

## CHAPTER 12

### TRAINING

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#### Section I. GENERAL

#### 102. (U) General

*a.* This chapter is a guide to assist the battalion commander in the effective training of his unit.

*b.* Included herein is general information on training objectives, conduct of training, standards to be attained, and a discussion on the Redstone trainer.

*c.* For appropriate training publications, see appendix I.

#### 103. (U) Objective

The objective of the training prescribed herein is to provide personnel in all units of the battalion with a thorough knowledge of the tactics and techniques essential to efficient operation of the field artillery missile battalion in combat.

#### 104. (U) Conduct of Training

*a.* Unit commanders conduct training in accordance with the principles discussed in FM 21-5 and ATP 6-630. The application of prior instruction to current training must be emphasized throughout training. Training under the Army training program is culminated by an Army training test.

*b.* The necessity for developing leadership, initiative, and a sense of responsibility in noncommissioned officers must be kept in mind throughout training. Noncommissioned officers should be utilized as much as possible to train their own sections. Unit officers should supervise and make frequent inspections to determine the status of training of individuals.

*c.* Realistic training is especially important. Simulation of essential operations for safety, work involved, or complex nature of the materiel must be avoided. Maximum use should be made of practical field exercises. Night training under blackout conditions must be stressed.

*d.* The various service schools conduct technical instruction to train key personnel in each unit of the group to perform their assigned

duties. Remaining personnel are trained as part of the unit training program.

### **105. (U) Standards To Be Attained**

The qualifications established by AR 611-201 should be used as guides for the standards to be attained by individuals. Appropriate Army training tests should be used as guides for the standard to be attained by units.

## **Section II. REDSTONE TRAINER**

### **106. (U) General**

*a.* The Redstone trainer is a device designed to assist in the training and testing of the proficiency of a missile battery in the firing procedures for the Redstone missile. It includes—

- (1) A special training missile which is substituted for the tactical missile.
- (2) A trainer test station.
- (3) Accessories.

*b.* The training missile is specially designed to furnish maximum opportunity for training, testing, and practice with minimum danger to using personnel and minimum chance for damage to costly materiel. The training missile can be used to perform most normal routine operations of the firing procedures. It can also be used to perform a variety of nonroutine operations concerned with detecting and isolating equipment malfunctions which might occur during the firing procedure. However, the trainer does have the following major limitations:

- (1) Some important parts of the firing procedures cannot be performed with the trainer.
- (2) Some firing procedures cannot be performed in the same way with the trainer that they must be performed with a tactical missile.
- (3) The ordnance company cannot train using the trainer.

*c.* The trainer test station contains a malfunction panel which is used for remotely inserting and removing the malfunction indications which could occur in a tactical missile. An automatically printed tape located in the trainer test station records operations performed in the test station during checkout activities. A large portion of the trainer test station contains equipment which simulates realistic signals in the training missile and the other operational equipment to resemble those of a tactical missile.

## 107. (U) Use of the Redstone Trainer

a. The Redstone trainer can be used effectively in training new missile battery-personnel, in cross-training of personnel within a battery, and in maintaining and improving job performance of trained personnel.

b. For a detailed discussion on the use and functions of the Redstone trainer, see references listed in appendix I.

## APPENDIX I

### REFERENCES

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#### 1. General

AR 117-5  
AR 190-60

AR 220-50  
AR 220-70  
AR 320-5

AR 320-50

AR 380-5  
AR 385-63

AR 525-30  
AR 611-201

AR 711-16

AR 735-5  
AR 735-35

AR 750-15

SR 385-310-5

FM 5-15  
FM 5-20

FM 5-36

FM 6-10  
FM 6-20-1

Military Mapping and Surveying.  
Physical Security of Army Atomic  
Weapons (U).

Regiments; General Provisions.  
Companies; General Provisions.  
Dictionary of United States Army  
Terms.

Authorized Abbreviations and Brevity  
Codes.

Safeguarding Defense Information.  
Regulations for Firing Ammunition  
for Training, Target Practice, and  
Combat.

Army Missiles.

Manual of Enlisted Military Occupa-  
tional Specialties.

Installation Stock Control and Supply  
Procedures.

General Principles and Policies.

Supply Procedures for TOE Units,  
Organizations, and Non-TOE Ac-  
tivities.

Maintenance Readiness and Field  
Maintenance Readiness of Represen-  
tative Critical Equipment.

Launching Guided Missiles and Heavy  
Rockets.

Field Fortifications.

Camouflage, Basic Principles and Field  
Camouflage.

Route Reconnaissance and Classifica-  
tion.

Field Artillery Communications.

