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A PROTOTYPE CREW DRILLS TRAINING PROGRAM

FOR XM1 TANK GUNNERY:

COMPANY COMMANDER'S MANUAL

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ARI Field Unit at Fort Knox, Kentucky

NOVEMBER 1979

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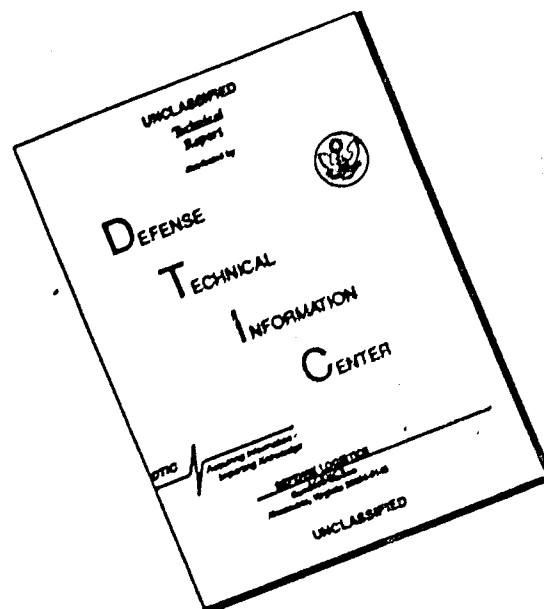


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| CREW DRILLS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PERFORMANCE CHECKLISTS                                                            | PERFORMANCE PRESCRIPTIONS                     |
| TANK GUNNERY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | COLLECTIVE TRAINING                                                               | ASSIGNMENT                                    |
| XM1 MAIN BATTLE TANK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | TRAINING MODELS                                                                   | ALGORITHMS                                    |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                   |                                               |
| <p>This report presents a prototype XM1 tank gunnery crew drills training program designed to support ongoing ARI research concerned with the design and development of Armor training structures. This particular research was focused on the design of collective training components for Armor gunnery tasks, and is responsive to the needs arising from the introduction of the XM1 main battle tank into the Armor inventory. Two major objectives were accomplished. First, fourteen crew drills were identified as representative of basic XM1 tank gunnery</p> |                                                                                   |                                               |

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20. Engagements, and behaviorally analyzed. Performance prescriptions detailing both individual and crew gunnery behaviors were developed for each crew drill requirement, along with performance checklists for assessing crew performance. Administrative, training, and evaluation specifications designed to structure training were also developed. Second, a collective training model was formulated that specified the training approach and supporting systems necessary to manage and quality control crew drill training. A training matrix, designed to promote intermediate and advanced tank gunnery proficiency, and training selection algorithms, designed to aid training assignment, were also developed as part of the training program.



Research Product 79-17

A PROTOTYPE CREW DRILLS TRAINING PROGRAM FOR  
XMI TANK GUNNERY: COMPANY COMMANDER'S MANUAL

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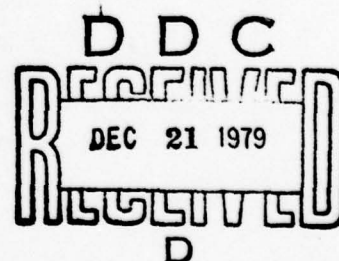
November 1979

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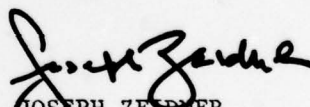
## FOREWORD

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The Armor Training Methods Team within the Fort Knox Field Unit of the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) is concerned with modifying models and structures for Armor training and on developing new training techniques to include methods, media, and devices. High priority needs include gunnery and maintenance training methods, and more efficient, less costly, dry-fire crew drills.

The research reported here is part of an ongoing in-house research effort described under Work Unit 001: Gunnery Training Components for the XM1 Tank (STO 80-9.1:3); Task E: Proficiency Training for Armor Crewmen; Thrust 1: Combat Skill Development/Retention. The research is responsive to HRN 80-89, Transition Training Components for XM1, and is sponsored by the U. S. Army Armor School, COL R. L. Coffman, Director of Training Developments (ATSB-TD). The research project is conducted under RDTE 2Q263743A794, Education and Training, USARI FY 80 Research Program.

The research is being executed by the ARI Field Unit, Fort Knox, Kentucky, with the support of the Directorate of Training Developments (DTD), U. S. Army Armor Center, Fort Knox, Kentucky. Personnel of the USARI appreciate the excellent cooperation given the research by DTD in providing technical and materiel support.

  
JOSEPH ZEIDNER  
Technical Director

## A PROTOTYPE CREW DRILLS TRAINING PROGRAM FOR XM1 TANK GUNNERY: COMPANY COMMANDER'S MANUAL

### BRIEF

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#### Requirement:

To maximize the combat potential of Armor weapon systems through research on the design and development of new training concepts and prototype training programs for gunnery and maintenance tasks in Armor systems.

#### Procedure:

The feasibility of using a dry-fire crew drills concept that will enable tank crews to optimize gunnery procedures in a low cost environment was examined for the XM1 weapon system. The crew drills selected to develop this concept were chosen from an inventory of target servicing requirements considered representative of XM1 tank gunnery. These drills take into consideration the different types of target engagements that can be realistically expected on the battlefield as well as the various methods and modes of fire delivery.

Analysis of these engagements consisted of several steps. XM1 training documentation was examined to determine the individual and crew behaviors required to carry out each crew drill. These data were then verified with XM1 subject matter experts and translated into crew performance sequence diagrams or performance prescriptions. Training prerequisites were then derived from these prescriptions and compiled to identify both individual and team task requirements essential to crew drill performance.

A training strategy to effect training delivery was then developed. Training objectives were specified for each crew drill to include the conditions under which the performance was to occur, the behaviors required, and the criteria or standards of acceptable performance. From these "blueprints", detailed specifications for administering and evaluating training were prepared for each crew drill. Step-size instructions describing how to carry out the training were then standardized across crew drills.

A crew drills training model was subsequently developed to incorporate the proposed training strategy as well as to specify the supporting management and quality control functions necessary to obtain effective and efficient training. To guide advanced gunnery efforts, a training matrix



was developed that increased the difficulty of the performances while maintaining the basic underlying skills. A training selection algorithm was then developed to direct the assignment of individual XM1 tank crews from basic to advanced tank gunnery.

#### Findings:

Fourteen (14) tank gunnery engagements were developed as part of an XM1 crew drills training program. For training, separate manuals were prepared for the company commander, platoon leaders, platoon sergeants, and tank commanders. Depending on which training manual is being addressed, the crew drills contain (a) administrative specifications (support requirements, planning time, references), training specifications (training prerequisites, training objectives, simulation techniques); evaluation specifications (informal, formal); and the training and evaluation materials (crew performance sequence diagrams, performance checklists) necessary to conduct crew drills training.

The potential utility of the dry-fire crew drill training concept remains to be empirically determined.

#### Utilization of Findings:

Tank gunnery proficiency is a major goal of Armor training and evaluation. Currently, the Army is preparing to enter the XM1 main battle tank into its inventory of Armor weapon systems. Since the capabilities of this tank far exceed those of the M60 series tank, a significant impact on training is expected. The prototype tank gunnery crew drills program developed for the XM1 can effectively reduce this impact by providing the training necessary to transition Armor crewmen from individual to sub-caliber or main gun firing requirements. Development of a formal plan for empirically determining the actual training effectiveness and efficiency of this program is viewed as absolutely essential before adoption can be recommended.

# A PROTOTYPE CREW DRILLS TRAINING PROGRAM FOR XM1 TANK GUNNERY: COMPANY COMMANDER'S MANUAL

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## CHAPTER I INTRODUCTION

1.1 PURPOSE: The purpose of this document is to provide XML company commanders with the capabilities necessary to train and evaluate the ability of their tank crews to perform tank gunnery engagements.

1.2 SCOPE: The crew drills in this document are derived from an analysis of XML tank gunnery engagements and include those crew performances determined essential to XML target servicing. Administrative, training, and evaluation specifications, along with crew performance sequence diagrams and performance checklists are provided for each drill. A training matrix is also provided for development of intermediate and advanced tank gunnery proficiency, along with training selection algorithms for assigning crews to the various gunnery programs. When developed, both pretest and post-test diagnostics will be included to measure individual and crew task performance for basic tank gunnery training.

1.3 CHARACTERISTICS: This document emphasizes crew level training with (a) the company commander responsible for program management, (b) the platoon leader responsible for the management, conduct, and evaluation of training, (c) the platoon sergeant responsible for scheduling, securing training resources, and supervising the training effort, and (d) the tank commanders responsible for training their own crews. The drills have four parts: Part One contains the administrative specifications; support requirements (personnel, equipment, materials, facilities), planning time (administrative, training, evaluation), and references. Part Two contains the training specifications; training prerequisites (individual-team task requirements), training objectives (condition, activity, standard), and simulation techniques. Part Three contains the evaluation specifications; informal (prerequisites, criteria, technique) and formal. Part Four contains the training and evaluation materials: crew performance sequence diagrams and performance checklists for appraising crew drill performance.

1.4 REVISION: Since the actual characteristics of the weapon system may change as a result of XML testing, and since the proposed training method is different from that of previous crew drills training, revision to this document is expected. With such improvements, a more effective and efficient training subsystem will be available for the XML at the time it's fielded.



## CHAPTER II

### TRAINING MANAGEMENT

2.1 In accordance with the decentralized training policy mandated by the Army Chief of Staff in 1971, the authority and responsibility for the planning, conduct and internal evaluation of training have been delegated to battalion and separate company commanders. In keeping with this concept of decentralized training, the battalion commander will retain the final authority and responsibility for the tank gunnery crew drills program. In addition, he will continue to provide the mission-type training guidance required to accomplish the broader command missions, allocate training resources, and monitor and evaluate the training effectiveness and efficiency of the training program.

2.2 The focus of the tank gunnery crew drills training effort, however, will be at the tank crew level. Each company commander will function as a separate "program" manager, while platoon leaders will function as "training" managers. For each tank crew, the platoon sergeant will serve as the "master" trainer, while the tank commanders serve as "trainers".

#### 2.3 TRAINING RESPONSIBILITIES

##### a. COMPANY COMMANDER:

For XM1 tank gunnery crew drills training, the company commanders will have the responsibility for programming the training effort within the framework of the unit's assigned mission requirement. As the "program manager", the company commander will:

(1) Determine the tank gunnery proficiency levels of XM1 trained tank crews for assignment to basic, intermediate, or advanced tank gunnery training.

(2) Schedule the pretesting and posttesting required to determine the level of individual and crew tank gunnery proficiency.<sup>1</sup>

(3) Obtain the training and evaluation resources required to achieve and assess individual and crew tank gunnery proficiency.

(4) Schedule the individual and crew training necessary to achieve required levels of tank gunnery proficiency.

(5) Quality control the training by evaluating tank crew success and adjusting training to meet the standards established for acceptable crew drill performance.

<sup>1</sup>Diagnostic pretests and posttests are currently being developed for the basic tank gunnery training program to assess individual skill proficiency and basic crew drill performance. When developed, these tests will be included as part of that program.

b. PLATOON LEADER:

(1) For XM1 crew drills training, the platoon leader has the overall responsibility for carrying out the administrative, training, and evaluation specifications presented in this document. As the "training manager," he must manage, conduct, and evaluate the crew drills training program.

(2) For each crew drill, the platoon leader will:

(a) Perform the individual tasks required of each tank crewmember until thoroughly familiar with the requirements.

(b) Train his tank commanders in all individual and team task requirements by rotating them through each crew position.

(c) Train his tank commanders to prepare and conduct their own crew drill training according to the recommended training approach.

(d) Participate in crew drills training and evaluation as a tank commander.

(e) Monitor the training process to ensure that the standards established for acceptable crew drill performance are being met.

c. PLATOON SERGEANT:

(1) For XM1 crew drills training, the platoon sergeant has the direct responsibility for carrying out the administrative specifications presented in this document. As the "master trainer" for the platoon, he must resolve both administrative and technical matters relating to XM1 crew drills training.

(2) For each crew drill, the platoon sergeant will:

(a) Ensure that the crew drill training and evaluation scheduled for each tank crew is performed.

(b) Secure the necessary equipment, materials, and facilities required to implement training and permit tank crew evaluation.

(c) Participate in crew drills training and evaluation as a tank commander.

(d) Supervise the training provided by other tank commanders, offering suggestions as necessary to improve the training process.

d. TANK COMMANDER:

(1) For XM1 crew drills training, the tank commanders have the direct responsibility for carrying out the training approach presented in this document. As the "trainers," they must prepare and conduct crew drills training.

(2) For each crew drill, the tank commanders will:

(a) Train each crewmember on the specific procedures they are to follow during a target engagement.

(b) Train each crewmember on the individual and team task requirements identified for their crew position.

(c) Provide whatever remedial training is considered necessary to ensure training success.

e. TANK CREWMEMBER:

(1) For XM1 crew drills training, each tank crewmember has the direct responsibility for acquiring the individual task requirements presented in this document. As a "professional soldier," each crewmember must perform his job with the highest level of skill possible.

(2) For each crew drill, the tank crewmembers will:

(a) Perform the procedures specified for their crew position by the tank commander.

(b) Perform the individual and team task requirements identified for their crew position.

(c) Obtain whatever self-instruction is needed to improve individual task performance and achieve the intended team effort.



## CHAPTER III

### ASSIGNMENT OF TANK CREWS TO XM1 TANK GUNNERY CREW DRILLS PROGRAMS

3.1 To meet unit combat readiness requirements envisioned for the sustainment of XM1 tank gunnery crew performance, nonessential tank gunnery training time must be eliminated from unit training schedules. Training administered to establish and maintain high standards of tank gunnery proficiency must be encouraged, but tempered to meet the criteria established for successful training. To meet its requirements, units must determine their precise training needs, develop the training prescriptions designed to meet those needs, and then conduct the kind of training that is both effective and efficient.

3.2 For the XM1, training selection algorithms have been developed for basic, intermediate and advanced tank gunnery crew drills training. These algorithms are to be used to (a) determine the tank gunnery proficiency level of XM1 tank crews prior to assignment to a particular crew drill's training effort, and (b) permit individual tank crews within a unit to progress through training based on their ability to generalize to higher order skill requirements. Once integrated into a unit's overall training management system, these training selection algorithms should provide the controls necessary for effective and efficient training.

#### 3.3 TRAINING SELECTION

- a. BASIC. (Refer to Figure 1.)
- b. INTERMEDIATE. (Refer to Figure 2.)
- c. ADVANCED. (Refer to Figure 3.)

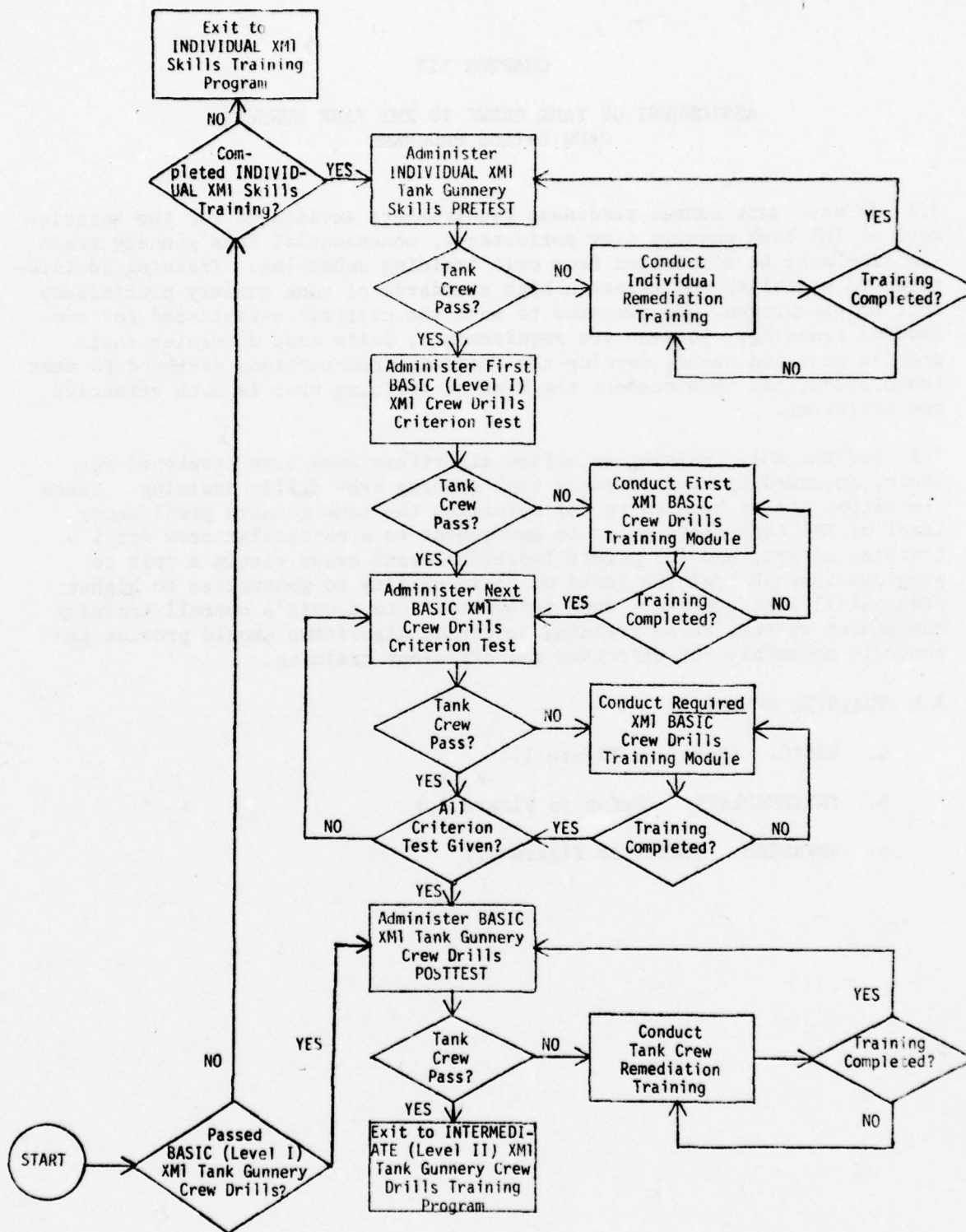


Figure 1. Training Selection Algorithm for Basic (Level I) XM1 Tank Gunnery Crew Drills Training.

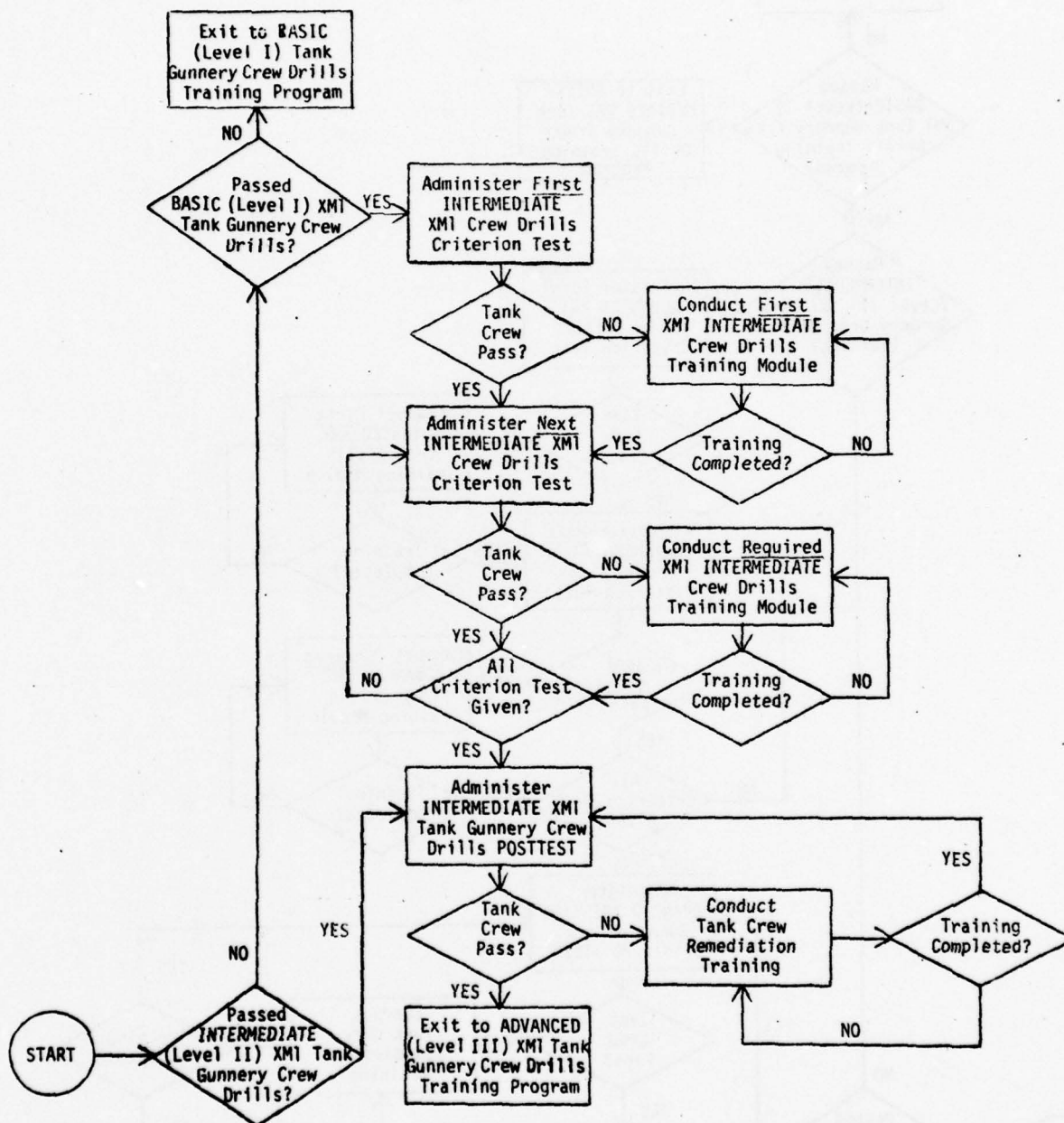


Figure 2. Training Selection Algorithm for Intermediate (Level II) XM1 Tank Gunnery Crew Drills Training.



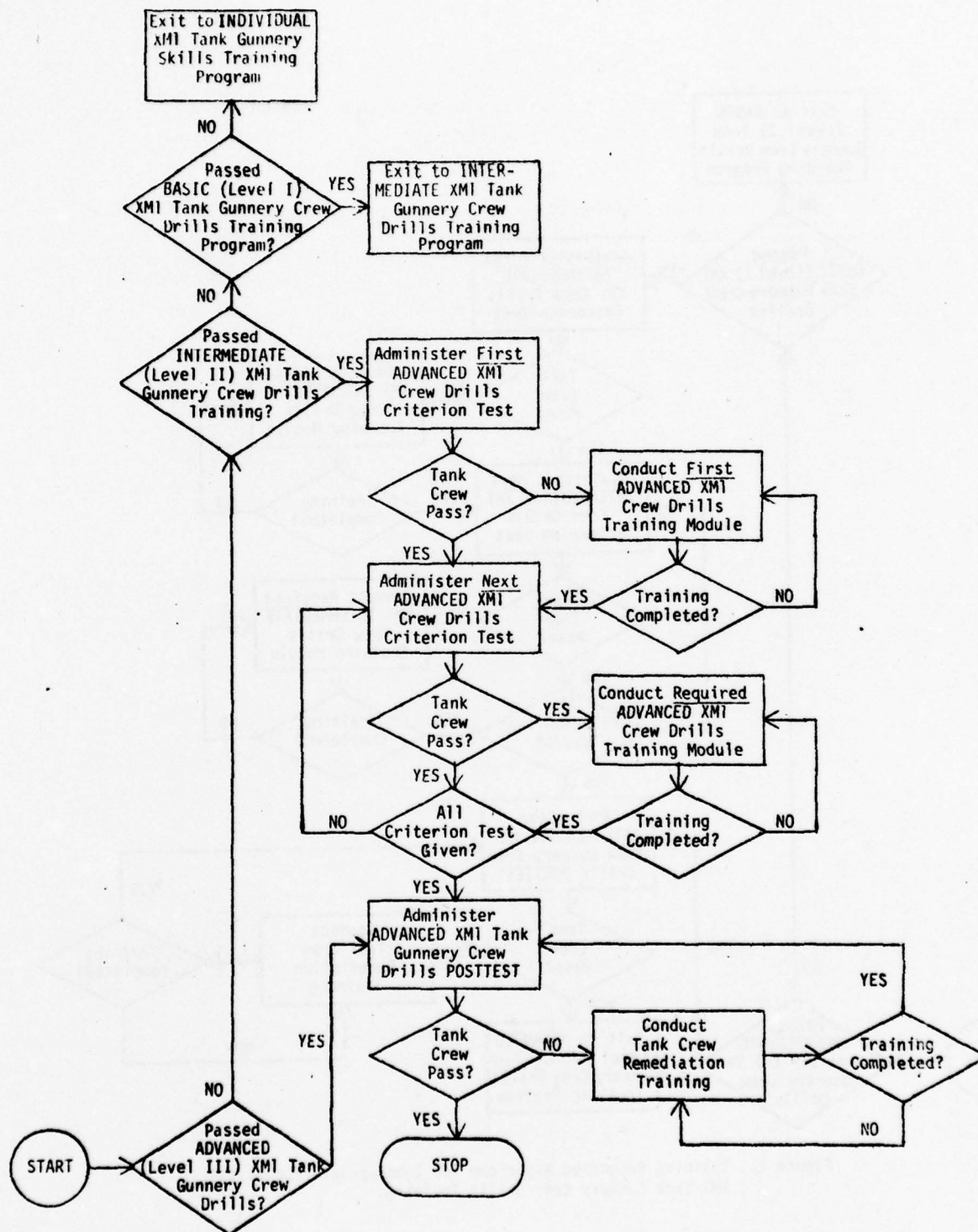


Figure 3. Training Selection Algorithm for Advanced (Level III) XM1 Tank Gunnery Crew Drills Training.

## CHAPTER IV

### HOW TO TRAIN

4.1 As tank commanders and "trainers," you must produce XM1 tank crews capable of performing their duties at a professional level of combat skill. The only way to ensure such success is through training, and the better the training the greater the certainty that your tank crews will be capable of defeating the enemy outnumbered and surviving on the modern battlefield. Following the performance-oriented training approach presented in this document will enable you to train successfully. With the immediate feedback provided at the end of each training requirement, you can readily determine that, "Yes, the crew can perform the task" or "No, they cannot."

4.2 Training in crew drills is done collectively, allowing each crewmember to perform his individual tasks simultaneously with the others in such a manner that together they perform proficiently to accomplish the intended team effort. Soldier's Manuals and Job Performance Guides expected to be fielded with the XM1 are excellent sources of assistance for you to prepare and conduct individual task training. Likewise, ARTEPs are comprised of a series of training and evaluation outlines which specify the products of collective task training. The crew drills contained in this document are intended to bridge the gap between these two systems.

#### 4.3 TRAINING APPROACH

##### a. PREREQUISITES:

(1) Before basic (Level I) crew drills training can begin, each crewmember must be able to perform the individual task requirements identified as prerequisite to the tank gunnery crew drills program. Evidence of eligibility is a passing score on the individual skills pretest.

(2) Before intermediate (Level II) or advanced (Level III) crew drills training can begin, each tank crew must be able to perform the crew drill requirements specified at the previous training level. Evidence of eligibility is a passing score on the previous crew drills posttest.

b. PREPARATION: Obtain and review the TRAINING SPECIFICATIONS and the crew performance diagram for the crew drill. When completely familiar with the requirements proceed as follows:

(1) Contact your platoon leader/sergeant and arrange for the target conditions to be set-up as specified in the training objective for the tank gunnery crew drill.

(2) When completed, have your crew enter the tank and set-up the conditions for the firing vehicle and crew stations as specified in the training objective for the crew drill.

(3) When completed, obtain and review the safety regulations and requirements for XM1 tank operation.

c. CONDUCT:

(1) Introduction

Review the training given by your platoon leader on how to conduct crew training. When completely familiar with the requirement, proceed as follows:

1 Read aloud the "activity" and "standard" specified in the training objective for the tank gunnery crew drill.

2 Explain how the overall training is to be carried out, how long it will take, and how the crew will be expected to demonstrate their ability to perform the crew drill.

3 Hand each crewmember a copy of the tank gunnery crew performance diagram and briefly describe what the tank crew must accomplish, in what amount of time, and to what standard of proficiency.

