone, including—</p> <p>(1) Location.</p> <p>(2) Strength.</p> <p>(3) Composition.</p> <p>(4) Activity.</p> <p>(5) Supporting weapons and units.</p> <p>(6) Possible avenues of approach.</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>f. Reported the situation to the platoon leader or platoon sergeant.</p>	<p>_____</p>	<p>_____</p>	<p>_____</p>
<p>g. Determined the existence of NBC contamination within the zone, if required.</p>	<p>_____</p>	<p>_____</p>	<p>_____</p>

- TASK:** Coordinate with an adjacent platoon (071-326-5775) (STP 21-24-SMCT).
- CONDITIONS:** The section is participating in an operation as part of a larger element.
- STANDARDS:** The section coordinates with adjacent elements for offensive and defensive operations to ensure mutually supporting positions, fires, and signals.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. In the offense, coordinated—			
a. Lateral distance between all attacking elements.	_____	_____	_____
b. Movement routes, to make sure mutual support by fire and maneuver could be maintained between the lead elements.	_____	_____	_____
c. Visual signals, such as hand-and-arm signals and pyrotechnics.	_____	_____	_____
d. Radio call signs/challenge and passwords.	_____	_____	_____
2. In the defense, coordinated the following items to make sure there were no gaps and that the fires interlocked and were mutually supporting:			
a. Location of positions (primary, alternate, and supplementary).	_____	_____	_____
b. Location of key weapons.	_____	_____	_____
c. Sectors of fire.	_____	_____	_____
d. Dead space between units.	_____	_____	_____
e. Location of observation posts.	_____	_____	_____
f. Signals.	_____	_____	_____
g. Patrols and ambushes (size, type, times of departure and return, and routes).	_____	_____	_____
3. If a final protective fire was allocated to the section, coordinated with the FIST FO and integrated the final protective fire into the fire plan for the larger element.	_____	_____	_____

- TASK:** Perform an area reconnaissance (17-3-1019, 171-121-3008) (FM 17-98, STP 17-19D23-SM, ARTEP 17-57-10-MTP).
- CONDITIONS:** The element is ordered to conduct an area reconnaissance. The enemy situation is unknown.
- STANDARDS:** The section collects and reports all information specified in the OPORD or FRAGO, orients on the reconnaissance objective, retains freedom to maneuver, and gains and maintains contact with the threat, if present. The formations and movement techniques are determined by the likelihood of enemy contact. (See STP 17-19D23-SM for the critical tasks.)

PERFORMANCE MEASURES	GO	NO-GO	NA
1. Planned the mission IAW troop-leading procedures (section sergeant).	_____	_____	_____
2. Deployed in the appropriate formation and used the technique of movement specified in OPORD.	_____	_____	_____
3. Conducted the reconnaissance.			
a. Retained freedom to maneuver.	_____	_____	_____
b. Dismounted scouts, as necessary, to gather information.	_____	_____	_____
c. Collected and recorded terrain information.			
(1) Determined trafficability of all major routes.	_____	_____	_____
(2) Determined cross-country trafficability of terrain within the area.	_____	_____	_____
(3) Located and evaluated all bridges in the area.	_____	_____	_____
(4) Located suitable fording or crossing sites near all bridges in the area.	_____	_____	_____
(5) Located and evaluated all overpasses, underpasses, and culverts.	_____	_____	_____
(6) Located mines, obstacles, and barriers in the area.	_____	_____	_____
(7) Located bypasses around built-up areas, obstacles, and contaminated areas.	_____	_____	_____
(8) Located landing or drop zones.	_____	_____	_____
(9) Reconnoitered terrain dominating the area, if required.	_____	_____	_____
d. Reported information to higher headquarters.	_____	_____	_____

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
e. Identified all enemy forces within the area.			
(1) Determined enemy locations.	_____	_____	_____
(2) Determined enemy strength.	_____	_____	_____
(3) Determined enemy composition.	_____	_____	_____
(4) Determined enemy activity.	_____	_____	_____
(5) Located enemy activity.	_____	_____	_____
(6) Identified possible avenues of approach.	_____	_____	_____
(7) Reported the situation to higher headquarters.	_____	_____	_____
f. Determined the existence and extent of NBC contamination in the area, if required.	_____	_____	_____

- TASK:** Perform a route reconnaissance (17-3-1017) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** The section is ordered to conduct a route reconnaissance, as part of a platoon. The enemy situation is unknown.
- STANDARDS:** The section provides the required information rapidly, accurately, and without significant loss of personnel or equipment.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Planned the mission IAW troop-leading procedures (section sergeant).	_____	_____	_____
2. Deployed in the appropriate formation and used the technique of movement specified in the OPORD.	_____	_____	_____
3. Conducted the reconnaissance.			
a. Retained freedom to maneuver.	_____	_____	_____
b. Dismounted scouts, as necessary, to gather information and provide security.	_____	_____	_____
c. Collected information about the route and adjacent terrain.	_____	_____	_____
(1) Determined trafficability along the route.	_____	_____	_____
(2) Reconnoitered terrain dominating the route.	_____	_____	_____
(3) Reconnoitered built-up areas and bypasses.	_____	_____	_____
(4) Reconnoitered lateral routes.	_____	_____	_____
(5) Determined the existence and extent of NBC contamination.	_____	_____	_____
(6) Reconnoitered bridges, underpasses, culverts, and tunnels.	_____	_____	_____
d. Identified all enemy forces that could affect the route.			
(1) Determined enemy location.	_____	_____	_____
(2) Determined enemy strengths.	_____	_____	_____
(3) Determined enemy composition.	_____	_____	_____
(4) Determined enemy activity.	_____	_____	_____
(5) Located enemy supporting weapons and units.	_____	_____	_____
(6) Identified possible avenues of approach.	_____	_____	_____
(7) Reported the situation to higher headquarters.	_____	_____	_____
e. Reported terrain information.			
(1) Submitted route classification overlay.	_____	_____	_____
(2) Submitted obstacle, bypass, and ford reports.	_____	_____	_____

