UNITED STATES ARMY
TRAINING AND DOCTRINE COMMAND
AND
UNITED STATES ARMY MATERIAL COMMAND

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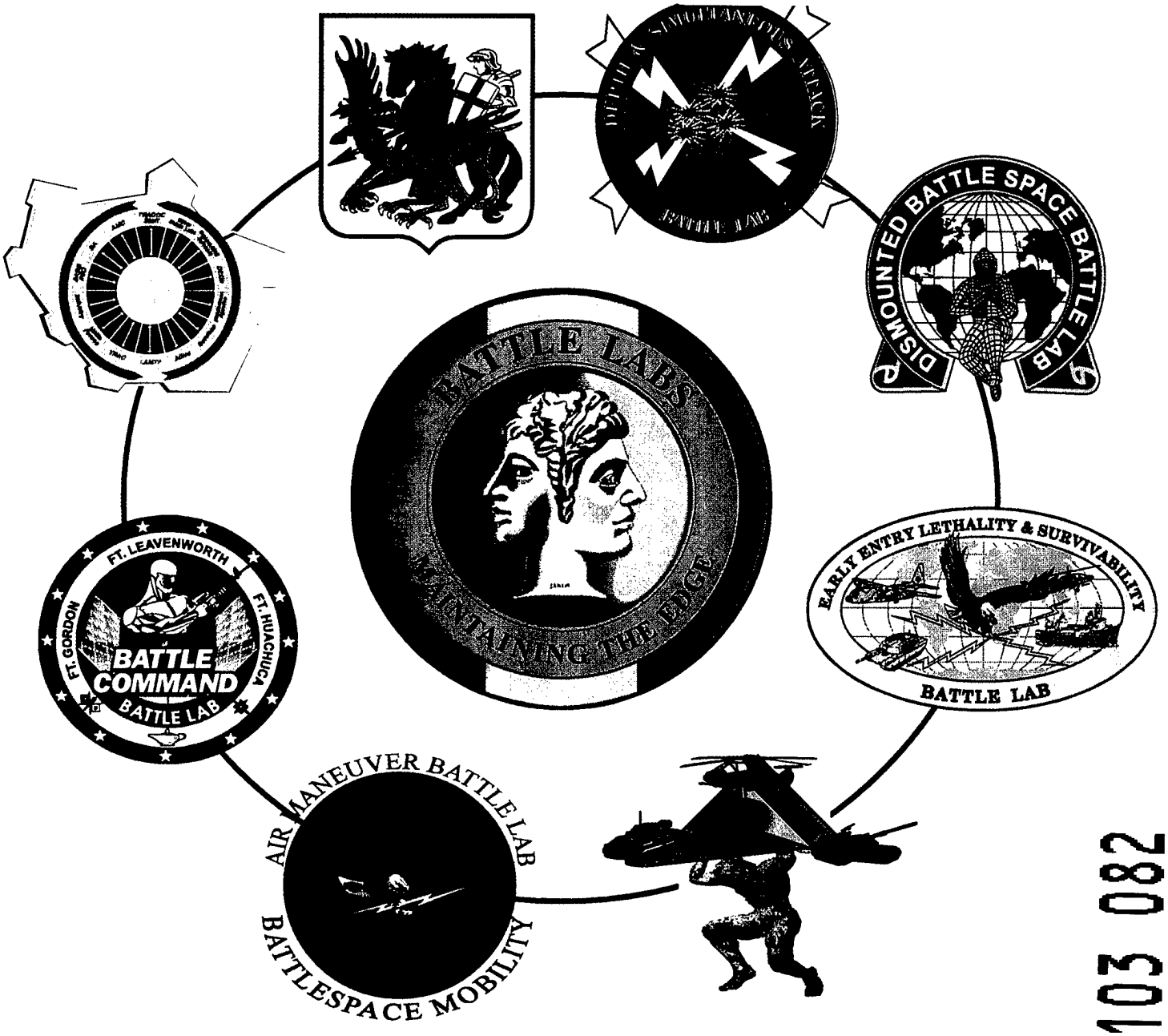

ADVANCED CONCEPTS & TECHNOLOGY II
PRE-PROPOSAL CONFERENCE
APRIL 14 -15, 1997

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY TRAINING AND DOCTRINE COMMAND
FORT MONROE, VIRGINIA 23651-5000

March 4, 1997

REPLY TO
ATTENTION OF

Battle Lab Integration, Technology
and Concepts Directorate

Ladies and Gentlemen:

I am pleased to present to you the proceedings of the Advanced Concepts and Technology II (ACT II) Pre-Proposal Conference for Fiscal Year 1998. The purpose of this conference is threefold. First, to present "technology demonstration interests" of the Battle Labs to industry and facilitate discussion topics; second, to allow industry to comment on the Draft Broad Agency Announcement (BAA); and third, to provide industry an opportunity to question the ACT II Program and procedures. These objectives are aimed at helping industry understand and respond to Army war-fighting capability requirements and for improving the ACT II Program.

This program represents the single best means for industry to demonstrate mature or nearing maturity technologies to the Battle Labs. Nowhere else in the Army's modernization efforts can industry's independent research and development efforts, combined with the streamlined acquisition approach, provide immediate technology superiority for the Army of the 21st century.

Your participation is warmly accepted, and we actively seek a partnership with you.

Sincerely,

Robert T. Clark

Robert T. Clark
Brigadier General, U.S. Army
Deputy Chief of Staff for
Combat Developments

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PRE-PROPOSAL CONFERENCE AGENDA

APRIL 14-15, 1997
OMNI NEWPORT NEWS HOTEL
NEWPORT NEWS, VIRGINIA

TUESDAY, APRIL 15, 1997

0600 REGISTRATION CONTINUES

0745 OPENING SESSION

ADMINISTRATIVE REMARKS
Captain J. G. Byrum
Battle Lab Integration, Technology and Concepts Directorate
Training and Doctrine Command

0800 INTRODUCTORY REMARKS - USER'S PERSPECTIVE
Brigadier General Robert T. Clark
Deputy Chief of Staff for Combat Developments
Training and Doctrine Command

0820 INTRODUCTORY REMARKS - DEVELOPER'S PERSPECTIVE
Major General Roy E. Beauchamp
Deputy Chief of Staff for Research, Development & Acquisition
Army Materiel Command

0840 ADVANCED CONCEPTS AND TECHNOLOGY II PROGRAM OVERVIEW
Dr. Kenneth Gabriel
Chief, Army Research Office - Washington

0920 BATTLE LAB OVERVIEW
Colonel Michael K. Mehaffey
Director, Battle Lab Integration, Technology and Concepts Directorate
Training and Doctrine Command

BREAK

1030 SESSION I - TECHNOLOGY DEMONSTRATION TOPICS

BATTLE COMMAND BATTLE LABS

Lieutenant Colonel (P) Douglas MacGregor
Deputy Director
Fort Leavenworth, KS

Colonel Reid Huff
Deputy Director
Fort Huachuca, AZ

Mr. Thomas W. Mims
Chief, Technical Assessment Division
Fort Gordon, GA

DEPTH & SIMULTANEOUS ATTACK BATTLE LAB
Mr. George Durham
Assistant Deputy Director

1130 QUESTIONS AND ANSWERS

1200 LUNCH

1330 SESSION II - TECHNOLOGY DEMONSTRATION TOPICS

COMBAT SERVICE SUPPORT BATTLE LAB
Colonel Larry W. Matthews
Deputy Director

EARLY ENTRY LETHALITY & SURVIVABILITY BATTLE LAB
Colonel Daniel R. Fake
Deputy Director

1450 QUESTIONS AND ANSWERS

DISMOUNTED BATTLESPACE BATTLE LAB
Mr. Richard Caravana
Assistant Deputy Director

AIR MANEUVER BATTLE LAB
Colonel Gary Coleman
Deputy Director

MANEUVER SUPPORT BATTLE LAB
Colonel Edwin J. Arnold
Deputy Director

MOUNTED BATTLESPACE BATTLE LAB
Mr. David Estes
Assistant Deputy Director

BREAK

1600 DRAFT BROAD AGENCY ANNOUNCEMENT QUESTIONS AND ANSWERS

1615 CLOSING REMARKS
Brigadier General Robert T. Clark
Deputy Chief of Staff for Combat Developments
Training and Doctrine Command

THE OVERALL CLASSIFICATION

OF THIS PUBLICATION IS

UNCLASSIFIED

NOTICE

This publication contains the briefings presented during this Pre-Proposal Conference of the Fiscal Year 98 Advanced Concepts and Technology II (ACT II) Program. Following the Conference, you may obtain a Proceedings Book, for a minimum fee, by contacting the Defense Technical Information Center (DTIC) References Service. The telephone number is 1-800-225-3842, option 5.

We hope that the above publication proves beneficial to your participation in the ACT II Program. If you have any additional questions and/or suggestions, please contact the Battle Lab Integration, Technology, and Concepts Directorate, ATCD-B, ATTN: CPT Byrum, (757) 728-5985.

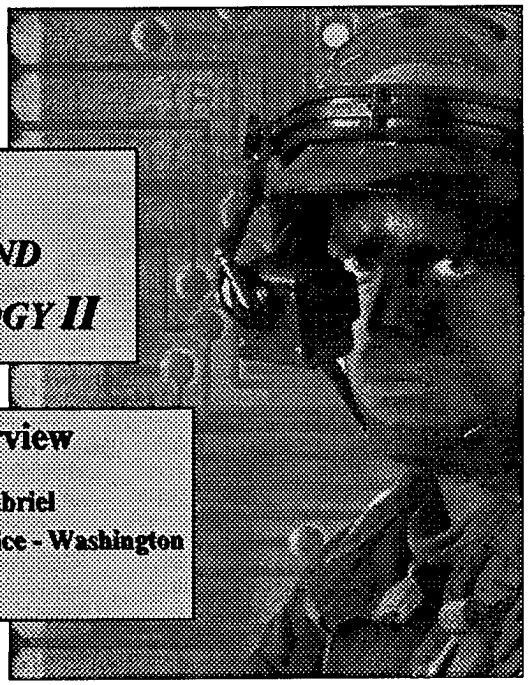
DISCLAIMER

The use of trade names in this report does not constitute official endorsement of any products. This report may not be cited for purpose of advertisement.

The Pre-Proposal Conference is not to be interpreted as the official ACT II acquisition solicitation (Broad Agency Announcement). Every attempt has been made to provide the most accurate data; however, the ACT II BAA, when released, shall be the official document for proposal preparation and submission information.

Army Research Office

ARMY RESEARCH OFFICE



ADVANCED CONCEPTS AND TECHNOLOGY II

Program Overview

Dr. Kenneth A. Gabriel
Director, Army Research Office - Washington

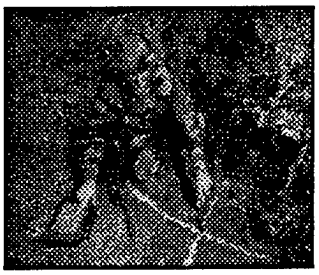
15 April 1997

ARMY RESEARCH OFFICE

The Vision of ACT II

Provide the user with a means to experiment with enabling technologies for near-term consideration or transition

ACT II **is unique in DoD by providing a common forum for user-developer interaction. This enables Battle Labs to rapidly access technologies and demonstrate meaningful solutions for our soldiers in one year.**



- ***Transform enabling technologies into user demonstrations in one year ...***
- ***Provide industry low-cost access to view the user's short term needs ...***
- ***Enhance the flexibility of Army acquisition.***

Army Research Office

ARMY RESEARCH OFFICE

Program Objectives

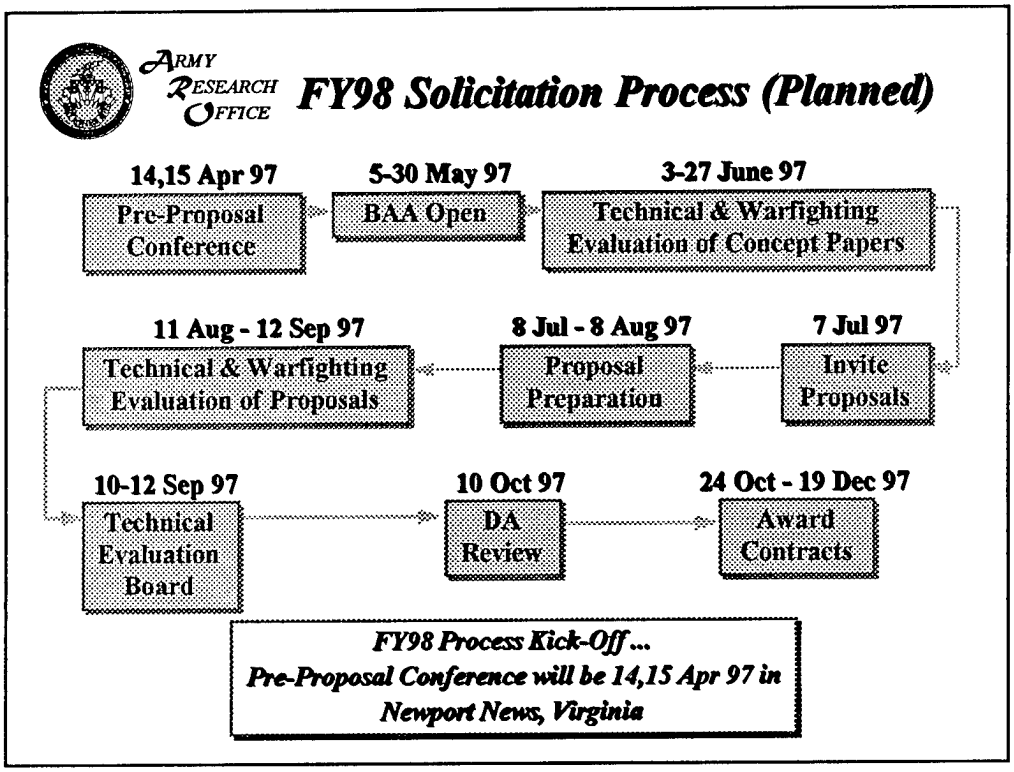
- Fund Industry/Academia to Demonstrate Concepts at the Army's Battle Labs
- Encourage Application of New Technology or Technology not Currently Available to the Army
- Transition Successful Technology to End Items or a Regular Funded Army Research and Development Program
- Accelerate the Army's Acquisition Cycle

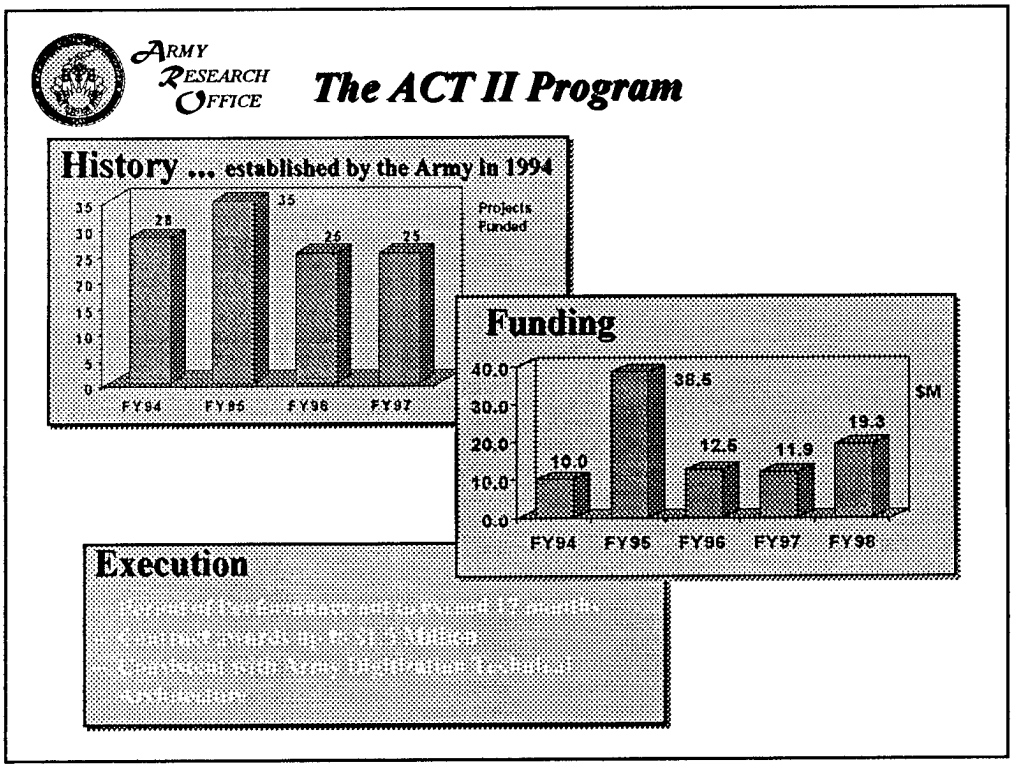
ARMY RESEARCH OFFICE

The Army's Battle Labs

- Battle Command
- Mounted Maneuver
- Dismounted Maneuver
- Aviation
- Maneuver Support
- Combat Service Support
- Depth and Simultaneous Attack
- Early Entry Lethality and Survivability

