Ens. Charles Wm Guier, Jr

PROJECTILES AND FUZES

April, 1943

1. This publication has been compiled by the joint effort and cooperation of the staffs of the U.S. Navy Bomb Disposal School, Navy Yard, Washington, D.C. and the U.S. Army Bomb Disposal School, Aberdeen Proving Ground, Aberdeen, Maryland.

2. Permission to publish information regarding U.S. Navy Projectiles and Projectile Fuzes has been authorized in a letter (PLd) A7-3 dated 8 March, 1943, from The Chief of the Bureau of Ordnance.

3. It is of vital importance to Bomb Disposal personnel that they have the most complete and accurate information on all projectiles and fuzes. Therefore, it is requested that this school be notified immediately of any corrections or additions to this publication.

D. L. Kauffman
Lt. Comdr., U.S.N.R.
Officer-in-Charge

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SECTION 2
PART A

U.S. ARMY
PROJECTILES

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PART A

U.S. ARMY
PROJECTILES

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INTRODUCTION

PURPOSE:

This manual is so designed as to give the Bomb Disposal Officer all the required data on U.S. Army projectiles and the operation of the fuzes.

SCOPE:

All service ammunition from 20 mm. through 16 inch projectiles, "STANDARD AND LIMITED STANDARD", are covered in the text.

A. GENERAL.

Ammunition for artillery can be divided into three types:- Fixed semi-fixed and separate loading.

1. Fixed ammunition consists of all the component parts, assembled together, necessary to propel it from the piece and function it at the desired point. These parts normally are the primer, the propelling charge, the propellant container (cartridge case), the fuze, the booster, the shell and the filler in the projectile.

2. Semi-fixed ammunition consists of the same component parts as listed above, but the propelling components can be removed from the projectile. To do this, the cartridge case opening is made sufficiently larger than the projectile so as to form a sliding fit.

3. In separate loading ammunition, the breech of the piece take the place of the cartridge case and the propellant, packed in cloth bags, is placed in the breech after the projectile has been seated in the barrel. The primer, in separate loading ammunition, is usually placed in a recess in the breech block after the other components have been loaded.

B. SERVICE ARTILLERY AMMUNITION.

There are four general types of modern service artillery ammunition used in the U.S. Army. These are:- High explosive shells, armor-piercing projectiles, chemical shells and shrapnel shells.

1. High explosive shells which contain a high percentage of their weight of high explosive.

2. Armor-piercing projectiles which contain only a small percentage of their weight as high explosive or none, in which case they are known as shot. Armor-piercing projectiles depend on their materiel of construction or the face-hardening treatment given the armor-piercing cap, which may be used, for their penetrating quality.

3. Chemical shells are relatively thin walled shells which contain smoke or gas. These are used for laying smoke screens to hide movements or in the event that poison gas is used in this war, will carry these agents. A British method of laying smoke has been adopted by the Army in which the filling of the projectile is in the shape of candles. These are ejected or the smoke emanates from the base of the shell which in the base ejection type if blown off by a burster charge ignited by a fuze. In the base emission type, an igniter pellet is fired by the propellant and begins burning before the shell leaves the muzzle. This in turn ignites a priming smoke charge and a smoke charge. The base emission type can only be used for short ranges whereas the base ejection type can be used, for longer ranges as the candles, after ejection, follow closely the path of the case.

4. Shrapnel and canister consist of a casing for a number of steel or lead balls which are scattered by a bursting charge in the case of the shrapnel, or by the explosion of container by the propellant in the case of canister. Shrapnel is out-model and is generally "LIMITED STANDARD" but will be issued as long as present stocks last.

C. PROPELLANTS.

1. Smokeless powder was introduced in 1890 as a replacement for black powder for artillery propellants. Army Ordnance first experimented with the double-base powder, Nitrocellulose-nitroglycerine, which was used in small arms until 1906.

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The smokeless powder now used consist of gelatinized nitrocellulose (NG) in the form of perforated grains. Nitrocellulose powders are still used as propellants for field mortars and for some larger caliber guns and mortars. This powder tends to crode the barrel of the piece and later developments have largely replaced it.

2. After World War I, certain weaknesses of nitrocellulose powders led to further experimentation. These weaknesses were:- Erosion of the barrel; absorption of moisture or the volatilization of the ether-alcohol both of which result in altering the burning rate; and the production of a large flash on firing of this type of powder which permits the ememy to ascertain your position accurately, especially at night. A flashless, non-hygroscopic (non-moisture-absorbing) powder (FNH) was developed by adding certain inert materials to nitrocellulose to reduce the heat of the products of combustion and also the absorptive powers of the powder. Flashlessness is also a function of the length of the bore, the quantity of powder used and other factors. Therefore, a powder which may be flashless in some weapons is not necessarily flashless in all. Where flashlessness is not obtained, the powder is designated non-hygroscopic (NH) only.

D. BURSTING CHARGES.

Several bursting charges are used in Army projectiles.

1. TNT which consists of tri-nitrated toluene forming tri-nitro-toluene TNT is the burster normally used in all high explosive projectiles.

2. 50-50 Amatol which consists of 50% by weight of ammonium nitrate and 50% TNT. Amatol absorbs moisture in storage forming a liquid which exudes through any opening present. Therefore it is standard practice to pour a cap or surround of TNT on top of an Amatol filling. Amatol is used for H.E. shells.

3. Trimonite which consists of 90% picric acid and 10% mononitro-napthalene. Trimonite is also used for high explosive shells.

4. Explosive 'D' is the standard filling for armor-piercing projectiles and consists of Ammonium Picrate. Explosive 'D' is press-loaded instead of cast as TNT.

E. PRIMERS.

Four types of primers are used to ignite the propellant for artillery projectiles.

1. Percussion primers, normally using black powder, which operate by a blow from a firing pin in the breech block of piece striking a primer cap which in turn fires the black powder. The primer normally extends up into the cartridge case to obtain more uniform burning.

2. Friction primers which operate by drawing a notched or serrated plug through a friction compound by means of a lanyard attached to the end of the primer firing leaf. The resulting flame ignites a black powder charge.

3. Electric primers function by means of an electric current passed through a platinum bridge which beats up and ignites the guncotton, in turn igniting the black powder charge. Electric primers are normally used for heavy artillery weapons in harbor defense emplacements.

4. Combination electric and percussion primers consist of the features of both electric and percussion types in a single unit. These are normally used in railway cannon and some large, separate-loading field weapons.

F. IGNITERS.

Igniters consist of silk bags of pure Army black powder and are used with some semi-fixed and separate-loading propelling charges. They increase the flame from the primer in order to achieve more uniform burning of large propelling charges.

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G. COLORS OF PROJECTILES.

1. High explosive shells were formerly painted yellow with black markings but since March 11, 1942 will be painted olive-drab with yellow markings. Rotating bands are never painted.
2. Armor-piercing which do not contain any high-explosive or fuze will be painted black with white markings.
3. Chemical shells are painted blue-grey with yellow markings and bands for smoke fillings, and green markings and bands for gas fillings.
4. Sub-caliber ammunition, normally used for training and filled with low-explosive is painted red.
5. Practice shells will be painted black or blue.

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 20 mm., Mk I		TYPE: High Explosive Incendiary	
GUNS USED IN:	20 mm., M1 20 mm., AN-M2 20 mm., Hispano /A/	TARGET:	Used by aircraft against light targets.

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 20 mm., Mk I	TYPE: High Explosive Incendiary
GUNS USED IN: 20 mm., M1 20 mm., AN-M2 20 mm., Hispano /A/	TARGET: Used by aircraft against light targets.

1.	COMPLETE ROUND: a. Overall length b. Total weight	H.E.I. Mk. I 7.19 inches 0.57 pound
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk. I 2.61 inch (w/o fuze) 0.78 inch 0.20 inch 0.78 inch 0.295 pound 0.03 pound of High Explosive and Incendiary composition. None. Yellow ogive, red body except rotating band, "H.E.I." stencilled in black.
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M21A1 or M21B1 4.34 inches 0.77 inch 0.95 inch 0.55 inch 0.205 pound (M21A1) 0.07 pound of Flashless Non-hygroscopic powder. M36 Berdon Primer. On base:- "20 MM., M21A1, LOT NO., manufacturer." "Flashless" when Flashless Non-hygroscopic powder is used.
4.	FUZE: a. Type b. Booster c. Adapter	No. 253 Mk. I Nose percussion (supersensitive). None. None.

5. REMARKS: After shell penetrates the target, the high explosive is detonated, and the incendiary composition is ignited.

Cartridge case, M21B1, is made of steel, M21A1 being made of brass.

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PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 20 mm. M75	TYPE: Armor-piercing
GUNS USED IN: 20 mm., M1 20 mm., AN-M2 20 mm., Hispano /A/	TARGET: For use from aircraft against armored targets.

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 20 mm. M75	TYPE: Armor-piercing
GUNS USED IN: 20 mm., M1 20 mm., AN-M2 20 mm., Hispano /A/	TARGET: For use from aircraft against armored targets.

1.	COMPLETE ROUND: a. Overall length b. Total weight	M75 7.22 inches 0.63 pound
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M75 3.25 inches 0.784 inch 0.203 inch 0.770 inch 0.367 pound 0.07 pound Flashless Non-hygroscopic powder. Three second internal tracer. Painted black except rotating band. On rotating band:- LOT NO. -----, year of manufacture, initials of manufacturer, caliber and designation of projectile.
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M21A1 or M21B1 4.34 inches 0.77 inch 0.95 inch 0.55 inch 0.205 pound (M21A1) 0.07 pound of Flashless Non-hygroscopic powder. M36 Berdon Primer. On base - "20 MM., M21A1, LOT NO., manufacturer." "Flashless" when Flashless Non-hygroscopic powder is used.
4.	FUZE: a. Type b. Booster c. Adapter	None

5. REMARKS: (a) Projectile is a solid steel shot.
(b) No cap is fitted to the projectile.
(c) Cartridge case, M21B1, is made of steel, M21A1 being made of brass.

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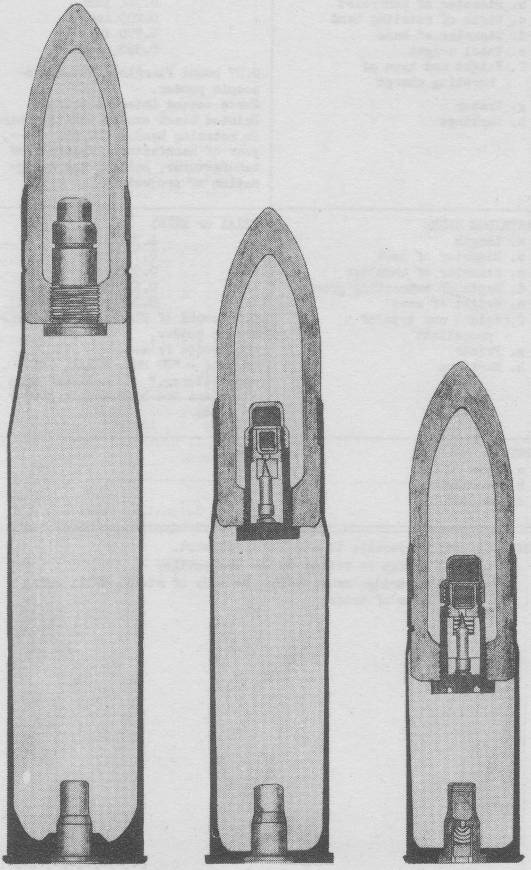
PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	37 mm., Mk. II	TYPE:	High Explosive
GUNS USED IN:	37 mm., M1916 37 mm., M3, M5, and M6	TARGET:	Used against personnel and light material targets.



PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 37 mm., Mk. II		TYPE: High Explosive	
GUNS USED IN: 37 mm., M1916 37 mm., M3, M5, and M6		TARGET: Used against personnel and light material targets.	
	FOR GUN	M1916	M3, M5, & M6
1.	COMPLETE ROUND: a. Overall length b. Total weight	Mk. II 6.92 inches 1.61 pounds	Mk. II 12.03 inches 2.72 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk. II 4.45 inches 1.45 inches 0.74 inch 1.44 inch 1.23 pounds 0.53 pound of cast T.N.T. None Painted yellow except rotating bands. Stencilled in black:- 37 MM. G., Shell Mk. II, LOT NO., Inspector's mark.	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	Mk. I A2 3.64 inches 1.43 inches 1.55 inches 1.74 inches 0.26 pound 0.07 pound of Flashless Non-hygroscopic powder. M23A2 percussion "37 MM., Shell Mk. II, M16 (or Mk. I A2), LOT NO., manufacturer's symbol, month and year of manufacture.	M16 8.75 inches 1.43 inches 1.93 inches 2.19 inches 0.93 pound 0.50 pound of Flashless Non-hygroscopic powder. M23A2 percussion
4.	FUZE: a. Type b. Booster c. Adapter	M38A1 Base detonating fuze. Tetryl booster. None.	
5.	REMARKS: Projectile has rounded ogive.		

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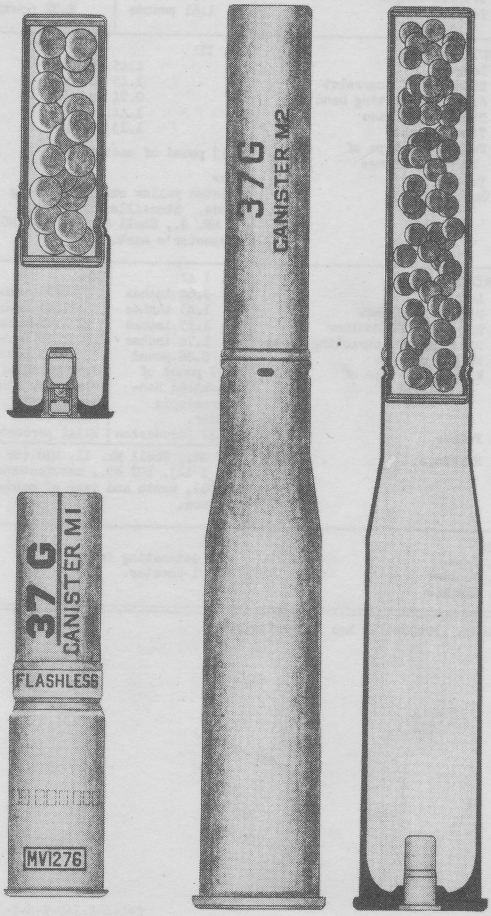
PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	37 mm., M1 Canister 37 mm., M2 Canister	TYPE:	Canister (Shrapnel)
GUNS USED IN:	37 mm., M1916 37 mm., M3, M5 and M6	TARGET:	Used against personnel in open.



PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 37 mm., M1 Canister 37 mm., M2 Canister		TYPE: Canister (Shrapnel)	
GUNS USED IN: 37 mm., M1916 37 mm., M3, M5 and M6		TARGET: Used against personnel in open.	
	FOR GUN	M1916	M3, M5 & M6
1.	COMPLETE ROUND:		
	a. Overall length	M1 Canister 6.6 inches	M2 Canister 14.53 inches
	b. Total weight	1.64 pounds	3.31 pounds
2.	CANISTER CASE:	M1 Canister	M2 Canister
	a. Length	4.14 inches	6.11 inches
	b. Diameter of bourrelet	1.49 inches	1.49 inches
	c. Width of rotating band	None fitted.	None fitted.
	d. Diameter of base	1.44 inches	1.44 inches
	e. Total weight	1.25 pounds	1.89 pounds
	f. Weight and type of bursting charge	32 lead shrapnel balls in a resin matrix.	122 lead shrapnel balls in a resin matrix.
	g. Tracer	None.	None.
	h. Markings	"37 G, CANISTER M1 (or M2)" in white on black case.	
3.	CARTRIDGE CASE:	Mk. I A2	M16
	a. Length	3.64 inches	8.75 inches
	b. Diameter of neck	1.43 inches	1.43 inches
	c. Diameter of shoulder	1.55 inches	1.93 inches
	d. Diameter of extracting flange	1.74 inches	2.19 inches
	e. Weight of case	0.26 pound	0.93 pound
	f. Weight and type of propellant	500 - 590 grains Flashless Non-hygroscopic powder.	0.50 pound Flashless Non-hygroscopic powder.
	g. Primer	M23A1 percussion	M23A2 percussion
	h. Markings	Stamped on base:- "CANISTER M1 (or M2), MK. I A2 (or M16), Flashless (when used), manufacturer's mark, and explosive LOT NO. ----"	
4.	FUZE: a. Type b. Booster c. Adapter	None.	None.
5.	REMARKS: Operation of canister:- A canister consists of a light metal case, filled with steel balls, containing no explosive charge. It breaks up on leaving the muzzle of the cannon, allowing the balls to scatter (TM 9-1900).		

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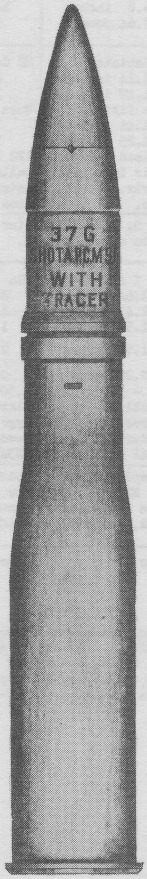
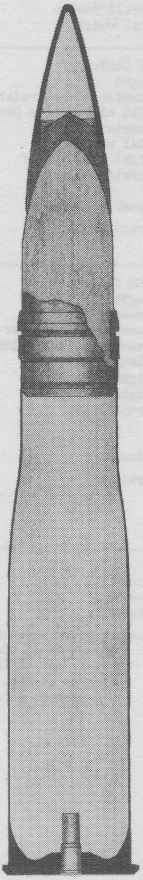
PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 37 mm., M51B1 & M51B2	TYPE: Armor-piercing with cap
GUNS USED IN: 37 mm., M3, M5 and M6	TARGET: Used against armored aircraft, vehicles, concrete shelters, and similar targets.





PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 37 mm., M51B1 & M51B2		TYPE: Armor-piercing with cap
GUNS USED IN: 37 mm., M3, M5 and M6		TARGET: Used against armored aircraft, vehicles, concrete shelters, and similar targets.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M51B1 and M51B2 14.53 inches 3.41 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M51B1 and M51B2 4.63 inches, 6.36 inches with windshield. 1.453 inches 0.74 inch 1.44 inches 1.92 pounds None. 0.1 pound (See 5a) Painted black except rotating band. Stencilled:- "37 G, SHOT APC M51B1 (or M51B2) WITH TRACER."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M16 8.75 inches 1.43 inches 1.93 inches 2.19 inches 0.93 pound 0.506 pound of Flashless Non-hygroscopic powder. M23A2 Stamped:- "37 MM., M51B1, M16, manufacturer's marks, LOT NO. of explosive, month and year of manufacture."
4.	FUZE: a. Type b. Booster c. Adapter	None.
5.	REMARKS: a. Projectile fitted with armor-piercing cap and windshield. The cap is of face-hardened, forged, alloy steel and is designed to break the face hardening of the armor plate. The windshield is of mild steel and is threaded to fit into the cap. b. Tracer burns for 2000 yards distance of travel.	

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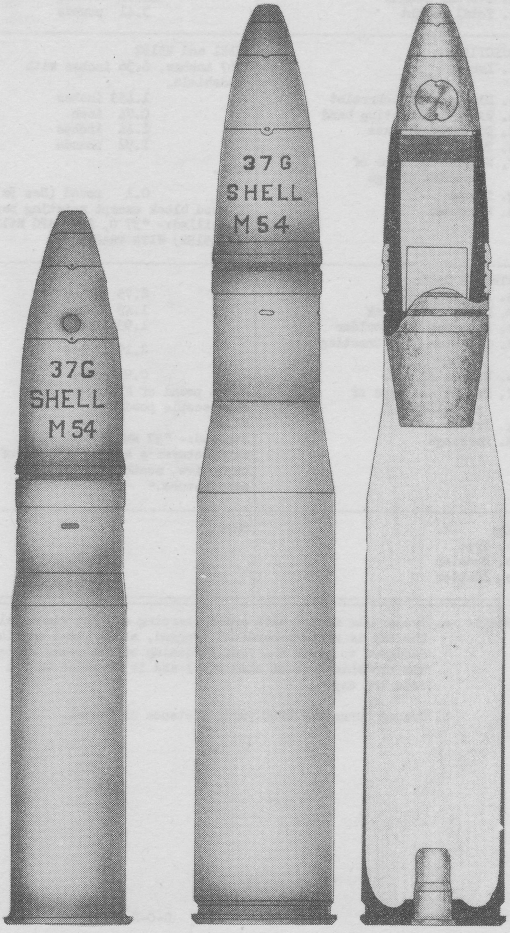
PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	37 mm., M54	TYPE:	High Explosive
GUNS USED IN:	37 mm., M1A2 Automatic gun. 37 mm., M4	TARGET:	Used against light material and personnel.



PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 37 mm., M54		TYPE: High Explosive	
GUNS USED IN: 37 mm., M1A2 Automatic gun. 37 mm., M4		TARGET: Used against light material and personnel.	
	FOR GUN	M1A2	M4
1.	COMPLETE ROUND: a. Overall length b. Total weight	M54 12.81 inches 2.62 pounds	M54 9.75 inches 1.93 pounds
2.	PROJECTILE: a. Length, w/fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M54 5.87 inches 1.45 inches 0.74 inch 1.15 inches 1.34 pounds 0.10 pound of Tetryl. 0.25 pound, with 20 grain igniter. Yellow except rotating band. Stencilled:- "37 G, Shell M54."	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M17 8.75 inches 1.43 inches 1.93 inches 0.08 inch 0.85 pound 0.38 pound of Flashless Non-hygroscopic powder. M23A2 Stamped on base:- "37 G, Shell M54, M17, manufacturer's mark, explosive LOT NO., month and year of manufacture."	Mk. III A2 5.63 inches 1.43 inches 1.55 inches flange - 1.735 inches. 0.39 pound 0.15 pound of Flashless Non-hygroscopic powder. M23A2
4.	FUZE a. Type b. Booster c. Adapter	M56 Point detonating. Tetryl booster. None.	

5. REMARKS: a. Tracer operates as self-destroying fuze for projectile if shell misses target.

b. Base of projectile is boat-tailed.

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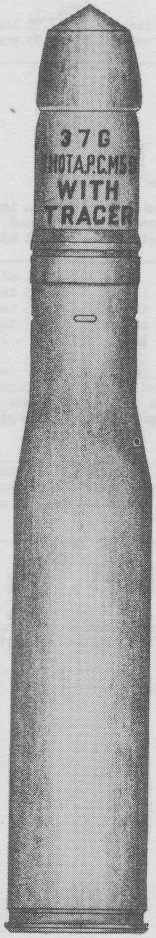
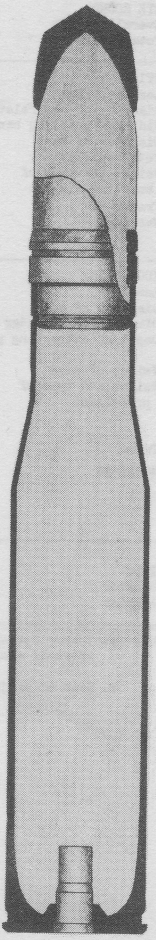
PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 37 mm., M59	TYPE: Armor-piercing with cap
GUNS USED IN: 37 mm., M1A2 Automatic gun.	TARGET: Used against armored aircraft and vehicles, concrete emplacements, etc.





PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 37 mm., M59	TYPE: Armor-piercing with cap
GUNS USED IN: 37 mm., M1A2 Automatic gun.	TARGET: Used against armored aircraft and vehicles, concrete emplacements, etc.

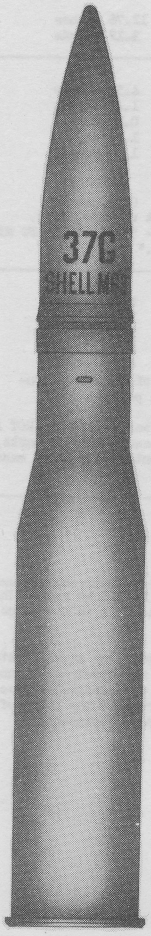
1.	COMPLETE ROUND: a. Overall length b. Total weight	M59 12.76 inches 3.12 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M59 4.59 inches 1.45 inches 0.74 inch 1.44 inches 1.91 pounds None. 0.01 pound Black except rotating band. Stencilled:- "37 G, SHOT APC M59, WITH TRACER."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M17 8.75 inches 1.43 inches 1.92 inches 0.08 inch 0.85 pound 0.31 pound of Flashless Non-hygroscopic powder. M23A2 Stamped on base:- "37 G, SHOT APC M59, M17, manufacturer's marks, LOT NO., month and year of manufacture."
4.	FUZE: a. Type b. Booster c. Adapter	None.

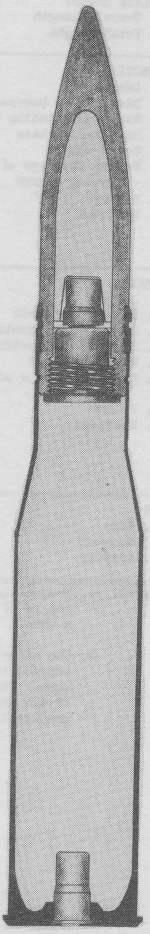
5. REMARKS: a. Projectile has armor-piercing cap fitted to nose. The cap is of 3/8 inch steel and the nose is in the shape of a cone.

b. The armor-piercing cap is of forged alloy steel, heat-treated to have a hard face and a relatively soft inner core. The hardened face destroys the hardened surface of the armor plate and the core protects the point of projectile by distributing the impact stresses.

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 37 mm., M63	TYPE: High Explosive
GUNS USED IN: 37 mm., M3, M5 and M6	TARGET: Used against personnel and light material targets.





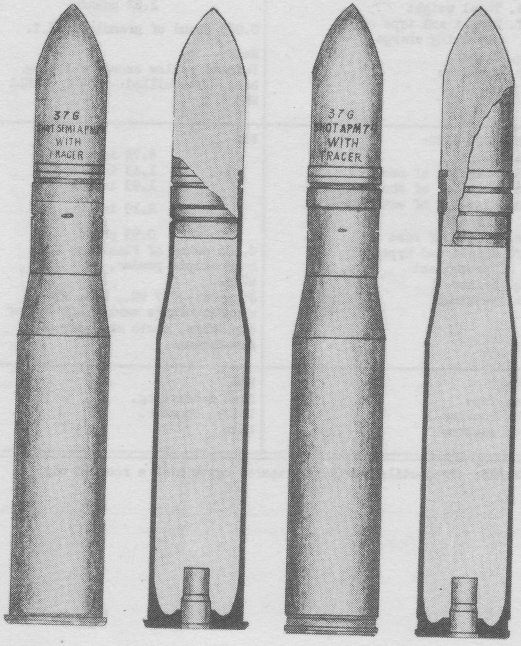
PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 37 mm., M63		TYPE: High Explosive
GUNS USED IN: 37 mm., M3, M5 and M6		TARGET: Used against personnel and light material targets.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M63 14.09 inches 3.03 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M63 5.92 inches 1.45 inches 0.74 inch 1.44 inches 1.62 pounds 0.085 pound of granular T.N.T. None Painted yellow except rotating band. Stencilled:- "37 G, SHELL M63."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M16 8.75 inches 1.43 inches 1.93 inches 2.19 inches 0.93 pound 0.506 pound of Flashless Non-hygroscopic powder. M23A2 Stamped:- "37 MM., M63, M16, manufacturer's marks, LOT NO. of explosive, month and year of manufacture."
4.	FUZE: a. Type b. Booster c. Adapter	M58 Base detonating. Tetryl booster. None.
5.	REMARKS: Projectile has long, tapered ogive with a rounded tip.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 37 mm., M74		TYPE: Armor-piercing	
GUNS USED IN:	37 mm., M1A2 Automatic gun 37 mm., M3, M5 & M6	TARGET:	Used against armored aircraft and vehicles, concrete emplacements, etc.



PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 37 mm., M74	TYPE: Armor-piercing
GUNS USED IN: 37 mm., M1A2 Automatic gun 37 mm., M3, M5 & M6	TARGET: Used against armored aircraft and vehicles, concrete emplacements, etc.

	FOR GUN	M1A2	M3, M5 & M6
1.	COMPLETE ROUND: a. Overall length b. Total weight	M74 13.01 inches 3.07 pounds	M74 13.01 inches 3.34 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M74 4.84 inches 1.45 inches 0.74 inch 1.44 inches 1.92 pounds None. 0.01 pound Painted black except rotating band. Stencilled in white:- "37 G, SHOT A.P. M74, WITH TRACER."	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M17 8.75 inches 1.43 inches 1.93 inches 0.08 inch 0.85 pound 0.25 pound of Flashless Non-hygroscopic powder. M23A2 percussion Stamped on base:- "SHOT A.P. M74, 37 MM., M17 (or M16), ammunition LOT NO., loader's initials, month and year of manufacture."	M16 8.75 inches 1.43 inches 1.93 inches flange - 2.19 inches. 0.93 pound 0.38 pound of Flashless Non-hygroscopic powder. M23A2 percussion
4.	FUZE: a. Type b. Booster c. Adapter	None.	

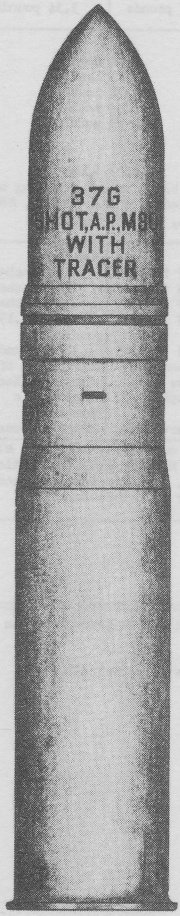
5. REMARKS: a. No armor-piercing cap or windshield is fitted to this projectile.

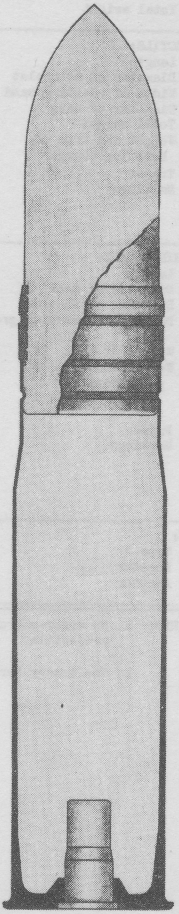
b. The tracer burns for 2000 yards of aerial flight.

C-O-N-F-I-D-E-N-F-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 37 mm., M80	TYPE: Armor piercing
GUNS USED IN: 37 mm., M4	TARGET: Used against armored aircraft and vehicles, concrete emplacements, etc.





PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 37 mm., M80		TYPE: Armor piercing
GUNS USED IN: 37 mm., M4		TARGET: Used against armored aircraft and vehicles, concrete emplacements, etc.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M80 9.34 inches 2.25 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M80 4.23 inches 1.45 inches 0.74 inch 1.44 inches 1.66 pounds None. 0.1 pound. Tracer contained in projectile. Projectile painted black. Stencilled in white:- "37 G, SHOT A.P. M80, WITH TRACER." Also stamped on rotating band with LOT NO. ----, month and year of manufacture in addition.
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	Mk. III A2 5.63 inches 1.43 inches 1.55 inches 1.735 inches 0.39 pound 2.3 ounces of Flashless Non-hygroscopic powder. M23A2 Stamped on base:- "37 G, M4, MK. III A2", explosive LOT NO., manufacturer's and inspector's marks.
4.	FUZE: a. Type b. Booster c. Adapter	None.

