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The Army Experiment III (AE3), sponsored by the Louisiana Maneuvers Task Force (LAM-TF) for the Association of the United States Army (AUSA) demonstration held 14-16 October, 1996 was comprised of the following major components:

- An Immersive Theater

- Stand Alone Interactive Displays

- A Force Projection Tactical Operation Center (FP TOC) Theater

The Immersive Theater demonstrated significant advances in digitization, simulation, and visualization technology and consisted of a story that portrayed tomorrow's Army Information Age tools. This story was told through a series of vignettes linked to the Army Modernization Objectives. The context for the story was a warfighting scenario featuring a Brigade or larger tactical unit. The vignettes featured various distributed experiment elements linked through the AE3 simulation and communication architecture. To the greatest extent possible, the vignettes provided opportunity for interaction by the audience.

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LAM TASK FORCE DO #14

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1. INTRODUCTION

The Army Experiment III (AE3), sponsored by the Louisiana Maneuvers Task Force (LAM-TF) for the Association of the United States Army (AUSA) demonstration held 14-16 October, 1996 was comprised of the following major components:

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- Stand Alone Interactive Displays
- A Force Projection Tactical Operation Center (FP TOC) Theater

The Immersive Theater demonstrated significant advances in digitization, simulation, and visualization technology and consisted of a story that portrayed tomorrow's Army Information Age tools. This story was told through a series of vignettes linked to the Army Modernization Objectives. The context for the story was a warfighting scenario featuring a Brigade or larger tactical unit. The vignettes featured various distributed experiment elements linked through the AE3 simulation and communication architecture. To the greatest extent possible, the vignettes provided opportunity for interaction by the audience.

Each of the Stand Alone Interactive Displays were designed to accommodate a small number of interactive participants at a time (5 to 10 persons) and reinforced the message provided in the immersive theater. The stand alone displays represented the Army's latest technological advances.

The Force Projection Tactical Operations Center (FP TOC) theater highlighted the demanding requirements for information technologies applicable to the tactical operations center.

The Louisiana Maneuvers AE3 demonstration at the October AUSA Meeting illustrated the demands that will be placed on our warriors in the 21st century battlefield, demonstrating the aspects of 21st century warfare in a distributed virtual battlefield.

1.1 *SCOPE*

The objectives of AE3 were as follows:

- To display how America's Army is a changing organization that is significantly different from the Cold War Army, and show how the Army is undergoing major re-engineering efforts to address the 21st Century environment.

- To display how America's Army is a learning organization that is always improving, never resting on its laurels, and willing to learn from industry and academia.

- To demonstrate that by leveraging Information Age Technology, America's Army can remain the best Army in the world, capable of land force dominance into the 21st Century. (A key principal is that the experiment was representative of the total Army information technology efforts in Training, Exercises and Military Operations (TEMO), Research, Development and Acquisition (RDA), Advanced Concepts Requirements (ACR), Digitization, and Command, Control, Communications, Computers and Intelligence (C4I)).

- To display how America's Army, as a steward of our Nation's resources, can leverage the significant modernization investments made over the past decade and focus future modernization efforts on those technologies and systems that will provide the greatest payoff on the battlefield.

This year's experiment expanded on the last year's experiment and focused more on linkage of simulations to C4I systems, the growth of Synthetic Theater of War (STOW) environment from Battalion Brigade Battle Simulation/Modular Semi Automated Forces (BBS/ModSAF) to Corps Level Computer Generated Forces/ModSAF (CLCGF/ModSAF/EAGLE), improvement of stealth view into STOW environment, virtual telepresence and future Command and Control (C2) environments, and demonstrated a more distributed presentation.

2. APPLICABLE DOCUMENTS

The following Documents were used in the preparation of this After Action Report (AAR).

- Statement of work for the LAM Task Force Army Experiment III, 12 March Rev 2.0, 1996.

- ADST II Delivery Order Proposal for Proof of Principal With Mini-FAS for the LAM Task Force Army Experiment III, 24 April 1996.

- Integration & Test Plan for the AUSA Demonstration - OCT, Version 1.0 (Preliminary), 20 June 1996.

- After Action Report for the October AUSA Demonstration 1995, 17 November 1995, Revision 1.0

- Feasibility Analysis Report for LAM Task Force Army Experiment III, 28 June 1996

- Integration and Test Plan for the Army Experiment III, 4 September 1996, revision 2.0

3. AE3 OVERVIEW

AE3 tasking was performed in two distinct parts. Part I consisted of planning and analysis of potential participants in the AUSA Demonstration. Part II consisted of the implementation and integration of the Government selected simulations into the experiment scenario which was written under Government supervision.

3.1 DOCUMENT OVERVIEW

This After Action Report consists of eight major sections: Participants; Requirements; Integration and Test; Immersive Theater Execution; Transportation; Residual Equipment; Lessons Learned (Recommendations) and Program Management. Each section is broken into several sub-sections containing more detailed information. Details are provided in Appendices A through H. The following paragraphs present a top level description for each major section.

3.2 *PARTICIPANTS*

3.2.1 Overview

The AE3 Participants provided the simulation tools to illustrate the Army's use of information systems in combat development, material development, operational testing, system acquisition, test and evaluation, and training development. The groups that demonstrated these activities are summarized in the following sections and were integrated into the AE3 exhibit at the October '96 AUSA.

3.2.1.1 *Long Haul Sites*

Long Haul Sites participated interactively in the AE3 scenario via Distributed Interactive Simulation (DIS) Protocol Data Units (PDU's). The Long Haul participants consisted of:

1. Missile Defense Battle Integration Center (MD BIC)
2. Depth & Simultaneous Attack (D&SA) Battle Lab
3. Dismounted Battlespace Battle Lab (DBBL)
4. Joint Virtual Laboratory (JVL)
5. Command and Control Vehicle (C2V)
6. Battlefield Planning and Visualization (BPV)
7. Streamlined Acquisition
8. SIMulation In Training for Advanced Readiness (SIMITAR)

Further detail on each Long Haul participant is provided in section 3.2.2 of this document.

3.2.1.2 *Standalone Displays*

Standalone Displays were small (approximately 200 square feet) self-contained booths located in the midway of the AE3 exhibit. Their purpose was to highlight a particular advancement in technology which plays an important role in the advancement of 21st Century and to provide a preview and debrief to visitors of the live virtual theaters. The term "Standalone" implies that each display was not a participant in the live simulation exercises presented in the Theaters however, each standalone display did help to further reinforce the message presented in the Immersive Theater and the Force Projection TOC Theater.

The Standalone Displays consisted of:

1. Logistics Anchor Desk (LAD)
2. Virtual Maintainer (VMAT)
3. Virtual Retinal Display
4. Tele-Medicine
5. Virtual Sand Table (VST)
6. Scout Vehicle
7. Army Enterprise
8. Un-manned Air Vehicle (UAV)
9. Portable Integrated Maintenance System (PIMS)

Further detail on each Standalone Display is provided in section 3.2.3 of this document.

3.2.1.3 *Theaters*

The AE3 Exhibit housed two live distributed simulation virtual theaters at the October '96 AUSA. Both the Immersive Theater and the Force Projection TOC Theater were designed to seat 50 people each presenting a live 20 minute distributed simulation exercise. The live exercises were phased in each theater such that participants would first be ushered in to view the live 20 minute Immersive Theater exercise and then have 10 minutes to move to the TOC Theater in preparation to view the live 20 minute TOC exercise. Total throughput capacity of AE3 at the AUSA show was calculated as follows:

- 2 shows / hour x 9 hours / day = 18 shows / day
- 3 days x 18 shows = 54 total shows
- 54 shows x 50 people / show = 2700 visitor throughput.

There were eight distributed sites participating in the exercise via the Interim Defense Research and Engineering Network (IDREN) Long Haul Network. The roles these sites played in the exercise as well as their network connectivity are discussed in greater detail in section 3.2.2 of this document. Coordination with the distributed sites, including precise exercise timing and control, was accomplished via voice commands from a single exercise director. The directors voice commands were communicated in digitized packets over the same Long Haul Network supporting the actual distributed simulation exercise. This tightly timed experiment schedule necessitated a rigid distributed exercise which ran without failure for the duration of the experiment.

Figure 3.2-1 depicts the AE3 Sheraton Washington floor plan. The typical flow of participant traffic was as follows: (1) Reception - obtain ticket for live theater presentations, (2) View Immersive Theater exercise, (3) View Force Projection TOC exercise, and (4) Exit live theaters to debriefing area then view Standalone Displays at random.
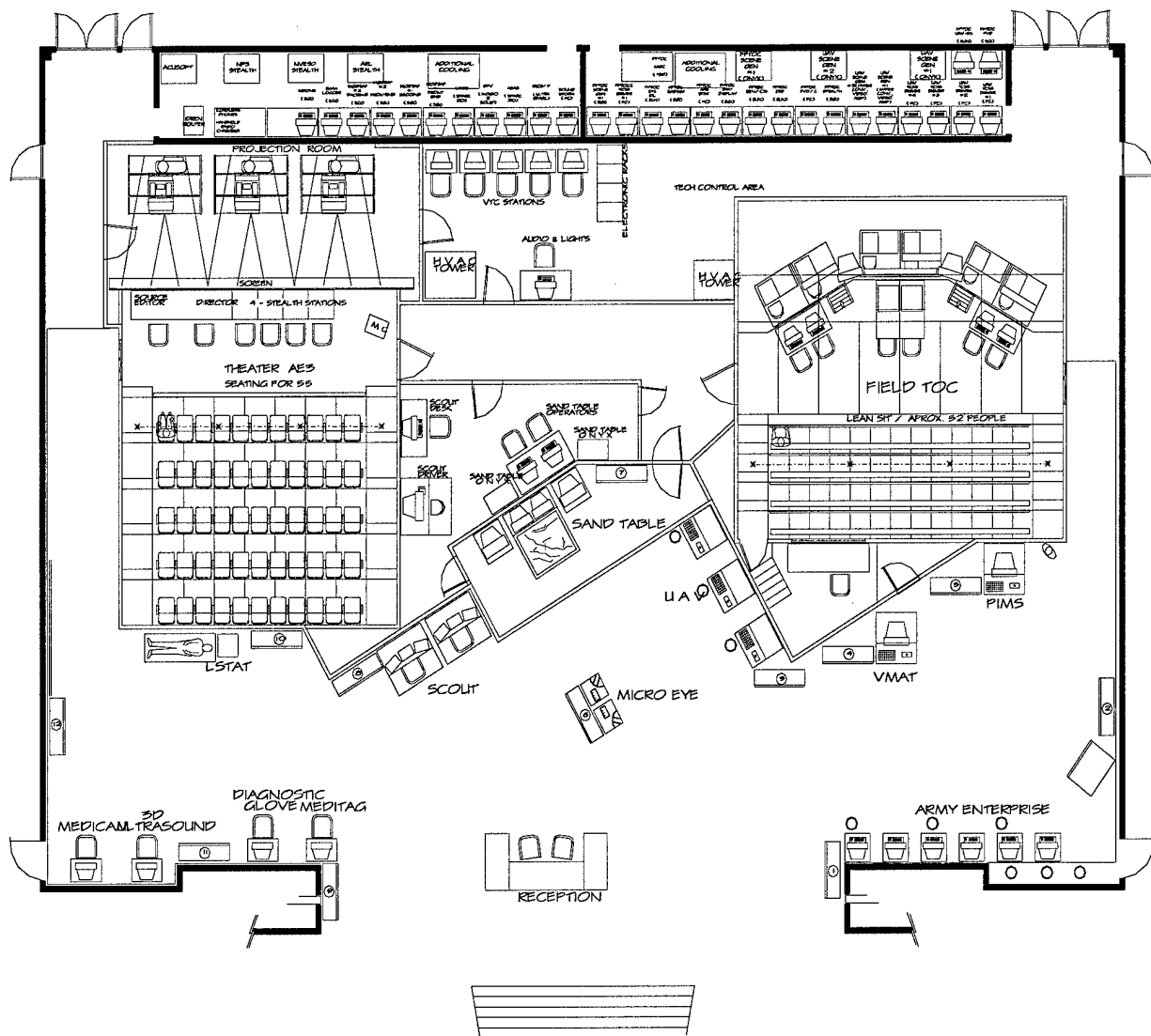
Figure 3.2-1 AE3 Floor Plan

3.2.2 Long Haul Sites Participation

3.2.2.1 *Missile Defense Battle Integration Center (MD BIC)*

MD BIC was a Long Haul networked participant located in Huntsville, Alabama.

Network Connection: Connected via a dedicated IDREN Connection at SSDC Huntsville Alabama to AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the FP TOC scenario.

Function: Provided Patriot Missile Launch and Destruction of attacking SCUD Missile. The MD BIC provided a computer workstation-based simulation which inserted an Patriot Missile simulation in the exercise.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDU's) to simulate the Patriot Missile in the FP TOC exercise..

Administrative Connection: Interfaced to an administrative phone conference via the Multicast Backbone (M-Bone) (for M-Bone info see 3.4.1.2) portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing (VTC): No participation in the Live VTC portion.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.2 *Depth & Simultaneous Attack (D&SA) Battle Lab*

D&SA was a Long Haul networked participant located in Fort Sill, Oklahoma.

Network Connection: Connected via a Defense Simulation Internet (DSI) connection to the IDREN connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the FP TOC scenario.

Function: Provided ATACMS Missile Launch and Destruction of enemy SCUD TEL Forward Operating Base (FOB). The D&SA provided a computer workstation-based simulation which inserted an Attack Missile simulation in the exercise.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDU's) to simulate the ATACMS in the FP TOC exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: No participation in the Live VTC portion.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.3 *Dismounted Battlespace Battle Lab (DBBL)*

DBBL was a Long Haul networked participant located in Fort Benning Georgia.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

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Function: Provided insertion of the 21st Century Land Warrior Simulation (a Dismounted Infantryman man-in-the-loop simulation) in the live Immersive Theater demonstration.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the Dismounted Infantry in the Immersive Theater exercise..

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a Point-to-point Integrated Services Digital Network (ISDN) connection providing a live Video-teleconference feed of the SAFOR Operators in the simulator at Fort Leavenworth. The live SAFOR Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the McKenna MOUT visual databases in the AE3 provided by TEC.

3.2.2.4 *Joint Virtual Laboratory (JVL)*

JVL was a Long Haul networked participant located in Fort Leavenworth, Kansas.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided insertion of Semi-Automated Forces (SAFOR) entity participation in the live Immersive Theater demonstration including EAGLE, ModSAF, CLCGF and ITEMS systems. These systems are all based on various computer workstations which populate the simulation exercise with entities that behave and respond realistically to their immediate situation within the battle.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the SAFOR entities in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a point-to-point ISDN connection providing a live Video-teleconference feed of the SAFOR Operator at Fort Leavenworth. The live SAFOR Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.5 *Command and Control Vehicle (C2V)*

The C2V was a Long Haul networked participant located in Fort Leavenworth, Kansas.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided insertion of Command and Control Vehicle entity participation in the live Immersive Theater demonstration.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the C2V in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a Point-to-point ISDN connection providing a live Video-teleconference feed of the C2V the Simulator Operator at Fort Leavenworth. The live C2V Simulator Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.6 *Battlefield Planning and Visualization (BPV)*

The BPV simulation required both a distributed and on-site components. The networked portion of BPV was co-located with the JVL at Fort Leavenworth, Kansas. The on-site portion of BPV was located at the AUSA site providing BPV visuals to the AE3 experiment which were ultimately displayed in the Immersive Theater.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided visualization of the BPV tool as it participated in the live Immersive Theater demonstration. The BPV is a computer workstation which provides the user with a real-time updated graphical view of Battlefield entity locations and status in aggregated and deaggregated formats.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the BPV in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: No Live Video Teleconference participation.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.7 *Streamlined Acquisition*

Streamlined Acquisition was a networked participant located in San Jose, California.

Network Connection: Connected via a dedicated T1 leased connection interfaced to the IDREN at Fix-West connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided insertion of a prototype Bradley Vehicle simulator in the live Immersive Theater demonstration. The simulated vehicle was integrated with computer-based design equipment demonstrating that designers can use a step-by-step process to model and test new designs in simulation, correcting problems before fabricating the actual hardware.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the Bradley vehicle in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a point-to-point ISDN connection providing a live Video-teleconference feed of the Streamlined Acquisition Lab at United Defense in San Jose, California. A live United Defense Engineer addressed the audience in the theater explaining the United Defense Streamlined Acquisition concept.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.8 *SIMulation In Training for Advanced Readiness (SIMITAR)*

The SIMITAR simulation was a distributed participant in the AE3 and was located in Bozeman, Montana.

Network Connection: Connected via a DSI to IDREN connection, connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided visualization of a scout vehicle entity in the live Immersive Theater demonstration.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the scout vehicle in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a Point-to-point ISDN connection providing a live Video-teleconference feed of the SIMITAR Simulator Operator at Bozeman. The live SIMITAR Simulator Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.3 Standalone Displays Participation

3.2.3.1 *Logistics Anchor Desk (LAD)*

The LAD was used in the FP TOC Theater to demonstrate improvements in the application of information technologies as they apply to real-time Logistics control on the battlefield. The LAD was used by the commanding officer in the FP TOC Theater exercise to electronically review and allocate inventory of supplies and equipment on the battlefield during the scenario.

LAD was also featured in a portion of the Immersive Theater scenario to show the same utility as in the FP TOC. The Immersive Theater portion was videotaped prior to the AE3 demonstration. Lockheed Martin supplied the equipment and personnel used to videotape the LAD portion of the theater scenario.

3.2.3.2 *Virtual Maintainer (VMAT)*

The VMAT was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The VMAT is a computer-based personal assistant that helps the Army mechanic to troubleshoot faulty equipment. VMATS virtual reality allows the mechanic to interact with simulated weapons systems and test equipment.

VMAT provided spoken dialogue-based maintenance assistance in an interactive virtual environment. VMAT incorporates a natural language processor and a diagnostic expert system on a Pentium-based personal computer to provide cost-effective realistic visualization and diagnostic assistance.

The VMAT application provides diagnostic instruction and assistance for replacing and replacement units by M1A1 organizational-level mechanics. The virtual environment includes the M1A2 Abrams tank and Simplified Test Equipment (STE). VMAT's modular design easily adapts to other applications.

VMAT required the following equipment and services from Lockheed Martin:

- Floor space: 7' x 2.5'
- Power: 2 x 110 Volts, 20 amps each.
- Network Connections:
    - One 128 Kbps ISDN data line to Huntsville,
    - Two Data POT lines,
    - Two Voice POT Lines.
- Two 37" NTSC monitors .

3.2.3.3 *Virtual Retinal Display*

The Virtual Retinal Display (VRD) was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The VRD is a new and innovative method of displaying information. It creates an image directly on the human eye by scanning a pinpoint beam of light in a precision pattern on the Retina.

The VRD, an enabling technology for personal visual displays, can enhance situational awareness, communications, and overall effectiveness of the information-intensive military applications. This device

offers unique advantages over conventional display technologies in image resolution, contrast ratio, brightness and power consumption.

Possible defense applications include ground and airborne situational awareness; immersive viewing for simulations and training; portable aids for telemedicine and telemaintenance; and high resolution displays for tactical, operational, and C4I missions.

Virtual Retinal Display required the following equipment and services from Lockheed Martin:

- Floor Space: 10′ x 10′.
- Power: 2 x 110 Volts, 20 Amp each.

3.2.3.4 *Tele-Medicine*

Telemedicine was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The Telemedicine concept is a Army Medical Department initiative to support casualty care to reduce mortality and morbidity in the future battlefield. These technologies support soldiers and will reengineer health-care delivery concepts for the battlefield in the year 2000 and beyond. Telemedicine was composed of the five displays described below:

3.2.3.4.1 MediTag

Meditag is a low-cost, high-volume, information technology device that can store an individuals entire medical history (text, data, images, video and audio) on a rugged 2 inch x 3/4 inch dog tag like device. Sample MediTags were displayed at the AE3 exhibit.

MediTag required the following equipment and services from Lockheed Martin:

- Floor Space: 6' x 6'.
- Power: 1 x 110 Volts, 20 Amp total.

3.2.3.4.2 Life Support for Trauma & Transport (LSTAT)

The LSTAT is a self-contained intensive care unit for transporting and monitoring seriously injured or ill patients. Because the casualty stays on the same litter with the same life support equipment, medical care is seamless from the rugged battlefield to the hospital facility.

Each unit has a mechanical ventilator, oxygen generator, suction device and environmental control canopy fitted on a NATO litter. An actual LSTAT prototype was displayed at the exhibit.

LSTAT required the following equipment and services from Lockheed Martin:

- Floor Space: 6' x 10'.
- Power: 1 x 110 Volts, 20 Amp total.

3.2.3.4.3 MediCam

MediCam is a soldier-mounted camera that allows video and audio communications between the battlefield and the physician. An actual MediCam was demonstrated at the AE3 exhibit.

MediCam required the following equipment and services from Lockheed Martin:

- Floor Space: 4' x 6'.
- Power: 1 x 110 Volts, 2 Amps total.

3.2.3.4.4 3D Ultrasound

The 3-D Ultrasound device helps field doctors and nurses to quickly pinpoint internal injuries. This device's telemedicine capabilities allow consultation with expert physicians worldwide. this device also allows the medic to consult with the physician in diagnosing and treating the patient at the onset of injury. An actual 3-D Ultrasound device was displayed at the AE3 exhibit.

3D Ultrasound required the following equipment and services from Lockheed Martin:

- Floor Space: 6' x 6'.
- Power: 1 x 110 Volts, 6 Amps total.
- One Dial out phone

3.2.3.4.5 Virtual Sand Table

The Virtual Sand Table (VST) was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The VST helps commanders and their staffs conduct the current battle and prepare for the future battle. The VST projects a stereo image on a table top and allows the commander to interact with the display through voice commands and hand gestures. Along with the digitization and situational awareness envisioned in Force XXI, the VST will be the commander's window into the current battle.

The VST also facilitates initial planning (including course of action (COA), development and analysis), rehearsals, and contingency planning. Staffs wargame on an accurate three dimensional representation of the area of operations using a familiar, sand-table-like paradigm.

Virtual Sand Table required the following equipment and services from Lockheed Martin:

- Floor Space: 8' x 10'.
- Power:
  - 3 x 110 Volts @ 15 Amps each,
  - 1 x 220 Volts @ 20 Amps each (L6-20 plug).
- Network Connection: 10BaseT to Virtual Sand Table
- Three standard 5 foot tables with skirts
- Two (2) standard office chairs.
- One Dial out phone

3.2.3.5 *Scout Vehicle*

The Scout Vehicle was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The Scout Vehicle reconfigurable simulator demonstrated the concepts and requirements that may be required of a future scout vehicle. Future technology was simulated in this system and included improved sensors and data fusion will allow the scout to rapidly identify, locate, and report information; thus extending the commanders vision of the tactical situation. Scout Vehicle required the following equipment and services from Lockheed Martin:

- Floor Space: 12' x 15'.
- Power:
  - 5 x 110 Volts @ 20 Amps each
  - 2 x 220 Volts @ 20 Amps each (L6-30R plug).
- Network Connection: 10BaseT to Scout Vehicle
- One standard 6 foot table with skirt.
- One Dial out phone

3.2.3.6 *Army Enterprise*

The Army Enterprise display was a series of 6 live interactive systems which were demonstrated to AE3 visitors during the AUSA show. The systems are parts of the Army Battle Command System (ABCS) which built on the Army Enterprise architecture of common technical standards, doctrinal integrity, and systems interoperability. The Army Enterprise strategy is a single unified vision for the Army C4I community focusing on joint and combined interoperability and serves as the enabler for land force dominance. The ABCS systems on display at the AE3 exhibit were:

- Army Global Command and Control System (AGCCS);
- All Source Analysis System (ASAS);
- Battlefield Planning and Visualization (BPV);
- Combat Service Support Control System (CSSCS);
- Maneuver Control System/Phoenix (MCS/P);
- Appliqué.

Each of these computer workstation-based systems reinforced the FP TOC theater message. (Duplicate systems played an integral role in the live FP TOC theater exercise.)

Army Enterprise required the following equipment and services from Lockheed Martin:

- Floor Space: 20' x 45'.
- Equipment Enclosures
- One Dial out phone

- One 60" Hi Res Monitor
- Four 20 amp power circuits
- Six 21" video monitors.

3.2.3.7 *Unmanned Air Vehicle (UAV)*

The UAV was a live interactive simulation system which was demonstrated to AE3 visitors during the AUSA show. The UAV simulation display illustrated how the simulation is used to determine UAV requirements and to help develop concepts for operational employment. It demonstrated how prototype systems are integrated through simulations and how man-machine interfaces are enhanced and refined to provide feedback to material developers for system upgrades.

UAV required the following equipment and services from Lockheed Martin:

- Floor Space: 8' x 10'.
- Power: 2 x 220 x 20 amp circuits, 5 x 110 x 20 amp circuits
  - Network Connection: Internet Access via IDREN
- Three 37" Composite Video monitors.
- One out calling phone
- Four standard 5 foot tables
- Shelf for 3 Personal Computers
- Two (2) standard office chairs.

3.2.3.8 *Portable Integrated Maintenance System (PIMS)*

The PIMS was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The PIMS integrates several advanced technology thrusts that combine video mentoring, logistics internet, wearable computer systems and weapon systems prognastics/diagnostics. The PIMS maintainer can use various tools that were previously unavailable. The PIMS maintainer is electronically linked with the information needed to help complete the mission effectively. These tools include instant video and audio access to subject matter experts located anywhere in the world, interactive electronic technical manuals, and logistics health data from the weapon system itself. All the information is presented in an easy to use nonobtrusive wearable system.

PIMS required the following equipment and services from Lockheed Martin:

- Floor Space: 8' x 10'.
- One out calling phone

3.2.4 Theaters

3.2.4.1 *Immersive Theater*

The Immersive Theater provided an environmentally controlled viewing area for AE3 visitors to witness the AE3 simulation scenario. The AE3 scenario script appears as an appendix in this document. A combination

of live networked simulations, pre-recorded presentations and video teleconference (VTC) feeds were fused and displayed on a 30 foot wide by 10 foot high projection screen. The live networked simulations transmitted DIS PDU's across the simulation network to the AUSA ballroom. The PDU's were decoded by 4 different computer Image Generators (IG's), supplied by Silicon Graphics Inc., which visually rendered the simulated imagery. In addition, there were over 20 computer-based workstations supplying processing and visualization elements. A total of 30 video feeds (IG's and Workstations) were interfaced to a 32 x 6 video switching matrix control system which controlled which of the video feeds were displayed on the screen in the theater in real-time.

The Immersive Theater was composed of the following subsystems:

- Enclosure Subsystem   (A physical enclosure which provided an acoustically and visually controlled viewing area).

- Audience Seating Subsystem (A tiered floor with seating for the audience)

- Visuals Subsystem (Produced the Stealth and Out The Window (OTW) views to support the presentation of the scenario in the theater.)

- Display Subsystem (Visual displays used to present visual segments of the scenario to the audience)

- Audio Subsystem (A loudspeaker system that presented the audio portion of the scenario to the audience)

- Lighting Subsystem (Provided ambient and scenario related lighting within the theater)

- Live Video Feed Subsystem (Interfaced the live video feeds from the distributed participants to the Switch Subsystem)

- DIS Audio Subsystem (Decoded DIS Audio PDUs and interfaced them to the Switch Subsystem)

- Recorded Audio/Video Subsystem (Recorded Audio/Video clips used for non-networked portions of the theater scenario.)

- Recorded PDU Subsystem (Recorded PDU traffic for use in the event of Long Haul Network disruption.)

- Switch Subsystem (Switched the multiple audio and video inputs to the Display and Audio Subsystems)

- Intercom Subsystem (Provided communications between technicians running the theater and the distributed participants)

- Local Node Subsystem (Consisted of local nodes of networked participants [BVP, LWSE, ASAS, MCSP, and ModSAF])

LAN Subsystem (Provided connectivity between networked subsystems, and between the Immersive Theater and the Long Haul Network.)

Figure 3.2.18-1 shows a decomposition of the Immersive Theater into functional subsystems.
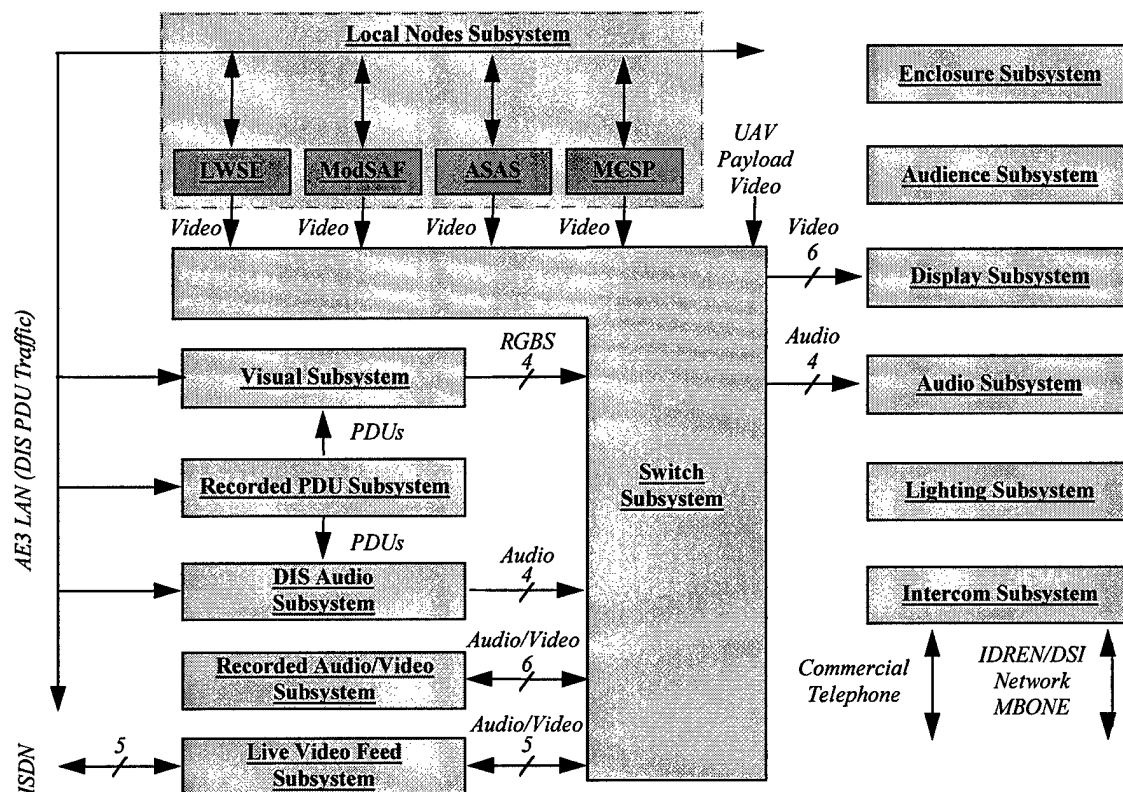
Figure 3.2.17-1 Immersive Theater functional block diagram

3.2.4.2 Force Projection - Tactical Operations Center (FP TOC)

The FP TOC provided an environmentally controlled viewing area for AE3 visitors to witness the AE3 FP TOC demonstration. A combination of live networked simulations and pre-recorded presentations were fused and displayed on two 35 inch high-resolution monitors. The live networked simulations transmitted DIS PDU's across the simulation network to the AUSA ballroom. The PDU's were decoded by 2 different computer Image Generators (IG's), supplied by Silicon Graphics Inc., which visually rendered the simulated imagery. In addition, there were 12 computer-based workstations on the FP TOC theater stage supplying processing and visualization elements. A total of 18 video feeds (IG's and Workstations) were interfaced to a 18 x 2 video switching matrix control system which controlled which of the video feeds were displayed on the two monitors in the theater in real-time.

The FP TOC Theater was composed of the following subsystems:

- Enclosure Subsystem (A physical enclosure was provided with an acoustically and visually controlled viewing area).

- Audience Seating Subsystem (A tiered floor with seating for the audience)

- Display Subsystem (Visual displays used to present visual segments of the scenario to the audience)

- Audio Subsystem (A loudspeaker system presented the audio portion of the scenario to the audience)

- Lighting Subsystem (Provided ambient and scenario related lighting within the theater)

- Recorded Audio/Video Subsystem (Recorded Audio/Video clips used for non-networked portions of the FP TOC scenario.)

- Recorded PDU Subsystem (Recorded PDU traffic for use in the event of Long Haul Network disruption.)

- Switch Subsystem (To switch the multiple audio and video inputs to the Display and Audio Subsystems)

- Intercom Subsystem (Provides communications between technicians running the FP TOC and the distributed participants)

- FP TOC Subsystem (Consisted various FP TOC workstations)

- LAN Subsystem (Provided connectivity between networked subsystems, and between the FP TOC and the Long Haul Network.)

Figure 3.2.18 shows a decomposition of the FP TOC into functional subsystems.
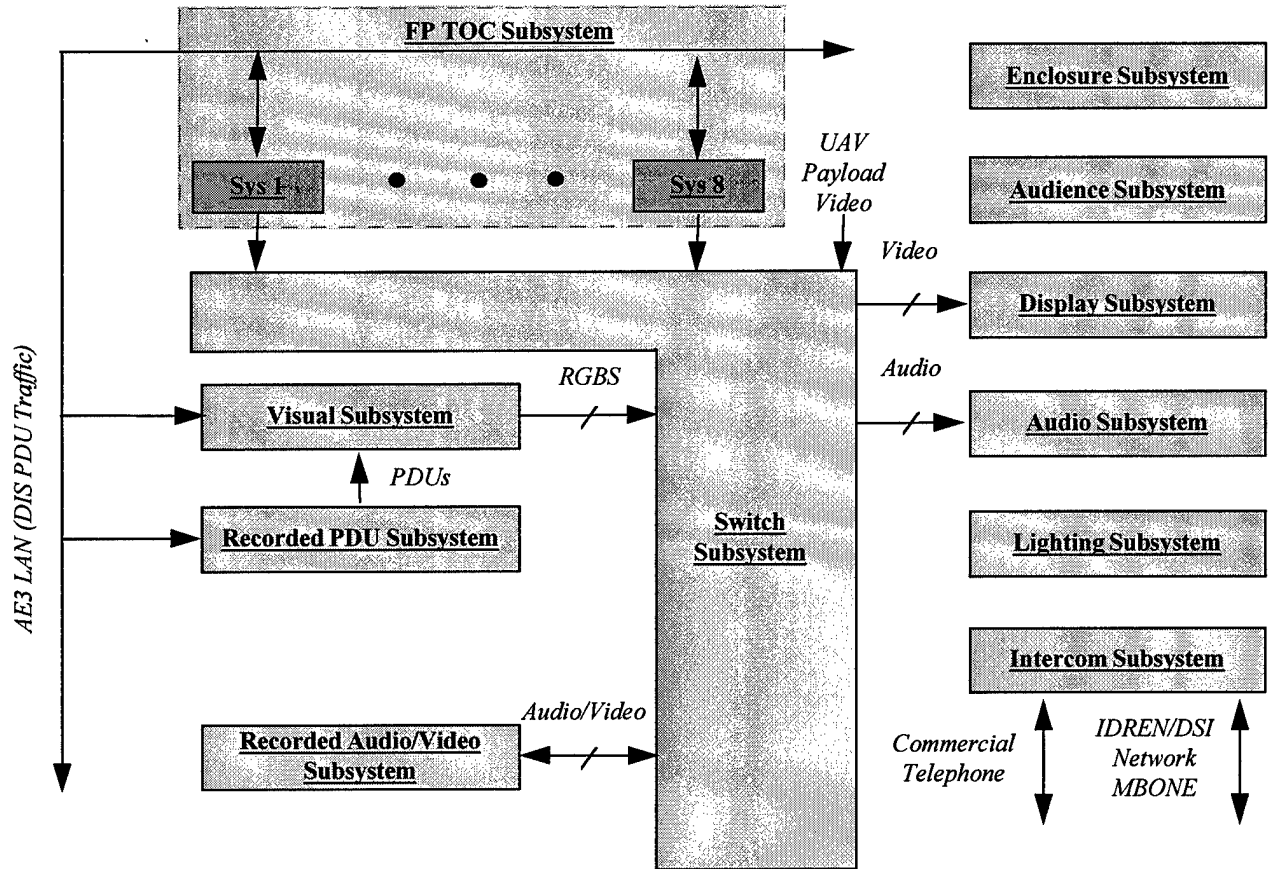
Figure 3.2.18-1 FP TOC functional block diagram

3.3 *AUSA SHOW PRODUCTION*

To prepare for and produce AE3 required coordination of multiple tasks. This section will summarize these tasks and detail the issues that needed to be addressed in preparation for and production of Army Experiment 3 at the 1996 October AUSA.

3.3.1 Hotel and Union Labor

Lockheed Martin contracted with the Sheraton Washington Hotel and Greyhound Exposition Services (GES) for services required to prepare the Cotillion Ballroom for Army Experiment III. These services included air conditioning, electrical power, telephone connections, network connections, tables, draping, and labor for installation, dismantling, and handling of equipment (unloading and loading trucks).

3.3.2 AE3 Teardown Pack and Ship

The planning for teardown packing and outbound shipping was discussed in detail during IPR's 8&9. The final plan was executed on the last day of the demonstration, Wednesday 16 October. Lockheed Martin discussed with each participant in the LAM TF booth, the procedures of outbound shipping. All Standalone Displays were packed and shipped by 10:30 p.m. Wednesday 16 October. The equipment was delivered to Wares United Van Lines warehouse. The outbound choices from Wares were: Wares Van Lines (regular freight out); Federal Express (charged to the participant); participant pick-up. All LAM TF ADST II items were tagged for later inventory.

The day after the demonstration, Thursday 17 October, all equipment was packaged in it's original crates or boxes. All equipment was crated and packaged in a safe and secure manner to prevent any damage during shipment. All Equipment was packed and not shipped loose. The equipment retained it's original crate number for tracking.

3.3.3 Heating Ventilation Air Conditioning (HVAC)

Lockheed Martin provided a power and cooling requirements analysis for AE3 computer equipment. Based on that analysis, the appropriate cooling services were contracted with the Sheraton. The supplemental HVAC required for the immersive and FP TOC theaters was supplied by Exhibit Crafts Inc. (ECI).

3.3.4 Power

Lockheed Martin provided a power requirements analysis (see Appendix E for power analysis) for all elements of the AUSA. Based on that analysis, the appropriate power services were contracted with the Sheraton. The requirements were for three separate sources of power. The exact placement and type of each power outlet on the Sheraton Ballroom floor was documented by Lockheed Martin on a CAD power distribution drawing. Copies of this drawing were supplied to Exhibit Crafts Inc. and the Sheraton subcontractors. ECI made provisions in the design of the exhibit structure for running power. The Sheraton Hotel was responsible for installation of the power on the floor and used the CAD drawing as a guide for placement of the power laydown prior to installation of the exhibit structure. The physical power distribution is shown in Figure 3.3.4-1.
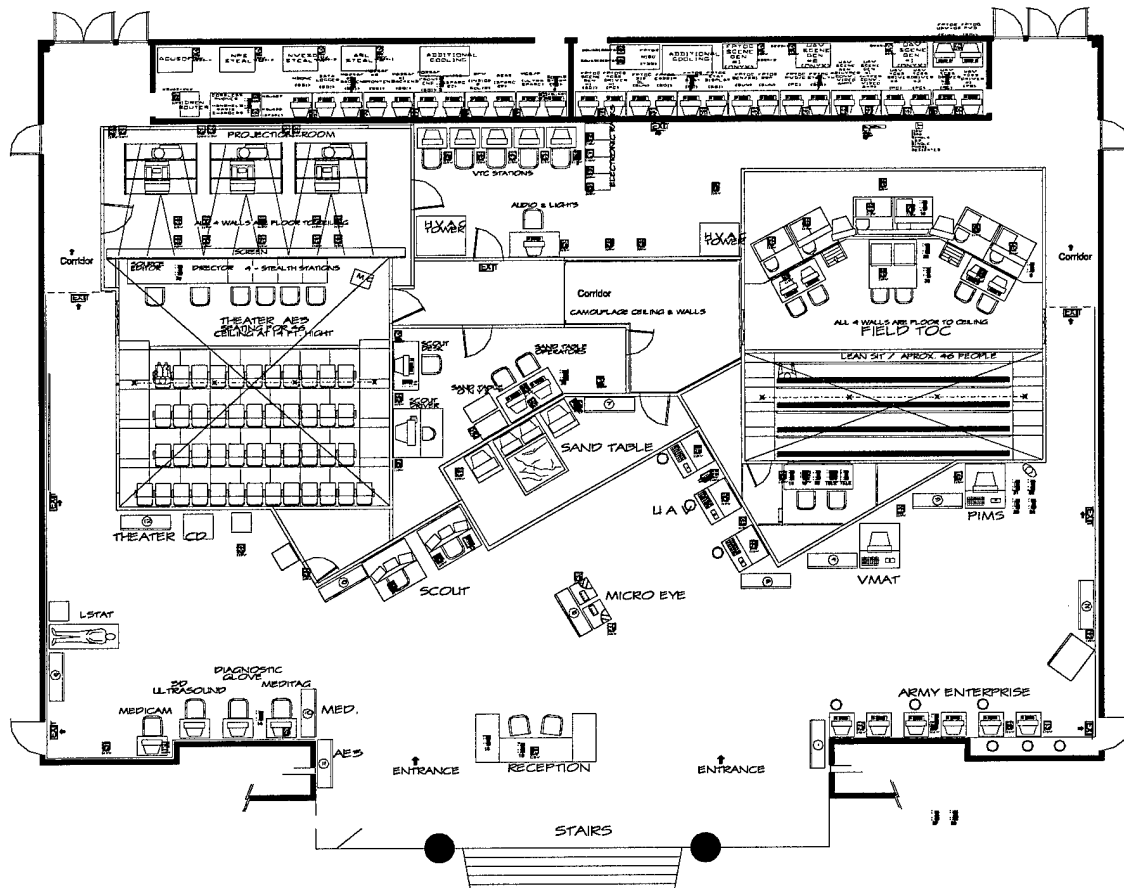
Figure 3.3.4-1 AE3 Exhibit Physical Power Distribution

3.3.5 Ballroom

The LAM TF stand alone displays and theater were installed and integrated into the Cotillion Ballroom. Section 3.2 describes each participant and Figure 3.2-1 illustrates the floor plan in for the AE3 demonstration.

3.3.6 Ancillary Communications

Lockheed Martin arranged for 1-800 dial-up teleconferencing telephone service between the distributed sites and both the Test facility (ARL) and the Cotillion Ballroom to be used for ancillary administrative control of the scenarios. This service was used extensively during Integration and Test as well as during the AUSA show to troubleshoot the live scenario and provide a means of conferencing multiple participants at distributed sites. This method of test proved invaluable in the months leading up to and including actual execution of the AE3 in Washington. Figure 3.3.6-1 summarizes the 1-800 dial-up teleconferencing utility:

AUSA Teleconference Backup

Teleconference Nodes Reserved For INTEGRATION AND TEST Sept 3 - Oct 4

1-800-865-4480

NODE	USAGE
4593	For Misc Debug and Conference
5214	For Misc Debug and Conference

Teleconference Nodes Reserved For AUSA Oct 8 - Oct 17

1-800-532-1188

NODE	USAGE
6115*	For Theater Admin
6116*	For Theater Technical

1-800-865-4480

NODE	USAGE
4593	For TOC Admin
5214	For TOC technical
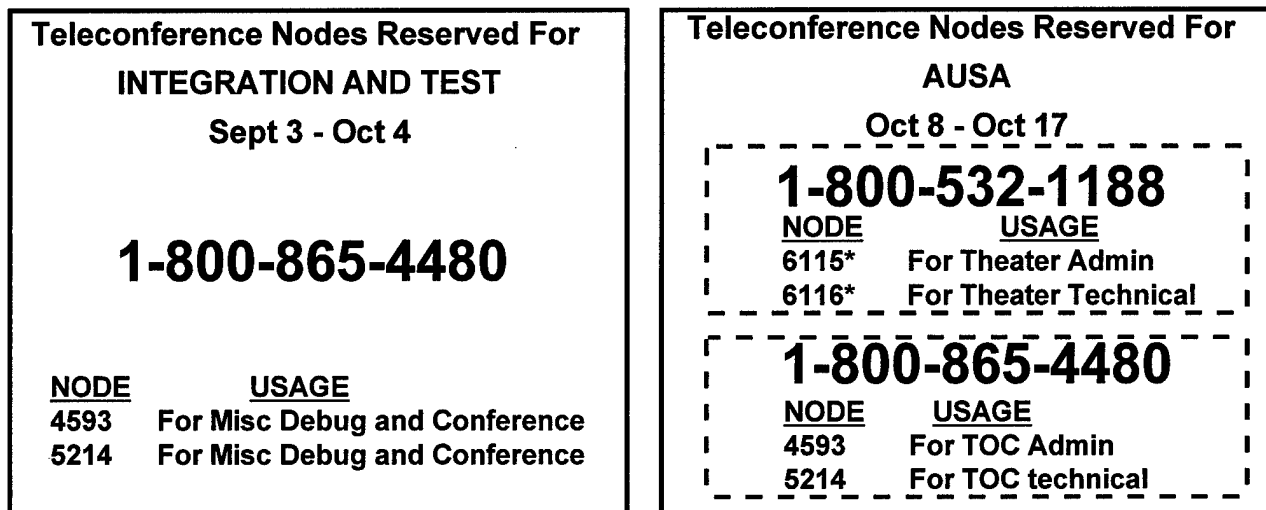
Figure 3.3.6-1 AE3 1-800 Dial-Up Teleconference Utility

Figure 3.3.6-2 represents the logical teleconference grouping that was utilized during interim integration & test and the AE3 demonstration. The teleconferencing method varied between using the M-Bone and AT&T 1-800 dial up service (para 3.3.6).
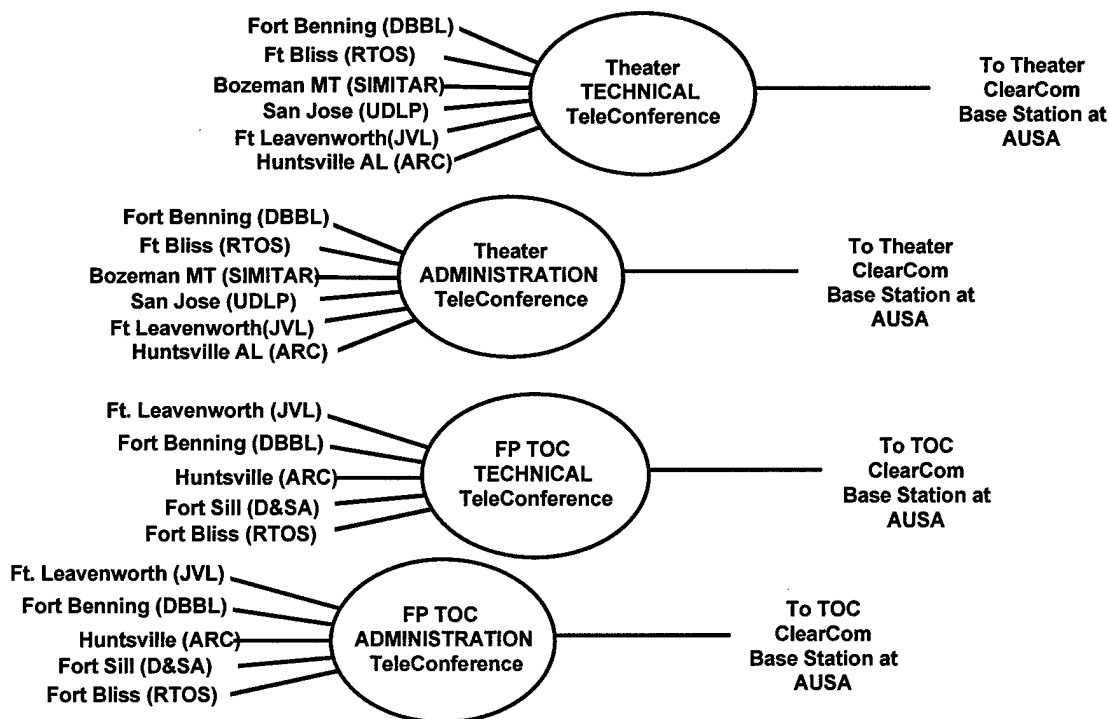
Figure 3.3.6-2 AE3 Logical Teleconference Groupings

Lockheed Martin provided Pagers for key participants during the AE3 integration period. The Pagers provided 1-800 Nationwide service with Voice Mail to facilitate instant access to resolve integration issues. The pagers were assigned to individuals as shown in Table 3.3.6-3.

