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.
**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)

**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**

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