

Simulation and Analysis Group

Modeling and Simulation Capabilities

Simulation and Analysis Group

- The mission of the Simulation and Analysis Group, ACB-330, is to conduct research to validate new aviation concepts, technologies, and system capacity issues using modeling & human-in-the-loop simulation.
- Products resulting from efforts are used in support of investment decision making for NAS modernization.

Simulation and Analysis Group

- **Real-Time (Human-in-the-Loop) Simulation**
- Fast-Time Simulation

Real-Time Simulation

Infrastructure

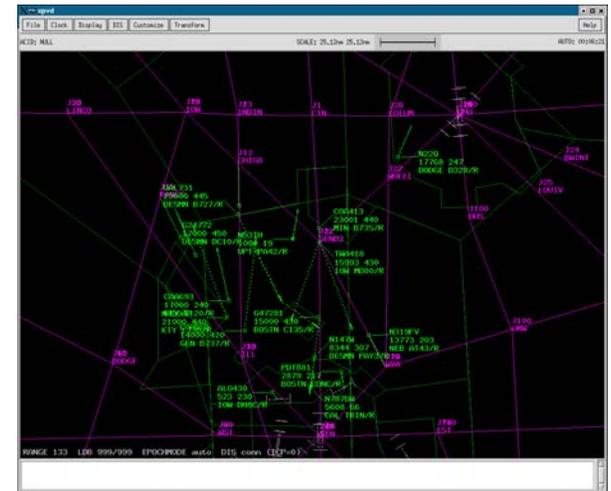


- EI²F – En Route Integration & Interoperability Facility
- DSR – Display System Replacement
- STARS – Standard Terminal Automation Replacement System

Real-Time Simulation Infrastructure



General Aviation
Cockpit Simulation
Facility



Traffic Generation Facility



AFTIL Lab

Real-Time Simulation Partnership & Simulation



Future Flight Central – NASA Ames
- DFW Airport Study

University of Alaska Anchorage
-Advanced Controller Training in a
Virtual Environment (ACTIVE-1)



Real-Time Simulations

- **Domestic Reduced Vertical Separation Minimum Simulation-Procedures**
 - 3 Simulations
 - Examined Controller Procedures
- **Small Aircraft Transportation System (SATS) High Volume Operations (HVO) Simulation:**
 - 3 Simulations
 1. En route using ZDC airspace.
 2. Terminal simulation using the PHL North Arrival sector(s).
 3. En route using ZDC airspace with link to NASA Pilot Lab
- **GPS Outage En Route Study (GOERS):**
 - Study to examine the effects of a GPS outage in En route airspace.

Real-Time Simulations

Aircraft Landing Lights Enhance Runway Traffic Safety (AL2ERTS):

- Investigate the safety effects of standardizing the use of aircraft lighting during taxi operations.

• **Advance Controller Training in a Virtual Environment-1 (ACTIVE-1):**

- The simulation investigated the effectiveness of using a high fidelity tower simulator as a training tool/technique for air traffic controllers.

• **Copter Instrument Landing System (Copter ILS):**

- The purpose was to validate a procedure for helicopters to fly Category II approaches in Category I conditions to airports with CAT I lighting equipment.

