Quiet Supersonic Platform (QSP)

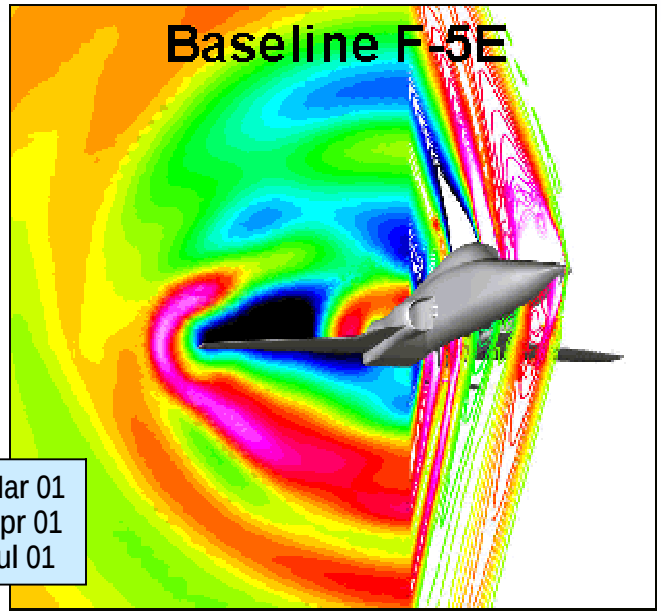
Shaped Sonic Boom Demonstrator (SSBD) Program

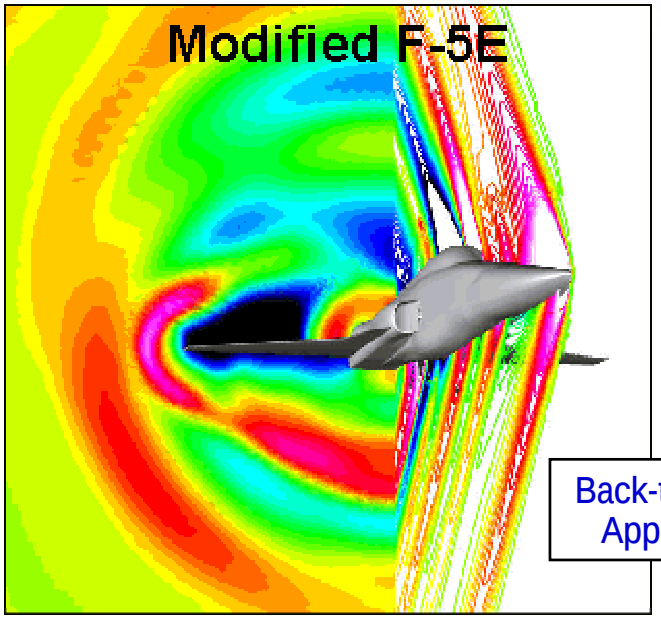
FAA Civil Supersonic Aircraft Workshop

13 November 2003

Shaped Sonic Boom Demonstrator (SSBD) Program Objective

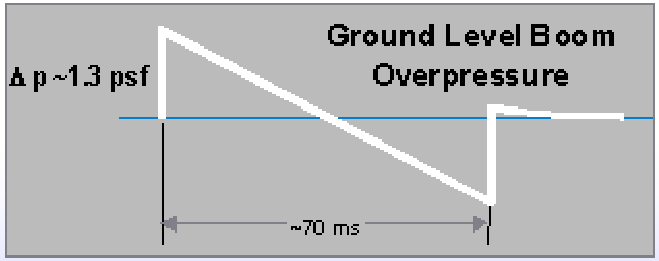
In-Flight Demonstration of Shaped Sonic Boom Persistence Through Real Atmosphere Using Aircraft Shaping Techniques First Proposed By Seabass and George In 1960s

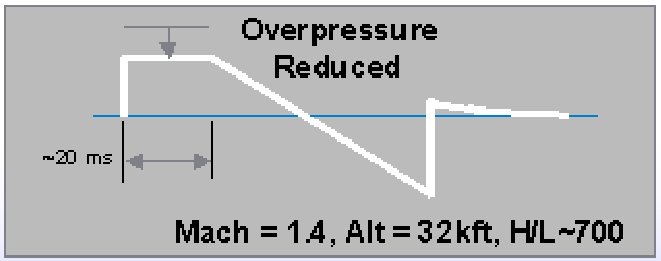




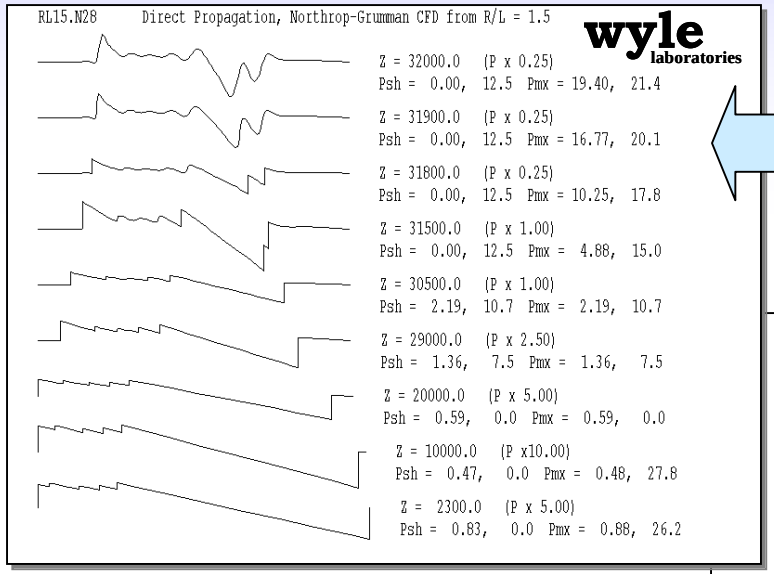
White Paper: Mar 01
Proposal: Apr 01
Award: Jul 01

