

VR in the Field: Hunter Warrior & JCOS/MCM

Situational Awareness Using the Virtual Reality Responsive Workbench

David Tate
Naval Research Laboratory
David.Tate@nrl.navy.mil



Marine Corps Sea Dragon Program

Virtual Reality Responsive Workbench



Workbench capabilities:

- Interactive battle planning and management
 - 3D God's eye view of a large battlespace.
 - Intuitive interaction with realistic 3D icons of vehicles, units, weapons, sensors, etc.
 - Near real time data feeds.
- Improved situational awareness through visualization
 - ARC Digital Raster Graphics (ADRG) 1:50,000 texture draped over the 3D terrain data.
 - Icon positions automatically track position reports.
- Intuitive user interface
 - Panning and zooming are accomplished by “grabbing” the terrain with a “laser pointer”.
 - Object icons can be moved with wand.
 - Status information is displayed on tabletop “heads-up display”



Hunter Warrior Advanced Warfighting Exercise

Virtual Reality Responsive Workbench

- Workbench was used in the Hunter Warrior Advanced Warfighting Exercise (AWE), March 1-14, 1997
- Special Purpose Marine Air Ground Task Force, Experimental (SPMAGTF(X)) used the workbench for planning and visualization of the battlespace.
- Digital Terrain Elevation Data (DTED) is used for creating the 3D terrain map.
- ARC Digital Raster Graphics (ADRG) used for texture overlay
- 3D icons represent tanks, trucks, squads, targeted areas of interest, etc.
- A “laser pointer” device creates a highly interactive, intuitive selection tool.