**TASK:** Perform reconnaissance by fire (FM 17-95).

**CONDITIONS:** Given all vehicles, weapons, and equipment organic to an indirect-fire element and scout section.

**STANDARDS:** The section identifies the suspected enemy position within 200 meters and adjusts fire to suppress the target area.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Reported.	_____	_____	_____
2. Called for fire.	_____	_____	_____
3. Observed enemy movement.	_____	_____	_____
4. Developed the situation using indirect fire.	_____	_____	_____
5. Continued to reconnoiter suspected enemy positions.	_____	_____	_____



- TASK:** Prepare a route reconnaissance overlay (051-196-3009) (STP 17-19D23-SM).
- CONDITIONS:** Given a military map, transparent paper (or similar material), pencils, critical information gathered from reconnaissance of a route (including applicable, completed reconnaissance report forms or reconnaissance messages), and references for standard reconnaissance, topographic, and military symbols.
- STANDARDS:** The section prepares an overlay, IAW FM 5-36, so that all critical characteristics that affect traffic flow, and all mission-essential information, are depicted. Standard topographic and military symbols from FM 21-31 and FM 101-5-1 are included, as required.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
<b>Note.</b> The overlay must be legible to receive a GO.			
1. Used transparent paper or similar material to draw the overlay.	_____	_____	_____
2. Drew two grid reference points on the overlay.	_____	_____	_____
3. Drew a north directional arrow on the overlay.	_____	_____	_____
4. Drew the reconnoitered route to map scale, with the end points marked with limit-of-sector symbols, and named the route.	_____	_____	_____
5. Drew a reconnaissance party information block on the overlay, with required data printed in the block.	_____	_____	_____
6. Prepared the correct route classification formula, and printed it directly above the reconnaissance party information block.	_____	_____	_____
7. Prepared and drew applicable symbols on the overlay for each characteristic affecting traffic flow.	_____	_____	_____
8. If abbreviated symbols or engineer resource symbols were used, attached applicable report forms and messages to the overlay.	_____	_____	_____

- TASK:** Emplace and retrieve a hasty protective minefield (17-3-1026) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** The section is in continuous operations. Mines from basic load are available, and the use of mines is allowed.
- STANDARDS:** The section plans and emplaces the mines to provide local security or to cover characteristics that affect traffic flow and all mission-essential information (such as dead space), then retrieves all mines prior to departure.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Reported intentions and requested authorization to emplace a minefield (section sergeant).	_____	_____	_____
2. Reconnoitered and selected the minefield location.			
a. Selected a location to block the most-likely avenues of approach.	_____	_____	_____
b. Made sure the site would tie in with the natural obstacles and could be covered with direct fires and observation.	_____	_____	_____
3. Established security.			
a. Designated a security element.	_____	_____	_____
b. Positioned the element to provide local security until the mines had been emplaced.	_____	_____	_____
4. Installed the mines.			
a. Received permission to install the minefield.	_____	_____	_____
b. Reported initiation of mine placements.	_____	_____	_____
c. Selected and marked mine locations.	_____	_____	_____
d. Emplaced, but did not arm, mines.	_____	_____	_____
e. Recorded the minefield on DA Form 1355-1-R (see Figure C-1).	_____	_____	_____
f. Armed and camouflaged the mines, starting with the row nearest the enemy.	_____	_____	_____
g. Collected and stored the safeties and shipping plugs, pending the recovery of the mines. (The storage location must be known by the section and platoon.)	_____	_____	_____

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
h. Moved the minefield, to include safety lanes. (The markings were visible only from the friendly side.)	_____	_____	_____
i. Recovered the security element.	_____	_____	_____
j. Reported completion to the platoon leader or platoon sergeant.	_____	_____	_____
5. Retrieved the mines.			
a. Received orders to retrieve the minefield.	_____	_____	_____
b. Emplaced security.	_____	_____	_____
c. Brought the safeties and shipping plugs for the recovery.	_____	_____	_____
d. Using DA Form 1355-1-R, disarmed the mines, starting with the row nearest the friendly positions.	_____	_____	_____
e. Removed and stored the mines for future use.	_____	_____	_____
f. Reported the completion of the retrieval to the platoon leader or platoon sergeant.	_____	_____	_____

