**TC 3-20.31**
**5 DECEMBER 2014**

# TRAINING AND QUALIFICATION, CREW

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Training Circular
No. 3-20.31

Headquarters
Department of the Army
Washington, DC

# Training and Qualification, Crew

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# Preface

Training Circular (TC) 3-20.31 provides a training strategy for crews to attain direct fire weapon proficiency by delivering fire on target(s) using the target itself as a point of aim for either the weapon system or having the leader control fires. It provides training principles and techniques for use by the crew to gain proficiency in engaging and destroying threats efficiently in any operational environment.

The principal audience for TC 3-20.31 is commanders, trainers, and Master Gunners of movement and maneuver units. Commanders, staffs, and subordinates ensure their decisions and actions comply with applicable U.S., international, and, in some cases, host-nation laws and regulations. Commanders at all levels ensure their Soldiers operate according to the law of war and the rules of engagement. (Refer to Field Manual [FM] 27-10, *The Law of Land Warfare*.)

TC 3-20.31 is written using a plan, prepare, execute and assess methodology. This publication applies to all direct fire platforms for combat arms MOSs, Stryker NBCRV, and military police assigned to weapons platforms in the Armor, Infantry, and Stryker brigades only. Sustainment units within those organizations must use TC 4-11.46, *Convoy Protection Platform Gunnery*, for their qualification standards.

For unmanned aircraft systems (UAS) within the brigade combat team, units must follow the training guidelines and requirements found in TC 3-04.45, *Combat Aviation Gunnery*. The proponent for these training strategies is the U.S. Army Aviation Center of Excellence.

This publication includes all the planning and preparation required for a successful weapons proficiency training program for both stabilized and mounted machine gun (MMG) crews. Where vehicle- or weapon-specific techniques are covered in this TC and conflict with technical manuals (TM), the readers should follow the techniques in the TM.

This publication applies to the active Army, the Army National Guard, the Army Reserve, and the United States Marine Corps unless otherwise stated. Users and readers of this publication are invited to submit recommendations that will improve its effectiveness.

The proponent of this publication is the U.S. Army Training and Doctrine Command (TRADOC). The preparing agency is the Doctrine and Collective Training Division, Maneuver Center of Excellence (MCoE). Send comments and recommendations on a DA Form 2028 (Recommended Changes to Publications and Blank Forms) to the point of contact. Comments also may be sent by any means, U.S. mail, fax, or telephone, as long as you use or follow the format of DA Form 2028, or submit an electronic DA Form 2028. You also may call for more information. Point of contact information is as follows.

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Unless otherwise stated in this publication, masculine nouns and pronouns refer to both men and women. For the purposes of clarity, Army standard and Marine Corps standard are directly implied when discussing “standard” or “standards.”

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# Summary of Changes

The following changes were made to TC 3-20.31, *Training and Qualification, Crew*, to facilitate commonality across all direct fire systems within the maneuver formations. Additionally, this standardizes the terminology used in previous gunnery marksmanship manuals.

- Gunnery, marksmanship, live fire, and training densities are defined.
- The direct fire training plan replaces the term gunnery training plan.
- Required performance measure (RPM) replaces the term minimum proficiency level (MPL).
- Live fire training density, replaces the term gunnery training density.
- A simulations gate to live fire (GTLF) has been added as Table II for crews.

To promote integration and commonality across all weapon systems, standard table sets have been grouped and renamed as part of the integrated weapons training strategy (IWTS). The updated structure of the standardized table set used within the manual is shown below:

- Prerequisite Tables:
    - Training Table I – Gunnery Skills Test (GST).
    - Training Table II – Simulations.
    - Training Table III – Proficiency.
- Live Tables:
    - Table IV – Basic.
    - Table V – Practice.
    - Table VI – Qualification.

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# Chapter 1
# Overview

To successfully conduct decisive action in any operational environment (OE), crews must be technically competent and tactically proficient in the employment of their platform weapon systems. Soldiers must develop and sustain tactical skills that allow them to maneuver effectively and survive on the battlefield. This combination of weapon system marksmanship and tactical skills training is essential for total weapon system proficiency.

TC 3-20.31 provides a systematic method to train weapon system proficiency for crews of main gun, ATGM, and mounted machine gun (MMG) weapons platforms within the movement and maneuver formations. It includes an evaluation of marksmanship and weapon system skills during the crew's training tables and the application of those skills. It defines the minimum crew proficiency prior to progressing to the next gate within the integrated weapons training strategy (IWTS). TC 3-20.31 provides the planning, preparation, and requirements for all crew training, and culminates in weapon system qualification.

## SECTION I – PURPOSE

1-1. TC 3-20.31 assists the commander in producing qualified crews using a standardized, holistic, and comprehensive training model. With the shift from an organization-centric model to a holistic model, weapon system marksmanship training and integrated strategies for all direct fire ground-based weapon systems are standardized and synchronized to provide a progressive and gated training regimen.

1-2. The weapon system marksmanship principles in this publication are designed to support all direct fire ground systems in the engagement process. They allow the commander the flexibility to develop his weapon system (crew) unit training program based on the OE that coincides with the unit mission. Threat target arrays (target types and ranges) are developed based on the unit's threat template for its mission.

1-3. TC 3-20.31 describes the crew training program, range operations, the engagement process, range requirements and scenario development, and the fundamental crew tables including the qualification standards for all direct fire weapon systems. When the procedures in this manual conflict with the procedures in the technical manual (TM), the procedures in the appropriate TM should be followed.

1-4. TC 3-20.31 is intended to guide units through their unit training plan (UTP) development and execution. Units must evaluate training to make sure it adheres to sound training policy and provides the unit commander with a viable assessment tool at the completion of each training event. When commanders wish to increase the table ammunition resources beyond those authorized, the unit is responsible for securing and managing those training resources.

## CREW PLATFORM FAMILY OF PUBLICATIONS

1-5. With the incorporation of Abrams, Bradley, the Stryker Family of Vehicles (FoV), and mounted machine gun (MMG) combat arms direct fire platforms into this manual, supporting documents and publications were developed to aid in the holistic approach to training these systems. These publications are in the following specific categories.

- Common crew publications.
- Platform specific publications.
- Applied systems publications.

1-6. The Training and Qualification, Crew Platforms manual requires the use of the following publications to support the unit's training plan:

- TC 3-20.31-10, *Gunnery Skills Test*.
- TC 3-20.31-11, *Vehicle Crew Evaluator Exportable Package (VCEEP)*.
- TC 3-20.31-12, *Live Fire Training Aids, Devices, Simulators, and Simulations (TADSS)*.
- TC 3-20.31-13, *Direct Fire Engagement Process (DIDEA)*.

1-7. This system reduces the core crew training and qualification document size and provides flexibility to users to print only the required information. The supporting publications are training circulars (TCs), and provide a flexible, rapid update method of publication to ensure units have the most accurate information available for use, planning, and training.

## SECTION II – SCOPE

1-8. TC 3-20.31 is designed specifically for the training of mounted crews. ADRP 3-90, *Offense and Defense*, states "a crew consists of all personnel operating a particular system." The term "crew" used within this manual relates to any direct-fire platform, wheeled or tracked, that is manned by multiple Soldiers to effectively employ that platform.

1-9. The weapons platforms using this training circular are defined in three specific categories of primary armament: main gun, anti-tank guided missile (ATGM) equipped, and MMG. The platform categories are described as:

- Main gun-equipped platforms. This category was previously identified as "stabilized" for training purposes. This category has been updated to include a more concrete definition, and is termed main gun. This category consists of combat vehicles with a fire control system whose primary armament is 25mm, 105mm, and 120mm. This category includes the Abrams series of main battle tanks, Bradley Fighting Vehicle series of vehicles, and Stryker Mobile Gun System (MGS) only.
- ATGM-equipped platforms. This category includes the Stryker ATGM and wheeled or tracked vehicles equipped with ATGM capabilities.
- Mounted machine gun platforms. This category was previously identified as "unstabilized" or "unstabilized RWS." This category has been updated to include a more accurate and refined definition. This category of combat vehicles is termed mounted machine gun (MMG) based on the platform's primary armament. This category of trucks, personnel carriers, the Stryker family of vehicles (FoV), the armored security vehicle (ASV), the amphibious assault vehicle (AAV), and any wheeled or tracked vehicle equipped with a pintle-mounted machine gun or remote weapons station (RWS).

1-10. TC 3-20.31 requires the use of certain terms and definitions to streamline the training process. This manual uses the following training specific terms throughout the manual for consistency, accuracy, and standardization:

- Marksmanship. The application of the fundamental skills of firing a weapon with precision and accuracy.

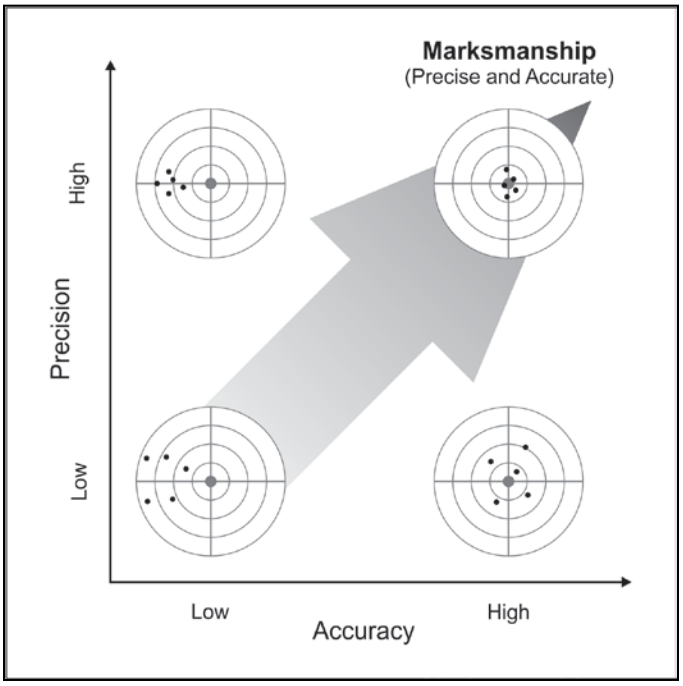


**Figure 1-1. Principles of marksmanship**

- **Gunnery**. Training events where the predominant evaluation focuses on the firer's knowledge, skills, marksmanship, and engagement techniques involved in the effective lethal employment of the weapon or system.

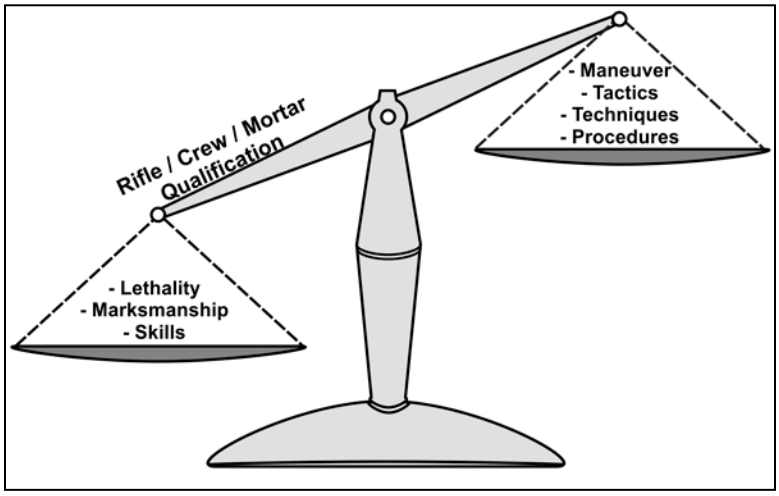


**Figure 1-2. Principles of gunnery evaluation**

- **Live fire**. Training events where the predominant evaluation focuses on the maneuver tactics, techniques, and procedures, and to a lesser degree, marksmanship skill.

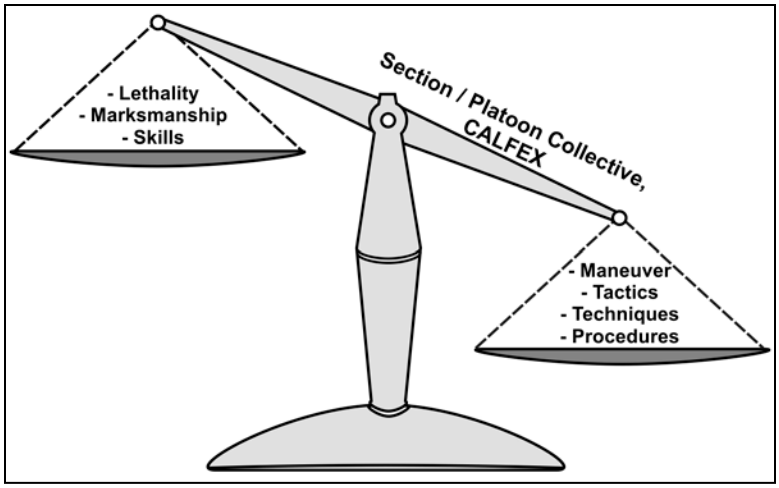


**Figure 1-3. Principles of live fire evaluation**

- **Training/Gunnery/Live fire Density**. A period of training that incorporates a complete cycle of gunnery or live fire events that include mission command elements and culminate in the qualification of a weapon, system, or small unit.
- **Training synchronization matrix (GUNLINE)**. An execution matrix to plan, prepare and conduct a training, gunnery, or live fire density.

1-11. TC 3-20.31 outlines platform crew tables designed to attain and sustain main gun, ATGM, and MMG crew direct-fire proficiency. TC 3-20.31 describes how to—

- Develop a unit weapons platform marksmanship training program.
- Conduct the direct-fire engagement process.
- Integrate training devices into unit weapons platform marksmanship training.
- Establish new training locations for combat training.

1-12. TC 3-20.31 also describes the—

- Actions, conditions, standards, and administrative guides for main gun, ATGM, and MMG skills tests.
- Procedures for developing tactical scenarios to support collective tables.
- Crew training tables used to aid commanders in determining overall platform proficiency.

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***Note.*** Critical procedural information contained in the technical/operator's manuals, which are listed in the references section, may be repeated in this manual for emphasis.

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## SECTION III – OVERVIEW

1-13. This section provides a general overview of the chapters of TC 3-20.31. This TC is a compilation of direct-fire weapon systems information from a variety of field manuals (FMs), technical bulletins (TB), TCs, and other documents to provide a single source for direct-fire weapons platform marksmanship planning and execution.

1-14. The following manuals have been used to facilitate the weapons training density planning of the commander and staff:

- FM 3-20.21, HBCT Gunnery.
- FM 3-22.3, Stryker Gunnery.
- FM 3-22.32, Improved Target Acquisition System, M41.
- FM 3-22.34, TOW Weapon System.
- TC 25-8, Training Ranges.
- ST 3-20.13-2, Stryker Mobile Gun System (MGS) Gunnery.

# CHAPTERS

1-15. Below is a brief synopsis of each chapter. This information provides a general overview of the topics provided in each of the following chapters.

### CHAPTER 2, CREW TRAINING PROGRAM

1-16. Chapter 2 describes the training strategy and planning considerations for units to be successful at weapon system proficiency training. The chapter is outlined so that units lacking experience with a table-based IWTS can easily incorporate the model into their unit training plan (UTP).

### CHAPTER 3, RANGE OPERATIONS

1-17. Chapter 3 outlines the procedures, duties, and responsibilities for planning and establishing both permanent and temporary maneuver marksmanship ranges. It provides the roles and responsibilities for the planners and unit Master Gunners to safely and effectively execute the UTP.

### CHAPTER 4, RANGE REQUIREMENTS AND SCENARIO DEVELOPMENT

1-18. This chapter provides information on the general capabilities and requirements for the Army's family of maneuver ranges that support crew training and qualification. It includes the steps necessary to successfully plan, coordinate, and execute the development of training table engagement scenarios to ensure that all training objectives of the weapons training density are met.

### CHAPTER 5, CREW TABLES

1-19. This chapter outlines the design of direct fire crew tables for main gun, ATGM, and MMG platforms. This chapter contains the targetry requirements; required performance measures (RPM), ammunition requirements, and standards for all engagements used in the crew tables.

### CHAPTER 6, CREW EVALUATION

1-20. Chapter 6 details the standard evaluation process that supports crew-level main gun, ATGM, and MMG training and qualification. This chapter thoroughly describes the evaluation process, engagement modifiers (EM) to facilitate point calculation, sample common crew score sheets, and the evaluator roles and responsibilities.

1-21. As the evaluation is a hybrid model of weapon system platforms of previous doctrinal publications, Soldiers must master the evaluation process prior to any weapons training density. To augment their training, a Master Gunner toolbox has been established with the Vehicle Crew Evaluator Exportable Package (VCEEP) to

facilitate certification of unit's evaluators. Visit https://www.us.army.mil/suite/kc/9773303 on the Army Knowledge Online (AKO) website for tools and supporting products for the evaluation process, classes, automated score sheets, and more. Users must have a valid AKO account to be granted access.

## Chapter 2

# Crew Training Program

This chapter provides guidelines on how to plan, prepare, execute, and assess direct fire training for main gun, ATGM, and MMG platforms through crew qualification. It provides guidance on training critical skills that produces Soldiers and crews with the ability to deliver integrated, lethal fire under adverse battlefield conditions. It includes general concepts for the integrated weapons training strategy (IWTS), and describes how to integrate other critical training events into the unit's weapons platform training program.

Developing unit training plans for crew proficiency requires attention to detail, thoroughness, flexibility, and timely resource planning. Commanders and Master Gunners should be thoroughly familiar with DA Pam 350-38, Standards in Weapons Training (commonly referred to as STRAC), as it provides commanders with the training ammunition authorizations for individual, crew, and collective events, and identifies the resources required to execute that training. STRAC strategies are the basis for determining training ammunition authorizations and for providing units and Army commands (ACOMs) and Army service component commands (ASCCs) the information necessary to forecast training ammunition.

Commanders, trainers, and planners must have a comprehensive understanding of the topics in this chapter, the IWTS, how each component of the training program interacts with other training programs, and have the ability to forecast and plan months in advance to achieve the desired level of proficiency. The ammunition requirements (found later in this publication) may be different from the training ammunition authorized within the approved FY STRAC document. Commanders, Master Gunners, planners, and trainers must be able to understand the differences, if any, and request their resources accordingly.

The crew training program is nested within the IWTS. It represents training and qualification through crew level. After completing crew qualification, the unit progressively executes a series of collective training tables. It is important for units to understand the basic concepts and principles of the IWTS.

***Note.*** USMC will refer to MCWP 5-1, Marine Corps Planning Process rather than the integrated weapons training strategy. All ammunition requirements and forecasting discussed will be resourced according to applicable Marine Corps policies and procedures.

## SECTION I – INTEGRATED WEAPONS TRAINING STRATEGY

2-1. The IWTS is designed to integrate with any unit training cycle and is not tied to the fiscal year (FY). The IWTS is comprised of specific elements that build a training and qualification model for each weapon, system, and echelon through battalion/squadron.

2-2. These elements are defined as:

- **Frequency**. This is the number of iterations a unit is resourced throughout a complete training cycle.
- **Gates**. Each training density contains four specific echelon-based gates. These gates must be completed in order shown below to progress to the next gate of training. The progressive gates are:
  - **Gate 4** – Individual and crew served weapons.
  - **Gate 3** – Squad, crew, fire direction center, and mortar.
  - **Gate 2** – Section and platoon.
  - **Gate 1** – Company/troop/team combined arms live fire exercise (CALFEX) and battalion / squadron / task force fire coordination exercise (FCX).
- **Tables**. The IWTS contains a standard series of tables that progressively build weapon system proficiency in a crawl-walk-run method of training. For each weapon, system, or echelon, a series of six tables were developed using hands-on, TADSS, simulations and gaming, and live training ammunition. The tables are numbered I through VI for standardization purposes. There are specific prerequisites and gates that must be completed within the table set in order to progress to the next echelon of training. The tables for any weapon or system, including crew platforms, are divided in two specific phases of training; prerequisites and live.
  - **Prerequisites**. Tables I, II, and III are designed specifically for training in garrison. Units progress to the live tables upon successful completion of the corresponding prerequisites.
  - **Live**. Tables IV, V, and VI are designed for live training events on a range facility, complex, or training area as appropriate. Table VI represents the culminating qualification of the weapon, system, or small unit/echelon. Table VI provides the commander a primary assessment tool to evaluate the Soldier, squad, crew, or unit's proficiency.

2-3. The training events in this TC are the termed the crew tables. At the completion of the crew tables, units will have lethal, proficient and qualified crews capable of executing collective training. They will have successfully completed all drivers' training and licensing requirements, as well as communication skill certifications. The successful completion of the qualification table validates the crew's completion of the training gate and is certified to move to the next gate in the training program.

# CREW TABLES

2-4. Figure 2-1 shows the crew tables and provides their general description and primary method of training. The environment column indicates a generalized training environment for the event, and includes the associated training principle or method to the event.

| | Prerequisites | | | Live | | |
|---|---|---|---|---|---|---|
| | Table I | Table II | Table III | Table IV | Table V | Table VI |
| Gate 3 Squad / Crew / FDC / Mortar TC 3-20.3X | Skills Evaluation | Simulations | Proficiency | Basic | Practice | Qualification |
| Method | Crawl | Crawl | Crawl | Walk | Walk | Run |

**Table 2-1. Crew tables**

2-5. The IWTS uses these tables to provide a common, consistent training model to all direct-fire crews. These tables are executed in a gated and progressive manner. The following is an overview description of the crew tables.

## TABLE I, GUNNERY SKILLS TEST

2-6. The Gunnery Skills Test (GST) evaluates the individual crewmember's ability to execute selected fundamental gunnery-related skills. Table I evaluates the entire crew's ability to execute selected tasks that are critical to the safe, successful live fire training. Table I is a mandatory prerequisite for any live fire event, including zero procedures, live fire accuracy screening test (LFAST), sub-caliber or in-bore training event, or any live fire maintenance procedure.

2-7. The tasks evaluated in Table I provide the commander a means to certify the crew's basic weapons platform proficiency prior to live fire training. It can be used as a guide for identifying individual and crew weapons platform strengths and weaknesses on specific fundamentals. The results from the GST should be used by the commander and Master Gunner when structuring the unit's crew training program.

2-8. Units can include additional tasks they require to support the training program, but cannot eliminate tasks for any weapon system. Units should consider including crewmember evacuation, fire drills, and roll-over drills as part of their GST training as well as supporting their unit's driver's training program.

2-9. Table I, Gunnery Skills Test, must be completed for record between T-6 and T-week. (Refer to the training horizon later in this chapter.) All actions, conditions, and standards for all platforms' respective GSTs can be found in the TC 3-20.3-10, *Gunnery Skills Test*, downloadable from Army Knowledge Online (https://www.us.army.mil/suite/files/9773910).

## TABLE II, SIMULATIONS

2-10. The purpose of these exercises is to ensure the crew possesses the skills and experience necessary to safely execute live fire exercises, which implies a fundamental understanding of the engagement process, fire commands, engagement techniques, and marksmanship. This is the culminating test of their abilities and skills on their platform in simulation after completing a complete simulations training plan.

2-11. Table II must be completed between T-6 and T-week to support the training events. Crewmembers will conduct direct-fire training using a simulator or gaming suite as available. These systems are used to train the VC and gunner on individual and crew-coordination skills, engagement techniques, and target acquisition.

2-12. The unit must use certified instructor/operators for their supporting simulations systems, as well as vehicle crew evaluators (VCEs) to evaluate all Table II scenarios. The certification process for the VCEs is detailed in Chapter 6, Crew Evaluation.

2-13. Table 2-2 shows the authorized primary and alternate simulations or gaming systems units must use to execute Table II for their respective vehicles. Units should avoid using alternate systems to conduct training whenever possible:

| Platform | Device | Method | | GTLF Scenario | | Remarks |
|---|---|---|---|---|---|---|
| | | Primary | Alternate | System Generated | Unit Master Gunner Developed | |
| **Main Gun / ATGM Platforms** | | | | | | |
| Abrams | AGTS | X | | X | | System-generated scenario. |
| | DAGTS | | X | X | | |
| | TAGTS | | X | X | | |
| | C-AGTS | X | | X | | |
| | COFT-M-SA | X | | X | | |
| | VBS-2 / VBS-3 | | X | | X | Master Gunner-developed scenario. |
| Bradley | BATS | X | | X | | System-generated scenario. |
| | BFV-COFT-SA | X | | X | | |
| | BFV-COFT-E | X | | X | | |
| | BFV-COFT-SA-TTT | | X | X | | |
| | VBS-2 / VBS-3 | | X | | X | Master Gunner-developed scenario. |
| MGS | MGS-AGTS | X | | X | | System-generated scenario. |
| | Desk Top Trainer | | X | X | | |
| | VBS-2 / VBS-3 | | X | | X | Master Gunner-developed scenario. |
| | ET | | X | | X | |
| ATGM | BST | X | | X | | System-generated scenario. |
| | STS | X | | X | | |
| **Mounted Machine Gun Platforms** | | | | | | |
| RWS | Desk Top Trainer | X | | X | | System-generated scenario. |
| | VBS-2 / VBS-3 | X | | | X | Master Gunner-developed scenario. |
| | ET | X | | | X | |
| Pintle Mounted | VBS-2 / VBS-3 | X | | | X | Master Gunner-developed scenario. |
| | RVTT | | X | | X | Master Gunner-developed scenario that uses the Required Performance Measures. Evaluation must be done with VCE. |
| | RVS | | X | | X | |
| | RV-COT | | X | | X | |
| | VCOT | X | | X | | |
| | AAV-TT | X | | X | | |
| | UGT | X | | X | | System-generated scenario. |
| | IGT | X | | X | | |
| | EST / FATS | X | | X | | Least preferred method. Units should seek a primary training device for training. Crew must progress through all scenarios available for the weapon system. Once complete, successfully complete the record fire scenario. |

**Table 2-2. Simulations required for executing GST, Table II**

2-14. For MGS crews ***not equipped*** with the Advanced Gunnery Training System (AGTS), the embedded trainer (ET) is authorized for completion of Table II. Units provided the AGTS may not use the ET system to meet their Table II requirements; however, they are encouraged to utilize ET systems in conjunction with AGTS for sustainment and cross training of their crews.

2-15. MMG crews can use the Engagement Skills Trainer (EST) or Firearms Training Systems (FATS) for fundamental training on their respective weapon; however, this is the least preferred method. Units should use this system to instruct proper engagement techniques, grouping, zeroing, and react to malfunction training. Units using EST/FATS as their Table II must ensure the crews complete ground-based grouping, zeroing, familiarization, and qualification events at a minimum. Units must augment their use of EST / FATS with gaming systems and hands-on thermal weapon sight instruction and use.

2-16. Each simulator has a prescribed exercise or series of exercises that must be completed successfully as a prerequisite to firing live ammunition. These exercises evaluate the crew's proficiency employing its weapon system or platform against common threats, provide engagements under chemical, biological, radiological and nuclear (CBRN) conditions, enhance and evaluate crew coordination, evaluate crew drills, and hone the crew's engagement techniques.

2-17. Simulation use is authorized by specific hours per month based on the platform type. Crews are resourced for simulator use at the rates shown below:

| | AC | | RC | |
|---|---|---|---|---|
| **Crew Type:** | **MG / ATGM** | **MMG** | **MG / ATGM** | **MMG** |
| **Monthly** | 4 | 1 | 2 | 0.5 |
| **Quarterly** | 12 | 3 | 6 | 1.5 |

**Table 2-3. Simulations use allocations by component and platform type**

2-18. For units using gaming systems (VBS2 or VBS3), the unit's Master Gunner must develop a series of increasingly more difficult scenarios for their experienced crews to execute, building on their previously mastered skills. The Master Gunner should build these progressive GTLF exercises to increase the level of difficulty of the scenarios. For example, units may increase the difficulty of their developed scenarios by increasing the range to target, increasing the number of limited visibility engagements, reducing ammunition available, or increasing the number of offensive engagements.

***Note.*** All simulations and games for training GTLF exercises must be evaluated by the unit's certified VCE or Master Gunner This reinforces the VCE training program, provides certified VCEs with additional training and experience, and ensures the crews receive accurate after action reviews comparable to those they should receive on the firing range.

2-19. Units that develop scenarios on games for training systems must take into account the level of experience of their training crews. Crews are evaluated on their experience in identified in one of the following categories:

- **New crew**. A crew where the vehicle commander, gunner, or both are new to their position on the vehicle. New crews begin training in the simulations and gaming systems at the entry level to build crew coordination, engagement skills, and cohesion. On vehicles with no vehicle commander (Stryker, for example), when the gunner is replaced, the crew is considered a new crew.
- **Turbulent crew**. A crew where both the vehicle commander and gunner previously have held the position they are in, but have not worked together as a crew. These crews should be assessed for proper placement within the simulation's training management system. Typically, the assessment shows they should begin training at the lowest common training scenario to maximize their training time. For crews that require gaming use, units build more difficult scenarios for these crews to negotiate. This ensures the crews remain challenged in the simulations and gaming system, and continue to learn direct-fire engagement techniques and procedures.
- **Experienced crew**. The vehicle commander and gunner previously have qualified together as a crew within the past nine months. Crews utilizing simulations must continue training through the next GTLF prior to executing any live fire event. For crews using gaming systems, the unit must develop and execute more challenging scenarios for their experienced crews to execute.

2-20. Table 2-4 shows how the unit Master Gunner should develop gaming scenarios for their crews during the weapons platform training program. It consists of a minimum of four scenarios per crew experience category. All scenarios must be successfully passed according to the standards in Chapter 6, Crew Evaluation. The gaming GTLF must be evaluated by the unit's VCEs. Each of the scenarios developed must follow the engagement and scenario guidelines found in this manual. Each scenario provides five day engagements and five night engagements. Units must focus on manipulation of the weapon's thermal optic, use of image intensifier (night vision goggles) with thermal optics, and allow crews to use the thermal sensors during the day engagements.

| Focus | New Crews | Turbulent Crews | Experienced Crews |
|---|---|---|---|
| | **Fundamental and Fire Commands** | **Fundamentals, Fire Commands, and Increased Difficulty** | **Increased Difficulty (Target Acquisition, Range to Target, Moving and Evasive Targets)** |
| Table III - Proficiency | | Extended range | Extended range, additional CBRN, increased number of offensive engagements, evasive moving targets |
| Table IV - Basic | | Extended range, additional CBRN, increased number of offensive engagements | Extended range, additional CBRN, increased number of offensive engagements, evasive moving targets, smaller targets (¾ scale or increased troop targets) |
| Table V - Practice | Extended range | Extended range, additional CBRN, increased number of offensive engagements | Extended range, additional CBRN, increased number of offensive engagements, evasive moving targets, smaller targets (¾ scale or increased troop targets), weapons malfunctions induced |
| Table VI - GTLF | | Extended range, additional CBRN, increased number of offensive engagements | Extended range, additional CBRN, increased number of offensive engagements, evasive moving targets, smaller targets (¾ scale or increased troop targets) |

**Table 2-4. Scenarios for the weapons platform training program**

***Note.*** DA PAM 350-38, *Standards in Weapons Training*, specifies simulator training requirements and skills sustainment intervals for certain weapons and weapon system platforms. Units also will use area command (ACOM) 350-1 and local training regulations.

## TABLE III, PROFICIENCY

2-21. Table III, Proficiency, is performed on the crew's vehicle. It is designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array, during day and limited visibility conditions. Crews execute these tasks from the offense and defense.

2-22. This course requires the use of laser-based TADSS for all crews. Units with TADSS available are not authorized to deviate from the TADSS requirement unless approved by the brigade commander. Units should focus on training and reinforcing the skills to detect, identify, decide, engage, and assess (DIDEA) on this table specifically with their thermal optics, day and night to best prepare them for the follow-on training events.

2-23. USMC units are not required to use TADSS for any platform on Table III. USMC follows the local commander's guidance concerning the conduct of Table III.

2-24. This course may be executed before the gunnery density begins or during the gunnery density itself, prior to any live fire event, including zero, live fire accuracy screening test (LFAST), or test fire. This includes use of any sub-caliber training device that fires live munitions, such as the Advanced In-bore Marksmanship Training Evaluation System – Tank (AIMTEST) or similar devices.

2-25. The commander may choose to use the live training method for the proficiency course firing sub-caliber ammunition, providing crews qualify during a device-based run first to demonstrate mastery of basic skills and safety principles. Upon qualification of Table III as a device-based event, the commander may re-fire the table with full-caliber or sub-caliber ammunition if the range and ammunition resourcing permits.

2-26. Units should use full-scale targets on this table, but may consider increasing the difficulty by using ¾-scale targets at full range for all scenarios. If ¾-scale targets are used, the Master Gunner may consider using F-type silhouettes rather than E-type silhouettes. (Refer to TC 25-8, *Training Ranges* for more information.)

## TABLE IV, BASIC

2-27. Table IV, Basic, is performed on the crew's vehicle. It is designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array, during day and limited visibility conditions, with a fully operational of simulated degraded fire control system, as applicable. Crews execute these tasks from the offense and defense using full-caliber ammunition.

2-28. The ASV and AAV, having dual weapon system turrets, are resourced for this table. All other MMG platforms, including RWS, are not resourced ammunition for this table. For those units that are not resourced, they may execute this training using TADSS or with full-caliber ammunition, if available.

2-29. This course is executed only after any zeroing or screening procedures have been completed successfully. Crews may execute this table using TADSS only when ammunition is unavailable or for re-training after the live fire training was completed.

2-30. Units should use full-scale targets on this table, but may consider increasing the difficulty by using ¾ scale targets at full range for all scenarios. If ¾-scale targets are used, the Master Gunner may consider using F-type silhouettes rather than E-type silhouettes. (Refer to TC 25-8, *Training Ranges* for more information.)

## TABLE V, PRACTICE

2-31. Table V, Practice, is performed on the crew's vehicle. It is designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array, during day and limited visibility conditions, with a fully operational or simulated degraded fire control system, as applicable. Crews execute these tasks from the offense and defense using full-caliber ammunition.

2-32. Units should use full-scale targets on this table, but may consider increasing the difficulty by using ¾ scale targets at full range for all scenarios. If ¾-scale targets are used, the Master Gunner may consider using F-type silhouettes rather than E-type silhouettes. (Refer to TC 25-8, *Training Ranges* for more information.)

2-33. This table prepares crews for the Table VI, Qualification. It is designed to be more difficult to master than the qualification. Units should retrain as necessary with full-caliber ammunition when possible.

## TABLE VI, QUALIFICATION

2-34. Table VI, Qualification, is performed on the crew's vehicle. It is designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array, during day and limited visibility

conditions, with a fully operational or simulated degraded fire control system, as applicable. Crews execute these tasks from the offense and defense using full-caliber ammunition.

2-35. Units are not authorized to present targets less than full-scale. All targets must meet the full-scale dimensions with standard thermal signatures as described in TC 25-8, *Training Ranges.*

2-36. This table also includes additional training requirements for Call-For (Call-for-fire, call-for-close combat attack, call-for MEDEVAC, call-for CASEVAC) and digital tasks. These additional tasks are described in Chapter 5, Crew Tables. These requirements must be completed before or after firing only, and are not intended to hinder the unit while executing the live fire scenarios.

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***Note.*** Successful completion of all prerequisites and Table VI complete the requirements of Gate 3. Crews that complete Gate 3 are authorized to conduct live fire Gate 2 events after successful completion of the Gate 2 prerequisite tables.

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2-37. Crews must successfully complete the qualification course prior to executing any collective live fire training in Gate 2 or Gate 1. Units must follow the training guidelines for those gates in the appropriate TC. Units may conduct "make-up" qualifications prior to live-collective training when required, but must ensure the live fire prerequisites are completed as directed.

## SECTION II – THE UNIT MASTER GUNNER

2-38. The Master Gunner is an institution-trained and certified subject matter expert (SME) on direct-fire weapons, weapon systems, ammunition, maintenance of weapon systems, and training programs. Master Gunner training specializes in a specific platform, but includes the key components of other weapons and systems required to develop direct fire training for all weapons and systems assigned to the unit.

2-39. For units without a Master Gunner assigned or authorized, the commander must select an experienced NCO, or training/range NCO, to support the weapons training programs in the unit. For simplicity, "Master Gunner" is used throughout this manual. For units without a Master Gunner position, a gunnery NCO who is experienced in gunnery and training should be identified to assist in development and execution of the unit training plan (UTP) for direct fire weapons or systems.

2-40. The Master Gunner's mission is to train the unit for direct fire training and is the SME for all weapons and weapon system platforms. The Master Gunner advises the commander on all aspects of direct fire training, capabilities, and employment. He is the commander's primary resource for the planning, development, execution, and evaluation of all direct fire training (individual, crew, and collective).

2-41. Unit commanders and staff must be familiar with what their Master Gunner provides in garrison, during training, and while deployed. The Master Gunner's duties include—

- Develop and implement of live fire or gunnery standard operating procedures.
- Track weapons system maintenance tasks and advising the commander on maintenance status.
- Maintain weapon system firing data.
- Assist the integration of newly assigned Soldiers.
- Establish and conduct initial skills training for new vehicle commanders or gunners.
- Assist in training new crew members.
- Train and certify VCEs.
- Recommend placement of new arrivals to the commander and command sergeant major or first sergeant.
- Recommend crew assignments for all platforms within the unit.
- Assist all elements in the unit concerning direct fire training and employment.
- Forecast and manage ammunition through the Training Ammunition Management Information System (TAMIS). Manages ammunition accounts for all subordinate units.

- Resource and request training areas and ranges through the Range Facility Management Support System (RFMSS).
- Manage direct fire training documents, gunnery skills test records, simulations training records, and crew rosters.
- Establish and oversee gunnery skills test training and evaluating the results.
- Coordinating the pickup, training, use, installation, troubleshooting, and turn-in of all TADSS required for conducting effective training.
- Certify and recertify other instructor/operators (I/Os), if senior instructor/operator (SI/O) qualified, to conduct crew direct fire training simulations training.
- Develop, validate, and manage games for training scenarios supporting the unit training program and the gaming GTLF exercises.
- Plan and manage crew direct fire training simulations training.
- Train crews on TADSS device-based direct fire training systems (installation, boresighting and troubleshooting procedures, point of aim, and maintenance).
- Oversee all direct fire training and execution.
- Maintain live fire training standards on all ranges.
- Advise the commander of the tactical capabilities and limitations of all platform weapon systems against threat systems (while in a tactical environment and in coordination with the intelligence staff officer [S-2]).

2-42. The Master Gunner's formal training includes extensive training in vehicle maintenance, range planning, preparation, execution, and all phases of direct fire training. The Master Gunner has additional responsibilities at various echelons at home station and during deployments:

- **Division Master Gunner.**
  - Design and safety certify sustainment ranges while deployed.
  - Develop installation range upgrade and modernization assessments and provide recommendations for MCA and other projects.
  - Coordinate with U.S. and foreign military representatives for joint and international live fire exercises.
  - Develop and recommend gunnery and live fire actions for inclusion in the command guidance.
  - Develop division-level gunnery standard operating procedures (GUNSOPs).
  - Provide gunnery subject matter expert advice to the commanding general and G-3.
  - Advise the commanding general on gunnery and live fire proficiency trends within the division.
  - Provide oversight of TADSS use, instruction, and management within the division.
  - Consolidate brigade training results and develop trend analysis.
  - Conduct quarterly Master Gunner coordination and collaboration meetings to ensure compliance with Division guidance, standards, and training strategy updates.
  - In coordination with the appropriate installation agencies, oversee and de-conflict training resources: ammunition allocations, training areas and land, simulations, TADSS, ranges, and training facilities.
  - Consolidate, review, and validate all Master Gunner School packets.
  - Establish Master Gunner training and mentorship program within the division.
  - Provide direct fire training subject matter expert assessments during pre-deployment sight survey activities.
  - Develop and oversee all combat system accuracy, zero, and screening procedures or checks during reception, staging, onward movement, and integration functions, as appropriate.
  - Serve as the commanding general's representative for all gunnery and live fire discussions during division, ACOM, Army, and international conferences and work groups.
  - When deployed, manage combat and training ammunition accounts for the divisional assets.
- **Brigade Master Gunner**

- Work closely with the subordinate unit Master Gunners to ensure standards are uniform throughout the brigade's training programs.
- Develop the written certification and recertification test for VCEs.
- Provide any new information on ways to improve crew training.
- Coordinate with range-operations personnel at the installation or major training area as necessary.
- Assist range operations to develop and upgrade range facilities based on identified training gaps within the brigade.
- Deconflict scheduling or use of training assets within the brigade.
- Maintain brigade-level TAMIS and RFMSS accounts and assists lower echelon unit account users.
- Create consolidated unit weapons platform proficiency reports upon completion of each live fire density. Identify training gaps, weaknesses, strengths, and overall unit proficiency for the brigade commander and S-3.
- When deployed, develop sustainment training ranges as required.
- When deployed, manage combat and training ammunition accounts.

- **Battalion Master Gunner.**
  - In conjunction with S-3, develop collective training exercises.
  - Continue to train Master Gunners and NCOs assigned to the battalion on live fire-related topics.
  - Assist the battalion commander and command sergeant major select candidates for Master Gunner School.
  - Supervise simulations training and gate to live fire execution and evaluations.
  - Track safety and maintenance messages that may impact training.
  - Develop and implement new training techniques to improve crew training.
  - Coordinate with brigade for direct fire training assets.
  - Plan, develop, manage, and execute VCE training.
  - Certify gunnery skills test evaluators according to this manual.
  - Coordinate for the certification of range safety personnel.
  - Manage the battalion ammunition, land, and range resourcing accounts through TAMIS and RFMSS.
  - Monitor company direct fire training plans.
  - Develop battalion-level direct fire training plans.
  - Consolidate unit live fire training records and provide analysis to the commander on unit proficiency, training gaps, training weaknesses, and overall performance.
  - Provide assistance for direct fire planning while deployed.
  - Develop and manage sustainment ranges during deployments.
  - Develop surface danger area diagrams, composite surface danger zones, and weapons danger zones for home station and deployed locations for direct fire planning.
- **Company Master Gunner**, where authorized.
  - Develop, manage resources, and execute company-level direct fire training plans.
  - Assist and coordinate armament maintenance and services, as required.
  - Assist and coordinate unit maintenance to correct turret or weapon malfunctions or deficiencies.
  - Complete and maintain DA Form 2408-4, Weapon Record Data on all medium and large caliber weapons, to include sniper rifles.
  - Coordinate with the battalion S-3 and battalion Master Gunner to secure company direct fire training assets.
  - Train VCEs.
  - Develop, design, and create local live fire training ranges as directed when deployed.
  - Report unit live fire training results to the next higher Master Gunner.

- Platoon Master Gunner, where authorized.
  - Assist with the maintenance of the platoon weapon systems and turret.
  - Update the company's Master Gunner or gunnery NCO on the platoon's crew training.
  - Assist the company's Master Gunner or gunnery NCO with unit direct fire training.
  - Manage crew roster changes.

## SECTION III – THE UNIT TRAINING PLAN (UTP)

2-43. The unit training plan (UTP) is the unit's overarching plan to attain key collective task (KCT) proficiency. As part of achieving the KCT proficiency, units develop their direct fire training plans, discussed below. Every live fire training event is led and managed through the operations process (plan-prepare-execute-assess). It is planned and coordinated in detail well before execution to ensure the training objectives are synchronized with the unit's KCTs. Crew direct fire training is just one series of events that support the unit's overall proficiency for combat, and is critical to the unit's success.

2-44. The concepts of the "T-week" (active component) and the "T-month" (reserve component) are used to provide a sequential framework that ensures all critical actions are completed before and after the training event is conducted. This process has to start early enough in the planning cycle to ensure all resources required to train are present and accounted for as the training begins.

2-45. All actions listed below in T-week and T-month are designed for simplicity. Active components read the "T minus" number in weeks, and reserve components read the same number as months. This aligns the requirements appropriately for most cases. If a schedule or task is required outside of that general framework, the specific change is identified in parentheses.

2-46. The T-week concept provides a framework and a backward planning method that provides specific considerations for the planning and coordination necessary for each training event. The T-week concept ensures that all significant actions necessary to execute the training are considered and completed in a timely manner. Although the following description is extensive, it does not take into account each unit or installation's particular requirements for planning and coordination. The T-week concepts support but do not replace the detailed planning a unit executes using the military decision-making process (MDMP), troop leading procedures (TLPs), or their own eight-step training model.

2-47. After completing the unit assessment and establishing the training goals, objectives, and requirements, the commander then can design his weapons platform training plan. The commander must select an approach to training that suits his unit's needs and is structured to the average proficiency level of his unit. The commander and the primary trainers then must schedule training to coincide with the availability of training days, devices, resources, training areas, and ranges. Whenever possible, training events should be combined to maximize the available operations tempo (OPTEMPO) and training days of the entire unit.

2-48. The greatest problem a commander faces in regards to direct fire training is crew roster changes. The commander must plan for reducing and controlling turbulence as the unit progresses across the training horizon. He must do this while he develops and before he executes his training plan. Some possible solutions to crew management challenges are:

- Change personnel as a crew rather than a single crewmember. For example, if a staff sergeant vehicle commander receives a promotion to platoon sergeant, then his entire crew moves with him. This causes only one crew change rather than two.
- Train an alternate for each position.
- Continually cross-training personnel for replacements. Experienced Soldiers are easier to train than new Soldiers.
- Form complete crews from new personnel who come into the unit to establish longevity in position.
- Reinforce the Excellence In Armor and other weapon- and system-related programs to assist with talent management.
- Encourage attendance to Master Gunner School with graduate stabilization within the unit.
- Encourage attendance to the Stryker Master Trainer, Stryker Leader, and other courses.

- Develop and execute a series of NCO professional development events that focus on instructing the trainer on weapons platform topics. For example, units could provide monthly sessions led by their SMEs on engagement techniques, reticle patterns, range determination, thermal optics, call for fire, or ammunition capabilities.

2-49. Planners and trainers must take adequate time and effort to determine the unit's current strengths and weaknesses concerning their direct fire proficiency and lethality. The IWTS provide a standardized means to train all weapons and platforms. This master strategy is synchronized to support the unit's training goals and objectives, METL, and commander's intent while working in a collaborative fashion with other training strategies. The unit's understanding of the training strategy's table sets, its mandatory training events (prerequisites), and throughput demands are key to crafting and executing a successful weapons platform training program.

# COMMANDER'S ASSESSMENT

2-50. Prior to developing any UTP, the commander must make a complete assessment of the unit's proficiency, training strengths, its weaknesses, and the standards he wishes to achieve. This assessment must be comprehensive to design training to achieve, improve, or sustain proficiency. Commanders assess and evaluate all aspects of training, including the planning, preparation, and execution. Leaders continuously monitor the unit's mission-essential task list (METL) proficiency to determine a quantifiable snap shot of the unit's current direct fire training proficiency. From this snap shot, the unit can develop a training plan to correct deficiencies, improve mastery, and sustain fundamentals. The Master Gunner advises the commander on all weapon and weapon systems capabilities, unit proficiency, training status, and employment. The commander assesses the overall proficiency of the unit's crews, and the Master Gunner focuses on the proficiency of each individual crew.

2-51. The following factors must be considered during the assessment of crew proficiency:

- **Previous training.** The commander assesses training with input from the executive officer (XO), operations staff officer (S-3), Master Gunner, subordinate leaders, and senior trainers. The NCOs are the primary trainers of Soldiers and crews, and assist in the development of unit training plans. The commander can use individual and crew training evaluations to assess the unit's current proficiency. Commanders can evaluate their unit's proficiency for weapons training by reviewing training records, such as:
- **Individual.** Evaluate Soldier skills that indicate individual training proficiency. The Soldier's performance on diagnostic and record GST, which evaluates specific platform-related individual proficiency. Individual weapons training and qualification scores indicate proficiency for personal and crew served weapons.
- **Crew.** The Common Crew Score Sheet and Common Crew Roll Up measure crew training proficiency by weapons platform task, from simulation and TADSS-based gate to live fire exercises through live fire qualification. Commanders should review their available simulations' training unit summaries along with performance analyses (simulator-dependent). Direct fire training results and evaluation sheets from the last training period provide additional field-oriented data, which can identify future training requirements.

2-52. The commander uses the specific task standards whenever possible to measure the demonstrated abilities of individuals and crews. Accurate and honest evaluations are necessary to identify where to place training emphasis. Leaders must make on-the-spot corrections and demand aggressive action to correct training deficiencies.

## MISSION-ESSENTIAL TASK LIST

2-53. The Department of the Army standardizes the unit METL for most operational units at the brigade level. This standardization ensures that like units have like capabilities. For training purposes, collective tasks that support METL and tasks groups change according to unit readiness and expected OE.

2-54. Time, resources, and command emphasis must all focus on training tasks that support the METL. Platoon leaders and platoon sergeants should use the appropriate individual tasks that support the training objectives using the following references:

- Combined Arms Training Strategy (CATS).
- Central Army Registry (CAR).
- Digital Training Management System (DTMS).
- Soldier's manuals.
- Soldier training publications.
- DA Pamphlet 350-38, Standards in Weapons Training.
- Deployment or mobilization plans.
- Army Universal Task List (AUTL).
- Universal Joint Task List (UJTL).
- Army, area command, and local regulations.
- Local standard operating procedures (SOPs).

2-55. The training and evaluation outlines for the collective tasks, drills, and individual tasks identified that support the unit's METL can be accessed through the DTMS and CATS found on the Army Training Network (ATN) (https://atn.army.mil ).

## WARFIGHTING SKILLS

2-56. Individuals, crews, squads, and platoons must achieve proficiency on tasks that are critical to sustain and improve direct fire training skills. The first set of tasks listed below applies to all Soldiers and platforms within any organization. They are inherent to training direct fire weapons and maximizing the use and employment of other warfighting functions and combined arms systems. The remainder of the tasks listed applies to main gun platforms (Abrams, Bradley, and Stryker Mobile Gun System) only. Commanders, planners, and trainers must make initial assessments on the crew's ability to perform the following tasks routinely to maintain awareness of the unit's overall combined arms proficiency.

2-57. All Soldiers and platform crews must be capable of—

- Detecting, identifying, and classifying threats, or discriminating them as friendly or neutral.
- Acquiring and engaging threats in an urban, woodland, or desert environment.
- Engaging stationary and moving threats from a stationary and moving combat vehicle.
- Engaging single and multiple threats in a CBRN environment.
- Engaging single and multiple threats at night and limited visibility.
- Engaging threats from a stationary protected and unprotected firing position.
- Calling for indirect fire (high explosive, smoke, and illumination).
- Calling for medical evacuation (MEDEVAC) or casualty evacuation (CASEVAC).
- Calling for support (such as close attack aviation and unmanned aerial systems).
- Engaging targets using digital coordination (applies to digitally equipped platforms only).
- Engaging multiple and successive threats.

2-58. Crews must be able to fully employ the capabilities of their system when the fire control system is degraded or damaged —

- Engaging single and multiple targets using the auxiliary sight, if equipped.
- Engaging single and multiple targets using manual controls, if equipped.
- Engaging multiple targets with multiple weapon systems from multiple stations, if capable.
- Engaging multiple and successive targets requiring different ammunition types, if capable.

2-59. Engaging targets using designation feature of the fire control system using the independent vehicle commander (VC) sight, if capable.

### CREW SIMULATION AND GAMING TRAINING ASSESSMENT

2-60. Crew simulations and games for training focus on the VC and gunner for main gun, ATGM and MMG crews. Simulations are not available for all systems, however, games for training systems (VBS2 and VBS3, for example) provide fundamental engagement techniques and crew coordination exercises. These simulations and gaming systems must be used throughout the training cycle. Units evaluate their crew's experience level and place them into the appropriate training category:

2-61. Evaluate crews with new personnel to determine their initial proficiency based on their warfighting skills. This evaluation can be conducted with hands-on training assessments, weapons platform specific scenarios in available simulators or gaming exercises.

2-62. Once the Master Gunner determines a crew's initial proficiency level, he should place them in the appropriate simulator or gaming system to maximize the crew's training time within the system. This ensures the crews are training within the system at a challenging level, they continue to reinforce skills previously mastered, and continue to experience increasingly more difficult tasks, conditions and standards.

2-63. After the crew has qualified on Table VI, Qualification, on their weapon platform during a previous weapons training density, units categorize them as an experienced crew. When a simulator has an instructional subsystem, crews must continue progress from previously achieved scenarios and progress to the next higher training gate. Crews training in a system without a system-generated GTLF should train tasks that sustain and improve strengths and weaknesses from previous direct fire training. In simulations that have incremental, progressive GTLF exercises, crews are required to successfully complete the next progressive GTLF exercise prior to participating in live fire events.

### TRAINING GOALS

2-64. Training goals vary according to the local training conditions. Commanders must design their training to their available training environments and to specifically address their unit proficiency assessments. The goal is to create a training environment that is as realistic and demanding as possible with the resources available. As a norm, the following goals should be set to ensure successful training:

- Set and enforce tough, but achievable standards. Tough standards generate effective training; loose standards produce weak units. The Soldiers must know when they have done well and when they need additional training and repetition to achieve mastery.
- Start early. All aspects of a training program must be thoroughly coordinated. Forecast and request resources and maintenance assistance long before they are needed.
- Be thorough. Leave nothing to chance. Avoid wasting resources and training opportunities. Give platoon leaders and vehicle commanders the guidance and assets needed to train their units effectively and efficiently.
- Be flexible. Continually update the training program to the unit's changing needs. If assessment and planning stop, the training program stagnates.
- Train continually. Train at every opportunity, not just during an intensified period, to get ready for qualification tables at all levels. Intensified programs should be used only to bring a unit to a desired proficiency level; then train continually to maintain and sustain that level.

2-65. Contingency plans and alternate methods of training should be identified when the primary plan cannot be executed. Training time is valuable and should not be lost due to unforeseen factors, whenever possible. Units should consider planning for increased fire-danger hazards, firing-hour constraints, environmental factors, digging requirements, and other impacts to their plans.

## TRAINING HORIZON

2-66. The training horizon is used to synchronize dedicated training time for organizations and units to train on METL tasks. Units in preparing for deployment develop training plans that focus on established readiness aim points such as manning, equipping, and training levels. The training horizon covers the period leading up to at least one readiness aim point. Command training guidance is published to provide detailed information on the unit's training objective.

2-67. The following sections provide a general breakdown of major "T-week" activities to use as a guide. It follows the T-week concept structure found in The Leader's Guide to Unit Training Management (UTM), located on the Army Training Network (https://atn.army.mil ). It assists in the development of their live fire density. This list is not all inclusive. Units must consider installation requirements, ACOM directives, and guidance from their higher headquarters when planning training.

2-68. During the planning process for any live fire event, there are a series of tasks that are executed, reviewed, or updated periodically to ensure the unit's success. Units and Master Gunners should review the following items weekly and report the status during any in-progress reviews (IPR) scheduled by the unit.

- Armament and platform maintenance.
- Individual and crew served weapon training and qualification status.
- Driver's training program (DTP) for the unit.
- Range safety officer (RSO) and range officer in charge (OIC) training and certification status.
- Simulations use and crew progression.
- Prerequisite training status, crew Tables I, II, and III.
- Current VCEs trained and certified within the unit.
- Simulations instructor/operator training and certification within the unit.
- Class V forecasting, including training ammunition, pyrotechnics, battle effects simulators (BES), smoke, and other enablers.
- Fire support (FIST)/fire support officer (FSO) indirect fire instruction to the supported units.

2-69. The initial planning for the training events are the most critical. The following series of tables show the key planning considerations and execution requirements prior to a unit's live fire event. The list is not all-inclusive, and units should reference their installation's policies and procedures for scheduling or securing training resources. This is only a guide.

## T-21 TO T-13 – IDENTIFY MAJOR TRAINING FACILITIES

2-70. Table 2-5 shows some key unit and Master Gunner tasks and functions during the T-21 to T-13 period. For the Reserve component, these tasks typically are completed during T-12. This timeframe focuses on identifying the major training facilities, ranges, training areas, and ammunition resources required to execute training. These resources require the longest lead-time to secure for training.

| T-21 to T-13 | Identify Major Training Facilities |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Analyze prior training results. | Request land, ranges, billeting / bivouac areas for training in RFMSS. |
| Issue training guidance. | Forecast ammunition including pyrotechnics, hostile fire simulators, smoke, and star clusters in TAMIS. |
| Review Driver's Training Program (DTP) and current licensing status. | Conduct instructor / operator (I/O) training. |
| Review and update crew roster. | Identify TADSS resources required. |
| | Conduct diagnostic GST. |
| | Coordinate and execute range safety officer / officer in charge (RSO / OIC) classes through Range Operations. |

**Table 2-5. T-21 through T-13 planning considerations.**

2-71. During T-21 through T-13, units identify the major training facilities required to execute their training plans. Units must follow local SOPs to secure facilities, which may not follow this timeline.

2-72. Forecasting ammunition well in advance on TAMIS, ensuring outstanding ammunition accounts have been reconciled, and sufficient resources are programmed for alterations to the plan. For example, units must consider the fire hazards during the training event and coordinate for ball only small-arms ammunition availability. The unit must coordinate closely with the installation ammunition office (or similar agency) for sufficient "in-lieu-of" quantities, how to draw them when necessary, and how to forecast those un-resourced ammunition types.

2-73. Developing the tentative training timeline provides backwards planning during the execution weeks of the training event. Units can de-conflict training issues earlier, and ultimately secure the facilities, training areas, and ranges required at the earliest opportunity.

2-74. Table III requires the use of TADSS the unit must schedule in advance, based on the installation's policies. This equipment is provided in finite quantities on the installation. Coordination of accurate training sets required allows for the installation's training support center to order, receive, process, and issue additional equipment based on the unit's requirements.

2-75. To provide sustainment training for the key individual and crew skills, the unit should conduct diagnostic gunnery skills tests. This provides additional proficiency assessments for the commander and allows the unit a rehearsal period for the record test. The diagnostic test helps identify training deficiencies to facilitate the appropriate amount of training prior to the required for record Table I.

2-76. Units should identify all the individual-, crew-, and leader-required certifications, qualifications, schools, classes, programs, and licenses that support the future training events. Driver's training, ammunition handlers, certified instructor/operators, range safety, and TADSS installation/troubleshooting are just a few of the most common training and certifications that need to be planned prior to training execution week.

2-77. Units must manage their individual weapon and crew served qualification requirements to support the crew tables. Although not required to ground-mount qualify crew served weapons prior to executing the crew tables exists, units may do so when resources are available. Executing these ranges prior to the crew training allows for the unit's new range safety officer (RSO) and range OIC-certified Soldiers experience conducting range operations on a smaller scale.

2-78. Units must take appropriate time to determine the crew compositions by position early in the planning cycle. This reduces the amount of re-fires, ammunition expenditures, or other resources to ensure an effective and efficient training program.

## T-12 – CONDUCT MISSION ANALYSIS

2-79. T-12 focuses on conducting a training event mission analysis. Gathering the information required to conduct training event planning is critical to developing successful training events. Units capture historical training records, after action reviews (AARs), maintenance status reports, Soldier and leader certifications, sergeant's time training (STT) plans, and other key training indicators to support the analysis. Table 2-6 shows some of the key unit and Master Gunner tasks that specifically support the mission analysis.

| T-12 | Conduct Training Event Mission Analysis |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Update crew roster / lock in crews. | Identify STT topics. |
| Determine Sergeant's Time Training focus topics. | Plan VCE courses. |
| Conduct staff coordination for gunnery OPORD annexes and enclosures. | Develop scenarios. |
| | Identify GST evaluators. |
| | Plan GST testing period(s). |
| | Coordinate for external evaluators. |

**Table 2-6. T-12 planning considerations.**

2-80. For RC units, all T-21 through T-13 tasks may be executed during the T-12 period on the training horizon. Most RC units will not have enough information concerning pending missions until one year prior to execution. RC units may have to adjust their planning process to support their training guidance and mission.

