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# **152mm Demilitarization**

**Demilitarization of 152mm TP-T  
&  
Canister (Flechette) Projectiles  
at  
Tooele Army Depot**

**Steven S. Smith  
Ammunition Equipment Division  
Tooele Army Depot**



***JMC - Ready - Reliable - Lethal***

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# 152mm Demilitarization

- **Scope of Project**
- **Description**
- **History**
- **Challenges/Solutions**



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# Demil Scope

## ✓ Two Basic Types of Projectiles

➤ M411 Series TP-T



➤ M625 Series Canister (flechette)



## ✓ R<sup>3</sup> (Resource Recovery, Recycle) Operation

➤ Recover Steel & Aluminum from Projectile



➤ Recover Propellant (Sold to Commercial Firm)



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# **DEMIL SCOPE**

## **Overall Requirements**

### ✓ **Remove All Energetics**

#### ➤ **Propellant**



#### ➤ **Nitrocellulose Case**



#### ➤ **Tracer Element on TP-T round**



### ✓ **Deform/Demil Projectile Body**

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# A Little History

✓ **US Army identified a need for armored reconnaissance vehicle for use by airborne units.**

- **Counter to Soviet Bloc PT76**
- **Air Transportable**
- **Amphibious**
- **AT & AP capability**

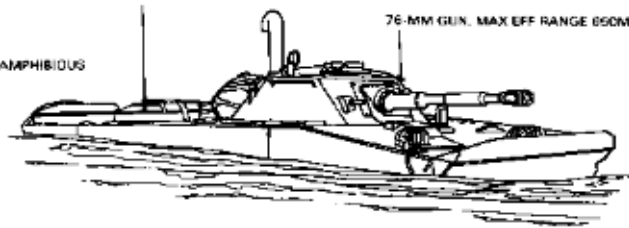


**PT-76 RECON** USED BY USSR, WARSAW PACT AND THIRD WORLD COUNTRIES

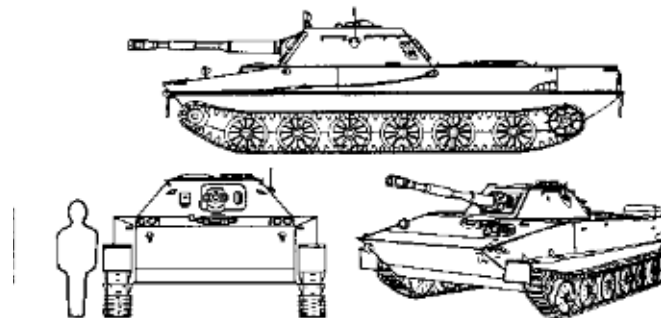
TURRET PLACED FORWARD ON HULL

76-MM GUN, MAX EFF RANGE 650M

AMPHIBIOUS



CHINA PRODUCES THE PT-76 WITH AN 85-MM GUN IN A T-54 SHAPED TURRET UNDER THE DESIGNATION TYPE 63



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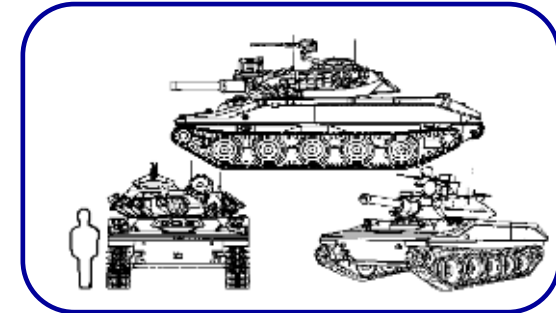
## A Little History

(Continued)



### ✓ M551 “Sheridan” AR/AAV (Armored Reconnaissance/Airborne Assault Vehicle) – fielded 1967

- Lightweight; aluminum hull & steel turret.
- Amphibious (with hull skirt)
- M81 152mm Launcher developed to give effective anti-tank capability, yet save weight & space as compared to the 90mm & 105mm guns used on M48/M60 series MBTs.
  - Dual capability
    - ★ Fires conventional projectiles for use in AP and close range AT situations
    - ★ Fires Shillelagh AT missile for use in long range anti-armor, “bunker busting” etc.



