E.6 POSTp

This program reads the data set generated by **PANELv2**, and generates a data file containing the tables needed to make a boundary layer analysis. Although these tables are designed to be used by the boundary layer program **CBLv2**, it does not make the complete data set for **CBLv2**. The user has to construct the initial data input. The program is provided to automate the most tedious aspects of the input preparation.

The program reads the **PANELv2** output data file. Recall that the solution is given continuously starting at the lower surface trailing edge, moving forward around the leading edge, and then moving aft on the upper surface to the trailing edge. Using this data the arc length is calculated and the stagnation point found. If the stagnation point does not occur at an input point, the stagnation point value of the arc length is estimated, and a point is added. The user is then asked to name the output file. The output file is generated as a table of arc length and pressure coefficient values for the lower surface, followed by a table of arc length and pressure coefficient values for the upper surface.

As an example, and to verify the code, we give a sample input, the screen output and a listing of the disk data file. Note that the disk file contains an additional column, set to zero. This is the value of the surface heat flux for use in the boundary layer calculation. We assume that the wall is adiabatic, and the heat flux is zero. The arc length is normalized by the chord length, assumed to be unity. The output format of the tables is 3F10.6.

Sample input:

```
NACA 2412 with 5 deg flap at .75
   Alpha    CL        cmc4      CD
  5.0000    1.2116   -0.1172   -0.0015
        98.0000000
           X/C               Y/C               Cp               U/UE
         1.0000000         -0.0218722        0.4457454        -0.7444828
         0.9989193         -0.0218588        0.3699587        -0.7937514
         0.9956822         -0.0218183        0.3248610        -0.8216684
         0.9903033         -0.0217497        0.2959175        -0.8390962
         0.9828073         -0.0216514        0.2764678        -0.8506070
         0.9732280         -0.0215215        0.2633044        -0.8583097
         0.9616088         -0.0213579        0.2546606        -0.8633304
         0.9480022         -0.0211583        0.2494899        -0.8663198
         0.9324694         -0.0209209        0.2471926        -0.8676447
         0.9150801         -0.0206440        0.2474237        -0.8675116
         0.8959120         -0.0203265        0.2500552        -0.8659936
         0.8750503         -0.0199681        0.2552201        -0.8630063
         0.8525876         -0.0195686        0.2634676        -0.8582147
         0.8286229         -0.0191286        0.2764418        -0.8506222
         0.8032618         -0.0186488        0.3003036        -0.8364786
         0.7766151         -0.0181297        0.3571291        -0.8017923
         0.7487994         -0.0176765        0.3026126        -0.8350973
         0.7199356         -0.0196039        0.2852925        -0.8454037
```

```
 0.6901487        -0.0215702         0.2705841        -0.8540585
 0.6595672        -0.0235606         0.2596269        -0.8604494
 0.6283228        -0.0255578         0.2511996        -0.8653325
 0.5965492        -0.0275420         0.2446724        -0.8690959
 0.5643821        -0.0294907         0.2397471        -0.8719248
 0.5319584        -0.0313784         0.2363357        -0.8738789
 0.4994153        -0.0331776         0.2345359        -0.8749080
 0.4668901        -0.0348579         0.2347106        -0.8748082
 0.4345195        -0.0363877         0.2381573        -0.8728360