Last Name	First Name	Beeper Phone Num
Eriksson	Karl	1-888-612-9403
Bryant	Bob	1-888-612-9226
To	Virginia	1-888-612-9250
Dykstra	Phil	1-888-612-9200
Kile	Tom	1-888-612-9401
Ksel	Jan	1-888-612-9258
LTC Smart	Tom	1-888-612-9212
Edwards	Bob	1-800-528-0799
Campbell	John	1-800-549-3213
Neuman	Stephanie	1-800-528-0803
Brown	Kirby	1-800-915-7352
Kalaf	Mike	1-800-474-5516
Helgesson	Ulf	1-800-309-4238
Hutton	Bob	1-800-329-7764
Floater	AE3 Show	1-888-612-9223
Floater	AE3 Show	1-888-612-9228
Floater	AE3 Show	1-888-612-9201
Kubik	Randy	1-800-558-6312
Umbarger	Jeff	1-800-238-7692

Table 3.3.6-3 AE3 Pager Assignments

3.3.7 Telephones/DataFax/2-Way Radios

Lockheed Martin ordered and supplied dial-up telephone services, instruments and 2-Way radios for administrative use in the Ballroom area. The telephones were used for any general telecommunications requiring communication through plain telephone lines. There were two phone lines installed in the kitchen area of the Cotillion Ballroom for voice and fax (the kitchen area was a convenient area which was utilized as the administrative area for management meetings and planning). LAM TF supplied a BROTHER FAX/Copier/Printer in the kitchen and utilized this unit for administrative purposes. The analog instrument for the immersive theater tech room phone #2 & #3 and the receptionist front desk phone # 15 was replaced with 900 Mhz cordless phones.

Figure 3.3.7-1 represents the logical distribution of analog telephone lines throughout the Cotillion Ballroom.

AUSA Phone Provider

- Admin - Immersive Theater Computer Room #1
- Admin - Immersive Theater Computer Room #2
- Admini - Immersive Theater Computer Room #3
- Admin - Immersive Theater Computer Room #4
- Admin - Immersive VTC Support Room #5
- Admin - FP TOC Computer Room #6
- Admin - FPT TOC Computer Room #7
- Admin - FP TOC Computer Room #8
- Admin - FP TOC Control Room#9
- Admin - FP TOC Control Room#10
- Admin - Scout Driver Area #11
- Admin - Sand Table Exhibit Area #12
- Admin - Scout Exhibit Area #13
- Admin - Tele Medicine Exhibit Area #14
- Admin - Receptionist Front Desk #15
- Admin - Receptionist Front Desk #16
- Admin - UAV Exhibit Area #17
- Admin - FP TOC Stage #18
- Admin - FP TOC Stage #19
- Admin - FP TOC Stage #20
- Admin - Virtual Maintainer Exhibit Area #21
- Admin - Virtual Maintainer Exhibit Area #22
- Admin - Virtual Maintainer Exhibit Area #23
- Admin - Virtual Maintainer Exhibit Area #24
- Admin - Army Enterprise Exhibit Area #25
- Admin - Coordination Center (Kitchen) 26
- Admin - Coordination Center (Kitchen) 27
- Admin - Immersive Theater Stage # 28
- Admin - Sand Table Computer Room #29

Figure 3.3.7-1 AE3 Logical Telephone Distribution

Hand held 2-Way radios were used extensively at the AE3 (through installation, integration and the demonstration.). Key people were identified who were involved in onsite AE3 installation and integration and needed to be available on-call. Figure 3.3.7-2 depicts the distribution of hand held 2-way radios.

2-Way Motorola Hand Held Transceivers

LINE	ASSIGNEE	CHAN
Administrative - Remote #1	K. Brown	a
Administrative - Remote #2	K. Wren	a
Administrative - Remote #3	J. Campbell	a
Administrative - Remote #4	M. Kalaf	b
Administrative - Remote #5	R. Kubik	b
Administrative - Remote #6	R. Noble	b
Administrative - Remote #7	S. McCarter	b
Administrative - Remote #8	J. Ksel	b
Administrative - Remote #9	B. Edwards	b

Figure 3.3.7-2 AE3 2-Way Radio Assignment

Figure 3.3.7-4 represents the distribution of the local communication Clear Comm headsets. This configuration was used for the interim integration & test and at the AE3 demonstration.
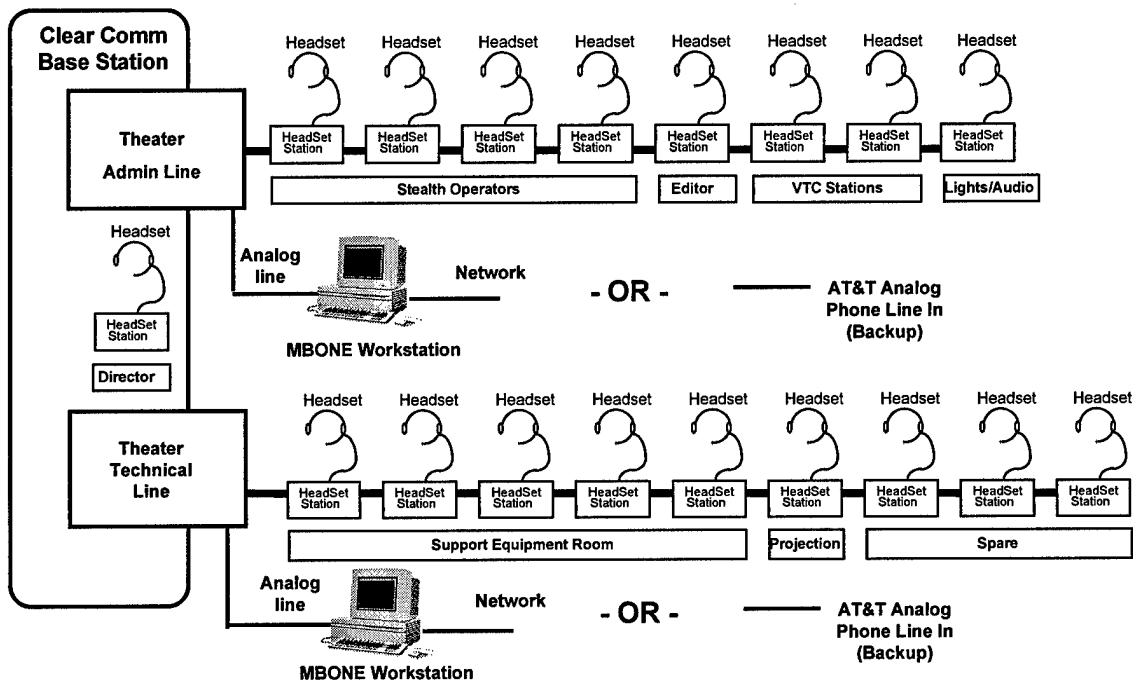
Figure 3.3.7-4 Clear Comm Distribution

3.3.8 Exhibit Support

3.3.8.1 *Perimeter Drapes*

Lockheed Martin arranged, through a Exhibit Crafts Inc. (ECI) to supply black perimeter drapes for the AUSA at the Cotillion Ballroom. (ECI) contracted with Greyhound Exposition Services (GES) to lease and install the black curtains.

3.3.8.2 *Furniture*

Lockheed Martin arranged for all custom furniture to be designed and built by Exhibit Crafts Inc. Folding tables and chairs were provided by the Sheraton.

3.3.8.3 *Immersive Theater*

Lockheed Martin arranged for, through ECI, based on designs received from the Exposition Conceptual Designer, an appropriate ramp, audience seating and the design of the enclosure for the Immersive theater including lighting, audio system (public address), sound deadening, and video projection systems.

3.3.8.4 *Carpet*

Lockheed Martin arranged for, through ECI, based on designs received from the Exposition Conceptual Designer, appropriate carpeting for both theaters and the Cotillion Ballroom.

3.3.8.5 *FP TOC*

Lockheed Martin arranged for, through ECI, based on designs received from the Exposition Conceptual Designer, an appropriate ramp, audience seating and the design of the enclosure for the FP TOC theater including lighting, audio system (public address), sound deadening, and video projection systems.

3.3.9 AE3 Network Communications

Figure 3.3.9-1 depicts the logical communications topology for AE3 networked participants.
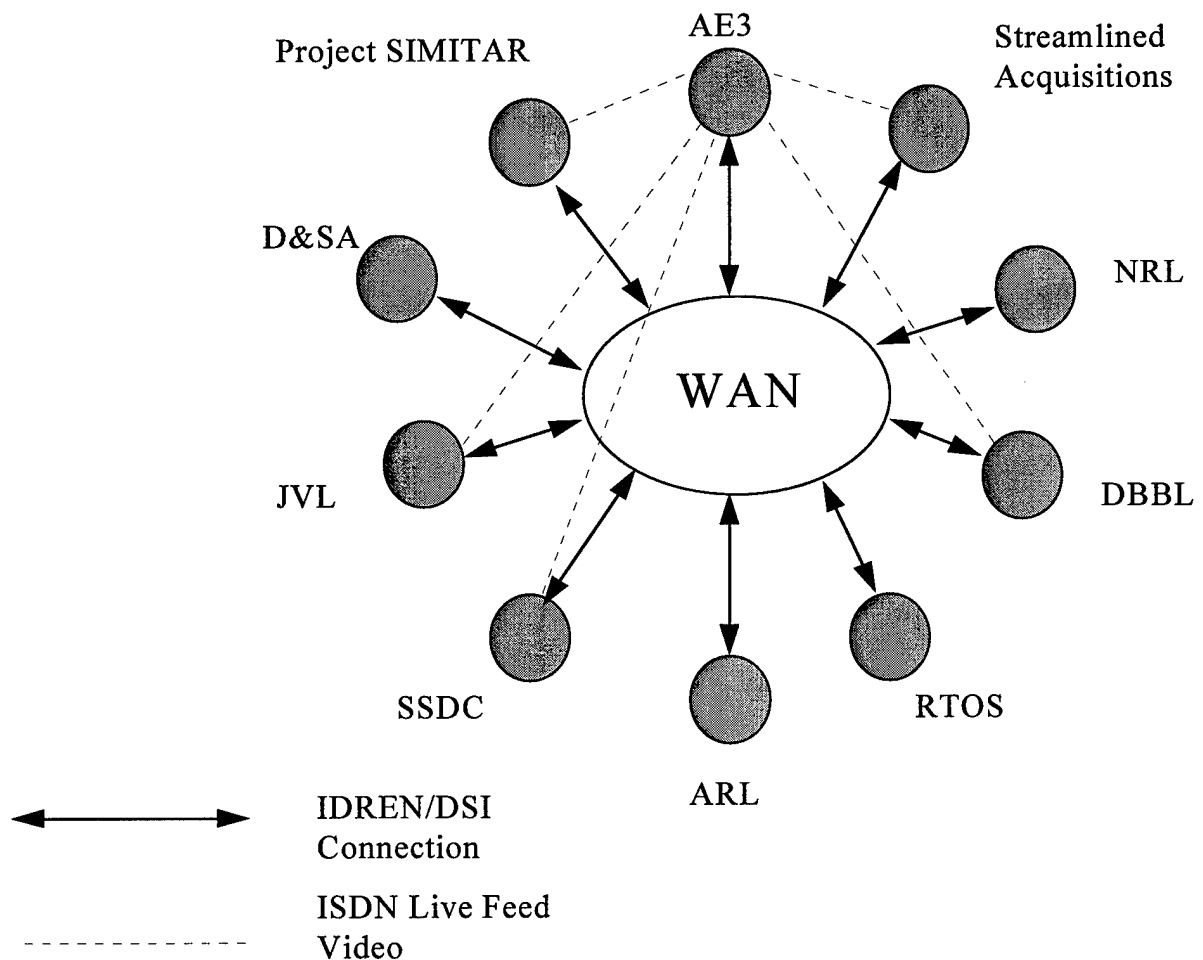
Figure 3.3.9-1 Logical Communications Topology for AE3 Networked Participants

3.3.9.1 *Integrated Services Digital Network (ISDN)*

ISDN network lines are required to carry the signal between two sites conducting a Video Teleconference (VTC). Five sites participated in the AE3 via live VTC. This necessitated lease of ISDN lines and associated air time by Lockheed Martin. Lockheed Martin arranged for, through local phone companies, ISDN lines per the following schedule: For the period 6 September 1996 through 31 October 1996 connections were made from the distributed sites listed below to:

> Lockheed Martin
> 12506 Lake Underhill Road
> Orlando, FL 32825

Distributed Sites:

> United Defense LP
> 1115 Coleman Ave
> San Jose, CA 95103
> POC: Don Cahalan 408.289.2744
>
> Land Warrior Test Bed
> Building 2866 (Cross Connect at Building 479)
> Way Street
> Fort Benning, GA 31905
> POC: Jim Morris 706.682.5300
>
> US Army TRAC
> Attn: ATRC JVL
> Funston Hall
> Fort Leavenworth, KS 66027
> POC: Gene Pal 913.684.7569
>
> Project SIMITAR
> 24 W. Menden Hall
> Bozeman, MT 59771
> POC: Dan Rose 406.444.6969
>
> For the period 9 October 1996 through 31 October 1996 connections were made from the distributed sites to:
>
> The Cotillion Ballroom
> Sheraton Washington
> 2660 Woodly Rd at Connecticut Ave NW
> Washington, DC 20008
> POC: Mike Looney 202.328.5600

Distributed Sites:

United Defense LP
1115 Coleman Ave
San Jose, CA 95103
POC: Don Cahalan 408.289.2744

Land Warrior Test Bed
Building 2866 (Cross Connect at Building 479)
Way Street
Fort Benning, GA 31905
POC: Jim Morris 706-682-5300

US Army TRAC
Attn: ATRC JVL
Funston Hall
Fort Leavenworth, KS 66027
POC: Gene Pal 913.684.7569

Project SIMITAR
24 W. Menden Hall
Bozeman, MT 59771
POC: Dan Rose 406.444.6969

SSDC
Huntsville, AL
POC: Kelvin Nunn 205.842.6529

A summary of the points of contact for ISDN service is contained in the Table 3.3.9.1-1.

Connection Type	Start Date	End Date	Time	BW	Location	Carrier	Carrier POCs
ISDN	10/9/96	10/17/96	NA	1 line 2B+D	Huntsville	AT&T already in place	Kelvin Nunn 1-205-842-6529 John Smith 1-205-876-1802
ISDN	8/23/96	10/31/96	NA	1 line 2B+D	DBBL	Bell South	Ann Downing 1-407-245-2032
ISDN	9/3/96	10/31/96	NA	Switch 56	Proj. Simitar	US West	Shirley Poglaze 1-801-237-8877
ISDN	8/20/96	10/31/96	NA	1 line 2B+D	Streamlined Acquisitions (United Defense)	Pacific Bell	Kathy Pizzillo 1-213-975-4089 Dave Olsen 1-213-975-2877
ISDN	8/19/96	10/31/96	NA	1 line 2B+D	JVL/TRAC	South Western Bell	Sheri Lux 1-800-229-3214
ISDN	8/30/96	10/15/96	NA	4 lines 2B+D	LMC	Bell South	Ann Downing 1-407-245-2032
ISDN	10/1/96 (D-Mark) 10/10 (Show)	10/31/96	NA	5 lines 2B+D	Sheraton, D.C.	Bell Atlantic	Dottie Price 1-301-595-2215 Andre Granderson 1-301-595-2216
ISDN Long Distance	8/28/96	10/31/96	NA	NA	All Locations	Sprint	Brenda Wagner 1-610-660-3971

Table 3.3.9.1-1 ISDN Points of Contact

3.3.9.2 *Interim Defense Research Engineering Network (IDREN)*

ARL had overall responsibility for the design and implementation of the IDREN portion of the Long Haul Network. ARL supplied all hardware and software needed to operate the IDREN portion of the Long Haul Network. Lockheed Martin supplied systems engineering support associated with the design of the IDREN. Also, Lockheed Martin acted as the single point of contact for all Long Haul Network maintenance problems.

The IDREN is an on-demand network facility. Once ARL had established connectivity to the AE3 distributed sites there was no requirement for advanced scheduling or coordination. Therefore, ARL did not have to arrange for IDREN connectivity.

3.3.9.3 *Defense Simulation Internet (DSI)*

Not all distributed sites participating in the AE3 Long Haul exercise had a direct connection into the IDREN. For those sites not directly connected to the IDREN, a DSI link was established to the closest IDREN repeater in the USA. This made it necessary for Lockheed Martin to schedule usage of the DSI during the integration period leading up the AE3 as well during the time period of the AE3 itself. Lockheed Martin arranged, through Houston Associates (1-800-259-9660), for DSI connectivity per the following schedule:

For the period 1 August 1996 through 4 October 1996 connections were required from the following distributed sites:

Location	Site Name
ARL Aberdeen, MD	ARL
DBBL Fort Benning, GA	DWBL
DSABL Fort Sill, OK	FAS
Project SIMITAR Bozeman, MT	163IN
RTOS Fort Bliss, TX	ADAS
Texas Instruments Dallas, TX	TI

For the period 9 October 1996 through 16 October 1996 connections were required from the following distributed sites:

Location	Site Name
ARL Aberdeen, MD	ARL
DSABL Fort Sill, OK	FAS
Project SIMITAR Bozeman, MT	163IN
RTOS Fort Bliss, TX	ADAS

3.3.9.4 *T1 Network Lines*

For those sites that had neither DSI or IDREN connections, dedicated T1 network lines had to be purchased and installed to support long haul data communications. Each site was outfitted with T1 connectivity with the exception of the connection into the AUSA exhibit at the Sheraton. For that connection, three T1 lines were installed to provide redundancy and minimize the possibility of losing the live network feed. A summary of T1 information is shown in Table 3.3.9.4-1.

Connection Type	Start Date	End Date	Location	Carrier	Carrier POCs	Site POCs
T1	8/12/96	10/31/96	Streamlined Acquisitions to FIXWest	Pacific Bell 24 hour line: 1-800-332-1321	Shelly Woodhouse 1-408-369-3317 Sharon Miller 1-408-369-3003	Don Cahalan 1-408-289-2744 Lance Topman 1-415-604-3664 Bill Jones 1-415-604-6482
T1	8/28/96	10/15/96	LMC to ARL	AT&T 24 hour line: 826-7982	Herb Rhodes 1-407-306-7257 Ron Brewer 1-303-430-2156	Herb Rhodes 1-407-306-7257 Tom Kile 1-410-278-6808
T1	10/10	10/31/96	ARL to AE3	AT&T 24 hour line: 826-7982	Ron Brewer 1-303-430-2156	Tom Kile 1-410-278-6808 Mike Looney 1-202-328-5600

Table 3.3.9.4-1 T1 Network Lines Points of Contact

3.3.9.5 *OSF Testing*

The Operational Support Facility (OSF) integration test was a month long test during which the AE3 participants connected to the OSF at Lockheed Martin in Orlando. Connectivity dates that were supported are detailed in paragraphs 3.3.9.1 through 3.3.9.4.

3.3.9.6 *AE3 Demonstration*

The AE3 demonstration required connectivity for an integration period plus connectivity for the actual AE3 demonstration. AE3 participants connected to the Sheraton in Washington DC. Connectivity dates that were supported are detailed in paragraphs 3.3.9.1 through 3.3.9.4

3.4 *INTEGRATION AND TEST*

Lockheed Martin prepared and executed a phased approach to the integration and testing. The AE3 integration and test process exercised various simulation elements in a building block fashion (refer to Appendix G). Testing began with a Long Haul Network test, followed by subsystem test, then integrated system tests, and finally a full system dry run. To support this phased approach the following test events and locations were scheduled:

- Long Haul Network Test - Aberdeen, Maryland, 8/5 - 8/26
- Operational Support Facility (OSF) Test - Orlando, Florida, 8/26 - 10/4
  - OSF Preparation, 8/26 - 8/30
  - OSF Point-to-Point Test, 9/3 - 9/13
  - OSF Scenario Test, 9/17 - 10/4
- Integration and Execution - AE3, Washington DC, 10/9 - 10/16

Figure 3.4-1 illustrates the communication nodes established to support the integration and test hosted in Orlando, FL and at the AUSA show site - Sheraton Washington.
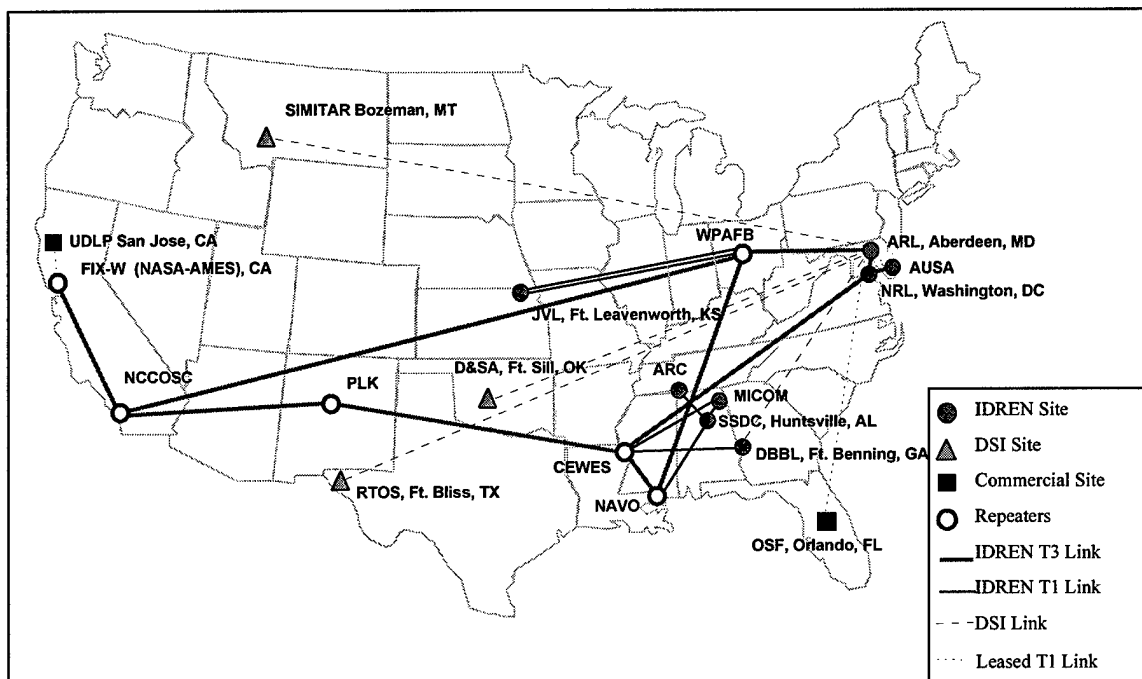
Note: DBBL DSI Link is a backup, IDREN T1 Installation in Aug '96
OSF Connection to ARL is for testing in September '96
JVL to WPAFB is dual T1
NRL to AUSA line is 10mb commercial line

Figure 3.4-1 AE3 Integration

Table 3.4-1 lists Immersive theater participants and gives the data regarding their interface to the theater and the FP TOC.

Immersive Theater Participant	Location	istributed	Live VTC Video	Onsite Video Feed	IS PDU Theater	IS PDU FP TOC
NV&ESD	Fort Belvoir, Virginia	N	N	N	Y	N
ARC	Huntsville, AL	Y	N	N	Y	Y
D&SA	Fort Sill, Oklahoma	Y	N	N	Y	Y
DBBL	Fort Benning, GA	Y	Y	N	Y	N
ARL	Aberdeen, MD	N	N	N	Y	N
JVL	Fort Leavenworth, KS	Y	Y	N	Y	Y
Streamlined Acquisition	San Jose, California	Y	Y	N	Y	N
Project Simitar	Bozeman, Montana	Y	Y	N	Y	N
RTOS	Fort Bliss, Texas	Y	Y	N	Y	Y
UAV	Draper Labs, MA	N	N	N	Y	N
Battle Planning & Visualization	Fort Leavenworth, KS	Y	Y	Y	N	N

Table 3.4-1 Interactive Theater Participants

3.4.1 Long Haul Network Test, 5 Aug - 26 Aug

This test was designed to provide verification of the performance and multicast routing integrity of the AE3 Long Haul Network, which was comprised of Interim Defense Research Engineering Network (IDREN), Defense Simulation Internet (DSI) and commercial T1 and other components. Specific sub-tests are listed in the following section.

3.4.1.1 *Reachability*

This test verified that the distributed Local Area Networks (LANs) could be contacted by the Long Haul Network, allowing the potential issues to network integration to be identified. The interrogation was accomplished by using UNIX command - ping.

3.4.1.2 *M-Bone (Multicast Backbone)*

The M-Bone audio and video functionality of the IDREN was tested. Testing verified M-Bone subsystem interface and audio/video quality. This test verified that the AE3 unique multicast addressing scheme allowed the required communications between distributed sites. There were three multicast groups; Immersive Theater, FP TOC Theater, and network/test control (audio teleconferencing). More information on the M-Bone can be acquired through URL.

http://www.arl.mil/ARL-Directorates/ASHPC/HPCD/MBONE/index.html.

3.4.1.3 *Long Haul Network Test Participants*

Table 3.4.1.3-1 lists the Long Haul Network test participant sites, their geographic locations and the type of network to which they interfaced.

Participant	Location	Network Interface
ARC	Huntsville, Alabama	IDREN
D&SA	Fort Sill, Oklahoma	DSI
DBBL	Fort Benning, Georgia	IDREN
ARL	Aberdeen, Maryland	IDREN, DSI, Commercial T1
JVL	Fort Leavenworth, Kansas	IDREN
Streamlined Acquisition	San Jose, California	Commercial T1
Project SIMITAR	Bozeman , Montana	DSI
RTOS	Fort Bliss, Texas	DSI
OSF	Orlando, Florida	Commercial T1

Table 3.4.1.3-1 Long Haul Network Test Participants

All of the initial tests were directed by ARL and supported by the technical points of contact from each participating site as shown in Table 3.4.1.3-2.

Participant	Point of Contact	Phone
ARC	Dai Chu Will Kistler	205-955-5405
D&SA	Bob Bryant	405-442-3616
DBBL	Jim Morris	706-682-4300 706-682-5300
ARL	Ginny To	410-278-3412
JVL	John Ratzenberger Gene Pal	913-684-9235 913-684-7570
Streamlined Acquisition	Bob Hatton	407-380-5500
Project SIMITAR	John Wasson SGT. Dan Rose	208-334-9603 406-444-6969
RTOS	Gil Zuniga	915-568-1238
Lockheed Martin	Bob Edwards	407-306-4453

Table 3.4.1.3-2 Technical Points of Contact for the Long Haul Network Test

3.4.1.4 *Long Haul Network Test Schedule*

Designated personnel were made available at each Long Haul site for on-call support between the hours of 1000 - 1800 EDT between the dates of 8/5 to 8/26.   Once the reachability to each site was verified, the machines that had been reached during the test remained up and communicating for the duration of test and through the AUSA show.

3.4.1.5 *Army Research Laboratory (ARL)*

ARL played the primary role in the Long Haul test and was responsible for the following:

- Providing mrouted software to all experiment participants. Software made available via FTP server as described in Section 3.4.1.6.

- Consulting on installation and operation of mrouted software if needed.

- Coordination, installation and test of IDREN network assets.
  - Direction of Reachability tests
  - Direction of M-Bone tests
    - Setting up multicast groups and M-Bone tunnels
    - Determining and implementing router filtering
    - DSI - IDREN packet forwarding
  - Direction of Bandwidth/Latency tests
- Generation of a periodic e-mail Test Results Report and forwarding to all AE3 participants

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3.4.1.6 *Mrouted Software*

Mrouted software was required for all distributed participants involved in the live simulation exercise. Mrouted is software that runs on a workstation that implements multicast routing. AE3 used multicast routing to pass data packets on the IDREN. Multicasting lowers bandwidth requirements by directing network traffic to only the appropriate locations. The mrouted software was available via an FTP server.

3.4.1.7 *Distributed Sites*

Each distributed site was responsible for the following:

- Acquiring, downloading and installing mrouted software on their designated mrouted machines (SGI Indy).

- As soon as possible, sending e-mail to "ae3coms@arl.mil" providing the IP address of the mrouted machine and the addresses of the simulation machines.

- During the individual site test, the designated personnel had to be available via phone until the M-Bone tunnel was up. The individual did not necessarily need to be at the simulation site if they had remote access.

- Coordination of required personnel, equipment and services at the distributed sites was a site responsibility.

3.4.1.8 *Equipment*

Each participating site required an SGI Indy running IRIX 5.3 for the test and duration of the experiment to run the mrouted software which was used to support multicasting. For those sites that could not obtain an Indy, loaners were supplied for the duration of the experiment.

3.4.1.9 *Lockheed Martin*

Lockheed Martin was responsible for the following:

- Scheduling the DSI connectivity and the commercial data line connectivity required for this test.

- Providing administrative and technical support to ARL as required for the conduct of the test.

3.4.2 OSF Integration and Test, 26 Aug - 4 Oct

OSF Test in Orlando provided functional and interface testing of Immersive Theater subsystems. This test also verified interconnected functionality of all AE3 sites. Initially, each component was tested individually. The test culminated in a full system test to verify the functional performance of the entire Immersive Theater. This test was be broken into three phases:

- Phase 1: OSF Preparation, 8/26 - 8/30 (Section 3.4.2.1)

- Phase 2: Point-to-Point Test, 9/3 - 9/13 (Section 3.4.2.2)

- Phase 3: Scenario Test, 9/17 - 10/4 (Section 3.4.2.3)

All tests were scheduled at Lockheed Martin for Monday through Friday, 0900 - 1800 hours EDT. The weekends were reserved as make-up time but were not worked..

3.4.2.1 *OSF Preparation 26 Aug - 30 Aug*

The Operational Support Facility (OSF) at Lockheed Martin ADST II facility was the site for interim integration and testing During this period Lockheed Martin performed the tasks required to prepare the facility for AE3 exercise integration and test. These tasks were: Assure that the facility established communication to the IDREN; Allocate appropriate space in the OSF; Install theater components (Local Area Network (LAN) lines, workstations, audio-visual equipment). The following paragraphs give details of the OSF preparation activities.

3.4.2.1.1 OSF Long Haul Network Communication Test

Initially the Lockheed Martin facility did not communicate to the DSI or IDREN networks. LMC installed a commercial T1 line from the Orlando OSF to ARL in Aberdeen, Maryland to provide connection into the IDREN and performed tests to verify connectivity.

3.4.2.1.2 Theater Components Test

The objective of this test was to verify interfaces between and operation of the theater subsystems.

The key subsystems of the Immersive Theater were installed at the OSF to provide a test bed for testing theater functional capability and to support long-haul testing. Both the integration of Long Haul Network participants and Long Haul Network functional test were coordinated from Lockheed Martin's OSF. The subsystems tested included: IG's; Soundstorm, Data logger; Clear Comm; SAFOR's; Audio/Visual System (including projection screen, projectors, edit station, and video switcher system)

Figure 3.4.2.1.2-1 shows the OSF LAN configuration (functionally identical to the AUSA LAN) relevant to the test. (The numbers next to each box represent the unique network address (IP address) of that machine on the distributed network.)
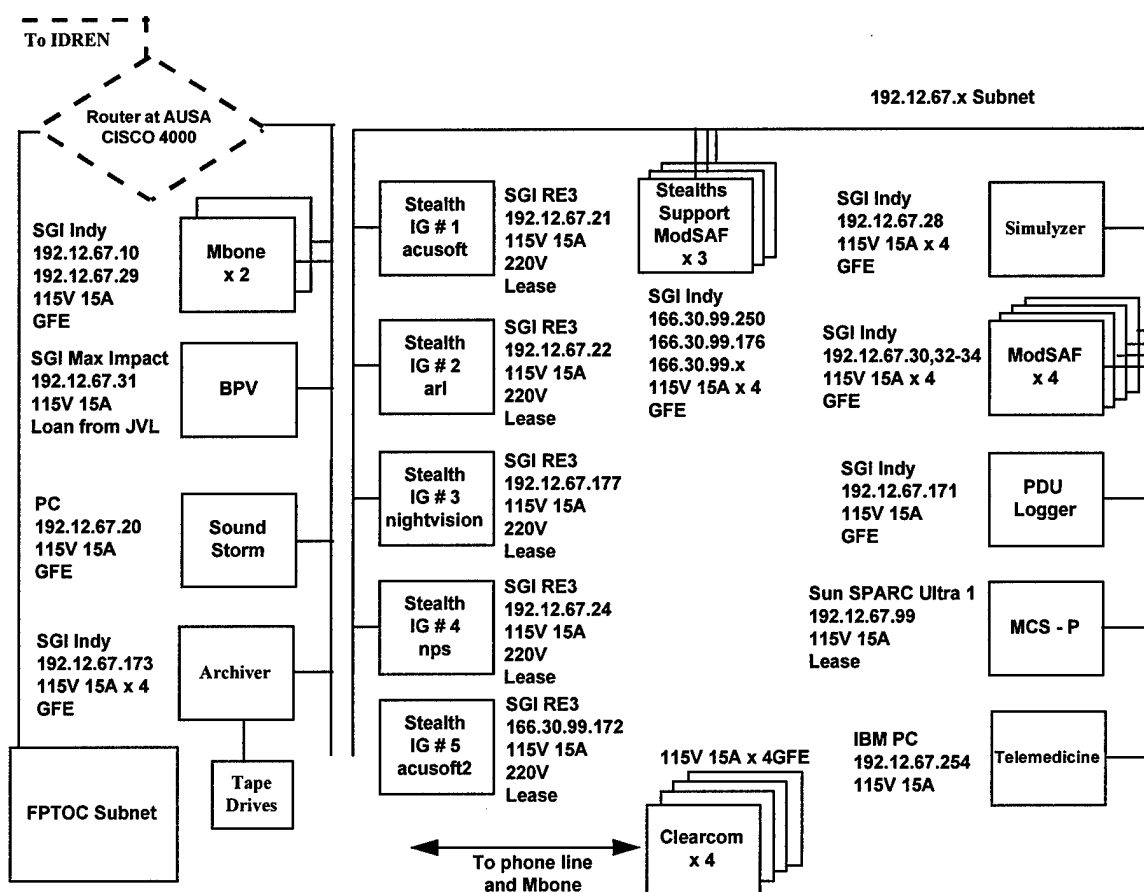
Figure 3.4.2.1.2-1 OSF/AUSA LAN Topology.

3.4.2.1.3 OSF Preparation Participants

Table 3.4.2.1.3-1 lists OSF preparation participants.

Participant	Location	Test Function	Test Schedule
ARL	Aberdeen, Maryland	Test T1 connection to OSF	8/26 - 8/30
LM (OSF)	Orlando, Florida	Test T1 connection to ARL , install and test LAN	8/26 - 8/30
AcuSoft	Orlando, Florida	Install and Test IG #1	8/26 - 8/30
SGI	Orlando, Florida	Install and Test IG #1	8/26 - 8/30
JVL	Orlando, Florida	Early data capture	8/26 - 8/30
Maguire Reeder	Orlando, Florida	Early data capture	8/26 - 8/30

Table 3.4.2.1.3-1 OSF Preparation Participants

3.4.2.2 *OSF Point-to-Point Test, 3 Sept - 9 Sept*

OSF point-to-point Test verified the operational functionality of the theater subsystem and the interface to each distributed site. The goal of the point-to-point phase was to identify and correct all software / hardware problems before Scenario Test at OSF. At the end of OSF point-to-point test the theater subsystems were functionally tested and integrated. Further, all distributed participants were interoperating correctly. This resulted in a system ready for full scenario dry-run and rehearsal.

As part of the point-to-point testing the following system tests were performed for each distributed site:

- Connectivity between the OSF and the distributed site.

- Correctness and interoperability of the visual data bases as loaded on their respective machines at the distributed sites were verified via a correlation test.

- Model uniformity was tested via inspection of enumeration tables, and representative sampling of distributed entities.

- The AE3 scenario was run to test long-haul effects of the exercise.

A key part of this test phase is the collection of data. Logger files were collected and made available to AE3 participants. These files are used all AE3 participants for debugging purposes.

To facilitate the distribution of logged files, databases, and public DIS test tools, Lockheed Martin establish an FTP account accessible via the Internet where any party wishing to retrieve information was able to do so by logging onto the system through the Internet.

The terrain data bases that were used for testing was Chorwon Korea and Fort Benning McKenna MOUT. Lockheed Martin prepared a standardized version of the Chorwon database in multiple database source data

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formats and placed it on the FTP site for distribution to all participants. The Naval Post Graduate School (NPS) prepared the MOUT database.

3.4.2.2.1 OSF Point-to-Point Test Participants

Table 3.4.2.2.1-1 lists all of the point-to-point test participants, their location and test times.

Participant	Location	Network Interface	Test Schedule
ARC	Huntsville, Alabama	IDREN	9/3 - 9/13
D&SA	Fort Sill, Ohio	DSI	9/3 - 9/13
DBBL	Fort Benning, Georgia	IDREN	9/3 - 9/13
ARL	Aberdeen, Maryland	IDREN, DSI	9/3 - 9/13
JVL	Fort Leavenworth, Kansas	IDREN	9/3 - 9/13
Streamlined Acquisition	San Jose, California	Commercial link	9/3 - 9/13
Project SIMITAR	Bozeman , Montana	DSI	9/3 - 9/13
RTOS	Fort Bliss, Texas	DSI	9/3 - 9/13
OSF	Orlando, Florida	Commercial Link	9/3 - 9/13

Table 3.4.2.2.1-1 OSF Point-to-Point Test Participants.

3.4.2.3 *OSF Scenario Test, 17 Sept - 4 Oct*

The Scenario Test was performed at the OSF in Orlando, Florida. The AE3 experiment scenario was exercised, for the first time, on a distributed simulation network using the IDREN / DSI / Commercial Data Lines environment. The scenario laydown was aggressive in terms of number of entities and complexity. However, the building block test approach used in earlier phases mitigated the risk associated with first-time implementation.

This test combined all sites over a three week period. Each morning was reserved for problem resolution and test setup (0800 - 1200 EDT). A live networked test was scheduled each test day (1300 - 1700 EDT). The first two weeks were devoted to integration test and scenario tuning and the third week was devoted to formal scenario dry run. Figure 3.4.2.3-1 shows the network configuration relevant to the test.
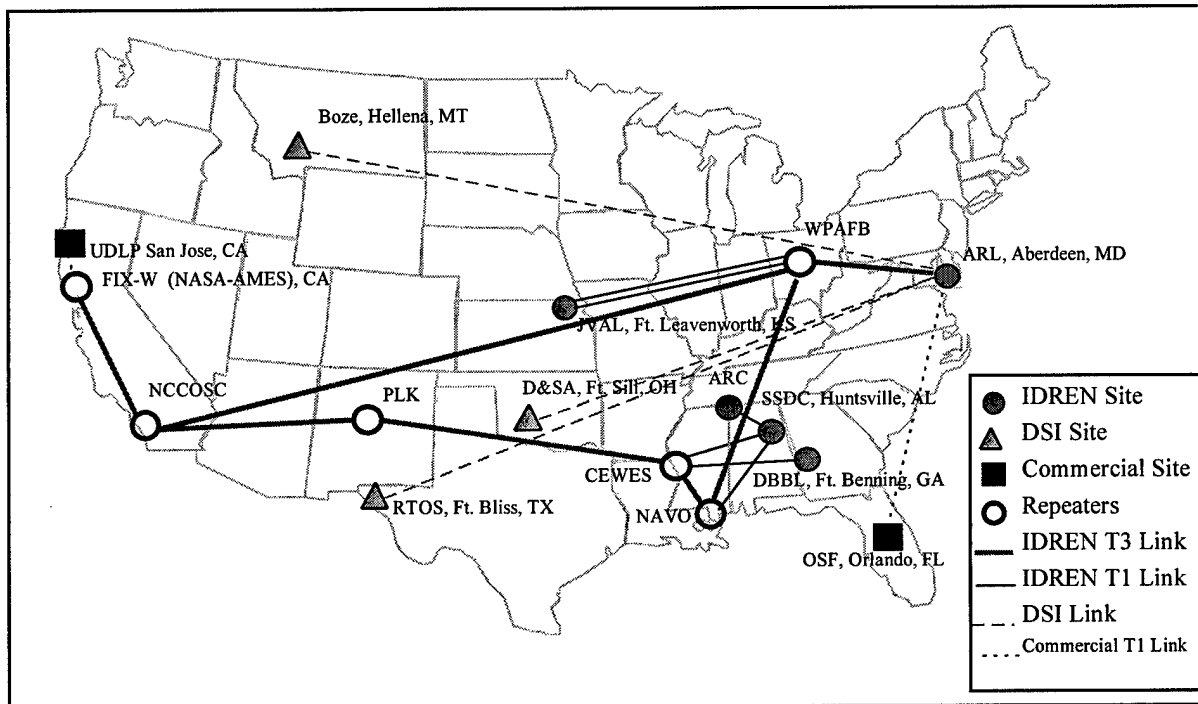
Figure 3.4.2.3-1 Scenario Test Network Configuration.

3.4.2.3.1 Network Load/Latency Test

This test identified the limits of system and network performance. PDU traffic was gradually increased to a level that was considered greater than "worst case" for the AUSA scenario to determine if this was possible without experiencing anomalies.

3.4.2.3.2 Live Feed Video Test

ISDN connections were made between the integration site at the OSF and each of the distributed video feed sources to test the Live Feed Video. Testing verified ISDN / Switch subsystem interface, VTC system band width (update rate) and image quality.

3.4.2.3.3 Scenario Rehearsal and Data Logging

Scenarios were repeatedly run and refined. Each trial was logged for playback over the network in case an anomaly needed to be debugged. The actual AE3 emcees rehearsed their voice script live during the trial runs. Formal trial runs were conducted during the final two days of rehearsal (Oct 2-4) which included supporting demonstrations for Army VIP's escorted by STRICOM.

3.4.2.3.4 Scenario Test Participants

Table 3.4.2.3.4-1 lists all of the long-haul participants, their location and specifies the type of the network to which they interfaced.

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Participant	Location	Network Interface	Schedule
ARC	Huntsville, Alabama	IDREN	9/17 - 10/4
D&SA	Fort Sill, Ohio	DSI	9/17 - 10/4
DBBL	Fort Benning, Georgia	IDREN	9/17 - 10/4
ARL	Aberdeen, Maryland	IDREN, DSI	9/17 - 10/4
JVL	Fort Leavenworth, Kansas	IDREN	9/17 - 10/4
Streamlined Acquisition	San Jose, California	Commercial link	9/17 - 10/4
Project SIMITAR	Bozeman , Montana	DSI	9/17 - 10/4
RTOS	Fort Bliss, Texas	DSI	9/17 - 10/4

Table 3.4.2.3.4-1 Scenario Test Participants.

3.4.3 AUSA Integration and Execution, 10/9-10/16

3.4.3.1 *Move-in*

The items used in the System Test were disassembled, packed, and transported to the Sheraton's Cotillion room for the AE3 demonstration. Due to a short set up time (5 days) the coordination of the move-in to the Sheraton had to be precisely executed. A detailed move-in schedule was coordinated months in advance and appears in appendix F. It was critical to assure that trucks arrived in the correct order to support the move-in activities in the correct sequence. For this reason a detailed shipping plan was coordinated in advance and is detailed in section 3.6 of this report.

3.4.3.2 *Integration*

The integration process focused on establishing a reliable demonstration capability which could be installed and up and running in a few days. Priorities had to be established for integration activities. First priority was establishing and testing connectivity for the Long Haul network linkage from ARL to the Sheraton Cotillion Ballroom. Second priority was integration and scenario test of the interactive theater components. Stand alone participants received lowest priority and were installed and tested as time permitted. A detailed AUSA Integration plan was coordinated months in advance and appears in appendix G.

3.4.3.3 *AE3 Operation*

The AE3 exhibit reception desk was manned by LAM Task Force personnel who provided the schedule of live show times, distributed tickets to the Live Theaters and handled VIP scheduling. Standalone exhibits were manned by the exhibitors with support from STRICOM and LAM Task Force personnel who provided subject matter expertise and helped to answer general exhibit questions and debrief personnel coming out of the live theaters. The schedule of virtual theater show times appears in Table 3.4.3.3-1:

Monday 14 October Schedule

Enter Theater	Theater Show	Exit Theater	TOC Show	Show Over
1100	1105	1125	1130	1150
1130	1135	1155	1200	1220
1200	1205	1225	1230	1250
1230	1235	1255	1300	1320
1300	1305	1325	1330	1350
1330	1335	1355	1400	1420
1400	1405	1425	1430	1450
1430	1435	1455	1500	1520
1500	1505	1525	1530	1550
1530	1535	1555	1600	1620
BREAK				
1630	1635	1655	1700	1720
1700	1705	1725	1730	1750
1730	1735	1755	1800	1820
1800	1805	1825	1830	1850
1830	1835	1855	1900	1920
1900	1905	1925	1930	1950

Table 3.4.3.3-1 Virtual Theater Show Schedules - 1 of 3

Tuesday 15 October Schedule

Enter Theater	Theater Show	Exit Theater	TOC Show	Show Over
0900	0905	0925	0930	0950
0930	0935	0955	1000	1020
1000	1005	1025	1030	1050
1030	1035	1055	1100	1120
BREAK				
1130	1135	1155	1200	1220
1200	1205	1225	1230	1250
1230	1235	1255	1300	1320
1300	1305	1325	1330	1350
1330	1335	1355	1400	1420
1400	1405	1425	1430	1450
1430	1435	1455	1500	1520
1500	1505	1525	1530	1550
1530	1535	1555	1600	1620
BREAK				
1630	1635	1655	1700	1720
1700	1705	1725	1730	1750
1730	1735	1755	1800	1820
1800	1805	1825	1830	1850
1830	1835	1855	1900	1920
1900	1905	1925	1930	1950

Table 3.4.3.3-1 Virtual Theater Show Schedules - 2 of 3

Wednesday 16 October Schedule

Enter Theater	Theater Show	Exit Theater	TOC Show	Show Over
0900	0905	0925	0930	0950
0930	0935	0955	1000	1020
1000	1005	1025	1030	1050
1030	1035	1055	1100	1120
BREAK				
1130	1135	1155	1200	1220
1200	1205	1225	1230	1250
1230	1235	1255	1300	1320
1300	1305	1325	1330	1350
1330	1335	1355	1400	1420
1400	1405	1425	1430	1450
1430	1435	1455	1500	1520
BREAK				
1530	1535	1555	1600	1620
1600	1605	1625	1630	1650
1630	1635	1655	1700	1720
1700	1705	1725	1730	1750
1730	1735	1755	1800	1820
1800	1805	1825	1830	1850
1830	1835	1855		

Table 3.4.3.3-1 Virtual Theater Show Schedules - 3 of 3

3.4.3.4 *Move-out*

The AE3 exhibit was disassembled, packed, and transported to Orlando and Colorado Springs. Due to a short tear down time (2 days) the coordination of the move-out to the Sheraton had to be precisely executed. The move out activities appear in the detailed move-in schedule that appears in appendix F.

3.5 *IMMERSIVE THEATER*

The Immersive Theater displayed a combination of live networked participants and pre-recorded presentations in the ballroom at the AUSA. The Immersive Theater was an enclosed room constructed within the ballroom.

3.5.1 Immersive Theater Fabrication

Lockheed Martin provided the following equipment and services to support the development, installation, and integration of the Immersive Theater.

