



This briefing was presented at the 8 June 2004 DAU Alumni Association Annual Symposium. Viewers are invited to visit the PEO Soldier Web site at <https://peosoldier.army.mil/> for current information. Questions can be submitted at this Web site or may be referred to the PEO Soldier Public Affairs cell at (703) 704-2802.



Soldier Interoperability Progress and Challenges

Defense Acquisition University
Alumni Association
Annual Symposium

8 June 2004

Activated 7 June 2002
<https://peosoldier.army.mil>

Moderator
COL John Norwood
Project Manager Soldier Equipment

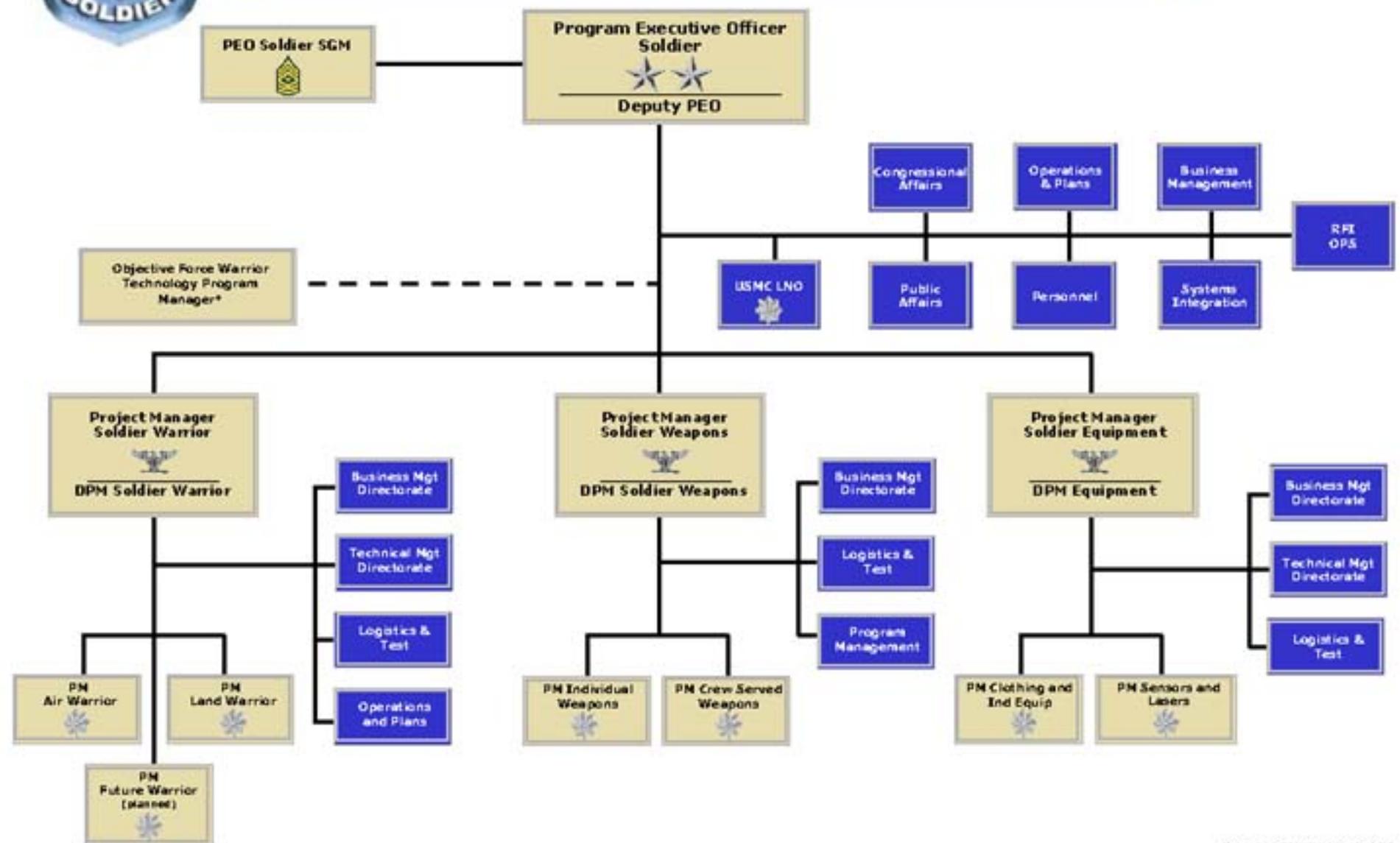


Panel Agenda

- **Introduction of Panel** COL Norwood
- **PEO Soldier Organization** COL Norwood
- **Soldier Equipment** COL Norwood
- **Soldier Weapons** Mr. Audette
- **Soldier Warrior** Mr. Brower
- **Discussion** All



PEO Soldier Organization



* Dual Reporting NSC/PEO



Fielding the Future Soldier



- > Land Warrior
- > Air Warrior
- > Mounted Warrior



Soldier Integration + **Soldier Weapons & Ammo** + **C2/SA/SU** + **Soldier Sensors & Lasers** + **Soldier ASIOE**

Fielding the Future Soldier Requires Alignment and Funding of Multiple Programs



Soldier Equipment

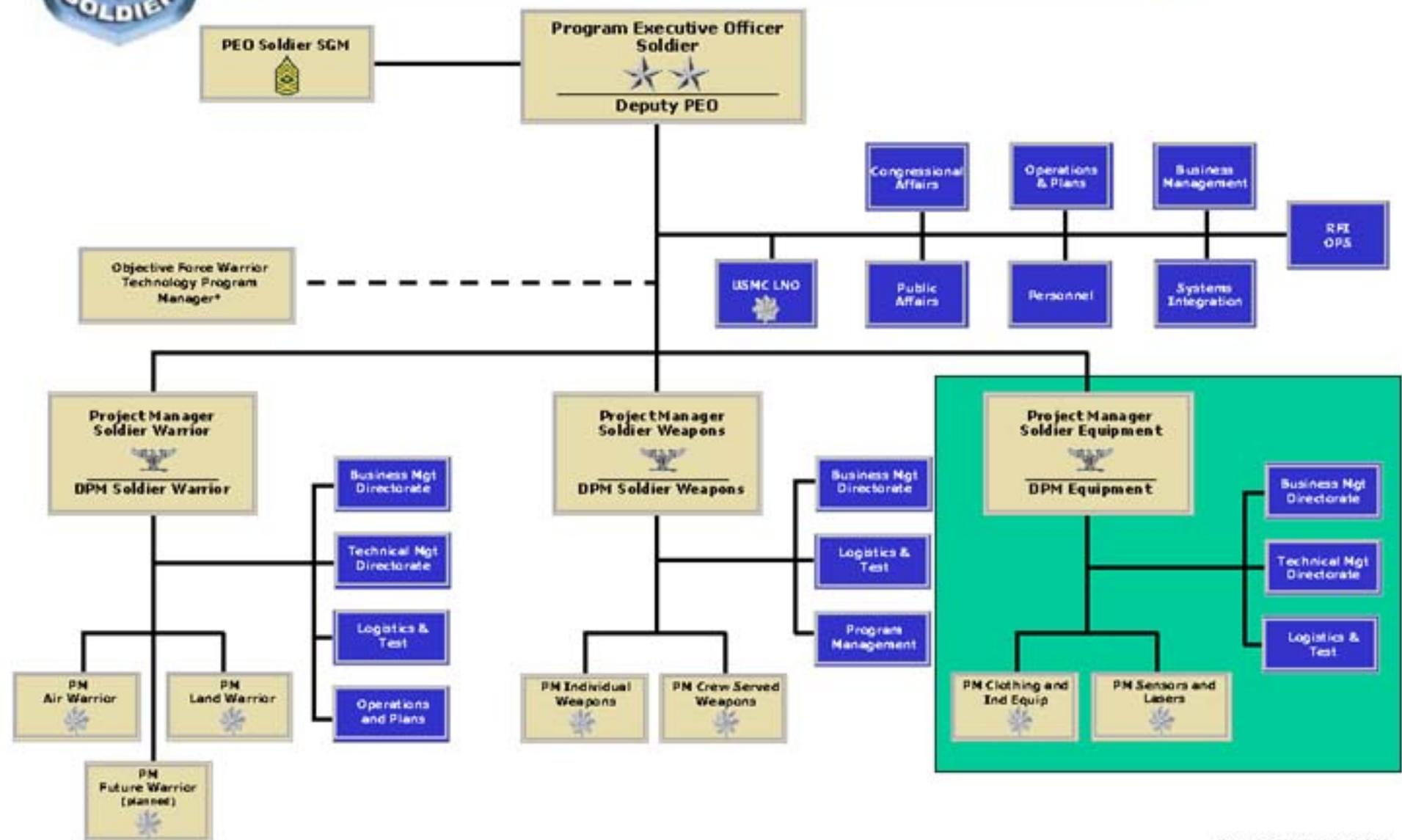
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**COL John Norwood
Project Manager Soldier Equipment**