 0.4024391        -0.0377340         0.2431501        -0.8699712
 0.3710229        -0.0389221         0.2475556        -0.8674355
 0.3401839        -0.0399931         0.2525682        -0.8645414
 0.3100253        -0.0409071         0.2589526        -0.8608411
 0.2806665        -0.0416239         0.2673756        -0.8559348
 0.2522234        -0.0421045         0.2785123        -0.8494043
 0.2248088        -0.0423124         0.2930953        -0.8407763
 0.1985313        -0.0422143         0.3119721        -0.8294745
 0.1734958        -0.0417806         0.3361298        -0.8147823
 0.1498030        -0.0409861         0.3667493        -0.7957705
 0.1275494        -0.0398104         0.4052571        -0.7711958
 0.1068267        -0.0382380         0.4533792        -0.7393381
 0.0877222        -0.0362578         0.5131727        -0.6977301
 0.0703175        -0.0338633         0.5869251        -0.6427090
 0.0546887        -0.0310520         0.6766533        -0.5686358
 0.0409059        -0.0278245         0.7823370        -0.4665437
 0.0290324        -0.0241841         0.8964363        -0.3218132
 0.0191246        -0.0201360         0.9877394        -0.1107275
 0.0112310        -0.0156868         0.9593768         0.2015521
 0.0053924        -0.0108432         0.5824928         0.6461480
 0.0016409        -0.0056122        -0.4040008         1.1849054
 0.0000000         0.0000000        -1.7449023         1.6567746
 0.0005002         0.0058259        -2.6745226         1.9169044
 0.0031628         0.0116941        -2.9049768         1.9761014
 0.0079837         0.0175852        -2.7717383         1.9420964
 0.0149496         0.0234709        -2.5445025         1.8826849
 0.0240374         0.0293150        -2.3239744         1.8231770
 0.0352145         0.0350744        -2.1347101         1.7705113
 0.0484385         0.0407000        -1.9771560         1.7254437
 0.0636571         0.0461390        -1.8458352         1.6869603
 0.0808082         0.0513357        -1.7348001         1.6537231
 0.0998199         0.0562337        -1.6390182         1.6245055
 0.1206108         0.0607775        -1.5545312         1.5982901
 0.1430902         0.0649138        -1.4783340         1.5742725
 0.1671584         0.0685932        -1.4081639         1.5518260
 0.1927072         0.0717714        -1.3423257         1.5304658
 0.2196209         0.0744106        -1.2795517         1.5098184
 0.2477766         0.0764795        -1.2188853         1.4895923
 0.2770449         0.0779549        -1.1595500         1.4695407
 0.3072913         0.0788213        -1.1008238         1.4494219
 0.3383766         0.0790714        -1.0417638         1.4289030
 0.3701580         0.0787058        -0.9795462         1.4069635
 0.4024706         0.0777333        -0.9185968         1.3851342
 0.4349543         0.0762537        -0.8643457         1.3654104
 0.4677068         0.0743547        -0.8154098         1.3473715
 0.5005847         0.0720664        -0.7705135         1.3306065
 0.5334447         0.0694218        -0.7292154         1.3149964
 0.5661440         0.0664560        -0.6915128         1.3005817
 0.5985411         0.0632060        -0.6577775         1.2875471
 0.6304962         0.0597102        -0.6291239         1.2763714
 0.6618723         0.0560078        -0.6085705         1.2682943
 0.6925348         0.0521391        -0.6073793         1.2678246
 0.7223530         0.0481446        -0.6721267         1.2931074
 0.7512006         0.0439604        -0.5213552         1.2334323
 0.7789551         0.0374099        -0.4203068         1.1917663
```

```
          0.8054997          0.0309641         -0.3440065          1.1593130
          0.8307229          0.0246744         -0.2788006          1.1308407
