



M1A2 SEP Tank Embedded Training Technology

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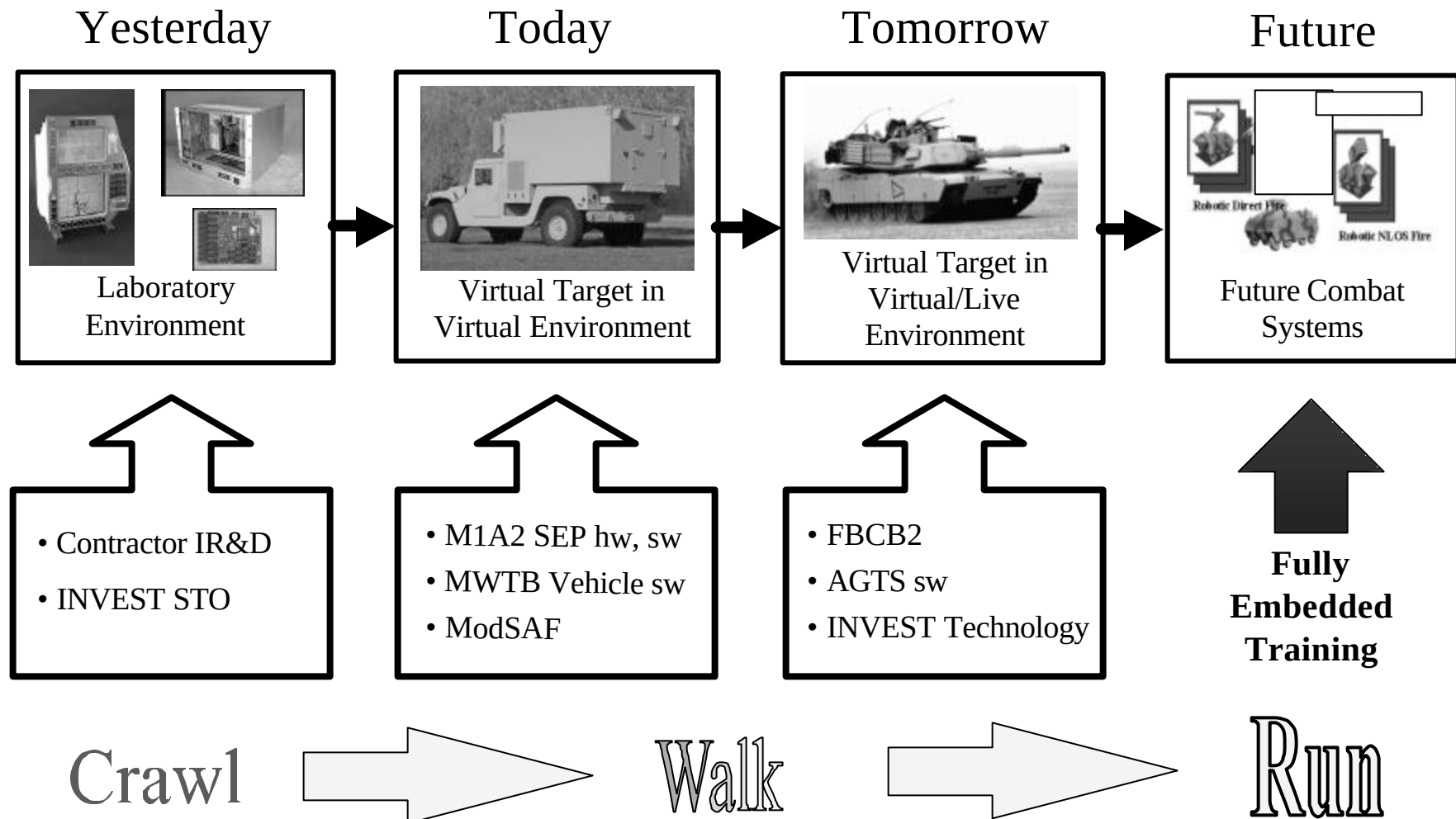
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Embedded Training Technology



Laboratory Based Research & Development



Yesterday

Reconfigurable Test Platform



Mobile Laboratory



- Utilized for Vehicle-on-the-Move Testing
- AM General M1097A2 HMMWV with a Military Shelter
 - 15KW Generator
 - 24,000 BTU ECU





Mobile Crew Station Simulation Laboratory (MCSSL)



Facilitates M1A2 SEP Tank Embedded Training Technology Implementation

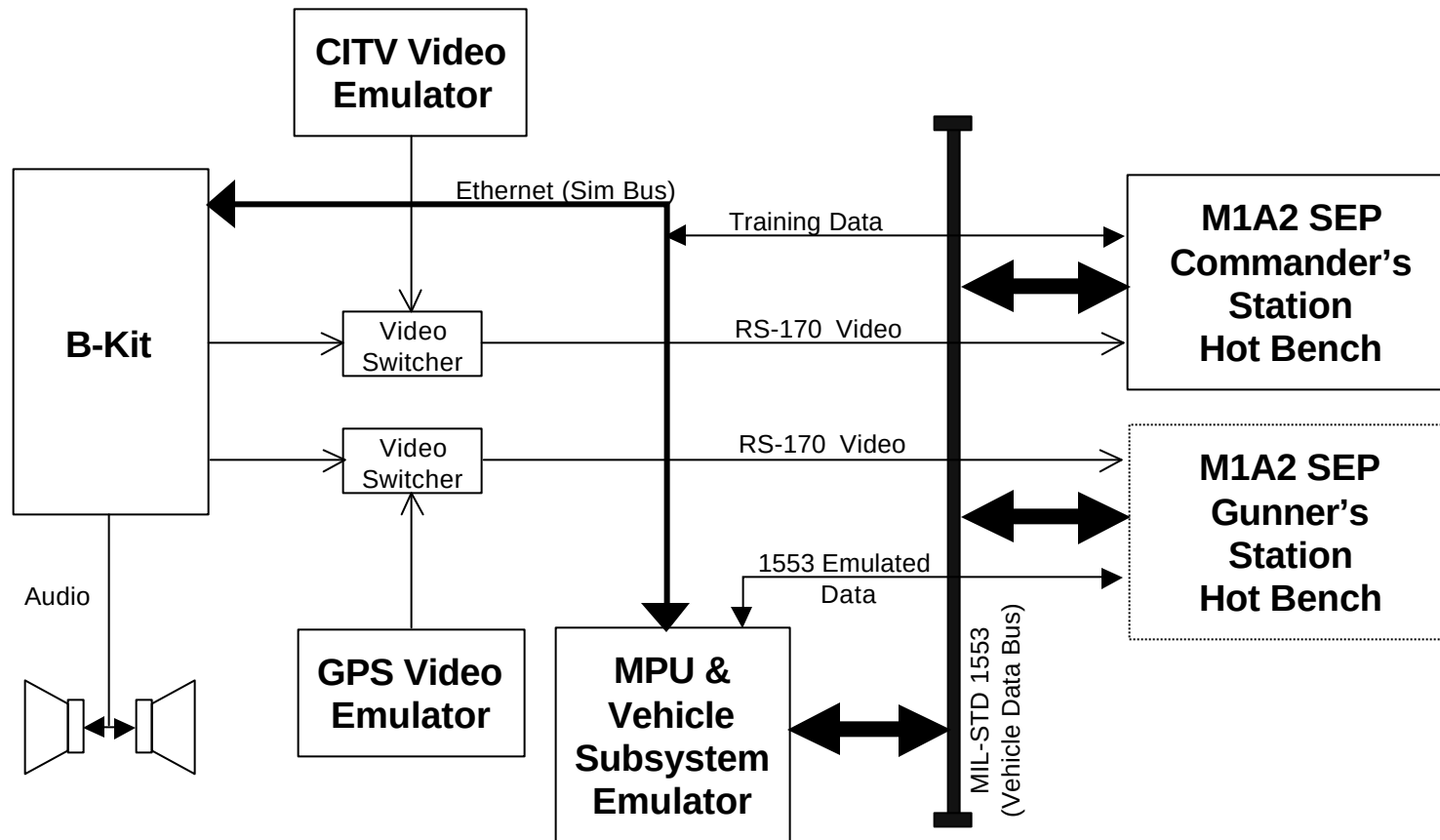
- Incorporates M1A2 SEP Tank LRUs or Commercial Equivalents
- Utilizes M1A2 SEP Tank Software
- Pre-platform Integration Risk Reduction