FACILITY REQUIREMENTS (inside the ballroom)
(1) Dial Out Phone in the front of the theater (integration use only)
Folding Tables
(12) 20 amp power circuits
(1) 5 Ton AC Unit

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FACILITY REQUIREMENTS (inside the techroom)
(4) Dial Out Phone in the front of the theater
Folding Tables
(8) 20 amp power circuits
(4) 30 amp 3 phase power circuits
(1) 5 Ton AC Unit

SOURCES
(4) 3 Channel SGI ONYX Image Generators. (These systems were used to provide the virtual view of the entities and databases in the AE3 exercises)
NPSNET (MCO)
LAMTF (MCO)
ARL (MCO)
NVESD (MCO)

DISPLAY HARDWARE
(1) 10' x 30' Rear Projection screen
(3) Barco 8100 LCD Light Cannon Projectors *(projected (3) 6'7" x 8'9" images / upper screen)*
(3) Sony VPH-1272 Graphic Projectors *(projected (3) 2'10" x 3'9" images / lower screen)*

CONTROL & SOURCE HARDWARE
(1) 32 x 8 RGBs Matrix Switcher
(2) SHOWDirect Control Systems
(6) Betacam SP Players (Video Backup)
(6) Betacam SP Recorders (Show Record)
(2) CRV Laser Disc Rec./Players (GoTo)
(14) Multi-Resolution Scan Converters
(14) Analog RGBs Interface Kits
(8) Signal Transcoders
(30) Source Monitors (LCD)

LIGHTING HARDWARE
(8) 1K Lekos
(2) 1K Scoops
(3) 1K DP's
(1) Schedule 40 Light Pole (Flown)
Control Console
Dimming
Cables & Distribution

PRODUCTION HARDWARE
(1) Sony Betacam SP Shooters Package
(1) Folsom Hi-Res Video Scan Converter
(20) Betacam SP VideoTapes

STAGING HARDWARE
(1) Custom Screen Divider / Support

(3) Scaffold Projection Towers
(1) Custom Control Console

VIDEO SOURCES

Feed	Qty.	Format
Stealth #1 (LAMTF)	3 Channel	Hi-Res
Stealth #2 (NPSNET)	3 Channel	Hi-Res
Stealth #3 (ARL)	3 Channel	Hi-Res
Stealth #4 (NVESD)	3 Channel	Hi-Res
BPV	1 Channel	Hi-Res
ASAS	Deleted	N/A
UAV	Deleted	N/A
MCS-P	1 Channel	Hi-Res
ModSAF	1 Channel	Hi-Res (SGI)
C3I (Fort Benning)	1 Channel	Hi-Res (SGI)
Live Feed (VTC)	4 Channel	NTSC
Recorded Video	9 Channel	NTSC

VIDEO TELECONFERENCING

SITES	SYSTEMS
AMC-UD - San Jose, CA	1 - PicTel System - Image Technical Services (ITS)
DBBL - Fort Benning, GA	1 - PicTel System (ITS)
SIMITAR - Bozeman, MT	1 - PicTel System (ITS)
RTOS - Fort Bliss, TX	1 - PicTel System (ITS)
JVL - Fort Leavenworth, KS	1 - PicTel System (ITS)
Sheraton - Wash., D.C.	5 - PicTel Systems (ITS)
Sheraton - Wash., D.C.	1 - CCD Theater Camera

AUDIO HARDWARE
(1) Soundstorm System
(1) Clear Com 8 Station 2 Ch. Com System
(1) Wireless IFB (MC)
(1) 32 x 8 Audio Console
(2) Main Speaker Enclosures
(2) Rear Speaker Enclosures
(2) Sub Woofer Enclosures
Amps & Processing
Cables & Distribution

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AUDIO SOURCES

Feeds	Quantity
Soundstorm #1	4 Channels
Live Feed (VTC)	5 Channels
Recorded Audio	4 Channels
.WAV File	2 Channels
Microphones	5 Channels

Figure 3.5.1-1 details the Immersive Theater video system wiring and routing.
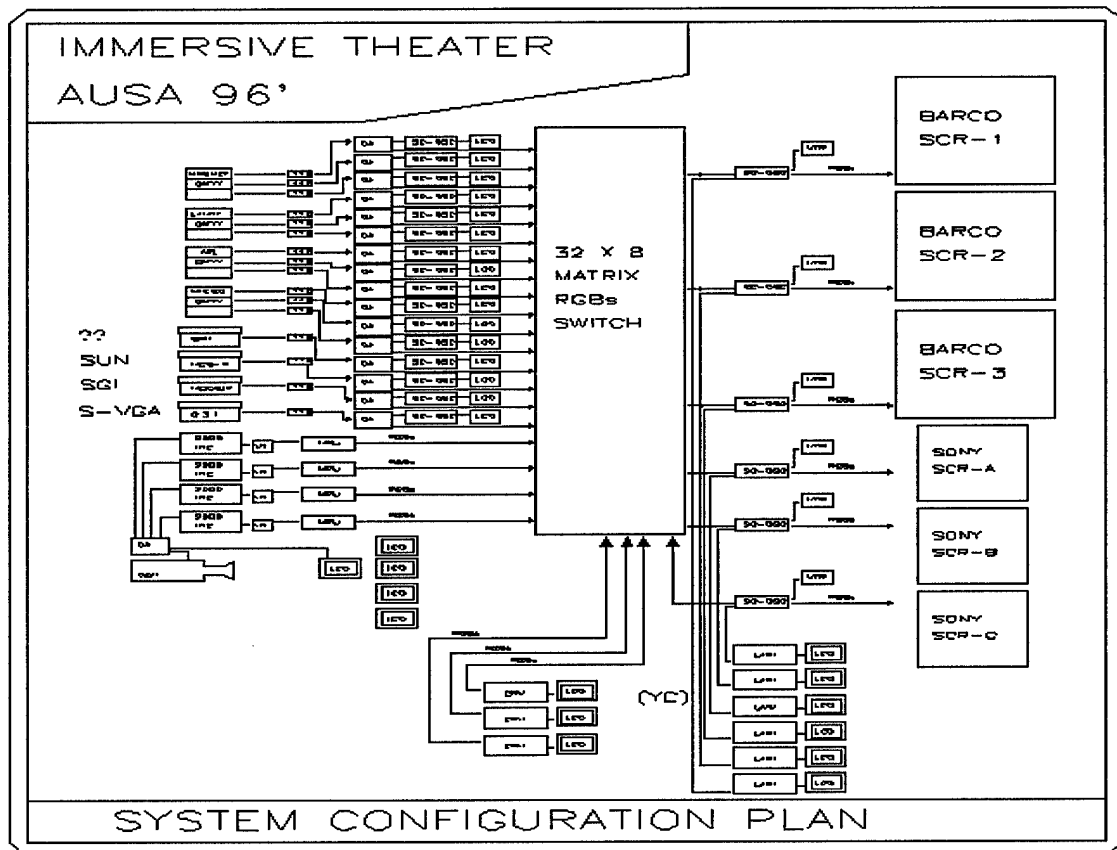
Figure 3.5.1-1 Immersive Theater Video System Wiring

3.5.2 Immersive Theater Presentation Management

This section discusses both Lockheed Martin and Image Technical Services AE3 organizations utilized in the Presentation for the Pre-Interim Site, Interim Site, and Demonstration. The Presentation Management consisted of different disciplines. The Test Director was responsible for making the audible instructions for executing the demonstration. In coordination with the test director was a Master of Ceremonies verbally presenting the immersive theater contents. There was a combination of five technicians and engineers that were placed in an operational role in the front of the audience of the immersive theater. The function of this

presentation personnel was to interact with the test directors queues. There was a rotation used to allow fresh operators to execute the demonstration.

There were several technicians and engineers supporting the operations of the behind the scenes of the immersive theater. The charter of this support included but was not limited to: network maintenance; ModSAF operation; workstation - BPV, Stealth, ASAS, MCS/P, datalogger, sound storm, M-Bone.

The Lockheed-Martin personnel supporting the pre-interim, interim site, and demonstration were as follows.

Pre-Interim Site

(1) Program Manager
(1) Program Engineer
(1) Lead Technician
(1) Technician
(1) Visual Engineer
(3) Engineers

Interim Site

(1) Program Manager
(1) Program Engineer
(1) Lead Technician
(1) Technician
(1) Visual Engineer
(3) Engineers

Demonstration

(1) Program Manager
(1) Program Engineer
(1) Lead Technician
(1) Technician
(1) Visual Engineer
(5) Engineers

The personnel required from IMAGE Technical Services to support the Immersive Theater Pre-Interim Site, Interim Site, and Demonstration were as follows.

Pre-Interim Site

(1) Videographer (Video Acquisition)
(1) System Engineer (Remote VTC Integration)
(2) System Engineers (Design)

Interim Site

(4) System Engineers
(1) Show Director

Demonstration

(4) System Engineers
(1) Show Director
(1) Camera Operator

3.6 *TRANSPORTATION*

LMC was responsible for the overall coordination, pick-up, staging, and delivery of the demonstration materials to the Sheraton Washington site and return to designated destinations. Wares Van and Storage Company provided coordination of the vehicles transporting the materials. Each Standalone exhibitor appointed a specific representative to work with LMC to ensure their compliance with published shipping schedules. The following Figures (3.6-1, 3.6-2) depict the "Inbound shipping" and the "Outbound Shipping" respectively and of the demonstration.

AE3 INBOUND SHIPPING
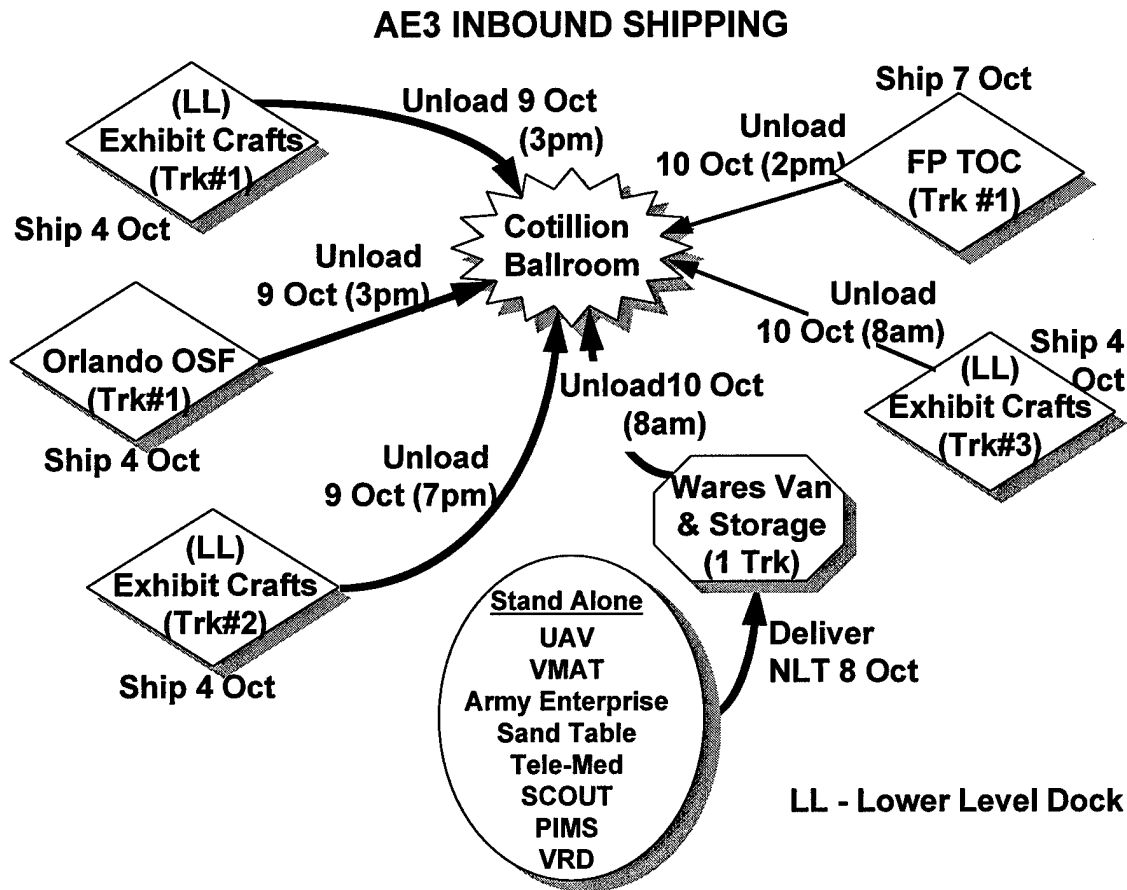
Figure 3.6-1 Inbound Shipping

The following table (Table 3.6-1) depicts the actual shipping schedule arriving and leaving at the Sheraton Cotillion Ballroom.

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Time	INBOUND 9 October	INBOUND 10 October	OUTBOUND 16 October	OUTBOUND 17 October
08:00	ECI #1	ECI #4 Stand Alones		ECI #1
09:00	LMC OSF			
11:00	ECI #2			LMC OSF
12:00				ECI #2
14:00		FP TOC		FP TOC
15:00	ECI #3			
16:00				ECI #3
18:00				ECI #4
19:00			Stand Alones ' ECI #1	
20:00			UAV Vans	

Table 3.6-1 Actual Shipping Schedule

AE3 OUTBOUND SHIPPING
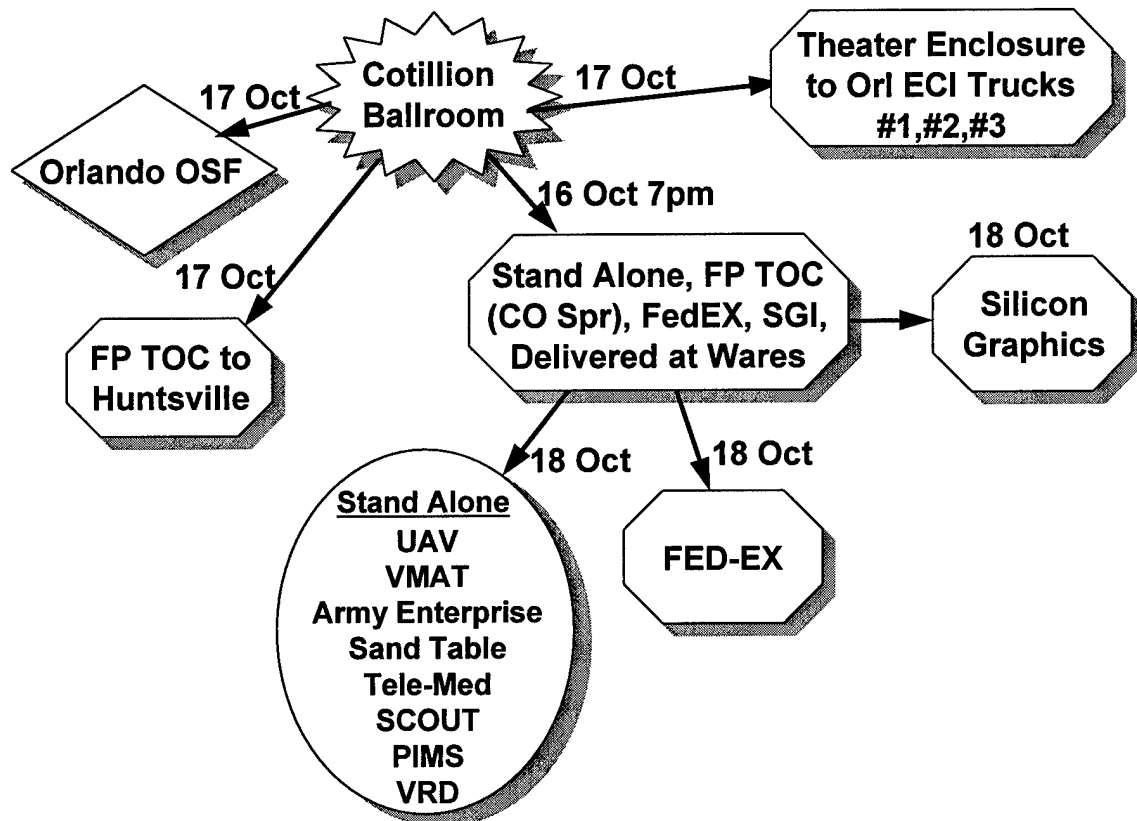
Figure 3.6-2 Outbound Shipping

The following were exceptions to this plan: Army Enterprise moved their personal equipment in and moved it out of the Cotillion Ballroom. The UAV group moved specific equipment in and moved all of their equipment out of the Cotillion Ballroom.

The FP TOC theater is currently stored at the FP TOC Colorado Springs facility. The immersive theater is being stored at an Orlando facility.

Exhibit Crafts used four 48' trucks.

3.7 *RESIDUAL EQUIPMENT*

The Residual Equipment lists all of the equipment that has been purchased for the AUSA Delivery Order. Each item is listed in a spreadsheet consisting of reference tag number, description, model, serial number, acquisition date, and user. This section is comprised of two spreadsheets, one is the running inventory of AUSA purchased assets and the other is the inventory presently at Suddath Inc. storage facilities. APPENDIX B - RESIDUAL EQUIPMENT lists the two spreadsheets of all AUSA owned equipment.

3.8 RECOMMENDATIONS

This section discusses the recommendations or "lessons learned" of several of the technical and non-technical players involved with the AE3. The following is a list of all the recommendations received after the demonstration was completed.

3.8.1 Implement Contrasting Scenarios for AE4

Observation:

The Army Experiment message may be better illustrated through the use of contrasting scenarios (Good outcome vs Bad outcome). This year the message, "Dominant Real Time Situational Awareness" was presented by running a simulated exercise in the theater and FP TOC. The exercise was constructed in the 21st Century and showed how a well-equipped US Army will perform assuming the Army does a good job leveraging available technology. (Good outcome) The message would be further enhanced by showing the contrast or "what if" should our Army not continue to leverage technology. (Bad outcome)

Discussion:

The problem is that the message has to be clearer to all levels of audience and that the consequences of ignoring the message could be better illustrated. The potential effect is that the message is lost on our audience and the audience may not be completely motivated or convinced.

AUSA should illustrate the seriousness of future battlefield complexity and danger of losing step with technological innovations and advancements which would result in forces at a disadvantage. The message would be further enhanced by showing the contrast or "what if" should our Army not continue to leverage technology. Instead of just showing how good we are today, we should show how quickly that could change, and the grave consequences awaiting. Next years authors of the AE4 message should start today conceptualizing a message which includes contrast.

Recommendation:

Notionally should present two scenarios to the audience. First show a poorly equipped 21st Century Army being out paced by an enemy with better intelligence and situational awareness, spiraling to a ever worsening situation. The second scenario would show an Army with world-leading technology, able to dominate the battlefield and win decisively. Finish with an observation that we can not afford to stand still and that we must remain far-sighted. This recommendation can be applied to any main theme selected for AE4. TRADOC and the Army leadership would improve the effectiveness of the Army Experiment by including some contrast in the AE4 message in '97.

3.8.2 Long Haul Network Integration at the Sheraton Washington

Observation:

The AE3 network line installation was scheduled for the week prior to AUSA '96 and, due to the nature of network installation, there was high risk that the live network feed would not be installed in time to support the live simulation exercise. There are many levels of telecommunications companies. The physical installation and engineering of the network is a multiple step processes. Should any problem happen this

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process could be delayed anywhere from days to weeks. The critical timing of the AUSA show dictated that long haul network lines be installed and tested early rather than just before the show.

Discussion:

The AE4 prime contractor (AE3 was Lockheed Martin) should accelerate AE4 network installation. Further, only one group should be made solely responsible for all network lines and activities to avoid any possible disconnects or confusion.

Recommendation:

Assuming the AE4 is still going to be conducted as a live simulation exercise it would be a good idea to do the following:

Make one organization solely responsible for all long-haul network establishment and connectivity.

Assuming that the Sheraton will continue to be the future host for the AUSA demonstration, permanently upgrade the Sheraton Hotel's internal network lines.

Very Important: Install AE4 network lines 2-4 weeks prior to the show and send a network engineer to the show to install and test the lines with a UNIX workstation.

3.8.3 Visual System Engineering Coordination

Observation:

There should be a greater coordination between the agency generating the script and the lead for the visual systems. This coordination needs to start early in the program.

Discussion:

A substantial amount of effort was spent reworking portions of the script because the visual systems could not produce the images required. The problem was such that a fifth visual system was identified as required during the Orlando integration phase. The following problems contributed:

The script was very tightly coordinated and the stealth visual system was required to teleport ("jump") from point-to-point frequently and display a picture almost instantaneously. This causes problems in any visual system because the database has to be paged in before a picture can be displayed.

One of the Long Haul SAFOR participants had a database correlation problem which resulted in Helicopters flying at 500 feet in the Theater when the simulation generating the Helicopters thought they were masked behind a hill within 50 feet of the terrain.

Recommendations:

When the Computer Generated Forces (CGF) scenes are generated they need to be viewed with a 3D viewer in a replicated scenario situation before they are blessed as finished.

3.8.4 Confine The Scenario to Localized Areas

Observation:

Database effort for AE3 was greater than anticipated.

Discussion:

Prior to AE3 simulator integration localized regions were selected in the database for the exercise. The ground entities within the simulation exercise were supposed to confine their movement to remain within the bounds of these areas. Upon actual integration, the SAFOR ground entities in the exercises were not within the agreed regions. The database scenery had been enhanced and enriched only within the agreed regions (a cost saving measure). This resulted in reworking areas of the data bases and an increase in the scope of the database enhancement effort.

Recommendations:

SAFOR operators and visual system engineers need to work closely to assure that the exercise looks good in the finished database and to minimize database modeling effort.

3.8.5 Record a Backup Sound Track

Observation:

Sounds were not recorded on the immersive theater backup video tapes.

Discussion:

Even when the show would run tape, SoundStorm was still required to send audio to the theater. It seems that this could be better handled by including the soundtrack along with the images.

Recommendation:

SoundStorm should be recorded as a track for when they cut to the audio/video system tape.

3.8.6 Enhance SoundStorm

Observation:

The battlefield sounds in the immersive theater did not always play appropriate sounds.

Discussion:

a.) SoundStorm does not support every sound required in the theater

b.) SoundStorm did not always play sounds that were "out of earshot" to the view position.

Recommendation:

a.) The SoundStorm system owned by LAM Task Force should be updated via a software maintenance agreement. Reality by Design offers a maintenance package for a yearly fee. Reality by Design can be reached at: (617)942-0440. Point of Contact: Joanne L. Metzger, President. Additional info at http://www.rbd.com.

b.) To play sounds that are out of earshot, yet still required for theatrical realism, SoundStorm sounds should be canned and recorded on the audio/visual tapes.

3.8.7 Wide Area Network Single Point of Contact

Observation:

At the beginning of integration at AE3, it was determined that the 10 Mbit line connecting NRL and the Cotillion Ballroom was not going to be installed as planned. This could have potentially resulted in not having the distributed sites connected to the show.

Discussion:

Not having an installed 10 Mbit line resulted in having to place an emergency order for two T1 lines to replace it. It was difficult to obtain a two day turn-around on T1 orders that normally take at least a month from the order date to the install date. ARL was responsible for the ordering the 10 Mbit line. They placed the order through MFS who, in turn, were to place an order through Bell Atlantic. Evidently, the order to Bell Atlantic was never made. MFS did correct the situation by pushing an order for two T1 lines through the system faster than normal.

It was also evident, after ARL did a band width analysis and after the show itself, that using a 10 Mbit line was not a necessity. Three T1 lines had plenty of band width. In fact, two T1 lines had enough band width to run the show however, it was reassuring to have the third T1 line as a backup.

Recommendation:

Only one person should be in charge of setting up the wide area network. Coordination between persons at differing organizations can cause confusion.

3.8.8 Network Line Installation Dates

Observation:

T1 and ISDN lines did take considerable time to install from the time the order had been placed. Facilities issues often pushed the install date back further.

Discussion:

Do not assume that every location has ISDN service. For example, the local carrier in Bozeman, MT did not provide ISDN service. They did however, provide "switched 56" service. This resulted in the PicTel system for that location having to be reconfigured. The T1 lines were not immune to problems either. There were

difficulties in bringing the T1 line from Bell South's D-mark into the OSF. In summary, order wide area network lines early using the contact names and numbers listed in the After-Action Report.

Recommendation:

Lines for the wide area network should be reserved/ordered as far in advance as possible.

3.8.9 T1 Leased Line Testing Considerations

Observation:

Neglecting to have a configured Communication Servicing Unit/Data Servicing Unit (CSU/DSU) at each location along with the proper cables could cause delays in testing the T1 line.

Discussion:

The carriers that install the T1 lines do not typically lease CSU/DSUs. Therefore, it is important to make sure that there is a CSU/DSU at each end of the T1 line and that it is configured correctly. Also, depending on the type of router, a specific cable is needed to connect the CSU/DSU to the router. Further, the CSU/DSU devices at each end of a given line must be identical meaning not only they are the same manufacturer and model number but, they must be programmed to be compatible.

Recommendation:

When ordering T1 lines, it is important to be sure that the location at each end of the T1 has a properly configured CSU/DSU and the correct cable to connect it to the router.

4. PROGRAM MANAGEMENT

4.1 *PROGRAM MANAGEMENT*

The Program Management that LMC performed was in accordance with the STRICOM Statement of Work for LAM TF Task Force Army Experiment III, (LAM TF AE3), Proof of Principle (w/Mini-FAS), 12 March 1996, Rev 2.0. This included program management support for the attendance of In-Process Reviews (IPRs), Scenario Development meetings, Technical Interchange Meetings (TIM's), and other meetings required to support the AE3. LMC analyzed the schedule and determined problem areas ASAP and took corrective actions as required. STRICOM provided responsible personnel at the LMC facility throughout the AE3 program. This function enabled immediate attention to possible out of scope issues.

4.2 *PROGRAM ORGANIZATION*

STRICOM's program organization is depicted in Figure 4.2-1 below.
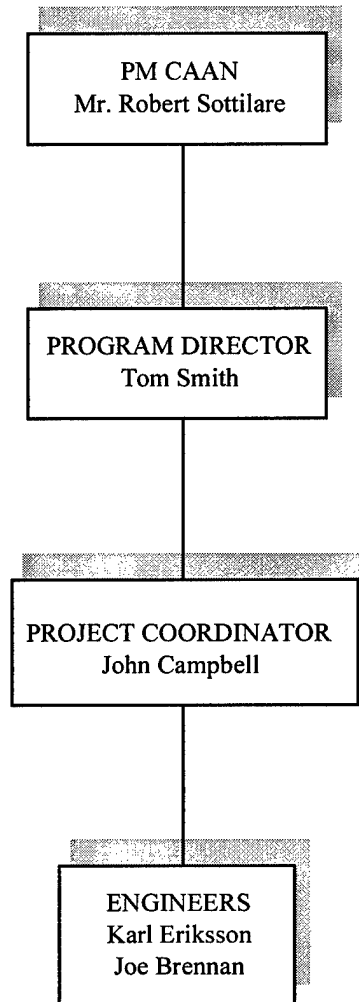
Figure 4.2-1 STRICOM AE3 Organization

LMC's final program organization is depicted in Figure 4.2-2.
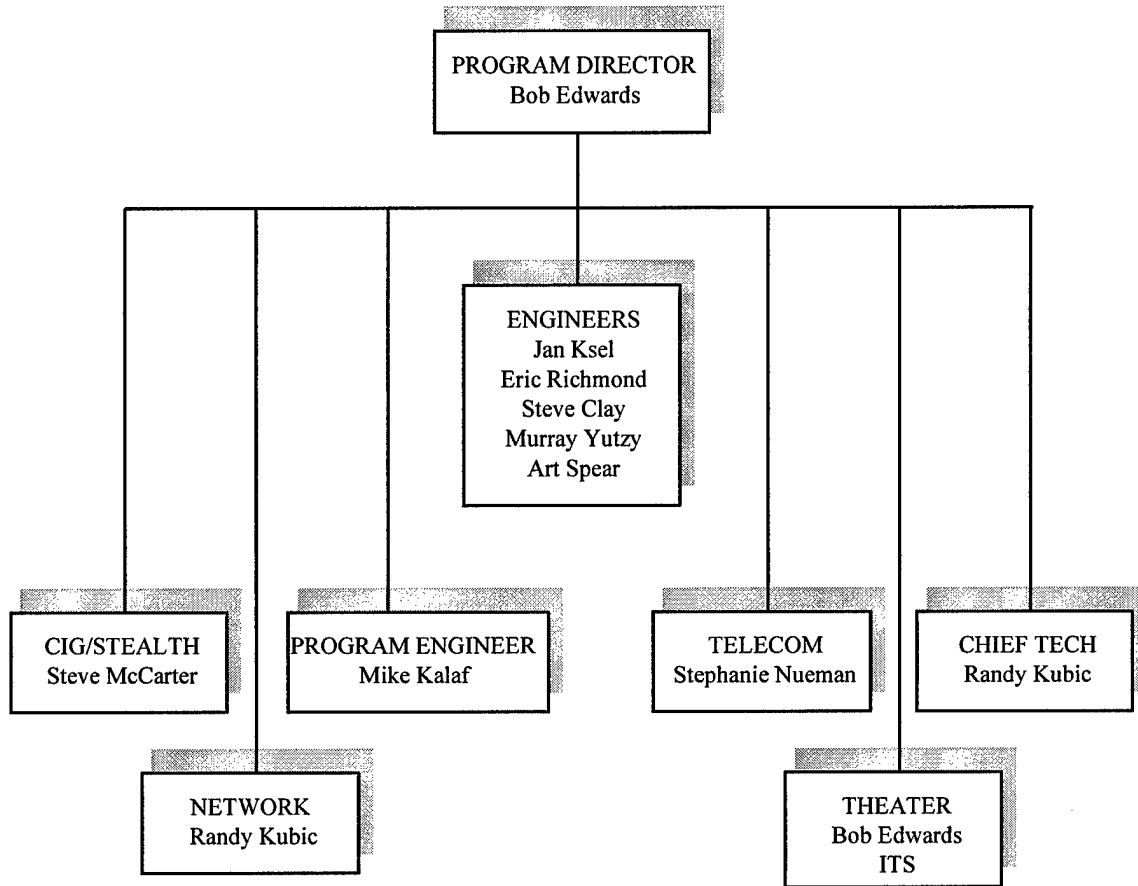
Figure 4.2-2 Lockheed-Martin AE3 Organization

4.3 *REPORTING*

LMC provided written visibility into the AE3 team activities through the weekly Contractor Progress, Status, and Management Reports and the monthly Program Status Reviews.

4.3.1 Contractor Progress, Status, and Management Report

A Contractor Progress, Status, and Management Report (CPSM) was sent to the Government weekly. This report included information relating to the progress made on each task and the current status of each task.

4.3.2 Contractor Cost/Schedule Status Report

A Cost/Schedule Status Report (C/SSR) was sent to the Government monthly. This report included information relating to the current expenditures made. The format of this report was generated IAW DI-F-6010A and the accepted LMC contractor formats.

4.3.3 Program Management Reviews

The AE3 team supported Program Management Reviews (PMR's) as required during the conduct of the proposed efforts. PMR's were held as required by the Government.

4.3.4 Scheduling

Scheduling was updated and maintained by the LMC management team. The scheduling process enabled the customer and LMC upper management detailed milestones to be met.

4.4 *IN PROGRESS REVIEWS (IPR)*

In preparation for AE3 there were a total of nine In Progress Reviews (IPR). Items presented at the IPR's were the following: design status; participant's status; integration and test schedules; move-in status; transportation status; and miscellaneous topics. Appendix H contains the IPR minutes.

APPENDIX A - Acronym List

AAR	After Action Report
ABCS	Army Battle Command System
ACR	Advanced Concepts Requirements
A/C	Air Conditioning
ADST	Advanced Distributed Simulation Technology
AE3	Army Experiment III
AE4	Army Experiment IV
AGCCS	Army Global Command and Control System
AMC	Army Material Command
AMP	Ampere
AO	Area of Operations
ARL	Army Research Laboratory
ARPA	Advanced Research Projects Agency
ASAS	All Source Analysis System
AT&T	American Telegraph and Telephone Company
ATACMS	Army Tactical Missile System
ATCCIS	Army Tactical Command and Control Information System
AUSA	Association of the United States Army
BBS	Battalion Brigade Battle Simulation
B-ISDN	Broadband Integrated Services Digital Network
BDS-D	Battlefield Distributed Simulation - Developmental
BPV	Battlefield Planning & Visualization
BVP	Battlefield Visualization Product
BTU	British Thermal Unit

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C2	Command and Control
C2V	Command and Control Vehicle
C4	Command, Control, Communications, Computers
C4I	Digitization, and Command, Control, Communications, Computers & Intelligence
CD-ROM	Compact Disc - Read Only Memory.
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CGM	Computer Graphic Metafile
CIG	Computer Image Generator
CLCGF	Corps Level Computer Generated Forces
Ckts	Circuits
CPU	Computer Processing Unit
C/SSR	Cost/Schedule Status Report
CSSCS	Combat Service Support Control System
CSU/DSU	Communication Servicing Unit/Data Servicing Unit
CTC	Combat Training Center
DBBL	Dismounted Battlespace Battle Lab
D&SABL	Depth and Simultaneous Attack Battle Lab
D&SA	Depth and Simultaneous Attack Battle Lab
DO	Delivery Order
DI	Dismounted Infantry
DIS	Distributed Interactive Simulation
Div	Division
DMA	Defense Mapping Agency
DOS	Disk Operating System

DBBL	Dismounted Battlespace Battle Lab
DSBL	Depth and Simultaneous Attack Battle Lab
DSI	Defense Simulation Internet
ECI	Exhibit Crafts Inc.
EUSA	Eighth US Army
FAA	Forward Assembly Area
FAS	Feasibility Analysis Study
FP TOC	Force Projection Tactical Operations Center
FSE	Fire Support Element
FTP	File Transfer Protocol
GES	Greyhound Exposition Services
GFE	Government Furnished Equipment
GFI	Government Furnished Information
HAI	Houston Associates, Inc
HQ	Headquarters
HVAC	Heating Ventilation Air Conditioning
IAW	In Accordance With
ID	Identification
IDO	IRIX Development Option
IDREN	Interim Defense Research Engineering Network
IG	Image Generator
IP	Internet Protocol
IPR	In-Progress Review
ISDN	Integrated Services Digital Network
ITSEC	Interservice/Industry Training Systems Education Conference

ITEMS™	Interactive Tactical Environment Management System™
ITS	Image Technical Services
JVL	Joint Virtual Laboratory
Kbits	Kilobits
Kbps	Kilobit per second
Kbits/Sec	Kilobits per second
KVA	Kilo Volt-Ampere
LAD	Logistics Anchor Desk
LAM	Louisiana Maneuvers
LAM-TF	Louisiana Maneuvers - Task Force
LAN	Local Area Network
LANDSAT	Land Satellite
LHN	Long Haul Network
LMC	Lockheed-Martin Corp
LOE	Level of effort
Log	Logistics
LSTAT	Life Support for Trauma And Transport
LTTS	Loral Training and Technical Services
LWSE	Land Warrior Simulation Extension
LWTB	Land Warrior Test Bed
M1	Abrams tank
MAC	Macintosh
MATMO	Medical Advanced Technology Management Office
MAX	Maximum
MB	MegaByte

M-Bone	Multicast BackBone
Mb	Megabits
Mb/sec	Megabits per second
MCS/P	Maneuver Control Station/Phoenix
MDBIC	Missle Defense Battle Integration Center
MHZ	Mega Hertz
MLRS	Multiple-Launch Rocket System
MM3V	Mobile Medical Mentoring Vehicle
ModSAF	Modular Semi-Automated Forces
MOUT	Mobile Operations in Urban Terrain
MPRS	Mission Planning Rehearsal System
MSI	Multi-Spectral Imagery
NAI/TAI	Names Area of Interest/Target Area of Interest
NATO	North Atlantic Treaty Organization
NEMA	National Electrical Manufacturers Association
NFS	Network File System
NPGS	Naval Post-Graduate School
NPSNET	Naval Post-Graduate School Network
NRaD	Naval Research and Development
NTC	National Training Center
OAD'94	October 1994 AUSA Demonstration
OAD'95	October 1995 AUSA Demonstration
OCs	Observers/Controllers
ODIN	Extension of the SIMNET SAF
OPFOR	Operational Forces

OSF	Operational Support Facility
OTW	Out The Window
PC	Personal Computer
PDU	Protocol Data Unit
PIMS	Portable Integrated Maintenance System
PMCAAN	Program Manager, Combined Arms Assessment Network
PMO	Program Management Office
PMR	Program Management Review
POC	Point of Contact
PSM	Personnel Status Monitor
PVD	Plan View Display
RDA	Research Development & Acquisition
Res	Resolution
RF	Radio Frequency
SAF	Semi-Automated Forces
SAFOR	Semi-Automated Forces
SAT	Satellite; short for Satellite Command
SATCOM	Satellite Command
SCSI	Small Computer Standard Interface
sec	Seconds
SGI	Silicon Graphics, Inc.
SHAPE	Supreme Headquarters Allied Powers Europe
SIK	Sikorsky Aircraft Company
Sim	Simulator
SIMITAR	Simulation In Training for Advanced Readiness

SIMM	Single Integrated Memory Module
SIMNET	Simulation Network
SME	Subject Matter Expert
SOF	Special Operations Force
SSDC	Space and Strategic Defense Command
STOW	Synthetic Theater of War
STRICOM	U.S. Army Simulation Training and Instrumentation Command
SWH	Sheraton Washington Hotel
T1	Digital T-carrier service
TARDEC	US Army Tank-Automotive Research, Development and Engineering Center
TEC	Topical Engineering Center
TEL	Transporter/Erector/Launcher
TEMO	Training, Exercise and Military Operations
TCM	Trauma Control Module
TDY	Temporary Duty
TI	Texas Instruments
TIES	Terrain Information Extraction System
TOC	Tactical Operations Center
TR	Technical Report
TRANSCOM	U.S. Army Transportation Command
UAV	Unmanned Air Vehicle
UDLP	United Defense Limited Partnership
USACOM	U.S. Army Command
USAF	United States Air Force
VCR	Video Camera Recorder

VMAT	Virtual Maintainer
VME	Virtual Memory Extension
VP	Virtual Prototype
VST	Virtual Sand Table
VTC	Video Tele-Communications
WAN	Wide Area Network
WDL	Western Development Labs
WRAMC	Walter Reed Army Medical Center

APPENDIX B - RESIDUAL EQUIPMENT

The following tables represent the residual equipment that has been acquired under the AUSA delivery Order (materials transferred from ADST I to ADST II and now under control of Lockheed Martin property management on behalf of LAM Task Force.)

TAG	DESCRIPTION	MODEL	S/N	LOCATION	SITE	OWNER	DATE	USER
B0000107	48" x 27" PALLET JACK WITHHAND CONTROL	9838T26		BAY	LWTB	LAMTF		
B0000106	6' WOOD STEP LADDER	4734540116		BAY	LWTB	LAMTF		
B0000100	ETHERNET, MULTIPORT	MT-800	00044300 096050KL	BAY	LWTB	LAMTF		
B0000101	LEVEL DOLLIES, WOOD HANDLE 5' J BAR	2750T1		BAY	LWTB	LAMTF		
B0000102	SOLID OAK DOLLIES 30"x18"	23235T51		BAY	LWTB	LAMTF		
B0000103	SOLID OAK DOLLIES 30"x18"	23235T51		BAY	LWTB	LAMTF		
B0000104	SOLID OAK DOLLIES 30"x18"	23235T51		BAY	LWTB	LAMTF		
B0000105	SOLID OAK DOLLIES 30"x18"	23235T51		BAY	LWTB	LAMTF		
B0000099	TCMB-100/ST POLYETHYLENE TOOL KIT	50F1839		F/E ROOM	LWTB	LAMTF		
A22965	CHASSIS, TARGET-32 W/PWR SUPPLY	705-10963-101	C115003I 0069	D13/ GFE ROOM	OSF	LAMTF		
A22846	CPU, MIS	R-3000-12	920154	SUDDATH (ORL) STORAGE	OSF	LAMTF		
A22847	CPU, MIS	R-3000-12	920159	SUDDATH (ORL) STORAGE	OSF	LAMTF		
A22848	CPU, MIS	R-3000-12	920152	SUDDATH (ORL) STORAGE	OSF	LAMTF		
A22849	CPU, MIS	R-3000-12	920160	SUDDATH (ORL) STORAGE	OSF	LAMTF		
A22850	CPU, MIS	R-3000-12	920153	SUDDATH (ORL)	OSF	LAMTF		

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A22851	CPU, MIS	R-3000-12	920151	STORAGE SUDDATH (ORL)	OSF	LAMTF		
A20476	DISPLAY	CD200V-120	23297588	STORAGE SUDDATH (ORL)	OSF	LAMTF		
A20477	DISPLAY	CD200V-120	13292728	STORAGE SUDDATH (ORL)	OSF	LAMTF		
A22988	DRAM-8C, 8MB	890-10298-301	754B306A 7029	D13/ GFE ROOM	OSF	LAMTF		
A22964	DRIVE, WINDC/FLOPPY	790-13662-101	000104	D13/ GFE ROOM	OSF	LAMTF		
A22959	FORCE DRAM 8, MEM BD	890-10298-301	754B306A 7027	D13/ GFE ROOM	OSF	LAMTF		
A22868	HUB, AUI - 10 BASE T	AT-3012T	EI624197	FORT KNOX (ON LOAN)	OSF	LAMTF		
A22869	HUB, AUI - 10 BASE T	AT-3012T	EJ164197	HIGH BAY	OSF	LAMTF		
A22870	HUB, AUI - 10 BASE T	AT-3012T	EI614197	FORT KNOX (ON LOAN)	OSF	LAMTF		
A22872	HUB, AUI - 10 BASE T	AT-MR420T	G09D4210	HIGH BAY	OSF	LAMTF		
A22874	HUB, AUI - 10 BASE T	AT-MR420T	G06V4211	ITSEC (ON LOAN)	OSF	LAMTF		
A22887	HUB, AUI - 10 BASE T	AT-MR420T	B0B74211	HIGH BAY	OSF	LAMTF		
A22888	HUB, AUI - 10 BASE T	AT-MR420T	G08B4211	HIGH BAY	OSF	LAMTF		
A24516	INTERFACE, PIPELINE 50	0700-0260-002	4480365	HIGH BAY	OSF	LAMTF		
A23565	KEYBOARD	9500900	000331458	CAMBRIDGE (ON LOAN)	CAMB	LAMTF		CAMB
A22875	KEYBOARD, WYSE	840358-01	407Z4301 051	D13/ GFE ROOM	OSF	LAMTF		
A22876	KEYBOARD, WYSE	840358-01	407Z4301 058	D13/ GFE ROOM	OSF	LAMTF		
A24448	LASER SCANNER, HANDHELD	LM-300-02	74288	BOB HATTON PWRBK	OSF	LAMTF		
A22899	MODEM, FAX SPORTSTER 14.4 EXTERNAL	14,400	00026800 07467907	D13/ GFE ROOM	OSF	LAMTF		

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A22940	MONITOR, 16" MULTI-SCAN	D-M17	7203054	ITSEC (ON LOAN)	OSF	LAMTF		
A23570	MONITOR, 20" MULTI-SCAN	D-M20	2428379	CAMBRIDGE (ON LOAN)	CAMB	LAMTF		CAMB
A22852	MONITOR, VIEWSONIC	7031	1630105473	D13/ GFE ROOM	OSF	LAMTF		
A22853	MONITOR, VIEWSONIC	7031	1630105476	SUDDATH (ORL) STORAGE	OSF	LAMTF		
A22855	MONITOR, VIEWSONIC	7031	1630105646	D11/ COL	OSF	LAMTF		
A24138	PRINTER, DESKJET 320	C2634A	MY4C12M0BJ	A12/ HORTON, DENNISU24/ K	OSF	LAMTF		
A24528	ROUTER, CISCO 2500 1E2T	CISCO2501	25341645	D13/ GFE ROOM	OSF	LAMTF		
A24529	ROUTER, CISCO 4500-M TOPASY	CISCO4500-M	45510834	D13/ GFE ROOM	OSF	LAMTF		
A20975	SCANNER, IMAGE COLOR	JX-325	32102254	D13/ GFE ROOM	OSF	LAMTF		
A22886	TERMINAL, WYSE	WY-55	OLU14500686	D13/ GFE ROOM	OSF	LAMTF		
A24500	UDS, MOTOROLA	UDSFT1SU	5271606	D13/ GFE ROOM	OSF	LAMTF		
A24501	UDS, MOTOROLA	UDSFT1SU	5305336	D13/ GFE ROOM	OSF	LAMTF		
A24503	UDS, MOTOROLA	UDSFT1SU	5271603	D13/ GFE ROOM	OSF	LAMTF		
A24641	VACCUUM, UPRIGHT	44245-030	099500527913	D13/ GFE ROOM	OSF	LAMTF		
A22618	VIDEODISC PLAYER, SONY	LDP-1550	16088	D13/ GFE ROOM	OSF	LAMTF		
A24139	CDROM DRIVE, PCMCIA 2X PORTABLE	KXL-D720	5EMDCB22381	A12/ HORTON, DENNISU24/ K	OSF	LAMTF		
A24530	CPU, IBM THINKPAD 701C,W/EXTNL DRIVE	366961	2630-5TU	D13/ GFE ROOM	OSF	LAMTF		ON LOAN STRICOM
A22941	CPU, INDY R4000	W8C-32	08006907B4D6	ITSEC (ON LOAN)	OSF	LAMTF		
LM01189	CPU, INDY R4000	W8C-32	080069088CAF	HIGH BAY	OSF	LAMTF		
A23568	CPU, INDY R4000	W8C-32	08006908	HIGH BAY	OSF	LAMTF		

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			8CB4					
A22962	FORCE CHASSIS	SYS68K/TARGET 32	C11500310066	D13/ GFE ROOM	OSF	LAMTF		
A22961	FORCE DISK CARD	705-10963-101	105	D13/ GFE ROOM	OSF	LAMTF		
A22958	FORCE DRAM 8, MEMORY BD	890-10298-301	754B306A7033	D13/ GFE ROOM	OSF	LAMTF		
A22960	FORCE DRAM 8, MEMORY BD	890-10298-301	754B306A7025	D13/ GFE ROOM	OSF	LAMTF		
A22871	HUB, AUI - 10 BASE T	AT-3012T	EJ834194	FORT KNOX (ON LOAN)	OSF	LAMTF		ON LOAN
A22873	HUB, AUI - 10 BASE T	AT-MR420T	G0BQ4210	FORT KNOX (ON LOAN)	OSF	LAMTF		ON LOAN
A22942	KEYBOARD	9500900	9514	HIGH BAY	OSF	LAMTF		
A23567	KEYBOARD	9500900	00015964	STRICOM (ON LOAN)	OSF	LAMTF		
A23569	MONITOR, 20" MULTI-SCAN	D-M20	2428380	HIGH BAY	OSF	LAMTF		
A22764	MULTIDISK 150, BERNOULLI	DRI0715	JV94260015	PROSE, SUZANNE	OSF	LAMTF		
A24518	STAND, VIDEO/AV	BRE10120		HIGH BAY	OSF	LAMTF		
A24533	STAND, VIDEO/AV	BRE10321		HIGH BAY	OSF	LAMTF		
A24534	STAND, VIDEO/AV	BRE10321		HIGH BAY	OSF	LAMTF		
A22903	TAPE DRIVE	AR110	BA279426	HIGH BAY	OSF	LAMTF		
A24499	UDS, MOTOROLA	UDSFT1SV	5305254	MURRAY YUTZY	OSF	LAMTF		
A24502	UDS, MOTOROLA	UDSFT1SU	5271454	D13/ GFE ROOM	OSF	LAMTF		
A24517	WIDE BODY TV STAND	BB44-E4	50AA0935	HIGH BAY	OSF	LAMTF		
A22844	MONITOR	D-M17	7202090		MWTB	LAMTF		
A24035	CASE, ARMADILLO	DIM: 32"Lx32"Wx29"H		TRAILER	OSF	LAMTF	6/06/96	
A24608	CASE, ARMADILLO, MONITOR	DIM: 60"Lx33"Wx32"H		HIGH BAY	OSF	LAMTF	6/06/96	
A24609	CASE, ARMADILLO, MONITOR	DIM: 60"Lx33"Wx32"H		HIGH BAY	OSF	LAMTF	6/06/96	
A24610	CASE, ARMADILLO,	DIM: 60"Lx33"W		HIGH BAY	OSF	LAMTF	6/06/96	

	MONITOR	x32"H						
A24037	CASE, ARMADILLO, RACK ASSEMBLY-CLEARCOM EQUIPMENT	DIM: 25"Lx25"W x48"H		TRAILER	OSF	LAMTF	5/30/96	
A24034	CASE, ARMADILLO, SGI	DIM: 32"Lx32"W x29"H		TEMP LOAN	SAIC	LAMTF	5/17/96	
A24527	CASE, ARMADILLO, SGI	DIM: 32"Lx32"W x24"H		TRAILER	OSF	LAMTF	6/06/96	
A24032	CASE, ARMADILLO, SGI COMPUTER	DIM: 32"Lx32"W x29"H		TRAILER	OSF	LAMTF	6/06/96	
A24033	CASE, ARMADILLO, SGI COMPUTER	DIM: 32"Lx32"W x29"H		TRAILER	OSF	LAMTF	6/06/96	
A24030	CASE, ARMADILLO, SOUND STORM EQUIPMENT	DIM: 29"Lx31"W x29"H		TRAILER	OSF	LAMTF	6/06/96	
A24036	CASE, ARMADILLO, UTILITIES	DIM: 27"Lx27"W x27"H		TRAILER	OSF	LAMTF	6/06/96	
A24611	CASE, ARMADILLO, VCR RACK	DIM: 43"Lx20"W x31"H		TRAILER	OSF	LAMTF	5/24/96	
A24469	CASE (INSIDE), PART OF A24037	DIM:		TRAILER	OSF	LAMTF	5/30/96	
A20412	CB BASE STATION	21-1548	001046	L2B2	OSF	LAMTF	8/14/96	
A20413	CB BASE STATION	21-1548	3314368	L2B2	OSF	LAMTF	8/14/96	
A20414	CB BASE STATION	21-1548	304303	L2B2	OSF	LAMTF	8/14/96	
A20415	CB BASE STATION	21-1548	33059540	L2B2	OSF	LAMTF	8/14/96	
A20451	CB BASE STATION	TRC-434	00002306	L2B2	OSF	LAMTF	8/14/96	
A20452	CB BASE STATION	TRC-434	002722	L2B2	OSF	LAMTF	8/14/96	
A20453	CB BASE STATION	TRC-434	304102	L2B2	OSF	LAMTF	8/14/96	
A20454	CB BASE STATION	TRC-434	001899	L2B2	OSF	LAMTF	8/14/96	

