

Program WingPlanAnal

WingPlanAnal provides local and integrated planform properties given the description of the planform. The properties are defined in the Geometry for Aerodynamicists Appendix to the Configuration Aerodynamics notes. Currently the program assumes a symmetric planform.

Program Operation:

Running the program, you will be prompted for the name of an input data set. The maximum name length is 15 characters. The output is sent to the screen, but can be sent to a file by changing the value of IWRIT to something other than 6 in the main program. The sample data case on the disk is B2Plan.inp.

INPUT

<u>Card</u>	<u>Field</u>	<u>Columns</u>	<u>Variable</u>	<u>Description</u>
1	1	1-60		Title Card
2	1	1-10	FILM	The number of points describing the leading edge
3		Blank Card used to put headers on the leading edge data		
4	1	1- 10	YL(i)	spanwise position of leading edge break point
	2	11-41	XL(i)	streamwise position of leading edge break point

Note: card 4 is repeated FILM times

5	1	1-10	FITM	The number of points describing the trailing edge
6		Blank Card used to put headers on the trailing edge data		
7	1	1- 10	YT(i)	spanwise position of trailing edge break point
	2	11-41	XT(i)	streamwise position of trailing edge break point

Note: 7 is repeated FITM times

OUTPUT

The input is echoed to allow for an easy check of the data, and to keep all information together. Then a table of leading edge and trailing edge locations and sweep angles is printed out. Then the integral characteristics are given. See the sample output below for details. If desired, the user can interactively ask for the leading and trailing edge locations and sweep at specific spanwise locations. A Sample input and output are available on the web.

Sample input for program **WingPlanAnal**:

```
B-2 Planform
2.0      Number of LE pts
YL      XL
0.0      0.00
86.0     59.47
6.0      Number of TE pts
YT      XT
0.00     65.46
12.66    56.82
22.50    63.24
43.90    48.26
72.74    67.90
86.00    59.47
end of data
```

Sample output from program **WingPlanAnal**:

```
WingPlanAnal

Wing Planform Geometry Analysis
Virginia Tech Aircraft Design Software Series
W.H. Mason, Department of Aerospace and Ocean Engineering
Virginia Tech, Blacksburg, VA 24061, email: whmason@vt.edu
version: January 22, 2006

Planform Properties
Enter name of data set:
B2plan.inp

Input Case Title: B-2 Planform

Planform Points

Leading Edge      iLM = 2

  i      YLE      XLE
  1      0.0000   0.0000
  2      86.0000  59.4700

Trailing Edge    iTM = 6

  i      YTE      XTE
  1      0.0000   65.4600
  2      12.6600  56.8200
  3      22.5000  63.2400
  4      43.9000  48.2600
  5      72.7400  67.9000
  6      86.0000  59.4700

Interpolated LE and TE points and sweep

  i      eta      y      XLE  LE sweep(deg)  XTE  TE sweep(deg)
  0      0.000    0.000  0.000  34.664    65.460  -34.312
  1      0.050    4.300  2.974  34.664    62.525  -34.312
  2      0.100    8.600  5.947  34.664    59.591  -34.312
```

3	0.150	12.900	8.921	34.664	56.977	33.122
4	0.200	17.200	11.894	34.664	59.782	33.122
5	0.250	21.500	14.868	34.664	62.588	33.122
6	0.300	25.800	17.841	34.664	60.930	-34.992
7	0.350	30.100	20.815	34.664	57.920	-34.992
8	0.400	34.400	23.788	34.664	54.910	-34.992
9	0.450	38.700	26.762	34.664	51.900	-34.992
10	0.500	43.000	29.735	34.664	48.890	-34.992
11	0.550	47.300	32.709	34.664	50.575	34.255
12	0.600	51.600	35.682	34.664	53.504	34.255
13	0.650	55.900	38.656	34.664	56.432	34.255
14	0.700	60.200	41.629	34.664	59.360	34.255
15	0.750	64.500	44.603	34.664	62.289	34.255
16	0.800	68.800	47.576	34.664	65.217	34.255
17	0.850	73.100	50.550	34.664	67.671	-32.446
18	0.900	77.400	53.523	34.664	64.937	-32.446
19	0.950	81.700	56.497	34.664	62.204	-32.446
20	1.000	86.000	59.470	34.664	59.470	-32.446

Integral Quantities

Planform Area = 5039.31300
Mean Aerodynamic Chord = 39.24220
X-Centroid = 39.75905
Spanwise position of MAC = 29.12163
X-Leading Edge of MAC = 20.13795
Quarter Chord of MAC = 29.94850
Aspect Ratio = 5.87064
Average Chord = 29.29833
Taper Ratio = 0.00000

Do you want LE/TE and Sweep? (Y/N)

Y

Input span location, Y=

25.

y = 25.00000 eta = 0.29070
X-le= 17.28779 sweep = 34.66432
X-te= 61.49000 sweep = -34.99204
c = 44.20221

Do you want another station? (Y/N)

n

Press RETURN to quit the program.