Today

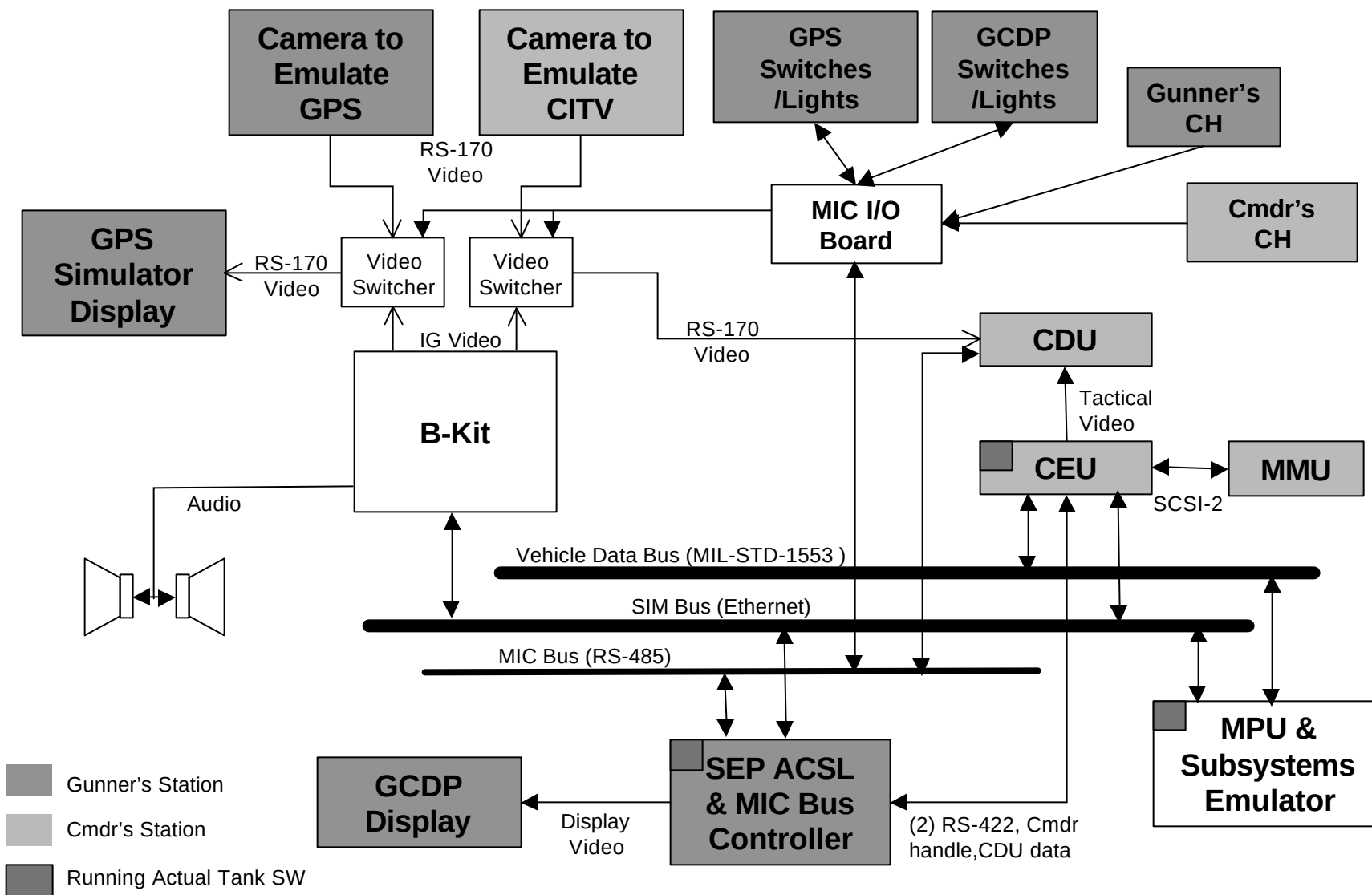


Cost Effective • Reconfigurable • Mobile

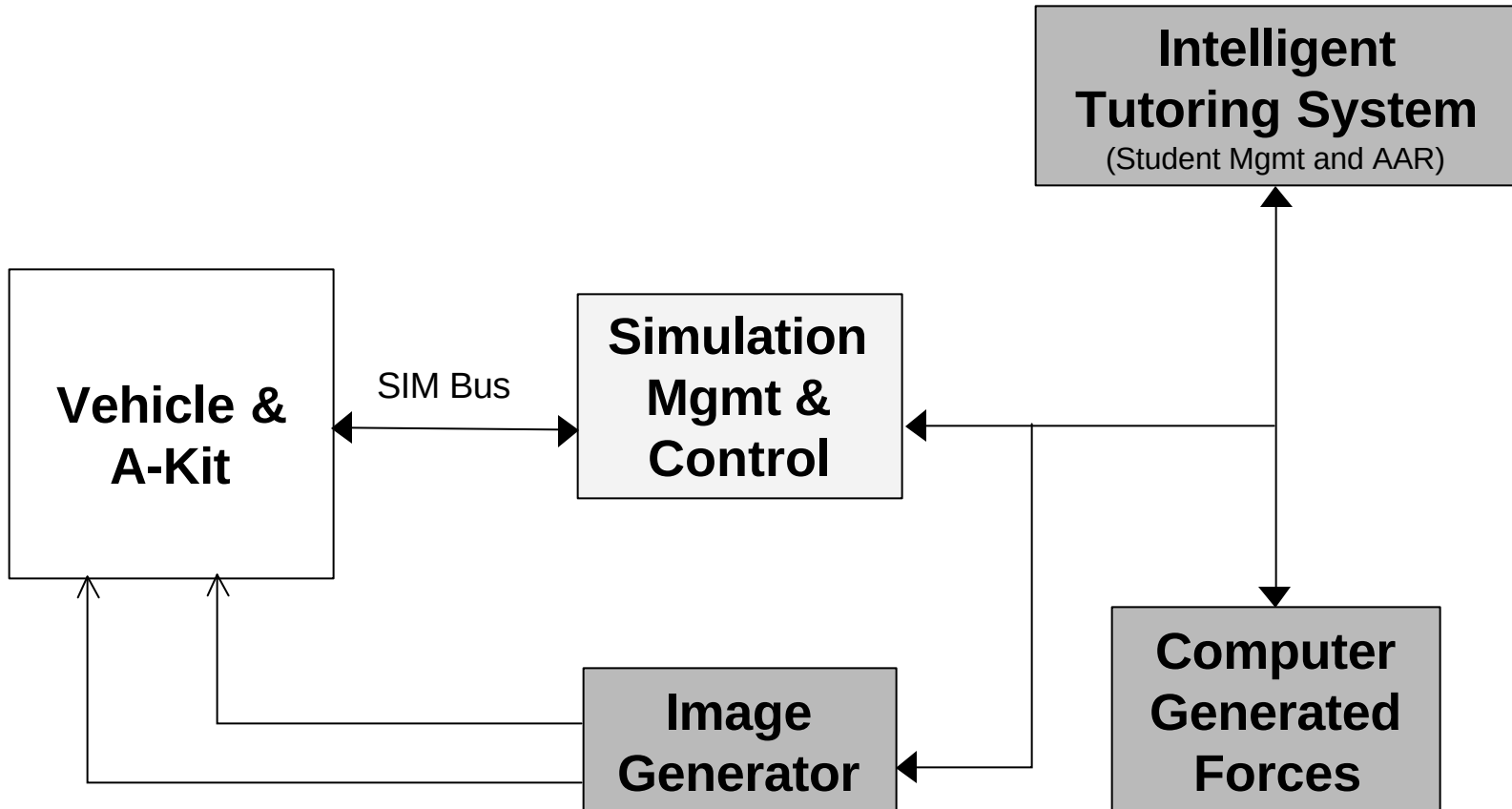
MCSSL Top Level Functional Diagram



MCSSL Detail Architecture Diagram



B-Kit Architecture Diagram



M1A2 SEP Tank



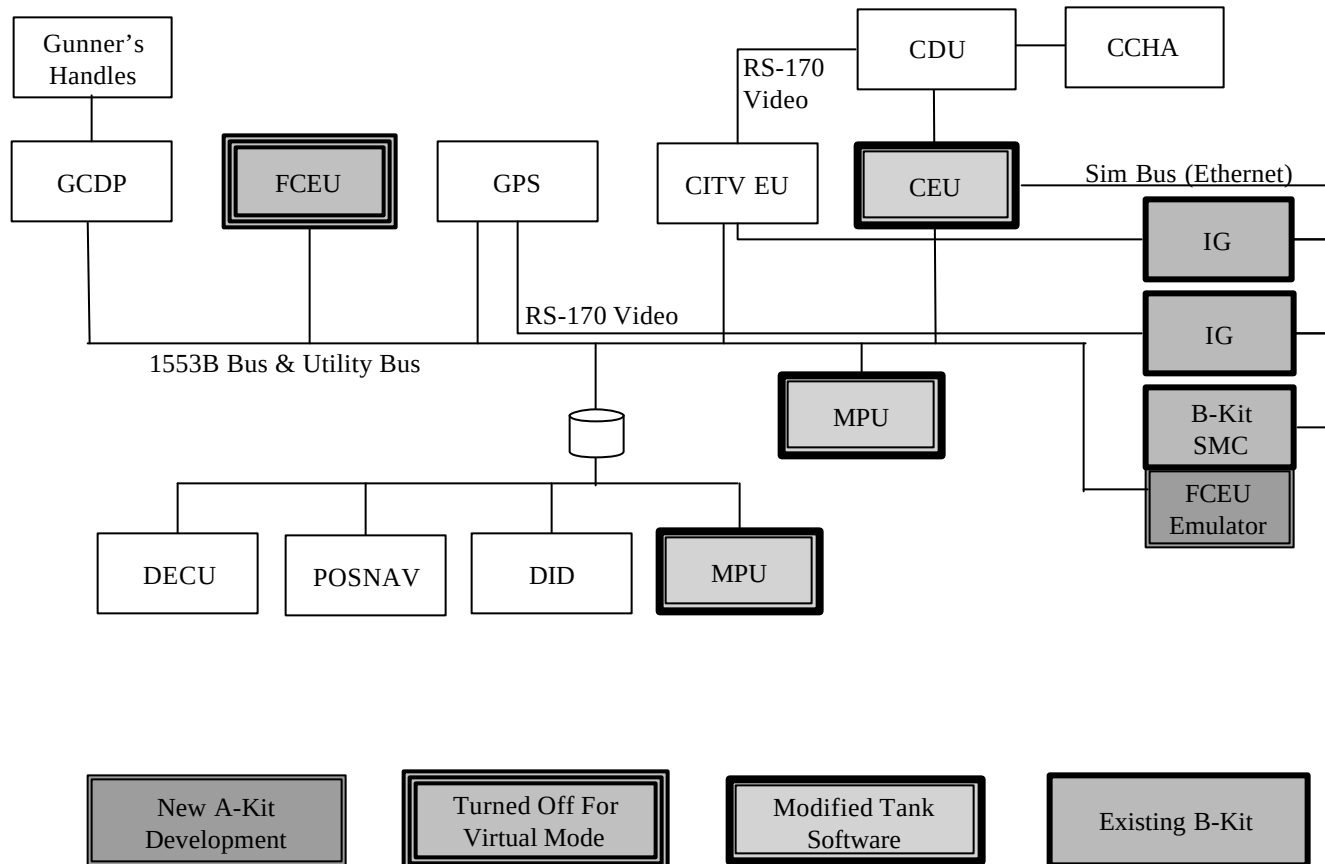


M1A2 SEP Tank - Embedded Training Demonstrations

