



A Gulfstream Perspective on the DARPA QSP Program and Future Civil Supersonic Initiatives

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GAC View of DARPA QSP



- The viability of a civil supersonic vehicle hinges on supersonic flight over land.
- The sonic boom mitigation element of the DARPA QSP program represents a positive step toward supersonic transportation.
- QSP program participants demonstrated positive teamwork toward a common goal.
- Technical Exchange Meetings provided excellent forums for program advancement.
- Visionary DARPA leadership and DARPA style program facilitated rapid and meaningful development.

Significant Accomplishments Achieved

- **Technology Development**
 - Pushing State-of-the-Art Boundaries
 - Aerodynamics, Propulsion, and Structures
 - Sonic Boom Mitigation
 - Design Methods
- **Configuration Development (for Low Boom)**
 - Incorporating “Nontraditional” Design Criteria
 - Pushing Performance Boundaries
 - Integrating and Evaluating Technologies
- **F5 Shaped Sonic Boom Flight Demonstration (SSBD)**
 - Excellent Validation of Design Methodology
 - Enhanced Understanding of Acoustic Signature Propagation
 - Experimental Proof of Shaped Ground Signatures

DARPA SSBD Success a First Step



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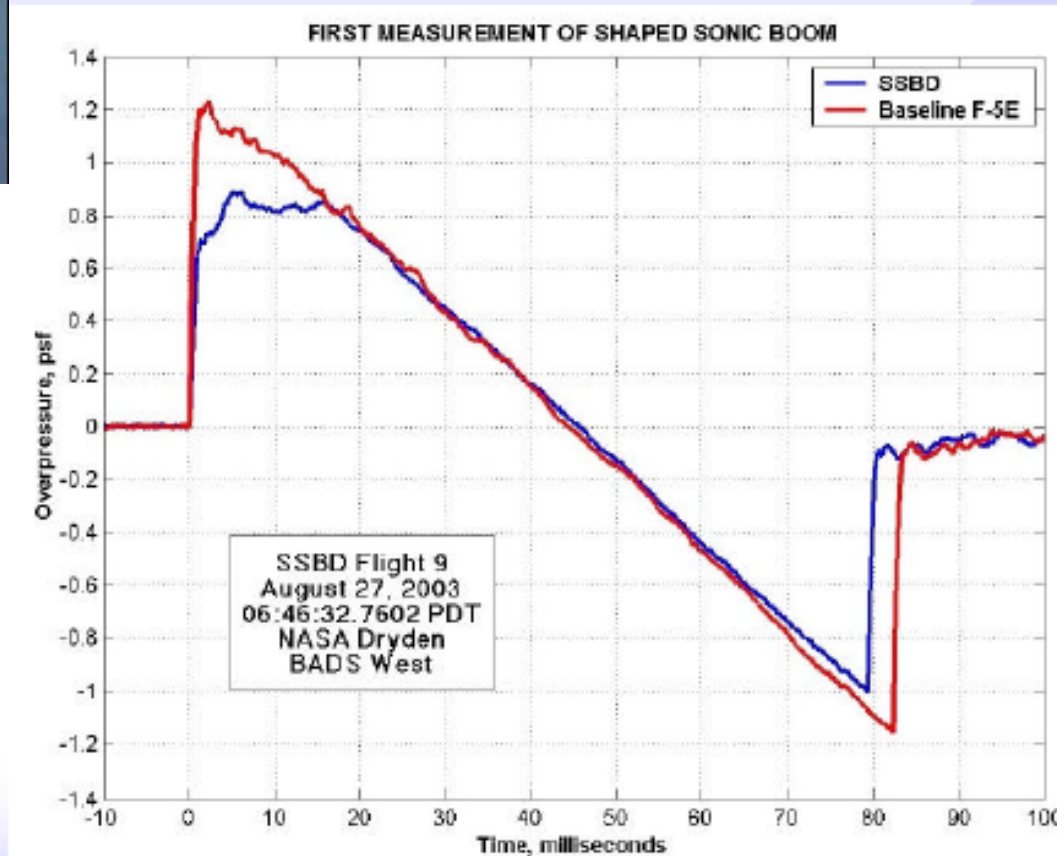
First-Ever Shaped Sonic Boom Recorded 27 August 2003



