



U.S. Army Research, Development and Engineering Command



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

ARDEC Overview – 53rd Annual NDIA Fuze Conference

20 May 2009

COL Scott Flynn

Deputy Director (A), ARDEC



- ARDEC Overview
- Army Fuze Safety Review Board Support
- ARDEC Fuzing Technology Initiatives
- ARDEC Fuzing In-House Capabilities
- Fuze Technology Integration
- OIF Experiences
- Summary





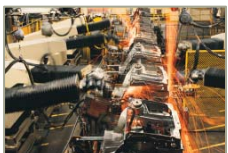
Research



Development



Production



Field Support



Demilitarization



Vision:

Innovative Armaments Solutions for Today and Tomorrow

Mission:

To develop and maintain a world-class workforce to execute and manage integrated life-cycle engineering processes required for the research, development, production, field support and demilitarization of munitions, weapons, fire control and associated items

Advanced Weapons – line of sight/beyond line of sight fire; non line of sight fire; scalable effects; non-lethal; directed energy; autonomous weapons

Ammunition – small, medium, large caliber; propellants; explosives; pyrotechnics; warheads; insensitive munitions; logistics; packaging; fuzes; environmental technologies and explosive ordnance disposal

Fire Control – battlefield digitization; embedded system software; aero ballistics and telemetry



ARDEC Provides the Technology for Over 90% of the Army's Lethality; Significant support to other Services Lethality

