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152mm Demilitarization

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

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Ammunition Equipment Division
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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)



✓ R³ (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**

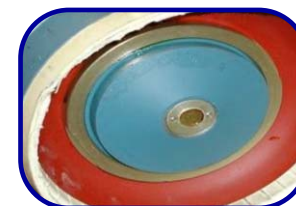
➤ **Propellant**



➤ **Nitrocellulose Case**



➤ **Tracer Element on TP-T round**



✓ **Deform/Demil Projectile Body**

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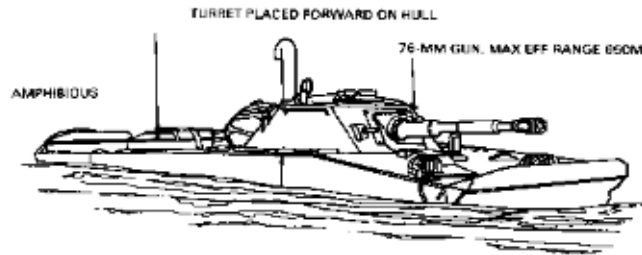
A Little History

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

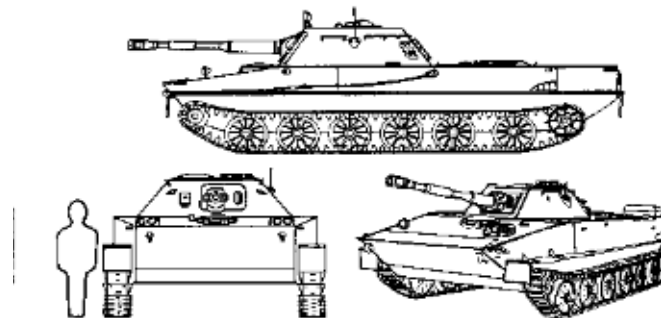
- **Counter to Soviet Bloc PT76**
- **Air Transportable**
- **Amphibious**
- **AT & AP capability**



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



CHINA PRODUCES THE PT-76 WITH AN 65-MM GUN IN A T-54 SHAPED TURRET UNDER THE DESIGNATION TYPE 63



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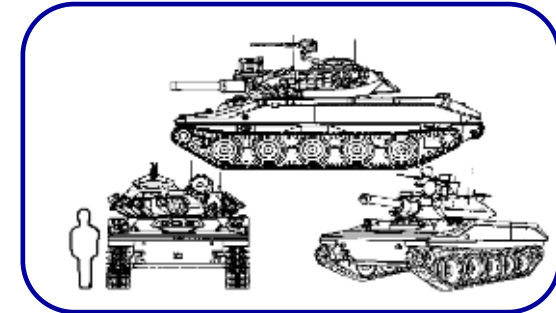
A Little History

(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 82nd 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

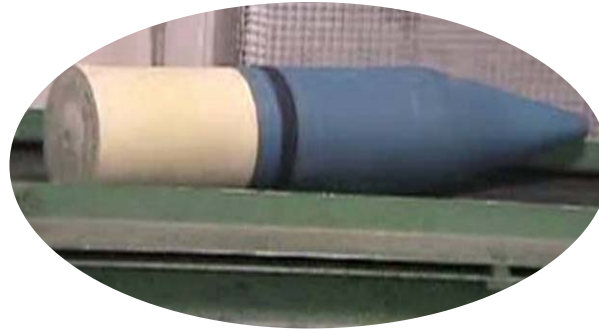
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M411 TP-T Round



