Smaller, Smarter & Lighter Systems

Nanotechnology Workshop

8 February 2001

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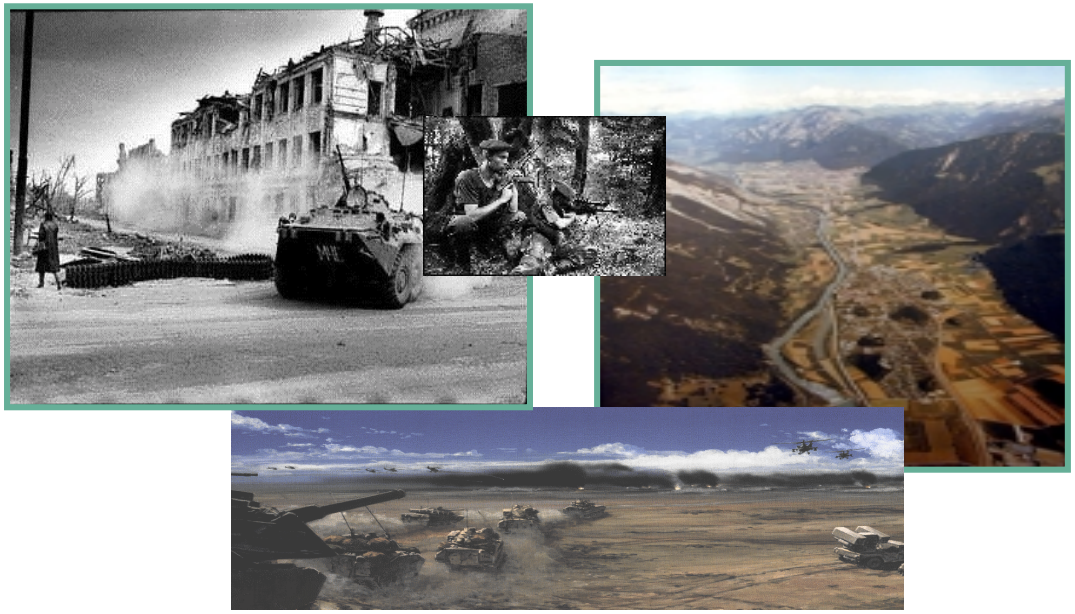
Objective Force Warrior - - -
Decisions Today for Tomorrow

Objective Force for Full Spectrum of Missions

Environmental Complexity

High

- ***Urban***



- ***Open, rolling terrain***

Low

Stability and Support Operations ***Small Scale Contingencies*** ***Major Theater War***