          0.8545192          0.0185923         -0.2196457          1.1043757
          0.8767895          0.0127683         -0.1642191          1.0789899
          0.8974414          0.0072517         -0.1111093          1.0540917
          0.9163895          0.0020905         -0.0593664          1.0292553
          0.9335560         -0.0026691         -0.0082251          1.0041041
          0.9488706         -0.0069838          0.0429915          0.9782681
          0.9622707         -0.0108130          0.0950488          0.9512892
          0.9737022         -0.0141200          0.1489126          0.9225440
          0.9831185         -0.0168725          0.2061138          0.8910029
          0.9904819         -0.0190429          0.2693959          0.8547539
          0.9957626         -0.0206093          0.3448462          0.8094157
          0.9989396         -0.0215556          0.4457439          0.7444838
```

Output to screen:

```
    PGM POSTP  - POST PROCESS DATA FROM PGM. PANELv2

    ECHO OF INPUT DATA:

 Enter name of file to be read:
postp.test

  Input data:
 NACA 2412 with 5 deg flap at .75
     Alpha    CL        cmc4      CD
  5.00000   1.21160  -0.11720  -0.00150
         98.0000000
              X/C                Y/C                Cp                U/UE
      1   1.0000000         -0.0218722          0.4457454         -0.7444828
      2   0.9989193         -0.0218588          0.3699587         -0.7937514
      3   0.9956822         -0.0218183          0.3248610         -0.8216684
      4   0.9903033         -0.0217497          0.2959175         -0.8390962
      5   0.9828073         -0.0216514          0.2764678         -0.8506070
      6   0.9732280         -0.0215215          0.2633044         -0.8583097
      7   0.9616088         -0.0213579          0.2546606         -0.8633304
      8   0.9480022         -0.0211583          0.2494899         -0.8663198
      9   0.9324694         -0.0209209          0.2471926         -0.8676447
     10   0.9150801         -0.0206440          0.2474237         -0.8675116
     11   0.8959120         -0.0203265          0.2500552         -0.8659936
     12   0.8750503         -0.0199681          0.2552201         -0.8630063
     13   0.8525876         -0.0195686          0.2634676         -0.8582147
     14   0.8286229         -0.0191286          0.2764418         -0.8506222
     15   0.8032618         -0.0186488          0.3003036         -0.8364786
     16   0.7766151         -0.0181297          0.3571291         -0.8017923
     17   0.7487994         -0.0176765          0.3026126         -0.8350973
     18   0.7199356         -0.0196039          0.2852925         -0.8454037
     19   0.6901487         -0.0215702          0.2705841         -0.8540585
     20   0.6595672         -0.0235606          0.2596269         -0.8604494
     21   0.6283228         -0.0255578          0.2511996         -0.8653325
     22   0.5965492         -0.0275420          0.2446724         -0.8690959
     23   0.5643821         -0.0294907          0.2397471         -0.8719248
     24   0.5319584         -0.0313784          0.2363357         -0.8738789
     25   0.4994153         -0.0331776          0.2345359         -0.8749080
     26   0.4668901         -0.0348579          0.2347106         -0.8748082
     27   0.4345195         -0.0363877          0.2381573         -0.8728360
     28   0.4024391         -0.0377340          0.2431501         -0.8699712
     29   0.3710229         -0.0389221          0.2475556         -0.8674355
     30   0.3401839         -0.0399931          0.2525682         -0.8645414
     31   0.3100253         -0.0409071          0.2589526         -0.8608411
     32   0.2806665         -0.0416239          0.2673756         -0.8559348