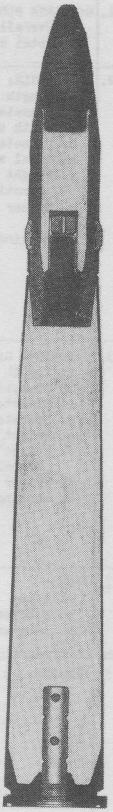
5. REMARKS: a. There is no armor-piercing cap or windshield fitted to this projectile.

b. Tracer burns for approximately 2000 yards of air travel.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 40 mm., Mk. II/T/L	TYPE: High Explosive w/tracer
GUNS USED IN: 40 mm., M1 (Bofors)	TARGET: Used as an anti-aircraft weapon with director control.



PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 40 mm., Mk. II/T/L		TYPE: High Explosive w/tracer
GUNS USED IN: 40 mm., M1 (Bofors)		TARGET: Used as an anti-aircraft weapon with director control.
1.	COMPLETE ROUND: a. Overall length b. Total weight	Mk. II/T/L 17.64 inches 4.64 pounds
2.	PROJECTILE: a. Length, w/o fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, w/o fuze f. Weight and type of bursting charge g. Tracer h. Markings	Mk. II/T/L 5.17 inches 1.567 inches 0.642 inch 1.30 inches 1.514 pounds 0.15 pound of cast T.N.T. 0.02 pound internal tracer acting as self destroying fuze. Painted yellow except rotating band. Stencilled in black:- "40 G, SHELL MK. II/T/L, TNT, WITH TRACER" Forward slope of rotating band stamped with LOT NO., year of manufacture, manufacturer's symbols, calibre and designation of shell.
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M22A1 or M22B1 12.22 inches 1.611 inches 1.874 inches 0.091 inch 1.93 pounds (M22A1) 0.68 pound of Flashless Non-hygroscopic powder. No. 12, Mk. II/L/, Q.F., percussion cartridge. Stamped on base:- "40 G, M22A1, LOT NO. (of filling), manufacturer's symbols, month and year of manufacture.
4.	FUZE: a. Type b. Booster c. Adapter d. Weight	No. 251, Mk. I/L/, or P.D. M64A1 or Navy Mk. 27. Percussion (point detonating), Direct acting. 109.7 grains of Tetryl. None. 0.219 pound
5.	REMARKS: (a) Projectile (as fired, i.e. w/fuze) weighs 1.954 pounds. (b) Cartridge case, M22B1, is made of steel. (c) Navy fuze, Mark 27, may be issued in lieu of Army components. C-O-N-F-I-D-E-N-T-I-A-L	

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 40 mm., M81	TYPE: Armor-piercing with tracer
GUNS USED IN: 40 mm., M1 (Bofors)	TARGET: Used against armored aircraft, armored vehicles, concrete emplacements, etc

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 40 mm., M81		TYPE: Armor-piercing with tracer
GUNS USED IN: 40 mm., M1 (Bofors)		TARGET: Used against armored aircraft, armored vehicles, concrete emplacements, etc
1.	COMPLETE ROUND: a. Overall length b. Total weight	M81 17.62 inches 4.54 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M81 6.19 inches 1.567 inches 0.642 inch 1.52 inches 1.96 pounds None. 0.02 pound, internal tracer Projectile painted black except rotating band. Stencilled in white:- "40 G, SHOT A.P. M81, WITH TRACER."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M25 or M25B1 12.22 inches 1.611 inches 1.874 inches 0.091 inch 1.88 pounds (M25) 0.65 pound of Flashless Non-hygroscopic powder. M23A2, 0.05 pound, percussion primer. Stamped on base:- "40 G, M25, LOT NO., manufacturer's and inspector's marks, month and year of manufacture.
4.	FUZE: a. Type b. Booster c. Adapter	None.

5. REMARKS: (a) Windshield of mild steel is fitted to nose of projectile to improve ballistics. A windshield adapter is also used.

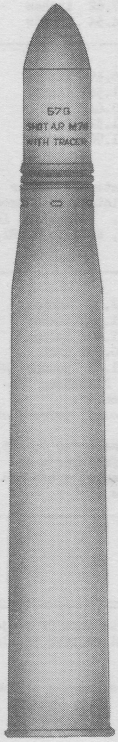
(b) The cartridge case, M25B1, is made of steel; the M25 being made of brass.

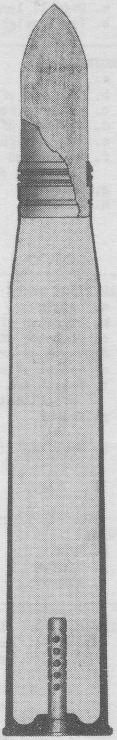
(c) Base of shell is boat-tailed.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 57 mm., M70	TYPE: Armor-piercing for anti-aircraft
GUNS USED IN: 57 mm., M1 & T2 A.A.	TARGET: Used against armored aircraft.





PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 57 mm., M70	TYPE: Armor-piercing for anti-aircraft
GUNS USED IN: 57 mm., M1 & T2 A.A.	TARGET: Used against armored aircraft.

1.	COMPLETE ROUND:	M70
	a. Overall length	23.22 inches
	b. Total weight	6.28 pounds
2.	PROJECTILE:	M70
	a. Length	6.81 inches
	b. Diameter of bourrelet	2.264 inches
	c. Width of rotating band	0.79 inch
	d. Diameter of base	2.235 inches
	e. Total weight	
	f. Weight and type of bursting charge	None, solid shot projectile.
	g. Tracer	0.1 pound internal tracer.
	h. Markings	Projectile, except rotating band, painted black. Stencilled in white:- "57 G, SHOT A.P. M70." Stamped on rotating band:- "57 MM., M70, contractor's initials, LOT NO. month and year of manufacture."
3.	CARTRIDGE CASE:	M23A2 (or M23A2B1)
	a. Length	17.40 inches
	b. Diameter of neck	2.319 inches
	c. Diameter of shoulder	2.810 inches
	d. Diameter of extracting flange	3.54 inches
	e. Weight of case	3.9 pounds, M23A2. 3.6 pounds, M23A2B1.
	f. Weight and type of propellant	2.25 pounds Flashless Non-hygroscopic powder.
	g. Primer	M1B1A2 percussion primer.
	h. Markings	Stamped on base:- "AMM. LOT NO., 57 MM., M23A2."
4.	FUZE:	None.
	a. Type	
	b. Booster	
	c. Adapter	

5. REMARKS: (a) No armor-piercing cap or windshield is fitted to this projectile.

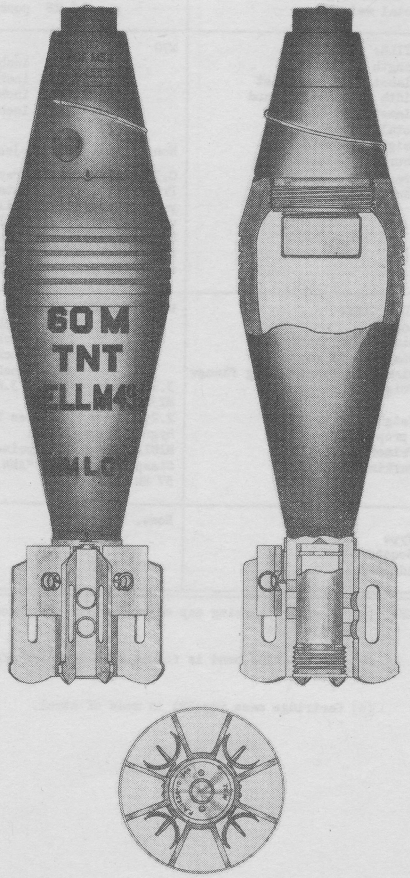
(b) The rotating band is formed with two circumferential grooves.

(c) Cartridge case M23A2B1 is made of steel.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	60 mm., M49A2	TYPE:	High explosive mortar
GUNS USED IN:	60 mm. Mortar M1 and M2	TARGET:	Personnel and light materiel targets.



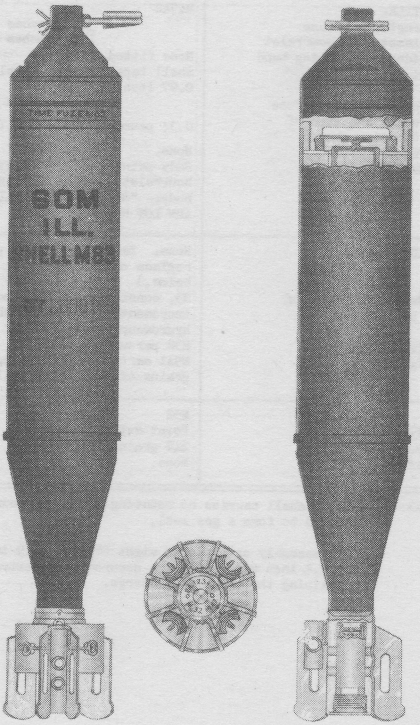
PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 60 mm., M49A2		TYPE: High explosive mortar
GUNS USED IN: 60 mm. Mortar M1 and M2		TARGET: Personnel and light materiel targets.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M49A2 9.54 inches 2.94 pounds
2.	PROJECTILE: a. Length, w/o fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, w/fuze f. Weight and type of bursting charge g. Tracer h. Markings	M49A2 5.01 inches 2.36 inches None fitted. Shell tapers from bourrelet to 0.97 inch. 2.46 pounds 0.34 pound of flake T.N.T. None. Body painted yellow except bourrelet. Stencilled in black on body:- "60 MM, TNT, SHELL M49A2, AMM LOT NO. ---".
3.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer c. Igniter	None. Tail assembly is provided to replace cartridge case. (See 5b below.) M3, consisting of 0.02 pound increments of flake Flashless Non-hygroscopic powder. M32 percussion M5A1 cartridge consisting of 47 grains of granulated ballistite.
4.	FUZE: a. Type b. Booster c. Adapter	M52 Point detonating. 247 grains of Tetryl None.
5.	REMARKS: a. Mortar shell carries no rotating bands but bourrelet is grooved to form a gas seal. b. Tail assembly consists of eight (8) fins 1.9 inches long and 0.8 inch wide which are secured to a central tube containing the propelling charge.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	60 mm., M83	TYPE:	Illuminating Mortar
GUNS USED IN:	60 mm. Mortar M1 and M2	TARGET:	Used to provide illumination where other sources are not available.



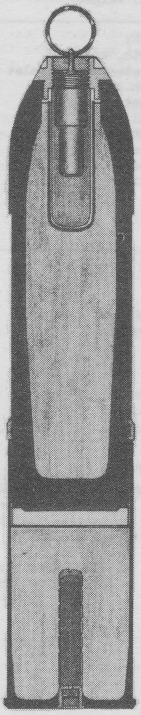
PROJECTILE DATA

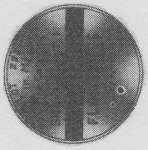
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 60 mm., M83		TYPE: Illuminating Mortar
GUNS USED IN: 60 mm. Mortar M1 and M2		TARGET: Used to provide illumination where other sources are not available.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M83 14.28 inches 3.77 pounds
2.	PROJECTILE: a. Length, w/o fuze b. Diameter of bourrelet c. Width of bourrelet d. Diameter of base e. Total weight f. Weight and type of illuminating filler g. Tracer h. Markings	M83 10.08 inches 2.362 inches 0.13 inch 0.82 inch 3.7 pounds None fitted. Projectile painted blue-grey with black stencilling of:- "60 MM., ILL., SHELL M83, LOT NO., Loader's initials."
3.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer c. Igniter	None. Tail assembly is provided to replace normal cartridge case. Tail assembly weighs 0.43 pounds. M4 increments - 4 increments form the normal propelling charge weighing 0.016 pound which is fitted between the blades of the fins of the tail assembly. M32 percussion primer - 0.02 pounds. M5A1 Cartridge - 0.01 pound.
4.	FUZE: a. Type	M65 Mechanical time fuze.
5.	REMARKS: a. Shell contains a flare candle and parachute. The fuze ignites the flare and expels the assembly 14 seconds after firing. b. The candle burns for a minimum of 25 seconds with a light of 110,000 candlepower.	

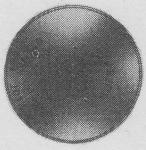
C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE:	2.95 inch Mk. I 75 mm., Mk. I	TYPE:	High Explosive
GUNS USED IN:	2.95 inch mountain gun. 75 mm. gun M1897, M1916 & M1917	TARGET:	Used against personnel, light materiel targets.







PROJECTILE DATA

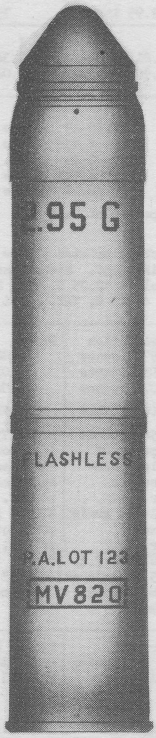
NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 2.95 inch Mk. I 75 mm., Mk. I	TYPE: High Explosive
GUNS USED IN: 2.95 inch mountain gun. 75 mm. gun M1897, M1916 & M1917	TARGET: Used against personnel, light materiel targets.

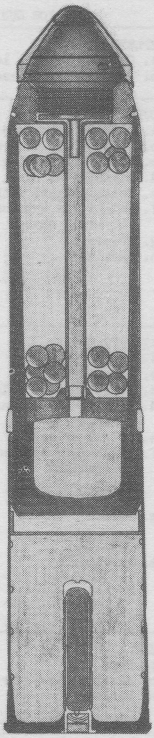
	FOR GUN	2.95 inch	75 mm.
1.	COMPLETE ROUND: a. Overall length, less fuze b. Total weight, less fuze	Mk. I 18.81 inches 13.98 pounds	Mk. I 23.34 inches 16.04 pounds
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, with fuze f. Weight and type of bursting charge g. Tracer h. Markings	Mk. I 10.49 inches 2.938 inches 0.49 inch 2.928 inches 12.18 pounds 1.64 pounds of cast TNT. None. Projectile painted yellow except rotating band. Stencilled in black on shell:- "2.95 G, TNT, SHELL MK. I or 75 G, TNT, SHELL MK. I."	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	No designation 6.578 inches 3.01 inches 3.01 inches 3.40 inches 1.56 pounds 0.45 pound of Flashless Non-hygroscopic powder. M1B1A1-100 grain percussion primer. "FLASHLESS, P.A. LOT NO. ----, MV 925 (muzzle velocity)" stencilled and stamped on side and base of case.	M18 13.82 inches 3.01 inches 3.04 inches 3.52 inches 2.75 pounds 1.35 pounds of Flashless Non-hygroscopic powder. M22-65 grain percussion primer.
4.	FUZE: a. Type b. Adapter - Booster c. Markings	M46 or M47 Point detonating Mk. III M46 - White nose M47 - Black nose	M46 or M47 Point detonating Mk. III
5.	REMARKS: a. Point detonating fuzes Mk. III, Mk. IV and M35 may be substituted for use in the 75 mm. projectile.		

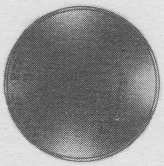
C-O-N-F-I-D-E-N-T-I-A-L

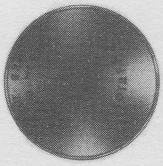
PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 2.95 inch Mk. I 75 mm., Mk. I	TYPE: Shrapnel
GUNS USED IN: 2.95 inch mountain gun. 75 mm. gun M1897, M1916 & M1917	TARGET: Used against personnel









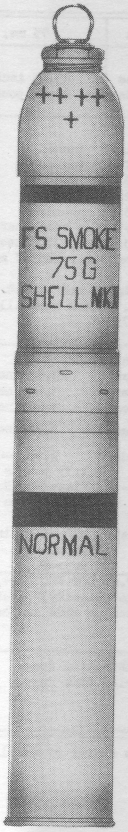
PROJECTILE DATA

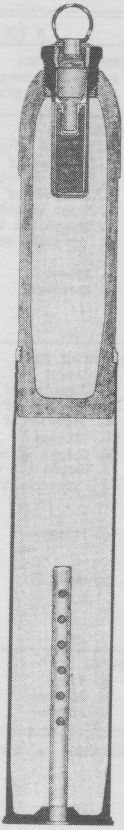
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 2.95 inch Mk. I 75 mm., Mk. I		TYPE: Shrapnel	
GUNS USED IN: 2.95 inch mountain gun. 75 mm. gun M1897, M1916 & M1917		TARGET: Used against personnel	
	FOR GUN	2.95 inch	75 mm.
1.	COMPLETE ROUND: a. Overall length b. Total weight	Mk. I 16.2 inches 18.08 pounds	Mk. I 23.45 inches 20.62 pounds
2.	PROJECTILE: a. Length, with fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, with fuze f. Weight and type of bursting charge g. Tracer h. Markings	Mk. I 11.23 inches 2.938 inches 0.49 inch 2.928 inches 15.95 pounds Filling consist of a base charge weighing 0.185 pound, 270 steel or lead balls, and 0.4 pound of matrix None. Projectile painted red except rotating band. Black stencilling:- "2.95 G" or "75 G"	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	No designation 6.578 inches 3.01 inches 3.01 inches 3.40 inches 1.56 pounds 0.45 pound of Flashless Non-hygroscopic powder. M1B1A1-100 grain percussion primer. "FLASHLESS, P.A. LOT NO. ----, MV 925 (muzzle velocity)" stencilled and stamped on side and base of case.	M18 13.82 inches 3.01 inches 3.04 inches 3.52 inches 2.75 pounds 1.35 pounds of Flashless Non-hygroscopic powder. M22-65 grain percussion primer.
4.	FUZE: a. Type b. Booster c. Adapter	21 second combination fuze. Pyrotechnic ring time fuze. None. None.	
5.	REMARKS: a. A flash tube runs from fuze to base charge of shell.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	75 mm., Mk. II	TYPE:	Chemical
GUNS USED IN:	75 mm., M1897, M1916 & M1917.	TARGET:	Used against personnel in chemical warfare.





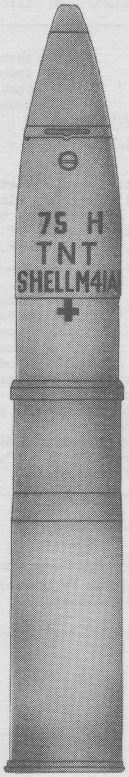
PROJECTILE DATA

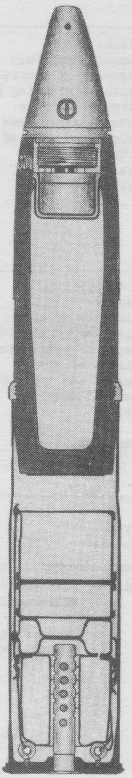
	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 75 mm., Mk. II	TYPE: Chemical
	GUNS USED IN: 75 mm., M1897, M1916 & M1917.	TARGET: Used against personnel in chemical warfare.
1.	COMPLETE ROUND: a. Overall length, less fuze b. Total weight, less fuze	Mk. II 23.59 inches 16.40 pounds - WP filling 16.48 pounds - FS filling
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, less fuze f. Weight and type of bursting charge g. Tracer h. Markings	Mk. II 23.59 inches 2.938 inches 0.49 inch 2.85 inches WP - 12.12 pounds FS - 12.20 pounds WP - 1.82 pounds FS - 1.90 pounds None. Projectile except rotating band painted blue-grey. Black stencilling:- Zone markings, band indicating charge, "WP (or FS SMOKE), 75 G, SHELL MK. II."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M18 13.82 inches 3.01 inches 3.04 inches 3.52 inches 2.75 pounds 1.35 pounds of Flashless Non-hygroscopic powder. M22 - 65 grain, black powder percussion primer. Stamped on base:- "SHELL MK. II, M18, AMM. LOT NO. ---", month and year of manufacture.
4.	FUZE: a. Type b. Booster	M46 or M47 Point detonating. M2 - 0.08 pound.
5.	REMARKS: a. Fillings:- WP is white phosphorus; FS (smoke) is chlorosulfuric acid and sulphur trioxide. b. Base of cartridge case has painted band indicating normal charge.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 75 mm., M41A1	TYPE: High Explosive
GUNS USED IN: 75 mm. Howitzer, M1.	TARGET: Used against personnel and unarmored materiel.





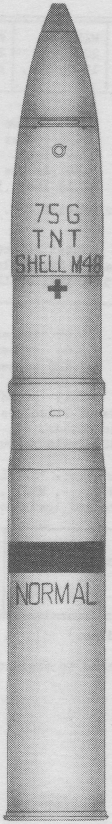
PROJECTILE DATA

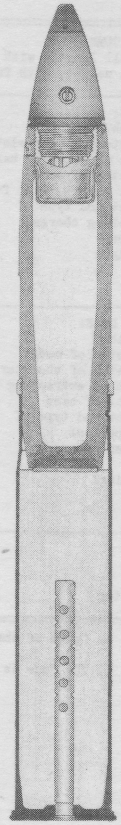
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943		
SIZE: 75 mm., M41A1		TYPE: High Explosive		
GUNS USED IN: 75 mm. Howitzer, M1.		TARGET: Used against personnel and unarmored materiel.		
1.	COMPLETE ROUND: a. Overall length, with fuze b. Total weight, with fuze	M41A1 21.98" 17.40 lbs.	M41A1 22.61" 17.76 lbs.	M41A1 22.01" 17.41 lbs.
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, with fuze f. Weight and type of bursting charge g. Tracer h. Markings	M41A1 9.77 inches 2.938 inches 0.49 inch 2.50 inches 13.76 lbs; 14.15 lbs; 13.78 lbs. 1.11 pounds of cast TNT. None. Projectile painted yellow except rotating band. Stencilled in black:- "75 H, TNT, SHELL M41A1".		
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting groove e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M5A1 10.69 inches 3.05 inches 3.125 inches 0.19 inch 2.45 pounds 1.04 pounds of Flashless Non-hygroscopic powder. M1B1A1 - 100 grain percussion primer. Stamped on base:- "SHELL M41A1, AMM. LOT NO. ---, M5A1", date of manufacture and loader's initials.		
4.	FUZE: a. Type b. Booster	M48 Point detonating. M20	M39A2	M54 Time and super-quick M20
5.	REMARKS: a. Ogive of shell - 18.3 inches radius. b. The fuze is screwed into and staked to shell or booster.			

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	75 mm., M48	TYPE:	High Explosive
GUNS USED IN:	75 mm. Howitzer, M1	TARGET:	Used against personnel and unarmored materiel.





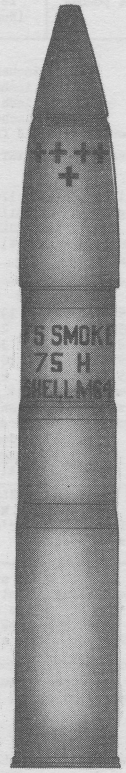
PROJECTILE DATA

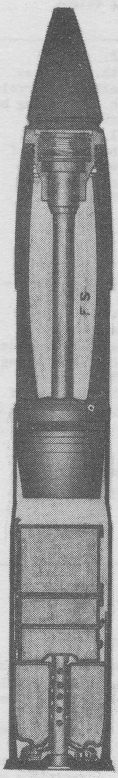
	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943	
	SIZE: 75 mm., M48	TYPE: High Explosive	
	GUNS USED IN: 75 mm. Howitzer, M1	TARGET: Used against personnel and unarmored materiel.	
1.	COMPLETE ROUND: a. Overall length b. Total weight	M48 23.48 inches 18.24 pounds	M48 26.66 inches 18.70 pounds (Normal charge)
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M48 11.26 inches 2.945 inches 0.49 inch 2.48 inches 14.60 pounds with M48 fuze. 1.47 pounds of cast TNT. None. Projectile painted yellow except rotating band. Stencilled in black:- "75 H, TNT, SHELL M48", zone markings (crosses) and charge markings.	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M5A1 10.69 inches 3.05 inches 3.125 inches 0.19 inch 2.45 pounds 1.06 pounds of Flashless Non-hygroscopic powder. M1B1A2 Stamped on base:- "SHELL M48, AMM. LOT NO. ---, M5A1 (or M18)", date of manufacture, loader's initials, charge markings.	M18 13.82 inches 2.92 inches 3.04 inches 0.24 inch 2.75 pounds 1.15 pounds of Flashless Non-hygroscopic powder. (Normal charge). M22A1
4.	FUZE: a. Type b. Adapter - booster	M48 Point detonating M20 & M20A1	M48 and M54 Point detonating, time and super quick. M20 & M20A1
5.	REMARKS: a. Booster held in projectile by set screw through nose of shell. Fuze screwed into booster and staked in place. b. Ogive radius - 22.0 inches. c. Weight of propellant for other than normal charge (M18 cartridge case):- SUPER - 2.00 pounds FNH. REDUCED - 0.59 pound FNH. d. Primer M31 is used with SUPER charge. e. Cartridge case M5A1B1, steel, 2.18 pounds, may be used in place of M5A1 (Brass).		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 75 mm., M64		TYPE: Chemical	
GUNS USED IN:	75 mm. Howitzer, M1.	TARGET:	Used against personnel during chemical warfare attacks.





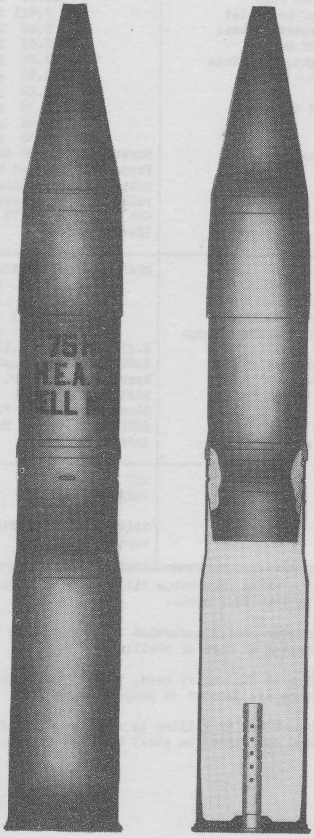
PROJECTILE DATA

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 75 mm., M64	TYPE: Chemical
	GUNS USED IN: 75 mm. Howitzer, M1.	TARGET: Used against personnel during chemical warfare attacks.
1.	COMPLETE ROUND: a. Overall length, with fuze b. Total weight	M64 23.49 inches WP - 18.89 pounds HS - 18.59 pounds FS - 19.05 pounds
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, with fuze f. Weight and type of filler g. Burster charge h. Markings	M64 10.76 inches 2.945 inches 0.49 inch 2.53 inches WP - 15.26 pounds HS - 14.95 pounds FS - 15.42 pounds WP - 1.35 pounds HS - 1.04 pounds FS - 1.51 pounds Burster charge M8 in casing M6. Projectile painted blue-grey except rotating band. Stencilled in yellow:- Zone crosses, "WP (or HS GAS or FS SMOKE) 75 H, SHELL M48". (See 5c and 5d).
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M5A1 (Brass), or M5A1B1 (Steel). 10.69 inches 3.05 inches 3.125 inches 0.19 inch 2.45 pounds, or 2.18 pounds 1.06 pounds of Flashless Non-hygroscopic powder. M1B1A2. Stamped on base:- "AMM. LOT NO., SHELL M64, 75 MM. M5A1", loader's initials.
4.	FUZE: a. Type b. Booster c. Adapter	M57 Point detonating. Steel adapter holding fuze and burster tube.
5.	REMARKS: a. WP - white phosphorus filling; HS - persistent gas filling; FS - smoke. b. Burster charge assembled in burster tube leading from adapter to base of shell. c. When HS filling is used, two (2) one-half inch green bands are painted on projectile. d. When WP or FS filling is used, a one-half inch yellow band is painted on shell below bourrelet.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 75 mm., M66		TYPE: H.E. Anti-tank	
GUNS USED IN:	75 mm. Howitzer, Pack, M1.	TARGET:	Used against tanks and is capable of penetrating homogeneous or face-hardened armor plate.



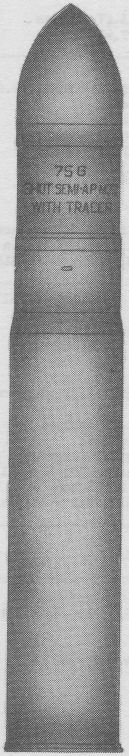
PROJECTILE DATA

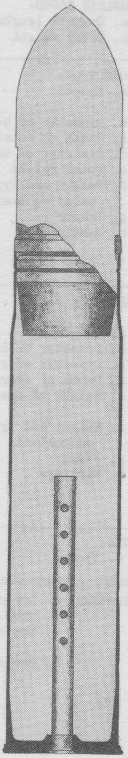
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 75 mm., M66		TYPE: H.E. Anti-tank
GUNS USED IN: 75 mm. Howitzer, Pack, M1.		TARGET: Used against tanks and is capable of penetrating homogeneous or face-hardened armor plate.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M66 23.47 inches 17.62 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M66 9.24 inches without cone; 12.07 inches with cone. 2.945 inches 0.49 inch 2.46 inches 13.10 inches 0.75 pound of Explosive 'D'. None. Projectile painted yellow except rotating band. Stencilled in black:- "75 H, H.E.A.T., SHELL M66"
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M5A1 (Brass) or M5A1B1 (Steel), Type II. 10.69 inches 3.025 inches 3.125 inches 0.19 inch 2.45 pounds (M5A1), 2.18 pounds (M5A1B1). 1.04 pounds of Flashless Non-hygroscopic powder. M1B1A2, 100 grain percussion primer Stamped on base:- "75 H, M5A1 (or M5A1B1), SHELL M66, AMM. LOT NO. ---", and loader's initials.
4.	FUZE: a. Type	M62 Base detonating.
5.	REMARKS: a. Cartridge case, M5A1 Type II is 0.025 inch smaller in neck diameter than Type I and is designed especially for the M66 projectile. b. Projectile has sheet-metal cone covering the nose.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 75 mm., M72		TYPE: Armor-piercing	
GUNS USED IN:	75 mm. Gun, M1897, M1916 and M1917. 75 mm. Tank Gun, M2 and M3.	TARGET:	Used against tanks and other armored vehicles having homogeneous armor.





PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 75 mm., M72		TYPE: Armor-piercing
GUNS USED IN: 75 mm. Gun, M1897, M1916 and M1917. 75 mm. Tank Gun, M2 and M3.		TARGET: Used against tanks and other armored vehicles having homogeneous armor.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M72 20.81 inches 18.80 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M72 9.17 inches 2.945 inches 0.49 inch 2.65 inches 13.94 pounds None, projectile is a solid shot. 49 grain charge of red tracer composition. Projectile painted black except rotating band. Stencilled in white:- "75 G, SHOT A.P. M72, WITH TRACER."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M18 (Brass) or M18B1 (Steel). 13.82 inches 2.92 inches 3.04 inches 0.24 inch M18 - 2.75 pounds M18B1 - 2.53 pounds 1.90 pounds of Flashless Non-hygroscopic powder. M31, 150 grain percussion primer. Stamped on base:- "AMM. LOT NO., SHOT A.P. M72, 75 G M18 (or M18B1)" loader's initials.
4.	FUZE:	None fitted.

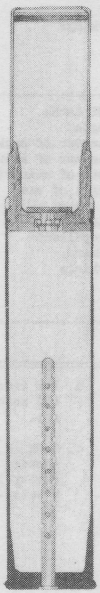
5. REMARKS: a. The tracer is designed to burn for approximately three (3) seconds after the projectile leaves the bore of the gun.

b. Back of the 49 grain tracer is placed a solid disk of igniter composition weighing 20 grains. The tracer cavity is covered with a celluloid disk and sealed with a water-proofing compound.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 75 mm., M89		TYPE: Chemical, Base Emission type	
GUNS USED IN:	75 mm. Gun, M1897, M1916, M1917; 75 mm. Tank guns M2 and M3.	TARGET:	Used for screening operations.



