NASA Dryden Aerospace Simulation Capability

Simulation Capability

Dryden Flight Research Center

PURPOSE:
Provides research teams the means to conduct efficient, thorough testing of advanced, highly integrated aerospace vehicles.

APPLICATIONS:
- High-fidelity 6-DOF real-time and desktop batch simulations
- Pilot-in-the-loop simulation
- Hardware-in-the-loop simulation
- Vehicle-in-the-loop simulation
- Closed-loop vehicle systems verification and validation testing
- Combined Systems Testing
- Mission Control Room training, mission planning, and post-mission data analysis

RESOURCES:
- Scalable and flexible simulation package to support conceptual design to flight
- Common, reusable technology for software and hardware to support multiple, varying projects
- Dedicated or configurable cockpits
- Configurable hardware interface unit for vehicle systems integration testing

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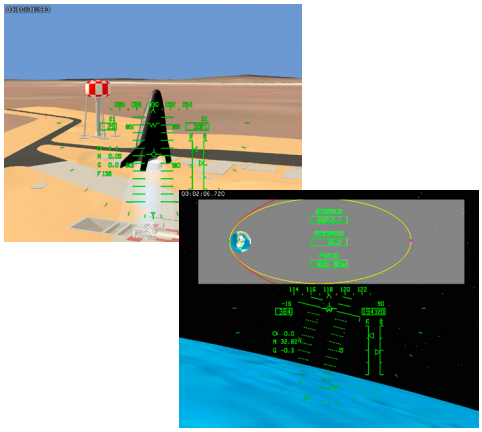
The NASA Dryden simulation capabilities support the most advanced aeronautical and space-based research now and in the future, through all phases of vehicle design, development, systems integration, verification, validation, and flight test.

We place the simulation capabilities in the hands of the customer

- The same software operates on a desktop as well as integrated laboratory environment
- All simulations are operable by one person
- Users have access to all the source code

Configurable Simulations



- Simulations are scalable to varying levels of complexity and stage of development
- Can support systems integration and evaluations of multiple design concepts
- Quick study of mission trajectories, flight management, and performance characteristics
- Mission planning and training to reduce or mitigate risks

Integrated Vehicle Testing

- Enables systems integration, verification, and validation testing of vehicle hardware and software
- Facilitates Failure Modes and Effects Testing (FMET)
- Test flight hardware and software as subsystems and components become available

To Fly What Others Only Imagine

www.nasa.gov/centers/dryden

NASA Dryden Walter C. Williams Research Aircraft Integration Facility (RAIF)

Research Aircraft Integration Facility (RAIF)

Dryden Flight Research Center

TEST BAYS:

- Six vehicle test bays in three physical areas
- Support both classified and proprietary projects simultaneously
- Interface to simulation laboratories and Mission Control Rooms
- Provide full vehicle system support infrastructure

SIMULATION LABS:

- Up to 11 simulation laboratories, each configurable to various security levels
- Labs overlook the test bays with data, video and audio connectivity

ACCOMMODATIONS:

- Co-location of project and facility management, vehicle maintenance, and engineering personnel
- Conference rooms
- 30,000 ft^2 office space

PAST PROJECTS:

- X-31, X-33, X-37, X-38, X-40, X-43A, F-18, F-15, F-16XL, C-17, UCAV, Pathfinder

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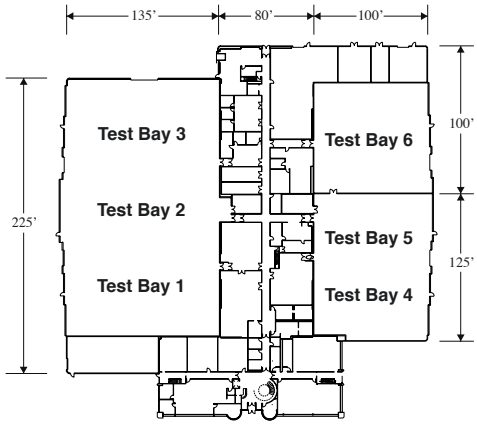
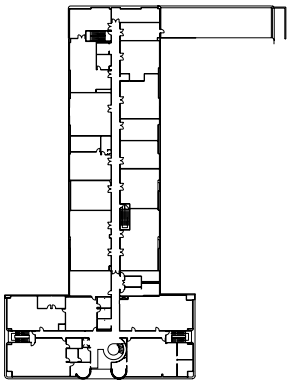


First Floor Layout



Second Floor Layout

Test Bay Vehicle Support Infrastructure

- Vehicle avionics cooling supply
- Independent hydraulic supply systems
- 120/208 three-phase 400 Hz power
- 28Vdc 400 Hz power
- 277/480V three-phase 60 Hz power
- Uninterruptible 277/480 60Hz power

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