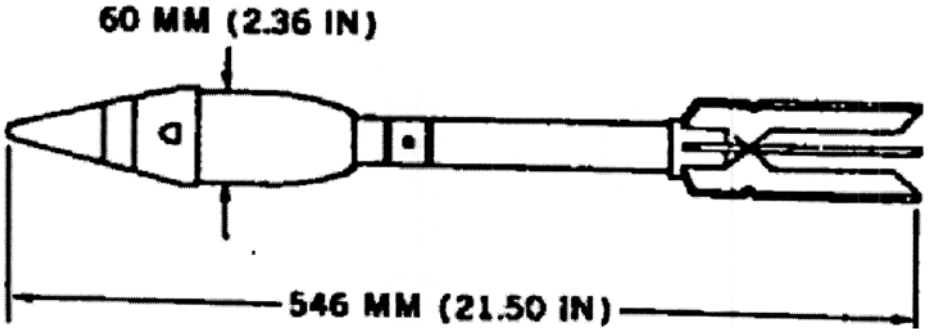
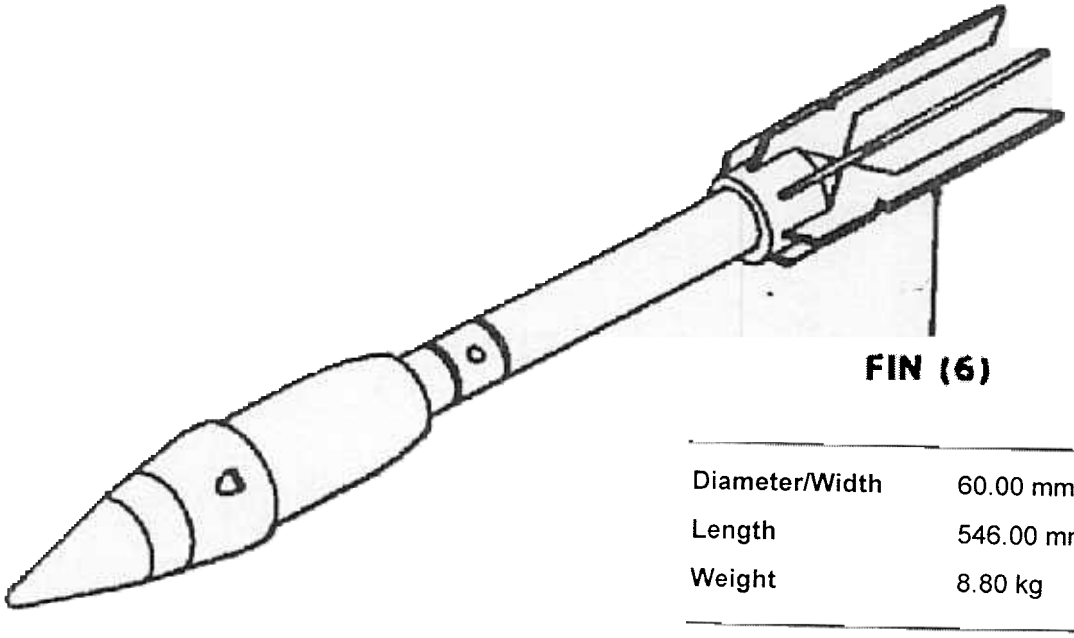
APPENDIX C

Figures of OE Items

U.S. ROCKET, 2.36-INCH, AT, PRACTICE, M7A1





Diameter/Width	60.00 mm
Length	546.00 mm
Weight	8.80 kg

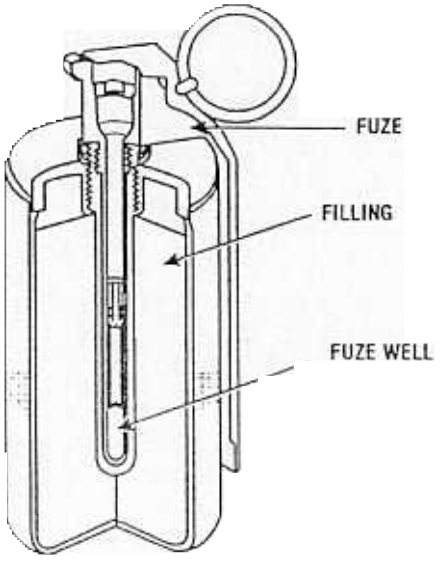
Explosive Type	NONE
Net Explosive Weight	Not Available

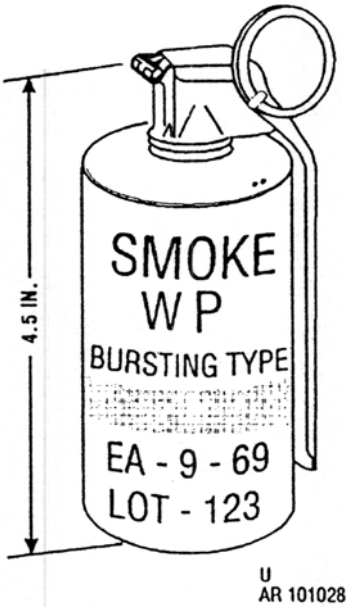
You can transport the munition to the disposal area.

