SHOULDER-FIRED WEAPONS ENHANCEMENTS

20 June 2001
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<td>Shoulder-Fired Weapons Enhancements</td>
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<tr>
<th>Author(s)</th>
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<tr>
<td>Burkhardt, David; Picchianti, Mark</td>
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<th>Performing Organization Name(s) and Address(es)</th>
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<td>TACOM-ARDEC</td>
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<td>NDIA (National Defense Industrial Association 2111 Wilson Blvd., Ste. 400 Arlington, VA 22201-3061</td>
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<th>Supplementary Notes</th>
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<td>Proceedings from Armaments for the Army Transformation Conference, 18-20 June 2001 sponsored by NDIA</td>
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Purpose

The Army has several types of disposable and reusable shoulder-fired weapon systems in inventory to defeat a variety of threat targets. The next generation of these types of weapon systems is based on leveraging emerging technologies; including advanced warheads, propulsion and fuzing systems, that will meet the soldiers requirements in the Interim and Objective Forces in the decades to come.
SMAW-D - Bunker Defeat Munition

Full Materiel Release and in Production for U. S. Army Contingency Forces

Disposable Launcher

Neutralizes Earth and Timber Bunkers
Defeats Light Armor
Breaches Masonry Walls

HEDP Ammunition

Caliber........... 83 mm
Length............... 32 in.
Weight............... 16 lbs.
Range............... 15-500 m
Use............ Day or Night

E & T Bunker
Cinder Block Wall
Filled Block Wall
Russian BTR-60
8" Concrete Wall
Triple Brick Wall
Russian BMP-2

Note: Images of various bunker types and their destruction by the SMAW-D.
8" MONTAGE WALL
Multi-Role Anti-Armor, Anti-Personnel Weapon System (MAAWS)

- Fielded To USSOCOM (Rangers and SEALs)
- Reusable 84mm, 22 Pound, 42 Inch Launcher
- Full Family Of Ammunition
  - HEAT, HEDP, HE, ADM, Smoke, Illumination
  - Weight 5.7-7.9 lbs
  - Full And Subcal Training Systems
- Maximum Effective Range: 100-1000m
- Ranging System With Picatinny Rail
- Currently In Production
- Used In Over 40 Countries

Saab Bofors Dynamics AB, Karlskoga, Sweden
**Readiness**
MAAWS Fielding and Sustainment

- Procurement To Support Current Users
- Procure/Field To New Users
- Weapon Life Study and Improvements
- Spare Parts Resupply System

**Upgrades**

**PIP Efforts**

- Foreign Comparative Test Programs
  - Upgraded HEAT, HE Fuzes
  - Low Cost Training Rounds
  - IM HEDP & HE Rounds
  - ADM Round
- Day/Night Laser Rangefinder Sight
- Smoke, IR Illum Rounds with Upgraded Fuzes

**Future**

Increase Capability

- Track Technology Developments
  - Smart Munitions
  - Warheads
  - Fire From Enclosure
- User Requirement Additions & Changes
M72 Light Antiarmor Weapon (LAW)

- Disposable Launcher
- Carry Length: 775 mm (31 in)
- Unit Weight: 3.6 kg (7.9 lb)
- Warhead Diameter: 66mm
- Shaped Charge + EFP Warheads
- Navy IM Explosive (M72A7)
- U. S. Army Type Classified 1993
- Currently In Production
- Available Immediately
- Fielded With USSOCOM (SEALs)
- Fielded in 10 Countries Worldwide

Improved M72 LAW Family
M136 AT4 (HEAT Round)

- Type Classified and Fielded
- Used by Army & USSOCOM
- Disposable System
- Warhead Diameter: 84mm
- Length: 39.3 in
- Unit Weight: 15 lbs
- Range: 30-300m
- Night Vision Capable
- Defeat Mechanism: Shaped Charge Warhead With Bi-Metallic Liner
- Currently In Production in Sweden
AT4
Shoulder-Fired Weapons
Growth Potential

Warheads

Propulsion

Fuzes
Follow Through Grenade (FTG)

Utilizes a Forward Shaped Charge to Create a Hole for a Follow Through Grenade Providing Incapacitating Fragments to Defeat the Target

- **FTG Technology**
  - Fuzed Follow Through Grenade
  - Provides Incapacitation Behind Walls