2-81. Units must identify all prerequisite training, certifications, qualifications, and requirements to support the training. This includes a detailed review the enablers used to support training.

2-82. During T-12, units consider and plan the available STT periods available, and should include live fire individual and crew tasks. Training guidance to sergeants should include an armament or weapons platform focus where appropriate, as recommended by the Master Gunner. For example, commander guidance could include vehicle identification training as part of the STT focus. This would directly benefit T-6 through T-week where the record Table I, Gunnery Skills Test, will be executed.

2-83. From T-12 through T-1, simulations and gaming training (platform-dependent) are conducted monthly. The Master Gunner must monitor the crew's progress and ensure each crew's completion of Table II, Simulations live fire prerequisite. Master Gunners should review the certified instructor/operators of the simulations and gaming systems, as well as the available number of certified VCEs. Units should use VCEs for all GTLF exercises to build VCE experience and their AAR techniques.

2-84. Managing crew rosters is a key responsibility of the unit. Units must consider the longevity of each individual crewmember, paying particular attention to the VC and gunner. Units must look beyond the training event at potential promotion, permanent change of station (PCS), end-term of service (ETS), retirement, position changes, and other common personnel actions that could impact the individual crew's stability. Units must be predictable when assigning crew position and limit last-minute crew changes. Crews may not have time to successfully complete training prerequisites as the T-weeks progress.

2-85. The unit should conduct an IPR for the upcoming training event. During this IPR, leaders should coordinate staff requirements to produce the operations order (OPORD) for the training event. This includes assigning enclosures and annexes development to the appropriate staff function.

2-86. Units should review their respective driver's training program to ensure sufficient training is planned to support the training event. Although driver's training is a recurring event, use of special equipment (generators, types of vehicles or new equipment) must be considered. Units should remember that when executing the

fundamental table sets, several key driver's training requirements are met. Units should consider the amount of driving any learner's permit Soldier will receive during day, night, and limited visibility, and any associated maintenance days that directly support the commander's driver's training program.

2-87. Master Gunners must deconflict any range, facility, or training area issues that arise as early as possible. Coordination with conflicted units, range operations, or consideration of alternate training locations will be required. For all resource scheduling, earlier is better. Units should refrain from securing large numbers of facilities early and dropping most of them closer to the training event. This prohibits other units from securing the resources early, and is indicative of a plan that is not well thought out.

2-88. Initial development of the training scenarios is completed during T-12. The Master Gunner must refer to the installation's range operations regulation to ensure proper lead time is provided for scenario approval. Master Gunners must complete a range recon, map analysis, terrain analysis, and targetry line-of-sight (LOS) review and ensure the scenario concept can be executed to standard.

2-89. The Master Gunner oversees and supports all armament maintenance checks and services, as required. This includes a detailed review of any DA Form 2408-4, Weapon Record Data cards, to ensure sufficient tube life remains to support the upcoming live fire events, recoil exercises, optics purging, and armament accuracy checks for main gun platforms, as required. For the MMG platforms, the Master Gunner should verify any gauging requirements, optics purging, and other services are completed.

2-90. The Master Gunner develops the framework for the gunnery OPORD with appropriate enclosures to support the complete training plan. The base OPORD for the training event is administrative, coordinating the actions necessary to manage the preparation, execution, and recovery from the training event. The OPORD should identify the individual and collective tasks to be trained and the desired level of proficiency at the completion of training. The OPORD also should address the actions to be taken to retrain the tasks during the event if the desired end-state is not achieved.

2-91. The Master Gunner must review the unit's roster of certified RSOs and OICs, to determine their respective expiration dates. Once complete, schedule certification courses to support all staff sergeants and above in the unit to support crew training.

2-92. Table VI, Qualification, requires external evaluation. (Refer to Chapter 6 of this publication for more information.) The Master Gunner must coordinate through brigade or regiment for the appropriate amount of support. Master Gunners should coordinate for a briefing to the tasked external evaluators prior to training execution. Although the method of evaluation is standardized, each installation's ranges may have restraints or conditions that impact the execution of specific engagements. External evaluators must be aware of these factors and collaborate with the firing unit Master Gunner to ensure consistent evaluation procedures.

## T-11 – REFINE EVENT REQUIREMENTS

2-93. The focus of T-11 is to refine the event training requirements based on previous training results. This focus identifies the training trends and gaps of the unit's current proficiency to address them in the commander's guidance as needed. The Master Gunner monitors crew progress in simulation and gaming systems, as well as develops the testing plans to meet the live fire prerequisites.

| T-11 | Refine Event Requirements |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Develop training event WARNORD. | Develop gunnery timeline (GUNLINE). |
| Review training scenarios. | Review DA Form 2408-4. |
| | Schedule TADSS draw. |
| | Create crew packets. |
| | Submit training scenarios. |

**Table 2-7. T-11 planning considerations**

2-94. Analyze previous training results available to the unit. Schedule additional training or re-training as necessary to support the training plan.

2-95. Provide planning guidance for concurrent training, follow-on collective training events, and maneuver training. The crew tables provide the foundation for the collective training tables within the IWTS. Units must ensure the planned training supports any collective training beyond Table VI. This includes management of the crews and crew rosters to ensure their longevity in their position supports the collective training plan.

2-96. Review scenarios to ensure they support the commander's guidance and intent. Once complete, the Master Gunner submits the scenarios to range operations and coordinate for the appropriate targetry, battle effects simulators, and pyrotechnics.

2-97. The Master Gunner develops the gunnery timeline, or GUNLINE, for the training event. Typically, this is placed on a spreadsheet to show specific ranges or training areas by day, the unit executing the training, and the type of training executed. The GUNLINE allows synchronization of the unit's efforts, provides a visual representation of the live fire density overall, and supports the tasks to subordinate units and specific instructions in the operations order.

2-98. The Master Gunner must review all DA Form 2408-4, Weapon Record Data card, for accuracy and to identify any weapon or system that may reach the threshold tube-wear. These cards also must denote the maintenance actions taken on the armament, including actions like recoil exercises, breach or breach ring replacements, and bore scope results.

2-99. The Master Gunner develops and schedules the TADSS plan through the local training support center (TSC). The TADSS plan must include all equipment and devices to support the GST and Table III, Proficiency. This may include coordination with range operations to acquire target lifting mechanisms, scaled or full-scale targetry, battle effects simulators, generators to run the equipment, and a hand-held targetry controller. Some units may require the use of dummy ammunition that is not supplied by TSC, but must be ordered through TAMIS or the ammunition supply point on the installation.

2-100. Master Gunners with mobile or deployable simulations systems should coordinate for their use during the live fire training tables in the gunnery density. This provides sustainment training as well as recertification training options for the commander.

2-101. Crew packets are developed by the Master Gunner to support the training events. They must include all live fire prerequisite training and testing results, the simulations or gaming GTLF scenario results, and any other training documentation. The packets must include sufficient pre-filled Common Crew Gunner Score Sheets and Common Crew Gunnery Roll-Up for all TADSS and live fire training tables. They should be placed in the order they will be fired based on the approved scenarios for ease of use by the unit.

## T-10 – PUBLISH WARNORD AND BEGIN PRE-EXECUTION CHECKS

2-102. During T-10, the unit publishes the training event WARNORD to allow the supporting staff and leaders' initial planning guidance and tasks. The unit determines the operational environment the training should replicate for target type, range to target, scenario development, and any supporting tactical tasks.

| T-10 | Publish WARNO and Begin Pre-Execution Checks |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Issue gunnery WARNORD. | TADSS training and certification. |
| | Verify Class V. |
| | Verify ranges, training areas, and facilities. |
| | Confirm GUNLINE. |

**Table 2-8. Publish WARNORD and begin pre-execution checks**

2-103. Publish the live fire density WARNORD to units. The order must contain sufficient information for the supporting staff to begin gunnery preparation. This includes items such as the required classes of supply, external evaluation requirements, internal training to support the event, and in-progress review schedules.

2-104. Issue WARNORD for GST as appropriate. If the GST is conducted in a company decentralized manner, units should provide separate guidance and orders.

2-105. Verify ammunition requirements. Update DRAFT OPORD for Class V requirements. Coordinate Class V plan for each range and training event by crew and unit.

2-106. Schedule TADSS operator, installation, troubleshooting, and alignment classes as appropriate. Priority of training should go to the gunners of the firing crews. This training is critical to the success of Table III, Proficiency.

2-107. Verify all ranges, training areas, and facilities required for GST, Table III, and the live fire training events. This includes any required use of wash rack facilities, weapons zeroing or screening procedures, and hard stand maintenance requirements. If the unit will be establishing an ammunition holding area (AHA), the unit also must confirm the appropriate approved location(s) through range operations. The Master Gunner may have to deconflict multi-use facilities, external unit requests for the same range or facility, and other issues that negatively affect the GUNLINE.

2-108. Once all tasks are verified, confirm the GUNLINE and provide the updated information to the S-3 to incorporate into the live fire density OPORD as appropriate.

## T-9 – CONDUCT RESOURCE PLANNING AND SUBMIT REQUESTS

2-109. During T-9 units develop and plan for the appropriate resources to support the training event. This includes all classes of supply, facilities, and external support.

| T-9 | Conduct Resource Planning and Submit Resource Requests |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Conduct gunnery IPR. | Confirm TADSS. |
| Final scenario review. | Verify scenario approval. |
| Publish commander's intent. | Confirm supply requests. |
| Submit convoy clearances. | Request medical support. |
| | Request range support as necessary (targets, BES, simulators, smoke). |

**Table 2-9. Conduct resource planning and submit initial resource requests**

2-110. The unit should establish a clear series of in-progress reviews for the training event. These should begin after the WARNORD is published bi-weekly during T-10. Once the unit reaches T-6, IPRs should be conducted weekly.

2-111. The unit reviews the final scenario developed by the Master Gunner Once complete, the unit S-6 in coordination with the Master Gunner creates the appropriate digital free text, combat message SITREPs, graphics, and icon population messages. The S-6 has the direct responsibility to support the digital traffic required to support the live fire event, including any FM or digital requirements for the Call-For tasks completed concurrently with the live fire density.

2-112. The S-3 publishes the commander's intent for the training event. This should include the focus of the live fire density, use of digital communications, SOP and TACSOP reviews, simulations use in support of the training event, prerequisite training and certifications, and the end state of training. Units should consider the inclusion of guidance supporting "high crew" for each firing platform type, and award recommendations for those exceptional performing crews.

2-113. The unit S-4 should submit any required convoy clearance requests as appropriate for the installation. The S-4 should have coordinated with the unit's supporting cavalry scouts to conduct a route reconnaissance to ensure the route of march supports any tactical or administrative convoys. The S-4 also should coordinate with the installation or supporting unit Military Police for any escort or traffic control support.

2-114. The Master Gunner must finalize the TADSS plan, including draw, training, issue, and turn in. This includes any vehicles required to support the TADSS installation and use instruction, inclement weather areas for training, and any detail support required.

2-115. The unit Master Gunner must conduct a follow-up with range operations to ensure the range scenario is approved. Once complete, any additional documents to support the scenarios should be coordinated with Range Operations, including targetry, thermalization of the target presentations, pyrotechnics support, and battle effects simulator use.

2-116. The Master Gunner must coordinate directly with the unit medics to review the medical support package provided on each range. This includes reviewing the status of the certified combat life saver (CLS) Soldiers within the unit, ambulance exchange points (AXP), MEDEVAC procedures and equipment, strip maps, and communications requirements. The unit's medic support team also should provide the evaluation procedures and plan to conduct the Call-For MEDEVAC and Call-For CASEVAC training requirements on the range.

## T-8 – EXECUTE RECONNAISSANCE AND LOCK-IN RESOURCES

2-117. T-8 focuses on range, facility, and training area reconnaissance to ensure they meet the training requirements for the planned event. Units should include the entire staff into the reconnaissance effort and physically walk the terrain whenever possible. Units may have to coordinate with other units occupying the ranges or training areas planned to not disrupt their training.

| T-8 | Execute Reconnaissance and Lock-in Resources |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Conduct range walk. | Certify GST instructors and evaluators. |
| Develop Composite Risk Management worksheet. | Conduct range walk. |
| Review local SOPs and regulations for additional training requirpements. | Confirm external evaluation support. |
| Develop tasks to subordinate units. | Develop conduct of the range and range / training area layout diagrams. |

**Table 2-10. Execute reconnaissance and lock-in resources**

2-118. Execute range and training area recon with key leadership and staff. This includes the identification of the primary functional areas on each range. This includes items such as the ammunition pad, medic location, Class I areas, maintenance areas, bivouac or billeting areas, AAR facilities, and the motorpool parking layout.

2-119. Unit should construct the DA Form 7566, *Composite Risk Management Worksheet,*(CRM) that supports each portion of the training event. This includes a review of the seasonal, live fire, inclement weather, night operations, and extended training hour hazards.

2-120. Review the local SOPs and regulations for any additional requirements. This includes items such as ammunition detail requirements, emergency procedures, range operations during severe weather and other similar procedural requirements.

2-121. The S-3 develops the tasks to subordinate units and specific instructions for the gunnery or live fire event's OPORD. The unit Master Gunner provides any live fire density specific items for the OPORD as necessary.

2-122. The Master Gunner certifies the instructors and evaluators for the GST period. Subordinate units should be prepared to support the GST with their most experienced NCOs.

2-123. The Master Gunner executes a range walk with the unit's experienced NCOs and subordinate Master Gunners to troubleshoot/war-game the gunnery plan. The Master Gunner provides any changes, updates, or modifications to the plan to the S-3 as necessary. The range walk should include reviewing the concurrent training plan, zeroing or screening procedures, conduct of the range, actions of the proofing team, and the execution of the Call-For engagement requirements.

2-124. Once complete with the range walk, the unit Master Gunner should develop a detailed conduct of the range briefing and update the range safety briefing. The conduct of the range briefing should include the general scenarios, actions of the vehicles on the range, locations of key personnel and activities (medic support, for example), and the general flow from occupation of the range through range closure. The Master Gunner presents this briefing to all crews and leadership executing training on the range or facility.

## T-7 – PUBLISH OPORD

2-125. During T-7, units issue the OPORD for the training event to the subordinate units and external support units. For training that requires an external evaluation, units should provide a copy to their headquarters for coordination.

| T-7 | Publish OPORD for Training Event |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Issue gunnery OPORD. | Confirm range support packages. |
| Issue CRM. | Develop briefing packets. |
| Verify convoy routes. | Coordinate barrier and road closures. |

**Table 2-11. Publish OPORD for training event**

2-126. The S-3 issues the live fire density OPORD. This includes all required annexes and enclosures required to support the training event.

2-127. The S-3 provides all commanders within the unit a copy of DA Form 7566, *Composite Risk Management Worksheet* (CRM), for record. Commanders apply risk-mitigation techniques and develop their daily risk assessments as required.

2-128. The unit S-4 confirms and verifies all convoy routes and clearances. The S-4 prepares updates for the following IPR as necessary.

2-129. The unit Master Gunner confirms all range support package products. This includes the S-4 expendable items, targetry and associated thermalization and pyrotechnics with range operations, and any external evaluator support.

2-130. Most range facilities firing medium and large caliber munitions require barrier gate use and road closures. The Master Gunner coordinates the barrier gate and road closure plan through range operations. The Master Gunner provides the accurate barrier and closure locations to the barrier detail NCO tasked in the OPORD.

2-131. The Master Gunner develops the briefing packets for each range or facility scheduled for use. This includes all packages for the briefing NCO, concurrent training NCO, and unit firing status tracking plans. The unit Master Gunner must consider the communications flow during the conduct of the range to ensure timely updates to all briefing packets are completed.

## T-6 —LOCK-IN TRAINING AND PUBLISH TRAINING SCHEDULES

2-132. Commanders develop their training schedules during T-6 in the Digital Training Management System (DTMS) to support the training event's OPORD. Table 2-12 shows the key tasks for both the unit and the Master Gunner:

| T-6 | Lock-in Training and Publish Training Schedules |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Conduct gunnery IPR. | Conduct / supervise GST. |
| Develop and publish training schedules. | Conduct VCE course. |
| Begin execution of Table II. | Verify e-581 ammunition documents. |
| | Review OIC / RSO status of unit. |

**Table 2-12. Lock in training and publish training schedules**

2-133. Unit begins conducting weekly IPRs to support the training event. Units should include a member from each staff element, the Master Gunner, and subordinate unit leadership. Any critical changes identified during the IPR should be recorded and implemented with supporting FRAGORDs.

2-134. Unit commanders should complete and submit all training schedules for the training period. Once approved, the commanders will input the schedules in the DTMS and publish. Commanders must include the appropriate firing uniform for all main gun platforms, including any personal protective equipment (PPE) required during live fire use. Main gun platform crews are required to wear complete Nomex suit, balaclava, Nomex gloves, and authorized, fire-resistant footwear. Use of clothing or undergarments made from synthetic materials is not authorized.

2-135. The Master Gunner supervises the conduct of Table I, GST, for record. Any GST conducted prior to T-6 must be completed again to meet the live fire prerequisites. There are no exceptions.

2-136. Units may begin executing Table II for record. Crews that have completed Table II prior to T-6 must complete the exercise again to meet the live fire prerequisites. There are no exceptions.

2-137. Units coordinate for recovery assets for the duration of the gunnery density. Units also must coordinate for wash rack facilities as their installation requires.

2-138. The Master Gunner verifies all DA Form e-581, *Request of Issue and Turn-In of Ammunition,* information supporting the ammunition draw for the live fire density. This includes any e-581s that are created to support the draw and use of "in-lieu-of" ammunition types for use during high fire hazard periods.

2-139. The Master Gunner should review the current list of certified RSO and OICs within the unit. Units should strive to have all staff sergeants (for crew gunnery purposes) and above certified annually through range operations. For units firing on non-tenant installations, the Master Gunner must coordinate for range safety certifications on the appropriate training installation.

## T-5 – COMPLETE TACTICAL PLAN AND SUPPORTING PRODUCTS

2-140. If the training event includes a tactical or maneuver portion, the unit completes those plans during T-5. Units also develop the evaluation packages required for both crew and any collective training planned during the training event.

| T-5 | Complete Tactical Plan and Supporting Products |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Coordinate for any Observer Controller - Trainer (OC-T) requirements. | Update tower books. |
| | Update OIC / RSO books and checklists. |
| Conduct gunnery IPR. | Develop crew packets. |
| Issue gunnery FRAGORD as necessary. | Verify supplies for range support. |

**Table 2-13. Complete tactical plan and supporting products**

2-141. If any tactical training coincides with the live fire training, complete the observer/controller/trainer (OC-T) plan. The unit must complete the master scenario events list (MSEL) supporting those collective tasks, as appropriate.

2-142. The unit continues to conduct IPRs on a weekly basis through training execution.

2-143. The Master Gunner updates the tower books (range book), RSO and OIC books and checklists, and crew packets as necessary. Updates to the crew packets are completed weekly as live fire prerequisite training and certifications are completed.

2-144. The unit Master Gunner must verify all the range support items requested to support training. This includes any targetry that was scheduled for construction, shipment and delivery of targetry and pyrotechnics, and scenario builds within the range operating system.

## T-4 – CONDUCT CERTIFICATIONS AND COMPLETE PREREQUISITE TRAINING

2-145. The unit must ensure it has sufficient personnel certified to support the training event. This training takes several weeks and should be monitored from T-4 through T-1. Certain training events have specific prerequisites that must be completed prior to any live fire execution. The Master Gunner updates the commander weekly on the progress of these requirements.

| T-4 | Conduct Certifications and Complete Prerequisite Training |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Conduct gunnery IPR. | Proof range scenarios. |
| Issue gunnery FRAGORD, as necessary. | Adjust scenarios as required. |
| Conduct Table III, Proficiency Course, if planned. | Draw Class IV as required (Table III). |
| Train convoy operations. | Draw Class V as required (Table III). |

**Table 2-14. Conduct certifications and complete prerequisite training**

2-146. Units continue to conduct live fire density IPRs weekly. Units issue FRAGORDs to support changes or modifications as necessary.

2-147. The unit may conduct Table III, Proficiency, in a decentralized manner. Table III can be conducted between T-6 and training execution, provided it is completed prior to any live fire event, including any zero or screening exercise.

2-148. Units confirm their TACSOP and SOPs during convoy operations training. This training supports the driver's training program within the unit. Units may choose to conduct convoy operations rehearsals at the completion of training, but it is not required.

2-149. The Master Gunner selects a proofing team. This team must include experienced gunners and vehicle commanders. The proofing team executes two primary functions:

- Provide troubleshooting support during zero, screening, or calibration procedures (live fire).
- Conduct proofing of each scenario on each training range. Procedures for proofing a range are found in Chapter 4, *Range Requirements and Scenario Development*.

2-150. The Master Gunner draws class IV and V materials, as appropriate, to support Table III if conducted separately from the gunnery training event. If the unit conducts Table III as part of the live fire density, these items will be drawn the week prior to the training event.

## T-3 – CONDUCT REHEARSALS

2-151. The unit executes rehearsals of the training event including back briefs from key leaders and staff. Units should conduct a thorough rehearsal or rock drill of the entire training event to identify potential issues as early as possible, and provide sufficient reaction time to correct any deficiencies or shortcomings. The Master Gunner continues to monitor live fire prerequisite training and testing, and brief to the commander on the current status.

| T-3 | Conduct Rehearsals |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Conduct key leader walk-through. | Identify fire-fighting details, as required. |
| Conduct medic support back-brief. | Identify target details, as required. |
| Confirm crew rosters. | Conduct range specific OIC and RSO briefings. |
| | Rehearse barrier guard and road closure plan. |

**Table 2-15. Conduct rehearsals**

2-152. The unit should conduct a key leader walk through as part of the weekly IPR. This walk through/terrain walk provides leaders an opportunity to review the training plan on each range, training area, and facility. Units should pay particular attention to the communications and digital support plan, ammunition issue and turn-in procedures, billeting or bivouac locations, and conduct of the range procedures. The medic support element should include a back brief to the key leaders detailing all medic support at each training location, as well as sick-call procedures, MEDEVAC and CASEVAC plans, ambulance exchange points (AXP), and Soldier Readiness Processing (SRP) capabilities.

2-153. The unit must confirm the crew rosters for all firing elements. Without appropriate crew management, the unit significantly reduces its effectiveness and qualification status, increases the resource demands, and fails to meet training readiness and proficiency goals.

2-154. The Master Gunner must identify and brief the cast of range support. This includes identification of the fire fighting NCOs, targetry NCO, barrier NCO, and their supporting detail requirements. (The specific members of the details will not be identified until the firing day.)

2-155. The Master Gunner briefs the planned and potential RSOs and OICs and provides any books and checklists they will need to execute during training. This provides them sufficient time to review their duties and responsibilities, as well as understand the complexity of the training events they are directly supporting.

2-156. The barrier NCO and Master Gunner must coordinate for a full rehearsal of the barrier gate and road closure plan. This rehearsal must be coordinated with range operations and must not negatively impact or interfere with units currently training. This rehearsal ensures communications connectivity can be established and maintained with all checkpoints. It also provides accurate timing of the process to ensure the range is capable of receiving an opening hot time/firing time day and night. The rehearsal should include one or more iterations for both closures.

## T-2 – FINALIZE ADMINISTRATIVE SUPPORT REQUIREMENTS

2-157. Units collect all required administrative documentation for the training event during T-2. Master Gunners continue to monitor the progress of the live fire prerequisite training and testing, and provide updates to the commander as necessary.

| T-2 | Finalize Administrative Support Requirements |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Update CRM, as required. | Draw and issue TADSS. |
| Conduct gunnery IPR. | Brief external evaluators. |
| Issue gunnery FRAGORD, as required. | Finalize crew packets. |

**Table 2-16. Finalize administrative support requirements**

2-158. Units update DA Form 7566, *Composite Risk Management Worksheet,* (CRM) as appropriate, based on expected weather hazards (S-2), training factors and complexity (S-3), or live fire issues (Master Gunner).

2-159. Unit provides the updated CRM during the live fire IPR. Any supporting FRAGORDs supporting changes or alterations to the plan also are provided.

2-160. The Master Gunner and a supporting detail with sign for, draw, and issue the supporting TADSS as necessary. Units must keep accurate accountability of the TADSS, particularly when using one system on multiple vehicles. The Master Gunner must take the time to provide a method of maintaining accountability of the equipment.

2-161. The Master Gunner conducts a briefing with the external evaluators tasked to support the live fire training event. This meeting should include a conduct of the range briefing, AAR expectations, facility equipment that supports the AARs, current training guidelines, and an overview of the firing scenarios day and night. It is important for the unit Master Gunner to record the contact information of all external evaluators, identify the day and night shift NCOICs, and provide range transportation coordination with the evaluation team.

2-162. The Master Gunner should finalize all crew packets used for the range. This includes sufficient blank documents for retraining and all live fire prerequisite documentation for all crews.

## T-1 – DRAW EQUIPMENT AND SUPPLIES

2-163. T-1 focuses on preparing the unit to enter the training period with pre-combat inspections (PCI), pre-combat checks (PCC), convoy briefings, and conducting support detail requirements. For units that are conducting Table III as part of their training event, they draw supporting TADSS and equipment from their training support center (TSC) or range operations.

| T-1 | Draw Equipment and Supplies - Execute Subordinate Rehearsals and Checks |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Subordinate units conduct PCI and PCC on all firing vehicles, armament, and thermal optics. | Verify all crew members have completed Gunnery Skills Test (GST), Table I. |
| Subordinate units perform convoy operations PCC and PCI. | Verify all crews have successfully completed simulations or gaming GTLF, as required. |
| Issue gunnery FRAGORD, as required. | Draw and issue TADSS, as required. |

**Table 2-17. Draw equipment and supplies**

2-164. Subordinate units conduct PCI and PCC on all firing vehicles, armament, and thermal optics. Subordinate units also perform PCI and PCC for convoy operations supporting movement to the training locations.

2-165. The Master Gunner ensures 100-percent successful completion of all Table I and Table II requirements for all crews and alternate firers, as appropriate. Any identified shortcomings require notification to the commander as well as a supportable training plan prior to firing.

2-166. The Master Gunner draws any remaining TADSS required to support the training plan. Coordination for routine troubleshooting and replacement of unserviceable components should be completed with the TSC.

## T-WEEK – EXECUTE TRAINING

2-167. T-week lasts for the duration of the training event. Units execute the training plan, re-training plan, and other tasks developed during the previous 21 weeks (12 months for RC). During execution, the Master Gunner maintains the current training executed for each crew, maintains and monitors ammunition expenditures on each training facility, and provides quality assurance and quality checks on all live fire-related documentation.

| T-Week | Execute Training |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Open and close ranges IAW local policy. | Provide range assistance as required. |
| Manage ammunition draw, issue, and turn in. | Oversee range operations on all live facilities. |
| Manage and record OPTEMPO utilization. | Provide quality assurance and quality checks on live-fire training score sheets, roll-ups, and AARs. |
| Provide concurrent training on all training event locations. | Collect and manage crew firing information, engagement scores, crew penalties, infractions, malfunctions, and alibi information as they occur. |
| Provide and execute re-training, as appropriate. | Provide daily updates of crew performance to the commander and key leaders. |
| Conduct mandatory classes during training down-time. | Update reporting NCO information as appropriate. |
| Execute digital tasks supporting live-training events. | Spot check barrier and target details. |
| Conduct daily SITREP to higher headquarters. | Verify targets are provided and presented IAW TC 25-8, Training Ranges, including thermalization. |
| | Provide recommendations to increase throughput and range management. |
| | Provide recommendations to the commander on gunnery-related topics. |

**Table 2-18. Execute training**

2-168. Open and close ranges according to installation's range safety regulations and policies for each range, facility, and training area. The tower books provided by the Master Gunner include all pertinent information to properly open and close the training locations.

2-169. Manage ammunition draw, issue, utilization, and turn-in. The unit's support platoon manages the issue and turn-in of all ammunition daily. The Master Gunner and range OIC periodically inspect this process throughout the training days. The OIC coordinates for gathering ammunition expenditures for day and night operations on each training location.

2-170. Manage and record OPTEMPO utilization for all combat platforms. The support platoon provides the OIC daily reports on Class III draw by quantity, bumper number (call sign), and type of POL product.

2-171. Provide concurrent training on all training event locations that focus specifically on the training tasks for that range or training facility. Provide and execute retraining, as appropriate.

2-172. The unit S-6 is the primary trainer and evaluator for all digital tasks. The S-6 reports to the Master Gunner and OIC the status of each completed vehicle by bumper number and task evaluated.

2-173. The Master Gunner oversees range operations on all live facilities. Further, he provides quality assurance and quality checks on live fire training score sheets, roll-ups, and AARs.

2-174. The range NCO is the primary point of live fire results collection and manages crew firing information, engagement scores, crew penalties, infractions, malfunctions, and alibi information as they occur. The range NCO disseminates the information to the reporting NCO, Master Gunner, and range OIC in a timely manner.

The Master Gunner and range NCO provide daily updates on crew performance to the commander and key leaders.

2-175. The Master Gunner verifies targets are provided and presented according to TC 25-8, *Training Ranges*, including thermalization and hostile fire simulators. The Master Gunner coordinates with the range operations personnel for any targetry deficiencies found on the range. If the Master Gunner identifies any target that is not presented to the Army standard on the qualification range, that target presentation may not be used until it is corrected. This includes targetry that is not thermalized or that does not provide the hostile fire simulation/battle effects simulator to the Army standard.

2-176. The Master Gunner provides recommendations to increase range throughput and management. Recommendations on all live fire-related topics will be provide to the commander.

## T+1 – RECOVER AND ASSESS TRAINING

2-177. T+1 provides the initial tasks of recovering from training operations. It also represents the first steps in analyzing training records from the event to develop future training requirements. Units are required to provide their live fire results in roll-up format, as well as common crew score sheets to the next higher headquarters for review and analysis.

| T+1 | Recover, Conduct Gunnery AARs, and Assess Training |
|---|---|
| **Unit Tasks** | **Master Gunner Tasks** |
| Open and close ranges IAW local policy. | Provide detailed analysis to the commander on the gunnery results overall. |
| Manage ammunition draw, issue, and turn in. | Analyze engagements and scenarios to identify training gaps, failures, or engagements that are too easy. |
| Manage and record OPTEMPO utilization. | Determine ammunition expended vs. drawn. Develop plan for turn-in and re-forecasting as necessary. |
| Provide concurrent training on all training event locations. | Determine "Top Gun" crew for each unit and overall based on commander's published guidance. |
| Provide and execute re-training, as appropriate. | Provide recommendations to leadership for Soldier attendance to Master Gunner School based on performance and potential. |
| Conduct mandatory classes during training down-time. | Develop and provide AAR to the external evaluation unit's leadership on their performance. |
| Execute digital tasks supporting live-training events. | Update crew rosters as appropriate. |
| Conduct daily SITREP to higher headquarters. | Develop simulations and gaming system training plan for qualified crews. |
| | Conduct AAR with firing crews to gather information about ranges, scenario, training, conduct of fire, and other gunnery topics. Apply lessons learned to next unit training plan as appropriate. |
| | Provide recommendations to the commander on gunnery-related topics. |
| | Submit detailed gunnery roll-up and complete qualification table results to higher headquarters for consolidation and submission to Weapons and Gunnery Branch, MCoE, for data collection. |

**Table 2-19. Recover and assess training**

2-178. The analysis of the live fire training event is the critical to the unit's success. It provides detailed analysis to the commander on the live fire results by crew, section, platoon, and unit. The Master Gunner must analyze the engagements and scenarios to identify training gaps, failure, or engagements that are too easy or too demanding. During the analysis, the Master Gunner must determine the ammunition expended vs. drawn, develop a plan for turn-in and re-forecasting the ammunition as necessary. This analysis is the first step in planning the next live fire training event.

2-179. The analysis also identifies excellence within the unit. The Master Gunner determines the "Top Gun" crew for each subordinate unit and the battalion/squadron based on the commander's published guidance. The analysis indicates exceptional performers for recommendations to leadership for Soldier attendance to Master Gunner School.

2-180. The unit must update crew rosters as appropriate. The Master Gunner assists in preparation of unit status reports regarding weapon and weapon system qualifications.

2-181. The unit's Master Gunner develops simulations and gaming system training plan for qualified (experienced) crews for sustainment training. These units continue training within the simulations or gaming systems to achieve the next higher GTLF in the system's instructional database or unit developed training scenarios, respective to their platform.

2-182. The unit should conduct an AAR with firing crews to gather information about ranges, scenarios, preparatory live fire training, conduct of fire, and other live fire topics. Apply lessons learned to the next training event planning process.

2-183. The Master Gunner submits a detailed live fire roll-up and complete qualification table results to the higher headquarters for consolidation and submission to the Weapons and Gunnery Branch, MCoE, for data collection and training trend analysis. This is critical in determining the Army's proficiency overall, and provides indications of training gaps, and potentially when certain standards must be increased.

2-184. The Master Gunner must update all DA Form 2408-4, *Weapon Record Data* cards, to ensure the maintenance records are accurate. Master Gunners must report to the executive officer any weapon or system that is nearing its maximum equivalent full charge (EFC) remaining life, as appropriate.

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## Chapter 3

# Range Operations

The Range Operations chapter outlines the procedures, duties, and responsibilities for planning and establishing both permanent and temporary live fire ranges and tactical courses. The training program requires the use of assets in the live fire domain to efficiently reach weapon system proficiency. This chapter focuses on defining how to leverage range training assets and resources appropriately to reach the intended training outcome.

The goal of this chapter is to enhance the knowledge of range operations, eliminate distractions for the training unit, and maximize the effective use of Army range facilities during the execution of device and live fire training.

## SECTION I – PLANNING RANGE EXERCISES

3-1. The planning process for any gunnery density usually begins six months (AC) or 12 months (RC) from the projected live fire date. This ensures that there is adequate time to fully synchronize all resources with training objectives. Planning must stay flexible; the plan is continuously refined as feedback is received from firing units.

***Note***. RC units conduct tasks identified for T-21 through T-13 during T-12 through T-8.

### COMMANDER'S INTENT

3-2. Planning a live fire training exercise begins with the commander's intent for the desired end state of the exercise. The commander issues guidance to his staff on the training mission(s) that the unit is to perform. The staff first plans for the training events to meet the commander's intent. The staff tailors a crew training program that supports the overall collective training plan. The S-3 and Master Gunner develop the tables using the inherent flexibility in the tables to tailor the tasks to the mission meet the commander's intent. They develop the crew tables by:

- The S-3 and Master Gunner identify how tables and tasks are going to be designed to train to the unit's specific mission
- The S-2 provides common threats in the expected theater of operation and most probable engagement ranges.
- The Master Gunner determines which ranges will support firing the crew tables, the specific firing and admin tasks, and develops scenarios for each table.

### TENTATIVE PLAN

3-3. The tentative plan for direct fire training, at minimum, must include the following:

- Tentative firing order and sustainment plan.
- Projected number of crews by unit and by type (main gun, ATGM, or MMG).
- Types of firing platforms.
- Training schedule conflicts.
- Projected crew turbulence.
- Ammunition requirements.

# RANGE AND AMMUNITION RESOURCES

3-4. Determining the proper area to execute training and identifying ammunition allocations is critical in the preparation for the weapons training density. Potential training areas need to consider safety needs and requirements as well as training needs.

3-5. Units need to plan for increased fire hazards on range complexes and facilities during certain seasons. When doing so, additional planning must include a means to continue live fire training without tracer ammunition. The Master Gunner must develop a plan in coordination with the brigade ammunition officer that includes sufficient ball-only ammunition to support their training. This requires "in-lieu-of" ammunition requests that include ammunition types that are traditionally not authorized to units in large quantities.

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For example, when the installation's fire hazard increases to "extreme" or "dangerous" due to extremely low precipitation, the installation bans the use of pyrotechnics and tracer ammunition. This is done to prevent uncontrollable or uncontainable fires that will damage the facilities, endanger the environment, and potentially cause harm off the installation. Delinking tracers from 4:1 mix ammunition is prohibited. When this occurs, the unit should execute an ammunition contingency plan to rapidly draw 7.62mm and caliber .50 linked ball ammunition to continue training through the firing restriction. This plan must be coordinated in advance with the installation and all documentation for the ammunition draw should be prepared.

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## TRAINING SITE SELECTION

3-6. Identify the training area or range(s) that support the training event. Make a thorough map and ground reconnaissance of areas available for firing. The range must be large enough to accommodate all weapon systems, types of ammunition, and types of exercises to be fired. Some considerations for site selection include the following:

- Sufficient maneuver area and enough targets to provide flexibility in maneuver.
- Targets in realistic arrays, not readily recognizable before presentation.
- Enfilade and defilade firing positions (two-tier battle positions), and reverse slope defense positions.
- Layouts of the entire range area to aid rehearsals, walk-through, and reconnaissance.
- Terrain that accommodates integration of squad and vehicle fire and maneuver if planning for collective training following the crew tables.
- Construction and environmental factors.

3-7. Use of TC 25-8, *Training Ranges*, is recommended in the planning stages before range selection. TC 25-8 identifies primary and alternate ranges used for training and qualification with specific weapons and weapon systems, based on applicable field and marksmanship and gunnery manuals.

## AMMUNITION FORECASTING

3-8. DA PAM 350-38, *Standard in Weapons Training*, provides a detailed listing of training ammunition resources authorized to units that support the respective weapon's training strategy. DA Pam 350-38, commonly referred to as STRAC or Standards in Training Commission, is published each fiscal year (FY). It provides the standards for weapons training proficiency which units must train to and achieve in a given FY.

3-9. Master Gunners determine their training ammunition requirements for their organic assigned weapons, weapon systems, and optics using the crew tables found in this manual. Master Gunners must be aware that the quantities listed in this training circular represent the requirement, and may not match DA Pam 350-38 exactly, which represent authorizations. From this information, the Master Gunner in collaboration with the S-3, determine the annual forecast of ammunition required to meet the training goals and objectives of the commander. The Master Gunner uses TAMIS to review, validate, and submit unit ammunition requirements and forecast their training ammunition authorizations by month.

3-10. The Army uses TAMIS to manage training ammunition Army-wide. It provides visibility of all levels of ammunition authorizations, expenditures, and monthly forecasts. Units plan their training events using TAMIS

authorizations and submit their monthly forecasts based upon their requirements. Once verified, ammunition stocks required for training will be shipped to the installation within 90 days of the training month.

3-11. Once issued, ammunition items are recorded as expenditures in TAMIS. At the completion of training, unused ammunition will be turned in to the supporting ammunition supply point (ASP), and the unit's ammunition account will be reconciled. Master Gunners must ensure any ammunition turned-in is applied to future forecasts for training. Proper management and coordination of ammunition resources are critical to the success of the unit and its live fire training events.

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For USMC, the appropriate NAVMC Training and Readiness manual provides a detailed listing of training ammunition resources authorized to units.

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### TRAINING RESOURCE SHORTFALLS

3-12. During initial planning it must be determined if the unit's available ranges and ammunition meet the planning requirements. The Master Gunner offers solutions to mitigate training resource shortfalls. Some examples include the following:

- The required range may be available at another installation.
- An existing range might be converted to support multiple training requirements.
- A simulation, sub-caliber training device, or reduced-scale range might satisfy the need.
- An increase in operational hours of available facilities will meet the shortage.
- Ammunition authorizations from adjacent units may be transferred to support shortfalls.
- Coordination for simulations systems assigned to external units can support increased training demand prior to live fire execution.

## RANGE OPERATIONS AND SCHEDULING

3-13. Training and firing activities require effective coordination with range operations and thorough understanding of the installation scheduling procedures. Range operations publishes the installation SOPs. These publications establish the policies and procedures for range activities consistent with safety and environmental regulations.

3-14. Installations supplement the safety and environmental regulations with SOPs applicable to individual facilities within the installation-training complex. These SOPs should be reviewed for range availability and then confirmed through range operations. Range SOPs should address the following:

- Access and egress control.
- Control and coordination of training facilities.
- Firing hours, limitation, and restrictions.
- Line of sight/safe-to-fire listing for each offensive and defensive firing area to each target location, by weapon caliber.
- After-action review capabilities, thermal optics, recording capabilities, and classroom or debriefing areas.
- Environmental compliance and stewardship.
- Communications with firing unit and range operations.
- Accident reporting.
- Ammunition and munitions handling.
- Medical support, MEDEVAC landing zone, and ambulance transfer points (AXP).
- Special use airspace.
- Range safety requirements and procedures.
- Severe weather conditions actions and personnel safety.
- Limits of fire.
- Target availability and capability.

- Thermalization capabilities.
- Target, fire fighting, and barrier detail requirements to the unit.

3-15. The automated system that simplifies and enhances the current process of range and training facility management and scheduling functions at an installation and is available at most installations is RFMSS. It provides the capability for a unit to electronically submit requests for reservations. Authorized users are able to view available facilities and scheduled them for approval, disapproval, and rescheduling. RFMSS also can detect scheduling, environmental, and safety conflicts. RFMSS tracks, collects, monitors, and displays range specific information.

## RANGE RECONNAISSANCE

3-16. The commander, S-3 and/or Master Gunner, as appropriate, conduct a reconnaissance of the ranges they will use to support their direct fire training plan. Additionally, the OIC and NCOIC for each range should personally conduct a reconnaissance and coordinate with Range Operations headquarters during T-8. The reconnaissance should provide answers to the following questions:

- What routes to the ranges or training areas will be used?
- What is the range throughput? Which includes the following considerations:
  - How many vehicles can occupy the facility at one time?
  - How many vehicles can run the combat course simultaneously?
  - What is the average time of one course run, day and night?
- Are battle positions or reverse slope defense positions available?
- What control facilities are available? What is their condition?
- Is the tower equipped with frequency modulation (FM) communication equipment? What is the unit required to provide? What will the installation or range facility provide?
- Are range safety markers visible for live fire? How will they be illuminated and thermalized at night?
- Did range operations provide SOPs? Review the standard operating procedures for the procedures or actions for the following:
  - How is access to the impact area controlled for live fire? What are the guard and barrier requirements?
  - Does the range support firing of all types of ammunition and pyrotechnics required for the exercise?
  - Who furnishes targets, target supplies, or vehicle visual modification sets? Where are targets stored? Are the targets the correct type, size, shape, and color? What is the condition of target mechanisms? Who provides the target operators and target details?
- Is there a boresight panel at the recommended range? Is it illuminated and thermalized?
- Can platforms boresight and zero simultaneously?
- What is the condition of moving targets?
- Who furnishes the caliber .50 in-bore devices or MILES equipment for the tactical course? Are all caliber .50 in-bore devices or MILES equipment accounted for and operational? Will range support sub-caliber and in-bore devices?
- Has the range or training area been cleared of unexploded ordnance?
- Who will furnish fire-fighting equipment, range flags, and range regulations?
- Does the range or training area provide adequate space for maneuvering vehicles and the weapons to be used?
- Does the range provide firing positions for indirect fire illumination?
- Does the range allow reduced vehicle-to-target ranges for limited visibility engagements?
- Who will supply thermal optics for scoring and control (range cameras and recording equipment)?
- What is the digital infrastructure provided on the range? This question includes the following considerations:

- Can range support Force XXI Battle Command Brigade and Below (FBCB2) or Blue Force Tracking (BFT) digital system use?
- Is audio/visual and instrumentation required?
- If digital equipment is not provided, where can the unit place a Tactical Operations Center to execute digital communications with the firing vehicles or elements?

- What pyrotechnics are required for the training scenario? Does the range or facility approve their use? Who emplaces the battle effects simulators (BES) required on all presented targets?
- Where are the following range operations and control areas (ROCAs):
  - Ammunition pad?
  - A 25-meter clearing and misfire pit?
  - Barriers locations /guard posts?
  - Mess area?
  - Latrine?
  - Helipad or MEDEVAC landing zone?
  - Aid station or defined medic support location?
  - Troop break and billet or bivouac areas?
  - Unit maintenance area? Hard stand location?
  - Vehicle refueling area?
  - Briefing and debriefing area (AAR facility)? What are the AAR capabilities on the range?
  - Track vehicle parking area?
  - Wheel vehicle parking area?
  - Concurrent training area?
  - Instrumentation area?
- What are the expendable supplies required to support the range? Lane marking, personal hygiene, cleaning supplies?
- How can the table scenarios be used to maximize crew throughput on the range?
- How much time should be planned for re-training or make-up firing?

## RANGE AND TRAINING AREA LAYOUT

3-17. Generally, vehicle ranges support both crew and collective live fire scenarios. Some ranges consist of stationary and moving vehicle positions; however, when there is a moving vehicle position, the maneuver box area is laid out to make sure the firing vehicle is within the firing limits of the range. When possible, course runs are not limited to roads or range trails, but are designed to maneuver cross-country.

3-18. Coordinate with the range facility manager to gather information about the facility. Determine if the surface danger zone (SDZ) diagram is current. Construct one, if necessary by referring to DA Pam 385-63, *Range Safety*. As a minimum, the training team needs to obtain the following information about the facility:

- A scaled range diagram (preferably in 100-meter increments) that identifies target pits (by type and number), battle positions, and firing points or map of the training area.
- A fire/no-fire matrix (commonly referred to as a "shot sheet" or "safe seen shot sheet"), which is the authorized list of targets allowed to be fired within the surface danger zone diagram from each firing point, battle position, or firing box. This must be provided in the range SOP.

## SECTION II – CONDUCTING RANGE OPERATIONS

3-19. Effective live training, carried out to a high doctrinal standard, is the cornerstone of operational success. The training of the critical tasks that units have to accomplish to ensure combat readiness is directly related to conducting live fire and maneuver training. Units must be able to run a variety of range and training area facilities, with varying levels of support from range operations.

# COMMANDER'S RESPONSIBILITIES

3-20. Battalion / squadron commanders must—

- Comply with the installation procedures for the certification of OICs and RSOs.
- Conduct risk management for all range operations.

3-21. The unit commander must—

- Ensure compliance with DA PAM 385-63, *Range Safety*, applicable TMs, FMs, installation range guidance, and applicable standard operating procedures for safe training and firing for each weapon system within the command.
- Ensure all personnel within the command are briefed on and comply with installation range procedures and safety requirements including required personal protective equipment.
- Designate an officer-in-charge and range safety officer for each firing exercise and or maneuver in accordance with DA PAM 385-63, *Range Safety*, Table 1-1.

# UNIT RANGE GUNNERY STANDARD OPERATING PROCEDURES

3-22. A unit range gunnery standard operating procedures (GUNSOP) saves both time and energy for the firing unit. The GUNSOP should include guidelines for occupying the range and describe actions to be taken for specific tasks, such as the following:

- Coordinating with maintenance contact teams.
- Replacing targets.
- Repairing target mechanisms.
- Fighting range fires and fire-fighting equipment.
- Breaking down ammunition.
- Moving vehicles to the ammunition point and to the ready line.
- Ammunition issue and dunnage turn-in guidance.
- Firing orders.
- Policing the range.
- Departing the range.
- Diagramming the vehicle traffic pattern through the range area.

# REQUIRED PERSONNEL

3-23. The commander is responsible for safety during all phases of training; however, he designates key personnel to run a range or training area. The minimum personnel required are an OIC, RSO, and medical support appropriate to the level of the training exercise as governed by local regulations to run any range or training area.

3-24. These personnel are required to maintain the certifications or qualifications as directed, and maintain the required documentation on the training facility prior to, during, and at the completion of the training event. The specific responsibilities of each are:

- OIC. The OIC is responsible for everything that occurs at the training site. The OIC duties include:
  - Ensuring the overall safe conduct of training and proper use of the installation training complex.
  - Receiving a range safety briefing from installation range operations organization on use of the training complex.
  - Ensuring the range safety officer is physically present at the training site.
  - Determining when it is safe to fire in accordance with applicable regulations and installation range requirements.
  - Receiving the receipt of final clearance from range operations to fire.
  - Providing the proper supervision of personnel performing misfire, hang-fire, and cook-off procedures.
  - Ensuring required communications are established and maintained.
  - Overseeing safe laser operations.
  - Ensuring adequate medical support is available.
  - Ensuring ammunition and explosives are properly handled, transported, stored, and accounted for within the training complex from the time of receipt to the time of expenditure or turn in.
  - Ensuring written log (DA Form 1594, *Daily Staff Journal or Duty Officer's Log*) is maintained of pertinent safety and control data concerning the operation of firing ranges, weapons training facilities, and maneuver areas, authorized operating times, impact area entries and exits, and cease fire authorizations.
  - Ensuring plans for firing exercises and maneuvers are coordinated with range operations.
  - Maintaining control of target areas to prohibit entry by unauthorized personnel.
  - Ensuring all ammunition malfunctions and accidents are reported to range operations in accordance with AR 75-1, *Malfunctions Involving Ammunition and Explosives*, and DA Pam 385-40, *Army Accident Investigations and Reporting*.
  - Ensuring coordination and approval has been gained from the range operations agency for all civilian personnel that will be entering the training site.
  - Briefing the range safety officer on the duties to be performed in support of the training event. Clearly establishing the requirement for the range safety officer to brief the officer-in-charge on the safety of the facility and unit, and the readiness to commence live fire operations prior to the start of firing.
  - Implementing risk management in all phases of the training events.
- RSO. The RSO duties include:
  - Ensuring all personnel pass the applicable gunnery skills test in the timeframe required for their system.
  - Conducting a safety briefing before any day or night firing.
  - Enforcing all safety regulations.
  - Ensuring all ammunition is handled correctly.
  - Enforcing smoking restrictions.
  - Ensuring all misfires are handled as stated in DA Pam 385-63, *Range Safety*, and the appropriate operator's manual.
  - Ensuring accidents are investigated and reported promptly in accordance with all regulations.
  - Ensuring weapons on live fire ranges are pointed toward the impact area at all times.
  - Ensuring all weapons and weapon systems are clear upon completing the day and night phase of training, as appropriate.
  - Ensuring personnel are clear of the danger area (except as authorized in DA Pam 385-63, *Range Safety*).

- Checking all ammunition for restricted or suspended lots, using TB 9-1300-385, *Munitions Restricted or Suspended*, or https://mhp.redstone.army.mil/.
- Ensuring barriers and guards are in place before the exercise is started.
- Checking medics to make sure they have all required medical equipment and Class VIII supplies and a properly marked vehicle or ambulance for transporting casualties.

- Medical personnel. The medical personnel duties include:
  - Meeting the local requirements to qualify as the medical support for the particular type of range/training area.
  - Having an aid bag.
  - Being familiar with local MEDEVAC reports and procedures.
  - Having an ambulance or vehicle available that has been properly marked as a medical vehicle and is dispatched with proper fuel and oil levels.
  - Knowing how to get to the aid station or hospital (primary and alternate route) and having rehearsed the route.
  - Maintaining 100-percent communications with the officer-in-charge and range safety officer on the range on the firing frequency (primary) as well as the admin frequency (alternate).
  - Having a strip map on hand to the closest military and civilian hospital, ambulance exchange point (AXP), helipad, and/or MEDEVAC location.
  - Is a licensed driver (not a primary driver of his vehicle).
  - Understanding his duties relevant to local range SOP.

## RECOMMENDED PERSONNEL

3-25. The commander typically should assign other personnel to assist in running the training event so he can supervise the overall event more effectively. Below are recommended additional personnel who the commander should utilize:

***Note.*** Additional personnel may be required by local regulation or policy.

- NCOIC, who will—
  - Supervise details and assist the OIC and RSO.
  - Coordinate placement of vehicles upon arrival.
- Beach Master, minimum rank of staff sergeant or above, that is weapon system qualified who—
  - Controls all firing vehicle movement on the range.
  - Receives the firing order from the OIC/Master Gunner for the table's phase.
  - Briefs the firing order during the safety brief
  - Verifies crews are in the correct firing order.
  - Verifies the firing crew's pre-fire checklist has been completed and turned into the ammo pad.
  - Ensures correct firing crew information is passed from the ammo pad/ready line to the tower.
- Ammunition NCO, who will ensure—
  - All ammunition is delivered and properly stored at the training site.
  - Necessary paperwork and access rosters are on hand and properly filled out.
  - The correct type and amount of ammunition is present at each training site.
  - Each vehicle receives the proper number of rounds, by type.
  - The training site is properly policed of brass and packaging materials.

- All ammunition is checked to make sure no restricted or suspended lots are used in training, using TB 9-1300-385, *Munitions Restricted or Suspended*, or https://mhp.redstone.army.mil/.
- Ammunition accountability is maintained at all times according to AR 190-11, *Physical Security of Arms, Ammunition, and Explosives*.
- All placard markings are displayed correctly at the ammunition point.
- Two 10-pound BC-rated fire extinguishers, minimum, are provided at the ammunition point.
- All ammunition is placed appropriately on dunnage and covered as required.

- Target NCO, who will ensure that—
  - Targets are the type, color, and have the required thermal capabilities specified in the firing scenario. All targetry meets the Army standard dimensions and placed in the correct array.
  - Moving targets are operable and trained operators are available when the unit creates their own firing range(s).
  - The target detail is available when needed.
  - There are enough spare targets, target mechanisms, and batteries on hand to support the range or training area.
- VCEs, who will—
  - Act as instructors during practice exercises.
  - Act as evaluators during qualification.
  - Confer with the officer-in-charge and Master Gunner on any scoring discrepancies.
  - Ensure compliance with all safety procedures.
  - Conduct AARs.
- Fire-fighting detail, who will—
  - Know who they are.
  - Know the location of equipment.
  - Know how to use the equipment.
- Radiotelephone operators (RTOs), who—
  - Can operate the radios.
  - Can use the communications security (COMSEC) equipment properly.
  - Can maintain a communications log.
- Briefing NCO, who knows—
  - How to conduct range operations.
  - Who is firing what weapon(s)?
  - The results of the crews/platoons already fired.
  - The location of other key personnel.
- Concurrent training NCO, who will—
  - Ensure proper set up and running of site.
  - Maintain control of personnel on site.
  - Gather site information for the officer-in-charge.

## MASTER GUNNER FOCUS AND DUTIES

3-26. The Master Gunner is the commander's direct fire technical advisor of the capabilities and limitations of all platform-specific weapon systems against threat systems. The Master Gunner helps the commander and the staff plan, develop, and conduct direct fire training. He develops scenarios based on commander's guidance and previous assessments.

3-27. Key areas of focus for the Master Gunner include—

- External resources are ready, such as—
    - Ammunition.
    - Fuel.
    - Range availability.
    - Maintenance assets.
    - Recovery assets.
- Crews are prepared by—
    - Meeting all live fire prerequisites.
    - Maintaining training records.
- Vehicles are prepared for the firing events. the following items must be verified or on hand as indicated:
    - Verify borescope, recoil exercise, and pullover completed, or other actions as required by the firing platforms.
    - DA Form 2408-4, *Weapon Record Data* card (in accordance with DA Pam 738-750, *Functional Users Manual for the Army Maintenance Management System*. Automated cards for gun tubes are located at https://tulsa.tacom.army.mil/guncard).
    - DA Form 2404, *Equipment Inspection and Maintenance Worksheet*, for all weapons and optics, as appropriate.
    - DA Form 5988-E, *Equipment Inspection/Maintenance Worksheet (Automated)*, for all equipment and platforms, as required.
- Range is prepared by having—
    - Scenarios approved.
    - Scenarios proofed.
- Evaluators are prepared.

3-28. The Master Gunner—

- Organizes range-firing exercises.
- Sets up range-firing exercises.
- Coordinates target arrays.
- Coordinates exposure times for targets.
- Coordinates maneuver box verification.
- Coordinates setup of all ranges to ensure they meet the standards in this manual.
- Prepares a surface danger area diagram and range overlay, if required (in accordance with AR / DA PAM 385-63, *Range Safety*).
- Prepares scaled ranges, if required.
- Ensures proper conduct of range-firing exercises.
- Supervises the crews to ensure proper boresighting.
- Confirms zero/LFAST procedures for all weapon systems.
- Conducts remedial training on site, as needed.
- Ensures implementation of a standard VCE program.
- Verifies all prerequisite tables are completed during T-6 through T-week, and records are maintained through the training event.
- Provides armament accuracy checks (AAC) and plumb and sync oversight, as necessary.
- Coordinate for all required TADSS to support the training plan.

## RANGE OPERATIONS BRIEFING

3-29. The range operations officer is responsible for the coordination and safe conduct of range activity for all units using range facilities. Normally, unit leaders are required to receive a range briefing from the range operations officer before occupying a range. Units should, if at all possible, receive the range brief prior to

conducting range reconnaissance, this allows for better planning and preparation. Range operations also should provide a set of local range regulations and policies.

## RANGE PREPARATION

3-30. The OIC and NCOIC should ensure they are prepared to set up the range. The following list is for the unit to review when developing the training plan:

- For live fire training events, the equipment list includes the following:
  - OPORD for the exercise.
  - Range regulations.
  - All other required regulations, SOPs, maps, and overlays.
  - Waivers, if necessary.
  - All range safety officer and officer-in-charge certification cards.
  - All TMs and operator's manuals for all equipment on the range.
  - Frequency modulation (FM) radio sets and antennas.
  - Evaluator communications (jump radios).
  - Gunner's quadrant.
  - Targets and target operating and control mechanisms.
  - Target repair equipment.
  - Flashlights for scorers.
  - Batteries for lights and radios.
  - Clipboards.
  - An ample supply of water for the planned personnel on range.
  - Stop signs.
  - Engineer tape.
  - Fire extinguishers for ammunition pads.
  - No smoking signs.
  - Ammunition markers.
  - Absorbent materials available for spills.
  - Flag sets.
  - Recovery means.
  - Briefing tent.
  - Score sheets.
  - Stopwatches/eight-face punch clock.
  - Binoculars/spotting scope.
  - Night-vision devices.
  - Field telephones, as required.
  - Fire-fighting equipment.
  - Vehicles for target and scoring detail, fire-fighting detail, backup aid vehicle, and safety officers (moving range).
  - Generators to power light sets.
  - Equipment for concurrent training.
  - Boresight equipment.
  - Weather station (or phone numbers to meteorological data source).
  - Portable armament accuracy check panel(s).
  - Sync ramp location.
  - Rescreening plan.
  - Maintenance area layout with hardstand capabilities.

- Other table of organization and equipment (TO&E) and expendable supplies.
- Range flag.
- Range lights, chemical lights, or lanterns.
- Compass for marking rounds out of impact area.
- Gunner's quadrant.
- Method of marking firing positions, boxes, and maneuver areas.

- For TADSS-based training events, the equipment list includes the following:
  - Laser-based engagement simulators.
  - Eye-safe laser filters, as required.
  - Target signature devices.
  - Blank adapters (when required for TADSS use).
  - In-bore devices.
  - Sub-caliber devices.

### RANGE COMMUNICATIONS

3-31. The installation range officer controls all ranges by wire and radio to obtain clearance to fire, report, coordinate, and call cease fires. The OIC controls all training activities, including firing, by the best means available. In all cases, the OIC plans for a backup communication system.