PEO Soldier Organization



* Dual Reporting NSC/PEO



Product Manager Clothing and Individual Equipment



- ✓ **Ballistic/Personal Protection**
- ✓ **Tactical/Environmental Clothing**
- ✓ **Individual/Unit Equipment**
- ✓ **Chemical Gear**
- ✓ **Personal Clothing**



Advanced Combat
Helmet



Advanced Bomb Suit



OTV



Body Armor



SAPI (set)



Joint Service
Lightweight
Integrated Suit
Technology
(JSLIST)



MOLLE
Load Carriage



AF Desert Flyers Boot



Standard Army Desert Boot



Product Manager Sensors and Lasers



Multi-function Laser System



AN/PEQ-2A Aiming Light/Illuminator



VIPER



AN/PAQ-4C Aiming Light



Lightweight Laser Designator/Rangefinder (LLDR)



Aviator's Night Vision Imaging System (ANVIS)



Aviator's Night Vision Imaging System/Heads-up Display (ANVIS/HUD)



Lightweight Video Recon System



Night Vision Device AN/PVS-7D



Night Vision Device AN/PVS-14



Family of Thermal Weapon Sight (TWS)



Laser Borelight System



Integrated Laser White Light Pointer



Enhanced Night Vision Goggles



Sniper Night Sight AN/PVS-10



PM Soldier Equipment Joint Programs



DOD

Joint Firefighter's Integrated Response Ensemble (JFIRE)/FIS-C
Joint Service Lightweight Integrated Suite Technology (JSLIST)
Joint Protective Aircrew Ensemble (JPACE)



Joint Interest

Thermal Weapon Sight
PVS-7
PVS-14
Sniper Night Sight
Viper
Mark VII
Lightweight Laser Designator Rangefinder



.....
Interceptor Body Armor
Modular Lightweight Load-carrying Equipment
Modular Sleeping Bag System
Improved Rainsuit
Light Weight Helmet
Anti-Microbial Socks/Improved Combat Sock
Improved Combat Shelter/Combat Tent
Improved Engineer Glove/Protective Glove System
Cold Weather Canteen/Improved Canteen
PAC 4



.....
Survival Egress Air (SEA) MK2 Device
Low Profile Flotation Collar
Lightweight Video Recon System





PM Soldier Equipment Joint Programs



DOD

Joint Firefighter's Integrated Response Ensemble (JFIRE)/FIS-C
Joint Service Lightweight Integrated Suite Technology (JSLIST)
Joint Protective Aircrew Ensemble (JPACE)



Joint Interest

Thermal Weapon Sight

PVS-7

PVS-14

Sniper Night Sight

Viper

Mark VII

Lightweight Laser Designator Rangefinder



Interceptor Body Armor

Modular Lightweight Load-carrying Equipment

Modular Sleeping Bag System

Improved Rainsuit

Light Weight Helmet

Anti-Microbial Socks/Improved Combat Sock

Improved Combat Shelter/Combat Tent

Improved Engineer Glove/Protective Glove System

Cold Weather Canteen/Improved Canteen

PAC 4



Survival Egress Air (SEA) MK2 Device

Low Profile Flotation Collar

Lightweight Video Recon System





Thermal Sensors

Thermal Weapon Sights provides surveillance and fire control capability for individual, crew served and mounted weapons during daylight, darkness and in visually degraded battlefield conditions.

Light



AN/PAS-13(V)1 LWTS
Target Recognition: 550m

Weapons:

M16 Series

M4

M136

Medium



AN/PAS-13(V)2 MWTS
Target Recognition: 1100m

Weapons:

M249

M240

Heavy



AN/PAS-13(V)3 HWTS
Target Recognition: 2200m

Weapons:

M2

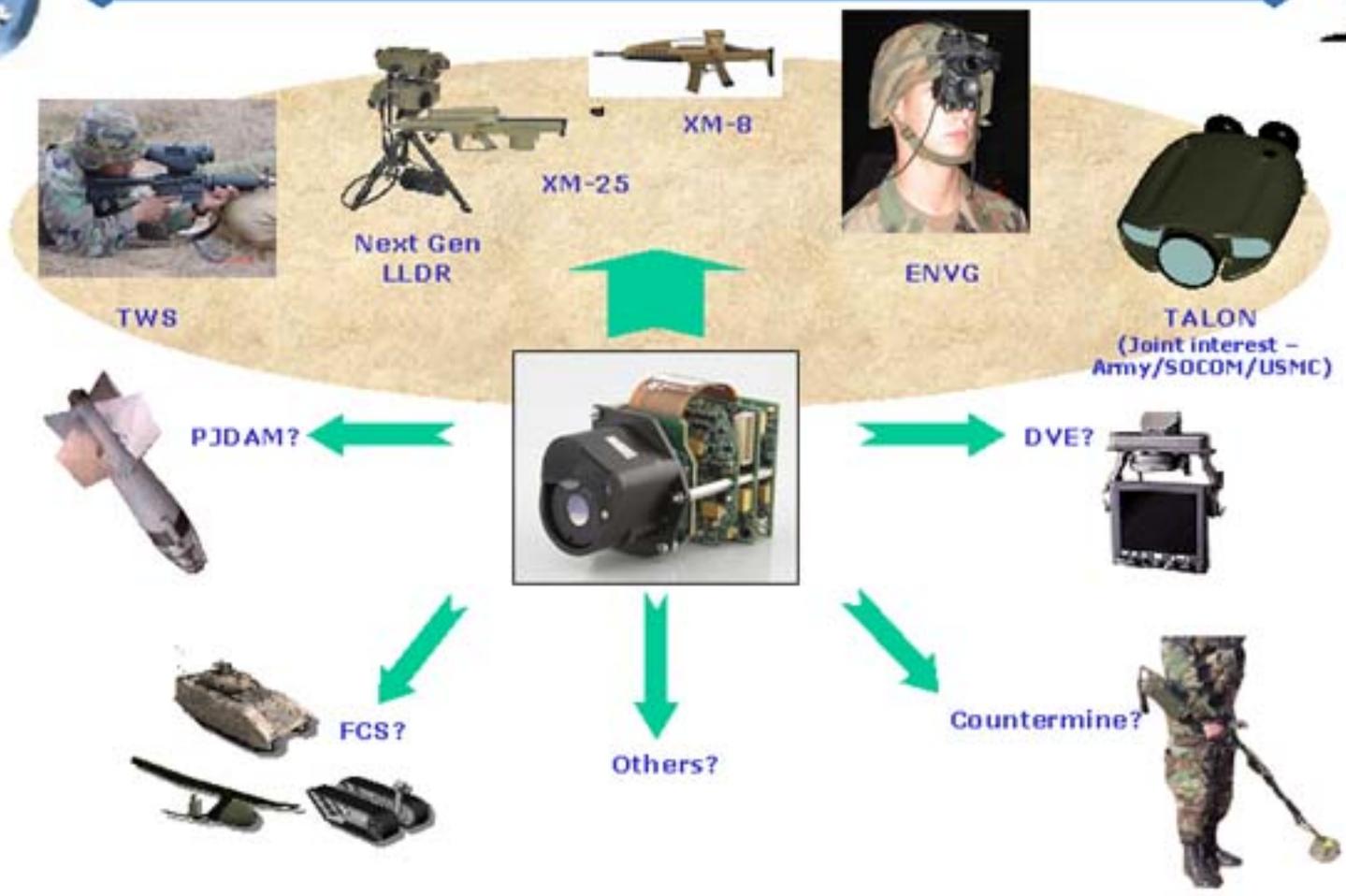
MK19

M24

**Broad technology application
across Joint mission areas**



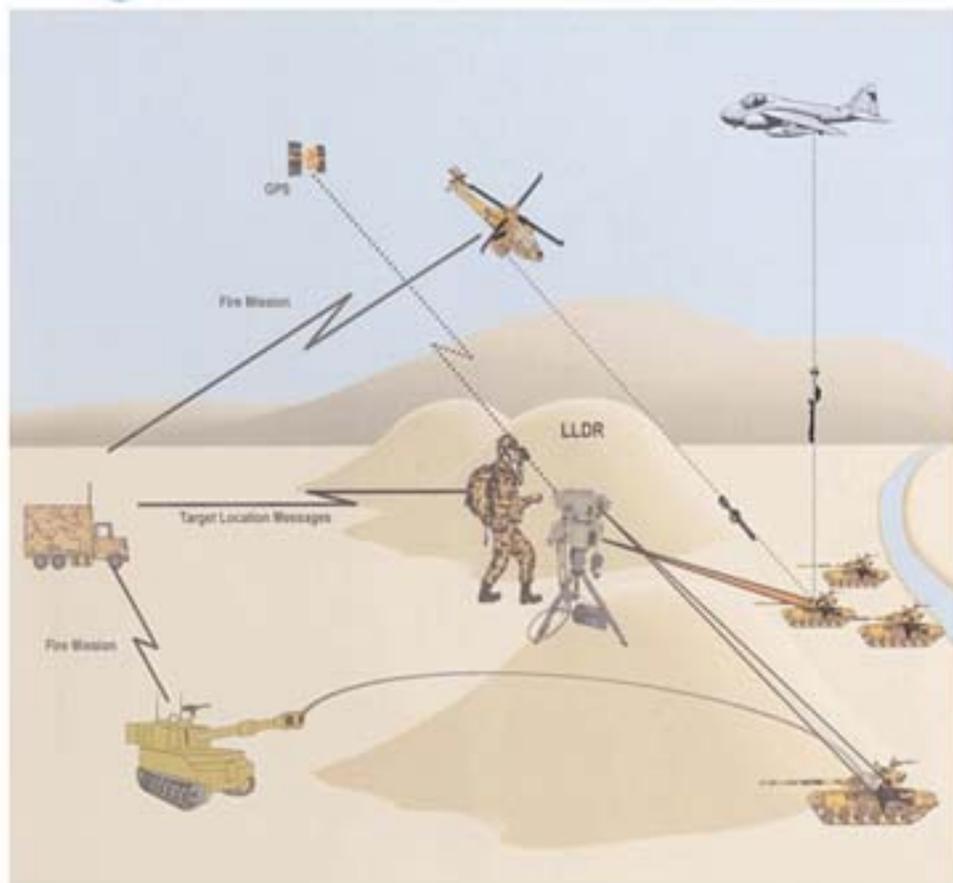
Sensor Development HTI By Definition



**Broad technology application
across Joint mission areas**



Laser Target Locators and Target Designation



MARK VII



VIPER

Dismounted Optic Systems



Lightweight Laser Designator Rangefinder

- **Target Designation is Joint by definition**
- **Requires Joint requirement development**
- **Doctrine, training and operational implications**

Common requirements needed for universal material solution



Interceptor Body Armor (IBA)



IBA =

Outer Tactical Vest (OTV)

+

Ballistic Inserts (set)



- **Type Classified in 1999.**
 - **Jointly developed with the Marine Corps**
 - **Replaces PASGT vest**
 - **Vest alone protects against fragmentation and 9mm rounds. With plates, protects against 7.62mm ball**
- **Requirement expanded to procure for entire operational Army. ~ 840,000**
- **Fielded to U.S. Army, U.S. Navy, U.S. Air Force, and F.B.I.**

Limited Industrial Base



Deltoid and Axillary Protector (DAP)



Deltoid/Brassard Protector

Background

- OIF/OEF combat experience with IED threat identified a supplemental force protection requirement for Interceptor Body Armor (IBA)
- DAP Provides 9mm & fragmentation protection to shoulder & underarm, equivalent to OTV protection

Success Story

- Rapid prototyping used to expedite DAP requirement, solicitation and contract award. Initial production articles funded by reprioritizing funds...deliveries began May 2004



Axillary/Side Protector



Front

Back



Deltoid & Axillary Protector (DAP)



DAP Requirement:
*Protect shoulder and underarm
from fragmentation & spall*

Axillary Protector

Deltoid Protector





Advanced Combat Helmet



- **SOCOM initiative**
 - Procured < 1,000/ month from 1 producer
- **Improved ballistic protection and more comfortable than PASGT**
- **Army began fielding as part of RFI Nov 02**
- **Ramping production to > 20,000 month with several producers**



Small demand → **large demand**



Lightweight Video Recon System



- **PM SEQ procuring and fielding to SOCOM units**
- **Ability to Send Time Critical Images and Situational Awareness Reports**
- **Multi-service (Army Special Forces, Navy Seals, Air Force ME-130s, Coast Guard) and Multi-National (US, UK, Canada) Compatibility**
- **Interfaces to FM, HF, VHF, UHF, and SATCOM Communications Devices**

Common requirements needed for universal material solutions

"America's Most Deployed Weapon System"



Briefing to
DAU Alumni Association

***Arming
the Current and
Future Soldiers***

PEO SOLDIER

BG James Moran
Program Executive Officer
www.peosoldier.army.mil

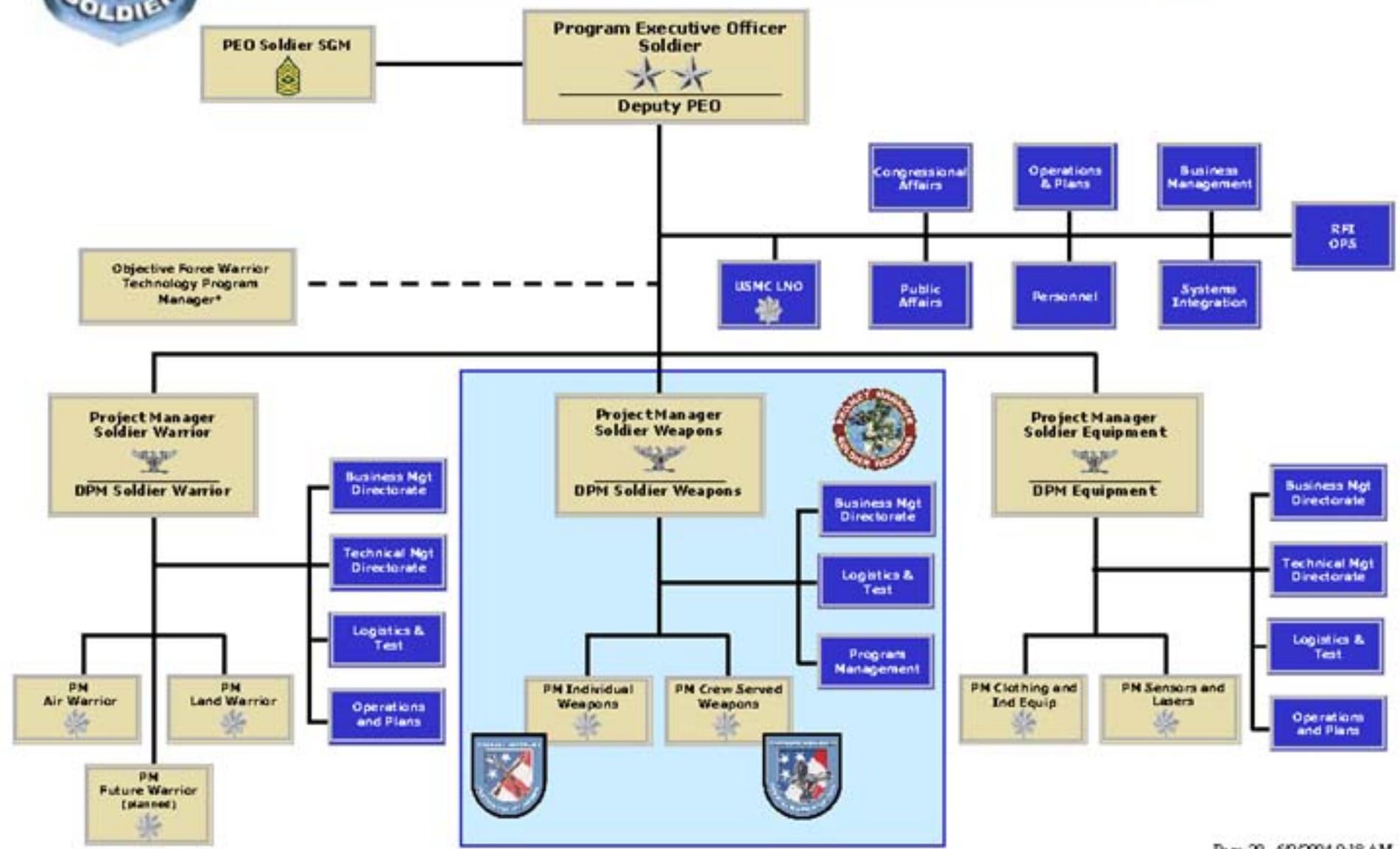
PM Soldier Weapons

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Project Manager Soldier Weapons
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"OUR ARMY AT WAR - RELEVANT AND READY"



