

Readme revised  
Aeroprograms V2

ReadMe Notes for the Programs accompanying, Basic Aerodynamics;  
Incompressible Flow

(c)2011 Gary A. Flandro, Howard M. McMahon, and Robert L. Roach  
(Cambridge University Press 2011)

I. Welcome:

The computer programs here are the second version of the software programs which accompany the textbook Basic Aerodynamics, Incompressible Flow, by Flandro, MacMahon,

and Roach (Cambridge University Press.)

Each program is in its own folder and most have their own install.exe file. To install the programs, simply execute the install.exe file (or directly copy the executable for those without an installation file). Answer the usual installation questions including where on your machine on which you want the folder of that program to

reside. The Dos-based programs do not need to be installed. Just copy the folder or executable to wherever you want on your machine.

All programs were originally Dos-based using QuickBasic 4.0. The more comprehensive programs have been converted to windows-based applications using VisualBasic 6.0.

Computationally intensive subroutines have been written in Fortran 77 and compiled using Salford's f95 Fortran compiler.

Updates to the text and programs will continue to be available at:

<http://www.cambridge.org/flandro>

After installation, the specific programs can be executed by double clicking on the program icon or by typing the name of the executable in the Run window available from

the windows Start button. Some versions of the programs use small intermediate data files which may remain and be overwritten by subsequent executions of the program. The use

of these small files will be eliminated as time permits the rewriting of those portions of the codes.

Questions, comments, bug reports, and requests for other features in the software are always welcome. Please email me, Robrt Roach at <rroach02@yahoo.com> or the Cambridge

University Press engineering editor, Peter Gordon whose email is [pgordon@cambridge.org](mailto:pgordon@cambridge.org).

II. Outline of this Readme

I. Welcome

II. Outline

III. Installation Instructions

IV. List of Programs on the book website

V. List of Documents contained in the program folders [not all programs have these additional instructions]

III. Installation Instructions

## Readme revised

There is one folder for each application. The applications in folders with '\_Pack' in the foldername are meant to be installed. Those without that designation can

simply be copied and executed. To install any of the applications so designated, open that folder and simply double click on the setup.exe file that exists in the folder. This

will lead you through a standard installation procedure. Fortunately, the programs are not complicated from an operating system standpoint. Each of the installed programs rely

on VisualBasic and windows dll and ocx files which are included in the support folders. Should any installation fail, it may still be possible to run the application by copying

all the files in the support folder (except the dll's and ocx's) to an application folder on the user's machine. The dll's and ocx's needed by any application are most likely

repeated in the other applications and will already be available. If the user already has VisualBasic 6.0 installed on the machine, then installation is not necessary. Only

the executables need be copied to the user's machine.

### IV. List of Programs

#### 1. Superposition Demonstration Program

This program has four demonstrations relevant to superposition of elementary solutions of the Laplace equation.

#### 2. Prandtl Lifting Line Program

This program computes the performance of straight tapered wings using Prandtl's lifting line theory.

#### 3. Airfoil Analysis

This includes a Standard Atmosphere program, the airfoil building program, and the airfoil Cp distribution program. Several other features were added, such as the

ability to read airfoil data files, airfoil interpolation to change the number of points which represent an airfoil shape, and computation of a drag polar.

#### 4. VLM\_Camber

This program computes the performance of straight tapered wings with sweep using the Vortex Lattice method. The user has the ability to choose from all the NACA camber

functions for the wing root and tip and the program linearly interpolates in between.

The program presents the wing in a 3D view which can be rotated if desired. Vortex lift is

computed for LE sweep angles beyond 45 deg.

#### 5. Blasius.exe

This Dos-based program presents a finite difference solution of the Blasius equation.

#### 6. FS.exe, Falkner-Skan Program

This Dos-based program presents a finite difference solution of the Falkner-Skan equation.

## Readme revised

### 7. 1D Compressible Flow Calculator

This program computes the isentropic relations and normal shock relations. Unlike most programs in which the user can only enter the Mach number, this program allows

entry of a valid number into any of the columns and then computes the remaining quantities. As such it is much more like using tables. One useful feature of the calculator is

that the user may enter data for any quantity and the remainder are computed after the user presses the "enter" (CR) key.

### V. List of Documents

1. Readme revised.pdf - This document.
2. Instructions for the Superposition Demo Program.pdf
3. Lifting Line Instructions.pdf
4. Airfoil Analysis Instructions.pdf
5. Instructions for VLM\_Camber.pdf