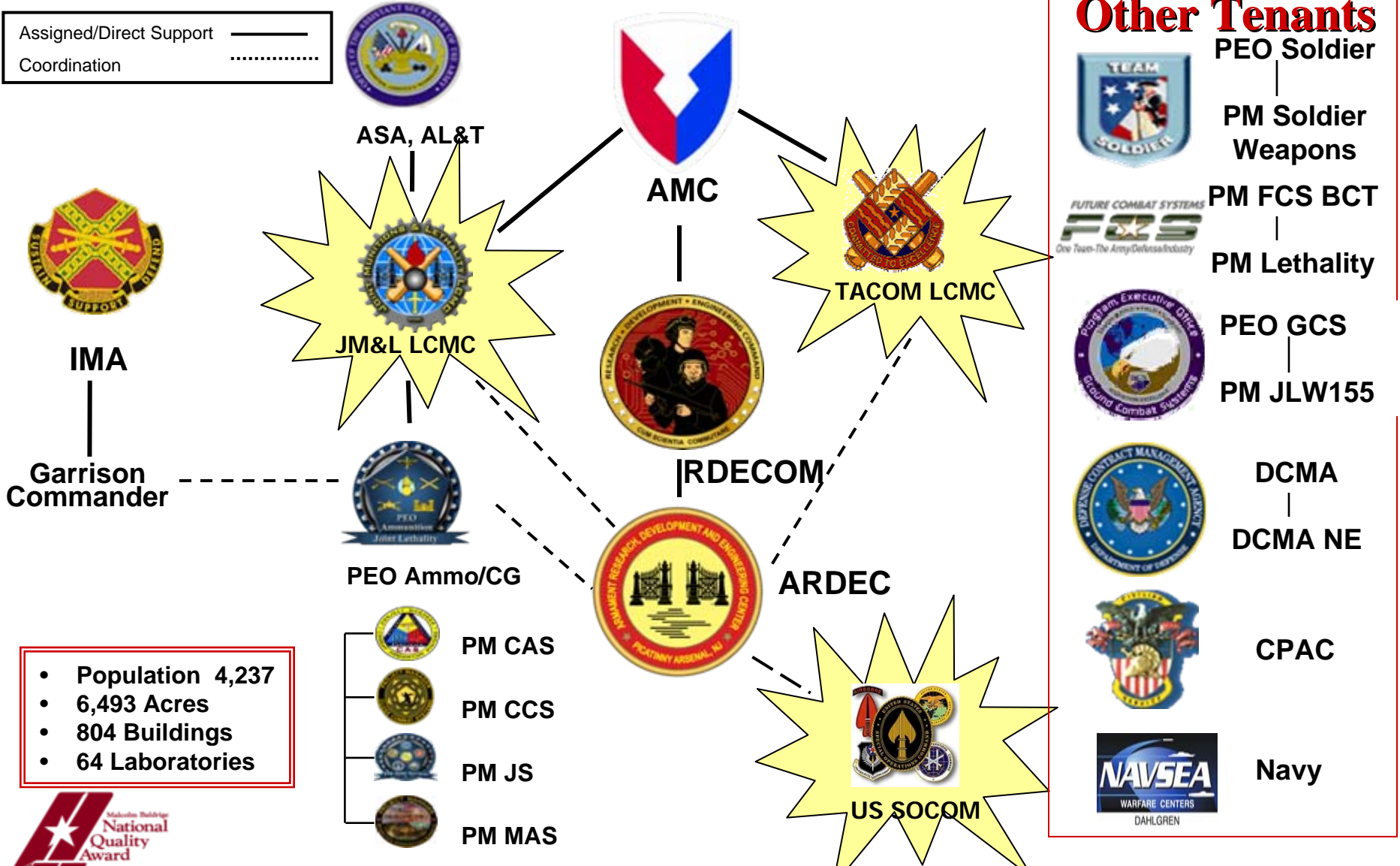


ARDEC Video





Assigned/Direct Support ———
Coordination ·········

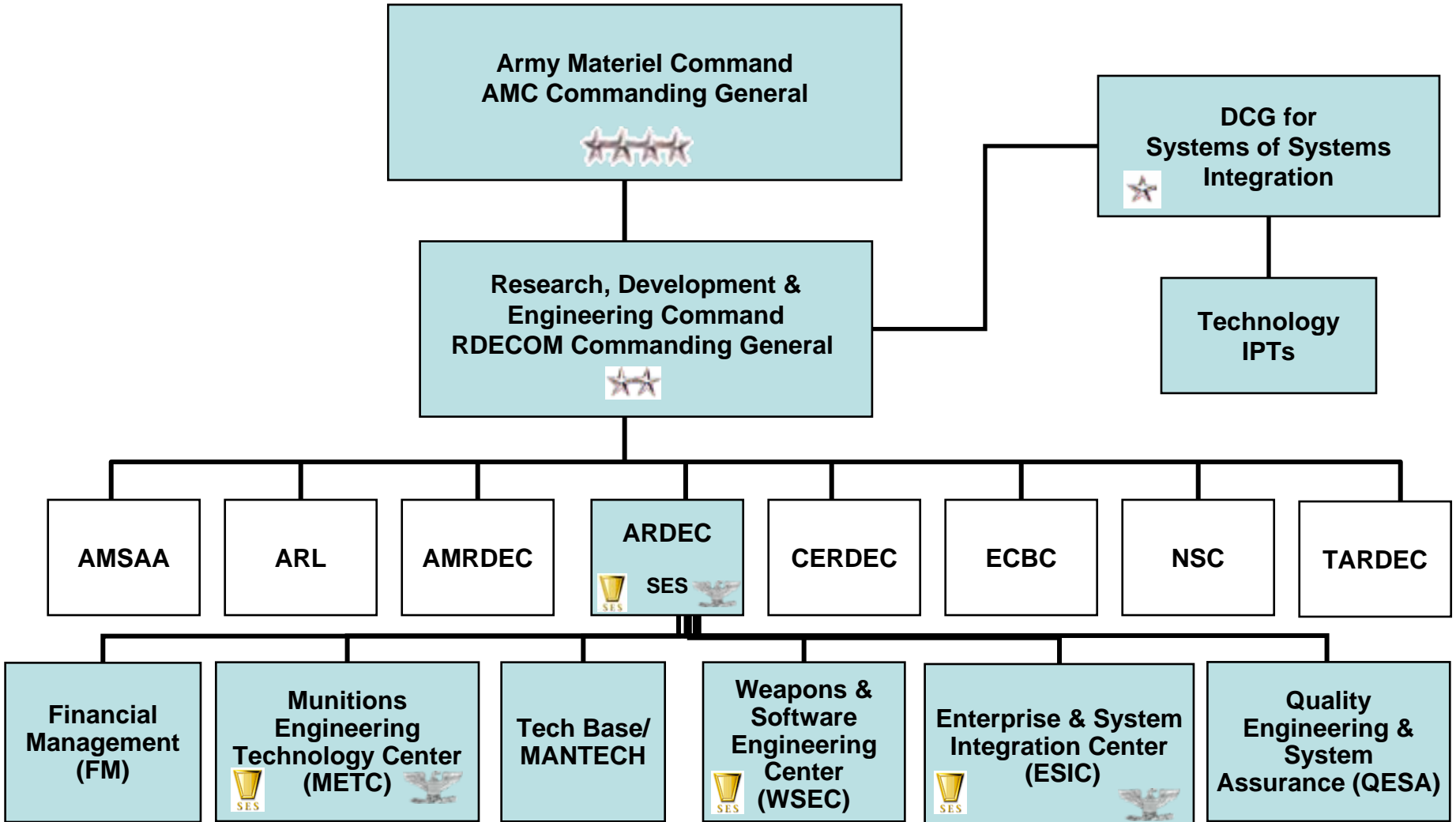


- Population 4,237
- 6,493 Acres
- 804 Buildings
- 64 Laboratories





ARDEC Organization - Chain of Command





Armament Research, Development & Engineering Center - Organization



Special Staff
 Inspector General: **J. Szatkiewicz, X6426**
 IRAC: **D. Murawski, X6360**
 Legal: **D. Scott, X3410**
 Small Business: **E. Bankit, X3068**
 Administrative Operations: **P. Rowland, X7243**
 Operations, Intel, & Security: **M. Felix, x8552**

Director/Deputy Director
Dr. Joseph A. Lannon/COL Russell Hrdy
6000/7000

Tech Base/MANTECH
A. Aprea (A)
X5015

Warhead Technologies
R. Fong
X2516

Weapons & Software Engineering Center
D. Castellano
X6444

Munitions Engineering Technology Ctr.
LTC Bosworth/J. Hedderich III
X6196/x6173

Enterprise & System Integration Ctr.
COL S. Flynn/K. Hayes (A)
X6006/7912

Fire Control Systems & Technology Directorate
Victor Galgano (A)
X6021

Weapon Systems & Technology Directorate
Mark Ford (A)
x3425

Benét Laboratories
Lee Bennett (A)
DSN 374-4736

Quality Engineering & System Assurance Directorate
D. Carra
X3918/4738

Munitions Systems & Technology Directorate
Ernest Logsdon
X8166

Fuze & Precision Armaments Technology Directorate
William Smith
X7258

Explosive Ordnance Disposal Technology Directorate
John Bostonian
X7643

Energetics, Warheads & Environmental Technology Directorate
Ross Benjamin
X4287

Financial Management Office
M. Manser
X8625

Log Res & Eng Directorate
Robert Rossi
X2168

Joint Service Small Arms Program Office
Joel Goldman
X6060

Army Fuze Management Office
Chris Janow
X5438

Project Integration Office
Vince Matrisciano (A)
X2675

Systems Engineering Dir
Jeff Dyer
X4707

Human Capital Management Office
Joseph Stankovich
X8506

Knowledge Management Office
George Albinson
X7376

Business Interface Office
Anthony Sebasto (A)
X6198

War-fighter Central
MAJ Dean
X1908

