Thermal & Fluids Engineering at Dryden Flight Research Center in 2008

Christopher Kostyk
Advanced Structures & Measurement Technologies Group
Research Aerostructures Branch
NASA Dryden Flight Research Center

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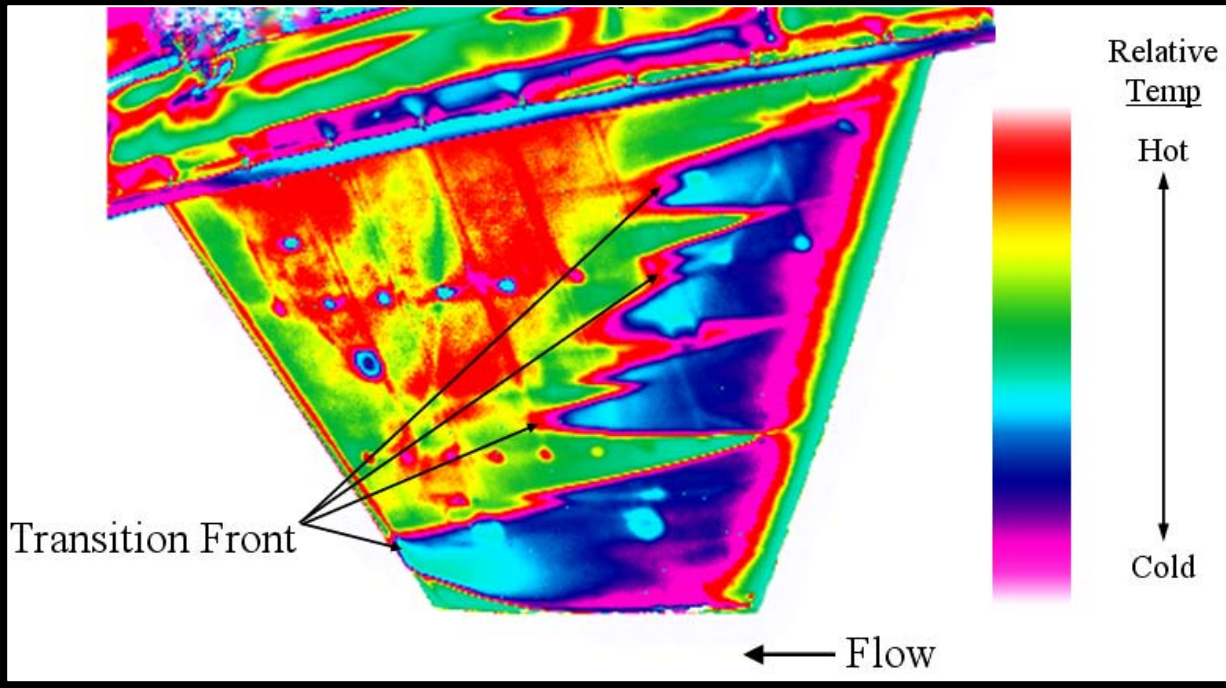
SOFIA

- Aero
  - Tufted a/c, captured baseline flow data (closed door)
  - Calibrated five port FADS
  - Open door instrumentation
- Thermal Structures
  - 157 TCs (thermal stress, fatigue acceleration, model validation)
  - Support analyses (thermal model, thermal stress, battery life prediction)

In-Flight Infrared Thermography Boundary Layer Transition Measurement

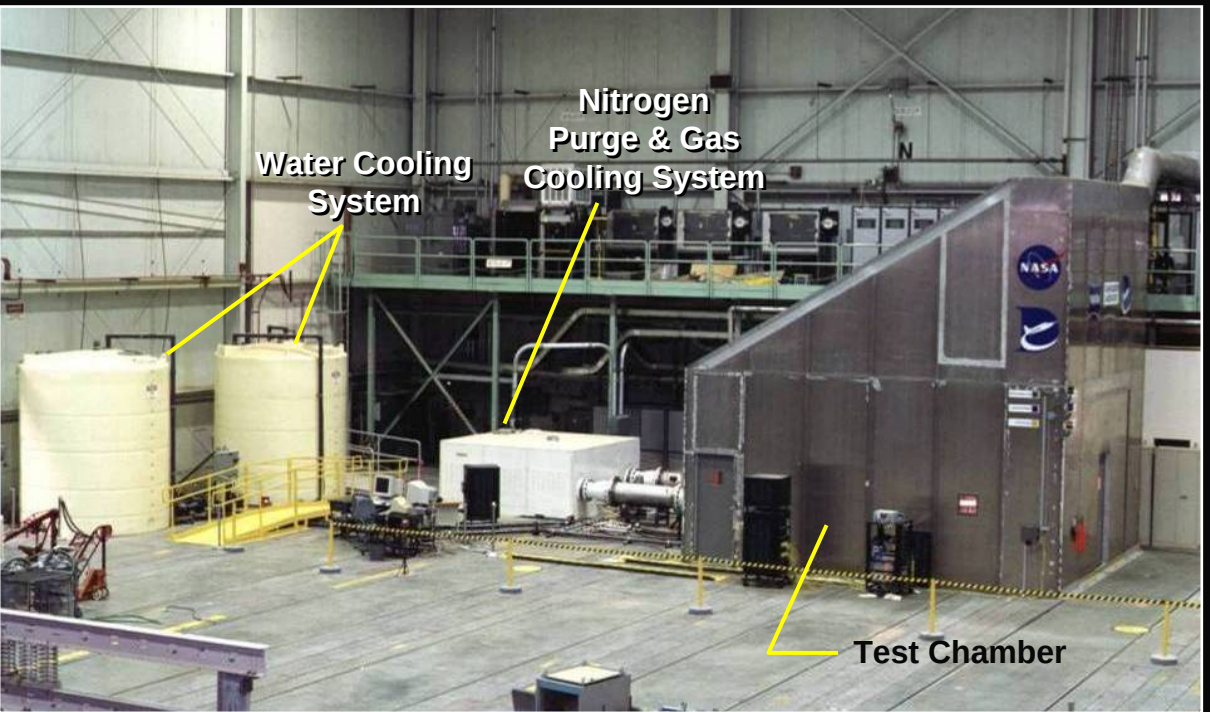
- Test article mounted on centerline store station of F-15B
- Leading-edge (LE) sweep angles of 15° and 30° (reversible)
- Target Mach~1.8 at approximately 40,000 ft / 12,000 m

