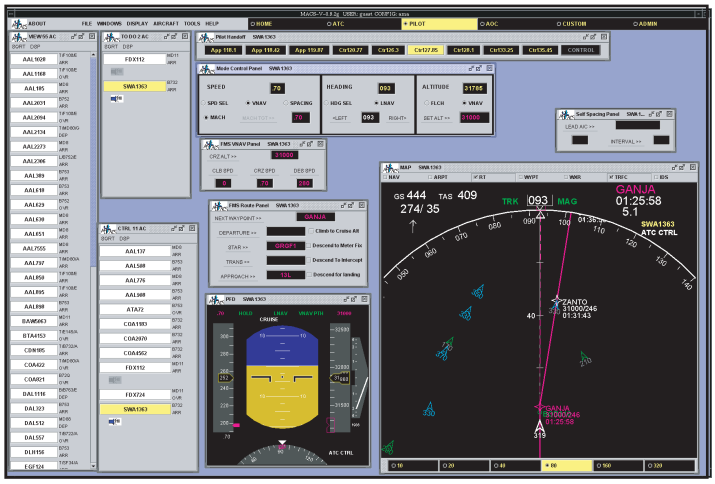
Human Systems
integration division

Distributed Human-in-the-Loop Research

Objective

To create a simulation environment that will allow for the testing of distributed air-ground operational concepts in a realistic manner. Using this environment, to test tools and procedures for the distribution of air-ground operations in the National Airspace System (NAS).



User Interface for AOL's Multi-Aircraft Control System

Approach

A research environment has been developed that permits the evaluation of new operational concepts. Using advanced tools and technology, these new principles of operation can be carefully tested and examined for their impact upon the air and ground users. The emphasis for the research is the evaluation of the triad involved in air traffic management operations: the controllers, the pilots, and the airlines operation centers. The linking of the test beds for the various users provides an opportunity to explore the multiple users and the issues that may arise when all parties are participating in operations. One such issue that is being explored is the distribution of separation authority between the pilots and controllers.

Impact

A simulation environment has been created to allow for the simultaneous testing of multiple operators on the air and ground. A variety of simulation studies have been conducted and have provided important data for aviation safety and efficiency. One study examined shifts in separation authority between pilots and controllers and found increased workload and role confusion. Another study evaluated new methods of air-ground data integration and found benefits to increased data sharing.

Information Technology

Increased air-ground data exchange capabilities and models.

POC: Everett Palmer, Ph.D.

URL: http://humansystems.arc.nasa.gov