Strategic Management Office
Joe Brescia
X2326

PM EM Gun
LTC Stephanie Foster
X9759



2007 Award Recipient Phone Numbers: COMM: (973) 724-XXXX

DSN 880-XXXX

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.



ARDEC – Supporting Four LCMC's



Department of the Army (DA)



Assigned/Direct Support	—————
Coordination

AL&T



AAE

AMC



RDECOM



JM&L LCMC



ARDEC

TACOM LCMC

TACOM ILSC Elements

- Weapon Arsenal & Depots

PEO Soldier

- PM SW

PEO GCS

- PM JLW155
- HBCT
- Stryker

PEO CS/CSS

- PM Force Projection
- PM Joint Combat Support Systems
- PM Tactical Vehicles

FARDEC

Guns Ammo & Fire Control
Technology Development
Technology Insertion
Technology Sustainment



Communication Electronics LCMC



Aviation Missile LCMC

JM&L LCMC

PEO AMMO

- PM MAS
- PM CAS
- PM CCS
- PM JS

JMC

- MLRC
- DAC
- Ammo Plants & Depots





ARDEC at a Glance



- Established “Center of Mass” for Armament Systems and Munitions for Joint Services
- ARDEC is the largest tenant at Picatinny Arsenal
 - Over 800 Buildings/64 Laboratories
- Proven track-record supporting **transition of technologies to the field**;
 - 18 Materiel Releases in FY 07, 8 Materiel Releases in FY 08
 - 16 Urgent Materiel Releases FY 07, 12 Urgent Materiel Releases in FY08
- ARDEC Gov’t Personnel ~ 3348; **1145 new hires since FY99**
 - Picatinny Site = 2887
 - Benet (Watervliet Arsenal) = 242
 - Rock Island Arsenal = 153
 - Adelphi & APG = 66
- >\$100M invested in “World Class” experimental R&D facilities since mid-90’s; Additional \$75M planned
- Strong partnerships with Industry, Academia, and other Government agencies - Growth and Success through **Cooperative Research and Development Agreements (CRADAs) = 121**
- Intellectual Property (as of 4Q08):
 - Invention Disclosures – 58
 - Patent Applications – 164
 - Patents Issued – 11
 Patent License Agreements = 14 (as of 4Q08)
- In-house rapid prototyping initiatives demonstrating new desired capabilities, supporting production prove-out and initial fielding demands