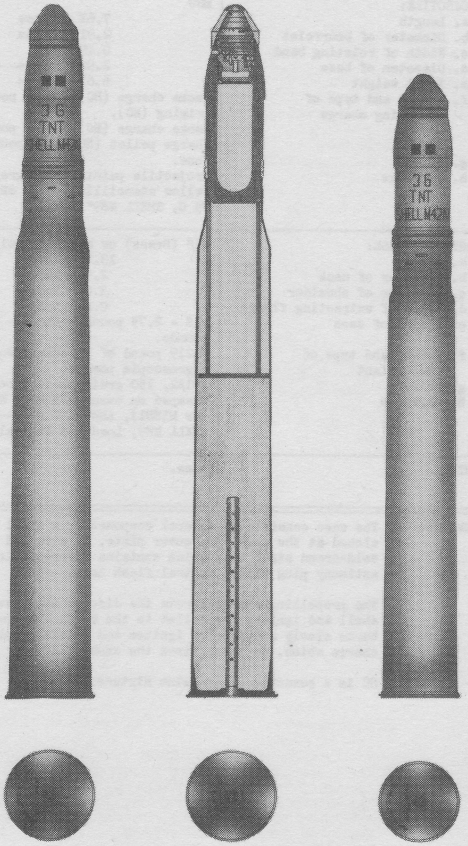
PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 75 mm., M89		TYPE: Chemical, Base Emission type
GUNS USED IN: 75 mm. Gun, M1897, M1916, M1917; 75 mm. Tank guns M2 and M3.		TARGET: Used for screening operations.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M89 20.26 inches 9.83 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M89 7.62 inches 2.915 inches 0.49 inch 2.928 inches 6.61 pounds Smoke charge (HC) - 1.68 pounds; priming (HC). Smoke charge (HC) - 1.33 pounds; charge pellet (HC) 0.02 pound. None. Projectile painted blue-grey with yellow stencilling:- "HC SMOKE, 75 G, SHELL M89".
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M18 (Brass) or M18B1 (Steel). 13.82 inches 2.92 inches 3.04 inches 0.24 inch M18 - 2.75 pounds; M18B1 - 2.53 pounds. 0.219 pound of Flashless Non-hygroscopic powder. M31A2, 150 grain percussion primer. Stamped on base:- 75 MM., M18 (or M18B1), AMM. LOT NO. ----, SHELL M89, Loader's initials.
4.	FUZE:	None.
5.	REMARKS: a. The case consists of several components; a steel tube, closed at the nose by a cover plate, is attached to a cold-drawn steel base which contains a screwed-in lead-antimony plug with a central flash hole. b. The propelling charge bursts the disc in the base of the shell and ignites the pellet in the base. The pellet burns slowly and finally ignites the priming smoke charge which, in turn, fires the smoke filling. c. HC is a hexachlorethane-zinc mixture.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE:	76 mm., M42A1 3 inch, M42A1	TYPE:	High Explosive
GUNS USED IN:	76 mm., M1. 3 inch gun, M1902, M1903, M1917, M1918, M1925, M1, M2, M3, M4, M5 and M6.	TARGET:	Used against personnel and unarmored materiel in general bombardment; 3 inch materiel used for anti-aircraft.



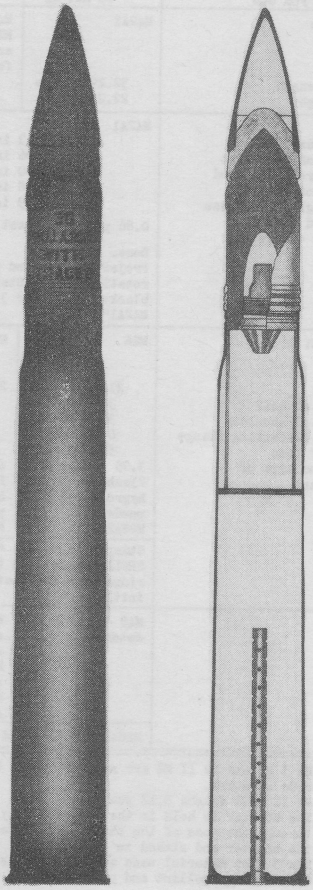
PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 76 mm., M42A1 3 inch, M42A1		TYPE: High Explosive	
GUNS USED IN: 76 mm., M1. 3 inch gun, M1902, M1903, M1917, M1918, M1925, M1, M2, M3, M4, M5 and M6.		TARGET: Used against personnel and unarmored materiel in general bombardment; 3 inch materiel used for anti-aircraft.	
	FOR GUN	76 mm. M1	3 inch
1.	COMPLETE ROUND:	M42A1	M42A1 with Mk. I M2 cartridge case and Mk. III A2 fuze.
	a. Overall length	32.29 inches	35.69 inches
	b. Total weight	22.23 pounds	26.65 pounds
2.	PROJECTILE:	M42A1	
	a. Length, less fuze	8.43 inches	
	b. Diameter of bourrelet	3.06 inches	
	c. Width of rotating band	1.00 inches	
	d. Diameter of base	2.98 inches	
	e. Total weight, less fuze	10.73 inches	
	f. Weight and type of bursting charge	0.86 pounds of cast TNT.	
	g. Tracer	None.	
	h. Markings	Projectile painted yellow except rotating band. Stencilled in black:- "76 G (or 3 G), TNT, SHELL M42A1".	
3.	CARTRIDGE CASE:	M26	Mk I M2 Mk II M2 Mk II M2-B1
	a. Length	21.30 inches	26.70" 23.08"
	b. Diameter of neck	3.09 inches	3.09" 3.08"
	c. Diameter of shoulder	3.17 inches	3.79" 3.32"
	d. Depth of extracting flange	0.30 inch	0.185" 0.185"
	e. Weight of case	5.28 pounds	8.5# 6.66#
	f. Weight and type of propellant	3.75 pounds of Flashless Non-hygroscopic powder.	4.87 pounds of Flashless Non-hygroscopic powder.
	g. Primer	M28A2	M28A1 or M28B1
	h. Markings	Stamped on base:- "AMM. LOT NO.--, SHELL M42A1, 76 G (or 3 G)", cartridge case designation, and loaders initials.	
4.	FUZE:	M48 - Point detonating.	Mk III A2 - 21 second anti-aircraft. M43A3 - mechanical time. M48 - Point detonating.
	a. Booster	M20A1 - 0.73 pound black powder.	
5.	REMARKS: a. Mk I M2 and Mk II M2 are made of brass; Mk II M2B1 is made of steel. b. Mk II M2B1 weighs 6.12 pounds. c. The booster is held in the projectile by a set screw through the nose of the shell. The fuze is screwed into the booster and staked in place. d. The 3 inch materiel uses a cardboard distance wad between the propellant and projectile.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE:	76 mm., M62 3 inch, M62	TYPE:	Armor-piercing with cap
GUNS USED IN:	76 mm. Gun M1 3 inch Gun M1918	TARGET:	Used against armored targets having homogeneous or face-hardened plate.



PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 76 mm., M62 3 inch, M62		TYPE: Armor-piercing with cap	
GUNS USED IN: 76 mm. Gun M1 3 inch Gun M1918		TARGET: Used against armored targets having homogeneous or face-hardened plate.	
	FOR GUN	76 mm.	3 inch
1.	COMPLETE ROUND: a. Overall length, with cap b. Total weight	M62 33.80 inches 24.80 pounds	M62 35.54 inches 27.24 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M62 13.26 inches with windshield; 8.94 inches without windshield. 3.035 inches 1.02 inches 2.98 inches 15.44 pounds 0.144 pound of Explosive "D". Tracer contained in base of fuze. Projectile painted black except rotating band. White stencilling:- "3 G (or 76 G), PROJ. A.P.C. M62, WITH TRACER".	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M26 21.30 inches 3.09 inches 3.07 inches 0.30 inch 5.28 pounds 3.63 pounds of Flashless Non-hygroscopic powder. M28A2 Stamped on base:- "AMM. LOT NO. --, A.P.C. M62, 76 MM. M26 (or 3 G MK II M2)", loader's initials.	Mk II M2, or Mk II M2B1. 23.08 inches 3.08 inches 3.318 inches 0.185 inch 6.66 pounds 4.62 pounds of Flashless Non-hygroscopic powder. M28A2
4.	FUZE: a. Type b. Booster c. Tracer	M66A1 Base detonating. The tracer consists of a red tracer pellet in front of an igniter composition pellet; the total weight being 0.01 pound.	M66A1 Base detonating.

5. REMARKS: a. Cartridge case, Mk II M2B1, is made of steel and weighs 6.12 pounds.

b. A distance wad of cardboard is used in the 3 inch, M62, between the propelling charge and projectile.

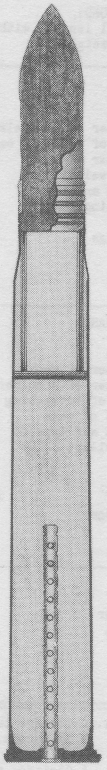
c. A windshield and armor-piercing cap are used with this projectile. The windshield is of cold-drawn, seamless, steel tubing or aluminum base alloy. The armor-piercing cap is of face-hardened steel.

C-O-N-F-I-D-E-N-T-I-A-L

531708 O - 43 - 5

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	76 mm., M79 3 inch, M79	TYPE:	Armor-piercing
GUNS USED IN:	76 mm., M1. 3 inch Gun, M1918, M1918A1, M1, M3 and M5.	TARGET:	Used against targets having homogeneous armor plate; also reinforced concrete.



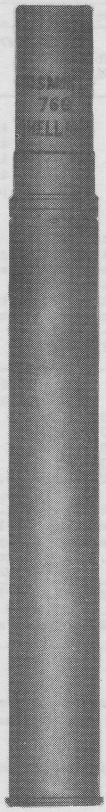
PROJECTILE DATA

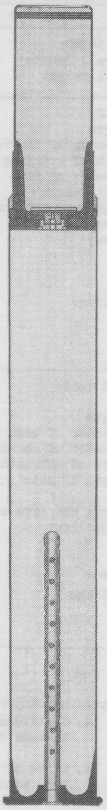
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 76 mm., M79 3 inch, M79		TYPE: Armor-piercing	
GUNS USED IN: 76 mm., M1. 3 inch Gun, M1918, M1918A1, M1, M3 and M5.		TARGET: Used against targets having homogeneous armor plate; also reinforced concrete.	
	FOR GUN	76 mm.	3 inch
1.	COMPLETE ROUND: a. Overall length b. Total weight	M79 29.76 inches 24.24 pounds	M79 31.57 inches 26.56 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M79 9.22 inches 2.995 inches 1.02 inches 2.98 inches 15.00 pounds None. Red tracer compound and igniter composition weighing 0.01 pound held in recess in base of projectile. Projectile painted black except rotating band. Stencilled in white:- "76 G (or 3 G), SHOT A.P. M79, WITH TRACER".	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M26 21.30 inches 3.09 inches 3.07 inches 0.30 inch 5.28 pounds 3.63 pounds of Flashless Non-hygroscopic powder. M28A2 Stamped on base:- "AMM. LOT NO.---, SHOT A.P. M79, 76 G M26 (or 3 G Mk II M2)", loader's initials.	Mk II M2, or Mk II M2B1. 23.08 inches 3.08 inches 3.318 inches 0.185 inch 6.66 pounds or 6.12 pounds. 4.38 pounds of Flashless Non-hygroscopic powder. M28A2 or M28A2B1.
4.	FUZE:	None.	
5.	REMARKS: a. Cartridge case, Mk II M2, is made of brass and Mk II M2B1 is made of steel. b. Ogive of projectile is 5.0 inch radius and nose curves to a point.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	76 mm., M88 3 inch, M88	TYPE:	Chemical, Base Emission
GUNS USED IN:	76 mm. Gun M1 3 inch Gun Anti-tank M5, M6 & M7	TARGET:	Used for screening operations.





PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 76 mm., M88 3 inch, M88		TYPE: Chemical, Base Emission	
GUNS USED IN: 76 mm. Gun M1 3 inch Gun Anti-tank M5, M6 & M7		TARGET: Used for screening operations.	
	FOR GUN	76 mm.	3 inch
1.	COMPLETE ROUND: a. Overall length b. Total weight	M88 28.56 inches 13.43 pounds	M88 30.85 inches 14.48 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M88 8.15 inches 2.98 inches 0.49 inch 2.98 inches 7.60 pounds The charge consist of three parts: An HC smoke charge weighing 1.75 pounds; an HC priming smoke charge weighing 1.38 pounds; and a charge pellet of HC weighing 0.02 pound. None. Projectile painted blue-grey with a one-half inch yellow band and yellow stencilling:- "HC SMOKE, 76 G (or 3 G), SHELL M88".	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Depth of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M26 21.30 inches 3.09 inches 3.07 inches 0.30 inch 5.28 pounds 0.219 pound of Flashless Non-hygroscopic powder. M28A2 Stamped on base:- "AMM. LOT NO. --, SHELL M88, 76 G M26 (or 3 G MK II M2)", and loader's initials.	Mk II M2 or Mk II M2B1. 23.08 inches 3.08 inches 3.318 inches 0.185 inch 6.66 pounds or 6.12 pounds. 0.219 pound of Flashless Non-hygroscopic powder. M28A2
4.	FUZE:	No fuze.	

5. REMARKS:

a. The case consists of several components; a steel tube, closed at the nose by a cover plate, is attached to a cold-drawn steel base which contains a screwed-in lead-antimony plug with a central flash hole.

b. The propelling charge bursts the disc in the base of the shell and ignites the pellet in the base. The pellet burns slowly and finally ignites the priming smoke charge which, in turn, fires the smoke filling.

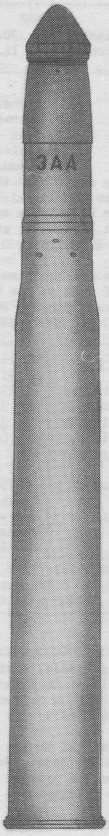
c. HC is a hexachlorethane-zinc mixture.

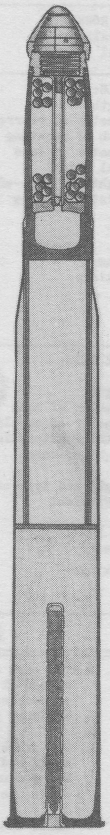
d. Cartridge case, Mk II M2B1, is made of steel and weighs 6.12 pounds.

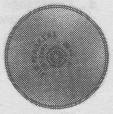
C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	3 inch, Mk I	TYPE:	Shrapnel
GUNS USED IN:	3 inch Gun, M1917, M1918, M1925M1, M1, M2, M3 and M4.	TARGET:	Used against personnel in the open.







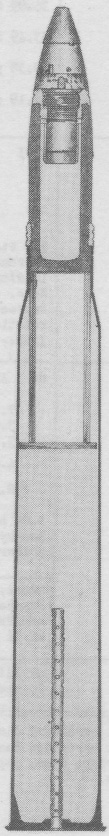
PROJECTILE DATA

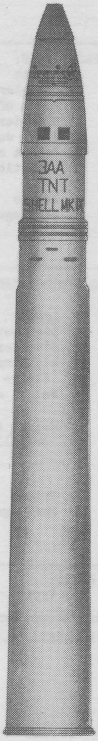
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 3 inch, Mk I		TYPE: Shrapnel	
GUNS USED IN: 3 inch Gun, M1917, M1918, M1925M1, M1, M2, M3 and M4.		TARGET: Used against personnel in the open.	
1.	COMPLETE ROUND: a. Overall length b. Total weight	Mk I 36.99 inches (Mk I A1 cartridge case). 33.49 inches (Mk II A1 cartridge case). 29.38 pounds (Mk I A1 cartridge case). 27.19 pounds (Mk II A1 cartridge case).	
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk I 11.55 inches 2.99 inches 0.55 inch 2.98 inches 15.25 pounds 108 steel balls in resin matrix surrounding a central burster leading to base burster charge. None. Projectile painted red except rotating band with black stencilling:- "3 AA, MK I SHRAPNEL."	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	Mk I A1 27.15 inches 3.09 inches 3.79 inches 4.67 inches 8.56 pounds 5.00 pounds of Non-hygroscopic powder. M28A1, or M28B1 (alternative) Stamped on base:- "AMM. LOT NO. --, SHRAPNEL MK I, 3 G MK I A1 (or MK II A1)", and loader's initials.	Mk II A1 23.65 inches 3.08 inches 3.40 inches 4.27 inches 6.75 pounds 4.62 pounds of Flashless Non-hygroscopic powder.
4.	FUZE: a. Type	Mk III A1. 21 second pyrotechnic time.	
5.	REMARKS: a. A cylindrical, cardboard distance wad, 12.5 inches long in the Mk I A1 cartridge case and 7.5 inches long in the Mk II A1 cartridge case, separates the propellant and the projectile.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 3 inch, Mk IX		TYPE: High Explosive
GUNS USED IN:	3 inch Gun, M1917, M1925M1, M2 & M4. 3 inch Gun, M1918, M1, M3, M6 & M7.	TARGET: Used against aircraft.





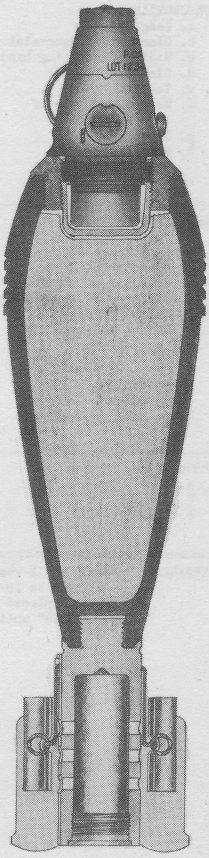
PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 3 inch, Mk IX		TYPE: High Explosive	
GUNS USED IN: 3 inch Gun, M1917, M1925M1, M2 & M4. 3 inch Gun, M1918, M1, M3, M6 & M7.		TARGET: Used against aircraft.	
	FOR GUN	M1918, M1, M3, M6, & M7	M1917, M1925M1, M2, & M4
1.	COMPLETE ROUND: a. Overall length b. Total weight	Mk IX 33.95 inches 24.84 pounds	Mk IX 37.57 inches 26.68 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk IX 12.40 inches 3.06 inches 1.00 inch 2.98 inches 12.80 pounds 0.91 pounds of cast TNT. None. Projectile painted yellow except rotating band. Stencilled in black:- "3 G, TNT SHELL MK. IX".	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant	Mk II M2, or Mk II M2B1. 23.08 inches 3.08 inches 3.318 inches 4.27 inches 6.66 pounds 4.87 pounds of Non-hygroscopic powder.	Mk I M2. 26.70 inches 3.09 inches 3.79 inches 4.67 inches 8.50 pounds 4.87 pounds of Non-hygroscopic powder.
	g. Primer h. Markings	M28A2, 300 grain percussion primer. Stamped on base:- "AWM. LOT NO.---, SHELL MK IX, 3 G MK I M2 (or MK II M2)", and loader's initials.	
4.	FUZE: a. Type b. Booster c. Adapter	M43A2 Mechanical time. M23 Adapter extends nose ogive and extends beyond body approximately.	
5.	REMARKS: a. This shell was formerly the "STANDARD" high explosive projectile for 3 inch anti-aircraft materiel but has been replaced by the SHELL M42A1. It will be "LIMITED STANDARD" until used up.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 81 mm., M43A1 3 inch, M43A1	TYPE: High Explosive
GUNS USED IN: 81 mm. Mortar M1 3 inch Trench Mortar Mk I A1.	TARGET: Used against personnel.



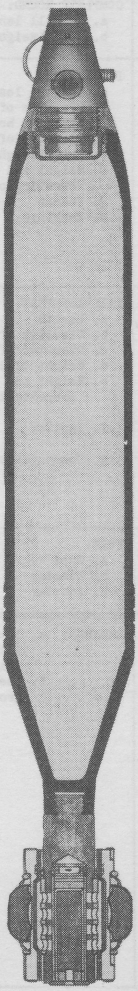
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 81 mm., M43A1 3 inch, M43A1		TYPE: High Explosive
GUNS USED IN: 81 mm. Mortar M1 3 inch Trench Mortar Mk I A1.		TARGET: Used against personnel.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M43A1 13.27 inches 7.05 pounds
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of bourrelet d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M43A1 7.74 inches 3.252 inches 1.02 inches 1.25 inches 5.48 pounds 1.23 pounds of cast TNT. None. Projectile painted yellow or olive drab except bourrelet. Black or yellow stencilling:- "81 M & 3 TM, TNT, SHELL M43A1, AMM. LOT NO. --".
3.	TAIL ASSEMBLY: a. Length b. Diameter of fins c. Diameter of central tube d. Weight of tail assembly e. Weight and type of propellant f. Igniter g. Construction of tail	 3.25 inches 2.80 inches 1.15 inches 0.95 pound 700 grains of (Nitroglycerine (double base)) powder in four increments. M3, 120 grain (Nitroglycerine (double base)) powder. Six fins, formed in pairs, are spot-welded to a central tube, threaded to screw into the base of the shell, and housing the igniter.
4.	FUZE: a. Type b. Booster c. Adapter	M52 Point detonating 29 grains of tetryl in fuze base. Yes.
5.	REMARKS: a. The propelling increments are held between the fins and around the central tube which is drilled to allow the flash from the igniter to pass to the propelling charge. b. There is only one bourrelet formed on this shell, and is grooved to form a gas-seal.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 81 mm., M45 3 inch, M45	TYPE: High Explosive
GUNS USED IN: 81 mm. Mortar M1 3 inch Mortar Mk I A1.	TARGET: Used against personnel



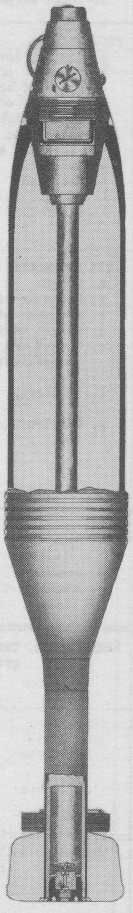
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 81 mm., M45 3 inch, M45		TYPE: High Explosive
GUNS USED IN: 81 mm. Mortar M1 3 inch Mortar Mk I A1.		TARGET: Used against personnel
1.	COMPLETE ROUND: a. Overall length b. Total weight	M45 23.59 inches 15.12 pounds
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of bourrelet d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M45 16.50 inches 3.126 inches 1.4 inches 1.18 inches 13.14 pounds 4.48 pounds of cast TNT. None. Projectile painted yellow or olive drab except bourrelet. Black or yellow stencilling:- "81 M & 3 TM, TNT, SHELL M45, AMM. LOT NO. ---".
3.	TAIL ASSEMBLY: a. Length b. Diameter of fins c. Diameter of central tube d. Weight of tail assembly e. Weight and type of propellant f. Igniter g. Construction of tail	4.65 inches 3.20 inches 1.25 inches 1.87 pounds Four increments, 400 grains total, of (Nitroglycerine (double base)) powder around central tube. M3, 120 grains (Nitroglycerine (double base)) powder. Tail assembly consists of four fins formed integrally with a hollow central tube which houses the igniter and around which are placed the propelling increments.
4.	FUZE: a. Type b. Booster c. Adapter	M45 Point detonating, superquick and delay. Contained in fuze. Yes. Fuze is screwed into and staked to the adapter.
5.	REMARKS: a. This projectile has only a rear bourrelet which is grooved to form a gas-seal.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	81 mm. and 3 inch, M56 81 mm. and 3 inch, M57	TYPE:	M56 - High Explosive M57 - Chemical
GUNS USED IN:	81 mm. Mortar M1 3 inch Mortar M1A1	TARGET:	Used against personnel. The M57 may also be used against armored vehicles.



PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 81 mm. and 3 inch, M56 81 mm. and 3 inch, M57		TYPE: M56 - High Explosive M57 - Chemical	
GUNS USED IN: 81 mm. Mortar M1 3 inch Mortar M1A1		TARGET: Used against personnel. The M57 may also be used against armored vehicles.	
1.	COMPLETE ROUND: a. Overall length b. Total weight	M56 22.29 inches 10.77 pounds	M57 22.89 inches WP - 11.50 pounds FS - 11.86 pounds HS - 10.41 pounds
2.	PROJECTILE: a. Length, with fuze M58 b. Diameter of bourrelet c. Width of rotating band d. Diameter of base	a. M56 or b. M57 17.73 inches 3.175 inches 1.00" (forward); 1.26" (rear). 1.14 inches	
	e. Total weight	9.91 pounds	WP - 10.62 pounds FS - 10.98 pounds HS - 9.53 pounds
	f. Weight and type of bursting charge	4.30 pounds of cast TNT.	M1 burster charge in M2 burster casing.
	g. Tracer	None.	None.
	h. Markings	a. Projectile painted yellow or olive drab except bourrelets. Black or yellow stencilling:- "81 M & 3 M, TNT, SHELL M56". b. Painted blue-grey except bourrelets. When WP or FS smoke fillings are used, a one-half inch yellow band and "WP SMOKE, 81 M & 3 M, SHELL M57, AMM. LOT NO." in yellow are stencilled on shell. With a HS filling, two one-half inch green bands and green stencilling "HS GAS, 81 M & 3 M, SHELL M57, AMM. LOT NO.---" appear on projectile.	
3.	TAIL ASSEMBLY: a. Length b. Diameter of tail vanes c. Weight of tail assembly d. Weight and type of propellant e. Primer	The tail assembly consists of twelve vanes radiating from a central tube containing the primer. 5.5 inches 3.15 inches 0.88 pound Four increments (M2) of (Nitroglycerine (double base)) powder in cloth containers placed around central tube at the base of the vanes. M34 percussion primer in central tube.	
4.	FUZE: a. Type b. Booster	M53 Point detonating 29 grains of tetryl.	M52 Point detonating 29 grains of tetryl.
	c. Adapter	The adapter continues the ogive of the projectile and is staked in place.	
5.	REMARKS: a. This shell has a forward and a rear bourrelet, the rear bourrelet being grooved similar to a rotating band.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 90 mm., M58	TYPE: High Explosive
GUNS USED IN: 90 mm. Gun M1	TARGET: Used against aircraft by anti-aircraft defenses; or anti-tank.

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 90 mm., M58		TYPE: High Explosive	
GUNS USED IN: 90 mm. Gun M1		TARGET: Used against aircraft by anti-aircraft defenses; or anti-tank.	
1.	COMPLETE ROUND: a. Overall length b. Total weight	M58 37.44 inches 39.15 pounds	
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M58 12.60 inches 3.62 inches 1.20 inches 3.10 inches 21.00 pounds 2.67 pounds of cast TNT (or alternative filling) None. Projectile painted olive drab except rotating band. Yellow stencilling:- "90 G, TNT, SHELL M58"	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M19; or M19B1. 23.70 inches 3.654 inches 4.40 inches 5.15 inches 11.00 pounds; or 10.10 pounds. 6.82 pounds of Non-hygroscopic smokeless powder. M28A2, 300 grain percussion primer. Stamped on base:- "AMM. LOT NO. --, SHELL M58, 90 MM. M19", and loader's initials.	
4.	FUZE: a. Type b. Booster c. Adapter	M43A1; or Mechanical time M20 or M20A1 None.	M48 point detonating M20A1

5. REMARKS:

a. This round is "LIMITED STANDARD", having been replaced by SHELL M71.

b. There are three alternative fillings: 1) 50/50 amatol and trimonite weighing 2.43 pounds with a TNT booster surround weighing 0.15 pound; or 2) a filling of trimonite (88% picric acid and 12% mononitronapthalene) weighing 2.76 pounds; or 3) a filling of ammonal (a mixture of 67% TNT, 22% ammonium nitrate, and 11% flaked aluminum) weighing 2.22 pounds with a TNT booster surround weighing 0.15 pound.

c. M48 fuze is used with SHELL M58 when used as anti-tank weapon.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 90 mm., M71	TYPE: High Explosive
GUNS USED IN: 90 mm. Gun M1	TARGET: Used against aircraft by anti-aircraft defenses.

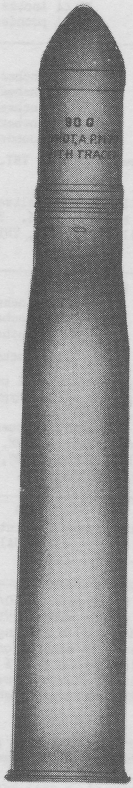
PROJECTILE DATA

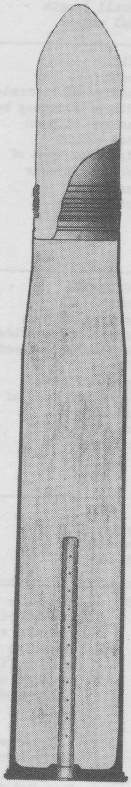
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 90 mm., M71		TYPE: High Explosive	
GUNS USED IN: 90 mm. Gun M1		TARGET: Used against aircraft by anti-aircraft defenses.	
1.	COMPLETE ROUND: a. Overall length b. Total weight	M71 37.44 inches 42.04 pounds	
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M71 12.60 inches 3.62 inches 1.20 inches 3.10 inches 23.40 pounds 2.04 pounds of cast TNT. None. Projectile painted olive drab except rotating band. Yellow stencilling:- "90 G, TNT, SHELL M71".	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M19 or M19B1 (Steel) 23.70 inches 3.654 inches 4.40 inches 5.15 inches 11.00 pounds; or 10.1 pounds. 7.31 pounds of Non-hygroscopic powder. M28A2, 300 grain percussion primer. Stamped on base:- "AMM. LOT NO. --, SHELL M71, 90 MM. M19", and loader's initials.	
4.	FUZE: a. Type b. Booster c. Adapter	M43A3; or Mechanical time M20A1 None	M48 Point detonating. M20A1
5.	REMARKS: a. There are three alternative fillings: 1) 50/50 Amatol and Trimonite weighing 1.81 pounds with a TNT booster surround weighing 0.15 pound; or 2) a filling of trimonite (88% picric acid and 12% mononitronapthalene); or 3) a filling of ammonal (a mixture of 67% TNT, 22% ammonium nitrate, and 11% flaked aluminum) weighing 1.95 pounds with a TNT booster surround weighing 0.15 pound. b. A light metal base cover prevents damage or premature detonation of the burster charge by the propellant. c. Fuze M48 is used when gun is used as anti-tank weapon.		

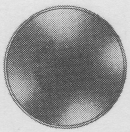
C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 90 mm., M77		TYPE: Armor-piercing	
GUNS USED IN: 90 mm. Gun M1, M3	TARGET:	Used against armored aircraft; or as anti-tank materiel.	







PROJECTILE DATA

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 90 mm., M77	TYPE: Armor-piercing
	GUNS USED IN: 90 mm. Gun M1, M3	TARGET: Used against armored aircraft; or as anti-tank materiel.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M77 32.75 inches 42.04 inches
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M77 10.00 inches 3.537 inches 1.20 inches 3.537 inches 23.40 pounds None. 0.01 pound of red tracer compound and 20 grains of igniter composition Projectile painted black except rotating band. White stencilling:- "90 G, SHOT A.P. M77, WITH TRACER."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M19; or M19B1 (Steel) 23.70 inches 3.654 inches 4.40 inches 5.15 inches 11.00 pounds; or 10.10 pounds. 7.31 pounds of Non-hygroscopic smokeless powder. M28A2 Stamped on base:- "AMM. LOT NO. --, 90 MM. M19, SHOT A.P. M77", and loader's initials.
4.	FUZE:	None
5.	REMARKS: a. SHOT M77 is made of chromium - molybdenum alloy steel. b. This round is "SUBSTITUTE STANDARD".	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 90 mm., M82		TYPE: Armor-piercing with cap
GUNS USED IN:	TARGET:	Used against aircraft and armored vehicles having homogeneous or face-hardened armor.

