

Military Munitions Response Program

Formerly Used Defense Sites

Munitions

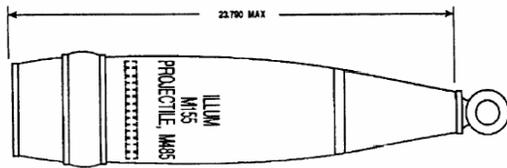
Recognition and Safety

Training

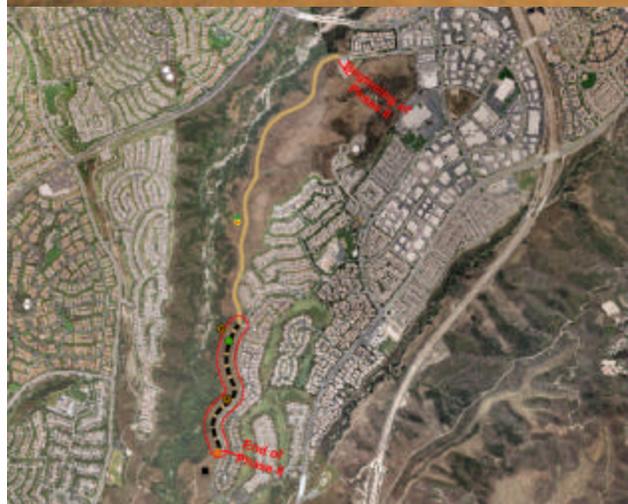
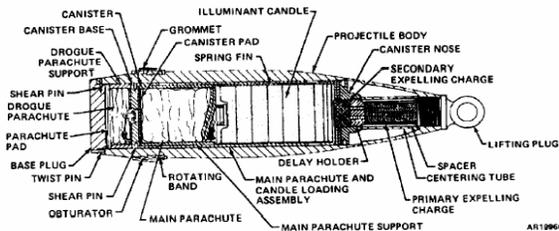
2004



PROJECTILE, 155-MILLIMETER: ILLUMINATING, M485 SERIES



U
AR 199659



Los Angeles District



**Technical Assistance - Managing Hazards to
Reduce Risk to the Public/Environmental Health –
Interagency Agreement # DW-96-95561701-0**



**Military Munitions
Response Program**

Formerly Used Defense Site

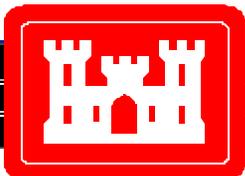
**Munitions
Recognition**

and

Safety

Training

2004

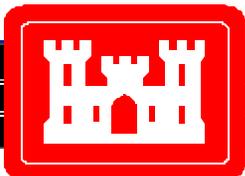
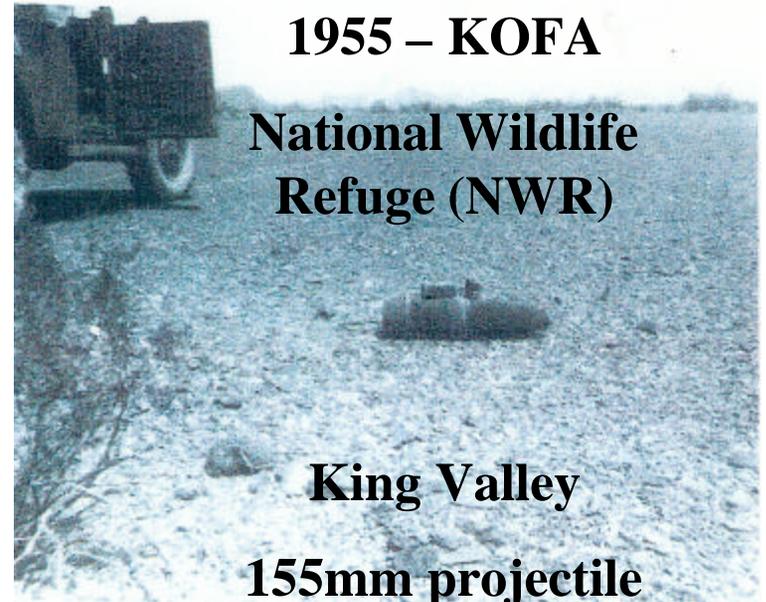


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Today's Goals

- Background of Formerly Used Defense Sites (FUDS) for context –
Larry Sievers (213) 452-3989
 - Makes sense of the Department of Defense's safety and environmental restoration program
- Munitions Recognition & Safety
BJ Allen (858) 674-6766
 - Recognize munitions, safety hazards and provide a framework for land manager/owner response to finding MEC

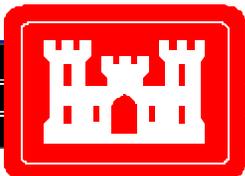


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AGENDA

- Purpose and Need
- History/Process of the Formerly Used Defense Site Program
- Munitions Recognition and Safety Training



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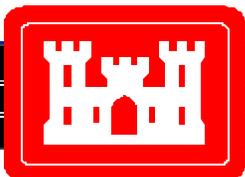


Purpose and Need

- Stakeholders including; EPA, USACE and Federal/State land managing agencies recognize that sites with Risk Assessments Codes (RAC) that will not receive near term evaluation and cleanup still have the potential for land managers and the public to encounter Munitions and Explosives of Concern (MEC) during routine use of the lands at Formerly Utilized Defense Sites (FUDS).



Fragments from high explosives found throughout the KOFA NWR area



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Purpose and Need, continued



37 mm high explosive projectile 1953

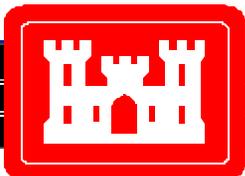


Practice anti tank mine ~1986

60 mm high explosive mortar 1986



Some 40 high explosives going back to the 1950s have been found in KOFA NWR

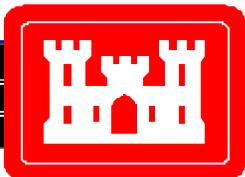


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Formerly Used Defense Sites (FUDS)

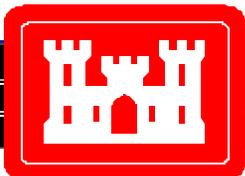
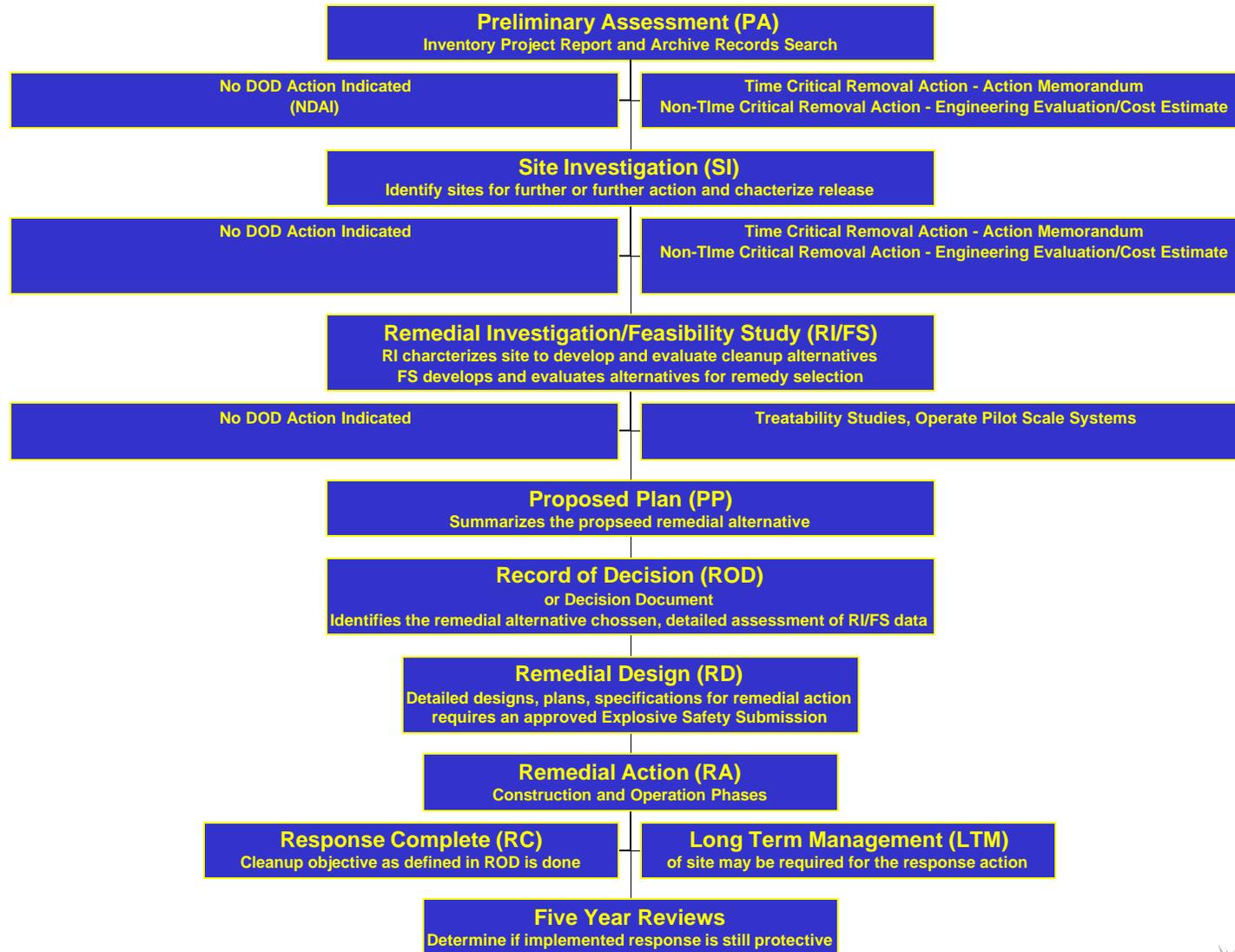
- Why • Congress 1986 *‘correction, detection and disposal of unexploded ordnance which creates an imminent and substantial endangerment....’*
- Where • *‘the Secretary shall carry out all response actions under CERCLA at properties owned by, leased or otherwise possessed by the United States’ – USACE assigned*
- Who • USACE has over 10,000 FUDS identified nationwide, over 1,300 in the Los Angeles District, funding limited
- How • Part of the Military Munitions Response Program (MMRP), established for DoD investigation/cleanup based on CERCLA process



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FUDS MMRP CERCLA Implementation



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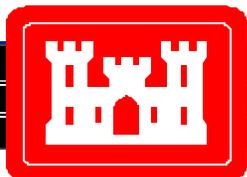
Military Munitions Response Program Preliminary Assessment/Site Investigation

Preliminary Assessment

- Inventory Project Report (INPR) reviews real estate records, determines FUDS eligibility yes/no
- Reviews MEC and HTRW releases or potential for release – need for removal action
- Gather existing data to determine if site poses health or safety threat
- INPR provides MEC RAC
- If RAC 1-4, Archive Records Search (ASR) for MEC Starts
- May result in TCRA/PRP/NDAI

Site Investigation

- Not full scale study of nature and extent
- Site visits, determine data needs, gather data, DQOs
- Eliminate potential/release from further consideration
- Determine need for potential removal action(s)
- Perform DoD relative Risk Site Evaluation
- Report will recommend NDAI, IRA, proceed to RI and identify data gaps



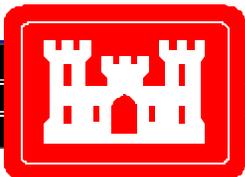
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Risk Assessment Code (RAC)

RAC 1 - 4 Action is required to mitigate the MEC hazard or protect personnel (i.e. fencing, physical barrier, guards, etc). Rankings 1-4 with 1 as highest priority, indicate the relative priority for cleanup among thousands of sites. It evaluates and scores the severity of a munitions (from catastrophic to negligible) and the probability (from frequent to improbable) of an MEC encounter.