Detonation not required.

The practice rounds are similar to their accompanying service rounds, except that they are inert-loaded and have a dummy fuze or steel weight to fill the empty fuze space. The warhead is made of steel.

GRENADE, HAND: SMOKE, WP, M15





Type Classification:

Obs. MSR 11756003

Use:

WP smoke hand grenade M15 is a bursting type grenade used for signaling, screening and incendiary purposes.

Description:

The grenade body is of sheet steel and is cylindrical in shape. The body has a fuze well liner and is filled with WP.

The screening effect of the smoke is limited because WP burns with such intense heat, the smoke tends to rise rapidly. Pieces of WP will burn for about 60 seconds, igniting any flammable substance contacted.

The hand grenade M206A1 and M206A2 are pyrotechnic delay-detonating fuzes. They differ only in body construction. The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, and a detonator assembly. The split end of the safety pin has an angular spread or a diamond crimp.

Safety clips are not required with these grenades.

Tabulated Data:

Grenade (with fuze):	
Model(s)	M15
Body	Sheet metal
Weight	31 oz
Length (max)	4.5 in.
Diameter	2-3/8 in.
Color	Grey w/1 yellow band and yellow markings
Filler:	
Type	WP
Weight	15 oz
Fuze:	
Model(s)	M206A1, M206A2
Type	Pyrotechnic delay-detonating
Primer	M42
Detonator	Lead azide, lead styphnate, RDX
Delay time	4-5 seconds
Weight	2.6 oz
Length	4.3 in.
Color	Olive drab w/black markings
Packing	N/A
Safety device	Pull ring and safety pin

Federal Supply Code:

NSN ---------- 1330-00-219-8510
DODAC---------- 1330-G935

Unit of Issue:

Each grenade packed -------- 1 per container

Packing Data:

*Packing box:
Weight (with contents)---- 46.0 lb
Dimensions ---------- 14.0 in. x 12.5 in. x 8.0 in.
Cube ---------- 0.80 cu ft

*NOTE: See DOD Consolidated Ammunition Catalog for additional information including NSNs.

Shipping and Storage Data:

Hazard class/division and storage compatibility group ---------- (04) 1.2H
UNO serial number ---------- 0245
UNO proper shipping name---------- Ammunition, smoke, white phosphorus
DOT class---------- Class A explosive
DOT marking ---------- HAND GRENADES

Functioning:

Removal of the safety pin permits release of the safety lever. When safety lever is released, it is forced away from the grenade body by a striker acting under the force of a striker spring. The striker rotates on its axis and strikes the percussion primer. The primer emits a small, intense spit of flame, igniting the delay element. The delay element burns for 4 to 5 seconds, then sets off the detonator. The detonator explodes rupturing the body and exposing the WP filler to air. The WP will burn approximately 60 seconds.

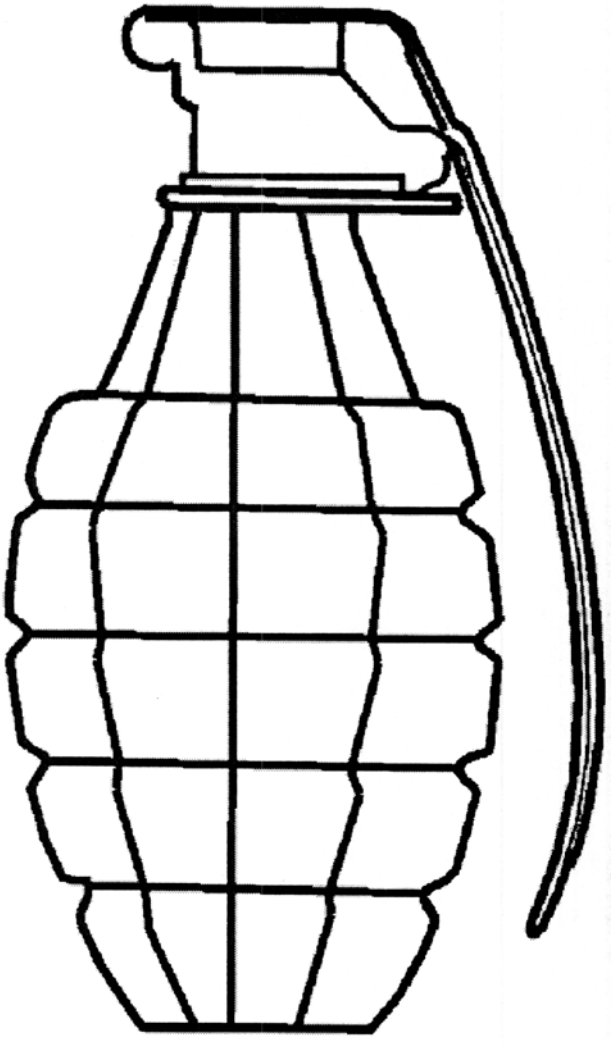
References:

TM 9-1330-200
TM 9-1330-200-12
TM 9-1330-200-34
FM 23-30

Drawings:

Assembly---------- 13-19-18
Fuze (M206A1) ---------- 82-1-104
Fuze (M206A2) ---------- 7548570
Packing (inner) ---------- 13-9-44
Packing (outer) ---------- 13-9-96

U.S. GRENADE, PRACTICE, MK II(2)



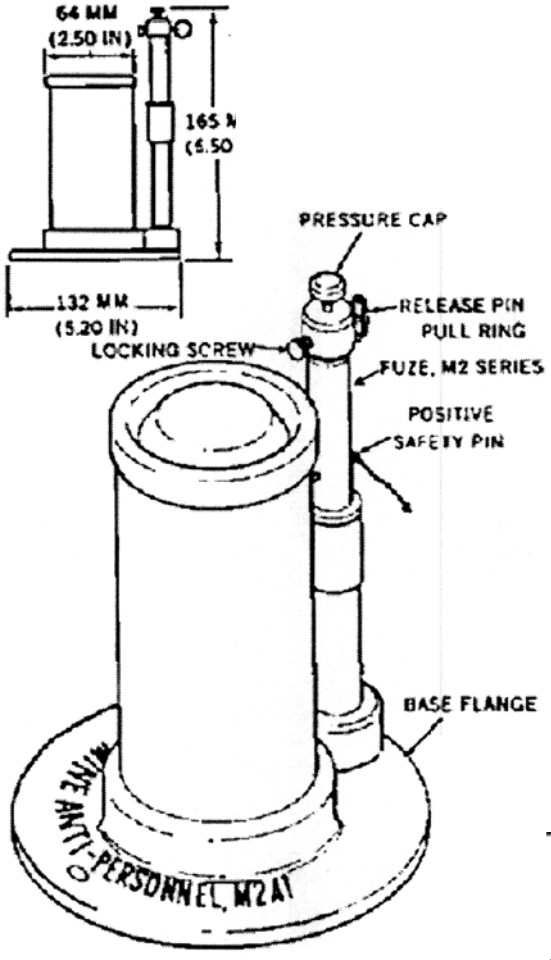
Country of Origin	United States
Diameter/Width	57.15 mm
Length	114.30 mm
Weight	580.61 g
Explosive Type	Black Powder
Net Explosive Weight	28.35 g

Do not transport.

Disposal by detonation.

This grenade consists of a fragmentation body with a filing hole in the base, an Igniting Fuze M206, a small charge of black powder, and a cork plug in the filling hole. Extra fuzes, charges, and plugs are supplied separately, so that the grenade body can be reused. The body is light blue. The body is cast iron.

U.S. FLARE, TRIP, M48



M2
EXTERNALLY IDENTICAL TO
M2A1, M2A1B1, M2A2

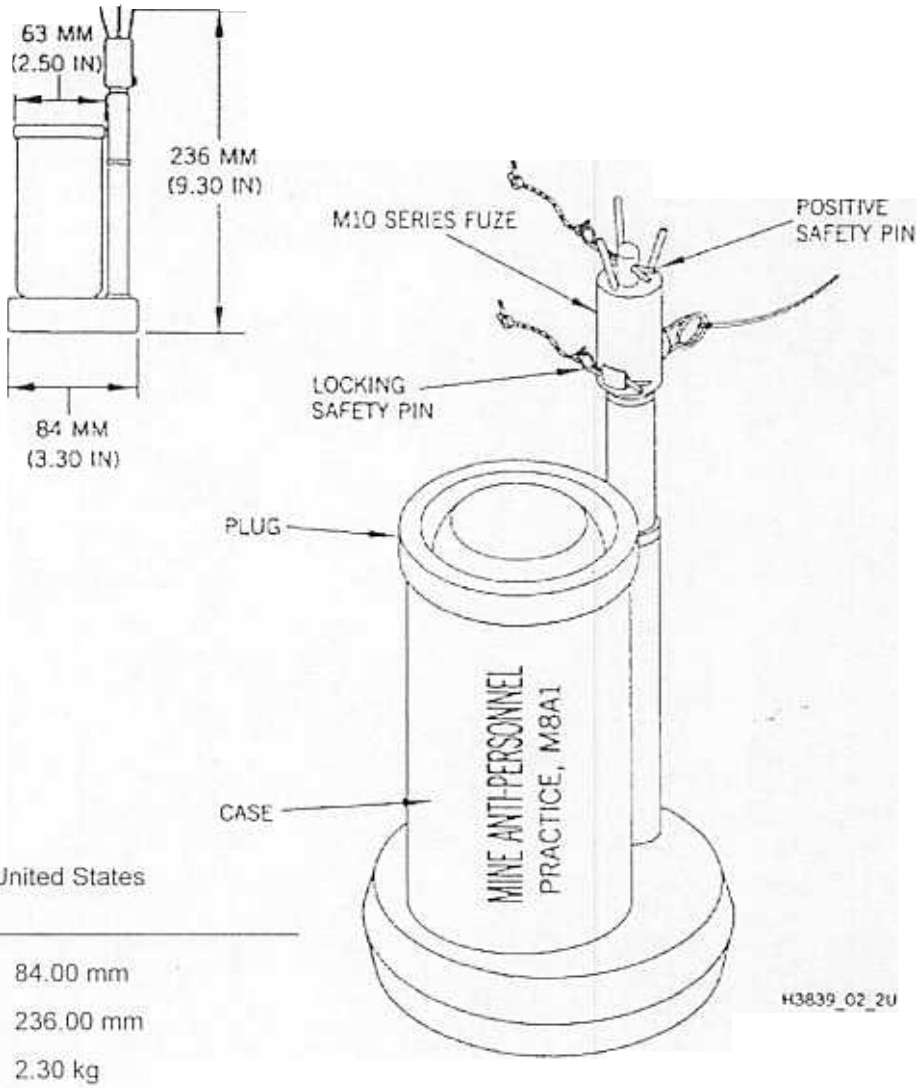
Country of Origin	United States
Diameter/Width	63.50 mm
Length	Not Available
Weight	Not Available
Explosive Type	Signal Composition, Gr
Net Explosive Weight	1.00 g