3-32. The unit will need to develop a communications plan to ensure positive control of the barrier detail at all required locations. The unit must include a communication plan that ensures direct contact and coordination with Target detail NCO, concurrent training NCO, beach master, AAR facility, and other key leaders.

3-33. The unit S-6 is expected to establish all communications requirements for the qualification range. This includes detailing all required range frequencies, providing jump-radio communication support, and digital communications requirements. (Refer to Section III – Digital Communications on the Range in this chapter.)

3-34. Units must check with range operations to determine any additional communications requirements that are not provided by the range facility. This includes AAR recording capabilities and playback on non-digital ranges.

## OPENING THE RANGE AND OCCUPYING THE TRAINING SITE

3-35. The range is opened and occupied according to local range SOP, unit SOP, and unit GUNSOP. The following personnel are responsible for the sequence of events used to open the range and occupy the training site:

- The OIC—
  - Receives a range briefing from range operations personnel a minimum of one day prior to range operations.
  - Moves to the range or training site before the training unit arrives.
  - Reports occupation and request hot/wet firing status of the range facility.
  - Checks communications and make sure backup communications are available for live fire exercises.
  - Ensures range equipment is present and operational.
  - Ensures barrier sweeps are conducted, if necessary.
  - Inspects the ammunition point.
  - Conducts safety specific checks with the range safety officer.
  - Prepares to open the range with all required training information.
- The NCOIC—
  - Sets up the concurrent training area.
  - Supervises ammunition, targets, and administrative details.

- Supervises placing vehicles in the correct order for firing or going through the tables.
- Supervises the communications set-up for the range.
- Inspects the gate guards.

- The RSO—
  - Briefs all personnel on range safety.
  - Ensures range guards are posted and briefed on live fire ranges.
  - Ensures no live ammunition is present on a non-firing range.
  - Inspects ammunition storage and handling.
  - Ensures all safety markers are present and visible on the range.
  - Conducts internal range sweeps, as required.
- Medical support –
  - MEDEVAC/CASEVAC plan known, rehearsed, and in place.
  - Ambulance exchange point (AXP) is known with appropriate strip-map available.
  - Strip map complete to all local military and civilian medical treatment facilities.
  - Landing zone marking equipment is available and serviceable; include equipment for night and limited visibility operations.

## DURING THE EXERCISE

3-36. The following personnel are responsible for certain events during the conduct of the exercise:

- The OIC, with assistance from the unit Master Gunner or other experienced NCO,—
  - Controls the firing of the live fire exercise.
  - Maintains proper spacing between units going through the course.
  - Maintains all required communications.
  - Ensures the direct fire training standards are met.
- The NCOIC—
  - Supervises all details.
  - Controls the movement of personnel from firing positions to concurrent training and other administrative areas.
- Beach master—
  - Knows the location of other key personnel.
  - Is aware of how the range is being conducted.
  - Coordinates all firing crews in the ready-line.
  - Coordinates, executes, and reports status of all additional required dry tasks to the tower.
- The RSO—
  - Ensures misfires are handled in accordance with safety regulations.
  - Observes and monitors training for any safety violation.
  - Clears each vehicle's weapon systems once the exercise is complete.
  - Has no additional duties assigned.
- The briefing NCO—
  - Knows the location of other key personnel.
  - Is aware of how the range is being conducted.
  - Stays aware of the results of firing.
  - Knows how many personnel are on the range.
- The Master Gunner—
  - Is available to assist with weapon malfunctions.
  - Adjudicates the alibi process and makes recommendations to the commander.
  - Advises OIC on conduct of range.

- Determines concurrent training changes based on firing unit performance.
- Leverages knowledge of ballistics to assist investigation of surface danger zone violations.
- Ensures exercise is conducted and evaluated according to standard.
- Ensures quantifiable results are captured for future assessment.

### CLOSING THE RANGE

3-37. The following personnel are responsible for certain events while closing the range:

- The OIC—
  - Notifies range operations that firing has ceased.
  - Ensures the range or training area is cleared in compliance with local regulations and standard operating procedures.
  - Debriefs unit leadership on the conduct of the range.
- The NCOIC—
  - Supervises ammunition and target details.
  - Ensures the policing and cleaning of range facilities is complete.
  - Ensures that petroleum, oil, and lubricants (POL) spills are cleaned up either by the using unit, or a supporting engineer unit, and reported to post authorities, depending on the size of the spill.
- The RSO—
  - Ensures all weapons are cleared.
  - Assists the Master Gunner with misfire reporting and handling.
- The ammunition NCOIC—
  - Ensures no ammunition is removed from the range by anyone other than authorized personnel.
  - Prepares residue certificates required by the ASP.
- The Master Gunner—
  - Ensures range scenario, targetry, and training enablers are prepared for any follow-on training unit, as appropriate.
  - Compiles all firing data, roll-ups, and reports.
  - Updates DA Form 2408-4, *Weapon Record Data* cards, as appropriate.
  - Compiles all qualification records and prepares commander out-brief/roll-up.
  - Ensures all misfires are reported and handled in accordance with the appropriate regulations, TMs, and local policies and procedures.

## ADMINISTRATION AND EMERGENCY DIRECTIONS

3-38. Administration requirements in DA Pam 385-63, local range regulations, and unit SOPs can be used to plan personnel and equipment requirements. Keep all current references at the training site at all times. Range Operations frequency, phone number, and certain emergency directions must be included. Emergency directions should include the MEDEVAC radio frequency and call sign; hospital phone numbers; and the frequency, call sign, and directions to the nearest aid station or dispensary.

### VEHICLE FLAGS

3-39. Individual vehicles, tanks, fighting vehicles, and armored personnel carriers may display flags to show the vehicle's weapon status in accordance with the appropriate FM. The use of vehicle flags and lights is an alternative safety precaution to reduce the risk of accidental losses during training operations. ***They are employed at the commander's discretion*** (DA Pam 385-63, *Range Safety*)**.** Most platforms do not have vehicle

flag sets provided in the basic issue items (BII) for the vehicle. Units should be prepared to provide flag sets for day and lights (electric or chemical) for limited visibility to aid in the safe conduct of the range.

3-40. Safety precautions for firing vehicle status designations will be determined by appropriate risk authority based on risk assessment and training objectives. Use of flags and lights is an alternative safety precaution to reduce risk of accidental losses during training operations.

3-41. Weapons system safety posture is always the responsibility of the VC regardless of the use of flags. Commanders may include additional requirements or restrictions to support the training goals, range throughput, and safety considerations during the training event.

3-42. Senior commanders (Army) or installation commanders (USMC) may require vehicles on a battle run to display status flags, lights, or other control measures based on their risk assessment.

## MASTER GUNNER RANGE BOX

3-43. The Master Gunner, or designated NCOICs, should set up a range box. This range box list should be amended depending on the situation, whether combat or training. The standard items in a range box should include the following items:

- Gunner's quadrant.
- Firing Tables (FT) for 120mm, 105mm, 40mm, 25mm, caliber .50, 7.62mm, and 5.56mm.
- Compass.
- Squad radios or equivalent.
- Thermal optic battery charging stations.
- Range maps.
- Portable boresight panel.
- Publications, including the following:
    - Local range regulations and range specific SOP.
    - AR and DA Pam 385-63, *Range Safety*.
    - DA Pam 350-38, *Standards in Weapons Training* (commonly referred to as "STRAC").
    - TC 3-20.31, *Training and Qualification, Crew*, and appropriate supporting text.
    - TC 25-8, *Training Ranges*.
    - All TMs for vehicle, weapons, communications, optics, and other devices.
    - DA Form 2408-4, *Weapon Record Data* card, (current form for all weapon systems firing and additional blank forms).
    - DA Form 1594, *Daily Staff Journal or Duty Officer's Log*, for use as the tower log.
- Crew training records, which includes the following:
    - Results from last GST.
    - Crew simulator unit backup.
- Range book with scenarios, scripts, crew rosters, prior results, and any other pertinent information.
- VCE support equipment, which includes the following:
    - Recordable compact discs (CD), or Digital Video Disc – Recordable (DVD-R) depending on the AAR recording equipment available on the range facility.
    - Timing boards (digital or device), or stopwatches for scoring procedures.
    - Calculators.
    - Pens, pencils and grease pencils.
    - Spare or laminated DA Form 8265, *Common Crew Score Sheet*.
    - Notebooks.
    - Document protectors.
- Target maintenance equipment, which includes the following:
    - Target cloth to support zeroing or screening procedures.

- Staple gun and staples.
- Hammer and nails.
- 100-mph tape.
- Roll of reverse polarity paper (commonly referred to as “no-power” thermal paper).

- Engineer tape.
- Additional Master Gunner tools, as necessary:
  - Weather station (with air temperature and barometric pressure).
  - Spare firing probes (120mm) or firing pins (105mm).
  - Headspace and timing gauge, for use on M2HB.
  - Firing circuit tester.
  - Spline keys.
  - ½-, 9/16- and ¾- wrenches.
  - 5mm and 6mm hex sockets.
  - Jeweler’s screwdriver.
  - Multimeter.
  - Jump cables/plugs (communications support).
  - Remote firing device (Abrams and MGS, as required).
  - Spotting scope sufficient to see impact of a large caliber round at 1500 meters (10x minimum).
  - Portable AAC panel.
  - Portable boresight panel.
  - Ruptured cartridge case extractors, 7.62mm and caliber .50.
  - Lacing pliers.
  - Lacing wire.
  - Needle nose pliers.
  - Tool kit, small arms repairman (NSN 5180-01-506-8287).

## SECTION III – DIGITAL COMMUNICATIONS ON THE RANGE

3-44. All units equipped with FBCB2 or BFT will conduct one day and one night digital message, icon population, and SITREP on Tables III, IV, V, and VI. FBCB2 includes both terrestrial (EPLRS based) and celestial (Satellite based, commonly referred to as BFT) versions. The use of FBCB2 and FBCB2-BFT requires special planning and preparation to ensure the use of the systems do not become a training distracter.

# PREPARATION

3-45. The Master Gunner and the unit S-6 should ensure that all FBCB2 systems are properly configured and operational prior to the start of the live fire density. Units should conduct a COMMEX in the motor pool at least two weeks prior to the live fire to ensure success.

3-46. EPLRS-based units will need to ensure that the correct COMSEC has been secured and loaded into their EPLRS radios. S-6 should confirm that either an EPLRS platoon from the brigade support battalion or the fixed tactical internet (FTI) is scheduled and coordinated to support the entire live fire period. EPLRS-equipped units must have network support from either the EPLRS ENM unit or the FTI to be successful.

3-47. BFT-equipped units should ensure that the S-6 has made any necessary coordination for satellite time or support through the FBCB2-BFT NOC (if required). Newer instrumented ranges such as the Digital Multi-Purpose Training Range (DMPTR), the Digital Multi-Purpose Range Complex (DMPRC), and the Digital Air-Ground Integration Range (DAGIR) have FBCB2 tactical operations center (TOC) kits and ancillary equipment installed in the tower. Master Gunners and unit S-6 personnel should inspect the FBCB2 set up on the instrumented ranges during their range reconnaissance.

# DIGITAL BASE STATION

3-48. To enable digital (FBCB2) communications, the unit should establish a digital base station using the FBCB2 TOC kit in the tower (where provided), using unit organic TOC kits, or with organic equipment using a vehicle within the unit.

3-49. At a minimum, one evaluator should man, monitor, and evaluate the firing vehicles' digital traffic at the established FBCB2 TOC. The evaluator will provide all digital traffic, icon populations, overlays, and predetermined messages to the firing vehicles as directed by the tower.

3-50. During unit occupation of an instrumented range (digital range), the Master Gunner and S-6 personnel must inspect and configure the TOC kit used to conduct the training event. The following is a list (not all inclusive) of items to do/verify to ensure success:

- Perform a complete PMCS on the FBCB2 system.
- Configure the satellite interface (BFT only).
- Verify the proper database is installed to ensure connectivity with all firing vehicles.
- Configure the role to be used during the training event.
- Clear logs and queues.
- Verify correct map data is loaded on all systems.
- Create address group.
- Set default message settings.
- Create message folders for each table.
  - Store a free text message for each engagement for use as the "Tower Prompt."
  - Store icon population update information.
  - Store free text messages for any Call-For engagement scenario as required by the unit's training plan.
  - Create and save free text and long form spot report messages for each engagement in the appropriate folders.

- Load overlays and graphics for the live fire event from the mission data loader.
- Conduct a communications (commo) check with all control elements and training systems.

## DATA SETS

3-51. Each digital scenario requires a data set consisting of a digital script and one or more overlays. Users can store these data sets in the mission data loader (MDL). This provides users an easy method to distribute the data sets to any FBCB2-equipped vehicle in the training event.

3-52. Units must ensure the address group is current in the controlling system to facilitate the rapid exchange of digital information on the range. Failure to maintain an accurate address group significantly reduces the training capabilities of the unit and hinders their progress completing the digital requirements.

## RANGE OVERLAY

3-53. Units should develop standard overlays, both FBCB2 and hardcopy, for each range. At a minimum, each overlay includes the following graphic control measures:

- **Objectives**. These are included for orientation.
- **Battle positions.** In limited visibility, this control measure shows tower and safety personnel the positions of the firing vehicles.
- **Boundaries.** These usually consist only of outer range safety markers.
- **Target reference points (TRPs).** These help orient vehicle commanders on the battlefield. They usually include inner and outer range safety markers or easily identified points on the battlefield.
- **Phase lines.** These help control movement.
- **Routes.** These help orient the vehicle and aid in sustainment operations.

3-54. Units must be prepared to include general threat location icon populations to support the training event. This includes using icon populations for unmanned aircraft systems (UAS), Close Combat Attack (CCA), Call-For-Fire (CFF), and Call for MEDEVAC digital tasks as planned.

## ICON MANAGEMENT AND ENGAGEMENT FLOW

3-55. Each engagement should begin with the base station operator directed to send a free text message from the digital base station to the firing vehicle. The free text message should include critical instructions for the crew to prepare for the upcoming engagement.

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***Note.*** All free text messages and spot reports used in the live fire event should be sent using FLASH precedence. This reduces the amount of latency in message sending and receipt.

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3-56. Next, units send a long form spot report which should include the appropriate enemy or friendly icons for the engagement. These can be pre-built and saved under the combat messages folder. Each long form spot report one can be named for the step or engagement in the scenario, as appropriate. This increases digital traffic efficiency and ensures that each crew receives the same prompts.

3-57. Approximately 10 seconds after the spot report message has been acknowledged by the crew; the step should be executed and targets presented.

3-58. Crews should engage the targets as necessary and complete the engagement by sending a basic combat message SITREP.

3-59. Sample Engagement Flow:

- Base station operator sends free text message, for example: “PREPARE FOR DEFENSIVE OPERATIONS, OCCUPY BP ONE, BATTLECARRY SABOT AND REPORT REDCON ONE ON THE FIRING NET.”
- Crew reports REDCON ONE.

- Base station operator sends appropriate SPOTREP.
- Crew receives and interprets SPOTREP.
- Targets are presented.
- Crew engages and reports using a combat messages SITREP
- Base station operator sends free text message instructing the crew to prepare for the next engagement.

3-60. Utilize the unit TACSOP to prepare, send, and receive data for digital engagements during live fire exercise. This process validates the unit's TACSOP during the training event.

3-61. Unit should use Quick Send messages and buttons to streamline and simplify the use of FBCB2 when possible. Units can add a Quick Send message to their training event on Tables III, IV, V, or VI, as needed.

# REHEARSAL

3-62. The unit must rehearse the range setup before executing tables. This allows for target synchronization, establishment of safety procedures, fratricide avoidance, and testing of communications to reduce training distracters on the live fire facility. The digital tasks must not negatively impact on the live fire throughput of the range or facility.

3-63. The techniques and procedures for the employment of FBCB2 during the live fire event which are given in this TC are simply recommendations. Units always should follow their own SOP, TACSOP, or GUNSOP as well as the operational instructions contained in the appropriate TMs and TBs. Units can refer to TB 11-7010-326-10-2, *BFT / FBCB2*, and TB 11-7010-326-10-3, *BFT / FBCB2,* for additional information and specific operating instructions and troubleshooting.

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## Chapter 4

# Range Requirements and Scenario Development

This chapter discusses ranges, range requirements, and scenario development to build effective training tables for crew live fire. It also includes detailed discussion on creating and proofing engagements for the crew tables for main gun, ATGM, and MMG platforms. It defines the required performance measures (RPMs), and details all additional requirements associated with the direct fire training and qualification at crew level, including digital tasks, Call-For tasks, and TOW missile certification tasks. This chapter only applies to combat arms crews assigned in Armor, Infantry, and Stryker brigade combat teams, as well as military police. It is not intended for use by sustainment elements in any formation. Sustainment units will follow the training guidelines found in TC 4-11.46, *Convoy Protection Platform Gunnery*.

## SECTION I – RANGE REQUIREMENTS

4-1. The unit develops scenarios for all training tables and events. Developing crew simulations and gaming scenarios that augment the live events also is required and follow the same procedures. The first step in developing a live fire scenario for mounted platform systems is to identify the range or facility that supports the unit training objectives.

## RANGE OR TRAINING AREA CONSIDERATIONS

4-2. Units must consider several factors to determine the training location for live fire training events. Units and the Master Gunner can refine the following questions to identify the scope of the training event and identify the best facility to meet the training requirements. Once complete, the unit must conduct a range reconnaissance before developing the scenario to ensure the facility meets the intent of training:

- What tables are you firing?
- How many lanes will be firing?
- What weapon platform types will be firing and what are their ammunition requirements?
- What are the weapon system platforms capabilities, limitations and restrictions?
- What is the maximum distance of the firing box for offensive engagements?
- What is the course speed (maximum and minimum)?
- Does the location of moving targets or custom targets influence the order of tasks to be fired?
- What targets are common to all firing weapons? What targets can be defeated by all ammunition types and weapons used during the scenarios to maximize the target presentations?
- What type of target thermalization is available on the range?
- What types of after action review capabilities are available on the range? Are there “dead spaces” that cause certain target areas not to have camera or visual observation by evaluators?

4-3. The family of Army ranges provides the training venue for Tables III through VI. Each maneuver range provides various capabilities based on the training focus of the facility. Master Gunners and planners must be familiar with the composition of each range type, their capabilities, intended use, and the range operations control area (ROCA) facilities associated with each. TC 25-8, *Training Ranges*, provides detailed information on the Army’s family of maneuver ranges and their capabilities.

4-4. Maneuver ranges are the primary training facilities to conduct main gun, ATGM, and MMG crew training through qualification. Installation facilities vary and the ranges may be named differently than the range types

discussed below. Facilities with specific honorary names still are identified by a type and facilities category code (FCC).

| Range Type | | | Task Capabilities | | | | |
|---|---|---|---|---|---|---|---|
| Facility | Abbreviation | FCC | Zero | Table III | Table IV | Table V | Table VI |
| Boresight, Screening, and Harmonization Range | BSHR | 17910 | **P** | M | M | | |
| Tank / Fighting Vehicle Stationary Gunnery Range | STAGR | 17863 | **P** | M | M | | |
| Scout / Recce Gunnery Complex | SRGC | 17858 | A | **P** | **P** | **P** | **P** |
| Multi-Purpose Training Range | MPTR | 17865 | A | **P** | **P** | **P** | **P** |
| Digital Multi-Purpose Training Range | DMPTR | 17859 | A | A | **P** | **P** | **P** |
| Multi-Purpose Range Complex | MPRC | 17868 | A | A | A | **P** | **P** |
| Digital Multi-Purpose Range Complex | DMPRC | 17860 | A | A | A | **P** | **P** |
| Battle Area Complex | BAX | 17870 | A | A | A | **P** | **P** |
| Digital Air-Ground Integration Range | DAGIR | 17721 | A | A | A | **P** | **P** |

**P** = Primary Capability - The range is specifically designed to conduct the training.

A = Alternate Capability - The range has the capability to conduct the training, should only be used if a Primary facility is unavailable.

M = Modification - This range would require unit modification coordinated with Range Operations to execute training.

More information on the Army's family of Maneuver Ranges can be found in TC 25-8, Training Ranges.

**Table 4-1. Family of maneuver ranges**

4-5. Each facility provides a specific amount of training equipment and capability to support unit training. Units must be familiar with each range's composition and layout to ensure the proper facility is allocated for the training event(s) planned. Table 4-2 shows each maneuver range's Army standard footprint, course road capability, and available targetry.

| Facility | Range Depth | Lanes | SIT | MIT | SAT | MAT | Facades | Urban Clusters (5 or 7 buildings) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 5 | 7 |
| Boresight, Screening, and Harmonization Range | 1500m | | 8 | | 8 | | | | |
| Tank / Fighting Vehicle Stationary Gunnery Range | 3000m | 1 (2) | 42 | 7 | 25 | 4 | | | |
| Scout / Recce Gunnery Complex | 2100m | 1 (2) | 154 | 8 | 35 | 4 | | | |
| Multi-Purpose Training Range | 3500m | 1 (2) | 146 | 4 | 30 | 6 | 5 | | 1 |
| Digital Multi-Purpose Training Range | 3500m | 1 (2) | 146 | 4 | 30 | 6 | 5 | | 1 |
| Multi-Purpose Range Complex | 5000m | 3 (6) | 306 | 45 | 80 | 12 | 8 | 1 | 1 |
| Digital Multi-Purpose Range Complex | 5000m | 3 (6) | 306 | 45 | 80 | 12 | 8 | 1 | 1 |
| Battle Area Complex | 4000m | 2 (4) | 222 | 14 | 43 | 6 | 8 | 1 | 1 |
| Digital Air-Ground Integration Range | 6000m | 2 (4) | 246 | 35 | 50 | 8 | 5 | | 1 |
| Range Depth = the minimum range depth from the baseline to the farthest extent of the target area.<br><br>Lanes = the number of lanes provided. On a maneuver range, each lane is constructed in a horseshoe fashion, creating two course roads, shown in (parenthesis).<br><br>Facades = single or multi-story wooden structures with typically 3 each SIT emplacements (included in SIT quantity).<br><br>Digital Air-Ground Integration Range has one AGI village. | | | | SIT = Stationary Infantry Target (E-type).<br><br>MIT = Moving Infantry Target, 15m or 40m length.<br><br>SAT = Stationary Armor Target.<br><br>MAT = Moving Armor Target. Standard length is 350m, bi-directional, varying speed, and evasive capabilities. | | | | | |

**Table 4-2. Army standard range facility capabilities**

4-6. Facilities may contain more equipment than listed above, based on the installation's needs, adjacent or overlapping range footprints, or any facility expansion projects. The quantities listed represent the minimum requirements to meet the Army standard facility type. Only those items specific to crew live fire training are shown for clarity.

4-7. Each target emplacement includes either a battlefield effects simulator (BES) (for stationary Armor targets (SAT), moving Armor targets (MAT) ), or a hostile fire simulator (HFS) (for stationary Infantry targets (SIT), moving Infantry targets (MIT)). These simulators are required for use on Tables III, IV, V, and VI.

4-8. BES requires additional pyrotechnics cartridges that training units must forecast within TAMIS. Units must ensure the proper pyrotechnics cartridges are ordered to ensure the training facility provides the required target indications to meet the Army standard.

4-9. HFS do not require any additional pyrotechnics to support the training event. These systems typically use a light source to replicate a muzzle flash for dismounted Infantry target presentations and arrays.

# TARGETRY

4-10. Typically, fixed range facilities have targets on hand or are locally manufactured. The unit must either request the targets or fabricate the targets themselves. All targets must be provided in accordance with TC 25-8, *Training Ranges*. This includes the physical dimensions of the target as well as the thermal signatures of those targets, for both day and night engagements. Units may use scaled targetry for Tables III, IV, and V to support their training objectives. Units must use full-scale targets for all qualification ranges.

4-11. All stationary targets are mounted on appropriate lifting mechanisms to facilitate target acquisition and scoring. All training and qualification events on range facilities require the use of hostile fire indicators (BES or HFS) during an engagement scenario. All targets, dismounted and vehicle threats, are required to provide a specific threat signature to the crew. Table 4-3 details the types of targets typically found on training ranges, their hostile fire indicator event, and the point of execution:

| Target Type | Presentation | Hostile Fire Indicator | Execution Point |
|---|---|---|---|
| Armor | Stationary (frontal or flank) moving or evasive (flank) threat tank or tank-like silhouettes. | 1 BES | 5 seconds after target lock |
| Light Armored | Stationary (frontal or flank), moving or evasive (flank) threat personnel carrier (PC) or Infantry Fighting Vehicle (IFV) silhouettes. | 1 BES | 5 seconds after target lock |
| Unarmored | Stationary (frontal or flank) moving or evasive (frontal or flank) threat silhouettes. Truck, sedan, VBIED, etc. | 1 BES for AT systems, 6-9 flashes per second for machine gun | 5 seconds after target lock (AT system) or every 5 seconds |
| Point Troop | Stationary or moving E-type target(s). Single target for Sniper, three targets for RGP teams. No more than three E-type silhouettes placed in line, depth, or wedge formation. Multiple targets placed no more than five meters apart or 10 meters in depth. | Sniper -1 flash RPG - 1 - BES | 5 seconds after target lock. Snipers continue every 8 seconds thereafter. |
| Area Troop | Four (4) to seven (7) stationary and moving E-type targets (typically referred to as a cluster or an array). Minimum of one moving target per cluster. Must be in a linear or wedge formation in a 30 meter by 20 meter footprint. Targets are no more than 5 meters apart. | One target in cluster presents 6-9 flashes in one second. Subsequent indicators rotate to another target in the array. | 5 seconds after target lock and every 5 seconds thereafter. No target should flash more than twice during one engagement. |
| Aerial | Stationary (frontal or flank) or moving (flank) threat attack helicopter silhouettes. Use of ballistic aerial targets for crew training and qualification are not authorized on Table VI. | 1 BES | 5 seconds after target lock. |

**Table 4-3. Types of targets found on training ranges**

4-12. Incorporate moving Armor targets (MATs) to add realism to live fire exercises scenario. The standard track length is 350 meters, but may be less depending on range terrain constraints. Incorporate the following information about MATs specific to your range into your scenario. Table 4-4 shows the available settings for standard mover configurations for planning and scenario development.

| Moving Target Type | Speed Requirements | Hostile Fire Indicator | Execution Point |
|---|---|---|---|
| Moving Target | 16-24 km/h or<br>10-15 mph. | 1 BES | 5 Seconds after target lock and mover is physically moving. |
| Evasive Target | 8-32 km/h or<br>5-20 mph.<br>Varying speed and direction execute short halt and / or change direction. | 1 BES | 5 seconds after target lock and mover is physically moving. If mover executes short halt, execute additional BES 2 seconds after halt. |

**Table 4-4. Moving and evasive target requirements**

4-13. Evasive targets should have the ability to change speed and direction, as well as alter their appearance or thermal signature as the vehicles' directions change. If the scenario includes the moving target executing a short halt, an additional BES/HFS must be initiated within two seconds after coming to a halt.

4-14. **Target visibility**. All targets must be 90-percent visible from the firing position for the entire exposure time. For offensive engagements, all targets must be 90-percent visible to the firing crew a minimum of 90-percent of the length of the maneuver/firing box. For example, if the target is presented for 50 seconds in the scenario, the target must be clearly 90-percent visible to the crew for a minimum of 45 seconds.

4-15. **Target exposure**. All targets will be presented for 50 seconds after target lock. For targets presented in groups, or where multiple targets are presented at the same time during the engagement, the target exposure time begins when all targets are fully presented and locked. Target exposure time runs continuously and is not interrupted. In the event of target malfunction, dust down, wind down, or any other special circumstance, the total time the target is not capable of being engaged for target mechanical reasons will be added to the end of the 50 seconds.

4-16. Using moving targets require scenario developers to pay particular attention to how the system is used during the engagement. The following is a list of actions to take using MATs during scenario development:

- Determine length of track in meters. (Standard is 350 meters in length.)
- Establish a required speed of mover, direction, and evasive characteristics.
- Identify the distance to reach full speed and lock in meters. (This varies on different range facilities.)
- Determine maximum speed in km/h.
- Ensure the moving target exposure time is for 50 seconds after locking and reaching set speed conditions. Ensure there is sufficient remaining track at the end of the presentation to slow and stop the moving target carriage. Typically, planners should include eight seconds for the moving target to accelerate and raise the panel for presentation. Depending on the range operating software, this may or may not be taken into account when the scenario is generated.
- Determine the start and end point of the presentation. The scenario may require specific start locations for each lane in the scenario which may require additional time between engagements to reset.
- Moving Infantry targets (MITs) may require direction changes to maintain movement throughout the desired 50-second exposure time.

## FRIENDLY AND NEUTRAL PRESENTATIONS

4-17. Friendly and neutral presentations ***are not authorized*** for training during Table III, IV, V, or VI. The primary purpose of these live training tables does not include the crew's ability to execute target discrimination and classification as friend, foe, or neutral.

4-18. Target discrimination and classification training tasks are executed during crew simulation and gaming exercises to provide ROC-V-compliant imagery. Crews must sustain their vehicle identification, discrimination, and classification skills using the ROC-V training packages supporting the GST (Table I). Unit commanders may incorporate vehicle combat identification panels into their collective training live fire scenarios.

## LATERAL DISPERSION OF TARGETS

4-19. Lateral dispersion is the distance between targets presented simultaneously. The intent is to ensure gunners and VCs are not able to acquire both targets in a two-target engagement or no more than two targets in a three-target engagement while in narrow field of view (NFOV). Scenario developers should follow the following rules of thumb to place multiple targets so crews maintain the ability to engage all targets and they are not presented too close together. Proofing the range to ensure lateral dispersion requirements are maintained is the Master Gunner's responsibility:

- Minimum target dispersion must be greater than the total distance of the narrow field of view (NFOV).
- The NFOV cannot have any digitally induced zoom or magnification when determining the appropriate amount of lateral dispersion.
- Maximum target dispersion is 400 mils. This keeps the firing crews scanning in a 600-700 mil arc on the range (up to approximately 40 degrees).
- Maximum target dispersion on manual controls (degraded) engagements is 200 mils. This equates to 20 rotations of the manual traversing mechanism on most combat platforms. (10 mils per rotation.)
- Multiple targets may be seen in wide field of view (WFOV).
- Multiple targets presented simultaneously may not be seen at the same time in NFOV.
- If range constraints limit the placement of the targets, the mil separation requirements may be waived by the commander. This change to the standard must be annotated on the firing vehicle's common score sheet in the remarks block. Improper target placement is NOT a crew penalty, but an after action review comment.
- In tasks where three targets are used, the third (delayed) target may be presented anywhere within the authorized safe engagement area.

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***Note.*** There are 17.78 mils per degree. Units with newer optics should reference the TM and identify the NFOV in degrees to determine the appropriate target placement.

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4-20. For MMG platforms, targets arrays should be realistic and not aligned one behind the other or side by side whenever possible. Units should maintain a minimum of 100 mils and a maximum of 200 mils during their engagements.

4-21. The process to determine the minimum and maximum lateral dispersion of targets is specific to the platform firing. The firing point for offensive engagements is the initial firing position within the maneuver box where the targets are activated. The following steps identify the lateral dispersion for precision and degraded multiple target engagements:

- Record the optic type used for the engagement: primary or auxiliary.
- Record the width in degrees of the optic used.
- Plot the firing location on a scaled map with accurate target overlay.
- Select a target for the scenario to use at the reference target.
- Draw a line from the firing point through the reference target.
- Record the range to the reference target.
- Cross reference the NFOV width in degrees or mils to the range to the reference target.

| Minimum Lateral Dispersion | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NFOV | | Range To Target (meters) | | | | | | | | | |
| (degrees) | (mils) | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| 8 | 142 | 28m | 57m | 85m | 114m | 142m | 170m | 199m | 227m | 256m | 284m |
| 9 | 160 | 32m | 64m | 96m | 128m | 160m | 192m | 224m | 256m | 288m | 320m |
| 10 | 178 | 36m | 71m | 107m | 142m | 178m | 214m | 249m | 285m | 320m | 356m |
| 11 | 196 | 39m | 78m | 118m | 157m | 196m | 235m | 274m | 314m | 353m | 392m |
| 12 | 213 | 43m | 85m | 128m | 170m | 213m | 256m | 298m | 341m | 383m | 426m |
| 13 | 231 | 46m | 92m | 139m | 185m | 231m | 277m | 323m | 370m | 416m | 462m |
| 14 | 249 | 50m | 100m | 149m | 199m | 249m | 299m | 349m | 398m | 448m | 498m |
| 15 | 267 | 53m | 107m | 160m | 214m | 267m | 320m | 374m | 427m | 481m | 534m |
| 16 | 284 | 57m | 114m | 170m | 227m | 284m | 341m | 398m | 454m | 511m | 568m |
| 17 | 302 | 60m | 121m | 181m | 242m | 302m | 362m | 423m | 483m | 544m | 604m |
| 18 | 320 | 64m | 128m | 192m | 256m | 320m | 384m | 448m | 512m | 576m | 640m |
| 19 | 338 | 68m | 135m | 203m | 270m | 338m | 406m | 473m | 541m | 608m | 676m |
| 20 | 356 | 71m | 142m | 214m | 285m | 356m | 427m | 498m | 570m | 641m | 712m |
| Maximum Lateral Dispersion | | | | | | | | | | | |
| | | Range to Target (meters) | | | | | | | | | |
| Optic | (mils) | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| Auxiliary | 200 | 40m | 80m | 120m | 160m | 200m | 240m | 280m | 320m | 360m | 400m |
| Primary | 400 | 80m | 160m | 240m | 320m | 400m | 480m | 560m | 640m | 720m | 800m |

**Table 4-5. Minimum and maximum lateral dispersion tables**

***Note.*** When using manual controls, scenario developers must follow the rules of thumb for lateral dispersion between targets as appropriate. Failure to do so significantly impacts the unit's training goals, and negatively impacts the crew's performance.

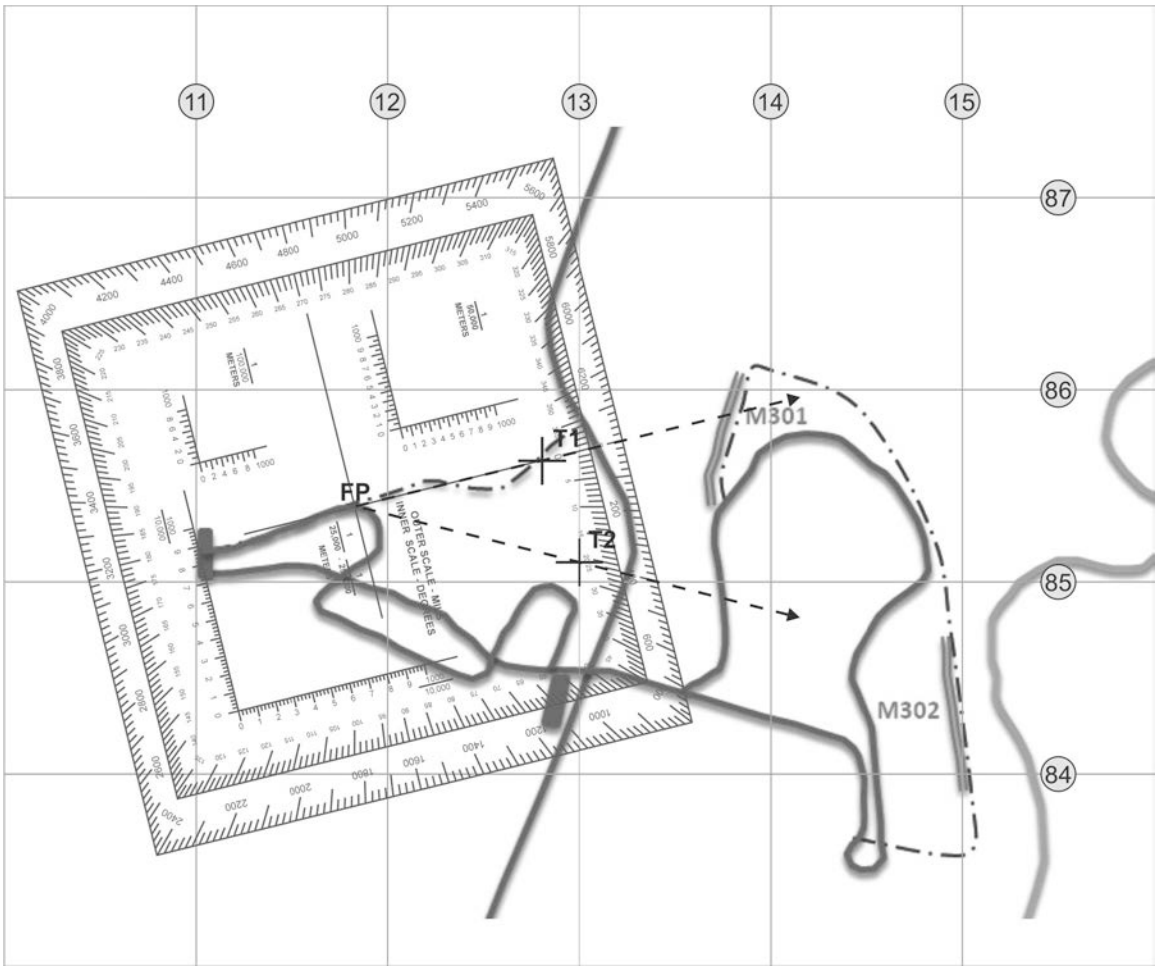


**Figure 4-1. Determining lateral dispersion during scenario development**

- Measure the distance from the reference target perpendicular to the line of sight (LOS). Mark the distance on the scaled map with target overlay.
- Draw a line from the firing point through the lateral distance point.
- Determine the maximum lateral dispersion distance based on the optic used and the range to the base target.
- Mark the maximum lateral dispersion distance from the reference target perpendicular to LOS.
- Draw a line from the firing point through the maximum lateral dispersion distance mark.
- Select the second target from the scaled map with target overlay that falls between the minimum and maximum lateral dispersion lines.
- If no target is available, complete the process again for the opposite side of the reference target, or select another reference target.

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***Note.*** The scaled map with target overlay must include a target matrix for the weapon system or ammunition caliber. Units cannot use targets that are not safety approved for the weapon or ammunition type.

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4-22. Repeat the process for all scenarios that include multiple targets.

## TARGET KILL STANDARDS

4-23. Each target presented must achieve the appropriate "target kill standards" for the ammunition directed for use during the engagement. These target kill standards are based on the ammunition capabilities and the target's ability to withstand direct fire engagements.

4-24. Table 4-7 describes each ammunition type's effects and required kill standards for the various target types. Commanders select the target type for each scenario based on the ammunition authorized and its target defeating capabilities.

| Target | Target Type | Standards |
|---|---|---|
| **120mm Point** | All | Hit target with at least one round. |
| **120mm Area** | Troop | Hit two troop targets with main gun (canister), minimum, and achieve a kill on 50 percent of area targets overall (canister and coax). |
| **105mm Point** | All | Hit target with at least one round. |
| **105mm Area** | Troop | Hit two troop targets with main gun (canister), minimum, and achieve a kill on 50 percent of area targets overall (canister and coax). |
| **25mm Point** | PC (KE) Unarmored (CE) | Hit with at least three rounds at any distance. Unarmored vehicles below 900 meters should be engaged with 7.62mm. |
| | ATGM Team | Hit with at least one round within five meters (HE) at a distance greater than 900 meters. |
| | Aerial Target | Hit with at least five rounds at any distance. |
| | Bunker/Fortified Buildings | Hit with at least five rounds (CE) at ranges to 1200 meters. |
| **25mm Area** | Troop | Suppress 75 percent of target area with HE at ranges greater than 900 meters. |
| **TOW Family of Missiles** | Armored Target | Hit with one missile (TOW - TOW 2B) from 65 meters to 3750 meters. |
| | Armored Target | Hit with one missile (TOW AERO) from 65 meters to 4500 meters. |
| | Bunker | Hit with one missile (TOW BB) from ranges of 1201 meters to 3750 meters. |
| **Caliber .50** | Troop | Hit one target with one round. |
| | Unarmored | Hit target with at least three rounds. |
| **40mm** | Troop | Hit with at least one round within five meters of target. |
| | Unarmored | Hit with at least one round within five meters of target. |
| **7.62mm** | Troop | Hit one target with one round. |
| | Unarmored | Hit target with at least three rounds. |

**Table 4-6. Scenario targets vs. ammunition capabilities**

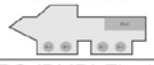
4-25. Targetry may be capable of being engaged and destroyed by weapon system but may be subject to range limitations. The unit must consult local SOPs and installation range operations when planning scenario.

4-26. Units select which target(s) will be presented during the scenarios. They must ensure that the weapon, ammunition, or weapon system that will be fired during the engagement has the ability to defeat the target they select. Units can refer to Figure 4-2 and Figure 4-3 to determine the appropriate targetry for the weapons or systems during their training events.

| Target List | | Ammunition Capabilities | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Small Arms | | 25mm | | 105mm / 120mm | | |
| | | 7.62mm | Cal .50/ 40mm | KE | CE | KE | CE | CAN |
| Sniper  | RPG Team  | X | X | | $X^1$ | | | |
| Troops  | Troops x2  | X | X | | $X^1$ | | | $X^2$ |
| Cargo Truck Frontal L1T-FRT  | Cargo Truck Flank L1T-FLK  | X | X | | X | | X | |
| Technical Truck Frontal L2T-FRT  | Technical Truck Flank L2T-FLK  | X | X | | X | | X | |
| Sedan Frontal L3T-FRT  | Sedan Flank L3T-FLK  | X | X | | X | | X | |
| Anti-Tank (AT-12) Frontal L4T-FRT  | Anti-Tank (AT-12) Flank L4T-FLK  | X | X | | X | | X | |
| Anti-Aircraft (ZSU) Frontal L5T-FRT  | Anti-Aircraft (ZSU) Flank L5T-FLK  | X | X | | X | | X | |

KE - Kinetic Energy rounds.
CE - Chemical Energy rounds.
CAN - Canister round (105mm and 120mm only).
$X^1$ - Due to range constraints, 25mm CE rounds will not be fired at troop targets.
$X^2$ - Canister rounds (CAN) are used for mass troop targets. If the unit is firing Abrams and Bradley vehicles on the same table using the same scenario, Bradley crews must be presented a CE capable target.

**Figure 4-2. Troop and unarmored targetry to ammunition capabilities reference**

| Target List | | Ammunition Capabilities | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Small Arms | | 25mm | | 105mm / 120mm | | |
| | | 7.62mm | Cal .50 / 40mm | KE | CE | KE | CE | CAN |
| PC (BMP) Frontal M1T-FRT  | PC (BMP) Flank M1T-FLK  | | X | X | | X | X | |
| PC (BTR) Frontal M2T-FRT  | PC (BTR) Flank M2T-FLK  | | X | X | | X | X | |
| PC (BMD) Frontal M3T-FRT  | PC (BMD) Flank M3T-FLK  | | X | X | | X | X | |
| PC (BRDM) Frontal M4T-FRT  | PC (BRDM) Flank M4T-FLK  | | X | X | | X | X | |
| Tank Frontal H1T-FRT  | Tank Flank H1T-FLK  | | | | | X | X | |
| Tank Defilade H1T-DEF  | Tank Turret H1T-TUR  | | | | | X | X | |
| Helicopter (HIND) Frontal H2T-FRT  | Helicopter (HIND) Flank H2T-FLK  | | | X[1] | X[2] | X | X | |
| Bunker, Frontal H3T-BKR  | | | | | | | X | |

KE - Kinetic Energy rounds.
CE - Chemical Energy rounds.
CAN - Canister round (105mm and 120mm only).
X[1] - KE rounds must be used on HIND targets at ranges >1200m.
X[2] - CE rounds must be used on HIND targets at ranges <=1200m.
ATGM / TOW - Should be used for tank and tank like targets, light armored targets >3000m, and bunker targets.

**Figure 4-3. Light armor and armored targetry to ammunition capabilities reference**

## URBAN STRUCTURES

4-27. Commanders may opt to conduct their weapons training utilizing facades, urban clusters or digital air/ground integration villages (A-GI villages) to replicate urban operations. Urban structures available on maneuver ranges vary in design, quantity, capability, and density. They are positioned to facilitate rudimentary urban and air-ground integration (A-GI) tasks. Units may choose to incorporate the targets available with these structures during Table III, IV, and V only.

4-28. The use of facades, urban structures, or A-GI Village targetry for qualification tables is not authorized. Engagements on the qualification table can incorporate the urban structures as target reference points, but may not use any targetry within the structure(s). These targets reduce the target acquisition training value required to assess a crew's proficiency overall during qualification.

4-29. The standard façade and urban structures can be found in TC 25-8, *Training Ranges*. They provide limited stationary Infantry target locations within the structure itself, and are intended to support anti-sniper, or individual or small group dismounted threats.

4-30. Units are not required to use these structures during the crew tables. They are provided as a commander option within the weapons platform training program only. Use of these structures should be focused during the collective training events.

## MANEUVER BOXES

4-31. The maneuver box includes the distance required for the vehicle to accelerate, target lift time (typically eight seconds), and the vehicle to begin a steady firing platform. Maneuver boxes must be defined clearly to accurately determine if the targets can be safely engaged for their entire exposure time and to accurately plot surface danger diagrams, as required.

4-32. Maneuver boxes consist of several key components. These components facilitate all actions of the crew and tower operations to effectively and safely execute an offensive engagement. These components are—

- Start point. The starting point for offensive engagements is the point where the firing vehicle receives the scenario prompt or script, and begins movement when directed.
- Acceleration box. The area between the start point and target activation line where the firing vehicle reaches stable firing speed.
- Target activation line. The point where targets are activated to reach the locked position.
- Firing box. The area that allows for safe direct fire engagement of the presented target array from any point within the area. This includes while moving on the offense, or areas that are selected for off-course-road defensive positions. The firing box boundaries are the target activation line and the stop point/cease fire line.
- Delay target activation. Any delayed targets are tied directly to the target lock of the initial presentation. All main gun table delay targets are presented 25 seconds after the initial presentation array is locked. Delay targets for the ATGM tables are presented 60 seconds after the initial presentation array is locked.
- Stop point/cease fire line. The point where the vehicle stops all movement and firing.

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***Note.*** The SDZ for the maneuver box is always calculated from the maneuver box's farthest, most extreme firing locations, typically on the boundaries identified by the start point and the stop point/cease fire line.

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4-33. To determine the size of a maneuver box, the scenario developer must know the expected average vehicle speed for the engagement and the total target exposure time. Table 4-8 shows how to determine the length of a maneuver box. If the first number after the decimal is five or more, round the length up to the next whole number.

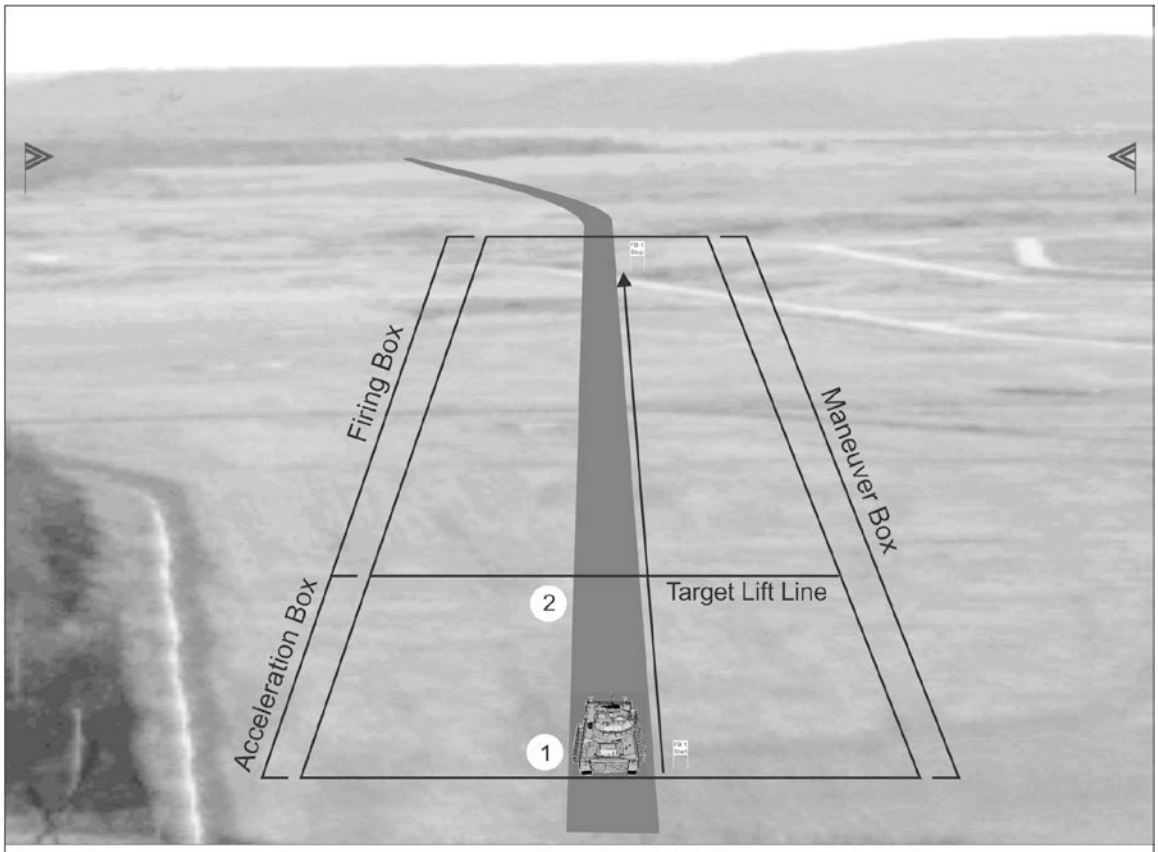
| Firing Vehicle Average Speed | | Maneuver Box Length | |
|---|---|---|---|
| Miles per hour (mph) | Kilometers per Hour (km/h) | Initial Presentation (One or Two Targets) | Delayed Presentation (Three or Four Targets, 25-Sec Delay) |
| 12 mph | 19 km/h | 311 m | 445 m |
| 13 mph | 21 km/h | 337 m | 482 m |
| 14 mph | 23 km/h | 363 m | 520 m |
| 15 mph | 24 km/h | 389 m | 557 m |
| 16 mph | 26 km/h | 415 m | 594 m |
| 17 mph | 27 km/h | 441 m | 631 m |
| 18 mph | 29 km/h | 467 m | 668 m |
| 19 mph | 31 km/h | 493 m | 705 m |
| 20 mph | 32 km/h | 519 m | 742 m |

Note.
1. Maneuver box length is determined by converting miles per hour (mph) to meters per seconds (mps) by multiplying using a constant value of 0.4471416.
2. Multiply the determined mps by the target exposure time + 8 seconds for target lifter time.
3. Round to the nearest whole number to obtain maneuver box length in meters.

**Table 4-7. Maneuver box depth requirements**

4-34. An eight-second target lift/firing vehicle acceleration time must be built into the table to accommodate target lock and a stable firing speed. The target lifter can begin raising the target into a locked position with the actual engagement occurring at a predetermined point within the maneuver box.

4-35. In-depth proofing of the range prior to execution determines at what point targets are in a locked position and able to be engaged. Due to variable target lift times as determined by target type (vehicle vs. troop silhouette), crew engagement before the physical lock (fully presented target), and range to range variances, this engagement point within the maneuver box will not be constant. This is why the “targets locked” time is recorded and annotated during engagement evaluation. At no time will the vehicle extend or surpass the exposure and engagement times.



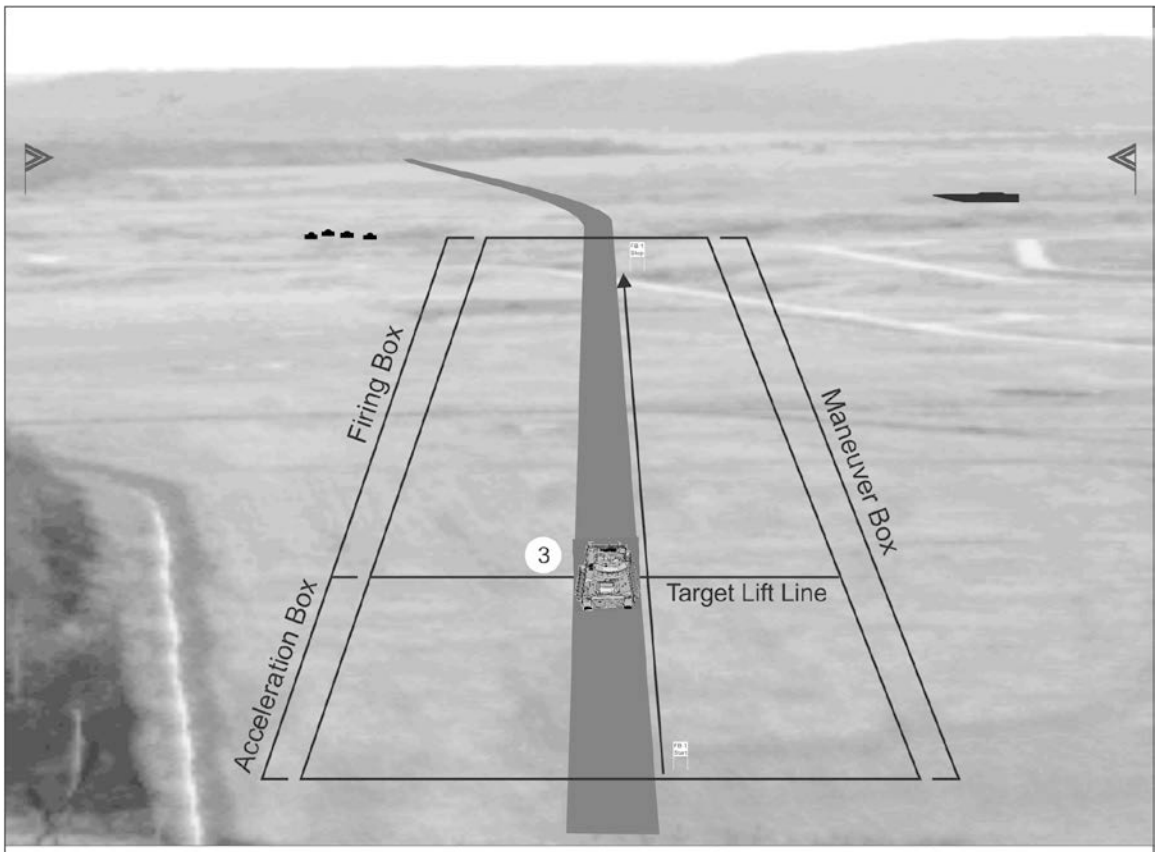

Note. Arrow represents the movement of one vehicle from FB 1 Start through FB 1 Stop.

1. Vehicle begins the offensive engagement at firing box 1 start (FB 1 Start).
2. Vehicle receives engagement prompt from the tower and begins movement through the acceleration box to the target lift line.

**Figure 4-4. Example of a maneuver box on an offensive engagement, part one**

4-36. Once the vehicle moves onto the course road, halts at the start point, and reports readiness condition one (REDCON ONE), the vehicle is directed to begin movement along the course road. The crew is expected to travel between 20 and 30 km/h, providing a stable platform to shoot from, for all main gun, ATGM, and MMG vehicles.

4-37. The offensive firing box includes an estimated distance the firing platforms require to achieve the desired speed. This area is identified as the "acceleration box," and varies in length from vehicle to vehicle.



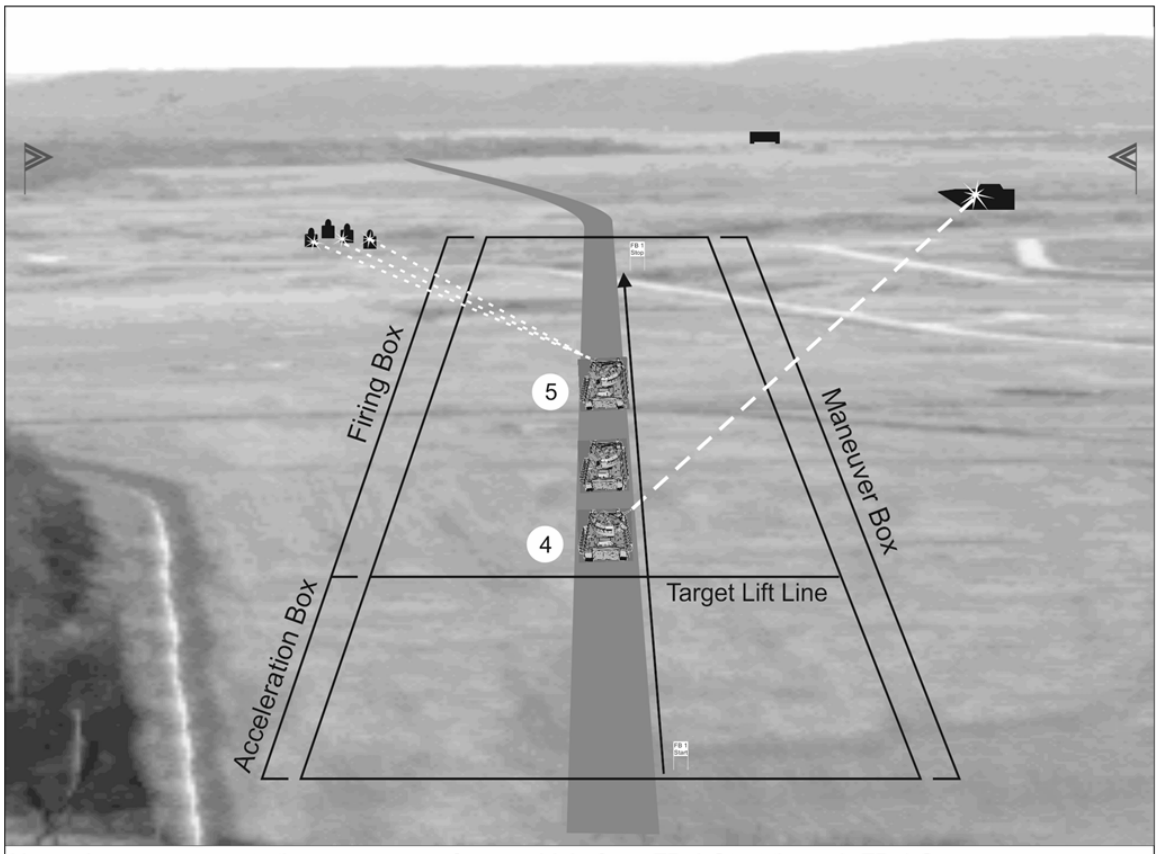

Note. Arrow represents the movement of one vehicle from FB 1 Start through FB 1 Stop.

3. As vehicle passes the predetermined target lift line, targets are activated and begin to rise into the locked position.

**Figure 4-5. Example of a maneuver box on an offensive engagement, part two**

4-38. Once the firing vehicle reaches the appropriate speed, the tower crew will observe the vehicle crossing the target lift line. This is an approximate point that was determined by the Master Gunner, and refined during the proofing of the scenario. At this point, the tower activates the initial presentation for the firing crew to engage.

4-39. The tower target operator announces, "TARGETS LOCKED," when all targets in the initial presentation are fully presented and locked into position. The VCEs initiate the timing of the engagement at this point.




Note. Arrow represents the movement of one vehicle from FB 1 Start through FB 1 Stop.