RAC 5 Usually indicates no DOD action required.



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Military Munitions Response Program Remedial Investigation/Feasibility Study

Remedial Investigation

- Field Investigation, sampling and testing
- Develop Conceptual Site Model with nature and extent
- May complete Risk Assessment
- Goal is to adequately characterize site for development of remedial strategy with ARARs

Feasibility Study

- Identify treatment options, develop remedial alternatives
- Evaluate remedial alternatives vs. criteria
- May conduct pilot studies of remedial alternatives
- Ensure the most appropriate remedy is selected



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Military Munitions Response Program PP/ROD/RD/RA

Proposed Plan

- Description of the Proposed Remedial Alternative intended for public review

Remedial Design

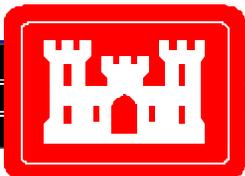
- Detailed designs, plans, specifications for remedial action, requires approved Explosive Safety Submittal

Record of Decision

- ‘Legal’ description of the selected remedial alternative/goals/strategy
- Rationale for selection

Remedial Action

- Construction and implementation phase for selected alternative



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Military Munitions Response Program RC/LTM/Five Year Review

Response Complete

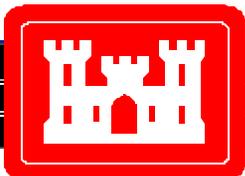
- When clean up objective as defined in ROD is met

Long Term Monitoring

- When part of the remedial objective must be monitored over time, i.e. an engineering control

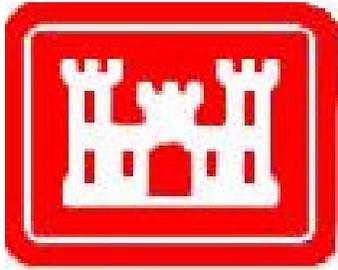
Five Year Review

- A formal review of current site conditions, new administrative policies, and new information is made to answer the question; is the implemented remedy still protective and meet the ROD objectives



Los Angeles District





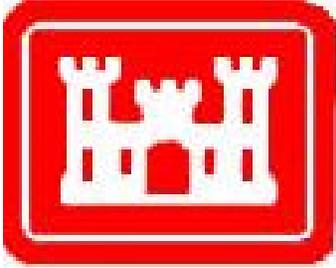
**U.S. Army Corps of Engineers,
Los Angeles District**

Munitions & Explosives

Recognition and Safety Training For



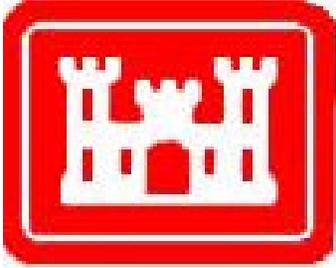
Land Managers and Stakeholders



**U.S. Army Corps of Engineers,
Los Angeles District**

General Safety Precautions

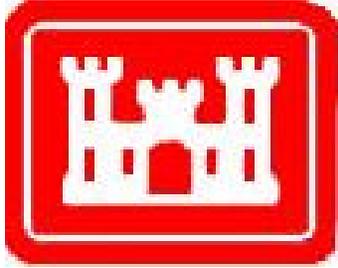
- Do not touch, directly or indirectly, any piece of suspected munition at any time
- Consider all practice munitions to contain a live charge
- Always be alert for tripwires and booby-trap devices
- Never spend more time near a suspected item than is absolutely necessary
- Never attempt to remove anything from any piece of munition



**U.S. Army Corps of Engineers,
Los Angeles District**

General Safety Precautions (Con't)

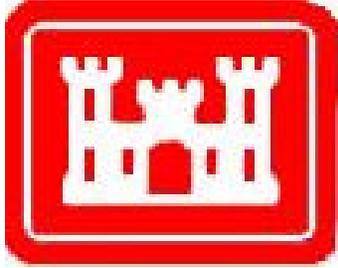
- Never use any radio transmitting device on a munition site until it has been determined to be safe
- Never assume that the color code is accurate
- Never enter a suspected minefield or grenade range
- Never move any wires or other parts of a piece of munition
- Never move any piece of munition suspected of having a photoflash or white phosphorus filler. Any movement could possibly re-ignite the filler



**U.S. Army Corps of Engineers,
Los Angeles District**

Definitions

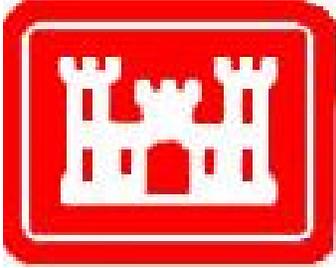
- AP – Armor Piercing
- AT – Anti-Tank
- Drill – Ordnance designed to give personnel practice with the ordnance, but it cannot be fired in a weapon.
- Dummy – Represents or looks like the actual item
- EMR – Electromagnetic Radiation – A series of waves, such as radio waves, that can cause an item to explode.
- Fuse – A pyrotechnic device using a burning low explosive in a flexible core, such as safety fuse.



**U.S. Army Corps of Engineers,
Los Angeles District**

Definitions

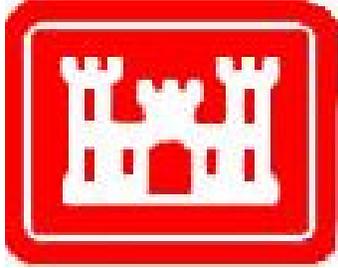
- Fuze – A mechanical, electrical or chemical device that produces the initial action to trigger an explosive device.
- HE – High Explosive
- HEAT - High Explosive Anti-Tank
- High Order – The entire consumption or detonation at its maximum rate of explosives being detonated.
- Inert - Ordnance that is identical to the actual item except that it is filled with inert material.
- Jet – The central stream of high velocity particles from a shaped charge munition



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Los Angeles District**

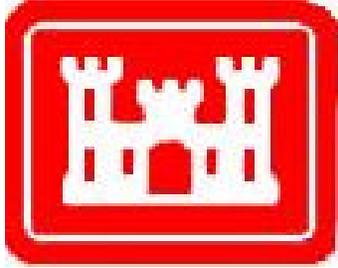
Definitions

- Low Explosive – An explosive that burns.
- Low Order – The incomplete detonation of an explosive train.
- PD – Point Detonating
- PIBD – Point Initiating, Base Detonating
- Practice – Normally inert items designed for use with a delivery system, may contain hazardous spotting charges.
- Shaped Charges – An item containing a shaped charge of explosives designed to penetrate armor or other heavy targets.
- WP – White Phosphorus



**U.S. Army Corps of Engineers,
Los Angeles District**

Projectiles



**U.S. Army Corps of Engineers,
Los Angeles District**

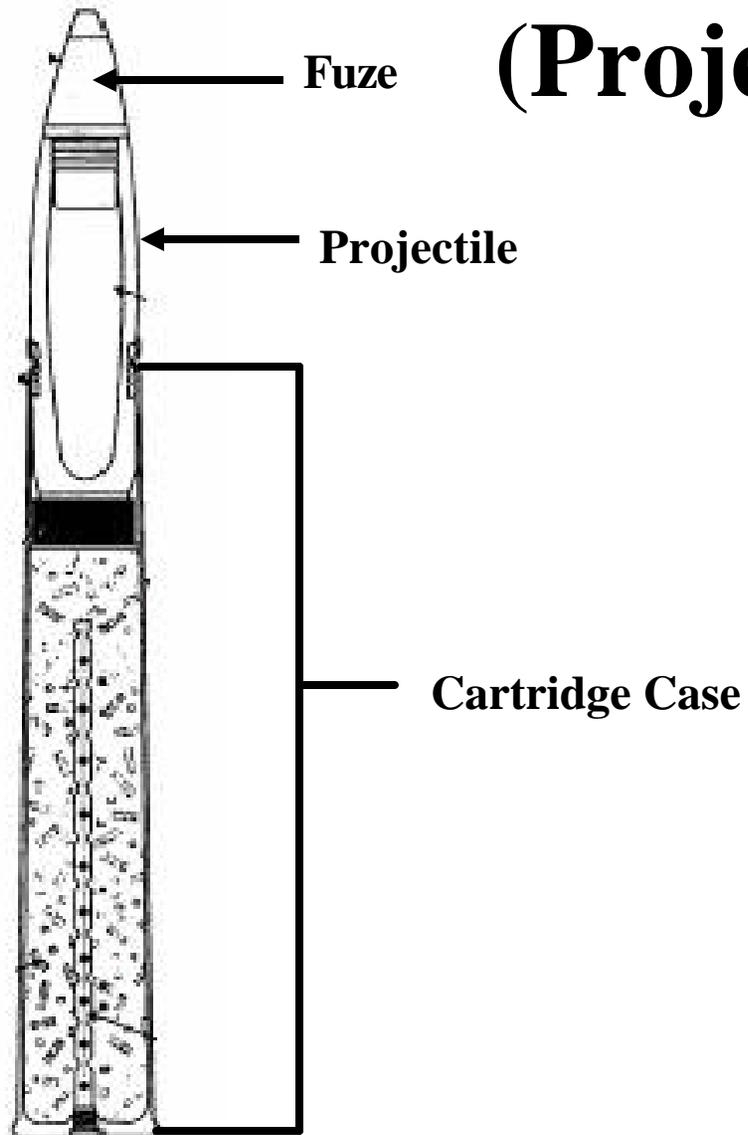
Definition

- **An object designed to be hurled or shot forward, such as a bullet, cannon shell, or artillery round**