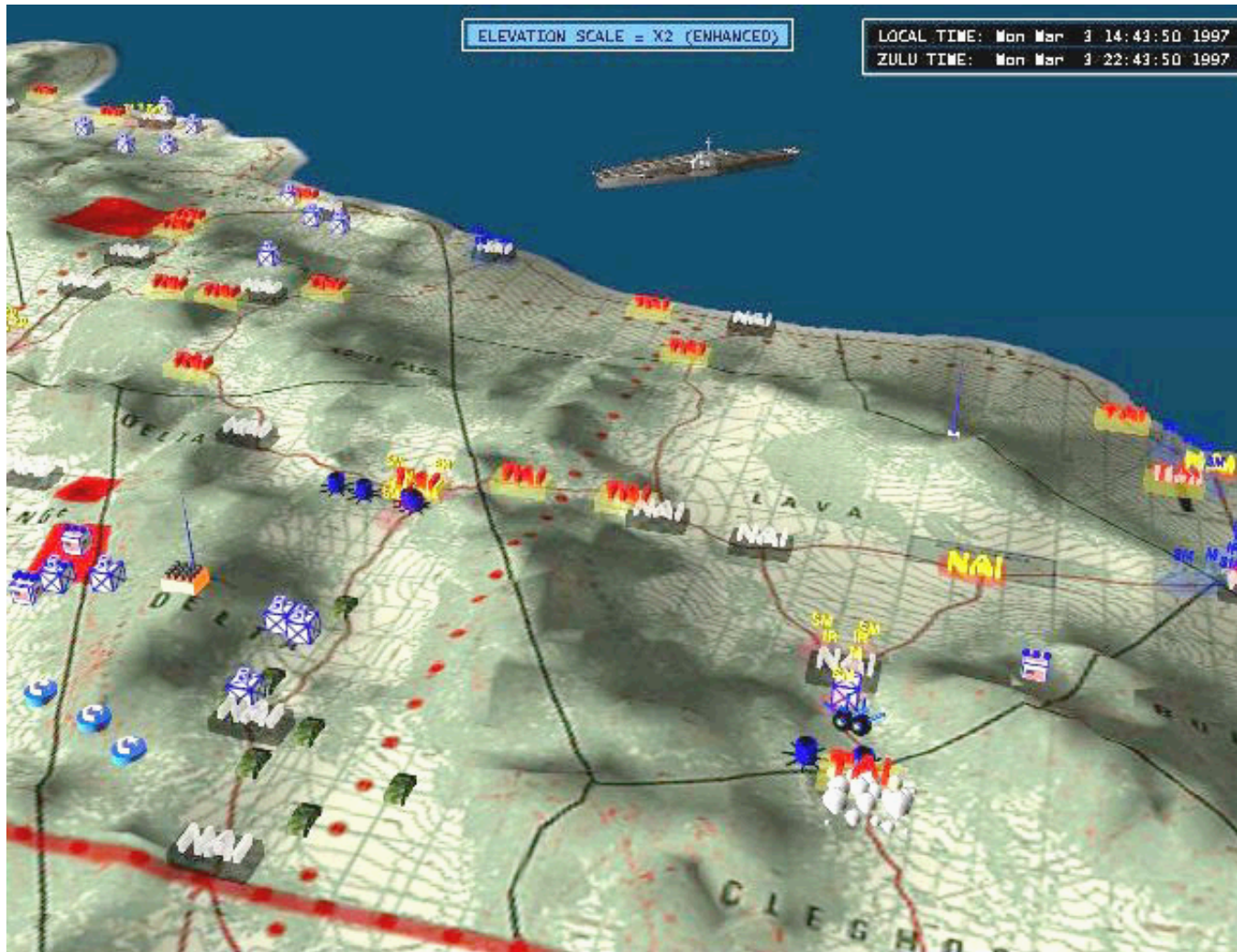


SPMAGTF(X) Commanding Officer Col. O'Leary receives training on the Workbench at the Enhanced Combat Operations Center in preparation for the Hunter Warrior exercise.



Hunter Warrior Scenario

Virtual Reality Responsive Workbench



Exercise Date
3 March 1997

Items shown:

- DTED terrain with ADRG overlay
- Named Areas of Interest
- Targeted Areas of Interest
- Cache Areas
- Sensors (IR, seismic, acoustic)
- Squads, platoons, headquarters
- Humvees, trucks, tanks
- Light armored vehicles
- Mine fields
- Wide area munitions
- Rubble



Hunter Warrior Scenario (Close-up)

Virtual Reality Responsive Workbench



Exercise Date

3 March 1997

Items shown:

- Humvees, trucks, tanks
- Light armored vehicles
- Squads (friend & foe)
- Headquarters
- Radio towers
- Named Areas of Interest
- Targeted Areas of Interest
- Sensors (seismic & magnetic)



CNN Report

Virtual Reality Responsive Workbench

March 8, 1997 – Military sees high-tech future



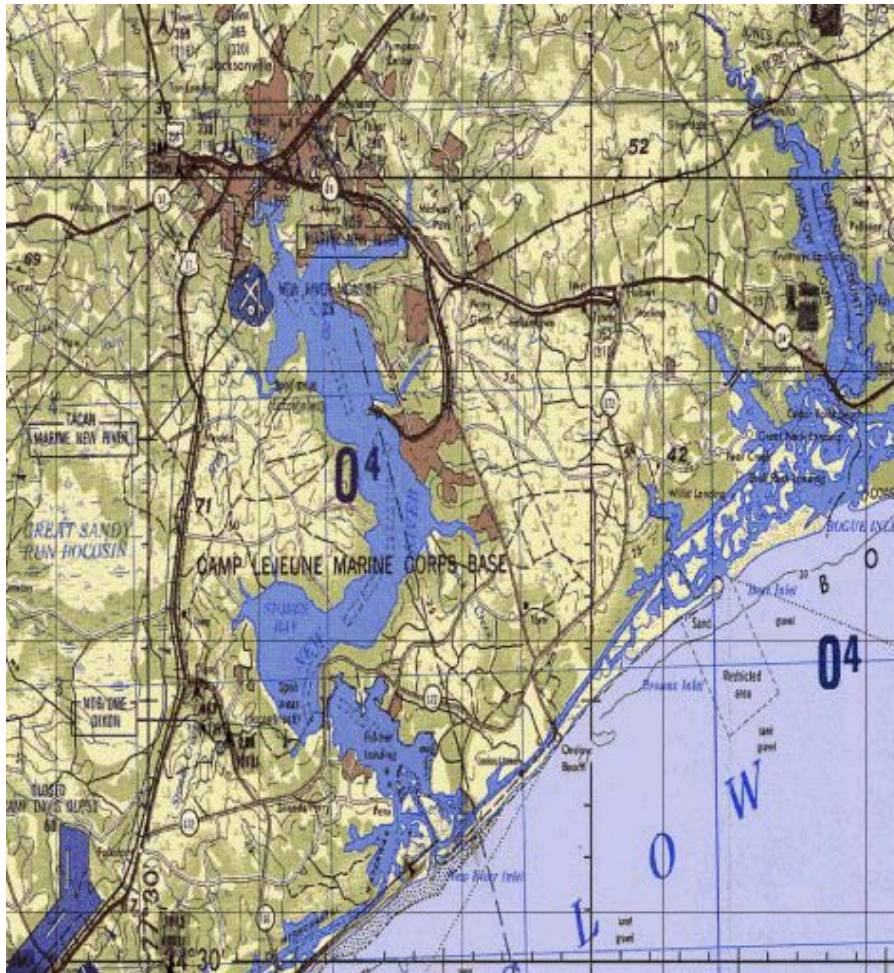
<http://www.cnn.com/US/9703/08/future.wars/>