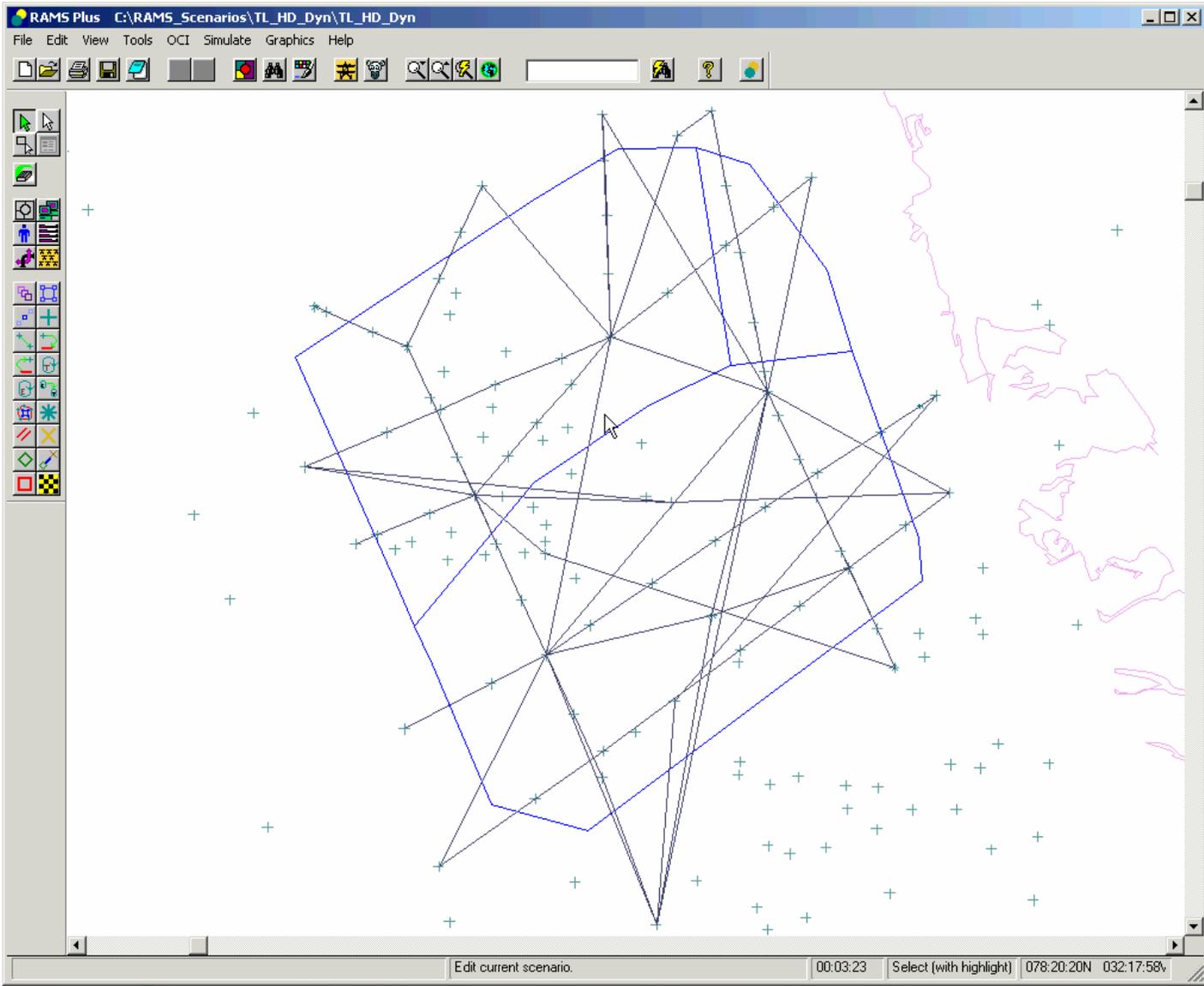
• **“Climb Via” Departure Procedures:**

- Analysis of Controller Phraseology for RNAV SID routes

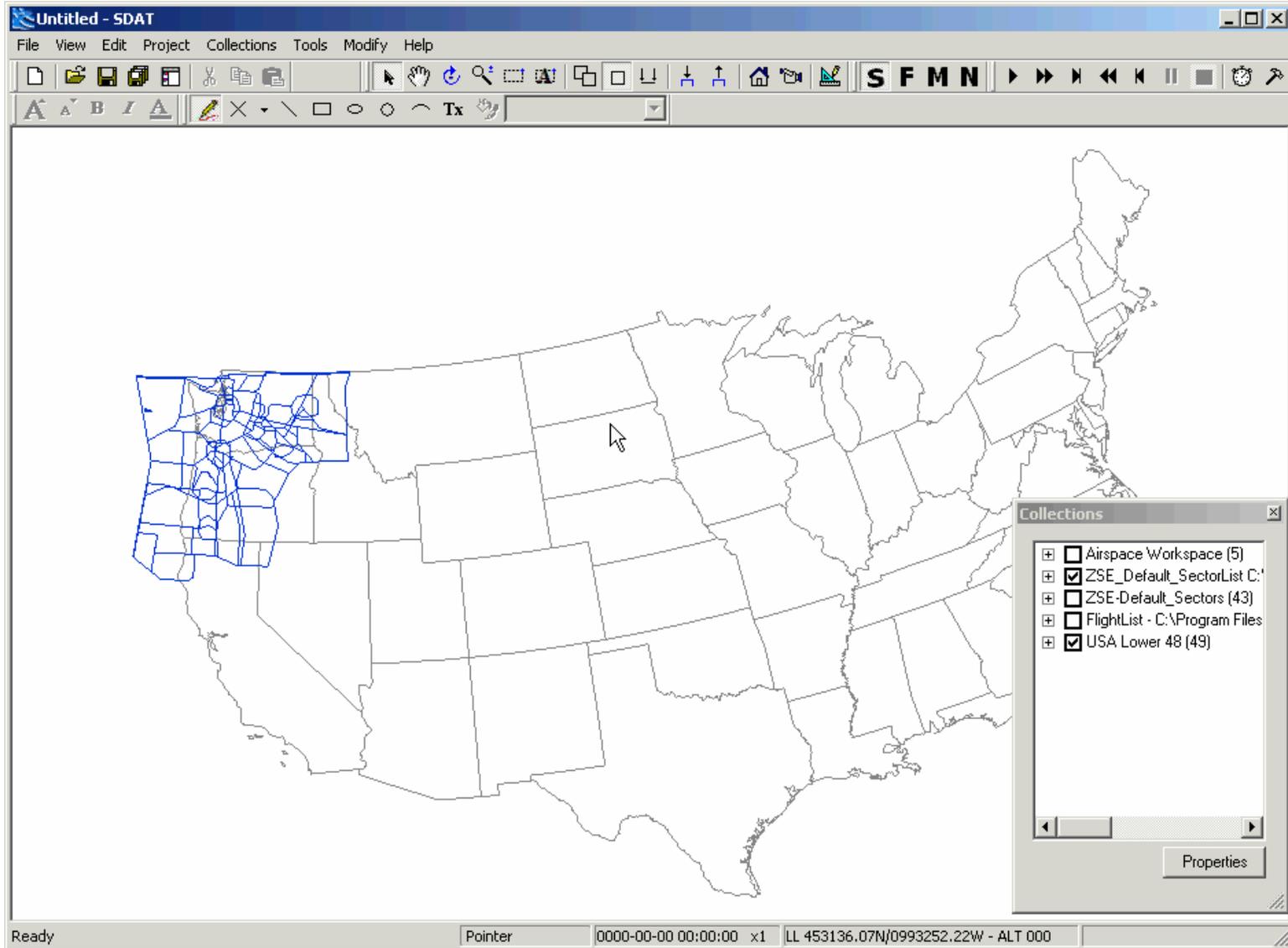
Simulation and Analysis Group

- Real-Time (Human-in-the-Loop) Simulation
- **Fast-Time Simulation**