4 Summarize the introduction by describing who, what, when, where, and how the training is to be conducted and evaluated.

(2) Presentation

(a) Train the tank crew to perform the individual procedures identified for their crew position during the target engagement.

1 Starting with the driver, then the loader and gunner, use the tank gunnery crew performance diagram to guide the one-on-one instruction.

2 Have the crewmember being trained perform the activities called for in the procedure as you talk him through the crew drill.

3 Critique each activity as it's performed and provide whatever corrective instruction is necessary to improve the performance.

4 Have the crewmembers not directly involved in the individual procedures training rehearse the procedure described on the crew drill performance diagram for their crew position.



(b) Train the tank crew to perform the team task requirements identified for the target engagement.

1 Refer to the training prerequisites specified for the tank gunnery crew drill and identify the team task requirements.

2 Team train the two-man team task requirement first, following the procedure described below for crew training.

3 Have tank crewmembers not involved in the team task training practice their individual activities and procedures for the engagement.

(c) Train the tank crew to perform the crew requirements identified for the target engagement.

1 Walk the tank crew through the target engagement procedure while maintaining accuracy on individual task requirements.

2 Gradually decrease the amount of time taken to perform the target engagement until the time and accuracy standards have been met.

3 Critique the tank crew after each dry-run performance by providing immediate knowledge of results.

4 Challenge yourself and your tank crew to exceed the training standards established for the target engagement.

## CHAPTER V

### HOW TO EVALUATE AND QUALITY CONTROL

4.1 The purpose of evaluation and quality control is to ensure that the training objectives determined for a program are being met, and if they are not, to introduce corrective adjustments so that the objectives can be eventually attained. This purpose is accomplished primarily through performance assessment. Performance assessment is a means of measuring the progressive achievement and terminal proficiency of trainees. A secondary method is program monitoring which is used to continuously evaluate the effectiveness of the overall program.

4.2 Evaluation and quality control of the basic (Level I) tank gunnery crew drills program will be accomplished using both formal and informal methods. Results from diagnostic tests being developed to measure both individual and tank crew proficiency must be used by the company commander as the basis for assessing progress and recommending changes that will result in criterion task performance. Results from informal appraisals conducted by both platoon leaders and sergeants must be used during the course of the program to continuously examine the effectiveness of adopted scheduling, training, and assessment approaches. Decisions arrived at from these efforts and the resultant changes, if any, can be used to maintain or improve the proficiency of the tank crews and the quality of the crew drills program. In the final analysis, one can readily determine that, "Yes, we are getting our money's worth" or "No, we are not."

#### 4.3 EVALUATION APPROACH

##### a. FORMAL:

(being developed separately)

b. INFORMAL

(1) Setting-up the Appraisal

Obtain and review the ADMINISTRATIVE, TRAINING, and EVALUATION SPECIFICATIONS developed for the crew drill. When completely familiar with the requirements, proceed as follows:

1 Obtain the support requirements specified for the evaluation.

2 Establish the conditions specified in the training objective for the firing vehicle, crew stations and target.

3 Position the platoon sergeant where he can best observe the loader and driver.

4 Take up a position where you can best observe the tank commander and gunner.

(2) Conduct

Obtain and review the EVALUATION MATERIALS developed for the crew drill, when completely familiar with the requirements, proceed as follows:

1 Read aloud the instructions to the tank crew, answering all questions.

2 Rate the crew's performance using the crew drill performance checklist according to the directions provided.

(3) Scoring

Obtain the crew drill performance checklist completed by the platoon sergeant after each appraisal trial. After ensuring it's completeness proceed as follows:

1 Check the time recorded for Trial 1, add it to the time you recorded, and divide the total by two.

2 Compare this average time to the performance time standard specified for the crew drill. If it is equal to or less than the time standard, write the word "GO" in the box opposite TIME under Trial 1. If it is greater than the time standard, write the words "NO-GO" in the box.

3 Check the performance ratings given by the platoon sergeant for the loader and driver and record these results onto your performance checklist.



4 Search each column under Trial 1 for error (E) ratings. If there is an "E" recorded on the checklist, write the words "NO-GO" in the box opposite ACCURACY under Trial 1. If there are no error (E) ratings, write the word "GO" in the box.

5 Compute the tank crew's performance SCORE for Trial 1 by checking the TIME and ACCURACY boxes. If either box has the words "NO-GO" in it, write the words "NO-GO" in the SCORE box for Trial 1. If both boxes have the word "GO" written in them, write the word "GO" in the box opposite SCORE under Trial 1.

#### (4) Critique

Critique the tank crew's performance after each performance appraisal. In doing so, adhere to the criteria for successful performance presented in the EVALUATION SPECIFICATIONS, and proceed as follows:

1 Begin the critique by reviewing individual tank crew member performance and comparing time and accuracy standards.

2 Identify the specific reason(s) for the crew's success or failure.

3 End the critique by reinforcing successful performance or instructing the crew to practice on their own to remove the cause(s) of failure.

#### 5.4 PROGRAM MONITORING

a. As a Platoon Leader, your role as a "training manager" is essential to achieving both effective and efficient crew drills training. You must not only be capable of performing each and every crew drill to the specified standards, but, more importantly, you must demonstrate the leadership necessary to create an attitude for achieving performance excellence among your tank crews.

b. To assist you in your role as "training manager" for the XM1 tank gunnery crew drills training program, the following actions are recommended:

(1) Complete the attached Platoon Training Record according to the instructions provided. Continuously update the record as crew drill training progresses.

(2) Select at random, individual tank crews within your platoon to verify their adherence to the recommended training approach.

(3) Conduct regular meetings with various crew members to assess their attitudes toward the program and to determine what changes, if any, they feel are needed to improve the training and/or evaluation processes.

(4) Submit regular progress reports to your company commander informing him of the platoon's training status. Seek out advice, as necessary, to accomplish your training management responsibilities.

#### 5.5 QUALITY CONTROL

a. As a Company Commander, your role as "program manager" for the crew drills training is to ensure that the training and evaluation taking place in your command is both effective and efficient. Although such program monitoring efforts can be assigned to a Company Training Officer, your active involvement in the quality control process is essential. Without your command presence, the importance attached to the program by the soldiers will be short-lived.

b. To protect your "vested interest" in the success of the crew drills program, the following actions are recommended.

(1) Select at random, at least two tank crews from the company (one may be led by a Platoon Leader or Sergeant) for verification purposes.

(2) Select four to six individual task performance items and at least two of the crew drills for independent administration.

(3) Administer both the individual and collective task performance items to the tank crews, obtaining whatever resources are required.

(4) Verify the results of this independent evaluation with the evaluation progress reports submitted by the tank crews' platoon leaders.

(5) Gross deviations from the two scores is indicative of "something wrong", and immediate action should be taken to determine what it is and to introduce the required corrective action.

c. Complete the attached COMPANY TRAINING RECORD according to the instructions provided.

[illegible]

## TANK PLATOON

UNIT -

PLT LDR

SGT

**LEVEL**

[illegible]

TOTALS



## PLATOON TRAINING RECORD

### INSTRUCTIONS

#### 1. ADMINISTRATIVE

- a. Complete the administrative information requested at the top of the sheet.
- b. Identify the tank number and its tank crewmembers in the space provided at the left side of the form.

#### 2. PRETEST

- a. Obtain the results of the PRETEST and enter the results for each tank crewmember as follows:

- (1) Locate the results of the PRETEST for the first tank crewmember.
- (2) Draw a diagonal (  ) in the box under PRETEST for the first tank crewmember (TC) listed.
- (3) If the TC "passed" the PRETEST, shade in the upper left diagonal (  ).
- (4) If the TC "failed" the PRETEST, shade in the bottom right diagonal (  ).

- b. When a tank crewmember that "failed" the PRETEST "passes" a retest of the requirements, write your initials in the upper left diagonal (  ).

- c. When all tank crews within the platoon have "passed" the PRETEST, shade in the TOTAL box under PRETEST.

#### 3. CREW DRILL

- a. Obtain the performance checklists used for the tank crew drill appraisal and enter the results for each tank crew as follows:

- (1) Locate the tank crew number on the sheet that matches the number on the performance checklist.

- (2) Locate the crew drill number on the sheet that matches the number on the performance checklist.

- (3) Locate the SCORE for TRIAL 1 on the performance checklist.

- (4) If the SCORE is "GO", draw a diagonal in the box opposite TRIAL number 1 for the tank crew and shade the upper left diagonal (  ).

- (5) If the SCORE is "NO-GO", draw a diagonal in the box opposite TRIAL number 1 for the tank crew and shade the bottom right diagonal (  ).

- b. When all tank crews in the platoon have "passed" a crew drill, shade in the TOTAL box opposite the box in which the last tank crew "passed."

#### 4. POSTTEST

With the exception of substituting POSTTEST for PRETEST, follow the same instructions as provided for recording PRETEST results.

## COMPANY TRAINING RECORD

| TANK COMPANY |      | UNIT  | CO    | XO    | DATE STARTED | ENDED |       |       |       |       |       |       |       |       |       |           |
|--------------|------|-------|-------|-------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|
| PLT          | TANK | 1     | 2     | 3     | 4            | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | POST TEST |
|              |      | TRIAL | TRIAL | TRIAL | TRIAL        | TRIAL | TRIAL | TRIAL | TRIAL | TRIAL | TRIAL | TRIAL | TRIAL | TRIAL | TRIAL |           |
|              |      | 1     | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 2     | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 3     | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 4     | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 5     | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 6     | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 7     | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 8     | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 9     | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 10    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 11    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 12    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 13    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 14    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 15    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 16    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 17    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 18    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 19    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 20    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 21    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 22    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 23    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 24    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 25    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 26    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 27    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 28    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      | 29    | 3     | 1     | 2            | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     |           |
|              |      | 30    | 1     | 2     | 3            | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     |           |
|              |      | 31    | 2     | 3     | 1            | 2     | 3     | 1     | 2     | 3     | 1     | 2     | 3     | 1     | 2     |           |
|              |      |       |       |       |              |       |       |       |       |       |       |       |       |       |       |           |

## COMPANY TRAINING RECORD

### INSTRUCTIONS

1. Complete the information requested at the top of the COMPANY TRAINING RECORD.
2. Obtain the PLATOON TRAINING RECORDS for the tank company.
3. Identify the tank platoons and the number of each tank within the platoons in the space at the left side of the RECORD.
4. Identify the training record for the first platoon listed and enter for each tank crew:
  - a. the PRETEST results,
  - b. the CREW DRILL results,
  - c. the POSTTEST results.
5. Repeat the above step for each of the remaining two tank platoons.
6. Compute the SUMMARY performance of the tank company by summing the TOTALs for the tank platoons as follows:
  - a. Check the TOTAL boxes for CREW DRILL 1.
  - b. Identify the maximum number of trials required by the platoons to "pass" the crew drill.
  - c. Record this data on the COMPANY TRAINING RECORD by shading in the SUMMARY box under CREW DRILL 1 that matches the number of the trial in which the last tank platoon "passed."
  - d. Repeat the above procedure for each of the remaining crew drills.



## CHAPTER VI

### DEVELOPMENT OF TANK GUNNERY CREW DRILLS PROFICIENCY

6.1 The ability of XML tank crews to meet the performance standards specified for each of the fourteen tank gunnery crew drills presented in this training document will establish a foundation on which to build highly proficient tank crews. These crews will have demonstrated an ability to engage and defeat enemy targets under an ideal set of battle conditions. The task ahead is to progress beyond these basic conditions until the tank crews can match the gunnery performances expected on the modern battlefield.

6.2 A training matrix has been produced to guide the development of XML tank gunnery crew drills proficiency. This training matrix is an extension of the basic crew drills training conditions presented earlier for the firing vehicle, target, and environment, and identifies the requirements for both intermediate and advanced XML tank gunnery crew performance. By extending the range of target engagement conditions, the basic tank gunnery procedures remain fixed while the level of task performance difficulty increases. Specifically, XML tank crews will now be required to engage half or turret exposed oblique or frontal tank targets poorly or barely visible across rolling or hilly terrain containing trees or wooded areas, rather than engaging fully exposed flank tank targets clearly visible across flat open terrain.

6.3 TRAINING APPROACH: To implement the training approach proposed for intermediate and advanced tank gunnery crew drills training, the following modifications to the basic crew drills training approach are necessary.

a. PREREQUISITES: To be eligible to participate in either the intermediate or advanced tank gunnery crew drills training, tank crews must obtain a passing score on the diagnostic posttest developed for the basic tank gunnery crew drills program.

b. PREPARATION:

(1) TCs should obtain and review the TRAINING MATRIX appropriate for the level of training (intermediate, advanced) and mode of operation (normal, emergency, degraded) selected for training.

(2) Platoon Leader/Sergeant should be contacted to set up the training conditions as specified in the selected TRAINING MATRIX.

c. INTRODUCTION:

(1) Identify the "conditions" specified for training and contrast them with the set of conditions identified for the basic or intermediate tank gunnery crew drills training.

(2) After handing each crewmember a copy of the tank gunnery crew performance diagram, point out to them that the crew drill procedure is exactly the same as before, and that it must be performed to the same time and accuracy standards.

d. PRESENTATION:

(1) Omit training the tank crew to perform the individual procedures identified for their crew position.

(2) Omit training the tank crew to perform the team task requirements identified for the target engagement.

6.4 EVALUATION APPROACH: To evaluate the training, the following modifications to the basic crew drills training program are required.

a. INFORMAL: The conditions for the training evaluation must reflect the conditions identified for the level of training (intermediate, advanced) and mode of operation (normal, emergency, degraded) selected for training; In all other instances, the requirements for informal evaluation remain the same.

b. FORMAL: (To be determined)

# TRAINING MATRIX<sup>1</sup> FOR XM1 TANK GUNNERY CREW DRILLS

| FIRING VEHICLE (XMI) |      |      |     |     |        |       |        |       |    | TARGET VEHICLE |          |     |      |        |       |          |       |       |      | ENVIRONMENT |      |         |      |         |      |            |      |      |      |     |    |   |     |   |   |
|----------------------|------|------|-----|-----|--------|-------|--------|-------|----|----------------|----------|-----|------|--------|-------|----------|-------|-------|------|-------------|------|---------|------|---------|------|------------|------|------|------|-----|----|---|-----|---|---|
| MODE                 | ENER | DEGR | STA | MTH | MOTION | SPEED | GUNNER | SIGHT | TC | METHOD         |          | NBR | TYPE | MOTION | SPEED | EXPOSURE | ANGLE | RANGE |      |             |      | SURFACE |      | TERRAIN |      | VISIBILITY |      |      |      |     |    |   |     |   |   |
|                      |      |      |     |     |        |       |        |       |    | WATN           | WACHTIME |     |      |        |       |          |       | 1000  | 1400 | 1800        | FLAT | ROLL    | HILL | OPEN    | TREE |            | WOOD | GOOD | POOR | HAD |    |   |     |   |   |
| 1                    |      |      |     |     | 1      |       | 1      |       |    |                | 1        | 1   |      |        |       | 1a       | b     | c     | 1a   | b           | c    | 1a      | b    | c       | 1a   | b          | c    |      |      |     |    |   |     |   |   |
| 2                    |      |      |     |     | 2      |       | 2      |       |    |                | 2        | 2   |      | 2      | 2a    | b        | c     | 2a    | b    | c           | 2a   | b       | c    | 2a      | b    | c          | 2a   | b    | c    |     |    |   |     |   |   |
| 3                    |      |      |     |     | 3      | 3a    | b      | c     | 3  |                | 3        | 3   |      | 3      |       | 3a       | b     | c     | 3a   | b           | c    | 3a      | b    | c       | 3a   | b          | c    | 3a   | b    | c   |    |   |     |   |   |
| 4                    |      |      |     |     | 4      | 4a    | b      | c     | 4  |                | 4        | 4   |      | 4      | 4a    | b        | c     | 4a    | b    | c           | 4a   | b       | c    | 4a      | b    | c          | 4a   | b    | c    | 4a  | b  | c |     |   |   |
| 5                    |      |      |     |     | 5      |       |        |       | 5  |                | 5        | 5   |      | 5      | 5a    | b        | c     | 5a    | b    | c           | 5a   | b       | c    | 5a      | b    | c          | 5a   | b    | c    | 5a  | b  | c |     |   |   |
| 6                    |      |      |     |     | 6      | 6a    | b      | c     | 6  |                | 6        | 6   |      | 6      |       | 6a       | b     | c     | 6a   | b           | c    | 6a      | b    | c       | 6a   | b          | c    | 6a   | b    | c   | 6a | b | c   |   |   |
| 7                    |      |      |     |     | 7      | 7a    | b      | c     | 7  |                | 7        | 7   |      | 7      | 7a    | b        | c     | 7a    | b    | c           | 7a   | b       | c    | 7a      | b    | c          | 7a   | b    | c    | 7a  | b  | c |     |   |   |
| 8                    |      |      |     |     |        | 8a    | b      | c     | 8  |                | 8        | 8   |      | 8      |       | 8a       | b     | c     | 8a   | b           | c    | 8a      | b    | c       | 8a   | b          | c    | 8a   | b    | c   | 8a | b | c   |   |   |
| 9                    |      |      |     |     | 9      | 9a    | b      | c     | 9  |                | 9        | 9   |      | 9      | 9a    | b        | c     | 9a    | b    | c           | 9a   | b       | c    | 9a      | b    | c          | 9a   | b    | c    | 9a  | b  | c | 9a  | b | c |
| 10                   |      |      |     |     | 10     |       |        |       | 10 |                | 10       | 10  |      | 10     | 10a   | b        | c     | 10a   | b    | c           | 10a  | b       | c    | 10a     | b    | c          | 10a  | b    | c    | 10a | b  | c | 10a | b | c |
| 11                   |      |      |     |     | 11     |       |        |       | 11 |                | 11       | 11  |      | 11     | 11a   | b        | c     | 11a   | b    | c           | 11a  | b       | c    | 11a     | b    | c          | 11a  | b    | c    | 11a | b  | c | 11a | b | c |
| 12                   |      |      |     |     | 12     |       |        |       | 12 |                | 12       | 12  |      | 12     | 12a   | b        | c     | 12a   | b    | c           | 12a  | b       | c    | 12a     | b    | c          | 12a  | b    | c    | 12a | b  | c | 12a | b | c |
| 13                   |      |      |     |     | 13     |       |        |       | 13 |                | 13       | 13  |      | 13     | 13a   | b        | c     | 13a   | b    | c           | 13a  | b       | c    | 13a     | b    | c          | 13a  | b    | c    | 13a | b  | c | 13a | b | c |
| 14                   |      |      |     |     | 14     |       |        |       | 14 |                | 14       | 14  |      | 14     | 14a   | b        | c     | 14a   | b    | c           | 14a  | b       | c    | 14a     | b    | c          | 14a  | b    | c    | 14a | b  | c | 14a | b | c |

<sup>1</sup>The training matrix contains three levels of tank gunnery proficiency for each of the 14 crew drills: a = basic, b = intermediate, c = advanced. These proficiency levels represent an increase in task performance difficulty brought about by corresponding changes in target engagement conditions.



## CHAPTER VII

### JOB OBJECTIVES FOR BASIC XM1 TANK GUNNERY CREW DRILLS TRAINING

|                                                                                 | <u>PAGE</u> |
|---------------------------------------------------------------------------------|-------------|
| 1.0 NORMAL MODE                                                                 |             |
| SINGLE TARGET SERVICING, DAY, MAIN GUN:                                         |             |
| STATIONARY VS. STATIONARY TARGET . . . . .                                      | 8-1         |
| 1.1.1.1.1.1 Given (a) a stationary XM1 tank in hull defilade,                   |             |
| (b) main gun battlesighted and loaded with SABOT ammunition, (c) an             |             |
| operational gunner's primary sight (GPS), and (d) a fully exposed flank         |             |
| view of a stationary tank target visible at 1000 meters during day-             |             |
| light; the XM1 tank crew will engage and destroy the threat target with-        |             |
| in <u>8</u> seconds using precision gunnery and no more than <u>2</u> rounds.   |             |
| SINGLE TARGET SERVICING, DAY, MAIN GUN:                                         |             |
| STATIONARY VS. MOVING TARGET . . . . .                                          | 8-15        |
| 1.1.1.1.2.1.1 Given (a) a stationary XM1 tank in hull defilade,                 |             |
| (b) main gun battlesighted and loaded with SABOT ammunition, (c) an             |             |
| operational gunner's primary sight (GPS), and (d) a fully exposed flank         |             |
| view of a tank target moving across flat open terrain at 10 mph and             |             |
| visible at 1000 meters during daylight; the XM1 tank crew will                  |             |
| engage and destroy the threat target within <u>8</u> seconds using precision    |             |
| gunnery and no more than <u>2</u> rounds.                                       |             |
| SINGLE TARGET SERVICING, DAY, MAIN GUN:                                         |             |
| MOVING VS. STATIONARY TARGET . . . . .                                          | 8-29        |
| 1.1.1.1.5.1.1 Given (a) an XM1 tank moving across flat open                     |             |
| terrain at 10 mph, (b) main gun battlesighted and loaded with SABOT             |             |
| ammunition, (c) an operational gunner's primary sight (GPS), and (d) a          |             |
| fully exposed flank view of a stationary tank target visible at                 |             |
| 1000 meters during daylight; the XM1 tank crew will engage and destroy          |             |
| the threat target within <u>8</u> seconds using precision gunnery and no more   |             |
| than <u>2</u> rounds.                                                           |             |
| SINGLE TARGET SERVICING, DAY, MAIN GUN:                                         |             |
| MOVING VS. MOVING TARGET . . . . .                                              | 8-43        |
| 1.1.1.1.6.1.1 Given (a) an XM1 tank moving across flat open                     |             |
| terrain at 10 mph, (b) main gun battlesighted and loaded with SABOT             |             |
| ammunition, (c) an operational gunner's primary sight (GPS), and (d) a          |             |
| fully exposed flank view of a tank target moving across flat open               |             |
| terrain at 10 mph and visible at 1000 meters during daylight; the               |             |
| XM1 tank crew will engage and destroy the threat target within <u>8</u> seconds |             |
| using precision gunnery and no more than <u>2</u> rounds.                       |             |

## SINGLE TARGET SERVICING, NIGHT, MAIN GUN:

STATIONARY VS. MOVING TARGET . . . . . 8-57

1.1.2.1.2.1.2 Given (a) a stationary XM1 tank in hull defilade, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational thermal imagery system (TIS), and (d) a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during nightlight; the XM1 tank crew will engage and destroy the threat target within 8 seconds using precision gunnery and no more than 2 rounds.

## MULTIPLE TARGET SERVICING, DAY, MAIN GUN:

MOVING VS. TWO STATIONARY TARGETS . . . . . 8-71

1.2.1.1.5.1.1 Given (a) an XM1 tank moving across flat open terrain at 10 mph, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational gunner's primary sight (GPS), and (d) a fully exposed flank view of two tank targets 100-200 meters apart and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy both threat targets within 16 seconds using precision gunnery and no more than 4 rounds.

## MULTIPLE TARGET SERVICING, DAY, MAIN GUN/COAXIAL MACHINEGUN:

MOVING VS. TWO STATIONARY TARGETS . . . . . 8-85

1.2.1.2.5.1.1 Given (a) an XM1 tank moving across flat open terrain at 10 mph, (b) main gun battlesighted and loaded with SABOT ammunition, (c) coaxial machinegun loaded and ready to fire, (d) an operational gunner's primary sight (GPS), and (e) a fully exposed flank view of a stationary tank target and a troop target 100-200 meters apart and visible at 600-1000 meters during daylight; the XM1 tank crew will engage and destroy the main gun target within 8 seconds using precision gunnery and no more than 2 rounds, and then suppress the coaxial machinegun troop target with area fire within 20 seconds using no more than 100 rounds.

## SIMULTANEOUS TARGET SERVICING, DAY, MAIN GUN/CALIBER .50 MACHINEGUN:

STATIONARY VS. TWO STATIONARY TARGETS . . . . . 8-99

1.3.1.1.1.1.1 Given (a) a stationary XM1 tank in hull defilade, (b) main gun battlesighted and loaded with SABOT ammunition, (c) caliber .50 machinegun loaded and ready to fire, (d) an operational gunner's primary sight (GPS) and TC's periscope, and (e) a fully exposed flank view of a stationary tank target and an ATGM (amn-packed) 100-200 meters apart and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the main gun target within 8 seconds using precision gunnery and no more than 2 rounds, while simultaneously destroying the caliber .50 ATGM (man-packed) target with point fire within 10 seconds using no more than 200 rounds.

## 2.0 EMERGENCY MODE

SINGLE TARGET SERVICING, DAY, MAIN GUN:

MOVING-TO-A-HALT VS. MOVING TARGET . . . . . 8-113

2.1.1.1.4.1.1 Given (a) an XM1 tank moving across flat open terrain at 10 mph with an inoperative stabilization system, (b) main gun battlesighted and loaded with SABOT ammunition, (c) a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the threat target from a halt within 8 seconds using precision gunnery and no more than 2 rounds.

## 3.0 DEGRADED MODE

SINGLE TARGET SERVICING, DAY, MAIN GUN:

RANGEFINDER FAILURE/BATTLESIGHT METHOD;

STATIONARY VS. MOVING TARGET . . . . . 8-127

3.1.1.1.2.1.1 Given (a) a stationary XM1 tank in hull defilade with an inoperative rangefinder, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational gunner's primary sight (GPS), and (d) a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the threat target within 8 seconds using battlesight gunnery and no more than 2 rounds.

SINGLE TARGET SERVICING, DAY, MAIN GUN:

LEAD ANGLE SENSOR FAILURE/PRECISION METHOD;

STATIONARY VS. MOVING TARGET . . . . . 8-141

3.1.1.1.2.2.1 Given (a) a stationary XM1 tank in hull defilade with an inoperative lead angle sensor, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational gunner's primary sight (GPS), and (d) a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the threat target within 8 seconds using precision gunnery and no more than 2 rounds.

SINGLE TARGET SERVICING, DAY, MAIN GUN:

CANT SENSOR FAILURE/PRECISION METHOD:

STATIONARY VS. MOVING TARGET . . . . . 8-155

3.1.1.1.1.3.1 Given (a) a stationary XM1 tank in hull defilade with an inoperative cant sensor, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational gunner's primary sight (GPS), and (d) a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the threat target within 8 seconds using precision gunnery and no more than 2 rounds.



SINGLE TARGET SERVICING, DAY, MAIN GUN:  
CROSSWIND SENSOR FAILURE/PRECISION METHOD;

STATIONARY VS. MOVING TARGET . . . . . 8-169

3.1.1.1.1.4.1 Given (a) a stationary XM1 tank in hull defilade with an inoperative crosswind sensor, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational gunner's primary sight (GPS), and (d) a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the threat target within 8 seconds using precision gunnery and no more than 2 rounds.

SINGLE TARGET SERVICING, DAY, MAIN GUN:  
GPS-TIS FAILURE/PRECISION METHOD;

STATIONARY VS. MOVING TARGET . . . . . 8-183

3.1.1.1.1.5.2 Given (a) a stationary XM1 tank in hull defilade with an inoperative primary (GPS) and thermal (TIS) sight, (b) main gun battlesighted and loaded with SABOT ammunition, (c) an operational gunner's auxiliary sight (GAS), and a fully exposed flank view of a tank target moving across flat open terrain at 10 mph and visible at 1000 meters during daylight; the XM1 tank crew will engage and destroy the threat target within 8 seconds using precision gunnery and no more than 2 rounds.