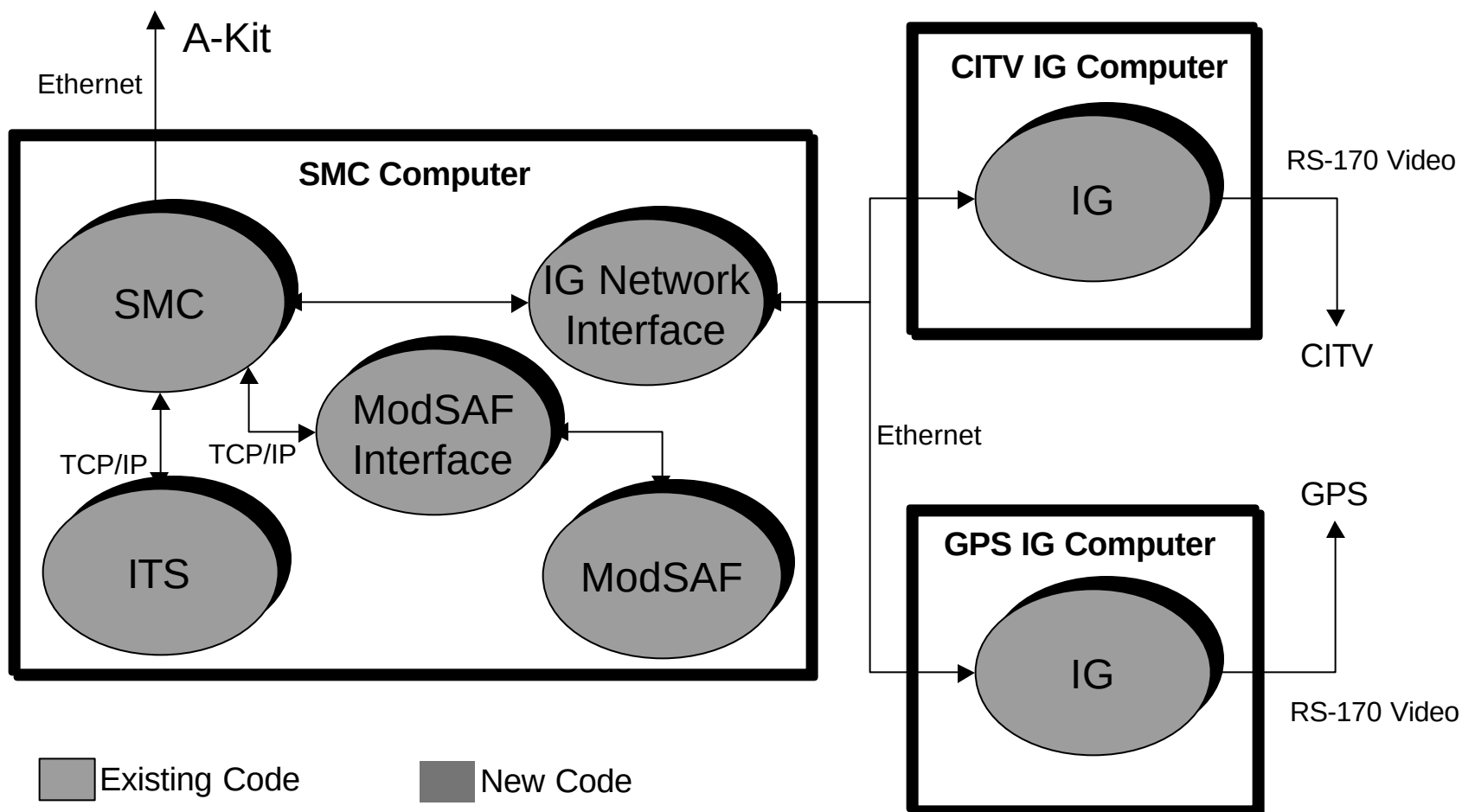


General Capabilities	Objective Demo	Initial Demo AUSA
Full Virtual Environment	X	X
After Action Review	X	No
AGTS Software Integration	X	No
Distributed Interactive Simulation (DIS)	X	Limited
Gunner Station Capabilities		
Gunner's Primary Sight (GPS)	X	Limited
Gunner's Control Display Panel (GCDP)	X	X
Gunner's Control Handle	X	X
Commander Station Capabilities		
