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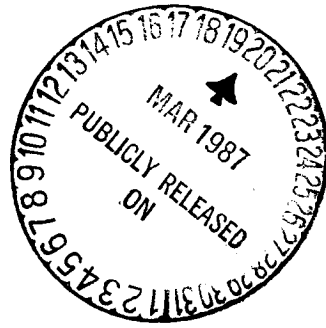
(NASA-CR-172501) VORSTAB: A COMPUTER PROGRAM FOR CALCULATING LATERAL-DIRECTIONAL STABILITY DERIVATIVES WITH VORTEX FLOW EFFECT (Kansas Univ. Center for Research, Inc.) 260 p

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VORSTAB - A COMPUTER PROGRAM FOR CALCULATING LATERAL-DIRECTIONAL STABILITY DERIVATIVES WITH VORTEX FLOW EFFECT



C. Edward Lan

THE UNIVERSITY OF KANSAS CENTER FOR RESEARCH, INC.
Flight Research Laboratory
Lawrence, Kansas

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INTRODUCTION

This report describes the usage of a computer program for calculating lateral-directional stability and control derivatives as described in reference 1. The method is applicable to wing-body combinations in subsonic flow.

In the following, a summary of the theoretical method, program capabilities, input format, output variables and program job control set-up are described. Then, input data of sample test cases and the corresponding output are given. The program listing is presented at the end.

SUMMARY OF THE THEORETICAL METHOD

The method is based on the Prandtl-Glauert equation in subsonic flow. The wing is assumed to be thin, so that thickness effect is not included. In the following, theoretical representation of the effects of wings, vortex flow and fuselage is summarized. Note that the effect of boundary layer separation is not accounted for. The wing wake is assumed to be flat.

(1) Wing Representation

The wing effect is represented by using a vortex distribution. The resulting integral equation for the wing surface boundary condition (i.e. flow tangency) is solved through the Quasi-Vortex-Lattice Method (QVLM) (ref. 2). The solution of the equation is the spanwise vortex density (γ_y) which is used to obtain the loading under symmetrical flight conditions. In addition, by calculating the net upwash along the leading edge using the predicted γ_y distribution,

the leading-edge thrust can also be calculated (ref. 2). Note that the leading-edge thrust is parallel to the plane of symmetry and is a component of the leading-edge suction. The latter is perpendicular to the leading edge. For a cambered wing, the relation between the leading-edge thrust and suction can be found in reference 3.

For the calculation of side-edge suction and lateral-directional characteristics, the most important quantity needed is the streamwise vortex density (γ_x). It is calculated by satisfying the conservation of vorticity,

$$\frac{\partial \gamma_x}{\partial x} + \frac{\partial \gamma_y}{\partial y} = 0 \quad (1)$$

In much the same way as using γ_y to calculate the longitudinal characteristics, both γ_y and γ_x are used to calculate the lateral-directional loading (refs. 1 and 2).

For a steady rolling wing, the viscous boundary layer tends to flow toward the wing tips, so that the effective overall angle of attack is reduced. In the program, an approximate method based on the boundary layer thickness of a rotating disk is used to estimate this reduction in angle of attack (ref. 1).

(2) Vortex Flow

To account for the effect of edge-separated vortex flow, Polhamus' method of the suction analogy (ref. 4) is extended to include the lateral-directional motion. In addition, the following features are also incorporated in the code.

(a) Augmented vortex lift effect.

For wings with a nonzero tip chord or with swept

trailing edges, the leading-edge vortex may pass over an additional (or less) planform area before reaching the wake. The vortex lift induced on the downstream planform area is called the augmented vortex lift (ref. 5)

(b) Strake Vortex

A strake vortex not only produces the augmented vortex lift, but also induces downwash inboard and upwash outboard of the strake-wing juncture. To account for this effect, a discrete vortex starting from the juncture to downstream infinity is introduced. The strength of this discrete vortex is calculated by equating the vortex lift to the Kutta-Joukowski force:

$$\frac{1}{2} \rho V_{\infty}^2 c_s c \, dy = \rho \Gamma w_{le} \, dl \quad (2)$$

where c_s is the sectional leading-edge suction coefficient, Γ is the equivalent circulation per unit length of the leading edge, w_{le} is the upwash at the leading edge and l is the length measured along the leading edge.

The total circulation or the vortex strength is then

$$\Gamma_t = \int_{le} \frac{\Gamma}{V_{\infty}} \, dl = \frac{1}{2} \int_{le} \frac{c_s c}{\frac{w}{V_{\infty}} |_{l.e.}} \, dy \quad (3)$$

Since both c_s and $w_{l.e.}$ depend on Γ_t , the circulation is determined iteratively.

(c) Vortex lift on wings with rounded leading edges

The vortex lift on a wing with rounded leading edges is known to have a value less than that with sharp edges. The method used to estimate the reduced vortex lift in the code is based on Kulfan's concept

(refs. 6 and 7). In the latter, the sectional angle of attack (α_s) at which the vortex separation first occurs is calculated by equating the leading-edge thrust to the leading-edge drag. For a symmetrical wing, the result is (ref. 1)

$$\alpha_s = \sin^{-1} \left\{ \pm \frac{\sin \alpha}{C'} \left(\frac{2r_o}{c} \right)^{1/2} \frac{\cos \Lambda_\ell}{(1 - M_\infty^2 \cos^2 \Lambda_\ell)^{1/2}} \right\} \quad (4)$$

where C' is the leading-edge singularity parameter at α given by

$$C' = \lim_{x \rightarrow x_\ell} \gamma_y \left(\frac{x - x_\ell}{c} \right)^{1/2} \quad (5)$$

and r_o is the leading-edge radius.

For a cambered wing, equation (4) is revised to be

$$\alpha_s = \sin^{-1} \left\{ \pm \frac{\sin \alpha + \alpha_1}{C'} \left(\frac{2r_o}{c} \right)^{1/2} \frac{\cos \Lambda_\ell}{\sqrt{1 - M_\infty^2 \cos^2 \Lambda_\ell}} - \alpha_1 \right\} \quad (6)$$

where α_1 appears in the expression for leading-edge suction (c_s) as follows

$$c_s = K [\sin \alpha + \alpha_1]^2 \quad (7)$$

where K is a function of geometry and Mach number.

If c'_s is the leading-edge suction coefficient for the corresponding noncambered wing, then α_1 can be calculated as

$$\alpha_1 = \left(\sqrt{\frac{c_s}{c'_s}} - 1 \right) \sin \alpha \quad (8)$$

(d) Vortex Breakdown

To predict the vortex breakdown effect, it is necessary to have the following information:

- (1) the angle of attack for vortex breakdown at the trailing edge (α_{BD}) for any planforms;
- (2) the progression of the breakdown point when $\alpha > \alpha_{BD}$;
- (3) the amount of remaining vortex lift in the region of breakdown.

In the present method, the calculated leading-edge suction distribution ($c_s c$) is used to correlate with the experimental data of Wentz (ref. 8) for the needed information mentioned above.

(3) Body Representation

The influence of fuselage on the flow field is represented by Ward's vortex multiplets (ref. 9) distributed along the fuselage centerline. Although the method is applicable to arbitrary body cross sections, it has been implemented only for bodies of revolution with any radius variation. However, the wing-body interference has been properly accounted for.

PROGRAM CAPABILITIES

This program has the following main features:

- (1) It is applicable to nonplanar wing configurations in subsonic flow, including winglets, vertical fins, etc. The leading and trailing edges may be curved. Up to six (6) lifting surfaces can be accepted. For wings with dihedral, they may be represented by up to five (5) contiguous spanwise panels with different dihedral angles.

- (2) It is also applicable to an asymmetrical configuration. Typical applications involve nonsymmetrical flap or aileron deflections.
- (3) General camber shapes may be defined at ten (10) or less spanwise stations. Option for exactly defining leading-edge flap geometry is also provided.
- (4) The twist distribution on lifting surfaces can be prescribed in a general way.
- (5) Nine (9) lateral-directional stability derivatives are calculated for both attached flow and vortex flow. For the latter, the effect of vortex breakdown is accounted for by an empirical method.
- (6) The control effectiveness for both longitudinal and lateral-directional motions can be calculated.
- (7) Ground effect under static conditions can also be calculated.

INPUT DATA FORMAT

Group 1 Format (13A6), 1 card

Title (I) A descriptive phrase describing the case to be run.

Group 2 Format 4(6X,I4), 1 card

NCASE User's specified case number which may be arbitrary.

NGRD = 1 if the wings are in ground effect.

 = 0 if the wings are in free air.

NASYM = 0 if the planform is symmetrical about X-Z plane.

 = 1 if the planform is not symmetrical about X-Z plane.

 In this case, only one lifting surface without winglets
 is allowed, and the whole planform must be defined,
 starting from the left tip.

NSUR Number of lifting surfaces, such as wing, canard, tails,
 etc. Limited to 6. Note. Winglets are not separate lifting
 surfaces.

Group 3 Format 4(6X,I4), 1 card

LAT = -1 if the rolling moment coefficient for a given aileron
 angle is to be computed.

 = 0 for symmetrical loading only

 = 1 if both symmetrical loading and lateral-directional
 derivatives are to be computed.

 For asymmetrical configurations (i.e., NASYM = 1), set LAT = 0.

 The resulting rolling and yawing moments are computed.

IBLC = 1, if a boundary layer correction is to be applied to
 roll derivatives.

 = 0, if no boundary layer correction is applied.

KT = 1, if the effect of rounded leading edges on vortex lift is calculated.
= 0, if full vortex lift effect is allowed.

IBD = 1, if the vortex breakdown effect is included in calculating vortex lift.
= 0, otherwise.

Groups 4 through 18 must be repeated NSUR times. The wing is the 1st surface.

Group 4 Format 8(6X,I4)

NC Number of spanwise sections on the right wing (bounded by points of discontinuities in geometry, such as change in sweep, edges of flap segments, panels with different dihedral angles, etc.) Limited to 5. (see Sketch 1).

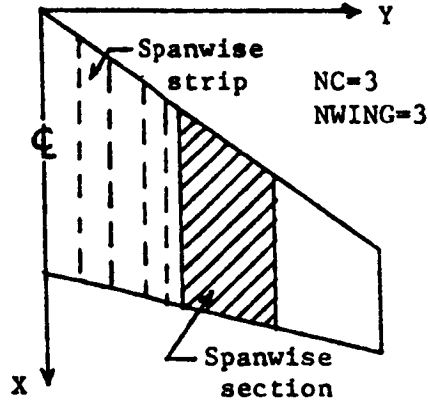
M1(I), I=1, NC Number of spanwise strips in each spanwise section. There are NC numbers. Maximum total number of strips is 48. (See Sketch 1). A minimum of 2 should be used in each section.

NWING The numerical value of last wing spanwise section, i.e., its most outboard section.

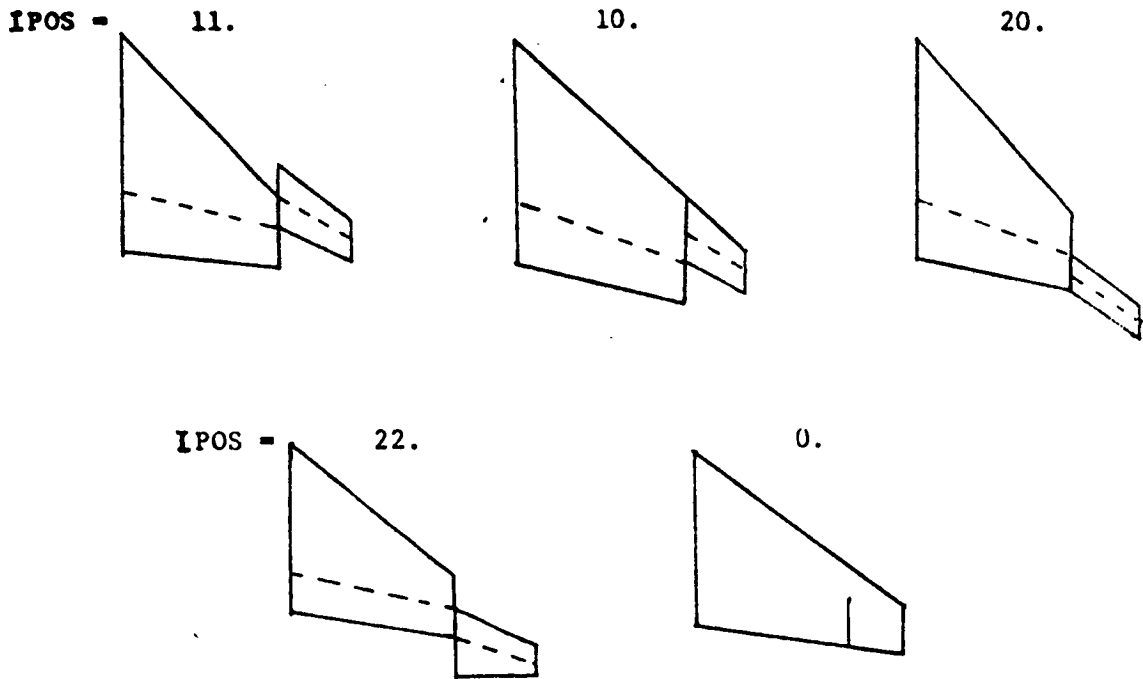
IWGLT = 1 if a winglet is present. = 2 if a vertical fin is present inboard of wing tip. = 0, otherwise. (Winglet or vertical Fin must be on the wing)

IPOS Winglet position indicator. The number used to identify the configuration in the code is based on whether the winglet is attached to the wing first or second chordwise section, respectively. It is indicated in sketch 2. If there is no winglet, it should be 0.

