

# TOW WEAPON SYSTEM



**NOVEMBER 2003**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY**

**DISTRIBUTION RESTRICTION:** Approved for public release; distribution is unlimited.

# TOW WEAPON SYSTEM

## CONTENTS

	Page
Preface.....	iv
<b>CHAPTER 1. INTRODUCTION</b>	
1-1. Characteristics.....	1-1
1-2. System Configurations.....	1-2
1-3. Missile Configurations and Types.....	1-5
1-4. TOW Missile Identification.....	1-6
1-5. Internal Components and Sequence of Operations.....	1-8
1-6. TOW Training Strategy.....	1-11
<b>CHAPTER 2. TRIPOD-MOUNTED TOW/TOW 2</b>	
Section I. Operation Procedures.....	2-1
2-1. System Checkout.....	2-1
2-2. Preventive Maintenance Checks and Services.....	2-1
2-3. Selection of Firing Positions.....	2-1
2-4. Preparation of Missiles.....	2-2
Section II. Performance Problems and Destruction Procedures.....	2-2
2-5. Malfunctions.....	2-2
2-6. Firing Limitations.....	2-4
2-7. Destruction of TOW Weapon Systems.....	2-9
<b>CHAPTER 3. M966-MOUNTED TOW/TOW 2</b>	
Section I. Individual Duties and Responsibilities.....	3-1
3-1. Squad Leader.....	3-1
3-2. Gunner.....	3-2
3-3. Driver-Loader.....	3-2
Section II. Operation Procedures.....	3-3
3-4. Equipment Storage.....	3-3
3-5. HMMWV Interchangeable Mount System.....	3-5
3-6. Preparation of an M966 for TOW Firing.....	3-6
3-7. Loading, Arming, and Unloading.....	3-12
3-8. Target Engagement.....	3-15

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

\*This publication supersedes FM 23-34, 17 August 1994.

		<b>Page</b>
	3-9. Immediate Action .....	3-15
	3-10. M220A1 Dismount .....	3-20
	3-11. M220A1 Remount .....	3-21
	3-12. M220A2 Dismount (Ready-to-Fire Configuration).....	3-23
	3-13. M220A2 Remount (Ready-to-Fire Configuration).....	3-24
	3-14. Firing Limitations .....	3-25
<b>CHAPTER 4. TOW TRAINING PROGRAM</b>		
Section	I. Training Assessment and Planning.....	4-1
	4-1. Commander’s Responsibility.....	4-1
	4-2. Sustainment Training and Evaluation.....	4-2
	4-3. TOW Training Guidelines .....	4-2
	4-4. TOW Gunnery Tables.....	4-4
	4-5. Conduct of Unit TOW Training.....	4-4
	4-6. Collective Training .....	4-5
Section	II. TOW Training Phases.....	4-5
	4-7. Phase I: Individual Training .....	4-6
	4-8. Phase II: Squad Training.....	4-18
	4-9. Phase III: Section Training .....	4-25
	4-10. Phase IV: Platoon Training.....	4-30
	4-11. Field Tracking.....	4-37
<b>CHAPTER 5. COMBAT TECHNIQUES OF FIRE</b>		
Section	I. Fire Control Measures .....	5-1
	5-1. Target Engagement Determination.....	5-1
	5-2. Fire Commands.....	5-5
	5-3. Target Tracking.....	5-8
	5-4. Target Engagement with the M220A1 (Basic TOW).....	5-9
	5-5. Target Engagement with M220A2 (TOW 2).....	5-11
Section	II. Helicopter Engagement.....	5-12
	5-6. Operational Concept .....	5-12
	5-7. Gunnery Training.....	5-12
Section	III. NBC and Limited Visibility Conditions .....	5-13
	5-8. Decontamination.....	5-13
	5-9. Thermal Target Recognition, Identification, and Engagement .....	5-13
	5-10. Effects of Weather and Obscurants .....	5-14
	5-11. Compensation for Target Appearance Variables.....	5-15
	5-12. Battlefield Identification .....	5-16
Section	IV. Electrooptical Countermeasures .....	5-16
	5-13. TOW Launcher .....	5-16
	5-14. TOW 2 Launcher .....	5-17
<b>APPENDIX A. TOW TRAINING TIPS .....</b>		<b>A-1</b>
<b>APPENDIX B. TRAIN-THE-TRAINER PROGRAM .....</b>		<b>B-1</b>
<b>APPENDIX C. FIGHTING POSITIONS .....</b>		<b>C-1</b>