Do not transport.

Disposal by detonation.

The flare is used to give warning of enemy marauders or infiltrating hostile troops; also for illuminating or signaling. The case is White to yellowish. The flare consists of a 1/4-inch pipe and a steel tube approximately 2.5 inches in inside diameter, which are attached to a base plate that contains a 75-grain propelling charge. The steel tube contains a delay fuse, an expelling charge, a candle, and a parachute assembly. The 0.25-inch pipe and the firing mechanism are joined by a coupling, and the pipe is threaded to the base plate. The firing train is composed of a primer, an igniter, and a relay charge. The firing mechanism contains the pressure cap, pull ring and pin, safety screw, safety cotter pin, and spring-loaded firing pin.

U.S. LANDMINE, PRACTICE, M8



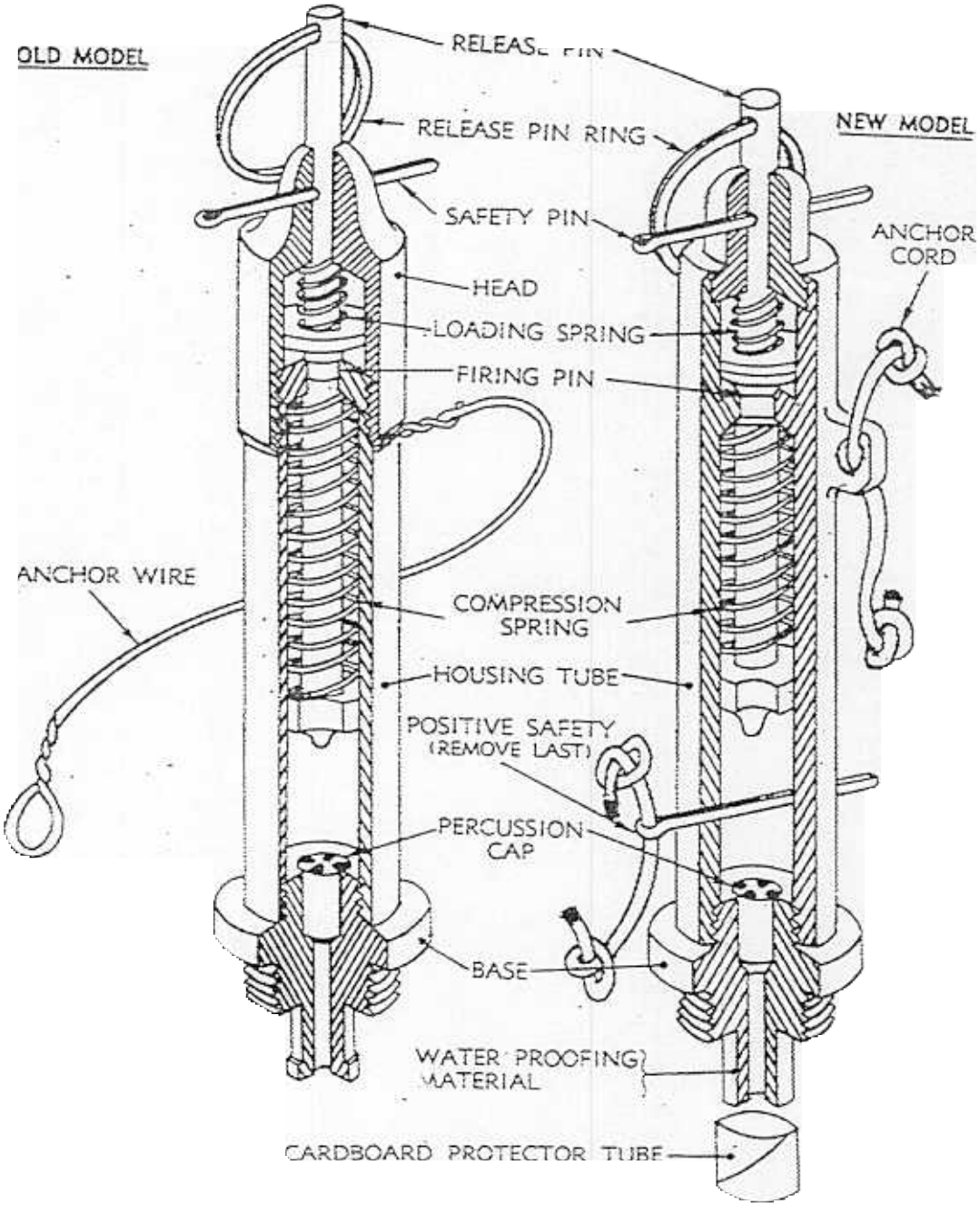
Country of Origin	United States
Diameter/Width	84.00 mm
Length	236.00 mm
Weight	2.30 kg
Explosive Type	Black Powder
Net Explosive Weight	11.00 g

Do not transport.