Note. For coplanar lifting surfaces, such as a coplanar wing-tail configuration, spanwise sections on both upstream and downstream surfaces must line up and numbers of spanwise strips in the corresponding spanwise sections must be the same. This is to avoid trailing vortices from passing over control points on the downstream surfaces.



Sketch 1.



Sketch 2

Group 5 Format 8(6X,I4)

NFP Number of trailing-edge flap segments. Limited to 5.

NJW(I), I=1, NFP Numerical value of the spanwise section in which the trailing-edge flap segment is contained. For either clean or full-span flap configurations, set NFP=1 and NJW (1) = 1. (See Sketch 3).

NVRTX The spanwise strip number on a lifting surface, cumulative from its center line, at which and outboard of which the leading-edge vortex lift effect is not included. Full vortex lift effect is assumed if this value is set to zero.

MVRTX The spanwise strip number on a lifting surface, cumulative from its center line, at which and inboard of which the L.E. vortex lift effect is not included.

NLEF = 1, if the flaps are flat leading-edge flaps.
 = 0, if the flaps are trailing-edge flaps.

IV = 1, if the lifting surface has dihedral of 90-deg. and is situated on the plane of symmetry.
 = 0, otherwise .

NAL Numerical value of the aileron segment among the trailing-edge flap segments. For a all-movable surface for lateral control, NW(2) should be 0 for that surface (See Group 7).

Group 6 Format 8F10.6, 1 card

DF(I), I = 1, NFP Trailing-edge flap angles in degrees, inboard trailing-edge flap segment first. For leading-edge flaps, the angles are negative for nose down. (See Note 1).*

Group 7 Format 5(6X,I4), 1 card

NW(1) Numbers of chordwise aerodynamic panels in chordwise sections

NW(2) (See Sketch 3). The chordwise section may be bounded along

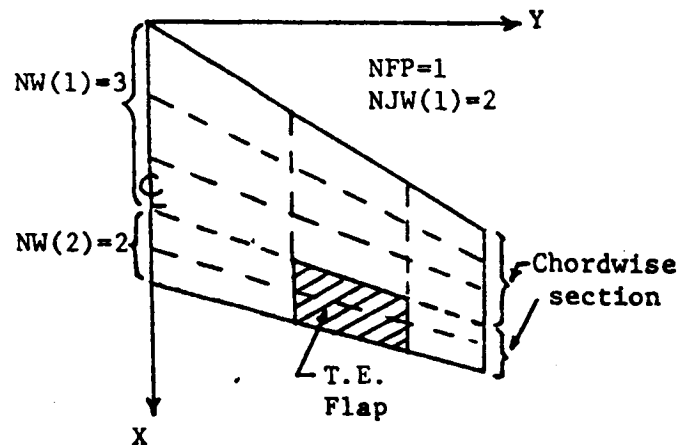
* Notes appear at the end of this Section.

trailing-edge flap hinge line or winglet leading edge. $NW(2) = 0$
 for clean configurations. $(NW(1) + NW(2))$ is limited to 15.
 Use at least 8 for $NW(1) + NW(2)$ for cambered sections.

ICAM = 0 for non-cambered airfoils
 = 1 if camber ordinates are to be read in.
 = 2 if camber slopes are defined analytically in subroutine ZCDX.
 = 3 if there are flat leading-edge flaps attached to a non-cambered wing.

IST Number of y stations at which camber ordinates are read in.
 Limited to 10. If ICAM = 3, IST is the number of leading-edge flap segments. If ICAM = 1, at least 2 y-stations are needed, to cover each surface, one at the root and the other at the tip.

ICAMT Numerical value of the y-station at which and beyond which the input cambers are for the winglet or vertical fin.
 = 0 if there is no camber for the winglet or fin.



Sketch 3

Omit Groups 8, 9, and 10 if ICAM \neq 1. Repeat Groups 8, 9, 10 IST times.

Group 8 Format 4F10.6

YT(I) y-station (dimensional) at which camber ordinates are read in.

XNUM number of camber ordinates to be read in. Limited to 21.

CURV(I) = 0. if camber is to be formed by connecting straight segments,
with first segment being regarded as flat leading-edge flap.

= 1. if cubic spline interpolation is used.

= 2. if cubic spline interpolation is used, with first segment
being flat leading edge flap.

CHND(I) Chord length at YT(I) station.

Group 9 Format 8F10.6

XT(I,J) x/c-values at which camber ordinates are read in for YT(I) station.

Group 10 Format 8F10.6

CA(J) z/c-values of camber ordinates at the corresponding XT(I,J)-
locations. (See Note 2).

Omit Groups 11, 12 and 13 if ICAM \neq 3. Repeat IST times.

Group 11 Format 2F10.6 (See Note 3).

YLEF (I,1) Extreme inboard y-coordinate of Ith flat leading-edge
flap segment.

YLEF (I,2) Extreme outboard y-coordinate of Ith flat leading-edge
flap segment.

Group 12 Format 6F10.6

XLF(I,1) } First corner point coordinates of Ith flat leading-edge
flap segment.

YLF(I,1) } See sketch 4.

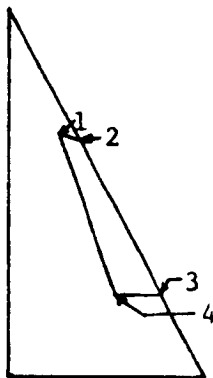
Z1

$\left. \begin{array}{l} \text{XLF(I,2)} \\ \text{YLF(I,2)} \\ \text{Z2} \end{array} \right\} \text{ Second corner point coordinates of Ith flat leading-edge flap segment.}$

Group 13 Format 6F10.6

$\left. \begin{array}{l} \text{XLF(I,3)} \\ \text{YLF(I,3)} \\ \text{Z3} \end{array} \right\} \text{ Third corner point coordinates of Ith flat leading-edge flap segment.}$

$\left. \begin{array}{l} \text{XLF(I,4)} \\ \text{YLF(I,4)} \\ \text{Z4} \end{array} \right\} \text{ Fourth corner point coordinates of Ith flat leading-edge flap segment.}$



Note: The flat flap must be inside the boundary of planform described in Group 15.

Sketch 4

Repeat Groups 14-18 "NC" times.

Group 14 Format 6X,I4

IPN = 1 if the shapes of L.E. and T.E. are to be defined numerically.
 = 0 otherwise.

Group 15 Format 8F10.6

Corner-point coordinates of a spanwise section. See sketch 5a.

XXL(1) L. E. X-coordinate of the inboard chord.

XXT(1) T. E. X-coordinate of the inboard chord.

YL(1) Y-coordinate of the inboard chord.

XXL(2) L. E. X-coordinate of the outboard chord.

XXT(2) T. E. X-coordinate of the outboard chord.

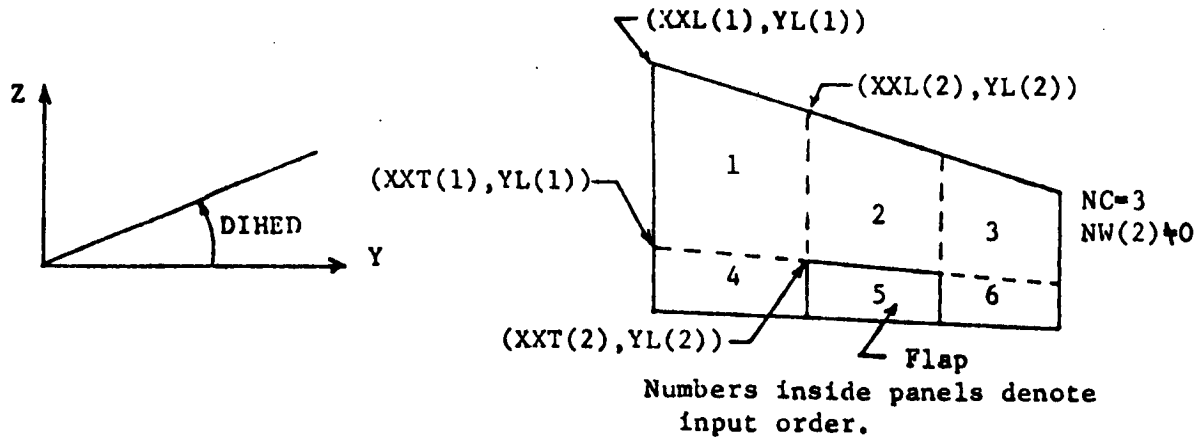
YL(2) Y-Coordinate of the outboard chord.

ZS elevation of root chord of the lifting surface relative to fuselage centerline.

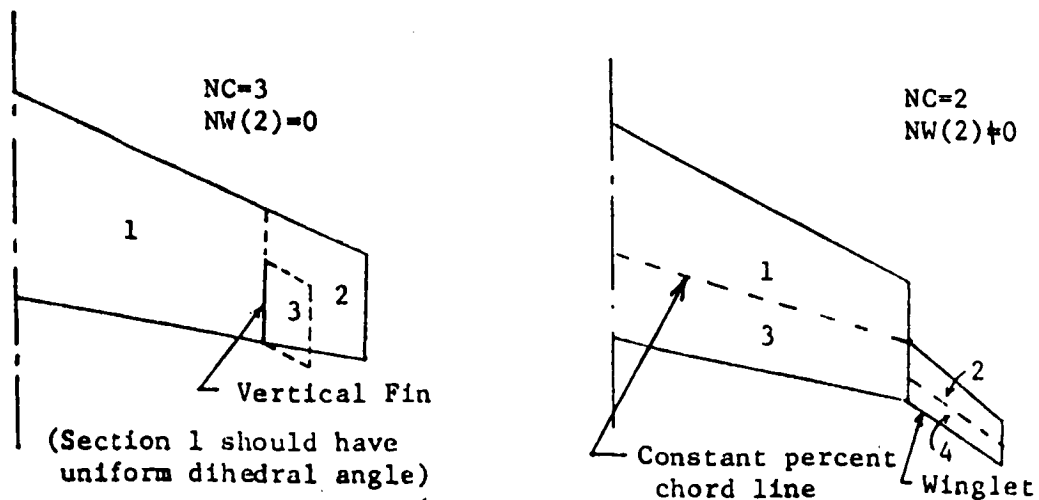
DIHED dihedral angle in degrees for the section. For NASYM = 1,

DIHED for the left wing is negative upwards.

Note. Groups 14 through 18 are to be repeated NC times. With trailing-edge flaps or winglet, another NC cards are needed to describe the flap and the associated regions. The order of input is illustrated in Sketch 5. Panels with dihedral must be rotated to X-Y plane for geometric description.



Sketch 5 a.



Sketch 5 b.

Groups 16 - 18 must be omitted if IPN = 0.

Group 16 Format 4(6X,I4)

NLE Number of input points to define the leading edge. Limited to 15.
NTE Number of input points to define the trailing edge. Limited to 15.
MCVL = 1 if the cubic spline is used to interpolate the L.E. shape.
 = 0 if straight segments are assumed.
MCVT = 1 if the cubic spline is used to interpolate the T.E. shape.
 = 0 if straight segments are assumed.

Group 17 Format 8F10.6

CA(I), I=1, NLE X-coordinates of input points to define the LE shape,
 measured relative to the LE of inboard chord.
YSL(I), I=1, NLE Y-coordinates of input points to define the LE shape,
 measured relative to the inboard chord. (See Note 4).

Group 18 Format 8F10.6

CA(I), I=1, NTE X-coordinates of input points to define the TE
 shape, measured relative to the TE of inboard chord.
YST(I), I=1, NTE Y-coordinates of input points to define the TE
↑ REPEAT NSUR TIMES shape, measured relative to the inboard chord.

Group 19 Format 6F10.6

AM Freestream Mach number < 1.0
HALFSW Half of reference wing area, same units as (CREF) squared.
 For asymmetrical configurations (i.e., NASYM = 1), use total area.
CREF Reference chord length
BREF2 Reference half span
XREF x-coordinate of moment reference point.
ALPCON = 1. if C_{L_α} and C_{m_α} are to be computed. For this case, set
 T.E. flap angles to zero. Calculation is done at $\alpha = 1$ radian.
 = 2, if the calculation is for one design lift coefficient based

on the attached-flow theory, = 3, if it is based on the vortex flow theory.

= 0, otherwise.

Group 20 Format 4F10.6, 1 card

(Set the following variables to 0, If ALPCON = 1.)

ALNM Number of angles of attack to be processed. If ICAM \neq 0 and IBD = 1, set ALNM \geq 2. Limited to 15.