     33   0.2522234         -0.0421045          0.2785123         -0.8494043
     34   0.2248088         -0.0423124          0.2930953         -0.8407763
```

```
 35   0.1985313          -0.0422143           0.3119721          -0.8294745
 36   0.1734958          -0.0417806           0.3361298          -0.8147823
 37   0.1498030          -0.0409861           0.3667493          -0.7957705
 38   0.1275494          -0.0398104           0.4052571          -0.7711958
 39   0.1068267          -0.0382380           0.4533792          -0.7393381
 40   0.0877222          -0.0362578           0.5131727          -0.6977301
 41   0.0703175          -0.0338633           0.5869251          -0.6427090
 42   0.0546887          -0.0310520           0.6766533          -0.5686358
 43   0.0409059          -0.0278245           0.7823370          -0.4665437
 44   0.0290324          -0.0241841           0.8964363          -0.3218132
 45   0.0191246          -0.0201360           0.9877394          -0.1107275
 46   0.0112310          -0.0156868           0.9593768           0.2015521
 47   0.0053924          -0.0108432           0.5824928           0.6461480
 48   0.0016409          -0.0056122          -0.4040008           1.1849054
 49   0.0000000           0.0000000          -1.7449023           1.6567746
 50   0.0005002           0.0058259          -2.6745226           1.9169044
 51   0.0031628           0.0116941          -2.9049768           1.9761014
 52   0.0079837           0.0175852          -2.7717383           1.9420964
 53   0.0149496           0.0234709          -2.5445025           1.8826849
 54   0.0240374           0.0293150          -2.3239744           1.8231770
 55   0.0352145           0.0350744          -2.1347101           1.7705113
 56   0.0484385           0.0407000          -1.9771560           1.7254437
 57   0.0636571           0.0461390          -1.8458352           1.6869603
 58   0.0808082           0.0513357          -1.7348001           1.6537231
 59   0.0998199           0.0562337          -1.6390182           1.6245055
 60   0.1206108           0.0607775          -1.5545312           1.5982901
 61   0.1430902           0.0649138          -1.4783340           1.5742725
 62   0.1671584           0.0685932          -1.4081639           1.5518260
 63   0.1927072           0.0717714          -1.3423257           1.5304658
 64   0.2196209           0.0744106          -1.2795517           1.5098184
 65   0.2477766           0.0764795          -1.2188853           1.4895923
 66   0.2770449           0.0779549          -1.1595500           1.4695407
 67   0.3072913           0.0788213          -1.1008238           1.4494219
 68   0.3383766           0.0790714          -1.0417638           1.4289030
 69   0.3701580           0.0787058          -0.9795462           1.4069635
 70   0.4024706           0.0777333          -0.9185968           1.3851342
 71   0.4349543           0.0762537          -0.8643457           1.3654104
 72   0.4677068           0.0743547          -0.8154098           1.3473715
 73   0.5005847           0.0720664          -0.7705135           1.3306065
 74   0.5334447           0.0694218          -0.7292154           1.3149964
 75   0.5661440           0.0664560          -0.6915128           1.3005817
 76   0.5985411           0.0632060          -0.6577775           1.2875471
 77   0.6304962           0.0597102          -0.6291239           1.2763714
 78   0.6618723           0.0560078          -0.6085705           1.2682943
 79   0.6925348           0.0521391          -0.6073793           1.2678246
 80   0.7223530           0.0481446          -0.6721267           1.2931074
