

*TB CML 73

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

**ROCKET, CHEMICAL, 115-MM, M55 (GB- AND
VX-FILLED) ROCKET, TRAINING, DUMMY, 115-MM, M60
AND
ROCKET, PRACTICE, SIMULANT EG, 115-MM, M61**

Headquarters, Department of the Army, Washington, D.C.
2 October 1963

SAFETY PRECAUTIONS

Personnel engaged in the handling, storage, and shipment of chemical agents and ammunition must observe the safety precautions described in TM 3-250 for the specific chemical agent involved.

1. Scope. This bulletin contains descriptions of three rockets authorized for use with the M91 115-mm multiple rocket launcher (TM 9-1055-215-12). Information on the use, functioning, shipment, storage, and destruction to prevent use by the enemy is included.

2. Use. The three rockets described herein are designed to be used as follows:

a. M55 115-mm Chemical Rocket. This rocket is used to cover a large-area target with a casualty agent either GB for a nonpersistent effect or VX for a persistent effect.

b. M60 115-mm Dummy Training Rocket. This rocket is used for training personnel in the techniques of loading rockets into the M91 multiple rocket launcher and preparing the rockets for firing (FM 6-54).

c. M61 115-mm Simulant EG Practice Rocket. This rocket is used for training personnel in the techniques of loading, preparation for firing, and firing of rockets from the M91 multiple rocket launcher.

3. Reports. Accidents involving injury to personnel or damage to materiel will be reported in accordance with AR 385-40. Accidents involving malfunction in combat or training will be reported in accordance with AR 700-1300-8.

4. Description. *a.* The M55 rocket (fig. 1) consists of a fin-nozzle assembly (1), a rocket motor (2), a filled (GB or VX) warhead (3), and a fuze (4)

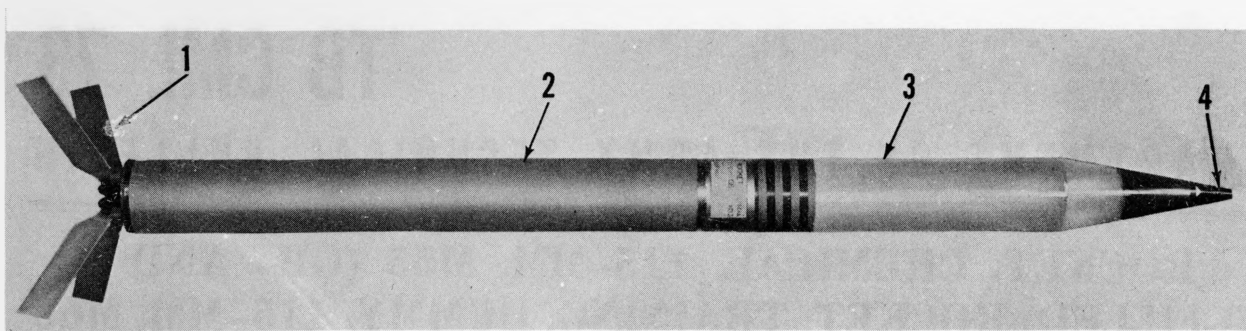
and adapter. Each rocket is packaged in an M441 shipping-and-firing container (fig. 2).

(1) *Fin-nozzle assembly.* The fin-nozzle assembly consists of a nozzle plate containing four nozzles. Four spring-loaded aluminum fins are attached to the nozzle plate. Lead wires from an electric squib in the igniter of the rocket motor project from one of the nozzles in the nozzle plate where they are readily available to the loader when the rear cap of the shipping-and-firing container is removed.

(2) *Rocket motor.* The rocket motor is a cylindrical steel tube containing an M67 double-base solid propellant and an igniter. The tube is threaded at each end to receive the warhead and nozzle plate of the fin-nozzle assembly. The propellant is designed so as not to present a high-explosive problem.

(3) *Warhead.* The warhead is an extruded aluminum cylinder with an ogival nose. A central burster tube, closed at the bottom and at the nose end, is welded to the body of the warhead. The tube runs from the nose to the base of the warhead and is threaded to receive the fuze. The burster tube contains two modified Composition B bursters.

*This bulletin supersedes TB CML 73, 20 April 1961, including C 1, 3 July 1962.