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Los Angeles District

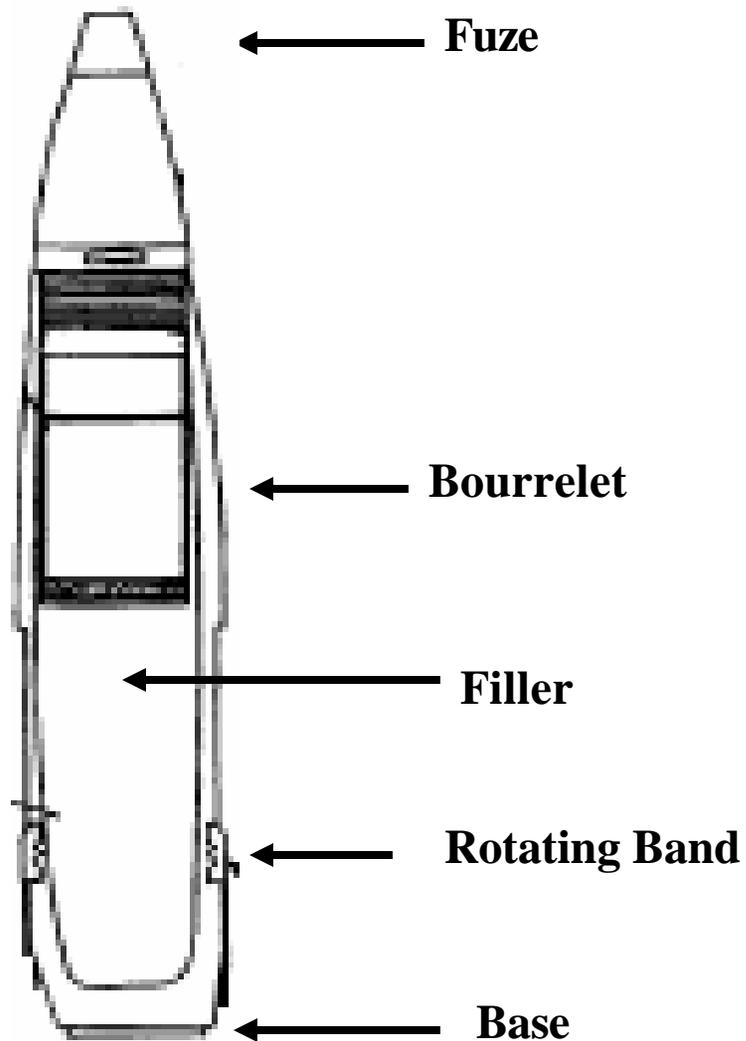
Unfired Cartridge (Projectile)





U.S. Army Corps of Engineers,
Los Angeles District

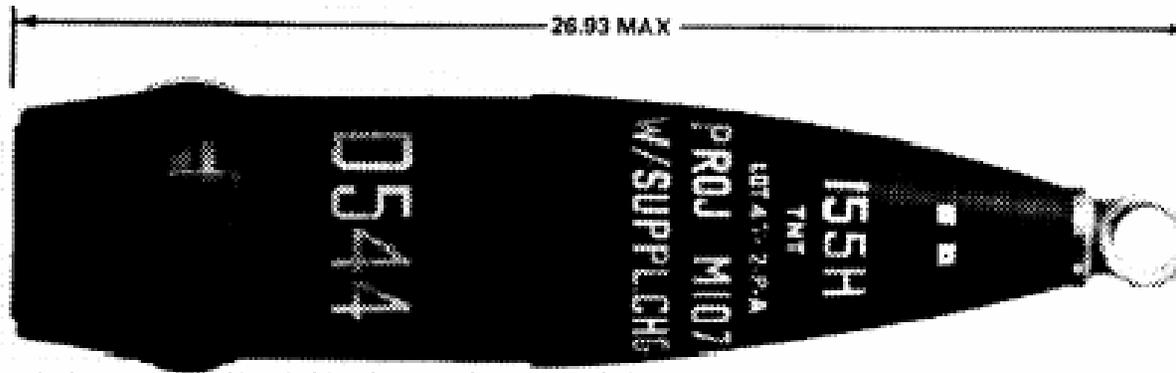
Parts of Projectile



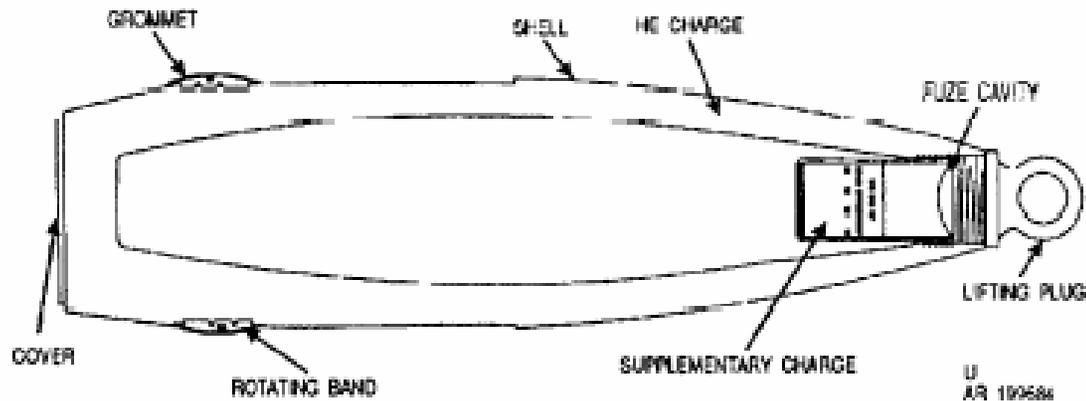


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Los Angeles District

Parts of Projectile (Boat-Tail Base)



AR199685

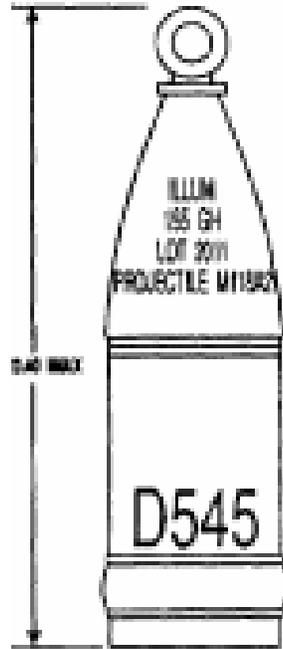


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AR 199684

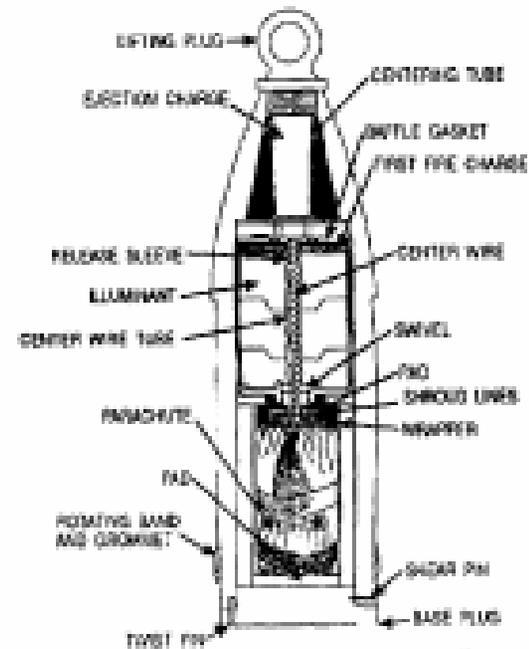


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Los Angeles District

Parts of Projectile (Square Base)



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AR 1596/1



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AR 1596/2



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Parts of Projectile (Rotating Band)





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Parts of Projectile (Fuze Types)

PD – Point Detonating

MT – Mechanical Time

BD – Base Detonating

VT – Variable Time (radar)

PDT- Pyrotechnic Delay time

PIBD – Point Initiating, Base Detonating



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Los Angeles District

Parts of Projectile (Fuze) (Nose)





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Los Angeles District

Parts of Projectile (Fuze) (Base)





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Los Angeles District

Types of Projectile

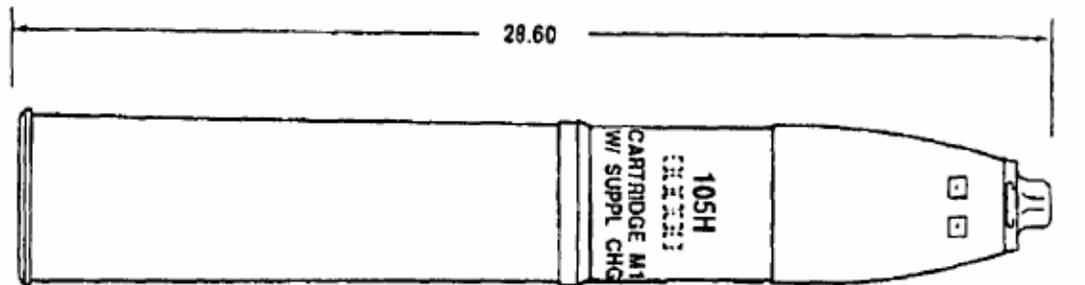
- **High Explosive (HE)**
- **High Explosive Anti-Tank (HEAT)**
- **Armor Piercing (AP)**
- **Chemical/Smoke**
- **Ejection**



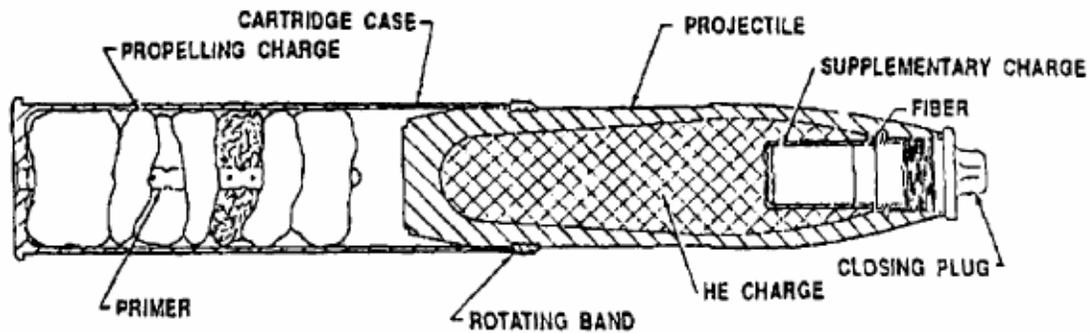
U.S. Army Corps of Engineers,
Los Angeles District