24 Jul 03

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

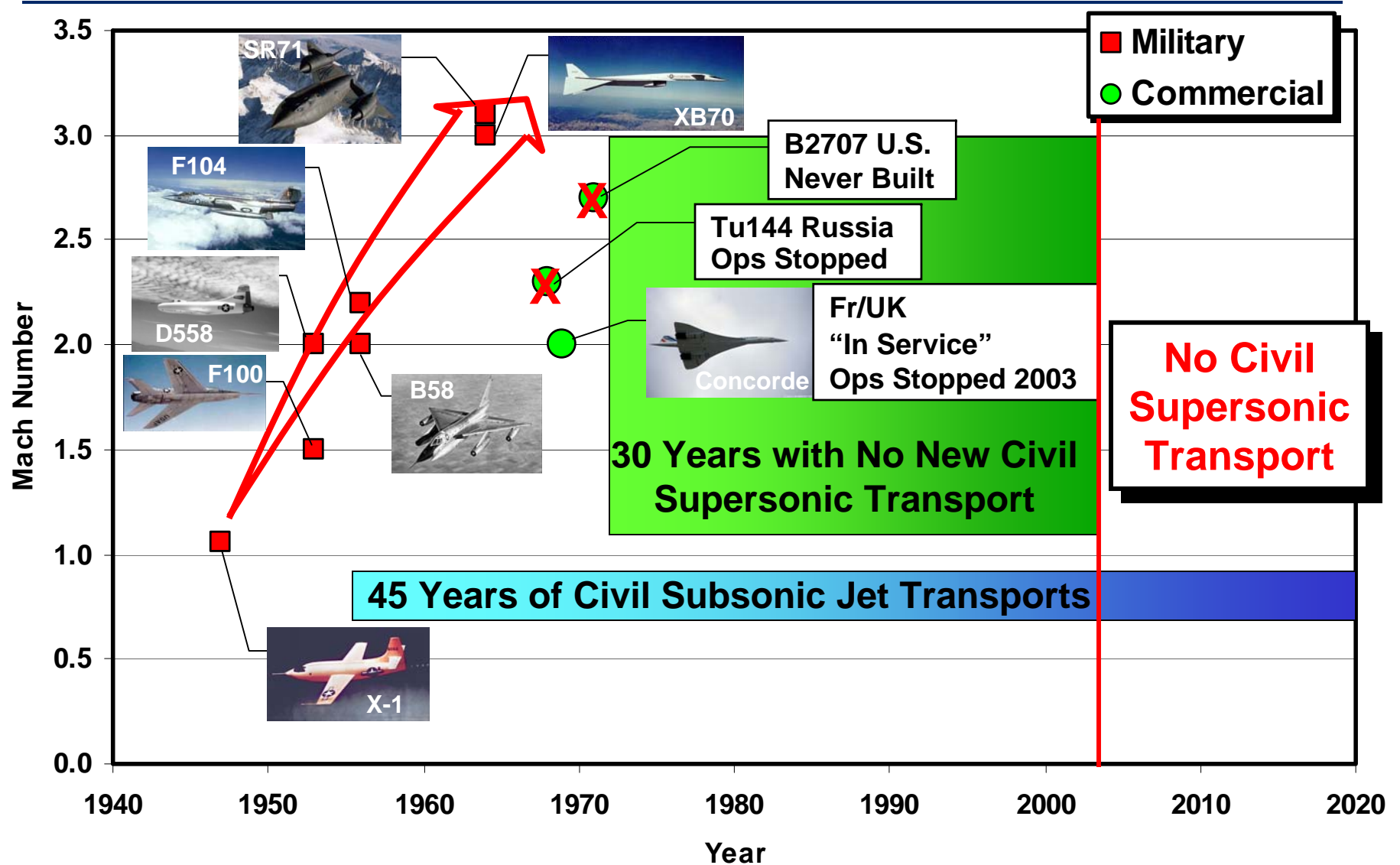


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Future Civil Supersonic Initiatives

Supersonic Aircraft Progress



Civil Supersonics / Concorde is Dead - What Now?

- **Different Market - Quiet Supersonic Jet (QSJ)**
 - Business Jet : Speed is Important & Affordable
- **Smaller Size**
 - TOGW ~ 100K lb
- **Lower Mach Number**
 - 1.6-2.0
- **Boom Suppression Progress**
 - DARPA Shaped Sonic Boom Demonstration
 - Boom Suppression Technology Development

