

AD-A189 370

Research Product 87-20

**Training Support Package
for Moving Target Engagement
With Existing Ranges and Devices**

**ARI Fort Benning Field Unit
Training Research Laboratory**

May 1987

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U. S. Army Research Institute for the Behavioral and Social Sciences

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Research accomplished under contract
for the Department of the Army

Litton Computer Services, Litton Systems Inc.

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER ARI Research Product 87-20	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) TRAINING SUPPORT PACKAGE FOR MOVING TARGET ENGAGEMENT WITH EXISTING RANGES AND DEVICES		5. TYPE OF REPORT & PERIOD COVERED Final Report October 1985-December 1985
7. AUTHOR(s) Ronald F. Martere, James R. Parish, and Jon P. Hunt		6. PERFORMING ORG. REPORT NUMBER ---
9. PERFORMING ORGANIZATION NAME AND ADDRESS Litton Computer Services P.O. Box 7113, Mountain View, CA 94034-7113		8. CONTRACT OR GRANT NUMBER(s) MDA 903-85-C-0253
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Research Institute for the Behavioral and Social Sciences, Fort Benning Field Unit, P.O. Box 2086, Fort Benning, GA 31905		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 2Q263743A794 6.37.43.A
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) U.S. Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue, Alexandria, VA 22333-5600		12. REPORT DATE May 1987
		13. NUMBER OF PAGES 43
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE ---
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) ---		
18. SUPPLEMENTARY NOTES Contracting Officer's Representative was Dr. Seward Smith.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Advanced Rifle Marksmanship (ARM) One Station Unit Training Remoted Target System, M16 rifle training, <i>Army training, Marksmanship, Gunnery trainers.</i>		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This research product presents a program of instruction for the engagement of infantry-type moving targets for Infantry One Station Unit Training (OSUT) soldiers. It was designed for use by the U.S. Army Infantry Training Center (ATC) Advanced Rifle Marksmanship (ARM) committee and cadre personnel. Instruc- tion is situationally focused. It is oriented for application on existing ranges and facilities at Fort Benning, Georgia. Additional ammunition resources are required for its implementation. Detailed lesson outlines and hard copy vu-graphs are included. <i>Keynotes:</i>		

Research Product 87-20

**Training Support Package
for Moving Target Engagement
With Existing Ranges and Devices**

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Department of the Army

May 1987

Army Project Number
2Q263743A794

Developing Training for Individual
and Crew-Served Weapons

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FOREWORD

There have been 23 published research products relating to rifle marksmanship since 1978. The majority of published research has focused on the Basic Rifle Marksmanship (BRM) program and skills for the engagement of stationary targets. This research has been critical in the evaluation of effectiveness of training related to rifle skills essential to the soldier. The results of these research efforts have improved overall performance of soldiers in the engagement of stationary targets by approximately 30 percent.

The battlefield has many personnel targets, both stationary and moving. Shooting moving personnel targets represents an equally important skill for the soldier. The research described in this report was monitored by Army Research Institute's Fort Benning Field Unit, whose mission is to conduct research and development of training and training technology using infantry combat systems and problems as the vehicles. The major focus is on the field experimentation within the infantry arena with the goal of obtaining results that can be generalized to similar systems/problems in other segments of the Army or other services. Primary emphasis is in the areas of training systems/training technology, team training, and weapons systems training, all to improve the performance of soldiers and units. The research task that supports this mission is titled "Developing Training for Individual and Crew-Served Weapons" and is organized under the "Train the Force" program area. Providing sponsorship for the research effort was the United States Army Infantry School (USAIS) under the letters of agreement on "Joint Efforts on Improved Training for Moving Target Engagement and Other Advanced Marksmanship Skills," dated 20 December 1984. For the work described in this report, presentations were made to USAIS in December 1986. It is expected that the research findings will be used to revise current training methods. Recommended revisions to training are expected to be implemented in the next Advanced Rifle Marksmanship (ARM) Program of Instruction (POI).



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TRAINING SUPPORT PACKAGE FOR MOVING TARGET ENGAGEMENT WITH EXISTING RANGES AND DEVICES

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TRAINING SUPPORT PACKAGE FOR MOVING TARGET ENGAGEMENT WITH EXISTING RANGES AND DEVICES

INTRODUCTION

Survival on the battlefield may depend upon a soldier's ability to engage moving targets with his rifle. The teaching of marksmanship skills is the responsibility of all leaders, especially at the initial entry level. It is here that soldiers learn fundamental rifle skills that will be used throughout their careers. Every attempt should be made to train the soldier to master these critical skills cost effectively. In support of the U.S. Army Infantry School (USAIS), the Army Research Institute (ARI) and its current resident contractor, Litton Computer Services, conducted research to identify both immediate and long-range improvements to moving target training (Hunt, Parish, Martere, Osborne, & Evans, Technical Report, in press).

Major findings of this training analysis were that the existing program of instruction (POI) was complex and inadequate. The existing program did not include a formal evaluation with established standards, with the goal to improve individual performance among soldiers undergoing training. The additional skills required to engage moving targets effectively were not given the needed emphasis. Moving target engagement skills of target detection, quick reaction, lead rules, rapid magazine change, and immediate action must be taught correctly and practiced to ensure proficiency and confidence. Significant improvements to this end can be made using current facilities and available training device technology. In addition to POI modification, personnel selected to perform as principal rifle marksmanship instructors should receive formal training in marksmanship techniques.

PROGRAM DEVELOPMENT

All USAIS institutional training programs related to the engagement of moving targets tasks were reviewed as a basis for the development of an improved training program. This review included specific periods of the Basic Rifle Marksmanship (BRM) program and moving target engagement periods of the Advanced Rifle Marksmanship (ARM) program. Only pertinent skills in the BRM program that are required for moving target engagement were reviewed and analyzed.