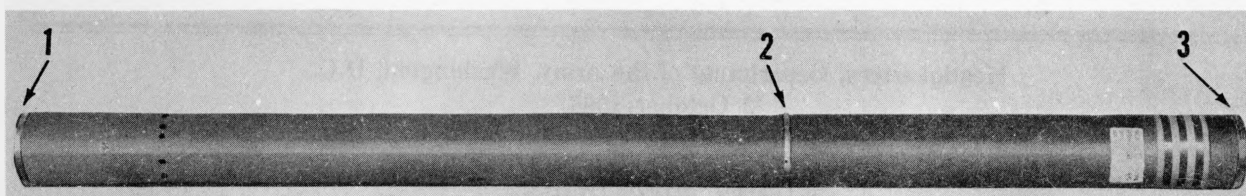
1. Fin-nozzle assembly

2. Rocket motor

3. Warhead

4. Fuze

Figure 1. Typical 115-mm rocket.

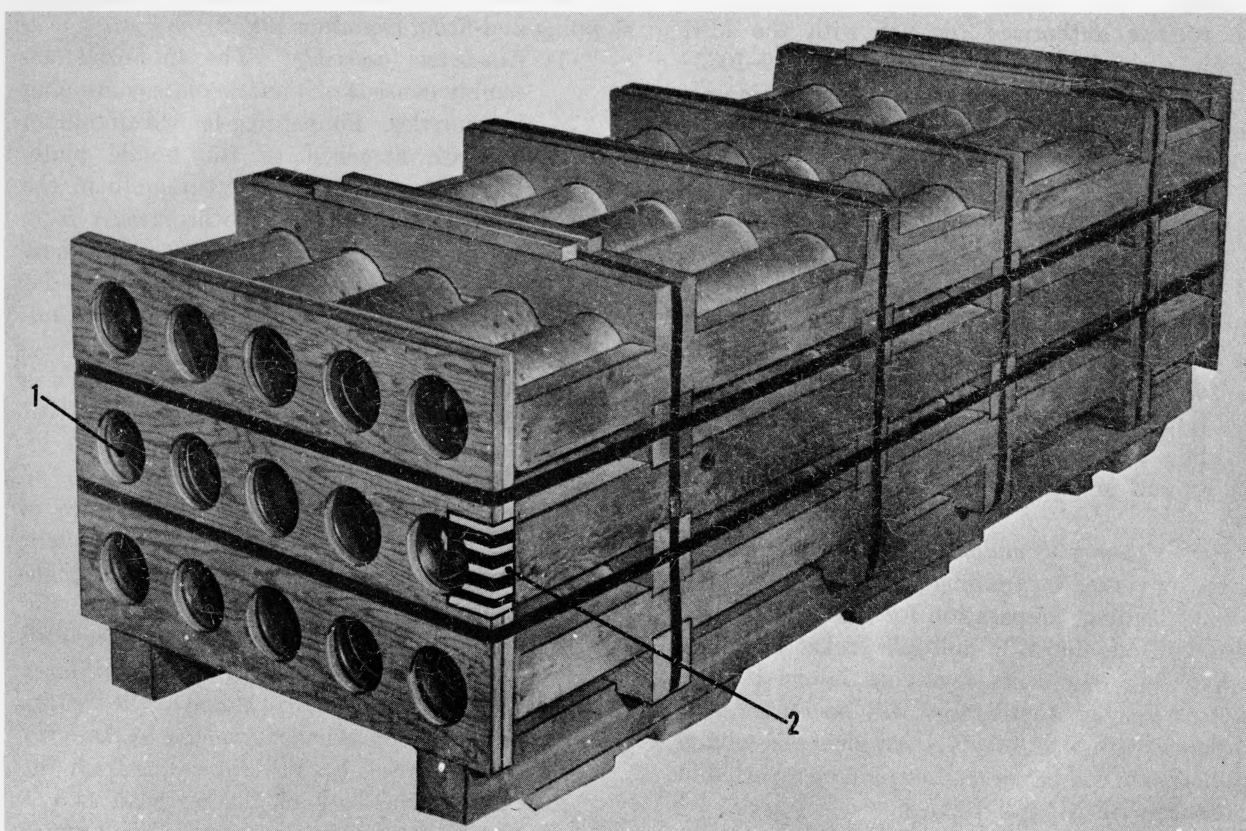


1. Rear end cap

2. Indexing ring

3. Front end cap

Figure 2. Typical shipping-and-firing container.



1. Opening

2. Decal

Figure 3. Wood crate.