**HASTY PROTECTIVE MINEFIELD RECORD**  
(FM 20-32 AND TC 20-32-1)

**INSTRUCTIONS**

- DESIGNATE AN EASILY IDENTIFIABLE REFERENCE POINT ON THE GROUND (A TREE, A STUMP, A STAKE OR THE LIKE). ORIENT THE FORM (THE BLANK FORM ON THE REVERSE) BY TYING IN THE CENTER POINT OF CIRCLES TO THE DESIGNATED REFERENCE POINT ON THE GROUND.
- TIE IN REFERENCE POINT TO A LANDMARK, SUCH AS A ROAD JUNCTION, HOUSE CORNER, ETC. THAT CAN BE FOUND ON A STANDARD MILITARY MAP.
- COMPLETE THE AZIMUTH BLOCK.
- COMPLETE THE FOLLOWING INFORMATION IN THE IDENTIFICATION BLOCK: UNIT, REF PT, REMARKS, MAP, AND SHEET NO., OIC, NAME, SSAN.
- STARTING FROM THE REFERENCE POINT, RECORD THE MAGNETIC AZIMUTH IN DEGREES (°) AND DISTANCE IN PACES (P) OF EACH LEG FROM THE FRIENDLY POSITION TOWARD THE ENEMY POSITION AND FROM RIGHT TO LEFT OR LEFT TO RIGHT ACROSS EACH ROW OF MINES. HOWEVER, ALL ROWS MUST BE RECORDED IN THE SAME DIRECTION. WHICHEVER DIRECTION IS USED, THE STARTING POINTS OF THE ROWS MUST BE MARKED A1, B1, ETC., AND THE ENDING POINTS MARKED A2, B2, ETC., AS SHOWN IN THE EXAMPLE. EACH MINE IN EACH ROW WILL BE NUMBERED SEQUENTIALLY FROM THE STARTING POINT TO THE LAST MINE IN THE ROW.
- FILL IN THE TABULAR BLOCK. (SEE EXAMPLE)
- FILL IN THE SCALE BEING USED WHERE SPACE IS PROVIDED: "SCALE: 2CM = " AND FILL IN THE PACE (P) READINGS IN THE RIGHT MARGIN.
- MAKE ALL MINEFIELD REPORTS (INTENTION, INITIATION, COMPLETION, TRANSFER AND CHANGE) BY SOME SECURE MEANS.
- NOTE WHAT HAS BEEN USED TO IDENTIFY A1 & B1: I.E.: 2x4 DRIVEN FLUSH WITH GROUND; STEEL PICKET OR FENCE POST WRAPPED WITH ENGINEER TAPE; ETC.

**AZIMUTH BLOCK**

SCALE: 2cm = 25 paces

Row	Type	Actuation	Mine number
A	M16A1	TRIPWIRE	1, 2, 6
	M2A1	CONTROLLED	3, 4, 5
B	M16A1	TRIPWIRE	1, 3
	M18A1	PRESSURE	2
Remarks LANDMARK IS ROAD JUNCTION AT NA12343409			

Unit	2 <sup>RD</sup> PLT, ACO 1-4 <sup>TH</sup> 2 <sup>RD</sup> BDE, 1 <sup>ST</sup> CAVAL DIV
Ref Pt	TREE STUMP SIDE OF ROAD
Remarks	POINTS A1 & A2, B1 & B2 ARE MARKED WITH 2"x2" STAKES
Map & Sheet No	TALBOT 5568
Name of OIC	LT. ALLAN
Signature	<i>[Signature]</i> TIME & DATE 1700 6/16/75
Mines removed	
Mines transferred	

DA FORM 1355-1-R, 1 July 75 REPLACES DA FORM 1355-1, 1 Mar 68 WHICH IS OBSOLETE

AG 6425-O-Army-Knox-Jul 76-1M

Figure C-1. Sample of a Completed DA Form 1355-1-R.

- TASK:** Execute a dismounted patrol (17-3-1024) (FM 17-98, ARTEP 17-57-10-MTP).
- CONDITIONS:** The section is ordered to execute a dismounted patrol with its organic personnel and equipment. Enemy contact is possible.
- STANDARDS:** The section gathers the necessary information without significant loss of personnel or equipment.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Prepared for the mission (section sergeant).			
a. Planned the patrol using troop-leading procedures, with specific attention to—			
(1) The organization of the patrol.	_____	_____	_____
(2) Equipment necessary to accomplish the mission.	_____	_____	_____
(3) Required coordination, to include—			
(a) Special equipment.	_____	_____	_____
(b) Resupply.	_____	_____	_____
(c) Transportation.	_____	_____	_____
(d) Departure or reentry of friendly lines.	_____	_____	_____
(e) Fire plan.	_____	_____	_____
(4) Primary and alternate routes.	_____	_____	_____
(5) Rally points (IRP, ORP, RERP).	_____	_____	_____
(6) Signals (visual and audio).	_____	_____	_____
b. Issued the order.			
(1) New challenge or password for use beyond FEBA.	_____	_____	_____
(2) Signals.	_____	_____	_____
(3) Tasks to be conducted at the objective.	_____	_____	_____
(4) Location of control measures.	_____	_____	_____
2. Conducted the patrol.			
a. Departed friendly lines.			
(1) Halted at the IRP.	_____	_____	_____
(2) Linked up with guide(s), as necessary.	_____	_____	_____
(3) Moved through the friendly unit without incident.	_____	_____	_____

PERFORMANCE MEASURES		GO	NO-GO	NA
b.	Conducted the mission.			
	(1) Controlled movement using graphic control measures.	_____	_____	_____
	(2) Maintained all-around security.	_____	_____	_____
	(3) Collected and recorded information about areas or zones, including—			
	(a) Location of the enemy.	_____	_____	_____
	(b) All lateral and axial routes.	_____	_____	_____
	(c) Proposed and actual obstacle locations.	_____	_____	_____
	(d) Specific information required by the OPORD.	_____	_____	_____
c.	Conducted actions on contact.			
	(1) Freeze.	_____	_____	_____
	(2) Hasty ambush.	_____	_____	_____
	(3) Immediate assault.	_____	_____	_____
	(4) Dispersal, using clock system.	_____	_____	_____
d.	Conducted actions at rally points.			
	(1) Rallied at last rally point, if dispersed en route.	_____	_____	_____
	(2) Assembled until the predetermined number of patrol members arrived, then continued the mission under the senior man present.	_____	_____	_____
	(3) Established 360-degree security at the rally point.	_____	_____	_____
e.	Returned to friendly lines.			
	(1) Coordinated prior to departure.	_____	_____	_____
	(2) Halted at the RERP.	_____	_____	_____
	(3) Contacted the friendly unit.	_____	_____	_____
	(4) Linked up with the guide.	_____	_____	_____
	(5) Moved through the friendly unit without incident.	_____	_____	_____
3.	The element debriefed the patrol members.			
	a. Prepared the patrol report.	_____	_____	_____
	b. Reviewed the patrol report with the patrol members to ensure accuracy and completeness.	_____	_____	_____
	c. Submitted the patrol report to the platoon leader or platoon sergeant.	_____	_____	_____

**TASK:** Conduct a defense by a squad (071-430-0002) (STP 21-24-SMCT).

**CONDITIONS:** Given a priority of work and locations for crew-served weapons, designated by the section leader in his OPORD or FRAGO. The section must prepare an assigned sector for the defense.