Skills found in the BRM program relevant to ARM moving target engagement on the Defense Test Range (DTR) equipped with the Remoted Target System (RETS) include target detection, rapid magazine change, and immediate action. The Infantry One Station Unit Training (OSUT) soldier is taught these critical skills in the third and fourth weeks of his training cycle. Difficulties in performing these tasks are evident during ARM, which is currently conducted in the eighth and ninth weeks of the OSUT program. Based on this review it is proposed that specific periods of primary instruction or concurrent training periods be devoted to target detection, rapid magazine changes, and immediate

action. It is further recommended that a skill proficiency test be administered prior to firing on the DTR RETS Range. The test should evaluate the soldier's proficiency to perform these tasks to standard.

Moving target training in the current ARM Program of Instruction (POI) was found to have such a complex method of determining proper lead rules as to inhibit effective target engagement. These rules coupled with the lack of emphasis on quick reaction to targets of opportunity and poorly prepared fighting positions practically nullified the soldier's attempt to succeed.

It is proposed that the DTR POI be modified to include emphasis on foxhole preparation, quick reaction, and use of the single lead rule as developed by the ARI. The standard foxhole supported position must be modified to allow for freedom of body movement using sandbags as a pivot point for the rifle. The upper body of the firer must be unrestrained during tracking of moving targets and supported for engagement of stationary targets. This is accomplished through the proper positioning of the available sandbags while in the foxhole position. Assistant Instructors (AIs) should assist the soldier in properly preparing his foxhole position prior to the commencement of the exercise. The soldier should be reminded that a successful engagement of moving targets is quick reaction to targets of opportunity. The AIs should instill confidence and motivate the soldier to increase his state of readiness and anticipation. AIs should be positioned well to the rear of the foxhole to preclude vocal and physical assistance to the soldier during firing.

The five lead rules now being taught as part of the ARM POI should be replaced with a simple lead rule. Currently soldiers are being taught to determine target speed, direction, and use of the front sight post to estimate range. After estimating these three variables the soldier must then determine and apply one of five lead rules appropriate for the moving target he is engaging. Target exposures are 3 to 5 seconds depending on the target's distance from the firing position. Short target exposures coupled with the requirement to evaluate and apply the selected lead rule causes confusion, and stress, and detracts from a successful target hit. The single lead rule eliminates the complex perceptual requirements of multiple lead rules. Proper application of the single lead rule will result in hits against targets of opportunity at distances up to 200 meters (Osborne & Smith, 1985). While distance and target speed will change the point of impact, a target hit will be achieved with a zeroed rifle and the proper application of the four fundamentals of marksmanship using the single lead rule.

It is proposed that a standard be established for qualification during ARM moving target training. Military Occupational Specialty (MOS) 11B and 11M OSUT soldier records should reflect meeting the standard as set by USAIS and the Army Training Center (ATC). Without a standard, the soldier's performance in hitting moving targets is meaningless. Establishing a standard will reinforce the importance of this critical combat skill.

Additionally instructor initiative and enthusiasm would be enhanced through revision of the current rotating station technique. Currently students rotate through three stations in a round-robin method. Instructors are detailed to train each group at their assigned station. It is proposed that instructor competitiveness would be instilled if he trained his assigned group

at each station. The effectiveness of his training would be evaluated through the computerized target hit results of his students on the DTR course.

The preferred sequence of training would be use of Aid to Improved Marksmanship (AIM) Book in applying the single lead rule, Dry Fire Mover, Rapid Magazine Change, and Immediate Action. The target detection station currently being taught as part of the DTR POI should be eliminated. OSUT soldiers are taught target detection during BRM. Reference to the importance of target detection during AIM instruction is sufficient. Elimination of this station will provide the necessary time period for the reinforcement of the more critical skills of rapid magazine change and immediate action.

Appendix A to this package includes complete lesson outlines to implement the recommended program. Time period restrictions and proficiency gate limits have been purposely omitted to allow for flexibility within its implementation. Minimal training of instructor and key personnel is required.

Upon completion of the instruction, groups would perform the live-fire portion of the POI. Live fire would consist of the ARI Intermediate scenario and current DTR record fire course. Soldiers who do not meet the established standard should refire a minimum of one time. Soldiers should be afforded the opportunity to verify the zero on their assigned rifles at the nearest 25-meter range, if necessary, prior to record fire.

The proposed ARM moving target POI as developed using current and modified OSUT lesson outlines. Hard copies of lesson outlines and supporting vignettes are included in Appendixes A and B. In addition, the "Notes to Trainer" section was written to introduce the program to personnel selected as rifle instructors and guide them in its implementation (Appendix C). The Notes to Trainer section discusses the purpose, scope, conduct of training, training materials, and evaluation of standards.

PROGRAM UTILIZATION

The proposed moving target portion of the USAIS ARM POI incorporates current and recommended institutional training objectives and standards. The USAIS is the proponent agency and if recommendations are accepted, with subsequent modifications, distribution to infantry units Army-wide could be accomplished.

Two primary benefits will occur as a direct result of this program. First, it will improve the level of individual soldier proficiency in attaining target hits on infantry-type moving targets and second, it will increase the overall level of confidence in the capabilities of the service rifle.

REFERENCES

- Hunt, J. P., Parish, J. R., Martere, R. F., Osborne, A. D., & Evans, K. L. (In press). The development and evaluation of moving target engagement training programs with the M16A1 rifle (Technical Report). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
- Osborne, A. D., & Smith, S. (1985). Unit rifle marksmanship guide (ARI Research Product 85-12). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD B105-422)

APPENDIX A
LESSON OUTLINES

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Fort Benning Field Unit
Fort Benning, Georgia 31905

April 1986

LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Defense Test Range (DTR)

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: Malone 18.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM Committee.
5. Training aids: See Annex A.
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," Aid to Improved Marksmanship (AIM) Book, and FM 23-9 "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: 18 hits of 42 targets on the DTR.

B. TRAINING OBJECTIVES:

TASK: Engage RETS moving and stationary targets with live fire.

CONDITION: During daylight hours while wearing steel helmet, Load Carrying Equipment (LCE), using an M16A1 rifle with two (2) magazines, and 42 rounds of 5.56 mm ball ammunition.

STANDARD: Achieve 18 targets hit of 42 target exposures at distances from 35 to 300 meters.

C. INTERMEDIATE TRAINING OBJECTIVES:

TASK: Perform a rapid magazine change (reference FM 23-9, p. 87, para. 5.3 and p. 113).