Spectrum of Conflict

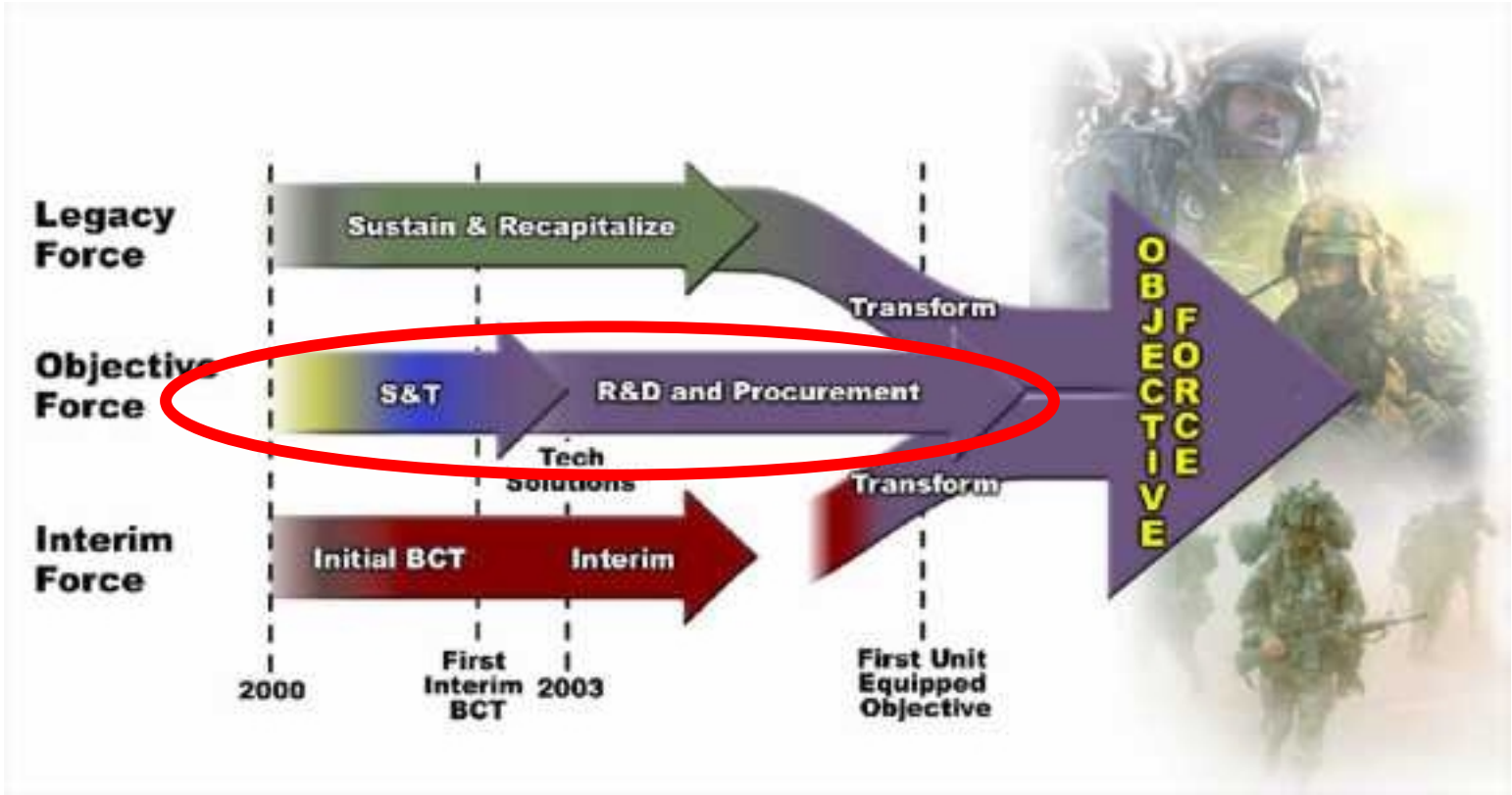
Increased strategic responsiveness

- ✓ ***BCT in 96 hrs; Div in 120 hrs; 5 Div in 30 days***
- ✓ ***Fight immediately upon arrival***
- ✓ ***Simultaneous air and sea lift***

"If we can't get to the fight faster, we're not relevant."

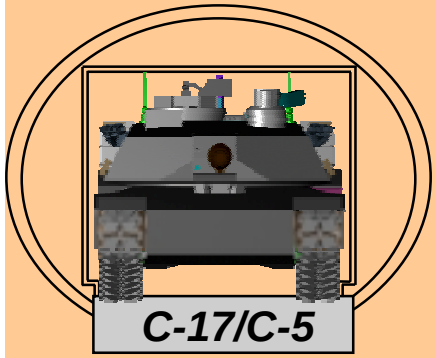
Sec Army Louis Caldera, 6 Nov 00

The Army Transformation



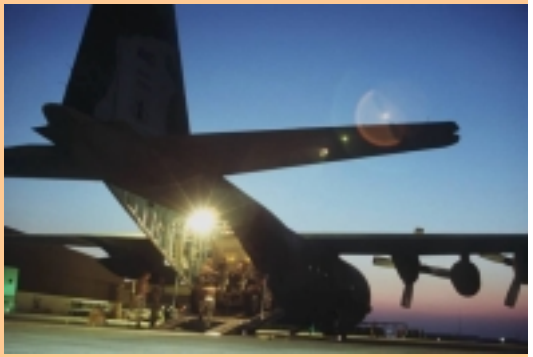
. . . Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable

Objective Force Requires Operational and Technology Innovation



Fit the C-130 "Crucible"

Up to:
70% Lighter
50% Smaller



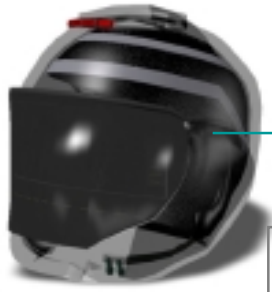
- Dismounted Soldier
- Lethality
- Survivability
- C^3 on the move

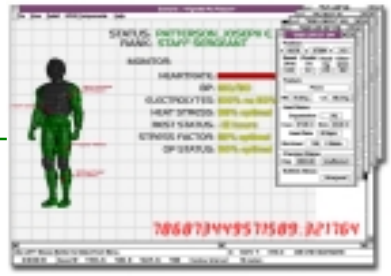
Challenges

Transformation Drives the Army to ...smaller, smarter, and lighter systems

Keeping The Soldier at the Center of The Objective Force

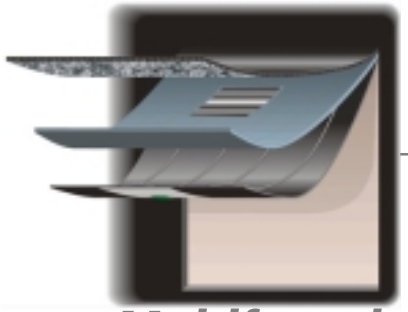
Helmet Subsystem



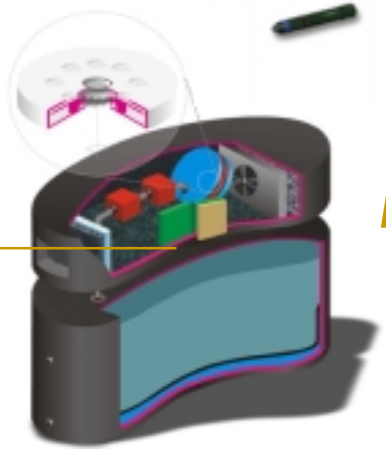


Biomedical Monitoring Subsystem

Weapon Subsystem



Multifunctional Uniform Subsystem



Power Subsystem

Future Warrior 2025
Weapon Subsystem – Lethality

We Need to Spark Our Imagination - - - "Predator" The Movie

A System of Systems Approach is Needed

Stealth

- Near invisible in visible light

Sensors

- Multi-spectral optics
- Acoustic

Power

- Near endless power source

Environmental Protection

- Self contained protection from “alien” environment

Fightability

- Agile warrior with full gear

Medical

- Self contained Medical kit

Lethality

- Lightweight laser guide air burst weapon

Ideas for a “nearly invincible” warrior system

Overwhelming lethality in a smaller, lighter, faster kinetic energy missile

Line of Sight Anti-Tank (LOSAT)

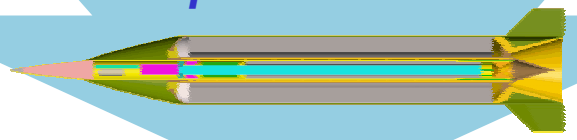
Length	9 ft 9 in
Weight	175 lb.

Increased Speed Required
For Reduced Size

$KE = \frac{1}{2} MV^2$

Length	4 ft.
Weight	50 lb.