**STANDARDS:** Within the time specified in the section leader's order, the section completes preparation for the defense while maintaining security, camouflage, and concealment.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Followed priority of work IAW unit SOP.	_____	_____	_____
2. Maintained security.			
a. Established OPs.	_____	_____	_____
b. Organized patrols.	_____	_____	_____
c. Planned for the use of STANO devices.	_____	_____	_____
3. Made sure the position offered cover and concealment.	_____	_____	_____
4. Maintained noise, light, and litter discipline.	_____	_____	_____
5. Supervised the construction of fighting positions.	_____	_____	_____
6. Made sure the fighting positions were mutually supporting.	_____	_____	_____
7. Made and submitted range cards to higher.	_____	_____	_____

- TASK:** Reorganize a squad following enemy contact while in the defense (071-430-0004) (STP 21-24-SMCT).
- CONDITIONS:** The section is defending as part of a larger unit that has just repelled an enemy assault.
- STANDARDS:** After enemy contact, the section reorganizes and consolidates in the defense.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Reorganized.			
a. Replaced key personnel and made sure all members knew the chain of command.	_____	_____	_____
b. Made sure the key weapons were manned.	_____	_____	_____
c. Moved the casualties to a covered and concealed location.	_____	_____	_____
d. Redistributed the ammunition within the section.	_____	_____	_____
e. Collected and reported captured enemy material and information.	_____	_____	_____
f. Made sure the turret weapons ready racks were reloaded.	_____	_____	_____
2. Consolidated in the defense.			
a. Reestablished security (OPs).	_____	_____	_____
b. Replaced camouflage.	_____	_____	_____
c. Replaced obstacles.	_____	_____	_____
d. Reassigned sectors of fire.	_____	_____	_____



**TASK:** Conduct unmasking procedures (031-503-3002) (STP 21-24-SMCT).

**CONDITIONS:** The section soldiers are wearing protective masks. Chemical agents have been used. A chemical agent detector may or may not be available.

**STANDARDS:** The section conducts unmasking procedures without incurring casualties by following the proper sequence with and without the M256 or M256A chemical agent detector kit.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Initiated unmasking procedures (chemical agent detector kit was available).			
a. Used the chemical agent detector kit.	_____	_____	_____
b. Determined that chemical agent was not present.	_____	_____	_____
c. Had two or three soldiers unmask for five minutes, then remask for ten minutes.	_____	_____	_____
d. Checked soldiers for chemical symptoms.	_____	_____	_____
e. Determined if an agent was present.	_____	_____	_____
f. Unmasked or remained masked (as appropriate).	_____	_____	_____
g. Continued to be alert for symptoms.	_____	_____	_____
2. Initiated unmasking procedures (chemical agent detector kit was not available).			
a. Had two or three soldiers keep their eyes wide open, break the seal of their mask, and hold their breath for 15 seconds.	_____	_____	_____
b. Had soldiers reseal, clear, and check their masks; waited ten minutes (preferably in the shade).	_____	_____	_____
c. Checked soldiers for symptoms.	_____	_____	_____
d. If they had no symptoms, had them unmask for ten minutes.	_____	_____	_____
e. Checked soldiers for chemical symptoms.	_____	_____	_____
f. If they had no symptoms, told the rest of the soldiers to unmask.	_____	_____	_____
g. Continued to be alert for symptoms.	_____	_____	_____

**TASK:** Cross a chemically contaminated area (03030C034) (FM 17-98, ARTEP 17-57-10-MTP).

**CONDITIONS:** The section is in continuous operations and is directed to cross a known, chemically contaminated area.

**STANDARDS:** The section remains capable of continuing operations, and does not suffer significant loss of personnel or equipment.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Prepared for crossing the area.			
a. Placed externally stored equipment inside, or covered it with available material.	_____	_____	_____
b. Directed the appropriate MOPP level for crossing, depending on the type of agent and protection available.	_____	_____	_____
c. Positioned the detector paper to provide warning.	_____	_____	_____
d. Made sure all drivers, vehicle commanders, and leaders knew the route of march or had strip maps.	_____	_____	_____
e. Made sure all vehicles were closed appropriately for the situation.	_____	_____	_____
2. Crossed the area.			
a. Avoided low ground, overhanging branches, and heavy brush to the extent allowed by the tactical situation.	_____	_____	_____
b. Dropped expendable, contaminated covering at the edge of the contaminated area.	_____	_____	_____
c. Conducted dismounted movement as rapidly as possible.	_____	_____	_____
3. Exited the contaminated area.			
a. Checked for contamination.	_____	_____	_____
b. If the mission permitted, completed chemical decontamination.	_____	_____	_____
c. If the mission did not permit decontamination, arranged for decontamination as soon as possible.	_____	_____	_____

**TASK:** Prepare and submit NBC-4 reports (031-503-4004) (STP 21-24-SMCT).

**CONDITIONS:** Given the time of day, your location (six-digit coordinate), and the reading from an IM-174 radiacmeter taken at your location.