CONDITIONS: Given an operational 16 rifle and two magazines.

STANDARD: Perform the rapid magazine change as quickly as possible.

TASK: Reduce a malfunction or stoppage (Reference FM 23-9, p. 88, para. 5.4.)

CONDITION: Given an M16 rifle and a magazine of 10 blank and 2 dummy rounds.

STANDARD: Clear stoppage and fire as quickly as possible.

TASK: Detect targets in sector of fire.

CONDITIONS: Without assistance, detect targets of opportunity within sector of fire as they appear during the scenario at ranges of 35 meters to 300 meters.

STANDARDS: Identify and engage targets as they appear in their lane.

D. SEQUENCE OF TRAINING:

1. Introduction: During this period of instruction, each of you will be required to engage moving and stationary targets at distances of 35 meters through 300 meters. You will engage targets from a foxhole fighting position as they appear in your lane without assistance. It is your responsibility to perform a rapid magazine change and apply immediate action in the event of a malfunction. This facility is designed to test you as infantrymen and you must apply all previous training to be successful.

2. Remoted Target System:

a. Target sequence, exposure time, and duration of movement are all computer controlled. Targets hit for each lane are automatically recorded for each target range.

NOTE: Post demonstrator for live-fire demonstration.

b. Live-fire demonstration.

3. Moving Target Training: Break company down into three groups. One principal instructor will be assigned to each group. Each assistant instructor will teach his assigned group in sequence; AIM Book, Principles of Moving Target Engagement, Dry Fire Mover and Immediate Action/Rapid Magazine Change. All training will be completed in ___ minutes. Breaks will be taken between classes.

- a. Aid to Improved Marksmanship (Encl 1, Annex A),
- b. Principles of Moving Target Engagement (Encl 2, Annex A),
- c. Dry Fire Mover (Encl 3, Annex A),
- d. Immediate Action/Rapid Magazine Change (Encl 4, Annex A).

4. Conclusion:

a. Recap main points:

- (1) Remoted Target System,
- (2) Lead guidance,
- (3) Position,
- (4) Principles of moving target engagement,
- (5) Aid to Improved Marksmanship,
- (6) Dry Fire Mover.

b. Clarify student questions.

c. Closing statement: Your success today proves that you are ready to take your place among those soldiers who guard this country as "INFANTRYMEN."

5. Moving Target Live Fire:

- a. Safety briefing,
- b. Firing order breakdown,
- c. Live-fire 39/39 scenario,
- d. Live-fire 42/42 record scenario.

E. SAFETY RESTRICTIONS: See USAIC Regulation 210-4.

F. ADDITIONAL COMMENTS AND INFORMATION: None.

ANNEX A

Training Aids and Equipment

3 charts No. 1 (single lead guidance)
AIM Books (___)
26 simulated foxhole stands
3 dry fire movers with 100-foot extension cord
1 range flag
2 magazines per soldier
1 PRC-77 with components
81 rounds of 5.56 mm ball ammunition per firer
12 rounds of 5.56 mm blank ammunition per firer
2 dummy rounds of 5.56 mm per firer
2 Lister bags
5 5-gallon water cans
2 cleaning rods
1 GE radio
1 Blank Adapter per firer
1 First Aid Kit
2 Smoke Grenades for MEDEVAC
15 rounds of 5.56 ball ammunition per firer (35% refires)
42 rounds of 5.56 ball ammunition per demonstration

Aid to Improved Marksmanship

3 chart No. 1 (single lead guidance)

75 AIM books

Encl 1 to Annex A

Principles of Moving Target Engagements

3 Chart No. 1 (single lead guidance)

26 simulated foxhole stands

Encl 2 to Annex A

Dry Fire Mover

26 simulated foxhole stands

3 Dry Fire Movers with 100-foot extension cord each.

Encl 3 to Annex A

Immediate Action/Rapid Magazine Change

1 M16A1 and two magazines per soldier

2 rounds of 5.56 mm dummy and 12 rounds of 5.56 mm blank per soldier

1 blank adapter per soldier

Encl 4 to Annex 4

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Fort Benning Field Unit
Fort Benning, Georgia 31905

April 1986

LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Aid to Improved Marksmanship (AIM) Book

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: As announced by training schedule.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM committee.
5. Training aids: Aid to Improved Marksmanship (AIM) Book and "E" type handout (Encl 1).
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," and FM 23-9, "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: None.

B. TRAINING OBJECTIVES:

TASK: Properly select correct aiming point using Aid to Improved Marksmanship (AIM) Book.

CONDITION: Given an explanation and demonstration, perform practical work using the AIM book.

STANDARD: Correctly apply the single lead rule point of aim on various moving targets.

C. INTERMEDIATE TRAINING OBJECTIVES: None.

D. SEQUENCE OF TRAINING:

1. Introduction: During this period of instruction you will learn to apply the single lead rule using the AIM Book. You will receive a demonstration and explanation, and perform practical work with this valuable training aid. As a result of this training you will have learned to select the correct lead on moving targets. Knowing how to use the AIM book will enable you to hit moving targets.

2. Explain lead guidance (FC 23-11, pp. 17-1 through 17-13).

NOTE: Post demonstrator/show chart (Encl 1).

- a. Explain Single Lead Rule (FC 23-11, pp. 17-4),
- b. Explain use of the AIM Book.

NOTE: Issue AIM Books and begin practical work. Principal Instructor and Drill Sergeants will assist as required to ensure full understanding of the single lead rule.

3. Perform Practical Work using the AIM Book.

4. Conclusion:

a. Recap main points:

- (1) Single lead rule,
- (2) Sight picture.

b. Clarify student questions.