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A24636	CPU, COMPAQ DESKPRO 590	173650-002	A539HSX 2E185		OSF	LAMTF		
A24485	CPU, GATEWAY 2000	BABY AT	2601609	HIGH BAY	OSF	LAMTF	6/24/96	
LM00798	CPU, INDY R4000	W8C-32	08006907 B4DA	SIM LAB	OSF	LAMTF	7/16/96	
LM01186	CPU, INDY R4000	W8C-32	08006907 B4D3	HIGH BAY	OSF	LAMTF	9/3/96	
LM00812	CPU, INDY R4000	W8C-32	08006908 927C		OSF	LAMTF		
A23564	CPU, INDY R4000	W8C-32	08006908 8CB5	ROOM M	OSF	LAMTF	6/24/96	
LM00807	HUB, AUI - 10 BASE T	AT-3012T	EJ154197	SIM LAB	OSF	LAMTF	7/18/96	
LM00858	HUB, AUI - 10 BASE T	AT-3012T	EJ684194	COMPUTER ROOM (203)	OSF	LAMTF	8/24/96	
A22857	KEYBOARD	QX201H	K209086159	SUDDATH	OSF	LAMTF		
A22906	KEYBOARD	9500900	0004093		OSF	LAMTF		
A22945	KEYBOARD	9500900	00009486	TEMP LOAN TO SAIC	SAIC	LAMTF	5/17/96	
LM00799	KEYBOARD	9500900	9931	SIM LAB	OSF	LAMTF	7/16/96	
LM00813	KEYBOARD	9500900	00020770	ROOM M	OSF	LAMTF	5/28/96	
LM01194	KEYBOARD	9500900	00031466	HIGH BAY	OSF	LAMTF	9/3/96	
A24525	KEYBOARD, GATEWAY 2000	2191011-00-004	01217555	HIGH BAY	OSF	LAMTF	6/24/96	
A24637	KEYBOARD, COMPAQ	120663-001A	1LJ39CH09912		OSF	LAMTF		
A15091	KEYBOARD, W/MOUSE	3201073-01	9336194116	L2B1	OSF	LAMTF	6/12/96	
LM01002	KEYBOARD, WYSE	840358-01	407Z4301057	SIM LAB	OSF	LAMTF	8/7/96	
LM01198	KEYBOARD, WYSE	840358-01	407Z4301053	HIGH BAY	OSF	LAMTF	9/3/96	
A17840	MASSCOMP, 5600	370-99715	0-0-2-697	ROOM S	OSF	LAMTF	6/12/96	
LM00959	MONITOR, 16" MULTI-SCAN	D-M17	7203053	FORT SILL, OK	OSF	LAMTF	8/2/96	LAMTF
A22946	MONITOR, 16" MULTI-SCAN	D-M17	7203052	L5A1	OSF	LAMTF		
A24606	MONITOR, 17" COLOR	D-M17	7218293	LMFS	LMFS	LAMTF	6/18/96	
LM00811	MONITOR, 20" MULTI-SCAN	D-M20	2413342	SIM LAB	OSF	LAMTF	7/18/96	
A23571	MONITOR, 20"	GDM-	2428374	TEMP	SAIC	LAMTF	5/17/96	

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	MULTI-SCAN	20D11		LOAN				
A24612	MONITOR, COLOR DIAMOND PRO 21"	THN9105SKTK	505004532	ROOM L	OSF	LAMTF	6/24/96	
A24613	MONITOR, COLOR DIAMOND PRO 21"	THN9105SKTK	505004530	ROOM L	OSF	LAMTF	6/24/96	
A24614	MONITOR, COLOR DIAMOND PRO 21"	THN9105SKTK	504003279	ROOM L	OSF	LAMTF	6/24/96	
A24638	MONITOR, COMPAQ 17" COLOR	190901-601	525CB02AB085		OSF	LAMTF		
A24484	MONITOR, GATEWAY 2000	CS1776LE	MH1934152559	HIGH BAY	OSF	LAMTF	6/24/96	
A16604	MONITOR, SONY	CPD-1201	505002	L2G3	OSF	LAMTF		
A24535	MONITOR, SONY	PVM-8041Q	2506307	L5C2	OSF	LAMTF	6/24/96	
A19740	PRINTER, APPLE COLOR	B1029LL/A	CC239HHG	ROOM L	OSF	LAMTF	2/05/96	
A24537	RGBS LINE DRIVER	IN2085	135815	L2B2	OSF	LAMTF	8/14/96	
A24538	RGBS LINE DRIVER	IN2085	135803	L2C2	OSF	LAMTF	8/14/96	
A24540	RGBS LINE DRIVER	IN2085	135812	L2C2	OSF	LAMTF	8/14/96	
A24541	RGBS LINE DRIVER	IN2085	135806	L2B2	OSF	LAMTF	8/14/968/14/96	
A15004	ROUTER, CMR	CMR/R	205280	L2A3	OSF	LAMTF	6/12/96	
LM00976	SPACEBALL W/ POWER SUPPLY	2003	0192072173	HIGH BAY	OSF	LAMTF	9/3/96	
A22897	STEREO AMPLIFIER	MX1500A	290481433		OSF	LAMTF	5/28/96	
A22898	STEREO AMPLIFIER	MX1500A	1293707793	TRAILER	OSF	LAMTF	5/28/96	
A24524	SYNTHESIZED VHF-FM RECEIVER	BR-3	05188	TRAILER	OSF	LAMTF	5/28/96	
LM01463	TELEPHONE, CELLULARONE	TFA-18	157-08449462	L1A3	OSF	LAMTF	5/30/96	
A19707	TERMINAL, WYSE	900109-07WY-60	01C19908831	SUDDATH	OSF	LAMTF	1/22/96	
A19709	TERMINAL, WYSE	900109-07WY-60	01C19A02114	SUDDATH	OSF	LAMTF	1/22/96	

A22881	TERMINAL, WYSE	WY-55	OLU1450 0134	HIGH BAY	OSF	LAMTF	5/24/96	
LM01203	TERMINAL, WYSE	WY-55	OLU1450 0649	HIGH BAY	OSF	LAMTF	9/3/96	
A22884	MONITOR, WYSE	WY-55	OLU1450 0694	ROOM L	OSF	LAMTF	6/05/96	
A19736	TV, 35" TUBE	CS3515R	529651	L5C1	OSF	LAMTF	5/28/96	
A19737	TV, 35" TUBE	CS3515R	546042	HIGH BAY	OSF	LAMTF	5/24/96	
A19738	TV, 35" TUBE	CS3515R	546455	HIGH BAY	OSF	LAMTF	5/24/96	
A19739	TV, 35" TUBE	CS3515R	546035	HIGH BAY	OSF	LAMTF	5/24/96	
A24472	VCR, MITSUBISHI	HS-U500	124406M	TRAILER	OSF	LAMTF	5/24/96	
A24473	VCR, MITSUBISHI	HS-U500	125429M	TRAILER	OSF	LAMTF	5/24/96	
A24474	VCR, MITSUBISHI	HS-U500	125426M	TRAILER	OSF	LAMTF	5/24/96	
A24475	VCR, MITSUBISHI	HS-U500	123453M	TRAILER	OSF	LAMTF	5/24/96	
A24476	VCR, MITSUBISHI	HS-U500	123613M	TRAILER	OSF	LAMTF	5/24/96	
A24477	VCR, MITSUBISHI	HS-U500	123743M	TRAILER	OSF	LAMTF	5/24/96	
A24478	VCR, MITSUBISHI	HS-U500	119214M	TRAILER	OSF	LAMTF	5/24/96	
A24479	VCR, MITSUBISHI	HS-U500	125294M	TRAILER	OSF	LAMTF	5/24/96	
A24480	VCR, MITSUBISHI	HS-U500	123671M	TRAILER	OSF	LAMTF	5/24/96	
A24481	VCR, MITSUBISHI	HS-U500	123646M	TRAILER	OSF	LAMTF	5/24/96	
A22889	VID/IO BOX	1701-30001	11154		OSF	LAMTF		
A22890	VID/IO BOX	1701-30001	VI011137	HIGH BAY	OSF	LAMTF	5/24/96	
A22891	VID/IO BOX	1701-30001	VI011131	HIGH BAY	OSF	LAMTF	5/24/96	
A22892	VID/IO BOX	1701-30001	V1011098	HIGH BAY	OSF	LAMTF	5/24/96	
A22893	VID/IO BOX	1701-30001	V1011087	HIGH BAY	OSF	LAMTF	5/24/96	
A22894	VID/IO BOX	1701-30001	VI011111	HIGH BAY	OSF	LAMTF	5/24/96	
A22895	VID/IO BOX	1701-30001	VI011085	HIGH BAY	OSF	LAMTF	5/24/96	
A22896	VID/IO BOX	1701-30001	V1011103	HIGH BAY	OSF	LAMTF	5/24/96	
A22949	VID/IO BOX	1701-30001	VI011175	HIGH BAY	OSF	LAMTF	5/24/96	
A22950	VID/IO BOX	1701-30001	VI011108	HIGH BAY	OSF	LAMTF	5/24/96	
A23507	VID/IO BOX	1701-30001	10987	HIGH BAY	OSF	LAMTF	5/20/96	
A24042	CASE, ARMADILLO			TRAILER	OSF	LAMTF	6/06/96	
A24526	CASE, ARMADILLO			TRAILER	OSF	LAMTF	6/06/96	
A24038	CASE,			TRAILER	OSF	LAMTF	6/06/96	

	ARMADILLO, 19" RACK							
A24040	CASE, ARMADILLO, FM			TRAILER	OSF	LAMTF	6/06/96	
A24413	PRINTER, COLOR	4693DX	B030886	L5B1	OSF	LAMTF	6/11/96	
LM00793	REPEATER, CENTRECOM	AT-MR820TR	F42Y5196 B	SIM LAB	OSF	LAMTF	7/16/96	CDF UPGRADE /ERIC SNYDER
A22009	MONITOR	PVM-1390	2013796	ROOM L	OSF	LAMTF	6/05/96	
A24647	HUB	AT-MR124	G0DR506 2H	L2B2	OSF	LAMTF		
A24648	HUB	AT-MR124	G09N5062 H	L2B2	OSF	LAMTF		
A24681	HUB, REPEATER, FOIRL / 10BASE2	AT-MR127F	G0C75129 A	L2B2	OSF	LAMTF	5/30/96	
A24649	HUB	AT-MR124	G0ER5062 H	L2B2	OSF	LAMTF	6/10/96	
LM01287	HUB	AT-MR124	G0F35062 H	RANDY KUBIK	OSF	LAMTF	9/4/96	RANDY KUBIK
A24680	HUB, REPEATER, FOIRL / 10BASE2	AT-MR127F	G0AN512 9A	L2B2	OSF	LAMTF		
A22867	HUB, AUI - 10 BASE T	AT-3012T	EJ274194	248 / COMMUNI CATIONS CLOSET	OSF	LAMTF	6/25/96	
A23573	SPACEBALL	2003	05950324 27	ROOM L	OSF	LAMTF	6/24/96	
A24615	CASE, ARMADILLO			QUAD A	OSF	LAMTF		
A25016	PRINTER, BROTHER	MFL-4500	L5336780 8	LMFS	LMFS	LAMTF		
A25021	SCANNER, MICROTEK SCANMAKER IISP			LMFS	LMFS	LAMTF		
A25006	MODEM, PSION 3FAX			LMFS	LMFS	LAMTF		
A25003	MODEM, PSION 3FAX			LMFS	LMFS	LAMTF		
LM01129	PRINTER, LASERJET 5P	C3150A	USFB2360 43	ROOM M	OSF	LAMTF	8/24/96	
LM00221	CPU, LAPTOP, IBM THINKPAD	755CDV	23-791KP	BOB EDWARDS	STRIC OM	LAMTF	6/19/96	
LM00220	CPU, POCKET,	3A		JOHN	STRIC	LAMTF	6/19/96	

	PSION SERIES 3A			CAMPBELL	OM			
LM00219	MODEM, PSION 3		FDA131466O	BOB EDWARDS	STRICOM	LAMTF	6/19/96	
LM00228	PRINTER, LASERJET 5P	C3150A	USFB235939	M3B/2 CUBE23	OSF	LAMTF	8/24/96	
LM01153	PRINTER, DESKJET 850C	C2145A	US56B110S7	M3B-2 CUBE 12	OSF	LAMTF	8/24/96	
A25053	SPEAKER	40-1361	NONE	BOB EDWARDS	OSF	LAMTF	8/24/96	
A25054	SPEAKER	40-1361	NONE	BOB EDWARDS	OSF	LAMTF	8/24/96	
A25072	BATTERY CHARGER FOR GP300	HTN9748C	NONE	L5C1	OSF	LAMTF	5/15/96	
A22977	MONITOR, MITSUBISHI	VS-6081	000123	SIM LAB	OSF	LAMTF	5/20/96	
A22978	MONITOR, MITSUBISHI	VS-6081	000125	HIGH BAY	OSF	LAMTF	5/20/96	
A22980	MONITOR, MITSUBISHI	VS-6081	000201	HIGH BAY	OSF	LAMTF	5/20/96	
A22985	MONITOR, MITSUBISHI	VS-6081	000222	HIGH BAY	OSF	LAMTF	5/20/96	
A22986	MONITOR, MITSUBISHI	VS-6081	000259	HIGH BAY	OSF	LAMTF	5/20/96	
A22987	MONITOR, MITSUBISHI	VS-6081	000266	SIM LAB	OSF	LAMTF	5/20/96	
A22979	MONITOR, MITSUBISHI	VS-6081	000199	HIGH BAY	OSF	LAMTF	5/20/96	
A22981	MONITOR, MITSUBISHI	VS-6081	000212	TRAILER	OSF	LAMTF	5/24/96	
A22982	MONITOR, MITSUBISHI	VS-6081	000218	TRAILER	OSF	LAMTF	5/24/96	
A22983	MONITOR, MITSUBISHI	VS-6081	000219	TRAILER	OSF	LAMTF	5/24/96	
A22984	MONITOR, MITSUBISHI	VS-6081	000221	TRAILER	OSF	LAMTF	5/24/96	
LM00558	SPEAKER, BOSE, ACCOUSTIMASS 5 SERIES II	143753	AM5B0XM595366	L2A4	OSF	LAMTF	5/29/96	
LM00559	SPEAKER, BOSE, ACCOUSTIMASS 5 SERIES II	143753	AM5B0XM492412	L2A4	OSF	LAMTF	5/29/96	
A25075	BATTERY CHARGER	HTN 9748C	NONE	BOB EDWARDS	OSF	LAMTF	5/30/96	
A23560	IF4B WIRE INTERFACE			TRAILER	OSF	LAMTF	5/30/96	

A23559	SOUND SYSTEM, MAIN STATION	MS-400A	BER-565303	TRAILER	OSF	LAMTF	5/30/96	
A23561	SOUND SYSTEM, ADAPT-A-COM	AC-10H	BER-564839	TRAILER	OSF	LAMTF	5/30/96	
A23562	SOUND SYSTEM, ADAPT-A-COM	AC-10H	BER-564840	TRAILER	OSF	LAMTF	5/30/96	
A24482	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076113	TRAILER	OSF	LAMTF	5/30/96	
A24483	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076108	TRAILER	OSF	LAMTF	5/30/96	
A24491	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076112	TRAILER	OSF	LAMTF	5/30/96	
A24489	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076107	TRAILER	OSF	LAMTF	5/30/96	
A24496	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076110	TRAILER	OSF	LAMTF	5/30/96	
A24497	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076109	TRAILER	OSF	LAMTF	5/30/96	
A24498	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076114	TRAILER	OSF	LAMTF	5/30/96	
A24642	SINGLE CHANNEL INTERCOM SYSTEM	MODEL 501	A076111	TRAILER	OSF	LAMTF	5/30/96	
LM00605	SPEAKERS, MINI, BOSE			L2C3	OSF	LAMTF	6/18/96	
LM00606	SPEAKERS, MINI, BOSE			L2C3	OSF	LAMTF	6/18/96	
LM00607	SPEAKERS, MINI, BOSE			L2C3	OSF	LAMTF	6/18/96	
LM00608	SPEAKERS, MINI, BOSE			L2C3	OSF	LAMTF	6/18/96	
A24041	CASE,			TRAILER	OSF	LAMTF	6/06/96	

	ARMADILLO							
A24994	KEYBOARD, COMPAQ	RJ101			OSF	LAMTF	6/19/96	
LM00222	ZIP DRIVE, 100MB IOMEGA	U DRI 70093	RB0F51A 0WM	M3B-2 CUBE 11	OSF	LAMTF	8/24/96	BOB EDWARDS
LM00223	SCANNER, MICROTEK	1108-90-310010	S5B75082 10	M3B/2 CUBE 11	OSF	LAMTF	8/24/96	BOB EDWARDS
LM00224	MONITOR, COMPAQ	190901-601	532CB02 AG843	M3B/2 CUBE 11	OSF	LAMTF	8/24/96	BOB EDWARDS
LM00226	CPU, COMPAQ PROLINEA	222630-004	A546HSK 4D088	BOB EDWARDS	OSF	LAMTF	8/24/96	BOB EDWARDS
LM00225	KEYBOARD, COMPAQ	RT101	1GD39CS 22943	M3B-2 CUBE 11	OSF	LAMTF	8/24/96	BOB EDWARDS
LM01302	PHONE, DIGITAL, CORDLESS	9100	10079513 047	DONALD BLOOM	OSF	LAMTF	9/9/96	DONALD BLOOM
LM01303	PHONE, DIGITAL, CORDLESS	9100	10079513 048	DONALD BLOOM	OSF	LAMTF	9/9/96	DONALD BLOOM
LM01304	PHONE, DIGITAL, CORDLESS	9100	10305960 01781	DONALD BLOOM	OSF	LAMTF	9/9/96	DONALD BLOOM
LM01305	PHONE, DIGITAL, CORDLESS	9100	10305960 01841	DONALD BLOOM	OSF	LAMTF	9/9/96	DONALD BLOOM

APPENDIX C - IMMERSIVE THEATER SCENARIO

WARRIORS IN THE INFORMATION AGE
Script for a Live Multi-Media Presentation
3 October 1996
(new3oct.doc)

Changes are annotated in bold letters. On left side screen 1,2,3 refer to the biggest screens in the display and Monitors A, B, C refer to smaller screens used for live picture views or to enrich the main picture on the bigger screens. The big screens are the focus of the theater presentation and they use multi-media including live virtual simulation, live action and video to deliver the message.

The pre-show graphics consisted of a collage of action soldier footage on screens **1,2,3** with STRATCOM messages and quotes on monitors **A, B, C** and annotated over the video. Messages and quotes to follow. At the proper time before the show begins the screens all fade to either black or blue to get the audience's attention. The first set of images appear on the screens 5 seconds before the narrator begins.

1 Videotape of soldiers operating computer equipment in the 21st Century **AE III** annotated over the screen.

2. Jane's Apache shoot. ARMY EXPERIMENT III annotated over the screen.

3 Videotape of soldiers operating computers in C2V at JVL. **AE III** annotated over the screen. Monitors **A, B, C** blank screen unless enrichment needed.

Same as script #1 initially, fades to below at words, "The technologies".
1. Videotape of TI Scout Vehicle. STAND-ALONES and a list of those experiments annotated over the screen.
2. Same as script #1.
3. Videotape of DBBL soldier on mobility platform. THEATER (SBE) and a list of those experiments annotated over the screen.
Monitor **A** - Graphic chart - SCOUT VEHICLE, COTILLION BALLROOM, Monitor **B** blank screen, Monitor **C** - Graphic chart - SOLDIER TRAINING IN VIRTUAL SIMULATION, FORT BENNING, GA.

Same as script # 2.

1.   PRESENTER (0:00-0:05):   Good morning/afternoon. I'm _____. Welcome to the Army's Warriors in the Information Age presentation.

2. PRESENTER (0:06-0:22): We're here to show you America's Army applying Information Age technology -now -to prepare for the 21st Century battlefield. Our soldiers are training with these new technologies -- including simulations -- And over the next twenty minutes, you'll see them in action – much of it, live.

3. PRESENTER (0:23-0:34): **This is a live distributed show where anything can happen so we'll have a good time!**

Same as script # 2.

4. PRESENTER (0:35-0:58): Much of what you'll see here will be new, and you may have some questions. We can't stop our live show while it's running, but we will have time for questions a little later. And you can learn more about these technologies as you move next door to the 21st Century **Tactical Operations center , or TOC,** and from the hands-on equipment here in the ballroom -- as well as from the CD you'll receive when you leave here today

Live video **VTC** feeds of troops in simulators,
1. Fort Benning, GA
2. Fort Leavenworth, KS after 10 seconds fades to San Jose, CA.
3. Bozeman, MT
1. Fort Benning, GA
2. San Jose, CA
3. Bozeman, MT
Monitor **A, B, C:** Graphic chart of network diagram, showing how sites are linked. Location titles annotated over the top of the monitor screen synchronized with **2** change.

5. PRESENTER (0:59-1:26): Now, let's talk about **the connectivity of this** special experiment! Here in the theater, you'll be seeing four live video feeds and seven live simulation feeds, coming from eight remote sites. Participants at the sites will communicate with multiple simulations over experimental networks, and interact in real time. Most will be linked on the same simulated battlefield, although they're up to a thousand miles apart. In the future, this will be routine, instead of a special experiment.

1. Videotape of 21st Century TOC with officer working at computer equipment.
2. Videotape of annotation 21ST CENTURY.
3. Videotape of male and female officers in 21st Century TOC gesturing to computer display.
Monitors **A, B, C** blank screen unless enrichment needed.

6. PRESENTER (1:27-1:37): The vignettes you're about to see take place in the 21st Century -- only four years away. By then, some of those officers you saw outside could be battalion or higher level commanders.

1. Videotape of CDR in TOC with computer.
2. Videotape of tank with embedded trainer.
3. Videotape of equipment design in virtual world.
Monitors **A** - Graphic chart - COMPRESS PLANNING AND DECISION-MAKING CYCLES, Monitor **B,** - Graphic chart - REAL TIME DOMINANT SITUATIONAL AWARENESS, Monitor **C** - Graphic chart - TEST IN SIMULATION BEFORE YOU BUILD

7. PRESENTER (1:38-2:06): They'll train and fight using information and simulation systems designed to compress planning and decision making cycles. Information technology will give them real time dominant situational awareness of the battlefield... and the ability to plan and act faster than our enemies can react. These technologies will also aid logisticians in managing the needs of a force projection Army... and future combat and materiel developers in testing new equipment, before it's ever built.

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1,2,3 Videotape of high energy, soldiers/combat footage annotated with STRATCOM messages such as Soldiers Are Our Credentials. Verbiage to follow.
Monitor **A, B, C** Quotes and STRATCOM messages. Verbiage to follow

8. PRESENTER (2:07-2:17): We're exploiting these technologies to give our soldiers the best tools possible -- so they can survive and win on the battlefield of the next century.

1-3 and Monitors **A, B, C** same as script # 8

9. PRESENTER (2:18-2:30): While no technology can make our soldiers invincible... these new tools <u>can</u> make them more efficient and effective...so we can continue to overmatch our adversaries and be better able to respond to our nation's needs.

TRANSITION FROM INTRODUCTION TO HISTORICAL PERSPECTIVE. (Fade to blank screen)

1,2,3 Videotape of collage of commander's metric tools (maps, binoculars, plotting and measuring devices, etc.) from the Civil War forward to Desert storm. Monitor **A, B, C** blank screen.

10. PRESENTER (2:31-2:39): But before we enter the future, let's set a historical perspective. Since ancient times, all ground commanders have grappled with the same three questions:

1-3 Same as script # 10 annotated with **1 -** Where am I? **2 -** Where are my friends? **3 -** Where is the enemy?
Monitors **A** - Graphic chart - WWI Corps frontage chart also showing lethality ranges and speed of battle graph.
Monitor **B** - Graphic chart -WWII Corps frontage chart also showing lethality ranges and speed of battle graph.
Monitors **C** - Graphic chart - Desert Storm Corps frontage chart also showing lethality ranges and speed of battle graph.

11. PRESENTER (2:40-2:45): Where am I? Where are my friends? And where is the enemy?

1,2,3 same as script # 11.
Monitor **A, B, C** same as script # 11

12. PRESENTER (2:46-3:14): The commander who can best answer these questions in the shortest time has dominant situational awareness. That commander knows where his or her units are, where friendly units are and where the enemy is...and he can plan and act faster than the enemy can react, resulting in victory. Throughout history, the commander's ability to answer those three questions and gain dominant situational

awareness has varied with the size, lethality and speed of the battlefield.

13. NOT USED
14. NOT USED
15. NOT USED

1-3 Videotape of stock battle action from WWI, WWII and Desert Storm. At the words "exponentially" the three questions annotate on 1 - Where am I? 2 - Where are my friends? 3 - Where is the enemy?
Monitors A, B, C - same as script # 11

16. PRESENTER (3:15-3:36): In the past hundred years, the size, lethality, and speed of the battlefield have expanded exponentially. The ability to gather battlefield information has kept up with that expansion -- but the sheer amount of data is often overwhelming. The challenge today and in the future is how to fuse or distill that data into usable information -- faster than the enemy can.

1-3 Same as script # 16, Monitor A, B, C same as script # 11

17. PRESENTER (3:37-3:58): By capitalizing on information technology, the Army is gaining that capability. Our 21st Century commanders will see more of the battlefield and communicate faster -- but most importantly, they'll use the data they gather more effectively... giving them REAL TIME dominant situational awareness to plan and execute faster than the enemy can react.

1 TI Simulator, live video feed VTC (Bozeman, MT)
2 MCS/P icon whiteboard view from JVL of the Corps laydown to brigade level.
3 C2V live video feed VTC (Fort Leavenworth) showing corps commander working at terminal.
Monitors A - 21ST CENTURY TOOLS, LIVE FROM BOZEMAN, MT, Monitor B - Graphic chart 21ST CENTURY COMMANDER'S REAL TIME DOMINATE SITUATIONAL AWARENESS PICTURE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor C - Graphic chart - 21ST CENTURY TOOLS - LIVE FROM FORT LEAVENWORTH, KS

18. PRESENTER (3:59-4:20): Our 21st Century commanders will visualize the battlefield on electronic operations maps updated continuously with key data. They will know where they are, where their friends are and where the enemy is. They will be able to compress their planning and decision cycles, utilizing more accurate information.

TRANSITION TO VIGNETTE 1.

1,2,3 and Monitor A, B, C Same as script # 18
At 4:30(time) bring up script # 20 scenes

19. PRESENTER (4:21-4:40): In our first vignette, you'll see how these technologies

help the corps commander compress planning and decision cycles in order to attack multiple targets at multiple locations nearly simultaneously in a deep battle_situation. We will condense the duration of the battle from hours to minutes, for the sake of time.

1 Virtual view of JSTARS airplane.
2 Video of JSTARS MTI monitor feed annotated with their purpose.
3 Live video feed -- JVL VTC of ASAS operator
Monitor **A** - JSTARS AIRCRAFT- LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **B** - Chart depicting the various Common ground Station intelligence products; Monitor **C** - Graphic chart - **ASAS OPERATOR REVIEWING JSTARS DATA**, LIVE FROM FORT LEAVENWORTH, KS

20. PRESENTER (4:41-5:11): To detect and accurately portray a major enemy attack, the Corps depends on intelligence collection systems, such as the joint Army /Air Force JSTARS aircraft. These systems collect and downlink huge quantities of **organized** intelligence data to Common Ground Stations. Then, skilled operators use sophisticated analysis technologies, such as the All Source Analysis System, to select, distill, and display the key information from that vast collection of data.

1-3 and Monitor **A, B, C** same as script # 20.

21. PRESENTER (5:12-5:22): The corps commander uses this information to monitor and predict the enemy's actions and to plan the attack throughout the depth of the enemy's sector.

22. NOT USED

1 & 3 Virtual tethered view of Predator UAV flying.
2 **Video of virtual UAV payload view of tank column.**
Monitor **A** - Graphic chart - PREDATOR UAV FLYS OVER THE BATTLEFIELD-LIVE SIMULATION FROM FORT LEAVENWORTH, KS
Monitor **B** - UAV VIEW OF BATTLEFIELD;
Monitor **C** - Graphic chart - Picture of a Predator UAV -annotated PREDATOR UAV

23. PRESENTER (5:23-5:42): The commander's first move is to detect and engage high priority targets deep behind the enemy's line. An unmanned aerial vehicle, or UAV, concentrates on the area indicated as critical by the JSTARS intelligence. This helps the corps to determine the thrust of the main attack, and to look for high value targets.

1,2,3 Blank screen, then after SCUD launch from Monitor **A** **video of** attached SCUD missile virtual picture which reaches top of apogee on screen 2 before script # 25 begins, Screen **3** stays blank.
Monitor **A** - video of SCUD launch, annotated SCUD LAUNCH; Monitor **B** - video tape

24. PRESENTER (5:43-5:52): Meanwhile, national reconnaissance assets observe an enemy SCUD launch and transmit the information to the corps.

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acquisition sequence showing SCUD launch detection on Commander's Real Time Display, annotated COMMANDER'S REAL TIME DISPLAY SHOWS LAUNCH; Monitor **C** - video of Patriot launcher preparing to launch annotated PATRIOT LAUNCHER.

1,2,3 Video of attached SCUD missile virtual picture continue from script # 24 to **3** and ends abruptly at the edge of Screen 2.
Monitor **A** - continued video of script # 24 annotated SCUD TEL; Monitor **B** - Videotape of appropriate ADA monitor, Patriot tracking, launch and destruction annotated PATRIOT TRACK, LAUNCH AND SCUD DESTRUCTION; Monitor **C** - Patriot launch switches to Desert Storm or other video footage showing explosion like one missile hitting another, annotated PATRIOT DESTROYS SCUD.

25. PRESENTER (5:53-6:03): Corps missile defense units receive the launch information, acquire the enemy missile, launch and destroy it.

1,2,3 Virtual view of Comanche team turning and flying in a new direction. Overlaid with audio track.
Monitor **A,C** Still pictures of Comanche helicopter annotated COMANCHE HELICOPTER, Monitor **B** Graphic chart - COMANCHE'S VIEW OF THE BATTLEFIELD - LIVE SIMULATION FROM FORT LEAVENWORTH, KS;

26. PRESENTER (6:04-6:15): The corps diverts a Comanche team on a deep reconnaissance mission to find and destroy the enemy **SCUD launcher**." The Comanches turn and begin to search for the **SCUD launcher**.

1-3 Virtual view of SCUD TEL and forward operating base as seen from Comanche. Monitor **B** - Graphic Chart - COMANCHE VIEW OF SCUD TEL AND FORWARD OPERATING BASE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitors **A&C** - blank screen

27. PRESENTER (6:16-6:26): Within minutes, the Comanches locate it, near a forward operating base with the critical missile reload trucks.

1-3 Same as script #27
Monitor **A,C** Video clip of TOC scene, showing incoming intelligence messages displayed on monitors. Monitor **B** - Graphic chart depicting an electronic call for fire

28. PRESENTER (6:27-6:40): The Comanche team leader sends a digital call for fire message directly to the supporting ATACMS unit to destroy the forward operating base.

1-3 Same as script #27
Monitor **A, B, C** same as script #28

29. PRESENTER (6:41-6:49): The corps has cleared the target, and the ATACMS firing unit

launches.

1,2 Same as script # 27.1.
3 Video of virtual view of attached ATACMS flight and target impact.
Monitor **A** - Graphic Chart - COMANCHE'S VIEW OF SCUD TEL AND FORWARD OPERATING BASE - SIMULATION FROM FORT LEAVENWORTH, KS AND HUNTSVILLE, AL, Monitor **B** - blank screen; Monitor **C** - Graphic Chart - ATACM'S MISSILE FLIGHT AND TARGET IMPACT - SIMULATION FROM FORT SILL, OK AND HUNTSVILLE, AL

30. PRESENTER (6:50-7:05): It would take the missile three to five minutes to reach the target. We will only show you a part of the flight and the impact. (Sound of missile impact)

31. **NOT USED**

1&2 Tethered virtual view showing TEL target left and Comanche attacking. (SGI)
3 Comanche thermal sensor view of target being attacked with Hellfire flyout. (SGI)
Monitor **A** - Graphic chart - COMANCHE'S VISUAL VIEW - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **B** - blank screen; Monitor **C** - COMANCHE'S THERMAL VIEW - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

32. PRESENTER (7:06-7:21): The ATACMs missile destroys most of the Forward Operating Base. The Comanche team conducts a target damage assessment, detects a second **SCUD launcher**, and rapidly destroys it.

1,3 black screen
2 Thermal sensor virtual view of MRLs, BRDM and trucks moving into the team's surveillance area.
Monitor **A,C** - Still pictures of a Special Forces reconnaissance team hiding , Monitor **B** - Graphic chart - THERMAL VIEW OF ENEMY HEAVY ROCKET LAUNCHERS - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

33. PRESENTER (7:22-7:40): While the Comanches complete their attack, another sensor is at work -- a Special Forces reconnaissance team. The team uses thermal sights to detect targets through smoke and obscurants along an enemy route. They burst-transmit the information to their headquarters.

1&3 Virtual view of F-15's flying cap over Marine strike aircraft. **2** same as script # 33
Monitor **A&C** - graphic chart - AIR FORCE CAP COVERING MARINE STRIKE AIRCRAFT - LIVE SIMULATION FROM FORT LEAVENWORTH, KS ; Monitor **B** same as script # 33.

34. PRESENTER (7:41-7:51): The Corps wants to attack the rocket systems as part of their counter fire efforts. So, it diverts Marine strike aircraft under Air Force counter-air **patrol** to do the job.

1,3 same as script # 34
2 Thermal sensor virtual view of attack aircraft bombing the rocket launchers as seen from Special Forces point of view.
Monitors **A, B, C** - video of pilots in aircraft

35. PRESENTER (7:52-8:00): The Marine strike aircraft attack the enemy rocket site, while the reconnaissance team assesses damage.

1 Tethered virtual view from UAV of enemy armored forces.
2. Datalog of virtual UAV view of battlefield.
3 Live video feed of JVL VTC of commander viewing a screen in his C2V.
Monitor **A** - Graphic Chart - ENEMY ARMOR - LIVE SIMULATION FROM FORT LEAVENWORTH, KS, Monitor **B** - Graphic chart - UAV VIEW, Monitor **C** - Graphic chart - CORPS COMMANDER, LIVE FROM FORT LEAVENWORTH, KS

36. PRESENTER (8:01-8:09): As the enemy rocket launchers burn, the Corps commander prepares to attack an enemy armor threat.

1,2 and Monitor **A,B** same as script # 36
3 Video feed of BVP screen in JVL
Monitor **C** - Graphic chart - INTELLIGENCE PICTURE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

37. PRESENTER (8:10-8:17): The UAV sensors confirm the target. The commander rechecks the intelligence picture to confirm attack timing. It looks good.

1,2,3 Virtual, tethered view of an attack company approaching armored column.
Monitor **B** - Graphic Charts - ATTACK TEAM'S VIEW - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **A,C** - blank screen

38. PRESENTER (8:18-8:27): The commander directs the Aviation Brigade to execute the attack helicopter battalion's plan. They will attack the armored column.

1,2,3 Virtual, tethered view of Comanches firing on anti-aircraft systems, weapon flyout and target destruction.
Monitors **A,C** blank; Monitor **B** Graphic chart - COMANCHES DESTROY ENEMY AIR DEFENSE - LIVE SIMULATION FROM FORT LEAVENWORTH,

39. PRESENTER (8:28-8:42): Comanches destroy enemy air defense systems. The AH-64D Longbow Apaches coordinate targeting data digitally and engage the armored column at maximum targeting range.

1,2,3 Virtual, tethered view of AH-64D Longbow Apaches firing on the armored column, weapon flyout, and target destruction.
Monitor **A, B, C** - video or still photos of Apache helicopters firing ordnance.

40. PRESENTER (8:43-8:53): After the engagement, the Corps receives reports of enemy destruction from the Comanche and UAV.

TRANSITION OUT OF ACTION, INTO VIGNETTE 1 SUMMARY.

1&3 Videotape clips from rehearsal. Monitors **A, B, C** Collage of segments reprising key parts of the vignette.
2 Graphics supered over similar images. Graphic listing main points:
-- Information Technology fuses and distills key information from overwhelming amounts of data
-- Dominant Real Time Situational Awareness compresses decision and planning cycles
-- Information technology provides:
    - increased lethality
    - increased speed and mass of attack
Monitor **A, B, C** - Collage of segments reprising key parts of vignettes

41. PRESENTER (8:54-9:15): So, that's what elements of a corps level battle might look like in the 21st Century. It'll be a fast, lethal, complex fight, that takes place over thousands of square miles of terrain. Our Corps commander used real time dominant situational awareness to act faster than the enemy could react by engaging and destroying multiple high priority targets at multiple locations nearly simultaneously.

1,2,3 Video of 21st Century TOC
Monitor **A, B, C** Same as script # 41

42. PRESENTER (9:16-9:23). When you visit the 21st Century TOC next, you can see some of the actual equipment we talked about in this operation.

1,2,3 same as script # 42
Monitor **A** - Graphic Chart - TASK FORCE XXI, Monitor **B** - Graphic chart - NATIONAL TRAINING CENTER, Monitor **C** - Graphic Chart - MARCH,1997

43. PRESENTER: (9:24-9:38) **The Army will learn more about dominant situational awareness during a brigade-level Advanced Warfighting Experiment at the National Training Center. There is more information in your CD.**

TRANSITION TO VIGNETTE 2

1&3 Chart showing line diagram from Corps to BDE
2 Monitor feed BPV icon corps map zooms down to BDE level and deaggregates.
Monitor **A&C** blank screen; Monitor **B** - graphic chart - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

44. PRESENTER (9:39-9:45): Let's move on now from the deep battle to the close battle, from the corps to a combat maneuver brigade.

1 Feed from monitor of BVP screen with brigade laydown.
2 Feed from monitor of MCS/P (file 45.2) shows warning order and brigade laydown .
3 Live video feed of JVL C2V with MCS/P view of brigade laydown (OTS)
Monitor A - Graphic chart - BRIGADE ZONE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor B - Graphic chart - WARNING ORDER; Monitor C -

45. PRESENTER (9:46-10:07): In this vignette, we'll focus again on situational awareness and planning and dissemination of orders among TOCs linked by simulations. Here, again, information technology will dramatically improve our speed and accuracy in training and combat. It will help make our soldiers virtual combat veterans, before they engage the enemy in actual combat.

Graphic chart - BRIGADE COMMANDER'S VEHICLE, LIVE FROM FORT LEAVENWORTH, KS

1,2,3 Monitor **A, B, C** same as script # 45 until script time 10:18 then **1** fades to live VTC Bozeman, MT showing OTS of Bn Cdr watching appliqué screen. Screen **2** switches from MCS/P file 45.2 to whiteboard file 48.2. Monitor **A** - Graphic chart - BATTALION COMMANDER'S VEHICLE, LIVE FROM BOZEMAN, MT
3 and **B, C** stay same as script # 45.

1 Live VTC Bozeman, MT showing OTS of Bn Cdr watching appliqué screen. Monitor **A** - Graphic chart - BATTALION COMMANDER'S VEHICLE, LIVE FROM BOZEMAN, MT
2&3 Monitors **B, C** Same as script #45.

1 and **A** Same as script #47
2 BPV view showing rehearsal at very slow speed. **3** Same as script # 45
Monitors **B** - COUNTERATTACK COURSE OF ACTION - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **C** Same as script #45.

1 and **A** same as script # 47
2 Feed from BPV monitor of rehearsal.
3 Same as script #45
Monitor **B** - Graphic Chart - REHEARSAL USING LINKED SIMULATION - LIVE SIMULATION FROM FORT LEAVENWORTH, KS, Monitor **C** - same as script #45

1. same as script # 47
2. same as script #49
3. same as script #45
Monitor **A** - same as script #47; Monitor **B** - same as script #49, Monitor **C** - same as script #45

1 Virtual view of enemy force entering view of scout. (SGI)

46. PRESENTER (10:08-10:23): As we join the brigade commander, battle is imminent. He sends a detailed warning order to his commanders and their TOCs to prepare them for a possible counterattack. His message appears almost instantly as a graphic on their computer screens.

47. PRESENTER: (10:24-10:33) Immediately, commanders and staffs at two levels share the same information. They're ready to conduct simultaneous planning using simulations.

48. PRESENTER (10:34-10:48): While the subordinate commanders study the warning order, the brigade commander uses automated planning tools to analyze various courses of action. He and his staff wargame the counterattack courses of action using a simulation.

49. PRESENTER (10:49-11:05): Next, he electronically rehearses it with the battalion commanders -- again using a simulation-- so they can see and hear how the commander expects the battle to unfold, and coordinate critical points.

50. PRESENTER (11:06-11:22): When he's satisfied, the brigade commander electronically disseminates the final order with any changes discovered during the rehearsal. This ability to plan and rehearse simultaneously between command levels drastically reduces planning cycles.

51. PRESENTER (11:23-11:38): An hour later, a scout detects enemy armor moving

2 Feed from monitor of MCS-P icon view 51.2, showing common situational awareness screen of enemy threatening village.
3 Live video feed of JVL C2V showing BDE CDR
Monitor **A** - graphic chart - LIVE SIMULATION FROM BOZEMAN, MT, SCOUT DETECTS ENEMY; Monitor **B** - Graphic chart - INTELLIGENCE PICTURE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS, Monitor **C**- Graphic chart - BRIGADE CDR'S COMMAND VEHICLE, LIVE FROM FORT LEAVENWORTH, KS

toward a key village. This could trigger the counterattack. The commander confirms the threat through his intelligence feeds. He directs the brigade to execute the counterattack they just rehearsed.

1&2 Virtual view of mechanized team with attachments advancing past working engineer vehicles.
3 Virtual view close-up of the UD Bradley fighting vehicle.
Monitor **A** - still picture of Grizzly engineer vehicle annotated GRIZZLY ENGINEER VEHICLE; Monitor **B** - still picture of Wolverine engineer vehicle annotated WOLVERINE ENGINEER VEHICLE; Monitor **C** - still picture of UD Bradley annotated M2A3 BRADLEY

52. PRESENTER (11:39-11:49): The plan calls for a mechanized task force to seize the village and block the enemy's advance. Lead elements of the task force conduct an in-stride breach, with engineer assistance, as they move toward the village.

1-3 and Monitor **A, B, C** Same as script #52

Live action: The **PRESENTER** circles the UD Bradley on **3** with a laser pointer.

53. PRESENTER (11:50-11:59): I want to bring your attention to this M2A3 Bradley fighting vehicle with a different turret -- we'll talk more about it later.

DATA BASE SWITCHES TO DBBL

DATA BASE SWITCHES TO DBBL

1,2 Virtual view from rear of Bradley and support team overwatching the assault team approaching the village. At the words, " clear the village" the squad receives sniper fire from the village and begins immediate action drill.
3 Live video VTC view of soldier on mobility platform at Fort Benning.
Live Action. (PRESENTER points to the mobility platform soldier's image on the virtual view, Monitors **A** and **B** as appropriate to the script)
Monitor **A** - PVD- bird's eye view of infantry platoon's action annotated - LIVE FROM

54. PRESENTER (12:00-12:31): The infantry dismounts to clear the village and begins to receive sniper fire. The soldier you see live from Fort Benning is using virtual simulation and head-mounted automated command and control equipment. **He is the first soldier in the column, here in the simulation.** (PRESENTER points to the mobility platform soldier's image on the virtual view). Throughout this portion of the battle you will see a live battlespace overview on this monitor (PRESENTER points to Monitor A) and various views of the soldiers' command and

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FORT BENNING, GA; Monitor **B** - blank screen until the squad receives fire then video tape monitor feed of fire team leader's IHAS SITREP message to squad/platoon leader reporting receiving fire. Message annotated - LIVE FROM FORT BENNING, GA; Monitor **C** - Graphic chart - SOLDIER TRAINING IN VIRTUAL SIMULATION, LIVE FROM FORT BENNING, GA.

control systems on this monitor. (PRESENTER points to Monitor B) These include messages, calls for fire, and **map displays**.

1,2 Virtual view from rear of Bradley and support team laying down a base of fire for the assault team which continues its immediate action drill.
3 Same as script # 54
Monitor **A** - Same as script # 54. Monitor **B** - video tape monitor feed of platoon leader's view of tactical map (shows his battlespace) annotated - LIVE FROM FORT BENNING, GA; Monitor **C** - same as script #54.

55. PRESENTER (12:32-12:55): The platoon leader's automated command and control system provides him with real time dominant situational awareness. He uses it to direct his units to destroy known enemy. This capability enhances the efficiency and lethality of his platoon, and reduces the probability of fratricide. Using similar information systems, fire team and squad leaders keep their commanders apprised of the situation.

1,2 same as script # 55.
3 same as script # 54.
Monitor **A,C** same as script # 55
Monitor **B** - video feed of Platoon Leader's IHAS SITREP to the platoon indicating an approaching enemy armored column, annotated - LIVE FROM FORT BENNING, GA.

56. PRESENTER (12:56-13:12): The platoon leader receives a SITREP from his commander indicating an enemy armored column approaching the village. Using his control system, he can constantly monitor his units, friendly units, and known enemy units. He can automatically update his subordinates with graphics, unit locations and orders.

1,2 Assault element reaches building ,
3 same as script # 54.
Monitor **A,C** same as script # 55
Monitor **B** - video monitor feed of IHAS call for fire annotated - LIVE FROM FORT BENNING, GA.

57. PRESENTER (13:13-13:21): As the assault continues, he executes a call for indirect fire on his command and control device to block the enemy armor column until the platoon clears the village.

1,2 Assault element enters building, traverses the stairs and negotiates obstacles while searching for the sniper, kills sniper.
3 same as script # 54.
Monitor **A** - Same as script # 55. Monitor **B** - video monitor feed of fire team leader's rifle view annotated - LIVE FROM FORT BENNING, GA; Monitor **C - Graphic Chart - RIFLE VIEW: PROVIDES ADVANCED SCANNING AND LASING**

58. PRESENTER (13:22-13:46): After the supporting fires are lifted, the assault element enters the building. **By scanning the room with his rifle view from a protected position, the fire team leader** locates and kills the sniper. The platoon leader now updates the platoon using his command and control headset.

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CAPABILITIES TO INDIVIDUAL SOLDIERS.

1,2 view of soldier observing enemy tanks and the results of the fire on the enemy force. Sends adjustments on command and control device. His actions same as soldier on screen 3

3 Soldier on mobility platform observing enemy tanks and the results of the fire on the enemy force. Sends adjustments on command and control device.

Monitor **A** - PVD view of platoon in village continuing to engage enemy elements annotated - LIVE FROM FORT BENNING, GA; Monitor **B** - Same as script #58 until fire team leader switches to rifle view message of IHAS automated fire adjustments; Monitor **C** - same as script #58

59. PRESENTER (13:47-14:04): The fire team leader observes .the artillery fire on the approaching enemy armor. **Placing his weapon reticle on the target and activating his laser rangefinder, he automatically sends the firing battery and his chain of command fire adjustments.**

1,2,3 Virtual view from Bradley gunner's viewpoint providing supporting fires for assault element against a building. A large explosion causes the squad to hit the ground. They get up and avoid a large crater to get to building. Supporting fires shift to the next building.

Monitors **A** Graphic chart - DYNAMIC TERRAIN MODELING (DTM) IMBEDDED INTO C4I SYSTEMS AUTOMATICALLY DISPLAYS TERRAIN CHANGES BASED ON INTELLIGENCE UPDATES; Monitor **B** - Graphic chart - DYNAMIC TERRAIN MODELING(DTM) ALTERS ELEVATION IN REAL TIME BASED ON WEAPONS EFFECTS MODELS; Monitor **C** - M2A3 BRADLEY SUPPORTING ASSAULT ELEMENT - LIVE SIMULATION FROM ARMY RESEARCH LAB, WASHINGTON, DC..

60. PRESENTER (14:05-14:21): **Covered by an overwatching Bradley,** A squad from the same platoon begins to clear another building. They emplace and detonate an explosive charges to gain entrance to the building.

1,2,3 Virtual view from Bradley gunner's viewpoint showing support fires going into next building. Squad emplaces explosive, detonates them and tactically enters the building.