**STANDARDS:** The section prepares an NBC-4 report in the correct format and submits it to the platoon leader.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Prepared an NBC-4 report.			
a. Wrote the location of the reading (universal transverse Mercator [UTM]) on line Q.	_____	_____	_____
b. Wrote the IM-174 radiacmeter reading on line R.	_____	_____	_____
c. Wrote the date and time of reading (noted whether the time was in local or Zulu) on line S.	_____	_____	_____
2. Submitted NBC-4 report.	_____	_____	_____

- TASK:** Prepare and submit NBC-1 reports (031-503-3005) (STP 21-24-SMCT).
- CONDITIONS:** Given a watch, compass, map, paper, pencil, and format for an NBC-1 report. An NBC attack has just occurred.
- STANDARDS:** The section submits an NBC-1 report (reporting as a minimum, lines B, D, H, and either C or F) within five minutes

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Prepared and submitted an initial NBC-1 (nuclear) report.			
a. Measured the time from flash to bang. Used a watch or counted slowly (one thousand and one, one thousand and two, etc.).	_____	_____	_____
b. Wrote the number of seconds on line J.	_____	_____	_____
c. Wrote the time shown on the watch on line D (noted whether the time was local or Zulu).	_____	_____	_____
d. Wrote the type of burst (surface, air, or unknown) on line H.			
(1) Surface—if a crater or a thick, dense stem from the cloud to the earth was seen.	_____	_____	_____
(2) Air—if the stem was not connected to the mushroom part of the cloud.	_____	_____	_____
(3) Unknown—if the cloud was unclear.	_____	_____	_____
e. If the crater could be seen, used the compass to determine the azimuth to the center of the mushroom cloud. Wrote the azimuth on line C.	_____	_____	_____
f. Wrote the section's location on line B.	_____	_____	_____
g. Gave or sent the report to the supervisor (if the report had to be transmitted, gave it a <i>flash</i> precedence).	_____	_____	_____
2. Prepared and submitted a subsequent NBC-1 (nuclear) report.			
a. Measured the angular cloud within five minutes after the burst. Wrote the angle on line L. Used one of the following items to measure the angular cloud within five minutes after the burst:			
(1) Aiming circle.	_____	_____	_____
(2) Battery commander's (BC) scope.	_____	_____	_____

PERFORMANCE MEASURES	GO	NO-GO	NA
(3) Theodolite.	_____	_____	_____
(4) Compass.	_____	_____	_____
b. Wrote the angles on line L.	_____	_____	_____
c. Measured the vertical angle from the ground to the top or bottom of the cloud ten minutes after the burst. Wrote down the vertical angle on line M. Also wrote whether the top or bottom was measured.	_____	_____	_____
d. Added line L or line M to the initial NBC-1 report. Sent or gave the entire message to the supervisor. If the report had to be transmitted, gave it an <i>immediate</i> precedence.	_____	_____	_____
3. Prepared and submitted initial NBC-1 (chemical or biological) report.			
a. Wrote the time the attack started on line D.	_____	_____	_____
b. Wrote the time the attack stopped on line E.	_____	_____	_____
c. Wrote the type of attack (biological or chemical) on line H.	_____	_____	_____
d. Wrote the location on line B.	_____	_____	_____
e. If the place attacked was not his position, wrote the location of the attack on line F.	_____	_____	_____
f. If the type of attack could be identified as artillery, aircraft, or other means, wrote the type of attack on line G.	_____	_____	_____
g. Gave or sent the report to the platoon leader. (If the report had to be transmitted, gave it a <i>flash</i> precedence.)	_____	_____	_____
4. Prepared and submitted a subsequent NBC-1 (chemical) report. Used the M256 kit to identify the type of chemical. Within five minutes, sent the message to the platoon leader. (If the report had to be transmitted, gave it an <i>immediate</i> precedence.)	_____	_____	_____

- TASK:** Calculate and designate placement of steel-cutting charges (051-193-3051) (STP 17-19D23-SM).
- CONDITIONS:** Given a steel target, explosives, and instructions on desired demolition results.
- STANDARDS:** The section determines the type of explosives needed, accurately calculates the minimum required, and places the charge on the target.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Used Table 1, <i>Characteristics of Explosives and Problem-Solving Format</i> . (See STP 17-19D23-SM.)	_____	_____	_____
2. Determined the correct calculation.	_____	_____	_____
3. Placed the charge on the proper location.	_____	_____	_____

- TASK:** Calculate and designate placement of timber-cutting charges (051-193-3052) (STP 17-19D23-SM).
- CONDITIONS:** Given a timber target, explosives, and instructions on desired demolition results.
- STANDARDS:** The section determines the type of explosives needed, calculates the minimum required, and places the charge on the target.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Used Table 1, <i>Characteristics of Explosives and Problem-Solving Format</i> . (See STP 17-19D23-SM.)	_____	_____	_____
2. Determined the correct calculation.	_____	_____	_____
3. Placed the charge on the proper location.	_____	_____	_____

- TASK:** React to indirect fire (FM 71-1, FM 17-12-1-1).
- CONDITIONS:** The section is operating in a tactical environment where enemy contact is possible or expected (the section may be either stationary or moving). The section observes artillery or smoke impacting near or on top of its position.
- STANDARDS:** The section reacts to indirect fire and is prepared to continue the mission.

<b>PERFORMANCE MEASURES</b>	<b>GO</b>	<b>NO-GO</b>	<b>NA</b>
1. Reacted to indirect fire while on the move.			
a. Executed evasive action to avoid the impact area.	_____	_____	_____
b. The crew dropped down inside the vehicle, and closed the hatches.	_____	_____	_____
c. Based on the enemy's expected use of chemical weapons and the type of rounds impacting, all personnel stopped breathing and masked.	_____	_____	_____
d. Continued to move out or away from the impact area.	_____	_____	_____
2. Reacted to indirect fires while stationary.			
a. The crew remained inside the vehicle.	_____	_____	_____
b. Based on the enemy's expected use of chemical weapons and the type of rounds impacting, all personnel stopped breathing, and masked.	_____	_____	_____
c. If indirect fire effectively suppressed the section's position and the section mission allowed, the section moved out of the impact area to adequate cover.	_____	_____	_____

## Appendix D

### Engagement Skills Trainer

Crew turbulence and the rising cost of ammunition, fuel, and spare parts make it difficult to produce and maintain skilled HMMWV crews and platoons. Additionally, units cannot get to major range complexes as often as they should or would like; therefore, more gunnery training must be done at home station using simulators, subcaliber training devices, and training-unique techniques. Training devices help fill the void caused by lack of resources and money. They cannot, however, replace or duplicate main gun firing or other vital aspects of gunnery or tactical training; their purpose is to augment training. Devices allow the trainer to identify and correct procedural errors. They also enable the trainer to spot tank crews or individuals that are having problems with a particular gunnery or tactical task.