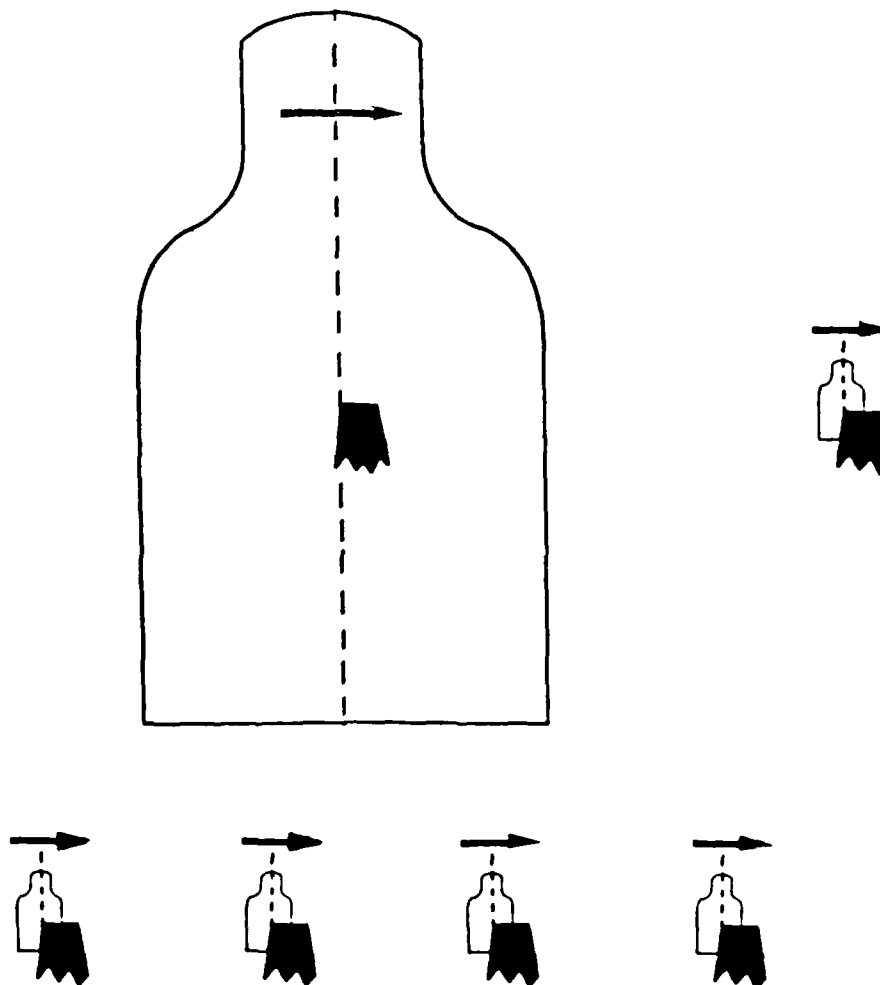
c. Closing statement: Using the AIM book will teach you to apply the correct amount of lead to a moving target. Remember the enemy will only be stationary after you hit him.

E. SAFETY RESTRICTIONS: None.

F. ADDITIONAL COMMENTS AND INFORMATION: None.

TRAINING AID

SINGLE LEAD RULE
("E" Type Handout)



Tracking a Moving Target at 150 M

Encl 1

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Fort Benning Field Unit
Fort Benning, Georgia 31905

April 1986

LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Principles of Moving Target Engagement

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: As announced by training schedule.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM Committee.
5. Training aids: "E" silhouette type handout (Encl 1) and simulated foxhole stands.
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," and FM 23-9 "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: None.

B. TRAINING OBJECTIVES:

TASK: Apply the four fundamentals of marksmanship from a foxhole semi-supported firing position to engage moving personnel targets.

CONDITION: Given an M16 rifle, a foxhole or simulated foxhole stand, and sandbags.

STANDARD: Demonstrate the correct position for engaging moving targets.

C. INTERMEDIATE TRAINING OBJECTIVES: None.

D. SEQUENCE OF TRAINING:

1. Introduction: During this period of instruction we will review the four fundamentals of rifle marksmanship and explain the necessary modifications to those fundamentals to successfully engage moving targets.

2. Four Fundamentals of Rifle Marksmanship (Review): (Reference FC 23-11 p. 5-1).

- a. Steady Position,
- b. Aiming,
- c. Breath Control,
- d. Trigger Squeeze.

3. Modifications to Four Fundamentals for Moving Targets: (Reference FC 23-11 pp. 17-9 through 17-13).

a. Steady position: (Foxhole position).

- (1) Stand clear of foxhole wall for freedom of body movement.
- (2) Adjust sandbags to acquire sufficient ground clearance for magazine and elbows.
- (3) Place back of non-firing hand on sandbag to act as a pivot point for tracking moving targets.
- (4) Place feet approximately shoulder-width apart.
- (5) Attain stock weld.
- (6) Keep both eyes open to scan area for targets.

NOTE: Targets may be engaged with both eyes open. If firer elects to close his non-firing eye to fire, he must immediately reopen both eyes after firing to enhance target detection.

(7) Stay ready to engage targets:

- (a) Eyes open,
- (b) Maintain stock weld,
- (c) Constantly scan target area,
- (d) React quickly.

b. Aiming (Moving Targets): "Single lead rule," place trailing edge of front sight post in center of mass in the direction of travel.

(1) Sight alignment (relationship of front and rear sight).

(2) Three parts of aiming (Sight Picture):

(a) Front sight,

(b) Rear sight,

(c) Target.

(3) Explain center mass of target.

(4) Explain Single Lead Rule (Encl 1).

c. Breath Control:

(1) Breathe normally between shots.

(2) Never over inhale or over exhale.

(3) Comfort is the key.

(4) Do not inhale or exhale while firing.

d. Trigger Squeeze:

(1) Hold pistol grip firmly with firing hand.

(2) Place index finger on the trigger.

(3) Take up trigger slack simultaneously while attaining proper aiming point (i.e., trailing edge of front sight - center of mass).

(4) Pull trigger smoothly using steady pressure straight to the rear while tracking the target until weapon fires.

4. Technique of Engagement:

a. Prepare foxhole position.

b. Load rifle upon command.

c. Keep both eyes open.

d. Maintain stock weld.

e. React quickly to target. Determine whether it is moving or stationary.

(1) If moving, place front sight trailing edge in center of mass in the direction of travel and begin trigger squeeze immediately.