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## A Little History

### (Continued)



- Sheridan used in Viet Nam to replace M48 Patton tank in Cavalry units.
  - Also used in Panama, and Operation Desert Shield/Desert Storm
  - M551 last used by 82<sup>nd</sup> Airborne.
- “Caseless” 152mm round was developed.
- First Successful use of “Caseless” Cannon Projectile
    - ★ Saves weight
    - ★ Eliminates empty shell cases inside vehicle
  - Used in both AT and AP applications
- Sheridan and 152mm round removed from service in 1997



152mm round also used in  
M60A2 “Starship” MBT

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# M411 TP-T Round



- ✓ DODIC D383
- ✓ 30,700 Qty Demilitarized
- ✓ Steel projectile
  - Mixed M411A1/2/3 & M411 less Spotting Charge
- ✓ Aluminum Lock Ring screwed onto base
  - Holds cartridge case to base of Projectile
- ✓ M13 Tracer
  - Steel tracer cup cemented into cavity in base
  - Aluminum foil disk and retainer screwed over tracer



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# M625 Canister Round Description



- ✓ DODIC D390
- ✓ 14,700 Qty Demilitarized
- ✓ Inert aluminum projectile w/ crimped on steel "lid".
  - 10,000 1 ½" Flechettes in each round
  - Aluminum & Steel Flechette "Bays" (Collars) inside canister



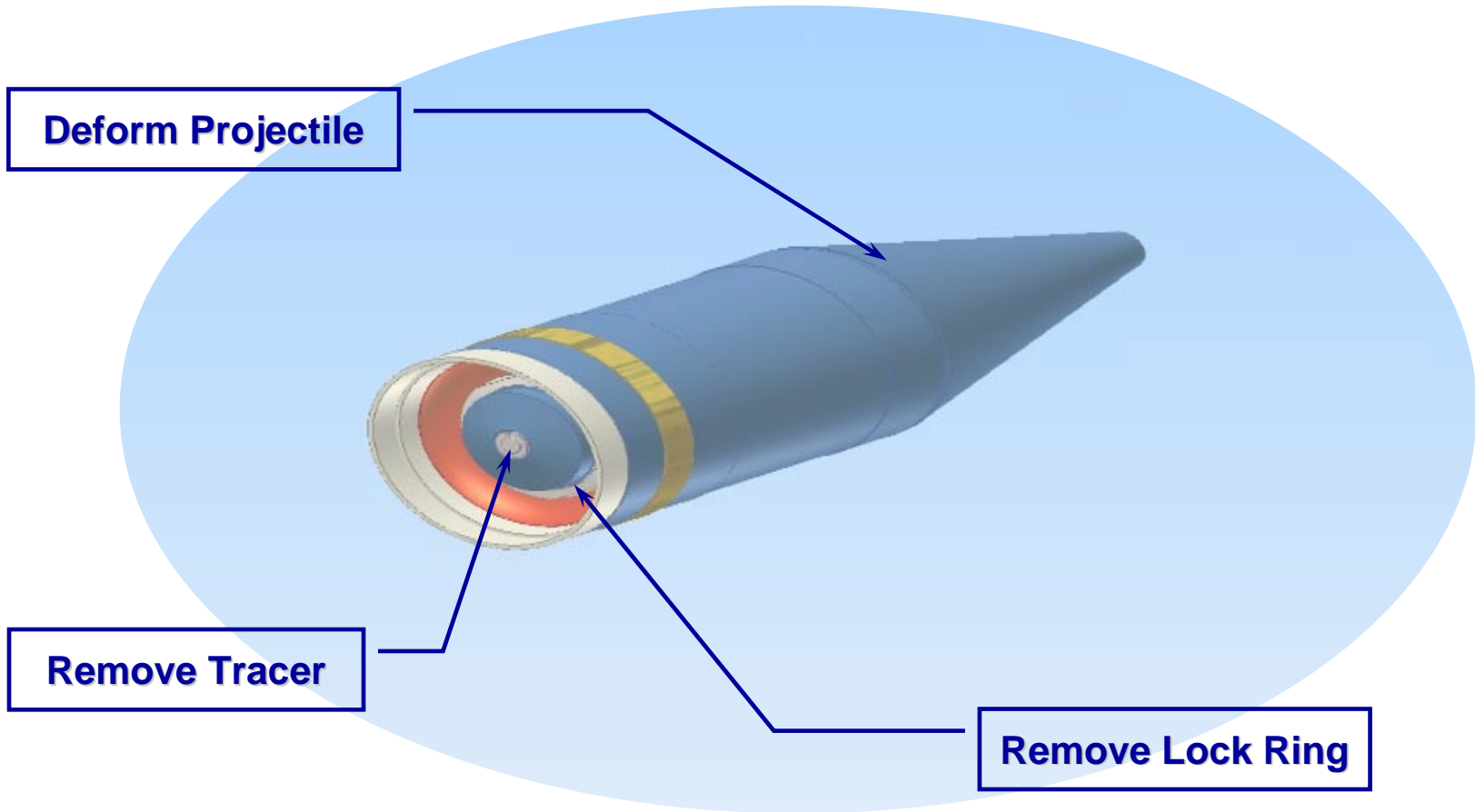
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# TP-T Challenges