4. When targets are locked into position, vehicle begins to engage targets.

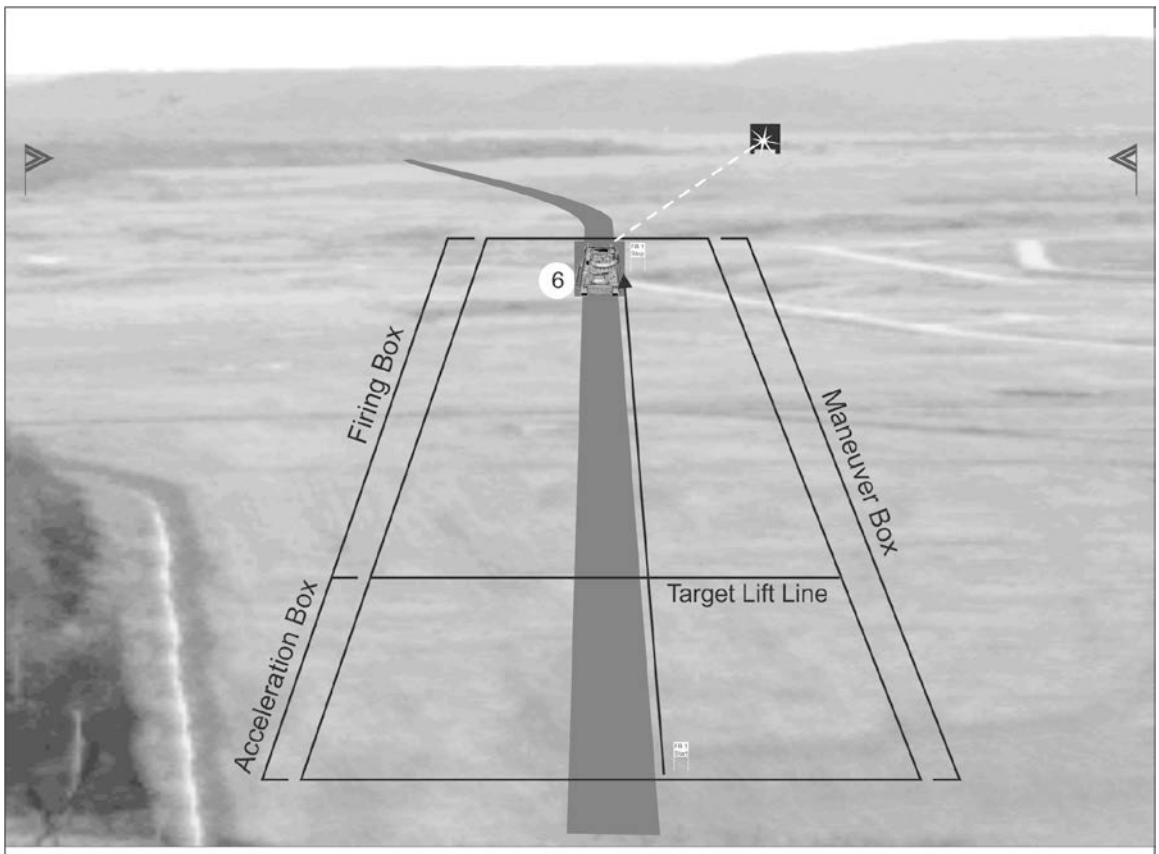
5. After a 25-second delay, the third target begins to rise.

**Figure 4-6. Example of a maneuver box on an offensive engagement, part three**

4-40. As the firing vehicle engages the targets, the VCE team maintains accountability of the firing events. These events are termed "firing occasions," and are the basis for the evaluation of the crew's performance.

4-41. If the scenario has a third or fourth target for presentation, the targets activate automatically at the pre-determined delay time. The delay time is tied directly to the activation and target lock of the initial presentation. Once the delay targets are fully presented, the target operator announces, "TARGETS LOCKED," to the evaluation crew.

4-42. Crews that are having difficulty identifying targets of the initial presentation still may be engaging those targets after the delay target array is presented. The Master Gunner and OIC must ensure the target arrays (initial and delayed) can be engaged safely throughout the firing box.




Note. Arrow represents the movement of one vehicle from FB 1 Start through FB 1 Stop.

6. Vehicle engages and destroys final delayed target and halts at firing box 1 stop.

**Figure 4-7. Example of a maneuver box on an offensive engagement, part four**

4-43. Crews should complete firing at all targets by the end of the maneuver box. Sufficient distance between the delay target array and the end of the maneuver box should be provided to ensure safe execution of the engagement during day and limited visibility conditions.

4-44. If a crew extends beyond the downrange edge of the maneuver box with the potential to engage targets for the offensive engagement, the tower must cease fire the crew. Scenario developers must consider this potential hazard and record the engagement time. The crew may be backed up along the course road to the maneuver box start point to begin its forward offensive movement and complete the engagement based on remaining target exposure time.

## DANGER ZONES

4-45. Danger zones are defined in DA Pam 385-63, *Range Safety*, as the ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation or weapon systems to include ammunition, explosives, and demolition explosives.

4-46. There are three types of danger zones: they are laser surface danger zone (LSDZ), surface danger zone (SDZ), and weapon danger zone (WDZ). Units must be familiar with all types of danger zones, their use, and their impact on the training event.

4-47. When establishing ranges, units must submit SDZ, WDZ, and/or LSDZ diagrams to the installation range operations for approval before firing. (Refer to DA Pam 385-63, *Range Safety*, for restrictions and precautions for SDZ diagrams.) The danger zone diagrams show range boundaries and safety features in overlay form, including safety limit markers for each firing position.

***Note.*** If you must construct a danger zone diagram, refer to Army Regulation and DA Pamphlet 385-63, *Range Safety*.

## SCALED RANGES

4-48. Units may conduct training for proficiency, basic, and practice courses on scaled ranges when access to full scale ranges is limited. If a scaled range is used, realism requires the use of scaled targetry. Scenario developers can identify scaled target dimensions, weights, and thermal signature requirements in TC 25-8, *Training Ranges*.

4-49. Scaled targets also may be used on Tables III, IV, and V on full-scale ranges when the commander's intent is to provide a more challenging, higher level of difficulty to the training event. This allows for more precise gun lay techniques while maintaining the training ammunition's round-to-round dispersion tolerances.

4-50. Units may conduct training with smaller scaled targetry to augment their training program. Use of $1/10^{th}$-scaled targets are best used in extremely confined spaces such as unit motor pools or local training areas. This allows crews to train on their platform using the fullest extent of the systems capabilities and redundant features. These smaller scaled targets can be added to lifting mechanisms and reverse polarity paper in order to replicate the unit's training scenario.

| Range To Replicate (meters) | 3/4 Scale Actual Range (meters) | 1/2 Scale Actual Range (meters) | 1/10 Scale Actual Range (meters) |
|---|---|---|---|
| 800 | 600 | 400 | 80 |
| 900 | 675 | 450 | 90 |
| 1000 | 750 | 500 | 100 |
| 1100 | 825 | 550 | 110 |
| 1200 | 900 | 600 | 120 |
| 1300 | 975 | 650 | 130 |
| 1400 | 1050 | 700 | 140 |
| 1500 | 1125 | 750 | 150 |
| 1600 | 1200 | 800 | 160 |
| 1700 | 1275 | 850 | 170 |
| 1800 | 1350 | 900 | 180 |
| 1900 | 1425 | 950 | 190 |
| 2000 | 1500 | 1000 | 200 |
| 2100 | 1575 | 1050 | 210 |
| 2200 | 1650 | 1100 | 220 |
| 2300 | 1725 | 1150 | 230 |
| 2400 | 1800 | 1200 | 240 |
| 2500 | 1875 | 1250 | 250 |
| 2600 | 1950 | 1300 | 260 |
| 2700 | 2025 | 1650 | 270 |
| 2800 | 2100 | 1400 | 280 |
| 2900 | 2175 | 1450 | 290 |
| 3000 | 2250 | 1500 | 300 |

**Table 4-8. Scaled ranges**

## SECTION II – SCENARIO DEVELOPMENT

4-51. Once the range, training area, or facilities are identified, the unit must develop all the scenarios to support the training events scheduled. The commander's guidance is implemented into the scenario, including:

- Designated range bands of targets.
- Percentage of defensive or offensive engagements.
- CBRN tasks and skills.
- Short halt or traffic control point engagements.
- Use of digital communications. (SITREP, SPOTREP, icon populations or scripts.)
- Additional task conditions.

4-52. Each engagement is made up of a target array. This target array can consist of one to three targets, depending on the platform type and engagement task. For engagements with three targets in the presentation, the third target will be presented to the firing crew 25 seconds after the initial presentation has locked into the fully presented position. Changing the set delay time for the third target's presentation is not authorized on any fundamental table.

4-53. For the MMG platforms and those platforms equipped with a RWS, no more than two targets will be presented during an engagement. Units may not separate these targets with a delay.

4-54. Practice and qualification tables may be conducted on the same range provided they do not contain the same scenarios. If one range facility is used for multiple tables, units should consider requiring firing vehicles to fire each table from a different lane.

# SCENARIO REQUIREMENTS

4-55. Using the selected range information, commander's guidance, RPMs, and standard task numbering system, the Master Gunner identifies the offensive and defensive firing positions that provide the best target saturation and availability. This helps meet the engagement criteria and RPMs at the most locations.

4-56. Scenario developers must take several requirements into account when building their training scenarios. These requirements and other considerations include:

- For offensive tasks with delay target(s), estimate where the firing vehicle should be to determine which target(s) to select. (Ensure course speed allows 50 seconds of exposure time.) Identify alternate targets for each engagement.
- If you are firing a dual-lane scenario, consider where the firing vehicles are in relation to each other when one finishes an engagement. Neither firing vehicle should be placed in the danger zone of the other while firing.
- If you are firing multiple vehicle types on the same range, take into consideration whether the vehicles will be firing at the same targetry and at what range-to-target they will be engaging.
- If multiple targets are used for multiple caliber weapons, verify the proper hit-sensitivity settings can be adjusted from the tower or if they are applied manually at the lifting mechanism. This may reduce the amount of viable targets for a scenario from one or more firing locations.
- Firing positions and offensive firing points may have to be adjusted to support multi-lane use.
- When listing target information, include the following:
    - Target pit number and target number.
    - Target type (TC 25-8, *Training Ranges*).
    - Hostile fire simulator (HFS) / battle effects simulator (BES) indicator requirements.
    - Vehicle range-to-target.
    - Hit sensitivity requirements.
    - Number of hits required to kill the target.
- For tanks, ensure loader's targets are always to the left of the main gun-target line and the vehicle commander's machine gun engagements are always to the right of the main gun-target line.
- Exposure time (target lift and delay time, if applicable).

- Type of ammunition to be fired at the target.
- Target speed, if moving.
- Target direction, if moving.
- Evasive moving target (target evasive maneuver plan).
- Alternate target number, type, hit sensitivity, settings, if applicable.

## FIRING TASKS AND ENGAGEMENT NUMBERS

4-57. The firing tasks are standardized for the live training events on Tables III, IV, V, and VI. Each of these tables consists of 10 total engagements built from the list of 10 firing tasks. These tasks support various critical skills, capabilities, or conditions that form the basic fundamentals required of the crewmembers.

| Task | Mounted Machine Gun Task Description | Main Gun Task Description | ATGM Task Description |
|---|---|---|---|
| 0 | Vehicle Commander / Assistant Gunner | Vehicle Commander | Vehicle Commander |
| 1 | Vehicle Commander / Assistant Gunner | Machine Gun Pure | Machine Gun Pure |
| 2 | Single Target | Machine Gun Pure | Machine Gun Pure |
| 3 | Single Target | Main Gun Pure | ATGM Pure |
| 4 | Single Target (Degraded) | Main Gun Pure | ATGM Pure |
| 5 | Multiple Targets (Degraded) | Change of Weapon System | Degraded |
| 6 | Multiple Targets | Change of Weapon System | Degraded |
| 7 | Multiple Targets | Degraded | Change of ATGM |
| 8 | Multiple Targets | Degraded | Change of Weapon |
| 9 | Multiple Targets | Simultaneous or Multiple Targets | Change of Weapon / ATGM |

**Table 4-9. Standardized task numbering**

***Note.*** Use of the word "main gun" denotes the largest caliber weapon on a multiple weapon system platform, typically 25mm, 40mm, 105mm, and 120mm. The term "machine gun" is used for all 7.62mm weapons on a platform, and caliber .50 on the ASV and AAV only. The .50 caliber engagements for the MGS and Abrams crews are located in Task 0 or Task 9, depending on the table.

4-58. Each table contains the tasks identified in the main gun, ATGM, or MMG task numbering system. The table number, followed by the task number identifies the specific engagement. For example, Engagement 58 identifies Table V, Task 8 as shown below.

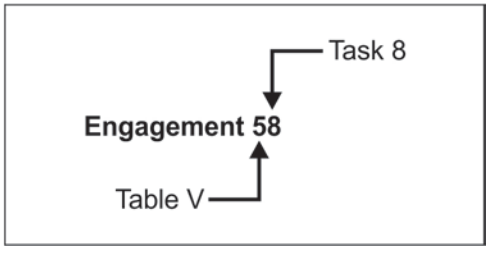



**Figure 4-8. Standard engagement numbering system**

4-59. The tables are organized into a logical numbering system with the conditions for each engagement. This sequence supports a progressive training methodology. This logic applies to Tables III through VI. Tables are executed in sequential order, although the crews only are required to successfully execute "gates" and "qualification" tables to progress further.

4-60. The targetry is aligned in a manner that allows a commander to fire different platform types on the same range using the same targets. The Master Gunner must take into consideration the capabilities of the different

weapon systems when planning his scenario. This is intended to speed up the gunnery process, reduce range constraints, and promote integration and cohesion within the combined arms team, and it also provides units the ability to cross attach as desired prior to the start of weapons platform training.

4-61. With little change or modification, all main gun platforms can fire the same scenario on the same range as all other main gun platforms. MMG platforms can similarly fire the same scenarios as any other MMG platform. This provides units the ability to cross-attach weapon systems prior to live training so they can train as they will deploy, maximize range throughput and utilization, and facilitate improved range efficiency in evaluation. In doing so, resource management, and weapons platform scenario standards are optimized across the battalion or brigade.

4-62. MMG platforms may not fire the main gun crew tables. Main gun platforms may not fire MMG crew tables. Although they appear similar, the attributes and capabilities trained, as well as ammunition and other resourcing are not the same.

4-63. At this point in scenario development, the Master Gunner must review the tables by platform type, main gun, ATGM, or MMG to build the engagements. These tables are built in the same manner, however, have different tasks, number of targets per engagement, and capability considerations.

## SECTION III – MOUNTED MACHINE GUN (MMG) – CREW TABLES

4-64. The principles of training crews to effectively and efficiently employ their assigned weapon platform include training to the fullest extent of the weapon system's capabilities. In general, crews must be able to effectively demonstrate their ability to employ their weapon(s) through training and qualification to the stated level of proficiency. This includes their ability to tactically employ their platform to engage and defeat:

- A stationary threat from a stationary vehicle (defensive engagement).
- A moving threat from a stationary vehicle (defensive engagement).
- A stationary threat from a moving vehicle (offensive engagement).
- A moving threat from a moving vehicle (offensive engagement).
- Multiple stationary and/or moving threats from a stationary vehicle (defensive engagement).
- Multiple stationary and/or moving threats from a moving vehicle (offensive engagement).
- Multiple stationary and/or moving threats with multiple weapons from a stationary vehicle (defensive engagement).
- Multiple stationary and/or moving threats with multiple weapons from a moving vehicle (offensive engagement).
- Single and multiple stationary and/or moving threats at close range (offensive or defensive engagement).
- Single and multiple stationary and/or moving threats at extended range, based on optics and ammunition capability(offensive or defensive engagement).
- Threats while in a simulated chemical environment (day and night).
- Threat(s) day and night, thermal optics dependent (system capabilities) (offensive or defensive engagement).

4-65. MMG platforms are tracked or wheeled vehicles with one weapon or system, including RWS and the M1117, armored security vehicle (ASV), and the AAVP7A1, amphibious assault vehicle (AAV). These platforms follow the MMG models shown within this chapter. These platforms have three generic attributes aligned across the 10 tasks per table: VC or assistant gunner (AG) engagements, single-target engagements, and multiple-target engagements. Task numbering system adheres to the same progressive training principles as the standard task numbering system.

| Task Number and Type | | | III Proficiency | | IV Basic | | V Practice | | VI Qualification | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Vehicle Commander / Assistant Gunner | Target(s): Truck RWS ASV / AAV | STA Cal.50 | | STA Cal.50 | | STA Cal.50 | | STA Cal.50 | |
| 1 | Vehicle Commander / Assistant Gunner | Target(s): Truck RWS ASV / AAV | STA 40mm | | STA 40mm | | STA 40mm | | STA 40mm | |
| 2 | Single Target | Target(s): Truck RWS ASV / AAV | STA Cal.50 | | STA Cal.50 | | STA Cal.50 | | STA Cal.50 | |
| 3 | Single Target | Target(s): Truck RWS ASV / AAV | MOV 40mm | | MOV 40mm | | MOV 40mm | | MOV 40mm | |
| 4 | Single Target (Degraded) | Target(s): Truck RWS ASV / AAV | STA Cal.50 | | STA Cal.50 | | STA Cal.50 | | STA Cal.50 | |
| 5 | Multiple Target (Degraded) | Target(s): Truck RWS ASV / AAV | STA Cal.50 | MOV Cal.50 | STA Cal.50 | MOV Cal.50 | STA Cal.50 | MOV Cal.50 | STA Cal.50 | MOV Cal.50 |
| 6 | Multiple Target | Target(s): Truck RWS ASV / AAV | STA 40mm | STA 40mm | STA 40mm | STA 40mm | STA 40mm | STA 40mm | STA 40mm | STA 40mm |
| 7 | Multiple Target | Target(s): Truck RWS ASV / AAV | STA Cal.50 | STA 40mm | STA Cal.50 | STA 40mm | STA Cal.50 | STA 40mm | STA Cal.50 | STA 40mm |
| 8 | Multiple Target | Target(s): Truck RWS ASV / AAV | STA 40mm | MOV Cal.50 | STA 40mm | MOV Cal.50 | STA 40mm | MOV Cal.50 | STA 40mm | MOV Cal.50 |
| 9 | Multiple Target | Target(s): Truck RWS ASV / AAV | MOV Cal.50 | MOV 40mm | MOV Cal.50 | MOV 40mm | MOV Cal.50 | MOV 40mm | MOV Cal.50 | MOV 40mm |
| **Note:** All vehicles fire their primary crew served weapon at all targets. ASVs / AAVs fire ammunition at the corresponding targets as indicated. | | | | | | | | | | |

**Table 4-10. Mounted machine gun crew tables III through VI**

4-66. All physical targets are selected based upon the ammunition type authorized and resourced for the engagement.

4-67. The ASV and AAV use the caliber .50 machine gun as its primary weapon during all engagements unless specifically stated otherwise. It is imperative that the unit pay strict attention to the ammunition to target requirements to ensure the maximum training is provided to the fundamental skills associated with the 40mm MK19. Crews that fire the wrong weapon at the target are penalized according to the rules found in Chapter 6, Crew Evaluation.

4-68. On platforms where the VC has the additional duty of primary gunner (RWS), Task 0, and Task 1 should be utilized to train alternate gunners during Tables III, IV and V. The primary firer will fire all 10 engagements during Table VI, Qualification. All tasks are fully resourced in the current weapons training strategy.

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***Note.*** Some ranges may not support multiple moving targets for a single engagement. Master Gunners can alter the first target's posture to STA when necessary, but should only do so as a last resort. Master Gunners should consider a "moving insurgent" target for small arms engagements where two moving armor targets (MATs) are not available on the range. Master Gunners that decide to use MIT targetry to meet the moving target requirement for small arms may not present any stationary Infantry targets during the presentation. Only the moving target may be presented for the moving target requirement.

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# TASK DESCRIPTIONS

4-69. Each engagement corresponds to a specific task a crew must execute. The tasks are defined by the capabilities of the weapon platform, based on the vehicle type. The following paragraphs provide a general definition of those tasks and any considerations the Master Gunner or training developer must be aware of in order to correctly build a scenario that meets the training requirements.

## VEHICLE COMMANDER ENGAGEMENTS

4-70. This engagement is specific for the VC. The gunner may not fire this engagement. Tasks 0 and 1 - VC engagements, have some limitations based on the optical capabilities of the platform. When applying the RPMs to this engagement task, the Master Gunner should use caution when applying the long-range / short-range main gun and the short-range machine gun RPMs. The intent for those RPMs is for the default firer (gunner) to engage long- and short-range targets.

4-71. On vehicles where there is no VC or the VC is the gunner, the VC will be the primary firer for all engagements. The driver or another alternate firer may not be used as an alternate firer on these engagements.

## CHANGE OF WEAPON SYSTEM

4-72. The change of weapon system engagement is to train the primary firer to engage multiple targets while changing weapons using the platform's fire control system. These are only available to ASV and AAV crews (Tasks 7, 8, and 9). These tasks require the crew to switch between caliber .50 and the MK19 while engaging multiple targets. Any RPM can be applied to this engagement task. The Master Gunner determines the range to target as appropriate.

## DEGRADED

4-73. Degraded engagements for MMG platforms are for use only by RWS, ASV, and AAV platforms. MMG pintle-mounted platforms do not have any degraded requirement.

4-74. Degraded engagements require the scenario developer to determine the mode or type of degradation to the fire control system (RWS) they desire to be trained. The modes of failure RWS-equipped platforms are: failure of the integrated fire control unit, failure of control grip, and failure of the LRF.

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Note. Commanders may not deviate from the options listed below for Table VI, Qualification, under any circumstances.

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| Platform | Degraded Action | Remarks |
|---|---|---|
| RWS | LRF inoperative | Firer must estimate the range and manually adjust the weapon onto target. |
| | FCU Failure | Firer must use manual means to fire the weapon during an engagement. |
| | Thermal optics inoperative | Firer must use back-up sight to acquire and engage targets. |
| ASV / AAV | Electric trigger failure | Firer must use mechanical means to fire the weapon during an engagement. |
| | Power traverse failure | Firer must use manual traverse controls to aim the armament in azimuth. |
| | Thermal sight failure | Firer must use iron or back-up sight to acquire and engage targets. |

**Table 4-11. RWS, ASV, and AAV degraded actions**

4-75. The VCE team must be able to confirm the mode of degradation during the engagement. Units may combine degradation and apply RPMs to these task types if practical. Scenario developers must pay close attention to the impacts to the crew's performance when combining types of degradation and applying required performance measures. Careful consideration will show certain combinations, although seemingly simple for one vehicle, may be impossible to execute on another.

### MULTIPLE TARGET ENGAGEMENTS

4-76. These engagements provide multiple stationary, stationary and moving, or multiple moving targets for training. Units cannot alter the target posture from moving (MOV) to stationary (STA) unless approved by the higher headquarters. Units can request an exception only when the range facility is incapable of meeting the training requirements.

## MOUNTED MACHINE GUN REQUIRED PERFORMANCE MEASURES

4-77. The RPMs are the required conditions for every ***table***. The commander, staff, and Master Gunner, or designated gunnery NCOIC, develops the scenarios by applying the RPMs to the tasks associated with each table. The tasks and applied RPMs ensure that all primary skill sets of the weapon system's capabilities are trained and tested during the tables. The RPMs outline—

- The requirements of the tables that the scenarios must contain.
- Provide a common set of requirements for all direct fire weapon crews to train to during the weapons training density.
- The "rules" that must be adhered to when developing the crew scenarios.
- The critical skills that must be trained and evaluated.

4-78. The unit selects several conditions for each task using the RPMs and the table tasks for their platform's training events. They include:

- Which engagements are fired from the offense?
- Which engagements are fired from the defense?
- Which engagement(s) are fired from the short-halt, if desired?
- Which engagement(s) are fired from a traffic control point, if desired?
- Range to every target.
- Target type presented, based on ammunition authorizations for the task.
- Which engagements are fired in CBRN environment?
- Which tasks are fired during the day phase?
- Which tasks are fired during the night phase?
- Firing position or maneuver box for all engagements on their range facility or complex.

4-79. The RPMs for the MMG Crew Tables are provided below. These must be incorporated into the scenario development.

| RPM | Frequency | Remarks |
|---|---|---|
| One defensive engagement | Day AND Night | |
| One offensive engagement | Day AND Night | Units should conduct multiple offensive engagements, day and night, whenever possible. |
| One short-range machine gun engagment | Day OR Night | Should not be used on a VC engagement for credit. |
| One long-range machine gun engagement | Day OR Night | |
| One CBRN engagement | Day AND Night | |
| One VC engagement | Day AND Night | |
| Digital tasks | Day AND Night | Send and receive digital message, icon population, minimum. |
| Call-For-Fire | Day AND Night | Notional to FIST or FSO for evaluation. Units may elect illumination, HE, or smoke tasks. |
| Call-For-MEDEVAC / CASEVAC | Day AND Night | Units should incorporate medic support to evaluate the tasks on a training frequency (FM). |
| Call-For-CCA (Close Combat Attack) | Day AND Night | Units can conduct this task notionally via FM or digitally. |
| **Weapon System Requirements** | **Short Range** | **Long Range** |
| 7.62mm | < 400 m | > 600 m |
| Caliber .50 | < 400 m | > 600 m |
| 40mm (MK19) | > 65 m and < 400 m | > 600 m and < 1000 m |

**Table 4-12. Mounted machine gun (MMG) required performance measures (RPMs)**

4-80. The following guidelines must be followed during the scenario development:

- All RPMs must be used during each table.
- More than one RPM can be used on a single task or engagement.
- Any task may be selected for day or night firing.
- Any task may be fired on the offense, provided caution and NO-GO warnings are addressed.
- Any task may be fired on the defense.
- Any task may be fired using short-halt or traffic control point.
- Any task may be assigned a CBRN RPM.
- Targetry must support the RPMs selected.
- Use caution when applying any RPM to a task.
- Use caution when combining RPMs.
- There are a minimum of two engagements during the day phase.
- There are a minimum of two engagements during the night phase.

4-81. When developing the scenario for the unit's live fire, units must carefully apply the RPMs to the tasks. These define the overall engagement, and with the complete list of 10 engagements, develop the scenario for the table.

4-82. When developing the scenario for a particular table, each of the RPMs must be applied at least once to tasks listed for that table. Units may select multiple RPMs for a single task. For example, a unit may develop an engagement that is executed during the day, on the offensive, firing at a long-range machine gun target, and under CBRN conditions.

4-83. "Caution" indicates engagements that may be fired using the listed RPM; however, units should consider the impacts of the selection. For example, if a crew is firing a degraded engagement using an auxiliary sight, you MAY fire the task at night, but you must have a method of illumination. Tasks of this nature will not be fired on qualification tables.

4-84. NO-GO indicates RPMs that may not be applied to the task under any circumstance. Any engagement can be fired day or night. Any engagement can be fired in a chemical environment.

| Task Number-Description | | Offense | | Defense | | Short-Range MG | Long-Range MG |
|---|---|---|---|---|---|---|---|
| | | Day | Night | Day | Night | | |
| 0 | Vehicle Commander / Alternate Gunner | | | | | Caution | Caution |
| 1 | Vehicle Commander / Alternate Gunner | | | | | Caution | Caution |
| 2 | Single Target STA | | | | | | |
| 3 | Single Target MOV | | | | | | |
| 4 | Single Target STA (Degraded) | NO-GO | NO-GO | | Caution | | |
| 5 | Multiple Targets STA / MOV (Degraded) | NO-GO | NO-GO | | Caution | | |
| 6 | Multiple Targets STA / STA | | Caution | | | | |
| 7 | Multiple Targets STA / STA | | Caution | | | | |
| 8 | Multiple Targets STA / MOV | | Caution | | | | |
| 9 | Multiple Targets MOV / MOV | | Caution | | | | Caution |

**Table 4-13. Mounted machine gun required performance measures (RPMs) application by engagement**

4-85. Due to the complexity and limitations of the fire control system on the ASV, all MK19 engagements should be fired at 800 meters or less during the day and at 300 meters or less at night. This is due to a system restriction, not a range constraint.

4-86. As the multiple mover engagement (Task 9) is extremely difficult, scenario developers should not use the long-range RPM on the qualification course (Table VI).

4-87. The NO-GO and caution statements as they relate to the RPMs by task are detailed below by task. If units are firing multiple variants of MMG platforms using the same scenario, all cautions and NO-GO statements apply to all firing vehicles:

- Tasks 0 and 1, VC/AG. The short-range and long-range machine gun engagements can be applied to these tasks; however, the intent is for the primary gunner to receive the training. Units should selectively apply these RPMs to these tasks. Unit training should focus on the marksmanship fundamentals to ensure all crewmembers are properly trained prior to conducting the qualification table.
- Tasks 4 and 5, Degraded. For RWS-equipped vehicles, RPMs for offensive or short-halt engagements are not authorized for these tasks for safety and system limitations.

- Tasks 4 and 5, Degraded. Units should use caution when applying RPMs for night engagements when they select the level of degradation with the thermal optic being inoperative.

4-88. Defensive engagements must begin with the vehicle starting in a turret-down or covered position where only the primary optics can observe the engagement area. For MMG platforms, this allows the gunner on the top of the vehicle to engage targets from the defilade position while protecting the vehicle. MMG platforms may fire from the defilade position when deemed safe and appropriate. This provides a more tactically sound gunnery engagement technique that protects (covers) the firing vehicle from threat fires. When firing from the defilade position, they may not move rearward to receive break time. No hide positions are available on any range to support this tactical option. If the firing vehicle chooses to move forward to the enfilade position to fire, no break time is authorized when returning to the defilade position when any active target exists.

4-89. MMG platforms will conduct offensive tasks with the firing vehicle on the move at a tactical speed that facilitates engaging the target safely within the designated maneuver box. Vehicles may elect to execute a short halt at their own discretion without penalty.

4-90. There are no distinctions between day or night engagements. Based upon the commander's intent and how the vehicles are equipped, units determine which engagements are fired during the day or night in accordance with RPMs. This facilitates maximum use of all live fire training hours to gain the highest vehicle throughput. A minimum number of engagements for the day (two) and night (two) are outlined in the RPMs. This allows units with strict firing hours the flexibility to shift engagements when necessary.

## TASKS WITH TARGET POSTURES

4-91. Target postures are identified as either stationary (STA) or moving (MOV). Each task provides the number of targets for each engagement with the required target posture.

4-92. Moving targets listed in tasks are a requirement for the table. All maneuver ranges provide sufficient moving target opportunities, both day and night, and for offensive and defensive engagements. Moving target requirements for their respective engagements cannot be downgraded to stationary unless critical system failures have occurred on the range, specifically target malfunction or lack of sufficient moving target emplacements on the facility.

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***Note***. Some ranges may not support multiple moving targets for a single engagement. On multiple mover engagements, Master Gunners can alter the first target's posture to STA when necessary, but should only do so as a last resort. Master Gunners should consider a "moving insurgent" target (a moving Infantry target or MIT) for small arms engagements where two moving Armor targets (MATs) are not available on the range. Master Gunners that decide to use MIT targetry to meet the moving target requirement for small arms may not present any stationary Infantry targets during the presentation. Only the moving target may be presented for the moving target requirement.

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4-93. For moving target requirements, the standard is to utilize a moving armor target (MAT) with the appropriate targetry. If the range cannot support the required moving targetry on the qualification ranges, the range does not meet the Army standard requirements for training of the system. The commander must annotate this and any other training deficiency on his unit status report (USR).

4-94. Stationary targets may be upgraded to moving targets based upon the commander's assessment of the unit's proficiency. Units also may increase the level of difficulty of the moving targets by increasing the evasive nature of the target during the engagements.

4-95. The number of targets per engagement cannot be changed. Ammunition resourcing and training on critical tasks are based on the target counts in each engagement. Units may not add to or reduce the target(s) presented during the engagements for any reason.

# MOUNTED MACHINE GUN TRAINING AMMUNITION ROLL-UP

4-96. Training ammunition requirements for the MMG platforms are listed in the roll-up below. Units must ensure sufficient ammunition resources are forecasted and provided to the training range, including anticipated retraining. Retraining ammunition is not specifically resourced, but is built in to the training requirement through historical first-round-hit-savings, commonly referred to as "ammunition harvesting."

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***Note.*** Ammunition for MMG platforms is currently not approved. Units must use existing ammunition authorizations to conduct the Crew Tables. Units conducting these crew tables through the qualification course are not required to complete the weapon's ground-role qualification.

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4-97. Planning factors used to develop scenario targets based on ammunition are as follows:

- The machine gun planning factor is 50 rounds per target.
- The 40mm planning factor is eight rounds per target.

| Mounted Machine Gun | | | | | |
|---|---|---|---|---|---|
| Table | 7.62mm | Caliber .50 | 40mm | BES | |
| | 4 : 1 Mix | | | TGT HIT | HOST FIRE |
| | A131 | A557 | BA30 | LA53 | LA54 |
| ZERO | 50 | 50 | 8 | | |
| III[1] | | | | 15 | 15 |
| IV | 750 | 750 | 120 | 15 | 15 |
| V | 750 | 750 | 120 | 15 | 15 |
| VI | 750 | 750 | 120 | 15 | 15 |
| Total | 2300 | 2300 | 368 | 60 | 60 |

Notes.
[1] The training rounds are not resourced for Table III. If ammunition is available and the crew has successfully dry-qualified this table, the commander may elect to execute this table utilizing full-caliber ammunition.

**Table 4-14. Mounted machine gun crew tables ammunition roll-up**

| ASV / AAV | | | | |
|---|---|---|---|---|
| Table | Caliber .50 | 40mm | BES | |
| | 4 : 1 Mix | | TGT HIT | HOST FIRE |
| | A557 | BA30 | LA53 | LA54 |
| ZERO | 50 | 8 | | |
| III[1] | | | 15 | 15 |
| IV | 400 | 56 | 15 | 15 |
| V | 400 | 56 | 15 | 15 |
| VI | 400 | 56 | 15 | 15 |
| Total | 1250 | 176 | 60 | 60 |

Notes.
[1] The training rounds are not resourced for Table III. If ammunition is available and the crew has successfully dry-qualified this table, the commander may elect to execute this table utilizing full-caliber ammunition.

**Table 4-15. ASV/AAV crew tables ammunition roll-up**

4-98. Units are resourced one BES cartridge per target on Tables III through VI as indicated above. BES pyrotechnics to support retraining or refires are resourced internally by the training unit. Units are responsible to forecast the BES cartridges using TAMIS, coordinate pick-up, and provide them to the appropriate range support personnel prior to training.

## SECTION IV – MAIN GUN CREW TABLES

4-99. The principles of training crews to effectively and efficiently employ their assigned weapon platform include training to the fullest extent of the weapon system's capabilities. In general, crews must be able to effectively demonstrate their ability to employ their weapon(s) through training and qualification to the stated level of proficiency. This includes their ability to tactically employ their platform to engage and defeat:

- A stationary threat from a stationary vehicle (defensive engagement).
- A moving threat from a stationary vehicle (defensive engagement).
- A stationary threat from a moving vehicle (offensive engagement).
- A moving threat from a moving vehicle (offensive engagement).
- Multiple stationary and/or moving threats from a stationary vehicle (defensive engagement).
- Multiple stationary and/or moving threats from a moving vehicle (offensive engagement).
- Multiple stationary and/or moving threats with multiple weapons from a stationary vehicle (defensive engagement).
- Multiple stationary and/or moving threats with multiple weapons from a moving vehicle (offensive engagement).
- Single and multiple stationary and/or moving threats at close range (offensive or defensive engagement)
- Single and multiple stationary and/or moving threats at extended range, based on optics and ammunition capability (offensive or defensive engagement).
- Threats while in a simulated chemical environment, day and night (offensive or defensive engagement).
- Threat(s) day and night, thermal optics-dependent (system capabilities) (offensive or defensive engagement).

4-100. Main gun-equipped platforms –Abrams main battle tanks, Bradley Fighting Vehicles (BFVs), and Stryker Mobile Gun System (MGS) – have six basic attributes across the 10 tasks fired per table. These attributes are: VC engagements, machine gun pure engagements, main gun pure engagements, change of weapon system engagements, degraded mode engagements, and simultaneous (Abrams and MGS) or multiple targets (BFV) engagements. The attributes facilitate training that meets the capabilities of the weapon platform, particularly when they are coupled with the RPMs, discussed later in this chapter.

| Task Number and Type | | | III Proficiency | IV Basic | V Practice | VI Qualification |
|---|---|---|---|---|---|---|
| 0 | Vehicle Commander | Target(s): | **STA** | **STA** | **STA** **STA** | **STA** **MOV** |
| | | Abrams | Cal.50 | Cal.50 | Coax Main | Main Main |
| | | Bradley | Main | Main | Coax Main | Main Main |
| | | MGS | Cal.50 | Cal.50 | Coax Main | Main Main |
| 1 | Machine Gun Pure | Target(s): | **STA** **STA** | **STA** **STA** | **STA** **STA** | **STA** **STA** |
| | | Abrams | Coax Coax | Coax Coax | Coax Coax | Coax Coax |
| | | Bradley | Coax Coax | Coax Coax | Coax Coax | Coax Coax |
| | | MGS | Coax Coax | Coax Coax | Coax Coax | Coax Coax |
| 2 | Machine Gun Pure | Target(s): | **STA** **STA** **STA** | **STA** **STA** | **STA** **STA** | **STA** **STA** |
| | | Abrams | Coax Coax Coax | Coax Coax | Coax Coax | Coax Coax |
| | | Bradley | Coax Coax Coax | Coax Coax | Coax Coax | Coax Coax |
| | | MGS | Coax Coax Coax | Coax Coax | Coax Coax | Coax Coax |
| 3 | Main Gun Pure | Target(s): | **MOV** | **STA** **MOV** | **STA** **MOV** | **STA** **MOV** |
| | | Abrams | Main | Main Main | Main Main | Main Main |
| | | Bradley | Main | Main Main | Main Main | Main Main |
| | | MGS | Main | Main Main | Main Main | Main Main |
| 4 | Main Gun Pure | Target(s): | **STA** **STA** **MOV** | **STA** | **STA** | **STA** **STA** |
| | | Abrams | Main Main Main | Main | Main | Main Main |
| | | Bradley | Main Main Main | Main | Main | Main Main |
| | | MGS | Main Main Main | Main | Main | Main Main |
| 5 | Change of Weapon System | Target(s): | **STA** **STA** **STA** | **STA** **STA** | **STA** **MOV** | **STA** **STA** **MOV** |
| | | Abrams | Coax Main Main | Coax Main | Coax Main | Coax Main Main |
| | | Bradley | Coax Main Main | Coax Main | Coax Main | Coax Main Main |
| | | MGS | Coax Main Main | Coax Main | Coax Main | Coax Main Main |
| 6 | Change of Weapon System | Target(s): | **STA** **STA** **STA** | **STA** **MOV** | **STA** **STA** | **STA** **STA** |
| | | Abrams | Coax Coax Main | Coax Main | Coax Main | Coax Main |
| | | Bradley | Coax Coax Main | Coax Main | Coax Main | Coax Main |
| | | MGS | Coax Coax Main | Coax Main | Coax Main | Coax Main |
| 7 | Degraded | Target(s): | **STA** **STA** | **STA** | **STA** **STA** | **STA** **STA** |
| | | Abrams | Main Main | Main | Coax Main | Main Main |
| | | Bradley | Main Main | Main | Coax Main | Main Main |
| | | MGS | Main Main | Main | Coax Main | Main Main |
| 8 | Degraded | Target(s): | **STA** | **STA** | **STA** | **STA** |
| | | Abrams | Coax | Coax | Coax | Coax |
| | | Bradley | Coax | Coax | Coax | Coax |
| | | MGS | Coax | Coax | Coax | Coax |
| 9 | Simultaneous or Multiple Target Engagement | Target(s): | **STA** **STA** **STA** | **STA** **STA** **STA** | **STA** **STA** **STA** | **STA** **STA** **STA** |
| | | Abrams | M240 Cal.50 Coax | M240 Cal.50 M240 | M240 Cal.50 M240 | M240 Cal.50 Coax |
| | | Bradley | Coax Coax Coax | Coax Coax Coax | Coax Coax Coax | Coax Coax Coax |
| | | MGS | Coax Cal.50 Coax | Coax Cal.50 Coax | Coax Cal.50 Coax | Coax Cal.50 Coax |

**Table 4-16. Main gun crew tables III through VI**

4-101. Target postures are identified with either “STA” or “MOV.” As range designs vary from installation to installation, a range facility may not provide enough moving targets to support the desired scenario. In this instance, a moving target may be substituted with a stationary target.

4-102. The ammunition resourced is identified in a number of ways on the figure. Each target’s block shows an ammunition code for the type of ammunition or weapon that must be used to engage that particular target.

This is done to ensure accurate management of training ammunition resources, and train the capabilities of the platforms where appropriate. Codes and their meanings are:

- Cal .50: The vehicle commander engages the target with the caliber .50 from his station.
- Coax: The gunner engages the target with the coaxially ("coax") mounted M240 series machine gun. On some Task 0 engagements, the vehicle commander may be tasked to engage a target with the coax from his position.
- Main gun: The firer executes the engagement with the main gun. The ammunition to be used on the engagement is given during the tower prompt or digital message to the crew.
- M240: If on an Abrams, this target is engaged by the loader with the loader's M240 series machine gun.

4-103. Alteration to the ammunition type is not authorized.

# TASK DESCRIPTIONS

4-104. Each engagement corresponds to a specific task a crew must execute. The tasks are defined by the capabilities of the weapon platform, based on the vehicle type. The following paragraphs provide a general definition of those tasks and any considerations the Master Gunner or training developer must be aware of in order to correctly build a scenario that meets the training requirements.

## VEHICLE COMMANDER ENGAGEMENT

4-105. This engagement is specific for the VC. The gunner may not fire this engagement. Task 0 - VC Engagements, have some limitations based on the optical capabilities of the platform. When applying the RPMs to this engagement task, the Master Gunner should use caution when applying the long/short-range main gun and the short-range machine gun RPMs. Those RPMs are designed to cause the default firer (gunner) to engage long- and short-range targets.

## MACHINE GUN PURE

4-106. Machine gun pure tasks will be conducted using machine guns that are coaxially aligned/mounted to the main gun only. The main gun will not be used during the engagement or any subsequent engagement directly related to this task. No main gun RPM can be applied to this task. The Master Gunner determines the range to target as appropriate and ensures it is 7.62mm-capable.

## MAIN GUN PURE

4-107. Main gun refers to the 25mm, 105mm, or 120mm armament on stabilized platforms, respectively. No other weapon system will be fired during the engagement or any subsequent engagement directly related to this task. No machine gun RPM can be applied to this task. The Master Gunner determines the range to target as appropriate. All targets are engaged with the primary weapon of the firing platform.

## CHANGE OF WEAPON SYSTEM

4-108. The change of weapon system engagement is to train the primary firer to engage multiple targets while changing weapons using the platform's fire control system. Any RPM can be applied to this engagement task. The Master Gunner determines the range to target as appropriate.

## DEGRADED

4-109. Degraded engagements require the scenario developer to determine the mode or type of degradation to the fire control system they desire to be trained. Degraded options for multi-weapon system platforms are: day primary sight failure, LRF failure, and turret drive system failure. The VCE team must be able to confirm the mode of degradation during the engagement.

4-110. Units may combine degradation and apply RPMs to these task types if practical. Scenario developers must pay close attention to the impacts to the crew's performance when combining types of degradation and applying required performance measures. Careful consideration will show certain combinations, although seemingly simple for one vehicle, may be impossible to execute on another.

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Note. Commanders may not deviate from the options listed below for Table VI, Qualification, under any circumstances.

---

| Platform | Degradation Type | Remarks |
|---|---|---|
| Abrams | Gunner's Auxiliary Sight (GAS) | Ballistic doors must be closed during prompt to crew. LRF inoperative. |
| | GAS with Manual Controls | Ballistic doors must be closed during prompt to crew. Power control handles and LRF are inoperable. Gunner must not traverse or elevate while the vehicle is moving. This condition may not be used on offensive engagements. |
| | Manual Controls | Power control handles are inoperative. Gunner must not traverse or elevate while the vehicle is moving. This condition may not be used on offensive engagements. |
| | Emergency Mode | Stabilization failure. Gunner places fire control system in emergency mode. |
| | Emergency Mode with GAS | Stabilization and gunner primary or thermal imaging sight failure. Gunner must close ballistic doors and place fire control system in emergency mode. |
| Bradley | Gunner's Auxiliary Sight (AUX) | Ballistic doors must be closed during prompt to crew. LRF and primary sight inoperative |
| | AUX with Manual Controls | Ballistic doors must be closed during prompt to crew. Power control handles and LRF are inoperable. Gunner must not traverse or elevate while the vehicle is moving. This condition may not be used on offensive engagements. |
| | Manual Controls | Power control handles are inoperative. This must be announced to the crew during prompt. |
| | Vehicle Commander AUX Sight | VC fires using auxiliary sight. Ballistic doors must be closed during prompt. |
| | Day Viewing Optic (DVO) | The Improved Bradley Acquisition Sight (IBAS) is inoperable. Thermal ballistic shield door must be closed during prompt. |
| MGS | Manual Controls | Power control handles are inoperative. VC must not traverse or elevate while the vehicle is moving. This condition may not be used on offensive engagements. |
| | Auxiliary Sight | Ballistic doors must be closed during prompt to crew. LRF inoperative. |
| | Stabilization Off | Stabilization failure. Gunner turns the stabilization switch to off. |
| | Manually Load Next Round | Gunner manually loads next round. |

**Table 4-17. Degradation types by platform**

## SIMULTANEOUS OR MULTIPLE TARGETS

4-111. This engagement is a multiple target engagement or simultaneous if the platform's weapon systems are capable of engaging multiple targets with separate weapon systems at the same time. The Abrams series will execute this task as a simultaneous engagement where the VC and loader engage their targets simultaneously, followed by the gunner engaging his target. Crews may opt to wait for all three targets to present themselves prior to engaging. In this event, the VC, loader, and gunner will engage their respective targets simultaneously from an enfilade position.

4-112. For all crews, if mortar or artillery illumination rounds are available (they are not resourced), units may incorporate their call for fire requirement (illumination) on this engagement. This is authorized on non-qualification tables only.

4-113. If Abrams crews will fire this scenario alongside other platforms (such as BFVs or MGSs), considerations for the simultaneous engagement must be made:

- If the tank urban survivability kit (TUSK) is installed on the Abrams, and thermal optics are available for the loader and vehicle commander; this engagement may be fired at night on non-qualification tables only.
- Target 1 and Target 2 are locked for the loader and vehicle commander. This provides the crew the opportunity to engage the targets in a tactically sound manner from a defilade.
- Target 3 may not be presented at the same time as the first two targets. Main gun crew table delay targets are required to provide a 25-second break between presentations of the initial target array. Delay targets for the ATGM tables are required to provide a 60-second break between presentations. Crews may wait to engage all three targets at once from the enfilade position if they choose.
- It is not recommended for the loader or vehicle commander to engage rocket propelled grenade (RPG), sniper, or troop targets with their weapon systems on the qualification table. Truck frontal and flank targets are the preferred targetry due to the weapon's mounted machine gun capability and lack of front sight post (loader). The truck type targets provide the most visible area for the rounds to strike in relation to a troop set or E-type silhouette series. If the loader is provided a thermal weapons sight with or without head mounted display, and the unit elects to fire this engagement during limited visibility, the loader must be provided a zero confirmation prior to negotiating the course when the crew performs its test fire. No ammunition is resourced for the loader's zero confirmation of any thermal weapon sight.
- Abrams crews may execute this task in an offensive posture with approval from the brigade commander with appropriate risk assessment and mitigation applied. This task fired on the offense is not recommended for any new crew or turbulent crew.
- The loader, if assigned, is the only individual authorized to engage targets for this engagement. If another crewmember defeats the loader's target, the crew receives an auto zero for the engagement, regardless if the loader attempted to engage or engaged without defeating his target or not.
- The long-range machine gun RPM should not be applied to the loader's engagement. Units must keep in mind that the loader's weapon does not have a front sight post that provides sufficient point of reference for effective fires at extended range.
- Scenario developers should consider the proper target presentation for the loader's portion of the engagement. Loaders will have difficulty engaging single sniper targets as part of the scenario, particularly at extended ranges beyond 200 meters. Truck frontal targets are the most common for loader engagements.
- Loader engagements should not be used to apply the short-range machine gun RPM. The intent of that specific RPM is to support the gunner's training and proficiency engaging targets at extremely close range. If the loader's engagement meets the RPM, units are encouraged to ensure the gunner has at least one short-range machine gun target as well.

# MAIN GUN REQUIRED PERFORMANCE MEASURES

4-114. The RPMs for the main gun crew tables are provided below. These must be incorporated into the scenario development. The following apply specifically to Abrams, Bradley, and MGS crew.

| RPM | Frequency | Remarks |
|---|---|---|
| One defensive engagement | Day AND Night | |
| One offensive engagement | Day AND Night | Units should conduct multiple offensive engagements, day and night, whenever possible. |
| One short-range machine gun engagment | Day OR Night | Should not be used on a VC engagement for credit. |
| One long-range machine gun engagement | Day OR Night | |
| One short-range main gun engagement | Day OR Night | |
| One long-range main gun engagement | Day OR Night | |
| One CBRN engagement | Day AND Night | |
| TOW engagement (TADSS-based) | Table III, Day AND Night | Units may include these tasks on other tables provided they do not interfere with throughput. |
| Digital tasks | Day AND Night | Send and receive digital message, icon population, minimum. |
| Call-For-Fire | Day AND Night | Notional to FIST or FSO for evaluation. Units may elect illumination, HE, or smoke tasks. |
| Call-For-MEDEVAC / CASEVAC | Day AND Night | Units should incorporate medic support to evaluate the tasks on a training frequency (FM). |
| Call-For-CCA (Close Combat Attack) | Day AND Night | Units can conduct this task notionally via FM or digitally. |
| **Weapon System Requirements** | **Short Range** | **Long Range** |
| 7.62mm | < 400 m | > 600 m |
| Caliber .50 | < 400 m | > 600 m |
| 25mm | < 400 m | > 1800 m |
| 105mm | < 400 m | > 1800 m |
| 120mm | < 400 m | > 1800 m |

**Table 4-18. Main gun required performance measures (RPMs)**

4-115. When developing the scenario for a particular table, each of the RPMs must be applied at least once to tasks listed for that table. Units may select multiple RPMs for a single task. For example, a unit may develop an engagement that is executed during the day, on the offensive, firing at a long-range machine gun target, and under CBRN conditions.

4-116. For Bradley units conducting Table III, all vehicles are required to perform one day and one night TOW engagement using TADSS. Units are encouraged to increase the requirement on Table III by firing the entire ATGM Table III, detailed in the next section, and will exceed the TOW RPM.

4-117. These define the overall engagement, and with the complete list of 10 engagements, develop the scenario for the table. When applying the RPMs to task(s), there are range, vehicle, and environmental conditions that must be considered during the development phase.

4-118. "Caution" indicates engagements that may be fired using the listed RPM; however, units should consider the impacts of the selection. For example, if a crew is firing a degraded engagement using an auxiliary sight, you may fire the task at night, but you must have a method of illumination. Tasks of this nature will not be fired on qualification tables.

4-119. "NO-GO" indicates RPMs that may not be applied to the task under any circumstance. Any engagement can be fired in a chemical environment.

| Task Number-Description | | Offense | | Defense | | Short Range Main Gun | Long Range Main Gun | Short Range MG | Long Range MG |
|---|---|---|---|---|---|---|---|---|---|
| | | Day | Night | Day | Night | | | | |
| 0 | Vehicle Commander | | Caution | | Caution | Caution | Caution | Caution | Caution |
| 1 | Machine Gun Pure | | | | | NO-GO | NO-GO | | |
| 2 | Machine Gun Pure | | | | | NO-GO | NO-GO | | |
| 3 | Main Gun Pure | | | | | | | NO-GO | NO-GO |
| 4 | Main Gun Pure | | | | | | | NO-GO | NO-GO |
| 5 | Change of Weapon System | | | | | | | | |
| 6 | Change of Weapon System | | | | | | | | |
| 7 | Degraded | Caution | Caution | | Caution | Caution | Caution | | |
| 8 | Degraded | Caution | Caution | | Caution | Caution | Caution | | |
| 9 | Simultaneous/ Multiple Targets | Caution | NO-GO | | Caution | NO-GO | NO-GO | | |

**Table 4-19. Main gun required performance measures (RPMs) by engagement**

4-120. The NO-GO and caution items listed on the main gun RPM application to task figure are detailed below by task number. If units are firing multiple variants of main gun platforms using the same scenario, all cautions and NO-GO statements apply to all firing vehicles:

**TASK 0, VEHICLE COMMANDER:**

- When the engagement directs the vehicle commander to fire the caliber .50 machine gun (Abrams and MGS), units should use caution applying night RPMs to this task. Units with vehicles without a VC weapon thermal capability may choose to fire night RPMs for this task; however, they will need to provide all firers with a means of adequately illuminating the targetry for the engagement. Units equipped with TUSK components may fire Task 0 or Task 9 (simultaneous engagement) at night, but should limit this to Tables III, IV or V only.

- The long-range main gun engagement intent is for the gunner to develop the long-range engagement skills as the primary firer, not the vehicle commander. Units may select Task 0 for this RPM, but should consider applying this RPM to an engagement where the gunner is the primary firer as well.
- The short-range main gun engagement is intended for the gunner to develop those skills as the primary firer, not the vehicle commander. Units may select Task 0 for this RPM, but should consider applying this RPM to an engagement where the gunner is the primary firer as well.
- The short-range machine gun engagement should not be used on this task. This RPM may be applied to tasks where the gunner is the primary firer only.
- The long-range machine gun engagement should not be used on this task for credit toward the RPM requirement. Targets may be placed at extended ranges for the vehicle commander; however, the goal is for the gunner to receive the long-range engagement skills.

**TASK 1 AND 2, MACHINE GUN PURE:**

- Both RPMs for short- and long-range main gun are not authorized on these tasks. These tasks only have machine gun ammunition allocated.

**TASKS 3 AND 4, MAIN GUN PURE:**

- The short-range and long-range machine gun RPMs are not authorized for these engagements. No small arms ammunition or targetry are associated with these tasks.

**TASK 5 AND 6, CHANGE OF WEAPON SYSTEM:**

- There are no RPM restrictions for a change of weapon system task.

**TASK 7 AND 8, DEGRADED:**

- Units must use caution when applying the Offense Day or Night RPM to this task. If the unit selects the level of degradation to using manual controls, this could cause severe injury to the crew and damage to the vehicle.
- Units are cautioned when applying the Night Defense RPM to these tasks. If the unit selects auxiliary optics for the level of degradation for the engagement, the crews will not be able to acquire and effectively engage targets during limited visibility without excessive illumination support.
- Units should use caution when applying the short- and long-range main gun RPM to these tasks. They are intended for use during engagements with a fully operational fire control system to train and test the crew's ability to engage properly with a fully-mission capable (FMC) system. Units may apply the RPM to these tasks when it meets the commander's training objectives, but another task also should be considered.
- When firing in degraded mode, if the unit selects the auxiliary sights, external illumination (mortar or field artillery) must be used and is resource intensive.

4-121. Issues that planners may experience are:

- Selecting "manual traverse (gun/turret drive failure) and gunner's auxiliary sight" is acceptable on any platform, but may present difficulties for some Bradley crewmember.
- Applying a gunner's primary sight or thermal imaging sight failure at night. Unless you have illumination rounds to support use of the auxiliary sight at night, this combination of events will be challenging, yet unproductive for the crew.
- Having a gun/turret drive failure during offensive engagements that require the use of manual controls is a safety hazard for all gunners. Use of the manual traverse handle on any main gun platform on the offense may result in critical or catastrophic injury to the crew. This combination is not authorized.
- When using manual controls, scenario developers must follow the rules of thumb for lateral dispersion between targets as appropriate. Failure to do so significantly impacts the training goals of the unit, and negatively impacts the crew's performance.

***Note.*** For Abrams platform only: Loader engagements should not be fired at night without using a thermal weapon sight. Units should not fire this engagement at night on Table VI.

**TASK 9, SIMULTANEOUS (MULTIPLE TARGETS):**

- Units are not authorized to apply the short-range or long-range main gun RPMs to this task. No main gun ammunition is resourced for Task 9, and no associated targets are authorized in the conditions of the task.
- Units without thermal optics authorized for all firers of the engagement are restricted from applying this engagement at night on Table VI. If units have illumination rounds to sufficiently support training, units may execute Task 9 during limited visibility on any table except the Table VI.
- For Abrams crews, units may not to use the short- or long-range machine gun RPM applied to the loader's target on Table VI.
- For Abrams and MGS crews, the vehicle commander target may not apply the short- or long-range RPMs to those targets.

## Tasks with Target Postures

4-122. Moving targets that are listed in tasks are a requirement for the table. All maneuver ranges provide sufficient moving target opportunities, both day and night, and for offensive and defensive engagements. Moving target requirements for their respective engagements cannot be downgraded to stationary unless critical system failures have occurred on the range. The only authorized alternate for moving targets is a frontal stationary target, if due to range constraints or target malfunction a moving target is not available. If the range cannot support the required moving targetry on the qualification ranges, the commander must annotate the training deficiency on his USR.

4-123. Stationary targets may be upgraded to moving targets based upon the commander's assessment of the unit's proficiency. Units also may increase the level of difficulty of the moving targets by increasing the evasive nature of the target during the engagements.

- The number of targets per engagement cannot be changed. Ammunition resourcing and training on critical tasks are based on the target counts in each engagement. Units may not add to or reduce the target(s) presented during the engagements for any reason.

# MAIN GUN TRAINING AMMUNITION ROLL-UP

4-124. The ammunition roll-up for main gun platform crew tables is provided below. Threat scenarios must match ammunition capabilities for each system. (The ammunition used must be capable of defeating the target presented.)

4-125. Planning factors used to develop scenario targets based on ammunition are:

- Machine guns require 50 rounds per target.
- 25mm requires eight (8) rounds per target.
- 105mm/120mm require 1.5 rounds per target
- Canister engagements require one (1) round per target.

| Abrams | | | | | | | |
|---|---|---|---|---|---|---|---|
| Table | 7.62mm | Caliber.50 | 120mm | | | BES | |
| | 4 : 1 Mix | | KE | CE | CAN | TGT HIT | HOST FIRE |
| | A131 | A557 | C785 | C784 | CA31 | LA53 | LA54 |
| | (A111) | (A598) | (AA38) | (A541) | | | |
| Zero | 50 | 50 | 2* | 2* | | | |
| III[1] | (550) | (100) | (8) | (7) | | 22 | 22 |
| IV | 450 | 100 | 6 | 3 | .5[2] | 17 | 17 |
| V | 550 | 50 | 5 | 6 | .5[2] | 19 | 19 |
| VI | 450 | 50 | 10 | 7 | | 21 | 21 |
| Totals | 1500 | 250 | 23 | 18 | 1 | 79 | 79 |

Note
*USMC requires four rounds KE and CE for zero.
[1] Training rounds are not resourced for Table III. If live ammunition is available and the crew has successfully blank-qualified this table, the commander may elect to execute this table utilizing full-caliber ammunition. The ammunition annotated are the rounds required if this situation exists. The Caliber .50 SLAP-T (AA38) and M20 API-T (A541) rounds are authorized and resourced for Abrams Table III utilizing Caliber .50 inbore device, provided the crew has previously blank-qualified this table. These ammunition amounts correspond with the 120mm full-caliber ammunition requirements.
[2] One M1028 canister round is resourced for each Abrams crew gunnery density per fiscal year. The round may be fired on either Table IV or Table V for each gunnery density.