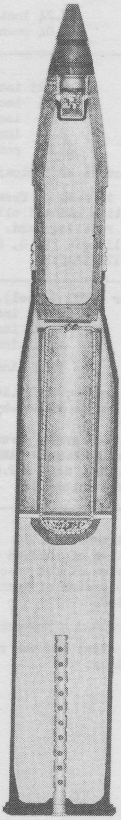
1.	COMPLETE ROUND: a. Overall length b. Total weight	M82 38.24 inches 42.04 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M82 16.125 inches 3.64 inches 1.20 inches 3.51 inches 25.00 pounds 1.40 pounds of Explosive "D". Housed in base of fuze. Projectile painted olive drab except rotating band. Yellow stencilling:- "90 G, PROJ. A.P.C. M82, WITH TRACER".
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M19; or M19B1 (Steel). 23.70 inches 3.654 inches 4.40 inches 5.15 inches 11.00 pounds; or 10.10 pounds. 7.31 pounds of Non-hygroscopic powder. M28A2, 300 grain percussion primer. Stamped on base:- "AMM. LOT NO. --, 90 MM. M19, SHOT A.P.C. M82", and loader's initials.
4.	FUZE: a. Type b. Booster c. Tracer	M68 Base detonating. 78 grains of pressed tetryl. 49 grains of red tracer composition and 20 grains of igniter composition.

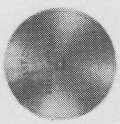
5. REMARKS: a. The cap is of face-hardened steel and the windshield is of steel or aluminum base alloy.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 105 mm., M38 105 mm., M38A1	TYPE: High Explosive
GUNS USED IN: 105 mm. Gun, A.A., M3.	TARGET: Used against aircraft





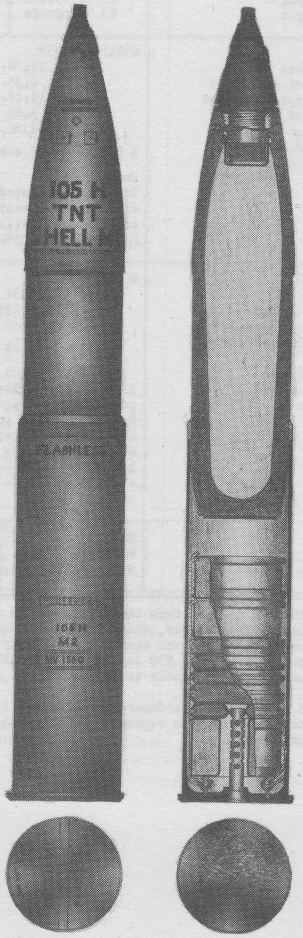
PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943	
	SIZE: 105 mm., M38 105 mm., M38A1	TYPE: High Explosive	
	GUNS USED IN: 105 mm. Gun, A.A., M3.	TARGET: Used against aircraft	
1.	COMPLETE ROUND: a. Overall length b. Total weight	M38A1 45.31 inches 63.73 pounds	M38 45.18 inches 63.79 pounds
2.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M38A1 and M38. 13.78 inches 4.35 inches 1.42 inches 3.65 inches 32.80 pounds 3.64 pounds of cast TNT. None. Projectile painted yellow or olive drab except rotating band. Black or yellow stencilling:- "AA, 105 G, TNT, SHELL M38 (or M38A1)".	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M6 30.37 inches 4.235 inches 5.40 inches 6.25 inches 19.00 pounds 11.0 pounds of Non-hygroscopic powder with an igniter of Flashless Non-hygroscopic powder. M28, 300 grain percussion primer. Stamped on base:- "105 MM., M6, LOT NO.---, SHELL M38A1 (or M38)", symbols of manufacturer, and date of manufacture.	
4.	FUZE: a. Type b. Adapter - booster	M43A3 Mechanical time. M20A1 - 0.73 lbs.	M2 Mechanical time. None.
5.	REMARKS: a. The M38 differs from the M38A1 only in the model fuze used. The M2 fuze, mechanical time, incorporated its own booster and was manufactured solely for the M38 projectile. The M38 is "LIMITED STANDARD", to be used until present stocks are exhausted. b. A cylindrical, cardboard distance wad is used in the cartridge case to separate the propellant and the projectile.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	105 mm., M1	TYPE:	High Explosive (semi-fixed)
GUNS USED IN:	105 mm. Howitzer, M2	TARGET:	Used against personnel and light materiel targets.



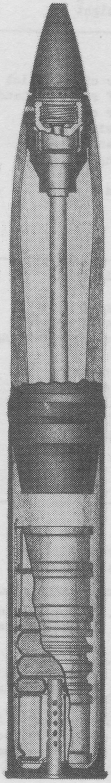
PROJECTILE DATA:

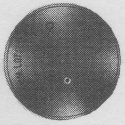
	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943	
	SIZE: 105 mm., M1	TYPE: High Explosive (semi-fixed)	
	GUNS USED IN: 105 mm. Howitzer, M2	TARGET: Used against personnel and light materiel targets.	
1.	COMPLETE ROUND: a. Overall length b. Total weight	M1 31.72 inches 42.46 pounds	
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M1 19.33 inches 4.146 inches 0.81 inch 3.45 inches 33.00 pounds 4.9 pounds of cast TNT. None. Projectile, except rotating band, painted yellow or olive-drab with black or yellow stencilling:- "105 H, TNT, SHELL M1."	
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M14, Type I. 14.64 inches 4.21 inches 4.35 inches 4.70 inches 5.90 pounds 3.04 pounds of Flashless Non-hygroscopic powder. M1B1A2, 100 grain percussion primer Stamped on base:- "AMM. LOT NO., SHELL M1, FLASHLESS, 105 MM. M14", loader's initials, zone or charge markings.	
4.	FUZE: a. Type b. Adapter-booster c. Fuze-well cup	M39A2, M48 Point detonating M20A1 Molded bakelite	M54 Time & Superquick M20A1 Molded bakelite
5.	REMARKS: a. The propelling charge is composed of a base section and seven increments to allow for zone firing. b. A base cover of thin steel is affixed to the base to minimize the danger of premature firing of the bursting charge by the propellant. c. Alternative fillings of 1) 4.57 pounds of 50/50 Amatol, with a TNT booster surround weighing 0.18 pound; and 2) 4.96 pounds of Trimonite may be used.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	105 mm., M60	TYPE:	Chemical (semi-fixed)
GUNS USED IN:	105 mm. Howitzer, M2.	TARGET:	Used to screen operations or when gas-filled - against personnel.



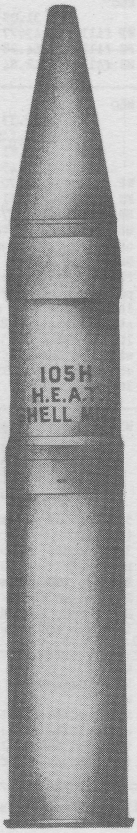


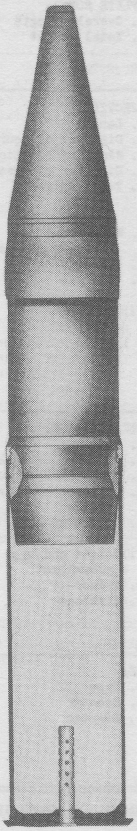
PROJECTILE DATA:

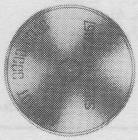
	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 105 mm., M60	TYPE: Chemical (semi-fixed)
	GUNS USED IN: 105 mm. Howitzer, M2.	TARGET: Used to screen operations or when gas-filled - against personnel.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M60 31.08 inches WP filler - 43.77 pounds FS filler - 44.28 pounds HS filler - 42.84 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M60 19.33 inches 4.146 inches 0.81 inch 3.45 inches WP filler - 34.70 pounds FS filler - 35.21 pounds HS filler - 33.77 pounds M5, Burster and tube - 1.11 pounds of which 0.40 pound is Tetryl. None. Projectile, except rotating band, painted blue-grey with a one-half inch yellow band and yellow stencilling:- "WP (or FS) SMOKE 105 H, SHELL M60"; or blue-grey with two one-half inch green bands and green stencilling:- "HS GAS, 105 H, SHELL M60."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M14 or M14B1 (steel) Type I. 14.64 inches 4.21 inches 4.35 inches 4.70 inches 5.90 pounds (brass); 5.40 pounds (steel). 3.04 pounds of Non-hygroscopic powder. M1B1A2, 100 grain percussion. Stamped on base:- "AMM. LOT NO., SHELL M60, 105 MM. M14", loader's initials and date of manufacture.
4.	FUZE: a. Type b. Booster c. Adapter	M57 Point detonating (Superquick) M22 Steel adapter extends the ogive approximately one inch and is threaded internally to receive the booster and fuze-well cup.
5.	REMARKS: a. Shell WP M60, and shell FS M60 are "LIMITED STANDARD". b. The weight of the chemical fillings are:- WP, Smoke, 4.06 pounds FS, Smoke, 4.61 pounds HS, Gas, 3.17 pounds C-O-N-F-I-D-E-N-T-I-A-L	

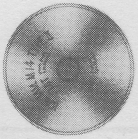
PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 105 mm., M67	TYPE: High Explosive anti-tank
GUNS USED IN: 105 mm. Howitzer, M2	TARGET: Used against armored vehicles.









C-O-N-F-I-D-E-N-T-I-A-L

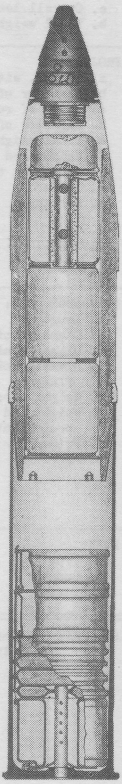
PROJECTILE DATA:

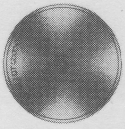
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 105 mm., M67		TYPE: High Explosive anti-tank
GUNS USED IN: 105 mm. Howitzer, M2		TARGET: Used against armored vehicles.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M67 31.05 inches 43.29 pounds
2.	PROJECTILE: a. Length, with cone b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M67 15.09 inches 4.146 inches 0.81 inch 3.55 inches 28.79 pounds Explosive "D". None. Projectile painted yellow or olive drab except rotating band. Stencilling in black or yellow:- "AMM. LOT NO., 105 MM., SHELL H.E. A.T. M67."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M14, Type II. 14.64 inches 4.21 inches 4.35 inches 4.70 inches 5.90 pounds 3.00 pounds of Flashless Non-hygroscopic powder. M1B1A2, 100 grain percussion. Stamped on base:- "105 MM. M14, AMM. LOT NO., SHELL H.E. A.T. M67" loader's initials and date of manufacture.
4.	FUZE: a. Type b. Booster c. Adapter	M62 Base detonating. Contained in fuze. None.
5.	REMARKS: a. This round was developed to be capable of penetrating either homogeneous or face-hardened armor.	

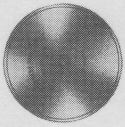
C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 105 mm., M84	TYPE: Chemical, Base Emission
GUNS USED IN: 105 mm. Howitzer, M2	TARGET: Used to screen operations.







C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 105 mm., M84		TYPE: Chemical, Base Emission
GUNS USED IN: 105 mm. Howitzer, M2		TARGET: Used to screen operations.
1.	COMPLETE ROUND: a. Overall length b. Total weight	M84 30.49 inches 41.94 pounds
2.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M84 18.75 inches 4.146 inches 0.81 inch 3.60 inches 32.87 pounds 0.14 pound of Army black powder. None. Projectile, except rotating band, painted blue-grey with a one-half inch yellow band below the bourrelet. Stencilled in yellow:- "SMOKE, SHELL M84."
3.	CARTRIDGE CASE: a. Length b. Diameter of neck c. Diameter of shoulder d. Diameter of extracting flange e. Weight of case f. Weight and type of propellant g. Primer h. Markings	M14 or M14B1 (Steel). 14.64 inches 4.21 inches 4.35 inches 4.70 inches 5.9 pounds (brass); 5.4 pounds (steel). 3.04 pounds of Non-hygroscopic powder. M1B1A2, 100 grain percussion. Stamped on base:- "AMM. LOT NO., SHELL M84, 105 MM. M14 (or M14B1)", loader's initials and date of manufacture.
4.	FUZE: a. Type b. Booster c. Adapter	M54 Time and Superquick. None. Yes.

5. REMARKS:

a. A base plate, 3.165 inches in diameter, is screwed into the base of the projectile, hand tight.

b. An adapter extends the ogive of the nose about two inches and is tapped to receive the fuze. The rear of the adapter is hollowed out to receive the black powder burster.

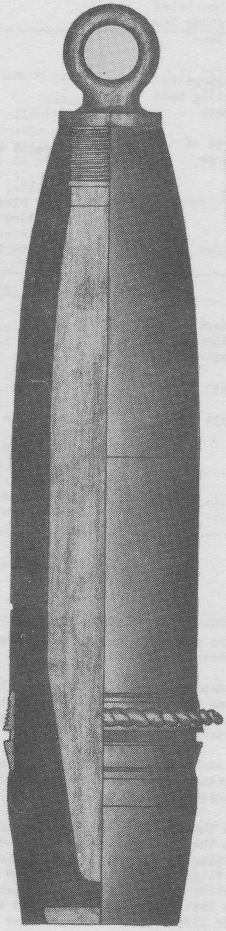
c. The smoke filling is divided into three candles, each weighing approximately 2.50 pounds, of HC (Hexachlorethane-zinc mixture) or a British smoke mixture.

d. When the fuze functions, after the shell has been fired from the howitzer, the black powder burster fires, igniting and expelling the candles. The candles follow the flight of the projectile and land nearby. By breaking the smoke-producing agent into three parts, less heat of burning is evolved with the result that the smoke cloud produced lies closer to the ground.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 4.5 inch, M65	TYPE: High Explosive (separate loading)
GUNS USED IN: 4.5 inch Field gun, M1.	TARGET: Used against personnel and light materiel targets.



PROJECTILE DATA:

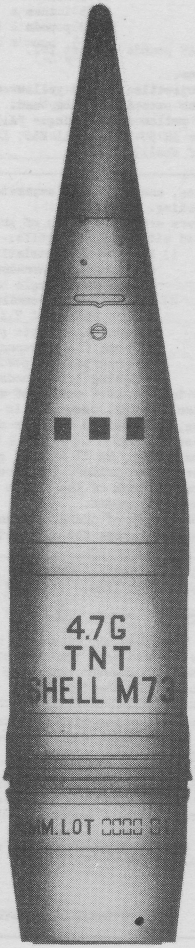
NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 4.5 inch, M65	TYPE: High Explosive (separate loading)
GUNS USED IN: 4.5 inch Field gun, M1.	TARGET: Used against personnel and light materiel targets.

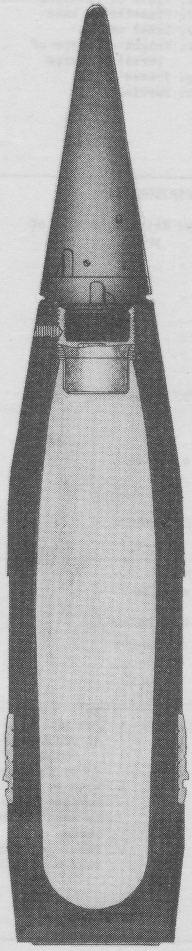
1.	PROJECTILE:	M65
	a. Length	18.90 inches
	b. Diameter of bourrelet	4.49 inches
	c. Width of rotating band	1.72 inches
	d. Diameter of base	3.75 inches
	e. Total weight	54.90 pounds
	f. Weight and type of bursting charge	4.49 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile painted yellow or olive drab except rotating band. Black or yellow stencilling:- "4.5 G, TNT (or AM 50-50), SHELL M65, LOT NO. (of shell)".
2.	CARTRIDGE CASE:	None, ammunition is separate loading.
	a. Weight and type of propellant	There are two weights of propellant used with this projectile:- 1) M7 (Normal) consisting of 6.5 pounds of Non-hygroscopic powder in a single bag; 2) or M8 (Super) consisting of a base charge of 7.43 pounds of Non-hygroscopic powder and one (1) increment of Non-hygroscopic powder weighing 3.56 pounds.
	b. Igniter	An igniter of 5 ounces of army black powder, contained in a silken bag, is sewed to the rear of the base charge.
	c. Primer	The primer, Mk II A1 - 21 grain, percussion primer, is placed in the breech block of the cannon when the round is loaded.
	d. Remarks	The breech of the gun forms the cartridge case for this materiel
3.	FUZE:	M67 M55A1
	a. Type	Mechanical time. Time and Super-quick.
	b. Booster	M21 M21
	c. Remarks	A fuze well cap of molded bakelite is screwed into the nose of the shell to prevent corrosion of the booster by the filler.
4.	REMARKS: a. Two alternative fillings may be used with this projectile 1) 50/50 Amatol, weight 4.08 pounds, and a booster surround of TNT weighing 0.2 pound; 2) or 4.64 pounds of Trimonite. b. With an M7 propelling charge, this projectile has a maximum range of 16,300 yards. When the M8 super charge is used the range is increased to a maximum of 21,000 yards. c. Fuze, point detonating, M51 and booster M21 may also be used with this projectile.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 4.7 inch, M73	TYPE: High Explosive (separate loading)
GUNS USED IN: 4.7 inch AA Gun	TARGET: Used against aircraft.





PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 4.7 inch, M73	TYPE: High Explosive (separate loading)
	GUNS USED IN: 4.7 inch AA Gun	TARGET: Used against aircraft.
1.	PROJECTILE:	M73
	a. Length	24.06 inches
	b. Diameter of bourrelet	4.693 inches
	c. Width of rotating band	2.25 inches
	d. Diameter of base	4.10 inches
	e. Total weight	50.00 pounds (Approx.)
	f. Weight and type of bursting charge	5.26 pounds of TNT. (See 4a)
	g. Tracer	None.
	h. Markings	Projectile painted yellow or olive drab except rotating band. Stencilled in black or yellow:- "4.7 G, TNT, SHELL M73."
2.	CARTRIDGE CASE:	M24
	a. Length	32.80 inches (See 4b)
	b. Diameter of extracting flange	7.55 inches
	c. Weight of case	24.70 pounds
	d. Weight and type of propellant	24.0 pounds of Non-hygroscopic powder.
	e. Primer	M1B1A2, 100 grain percussion primer
3.	FUZE:	M61
	a. Type	Mechanical time - anti-aircraft.
	b. Booster	M20A1

4. REMARKS: a. There are two alternative bursting charges:-

1) 50/50 Amatol, weight 4.80 pounds, with a TNT booster surround weighing 0.15 pound.

2) Trimonite weighing 5.42 pounds.

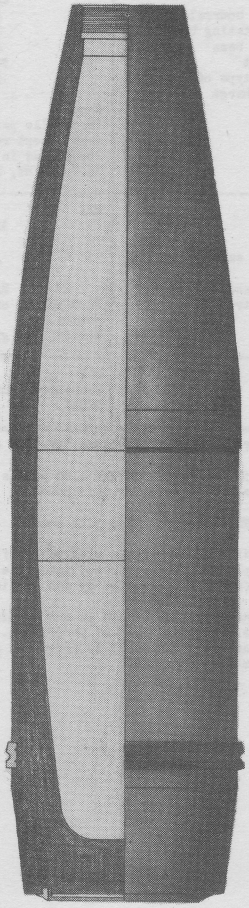
3) With either of the alternative fillings, a molded plastic cup is screwed into nose of shell to protect fuze from corrosion by the filling.

b. A large cork is placed in the opening of the cartridge case to prevent loss of propellant. This cork stays in place until the shell is fired and passes out of the muzzle at that time.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	155 mm., Mk I.	TYPE:	High Explosive
GUNS USED IN:	155 mm. Howitzer M1917, M1917A1 and M1918.	TARGET:	Used against personnel and light materiel targets.



C-O-N-F-I-D-E-N-T-I-A-L

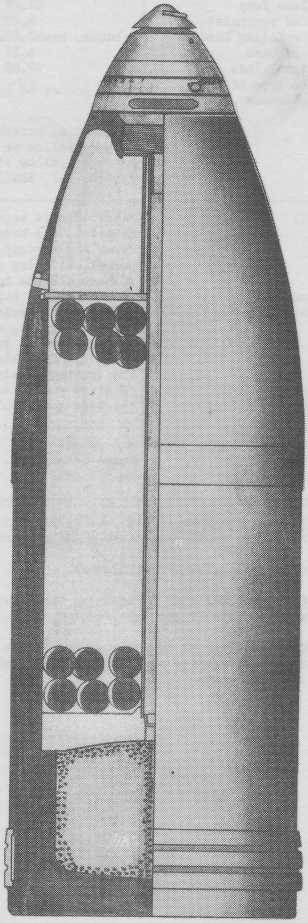
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 155 mm., Mk I.		TYPE: High Explosive
GUNS USED IN: 155 mm. Howitzer M1917, M1917A1 and M1918.		TARGET: Used against personnel and light materiel targets.
1.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight, less fuze f. Weight and type of bursting charge g. Tracer h. Markings	Mk I. 22.88 inches 6.085 inches 2 bands, each 0.602 inch 5.12 inches 92.62 pounds 15.17 pounds of cast TNT. None. Projectile, except rotating bands, painted yellow or olive-drab with black or yellow stencilling:- "155 H, TNT, SHELL MK I."
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer c. Igniter	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. M1A1 cartridge bag - 3.89 pounds of Non-hygroscopic powder. M2 cartridge bag - 8.25 pounds of Non-hygroscopic powder. Mk II A1, 21 grain percussion. The igniter consists of 3 ounces of black powder in a bag sewed to the base section.
3.	FUZE: a. Type b. Adapter - booster	M46 or M47 Point detonating. Mk III AM2.
4.	REMARKS: a. 155 mm. Shell Mk I, H.E., is "LIMITED STANDARD" and will be issued until present supplies are exhausted. b. Radius of ogive - 65.47 inches. c. Cartridge bag M1A1 is known as the "green bag charge" and consists of one base section and four increments. d. Cartridge bag M2 is known as the "white bag charge" and is a super-charge consisting of one base section and two increments.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., Mk I	TYPE: Shrapnel
GUNS USED IN: 155 mm. Gun M1917 & M1918. 155 mm. Howitzer M1917, M1917A1 and M1918.	TARGET: Used against personnel.



C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

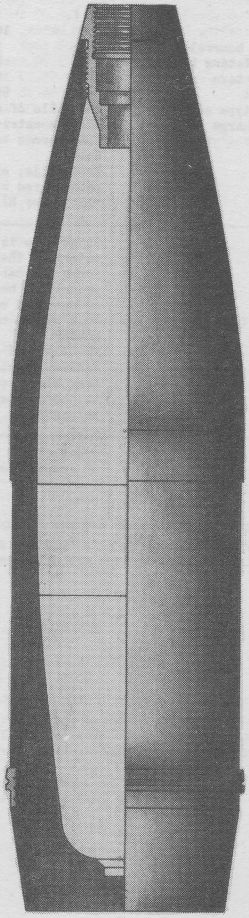
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 155 mm., Mk I		TYPE: Shrapnel
GUNS USED IN:	155 mm. Gun M1917 & M1918. 155 mm. Howitzer M1917, M1917A1 and M1918.	TARGET: Used against personnel.

1.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk I. 18.825 inches 5.95 inches 1.21 inches 5.68 inches 95.00 pounds 800 balls of antinomy and lead in a resin matrix. Base charge of 1.21 pounds of shrapnel powder. None. Projectile, except rotating bands, painted red with black stencilling: "155 G (or H)."
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer c. Igniter	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. 26.2 pounds of Non-hygroscopic powder. Mk II A1, 21 grain percussion. Igniter consists of 8 ounces of Army black powder in a bag sewed to the bottom of base charge (propellant).
3.	FUZE: a. Type b. Booster c. Adapter	Model 1907 45 second combination fuze. None. None.
4.	REMARKS: a. 155 mm. Shrapnel Mk I is "LIMITED STANDARD", to be used until present supplies are exhausted.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	155 mm., Mk II & Mk II A1	TYPE:	Chemical
GUNS USED IN:	155 mm. Howitzer, M1917, M1917A1 and M1918.	TARGET:	Used for screening operations, or against personnel when gas-filled.



C-O-N-F-I-D-E-N-T-I-A-L

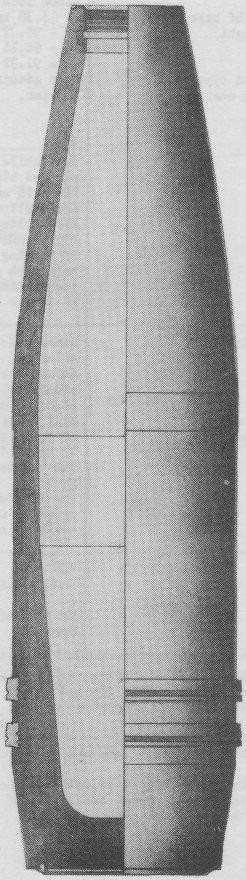
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 155 mm., Mk II & Mk II A1		TYPE: Chemical	
GUNS USED IN: 155 mm. Howitzer, M1917, M1917A1 and M1918.		TARGET: Used for screening operations, or against personnel when gas-filled.	
1.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk II 22.88 inches 6.08 inches Two bands, each 0.602 inch. 5.30 inches WP - 95.77 lbs. FS - 96.16 lbs. HS - 91.32 lbs. Fuze adapter-booster. None. Projectile, except rotating bands, painted blue-grey. If filling is WP or FS smoke, one (1) one-half inch yellow band and yellow stencilling:- "WP (or FS) SMOKE, 155 H, SHELL MK II (or MK II A1)." If filling is HS (gas), two one-half inch green bands and green stencilling:-"HS GAS, 155 H, SHELL MK II (or MK II A1)."	Mk II A1 22.97 inches 6.10 inches Two bands, each 0.602 inch. 5.20 inches WP - 97.94 lbs. FS - 99.33 lbs. HS - 94.50 lbs. M1 Burster casing and M6 burster, 0.66 pound of tetryl. None.
2.	CARTRIDGE CASE: a. Weight and type of propellant. b. Primer c. Igniter	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. M1A1 cartridge bag - 3.89 pounds of Non-hygroscopic powder. M2 cartridge bag - 8.25 pounds of Non-hygroscopic powder. Mk II A1, 21 grain percussion. The igniter consists of 3 ounces of black powder in a bag sewed to the base section.	
3.	FUZE: a. Type b. Booster	M46 Point detonating Mk VI B adapter-booster.	M57 Point detonating (Superquick). M22
4.	REMARKS: a. 155 mm. Mk II, Chemical, is "LIMITED STANDARD", having been replaced by the 155 mm. Mk II A1, and will be issued until present stocks are exhausted. b. Cartridge bag M1A1 is known as the "green bag charge" and consists of one base section and four increments. c. Cartridge bag M2 is known as the "white bag charge" and is a super-charge consisting of one base section and two increments.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	155 mm., Mk III and Mk III A1.	TYPE:	High Explosive
GUNS USED IN:	155 mm. Gun, M1917, M1917A1, and M1918M1.	TARGET:	Used against personnel and light materiel targets.



C-O-N-F-I-D-E-N-T-I-A-L

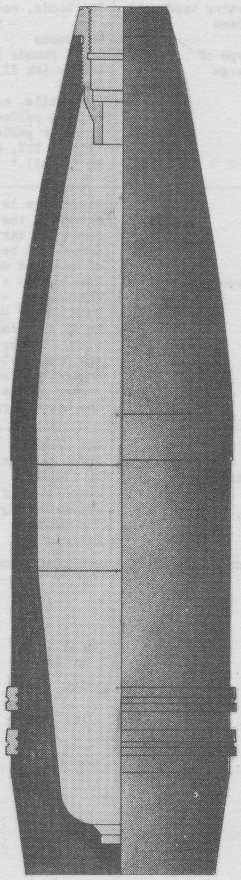
PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943	
	SIZE: 155 mm., Mk III and Mk III A1.	TYPE: High Explosive	
	GUNS USED IN: 155 mm. Gun, M1917, M1917A1, and M1918M1.	TARGET: Used against personnel and light materiel targets.	
1.	PROJECTILE:	Mk III	Mk III A1
	a. Length, less fuze	22.88 inches	
	b. Diameter of bourrelet	6.085 inches	
	c. Width of rotating band	Two bands, each 0.602 inch wide.	
	d. Diameter of base	5.24 inches	
	e. Total weight	95 pounds	96.15 pounds
	f. Weight and type of bursting charge	15.71 pounds (Mk III) or 15.21 pounds (Mk III A1) of cast TNT.	
	g. Tracer	None.	
	h. Markings	Projectile, except rotating bands, painted yellow or olive-drab with black or yellow stencilling:- "155 G, TNT, SHELL MK III (or MK III A1)."	
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.	
	a. Weight and type of propellant	Base charge - 19.0 pounds Increment - 6.0 pounds. Both are of Non-hygroscopic powder.	
	b. Primer	Mk II A1 primer, 21 grain percussion. The primer is inserted into the breech block.	
	c. Igniter	An igniter pad of 8 onces of black powder is sewed to the bottom of the base charge.	
3.	FUZE:	M46 or M47	M51A1
	a. Type	Point detonating	Point detonating
	b. Adapter-booster	Mk III AM2 consisting of approximately one ounce of tetryl.	M21A1
4.	REMARKS:		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., Mk VII and Mk VII A1	TYPE: Chemical
GUNS USED IN: 155 mm. Gun M1918M1, M1917 and M1918.	TARGET: With smoke filler - used to screen operations. With gas filler - used against personnel.