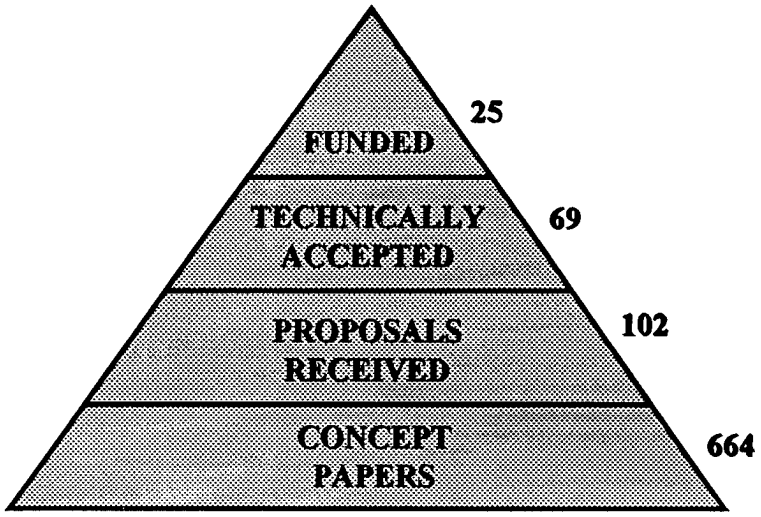
Army Research Office





ARMY RESEARCH OFFICE

FY97 ACT II Program



ARMY RESEARCH OFFICE

The Evaluation Process ...

Your Part:

Step 1: Two-Page Concept Papers

Step 2: Full Proposals

Our Part:

- **Technical Evaluation**
- **Military Evaluation (weighted heaviest)**
- **Cost Realism**
- **Order-of-Merit Listing**

... Designed to Reduce Your Burden

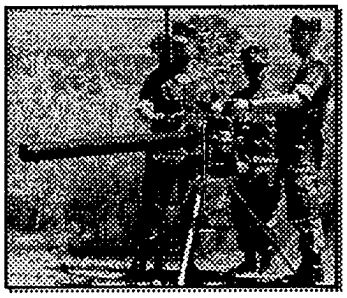
Army Research Office

Technical Evaluation Criteria

- Soundness and Technical Merit of the Proposed Approach and its Incremental Progress Toward Topic or Subtopic Solution
- Adequacy of the Proposed Effort in Fulfilling the Requirements of the Topic
- Qualification of the Proposed Principal Key Investigators, Supporting Staff, and Consultants
- Does not Duplicate Current or Previous Efforts

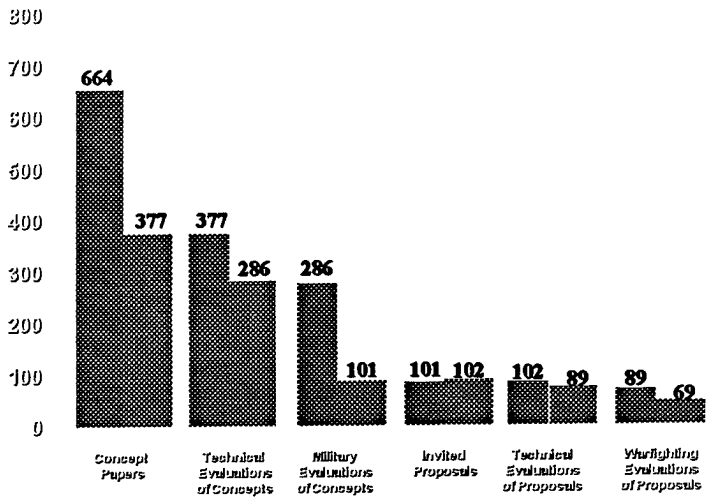
Warfighting Capability Criteria

- Doctrinal Soundness and the Improvements Proposed in the Topic Area
- Reasonableness and Feasibility to Demonstrate the Proposed Topic Areas' Warfighting Capability



Army Research Office

FY97 ACT II Evaluation Process



FY97 Project Summaries

Proposal	Company	Proposal Title	RDEC
97-BCBL-064	Lucent Technologies Inc	Advanced Party Cellular Communications Support w/VSAT Back-haul Capability	CECOM
97-CSS-018	McDonnell Douglas Aerospace	Integrated Maintenance and Logistics Soldier System	NRDEC
97-DBBL-023	FFE International Inc	Improved Survivability with Holographic I2 Goggles	CECOM
97-DSA-018	Hughes Missile Systems Co	Outrider (Silent Eyes) Imaging Artillery Projectile	ARDEC
97-EELS-039	Rolands and Associates Inc	Integration of IDEAAS in JTLS Using Distributed Interactive Simulation Protocol	MICOM
97-LAM-007	Research Triangle Institute	Trauma Patient Simulation	MRMC
97-MTD-009	Lockheed Martin Vought Systems Corp	Virtual Prototype for Future Scout Systems	TARDEC
97-BCBL-073	Mystech Associates Inc	Implementation of "Knowbots" on the Tactical Internet	CECOM

Army Research Office

ARMY RESEARCH OFFICE FY97 Project Summaries (Con't)

Proposal	Company	Proposal Title	RDEC
97-CSS-117	Mobile Datacom Corp	Integrated MTS Technologies and Radio Frequency Tagging	CECOM
97-DBBL-079	Monterey Bay Corporation	Paintball-based Underbarrel Non-Lethal Weapon System	ARDEC
97-DSA-071	McDonnell Douglas Aerospace	Enhanced Combat Identification	MICOM
97-EELS-048	Northrop Grumman Corp	Use of Programmable Digital Radio for High Data Rate Tactical Wireless Comm Link	CECOM
97-MTD-062	Lockheed Martin Electro Optical Sys Inc	Semiconductor Laser Directional IRCM	CECOM
97-BCBL-075	Mystech Associates Inc	Federation of Existing RISTA Models	STRICOM
97-CSS-139	Morris Brown College, CERT	Competitive Algorithms for Computerized Training	ARI
97-DBBL-107	Chain Reactions Inc	Advanced Membrane Transducer for Increased Flexibility	CECOM

ARMY RESEARCH OFFICE FY97 Project Summaries (Con't)

Proposal	Company	Proposal Title	RDEC
97-DSA-047	Syracuse Research Corp	Distributed Interactive Simulation of Weapons Location Radar	CECOM
97-CSS-156	Trustees of Boston University	Chemical Agent Water Monitor	ERDEC
97-DSA-046	General Dynamics Lands Systems	SINCGARS High Data Networking Radio	CECOM
97-EELS-019	Harris RF Communications	High Data Rate Long-Range HF Communication System with Scalable Waveforms	CECOM
97-EELS-016	Physical Optics Corporation	Autonomous Remote Chem-Bio Agent Sensor	ERDEC
97-MTD-115	Optimetrics Inc	Development of Distributed Hit Avoidance Analysis Tool	TARDEC
97-CSS-082	Advanced Communications Systems Inc	Combat Service Support Command, Control, Communications and Automation Integration	CECOM
97-CSS-093	John Hopkins University	Non-Invasive Portable Imaging System for Casualty Monitoring	MRMC
97-DBBL-106	Powell River Laboratory	Precision Munitions	ARDEC

Battle Labs -- an Overview

TRADOC

Battle Lab Integration

Battle Lab Overview

Presented by

COL Michael K. Mehaffey

Director, Battle Lab Integration, Technology and Concepts Directorate
Deputy Chief of Staff for Combat Developments
Headquarters, US Army Training and Doctrine Command

Battle Labs

Battle Labs
Integration
Technology
Concepts
BLITCD

Why Battle Labs?

- The need to experiment
- Changes in strategy, policy & resources
- Changes in doctrine
- Methods of warfare are changing
- Tactically savvy soldiers & leaders
- Technology opportunities (especially info-)
- Provide sheltered institution for examining change

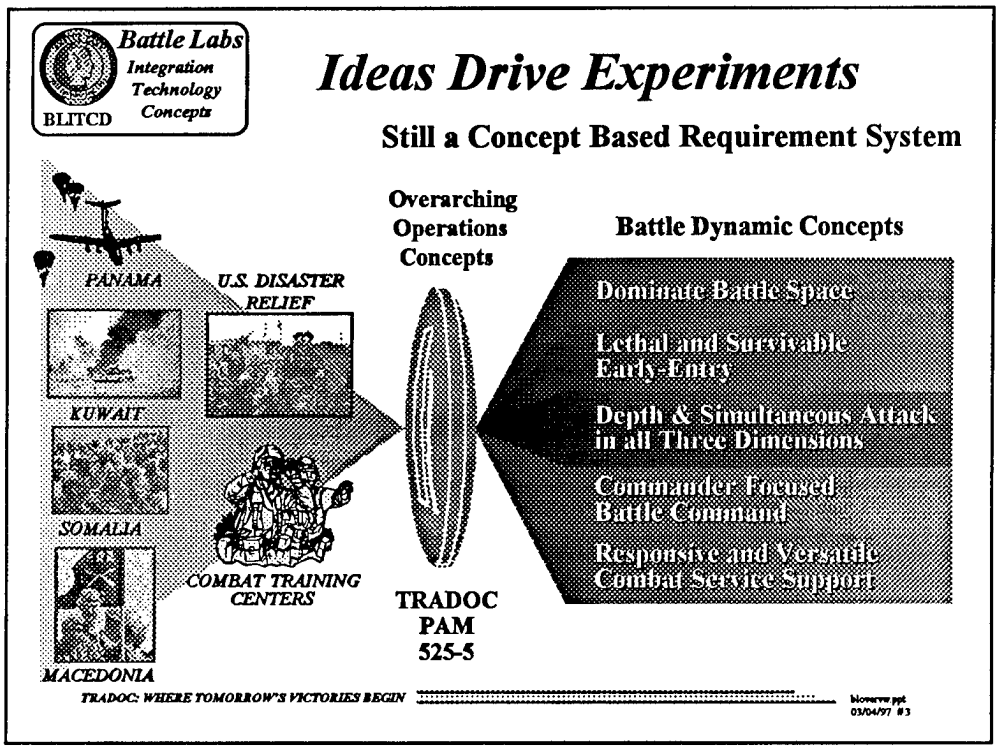
Established in May 1992

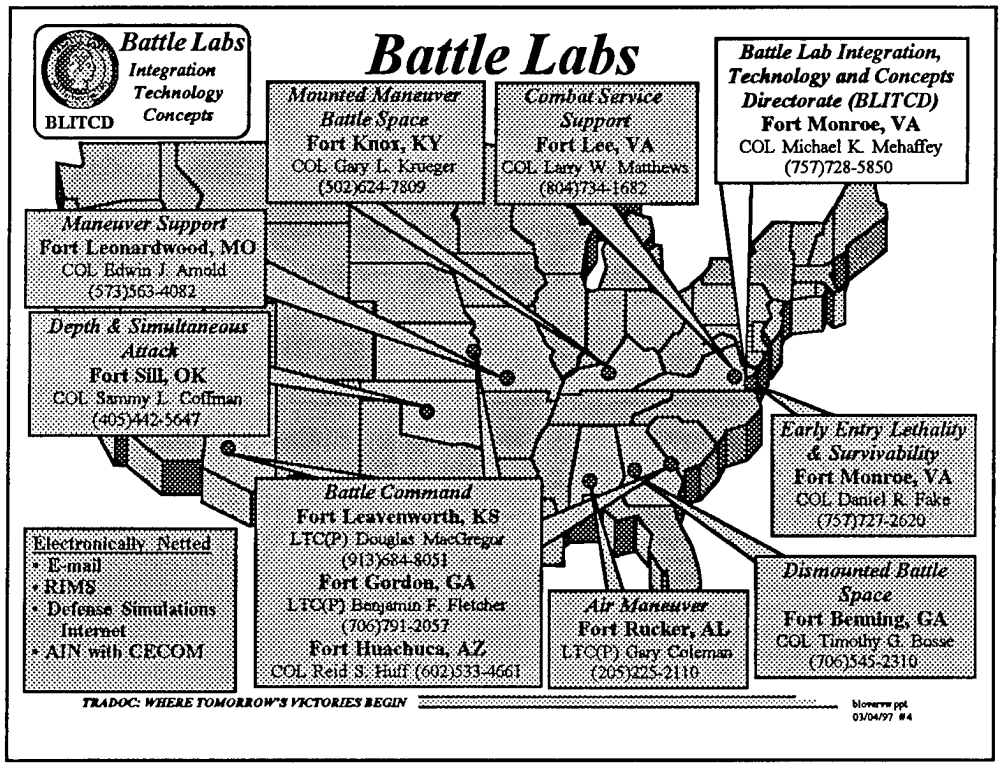
Historical underpinnings

Glimmerings of future battle

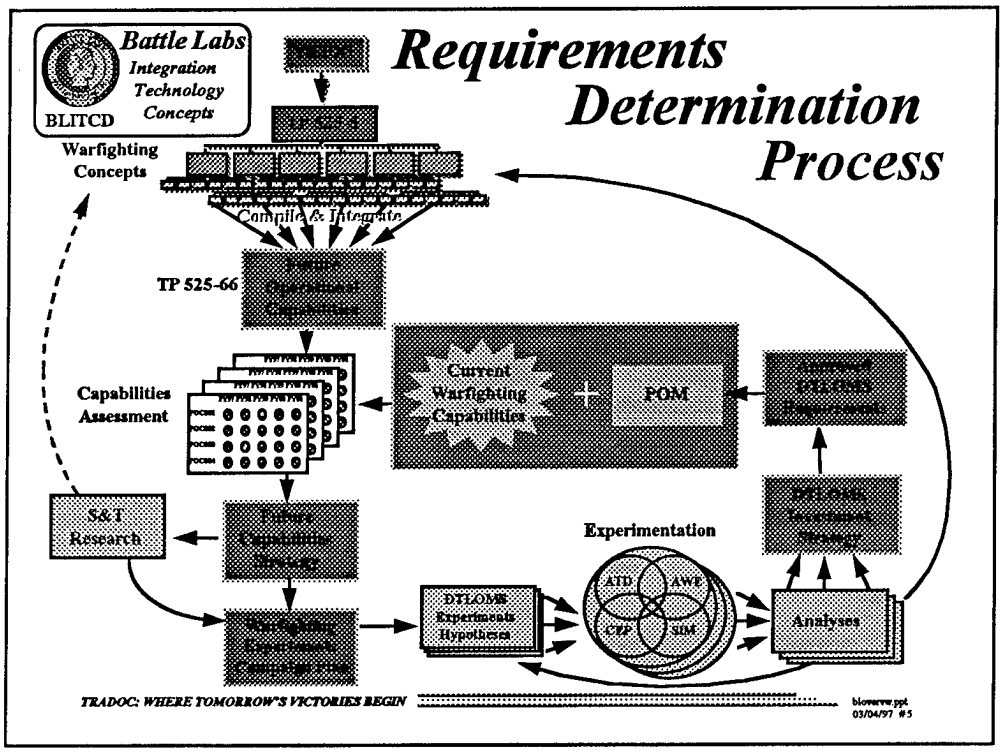
Operational Enhancements for deployed soldiers today!