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# TP-T Remove Lock Ring--

**What Didn't Work**



- ✓ **Removing Lock Ring with APE 1002**
  - Base of round prevented complete access
  - Fixture could not remove cemented Lock Ring



- ✓ **Removing Lock Ring with Cable Shear**
  - Base of round prevented adequate access
  - Hard to center shear on ring – could easily slip off
  - Frequent replacement of cutters due to cutting into steel at base

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## **TP-T Remove Lock**

### **Ring--**

**What Didn't Work**



- ✓ **Cutting base of projectile with powered saw**
  - **Time-consuming**
  - **Projectile base still had cartridge case “bowl” attached, requiring additional operation**
  - **Too large to demil in APE 1236 furnace**



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## TP-T Remove Lock Ring--

### What Didn't Work



- ✓ **Use Air Chisel to Drive Lock Ring Off**
  - Feasible, but time- consuming
  - Hard on operator
    - Potential Repetitive Motion injuries
    - Increased safety risk



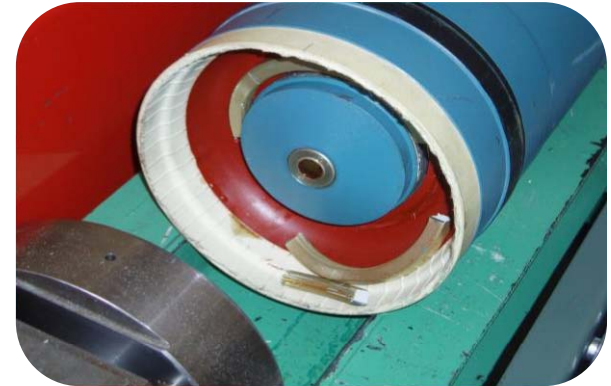
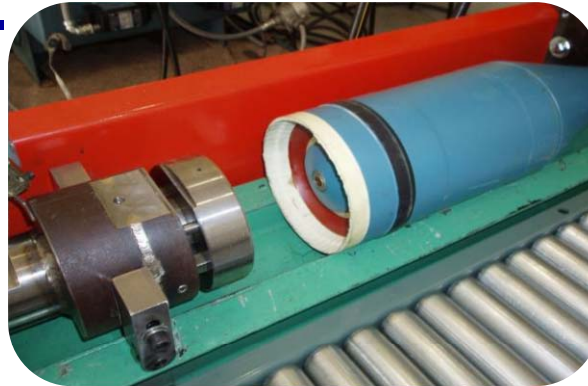
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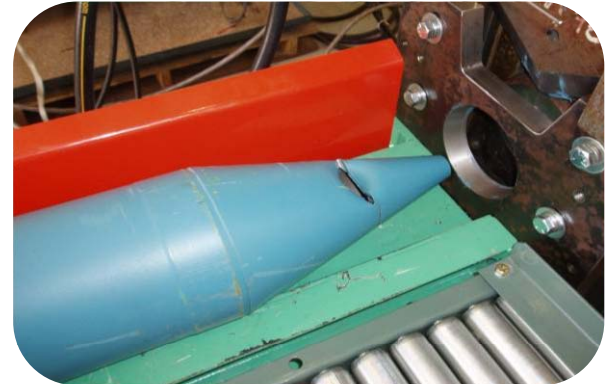
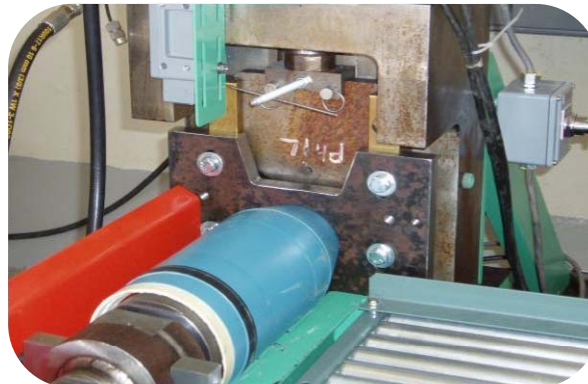
# UNCLASSIFIED TP-T Remove Lock Ring-- What Did Work



