

Product Name :
Flight Demonstration Wind Tunnel

Product Code :
Aerodynamics-0005



Description :

Flight Demonstration Wind Tunnel

Technical Specification :

For classroom demonstrations and student investigations into the behaviour of fixed-wing aircraft and wing performance during take-off, flight and landing.

The apparatus is an open-circuit wind tunnel with a model aircraft suspended in the working section. The model is supported by linkages that allow it to move vertically and to pitch about the quarter chord point independently. The working section is brightly illuminated and the aircraft model is clearly visible through a large transparent window. The operator flies the aircraft manually using a control column and throttle. These are positioned directly in front of the window and are arranged typically as found in a light aircraft, providing realistic simulation of flight and the effect of the control surfaces. To fly the aircraft, the operator pushes the throttle lever forward to increase the tunnel airspeed. When the airspeed reaches a certain level the aircraft may be made to 'take-off' by drawing the control column slowly back. A digital display shows air velocity (pressure) in the working section, attitude, altitude or lift force on the aircraft.

Air enters the working section through a flow straightener. The throttle controls the air speed in the tunnel by regulating an axial flow fan downstream of the working section. The change in air speed in the wind tunnel simulates the effect of increasing the change in air speed of a real aircraft due to a change in thrust from the propeller.

The control column is linked to the 'all-flying' tailplane of the aircraft. Pushing the column forward or pulling it back changes the angle of the whole tailplane. A scale on the control column indicates the tailplane angle. The control column differs from that of a normal aircraft in that it has no lateral control of the aircraft: it has no rudder on the tailplane and may only move up or down.

A locking control under the control column can lock the angle of the tail plane to any setting.

Small tufts cover the port wing of the aircraft. These show the direction and quality of airflow over the wing surface, to show separation and stall. Using the optional Smoke Generator (available separately) enhances flow visualisation.

An adjustable weight allows the student to set the centre of gravity of the model to different positions from fore to aft of the quarter chord point. A scale below the weight indicates the position. This enables students to derive the trim curves and identify the neutral point.

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