 81   0.7512006           0.0439604          -0.5213552           1.2334323
 82   0.7789551           0.0374099          -0.4203068           1.1917663
 83   0.8054997           0.0309641          -0.3440065           1.1593130
 84   0.8307229           0.0246744          -0.2788006           1.1308407
 85   0.8545192           0.0185923          -0.2196457           1.1043757
 86   0.8767895           0.0127683          -0.1642191           1.0789899
 87   0.8974414           0.0072517          -0.1111093           1.0540917
 88   0.9163895           0.0020905          -0.0593664           1.0292553
 89   0.9335560          -0.0026691          -0.0082251           1.0041041
 90   0.9488706          -0.0069838           0.0429915           0.9782681
 91   0.9622707          -0.0108130           0.0950488           0.9512892
 92   0.9737022          -0.0141200           0.1489126           0.9225440
 93   0.9831185          -0.0168725           0.2061138           0.8910029
 94   0.9904819          -0.0190429           0.2693959           0.8547539
 95   0.9957626          -0.0206093           0.3448462           0.8094157
 96   0.9989396          -0.0215556           0.4457439           0.7444838

  STAGNATION PT. SEARCH
```

```
        J      X/C        Y/C        SARC     UE/UINF       CP

       40   0.087722  -0.036258   0.913194  -0.697730   0.513173
       41   0.070317  -0.033863   0.930764  -0.642709   0.586925
       42   0.054689  -0.031052   0.946645  -0.568636   0.676653
       43   0.040906  -0.027825   0.960803  -0.466544   0.782337
       44   0.029032  -0.024184   0.973225  -0.321813   0.896436
       45   0.019125  -0.020136   0.983934  -0.110727   0.987739
       46   0.011231  -0.015687   0.993005   0.201552   0.959377
       47   0.005392  -0.010843   1.000607   0.646148   0.582493
       48   0.001641  -0.005612   1.007069   1.184905  -0.404001
       49   0.000000   0.000000   1.012945   1.656775  -1.744902
       50   0.000500   0.005826   1.018822   1.916904  -2.674523

       STAG PT: XSP= 0.016326  YSP=-0.018558   SSP=0.987150  JS=45  JLE=49

       E1     =   0.0032163     E2    =   0.0058546
       ISTAGP =   1

       OUTPUT OF POSTp RESULTS

 send output to a file? (Y/N):
y

 enter file name:
postp.out

       ALPHA    =    5.00000
       MACH NO. =    0.10000
       CL       =    1.21160
       CMC4     =   -0.11720
       CD       =   -0.00150
       No. of upper surface values in x/c, Cp table =   52
       No. of lower surface values in x/c, Cp table =   46

    lower surface

       J      X/C        Y/C        S/C       U/UINF       CP
       1   0.016326  -0.018558   0.000000   0.000000   1.000000
       2   0.019125  -0.020136   0.003216  -0.110727   0.987739
       3   0.029032  -0.024184   0.013925  -0.321813   0.896436
       4   0.040906  -0.027825   0.026347  -0.466544   0.782337
       5   0.054689  -0.031052   0.040505  -0.568636   0.676653
       6   0.070317  -0.033863   0.056386  -0.642709   0.586925
       7   0.087722  -0.036258   0.073956  -0.697730   0.513173
       8   0.106827  -0.038238   0.093164  -0.739338   0.453379
       9   0.127549  -0.039810   0.113946  -0.771196   0.405257
      10   0.149803  -0.040986   0.136232  -0.795771   0.366749
      11   0.173496  -0.041781   0.159938  -0.814782   0.336130
      12   0.198531  -0.042214   0.184977  -0.829475   0.311972
      13   0.224809  -0.042312   0.211255  -0.840776   0.293095
      14   0.252223  -0.042105   0.238671  -0.849404   0.278512
      15   0.280667  -0.041624   0.267118  -0.855935   0.267376
      16   0.310025  -0.040907   0.296486  -0.860841   0.258953
      17   0.340184  -0.039993   0.326658  -0.864541   0.252568
      18   0.371023  -0.038922   0.357516  -0.867436   0.247556
