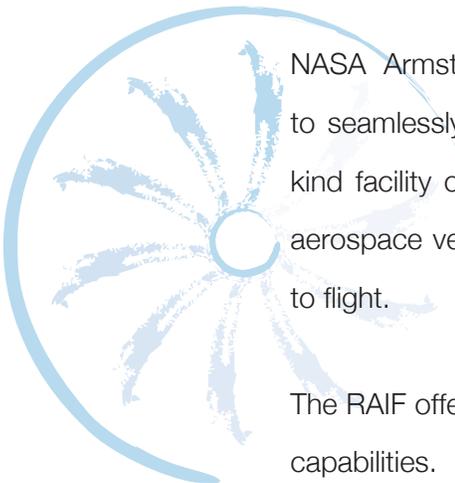




NASA's Aeronautics Test Program Research Aircraft Integration Facility



NASA Armstrong's Research Aircraft Integration Facility (RAIF) provides the ability to seamlessly integrate simulation and vehicle systems under one roof. This one-of-a-kind facility can simultaneously support a wide variety of advanced, highly integrated aerospace vehicles through all phases of a research program, from conceptual design to flight.

The RAIF offers high-fidelity six degree of freedom, batch, and real-time flight simulation capabilities. The facility provides support for system integration and closed-loop verification and validation testing of components, systems, and entire vehicles. Also available are complete aircraft ground-support services, including all electrical, hydraulic,

and cooling-air systems required for vehicle-system integration, functional checks, and routine aircraft maintenance.



F/A-18 simulator.



Gayle Patterson in the UAS in the NAS sim.



Gary Bell in the Ikhana/Predator B sim.



F/A-18 flight simulator.

Facility Benefits

- Provides research teams with the means to conduct efficient, thorough testing of advanced, highly integrated research vehicles
- Provides configurable systems for all facets of a research program including simulation software, hardware, and direct vehicle support infrastructure
- Provides scalable systems for
 - Evaluation of design concepts
 - Piloted or vehicle-and hardware-in-the-loop operations
 - Combined systems testing
 - System integration and full mission support
 - Control-room training, mission planning, and data analysis
- Can be configured to accommodate up to 11 simulation laboratories
- Can be tailored to support varying access and security requirements within each lab
- Offers audio, video, and data connectivity to any of the six facility hangar bays as well as to the Armstrong Mission Control Center

Facility Applications

The RAIF has been a critical asset for the successful implementation of some of the nation's most revolutionary and valuable research efforts. These efforts supported a variety of research vehicles that cover subsonic through hypersonic flight regimes, including X-43A(Hyper-X), F-18, F-15, and C-17.

Data Acquisition and Processing

- Simulation software capabilities:
 - High-fidelity, 6-DOF simulation packages
 - Software simulation package supports both real-time (human-in-the-loop and hardware-in-the-loop) and non-real-time (desktop) operations
 - Common, configurable software supporting multiple projects
 - Multiple operating system platforms (Solaris and Linux)
 - Support multiple programming languages (FORTRAN, C, C++,Java, and Ada)
 - Multiview out-the-window graphics with heads-up displays (HUD) and articulated three-dimensional models of flight vehicles
 - Operable by one person
- Simulation hardware capabilities:
 - Dedicated or configurable fixed-base engineering simulation cockpits
 - Configurable hardware interface units for vehicle-systems integration testing
 - Common configurable hardware to support multiple projects
 - Configurable Simulation Electric Stick (SES) and rudder pedal systems
 - Configurable Cockpit Interface Unit (CIU)
 - Flight hardware interface capability (MIL-STD-1553, ARINC 429, and analog and discrete signals)



Brent Bieber and Dennis Pitts in Dream Chaser sim.

Characteristics

- Test bays 1, 2, and 3 provide over 30,000 square feet of hangar space
- The 225-by 135-ft hangar is accessible through a split 225-by 50-ft door
- Test bays 4 and 5 provide a total of 12,500 square feet of hangar space
- Test bay 6 is a single-vehicle bay providing 1000 square feet of hangar space that can be configured to support programs with more stringent security requirements
- Test bay data and communication connectivity to RAIF simulation labs and Armstrong control rooms
- Co-located vehicle maintenance support staffing
- Co-located program and vehicle engineering and technician staff
- Complete vehicle support systems (aircraft cooling, electrical power, and hydraulics)
- Electrostatic Discharge Association (ESD) certified support labs

Contact Information

www.aeronautics.nasa.gov/atp
Gary V. Kellogg
Chief, Simulation Engineering Branch
Armstrong Flight Research Center
661-276-3779
E-mail: gary.v.kellogg@nasa.gov