Monitor **A** - FUTURE DTM WILL SUPPORT WEAPONS MODELING

61. PRESENTER (14:22-14:39)
After the platoon leader uses his command and control system to shift fires, the **overwatching Bradleys pass through craters created by artillery fire** enroute to rejoin the dismounted squad.

C-13

SIMULATIONS TO REDUCE ACQUISITION TIME AND MINIMIZE ENVIRONMENTAL IMPACT; Monitor **B** - Graphic chart - DTM ALSO ALTERS BUILDING STRUCTURES IN REAL TIME BASED ON WEAPONS EFFECTS MODELS. Monitor **C** - M2A3 BRADLEY SUPPORTING THE ASSAULT ELEMENT - LIVE SIMULATION FROM ARMY RESEARCH LAB, WASHINGTON, DC

TRANSITION FROM ACTION TO VIGNETTE 2 SUMMARY.

Videotape clips from Vignette 2:
1 Planning process
2 Vignette summary graphic (supered over video).
Information Technology:
-- increases accuracy of planning and chance of success.
-- execute faster than enemy can react.
-- execute more efficiently because of dominant real time situational awareness
3 Videotape or datalog of portions of the DBBL action.
Monitor **A, B, C** Videotape clips from Vignette 2.

62. PRESENTER (14:40-14:56): These new technologies allow the brigade to plan and rehearse more accurately, and more thoroughly in training and combat, using simulation linked TOCs ...and to execute faster than the enemy can react. They allow soldiers to do their jobs more safely...and efficiently.

TRANSITION TO VIGNETTE 3, ALL SCREENS AND MONITORS FADE TO BLANK

1,2,3 and monitor A, B, C same as script # 62

63. PRESENTER (14:57-15:03): Now, let's switch gears and look at additional ways we can use these technologies.

INTRODUCTION TO NEW TECHNOLOGIES FOR EXPERIMENTATION.

See script item # 52 for feed descriptions except **1** and **3** reversed
1 Virtual view close-up of the UD Bradley fighting vehicle.
2,3 Virtual view of advancing mechanized

64. PRESENTER (15:04-15:16): Combat and materiel developers will use Information Age technology to test new vehicle and equipment concepts even before they're built -- like the Bradley fighting vehicle with the different

team with attachments. (SGI)
Monitors **A, B, C** blank screen

turret I pointed out earlier.

1,2,3 Monitor **A, B, C** Same as script # 64

65. PRESENTER (15:17-15:24): **An** engineer working on a new design for an improved version of today's Bradley fighting vehicle will discuss the use of simulations in materiel design. Welcome **San Jose.**

1 Live video VTC of UD engineer
2,3 Same as script # 64.
Monitor **A** - Graphic Chart -**COMBAT SIMULATION AND INTEGRATION LAB, SAN JOSE, CA;**
Monitor **B, C** - blank screen

66. ENGINEER (15:25-15:37): **I am Mr._____,** I am going to introduce you to two of the acquisition streamlining processes that we have implemented here at the Combat Simulation and Integration Lab at United Defense.

1 same as script # 66.
2 Video sequence of progressively more complex electronic diagrams. As each diagram leaves **2** it moves to Monitors **A, B, C** in order
3 Video of rotating 3-D master model
Monitor **A** - Video of first diagram on **2,**
Monitor **B** - blank screen until video of second diagram on **2,** Monitor **C** - blank screen until video of third diagram on **2**

67. ENGINEER (15:38-15:58): The first is our concurrent art to part environment. Our product and product structures are developed and represented as a 3-D computer master model. This model is the basis for integration of the systems and processes used for computer-aided design, computer aided manufacturing, technical publications, and product data management.

1 same as script # 66
2,3 Video of the Combat and Simulation Laboratory
Monitor **A** - Graphic Chart -MR. HOUGARTY , SAN JOSE, CA;
Monitor **B** - blank screen, Monitor **C** Graphic chart - COMBAT SIMULATION AND INTEGRATION LAB

68. ENGINEER (15:59-16:11): The second process was developed here in our Combat Simulation and Integration Lab and is currently being used for the Bradley A3 project. We call this process Simulate-Emulate-Stimulate.

1 same as script # 66.
2 Video of computer with screens to be highlighted in the next storyboard
3 Slow montage of M2A3 subsystems
Monitor **A** - same as script # 68.
Monitor **B** - graphic chart - M2A3 SIMULATION; Monitor **C** - M2A3 BRADLEY SUBSYSTEMS

69. ENGINEER (16:12-16:24): Our lab and our subcontractors use common computer tools to generate models of their hardware and software systems. Each subsystem's basic functionality is tested within a computer like this one. This is the simulation phase.

70. ENGINEER (16:25-16:47): The screens you see illustrate the engineering interface to this tool. The turret drive unit is highlighted. This process is iterative and spawns the next

1 same as script # 66
2 Video sequence of progressively more

complex electronic diagrams. As each diagram leaves 2 it moves to Monitors **A, B, C** in order
3   Video of M2A3 turret on the test stand annotated LAB M2A3 BRADLEY TURRET
Monitor **A** - video of first diagram on **2,** Monitor **B** - blank screen until video of second diagram on **2,** Monitor **C** - blank screen until video of third diagram on **2**

1 same as script # 66
2,3 Same as script # 70
Monitor **A, B, C** - Same as script # 70

1 same as script # 66
2 Video of gunner's hand station in lab being moved right
3 Video of turret moving in conjunction with gunner's hand station in simulation
Monitor **A** - Graphic Chart -MR. HOUGARTY, SAN JOSE, CA;
Monitor **B** - Graphic Chart - M2A3 BRADLEY GUNNER'S HAND STATION SUBSYSTEM; Monitor **C** - Graphic chart - M2A3 BRADLEY TURRET IN SIMULATION

1 Live video VTC OTS of soldier rotating the gunner's hand station that will transition into the turret rotation on the test stand
2,3 Virtual view of M2A3 turret turning in response to the soldier's actions on **1**
Monitor **A** - Graphic Chart - STIMULATION PHASE, LIVE FROM SAN JOSE, CA;
Monitor **B** - graphic chart - M2A3 BRADLEY IN SIMULATION, Monitor C - graphic chart - VIRTUAL M2A3 BRADLEY

INTRODUCTION   TO   NEW TECHNOLOGIES FOR LOGISTICS.

1 Video view of LAD set-up
2   Video of monitor feed showing automatic consumption screen
3 Video view of LAD set-up

step of the process, the emulation phase. In this phase the models are further refined and decomposed to emulate all the subsystem characteristics at the Line Replaceable Unit level.

71. ENGINEER (16:48-17:00): Within these two phases, all of the conceptual designs and interfaces have been modeled. Many design updates and improvements can be made within these cycles faster and cheaper than earlier design-build-test-redesign cycles.

72. ENGINEER (17:01-17:18): Actual vehicle hardware is driven by these computer models in the final phase, the stimulation phase. In this phase, the soldier can be introduced into the design and evaluation process, providing hands-on feedback in specific tasks or in virtual combat situations.

73.   ENGINEER (17:19-17:31): As an example, a soldier inputs a turret movement command, our test stand unit slews under his direction, and your virtual world simulation sees his vehicle input simultaneously.

74. PRESENTER (17:32-17:54): Information Age technology will also help logisticians. It will give them new tools so they can support our troops more quickly and efficiently in the

Monitor **A** - **BLANK SCREEN**
Monitor **B** - Graphic chart - **LOGISTICS ANCHOR DESK**
Monitor **C** - **BLANK SCREEN**

field: Using built-in logistics monitors, they'll continuously receive ammunition, fuel consumption, and maintenance information, in real time, throughout the battle. So, they can redistribute resources constantly.

1-3 and Monitors **A, B, C** same as script # 74

75. PRESENTER (17:55-18:07): These computerized analytical tools will give commanders more flexibility, the opportunity to anticipate conditions, and the chance to execute continuous operations for longer periods of time.

TRANSITION FROM ACTION TO VIGNETTE 3 SUMMARY

1,2,3 and Monitor **A, B, C** Videotape clips edited into a montage from all three vignettes w/supered graphics
-- Battle.
-- Training.
-- Equipment development.
-- Logistics
-- Speed
-- Accuracy
Monitor **A, B, C** - Videotape clips edited into a montage from all three vignettes

76. PRESENTER (18:08-18:16): Information Age technology is rich with potential to improve our Army's training, equipment development, logistics, and warfighting capabilities.

1,2,3 and Monitor **A, B, C** same as script # 76

77. PRESENTER (18:17-18:29): It holds the power to let commanders visualize and control the battlefield and to communicate better and faster than ever before.

TRANSITION FROM VIGNETTE 3 TO CONCLUSION.

1-3 and monitor **A, B, C** same as script #1

78. PRESENTER (18:30-18:57): As we explore the technologies of tomorrow, we must remember that America's Army is the best fighting force in the world today because of the foresight of yesterday's leaders. They developed the warfighting concepts that have led to the outstanding equipment, training programs, and doctrine we now rely on. Our challenge is to be just as farsighted for the soldiers of tomorrow...

Video clips with graphic supers:
1-3. same as script # 1 with below annotated one per screen
-- Where am I?
-- Where are my friends?
-- Where is the enemy?
Monitors **A, B, C** blank screen

79. PRESENTER (18:58-19:12): ...so we can be sure that in the 21st century, America's warriors will know where they are, where their friends are, and where the enemy is, giving them real time dominant situational awareness.

TRANSITION FROM MAIN PROGRAM TO POST SHOW

1,2,3 and **A, B, C** Post show same as pre-show

80. PRESENTER (19:13-19:28):Thank you for coming to our Warriors in the Information Age experiment. It's been a pleasure talking with you. Don't forget to pick up your CD. **Please follow me to the 21st Century TOC.**

APPENDIX D - IMMERSIVE THEATER SCRIPT
MC Reading Script- 2 Oct Copy

1. **5 sec-**PRESENTER (0:00-0:05): Good morning/afternoon. I'm _____. Welcome to the Army's Warriors in the Information Age presentation.

2. **16 sec-**PRESENTER (0:06-0:22): We're here to show you America's Army applying Information Age technology -<u>now</u> -to prepare for the 21st Century battlefield. Our soldiers are training with these new technologies -- including simulations -- And over the next twenty minutes, you'll see them in action – much of it, live.

3. **11 sec-**PRESENTER (0:23-0:34): This is a live **distributed** show where anything can happen so we'll have a good time!

4. **23 sec-**PRESENTER (0:35-0:58): Much of what you'll see here will be new, and you may have some questions. We can't stop our live show while it's running, but we will have time for questions a little later. And you can learn more about these technologies as you move next door to the 21st Century TOC, and from the hands-on equipment here in the ballroom -- as well as from the CD-ROM you'll receive when you leave here today.

5. **27 sec-**PRESENTER (0:59-1:26): Now, let's talk about the connectivity of this special experiment! Here in the theater, you'll be seeing four live video feeds and seven live simulation feeds, coming from eight remote sites. Participants at the sites will communicate with multiple simulations over experimental networks, and interact in real time. Most will be linked on the same simulated battlefield, although they're up to a thousand miles apart. In the future, this will be routine, instead of a special experiment.

6. **10 sec-**PRESENTER (1:27-1:37): The vignettes you're about to see take place in the 21st Century -- only four years away. By then, some of those officers you saw outside could be battalion or higher level commanders.

7. **28 sec-**PRESENTER (1:38-2:06): They'll train and fight using information and simulation systems designed to compress planning and decision making cycles. Information technology will give them real time dominant situational awareness of the battlefield... and the ability to plan and act faster than our enemies can react. These technologies will also aid logisticians in managing the needs of a force projection Army... and future combat and materiel developers in testing new equipment, before it's ever built.

8. **10 sec-**PRESENTER (2:07-2:17): We're exploiting these technologies to give our soldiers the best tools possible -- so they can survive and win on the battlefield of the next century.

9. 12 sec-PRESENTER (2:18-2:30): While no technology can make our soldiers invincible... these new tools <u>can</u> make them more efficient and effective...so we can continue to overmatch our adversaries and be better able to respond to our nation's needs.

10. 8 sec-PRESENTER (2:31-2:39): But before we enter the future, let's set a historical perspective. Since ancient times, all ground commanders have grappled with the same three questions:

11. 5 sec-PRESENTER (2:40-2:45): Where am I? Where are my friends? And where is the enemy?

12. 28 sec-PRESENTER (2:46-3:14): The commander who can best answer these questions in the shortest time has dominant situational awareness. That commander knows where his or her units are, where friendly units are and where the enemy is...and he can plan and act faster than the enemy can react, resulting in victory. Throughout history, the commander's ability to answer those three questions and gain dominant situational awareness has varied with the size, lethality and speed of the battlefield.

13. NOT USED.
14. NOT USED.
15. NOT USED.

16. 21 sec-PRESENTER (3:15-3:36): In the past hundred years, the size, lethality, and speed of the battlefield have expanded exponentially. The ability to gather battlefield information has kept up with that expansion -- but the sheer amount of data is often overwhelming. The challenge today and in the future is how to fuse or distill that data into usable information -- faster than the enemy can.

17. 21 sec-PRESENTER (3:37-3:58): By capitalizing on information technology, the Army is gaining that capability. Our 21st Century commanders will see more of the battlefield and communicate faster -- but most importantly, they'll use the data they gather more effectively... giving them REAL TIME dominant situational awareness to plan and execute faster than the enemy can react.

18. 21 sec-PRESENTER (3:59-4:20): Our 21st Century commanders will visualize the battlefield on electronic operations maps updated continuously with key data. They will know where they are, where their friends are and where the enemy is. They will be able to compress their planning and decision cycles, utilizing more accurate information.

19. 19 sec-PRESENTER (4:21-4:40): In our first vignette, you'll see how these technologies help the corps commander compress planning and decision cycles in order to attack multiple targets at multiple locations nearly simultaneously in a deep battle_situation. We will condense the duration of the battle from hours to minutes, for the sake of time.

20. 30 sec-PRESENTER (4:41-5:11): To detect and accurately portray a major enemy attack, the Corps depends on intelligence collection systems, such as the joint Army /Air Force JSTARS aircraft. These systems collect and downlink huge quantities of **organized** intelligence data to Common Ground Stations. Then, skilled operators use sophisticated analysis technologies, such as the All Source Analysis System, to select, distill, and display the key information from that vast collection of data.

21. 10 sec-PRESENTER (5:12-5:22): The corps commander uses this information to monitor and predict the enemy's actions and to plan the attack throughout the depth of the enemy's sector.

22. NOT USED.

23. 19 sec-PRESENTER (5:23-5:42): The commander's first move is to detect and engage high priority targets deep behind the enemy's line. An unmanned aerial vehicle, or UAV, concentrates on the area indicated as critical by the JSTARS intelligence. This helps the corps to determine the thrust of the main attack, and to look for high value targets.

24. 9 sec-PRESENTER (5:43-5:52): Meanwhile, national reconnaissance assets observe an enemy SCUD launch and transmit the information to the corps.

25. 10 sec-PRESENTER (5:53-6:03): Corps missile defense units receive the launch information, acquire the enemy missile, launch and destroy it.

26. 11 sec-PRESENTER (6:04-6:15): The corps diverts a Comanche team on a deep reconnaissance mission to find and destroy the enemy **SCUD launcher**. The Comanches turn and begin to search for the **SCUD launcher.**

27. 10 sec-PRESENTER (6:16-6:26): Within minutes, the Comanches locate it, near a forward operating base with the critical missile reload trucks.

28. 13 sec-PRESENTER (6:27-6:40): The Comanche team leader sends a digital call for fire message directly to the supporting ATACMS unit to destroy the forward operating base.

29. 8 sec-PRESENTER (6:41-6:49): The corps has cleared the target, and the ATACMS firing unit launches.

30. 15 sec-PRESENTER (6:50-7:05): It would take the missile three to five minutes to reach the target. We will only show you a part of the flight and the impact. (Sound of missile impact).

31. NOT USED

32. 15 sec-PRESENTER (7:06-7:21): The ATACMs missile destroys most of the Forward Operating Base. The Comanche team conducts a target damage assessment, detects a second **SCUD launcher** and rapidly destroys it.

33. 18 sec-PRESENTER (7:22-7:40): While the Comanches complete their attack, another sensor is at work -- a Special Forces reconnaissance team. The team uses thermal sights to detect targets through smoke and obscurants along an enemy route. They burst-transmit the information to their headquarters.

34. 10 sec-PRESENTER (7:41-7:51): The Corps wants to attack the rocket systems as part of their counter fire efforts. So, it diverts Marine strike aircraft under Air Force counter-air **patrol** to do the job.

35. 8 sec-PRESENTER (7:52-8:00): The Marine strike aircraft attack the enemy rocket site, while the reconnaissance team assesses damage.

36. 8 sec-PRESENTER (8:01-8:09): As the enemy rocket launchers burn, the Corps commander prepares to attack an enemy armor threat.

37. 7 sec-PRESENTER (8:10-8:17): The UAV sensors confirm the target. The commander rechecks the intelligence picture to confirm attack timing. It looks good.

38. 9 sec-PRESENTER (8:18-8:27): The commander directs the Aviation Brigade to execute the attack helicopter battalion's plan. They will attack the armored column.

39. 14 sec-PRESENTER (8:28-8:42): Comanches destroy enemy air defense systems. The AH-64D Longbow Apaches coordinate targeting data digitally and engage the armored column at maximum targeting range.

40. 10 sec-PRESENTER (8:43-8:53): After the engagement, the Corps receives reports of enemy destruction from the Comanche and UAV.

41. 21 sec-PRESENTER (8:54-9:15). So, that's what elements of a corps level battle might look like in the 21st Century. It'll be a fast, lethal, complex fight, that takes place over thousands of square miles of terrain. Our Corps commander used real time dominant situational awareness to act faster than the enemy could react by engaging and destroying multiple high priority targets at multiple locations nearly simultaneously.

42. 7 sec-PRESENTER (9:16-9:23): When you visit the 21st Century TOC next, you can see some of the actual equipment we talked about in this operation.

43. 14 sec-PRESENTER: (9:24-9:38) **The Army will learn more about dominant situational awareness during a brigade-level Advanced Warfighting Experiment at the National Training Center. There is more information in your CD.**

44. 6 sec-PRESENTER (9:39-9:45): Let's move on now from the deep battle to the close battle, from the corps to a combat maneuver brigade.

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45. 21 sec-PRESENTER (9:46-10:07): In this vignette, we'll focus again on situational awareness, planning and dissemination of orders among TOCs linked by simulations. Here again, information technology will dramatically improve our speed and accuracy in training and combat. It will help make our soldiers virtual combat veterans, before they engage the enemy in actual combat.

46. 15 sec-PRESENTER (10:08-10:23): As we join the brigade commander, battle is imminent. He sends a detailed warning order to his commanders and their TOCs to prepare them for a possible counterattack. His message appears almost instantly as a graphic on their computer screens.

47. 11 sec-PRESENTER: (10:24-10:33) Immediately, commanders and staffs at two levels share the same information. They're ready to conduct simultaneous planning using simulations.

48. 14 sec-PRESENTER (10:34-10:48): While the subordinate commanders study the warning order, the brigade commander uses automated planning tools to analyze various courses of action. He and his staff wargame the counterattack courses of action using a simulation.

49. 16 sec-PRESENTER (10:49-11:05): Next, he electronically rehearses it with the battalion commanders -- again using a simulation-- so they can see and hear how the commander expects the battle to unfold, and coordinate critical points.

50. 16 sec-PRESENTER (11:06-11:22): When he's satisfied, the brigade commander electronically disseminates the final order with any changes discovered during the rehearsal. This ability to plan and rehearse simultaneously between command levels drastically reduces planning cycles.

51. 15 sec-PRESENTER (11:23-11:38): An hour later, a scout detects enemy armor moving toward a key village. This could trigger the counterattack. The commander confirms the threat through his intelligence feeds. He directs the brigade to execute the counterattack they just rehearsed.

52. 10 sec-PRESENTER (11:39-11:49): The plan calls for a mechanized task force to seize the village and block the enemy's advance. Lead elements of the task force conduct an in-stride breach, with engineer assistance, as they move toward the village.

53. 9 sec-PRESENTER (11:50-11:59): I want to bring your attention to this M2A3 Bradley fighting vehicle with a different turret -- we'll talk more about it later.

54. 31 sec-PRESENTER (12:00-12:31): The infantry dismounts to clear the village and begins to receive sniper fire. The soldier you see live from Fort Benning is using virtual simulation and head-mounted automated command and control equipment. He is the first soldier in the column, here in the simulation. (PRESENTER points to the mobility platform soldier's image

on the virtual view). Throughout this portion of the battle you will see a live battlespace overview on this monitor (PRESENTER points to Monitor A) and various views of the soldiers' command and control systems on this monitor. (PRESENTER points to Monitor B) These include messages, calls for fire, and **map displays**.

55. 23 sec-PRESENTER (12:32-12:55): The platoon leader's automated command and control system provides him with real time dominant situational awareness. He uses it to direct his units to destroy known enemy. This capability enhances the efficiency and lethality of his platoon, and reduces the probability of fratricide. Using similar information systems, fire team and squad leaders keep their commanders apprised of the situation.

56. 16 sec-PRESENTER (12:56-13:12): The platoon leader receives a SITREP from his commander indicating an enemy armored column approaching the village. Using his control system, he can constantly monitor his units, friendly units, and known enemy units. He can automatically update his subordinates with graphics, unit locations and orders.

57. 8 sec-PRESENTER (13:13-13:21): As the assault continues, he executes a call for indirect fire on his command and control device to block the enemy armor column until the platoon clears the village.

58. 24 sec-PRESENTER (13:22-13:46): After the supporting fires are lifted, the assault element enters the building. **By scanning the room using his rifle view from a protected position, the fire team leader locates and kills the sniper.** The platoon leader now updates the platoon using his command and control headset.

59. 17 sec-PRESENTER (13:47-14:04): The fire team leader observes .the artillery fire on the approaching enemy armor. **Placing his weapon reticle on the target and activating his laser rangefinder, he automatically sends the firing battery and his chain of command fire adjustments.**

60. 16 sec-PRESENTER (14:05-14:21): **Covered by an overwatching Bradley,** a squad from the same platoon begins to clear another building. They emplace and detonate an explosive charges to gain entrance to the building.

61. 17 sec-PRESENTER (14:22-14:39): After the platoon leader uses his command and control system to shift fires, the **overwatching Bradleys pass through craters created by artillery fire** enroute to rejoin the dismounted squad.

62. 16 sec-PRESENTER (14:40-14:56): These new technologies allow the brigade to plan and rehearse more accurately, and more thoroughly in training and combat, using simulation linked TOCs ...and to execute faster than the enemy can react. They allow soldiers to do their jobs more safely...and efficiently.

63. 6 sec-PRESENTER (14:57-15:03): Now, let's switch gears and look at additional ways we can use these technologies.

64. 12 sec-PRESENTER (15:04-15:16): Combat and materiel developers will use Information Age technology to test new vehicle and equipment concepts even before they're built -- like the Bradley fighting vehicle with the different turret I pointed out earlier.

65. 7 sec-PRESENTER (15:17-15:24): **An** engineer working on a new design for an improved version of today's Bradley fighting vehicle will discuss the use of simulations in materiel design. Welcome **San Jose**.

66. 12 sec-ENGINEER (15:25-15:37): **I am Mr. _____**I am going to introduce you to two of the acquisition streamlining processes that we have implemented here at the Combat Simulation and Integration Lab at United Defense.

67. 20 sec-ENGINEER (15:38-15:58): The first is our concurrent art to part environment. Our product and product structures are developed and represented as a 3-D computer master model. This model is the basis for integration of the systems and processes used for computer-aided design, computer aided manufacturing, technical publications, and product data management.

68. 12 sec-ENGINEER (15:59-16:11): The second process was developed here in our Combat Simulation and Integration Lab and is currently being used for the Bradley A3 project. We call this process Simulate-Emulate-Stimulate.

69. 12 sec-ENGINEER (16:12-16:24): Our lab and our subcontractors use common computer tools to generate models of their hardware and software systems. Each subsystem's basic functionality is tested within a computer like this one. This is the simulation phase.

70. 22 sec-ENGINEER (16:25-16:47): The screens you see illustrate the engineering interface to this tool. The turret drive unit is highlighted. This process is iterative and spawns the next step of the process, the emulation phase. In this phase the models are further refined and decomposed to emulate all the subsystem characteristics at the Line Replaceable Unit level.

71. 12 sec-ENGINEER (16:48-17:00): Within these two phases, all of the conceptual designs and interfaces have been modeled. Many design updates and improvements can be made within these cycles faster and cheaper than earlier design-build-test-redesign cycles.

72. 17 sec-ENGINEER (17:01-17:18): Actual vehicle hardware is driven by these computer models in the final phase, the stimulation phase. In this phase, the soldier can be introduced into the design and evaluation process, providing hands-on feedback in specific tasks or in virtual combat situations.

73. 12 sec-ENGINEER (17:19-17:31): As an example, a soldier inputs a turret movement command, our test stand unit slews under his direction, and your virtual world simulation sees his vehicle input simultaneously.

74. 22 sec-PRESENTER (17:32-17:54): Information Age technology will also help logisticians. It will give them new tools so they can support our troops more quickly and efficiently in the field: Using built-in logistics monitors, they'll continuously receive ammunition, fuel consumption, and maintenance information, in real time, throughout the battle. So, they can redistribute resources constantly.

75. 12 sec-PRESENTER (17:55-18:07): These computerized analytical tools will give commanders more flexibility, the opportunity to anticipate conditions, and the chance to execute continuous operations for longer periods of time.

76. 8 sec-PRESENTER (18:08-18:16): Information Age technology is rich with potential to improve our Army's training, equipment development, logistics, and warfighting capabilities.

77. 12 sec-PRESENTER (18:17-18:29): It holds the power to let commanders visualize and control the battlefield and to communicate better and faster than ever before.

78. 27 sec-PRESENTER (18:30-18:57): As we explore the technologies of tomorrow, we must remember that America's Army is the best fighting force in the world today because of the foresight of yesterday's leaders. They developed the warfighting concepts that have led to the outstanding equipment, training programs, and doctrine we now rely on. Our challenge is to be just as farsighted for the soldiers of tomorrow.

79. 14 sec-PRESENTER (18:58-19:12): ...so we can be sure that in the 21st century, America's warriors will know where they are, where their friends are, and where the enemy is, giving them real time dominant situational awareness.

80. 15 sec-PRESENTER (19:13-19:28): Again, thank you for coming to our Warriors in the Information Age experiment. It's been a pleasure talking with you. Don't forget to pick up your CD. **Please follow me to the 21st Century TOC.**

APPENDIX E - COTILLION BALLROOM POWER

ZONE K - Immersive Theater Computer Room					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
IDREN Router	Cisco 4000	-A-			Quad Plug
CSU/DSU		-A-			Quad Plug
Stealth IG # 1	SGI RE3 (3) channel	-A-		30	3 phase
Stealth IG # 2	SGI RE3 (3) channel	-A-		30	3 phase
Stealth IG # 3	SGI RE3 (3) channel	-A-		30	3 phase
Stealth IG # 4	SGI RE3 (3) channel	-A-		30	3 phase
Additional Cooling		-A-			
Sound Storm	PC CPU	-A-	5		Quad Plug
Sound Storm	PC Display	-B-	2		Quad Plug
MCS/P	Ultra Sparc CPU	-A-	5		Quad Plug
MCS/P	Ultra Sparc Display	-B-	2		Quad Plug
ASAS	Sun Sparc 20 CPU	-A-	5		Quad Plug
ASAS	Sun Sparc 20 Display	-B-	2		Quad Plug
BPV	SGI Solid Impact CPU	-A-	5		Quad Plug
BPV	SGI Solid Impact Display	-B-	2		Quad Plug
LWSE	Sun Sparc 20 CPU	-A-	5		Quad Plug
LWSE	Sun Sparc 20 Display	-B-	2		Quad Plug
ModSAF #1 Front End CPU	SGI CPU	-A-	5		Quad Plug
ModSAF #1 Front End Display	SGI Display	-B-	2		Quad Plug
ModSAF #1 Back End CPU	SGI CPU	-A-	5		Quad Plug
ModSAF #1 Back End Display	SGI Display	-B-	2		Quad Plug
ModSAF #2 Front End CPU	SGI CPU	-A-	5		Quad Plug
ModSAF #2 Front End Display	SGI Display	-B-	2		Quad Plug
ModSAF #2 Back End CPU	SGI CPU	-A-	5		Quad Plug
ModSAF #2 Back End Display	SGI Display	-B-	2		Quad Plug
Data Logger CPU	SGI CPU	-A-	5		Quad Plug
Data Logger Display	SGI Display	-B-	2		Quad Plug
M-Bone CPU	SGI CPU	-A-	5		Quad Plug
M-Bone Display	SGI Display	-B-	2		Quad Plug

Cordless Phone #1		-A-	1		Quad Plug
Cordless Phone #2		-A-	1		Quad Plug
Cordless Phone #3		-A-	1		Quad Plug
Handheld Radio Battery Charger	Motorola	-A-	1.5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
IT Computer Room Power Totals			121.5	120	
			Amps	Amps	

ZONE C - FP TOC Computer Room					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
UAV TCSS Driver #1	PC CPU	-A-	4		Quad Plug
UAV TCSS Driver #1	PC Display	-B-	1.2		Quad Plug
UAV TCSS Driver #1	RS422 Converter	-C-	1		Quad Plug
UAV TCSS Driver #2	PC CPU	-A-	4		Quad Plug
UAV TCSS Driver #2	PC Display	-B-	1.2		Quad Plug
UAV TCSS Driver #2	RS422 Converter	-C-	1		Quad Plug
UAV TCSS Driver #3	PC CPU	-A-	4		Quad Plug
UAV TCSS Driver #3	PC Display	-B-	1.2		Quad Plug
UAV TCSS Driver #3	RS422 Converter	-C-	1		Quad Plug
UAV TCSS Driver #4	PC CPU	-A-	4		Quad Plug
UAV TCSS Driver #4	PC Display	-B-	1.2		Quad Plug
UAV TCSS Driver #4	RS422 Converter	-C-	1		Quad Plug
UAV Scene Generator #1	Hyper Converter	-A-	2		Quad Plug
UAV Scene Generator #1	Video Distribution Amp	-B-	1		Quad Plug
UAV Scene Generator #1	SGI Monitor	-C-	3		Quad Plug
UAV Scene Generator #1	Onyx	-D-		13	

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UAV Scene Generator #2	Hyper Converter #1	-A-	2		Quad Plug
UAV Scene Generator #2	Hyper Converter #2	-B-	2		Quad Plug
UAV Scene Generator #2	Hyper Converter #3	-C-	2		Quad Plug
UAV Scene Generator #2	Video Distribution Amp	-D-	1		Quad Plug
UAV Scene Generator #2	SGI Monitor	-E-	3		Quad Plug
UAV Scene Generator #2	Onyx	-F-		13	
FP TOC Stealth	SGI CPU	-A-	16		Quad Plug
FP TOC Stealth	SGI Display	-B-	0		Quad Plug
FP TOC PVD/C	PC CPU	-A-	5		Quad Plug
FP TOC PVD/C	PC Display	-B-	0		Quad Plug
FP TOC DRP	Sun CPU	-A-	5		Quad Plug
FP TOC DRP	Sun Display	-B-	0		Quad Plug
FP TOC SEN/C2I	Sun CPU	-A-	5		Quad Plug
FP TOC SEN/C2I	Sun Display	-B-	0		Quad Plug
FP TOC Stat Display	SGI CPU	-A-	5		Quad Plug
FP TOC Stat Display	SGI Display	-B-	0		Quad Plug
FP TOC AAR Stat	PC CPU	-A-	5		Quad Plug
FP TOC AAR Stat	PC Display	-B-	0		Quad Plug
FP TOC EADSIM	SGI CPU	A	5		Quad Plug
FP TOC EADSIM	SGI Display	-B-	0		Quad Plug
FP TOC DIS DL	Sun CPU	-A-	5		Quad Plug
FP TOC DIS DL	Sun Display	-B-	0		Quad Plug
FP TOC TCSS Driver #1	PC CPU	-A-	5		Quad Plug
FP TOC TCSS Driver #1	PC Display	-B-	0		Quad Plug
FP TOC Scene Generator #1	SGI	-A-		16	
FP TOC Scene Generator #1	SGI	-B-	5		Quad Plug
FP TOC Misc	Misc	-A-	20		Quad Plug
Additional Cooling		-A-			
FP TOC PVD	SGI CPU	-A-	5		Quad Plug
FP TOC PVD	SGI Display	-B-	0		Quad Plug
FP TOC UAV-GS	Sun CPU	-A-	10		Quad Plug
FP TOC UAV-GS	Sun Display	-B-	0		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug

Equipment Name	Equipment Type	Minor Item	Power Req. 110 (A)	220 (A)	Power Outlet Type
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
FP TOC Computer Room Power Totals			176.8	42	
			Amps	Amps	
ZONE T - Tech Control					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
FP TOC Misc.		-A-			Quad Plug
FP TOC Misc.		-A-			Quad Plug
FP TOC Misc.		-A-			Quad Plug
FP TOC Misc.		-A-			Quad Plug
Image Tech	FP TOC Video Switch	-A-	5		Quad Plug
Image Tech	FP TOC Lighting Control (?)	-A-	5		Quad Plug
Image Tech	FP TOC Audio Control	-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech	VTC #1	-A-	5		Quad Plug
Image Tech	VTC #1	-A-	5		Quad Plug
Image Tech	VTC #1	-A-	5		Quad Plug
Image Tech	VTC #1	-A-	5		Quad Plug
Image Tech	VTC #2	-A-	5		Quad Plug
Image Tech	VTC #2	-A-	5		Quad Plug
Image Tech	VTC #2	-A-	5		Quad Plug
Image Tech	VTC #2	-A-	5		Quad Plug
Image Tech	VTC #3	-A-	5		Quad Plug
Image Tech	VTC #3	-B-	5		Quad Plug
Image Tech	VTC #3	-A-	5		Quad Plug
Image Tech	VTC #3	-B-	5		Quad Plug
Image Tech	VTC #4	-A-	5		Quad Plug
Image Tech	VTC #4	-A-	5		Quad Plug
Image Tech	VTC #4	-A-	5		Quad Plug
Image Tech	VTC #4	-A-	5		Quad Plug
Image Tech	VTC #5	-A-	5		Quad Plug
Image Tech	VTC #5	-A-	5		Quad Plug
Image Tech	VTC #5	-A-	5		Quad Plug

Image Tech	VTC #5	-A-	5		Quad Plug
Image Tech	Electronics Rack #1	-A-	5		Quad Plug
Image Tech	Electronics Rack #1	-A-	5		Quad Plug
Image Tech	Electronics Rack #1	-A-	5		Quad Plug
Image Tech	Electronics Rack #1	-A-	5		Quad Plug
Image Tech	Electronics Rack #2	-A-	5		Quad Plug
Image Tech	Electronics Rack #2	-A-	5		Quad Plug
Image Tech	Electronics Rack #2	-A-	5		Quad Plug
Image Tech	Electronics Rack #2	-A-	5		Quad Plug
Image Tech		-A-	100		
Image Tech	Spot Light PDP	-A-		100	
Exhibit Crafts	A/C UNIT	-A-		30	pigtail
Exhibit Crafts	A/C UNIT	-A-		30	pigtail
Exhibit Crafts	A/C UNIT	-A-		30	pigtail
Exhibit Crafts	Outside A/C UNIT	-A-		30	pigtail
Exhibit Crafts	Outside A/C UNIT	-A-		30	pigtail
Spare	Electronics Rack #3	-A-	5		Quad Plug
Spare	Electronics Rack #3	-A-	5		Quad Plug
Spare	Electronics Rack #3	-A-	5		Quad Plug
Spare	Electronics Rack #3	-A-	5		Quad Plug
Spare	Electronics Rack #4	-A-	5		Quad Plug
Spare	Electronics Rack #4	-A-	5		Quad Plug
Spare	Electronics Rack #4	-A-	5		Quad Plug
Spare	Electronics Rack #4	-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Tech Control Power Totals			340	250	
			Amps	Amps	

ZONE P - Projection Room					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
Image Tech	Large Projector #1	-A-	5		Quad Plug
Image Tech	Small Projector #1	-A-	5		Quad Plug

Image Tech	Large Projector #2	-A-	5		Quad Plug
Image Tech	Small Projector #2	-A-	5		Quad Plug
Image Tech	Large Projector #3	-A-	5		Quad Plug
Image Tech	Small Projector #3	-A-	5		Quad Plug
Image Tech	Stealth #1 CPU	-A-	5		Quad Plug
Image Tech	Stealth #1 Display	-B-	5		Quad Plug
Image Tech	Stealth #2 CPU	-A-	5		Quad Plug
Image Tech	Stealth #2 Display	-B-	5		Quad Plug
Image Tech	Stealth #3 CPU	-A-	5		Quad Plug
Image Tech	Stealth #3 Display	-B-	5		Quad Plug
Image Tech	Stealth #4 CPU	-A-	5		Quad Plug
Image Tech	Stealth #4 Display	-B-	5		Quad Plug
Image Tech	Director Station	-A-	5		Quad Plug
Image Tech	Source Editor	-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug
Image Tech		-A-	5		Quad Plug

Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Projection Room Power Totals			320	0	
			Amps	Amps	

ZONE F - FP TOC Theater

Equipment Name	Equipment Type	Minor Item	Power Req. 110 (A)	220 (A)	Power Outlet Type
FP TOC ASAS/W	Sun CPU	-A-	5		Quad Plug
FP TOC ASAS/W	Sun Display	-B-	0		Quad Plug
FP TOC AFATDS	HP CPU	-A-	5		Quad Plug
FP TOC AFATDS	HP Display	-B-	0		Quad Plug
FP TOC MCS/P	Sun CPU	-A-	5		Quad Plug
FP TOC MCS/P	Sun Display	-B-	0		Quad Plug
FP TOC ADSI	PC CPU	-A-	5		Quad Plug
FP TOC ADSI	PC Display	-B-	0		Quad Plug
FP TOC FAAD	HP CPU	-A-	5		Quad Plug
FP TOC FAAD	HP Display	-B-	0		Quad Plug
FP TOC GALE	Sun CPU	-A-	5		Quad Plug
FP TOC GALE	Sun Display	-B-	0		Quad Plug
FP TOC MSTS	SGI CPU	-A-	5		Quad Plug
FP TOC MSTS	SGI Display	-B-	0		Quad Plug
FP TOC DAMS	Sun CPU	-A-	5		Quad Plug
FP TOC DAMS	Sun Display	-B-	0		Quad Plug
FP TOC CRTD	Sun CPU	-A-	5		Quad Plug
FP TOC CRTD	Sun Display	-B-	0		Quad Plug

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FP TOC LAD	Sun CPU	-A-	5		Quad Plug
FP TOC LAD	Sun Display	-B-	0		Quad Plug
FP TOC Serial Hub		-A-	5		Quad Plug
FP TOC Display #1		-A-			Quad Plug
FP TOC Display #2		-A-			Quad Plug
FP TOC TSIU	Sun CPU	-A-	5		Quad Plug
FP TOC TSIU	Sun Display	-B-	0		Quad Plug
FP TOC PIU	PC CPU	-A-	5		Quad Plug
FP TOC PIU	PC Display	-B-	0		Quad Plug
FP TOC Misc.		-A-	5		Quad Plug
UAV TCSS #1	Sun Monitor	-A-	5		Quad Plug
UAV TCSS #1	Sparc 20 CPU	-A-	5		Quad Plug
UAV TCSS #1	Joystick	-A-	5		Quad Plug
UAV TCSS #1	RS-422 Converter	-A-	5		Quad Plug
UAV TCSS #1	Sony 9" Monitor	-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Exhibit Crafts FP TOC	Ceiling Lighting				
FP TOC Theater Power Totals			130	0	
			Amps	Amps	

ZONE Z - FP TOC TECH AREA					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Image Tech		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug

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Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
FP TOC TECH AREA Power Totals			240	0	
			Amps	Amps	

ZONE V - Virtual Maintainer Standalone Display					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
V-Mat Monitor #1	Mitsubishi 37"	-A-	20		Quad Plug
V-Mat Monitor #2	Mitsubishi 37"	-A-	20		Quad Plug
V-Mat Light Board	Light Board	-A-	7.5		Quad Plug
V-Mat Light Board	Light Board	-B-	7.5		Quad Plug
Zone V Quad #1	Quad Outlet	-A-	20		Quad Plug
Zone V Quad #2	Quad Outlet	-A-	20		Quad Plug
Zone V Quad #3	Quad Outlet	-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Virtual Maintainer Standalone Power Totals			135	0	
			Amps	Amps	

ZONE U - UAV Standalone Display					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
UAV TCSS #2	Sun Monitor	-A-	1.6		Quad Plug
UAV TCSS #2	Sparc 20 CPU	-B-	4.6		Quad Plug
UAV TCSS #2	Joystick	-C-	0.3		Quad Plug
UAV TCSS #2	RS-422 Converter	-D-	0.1		Quad Plug
UAV TCSS #2	Sony 9" Monitor	-E-	2		Quad Plug
UAV TCSS #3	Sun Monitor	-A-	1.6		Quad Plug
UAV TCSS #3	Sparc 20 CPU	-B-	4.6		Quad Plug
UAV TCSS #3	Joystick	-C-	0.3		Quad Plug
UAV TCSS #3	RS-422 Converter	-D-	0.1		Quad Plug
UAV TCSS #3	Sony 9" Monitor	-E-	2		Quad Plug
UAV TCSS #4	Sun Monitor	-A-	1.6		Quad Plug

UAV TCSS #4	Sparc 20 CPU	-B-	4.6		Quad Plug
UAV TCSS #4	Joystick	-C-	0.3		Quad Plug
UAV TCSS #4	RS-422 Converter	-D-	0.1		Quad Plug
UAV TCSS #4	Sony 9" Monitor	-E-	2		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Virtual Maintainer Standalone Power Totals			125.8	0	
			Amps	Amps	

ZONE E - Virtual Retinal Standalone Display					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
Zone E Quad #1	Quad Outlet	-A-	20		Quad Plug
Zone E Quad #1	Quad Outlet	-B-	20		Quad Plug
Zone E Quad #1	Quad Outlet	-C-	20		Quad Plug
Zone E Quad #1	Quad Outlet	-D-	20		Quad Plug
VRD Light Board #1	Light Board	-A-	7.5		Quad Plug
VRD Light Board #1	Light Board	-A-	7.5		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Virtual Retinal Display Standalone Power Totals			135	0	
			Amps	Amps	

ZONE M - Telemedicine Standalone Display					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
TeleMed Light Board #1	Light Board	-A-	7.5		Quad Plug
TeleMed Light Board #1	Light Board	-B-	7.5		Quad Plug

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TeleMed Light Board #2	Light Board	-A-	7.5		Quad Plug
TeleMed Light Board #2	Light Board	-B-	7.5		Quad Plug
TeleMed Light Board #3	Light Board	-A-	7.5		Quad Plug
TeleMed Light Board #3	Light Board	-B-	7.5		Quad Plug
TeleMed Light Board #4	Light Board	-A-	7.5		Quad Plug
TeleMed Light Board #4	Light Board	-B-	7.5		Quad Plug
LSTAT		-A-	8		Quad Plug
LSTAT Monitor		-B-			Quad Plug
LSTAT 1 kW Light		-C-			Quad Plug
Diagnostic Glove		-A-	6		Quad Plug
Diagnostic Glove Monitor		-B-			Quad Plug
3 D Ultra Sound		-A-	6		Quad Plug
MediTag		-A-	6		Quad Plug
Medi Cam		-A-	7.5		Quad Plug
Medi Cam		-B-	7.5		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Spare		-A-	20		Quad Plug
Telemed Standalone Display Power Totals			161	0	
			Amps	Amps	
ZONE I - Virtual Sand Table Standalone Display					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
VST Light Board #1	Light Board	-A-	7.5		Quad Plug
VST Light Board #1	Light Board	-B-	7.5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug

Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-		30	L6-30R
Spare		-A-		30	L6-30R
VRD Standalone Power Totals			85	60	
			Amps	Amps	
ZONE S - Scout Vehicle Standalone Display					
			Power Req.		
Equipment Name	Equipment Type	Minor Item	110 (A)	220 (A)	Power Outlet Type
Scout Light Board #1	Light Board	-A-	7.5		Quad Plug
Scout Light Board #1	Light Board	-B-	7.5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
		-A-	5		Quad Plug
		-A-	5		Quad Plug
		-A-	5		Quad Plug
		-A-	5		Quad Plug
Spare		-A-		30	L6-20
Scout Vehicle Standalone Power Totals			85	30	
			Amps	Amps	
ZONE A - Army Enterprise Standalone Display					

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Equipment Name	Equipment Type	Minor Item	Power Req. 110 (A)	220 (A)	Power Outlet Type
AE Light Board #1	Light Board	-A-	7.5		Quad Plug
AE Light Board #1	Light Board	-B-	7.5		Quad Plug
AE Light Board #2	Light Board	-A-	20		Quad Plug
AE Light Board #2	Light Board	-B-	20		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Army Enterprise Standalone Power Totals			135	0	
			Amps	Amps	
ZONE R - Reception Standalone Display					
Equipment Name	Equipment Type	Minor Item	Power Req. 110 (A)	220 (A)	Power Outlet Type
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Spare		-A-	5		Quad Plug
Reception Standalone Power Totals			20	0	
			Amps	Amps	

Cotillion Ballroom Totals			2210.1	502	

APPENDIX F - MOVE-IN SCHEDULE

ADST II ——————————————————— ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Monday Oct 7 - Noon to Midnight

Oct 7 Monday	MOVE IN	SET UP	INTEGRATION
1200 Hours			
1300			
1400			
1500			
1600			
1700			
1800			
1900			
2000			
2100			
2200			
2300			
Support →		Sheraton. MSN	

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ADST II ——————————————————— ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Tuesday Oct 8 - AM to Noon

Oct 8 Tuesday	MOVE IN	BUILD UP	INTEGRATION
0000 Hours		Install 10Mbit Line	
0100			
0200			
0300			
0400			
0500			
0600		(end)	
0700			
0800		These installations	
0900		will be behind the West walls on N	
1000		& S Cotillion Ballroom	
1100			
Support →			

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ADST II ——————————————— ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Tuesday Oct 8 - Noon to Midnight

Oct 8, Tuesday	MOVE IN	SET UP	INTEGRATION
1200 Hours			
1300			
1400			
1500			
1600			
1700			
1800			
1900			
2000			
2100			
2200			
2300			
Support →		Bell Atlantic MSF	

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ADST II ——————————————— ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Wednesday Oct 9 - AM to Noon

Oct 9, Wednesday	MOVE IN	BUILD UP	INTEGRATION
0000 Hours		Install Power lines into the back rooms	
0100			
0200			
0300			
0400			
0500			
0600		(end)	
0700			
0800		These installations will be behind the West wall of the N & S Cotillion Ballroom	
0900			
1000			
1100			
Support →		Sheraton	

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ADST II — ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Wednesday Oct 9 - Afternoon to Midnight

Oct 9, Wednesday	MOVE IN	SET - UP	INTEGRATION
1200	OSF (includes FP TOC Priority Equipment) and Exhibit Crafts #1 Trucks arrive at Sheraton Dock		
1300	Unload OSF Truck (includes FP TOC Priority Equipment) and	Power Installation	
1400	Exhibit Crafts Truck #1(carpet, (2) skids of backwall)		
1500		Install Outline Theater Drapes Enclosures with tape	
1600	(end)		
1700	Unload Exhibit Crafts Truck #2	(end) Theater AV and Theater/FP TOC	
1800		Tech Rooms Set Up	Integration Status Meeting
1900	(end)	Install Install LAN Carpet	
2000		Construct Exhibit Structure	
2100			
2200	Loading Dock Curfew		
2300	▼	▼ ▼ ▼ (end) ▼	
Support →	Sheraton - GES, LMC	Sheraton - ITS, LMC Ex C, GES	LMC Image Technical Services ScuSoft, NRL, ARL, NVESD FP TOC

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ADST II — ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Thursday Oct 10 - AM to Noon

Oct 10, Thursday	MOVE IN	SET - UP	INTEGRATION
0000 Hours	Loading Dock Curfew	Construct Power Exhibit Installation Structure	
0100			
0200			
0300			
0400			
0500			
0600	(end)	Theater AV and TH/TOC Tech Rooms Set Up	
0700		ISDN Install Lines Telephones	Install Backup T1 Line
0800	Unload Exhibit Unload Stand Crafts Truck #3 Alone Equip	Set Up Install CIGs LAN	IDREN WAN to LAN
0900	Truck	Install AC Units	Integration & Test
1000	(end) (end)		
1100	▼ ▼ (end) (end) ▼ ▼ ▼		▼ ▼
Support →	Sheraton - GES, LMC	Sheraton - GES, LMC	LMC, ITS, uH, ScuSoft, NRL, ARL, NVESD