- (4) *Fuze.* An M417 point detonating fuze is screwed into the fuze adapter of the M55 rocket.

b. The M60 dummy training rocket looks like the M55 rocket but consists of a warhead filled with simulant EG, a dummy fuze, a dummy burster, and a rocket motor in which inert material replaces the igniter and the propellant.

c. The M61 practice has the same components as the M55 except that the filling is simulant EG.

d. *M441 Shipping-and-Firing Container.*

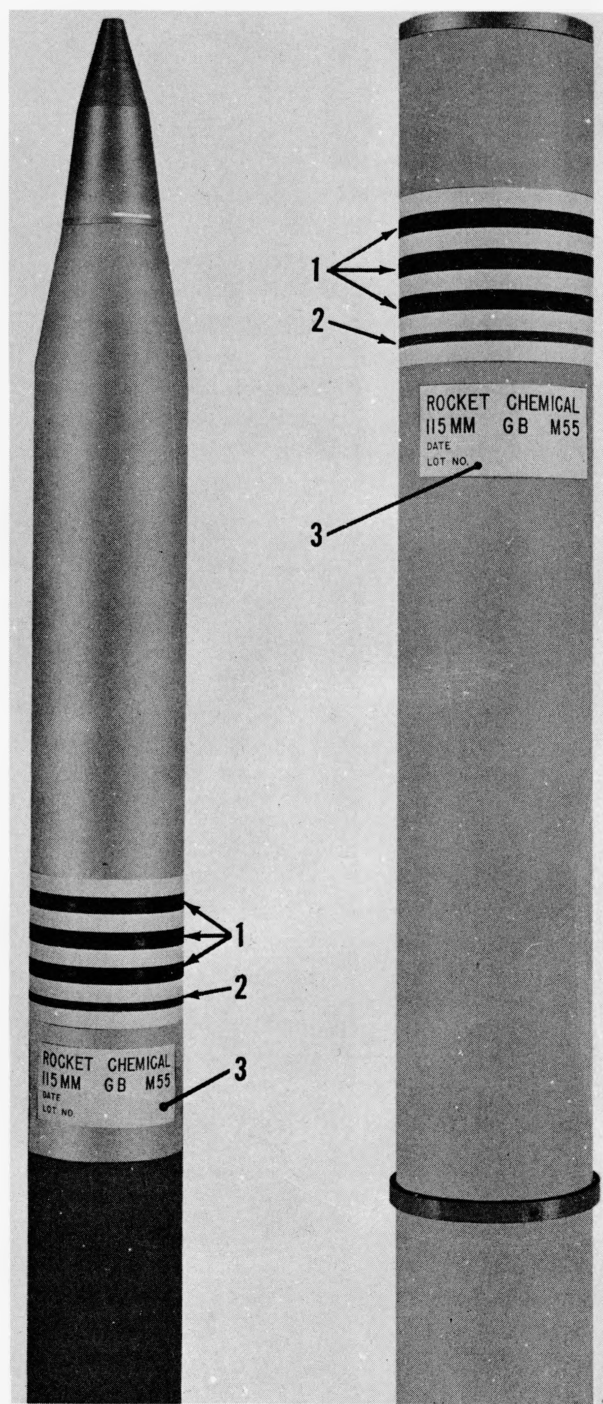
(1) Each rocket is supplied inside a shipping-and-firing container, which is made of fiberglass reinforced with plastic. The container is closed at each end with a removable cap (1 and 3, fig. 2). Each cap is fitted with a screwplug, which is removed only for testing during surveillance. An indexing ring (2) is used to lock the shipping-and-firing container in the cluster assembly of the M91 multiple rocket launcher.

(2) Fifteen rockets in their shipping-and-firing containers are packed in a wood crate (fig. 3). The end panels of the crate are provided with openings (1) to permit removal of the screwplugs in the end caps of each shipping-and-firing container.

5. Functioning. a. A 24-volt power source from a vehicle battery or the thermal cell in the remote firing box of the M91 launcher will fire the electric squib in the igniter assembly of the rocket motor. The igniter ignites the propellant. The burning propellant generates gases that are exhausted through the nozzles in the nozzle plate. The thrust developed by the exhaust propels the rocket to the target. The fuze functions on impact causing the burster to detonate and burst the aluminum body of the warhead.

b. When a GB-filled warhead is detonated, the agent is dispersed as a vapor and carried by the wind over the target area. When a VX-filled warhead is detonated, the agent is dispersed as an aerosol or liquid droplets in the vicinity of the impact area. When an M61 simulant EG practice rocket warhead is detonated, the filling is dispersed as an aerosol and dissipated as a harmless cloud.