Program Executive Office Soldier



* Dual Reporting NSC/PEO



Soldier Weapons Today and Tomorrow



Individual
Circa (1963)

Crew Served



M16A4 Rifle



M16/M203



M4 Carbine



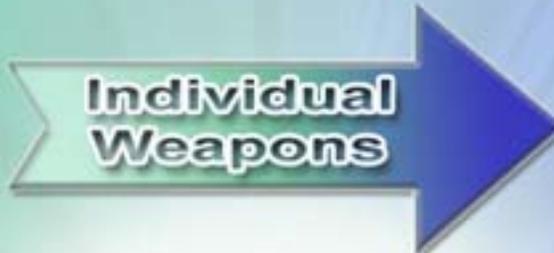
MK19 Grenade Machine Gun



M2 .50 CAL Machine Gun



M249 Squad Automatic Weapon (SAW)



Individual Weapons

25mm Ammo
High and Low Velocity



- Airburst
- Thermobaric
- Armor piercing

40mm Ammo
Thermobaric



Crew Served Weapons



XM8 Carbine



XM320 40mm Grenade Launcher



XM29 Integrated Airburst Weapon System



XM25 Air Burst Weapon



M107 Long Range Sniper Rifle



XM307/XM312 Advanced Crew Served Weapon



Common Remotely Operated Weapon Station (CROWS)

Lethality Leap Ahead Achievable in 12/24 Months



Joint Service Small Arms Program Management Committee Membership



Chairman
COL Scott Crizer
**(Designated Commander, Armament
Systems Integration Center)**



Army:	Mr. F. Stone
Marines:	Mr. W. Barnebee
Air Force:	LtCol D. Miller
Navy:	Mr. J. Gaskill
Coast Guard:	CAPT J. Yost
SOCOM:	COL T. Spellissy
Army PM Soldier Weapons:	COL M. Smith
Joint Non-Lethal Weapons Directorate:	Mr. K. Swenson



JSSAP



Responsibilities



Promotes, coordinates and manages the Small Arms Tech Base for all Services.

Maintains liaison with Services' Small Arms-related PM's and DoD/Industry facilities.

Participates in international forums (e.g., NATO) to glean RDT&E and fielding data.

Identifies potential joint programs and harmonizes Service requirements.

Prepares, maintains and updates a harmonized DoD-wide JSSAMP.

Manages the National Small Arms Center (Since 2004)

Since 1978

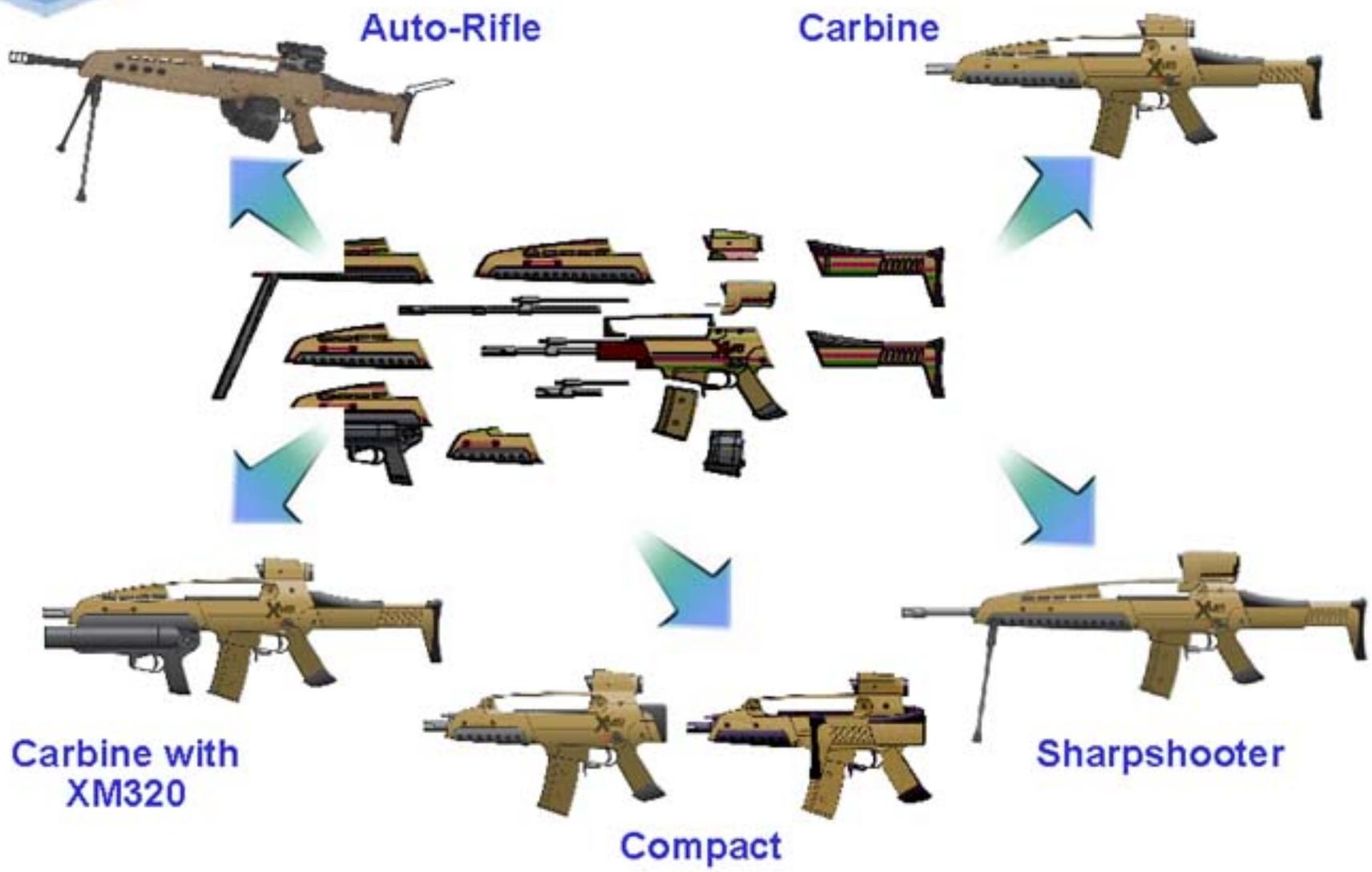


XM8 Modular Assault Weapon System





XM8 Modular FAMILY





XM8 Capabilities/Benefits



Baseline Assault Rifle

- **Characteristics:**
 - Collapsible Buttstock
 - 12.5" Barrel
 - Integrated Baseline Sight
 - Improved Magazines
 - Weight: 6.99 Lbs W/Optic



Sharpshooter/Auto-Rifle

- **Characteristics:**
 - Collapsible Buttstock
 - 20" Barrel
 - Integrated 4x Sight
 - Improved Magazines
 - Integrated Bipod
 - High Capacity Magazine For Auto-rifle
 - Weight: 8.0 lbs w/optic

- **Integrated Sight/Lasers**
- **Ambidextrous Controls**
- **Reconfigurable At Unit**
 - ? One Platform For All Variants
- **Backup Mechanical Sight**
- **Greater Accuracy**
 - ? ? 2° Moa
- **Greater Reliability**
 - ? 3X Increase
 - ? 20K Rds W/O Stoppage
- **Longer Weapon Life**
 - ? 2-3X Increase
 - ? ? 20K Rds
- **Reduced Cleaning Time**
 - ? 70% Reduction
- **Reduced Training Time**
 - ? 2X Reduction
- **Lower System Weight**
 - ? 30% Reduction
- **Lower System Cost**
 - ? 30% Reduction
- **Zero Drain Time**



Compact

- **Characteristics:**
 - Fixed Buttstock Or Folding Or Telescoping Stock
 - 9.5" Barrel
 - Integrated Baseline Sight
 - Improved Magazines
 - Weight: 6.2 Lbs W/Optic