	Page
<b>APPENDIX D. STANDARD RANGE CARD .....</b>	D-1
<b>APPENDIX E. SAFETY.....</b>	E-1
<b>APPENDIX F. TOW TRAINING DEVICES.....</b>	F-1
<b>APPENDIX G. COMBAT VEHICLE IDENTIFICATION.....</b>	G-1
<b>APPENDIX H. OPFOR/THREAT COUNTERPART SYSTEMS.....</b>	H-1
<b>GLOSSARY.....</b>	Glossary-1
<b>REFERENCES.....</b>	References-1
<b>INDEX.....</b>	Index-1

## PREFACE

This manual discusses the many changes in the TOW missile, TOW training, and OPFOR armored vehicles and countermeasures. It includes training information on the M220A1 (basic) and M220A2 tube-launched, optically tracked, wire-guided (TOW) weapon systems and carrier M966. Its intended audience includes leaders and members of mechanized infantry, light infantry, airborne, and airmobile infantry organizations who train and test individuals and crews. Units with M2/M3 Bradley fighting vehicle systems should also refer to FM 23-1 for additional training and testing requirements.

The proponent of this publication is US Army Infantry School. Send comments and recommendations on DA Form 2028 directly to Commandant, US Army Infantry School, ATTN: ATSH-INB-B, Fort Benning, Georgia 31905-5595, or email to [doctrine@benning.army.mil](mailto:doctrine@benning.army.mil).

Unless otherwise stated, masculine nouns and pronouns do not refer exclusively to men.

---

## CHAPTER 1 INTRODUCTION

*The TOW is a crew-portable heavy antitank missile weapon system that can be operated from armored, lightly armored, and unarmored multipurpose vehicles and helicopters, and from the ground mount. The system consists of a guided missile and a launcher to engage tanks, fortifications, and other materiel targets. The term "TOW" is an acronym derived from the words that describe the principal operating features of the missile—tube-launched, optically tracked, wire-guided. The launcher initiates, tracks, and controls the flight of the missile by guidance signals transmitted over a command-link wire that connects the missile with the launcher.*

### 1-1. CHARACTERISTICS

The TOW weapon system consists of a launcher, which has tracking and control capabilities, and the missile, which is encased in a launch container. The launcher is equipped with self-contained, replaceable units.

a. **Capabilities.** The TOW is mainly an antitank weapon used for long-range engagement of armored targets. It can be employed in all weather conditions as long as the gunner can see his target through the daysight tracker or nightsight. The TOW also provides a long-range assault capability against heavily fortified bunkers, pill boxes, and gun emplacements.

(1) The ITOW missile can destroy targets at a minimum range of 65 meters and a maximum range of 3,750 meters. The TOW 2B missile can destroy targets at a minimum range of 288 meters when fired from the ground mount and 200 meters when fired from the HMMWV or BFV. The TOW 2B has a maximum range of 3,750 meters whether ground- or vehicle-mounted.

(2) The automatic missile tracking and control capabilities of the TOW weapon system provide a high first-round-hit probability. To operate the system, the gunner places the crosshairs of the sighting system (either the daysight tracker or the nightsight) on the target, fires the missile, and centers the crosshairs on the target image until missile impact. The optical tracking and command functions within the system guide the missile along the gunner's line of sight. The gunner does not apply lead, windage, or elevation.

b. **Mobility.** The TOW weapon system can be vehicle-mounted or ground emplaced (tripod-mounted) for operation. Missiles can be launched from either operational mode. (Detailed operating procedures for each configuration are provided in Chapters 2 and 3.)

(1) The entire system can be hand-carried by a weapon crew; therefore, emplacement sites can be changed quickly to minimize detection or to engage targets that are out of range.

(2) The vehicle-mounted launcher is more mobile and can be quickly prepared for use. The launcher can be assembled and disassembled without the use of tools.

(3) Built-in self-test circuits can be used to check the operational condition of the assembled launcher whether ground- or vehicle-mounted.