SNUM Number of spanwise stations involving augmented vortex lift.

DVRTX =1, if an additional discrete strake vortex is needed to calculate the augmented vortex lift effect.

= 0, otherwise

CLDS = design lift coefficient if ALPCON = 2 or 3.

= 0, otherwise.

If ALPCON = 1., skip Group 21.

Group 21 Format 8F10.6

ALPA(I) Angles of attack in degrees. ALNM numbers. If there are camber, leading-edge flaps, and/or rounded leading edges, start with a high value of angles (such as 35-40 deg.).

Repeat Group 22 SNUM times. If SNUM = 0, use one blank card.

Group 22 Format 7F10.6

SNI Spanwise strip number, cumulative from the center line of the first lifting surface, starting from which the leading-edge vortex produces the vortex lift augmentation on a downstream surface. = 0. if there is no vortex lift augmentation.

SNE Ending spanwise strip number for vortex lift augmentation.
= 0. if there is no vortex lift augmentation.

CTILT Characteristic length for augmented vortex lift effect. It may be positive or negative. (See Note 5).

SLETH L.E. length of the lifting surface which produces the vortex lift augmentation.

XCNTD X-coordinate of the assumed centroid of augmented vortex lift.

YCNTD Y-coordinate of the centroid of augmented vortex lift.

XTILT X-distance from the outboard L.E. of the originating surface to the T.E. of the receiving surface over which the vortex is assumed to pass. (See Note 5).

SR The lifting surface number receiving the augmented vortex lift effect.

Groups 23 through 28 are repeated NSUR times. Omit Groups 23 and 24 if KT=0.

Group 23 Format (6X,I4), 1 card

ICNLE = 0 for constant L.E. radius/local chord ratio.
= 1 for constant L.E. radius.
= 2 for variable L.E. radius/chord ratio.

Group 24 Format 8F10.6

RC = L.E. radius/local chord if ICNLE = 0.
= L.E. radius if ICNLE = 1
= L.E. radius/local chord, if ICNLE = 2, at all spanwise control stations.

If ALPCON = 1., Groups 25 - 28 should be omitted.

Group 25 Format 3F10.6

TWST = 1. if there is geometric twist.
= 0. otherwise.

RINC Incidence angle, in degrees, of the lifting surface.

TINP Incidence angle, in degrees, of winglet or vertical fin, relative to the root of the lifting surface.

Groups 26 through 28 should be omitted if TWST = 0.

Group 26 Format 2F10.6

YNUM Number of y-stations to be used to describe twist distribution.

TCURV = 0. if the twist distribution is assumed to have piecewise
 linear variation.

 = 1. if cubic spline interpolation is used.

Group 27 Format 8F10.6

YTS(I) Nondimensional (based on semispan) y coordinates at which twist
 angles are defined. YNUM numbers. Limited to 21.

Group 28 Format 8F10.6

CA(I) Twist angles in degrees at the corresponding y-stations.

 Negative for washout (i.e., leading-edge down).

Group 29 Format 2F10.6

HEIGHT Height of 3/4 chord point of mean geometric chord from
 ground if NGRD = 1.

 = 0., otherwise.

ATT = Pitch attitude angle of wings, in degrees.

 = 0. if NGRD = 0.

Group ~~30~~ must be omitted if LAT \neq 1.

Group 30 Format 4F10.6

P = $pb/2V_\infty$, the maximum roll helical angle in radian.

BK Sideslip angle in radian.

RL = $rb/2V_\infty$, the yaw rate parameter, in radian. If RL = 0,
 then $pb/2V_\infty = P \cos(\alpha)$ and $rb/2V_\infty = P \sin(\alpha)$.

CFF Skin friction coefficient based on mean geometric chord,

 if IBLC = 1.

 =0. otherwise.

PBK = 1. if roll derivatives in combination with sideslip are to be computed. = 0. otherwise.

Group 31 Format 4(6X,I4)

KF = 1 if a fuselage is present
= 0 otherwise

NT number of Fourier-series terms, excluding the zero-order term, to satisfy the body surface boundary condition. Usually, 2 or 3 will be sufficient.

NCUM number of circumferential locations on the body surface at which the pressure loading is to be computed. For midwing configurations, use even number. Limited to 10.

NF number of control stations along the fuselage axis. Limited to 20.

Group 32 Format 5F10.6

XAS(1) X-coordinate of the fuselage nose.

XAS(2) X-coordinate of the fuselage tail.

FUSIND = 0. if the fuselage geometry is to be defined analytically in Functions FUR(X) and SLOP(X) (i.e. $r(x)$ and $r(x) \frac{dr(x)}{dx}$ respectively).
= 1. otherwise.

FUSNO number of fuselage stations to be input to define the fuselage shape if FUSIND = 1. Limited to 21.
= 0. otherwise.

FSHAP = 1. if the input fuselage shape is to be interpolated through cubic spline interpolation.

= 0. if the input points for the fuselage shape are connected with straight segments.

= arbitrary if FUSIND = 0.

X1 the body station in fraction of body length at which the rate of change of cross-sectional area with body length first reaches max. negative value. See Datcom.

Groups 33, 34 must be omitted if FUSIND = 0

Group 33 8F10.6

XFF(I) X-coordinates of fuselage to input its radius. FUSNO numbers.

Group 34 8F10.6

RFF(I) radii of fuselage at XFF(I) stations.

* To run additional cases, repeat Groups 1 - 34 *

Note: Total number of unknowns to be solved in the program

$$= \text{NSUR} \sum [(\Sigma M1(I)) * (NW(1) + NW(2))] + NF*NT$$

An example of calculating total number of unknowns is given on page 61.

Notes

1. For ailerons, only those on the right wing are prescribed. Antisymmetrical deflection is assumed. Downward deflection is positive. For rudders with conventional positive deflections (i.e. deflected to the left), the input angles must be negative.

For flap angles given normal to a hinge line, they must be converted to those measured in the streamwise direction for input as "DF". The conversion relation can be derived by vector analysis and is given as follows:

$$\sin\delta_s = \sin\delta_n \cos \Lambda \quad (9)$$

where δ_s is the flap angle measured in the streamwise direction, δ_n is that normal to the hinge line and Λ is the sweep angle of the hinge line.

2. For a conical camber, a useful mathematical description of the shape can be found in Appendix B of reference 3.

Equal spacing of input points is the best if cubic spline is to be used for interpolation.

3. For a plane flap, a useful exact description of its geometry and deflection can be found in Appendix B of reference 3.

It can be described by the following equation

$$ax + by + cz + d = 0 \quad (10)$$

where

$$a = (y_4 - y_1)(z_3 - z_2) - (y_3 - y_2)(z_4 - z_1)$$

$$b = (x_3 - x_2)(z_4 - z_1) - (x_4 - x_1)(z_3 - z_2)$$

$$c = (x_4 - x_1)(y_3 - y_2) - (x_3 - x_2)(y_4 - y_1)$$

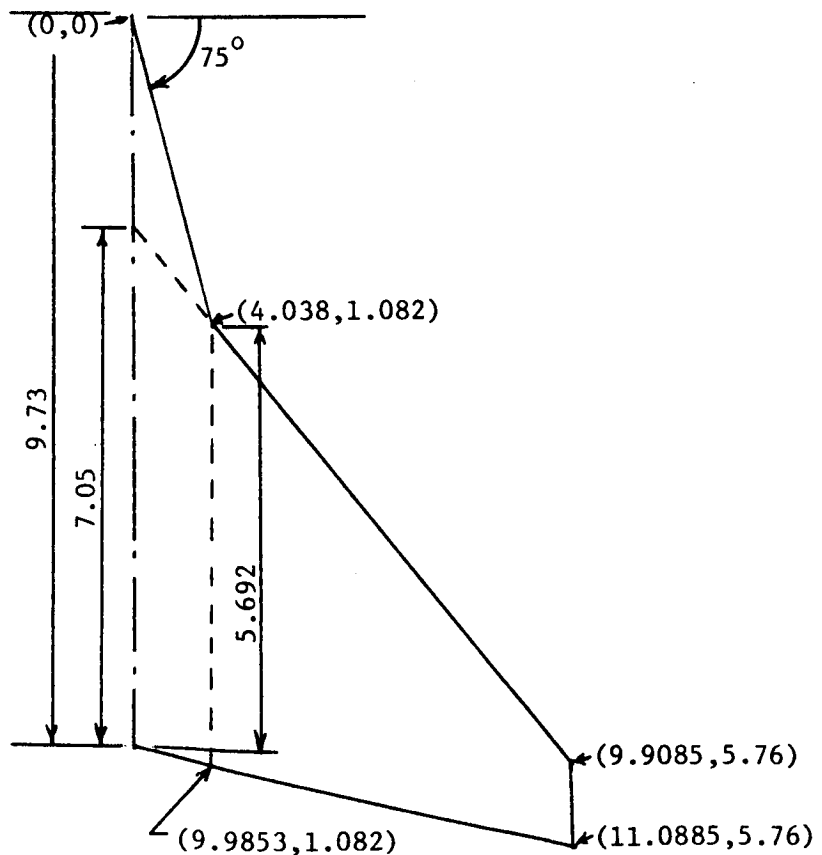
The streamwise slope is then given by

$$\frac{\partial z}{\partial x} = -\frac{a}{c} \tag{11}$$

4. For the input of a curved leading edge, the coordinates (x,y) of the leading edge of inboard chord are regarded as (0,0).
5. The choice of CTILT is based on reference 5. On the other hand, XTILT is to represent the severity of adverse pressure gradient over which the vortex must pass. As a result of using XTILT, the vortex may break down earlier. For a simple wing planform, both CTILT and XTILT are the same. For strake-wing configurations, they are different in general. The choice is somewhat empirical in nature. The following examples will illustrate their choice based on experience.

(1) A strake-wing configuration

This example is taken from reference 10 and is as shown in the following sketch.



For this configuration,

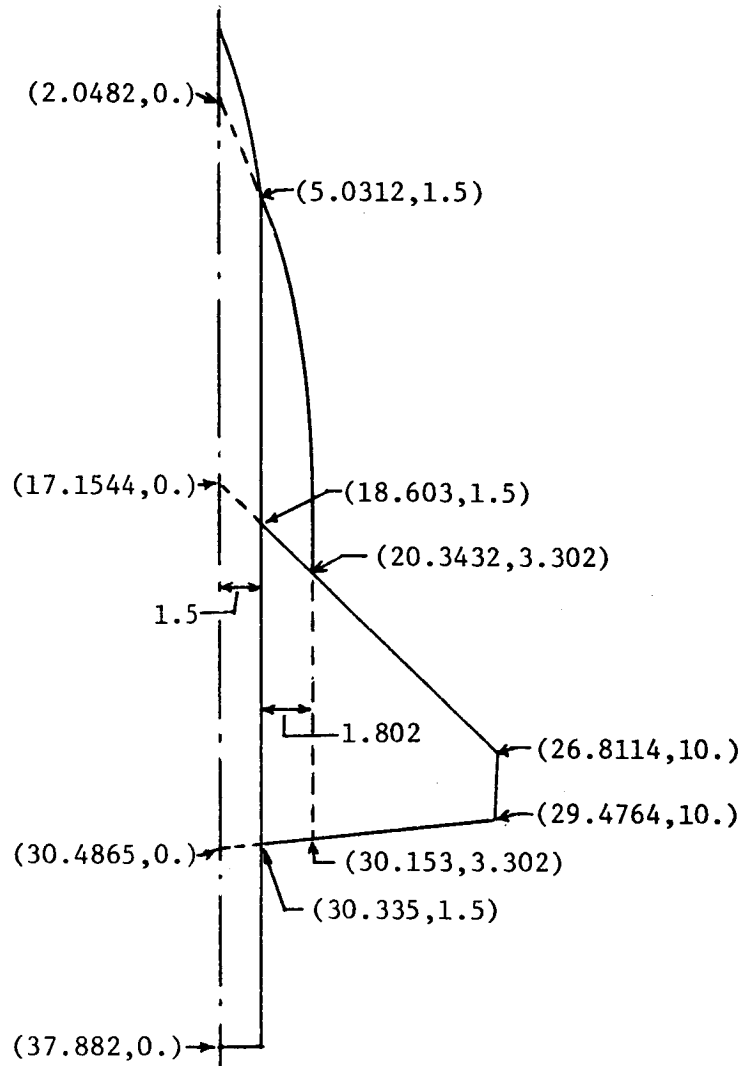
$$\text{Strake } \left\{ \begin{array}{l} \text{CTILT} = 5.692 \\ \text{XTILT} = \frac{7.05}{9.73} \times 4.038 = 2.9258 \end{array} \right.$$

Note that for a strake, XTILT is to be expressed in terms of the root chord (4.038) of an equivalent delta wing for the strake. Similarly,

$$\text{Wing } \left\{ \begin{array}{l} \text{CTILT} = 9.9853 - 9.9085 = 0.0768 \\ \text{XTILT} = \text{CTILT} = 0.0768 \end{array} \right.$$

(2) A strake-wing body configuration

This example is taken from reference 11 and is as shown in the following sketch.