C-O-N-F-I-D-E-N-T-I-A-L

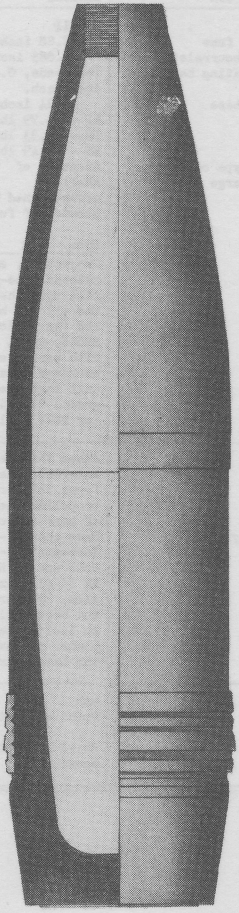
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 155 mm., Mk VII and Mk VII A1		TYPE: Chemical	
GUNS USED IN: 155 mm. Gun M1918M1, M1917 and M1918.		TARGET: With smoke filler - used to screen operations. With gas filler - used against personnel.	
	FOR GUN	M1918M1	M1917 and M1918
1.	PROJECTILE:		
	a. Length, less fuze	Mk VII 22.88 inches	Mk VII A1 22.88 inches
	b. Diameter of bourrelet	6.085 inches	6.098 inches
	c. Width of rotating band	Two bands, 0.602 inch each.	Two bands, 0.602 inch each.
	d. Diameter of base	5.24 inches	5.20 inches
	e. Total weight	WP - 96.79 lbs. FS - 98.33 lbs. HS - 93.49 lbs.	WP - 98.27 lbs. FS - 99.66 lbs. HS - 94.83 lbs.
	f. Weight and type of bursting charge	Bursting of shell is accomplished by booster of fuze.	M1 Burster casing and M6 Burster consisting of 0.36 pound of tetryl.
	g. Tracer	None.	None.
	h. Markings	Projectile, except rotating bands, painted blue-grey. With smoke fillings, the markings consist of:- One (1) one-half inch yellow band and (in yellow) "155 G, WP (or FS) SMOKE, SHELL MK VII (or MK VII A1)" With persistent gas filling, the markings consist of:- Two (2) one-half inch green bands, and (in green) "155 G, HS GAS, SHELL MK VII (or MK VII A1)."	
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.	
	a. Weight and type of propellant	Base charge - 19.0 pounds. Increment - 6.0 pounds. Both are of Non-hygroscopic powder.	
	b. Primer	Mk II A1 primer, 21 grain percussion. The primer is inserted into the breech-block.	
	c. Igniter	An igniter pad of 8 ounces of black powder is sewed to the bottom of the base charge.	
3.	FUZE:		
	a. Type	M46 Point detonating	M57 Point detonating (Superquick).
	b. Booster	Mk VI B adapter booster	M22.
	c. Adapter		
4.	REMARKS:		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 155 mm., M101 & M101B1		TYPE: High Explosive	
GUNS USED IN:	155 mm. Gun M1918, M1918M1, M1 & M1A1	TARGET:	Used against personnel and light materiel targets.



C-O-N-F-I-D-E-N-T-I-A-L

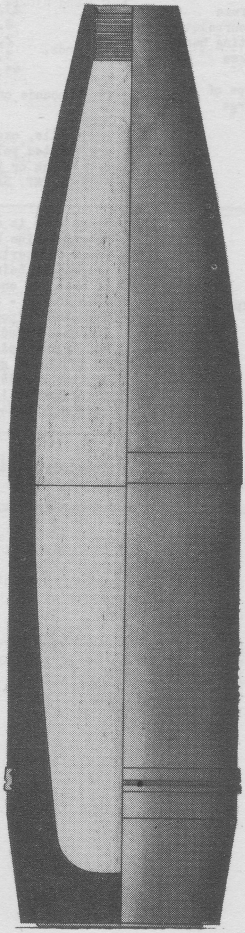
PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 155 mm., M101 & M101B1	TYPE: High Explosive
	GUNS USED IN: 155 mm. Gun M1918, M1918M1, M1 & M1A1	TARGET: Used against personnel and light materiel targets.
1.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M101 and M101B1. 23.80 inches 6.092 inches 2.02 inches 5.10 inches 95.37 pounds 15.13 pounds of cast TNT. None. Projectile, except rotating bands, are painted yellow or olive-drab with black or yellow stencilling:- "155 G, TNT, SHELL M101."
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer c. Igniter	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. Base charge - 21 pounds of Non-hygroscopic powder. Increment (one) - 10 pounds of Non-hygroscopic powder. Mk II A1, 21 grain percussion. Igniter consists of 10 ounces of black powder in a bag sewed to bottom of base charge.
3.	FUZE: a. Type b. Adapter - booster	M51 Point detonating. M21 - Tetryl.
4.	REMARKS:	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	155 mm., M102 & M102B1	TYPE:	High Explosive
GUNS USED IN:	155 mm. Howitzer, M1917, M1917A1 and M1918.	TARGET:	Used against personnel and light materiel targets.



C-O-N-F-I-D-E-N-T-I-A-L

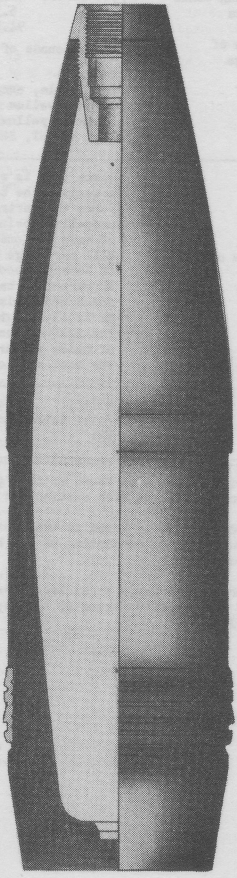
PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 155 mm., M102 & M102B1	TYPE: High Explosive
	GUNS USED IN: 155 mm. Howitzer, M1917, M1917A1 and M1918.	TARGET: Used against personnel and light materiel targets.
1.	PROJECTILE:	M102 and M102B1.
	a. Length, less fuze	23.80 inches
	b. Diameter of bourrelet	6.092 inches
	c. Width of rotating bands	Two bands, 0.602 inch each
	d. Diameter of base	5.30 inches
	e. Total weight	94.85 pounds
	f. Weight and type of bursting charge	15.56 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating bands, painted yellow or olive-drab with black or yellow stencilling:- "155 H, TNT, SHELL M102 (or M102B1)
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	M1A1 cartridge bag - 3.89 pounds of Non-hygroscopic powder. M2 cartridge bag - 8.25 pounds of Non-hygroscopic powder.
	b. Primer	Mk II A1, 21 grain percussion.
	c. Igniter	The igniter consists of 3 ounces of black powder in a bag sewed to the base section.
3.	FUZE:	M51A1; or M55A1
	a. Type	Point detonating; Time & superquick
	b. Booster	M21
4.	REMARKS: a. Cartridge bag M1A1 is known as the "green bag charge" and consists of one base section and four increments.	
	b. Cartridge bag M2 is known as the "white bag charge" and is a super-charge consisting of one base section and two increments.	
	c. This projectile has a steel base cover to minimize danger of premature firing of the explosive by the propellant.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943	
SIZE: 155 mm., M104 & M104B1	TYPE: Chemical (Separate loading)	
GUNS USED IN: 155 mm., Gun M1	TARGET:	With smoke filling - used to screen operations, with gas filling - used against personnel.



C-O-N-F-I-D-E-N-T-I-A-L

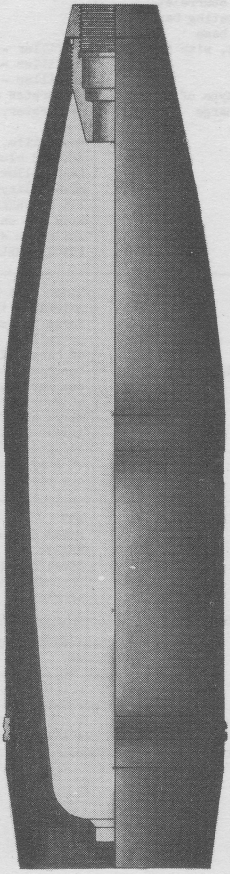
PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 155 mm., M104 & M104B1	TYPE: Chemical (Separate loading)
	GUNS USED IN: 155 mm., Gun M1	TARGET: With smoke filling - used to screen operations, with gas filling - used against personnel.
1.	PROJECTILE:	M104 and M104B1
	a. Length, less fuze	22.84 inches
	b. Diameter of bourrelet	6.092 inches
	c. Width of rotating band	2.02 inches
	d. Diameter of base	5.30 inches
	e. Total weight, with fuze	WP filler - 98.42 pounds FS filler - 99.72 pounds HS filler - 95.12 pounds
	f. Weight and type of bursting charge	M1 Burster casing, 1.69 pounds; and M6 Burster, 0.66 pound of tetryl.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted blue-grey with a one-half inch yellow band and yellow stencilling:- "WP (or FS) SMOKE 155 H, SHELL M104"; or blue-grey with two one-half inch green bands and green stencilling:- "HS GAS, 155 H, SHELL M104."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and increments.
	a. Weight and type of propellant	One base charge, 21 pounds, and one increment, 10 pounds. Both of Non-hygroscopic powder.
	b. Primer	Mk II A1, 21 grain percussion primer inserted in breech-block.
	c. Igniter	An igniter consisting of 10 ounces of Army black powder is sewed to the bottom of the base charge.
3.	FUZE:	M57
	a. Type	Point detonating (Superquick).
	b. Booster	M21A1.
	c. Adapter	Steel adapter brazed into shell. Threaded internally to take booster.
4.	REMARKS: a. The weight of the chemical fillers are:- WP (white phosphorus) - 15.6 pounds. FS (liquid sulphur trioxide - chlorsulphonicacid) - 16.9 pounds. HS (mustard gas-persistent) - 11.7 pounds.	
	b. The M104 projectile has a flat-base cavity whereas the M104B1 has a hemi-spherical base cavity.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., M1C5 & M105B1	TYPE: Chemical (Separate loading)
GUNS USED IN: 155 mm. Howitzer, M1917, M1917A1 and M1918.	TARGET: Smoke-filled:- Used to screen operations. Gas-filled:- Used against peraonnel.



C-O-N-F-I-D-E-N-T-I-A-L

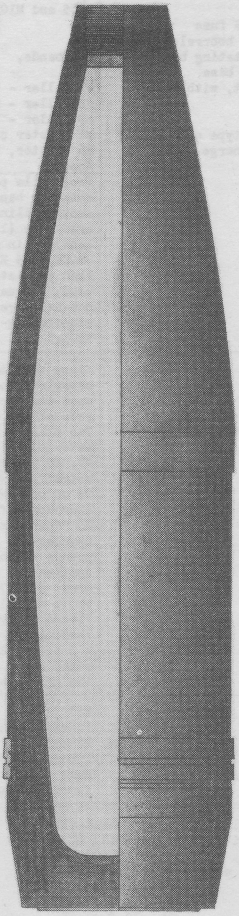
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 155 mm., M105 & M105B1		TYPE: Chemical (Separate loading)
GUNS USED IN: 155 mm. Howitzer, M1917, M1917A1 and M1918.		TARGET: Smoke-filled:- Used to screen operations. Gas-filled:- Used against peraonnel.
1.	PROJECTILE:	M105 and M105B1.
	a. Length, less fuze	22.84 inches
	b. Diameter of bourrelet	6.092 inches
	c. Width of rotating bands	Two bands, 0.602 inch each.
	d. Diameter of base	5.30 inches
	e. Total weight, with fuze	WP filler - 97.92 pounds FS filler - 99.22 pounds HS filler - 94.02 pounds
	f. Weight and type of bursting charge	M1 Burster casing, 1.69 pounds; and M6 Burster, 0.66 pounds of tetryl.
	g. Tracer	None.
	h. Markings	Projectile painted blue-grey except rotating bands. When WP or FS smoke filling is used, the markings are:- One (1) one-half inch yellow band and in yellow- "WP (or FS) SMOKE, 155 H, SHELL M105." When persistent gas (mustard) is used, the markings are:- Two (2) one-half green bands and green stencilling- "HS GAS, 155 H, SHELL M105."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, no cartridge case is used and the breech of the howitzer acts as the case.
	a. Weight and type of propellant	Two charges are used with this materiel:- 1) "Green bag charge", M1, of Non-hygroscopic powder and weighing 3.97 pounds which is made up of one base section and four increments for zones 1 to 5. 2) "White bag charge", M2, of Non-hygroscopic powder weighing 8.25 pounds which is made up of one base section and two increments for zones 5 to 7 inclusive.
	b. Primer	Mk II A1, 21 grain percussion. Placed in breech-block of gun after loading.
	c. Igniter	A 3 ounce black powder igniter in a bag sewed to the base section of the propellant.
3.	FUZE:	M57
	a. Type	Point detonating with Superquick.
	b. Booster	M21A1.
	c. Adapter	A steel adapter is brazed into the nose of the shell and is threaded to receive the booster.
4.	REMARKS: a. Shell M105B1 has a hemi-spherical base in the inner cavity while the shell M105 has a flat base. b. The weight of the fillings are:- WP - 15.6 pounds FS - 16.9 pounds HS - 11.7 pounds	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., M107	TYPE: High Explosive (Separate loading)
GUNS USED IN: 155 mm., Howitzer Ml.	TARGET: Used against personnel and unarmored materiel targets



C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

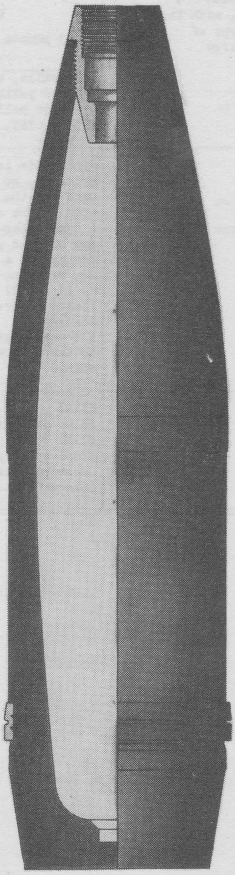
NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., M107	TYPE: High Explosive (Separate loading)
GUNS USED IN: 155 mm., Howitzer M1.	TARGET: Used against personnel and unarmored materiel targets

1.	PROJECTILE:	M107
	a. Length, less fuze	23.80 inches
	b. Diameter of bourrelet	6.092 inches
	c. Width of rotating band	1.02 inches
	d. Diameter of base	5.12 inches
	e. Total weight, with fuze	95.00 pounds
	f. Weight and type of bursting charge	15.13 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab with black or yellow stencilling:- "155 H, TNT, SHELL M107."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, no cartridge case is used and the breech of the howitzer acts as the case.
	a. Weight and type of propellant	A "green bag charge", M1, of Non-hygroscopic powder weighing 5.56 pounds and a "white bag charge", M2, weighing 13.47 pounds.
	b. Primer	Mk II A1, 21 grain percussion. Placed in breech-block after loading.
	c. Igniter	A 3 ounce igniter charge is sewed to the bottom of the propellant charge.
3.	FUZE:	M51A1 M55A1
	a. Type	Point detonating Time & superquick
	b. Booster	M21A1 Tetryl booster.
	c. Adapter	Steel adapter screwed into and brazed to shell. Threaded internally to receive booster.
4.	REMARKS:	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., M110 & M110B1	TYPE: Chemical (Separate loading)
GUNS USED IN: 155 mm. Howitzer M1.	TARGET: Smoke-filled:- Used to screen operations. Gas-filled:- Used against personnel.



C-O-N-F-I-D-E-N-T-I-A-L

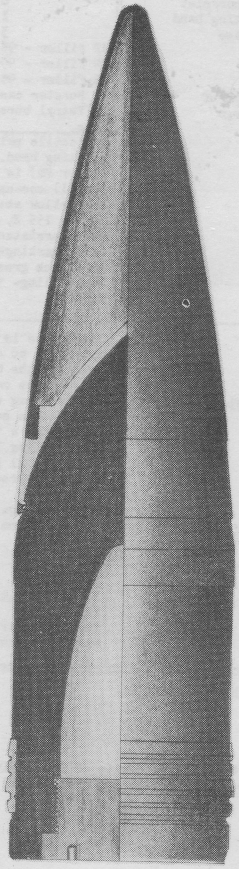
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 155 mm., M110 & M110B1		TYPE: Chemical (Separate loading)
GUNS USED IN: 155 mm. Howitzer M1.		TARGET: Smoke-filled:- Used to screen operations. Gas-filled:- Used against personnel.
1.	PROJECTILE:	M110
	a. Length, less fuze	22.84 inches
	b. Diameter of bourrelet	6.092 inches
	c. Width of rotating band	1.02 inches
	d. Diameter of base	5.30 inches
	e. Total weight	WP filler - 98.10 pounds FS filler - 99.40 pounds HS filler - 95.01 pounds
	f. Weight and type of bursting charge	M1 Burster casing, 1.69 pounds; and M6 Tetryl burster, 0.66 pound.
	g. Tracer	None.
	h. Markings	Projectile painted blue-grey except rotating band. When smoke filling (WP or FS) is used, markings are:- One (1) one-half inch yellow band and yellow stencilling- "WP (or FS) SMOKE, 155 H, SHELL M110." When persistent gas filling is used, markings are:- Two (2) one-half inch green bands and green stencilling- "HS GAS, 155 H, SHELL M110."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, no cartridge case is used and the breech of the howitzer acts as the case.
	a. Weight and type of propellant	A "green bag charge", M1, of Non-hygroscopic powder weighing 5.56 pounds and a "white bag charge", M2, weighing 13.47 pounds.
	b. Primer	Mk II A1, 21 grain percussion. Placed in breech-block after loading.
	c. Igniter	A 3 ounce igniter charge is sewed to the bottom of the propellant charge.
3.	FUZE:	M57
	a. Type	Point detonating with Superquick.
	b. Booster	M22
	c. Adapter	Steel adapter screwed into and brazed to nose of projectile.
4.	REMARKS: a. Weight of fillings:- WP (Smoke) - 15.6 pounds FS (Smoke) - 16.9 pounds HS (Gas) - 11.7 pounds b. The base of the cavity of Shell M110 is flat while the base of the cavity in Shell M110B1 is hemi-spherical.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 155 mm., M112	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 155 mm. Gun M1	TARGET: Used against armored targets having homogeneous or face-hardened plate.



PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 155 mm., M112		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 155 mm. Gun M1		TARGET: Used against armored targets having homogeneous or face-hardened plate.
1.	PROJECTILE:	M112
	a. Length, with cap and windshield	23.62 inches
		(less windshield) 14.61 inches
	b. Diameter of bourrelet	6.187 inches
	c. Width of rotating band	2.02 inches
	d. Diameter of base	6.092 inches
	e. Total weight	100.00 pounds
	f. Weight and type of bursting charge	1.44 pounds of Explosive "D".
	g. Tracer	None.
	h. Markings	Projectile, except rotating band painted yellow or olive-drab with black or yellow stencilling:- 105 G, PROJ. A.P. M112.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and increments.
	a. Weight and type of propellant	One base charge, 21 pounds, and one increment, 10 pounds. Both of Non-hygroscopic powder.
	b. Primer	Mk II A1, 21 grain percussion primer inserted in breech-block.
	c. Igniter	An igniter consisting of 10 ounces of Army black powder is sewed to the bottom of the base charge.
3.	FUZE:	M60
	a. Type	Base detonating
	b. Booster	100 grains of tetryl in fuze
	c. Adapter	None.

4. REMARKS:

a. The projectile is made of forged or cast steel.

b. The armor-piercing cap, weighing 5.27 pounds, is of forged steel which has been face-hardened to increase the penetrability with the inner part of the cap being relatively softer to protect the pointed nose of the projectile. (An alternative material for the cap is malleable cast iron.)

c. The windshield is a hollow, steel cone weighing 4.82 pounds. It is threaded internally to screw onto the armor-piercing cap.

C-O-N-F-I-D-E-N-T-I-A-L

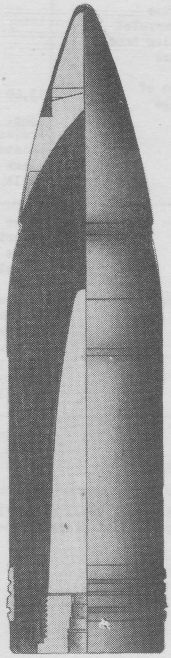
PROJECTILE DATA:

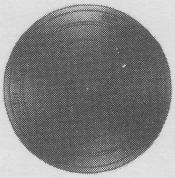
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 6 inch, Mk II A1		TYPE: High Explosive (Separate loading)
GUNS USED IN: 6 inch Seacoast Gun, M1897M1, M1900, M1903, M1905 and M1908.		TARGET: Used against personnel and for general bombardment.
1.	PROJECTILE:	Mk II A1.
	a. Length, less fuze	21.23 inches
	b. Diameter of bourrelet	5.98 inches
	c. Width of rotating band	2.00 inches
	d. Diameter of base	5.96 inches
	e. Total weight	90.55 pounds
	f. Weight and type of bursting charge	13.69 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab with black or yellow stencilling:- "6 IN., TNT, SHELL MK II A1."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
	a. Weight and type of propellant	For gun M1897M1 and M1908 - 29.0 pounds (single section) of Non-hygroscopic powder. For gun M1900, M1903 and M1905 - 32.5 pounds (single section) of Non-hygroscopic powder.
	b. Primer	M30 Electric primer.
3.	FUZE:	M46 or M47
	a. Type	Point detonating.
	b. Adapter - booster	Mk II A, 4.4 ounces of tetryl.
4.	REMARKS: a. 6 inch, SHELL MK II A1 is "LIMITED STANDARD" and will be issued until present stocks are exhausted.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	6 inch, Model 1911	TYPE:	Armor-piercing (Separate loading)
GUNS USED IN:	6 inch Seacoast Gun, M1897M1, M1900, M1903, M1905 and M1908.	TARGET:	Used against armored targets such as naval warcraft.





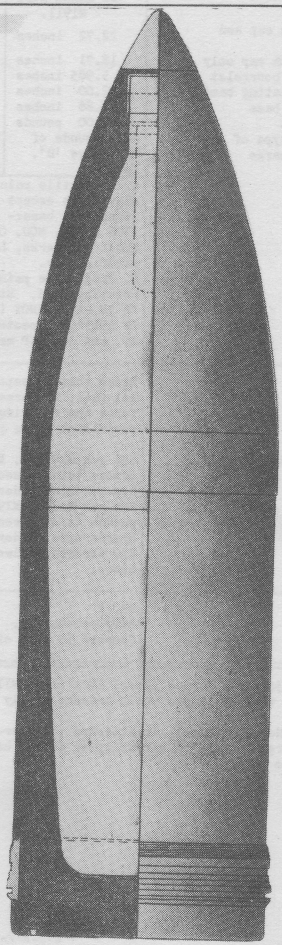
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 6 inch, Model 1911		TYPE: Armor-piercing (Separate loading)	
GUNS USED IN: 6 inch Seacoast Gun, M1897M1, M1900, M1903, M1905 and M1908.		TARGET: Used against armored targets such as naval warcraft.	
1.	PROJECTILE:	a. SHELL A.P. M1911.	b. SHOT A.P. M1911.
	a. Length, with cap and windshield	22.72 inches	20.60 inches
	Length, with cap only	18.71 inches	16.59 inches
	b. Diameter of bourrelet	5.985 inches	5.985 inches
	c. Width of rotating band	2.00 inches	2.00 inches
	d. Diameter of base	5.86 inches	5.86 inches
	e. Total weight	108.00 pounds	108.00 pounds
	f. Weight and type of bursting charge	4.53 pounds of Explosive 'D'.	1.54 pounds of Explosive 'D'.
	g. Tracer	None.	None.
	h. Markings	a. Projectile painted yellow or olive-drab except rotating band. Stamped on base:- "6 IN. A.P. SHELL (108 LBS.), MOD. OF 1911", inspector's marks, LOT NO., date of manufacturer. b. Projectile painted black except rotating band. Stamped on base:- "6 IN. A.P. SHOT (108 LBS.), MOD. OF 1911", inspector's marks, LOT NO. and date of manufacture.	
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.	
	a. Weight and type of propellant	For gun M1897M1, M1908 - 29.0 pounds (single section) of Non-hygroscopic powder. For gun M1900, M1903, M1905 - 32.0 pounds (single section) of Non-hygroscopic powder.	
	b. Primer	M30 electric primer in breech-block.	
3.	FUZE: a. Type b. Booster	Mk. V Base detonating. Booster in base of fuze.	
4.	REMARKS: a. Projectile, 6 inch, Model 1911 is "LIMITED STANDARD" and will be issued until present supply is exhausted. b. Windshield, steel, is attached to armor-piercing cap (forged steel) by screws after having been threaded into place.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	8 inch, Mk. I A1	TYPE:	High Explosive (Separate loading)
GUNS USED IN:	8 inch Gun, M1888, M1888M1 or M1888M2 8 inch Howitzer, Mk VI, Mk VII, Mk VIII 1/2 M1.	TARGET:	Used against personnel and for general bombardment.



PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 8 inch, Mk. I A1		TYPE: High Explosive (Separate loading)
GUNS USED IN:	8 inch Gun, M1888, M1888M1 or M1888M2 8 inch Howitzer, Mk VI, Mk VII, Mk VIII 1/2 M1.	TARGET: Used against personnel and for general bombardment.

1.	PROJECTILE:	Mk. I
	a. Length	29.01 inches
	b. Diameter of bourrelet	7.975 inches
	c. Width of rotating band	2.00 inches
	d. Diameter of base	7.75 inches
	e. Total weight	200.00 pounds
	f. Weight and type of bursting charge	29.63 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab with black or yellow stencilling:- "8 G (or H), TNT, SHELL MK I."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	For gun, base and increment sections of NC (Nitrocellulose or Pyrocellulose) powder weighing 70.6 pounds. For howitzer, 10.75 pounds of NC (Nitrocellulose or Pyrocellulose) powder.
	b. Primer	For gun, M30 Electric primer. For howitzer, Mk VII and Mk VI, friction igniter Mk IV. For howitzer, Mk VIII 1/2 M1, Mk II A1 percussion primer.
	c. Igniter	For Gun:- The igniter consist of a core and two pads, the core extending along the axis of the base section and the pads are sewed at each end. The total igniter charge weighs 17 ounces.
3.	FUZE:	M46 or M47.
	a. Type	Point detonating.
	b. Adapter - booster	Mk II A1 Tetryl booster.

4. REMARKS: a. Howitzer, Mk VII, is British design.

b. Base plate, Type IX is used to minimize the danger of premature explosion of the bursting charge by the propellant.

C-O-N-F-I-D-E-N-T-I-A-L

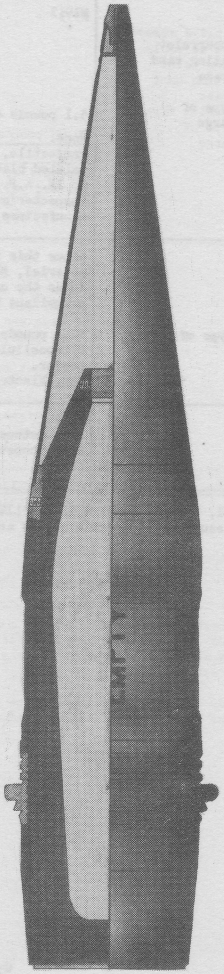
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 8 inch, M1911		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 8 inch Gun, M1888, M1888M1 and M1888MII.		TARGET: Used against armored targets such as naval warcraft.
1.	PROJECTILE:	M1911
	a. Length	33.00 inches
	b. Diameter of bourrelet	7.98 inches
	c. Width of rotating band	2.66 inches
	d. Diameter of base	7.93 inches
	e. Total weight	323.00 pounds
	f. Weight and type of bursting charge	5.1 pounds of Explosive 'D'.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted black. Stamped on base:- "8 IN. A.P. SHOT, MODEL OF 1911", inspector's marks and date of manufacture.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
	a. Weight and type of propellant	82.4 pounds (single section) of Nitrocellulose or Pyrocellulose powder.
	b. Primer	M30, Electric primer.
3.	FUZE:	Mk V.
	a. Type	Base detonating.
	b. Booster	None, booster charge contained in fuze.
4.	REMARKS: a. Shell, 8 inch, Model 1911 is "LIMITED STANDARD" and will be issued until present stocks are exhausted.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 8 inch, M103	TYPE: High Explosive (Separate loading)
GUNS USED IN: 8 inch Gun, Mk VI Mod. 3A2.	TARGET: Used against personnel and for heavy bombardment.



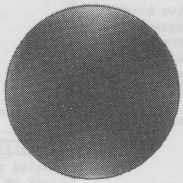
PROJECTILE DATA:

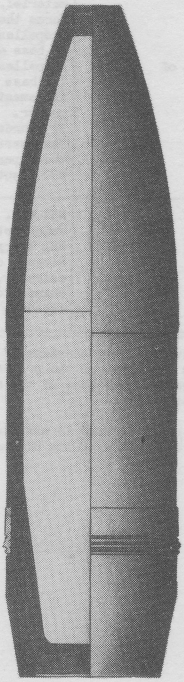
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 8 inch, M103		TYPE: High Explosive (Separate loading)
GUNS USED IN: 8 inch Gun, Mk VI Mod. 3A2.		TARGET: Used against personnel and for heavy bombardment.
1.	PROJECTILE:	M103
	a. Length, with ogive assembly	40.95 inches
	without ogive assembly	25.71 inches
	b. Diameter of bourrelet	7.99 inches
	c. Width of rotating band	3.31 inches
	d. Diameter of base	7.18 inches
	e. Total weight, with fuze	240.37 pounds
	f. Weight and type of bursting charge	20.90 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab with black or yellow stencilling:- "8 IN., TNT, SHELL M103."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	Propellant charge consists of one (1) base section and one (1) increment of Non-hygroscopic powder. The base section weighs 72 pounds and is the normal charge. The increment, when used, forms the supercharge weighing 104 pounds
	b. Primer	M30 Electric primer.
3.	FUZE:	M51 Mod. 1.
	a. Type	Point detonating.
	b. Booster	M21 Tetryl booster.
	c. Remarks	Because of the elongated ogive assembly, an extension flash channel of 13 inches has been added to the M51 fuze.
4.	REMARKS: a. The ogive assembly consists of a steel cone which extends the ogive of the projectile. The assembly is screwed to the nose of the shell and is secured by a set screw.	
	b. A base cover is used to minimize the danger of premature detonation of the explosive.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 8 inch, M106	TYPE: High Explosive (Separate loading)
GUNS USED IN: 8 inch Howitzer M106	TARGET: Used against personnel and for heavy bombardment.





PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 8 inch, M106		TYPE: High Explosive (Separate loading)
GUNS USED IN: 8 inch Howitzer M106		TARGET: Used against personnel and for heavy bombardment.
1.	PROJECTILE: a. Length, less fuze b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	M106 31.40 inches 7.99 inches 2.02 inches 7.62 inches 200.37 pounds 36.98 pounds of cast TNT. None. Projectile, except rotating band, painted yellow or olive-drab with black or yellow stencilling:- "8 IN., TNT, SHELL M106."
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. Normal charge - 13.4 pounds of Flashless Non-hygroscopic powder. Supercharge - 28.25 pounds of Flashless Non-hygroscopic powder. Mk II Al, 21 grain, percussion.
3.	FUZE: a. Type b. Booster	M51A1. Point detonating. M21A1
4.	REMARKS: a. A copper base cover is used to minimize the danger of premature explosion of the bursting charge by the propellant.	

C-O-N-F-I-D-E-N-T-I-A-L

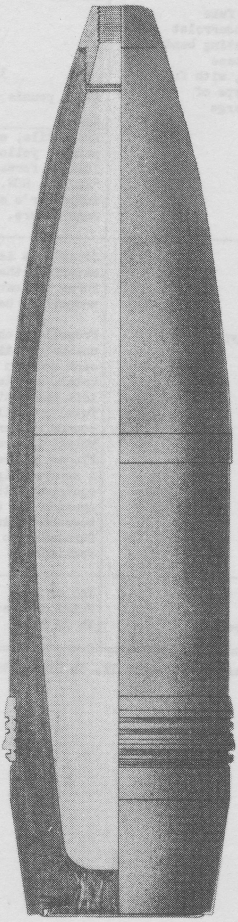
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 240 mm., Mk III		TYPE: High Explosive (Separate loading)
GUNS USED IN: 240 mm. Howitzer M1918 (Schneider)		TARGET: Used for general bombardment.
1.	PROJECTILE:	Mk. III
	a. Length, less fuze	32.64 inches
	b. Diameter of bourrelet	9.43 inches
	c. Width of rotating band	2.02 inches
	d. Diameter of base	7.33 inches
	e. Total weight, with fuze	345.00 pounds
	f. Weight and type of bursting charge	49.22 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped forward of rotating band:- "240 MM. HOW., SHELL MK III", inspector's mark and date of manufacture.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
	a. Weight and type of propellant	Propelling charge consists of five unequal sections; four sections each contain one-fifth of the total, and two sections each contain one-tenth of the total. Total propellant weighs 36.4 pounds of Non-hygroscopic powder.
	b. Primer	M21A1, 21 grain, percussion. Placed in breech-block.
	c. Igniter	A separate igniter is furnished equipped with straps to join igniter and complete charge together. An extra igniter is furnished so as to use up unused sections.
3.	FUZE:	M46 or M47.
	a. Type	Point detonating.
	b. Adapter - booster	Mk II A1.
4.	REMARKS: a. A base cover, Type IX, is fitted to base of projectile.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 240 mm., M114	TYPE: High Explosive (Separate loading)
GUNS USED IN: 240 mm. Howitzer M1.	TARGET: Used for general bombardment.