Commander's Independent Thermal Viewer (CITV) Sight	X	X
Command & Control (including FBCB2)	X	No
Integrated Training Menus on CDU	X	X
Commander's Control Handle	X	X
Hardware Features		
Ruggedized Embedded Training LRUs	X	X
A-Kit for M1A2 SEP Tank	X	Limited

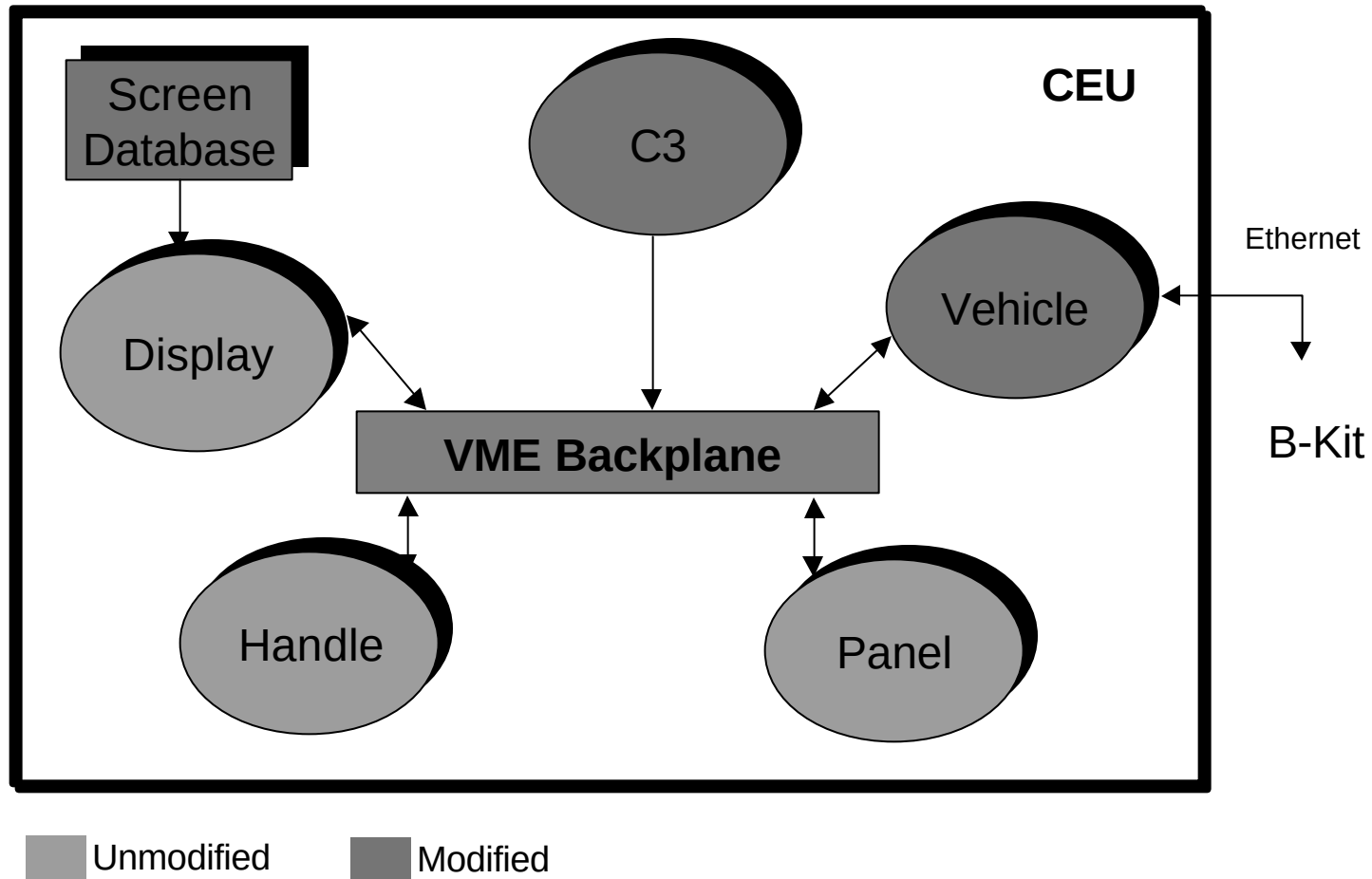
M1A2 SEP Tank Embedded Training System Architecture