**Table 4-20. Main gun crew table ammunition requirements**

| Bradley | | | | | | |
|---|---|---|---|---|---|---|
| Table | 7.62mm | 25mm | | BES | | TOW |
| | 4 : 1 Mix | KE | CE | TGT HIT | HOST FIRE | ATWESS |
| | A131 | A940 | A976 | LA53 | LA54 | |
| | (A111) | | | | | (L367) |
| Zero | 50 | 8 | | | | |
| III[1] | (600) | | | 44 | 44 | (22) |
| IV | 500 | 32 | 24 | 17 | 17 | |
| V | 600 | 32 | 24 | 19 | 19 | |
| VI | 500 | 48 | 40 | 21 | 21 | |
| Totals | 1650 | 120 | 88 | 101 | 101 | (22) |

Note.
[1] The 7.62mm rounds are not resourced for Table III. If live ammunition is available and the crew has successfully blank-qualified this table, the commander may elect to execute this table utilizing full-caliber ammunition.

**Table 4-21. Bradley crew table ammunition requirements**

| MGS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Table | 7.62mm | Caliber .50 | 105mm | | | | BES | |
| | 4 : 1 Mix | | KE | HEAT | HEP | CAN | TGT HIT | HOST FIRE |
| | A131 | A557 | C520 | C511 | CA37 | CA40 | LA53 | LA54 |
| | (A111) | (A598) | | | | | | |
| ZERO | 50 | 50 | 4 | 4 | 4 | | | |
| III[1] | (550) | (100) | | | | | 22 | 22 |
| IV | 450 | 100 | 2 | 4 | 2 | 1 | 17 | 17 |
| V | 550 | 50 | 2 | 7 | 2 | 1 | 19 | 19 |
| VI | 450 | 50 | 2 | 9 | 5 | 1 | 21 | 21 |
| Total | 1500 | 250 | 10 | 24 | 13 | 3 | 79 | 79 |

Note.
[1] Training rounds are not resourced for Table III. If live ammunition is available and the crew has successfully blank-qualified this table, the commander may elect to execute this table utilizing full-caliber ammunition.

**Table 4-22. MGS crew table ammunition requirements**

4-126. Units are resourced one BES cartridge per target on Tables III through VI as indicated above. BES pyrotechnics to support retraining or refires are resourced internally by the training unit. Units are responsible to forecast the BES cartridges using TAMIS, coordinate pick-up, and provide them to the appropriate range support personnel prior to training.

## SECTION V – ATGM CREW TABLES

4-127. The principles of training crews to effectively and efficiently employ their assigned weapon platform include training to the fullest extent of the weapon system's capabilities. In general, crews must be able to effectively demonstrate their ability to employ their weapon(s) through training and qualification to the stated level of proficiency. This includes their ability to tactically employ their platform to engage and defeat:

- A stationary threat from a stationary vehicle (defensive engagement).
- A moving threat from a stationary vehicle (defensive engagement).
- A stationary threat from a short halt posture.
- A moving threat from a short halt posture.
- Multiple stationary and/or moving threats from a stationary vehicle (defensive engagement).
- Multiple stationary and/or moving threats from a short halt posture.
- Multiple stationary and/or moving threats with multiple weapons from a stationary vehicle (defensive engagement).
- Multiple stationary and/or moving threats with multiple weapons from a short halt posture.
- Single and multiple stationary and/or moving threats at close range.
- Single and multiple stationary and/or moving threats at extended range, based on optics and ammunition capability.
- Threats while in a simulated chemical environment, day and night.
- Threat(s) day and night, thermal optics-dependent (system capabilities).

4-128. ATGM-equipped platforms –Stryker ATGM, ITAS, and Scout ATGM – have six basic attributes across the 10 tasks fired per table. These attributes of the tasks are: VC engagements, machine gun pure engagements, ATGM pure engagements, change of ATGM engagements, change of weapon engagements, and degraded mode engagements. The attributes facilitate training that meets the capabilities of the weapon platform, particularly when they are coupled with the RPMs, discussed later in this section.

| Task Number and Type | | | III Proficiency | IV Basic | V Practice | VI Qualification |
|---|---|---|---|---|---|---|
| 0 | Vehicle Commander | Target(s): ATGM | STA TOW | STA TOW | STA TOW STA TOW | STA TOW MOV TOW |
| 1 | Machine Gun Pure | Target(s): ATGM | STA MMG STA MMG | STA MMG STA MMG | STA MMG STA MMG | STA MMG STA MMG |
| 2 | Machine Gun Pure | Target(s): ATGM | STA MMG STA MMG STA MMG | STA MMG STA MMG | STA MMG STA MMG | STA MMG STA MMG |
| 3 | ATGM Pure | Target(s): ATGM | MOV TOW | STA TOW MOV TOW | STA TOW MOV TOW | STA TOW MOV TOW |
| 4 | ATGM Pure | Target(s): ATGM | STA TOW STA TOW MOV TOW | STA TOW | STA TOW | STA TOW STA TOW |
| 5 | Degraded | Target(s): ATGM | STA TOW STA TOW | STA TOW | STA TOW STA TOW | STA TOW STA TOW |
| 6 | Degraded | Target(s): ATGM | STA TOW | STA TOW | STA TOW | STA TOW |
| 7 | Change of ATGM | Target(s): ATGM | STA BB STA 2B STA BB | STA 2B STA BB | STA BB MOV 2B | STA 2B STA BB MOV 2B |
| 8 | Change of Weapon | Target(s): ATGM | STA MMG STA TOW STA TOW | STA TOW MOV MMG MOV TOW | STA TOW STA TOW MOV MMG | STA TOW/ MMG STA TOW/ MMG STA TOW/ MMG |
| 9 | Change of Weapon / ATGM | Target(s): ATGM | STA MMG STA BB MOV 2B | STA 2B MOV MMG STA BB | STA BB MOV 2B STA MMG | STA BB/ MMG MOV 2B/ MMG MOV 2B/ MMG |

**Table 4-23. ATGM crew tables III through VI**

4-129. Target postures are identified with either “STA” or “MOV.” As range designs vary from installation to installation, a range facility may not provide sufficient moving targets to support the desired scenario. In this instance, a moving target may be substituted with a stationary target.

4-130. The ammunition resourced is identified in a number of ways on the figure. Each target’s block shows an ammunition code for the type of ammunition or weapon that must be used to engage that particular target. This is done to ensure accurate management of training ammunition resources, and train the capabilities of the platforms where appropriate. Codes and their meanings are:

- ATGM: The firer executes the engagement with the ATGM system. The unit will direct the specific ATGM type used for each target within the engagement during the tower prompt or digital message to the crew. This includes the ability to use two separate types of missiles during any multiple target engagement.
- MMG: mounted machine gun. This is the secondary armament for the firing weapon system. This can be either an M240, caliber .50, or MK19 grenade machine gun. This target is engaged by either the vehicle commander or gunner, as directed by the tower script, using the crew served machine gun.
- 2B: The missile used for engagement is the TOW-2B. Master Gunners must pay particular attention when developing the scenarios for Tasks 7, 8, and 9, as the targetry and fire commands must coincide with the authorized/required missile type.

- BB: The missile used for the engagement is the TOW-Bunker Buster (BB). Master Gunners must pay particular attention when developing the scenarios for Tasks 7, 8, and 9, as the targetry and fire commands must coincide with the authorized/required missile type.

4-131. Alteration to the ammunition type is not authorized.

# TASK DESCRIPTIONS

4-132. Each engagement corresponds to a specific task a crew must execute. The tasks are defined by the capabilities of the weapon platform, based on the vehicle type. The following paragraphs provide a general definition of those tasks and any considerations the Master Gunner or training developer must be aware of in order to correctly build a scenario that meets the training requirements.

## VEHICLE COMMANDER ENGAGEMENT

4-133. This engagement is specific for the VC. The gunner may not fire this engagement. Task 0 - VC Engagements, have some limitations based on the optical capabilities of the platform. When applying the RPMs to this engagement task, the Master Gunner should use caution when applying the long-range/short-range main gun and the short-range machine gun RPMs. The intent for those RPMs is for the default firer (gunner) to engage long- and short-range targets.

## MACHINE GUN PURE

4-134. Machine gun pure tasks will be conducted using machine guns that are coaxially aligned/mounted to the main gun only. The main gun will not be used during the engagement or any subsequent engagement directly related to this task. No main gun RPM can be applied to this task. The Master Gunner determines the range to target as appropriate and ensures it is 7.62mm-capable.

## ATGM PURE

4-135. ATGM refers to the missile system with similar simulated missiles for the engagement or task. This task may not include any change of ammunition/weapon functions. No machine gun RPM can be applied to this task. The Master Gunner determines the range to target as appropriate.

## CHANGE OF ATGM

4-136. The change of weapon system engagement is to train the primary firer to engage multiple targets while changing ATGM type using the platform's fire control system. The intent of this task is to ensure the crew can engage and defeat multiple and varying threats with two separate types of missiles. This requires the crew to perform the appropriate crew drill, conduct of fire, and crew responses to effectively and correctly engage threats with the missile specifically designed to defeat it. The Master Gunner determines the range to target as appropriate.

## DEGRADED

4-137. Degraded engagements require the scenario developer to determine the mode or type of degradation to the fire control system they desire to be trained. Degraded options for ATGM systems are limited to using the day optic during the day (the primary sight being thermal during day, night, and limited visibility). The VCE team must be able to confirm the mode of degradation during the engagement.

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Note. Commanders may not deviate from the options listed below for Table VI, Qualification, under any circumstances.

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| Platform | Degraded Action | Remarks |
|---|---|---|
| ITAS | Thermal mode failure | Firer must use day optic to acquire and engage targets. |
| Stryker ATGM | Thermal mode failure | Firer must use day optic to acquire and engage targets. |
| | Power traverse failure | Firer must use manual traverse controls to aim the armament in azimuth. |

**Table 4-24. ATGM degradation types by platform**

# ATGM REQUIRED PERFORMANCE MEASURES

4-138. The RPMs for the ATGM crew tables are provided below. These must be incorporated into the scenario development. The following apply to all ATGM systems. Bradley platforms will apply these RPMs to their TOW training requirements on Table III only.

| RPM | Frequency | Remarks |
|---|---|---|
| One defensive engagement | Day AND Night | |
| One offensive engagement | Day AND Night | |
| One short-range ATGM | Day OR Night | |
| One long-range ATGM | Day OR Night | |
| One CBRN engagement | Day AND Night | |
| Digital tasks | Day AND Night | Send and receive digital message, icon population, minimum. |
| Call-For-Fire | Day AND Night | Notional to FIST or FSO for evaluation. Units may elect illumination, HE, or smoke tasks. |
| Call-For-MEDEVAC / CASEVAC | Day AND Night | Units should incorporate medic support to evaluate the tasks on a training frequency (FM). |
| Call-For-CCA (Close Combat Attack) | Day AND Night | Units can conduct this task notionally via FM or digitally. |
| **Weapon System Requirements** | **Short Range** | **Long Range** |
| TOW | =< 800 m | => 2500 m |

**Table 4-25. ATGM required performance measures (RPMs)**

4-139. When developing the scenario for a particular table, each of the RPMs must be applied at least **once** to tasks listed for that table. Units may select multiple RPMs for a single task.

4-140. When developing the scenario for the unit's live fire, units must carefully apply the RPMs to the tasks. These define the overall engagement, and with the complete list of 10 engagements, develop the scenario for the table. When applying the RPMs to task(s), there are range, vehicle, and environmental conditions that must be considered during the development phase. These considerations are shown on the following figures specifically for the ATGM crew tables.

4-141. "Caution" indicates engagements that may be fired using the listed RPM; however, units should consider the impacts of the selection. For example, if a crew is firing a degraded engagement using an auxiliary sight, you MAY fire the task at night, but you must have a method of illumination. Tasks of this nature will not be fired on qualification tables.

4-142. NO-GO indicates RPMs that may not be applied to the task under any circumstance. Any engagement can be fired day or night. Any engagement can be fired in a chemical environment.

| Task Number-Description | | Offense | | Defense | | Short Range ATGM | Long Range ATGM |
|---|---|---|---|---|---|---|---|
| | | Day | Night | Day | Night | | |
| 0 | Vehicle Commander | | Caution | | Caution | Caution | Caution |
| 1 | Machine Gun Pure | | Caution | | Caution | NO-GO | NO-GO |
| 2 | Machine Gun Pure | | Caution | | Caution | NO-GO | NO-GO |
| 3 | ATGM Pure | | | | | | |
| 4 | ATGM Pure | | | | | | |
| 5 | Degraded | | NO-GO | | NO-GO | | |
| 6 | Degraded | | NO-GO | | NO-GO | | |
| 7 | Change of ATGM | | | | | | |
| 8 | Change of Weapon | | Caution | | Caution | | |
| 9 | Change of Weapon and ATGM | | Caution | | Caution | | |

**Table 4-26. ATGM RPM caution matrix**

4-143. The NO-GO and caution items listed on the ATGM RPM application to task figure are detailed below by task number. If units are firing multiple variants of main gun platforms using the same scenario, all cautions and NO-GO statements apply to all firing vehicles:

**TASK 0, VEHICLE COMMANDER:**

- Units should not use this task for the CBRN RPM if possible.

**TASK 1 AND 2, MACHINE GUN PURE:**

- Units may not fire ATGMs at any machine gun target. No ATGM long- or short-range RPM may be applied. If units choose to include a CBRN RPM to these tasks, they should consider increasing the requirement to include firing ATGMs in a chemical environment.

**TASKS 3 AND 4, ATGM PURE:**

- These tasks may only contain ATGM engagements using the same type of missile for each target presented within the engagement. There are no specific RPM restrictions for these tasks.

**TASK 5 AND 6, DEGRADED:**

- Units may only select degraded engagements for day firing.
- Units are cautioned when applying the Night Defense RPM to this task. Crews will not be able to acquire and effectively engage targets during limited visibility without excessive illumination support.

**TASK 7, CHANGE OF ATGM:**

- Units must ensure the targets presented are appropriate for the specific missile type identified for the engagement.

**TASK 8, CHANGE OF WEAPON:**

- Units must use caution when executing these tasks due to the complexity of firing a missile and changing to the secondary armament. Units should not execute these tasks at night if no thermal optic is available for their secondary armament systems without appropriate illumination capabilities to support all firers.

**TASK 9, MULTIPLE TARGETS:**

- This is the most complex task that requires crews to change between missile types with a transition to secondary armament within the same engagement. Units should use caution when using this task at night or in limited visibility. Certain engagements will require additional target engagements with the secondary armament. Units are cautioned to not place Task 9 during the night phase if the secondary armament does not have an accurate thermal capability.

### Tasks with Target Postures

4-144. Moving targets that are listed in tasks are a requirement for the table. All maneuver ranges provide sufficient moving target opportunities, both day and night, and for offensive and defensive engagements. Moving target requirements for their respective engagements cannot be downgraded to stationary unless critical system failures have occurred on the range. The only authorized alternate for moving targets is a frontal stationary target, if due to range constraints or target malfunction a moving target is not available. If the range cannot support the required moving targetry on the qualification ranges, the commander must annotate the training deficiency on his unit status report (USR).

4-145. Stationary targets may be upgraded to moving targets based upon the commander's assessment of the unit's proficiency. Units also may increase the level of difficulty of the moving targets by increasing the evasive nature of the target during the engagements.

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***Note.*** The number of targets per engagement cannot be changed. Ammunition resourcing and training on critical tasks are based on the target counts in each engagement. Units may not add to or reduce the target(s) presented during the engagements for any reason.

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## ATGM TABLES AMMUNITION ROLL-UP

4-146. The ammunition roll-up for the ATGM crew tables is provided below. Threat scenarios must match ammunition capabilities for each system. (The ammunition used must be capable of defeating the target presented.)

4-147. Planning factors used to develop scenario targets based on ammunition are:

- Machine guns require 50 rounds per target.
- ATGM missiles require 1.5 ATWESS per target.

| ATGM | | | | | |
|---|---|---|---|---|---|
| Table | Caliber .50 / 7.62mm | 40mm | BES | | TOW |
| | 4 : 1 Mix | | TGT HIT | HOST FIRE | ATWESS |
| | A557 | BA30 | LA53 | LA54 | (L367) |
| ZERO | 50 | 8 | | | |
| III[1] | | | 15 | 15 | 15 |
| IV | 320 | 56 | 15 | 15 | 15 |
| V | 320 | 56 | 15 | 15 | 15 |
| VI | 320 | 56 | 15 | 15 | 15 |
| Total | 1010 | 176 | 45 | 60 | 60 |

Note.
[1] The training rounds are not resourced for Table III. If ammunition is available and the crew has successfully dry-qualified this table, the commander may elect to execute this table utilizing full-caliber ammunition.

**Table 4-27. ATGM crew tables ammunition allocation**

4-148. Units are resourced one BES cartridge per target on Tables III through VI as indicated above. BES pyrotechnics to support retraining or re-fires are resourced internally by the training unit. Units are responsible to forecast the BES cartridges using TAMIS, coordinate pick-up, and provide them to the appropriate range support personnel prior to training.

## SECTION VI - SYNCHRONIZING THE SCENARIO

4-149. For units to complete the scenario for submission to range operations at their installation, they first must synchronize the events on each training table. This includes considering the amount of time required to fire the day and night scenario for one vehicle. This has a direct impact on the unit's daily range throughput, available retraining time, and potential requests for additional firing hours (particularly for the night phase).

# SCENARIO SEQUENCE

4-150. Once the engagements are drafted, they must be put into a firing sequence or step order for execution on the range. This can be done in a variety of ways, but general rules are to—

- Start with a defensive, long-range engagement to maximize the range complex's capabilities.
- Allow two defensive engagements to be fired in a row. This can save valuable range time.
- Do not fire all defensive engagements first, followed by offensive engagements. This will cause mission command problems for the tower. Minimize back-to-back offensive engagements when running multiple lanes.
- Base the number of day and night engagements on the available daylight and firing hours. The engagements and table structure provides for a mixture from eight day/two night engagements through variations of two day/eight night engagements. This facilitates throughput for units that fire on extreme northern ranges or have significant range restrictions.
- Retrograde engagements, if used, should be conducted from the farthest point down range in the scenario to allow range throughput to be maintained. This type of engagement is considered offensive and will be graded as such. The use of this type of engagement signifies that the gunner will engage targets in the impact area while firing over the rear of the vehicle platform as it moves back toward the baseline. The use of this type of engagement presents unique challenges regarding target acquisition, target engagement techniques, and mission command.

4-151. The figures below show standard calculations for main gun / ATGM platform throughput during live training events. These calculations include the platform conducting test fire, the scenarios for the day/night phase, and clearing vehicle off the range (RSO). The typical scenario consists of 14 vehicles executing six day and four night engagements (6:4 mix) for range throughput considerations at the Army level:

| | | Main Gun Total Firing Time Required (hours) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Night | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 8 | 2 | 16.50 | 17.75 | 19.00 | 20.20 | 21.50 | 22.75 | 24.00 | 25.25 | 26.50 | 27.75 | 29.00 |
| 7 | 3 | 17.75 | 19.25 | 20.50 | 22.00 | 23.25 | 24.75 | 26.00 | 27.50 | 28.75 | 30.25 | 31.50 |
| 6 | 4 | 16.50 | 17.75 | 19.00 | 20.25 | 21.50 | 22.75 | 24.00 | 25.25 | 26.50 | 27.75 | 29.00 |
| 5 | 5 | 17.75 | 19.25 | 20.50 | 22.00 | 23.25 | 24.75 | 26.00 | 27.50 | 28.75 | 30.25 | 31.50 |
| 4 | 6 | 19.00 | 20.50 | 22.00 | 23.50 | 25.00 | 26.50 | 28.00 | 29.50 | 31.00 | 32.50 | 34.00 |

**Table 4-28. Main gun/ATGM throughput including test fire and clearing vehicle off the range**

***Note***. Overall time requirements are based on a single firing lane and include four hours of range maintenance down time (two blocks of two hours each). This is standard at most facilities. These calculations are for planning purposes only. Units that are more proficient in tower operations may have an increased throughput.

- MMG throughput by engagement, including weapon test fire and clearing the vehicle off the range (RSO). The typical scenario consists of 20 each MMG vehicles executing six day and four night engagements (6:4 mix) for range throughput considerations at the Army level:

| Mounted Machine Gun Total Firing Time Required (hours) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Night | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 8 | 2 | 14.00 | 15.25 | 16.25 | 17.25 | 18.25 | 19.00 | 20.25 | 21.25 | 22.25 | 23.25 | 24.00 |
| 7 | 3 | 14.00 | 15.25 | 16.25 | 17.25 | 18.25 | 19.00 | 20.25 | 21.25 | 22.25 | 23.25 | 24.00 |
| 6 | 4 | 14.00 | 15.25 | 16.25 | 17.25 | 18.25 | 19.00 | 20.25 | 21.25 | 22.25 | 23.25 | 24.00 |
| 5 | 5 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 |
| 4 | 6 | 14.00 | 15.25 | 16.25 | 17.25 | 18.25 | 19.00 | 20.25 | 21.25 | 22.25 | 23.25 | 24.00 |

**Table 4-29. Mounted machine gun throughput including test fire and clearing vehicle off the range**

***Note.*** Overall time requirements are based on a single firing lane and include four hours of range maintenance down time (two blocks of two hours each). This is standard at most facilities. These calculations are for planning purposes only. Units that are more proficient in tower operations may have an increased throughput.

- Day runs should be fired first, followed by the night run. This is not required, but is standard practice. Units can start any or all crews with the night phase, but should limit the practice to ensure the crew has demonstrated live fire proficiency and weapon's safety practices during the day phase.
- If a crew is partially finished during the day run, verify what engagements have been completed. If one defense, one offense and one CBRN engagement have been executed during the day phase, the unit can push the remaining engagement(s) to the night phase and complete the table. This also applies to units that begin the firing phase initially at night.

4-152. Each installation may have specific requirements for scenario development. Check the local range SOP before beginning the planning process. When planning the scenarios for a qualification range, it is recommended that two scenarios per lane are developed with sufficient alternate targets. When developing scenarios for multiple lanes, units must keep the targets for like engagements within the same range band (+/- 200 meters) of the other scenario(s). Units are to use the greater range to target from like engagement scenarios on the same range as the one scoring from for all crews.

## SCENARIO DIFFICULTY

4-153. The Master Gunner is responsible for ensuring the difficulty of the scenarios are balanced to support well-rounded training for new, turbulent, and experienced crews. After reviewing the previous live fire training records, the Master Gunner's scenarios should follow the guidelines below:

- 10-percent of the crews should achieve 90 points or better on each engagement.
- 20-percent of the crews should achieve 80 points or better on each engagement.
- 70-percent of the crews should be able to successfully complete each engagement.

4-154. In any scenario, there are certain engagements that receive higher scores than others. For example, the VC engagements typically score higher on average than other engagements. This is not indicative that the engagement is too simple, but rather, the VC has more experience and is typically firing at a single target. This is completely acceptable. Master Gunners should consider challenging the crews during training.

4-155. The difficultly of any engagement can be increased using basic principles of gunnery.

- Smaller targets are more difficult to hit. Consider using BRDM frontals instead of technical truck frontals, for example. On Tables III, IV, and V, units should consider using ¾-scale targetry.

- Increased range to target. Although the scoring model provides sufficient time to engage targets at extended range, a more precise lay of the weapon requires additional time, and ultimately increases the difficulty to the crew.
- Reduce the range on both targets on the initial presentation. Reduced ranges equate to more lethal threats. The threat-based evaluation system requires rapid detection, identification, and defeat of short-range targets.
- Use more offensive engagements. If the range permits, increase the number of offensive engagements in the scenario.
- Increase stationary (STA) targets to a moving (MOV) posture. Moving targets increase the skill and marksmanship required to defeat the threat rapidly.
- Increase the type of degradation to the fire control system, if applicable.
- Increase the lateral dispersion of targets in the array. Do not exceed the maximum lateral dispersion; however, provide target arrays that are on the extreme edges of the lateral dispersion.
- Use evasive moving targets or increase the speed of the moving targets. Provide moving targets that change speed and direction during the engagement.
- Increase the use of CBRN conditions during the scenarios. Firing in overpressure with protective mask reduces the crew's dexterity and increases the difficulty level. Provide a CBRN engagement on the offense, day and night.

4-156. Master Gunners should review the possible interactions of the targetry, the RPMs, target type, and range to target considerations. Master Gunners must ensure they do not create an "impossible" engagement for their crews to execute. Those "impossible" engagements negatively impact the crew's confidence, the commander's training plan, the overall proficiency of the unit, and waste training ammunition and time.

4-157. Units should refrain from using "off-the-shelf" scenarios from another unit. More often than not, the scenario was changed during firing through lessons learned. Ultimately, the unit using the off-the-shelf scenario will learn the same lessons as the first unit, wasting time and resources.

4-158. The Master Gunner should war-game the scenarios he develops prior to submitting to range operations. Consider all the ramifications of the crews executing each task, how long they should take to execute, and movement of other vehicles on the range to prepare for the next engagement. When using multiple firing lanes, consider the downrange movement of both vehicle and the sequence they will be using (steps) to complete the training table.

## TOW/ATGM TASKS

4-159. Vehicles equipped with a missile system will conduct missile engagements during the crew tables. ATGM equipped vehicles will execute a minimum of one day and one night engagement on Table III. These tasks will be executed with laser-based TADSS and will be in addition to the engagements for the platform.

4-160. Bradley-equipped units should consider firing the entire ATGM Table III in addition to their Main Gun Table III to enhance their TOW engagement skills without negatively impacting their training timeline.

4-161. In the event that TADSS are unavailable, these tasks must be executed in dry-fire mode. Units should include additional missile specific tasks as necessary. These may include load, unload, perform misfire procedures, and similar procedures, as the commander requires.

4-162. The TADSS-based nature of these tasks allows the platform to complete them in a dry-training status while awaiting movement to the live fire start position. They may be conducted before or after live fire events are complete, and are not intended to negatively impact the live fire range throughput.

4-163. These tasks are evaluated by the platoon sergeant or designated NCO (beach master, for example). The status of the evaluation is reported to the Master Gunner and range NCOIC upon completion of the task(s). The results are captured on the respective crew's common roll-up.

## DIGITAL COMMUNICATIONS, TASKS 171-170-0001 AND 171-170-0008

4-164. Digitally equipped units conducting Tables III through VI have specific tasks to execute during their live fire training events. Commanders may add to the requirements, but not take away. The minimum requirements include the following:

- Firing vehicle must populate icons once during the day and once during the night.
- Firing vehicle must send and receive one digital message on each table, day and night.

4-165. Units should consider using one vehicle or tactical operations center as the primary means of controlling the digital traffic. The vehicles do not need to perform the function during the engagements, but rather can execute these tasks while waiting to move to a firing lane (in the ready line).

4-166. Units can use their communications team to support the digital tasks while providing support to the live fire ranges. This enables the communication team to conduct jump frequency checks, necessary troubleshooting, and required tasks prior to vehicles negotiating the live fire training. This allows the unit to maximize its range time.

## CALL-FOR REQUIREMENTS

4-167. For Tables III through VI, vehicle crews must exercise their ability to call for fire, call for close air attack, execute target hand-off, and request MEDEVAC or CASEVAC, day and night. These tasks are executed on their vehicle and are conducted notionally as to not disrupt the flow or conduct of the range.

4-168. Units can use their tactical operations center on a separate frequency from the admin, firing, or jump frequencies to conduct the call for tasks. These tasks are not required to be completed during the live fire execution, but are completed prior to or post execution of the crew's day or night live fire.

4-169. Training can be centralized at the ready line or in the motor pool of the range facility. A concurrent training NCO can facilitate the call-for tasks, providing the necessary information to the VC. Once provided, the VC places the information into the proper format and executes the task. These tasks do not require the use of FM radios; however, units should provide a training frequency to increase the training realism with the appropriate replies. Units should use their supporting FIST for evaluation of all fire missions.

### Call-For-Fire, Task 061-C01-1081

4-170. The Call-For-Fire task includes the VC executing a notional fire mission where:

- One call for fire mission is executed day and night on Tables III, IV, V, and VI.
- The grid or expected impact must be within 150 meters of the target area. Units can increase the level of difficulty of the call for task by requiring different mission types, fire patterns, or other elements based on the FIST team's assessment.
- Units should include engagements for high explosive, illumination, and smoke missions.

### Call For MEDEVAC / CASEVAC, Task 081-COM-0101

4-171. The Call-For-MEDEVAC/CASEVAC task includes, at a minimum, the VC executing a notional casualty evacuation using the Army-standard 9-Line MEDEVAC request format where:

- One MEDEVAC/CASEVAC is executed day and night on Table III, IV, V, and VI.
- The format must be completed correctly using the 9-Line request format for training.
- Units should create separate scenarios for the vehicle commander to derive the 9-Line format information from.
- Vehicle commander successfully and accurately completes the notional exercise within two minutes.

### Call For Close Combat Attack (CCA)

4-172. The Call-For-Close Combat Attack (CCA)/Target-Hand-Off task includes the VC executing a notional engagement or target hand off using the Army-standard Format 22, (FM 3-09.32, *JFIRE, Multi-Service Tactics, Techniques, and Procedures for the Joint Application of Firepower*), 5-Line CCA request format where:

- One CCA request is executed day and night on Tables III, IV, V, and VI.
- The format must be completed correctly using the 5-Line request format for training.
- Units should create separate scenarios for the vehicle commander to derive the 5-Line format information.
- Vehicle commander successfully and accurately completes the notional exercise within two minutes, including Format 22, CCA 5-Line Attack Brief.
- Commanders may elect to have vehicle commanders execute a target-hand-off to a supporting UAS that may or may not be notionally presented. Units should coordinate for UAS operators to support collaborative training during the crew tables. UAS operators for Shadow systems are authorized training flight time to support all fundamental table requirements. If units coordinate for UAS support for live events, the unit is not required to execute the task on the same live fire facility and can use an adjacent training area. This minimizes the negative impacts to live fire range throughput.

## CREATING THE SCENARIO SCRIPT

4-173. For each scenario, the tower must prompt the firing crew to prepare for the pending engagement. These prompts are specific to the engagement and must explain the scenario in sufficient detail to ensure the crew is prepared to meet the task and conditions.

4-174. All scripts must support the units TACSOP, including naming conventions for graphic control measures, methods of execution or friendly force identification. Units should use the tower script as a training opportunity to reinforce and validation their TACSOP information, and build a combat-relevant scenario for their crews.

4-175. All commands to the firing vehicle come from the tower, or digitally from the unit S-6 when directed by the tower. The tower must maintain 100-percent accountability of firing crews forward of the base line, their movements, and weapon orientation at all times. The tower must only use administrative commands when maintaining safety requires. The following is an example of the scenario four-step process.

**Step 1** – Position the vehicle appropriately on the range based on the firing vehicle posture for the engagement.

---

**Tower**: MOVE TO AND OCCUPY A HASTY POSITION ALONG ROUTE MOBILE, VICINITY CHECK POINT FIVE-SEVEN. REPORT WHEN SET.

**VC**: BLACK SIX, THIS IS BLUE ONE, SET, CHECK POINT FIVE-SEVEN.

---

**Step 2** – Prepare the crew for specific conditions of the task such as VC engagement, CBRN conditions or degraded engagements.

---

**Tower**: NBC-1 REPORT PENDING, ALPHA AND BRAVO WILL BE OPERATING IN DOWN-WIND HAZARD AREAS. PREPARE FOR POTENTIAL CHEMICAL OPERATIONS, INCREASE TO MOPP THREE. REPORT WHEN SET.

**VC**: BLACK SIX, THIS IS BLUE ONE, REDCON ONE.

---

**Step 3** – Identify general target description and location information.

---

**Tower**: BRAVO REPORTS INSURGENT FORCE MOVING INTO SECTOR VICINITY TRP THREE. TECHNICAL TRUCK TRANSPORTING DISMOUNTS POSSIBLE...

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**Step 4** – Initiate the engagement.

**Tower**: BOUND ALONG ROUTE MOBILE TO CHECK POINT SIX-THREE. WEAPONS FREE, RED DIRECT. ENGAGE AND DESTROY UPON CONTACT, OVER.

**VC**: BLACK SIX, BLUE ONE, ROGER, WEAPONS FREE, RED DIRECT, OUT.

4-176. In the example above, all the necessary information to relay to the crew was provided notionally from the tower. The tower serves as the higher headquarters to the firing vehicle. All scripting should be tactically based and not administrative unless absolutely necessary.

4-177. For digital tasks, the unit S-6 should develop free text messages that support the engagements. The S-6 sends the prepared text message when directed by the tower. Firing vehicles must confirm receipt of the message prior to executing. The S-6 notifies the tower once confirmation is received in order for the tower to maintain positive control of the firing vehicle and appropriate target activation.

## SECTION VII – PROOFING THE SCENARIO

4-178. After the on-paper scenario is approved by the commander and installation range support, it must be proofed on the facility using the vehicle(s) for which the scenario is approved. It is imperative this is conducted well before the unit arrives on the range for training. Proofing early provides the unit time and flexibility to make any adjustments to the scenario.

4-179. The proofing of the scenario, including primary and alternate targetry, is critical for the successful execution of the unit's training event by preventing lost training time due to scenario adjustment. The unit must verify the following elements of the scenario:

- Defensive firing position line of sight to all targets.
- Offensive maneuver box line of sight to all targets presented.
- Time to move from one firing position to the next.
- Obstructions to the firing crew that would impede target acquisition, detection, or engagement.
- Army standard targetry, including thermalization, is provided for all engagements according to the specifications listed in TC 25-8, *Training Ranges*.
- Sufficient maneuver space is provided for engaging all targets within the scenario at the fastest maneuver speed for the entire engagement.
- Crews can clearly see the appropriate range markers (commonly called range fans) at all firing locations, offense and defense.
- Unit times the sequence of events for both day and night scenarios. Night scenarios should be proofed during limited visibility.
- Unit must check the ready line area and ensure space is available for concurrent training, required Call-For tasks, communication checks or other training opportunities.

4-180. All conditions must be the same as if actually firing, using the same type weapon platform(s) that will be firing. If firing a dual-lane scenario, proof both lanes at the same time. Each target should be checked for validity by making sure it can be viewed through the firing vehicle optics throughout the entire presentation time.

4-181. The range to the targets and the target presentation times should be verified. For offensive engagements, the proofing vehicle should maneuver through the entire maneuver box to ensure that targets are not masked for any part of their presentation time.

4-182. On computer-controlled ranges, Master Gunners will proof scenarios and adjust target lift times as necessary to ensure that multiple targets are programmed to lift simultaneously. Adjustments also may be necessary for delayed targets to ensure they are presented with the proper lift time and have the appropriate target exposure time.

4-183. Proofing should be accomplished by making sure targets can be viewed through the auxiliary sites throughout the entire exposure time. Using only the primary sight to proof can lead to dead space within the gun-target line. The Master Gunner must ensure 90-percent target visibility is maintained for all targets presented. This includes 90-percent of the target visible through 90-percent of the offensive movement of the firing vehicle.

4-184. A method to ensure visibility meets the Army standard, the Master Gunner can mark each target with engineer tape at the 90-percent line. Using the lowest optic available on the platform and view the target through the entire presentation. When verifying MMG targets, the Master Gunner should use the thermal sight to ensure the thermalization correct for both day and night engagements.

4-185. The following images show the target through various auxiliary sights. Notice the 90-percent line is identified with engineer tape appropriately placed on the target. When viewing the target, the engineer tape should be barely visible to the firing platform. This indicates the target is presented at least to the 90-percent standard.

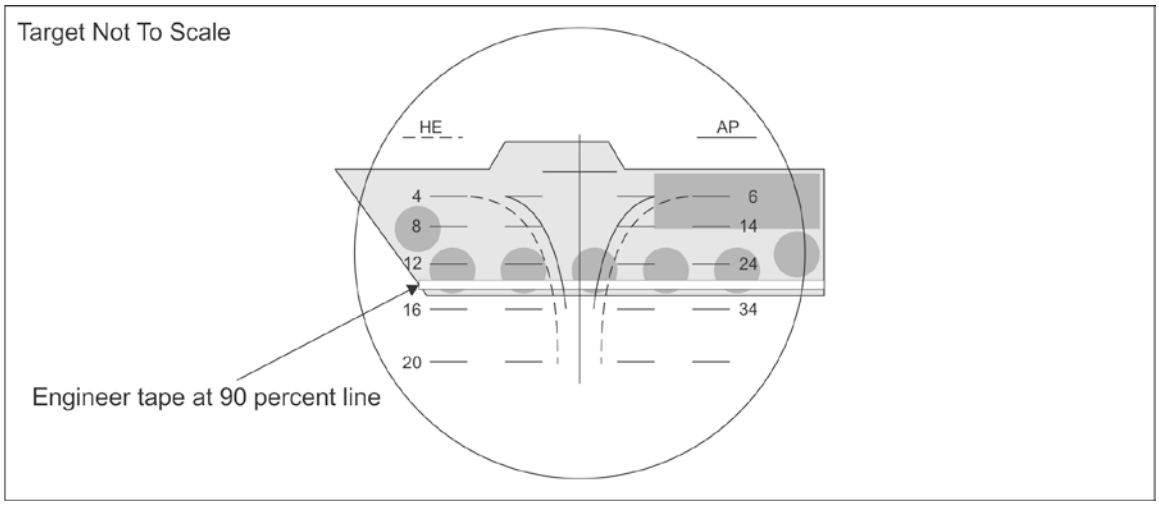


**Figure 4-9. Target visibility proofing example, Bradley auxiliary sight vs. BMD**

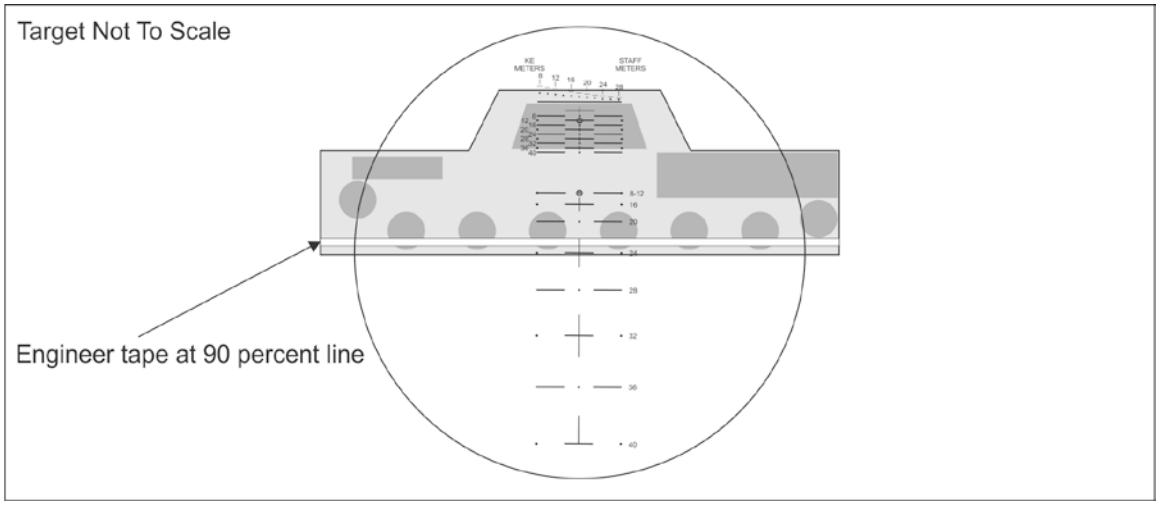


**Figure 4-10. Target visibility proofing example, Abrams auxiliary vs. tank flank**

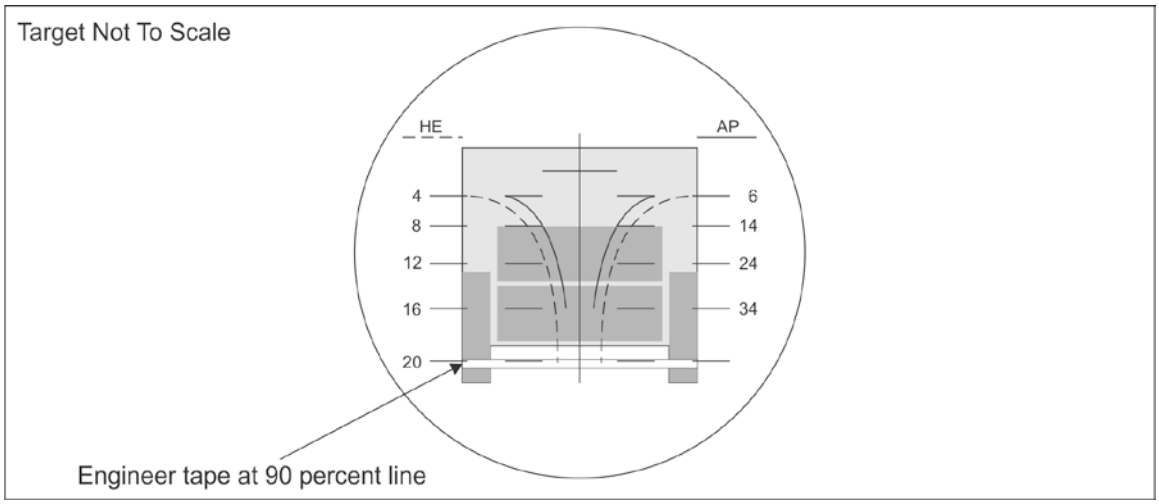


**Figure 4-11. Target visibility proofing example, Bradley auxiliary sight vs. truck frontal**

# Chapter 5
# Crew Tables

This chapter covers crew prerequisites and live fire training through qualification for all combat arms direct fire platforms. This chapter culminates with the qualification requirements for the maneuver force's platforms. It defines the training and qualification standards, crew ratings, and details all additional training requirements, including digital tasks, Call-For tasks, and TOW/ATGM missile certification tasks. Once successfully completed, crews are qualified to progress to the collective live training events in gates 2 and 1, respectively.

This chapter provides an overview of the qualification standards for reporting purposes. This provides a snapshot to commanders of the Army's requirement to achieve and sustain a level of crew proficiency across a battalion-size element. It includes commander options for managing crews between gunnery densities and provides suggestions on how to maximize the qualification ratings within the unit when crew turbulence occurs.

This chapter only applies to combat arms crews assigned in Armor, Infantry, and Stryker Brigade Combat Teams, as well as military police. It is not intended for use by sustainment elements in any formation. Sustainment units will follow the training guidelines found in TC 4-11.46, *Convoy Protection Platform Gunnery*.

## SECTION I – PREREQUISITE CREW TABLES

5-1. The following section discusses the specific prerequisites for the crew tables. It includes the action, conditions, and standards crews are required to achieve prior to executing any live fire event, including zeroing or screening procedures.

5-2. The live fire prerequisites are specific to Tables I, II, and III. They can be completed in any order, and typically are completed prior to the live fire density. Table III may be conducted during the gunnery density, provided is it successfully completed prior to any live fire event, including zero, screening, sub-caliber, or in-bore training.

5-3. Each prerequisite must be completed between T-6 and T-week prior to any zero, screening, sub-caliber, or other live fire event.

## TABLE I – GUNNERY SKILLS TEST

5-4. Table I, Gunnery Skills Test consist of those tasks that are critical to the safety of the crew and essential to the operation of the combat platform assigned. Table I is designed to test the crew's ability as a whole to accomplish these vital tasks in a timely manner. All tasks should be conducted in garrison, prior to the weapons training density. The GST is a live fire prerequisite that must be completed prior to executing any live fire event, including zeroing procedures or Table IV, Basic. See TC 3-20.31-10, *Gunnery Skills Test*, for specific testing and evaluation information.

5-5. Crews must successfully complete Table I, Gunnery Skills Test within the training window T-6 though T-week for both AC and RC. Refer to Chapter 2, Unit Training Program, for more information on the training timelines for all live fire prerequisites.

| Table I, Gunnery Skills Test | |
|---|---|
| **Action:** | Demonstrate proficiency on weapon or platform specific gunnery-related skills. |
| **Conditions:** | Given the following:<br>• Fully mission capable equipment, weapon(s), optic(s), and vehicles for the position assigned.<br>• A certified evaluator.<br>• Test and evaluation criteria as established by TC 3-20.31-10, Gunnery Skills Test. |
| **Standard:** | The crew must successfully pass GST using the evaluation standards between T-6 and T-week. |

**Table 5-1. Table I, Gunnery Skills Test**

# TABLE II – SIMULATIONS

5-6. Table II, Simulations, is designed to evaluate the crew's ability to engage stationary and moving targets from a stationary and moving vehicle, during day and limited visibility in a simulated environment. Table II is a live fire prerequisite that must be completed prior to any event using live ammunition (zeroing, for example).

5-7. Units must use the approved primary or alternate simulations to execute Table II for record between T-6 and T-week. Units must maintain the training records for all crews and have them available during live fire training events.

| Table II, Simulations | |
|---|---|
| **Action:** | Engage and destroy stationary and moving targets from a stationary or moving vehicle in a simulated environment. |
| **Conditions:** | Given the following:<br>• A fully operational simulator.<br>• A certified Vehicle Crew Evaluator.<br>• A prescribed Gate To Live Fire exercise which includes an accurate replication of Table VI Qualification, meeting all required performance measures listed in TC 3-20.31. |
| **Standard:** | The crew must successfully pass the Gate To Live Fire exercise using the evaluation standards between T-6 and T-week. Refer to the evaluation standards of TC 3-20.31. |

**Table 5-2. Table II, Simulations**

# TABLE III – PROFICIENCY

5-8. Table III, Proficiency, is a single vehicle course that is designed to evaluate the crew's ability to engage stationary and moving targets placed in a tactical array from a stationary and moving vehicle, during both day and limited visibility conditions. This course must be qualified device-based prior to using any full-caliber ammunition.

5-9. For platforms that do not have any laser-based TADSS for direct fire training, units may conduct this course with blank ammunition or dry as appropriate. Failure to coordinate for TADSS does not constitute justification for executing with blank ammunition or dry.

5-10. Bradley Fighting Vehicles ***must*** complete the Main Gun Table III at a minimum. Additionally, units should complete ATGM Table III to the standards shown below to support their TOW training plan. The ATGM crew Table III augments the TOW qualification requirements for simulations.

| Table III, Proficiency | |
|---|---|
| **Action:** | Engage and destroy stationary and moving targets placed in a tactical array, during day and limited visibility from a stationary or moving vehicle and requires the use of laser-based TADSS for all crews. |
| **Conditions:** | Given the following:<br>• A fully operational platform with weapon or weapon system.<br>• Appropriate laser-based training devices.<br>• Authorized blank ammunition and pyrotechnics.<br>• A certified Vehicle Crew Evaluator.<br>• Full-scale or scaled targets to meet the scenario requirements. |
| **Standard:** | The crew must:<br>• Score a minimum of 700 of 1000 points overall.<br>• Score 70 points or more on all targets presented on seven (7) out of ten (10) engagements.<br>• Qualify at least one night engagement.<br>• Successfully pass using the evaluation standards between T-6 and T-week. |

**Table 5-3. Table III, Proficiency**

## SECTION II – LIVE FIRE CREW TABLES

5-11. This section provides the action, conditions, and standards for the live fire set of crew tables. It provides the general requirements for successful completion of each table, as well as the qualification standards required to progress to live fire collective training for the assigned platform.

5-12. Units must ensure all firing crews have successfully completed the live fire prerequisites requirements detailed in the previous section. Units are not authorized to waive the prerequisite requirements.

# TABLE IV – BASIC

5-13. Table IV, Basic, is conducted with full-caliber live ammunition for authorized platforms. Units that are not authorized full-caliber ammunition may conduct this table with TADSS or live ammunition, if resources are available.

5-14. Table IV is designed for all main gun/ATGM crews, the ASV and AAV to evaluate the crew's ability to engage stationary and moving targets placed in a tactical array from an offensive or defensive posture, during day and limited visibility conditions, using the all available weapon systems and different components of the fire control system (normal and degraded modes).

5-15. This is a "multiple-qualification criteria" table. Crews must score more than 700 points overall, with a minimum of 70 points per target, during 7 of 10 engagements, and the crew must qualify at least one engagement during limited visibility to qualify.

| Table IV, Basic | |
|---|---|
| **Action:** | Engage and destroy stationary and moving targets placed in a tactical array, during day and limited visibility from a stationary or moving vehicle by using full-caliber ammunition. |
| **Conditions:** | Given the following:<br>• A fully operational platform with weapon or weapon system.<br>• Appropriate Caliber .50 and 40mm ammunition (ASV / AAV).<br>• Appropriate laser-based training devices, if required<br>• Authorized blank ammunition and pyrotechnics.<br>• A certified Vehicle Crew Evaluator.<br>• Full-scale or scaled targets to meet the scenario requirements. |
| **Standard:** | The crew must:<br>• Score a minimum of 700 of 1000 points overall.<br>• Score 70 points or more on all targets presented on seven (7) out of ten (10) engagements.<br>• Qualify at least one night engagement. |

**Table 5-4. Table IV, Basic**

# TABLE V – PRACTICE

5-16. Table V, Practice, is a single vehicle practice table used in preparation for the qualification course. The Practice course is designed to challenge crews by using demanding tasks, using full or scaled targets (¾). Table V is designed to train the crew to engage moving and stationary targets placed in a tactical array using all vehicle weapon systems while in the offensive or defensive postures. It requires the crew to call on the knowledge gained throughout all previous tables.

5-17. Table V will prepare the crew for Table VI, Qualification, by presenting them with tasks that require the crew to use all the aspects of their fire control system against a variety of target arrays.

5-18. This is a "multiple qualification criteria" table. Crews must score at least 70 points per target in accordance with kill standards in Chapter 6 on single and multiple target engagements to qualify the engagement. Crews also must score more than 700 points overall with a minimum of 70 points per target during 7 of 10 engagements on the practice table to be qualified.

| Table V, Practice | |
|---|---|
| **Action:** | Engage and destroy stationary and moving targets placed in a tactical array, during day and limited visibility from a stationary or moving vehicle by using full-caliber ammunition. |
| **Conditions:** | Given the following:<br>• A fully operational platform with weapon or weapon system.<br>• Allotted ammunition.<br>• A certified Vehicle Crew Evaluator.<br>• Full-scale or scaled targets to meet the scenario requirements. |
| **Standard:** | The crew must:<br>• Score a minimum of 700 of 1000 points overall.<br>• Score 70 points or more on all targets presented on seven (7) out of ten (10) engagements.<br>• Qualify at least one night engagement. |

**Table 5-5. Table V, Practice**

# TABLE VI – QUALIFICATION

5-19. Table VI, Qualification, is a single platform qualification table. Table VI is designed to evaluate the crew on engaging moving and stationary targets placed in a tactical array using all vehicle weapon systems while in the offensive or defensive postures.

***Note.*** Table VI must be fired using full-caliber ammunition against full-scale targetry.

5-20. This is a "multiple qualification criteria" table. Crews must score at least 70 points per target in accordance with kill standards in Chapter 6 on single and multiple target engagements to qualify the engagement. Crews must also score more than 700 points overall with a minimum of 70 points per target during 7 of 10 engagements on the qualification table to be used. Crews also must qualify at least one engagement during limited visibility to be considered qualified.

| Table VI, Qualification | |
|---|---|
| **Action:** | Engage and destroy stationary and moving targets placed in a tactical array, during day and limited visibility from a stationary or moving vehicle by using full-caliber ammunition. |
| **Conditions:** | Given the following:<br>• A fully operational platform with weapon or weapon system.<br>• Allotted ammunition.<br>• A certified Vehicle Crew Evaluator.<br>• Full-scale targets to meet the scenario requirements. |
| **Standard:** | The crew must:<br>• Score a minimum of 700 of 1000 points overall.<br>• Score 70 points or more on all targets presented on seven (7) out of ten (10) engagements.<br>• Qualify at least one night engagement. |

**Table 5-6. Table VI, Qualification**

***Note.*** If any individual target score on an engagement is less than 70 points, the engagement is UNQUALIFIED, regardless of overall engagement score.

**PREREQUISITE FOR PROGRESSION TO THE NEXT GATE**

**Successful completion of Table VI, Qualification, within the crew's qualification period (AC or RC) is required prior to conducting any collective live fire training event in gates 2 or 1.**

## SECTION III – QUALIFICATION STANDARDS

5-21. The crew tables culminate in the evaluation of the crew's ability to destroy threat targets using full-caliber ammunition both day and night. Qualification on Table VI is a prerequisite for crews to advance to collective live fire training.

5-22. Table VI falls under the multiple-qualification criteria to be qualified:

- Crews must qualify 7 of 10 engagements by qualifying all targets by scoring a minimum of 70 points on each target.
- Score a minimum of 700 points combined total for all ten engagements.
- Crews must qualify at least one engagement during the day phase and one during the night phase.

# CREW RATINGS

5-23. Crews are evaluated on their level of competence on their platform using the standard evaluation procedures as described in Chapter 6. The end state for each crew after completing Table VI is a crew that is confident and competent to a standard that best prepares them for combat.

5-24. The crew rating is an overall snapshot of the performance on the crew qualification table that provides commanders an overview of the crew's performance and competence employing their platform. It also is an indicator of unit readiness and training deficiencies for future training events.

5-25. The qualification course crew ratings are based on a multiple-qualification criteria system. This system requires crews to qualify a minimum number of engagements and have a minimum number of overall points to be considered qualified. Failure to meet the qualified standard requires crews to refire engagements, or in severe cases, be replaced as appropriate.

5-26. Crews will receive an overall qualification rating for Table VI, Crew Qualification, based on the multiple-qualification criteria as outlined below.

| | |
|---|---|
| **Distinguished** | Crew scored at least 70 points per target on at least nine of 10 engagements and at least 900 total points of a possible 1000. |
| **Superior** | Crew scored at least 70 points per target on at least eight of 10 engagements and at least 800 total points of a possible 1000. |
| **Qualified** | Crew scored at least 70 points per target on at least seven of 10 engagements and at least 700 total points of a possible 1000 points. |
| **Unqualified** | Crew failed to achieve 70 points or more per target on four or more engagements or less than 700 total points of a possible 1000 points. |

**Table 5-7. Crew ratings**

# QUALIFICATION REFIRES

5-27. If a crew fails to qualify, it refires for qualification. The highest rating that a crew can earn when refiring is Qualified.

- A crew re-fires only the engagements that they failed to achieve the minimum standard on. Units should initially focus on those non-qualified engagements that provide the most points to gain.
- A crew re-fires only the number of engagements required to obtain a qualified rating.

5-28. The integrated weapons training strategy (IWTS) must support all unit readiness status reporting requirements in accordance with Army Regulation 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies*, AR 350-1, *Army Training and Leader Development*, and AR 350-10, *Management of Army Individual Training Requirements and Resources*.

5-29. The qualification standards are driven by the IWTS, are reported IAW AR 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies*, and tied directly to the individual and collective training proficiency goals of the force generation model. The training status for a reporting unit is detailed as a specific aim point within the force generation cycle, and has direct training implications within the IWTS.

5-30. **Crew Qualification**. These standards are applicable to main gun/ATGM (Abrams, Bradley, Stryker MGS, and Stryker ATGM) and MMG (Scout, Armored Security Vehicles (ASV), Stryker ICV, Stryker RV, and RWS-equipped vehicles) platforms in ABCT, SBCT, and IBCT formations. This does not include non-combat arms MOS personnel.

| Crew Qualification | | TC 3-20.31, Training and Qualification, Crew |
|---|---|---|
| **Qualification Period:** | | **(AC) 9 months / (RC) Training Year (TY)** |
| **Prerequisites:** | Table I, Gunnery Skills Test | Each crew member has successfully completed Table I, between T-6 and T-week to the qualification training event. |
| | Table II, Simulations | Crew has successfully completed Table II, between T-6 and T-week to the qualification training event. |
| | Table III, Proficiency | Crew has successfully completed Table III with authorized TADSS between T-6 and T-week to the qualification training event. |
| **Live Training:** | Table IV, Basic | Crew has trained on basic skills of the platform within the previous qualification period. If the crew is not resourced training ammunition for Table IV, the unit has the option to conduct the training with authorized TADSS for additional training. |
| | Table V, Practice | Crew has trained on the practice course in preparation for the qualification event within the previous qualification period. |
| **Standard:** | Table VI, Qualification | The crew has successfully completed Table VI, Qualification, for the assigned platform within the last qualification period. |
| **Gate Requirement:** | Crews must successfully complete Table VI prior to executing any live fire event in Gates 2 or 1. | A qualified crew is a Vehicle Commander and gunner combination that successfully completes Table VI as outlined in TC 3-20.31.<br>Authorized commanders may deviate from this requirement when live and tactical proficiency is adequately displayed. See Crew Management below. |
| **Reporting:** | 85% | Battalion size elements are rated "**Trained**" or "**T**" by maintaining and sustaining 85% qualification on all assigned Main Gun / ATGM crews (regardless of vehicle type) and 85% of all Mounted Machine Gun crews (regardless of type) as defined in the standard above. |

**Table 5-8. Crew qualification standards**

## SECTION IV – CREW MANAGEMENT

5-31. Units experience crew turbulence periodically between gunnery densities. Typically, crew turbulence is caused by a key leader within the crew (VC or gunner) being promoted, transferred, retirement, permanent change of station (PCS), or end-term of service (ETS) by one or more of the leaders.

5-32. Commanders must review their crew rosters periodically, particularly prior to the gunnery density, in order to best manage their qualification statistics. Managing crews to maintain and sustain crew qualification proficiency levels required by the Army are a continuing challenge.

5-33. The key positions in a crew are specific to the platform. The key positions for all vehicles are the VC and gunner. For platforms where the VC is the gunner (Stryker ICV, for example), commanders must consider training alternate gunners through cross training, listed below.

5-34. To best manage crew turbulence, the commander should consider the following:

- Select key leaders together. This maximizes the vehicle commander's and gunner's longevity and future qualifications more stable.
- Position by potential. Identify those leaders that have solid promotion potential. Place those leaders in the next higher position (gunner to vehicle commander, for example), and have them qualify in advance of their pending or expected promotion.
- Transfer trained crews together. Promotions may initiate inter-battalion transfers. Commanders should consider moving the newly promoted leader and their gunner together when the gaining unit will benefit from maintaining a qualified crew.
- Cross-train potential replacements. Although the weapon or system may not be authorized resources specifically dedicated to cross-training, units should invest first-round-hit ammunition savings, commonly referred to as "ammunition harvesting," to cross training young leaders. In doing so, commanders can mitigate key position turnover with qualified leaders in stride with crew turbulence.
- Assess qualified new arrivals. Commanders that receive new leaders who qualified within the last qualification period have assessment options to maintain weapon or system qualifications. Commanders can assess two previously qualified leaders from different crews to determine their qualification status when assigned together. This is the least preferred method of crew management and requires the commander and Master Gunner to make assessments using previous crew records, sustainment training in simulations, and other training methods to determine their qualification status. The commander may consider a turbulent crew as qualified when the vehicle commander and gunner have:
  - Previously qualified in their assigned position on a different crew within the previous qualification period.
  - Displayed crew proficiency during a minimum of eight hours in simulation.
  - Successfully completed the simulations Gate To Live Fire with a score of 850 or above.
  - Successfully complete Table I, Gunnery Skills Test.

