

## CHAPTER 12

### TRAINING

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#### Section I. GENERAL

##### 102. (U) General

*a.* This chapter is a guide to assist the group 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 group with a thorough knowledge of the tactics and techniques essential to efficient operation of the field artillery missile group 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 firing 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 firing 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     | Military Mapping and Surveying.  |
| AR 190-60    | Physical Security of Army Atomic Weapons (U).  |
| AR 220-50    | Regiments; General Provisions.   |
| AR 220-70    | Companies; General Provisions.   |
| AR 320-5     | Dictionary of United States Army Terms.  |
| AR 320-50    | Authorized Abbreviations and Brevity Code.   |
| AR 380-5     | Safeguarding Defense Information.  |
| AR 385-63    | Regulations for Firing Ammunition for Training, Target Practice, and Combat.                                   |
| AR 525-30    | Army Missiles.   |
| AR 611-201   | Manual of Enlisted Military Occupational Specialties.  |
| AR 711-16    | Installation Stock Control and Supply Procedures.  |
| AR 735-5     | General Principles and Policies.   |
| AR 735-35    | Supply Procedures for TOE Units, Organizations, and Non-TOE Activities.  |
| AR 750-15    | Maintenance Readiness and Field Maintenance Costs, Maintenance Readiness of Representative Critical Equipment. |
| SR 385-310-5 | Launching Guided Missiles and Heavy Rockets.   |
| FM 5-15      | Field Fortifications.  |
| FM 5-20      | Camouflage, Basic Principles and Field Camouflage.   |
| FM 5-36      | Route Reconnaissance and Classification.   |
| 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.
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.
TM 39-4006-2	T4006 Test Set: Operation and Maintenance Instructions with Illustrated Parts Breakdown.
TM 39-4007-2	T4007 Control Monitor: Operation and Maintenance with Illustrated Parts Breakdown.
TM 39-T4008-2	T4008 Simulator: Operation and Maintenance with Illustrated Parts Breakdown.
TA 23-100	Ammunition for Training.
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	Title Insert (informal accountability).
DA Form 1546	Request for Issue or Turn-in.

## 2. Field Artillery

FM 6-20	Field Artillery Tactics and Techniques.
FM 6-35	Field Artillery Missile, Redstone.
FM 6-165	Warhead Section, XM18, XM30, XM31, and XM33 (Redstone) (U).
FM 6-40	Field Artillery Gunnery.
FM 6-140	The Field Artillery Battery.
TM 6-200	Artillery Survey.
TM 6-300-( )	Army Ephemeris.
TOE 6-630T	Field Artillery Missile Group (Redstone).
TOE 6-631T	Headquarters and Headquarters Battery. Field Artillery Missile Group (Redstone).
TOE 6-634	Field Artillery Missile Battery, Redstone.
ATP 6-100	Army Training Program for Field Artillery Unit.
ATP 6-630	Army Training Program for Field Artillery Missile Group (Redstone).
ATT 6-630	Field Artillery Missile Group (Redstone).
FT Redstone A-2	Firing Tables for Field Artillery Missile, 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; Zone to Zone Transformation Tables.
TM 5-241-3/2	Universal Transverse Mercator Grid Tables for Latitudes 0° through 80°; International Spheroid (meters). Volume II, Transformation of Coordinates from Grid to Geographic.
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- 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).
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- TM 5-6115-208-10 Operators Manual: Generator Set 60 KW (Cummins Model JS-6G).
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- TM 5-6115-208-20P Organization Repair Parts 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.
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TM 5-9100-1 through -7 series.	Generating and Charging Plant, Liquid Oxygen and Nitrogen, Air Products Model, LEON-5.
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 1500 lbs Liquid, 150 Gallon, Hofman Model 600V- LO-1.
TOE 5-464C	Engineer Company, Redstone.
ATP 5-( )	Army Training Program for Engi- neer Company, Redstone.
TB ENG 39	Safe Handling of Compressed Gases.
BB-0-925	Federal Specifications, Purity Stand- ards 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.

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Vol II-A, ITM 9-1400-352-34.	Ordnance Inspection Procedures.
ITM 9-1400-360-12	Maintenance Operational Readiness Procedures: Artillery Operations.
ITM 9-1400-361-34	Maintenance Operational Readiness Procedures: Ordnance Operations.
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- Stabilized Platform (ST-80): Lists of Equipment, Repair Parts, and Tools (App. III).
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- Range Computer: Lists of Equipment, Repair Parts, and Tools (App. III).
- Ballistic Guided Missile XM8: Guidance and Control System; Lateral Computer Maintenance.
- Lateral Computer: Lists of Equipment, Repair Parts, and Tools (App. III).
- Ballistic Guided Missile XM8: Guidance and Control System; Control Computer Maintenance.
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- Missile Programming Data Computer AN/MJQ-1: Description and Operation (U).
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ation, and Utilization.
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III).

Copies of "Notes on Development Type Material" may be obtained at no cost by writing to Commander, U.S. Army Ordnance Missile Command, ATTN: ORDAB-SC, Army Ballistic Missile Agency, Redstone Arsenal, Alabama.