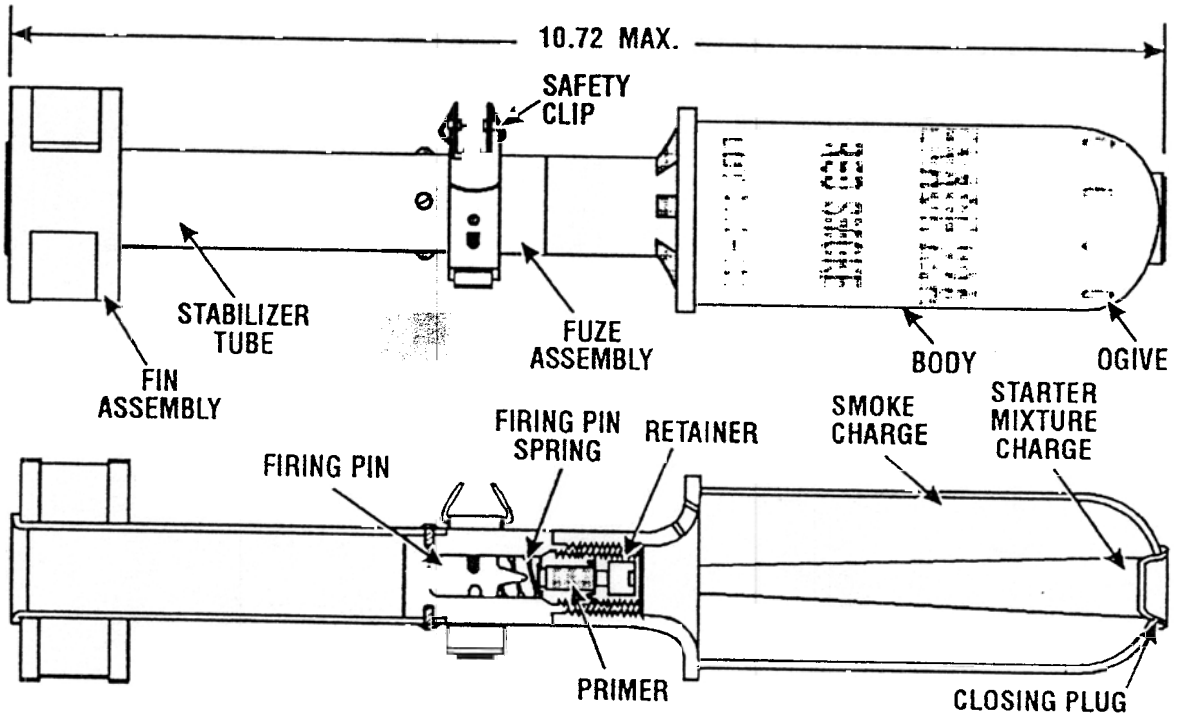
Disposal by detonation.

The figure shows the appearance and dimensions of the M8 and M8A1 practice mines which simulate operation of the M16 series service mines. These are sound and smoke producing mines actuated by an M10, M10A1 (M8 mine), or M10A2 (M8A1 mine) combination pull/pressure fuze. These mines and fuzes are painted blue with markings stenciled in white. The case is steel.

MALL A. M: AND TRENCH WA A



GRENADES, RIFLE: SMOKE, GREEN, RED, VIOLET OR YELLOW, M22 AND M22A2



Type Classification:

Obs. MSR 11756003

Use:

For signaling and for laying smoke screens. Produces green, red, violet or yellow smoke.

Description:

The M22 and M22A2 consist of three basic parts: a steel stabilizer assembly, an integral fuze and a body. The fuze is a mechanical impact-igniting type. The body is filled with a burning-type smoke charge which contains a dye to color the smoke. The surfaces of the smoke charge within the body are coated with a starter mixture charge to facilitate ignition. A small opening or air hole in the nose of the ogive is covered by a nose closing plug.

Difference Between Models:

The M22 and M22A2 grenades differ only in minor features.

Tabulated Data:

Model(s)	M22 or M22A2
Type	Smoke (colored)
Weight	1.26 lb
Dimensions:	
Diameter	1.8 in.
Height	10.72 in.
Charge (a mixture of baking soda, potassium perchlorate, sugar and a dye to color the smoke)	0.4 lb
Body	Sheet steel
Fuze	Integral
Type	Mechanical impact igniting
Color	Light green w/color of smoke produced painted on body union; black marking
Packing	1 per container; 10 containers per packing box

Federal Supply Code:

NSNs:

Green	1330-00-935-6122
Red	1330-00-541-9884
Violet	1330-00-618-5779
Yellow	1330-00-541-9883

DODACs:

Green	1330-G995
Red	1330-H010
Violet	1330-H020
Yellow	1330-H035

See DOD Consolidated Ammunition Catalog for additional information.