5-35. If commanders are not completely confident in the crew cohesion, capability, experience, and performance, they must rate them as unqualified through the next training density.

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# Chapter 6
# Crew Evaluation

Direct fire crew gunnery evaluation follows a common method across all maneuver platforms. This includes main gun, ATGM, and MMG platforms. This chapter details two critical areas that facilitate exceptional crew live fire training: VCEs' composition, roles, responsibilities, and prerequisites and the evaluation procedures.

A quality team of experienced, trained, and certified VCEs is the key for a unit's success during simulation and live fire crew training. This information supports the tables presented in Chapter 5, Crew Tables.

## SECTION I – VEHICLE CREW EVALUATORS

6-1. Trained and experienced evaluators must be used to achieve the goals and objectives of the weapons platform training program and to determine the level of proficiency of the firing crews. The VCEs are the keys to a successful weapons training density that builds on crews' previous performance, increased competence and confidence. Selecting, certifying, and effectively utilizing these evaluators enable a high proficiency standard. The VCE's primary method of instruction to the crews is an effective AAR. The VCE, if selected correctly, is a large contributor to the overall success of the unit during the live fire events as he collects data and facilitates the AAR process.

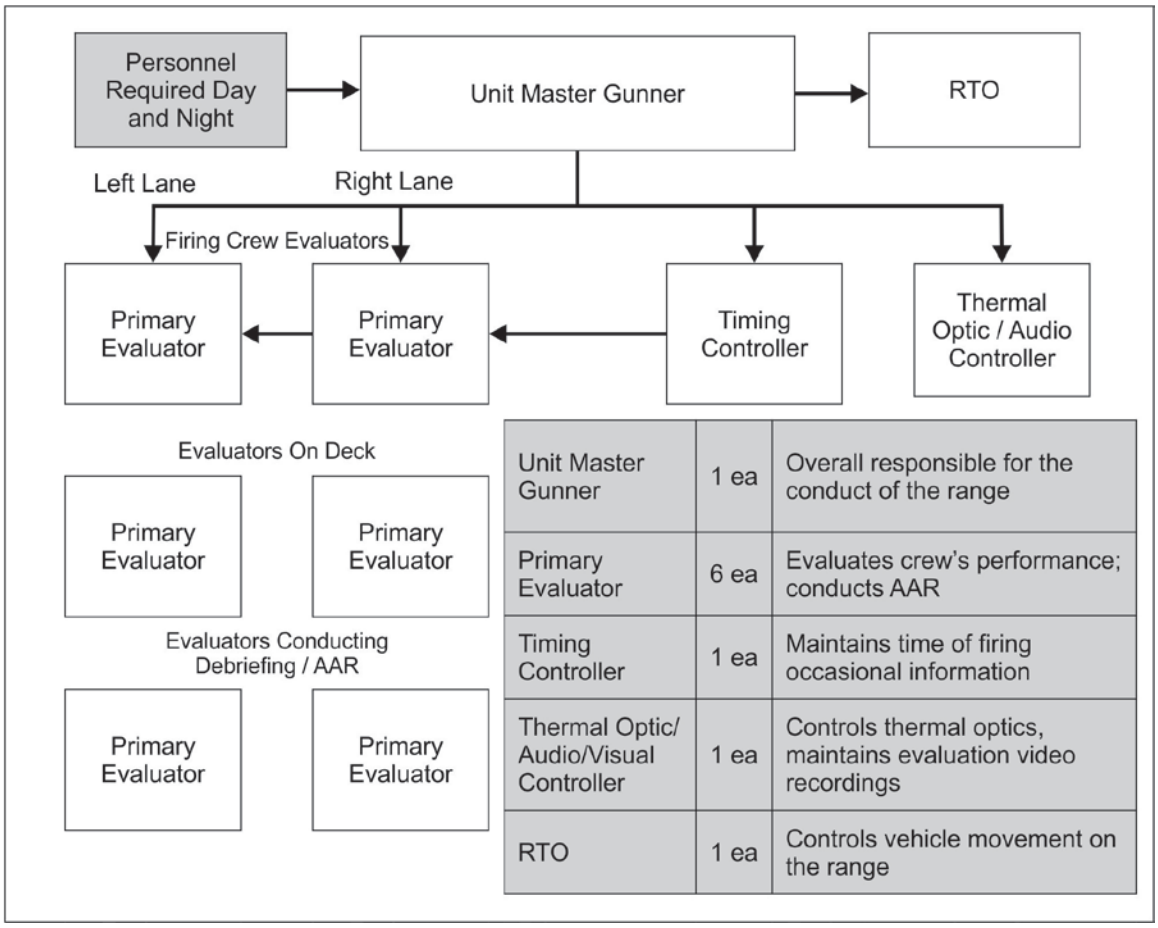
6-2. Commanders should select highly competent crewmembers who meet the prerequisites to perform the duties as VCEs. They should consider the crewmember's past performance, competence, experience, and leader recommendations to identify the best personnel for evaluator positions, particularly for qualification tables. It is essential that the evaluators have exceptional attention to detail, live fire experience, and professionalism to provide the firing crews excellent feedback, tips, methods, and engagement techniques that will drastically increase the crews' lethality through the course of the weapons training density.

## VEHICLE CREW EVALUATOR TEAM COMPOSITION

6-3. A VCE team must be trained and certified prior to live fire to evaluate a gunnery density correctly. Once completed, the unit must ensure sufficient VCEs are available to support the live fire event. Evaluations of crew gunnery always come from outside the firing platoon element, and for qualification purposes, VCEs external to the battalion are required.

6-4. Depending on the size of the weapons training density (make-up gunnery, platoon, company, or battalion) and the type of range facility used, the number of evaluators may vary. Having the correct number and type of evaluators per firing range maximizes the unit's throughput of firing vehicles on the range, reduce range down time, and provide for the highest quality evaluations.

6-5. There are four key elements of a VCE team: the primary evaluator, the timing controller, the thermal optic / audio controller, and the radio-telephone operator (RTO). Depending on the range complex, additional members in the same roles should be employed to facilitate crew throughput and a smooth transition between firing crews. For example, when firing on a multipurpose range complex (MPRC) using two core firing lanes, a possible team composition is shown in the following figure.




| | | |
|---|---|---|
| Unit Master Gunner | 1 ea | Overall responsible for the conduct of the range |
| Primary Evaluator | 6 ea | Evaluates crew's performance; conducts AAR |
| Timing Controller | 1 ea | Maintains time of firing occasional information |
| Thermal Optic/ Audio/Visual Controller | 1 ea | Controls thermal optics, maintains evaluation video recordings |
| RTO | 1 ea | Controls vehicle movement on the range |

**Figure 6-1. Example vehicle crew evaluator team**

6-6. Units should ensure they have sufficient personnel to support both day and night operations. The same number of personnel determined appropriate for the day phase should be planned for during the night phase. This provides the evaluators off time to conduct other missions, especially as typical night fire phases continue until mandatory shut down times. On non-qualification tables, evaluators typically are provided from within the unit, although from a separate platoon from the firing vehicle.

6-7. Evaluators external to the firing unit's battalion are required for evaluating qualification tables (Table VI). These evaluators must conduct a coordination meeting with the firing unit prior to the live fire density to ensure consistency of evaluation. This ensures current standards are used by all evaluators and reduces confusion, particularly during the qualification tables. The external lead evaluator also is required to attend the day and night safety brief and conduct of the range briefing the day of firing. The brigade S-3 typically tasks external evaluators for qualification tables.

# EVALUATOR ROLES AND PREREQUISITES

6-8. When selecting an evaluator for live fire training, the following prerequisites will be met to provide the crews the best available assessment of their live fire performance. As the VCE teams are comprised of different positions, duties, and responsibilities, the prerequisites are developed by team position.

## MASTER GUNNER

6-9. The battalion Master Gunner is responsible for the training and certification of the VCEs within the organization. This includes actively managing the roster of certified and experienced VCEs to support the unit training plan (UTP), including both simulations and live-crew training.

6-10. During execution, the Master Gunner is responsible for quality control of scoring procedures, score sheets, and evaluation practices. The Master Gunner is ultimately responsible to uphold the standards detailed within this publication, and the application of the prerequisites, rules, guidelines, and standards across all simulations-based and live crew training.

6-11. The designated Master Gunner (platoon, company, or battalion) must review the scoring packets (common crew score sheets and roll-up) prior to the AAR for each crew. The battalion Master Gunner must review all score packets on the qualification course.

6-12. The Master Gunner provides a comprehensive analysis on crew proficiency to the commander, including training gaps, maintenance issues, exceptional performance, and recommendations for future live training events. The updates to the unit commander and leadership should be available daily, with a final report within five days of completing the live training event.

6-13. The Master Gunner is responsible for the effectiveness and efficiency of the scenario. He is required to brief external evaluation teams on the conduct of the range, the sequence or steps for the day and night phases of training, and provide all necessary training information to those evaluators for use. This includes all score sheets required to complete the training such that it minimizes the administrative processes of the evaluation team and maximizes their ability to evaluate, assess, review, and execute the AARs.

6-14. The Master Gunner is an arbitrator in any dispute between the evaluation team and the crews. The Master Gunner adjudicates all range issues, evaluation procedures and practices, and make final scoring determination.

6-15. The Master Gunner provides recommendations to the approving authority for any alibi requests. This includes verification of the fault initiating the request.

6-16. The Master Gunner is responsible for the conduct of the AARs, the key topics to present to the firing crews, and the score sheets used to guide the critique. He must coordinate for the collection of all associated administrative paperwork at the completion of the AAR, and provide the final results to the range team for accountability and recording, particularly for the commander's update and the reporting NCO's briefing book.

## PRIMARY EVALUATOR

6-17. The evaluator is responsible for leading the AAR for firing crews upon completion of each run (day/night). This evaluator will complete the score sheets with all data as outlined later in this chapter. Whenever possible, the evaluator should be—

- A sergeant or above with experience serving as a vehicle commander.
- Weapon system qualified, within the last 12 months, AC, or within the last training year (TY), for RC.
- Certified or recertified no earlier than T-6 (AC) or T-9 (RC) and no later than T-1 of evaluating the training event. Certification and recertification procedures are discussed later in this chapter.
- An experienced vehicle commander of the same platform type as the firing crew is required. Although the scoring and evaluation procedures are standard, it is extremely difficult for an evaluator to conduct the AAR where the evaluator has limited or no experience as a vehicle commander or gunner on the evaluated crew's platform. This may be difficult to manage based on unit composition; however, units should make every attempt to follow the rules of thumb provided below:
    - Experienced main gun/ATGM gunner or vehicle commander can evaluate main gun/ATGM crews.
    - Experienced main gun/ATGM gunner or vehicle commander can evaluate MMG crews.
    - Experienced MMG gunner or vehicle commander can evaluate MMG crews.
    - MMG gunner or vehicle commander cannot evaluate a main gun / ATGM crew unless they are qualified on the weapon system and certified by the unit Master Gunner.

6-18. Primary evaluators are charged with upholding the standards and intent of the evaluation process, its rules and requirements, and provide an accurate assessment of the crew's performance. All members of the evaluation team are responsible for quality control and quality assurance on all documentation for the evaluations assigned. They are to ensure the completeness and accuracy of the evaluations, particularly on the score cards.

6-19. The primary evaluators serve as a second set of eyes for those evaluations which they are not specifically assigned to. They ensure the score card "tells the complete story" of what happened during the engagement through accurate recording of firing occasional information, time determination, point calculation, and any annotated remarks.

6-20. The primary evaluator is responsible for accurately determining target score(s) and overall engagement score. They also are required to assess any earned crew penalties as described within this chapter. Evaluators are not authorized to assess any penalties that are not specifically written in this chapter. Any infraction not specifically detailed within this chapter may only be addressed on the score card in the remarks field for use during the AAR. Primary evaluators are not authorized to alter or change the scoring information on any score card they are not assigned.

6-21. Typically, range facilities operate multiple lanes to maximize throughput. One primary evaluator is required per lane firing, and three rotations of lane evaluators will be required. This allows one section of lane evaluators in the tower during a live fire run, one section of lane evaluators debriefing crews using an AAR, and one section of lane evaluators preparing to evaluate ("on-deck"). This facilitates smooth operation of the range in the event an AAR does not begin immediately or an AAR requires more time to reach the training objectives.

6-22. For external evaluations, the lead VCE should be a Master Gunner or identified as a unit's senior live fire trainer. They are responsible for reviewing the qualification scenario to ensure all RPMs are applied, the "Call For" engagement and any required digital tasks are scheduled. The lead VCE serves as a quality assurance, quality control NCO for the duration of the live fire density. If the unit has the ability and does not fully utilize the RPMs, "Call For" engagement, or digital tasks, the maximum crew rating the crews can receive is "Qualified." No higher ratings are authorized for incomplete qualification evaluations. The lead VCE is required to notify the firing unit and higher headquarters Master Gunner or S-3 of the discrepancies identified in the scenario prior to execution.

## TIMING CONTROLLER

6-23. This evaluator's primary responsibility (as detailed later in this chapter) is to accurately keep time of firing occasion information. Accuracy of the timing information is critical to effectively identifying the crew's target engagement times, score(s), and engagement qualification status. The specific firing information will be discussed later in the chapter. The timing controller—

- Is a sergeant or above.
- Must have some previous live fire experience as a gunner or vehicle commander.
- Is certified or recertified within T-6 to T-week of evaluating any live fire exercise on conduct of fire, crew response, engagement techniques, timing procedures, and safety aspects of the firing vehicles. Certification and recertification procedures are discussed later in this chapter.
- Can be of any MOS provided all other requirements are met. The standard evaluation process allows for unit flexibility when assigning evaluators to this position.

6-24. The timing controller's function is directly supported by the rest of the VCE team. Units should use this position to mentor gunners and vehicle commanders new to their position when possible. Crew evaluation provides a great deal of training to team members and assists in their professional development through mentorship with the more experienced members of the team. Units are encouraged to rotate gunners and vehicle commanders through this position for experience in the evaluation process, timing procedures, conduct of the range, and range operations.

## OPTIC/AUDIO CONTROLLER

6-25. This evaluator's primary responsibility is to orchestrate and facilitate the video and audio recordings to support the evaluation, retiming of engagements (if necessary), and the after action review tape. The evaluator—

- Is a specialist or above.
- Should have live fire experience. Must be trained by the unit Master Gunner, designated NCOIC, or range operations personnel on proper use and care of the equipment, adjustment of optics, engagement scenarios, target locations, and recording techniques.

- This evaluator does not have to certify through the VCEEP, but it is highly encouraged.
- Must have a working knowledge of fire commands and can clearly identify the intended target the crew is actively engaging in a timely manner to facilitate the AAR. He must be acutely aware of audio cues, tower prompts, and fire commands from the firing net and the jump radio frequency. His proficiency at this task is critical in providing the firing crews a video representation of their engagements that clearly show target sensing(s), round impact(s) in and around the target area and communications internal to the crew as well as directions from the tower.

## RADIO TELEPHONE OPERATOR

6-26. The tower RTO's primary responsibility is to control movement of firing and non-firing vehicles on the range in a safe manner, and control the script or firing instructions to the crews. This position may be provided by the firing unit and does not have to be tasked for external support. The RTO—

- Is a sergeant or above.
- Should have previous live fire experience. Should have previous tower experience, but can be trained during the individual and practice tables. If experience is limited, he should not be used on the qualification tables.
- No certification is required. He must be briefed on the conduct of the range by the unit Master Gunner or gunnery NCO. He also must be provided with a copy of the tactical script (radio traffic) that will be read or digitally delivered to the firing crews over the firing frequency to initiate their engagement.
- Although only one RTO is required for the day and night phase, units should consider separating the RTO details between the administrative net and the firing net, each with their own respective RTO. This additional RTO is extremely helpful in pushing crews to the firing line while his counterpart can focus on the safe conduct of the firing line.

6-27. During the weapons training density, units should rotate evaluators through all team positions and take Soldiers that do not meet all the prerequisites for qualification tables and incorporate them into the non-qualification tables. This enhances their skills and is an exceptional learning experience for the junior leaders.

6-28. For digitally equipped units, it is recommended to incorporate the battalion S-2 into the RTO position. This allows for the unit's intelligence section to develop tactical scenario scripts, overlays, and tactical messages, as well as the unit to exercise multiple aspects of digital communications. This may require the unit to establish a TOC or TAC to support range operations. Units may develop "canned" or standardized preassembled free-text messages that support vehicle instructions and directions, as well as icon population of target locations for each scenario step or engagement.

6-29. The unit's communications section is vital to the success of any range. It should not be tasked for the RTO position; however, it should provide jump radio checks and communications troubleshooting efforts in support of range operations. In accordance with AR and DA Pam 385-63, Range Safety, the RTO cannot be the range OIC or RSO.

## VEHICLE CREW EVALUATOR ADDITIONAL DUTIES

6-30. In addition to the duties outlined by position above, the VCE also is responsible for the following:

- Quality assurance and quality control of all evaluations, products, and information provided to the unit for the training event.
- Reporting the final results of the firing phase, day and night, by engagement to the unit Master Gunner. Compiling the unit's results is a unit responsibility.

6-31. The VCE does not control the alibi process. He should, however, provide relevant firing information regarding the scenario, crew actions, and other situational information to the Master Gunner. The Master Gunner utilizes all pertinent information to determine if the situation qualifies for a request for an alibi. The Master Gunner provides the appropriate recommendation to the commander that maintains the approving authority.

6-32. For qualification tables, external evaluators are only responsible for first run engagements. Any additional training re-fires that are not a result of an approved alibi, or second run attempts are solely the responsibility of the firing unit.

# VEHICLE CREW EVALUATOR'S CERTIFICATION

6-33. Members of the evaluation team, who are required to be certified as listed above, must be trained and certified using the approved VCEEP. Units are not authorized to develop their own training package, but are encouraged to ***add to*** the standard training package, particularly when addressing local installation topics.

## CERTIFICATION

6-34. VCEs are expected to be certified or recertified ***no earlier than*** T-6 (AC) or T-9 (RC) and no later than T-1 of evaluating the training event.

6-35. VCE certification consists of—

- Selection by the unit commander based on the prerequisites listed earlier in this chapter.
- Completion of the 40-hour VCEEP for the appropriate platform. The approved course includes detailed instruction for vehicle crew evaluators, successful completion of a written exam, and successful completion of one practical exercise. The standards for the instruction module, written test, and practical exercises are provided in the VCEEP. Although the gunnery evaluation process is standardized, the VCEEP package is oriented specifically to the weapon platform(s) being evaluated. The VCEEP can be obtained from the VCEEP folder located at https://www.us.army.mil/suite/kc/43197507 . Users must have a valid AKO account and Common Access Card (CAC) to gain access.
- For digitally equipped units, VCEs must be FBCB2/BFT-trained in accordance with local policies and procedures.

## RECERTIFICATION

6-36. Recertification is refresher training for VCEs. Recertification consists of successful completion of the VCEEP written examination and practical exercise. The recertification also includes information and instruction on any doctrinal changes that directly affect the evaluation process that have occurred since the last certification.

6-37. Master Gunners should be prepared to retrain any VCEs who fail to meet the recertification standards listed in the VCEEP. Only one attempt is authorized for recertification purposes. Any failures of the recertification require the evaluator to begin the certification process over with the approved 40-hour block of instruction.

## SUSTAINMENT

6-38. VCE sustainment training provides an opportunity for the evaluators to reinforce what they have learned during previous VCEEP courses. It strengthens their knowledge and experience through practical exercises and training opportunities at the unit level. Unit developed sustainment training increases the experience level of the certified VCEs and keeps them abreast of updated gunnery techniques, engagement methods, and training practices. The following is a list of some sustainment training opportunities units can leverage for their certified VCEs:

- Assign as a VCE for an external unit's gunnery or weapons training density.
- Conduct or train as an instructor/operator (I/O) for the unit's training simulator shelter(s).
- Evaluate crews while completing chair drills.
- Act as assistant instructors during VCEEP courses for own and external units.
- Develop gunner training classes that instruct conduct of fire, primary marksmanship instruction and evaluation (PMI&E) classes, or other gunnery-related tasks.

### VEHICLE CREW EVALUATOR TRAINER RESPONSIBILITIES

6-39. Designated live fire VCE trainers are gunnery SMEs, and are typically the unit's assigned Master Gunner In units without Master Gunner authorizations, the commander selects an experienced, senior NCO to serve as the live fire VCE trainer.

6-40. The VCE trainers review, become certified, and conduct VCE training using the VCE exportable package for their unit(s). VCE trainers may attend a VCE course taught at other units to meet certification requirements when necessary, and should serve as an assistant instructor (AI) prior to conducting their own course as the primary instructor (PI).

6-41. School-trained Master Gunners are only required to pass the VCE recertification requirements, regardless of time between certifications. They have been certified through a comprehensive train-the-trainer course for crew evaluations. Once recertified as listed above, the Master Gunner is authorized to instruct any VCE class using the approved VCEEP courseware.

6-42. The following list provides the training responsibilities at each level for the VCE program.

- Brigade monitors subordinate unit VCE training programs. Provide updates to gunnery and live fire training publications as appropriate.
- Battalions develop, plan, and execute the VCE training program for certification, recertification, and sustainment.
- Companies and platoons support all VCE training and maintain certified VCEs.

## SECTION II – EVALUATION TERMS AND CONCEPTS

6-43. Evaluators will use the standard scoring model for Tables III, IV, V, and VI. This model is a common scoring system used for all crew level direct fire platform evaluations. This system of evaluation represents a shift from performance-based gunnery to a hybrid threat threshold/performance model, termed "threat-based" methodology.

6-44. This crew training evaluation system requires a thorough understanding of key terms and concepts used frequently during gunnery. These terms and concepts assist in the scoring process and define the evaluation process described in Section III.

# THREAT-BASED METHODOLOGY

6-45. The standard weapons platform evaluation model is designed specifically to reflect the potential threat's capability to change the DIDEA process of the firing vehicle. The evaluation model is developed to incorporate five areas that directly correlate to each target's perceived level of threat to the firing vehicle. The areas considered are the:

- **Firer**.
- **Firing platform posture**: defense or offense.
- **Target type**: armored, light armored, unarmored, or troop-type.
- **Target posture**. This includes stationary frontal, stationary flank, moving, or evasive postures.
- **Range to target**.

6-46. These five topics allow the model to articulate a clear level of danger the threat poses to the firing crew, and provides offset considerations accordingly. For example, a mounted machine gun MK19, 40mm crew firing at 1400 meters requires additional time to accommodate for the ballistic characteristics and time of flight.

6-47. The 70-point line has been identified to articulate a point in time where the threat has ***effectively altered*** the DIDEA process of the firing vehicle. This line is the established ***standard*** for defeating a target based on its type and range.

6-48. Engagement times above the 70-point line indicate that the firing crew has defeated that target before the threat altered its DIDEA process. Above the 70-point line, crews receive additional points based on their speed at defeating the threat and are rewarded for higher proficiency and performance.

6-49. Firing vehicles that receive greater than 70 points on a target have successfully defeated that target to standard. Where multiple targets are presented, all targets must be successfully defeated in the same manner of scoring to successfully pass the overall engagement.

6-50. When a firing crew has successfully defeated all targets within an engagement receiving 70 points or more per target, that engagement is considered "qualified." Any engagement that results in a target score less than 70 points, regardless of the overall engagement score, the engagement is "unqualified."

## FIRER

6-51. When considering the firer, the evaluator must take into account the platform and the weapon capability as well. In order to ensure each firer is evaluated on the capabilities of the overall system they are employing, the evaluator must understand the platform and authorized firer.

6-52. Each firing platform and identified weapon or system used during an engagement must have the capability to destroy the presented target(s). The Master Gunner is responsible to ensure the engagements for the scenario use targets that the firing platform or its selected weapon has the capability to defeat. For example, units should not select a BMP target for a MMG crew to defeat with the caliber .50 machine gun. A cross reference of the target to weapon/ammunition capability is provided in the Range Requirements and Scenario Development chapter

6-53. There are three basic firing vehicle types: main gun, ATGM, and MMG platforms. Of these basic systems, various firers may be able to engage targets with primary or secondary armaments. The following list provides a quick reference to the platform and available firers that will directly impact the amount of time a crew has to defeat a threat.

6-54. The main gun platforms are:

- Abrams series. The possible firers are:
  - Gunner firing the main gun or coax machine gun.
  - Vehicle commander firing the main gun or coax.
  - Vehicle commander firing caliber .50 from the CWS, SCWS, or CROWS.
  - Loader firing M240.
- Bradley series. The possible firers are:
  - Gunner firing the 25mm or the coax.
  - Gunner or vehicle commander firing the TOW.
  - Vehicle commander firing the 25mm or the coax.
- Stryker Mobile Gun System (MGS). The possible firers are:
  - Gunner firing the main gun or the coax machine gun.
  - Vehicle commander firing the main gun or the coax machine gun.
  - Vehicle commander firing the caliber .50 machine gun (pintle-mounted).

6-55. The ATGM platforms are:

- Stryker ATGM. The possible firers are:
  - Vehicle commander or gunner firing the ATGM.
  - Vehicle commander firing the secondary armament.
- Improved Thermal Acquisition System (ITAS)-equipped vehicles. The possible firers are:
  - The vehicle commander or gunner firing the ATGM.
  - The vehicle commander or gunner firing the secondary armament, as available.

6-56. The MMG platforms are:

- RWS-equipped vehicles. The possible firers are:
  - The vehicle commander/gunner firing the primary weapon. Some vehicles are not manned with a vehicle commander, in which case the gunner assumes the role of the vehicle commander.
- Vehicles with pintle-mounted machine guns. The possible firers are:

- The vehicle commander or gunner firing the primary weapon. Some vehicles are not manned with a vehicle commander, in which case the gunner assumes the role of the vehicle commander.

- ASV and AAV vehicles (dual-mounted machine gun systems). The possible firers are:
  - Gunner firing the primary or secondary armament.
  - Vehicle commander firing the primary or secondary armament from the gunner's location.

6-57. The firing platform, weapon, and firer information is applied to all engagements for each target presented. This information is used to determine the target's overall level of danger presented to the firing vehicle.

## FIRING PLATFORM POSTURE

6-58. The firing vehicle posture identifies if the vehicle is executing the engagement from an authorized defensive firing position or an authorized offensive method. For training purposes, vehicles may be directed to execute the engagement in the following manner:

### DEFENSE

6-59. Defense postures indicate that the vehicle is masked to the threat by cover and concealment to such a degree that prevents observation and direct fire engagement from the threat that would disrupt the DIDEA process. This requires the firing vehicle to use a defensive battle position or a reverse slope defensive position.

6-60. Each vehicle executing a defensive engagement is required to start from a predetermined point in the defensive firing position. These start points are shown in Table 6-1:

| Platform | Defensive Firing Position | Remarks |
|---|---|---|
| Abrams | Turret down, optics exposed (defilade) | Vehicle must fire the main gun and coax from the enfilade position. |
| Bradley | Turret down, optics exposed (defilade) | |
| MGS | Hull down, gun pod and optics exposed (enfilade) | Vehicle does not move during defensive engagements. All firing is conducted from the defensive start point. No tactical break time is authorized for this vehicle. |
| ATGM | Hull down, ATGM system and optics exposed (enfilade) | |
| Mounted Machine Gun | Vehicle down, weapon or RWS exposed (enfilade) | |

**Table 6-1. Defensive Firing Position by platform or vehicle type.**

6-61. Stryker MGS, ATGM, and MMG crews begin all defensive engagements from the enfilade position. They will engage targets from the enfilade position with no movement of the vehicle. These vehicles ***are not authorized*** any tactical break time, discussed later in this chapter.

### OFFENSE

6-62. Offense postures indicate the firing vehicle will be executing the engagement from an exposed position for the duration of the engagement. The vehicle may be moving (traditional offense) or be postured in a tactical manner that exposes the hull/crew compartment of the vehicle at all times. Offense postures allow the threat array the ability to actively engage immediately upon presentation. The following terms are used when describing the offensive tasks for crew training:

- **Offense** (traditional offense) engagements are where the firing vehicle is moving at a speed appropriate for the platform as directed during the conduct of the range briefing.
- **Retrograde** engagements are where the firing vehicle is oriented up range (toward the baseline) with the main and/or secondary armament oriented downrange (over the rear of the vehicle). The vehicle is moving at a speed appropriate for the platform as directed during the conduct of the range briefing.
- **Short-halt** engagements are those where the firing platform is moving at an appropriate speed during the engagement and is required to stop in order to engage and defeat the threat presentations. Use of

the short halt as an offensive posture is not required, and is not authorized as part of the scenario on the qualification course. Firers that tactically choose to execute a short halt may do so, as necessary. No crew penalty may be assessed for tactical decisions of the crew.

- **Traffic control point (TCP)** engagements are those where the firing platform is not provided additional cover and concealment protection from the presented threats. These engagements are executed while the firing vehicle is stationary. Use of the traffic control point as an offensive posture is not required, and is not authorized on the qualification course.

## TARGET TYPE

6-63. Each target type provides the threat a different level of ballistic protection and survivability. This directly translates into the threat's ability to survive through a direct fire engagement, initiate direct fires, or return fire in order to defeat the firing vehicle. The target type is tied to its posture and range, discussed later.

6-64. When developing the scenarios, the Master Gunner is required to place the most dangerous target as "Target 1" in the initial presentation. This allows the evaluation team to assess the crew's ability to correctly engage the most dangerous target prior to lesser threats in any given situation. Points are automatically reduced for crews that defeat lesser dangerous targets before more dangerous targets. Evaluators are not authorized to assess penalties for this infraction, but are required to identify the instance during the AAR.

6-65. The target type is identified by three groups of armor protection, and includes a fourth group for all dismounted threats.

- **Armored** targets **(ARM)** – tank or tank-like targets that require missiles or large caliber munitions to defeat.
- **Lightly armored** targets **(LAR)** – tracked or wheeled vehicles that require medium and large caliber weapons or missiles to defeat. All lightly armored targets are assumed to have an anti-tank capability either through direct fire or anti-tank system means.
- **Unarmored** targets **(UNA)** – light-skinned wheeled or tracked vehicles that afford no specific armor protection that can be defeated by small arms (7.62mm) and above weapons. All unarmored targets are assumed to have an anti-tank capable system at all ranges.
- **Troop** targets **(TRP)** – any dismounted threat with no armor protection. This includes squads, RPG teams, snipers, and insurgents in varying configurations that can be defeated by any weapon or system. All troop and troop like targets are assumed to have an RPG or similar weapon system capable of defeating friendly forces out to 300 meters.

## TARGET POSTURE

6-66. Target posture relates to the offensive or defensive nature of the threat. Four target postures are provided that relate to the tactical movement of each target or cluster within a presentation:

- **Stationary frontal (STA)**. The target is stationary with the maximum amount of armor facing toward the firer. Stationary frontal targets are assumed to have the primary armament oriented toward the firer.
- **Stationary flank (FLK)**. The target is stationary with a side (flank) of the vehicle is facing the firer. Flank targets are assumed to have their primary weapon system oriented away from the firing vehicle, indicating it is not prepared to engage the firer.
- **Moving flank (MOV)**.The target is moving at a relatively consistent speed across the firer's front, side, or both. The range to target may or may not change during movement based on the capabilities of the range facility. All moving flank targets are assumed to have their primary armament oriented away from the firing vehicle with limited stabilization.
- **Evasive flank (EVA)**.A moving target with variable speed and direction to the firer's front, side, or both. All evasive moving targets are assumed to have their main armament oriented toward the firing vehicle, but with limited stabilization. Evasive targets are available as an option to the unit and are not required.

### RANGE TO TARGET

6-67. Range assesses the distance from the firer to the threat. It has a direct correlation to the threat's decreasing accuracy as range to target increases. For scoring purposes, range to target will only determine near before far after considering the other threat capabilities.

6-68. Threats of the same target type and target posture will not be assessed by near before far within the same range band (two PCs, frontal, 1400 meters, for example). Range is used as a threat discriminator in conjunction with the target type and posture to accurately determine the level of threat presented to the firer.

6-69. For training, when multiple lanes are used for a table on a given range, the lane with the ***farthest target*** within an engagement shall identify the range to target for scoring purposes.

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For example, Engagement 67 from the main gun tables will be fired from two lanes on the same range. This engagement has two targets presented for the degraded task. The unit selects a PC frontal for target 1for the engagement requirement. In the left lane, this target is at 820 meters. In the right lane, the target for the engagement is located at 740 meters. On the score sheet, the 820-meter range is used to determine the score for ***both*** lanes. Master Gunners should ensure that these ranges are within 100 meters of each other, even if they cross into a different range band. This gives the benefit of the doubt to the crew and allows for easier development of standardized lane scenarios.

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## THREAT LEVELS

6-70. The firing crew must assess each threat based on its presented level of danger. Targets are classified in three distinct threat levels:

- **Most Dangerous.** An identified threat that has the capability to defeat the friendly force and is preparing to do so. These targets must be defeated immediately.
- **Dangerous.** An identified threat that has the capability to defeat the friendly force, but is not prepared to do so. These targets must be defeated after all Most Dangerous targets are eliminated.
- **Least Dangerous**. Any threat that does not have the ability to defeat the friendly force, but has the ability to coordinate with other threats which do. These targets are defeated after all threats of a higher threat level are defeated.

6-71. When discussing most dangerous, dangerous, and least dangerous targets, the scoring model determines the level of danger of each target within a presentation. The scoring model uses the definitions above in order to characterize each target within a presentation correctly, and determine the specific order in which those targets should be engaged by the crew.

6-72. All factors discussed earlier in the threat-based methodology determine each target's threat level. These factors include the firer, firing vehicle posture, target type, target posture, and range to target. These factors are used to determine which target the firer should defeat first, as it presents the highest threat.

6-73. All targets, including multiple targets of the same threat level, are serviced in a specific sequence using based on their threat level. The engagement sequence will follow these general rules:

- Near before far.
- Frontal before flank.
- Stationary before moving.

6-74. These aspects of target discrimination and engagement criteria are assessed as critiques during the AAR process. They are identified by the VCE during the evaluation process and are used as talking points as appropriate. It is not necessary to include a penalty for failing to engage the most dangerous threat before all other targets. The scoring model automatically enforces a penalty by requiring the crew to defeat the most dangerous target in less time than all other targets. Failure of the crew to accomplish that will ultimately result in fewer points in the scoring model.

6-75. VCEs must be comfortable identifying the difference in scores when crews engage and defeat threats in the appropriate order. This is a key talking point during the AAR for every engagement.

# TARGET DELAYS

6-76. Certain engagements on the main gun/ATGM crew tables require a target presentation after a set period of time. These presentations are executed on a specific delay from the initial presentation. The table below shows the standard delay times with their authorized exposure times for each crew table set:

| Platform Type | Exposure Time | Delay for Secondary Presentation |
|---|---|---|
| Main Gun | 50 seconds | 25 seconds |
| Machine Gun | 50 seconds | 25 seconds |
| ATGM | 120 seconds | 60 seconds |

**Table 6-2. Target delays by platform type.**

6-77. The evaluator team needs to ensure when the delay target presentation is fully locked in place and record that time. Like any other target, although executed for display at the appropriate time, it may take a few seconds to reach the fully up/locked position.

6-78. Exposure time is recorded on a single timeline for all targets for the engagement. Evaluators use the single timeline to record all the firing events during an engagement, including the end of exposure time for each target and the delay presentation time, as required.

6-79. Exposure time continues until one of the following action occurs:

- All targets in the engagement are defeated.
- The authorized target exposure has expired for all targets in the engagement.

6-80. Exposure time is segmented into two categories: engagement and break time. All firing occasional information falls into one of those categories and provides the key information to determine a crew's score against a specific or series of targets during an engagement.

# TARGET LOCK

6-81. During the presentation of an engagement, the target array must be presented fully to the firing crew for the evaluation process to begin. Target lock indicates that all targets in the presentation are fully presented and locked into position, providing the firer a minimum of 90-percent target visibility throughout the engagement.

6-82. The sequence of events during any engagement are:

- Vehicle is postured correctly for the pending engagement. Vehicle commander reports REDCON ONE.
- Tower initiates engagement scenario or engagement step on the range operation computer.
- Range operation computer indicates when all targets in the presentation are locked in position.
- Evaluators start the engagement evaluation (exposure time begins, discussed later in this chapter).

6-83. The fully locked position is shown in the following figures:

Two targets are being presented, but the left target is still lifting. Time DOES NOT start until both targets in the initial presentation are up and locked in place.

**Figure 6-2. Example targets not fully presented**

Both targets above have been presented and locked in place, TIME STARTS.

**Figure 6-3. Example targets fully presented and locked**

## ACTIVE TARGETS

6-84. Targets are considered "active" when any target in a presentation is engaged with direct fire or locked (when on the offense). For delay targets, they are considered active if any target is currently active or when it is engaged. Active targets are defined as threats that are actively seeking to destroy the firing vehicle. Evaluators must annotate the time each target becomes active within the engagement. A target is considered active when one of the following occurs:

- The firing vehicle is in the enfilade or on the offense and the presentation target(s) are locked.
- The firing vehicle engages any target, regardless if it is locked in position or not.
- The vehicle commander directs movement or the firing vehicle begins movement to the enfilade position.
- A delay target is presented and locked while any target from the initial presentation remains active (has not been destroyed).

6-85. Once a target is active, it remains active until the crew defeats it by the respective kill standard, described below. Evaluators must annotate the time each target became inactive.

6-86. If the firing vehicle is on the offense, executing a short halt, or directed to perform a traffic control point engagement, targets are active once the presentation's array is locked in position. If the firing vehicle engages any target prior to the array fully locking into position, all targets in the array are considered active.

6-87. The time threat targets are active determines the overall engagement time, and subsequently, the scored evaluation for the engagement. The specific instructions for determining the score are provided later in this chapter.

## TARGET KILL STANDARDS

6-88. A firing crew must destroy all targets presented above the 70-point line during an engagement to pass or qualify that engagement. The appropriate kill standard must be achieved by the crew to change any active target to an inactive status.

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***Note.*** These standards are for training purposes only. The target kill standards are used to determine when a target has been successfully hit for evaluation and are not for use in combat.

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6-89. The target kill standards are based on the weapon system employed. If a crew fails to achieve a kill on any target during an engagement as listed below, that crew will fail to achieve any points for the engaged target and ultimately fail the overall engagement. All targets must be hit and score a minimum of 70 points per target to successfully pass or qualify the engagement.

6-90. For engagements using the 40mm training ammunition for MK19, most ranges are not capable of identifying strikes of the round within a five-meter radius of the target or target area. In these cases, the evaluation team must be able to observe each target area and announce to the scoring team and the crew when the target has been successfully defeated to the respective kill standard. Providing communication to the firing vehicle when target destruction is achieved provides a recorded and measurable timing event for the evaluation and the AAR.

| Target | Target Type | Standards |
|---|---|---|
| **120mm Point** | All | Hit target with at least one round. |
| **120mm Area** | Troop | Hit two troop targets with main gun (canister), minimum, and achieve a kill on 50 percent of area targets overall (canister and coax). |
| **105mm Point** | All | Hit target with at least one round. |
| **105mm Area** | Troop | Hit two troop targets with main gun (canister), minimum, and achieve a kill on 50 percent of area targets overall (canister and coax). |
| **25mm Point** | PC (KE) Unarmored (CE) | Hit with at least three rounds at any distance. Unarmored vehicles below 900 meters should be engaged with 7.62mm. |
| | ATGM Team | Hit with at least one round within five meters (HE) at a distance greater than 900 meters. |
| | Aerial Target | Hit with at least five rounds at any distance. |
| | Bunker/Fortified Buildings | Hit with at least five rounds (CE) at ranges to 1200 meters. |
| **25mm Area** | Troop | Suppress 75 percent of target area with HE at ranges greater than 900 meters. |
| **TOW Family of Missiles** | Armored Target | Hit with one missile (TOW - TOW 2B) from 65 meters to 3750 meters. |
| | Armored Target | Hit with one missile (TOW AERO) from 65 meters to 4500 meters. |
| | Bunker | Hit with one missile (TOW BB) from ranges of 1201 meters to 3750 meters. |
| **Caliber .50** | Troop | Hit one target with one round. |
| | Unarmored | Hit target with at least three rounds. |
| **40mm** | Troop | Hit with at least one round within five meters of target. |
| | Unarmored | Hit with at least one round within five meters of target. |
| **7.62mm** | Troop | Hit one target with one round. |
| | Unarmored | Hit target with at least three rounds. |

**Table 6-3. Training target kill standards**

6-91. During Tables III through VI, the tower must be prepared to serve as a notional wingman for the firing crew. The tower may announce over the firing net when the kill standard is achieved on any target, regardless if it falls automatically or not.

6-92. A VCE must observe the target area to ensure proper kill standard credit is given to all crews. This requires the VCEs to train with the tower camera system and coordinate for target hit sensing announcements from the range operator. Area weapons receiving credit for achieving a kill standard will initiate the tower to announce TARGET to the firing crew, as necessary.

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For example, when firing with the MK19, round strikes within five meters of the target may not be identified by all range equipment (hit sensors). This allows for the announcement by the tower of TARGET over the firing frequency to be recorded for timing purposes and playback during the AAR.

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# MECHANICAL MALFUNCTIONS

6-93. When a vehicle crew is preparing for live fire, they should ensure that their vehicle is fully-mission capable (FMC). PMCS and all prep-to-fire checks must be completed prior to each live fire phase (day and night). ***Crews will not receive additional time due to mechanical malfunctions***.

6-94. Mechanical malfunctions with armament are specifically tied to the weapon's cycle of function. All weapons, including missiles, follow the same cycle, although some procedures may be executed manually or may be omitted based on the weapon's design. The cycle of function can be performed as integrated and overlapping actions. The cycle of function is described in specific phases for direct fire weapons:

- **Feeding.** This positions the cartridge such that it is prepared for chambering.
- **Chambering.** The round is seated within the chamber of the weapon.
- **Locking.** The locking phase secures the bolt or breech block to the barrel or breech, ensuring the cartridge is fully chambered. This ensures gas pressure of the round is maintained forward of the bolt, allowing for the expansion of gas to propel the projectile down the barrel.
- **Firing.** This phase ignites the primer of the cartridge and detonates the low explosives of the cartridge.
- **Unlocking.** This phase contains all the actions of the weapon to unlock the bolt or breech block from the barrel or breech.
- **Extraction.** This phase begins once the bolt or breech block is unlocked. It extracts the expended cartridge case or aft cap from the chamber area.
- **Ejection.** The ejection phase contains all actions of the weapon to properly eject the expended cartridge case from the chamber area of the weapon completely, such that another round may be fed into the chamber area.
- **Cocking.** This phase includes all the actions to prepare the weapon to fire the next round. For electrically fired systems, this includes any actions that reset the firing circuit, electric timing events, or manual functions to prepare the weapon to fire the next round.

6-95. Malfunctions are a direct failure one of the phases in the cycle of functioning. When malfunctions occur, evaluators must be prepared to discuss the actions, failures, malfunctions, or safety issues that relate to the crew's experiences and actions during the engagement.

6-96. The following malfunctions ***are not break times. (These are described later in this chapter.)*** but in rare cases may be grounds for an alibi only if proven not to be induced by crew error:

| | | Stoppage | Misfire | Case Base (Abrams) | Loading (MGS) | Breech Up |
|---|---|---|---|---|---|---|
| Cycle of Funtioning | Feeding | X | | | X | |
| | Chambering | X | | | X | |
| | Locking | X | | | X | |
| | Firing | X | X | | | |
| | Unlocking | X | | | | X |
| | Extracting | X | | X | | X |
| | Ejecting | X | | X | | X |
| | Cocking | X | | | | X |

**Table 6-4. Cycle of functioning to malfunction cross reference**

- **Stoppage.** Stoppage is caused by several factors and can occur due to a failure in any of the phases within the cycle of functioning. A machine gun stoppage is not grounds for break time. Crews must apply immediate action and fight through the malfunction. If a crew experiences a stoppage, they must announce STOPPAGE to alert the tower that a malfunction has occurred.
- **Misfire.** An instance with a main gun or ATGM where the round fails to fire. When experiencing a misfire, the crew is required to announce MISFIRE. and immediately go through the appropriate procedures as stated in the respective technical manual. All weapon systems have effective misfire procedures that must be followed in a safe and timely manner.

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***Note.*** Crews must use the approved misfire procedures for their weapon as outlined in the respective TM. Tower operations must be familiar with the various misfire procedures for all firing vehicles as well as any specific installation or range SOP requirements.

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- **Case base (Abrams).** (This malfunction was formerly known as AFT CAP. This aligns with the proper terms of the cartridge case base assembly for accuracy and consistency.) A case base hanging up in the case base deflector is not grounds for breaking time. If a crew experiences a case base issue, they must announce CASE BASE to alert the tower that a malfunction has occurred. No alibis are authorized for case base-related malfunctions. The primary cause for a case base malfunction during extraction or ejection is crew error when adjusting the deflector or a training issue where the loader sets the main gun to SAFE prior to the breech locking open and fully extracting and ejecting the case base.
- **Breech up (Abrams).** A breech up is not grounds for breaking time. On the occurrence of a breech up, the crew will clear the malfunction in accordance with TM 9-2350-264-10-2, *Tank, Combat, Full-Tracked: 120mm, M1A1*, or TM 9-2350-388-10-2, *Tank, Combat, Full-Tracked: 120mm, M1A2 System Enhancement Package (SEP)*, respectively. The Master Gunner or vehicle commander must pull the crew from the range, and maintenance must verify, troubleshoot, and repair the fault. If a crew experiences a breech up, they must announce BREECH UP to alert the tower that a malfunction has occurred. There are several contributing factors during unlocking, extraction, or ejection that causes the breech to remain in the locked position after firing.
- **MGS Auto-load failures:** All failures of the MGS auto loader are a malfunction to the feeding, chambering, or locking phases of the cycle of functioning.
- **Rammer not home (MGS).** The rammer did not return to the home position after loading a round. This could happen before or during an engagement. If the malfunction occurs prior to the start of the engagement, the crew must troubleshoot or be pulled from the range. If the malfunction occurs during an engagement after the initial round fires, the crew must announce RAMMER NOT HOME

and commence troubleshooting procedures. If the crew did not identify the rammer was not stowed in the home position prior to the engagement, the crew must announce MISFIRE – RAMMER NOT HOME then commence troubleshooting procedures.

- **Breech (MGS).** A breech obstruction occurs or the breech fails to open. Crews will announce BREECH and commence troubleshooting. If the crew failed to identify the failure until after trigger squeeze, they must announce MISFIRE – BREECH and commence troubleshooting procedures.
- **Gun out of battery (MGS).** This occurs after firing where the gun physically comes out of the mechanical battery. The crew must announce BATTERY, followed by CEASE FIRE. The tower must announce CEASE FIRE – FREEZE, and cease all live training immediately.
- **Auto loader failure (MGS).** This can occur before or during an engagement. If the malfunction occurs before the engagement, the crew must announce AUTO LOADER FAULT and initiate troubleshooting procedures. If the malfunction occurs during an engagement, the crew must announce AUTO LOADER FAULT and either announces CEASE FIRE or MANUAL LOAD to overcome the failure.

6-97. Crew error is defined as—

- Failure to follow instructions.
- Failure to follow procedures as outlined in applicable operator TM or TC.
- Training failure where a crewmember fails to follow established procedures during operation.

6-98. Any mechanical malfunction will be recorded in the REMARKS block for the engagement on which it occurred. VCE's must annotate any action or failure done by the crew to overcome the malfunction and prepare to discuss them with the crew during the AAR. Evaluators must annotate on the timeline when the malfunction or instance occurred.

6-99. When a malfunction occurs, the VCE will annotate the time of each announcement of the malfunction experienced by the crew. Evaluators must provide a detailed note in the remarks section of the common crew score sheet concerning the malfunction and the crew's actions to overcome the interruption during the engagement.

6-100. No break time is authorized for any malfunction. Once the engagement is initiated, it continues uninterrupted through the end of the target exposure time of all targets within the array. If the malfunction still impedes the ability of the crew to engage targets, the VC is responsible for pulling his crew from the training event to correct the malfunction when safe to do so.

6-101. If crews continue training after the malfunction occurs without removing their vehicle from the range, no engagements may receive an alibi for the malfunction. Crews that continue to train after these malfunctions occur accept any risk or potential to their training outcome with the understanding that no alibis will be permitted.

6-102. If another malfunction is experienced by the crew, the vehicle should be pulled from the training event until thorough troubleshooting and appropriate maintenance actions are conducted and certified complete by the Master Gunner. In the event the crew elects to continue the training event rather than moving to the maintenance activity, all potential alibis are forfeited for engagements where the malfunction occurred or in future engagements where the same malfunction occurs.

6-103. Crews are expected to resolve their weapon malfunctions in a tactical manner. Weapon's firing malfunctions are not a justification for an alibi unless it is clearly determined by maintenance, QASAS or PM MAS representatives, respectively, of the cause of the malfunction and crew error is ruled out as the primary contributing factor.

## DUST DOWN/WIND DOWN

6-104. A dust down occurs when a round falls short of the target (skips) and debris (not the round itself) knocks the target down. This only applies to Abrams and Stryker MGS platforms during the conduct of a main gun engagement.

6-105. A wind down occurs when a large caliber round passes (not striking) a target panel and blows the target down. The tower must be able to confirm the wind down with the target operator in the tower.

6-106. If either a skip round or near miss knocks down the target, the VCE or control officer announces DUST DOWN or WIND DOWN at the end of the engagement, as appropriate over the firing frequency. Tower crews should follow these steps to provide the crew the appropriate amount of target exposure time remaining:

- If the target is the only target remaining in a multiple-target engagement, all time (engagement and exposure) will stop until the target is re-presented. (It may need to recycle on the tower instrumentation requiring additional time.)
- If the target has to be re-presented due to dust down, wind down, or target malfunction, the crew will be alerted and told the exposure time remaining for that target.
- When the target is re-presented, time will start when the target is fully exposed (locked) or a weapon system fires, whichever occurs first.
- If more than one target remains after a dust down or wind down, engagement time will not be stopped unless all other targets are knocked down before the dust-down target reappears.
- Break time will not include any reloading time required by the crew or weapon system. The crew must be capable of engaging the target with the appropriate ammunition before break time can be applied.

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For example, C-66 has a two-tank engagement. The crew skips a round into the first target, target time continues to run and the tower does NOT announce DUST DOWN and immediately attempts to represent the dust down target. The crew continues the engagement and scores a target hit on the second target. If the dust down target is represented while the crew is engaging target two the engagement continues with no break time. If the target cannot be represented immediately the tower announces DUST DOWN ON (TARGET ONE). The target time stops after the hit on the second target and the crew reengages the first target after representation. Break time is only given when no target is presented for the crew to engage.

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# ANNOTATING FIRING EVENTS

6-107. The evaluation system uses a series of abbreviations for the critical firing events during an engagement, called firing occasional information. These abbreviations represent all the key actions of any crew on any platform during any engagement. They provide the key points in time the evaluator must capture and record in order to effectively evaluate the crew's performance.

6-108. The firing occasional information's terms and abbreviations are show in the table below for reference, and discussed further during the next section. Evaluators must be fluent in translating the abbreviations, understanding their meaning, and transforming them into an accurate account of the crew's engagement.

| Firing Event | Abb | Definition |
|---|---|---|
| Open Time | OP# | The instant a weapon initiates firing at a threat. Typically only used when using machine guns or 25mm. |
| Close Time | CL# | The time a weapon ceases to engage a target without killing it and shifts to a supplemental target. |
| Driver Up | DU | Announcement to the driver to move forward from a defilade to an enfilade position. |
| Driver Back | DB | Announcement to the driver to move rearward to a defilade position or an alternate position. |
| Doubtful (Left / Right) (Target Number) | D# | The strike of the round in relation to the target number shown is to the left or right side. (DL2 = Doubtful Left, Target 2). |
| Lost (Target Number) | L# | The strike of the round in relation to the target was unobservable by the crew. |
| Over (Target Number) | O# | The strike of the round in relation to the target was overlined. |
| Short (Target Number) | S# | The strike of the round to the indicated target was short. Additional comments concerning how short should be included in the remarks area. |
| Target (Target Number) | T# | The strike of the round to the indicated target was a target hit. |
| Termination | X | The VC terminated the engagement. |
| Cease Fire | CF | Indicates a crew member has announced CEASE FIRE to the crew. |
| Malfunction | M | Identifies the time a malfunction occurred during the engagement. The evaluator must include what type of malfunction in the remarks block. |
| Stoppage | ST | The time a machine gun experienced a stoppage to the cycle of functioning. |
| Misfire | MF | Indicates the crew has experienced a misfire of the main gun. |
| Case Base | CB | The time CASE BASE was announced by the crew indicating the ammunition case base is stuck in the breech or stub base deflector area. |
| Breech Up | BU | Indicates the crew announced the breech block closed prior to loading a subsequent main gun round. |
| Rammer | R | Indicates that the rammer did not return to the home position after loading a round. |
| Gun out of Battery | B | Indicates the crew announced the gun came out of battery. The crew must announce BATTERY followed by CEASE FIRE. |
| Auto-loader Fail | AL | Indicates the time the auto-loader malfunction occurred. |
| Malfunction Cleared | C | Indicates the time when the crew has cleared any identified malfunction. |
| Obscuration | OB | Describes the time that the target is not viewable to the crew due to obscuration at the vehicle or obscuration at the target. |
| Obscuration Cleared | OC | Indicates the time when obscuration was clear. |
| Dust Down / Wind Down | DD / WD | Describes that a target has been knocked down by either wind or debris from a short round. |
| Thermal Fail | TF | Identifies the time the crew experienced a thermal failure. |
| Not Engaged | NE | Indicates that the crew did not engage a target within the presentation. |
| No Kill | NK | Indicates that the crew did not achieve the kill standards on a target. |

**Table 6-5. Firing occasional information terms and abbreviations**

- **Open Time target number (OP#).** This term is used to identify the instant a machine gun or 25mm initiates fires against a threat. OP must include the target number engaged when annotating the information on the score sheet (OP2 indicates “opening time against Target 2.”)
- **Close Time target number (CL#).** This is used to identify the time a weapon ceases to engage a target without defeating it and fires are shifted to a supplemental target. CL must include the target number engaged when annotating the information on the score sheet (CL2 indicates “closing time

against Target 2.") This should only be used if the crew failed to announce a sensing prior to shifting fires to a supplemental target. Use of CL indicates there will be a crew penalty for failing to announce a sensing as required.

- **Driver Up (DU).** This abbreviation indicates the vehicle commander has directed the vehicle to move forward, or that the vehicle moved forward using their SOP.
- **Driver Back (DB).** This indicates the announcement to the driver to seek alternate or to move to the defilade position. It may be used when the vehicle moves rearward without verbal direction from the VC.
- **Doubtful, Left / Right, Target Number (D[L/R][#]).** This statement indicates the strike of the round in relation to the target where the impact does not hit the target and is either left or right of the target area. (DL2 indicates "doubtful left against Target 2.")
- **Lost, target number (L#).** The strike of the round in relation to the target or target area was unobservable by the crew. (L2 indicates "round fired at Target 2 was lost.")
- **Over, target number (O#).** The strike of the round was observed by the crew over the target or target area. (O1 indicates the "round(s) fired at Target 1 was over the target area.")
- **Short, target number (S#).** The strike of the round to the indicated target was short. Additional comments concerning how short the strike of the round occurred should be included in the remarks. (S3 indicates the "round fired against Target 3 was short." Additional comments should include "how short," such as "2 panel forms," "100 meters," etc.)
- **Target, target number (T#).** The strike of the round to the indicated target physically struck the target or target area, as appropriate. (T2 indicates the round "effectively struck Target 2.")
- **Termination (X).** The vehicle commander terminated the engagement or ceased all firing during the engagement.
- **Cease Fire (CF).** Indicates a crewmember has announced CEASE FIRE to the crew. If CEASE FIRE was announced for any reason other than the engagement was complete, the evaluator must annotate the reason for the announcement. If the tower directs CEASE FIRE or any type of administrative CEASE FIRE, the evaluator must annotate the circumstances surrounding the CEASE FIRE.
- **Malfunction (M).** Indicates a malfunction occurred during the engagement. This is only used when the malfunction occurs that is not listed above. Evaluators should use CLR to indicate when the malfunction is cleared, described below.
- **Malfunction Cleared (C).** Indicates the time when any identified malfunction is cleared by the crew. This is not used for misfires or stoppage where the round firing indicates the malfunction is cleared.
- **Misfire (MF).** Indicates the crew has experienced a misfire (failure to fire) of the main gun, 25mm, or missile system. Evaluators must review and critique the actions of the crew to overcome the misfire and annotate the crew's actions on the score sheet for the engagement.
- **Stoppage (ST).** This indicates a machine gun experienced a stoppage to the cycle of functioning. Evaluators must comment on the steps taken by the crew to overcome the malfunction.
- **Case Base (CB).** This indicates the time the crew announced CASE BASE indicating the ammunition case base is stuck in the breech or case base deflector area. Evaluators must annotate the time of the announcement and not when the weapon fired. CB indicates when the crew was aware of the issue, not when the issue physically occurred. Evaluators should use C to indicate when the malfunction is cleared.
- **Breech Up (BU).** This indicates the crew announced the breech block remained closed after firing the previous round and prevents the loading of a subsequent round. Evaluators should annotate BU upon the announcement of the malfunction and not when the malfunction physically occurred during firing. Evaluators should use C to indicate when the malfunction is cleared.
- **Rammer not home (R).** The rammer did not return to the home position after loading a round. When the malfunction occurs, the crew must announce RAMMER NOT HOME. If the crew did not identify the rammer was not stowed in the home position prior to the engagement, the crew must announce MISFIRE – RAMMER NOT HOME. Once announced, the crew must initiate troubleshooting procedures.

- **Breech (BU).** A breech obstruction occurs or the breech fails to open. Crews will announce BREECH. If the crew failed to identify the failure until after trigger squeeze, they must announce MISFIRE – BREECH. The crew will initiate troubleshooting procedures as required.
- **Gun out of battery (B).** The crew must announce BATTERY followed by CEASE FIRE. The tower must announce CEASE FIRE – FREEZE and cease all live training immediately.
- **Auto-loader failure (AL).** The crew must announce AUTO LOADER FAULT and initiate troubleshooting procedures. If the malfunction occurs during an engagement, the crew must announce AUTO LOADER FAULT and either announces CEASE FIRE or MANUAL LOAD to overcome the failure.
- **Obscuration (OB).** Describes the time that the target is not viewable to the crew, the weapon is prepared to fire, and the crew cannot safely engage any target in the presentation with any weapon system.
- **Obscuration Clear (OC).** This is only used when obscuration was annotated on the score sheet. OC indicates the end of any obscuration time. It indicates on the score sheet when obscuration was clear, an element of a fire command was issued after obscuration time started, or when the evaluators believe obscuration is no longer hindering the safe engagement of a target.
- **Dust Down (DD).** Describes that during the engagement, a target was knocked down not by a round or series of rounds striking the target, but by wind, debris, or other anomalies. Annotating the time is critical to ensure the proper target representation time is determined for the benefit of the doubt to the crew.
- **Thermal Fail (TF).** Identifies the time the crew experienced a thermal failure during an engagement. If the failure occurs during night or limited visibility, the evaluator must identify the amount of exposure time remaining for the target presentation to ensure the appropriate amount of exposure time is provide during any representation of the target array once the failure is corrected. In the event the evaluator believes the failure is crew induced, no represent time is authorized. Evaluators must annotate the circumstances related to the thermal failure on the engagement score sheet. Evaluators should use CLR to indicate when the malfunction is cleared.
- **Not Engaged (NE).** Identifies that the labeled target was not engaged during the engagement. NE is placed where the target exposure expires for the respective target. Evaluators must include the target number that corresponds to the specific threat that was not engaged.
- **No Kill (NK).** Identifies when the crew engaged a target but did not successfully meet the kill standards listed within this chapter. Evaluators must annotate NK with the appropriate target number where target exposure time expired, respectively.