This appendix discusses the Engagement Skills Trainer (EST), which is designed to help units conduct simulated marksmanship and engagement skills training exercises. The using unit is responsible for prior planning, coordination, training the trainer, unit train-up, and external or internal evaluation. Adequate attention in these areas will ensure the highest level of success prior to the conduct of training.

This appendix should not be used as a stand-alone reference; however, it should be used in conjunction with the system's operator manuals and all applicable FMs, TMs, and other training manuals.

### Characteristics

The EST is a multipurpose device, designed to support the indoor training of squad-sized units on basic and advanced marksmanship, as well as fundamental tactical engagement skills. The device uses the latest in videodisk-based and synchronized microcomputer technology to provide a variety of target arrays, courses of fire, and tactical engagement exercises. Once an exercise is selected, the EST displays proportionately correct targets on a panoramic screen. These targets are engaged with laser-fitted, modified weapons; such as, the AR15A2/M16A2 rifle, the M60/M240B machine gun, the M2 .50 caliber machine gun, and the M136 (AT-4) rocket launcher. These weapons provide the recoil and sound of real weapons firing live ammunition. The EST provides immediate or delayed on-screen feedback of all training activities, as well as printed feedback of the same.

The complexity of the administrative operation of the system is in contrast to the simple hands-on, real-world equipment interfaced with the individual soldier and squad. The following table depicts the equipment with which the individual soldier or squad will interface. (Figure D-1 depicts a typical EST battle simulation area.)



ENGAGEMENT SKILLS TRAINER	
<b>Video Projection Screen</b>	The video projection screen consists of three 7-foot by 10-foot screens, fitted together to provide a panoramic view of synchronized video images presented during training exercises.
<b>Carbon Dioxide (CO<sub>2</sub>) Recoil Capability</b>	The CO <sub>2</sub> containers provide gas pressure to cycle the action and simulate the recoil for the weapons.
<b>Speakers</b>	Weapon sound is emitted through a series of speakers.
<b>Weapons</b>	<p>The EST can accommodate the simultaneous firing of up to 12 weapons in a variety of configurations. Although these weapons cannot be loaded with live ammunition, each has been modified to function in a realistic fashion; so that loading, firing, misfire procedures, and normal firing are performed the same as if they were the real weapons.</p> <ul style="list-style-type: none"> <li>• <i>M16A2 rifle.</i> The M16A2 rifle uses an eye-safe laser, installed inside the barrel, to produce a detectable laser trace on the viewing screen. The laser trace is used to identify shot location and determine target hits.</li> <li>• <i>M16A2 rifle and M203 grenade launcher combination.</i> This combination can be used as a rifle or a grenade launcher. When used as a rifle, its functions are exactly like the M16A2, including recoil. When used as a grenade launcher, it has no recoil. It contains a leaf sight for engaging targets out to 200 meters and a quadrant sight for engaging targets beyond 200 meters. Loading is completed by depressing the barrel latch, sliding the barrel fully forward, inserting a dummy round into the chamber, and sliding the barrel to the rear until locked. The M203 grenade launcher will not accept standard 40-mm grenades.</li> <li>• <i>M60/M240B and M2 machine guns.</i> These machine guns use the same technology used in the M16A2 rifle. They can be fired from the bipod, tripod, or assault positions. Only modified linked belts of ammunition will work with the EST's machine guns. The belt of ammunition should not be delinked, except when responding to a runaway gun; it must be relinked in exactly the same way that it was configured prior to the break.</li> <li>• <i>MK 19 grenade machine gun.</i> The MK 19 training weapon is an actual MK 19, mod. 3, grenade machine gun that is converted temporarily into a training weapon. The MK 19 training weapon uses a fully functioning MK 19 with special components that will mount onto the weapon. The conversion from a functional weapon to a training weapon takes less than ten minutes. Converting the training weapon back into a functional weapon also takes less than ten minutes. The training weapon is fitted with an eye-safe laser system for training purposes. The trainer produces recoil by using a pneumatic cylinder, and compresses CO<sub>2</sub> gas.</li> <li>• <i>M136 (AT-4).</i> The M136 training weapon is an in-bore insert for use with all expended AT-4, 84-mm rocket launchers. An eye-safe laser located in the training device shows the training system where the weapon simulates launch effect by using compressed CO<sub>2</sub> gas.</li> <li>• <i>9-mm pistol.</i> The Beretta 9-mm semiautomatic pistol can be used as a stand-alone weapon with plastic bullets to recoil the weapon or as a system weapon recoiled by CO<sub>2</sub> gas. Training with the pistol can be done on silhouette targets for marksmanship proficiency and with LAPD scenarios for law enforcement purposes.</li> </ul>

**Note.** Although the lasers used in the EST have been approved as *eye safe* by the food and drug administration, prolonged exposure to the laser, or a laser malfunction, could result in eye damage.