## TANK GUNNERY CREW DRILL

|                                            |                                    |                  |                         |
|--------------------------------------------|------------------------------------|------------------|-------------------------|
| <u>1.0</u> NORMAL                          | <u>1.1</u> SINGLE TARGET SERVICING | <u>1.1.1</u> DAY | <u>1.1.1.1</u> MAIN GUN |
| <u>1.1.1.1.1</u> STATIONARY VS. STATIONARY | <u>1.1.1.1.1</u> PRECISION METHOD  |                  |                         |
| <u>1.1.1.1.1.1</u> GUNNER'S PRIMARY SIGHT  |                                    |                  |                         |

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, fully operational.
- 2 Three (3) full scale stationary Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time: \_\_\_\_\_ minutes.
- (3) Evaluation time: \_\_\_\_\_ minutes.
- (4) Total time: \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing the gun
  - 1.5 Monitoring target engagement
    - 1.5.1 Identifying correct sight picture
    - 1.5.2 Identifying correct lasing
    - 1.5.3 Identifying ready-to-fire status
  - 1.6 Round sensing
    - 1.6.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets



- 2.2 Positioning gun/turret
  - 2.2.1 Traversing the turret
  - 2.2.2 Elevating/depressing the gun
- 2.3 Laying on targets
  - 2.3.1 Applying main gun methods of fire
    - 2.3.1.1 Applying precision method of fire
- 2.4 Ranging to targets
  - 2.4.1 Laser ranging to targets
- 2.5 Firing on targets
  - 2.5.1 Determining ready-to-fire status
  - 2.5.2 Firing the main gun
    - 2.5.2.1 Firing electrically
- 2.6 Round sensing
- 2.7 Adjusting fire
  - 2.7.1 Adjusting main gun fire
    - 2.7.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR (must be capable of)

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions:

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation

3x respectively e MAGNIFICATION selectors for GPS and TIS are in 10x and  
f THERMAL MODE switch is in STANDBY and RCVR READY light  
is lit

- \*g Laser RANGE switch is in ARM LAST RTN
- h GUN SELECT switch is in TRIGGER SAFE and light is lit
- i FIRE CONTROL MODE switch is in MAIN and light is lit
- j AMMUNITION SELECT switch is in APDS and light is ON

### 3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on  
and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in  
protected position, seat back is removed and stowed, and knee switch is  
down in firing position.
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spent case ejection guard is forward and MAIN GUN STATUS  
SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready  
ammunition compartment

### 4 DR Station

- a DR is seated with CVC helmet on and connected to inter-  
com control box
- b DR hatch is closed and locked
- c PARKING BRAKE is depressed and light is lit
- d Drain valves are in CLOSED position
- e Steer-throttle control is adjusted for driving
- f Engine is operating between 900-1000 RPMs
- g TACTICAL IDLE ON/OFF switch is in OFF
- h All AUXILIARY SYSTEMS switches are in OFF
- i MASTER WARNING and MASTER CAUTION lights are unlit
- j ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

### (c) Target:

- 1 Three (3) full scale Soviet tank silhouettes, flank view.
- 2 Targets located at approximately 1000 meters and 50-100  
meters apart.
- 3 Targets positioned within a 30° angle forward of main gun.

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN de-  
pending upon the tactical situation. For training purposes, the laser  
must be SAFED to prevent actual firing.

\*\*For training purposes, the breech is left open for loading a "second"  
round. As such, the loader is to simulate a battlesight mode, i.e.,  
gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.



(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank-stationary target engagement using the GPS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

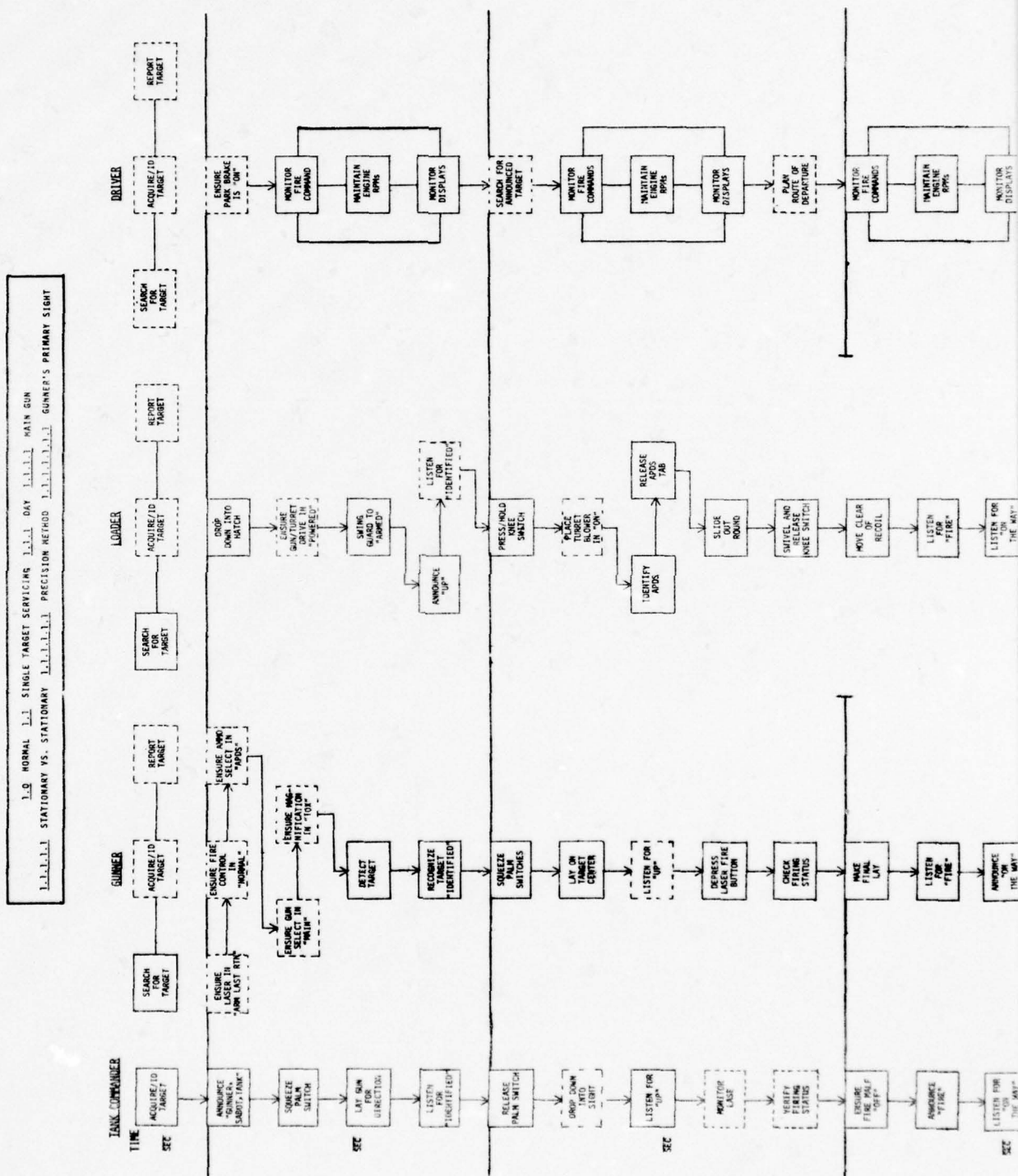
(1) Pretest

(being developed separately)

(2) Posttest

(being developed separately)

## TANK GUNNERY CREW DRILL







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A STATIONARY TANK TARGET FROM A STATIONARY XML USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE SUCCESSIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"GOOD -- SINCE THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

# TANK GUNNERY CREW DRILL

## PERFORMANCE CHECKLIST

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
 1.1.1.1.1 STATIONARY VS. STATIONARY 1.1.1.1.1.1 PRECISION METHOD  
 1.1.1.1.1.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

TIME 

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|--|--|--|

 Trial 1 2 3 + ACCURACY 

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 Trial 1 2 3 = SCORE 

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 Trial 1 2 3

8-13

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APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

**RATING PERFORMANCE**

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

**TIMING PERFORMANCE**

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
1.1.1.1.2 STATIONARY VS. MOVING 1.1.1.1.2.1 PRECISION METHOD  
1.1.1.1.2.1.1 GUNNER'S PRIMARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

1 One (1) XM1 tank, fully operational.

2 Three (3) full scale moving (10 MPH) Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.

3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgt will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew

##### (b) Equipment:

1 Same as training equipment.

2 Two (2) stopwatches.

##### (c) Materials:

1 One (1) instruction sheet for conducting tank crew appraisal.

2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time: \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing the gun
  - 1.5 Monitoring target engagement
    - 1.5.1 Identifying correct sight picture
    - 1.5.2 Identifying correct tracking
    - 1.5.3 Identifying correct lasing
    - 1.5.4 Identifying ready-to-fire status
  - 1.6 Round sensing
    - 1.6.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets



- 2.1 Acquiring targets
  - 2.1.1 Acquiring announced targets
- 2.2 Positioning gun/turret
  - 2.2.1 Traversing turret
  - 2.2.2 Elevating/depressing the gun
- 2.3 Laying on targets
  - 2.3.1 Applying main gun methods of fire
    - 2.3.1.1 Applying precision method of fire
- 2.4 Tracking targets
- 2.5 Ranging to targets
  - 2.5.1 Laser ranging to targets
- 2.6 Firing on targets
  - 2.6.1 Determining ready-to-fire status
  - 2.6.2 Firing the main gun
    - 2.6.2.1 Firing electrically
- 2.7 Round sensing
- 2.8 Adjusting fire
  - 2.8.1 Adjusting main gun fire
    - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures

- 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures

(2) Team Task Requirements

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR (must be capable of)

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, chest guard placed in the firing position, and looking through the GPS.

stowed b Main gun elevation travel lock is unlocked and  
c DAYLIGHT ballistic door handle is in OPEN  
d GPS and TIS are prepared for operation  
 10x and 3x respectively e MAGNIFICATION selectors for GPS and TIS are in  
 light is lit f THERMAL MODE switch is in STANDBY and RCVR READY  
\*g Laser RANGE SWITCH is in ARM LAST RTN  
h GUN SELECT switch is in MAIN and light is lit  
 is lit i FIRE CONTROL MODE switch is in NORMAL and light  
j AMMUNITION SELECT switch is in APDS and light is on

### 3 LR Station

a LR hatch is locked in full open position  
b LR is in standing height position with CVC helmet  
 on and connected to intercom control box  
c Knee guard is in "up" position, chest guard is in  
 protected position, seat back is removed and stowed, and knee switch is  
 down in firing position  
d Turret traverse lock is in UNLOCKED  
e GUN TURRET DRIVE switch is in POWERED and light  
 is lit  
f Spent case ejection guard is forward and MAIN GUN  
 STATUS SAFE light is lit  
\*\*g Main gun breech is "open"  
\*\*\*h Four (4) dummy rounds of each ammo are stowed in  
 ready ammunition compartment

### 4 DR Station

a DR is seated with CVC helmet on and connected to  
 intercom control box  
b DR hatch is closed and locked  
c PARKING BRAKE is depressed and light is lit  
d Drain valves are in CLOSED position  
e Steer-throttle control is adjusted for driving

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN de-  
 pending upon the tactical situation. For training purposes, the laser  
 must be SAFED to prevent actual firing.

\*\*For training purposes, the breech is left open for loading a "second"  
 round. As such, the loader is to simulate a battlesight mode, i.e.,  
 gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.





(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest

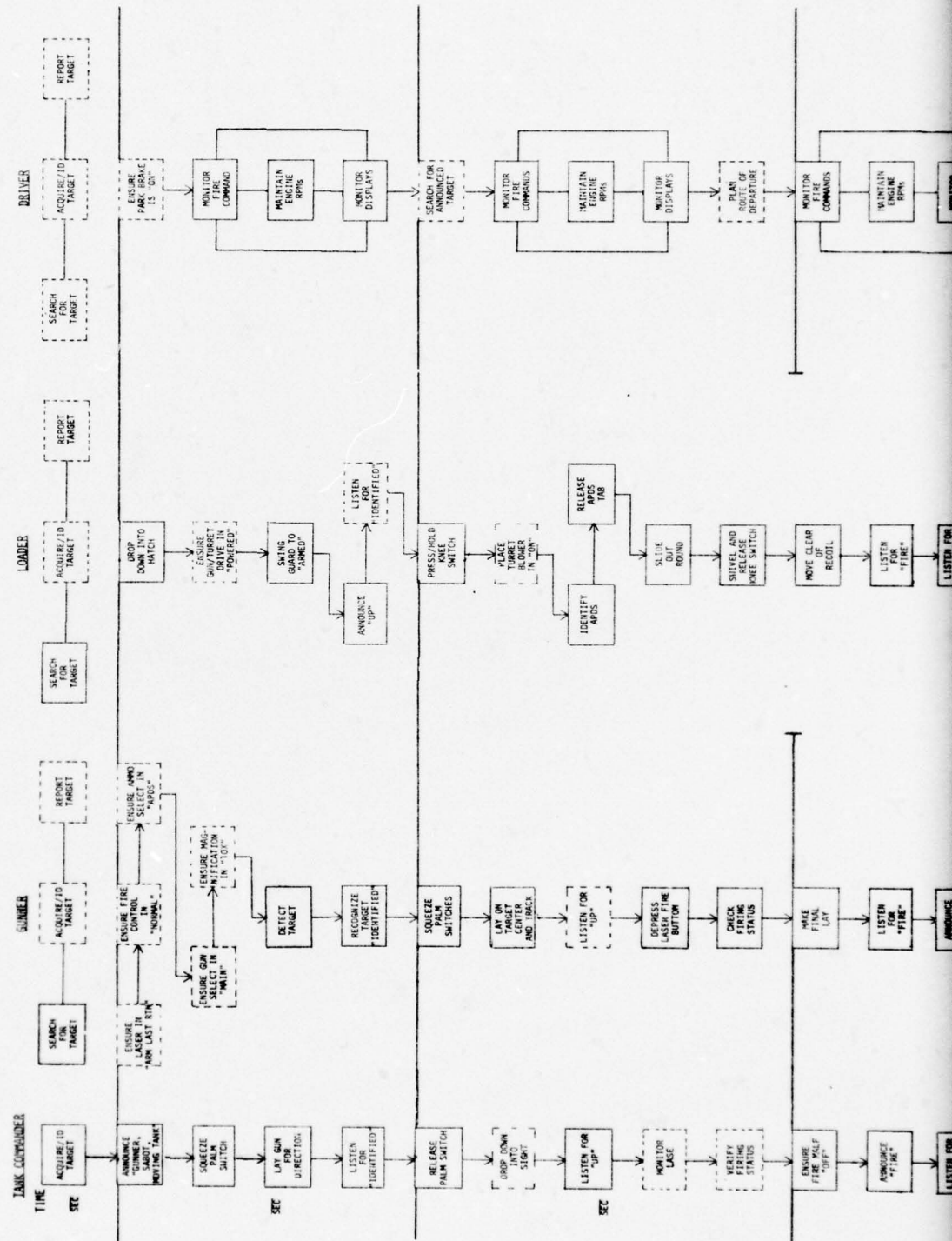
(being developed separately)

(2) Posttest

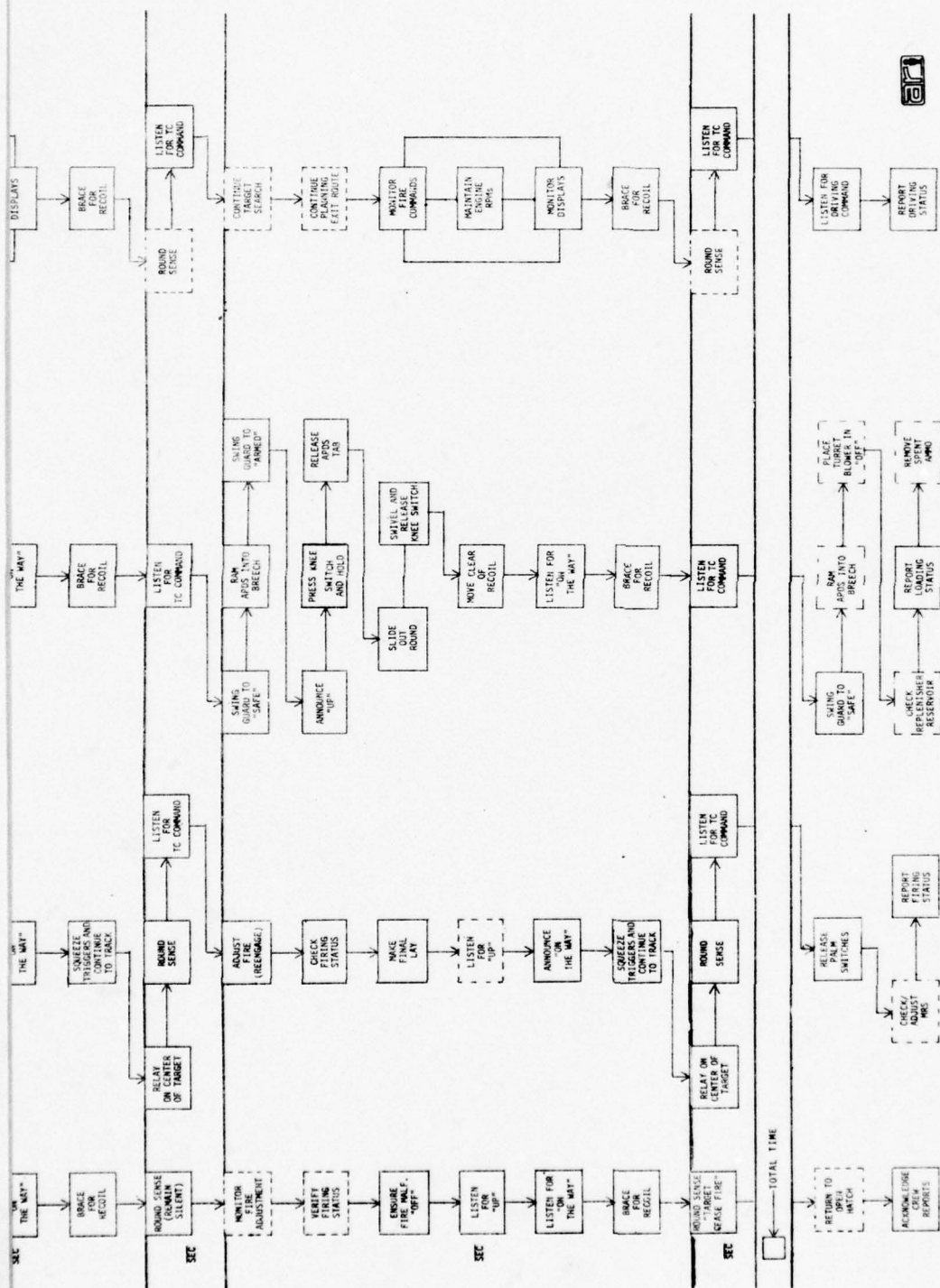
(being developed separately)

# TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICES 1.1.1 DAY 1.1.1.1 MAIN GUN  
1.1.1.2 STATIONARY VS. MOVING 1.1.1.2.1 PRECISION METHOD 1.1.1.2.1.1 GUNNER'S PRIMARY SIGHT







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A MOVING TANK TARGET FROM A STATIONARY XM1 USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE SUCCESSIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSES THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT PERFORMANCE TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED THE APPRAISAL WILL BE STOPPED AND THE CREW WILL BE INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"GOOD -- SINCE THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

## TANK GUNNERY CREW DRILL

## PERFORMANCE CHECKLIST

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
 1.1.1.1.2 STATIONARY VS. MOVING 1.1.1.1.2.1 PRECISION METHOD  
 1.1.1.1.2.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial 1 2 3  
 TIME    + ACCURACY Trial 1 2 3    = SCORE Trial 1 2 3



APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
1.1.1.1.5 MOVING VS. STATIONARY 1.1.1.1.5.1 PRECISION METHOD  
1.1.1.1.5.1.1 GUNNER'S PRIMARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, fully operational.
- 2 Three (3) full scale stationary Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing the gun
  - 1.5 Issuing driving commands
    - 1.5.1 Directing Driver toward target
  - 1.6 Monitoring target engagement
    - 1.6.1 Identifying correct sight picture
    - 1.6.2 Identifying correct tracking
    - 1.6.3 Identifying correct lasing
    - 1.6.4 Identifying ready-to-fire status
  - 1.7 Round sensing
    - 1.7.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets



- 2.2 Positioning gun/turret
  - 2.2.1 Traversing the turret
  - 2.2.2 Elevating/depressing the gun
- 2.3 Laying on target
  - 2.3.1 Applying main gun methods of fire
    - 2.3.1.1 Applying precision method of fire
- 2.4 Tracking targets
- 2.5 Ranging to targets
  - 2.5.1 Laser ranging to targets
- 2.6 Firing on targets
  - 2.6.1 Determining ready-to-fire status
  - 2.6.2 Firing the main gun
    - 2.6.2.1 Firing electrically
- 2.7 Round sensing
- 2.8 Adjusting fire
  - 2.8.1 Adjusting main gun fire
    - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing ammo from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Driving the tank

- 2.1 Placing the tank in motion
  - 2.1.1 Releasing parking brake
  - 2.1.2 Shifting transmission
  - 2.1.3 Accelerating/decelerating engine
  - 2.1.4 Steering the tank
    - 2.1.4.1 Driving forward
- 2.2 Acquiring targets
  - 2.2.1 Acquiring announced targets
- 2.3 Selecting routes
- 2.4 Maneuvering tank for firing
  - 2.4.1 Firing on-the-move
    - 2.4.1.1 Positioning tank for firing
    - 2.4.1.2 Responding to TC driving commands
    - 2.4.1.3 Maintaining steady speed
    - 2.4.1.4 Identifying adverse terrain
    - 2.4.1.5 Identifying defilade firing positions
- 2.5 Stopping the tank
  - 2.5.1 Applying service brakes
- 3 Round sensing
- 4 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR (must be capable of)

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

(c) TC/DR (must be capable of)

- 1 Acquiring targets
  - 1.1 Acquiring announced targets

b. TRAINING OBJECTIVE

(1) Conditions:

(a) Firing Vehicle:

- 1 Tank is moving at 16 KMH (10 MPH)
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation and turret is in power
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Station:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, chest guard placed in the firing position, and looking through the GPS
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- \*g Laser RANGE switch is in ARM LAST RTN
- h GUN SELECT switch is in MAIN and light is lit
- i FIRE CONTROL MODE switch is in NORMAL and light is lit
- j AMMUNITION SELECT switch is in APDS and light is ON

3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spend case ejection guard is forward and MAIN GUN STATUS SAFE light is lit

\*Normally the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.



\*\*g Main gun breech is "open"  
\*\*\*h Four (4) "dummy" rounds of each ammo are  
stowed in ready ammo compartment

4 DR Station

a DR is seated with CVC helmet on and connected  
to intercom control box, and looking through day periscopes  
b DR hatch is closed and locked  
c Drain valves are in CLOSED position  
d Steer-throttle control is adjusted for driving  
e Tank speedometer is steady at 16 KMH (10 MPH)  
f All AUXILIARY systems switches are in OFF  
g MASTER WARNING and MASTER CAUTION lights are  
unlit  
h ELECTRICAL SYSTEM gage is steady between 27.5  
and 28.5 volts

(c) Target:

1 Three (3) full scale stationary Soviet tank  
silhouettes, flank view  
2 Targets located at approximately 1000 meters and  
50-100 meters apart  
3 Targets positioned in a 30° angle forward of main  
gun

(d) Environment:

1 Terrain surface is flat  
2 Surrounding area is open  
3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual  
and crew behaviors required to complete a two round moving tank-stationary  
target engagement using the GPS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round  
single target engagement without error and within \_\_\_\_ seconds from the  
alert element of the TCs fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank  
target silhouettes, positioned at comparable target ranges, and an eye-  
safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-  
scaled range.

\*\* For training purposes, the breech is left open for loading a  
"second" round. As such, the loader is to simulate a battlesight  
mode, i.e., gun loaded and breech closed.  
\*\*\* Sufficient rounds are necessary to simulate round selection.

### 3. EVALUATION SPECIFICATIONS

#### a. INFORMAL

##### (1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

##### (2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

##### (b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

#### b. FORMAL

##### (1) Pretest

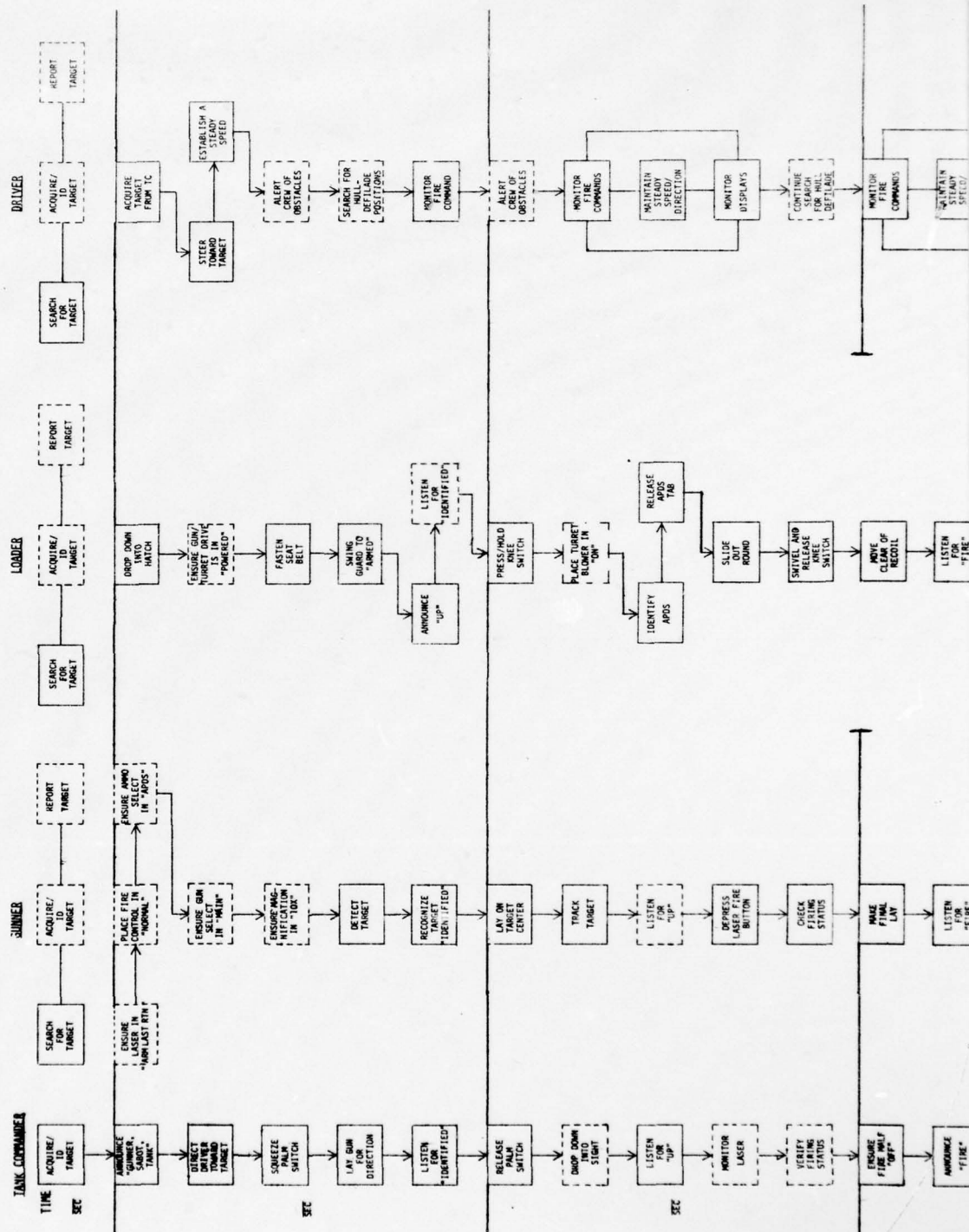
(being developed separately)

##### (2) Posttest

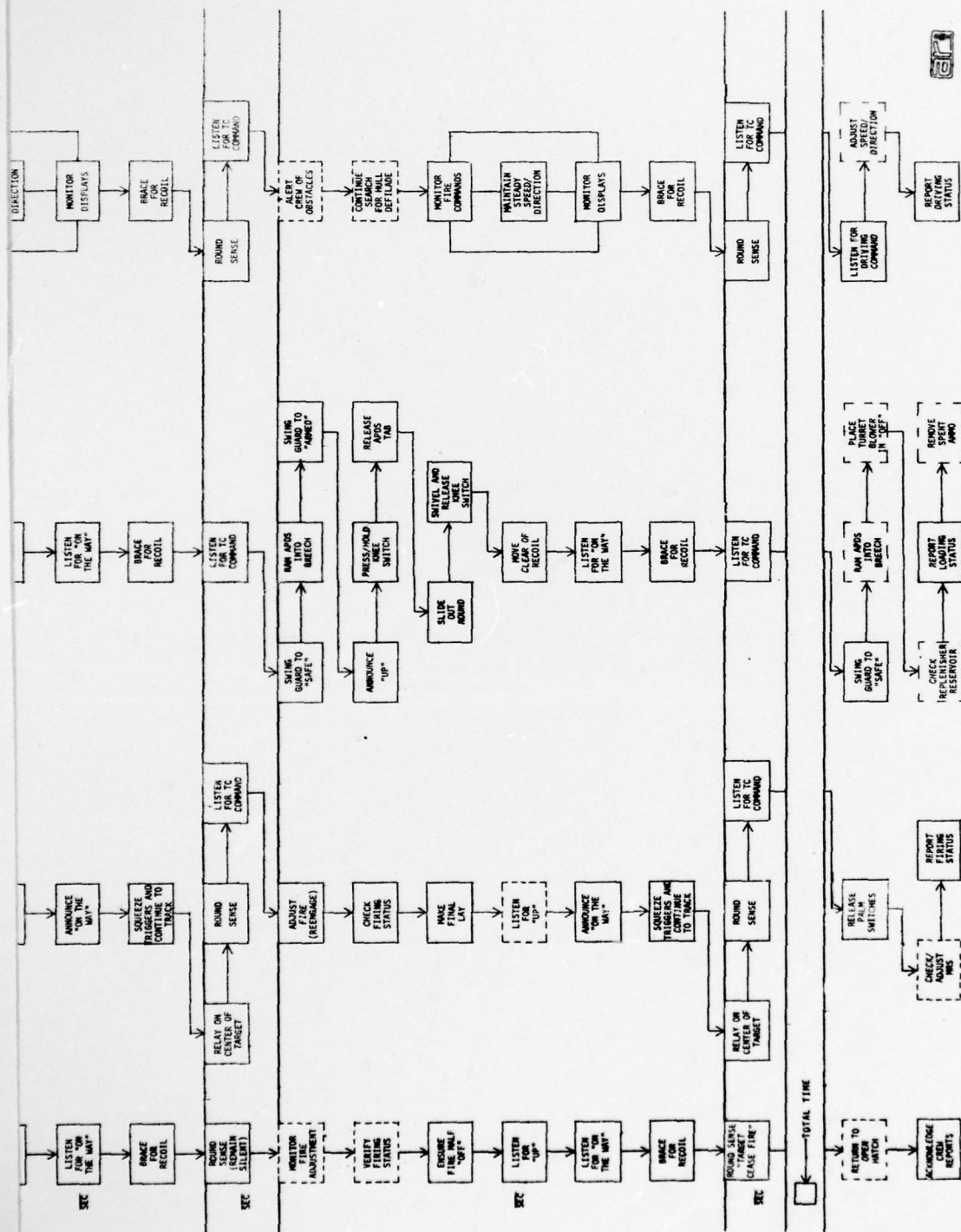
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# TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
1.1.1.1.5 MOVING VS. STATIONARY 1.1.1.1.5.1 PRECISION METHOD 1.1.1.1.5.1.1 GUNNER'S PRIMARY SIGHT







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A STATIONARY TANK TARGET FROM A MOVING XML USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE SUCCESSIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

## TANK GUNNERY CREW DRILL

## PERFORMANCE CHECKLIST

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
 1.1.1.1.5 MOVING VS. STATIONARY 1.1.1.1.5.1 PRECISION METHOD  
 1.1.1.1.5.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining steady speed                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining speed/direction                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial 1 2 3  
 TIME    + ACCURACY Trial 1 2 3    = SCORE Trial 1 2 3



APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
1.1.1.1.6 MOVING VS. MOVING 1.1.1.1.6.1 PRECISION METHOD  
1.1.1.1.6.1.1 GUNNER'S PRIMARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, fully operational.
- 2 Three (3) full scale moving (16 KMH) Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgt will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew

##### (b) Equipment:

- 1 Same as training equipment.
- 2 Two (2) stopwatches.

