

## *Engineer in Charge*

### **Two-Dimensional Low-Turbulence Pressure Tunnel (LTPT)**

Purpose: To provide reliable airfoil data at high Reynolds numbers and, more specifically, to develop low-drag airfoils.

Initial cost: \$611,000

Circuit and pressure: Single-return, 1 10 atmospheres (1 150 psia)

Test section: 7'6" × 3', closed throat

Drive system: Fan; 2000-HP electric motor

Maximum speed: 300 MPH (1 atm.), 220 MPH (4 atm.), 160 MPH (10 atm.)

Special features: Eleven screening elements to reduce turbulence levels; high-contraction-ratio entrance cone; unusual method of measuring lift and drag.

Key members of design team: Eastman N. Jacobs, Ira H. Abbott, Albert E. von Doenhoff

Authorized: 1938

Operational: Spring 1941

Major modifications: Converted for use with Freon, 1947-1948; converted to slotted throat in 1953. (Neither of these modifications was very successful, however.)

Significance: "When the LTPT commenced operation in the spring of 1941, it began war work on a crash basis. With its unique low-turbulence-flow characteristics, it was an ideal tool with which to explore the capabilities of a revolutionary type of wing—the newly conceived laminar-flow airfoil." Baals and Corliss, *Wind Tunnels of NASA*, p. 40.

Disposition: Served on a standby basis as a pressure vessel for the 26-Inch Transonic Blowdown Tunnel after 1955; reactivated in early 1970s because of interest in low-speed characteristics of new types of supercritical airfoil.

Reference: TN 1283