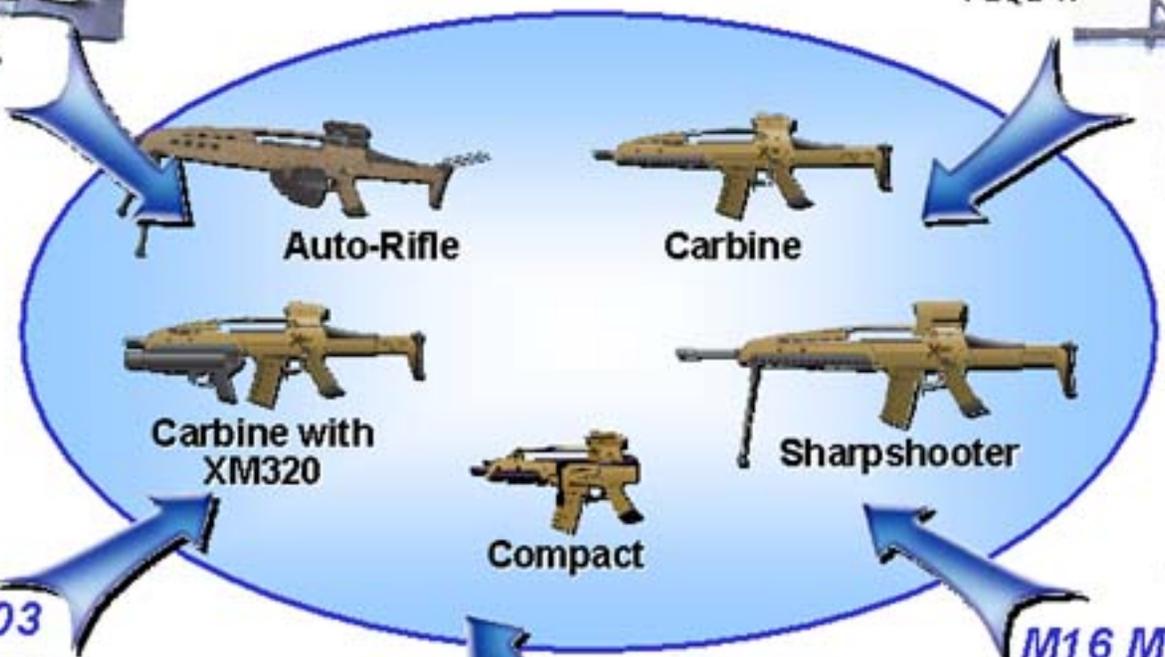
XM320 Grenade Launcher

- **Characteristics:**
 - Attaches To XM8 W/O Tools
 - Pivoting Barrel Design
 - Accepts All 40mm Rounds
 - Integrated Leaf Or Digital Sight
 - Single Shot
 - Weight: 9.01 Lbs W/Optic



XM8 FAMILY of Modular Weapons Can Replace...

M249 (Auto Rifle Role)



Multiple Eaches Replaced By Single Integrated FAMILY



XM8 Firing





XM25 Air Burst Weapon





XM25 Air Burst Weapon System



Air Burst Capabilities

- Defeats Defilade Targets
- Attacks Point Targets Out To 500m
- Attacks Area Targets Out To 700m
- Semi-automatic
- System Weight <12 Lbs (XM25 Variant)
 - Weapon
 - Target Acquisition/Fire Control (TA/FC)
 - Power Supply
 - Magazine/Ammo
 - Sling

High Explosive
Air Bursting Ammo

Flechette



25mm
Low Velocity
Ammo



Thermobaric

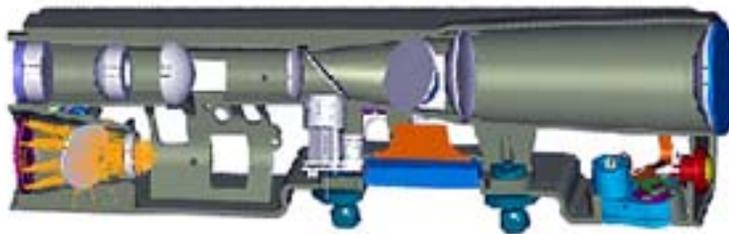
Non-lethal



Training



XM104 Target Acquisition/Fire Control



2.62 lbs



Function	Capabilities
Hybrid DVO (Direct view optics)	Provides 500m day recognition against personnel targets – with wide 15 degree FOC (2x)
Thermal	Provides 500m day/night against personnel targets – 12 degree Horizontal FOV with P(rec) 90%
Laser Rangefinder	Provides target range – High repetition rate (for assisted ranging) and high range accuracy out to 1000m
Display	Provides red symbology/reticle overlay on the DVO image and provides video display for the thermal image
Fuze Setter	Programs ammo for airburst (AB) with PD (Point Detonate) backup
CPU	Provides the “brains” for the fire control system: controls operation, reads all the sensors, calculates the ballistic solution, commands the display symbology, controls power management and LW interface, performs BIT, and etc.
Compass	Provides heading for Situational Awareness, also provides cant/tilt angles for inputs to the ballistic calculation
Land Warrior Interface	Capabilities to provide video and symbology to Land Warrior Helmet Mounted Display and two way data and control communications



Advanced Crew Served Weapon





Advanced Crew Served Weapon



XM307

Kit Change at
Unit Level (5 Parts)



XM312

- Supports FCS Defensive Armaments
- 25mm Munitions
 - Air-bursting Munitions Defeat Defilade Targets
 - Armor Piercing Munitions Defeat Light Armor
- Day/Night/All Weather Capable Fire Control

- Supports FCS Field Evaluation
- XM312 Is A Direct Replacement For 87 Year Old M2
- Could Support Stryker BCT Fieldings
- Accelerated Program Possible W/Funding
 - Delivers Start In 12 Mo - 50 Wpns In 18 Mo
 - Full-rate Production Line In 24 Mo

- One Weapon Replaces Two Weapons – M2 & MK19
- Dual Feed Capability For Vehicular Variants
- Light Weight
 - Can Be Dismounted From Platform
 - 2-man Portable (50.3 Lbs/43.7 Lbs) Vice 128 Lb M2 Or 144 Lb MK19
- System Dispersion 1.5 Mil
- No Headspace Or Timing Adjustments
- Maximum Commonality Between XM307 And XM312
- Minimized Future Logistic Impact
- Capable Of Remote Operations