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time: \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Tank Requirements:

(a) TC (must be capable of)

1 Handing-off targets

1.1 Acquiring targets

1.2 Determining method of target engagement

1.3 Issuing fire commands

1.4 Laying main gun for direction

1.4.1 Traversing the turret

1.4.2 Elevating/depressing gun

1.5 Issuing driving commands

1.5.1 Directing Driver toward target

1.6 Monitoring target engagement

1.6.1 Identifying correct sight picture

1.6.2 Identifying correct tracking

1.6.3 Identifying correct lasing

1.6.4 Identifying ready-to-fire status

1.7 Round sensing

1.7.1 Confirming gunner's round sensing

2 Performing post-firing procedures

2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

2 Engaging targets

2.1 Acquiring targets

2.1.1 Acquiring announced targets



- 2.2 Positioning gun/turret
  - 2.2.1 Traversing turret
  - 2.2.2 Elevating/depressing gun
- 2.3 Laying on targets
  - 2.3.1 Applying main gun methods of fire
    - 2.3.1.1 Applying precision method of fire
- 2.4 Tracking targets
- 2.5 Ranging to targets
  - 2.5.1 Laser ranging to target
- 2.6 Firing on targets
  - 2.6.1 Determining ready-to-fire status
  - 2.6.2 Firing the main gun
    - 2.6.2.1 Firing electrically
- 2.7 Round sensing
- 2.8 Adjusting fire
  - 2.8.1 Adjusting main gun fire
    - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedures

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing main gun for firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breach
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Driving the tank
  - 2.1 Placing the tank in motion
    - 2.1.1 Releasing parking brake
    - 2.1.2 Shifting transmission
    - 2.1.3 Accelerating/decelerating engine
    - 2.1.4 Steering the tank
      - 2.1.4.1 Driving forward
  - 2.2 Acquiring targets
    - 2.2.1 Acquiring announced targets
  - 2.3 Selecting routes
  - 2.4 Maneuvering tank for firing
    - 2.4.1 Firing on-the-move
      - 2.4.1.1 Positioning tank for firing
      - 2.4.1.2 Responding to TC driving commands
      - 2.4.1.3 Maintaining steady speed
      - 2.4.1.4 Identifying adverse terrain
      - 2.4.1.5 Identifying defilade firing positions
  - 2.5 Stopping the tank
    - 2.5.1 Applying service brakes
- 3 Round sensing
- 4 Performing Post-firing procedures

(2) Team Task Requirements

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret
- 3 Round sensing

(c) TC/DR

- 1 Acquiring targets
  - 1.1 Acquiring announced targets

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle:

- 1 Tank is moving at 16 KMH (10 MPH)
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation and turret is in power
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck.
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- \*g Laser RANGE switch is in ARM LAST RTN
- h GUN SELECT switch is in MAIN and light is lit
- i FIRE CONTROL MODE switch is in NORMAL and light is lit
- j AMMUNITION SELECT switch is in APDS and light is ON

3 LR Station

- a LR hatch is locked in full open position

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.



b LR is in standing height position with CVC helmet on and connected to intercom control box  
c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position  
d Turret traverse lock is in UNLOCKED  
e GUN TURRET DRIVE switch is in POWERED and light is lit  
f Spend case ejection guard is forward and MAIN  
GUN STATUS SAFE light is lit  
\*\*g Main gun breech is "open"  
\*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

4 DR Station

a DR is seated with CVC helmet on and connected to intercom control box  
b DR hatch is closed and locked  
c Drain valves are in CLOSED position  
d Steer-throttle control is adjusted for driving  
e Tank speedometer is steady at 16 KMH (10 MPH)  
f ALL AUXILIARY SYSTEMS switches are in OFF  
g MASTER WARNING and MASTER CAUTION lights are unlit  
h ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

(c) Targets:

1 Three (3) full scale moving Soviet tank silhouettes, flank view  
2 Targets moving left-to-right/right-to-left at 16 KMH (10 MPH)  
3 Targets located at approximately 1000 meters and 50-100 meters apart  
4 Targets positioned in a 30° angle forward of main gun

(d) Environment:

1 Terrain surface is flat  
2 Surrounding area is open  
3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank-moving target engagement using the GPS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

\*\* For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\* Sufficient rounds are necessary to simulate round selection.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eyesafe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

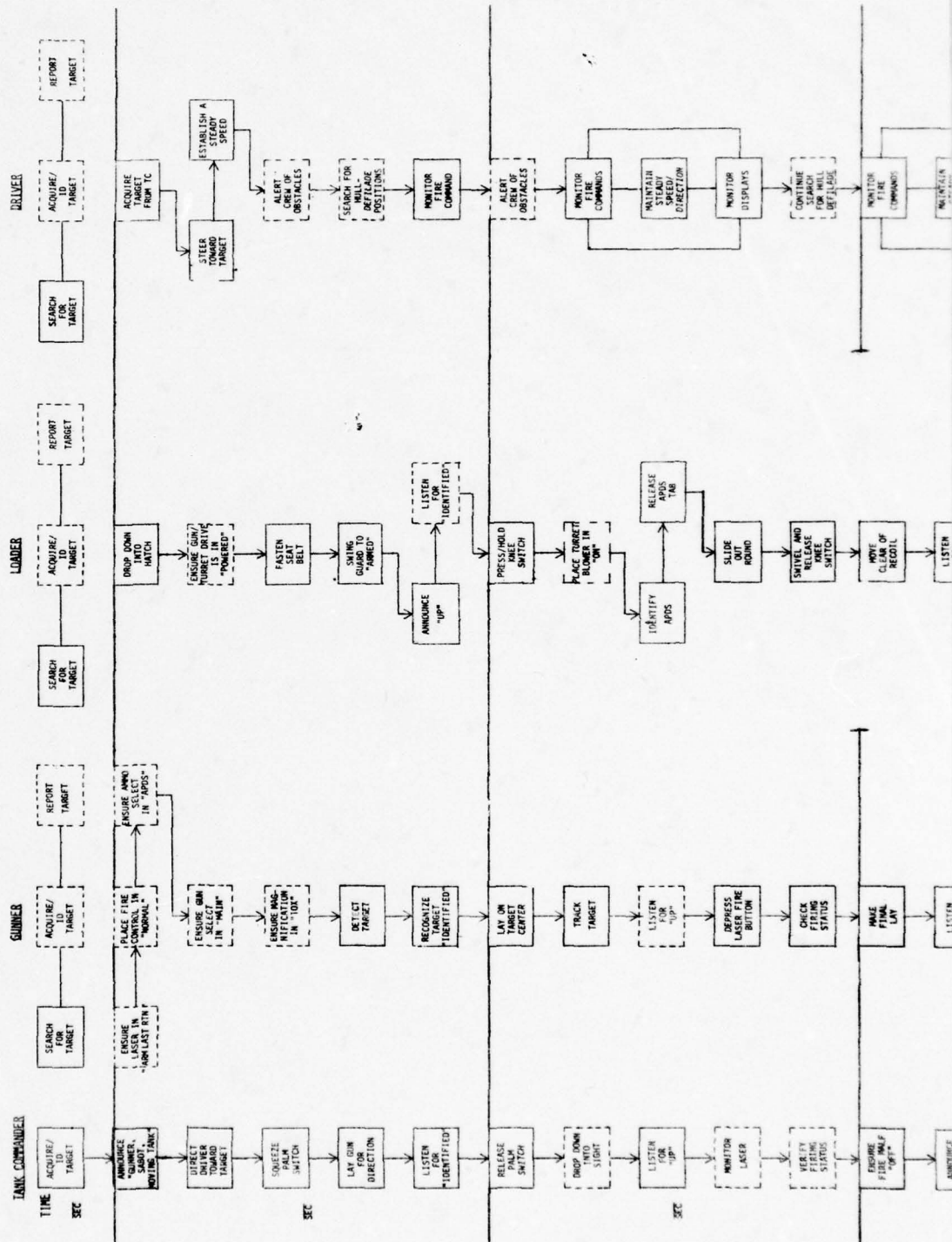
b. FORMAL

(1) Pretest  
(being developed separately)

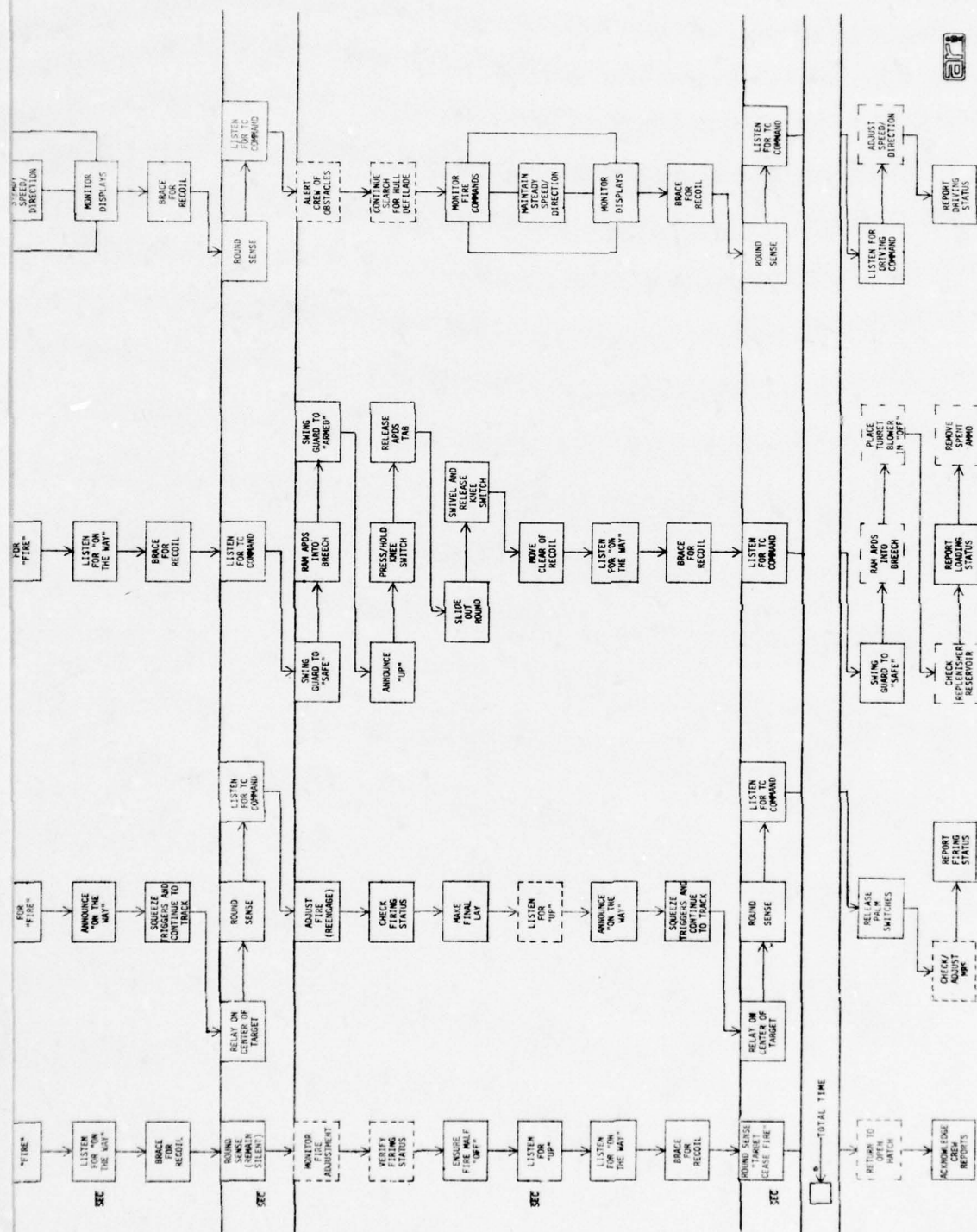
(2) Posttest  
(being developed separately)

# TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.1 DAY 1.1.1.1 MAIN GUN  
1.1.1.1.6 MOVING VS. MOVING 1.1.1.1.6.1 PRECISION METHOD 1.1.1.1.6.1.1 GUNNER'S PRIMARY SIGHT







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A MOVING TANK TARGET FROM A MOVING XM1 USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE SUCCESSIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

|                   |                                    |                        |                         |
|-------------------|------------------------------------|------------------------|-------------------------|
| <u>1.0</u> NORMAL | <u>1.1</u> SINGLE TARGET SERVICING | <u>1.1.1</u> DAY       | <u>1.1.1.1</u> MAIN GUN |
| <u>1.1.1.1.6</u>  | MOVING VS. MOVING                  | <u>1.1.1.1.6.1</u>     | PRECISION METHOD        |
|                   | <u>1.1.1.1.6.1.1</u>               | GUNNER'S PRIMARY SIGHT |                         |

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining steady speed                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining speed/direction                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

|                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trial                                                                                                                                                                                                                                                                                                   | Trial                                                                                                                                                                                                                                                                                                         | Trial                                                                                                                                                                                                                                                                                                      |
| 1    2    3                                                                                                                                                                                                                                                                                             | 1    2    3                                                                                                                                                                                                                                                                                                   | 1    2    3                                                                                                                                                                                                                                                                                                |
| TIME <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> | + ACCURACY <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> | = SCORE <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> <span style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></span> |

8-55

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APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

---

<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

1.0 NORMAL 1.1 SINGLE TARGET SERVICING 1.1.2 NIGHT 1.1.2.1 MAIN GUN  
1.1.2.1.2 STATIONARY VS. MOVING 1.1.2.1.2.1 PRECISION METHOD  
1.1.2.1.2.1.2 THERMAL IMAGING SYSTEM

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

1 One (1) XM1 tank, fully operational.

2 Three (3) full scale moving (16 KMH) Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart

3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

### (2) Evaluation

(a) Personnel: Plt Ldr/Sgt will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

1 Same as training equipment.

2 Two (2) stopwatches.

##### (c) Materials:

1 One (1) instruction sheet for conducting tank crew appraisal.

2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

1 Handing-off targets

1.1 Acquiring targets

1.1.1 Identifying thermal targets

1.2 Determining method of target engagement

1.3 Issuing fire commands

1.4 Laying main gun for direction

1.4.1 Traversing the turret

1.4.2 Elevating/depressing the gun

1.5 Monitoring target engagement

1.5.1 Identifying correct sight picture

1.5.2 Identifying correct tracking

1.5.3 Identifying correct lasing

1.5.4 Identifying ready-to-fire status

1.6 Round sensing

1.6.1 Confirming gunner's round sensing

2 Performing post-firing procedures

2.1 Performing main gun post-firing procedures

(b) GR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing main gun for firing

2 Engaging targets

2.1 Acquiring targets



- 2.1.1 Acquiring announced targets
      - 2.1.1.1 Identifying thermal targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing gun
  - 2.3 Laying on target
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying precision method of fire
  - 2.4 Tracking targets
  - 2.5 Ranging to targets
    - 2.5.1 Laser ranging to target
  - 2.6 Firing on targets
    - 2.6.1 Determining ready-to-fire status
    - 2.6.2 Firing the main gun
      - 2.6.2.1 Firing electrically
  - 2.7 Round sensing
  - 2.8 Adjusting fire
    - 2.8.1 Adjusting main gun fire
      - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-firing procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Maintaining tank readiness
- 2 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit
- g Domelight selector is turned to red mark and red light is lit

## 2 GR Station

intercom control box, a GR is seated with CVC helmet on and connected to chest guard placed in the firing position, and looking through the GPS

b Main gun elevation travel lock is unlocked and stowed

c DAYLIGHT and THERMAL ballistic door handles are in OPEN

d GPS and TIS are prepared for operation

e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively

f THERMAL MODE switch is in ON and light is lit

g FLTR/CLEAR/SHTR switch is in SHTR

h Polarity switch is in BLACK HOT

\*i Laser RANGE switch is in ARM LAST RTN

j GUN SELECT switch is in MAIN and light is lit

k FIRE CONTROL MODE switch is in NORMAL and light is lit

l AMMUNITION SELECT switch is in APDS and light is ON

## 3 LR Station

a LR hatch is closed and locked

b LR is seated with CVC helmet on and connected to intercom control box

c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position

d Turret traverse lock is in UNLOCKED

e GUN TURRET DRIVE switch is in POWERED and light is lit

f Spent case ejection guard is forward and MAIN GUN STATUS SAFE light is lit

\*\*g Main gun breech is "open"

\*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

i Domelight selector is turned to red mark and red light is lit

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.



#### 4 DR Station

- intercom control box
- a DR is seated with CVC helmet on and connected to
  - b DR hatch is closed and locked
  - c PARKING BRAKE is depressed and light is lit
  - d Drain valves are in CLOSED position
  - \*e Steer-throttle control is adjusted for driving
  - \*f Engine is operating between 900-1000 RPMs
  - g TACTICAL IDLE ON/OFF switch is in OFF
  - h Night vision viewer is installed with NIGHT PERISCOPE switch in ON and light lit
  - \*i All other AUXILIARY SYSTEMS switches are in OFF
  - j MASTER WARNING and MASTER CAUTION lights are unlit
  - k ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts
  - l Domelight selector is turned to red mark and red light is lit

#### (c) Target:

- 1 Three (3) full scale moving Soviet tank silhouettes, flank view.
- 2 Targets moving left-to-right/right-to-left at 16 KMH (10 MPH)
- 3 Targets located at approximately 1000 meters and 50-100 meters apart.
- 4 Targets positioned in a 30° angle forward of main gun.

#### (d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank-moving target engagement using the TIS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_ seconds from the alert element of the TC's fire command.

#### c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

### 3. EVALUATION SPECIFICATIONS

#### a. INFORMAL

##### (1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

##### (2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

##### (b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

#### b. FORMAL

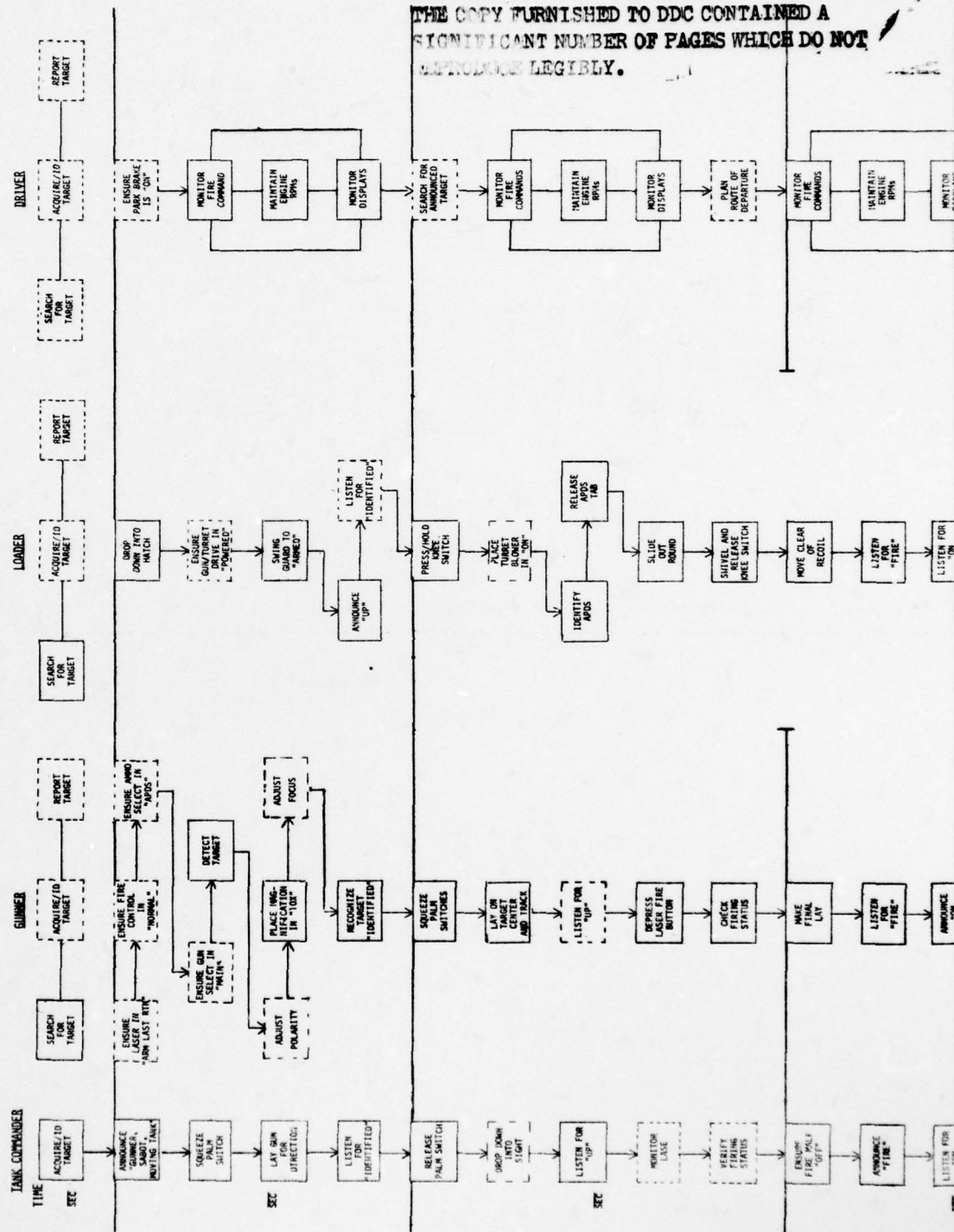
##### (1) Pretest:

(being developed separately)

##### (2) Posttest:

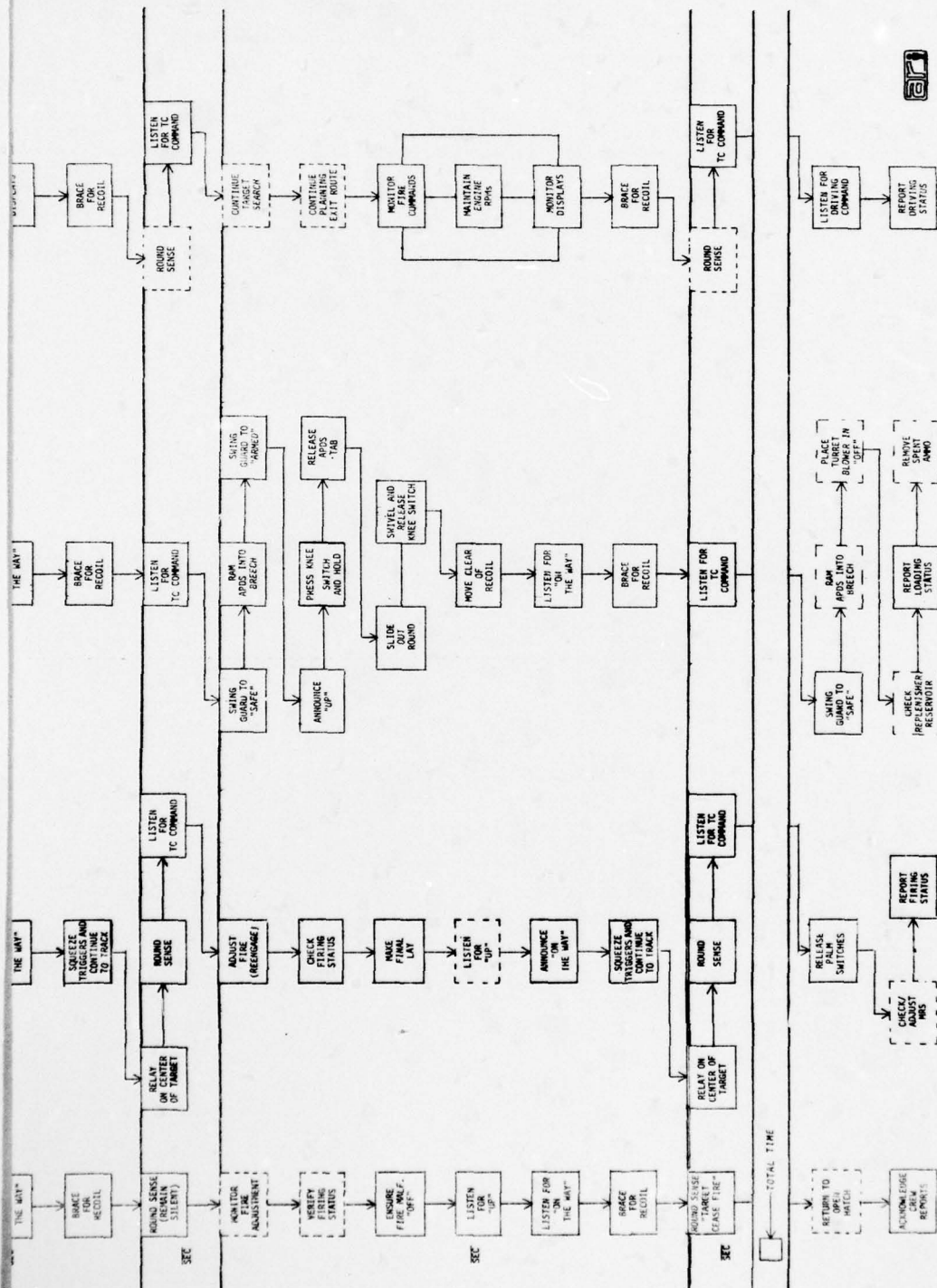
(being developed separately)

|           |                       |             |                         |               |       |               |                        |
|-----------|-----------------------|-------------|-------------------------|---------------|-------|---------------|------------------------|
| 1.0       | MURAL                 | 1.1         | SINGLE TARGET SERVICING | 1.1.2         | NIGHT | 1.1.2.1       | MAIN GUN               |
| 1.1.2.1.2 | STATIONARY VS. MOVING | 1.1.2.1.2.1 | PRECISION METHOD        | 1.1.2.1.2.1.2 |       | 1.1.2.1.2.1.2 | THERMAL IMAGING SYSTEM |