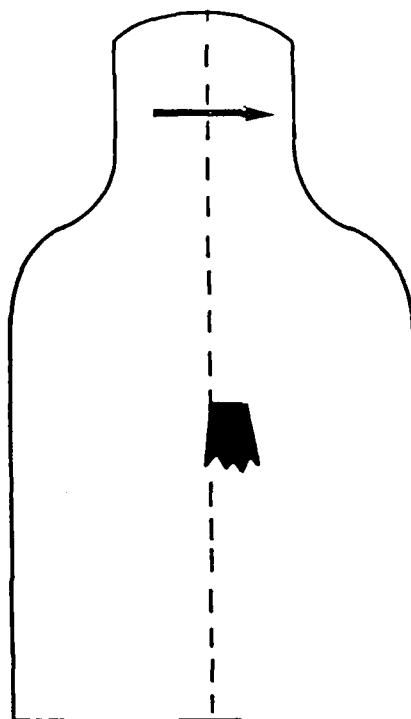
(2) If stationary, attain proper sight picture in target center of mass and squeeze the trigger.

f. After firing, relay to center of lane and scan area for other targets with both eyes open.

E. CONCLUSION:

1. Clarify student questions.
2. Recap main points:
 - a. Modifications to the fundamentals of marksmanship,
 - b. Single lead rule of engagement,
 - c. Technique of engagement.
3. Closing statement: Remember, there are three types of soldiers on the modern battlefield, the living, the dead, and those waiting to see which of the first two they are!

SINGLE LEAD RULE
("E" Type Handout)



Tracking a Moving Target at 150 M

Encl 1

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Fort Benning, Georgia 31905

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LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Dry Fire Mover

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: Malone 18.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM Committee.
5. Training aids: Dry Fire Mover, extension cord, and foxhole stands.
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," and FM 23-9, "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: None.

B. TRAINING OBJECTIVES:

TASK: To dry fire on Dry Fire Mover.

CONDITIONS: During daylight hours in a concurrent training area given an explanation and demonstration each soldier will perform practical exercise in tracking a moving target and perform a rapid magazine change upon command.

STANDARD: Demonstrate ability to engage a moving target while dry firing.

C. INTERMEDIATE TRAINING OBJECTIVES: None.

D. SEQUENCE OF TRAINING:

1. Introduction: During this period of instruction, you will apply the necessary modifications of the fundamentals of marksmanship you have been taught to engage a moving target. Engaging a moving target is not difficult if you know and apply the proper shooting techniques.

2. Dry Fire Mover:

NOTE: Post demonstrator.

- a. Foxhole semisupported position,
- b. Rapid magazine change.

NOTE: Demonstrate the Dry Fire Mover.

NOTE: Release demonstrator.

3. Practical Exercise.

4. Conclusion:

- a. Recap main points.
- b. Clarify student questions.
- c. Closing statement: By applying the techniques you have learned today you will be able to engage any moving target effectively.

E. SAFETY RESTRICTIONS: USAIC Regulation 210-4.

F. ADDITIONAL COMMENTS AND INFORMATION: None.

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LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Immediate Action

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: As announced by the training schedule.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM Committee.
5. Training aids: M16A1 rifle, 2 magazines, dummy rounds, blank ammunition, and blank adapter.
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," and FM 23-9 "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: None.

B. TRAINING OBJECTIVES:

TASK: Reduce a stoppage and continue to fire.

CONDITION: Given an M16A1 rifle and a magazine of 10 blanks and 2 dummy rounds assume a foxhole semisupported position, fire upon command and reduce stoppages as they occur.

STANDARD: Accomplish task within ____ seconds without assistance.

NOTE: Magazines will be loaded with 10 blank rounds and 2 dummy rounds in a random order by peers.

C. INTERMEDIATE OBJECTIVES: None.

D. SEQUENCE: Steps in Immediate Action:

1. Slap (tap) upwards on magazine to ensure it is fully seated in magazine well with the nonfiring hand. (Tap is more appropriate, as a hand slap can cause double feed problems.) Tilt rifle ejection port towards ground approximately 45 degrees.

2. Using firing hand pull charging handle all the way to the rear.

3. Observe for extraction and ejection of cartridge.
4. Release the charging handle.
5. Tap bolt assist with the heel of firing hand to ensure bolt assembly is fully seated.
6. Aim and attempt to fire.

NOTE: Immediate Action procedure must be performed in sequence. If rifle fails to fire, perform Remedial Action. Reload rifle and continue to fire. Assistance by safety personnel should be minimal. Key word is SPORTS.

Practical Exercise

E. CONCLUSION:

1. Clarify student questions.
2. Closing statement: Your rifle is one of the finest in the world today, however, stoppages can occur. Your life depends on your ability to correct those malfunctions.

F. SAFETY RESTRICTIONS: USAIC 210-4.

U.S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

Fort Benning Field Unit
Fort Benning, Georgia 31905

April 1986

LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Rapid Magazine Change

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: As announced by the training schedule.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM Committee
5. Training aids: M16A1 rifle with two magazines loaded with one blank round each, and blank adapter.
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," and FM 23-9 "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: None.

B. TRAINING OBJECTIVES:

TASK: Accomplish a rapid magazine change.

CONDITION: Given an operational M16A1 rifle and two magazines with one round each of M200 blank ammunition, the soldier will "LOAD AND FIRE" one (1) round upon command of principal/assistant instructor, without further command, remove empty magazine, insert loaded magazine, aim and fire his weapon.

STANDARD: Perform rapid magazine change and fire his weapon in ____ seconds or less.

C. INTERMEDIATE OBJECTIVES: None

D. SEQUENCE:

NOTE: Post demonstrator.

NOTE: Fully operational M16 series rifles will lock the bolt to the rear when last round is fired.

Right Handed Firers:

1. Remove index finger from trigger and depress the magazine release catch while maintaining secure grip on the rifle.
2. Simultaneously grasp and remove empty magazine with the left hand. Place the empty magazine on the ground.
3. Secure loaded magazine with left hand, with rounds "up and forward."
4. Insert loaded magazine into the magazine well and "tap" upwards with the palm of left hand to ensure that magazine is fully seated and locked into the weapon.
5. Depress the "bolt release" with the thumb of the left hand. The bolt will go forward and seat the first round for firing.
6. Return left hand to its original firing position on the hand guard.