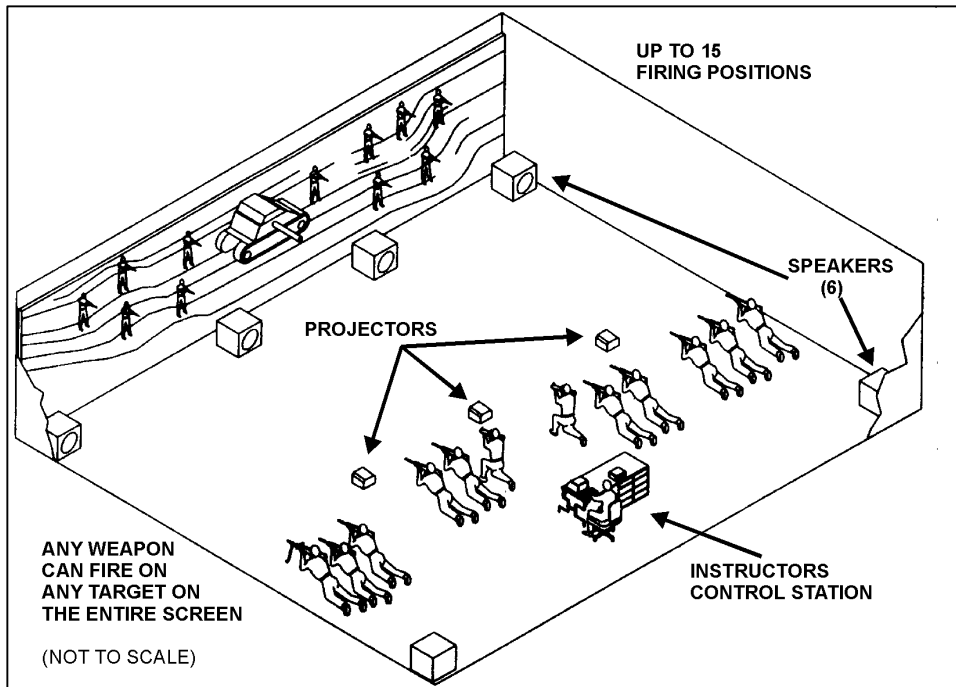


Figure D-1. Typical EST Battle Simulation Area.

#### SAFETY CAUTION

Weapons safety is very important. The weapons supplied with the EST have been extensively modified and cannot be returned to normal operation or made to accept live ammunition. To avoid injury, always treat your EST weapon as though it was real. Never look directly into the barrel of any weapon.

## Training Capabilities

The EST is designed primarily to support the training of individual and collective marksmanship and squad-level tactical skills. This section describes, briefly, the array of training exercises that can be conducted on the EST, and the training preparation required for the same. These exercises are on videodisks. EST I and II contain tactical engagement exercises. EST IV contains basic and advanced marksmanship training exercises. Consistent with all military training, EST-based training should always be conducted in accordance with the philosophy, principles, drills, tasks, and procedures contained in many military service training publications. At the same time; however, a unit's instructor/operator, or master gunner should draw upon the full range of his experience to achieve maximum payoff from the use of this device.

Normally, a squad- or platoon-size element is ideal to train in the EST. It is possible to train a troop- or company-size unit; however, train-up must be completed prior to arrival at the EST, and a rotation plan must be developed and followed carefully.

## **MARKSMANSHIP TRAINING**

The progressive nature of the marksmanship training capabilities of the EST are applicable to active- and reserve-component training missions, and will support individual and crew-served weapons qualification train-up. It is a flexible, low cost, realistic, and effective trainer. It can also be used as a successful retrainer during range firing and engagement skills training if soldiers are experiencing poor marksmanship skills.

The engagement skills combat scenario system is an important enhancement trainer utilized by units in the conduct of collective tasks. The system can be used in scenarios that can be linked, similar to situational training exercises, to support the lane training concept.

First priority for the training unit after identifying their METL and establishing training requirements that support the same, is to develop a plan for integrating simulations training into their training plan.

As in marksmanship training, the responsibility for train-up, train the trainer, leaders training, and conduct and evaluation of the training is the responsibility of the using unit.

## **TACTICAL EXERCISES**

After mastering individual skills, a squad should be ready to undertake the tactical exercises presented in EST I and II. These exercises have been developed to provide squad-size units with the opportunity to practice individual, leader, and collective skills in a simulated combat environment.

Unit trainers set up tactical exercises for the participating squads by describing the situation and clearly establishing the conditions and standards for each task to be trained. Most of the exercises can be effectively initiated by issuing an OPORD. For example, a platoon leader might describe the tactical situation to the squad and then issue platoon order (OPORD or FRAGO) for conduct of the defense to the squad leader. The squad leader would then organize his squad, prepare it for combat, issue his order, and fight within the context of the EST exercise.

## Glossary

<b>AAR</b>	after-action review
<b>AC</b>	alternating current
<b>AI</b>	assistant instructor
<b>ammo</b>	ammunition
<b>API</b>	armor-piercing incendiary
<b>APC</b>	armored personnel carrier
<b>API-T</b>	armor-piercing incendiary tracer
<b>AR</b>	Army regulation
<b>ARTEP</b>	Army Training and Evaluation Program
<b>ATGM</b>	antitank guided missile
<b>ATWESS</b>	antitank weapons effect simulator system
<b>ATTN</b>	attention
<b>BC</b>	battery commander
<b>BCIS</b>	battlefield combat identification system
<b>BGM</b>	ballistic guided missile
<b>BII</b>	basic issue items
<b>BMD</b>	amphibious Soviet air-droppable vehicle
<b>BMP</b>	Soviet tracked armored personnel carrier
<b>BOT</b>	burst on target
<b>BRDM</b>	Soviet wheeled reconnaissance vehicle
<b>BTM</b>	Soviet ditching machine
<b>BTR</b>	Soviet APC and command vehicle
<b>cm</b>	centimeters
<b>CO EXEVAL</b>	company exercise evaluation
<b>CPL</b>	corporal
<b>DA</b>	Department of the Army
<b>DODIC</b>	Department of Defense Identification Code
<b>dvr</b>	driver
<b>ea</b>	each
<b>eng</b>	engagement
<b>EST</b>	engagement skills trainer
<b>F</b>	fire
<b>FIST</b>	fire support team
<b>FKSM</b>	Fort Knox supplemental material
<b>FM</b>	field manual
<b>FPL</b>	final protective line
<b>FSN</b>	Federal stock number
<b>FRAGO</b>	fragmentary order
<b>FSO</b>	fire support officer