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Thursday Oct 10 - Noon to Midnight

Oct 10, Thursday	MOVE IN	SET UP	INTEGRATION
1200 Hours		Construct Exhibit Structure / Power Installation	AUSA to IDREN Network Connection to / Theater AV and
1300		ISDN Stand Alone Lines / Install phones / Displays Setup	SubNets Test / TH/TOC
1400	Unload FP TOC Non Priority Truck		Long Haul / Tech / Connectivity Test - Rooms / All Theater & TOC Int
1500			Participants
1600	(end)	(end)	
1700	(end)	(end)	
1800			Integration Status Meeting
1900			
2000			
2100	*Move In Complete*		(end) (end) (end)
2200			
2300		▼ ▼	
Support →	Sheraton - GES - LMC	Exhibit Crafts - GES Standalone Participants	All LH and On-Site Theater FP TOC Participants

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Friday Oct 11 - AM to Noon

Oct 11, Friday	MOVE IN	BUILD UP	INTEGRATION
0000 Hours		Construct Exhibit Structure / Install Theater Ceiling	No Integration testing Planned Use This Time for Problems
0100			
0200			
0300		(end)	
0400			
0500			
0600			(end)
0700		Stand Alone Displays Setup / FP TOC	WAN/LAN Ini & Test All Theater & / PIC TEL Integration
0800		Theater Kitchen / Set Up Set Up	TOC Participants
0900		(end)	
1000			
1100		(end) (end) ▼	▼ ▼
Support →	MOVE IN COMPLETE	Exhibit Crafts - GES - FP TOC - LMC - Stand Alones	All LH and On-Site Theater FP TOC Participants

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ADST II ———————————————— ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Friday Oct 11 - Noon to Midnight

Oct 11, Friday	MOVE IN	SET UP	INTEGRATION
1200 Hours		FP TOC Theater Set Up	Scenario Tuning & Rehearsing PIC TEL Integration
1300			
1400			
1500			
1600			
1700			
1800			Integration Status Meeting (end)
1900			
2000			
2100			
2200		(end)	(end)
2300		*Set Up Complete*	
Support →	MOVE IN COMPLETE	Exhibit Crafts, GES, CRL, FP TOC	All LH and On-Site Theater/FP TOC Participants

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ADST II ———————————————— ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Saturday Oct 12 - AM to Noon

Oct 12, Saturday	MOVE IN	SET UP	INTEGRATION
0000 Hours			No Integration testing Planned Use This Time for Problems
0100			
0200			
0300			
0400			
0500			
0600			(end)
0700			
0800			Technical Rehearsal
0900			
1000			
1100			↓
Support →	MOVE IN COMPLETE	SET UP COMPLETE	All LH and On-Site Theater/FP TOC Participants

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ADST II ————————————— ADST-II-MISC-015R-9600247 (Month 8) ——

Move In Schedule - Saturday Oct 12 - Noon to Midnight

Oct 12, Saturday	MOVE IN	SET UP	REHEARSAL
1200 Hours			Technical Rehearsal
1300			(end)
1400			Kirby's Playtime
1500			
1600			
1700			
1800			(end) Integration Status Meeting
1900			Long Haul Integration
2000			Testing and Scenario Dry
2100			Runs
2200			(end)
2300			
Support →	MOVE IN COMPLETE	SET UP COMPLETE	All LH and On-Site Theater/FP/TOC Participants

MKK 11/9/96   Page 11   *LOCKHEED MARTIN*

ADST II ————————————— ADST-II-MISC-015R-9600247 (Month 8) ——

Move In Schedule - Sunday Oct 13 - AM to Noon

Oct 13, Sunday	MOVE IN	SET UP	REHEARSAL
0000 Hours			No Integration testing Planned Use This Time for Problems
0100			
0200			
0300			
0400			
0500			
0600			(end)
0700			Power up and AM Readiness Tests
0800			Stand by
0900			carpenters Wipe Down
1000			
1100			(end) (end)
Support →	MOVE IN COMPLETE	SET UP COMPLETE	All LH and On-Site Theater/FP/TOC Participants

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ADST II — ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Sunday Oct 13 - Noon to Midnight

Oct 13, Sunday	MOVE IN	SET UP	REHEARSAL
1200 Hours			
1300			Full Dress Rehearsal and VIP Walk Through
1400			
1500			
1600			
1700			
1800			
1900			(end)
2000			Post Rehearsal MTG
2100			
2200			Ready For Showtime
2300			
Support →	MOVE IN COMPLETE	SET UP COMPLETE	All LH and Off-Site Theater/FP BOC Participants

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ADST II — ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Monday Oct 14 - AM to Noon

Oct 14, Monday	DEMO TIME	SET UP	REHEARSAL
0000 Hours			
0100			
0200			
0300			
0400			
0500			
0600			
0700		Pre-Demonstration Set Up	
0800			
0900		(end)	
1000	BE HOT		
1100	▼		
Support →	All Demo Personnel	All Demo Personnel	INTEGRATION COMPLETE

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ADST II ———————————————————— ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Monday Oct 14 - Noon to Midnight

Oct 14, Monday	DEMO TIME	SET UP	REHEARSAL
1200 Hours	BE HOT		
1300			
1400			
1500			
1600			
1700			
1800			
1900			
2000	*(end) Post Demo MTG*		
2100			
2200			
2300			
Support →	All Demo Personnel	SET UP COMPLETE	INTEGRATION COMPLETE

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ADST II ———————————————————— ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Tuesday Oct 15 - AM to Noon

Oct 15, Tuesday	DEMO TIME	SET UP	REHEARSAL
0000 Hours			
0100			
0200			
0300			
0400			
0500			
0600			
0700		Pre-Demonstration Set Up	
0800	BE HOT		
0900			
1000			
1100	▼		
Support →	All Demo Personnel	All Demo Personnel	INTEGRATION COMPLETE

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ADST II ——————————————— ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Tuesday Oct 15 - Noon to Midnight

Oct 15, Tuesday	DEMO TIME	SET UP	REHEARSAL
1200 Hours	BE HOT		
1300			
1400			
1500			
1600			
1700			
1800			
1900	(end)		
2000	Post Demo MTG		
2100			
2200			
2300			
Support →	All Demo Personnel	SET UP COMPLETE	INTEGRATION COMPLETE

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ADST II ——————————————— ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Wednesday Oct 16 - AM to Noon

Oct 16, Wednesday	DEMO TIME	SET UP	REHEARSAL
0000 Hours			
0100			
0200			
0300			
0400			
0500			
0600			
0700		Pre-Demonstration Set Up	
0800	BE HOT		
0900			
1000			
1100			
Support →	All Demo Personnel	All Demo Personnel	INTEGRATION COMPLETE

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ADST II — ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Wednesday Oct 16 - Noon to Midnight

Oct 16, Wednesday	DEMO TIME	TEAR DOWN	Move Out
1200 Hours	BE HOT		
1300			
1400			
1500			
1600			
1700	(end)		
1800	VIDEO TAPE (end)	Tear Down Tech Rooms, Pic Tel Equip	
1900	Post Demo MTG	Tear Down AV and Computer Equipment — Tear Down Exhibit Structures	
2000			Load ECI Truck #1 and Standalone Particpants Truck Incl FP TOC to CO.Springs, SGI, FedEX
2100			
2200			
2300		(end) (end)	
Support →	All Demo Personnel	All Tear Down Personnel	INTEGRATION COMPLETE

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ADST II — ADST-II-MISC-015R-9600247 (Month 8)

Tear Down Sched - Thursday Oct 17 - AM to Noon

Oct 17, Thursday	DEMO TIME	TEAR DOWN	MOVE OUT
0000 Hours		Tear Down Exhibit Structures	
0100			
0200			
0300			
0400			
0500			
0600			
0700			Move Out Continues ECI#1(NE)
0800		Tear Down AV and Computer Equipment	
0900			
1000			
1100		(end)	OSF(SE), EC#2 (NE)
Support →	DEMO COMPLETE	Exhibit Crafts	LMC Ex Crafts - GFE

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ADST II ──────────────── ADST-II-MISC-015R-9600247 (Month 8) ──

Demo Schedule - Thursday Oct 17 - Noon to Midnight

Oct 17, Thursday	DEMO TIME	TEAR DOWN	MOVE OUT
1200 Hours		Tear Down Exhibit Structures	OSF (SE), EC#2 (NE)
1300			
1400			
1500			FP TOC (NE)
1600			
1700		(end)	EC#3 (SE)
1800			
1900			
2000			
2100			(end)
2200			
2300			
Support →	Demo Complete	Tear Down Complete	EMC, EC Club, OES

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APPENDIX G - INTEGRATION PLAN

ADST II —————————————————— ADST-II-CDRL-015R-9600195a —

AE3 OSF INTEGRATION AND TEST

Orlando OSF Test General Assumptions

- WAN Test is Successfully Completed Prior to OSF Test
- Integration and Test is Broken into Three Phases:
  - Phase 1: OSF Preparation   Aug 26 - 30
  - Phase 2: Point to Point Testing   Sept 3 - 13
  - Phase 3: Scenario Testing   Sept 17 - Oct 4
- All Testing is scheduled at Lockheed Martin for Monday Through Friday, 0900 - 1800 hours EST.
- Weekends are Make-up Time if we fall behind.

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ADST II —————————————————— ADST-II-CDRL-015R-9600195a —

AE3 OSF INTEGRATION AND TEST

Phase 1 - OSF Preparation
Aug 26 to 30

1. Allocate Space in the OSF for All Tests
2. Install ISDN Lines into OSF High Bay
3. Install Dedicated T1 to ARL
4. Install WAN Router on the Commercial T1 Line to ARL
5. Install and Test LAN
6. Install DIS Support Workstations on LAN
7. Point to Point Test of OSF to ARL Connection

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AE3 OSF INTEGRATION AND TEST

Phase 2 - Point to Point Testing
Sept 3 to 13

- Point to Point Testing is scheduled Monday Through Friday, 0900 - 1800 hours Eastern Time
- East Sites Are: OSF, ARL, JVL, DBBL, D&SA, ARC
  - Point to Point Testing for East Sites is Scheduled for 0900 - 1200 hours Eastern Time
- West Sites Are: RTOS, SIMITAR, UDLP
 - Point to Point Testing for West Sites is Scheduled for 1400 - 1800 Eastern Time

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AE3 OSF INTEGRATION AND TEST

Phase 2 - Point to Point Testing

Sept 3 to 13 at Orlando
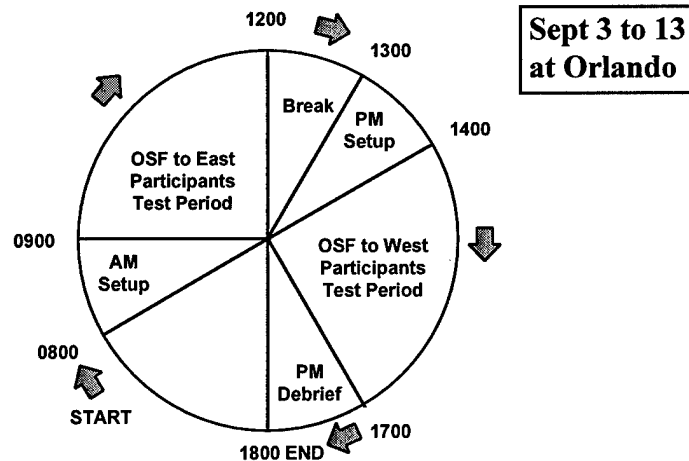
Hourly OSF Point to Point Test Schedule

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AE3 OSF INTEGRATION AND TEST

Phase 3 - Long Haul Scenario Testing
### Sept 17 to Oct 4

- Long Haul Scenario Testing Combines All Sites (East and West) Over a Three week Period
- Mornings are Reserved for Problem Resolution and Test Setup (0800 - 1200 Eastern Time)
- Live Networked Testing is Scheduled Each Test Day for 1300 - 1700 Hours Eastern Time.
- First Two Weeks are Integration Test and Scenario Tuning
- Third Week is Formal Dry Runs

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AE3 OSF INTEGRATION AND TEST

Phase 3 - Long Haul Scenario Testing

Sept 17 to Oct 4 at Orlando

1200
1300
Break
Problem Resolution and Long Haul Set Up
Long Haul Scenario Test (OSF to East-West Participants)
0900
0800
START
1700 END
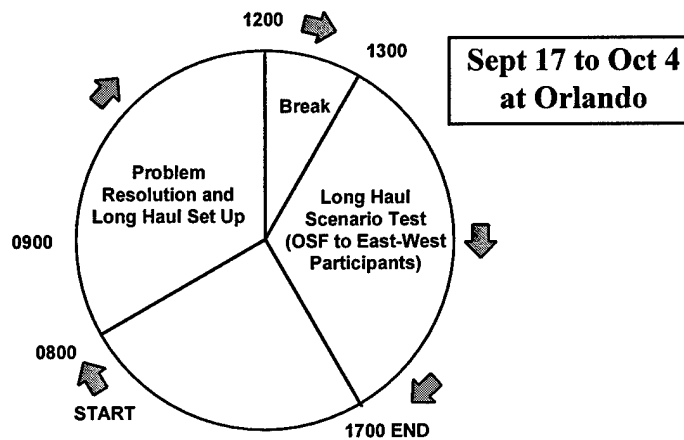
Hourly OSF Long-Haul Scenario Test Schedule

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ADST II ——————————————————————— ADST-II-CDRL-015R-9600195a ———

AE3 OSF INTEGRATION AND TEST

Phase 1 - OSF Preparation - Aug 26 to 30

DATE	OSF PREPARATION AND TEST ACTIVITIES		
Aug 26 Monday	Prepare OSF High Bay for LAM TF equipment. Install All Network	Complete Installation of T1 Router in OSF	Install and Test Stealth IG #1 at OSF (AcuSoft).
Aug 27		↑	
Aug 28	Install and checkout test	Establish OSF leased T1 to ARL Network Connectivity	↑
Aug 29	DIS support equipment in OSF -		Early Data Capture of Virtual Simulator Shots.
Aug 30 Friday	(ModSAF, Data Loggers, Sound Storm)	↓	↓
Support →	DIS	OSF, ARL	Maguire, Reeder, AcuSoft, JVL

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AE3 OSF INTEGRATION AND TEST

Phase 2 - Point to Point Testing

Sept 3 to 13 at Orlando

1200
1300
Break
PM Setup
1400
OSF to East Participants Test Period
OSF to West Participants Test Period
0900
AM Setup
0800
PM Debrief
1700
START
1800 END
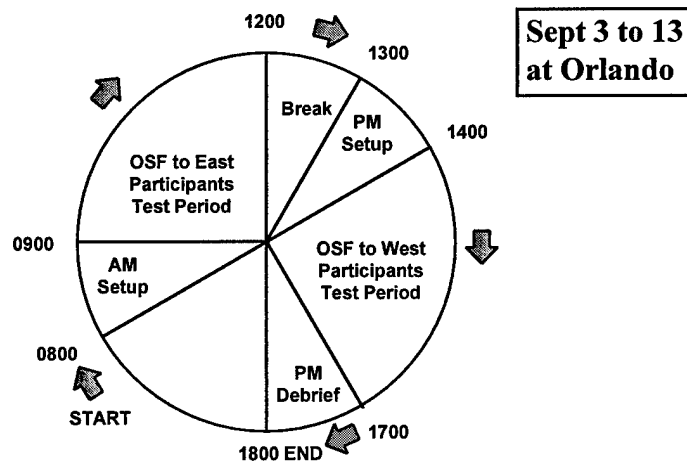
Hourly OSF Point to Point Test Schedule

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ADST II ———————————————————— ADST-II-CDRL-015R-9600195a —

AE3 OSF INTEGRATION AND TEST
Phase 2 - Point to Point Testing - Sept 3 to 13

DATE	OSF TEST ACTIVITIES		
Sept 2 Monday	HOLIDAY		
Sept 3	Point to Point Reachability Testing to WAN Participants from OSF	SAFOR JVL Reachability Testing	Early Integration for IG's & Database (SGI Integration) and
Sept 4			
Sept 5		SAFOR JVL Appearance Testing at OSF	Early Data Capture of Virtual Simulator Shots.
Sept 6 Friday			
Support →	DBBL, D&SA, UDLP, SIMITAR, RTOS, ARC, LMC	JVL, ITEMS, EAGLE, ModSAF, LMC	NVESD, ARL, NPS, AcuSoft, Maguire Reeder

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AE3 OSF INTEGRATION AND TEST
Phase 2 - Point to Point Testing - Sept 3 to 13 (Continued)

DATE	OSF TEST ACTIVITIES			
Sept 9 Monday	Point to Point Appearance Testing and Point to Point Database Correlation Testing	Immersive Theater Audio/Visual Installation at OSF, Stand Alone Test, Video Source Verification, Video Output Calibration	Install AE3 Scenario Test Equipment at OSF (MCS/P, ASAS, BPV, MBONE, LWSE, Scout)	Data Capture of Virtual Simulator Shots.
Sept 10				
Sept 11				
Sept 12				
Sept 13 Friday				
Support →	JVL, DBBL, D&SA, UDLP, SIMITAR, RTOS, ARC, LMC	Image Technical Services	JVL, D&SA, UDLP, SIMITAR, ARL	Maguire Reeder, AcuSoft, NPS, NVESD, ARL, JVL

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AE3 OSF INTEGRATION AND TEST

Phase 3 - Long Haul Scenario Testing

1200

1300

**Sept 17 to Oct 4
at Orlando**

Break

Problem
Resolution and
Long Haul Set Up

Long Haul
Scenario Test
(OSF to East-West
Participants)

0900

0800

START

1700 END

Hourly OSF Long-Haul Scenario Test Schedule

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AE3 OSF INTEGRATION AND TEST

Phase 3 - Long Haul Scenario Testing - Sept 17 to Oct 4

DATE	OSF TEST ACTIVITIES		
Sept 16 Monday	Travel Day - Scenario Testing Support Personnel Travel to Orlando PRE BADGING FOR OSF ENTRY IS A MUST!		
Sept 17			
Sept 18	Scenario Tuning & Debug (Mornings)	Theater Dry Run (Afternoons)	Data Capture of live and Data Logged Scenario Shots (Daily All Day)
Sept 19			
Sept 20 Friday			
Support →	ALL DISTRIBUTED PARTICIPANTS		

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AE3 OSF INTEGRATION AND TEST

Phase 3 - Long Haul Scenario Testing - Sept 17 to Oct 4

DATE	OSF TEST ACTIVITIES		
Sept 23 Monday			
Sept 24	Scenario Tuning & Debug (Mornings)	Theater Dry Run (Afternoons)	Data Capture of live and Data Logged Scenario Shots (Daily All Day)
Sept 25			
Sept 26			
Sept 27 Friday			
Support →	ALL DISTRIBUTED PARTICIPANTS		

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AE3 OSF INTEGRATION AND TEST

Phase 3 - Long Haul Scenario Testing - Sept 17 to Oct 4

DATE	OSF TEST ACTIVITIES		
Sept 30 Monday	Scenario Tuning	Theater Dress Rehearsal	Data Capture of live Scenario Shots
Oct 1			
Oct 2	Final Formal End-to-End Rehearsals and Capture of Live Data		
Oct 3			
Oct 4 Friday	Pack all OSF located Equipment for Shipping to AUSA (Includes FP TOC Priority Equipment). Current Plan is to Unload this Equipment into the Cotillion Ballroom at 1500 hours on Wednesday 9 Oct.		
Support →	ALL DISTRIBUTED PARTICIPANTS		

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APPENDIX H - IPR MINUTES

SUBJECT: Minutes of the Initial Planning Conference (In-Process Review # 1) for the 1996 Army Experiment

1. The Initial Planning Conference was held on 11 and 12 December in Grant Auditorium, at Fort Leavenworth, Kansas. The purpose of the conference was to bring together representatives of the various organizations to exchange ideas and discuss potential ideas and concepts for inclusion in the 1996 Army Experiment. The planned agenda is at Enclosure 1. A copy of the sign-in roster is at Enclosure 2.

2. LTC Kirby Brown opened the session at 1300 hours, 11 December. He introduced himself to the group and explained the mission of the Louisiana Maneuvers Task Force (LAM TF) and its responsibilities as related to the Army Experiment and the Annual AUSA Symposium. He quickly went over administrative announcements and instructions, then explained the agenda for the two-day working session. As many were participating for the first time, individuals were requested to introduce themselves to the group and identify the command and/or project they were representing.

3. LTC Brown explained the nomenclature of the Army Experiment (AE) and why we are referring to the 1996 Army Experiment as AEIII (AE3). The AUSA convention and AEIII are separate and distinct. He stressed that the purpose of AEIII is to provide an accelerated experimental forum for the Army and that the AUSA convention is simply where those experiments that are demonstrable will be showcased. Technology is moving at an explosive pace and we are trying to exploit it for the future. We want to strive for the art of the possible, oriented towards 10 years out. The Army Experiment is also separate from, but functions as part of the Army's Strategic Communications Plan. He then went over and explained the "Prevailing Philosophies" that are the operating principles for the Army Experiment:

   a. America's Army is a changing organization... significantly different from the Cold War Army; currently undergoing major reengineering efforts to address the 21st Century environment.

   b. America's Army is a learning organization... always improving: never resting on its laurels; willing to learn from industry and academia.

   c. Only by leveraging Information Age technology can America's Army remain the best army in the world, capable of land force dominance into the 21st Century.

   d. America's Army, as a steward of our Nation's resources, intends to leverage the significant modernization investments made over the past decade and focus future modernization efforts on those technologies/systems that will provide the greatest payoff on the battlefield.

4. LTC Brown discussed last years Army Experiment (AEII), explaining the three components: the Virtual Theater, the Force Projection Tactical Operations Center (FP TOC), and the Army Experiment displayed in the Cotillion Ballroom. He explained the linkages/Synthetic Theater of War (STOW) and the inner and outer wall displays (Tiers II and III). He then presented the logical network and the top-level architecture (Enclosures 3 and 4).

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5. Mr. Jim Calpin, Mitre Corporation, presented a strawman concept (Enclosure 5) for this year's Army Experiment.

    a. The developmental goal was to identify a new and innovative concept that maximizes visitor interest and learning while minimizing cost. More Joint/Combined play is highly desirable.

        (1) A possible theme, "Information Operations in the 21st Century," could highlight how the Army is leveraging cutting-edge information technologies to enhance the complete spectrum of warfighting concerns. The central focus of the floor display would be a "TOC of the Future," combining existing/developmental C4I systems with "new" capabilities (e.g., COA wargaming, battlefield visualization, VTC, etc.)

        (2) TOC operations in a true STOW environment could include operational interface with live forces in the field at the NTC (3rd ACR: 6-19 Oct 96) and at the JRTC (82nd ABN: 12-23 Oct 96). Integration of Corps Level Computer Generated Forces (CLCGF) and STOW-TMD to simultaneously drive C4I systems in both the corps/division level TOC and the FP TOC would provide leave-behind experimental capability.

    b. This presentation resulted in a good discussion of the need to involve the other services and also to show the benefits to the soldier of situational awareness, COA analysis, the STOW environment, and C4I.

    c. LTC Brown reminded everyone that this strawman concept was just a point to launch from and that the final concept could be very similar or quite different. The intent of the presentation was to get everyone thinking of the possibilities.

6. MAJ Hamilton, Force XXI Logistics Office, presented possible ideas and concepts (Enclosure 6) developed by AMC; primarily the Combat Synthetic Test Training Assessment Range (STTAR) and Survivable Armed Reconnaissance on the Digitized Battlefield (SARDB).

7. MAJ Al Gammons, Army Space Command, explained the relationship between the Space and Strategic Defense Command (SSDC), the FP TOC, and the Missile Defense Battle Integration Center (MD BIC). He stated that they want to get Air Force simulations and AEGIS into play. ARSPACE wants a training event, not a demonstration, at AUSA. They are looking for a rehearsal capability for real world contingencies. The FP TOC can probably be distributed; therefore, it won't be necessary to send the whole FP TOC to AUSA. His presentation is at Enclosure 7.

8. LTC James Wall, Army Research Laboratory, presented a briefing (Enclosure 8) on the Virtual Sand Table (VST). The technology already exists and could be a stealth viewer for DIS simulations. Interface with the sand table can be accomplished through voice recognition and/or gestures.

9. Mr. Ralph Burkhart, Draper Laboratory, presented what the Joint Technology Center System Integration Laboratory is currently developing that might be of utility to AEIII. A copy of his briefing, "UAV Simulation Support for III Corps Training Exercises" is at Enclosure 9. Mr. Milton Adams followed up with a briefing (Enclosure 10) on their C4I efforts working with ARPA and the Navy. They are very involved in information sharing and collaborative training.

10. The working session was adjourned at 1700 hours and reconvened at 0800 hours the following morning.

11. LTC Ken Johnson, TRADOC DCST, presented a Distance Learning briefing (Enclosure 11) highlighting their plans to support US Army training in Bosnia.

10. Dr. Tom Warren, Research Triangle Institute, reviewed last year's Virtual Theater set-up and explained the theater's capabilities, including planned upgrades to the project. His presentation is at Enclosure 12.

11. MAJ John Campbell, Battle Command Battle Lab, introduced the FXXI Battle Command Combat Information Center (CIC) that provides a division-level relevant common picture for the commander. That presentation is at Enclosure 13.

12. Mr. Jan Chervenak, Dismounted Battlespace Battle Lab (DBBL), provided information (Enclosure 14) on the DBBL Simulation Center experiment that focuses on individual leaders and discussed how they might incorporate other services into the experiment.

13. Mr. Tom Smith, Simulation Training and Instrumentation Command (STRICOM), explained STRICOM's functions and responsibilities in its relationship with the LAM TF and the Army Experiment. He also explained the changeover of experiment integration and testing activities from Loral to Lockheed Martin; the latter being awarded the new 5-year Advanced Distributed Simulation Technology (ADST) support contract. He advised the group that STRICOM had completed its own Technical After Action Report of AEIII (copy at Enclosure 15) and that he would provide copies upon request. Copy requests should be directed to Tom Smith, e-mail: smitht@stricom.army.mil or phone (407) 384-2387 (DSN 960-8826).

14. Ms. Virginia To Kaste, Army Research Laboratory, presented a briefing (Enclosure 16) on the Variable Resolution Terrain Model. With the proper resolution, the model can reflect cratering, punching holes in walls, effects of weather on terrain, etc. The model can create user-defined terrain to the user's specified resolution. The model is also DIS compatible so it can run with ModSAF and other models.

15. Mr. Mike Hannon, TRADOC Analysis Center (TRAC), presented an overview (Enclosure 17) of the Corps Level Computer Generated Forces (CLCGF) architecture. Mr. Dave Prybyla followed with a summary (Enclosure 18) of what was learned during JPSD 95, which linked CBS with CLCGF.

16. MAJ Don Renner, Office of the Director for Information Systems for Command, Control, Communications, and Computers (ODISC4), explained what DISC4 is and does, then presented their concept for AEIII. The concept presented one congealing thought: One Army -- One Architecture for interoperability and joint projection. This would be accomplished through the demonstration of the Warfighter Information Network (WIN). Their concept briefing is at Enclosure 19.

17. LTC Brown led an open discussion of the AEIII concept. He explained the savings to be made by testing connectivity via long haul. Past successes support the belief that we may be able to long-haul individual experiment activities to the AUSA demonstration and leave the bulk of the equipment and personnel at home station. He expanded this idea into his vision of how the AUSA demonstration could be laid out. He wants to make it more audience interactive with a series of vignettes, synchronized with

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the overall scenario, showcasing the activities at remote locations. It would be an immersive environment linked to the virtual and real domains.

18. A working group chaired by Mr. Joe Jennings, Mitre Corporation, was established to flesh out the concept. The concept should show how we will develop a distributed experimental capability that can be used to conduct/support experimentation on Force XXI issues (especially relating to C4I and Information Operations), and support a
demonstration of the "art of the possible" in Information Operations at the AUSA convention in Oct 1996. The concept should include a statement of the objectives of the experiment in general and the AUSA demonstration in particular, a basic unifying theme for the AUSA demonstration, a recommended list of participating systems for both the experiment and the AUSA demonstration, a brief description of each system's role, a graphic of the AUSA demonstration, an overview of the technical architecture, and a milestone schedule for implementing the concept. Appointed work group members include LTC Dave Tyner, Mr. Ulf Helgesson, MAJ Al Gammons, Mr. Jan Chervenak, MAJ Don Renner, MAJ John Campbell, Ms. Virginia To Kaste, MAJ James Vaglia, and representatives from TRAC and STRICOM/Lockheed Martin. The group will meet 8-9 January 1996 in the Washington DC area. Results of their work will be distributed via e-mail to all AEIII participants by 19 January. The draft concept will be used as the basis for further developments of individual experiments and the building of a cohesive final concept. This will serve as the intent for the next IPR.

19. The consensus of the attendees was that the following should be developed/identified as potential candidates for inclusion in AEIII:

a. Corps Level Computer Generated Force (CLCGF)

b. Virtual Sand Table

c. Dynamic Terrain

d. Network - ATAI/ISDR (ADS)

e. Ultra-small light-weight portable computers

f. Classroom XXI / Education XXI

g. BCBL Combat Information Center

h. DBBL WARLINK

I. FP TOC

j. Total Army / Joint participation

k. Virtual Theater

l. Warfighter Information Network (WIN)

m. Joint collaboration at the command level

20. After polling the attendees, it was decided that the next In-Process Review (IPR #2) will be held in Orlando, Florida, starting at 0900 hours 30 January 1996 and ending at 1200 hours on 31 January. The purpose of this IPR will be to further define the integrated experiment concept and distributed display module. The final concept from this IPR will be presented for design approval to the CSA/VCSA/DAS in mid-February. The February IPR will be the decision point and beginning of technical design. Further information and agenda for the February IPR will be distributed separately.

21. LTC Brown summarized the accomplishments of the IPR and answered all remaining questions. He then thanked all the participants for their hard work and contributions, closing the conference at approximately 1200 hours, 12 December.

22. Copies of briefings were available during the conference and are not included for distribution with these minutes. Briefings are maintained on file and additional copies are available upon request through Ken Wren.

23. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

<div align="right">(s)
Kirby R. Brown
LTC, QM
LAM Task Force</div>

19 Enclosures
     as
(Enclosures omitted)

SUBJECT: Minutes of In Process Review # 2 for Army Experiment III (AE3)

1. The second In Process Review was held on 30 and 31 January in Ballroom C of the Holiday Inn - University of Central Florida, Orlando, Florida. The purpose of the conference was to develop a list of proposed sub-experiments and a demonstration concept plan for the 1996 Army Experiment. The planned agenda is at Enclosure 1.

2. LTC Kirby Brown opened the session at 0900 hours, 30 January. He introduced himself and welcomed those in attendance. Since there were many new to the Army Experiment, attendees were asked to identify themselves to the group. A list of the attendees is provided at Enclosure 2. An updated points-of-contact (POC) roster is also provided (Enclosure 3) for your information and use.

3. LTC Brown discussed the mission of the Technical Concept Development Team that met 17-18 January at Mitre in McLean, VA. He stated that the team's recommended concept is the starting point for this year's efforts. He further explained that the Synthetic Theater Of War (STOW) environment is the primary infrastructure of the Experiment and the plan is to exploit/expand on that. He then went over the objectives for the IPR:

    a. To Develop:

        (1) The candidate list for this year's experiment.

        (2) The AE3 integrated experiment concept.

        (3) A distributed display concept for the AUSA demonstration.

    b. To Prepare:

        (1) For late February concept briefing to DAS/VCSA/CSA.

        (2) The technical design.

4. Mr. Jim Calpin, Mitre Corporation, presented the conclusions and recommendations of the Technical Concept Development Team (Enclosure 4). A suggested theme for AE3 is "America's Army…Warriors for the Information Age." He started with an explanation of the relationship of AE3 with the AUSA exhibition and was followed by Mr. Joe Jennings, Mitre Corporation, who briefed the proposed AE3 simulation architecture (Enclosure 5).

    a. The basic features of that architecture are that it must be:

        (1) Reconfigurable - nodes selected for specific experiment needs.

        (2) Capable of supporting a wide variety of constructive, virtual, and live simulations with possibly more than one type of simulation at each node.

        (3) Capable of supporting a variety of data protocols with multicast routing.

(4) Require minimal modifications to the simulation networks at each node.

(5) Inexpensive to set up and maintain.

     b. In the future, the high-level architecture (HLA) will meet these requirements. In the short term, the Joint Precision Strike Demonstration/Corps-Level Computer-generated Force (JPSD/CLCGF) architecture is a viable alternative.

5. Mr. Phil Dykstra, Army Research Laboratory (ARL), presented several AE3 communications options and explained the costs associated/anticipated with each option (Enclosure 6). First-cut estimate based on 12 month duration option is between 1.2 and 2.2 million dollars. We owe Mr. Dykstra a refined list of node sites and closer duration estimate. Possible ways to lessen or share these costs with other agencies were discussed.

6. Mr. Calpin continued with a general laydown of the three physical elements anticipated at the AUSA demonstration: Cotillion Ballroom (Theater and Interactive Demos), FP TOC (probably on site), and Foyer/Information Desk. He explained that the AE3 message would be told through a series of vignettes (the theater scenario) framed by or linked to the C4I objectives of Project and Sustain, Protect the Force, Win the Information War, Conduct Precision Strike, and Dominate Maneuver.

7. Mr. Ulf Helgesson, IDA, elaborated on the physical layout planned for the Cotillion Ballroom (AUSA demonstration). He stressed that the theater should be interactive multimedia and that the stand-alone demos should have high "grab" value (be spectacular). He also reminded everyone that space this year would be as limited and critical as last year, if not more so.

8. LTC Mike Bowman, AMC, presented 21st Century Logistics for Force XXI (Enclosure 7). He proposed that AMC participate in the theater (with two logistics vignettes) and also have a stand-alone, interactive, Logistics Information Systems Display. Ms. Kim Wright, AMC, presented an update on the Logistics Anchor Desk (LAD) and its involvement in real-world operations (Enclosure 8). She will provide LTC Brown an update on what ATTCS and simulations LAD currently links with. Mr. John Smith, MICOM, followed with a presentation on a wearable computer system (maintenance technology) and explained the capabilities it provided (Enclosure 9).

9. MAJ Brian Birdwell, BCBL-Leavenworth, presented WARLAB XXI proposal (Enclosure 10). It consisted of the Army Battle Command System/ATTCS, the Course of Action Support Tool, and the Mission Planning and Rehearsal Training System.

10. Mr. Jan Chervenak, DBBL, presented a "Benning Node" strategy (Enclosure 11) whereby all equipment would remain at Fort Benning and participate via longhaul. He proposed two thrusts: Soldier digitization/Situational awareness included a soldier computer, helmet mounted display, day camera, thermal sight, and night vision device; Simulator/Simulation Technology Integration included WarLink, McKenna Military Operations in Urban Terrain (MOUT), Simulation and Training Aid for the Dismounted Soldier (STRADIS), and INFOSCOPE.

11. Mr. George Rumford, White Sand Missile Range (WSMR), briefed the Combat Synthetic Test and Training Assessment Range (Combat STTAR) (Enclosure 12). He explained their concept and efforts to combine testing with training. He discussed what they have been doing, then expanded to what they want to do in the operational future.

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12. Mr. Ed Arendt, TRADOC Analysis Center (TRAC), presented TRAC's support and participation in AE3 (Enclosure 13). TRAC wants to help provide the overall synthetic battlefield and help demonstrate the interaction of real or prototype C3I systems within the synthetic environment. He expressed some concern about remoting (longhaul participation), but stated that TRAC would like to gain more experience in this area.

13. LTC James Wall, Army Research Laboratory (ARL), presented the Virtual Sand Table (VST) and briefly discussed a Virtual Unmanned Aerial Vehicle (VUAV). His presentation is at Enclosure 14.

14. Ms. Virginia To, ARL, presented a short demonstration video and then a briefing on the generation of realistic dynamic events in real-time (Enclosure 15). This included weapons effect modeling on structures (blast and penetration) as well as on terrain (cratering). She would like to integrate these capabilities into other experiments versus using as a stand-alone display or demonstration.

15. Ms. Chris Spiegl, Texas Instruments(TI), presented how TI wants to focus its contribution on the value of sensor information (Enclosure 16). This would be demonstrated in the STOW environment (theater), and in a stand-alone display. The display could also be linked with Comanche, the TOC, or any other player. The baseline vehicle simulator could be either the sensor or the shooter, and was suggested to be an M1A2 tank.

16. Mr. George Jaques, Coleman Research Corporation (CRC), presented an overview of the Missile Defense-Battle Integration Center (MD-BIC) proposal (Enclosure 17). MD-BIC wants to link the DIS domains within the experiment architecture. Ms. Dai Chu continued with a presentation of MD-BIC issues (Enclosure 18), then briefed Weather Implementation effects (Enclosure 19). MAJ Al Gammons followed with an explanation of Synthetic Battlefield Environment (SBE) architecture (Enclosure 20). ARSPACE would like to expand the training value of the FP TOC and add an after-action-review capability.

17. Mr. Ken Overturf, ARINC (with SSDC), presented the Global Broadcast System and its architecture (Enclosure 21). He then presented a briefing (Enclosure 22) on LEOCOMM (Low-Earth-Orbit Communications) system capabilities. He suggested that a static display could demonstrate real-time communication and tracking capabilities at the AUSA demonstration.

18. LTC Mark Jefferson, OSD-DMSO, presented the DOD Modeling and Simulation Strategy (Enclosure 23), including the Modular Re-configurable C4I Interface (MRCI) notional design, and the goals of the High Level Architecture (HLA).

19. Mr. Don Ariel, RAYDON, provided information (Enclosure 24) on the Bradley vehicle training simulator (Bradley FIST) currently under sponsorship of ARPA SIMITAR. AE3 could help move the project toward completion and provide increased reserve component participation in AE3.

20. MAJ Don Renner, ODISC4, presented the concept of "One Army, One Architecture" (Enclosure 25), which demonstrates the connectivity of all systems via the Warfighter Information Network. This could be accomplished with a stand-alone or integrated display.

21. Due to the lateness of the hour, LTC Brown quickly explained his expectations for the next days activities, and at 1700 hours adjourned the meeting until the following morning.

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22. LTC Brown reconvened the IPR at 0830 hours, 31 January, went over the days agenda, then resumed the proponent briefings.

23. Dr. Tom Warren, Research Triangle Institute, presented the Virtual Theater concept (Enclosure 26) for a real-time, 3-D, immersive, interactive, synthetic environment with sound. This exhibit would be mobile and available to different audiences at low cost. He suggested that the Virtual Theater can act as an introductory area to the STOW immersive environment as well as a "to learn more" center for browsers after the STOW immersive environment. Dr. Warren also presented a briefing (Enclosure 27) of the Virtual Maintenance Assistant and Trainer (VMAT), to include possible vignettes involving both medical and maintenance scenarios.

24. MAJ Ed Healy, PEO-Aviation, discussed Longbow Apache and Comanche simulators. He stated that they should be considered for remote use only. He then covered the Army Airspace Command and Control System (A2C2S) Program and its system architecture (Enclosure 28). The A2C2S is basically a battalion jump-TOC in a Blackhawk platform.

25. LTC Neil Fay, Medical Advanced Technology Management Office (MATMO), briefly highlighted several areas to be considered for stand-alone displays: MediTag, CareMed, MediCam, Life Support for Trauma and Transportation (LSTAT), Personnel Status Monitor (PSM), and TeleMedicine.

26. LTC Brown then reviewed all the proposals to clarify and distill the various concepts and to coordinate concepts that supported each other. The following paragraphs outline the refined concepts and the pertinent discussion.

a. AMC - The Log Anchor Desk (LAD) will be considered for part of the theater presentation and will be distributed. AMC's technical objective for the LAD is due from Ms. Wright by 2 February. The Telemaintenance concept is a possible stand-alone, interactive demonstration. Concept is to consolidate four primary telemaintenance programs into one and port a small, belt-mounted wireless computer.

b. BCBL - WARLAB XXI consists of three components - ATCCS, COAST, and MPRTS. All are MCS/P compatible and distributable. The concept is to demonstrate the training capability that WARLAB XXI provides, using MPRTS and COAST tools as backbone for C2 tools at the tactical level.

c. DBBL - The concept is twofold: to depict soldier digitization and its evolution from the Warrior Focus AWE through the TF XXI AWE and to insert live combatants into virtual simulation to show technological integration. The technical enhancement is completing the virtual battlefield paradigm. There is possible Marine Corps interest in this proposal and interest by the FP TOC to have a dismounted INFOSCOPE-type sensor to provide a sensor-to-shooter link for deep strike. ARL dynamic terrain will support the DBBL effort.

d. Combat STTAR - The concept is to possibly have STTAR support a distributed live part of the theater with Mr. Jennings of MITRE working applications.

e. TRAC - TRAC provides a distributed synthetic system (ModSAF/EAGLE) which allows a viable ground maneuver synthetic environment to a corps-level base scenario. There will be a backup simulation on site if initial tests indicate communication problems from Fort Leavenworth.

H-9

f. ARL: Virtual Sand Table - The concept is for the virtual sand table to be an interactive, stand-alone demonstration to depict a C2 environment tool which may have mission rehearsal capabilities. It will use terrain compatible with the theater scenario. MAJ Birdwell from BCBL will get LTC Wall the needed MCS/P data to try to use the sandtable in conjunction with MCS/P. The technical enhancement is an interactive 3-D terrain application for commanders.

g. UAV - The concept is for a monitor and input device portraying virtual UAV based on the theater scenario to provide an interactive demonstration. At this point, the UAV provider may be ARL or another organization. If FP TOC requires the virtual UAV, they have ARL's priority. The technical enhancement would be a realistic sensor-to-shooter training capability for the staff and shooters.

h. ARL: Dynamic Terrain - The concept is for dynamic terrain to support DBBL with the McKenna database in the synthetic environment. It will support other applications, if appropriate. The technical enhancement is the ability to dramatically change simulation terrain on desktop machines.

i. Texas Instruments - The concept is to use an appropriate vehicle simulator to focus on sensor information with emphasis on night sensor-to-shooter links. This will be an interactive demonstration on an approximately 9x6 foot platform. It may also be a data source for other demonstrations or the FP TOC to provide sensor data for other systems to act on.

j. SSDC - Overall Concept is to link the three domains of the synthetic environment to depict a number of battlefield applications. They propose several experiments to integrate this concept.

(1) SSDC MDBIC - The AEROSTAT and weather implementation capabilities can be used to enhance other proposals as needed. These capabilities will be distributed.

(2) The concept is to replicate a generic future TOC actively operating. The TOC will attempt to have all remote feeds come through one input. The technical enhancement will be an AAR capability for the TOC which allows the participant to critique their actions on mission execution.

(3) ARSPACE: GBS - The concept is to depict the GBS providing an in-theater downlink capability broadcasting necessary scenario data to support other proposals or the theater presentation. The method would be a hand-held transmitter calling for imagery of a specific grid.

(4) ARSPACE: LEOCOMM - Same as GBS above for application, problem is satellite coverage and timing.

k. NGB: SIMITAR - The concept of this proposal was to provide an M2 simulator depicting a training simulation used by the National Guard to train individual and collective M2 tasks. The technical enhancement was the use of technology to increase training efficiency.

l. RTI: Virtual Theater - The concept is to use the virtual theater as a STOW immersive environment and a "learn more" center for browsers. It would also provide interactive tours of AE1 and AE2.

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m. PEO AVN: Comanche, Apache Longbow and A2C2S - The concept for the Comanche and Apache Longbow simulators is to support the main synthetic environment distributed from Fort Rucker. There is also a stand-alone demonstration capability for the A2C2S mockup which can link to MCS/P.

n. MATMO: MediTag, MediCam, CareMed, LSTAT - The concept is for a stand-alone, interactive demonstration to illustrate the application of these technologies. There is a possibility for non-interference TeleMedicine input from Bosnia. LTC Fay promised a more complete proposal by 2 February.

27. DMSO: Presented an overview MCRI. This is a parallel effort being worked within the Army Experiment for this year. This effort will work in tandem with the TRAC CLCGF project.

28. LTC Brown discussed the status of the IPR objectives, then went over the Cotillion Ballroom layout. He envisions three to five stand-alone displays in the loiter area, and a theater with a synthetic environment that highlights the use of technology.

29. LTC Brown informed the group that the video tape and pamphlet used last year would be replaced by a CD-ROM for AE3. LTC's Tom Smart and Scott Fernald are the leaders for this project.

30. The next In-Process Review (IPR #3) will be held in the Holiday Inn-UCF, Orlando, Florida, starting at 1300 hours 5 March and ending at 1200 hours, 6 March. Further information and agenda for IPR# 3 will be distributed at a later date.

31. LTC Brown summarized the accomplishments of the IPR and answered all remaining questions. He promised that the minutes of this IPR, including a POC roster, would be distributed by next Monday (5 Feb). He also announced that a copy of the concept briefing (to be) given to the CSA/DAS would be distributed prior to the next IPR. A letter of instruction and request for individual proponents' technical concept requirements should also be sent out before the next IPR. He then thanked all the participants for their hard work and contributions, closing the conference at 1120 hours, 31 January.

32. Copies of briefings (enclosures) are not included for distribution with these minutes. Attendees selected particular briefings of interest before departing the IPR and copies of those briefings were separately faxed to the requesters. Briefings are maintained on file and additional copies are available upon request through Ken Wren.

33. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

Kirby R. Brown
LTC, QM
LAM Task Force

28 Enclosures
    as

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Enclosure 1

IPR #2 Agenda

30 January 1996

0850	Sign-in/settle-in	
0900	Welcome, admin announcements, and opening remarks	LTC Brown
0915	Report/discussion from the concept development working group	Jim Calpin
1000	Experiment proposals:	AMC BCBL DBBL DSABL
1200	Lunch break	
1300	Experiment proposals:	TRAC ARL All others
1645	Summary of days activities and assignment of working groups as required	LTC Brown
1700	Adjourn	

31 January 1996

0830	Reports of working groups	If required
0900	Integrated display module concept discussion	LTC Brown
1030	Final display module design	LTC Brown
1120	Future tasks, suspenses, and IPR schedule	LTC Brown
1150	Summary and closing remarks	LTC Brown
1200	Close	

Enclosure 2

IPR #2 ATTENDEES

ARIEL, Don	Raydon Corp (SIMITAR)
ANASTAS, Kevin LTC	LAM TF (Pentagon)
ANDERSON, John LTC	ARSPACE
ARENDT, Ed	TRAC
BARHAM, Paul	Naval Postgraduate School
BIRDWELL, Brian MAJ	BCBL (Fort Leavenworth)
BOWMAN, Mike LTC	AMC Force XXI Synchronization Office
BRENNAN, Joe	STRICOM PM CAAN
BROWN, Kirby LTC	LAM TF (Fort Leavenworth)
CALPIN, Jim	Mitre
CHERVENAK, Jan	DBBL Sim Ctr (Fort Benning)
CHU, Dai	SSDC-MDBIC
CORREA, Mario	Inst Dev Dir WSMR
COSBY, Mark	SAIC
DYKSTRA, Phil	ARL
EDWARDS, Bob	Lockheed Martin Loral
ERIKSSON, Karl	STRICOM
FAY, Neil LTC	MATMO
FERNALD, Scott LTC	LAM TF
FISH, E.G.	Lockheed Martin Loral
GAMMONS, Al MAJ	ARSPACE
GEDDES, John LTC	ARL/LAM TF
HEALY, Ed MAJ	Comanche PMO
HELGESSON, Ulf	Institute for Defense Analysis
HERSEY, Mike LTC	NGB Joint Venture Axis
JACQUES, George	CRC (represents SSDC)
JEFFERSON, Mark LTC	OSD, DMSO
JENKINS, Rick	ARSPACE
JENNINGS, Joe	Mitre
JOHNSON, Kenn LTC	DCST TRADOC TDAD
KALAF, Michael	Lockheed Martin Loral
KEARNY, David	Texas Instruments
KUENE, Cindy	NCCOSC RDTE
LOCKE, Linda	AMC LOGSA
NIFONG, Michael LTC	BCBL-H
NOVAK, Jason	Mitre
O'BYRNE Jim LT (USN)	NRAD
OVERTURF, Ken	ARINC (with ARSPACE)
REGALDO, Frank	STRICOM-PM-CAAN
RENNER, Don MAJ	ODISC4
RESSLER, Richard LTC	Army Model And Simulation Office
RUMFORD, George	Inst Dev Dir WSMR
SMART, Thomas LTC	LAM TF
SMITH, John V.	MICOM

SMITH, Tom	STRICOM, PM CAAN
SPIEGL, Chris	Texas Instruments
TO, Virginia	ARL
TYNER, Dave LTC	LAM TF (Carlisle)
WALL, James LTC	ARL
WARREN, Tom	Research Triangle Institute
WREN, Ken	Cubic (supporting LAM TF)
WRIGHT, Kim	Army Materiel Command

SUBJECT: Minutes of In Process Review # 3 for Army Experiment III (AE3)

1. The third In Process Review was held on 28 and 29 March in Ballroom C of the Holiday Inn - University of Central Florida, Orlando, Florida. The purpose of the conference was to present the demonstration concept plan for the 1996 Army Experiment, review candidate experiments and technical plans, and further develop the theater scenarios. The original agenda is at Enclosure 1.