      19   0.402439  -0.037734   0.388954  -0.869971   0.243150
      20   0.434519  -0.036388   0.421063  -0.872836   0.238157
      21   0.466890  -0.034858   0.453470  -0.874808   0.234711
      22   0.499415  -0.033178   0.486039  -0.874908   0.234536
      23   0.531958  -0.031378   0.518631  -0.873879   0.236336
      24   0.564382  -0.029491   0.551110  -0.871925   0.239747
      25   0.596549  -0.027542   0.583336  -0.869096   0.244672
```

26	0.628323	-0.025558	0.615171	-0.865332	0.251200
27	0.659567	-0.023561	0.646480	-0.860449	0.259627
28	0.690149	-0.021570	0.677126	-0.854059	0.270584
29	0.719936	-0.019604	0.706978	-0.845404	0.285293
30	0.748799	-0.017677	0.735910	-0.835097	0.302613
31	0.776615	-0.018130	0.763733	-0.801792	0.357129
32	0.803262	-0.018649	0.790385	-0.836479	0.300304
33	0.828623	-0.019129	0.815751	-0.850622	0.276442
34	0.852588	-0.019569	0.839719	-0.858215	0.263468
35	0.875050	-0.019968	0.862186	-0.863006	0.255220
36	0.895912	-0.020327	0.883050	-0.865994	0.250055
37	0.915080	-0.020644	0.902221	-0.867512	0.247424
38	0.932469	-0.020921	0.919613	-0.867645	0.247193
39	0.948002	-0.021158	0.935147	-0.866320	0.249490
40	0.961609	-0.021358	0.948755	-0.863330	0.254661
41	0.973228	-0.021521	0.960376	-0.858310	0.263304
42	0.982807	-0.021651	0.969956	-0.850607	0.276468
43	0.990303	-0.021750	0.977452	-0.839096	0.295918
44	0.995682	-0.021818	0.982832	-0.821668	0.324861
45	0.998919	-0.021859	0.986069	-0.793751	0.369959
46	1.000000	-0.021872	0.987150	-0.744483	0.445745

upper surface

J	X/C	Y/C	S/C	U/UINF	CP
1	0.016326	-0.018558	0.000000	0.000000	1.000000
2	0.011231	-0.015687	0.005855	0.201552	0.959377
3	0.005392	-0.010843	0.013457	0.646148	0.582493
4	0.001641	-0.005612	0.019919	1.184905	-0.404001
5	0.000000	0.000000	0.025795	1.656775	-1.744902
6	0.000500	0.005826	0.031672	1.916904	-2.674523
7	0.003163	0.011694	0.038141	1.976101	-2.904977
8	0.007984	0.017585	0.045770	1.942096	-2.771738
9	0.014950	0.023471	0.054900	1.882685	-2.544502
10	0.024037	0.029315	0.065711	1.823177	-2.323974
11	0.035214	0.035074	0.078289	1.770511	-2.134710
12	0.048439	0.040700	0.092662	1.725444	-1.977156
13	0.063657	0.046139	0.108826	1.686960	-1.845835
14	0.080808	0.051336	0.126748	1.653723	-1.734800
15	0.099820	0.056234	0.146382	1.624506	-1.639018
16	0.120611	0.060778	0.167665	1.598290	-1.554531
17	0.143090	0.064914	0.190523	1.574273	-1.478334
18	0.167158	0.068593	0.214871	1.551826	-1.408164
19	0.192707	0.071771	0.240618	1.530466	-1.342326
20	0.219621	0.074411	0.267661	1.509818	-1.279552
21	0.247777	0.076480	0.295894	1.489592	-1.218885
22	0.277045	0.077955	0.325200	1.469541	-1.159550
23	0.307291	0.078821	0.355459	1.449422	-1.100824
24	0.338377	0.079071	0.386546	1.428903	-1.041764
25	0.370158	0.078706	0.418330	1.406963	-0.979546
26	0.402471	0.077733	0.450657	1.385134	-0.918597
27	0.434954	0.076254	0.483175	1.365410	-0.864346
28	0.467707	0.074355	0.515983	1.347371	-0.815410
29	0.500585	0.072066	0.548940	1.330606	-0.770513
30	0.533445	0.069422	0.581907	1.314996	-0.729215
31	0.566144	0.066456	0.614740	1.300582	-0.691513
32	0.598541	0.063206	0.647300	1.287547	-0.657777
33	0.630496	0.059710	0.679446	1.276371	-0.629124
34	0.661872	0.056008	0.711040	1.268294	-0.608571
35	0.692535	0.052139	0.741946	1.267825	-0.607379
36	0.722353	0.048145	0.772030	1.293107	-0.672127
37	0.751201	0.043960	0.801185	1.233432	-0.521355
38	0.778955	0.037410	0.829706	1.191766	-0.420307
39	0.805500	0.030964	0.857022	1.159313	-0.344007

```
      40   0.830723   0.024674   0.883018   1.130841  -0.278801
      41   0.854519   0.018592   0.907579   1.104376  -0.219646
      42   0.876790   0.012768   0.930598   1.078990  -0.164219
      43   0.897441   0.007252   0.951975   1.054092  -0.111109