\$100M Tech Base portfolio addressing Joint needs (Core Tech Base/ManTech only; does not include SBIR or Congressional Plus-ups)



Advanced Weapons Systems

- Indirect Fire
- Direct Fire
- Scalable Effects
- Non-Lethal
- Ammunition
 - Small Caliber
 - Medium Caliber
 - Large Caliber
- Directed Energy
- Remote Weapons
- Insensitive Munitions
- Fuzes
- Telemetry
- Precision Armaments Components
 - Grenades
 - Maneuver Support Munitions
 - Demolitions

Advanced Energetics, Warheads & Ammunition

- Propellants
- Explosives
- Pyrotechnics
- Warheads
 - Kinetic Energy
 - EFPs
 - Fragmentation
 - Chemical Energy

Fire Control

- Battlefield Digitization/SW Applications
- Embedded Systems SW
- Firing Tables
- Firing Tables: Ballistics
- Automated Test Systems

Logistics

- Ammunition Logistics RDTE
- Battlefield Tools and Equipment



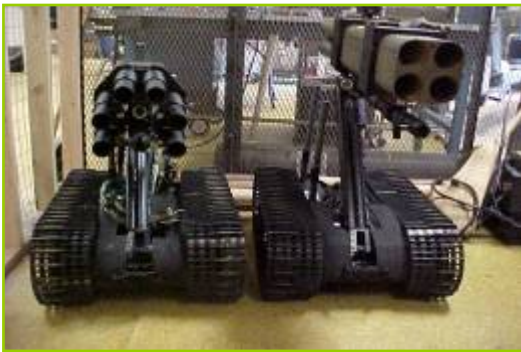


Significant Technical Accomplishments



Development

TALON- US Army's First Functioning Lightweight Weaponized Robotic Platform



Key Product Transition To PEO XM395 Precision Guided Mortar Munition (PGMM)



Fielded for SOCOM

84mm High Explosive Dual Purpose & 84mm Area Denial Munitions For Multi-Role Anti-Armor Antipersonnel Weapon (MAAWS)



HEDP 502 IM



ADM 401 Flechette
New Extra Large 7.5" EFP For M303 Special Operations Demo Kit

Enduring Freedom URGENT Releases

Non-Lethal Capability Set

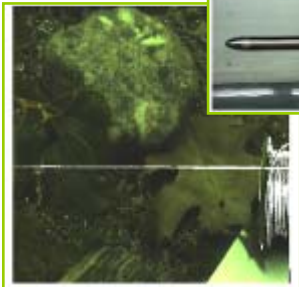


M898 Sense & Destroy Armor (SADARM)