Field Artillery Tactics.

|                   |  |
|-------------------|--|
| FM 6-20-2         | Field Artillery Techniques.  |
| FM 11-series      | Signal.  |
| FM 21-5           | Military Training.   |
| FM 21-6           | Techniques of Military Instructions.   |
| FM 21-30          | Military Symbols.  |
| FM 24-series      | Communication Techniques.  |
| FM 100-5          | Field Service Regulations; Operations.   |
| FM 101-5          | Staff Officers' Field Manual: Staff Organization and Procedure.                              |
| FM 101-31         | Nuclear Weapons Employment (U).  |
| FM 101-31A        | Nuclear Weapons Employment (U).  |
| TM 39-0-1         | Numerical Index to Joint Special Weapons Publications (U).                                   |
| TM 39-C39-16-1    | Assembly, Test, and Storage Procedures for Adaption Kit (U)                                  |
| TM 39-W39-16-1    | (Title classified.)  |
| TM 39-W39-16-9    | Prefire Procedures (U).  |
| TM 39-T4000-2     | T4000 Test Set: Operation and Maintenance Instructions with Illustrated Parts Breakdown (U). |
| TM 39-T4005-2     | T4005 Test Set: Operation and Maintenance Instructions with Illustrated Parts Breakdown (U). |
| TM 39-4006-2      | T4006 Test Set: Operation and Maintenance Instructions with Illustrated Parts Breakdown (U). |
| TM 39-4007-2      | T4007 Control Monitor: Operation and Maintenance with Illustrated Parts Breakdown (U).       |
| TM 39-T4008-2     | T4008 Simulator: Operation and Maintenance with Illustrated Parts Breakdown.                 |
| TA 23-100         | Ammunition for Training (U).   |
| DA Pam 108-1      | Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.                    |
| DA Pam 310-series | Military Publications Indexes.   |
| DA Form 6-22      | Computation—Conversion UTM Grid Coordinates to Geographic Coordinates.                       |
| DA Form 9-80      | Job Order File.  |
| DA Form 811       | Work Request and Job Order (4-part set).   |
| DA Form 1510      | Maintenance Readiness and Field Maintenance Costs.   |

DA Form 1543  
DA Form 1546

Title Insert (informal accountability).  
Request for Issue or Turn-in.

## 2. Field Artillery

|                 |  |
|-----------------|--|
| FM 6-20-1       | Field Artillery Tactics.   |
| FM 6-20-2       | Field Artillery Techniques.  |
| FM 6-35         | Field Artillery Missile, Redstone.   |
| FM 6-40         | Field Artillery Gunnery.   |
| FM 6-140        | The Field Artillery Battery.   |
| FM 6-2          | Artillery Survey.  |
| TM 6-300-( )    | Army Ephemeris.  |
| TOE 6-635E      | Field Artillery Missile Battalion<br>(Redstone).   |
| TOE 6-636E      | Headquarters and Headquarters Bat-<br>tery, Field Artillery Missile Bat-<br>talion (Redstone). |
| TOE 6-637E      | Field Artillery Missile Battery, Red-<br>stone.  |
| ATP 6-100       | Army Training Program for Field<br>Artillery Unit.   |
| ATP 6-635       | Army Training Program for Field<br>Artillery Missile Battalion (Red-<br>stone).                |
| ATT 6-635       | Field Artillery Missile Battalion (Red-<br>stone).   |
| FT Redstone A-2 | Firing Tables for Field Artillery Mis-<br>sile, Redstone.                                      |

## 3. Engineer

|              |  |
|--------------|--|
| TM 5-232     | Elements of Surveying.   |
| TM 5-234     | Topographic Surveying.   |
| TM 5-241-1   | Grids and Grid References.   |
| TM 5-241-2   | Universal Transverse Mercator Grid;<br>Zone to Zone Transformation Tables.   |
| TM 5-241-3/2 | Universal Transverse Mercator Grid<br>Tables for Latitudes 0° through 80°;<br>International Spheroid (meters).<br>Volume II, Transformation of Co-<br>ordinates from Grid to Geographic. |
| TM 5-241-4/2 | Universal Transverse Mercator Grid<br>Tables for Latitudes 0° through 80°;<br>Clarke 1866 Spheroid (meters).<br>Volume II, Transformation of Co-<br>ordinates from Grid to Geographic.   |