Unit of Issue:

Each grenade packed	1 per container, 10 containers per packing box.

Packing Data:

Loaded packing box:

Weight	31.5 lb
Dimensions	19.0 in. x 6.5 in. x 14.625 in.
Cube	1.05 cu ft

Shipping and Storage Data:

Hazard class/division and storage compatibility group	1.4G
UNO serial number	0303
UNO proper shipping name	Ammunition, smoke
DOT class	Class C explosive
DOT marking	SMOKE GRENADES, HANDLE CAREFULLY - KEEP FIRE AWAY

Functioning:

Colored smoke rifle grenades M22 and M22A2 function on impact, emitting a cloud of colored smoke for approximately one minute. After being fired from a rifle equipped with a grenade launcher, these grenades function as follows:

The grenade ogive strikes the ground or other resistant object.

Inertia of the firing pin overcomes spring tension and the firing pin strikes the primer.

The primer emits a small, intense spit of flame.

Flame from the primer ignites the starter mixture charge.

The burning starter mixture charge ignites the smoke charge.

The smoke charge burns for approximately 1 minute, emitting a dense cloud of colored smoke through holes in the base of the body.

References:

TM 9-1330-200
TM 9-1330-200-12
TM 9-1330-200-34
FM 23-30
DOD Consolidated Ammo Catalog

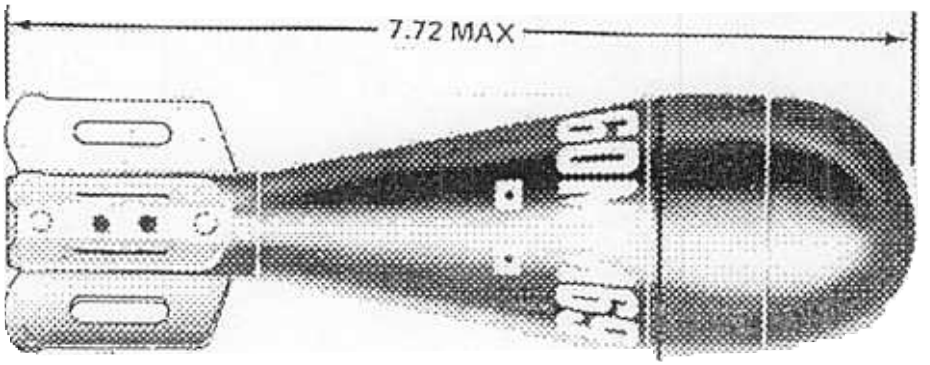
Drawings:

Assembly	82-0-117
Fuze (integral with body)	82-2-41
Packing (inner)	9227347
Packing (outer)	9227348

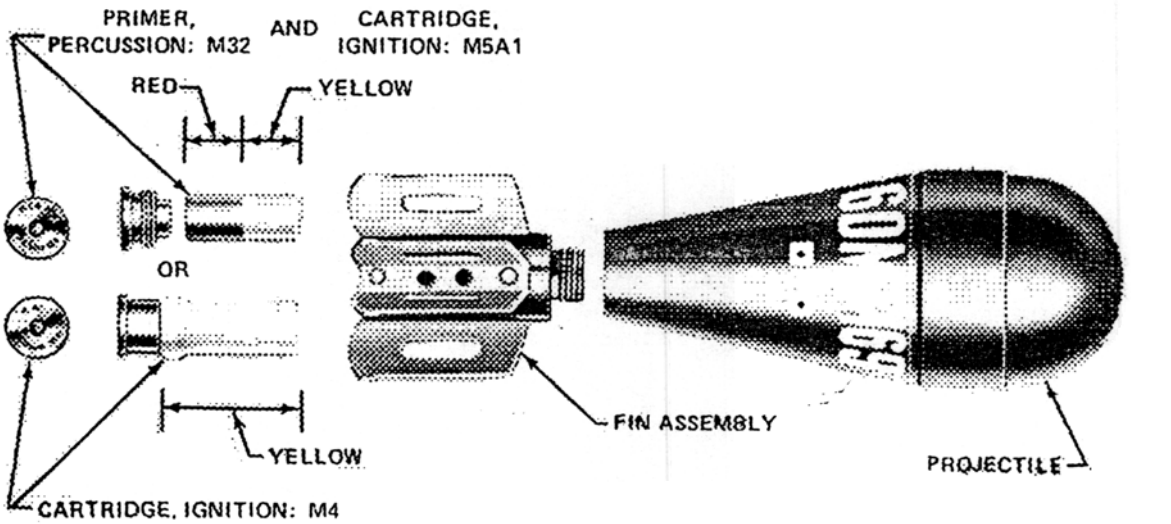
Remarks:

Colored smoke rifle grenades M22 and M22A2 have a range of over 200 meters. Colored smoke rifle grenades M22 and M22A2 are similar to appearance to WP smoke rifle grenade M19A1 but are somewhat smaller.