Types of Projectile

CARTRIDGE, 105-MILLIMETER: HE, M1



U
AR 199735-A

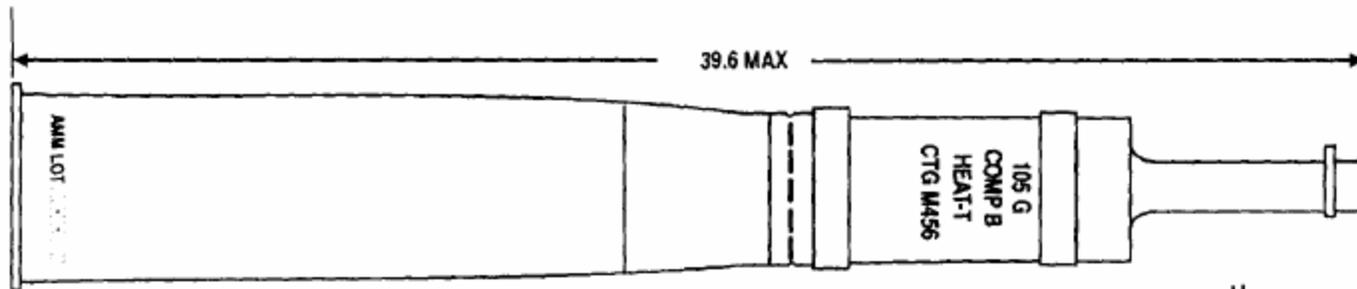




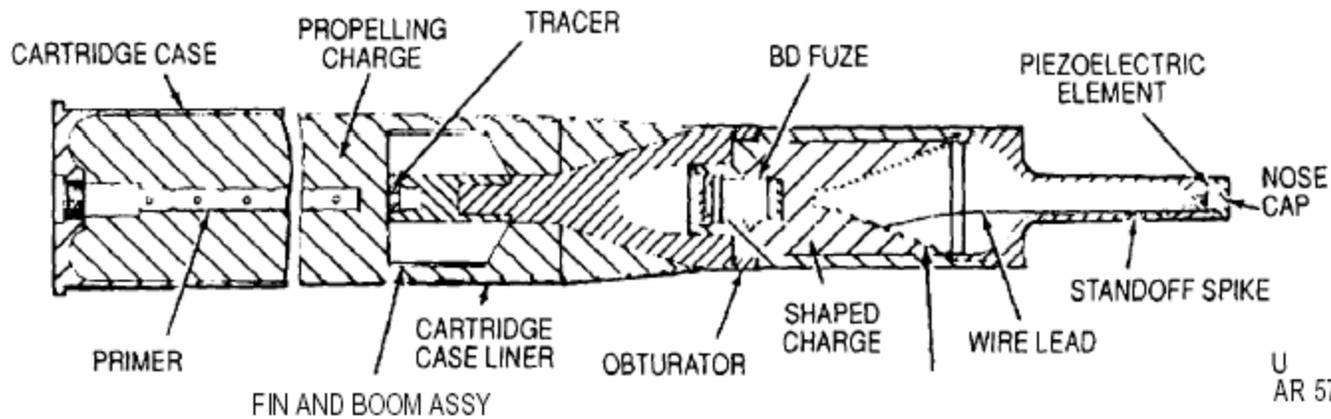
U.S. Army Corps of Engineers,
Los Angeles District

Types of Projectile

CARTRIDGE, 105 MILLIMETER: HEAT-1; M456 SERIES



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AR 199817-A



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AR 5797



U.S. Army Corps of Engineers,
Los Angeles District

Types of Projectile

High Explosive Anti-Tank (HEAT)

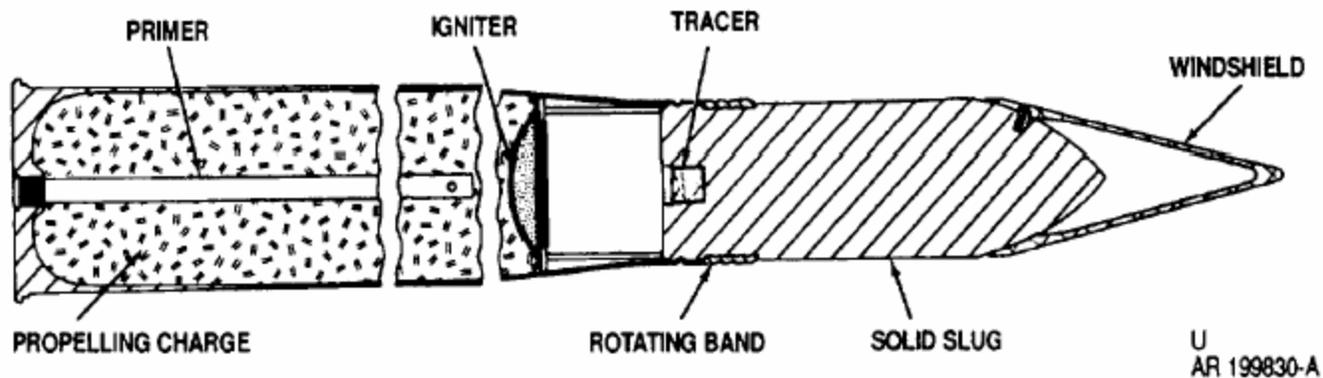
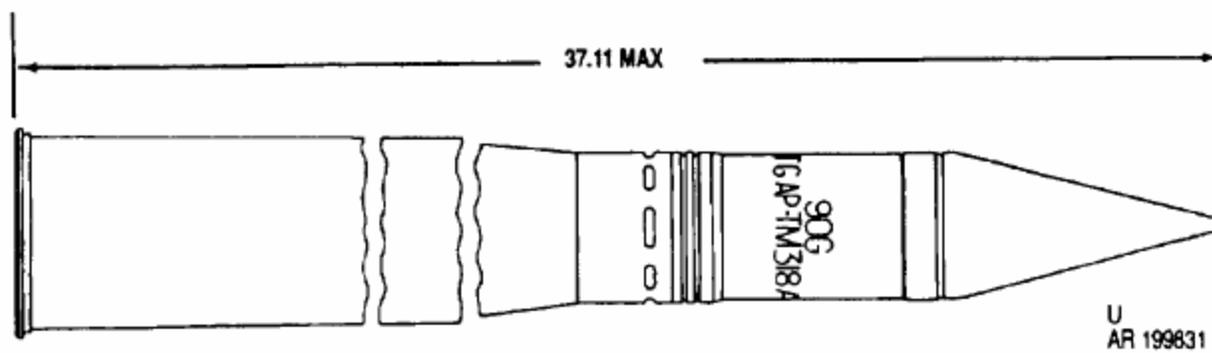




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Types of Projectile

CARTRIDGE, 90 MILLIMETER: AP-T, M318, MV2800; AND M318 (T33E7)
OR M318A1, MV3000





U.S. Army Corps of Engineers,
Los Angeles District

Types of Projectile

Armor Piercing (AP)

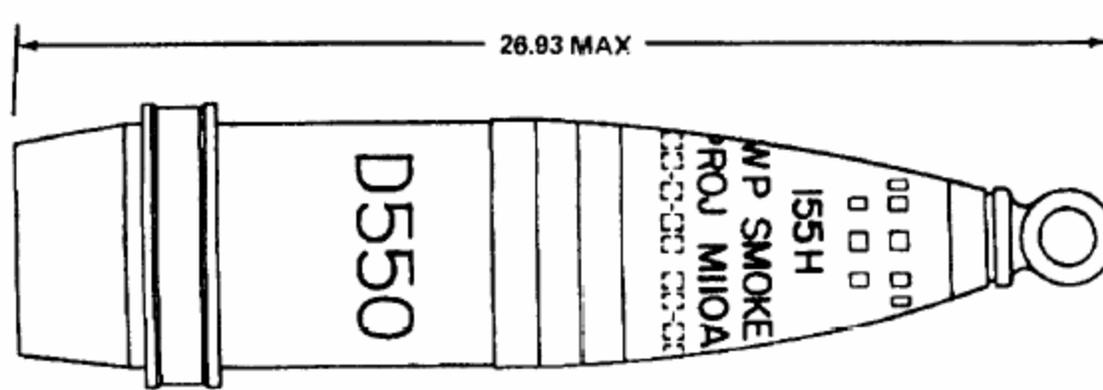




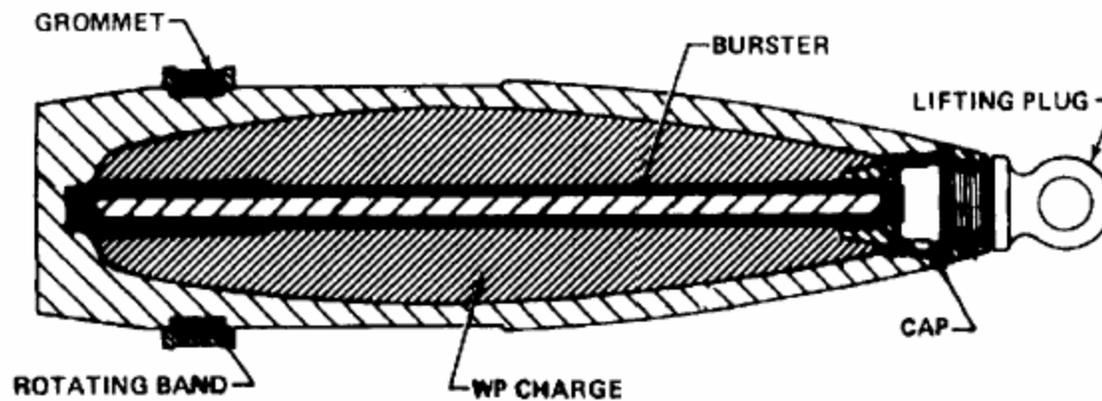
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Los Angeles District

Types of Projectile

PROJECTILE, 155-MILLIMETER: SMOKE WP, M110A1 (M110E2) M110A2 (M110E3)



AR 199681-A





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Los Angeles District

Types of Projectile

Chemical / Smoke

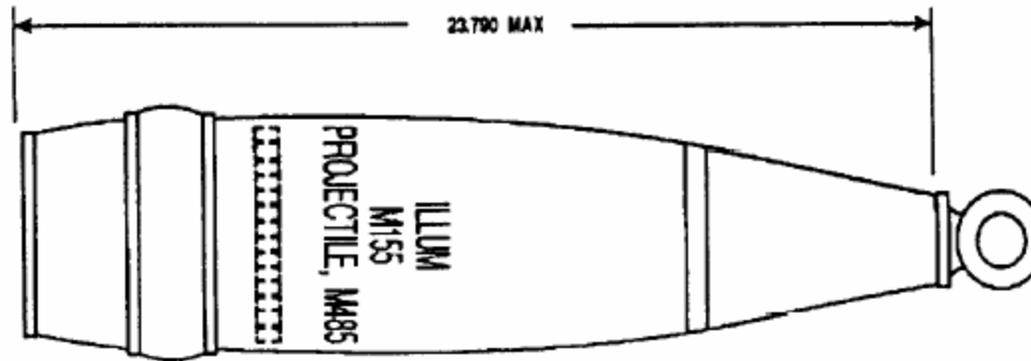




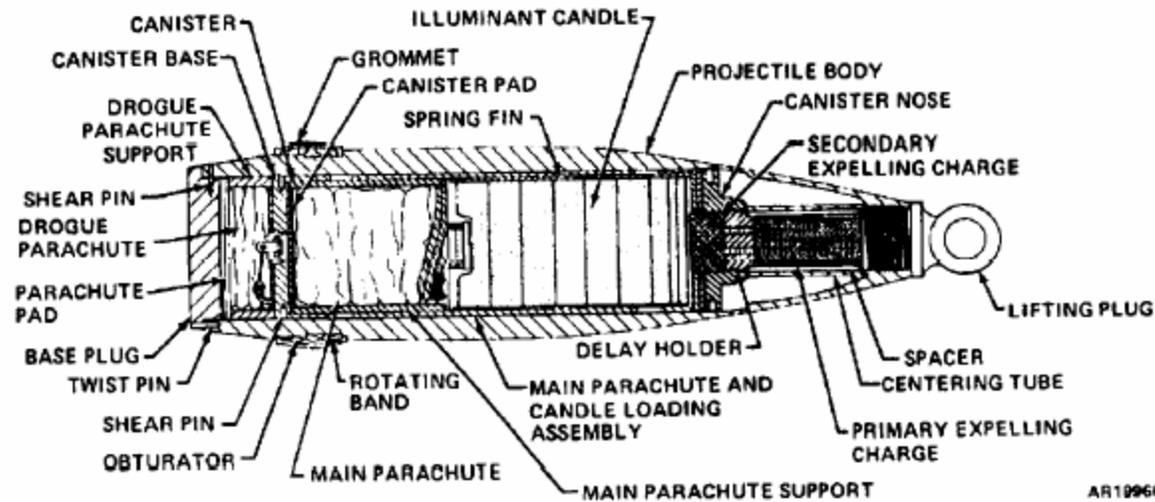
U.S. Army Corps of Engineers,
Los Angeles District