2. LTC Kirby Brown opened the session at 1300 hours, 28 March. He introduced himself and welcomed those in attendance. (A list of the attendees is provided at Enclosure 2.) After reviewing the LAM TF role in AE3 and its link to the Army's Strategic Communications Plan, he discussed and updated the agenda for the day. He then listed the items to be accomplished during this IPR:

   a. Review candidate experiments, technical plans, and dollars.

   b. Finalize experiments locations.

   c. Finalize theater story concept and players/scenario.

   d. Develop communications structure.

   e. Provide framework for follow-on educational products (CD ROM).

   f. Structure technical and scenario work groups.

   g. Break down equipment costs.

   h. Inform all participants of the AE3 web site (http://204.7.227.75:443/AE3/).

   I. Select future IPR dates.

3. LTC Brown highlighted and discussed significant points from the Concept Briefing that was presented on 22 March to LTG Dubia, the Director of the Army Staff. That briefing is on the AE3 Home Page.

4. Mr. George Jacques (Coleman Research) presented the Space and Strategic Defense Command (SSDC) plan (Enclosure 3) to show how information technology helps commanders visualize the battlefield/battle space: to demonstrate the FP TOC's Information Age Applications to plan, coordinate, and execute TMD and Force XXI operations, to demonstrate STOW technology's Training Value Added to synchronize and integrate combat power, and to demonstrate information age technology to enhance Mission Planning and Rehearsals, Course of Action Analysis, and After Action and Review Analysis. He was

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followed by Ms Dai Chu (MDBIC), who further elaborated on Theater Missile Defense aspects of the FP TOC and synthetic battlefield environment (Enclosure 4). MAJ Gammons (ARSPACE) continued with an explanation of proposed FP TOC connectivity and communications means (Enclosure 5). Ms Sharon Campbell (ARSPACE) then presented the capabilities and advantages of using the Global Broadcast Service (GBS) for data and voice transmission (Enclosure 6).

5. Mr. Allen Hardison (AMC) presented past and current uses of the Logistics Anchor Desk (LAD), including real-world applications of LAD capabilities (Enclosure 7). LTC Brown asked ARSPACE if this is a capability they need to "grow" in FP TOC. The answer was yes. The decision was made to have LAD participate as part of FP TOC and not as a separate stand-alone. Mr. Hardison will work with ARSPACE to incorporate the LAD as the logistics vehicle for the FP TOC.

6. MAJ Rick Burtnett (STRICOM) presented the Dismounted Infantryman concept, explaining what he wanted to have shown in the theater (Enclosure 8). He wants to portray the Land Warrior System.

7. Mr. Kelvin Nunn (MICOM) presented Telemaintenance/VMAT as a collection of technologies designed to aide in diagnoses and repair of weapon systems (Enclosure 9). He explained that application of these capabilities can be woven into the theater scenario and/or demonstrated with a wearable computer system displayed as a stand-alone.

8. Mr. Jim Pittman (Mitre w/TRAC) explained how Corps Level Computer Generated Forces (CLCGF) links virtual and constructive models with actual military systems in a synthetic environment where the warfighter/staff can step into the battle at any echelon to experiment, test, or train with new tactics, techniques, or procedures (Enclosure 10). He also informed the assembly about the Joint Virtual Experimentation Laboratory (JVL) that is being put together at Fort Leavenworth and addressed what will be available in time for AE3. He also presented an overview of the CLCGF architecture.

9. Mr. Bob Hatton (United Defense) presented a concept for Streamlined Acquisition (Enclosure 11) describing the process: its value, configuration, components, and communication links.

10. MAJ Larry Carpenter (APM Simulations and Training [Comanche]) presented his concept for AE3 (Enclosure 12) and discussed the Aviation Warfighting Cell.

11. Mr. Jim Calpin (Mitre) presented a briefing on Appliqué and the Tactical Internet (Enclosure 13). He suggested that Appliqué could be incorporated into the theater or set up as a stand-alone display, with the Tactical Internet functioning as its communications medium (as well as handling other traffic). An Army sponsor is yet to be identified.

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12. Mr. Max Lorenzo (Night Vision Lab) demonstrated (via VHS tape) the types of night vision sensor effects that can be generated, then presented a capabilities briefing (Enclosure 14). These capabilities can be incorporated into the theater scenario, but night vision sensors will not be a stand-alone display.

13. Due to the lateness of the hour, LTC Brown quickly explained who should participate in the evening work group session, what the expectations were, and then at 1735 hours adjourned the formal session until the next morning.

14. The scenario integration work group met 1900-2125 hours Thursday evening, led by LTC Dave Tyner (LAM TF) and Mr. Mike Collins (Cubic). They used, as a jumping-off point for follow-on scenario development, the Concept Working Papers that were distributed to (placed on the tables of) all attendees at the start of the IPR (Enclosure 15).

15. LTC Brown reconvened the IPR at 0800 hours Friday morning and updated the agenda for the day, primarily presentation sequence changes. LTC Scott Fernald announced that there was a retinal display demonstration set up in the foyer and invited all to visit it during breaks.

16. MAJ Jim Vaglia (Army Research Lab) presented the Virtual Sand Table concept (Enclosure 16). This is a stand-alone 3D representation of the battlefield that can be used for mission planning and rehearsal or as a window into the current battle. Commanders can input through hand gestures and voice commands.

17. Mr. Dave Kearney (Texas Instruments) presented a candidate for the Advanced Tank Armored Simulator (Enclosure 17), a scout vehicle, explaining that the emphasis would be on the mission instead of the type of vehicle. Any vehicle type can be used, even a Humvee. The idea is to showcase the sensors. Although nominated as a stand-alone display, it can be readily imported into the theater scenario if so desired.

18. MAJ Don Renner (ODISC4) presented the Army Enterprise concept (Enclosure 18) to use the Army Global Command and Control System (AGCCS) as a common C4I thread. Army Enterprise will be a stand-alone displayed on the landing/foyer next to the Cotillion Ballroom in the Sheraton-Washington Hotel (AUSA convention site).

19. LTC Scott Fernald (LAM TF) presented his concept (Enclosure 19) for a stand-alone Countermine display consisting of an Infrared Mine Detection System designed to detect, identify, and classify mines through the use of an IR camera and processed through a parallel image processor, then displayed to the user using virtual retinal display technology.

20. LTC Neil Fay (Medical Advanced Technology Management Office) discussed the possibility of integrating MSC/P compatible Medical Situational Awareness and Control (MSAC) into the FP TOC. He also described several possible candidates for stand-alone TeleMedicine displays:

    a. MediTag and Medical Digital Assistant.

    b. Life Support for Trauma and Transport (LSTAT).

    c. Diagnostic Glove.

    d. MediCam.

    e. Man-Pack 3D Ultrasound.

    f. CareMed.

    g. Automated Laser Debridement.

21. Mr. Mike Collins presented the initial results of the Scenario Integration Working Group's evening session. At the conclusion of this briefing, LTC Brown said he would review the draft scenario (provided below) and adapt/adjust it to produce the final planning version. That version will be distributed with the agenda for the next IPR and attached as guidance for the Technical Working Group. The scenario developed at the evening session is as follows:

    a. The Story Introduction: 3 Minutes

       (1) Introduction - An historical example depicts how the increased speed and depth of the current battlefield requires decreased information transmission and coordination times and increased information accuracy. Proper application of technology allows us to increase the efficiency and effectiveness of our current force.

       (2) Medium - Multimedia presentation with narration. No links required.

       (3) Major Points:

          (a) Minute 0-2:00 -- Narrator stresses why the Army is applying Information Technology. Compares past and current C2 and battlespace to 2010. Uses historical examples (GEN Griffith's discussion with Iraqi Division Commander or Lee at Gettysburg) to show the requirements for Information Technology in terms of time and effect. Must be able to execute quicker than the enemy can react.

          (b) Minute 2:00-2:30 -- Stresses the importance of the

synthetic environment as the medium for implementing information technology.

(c) Minute 2:30-3:00 -- Establishes the setting for
transition to Military Operations - The Corps Fight. Telescope view of
pieces of an overall scenario.

b. Vignette 1 -- Military Operations-Corps Deep Fight: 5 Minutes

(1) Depicts the application of technology to find critical enemy
assets at multiple deep sites, to rapidly plan an attack with joint assets,
to confirm target locations, to coordinate attack execution, to assess
strike results, and to plan and coordinate restrikes. Compares this fight
to a single target joint strike in Desert Storm in terms of time and
effects.

(2) Medium - Central narration supported by distributed examples
and multimedia. CLCGF is the simulation driver. Depicts how current
experiments provide the necessary capability.

(3) Major Points:

(a) Minute 4-4:30 -- Narrator describes an ATACMS attack
during Desert Storm using multimedia backup or CLCGF replication. It took 8
hours to detect, decide, deliver, and assess a single ATACMS strike to
destroy one SA2 ADA site.

(b) Minute 4:30-5:30 -- JSTARS observing theater wide. Feeds
going to Corps. JSTARS and SOF team spot and report enemy MRL unit movement
to TOC (seen virtual, with Night Vision, video). TOC tasks deep recon
Comanche to monitor and launches UAV (TOC shown in video clip, Comanche and
UAV distributed, flying done in virtual).

(c) Minute 5:30-6:00 -- Comanche calls for fire on MRLs
(Comanche on virtual and distributed). TOC clears target (Video clip).
ATACMS fires (distributed from Fort Sill with video and photo backup).
Enemy TEL launches deep (virtual and video). THAADs shoots down (virtual
and distributed). Medical reacts to NBC threat (video).

(d) Minute 6:00-7:00 -- UAV arrives at MRL site for BDA
(virtual and distributed). Sees destroyed vehicles, holes (dynamic
terrain). UAV affected by weather. UAV and JSTARS spot and decides to
restrike. Comanche and Apache Longbow launch to attack armored formation.
JSTARS and UAV spot and report lead elements of an enemy armor formation.
TOC decides to restrike. Air Force strikes deeper armored formations in
coordination with attack helicopters.

(e) Minute 7:00-8:00 -- JSTARS and UAV assess damage.
Transition to the Bde/DIV fight. Multiple successful coordinated deep

strikes on multiple targets at multiple locations in the same 8 hours as 1991. Emphasize that example of UAV is in demo area and FP TOC, Comanche will be used in FP TOC.

    (4) Nodes: Corps Combat Simulation Node (Fort Leavenworth)
         Communications/Integration Node (ARL)
         TMD Simulation Node (ARC)

    (5) Linkages: Corps Combat Simulation Node and TMD
         Simulation Node to Communications/
         Integration Node
         JVL (CLCGF, SOF), D&SABL (ATACMS) to Corps
         Combat Simulation Node
         Fort Bliss (THAAD), ARSPACE (Global Broadcast
         System), AVTB (Comanche), JSTARS to
         TMD Simulation Node
         UAV, Air Force to Communications/Integration Node

c. Vignette 2 -- Military Operations - Bde Fight: 6 Minutes

    (1) Depicts the application of technology to disseminate a DIV order and to plan, rehearse, and execute the order at BDE level in greatly reduced time. Shows the value of situational awareness and mission rehearsal in reacting to an enemy action during mission execution. Compares the time and effects of this operation to current operations.

    (2) Medium - Centralized narration supported by distributed examples and multimedia. CLCGF is the simulation driver.

    (3) Major Points:

        (a) Minute 9:00-10:00 -- Narrator depicts an average of 24 hours to plan a brigade attack from receipt of division orders, through rehearsal to beginning the operation. With digitization, which results in common situational awareness, and simulation/visualization tools, this time can be reduced by at least half with significant increases in accuracy and quality of planning. Simulation and visualization tools will allow planners and decision-makers to train and fight using the same linkages, equipment, and procedures seamlessly. Bde receives Division order on MCS/P via Tactical Internet or GBS. Includes ops, Intel, logistics, air, air defense, engineer, and digital IPB. TOC sends to JVL. (Distributed and video)

        (b) Minute 10:00-11:00 -- Bde Staff conducts decision-making process on MCS/P including course of action analysis and rehearsal (JVL distributed and video).

        (c) Minute 11:00-12:00 -- Bde launches UAV. JSTARS and UAV

spot enemy threat attacking village at NAI. Weather affects UAV. Bde Cdr
decides to use planned rehearsed counter-attack option. (JSTARS, UAV
distributed and video; Bde Cdr is video)

       (d) Minute 12:00-13:30 -- Mechanized battalion
counterattacks to block enemy (distributed virtual and video). Narrator
highlights one unusual vehicle (United Defense vehicle). Platoon
dismounts. PL C4I display shows common situation awareness. Dynamic
terrain used in MOUT scenario. (All distributed, virtual and video) Soldier
display shows his view in virtual and video. Comanche and Apache Longbow
support infantry.

       (e) Minute 13:30-14:00 -- Bde Cdr and staff monitor the
battle's progress on A2C2S and use MCS/P to make plan changes before the
enemy can act, which allows the Bde Cdr to force the enemy to do what the
Bde Cdr wants the enemy to do. (Distributed and video)

       (f) Minute 14:00-15:00 -- As the battle begins, medics use
MEDI-TAG and MEDI-CAM to assist the evacuation and triage process. Emphasize
MCS/P and UAV in FP TOC and UAV and MEDI-TAG/MEDI-CAM in demo area.
Transitions to Post Operations. (video)

       (4) Nodes: Corps Combat Simulation Node (Fort Leavenworth)
           Communications/Integration Node (ARL)
           TMD Simulation Node (ARC)

       (5) Linkages: Corps Combat Simulation Node, TMD Simulation
           Node to Communications/Integration Node
           Marines and Medical to Communications/Integration
             Node
           JVL(CLCGF, MCS/P) to Corps Combat Simulation
             Node
           DBBL(PL C4I, Soldier display, Mech Bn, Dynamic
             terrain), AVTB (Apache, A2C2S), GBS,
             Tactical Internet to TMD Simulation Node

  d. Vignette 3 -- Post Operations: 3 Minutes

       (1) Depicts the use of battlefield data and digital technology to
train units at home station, to educate individuals for future conflict, and
to use simulations and battlefield data to simplify and improve combat
developments.

       (2) Medium - Centralized narration supported by distributed
examples and multimedia.

       (3) Major points:

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(a) Minute 15:00-16:00 -- Students at TRADOC schools and combat developments analysts at TRADOC Battle Labs use battlefield digital data and rehearsal tools to study and wargame alternate courses of action (Distributed an video).

(b) Minute 16:00-18:00 -- Industry takes Army requirements documentation from analysis of battlefield digitization and establishes prototypes in computer software for simulation testing and verification before hardware prototypes are built, reducing acquisition time. Use United Defense's Combat System Integration Laboratory developed from AE I as an example. (Distributed and video)

      (4) Node: Corps Combat Simulation Node (Fort Leavenworth)
          Communications/Integration Node (ARL)
          Live Simulation Node (WSMR)
          TMD Simulation Node (ARC)

      (5) Linkages: Corps Combat Simulation Node, Live Simulation
          Node to Communications/Integration Node
          D&SABL(rehearsal tools) to Corps Combat Simulation
             Node
          DBBL (rehearsal tools) to TMD Simulation Node (ARC)
          United Defense lab to Live Simulation Node (WSMR)

e. The Story Summary: 2 Minutes

(1) Review of key points of the Story with emphasis on the prime and sub-messages.

(2) Medium - Multimedia presentation with narration.

(3) Major Points: Minute 18:00-20:00 -- The Army is spending it's modernization funding wisely and that funding should continue. Digitization improves the efficiency and effectiveness of the current force which increases the probability of battlefield success. "If I know where I am and I know where he is." Sensor to shooter links ~ time ~ weapon footprint. Information Technology improves decision-making and preparation for war

f. IDREN Nodes:

(1) Fort Leavenworth - Corps Combat Simulation Node: JVL, Depth and Simultaneous Attack Lab, Others

(2) White Sands Missile Range - Live Simulation Mode: Others

(3) Army Research Laboratory - Communications/Integration Mode: Sheraton Washington, Fort Belvoir, ARL, Other Services

(4) Advanced Research Center - Theater Missile Defense Simulation
Node: Fort Bliss, Aviation Test Bed, ARSPACE, Dismounted Battle Lab, Other

22. Mr. Phil Dykstra (Army Research Lab) went over the Network
finalization, listing IDREN nodes that already exist and the two to be added
(AUSA site and JVL at Fort Leavenworth). He pointed out that the network
was shown on the world wide web at http://ww.arl.mil/HPLMP/DREN. There was
much discussion about the ability of the network to handle such a big
scenario with VTC and PDU's and whether T-1 links can handle the traffic.
 More detailed information on actual requirements is needed before
adjusting/down sizing the scenario or distribution plan.

23. At the conclusion of the discussions on scenario and communications
architecture, LTC Brown addressed both issues and stated that he had all the
groups input and would take that scenario, review, adjust, and adapt it as
necessary, then publish it as a final document for the Technical Working
Group to flesh out and develop the communications system architecture to
support it. The scenario and communications architecture will be reviewed
in final form at the next IPR.

24. LTC Brown explained the importance of each proponent's Technical
Concept Plan and what it was used for. He requested that each proponent
update its plan (based on information gleaned at this IPR) and get it to Ken
Wren by close of business Friday (April 5). Preferred method is e-mail as
an attachment or FTP.

25. Mr. Bob Edwards (Lockheed Martin) presented an overview of Lockheed
Martin and its role in the ADST II contract (Enclosure 20). Its role in LAM
TF and AE3 will grow as it evolves.

26. LTC Fernald introduced Mr. Don Steele (Coleman Research) who explained
the requirements, guidance, and expectations (Enclosure 21) for the CD that
this year will replace last years video, brochure, and display briefers. He
reminded everyone that all input should be sent to him and that materials
must be for public release. He also asked that components provide him a POC
for their portion of the CD. He further asked that all applicable materials
currently on hand should be sent to him no later than 19 April.

27. The next In-Process Review (IPR #4) will be held in the Sheraton Hotel,
Orlando, Florida, starting at 1300 hours 23 April and ending at 1700 hours
24 April. This is a change from the location announced at the meeting. The
Sheraton Hotel is located at the corner of Alafaya Road and E. Colonial
Drive. The telephone number for the Sheraton is (407) 658-9008. Make your
room reservations as soon as possible and tell the hotel that you are with
the LAM TF group. IPR #5 will be conducted at Fort Leavenworth, commencing
at 1300 hours 21 May and ending at 1200 hours 22 May. Further information
and agenda for future IPR's will be distributed at a later date. The

initial Technical Working Group will meet prior to the next IPR.

28. LTC Brown summarized the accomplishments of the IPR and answered all
remaining questions. He stated that the minutes of this IPR would be
distributed by next Friday (5 April). He then thanked all the participants
for their hard work and contributions, closing the conference at 1120 hours,
29 March.

29. Copies of briefings (enclosures to these minutes) are not included for
distribution (via fax and e-mail) with these minutes. Our first try at
going paperless was not a complete success. These IPR minutes are being
distributed via e-mail and fax with only the first two enclosures. The rest
of the enclosures are or will be posted on the project homepage, linked to
the original IPR minutes, as we work with you to get all of them. The
various formats and paper only copies are hampering the effort. For those
that didn't leave electronic files (in PowerPoint), please forward them to
Ken Wren as soon as you can. In the interim, enclosures that do not contain
the referenced briefing are so noted and the applicable POC annotated.
Please contact the appropriate POC directly for additional information or
copy of that particular briefing. The AE3 Home Page is at
http://204.7.227.75:443/AE3/.

30. The following is a consolidated list of announced suspense
dates/actions:

    a. 5 April -- Updated Technical Concept Plans to Ken Wren.

    b. 5 April -- Minutes for IPR #3 published and enclosures on the web.

    c. 5 April -- Technical Working Group meeting agenda published.

    d. 8 April -- Agenda for IPR #4 published.

    e. 19 April -- On-hand materials to Don Steele for CD consideration.

31. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic
Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail:
wrenk@monroe-emh11.army.mil.

                            (s)
21 Enclosures   Kirby R. Brown
      as   LTC, QM
1 and 2 are attached   LAM Task Force
3-21 are available on AE3 Home Page

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Enclosure 1
Original IPR Agenda

28 March (Thursday)

1250 Sign-in/settle-in/give briefing disk/paper copies to Ken Wren

1300 Welcome, admin announcements, and opening remarks   LTC Brown

1310 Presentation/Discussion of concept briefing,   LTC Brown
         CD ROM, and further development of vignettes

1430 Proponent presentations:
   Log Anchor Desk   Ms Kim Wright
   WARLAB XXI   MAJ Birdwell
   Dismounted Infantry/Dynamic Terrain   Mr Jan Chervenak
   Combat STTAR   Mr George Rumford
   Corps-Level Computer-Generated Forces   Mr Kent Pickett
   Streamlined Acquisition   LTC Brown
   Comanche/Apache LongBow   MAJ Carpenter
   Appliqué/Tactical INTERNET   Mr Jim Calpin
   Unmanned Aerial Vehicle   ARL
   GBS/LEOCOMM   ARSPACE

1650 Summary of days activities and assignment
         of Scenario Integration Working Group   LTC Brown

1700 Adjourn general session for the day

1900 Scenario Integration Working Group session   LTC Tyner

29 March (Friday)

0800 Stand-alone display presentations:
   Virtual Sand Table   ARL
   Advanced Tank Artillery Simulator (ATAS)   Ms Chris Spiegl
   Unmanned Aerial Vehicle   ARL
   Tele-Maintenance/VMAT   Mr Kelvin Nunn
   Army Enterprise   MAJ Renner
   Mine Detection   LTC Fernald
   Tele-Medicine   LTC Fay
   FP TOC   ARSPACE

0930 Network Finalization   Mr Phil Dykstra

1000 Scenario Discussion   LTC Brown

1030 Technical Concept Project Plan   LTC Brown

1100 Lockheed Martin Overview   Mr Edwards

1120 Summary and closing remarks   LTC Brown

1200 Close

SUBJECT: Minutes of In Process Review # 4 for Army Experiment III (AE3)

1. The fourth In Process Review (IPR#4) of Army Experiment III (AE3) was conducted 23-34 April 1996 at the Sheraton Hotel in Orlando, Florida. The IPR consisted of two sessions. The first session (1300 - 1700 hours, 23 April) addressed those experiments approved as "stand-alones" for on-site display at the October AUSA Convention and also the FP TOC (as a special on-site display). The second session (0830 - 1700 hours, 24 April) addressed those experiments that will be distributed (from remote locations; not on-site) to the AUSA Convention site and integrated into the theater presentation. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 1300 hours. He welcomed the attendees and went over the updated agenda (Enclosure 2) for the first session, explaining the changes and the rationale for two sessions. He then explained that the purpose of the IPR was to lock down the various display components and to continue developing the scenario, transitioning to a final strawman.

3. Mr. Don Steele (Coleman Research) presented a briefing of how the CD ROM would be organized and operate (Enclosure 3). He stated that the CD would also include related references such as the Army Weapon Systems Handbook and the Army Modernization Plan. He also presented several tips for shooting digital video footage. LTC Brown reiterated how important the CD is because of its functionality in the future. It will be put on the World Wide Web and distributed to students at the service schools, CGSC, etc. CD development and production will not be managed on an IPR basis, but will be handled off-line. LTC's Fernald and Smart are overall in charge of this project.

4. A short break was taken while the meeting room was reconfigured to accommodate the one-on-one discussions. In addition to the individual proponent representative(s), the following individuals were present at each those discussions: LTC Brown (Project Manager), Mr. Ulf Helgesson (design), Mr. Joe Jennings and Mr. Jim Calpin (technical), Mr. Mike Collins (scenario), LTC Smart (CD ROM), Mr. Ken Wren (admin) and Mr. Bob Edwards and Mr. Steve Manzi (integration).

     a. Virtual Sand Table (POC - MAJ Vaglia, Army Research Lab): Examined an updated concept plan. Discussed the need for 37" monitors and the possibility of having the TI Scout vehicle shown as an entity on the VST. It was decided that there would not be a head-mounted display used with the VST.

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     b. Scout Vehicle (POC - Mr. Dave Kearney, Texas Instruments): Examined layout and discussed possibility of using Scout in scenario. If in scenario, it would be a separate simulator, not the stand-alone in the Cotillion Ballroom. It was recommended that the driver's seat be removed from the on-site simulator and the two gunner stations be represented as two separate vehicles.

     c. Virtual Retinal Display (POC - Mr. A. J. Yarmie, Microvision): This is the replacement for the Mine Detection/Countermine display nomination (see Enclosure 4). Because he had concerns about the safety of retinal displays, LTC Brown asked that the concept be checked with either OSHA or Army Standards. Mr. Karl Ericksson (STRICOM) agreed to coordinate the safety issue.

d.   Tele-Medicine (POC - LTC Neil Fay, MATMO):   Discussed list of candidates and recommended priority for inclusion as displays. The candidates were: 1) MediTag and Medical Digital Assistant, 2) Life Support for Trauma and Transport (ASTAT), 3) The Diagnostic Glove, 4) MediCam. 5) Man-Pack 3D Ultrasound, and 6) CareMed. LTC Brown approved the top four and number five (Ultrasound) will be included if available (not in Bosnia field trial) and room can be found. The Personal Status Monitor (PSM) might be used in lieu of Ultrasound if space is reserved for the Ultrasound but it does not become available.

e.   Virtual Maintainer (POC - Mr. Kelvin Nunn, MICOM Logistics Lab): This display will consist of a wearable computer with remote connection to a maintainer in a field location, weapons system diagnostics, and electronic field manuals (see Enclosure 5). The display will additionally include a virtual environment using 3D glasses and voice activated diagnostics procedures.

f. Force Projection (FP) Tactical Operations Center (TOC) (POC - MAJ Randy Cash, SSDC): Possible alternative on-site locations at the Sheraton-Washington were discussed. A site survey will be conducted in early May to identify any restrictions that may limit alternatives. The FP TOC will include a Logistics Anchor Desk and an Unmanned Aerial Vehicle control station. There could be a Global Broadcast Service (GBS) receiver located at the TOC, the SSDC display, and maybe at the Joint Virtual Experimentation Lab (JVEL) at Fort Leavenworth. Requirements of the SSDC, MD-BIC, and GBS Joint In-theater Injection (JITI) capability will be consolidated in an updated FP TOC Technical Concept Plan.

g. No one was present to represent the Unmanned Aerial Vehicle (UAV) display. The Army Enterprise display was previously coordinated and approved.

5. As this completed the first session, the IPR was recessed at 1700 hours until the second session started at 0830 hours the following morning.

6. LTC Brown opened the second session with a quick review of the purpose of the IPR and the revised agenda.

7. Mr. Mike Collins (Cubic Applications) presented a briefing of the latest version of the theater scenario and highlighted the changes made since last IPR (see Enclosure 6). The issue of the
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terrain box was discussed. Further action is required to ensure that all "players" will have access to the Korean terrain box. Mr. Collins showed the icon and entity counts throughout the scenarios. In response to the asked question, it was decided that both the Comanche and UAV would probably be used to conduct battle damage assessment.

8. Mr. Don Steele (Coleman Research) presented an encore briefing of the CD ROM project that he had presented the day before. The CD cut-off date is 1 August.

9. Mr. Joe Jennings (Mitre) briefed the results (see Enclosures 7and 8) of the Technical Working Group meeting conducted 15-16 April. He explained what they wanted to accomplish and how they went about doing so. Mr. Bob Edwards (Lockheed Martin) explained the information required to integrate the various components. (He later provided a form to help participants identify those requirements. A copy

of that form is at Enclosure 9.) Mr. Jennings continued with the technical plan to implement the three scenarios (vignettes). Timelines are still being worked. He reiterated that he is the POC for technical matters, Mr. Mike Collins is the POC for the scenario, and they will work together on parallel tracks. He then went over the communications plan and recommended/tentative test schedule:

20-21 May	Tech Working Group meeting
24-28 Jun	ARL performance test w/DBBL
1 Jul	ICD complete
1 Aug	All IDREN sites operational
5-9 Aug	Network load test (all sims) and data logging
2-6 Sep	Theater set-up and test (Belvoir?)
9-13 Sep	Distributed network testing and data logging; ARL
8 Oct, 0600	Start network installation at AUSA
11 Oct, 0600	All nets and sims in place and running for test and rehearsal
13 Oct	Dress rehearsal
14-16 Oct	AUSA, Washington DC

10. After a short break, Mr. Jennings continued by addressing some of the questions raised during the break. He suggested that questions concerning communications be referred to Mr. Randy Kubic (Lockheed Martin) and Mr. John Ratzenberger (TRAC-Leavenworth) as they had a lot of expertise in multi-cast routing. He then clarified the scheduling requirements of IDREN versus the DSI. IDREN does not have to be formerly scheduled in advance, but those needing access to the IDREN via the DSI will have to be scheduled. He explained that the tentative test plan identifies only the major tests; other testing can and will be accomplished as required.

11. Mr. Randy Kubic introduced himself to the attendees and addressed the AUSA network issues and concerns. He is responsible for installation and administration of the network. He plans to set up a FTP file/server to make needed information more accessible. When this is set up it will replace the temporary one now in use (204.7.227.75/transfer/Brownk). When available, the new FTP site will be announced and access instructions published.

12. LTC Brown identified the control and administration team organized for the AE3 project. LTC Kirby Brown is the Project Manager/Leader. Lockheed Martin has ADST II responsibilities
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(technical integration, exhibit services, etc.). The CD ROM project is headed by LTC's Fernald and Smart, and technically managed by Mr. Don Steel. Mr. Ulf Helgesson is responsible for
industrial design and Jason Novak (Mitre) is working with him on visualization and design. Mr. Mike Collins is the scenario story interface with Mr. Jennings and Mr. Calpin who are the technical representatives. Mr. Ken Wren is responsible for administration (scheduling, recordkeeping, web site, etc.).

13. LTC Brown discussed objectives to be accomplished over the next month:

a. Technical Test Plan (POC - Mr. Bob Edwards).

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    b. Video Teleconferencing Plan (POC - Mr. Bob Edwards).

    c. Stand-alone Displays draft design (POC - Mr. Ulf Helgesson).

    d. Theater treatment (1st generation of story-board).

    e. 1st cut shot list schedule/data capture plan.

    f. All funding decisions finished and most funds disbursed.

14. The lunch break was taken early (1120-1230 hours) and the rest of the afternoon was devoted to one-on-one discussions with those proponents with experiments that will be distributed (from remote locations; not on-site) to the AUSA Convention site and integrated into the theater presentation:

    a. FP TOC (POC - MAJ Cash, SSDC): Discussed the possibility of expanding or "exploding" the TOC layout to accommodate large groups (45-60 people). Consensus was that breaking the large group into two or more smaller groups and staggering the TOC presentation was not a viable alternative. MAJ Cash is to come back with his plan to handle large groups. The FP TOC Technical Concept Plan will incorporate/include the requirements of the Logistics Anchor Desk, the Unmanned Aerial Vehicle, the Depth and Simultaneous Attack Battle Lab, and GBS JITI. Need to determine if there are enough UAV stations to do everything. Need one each for the TOC and theater; the rest (2-4) in the stand-alone kiosk. MAJ Cash promised to give LTC Brown his priority list of "live" requirements NLT Monday, 29 April.

    b. Dismounted Infantryman (POC - MAJ Burtnett, STRICOM): Discussed the Dismounted Battlespace Battle Lab (DBBL) concept to present the Land Warrior System. United Defense's "little ugly vehicle" (LUV) will also be shown in the Dismounted Infantryman portion of the scenario. DBBL is responsible for the single Technical Concept Plan that also includes the requirements of Dynamic Terrain (Army Research Lab) and the LUV (United Defense).

    c. Streamlined Acquisition (POC - Mr. Bob Hatton, United Defense): Concept was presented and discussed with no major areas of concern.
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    d. Corps Level Computer Generated Forces (CLCGF) (POC - Mr. John Ratzenberger, TRAC): Discussed how CLCGF would support the theater scenarios, the participation of the
Joint Virtual Experimentation Lab (JVEL), and the requirement for a Command and Control Vehicle (C2V) mockup for use at the JVEL. TRAC is also examining the option of including a Mission Planning and Rehearsal Training System. The use of appliqué and/or Combat STTAR is still undecided. Mr. Joe Jennings agreed to research these areas and come back with an answer/recommendation.

    e. Night Vision (POC - Mr. Max Lorenzo, CECOM): The sensors can support all scenario perspectives, but Mr. Lorenzo suggested that the scenario battles be fought at night to highlight the sensor capabilities. He will work with Mr. Ratzenberger to see what can be accommodated and with Mr. Collins for scenario fit.

f. Comanche/Apache Longbow (POC - Mr. Matt Arnold, PEO Aviation): All representatives were new to the project. The terrain database was discussed. After all related input from the other proponents is in, the decision will be announced as to which database will be used (National Training Center or Korea). The use of aviation assets in the theater scenario was discussed as well as the number of entities.

15. The IPR was concluded at 1700 hours.

16. The next AE3 IPR (IPR #5) is scheduled for 21-22 May, starting at 1300 hours on Tuesday and finishing at 1200 hours on Wednesday. There will be a Technical Working Group (TWG) meeting preceding the IPR. The TWG will start at 1300 hours Monday (20 May) and finish at 1200 hours Tuesday. Agendas will be published at a later date. Both meetings will be conducted at the Sheraton Hotel in Orlando, Florida. (The IPR was moved from Fort Leavenworth because of billeting shortage and traffic congestion.) The Sheraton Hotel is located at the corner of Alafaya Road and E. Colonial Drive. The telephone number for the Sheraton is (407) 658-9008. Make your room reservations as soon as possible and tell the hotel that you are with the STRICOM/LAM TF group.

17. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

9 Enclosures
   as

Kirby R. Brown
LTC, QM
LAM Task Force

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ENCLOSURE 1

Revised Agenda
AE3 IPR #4

<u>23 April (Tuesday)</u>

1250 Sign-in/settle-in/give disk/paper copies to Ken Wren

1300 Welcome, admin announcements, and
     opening remarks   LTC Brown

1315 CD Update   Mr. Steele

1330 One-on-one Proponent Reviews (in order):

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Virtual Sand Table	ARL
Scout Vehicle	Texas Instruments
Virtual Retinal Display	Microvision
Tele-Medicine	LTC Fay
Virtual Maintainer	AMC
FP TOC (on-site special)	ARSPACE

1700 Adjourn Tuesday's session

24 April (Wednesday)

0820 Sign-in/settle-in/give briefing disk/paper copies to Ken Wren

| 0830 | Welcome, admin announcements, and opening remarks | LTC Brown |

0900 Scenario Working Group report   Mr. Collins

0930 CD Update   Mr. Steele

1000 Technical Working Group report   Mr. Jennings

1115 Integration   Mr. Edwards

1130 Review of suspenses, next IPR schedule,
     coordination, and milestones.   LTC Brown

1200 Lunch

1300 One-on-one Proponent Reviews (in order):

FP TOC - Distributed	SSDC
SBE	MD-BIC
LAD	AMC
GBS/LEOCOM	ARSPACE
Unmanned Aerial Vehicle	SIL
DSABL- ADOCS and Sims Support	D&SA Btl Lab
Dismounted Infantry with Dynamic Terrain	DBBL
Dynamic Terrain	ARL
Corps-Level Computer-Generated Forces	TRAC
Combat STTAR	WSMR
Night Vision	NVESD
Comanche/Apache LongBow	AVTB
Streamlined Acquisition	AMC/UDC

1700 Tentative Close

ENCLOSURE 2

IPR Attendees

Arnold, Matt	PEO Aviation
Brown, Kirby LTC	LAM TF
Burtnett, Rick MAJ	STRICOM
Calpin, Jim	Mitre
Campbell, Sharon	ARSPACE
Cash, Randy MAJ	SSDC
Chu, Dai	SSDC-MD BIC
Collins, Mike	Cubic Applications
Deaso, Robert	NVESD Fort Belvoir
Edwards, Bob	Lockheed Martin
Eriksson, Karl	STRICOM
Etcheverry, Mike CPT	AMC
Fay, Neil LTC	MATMO (USAMRMC)
Fernald, Scott LTC	LAM TF
Goins, Ray	Comanche (RAIL)
Hardison, Allen	AMC
Hatton, Bob	United Defense
Havicon, Robert	AEPCO/Apache PM
Helgesson, Ulf	IDA
Jacques, George	CRC w/SSDC
Jennings, Joe	Mitre
Kearney, David	Texas Instruments
Kubic, Randy	Lockheed Martin
Lorenzo, Max	CECOM NVESD
Manzi, Steve	Lockheed Martin
Neumann, Susan MAJ	HQ AMC
Novak, Jason	Mitre
Nunn, Kelvin	MICOM Log Lab
Pittman, Jim	Mitre w/TRAC
Ratzenberger, John	TRAC
Ridley, James H.	E Trp Comanche
Schmidt, Timothy	CRC w/ MD BIC
Smart, Thomas LTC	LAM TF
Smith, John	MICOM
Smith, Tom	STRICOM PM CAAN
Stallcup, Waymon CPT	ARSPACE
Steele, Don	CRC
Vaglia, James MAJ	ARL
Vandewart, Geoffrey	TSM Longbow
Wren, Ken	Cubic Applications
Yarmie, A. J.	Microvision

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IPR #5

SUBJECT: Minutes of In Process Review # 5 for Army Experiment III (AE3)

1. The fifth In Process Review (IPR#5) of Army Experiment III (AE3) was conducted 21-22 May 1996 at the Sheraton Hotel in Orlando, Florida. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 1300 hours. He welcomed the attendees and updated them on actions that had transpired since the last IPR. AUSA has now agreed to allow the AE3 to use both halves of the Cotillion Ballroom for the exhibition. Current plan is to set up the FP TOC in the additional half. He then went over the planned agenda (Enclosure 2) and explained what each of the theater products consists of. He also presented and discussed the objectives for the IPR:

   a. Review Theater Products (scripts/storyboard/shot list)

   b. Complete/coordinate Theater Data Capture Plan

   c. Finalize Distributed Architecture and Simulations Support Plans

   d. Develop Video Teleconferencing Plan

   e. Review/coordinate Master Integration and Test Plan

   f. Decide on Theater Visualization System

   g. Update CD ROM status (timeline and suspense dates)

   h. Review updated Technical Concept Plans

   i. Review first draft Stand-alone Displays layout

   j. Plan future events/requirements.

2. LTC Brown went over the status of funds distribution. Those that still had funding issues were invited to discuss those issues off-line later that evening.

3. Mr. Joe Jennings introduced the report of results of the Technical Working Group (TWG) meeting that was conducted immediately preceding the IPR. He stated that the technical plans are all feasible and that there appear to be no unresolvable issues or "warstoppers." He explained that the addition of Battlefield Visualization, another TI Scout vehicle simulator to be located in Montana, and the Comanche simulator not being located on-site in DC are changes since the last IPR. He also suggested

that to avoid possible confusion the phrase "real" or "real-time" be used in the future instead of "live." He then explained that he was amalgamating and reordering the original agenda items to facilitate presentation of the TWG results, providing a short overview of each agenda item and identifying the person who would present that issue.

a. Mr. Bob Edwards discussed the terrain data base. Korean terrain used in AE2 will also be the play box for this years effort, but with added features where possible for improved visualization. Mr. John Ratzenberger volunteered to review and select the best terrain in the play box that will support the scenario and yet can be improved the best/easiest, e.g. replacing 2-dimensional tree lines with 3-dimensional ones and texturing the terrain. To support TI Scout vehicle modeling, S-1000 was added to the database requirements identified to date. Mr. Edwards then presented his plan to obtain and distribute database data. 15 July was established as the target date to complete and distribute the data base. A base-line version will be distributed as soon as available and update/enhancements are finished. The experiment will be run on DIS version 2.0.4. Enumerations will be those defined in ModSAF version 2.1. The enumeration list was given to Ken Wren for posting to the AE3 FTP site for download by those that require it. (FTP to 204.7.227.75, log on as anonymous, go to sub-directory transfer, then to sub-directory brownk. The file is titled disconst.rdr and can be opened in MS Word.) LTC Brown asked Ken Wren to also acquire the ModSAF maps that Mr. Edwards identified as needed.

b. Ms Virginia To and Mr. Steve Manzi presented the communications plan and verified the distributed site listing (Enclosure 3). Ms To will pull together the communications package and meet (ARL, Lockheed Martin, and Mitre) next week in DC to develop a form on which to capture all participants' communication requirements. When that form is ready, it will be placed on the AE3 FTP site and all concerned will be notified of that action. Mr. Edwards is responsible for scheduling of the DSI. As soon as the network is up, informal capability testing will commence.

c. Mr. Ulf Helgesson presented his initial concept for the theater visualization consisting of three large screens (approximately 9'X7.5') and six smaller screens (at least 37"). All screens will be rear projection. The need for soundproofing of some kind was recognized.

d. Mr. Mike Collins summarized the status of the scenario. It will probably have to be shortened to bring it within the 20 minute target. LTC Brown reemphasized the importance of the theater script and the message it conveys. Mr. Collins later distributed the most recently updated copies of the script (Enclosure 4).

e. LTC Tom Smart presented and distributed the Theater Data Capture Plan explaining what it is and what it accomplishes. He needs the

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appropriate representatives to fill in portions of the plan, e.g., POC, location, shoot date, etc. The Data Capture Plan will be put on the AE3 FTP site and also e-mailed to those concerned.

f. Mr. Bob Edwards presented the first-cut Master Integration and Test Plan. This document is at the schedule level, but the final document will cover the "how and what." There was a lengthy discussion of where (Orlando vs ARL/NRL) and when (August vs September) to conduct load testing.

4. LTC Brown explained the evenings schedule and his expectations for the round table working session that evening, then at 1640 hours adjourned the IPR until the next morning.

5. During the evening session (1900-2130 hours) Technical Concept Plans of those with distributed portions (theater participants) were examined. Issues discussed included:

a. FP TOC - Needs crane to lift shelters off vehicles and dollies to move them inside the Cotillion Ballroom. Can run off 110 voltage for everything except the UAV, which needs 220 volts. FP TOC Technical Concept Plan will be updated to also include the power requirements of SSDC, UAV, and GBS (if participating). Mr. Helgesson will visit the FP TOC set up at Fort Bliss during Roving Sands exercise on 5-6 June. There are no conflicts with the theater scenario.

b. UAV - Needs two IP addresses for ONYX drivers.

c. Brigade and Battalion vignette - Added a second TI Scout Simulator (Bn Cdr's C2V). Joint Virtual Experimentation Lab (JVL) will run the staff drill (Course of Action/Rehearsal tool simulation or Battlefield Visualization Product (BVP). It was suggested that the C2V players be seasoned people, maybe past commanders. JVL will orchestrate the Comanche in ITEMS.

c. Dismounted Infantryman/Dynamic Terrain - Dynamic terrain will be highlighted at the end of the dismounted scenario when soldiers are clearing/moving through the village. Major concern was the switching from one CIG to another (NPSNet vs ARL).

6. The IPR reconvened at 0800 hours, Wednesday.

7. Mr. Bob Edwards summarized the changes (made during his Tuesday presentation) to the Master Integration and Test Plan. The revised schedule is shown below.

Definitization 5/22/96
- Theater Definitization 5/22/96

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- Scenario Definitization 5/22/96
-- Story Board 5/22/96
-- Shot List 5/22/96
- Exhibit Floor Allocation Decision 5/22/96
Development 5/23/96 - 8/21/96
 - Sub Systems (Participants) 5/23/96 - 8/2/96
 - Ballroom Floor Plan 5/23/96 - 6/12/96
 - Theater (AV/Mech/Stealth) 5/23/96 - 8/21/96
 - Collect Database Source 5/23/96 - 7/12/96
 - Distribute Database to Participants 7/15/96
 - VTC Subsystem 5/23/96 - 7/17/96
 - LHN Sub System 5/23/96 - 7/31/96
IDREN Network Testing 8/5/96 - 8/9/96
 - Multicast 8/5/96 - 8/6/96
 - Load 8/7/96 - 8/9/96
Interim Testing (Orlando) 8/19/96 - 10/8/96
 - Orlando OSF Preparation 8/19/96 - 9/5/96
 -- 10 MB Connection to Orlando 8/19/96
 -- 10 MB Stand-Alone Testing 8/20/96 - 8/29/96
 -- Install Integrate Theater, Stealth 9/2/96 - 9/5/96
 -- Install Integrate SAFOR 9/5/96
 - Integrate Long-Haul Participants 8/30/96 - 10/8/96
 -- Fort Benning - DBBL 8/30/96 - 9/2/96
 -- Fort Leavenworth - TRAC 8/30/96 - 9/2/96
 -- Helena, MT - Texas Instruments 8/30/96 - 9/2/96
 -- San Jose - United Defense 9/3/96 - 9/5/96
 -- Fort Bliss 9/3/96 - 9/5/96
 -- Fort Sill 9/3/96 - 9/5/96
 -- Huntsville - SSDC 9/3/96 - 9/5/96
 -- Network Testing 9/6/96 - 9/11/96
 --- Broadcast 9/6/96 - 9/9/96
 --- Appearance 9/10/96 - 9/11/96
 --- Survivability/Lethality 9/10/96 - 9/11/96
 -- Scenario Tuning 9/12/96 - 9/18/96
 -- Mission Rehearsal 9/19/96 - 10/2/96
 -- Pack and Ship to Show 10/3/96 - 10/8/96
AE3 Integration 10/9/96 - 10/18/96
 - Setup for AUSA 10/9/96 - 10/10/96
 - Dress Rehearsal 10/11/96 - 10/13/96
 - AUSA Demo/AE3 Experiment 10/14/96 - 10/16/96
 - Teardown 10/17/96 - 10/18/96

8. Proponents with Stand-Alone displays presented status briefings and
updated/verified their equipment and power requirements:

a. Virtual Sand Table (MAJ Vaglia) - Everything is on track and no
problems are expected. CD ROM still needs working. Need four more sets
of Crystal Eyes glasses.

b. Scout Vehicle (Mr. Jim King) - Presented layout and typical (stand-alone) scenario. One of the four simulators in Helena, Montana will be integrated in the theater scenario. Another simulator might be available to integrate into the FP TOC scenario. MAJ Gammons will coordinate this inclusion if it becomes a reality. Decision will be made by next IPR.

c. UAV (Mr. Ralph Burkhart) - Will provide "total" concept plan that also includes the integrated requirements. Still needs to work the CD ROM requirements.

d. Virtual Maintainer (Mr. Kelvin Nunn) - Everything on track.

e. Army Enterprise (MAJ Don Renner) - No problems anticipated. Updated actions and issues ongoing. Went over internal schedule of events/tests in preparation for AUSA exhibit.

f. Virtual Retinal Display (Mr. Mark Schulz) - Presented concept briefing and asked for assistance to ensure his scenario was doctrinally sound. LTC Dave Tyner will assist with the scenario.

9. LTC Brown explained that the support programmatics (including equipment) is to make requirements known via the Technical Concept Plan, identify them for inclusion in Mr. Helgesson's design sketches (which will then be codified as the Lockheed Martin Engineering and Integration Plan), and also to update requirements as appropriate at each IPR.

10. Mr. Don Steele discussed the status of the CD ROM. We have not completed the first phase of his three phased plan, but have already moved ahead into the second phase. "Source" material (originals) are now needed. He reminded the attendees that the final input cutoff date is still 19 July. LTC Brown again emphasized the importance of the CD as it replaces the video, canned speeches, and brochure used last year.

11. Mr. Ken Wren explained that hotel room reservations are an organizational responsibility this year and distributed a list of hotels/telephone numbers to assist in finding lodging. He suggested that proximity to a subway station should be a major factor when selecting a hotel. The Sheraton-Washington Hotel (AUSA Convention site) is next to the Woodley Park Zoo subway station and that parking is seldom available and usually very expensive. Room reservations should accommodate the following planning dates: Set up starts 9 October; rehearsals start 12 October; exhibition is 14-15 Oct; and teardown/ship equipment 17-18 October. He then explained that requirements for uniformed soldiers to assist/participate in the exhibit should be submitted to him NLT 1 July for consolidation and eventual submission to ODCSOPS. (LTC Brown reminded everyone that they had a responsibility to adequately prepare any

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soldiers they employ. This includes briefing them about what to expect when TDY to the DC area and fiscal common sense.) The following information is required when requesting soldiers:

a. Personnel required (including NCOIC if desired), by component, rank, and MOS (and simulator used, if applicable)

b. When and where required (include any testing and rehearsals)

c. Uniform/equipment requirements

d. (if known) Providing unit/soldier names and providing unit POC and RM POC

e. Your AE3 POC

12. LTC Scott Fernald presented a briefing (Enclosure 5) on the Army Strategic Communications Plan and explained the importance of the targeted audience and making sure that AE3 is linked to Task Force XXI.

