Human Factors

research and technology division

Air/Ground Integration for Efficient Arrival Management

Objective

Develop an operational concept in which controllers and pilots use integrated air/ground procedures and automation tools to efficiently manage aircraft arriving at a hub airport.

Tom Prevot and the enroute controller display.

Approach

Demonstrate concept through real-time simulation involving multiple air traffic controllers and piloted aircraft simulators. Controllers use a number of advanced automation tools to plan and implement efficient arrival flow into a busy terminal area. Controllers issue trajectory clearances to pilots with datalink. Pilots use their autoflight systems to precisely fly these efficient descent clearances.

Impact

Experimental results show that a very efficient arrival flow can be achieved in en route transition airspace. The tools and procedures appear to be acceptable to flight crews and controllers. FMS routes in the TRACON resulted in reduced transit time and increased throughput. Datalink for information exchange and strategic clearances resulted in dramatic reduction in frequency congestion in both en route and TRACON airspace. Controller and pilot participants were enthusiastic about the operational concept.

Information Technology

The multi-center air/ground simulation facility permits the simulation of both data and voice communications for human-in-the-loop evaluations of advanced air/ground traffic management concepts.

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URL: http://humanfactors.arc.nasa.gov/ihi/