Shoots/Handles/Maintains Like A Light Machine Gun



Advanced Crew Served Weapon Firings



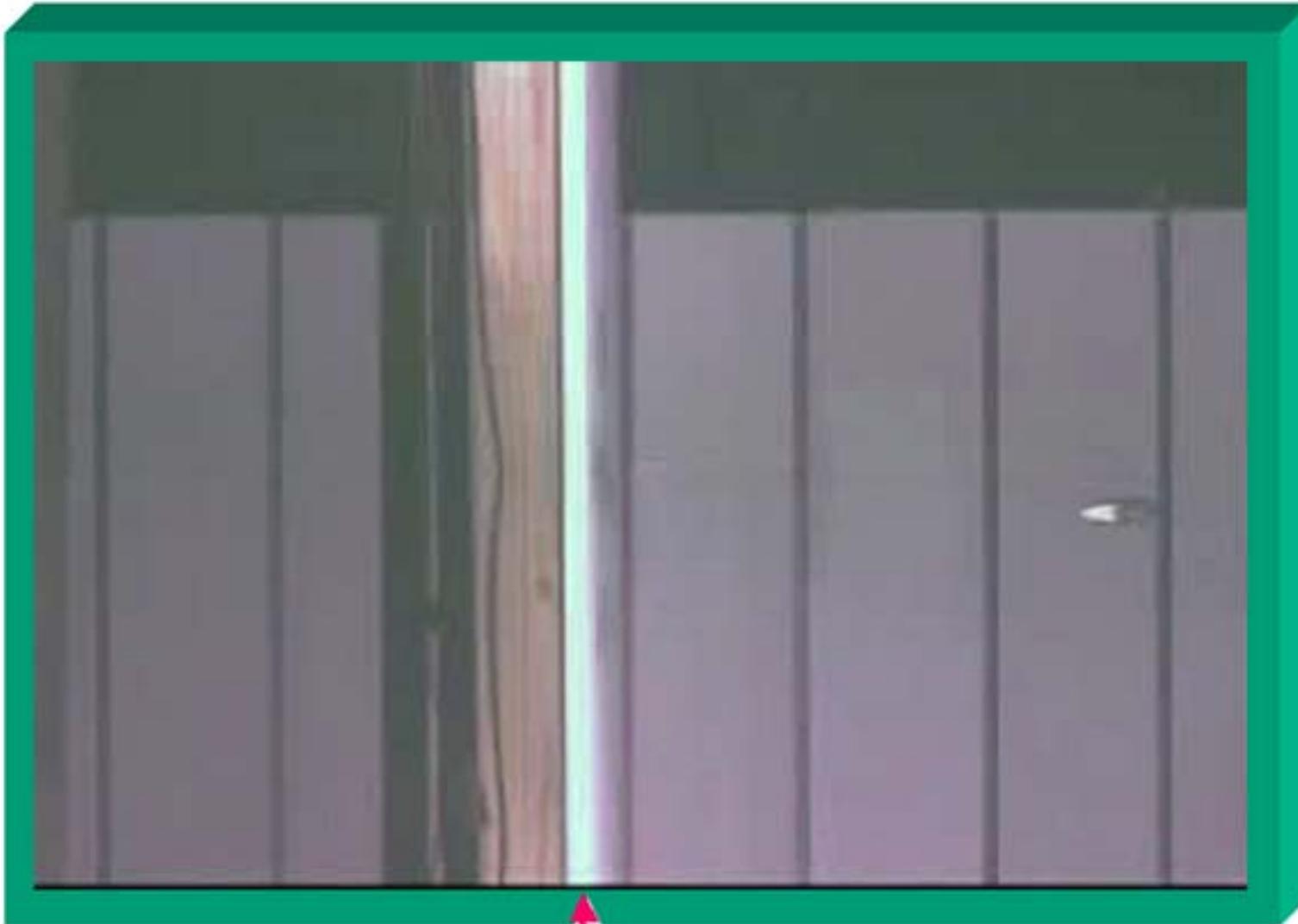


Advanced Crew Served Weapon Firings (25mm Airburst Over Target)





Advanced Crew Served Weapon Firings (25mm Armor Piercing)



1- inch RHA



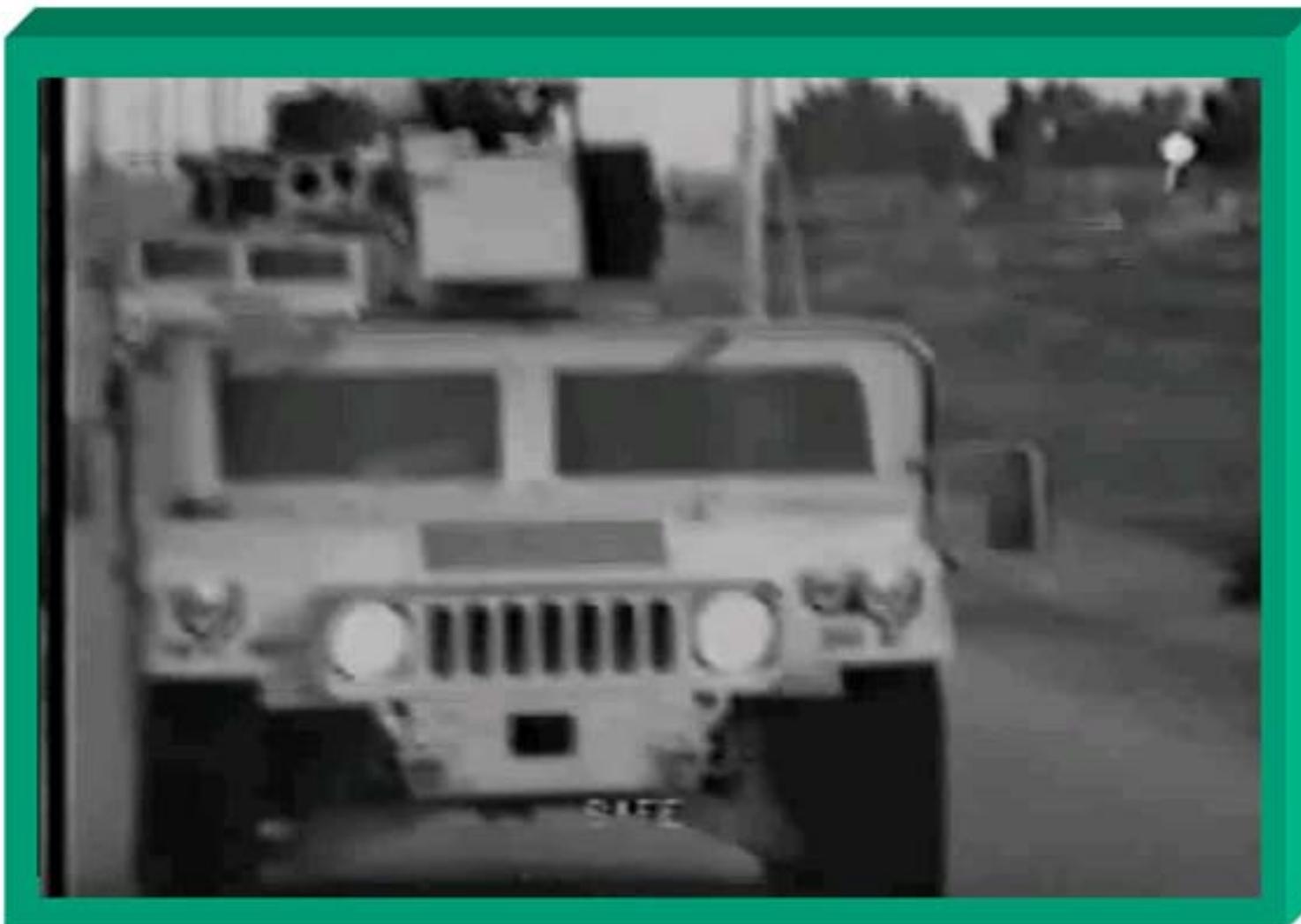
XM101 Common Remotely Operated Weapon Station (CROWS)

- **Provides Soldier With Capability To Acquire And Engage A Target While Protected By An Armored Vehicle**
- **Supported Weapons**
 - MK19, M2, M249, M240b
 - Potential Growth To M230If, M260 And XM307
 - Weapons Are Quickly Interchangeable By The User
- **Sensor Suite Permits Target Engagement Under Day And Night Conditions**
- **Two Axis Stabilized Mount, Laser Rangefinder And Fire Control Software Allow On The Move Target Acquisition And First Burst Target Engagement**
- **Can Track Target Independently Of Gun Motion**





XM101 Operations





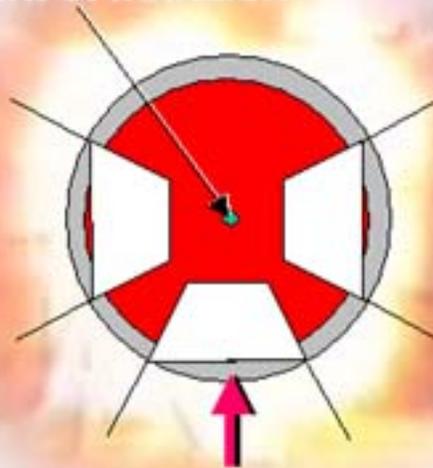
XUV Demonstration





Thermobaric Munitions

Point of Initiation



Projectile Flight Path

Legend

Red- 40MM Thermobaric Grenade

Ph/PK = 1

White-40MM HEDP Grenade

Ph/Pk >0.5<1.0

Technology Of Thermobarics Demonstrated

- Munitions Have Agility To Defeat A Range Of Targets
- Pressure And Light Output Used In Combination To Defeat Enemy Vulnerabilities

Xm1060

- 40mm Low Velocity Rounds Developed In 120 Days
- Operational Use Similar To M433 HEDP
- Deployed To Afghanistan



25mm High Velocity

- 25mm High Velocity Air Burst Rounds Developed In 90 Days
- Demonstrated During Sep 03 Infantry Conference



Thermobarics Provide Surgical Effectiveness



Thermobaric Munitions Firings (40mm Dynamic)





XM110, 7.62mm Semi-Automatic Sniper System (SASS) SEP Program

Description:

**Effective Against Personnel Targets & Possible Light Materiel Targets
Supplements Sniper's Role To Support Combat Operations**

- **Greater Firepower & Possible Standoff Ranges To Improve Sniper Survivability**



Capabilities of Item:

- **Rapid Fire/Rapid Reload, Suppressed Sniper Rifle**
- **Exceeds Rate-of-Fire & Lethality of M24 SWS**
- **Reduced Weight**
- **Primarily Anti-Personnel Ranges Equal to or Greater than M24**
- **Includes Enhanced Sniper Spotting Scope**

***Objective:* To qualify and Type Classify Standard a COTS/NDI Semi-Automatic Weapon To Replace M24 (7.62mm Bolt Action) Sniper Weapon System (SWS)**



The Soldier "America's Most Deployed Weapon System"



**"EVERY SOLDIER IS A
RIFLEMAN FIRST"**

GEN SCHOOMAKER



WE CAN DELIVER





Soldier Warrior

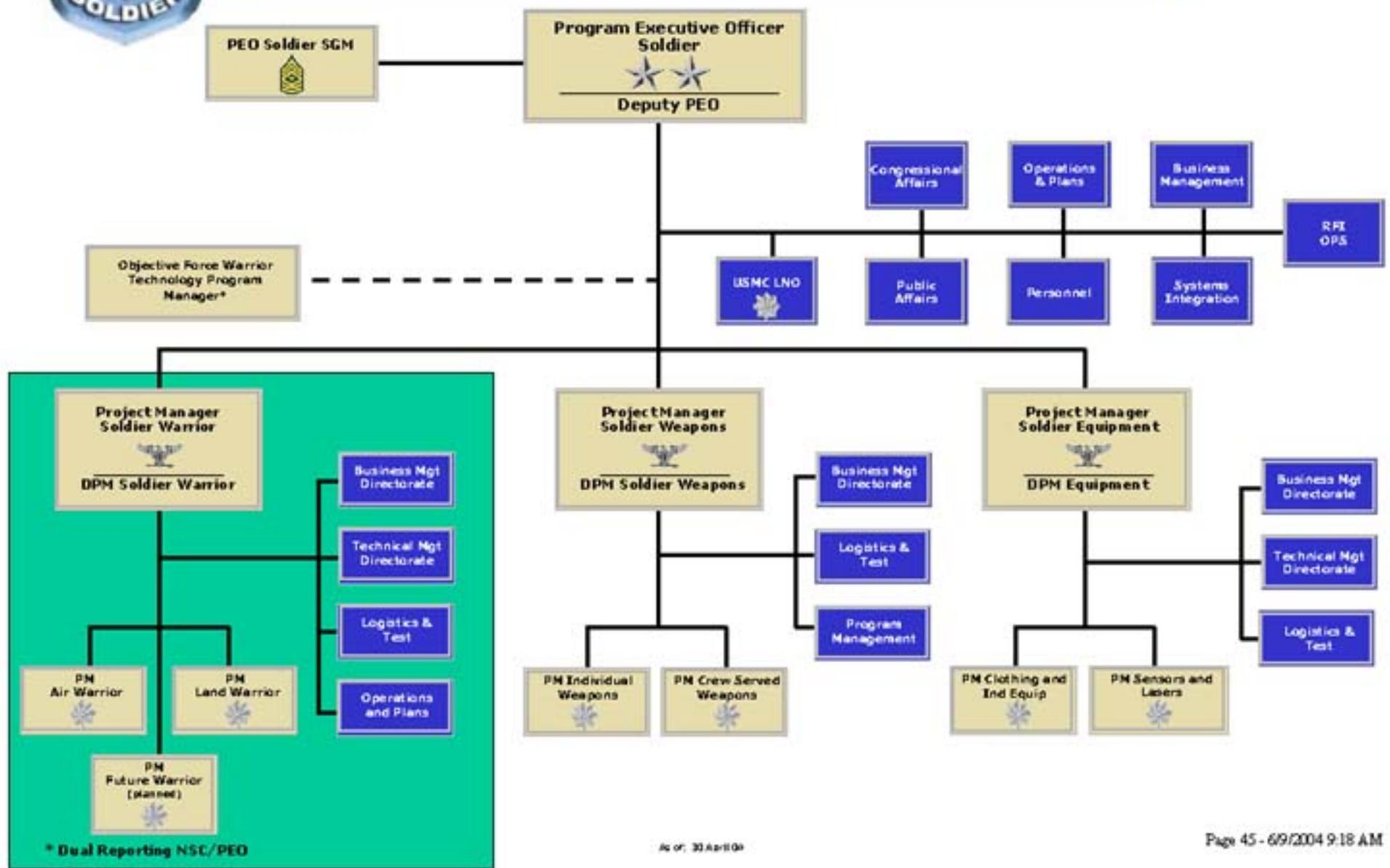
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**Mr Bill Brower
Acting PM Soldier Warrior**



PEO Soldier Organization



* Dual Reporting NSC/PEO

As of: 30 Apr 04

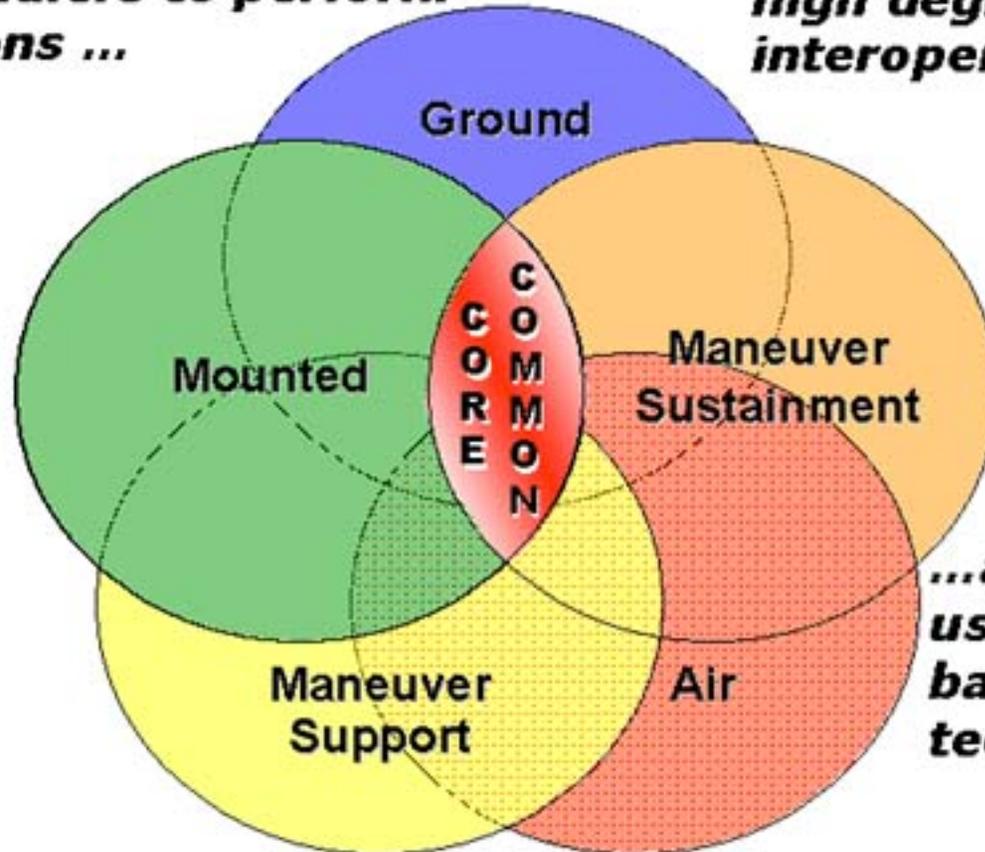


Internal Interoperability (Commonality, Modularity and Reuse)



***The Soldier As A Systems
Architecture optimizes core,
common and unique functions
required by soldiers to perform
specific missions ...***

***... achieve a
high degree of
interoperability ...***



***...and allow better
use of consumer-
based
technologies***



Interoperability – Soldier Radio Initiatives



● Multi-Band Inter/Intra Team Radio (MBITR)

- Radio sets are being purchased for the Rapid Fielding Initiative (RFI), based on requirements validated by the Army G-3.
- Satisfying small unit requirements for a lightweight, secure voice radio

● Enhanced Position Location Reporting System (EPLRS) MicroLight

- Radio set is being integrated into the LW-SI program as the Leader/Soldier radio.
- Fully functional EPLRS radio in a small form factor, compatible "over-the-air" with Stryker Data communications.