C-O-N-F-I-D-E-N-T-I-A-L

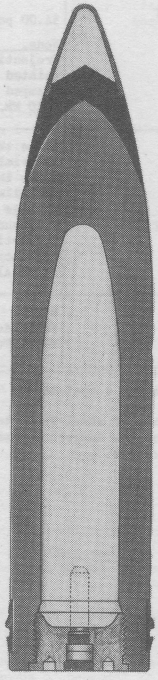
PROJECTILE DATA:

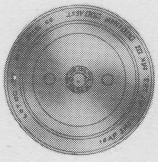
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 240 mm., M114		TYPE: High Explosive (Separate loading)
GUNS USED IN: 240 mm. Howitzer M1.		TARGET: Used for general bombardment.
1.	PROJECTILE:	M114
	a. Length, less fuze	38.00 inches
	b. Diameter of bourrelet	9.437 inches
	c. Width of rotating band	2.52 inches
	d. Diameter of base	4.05 inches
	e. Total weight	360.00 pounds
	f. Weight and type of bursting charge	54.00 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped forward of rotating band:- "240 MM. HOW. M1, SHELL M114."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	88 pounds of Non-hygroscopic powder consisting of a base section and one increment.
	b. Primer	Mk II A1, 21 grain, percussion.
3.	FUZE:	M51A1
	a. Type	Point detonating.
	b. Adapter - booster	M21A1 Tetryl booster
4.	REMARKS: a. Projectile has a boat-tail.	
	b. A base cover of steel is fitted to base of the projectile to minimize the danger of premature explosion of the bursting charge.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 10 inch, Mk III		TYPE:	Armor-piercing (Separate loading)
GUNS USED IN:	10 inch Seacoast Gun M1888, M1888MI, M1888MII, M1895, M1895MI and M1900.	TARGET:	Used against armored targets such as naval warcraft.





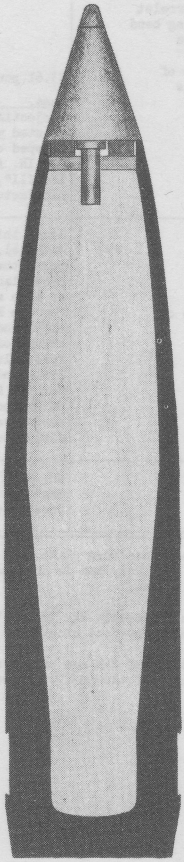
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 10 inch, Mk III		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 10 inch Seacoast Gun M1888, M1888MI, M1888MII, M1895, M1895MI and M1900.		TARGET: Used against armored targets such as naval warcraft.
1.	PROJECTILE:	Mk. III.
	a. Length, with cap and windshield	45.67 inches
	Length, with cap only	41.69 inches
	b. Diameter of bourrelet	9.98 inches
	c. Width of rotating band	3.33 inches
	d. Diameter of base	9.93 inches
	e. Total weight	617.00 pounds
	f. Weight and type of bursting charge	33.61 pounds of Explosive 'D'.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped on base of projectile:- "10 IN. A.P. SHELL, 617 LBS., MK. III", inspector's marks and manufacture marks.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	For Gun M1888, M1888MI, M1888MII, M1895 and M1895MI:- Two section charge of Nitrocellulose or Pyrocellulose powder weighing 155 pounds. For Gun M1900:- Two section charge of Nitrocellulose or Pyrocellulose powder weighing 176 pounds.
	b. Primer	M30, Electric primer.
3.	FUZE:	Mk. V.
	a. Type	Base detonating
	b. Booster	Booster contained in fuze.
4.	REMARKS: a. Projectile has base plate, 6.2 inches diameter, which screws into body and is drilled and threaded to receive the Mk V fuze.	
	b. 10 inch Projectile Mk. III is "LIMITED STANDARD" for issue until present stocks are exhausted.	
	c. Windshield and cap are one-piece forged steel. The windshield is threaded to screw on to cap.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 10 inch, Mk IV		TYPE:	High Explosive (Separate loading)
GUNS USED IN:	10 inch Seacoast Gun M1888, M1888MI, M1888MII, M1895 and M1895MI.	TARGET:	Used for general bombardment.



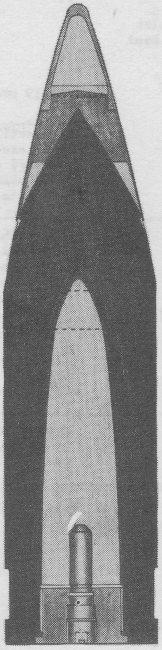
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 10 inch, Mk IV		TYPE: High Explosive (Separate loading)
GUNS USED IN: 10 inch Seacoast Gun M1888, M1888MI, M1888MII, M1895 and M1895MI.		TARGET: Used for general bombardment.
1.	PROJECTILE:	Mk IV.
	a. Length, less fuze	32.42 inches
	b. Diameter of bourrelet	9.975 inches
	c. Width of rotating band	3.33 inches
	d. Diameter of base	9.93 inches
	e. Total weight	519.08 pounds
	f. Weight and type of bursting charge	71.19 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile painted yellow or olive-drab except rotating band. Stamped forward of rotating band:- "10 IN. GUN, SHELL MK IV", inspector's mark and date of manufacture.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	Propelling charge consists of one base and one increment section of Nitrocellulose or Pyrocellulose powder weighing a total of 160 pounds.
	b. Primer	M30, Electric primer.
3.	FUZE:	M46 or M47.
	a. Type	Point detonating.
	b. Adapter - booster	Mk II A1.
4.	REMARKS: a. Shell, 10 inch, Mk IV is "STANDARD" for manufacture as of February 1, 1941.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	10 inch, Model 1911	TYPE:	Armor-piercing (Separate loading)
GUNS USED IN:	10 inch Seacoast Gun M1888, M1888MI, M1888MII, M1895, M1895MI and M1900.	TARGET:	Used against armored targets such as naval warcraft.



PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 10 inch, Model 1911		TYPE: Armor-piercing (Separate loading)
GUNS USED IN:	10 inch Seacoast Gun M1888, M1888MI, M1888MII, M1895, M1895MI and M1900.	TARGET: Used against armored targets such as naval warcraft.

1.	PROJECTILE:	M1911
	a. Length, with cap and windshield	41.22 inches
	Length, with cap only	35.70 inches
	b. Diameter of bourrelet	9.98 inches
	c. Width of rotating band	3.33 inches
	d. Diameter of base	9.93 inches
	e. Total weight	617.00 pounds
	f. Weight and type of bursting charge	33.61 pounds of Explosive 'D'.
	g. Tracer	None.
	h. Markings	Projectile painted yellow or olive-drab except rotating band. Stamped on base of projectile:- "10 IN. A.P. SHOT, 617 LBS. MOD. OF 1911", inspector's marks and Lot No.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	For Gun M1888, M1888MI, M1888MII, M1895 and M1895MI:- Two section charge of Nitrocellulose or Pyrocellulose powder weighing 155 pounds. For Gun M1900:- Two section charge of Nitrocellulose or Pyrocellulose powder weighing 176 pounds.
	b. Primer	M30, Electric primer.
3.	FUZE:	Mk V
	a. Type	Base detonating
	b. Booster	Booster contained in fuze.

4. REMARKS: a. Projectile has base plate, 6.2 inches diameter, which screws into body and is drilled and threaded to receive the Mk V fuze.

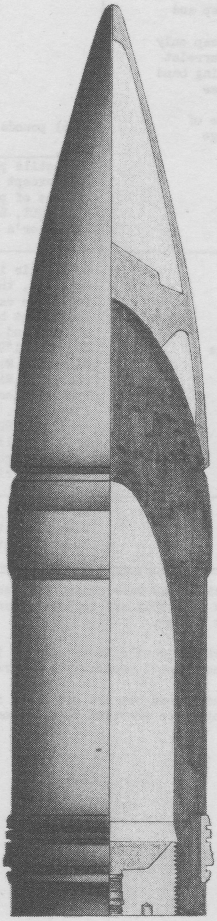
b. 10 inch Projectile Model of 1911 is "LIMITED STANDARD" for issue until present stocks are exhausted.

c. Windshield and cap are one-piece forged steel. The windshield is threaded to screw on to cap.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 12 inch, Mk I		TYPE:	Armor-piercing (Separate loading)
GUNS USED IN:	12 inch Seacoast Gun M1888 & M1895	TARGET:	Used against armored targets such as naval warcraft.



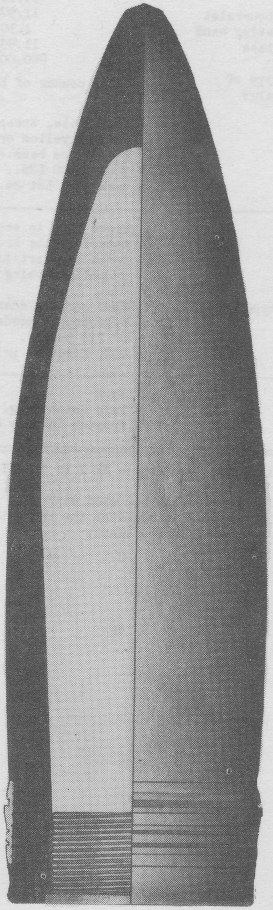
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 12 inch, Mk I		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 12 inch Seacoast Gun M1888 & M1895		TARGET: Used against armored targets such as naval warcraft.
1.	PROJECTILE: a. Length, with cap without cap b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk I 54.24 inches 36.79 inches 11.975 inches 4.10 inches 11.93 inches 900.00 pounds 43.34 pounds of Explosive 'D'. None. Projectile, except rotating band, painted yellow or olive drab. Stamped on base:- "12 IN. GUN A.P. PROJ., 900 LBS., MK. I", inspectors marks and Lot No..
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags. Four section charge of Non-hygroscopic powder weighing a total of 270 pounds. M30, Electric primer.
3.	FUZE: a. Type b. Booster	Mk X Base detonating. Booster in fuze body.
4.	REMARKS: a. 12 inch A.P. projectile Mk I is "LIMITED STANDARD". b. The armor-piercing cap used with this projectile is unique in that it combines the cap with a windshield, the two being in one piece.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	12 inch, Mk. VI	TYPE:	High Explosive (Separate loading)
GUNS USED IN:	12 inch Seacoast Gun M1895 (Railway mount). 12 inch Mortar M1890 & M1908.	TARGET:	Used for general bombardment.



PROJECTILE DATA:

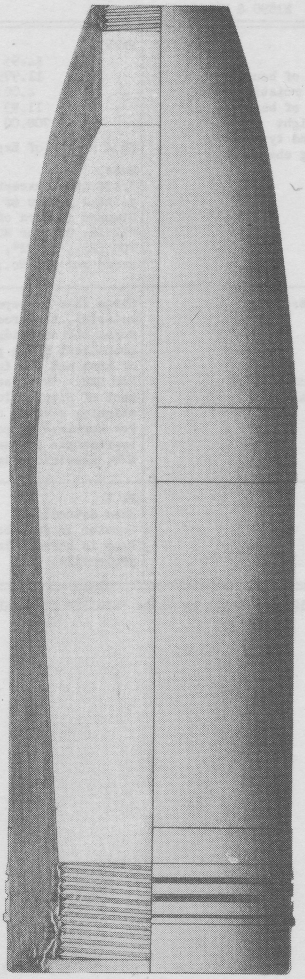
NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 12 inch, Mk. VI		TYPE: High Explosive (Separate loading)
GUNS USED IN:	12 inch Seacoast Gun M1895 (Railway mount). 12 inch Mortar M1890 & M1908.	TARGET: Used for general bombardment.

1.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk VI 44.95 inches 11.975 inches 4.00 inches 11.93 inches 700.00 pounds 86.4 pounds of Explosive 'D'. None. Projectile, except rotating band, painted yellow or olive-drab. Stamped forward of rotating band:- "12 IN. GUN (or MORTAR), SHELL, 700 LBS., MK VI", inspector's marks and Lot No..
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. For Gun:- Base section and increment of Nitrocellulose powder weighing a total of 220 pounds. For Mortar:- 63 pounds of Non-hygroscopic powder. M30, Electric primer.
3.	FUZE: a. Type b. Booster c. Adapter	Mk V Base detonating. Booster in fuze body. Fuze is screwed into base plug of projectile.
4.	REMARKS: a. 12 inch Shell Mk VI is "LIMITED STANDARD".	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 12 inch, Mk VI A	TYPE: High Explosive (Separate loading)
GUNS USED IN: 12 inch Mortar M1890 & M1908.	TARGET: Used for general bombardment.



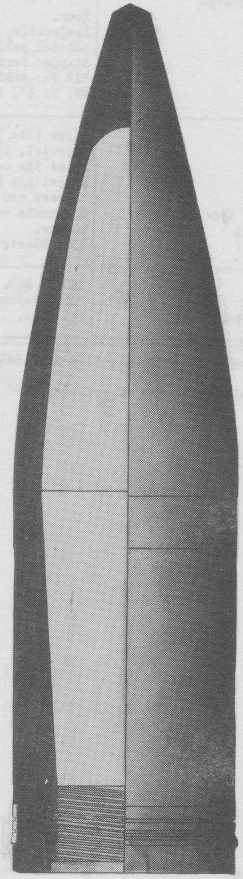
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 12 inch, Mk VI A		TYPE: High Explosive (Separate loading)
GUNS USED IN: 12 inch Mortar M1890 & M1908.		TARGET: Used for general bombardment.
1.	PROJECTILE:	Mk VI A.
	a. Length, without fuze	39.8 inches
	b. Diameter of bourrelet	11.975 inches
	c. Width of rotating band	4.00 inches
	d. Diameter of base	11.93 inches
	e. Total weight	692.9 pounds
	f. Weight and type of bursting charge	103.40 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped forward of rotating band:- "12 IN. MORTAR SHELL, 693 LBS., MK. VI A", inspector's marks.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	63 pounds of Non-hygroscopic powder.
	b. Primer	M30, Electric igniter.
3.	FUZE:	M46 or M47.
	a. Type	Point detonating.
	b. Adapter - booster	Mk. II A.
4.	REMARKS: a. Shell, 12 inch, Mk. VI A is "LIMITED STANDARD".	
	b. Only 2.0 inches of rotating band is seated in groove.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 12 inch, Mk VIII	TYPE: High Explosive (Separate loading)
GUNS USED IN: 12 inch Mortar, M1890 & M1908.	TARGET: Used for general bombardment.



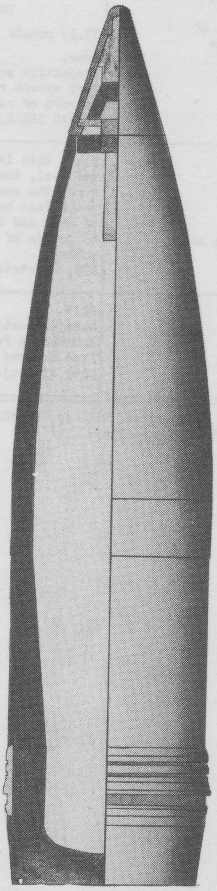
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 12 inch, Mk VIII		TYPE: High Explosive (Separate loading)
GUNS USED IN: 12 inch Mortar, M1890 & M1908.		TARGET: Used for general bombardment.
1.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk VIII 46.69 inches 11.975 inches 2.00 inches 11.93 inches 700.00 pounds 87.57 pounds of Explosive 'D'. None. Projectile painted yellow or olive-drab except rotating band. Stamped forward of rotating band:- "12 IN. MORTAR SHELL, 700 LBS., MK. VIII."
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. 63 pounds of Non-hygroscopic powder. M30, Electric primer.
3.	FUZE: a. Type b. Booster c. Adapter	Mk V Base detonating Booster in fuze body. Fuze screwed into center of base plug of projectile.
4.	REMARKS: a. Shell, 12 inch, Mk. VIII is "STANDARD" for manufacture as of February 1, 1941.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 12 inch, Mk X	TYPE: High Explosive (Separate loading)
GUNS USED IN: 12 inch Seacoast Gun M1895.	TARGET: Used for general bombardment.



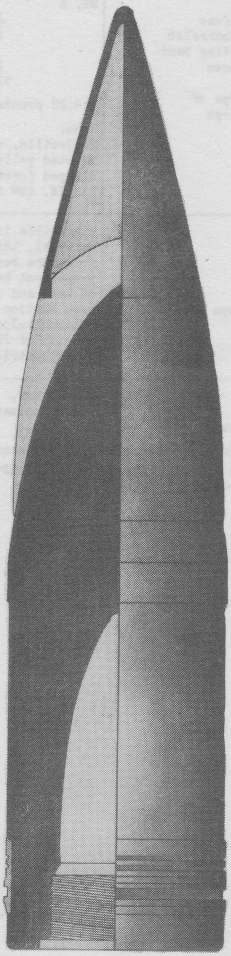
PROJECTILE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 12 inch, Mk X	TYPE: High Explosive (Separate loading)
	GUNS USED IN: 12 inch Seacoast Gun M1895.	TARGET: Used for general bombardment.
1.	PROJECTILE:	Mk. X
	a. Length, less fuze	43.11 inches
	b. Diameter of bourrelet	11.975 inches
	c. Width of rotating band	4.00 inches
	d. Diameter of base	11.93 inches
	e. Total weight	712.00 pounds
	f. Weight and type of bursting charge	118.28 pounds of cast TNT.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped forward of rotating band:- "12 IN. GUN SHELL, 712 LBS., MK X."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	Base section and increment of Nitrocellulose powder weighing a total of 220 pounds.
	b. Primer	M30, Electric primer.
3.	FUZE:	M46 or M47.
	a. Type	Point detonating.
	b. Adapter - booster	Mk. II A.
4.	REMARKS: a. Shell, 12 inch, Mk. X is "STANDARD" for manufacture as of February 1, 1941.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 12 inch, Mk. XVI	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 12 inch Seacoast Gun M1888, M1895 and M1900.	TARGET: Used against armored targets such as naval warcraft.



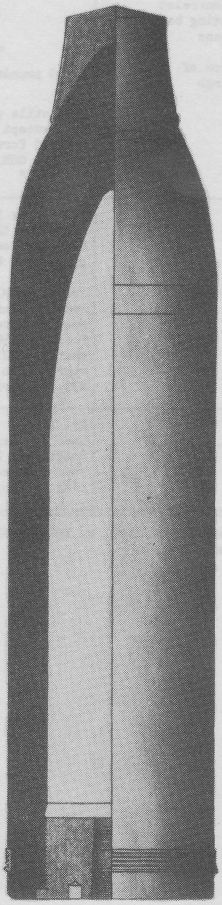
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 12 inch, Mk. XVI		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 12 inch Seacoast Gun M1888, M1895 and M1900.		TARGET: Used against armored targets such as naval warcraft.
1.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk. XVI. 50.45 inches 11.986 inches 4.00 inches 11.93 inches 975.00 pounds 22.20 pounds of Explosive 'D'. None. Projectile painted yellow or olive drab except rotating band. Stamped forward of rotating band:- "12 IN. GUN, A.P. PROJ., 975 LBS., MK. XVI."
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags. For Guns, M1888 and M1895:- Four section charge of 270 pounds of Non-hygroscopic powder. For Gun M1900:- Four section charge of 295 pounds of Non-hygroscopic powder. M30, Electric primer.
3.	FUZE: a. Type b. Booster c. Adapter	Mk. X Base detonating. Booster in body of fuze. Fuze screwed into center of base plug of projectile.
4.	REMARKS: a. Projectile, 12 inch, Mk XVI is "STANDARD" for issue and manufacture.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	12 inch, M1898 12 inch, Mk. XXVIII	TYPE:	Deck-piercing (Separate loading)
GUNS USED IN:	12 inch Mortar M1890 & M1908. 12 inch Mortar M1912.	TARGET:	Used against armored naval seacraft.



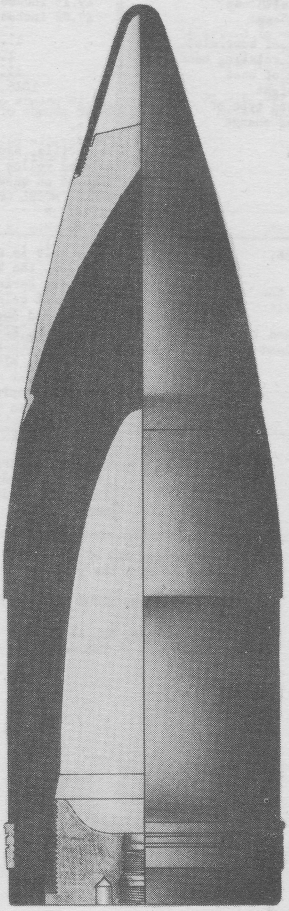
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 12 inch, M1898 12 inch, Mk. XXVIII		TYPE: Deck-piercing (Separate loading)	
GUNS USED IN: 12 inch Mortar M1890 & M1908. 12 inch Mortar M1912.		TARGET: Used against armored naval seacraft.	
1.	PROJECTILE:	M1898	Mk. XXVIII
	a. Length, with cap	49.15 inches	49.31 inches
	without cap	47.82 inches	47.18 inches
	b. Diameter of bourrelet	11.975 inches	
	c. Width of rotating band	1.25 inches	
	d. Diameter of base	11.93 inches	
	e. Total weight	1046.00 pounds	
	f. Weight and type of bursting charge	58.52 pounds of Explosive 'D'.	
	g. Tracer	None.	
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped on base:- "12 IN. D.P. SHELL, MODEL OF 1898 (or MK XXVIII)."	
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.	
	a. Weight and type of propellant	For Mortar, M1890 and M1908:- 47 pounds of Non-hygroscopic powder. For Mortar, M1912:- Base section and increment of 60 pounds of Non-hygroscopic powder.	
	b. Primer	M30, Electric primer.	
3.	FUZE:	Mk X	
	a. Type	Base detonating.	
	b. Booster	Booster in body of fuze.	
	c. Adapter	Fuze screwed into center of base plug.	
4.	REMARKS: a. The armor-piercing cap of the M1898 has been increased in thickness to make the projectile Mk. XXVIII.		
	b. Projectile, 12 inch, M1898 is "LIMITED STANDARD".		
	c. Projectile, 12 inch, Mk. XXVIII is "STANDARD" for issue and manufacture as of February 1, 1943.		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 12 inch, Model of 1911A		TYPE:	Deck-piercing (Separate loading)
GUNS USED IN:	12 inch Mortar M1890 & M1908 12 inch Mortar M1912.	TARGET:	Used against armored naval seacraft.



C-O-N-F-I-D-E-N-T-I-A-L

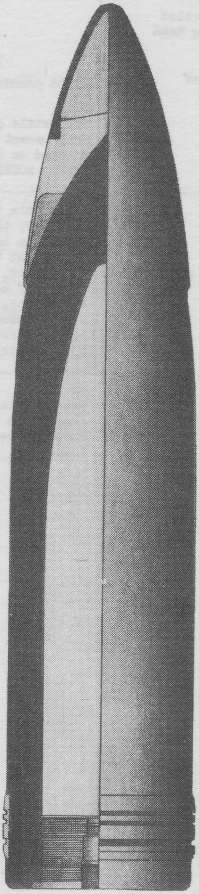
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 12 inch, Model of 1911A		TYPE: Deck-piercing (Separate loading)
GUNS USED IN: 12 inch Mortar M1890 & M1908 12 inch Mortar M1912.		TARGET: Used against armored naval seacraft.
1.	PROJECTILE:	M1911A
	a. Length, with cap	38.08 inches
	without cap	31.19 inches
	b. Diameter of bourrelet	11.975 inches
	c. Width of rotating band	2.00 inches
	d. Diameter of base	11.93 inches
	e. Total weight	700.00 pounds
	f. Weight and type of bursting charge	24.16 pounds of Explosive 'D'.
	g. Tracer	None.
	h. Markings	Projectile painted yellow or olive drab except rotating band. Stamped on base:- "12 IN. D.P. SHELL, MODED OF 1911A."
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
	a. Weight and type of propellant	For Mortar, M1890 and M1908:- 47 pounds of Non-hygroscopic powder. For Mortar, M1912:- Base section and increment of 60 pounds of Non-hygroscopic powder.
	b. Primer	M30, Electric primer.
3.	FUZE:	Mk X
	a. Type	Base detonating.
	b. Booster	Booster in body of fuze.
	c. Adapter	Fuze screwed into center of base plug.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	12 inch, M1912A	TYPE:	Deck-piercing (separate loading)
GUNS USED IN:	12 inch Seacoast Guns, M1888, M1895 and M1900	TARGET:	Used against armored naval seacraft.



PROJECTILE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 12 inch, M1912A	TYPE: Deck-piercing (separate loading)
GUNS USED IN: 12 inch Seacoast Guns, M1888, M1895 and M1900	TARGET: Used against armored naval seacraft.

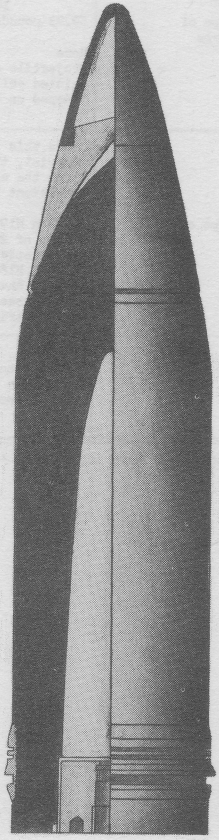
1.	PROJECTILE:	M1912A
	a. Length with cap	55.46 inches
	b. Length without cap	47.46 inches
	c. Diameter of bourrelet	11.93 inches
	d. Width of rotating band	4.0 inches
	e. Diameter of base	11.68 inches
	f. Total Weight	1070.0 pounds
	g. Weight and type of bursting charge	59.73 pounds of Explosive "D"
	h. Tracer	None
	i. Markings	Projectile except rotating band painted yellow or olive drab. Stamped on base: "12 In. D.P. SHELL MODEL OF 1912A
2.	CARTRIDGE CASE	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
	a. Weight and type of propellant	For Gun M1900: Four section charge of 295 pounds of Non-hygroscopic powder. For Gun M1888 and M1895: Four section charge of 270 pounds of Non-hygroscopic powder.
	b. Primer	M30 electric primer.
3.	FUZE:	Mk. X
	a. Type	Base detonating
	b. Booster	Booster in body of fuze.
	c. Adapter	Fuze screwed into center of base plug.

4. REMARKS: a. 12 inch Shell Model of 1912A is 'LIMITED STANDARD'

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	12 inch, Model of 1913	TYPE:	Deck-piercing (separate loading)
GUNS USED IN:	12 inch Seacoast Guns, M1888, M1895 and M1900	TARGET:	Used against armored naval seacraft.



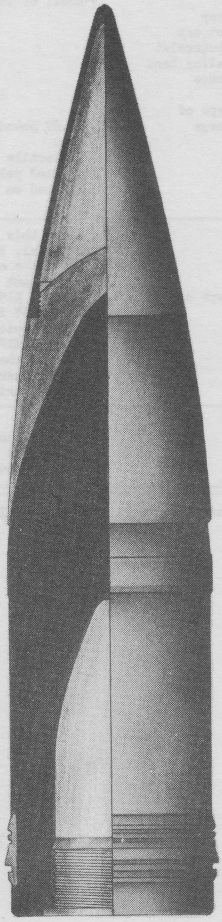
PROJECTILE DATA

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	SIZE: 12 inch, Model of 1913	TYPE: Deck-piercing (separate loading)
	GUNS USED IN: 12 inch Seacoast Guns, M1888, M1895 and M1900	TARGET: Used against armored naval seacraft.
1.	PROJECTILE	Model of 1913
	a. Length with cap	48.82 inches
	Length without cap	40.81 inches
	b. Diameter of bourrelet	11.975 inches
	c. Width of rotating band	4.0 inches
	d. Diameter of base	11.93 inches
	e. Total weight	1070.0 pounds
	f. Weight and type of bursting charge	19.47 pounds of Explosive "D"
	g. Tracer	None
	h. Markings	Projectile except rotating band painted yellow or olive drab. Stamped on base: "12 IN. D.P. SHELL MODEL OF 1913"
2.	CARTRIDGE CASE	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
	a. Weight and type of propellant	For Gun M1900: Four section charge of 295 pounds of Non-hygroscopic powder. For Gun M1888 and M1895: Four section charge of 270 pounds of Non-hygroscopic powder.
	b. Primer	M30 electric primer.
3.	FUZE:	Mk. X
	a. Type	Base detonating
	b. Booster	Booster in body of fuze.
	c. Adapter	Fuze screwed into base plug.
4.	REMARKS: a. 12 inch D.P. Shell M1913 is 'LIMITED STANDARD'	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 14 inch, Mk. VI		TYPE:	Armor-piercing (Separate loading)
GUNS USED IN:	14 inch Seacoast Gun M1907, M1909, M1910, M1910MI, M1920MI and M1920MII	TARGET:	Used against armored targets such as naval warcraft.



C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 14 inch, Mk. VI	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 14 inch Seacoast Gun M1907, M1909, M1910, M1910MI, M1920MI and M1920MII	TARGET: Used against armored targets such as naval warcraft.

1. PROJECTILE:	Mk. VI
a. Length, with cap and windshield	66.30 inches
Length, with cap only	44.68 inches
b. Diameter of bourrelet	13.984 inches
c. Width of rotating band	4.65 inches
d. Diameter of base	13.68 inches
e. Total weight	1560.00 pounds
f. Weight and type of bursting charge	31.36 pounds of Explosive 'D'.
g. Tracer	None.
h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped on base:- "14 IN. GUN A.P. PROJ., MK. VI, 1560 LBS.", inspector's marks, Lot No. and manufacture marks.
2. CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
a. Weight and type of propellant	For Gun M1907:- Four section charge total weight 320 pounds of Non-hygroscopic powder. For Gun M1909:- Two section charge of Non-hygroscopic powder weighing a total of 435 pounds. For Gun M1910 and M1910MI:- Four section charge of Non-hygroscopic powder weighing a total of 436 pounds. For Gun M1920MI and M1920MII:- Four section charge of Non-hygroscopic powder weighing a total of 460 pounds.
b. Primer	All guns, except the M1920MI and M1920MII, use electrical primers. The excepted guns use the Mk. XV M1 combination electric and percussion primer.
3. FUZE:	Mk X
a. Type	Base detonating.
b. Booster	None.