## 1-2. SYSTEM CONFIGURATIONS

The TOW weapon system comes in two configurations—the M220A1 (TOW) and the M220A2 (TOW 2).

a. **M220A1 TOW Weapon System.** The M220A1 TOW (Figure 1-1) consists of a tripod, a traversing unit, a launch tube, a daysight tracker, an AN/TAS-4 nightsight, a missile guidance set (MGS), a battery assembly housed in the compartment of the MGS, and an encased missile.

(1) The M220A1 TOW weighs about 265.5 pounds with all of its components and carrying cases; with encased missile (BGM-71A), it weighs 320 pounds. (For a detailed description of the M220A1 TOW, see TM 9-1425-472-12.)

(2) The M220A1 TOW can fire all four configurations of TOW missiles, which include many types. However, it cannot take full advantage of the BGM-71D TOW 2 and BGM-71E TOW 2A or TOW 2B counter countermeasures when tracking through obscurants.

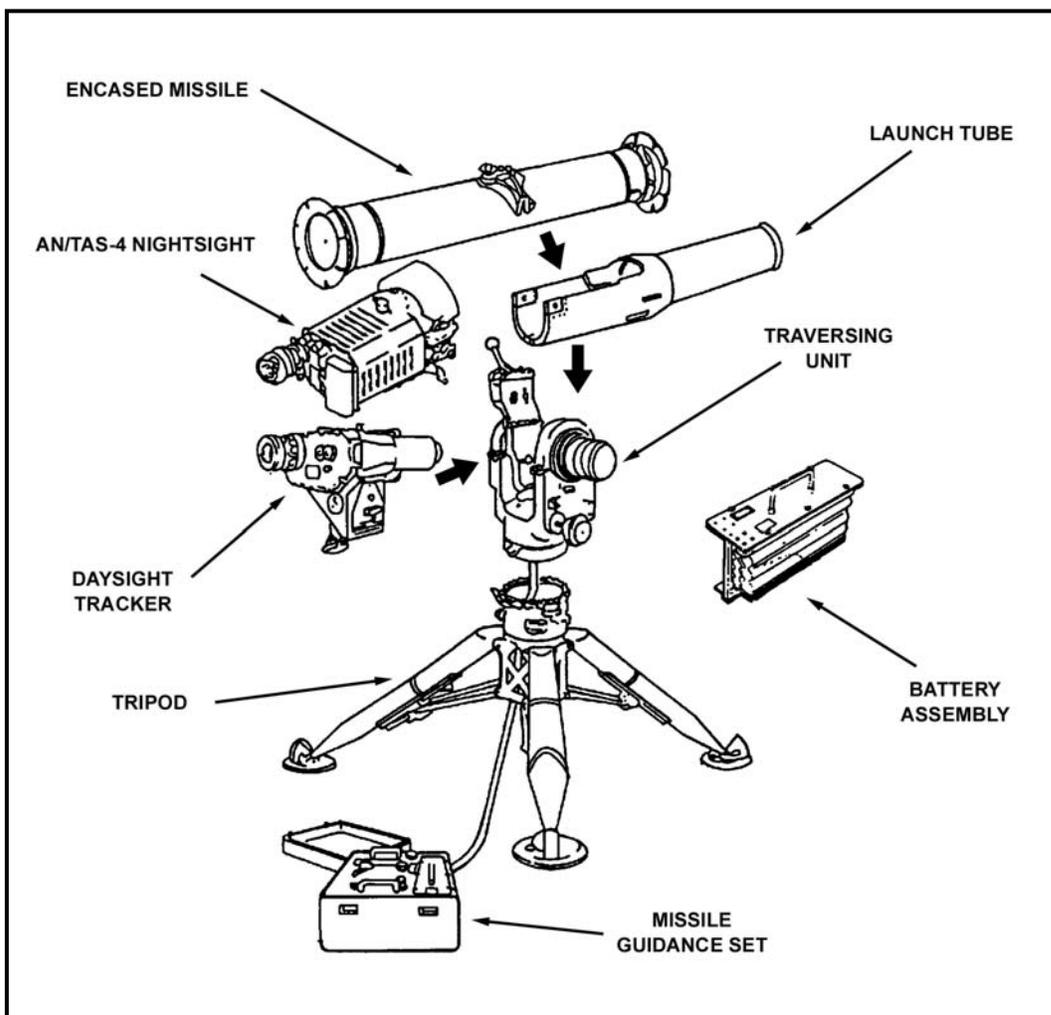


Figure 1-1. M220A1 TOW components.