**Numerous Attributes Combine to Enhance
QSJ Feasibility and Acceptability**

Doubling Speed Redefines Air Transport

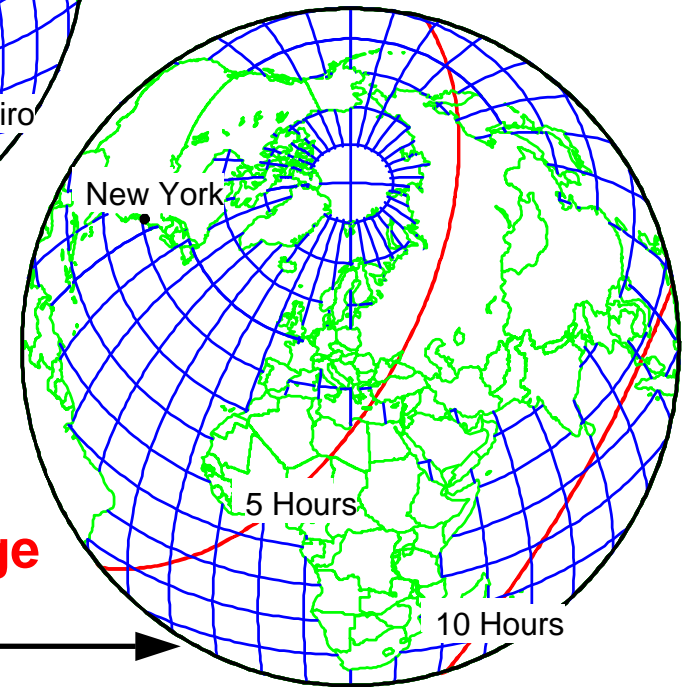
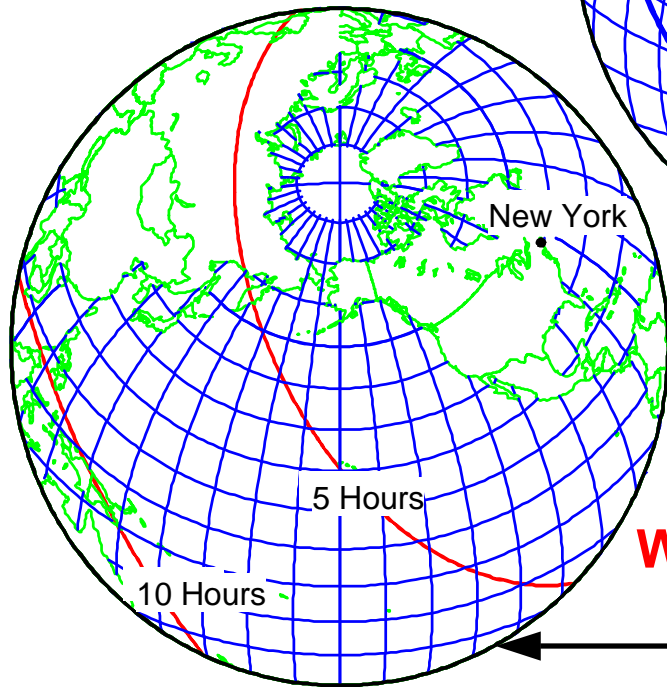
Speed that redefines a 12 hour work day -- there and back with 2 hours minimum on location

Assuming Mach 1.8,
4,500 nm range
capability



Westbound from New York

Eastbound from New York



Worldwide Coverage
in 10 hours

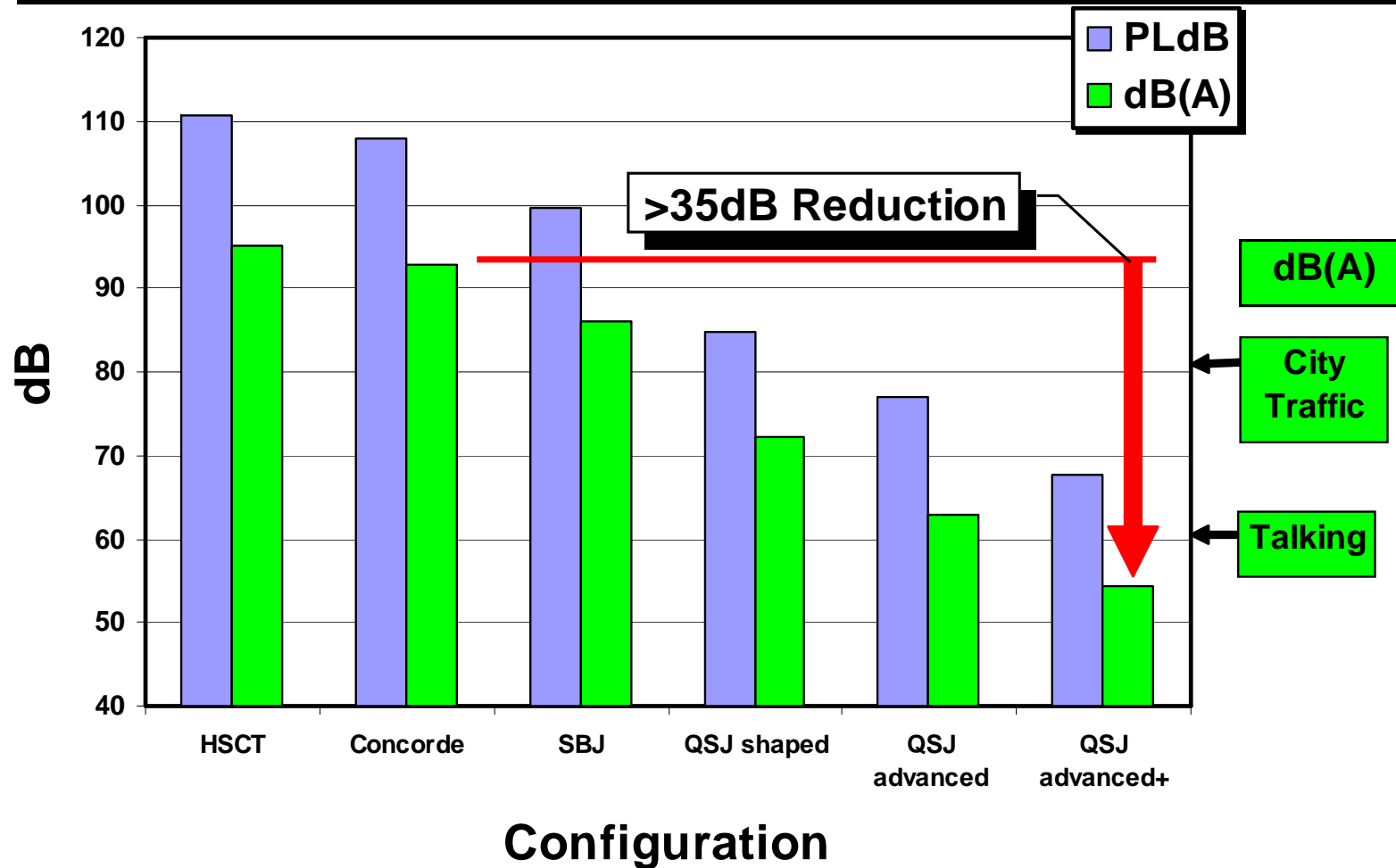
Quiet Supersonic Jet (QSJ) Market Assessment