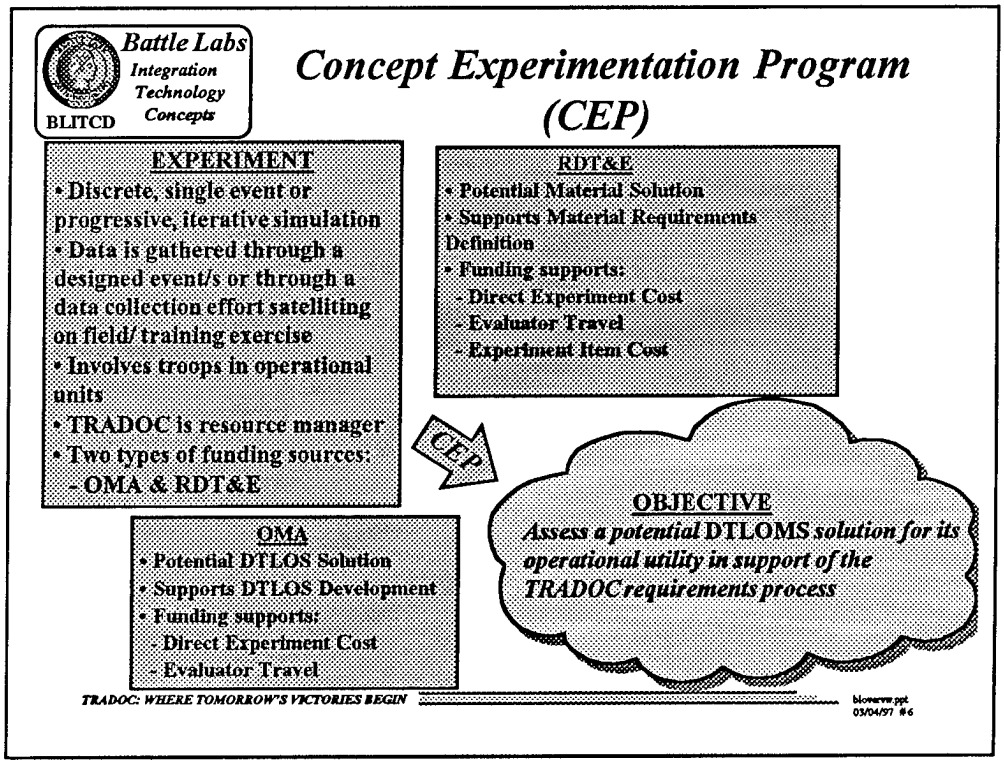
Battle Labs -- an Overview





Battle Labs -- an Overview



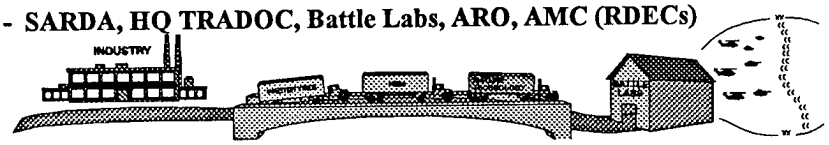


Battle Labs -- an Overview

Battle Labs
Integration
Technology
Concepts
BLITCD

Advanced Concepts and Technology II (ACT II) Program

- **Provides industry interaction with Battle Labs**
  - **Funding**
  - **Simplified Procedure**
  - **Mature Technologies**
  - **Non-developmental Items (NDI)**
  - **Prototypes**
- **Battle Labs and Proponents solicit highest priority FOC needs via a Broad Agency Announcement**
- **Army Research Office serves as TRADOC's executive agent**
- **Selection Process Participants:**
  - **SARDA, HQ TRADOC, Battle Labs, ARO, AMC (RDECs)**



TRADOC: WHERE TOMORROW'S VICTORIES BEGIN

Battle Labs
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Concepts
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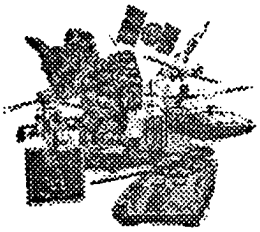
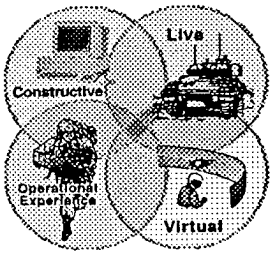
Battle Laboratory Experiment (BLE)

EXPERIMENT
- **Discrete, single event or progressive, iterative simulation**
- **Proponent and /or Battle Lab managed sponsorship**
- **Quick analysis of an issue**
- **Follows same requirements for experimentation planning and reporting as CEPs**





FUNDING
- **By sources other than the CEP (school discretionary funds or by funding from another government agency)**
- **Low cost**

TRADOC: WHERE TOMORROW'S VICTORIES BEGIN

Battle Labs -- an Overview

Battle Labs
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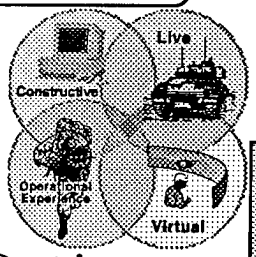
Advanced Warfighting Experiments



... are Center of Gravity culminating efforts, focused on major increases to warfighting capabilities across the Battlefield Dynamic and Battlefield Operating Systems

Doctrine
Training
Leader
Development
Organizations
Materiel
Soldiers

- ✓ Sponsored by HQ TRADOC or Battle Lab
- ✓ Broad in scope
- ✓ Multi-facetted simulations:
  - Tactically competitive environments
  - Progressive & iterative
  - Relevant scenarios
- ✓ Field soldiers and units
- ✓ Begins with hypothesis – works with issues and initiatives
- ✓ Combined Arms, horizontal look across the force
- ✓ Will yield ideas/results/technology:
  - that we keep... and invest in
  - discard
  - experiment further with

Battle Labs
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Concepts
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Advanced Technology Demonstration (ATD)

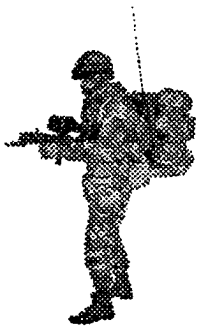
DESCRIPTION

- S&T funded
- Conducted in operational versus laboratory environment
- Defined exit criteria
- Transition into system improvements or R&D programs
- Performance period intended to be 3 - 5 years

EXECUTION

- SARDA approves and resources
- Battle Labs manage sponsorship and provide horizontal integration across the battlefield dynamics

FY 93
Battlefield Combat Identification
Intelligent Minefield
FY 94
Composite Armored Vehicle
Hunter Sensor Suite
FY 95
Target Acquisition
Guided MLRS
FY 96
Vehicle Mounted Mine Detector
Integrated Biodetection
FY 97
Battlespace Command and Control
Rapid Battlefield Visualization



OBJECTIVE
Evaluate technical performance against developed exit criteria

Battle Labs -- an Overview

Battle Labs
Integration
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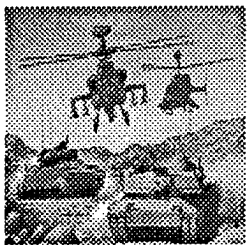
Advanced Concept Technology Demonstration (ACTD)

DESCRIPTION
- Integrating effort to assemble and demonstrate a significant, new military capability
- Based upon maturing advanced technology(ies)
- Conducted in an operational environment at adequate scale to clearly show utility and system integration
- Joint Potential

EXECUTION
- OSD approves
- Funding (cost share):
  - OSD and Service(s)
- Battle Labs provide Army management
- CINC Sponsor:
  - Provides units
  - Receives residuals

APPROVED ACTDs
Precision/Rapid Counter-MRL
Joint Countermine
Joint Combat Identification
Rapid Force Projection Initiative-Early Entry

APPROVAL IN PROCESS ACTDs
Rapid Battlefield Visualization
Joint Logistics
Military Operations in Urban Terrain (MOUT)



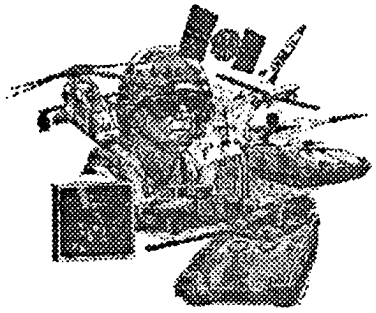
OBJECTIVES
- Evaluate military utility
- Develop concepts and doctrine
- Capture residual operational capability

Battle Labs
Integration
Technology
Concepts
BLITCD

Battle Labs...Agents of Change

"Requirements Determination Process / Acquisition"

- **Battle Labs methodology being explored by other Services**
- **British and Germans establishing their own labs**
- **Demonstrated reductions in cost, risk and fielding timelines of advanced capabilities**
- **Advanced capabilities provided to Contingency Forces**



The only thing harder than getting a new idea into the military mind is to get the old one out. ***B.H. Liddell Hart***

Battle Command Battle Lab - Ft. Leavenworth

TERRAIN EVALUATION FUNCTIONALITY SOFTWARE (TEF) FOR THE ARMY BATTLE COMMAND SYSTEM (ABCS)

LTC(P) DOUGLAS MACGREGOR
DEPUTY DIRECTOR
BATTLE COMMAND BATTLE LAB
FORT LEAVENWORTH, KS

UNCLASSIFIED

TERRAIN EVALUATION FUNCTIONALITY SOFTWARE (TEF) FOR THE ARMY BATTLE COMMAND SYSTEM (ABCS)

TAILORABLE AND SCALABLE "WARFIGHTER" TERRAIN EVALUATION SOFTWARE MODULE TO INCORPORATE WITHIN EACH UNIQUE ABCS COMPONENT. DUAL USE CAPABILITY TO SUPPORT TERRAIN EVALUATION TRAINING IN TRADOC SCHOOLS.

TEF SOFTWARE FOR ABCS

- VALIDATE ARMY RQMTS FOR JMTK
- TARGET USER IS *WARFIGHTER*
- SCALABLE AND TAILORABE TO BOS'es
  - * CTIS, MCS, ASAS, CSSCS, AFATDS, FAADC2I, FBCB2
  - * CTIS PROVIDES DATA SETS & COMPLEX ANALYSES
- CAPABLE OF USING MULTIPLE DATA SETS
- UNIX, WINDOWS 95, WINDOWS NT CAPABLE
- INCOPORATE TACTICAL WEATHER EFFECTS
- DUAL USE TERRAIN EVALUATION TRAINING
- DEVELOPMENT AT MSBL AND BCBL-L

Battle Command Battle Lab - Ft. Leavenworth

INNOVATIVE, INTERACTIVE, AND COLLABORATIVE MOBILE VISUALIZATION FOR BATTLE COMMAND

DESIGN, DEVELOP, AND TEST PROTOTYPE VISUALIZATION TECHNOLOGY FOR UNTETHERED WARFIGHTER IN STATIC AND MOBILE TACTICAL OPERATION CENTERS

INNOVATIVE, INTERACTIVE, AND COLLABORATIVE MOBILE VISUALIZATION FOR BATTLE COMMAND

- SIGNIFICANTLY REDUCE VOLUME, WEIGHT, & POWER REQUIREMENTS
- MULTIPLE INTERFACE CAPABILITY
- MAINTAIN REQUIRED MAP RESOLUTION
- BRIGHTNESS AND CONTRAST ACCEPTABLE
- MINIMAL NAUSEAU EFFECTS WHILE MOBILE
- UNTETHERED CAPABILITY FROM CPU
- TESTING & EVALUATION AT FT. LEAVENWORTH

Battle Command Battle Lab - Ft. Huachuca

Common Battalion-Level Battle Command System

COL Reid Huff
Deputy Director
Battle Command Battle Lab (Huachuca)

UNCLASSIFIED

Common Battalion-Level Battle Command System

- Objective

Develop a simplified prototype system that satisfies cross-Battlefield Functional Area (BFA) needs and the unique limitations of battle command at the maneuver battalion level.

Intent of the project is accelerated requirements definition and concept exploration with a focus on assessing the feasibility and desirability of adopting such a specialized capability for the battalion echelon.

Battle Command Battle Lab - Ft. Huachuca

Common Battalion-Level Battle Command System

- Problem

  - "One size fits all" design philosophy

  - Key messaging / database vertical BFA integration processes relative to Maneuver BN

Common Battalion-Level Battle Command System

- Approach

  - Select essential ATCCS capabilities

  - Evolve to a simplified BN prototype that supports proven integrated staff processes

  - Use ASAS-RWS Version 3 as candidate system
    - -- COE / CHS compliant migration path
    - -- Can host ASAS & MCS functionality
    - -- Supports immediate software re-use

Battle Command Battle Lab - Ft. Huachuca

Common Battalion-Level Battle Command System

- ACT II Focus: Four Primary Requirements
  - Integrated process through use of common tools
  - Common dynamic overlay exchange in lieu of messaging
  - Graphics & database interface / info exchange
  - Training

Common Battalion-Level Battle Command System

- Integrated Process Through Use of Common Tools
  - Automated IPB (Intelligence Preparation of the Battlespace)
  - Common tools for enemy & friendly Courses of Action (COA) development
  - Decision support template
  - Battlefield Operation System (BOS) synchronization / execution matrix
  - Execution matrix linked to battle tracking

Battle Command Battle Lab - Ft. Huachuca

Common Battalion-Level Battle Command System

- <u>Common Dynamic Overlay in Lieu of Messaging</u>

  - Distribution of core operations & intelligence graphics

  - Automated data-basing of user-selected graphics

  - Two-way, multi-node, automated overlay updates

  - Direct interface with Appliqué

Common Battalion-Level Battle Command System

- <u>Graphics & Database Interface / Info Exchange</u>

  - Significantly downsized database
    ...supports map icon placement

  - Capability to receive full download from higher echelons

  - Database info generated from icons & vice versa

  - Generate graphics which generate database records

Battle Command Battle Lab - Ft. Huachuca

Common Battalion-Level Battle Command System

- Training
  - Inherently merges & trains Operations & Intelligence
  - 5 days max to train an integrated S-2/3 audience
  - Graphical focus minimizes training complexities

Common Battalion-Level Battle Command System

- Contractor Development Environment
  - Development will occur on-site at Ft. Huachuca at the Battle Command Battle Lab (Huachuca) Battle Technology Laboratory facility
  - GFE: Source code
  - GFE: Development work station platform, All-Source Analysis System Remote Workstation (ASAS-RWS), Version 3

Battle Command Battle Lab - Ft. Huachuca

THE EMPLOYMENT OF MICROELECTRONIC SENSORS AND GROUND ROBOTIC VEHICLES TO ENHANCE ISR MISSIONS

Definition: The demonstration of microelectronic sensors onboard ground robotic or tele-operated vehicles to enhance and diversify ground intelligence collection capability.