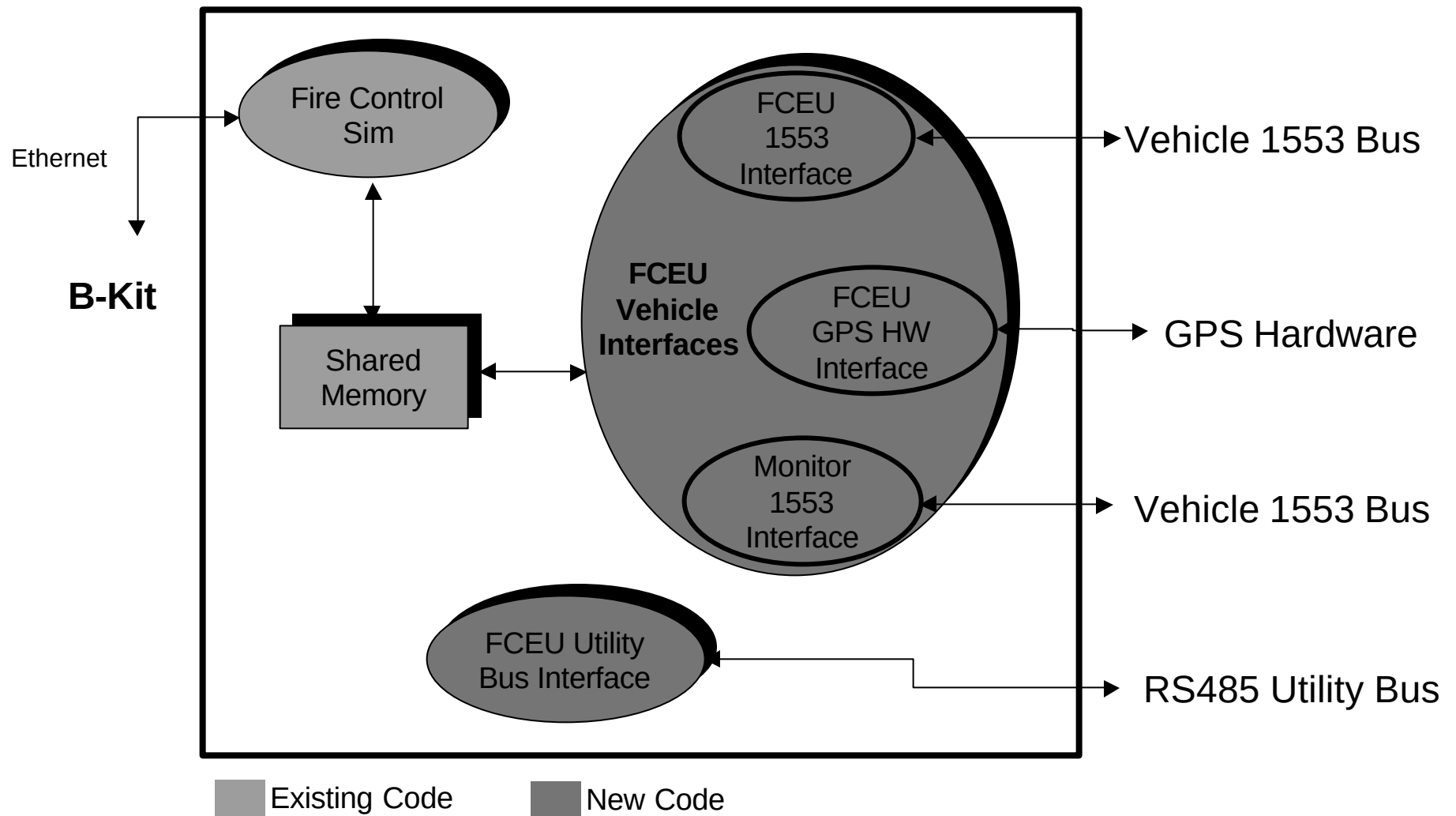
B-Kit Architecture



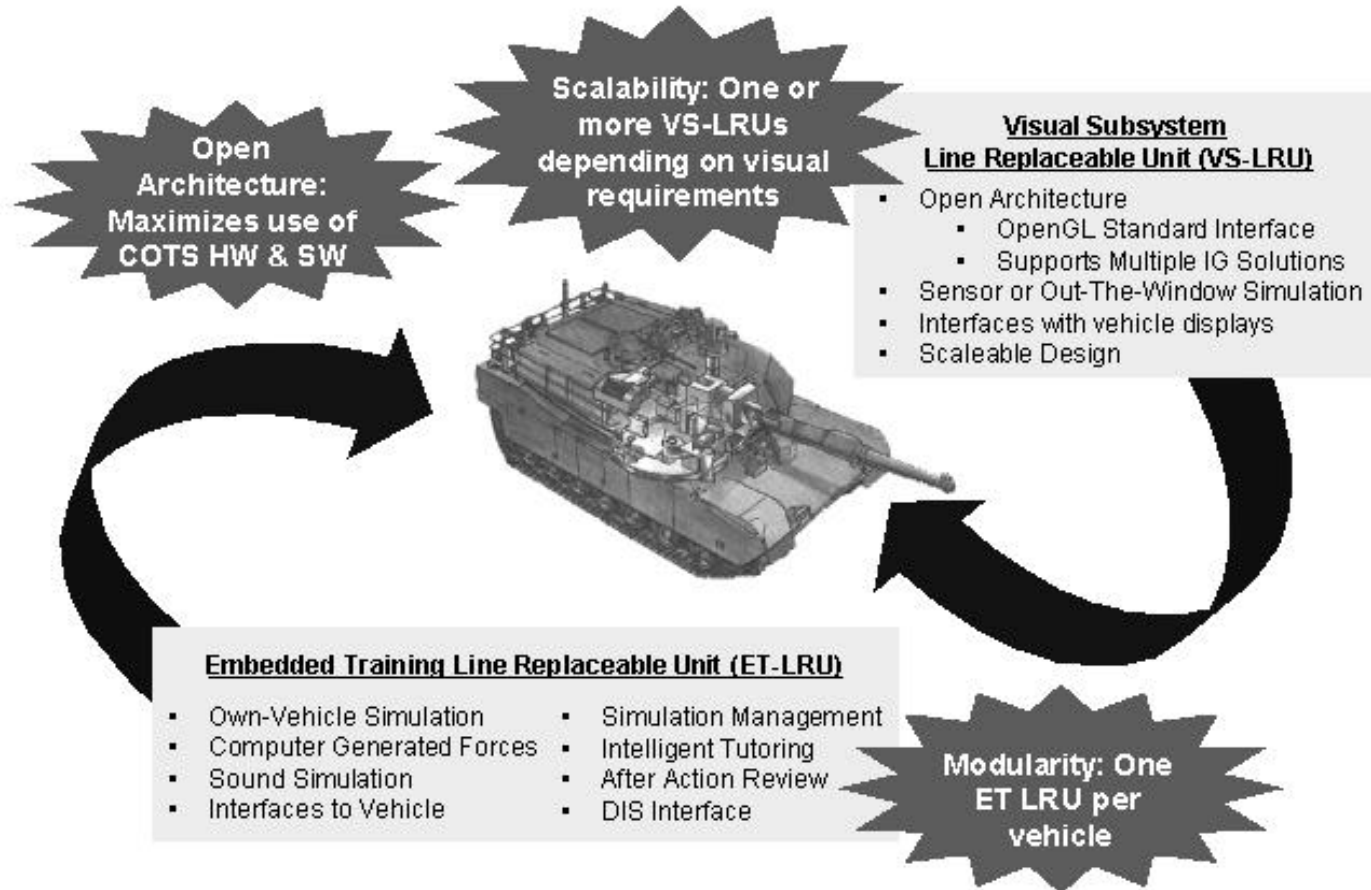
Commander's Electronic Unit (CEU) Architecture



FCEU Emulator Architecture



Technical Approach - Building Block Solution



A building block approach using an ET-LRU and multiple VS-LRUs allows for maximum flexibility and cost effectiveness