Types of Projectile

PROJECTILE, 155-MILLIMETER: ILLUMINATING, M485 SERIES



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AR 199659



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U.S. Army Corps of Engineers,
Los Angeles District

Types of Projectile

Ejection





U.S. Army Corps of Engineers, Los
Angeles District

Mortars

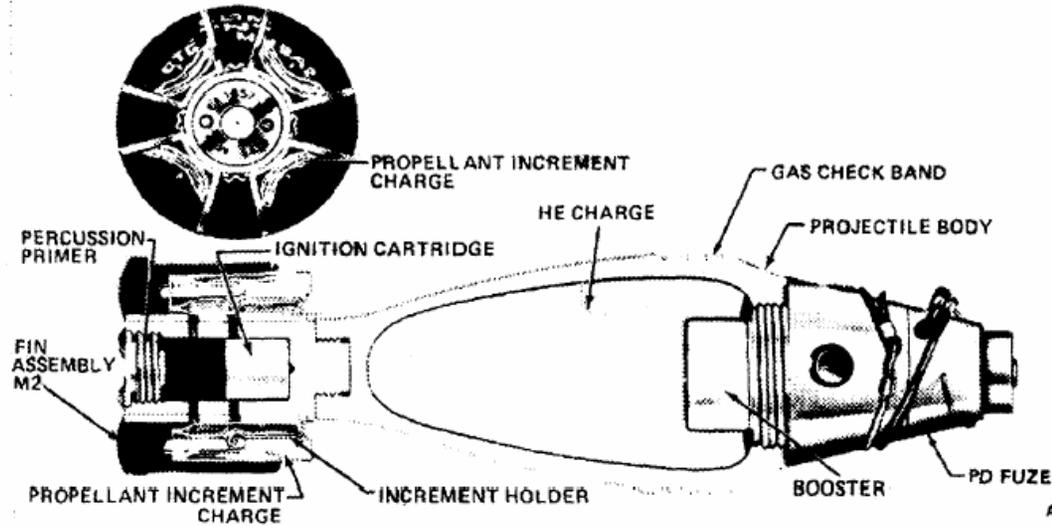
- High Explosive
- Chemical/WP
- Illumination



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AR199518



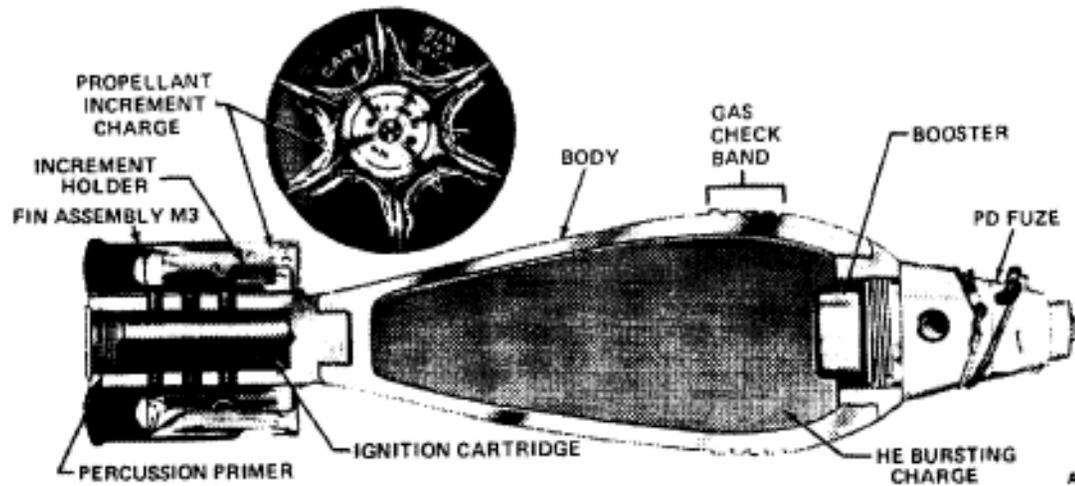
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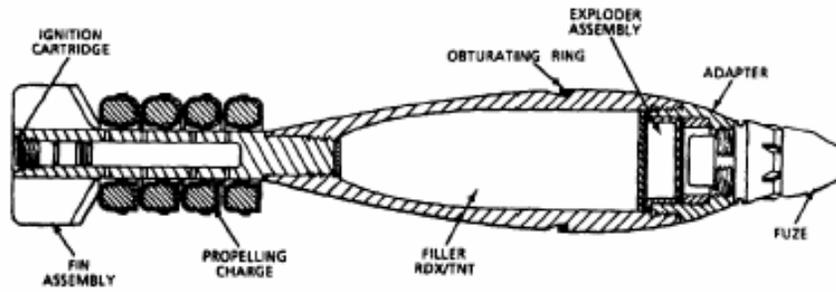
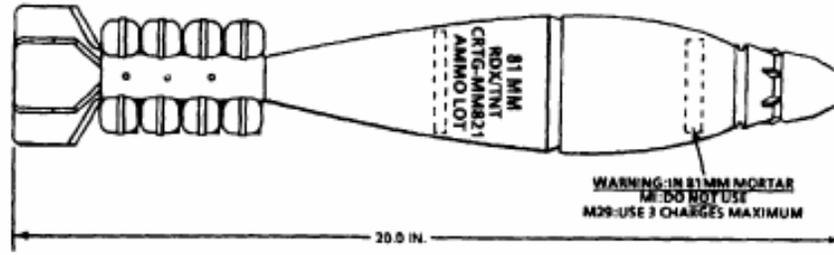
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AR195490

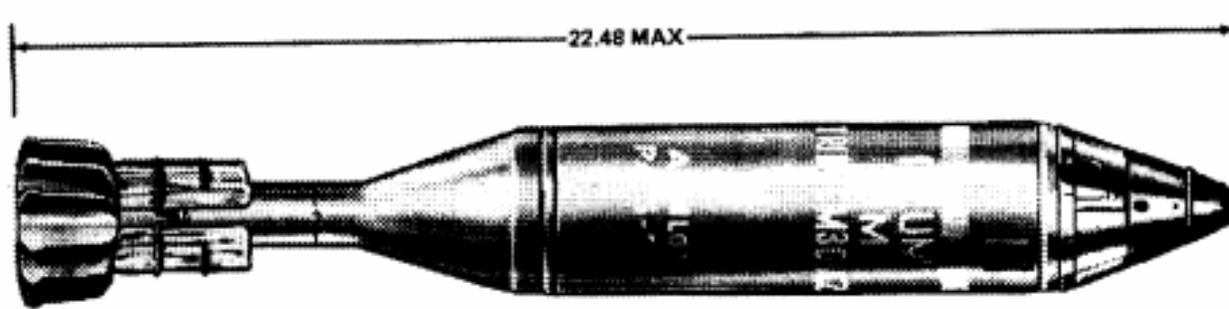


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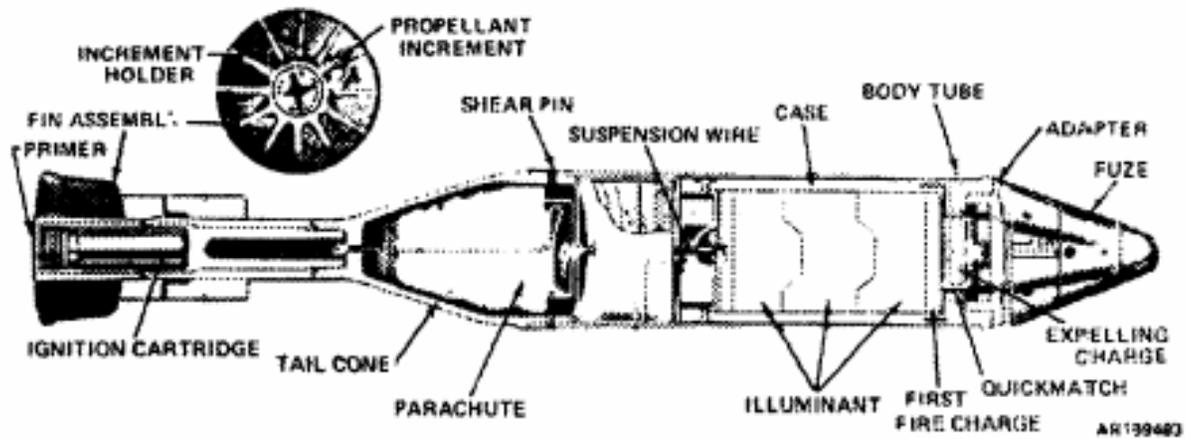