THE EMPLOYMENT OF MICROELECTRONIC SENSORS AND GROUND ROBOTIC VEHICLES TO ENHANCE ISR MISSIONS

REQUIRED COLLECTION:

- Modern communications and non-communication signals
- Threat system data
- Terrain, environmental, & weather parameters
- NBC threats
- Theater Missile Attack
- Battle Damage Assessment
- Search underground pipelines

Battle Command Battle Lab - Ft. Huachuca

THE EMPLOYMENT OF MICROELECTRONIC SENSORS AND GROUND ROBOTIC VEHICLES TO ENHANCE ISR MISSIONS

SENSOR REQUIREMENTS:

- Collection against various signatures - electronic, visual, thermal, magnetic, acoustic, movement
- ATR recognition capabilities
- Easily reprogrammable via distributed means
- Electronic tagging capabilities
- Address cosite mitigation concerns

THE EMPLOYMENT OF MICROELECTRONIC SENSORS AND GROUND ROBOTIC VEHICLES TO ENHANCE ISR MISSIONS

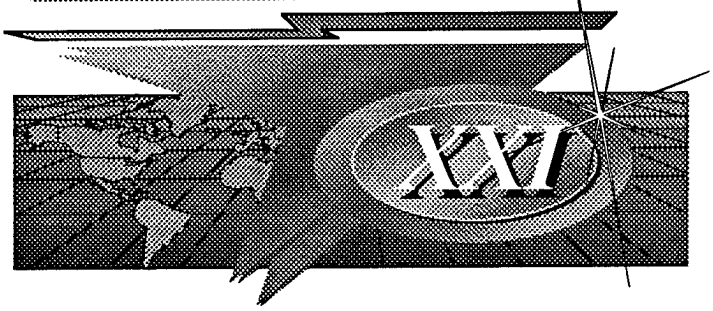
VEHICLE REQUIREMENTS:

- Small
- Control system design
- Information feedback and presentation
- Controller interface
- Maneuverability
- Obstacle avoidance

Battle Command Battle Lab - Ft. Gordon

America's Army

Warfighter Information Network



Thomas W. Mims
Chief, Technology Assessment Division
Battle Command Battle Lab
United States Army Signal Center
Fort Gordon, Georgia

ACT- II Pre-Proposal Conference
14-15 April 1997

"Key Leg of the Strategic Triad"

America's Army

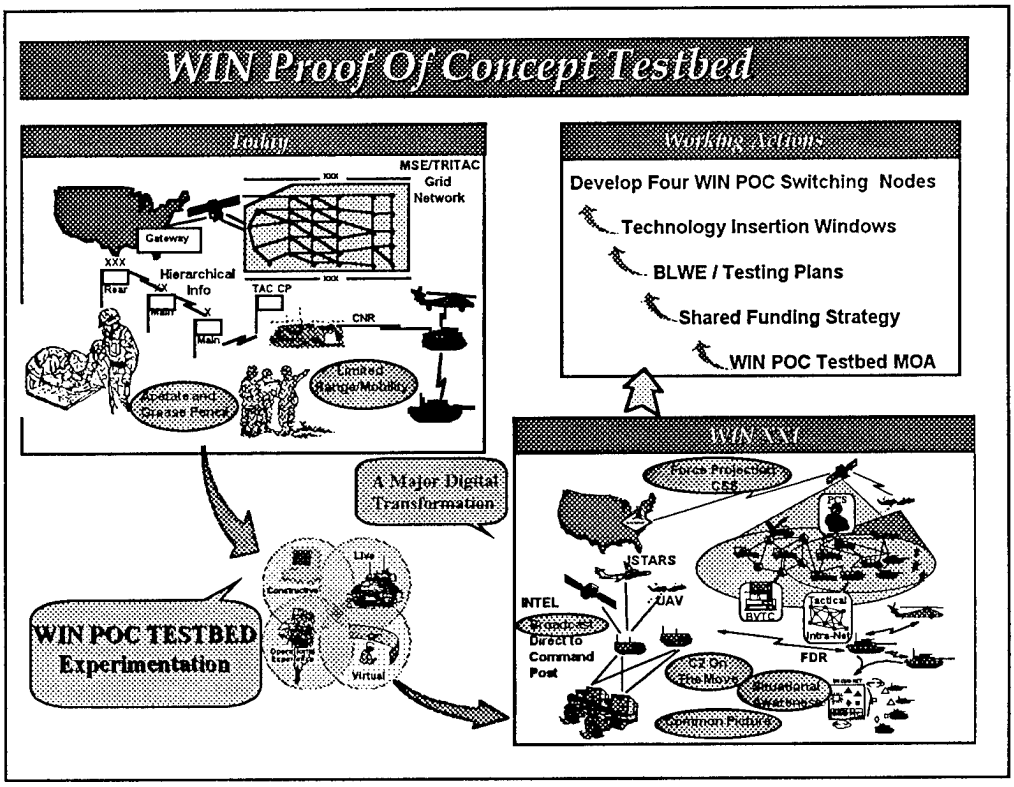
WIN Defined

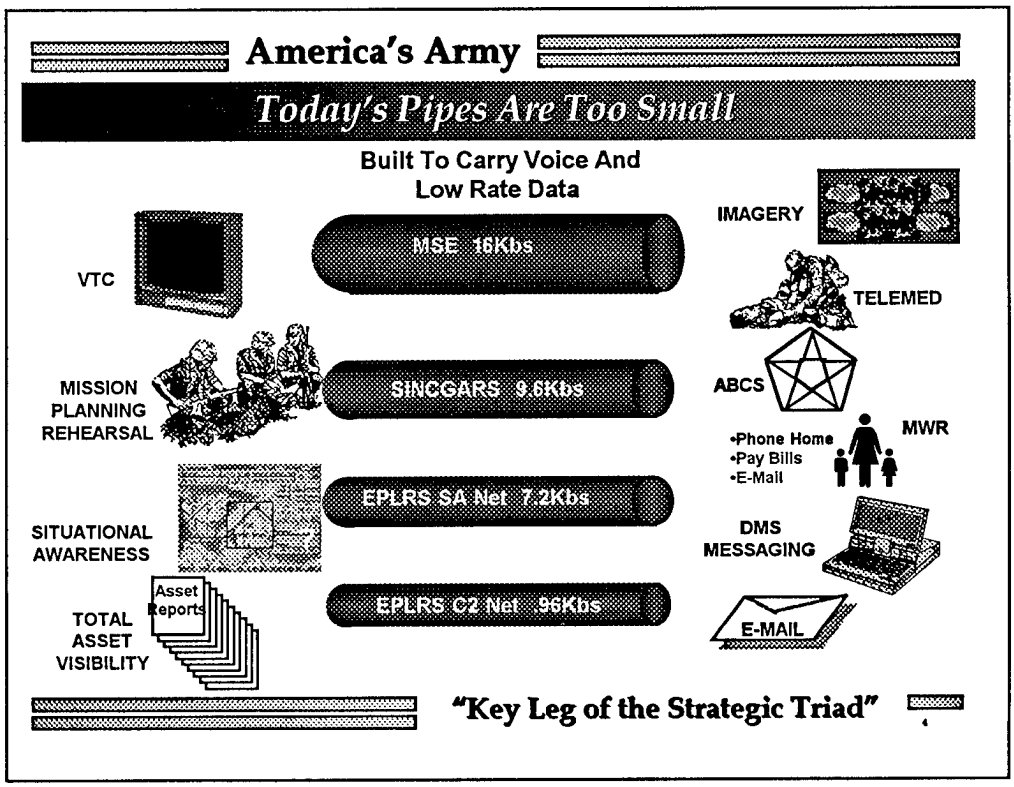
Warfighter Information Network (WIN) Concept:

An Evolving Integrated C4 Network that is Comprised of Commercially Based, High Technology Information and Communication Systems. *WIN* is Designed to Increase the Capacity and Velocity of Information Distribution Throughout the Battlespace in Order to Gain Information Dominance. *WIN* will Maximize Information Services for the Warfighter and Support the Power Projection Force of the 21st Century from Sustaining Base to Fighting Platform.

"Key Leg of the Strategic Triad"

Battle Command Battle Lab - Ft. Gordon





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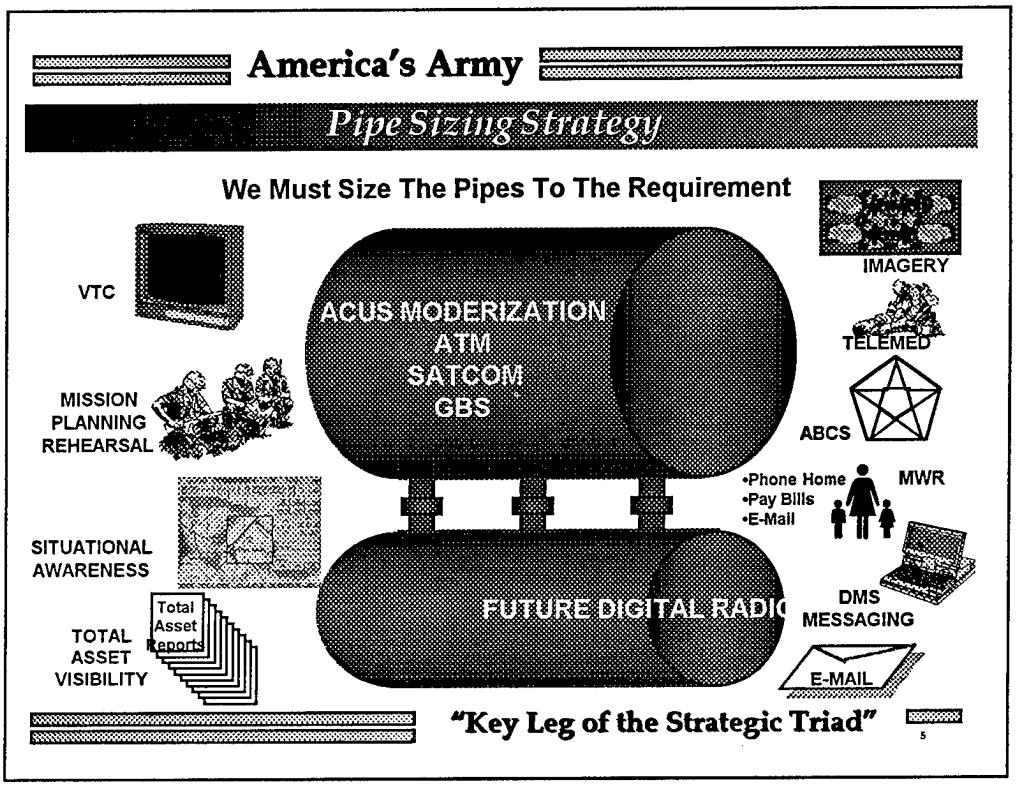
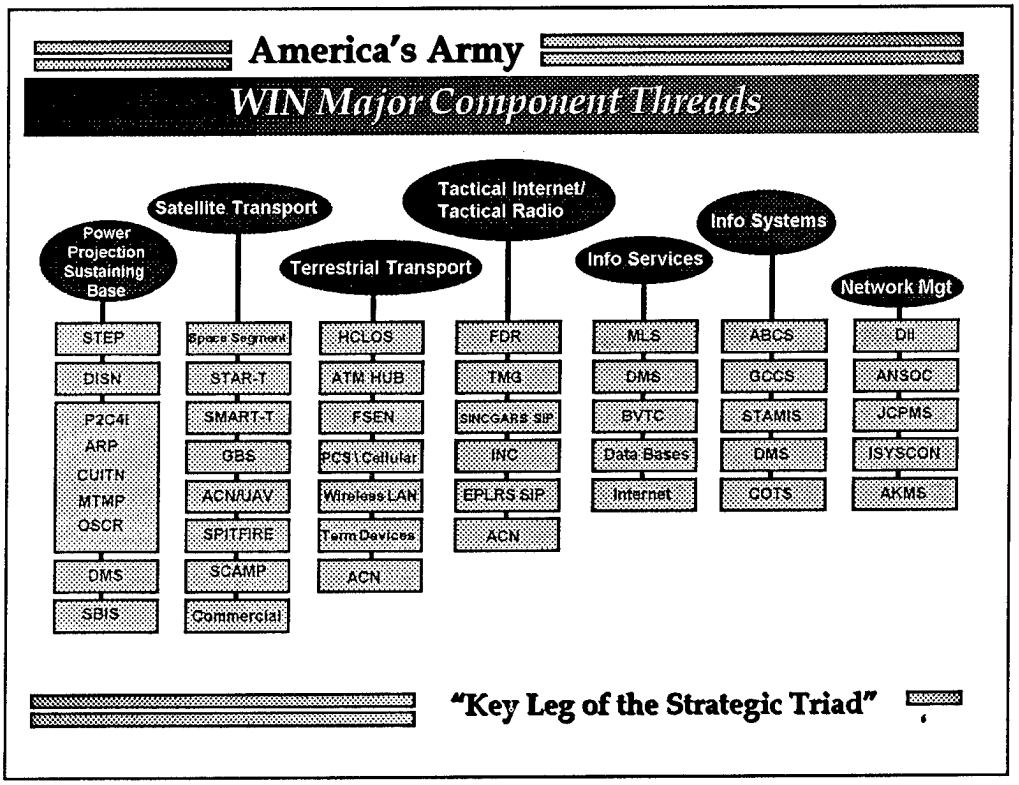
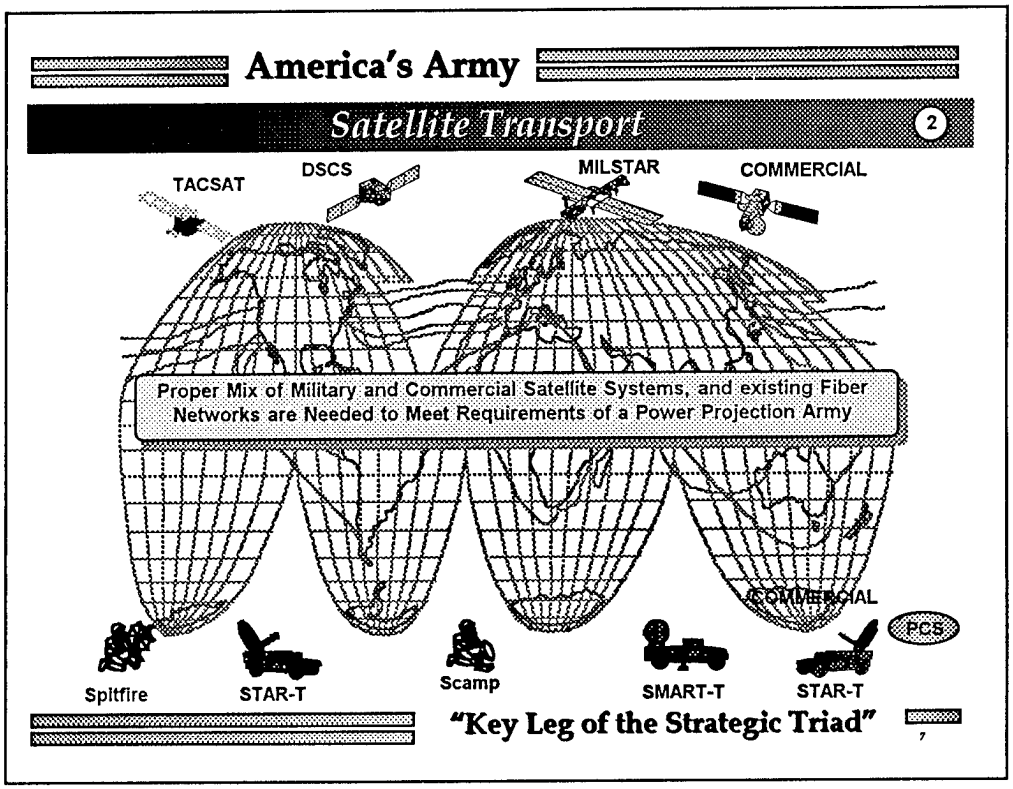
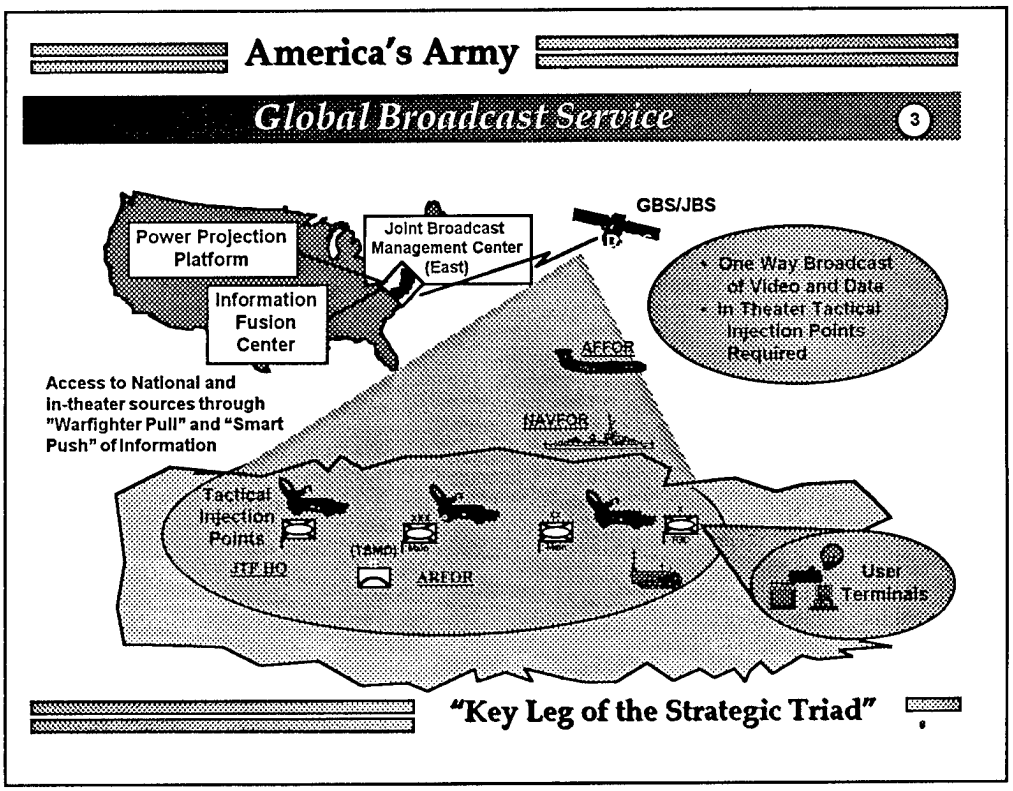