In this case, the aft fuselage will contribute to the adverse pressure gradient for the strake vortex. The projected fuselage area on the X-Y plane downstream of the wing leading edge can be calculated to be

$$\frac{37.882 - 17.1544 + 37.882 - 18.603}{2} \times 1.5 = 30.0050.$$

Divided by the total width of the strake region, this is equivalent to a streamwise length of

$$\frac{30.0050}{1.5 + 1.802} = 9.0869$$

Therefore, the total distance of adverse pressure region is

$$9.0869 + (30.335 - 18.603) = 20.8189$$

This must be expressed in terms of the root chord of an equivalent delta wing of the strake as

$$XTILT = \frac{20.8189}{30.4865 - 2.0482} \times (20.3432 - 5.0312) = 11.21 \text{ (for strake vortex)}$$

CTILT is given by

$$CTILT = 30.335 - 20.3432 = 9.9918 \text{ (for strake vortex)}$$

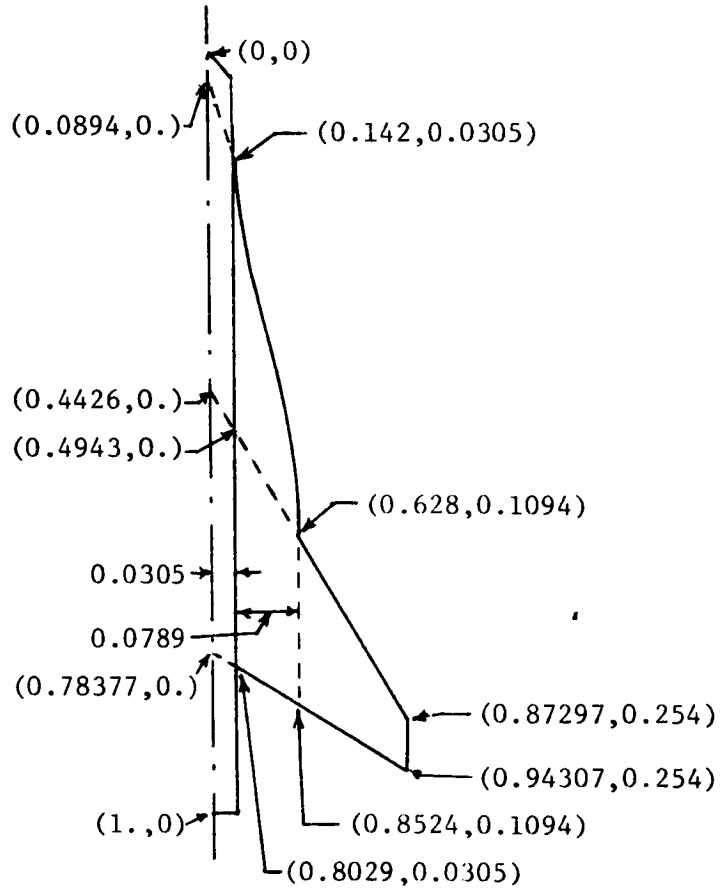
For the wing,

$$CTILT = 30.153 - 26.8114 = 3.3416$$

$$XTILT = CTILT = 3.3416$$

(3) Second strake-wing body configuration

This example is taken from reference 12 and is as shown in the following sketch.



The projected fuselage area on the X-Y plane downstream of the wing leading edge can be calculated to be

$$\frac{1-0.4426 + 1 - 0.4943}{2} \times 0.0305 = 0.016212$$

Divided by the total width of the strake region, this is equivalent to a streamwise length of

$$\frac{0.016212}{0.0305 + 0.0789} = 0.1482$$

It follows that the total distance of adverse pressure region is

$$0.8029 - 0.4943 + 0.1482 = 0.4568$$

This is expressed in terms of the root chord of an equivalent delta wing of the strake as

$$XTILT = \frac{0.4568}{0.78377 - 0.0894} \times (0.6280 - 0.1420) = 0.32$$

(for strake vortex)

CTILT is given by

$$CTILT = 0.8029 - 0.6280 = 0.1749 \text{ (for strake vortex)}$$

For the wing,

$$CTILT = 0.8524 - 0.87297 = -0.02057$$

$$XTILT = CTILT = -0.02057$$

OUTPUT VARIABLES

- (1) At the beginning of the output, all input data will be printed.

HALFSW = half of reference wing area

CREF = reference chord

- (2) Vortex element endpoint coordinates

(X1,Y1,Z1) coordinates of the inboard endpoint of a bound
vortex element

(X2,Y2,Z2) coordinates of the outboard endpoint of a bound
vortex element

- (3) Control point coordinates

One set of (XCP, YCP, ZCP) values defines a control point
location

- (4) Tip suction

X/C nondimensional x coordinate with respect to tip chord

CTIP = $S_t(x) / (\frac{1}{2}\rho V_\infty^2 c_t)$, where S_t is the tip suction force per unit length and c_t is the tip chord

Y/S y divided by half span

$$\text{GAMMA} = - \int_{x_\ell}^x \gamma_y(x', y) dx'$$

$$\text{GAMAX} = \gamma_x$$

(5) Pressure distribution in attached flow

XV nondimensional chordwise location (referred to local chord)

YV nondimensional spanwise location (referred to semispan of the lifting surface)

$$\text{CP} = \Delta C_p$$

(6) Sectional characteristics

Y/S nondimensional y-station, referred to semispan of the lifting surface

CL sectional lift coefficient

CM sectional pitching moment coefficient about the Y axis

CT sectional leading-edge thrust coefficient

CDI sectional induced drag coefficient

CS*C sectional suction coefficient multiplied by local chord

CAV sectional axial (along X-axis) force coefficient due to leading edge vortex

(7) The next group of output variables is the overall aerodynamic characteristics in attached potential flow. If ALPCON = 1.0, the lift and pitching moment coefficients will be C_{L_α} and C_{M_α} .

(8) If ALPCON = 1.0, the factors, K_p , $K_{v,le}$, and $K_{v,se}$ etc. to be used in the method of suction analogy for a noncambered

wing will be printed next. They are used in the following formulas:

$$C_L = K_p \sin^2 \alpha + (K_{v,le} + K_{v,se}) \sin^2 \alpha \cos \alpha$$

$$C_{D_i} = C_L \tan \alpha$$

$$C_m = K_p \sin \alpha \cos \alpha \frac{\bar{x}_p}{C_{ref}} + K_{v,le} \sin^2 \alpha \frac{\bar{x}_{le}}{C_{ref}} + K_{v,se} \sin^2 \alpha \frac{\bar{x}_{se}}{C_{ref}}$$

- (9) If a fuselage is present, the pressure coefficient (C_p) at (X/L, THETA) will be printed, where L is the fuselage length and THETA (i.e. θ) is measured clockwise (facing upstream) from the positive Z axis (i.e. upwards). The fuselage local loading is defined as

$$C_N = -\frac{1}{r} \int_0^{2\pi} C_p (rd\theta) \cos \theta \quad (12)$$

The overall fuselage aerodynamic coefficients are all based on the input reference area and chord.

- (10) Next, the attached flow results are summarized. For the lift coefficient,

CL(LS) the total lift coefficient from all lifting surfaces

CLF the total lift coefficient from the fuselage

$$CL = CL(LS) + CLF$$

Similar definitions apply to C_D and C_m .

- (11) Total aerodynamic coefficients to be used in the method of suction analogy are summarized as follows, using the lift coefficient (C_L) as an example.

CLP the "potential-flow" component of C_L

CLVLE the leading-edge vortex lift
 CLVSE the side-edge (i.e. tip) vortex lift
 CLVAUG the augmented vortex lift
 CLDVP the "potential-flow" component of C_L due to the
 strake discrete vortex
 CLDVV the vortex lift component due to the strake discrete
 vortex
 CLF the fuselage lift
 CL total lift coefficient
 CAXP the axial force coefficient in potential flow, negative
 for pointing forward
 CAXV the axial force coefficient due to leading-edge vortex

(12) For an asymmetrical configuration or a configuration with lateral or directional control input, the resulting rolling (CL) and yawing (CN) moments will be printed for both attached and vortex flows, with and without tip suction effect. Based on experience, those without tip suction effect seem to agree better with limited windtunnel data.

(13) The lateral-directional stability derivatives are defined in accordance with standard definitions as follows:

$$CYB = \frac{\partial C_y}{\partial \beta}, \quad C_y = \text{side force}/q S_{ref}$$

$$CLB = \frac{\partial C_\ell}{\partial \beta}, \quad C_\ell = \text{rolling moment}/q S_{ref} b_{ref}$$

$$CNB = \frac{\partial C_n}{\partial \beta}, \quad C_n = \text{yawing moment}/q S_{ref} b_{ref}$$

$$CYP = \frac{\partial C_y}{\partial \bar{p}}, \quad \text{where } \bar{p} = pb/2V_\infty \text{ is an input variable and } p$$

is the roll rate

$$CLP = \frac{\partial C_l}{\partial \bar{p}}$$

$$CNP = \frac{\partial C_n}{\partial \bar{p}}$$

$$CYR = \frac{\partial C_y}{\partial \bar{r}}, \text{ where } \bar{r} = rb/2V_\infty \text{ is an input variable and } r$$

is the yaw rate

$$CLR = \frac{\partial C_l}{\partial \bar{r}}$$

$$CNR = \frac{\partial C_n}{\partial \bar{r}}$$

- (14) The bending moment distribution and the bending moment coefficients at the root chord for the attached flow will be printed last.

PROGRAM JOB CONTROL SET-UP

The code can be run in overlays or segmentation. The following segmentation set-up is for the Cyber 175 computer system at the NASA Langley Research Center.

```
*
* SEGMENTATION DIRECTIVES FOR THE UNIVERSITY
* OF KANSAS PROGRAM "VORSTAB".
*
* APRIL, 1984
*
*
*   COMMON
*   ROOT   TREE   VORSTAB-(GEMTRY,DWASH,SOLUTN,LOAD)
*
*   VORSTAB INCLUDE VORSTAB,FUR,SLOP,FUSVOL,UNWF,FUSELA
*   VORSTAB INCLUDE ZCDX,TWIST,ZCR,ZCAM,VMSEQN,PNLEF
*
*   GEMTRY  INCLUDE GEMTRY,GEOFUS,PANEL,SPLINE,SHAPLE,SHAPTE
*
*   DWASH   INCLUDE DWASH,INVN,WING,UNFW,VELFUS,FALONE
*
*   SOLUTN  INCLUDE SOLUTN,THRUST,GAMAX,AUGVOR,SPNINT,LATERL
*   SOLUTN  INCLUDE WBETA,VLCTY,VERCOR
*
*   LOAD    INCLUDE LOAD,CPFUS,UTFW,FUSLFT,CENTRD,FRATN
*   LOAD    INCLUDE REDBD,BDPT,BENDIN,BACKWH,DRAG
*
*
*   END
```

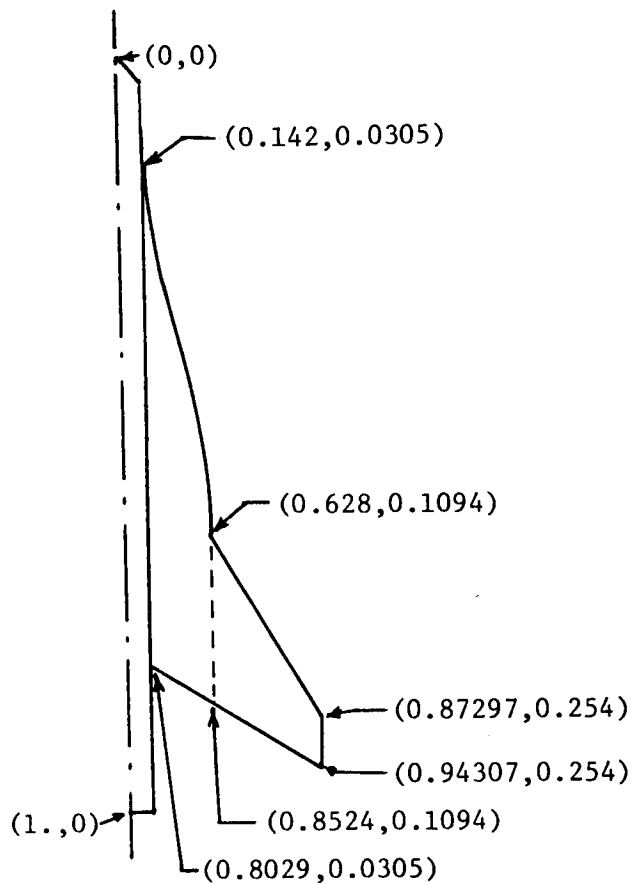
Notes.

- (1) With existing dimensions for some arrays, a total number of unknowns equal to 195 is allowed. The minimum memory for execution with overlays is 80K (decimal).
- (2) Four (4) working disk files are needed during execution. They are designated as (01), (02), (03) and (04).
- (3) An example of calculating total number of unknowns is given on page 61.