NOTE: Use right hand to tap bolt assist if necessary to seat first round.

7. Return index finger to the trigger, aim, and fire.

NOTE: The safety is not used during a rapid magazine change. Assistant instructors must ensure the firer maintains a safe posture during the conduct of a rapid magazine change.

Left Handed Firers:

1. Remove right hand from the hand guard and depress the magazine release catch with the thumb of the right hand. Simultaneously grasp the empty magazine with the right hand and place it on the ground.
2. Secure the loaded magazine with the right hand, "rounds up and forward" and insert into the magazine well. Tap "upwards" with the palm of the right hand to ensure the magazine is fully seated and locked into the weapon.
3. Using the right hand, fingers extended and joined, reach over the carrier handle and depress the bolt release catch allowing the bolt to go forward, seating the first round.

NOTE: Use right hand tap bolt assist if necessary to fully seat first round.

4. Return the right hand to firing position, aim and fire.

NOTE: The safety is not engaged during a rapid magazine change. Assistant instructors must ensure that firers maintain a safe posture during conduct of a rapid magazine change.

NOTE: Release demonstrator.

Student Practical Work

E. CONCLUSIONS:

1. Clarify student questions.
2. Closing statement: Without the ability to perform a rapid magazine change, rapid fire, automatic fire, and suppressive fire are impossible!

F. SAFETY RESTRICTIONS: USAIC Regulation 210-4.

U.S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

Fort Benning Field Unit
Fort Benning, Georgia 31905

April 1986

LESSON OUTLINE: ADVANCED RIFLE MARKSMANSHIP

LESSON TITLE: Intermediate Scenario (39/39)

A. ADMINISTRATIVE INSTRUCTIONS:

1. When training will be given: As announced by training schedule.
2. Training location: Malone 18.
3. Who will be trained: Initial Entry Training (IET) Soldiers.
4. Principal and assistant trainers: ARM Committee.
5. Training aids: None
6. References: FC 23-11, "Unit Rifle Marksmanship Training Guide," and FM 23-9 "M16A1 Rifle and Rifle Marksmanship."
7. End of block test: Malone 18 IRETS 42/42 scenario.

B. TRAINING OBJECTIVES

TASK: Engage RETS stationary and moving targets with live fire.

CONDITION: During daylight hours while wearing steel helmet, Load Carrying Equipment (LCE), using an M16A1 rifle with two magazines and 39 rounds of M193 5.56 mm ball, engage stationary and moving targets.

STANDARD: Hit a combination of 20 targets at ranges of 35 m to 300 m.

C. INTERMEDIATE TRAINING OBJECTIVES: None

D. SEQUENCE OF TRAINING:

1. Introduction: During this period of instruction each of you will be required to engage stationary and moving targets from a foxhole fighting position as they appear in your lane. In addition, you will receive coaching during the course.

2. Course of Fire:

a. Table I: Random stationary target exposures 50-300 m. Random exposures of moving targets (attack/retreat mode). Total shots: 16 rounds.

b. Table II: Combination of stationary and moving targets in the attack/retreat mode, 35 to 300 m. Total shots: 23 rounds.

c. Closing statement: The training you have received will enhance your performance in the next record fire course.

E. SAFETY RESTRICTIONS: See USAIC Regulation 210-4.

F. ADDITIONAL COMMENTS AND INFORMATION:

1. Computer cassette available at DTR.
2. Intermediate scenario designed for use prior to record fire 42/42 scenario.
3. Ammunition requirements: 39 rounds per soldier. Alibis are not allowed.

ANNEX B

SAFETY BRIEFING

NOTE: This safety briefing is to be read verbatim. It is not to be generalized or paraphrased in any manner, and only those soldiers who receive this safety briefing will be authorized to fire on the range.

1. The first priority of this range is safety: All of the following safety procedures will be followed, always. Anyone found or caught not adhering to these set rules will be removed from this range immediately by your drill sergeant.
2. The two red and white candy striped poles, located on the far right and far left (point to them), are the range left and right limits. At no time will you fire or point your weapon outside the limits of these poles.
3. Anytime you are in possession of your weapon while on the firing line, the selector lever will be on "SAFE," the bolt will be locked to the rear, and dust cover open (Demonstrate).
4. You will always enter and exit the firing line at the base of the tower and between the two red colored poles (Point).
5. You will always maintain your weapon up and down range whenever you are on the firing line; never place your finger within the trigger housing area (Demonstrate).
6. Remember, on the firing line your bolt is locked to the rear, and the weapon is on SAFE, always!
7. You will never smoke on or near the firing line, but only in designated smoking areas. (Inform them where.)
8. You will never eat or drink on the firing line unless the tower permits you to drink from your canteen. Inform the nearest instructor if you need water.
9. You will never physically touch your weapon in any manner while there are still personnel down range in front of the firing line, not even to make sight changes.
10. You will load your magazine into the weapon only on the command of the tower.
11. You will not be permitted to fire without ear plugs inserted in your ears.
12. Before you are permitted to leave the firing line your weapon must be rodded by the Safety NCO, regardless of whether you have fired your weapon or not. There are no exceptions to this rule.