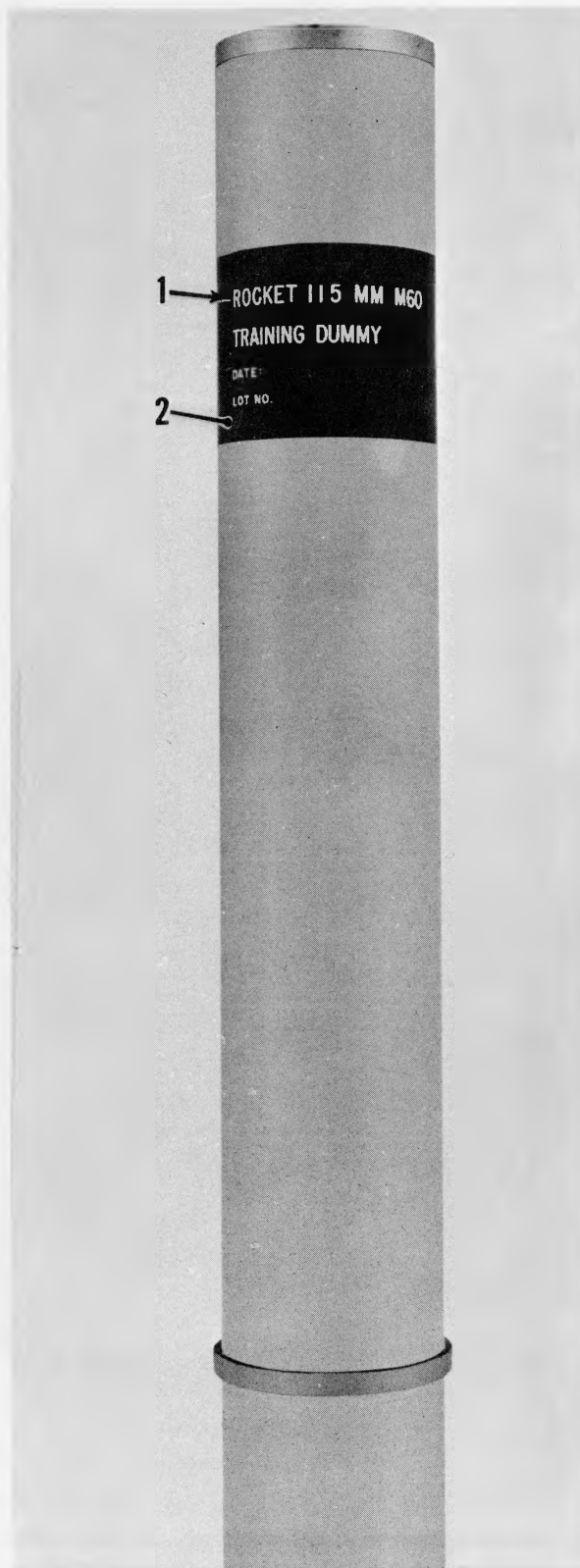
6. Identification. Each of the three rockets, the shipping-and-firing container, and the wood crate are color coded to identify the agent filling and the explosive component of the warhead. Decals are affixed to each rocket and shipping-and-firing container.