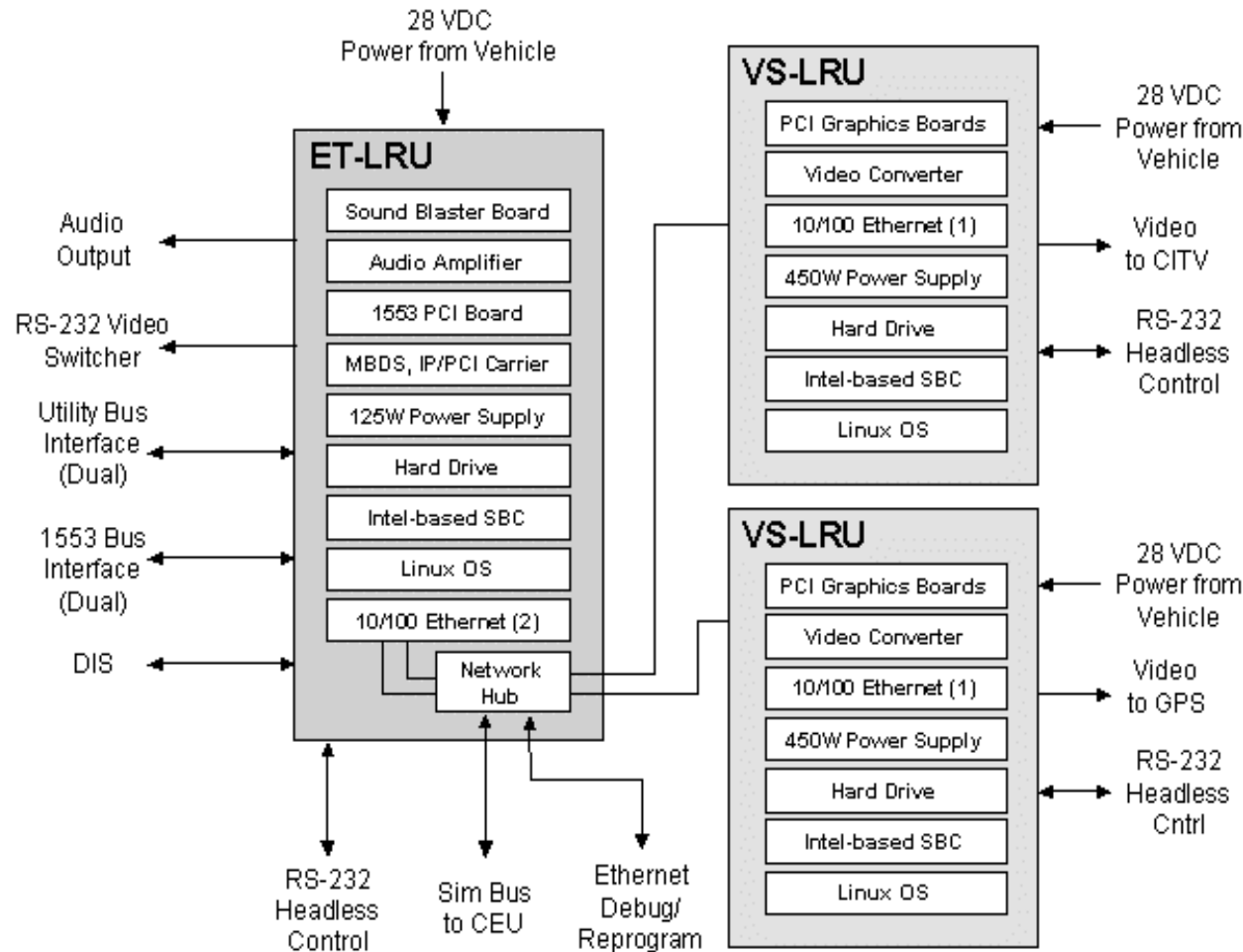


Building Block Approach Advantages

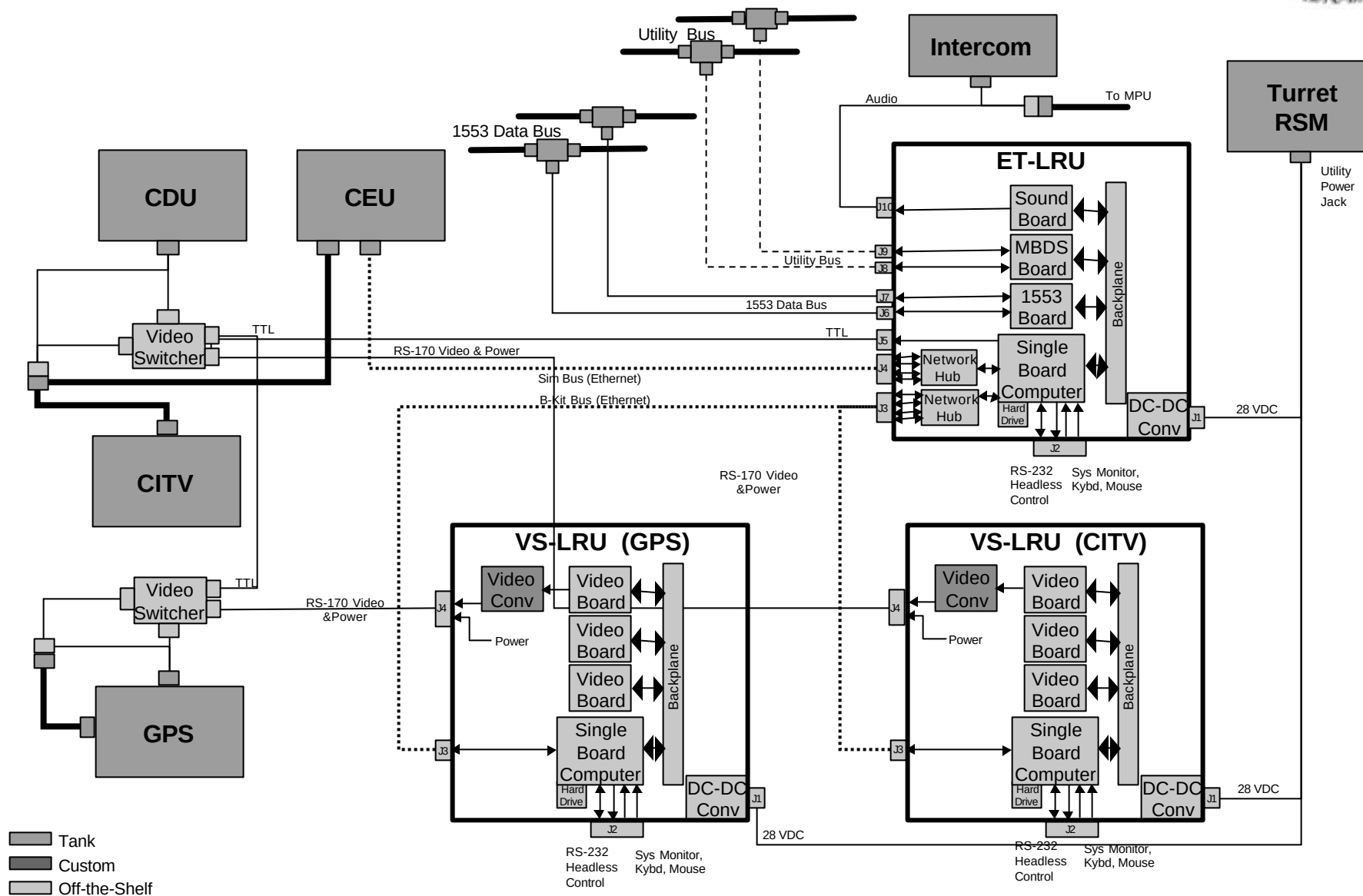


Attribute	Advantages
Placement	Placement of multiple small boxes will be easier to achieve within the tight confines of the legacy ground combat vehicle.
Environmental	Distribution of the heat loads assists in heat load management.
Power Management	Distribution of the power loads assists in power management.
Scalability	Additional capabilities (e.g., adding the driver) can be achieved by adding a VS-LRU in the driver's area.
Modularity	System modularity is achieved by logical distribution of software and hardware functions allowing changes in subsystem configuration without impacting the entire architecture.
Graceful Degradation	Failure of a single VS-LRU does not imply total system failure.