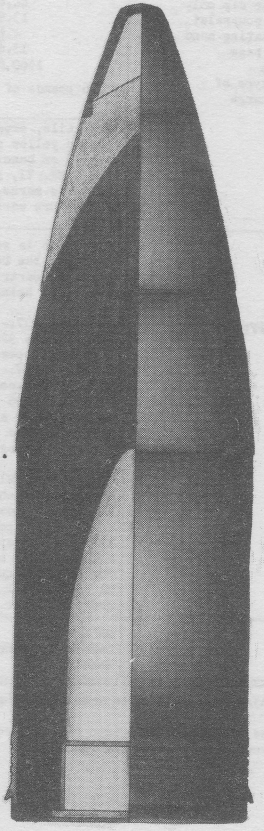
4. REMARKS: a. Projectile fitted with armor-piercing cap and windshield.

b. Base plug is screwed into rear of projectile and is threaded to receive the fuze.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 14 inch, Mk VIII (M9A1)		TYPE:	Armor-piercing (Separate loading)
GUNS USED IN:	14 inch Seacoast Gun M1907, M1909, M1910, M1910MI, M1920MI & M1920MII	TARGET:	Used against armored targets such as naval warcraft.



PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 14 inch, Mk VIII (M9A1)	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 14 inch Seacoast Gun M1907, M1909, M1910, M1910MI, M1920MI & M1920MII	TARGET: Used against armored targets such as naval warcraft.

1. PROJECTILE:	Mk VIII (M9A1)
a. Length, with cap and windshield	49.023 inches
Length, with cap only	44.68 inches
b. Diameter of bourrelet	13.98 inches
c. Width of rotating band	4.65 inches
d. Diameter of base	13.30 inches
e. Total weight	1400.00 pounds
f. Weight and type of bursting charge	Explosive 'D' - approx. 30 pounds.
g. Tracer	None.
h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Stamped on base:- "14 IN. GUN A.P. PROJ., MK. VIII, 1400 LBS.", inspector's marks, Lot No..
2. CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags.
a. Weight and type of propellant	For Gun M1907:- Four section charge of Non-hygroscopic powder weighing a total of 320 pounds. For Gun M1909:- Two section charge of Non-hygroscopic powder weighing a total of 435 pounds. For Gun M1910 and M1910MI:- Four section charge of Non-hygroscopic powder weighing a total of 436 pounds. For Gun M1920MI and M1920MII:- Four section charge of Non-hygroscopic powder weighing a total of 460 pounds.
b. Primer	All guns, except the M1920MI and M1920MII, use electrical primers. The excepted guns use the Mk. XV M1 combination electric and percussion primer.
3. FUZE:	Mk. X
a. Type	Base detonating
b. Booster	None.

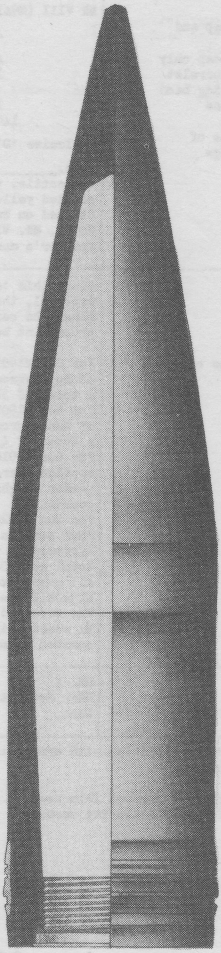
4. REMARKS: a. Projectile is fitted with armor-piercing cap and a windshield.

b. Base plug is screwed into rear of projectile and is threaded to receive the screw.

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
SIZE:	14 inch, Mk XI (M2A1)	TYPE:	High Explosive (Separate loading)
GUNS USED IN:	14 inch Seacoast Gun M1920MI and M1920MII.	TARGET:	Used in general bombardment.



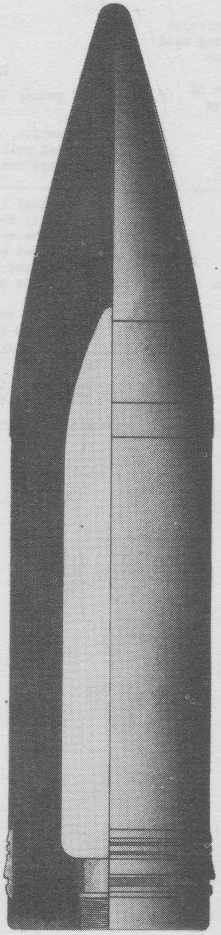
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 14 inch, Mk XI (M2A1)		TYPE: High Explosive (Separate loading)
GUNS USED IN: 14 inch Seacoast Gun M1920MI and M1920MII.		TARGET: Used in general bombardment.
1.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk XI (M2A1) 62.05 inches 13.98 inches 4.65 inches 13.89 inches 1208.00 pounds 167 pounds of Explosive 'D'. None. Projectile, except rotating band, painted yellow or olive-drab. Markings not known.
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment. 480 pounds of Non-hygroscopic powder. Mk XV M1, combination electric and percussion primer.
3.	FUZE: a. Type b. Booster	Mk. V Base detonating. Booster in base of fuze.
4.	REMARKS:	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 14 inch, M1909	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 14 inch Seacoast Gun M1907, M1909, M1910 and M1910MI	TARGET: Used against armored targets such as naval warcraft.



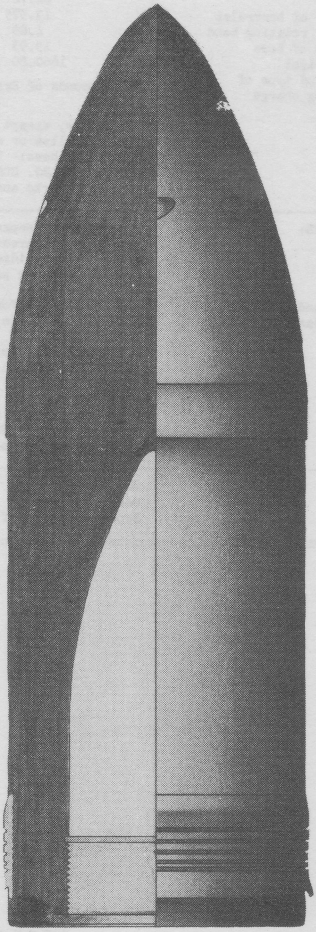
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
SIZE: 14 inch, M1909		TYPE: Armor-piercing (Separate loading)	
GUNS USED IN: 14 inch Seacoast Gun M1907, M1909, M1910 and M1910MI		TARGET: Used against armored targets such as naval warcraft.	
1.	PROJECTILE: a. Length b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings		M1909 62.72 inches 13.975 inches 4.65 inches 13.93 inches 1660.00 pounds 88.31 pounds of Explosive 'D'. None. Projectile, except rotating band, painted yellow or olive-drab. Stamped on base:- "14 IN. GUN SHELL 1660 LBS. MOD. 1909", inspector's marks and Lot No..
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer		Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags. For Gun M1907:- Four section charge of Non-hygroscopic powder weighing 320 pounds. For Gun M1909:- Two section charge of Non-hygroscopic powder weighing 435 pounds. For Gun M1910 and 1910MI:- Four section charge of Non-hygroscopic powder weighing 436 pounds. M30, Electric primer.
3.	FUZE: a. Type c. Booster		Mk X Base detonating Booster in base of fuze.
4.	REMARKS:		

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 16 inch, Mk II Mod. 2	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 16 inch Howitzer M1920; 16 inch Seacoast Gun M1919 and Mk II (Navy)	TARGET: Used against armored targets such as naval warcraft.



PROJECTILE DATA:

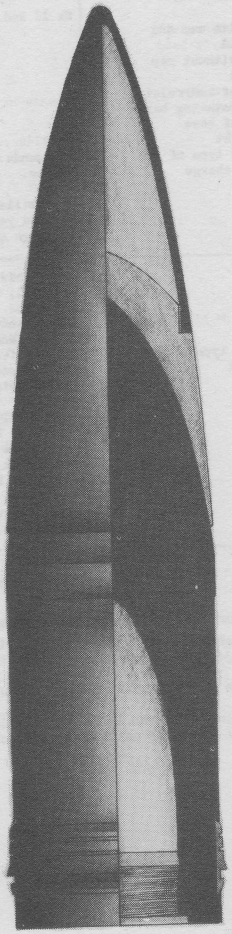
NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 16 inch, Mk II Mod. 2	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 16 inch Howitzer M1920 16 inch Seacoast Gun M1919 and Mk II (Navy)	TARGET: Used against armored targets such as naval warcraft.

1.	PROJECTILE:	Mk II Mod. 2
	a. Length, with cap and windshield	56.54 inches
	Length, without cap or shield	48.35 inches
	b. Diameter of bourrelet	15.98 inches
	c. Width of rotating band	5.23 inches
	d. Diameter of base	15.25 inches
	e. Total weight	2100.00 pounds
	f. Weight and type of bursting charge	58 pounds of Non-hygroscopic powder.
	g. Tracer	None.
	h. Markings	Projectile, except rotating band, painted yellow or olive-drab. Markings not given.
2.	CARTRIDGE CASE:	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags of base and one increment.
	a. Weight and type of propellant	For Howitzer M1920:- Base section and increment of Nitrocellulose powder weighing a total of 296 pounds. For Gun M1919:- Four section charge of Non-hygroscopic powder weighing a total of 832 pounds. For Gun Mk II (Navy):- Six section charge of Non-hygroscopic powder weighing a total of 672 pounds.
	b. Primer	Mk XV M1, combination electric and percussion primer.
3.	FUZE:	Mk X
	a. Type	Base detonating.
	b. Booster	Booster in fuze.
4.	REMARKS: a. An armor-piercing cap and windshield is fitted to this projectile but not shown in drawing.	
	b. Fuze is fitted into threaded hole in center of base plug.	
	c. 16 inch Shell Mk II Mod. 2 is "LIMITED STANDARD" and will be issued until present stocks are exhausted.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 16 inch, Mk V	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 16 inch Seacoast Gun M1895 & M1919	TARGET: Used against armored targets such as naval warcraft.



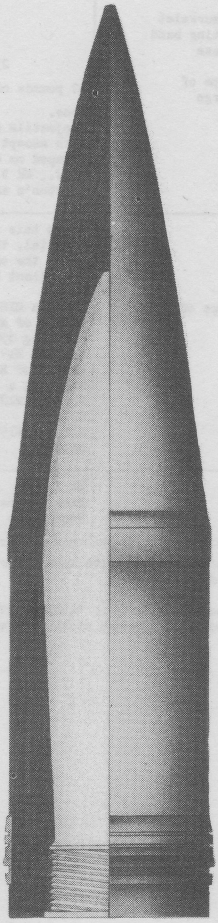
PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 16 inch, Mk V		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 16 inch Seacoast Gun M1895 & M1919		TARGET: Used against armored targets such as naval warcraft.
1.	PROJECTILE: a. Length, with cap and windshield b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk V 75.30 inches 15.982 inches 5.33 inches 15.68 inches 2340.00 pounds 52 pounds of Explosive 'D'. None. Projectile painted yellow or olive-drab except rotating bands. Stamped on base:- 16 IN. GUN A.P. PROJ., MK V, 2340 LBS.", inspector's marks, Lot. No..
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags. For Gun M1895:- Single section charge of Nitrocellulose powder weighing 650 pounds. For Gun M1919:- Four section charge of Non-hygroscopic powder weighing a total of 832 pounds. For Gun M1895:- Electric primer M30. For Gun M1919:- Mk XV M1, combination.
3.	FUZE: a. Type b. Booster	Mk X Base detonating. Booster in fuze.
4.	REMARKS: a. Projectile fitted with armor-piercing cap and a windshield. b. 16 inch Shell Mk V is "LIMITED STANDARD" and will be issued until present stocks are exhausted.	

C-O-N-F-I-D-E-N-T-I-A-L

PROJECTILE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
SIZE: 16 inch, Mk IX	TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 16 inch Seacoast Gun M1895 & M1919	TARGET: Used against armored targets such as naval warcraft.



PROJECTILE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
SIZE: 16 inch, Mk IX		TYPE: Armor-piercing (Separate loading)
GUNS USED IN: 16 inch Seacoast Gun M1895 & M1919		TARGET: Used against armored targets such as naval warcraft.
1.	PROJECTILE: a. Length, with cap and windshield b. Diameter of bourrelet c. Width of rotating band d. Diameter of base e. Total weight f. Weight and type of bursting charge g. Tracer h. Markings	Mk IX 74.62 inches 15.982 inches 5.33 inches 15.93 inches 2340.00 pounds 57 pounds of Explosive 'D'. None. Projectile, except rotating band, painted yellow or olive-drab. Stamped on base:- "16 IN. A.P. PROJ. 2340 LBS., Mk IX", inspectors marks and Lot No..
2.	CARTRIDGE CASE: a. Weight and type of propellant b. Primer	Since this is separate loading materiel, the breech of the gun forms the cartridge case, the propellant being packed in bags. For Gun M1895:- Single section charge of Nitrocellulose powder weighing 650 pounds. For Gun M1919:- Four section charge of Non-hygroscopic powder weighing a total of 832 pounds. For Gun M1895:- M30 Electric. For Gun M1919:- Mk XV M1 combination.
3.	FUZE: a. Type b. Booster	Mk X Base detonating. Booster in fuze.
4.	REMARKS: a. Projectile has armor-piercing cap and windshield fitted to it. b. Fuze is screwed into base plug. c. Shell Mk IX, 16 inch, is STANDARD for manufacture as of February 1, 1941.	

C-O-N-F-I-D-E-N-T-I-A-L

SECTION 2
PART B

U.S. ARMY PROJECTILE FUZES

C-O-N-F-I-D-E-N-T-I-A-L

SECTION 2
PART B

U.S. ARMY
PROJECTILE
FUZES

FUZE DATA:

NATIONALITY: U. S. ARMY INFORMATION DATE: April 1943

INDEX

FUZE DATA:

NATIONALITY: U. S. ARMY INFORMATION DATE: April 1943

INTRODUCTION

A. GENERAL:

1. A fuze is a mechanical device used in a projectile to explode it at the time and under the circumstances desired.

2. Fuzes are classified according to the position in which they are assembled in the projectile; nose (point) or base fuzes. This classification may be further broken down according to the type of functioning.

a. Impact fuzes which function on striking the target. These fuzes may be further classified as "superquick" or "delay".

b. Time fuzes which contain a graduated time element, either pyrotechnic train or clockwork, and which are designed to detonate the shell a predetermined time after leaving the muzzle.

c. "Combination" fuzes combine two or more features of the above named types, such as "time and superquick".

Note: The terms "superquick" and "delay" refer to the action at the time of impact whereas "time" refers to the time after the instant of firing.

B. SAFETY FEATURES:

All types of fuzes in current use incorporate safety features designed to prevent functioning of the fuze until after the projectile has been launched. In addition the later fuzes have been designed so that the detonator is separated from the primer components by an interrupter which does not clear the flash channel until centrifugal force of rotation overcomes spring pressure.

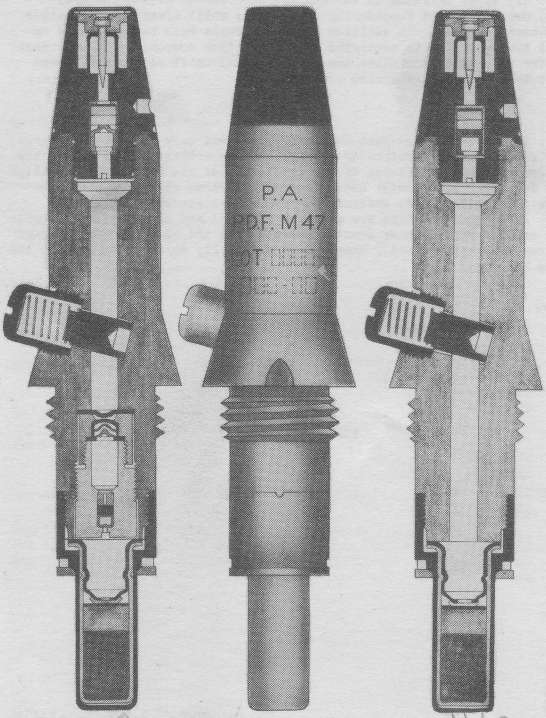
C. BOOSTERS:

1. Boosters in present use incorporate not only the booster charge, but rotors carrying detonator charges. These rotors further reduce the danger of premature firing of the projectile as the rotor does not align the detonator and booster until centrifugal force acts. Boosters for chemical shell do not, ordinarily, have rotors assembled in them.

2. Adapter-boosters are used for chemical and high-explosive shells and consist of a booster housing screwed into the adapter. The adapter is screwed into the shell nose and is internally threaded to receive the fuze body.

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M46 & M47	TYPE FUZE: Point Detonating
MARKINGS: Stamped on body:- Lot No., initials of loader, date loaded. Sample:- P.A. P.D.F. M46 LOT NO. 1234-5 P.A. 6-35"	PROJECTILES USED IN: There are many shells using the M46. Some are:- Mk I, H.E. Shell & Chemical Mk II 75 mm. Mk I, H.E. Shell & Chemical Mk II & Mk III 155 mm. Mk I, H.E. Shell 8 inch Gun and Howitzer Shell, H.E. Mk III 240 mm. How. Shell, H.E. Mk X 12 inch Gun. Used in M47:- H.E., Mk I, Shell 75 mm. H.E., Mk II, Shell 6 inch. H.E., Mk I, Shell 8 inch Gun and Howitzer H.E., Mk III, Shell 240 mm. How. H.E., Mk IV, Shell 10 inch. H.E., Mk X, Shell 12 inch.



FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M46 & M47	TYPE FUZE: Point Detonating
MARKINGS: Stamped on body:- Lot No., initials of loader, date loaded. Sample:- P.A. P.D.F. M46 LOT NO. 1234-5 P.A. 6-35"	PROJECTILES USED IN: There are many shells using the M46. Some are:- Mk I, H.E. Shell & Chemical Mk II 75 mm. Mk I, H.E. Shell & Chemical Mk II & Mk III 155 mm. Mk I, H.E. Shell 8 inch Gun and Howitzer Shell, H.E. Mk III 240 mm. How. Shell, H.E. Mk X 12 inch Gun. Used in M47:- H.E., Mk I, Shell 75 mm. H.E., Mk II, Shell 6 inch. H.E., Mk I, Shell 8 inch Gun and Howitzer H.E., Mk III, Shell 240 mm. How. H.E., Mk IV, Shell 10 inch. H.E., Mk X, Shell 12 inch.

		M46	M47
1.	OVERALL LENGTH	5.66 inches	5.66 inches
2.	TOTAL WEIGHT	0.74 pound	0.69 pound
3.	MATERIAL OF CONSTRUCTION	Brass	Brass
4.	THREADED LENGTH	0.4 inch 12.7 threads per inch. Right hand threads.	0.4 inch 12.7 threads per inch. Right hand threads.

5. DESCRIPTION & OPERATION:

Fuze consists of a head and body which screws into the shell. In the head is an aluminum firing pin and a brass cup acting as a support for the pin. Just below the firing pin is the upper detonator. The body contains a centrifugal interrupter, upper detonator and lower detonator, and an upper detonator flash channel. The lower detonator is screwed into the base of the body.

The fuze is ready for functioning when screwed into the shell. During flight centrifugal force clears the interrupter of the flash channel. On impact, the firing pin crushes the cup support and is driven into the upper detonator. The flash sets off the lower detonator which sets off the booster and main filler.

6. SAFETY FEATURES:

Central channel is blocked by an interrupter until projectile is in flight and centrifugal force clears the channel of the interrupter. Firing pin support cup will resist set back and rough handling in transport.

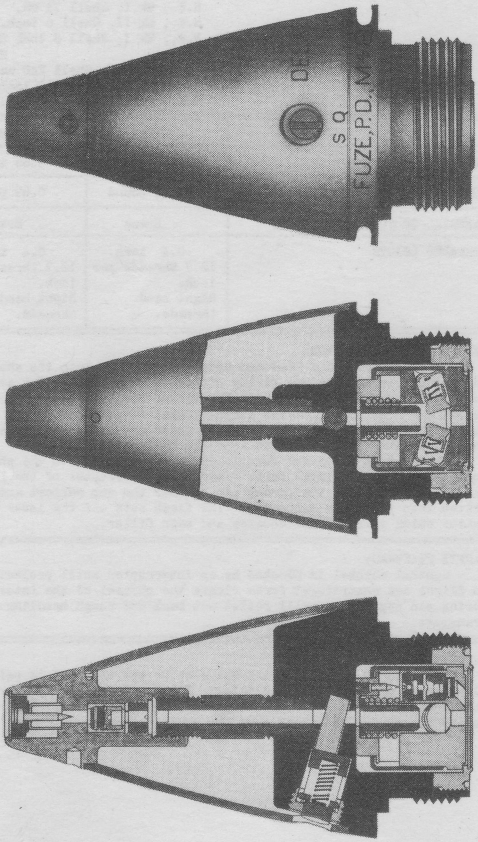
7. REMARKS:

The head of M46 is painted white while the M47 head is painted black as it has a 0.05 second delay. The two fuzes are similar in construction and functioning except that M47 has a delay primer and pellet to receive the flash from the upper detonator.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M48 & M48A1	TYPE FUZE: Point Detonating
MARKINGS: Sample "FUZE, P.D., M48 LOT 1234-5 P.A. 1-36	PROJECTILES USED IN: Shell, H.E., M48 - 75 mm. Gun Shell, H.E., M41A1 - 75 mm. How. Shell, H.E., M42 - 3 inch Sea-coast Gun Shell, H.E., M1 - 105 mm. How.



FUZE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
DESIGNATION: M48 & M48A1		TYPE FUZE: Point Detonating
MARKINGS: Sample "FUZE, P.D., M48 LOT 1234-5 P.A. 1-36		PROJECTILES USED IN: Shell, H.E., M48 - 75 mm. Gun Shell, H.E., M41A1 - 75 mm. How. Shell, H.E., M42 - 3 inch Sea-coast Gun Shell, H.E., M1 - 105 mm. How.
1.	OVERALL LENGTH	4.55 inches
2.	TOTAL WEIGHT	1.41 pounds
3.	MATERIAL OF CONSTRUCTION	Steel head & body; Aluminum ogive; Brass moving parts.
4.	THREADED LENGTH	0.48 inch 14 threads per inch Right hand threads

5. DESCRIPTION & OPERATION:

The fuze consists of a head which carries the super quick element; a body which carries the delay element, setting device, and threads for assembling the fuze to the booster; a flash tube which forms a channel for the super quick detonation and holds the head in the proper position; an aluminum ogive which continues the contour of the projectile ogive; and a delay plunger assembly.

By means of the setting sleeve, two settings are possible; super quick and 0.05 second delay. When the setting sleeve is set for super quick, the interrupter moves to its armed position by action of centrifugal force while projectile is in flight. On impact, the firing pin support cup is crushed and the firing pin sets off the detonator, the flash of which goes through the cleared channel and into the M20 booster.

In the case of 0.05 second delay setting, the interrupter is stopped by the setting sleeve and hence the flash channel is blocked. At the same time the delay firing assembly is armed by two centrifugal plungers assuming the armed position. On impact the detonator assembly is carried against a plunger spring onto a firing pin.

This fuze contains two firing pins and two detonator assemblies. On impact both super quick and delay assemblies are functioned. However the super quick functions first if setting sleeve is on "super quick". If on "delay" the flash from "super quick" is blocked off and the delay assembly works.

6. SAFETY FEATURES:

1. Firing pin cup or support will not collapse on set back but will on impact.
2. The interrupter when set for "super quick" blocks the flash channel until projectile is well in flight.
3. The delay firing pin is prevented from contacting the delay primer by means of centrifugal pins in conjunction with the plunger support until projectile is in flight.
4. The plunger restraining spring prevents the delay firing pin from contacting the delay primer as a result of creep force during flight.
5. Fuze is used with the M20 booster which makes it bore safe.

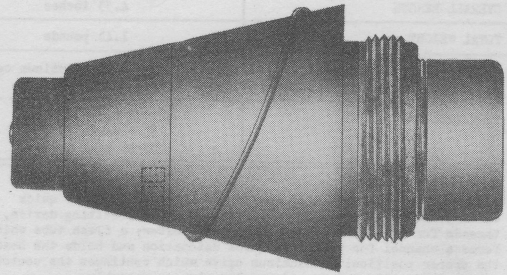
7. REMARKS:

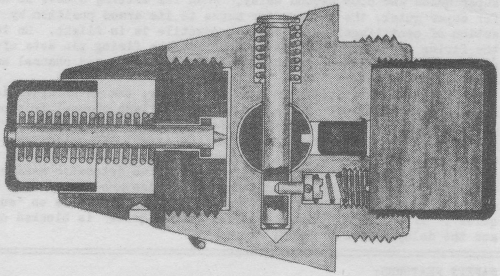
The M48 and M48A1 are similar except the delay in M48A1 is 0.15 second instead of 0.05 second as in the M48 fuze.

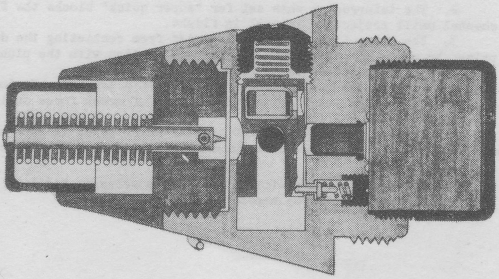
C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M52	TYPE: Point Detonating
MARKINGS: Sample:- P.D. M52, LOT 1234 P.A. 8-39	PROJECTILES USED IN: M43A1 81 mm. Mortar M49A2 60 mm. Mortar







FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M52	TYPE: Point Detonating
MARKINGS: Sample:- P.D. M52, LOT 1234 P.A. 8-39	PROJECTILES USED IN: M43A1 81 mm. Mortar M49A2 60 mm. Mortar

1.	OVERALL LENGTH	3.8 inches
2.	TOTAL WEIGHT	13.0 ounces
3.	MATERIAL OF CONSTRUCTION	Plastic and brass; aluminum and brass.
4.	THREADED LENGTH	0.5 inch 10 threads per inch Right Hand Thread

5. DESCRIPTION AND OPERATION:

The fuze body contains a striker and spring loaded primer holder slide, also a spring loaded safety pin held in place by a spring loaded detent. The fuze arms by set back when the projectile is fired. Set back forces the detent out of the safety pin which is forced out of the body of the fuze by spring pressure thus freeing the primer holder slide so that it is forced across the body and is stopped and held in place by a second detent which slips into a hole in the primer holder slide keeping the primer lined up with the striker. Upon impact the striker fires the primer and the primer in turn fires the booster.

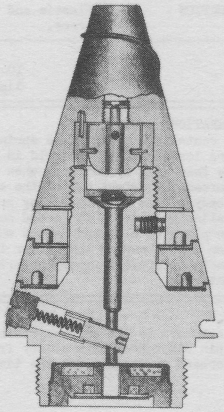
6. SAFETY FEATURES:

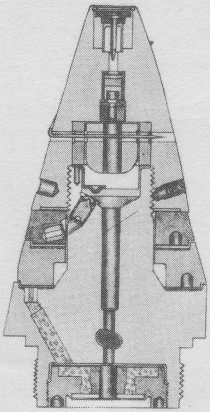
The force of set back is the only way this fuze can arm, also there is a safety pin which keeps the slider from moving. The slider is in the forward position until the time the shell is fired.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
DESIGNATION: M54, M55 and M55A1		TYPE: Time and Super Quick
MARKINGS: FUZE TIME AND SUPER Sample: QUICK, M54 L.F. C. LOT P.A. 11-22 3/43		PROJECTILES USED IN: 75 mm. Gun and howitzer M48 105 mm. Howitzer, M1 75 mm. Howitzer, M1A1





FUZE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
DESIGNATION: M54, M55 and M55A1		TYPE: Time and Super Quick
MARKINGS: FUZE TIME AND SUPER QUICK, M54 L.F. C. LOT P.A. 11-22 3/43 Sample:		PROJECTILES USED IN: 75 mm. Gun and howitzer M48 105 mm. Howitzer, M1 75 mm. Howitzer, M41A1
1.	OVERALL LENGTH	4.57 inches
2.	TOTAL WEIGHT	1.45 pound
3.	MATERIAL OF CONSTRUCTION	Brass and aluminum.
4.	THREADED LENGTH	1.7 inches 14 threads per inch Right Hand Threads

5. DESCRIPTION AND OPERATION:

The fuze consists of a head which carries the Super Quick element; a body which carries the delay element and setting device and threads to assembly, the fuze to the booster; a flash tube which forms a channel for the Super Quick element.

The Super Quick action is P.D. if the time element does not have time to run out.

Upon impact the striker in the fuze head is driven into the detonator which flashes through the flash channel by the interrupter which clears the flash path by action of centrifugal force into the booster. The powder time delay train will function from 0 to 25 seconds in steps of 0.2 seconds each. A plunger in the fuze head held in place by a shear pin moves back shearing the pins by action of set back striking the primer striker over the primer firing the primer starting the upper ring of the two powder rings in the fuze, the upper ring being fixed and immobile. The powder ring burns in a clockwise direction until it comes to a flash hole through to the lower ring, firing the lower powder ring which can be varied in length by rotation of the lower ring. It in turn burns in a counter clockwise direction until it flashes through a flash hole into the body charge which in turn fires magazine charge which functions the booster.

6. SAFETY FEATURE:

An interrupter in the flash path.

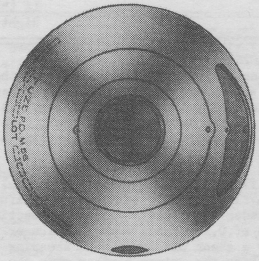
7. REMARKS:

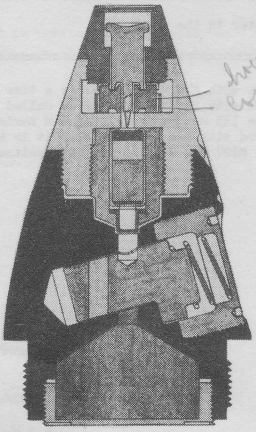
The M54 fuze with the M20 booster is a time and Super Quick fuze; but the M54 with the M21 booster is called the M55 and used in the Mk. series 155 mm. projectiles and M series 4.5 inch guns. If the M54 is used with the M21A1 booster it is known as the M55A1 and used in H.E. M107 and Mk. 1A1 155 mm. Howitzer and M65 for 4.5 inch guns.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M56	TYPE FUZE: Point Detonating
MARKING: Sample "FUZE, P.D., M56 P.A. 5-40 LOT 1234-56"	PROJECTILES USED IN: 37 mm., H.E. M54





FUZE DATA:

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943
DESIGNATION: M56		TYPE FUZE: Point Detonating
MARKING: Sample "FUZE, P.D., M56 P.A. 5-40 LOT 1234-56"		PROJECTILES USED IN: 37 mm., H.E. M54
1.	OVERALL LENGTH	2.21 inches
2.	TOTAL WEIGHT	0.17 pound
3.	MATERIAL OF CONSTRUCTION	Aluminum Alloy
4.	THREADED LENGTH	0.25 inch approximately 20 threads per inch Right hand threads

5. DESCRIPTION & OPERATION:

Fuze consists of nose screwed into a head which is screwed into the body. The nose houses the firing pin while the head contains two half blocks, the grooves of which support the firing pin flange. In the head also is the detonator holder, containing the upper, intermediate and lead-in detonators. The body houses a spring-loaded slider carrying a slider charge which is out of alignment in the safe position. Below the slider is the main booster charge screwed into the lower part of the body.