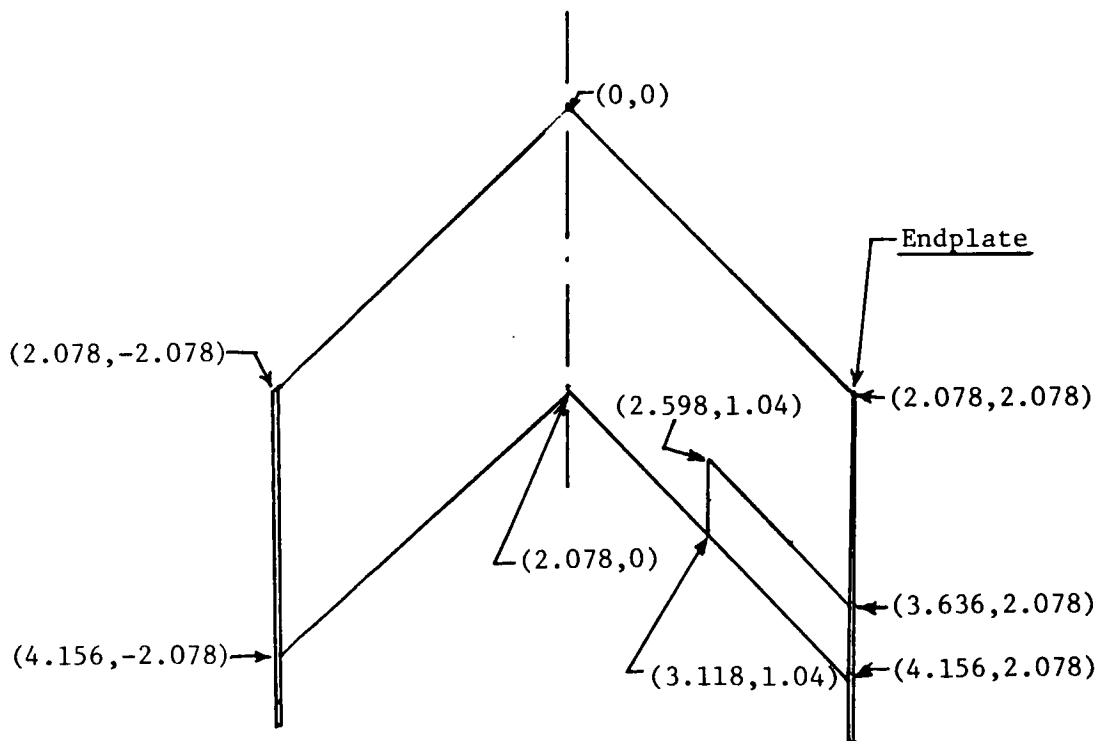
SAMPLE INPUT AND OUTPUT

Three sample cases are included in the following. The configurations are shown below.

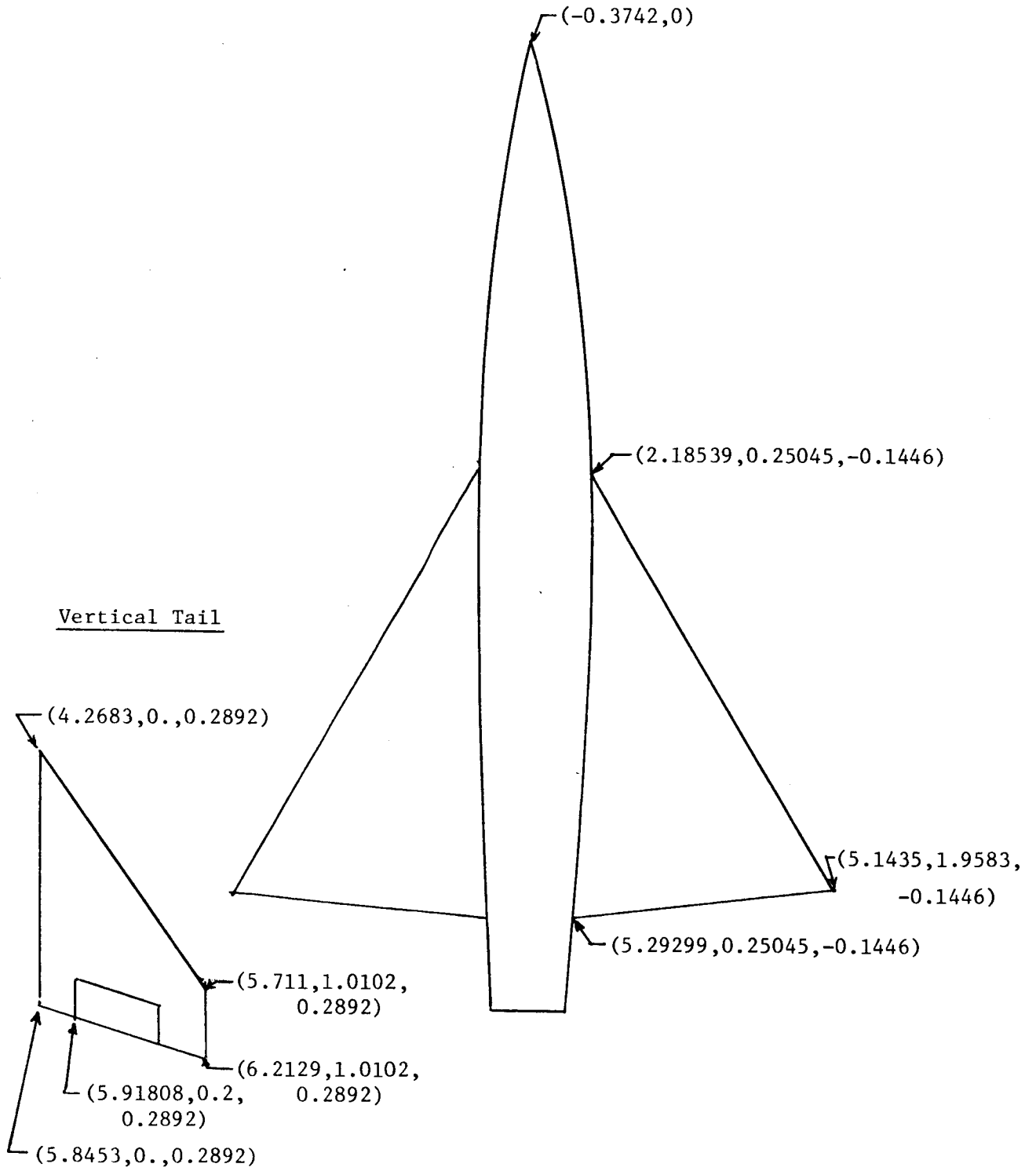
1. Sample Case 1.



2. Sample Case 2



3. Sample Case 3



1. Sample Case 1

Input Data

LARGE STRAKE-WING OF FOX, TM 74071

10	0	0	1						
1	0	0	1						
3	3	4	7						
1	1	0	3						
0.000000									
6	0	0	0						
0									
0.000000	1.000000	0.000000	.030500	1.000000	.030500	.030500	0.000000	0.000000	0.000000
1									
.142000	.802900	.030500	.628000	.852400	.109400	.109400	0.000000	0.000000	0.000000
12	2	1	0						
0.000000	.197300	.210400	.223500	.236700	.302400	.315600	.341800		
.355000	.368200	.381300	.486000						
0.000000	.033500	.036100	.038450	.043400	.063500	.067100	.072980		
.075350	.077160	.078740	.078900						
0.000000	.049500								
0.000000	.078900								
0									
.628000	.852400	.109400	.872970	.943070	.254000	.254000	0.000000	0.000000	0.000000
.300000	.051600	.233000	.254000	.571500	0.000000				
1.000000	2.000000	1.000000	0.000000						
36.000000									
4.000000	7.000000	.174900	.492400	.740200	.109400	.320000	0.000000	0.000000	0.000000
8.000000	14.000000	-.020570	.284500	.908020	.254000	-.020570	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000							
0.000000	0.000000								
.100000	.087270	0.000000	0.000000	0.000000	0.000000				
0	0	0	0						

Output

```

*****
LARGE STRAKE-WING OF FOX, TM 74071
*****
10 0 0 1
0 0 0 1
CASE NUMBER = 10
*****

```

INPUT DATA

```

1 0 0 1 1 0 0 0
3 3 4 7 3 0 0 0
1 1 0 3 0 0 0 0
0.000000
6 0 0 0 0 0 0 0
0
0.000000 1.000000 0.000000 .030500 1.000000 .030500 0.000000 0.000000
.142000 .802900 .030500 .628000 .852400 .109400 0.000000 0.000000
12 2 1 0
0.000000 .197300 .210400 .223500 .236700 .302400 .315600 .341800
.355000 .368200 .381300 .486000
0.000000 .033500 .036100 .038450 .043400 .063500 .067100 .072980
.075350 .077160 .078740 .078900
0.000000 .049500
0.000000 .078900
0
.628000 .852400 .109400 .872970 .943070 .254000 0.000000
.300000 .051600 .233000 .254000 .571500 0.000000
1.000000 2.000000 1.000000 0.000000
36.000000
4.000000 7.000000 .174900 .492400 .740200 .109400 .320000 0.000000
8.000000 14.000000 -.020570 .284500 .908020 .254000 -.020570 0.000000
0.000000 0.000000 0.000000
0.000000 0.000000
.100000 .087270 0.000000 0.000000 0.000000
0 0 0 0 0 0 0 0
HALF SW= .51600E-01 CREF= .23300E+00

```

VORTEX ELEMENT ENDPOINT COORDINATES=

X1	X2	Y1	Y2	71	72
.01704	.02629	0.00000	.00941	0.00000	0.00000
.14645	.15448	0.00000	.00941	0.00000	0.00000
.37059	.37652	0.00000	.00941	0.00000	0.00000
.62941	.63290	0.00000	.00941	0.00000	0.00000
.85355	.85493	0.00000	.00941	0.00000	0.00000
.98296	.98312	0.00000	.00941	0.00000	0.00000
.02629	.03776	.00941	.02109	0.00000	0.00000

.75289	.78674	.14153	.16759	C.00000	0.00000
.80209	.82874	.14153	.16759	0.00000	0.00000
.84471	.86512	.14153	.16759	0.00000	0.00000
.86931	.88613	.14153	.16759	0.00000	0.00000
.72935	.77663	.16759	.19581	0.00000	0.00000
.75036	.79374	.16759	.19581	0.00000	0.00000
.78674	.82337	.16759	.19581	0.00000	0.00000
.82874	.85759	.16759	.19581	0.00000	0.00000
.86512	.88722	.16759	.19581	0.00000	0.00000
.88613	.90433	.16759	.19581	0.00000	0.00000
.77663	.82031	.19581	.22187	0.00000	0.00000
.79374	.83382	.19581	.22187	0.00000	0.00000
.82337	.85722	.19581	.22187	0.00000	0.00000
.85759	.88424	.19581	.22187	0.00000	0.00000
.88722	.90763	.19581	.22187	0.00000	0.00000
.90433	.92114	.19581	.22187	0.00000	0.00000
.82031	.85374	.22187	.24182	0.00000	0.00000
.83382	.86450	.22187	.24182	0.00000	0.00000
.85722	.88312	.22187	.24182	0.00000	0.00000
.88424	.90463	.22187	.24182	0.00000	0.00000
.90763	.92326	.22187	.24182	0.00000	0.00000
.92114	.93401	.22187	.24182	0.00000	0.00000
.85374	.87184	.24182	.25261	0.00000	0.00000
.86450	.88110	.24182	.25261	0.00000	0.00000
.88312	.89714	.24182	.25261	0.00000	0.00000
.90463	.91567	.24182	.25261	0.00000	0.00000
.92326	.93172	.24182	.25261	0.00000	0.00000
.93401	.94098	.24182	.25261	0.00000	0.00000

CONTROL POINT COORDINATES=

XCP	YCP	ZCP	XCP	YCP	ZCP
.07115	.00447	0.00000	.25335	.00447	0.00000
.50223	.00447	0.00000	.75112	.00447	0.00000
.93331	.00447	0.00000	1.00000	.00447	0.00000
.08122	.01525	0.00000	.26144	.01525	0.00000
.50762	.01525	0.00000	.75381	.01525	0.00000
.93403	.01525	0.00000	1.00000	.01525	0.00000
.09128	.02603	0.00000	.26953	.02603	0.00000
.51302	.02603	0.00000	.75651	.02603	0.00000
.93476	.02603	0.00000	1.00000	.02603	0.00000
.24928	.03803	0.00000	.35880	.03803	0.00000
.50841	.03803	0.00000	.65802	.03803	0.00000
.76754	.03803	0.00000	.80763	.03803	0.00000
.35925	.05776	0.00000	.44963	.05776	0.00000
.57308	.05776	0.00000	.69654	.05776	0.00000
.78692	.05776	0.00000	.82000	.05776	0.00000
.43657	.08214	0.00000	.51478	.08214	0.00000
.62162	.08214	0.00000	.72844	.08214	0.00000

.80667	.08214	0.00000	.83530	.08214	0.00000
.56256	.10187	0.00000	.61849	.10187	0.00000
.69488	.10187	0.00000	.77128	.10187	0.00000
.82720	.10187	0.00000	.84767	.10187	0.00000
.65196	.11490	0.00000	.69196	.11490	0.00000
.74659	.11490	0.00000	.80122	.11490	0.00000
.84121	.11490	0.00000	.85585	.11490	0.00000
.67739	.13058	0.00000	.71433	.13058	0.00000
.76478	.13058	0.00000	.81523	.13058	0.00000
.85216	.13058	0.00000	.86568	.13058	0.00000
.71545	.15403	0.00000	.74781	.15403	0.00000
.79200	.15403	0.00000	.83619	.15403	0.00000
.86854	.15403	0.00000	.88039	.15403	0.00000
.76035	.18170	0.00000	.78730	.18170	0.00000
.82411	.18170	0.00000	.86092	.18170	0.00000
.88787	.18170	0.00000	.89773	.18170	0.00000
.80524	.20937	0.00000	.82679	.20937	0.00000
.85622	.20937	0.00000	.88565	.20937	0.00000
.90720	.20937	0.00000	.91508	.20937	0.00000
.84330	.23282	0.00000	.86027	.23282	0.00000
.88344	.23282	0.00000	.90662	.23282	0.00000
.92358	.23282	0.00000	.92979	.23282	0.00000
.86874	.24850	0.00000	.88264	.24850	0.00000
.90163	.24850	0.00000	.92063	.24850	0.00000
.93453	.24850	0.00000	.92962	.24850	0.00000

 ANGLE OF ATTACK = 36.000 DEG.