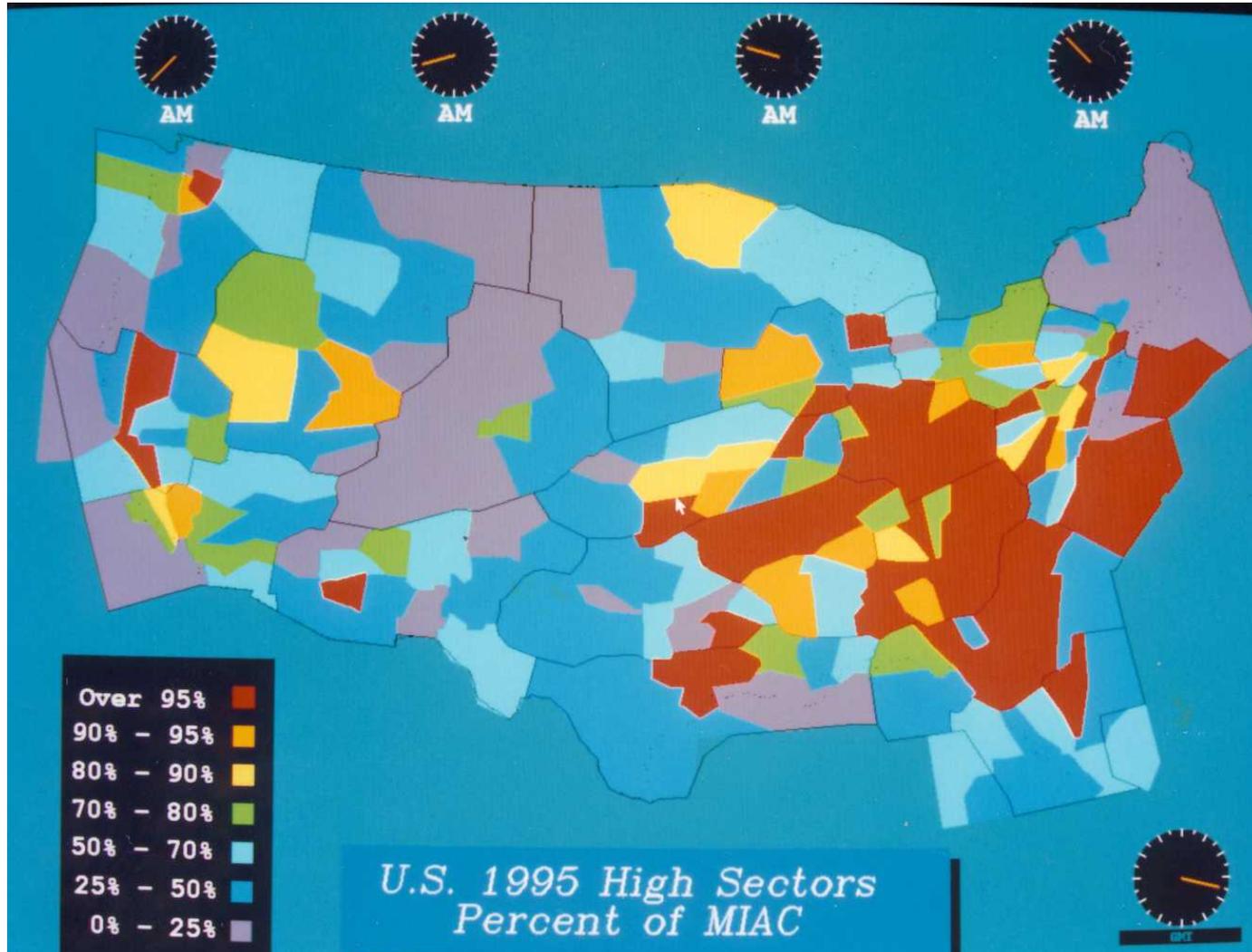
RAMS Demonstration



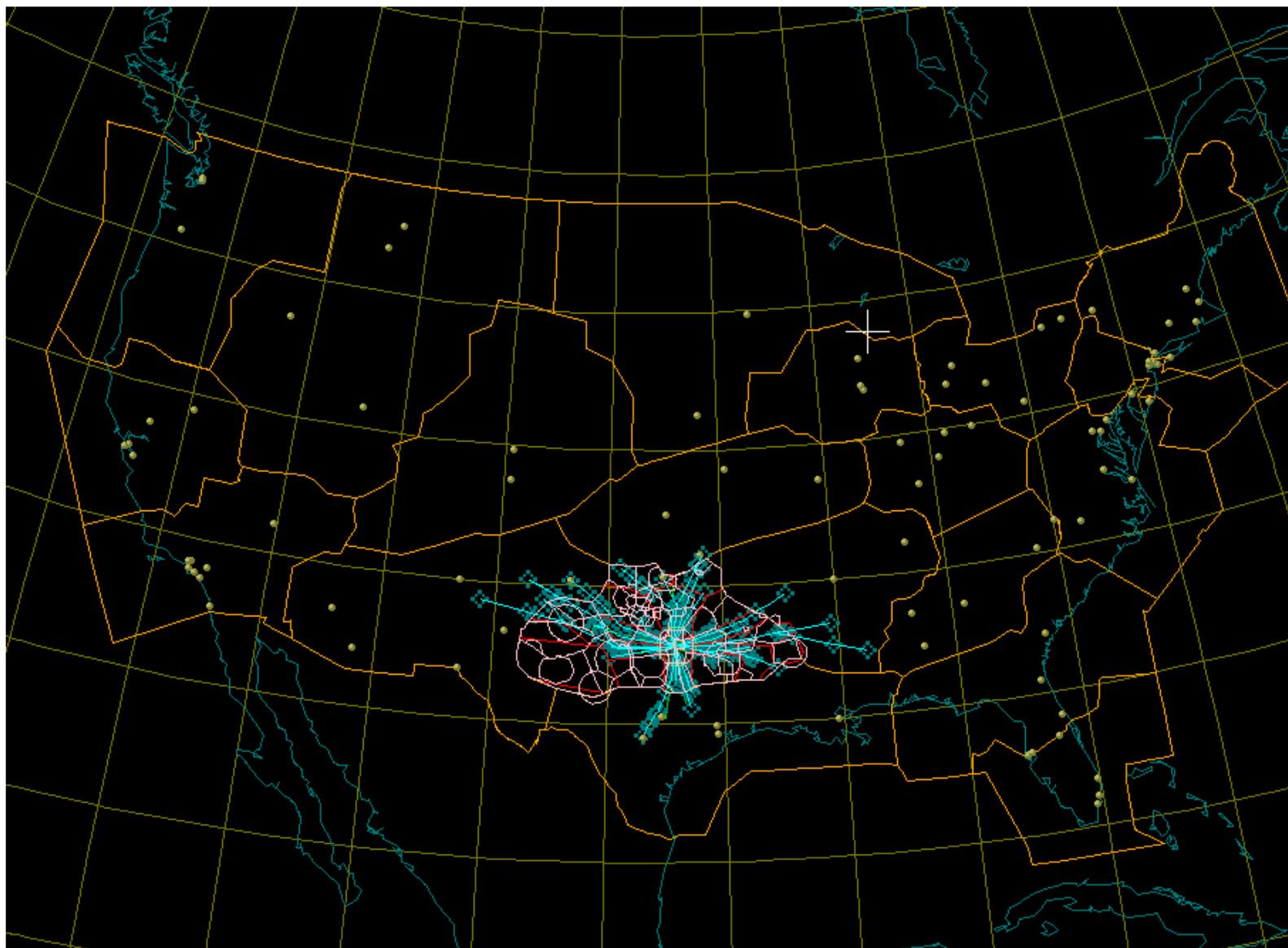
SDAT Demonstration



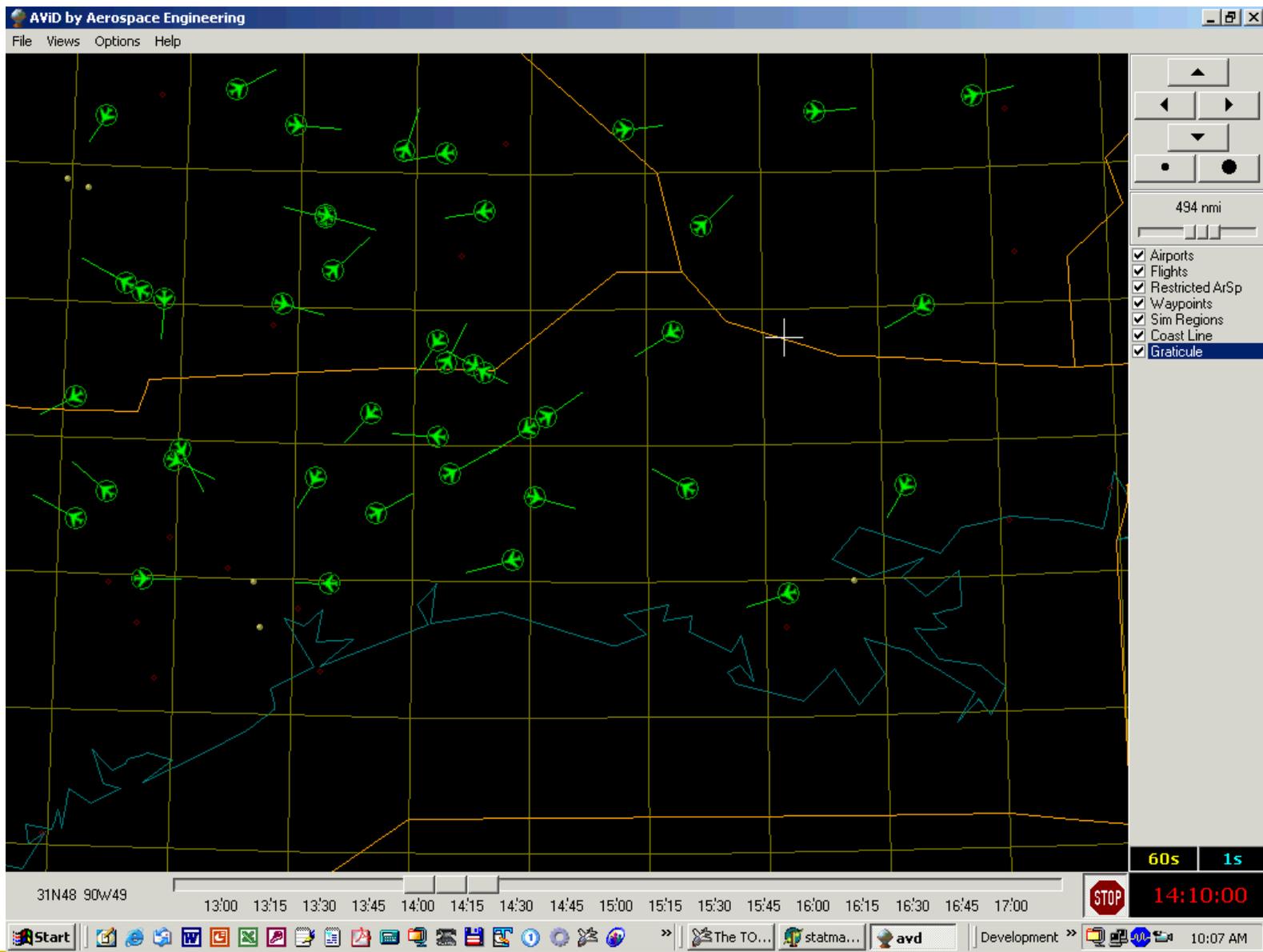
NASPAC



AWSIM Demonstration



AWSIM Demonstration



Fast-Time Simulation Studies

- **Small Aircraft Transportation System (SATS) Study:**
 - The objective of this study will be to understand the effects of introducing new aircraft (SATS) into the NAS will have on sectors loads, airports, and airports in metropolitan areas.
- **NASPAC Evaluation of ORD**
 - Assess the impacts of capacity improvements to ORD on the NAS.
- **TFM-M Analysis**
 - Study the impacts TFM-M has on NAS operations for several future year scenarios
- **RNP Analysis**
 - Analyze DFW departures and changing the standard departure fixes.

FAA/Eurocontrol Action Plans and other Initiatives

- **Action Plan 5**
 - Workshop examining ‘typical’ scenarios at each level of technology development.
- **Action Plan 9**
 - Capability Assessment of Various Fast-Time Simulation Models and Tools
- **Action Plan 16**
 - Common Trajectory Prediction
- **SATMS**
 - Space and Air Traffic Management System

Contact Info

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