- ✓ 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



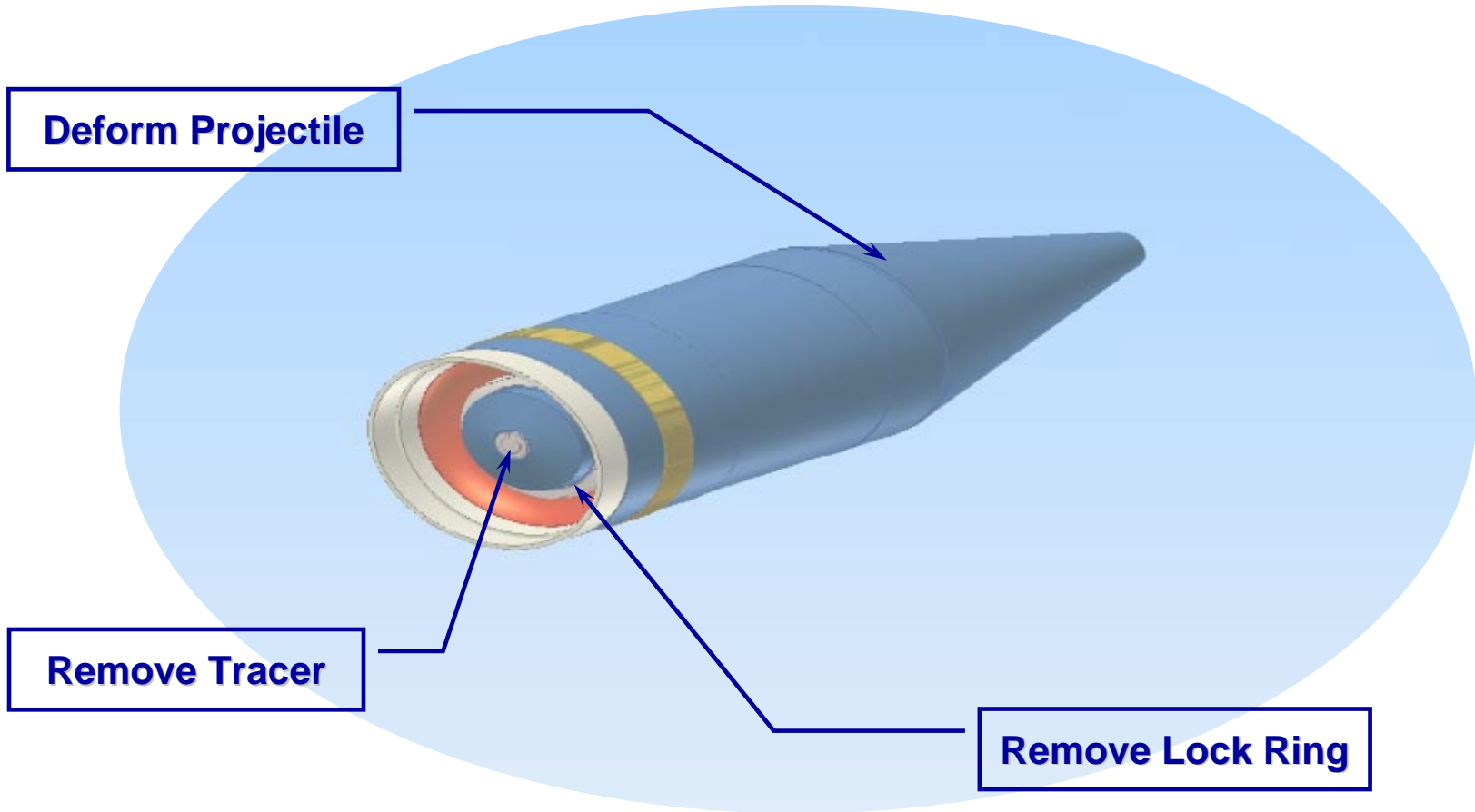
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TP-T Challenges



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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



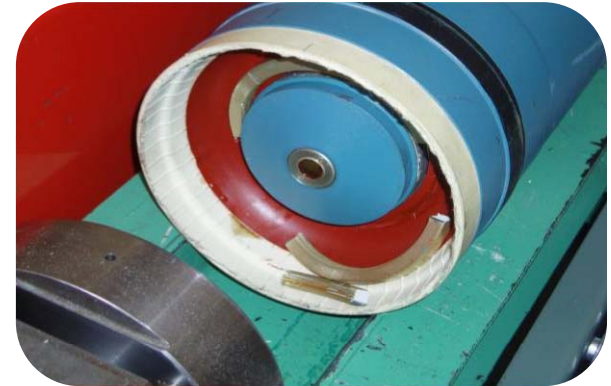
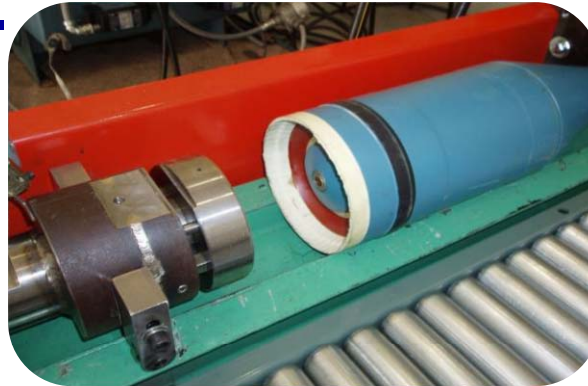
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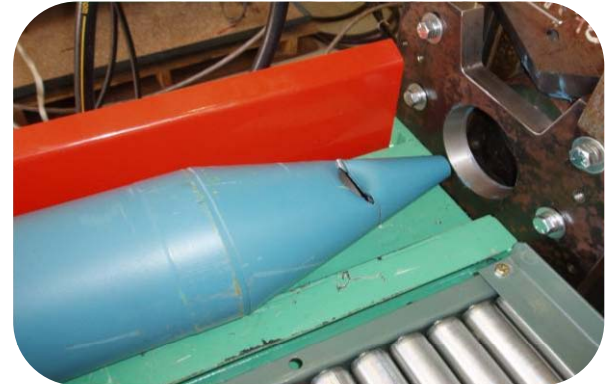
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- ✓ Removing Lock Ring with Non-standard APE Lock Ring Cutter.