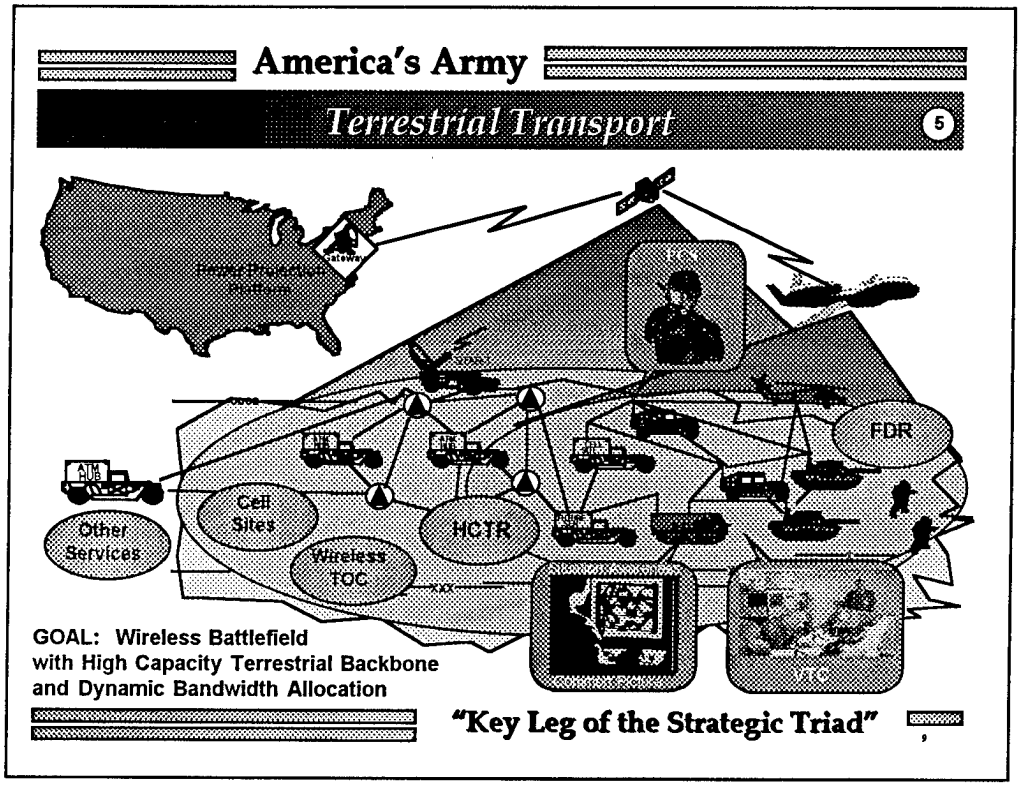


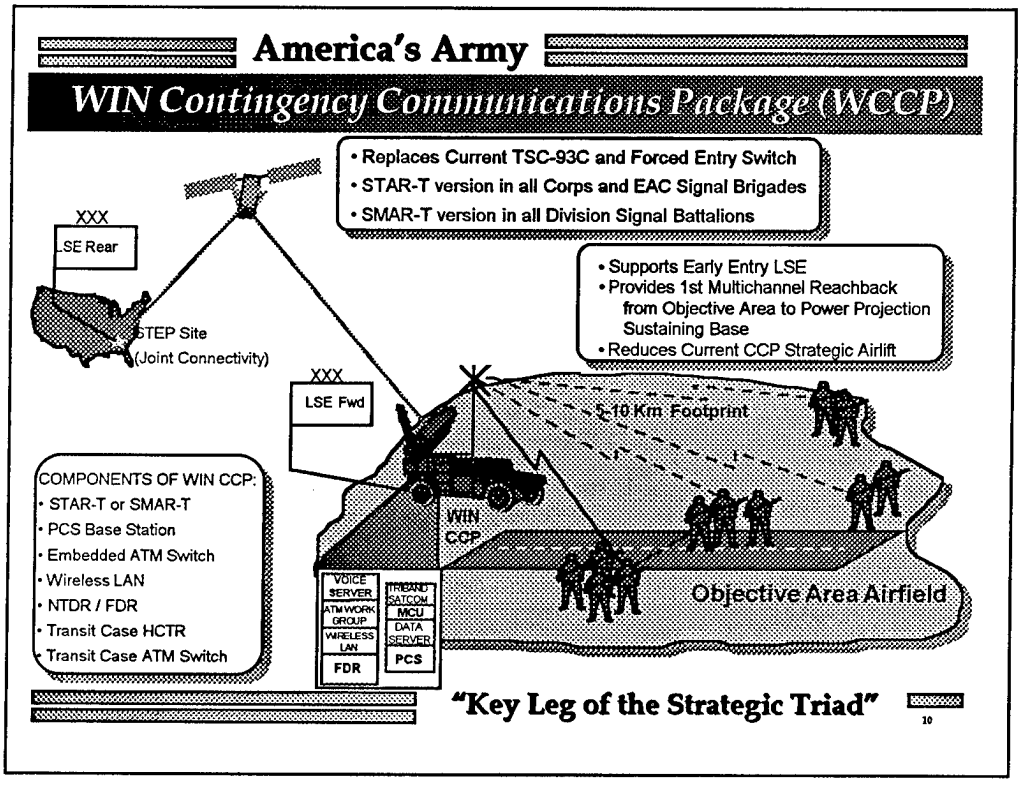
Battle Command Battle Lab - Ft. Gordon



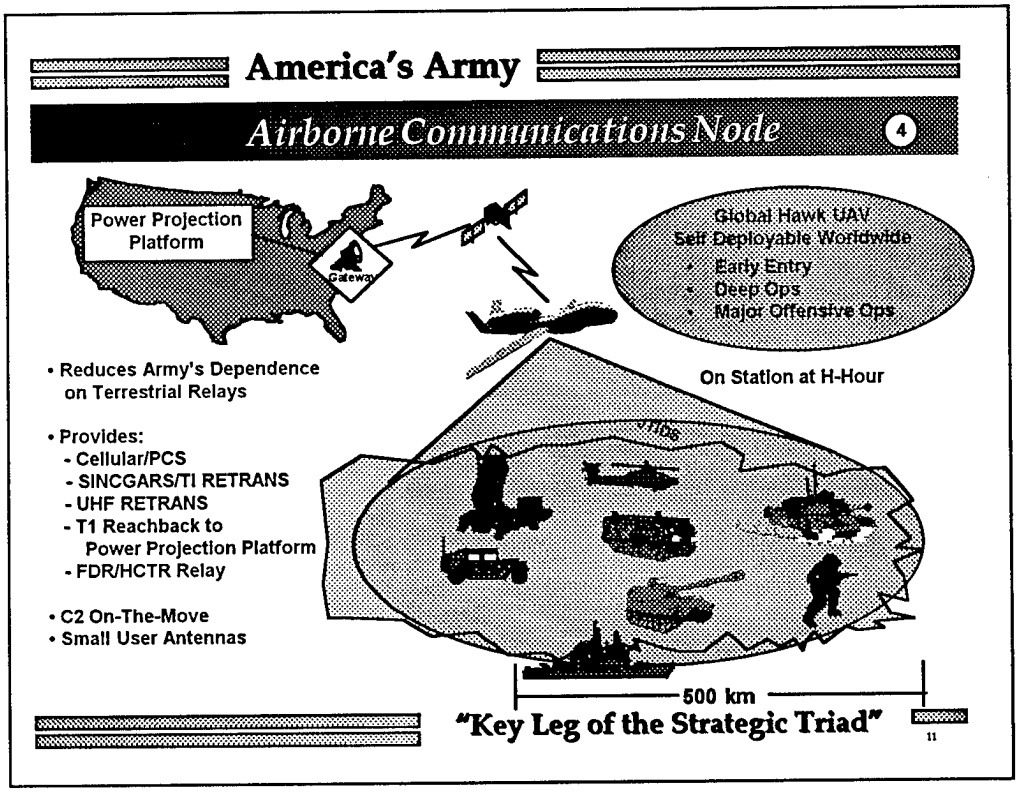


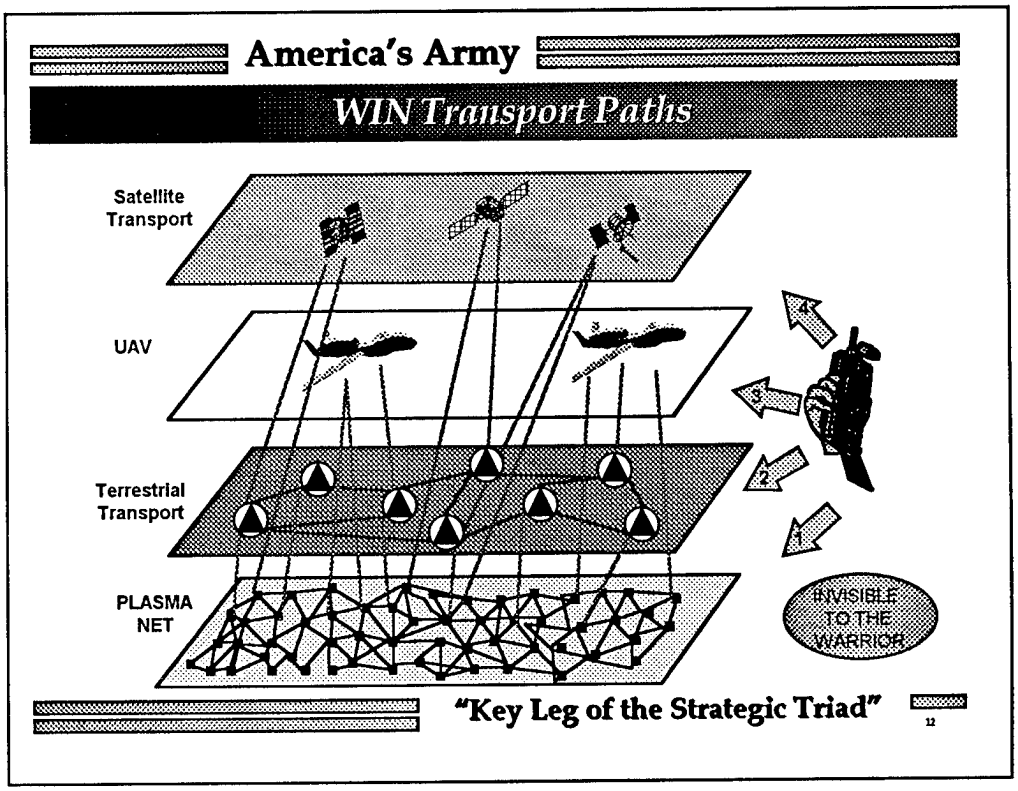
Battle Command Battle Lab - Ft. Gordon



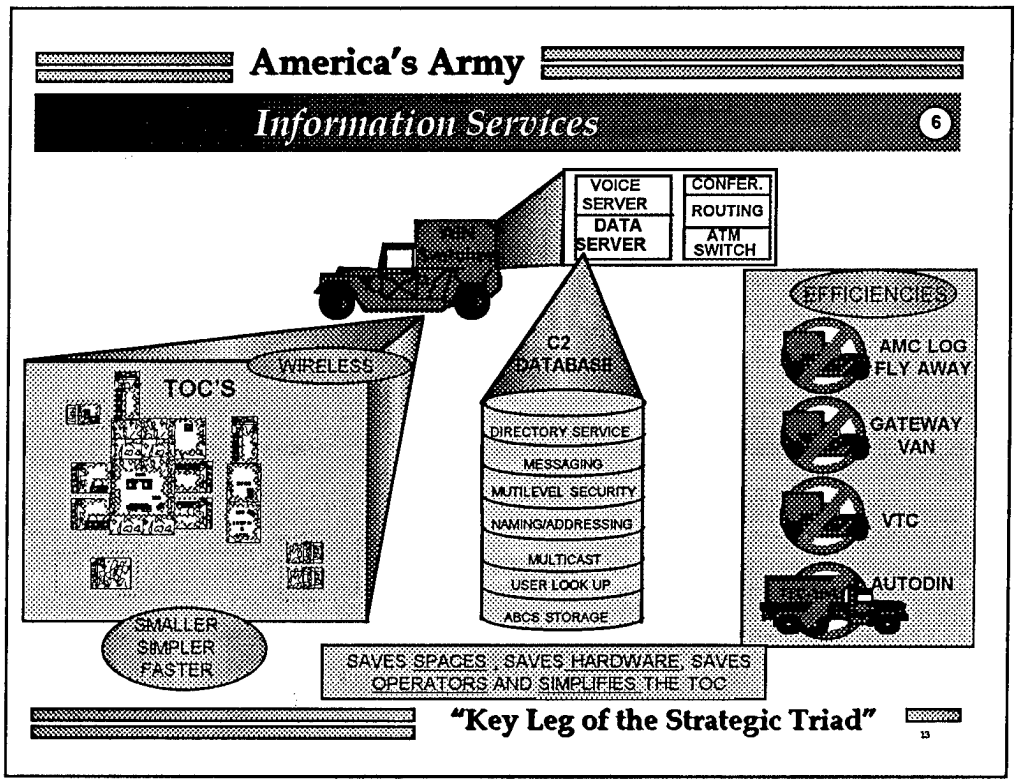


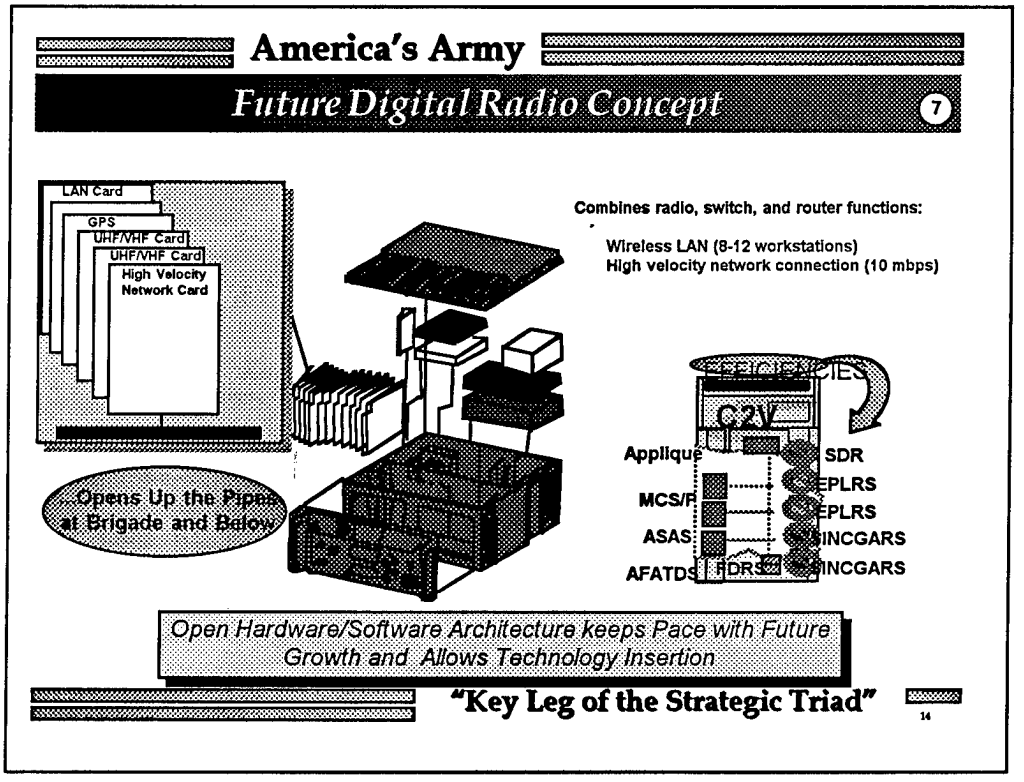
Battle Command Battle Lab - Ft. Gordon





Battle Command Battle Lab - Ft. Gordon





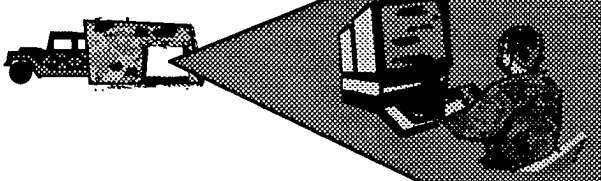
Battle Command Battle Lab - Ft. Gordon

America's Army

Joint Network Management

8

Electronic Network Management Un-Burdens the User



- FREQUENCY MANAGEMENT
- DIRECTORY MANAGEMENT
- COMSEC MANAGEMENT
- NETWORK LINK/ LOAD ANALYSIS
- SYSTEM STATUS
- ROUTING TABLES
- ASSET CONTROL
- SATCOM AVAILABILITY
- EQUIPMENT/ PERSONNEL STATUS
- CONTINUITY OF OPERATIONS
- WHAT IF DRILLS

The Complexity of New Systems is Overwhelming.

MUST BE CAREFULLY MANAGED

"Key Leg of the Strategic Triad"

15

America's Army

WIN Development Strategy

- ✓ Incremental Approach - Funding Bands Over Time
- ✓ Downsized, Smaller, More Efficient Designs
- ✓ Identify Legacy Programs that can be Replaced/Eliminated
- ✓ Re-invest Some Programmed Monies in "Network" Programs that Benefit Everyone - "Contribution" Tax
- ✓ Grow From Existing MDEPS - Minimize "New Start"
- ✓ Transition/Phase-out Costly User Unique Solutions (LSE Flyaway, MGV, Trojan Spirit, Telemedicine)

...Everyone has "Stock" in WIN... Requires a Concerted Funding Contribution from the Total Army

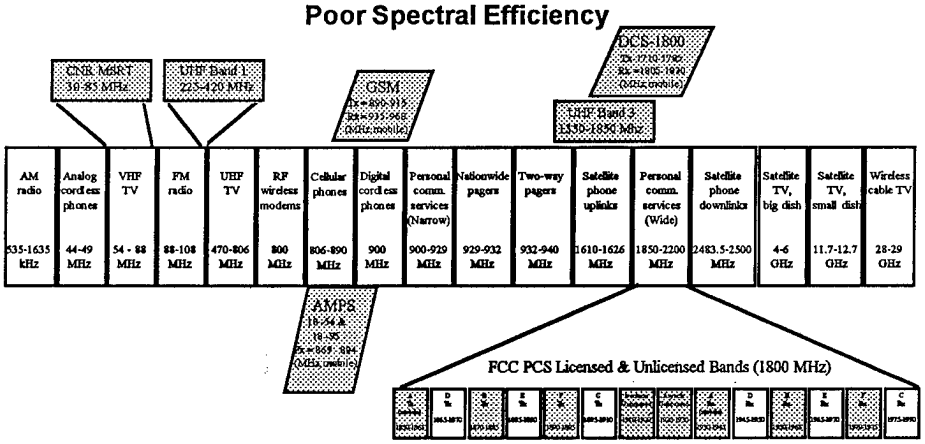
"Key Leg of the Strategic Triad"

16

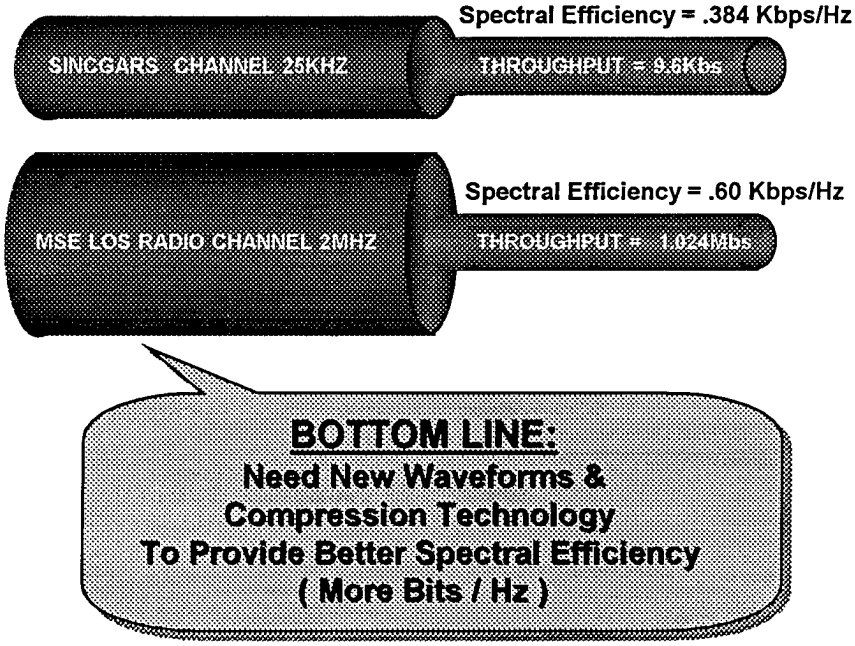
SPECTRAL EFFICIENCY & COMPRESSION TECHNOLOGY

Spectrum Issues:

Heavy Allocation of Frequency
Military Losing Dedicated Spectrum
Poor Spectral Efficiency



SPECTRAL EFFICIENCY / COMPRESSION TECHNOLOGY



BOTTOM LINE:

Need New Waveforms &
Compression Technology
To Provide Better Spectral Efficiency
(More Bits / Hz)

Depth and Simultaneous Attack Battle Lab Technology Interests

Mr. George Durham

Assistant DeputyDirector

Depth and Simultaneous Attack Battle Lab

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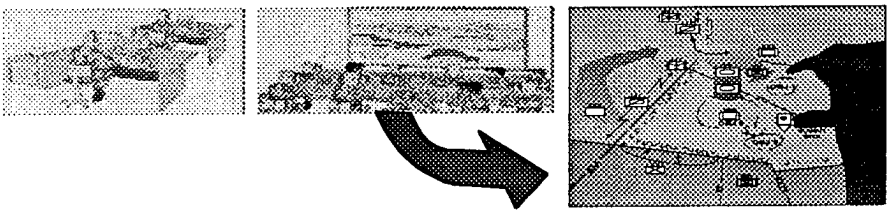
Advanced Training Technology for Mobile, Multi-level, Fire Support Organizations