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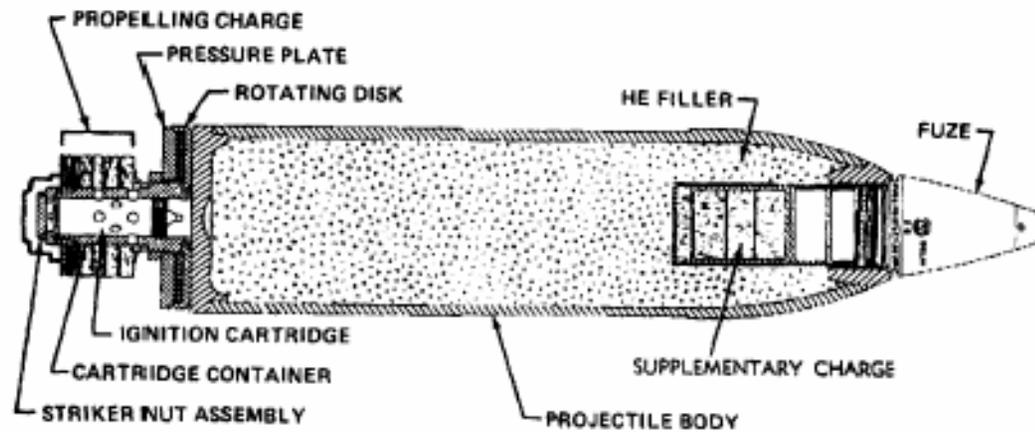
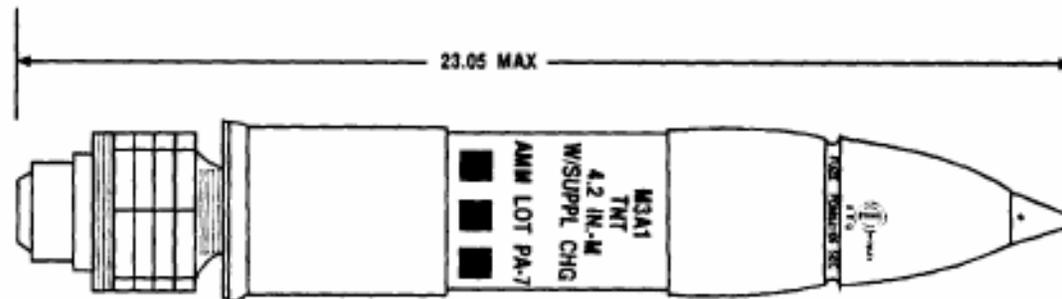
AR199494



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U.S. Army Corps of Engineers, Los
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Placed Munitions (MINES)



U.S. Army Corps of Engineers, Los
Angeles District

Definition

**An item designed to be placed to kill
or destroy personnel or equipment**



**U.S. Army Corps of Engineers, Los
Angeles District**

Anti-Tank & Anti-Personnel



U.S. Army Corps of Engineers, Los Angeles District

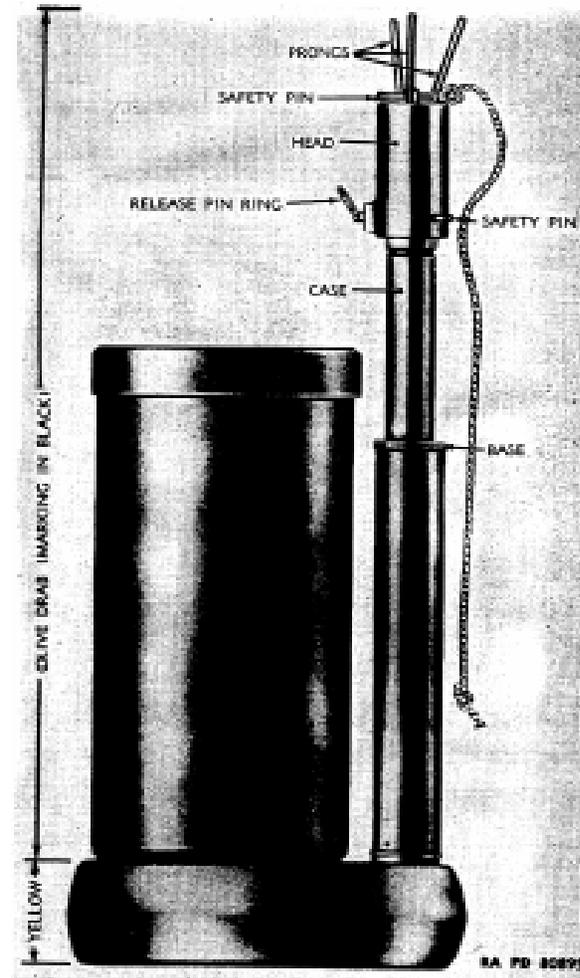
Anti-Tank





U.S. Army Corps of Engineers, Los Angeles District

Anti-Personnel





**U.S. Army Corps of Engineers, Los
Angeles District**

Dropped Munitions (Bombs)



U.S. Army Corps of Engineers, Los
Angeles District

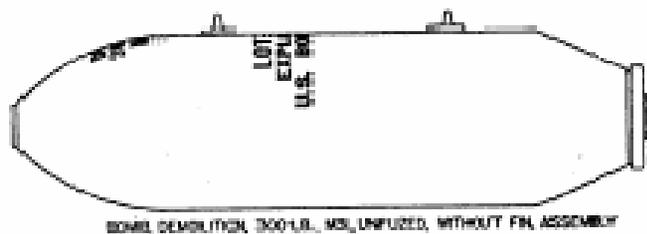
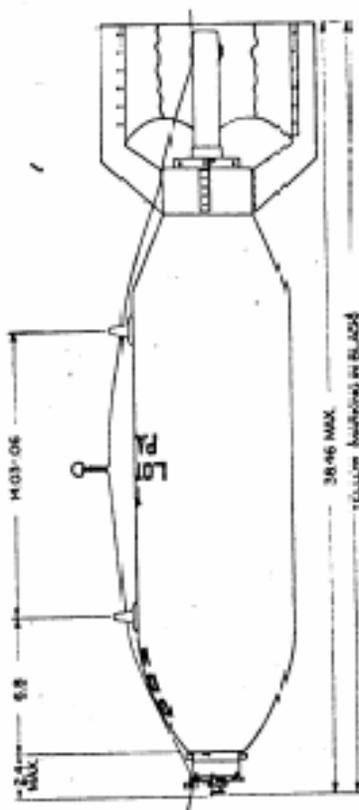
Definition

A bomb is a munition designed to be dropped from an aircraft in flight. It usually consists of a metal container filled with explosives or chemicals; a device for stabilizing in flight; and a mechanism for the causing the bomb to detonate at the appropriate time.

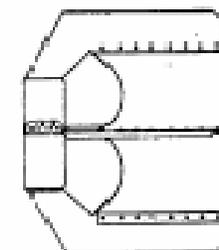


U.S. Army Corps of Engineers, Los Angeles District

Old Series GP & Demo Bombs



BOMB, DEMOLITION, 300-LB., MBL, UNFUZZED, WITHOUT FIN, ASSEMBLY



FIN, ASSEMBLY FOR 300-LB DEMOLITION BOMB, MBL
REF: 8752-107



U.S. Army Corps of Engineers, Los
Angeles District

Low-Drag Bombs

BOMB, LOW DRAG, GENERAL PURPOSE

MK 81, 250 POUND

MK 82, 500 POUND

MK 83, 1000 POUND

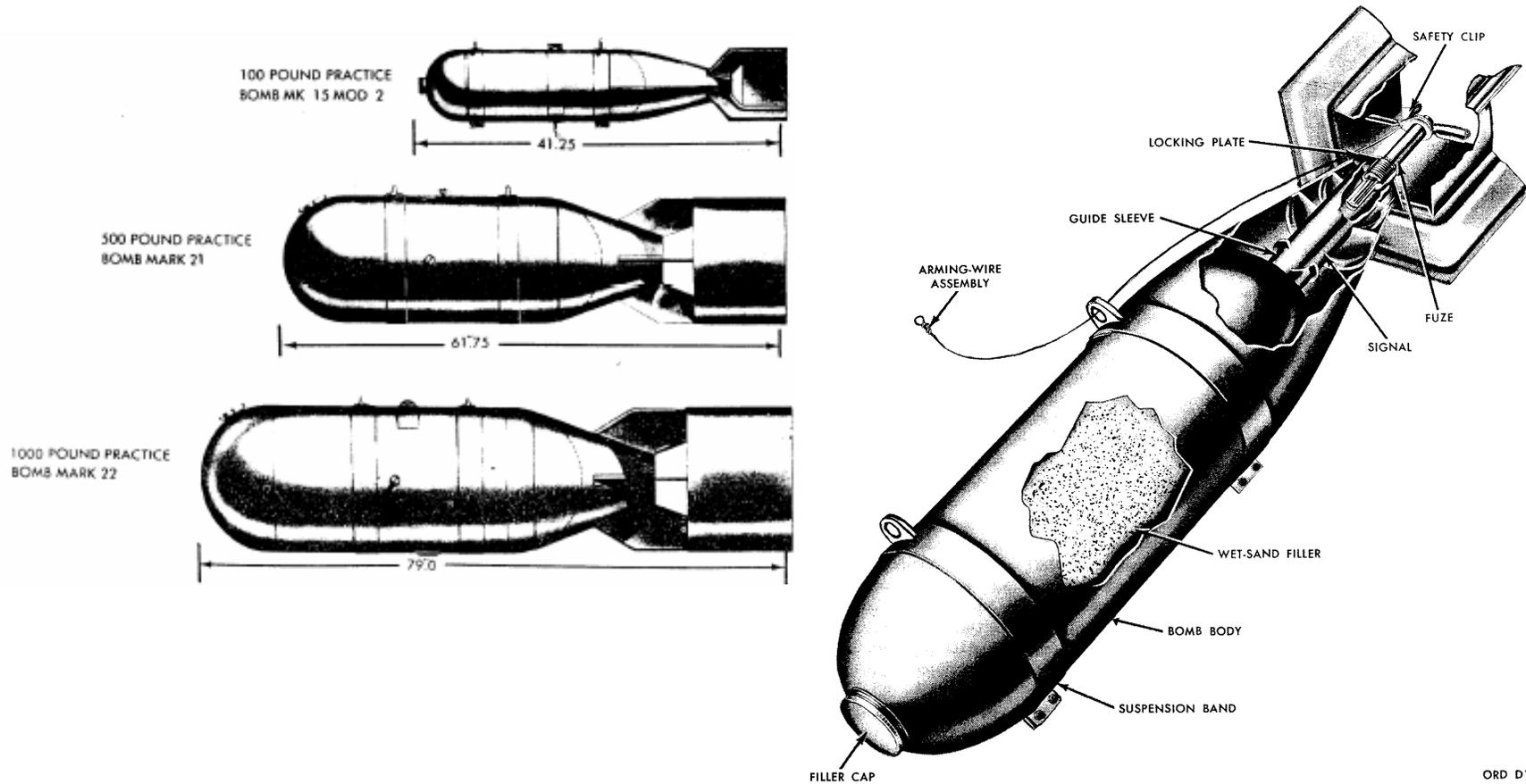
MK 84, 2000 POUND





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Practice Bombs

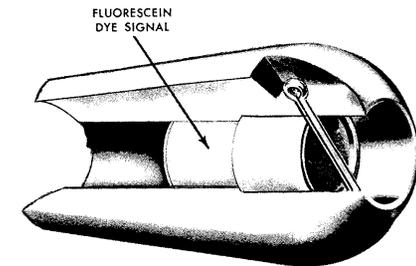
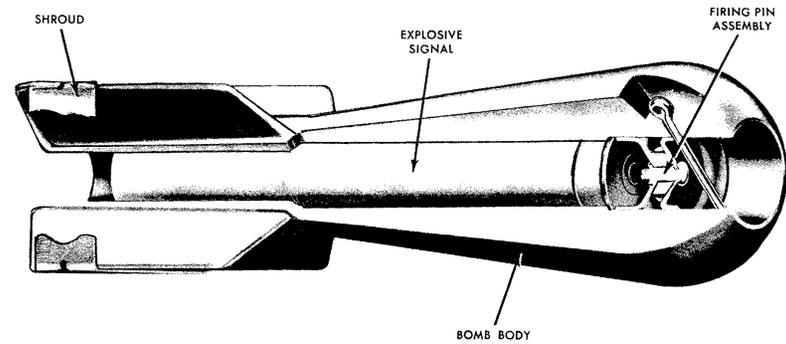
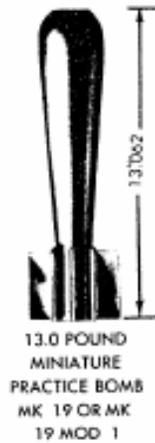
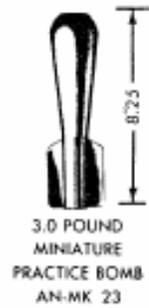