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APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A MOVING TANK TARGET AT NIGHT FROM A STATIONARY XMI USING THE TIS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE SUCCESSIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

|                   |                                             |                                     |                         |
|-------------------|---------------------------------------------|-------------------------------------|-------------------------|
| <u>1.0</u> NORMAL | <u>1.1</u> SINGLE TARGET SERVICING          | <u>1.1.2</u> NIGHT                  | <u>1.1.2.1</u> MAIN GUN |
|                   | <u>1.1.2.1.2</u> STATIONARY VS. MOVING      | <u>1.1.2.1.2.1</u> PRECISION METHOD |                         |
|                   | <u>1.1.2.1.2.1.2</u> THERMAL IMAGING SYSTEM |                                     |                         |

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

|                                                                                                                                 |                                                                                                                                       |                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Trial<br>1      2      3                                                                                                        | Trial<br>1      2      3                                                                                                              | Trial<br>1      2      3                                                                                                           |
| TIME <table style="display: inline-table; border: 1px solid black; width: 60px; height: 20px; vertical-align: middle;"></table> | + ACCURACY <table style="display: inline-table; border: 1px solid black; width: 60px; height: 20px; vertical-align: middle;"></table> | = SCORE <table style="display: inline-table; border: 1px solid black; width: 60px; height: 20px; vertical-align: middle;"></table> |

8-69

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APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

---

<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

1.0 NORMAL 1.2 MULTIPLE TARGET SERVICING 1.2.1 DAY 1.2.1.1 MAIN GUN  
1.2.1.1.5 MOVING VS. TWO STATIONARY TARGETS 1.2.1.1.5.1 PRECISION METHOD  
1.2.1.1.5.1.1 GUNNER'S PRIMARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, fully operational
- 2 Two (2) full scale stationary Soviet tank silhouettes, flank view, located at 1000 meters and 100-200 meters apart.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing gun
  - 1.5 Issuing driving commands
    - 1.5.1 Directing Driver toward target
  - 1.6 Monitoring target engagement
    - 1.6.1 Identifying correct sight picture
    - 1.6.2 Identifying correct tracking
    - 1.6.3 Identifying correct lasing
    - 1.6.4 Identifying ready-to-fire status
  - 1.7 Round sensing
    - 1.7.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing



- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying precision method of fire
  - 2.4 Tracking targets
  - 2.5 Ranging to targets
    - 2.5.1 Laser ranging to target
  - 2.6 Firing on targets
    - 2.6.1 Determining ready-to-fire status
    - 2.6.2 Firing the main gun
      - 2.6.2.1 Firing electrically
  - 2.7 Round sensing
  - 2.8 Adjusting Fire
    - 2.8.1 Adjusting main gun fire
      - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready to fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically

3.1.3.3 Setting ammo letter codes

4 Performing post-firing procedures

4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

2 Driving the tank

2.1 Placing the tank in motion

2.1.1 Releasing parking brake

2.1.2 Shifting transmission

2.1.3 Accelerating/decelerating engine

2.1.4 Steering the tank

2.1.4.1 Driving forward

2.2 Acquiring targets

2.2.1 Acquiring announced targets

2.3 Selecting routes

2.4 Maneuvering tank for firing

2.4.1 Firing on-the-move

2.4.1.1 Positioning tank for firing

2.4.1.2 Responding to TC driving commands

2.4.1.3 Maintaining steady speed

2.4.1.4 Identifying adverse terrain

2.4.1.5 Identifying defilade firing positions

3.4 Stopping the tank

3 Round sensing

4 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

1 Performing ready-to-fire procedure

1.1 Preparing for main gun firing

(b) TC/GR

1 Acquiring targets

1.1 Identifying targets

2 Handing-off targets

2.1 Releasing gun/turret to gunner

3 Round sensing

(c) TC/DR

1 Acquiring targets

1.1 Acquiring announced targets

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle:

- 1 Tank is moving at 16 KMH (10 MPH)
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation and turret is in power
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Station:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- \*g Laser RANGE switch is in ARM LAST RTN
- h GUN SELECT switch is in MAIN and light is lit
- i FIRE CONTROL MODE switch is in NORMAL and light is lit
- j AMMUNITION SELECT switch is in APDS and light is ON

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.



### 3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spend case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

### 4 DR Station

- a DR is seated with CVC helmet on and connected to intercom control box
- b DR hatch is closed and locked
- c Drain valves are in CLOSED position
- d Steer-throttle control is adjusted for driving
- e Tank speedometer is steady at 16 KMH (10 MPH)
- f All AUXILIARY systems switches are in OFF
- g MASTER WARNING and MASTER CAUTION lights are unlit
- h ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

#### (c) Target:

- 1 Two (2) full scale stationary Soviet tank silhouettes, flank view
- 2 Targets located at approximately 1000 meters and 100-200 meters apart
- 3 Targets positioned in a 30° angle forward of main gun

#### (d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

(2) Activity: The XML tank crew must perform the individual and crew behaviors required to complete a four round moving tank-stationary, stationary multiple target engagement using the GPS and precision method of fire.

(3) Standard: The XML tank crew must complete the four round multiple target engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial.

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest

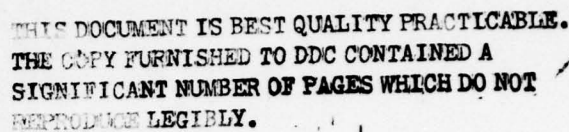
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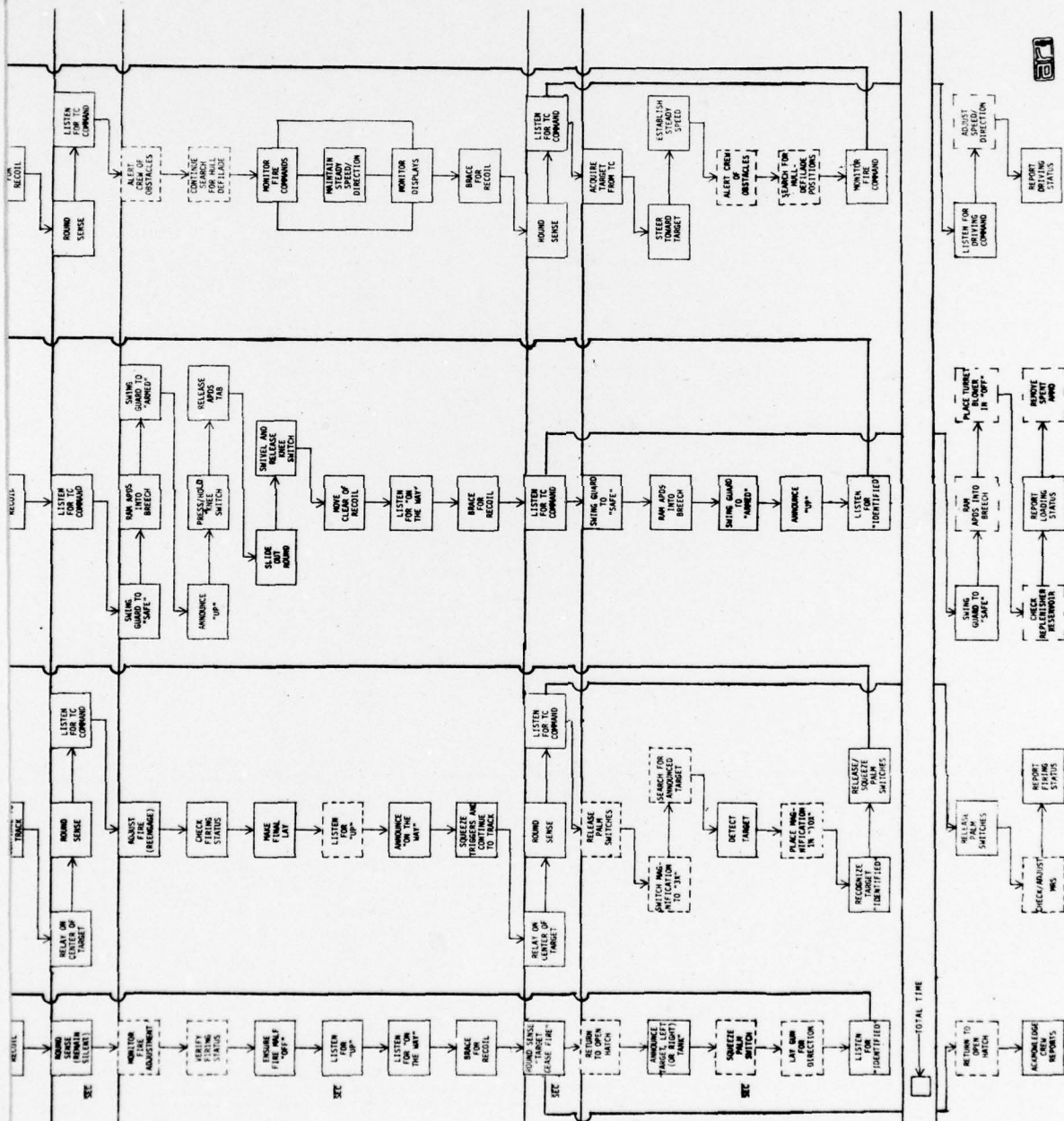
(2) Posttest

(being developed separately)



| TANK GUNNER CREW DRILL |                                   |             |                           |                                     |
|------------------------|-----------------------------------|-------------|---------------------------|-------------------------------------|
| 1.0                    | NORMAL                            | 1.2         | MULTIPLE TARGET SERVICING | 1.2.1 DAY                           |
|                        |                                   |             |                           | 1.2.1.1 MAIN GUN                    |
| 1.2.1.1.5              | MOVING VS. TWO STATIONARY TARGETS | 1.2.1.1.5.1 | PRECISION MET.            | 1.2.1.1.5.1.1 GUNNER'S HAZARD SIGHT |





APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS PERFORMANCE APPRAISAL IS TO DETERMINE THE TANK CREW'S ABILITY TO ENGAGE MULTIPLE STATIONARY TANK TARGETS FROM A MOVING XM1 USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."



TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

1.0 NORMAL 1.2 MULTIPLE TARGET SERVICING 1.2.1 DAY 1.2.1.1 MAIN GUN  
1.2.1.1.5 MOVING VS. TWO STATIONARY 1.2.1.1.5.1 PRECISION METHOD  
1.2.1.1.5.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                         | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|-------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                           | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command (1st target)         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction             |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks           |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing targets ("IDENTIFIED")        |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining steady speed                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                   |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)         |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (release)        |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining speed/direction               |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command (2d target)          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction             |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")         |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining steady speed                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                   |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Range determination                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)         |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (release)        |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining speed/direction               |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial      Trial      Trial  
 1    2    3      1    2    3      1    2    3  
 TIME    + ACCURACY    = SCORE

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

|                   |                                      |                  |                                                |                                                    |                                                   |                                             |
|-------------------|--------------------------------------|------------------|------------------------------------------------|----------------------------------------------------|---------------------------------------------------|---------------------------------------------|
| <u>1.0</u> NORMAL | <u>1.2</u> MULTIPLE TARGET SERVICING | <u>1.2.1</u> DAY | <u>1.2.1.2</u> MAIN GUN/<br>COAXIAL MACHINEGUN | <u>1.2.1.2.5</u> MOVING VS. TWO STATIONARY TARGETS | <u>1.2.1.2.5.1</u><br>PRECISION/AREA FIRE METHODS | <u>1.2.1.2.5.1.1</u> GUNNER'S PRIMARY SIGHT |
|-------------------|--------------------------------------|------------------|------------------------------------------------|----------------------------------------------------|---------------------------------------------------|---------------------------------------------|

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training:

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, fully operational.
- 2 One (1) full scale stationary Soviet tank silhouette, flank view, located at 1000 meters.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.
- 4 Nine (9) E-silhouette troop targets located at 600-800 meters and 20-25 meters apart, and 100-200 meters from tank target.
- 5 One (1) belt of dummy caliber 7.62 ammunition.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

### (2) Evaluation:

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal
- 2 Two (2) crew performance checklists with directions.



(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing the gun
  - 1.5 Issuing driving commands
    - 1.5.1 Directing Driver toward target
  - 1.6 Monitoring target engagement
    - 1.6.1 Identifying correct sight picture
    - 1.6.2 Identifying correct tracking
    - 1.6.3 Identifying correct lasing
    - 1.6.4 Identifying ready-to-fire status
  - 1.7 Round sensing
    - 1.7.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
  - 1.2 Preparing for coaxial machinegun firing
- 2 Loading weapons

- 2.1 Loading the coaxial machinegun
  - 2.1.1 Safing the machinegun
  - 2.1.2 Opening/closing the cover
  - 2.1.3 Loading ammo in feedtray
  - 2.1.4 Arming the machinegun
    - 2.1.4.1 Charging the machinegun
- 3 Engaging targets
  - 3.1 Acquiring targets
    - 3.1.1 Acquiring announced targets
  - 3.2 Positioning gun/turret
    - 3.2.1 Traversing the turret
    - 3.2.2 Elevating/depressing the gun
  - 3.3 Laying on targets
    - 3.3.1 Applying main gun methods of fire
      - 3.3.1.1 Applying precision method of fire
    - 3.3.2 Applying coaxial machinegun methods of fire
      - 3.3.2.1 Applying area fire method
  - 3.4 Tracking targets
  - 3.5 Ranging to targets
    - 3.5.1 Laser ranging to targets
  - 3.6 Firing on targets
    - 3.6.1 Determining ready-to-fire status
    - 3.6.2 Firing the main gun
      - 3.6.2.1 Firing electrically
    - 3.6.3 Firing the coaxial machinegun
      - 3.6.3.1 Firing electrically
  - 3.7 Round sensing
  - 3.8 Adjusting fire
    - 3.8.1 Adjusting main gun fire
      - 3.8.1.1 Applying reengage method
    - 3.8.2 Adjusting coaxial machinegun fire
      - 3.8.2.1 Applying Burst-on-Target (BOT) method
- 4 Unloading weapons
  - 4.1 Unloading the coaxial machinegun
    - 4.1.1 Safing the machinegun
    - 4.1.2 Opening/closing the cover
    - 4.1.3 Clearing the machinegun
- 5 Performing post-firing procedures
  - 5.1 Performing main gun post-fire procedure
  - 5.2 Performing coaxial machinegun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
  - 1.2 Preparing for coaxial machinegun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo

- 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
  - 2.2 Loading the coaxial machinegun
    - 2.2.1 Safing the machinegun
    - 2.2.2 Opening/closing the cover
    - 2.2.3 Loading ammo in feedtray
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
  - 3.2 Unloading the coaxial machinegun
    - 3.2.1 Safing the machinegun
    - 3.2.2 Opening/closing the machinegun cover
    - 3.2.3 Clearing the machinegun
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure
  - 4.2 Performing coaxial machinegun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
  - 1.2 Preparing for coaxial machinegun firing
- 2 Driving the tank
  - 2.1 Placing the tank in motion
    - 2.1.1 Releasing the parking brake
    - 2.1.2 Shifting transmission
    - 2.1.3 Accelerating/decelerating engine
    - 2.1.4 Steering the tank
      - 2.1.4.1 Driving forward
  - 2.2 Acquiring targets
    - 2.2.1 Acquiring announced targets
  - 2.3 Selecting routes
  - 2.4 Manuevering tank for firing
    - 2.4.1 Firing on-the-move
      - 2.4.1.1 Positioning tank for firing
      - 2.4.1.2 Responding to TC driving commands
      - 2.4.1.3 Maintaining steady speeds
      - 2.4.1.4 Identifying adverse terrain
      - 2.4.1.5 Identifying defilade firing positions
- 3 Round sensing
- 4 Performing post-firing procedures

## (2) Team Task Requirements

(a) GR/LR/DR (must be capable of)



1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

(b) TC/GR (must be capable of)

1 Acquiring targets

1.1 Identifying targets

2 Handing-off targets

2.1 Releasing gun/turret to Gunner

3 Round sensing

(c) TC/DR (must be capable of)

1 Acquiring targets

1.1 Acquiring announced targets

1.1.1 Responding to TC driving commands

b. TRAINING OBJECTIVE

(1) Conditions:

(a) Firing Vehicle:

1 Tank is moving at 16 KMH (10 MPH)

2 Preventive Maintenance Checks and Services (PMCS)

are performed; equipment is fully operational

3 Individual crew stations are prepared for operation;

communication system is in operation and turret is in power

4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Station:

1 TC Station

a TC hatch is locked in full open position

b TC is in a standing height position with CVC helmet on and connected to intercom control box, and looking through binoculars hung around neck

c Knee guard is in firing position

d TURRET POWER switch is in ON

e AUX HYDR POWER switch is in OFF

f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

a GR is seated with CVC helmet on and connected to intercom control box, chest guard placed in the firing position, and looking through the GPS

b Main gun elevation travel lock is unlocked and stowed

c DAYLIGHT ballistic door handle is in OPEN

d GPS and TIS are prepared for operation

e MAGNIFICATION selectors for GPS and TIS are in 10x

and 3x respectively

light is lit                    f THERMAL MODE switch is in STANDBY and RCVR READY

\*g Laser RANGE switch is in ARM LAST RTN

h GUN SELECT switch is in MAIN and light is lit

is lit                           i FIRE CONTROL MODE switch is in NORMAL and light

j AMMUNITION SELECT switch is in APDS and light is ON

3 LR Station

a LR hatch is closed and locked

intercom control box        b LR is seated with CVC helmet on and connected to

c Knee guard is in "up" position, chest guard is in

protected position, seat back is removed and stowed, and knee switch is

down in firing position      d Turret traverse lock is in UNLOCKED

e GUN TURRET DRIVE switch is in POWERED and light is

lit                              f Spend case ejection guard is forward and MAIN GUN

STATUS SAFE light is lit    \*g Main gun breech is "open"

\*\*\*h Four (4) "dummy" rounds of each ammo are stowed

in ready ammo compartment   i Coaxial machinegun is loaded with "dummy" ammo belt

j Coaxial machinegun cover is locked closed and

manual safety is in "F"

4 DR Station

a DR is seated with CVC helmet on and connected to

intercom control box        b DR hatch is closed and locked

c Drain valves are in CLOSED position

d Steer-throttle control is adjusted for driving

e Tank speedometer is steady at 16 KMH (10 MPH)

f All AUXILIARY systems switches are in OFF

g MASTER WARNING and MASTER CAUTION lights are unlit

h ELECTRICAL SYSTEM gage is steady between 27.5 and

28.5 volts

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

(c) Target:

- 1 One (1) full scale stationary Soviet tank silhouette, flank view.
- 2 Targets located at approximately 1000 meters and 100-200 meters apart from the troop target.
- 3 Nine (9) E-silhouette troop targets located at 600-800 meters and 20-25 meters apart
- 4 Targets positioned in a 30° angle forward of main gun

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a multiple moving tank-stationary tank/troop target engagement by using the GPS main gun/coaxial machinegun and precision area methods of fire.

(3) Standard: The XM1 tank crew must complete the multiple target engagement without error, destroying the main gun target in \_\_\_\_\_ seconds using no more than 2 rounds, and suppressing the troop target with coaxial machinegun fire \_\_\_\_\_ seconds using no more than 100 rounds.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank and troop target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.



(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trail:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

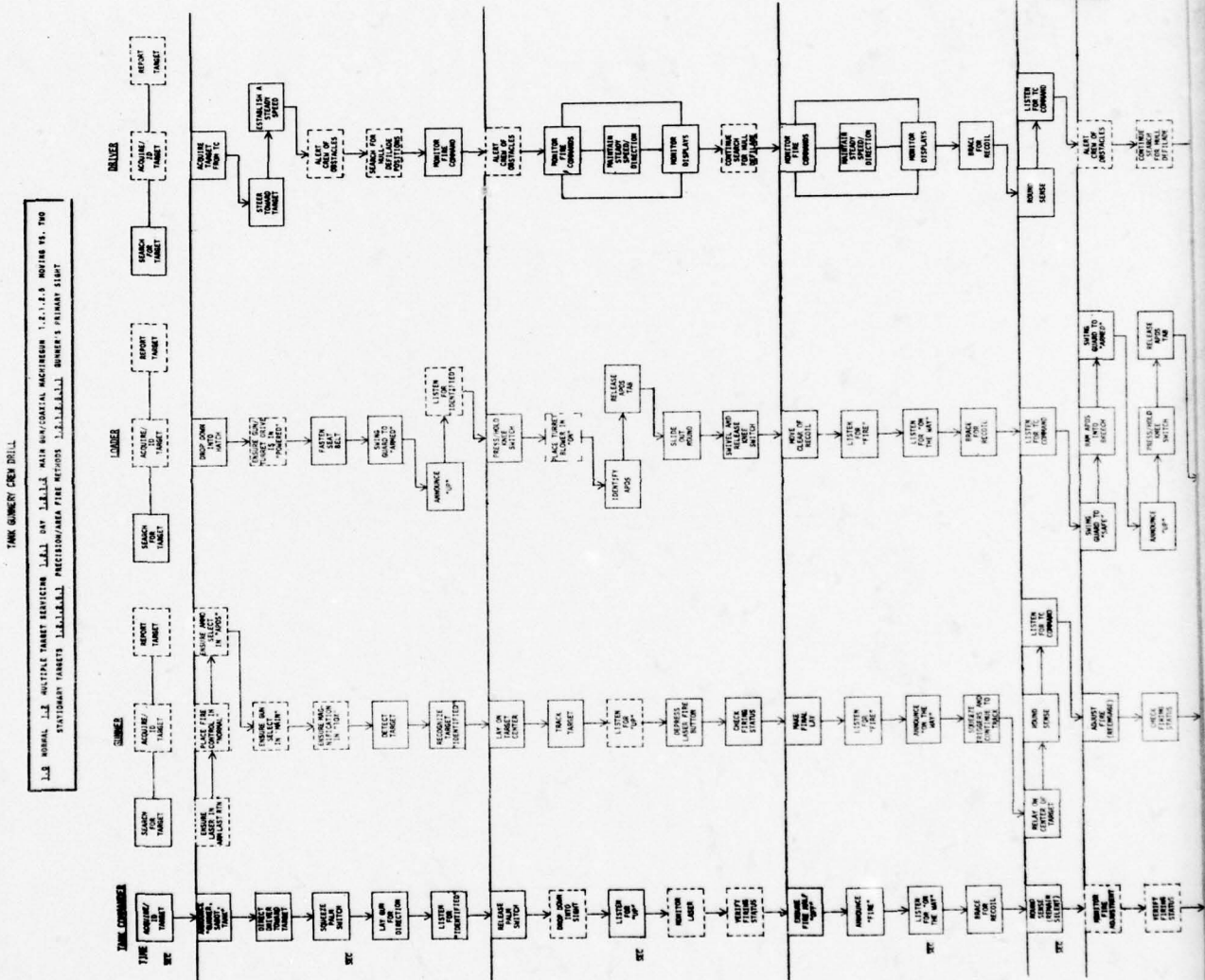
(1) Pretest

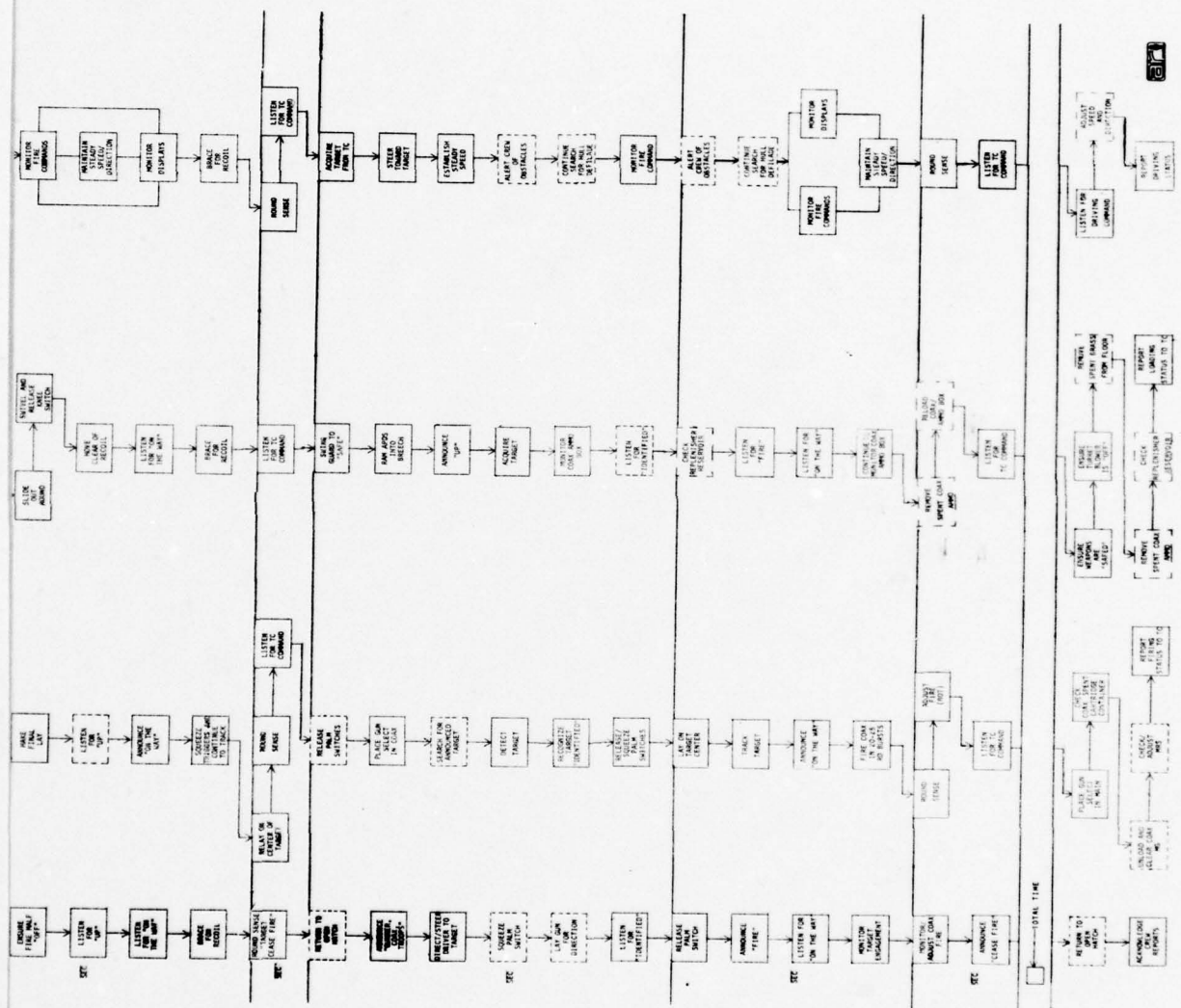
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(2) Posttest

(being developed separately)

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APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE MULTIPLE STATIONARY MAIN GUN AND COAXIAL MACHINEGUN TARGETS FROM A MOVING XMI USING THE GPS AND PRECISION/AREA FIRE METHODS OF ENGAGEMENT. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

1.0 NORMAL 1.2 MULTIPLE TARGET SERVICING 1.2.1 DAY 1.2.1.2 MAIN GUN/COAXIAL MACHINEGUN  
1.2.1.2.5 MOVING VS. TWO STATIONARY 1.2.1.2.5.1 PRECISION/AREA FIRE METHODS  
1.2.1.2.5.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                                  | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                                    | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring targets                                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire commands (1st target)                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing main gun ready-to-fire checks           |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining steady speed                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (release)                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining speed/direction                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC announces "CEASE FIRE")          |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command (2d target)                   |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing coaxial machinegun ready-to-fire checks |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Responding to fire command ("UP")                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining steady speed                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target                                   |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                                  |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "CEASE FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |

TIME 

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
|---|---|---|

 + ACCURACY 

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
|---|---|---|

 = SCORE 

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
|---|---|---|

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.