- 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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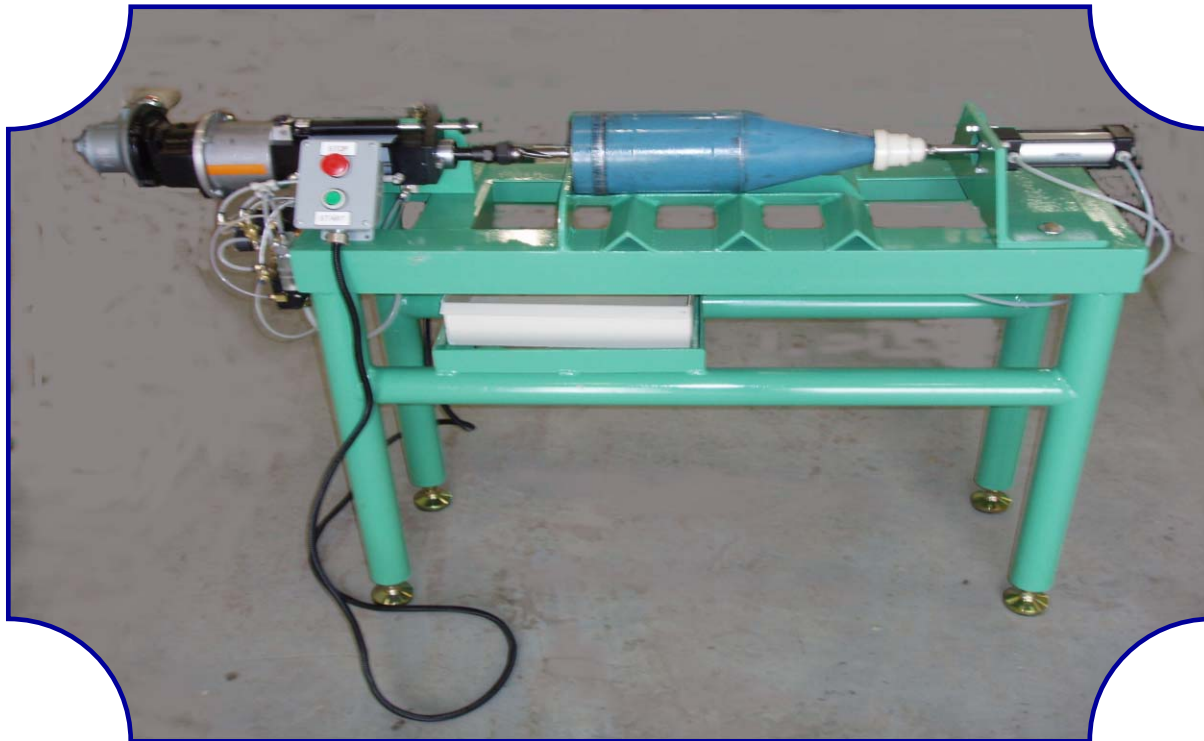
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TP-T Remove Tracer

What Did Work



- ✓ Removing Tracer with Non-standard APE Drillout Machine



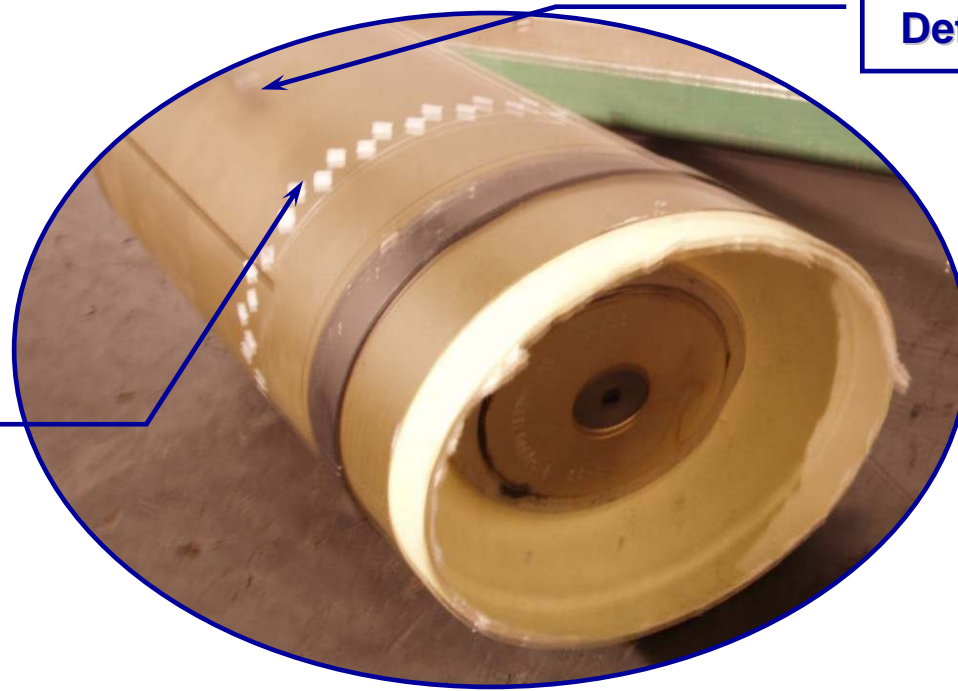
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Canister Challenges



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???

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