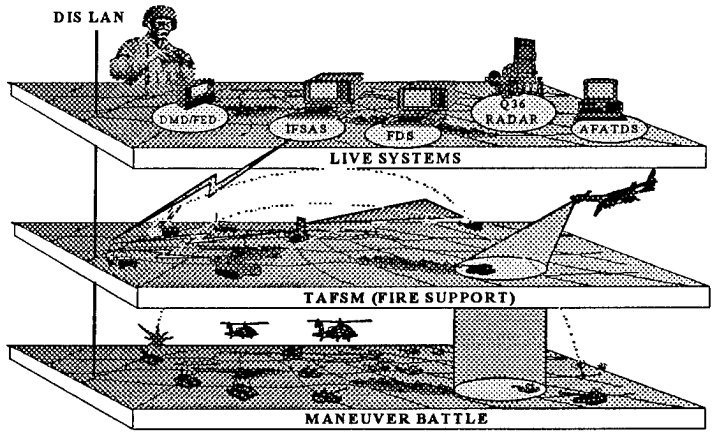


To demonstrate prototype interactive, collaborative, modular training technology which progresses beyond stand alone, localized training in a static operational or training environment to emphasize enhanced mobility corresponding to the supported force and the theater of operations.

Depth & Simultaneous Attack Battle Lab

Advanced Training Technology for Mobile, Multi-level, Fire Support Organizations

Multi-Level/Multi-Dimensional Training



Advanced Training Technology for Mobile, Multi-level, Fire Support Organizations

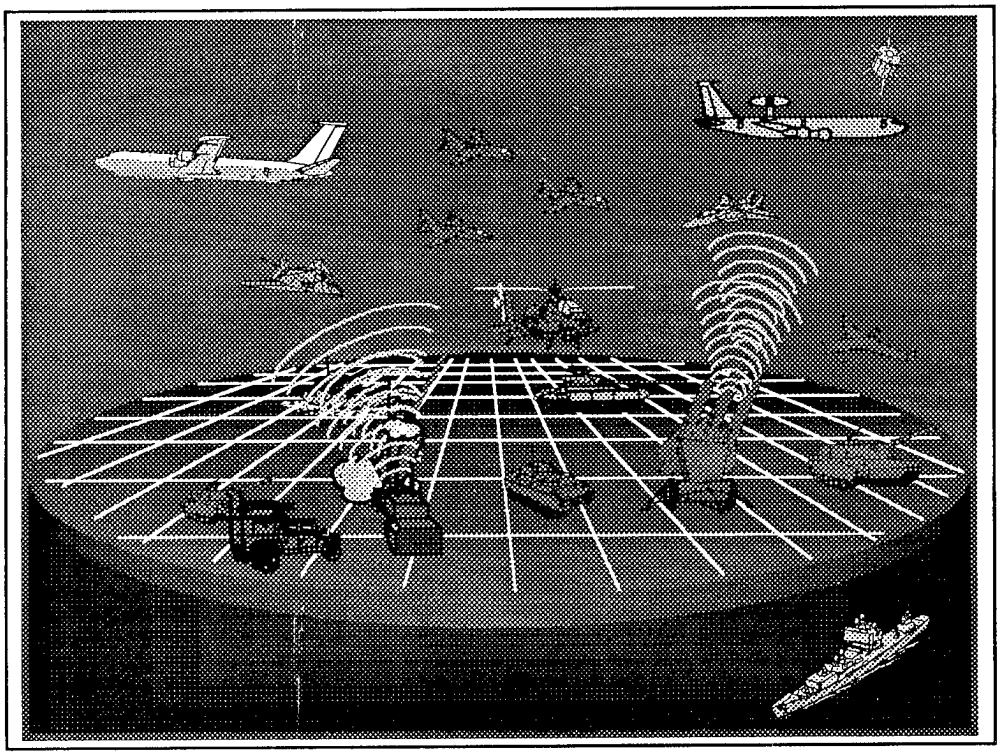
MAJOR CHARACTERISTICS

- Train and evaluate over actual tactical systems (hardware-in-the-loop)
- Modify scenarios quickly and easily to meet the needs of a dynamic, interactive environment
- Deploy small, mobile, wireless, lightweight, low power consumption training technology for both light and heavy forces
- Enhance mobility corresponding to supported force and theater of operations
- Execute on the move, while maintaining required scenario control and facilitate dynamic intervention, data collection of student/operator input, after-action assessment capability and student/operator record keeping

Depth & Simultaneous Attack Battle Lab

Directed Energy Weapons for Air Defense

To demonstrate Directed Energy Weapons (DEW) as a replacement/complement to missiles and bullets, low cost per kill and compact weapons.



Depth & Simultaneous Attack Battle Lab

Directed Energy Weapons for Air Defense

MAJOR CHARACTERISTICS

Include, but are not limited to, High Energy Lasers and High Power Microwaves which:

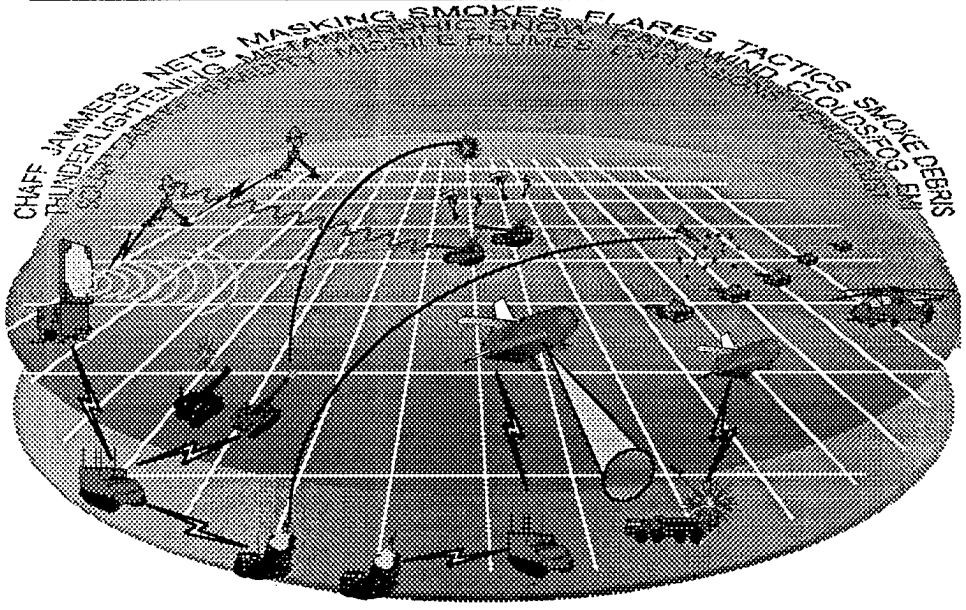
- **Decrease use of conventional munitions**
- **Operate on the multidimensional, non-linear, distributed battlefield**
- **All weather operations capability.**
- **Inflict lethal damage or disabling disruption to critical components.**
- **Destroy or disable air, space or surface threats to the force.**

Depth & Simultaneous Attack Battle Lab

Advanced Sensor Capabilities for Synchronized Precision Attack

To demonstrate through simulations and/or field testing, the physical limitations of various sensor technologies, and incorporate this knowledge into a reconfigurable simulation.