- TM 5-241-5/2 Universal Transverse Mercator Grid Tables for Latitudes 0° through 80°; Bessel Spheroid (meters). Volume II, Transformation of Coordinates from Grid to Geographic.
- TM 5-241-6/2 Universal Transverse Mercator Grid Tables for Latitudes 0° through 80°, Clarke 1880 Spheroid (meters). Volume II, Transformation of Coordinates from Grid to Geographic.
- TM 5-241-7 Universal Transverse Mercator Grid Tables for Latitudes 0° through 45°; Everest Spheroid (meters). Transformation of Coordinates from Geographic to Grid and from Grid to Geographic.
- TM 5-351 Gas Generating.
- TB 5-351-1 Liquid Oxygen and Nitrogen.
- TM 5-505 Maintenance of Engineer Equipment.
- TM 5-4310-205-10 Operators Manual: Compressor Air Reciprocating (Clark Model HO-5C1).
- TM 5-4310-205-20 Organizational Maintenance: Compressor Air Reciprocating (Clark Model HO-5C1).
- TM 5-4310-205-35 Field and Depot Maintenance: Compressor Air Reciprocating (Clark Model HO-5C1).
- TM 5-6115-208-10 Operators Manual: Generator Set 60 KW (Cummins Model JS-6G).
- TM 5-6115-208-20 Organization Maintenance Manual: Generator Set 60 KW (Cummins Model JS-6G).
- TM 5-6115-208-20P Organization Repair List for Generator Set 60 KW (Cummins Model JS-6G).
- TM 5-8120-201-12 Operator and Organizational Maintenance Manual: Tank, Liquid Oxygen, Semitrailer Mounted, 18,000 lbs.
- TM 5-8120-201-35 Field and Depot Maintenance Manual: Tank, Liquid Oxygen, Semitrailer Mounted, 18,000 lbs.
- TM 5-9104-1 through -9-series Generating and Charging Plant, Liquid Oxygen and Nitrogen, Air Products Model, LEON-20.

|            |   |
|------------|---|
| TM 5-9139  | Container, Oxygen, Vacuum Shell, Skid-Mounted 1,500 lbs Liquid, 150 Gallon, Hofman Model 600V-LO-1. |
| TOE 5-464C | Engineer Company, Redstone.   |
| ATP 5-( )  | Army Training Program for Engineer Company, Redstone.   |
| TB ENG 39  | Safe Handling of Compressed Gases.  |
| BB-0-925   | Federal Specifications, Purity Standards for Handling and Testing Liquid Oxygen.                    |

#### 4. Ordnance

|                     |   |
|---------------------|---|
| TOE 9-217T          | Ordnance Company, Redstone.   |
| ATP 9-217           | Army Training Program for Missile Maintenance Units.  |
| FM 9-1              | Ordnance Service in the Field.  |
| FM 9-2              | Ordnance Corps Logistical Data.   |
| FM 9-3              | Ordnance Direct Support Service.  |
| FM 9-5              | Ordnance Ammunition Service.  |
| TM 9-1903           | Care, Handling, Preservation and Destruction of Ammunition.   |
| TM 9-1400-350-10    | Operators Manual: Introduction and Description (U).   |
| TM 9-1400-350-12    | Operators and Organizational Maintenance Manual: Maintenance-Operational Readiness Procedures—Artillery Operations.   |
| TM 9-1400-350-34/1  | Field Maintenance Manual: Ordnance Inspection Procedures.   |
| TM 9-1400-350-34/2  | Field Maintenance Manual: Maintenance-Operational Readiness Procedures—Ordnance Operations.                           |
| TM 9-1410-350-14/1  | Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Shipment, Handling, and Storage. |
| TM 9-1410-350-34P/1 | Organizational and Field Maintenance Repair Parts and Special Tools List for Ballistic Guided Missile M8.             |
| TM 9-1410-350-14/2  | Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Ballistic Shell.                 |



- TM 9-1410-350-14/3 Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Propulsion System.
- TM 9-1410-350-14/4 Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Description.
- TM 9-1410-350-14/5 Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System and Electrical System: Maintenance.
- TM 9-1410-350-14/6 Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System and Electrical System: Component Replacement and Cable Repair.
- TM 9-1410-350-14/7 Operator, Organizational, and Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System and Electrical System: Schematics and Wiring Diagrams.
- TM 9-1410-350-34/1 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Stabilized Platform ST-80 (U).
- TM 9-1410-350-34P/1 Field Maintenance Repair Parts and Special Tools List for Stabilized Platform ST-80: Ballistic Guided Missile M8.
- TM 9-1410-350-34/2 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Range Guidance Computer (U).
- TM 9-1410-350-34P/2 Field Maintenance Repair Parts and Special Tools List for Range Guidance Computer: Ballistic Guided Missile M8.
- TM 9-1410-350-34/3 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Lateral Guidance Computer (U).