1. Green bands 2. Yellow band
3. Identification decal

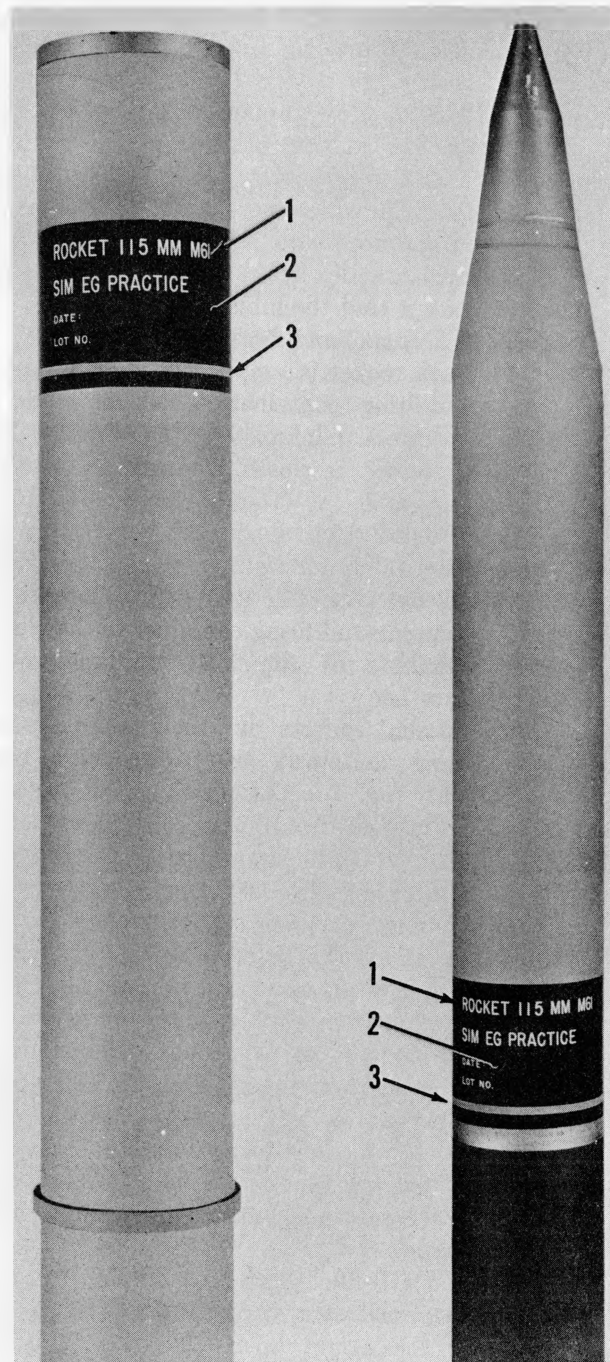
Figure 4. M55 115-mm chemical rocket.

a. *Chemical Agent-Filled Rockets.* The M55 rocket (fig. 4) is filled with either GB or VX. An identification decal is affixed to the warhead of each rocket and to the forward end of the shipping-and-firing container. The decal (3) contains the nomenclature, the symbol for the chemical agent, the manufac-



1. Nomenclature 2. Blue background

Figure 5. M60 115-mm dummy training rocket.



1. Nomenclature 2. Blue background
3. Yellow band

Figure 6. M61 115-mm simulant EG practice rocket.

turer's lot number, and the filling date. Both the rocket and shipping-and-firing container are further identified by a decal containing a $\frac{1}{4}$ -inch yellow band (2) and three $\frac{3}{8}$ -inch green bands (1) on a gray background.