- Productive Use of Time an Imperative in Worldwide Commerce
 - **Speed is Important - Target: M=1.6-2.0**
- Two Gulfstream Market Assessments Identify Conservative Sales of **180-350 Aircraft**
- Two Independent Market Assessments (Meridian and Teal) **300-400 Aircraft**
- Fractional Ownership Offers Large Potential for QSJ
- **Supersonic Overland Flight Is a Requirement**
- Range Beyond 4000 nm Is an Advantage

**Market Assessment is Favorable If It
Can Be Accomplished Technically**

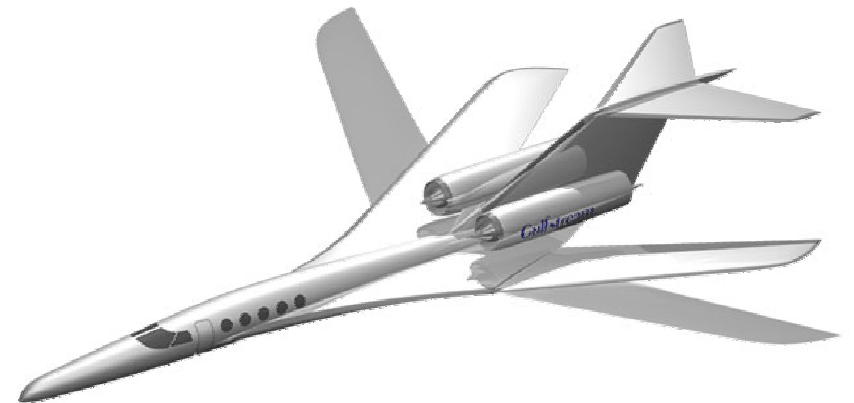
Cruise Acoustic Signature Levels

QSJ Advanced+ > 35dB Quieter Than Concorde



QSJ Conceptual Program Highlights

- **Supersonic Over Land Flight a Market Requirement**
 - **FAA Prohibition Must Be Replaced With Rational Rule If Progress Is To Be Made**
- **Sonic Boom Suppression a Key Technology**
- **Supersonic Over Land Flight Requires Two-Part Program**
 - **Boom Technology Demonstrator / Rule-Making**
 - **Production Program**
- **High Risk R&D \$ Required**
- **Entry Into Service a Decade Away**



Pushing the Performance Envelope

Today's Reality



Tomorrow's Vision



Max Weight	91,000 lb	100,000 lb
Typical Payload	8 pax	8 pax
TO Field Length	6,000 ft	6,000 ft
Cruise Speed	0.80 M	1.80 M
Range	6,750 nm	4,800 nm

QSJ – Potential to be First Successful Civil Supersonic Aircraft

Gulfstream

A GENERAL DYNAMICS COMPANY
