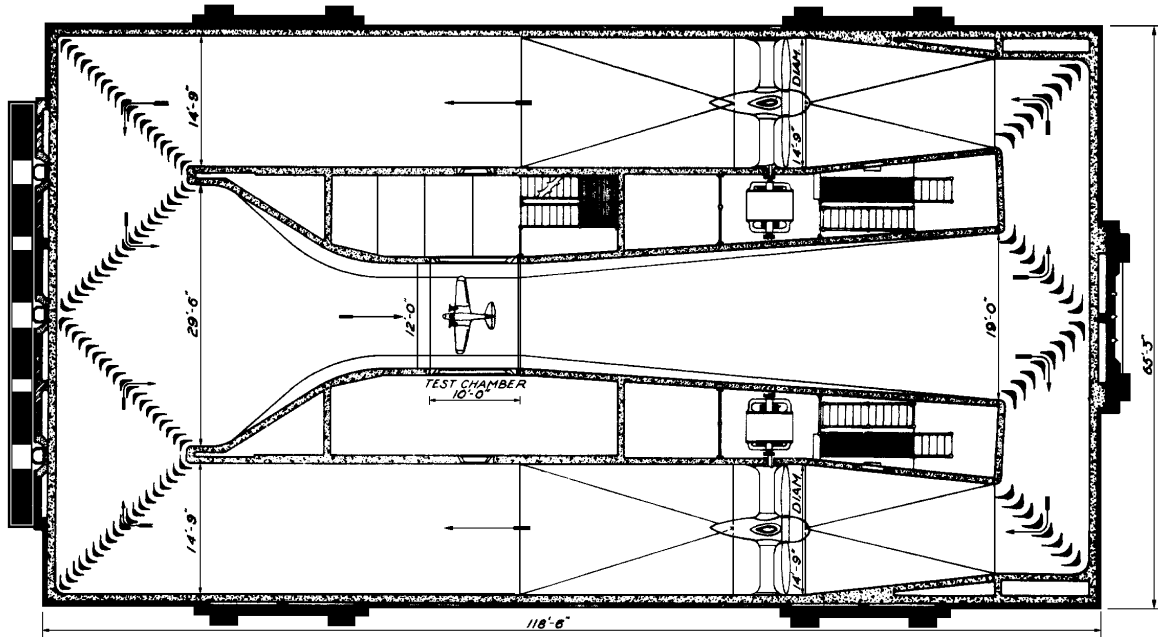


# U.W.A.L. At A Glance

F. K. Kirsten Wind Tunnel



SECTIONAL PLAN THRU TUNNEL AXIS

## DESCRIPTION

<b>TYPE OF FACILITY:</b>	Subsonic, double return, closed circuit wind tunnel.
<b>TYPES OF TESTS:</b>	Force and moments, pressure, and flow visualization (e.g. for aircraft, boats, cars, trucks, bicycles, buildings, and air turbines, etc.)
<b>TEST SECTION:</b>	8' x 12' (10' long) vented to the atmosphere. Retractable ceiling. Windows available on all sides.
<b>AIRSPPEEDS:</b>	20 - 200 MPH (90 m/sec, 295 ft/sec)
<b>DYNAMIC PRESSURES:</b>	1 - 100 psf
<b>FLOW ANGULARITY:</b>	Upflow = $-0.012^\circ$ , Crossflow = $0.0^\circ$
<b>TURBULENCE INTENSITY:</b>	0.72%
<b>REPEATABILITY:</b>	Repeatable to one drag count, verified with a calibration model.

## CAPABILITIES

- DATA ACQUISITION:**
- 6-Component force & moment data
  - Up to 20 additional channels of data (such as pressures, strain gauge output, etc.)
- DATA REDUCTION:**
- On-line plots of semi-corrected data are created as the data are taken, real-time
  - Final reduction is completed using PC
- MODEL POSITIONING:**
- Simultaneous pitch and yaw (standard configuration)
  - Yaw turntable allows for  $360^\circ$  of yaw (no pitching)
  - Fully automated quick and accurate model positioning ( $\pm 0.02^\circ$ )
- BALANCE RANGES:**

Component:	Lift	Drag, Side Force	Pitch, Yaw, & Roll Moments
Maximum:	2500 lbs.	250 lbs.	5000 in.-lbs.

## TEST SERVICES

- FLOW VISUALIZATION:** Smoke, fluorescent oils, probe and surface tufts, ink drop, sublimation, and china clay are all available.
- PHOTOGRAPHY:** Digital and 35mm still photography; VHS and Hi8 video photography.
- PROBES:** Pitot static tubes, 5-hole probes, shielded total head tubes, wake rakes, hot-wire anemometers.
- TRAVERSING RIG:** Allows accurate 3-axis positioning of probes anywhere in the test section while the tunnel is operating.
- POWERED TESTING:** Auxiliary electrical power (2-125 Hp @ 0.5-1.5 V/Hz) to the model for operating propellers or other devices.
- GROUND PLANE:** For simulating the effect of the ground, a standard ground plane (12' x 12') can be installed from 25.5 - 43.0 inches above the floor, in approximately ¼ inch increments.
- PRESSURE SENSORS:** Pressure transducers and electronic pressure scanning modules are available for accurate pressure measurements.
- 2D TESTING:** For simulating the two-dimensional airflow, a set of inserts can be installed to test models with 41.5 inch span, and a chord of 36 inches.

## OTHER SERVICES

- Model design and construction/modification.
- Data analysis and consulting services of aeronautical engineer(s).
- Computational fluid dynamics (CFD) analysis.

## ABOUT THE FACILITY

- RATES:** UWAL is committed to providing high quality, affordable aerodynamic testing for both the private and public sector. Please contact us for our current rates.
- SECURITY:** We can secure our facility to varying degrees to meet your needs.
- STAFF:** UWAL is operated and maintained by a team of aeronautical engineers; electrical engineers, a computer systems administrator, and aeronautical engineering students from the University of Washington.
- HOURS:** Standard hours of operation are 7:30 a.m. to 4:30 p.m., Monday through Friday. Extended shifts and weekend shifts can be accommodated to meet your needs.

## OTHER FACILITIES AT UWAL

- 0.7m x 0.7m Water Tunnel, maximum speed 2.3 ft/sec.
- 3' x 3' Hexagonal Venturi Wind Tunnel, maximum speed of 78 MPH.
- 3' x 3' Low Speed Wind Tunnel, maximum speed of 136 MPH.

If you are interested in testing at UWAL or have any questions, please feel free to contact us!



**U.W.A.L.**

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