ORD D1167



U.S. Army Corps of Engineers, Los Angeles District

Practice Bombs



ORD D1160



**U.S. Army Corps of Engineers, Los
Angeles District**

Rockets & Guided Missiles



**U.S. Army Corps of Engineers, Los
Angeles District**

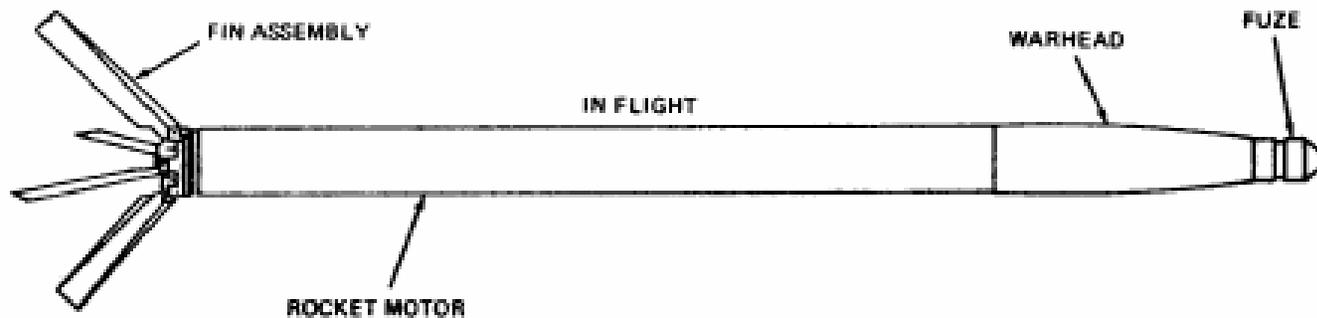
Types of Rockets

- **Ground**
- **Aircraft**



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Basic ID Features of a Rocket





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Ground Rockets

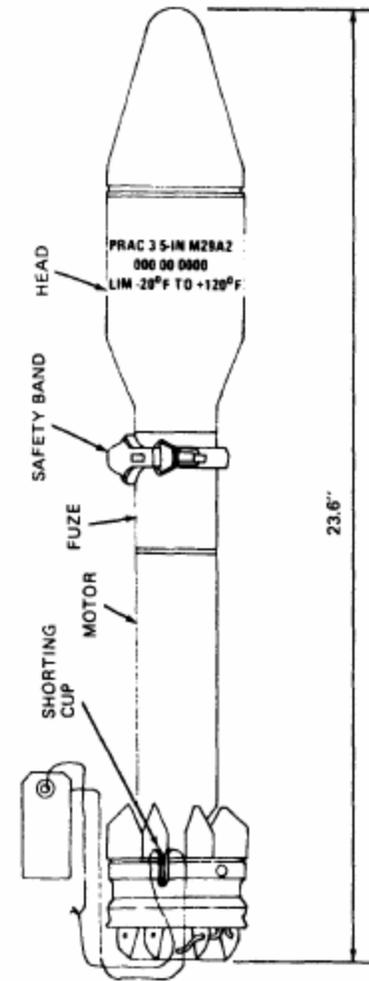
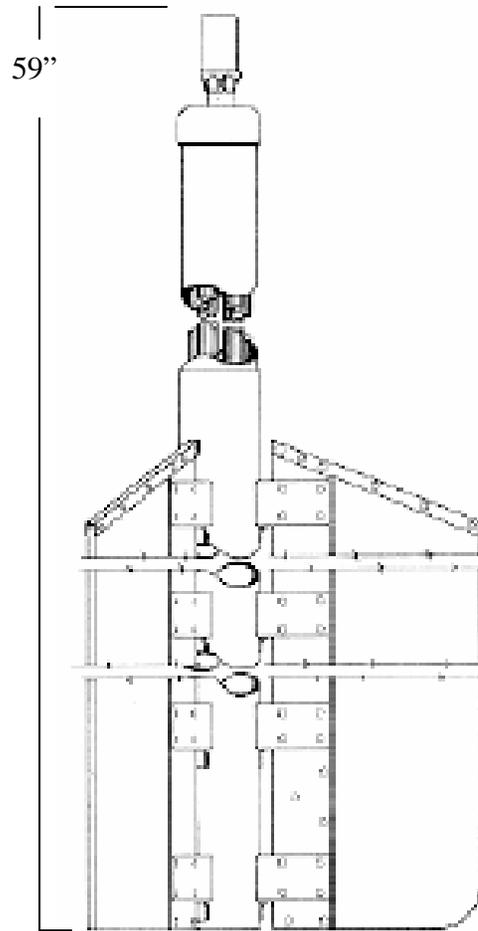
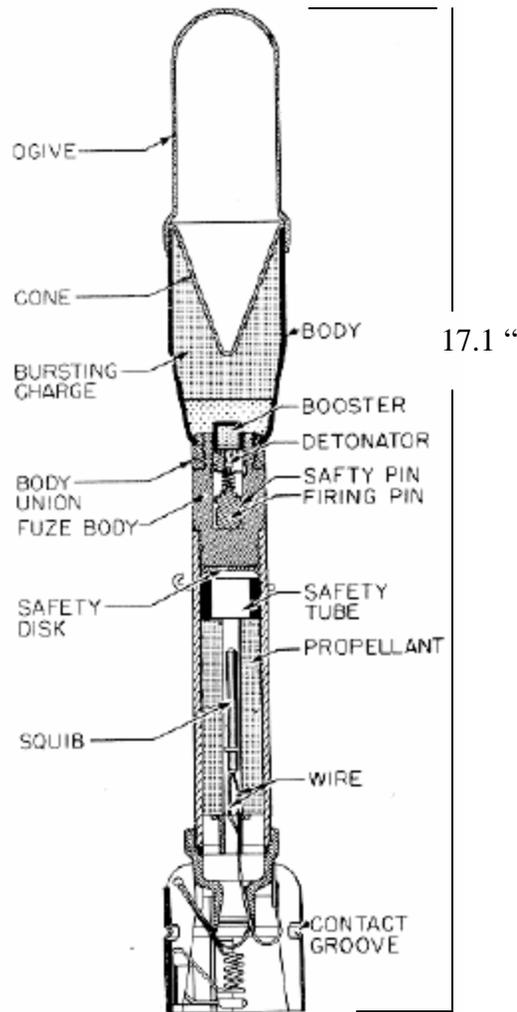


Figure 115. 2.36-inch A/T Rocket M6A1



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Ground Rockets





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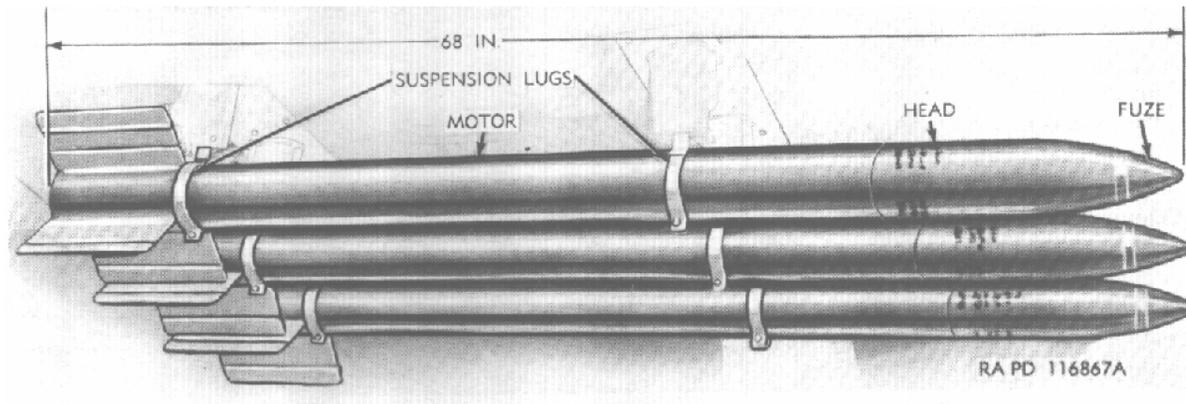
Ground Rockets





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Aircraft Rockets





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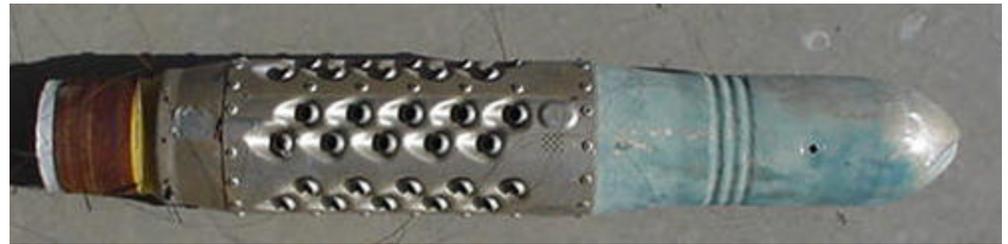
Aircraft Rockets





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Guided Missiles





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Thrown Munitions (Grenades)



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Definition

A thrown munition is a small missile filled with High Explosives or Chemicals and used against the enemy at relatively short ranges. Grenades may be either thrown by hand or projected with a rifle or grenade launcher.



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Hand Grenades

Grenades are classified according to use.