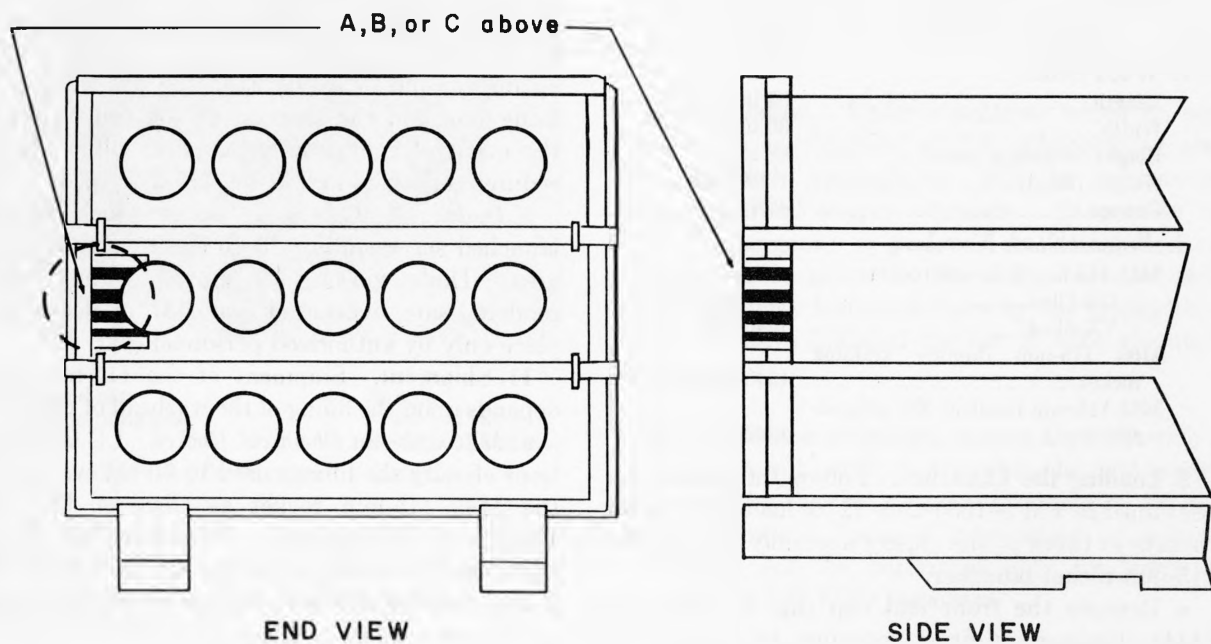
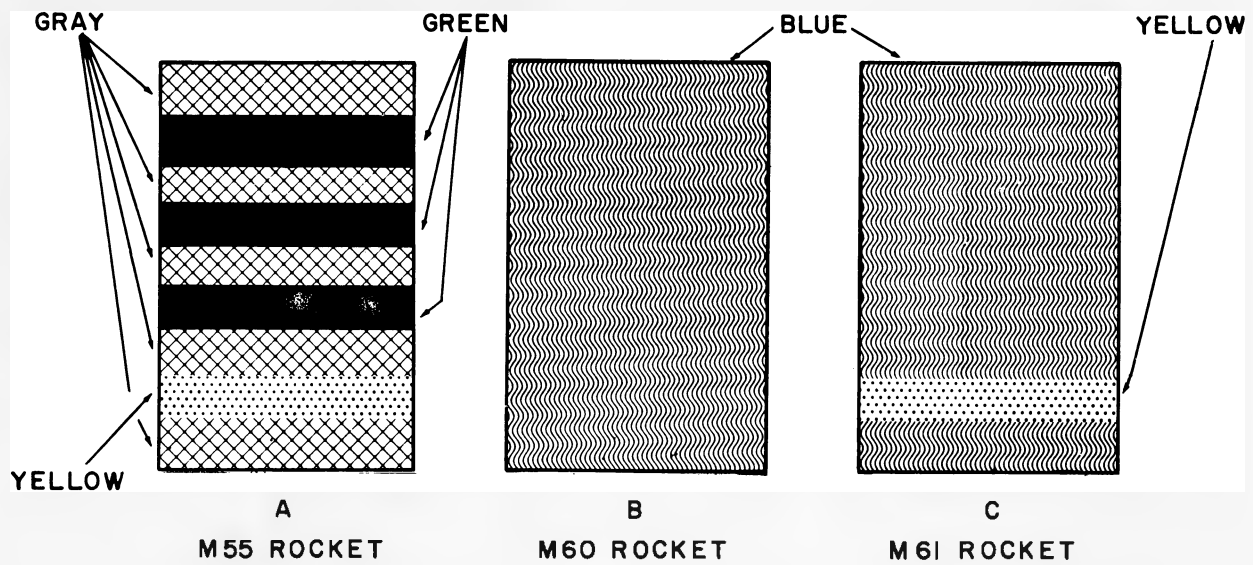


Figure 7. Wood crate identification.

b. Dummy Training Rocket. The M60 dummy training rocket (fig. 5) is a completely inert round and is readily identified by a blue decal (2) containing the nomenclature (1) stenciled in $\frac{3}{8}$ -inch letters affixed to the shipping-and-firing containers.

c. Simulant-Filled Rocket. The M61 rocket (fig. 6) is filled with simulant EG and contains a high explosive burster. An identification label containing a $\frac{1}{4}$ -inch yellow band (3) and the nomenclature (1) stenciled in $\frac{3}{8}$ -inch white letters on blue background (2) is affixed to the shipping-and-firing container.

d. Wood Crate. The wood crate (fig. 7) is identified by a distinctive decal on the end of each crate at the center tier of rockets. These decals identify the type of rocket packaged in the crate.

7. Tabulated Data. (All data are approximate.)

a. Rocket.

Length.....	78 in.
Diameter.....	4.5 in.
Weight.....	58 lb.
Range.....	3,000-12,000 m.

b. Shipping-and-Firing Container.

Length.....	82 in.
Diameter.....	4.9 in.
Weight	
Empty.....	16 lb.
Plus rocket.....	74 lb.

c. Wood Crate.

