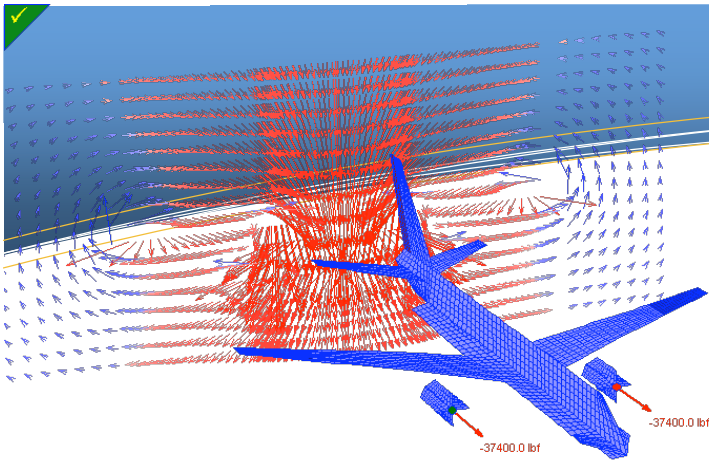# SURFACES

Simplifying Aircraft

SURFACES uses a three-dimensional Vortex Lattice Method (VLM) to determine the airflow around your design, allowing you to extract an incredible amount of information from the solution. Ranging from elementary plotting of the flow solution to sophisticated extraction of loads and stability derivatives, you will find yourself resorting to using SURFACES for more aspects of your design than you thought possible.

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LOOKING FOR POWERFUL AND EASY TO USE AIRCRAFT DESIGN SOFTWARE?

Are you looking for software to help you design and optimize your aircraft? If so, look no further. **SURFACES** is the ultimate tool for anyone designing aircraft. Whether a professional aerospace engineer or a designer of homebuilt aircraft, **SURFACES** is not only user friendly, it also provides extremely powerful features to help you design your aircraft.

VIRTUAL WIND TUNNEL

Use the Virtual Wind Tunnel to study design changes or create lookup tables for your favorite flight simulator. Sweep Angle-of-Attack, Angle-of-Yaw, roll rate, pitch rate, yaw rate, control surface deflections, and airspeed. Retrieve forces and moments in Body, Stability, or Wind Coordinate systems.

STABILITY AND CONTROL

Determine 80 stability derivatives and perform sophisticated dynamic stability analyses. Plot your aircraft's Short Period, Phugoid, Spiral Stability, Rolling Convergence, and Dutch Roll modes. You can even display the dynamic motion of the aircraft in real time! Study how changing selected stability derivatives modifies these critical modes. Create a movie of the dynamic motion and insert into presentations.

AIR LOADS

Extract surface pressures, forces and moments, force and moment coefficients, distributed loads, section lift coefficients, hinge moments, and create shear, moment and torsion diagrams on the model for greater clarity!

PERFORMANCE

Estimate total drag and its impact on important performance characteristics, such as range, glide ratio, cruising speed, and more. Compare the properties of your airplane to similar airplanes to help you figure out how to gain the competitive edge.

As an aircraft designer you want to understand the properties of your design. Perhaps you want to compare it to other aircraft, not to mention get solid answers to a variety of what-if questions, such as what happens to trim drag if you resize the horizontal tail or change your wing's aspect ratio? How much wing twist should you incorporate to promote favorable stall characteristics while not impacting cruise drag too much? How much torsion, shear, and bending loads will the wings have to react? How much stick force will the pilot experience when deflecting the ailerons at a give flight condition? What is the minimum required elevator deflection at forward CG in the landing configuration? What do your airplane's Phugoid or Dutch Roll modes look like? Are they satisfactorily damped? There are hundreds of other burning questions that all require hard-to-get answers. Until now.

- Symbolic solver allows unprecedented analysis power.
- Symbolic solver allows automatic update of all properties with geometry changes.
- Symbolic solver allows you to include realistic power effects.
- Determine 80 stability derivatives with a click of a mouse.
- Trim your models using actual control surfaces deflections.
- Determine shear and moments about any arbitrarily oriented coordinate system.
- Powerful, but yet easy to use tools are featured.
- Extremely versatile and easily adaptable to your design methodologies.
- Optimize your aircraft with ease for performance, loads, and stability & control.
- Program developed is based on a real aircraft design and certification environment.
- Extremely user-friendly. Included tutorial videos will get you started right away.

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