<b>FTX</b>	field training exercise
<b>gnr</b>	gunner
<b>GST</b>	Gunnery skills test
<b>GTA</b>	graphic training aid
<b>HB</b>	heavy barrel
<b>HE</b>	high explosive
<b>HEAT</b>	high-explosive antitank
<b>HIND-D</b>	Soviet attack helicopter
<b>HMMWV</b>	high mobility multipurpose wheeled vehicle
<b>HQ</b>	headquarters
<b>IAW</b>	in accordance with
<b>IFFN</b>	identified friend, foe or neutral
<b>IFV</b>	Infantry fighting vehicle
<b>IRETS</b>	infantry remoted target system
<b>IRP</b>	initial rally point
<b>K</b>	kill
<b>kmph</b>	kilometers per hour
<b>LFX</b>	live-fire exercise
<b>LOS</b>	line of sight
<b>LP</b>	listening post
<b>LTID</b>	laser target interface device
<b>M</b>	miss
<b>m</b>	meter(s)
<b>m</b>	mil
<b>MEL</b>	maximum engagement line
<b>METL</b>	mission essential task list
<b>METT-T</b>	mission, enemy, terrain, troops, and time available
<b>MGS</b>	missile guidance set
<b>MILES</b>	multiple integrated laser engagement system
<b>min</b>	minutes
<b>MK</b>	Mark
<b>mm</b>	millimeter
<b>MOPP</b>	mission-oriented protective posture
<b>mph</b>	miles per hour
<b>MPRC</b>	multipurpose range complex
<b>MPTR</b>	multipurpose training range
<b>MSR</b>	missile simulation round
<b>MT LB</b>	amphibious Soviet vehicle
<b>MTP</b>	mission training plan
<b>N</b>	no
<b>NA</b>	not applicable

<b>NBC</b>	nuclear, biological, chemical
<b>NCOIC</b>	noncommissioned officer in charge
<b>NE</b>	not engaged
<b>NSN</b>	National stock number
<b>OIC</b>	officer in charge
<b>OP</b>	observation post
<b>OPFOR</b>	opposing forces
<b>OPORD</b>	operations order
<b>ORP</b>	objective rally point
<b>OT</b>	Czechoslovakian personnel carrier
<b>pam</b>	pamphlet
<b>PAS</b>	passive acquisition sight
<b>PC</b>	personnel carrier
<b>PCS</b>	permanent change of station
<b>PD</b>	primer detonating
<b>PDF</b>	principle direction of fire
<b>PGS</b>	precision gunnery system
<b>PGTS</b>	platoon gunnery training system
<b>PI</b>	primary instructor
<b>PIBD</b>	point initiating, base detonating
<b>POL</b>	petroleum, oils, and lubricants
<b>PRC</b>	portable radio configuration
<b>PVS</b>	passive viewing sight
<b>qual</b>	qualified
<b>R</b>	range (formula)
<b>rds</b>	rounds
<b>REDCON</b>	readiness condition
<b>ref pt</b>	reference point
<b>RERP</b>	reentry rally point
<b>RP</b>	reference point
<b>RPG</b>	rocket-propelled grenade
<b>rpm</b>	rounds per minute
<b>RSO</b>	range safety officer
<b>S2</b>	Intelligence Officer (U.S. Army)
<b>S3</b>	Operations and Training Officer (U.S. Army)
<b>SALUTE</b>	size, activity, location, unit, time, equipment
<b>SAT</b>	satisfactory
<b>SAW</b>	squad automatic weapon
<b>sec</b>	second(s)
<b>SLAP</b>	saboted light armor penetrating
<b>SM</b>	soldier's manual
<b>SMCT</b>	soldier's manual of common tasks
<b>SOI</b>	Signal Operation instructions

<b>SOP</b>	standing operating procedures
<b>SP</b>	start point
<b>STANO</b>	surveillance, target acquisition, and night observation
<b>STP</b>	soldier's training publication
<b>STRAC</b>	Standards in Training Commission
<b>STX</b>	situation training exercise
<b>T&amp;E</b>	training and evaluation
<b>TB</b>	technical bulletin
<b>TC</b>	training circular, truck commander
<b>TCE</b>	truck crew evaluator
<b>TCEPT</b>	truck crew evaluator performance test
<b>tech</b>	technique
<b>TGST</b>	TOW gunnery skills test
<b>tgts</b>	targets
<b>TM</b>	technical manual
<b>TOT</b>	tracer on target
<b>TOW</b>	tube-launched, optically tracked, wire-guided
<b>TOW FTT</b>	TOW field tactical trainer
<b>TOW GT</b>	TOW gunnery trainer
<b>TP</b>	target practice
<b>TRADOC</b>	US Army Training and Doctrine Command
<b>TRC</b>	training readiness condition
<b>TRP</b>	target reference point
<b>TVS</b>	thermal viewing sight
<b>UNSAT</b>	unsatisfactory
<b>UTM</b>	universal traverse mercator
<b>W</b>	width
<b>WRP</b>	weapons reference point
<b>Y</b>	yes
<b>ZSU</b>	Soviet antiaircraft vehicle

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**DENNIS J. REIMER**  
*General, United States Army*  
*Chief of Staff*

**Official:**

  
**JOEL B. HUDSON**  
*Administrative Assistant to the*  
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