FAR 23 LOADS L O A D C A L C U L A T I O N S

FAR 23 LOADS

Critical Wing Load

Weight and Balance

Wing Geometry

Horizontal Tail Geometry

F AR 23 LOADS provides a procedure to calculate the loads on an airplane according to the Code of Federal Regulations, Title 14 - Aeronautics and Space, Chapter I - Federal Aviation Administration, Subchapter C - Aircraft, Part 23 - Airworthiness Standards, Normal, Utility, Acrobatic and Commuter Category Airplanes, Subpart C - Structures. This is referred to as 14 CFR Part 23. Most of the detailed flight loads are developed from the flight envelopes specified in 14 CFR sections 23.333 and 23.345.

Loads

At every point specified in the flight envelope, the airplane is balanced by a tail load reacting to the specified linear normal acceleration and the aerodynamic lift, drag and moment about the center of gravity. The data needed to make these balancing calculations consists of weight and center of gravity, aerodynamic surface geometry, structural speeds and aerodynamic coefficients. Modules in the FAR 23 LOADS program develop these data. After these balancing loads data are developed, the critical structural loads are determined for each component. For the critical conditions, the air loads, inertia loads and net loads are calculated. Aileron, flap, tab, engine mount, landing and one engine out loads are also calculated.

The loads on the airplane are determined by (1) the three view drawing, (2) the chosen maximum take-off weight, (3) the chosen category and load factor. The software calculates the loads using methods acceptable to the FAA and acutally recommended in the previous CAR3/CAM3/CAM4 and FAR 23/FAR 25 regulations. Previous versions of this software have been used as a reference by hundreds of individuals and companies in over 40 countries. It has been licensed to the FAA.

Type Certification

FAR 23 LOADS provides the means to calculate and print a loads report, including compressibility and altitude effects, for FAA Type Certification.

Supplemental Type Certification

Strength substantiation is required for most Supplemental Type Certifications (STCs) for changes to Type Certificated airplanes. The original loads report for certification are proprietary information and not available to persons making changes to type certificated airplanes. Users of this software have received approval for STCs.
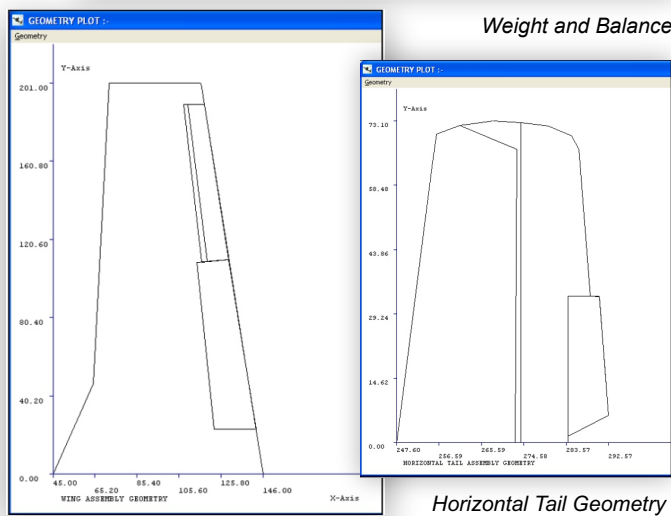
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Experimental or Kit Airplanes

The loads on experimental home built airplanes, kit planes or ultra light airplanes should be calculated for flight safety. Weight may be reduced with stress analysis or testing only after calculating accurate loads. Although there are no FAR certification requirements for loads and strength analysis for this category in the US, there should be great concern for flight safety in this freedom from regulation.

The computer aided engineering approach can produce a reasonably complete airplane loads report. The program is based on the Federal Aviation Regulations, text references in the industry and years of experience in the certification process of FAR 23 airplanes.
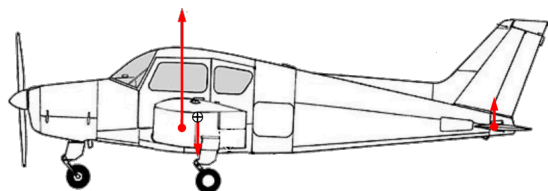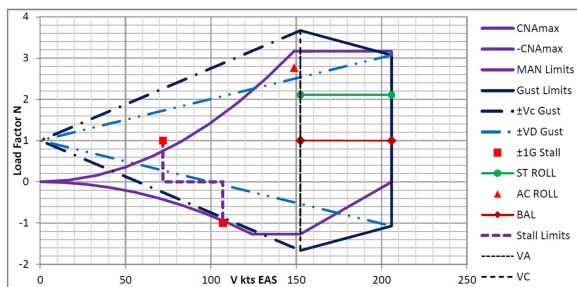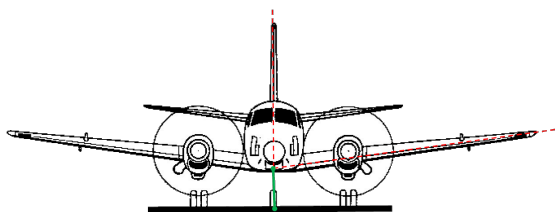
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FAR 23 LOADS Features

- Intuitive graphic user interface

- FAA-supported re-development effort

- Modules are fully integrated, single database

- Modules can also be run as stand-alone applications

- Program includes theoretical documentation and user interface guide with two airplane examples
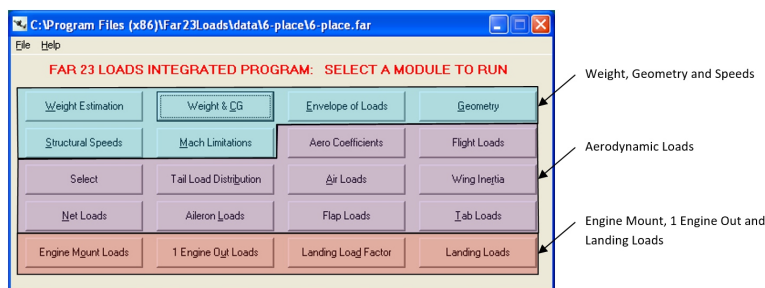
Main Menu

FAR 23 LOADS Consists of 20 Modules

- Weight Estimation
- Weight & CG
- Envelope of Loads
- Geometry
- Structural Speeds
- Mach Limitations
- Aero Coefficients
- Flight Loads
- Select Critical Loads
- Tail Load Distribution
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- Flap Loads
- Tab Loads
- Engine Mount Loads
- One Engine Out Loads
- Landing Load Factor
- Landing Loads

DARcorporation
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