13. LTC Brown then solicited comments and opened the forum to general questions and discussions. Issues discussed included:

a. LTC Brown stressed the need to ensure continuity of component POCs (primary/technical). He asked if anyone objected to putting the POC roster on the web site and received no negative response; therefore, the roster will be added to the AE3 home page.

b. Attendees should start thinking about any lightboards that may be required. This will be an agenda item at the next IPR.

c. Everyone was asked to provide an up-to-date Technical Concept Plan to Ken Wren by Friday, 31 May. These will be posted on the FTP site and should be kept updated by the proponents.

d. Entity counts for the scenario are due to Mr. Bob Edwards, copy to Mr. Steve Manzi, NLT 31 May.

e. Uniforms for soldiers at the AUSA exhibit will be the BDU.

f. Decision was announced that all should plan for full blown testing to be conducted at the ARL facility in DC during the last two weeks of September, subject to inspection of the facility and determination of its capabilities.

14. The next In Process Review (IPR #6) will be conducted in Colorado Springs, 20-21 June. Meeting will start at 1300 hours on Thursday and finish at 1200 hours Friday.

a. Twenty-five government-rate rooms have been blocked at the in the Holiday Inn Express, (719) 591-6000 (ask for Sharon Creighton and tell her you are attending the LAM TF conference at ARINC). These rooms are blocked only until 10 June, so make haste if you want one. Directions to the hotel from the airport: Turn right (north) on Powers Boulevard at first stop light upon exiting the airport. Turn left (west) on Fountain Boulevard at second stop light. Turn left (south) on AeroPlaza Drive at first stop light. Holiday Inn Express entrance located on the immediate left after turning onto AeroPlaza Drive.

b. The meeting will be held at the main conference room at the ARINC facility, 1925 AeroTech Drive, Suite 212. ARINC is east of the Holiday Inn Express, across an empty field.

15. The following planning dates and locations were tentatively established for future IPRs (as needed):

IPR #7 - 23/24 July at Fort Leavenworth, Kansas
IPR #8 - 27/28 August at Washington, DC
IPR #9 - 24/25 September at Orlando, Florida

16. LTC Brown thanked everyone for their efforts and closed the IPR at 1125 hours.

17. Only Enclosures 1 and 2 are attached. Enclosures 3 through 5 will be posted on the project home page, linked to these IPR minutes. The AE3 Home Page is at http://204.7.227.75:443/AE3/.

18. POC for this action is LTC Brown. Recorder was Ken Wren, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

ENCLOSURE 2

Planned Agenda

1300 hrs, 20 May - 1200 hrs, 21 May Technical Working Group Meeting

21 May (Tuesday)

1250   Sign-in/settle-in/give copies of updated Concept Plan to Ken Wren

1300   Welcome, admin announcements, and
          opening remarks LTC Brown

1310 Status of Participants and Funding LTC Brown

1320 Terrain and Other Databases Mr. Jennings

1330 Theater Distributed Architecture/
Communications Plan Mr. Jennings

1400 Theater Visualization System Plan Mr. Helgesson/Mr. Novak

1420 Theater Products   Mr. Collins

1500 Theater Data Capture Plan LTC Fernald/LTC Smart

1530 Video Teleconferencing Plan Mr. Edwards

1600 Integration and Test Plan Mr. Edwards

1650   Summary of days accomplishments and plans/guidance
for the following morning's session LTC Brown

1700   Adjourn Tuesday's formal IPR session LTC Brown

1900-2100 Round-table working session (distributed portions) LTC Brown

22 May (Wednesday)

0800 Admin announcements/agenda update LTC Brown

0810 Stand-alone Display Update Briefings(in turn):

 Virtual Sand Table
 Scout Vehicle
 Unmanned Aerial Vehicle
 Virtual Maintainer
 Army Enterprise
 Tele-Medicine
 Virtual Retinal Display
 FP TOC (on-site display)

1020   Stand-alone Displays Design Mr. Helgesson

1035   CD ROM Update Mr. Steele

1050 Soldier Support/Billeting Requirements Ken Wren

1100 Open discussion of general issues LTC Brown

1130   Review of suspenses, next IPR schedule,
coordination, and milestones. LTC Brown

1150 Summary and closing remarks LTC Brown

1200 Close

IPR #6

SUBJECT: Minutes of In Process Review # 6 for Army Experiment III (AE3)

1. The sixth In Process Review (IPR#6) of Army Experiment III (AE3) was conducted 20-21 June 1996 at ARINC in Colorado Springs, Colorado. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 1300 hours, thanking ARINC for allowing us to use their facility. He introduced himself to the new attendees and welcomed all attendees to the meeting. He stated that the primary goal of this IPR was to continue cross-checking component plans and requirements against the master plan.

3. Mr. Ken Overturf (ARINC) gave administrative announcements (locations of phones, bathrooms, smoking area, copy machine, etc.)

4. LTC Brown then went over the following IPR objectives:

  a. Review layout of Cotillion Ballroom

  b. Cross-check that all stand-alones and on-site exhibits are integrated.

  c. Verify and consolidate all technical requirements, capturing accurate scope of work for exhibition construction.

  d. Review IDREN laydown and cross-check requirements. Fix suspense dates for due outs.

  e. Review status of theater products and cross-check data capture plan.

  f. Review project master timeline and the first draft of the integration master plan.

  g. Review updated/final technical concept plans.

  h. CD ROM laydown. Cross-check data capture plan.

5. Mr. Ulf Helgesson presented a laydown of the Cotillion Ballroom. He explained the rationale of the layout, the traffic flows, and "escape" plans. There will be three main areas: the midway (consisting of stand-alones), the theater, and the TOC. Final layout is dependent on the TOC layout (decision was announced on 21 June). He also discussed areas for location of support electronics. Working together, Ulf controls the layout of the ballroom and Lockheed Martin sorts out what

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goes behind the wall (support electronics). Once the layout is finalized, a copy will be posted to the AE3 Homepage.

6. Mr. Randy Noble presented the Theater Visualization Plan. He covered theater control, video sources, audio sources, live feed (VTC), projection staging, audio staging, and lighting. There was a lengthy discussion of how to handle losses of feeds or resynchronization because of audience questions, etc. During train up, everyone needs to prepare for interruptions - run battle drills. Decision was made that there would be a 3X3 screen configuration and five VTC sites. The distributed VTC sites are now:

  a. United Defense - San Jose, CA

  b. Dismounted Battlespace Battle Lab - Fort Benning, GA

  c. SIMITAR - Bozeman, MT

  d. RTOS - Fort Bliss, TX

  e. Joint Virtual Laboratory (JVL) - Fort Leavenworth, KS

7. Mr. Don Steele (CRC) presented an update on the CD ROM. He went through a rough draft to illustrate contents and structure. LTC Brown asked that the FP TOC not be listed as a stand-alone, but separately. This results in three experiment groups: stand-alone, distributed, and FP TOC. A button needs to be added to allow viewers to skip to that area or subject they are most interested in. The CD cover will be sorted out soon; it will probably be the same as the main screen on the CD. The Secretary of the Army will be asked to add comments/provide an interview. Need to add in Force XXI and AWEs as a section in the CD for information purposes (Army Strategic Communications Plan).

8. LTC Tom Smart distributed copies of the Data Capture Plan to those directly involved. He asked that all review and any comments or recommendations be made as soon as possible. He announced a meeting to be held that evening with Mr. Dennis Reeder, Mr. Bob Edwards, Mr. Randy Noble, Mr. Jim Calpin, and any other interested party to ensure the capture dates are sufficient and coordinated.

9. Mr. Bob Edwards (Lockheed Martin) presented the Master Integration and Test Plan. He went over the distributed theater components and had each participant confirm/change requirements. He then went over the stand-alone components. Mr. Edwards, Ms. Ginny To, and Mr. Joe Jennings are to determine exact contents of the test plan. LTC Brown stated that a published plan is due at the next IPR. Major test events are:

  a. IDREN Network Testing (Long Haul) at Aberdeen, MD, 5 - 9 August.

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b. Interim System Testing at Orlando OSF, Orlando, FL, 19 August - 11 September.

c. System Test and rehearsal at Aberdeen, MD, 18 September - 8 October.

d. AUSA Integration at Washington D. C., 9 - 11 October.

e. AUSA rehearsal and execution at Washington D. C., 12 - 16 October.

10. Stand-alone displays were reviewed, including Technical Concept Plans and Concept Briefings, lightboard standards, and power and equipment requirements. Mr. Helgesson, Mr. Kubik, and Mr. Manzi audited power and equipment requirements.

a. Virtual Sand Table (MAJ Jim Vaglia): Concerns about metal and lighting were addressed and resolved. LTC Brown asked MAJ Vaglia to contact him the week of 28 June reference a possible source for CrystalEyes. LTC Brown asked Lockheed Martin to clean and refurbish all old lightboards.

b. Scout Vehicle (Mr. Dave Kearney/Mr. John Wasson): There needs to be two separate projects - the scout vehicle simulator in the ballroom will be referred to as the Scout Vehicle project while the scout vehicle simulator in Bozeman, MT, will be referred to as the SIMITAR project. Separate updated Technical Concept Plans were provided by Mr. Jim King during the meeting. Texas Instruments is providing their own simulator infrastructure and Lockheed Martin will provide partition, tables, and chairs.

c. Unmanned Aerial Vehicle (Mr. Ralph Burkhart): An updated Concept Briefing is required. The UAV briefing should explain that TCSS (Tactical Control System Surrogate) is a joint Army/Navy program and the Predator is AF/Army. LTC Brown agreed to video tape/data log the theater piece - the issue is when to tape the video due to UAV's schedule. Mr. Collins agreed to look at reweaving the UAV in script item 46 (both video and words).

d. Virtual Maintainer (Mr. Kelvin Nunn): Provided updated Tech Plan.

e. Army Enterprise (LTC Pat McNiece): Provided new concept. Changes in design and equipment require redo of all specifications. MAJ Renner is to contact Mr. Helgesson and work through the redesign no later than 28 June.

f. Virtual Retinal Display (Mr. Mark Schulz): On track - no significant concerns.

g. Force Projection TOC (MAJ Al Gammons): Concept briefing and
Technical Concept Plan, including UAV power and equipment requirements,
is due 3 July. Issue concerning classification of ASAS was surfaced.
Decision was made to go with the TOC design worked out in El Paso.
Agreement was reached that previously paid funds to SSDC would be drawn
down to pay for exhibit construction and theater electronics.
Requirements were given to Mr. Helgesson and Mr. Randy Noble for
separate costing and inclusion in overall packages.

11. The regular IPR session was adjourned for the day at 1930 hours.

12. A special work session for Dismounted Infantry was convened in a
meeting room at the Holiday Inn Express, 2000 - 2130 hours. MAJ Burtnett
is to analyze his budget to determine if the planned DBBL participation
can be accomplished with the funds allocated and report back to LTC Brown
NLT 3 July.

a. CPT Ed Jennings (BBCL) presented and discussed a new script for the
dismounted infantry portion of the theater.

b. MAJ Rick Burtnett (STRICOM) promised to provide the MOUT database
to Ms. Ginny To (ARL) for her use in the Dynamic Terrain portion.

c. Mr. Paul Barham (NPS) promised a copy of the Dismounted Infantry Soldier model to Ms.
To by 4 July.

d. Agreement was reached on simulation courses of action. Updated
consolidated Technical Plan is due to Mr. Wren NLT 28 June.

e. A scenario terrain database work group will meet in conjunction with
the Joint Virtual Laboratory (JVL) visit and meeting on 17 July (see
paragraph 15b below).

13. The IPR was reconvened at 0730 hours, Friday 21 June. LTC Brown
reordered the agenda sequence for the day then discussed the next IPR.
The next In Process Review (IPR #7) will be conducted at Fort
Leavenworth, Kansas, 18-19 July. Meeting will start at 0900 hours on
Thursday and finish at 1200 hours Friday. Detailed information and
planned agenda will be provided in a separate correspondence (NLT 28
June).

14. Mr. Mike Collins updated the status of the theater script. He
passed out copies, explaining that the left side (shot list) is locked
in, but the right side (narrative) is still being "tweaked." The script
should match the capture plan; everyone was asked to make sure there are
no disconnects. The use of the term "2010" versus "21st Century" was
discussed. Minor word changes were discussed during the break.

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15. Distributed components were reviewed, including Technical Concept Plans and Concept Briefings, lightboard standards, and power and equipment requirements. Mr. Helgesson, Mr. Kubik, and Mr. Manzi audited power and equipment requirements.

  a. Force Projection TOC Synthetic Battlefield Environment (Mr. Dan Fugit): One all inclusive Technical Concept Plan will be submitted by 3 July. Went over layout and updated lightboard plan. LTC Brown disapproved the TOC lightboards. Technical requirements were verified with Lockheed Martin and power requirements were identified. A second Bozeman SIMITAR simulator was added to the connectivity plan. Went over the communications architecture. Security of classified systems is an area of concern and will require some firewalls and sanitation of data. FP TOC will integrate its test plan with the master test plan. Mr. Edwards will have terrain files ready for distribution NLT 15 July. Agreement on aviation simulation (ITEMS) was reached between Mr. Arnold and Mr. Fugit. Mr. Arnold will provide the software and Mr. Fugit will provide the hardware platforms.

  b. Corps Level Computer Generated Forces (CLCGF) (Mr. Jim Pittman): Discussed status of Joint Virtual Lab (JVL) set up and operational capabilities. SIMITAR needs to send people to Leavenworth for MCS/P and ASAS training. Need dummy SINCGARS for C2V mockup. VTC will be leased. Soldiers to populate the C2V are still a requirement. Chorwan terrain will be used. Need to look at the number of entities to ensure there are enough for realism of FP TOC play. The possible need was recognized for a "target" meeting and JVL visit (Fort Leavenworth) before the next IPR. This meeting/visit is tentatively scheduled to start at 1500 hours on Wednesday, 17 July. Details will be provided with the agenda for IPR #7.

  c. Streamlined Acquisition (Mr. Bob Hatton): Has all required models and database and will play in vignettes #2 and #3. Scenario input is due to Mr. Mike Collins NLT 25 June.

  d. Night Vision (Mr. Max Lorenzo): At issue was comparison of virtual versus thermal view. Terrain enhancements will be decided as soon as the threat laydown is designated. Mr. Pittman/Mr. Ratzenberger will sort out details of the threat laydown for the next IPR in conjunction with the "target" meeting mentioned above. Mr. Matt Arnold (PEO Aviation) will work with Mr. Lorenzo to determine the location of the special operations site.

  e. Log Anchor Desk (Mr. Allen Hardison): No technical problems. Don't need VTC from LAD at AMC HQ - will use video capture of screens and filmed "talking head."

  f. Simulation in training for Advanced Readiness (SIMITAR) (Mr. John

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Wasson): Working on ISDN line at Bozeman, MT. Other options are being examined. Need software and training for MCS/P. Mr. Pittman will coordinate software and equipment and Mr. Wren will coordinate with BCBL for the training.

g. Dismounted Battlespace Battle Lab/Dynamic Terrain (DBBL/DT) (MAJ Rick Burtnett/Ms. Ginny To): Consolidated Technical Concept Plan is due 28 June. Discussed scenario changes and technical requirements. Timeline was coordinated. Some theater screens may be used for supporting diagrams, text, etc. ARL needs a person in the Cotillion Ballroom to manage ARL on-site equipment unless other arrangements are worked out with Lockheed Martin.

16. Communications Architecture Plan: Mr. Bob Edwards collected and confirmed database source requirements. Mr. Joe Jennings updated efforts to finalize the Communications Plan. Ms. To went over physical connectivity nodes (DSI links) in use by the theater and the Logical Connectivity diagram. DBBL and ARC need to determine if T1 lines will be sufficient. Two issues remain to be resolved: 1) DBBL bandwidth, and 2) VTC meeting on Thursday, 27 June, to resolve connectivity of ARC to SSDC. Mr. Manzi will distribute information on this meeting. Meeting results are to be provided to LTC Brown on 28 June.

17. There will be twelve (12) lightboards located in the Cotillion Ballroom. Lightboards will be standardized with a headline/title (2 or 3 words) across the top with up to 4 subordinate bullets (maximum of 8 words each). The area below this will be divided (side by side) between the text body (maximum 120 word paragraph) and the graphic (roughly 4X5 proportion, 5 being the height). Distribution of lightboards is as follows:

a. Army Enterprise - 2

b. Virtual Sand Table - 1

c. Scout Vehicle - 1

d. Virtual Retinal Display - 1

e. Tele-Medicine - 2

f. Unmanned Aerial Vehicle - 1

g. Virtual Maintainer - 1

h. Theater queuing area - 1

i. Cotillion Ballroom (general) - 2

18. The meeting was opened for general discussion and questions. There
being no further business, LTC Brown thanked everyone for their efforts
and closed the IPR at 1145 hours, reminding everyone that the next IPR
will be at Fort Leavenworth, KS, on the 18th and 19th of July.

19. POC for this action is LTC Brown. Recorder was Ken Wren, at (913)
684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

IPR #7

SUBJECT: Minutes of In Process Review #7 for Army Experiment III

1. The seventh In Process Review (IPR #7) of Army Experiment III (AE3) was conducted 18-19 July 1996 at Eisenhower Hall at Fort Leavenworth, Kansas. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 0900 hours , 18 June, and welcomed all attendees to the meeting. He then went over the following IPR objectives:

    a. Confirm that all requirements are captured.

    b. Confirm that all component plans are complete.

    c. Confirm that all databases have been distributed.

    d. Confirm that all pending actions are coordinated.

    e. Finalize the Cotillion Ballroom layout.

    f. Finalize the Communications Architecture Plan.

    g. Finalize the Integration Master Plan and Timeline.

    h. Finalize the theater script.

2. Mr. Ulf Helgesson presented an updated laydown of the Cotillion Ballroom.

3. Mr. Phil Dykstra presented the Communications Architecture Plan. He stated that moving the testing to Orlando from ARL carries a little more risk. Mr. Dykstra and LTC Geddes will work the issue of a router purchase for UDP. A tour of DSI sites will be set up. Some sites still have not provided needed data (IP addresses, machines used, etc.)

4. Lockheed Martin representatives went over requirements and the Integration Master Plan. Mr. Steve Manzi defined the integration requirements of the theater, the FP TOC, and the stand-alone exhibits for the Long Haul and OSF tests and AE3 execution. He briefed the new dates and location for integration testing:

    a. IDREN Test, Aug 1 - 30, Local to Sites from ARL.

    b. Long Haul Testing, Aug 30 - Sep 11, Local to Sites from Orlando OSF.

c. System Test, Sep 12 - Oct 3, Local w/ Participants at OSF.

d. AUSA, Oct 9 - 17, Sheraton in D.C.

5. Mr. Manzi went over each proponent to verify dates and required events, equipment, and personnel. He also covered IG application host information (RAM and texture memory) requirements, database source requirements, and a database source requirements matrix.

6. Mr. Randy Kubik briefed the LAN (theater subnet).

7. Mr. Manzi discussed the shipping and move-in schedule. An updated version of that schedule/marking instructions is at Enclosure 2. LTC Brown made a decision to use consolidated shipping point for flow control into the Sheraton hotel. A more detailed movement plan will be published before the next IPR.

8. Mr. Randy Noble presented the theater visualization plan. He addressed theater hardware, control and source hardware, and video sources. He went over the VTC sites and system requirements. He then covered the same areas for the FP TOC.

9. Mr. Joe Jennings explained that the communications plan was not yet final as all requirements had not been validated. He stated that all requirements would be checked and verified during the round-robin check the following morning.

10. Mr. Mike Collins presented the theater script and storyboard and explained their relationship with the data capture plan. He then conducted an event-by-event walk-through of the storyboard as LTC Smart cross referenced the data capture plan and the script participants verified its accuracy or recommended changes. The updated script and data capture plan are now on the FTP site (204.7.227.75) as files 24JULscript.doc and 24JULdcp.xls, respectively.

11. Mr. Don Steele showed a beta version of the CD ROM, explaining its organization, giving examples of content, and showcasing its capabilities and search engine.

12. Due to the lateness of the hour, LTC Brown announced that the FP TOC presentation would be conducted as a special evening session. He then adjourned the regular IPR session for the day.

13. The evening session convened at 1730 hours in Wagner Hall. LTC Brown reviewed the FP TOC concept and discussed issues involved in the testing and setup of the TOC. Only those few items required for the testing at OSF will be shipped to Orlando. It was agreed that Lockheed

Martin would ship the TOC from Huntsville to the AUSA convention and
back. It was also agreed that integration testing would be from
Huntsville and a consolidated shipment package would be used.

14. LTC Brown reconvened the IPR at 0800 hours, Friday, 19 June. He
summarized the accomplishments of the prior day and went over the agenda
for the second day's activities. He informed the group that the Masters
of Ceremony for the theater will be LTC Phillip Macklin, LTC Neil Fay,
MAJ Shiela Taylor, and CPT Ed Jennings. He also announced the new e-mail
addresses for himself, Mike Collins, and Ken Wren that will go into
effect on 30 July:

    a. LTC Kirby Brown -- brownk@leav-emh1.army.mil

    b. Mike Collins -- collinsm@leav-emh1.army.mil

    c. Ken Wren -- wrenk@leav-emh1.army.mil

15. Mr. John Ratzenberger presented the threat laydown, identifying the
terrain locations upon which the scenario events would be played.

16. Mr. Ken Wren requested that all agencies provide (via e-mail) a list
of anticipated AUSA attendees NLT 1 August. Final changes and additions
must be submitted NLT 1 September. Ken will submit consolidated list of
names to AUSA, obtain completed exhibitor badges, and distribute them at
the Cotillion Ballroom during setup. Required information is:
Rank/Title, First Name, Last Name, and Organization. He then discussed
identified requirements for uniformed soldiers and training of those
soldiers. CPT Jones (BPV) may be able to provide an ASAS operator to the
JVL. A minimum of four more soldiers are required by the JVL. There is
a requirement for ten (10) individuals to receive MCS/P training: two
from Bozeman (SIMITAR), two from Texas Instruments, the four operating at
the JVL, and two TRAC personnel. Training is needed on MCS/P Beta
version, not the baseline version.

17. A Memorandum of Instruction for the completion of the AUSA '96 After
Action Report was distributed. (The last sentence in the first paragraph
of the MOI should be corrected to read "Suspense ... is 28 October,
1996." The "18" is a typo.) Selected individuals responsible for
submission of annexes and/or appendices were identified/verified:

    Annex C: Army Enterprise - MAJ Renner
    Annex D: Streamlined Acquisition - Bob Hatton
    Annex E: Land Warrior - CPT Jennings
       Appendix 1: Dynamic Terrain - Virginia To
    Annex F: Unmanned Aerial Vehicle - Steve Yerby
    Annex G: Scout Vehicle - Dave Kearney
    Annex H: SIMITAR - John Wasson

Annex I: Night Vision Simulation - Max Lorenzo
Annex J: Virtual Sand Table - MAJ Vaglia
Annex K: Virtual Retinal Display - Mark Shulz
Annex L: Virtual Maintainer - Kelvin Nunn
Annex M: Telemedicine - CPT Chand
Annex N: Theater
   Appendix 1: Visualization Plan - Randy Noble
   Appendix 4: Script & Storyboards - Mike Collins
Annex O: Force XXI (FP) TOC - MAJ Cash
   Appendix 1: Synthetic Battlefield Environment - Dan Fugit
   Appendix 2: Unmanned Aerial Vehicle - Steve Yerby
   Appendix 3: Log Anchor Desk - Allen Hardison
Annex P: CLCGF - Jim Pittman
   Appendix 1: Battlefield Planning and Visualization - CPT Jones
   Appendix 2: Aviation - Matt Arnold
Annex Q: Communications - Joe Jennings
   Appendix 1: IDREN - Phil Dykstra
   Appendix 2: Distributed Communications - Joe Jennings
Annex R: CD ROM - Don Steele

18. Mr. Wren explained how the round-robin would be set up and distributed check-off forms to the various proponent POCs. POCs rotated through each station:

   a. Station A - Reviewed the Cotillion Ballroom layout and exhibition service requirements, lightboards (when applicable), and all equipment and/or services required of Lockheed Martin.

   b. Station B - Reviewed simulations and theater support requirements and connectivity.

   c. Station C - Reviewed theater script and data capture plan (if applicable) and verified planned or completed inputs to the CD ROM.

   d. Station D - Reviewed the communications plan and coordinated all remaining planned actions and tests.

   e. Station E - Reviewed Technical Concept Plans, Concept Briefings, and funding status, as appropriate.

19. After all proponents had completed the round-robin, LTC Brown reconvened the general session. The meeting was then opened for general discussion and questions.

20. The next IPR (IPR # 8), previously planned to be held in Washington, D.C. will now be held in Orlando, Florida. Dates are unchanged from previously announced: 27-28 August. IPR #8 will convene at 1300 hours,

27 August (Tuesday), in the conference room of the Sheraton Hotel.
Evening work session(s), as usual, may be required. The IPR is
scheduled to close at 1200 hours on 28 August (Wednesday). The Sheraton
Hotel is located at the corner of Alafaya Road and E. Colonial Drive,
Orlando, Florida. The hotel phone number is (407) 658-9008.

21. There being no further business, LTC Brown thanked everyone for
their efforts and closed the IPR at 1150 hours.

22. If you are missing gold rimmed glasses (bifocals) in a brown case,
please contact Ken Wren to discuss the enormous reward for their safe
return.

23. Reminder: Lightboard illustrations are due to Mr. Ulf Helgesson NLT
14 August. Illustrations should be provided on SYQUEST cartridge (88mb
or less) and done in ADOBE Photoshop 3.0 or earlier (Power MAC File).
Lightboard text (in MSWord) is due NLT 7 August. In addition to the
above, whenever possible, original artwork (not a copy) should be
provided and will result in the best production results. Direct your
questions to Ulf at (818) 883-3772.

24. For planning purposes: IPR # 9 is now scheduled for 25-26
September, at the Sheraton Hotel in Orlando, Florida. This is one day
later than previously planned/announced.

25. POC for this action is LTC Brown. Recorder was Ken Wren, at (913)
684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil (after
30 July -- wrenk@leav-emh1.army.mil).

IPR #8

SUBJECT: Minutes of In Process Review #8 for Army Experiment III

1. The eighth In Process Review (IPR #8) of Army Experiment III (AE3) was conducted 27-28 August 1996 at the Sheraton Hotel in Orlando, Florida. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the meeting at 1300 hours, 27 August, and welcomed all attendees to the meeting. He stated that this was to be a "working" IPR rather than a "conceptual" one; to determine status and fine tune as necessary. He then went over the IPR objectives:

a. Finalize the OSF Integration and Test Plan.

b. Finalize the Cotillion Ballroom layout.

c. Finalize the Data Capture Plan.

d. Finalize the Communications Plan.

e. Finalize the Transportation Plan.

f. Finalize the Move-in and Set-up Plan.

g. Ensure component plans are in synch.

h. Discuss exhibit operation and administration.

2. LTC Brown went over the agenda, explaining that the Tuesday afternoon session would be primarily devoted to reviewing the main project plans in detail, the evening session would be devoted to reviewing each individual component via a series of stations, and Wednesday morning would be used to address execution of the project at the AUSA convention and issue resolution.

3. Mr. Ulf Helgesson provided an overview of the exhibit's physical arrangement in the Cotillion Ballroom.

4. Mr. Joe Jennings introduced the Communications Plan and explained who would be presenting each part of the plan.

    a. Mr. Phil Dykstra presented the Distributed Network status by site and component: (Indy, software, reachablility, accounts) for Fort Sill (D&SABL), Fort Bliss (RTOS), Fort Benning (DBBL), SSDC/ARC, Fort Leavenworth (JVL), Bozeman (SIMITAR), and San Jose (UDLP). He also reported on the status of communication hookups at the OSF, the AUSA

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site, and at the Army Research Lab. He stated that network control still needed to be fine tuned between ARL and Lockheed Martin.

   b. Mr. Randy Noble presented the status of VTC sites. The JVL is installed and operational. UDLP is scheduled to be brought online August 27-29; DBBL brought online September 3-5; and SIMITAR is scheduled for September 5-7. He addressed a possible problem with the Bozeman VTC's quality due to the fact that no TELCOM provides T1 lines in that area, only switched 56Kbs.

   c. Ms Stephanie Neuman went over the leased lines network status, including ISDN connectivity, T1 line connectivity, and DSI connectivity. She identified emplacement status, coordination, and on-site POCs for each connection.

   d. Mr. Randy Kubik presented a schematic of the local area network (LAN) that will be established in the Cotillion Ballroom. It will be comprised of three subnets: the Theater subnet, the FP TOC subnet, and the Stand-alones subnet.

   e. Mr. Bob Edwards provided an overview of the AUSA Show Communications. He covered telephones, 2-way radios, and teleconferencing (for backup connectivity). He also presented the separate internal communications networks set up for the theater and the FP TOC. He identified the following POCs for show communications:

Bob Edwards	Lead System Integration (System POC)
Randy Kubik	Network Communications
Mike Kalaf	Transportation, Move-in, Facilities
	Exhibit Structure
	Scenario Dry Runs
Tim Voss	SAFOR, DIS, Loggers
Steve Clay	ASAS, MCS/P, BPV
Stephanie Neuman	ISDN, DSI, T1 lines
	Stand-alone coordination
Jan Ksel	FP TOC
	CM and Data Files
Steve McCarter	Audio Visual
	Database and IGs
Blake Culpepper	Property Management/Logistics
John Campbell	Government Liaison

5. Mr. Bob Edwards presented the final Operational Support Facility (OSF) Integration and Test Plan. Phase 1 (OSF Preparation) is August 26-30, Phase 2 (point-to-point Testing) is September 3-13, and Phase 3 (Long Haul Scenario Testing) is September 17-October 4. Masters of Ceremony will also rehearse during the scenario testing on 1-3 October.

6. Mr. Randy Noble updated the status of the theater. There will be 29 sources (30 with ASAS), including the VTC stations. He presented the System Configuration Plan and went over the status of staging construction and hardware/software.

7. Mr. Mike Kalaf updated the Transportation Plan for inbound and outbound shipping. The complete Plan was distributed prior to the IPR, so he only needed to confirm selected information. He also distributed self-adhering pre-addressed shipping labels for containers being shipped to the staging facility (Wares Van and Storage in Manasas, VA). He then went over the Move-in/Set-up Plan. The actual move-in of equipment, construction of exhibit walls, and installation of power and communications will be a carefully orchestrated series of sequential deliveries and events commencing at 1400 hours, 9 October, and continuing around the clock until 2300 hours, 11 October. Technical rehearsals begin at 0800, 12 October.

8. Mr. Mike Collins provided status of the theater script and highlighted those actions still required to complete the Data Capture Plan. The following sites are scheduled for data capture (at the OSF) and should be up and capable of providing their specific scene requirements on the dates indicated:

   a. 12-13 Sep JVL, JVL/ITEMS, SIMITAR, Night Vision, BPV, and AcuSoft. VTC sites in JVL and Bozeman require soldier in BDUs.

   b. 18 Sep DBBL, ARL, and UAV (if not accomplished on 29 Aug)

9. The IPR was temporarily adjourned for the evening meal break, reconvening at 1900 hours for the scheduled round-robin checks:

   a. Station A Communications requirements and connectivity status.

   b. Station B Physical (Cotillion Ballroom) requirements, lightboards, move-in, and transportation.

   c. Station C Data Capture Plan and exhibitor badges.

   d. Station D Issues/problems resolution, status check of all ongoing actions, and individual scripts.

10. The evening IPR session was completed at 2220 hours.

11. The regular IPR reconvened at 0800 hours, Wednesday, 28 August. LTC Brown updated and reviewed the agenda for the morning's session.

12. Mr. Don Steele thanked those who had been prompt with their input, then showed portions of the CD ROM that had been completed (vignettes and

some experiments) and explained how the button bar along the bottom of
the frames can be used to call up "factoids" or additional information.

13. LTC Smart briefed on CD-ROM and Web Site security. Following a
briefing to GEN Reimer on the overall AE3 project and the CD-ROM, the CSA
asked that "someone in the business" ensure we were not "shooting
ourselves in the foot" with the CD. His concern was the quantity of
information it provided from a single source and the security of
individual web sites. His comment resulted from a monthly computer
incidents report provided by the Land Information Warfare Agency (LIWA).
LIWA is currently standing up as an INSCOM office.

   a. On the issue of quantity of information provided on the CD-ROM
the question is: Does the compilation of so much unclassified
information make the product sensitive? This is an OPSEC/CI issue and
will require a command decision following a review of the CD.

   b. LTC Smart told the participants that LIWA was provided a listing
of web sites to be included on the CD-ROM and they would, within their
current resource constraints, provide a vulnerability analysis of those
sites. LTC Smart recommended participants speak with their web managers
about requesting LIWA or DISA conduct a vulnerability assessment of their
site. POCs to request an analysis are: (LIWA) LTC Bob Vrtis or Brian
Purdy at (703) 706-1462/2266 or Rob Karas (800) 357-4231. If a site is
identified as having a security problem and that problem is not corrected
before the master CD is produced or the command does not acknowledge and
accept the risk, the site will be removed from the CD.

   c. LTC Smart handed out a list of LIWA recommendations for web
managers to help with site security. If you need a copy of these
recommendations, contact Ken Wren and he will fax you a copy.

14. LTC Brown reviewed all issues gleaned from the previous evening's
round-robin checks:

   a. Army Enterprise self-move-in.

   b. Aviation CD ROM input/data to AcuSoft.

   c. BPV SGI MAX impact machine.

   d. JVL 2nd T1 line status/MCS-P data pass.

   e. FP TOC two more Indys for M-Bone.

   f. Tele-Med lightboard pictures.

   g. UDP Indy M-Bone.

h. MITRE   John Madden Pen.

i. UAV   Payload view data logger.

15. LTC Brown then explained how the exhibit at AUSA would be operated:

a. Show times   Theater shows will normally be scheduled every half
hour beginning at 1100 hours on Monday, 12 October, and at 0900 hours on
Tuesday and Wednesday. The last theater show on each day will be
scheduled at 1900 hours. The FP TOC presentation will follow the theater
show, starting every half hour (on the hour and half hour). The last FP
TOC presentation on each day will start at 1930 hours. On Monday, there
will be no 1600 theater show, nor follow-on FP TOC show at 1630. These
times are blocked out for personnel breaks and equipment
repairs/tune-ups. On Tuesday and Wednesday, morning breaks will be
scheduled at 1100 hours (theater) and 1130 hours (FP TOC) and afternoon
breaks scheduled at 1600 hours (theater) and 1630 hours (FP TOC).

b. Theater seating   There will be three rows of 11 seats each and a
back row of 13 seats for a total of 46 seats. The back two rows of seats
(with best view) will be where VIPs are seated. Another 5 seats (closest
to the theater entry) will be reserved on a regular basis for late-coming
VIPs or unexpected "tag-alongs." Seats not reserved for VIPs will be
available to the general public.

c. VIP scheduling   All VIPs will be scheduled through the DAS
Strategic Communications Working Group (LTC Smart is AE3 POC). Visits
will be by show and integrated with the general public whenever possible.
VIPs will view stand-alone displays if waiting for the theater (because
the shows are on a set schedule). We will adjust if we find that this
plan does not work.

d. Masters of Ceremony (LTC Neil Fay, LTC Phil Macklin, MAJ Sheila
Taylor, MAJ Rick Platt, and CPT Ed Jennings)   MCs are responsible for
greeting the crowd at the theater entrance, narrating the theater show,
emptying the crowd from the theater and loading them into the FP TOC,
answering questions immediately after the FP TOC presentation, exiting
the crowd to the stand-alone area, and being available for individual
questions. MCs will rotate, normally taking each 4th theater
presentation.

e. Visitor Flow   Visitors will enter the Cotillion Ballroom and
visit the stand-alone displays until theater show times (on the hour and
half hour). Scheduled VIPs will be escorted to the reception area where
a VIP handler will pick up the group and give a quick overview of the
exhibit before leading the group to the show. At the designated show
time, the theater doors will be opened and the crowd ushered in. Five

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minutes after the doors are opened, the theater presentation will commence and last for 20 minutes. At the conclusion of the theater presentation, the MC will lead the crowd from the theater into the FP TOC (5 minutes available for transition) and introduce the FP TOC spokesperson. The FP TOC presentation will begin on the hour/half-hour and last 20 minutes. At the conclusion of the FP TOC presentation, the MC, in conjunction with the FP TOC spokesperson, will answer any questions (5 minutes available) and then lead the crowd out of the FP TOC area in time for the follow-on crowd and its' MC from the just completed theater presentation to move into the FP TOC area. Those exiting the FP TOC presentation are then free to start/finish their viewing of the stand-alone displays.

   f. Cotillion Ballroom Rehearsals   Scheduled as follows:

     Friday 11 October:
       0900-1600   MC training and rehearsals

     Saturday 12 October:
       1400   Full scope rehearsal (untimed)
       1900   Full Dress rehearsal (untimed)

     Sunday 13 October:
       1300 - 2000   Timed Full Dress rehearsals
       1530   CSA Walk-through (tentative time)
       1800   Escort orientation

   g. LTC Brown has established an operational on-site organization for control of activities in the Cotillion Ballroom:

     VIP Handlers: LTC Smart, LTC Fernald, LTC Geddes, Mr. Joe Jennings, Mr. Jim Calpin, and Bill West. (LTC Smart will also be the VIP scheduler.)

     Operations Cell (firemen): Ken Wren, Mike Collins, and John Campbell

     Reception Desk: Sue Powers

     Technicians: Bob Edwards and his cast of thousands

   h. The operations cell will always be in contact (via walkie-talkies) with LTC Brown and Bob Edwards. Anyone needing to contact either LTC Brown or Bob Edwards can do so through any member of the Operations Cell.

   i. Sue Powers (at the Reception desk) will assist visitors, record/pass messages, and store a small supply of CD ROMS. She will be

the POC for Exhibitor Badge issue and maintain the AE3 notification
roster. All POCs should report their place of lodging and telephone
number to Sue as soon as possible after arriving in Washington D.C.

j. Daily Meetings Primary POCs only will meet daily at 15 minutes
prior to start time. There will also be an all-hands meeting at 2000
hours daily. Meeting may be held in the theater and involve remote sites
(VTC).

k. Security Hotel guards will come on duty at 1800 hours Friday,
11 October. Once guards are posted, access to the convention area will
be by badge only. AE3 badges will be distributed starting on Thursday,
10 October. Special badges allowing escort of unbadged visitors will be
available as required from Ken Wren.

l. Breaks and Storage Areas Individual displays/exhibits must
coordinate their own personnel break schedules. A break area and an area
for storage of personal gear will be designated in or near the Cotillion
Ballroom.

m. Filming and Photos Still photo and video shots will be taken
after the CSA's walk-through on Sunday, 13 October. There will be other
occasions when photos will be taken during the exhibit's operation, but
there will be no late-night after-hours photo or filming sessions.

n. Dress Code Starting at 0800 hours Monday, 14 October, through
COB Wednesday, the following dress requirements will be in effect: MCs,
VIP escorts, and display spokespersons will wear Class A uniform
(prepared to go to Class B if so directed); civilians will wear coat and
tie; working technicians will wear casual-business attire; and soldiers
participating in the exhibit will wear the BDU. Common sense will rule
requests for exception should be directed to LTC Brown.

o. Rules of Conduct Displays are to be manned at all times during
posted operating hours; there will be no visible eating or drinking in
the Cotillion Ballroom by AE3 personnel during posted operating hours;
 smoking will be in designated areas only (outside on loading docks); no
personal gear should be visible in the display area; and there should be
no unnecessary loitering of non-visitors in the display areas.

16. LTC Brown then opened the floor to general discussion of issues and
answered all questions. The following general guidance was given: After
you bring up your networks (especially the M-Bone), leave them on.

17. Dates for the next IPR (#9) are as previously announced: 25-26
September. IPR #9 will convene at 1300 hours, 25 September (Wednesday),
in Lockheed Martin's Operational Support Facility (OSF), Orlando,
Florida. Evening work session(s), as usual, may be required. The IPR is

scheduled to close at 1200 hours on 26 September (Thursday). If you have
not yet faxed a visit request (for an access badge to the OSF) contact
Ken Wren and he will fax you a copy of the form that must be completed
and faxed to Lockheed Martin to obtain the access badge. If you plan to
stay at the Sheraton Hotel located at the corner of Alafaya Road and E.
Colonial Drive, the hotel phone number is (407) 658-9008. The number for
the Holiday Inn - UCF (12125 High Tech Ave) is (407) 275-9000.

18. LTC Brown announced that there is no requirement for POCs
representing the following displays/areas to attend IPR #9:

    Depth & Simultaneous Attack Battle Lab
    Army Enterprise
    Log Anchor Desk
    Scout Vehicle
    Tele-Medicine
    Unmanned Aerial Vehicle
    Virtual Maintainer
    Virtual Retinal Display

19. IPR #9 will be devoted to reviewing the testing and integration of
the various pieces that comprise the Theater and the FP TOC. This IPR
will be conducted in the OSF high bay. Those stations hooked into the
VTC will participate by VTC.

20. There being no further business, LTC Brown thanked everyone for
their efforts and closed the IPR at 1045 hours.

21. Reminder (for stand-alones only): If you have not already provided
a copy of your planned display "pitch" to LTC Brown, you need to do so
now.

22. POC for this action is LTC Brown. Recorder was Ken Wren, at (913)
684-4042, DSN 552, FAX 3566, e-mail: wrenk@leav-emh1.army.mil.

IPR #9

SUBJECT: Minutes of In Process Review #9 for Army Experiment III

1. The ninth In Process Review (IPR #9) of Army Experiment III (AE3) was conducted 25-26 September 1996 at and from Lockheed Martin's Operational Support Facility (OSF) in Orlando, Florida.

2. LTC Kirby Brown opened the meeting at 1300 hours, Wednesday, 25 September, and explained to the participants how and from what locations the various portions of the IPR would be conducted.

3. A video teleconference was then conducted in the OSF high bay with the Joint Virtual Lab (JVL) at Fort Leavenworth, Kansas, the Dismounted Battlespace Battle Lab (DBBL) at Fort Benning, Georgia, and the SIMITAR project at Bozeman, Montana. This conference was held in the presence of the Lockheed Martin integrators and all participants were given a chance to report the status of their integration and identify any problems being encountered. General consensus was that everything was moving toward successful completion and only minor "tweaks" were needed.

4. LTC Brown also teleconferenced via video with the UDLP (Streamlined Acquisition) in San Jose and discussed their status and rehearsal.

5. A teleconference call was placed via speaker phone from an OSF conference room to MAJ Al Gammons (FP TOC) and Mr. Dan Fugit (SSDC MD-BIC). Mr. Mike Kalaf was present to discuss the move-in/out plan and Mr. Bob Edwards handled integration issues. There was some initial confusion because the FP TOC was also using the same line to conduct rehearsals and testing, but the FP TOC agreed to move to another line while the IPR was being conducted. Problems with the DSI node were identified. LTC Brown asked Mr. Phil Dykstra and Ms Virginia To (both at ARL) to develop recommended solutions and report same the following day.

6. A schedule for the rehearsals to be conducted 30 September through 3 October was published and distributed to all participants on site and via fax to the distributed locations. The rest of the day was devoted to fine tuning the script, theater integration, theater rehearsals, and working off-line to address individual problems as they arose.

7. The IPR reconvened at 0830 hours the following morning (Thursday, 26 September). Mr. Randy Noble updated the status of theater integration and Mr. Mike Kalaf presented a report on the latest plans for transportation, move-in, and move-out. The move-out will be particularly challenging due to the amount and configuration of equipment that must be removed from the Cotillion Ballroom in a very short span of time. LTC Brown adjusted the theater and FP TOC show times as follows: The theater will conduct two showings on Wednesday from 1800-1900 via

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"data-logger"/video tape, closing at 1900 hours; the FP TOC will conduct
its last showing at 1830 closing at 1900 hours; the stand-alone displays
will close on or about 1930 hours. An all hands meeting will be
conducted at 1935 hours with tear-down commencing at 2000 hours. This
change provides a high probability of meeting current hotel NLT move-out
schedule by freeing up much of the theater and FP TOC electronic
equipment for earlier tear-down and preparation for transport. It was
generally agreed that this would make it possible, but not easy, to meet
the move-out deadline.

8. A teleconference was conducted via speaker phone with Mr. Phil
Dykstra and Ms Virginia To at ARL. Mr. Joe Jennings, Mr. Randy Kubik,
Mr. Bob Edwards, and Ms Stephanie Neuman were on site. Several possible
solutions to the DSI problems being encountered by the FP TOC were
discussed and a way to reconfigure and reroute data was identified as the
best solution. Mr. Dykstra accepted responsibility to resolve the
problem.

9. A teleconference was conducted with the stand-alone displays to
report/update status and clarify any issues or problems encountered.
Unmanned Aerial Vehicle (UAV) and Virtual Sand Table (VST)
representatives participated on site. Army Enterprise, Virtual
Maintainer, and Scout Vehicle participated via the teleconference line.
Mr. Ulf Helgesson was also on line. Tele-Medicine and Virtual Retinal
Display (VRD) did not participate, but unresolved issues or problems are
not anticipated. Everyone was in consonance with the transportation and
move-in/out plans.

10. The teleconference line was left open for any other AE3 participants
to identify and/or discuss issues. There being no further input
received, the line was closed and the IPR adjourned at 1145 hours.

11. LTC Brown reminded all participants that everyone must make an extra
effort to be online and ready for next week's full-up rehearsals (1-3
Oct) and especially during setup and on-site execution during the period
10-16 October. It is also not too early to start working on your input
to the AAR.

12. Washington D.C. rehearsal schedule will be put out via M-Bone and
e-mail during the setup time. It is imperative that everyone be on
active standby during the period 9 and 10 October. Stay ready.

13. POC for this action is LTC Brown. Recorder was Ken Wren, at (913)
684-4042, DSN 552, FAX 3566, e-mail: wrenk@leav-emh1.army.mil.

Monday's Schedule

Enter Theater   Theater Show   Exit Theater   TOC Show   Show Over

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1100	1105	1125	1130	1150
1130	1135	1155	1200	1220
1200	1205	1225	1230	1250
1230	1235	1255	1300	1320
1300	1305	1325	1330	1350
1330	1335	1355	1400	1420
1400	1405	1425	1430	1450
1430	1435	1455	1500	1520
1500	1505	1525	1530	1550
1530	1535	1555	1600	1620
BREAK				
1630	1635	1655	1700	1720
1700	1705	1725	1730	1750
1730	1735	1755	1800	1820
1800	1805	1825	1830	1850
1830	1835	1855	1900	1920
1900	1905	1925	1930	1950

MIDWAY (Stand-alones) Closes o/a 2030

Tuesday's Schedule

Enter Theater	Theater Show	Exit Theater	TOC Show	Show Over
0900	0905	0925	0930	0950
0930	0935	0955	1000	1020
1000	1005	1025	1030	1050
1030	1035	1055	1100	1120
BREAK				
1130	1135	1155	1200	1220
1200	1205	1225	1230	1250
1230	1235	1255	1300	1320
1300	1305	1325	1330	1350
1330	1335	1355	1400	1420
1400	1405	1425	1430	1450
1430	1435	1455	1500	1520
1500	1505	1525	1530	1550
1530	1535	1555	1600	1620
BREAK				
1630	1635	1655	1700	1720
1700	1705	1725	1730	1750
1730	1735	1755	1800	1820
1800	1805	1825	1830	1850
1830	1835	1855	1900	1920
1900	1905	1925	1930	1950

MIDWAY (Stand-alones) Closes o/a 2030

Wednesday's Schedule

Enter Theater	Theater Show	Exit Theater	TOC Show	Show Over
0900	0905	0925	0930	0950
0930	0935	0955	1000	1020
1000	1005	1025	1030	1050
1030	1035	1055	1100	1120
BREAK				
1130	1135	1155	1200	1220
1200	1205	1225	1230	1250
1230	1235	1255	1300	1320
1300	1305	1325	1330	1350
1330	1335	1355	1400	1420
1400	1405	1425	1430	1450
1430	1435	1455	1500	1520
BREAK				
1530	1535	1555	1600	1620
1600	1605	1625	1630	1650
1630	1635	1655	1700	1720
1700	1705	1725	1730	1750
1730	1735	1755	1800	1820
1800	1805	1825	1830	1850
1830	1835	1855		

MIDWAY (Stand-alones) Closes o/a 1935