Commonality

(Commercial Standards, Military Packaging)



- **USB-2 Interface**
- **Battery Connections**
 - System Connections
 - Recharge
- **Battery Voltage**
- **Handheld Device is the common platform for Land Warrior**
 - Leader's planning,
 - External display,
 - Mission support application,
 - Maintenance application
 - Use in other platforms

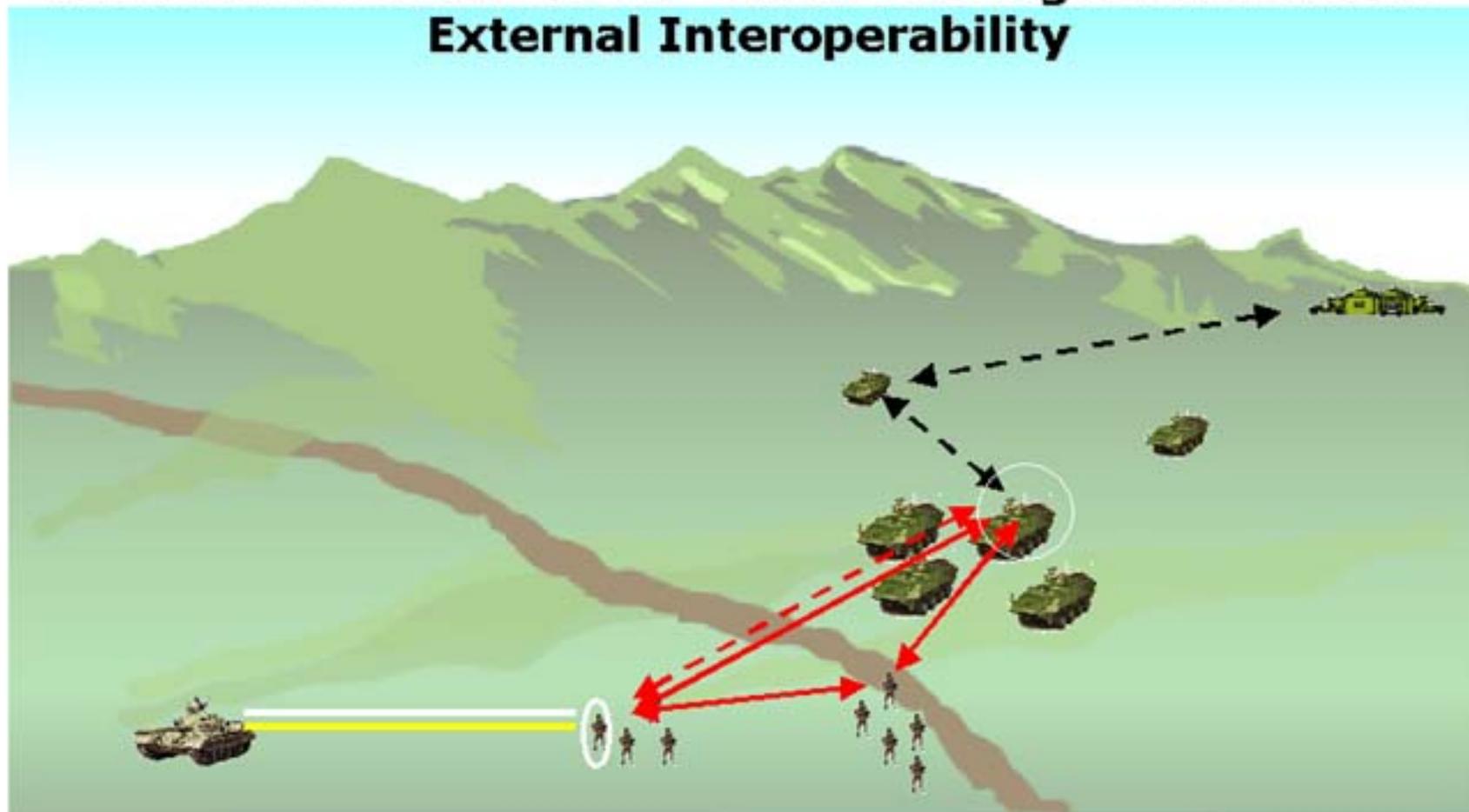




Soldier Connectivity

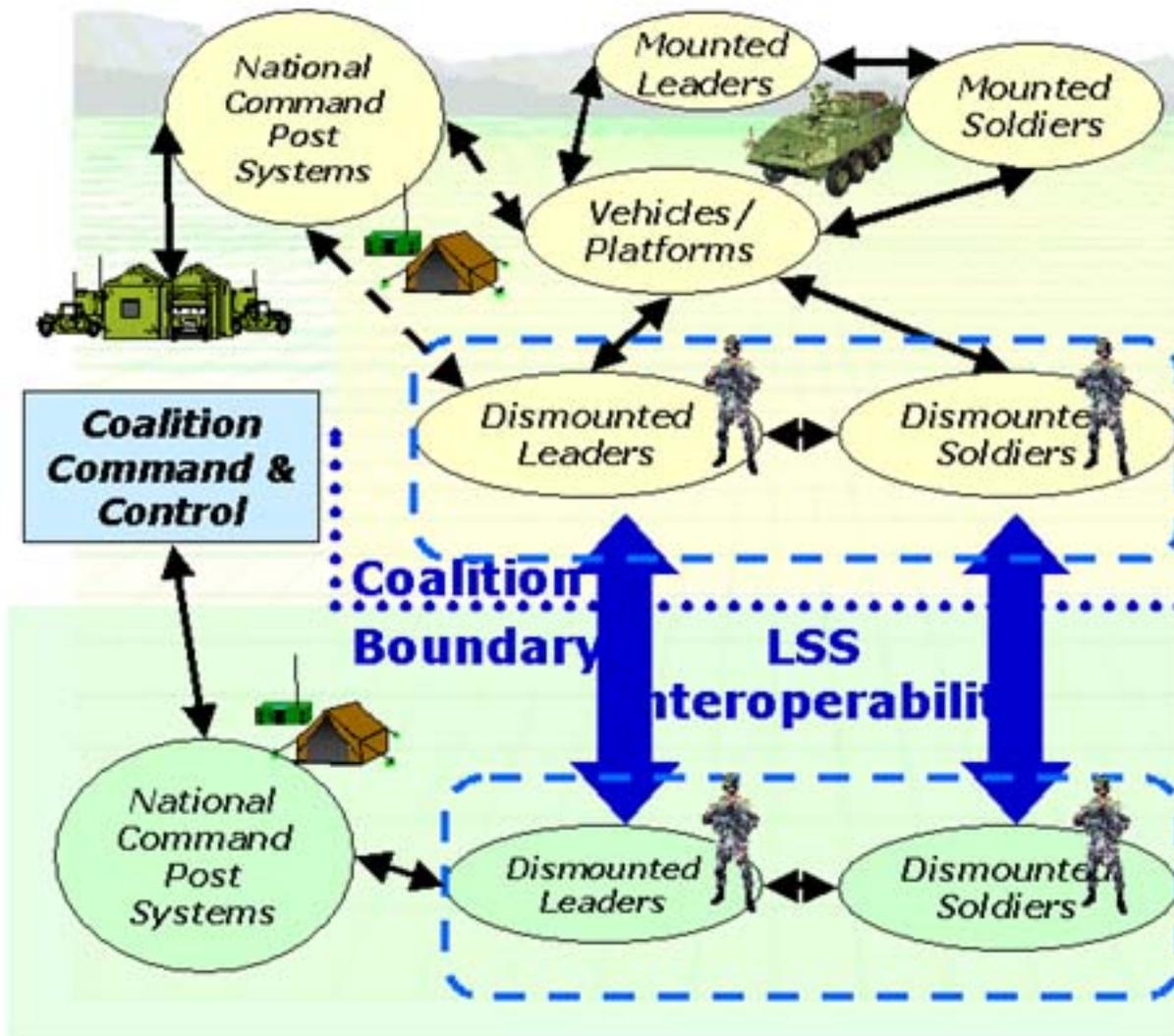


Each Soldier is a Sensor = New Paradigm That Affects External Interoperability





NATO Interoperability for Dismounted Soldier Systems



- One or more levels of data interchange can be implemented for coalition operations at the soldier level.
- Common battery connectors and power compatibility will simplify logistics with coalition forces.
- Common power connectors to recharge soldier batteries on coalition platforms.



Challenges

- **Broad technology application across Joint mission areas.**
- **Joint requirements leading to common specifications**
- **Alignment and funding of multiple programs**
- **Modular and common solutions for weapons development**
- **Soldier-level interoperability; Army, Joint, Combined**