Back-to-Back Approach



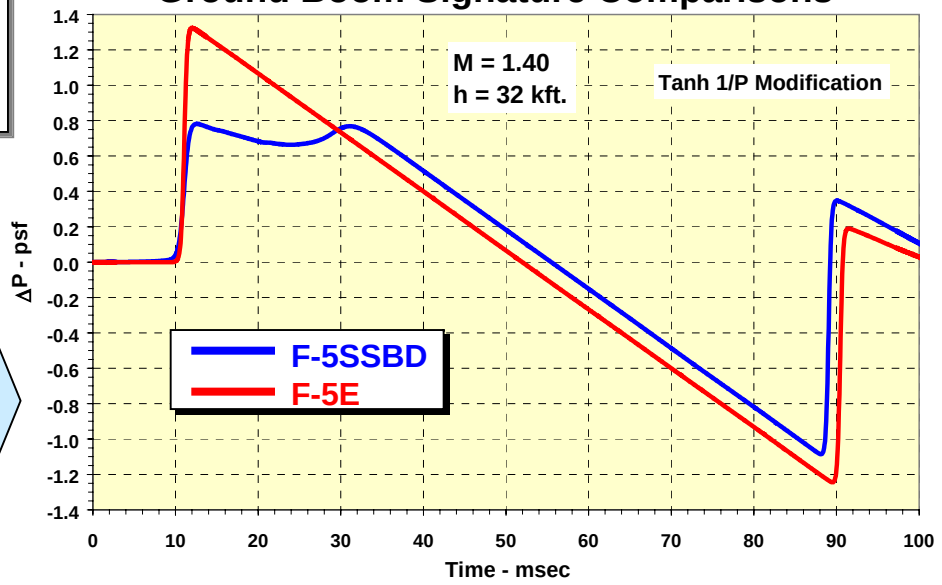


SSBD Predicted Solution



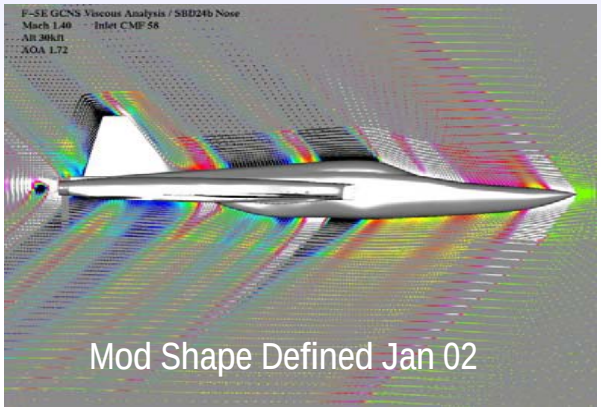
Predicted Pressure Signature Behavior as it Propagates from Aircraft to Ground

Predicted Ground Signature With Atmospheric Smoothing



Build-Up Approach To Development & Validation

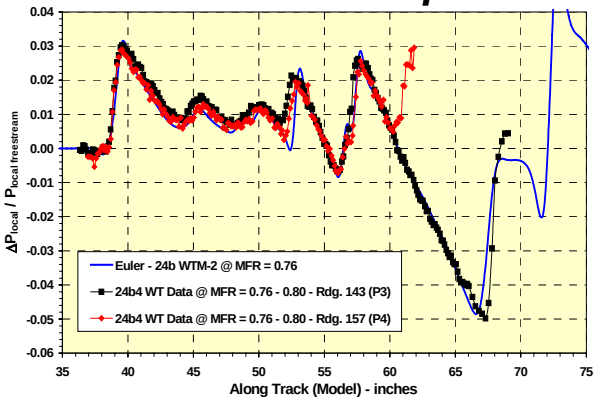
Extensive CFD



Inlet Shock Flight Test

Boom Tunnel Tests

Correlations Completed



S&C Tunnel Test

Force Tunnel Test

- ☑ IDRs - 12/01 & 2/02
- ☑ PDR - 3/02
- ☑ CDR - 7/02
- ☑ Pre-FRR - 1/03

NORTHROP GRUMMAN Integrated Systems

Fabrication & Flight Operations

USN F-5E Arrives NGSA

Jan 03

Mod Nose Attached


Mar 03

Fairings Attached

Apr 03

Flight Ops Prep

May 03

First Taxi


9 Jun 03

First Flight


24 Jul 03

Envelope Expansion & Ferry Flights ⇨ **Back-to-Back & Probe Flights** ⇨ **17 Flawless Flights Over 1 Month!**

NORTHROP GRUMMAN Integrated Systems

Back-to-Back Data Flight

27 August 2003

USN Fallon F-5E With F-5 SSBD During Palmdale Flight Prep

F-5 SSBD Aircraft Takes-Off Followed By Baseline F-5E 45-Seconds Later

First-Ever Shaped Sonic Boom
Recorded 27 August 2003

Signatures recorded during SSBD back-to-back data flights in the Edwards AFB supersonic flight corridor early morning

Estimated conditions:
Mach 1.36+,
Altitude 32,000 ft