

Public Domain Computer Programs for the Aeronautical Engineer

CONTENTS OF CURRENT VERSION (Last updated 1 January 2009)

1. Area Rule - Harris Wave Drag Program
2. WingBody - Woodward Subsonic/Supersonic Panel Code
3. PanAir - Higher order subsonic and supersonic panel code for general aircraft configurations
4. Coordinates of NACA Airfoils - computes the ordinates of 4-digit, 4-digit-modified, 5-digit, and 6-series airfoils.
5. Digital Datcom - Stability and control using the USAF's [Data Compendium \(DATCOM\)](#)
6. US Standard Atmosphere - pressure, temperature, etc. from 0 to 1000 km.
7. MAC - Mean aerodynamic chord of a complex wing planform
8. VuCalc - Interactive Compressible Flow Solver, direct and inverse
9. PanAir Input Preprocessor - Make PanAir input with a script file in free format
10. Wing and Fuselage Geometry Generator - creates wireframe models of wings or bodies
11. Pablo - Potential flow about an airfoils and boundary layer
12. Quiz - Student drill program for aviation phonetic alphabet, Morse code, and 3-letter airport codes
13. Inlet - Flow Field in 2D or axisymmetric supersonic inlet by method of characteristics
14. Arrow Wing Wave Drag - closed form solution for the wave drag of an arrow or delta wing
15. Gas Properties - computes real gas properties of ten important gases
16. FLUID - Computes thermodynamic and transport properties of many gases, including air and steam
17. Surface Viewer - graphs a function of two variables.
18. Induced Drag - from a sparse spanwise load distribution
19. Wing Shape for Minimum Induced Drag by Vortex Lattice - optimum shape of a wing-tail or wing-canard
20. FairData - compute a smoothing spline for plotting wind tunnel data.
21. Hidden-Line Program - Draws perspective views with hidden line removal of an arbitrary configuration
22. ThreeView - produce plan, side, and rear views from the same input file as HiddenLine.
23. Conversion Programs - Converting input files for WingBody, WaveDrag, or PanAir into LaWGS format.
24. Turbulent Skin Friction - Reference temperature method for computing turbulent skin friction.
25. Eppler - Design and analysis of low speed airfoils
26. Solution of Quartic, Cubic and Quadratic Polynomials with Real Coefficients
27. Virtual Reality Model of Airplane Configuration - Use a VRML viewer to explore in 3D
28. Contour Plotter - plot contours of a 2-D function defined at a general set of points.
29. Optimum Flight Trajectory - find the best climb, cruise and descent path using energy methods.
30. Solar Power from a Satellite - compute electric power from solar panels on a satellite in earth orbit.
31. Tidy - renumber Fortran programs and indent loops consistently. Creates upper or lower case.
32. LineInt - solve for intersections of straight lines in 2D
33. LinIntrp - compute interpolated points on a straight line in 3D
34. Hypersonic Arbitrary Body - an all-new rewrite of Mark IV. (Mark IV also on CD)
35. Computer Methods for Mathematical Computation - Fortran 95 procedures from the classic textbook
36. Analysis of aircraft motions. Deduce attitude, forces, moments from radar data plus downlinked altitude
37. TEA201. The famous Carlson-Middleton program for analysis and design of supersonic wings.
38. FLUTTER - Modified strip analysis method for predicting wing flutter at subsonic to hypersonic speeds.
39. GRAPE- Two-dimensional grids about airfoils and other shapes by the use of Poisson's equation
40. MassProp - Mass properties of a rigid structure. Gets principal axes and moments of inertia.
41. Kernel - Steady and oscillatory kernel function method for interfering surfaces
42. MISLIFT- Aerodynamic lift on wing-body combination at small angles of attack in supersonic flow.
43. ORACLS- Optimal regulator algorithms for the control of linear systems
44. VASP- Variable dimension automatic synthesis program for Kalman filters and control theory
45. VMACO - Variable metric algorithm for constrained optimization. Methods of Powell & Fletcher
46. W12SC3 - Supersonic wing design and analysis based on the USSAERO program by Woodward.
47. RATSPL - Rational spline subroutines for a smooth representation of experimental data
48. ABAXI - Transient response of ablating axisymmetric bodies including the effects of shape change

WORKS IN PROGRESS (now on CD-ROM)

1. ABLATE - Analytical comparisons of ablative nozzle heat protection materials.
2. ANDUCT - Calculate velocities in an asymmetric annular duct using the velocity gradient method
3. AOFA - Three-dimensional supersonic flow around a body of revolution at angle of attack
4. ARIES Aircraft roll-out iterative energy simulation program for brake performance during rollout.
5. CAS2D - Non-rotating blade-to-blade, steady, potential transonic cascade flow analysis code
6. CELEST - Transformation of coordinates in Celestial Coordinates
7. COLDARC - Dissociated air flow effects during plasma arc testing
8. COREL - Conical Relaxation for supersonic wing design and analysis
9. DIVERGE - Aeroelastic divergence characteristics of unguided, slender body, multi-stage launch vehicles
10. ELASTIC - Static aeroelasticity program from U. Kansas
11. EXHAUST - Analysis of three-dimensional supersonic nozzle exhaust flow fields
12. FSD - Flexible spacecraft dynamics
13. GENOPTICS - A general optical systems evaluation program
14. IPEG - Improved price estimation guidelines to estimate the price of a manufactured product.
15. LONGLIB - a graphics library for vector plotting to CRT's and laser printers.
16. MISER2 - Mistuning effects on turbofan cascades
17. MONITOR - Monte Carlo investigation of trajectory operations and requirements
18. NASTPLT - Nastran plotting post processor to translate NASTRAN generated plot files
19. NSEG - A segmented mission analysis program for low and high speed aircraft
20. OPTIM - Determine a vertical profile which minimizes aircraft fuel burn or direct operating cost
21. PILOT - Parameterized investigation of launch opportunities and trajectories
22. RBLADE - Design of two-dimensional supersonic turbine rotor blades with boundary layer correction
23. RELAY - Fast Mars relay communication link analysis
24. ROTOR - Aeroelastic analysis for rotorcraft in flight or in a wind tunnel
25. SHIFARC - Super/Hypersonic inviscid flow around real configurations
26. SNEAK - Analysis of aircraft wiring circuits
27. SSSP - Space Shuttle Synthesis Program
28. TANDEM - Velocities and streamlines on a blade-to-blade stream surface of a tandem blade turbomachine
29. THERM1D - 1-D numerical analysis of the transient thermal response of multilayer insulative systems
30. TOL - Takeoff and landing performance capabilities of transport category aircraft
31. TOMARS - A rapid, flexible, preliminary Earth-Mars mission-analysis computer program
32. TPS - Thermal Protection System multidimensional heat conduction program
33. VASCOMP - V/STOL aircraft sizing and performance (VASCOMP II)

Public Domain Computer Programs for the Aeronautical Engineer is published on a CD-ROM including full public domain source code for all programs. Order your copy (\$295.00) directly from <http://www.pdas.com/store/> or go to the web site www.pdas.com for other options.

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