CHORDWISE DISTRIBUTION OF TIP SUCTION COEFFICIENT

X/C	CTIP
.01704	.29393
.14645	1.64777
.37059	2.13456
.62941	2.17448
.85355	2.27514
.98296	2.27800

TIP SUCTION COEFFICIENT = .09476 (ONE SIDE ONLY)

THE X-COORDINATE OF CENTROID OF TIP SUCTION = -.34030

ELEMENT	Y/S	GAMMA	GAMAX
1	.01759	-.02194	.53171
2	.01759	-.04538	.15081
3	.01759	-.08392	.19733
4	.01759	-.12045	.05675
5	.01759	-.14713	.03163

6	.01759	--.15351	.01691
7	.06004	--.01978	.90803
8	.06004	--.04239	.60178
9	.06004	--.08245	.35227
10	.06004	--.12974	.16483
11	.06004	--.14632	.13474
12	.06004	--.15212	.24226
13	.10249	--.01306	1.18747
14	.10249	--.03459	1.07977
15	.10249	--.07934	.51189
16	.10249	--.12787	.27548
17	.10249	--.14439	.23804
18	.10249	--.14828	.47044
19	.14974	--.01406	5.62237
20	.14974	--.03854	.47834
21	.14974	--.08047	.59609
22	.14974	--.11900	.85633
23	.14974	--.13346	.28663
24	.14974	--.14082	.18488
25	.22740	--.01764	3.62719
26	.22740	--.05861	.90913
27	.22740	--.09037	.61790
28	.22740	--.11004	.84778
29	.22740	--.12900	.48844
30	.22740	--.13730	.26259
31	.32339	--.02161	4.55613
32	.32339	--.05565	1.57453
33	.32339	--.07448	1.27157
34	.32339	--.09575	.89644
35	.32339	--.12060	.57474
36	.32339	--.13105	.36632
37	.40105	--.01104	13.13289
38	.40105	--.03352	5.46155
39	.40105	--.05774	3.25179
40	.40105	--.08906	2.06326
41	.40105	--.11569	.81382
42	.40105	--.12429	.47167
43	.45238	--.03923	9.22231
44	.45238	--.09822	2.68852
45	.45238	--.13437	1.01236
46	.45238	--.16239	.60684
47	.45238	--.17980	.51799
48	.45238	--.18564	.47998
49	.51408	--.03116	7.77621
50	.51408	--.08702	2.52112
51	.51408	--.12917	1.26764
52	.51408	--.15806	.81153
53	.51408	--.17397	.63208
54	.51408	--.17860	.52900

55	.60643	-.02729	7.67845
56	.60643	-.07852	2.53032
57	.60643	-.11991	1.42922
58	.60643	-.14786	.97368
59	.60643	-.16217	.76281
60	.60643	-.16614	.63959
61	.71535	-.02411	8.14845
62	.71535	-.06089	2.72788
63	.71535	-.10745	1.59914
64	.71535	-.13230	1.13633
65	.71535	-.14430	.92860
66	.71535	-.14747	.82037
67	.82428	-.02073	8.79373
68	.82428	-.06008	2.99220
69	.82428	-.09186	1.78658
70	.82428	-.11151	1.35854
71	.82428	-.11995	1.22579
72	.82428	-.12199	1.15174
73	.91663	-.01710	9.19286
74	.91663	-.04915	3.13474
75	.91663	-.07250	2.09222
76	.91663	-.08383	1.91550
77	.91663	-.08764	1.91832
78	.91663	-.08852	1.90353
79	.97833	-.01333	8.99949
80	.97833	-.03400	3.75564
81	.97833	-.04289	3.70816
82	.97833	-.04548	4.06675
83	.97833	-.04661	4.14070
84	.97833	-.04677	4.15477

VORTEX-BREAKDOWN CHARACTERISTICS

***FOR SURFACE NUMBER 1 ***

(FOR NONCAMBERED WING)

CENTROID TO MAX. SUCTION FORCE, YRAB = .60666

TOTAL SUCTION FORCE TO MAX. CS*C/(CB*SIN(ALP)**2) = 5.88343

L.E. LENGTH OF MAX. SUCTION CENTROID = 3.28848

ALPHA FOR VORTEX BREAKDOWN AT T.E. = 38.00000 DEG.
(WITHOUT CAMBER CORRECTION, FOR SYMMETRICAL LOADING)

CENTROID TO MAX. SUCTION FORCE, YRAB = .23657

TOTAL SUCTION FORCE TO MAX. CS*C/(CB*SIN(ALP)**2) = 2.70303

L.O.E. LENGTH OF MAX. SUCTION CENTROID = .87602

ALPHA FOR VORTEX BREAKDOWN AT T.O.E. = 16.57974 DEG.
(WITHOUT CAMBER CORRECTION, FOR SYMMETRICAL LOADING)

VORTEX-BREAKDOWN CHARACTERISTICS

***FOR SURFACE NUMBER 1 ***

(FOR NONCAMBERED WING)

L.O.E. LENGTH OF MAX. SUCTION CENTROID = 2.15189

ALPHA FOR VORTEX BREAKDOWN AT T.O.E. = 33.31794 DEG.
(WITHOUT CAMBER CORRECTION, FOR RIGHT WING IN SIDESLIP)

L.O.E. LENGTH OF MAX. SUCTION CENTROID = .76585

ALPHA FOR VORTEX BREAKDOWN AT T.O.E. = 12.83925 DEG.
(WITHOUT CAMBER CORRECTION, FOR RIGHT WING IN SIDESLIP)

VORTEX-BREAKDOWN CHARACTERISTICS

***FOR SURFACE NUMBER 1 ***

(FOR NONCAMBERED WING)

L.O.E. LENGTH OF MAX. SUCTION CENTROID = 10.52420

ALPHA FOR VORTEX BREAKDOWN AT T.O.E. = 41.44240 DEG.
(WITHOUT CAMBER CORRECTION, FOR LEFT WING IN SIDESLIP)

L.O.E. LENGTH OF MAX. SUCTION CENTROID = 1.03240

ALPHA FOR VORTEX BREAKDOWN AT T.O.E. = 22.28783 DEG.
(WITHOUT CAMBER CORRECTION, FOR LEFT WING IN SIDESLIP)

***THE FOLLOWING ALPHAS FOR VORTEX BREAKDOWN AT T.O.E. HAVE BEEN CORRECTED FOR
CAMBER AND ADVERSE PRESSURE GRADIENT IN VORTEX LIFT AUGMENTATION, IF ANY***

***FOR SURFACE NUMBER 1 ***

REVISED ALPHA RDTE = 32.2570DEGREES
(FOR SYMMETRICAL LOADING)

REVISED ALPHA RDTE = 27.5750DEGREES
(FOR RIGHT WING IN SIDESLIP)

REVISED ALPHA 8DTE = 35.700DEGREES
(FOR LEFT WING IN SIDESLIP)

REVISED ALPHA 8DTE = 16.974DEGREES
(FOR SYMMETRICAL LOADING)

REVISED ALPHA 8DTE = 13.233DEGREES
(FOR RIGHT WING IN SIDESLIP)

REVISED ALPHA 8DTE = 22.682DEGREES
(FOR LEFT WING IN SIDESLIP)

XX

PRESSURE DISTRIBUTION AT ALPHA = 36.000 DEG.

XX

VORTEX	XV	YV	CP
1	.01704	.01759	.89806
2	.14645	.01759	.18870
3	.37059	.01759	.41396
4	.62941	.01759	.43631
5	.85355	.01759	.11845
6	.98296	.01759	.02312
7	.01704	.06004	.82377
8	.14645	.06004	.20266
9	.37059	.06004	.42664
10	.62941	.06004	.44406
11	.85355	.06004	.11107
12	.98296	.06004	.02112
13	.01704	.10249	.57998
14	.14645	.10249	.25716
15	.37059	.10249	.44599
16	.62941	.10249	.45753
17	.85355	.10249	.08706
18	.98296	.10249	.01495
19	.01704	.14974	1.05748
20	.14645	.14974	.45240
21	.37059	.14974	.63233
22	.62941	.14974	.57972
23	.85355	.14974	.26336
24	.98296	.14974	.10871
25	.01704	.22740	1.86931
26	.14645	.22740	.79943
27	.37059	.22740	.43600
28	.62941	.22740	.61915
29	.85355	.22740	.37991
30	.98296	.22740	.14995

31	.01704	.32339	2.47150
32	.14645	.32339	.60794
33	.37059	.32339	.50791
34	.62941	.32339	.74338
35	.85355	.32339	.49377
36	.98296	.32339	.17952
37	.01704	.40105	2.16033
38	.14645	.40105	.94367
39	.37059	.40105	1.10727
40	.62941	.40105	.90305
41	.85355	.40105	.57896
42	.98296	.40105	.19142
43	.01704	.45238	5.79854
44	.14645	.45238	1.73985
45	.37059	.45238	1.10303
46	.62941	.45238	.79654
47	.85355	.45238	.49952
48	.98296	.45238	.15241
49	.01704	.51408	6.14122
50	.14645	.51408	1.98612
51	.37059	.51408	1.16014
52	.62941	.51408	.76074
53	.85355	.51408	.43284
54	.98296	.51408	.13249
55	.01704	.60643	6.68043
56	.14645	.60643	2.19745
57	.37059	.60643	1.24168
58	.62941	.60643	.76259
59	.85355	.60643	.40945
60	.98296	.60643	.12643
61	.01704	.71535	7.32972
62	.14645	.71535	2.41418
63	.37059	.71535	1.32962
64	.62941	.71535	.76969
65	.85355	.71535	.38887
66	.98296	.71535	.11741
67	.01704	.82428	7.99630
68	.14645	.82428	2.60943
69	.37059	.82428	1.37077
70	.62941	.82428	.70789
71	.85355	.82428	.31703
72	.98296	.82428	.09129
73	.01704	.91663	8.43095
74	.14645	.91663	2.63178
75	.37059	.91663	1.14183
76	.62941	.91663	.43830
77	.85355	.91663	.17185
78	.98296	.91663	.04790
79	.01704	.97833	7.76894

80	.14645	.97833	1.63153				
81	.37059	.97833	.35577				
82	.62941	.97833	.13766				
83	.85355	.97833	.05838				
84	.98206	.97833	.01604				

Y/S	CL(RIGHT)	CL(LEFT)	CM	CT	CDI	CS+C	CAV
.01759	.28023	.28023	.23824	.01663	.18304	0.00000	0.00000
.06004	.28487	.28487	.22592	.02286	.17871	0.00000	0.00000
.10249	.28362	.28362	.20571	.02485	.17534	0.00000	0.00000
.14974	.48265	.48265	.25621	.10814	.21700	.55841	0.00000
.22740	.58165	.58165	.16052	.13350	.25758	.22852	0.00000
.32339	.68795	.68795	-.01344	.20695	.24403	.14853	0.00000
.40105	1.07431	1.07431	-.37828	.52073	.13688	.69221	0.00000
.45238	1.46848	1.46848	-.71665	.71158	.18735	.29178	0.00000
.51408	1.54695	1.54695	-.85734	.76180	.18228	.19960	0.00000
.60643	1.69804	1.69804	-1.10942	.89223	.13084	.17409	0.00000
.71535	1.88815	1.88815	-1.44069	1.07290	.04565	.16309	0.00000
.82428	2.05863	2.05863	-1.75651	1.27895	-.08518	.15094	0.00000
.91663	2.04958	2.04958	-1.81663	1.43188	-.28079	.13126	0.00000
.97833	1.52968	1.52968	-1.24882	1.27409	-.46348	.09514	0.00000