Length.....	83 in.
Width.....	30 in.
Height (including skids).....	28 in.
Weight (filled).....	1,350 lb.
Cubage.....	42.7 cu. ft.

d. Federal Stock Numbers.

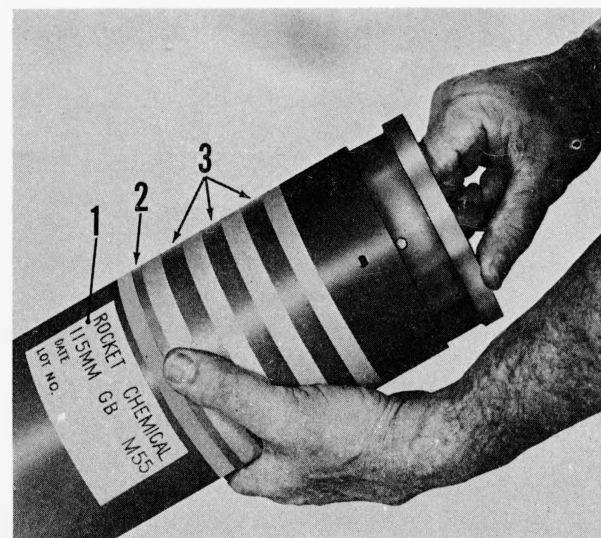
M55 115-mm chemical rocket	
GB-filled.....	1340-716-1450
VX-filled.....	1340-724-3567
M60 115-mm dummy training rocket.....	1340-861-9817
M61 115-mm simulant EG practice rocket.....	1340-858-5780

8. Loading the Launcher. Follow the procedures contained in TM 9-1055-215-12 for loading 115-mm rockets in tubes of the cluster assembly of the M91 115-mm rocket launcher.

a. Remove the front end cap (fig. 8) from the M441 shipping-and-firing container by raising the handle to an upright position, rotating the cap 90°, and then pulling the cap free from the container.

b. Remove the rear end cap in the same manner as the front end cap and detach the rocket motor ignition cable jack from the end cap.

c. Plug the lead wires from the igniter assembly into the proper tip jack on the cluster assembly of the M91 multiple rocket launcher.



1. Identification decal 2. Yellow band
3. Green bands

Figure 8. Removing front end cap.

9. Firing. The rocket is fired as described in TM 9-1055-215-12.

10. Misfires, Hangfires, and Duds. *a. Misfires and Hangfires.* A misfire is caused by the failure of the propellant or igniter booster to function. A hangfire is a temporary failure to function; this is, an unexpected delay between the operation of the firing box and the ignition of the propellant. In the event of a misfire or hangfire, follow the procedures contained in TM 9-1055-215-12.

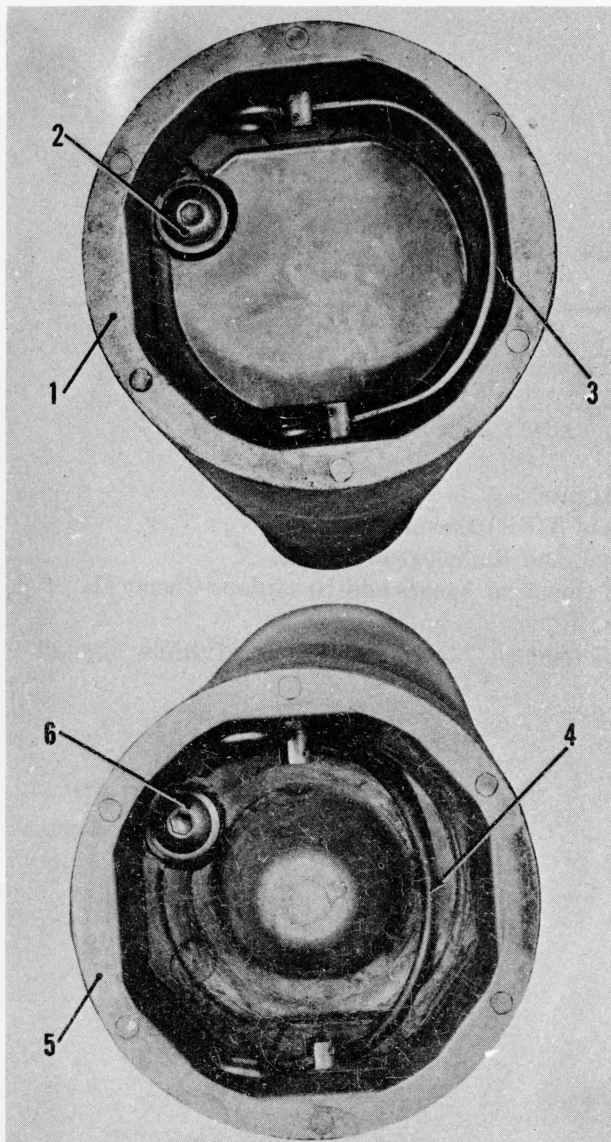
b. Duds. A dud is a rocket which although launched successfully fails to function in the target area. Duds will not be moved. They will be rendered safe, evacuated (par. 13), or destroyed in place only by authorized personnel (par. 14).