- **Application to SF Weapons**
  - Diehl Bunkerfaust System
  - IMI Warhead on SMAW-D
  - Both Tested by TECOM
  - Defeated Wall Targets (Triple Brick and 8” Reinforced Concrete) at 0 and 45 Degrees
  - Achieved High Degree of Behind Target Effects ($P(i) >$ Requirement)
High Impulse Thermobaric

Replaces Conventional Aluminized Explosive with a High Impulse Thermobaric Explosive

• **Thermobaric Technology**
  – Achieves Higher Pressure, Temperature and Duration Levels
  – Material is Normally a Slurry of Reactive Metal and Liquid Fuels
  – Optimized for Enclosed Spaces

• **Application to SF Weapons**
  – SMAW-D with HIT Warhead
  – Testing at RTTC - Jul 01
  – Determine Feasibility of Loading HIT SMAW-D Warhead
  – Determine Hit Blast Effects on Triple Brick and Concrete Walls
  – Establish Feasibility of Thermobaric Warheads for MOUT Environments for SF Systems

*SMAW-D With HIT Blast Warhead*
THERMOBARRIC
EFP Warheads

Brick and Reinforced Concrete Wall Breaching Warhead

X-Ray of EFPs

12-inch Brick Wall

8” Reinforced Concrete Wall

24” X 24” Heavily Reinforced Concrete Column - 65% of Concrete Removed
Shaped Charge Blast Warheads

- One Multipurpose Warhead for Bunker and Armor Target Defeat
- Aluminized IM Explosive Replaces Conventional Explosive
- Demonstrated Bunker Defeat
- Dynamic Armor Testing - 4QFY01
Confined Space Propulsion Technology

Provides a Fire from Enclosure Capability to Fielded Shoulder-Fired Weapons while Maintaining their Lethality Against their Target Set

- **Confined Space Technology**
  - Davis Gun Counter-Mass Principle
  - Maintain Velocity
  - Low Visual Signature
  - Safely Fire From Enclosure
  - Multiple Firings Allowable f/Training
  - Reduced Backblast Danger Zone

- **Technology Application**
  - BDM (SMAW-D/CS)
  - AT4 (AT4 CS)
  - M72 LAW (CS)
  - MAAWS (CS)

*USMC SMAW-CS Propulsion Subsystem*
SMAW-D/CS Demonstration Program

- Leverage Completed USMC SMAW CS Demonstration Validation Program
- Successful Ballistic Testing Completed
- Significant Noise and Backblast Danger Zone Reduction
- Army Phase I (Concept Feasibility) Program Initiated - Apr 01
- Phase II (System Development & Demonstration) Planned & Funded - Aug 01
- Phase III (Qualification Testing) Planned FY02/03

SMAW-CS Propulsion Subsystem
AT4 Confined Space (AT4CS)

- Weight: 16.5 lbs
- Length: 41 inches
- Range: 30-300m
- In Production in Sweden
- Fielded in France/Denmark
- USSOCOM FCT Program
- Addresses Highest Priority Target (Armor)
- Provides Near Term Solution to Confined Space Firings
- Utilize Existing AT4 Launcher & Warhead
- Leverages Existing AT4 Training and Support Systems
- Demonstrated Noise Reduction (U.S. Army CHPPM)
- Urgent Fielding to USASOC in FY01

Saab Bofors Dynamics AB, Karlskoga, Sweden
SHOULDER 2
Confined Space M72 LAW

- Utilizes High Density Gelled CM
- ‘Rocket’ Concept Demonstrated in 1994 MPIM Tech Base Program
- Fully Contains Flash and Smoke
- Very Low Firing Noise Levels
- Duplicates Tactical Round Velocity 200 m/s (650 f/s)
- Existing Warheads, Fuze, and Launcher Used Without Change
- No Visible Firing Signature
- Total System Weight < 11 lbs
- Firing Noise < 150 dB
- Flight Weight Demonstration Tests: Aug 01
Advanced Fuzing Technologies

• Improved Versions of Baseline Fuzes
  – Mk 420 Mod 0 (SMAW-D)
  – HEAT, HE, SMOKE, ILLUM (MAAWS)
  – AT4 CS

• Incorporate Next Generation Technology
  – MEMS (Across All SFW Platforms)
  – Improves Safety, Reliability and Long-Term Stability
Conclusion

• Lighter
• Proliferable
• Versatile
• Lethal
• Affordable

Through the Application of Advanced Technologies Tomorrow’s Shoulder-Fired Weapons will Continue to Play an Integral Role as the Army Transforms Through the Interim to the Objective Force