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

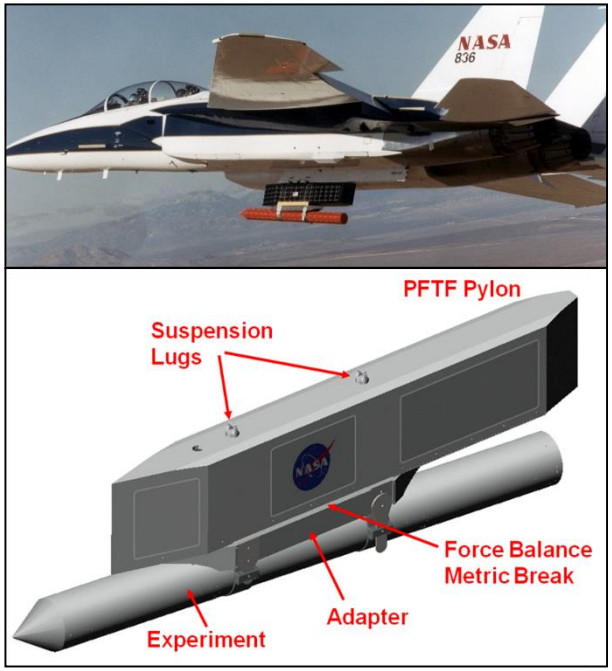
- Supports 3 current test fixtures with separate instrumentation systems and telemetry stream
  - Advanced Flight Test Fixture (AFTF)
  - Propulsion Flight Test Fixture (PFTF)
  - Centerline Instrumented Pylon (CLIP)
- Standard pylons are available
- Aircraft is capable of being modified

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

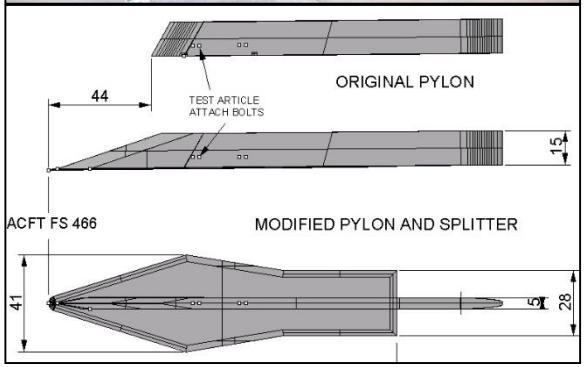
Propulsion Flight Test Fixture (PFTF)

- 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)

Quiet Spike (2006-09)

Supersonic Boundary Layer Transition (2010-14)

Channeled Center-body Inlet Experiment (2011)

Future Testbed – F-15D (~2018)

- 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 telemtry Streams
- Currently at Preliminary Design Review (PDR) stage