## TANK GUNNERY CREW DRILL

|                                                 |                                                        |                  |
|-------------------------------------------------|--------------------------------------------------------|------------------|
| <u>1.0</u> NORMAL                               | <u>1.3</u> SIMULTANEOUS TARGET SERVICING               | <u>1.3.1</u> DAY |
| <u>1.3.1.1</u> MAIN GUN/CAL .50                 | <u>1.3.1.1.1</u> STATIONARY VS. TWO STATIONARY TARGETS |                  |
| <u>1.3.1.1.1.1</u> PRECISION/POINT FIRE METHODS | <u>1.3.1.1.1.1.1</u> GUNNER'S                          |                  |
| PRIMARY SIGHT/TC's PERISCOPE                    |                                                        |                  |

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, fully operational
- 2 One (1) full scale stationary Soviet tank silhouette, flank view, located at 1000 meters.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.
- 4 One (1) ATGM (man-packed) located at 1000 meters and 100-200 meters from tank target
- 5 One (1) belt of dummy caliber .50 ammunition

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

#### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for caliber .50 machinegun firing
- 2 Loading weapons
  - 2.1 Loading the caliber .50 machinegun
    - 2.1.1 Safing the machinegun
    - 2.1.2 Opening/closing the cover
    - 2.1.3 Loading ammo in feedtray
    - 2.1.4 Arming the caliber .50 machinegun
      - 2.1.4.1 Charging the machinegun
- 3 Engaging targets
  - 3.1 Acquiring targets
  - 3.2 Determining method of target engagement
  - 3.3 Issuing fire commands
  - 3.4 Positioning weapons
    - 3.4.1 Positioning Commander's weapon station
      - 3.4.1.1 Traversing the station
      - 3.4.1.2 Elevating/depressing caliber .50
  - 3.5 Laying on targets
    - 3.5.1 Applying machinegun methods of fire
      - 3.5.1.1 Applying point fire method

machinegun

- 3.6 Tracking targets
- 3.7 Ranging on targets
  - 3.7.1 Estimating range to targets
- 3.8 Firing on targets
  - 3.8.1 Firing caliber .50 machinegun
    - 3.8.1.1 Firing electrically
- 3.9 Adjusting Fire
  - 3.9.1 Adjusting caliber .50 machinegun fire
    - 3.9.1.1 Applying Burst-on-Target (BOT) method
- 4 Handing-off targets
  - 4.1 Laying main gun for direction
    - 4.1.1 Traversing the turret
    - 4.1.2 Elevating/depressing the gun
- 5 Performing post-firing procedures
  - 5.1 Performing main gun post-fire procedure
  - 5.2 Performing caliber .50 machinegun post-fire procedure
- 6 Unloading weapons
  - 6.1 Unloading the caliber .50 machinegun
    - 6.1.1 Safing the machinegun
    - 6.1.2 Opening/closing the cover
    - 6.1.3 Clearing the machinegun

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying precision method of fire
  - 2.4 Tracking targets
  - 2.5 Ranging to targets
    - 2.5.1 Laser ranging to target
  - 2.6 Firing on targets
    - 2.6.1 Determining ready-to-fire status
    - 2.6.2 Firing the main gun
      - 2.6.2.1 Firing electrically
  - 2.7 Round sensing
  - 2.8 Adjusting fire
    - 2.8.1 Adjusting main gun fire
      - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedures



(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo color codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; equipment is fully operational
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit
- g Cal .50 machinegun is loaded with dummy ammo belt and safety is in "F"

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- \*g Laser RANGE switch is in ARM LAST RTN
- h GUN SELECT switch is in MAIN and light is lit
- i FIRE CONTROL MODE switch is in NORMAL and light is lit
- j AMMUNITION SELECT switch is in APDS and light is ON

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spent case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

4 DR Station

- a DR is seated with CVC helmet on and connected to intercom control box
- b DR hatch is closed and locked
- c PARKING BRAKE is depressed and light is lit
- d Drain valves are in CLOSED position
- e Steer-throttle control is adjusted for driving
- f Engine is operating between 900-1000 RPMs
- g TACTICAL IDLE ON/OFF switch is in OFF
- h All AUXILIARY SYSTEMS switches are in OFF
- i MASTER WARNING and MASTER CAUTION lights are unlit
- j ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

(c) Target:

- 1 One (1) full scale stationary Soviet tank silhouette, flank view, located at 1000 meters
- 2 One (1) ATGM (man-packed) located at 1000 meters, and 100-200 meters from tank target
- 3 Targets positioned in a 30° angle forward of main gun

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

**\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed**

**\*\*\*Sufficient rounds are necessary to simulate round selection.**



(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank-stationary target engagement using the GPS and precision method of fire while simultaneously engaging an ATGM (man-packed) using the TC's periscope and caliber fifty machinegun.

(3) Standard: The XM1 tank crew must complete the simultaneous target engagement without error, destroying the main gun target in \_\_\_\_\_ seconds from the alert element of the TC's fire command using no more than two rounds, and destroying the caliber .50 ATGM (man-packed) target with point fire in \_\_\_\_\_ seconds using no more than 200 rounds.

#### c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank and troop target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

### 3. EVALUATION SPECIFICATIONS

#### a. INFORMAL

##### (1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

##### (2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest

(being developed separately)

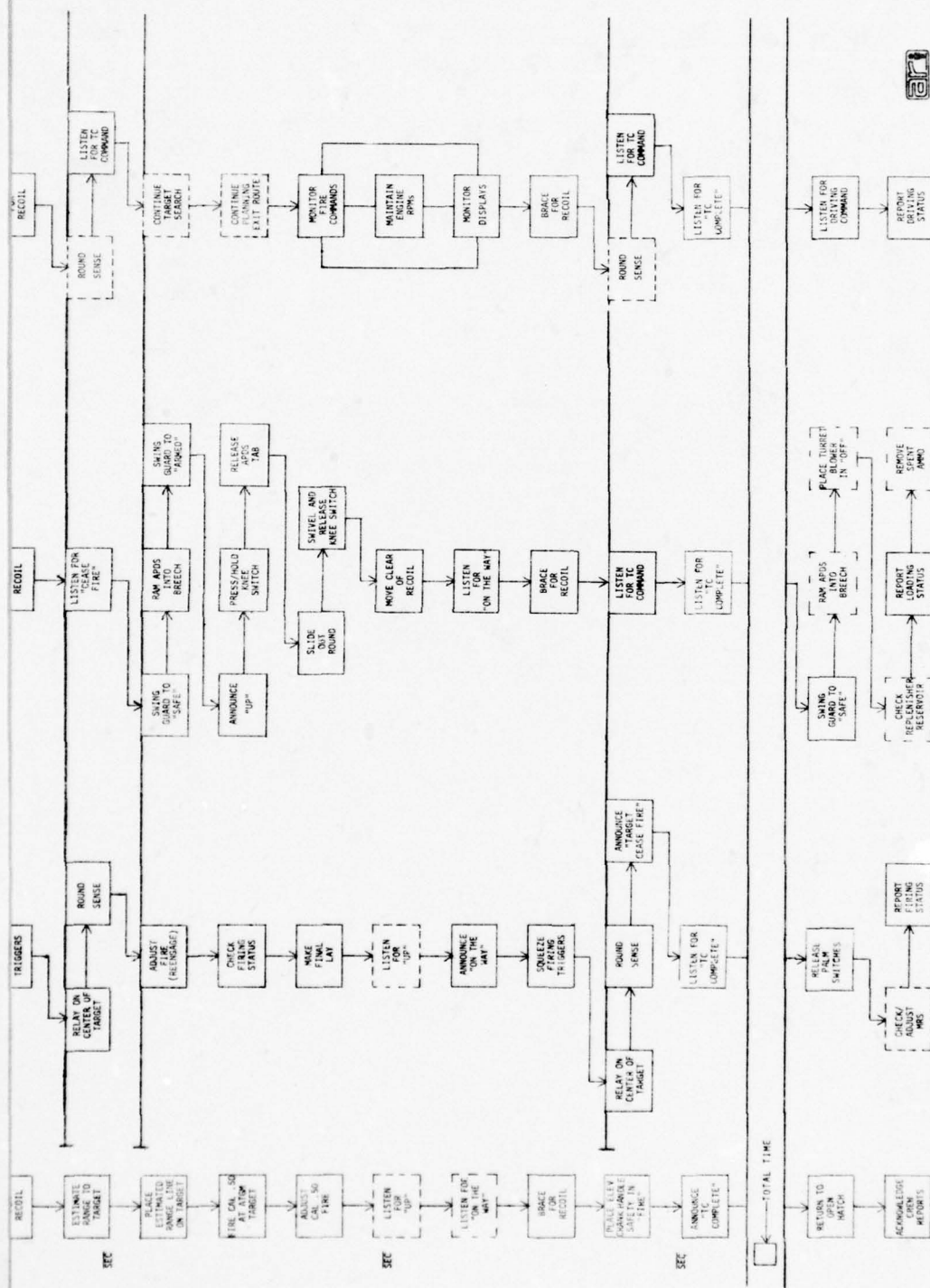
(2) Posttest

(being developed separately)

1.2 NORMAL 1.3 SIMULTANEOUS TARGET SERVICING 1.3.1 DAY 1.3.1.1 MAIN GUN/CAL .50 1.3.1.1.1 STATIONARY VS. TWO STATIONARY TARGETS 1.3.1.1.1.1 PRECISION/POINT FIRE METHODS 1.3.1.1.1.1.1 GUNNER'S PRIMARY SIGHT/TC'S PERISCOPE







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE SIMULTANEOUS STATIONARY TANK/CAL .50 TARGETS FROM A STATIONARY XMI USING THE GPS AND TC'S PERISCOPE AND PRECISION/POINT FIRE METHODS OF ENGAGEMENT. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

1.0 NORMAL 1.3 SIMULTANEOUS TARGET SERVICING 1.3.1 DAY 1.3.1.1 MAIN GUN/  
CAL .50 1.3.1.1.1 STATIONARY VS. TWO STATIONARY 1.3.1.1.1.1 PRECISION  
1.3.1.1.1.1.1 GUNNER'S PRIMARY SIGHT/TC'S PERISCOPE

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring targets                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE AND ADJUST.<br>CAL. FIFTY"  |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintain engine RPMs                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(GR announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Positioning Cmdr's weapon station            |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Estimating range                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing Cal .50 machinegun                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Adjusting fire                               |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "END OF MISSION"                  |           |   |   |        |   |   |        |   |   |        |   |   |

Trial                      Trial                      Trial  
 1      2      3                      1      2      3                      1      2      3  
 TIME    + ACCURACY    = SCORE



APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

|                                              |                                     |                  |                         |
|----------------------------------------------|-------------------------------------|------------------|-------------------------|
| <u>2.0</u> EMERGENCY                         | <u>2.1</u> SINGLE TARGET SERVICING  | <u>2.1.1</u> DAY | <u>2.1.1.1</u> MAIN GUN |
| <u>2.1.1.1.4</u> MOVING TO A HALT VS. MOVING | <u>2.1.1.1.4.1</u> PRECISION METHOD |                  |                         |
| <u>2.1.1.1.4.1.1</u> GUNNER'S PRIMARY SIGHT  |                                     |                  |                         |

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

1 One (1) XM1 tank, with stabilization system made inoperative  
2 Three (3) full scale moving (16 KMH) Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.

3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

#### (2) Evaluation

(a) Personnel: Plt Ldr/Sgt will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew

##### (b) Equipment:

1 Same as training equipment.

2 Two (2) stopwatches.

##### (c) Materials:

1 One (1) instruction sheet for conducting tank crew appraisal.

2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing gun
  - 1.5 Issuing driving commands
    - 1.5.1 Directing Driver toward target
  - 1.6 Monitoring target engagement
    - 1.6.1 Identifying correct sight picture
    - 1.6.2 Identifying correct tracking
    - 1.6.3 Identifying correct lasing
    - 1.6.4 Identifying ready-to-fire status
  - 1.7 Round sensing
    - 1.7.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets
  - 2.1 Acquiring targets



- 2.1.1 Acquiring announced targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
  - 2.4 Tracking targets
  - 2.5 Ranging to targets
    - 2.5.1 Laser ranging to target
  - 2.6 Firing on targets
    - 2.6.1 Determining ready-to-fire status
    - 2.6.2 Firing the main gun
      - 2.6.2.1 Firing electrically
  - 2.7 Round sensing
  - 2.8 Adjusting fire
    - 2.8.1 Adjusting main gun fire
      - 2.8.1.1 Applying reengage method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-firing procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo color codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(c) DR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

2 Driving the tank

2.1 Placing the tank in motion

2.1.1 Releasing parking brake

2.1.2 Shifting transmission

2.1.3 Accelerating/decelerating engine

2.1.4 Steering the tank

2.1.4.1 Driving forward

2.2 Acquiring targets

2.2.1 Acquiring announced targets

2.3 Selecting routes

2.4 Maneuvering tank for firing

2.4.1 Firing from-a-halt

2.4.1.1 Positioning tank for firing

2.4.1.2 Responding to TC driving commands

2.4.1.3 Identifying adverse terrain

2.4.1.4 Identifying defilade firing positions

2.5 Stopping the tank

2.5.1 Applying service brakes

3 Round sensing

4 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

(b) TC/GR

1 Acquiring targets

1.1 Identifying targets

2 Handing-off targets

2.1 Releasing gun/turret

3 Round sensing

(c) TC/DR

1 Acquiring targets

1.1 Acquiring announced targets

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle:

- 1 Tank is moving at 16 KMH (10 MPH)
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; stabilization system is inoperative
- 3 Individual crew stations are prepared for operation; communication system is in operation and turret is in power
- 4 Preparing to fire checks are performed for EMER mode

(b) Crew Stations:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck.
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- \*g Laser RANGE switch is in ARM LAST RTN
- h GUN SELECT switch is in MAIN and light is lit
- i FIRE CONTROL MODE switch is in EMER and light is lit
- j AMMUNITION SELECT switch is in APDS and light is ON

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN DEPENDING UPON THE TACTICAL SITUATION. For training purposes, the laser must be SAFED to prevent actual firing.



3 LR Station

- a LR hatch is closed and locked
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spend case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

4 DR Station

- a DR is seated with CVC helmet on and connected to intercom control box
- b DR hatch is closed and locked
- c Drain valves are in CLOSED position
- d Steer-throttle control is adjusted for driving
- e Tank speedometer is steady at 16 KMH (10 MPH)
- f All AUXILIARY SYSTEMS switches are in OFF
- g MASTER WARNING and MASTER CAUTION lights are unlit
- h ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

(c) Target

- 1 Three (3) full scale moving Soviet tank silhouettes, flank view
- 2 Targets moving left-to-right/right-to-left at 16 KMH (10 MPH)
- 3 Targets located at approximately 1000 meters and 50-100 meters apart
- 4 Targets positioned in a 30° angle forward of main gun

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round moving to a halt-moving target engagement with an inoperative stabilization system using the GPS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest:

(being developed separately)

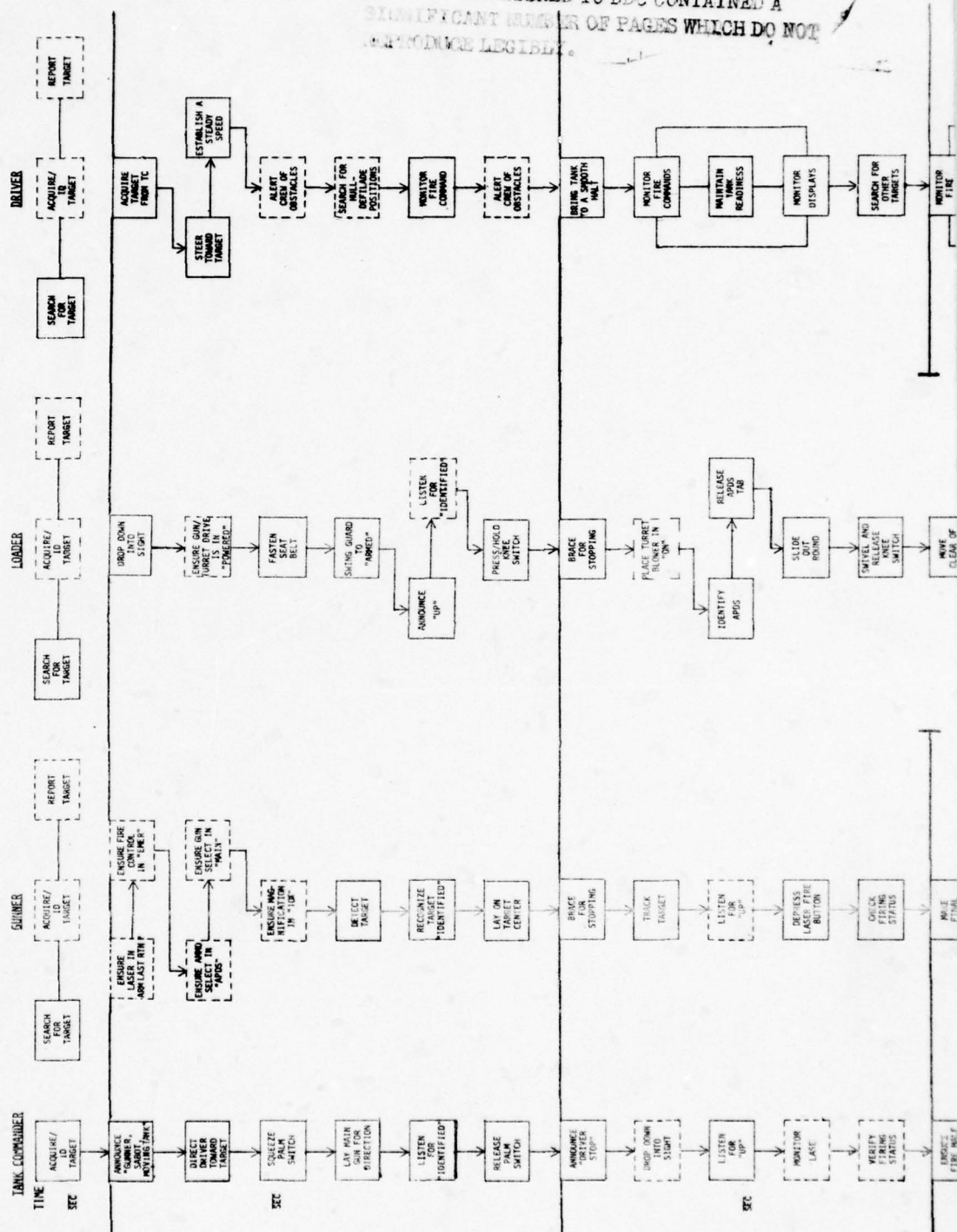
(2) Posttest:

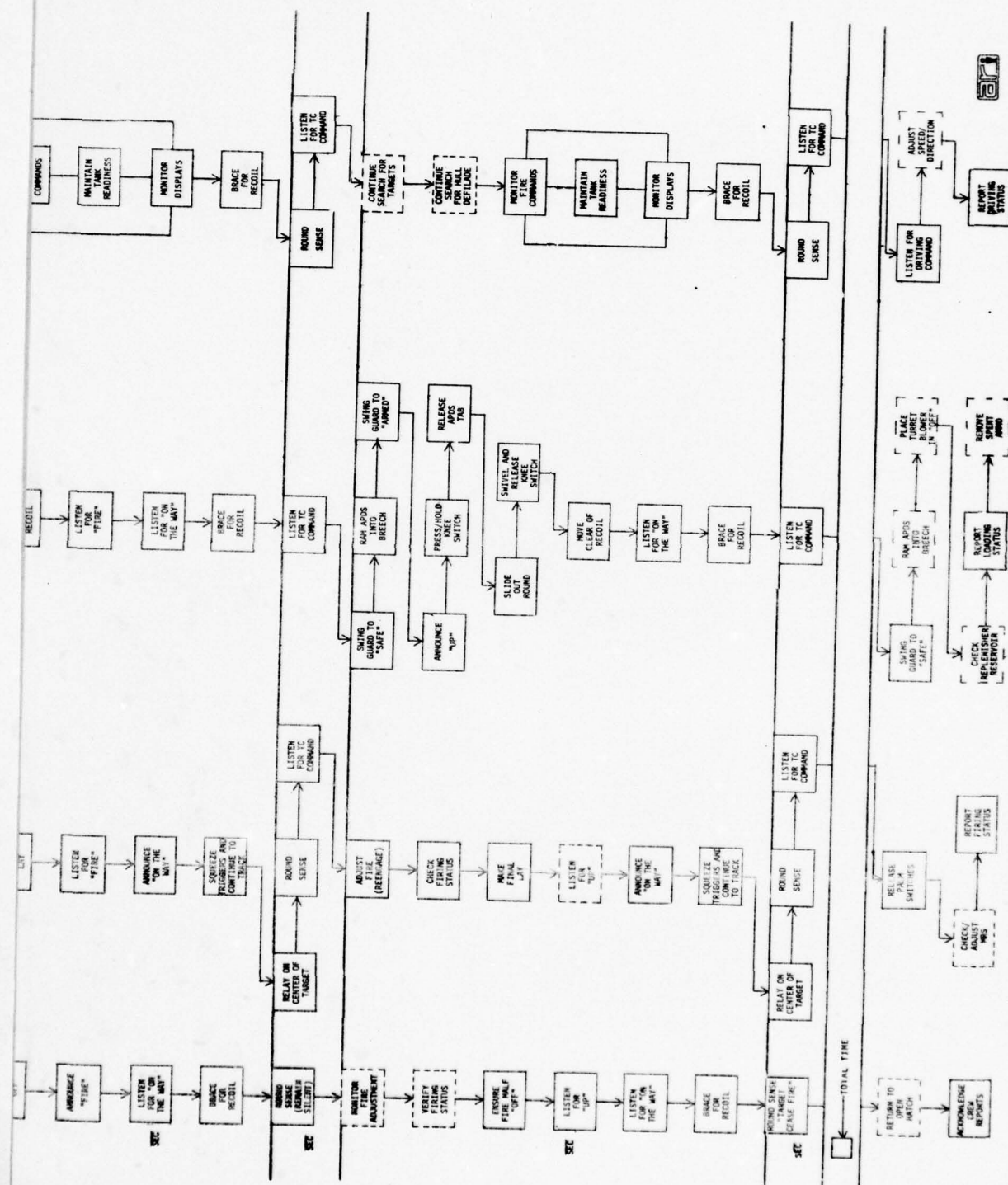
(being developed separately)



# TANK GUNNERY CREW DRILL

2.0 EMERGENCY 2.1 SINGLE TARGET SERVICING 2.1.1 DAY 2.1.1.1 MAIN GUN 2.1.1.1.4 MOVING TO A HALT VS. MOVING  
2.1.1.1.4.1 PRECISION METHOD 2.1.1.1.4.1.1 GUNNER'S PRIMARY SIGHT





APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A MOVING TANK TARGET FROM AN XMI BRIEF HALT USING THE GPS, EMERGENCY FIRING MODE, AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."



## TANK GUNNERY CREW DRILL

## PERFORMANCE CHECKLIST

2.0 EMERGENCY 2.1 SINGLE TARGET SERVICING 2.1.1 DAY 2.1.1.1 MAIN GUN  
 2.1.1.1.4 MOVING TO A HALT VS. MOVING 2.1.1.1.4.1 PRECISION METHOD  
 2.1.1.1.4.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                             | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|-----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                               | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks               |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")             |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Steering toward target                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Stopping the tank                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                               |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                 |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Depressing brake pedal                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)             |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (relase)             |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Depressing brake pedal                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target center                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>( TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

TIME 1 2 3 + ACCURACY 1 2 3 = SCORE 1 2 3

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

<sup>1</sup>The procedure for the scoring of a performance checklist is presented in Chapter V.

## TANK GUNNERY CREW DRILL

|            |          |                  |                         |                      |     |                |                        |
|------------|----------|------------------|-------------------------|----------------------|-----|----------------|------------------------|
| <u>3.0</u> | DEGRADED | <u>3.1</u>       | SINGLE TARGET SERVICING | <u>3.1.1</u>         | DAY | <u>3.1.1.1</u> | MAIN                   |
|            | GUN      | <u>3.1.1.1.2</u> | STATIONARY VS. MOVING   | <u>3.1.1.1.2.1</u>   |     |                | RANGEFINDER            |
|            |          |                  | FAILURE/BATTLESIGHT     | <u>3.1.1.1.2.1.1</u> |     |                | GUNNER'S PRIMARY SIGHT |

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TC's will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, with rangefinder made inoperative.
- 2 Three (3) full scale moving (16 KMH) Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.



(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements:

(a) TC (must be capable of)

1 Handling-off targets

1.1 Acquiring targets

1.2 Determining method of target engagement

1.3 Issuing fire commands

1.4 Laying main gun for direction

1.4.1 Traversing the turret

1.4.2 Elevating/depressing gun

1.5 Ranging to targets

1.5.1 Battlesight ranging to target

1.6 Monitoring target engagement

1.6.1 Identifying correct sight picture

1.6.2 Identifying correct tracking

1.6.3 Identifying ready-to-fire status

1.7 Round sensing

1.7.1 Confirming gunner's round sensing

2 Performing post-firing procedures

2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying battlesight method of fire
  - 2.4 Tracking targets
  - 2.5 Firing on targets
    - 2.5.1 Determining ready-to-fire status
    - 2.5.2 Firing the main gun
      - 2.5.2.1 Firing electrically
  - 2.6 Round sensing
  - 2.7 Adjusting fire
    - 2.7.1 Adjusting main gun fire
      - 2.7.1.1 Applying burst-on-target (BOT)
      - 2.7.1.2 Applying standard adjustment
        - 2.7.1.2.1 Applying target form
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedures

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically

3.1.3.2 Loading round in stowage tube

3.1.3.3 Setting ammo letter codes

4 Performing post-firing procedures

4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

1 Performing ready-to-fire procedure

1.1 Preparing for main gun firing

2 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

(b) TC/GR

1 Acquiring targets

1.1 Identifying targets

2 Handing-off targets

2.1 Releasing gun/turret

3 Round sensing

#### b. TRAINING OBJECTIVE

(1) Conditions:

(a) Firing Vehicle:

1 Tank is stationary in a hull defilade position

2 Preventive Maintenance Checks and Services (PMCS) are performed; laser rangefinder is inoperative.

3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs

4 Preparing to fire checks are performed for NORMAL mode



(b) Crew Station

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit
- g BATTLE RANGE is depressed and 1600 is displayed in sight

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- g AUTO RANGE is cancelled
- h 1600 meters is displayed in GPS and entered in computer
- \*i Laser RANGE switch is in ARM LAST RTN
- j GUN SELECT switch is in MAIN and light is lit
- k FIRE CONTROL MODE switch is in NORMAL and light is lit
- l AMMUNITION SELECT switch is in APDS and light is on

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

### 3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spent case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

### 4 DR Station

- a DR is seated with CVC helmet on and connected to intercom control box
- b DR hatch is closed and locked
- c PARKING BRAKE is depressed and light is lit
- d Drain valves are in CLOSED position
- e Steer-throttle control is locked in "up" position
- f Engine is operating between 900-1000 RPMs
- g TACTICAL IDLE ON/OFF switch is in OFF
- h All AUXILIARY SYSTEMS switches are in OFF
- i MASTER WARNING and MASTER CAUTION lights are unlit
- j ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

### (c) Target:

- 1 Three (3) full scale moving Soviet tank silhouettes, flank view.
- 2 Targets moving left-to-right/right-to-left at 16 KMH (10 MPH).
- 3 Targets located at approximately 1000 meters and 50-100 meters apart.
- 4 Targets positioned within a 30° angle forward of main gun.

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary-moving target engagement with an inoperative rangefinder using the GPS and battlesight method of fire.

(3) Standard: The XM1 tank crew must complete the two round engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.