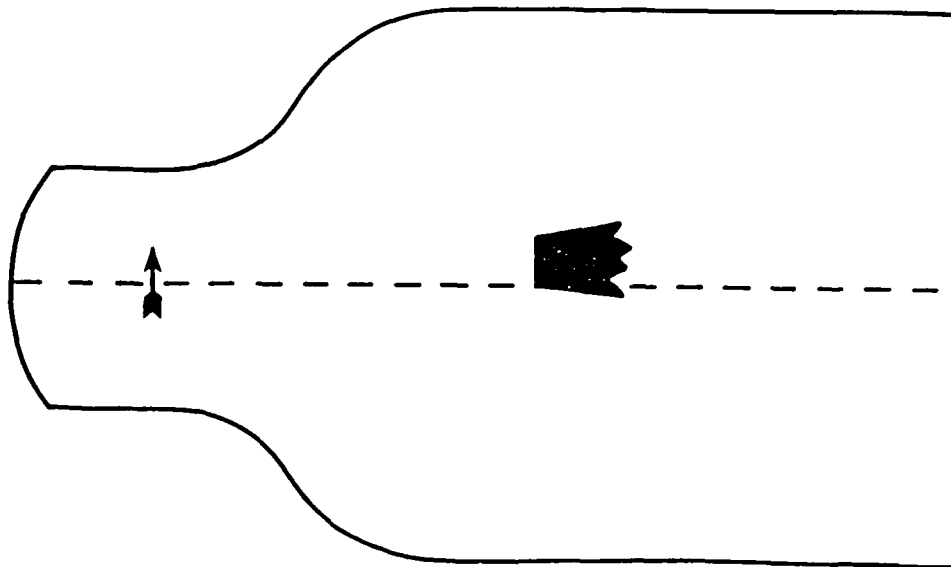
13. You are to consider your weapon loaded at all times, even in the break areas, so never point the weapon at anyone or anything; never play with your weapon.
14. When you are on the range, but not on the firing line you will carry your weapon slung across your back with the muzzle facing skyward or up (Demonstrate).
15. While on this range your selector lever on your weapon will always remain on SAFE, unless you are told otherwise by the tower only.
16. Left-handed firers will not be permitted to fire without left-handed brass deflectors attached to the weapon.
17. Anyone observing an unsafe act will immediately place his weapon on SAFE, place it in the V-notch stake and then give both the vocal alarm and visual signal of cease fire. (Demonstrate and have soldiers demonstrate.) If you are another firer and you observe this going on, then you are to place your weapon on SAFE, place it in the V-notch stake and begin the cease fire procedures. This will continue until all personnel on the firing line are doing this and will not cease until commanded by the range tower.
18. Once you have been cleared off the firing line you will report immediately to the ammunition point and turn in all ammo and expended brass.
19. No one will leave this range until he has been shaken down by either an NCO or Drill Sergeant for ammo and brass. Anyone caught with ammo or brass in his possession after he has given his "No Brass, No Ammo, Sergeant" declaration is susceptible to disciplinary punishments under the Uniform Code of Military Justice.
20. Here we have numerous varieties of poisonous snakes. Most common found on the ranges are copperhead, rattlesnake, coral snake, and water moccasin. These snakes are usually found in cool places in the summer (foxholes, under sandbags, logs, etc.). Always observe an area very closely and avoid. Do not bother the snakes. In the event that you are bitten, report it to the range personnel, do NOT attempt to handle the snake.
21. Electrical Storms (when appropriate): When an electrical storm occurs the Safety NCO will direct the tower operator to prepare to disperse soldiers. At that time the tower will give the command To Lock and Clear All Weapons and Ground All Equipment (except for wet weather gear). Then tower operator will direct soldiers to a safe area.
22. Heat Casualties (when appropriate): The environment is extremely hot with a high humidity. Because of the high humidity the body's perspiration cannot evaporate and cool the body. Should you or your buddy have the following symptoms: Cool, moist or hot, dry skin, profuse sweating, headaches, dizziness, weakness, rapid pulse, or severe cramps in abdomen or legs--make the Range Cadre or AIs aware. These are symptoms of a possible heat casualty.
23. Cold Weather Injuries (when appropriate): Range OICs will ensure that warm-ups are properly utilized. Ten (10) minute breaks will be scheduled for each 60 minute block of instruction. During conference sessions, individuals

should be allowed to move their feet, hands, etc., in order to maintain circulation. Adequate dry clothing is the key to prevention of cold weather injuries. Supervisors at every level will ensure that their subordinates are adequately protected during cold weather. Range OICs will coordinate with company personnel to rotate soldiers into warm-up tents when inclement weather conditions dictate the need for this to preserve troop health.

24. Demonstrate Immediate Action.
25. Demonstrate Remedial Action.
26. Briefly mention the Pop and No Kick possibility.
27. Are there any questions concerning this range's safety procedures?