- TM 9-1410-350-34P/3 Field Maintenance Repair Parts and Special Tools List for Lateral Guidance Computer: Ballistic Guided Missile M8.
- TM 9-1410-350-34/4 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Control Computer.
- TM 9-1410-350-34P/4 Field Maintenance Repair Parts and Special Tools List for Control Computer: Ballistic Guided Missile M8.
- TM 9-1410-350-34/5 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Control Relay Box.
- TM 9-1410-350-34P/5 Field Maintenance Repair Parts and Special Tools List for Control Relay Box: Ballistic Guided Missile M8.
- TM 9-1410-350-34/6 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Program Device.
- TM 9-1410-350-34P/6 Field Maintenance Repair Parts and Special Tools List for Program Device: Ballistic Guided Missile M8.
- TM 9-1410-350-34/7 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Inverter.
- TM 9-1410-350-34P/7 Field Maintenance Repair Parts and Special Tools List for Inverter: Ballistic Guided Missile M8.
- TM 9-1410-350-34/8 Field Maintenance Manual: Ballistic Guided Missile M8: Guidance and Control System: Actuator.
- TM 9-1410-350-34P/8 Field Maintenance Repair Parts and Special Tools List for Actuator: Ballistic Guided Missile M8.
- TM 9-1430-350-12/2  
(when published) Operator and Organizational Maintenance Manual: Truck-Mounted Guided Missile Programming Data Computer, AN/MJQ-1.
- TM 9-1430-350-14/1 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile Programmer-Test Station AN/MSM-38: Description and Operation.

- TM 9-1430-350-14/2 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile Programmer-Test Station AN/MSM-38: Maintenance.
- TM 9-1430-350-24P/2 Organizational and Field Maintenance Repair Parts and Special Tools List for Truck-Mounted Guided Missile Programmer-Test Station AN/MSM-38.
- TM 9-1430-350-14/3 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile Programming Data Computer AN/MJQ-1: Description and Operation.
- TM 9-1430-350-14/4 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile Programming Data Computer AN/MJQ-1: Maintenance.
- TM 9-1430-350-14/5 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile Programming Data Computer AN/MJQ-1: Adjustments and Checks.
- TM 9-1430-350-34P/5 Field Maintenance Repair Parts and Special Tools List for Truck-Mounted Guided Missile Programming Data Computer AN/MJQ-1.
- TM 9-1430-350-14/6 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile Programming Data Computer AN/MJQ-1: Wire Lists.
- TM 9-1440-350-14 Operator, Organizational, and Field Maintenance Manual: Guided Missile Platform Launcher M74 and Truck-Mounted Guided Missile Erector-Servicer M478.
- TM 9-1440-350-24P Organizational and Field Maintenance Repair Parts and Special Tools List for Guided Missile Platform Launcher M74 and Truck-Mounted Guided Missile Erector-Servicer M478.

- TM 9-1450-350-14/1 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Hydrogen Peroxide Servicer M506.
- TM 9-1450-350-24P/1 Organizational and Field Maintenance Repair Parts and Special Tools List for Truck-Mounted Hydrogen Peroxide Servicer M506.
- TM 9-1450-350-14/2 Operator, Organizational, and Field Maintenance Manual: Repair Parts Vehicles: Semitrailer-Mounted Guided Missile System Supply Office M484, Truck-Mounted Preservation and Storage Shop M485, Guided Missile Bulk Material Repair Parts Truck M486, Guided Missile Repair Parts Trailer M487, and Guided Missile Repair Parts Truck M488.
- TM 9-1450-350-24P/2 Organizational and Field Maintenance Repair Parts and Special Tools List for Repair Parts Vehicles: Semitrailer-Mounted Guided Missile System Supply Office M484, Truck-Mounted Preservation and Storage Shop M485, Guided Missile Bulk Material Repair Parts Truck M486, Guided Missile Repair Parts Trailer M487, and Guided Missile Repair Parts Truck M488.
- TM 9-1450-350-14/3 Operator, Organizational, and Field Maintenance Manual: Trailer-Mounted Guided Missile System Power Distribution Station AN/MSQ-32.
- TM 9-1450-350-24P/3 Organizational and Field Maintenance Repair Parts and Special Tools List for Trailer-Mounted Guided Missile System Power Distribution Station AN/MSQ-32.
- TM 9-1450-350-14/4 Operator, Organizational, and Field Maintenance Manual: Trailer-Mounted Guided Missile Battery Servicing Shop M479.