Naval Research
Laboratory



Mine Countermeasures ACTD Demonstration I

Virtual Reality Responsive Workbench



U.S. Atlantic Command (USACOM) Joint Task Force Exercise (JTFEX-97-3) Amphibious Assault Scenario

- Camp Lejeune, NC, 8/18/97 - 9/5/97.
- Scenario includes shallow-water, beach and land emphasis.
- Nine novel systems participating.
- Joint Countermine Operational Simulation (JCOS) provides synthetic forces (ModSAF).
- Navy, Marine, and Army forces simulated.
- Combination of live and synthetic forces.

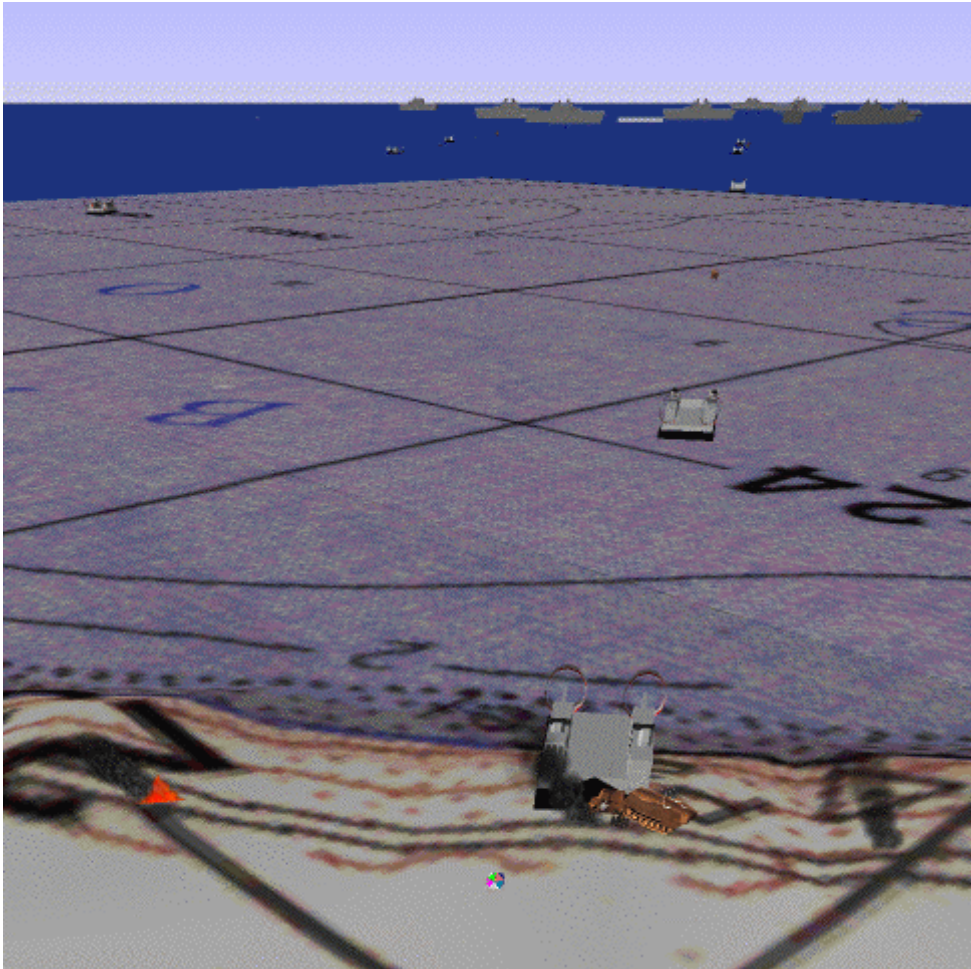
VRRWB Role

- Workbench is used for visualization of JCOS simulation of amphibious assault.
- Dynamic position updates provided from Distributed Interactive Simulation (DIS) broadcast packets.