APPENDIX B
LIST OF VU-GRAPHS

MOVING TARGET SINGLE LEAD RULE



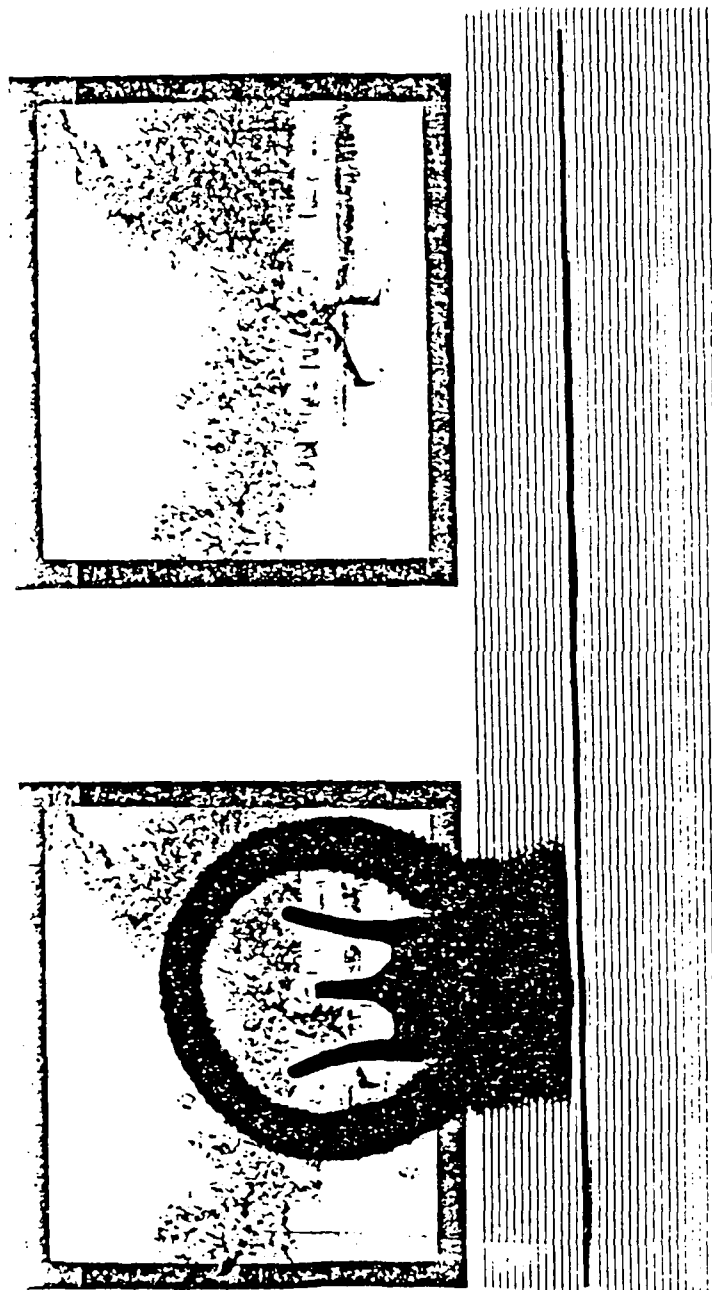
TA 154-86A

"PLACE THE TRAILING EDGE OF THE FRONT SIGHT AT TARGET CENTER
IN THE DIRECTION THE TARGET IS MOVING"



Range - 75 meters

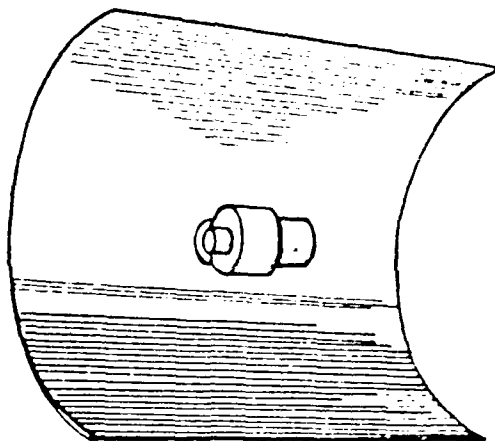
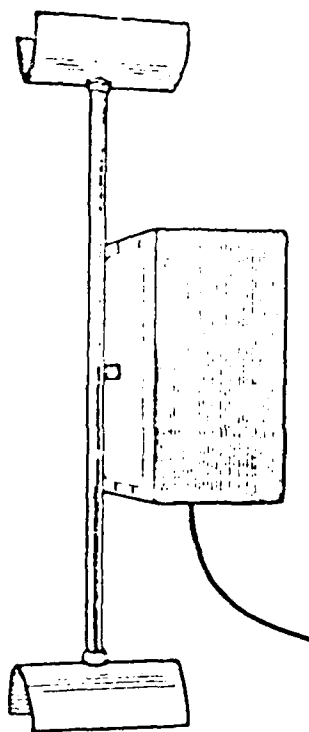
Running



THE PURPOSE OF THE AIM BOOK IS TO TEACH SOLDIERS HOW TO APPLY THE SINGLE-LEAD RULE AND SUCCESSFULLY ENGAGE MOVING TARGETS AT RANGES OUT TO 200 METERS. THE SINGLE-LEAD RULE IS TO PLACE THE TRAILING EDGE OF THE FRONT SIGHT POST ON THE CENTER OF MASS IN THE DIRECTION OF TARGET TRAVEL. THE DOT ON THE ENEMY SOLDIER DEPICTS THE STRIKE OF THE BULLET. THE AIM BOOK DEPICTS A SOLDIER AT RANGES OF 75, 125, AND 185 METERS EITHER WALKING OR RUNNING.

AID TO IMPROVED MARKSMANSHIP (AIM)

TA 154-86A



THIS DEVICE IS USED DURING MOVING TARGET PREPARATORY MARKSMANSHIP TRAINING. IT ROTATES UNDER THE POWER OF A SMALL ROTISSERIE-TYPE MOTOR WITH A SCALED TARGET LOCATED ON EITHER END. SOLDIERS FORM A CIRCLE AROUND THE DEVICE AND SIMULATE ENGAGING THE TARGET EACH TIME IT COMES BY. THIS DEVICE WAS BUILT BY THE TRAINING AIDS SUPPORT CENTER (TASC) AT FORT BENNING, GEORGIA.

DRY FIRE MOVING TARGET TRAINER

TA 154-86A

APPENDIX C

NOTES TO TRAINERS

PURPOSE

This instructional package is designed to provide standardized and comprehensive training methods and techniques for use in teaching the Infantry One Station Unit Training (OSUT) soldier to engage moving targets with his rifle. It is concerned with instructing those critical marksmanship skills and principles that, when properly applied, will ensure success on the battlefield.

SCOPE

This training package encompasses all aspects of Rifle Marksmanship Training applicable to moving target engagements. It incorporates approved and proposed training objectives and standards which are presented in the One Station Unit Training (OSUT) program of instruction for moving target training. Instructional subjects include:

- a. AIM Book Training,
- b. Foxhole Preparation,
- c. Target Detection,
- d. Immediate Action,
- e. Rapid Magazine Change.

CONDUCT OF TRAINING

The instructional format of this training program has been developed to accommodate situationally focused instruction during the proposed training time. It consists of 8 hours of instruction that begin with a review of critical BRM skills and progress systematically, teaching other skills necessary to engage moving targets. It is recommended that the proposed block of instruction be given in sequence and in its entirety.

TRAINING MATERIALS

- a. Required for Instruction. All necessary lesson outlines and hard copies of supporting Vu-graphs are provided in the training package.
- b. Reinforcement Training. Reinforcement training will be given using the primary training aids provided in the package. It is imperative that soldiers fully understand and can apply all critical skills prior to live fire.

EVALUATION OF STANDARDS

The proposed ARM program will embody _____ skill proficiency gates: Soldiers must demonstrate during practical exercises, their ability to perform to standard at the end of each block of instruction. While qualification is not a requirement for OSUT graduation at the current time, training records should reflect performance on the Defense Test Range (DTR) Remoted Target Systems (RETS) course. A minimum of 18 targets hit will be noted as

"satisfactory." Soldiers who do not meet this standard should refire the course a minimum of one time.