- TM 9-1450-350-24P/4 Organizational and Field Maintenance Repair Parts and Special Tools List for Trailer-Mounted Guided Missile Battery Servicing Shop M479.
- TM 9-1450-350-14/5 Operator, Organizational, and Field Maintenance Manual: Accessories Transportation Trucks.
- TM 9-1450-350-24P/5 Organizational and Field Maintenance Repair Parts and Special Tools List for Accessories Transportation Trucks.
- TM 9-1450-350-14/6 Operator, Organizational, and Field Maintenance Manual: Trailer-Mounted Guided Missile Air Servicer M483.
- TM 9-1450-350-24P/6 Organizational and Field Maintenance Repair Parts and Special Tools List for Trailer-Mounted Guided Missile Air Servicer M483.
- TM 9-2330-350-14 Operator, Organizational, and Field Maintenance Manual: Alcohol Tank Semitrailer M388.
- TM 9-2330-350-24P Organizational and Field Maintenance Repair Parts and Special Tools List for Alcohol Tank Semitrailer M388.
- TM 9-4935-350-14/1 Operator, Organizational, and Field Maintenance Manual: Semitrailer-Mounted Guided Missile Test Station AN/MSM-33 Control Components and Semitrailer-Mounted Guided Missile Test Station AN/MSM-41 Guidance Components.
- TM 9-4935-350-34P/1 Field Maintenance Repair Parts and Special Tools List for Semitrailer-Mounted Guided Missile Test Station AN/MSM-33 Control Components and Semitrailer-Mounted Guided Missile Test Station AN/MSM-41 Guidance Components.
- TM 9-4935-350-14/2 Operator, Organizational, and Field Maintenance Manual: Actuator Test Fixture.
- TM 9-4935-350-34P/2 Field Maintenance Repair Parts and Special Tools List for Actuator Test Fixture.

- TM 9-4935-350-14/3 Operator, Organizational, and Field Maintenance Manual: Control Computer Test Fixture.
- TM 9-4935-350-34P/3 Field Maintenance Repair Parts and Special Tools List for Control Computer Test Fixture.
- TM 9-4935-350-14/4 Operator, Organizational, and Field Maintenance Manual: Control Relay Box Test Fixture.
- TM 9-4935-350-34P/4 Field Maintenance Repair Parts and Special Tools List for Control Relay Box Test Fixture.
- TM 9-4935-350-14/5 Operator, Organizational, and Field Maintenance Manual: Program Device Test Fixture.
- TM 9-4935-350-34P/5 Field Maintenance Repair Parts and Special Tools List for Program Device Test Fixture.
- TM 9-4935-350-14/6 Operator, Organizational, and Field Maintenance Manual: Inverter Test Fixture.
- TM 9-4935-350-34P/6 Field Maintenance Repair Parts and Special Tools List for Inverter Test Fixture.
- TM 9-4935-350-14/7 Operator, Organizational, and Field Maintenance Manual: Guidance Computer Test Fixture (U).
- TM 9-4935-350-34P/7 Field Maintenance Repair Parts and Special Tools List for Guidance Computer Test Fixture.
- TM 9-4935-350-14/8 Operator, Organizational, and Field Maintenance Manual: Stabilized Platform ST-80 Test Fixture.
- TM 9-4935-350-34P/8 Field Maintenance Repair Parts and Special Tools List for Stabilized Platform ST-80 Test Fixture.
- TM 9-4935-350-14/9 Operator, Organizational, and Field Maintenance Manual: Semitrailer-Mounted Stabilized Platform Test Station AN/MJM-3: Description and Operation (U).
- TM 9-4935-350-14/10 Operator, Organizational, and Field Maintenance Manual: Semitrailer-Mounted Stabilized Platform Test Station AN/MJM-3: Maintenance.

- TM 9-4935-350-34P/10 Field Maintenance Repair Parts and Special Tools List for Semitrailer-Mounted Stabilized Platform Test Station AN/MJM-3.
- TM 9-4935-350-14/11 Operator, Organizational, and Field Maintenance Manual: Truck-Mounted Guided Missile System Pneumatic Shop M477.
- TM 9-4935-350-34P/11 Field Maintenance Repair Parts and Special Tools List for Truck-Mounted Guided Missile System Pneumatic Shop M477.
- TM 9-4935-350-14/12 Operator, Organizational, and Field Maintenance Manual: Missile System Test Equipment Calibrator Set: Description, Operation, and Maintenance.
- TM 9-4935-350-34P/12 Field Maintenance Repair Parts and Special Tools List for Missile System Test Equipment Calibrator Set.
- TM 9-4935-350-14/13 Operator, Organizational, and Field Maintenance Manual: Missile System Test Equipment Calibrator Set: Calibration Procedures.
- TM 9-6930-350-34P/2 Field Maintenance Repair Parts and Special Tools List for Guided Missile System Training Set AN/MSQ-T3.