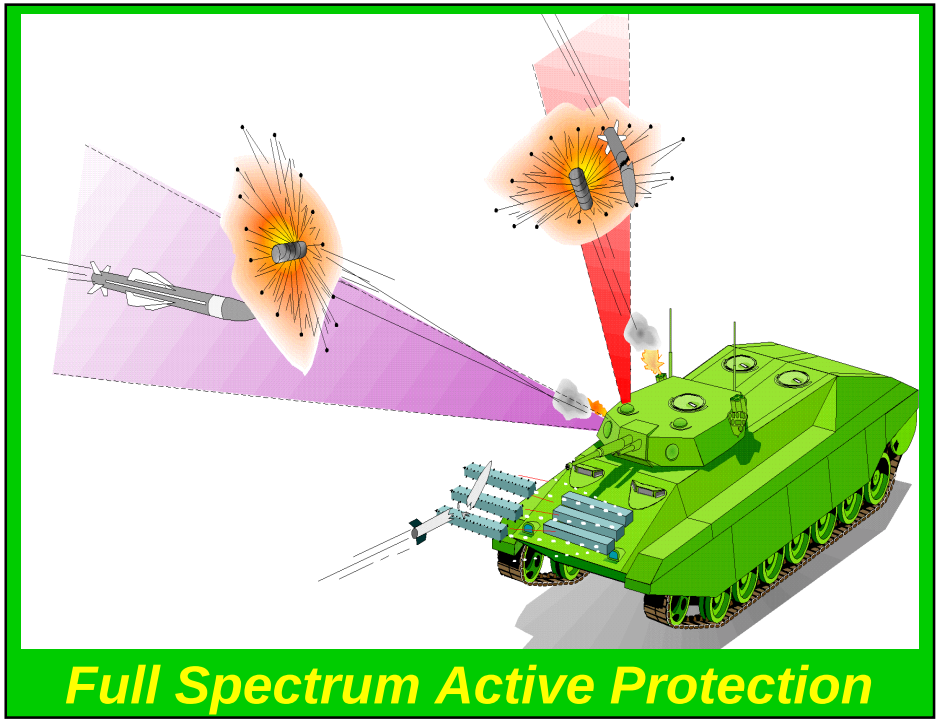
Compact KE Missile



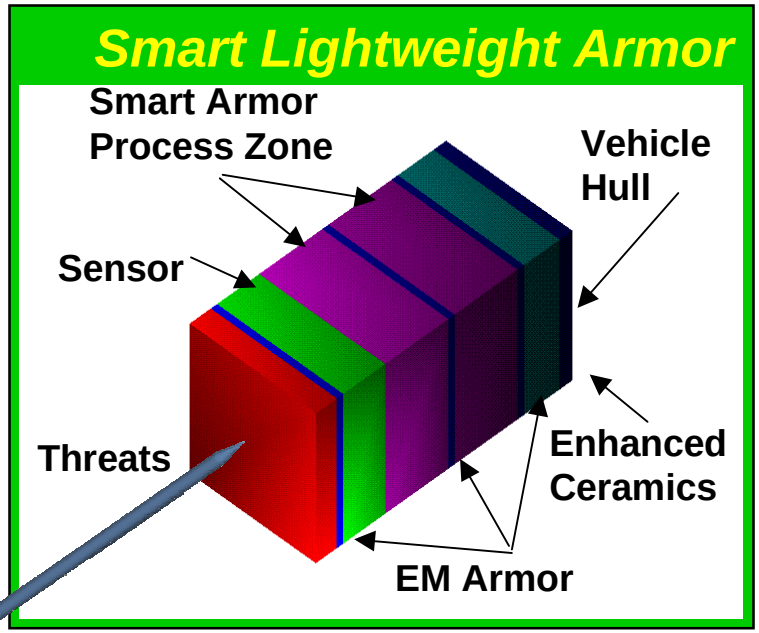
LOSAT-Like Lethality in 4 ft/50 lbs

Surviving first round engagements

… 70 ton Survivability in <20 ton Systems



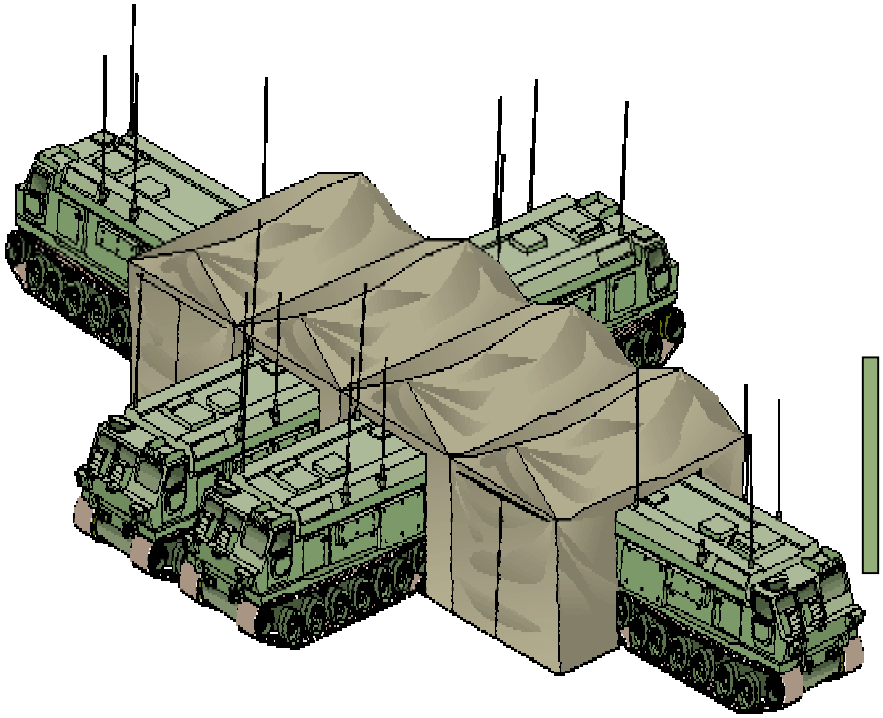
Full Spectrum Active Protection



Defeat threats with lighter,smarter systems

Enabling Commander to Control and Direct the Battle from Anywhere in the Battlespace

….Agile Commander ATD



Radically reduced footprint

Smaller, smarter systems for mobile C3

Reducing soldiers' risk ...

Controlled Autonomous Robotic Systems

Ruck Sack Carrier

Convoy

Rear Security

Fires

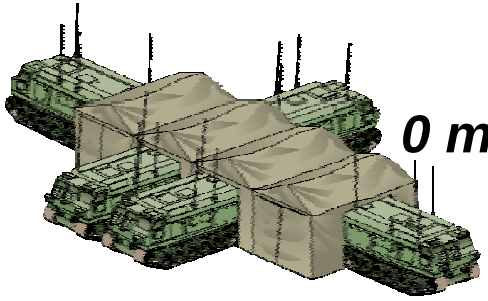
Improved soldier effectiveness with smarter systems

Focusing Technology Innovation . . . Smaller, Smarter & Lighter

Today

~100 lb. load

70+ tons



0 mph

S&T -- Accelerating the pace of Army Transformation

Objective Force

< 30 lb. load

< 20 tons

> 40 mph

Army Nanotechnology . . . Opportunity

- **Pervasive Impact on Future Army Systems**
  - **Low power, intelligent, light weight, multifunctional devices**
- **Revolutionary capabilities, not incremental improvements**
  - **Soldier Systems**
    - **Smaller, Lighter Sensor, Communication, Computing & Power Devices**
    - **Integral Chem/Bio, Laser, and Ballistic Protection**
    - **Integrated Thermal Management**
  - **Combat Systems**
    - **Armors and Structural Components**
    - **Advanced Engines**
    - **Next Generation Pentrators and Warheads**
    - **Next Generation Propellants and Explosives**
    - **Advanced Communications, Electronics and Sensors**
- **Approach - Establish University Affiliated Research Center (UARC) to Harvest Academic/Industry Breakthroughs**

Summary

- ***The path to Army Transformation <u>demands</u> responsive & deployable systems***

- ***Army S&T <u>Focus</u> is on smaller, lighter, and smarter systems***

- ***We are <u>doing</u> things that have never been done before***

"The only thing that matters is Innovation."
Peter Drucker