2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Prétest:

(being developed separately)

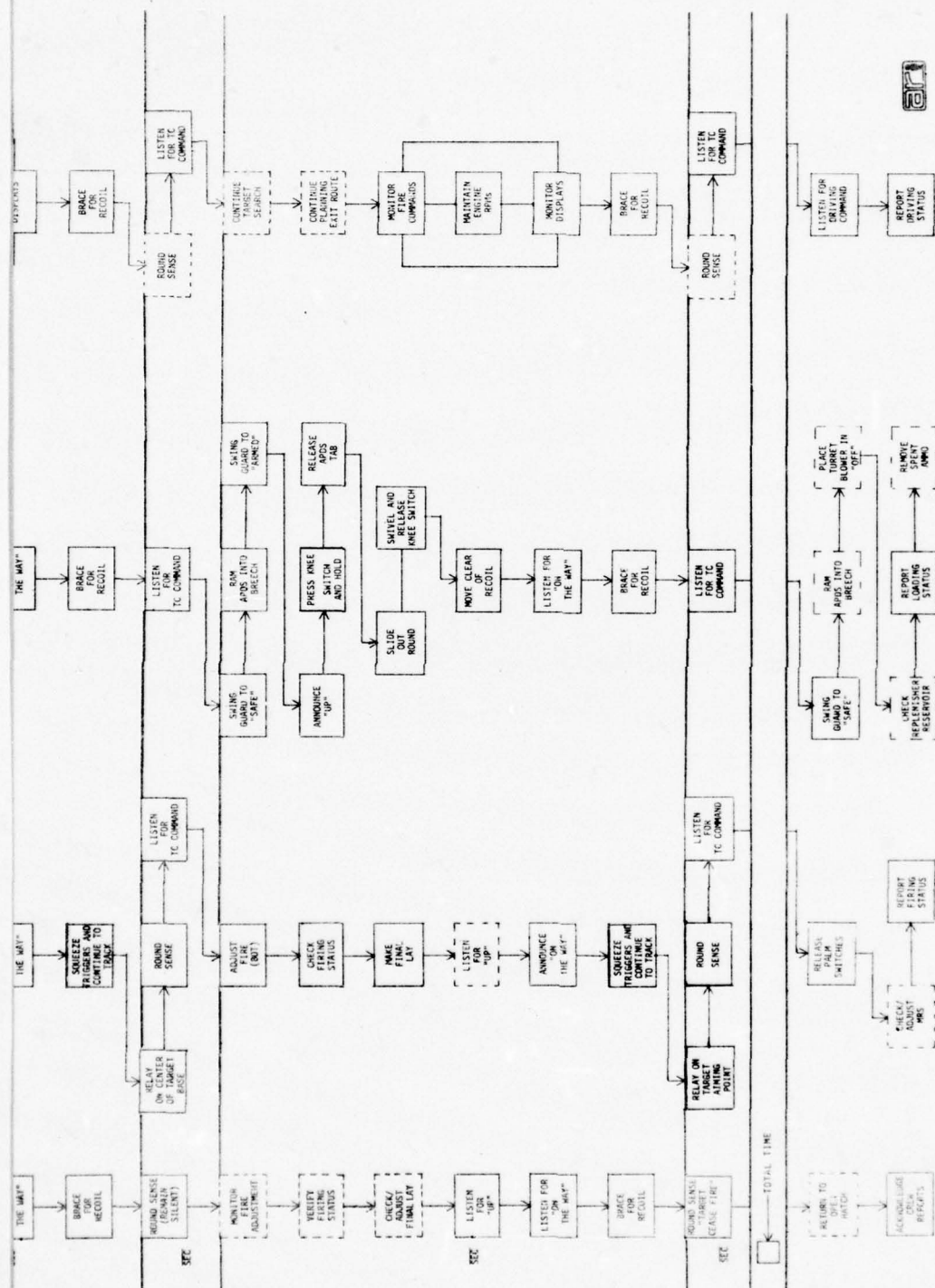
(2) Posttest:

(being developed separately)

|           |                       |             |                                 |               |                        |         |          |
|-----------|-----------------------|-------------|---------------------------------|---------------|------------------------|---------|----------|
| 3.2       | Degraded              | 2.1         | Single target servicing         | 3.1.1         | Day                    | 2.1.1.1 | Main gun |
| 3.1.1.1.2 | Stationary vs. moving | 3.1.1.1.2.1 | Rangefinder failure/battlesight | 3.1.1.1.2.1.1 | Gunner's primary sight |         |          |



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APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A MOVING TANK TARGET FROM A STATIONARY XML WITH AN INOPERATIVE RANGE-FINDER USING THE GPS AND BATTLESIGHT METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL IS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

# TANK GUNNERY CREW DRILL

## PERFORMANCE CHECKLIST

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
 3.1.1.1.2 STATIONARY VS. MOVING 3.1.1.1.2.1 RANGEFINDER FAILURE/BATTLESIGHT METHOD  
 3.1.1.1.2.1.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                         | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|-------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                           | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction             |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks           |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")         |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on center of target base           |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                   |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on center of target base         |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)         |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (BOT)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                    |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                   |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point           |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial 1 2 3  
 TIME    + ACCURACY    = SCORE

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

---

<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.



## TANK GUNNERY CREW DRILL

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.2 STATIONARY VS. MOVING 3.1.1.1.2.2 LEAD ANGLE SENSOR FAILURE/  
PRECISION METHOD 3.1.1.1.2.2.1 GUNNER'S PRIMARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

1 One (1) XM1 tank, with lead angle sensor made inoperative.  
2 Three (3) full scale moving (16 KMH) Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.

3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

#### (2) Evaluation

(a) Personnel: Plt Ldr/Sgt will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew

##### (b) Equipment:

1 Same as training equipment.  
2 Two (2) stopwatches.

##### (c) Materials:

1 One (1) instruction sheet for conducting tank crew appraisal.  
2 Two (2) crew performance checklists with directions.

(d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105-MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements

(a) TC (must be capable of)

1 Handing-off targets

1.1 Acquiring targets

1.2 Determining method of target engagement

1.3 Issuing fire commands

1.4 Laying main gun for direction

1.4.1 Traversing the turret

1.4.2 Elevating/depressing gun

1.5 Monitoring target engagement

1.5.1 Identifying correct sight picture

1.5.2 Identifying correct tracking

1.5.3 Identifying correct lasing

1.5.4 Identifying ready-to-fire status

1.6 Round sensing

1.6.1 Confirming gunner's round sensing

2 Performing post-firing procedures

2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

2 Engaging targets

2.1 Acquiring targets

2.1.1 Acquiring announced targets

2.2 Positioning gun/turret

2.2.1 Traversing turret

- 2.2.2 Elevating/depressing gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying precision method of fire
    - 2.3.2 Applying target lead
  - 2.4 Tracking targets
  - 2.5 Ranging to targets
    - 2.5.1 Laser ranging to target
  - 2.6 Firing on targets
    - 2.6.1 Determining ready-to-fire status
    - 2.6.2 Firing the main gun
      - 2.6.2.1 Firing electrically
  - 2.7 Round sensing
  - 2.8 Adjusting fire
    - 2.8.1 Adjusting main gun fire
      - 2.8.1.1 Applying reengage method
      - 2.8.1.2 Applying burst-on-target (BOT)
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedures

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure



(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures

(2) Team Task Requirements:

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret
- 3 Round sensing

#### c. TRAINING OBJECTIVES

(1) CONDITIONS

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; lead angle sensor is inoperative
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations:

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- g AUTO LEAD is cancelled and previous data, if any, shows on display
- \*h Laser RANGE switch is in ARM LAST RTN
- i GUN SELECT switch is in MAIN and light is lit
- j FIRE CONTROL MODE switch is in NORMAL and light is lit
- k AMMUNITION SELECT switch is in APDS and light is on

3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position.

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

d Turret traverse lock is in UNLOCKED  
e GUN TURRET DRIVE switch is in POWERED and  
light is lit  
f Spent case ejection guard is forward and MAIN  
GUN STATUS SAFE light is lit  
\*\*g Main gun breech is "open"  
\*\*\*h Four (4) dummy rounds of each ammo are stowed  
in ready ammunition compartment

4 DR Station

a DR is seated with CVC helmet on and connected  
to intercom control box  
b DR hatch is closed and locked  
c PARKING BRAKE is depressed and light is lit  
d Drain valves are in CLOSED position  
e Steer-throttle control is adjusted for driving  
f Engine is operating between 900-1000 RPMs  
g TACTICAL IDLE ON/OFF switch is in OFF  
h All AUXILIARY SYSTEMS switches are in OFF  
i MASTER WARNING and MASTER CAUTION lights are  
unlit  
j ELECTRICAL SYSTEM gage is steady between  
27.5 and 28.5 volts

(c) Target:

1 Three (3) full scale moving Soviet tank silhou-  
ettes, flank view  
2 Targets moving left-to-right/right-to-left at  
16 KMH (10 MPH)  
3 Targets located at approximately 1000 meters and  
50-100 meters apart  
4 Targets positioned in a 30° angle forward of  
main gun

(d) Environment:

1 Terrain surface is flat  
2 Surrounding area is open  
3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual  
and crew behaviors required to complete a two round stationary tank-  
moving target engagement with an inoperative lead angle sensor using  
the GPS and precision method of fire.

\*\*For training purposes, the breech is left open for loading a "second"  
round. As such, the loader is to simulate a battlesight mode, i.e.,  
gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.



(3) Standard: The XML tank crew must complete the two round engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest

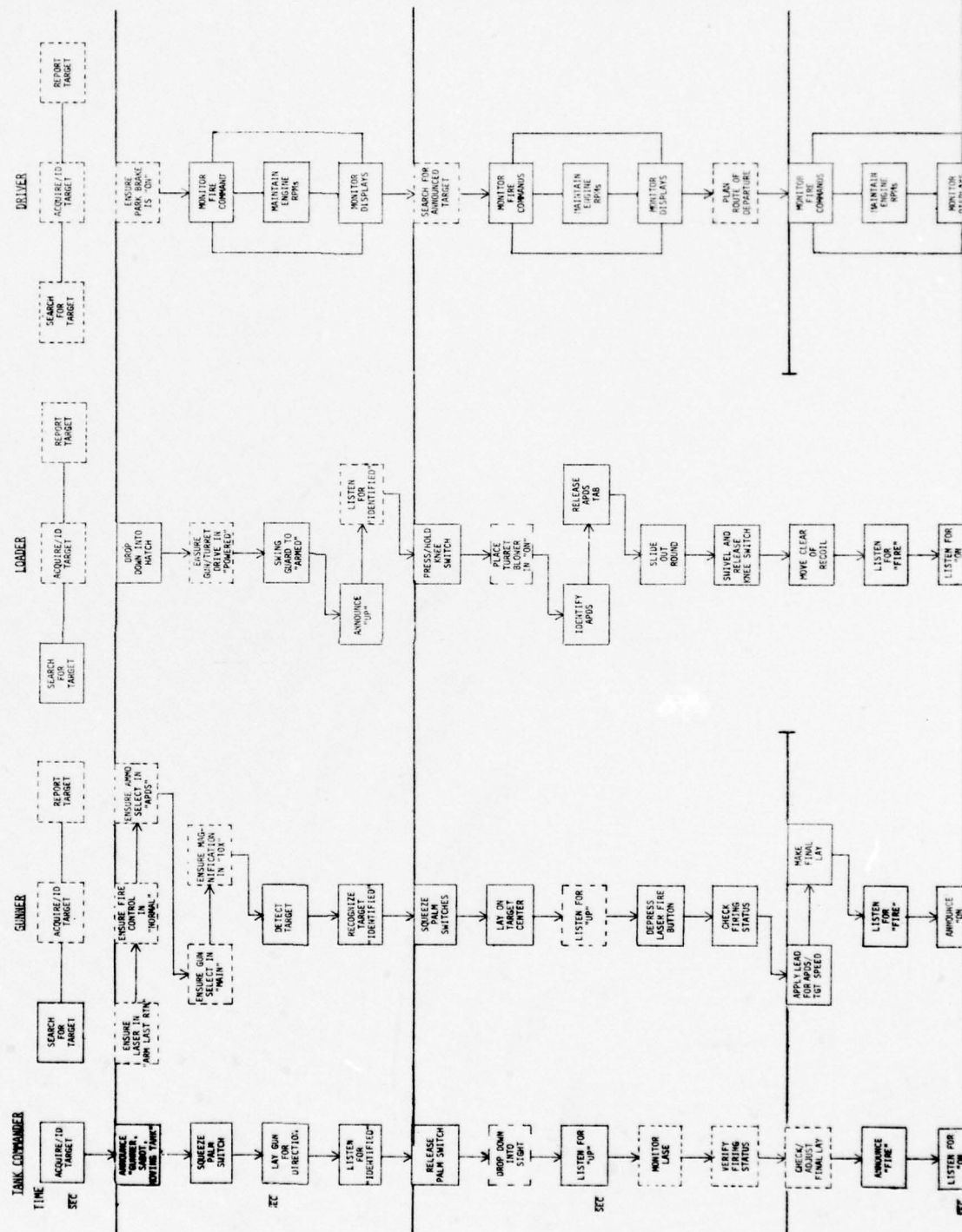
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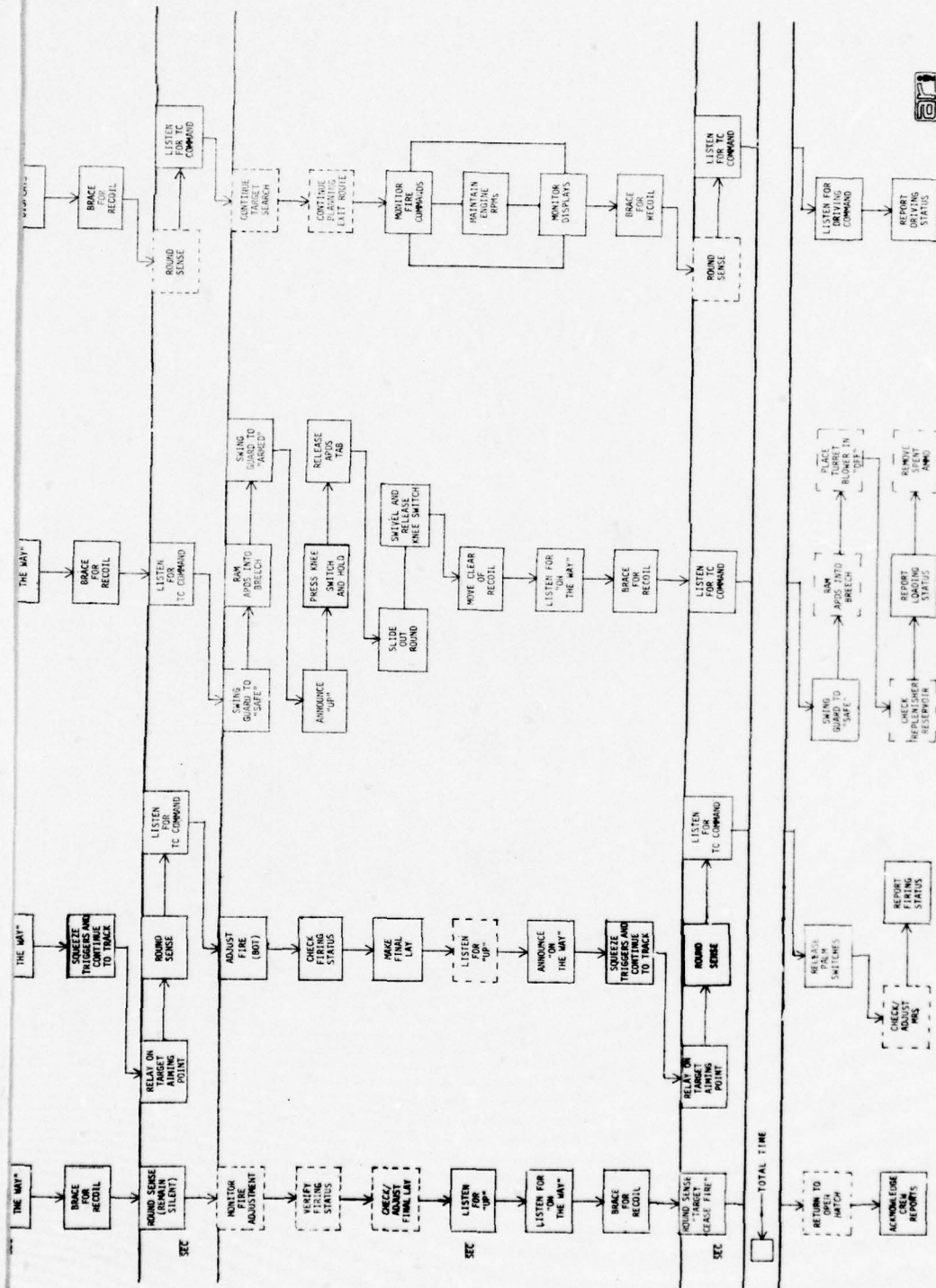
(2) Posttest

(being developed separately)

# TANK GUNNERY CREW DRILL

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.2 STATIONARY VS. MOVING 3.1.1.1.2.2 LEAD ANGLE SENSOR FAILURE/PRECISION METHOD 3.1.1.1.2.2.1 GUNNER'S PRIMARY SIGHT







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A MOVING TANK TARGET FROM A STATIONARY XM1 WITH AN INOPERATIVE LEAD ANGLE SENSOR USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

## TANK GUNNERY CREW DRILL

## PERFORMANCE CHECKLIST

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
 3.1.1.1.2 STATIONARY VS. MOVING 3.1.1.1.2.2 LEAD ANGLE SENSOR FAILURE/PRECISION METHOD  
 3.1.1.1.2.2.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying target lead                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Tracking target                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point              |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (BOT)               |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial 1 2 3  
 TIME    + ACCURACY    = SCORE    Trial 1 2 3

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

---

<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.



## TANK GUNNERY CREW DRILL

|                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>3.0</u> DEGRADED <u>3.1</u> SINGLE TARGET SERVICING <u>3.1.1</u> DAY <u>3.1.1.1</u> MAIN GUN<br><u>3.1.1.1.1</u> STATIONARY VS. STATIONARY <u>3.1.1.1.1.3</u> CANT SENSOR FAILURE/<br>PRECISION METHOD <u>3.1.1.1.1.3.1</u> GUNNER'S PRIMARY SIGHT |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TC's will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, with cant sensor made inoperative.
- 2 Three (3) full scale stationary Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

##### (d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

- (1) Individual Task Requirements

- (a) TC (must be capable of)

1 Handing-off targets

1.1 Acquiring targets

1.2 Determining method of target engagement

1.3 Issuing fire commands

1.4 Laying main gun for direction

1.4.1 Traversing the turret

1.4.2 Elevating/depressing the gun

1.5 Monitoring target engagement

1.5.1 Identifying correct sight picture

1.5.2 Identifying correct lasing

1.5.3 Identifying ready-to-fire status

1.6 Round sensing

1.6.1 Confirming gunner's round sensing

2 Performing post-firing procedures

2.1 Performing main gun post-fire procedure

- (b) GR (must be capable of)

1 Performing ready-to-fire procedures

1.1 Preparing for main gun firing

2 Engaging targets

2.1 Acquiring targets

2.1.1 Acquiring announced targets

2.2 Positioning gun/turret

2.2.1 Traversing turret

2.2.2 Elevating/depressing the gun

- 2.3 Laying on targets
  - 2.3.1 Applying main gun methods of fire
    - 2.3.1.1 Applying precision method of fire
  - 2.3.2 Applying correction for cant
- 2.4 Ranging to targets
  - 2.4.1 Laser ranging to targets
- 2.5 Firing on targets
  - 2.5.1 Determining ready-to-fire status
  - 2.5.2 Firing the main gun
    - 2.5.2.1 Firing electrically
- 2.6 Round sensing
- 2.7 Adjusting fire
  - 2.7.1 Adjusting main gun fire
    - 2.7.1.1 Applying reengage method
    - 2.7.1.2 Applying Burst-on-Target (BOT) method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures



(2) Team Task Requirements

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing

(b) TC/GR (must be capable of)

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions

(a) Firing Vehicle

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; cant sensor is inoperative
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively

light is lit  
shows on display  
is lit

- f THERMAL MODE switch is in STANDBY and RCVR READY
- g AUTO CANT is cancelled and previous data, if any,
- \*h Laser RANGE switch is in ARM LAST RTN
- i GUN SELECT switch is in MAIN and light is lit
- j FIRE CONTROL MODE switch is in NORMAL and light
- k AMMUNITION SELECT switch is in APDS and light is ON

### 3 LR Station

on and connected to intercom control box

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d GUN TURRET DRIVE switch is in POWERED and light is lit
- e Spend case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*f Main gun breech is "open"
- \*\*\*g Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

### 4 DR Station

intercom control box

- a DR is seated with CVC helmet on and connected to
- b DR hatch is closed and locked
- c PARKING BRAKE is depressed and light is lit
- d Drain valves are in OPEN position
- e Steer-throttle control is adjusted for driving
- f Engine is operating between 900-1000 RPMs
- g TACTICAL IDLE ON/OFF switch is in OFF
- h All AUXILIARY SYSTEMS switches are in OFF
- i MASTER WARNING and MASTER CAUTION lights are unlit
- j ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

(c) Target:

1 Three (3) full scale Soviet tank silhouettes, flank view

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

- 2 Targets located at approximately 1000 meters and 50-100 meters apart
- 3 Targets positioned within a 30° angle forward of main gun

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank-stationary target engagement with an inoperative cant sensor using the GPS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:



1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest:

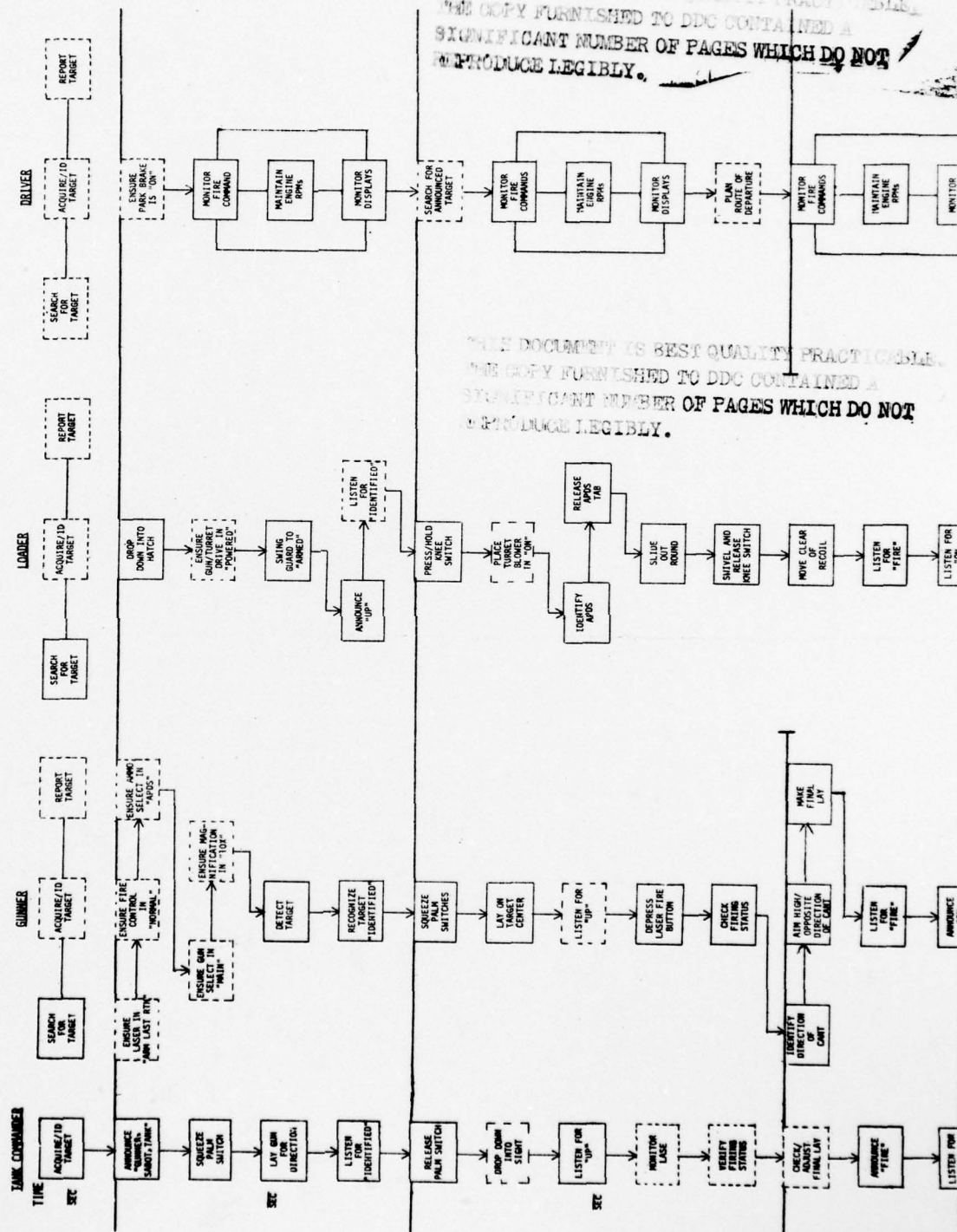
(being developed separately)

(2) Posttest:

(being developed separately)

# TANK GUNNERY CREW DRILL

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN 3.1.1.1.1 STATIONARY VS. STATIONARY  
3.1.1.1.3 CANT SENSOR FAILURE/PRECISION METHOD 3.1.1.1.3.1 GUNNER'S PRIMARY SIGHT







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A STATIONARY TANK TARGET FROM AN XMI WITH AN INOPERATIVE CANT SENSOR USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.1 STATIONARY VS. STATIONARY 3.1.1.1.1.3 CANT SENSOR FAILURE/PRECISION METHOD  
3.1.1.1.1.3.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying cant correction                     |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point              |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (BOT)               |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point              |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial  
1      2      3  
 TIME   

 Trial  
1      2      3  
 + ACCURACY   

 = SCORE

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.



## TANK GUNNERY CREW DRILL

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.1 STATIONARY VS. STATIONARY 3.1.1.1.1.4 CROSSWIND SENSOR FAILURE/  
PRECISION METHOD 3.1.1.1.1.4.1 GUNNER'S PRIMARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, with crosswind sensor made inoperative.
- 2 Three (3) full scale stationary Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.
- 3 Four (4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

##### (d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105 MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

(1) Individual Task Requirements

(a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing turret
    - 1.4.2 Elevating/depressing the gun
  - 1.5 Monitoring target engagement
    - 1.5.1 Identifying correct sight picture
    - 1.5.2 Identifying correct lasing
    - 1.5.3 Identifying ready-to-fire status
  - 1.6 Round sensing
    - Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

(b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing the gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying precision method of fire
      - 2.3.1.2 Applying aim-off

- 2.4 Ranging to targets
  - 2.4.1 Laser ranging to targets
- 2.5 Firing on targets
  - 2.5.1 Determining ready-to-fire status
  - 2.5.2 Firing the main gun
    - 2.5.2.1 Firing electrically
- 2.6 Round sensing
- 2.7 Adjusting fire
  - 2.7.1 Adjusting main gun fire
    - 2.7.1.1 Applying reengage method
    - 2.7.1.2 Applying Burst-on-Target (BOT) method
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Handling main gun ammo
    - 3.1.3 Stowing ammo in ready ammo compartment
      - 3.1.3.1 Opening/closing ammo door electrically
      - 3.1.3.2 Loading round in stowage tube
      - 3.1.3.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures

(2) Team Task Requirements

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing main gun for firing



(b) TC/GR (must be capable of)

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions:

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; crosswind sensor is inoperative
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations

1 TC Station

- a TC hatch is locked in full open position
- b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
- c Knee guard is in firing position
- d TURRET POWER switch is in ON
- e AUX HYDR POWER switch is in OFF
- f VEHICLE MASTER POWER and TURRET POWER lights are lit

2 GR Station

- a GR is seated with CVC helmet on and connected to intercom control box and chest guard is placed in the firing position
- b Main gun elevation travel lock is unlocked and stowed
- c DAYLIGHT ballistic door handle is in OPEN
- d GPS and TIS are prepared for operation
- e MAGNIFICATION selectors for GPS and TIS are in 10x and 3x respectively
- f THERMAL MODE switch is in STANDBY and RCVR READY light is lit
- g AUTO CROSSWIND is cancelled and previous data, if any, shows on display

is lit

- \*h Laser RANGE switch is in ARM LAST RTN
- i GUN SELECT switch is in MAIN and light is lit
- j FIRE CONTROL MODE switch is in NORMAL and light
- k AMMUNITION SELECT switch is in HEAT and light is ON

3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in firing position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light

is lit

- f Spend case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

4 DR Station

- a DR is seated with CVC helmet on and connected to intercom control box
- b DR hatch is closed and locked
- c PARKING BRAKE is depressed and light is lit
- d Drain valves are in CLOSED position
- e Steer-throttle control is adjusted for driving
- f Engine is operating between 900-1000 RPMs
- g TACTICAL IDLE ON/OFF switch is in OFF
- h All AUXILIARY SYSTEMS switches are in OFF
- i MASTER WARNING and MASTER CAUTION lights are unlit
- j ELECTRICAL SYSTEM gage is steady between 27.5-

28.5 volts

(c) Target:

1 Three (3) full scale Soviet tank silhouettes, flank view

\*Normally, the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

2 Targets located at approximately 1000 meters and 50-100 meters apart.

3 Targets positioned within a 30° angle forward of main gun.

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank -stationary target engagement with an inoperative crosswind sensor using the GPS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

c. SIMULATION TECHNIQUE

(a) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(b) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

3. EVALUATION SPECIFICATIONS

a. INFORMAL

(1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

(2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.