## APPENDIX II

# CONDUCT OF SERVICE PRACTICE

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### Section I. GENERAL

#### 1. Purpose and Scope

a. This appendix is a guide for all personnel concerned with the conduct of service practice for the field artillery missile group, Redstone.

b. This appendix covers basic provisions for service practice, responsibilities of individuals, safety precautions peculiar to the Redstone missile system, and phases of service practice.

#### 2. Basic Provisions for Service Practice

a. *Purpose.* Service practice is a part of the tactical field training of the field artillery missile group, Redstone. The preparation, execution, and conduct of fire with tactical missiles is the final phase of training for battle. The techniques of preparation, execution, and conduct of fire must be developed and taught by units before they can be considered qualified to undertake service practice. These techniques must be developed and taught by many mock firing exercises.

b. *Scope.* Service practice combines all elements of field artillery training—tactical employment, mobility, signal communication, and preparation, execution, and conduct of fire. Service practice with the Redstone missile is conducted as an extension of tactical field exercises wherein the most realistic tactical situation permitted by local conditions is created. These exercises should generally conform to the provisions of Army Training Test 6-630 for field artillery missile groups, Redstone, except for differences indicated herein.

c. *Responsibilities.* The group commander is responsible for the conduct, scoring, and evaluation of the service practice. Based on recommendations of the group commander, the next higher headquarters authorizes and arranges for service practice.

d. *Frequency.*

- (1) Each field artillery missile group, Redstone, will conduct service practice as part of its training under the Army training program.
- (2) Each field artillery missile group, Redstone, will conduct service practice during the 3-month period prior to overseas deployment.

- (3) The requirement in (2) above will be fulfilled by the service practice in (1) above, if the service practice falls in the 3-month period prior to oversea deployment.

*e. Ammunition Allowances.* Ammunition allowances for service practices will be as specified in Table of Allowances (TA) 23-100 or directives from higher authority.

*f. Personnel.*

- (1) In view of the infrequency of service practice, personnel should be assured of maximum training benefits from each missile fired. The maximum number of personnel assigned to units designated to conduct service practice should participate in these exercises. Unit commanders must be resourceful in initiating and adopting measures designed to provide maximum benefit from firing exercises to personnel of their command.
- (2) All personnel required to monitor, record, and evaluate the service practice, including personnel efficiency and equipment performance, are furnished from other than the participating group by commanders ordering the service practice.

*g. Materiel and Equipment.* The group is limited to that equipment authorized in TOE 6-630D, which does not provide additional equipment for monitoring, recording, and evaluating the service practice. Such equipment is provided by commanders ordering the service practice.

*h. Command to Cease Fire.*

- (1) A command or signal which will cause the operations in progress to cease may be given by any person in Government service when unsafe conditions such as the following are observed:
- (a) Individuals, vehicles, or aircraft are in field of fire.
  - (b) Malfunctioning of any fire control materiel or safety features thereof.
  - (c) Improper safety procedures are being employed.
- (2) All operations concerning the missile and fire control materiel will cease upon receipt of this command.

*i. Adaptation to Local Conditions.* Commanders may order that the provisions of this appendix be adapted to local conditions. However, modifications of Department of the Army regulations on safety should not be allowed except as provided herein.

*j. Scoring.* The group's performance is graded as indicated in ATT 6-630, Field Artillery Missile Group, Redstone.

*k. Personnel Errors.* After recording personnel errors for scoring purposes, umpires will insure that these errors are corrected prior to firing the missile. This procedure will limit the cause of impact errors to materiel and equipment deficiencies or malfunctions.

## Section II. RESPONSIBILITIES OF INDIVIDUALS

### 3. General

The discussion contained in FM 6-40 relative to responsibilities and duties of individuals in the conduct of service practice is applicable except as modified herein.

### 4. Commander Ordering Practice

The commander ordering practice—

a. Arranges for range facilities; coordinates security and clearances; and provides for missile warhead section, propellants, and maintenance support.

b. Specifies the date, time, and place of practice.

c. Appoints safety officers, umpires, and other officials as required.

d. Provides the chief umpire with necessary survey data with which to check the group survey.

e. Provides target information to the chief umpire sufficiently far in advance to allow computation and checking of firing data with which to compare that data subsequently computed by the group.

f. Provides the group with survey control.

g. Prescribes reports required.

### 5. Officer in Charge

The group commander acts as the officer in charge of firing.

### 6. Umpire Team

a. The chief umpire supervises the performance of duties prescribed for the umpire team and may also be assigned the duty of chief safety officer.

b. The umpire team—

(1) Performs duties and renders reports prescribed.

(2) Scores performance of unit personnel and equipment.

(3) Insures that personnel errors are corrected before missile is fired and that they are recorded for scoring purposes.

(4) Reports to chief umpire when unit is ready to fire.

(5) Provides necessary equipment and instruction to safety officers to enable them to fulfill their mission.