CARTRIDGE, 60 MILLIMETER: TRAINING, M69



AR199510



AR199509

Type Classification:

Std OTCM 37119, dtd 1959.

Us

This cartridge is used for training in the loading and firing of 60mm mortars M2 and M19.

Description:

Unlike other mortar ammunition, the components of this round are issued separately. This facilitates replacement of damaged, worn, or expended parts. The complete round consists of an inert projectile, a fin assembly, an ignition cartridge, and a percussion primer. The pear-shaped, cast iron projectile has no provision for a fuze and is internally threaded at the base to accept the fin assembly.

Functioning:

When the cartridge is loaded, it slides down the mortar tube until the percussion primer in the ignition cartridge strikes the firing pin in the base cap of the mortar. The primer detonates the ignition cartridge. Since this round is fired only at Charge 0, the gases from the ignition cartridge expel the projectile from the mortar tube and propel it to the target. The projectile is fin-stabilized in flight. Since the cartridge is inert, there is no detonation upon impact and the cartridge may be recovered for reuse.

Tabulated Data:

Complete round:	
Type	Training
Weight assembled	4.43 lb
Length assembled	7.72 in.
Projectile:	
Body material	Cast iron

Color:	
Old mfg	Black or blue w/white markings
New mfg	Bronze w/white markings
Filler and weight	Inert
Components:	
Ignition cartridge	M5A1 or M4 (complete)
Propellant charge	None
Percussion primer	M32
Fin assembly	M5 (or modified M2)
Fuze	None

Temperature Limits:

Firing:	
Lower limit	-40°F (-40°C)
Upper limit	+125°F (+51.7°C)
Storage:	
Lower limit	−80°F (for period not more than 3 days) (-62.2°C)
Upper limit	+160°F (for period not more than 4 hr/day) (+71.1°C)
*Packing	A training kit used in the field holds 10 training cartridges and accessories

*Packing Box:	
Weight	65 lb
Dimensions	21-7/16 x 18-5/16 x 7-27/32 in.
Cube	1.4 cu ft

*NOTE: See DOD Consolidated Ammunition Catalog for complete packing data including NSN's.

Shipping and Storage Data:

Quantity-distance class	N/A
Storage compatibility group	N/A
DOT shipping class	N/A
DOT designation	AMMUNITION FOR CANNON WITH INERT PROJECTILES
DODAC	1310-B629
Drawing number	9222994

Ballistics:

Charge	0
Muzzle velocity	46.4 mps (152.24 fps)
Maximum range	193 m (211.14 yd)

Limitations:

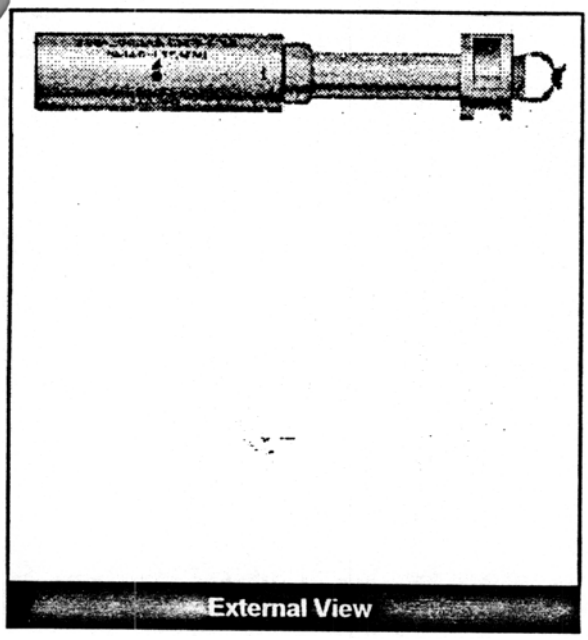
This round is to be fired at Charge 0 only.

Reference:

TM 9-3071-1
TM 9-1015-215-10

Munition Information: Description

U.S. SIGNAL, 1.6-IN, GROUND, WHITE STAR M17 - M33



External View

Country of Origin	United States
Diameter/Width	40.64 mm
Length	152.40 mm
Weight	Not Available
Explosive Type	Pyrotechnic Composition
Net Explosive Weight	Unknown

You can transport the munition to the disposal area.

Disposal by detonation.

The signal is assembled in a cylindrical case, and equipped with a finned tail assembly for stabilization purposes. The primer is located in the head of the signal, and the propelling charge is contained in a small cavity under the head. The end opposite the primer is closed by a press-fit cap to which the tail assembly is attached. The signal has a solid tail stem and an X-shaped fin. Embossed letters on the fin indicate the color and type of star(s). Pyrotechnic compositions are complex chemical mixtures. On burning, they produce illuminations ranging in intensity from the "dark fire" used as an element of blinker signals to the brilliant flash produced by the photoflash bombs. Standard pyrotechnics, in general, consist of compounds to provide oxygen for burning, such as chlorates and nitrates; aluminum or magnesium for fuel; salts of barium, copper, or strontium for color; and agents such as asphalt and paraffin for binding and waterproofing. Pyrotechnics usually functions by means of an igniter train. In general, ignition is initiated by a primer mixture and intensified by a "first-fire" composition which ignites the luminous candle. The body is made of cardboard.