(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error.

2 Each tank crew must complete the crew drill within the specified time.

b. FORMAL

(1) Pretest:

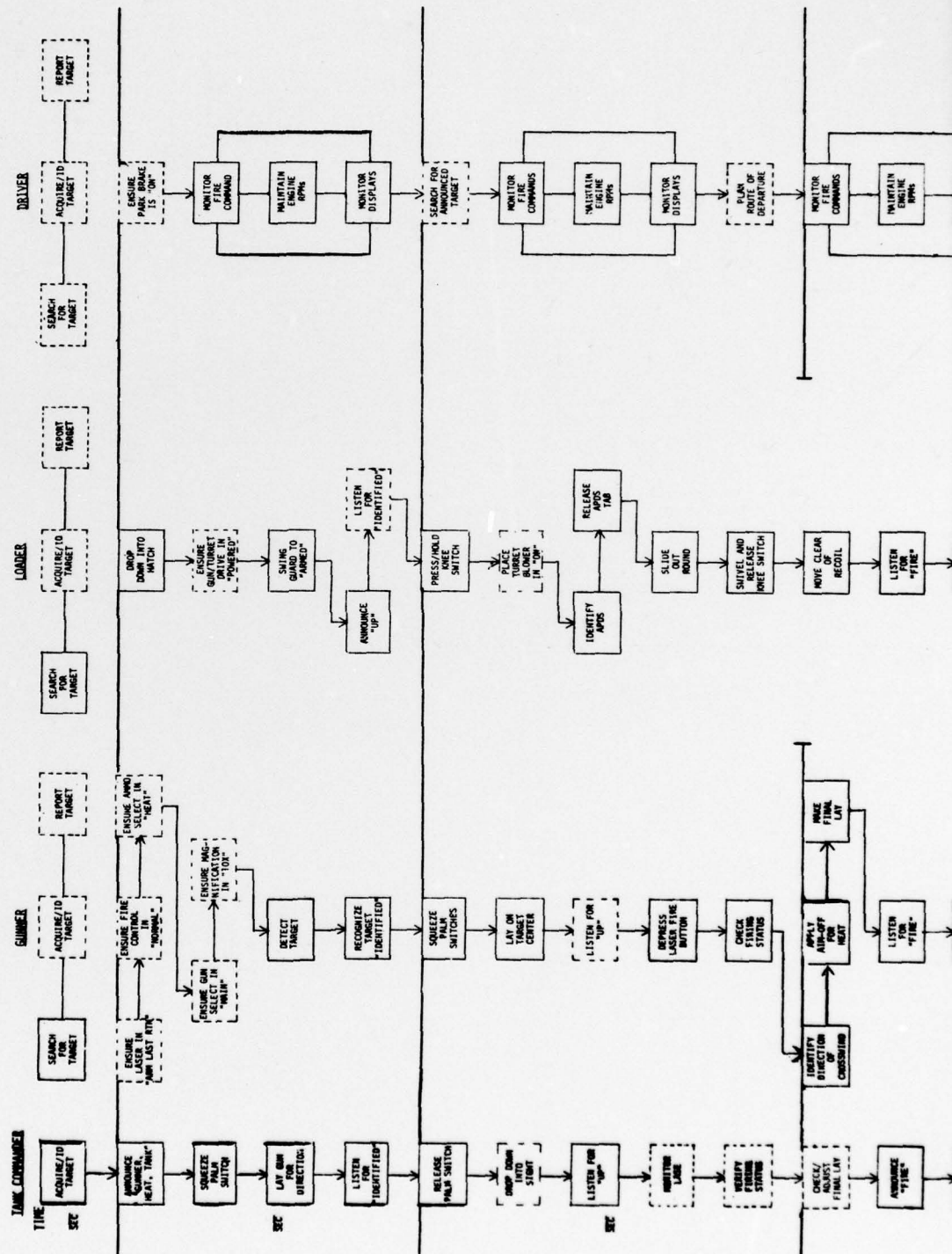
(being developed separately)

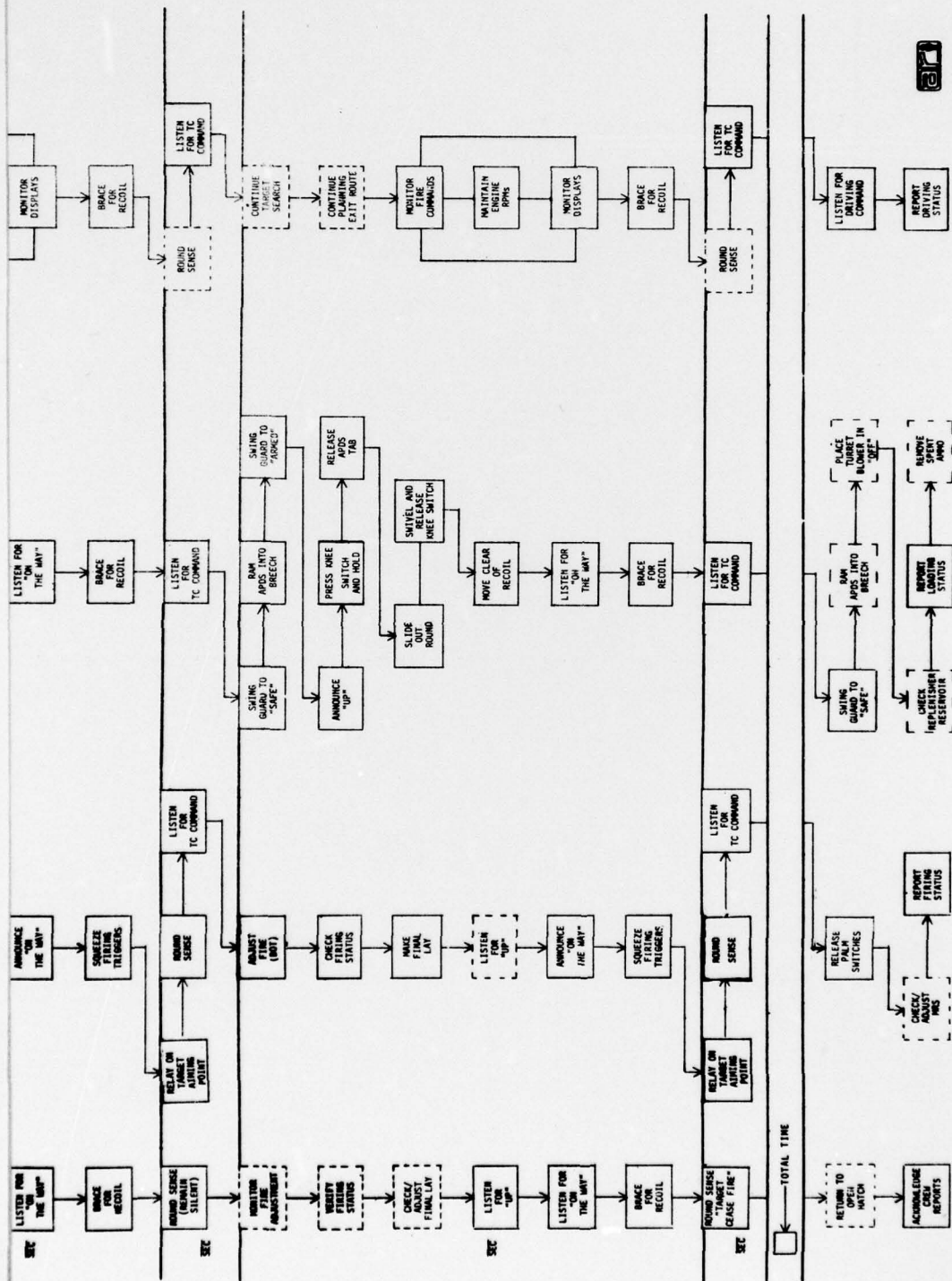
(2) Posttest:

(being developed separately)

# TANK GUNNERY CREW DRILL

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN 3.1.1.1.1 STATIONARY VS. STATIONARY  
3.1.1.1.1.4 CROSSWIND SENSOR FAILURE/PRECISION METHOD 3.1.1.1.1.4.1 GUNNER'S PRIMARY SIGHT







APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A STATIONARY TANK TARGET FROM A STATIONARY XMI WITH AN INOPERATIVE CROSSWIND SENSOR USING THE GPS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."

TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.1 STATIONARY VS. STATIONARY 3.1.1.1.4 CROSSWIND SENSOR FAILURE/PRECISION METHOD  
3.1.1.1.4.1 GUNNER'S PRIMARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying on target center                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Laser ranging                                |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying aim-off                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (BOT)               |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun ("UP")                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point              |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing<br>(TC announces "CEASE FIRE") |           |   |   |        |   |   |        |   |   |        |   |   |

Trial                      Trial                      Trial  
          1       2       3                      1       2       3                      1       2       3  
 TIME       + ACCURACY       = SCORE

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE,"
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

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<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.



## TANK GUNNERY CREW DRILL

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.1 STATIONARY VS. STATIONARY 3.1.1.1.5 GPS FAILURE/PRECISION METHOD  
3.1.1.1.1.5.2 GUNNER'S AUXILIARY SIGHT

### 1. ADMINISTRATIVE SPECIFICATIONS

#### a. SUPPORT REQUIREMENTS

##### (1) Training

(a) Personnel: Plt Ldr/Sgt will manage the training; TCs will train their own crews.

##### (b) Equipment:

- 1 One (1) XM1 tank, with GPS and TIS made inoperative.
- 2 Three (3) full scale stationary Soviet tank silhouettes, flank view, located at 1000 meters and 50-100 meters apart.
- 3 Four(4) dummy rounds of APDS, HEAT, HEP and B-HIVE stowed in ready ammunition compartment.

##### (c) Materials:

One (1) performance sequence diagram describing the tank gunnery crew drill.

##### (d) Facilities:

One (1) range or garrison area with capabilities for conducting the crew drill.

##### (2) Evaluation

(a) Personnel: Plt Ldr/Sgts will evaluate their own crews; Plt Ldr/Sgts will evaluate each others crew.

##### (b) Equipment:

- 1 Same as training equipment
- 2 Two (2) stopwatches

##### (c) Materials:

- 1 One (1) instruction sheet for conducting tank crew appraisal.
- 2 Two (2) crew performance checklists with directions.

##### (d) Facilities: Same as training facilities.

b. PLANNING TIME

- (1) Administrative time \_\_\_\_\_ minutes.
- (2) Training time \_\_\_\_\_ minutes.
- (3) Evaluation time \_\_\_\_\_ minutes.
- (4) Total time \_\_\_\_\_ minutes.

c. REFERENCES

- (1) FM 17-12 (Tank Gunnery)
- (2) FM 17-12-1 (Tank Gunnery for XM1 Main Battle Tank)
- (3) DEP 9-2350-255-10-1 (Operator's Manual for Tank, Combat, Full-tracked, 105 MM Gun, XM1)

2. TRAINING SPECIFICATIONS

a. PREREQUISITES

- (1) Individual Task Requirements

- (a) TC (must be capable of)

- 1 Handing-off targets
  - 1.1 Acquiring targets
  - 1.2 Determining method of target engagement
  - 1.3 Issuing fire commands
  - 1.4 Laying main gun for direction
    - 1.4.1 Traversing the turret
    - 1.4.2 Elevating/depressing the gun
  - 1.5 Ranging to targets
    - 1.5.1 Estimating range to target
  - 1.6 Round sensing
    - 1.6.1 Confirming gunner's round sensing
- 2 Performing post-firing procedures
  - 2.1 Performing main gun post-fire procedure

- (b) GR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Engaging targets
  - 2.1 Acquiring targets
    - 2.1.1 Acquiring announced targets
  - 2.2 Positioning gun/turret
    - 2.2.1 Traversing turret
    - 2.2.2 Elevating/depressing the gun
  - 2.3 Laying on targets
    - 2.3.1 Applying main gun methods of fire
      - 2.3.1.1 Applying precision method of fire
  - 2.4 Ranging to targets
    - 2.4.1 Applying announced range

- 2.5 Firing on targets
  - 2.5.1 Determining ready-to-fire status
  - 2.5.2 Firing the main gun
    - 2.5.2.1 Firing electrically
- 2.6 Round sensing
- 2.7 Adjusting fire
  - 2.7.1 Adjusting main gun fire
    - 2.7.1.1 Applying Burst-on-Target (BOT) method
    - 2.7.1.2 Applying Standard Adjustment method
      - 2.7.1.2.1 Applying meter correction
- 3 Performing post-firing procedures
  - 3.1 Performing main gun post-fire procedure

(c) LR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Loading weapons
  - 2.1 Loading the main gun
    - 2.1.1 Safing the main gun
    - 2.1.2 Removing round from ready ammo compartment
      - 2.1.2.1 Opening/closing ammo door electrically
      - 2.1.2.2 Identifying main gun ammo
      - 2.1.2.3 Removing ammo from stowage tube
      - 2.1.2.4 Handling main gun ammo
    - 2.1.3 Loading ammo in breech
    - 2.1.4 Arming the main gun
- 3 Unloading weapons
  - 3.1 Unloading the main gun
    - 3.1.1 Safing the main gun
    - 3.1.2 Removing round from breech
      - 3.1.2.1 Opening/closing breech manually
      - 3.1.2.2 Loading round in stowage tube
      - 3.1.2.3 Setting ammo letter codes
- 4 Performing post-firing procedures
  - 4.1 Performing main gun post-fire procedure

(d) DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing
- 2 Performing post-firing procedures

(2) Team Task Requirements

(a) GR/LR/DR (must be capable of)

- 1 Performing ready-to-fire procedures
  - 1.1 Preparing for main gun firing



(b) TC/GR (must be capable of)

- 1 Acquiring targets
  - 1.1 Identifying targets
- 2 Handing-off targets
  - 2.1 Releasing gun/turret to gunner
- 3 Round sensing

b. TRAINING OBJECTIVE

(1) Conditions:

(a) Firing Vehicle:

- 1 Tank is stationary in a hull defilade position
- 2 Preventive Maintenance Checks and Services (PMCS) are performed; GPS and TIS are inoperative
- 3 Individual crew stations are prepared for operation; communication system is in operation, turret is in power, and engine is operating between 900-1000 RPMs
- 4 Preparing to fire checks are performed for NORMAL mode

(b) Crew Stations:

- 1 TC Station
  - a TC hatch is locked in full open position
  - b TC is in a standing height position with CVC helmet on and connected to intercom control box, and is looking through binoculars hung around neck
  - c Knee guard is in firing position
  - d TURRET POWER switch is in ON
  - e AUX HYDR POWER switch is in OFF
  - f VEHICLE MASTER POWER and TURRET POWER lights are lit
- 2 GR Station
  - a GR is seated with CVC helmet on and connected to intercom control box, and chest guard is placed in the firing position
  - b Main gun elevation travel lock is unlocked and stowed
  - c DAYLIGHT ballistic door handle is in OPEN
  - d GAS is in ON and prepared for operation
  - e Combination APDS/HEAT reticle is positioned in GAS
  - \*f Laser RANGE switch is in ARM LAST RTN
  - g GUN SELECT switch is in MAIN and light is lit
  - h AMMUNITION SELECT switch is in APDS and light is ON

\*Normally the RANGE switch would be in ARM LAST RTN or ARM 1ST RTN depending upon the tactical situation. For training purposes, the laser must be SAFED to prevent actual firing.

3 LR Station

- a LR hatch is locked in full open position
- b LR is in standing height position with CVC helmet on and connected to intercom control box
- c Knee guard is in "up" position, chest guard is in protected position, seat back is removed and stowed, and knee switch is down in firing position
- d Turret traverse lock is in UNLOCKED
- e GUN TURRET DRIVE switch is in POWERED and light is lit
- f Spent case ejection guard is forward and MAIN GUN STATUS SAFE light is lit
- \*\*g Main gun breech is "open"
- \*\*\*h Four (4) dummy rounds of each ammo are stowed in ready ammunition compartment

4 DR Station

- a DR is seated with CVC helmet on and connected to intercom box
- b DR hatch is closed and locked
- c PARKING BRAKE is depressed and light is lit
- d Drain valves are in CLOSED position
- e Steer-throttle control is locked in "up" position
- f Engine is operating between 900-1000 RPMs
- g TACTICAL IDLE ON/OFF switch is in OFF
- h All AUXILIARY SYSTEMS switches are in OFF
- i MASTER WARNING and MASTER CAUTION lights are unlit
- j ELECTRICAL SYSTEM gage is steady between 27.5-28.5 volts

(c) Target:

- 1 Three (3) full scale Soviet tank silhouettes, flank view
- 2 Targets located at approximately 1000 meters and 50-100 meters apart
- 3 Targets positioned within a 30° angle forward of main gun

(d) Environment:

- 1 Terrain surface is flat
- 2 Surrounding area is open
- 3 Visibility is good

\*\*For training purposes, the breech is left open for loading a "second" round. As such, the loader is to simulate a battlesight mode, i.e., gun loaded and breech closed.

\*\*\*Sufficient rounds are necessary to simulate round selection.

(2) Activity: The XM1 tank crew must perform the individual and crew behaviors required to complete a two round stationary tank - stationary target engagement using the GAS and precision method of fire.

(3) Standard: The XM1 tank crew must complete the two round single target engagement without error and within \_\_\_\_\_ seconds from the alert element of the TC's fire command.

#### c. SIMULATION TECHNIQUE

(1) Dry-Fire: Use an M55 laser device with non-reflective tank target silhouettes, positioned at comparable target ranges, and an eye-safe laser rangefinder.

(2) Live-Fire: Use a caliber .50 subcaliber device with a 1/1-scaled range.

### 3. EVALUATION SPECIFICATIONS

#### a. INFORMAL

##### (1) Prerequisites:

(a) Each crewmember must have practiced the individual tank gunnery procedure identified for his crew position.

(b) Specified crewmembers must have practiced the team tank gunnery procedures identified for the crew drill.

(c) The tank crew must have practiced the individual and team tank gunnery procedures within the context of the total crew drill requirement.

##### (2) Criteria:

(a) Each tank crew must successfully complete three (3) successive performance appraisal trials to be considered trained on a crew drill.

(b) To successfully complete a performance appraisal trial:

1 Each crewmember must perform all of the actions specified on the crew drill performance checklist without error

2 Each tank crew must complete the crew drill within the specific time.

#### b. FORMAL

##### (1) Pretest

(being developed separately)

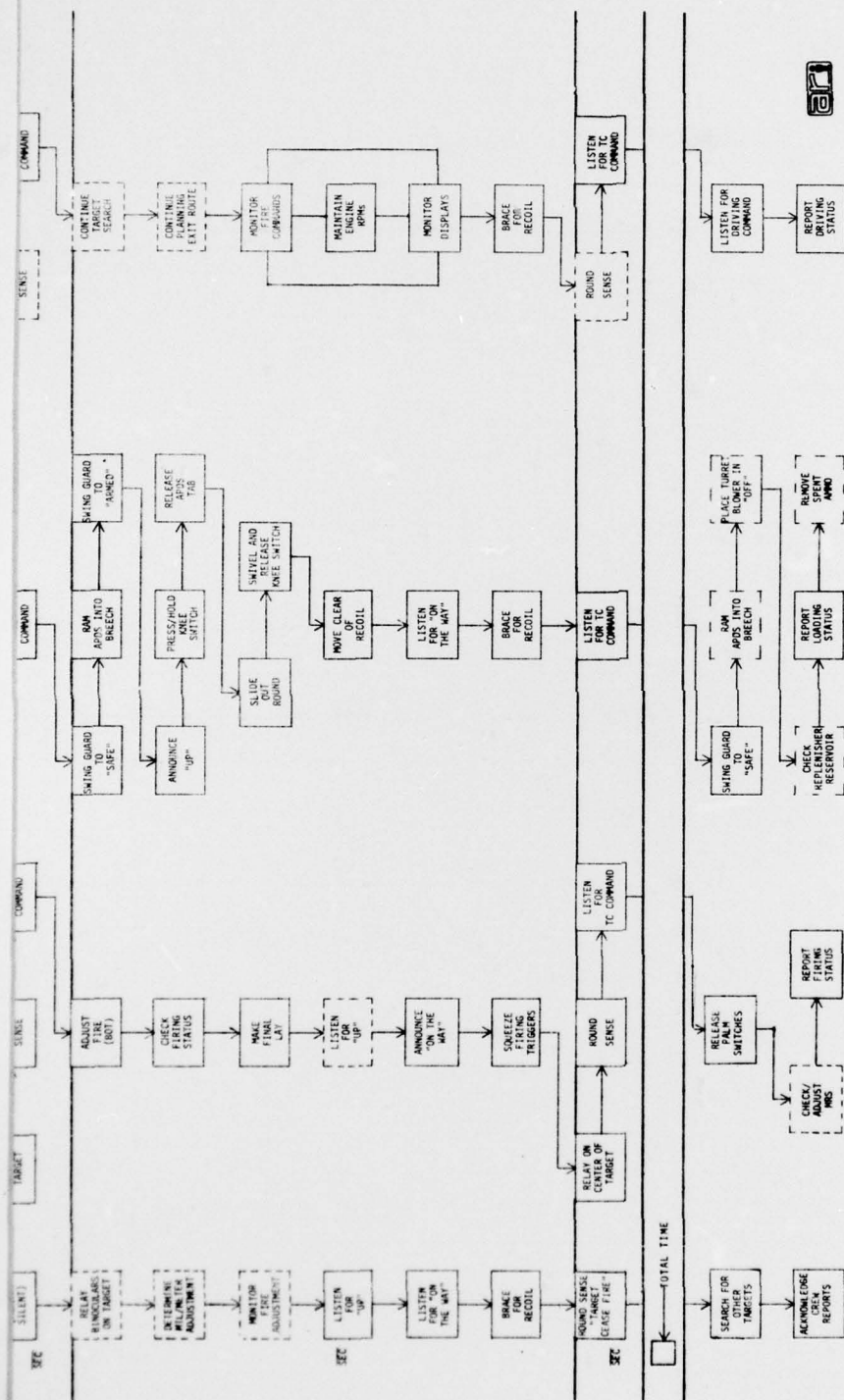
##### (2) Posttest

(being developed separately)



3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN 3.1.1.1.1 STATIONARY VS. STATIONARY  
3.1.1.1.5 GPS FAILURE/PRECISION METHOD 3.1.1.1.1.5.2 GUNNER'S AUXILIARY SIGHT





APPRAISAL:  
TANK CREW INSTRUCTIONS

IMPORTANT: READ THESE INSTRUCTIONS TO THE TANK CREW EXACTLY AS WRITTEN.

"THE PURPOSE OF THIS APPRAISAL IS TO DETERMINE THE CREW'S ABILITY TO ENGAGE A STATIONARY TANK TARGET FROM A STATIONARY XMI WITH AN INOPERATIVE GPS USING THE GAS AND PRECISION METHOD OF FIRE. TO SUCCESSFULLY COMPLETE THE APPRAISAL, THE CREW MUST PASS THREE CONSECUTIVE PERFORMANCE TRIALS. EACH TRIAL WILL BE CONDUCTED UNDER THE SAME CONDITIONS AS IT WAS DURING TRAINING. DURING EACH TRIAL, THE CREW WILL BE OBSERVED TO DETERMINE IF IT (1) FOLLOWED THE CORRECT PROCEDURES FOR THE ENGAGEMENT, AND (2) IF IT COMPLETED THE ENGAGEMENT IN \_\_\_ SECONDS. AFTER COMPLETING A PERFORMANCE TRIAL, THE CREW WILL BE GIVEN A CRITIQUE OF ITS PERFORMANCE. IF THE CREW PASSED THE TRIAL, WE WILL PROCEED IMMEDIATELY TO THE NEXT APPRAISAL TRIAL. IF THE PERFORMANCE TRIAL WAS FAILED, THE APPRAISAL WILL BE STOPPED AND THE CREW INSTRUCTED TO PRACTICE THE ENGAGEMENT UNTIL THE DEFICIENCIES ARE REMOVED. ARE THERE ANY QUESTIONS BEFORE WE BEGIN THE APPRAISAL?" (Answer questions.)

"IF THERE ARE NO (MORE) QUESTIONS, TIME STARTS WHEN I GIVE THE COMMAND TO BEGIN." (Make certain crew is ready.)

"BEGIN."



TANK GUNNERY CREW DRILL  
PERFORMANCE CHECKLIST

3.0 DEGRADED 3.1 SINGLE TARGET SERVICING 3.1.1 DAY 3.1.1.1 MAIN GUN  
3.1.1.1.1 STATIONARY VS. STATIONARY 3.1.1.1.1.5 GPS FAILURE/PRECISION METHOD  
3.1.1.1.1.5.2 GUNNER'S AUXILIARY SIGHT

| PERFORMANCE STEPS                            | COMMANDER |   |   | GUNNER |   |   | LOADER |   |   | DRIVER |   |   |
|----------------------------------------------|-----------|---|---|--------|---|---|--------|---|---|--------|---|---|
|                                              | 1         | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 | 1      | 2 | 3 |
| Acquiring target                             |           |   |   |        |   |   |        |   |   |        |   |   |
| Issuing fire command                         |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying main gun for direction                |           |   |   |        |   |   |        |   |   |        |   |   |
| Performing ready-to-fire checks              |           |   |   |        |   |   |        |   |   |        |   |   |
| Recognizing target ("IDENTIFIED")            |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Laying announced range line on target center |           |   |   |        |   |   |        |   |   |        |   |   |
| Checking firing status                       |           |   |   |        |   |   |        |   |   |        |   |   |
| Announcing "FIRE"                            |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Refining target lay                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point              |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC remains silent)            |           |   |   |        |   |   |        |   |   |        |   |   |
| Applying fire adjustment (BOT)               |           |   |   |        |   |   |        |   |   |        |   |   |
| Reloading main gun                           |           |   |   |        |   |   |        |   |   |        |   |   |
| Arming main gun                              |           |   |   |        |   |   |        |   |   |        |   |   |
| Preparing to reload                          |           |   |   |        |   |   |        |   |   |        |   |   |
| Firing ("ON THE WAY")                        |           |   |   |        |   |   |        |   |   |        |   |   |
| Maintaining engine RPMs                      |           |   |   |        |   |   |        |   |   |        |   |   |
| Relaying on target aiming point              |           |   |   |        |   |   |        |   |   |        |   |   |
| Round sensing (TC announces "CEASE FIRE")    |           |   |   |        |   |   |        |   |   |        |   |   |

Trial                      Trial                      Trial  
 1      2      3                      1      2      3                      1      2      3  
 TIME    + ACCURACY    = SCORE

APPRAISAL:  
CREW DRILL PERFORMANCE CHECKLIST

DIRECTIONS<sup>1</sup>

RATING PERFORMANCE

1. Identify performance steps done correctly by placing a check (✓) in the column labelled "1" for the tank crewmember whose performance is being appraised. For the platoon leader, this would be a check (✓) in column labelled "1" for "COMMANDER" and "1" for "GUNNER." For the platoon sergeant, this would be a check (✓) in the column labelled "1" for "LOADER" and "1" for "DRIVER."
2. Identify performance errors by writing the letter "E" in the column labelled "1" for the tank crewmember whose performance is being appraised.
3. For the second trial, record the checks (✓) or errors (E) under the columns labelled "2" for the appropriate tank crewmember.
4. For the third trial, record the checks (✓) or errors (E) under the columns labelled "3" for the appropriate crewmember.

TIMING PERFORMANCE

1. Time the crew's performance by starting your stopwatch on the command "BEGIN," and stopping it on the TC's command "CEASE FIRE."
2. Identify performance time by writing the number of seconds in the box opposite TIME under TRIAL 1.
3. For the second trial, record the TIME under TRIAL 2.
4. For the third trial, record the TIME under TRIAL 3.

<sup>1</sup> The procedure for the scoring of a performance checklist is presented in Chapter V.