*** THE FOLLOWING ARE ATTACHED POTENTIAL FLOW RESULTS ***

TOTAL LIFT COEFFICIENT = 1.31223
TOTAL INDUCED DRAG COEFFICIENT = .26877
THE INDUCED DRAG PARAMETER = .15609
TOTAL PITCHING MOMENT COEFFICIENT = -.33963
FAR-FIELD INDUCED DRAG = .25789
FAR-FIELD INDUCED DRAG PARAMETER = .14977

(NOTE. THE INDUCED DRAG COMPUTATION IS FOR SYMPETRICAL LOADING ONLY)

SUMMARY OF ATTACHED FLOW RESULTS AT ALPHA = 36.000 DEG., M = .300

CL(LS) = 1.31223 CLF = 0.00000 CL = 1.31223
CD(LS) = .26877 CDF = 0.00000 CD = .26877
CM(LS) = -.33963 CMF = 0.00000 CM = -.33963

ORIGINAL PAGE IS
OF POOR QUALITY

**INCLUDING THE EFFECT OF LE AND SE VORTEX LIFT*

CYB = -.1864326 CLB = -.4490737 CNB = -.0337335
CYP = .0018970 CLP = -.3734321 CNP = .0019839
CYR = -.0470317 CLR = .4073280 CNR = -.0497574

STABILITY DERIVATIVES BASED ON STABILITY AXES

CYB = -.1864326 CLB = -.3831363 CNB = .2366679
CYP = -.0261098 CLP = -.0669658 CNP = .0144866
CYR = -.0391645 CLR = .4198307 CNR = -.3562236

***STABILITY DERIVATIVES EVALUATED AT ALPHA = 36.000 DEGREES
AND AT MACH NO. = .30, BASED ON BODY AXES (IN DEG RADIAN)***

INCLUDING THE EFFECT OF LE VORTEX LIFT

CYB = -.3233720 CLR = -.4395476 CNB = .0599071
CYP = .3876010 CLP = -.2964481 CNP = -.2563306
CYR = -.2214207 CLR = .3173304 CNR = .0642369

STABILITY DERIVATIVES BASED ON STABILITY AXES

CYB = -.3233720 CLB = -.3203890 CNB = .3068255
CYP = .1834280 CLP = -.1428231 CNP = -.1058927
CYR = -.4069593 CLR = .4677772 CNR = -.0893881

THE FOLLOWING BENDING MOMENT COEFFICIENT IS BASED ON $Q \cdot S \cdot (R/2)$
WHERE $S = .10320$ AND $R/2 = .25400$
(FOR ATTACHED POTENTIAL FLOW ONLY)

Y/S	RM(RIGHT)	RM(LEFT)
.01759	.29867	.29867
.06004	.27187	.27182
.10249	.24629	.24629
.14974	.21900	.21900

THE FOLLOWING PARAMETERS ARE USED IN THE METHOD OF SUCTION ANALOGY

CLP = .98668 CLVE = .82501 CLVSE = .07167 CLVAUG = .12919
 CDP = .71686 CDVLE = .59940 CDVSE = .05207 CDVAUG = .09386
 CNP = -.33963 CMVLE = .18324 CMVSE = -.12938 CMVAUG = -.07772
 CLOVP = -.08335 CLOVV = -.00767 CLF = 0.00000 CL = 1.92151
 CDDVP = -.06056 CDDVV = -.00557 CDF = 0.00000 CD = 1.39606
 CMDVP = .00521 CMDVV = -.02624 CMF = 0.00000 CM = -.38452

CAXP = 0.00000 CAXV = 0.00000

 THE FOLLOWING ROLLING AND YAWING MOMENTS ARE BASED ON
 A REFERENCE SPAN OF .50800 AND A REFERENCE AREA OF .10320

STABILITY DERIVATIVES BY POTENTIAL FLOW THEORY

***STABILITY DERIVATIVES EVALUATED AT ALPHA = 36.000 DEGREES
 AND AT MACH NO. = .30, BASED ON BODY AXES (IN PER RADIAN)***

CYB = -.3738846 CLB = -.8921335 CNB = .1653740
 CYP = 1.9001017 CLP = -.1940313 CNP = -.7986785
 CYR = -1.1245662 CLR = .5450750 CNR = .4269667

STABILITY DERIVATIVES BASED ON STABILITY AXES

CYB = -.3738846 CLB = -.6245467 CNR = .6581733
 CYP = .8409441 CLP = -.1000774 CNP = -.4157586
 CYR = -2.0751860 CLR = .9279949 CNR = .3330128

STABILITY DERIVATIVES WITH EDGE VCPTFX SEPARATION

***STABILITY DERIVATIVES EVALUATED AT ALPHA = 36.000 DEGREES
 AND AT MACH NO. = .30, BASED ON BODY AXES (IN PER RADIAN)***

ORIGINAL PAGE IS
OF POOR QUALITY

.22740	.17771	.17771
.32339	.13243	.13243
.40105	.10073	.10073
.45238	.08224	.08224
.51408	.06250	.06250
.60643	.03845	.03845
.71535	.01807	.01807
.82428	.00585	.00585
.91663	.00098	.00098
.97833	.00004	.00004

THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN AND WING AREA
AT THE WING ROOT = .310128 (RIGHT), = .310128 (LEFT)

2. Sample Case 2

Input Data

TN 2229, AILERON EFFECTIVENESS WITH ENDPLATES FOR 45-DEG WING

	0	1	1	2	3	4	5	0
20	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
5	3	7	4	4	4	4	4	0
0	4	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
7.053000	2	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
3.117000	4.675000	-3.117000	2.078000	3.636000	-2.078000	0.000000	0.000000	-90.000000
0	0	0	0	0	0	0	0	0
2.078000	3.636000	-2.078000	0.000000	1.558000	0.000000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0
0.000000	1.558000	0.000000	1.040000	2.598000	1.040000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0
1.040000	2.598000	1.040000	2.078000	3.636000	2.078000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0
2.078000	3.636000	2.078000	3.117000	4.675000	3.117000	0.000000	0.000000	90.000000
0	0	0	0	0	0	0	0	0
4.675000	5.195000	-3.117000	3.636000	4.156000	-2.078000	0.000000	0.000000	-90.000000
0	0	0	0	0	0	0	0	0
3.636000	4.156000	-2.078000	1.558000	2.078000	0.000000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0
1.558000	2.078000	0.000000	2.598000	3.118000	1.040000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0
2.598000	3.118000	1.040000	3.636000	4.156000	2.078000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0
3.636000	4.156000	2.078000	4.675000	5.195000	3.117000	0.000000	0.000000	90.000000
0	0	0	0	0	0	0	0	0
270000	8.636170	2.078000	2.078000	1.558500	0.000000	0.000000	0.000000	0.000000
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
12.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0	0	0	0	0	0	0	0	0

Output

 TN 220,AILERON EFFECTIVENESS WITH ENDPLATES FOR 45-DEG WING

 20 0 1 1

 CASE NUMBER = 20

INPUT DATA	0	0	0	4	3	5	0
0	0	0	0	4	3	5	0
5	3	7	4				
0	4	0	0	0	0	0	0
1							
7.053000	2	0	0	0			
0							
3.117000	4.675000	-3.117000	2.078000	3.636000	-2.078000	0.000000	-90.000000
0							
2.078000	3.636000	-2.078000	0.000000	1.558000	0.000000	0.000000	0.000000
0							
0.000000	1.558000	0.000000	1.040000	2.598000	1.040000	0.000000	0.000000
0							
1.040000	2.598000	1.040000	2.078000	3.636000	2.078000	0.000000	0.000000
0							
2.078000	3.636000	2.078000	3.117000	4.675000	3.117000	0.000000	90.000000
0							
4.675000	5.195000	-3.117000	3.636000	4.156000	-2.078000	0.000000	-90.000000
0							
3.636000	4.156000	-2.078000	1.558000	2.078000	0.000000	0.000000	0.000000
0							
1.558000	2.078000	0.000000	2.598000	3.118000	1.040000	0.000000	0.000000
0							
2.598000	3.118000	1.040000	3.636000	4.156000	2.078000	0.000000	0.000000
0							
3.636000	4.156000	2.078000	4.675000	5.195000	3.117000	0.000000	90.000000
0							
.270000	8.636170	2.078000	2.078000	1.558500	0.000000		
1.000000	0.000000	0.000000	0.000000	0.000000			
12.000000							
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000				
0.000000	0.000000						

HALF SW= .86362E+01 0 CREF= .20780E+01

VORTEX ELEMENT ENDPOINT COORDINATES=

X1	X2	Y1	Y2	Z1	Z2
3.18182	2.90067	-3.07746	-2.79630	0.00000	0.00000

3.85646	3.57530	-3.07746	-2.79630	0.00000	0.00000
4.53109	4.24994	-3.07746	-2.79630	0.00000	0.00000
2.90067	2.50306	-2.79630	-2.39870	0.00000	0.00000
3.57530	3.17770	-2.79630	-2.39870	0.00000	0.00000
4.24994	3.85233	-2.79630	-2.39870	0.00000	0.00000
2.50306	2.18237	-2.39870	-2.07800	0.00000	0.00000
3.17770	2.85700	-2.39870	-2.07800	0.00000	0.00000
3.85233	3.53163	-2.39870	-2.07800	0.00000	0.00000
2.18237	2.00726	-2.07800	-1.90290	0.00000	0.00000
2.85700	2.68190	-2.07800	-1.90290	0.00000	0.00000
3.53163	3.35653	-2.07800	-1.90290	0.00000	0.00000
2.00726	1.72060	-1.90290	-1.61624	0.00000	0.00000
2.68190	2.39524	-1.90290	-1.61624	0.00000	0.00000
3.35653	3.06987	-1.90290	-1.61624	0.00000	0.00000
1.72060	1.34607	-1.61624	-1.24170	0.00000	0.00000
2.39524	2.02070	-1.61624	-1.24170	0.00000	0.00000
3.06987	2.69533	-1.61624	-1.24170	0.00000	0.00000
1.34607	.94067	-1.24170	-.83630	0.00000	0.00000
2.02070	1.61530	-1.24170	-.83630	0.00000	0.00000
2.69533	2.28993	-1.24170	-.83630	0.00000	0.00000
.94067	.56613	-.83630	-.46176	0.00000	0.00000
1.61530	1.24076	-.83630	-.46176	0.00000	0.00000
2.28993	1.91540	-.83630	-.46176	0.00000	0.00000
.56613	.27947	-.46176	-.17510	0.00000	0.00000
1.24076	.95410	-.46176	-.17510	0.00000	0.00000
1.91540	1.62874	-.46176	-.17510	0.00000	0.00000
.27947	.10437	-.17510	-.00000	0.00000	0.00000
.95410	.77900	-.17510	-.00000	0.00000	0.00000
1.62874	1.45363	-.17510	-.00000	0.00000	0.00000
.10437	.31872	0.00000	.21435	0.00000	0.00000
.77900	.99335	0.00000	.21435	0.00000	0.00000
1.45363	1.66799	0.00000	.21435	0.00000	0.00000
.31872	.62437	.21435	.52000	0.00000	0.00000
.99335	1.29900	.21435	.52000	0.00000	0.00000
1.66799	1.97263	.21435	.52000	0.00000	0.00000
.62437	.93001	.52000	.82565	0.00000	0.00000
1.29900	1.60465	.52000	.82565	0.00000	0.00000
1.97263	2.27928	.52000	.82565	0.00000	0.00000
.93001	1.14437	.82565	1.04000	0.00000	0.00000
1.60465	1.81900	.82565	1.04000	0.00000	0.00000
2.27928	2.49363	.82565	1.04000	0.00000	0.00000
1.14437	1.35831	1.04000	1.25394	0.00000	0.00000
1.81900	2.03294	1.04000	1.25394	0.00000	0.00000
2.49363	2.70757	1.04000	1.25394	0.00000	0.00000
1.35831	1.66337	1.25394	1.55900	0.00000	0.00000
2.03294	2.33800	1.25394	1.55900	0.00000	0.00000
2.70757	3.01263	1.25394	1.55900	0.00000	0.00000
1.66337	1.96843	1.55900	1.86406	0.00000	0.00000
2.33800	2.64306	1.55900	1.86406	0.00000	0.00000