Advanced Sensor Capabilities for Synchronized Precision Attack



Depth & Simultaneous Attack Battle Lab

Advanced Sensor Capabilities for Synchronized Precision Attack

- **Each sensor type (acoustic, millimeter wave, infared, LADAR, magnetic, visible...) is affected differently by each component of "the fog of war"**
- **As sensor technologies proliferate and sensor requirements and costs increase, it is necessary to compare sensor capabilities under all conditions in simulations prior to live testing.**

Combat Service Support Battle Lab

Combat Service Support (CSS) Intranet

COL Larry Matthews
Deputy Director
CSS Battle Lab

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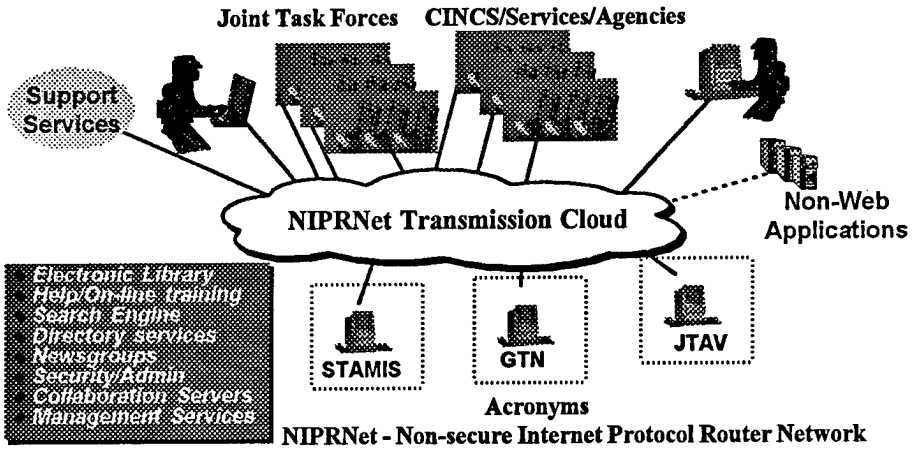
Combat Service Support (CSS) Intranet

The CSS Intranet will provide wireless web-based capabilities for the warfighters and CSS staff to locate, access, and integrate combat support information, applications, and support services from a single desktop computer.

Combat Service Support Battle Lab

Combat Service Support (CSS) Intranet



Acronyms

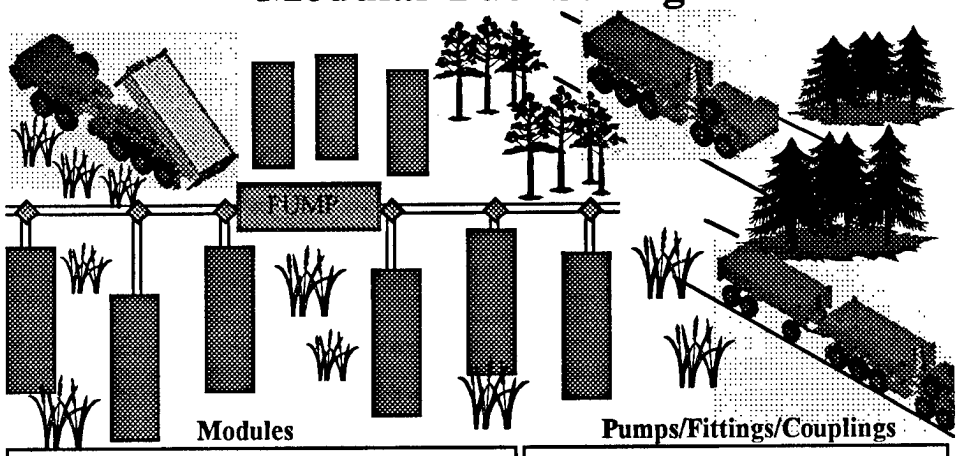
NIPRNet - Non-secure Internet Protocol Router Network
CINC - Commander in Chief
STAMIS - Standard Army Management Information System
GTN - Global Transportation Network
JTAV - Joint Total Asset Visibility

Combat Service Support Battle Lab

Modular Fuel Storage

Modular fuel storage is an initiative to improve fuel storage operations in the heavy divisions' area of operations. The focus is on efficiencies gained from rapid delivery of an entire bulk fuel load without transferring fuel from vehicle to collapsible bag. The concept provides for the storage of Class III (B) using fuel modules, which fit on a Load Handling System truck with trailer, replacing the 10,000 gallon collapsible storage bags in the divisional fuel system supply point (FSSP).

Modular Fuel Storage



- ❖ Highly ordered polymers into textile fibers
- ❖ Composite materials
- ❖ Outstanding strength to weight ratios
- ❖ Reduced weight
- ❖ Signature reduction
- ❖ Ballistic protection

- ❖ Gas turbine engine technology
- ❖ Turbomachinery
- ❖ Metal matrix composites
- ❖ Ceramic matrix composites
- ❖ Two stage compressor
- ❖ Improved turboshaft power ratios

Combat Service Support Battle Lab

Logistics Survivability

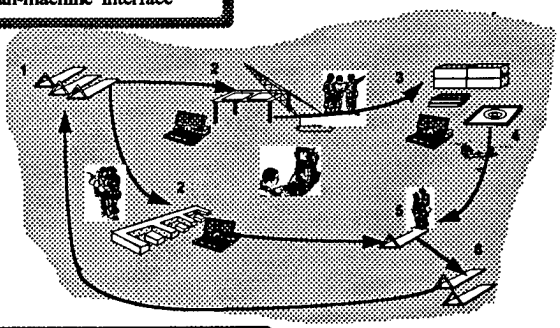
Provide survivable, flexible, responsive, and mobile munitions logistics supply systems for our power projection force:

- **Survivable ammo supply area that protects critical munitions and reduces the logistics footprint.**
- **System of equipment enhancements to increase munitions distribution velocity.**

Logistics Survivability

Unconventional Materiel Handling Equip
- Non-linear controls
- Smart materials
- Man-machine interface

Sea-Based Sustainment
- Commercial ammunition ship off-shore resupply technologies
- Mission Configured Load preparation shipboard
- Helicopter delivery technologies



Advanced Air Delivery
- ISO Container Handling Sys
- Ground Handling System
- Universal Transfer Platform

Modular Packaging & Containerization
- Advanced packaging designs
- Modular containerization designs

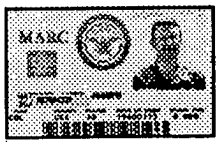
Intelligent Ammo Supply Area
- Automated warehousing
- Multiple MHE with one operator

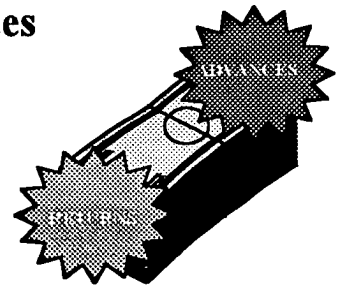
MARC Cash Advance / Collection

Utilize the MARC (or other standard issue "Smart Card) to efficiently advance and collect cash on the battlefield. The system will utilize administrative data stored on the card to create transactions. The system will write the customer's cash advance / collection data on their MARC. The system must interface with current disbursing and accounting systems.

MARC Cash Advance / Collection

- **Expands Turn-In Points on Non-Linear Battlefield**
- **Increases the Mobility of Paying Agents**
- **Prevents Departure of Agents from Theater with Outstanding Advances**

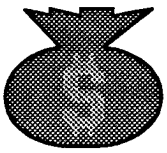




Renewable Power Sources and Accessories

Renewable power sources that are, in comparison to conventional power sources, smaller, weigh less, provide increased levels of power, require minimal to no maintenance, and are not environmentally constrained in application.

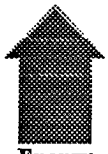
Renewable Power Sources and Accessories



Costs

We need renewable power sources that:

- **Last Longer**
- **Have More Energy**
- **Are Environmentally Friendly**
- **Weigh Less**
- **Cost Less**



Energy Requirements

Environmentally Friendly

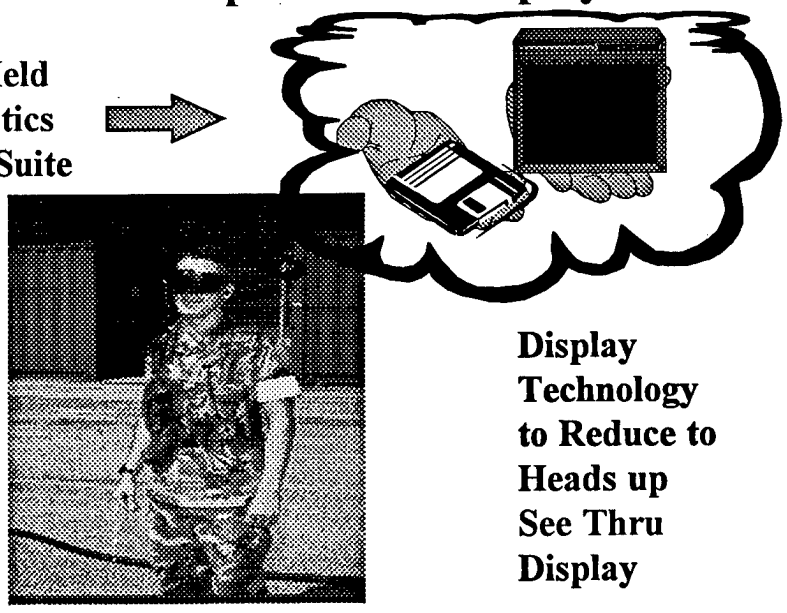
Weight

Combat Service Support Battle Lab

High Resolution, Low Power, Color Heads Up/See-thru Display

This topic solicits the development of display technology which will lead to individual soldier low-cost, high-resolution heads-up see-thru displays. For medical purposes, these displays will be the interface between a multi-input hand-held non-invasive diagnostic sensor suite and medical decision-assist software. Such technology will allow hands-free data retrieval and prompting during far-forward combat trauma treatment.

High Resolution, Low Power, Color Heads Up/See-thru Display



Combat Service Support Training Support

- "Micro-Worlds"--Problem Solving Tools for CSS Leaders
- Subset of Electronic Performance Support Aides
- Function of Desktop Modeling

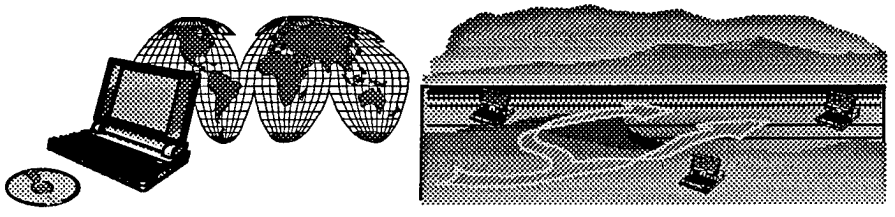
Solve for:

When?
Where?
Which Route[s]?
Which Step[s]?
How Much?
How Long?

Combat Service Support Training Support

Deploy primarily as embedded tools in electronic documents on CD-ROM, notebook hard drives, and via the Internet:

Field Manuals; Technical Manuals; Training Manuals



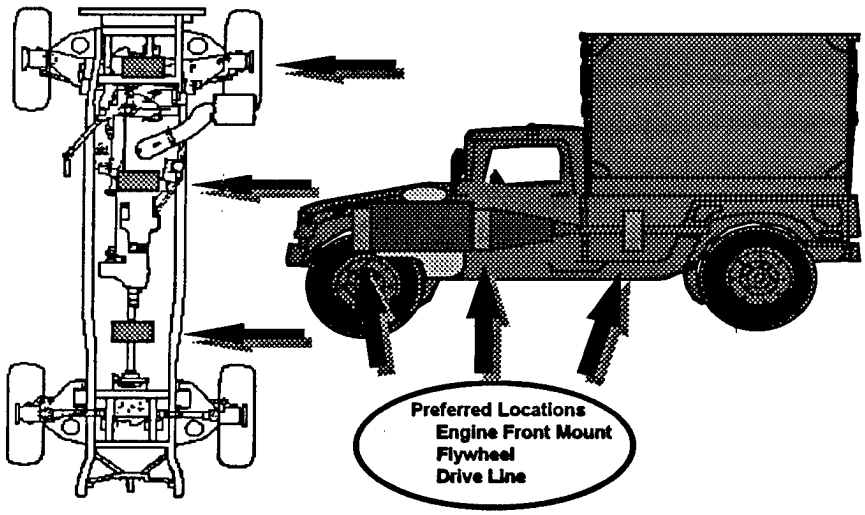
Combat Service Support Training Support

Use on student workstations, in Distance Learning classrooms, and with other equipment.

On-Board Integrated Vehicle Power Source

Looking for technology that will provide electrical power to operate the vehicle and ancillary or auxiliary equipment. The power source must be integrated as part of the vehicle and capable of generating alternating and direct current, simultaneously. This technology must provide sufficient alternating current to operate common tools, while supplying sufficient direct current to maintain vehicle operations and battery charging requirements. Power requirements should equal or exceed 75 DC amps and 5 kilowatts AC power.

On-Board Integrated Vehicle Power Source



Early Entry Lethality and Survivability

Remote Early Entry Force

Sea State 3 (SS3) Vessel Discharge Enablers

COL Daniel R. Fake
Deputy Director
Early Entry Lethality, Survivability
Battle Laboratory

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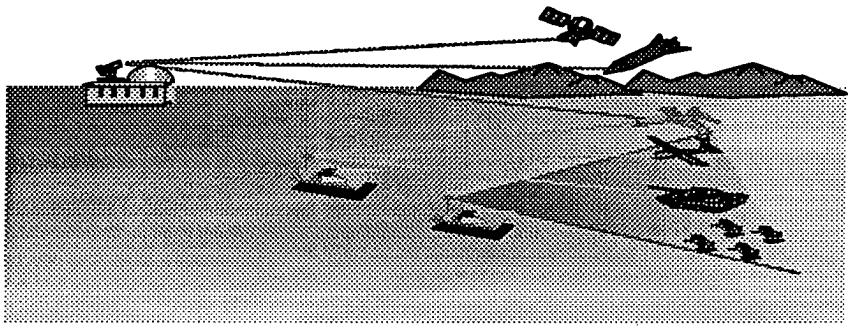
Remote Early Entry Force

- Employ technologies that significantly increase individual and system survivability.
- Provide systems that encompass a combination of security reconnaissance, surveillance, target acquisition-designation, chem/bio detection and target attack capabilities (e.g.. robotics, sensors, weapons).
- Enhance the commander's ability to shape the battlespace through remote and/or autonomous lethal and non-lethal capabilities prior to force arrival.
- Capability to assess risk prior to human force arrival.

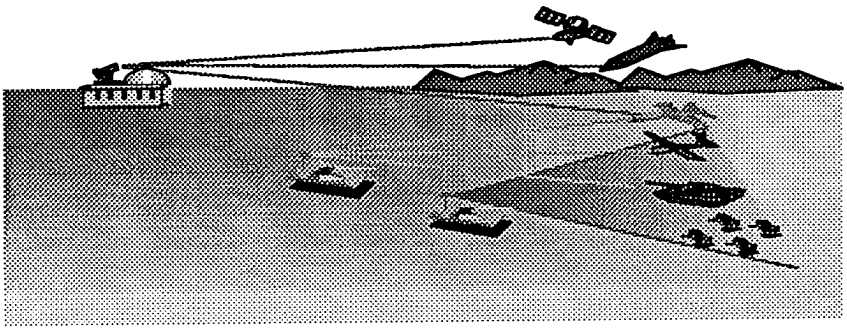
Early Entry Lethality and Survivability

Remote Early Entry Force



Early Entry Lethality and Survivability

Remote Early Entry Force



Sea State 3 (SS3) Vessel Discharge Enablers

- Provide technology that enhances the capability to discharge vessels anchored in-stream to lighterage and roll-on/roll-off discharge platforms during Joint Logistics Over the Shore (JLOTS) operations in sea state three (SS3) conditions.
- May include improvements to existing JLOTS systems or innovative technologies for direct mitigation of high sea states in the off-shore operating area.
- System/modification must be affordable, adaptable, user employable, transportable and survivable in SS3.
- Require an operable prototype system.