## SECTION III – EVALUATION TIMING

6-109. When evaluating crews, the VCE must be able to apply the principles of the previous section to the score sheet. This includes identifying various firing occasion information. From that identified information, the evaluator determines the exposure time, engagement times per target, any additional time that may be used to amend engagement time, or to generate other comments that directly relate to the engagement evaluation.

6-110. Certain timing events must be recorded to determine a firing crew's score for an individual target, in a single or multiple target array and the overall engagement. These timing events begin and end at specific times, and in certain instances, can cause a "break time" where the running engagement time is theoretically "paused." This section details the different measurements of time that are required for the evaluator (timing controller) to accurately measure, record, and report the information to the primary evaluator.

6-111. It is imperative that the timing controller be fluent in all the terms, definitions, and actions listed in this section. Most common errors during live fire evaluation are a direct result of the evaluator's lack of attention to detail during the timing procedures. These evaluator errors can cripple a crew's ability to qualify an engagement, and perhaps, the entire table.

6-112. Evaluations are based on four specific types of time that directly relate to the crew's performance. These are categorized as:

- Exposure time.
- Engagement time.
- Break time.
- Sector clear time.

# EXPOSURE TIME

6-113. Exposure time is a constant during the evaluation of an engagement. It is a single timeline that has a distinct start and end time for each engagement. Exposure time is a fixed length for each target presentation within the scenario. This is the basis from which the target engagement time will be determined.

6-114. All targets are presented (exposed) based on the firing platform's weapon. The standard exposure are shown below:

| Platform Type | Exposure Time |
|---|---|
| Main Gun | 50 seconds |
| Machine Gun | 50 seconds |
| ATGM | 120 seconds |

**Table 6-6. Exposure time by platform type**

6-115. Exposure time starts for all engagements when one of the following occur:

- All targets in the initial presentation are fully locked into position, as identified by the tower's target operating software.
- The firing vehicle engages a target or target area prior to those targets being locked. This allows for accurate evaluation of crews that engage target(s) rapidly before they reach the fully locked position.

6-116. Moving target exposure times are no different than for stationary targets. The scenario may require the moving target be evasive in nature, but the total exposure time authorized remains the same.

# ENGAGEMENT TIME

6-117. Engagement time is a category within target exposure time. It represents the time the crew utilized to engage and defeat each target presented during the engagement. Engagement time is any time that the crew is held accountable for during the evaluation of any engagement. Regardless of crews executing offensive or defensive engagements, the rules to determine the engagement time are:

- Are threat targets still active?
- Is the crew authorized tactical break time?
- Is the crew authorized obscuration break time?

6-118. Evaluators must follow the engagement time rules for all targets during the evaluation. Evaluators must pay particular attention to the active status of any delay presentation in order to provide a fair assessment of the crew's performance during an engagement.

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***Note.*** If any vehicle fires any weapon at any target from the defilade position, all targets presented are considered active.

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# BREAK TIME

6-119. Within exposure time, if the time is not categorized as engagement time, it is categorized as break time. During an engagement, break time is a distinct length of time where the crew was unable to actively engage a target based on a series of rules. Break time consists of four separate types that define why the crew was unable to engage a specific threat. The four break times are:

- Defilade (or defilade break time).
- Tactical break.
- Obscuration.
- Sector clear.

6-120. Evaluators must be familiar with the four types of break time to effectively assess a crew's performance during any engagement. All break times have a direct impact on the crew's scoring for any given engagement, except cease fire time.

## Defilade Time

6-121. Defilade time is provided to crews under specific conditions during defensive engagements. Defilade time is provided once during MMG defensive engagements and up to twice for main gun and ATGM defensive engagements. There are two instances of defilade time: initial and delay.

6-122. **Initial defilade** is provided in the defense for all crews where all of the following conditions are met:

- The crew is properly positioned in their defensive firing position.
- All targets in the presentation are locked.
- The crew has not engaged any targets currently presented. (No active targets are present.)

6-123. **Delay defilade** is authorized only for main gun and ATGM crews where all of the following conditions are met:

- Prior to the delay presentation's target lock, all targets from the initial presentation are defeated / inactive.
- The vehicle is in the authorized defensive firing position when the delay presentation is locked.
- The vehicle has not engaged any target in the delay presentation.

6-124. Initial and delay defilade time ends when one of the following occurs:

- The crew engages any target.
- The vehicle commander directs the vehicle to move forward to an enfilade position.

- The vehicle begins movement forward to an enfilade position with or without commands from the vehicle commander or gunner.

6-125. No defilade time is given for movement of a vehicle from the enfilade to the defilade. This movement is considered tactical break time, discussed below.

***Note***. MGS, ATGM, and MMG crews do not move from their initial defensive firing position. Any movement forward stops any authorized defilade time. These vehicles are not authorized tactical break time as discussed below.

## Tactical Break Time

6-126. Tactical break time is applied to Abrams and Bradley platforms only. Tactical break time is provided for Abrams and Bradley crews fighting from the defense only. It provides a means for the crew to notionally move to an alternate firing position on command.

6-127. Tactical break time occurs after an Abrams or Bradley platform moves to an enfilade position to engage a target or series of targets. Once a target has been engaged, the crew has the option to tactically move to a notional alternate position. Tactical break time will be authorized for Abrams and Bradley crews where:

- The vehicle commander directs the driver to move back, back up, seek alternate, or another phrase that initiates vehicle movement to an alternate firing position.
- The vehicle begins movement from an enfilade position to a turret-down position.
- No weapon is actively engaging any target presentation.

6-128. Tactical break time ends when one of the following actions occur:

- The vehicle commander or gunner directs the movement of the vehicle forward to the enfilade position.
- A weapon fires or a command of execution is given.

6-129. There is no limit to the number of tactical break time segments that are given to the Abrams or Bradley crews. Tactical break time does not increase the exposure time for any target.

6-130. When tactical break time is authorized, it is applied to all active targets in the engagement when the tactical break occurred. There is no limit to the length of the tactical break time; however, crews are expected to defeat all threats within the exposure time provided as rapidly as possible.

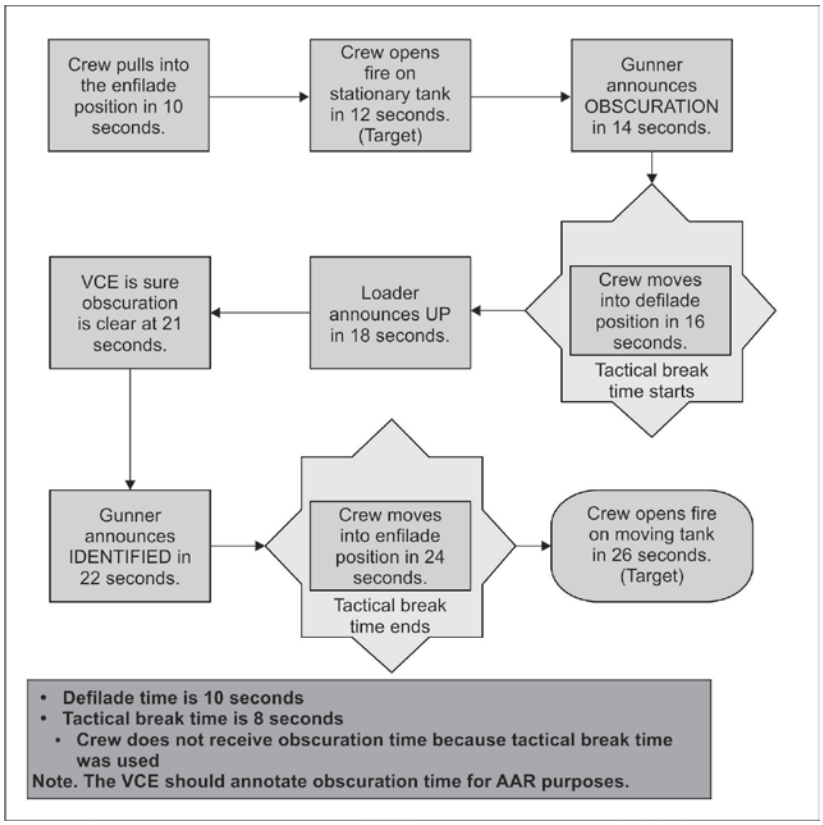


**Figure 6-4. Abrams tactical break time example.**

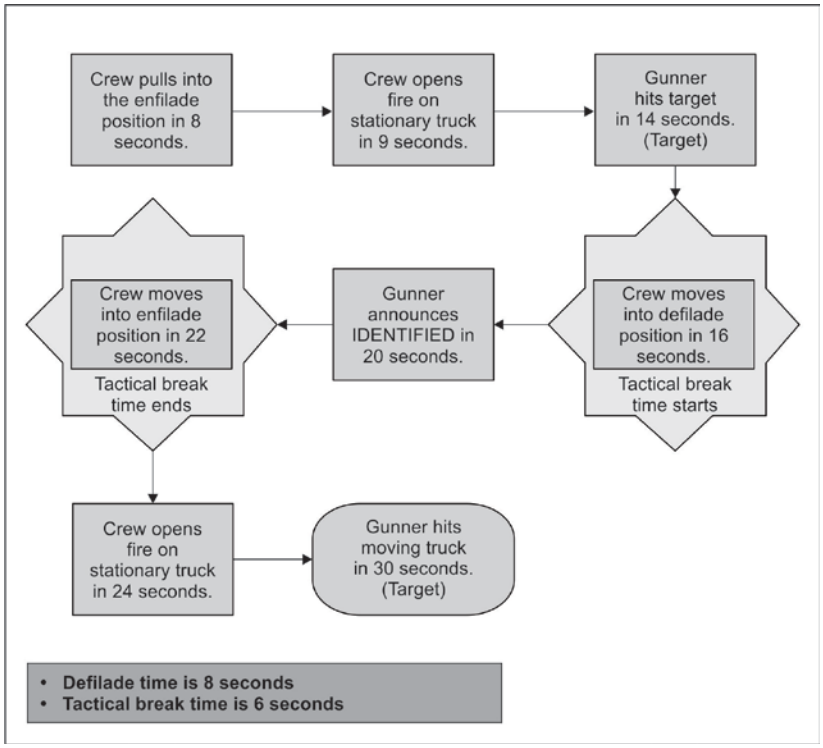


**Figure 6-5. Bradley tactical break time example.**

## Obscuration Break Time

6-131. Obscuration break time is the time that a target is not viewable to a crew due to obscuration at the vehicle and obscuration in the target area. It is typically only authorized for Abrams and MGS crews. There are two types of obscuration:

- Local obscuration. Upon firing the main gun, the firing vehicle is shrouded in dust or debris around the vehicle such that the optics are incapable of observing any target and the crew cannot safely engage any target currently locked in position.
- Target obscuration. Upon firing the main gun at a target, the strike of the round at the target is short or doubtful. The strike of the main gun round at the target area causes dust or debris such that the target cannot be clearly seen from the firing vehicle to safely service with a subsequent round.

6-132. Obscuration break time, commonly referred to as "target obscuration," may only be provided to crews experiencing either local or target obscuration where:

- The target presentation is locked.
- The firing vehicle is incapable of safely engaging any active target, regardless of weapon, due to obscuration as described above.
- The main gun is loaded, armed, and prepared to engage a main gun target. The crew of the firing vehicle must announce when a subsequent main gun round is armed (Abrams) or loaded (MGS).
- The crew has announced a response that indicates they cannot safely engage any active target. Typically, the firer announces CANNOT IDENTIFY or TARGET OBSCURED or another phrase as part of their crew response duties to inform the vehicle commander.

6-133. Obscuration break time is subtracted from the active target(s) affected by the obscuration only. If multiple active targets are presented and the crew has the ability (mechanically) to engage any of them and chooses not to, no obscuration time is authorized for any active target.

6-134. In order to determine the obscuration break time for any engagement, evaluators must accurately determine the start point. The obscuration break time criteria are:

- The firing weapon must be prepared to fire as stated above**.** A vehicle is prepared to fire when the main gun is loaded, armed, and the fire control system is postured correctly for the main gun ammunition loaded.
- The crew has no active target that they can safely engage with any weapon system.
- The crew has announced the target array is obscured.
- The evaluators believe the firing vehicle is experiencing some form of obscuration preventing them from engaging any active threat.
- On the offense, the crew is actively attempting to maneuver through or tactically mitigate the obscuration.

6-135. Obscuration time ends when one of the following occurs:

- The crew announces IDENTIFIED (RANGE) or commands that indicate the crew has the ability to engage any active target.
- The vehicle commander or gunner issues another fire command.
- A round is fired.
- The evaluators perceive the obscuration is not impeding the crew's ability to engage any active target.

6-136. Obscuration time identified may be added to the target exposure time by locking the active targets in place for the corresponding amount of obscuration break time authorized by the evaluator team.

For example, a target is engaged and missed, and was prepared to reengage at 35 seconds. The firing vehicle is clearly obscured by dust and debris, is prepared to engage the active target, no other active target is present, and the crew has announced their obscured from safely engaging. The evaluators identify 20 seconds the crew has been obscured and authorized break time. The target presentation must be locked for 15 seconds. (50 seconds minus 35 seconds of total time that meets the obscuration criteria equals 15 seconds.) This allows for a complete 50 seconds of unobstructed engagement time.

6-137. Target obscuration is at the discretion of the VCE based on firing and weather conditions. Calculating obscuration time requires attention to detail. Evaluators must remember the perspective of the evaluators and target conditions from the tower are quite different from the perspective of the firing crew, especially during night engagements.

6-138. Evaluators must ensure the obscuration break time is not given:

- For delayed targets that were not presented during the obscuration.
- To a target such that it exceeds the authorized target exposure time.
- For a target that was no longer presented.

6-139. The intent of scoring and timing is to force crews to train as they would fight. Crews should be trained and rewarded for hitting targets rapidly, but not penalized when artificial maneuver constraints prevent them from continuing to engage targets. VCEs are responsible for determining whether local obscuration prevents the crew from continuing to engage its targets. VCEs are responsible to maintain fairness and equity when calculating break times across all firing crews.

6-140. All actions in determining the obscuration break time as discussed above are required to be recorded on the engagement score sheet in a clear and concise manner. Failing to annotate all pertinent obscuration information on the score sheet could result in the crew not receiving the authorized break time in the event the engagement is retimed by an adjudicating NCO.

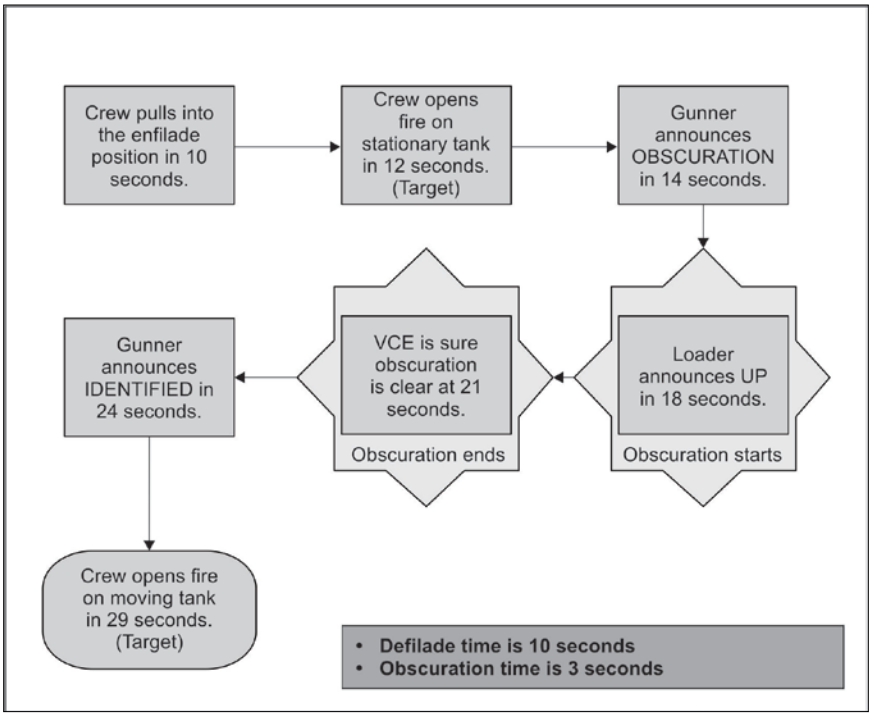


**Figure 6-6. Defense obscuration break example**

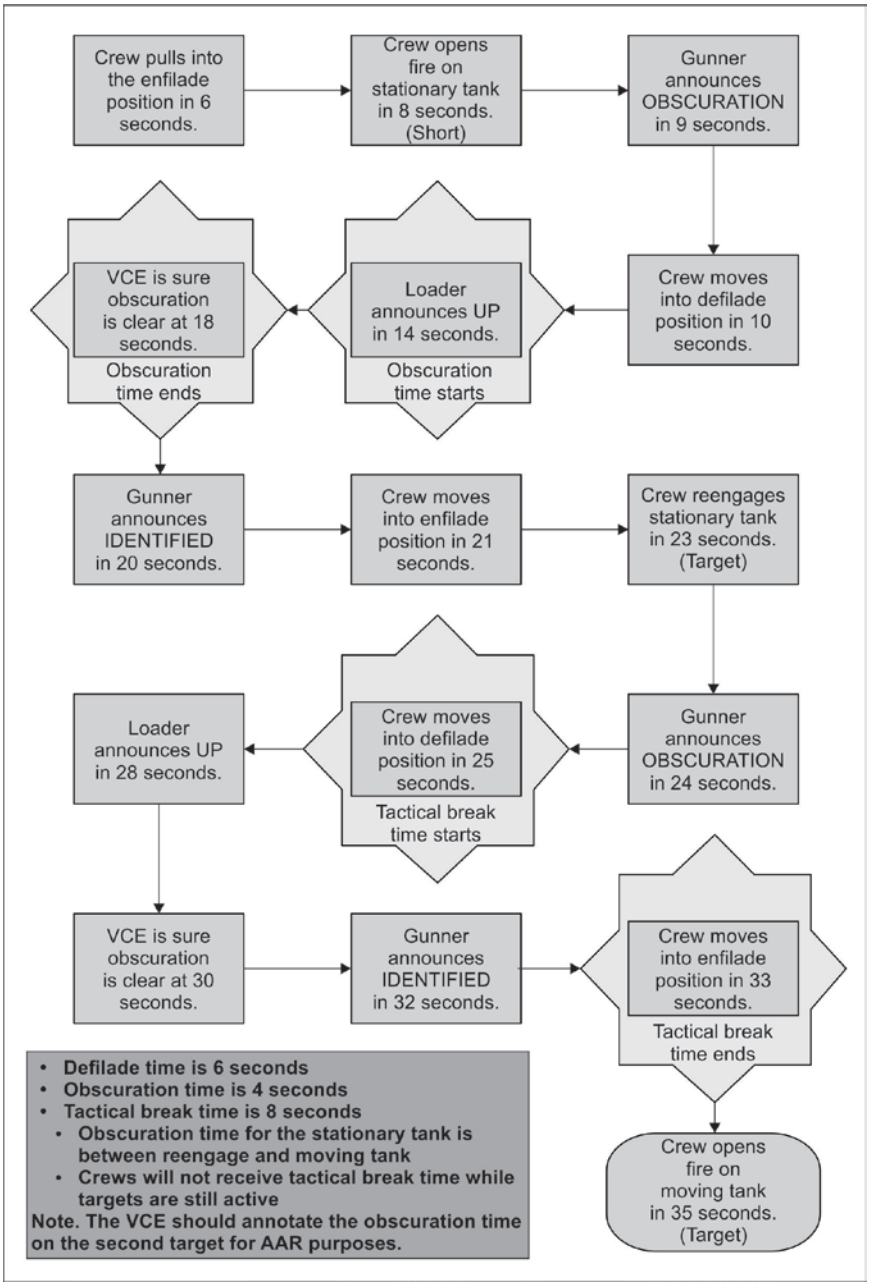


**Figure 6-7. Abrams obscuration and tactical break time example**

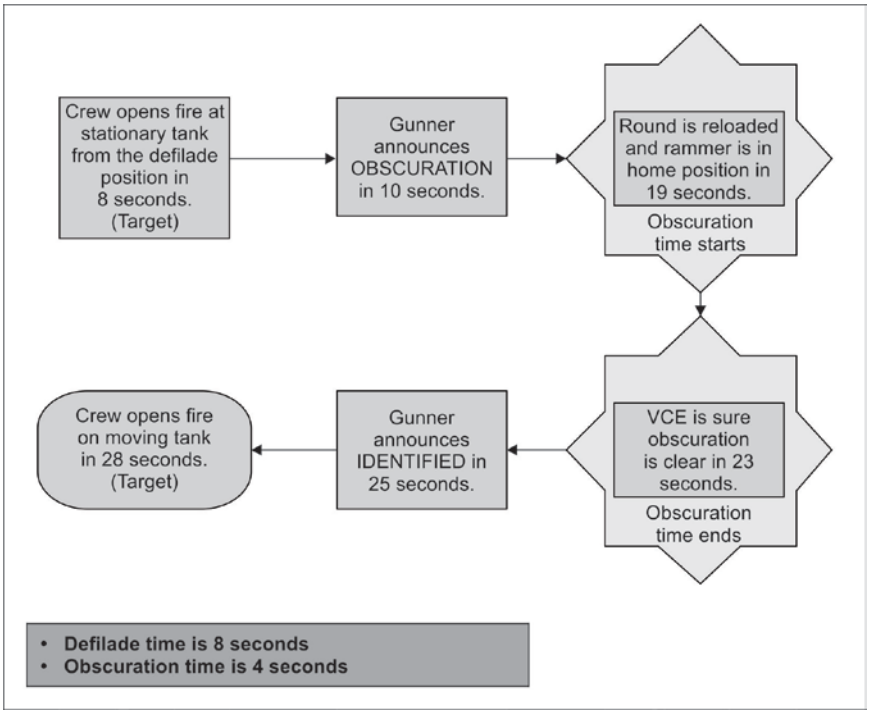


**Figure 6-8. MGS defense obscuration break time example**

## Sector Clear Time

6-141. Sector clear (SC) time is a period of time that depicts when the crew has ceased all engagements against all targets presented during an engagement. This time is not used to calculate the crew's overall score for the engagement.

6-142. The start of the SC time is determined by:

- Vehicle commander or gunner announcing the termination of the engagement.
- All targets have been defeated. (No active targets remain.)
- No targets are inactive (presented and not engaged). This does not include any second defilade time authorized between the initial and delay presentations.

6-143. SC time ends when the target exposure time expires. This allows evaluators to verify their evaluations of any engagement by ensuring that:

$$Exposure\ Time = Engagement\ Time + Total\ Break\ Time + Sector\ Clear\ Time$$

Or

$$Exposure\ Time = Engagement\ Time + (Defilade + Tactical + Obscuration) + Sector\ Clear\ Time$$

# ALIBI PROCESS

6-144. The alibi process is the procedure that must be followed when a crew requests an alibi due to no fault of their own. These include vehicle mechanical failures and safety considerations that prevent firing once an engagement has begun. All platforms or separate weapons executing live fire have the ability to continue the engagement to overcome most issues. Alibis should rarely be granted. Units should choose to re-fire the engagement(s) as second run only.

6-145. The expectation during training for every live fire engagement is that once a VC reports to the tower that the crew is REDCON ONE (prepared to negotiate the engagement as directed by the tower prompt), it accepts the next 50- to 75-second engagement as final for its first run.

6-146. During the course of gunnery, situations may present themselves which do not allow a crew, through no fault of its own, to qualify. In certain cases, the alibi process may be applied.

6-147. An alibi is –

- The process used for a crew to overcome a catastrophic event or an unsafe condition that prevented them from executing the engagement to the conditions listed through no fault of its own.

6-148. An alibi is not –

- A means to achieve a higher score to qualify or achieve a higher rating or standing once qualified on the table.
- A reason to refire an engagement because the crew could have done better.
- A reason to be negligent in the performance of -10 maintenance functions, prep-to-fire checks, pre-combat checks (PCC), pre-combat inspections (PCI), or armament services.

6-149. The following conditions apply to all alibis:

- Alibis will only be granted for malfunctions and unsafe conditions that were of no fault of the crew and were not identifiable by the crew by performing PMCS and prepare to fire checks. Typically, the limitations for alibis are catastrophic engine failure or thermal optic failure during the night phase of live fire. Malfunctions that can be corrected by the crew through immediate action are not the basis for an alibi.
- Allow a crew one alibi for one engagement only. If a vehicle commander decides to continue on with the training event without pulling his crew to correct any possible maintenance issue(s), the vehicle commander accepts the risk of failing his crew's training and is not authorized an alibi.
- Weapons malfunctions caused by parts or components that are "out of adjustment" are not grounds for an alibi.
- Once a vehicle commander has indicated that the crew is prepared to execute an engagement, the engagement continues through completion. At the completion of the engagement, the vehicle commander may choose to remove his vehicle from the range to identify and assess the problem that caused the mechanical malfunction. If the mechanical malfunction was not induced by crew error, then the vehicle commander can request an alibi.
- The firing unit Master Gunner must verify the alibi before requesting an alibi to the battalion or task force commander. If the fault cannot be validated, it cannot be submitted for approval.
- Only the battalion or task force commander can grant an alibi. The alibi must be documented and reported to the unit's higher headquarters with the overall live fire results.
- Any alibi granted will be annotated in the remarks section of the score sheet by the vehicle commander evaluator. The VCEs are responsible to evaluate all alibi fires.

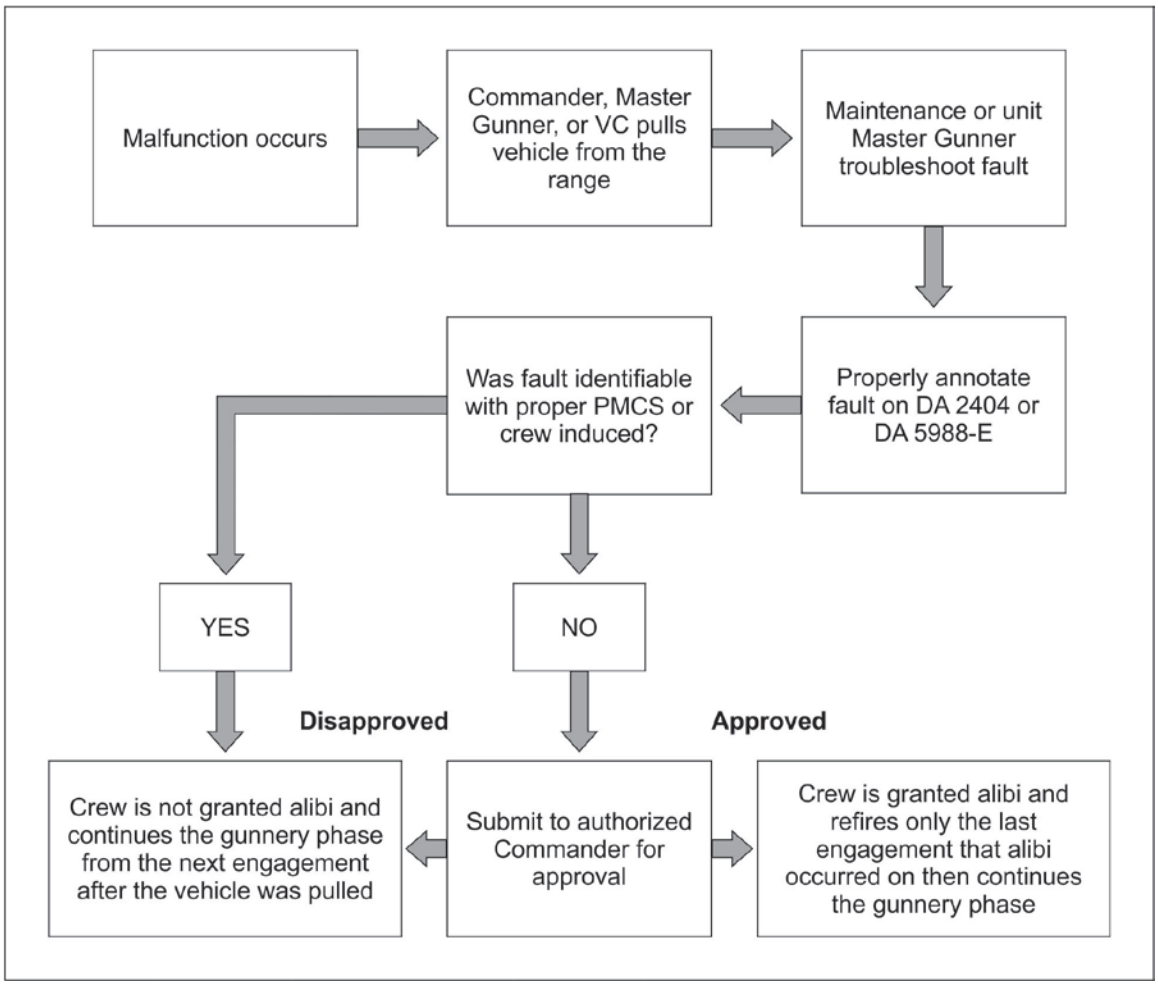


**Figure 6-9. Alibi process**

## SECTION IV – EVALUATING THE CREW'S DUTIES

6-150. Evaluating the crew's performance while conducting engagement, either in simulation or during live events, requires an acute attention to detail, an in-depth knowledge and understanding of the engagement process, and the capabilities and limitations of the firing weapon or system. When evaluators identify shortcomings, errors, inaccurate or incorrect responses during the conduct of fire, they must be able to effectively annotate and remark on those issues.

6-151. To assist the evaluators with their evaluation, crew penalties are defined and listed in a logical sequence. Only those penalties listed within this section may be assessed against any crew. Any unit specific penalties may only be assessed as AAR talking points.

# CREW PENALTIES

6-152. This section is set up for evaluators to easily identify crew penalties for the specific platform they are evaluating. Crew penalties vary in severity. They are assessed for teaching purposes, and provide an additional measure of proficiency for commanders to consider. Penalties under the common heading are applicable to all platforms. VCEs implement crew-duty penalties to ensure the crews utilize proper engagement safety, techniques and procedures, as well as maintain standard conduct of fire procedures to build crew cohesion.

6-153. There are four categories of crew-duty penalties which may be applied to any engagement:

- **Immediate disqualification**. Extremely hazardous conduct.
- **Automatic zero**. Disregard for announced actions, conditions, and standards.
- **30-point**. Failure to adhere to basic safety/personnel protection precepts.
- **Five-point**. Failure to perform fundamental leader/crew tasks.

6-154. VCEs are not authorized to deduct points for any crew-duty penalty not listed within this chapter. Units are not authorized to create additional crew penalties for any reason. These are established standards used for all platform gunnery and aid in providing a standardized method of evaluation across the force. In the event a unit or evaluator wishes to add key teaching points, they should create a list for inclusion in the evaluation solely as discussion points for use during the AAR.

6-155. The reverse side of DA Form 8265-1, *Common Crew Roll Up*, contains a Crew Penalties Matrix. The matrix legend in the lower left portion should be used when reading and inputting penalties to the front of the form. Figure 6-10 shows the naming convention legend for ease of use:

6-156. The legend provides a reference to the penalty codes that relate to specific infractions. These standardized codes are used during live and simulations-based training at the crew level. The standard coding system of these penalties provides a means of identifying training gaps and trends across a broader training community, and establishes a finite listing of actions that negatively impact the crew's overall performance, safety, cohesion, and efficiency.

| | |
|---|---|
| DQ-01 | Crew fires outside the range fan. |
| DQ-02 | Crew member not in proper uniform. |
| DQ-03 | Firing into the berm from the defilade. |
| DQ-04 | Negligent discharge. |
| DQ-05 | Guards, shields, screens and doors not closed, properly installed, or serviceable. |
| DQ-06 | Loader holding a round in his lap when firing the main gun (Abrams). |
| DQ-07 | Ammunition doors remain open while firing (Abrams). |
| DQ-08 | Incorrectly installed or unserviceable stub base catcher box or stub base deflector (Abrams). |
| AZ-01 | Failure to adhere to the conditions of the task for the given engagement. |
| AZ-02 | Failure to button up or mask during a CBRN engagement. |
| AZ-03 | Using components of the fire control system that are announced as degraded in the conditions of the task. |
| AZ-04 | Vehicle commander not firing his engagement. |
| AZ-05 | Gunner identifies the target with the gunner's auxiliary sight before receiving the command DRIVER MOVE OUT (defensive posture, Abrams). |
| AZ-06 | Destruction of a target by a crew member not described in the condition of the task. |
| AZ-07 | Failure to over-pressurize during a CBRN engagement (Abrams). |
| AZ-08 | Fires the main gun at troops, except for canister and 25mm engagements as directed by the tower (range constraints). |
| AZ-09 | Failure to raise TOW launcher when in the defense or in a traffic control point engagement (Bradley). |

**LEGEND**

**Penalty Type → 05 - 02 ← Sequence Number**

| | |
|---|---|
| **DQ - Immediate Disqualification** | **AZ - Automatic Zero** |
| **30 - 30 Point Penalty** | **05 - 5 Point Penalty** |

**Figure 6-10. Penalty matrix, left side**

| | |
|---|---|
| 30-01 | Firing or attempting to fire before the command of execution. |
| 30-02 | Firing or attempting to fire the main gun before announcing UP (Abrams) or attempting to fire while main gun is loading (Mobile Gun System). |
| 30-03 | Announcing FIRE before the loader announces UP on main gun engagements (Abrams). |
| 30-04 | Firing or attempting to fire the main gun before announcing ON THE WAY (Abrams only. For other platforms, see 05-06). |
| 30-05 | Loader or gunner leaves the main gun armed or arms the main gun between engagements without receiving a fire command (Abrams or Mobile Gun System). |
| 30-06 | Firing or attempting to fire the main gun with the hatches open or with personnel outside of the vehicle (Mobile Gun System). |
| 30-07 | Failure of vehicle commander to announce DESIGNATE when designating a target using commander's independent sight. |
| 05-01 | Vehicle commander fails to announce element of fire command that is not provided by the fire control system. |
| 05-02 | Failure of vehicle commander to use required modifier terms. |
| 05-03 | Firer (gunner or loader) fails to identify the target prior to command of execution. |
| 05-04 | Gunner or loader fails to announce range to target after announcing IDENTIFIED. |
| 05-05 | Vehicle commander or gunner fails to give sensing (as required). |
| 05-06 | Firing or attempting to fire before announcing ON THE WAY (for Abrams main gun, see 30-04). |
| 05-07 | Incorrect crew response to a fire command. |
| 05-08 | Failure of vehicle commander to use FIRE AND ADJUST and DESIGNATE (as required). |
| 05-09 | Failure to announce ammunition that is loaded during change of ammunition such as SABOT LOADED or HEAT LOADED (loader Abrams or gunner Mobile Gun System). |
| 05-10 | Gunner fails to announce AMMUNITION / WEAPON INDEXED (as required). |
| 05-11 | Loader announces UP when it is obvious to the vehicle crew evaluator that the round is not loaded (Abrams). |
| 05-12 | Loader arms main gun when gunner is directed to engage with machine gun (Abrams). |
| 05-13 | Incorrect engagement techniques. |
| 05-14 | Failure to announce CEASE FIRE for the main gun before giving a fire command for loader's M240 (Abrams). |

**Figure 6-11. Penalty matrix, right side**

6-157. The VCE is required to have a full understanding of these penalties, their codes, and the authorized method of deducting the penalties. The VCE must be able to easily and rapidly detect these penalties using various methods during evaluation. Failure to do so may result in serious safety concerns. All penalties assessed must be discussed during the AAR for the engagement they occur.

6-158. The following section includes a short explanation of each penalty, provided by grouping, then by their applicability to all (common) platforms, followed by those specific to the main gun/ATGM systems.

## IMMEDIATE DISQUALIFICATION

6-159. **Definition - Extremely hazardous conduct**. An extremely hazardous action of a crew or crewmember during a live fire training exercise. Identification of some of these penalties may only be accomplished through the use of on-board cameras during the training event.

6-160. **Application**. Immediate disqualifications are applied immediately, and at times, prior to a live-round being fired. All immediate disqualification penalties require the crew to immediately cease fire, and perform all required actions to clear and elevate all weapon systems (unless investigation of the incident is required). The crew must be removed from the range upon verification the platform's weapons are safe.

6-161. The following finite list of all immediate disqualification penalties for main gun, ATGM, and MMG crews, respectively. Units are not authorized to add to the penalties listed below, nor make any modifications to their definition or intent:

- **DQ-01:** Crews firing outside the range fans. A firer or firing vehicle may not fire any weapon outside the marked left and right range fans. This conduct, either accidental or deliberate, must be reported to range operations immediately.
- **DQ-02:** Crewmembers not in proper uniform. All crewmembers are required to wear the proper uniform while firing according to DA PAM 385-63, *Range Safety*, conditions of the firing event, and the unit commander. Crews requiring the use of flame retardant uniforms must comply with the respective vehicle's TM for the proper wear and appropriate use guidelines.
- **DQ-03:** Firing into the berm from the defilade. Vehicle commanders are responsible for ensuring the vehicles weapon systems are clear of the berm prior to issuing the command of execution. Crews that discharge weapons of any caliber into the battle position will be immediately disqualified. This conduct, either accidental or deliberate, must be reported to range operations immediately.
- **DQ-04:** Negligent discharge. The unintentional and careless discharge of ammunition by any weapon system without initiation of a fire command or proper control measure. This conduct must be reported to the unit commander immediately.
- **DQ-05:** Guards, shields, screens and doors not closed properly installed, or serviceable. The proper mounting and instillation of safety guards, shields, and screens is illustrated in applicable TM, failure to adhere to their use is a serious safety concern that could result in injury, death, or damage to the equipment. The range OIC is required to halt the training sequence for the firing crew prior to executing the target array for training. The range OIC is responsible to ensure no target arrays are presented to any crew that fails to have their vehicle's guards in place. No crewmember may dismount the firing vehicle during any engagement.
- **DQ-06 (Abrams):** Loader holding a round in his lap when firing the main gun. Commonly referred to "lap-loading" is a major safety concern for the entire crew and not permitted. The range OIC is required to cease all live-training activity immediately once this violation is identified.
- **DQ-07 (Abrams):** Ammunition doors remain open during firing. Due to safety concerns, neither the ready nor the semi-ready ammunition door may be open during firing. This includes engaging of the knee switch constantly or disabling the ammunition door circuit breaker.
- **DQ-08 (Abrams):** Stub base catcher box or case base deflector not properly installed. Use of the main gun during any engagement without the stub baser deflector or catcher box properly installed is prohibited. Failure to install or use these components can cause severe injury to the crew or damage to the firing vehicle.

## AUTOMATIC ZERO-POINT PENALTY

6-162. **Definition - Disregard for announced actions, conditions, and standards**. An automatic zero-point penalty commonly referred to as an "auto zero," is assessed for any disregard for the announced task, action, or conditions for any engagement. This includes any RPM that may be applied to a task's conditions.

6-163. **Application**. Any crew found in violation of the following policies will receive 0 points for the engagement they are firing. These penalties are applied at the completion of the engagement.

6-164. The following finite list of all auto-zero penalties for main gun, ATGM, and MMG crews, respectively. Units are not authorized to add to the penalties listed below, nor make any modifications to their definition or intent. These penalties are applied when the crew changes or alters the conditions of a task during an engagement. The conditions of the task consist of vehicle posture, defeating a machine gun target with main gun, defeating a main gun target with machine gun, and the destruction of any target by an unauthorized firer:

- **AZ-01:** Not adhering to the conditions of the task for the given engagement. Failure to fire a task in accordance with the set conditions given for that particular engagement.
- **AZ-02:** Not buttoned up or masked during a CBRN (RPM) engagement. Crewmembers failing to don protective masks for CBRN engagements. Units may require crews to submit NBC-1 reports or other chemical-related tasks as part of their scenario; however, crews who fail to execute these unit-directed functions ***may not be penalized***.

- **AZ-03:** Using components of the fire control system that are announced as degraded in the conditions of the task. For example, an RWS crew that clearly determines the range to target with the LRF during a degraded, LRF-failure engagement, or a main gun/ATGM crew required to use the manual control handles as part of the conditions when it is evident a crewmember used the power control handles.
- **AZ-04:** Vehicle commander fails to execute his engagement. This penalty will be assessed when the gunner fires the weapon system on identified vehicle commander engagements. For main gun crews, the vehicle commander must fire his engagement from his position on the vehicle.
- **AZ-05 (Abrams, Defense, GAS):** Gunner identifies the target with the GAS before command of DRIVER MOVE OUT is given. Identifying a target while in the defilade in the GAS demonstrates that the crew is not in a correct defensive position or the gunner is failing to use the appropriate optic for the degraded task.
- **AZ-06 (Abrams):** Loader purposely does not engage his target on loader/simultaneous engagement to allow another crewmember to engage and defeat the target. This also applies to an ***unintentional*** engagement of the loader's target by another crewmember.
- **AZ-07 (Abrams):** Not over-pressurized during a CBRN engagement (commander selected option). When selected by the commander for CBRN tasks, any Abrams crews not buttoning up and/or utilizing the vehicle's over-pressure system during a CBRN engagement.
- **AZ-08:** Firing the main gun at troops except as directed by the tower. Firing the main gun at troop or troop like targets unless specifically directed by the conditions of the engagement or tower. Specific tasks that are authorized by the tower include canister engagements or 25mm area target engagements.
- **AZ-09 (Bradley, Defense or TCP):** Failure to raise the TOW launcher when in the defense or when executing a traffic control point engagement. Failing to utilize standard engagement techniques by failing to raise TOW launcher prior to REDCON ONE during defensive or traffic control point engagements. This penalty **may not be enforced** during administrative halts during the execution of the range.

## THIRTY-POINT PENALTY

6-165. **Definition - Failure to adhere to basic safety/personnel protection precepts**. These penalties are commonly referred to as "safety penalties" or "safeties."

6-166. **Application**. Any crew found in violation of the following policies will receive a 30-point deduction for the engagement they are firing. These penalties are applied at the completion of the engagement. Evaluators may not take more points than the crew earned during the engagement.

6-167. The following finite list of all 30-point penalties for main gun, ATGM, and MMG crews, respectively. Units are not authorized to add to the penalties listed below, nor make any modifications to their definition or intent:

- **30-01:** Firing or attempting to fire before the command of execution. Any firer that physically fires or attempts to fire any weapon or system without the clear command of execution.
- **30-02 (Abrams/MGS):** Firing or attempting to fire the main gun before the announcement of UP (Abrams), or attempting to fire the main gun while it is loading (MGS).
- **30-03 (Abrams):** Announcing FIRE before the loader announces UP.

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***Note.*** If the crew announces FIRE before UP ***and*** fires the main gun before UP, that crew will receive both 30-01 ***and*** 30-02 penalties.

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- **30-04 (Abrams Main Gun):** Firing or attempting to fire the main gun prior to announcing ON THE WAY. This penalty only applies for main gun engagements on Abrams platforms. For all other platforms and machine guns, see penalty 05-06, described later in this section. The correct trigger squeeze is expected to coincide with the announcement of the "Y" in ON THE WAY.
- **30-05 (Abrams/MGS):** Loader or gunner leaving the main gun armed or arming the main gun between engagements without receiving a fire command. Loaders are not authorized to arm the main

gun or leave the main gun in an armed status between engagements. This includes "preparing for a pending engagement" without any initiation of a fire command involving the use of the main gun. This applies to the gunner when leaving the electrical safe in the armed position between engagements or without direction from a fire command.

- **30-06 (MGS):** Firing or attempting to fire the main gun with the hatches open or personnel outside the vehicle. MGS crews must be buttoned up during main gun engagements due to excessive overpressure hazards.
- **30-07:** Vehicle commander fails to announce DESIGNATE when designating a target using the commander's independent viewer. DESIGNATE must be used whenever the vehicle commander uses his independent viewer and designates the gunner to a follow-on (supplemental) target.

## FIVE-POINT PENALTY

6-168. **Definition - Failure to perform fundamental leader or crew tasks**. The leader and crew tasks listed are required by the engagement process found in TC 3-20.31-13, *Direct Fire Engagement Process (DIDEA)*.

6-169. **Application**. Any crew found in violation of the following policies will receive a five-point deduction for the engagement they are firing. These penalties are applied at the completion of the day or night firing phase where they occur. Evaluators may not take more points than the crew earned during the engagement.

6-170. The following finite list of all five-point penalties for main gun, ATGM, and MMG crews, respectively. Units are not authorized to add to the penalties listed below, nor make any modifications to their definition or intent:

- **05-01**: The vehicle commander fails to provide any required element or term in the fire command as described in the conditions of the task for the engagement.
- **05-02**: Vehicle commander fails to use the required modifier term to specifically identify which target to engage when multiple targets are announced in an initial or supplemental fire command.
- **05-03**: Firer fails to announce IDENTIFIED as a required crew response during any fire command.
- **05-04**: Gunner or loader fails to announce the RANGE to target after IDENTIFIED prior to engaging a target. This represents an incorrect response to a fire command. This includes failing to announce CHOKED (RANGE) when directed to determine range using a stadia or stadiametric reticle.
- **05-05**: Failure to announce a sensing as required. Sensings must be given for every 105mm or 120mm round fired, prior to any subsequent or supplemental fire command, and prior to terminating any engagement.
- **05-06**: Firing or attempting to fire before announcing ON THE WAY as required. This cannot be given to an Abrams when firing the main gun. (See penalty 30-04.)
- **05-07**: Incorrect response to a fire command. This penalty is applied to crews that fail to provide the required response terms as described in TC 3-20.31-13, *Direct Fire Engagement Process (DIDEA)* This penalty must be supported by the DIDEA text, where the response or action is specifically required.
- **05-08 (Abrams / MGS):** Vehicle commander fails to use FIRE AND ADJUST or FIRE AND ADJUST with DESIGNATE, as required.
- **05-09 (Abrams / MGS):** Loader or gunner fails to announce ammunition that is loaded or indexed during a change of ammunition command (HEAT LOADED, SABOT LOADED, and similar commands). The loader must load and announce the loaded ammunition as stated in the fire command. (For example, FIRE, FIRE ammo.)
- **05-10:** Gunner fails to announce weapon/ammunition that is indexed during a change of weapon / ammunition command. This penalty applies to gunners who fail to announce (AMMUNITION) INDEXED or (WEAPON) INDEXED as appropriate.
- **05-11 (Abrams):** Loader announces UP when it is obvious to the VCE that the round is not loaded. This is a penalty is typically applied when a misfire occurs, where the loader announced the weapon is loaded and armed (UP), but the breech is not fully closed or loading is not yet complete. Evaluators with the ability to monitor the crew's performance inside the vehicle should pay close attention to the loader's actions to ensure proper conduct of fire and safety are maintained.

- **05-12 (Abrams):** Loader arms main gun when the gunner is directed to engage with the coax. This penalty is used to prevent the accidental discharge of the main gun when the vehicle commander intends to engage the target with the coax machine gun.
- **05-13 (Bradley ODS or Bradley AUX):** Incorrect engagement techniques. Bradley ODS or Bradley crews firing from the AUX sight are required to fire a sensing round prior to the killing burst. In the event the sensing round kills the target, no penalty will be assessed. All 25mm point targets require three strikes to achieve the kill standard. When one strike defeats the threat, the target presentation is not configured to standard.
- **05-14 (Abrams):** Failure to announce CEASE FIRE for the main gun prior to giving a fire command for a loader's M240 engagement. The vehicle commander must announce CEASE FIRE if the main gun was in use prior to initiating a fire command for a loader engagement.

# APPLICATION OF PENALTIES

6-171. All safety penalty points are deducted from the engagement that they occur on. This includes "immediate disqualification," "automatic zero," and "30-point" penalties.

6-172. Five-point penalties represent leader and fundamental tasks crews must be proficient in to maintain training effectiveness and crew cohesion. Five-point penalties are deducted from the end of every table's phase, day and night, where they occurred. This allows the crew the maximum points to qualify the engagement. The intent is to ensure a crew only fails an engagement due to safety, failure to adhere to task, conditions, and standards, or that they fail to defeat targets in the required amount of time.

6-173. There is no limit to the number of crew penalties that can be assessed to a crew. There is no limit to how many times any type of crew penalty is assessed; however, crews may not be assessed multiple penalties for the same infraction. When an infraction falls under multiple penalty categories, only one penalty may be assessed. In the event multiple penalties of difference categories are possible, only the highest category may be assessed to the crew from any single infraction.

6-174. Evaluators may only assess penalties from points earned on an engagement. For example, if a crew achieves a raw score of 47 points, but receives two penalties of 30-points each, the maximum number of points assessed cannot be greater than 47.

6-175. All penalties in excess of the available points must be annotated for the crew's AAR. No penalties are assessed for actions between engagements except for DQ-04, Negligent Discharge.

6-176. Five-point penalties that occur on a zero-point engagement will not be deducted from the end of the phase roll-up (day or night). Ultimately, penalties may only be assessed on points earned during the engagement.

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***Note.*** A crew must achieve 70 points or more on each target presented to qualify the engagement. If a crew fails to achieve 70 points on any target presented during an engagement, that crew cannot qualify the engagement even though their overall engagement score is above 70 points on average.

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# DISQUALIFICATION CRITERIA AND RECERTIFICATION

6-177. A disqualification is the immediate removal from live-training of any unsafe crew until the crew satisfactorily completes a recertification program. Disqualification is a critical failure in the safe conduct of the range by leaders using weapons or weapon systems in such a manner that has the potential to injure or kill Soldiers or civilians, or excessive damage to government property.

6-178. The following is a list of disqualification criteria:

- A crew that performs any actions listed in the "immediate disqualification" section above.
- A crew that performs three each 30-point penalties, "failure to adhere to basic safety/personnel protection precepts" during the same table.

***Note.*** A crewmember or entire crew can be disqualified and require recertification for actions not associated with firing. The unit commander may disqualify individuals or crews that consistently perform unsafe acts during non-firing or preparation tasks. This type of disqualification will be at the discretion of the unit commander.

### RECERTIFICATION STANDARDS

6-179. Recertification for live fire exercises and training tables will be permitted and validated by the battalion or squadron commander. The recertification process cannot be delegated.

6-180. The following is a list of prerequisites that must be performed before recertification is granted:

- Company commander counsels the crew describing the reason for disqualification on DA Form 4856, *Developmental Counseling Form*. The plan of action block must state all necessary requirements for recertification. The leader's responsibilities block should state the Master Gunner platoon sergeant as the certifying official for all recertification tasks. The battalion commander must sign assessment block once all requirements are met to complete the recertification requirements.
- Retrain and retest all tasks in Table I, Gunnery Skills Test, pertaining to the weapons on the platform only. The crew must achieve all GOs to successfully complete the re-training requirement.
- Successfully complete Table II, Simulations Gate To Live Fire, on the authorized training system.

***Note.*** The battalion or squadron commander is the approving authority for all recertification. A commander may impose additional re-training requirements as desired to ensure the crew's safety and effective performance during live fire training.

## SECTION V – COMMON CREW SCORE SHEET

6-181. Evaluators use DA Form 8265, *Common Crew Score Sheet,* to record the results of the training table engagements. The instructions for completing the score sheet are provided below.

### HEADER INFORMATION (ADMIN).

6-182. Evaluators need to ensure that they have all the required information available to complete the header section. The header information (administrative) area records the crew, unit, and scenario targetry information that assists in the accurate determination of the engagement score.

- Block 1: Enter the engagement number (Table Number + Task Number = Engagement Number).
- Block 2: Enter the firing (own) vehicle's posture (defense or offense).
- Block 3: Enter the complete VCE standard name line (rank, last name, first name, middle initial).
- Block 4: Enter the date the engagement was executed.
- Block 5: Enter the firing crew's unit name.
- Block 6: Enter the bumper number of firing crew. If the crew does not use bumper numbers, enter the firing crew's call-sign.
- Block 7a: Conditions of the task for the engagement. Check all boxes that apply to the engagement.
- Block 7b: Degraded conditions for the engagement. Check all boxes that apply to the engagement.
- Block 8: Target 1 information (8a. through 8g.). Enter the specific information about Target 1 for the engagement as described below:
    - Block 8a. Target type. Enter the target type for Target 1. This target must accurately identify the most dangerous target of the initial presentation (Target 1 and Target 2). Use the information in Block 3 on the reverse of the form to identify the correct target type.
    - Block 8b. Range to target. Enter the appropriate range to Target 1. Range to target should be listed in 100 meter increments.

- Block 8c. Target posture. Enter the appropriate target posture from Block 4 on the reverse of the form.
- Block 8d. Ammunition type. Annotate the authorized ammunition type for the target within the engagement. This should be identified as "Sabot," "HEAT," "AP," HE," "CAN," "HEP," "MPAT," or the specific small arms caliber, as appropriate.
- Block 8e. Rounds authorized. Enter the total number of authorized rounds for the target.
- Block 8f. Rounds expended. This will be completed at the end of the engagement. For main gun engagements, enter the true number of rounds the crew fired at the target. For small arms, enter an approximate number of rounds expended at the target.
- Block 8g. Firer. Enter the appropriate firer that is required to engage the target by the conditions of the task, found in Block 1 on the reverse of the form.

- Block 9: Target 2 information (9a. through 9g.). Enter the specific information about Target 2 for the engagement as described below:

  - Block 9a. Target type. Enter the target type for Target 2. This target must accurately identify the least dangerous target of the initial presentation (Target 1 and Target 2). Use the information in block 3 on the reverse of the form to identify the correct target type.
  - Block 9b. Range to target. Enter the appropriate range to Target 2. Range to target should be listed in 100 meter increments.
  - Block 9c. Target posture. Enter the appropriate target posture from Block 4 on the reverse of the form.
  - Block 9d. Ammunition type. Annotate the authorized ammunition type for the target within the engagement. This should be identified as "Sabot," "HEAT," "AP," HE," "CAN," "HEP," "MPAT," or the specific small arms caliber, as appropriate.
  - Block 9e. Rounds authorized. Enter the total number of authorized rounds for the target.
  - Block 9f. Rounds expended. This will be completed at the end of the engagement. For main gun engagements, enter the true number of rounds the crew fired at the target. For small arms, enter an approximate number of rounds expended at the target.
  - Block 9g. Firer. Enter the appropriate firer that is required to engage the target by the conditions of the task, found in Block 1 on the reverse of the form.

- Block 10: Target 3 information (10a. through 10g.). Enter the specific information about Target 3 for the engagement as described below:

  - Block 10a. Target type. Enter the target type for Target 3. This target must accurately identify the most dangerous target of the initial presentation (Target 3 and Target 4). Use the information in Block 3 on the reverse of the form to identify the correct target type.
  - Block 10b. Range to target. Enter the appropriate range to Target 3. Range to target should be listed in 100 meter increments.
  - Block 10c. Target posture. Enter the appropriate target posture from Block 4 on the reverse of the form.
  - Block 10d. Ammunition type. Annotate the authorized ammunition type for the target within the engagement. This should be identified as "Sabot," "HEAT," "AP," HE," "CAN," "HEP," "MPAT," or the specific small arms caliber, as appropriate.
  - Block 10e. Rounds authorized. Enter the total number of authorized rounds for the target.
  - Block 10f. Rounds expended. This will be completed at the end of the engagement. For main gun engagements, enter the true number of rounds the crew fired at the target. For small arms, enter an approximate number of rounds expended at the target.
  - Block 10g. Firer. Enter the appropriate firer that is required to engage the target by the conditions of the task, found in Block 1 on the reverse of the form.

- Block 11: Target 4 information (11a. through 11g.). Enter the specific information about Target 4 for the engagement as described below:

- Block 11a. Target type. Enter the target type for Target 4. This target must accurately identify the least dangerous target of the initial presentation (Target 3 and Target 4). Use the information in Block 3 on the reverse of the form to identify the correct target type.
- Block 11b. Range to target. Enter the appropriate range to Target 4. Range to target should be listed in 100 meter increments.
- Block 11c. Target posture. Enter the appropriate target posture from Block 4 on the reverse of the form.
- Block 11d. Ammunition type. Annotate the authorized ammunition type for the target within the engagement. This should be identified as "Sabot," "HEAT," "AP," "HE," "CAN," "HEP," "MPAT," or the specific small arms caliber, as appropriate.
- Block 11e. Rounds authorized. Enter the total number of authorized rounds for the target.
- Block 11f. Rounds expended. This will be completed at the end of the engagement. For main gun engagements, enter the true number of rounds the crew fired at the target. For small arms, enter an approximate number of rounds expended at the target.
- Block 11g. Firer. Enter the appropriate firer that is required to engage the target by the conditions of the task, found in Block 1 on the reverse of the form.

***Note.*** Block 8 ***must be*** the most dangerous target of Target 1 and Target 2. Block 10 ***must be*** the most dangerous of Target 3 and 4.

**COMMON CREW SCORE SHEET**

For use of this form, see TC 3-20.31, the proponent agency is TRADOC.

| 1. ENGAGEMENT | 2. OWN VEHICLE POSTURE | 3. VEHICLE CREW EVALUATOR | 4. DATE | 5. UNIT | 6. BUMPER NUMBER |
|---|---|---|---|---|---|
| 69 | DEFENSE | SFC PATTON | 20140623 | D Co 1-23 CAV | D14 |

| 7a. CONDITIONS (CHECK ALL THAT APPLY): | | | | | | 7b. DEGRADED CONDITIONS (CHECK ALL THAT APPLY): | | |
|---|---|---|---|---|---|---|---|---|
| ☒ DAY | ☐ SHORT-RANGE MAIN GUN | ☐ SHORT-RANGE MACHINE GUN | ☐ VEHICLE COMMANDER | | | ☐ MANUAL | ☐ GAS / AUX | |
| ☐ NIGHT | ☐ LONG-RANGE MAIN GUN | ☐ LONG-RANGE MACHINE GUN | ☐ CBRN | | | ☐ LRF | ☐ THERMAL | |

| 8. TARGET 1 (Most Dangerous) | | | 9. TARGET 2 (Least Dangerous) | | | 10. TARGET 3 | | | 11. TARGET 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a. TYPE | b. RANGE | c. POSTURE | a. TYPE | b. RANGE | c. POSTURE | a. TYPE | b. RANGE | c. POSTURE | a. TYPE | b. RANGE | c. POSTURE |
| TRK | 300 | STA | TRK | 800 | STA | TRPS | 500 | STA | | | |
| d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED | d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED | d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED | d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED |
| 7.62 | 50 | 40 | .50 cal | 50 | 30 | 7.62 | 50 | 45 | | | |
| g. FIRER | ABRAMS LDR | | g. FIRER | ABRAMS VC | | g. FIRER | ABRAMS GNR | | g. FIRER | | |

**Figure 6-12. Header admin information example**

## ENGAGEMENT INFORMATION

6-183. The middle section of the form is where the VCE annotates the sequence of events for the engagement in a graphical manner. Shorthand reference codes are available on the top of Block 12 on the score sheet. They should be used to describe the actions of the platform, firing occasional information, and target status.