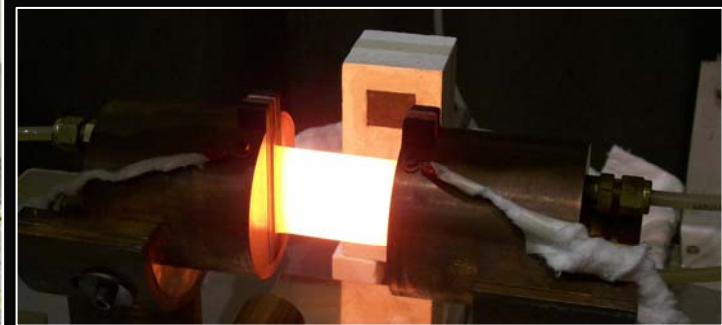
Digital False Color Image
30° LE, M~1.72



Thermal Testing

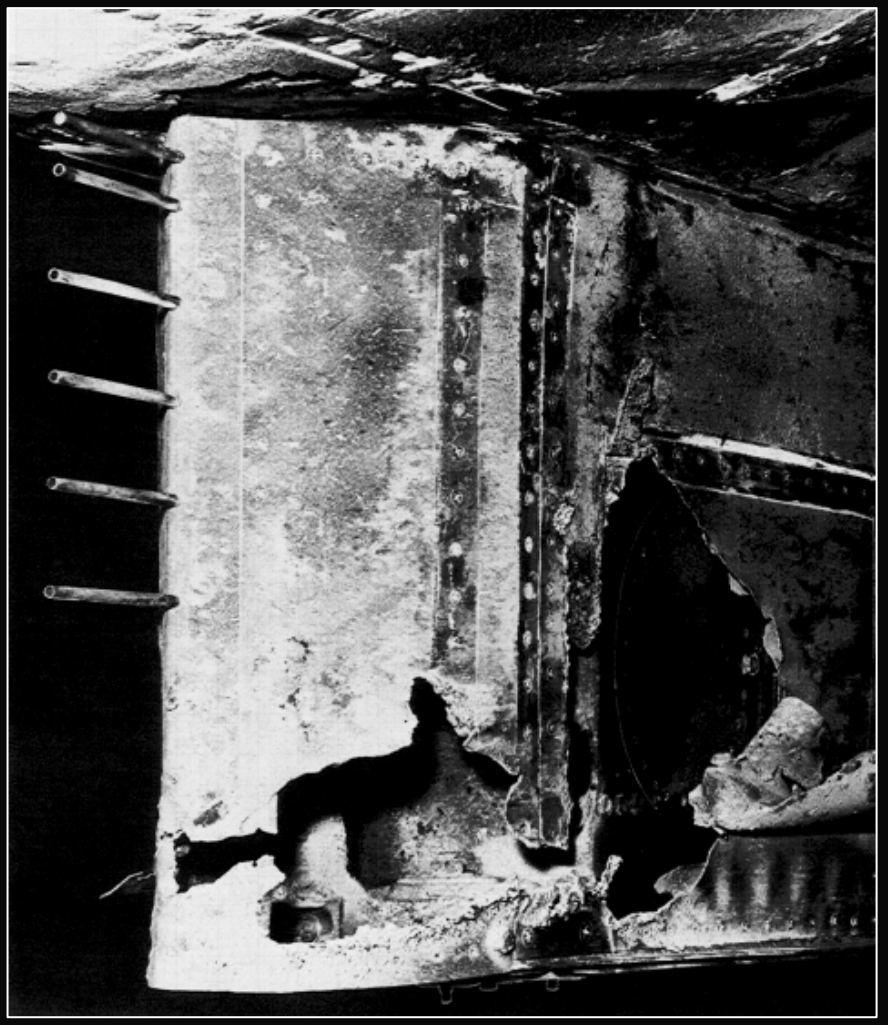
- Advanced TPS concepts
  - Two development stages from one company, first evolution tested to 3500°F
  - One development stage from another company, about to be tested
- High temperature heat flux gage
- Hot modal survey
  - Completed 500°F hold modal survey
  - Preparing for X-37 trajectory modal survey





Aerodynamic Heating Analysis

- TPATH – in-house transient aerodynamic heating code
- Knowledge transfer
- Aerodynamic heating data set/validation case archive generation



Questions