### 7. Group Commander

The group commander is normally designated as the officer in charge of firing. He—

a. Insures that organization training has advanced to prescribed standards prior to service practice.

b. Disseminates necessary information concerning practice in advance to his command.

c. Furnishes appropriate practice plans to umpires and officials.



d. Establishes unit standing operating procedure (SOP) on safety peculiar to the local situation, to include provisions for appointment of safety officers.

e. Establishes and enforces restrictions on personnel relative to movement in practice area.

f. Provides for the keeping of necessary records to aid in determination of firing proficiency, training progress, and equipment performance.

g. Assumes responsibility of "commander ordering practice" when his organization is operating independently.

h. Prepares reports for higher headquarters when prescribed. These reports should include recommendations for further training, modification of handling procedures, and doctrinal changes made apparent from service practice. Deficiencies noted during the exercises also should be included.

i. Conducts prompt critiques of the practice, to include personnel, equipment, and missile performance; results of post-attack analysis, if conducted; and discrepancies noted in the conduct of fire.

## 8. Firing Battery Commanders

The battery commanders—

a. Follow training directives, provisions of this appendix, and pertinent instructions relative to the exercise.

b. Maintain prescribed records relative to firing and forward required reports to group.

c. Supervise all activities pertaining to their respective batteries.

## Section III. SAFETY

### 9. General

A unit safety standing operating procedure (SOP) based on information contained in AR 385-63, SR 385-310-5, local directives, and this appendix must outline necessary precautions to be exercised in the handling, testing, transporting, and storing of missiles and associated equipment. Precautions to be observed in firing and detailed duties of safety personnel must also be included.

### 10. Safety Officers

The commander ordering service practice is responsible for the appointment of safety officers. One safety officer is appointed for each battery to fire in addition to a chief safety officer who may also be the chief umpire.

a. *Chief Safety Officer.* The chief safety officer—

(1) Is responsible for all phases of safety throughout the practice exercises.

(2) Instructs all safety officers in the performance of their duties.

(3) Coordinates with installation range officer, to include limits of danger area and safety limits.

- (4) Coordinates preparation of safety diagrams.
- (5) Determines when it is safe to fire.
- (6) Furnishes safety officers with safety limits of assigned firing area in written form. This may include a safety diagram or the coordinates outlining the approved impact area.
- (7) Receives report from chief umpire (when not acting in that capacity himself) when missile is ready to be fired and obtains authority from him to fire.
- (8) Authorizes issuance of the command to fire after assuring himself that all safety precautions have been taken.

*b. Safety Officers.* The safety officers—

- (1) Represent the chief safety officer (chief umpire) at each battery.
- (2) Take posts at assigned firing positions and check for proper laying of the missile, proper employment of electrical check-out procedures, and observance of proper procedures to avoid fire hazards.
- (3) Report to chief safety officer (chief umpire) when missile is ready to fire.

#### **Section IV. PHASES OF SERVICE PRACTICE**

##### **11. General**

The conduct of service practice includes four phases—preparation; reconnaissance, selection, and occupation of position (RSOP); firing; and post practice. Planning and operations requiring consideration during each phase are outlined in paragraphs 12 through 15 below.

##### **12. Preparation Phase**

The preparation phase includes—

- a.* Issuance of appropriate warning orders by commanders at all echelons.
- b.* Determination of range facilities, availability, and SOP.
- c.* Formulation of assumed tactical situation on which to base subsequent orders.
- d.* Determination of the data needed to evaluate the service practice and the selection of means to provide these data in a suitable form.
- e.* Coordination with the installation range officer to include matters concerning local range safety requirements.
- f.* Checking ground handling, fire control, and firing equipment for condition and adjustment.
- g.* Drawing missiles and warhead sections.
- h.* Checking laying equipment for condition and adjustment.
- i.* Determination of the time service practice is to start and its duration.
- j.* Completing details incident to reconnaissance, selection, and occupation of position.

- k. Determination of survey requirements.
- l. Making provisions for communication systems.
- m. Providing route markers.
- n. Establishing local security.

### **13. Reconnaissance, Selection, and Occupation of Position Phase**

The RSOP phase includes—

- a. Reconnaissance and selection of position.
- b. March discipline.
- c. Occupation of position.
- d. Organization of position. Organization includes—
  - (1) Construction of necessary field fortifications, revetments, and shelters.
  - (2) Organization and maintenance of rigid security measures.
  - (3) Exercise of strict camouflage discipline.
  - (4) Laying and final testing of launcher and missile.
  - (5) Determination of survey data.
  - (6) Preparation of missile.
- e. Simulated attacks on battery positions and motor parks.
- f. Simulated casualties requiring care and evacuation.

### **14. Firing Phase**

The firing phase includes—

- a. Computation of data.
- b. Conduct of firing procedures.
- c. Final preparations for firing.
- d. Proper execution of firing sequence.
- e. Maintenance of records.

### **15. Post-Practice Phase**

The post-practice phase includes—

- a. Police of area.
- b. Checking equipment.
- c. Cleaning and maintenance of equipment.
- d. Displacement.
- e. Reconnaissance of impact area.
- f. Post-attack analysis of fire.
- g. Scoring by umpire teams.
- h. Completing records and reports.
- i. Critique.

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