APPENDIX D

M2 Parcel Field Reconnaissance Memo

and

Field Notes from Site Investigation for Other Hazardous Constituents

D.2.4 *Ordnance Distribution.* All previous investigations in and around the M2 Parcel indicate it was used for training with OE practice items and training aids. Any OE or ordnance related scrap that resulted from this activity would be expected to be located primarily on the ground surface or within the upper 2 feet of subsurface. This distribution of the OE increases the risk of individuals encountering OE.

D2.5 *Ordnance density.* Previous investigations adjacent to the M2 Parcel indicate that a low density of OE would be expected to be located within the M2 Parcel. The geophysical data that was collected from the M2 Parcel indicates 100 to 200 subsurface anomalies per acre will be encountered. Based on the EE/CA and Removal Action being conducted on areas contingent to this property, approximately 10-20 percent of these items are OE. This creates a low risk of incidental hunters and hikers encountering OE. However, it is anticipated that future uses would include construction activities. This significantly increases the risk of encountering OE.

D2.6 *Ordnance Sensitivity.* A list of potential OE items that may be encountered at the site is listed in Table 1.1. If expended, these items have no explosive hazard associated with them. If unexpended, most of these items will have a small explosive hazard associated with it. In addition, unexpended items containing smoke or White Phosphorus are also an incendiary hazard. The most sensitive of these would be an item containing White Phosphorus which ignites immediately upon exposure to air. Although the risk of death to an individual due to detonation of one of these items is very low, there is a risk of serious injury to an individual who is in very close proximity to an item when detonated or ignited.

D2.7 *Individual Behavior.* All hunters who obtain permits to hunt at FMC are required to attend safety training to increase awareness associated with the potential of encountering OE at FMC and the appropriate actions to take when this happens. This significantly lowers the risk of an OE accident for these individuals. However, other individuals who may access the M2 Parcel without authorization may be unaware of the potential OE and its associated hazards. Human nature is to closely examine an unfamiliar item in order to identify it. This increases the likelihood that someone may pick an item up to try to identify it. This increases the risk of detonation or ignition of an unexpended OE item in close proximity to an individual.

D2.8 *Institutional Behavior.* The FMC Transition Operations Center attempts to protect all individuals from exposure to OE or potential OE accidents through training, signage, fencing, and remediation of OE hazards. In addition, FMC has communicated openly with the public the potential hazards associated with this property, to include delay of transfer of property potentially containing OE until the hazards can be mitigated. However, the installation encompasses approximately 19,000 acres of which several acres are open to public access. This makes it impossible to completely monitor all access if individuals accidentally or purposefully bypass these controls. Although these controls cannot eliminate all risk of a potential OE accident, they do significantly reduce that risk.

D.3 EVALUATION OF PROTECTIVENESS OF ALTERNATIVES

D.3.1 *Alternative 1- No DoD Action Indicated* did not reduce any of the risks associated with OE at the M2 Parcel and is not considered protective of the public.

D3.2 *Alternative 2- Land Use Controls* does reduce the risks associated with most of these factors, although on its own it does not reduce the risk enough to permit the future commercial development of the property without additional risk reduction. However, LUCs in the form of education of site workers on the potential OE hazards that may be associated the property and identification of proper notifications to take if any OE is encountered are considered essential for all property of this nature.

D3.3 *Alternative 3- Construction Support* does reduce risks associated with the future use of this property, however it is not considered protective of the public under its current use.

D3.4 *Alternative 4- Surface and Subsurface Removal of OE with Land Use Controls* significantly reduces all risks associated with this property.

CONCLUSIONS

The risk associated with the M2 Parcel was evaluated based on eight factors that contribute to the likelihood of exposure to OE and a potential for an OE accident. *Alternative 4- Surface and Subsurface Removal of OE* does significantly reduce the exposure to OE and the potential for an OE accident. Implementation of the recommended alternative in conjunction with LUCs in the form of education of site workers on the potential OE hazards that may be

associated the property and identification of proper notifications to take if any OE is encountered will result in the property being safe for the intended land use.

APPENDIX E

COST ANALYSES

ITEM	Mag & Flag Rate	Digital Mapping Rate	UNIT	Quantity	"Mag" & "Flag"	Digital Mapping
Tasks						
Surveying	$ 500.00	$ 500.00	acre	20	$ 10,000	$ 10,000
Brush clearing	$ 1,000.00	$1,000	acre	20	$ 20,000	$ 20,000
Geophysical Mapping	$ -	$1,500	acre	20	$ -	$ 30,000
Clearance	$ 2,500.00	$ 1,500.00	acre	20	$ 50,000	$ 30,000
Engineering	$12,500.00	$ 15,000.00	LS	1	$ 12,500	$ 15,000
Travel	$25,000	$30,000	LS	1	$ 25,000	$ 30,000
Equipment	$ 7,500.00	25,000	LS	1	$ 7,500	$ 25,000
Total					$ 125,000	$ 160,000