- ✓ Removing Lock Ring with Non-standard APE Lock Ring Cutter.



- Used with modified Rocket Shear to deform projectile.



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## **TP-T Remove Tracer**

### **What Didn't Work**

- ✓ **Unscrew Tracer Retainer & Pull out Tracer**
  - Retainer glued in; broke removal tools
- ✓ **Using open burn pan and bulk propellant to burn off cartridge case bowl & ignite tracer**
  - Labor Intensive
  - Cartridge case “bowl” merely charred under retainer; remained relatively intact
  - Tracer did not burn, even with foil ruptured.



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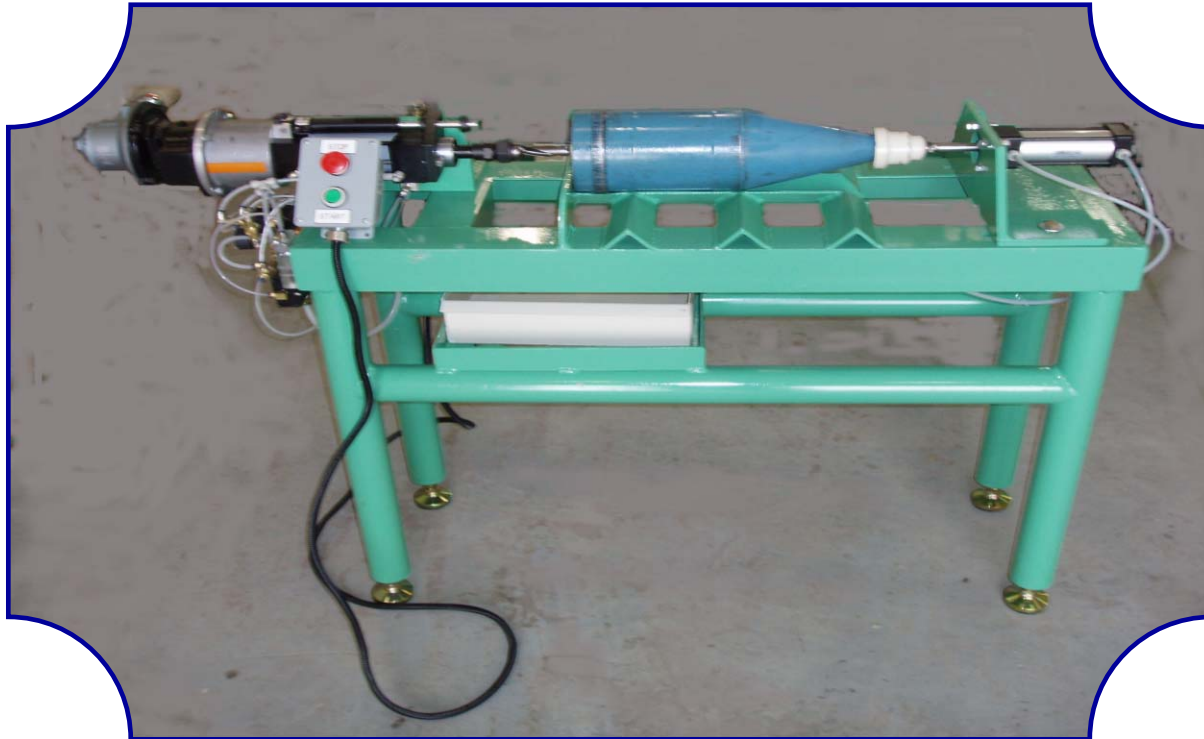
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# TP-T Remove Tracer