      44   0.916390   0.002090   0.971613   1.029255  -0.059366
      45   0.933556  -0.002669   0.989427   1.004104  -0.008225
      46   0.948871  -0.006984   1.005338   0.978268   0.042992
      47   0.962271  -0.010813   1.019274   0.951289   0.095049
      48   0.973702  -0.014120   1.031175   0.922544   0.148913
      49   0.983118  -0.016872   1.040985   0.891003   0.206114
      50   0.990482  -0.019043   1.048661   0.854754   0.269396
      51   0.995763  -0.020609   1.054170   0.809416   0.344846
      52   0.998940  -0.021556   1.057485   0.744484   0.445744

STOP
```

Output disk data file:

```
 NACA 2412 with 5 deg flap at .75
    5.00000    0.10000    1.21160   -0.11720   -0.00150

     lower surface
    s/c        Cp       dT/dy
  0.000000  1.000000  0.000000
  0.003216  0.987739  0.000000
  0.013925  0.896436  0.000000
  0.026347  0.782337  0.000000
  0.040505  0.676653  0.000000
  0.056386  0.586925  0.000000
  0.073956  0.513173  0.000000
  0.093164  0.453379  0.000000
  0.113946  0.405257  0.000000
  0.136232  0.366749  0.000000
  0.159938  0.336130  0.000000
  0.184977  0.311972  0.000000
  0.211255  0.293095  0.000000
  0.238671  0.278512  0.000000
  0.267118  0.267376  0.000000
  0.296486  0.258953  0.000000
  0.326658  0.252568  0.000000
  0.357516  0.247556  0.000000
  0.388954  0.243150  0.000000
  0.421063  0.238157  0.000000
  0.453470  0.234711  0.000000
  0.486039  0.234536  0.000000
  0.518631  0.236336  0.000000
  0.551110  0.239747  0.000000
  0.583336  0.244672  0.000000
  0.615171  0.251200  0.000000
  0.646480  0.259627  0.000000
  0.677126  0.270584  0.000000
  0.706978  0.285293  0.000000
  0.735910  0.302613  0.000000
  0.763733  0.357129  0.000000
  0.790385  0.300304  0.000000
  0.815751  0.276442  0.000000
  0.839719  0.263468  0.000000
  0.862186  0.255220  0.000000
  0.883050  0.250055  0.000000
  0.902221  0.247424  0.000000
  0.919613  0.247193  0.000000
  0.935147  0.249490  0.000000
  0.948755  0.254661  0.000000
  0.960376  0.263304  0.000000
  0.969956  0.276468  0.000000
```

```
0.977452  0.295918  0.000000
0.982832  0.324861  0.000000
0.986069  0.369959  0.000000
0.987150  0.445745  0.000000

   upper surface
  s/c        Cp       dT/dy
0.000000  1.000000  0.000000
0.005855  0.959377  0.000000
0.013457  0.582493  0.000000
0.019919 -0.404001  0.000000
0.025795 -1.744902  0.000000
0.031672 -2.674523  0.000000
0.038141 -2.904977  0.000000
0.045770 -2.771738  0.000000
0.054900 -2.544502  0.000000
0.065711 -2.323974  0.000000
0.078289 -2.134710  0.000000
0.092662 -1.977156  0.000000
0.108826 -1.845835  0.000000
0.126748 -1.734800  0.000000
0.146382 -1.639018  0.000000
0.167665 -1.554531  0.000000
0.190523 -1.478334  0.000000
0.214871 -1.408164  0.000000
0.240618 -1.342326  0.000000
0.267661 -1.279552  0.000000
0.295894 -1.218885  0.000000
0.325200 -1.159550  0.000000
0.355459 -1.100824  0.000000
0.386546 -1.041764  0.000000
0.418330 -0.979546  0.000000
0.450657 -0.918597  0.000000
0.483175 -0.864346  0.000000
0.515983 -0.815410  0.000000
0.548940 -0.770513  0.000000
0.581907 -0.729215  0.000000
0.614740 -0.691513  0.000000
0.647300 -0.657777  0.000000
0.679446 -0.629124  0.000000
0.711040 -0.608571  0.000000
0.741946 -0.607379  0.000000
0.772030 -0.672127  0.000000
0.801185 -0.521355  0.000000
0.829706 -0.420307  0.000000
0.857022 -0.344007  0.000000
0.883018 -0.278801  0.000000
0.907579 -0.219646  0.000000
0.930598 -0.164219  0.000000
0.951975 -0.111109  0.000000
0.971613 -0.059366  0.000000
0.989427 -0.008225  0.000000
1.005338  0.042992  0.000000
1.019274  0.095049  0.000000
1.031175  0.148913  0.000000
1.040985  0.206114  0.000000
1.048661  0.269396  0.000000
1.054170  0.344846  0.000000
1.057485  0.445744  0.000000
```