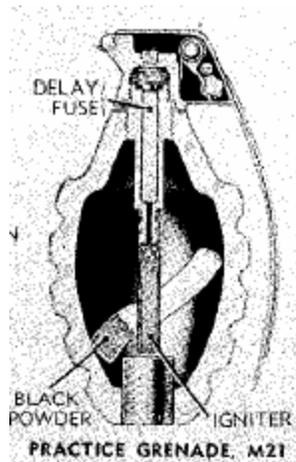
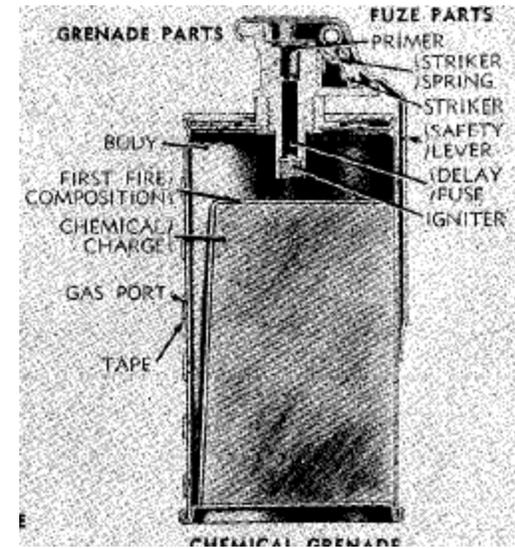
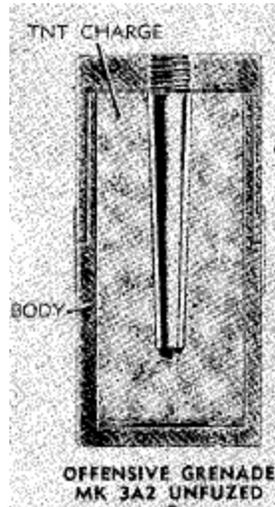
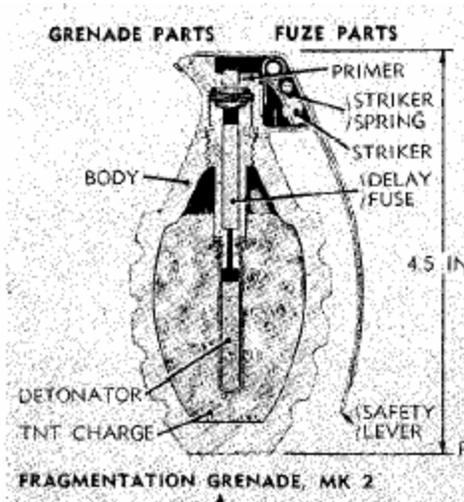
The major uses are:

- Fragmentation
- Offensive
- Chemical (Burning or Bursting)
- Practice



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Hand Grenades





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Hand Grenades





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Rifle Grenades

Rifle Grenades are fin stabilized projectiles launched from rifles

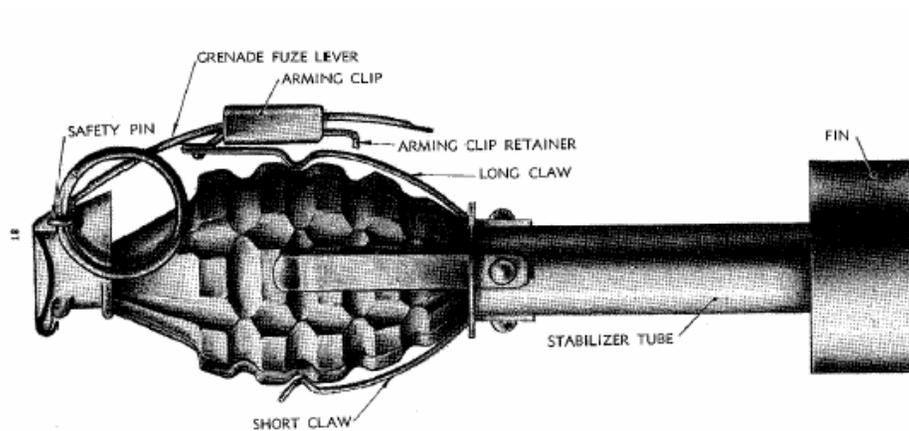


Figure 46 -- Fragmentation Grenade Projection Adapter M1

RA PD 48335



RA PD 151266



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Rifle Grenades

Rifle Grenades are fin stabilized projectiles launched from rifles





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Standard Operating Procedures For Unexploded Ordnance

Safety Precautions:

- Do not touch
- Consider all parts dangerous
- Minimum amount of time near
- Never Attempt to move or uncover
- Never use a radio within 50 feet
- Never Assume color code is accurate



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Standard Operating Procedures For Unexploded Ordnance

Reporting Procedures:

- Mark the item
 - With highly visible flagging
 - Get coordinates if possible, hand held GPS
 - Take a digital photo to email to responding agency
 - If in area frequented by visitors close area or leave guard to eliminate chance encounters

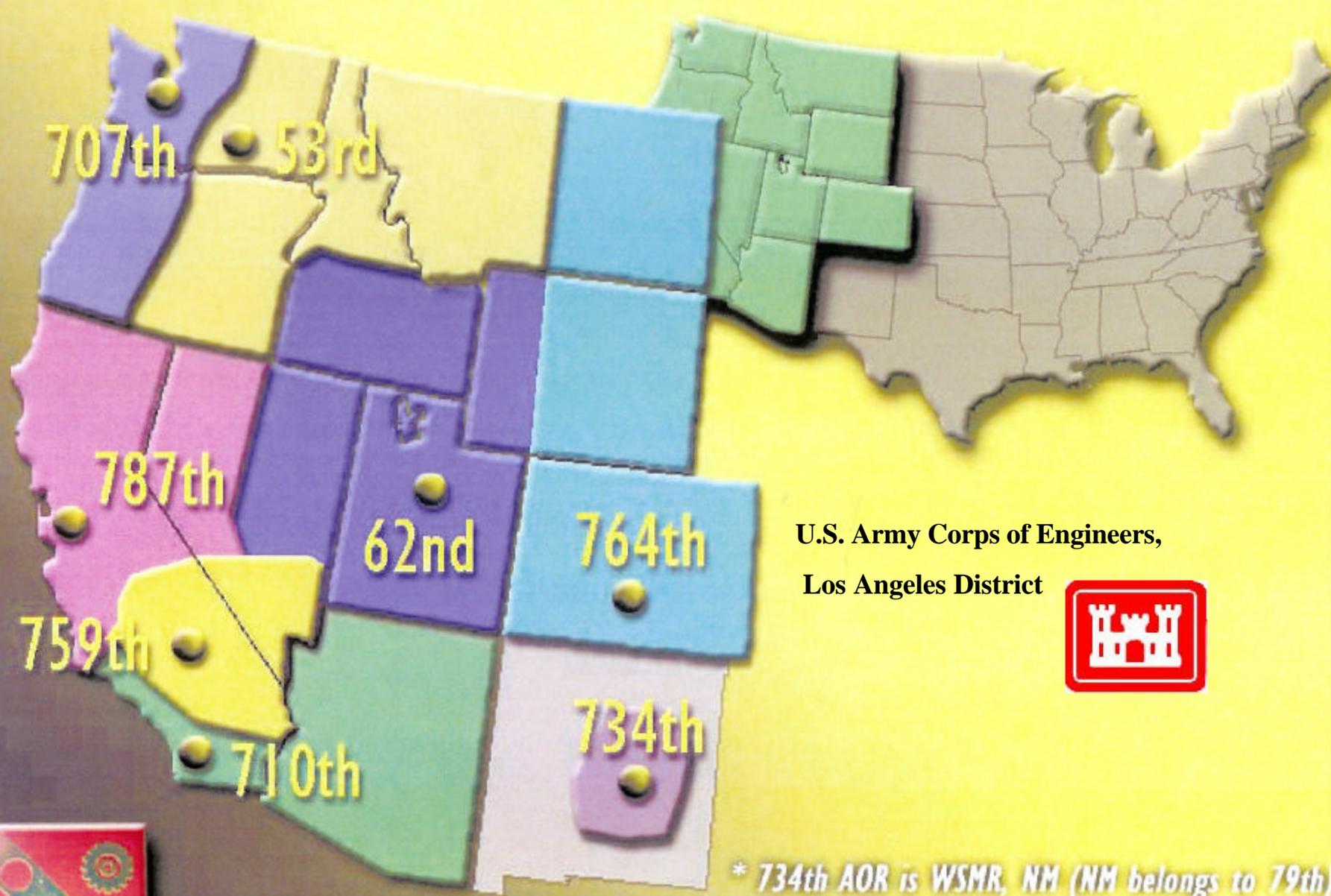


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Standard Operating Procedures For Unexploded Ordnance

Reporting Procedures:

- Report the item, be prepared to provide:
 - General description length, width, color
 - If the location is amenable to a blow-in-place, for example is it near a structure or open space
 - Take a digital photo to email to responding agency
 - Be prepared to take responders back to the location



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** 734th AOR is WSMR, NM (NM belongs to 79th)*



3rd Ordnance Battalion (EOD)



U.S. Army Corps of Engineers, Los Angeles District

Unit	Location	DSN	24 hr #	FAX
3rd EOD BN	Ft. Lewis, WA	357	(253) 967-1971	4869
53rd EOD	Yakima, WA	638	(509) 577-3375	3138
62nd EOD	Tooele, UT	790	(435) 833-2962	2963
707th EOD	Ft. Lewis, WA	357	(253) 967-5507	4420
710th EOD	San Diego, CA	553	(619) 553-8500	8095
734th EOD	White Sands, NM	258	(505) 678-2035	6228
759th EOD	Ft. Irwin, CA	470	(760) 380-4092	4097
764th EOD	Ft. Carson, CO	691	(719) 526-2643	3521
787th EOD	Moffett Airfield, CA	359	(650) 603-8301	8305



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Review

What is it?



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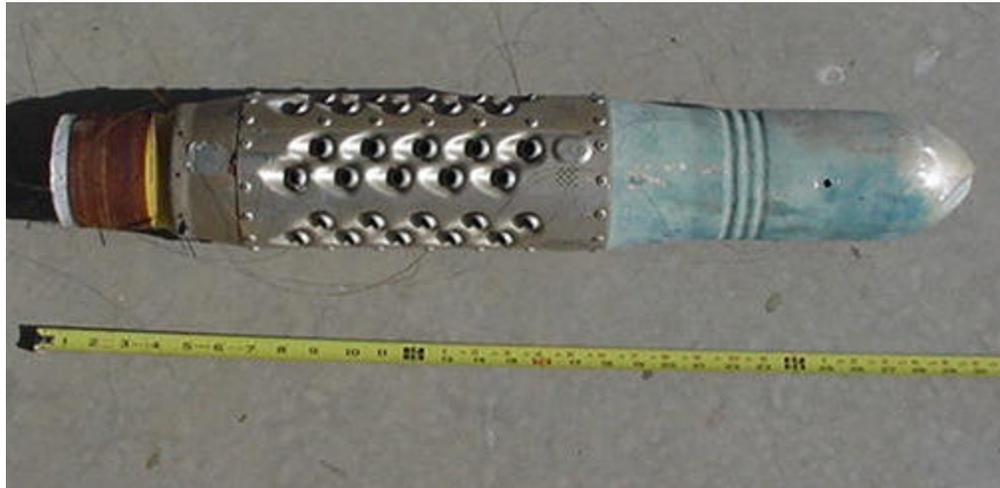


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Questions?