Early Entry Lethality and Survivability

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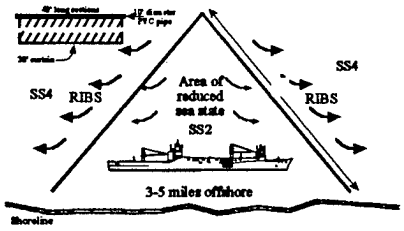
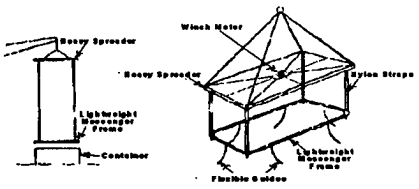
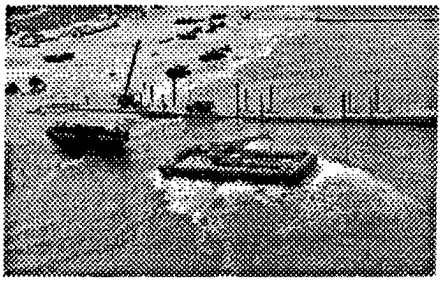






Dismounted Battlespace Battle Lab

Situational Awareness in Urban Terrain

Integrated Capabilities of Weapon Aiming and Acquisition

Mr. Richard Caravana

Dismounted Battlespace Battle Lab

UNCLASSIFIED

Situational Awareness in Urban Terrain

- Employ technologies that significantly increase individual and small unit situational awareness will operating in urban terrain.
- Advanced concepts are sought that will provide a means to characterize urban structures, in three dimension, to include soldier/unit sensors that determine the structure before it is entered and sensors that determine the structure as soldiers negotiate the structure.
- Included are 3D mapping, position location on the move and satellite masked navigation.

Dismounted Battlespace Battle Lab

Integrated Capabilities of Weapon Aiming and Acquisition

- No capability exists for soldiers equipped with I2 devices to hand-off targets to soldiers equipped with thermal devices.
- A capability is required that will enable soldiers equipped with infared image intensification (I2) devices to point out targets or other items of interest to soldiers equipped with thermal devices and vice versa.

AIR MANEUVER BATTLE LAB
U.S. ARMY AVIATION CENTER

COLONEL GARY COLEMAN
DEPUTY DIRECTOR

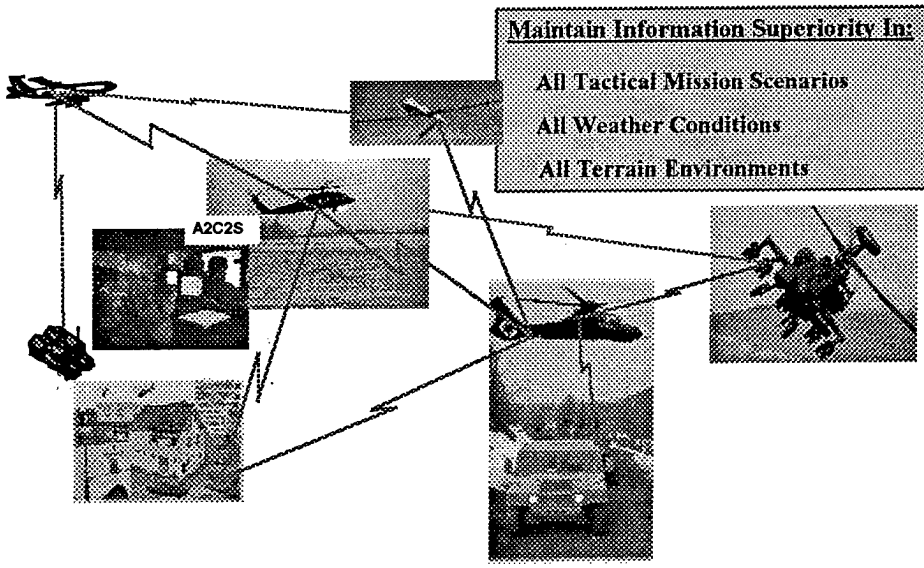
UNCLASSIFIED

Aviation Tactical Nap-of-the-Earth Non-Line-of-Sight Communications

Objective: To examine new concepts and new technologies that may enhance Army Aviation Tactical Nap-of-the-Earth Non-Line-of-Sight Communications capabilities

Air Maneuver Battle Lab

Aviation Tactical Nap-of-the-Earth Non-Line-of-Sight Communications



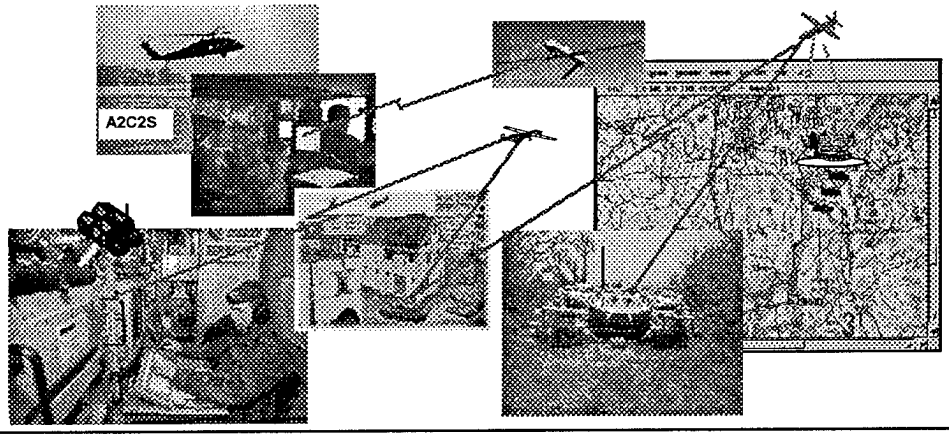
Air Maneuver Battle Lab

Manned and Unmanned Teaming Control

Objective: To demonstrate new concepts and technologies to enhance Army aviation cooperative team operation of manned and unmanned systems. The focus of this effort will be on man-in-the-loop control theories and mechanisms by which man-in-the-loop can control a variety of unmanned platforms.

Manned and Unmanned Teaming Control

Demonstrate Man-in-the-loop control theories and mechanisms by which man-in-the-loop can control a variety of unmanned platforms



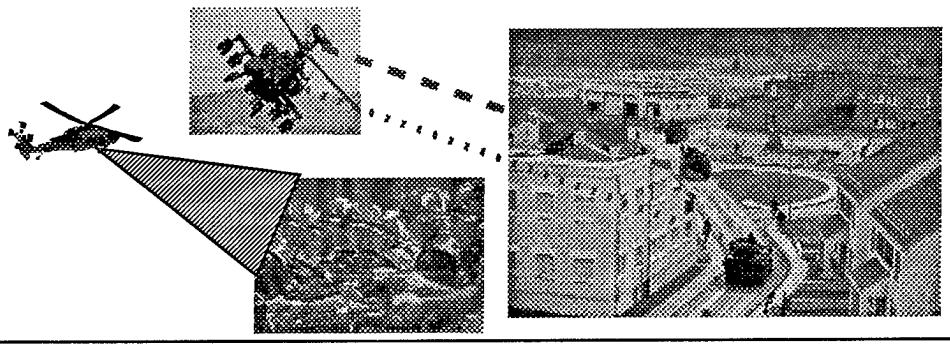
Air Maneuver Battle Lab

Airborne Non-Lethal Weapons

Objective: Evaluate aviation applications of innovative, less-than-lethal devices for military and commercial use. The goal is to increase mission effectiveness of helicopters in operations that require the application of non-lethal effects upon personnel and/or equipment.

Airborne Non-Lethal Weapons

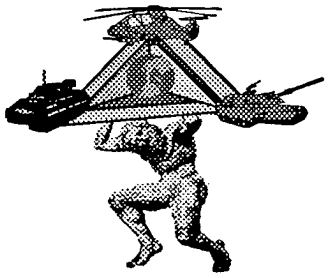
Evaluate aviation applications of innovative, less-than-lethal, devices for military and commercial use.



Maneuver Support Battle Lab

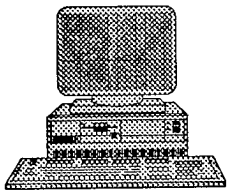
Auto Feature Extraction

Colonel Edwin J. Arnold, Jr.
Deputy Director
Maneuver Support Battle Lab

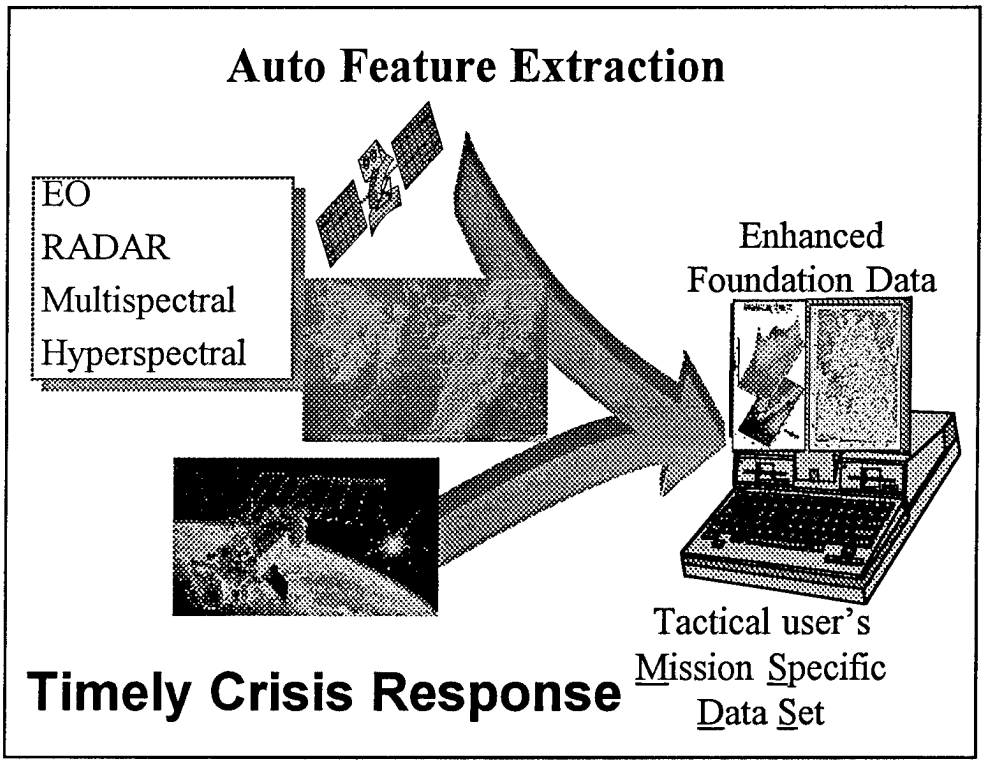


Auto Feature Extraction

Future terrain feature extraction and analysis tools to densify the existing Foundation Data using all available sources enabling the creation of a Mission Specific Data Set prior to deployment.



Maneuver Support Battle Lab

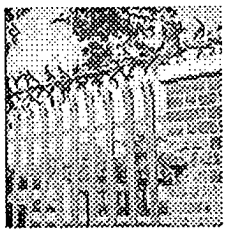


Maneuver Support Battle Lab

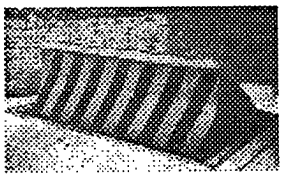
Advanced Tactical Security Systems & Barriers

Future automated security systems that provide security and protection for DOD personnel and property. Must provide detection and assessment capabilities as a minimum with an autonomous response capability in follow on systems.

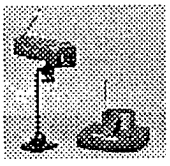
Advanced Tactical Security Systems & Barriers

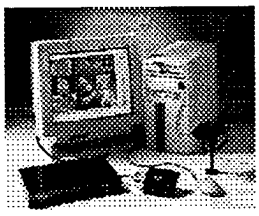


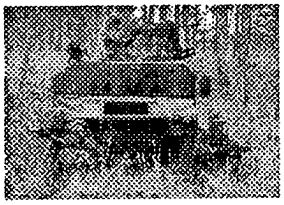
- Detect
- Assess
- React



Conserve manpower



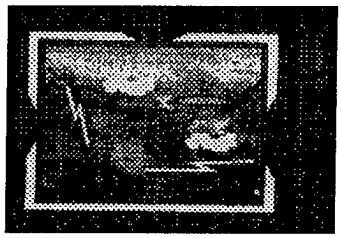




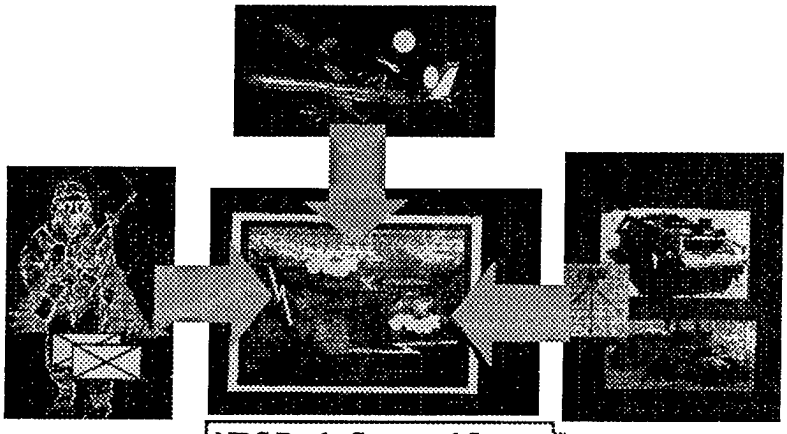
Maneuver Support Battle Lab

NBC Battle Command System

Future decision support system to analyze NBC information from battlespace visualization systems and track, model and simulate current and future NBC situations and provide recommended countermeasures.



NBC Battle Command System



- Joint NBC Warn/Report System
- Military Commo
- Local Weather Data
- Intelligence Data
- Medical & Civilian Systems
- Situational Awareness Data

Compatible with

NBC Battle Command System

Maneuver Support Battle Lab

Raptor Robotic Employment System

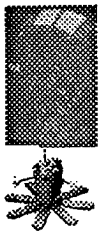
Future remote/robotic advanced technologies capable of non-intrusive delivery to precise locations and recovery of the multiple (imaging /sensor and attack) components of the Raptor Intelligent Combat Outpost.

Raptor Robotic Employment System

Self-deployable up to 300 km

Precision employment to support

- reconnaissance/ surveillance
- target acquisition-designation
- target attack
- NBC Detection
- mine/countermine



Avoids obstacles, enemy contact/detection

Self protection/self destruction capability

Self recoverable upon mission completion

Brigade and Below Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

Mr. David Estes
Deputy Director
Mounted Maneuver Battlespace Lab

UNCLASSIFIED

Brigade and Below C4ISR

- Provide expanded, more efficient, and increased capabilities
  - Warfighter interaction and interface with C4ISR systems
    - Voice interaction
    - Multiple displays integrated into helmet
    - "Helmet conference" capabilities
  - Staff aids
    - Course of Action development and analysis
    - Information transformation to intelligence
    - Perception of battlefield

Brigade and Below C4ISR

- Provide expanded, more efficient, and increased capabilities
  - Heterogeneous distribution of information
  - Battlefield Operating System (BOS) and integrated displays of information
  - Virtual rehearsals
  - Embedded training
  - Distributed Interactive Simulation (DIS) compliant
  - Robust sensors (platform and unmanned) and sensor integration

Brigade and Below C4ISR

- Integration of systems with current and legacy systems
  - Army Tactical Command and Control Systems (ATCCS)/Army Battle Command Systems (ABCS)
  - Force XXI Battle Command Brigade and Below (FBCB2)
  - Common Hardware System 2 (CHS2)
  - Army communication systems

Integrator of Mounted Battlespace

RECONNAISSANCE

- Expand the capabilities of mounted ground and air reconnaissance forces to detect and identify threat forces and activity
  - Includes the detection of NBC hazards and man-made obstacles
  - Perform all missions while stationary and on the move, during periods of limited/obscured vision, and beyond threat detection range
  - "over the hill" capability

RECONNAISSANCE

- Provide real time information to the mounted force commander
  - Heterogeneous distributive information flow
  - Rapid dissemination and integration gathered and passed over long distances
  - Synchronize fires
  - Significant improvement required in communications capability and data transfer to ensure integration with sensors and pass real time information to commanders

Mounted Maneuver Battlespace Lab

RECONNAISSANCE

- Sensors
  - All sensors integrated with other systems to ensure compatibility
  - Platform sensor packages capable of tailoring to mission and echelon
  - Ground, air and space based sensors to augment platform efforts
- Platforms and systems must be countermeasure resistant and have low signatures across all spectrums

Integrator of Mounted Battlespace

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