Future

Autonomous Projectiles



Hyperspectral Imaging Devices

Fielded for Army, Marines



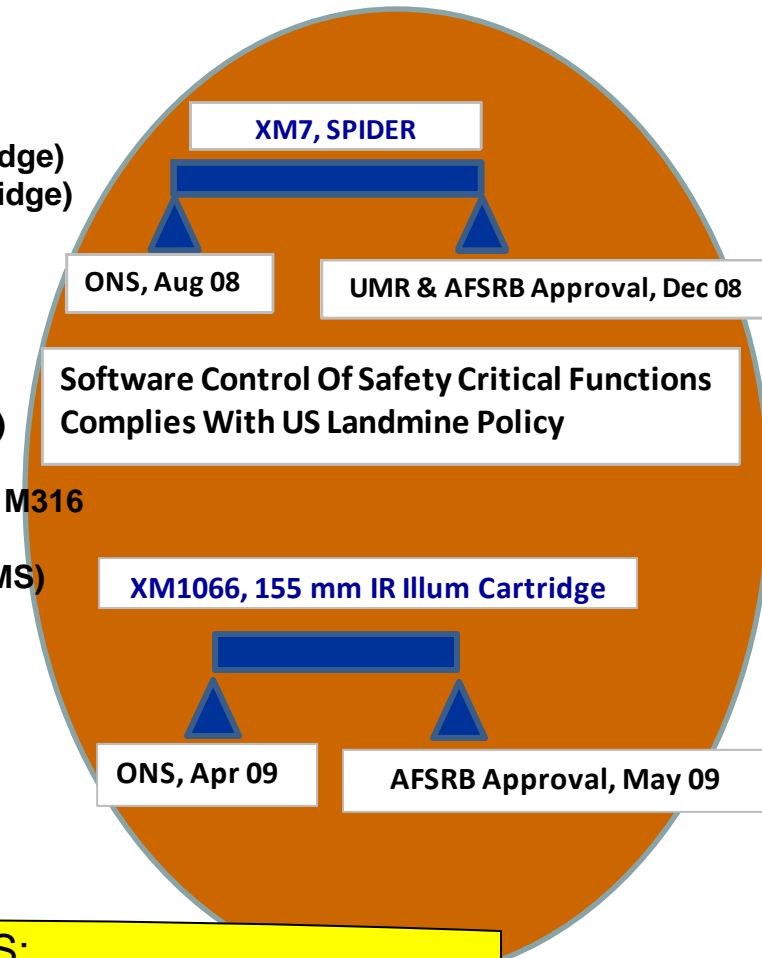
World's First 81mm M816 IR Mortar Illuminating Cartridge

M107 .50 Cal Sniper Rifle





- 2008 & 2009 Fuze Safety Certification (TC and Materiel Release)
 - GMLRS, Unitary, XM31E1
 - P-SDF, XM1161 & XM1162
 - MI-RAMS, XM156
 - Non-Lethal Bursting Grenade, XM104
 - Electronic Time Fuze, M762/M767 (for use with 105mm IR Cartridge)
 - M762/M762A1 & M782 MOFA (for use with 105mm HE PFF Cartridge)
 - Grenade Rifle Entry Munition, M100
 - BTV-1 EL Diversionary Hand Grenade, MK13 Mod 0
 - Electronic S&A&Fire GMLRS Unitary, M31A1
 - e-SDF, 105mm, M234
 - M762/M767A1 (For Use With 105mm DPICM)
 - Multi-Role Anti-Armor Anti-Personell Weapon System (MAAWS)
 - M762 / M762A1 (For Use With 155 mm, XM1066 IR Illum Projo)
 - Time Delay – Sympathetic Det (TD-SYDET) and Trainer, M153 & M316
 - Dual Safe Fuze for AT4CS-RS 84 mm HEAT
 - Magneto-Inductive Remote Activation Munition System (MI-RAMS)
- 2008 & 2009 UMR & Approval Letters
 - TOW Bunker Buster Missile System
 - M820 Hellfire AGM-114FA Missile
 - **XM7 Spider (1st to use software for safety critical functions)**
 - MK14, Anti-Structural Hand Grenade
 - XM282 Multi-Purpose Penetrator Rocket Warhead
 - **XM 1066, 155 IR Illum**



ARDEC FOCUS:
Deliver Safest & Most Capable Fuze Solutions To The Warfighter

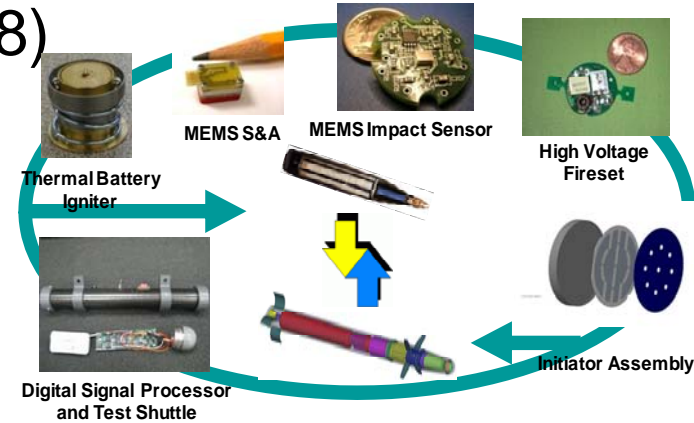


ARDEC Fuzing Technology Initiatives



- Fuze and Power (FAP) ATO (2005-2008)

- Multi-Point Initiation
- Proximity Sensors
- MEMS Technology
 - S&A's & Environment Sensors
- Power/Energy Sources