ET & VS LRUs – Maximum Use of Common COTS SRUs

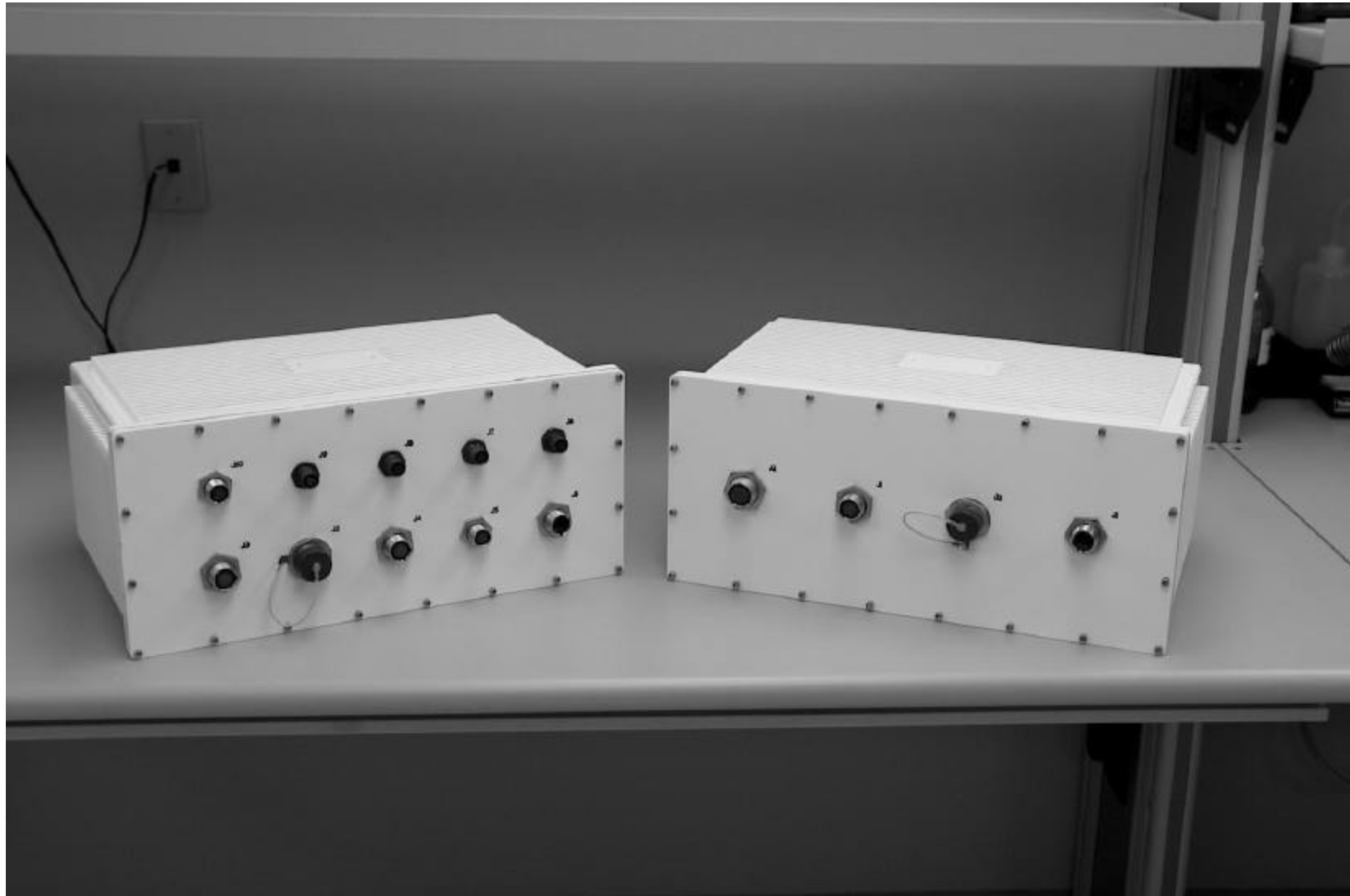


AUSA Demo Hardware Architecture

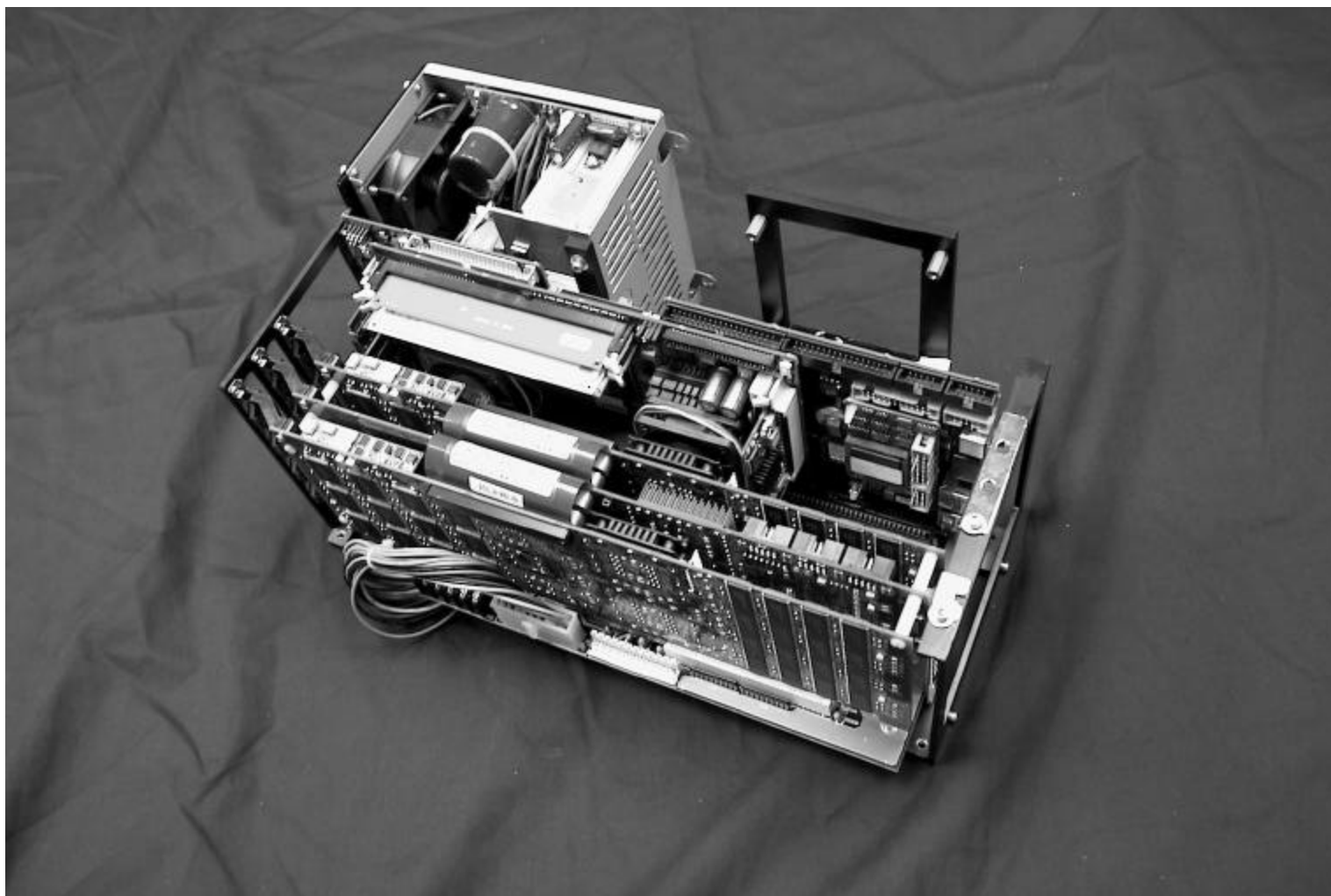




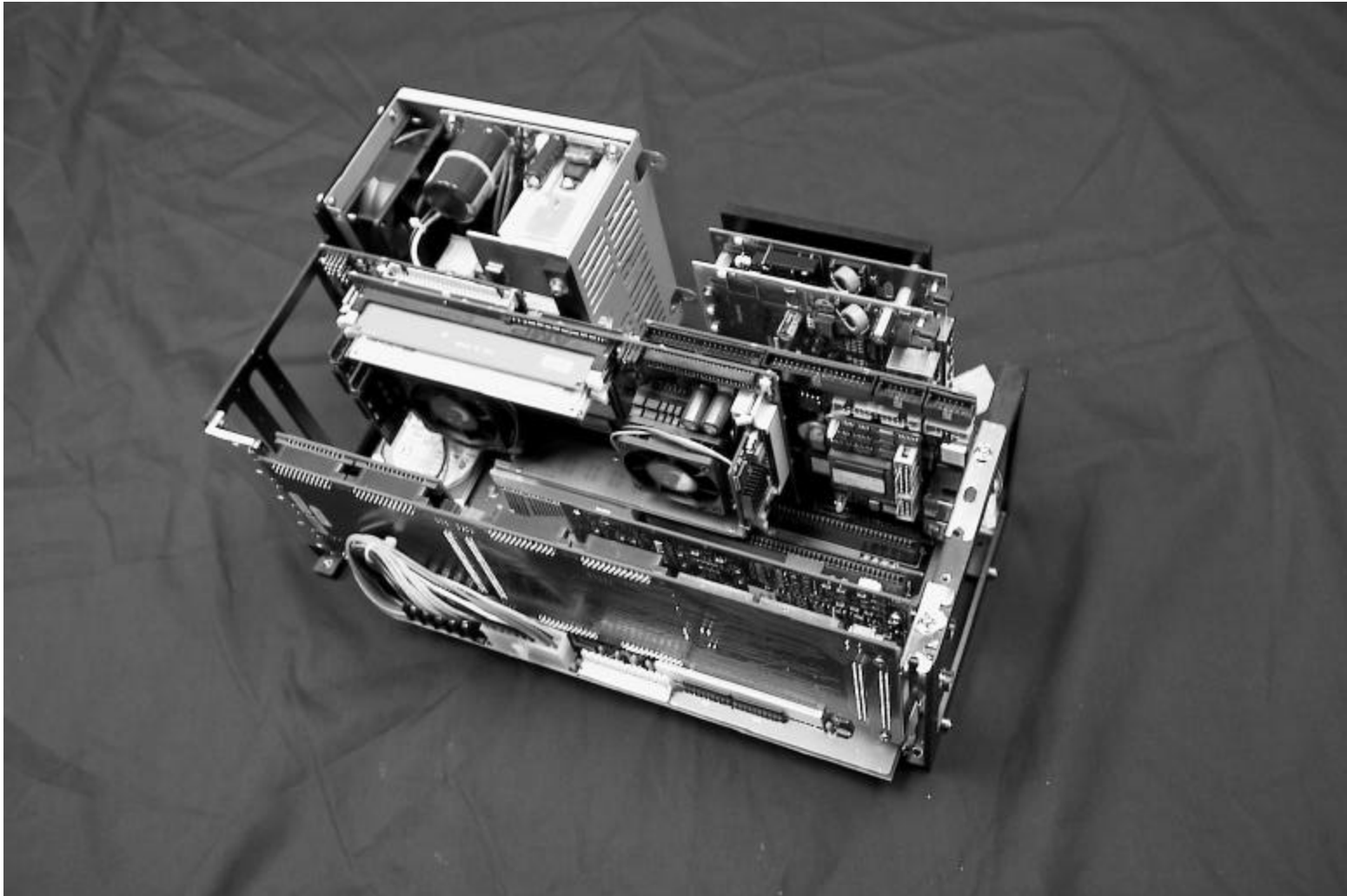
AUSA Demo Prototype LRUs



Visual Subsystem (VS) Prototype LRU



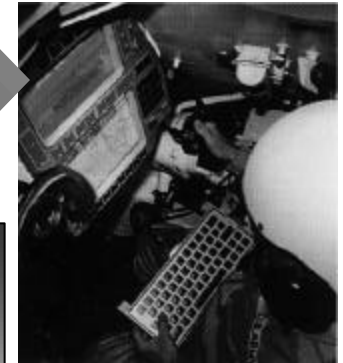
Embedded Training (ET) Prototype LRU



M1A2 SEP Tank Embedded Training Technology



M1A2 SEP Tank Block Upgrade
FY 03/04



Requirements

Technology Transfer



MCSSL (ET R&D)

- Design & Documentation
- A/B-Kit Development

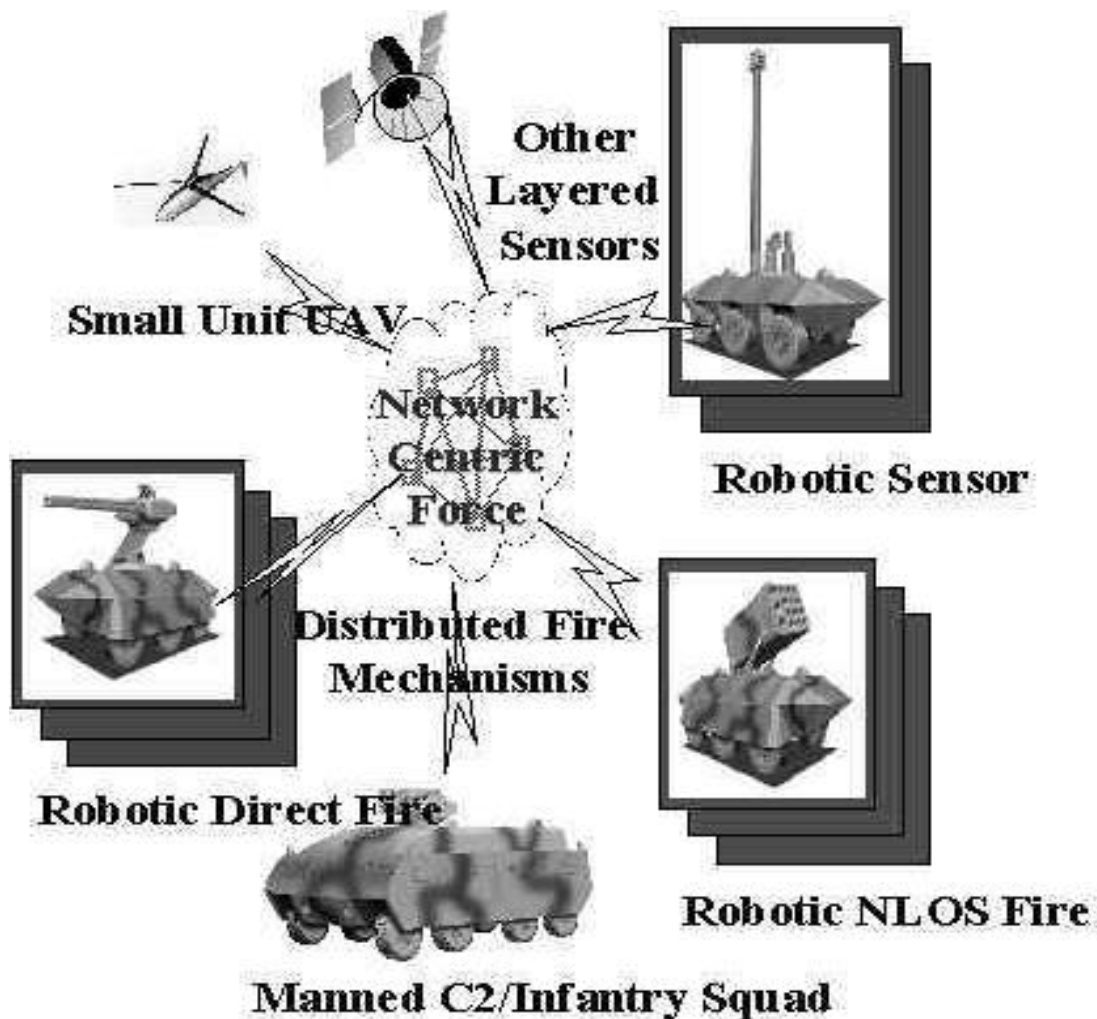
- Precision Gunnery
- Full Crew Training
- Mission Planning/Rehearsal
- Mobility Training
- Section/Platoon Gunnery
- Combined Arms Training



Embedded Training Technology Challenges

- **Medium Risk Technology Challenges**
 - Hardware Miniaturization, Ruggedization, Heat Management
 - Secure High Bandwidth Inter-vehicular Communication
 - Real-time Database Development & Deployment
- **High Risk Technology Challenges**
 - Virtual Image Insertion into Live Imagery
 - Synchronized Semi-Auto Forces

Future Combat Systems



Future

Embedded Training