What Did Work



- ✓ Removing Tracer with Non-standard APE Drillout Machine



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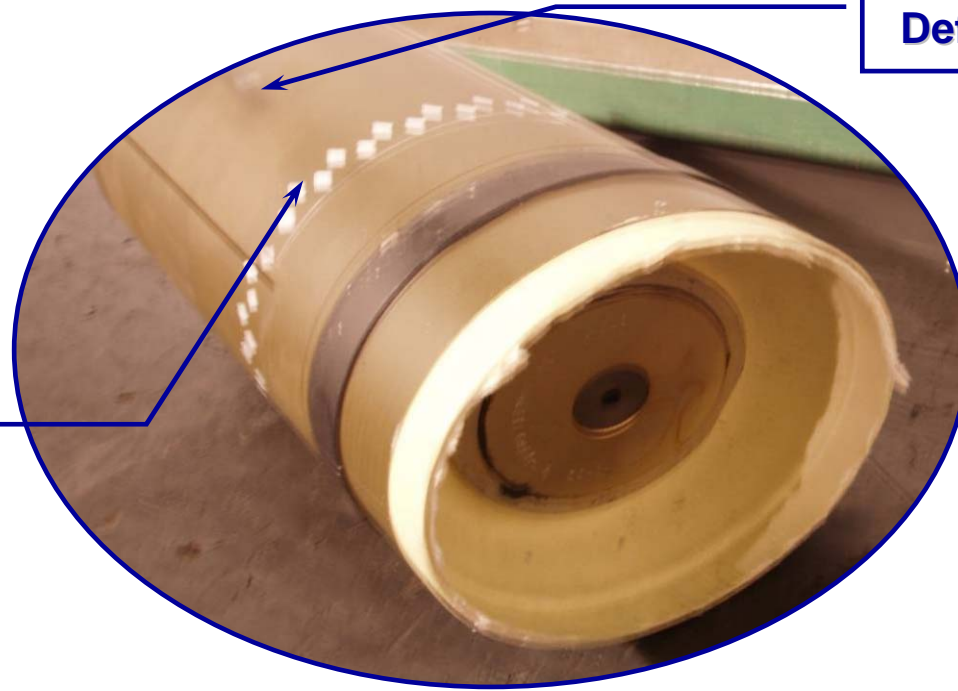




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# Canister Challenges



**Deform Projectile**

**Remove Flechettes**

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# Canister Remove Flechettes & Deform Projectile

What Didn't Work



## ✓ Use Shear to “Pop” Lid off

### ➤ Deformed end of canister

- Lid didn't come off completely; had to be pried off
- Flechettes couldn't come past deformed opening



## ✓ Use “Can Opener” Style Hand Tool

### ➤ Time-consuming

### ➤ High Potential for Repetitive Motion Injury

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## Canister Remove Flechettes & Deform Projectile



### What Did Work

- ✓ Cut Base off Canister with Circular Cutter
- ✓ Flechettes dumped out and collected
- ✓ Cases & Flechette Bays Dumped into Scrap Container



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QUESTIONS???

QUESTIONS???

QUESTIONS???

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