6-184. A 75-second time bar is located in the center of the form. Evaluators will circle the appropriate time when specific actions or firing occasional information occur. Once complete, the VCE will draw lines above or below the time line connecting actions to a specific target. Lines are used above the timeline to replicate the vehicle is in the enfilade, fully exposed to the threat presentation (offense), when firing at a threat, or to identify a target is active. These actions are discussed in the following paragraphs.

6-185. A standardized shorthand code for all possible firing occasional information including malfunctions is listed on the front of DA Form 8265, *Common Crew Score Sheet*, and is provided as a reference table earlier in this chapter. Evaluators should be familiar with these codes in order to quickly describe the continuous actions during any engagement within block 12a and 12b.

- Block 12a. The location ***above*** the timeline, Block 12a, UP / FIRE / ACTIVE TARGET is specific for three types of events or actions:
  - ***Up***. When in the defense, the platform is considered UP. The vehicle either moves forward to an enfilade or continues to remain in the enfilade.
  - ***Fire***. When firing at any target, whether on the offense or defense.
  - ***Active Target***. When a target meets the "active" status requirements, regardless if the vehicle is in the defilade position or not.

***Note.*** UP, FIRE, and ACTIVE TARGET override any DOWN time. If a vehicle is UP, firing, or an active target is present, the vehicle cannot receive defilade time for credit. The graphic may show the vehicle in the defilade, but the active status of the target will show it was engaged and not defeated.

- Block 12b. Evaluators will use Block 12b, the VEHICLE DOWN portion, underneath the timeline, to indicate when a platform is in a defensive firing position correctly or firing point.

6-186. Figure 6-13 shows how the information is graphically displayed by the evaluator. This includes the shorthand for all the firing occasional information. The intent of this section is to provide any reviewer a simple understanding of the enter series of events as they occurred during the engagement.

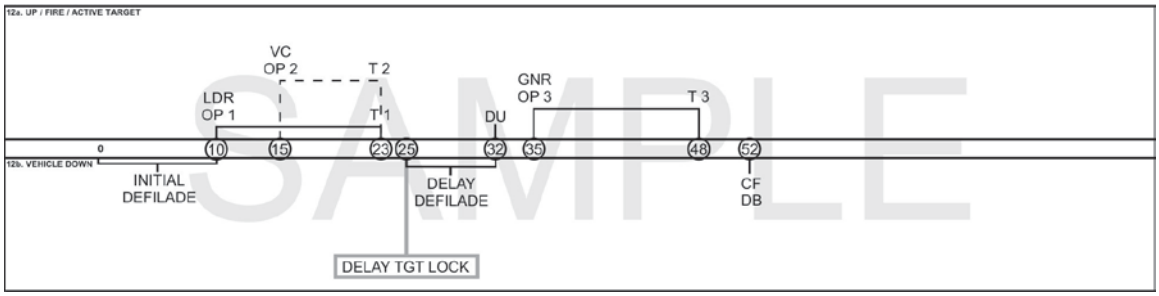



**Figure 6-13. Filling out the timeline example**

**Reading the timeline**. In the example above, an Abrams is in the defense, negotiating engagement 69, with simultaneous small arms targets. The defilade is provided until the loader (LDR) opens (OP) with his machine gun from the defilade at his target (TGT 1) at the 10-second point. The next firing occasion is the VC opening (OP) with his machine gun on his target (TGT 2) in 15 seconds. Both the loader and VC defeat their targets in 23 seconds (T1, T2). The third target activated on the standard delay at 25 seconds. With no active targets present, the crew remaining in the defilade, they are considered DOWN. The delay target (target 3) is not considered active because all targets were destroyed before target 3 was presented and the crew has not engaged it. The driver is given DRIVER MOVE UP in 32 seconds (DU). The gunner opened with the coax on his target (target 3) in 35 seconds (GNR, OP3), and defeated that target in 48 seconds (T3). The VC issued CEASE FIRE, DRIVER BACK UP in 52 seconds.

## TASK / ENGAGEMENT EVENTS

6-187. The bottom of the form allows the VCE to write down any AAR talking points, crew penalties, the target kill time(s), engagement modifier(s), defilade time(s) authorized, break time(s) authorized, and the computation of the final engagement time(s).

6-188. From this information, the points scored per target can be identified using the time/score matrix located at the bottom of Block 12b. Once the target's engagement time is calculated, the final engagement points are determined and placed in the appropriate block.

6-189. The bottom row of the form indicates the points received for each target, the overall raw points for the engagement, the number of targets presented during the engagement, and the base score. The base score (block 19c) is not the final score, but represents an initial overview of the engagement prior to any penalties being assessed.

6-190. The right bottom of the form shows the engagement crew penalty information (Block 20). This shows all penalties associated to the engagement, and provides the instructions required to correctly apply them to the base score. This section also determines the point value of five-point penalties that are transferred to the DA Form 8265-1, *Common Crew Roll-Up*, (Block 21) for adjudication at the end of the day or night phase, respectively.

6-191. The specific instructions for filling out the bottom of the common crew score sheet are provided below. They will require an understanding and accurate calculation of the engagement modifier (EM), described in the next section. The EM calculation is required to complete blocks 13 through 16, sub-block b.

- Block 13: Target 1 (a. Kill Time, b. Modifier, c. Defilade, d. Break, e. Engagement Time, f. Points).
  - Block 13a. Kill time. Enter the time from the timeline (Block 12) where the crew achieved the kill standards against the target.
  - Block 13b. Modifier. Enter the engagement modifier (EM) determined from the Block 8f on the reverse of the form.
  - Block 13c. Defilade. Enter the authorized amount of defilade time identified in Block 12. If the vehicle is firing from the offense, no defilade time is authorized. Only initial defilade time may apply to Target 1 and 2, respectively. Delay defilade time does not apply to these targets.
  - Block 13d. Break. Enter any authorized break time determined from Block 12 for the target. This includes only tactical break and obscuration break, directly relating to Target 1.
  - Block 13e. Engagement Time. Subtract blocks 13b, c, and d from Block 13a.
  - Block 13f. Points. Using the Target Engagement Time row at the bottom of Block 12b, find the engagement time from Block 13e. Record the point value that corresponds to the target engagement time. If a target was presented and the number listed in Block 13e is less than 1, enter 100 points.

- Block 14: Target 2 (a. Kill Time, b. Modifier, c. Defilade, d. Break, e. Engagement Time, f. Points).
  - Block 14a. Kill time. Enter the time from the timeline (Block 12) where the crew achieved the kill standards against the target.
  - Block 14b. Modifier. Enter the engagement modifier (EM) determined from the Block 1f on the reverse of the form.
  - Block 14c. Defilade. Enter the authorized amount of defilade time identified in Block 12. If the vehicle is firing from the offense, no defilade time is authorized. Only initial defilade time may apply to Target 1 and 2, respectively. Delay defilade time does not apply to these targets.
  - Block 14d. Break. Enter any authorized break time determined from Block 12 for the target.
  - Block 14e. Engagement Time. Subtract blocks 14b, c, and d from Block 14a.
  - Block 14f. Points. Using the Target Engagement Time row at the bottom of Block 12b, find the engagement time from Block 14e. Record the point value that corresponds to the target engagement time. If a target was presented and the number listed in Block 14e is less than 1, enter 100 points.

- Block 15: Target 3 (a. Kill Time, b. Modifier, c. Defilade, d. Break, e. Engagement Time, f. Points).
  - Block 15a. Kill time. Enter the time from the timeline (Block 12) where the crew achieved the kill standards against the target.
  - Block 15b. Modifier. Enter the engagement modifier (EM) determined from the Block 1f on the reverse of the form.
  - Block 15c. Defilade. Enter the authorized amount of defilade time identified in Block 12. If the vehicle is firing from the offense, no defilade time is authorized. Only delay defilade time may apply to Target 3 and 4, respectively. Initial target time does not apply to these targets.
  - Block 15d. Delay/Break. Enter any authorized break and delay time determined from Block 12 for the target.
  - Block 15e. Engagement Time. Subtract blocks 15b, c, and d from Block 15a.
  - Block 15f. Points. Using the Target Engagement Time row at the bottom of Block 12b, find the engagement time from Block 15e. Record the point value that corresponds to the target engagement time. If a target was presented and the number listed in Block 15e is less than 1, enter 100 points.

- Block 16: Target 4 (a. Kill Time, b. Modifier, c. Defilade, d. Break, e. Engagement Time, f. Points).

- Block 16a. Kill time. Enter the time from the timeline (Block 12) where the crew achieved the kill standards against the target.
- Block 16b. Modifier. Enter the engagement modifier (EM) determined from the Block 1f on the reverse of the form.
- Block 16c. Defilade. Enter the authorized amount of defilade time identified in Block 12. If the vehicle is firing from the offense, no defilade time is authorized. Only delay defilade time may apply to Target 3 and 4, respectively. Initial target time does not apply to these targets.
- Block 16d. Delay/Break. Enter any authorized break time determined from Block 12 for the target.
- Block 16e. Engagement Time. Subtract blocks 16b, c, and d from Block 16a.
- Block 16f. Points. Using the Target Engagement Time row at the bottom of Block 12b, find the engagement time from Block 16e. Record the point value that corresponds to the target engagement time. If a target was presented and the number listed in Block 16e is less than 1, enter 100 points.

- Block 17: Malfunctions.
  - Block 17a. Breech Up. Enter the number of breech up malfunctions that occurred during the engagement.
  - Block 17b. Case Base. Enter the number of case base malfunctions that occurred during the engagement.
  - Block 17c. Misfire. Enter the number of main gun misfires that occurred during the engagement.
  - Block 17d. Stoppage. Record the number of malfunctions that resulted in a stoppage during the engagement.
  - Block 17e. Thermal Fail. Identify the number of thermal failures that occurred during the engagement.
- Block 18: Penalty Codes/Remarks. Place the appropriate penalty code from DA Form 8265-1, *Common Crew Roll-Up*, page 2, which were assessed during the engagement.
- Block 19a. Total Points. Enter the sum of the point values in blocks 13f through 16f.
- Block 19b: Number of Targets. Enter the total number of targets presented during the engagement.
- Block 19c: Base Score. Divide the total points from Block 19a by the total number of targets presented shown in Block 19b.
- Block 20a. Number of Immediate Disqualification (DQ) penalties. Enter the total number of Immediate Disqualification penalties identified in Block 18.
- Block 20b. Number of Automatic Zero (AZ) penalties. Enter the total number of Automatic Zero penalties identified in Block 18.
- Block 20c. Number of 30-point penalties. Enter the total number of 30-point safety penalties identified in Block 18.
- Block 20d. Number of five-point penalties. Enter the total number of five-point penalties identified in Block 18.
- Block 20e. Engagement Penalties. Determine the total points assessed against the crew for all DQ, AZ, and 30-point penalties. This does not include the five-point penalties.
- Block 20f: Engagement Score. This is the overall score after all DQ, AZ, and 30-point engagement penalties, if any, are subtracted from the base score. Enter the sum of Block 19c, Base Score, minus Block 20e, Engagement Penalties, to determine the Engagement Score entered in Block 20f. If the sum is a negative number, enter zero in Block 20f. This score will be transferred to DA Form 8265-1, *Common Crew Roll-Up*, page 1, Block 7c.
- Block 21a. Engagement Score from Block 20f. Enter the value from Block 20f.
- Block 21b.Total five-point deductions. Enter the value of Block 20d multiplied by five (total point value of five-point penalties).
- Block 21c. Total leader or fundamental crew penalty point deductions allowed at the end of the firing phase. Enter the lowest number of Block 21a and 21b.

- Block 21d. Did the crew obtain 70 points per target (YES/NO)? If the crew achieved 70 points on each target presented, check YES. If the crew failed to achieve 70 points or more on any target presented, check NO.
- Block 21e. Qualified engagement (YES / NO)? Check YES if Block 21d equals YES and Block 21a is 70 or greater.

| TARGET ENGAGEMENT TIME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POINTS | 99 | 97 | 96 | 94 | 93 | 91 | 89 | 88 | 86 | 85 | 83 | 81 | 80 | 79 | 78 | 77 | 75 | 73 | 72 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| 13. TARGET 1 | 14. TARGET 2 | 15. TARGET 3 | 16. TARGET 4 | 17. MALFUNCTIONS | 18. PENALTY CODES / REMARKS | NOTE: Assess DQ, AZ, and 30-point penalties and enter penalties in Block 20e. Assess 5-point penalties at the end of each day or night phase on the Common Crew Roll-Up, and enter points in Block 21c. | | | |
|---|---|---|---|---|---|---|---|---|---|
| a. KILL TIME: 23 | a. KILL TIME: 23 | a. KILL TIME: 48 | a. KILL TIME: | a. BREECH UP: | 05-12 | | | | |
| b. MODIFIER (-) 9 | b. MODIFIER (-) 12 | b. MODIFIER (-) 8 | b. MODIFIER (-) | b. CASE BASE: | -5: Loader arms main gun when gunner is directed to engage with machine gun. | 29a. NUMBER OF IMMEDIATE DISQUALIFICATION (DQ) PENALTIES: | 0 | 21a. ENG SCORE (from block 20f): | 93 |
| c. DEFILADE (-) 10 | c. DEFILADE (-) 10 | c. DEFILADE (-) 7 | c. DEFILADE (-) | c. MISFIRE: | | b. NUMBER OF AUTOMATIC ZERO (AZ) PENALTIES: | 0 | b. TOTAL 5-POINT DEDUCTIONS (Multiply Block 20d times 5 points): | 5 |
| d. BREAK (-) 0 | d. BREAK (-) 0 | d. DELAY / BREAK (-) 25 | d. DELAY / BREAK (-) | d. STOPPAGE: | | c. NUMBER OF 30-POINT SAFETY PENALTIES: | 0 | c. TOTAL LEADER OR FUNDAMENTAL CREW PENALTY POINT DEDUCTION ALLOWED AT END OF FIRING PHASE (Use the lesser of Block 21a or 21b): | 5 |
| e. ENG TIME (=) 4 | e. ENG TIME (=) 1 | e. ENG TIME (=) 8 | e. ENG TIME (=) | e. THERMAL FAIL: | | d. NUMBER OF 5-POINT PENALTIES: | 1 | | |

| f. POINTS | f. POINTS | f. POINTS | f. POINTS | 19a. TOTAL POINTS | b. NO. OF TGTS | c. BASE SCORE | e. ENG PENALTIES | f. ENG SCORE | d. DID CREW SCORE AT LEAST 70 POINTS ON EACH TARGET? | e. QUALIFIED ENG |
|---|---|---|---|---|---|---|---|---|---|---|
| 94 | 99 | 88 | 0 | 281 | 3 | 93 | 0 | 93 | ☒ YES ☐ NO | ☒ YES ☐ NO |

SAMPLE

**Figure 6-14. Completing blocks 13 through 21 examples.**

## ENGAGEMENT MODIFIER

6-192. To determine the engagement modifier (EM), evaluator's use the reverse of DA Form 8265, *Common Crew Score Sheet.* For each target presented during the engagement, evaluators must answer the five questions listed in blocks 1 through 5. The following series of figures explains the process to determine the EM for each presented target.

6-193. Once the EM is determined, the EM for each respective target must be placed in the corresponding target's modifier block on the front of the page. Use blocks 8f through 11f, as appropriate for the engagement targetry for placement in blocks 13b through 16b on page 1.

**ENGAGEMENT MODIFIER (EM) CALCULATION**

For use of this form, see TC 3-20.31, the proponent agency is TRADOC.

| 1. Firer | | 6. Engagement Notes | 7. Instructions | 8.Target 1 | 9.Target 2 | 10.Target 3 | 11.Target 4 |
|---|---|---|---|---|---|---|---|
| Abrams Gunner | 0 | **Find values in blocks 1 thru 5 and move to blocks a. thru e. on corresponding target.** | a. Select the point value for the specific firer from block 1. | a. 4 | a. 4 | a. 0 | a. |
| Bradley | 1 | | | | | | |
| MGS | 2 | | | | | | |
| RWS / CROWS / SCWS | 3 | | | | | | |
| Pintle / CWS / Loader | 4 | | | | | | |
| RWS (MK 19) | 5 | | | | | | |
| Pintle (MK 19) | 6 | | | | | | |
| ATGM / TOW | 20 | | | | | | |
| **2. Firing Vehicle Posture** | | **Add total for each target in block f.** | b. Select the point value for the firing vehicle posture from block 2. | b. 3 (+) | b. 3 (+) | b. 3 (+) | b. (+) |
| Defense | 3 | | | | | | |
| Offense | 7 | **Repeat block 1 thru 5 for each available target. Once complete add each target's value and put in block f. as appropriate.** | | | | | |
| **3. Target Type** | | | c. Select the point value for the intended target type using block 3. | c. 2 (+) | c. 2 (+) | c. 3 (+) | c. (+) |
| Armored | 0 | **Note. The most dangerous target will have a value equal to or less than the second target in the presentation.** | | | | | |
| Light Armored | 1 | | | | | | |
| Unarmored | 2 | | | | | | |
| Troops / RPG / Sniper / Bunker | 3 | **Example:** | d. Select the point value for the intended target posture using block 4. | d. 1 (+) | d. 1 (+) | d. 1 (+) | d. (+) |
| **4. Target Posture** | | | | | | | |
| Frontal | 1 | **Block 8.f. (Target 1 EM) must be equal to or less than block 9.f. (Target 2 EM). If it is not, this indicates that Target 1 is not the most dangerous target.** | | | | | |
| Flank | 2 | | | | | | |
| Moving | 3 | | | | | | |
| Evasive (Direction Change) | 4 | | e. Select the point value for the range to target using the values in block 5. | e. -1 (+) | e. 2 (+) | e. 1 (+) | e. (+) |
| **5. Range to Target** | | | | | | | |
| 0000 to 0400 meters | -1 | **Blocks 8.f. thru 11.f. will transfer to block 13.b. thru 16.b. on DA FORM 8265 page 1, respectively.** | | | | | |
| 0401 to 0600 meters | 1 | | | | | | |
| 0601 to 1200 meters | 2 | | | | | | |
| 1201 to 1800 meters | 3 | | | | | | |
| 1801 to 2000 meters | 4 | | | | | | |
| 2001 to 2200 meters | 6 | | | | | | |
| 2201 to 2400 meters | 10 | | | | | | |
| 2401 to 2800 meters | 16 | | f. Determine the target modifier by adding all appropriate blocks for each target presented (total EM). | f. 9 (=) | f. 12 (=) | f. 8 (=) | f. (=) |
| 2801 to 3100 meters | 22 | | | | | | |
| > 3101 meters | 26 | | | | | | |

ATGM Antitank Guided Missile; CROWS Common Remotely Operated Weapon Station; CWS Commander's Weapon Station; MGS Mobile Gun System; RPG Rocket-Propelled Grenade; RWS Remote Weapon Station; SCWS Stabilized Commander's Weapon Station

| 8. Target Engagement Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9. Points | 99 | 97 | 96 | 94 | 93 | 91 | 89 | 88 | 86 | 85 | 83 | 81 | 80 | 79 | 78 | 77 | 75 | 73 | 72 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

SAMPLE

**Figure 6-15. Determine engagement modifier (EM) example**

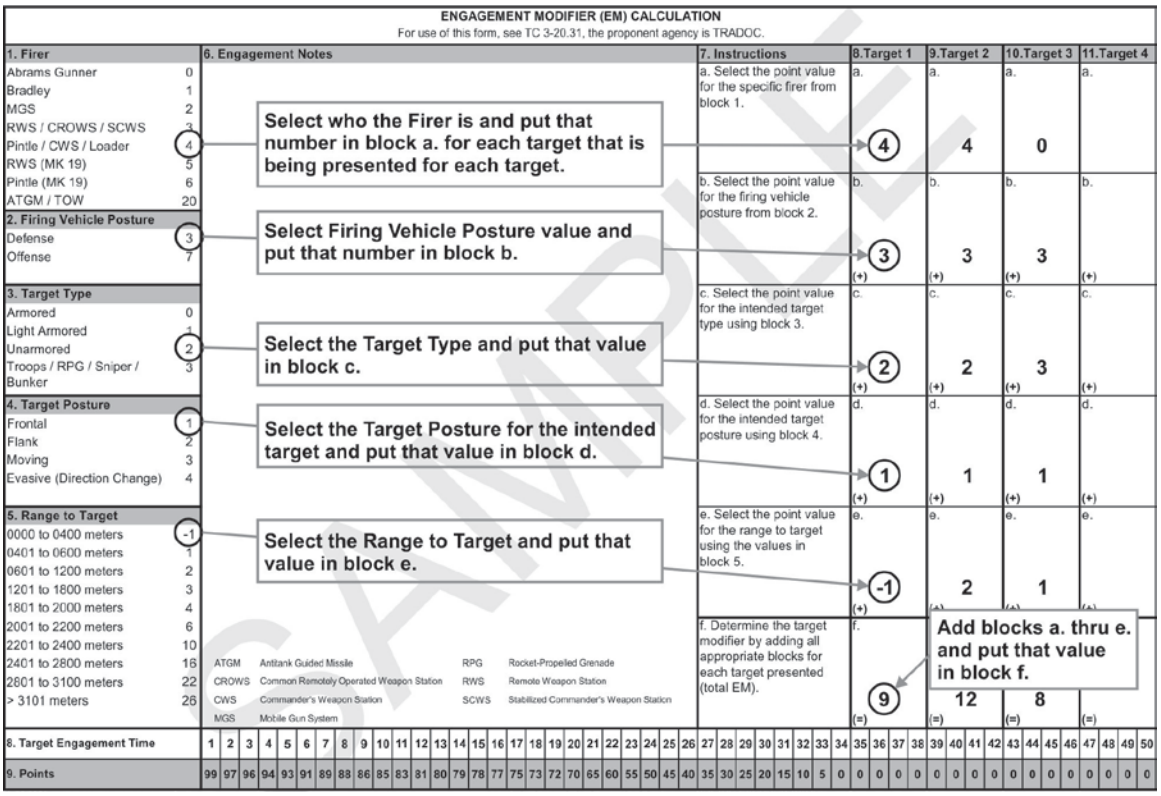



**Figure 6-16. Example of engagement modifier (EM) score calculations**

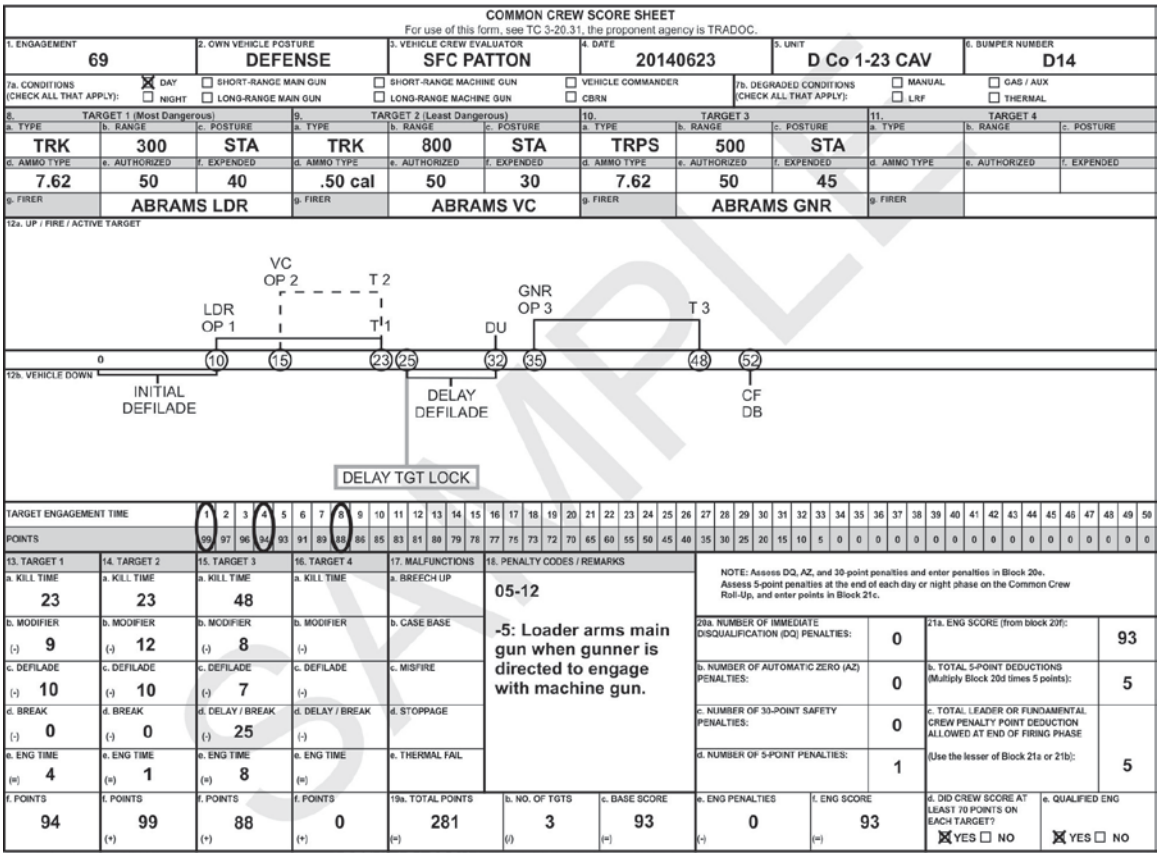
6-194. Once all the target EMs are calculated, the totals listed in the respective target's "Block f" are placed in 13b through 16b, as appropriate. Evaluators must ensure the EMs for each target are transferred to the correct target column on the front of the score sheet.

6-195. The Master Gunner must ensure that the most dangerous target of any two-target presentation is listed as "Target 1" in each scenario. To check this, evaluate the EM for each target. The lower the EM score, the more dangerous the target. Target 1's EM score should be less than or equal to Target 2's EM score. For units using this score sheet during advanced training using up to four targets, Target 3's EM score must be less than or equal to Target 4's EM score also.

## EXAMPLE SCORE SHEET

6-196. The following is an example of a correctly completed score sheet. This shows all pertinent blocks filled out appropriately with the minimum requirements. Additional remarks may be required or desired by the evaluator to facilitate the AAR process. Any crew penalties must be annotated in the REMARKS Block 18 to ensure the entire story of the engagement can be clearly understood by anyone reviewing the document, whether or not they were on the range during gunnery.

6-197. Evaluators must keep in mind that even the best engagements can be improved to make the crew more efficient and effective. Crews will have tailored gunnery training based up the score sheet's information and overall gunnery performance. Trainers cannot address key issues if they are not recorded in a standardized and understandable manner.



**COMMON CREW SCORE SHEET**

For use of this form, see TC 3-20.31, the proponent agency is TRADOC.

| 1. ENGAGEMENT | 2. OWN VEHICLE POSTURE | 3. VEHICLE CREW EVALUATOR | 4. DATE | 5. UNIT | 6. BUMPER NUMBER |
|---|---|---|---|---|---|
| 69 | DEFENSE | SFC PATTON | 20140623 | D Co 1-23 CAV | D14 |

7a. CONDITIONS (CHECK ALL THAT APPLY): ☒ DAY ☐ NIGHT ☐ SHORT-RANGE MAIN GUN ☐ LONG-RANGE MAIN GUN ☐ SHORT-RANGE MACHINE GUN ☐ LONG-RANGE MACHINE GUN ☐ VEHICLE COMMANDER ☐ CBRN

7b. DEGRADED CONDITIONS (CHECK ALL THAT APPLY): ☐ MANUAL ☐ GAS / AUX ☐ LRF ☐ THERMAL

| 8. TARGET 1 (Most Dangerous) | | | 9. TARGET 2 (Least Dangerous) | | | 10. TARGET 3 | | | 11. TARGET 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a. TYPE | b. RANGE | c. POSTURE | a. TYPE | b. RANGE | c. POSTURE | a. TYPE | b. RANGE | c. POSTURE | a. TYPE | b. RANGE | c. POSTURE |
| TRK | 300 | STA | TRK | 800 | STA | TRPS | 500 | STA | | | |
| d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED | d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED | d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED | d. AMMO TYPE | e. AUTHORIZED | f. EXPENDED |
| 7.62 | 50 | 40 | .50 cal | 50 | 30 | 7.62 | 50 | 45 | | | |
| g. FIRER | ABRAMS LDR | | g. FIRER | ABRAMS VC | | g. FIRER | ABRAMS GNR | | g. FIRER | | |

12a. UP / FIRE / ACTIVE TARGET



| TARGET ENGAGEMENT TIME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POINTS | 99 | 97 | 96 | 94 | 93 | 91 | 89 | 88 | 86 | 85 | 83 | 81 | 80 | 79 | 78 | 77 | 75 | 73 | 72 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| 13. TARGET 1 | 14. TARGET 2 | 15. TARGET 3 | 16. TARGET 4 | 17. MALFUNCTIONS | 18. PENALTY CODES / REMARKS |
|---|---|---|---|---|---|
| a. KILL TIME: 23 | a. KILL TIME: 23 | a. KILL TIME: 48 | a. KILL TIME | a. BREECH UP | 05-12<br>-5: Loader arms main gun when gunner is directed to engage with machine gun. |
| b. MODIFIER: (-) 9 | b. MODIFIER: (-) 12 | b. MODIFIER: (-) 8 | b. MODIFIER (-) | b. CASE BASE | |
| c. DEFILADE: (-) 10 | c. DEFILADE: (-) 10 | c. DEFILADE: (-) 7 | c. DEFILADE (-) | c. MISFIRE | |
| d. BREAK: (-) 0 | d. BREAK: (-) 0 | d. DELAY / BREAK: (-) 25 | d. DELAY / BREAK (-) | d. STOPPAGE | |
| e. ENG TIME: (=) 4 | e. ENG TIME: (=) 1 | e. ENG TIME: (=) 8 | e. ENG TIME (=) | e. THERMAL FAIL | |
| f. POINTS: 94 | f. POINTS: 99 (+) | f. POINTS: 88 (+) | f. POINTS: 0 (+) | | |

NOTE: Assess DQ, AZ, and 30-point penalties and enter penalties in Block 20e. Assess 5-point penalties at the end of each day or night phase on the Common Crew Roll-Up, and enter points in Block 21c.

| | | | |
|---|---|---|---|
| 19a. TOTAL POINTS: 281 (=) | b. NO. OF TGTS: 3 (/) | c. BASE SCORE: 93 (=) | |
| 20a. NUMBER OF IMMEDIATE DISQUALIFICATION (DQ) PENALTIES: | 0 | 21a. ENG SCORE (from block 20f): | 93 |
| b. NUMBER OF AUTOMATIC ZERO (AZ) PENALTIES: | 0 | b. TOTAL 5-POINT DEDUCTIONS (Multiply Block 20d times 5 points): | 5 |
| c. NUMBER OF 30-POINT SAFETY PENALTIES: | 0 | c. TOTAL LEADER OR FUNDAMENTAL CREW PENALTY POINT DEDUCTION ALLOWED AT END OF FIRING PHASE (Use the lesser of Block 21a or 21b): | 5 |
| d. NUMBER OF 5-POINT PENALTIES: | 1 | | |
| e. ENG PENALTIES: 0 (-) | f. ENG SCORE: 93 (=) | d. DID CREW SCORE AT LEAST 70 POINTS ON EACH TARGET? ☒ YES ☐ NO | e. QUALIFIED ENG ☒ YES ☐ NO |

SAMPLE

**Figure 6-17. Example filled out score sheet**

6-198. Transferring information to DA Form 8265-1, *Common Crew Roll-Up*. Transfer the blocks shown from DA Form 8265, *Common Crew Score Sheet*, to the identified block on DA Form 8265-1, *Common Crew Roll-Up*, as shown below:

**COMMON CREW ROLL-UP**

For use of this form, see TC 3-20.31, the proponent agency is TRADOC.

| 1. BUMPER NUMBER | 2. VEHICLE PLATFORM | 3. UNIT | 4. DATE |
|---|---|---|---|
| D 14 | ABRAMS | Dco 1-23 CAV | 20140623 |
| **5a. VEHICLE COMMANDER RANK AND NAME** | **b. GUNNER RANK AND NAME** | **c. DRIVER RANK AND NAME** | **d. LOADER RANK AND NAME** |
| SFC STANTON, P | SGT GRIFFIN, K | SPC PARTRIDGE, I | PFC GOODKNIGHT, B |
| **6a. SIMULATOR TYPE** | **b. VIRTUAL GATE-TO-LIVE-FIRE LEVEL** | **c. VIRTUAL GATE-TO-LIVE-FIRE DATE** | **d. VIRTUAL GATE-TO-LIVE-FIRE SCORE** |
| AGTS | LEVEL X | 20140423 | 810 |

**7. SCORING DATA** / **8. MALFUNCTIONS** / **9. REMARKS**

| a. DAY / NIGHT | b. ENGAGEMENT NUMBER | c. ENGAGEMENT SCORE | d. VALUE OF 5-PT PENALTIES ALLOWED | e. QUALIFIED YES / NO | a. BREECH UP (BU) | b. CASE BASE (BC) | c. MISFIRE (MF) | d. STOPPAGE (ST) | e. THERMAL FAIL (TF) |
|---|---|---|---|---|---|---|---|---|---|
| D | 62 | 100 | 5 | ☒ YES ☐ NO | 0 | 0 | 0 | 0 | 0 |
| D | 68 | 91 | 0 | ☒ YES ☐ NO | 0 | 0 | 0 | 0 | 0 |
| D | 64 | 67 | 0 | ☐ YES ☒ NO | 0 | 0 | 1 | 0 | 0 |
| D | 60 | 100 | 0 | ☒ YES ☐ NO | 0 | 0 | 0 | 0 | 0 |
| D | 67 | 80 | 0 | ☒ YES ☐ NO | 0 | 0 | 0 | 0 | 0 |
| D | 69 | 93 | 5 | ☒ YES ☐ NO | 0 | 0 | 0 | 0 | 0 |
| N | 61 | 80 | 0 | ☒ YES ☐ NO | 0 | 0 | 0 | 1 | 0 |
| N | 65 | 100 | 0 | ☒ YES ☐ NO | 0 | 0 | 0 | 1 | 0 |
| N | 63 | 60 | 0 | ☐ YES ☒ NO | 1 | 0 | 0 | 0 | 0 |
| N | 66 | 95 | 0 | ☒ YES ☐ NO | 0 | 0 | 0 | 0 | 0 |
| 10a. DAY RUN TOTAL | b. 531 | c. 10 | | d. POINTS / QUALIFIED 521 / 5 | e. 0 | f. 0 | g. 1 | h. 0 | i. 0 |
| 11a. NIGHT RUN TOTAL | b. 335 | c. 0 | | d. POINTS / QUALIFIED 335 / 3 | e. 1 | f. 0 | g. 0 | h. 2 | i. 0 |
| 12a. OVERALL TOTAL | | | | b. POINTS / QUALIFIED 856 / 8 | c. 1 | d. 0 | e. 1 | f. 2 | g. 0 |

Annotate any remarks throughout the table for AAR discussion in this section.

Common talking points could be penalties, any malfunctions that occurred in either phase (day or night), scanning techniques, point of aim / point of impact, crew coordination, or any other talking points that would assist the crew in future engagements.

13. RATING (CHECK ONE) ☐ DISTINGUISHED ☒ SUPERIOR ☐ QUALIFIED ☐ UNQUALIFIED ☐ REFIRE (Q2)

| 14. VEHICLE COMMANDER SIGNATURE (DAY) | 15. VEHICLE CREW EVALUATOR PRINTED NAME / SIGNATURE (DAY) |
|---|---|
| SFC PATRICK STANTON | SFC PATTON, G GEORGE PATTON |
| **16. VEHICLE COMMANDER SIGNATURE (NIGHT)** | **17. VEHICLE CREW EVALUATOR PRINTED NAME / SIGNATURE (NIGHT)** |
| SFC PATRICK STANTON | SFC BRADLEY, O OMAR BRADLEY |

SAMPLE

**Figure 6-18. Example filled out DA Form 8265-1, Common Crew Roll-Up**

| From DA Form 8265 | To DA Form 8265-1 |
|---|---|
| Block 7a (Day / Night) | Block 7a |
| Block 1 | Block 7b |
| Block 21a | Block 7c |
| Block 21c | Block 7d |
| Block 21e | Block 7e |
| Block 17a | Block 8a |
| Block 17b | Block 8b |
| Block 17c | Block 8c |
| Block 17d | Block 8d |
| Block 17e | Block 8e |

**Table 6-7. DA Form 8265 to DA Form 8265-1 information transfer**

## SECTION VI – ADDITIONAL TASKS

6-199. All crews must perform one of the "Call For" engagements during the day phase and another during the night phase. These engagements are graded on a GO/NO-GO basis.

6-200. The three variations that the commander may select from are—

- Call for fire.
- Request MEDEVAC. (See CATS TASK**:** 081-831-0101 - *Request Medical Evacuation*.).
- Call for support according to the unit's SOP.

6-201. For the "call for fire" task, the crew must give a grid coordinate within 150 meters of the target while it is exposed to receive points for the engagement. Failure to give a grid within 150 meters of the target will result in a "NO-GO" for the event.

6-202. All units equipped with digital equipment (FBCB2, for example) are required to perform one digital transmission from each firing vehicle as shown in the Required Performance Measures for the respective crew tables. These tasks are required once during the day phase and once during the night phase, minimum. It includes receiving a FLASH digital message, receiving icon population, and sending a battle damage assessment at a minimum.

6-203. Crews must successfully send and receive those digital messages and icon populations from a controlling net to receive a GO.

## SECTION VII – AFTER ACTION REVIEWS

6-204. An after action review (AAR) is a professional discussion of an event, focused on performance standards that enable Soldiers to discover for themselves what happened, why it happened, and how to sustain strengths and improve weaknesses. The purpose of an AAR during gunnery is to help the crew understand their actions and interactions during that particular phase of a gunnery table.

6-205. Formal AARs are a required event during each phase of each table of gunnery. If done properly AARs can be one of the best assets a crew can have to improve or sustain upon.

6-206. The VCE will conduct a formal AAR after all crew gunnery events. (Refer to the *Leader's Guide to After-Action Reviews* [AAR] located on the ATN.) During AARs, he combines the feedback received from all participants into a coherent, usable product to guide the AAR. AARs identify where a crew meets, or fails to meet, Army standards. AARs provide commanders, leaders, and training managers with a focus for future training events.

| AAR Format | AAR Rules |
|---|---|
| • Introduction<br>• Rules<br>• Training Objectives<br>• Orient to Visual<br>• Chronological Order<br>• Close on Positive Note | • Seek Maximum Participation<br>• Not a Critique<br>• Use Open Ended Questions<br>• Dynamic, Candid, Professional<br>• Maintain Focus<br>• Constantly Review Teaching points<br>• Record Key Points |

**Table 6-8. AAR format and rules**

## PLANNING THE AARs

6-207. Successful AARs require planning and resource management. Commanders and training managers—

- **Select and train vehicle crew evaluators (VCE).** One of the most challenging tasks during the planning phase is selecting and training qualified evaluators. Whom they select depends on the type of evaluators they need– crew, section, or platoon evaluators or internal or external evaluators.
- **Use Qualified VCEs.** Evaluators required for crew gunnery events must hold VCE qualifications. VCEs should be weapons platform qualified and have recent experience on the platform they will be evaluating. Commanders are responsible to select the best-qualified evaluators for the AAR process, particularly when like MOS evaluators are not available. Normally, individual and crew gunnery Tables I through V are internally evaluated, and Table VI is evaluated externally.
- **For MGS crews only:** Due to the limited number of MGS crews within a brigade an external evaluation may not be feasible. SBCTs should attempt to utilize external evaluators whenever possible, to include using qualified Abrams or Bradley VCEs. If no external evaluators are available, Commanders should utilize non-firing crews from other platoons to evaluate Table VI.
- **Develop evaluation records.** Ensure the common crew gunnery score sheets are prefilled with the crew information and engagement information.
- **Select the AAR site.** When organizing the training site, the commander and training managers should plan the location of the AAR site. They should locate it close enough to the training site to avoid long delays between training and reviewing the training results; however, they should place it far enough from the training area to avoid the distractions of other elements conducting training, such as the signatures of vehicles moving or firing. The AAR site should accommodate all participants comfortably and shelter them from the elements.
- **Select training aids.** Many ranges have excellent thermal range cameras, thru-sight video systems, and visual and audio recording/playback capabilities. Training aids give evaluators and participants a means to reenact to the training event. They can also encourage discussion. At a minimum, evaluators should use a range diagram of the area. Time must be allocated prior to gunnery to ensure the proper amount of personnel trained on this equipment will be enough to facilitate range operations and AARs. Training aids to use during AARs include—
    - **Charts or drawings.** This should show the scenario, routes, and targets with any operational graphics supporting the AAR. Using charts or drawings lets all participants review actions while they follow the prescribed scenario.
    - **Sand tables/terrain boards.** This shows the topographical features of the area. Sand tables should reflect the scale of the area accurately. They should show the scenario, routes, and targets, along with any operational control measures that apply to the training. This allows the evaluator to guide the discussions while focusing on the particular place the action occurred.
    - **Digital voice recorders (DVR).** Digital voice recorders can play back the fire commands and the radio-net traffic. (Recorders allow the crew to hear their commands and review their responses.)
    - **Thru-sight videos (TSV).** TSVs allow playback of real-time video of live fire gunnery engagements and fire commands. It offers a look at engagement techniques and identifies errors that can be corrected before the next training event.
    - **Precision gunnery system AAR computer.** This is used to review gunnery data during device-based exercises. It allows the evaluator and crew members to see the placement of each round in relation to the target and its corresponding data.
    - **Digital Range Training System (DRTS).** This is used to compile a video and audio presentation. Through use of downrange cameras and audio/video recording devices a real-time history is developed and used during the AAR process.
    - **Video Editing.** For any range with video capability, the VCE should be diligent with the range camera operators to isolate the video that would best benefit the crew for which is being evaluated. Through-site will not always be the best video as there are many aspects of gunnery that effect speed and efficiency.

***Note.*** On video-capable ranges, all efforts to show effects on target and crew sensings should be made by the VCE during the AAR. This provides the crew with valuable insight to gunner techniques and aid in adjudication of questionable engagements or scoring discrepancies.

## PREPARING FOR THE AARs

6-208. Before conducting an evaluation and an AAR, the VCE prepares himself and the AAR site:

- **Review the scenario.** Before evaluating a crew or platoon, the evaluator must know the scenario and mission, collective tasks, and terrain of the training area. The senior VCE (Master Gunner) will review the scenario to ensure it achieves all of the required performance measures (RPMs). Each individual VCE will be knowledgeable of the RPMs achieved on each engagement to facilitate his AAR process. Once the evaluator knows the scenario and mission, he must ensure he knows the doctrine that applies.
- **Observe training.** The evaluator must place himself in the best position to observe the task being conducted. The evaluator must record his observations.
- **Collect information and optimize training aids.** After the event, the evaluator must collect information from other observers. During gunnery events, the evaluator collects information such as target kill times from the tower observers and VCEs. Additionally, video and audio recordings should be collected, reviewed and identified to maximize the crew's understanding of the events.
- **Develop a discussion outline.** The evaluator must develop an outline he wants to follow during the AAR. He should identify the key areas he wants the participants to discuss, to include both strong and weak points. To accomplish his goal for the AAR, he should list key questions to ask to give him the results he wants. The evaluator must determine what methods or techniques he will suggest to improve efficiency. If required, he should ask Master Gunners or other experienced personnel to relay helpful tips to the crew or platoon.
- **Rehearse.** Before participants arrive at the AAR site, the evaluator organizes his training aids, evaluation sheets, and seating arrangements. The evaluator should ensure the training aids are functioning and viewable by all participants. At a minimum, evaluators should rehearse the key points to be made.

## CONDUCTING THE AARs

6-209. Crewmembers usually know how they performed before the AAR, though they may not know why they performed the way they did. The function of the evaluator conducting the AAR is to encourage crewmembers to discuss what they did and guide them into discovering why. The crewmembers then determine how they can do it differently next time. The evaluator aids in these discussions and provides expertise when needed. When conducting AARs, the evaluator should use the following guidelines:

| AAR Format | |
|---|---|
| • Introduction and rules.<br>• Review of training objectives.<br>• Commander's mission and intent (what was supposed to happen).<br>• Relevant doctrine and tactics, techniques, and procedures (TTPs).<br>• Summary of recent events (what happened). | • Discussion of key issues (why it happened and how to improve).<br>• Discussion of optional issues.<br>• Discussion of force protection issues (discussed throughout).<br>• Closing comments (summary). |

**Table 6-9. AAR format to follow**

- **Make sure all participants are present.** The evaluator should not begin the AAR until all participants are present. Anyone missing may have witnessed an event and may have something to contribute to the discussion.

- **Establish the rules of engagement.** AARs are not **"**finger-pointing" sessions. No crewmember should be singled out for blame for the crew's poor performance or mistakes that might have occurred during the engagement.
- **Restate the training objectives.** The evaluator begins the AAR by restating the training objectives of the training event and its major tasks for the crew (crew gunnery). He begins by stating its title, "You just completed the day phase of Table VI." He then highlights the major task involved, "This phase tested your ability to conduct four engagements. The first was a defensive engagement using the auxiliary sight, the second was an offensive engagement, the third was a defensive commander engagement in a CBRN environment, and the fourth was a retrograde while returning up range."
- **Generate discussion**. The evaluator begins the discussion by asking questions about the first event. For crew gunnery, "Who saw the target first?" After discussing one event, the evaluator asks questions about the next. He and the evaluated crew/unit discuss events in chronological order. The VCE guides the discussion but does not dominate it. The following must be maintained throughout the AAR:

    - Dynamic, candid, and professional discussions of training that focus on performance and safety.
    - Form all questions so they do not single a crewmember out and put him on the defensive.
    - An AAR is not a critique.
    - Do not form discussion that would seem as if the VCE was grading the crew.
    - Always end in a positive manner.

- **Orient on training objectives.** As discussions move away from the objectives, the evaluator must bring the discussions back on track. The evaluator keeps discussions on topic to make the best use of valuable AAR time.
- **Seek maximum participation.** Evaluators must make sure all participants are heard and not let one person monopolize discussions. If a member has not participated, the evaluator asks him a direct question such as, "What were you doing during this time?"
- **Summarize to emphasize key learning points.** As weaknesses are discovered and discussed, the evaluator summarizes the result and the solution.

| AAR Key Points | |
|---|---|
| After action reviews- | |
| • Are conducted during or immediately after each event.<br>• Focus on intended training objectives.<br>• Focus on soldier, leader, and unit performance.<br>• Involve all participants in the discussion. | • Use open-ended questions.<br>• Are related to specific standards<br>• Determine strengths and weaknesses.<br>• Link performance to subsequent training. |

**Table 6-10. Key notes used during AAR**

- **Overview the event.** The evaluator closes the AAR by reviewing strengths and weaknesses relative to Army standards. For example, "(Crew), we found that during the fourth engagement, you failed to engage the light armor target. This gave him the time to place a killing burst on your vehicle. After the discussion we just finished, you now know how to avoid this mistake in the future..."

---

***Note***. During gunnery AARs, the VCE conducting is required to discuss any crew cuts and an analysis of combat actions conducted during the table.

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# Glossary

## SECTION I – ACRONYMS AND ABBREVIATIONS

| Acronym/Term | Definition |
|---|---|
| | **A** |
| **AAR** | after-action review |
| **AAV** | amphibious assault vehicle |
| **AC** | active component |
| **ACOM** | Army command |
| **AG** | assistant gunner |
| **A-GI** | air-ground integration |
| **AI** | assistant instructor |
| **AIMTEST** | Advanced In-bore Markship Training Evaluator System-Tank |
| **ASCC** | Army service component command |
| **ASV** | armored security vehicle |
| **ATGM** | anti-tank guided missile |
| **AUTL** | Army Universal Task List |
| **AXP** | ambulance exchange point |
| | **B** |
| **BES** | Battle effects simulator |
| **BFT** | Blue Force tracker |
| **BFV** | Bradley Fighting Vehicle |
| | **C** |
| **CALFEX** | combined arms live fire exercise |
| **CASEVAC** | casualty evacuation |
| **CATS** | combined arms training strategy |
| **CBRN** | chemical, biological, radiological, nuclear |
| **CD** | compact disc |
| **CRM** | composite risk management |
| | **D** |
| **DIDEA** | detect, identify, decide, engage, and assess |
| **DMPRC** | Digital Multi-Purpose Range Complex |
| **DMPTR** | Digital Multi-Purpose Training Range |
| **DTMS** | Digital Training Management System |
| **DVD-R** | digital versatile disc-recordable |
| | **E** |
| **EFC** | equivalent full charge |
| **EM** | engagement modifier |
| **EST** | Engagement Skills Trainer |
| | **E** |

| | |
|---|---|
| **ETS** | end-term of service |
| | **F** |
| **FATS** | Firearms Training System |
| **FCC** | facilities capability code |
| **FCX** | fire coordination exercise |
| **FM** | field manual |
| **FMC** | fully mission capable |
| **FoV** | family of vehicles |
| **FRAGORD** | fragmentary order |
| | **G** |
| **GST** | Gunnery Skills Test |
| **GTLF** | Gates to Live Fire |
| **GUNSOP** | Gunnery standard operating procedure |
| | **H** |
| **HFS** | hostile fires simulator |
| | **I** |
| **I/O** | instructor/operator |
| **IPR** | in-progress report |
| **ITAS** | Improved Thermal Acquisition System |
| **IWTS** | Integrated weapons training stratery |
| | **K** |
| **KCT** | key collective tasks |
| | **L** |
| **LFAST** | live fire aiming system test |
| **LOS** | line of sight |
| **LSDZ** | laser surface danger zone |
| | **M** |
| **MAT** | moving armor target |
| **MDL** | manual data loader |
| **MDMP** | military decisionmaking process |
| **MEDEVAC** | medical evacuation |
| **METL** | mission-essential task list |
| **MGS** | mobile gun system |
| **MIT** | moving Infantry target |
| **MMG** | mounted machine gun |
| **MOV** | moving |
| **MPRC** | multi-purpose range complex |
| | **N** |
| **NCO** | non-commissioned officer |
| **NCOIC** | non-commissioned officer-in-charge |
| | **N** |

| | |
|---|---|
| **NFOV** | narrow field of view |
| | **O** |
| **OE** | operational environment |
| **OIC** | officer-in-charge |
| **OPORD** | operations order |
| **OPTEMPO** | operations tempo |
| | **P** |
| **PCC** | pre-combat check |
| **PCI** | pre-combat inspection |
| **PCS** | permanent change of station |
| | **R** |
| **RC** | Reserve component |
| **RPM** | required performance measures |
| **RSO** | range safety officer |
| **RTO** | radio-telephone operator |
| **RWS** | remote weapons station |
| | **S** |
| **SAT** | stationary Armor target |
| **SC** | sector clear |
| **SDZ** | surface danger zone |
| **SIT** | stationary Infantry target |
| **SME** | subject matter expert |
| **SOP** | standard operating procedure |
| | **T** |
| **TACSOP** | tactical standard operating procedures |
| **TB** | technical bulletin |
| **TC** | training circular |
| **TCP** | traffic control point |
| **TOC** | tactical operations center |
| **TRADOC** | U.S. Army Training and Doctrine Command |
| **TRP** | target reference point |
| | **U** |
| **UAS** | unmanned aerial system |
| **USR** | unit status report |
| **UTP** | unit training plan |
| | **V** |
| **VC** | vehicle commander |
| **VCE** | vehicle crew evaluator |
| **VCEEP** | Vehicle Crew Evaluator Exportable Package |
| | **W** |
| **WFOV** | wide field of view |

## SECTION II – TERMS

**Active targets**

Targets are considered active when they are engaged with direct fire and are threats that are actively seeking to destroy the firing vehicle.

**Alert**

The first element of the fire command, notifies the crew of a pending engagement and identifies who will be firing to the crew.

**Assess**

Evaluates the weapons or options employed to defeat the threat or threats. It is the process the crew uses to determine if the applied weapons or options delivered the desired effect.

**Automatic zero**

Is assessed for any disregard for the announced task, action, or conditions for any engagement.

**Basic**

Performed on the crew's vehicle, designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array executed from the offense and defense using TADSS or full-caliber ammunition if available.

**Battlecarry**

A posture in which a vehicle is prepared for an engagement at all times.

**Battlesight range**

The range applied to the vehicles fire control system to provide a standard range to target for the ballistic computer for emergency situations that require firing without the use of a laser range finder.

**Cease fire**

Directs all firing to stop immediately regardless of threat status.

**Chamber**

The round is seated within the chamber of the weapon.

**Cocking**

This phase includes all the actions to prepare the weapon to fire the next round. For electrically fired systems, this includes any actions that reset the firing circuit, electric timing events, or manual functions to prepare the weapon to fire the next round.

**Crew response**

A confirmation that the crew member understands the fire command, has completed an implied or directed task provided by the fire command, or to provide information to the crew.

**Decide**

Decide is the determination by the crew to engage or not. Crews use all the situational information at their disposal to ensure an appropriate level of response to the threat.

**Degraded equipment**

The firing vehicle will be considered degraded when their fire control system or weapon system is not fully functioning and will require the VC to issue elements of the fire command that normally are optional, respective to his vehicle, to overcome the failure.

**Detect**

Actively seeking to acquire threats and their accurate location. The target detection process takes practice and skill to successfully acquire potential threats in various environments and visibility conditions.

**Direction**

The fourth element of the fire command given to guide the gunner when the commander cannot lay the weapon for direction from his position.

**Ejection**

The ejection phase contains all actions of the weapon to properly eject the expended cartridge case from the chamber area of the weapon completely, such that another round may be fed into the chamber area.

**Engage**

Engage is the specific application of military options or weapons to defeat, neutralize, or destroy the threat presented. Successful implementation of the weapons or military options at the disposal of the firer will efficiently and effectively alter, disrupt, or halt the threat's DIDEA process, and ultimately eliminate the threat to friendly forces.

**Engagement time**

A subset of the target exposure time that represents the time the crew utilized to engage and defeat each target presented during the engagement.

**Execution**

All fire commands must be executed in order for the firer to commence the engagement.

**Extraction**

This phase begins once the bolt or breech block is unlocked. It extracts the expended cartridge case or case base from the chamber area.

**Feeding**

This positions the cartridge such that it is prepared for chambering.

**Fire and adjust**

Directs the firer to commence firing and that they will not receive any additional commands from the vehicle commander.

**Firing**

This phase ignites the primer of the cartridge and detonates the low explosives of the cartridge.

**Five-point penalty**

Failure to perform fundamental leader or crew tasks.

**Gate To Live Fire (GTLF)**

A prerequisite to any life-fire event, including weapon zeroing, screening, or live fire maintenance procedure.

**Gunnery Skills Test (GST)**

Evaluates the individual crewmember's ability to execute selected fundamental gunnery-related skills.

**Identify**

Once a potential threat is acquired and detected, the firer must accurately identify the target as friend, foe, or neutral. Target identification is a systematic process supporting the characterization of detected objects. Once identified as a hostile threat, crews classify the threat as most dangerous, dangerous, or least dangerous from their perspective.

**Immediate disqualification**

An extremely hazardous action of a crew or crew member during a live fire training exercise.

**Initial fire command**

Initiates a direct fire engagement on a target.

**Lateral dispersion**

The distance between targets presented simultaneously.

**Locking**

The locking phase secures the bolt or breech block to the barrel or breech, ensuring the cartridge is fully chambered. This ensures gas pressure of the round is maintained forward of the bolt, allowing for the expansion of gas to propel the projectile down the barrel.

**Manuever box**

The maximum distance the vehicle could travel while providing 90-percent visibility to all targets exposed.

**Master Gunner**

An institution-trained and certified subject matter expert on direct fire weapons, weapon systems, ammunition, maintenance of weapon systems, and training programs, advises the commander through assessments, planning, development, implementation, instruction, execution, evaluation, and reassessment through all aspects of direct fire and combat readiness training.

**Mounted machine gun platform**

Tracked or wheeled vehicles with one weapon system, including RWS and the M1117, armored security vehicle and the amphibious assault vehicle.

**Practice (course)**

Performed on the crew's vehicle, designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array executed from the offense and defense using full-caliber ammunition.

**Precision engagement**

The most accurate method of direct fie engagement for all weapon platforms that uses the entire fire control system organic to the vehicle to engage threat targets.

**Proficiency (course)**

Performed on the crew's vehicle, designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array executed from the offense and defense, requires the use of laser-based TADSS to complete.

**Qualification (course)**

Performed on the crew's vehicle, designed to train and evaluate the crew's ability to engage stationary and/or moving targets placed in a tactical array, during day and limited visibility conditions, executed from the offense and defense using full-caliber ammunition.

**Range or elevation**

The fifth element of the fire command that tells the crew and gunner what range to set on the weapon sight, or to index or apply to the fire controls system, and optionally at what elevation the target is located.

**Reduced fire command**

Any fire command with less than the seven elements and require a minimum of the target description, the command of execution, and a termination of the engagement.

**Reengage**

Can be used as target description during subsequent and supplemental fire commands that alerts the current firer to continue engaging the same target or one that has been previously engaged with the same weapon system.

**Sequential engagement**

Require the use of one or more weapon systems against multiple targets in a sequential manner, one after the other and use an initial fire command when initiating direct fires at the first target and a supplemental fire command to direct fires against secondary targets.

**Simultaneous engagement**

An engagement where multiple weapon systems are engaging one or more targets, these targets can be engaged at the same time, or in a sequenced series of events.

**Stabilized platform**

Consist of Abrams main battle tanks, Bradley Fighting vehicles, and Stryker Mobile Gun System.

**Standard adjustment**

Is the primary means for weapon systems without a fire control system or those vehicle whose fire control systems are damaged, to direct main and machine gun fires on a target accurately and effectively.

**Standard fire command**

Fire command that includes all seven elements.

**Subsequent fire command**

Directs the crew to continue engaging a target by delivering subsequent rounds against the same target.

**Supplemental fire command**

Given after the initial fire command is executed and the initial target has been adequately serviced, shifts fires to another target described during the initial fire command or at targets that present themselves during the engagement.

**Suppress**

Directs the firer to continue to engage the target with small arms fire in order to suppress any dismounted activity in the same area.

**Target description**

The third element of the fire command that is the description of the threat or threats that the crew will be engaging.

**Termination**

The seventh element of the fire command that informs all crewmembers to stop firing of all weapons and systems.

**Thirty-point penalty**

Failure to adhere to basic safety/personnel protection precepts during live fire events.

**Unlocking**

This phase contains all the actions of the weapon to unlock the bolt or breech block from the barrel or breech.

**Unit training plan**

The unit's overarching plan to attain key collective task proficiency.

**Weapon/ammunition**

The second element of the fire command that identifies to the crew which weapon or ammunition type will be fired during the engagement.

**Weapon safety status**

Common color codes that indicate the direct fire status of any given weapon system.

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