11. Shipment. Shipment of the 115-mm rocket depends upon the filling of the warhead of the rocket.

a. M55 115-mm Chemical Rocket. I.C.C. Regulations classify the fillings used to fill the warheads of the M55 115-mm rocket as Class A Extremely Dangerous Poisons and the rockets as Class A Chemical Ammunition, Dangerous Explosives. TM 3-250 provides detailed information on the shipment of chemical agents and ammunition by air, rail, or water.

b. M60 115-mm Dummy Training Rocket. There are no restrictions on the handling or shipment of this round.

c. M61 115-mm Simulant EG Practice Rocket. The M61 115-mm rocket is classified as a Class A Chemical Ammunition and must be handled and shipped as such (TM 3-250).



- | | |
|-----------------------|------------------------|
| 1. Rear end cap | 4. Handle |
| 2. Rear sampling plug | 5. Front end cap |
| 3. Handle | 6. Front sampling plug |

Figure 9. Front and rear end caps.

12. Storage. Storage criteria for the 115-mm rocket are dependent upon the filling of the warhead and the explosive component of the rocket.

a. M55 115-mm Chemical Rockets. These rockets are filled with nerve agents and are classified as Group A chemical agents (TM 3-250). Wood crates containing M55 115-mm chemical rockets should be stored in corbetta or igloo-type magazines located downwind from all inhabited areas. The downwind vapor hazard (TM 3-250) should be determined before the storage area is selected. All storage sites should be inclosed by fences to prevent unauthorized entry. All fences should be posted at 50-foot intervals with suitable warning signs. All magazines in which these rockets are stored must be marked to indicate that the magazine contains Class A chemical ammunition.

b. M60 115-mm Dummy Training Rocket. The M60 115-mm dummy training rocket is a completely inert round and may be stored in any area, warehouse, or shed which will provide protection from the weather.

c. M61 115-mm Simulant EG Practice Rocket. This round presents an explosive hazard due to the warhead burster, fuze, and rocket motor propellant. Igloo or corbetta-type magazines within quantity-distance factors for the high explosive components are recommended for storage of the M61 115-mm rocket.

13. Evacuation. Under conditions which do not involve the employment of toxic chemical agents, chemical-filled ammunition will be evacuated through normal supply channels. Evacuation in case of emergency is preferred to destruction of chemical ammunition in the field, because such destruction may lead to a claim by the enemy that our forces have initiated the use of toxic chemical agents.

14. Destruction to Prevent Enemy Use. Chemical ammunition will not be destroyed in the field except as directed by the theater army commander. When orders to destroy chemical ammunition are issued, destruction will be performed only by specially trained chemical EOD personnel.

APPENDIX

REFERENCES

AR 75-15	Responsibilities and Procedures for Explosive Ordnance Disposal.
AR 385-40	Accident Reporting and Records.
AR 700-1300-8	Malfunctions Involving Ammunition and Explosives.
FM 6-54	115-mm Area Toxic Rocket System.
TM 3-215	Military Chemistry and Chemical Agents.
TM 3-220	Chemical, Biological, and Radiological (CBR) Decontamination.
TM 3-240	Field Behavior of Chemical Biological, and Radiological Agents.
TM 3-250	Storage, Shipment, and Handling of Chemical Agents and Hazardous Chemicals.
TM 3-304	Protective Clothing and Accessories.
TM 9-1055-215-12	Operator and Organizational Maintenance Manual: 115-mm Multiple Rocket Launcher, M91.

By Order of the Secretary of the Army:

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NG: State AG (3); units org under TOE's 7-2, 17-2 (1).

USAR: Same as active Army except one (1) copy to each unit.

For explanation of abbreviations used, see AR 320-50.

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