JCOS Scenario

Virtual Reality Responsive Workbench



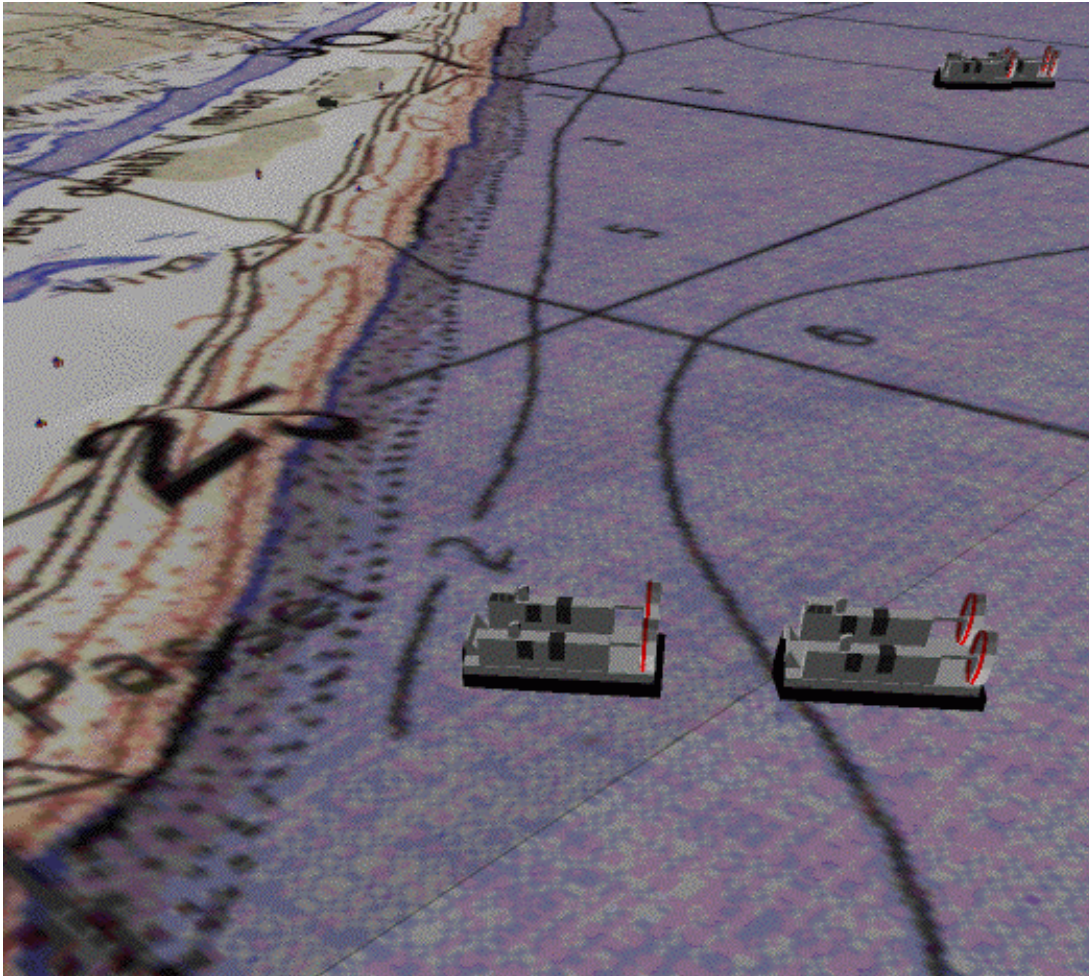
Simulated Amphibious Assault Scenario

- Offshore battle group.
- Underwater mine clearing performed from air and sea with novel ACTD systems.
- Beach assault from LCACs
- Vehicles disembarking from LCACs
- Land mine clearing operations performed from air, land vehicles, and dismounted infantry with novel ACTD systems.
- Weapons detonations simulated and visualized.



JCOS Scenario (Close-up)

Virtual Reality Responsive Workbench



Simulated Amphibious Assault Scenario

- Two assault lanes have been cleared of underwater mines (includes shallow water and surf zone areas).
- LCACs approaching beach.
- Mines and mine fields located and identified using novel ACTD systems.



Development Team

— Virtual Reality Lab —

**Robert Doyle, James Durbin, Larry Rosenblum,
Christopher Scannell, Ed Swan, David Tate**
Naval Research Laboratory

John Crowe, Robert King
Daniel H. Wagner Associates

Bradley Colbert, Eddy Kuo
ITT Systems & Sciences Corporation

LCDR Tony King
Navy Computer and Telecommunications Station, Washington

Student Interns from:
Catholic Univ. , Elizabeth City State Univ., Georgia Tech, Iowa State,
Michigan State, Univ. of Missouri, State Univ. of New York

For more information:
<http://www.ait.nrl.navy.mil/vrlab>
<http://www.cnn.com/US/9703/08/future.wars/>

Naval Research
Laboratory

