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
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**
  – Access 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
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