F-15B 836
Supersonic Research Testbed
Capabilities

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F-15B 836 Overview

• F-15B (74-0141) – Obtained in 1993 from Hawaii ANG
  • Last flying B-model in the U.S.

• Two-Seat version

• Two F100-PW-220E engines – upgraded in 2014
  • 24,000 lb thrust class
  • Digital engine control

• Weights (1,500 lbs lighter than F-15D)
  • 42,000 lb – typical takeoff weight
  • 32,000 lb – typical landing weight
  • 12,000 lb – internal fuel (2,000 less than F-15D)

• Speed/Altitude
  • Mach 2+ / 60,000 feet (with pressure suit modification)
  • Mach 2 / 50,000 feet with test fixtures

• Dimensions
  • Length – 64 feet
  • Wingspan – 43 feet
F-15B 836 Aircraft Systems/Limitations

- Two UHF Radios
- TACAN
- Air Refueling capable
- INS without GPS – up to 1 nm/hour drift
  - Supplemented with Garmin 496 Handheld
- Multi-Stage Improvement Program (MSIP) not accomplished
  - H009 Bus - no 1553 bus
- No Radar or TCAS – requires chase aircraft
- No ILS
- No visible moisture - Ground or Flight
- Armament/Defensive Systems Removed
F-15B 836 Instrumentation

• Research Nose Boom/Radome
  • Total/Static Pressure, Alpha/Beta)

• Aircraft instrumentation system with S-Band telemetry and on board recording capability (Chapter 10)

• Video Recording and Downlink

• Video display in rear cockpit

• High speed camera for center station

• IR Camera for center station

• Research GPS (Ashtech Z-12)

• C-Band radar tracking beacon
F-15B Test Configurations

• Supports 3 current test fixtures with separate instrumentation systems and telemetry stream
  • Advanced Flight Test Fixture (AFTF)
  • Propulsion Flight Test Fixture (PFTF)
  • Centerline Instrumented Pylon (CLIP)

• Standard pylons are available

• Aircraft is capable of being modified
Advanced Flight Test Fixture (AFTF)

• Configurable fixture
• Dimensions: 107 x 32 x 8 in
• Weight: 500 lbs

Configuration
• PCM Data Encoder
• 8 instrumentation bays
• Reconfigurable leading edge
• Removable NACA boom (Alpha, Beta, pressure)
• Temp/pressure sensors, load cells and accelerometers

• Mach 2.0 / 50,000 feet / 3 G’s
Propulsion Flight Test Fixture (PFTF)

- Pylon, Adapter and experiment
- Adjustable Alpha (up to 8 degs)
- Dimensions: 107 x 19 x 10 in  
  + Plus adapter/experiment
- Weight: 1100 lbs  
  + 500 lbs max adapter/experiment
- Configuration  
  - PCM Data Encoder  
  - 3 instrumentation bays  
  - Force Balance – 3 axis load and moment sensors  
  - Temp/pressure sensors, load cells and accelerometers
- Mach 2.0 / 50,000 feet / 3 G’s
Centerline Instrumented Pylon (CLIP)

• Modified F-15 Center Pylon
• Minimize flow disturbances
• Allows larger experiment
• Dimensions: 196 x 15 x 5 inches
  • 41 inch max adapter/experiment
• Weight: 580 lbs + experiment
• Configuration
  • PCM Data Encoder
  • 3 instrumentation bays
  • Force Balance – 3 axis load and moment sensors
  • Temp/pressure sensors, load cells and accelerometers
• Mach 2.0 / 50,000 feet / 5 G’s
Example Experiments

Lifting Insulating Foam Trajectory (2005)

Supersonic Boundary Layer Transition (2010-14)

Quiet Spike (2006-09)

Channeled Center-body Inlet Experiment (2011)

• F-15D Replacement for F-15B 836
• Same Baseline Capabilities as 836
• Added Aircraft Capabilities
  • EGI Navigation
  • Radar and ILS in chase configuration
  • TCAS/TAWS (Traffic and Terrain Avoidance Systems)
  • +2,000 lb Internal Fuel (above F-15B)
• Added Instrumentation
  • Improved telemetry data rate
  • HD Video Downlink
  • Cockpit Audio Recording and Hot Mic
  • Multi-station Camera
  • 1553 Bus Data
  • Ethernet data connection in cockpit
  • S or C-Band telemetry Streams

• Currently at Preliminary Design Review (PDR) stage