As force of linear acceleration is overcome by centrifugal force, the half blocks working seperate against a spring. Due to the angles of the edges of the grooves, the firing pin is forced toward the nose. When the half blocks clear the firing pin flange, the pin falls between the blocks and rests on the upper detonator. To complete the arming, centrifugal force lines up the slider charge with the explosive train by compressing the coil spring.

On impact the nose of the fuze is crushed, driving the firing pin into the priming composition of the upper detonator.

6. SAFETY FEATURES:

The firing pin is held in a safe position by grooves in the half blocks held together by a flat spring. The slider is unarmed until it leaves the muzzle due to a spring and force of linear acceleration as it passes thru the bore of the gun.

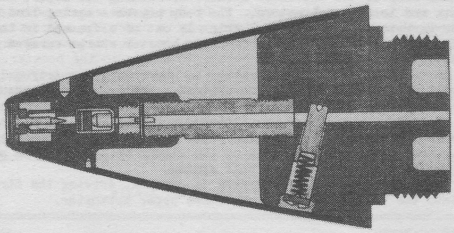
7. REMARKS:

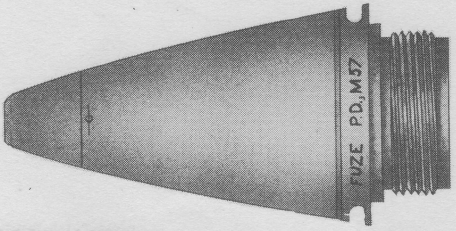
This is a super sensitive fuze having no delay.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M57	TYPE FUZE: Point Detonating
MARKING: Sample "FUZE, P.D., M57 LOT 1234-56 P.A. 3-36"	PROJECTILES USED IN: Shell, Chemical M64 - 75 mm. H Shell, Chemical M60 - 105 mm. H





FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M57	TYPE FUZE: Point Detonating
MARKING: Sample "FUZE, P.D., M57 LOT 1234-56 P.A. 3-36"	PROJECTILES USED IN: Shell, Chemical M64 - 75 mm. H Shell, Chemical M60 - 105 mm. H

1.	OVERALL LENGTH	4.55 inches
2.	TOTAL WEIGHT	1.41 pounds
3.	MATERIAL OF CONSTRUCTION	Body - Steel or brass; Ogive - Aluminum; Head - Brass.
4.	THREADED LENGTH	0.4 inch Approximately 14 threads per inch Right hand threads

5. DESCRIPTION & OPERATION:
This fuze is similar to the M48 P.D. fuze except it contains no delay element. In flight centrifugal force clears the central channel of the spring loaded interrupter. On impact the closing disc is crushed, thereby causing the firing pin to crush the supporting cup and to penetrate the super quick detonator. The detonating wave passes through the open flash hole of the fuze to the booster. The M22 booster is used in conjunction with this fuze.

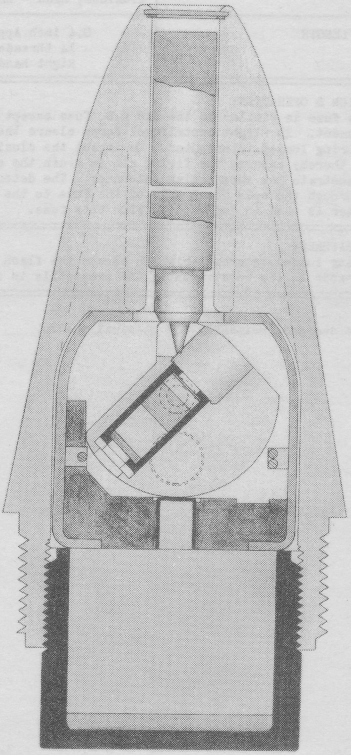
6. SAFETY FEATURES:
Spring loaded interrupter which blocks the flash channel from the detonator to the booster until the projectile is in flight.

7. REMARKS:
Fuze designed primarily for chemical shells.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M64 and M64A1	TYPE: Point Detonating
MARKING: Sample:- "FUZE, P.D., M46A1, P.A. 1-42 LOT 1234-56". Approximately 1/4 inch above body shoulder.	PROJECTILES USED IN: Shell, H.E., Mark II 40 mm. with tracer.



FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M64 and M64A1	TYPE: Point Detonating
MARKING: Sample:- "FUZE, P.D., M46A1, P.A. 1-42 LOT 1234-56". Approximately 1/4 inch above body shoulder.	PROJECTILES USED IN: Shell, H.E., Mark II 40 mm. with tracer.

1.	OVERALL LENGTH	2.4 inches
2.	TOTAL WEIGHT	0.25 pounds
3.	MATERIAL OF CONSTRUCTION	Aluminum alloy-die casting
4.	THREADED LENGTH	0.40 inches 14 threads per inch Right hand threads

5. DESCRIPTION AND OPERATION FOR M64A1:

The fuze consists of an aluminum body with a cavity for a rotor housing. The rotor is pivoted on two pins and held in the safe position by two yoke-spring-loaded centrifugal pins. While in the safe position the detonator assembly in the rotor is not in line with the aluminum firing pin or the booster. In front of the firing pin is the plastic striker. A booster is screwed into the base of the fuze body.

In flight, centrifugal force throws the rotor lock pins out against the spring. The rotor then turns about the pivot pins to the armed position. On impact the forward portion of the body is crushed driving the striker against the firing pin which sets off a priming mixture and a series of detonator charges in the rotor. Detonator fires the lead-in booster held in the rotor housing. In turn the main booster and filling are detonated.

6. SAFETY FEATURE:

Rotor carrying detonator is out of line with firing pin and booster until rotational velocity is approximately 20,000 revolutions per minute.

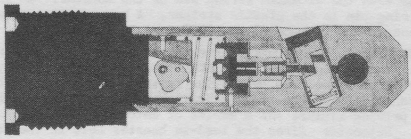
7. REMARKS:

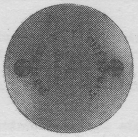
M64 and M64A1 are similar in principle and functioning. The differences lie in the machining of the component parts.

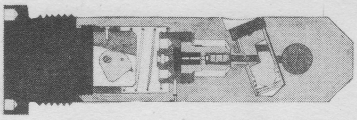
C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: Mk. V	TYPE: Base Detonating
MARKINGS: Head stamped with:- 1. Base-detonating fuze 2. Mark V 3. Non-delay 4. G, H, or Mortar 5. "Medium" or "Major" depending on size of fuze heads. 6. Name of Manufacturer, LOT No., and date of manufacture.	PROJECTILES USED IN: 3 inch Shell, H.E. Model 1915 6 inch Shell, A.P. Model 1911 6 inch Shot, A.P. Model 1911 8 inch Shot, A.P. Model 1911 10 inch Shot, A.P. Model 1911 10 inch Shot, A.P. Mark III 12 inch Shell, H.E. Mark VI, VIII 14 inch H.E., A.P. Mk. XI, M2A1







FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: Mk. V	TYPE: Base Detonating

MARKINGS:
Head stamped with:-
1. Base-detonating fuze
2. Mark V
3. Non-delay
4. G, H, or Mortar
5. "Medium" or "Major" depending on size of fuze heads.
6. Name of Manufacturer, LOT No., and date of manufacture.

PROJECTILES USED IN:
3 inch Shell, H.E. Model 1915
6 inch Shell, A.P. Model 1911
6 inch Shot, A.P. Model 1911
8 inch Shot, A.P. Model 1911
10 inch Shot, A.P. Model 1911
10 inch Shot, A.P. Mark III
12 inch Shell, H.E. Mark VI, VIII
14 inch H.E., A.P. Mk. XI, M2A1

1.	OVERALL LENGTH	5.77 inches - Medium 6.67 inches - Major
2.	TOTAL WEIGHT	3.27 pounds (Approx.) (Not given in drawings)
3.	MATERIAL OF CONSTRUCTION	Steel
4.	THREADED LENGTH	0.57 inch - Medium 0.97 inch - Major 12 threads per inch - Medium 10 threads per inch - Major Left hand threads

5. DESCRIPTION AND OPERATION:

Fuze consists of a solid metal head, and body containing percussion plunger with firing pin, restraining spring, primer, detonator, sliding tetryl charge and booster charge. The whole assembly is screwed into base of projectile.

When projectile leaves the muzzle, centrifugal force acts on two spring-loaded pins causing them to unlock the firing pin. The plunger rotates to bring the firing pin in line with the primer. Simultaneously to the above, the sliding charge working against a spring is brought in line with the main booster and detonator. On impact the plunger carries the firing pin into the primer to initiate the explosive train.

6. SAFETY FEATURES:

Percussion plunger and sliding charge are in safe positions until projectile reaches approximately 2000 revolutions per minute.

7. REMARKS:

The only difference between "Major" and "Medium" is the size of the fuze head.

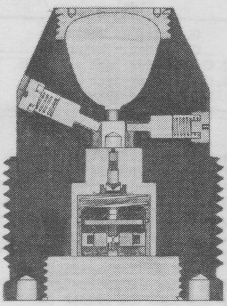
C-O-N-F-I-D-E-N-T-I-A-L

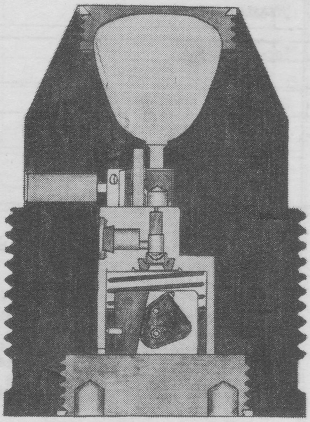
FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: Mk. X and M60	TYPE: Base Detonating

MARKINGS:
On base of fuze;
1. BASE DETONATING FUZE, Mk. X or BASE DETONATING FUZE M60.
2. Initials or symbols of manufacturer of the metal parts.
3. Amount of delay in seconds.
4. Lot number of loaded fuzes.
5. Initials or symbol of loading plant.
6. Month and year of loading.

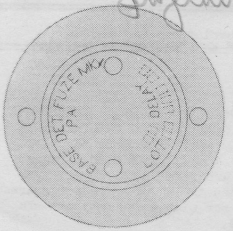
PROJECTILES USED IN:
M60 used in:
155 mm. A.P. M 112
Mk. X used in:
6 inch A.P. Shot XXXIII
8 inch A.P. XX Model 1 and 3
12 inch Shell D.P. 11A, '98
14 inch A.P. Mk. VI
14 inch Shell Mk. '09
14 inch A.P. M9A1 (VIII)
16 inch A.P. Mk. V
16 inch A.P. Mk. II Model 2
16 inch A.P. Mk. IX

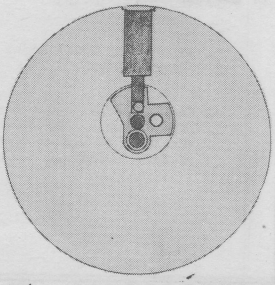




MKX
in trigger projectile

M60





FUZE DATA

NATIONALITY: U. S. ARMY — INFORMATION DATE: April 1943

DESIGNATION: Mk. X and M60 — TYPE: Base Detonating

MARKINGS:
On base of fuze;
1. BASE DETONATING FUZE, Mk. X or BASE DETONATING FUZE M60.
2. Initials or symbols of manufacturer of the metal parts.
3. Amount of delay in seconds.
4. Lot number of loaded fuzes.
5. Initials or symbol of loading plant.
6. Month and year of loading.

PROJECTILES USED IN:
M60 used in:
155 mm. A.P. M 112
Mk. X used in:
6 inch A.P. Shot XXXIII
8 inch A.P. XX Model 1 and 3
12 inch Shell D.P. 11A, '98
14 inch A.P. Mk. VI
14 inch Shell Mk. '09
14 inch A.P. M9A1 (VIII)
16 inch A.P. Mk. V
16 inch A.P. Mk. II Model 2
16 inch A.P. Mk. IX

1.	OVERALL LENGTH (Mk. X)	4.28 inches
2.	TOTAL WEIGHT (Mk. X)	8.0 pounds
3.	MATERIAL OF CONSTRUCTION (Mk. X)	Chromium molybdenum steel.
4.	THREADED LENGTH (Mk. X)	1.7 inches 7 threads per inch Left Hand Threads

5. DESCRIPTION AND OPERATION:

Fuze screws into base of projectile. Main features are the plunger containing the firing pin and the detonator-carrying rotor which when unarmed separates delay pellet from booster. Normally the firing pin is held locked in the unarmed position by two pins and springs, which under centrifugal force move outward and unlock the firing pin. Centrifugal force rotates plunger into the armed position. The rotor, containing the tetryl detonator, is also held in the safe position by two spring-loaded pins. Rotary motion of projectile frees the rotor of pins and also rotates rotor into armed position, locking it there.

When the projectile leaves the muzzle, centrifugal force acting on the firing pin spring-loaded detents, the plunger, rotor and rotor locking pins, arms the fuze. On impact, the plunger overcomes the resistance of restraining spring and the firing pin is driven into the primer. Delay pellet, detonator, booster and main charge complete the explosive train.

6. SAFETY FEATURE:

This fuze is bore safe. Armed by centrifugal force.

7. REMARKS:

Plunger and rotor arm at 1300 revolutions per minute.

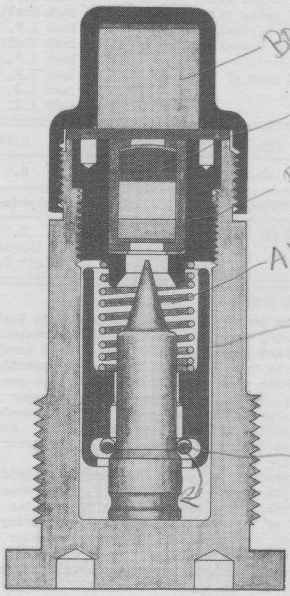
8. FUZE BASE DETONATING M60

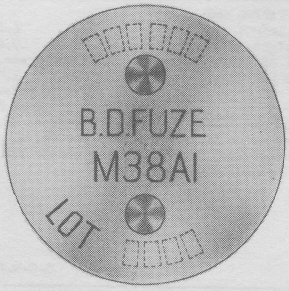
a. Overall Length — 4.28 inches
b. Total Weight — 9.22 pounds
c. Material of Construction — Steel and brass.
d. Threaded Length — 1.035 inches, 6 threads per inch, Left Hand Threads
e. Operation and Safety features are same as Mk. X
f. This fuze has a larger head than the Mk. X. The rotor arms and locks at 1450 revolutions per minute and does not arm at 1150 revolutions per minute.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M38, M38A1 & M58	TYPE FUZE: Base Detonating
MARKINGS: B.D. FUZE M38A1 (or M58) LOT NO., loaders initials, date of manufacture	PROJECTILES USED IN: M38A1 - Shell H.E. Mk II 37 mm. M58 - Shell H.E. M63 37 mm.





FUZE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943	
	DESIGNATION: M38, M38A1 & M58	TYPE FUZE: Base Detonating	
	MARKINGS: B.D. FUZE M38A1 (or M58) LOT NO., loaders initials, date of manufacture	PROJECTILES USED IN: M38A1 - Shell H.E. Mk II 37 mm. M58 - Shell H.E. M63 37 mm.	
		M38 & M38A1	M58
1.	OVERALL LENGTH	1.9 inches	2.02 inches
2.	TOTAL WEIGHT	0.15 lbs. Approx.	0.30 pounds
3.	MATERIAL OF CONSTRUCTION	Cold drawn steel	Steel
4.	THREADED LENGTH	0.4375 inch 18 threads per inch. Left hand threads	0.3750 inch 18 threads per inch. Left hand threads

5. DESCRIPTION & OPERATION:

On setback, the plunger forces the resistance ring over the shoulder on the firing pin down to the groove at the lower end of the firing pin. Plunger is locked to the firing pin. The spring prevents forward movement of the integral assembly of the plunger and firing pin while in flight.

Upon impact and due to inertia, the assembly of plunger and firing pin moves forward functioning the detonator assembly which causes detonation of the tetryl booster pellet. This in turn functions the bursting charge in the projectile.

6. SAFETY FEATURES:

Resistance ring in conjunction with the plunger prevents firing until after it has been passed from the weapon.

7. REMARKS:

1. M58 is a modification of the M38 base detonating fuze. The internal mechanism is the same, therefore its operation is the same. The difference lies in the diameter of the fuze body. It is used in the M63 H.E. 37 mm. shell whose explosive cavity is larger than the Mk II 37 mm. H.E. shell which uses the M38A1.

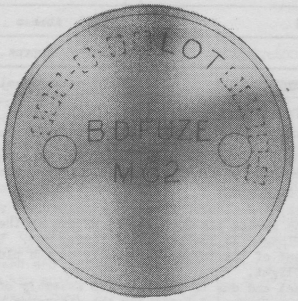
2. Fuze M38 and M38A1, base detonating, is a non delay fuze and is not bore safe. Weight is approximately 0.125 pound.

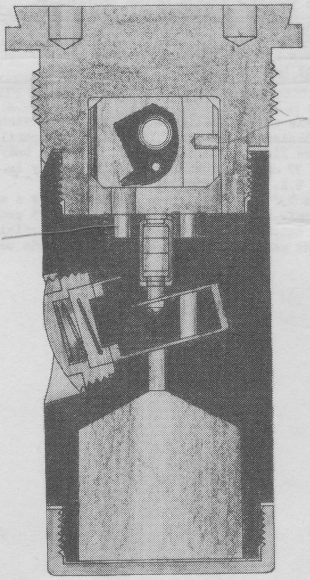
3. The detonator of the M38A1 contains a priming composition and lead azide as compared with mercury fulminate used in M38.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M62	TYPE FUZE: Base Detonating
MARKINGS: Stamped on base:- Fuze designation, loader's initials, date loaded and Lot No.	PROJECTILES USED IN: Shell, H.E., A.T., 75 mm., M66 Shell, H.E., A.T., 105 mm., M67





FUZE DATA:

	NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
	DESIGNATION: M62	TYPE FUZE: Base Detonating
	MARKINGS: Stamped on base:- Fuze designation, loader's initials, date loaded and Lot No.	PROJECTILES USED IN: Shell, H.E., A.T., 75 mm., M66 Shell, H.E., A.T., 105 mm., M67
1.	OVERALL LENGTH	3.54 inches
2.	TOTAL WEIGHT	8970 grains = 1.3 lbs. approx.
3.	MATERIAL OF CONSTRUCTION	Cold drawn steel
4.	THREADED LENGTH	0.31 inch 12 threads per inch Left hand threads

5. DESCRIPTION & OPERATION:

Fuze consists of the body screwed to the head. A booster cup is screwed to the body. The whole assembly is screwed into the base of projectile.

The head contains a percussion plunger assembly containing the firing pin which is held away from the primer by a spring loaded safety pin. In the body is a sliding charge assembly which is kept out of alignment until linear acceleration has been over come and rotational velocity reaches 3,600 revolutions per minute.

When projectile leaves the muzzle, centrifugal force brings percussion plunger and the sliding charge in line with the detonator and booster lead charges. On impact the plunger moves forward and ignites the primer, intermediate charge of lead azide, tetryl charge, slider charge, booster lead charge and booster charge in that order.

6. SAFETY FEATURES:

Two bore safe features. 1. Percussion plunger assembly arms at 2300 revolutions per minute. 2. Sliding charge aligns itself at 3600 revolutions per minute. Plunger is also held back by a spring loaded pin.

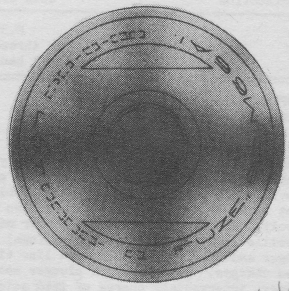
7. REMARKS:

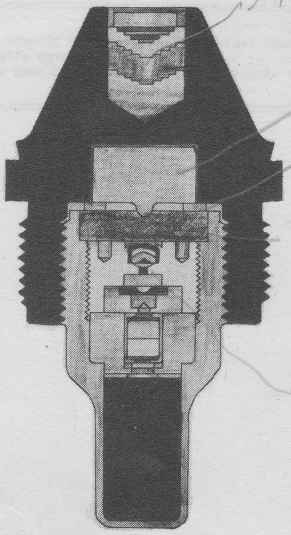
None.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M66A1	TYPE FUZE: Base Detonating
MARKINGS: Stamped on head:- "FUZE B.D. M66A1" Loader's initials or symbol, date (month & year) loaded and lot no.	PROJECTILES USED IN: 75 mm., A.P.C. M61 3 inch, A.P.C. M62





FUZE DATA:

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M66A1	TYPE FUZE: Base Detonating
MARKINGS: Stamped on head:- "FUZE B.D. M66A1" Loader's initials or symbol, date (month & year) loaded and lot no.	PROJECTILES USED IN: 75 mm., A.P.C. M61 3 inch, A.P.C. M62

1.	OVERALL LENGTH	3.45 inches
2.	TOTAL WEIGHT	1.0 pounds
3.	MATERIAL OF CONSTRUCTION	Steel body; Brass striker
4.	THREADED LENGTH	0.5 inch 10 threads per inch Left hand threads

5. DESCRIPTION & OPERATION:

Fuze is in two steel parts. Body is of forged and milled steel having male and female threads at base. Into the body is screwed the steel housing for primer, delay, detonator and booster. When assembled to the projectile, the fuze extends out in the form of a boat tail. The body contains the heavy brass striker and a soft retaining brass washer.

No action on set back or in flight except burning of tracer contained in head of fuze. On impact the striker collapses the brass retaining washer and impacts the primer.

6. SAFETY FEATURES:

Soft brass washer which collapses on impact due to inertia action of a heavy brass firing pin.

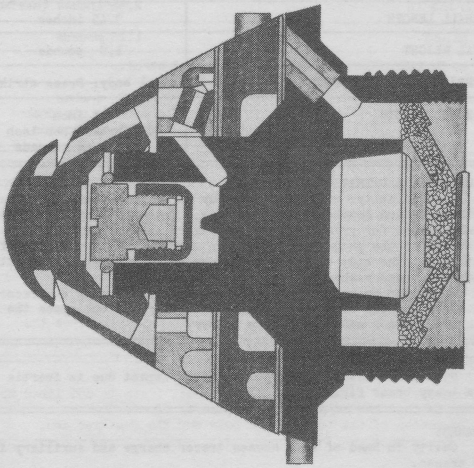
7. REMARKS:

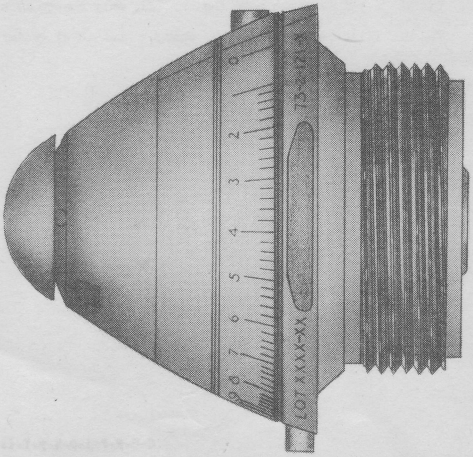
Cavity in head of fuze houses tracer charge and auxiliary igniter for tracer.

C-O-N-F-I-D-E-N-T-I-A-L

FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: Mk. III, IIIA1, and IIIA2	TYPE: Time
MARKING: Sample:- 21 SEC. MK. III, P. A. LOT NO. XXX 73-3-114X	PROJECTILES USED IN: Mk. 1 and M42





FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: Mk. III, IIIA1, and IIIA2	TYPE: Time
MARKING: Sample:- 21 SEC. MK. III, P. A. LOT NO. XXX 73-3-114X	PROJECTILES USED IN: Mk. 1 and M42

1.	OVERALL LENGTH	2.56 inches (maximum)
2.	TOTAL WEIGHT	1.25 pounds
3.	MATERIAL OF CONSTRUCTION	Brass and steel.
4.	THREADED LENGTH	1.7 inches 14 threads per inch Right Hand Threads

5. DESCRIPTION AND OPERATION:

The fuze consists of a body which contains two rings which contain a powder delay, the upper being fixed and the lower ring is moveable. This fuze can be set from 0 to 21.2 seconds in steps of 1/5 second.

When the projectile is fired from the weapon, a plunger containing the primer moves back overcoming a resistance ring and slips through the ring by the action of set back and impacts the striker. The upper delay powder ring is fired and burns in a clockwise direction until it comes to a flash hole through to the lower ring which burns in a counter clockwise direction until it fires the magazine charge.

6. SAFETY FEATURES:

When the fuze is set on safe the powder train is not lined up properly so that the magazine charge can be fired.

The action of set back is the only way the fuze can arm.

7. REMARKS:

a. The Mk. III has a 95 grain magazine and can not be used with a M20 booster.

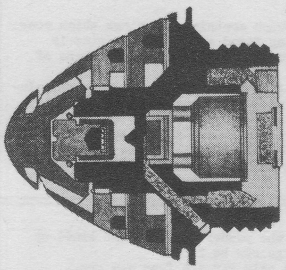
b. The Mk. IIIA1 is similar to the Mk. III, only change is a heavy nose piece.

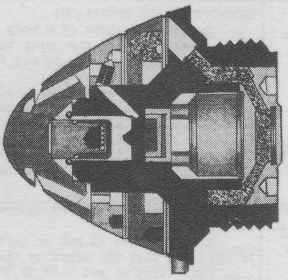
c. The Mk. IIIA2 has the magazine charge cut to 21 grains and the M20 booster is used.

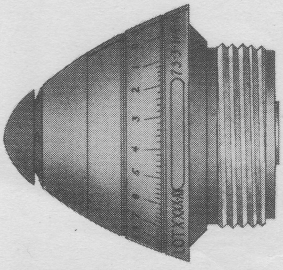
C-O-N-F-I-D-E-N-T-I-A-L

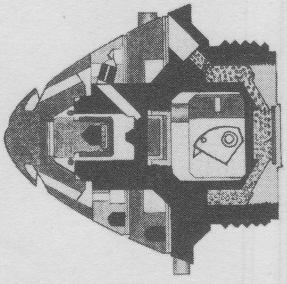
FUZE DATA

NATIONALITY:	U. S. ARMY	INFORMATION DATE:	April 1943
DESIGNATION:	M1907M 21 Sec. M1907M 45 Sec.	TYPE:	Time and Impact
MARKINGS: Sample:- M1907M 45 SEC. LOT NO. Manufacturer, date of manufacture and drawing number.		PROJECTILES USED IN: Mk. I 155 mm. Mk. I 2.95 inch Shrapnel M7 and M2A2	









FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M1907M 21 Sec. M1907M 45 Sec.	TYPE: Time and Impact
MARKINGS: Sample:- M1907M 45 SEC. LOT NO. Manufacturer, date of manufacture and drawing number.	PROJECTILES USED IN: Mk. I 155 mm. Mk. I 2.95 inch Shrapnel M7 and M2A2

1.	OVERALL LENGTH	2.88 inches
2.	TOTAL WEIGHT	1.25 pounds
3.	MATERIAL OF CONSTRUCTION	Brass.
4.	THREADED LENGTH	1.7 inches 14 threads per inch Right Hand Threads

5. DESCRIPTION AND OPERATION:

Time element same as Mk. III. The impact or percussion action: the firing pin is armed by centrifugal force, the firing pin being unlocked, revolves to the armed position and on impact the firing pin fires the primer and the flash enters the magazine charge by a flash path functioning the explosive charge.

6. SAFETY FEATURES:

When the fuze is set on safe the powder train is not lined up properly so that the magazine can be fired.

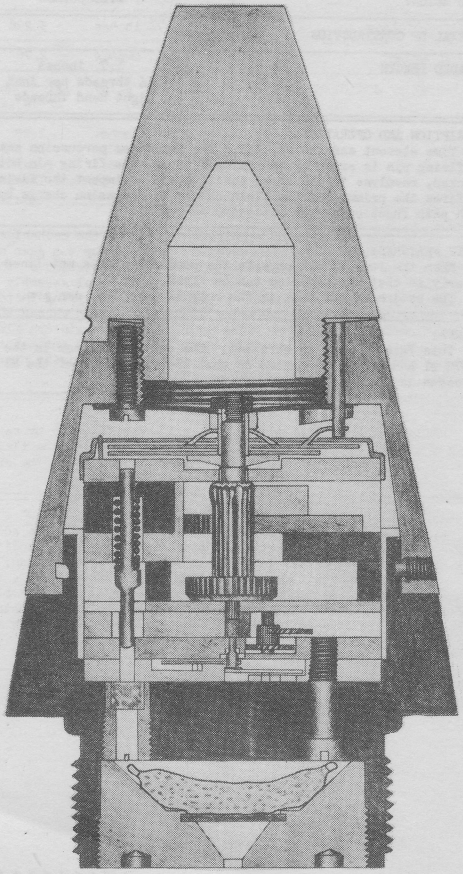
The action of set back is the only way the fuze can arm.

7. REMARKS:

This fuze is used in shrapnel. The only difference in the M1907M 21 second and 45 second is that the delay time of the M1907M 45 second is longer.

FUZE DATA

NATIONALITY: U. S. ARMY	INFORMATION DATE: April 1943
DESIGNATION: M43, M43A1 M2 , M43A2	TYPE: Time
MARKINGS: Sample:- "MECH. TIME FUZE M2" (M43, M43A1, M43A2) Manufacturer, Lot Number, Inspector's Initials, and date.	PROJECTILES USED IN: M2 used in M38 105 mm. Shell M43, M43A1, M43A2 used in: 3 inch Mk. IX, M42 90 mm. M82, M71 105 mm. M38M1



FUZE DATA

NATIONALITY: U. S. ARMY		INFORMATION DATE: April 1943	
DESIGNATION: M43, M43A1 M2 , M43A2		TYPE: Time	
MARKINGS: Sample:- "MECH. TIME FUZE M2" (M43, M43A1, M43A2) Manufacturer, Lot Number, Inspector's Initials, and date.		PROJECTILES USED IN: M2 used in M38 105 mm. Shell M43, M43A1, M43A2 used in: 3 inch Mk. IX, M42 90 mm. M58, M71 105 mm. M38M1	
		M43 M43A1, M43A2	M2
1.	OVERALL LENGTH	3.74 inches	5.298 inches
2.	TOTAL WEIGHT	22.6 ounces	2.76 pounds
3.	MATERIAL OF CONSTRUCTION	Aluminum alloy and brass.	Aluminum alloy, brass and steel.
4.	THREADED LENGTH	1.7 inches 14 threads per inch Right Hand Threads	2.20 inches 16 threads per inch

5. DESCRIPTION AND OPERATION:

This fuze consists of a body which carries the mechanical clockwork time element. The clockwork is functioned by two gear segments which are actuated by centrifugal force of the rotation of the projectile in flight. The escapement or balance wheel assembly is slightly different than normal having a straight spring instead of the spiral spring. The operation of the gear train causes the timing disc to rotate. When the firing notch comes opposite the firing arm shaft the latter falls into the firing notch. This rotates the firing arm shaft which releases the spring loaded firing pin by cam action.

6. SAFETY FEATURES:

The fuze has three safety features. Two function by set back and the third by centrifugal force. The first holds the timing disc, the second holds the firing device and the third the clockwork.

7. REMARKS:

The M43A1 is a slight change of the M43 which is the addition of a copper disc to protect the timing disc. The M43A2 modification is that it cannot be set to function less than 1.67 seconds.

The M2 fuze has a booster similar to the M20 and has a larger thread so it can be used in M38 105 mm. shells without aid of a adapter. The M2 has been replaced by the M43 with M20 booster. The M2 will be used in the M38 105 mm. until present supply runs out.

C-O-N-F-I-D-E-N-T-I-A-L

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