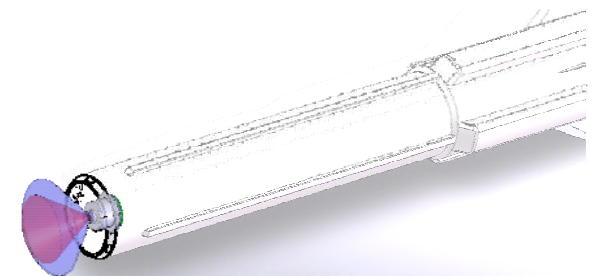
- Scalable Technology for Adaptive Response (STAR) ATO

- 250 mm GMLRS, 105 mm Precision, 30 mm Airburst

- Kinetic Energy-Active Protection System Target Detection Device (KE-APS TDD) ATO

- Advanced Munitions Technologies ATO

- DoD Fuze Technology Initiative

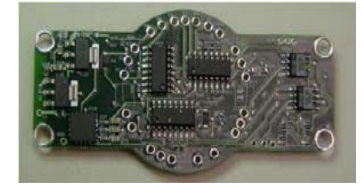
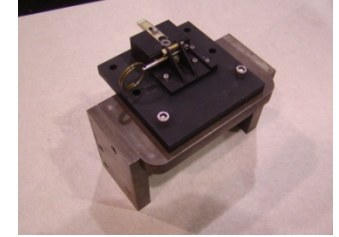
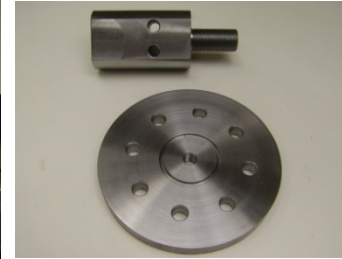




ARDEC In-House Fuzing Capabilities Fuze Development Center



Mission: To Accelerate New Technology To The



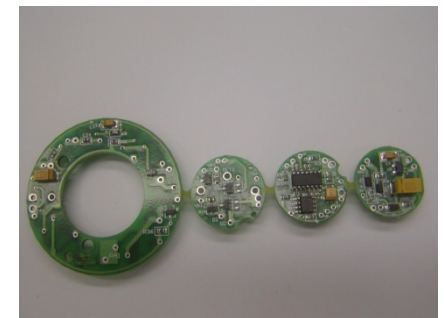
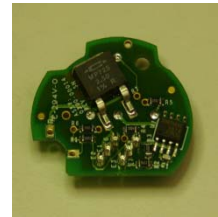
Capabilities for Rapid Prototyping:

- Custom Circuit Card Design and Fabrication
- Automated Surface Mount Assembly
- Real-Time X-Ray Inspection
- Environmental Test
- Optical Strain and Stress Measurement
- Stereo lithography
- High Speed Spin Stand
- Machine Shop



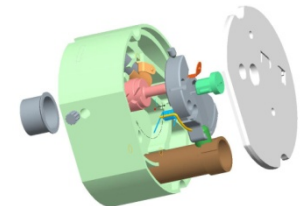
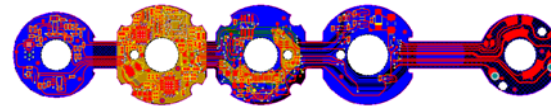
Current Projects Supported:

- M208 Smoke Pot Fuze
- SMADSNET
- Rattlesnake
- Artillery Training Kit
- M228 Support
- M762 Training Fuzes



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

- Technology Insertion To Current Munition Items
- Addresses Industrial Base Single Point Failure Issues
 - Risk Mitigation:
 - Battery Aging
 - M734A1 Digital Signal Processor (Alternative Design)
 - Block Upgrades:
 - Standardization of Hand Grenade Fuzes
 - 30mm Increased sensitivity M759 Fuze
 - Mortar S&A enhancements
- PEO Ammunition / User Payoff:
 - Insert Current Technology Into Today's Munitions
 - Preclude Obsolescence By Incorporating Component Technology
 - Provide Safer, More Reliable and More Lethal Munitions





- **Global Leader In Armaments Technology Solutions**
- **Provide Exceptional Customer Satisfaction**
 - **We work with soldiers:**
 - **develop new armaments systems,**
 - **improve fielded systems**
 - **quickly solve field problems**
- **State of the Art Fuzing Capabilities**
 - **In-House Facilities**
 - **S&T Technical Expertise**



Providing Increased Capability
to the Warfighter

Flexible, Agile, Innovative, and Responsive