3.01263	3.31769	1.55900	1.86406	0.00000	0.00000
1.96843	2.18237	1.86406	2.07800	0.00000	0.00000
2.64306	2.85700	1.86406	2.07800	0.00000	0.00000
3.31769	3.53163	1.86406	2.07800	0.00000	0.00000
2.18237	2.50306	2.07800	2.39870	0.00000	0.00000
2.85700	3.17770	2.07800	2.39870	0.00000	0.00000
3.53163	3.85233	2.07800	2.79630	0.00000	0.00000
2.50306	2.90067	2.39870	2.79630	0.00000	0.00000
3.17770	3.57530	2.39870	2.79630	0.00000	0.00000
3.85233	4.24994	2.39870	3.07746	0.00000	0.00000
2.90067	3.18182	2.79630	3.07746	0.00000	0.00000
3.57530	3.85646	2.79630	-2.79630	0.00000	0.00000
4.24994	4.53109	2.79630	-2.79630	0.00000	0.00000
4.71161	4.43046	-3.07746	-2.79630	0.00000	0.00000
5.07930	4.79815	-3.07746	-2.39870	0.00000	0.00000
4.43046	4.03285	-2.79630	-2.39870	0.00000	0.00000
4.79815	4.40054	-2.79630	-2.07800	0.00000	0.00000
4.03285	3.71215	-2.39870	-2.07800	0.00000	0.00000
4.40054	4.07985	-2.39870	-1.90290	0.00000	0.00000
3.71215	3.53705	-2.07800	-1.90290	0.00000	0.00000
4.07985	3.90474	-2.07800	-1.61624	0.00000	0.00000
3.53705	3.25039	-1.90290	-1.61624	0.00000	0.00000
3.90474	3.61809	-1.90290	-1.24170	0.00000	0.00000
3.25039	2.87585	-1.61624	-1.24170	0.00000	0.00000
3.61809	3.24355	-1.61624	-0.83630	0.00000	0.00000
2.87585	2.47045	-1.24170	-0.83630	0.00000	0.00000
3.24355	2.83815	-1.24170	-0.46176	0.00000	0.00000
2.47045	2.09591	-0.83630	-0.46176	0.00000	0.00000
2.83815	2.46361	-0.83630	-0.17510	0.00000	0.00000
2.46361	2.17695	-0.46176	-0.17510	0.00000	0.00000
1.80926	1.63415	-0.17510	-0.00000	0.00000	0.00000
2.17695	2.00185	-0.17510	0.00000	0.00000	0.00000
1.63415	1.84850	0.00000	0.21435	0.00000	0.00000
2.00185	2.21620	0.00000	0.21435	0.00000	0.00000
1.84850	2.15415	0.21435	0.52000	0.00000	0.00000
2.21620	2.52185	0.21435	0.52000	0.00000	0.00000
2.15415	2.45980	0.52000	0.82565	0.00000	0.00000
2.52185	2.82750	0.52000	0.82565	0.00000	0.00000
2.45980	2.67415	0.82565	1.04000	0.00000	0.00000
2.82750	3.04185	0.82565	1.04000	0.00000	0.00000
2.67415	2.88809	1.04000	1.25394	0.00000	0.00000
3.04185	3.25579	1.04000	1.25394	0.00000	0.00000
2.88809	3.19315	1.25394	1.55900	0.00000	0.00000
3.25579	3.56085	1.25394	1.55900	0.00000	0.00000
3.19315	3.49821	1.55900	1.86406	0.00000	0.00000
3.56085	3.86591	1.55900	1.86406	0.00000	0.00000
3.49821	3.71215	1.86406	2.07800	0.00000	0.00000
3.86591	4.07985	1.86406	2.07800	0.00000	0.00000

3.71215	4.03285	2.07800	2.39870	0.00000
4.07985	4.40054	2.07800	2.39870	0.00000
4.03285	4.43046	2.39870	2.79630	0.00000
4.40054	4.79815	2.39870	2.79630	0.00000
4.43046	4.71161	2.79630	3.07746	0.00000
4.79815	5.07930	2.79630	3.07746	0.00000

CONTROL POINT COORDINATES =

XCP	YCP	ZCP	XCP	YCP	ZCP
3.35434	-2.96484	0.00000	4.13334	-2.96484	0.00000
4.52284	-2.96484	0.00000	2.98700	-2.59750	0.00000
3.76600	-2.59750	0.00000	4.15550	-2.59750	0.00000
2.61966	-2.23016	0.00000	3.39866	-2.23016	0.00000
3.78816	-2.23016	0.00000	2.38841	-1.99891	0.00000
3.16741	-1.99891	0.00000	3.55691	-1.99891	0.00000
2.16318	-1.77368	0.00000	2.94218	-1.77368	0.00000
3.33168	-1.77368	0.00000	1.82611	-1.43661	0.00000
2.60511	-1.43661	0.00000	2.99461	-1.43661	0.00000
1.42850	-1.03900	0.00000	2.20750	-1.03900	0.00000
2.59700	-1.03900	0.00000	1.03089	-.64139	0.00000
1.80989	-.64139	0.00000	2.19939	-.64139	0.00000
.69382	-.30432	0.00000	1.47282	-.30432	0.00000
1.86232	-.30432	0.00000	.46859	-.07909	0.00000
1.24759	-.07909	0.00000	1.63709	-.07909	0.00000
.48881	.09931	0.00000	1.26781	.09931	0.00000
1.65731	.09931	0.00000	.74881	.35931	0.00000
1.52781	.35931	0.00000	1.91731	.35931	0.00000
1.07019	.68069	0.00000	1.84919	.68069	0.00000
2.23869	.68069	0.00000	1.33019	.94069	0.00000
2.10919	.94069	0.00000	2.49869	.94069	0.00000
1.52862	1.13912	0.00000	2.30762	1.13912	0.00000
2.69712	1.13912	0.00000	1.78812	1.39862	0.00000
2.56712	1.39862	0.00000	2.95662	1.39862	0.00000
2.10888	1.71938	0.00000	2.88788	1.71938	0.00000
3.27738	1.71938	0.00000	2.36838	1.97888	0.00000
3.14738	1.97888	0.00000	3.53688	1.97888	0.00000
2.61966	2.23016	0.00000	3.39866	2.23016	0.00000
3.78816	2.23016	0.00000	2.98700	2.59750	0.00000
3.76600	2.59750	0.00000	4.15550	2.59750	0.00000
3.35434	2.96484	0.00000	4.13334	2.96484	0.00000
4.52284	2.96484	0.00000	4.78284	-2.96484	0.00000
5.04284	-2.96484	0.00000	4.41550	-2.59750	0.00000
4.67550	-2.59750	0.00000	4.04816	-2.23016	0.00000
4.30816	-2.23016	0.00000	3.81691	-1.99891	0.00000
4.07691	-1.99891	0.00000	3.50168	-1.77368	0.00000
3.85168	-1.77368	0.00000	3.25461	-1.43661	0.00000
3.51461	-1.43661	0.00000	2.85700	-1.03900	0.00000
3.11700	-1.03900	0.00000	2.45039	-.64139	0.00000

2.71939	-0.64139	0.00000	2.12232	-0.30432	0.00000
2.38232	-0.30432	0.00000	1.89709	-0.07909	0.00000
2.15709	-0.07909	0.00000	1.91731	0.09931	0.00000
2.17731	0.09931	0.00000	2.17731	0.35931	0.00000
2.43731	0.35931	0.00000	2.49869	0.68069	0.00000
2.75869	0.68069	0.00000	2.75869	0.94069	0.00000
3.01869	0.94069	0.00000	2.95712	1.13912	0.00000
3.21712	1.13912	0.00000	3.21562	1.39862	0.00000
3.47662	1.39862	0.00000	3.53738	1.71938	0.00000
3.79738	1.71938	0.00000	3.79688	1.97888	0.00000
4.05688	1.97888	0.00000	4.04816	2.23016	0.00000
4.30816	2.23016	0.00000	4.41550	2.59750	0.00000
4.67550	2.59750	0.00000	4.78284	2.96484	0.00000
5.04284	2.96484	0.00000			

 ANGLE OF ATTACK = 12.000 DEG.

CHORDWISE DISTRIBUTION OF TIP SUCTION COEFFICIENT

X/C	CTIP
0.05022	0.00616
0.37488	0.02520
0.69954	0.02748
0.78641	0.02962
0.96335	0.03003

CHORDWISE DISTRIBUTION OF TIP SUCTION COEFFICIENT

X/C	CTIP
0.05022	0.00486
0.37488	0.01932
0.69954	0.02023
0.78641	0.02143
0.96335	0.02163

TIP SUCTION COEFFICIENT = 0.01082 (ONE SIDE ONLY)

THE X-COORDINATE OF CENTROID OF TIP SUCTION = -2.79276

ELEMENT	Y/S	GAMMA	GAMAX
1	-0.95118	-0.05787	-0.41926
2	-0.95118	-0.12154	-0.41331
3	-0.95118	-0.12966	-0.45029
4	-0.83333	-0.09486	-0.50340
5	-0.83333	-0.22031	-0.30186
6	-0.83333	-0.25368	-0.31325
7	-0.71548	-0.11718	-0.59864
8	-0.71548	-0.29300	-0.32962

9	-.71548	-.35604	-.31820
10	-.64129	-.17107	-.81399
11	-.64129	-.40965	-.36760
12	-.64129	-.48368	-.41275
13	-.56904	-.17868	-.86448
14	-.56904	-.44238	-.32197
15	-.56904	-.53845	-.24572
16	-.46089	-.18525	-.87099
17	-.46089	-.46480	-.26860
18	-.46089	-.57241	-.16342
19	-.33333	-.18212	-.83951
20	-.33333	-.46412	-.23621
21	-.33333	-.58676	-.12536
22	-.20577	-.16992	-.76492
23	-.20577	-.45186	-.19257
24	-.20577	-.58069	-.08747
25	-.09763	-.14916	-.64834
26	-.09763	-.41926	-.15233
27	-.09763	-.55980	-.06899
28	-.02537	-.13087	-.57151
29	-.02537	-.39074	-.15637
30	-.02537	-.53913	-.05140
31	.03186	-.13213	.56037
32	.03186	-.39284	.12923
33	.03186	-.54158	.04218
34	.11527	-.15377	.67407
35	.11527	-.42792	.15563
36	.11527	-.56814	.06028
37	.21838	-.17213	.77769
38	.21838	-.45894	.19381
39	.21838	-.59258	.07591
40	.30179	-.18085	.83389
41	.30179	-.47375	.22919
42	.30179	-.60746	.09839
43	.36545	-.18559	.85319
44	.36545	-.48019	.23713
45	.36545	-.62378	.15547
46	.44871	-.18850	.88477
47	.44871	-.48491	.26532
48	.44871	-.63271	.21124
49	.55161	-.18579	.89085
50	.55161	-.47774	.31685
51	.55161	-.62251	.31035
52	.63487	-.17989	.86921
53	.63487	-.45552	.36362
54	.63487	-.58002	.41968
55	.71548	-.12523	.63671
56	.71548	-.33417	.38602
57	.71548	-.42956	.42993

ORIGINAL PAGE IS
OF POOR QUALITY

58	.83333	-.10550	.55785
59	.83333	-.25537	.35814
60	.83333	-.30351	.39146
61	.95118	-.06537	.47563
62	.95118	-.14036	.48958
63	.95118	-.15270	.54140
64	-.95118	-.13268	-.45284
65	-.95118	-.13353	-.45439
66	-.83333	-.25872	-.31183
67	-.83333	-.26143	-.30792
68	-.71548	-.36474	-.31155
69	-.71548	-.36985	-.29988
70	-.64129	-.49682	-.43690
71	-.64129	-.50470	-.41681
72	-.56904	-.55799	-.23478
73	-.56904	-.56868	-.21353
74	-.46089	-.59681	-.14280
75	-.46089	-.61104	-.10719
76	-.33333	-.61426	-.10025
77	-.33333	-.63086	-.05750
78	-.20577	-.61205	-.06456
79	-.20577	-.63117	-.01774
80	-.09763	-.59649	-.04701
81	-.09763	-.61919	-.00026
82	-.02537	-.57934	-.04187
83	-.02537	-.60741	-.00324
84	.03186	-.58202	.02526
85	.03186	-.60954	-.07288
86	.11527	-.60524	.03448
87	.11527	-.62833	-.01687
88	.21838	-.62801	.03545
89	.21838	-.65030	-.02903
90	.30179	-.64860	.03361
91	.30179	-.67478	-.06000
92	.36545	-.68730	.09628
93	.36545	-.72246	-.03751
94	.44871	-.70292	.16647
95	.44871	-.73913	.03598
96	.55161	-.68927	.30397
97	.55161	-.72180	.19598
98	.63487	-.63113	.47783
99	.63487	-.65562	.40985
100	.71548	-.44945	.43329
101	.71548	-.45802	.41324
102	.83333	-.31049	.39949
103	.83333	-.31476	.39587
104	.95118	-.15638	.53928
105	.95118	-.15755	.54041

XX

PRESSURE DISTRIBUTION AT ALPHA = 12.000 DEG.

AND AILERON ANGLE = 0.000 DEG.

XX

VORTEX	XV	YV	CP(LEFT)	CP(RIGHT)
1	.05022	-.95118	.49959	.49959
2	.37488	-.95118	.05853	.05853
3	.69954	-.95118	.01639	.01639
4	.78641	-.95118	.00857	.00857
5	.96335	-.95118	.00295	.00295
6	.05022	-.83333	.84576	.84576
7	.37488	-.83333	.16977	.16977
8	.69954	-.83333	.04480	.04480
9	.78641	-.83333	.02783	.02783
10	.96335	-.83333	.00886	.00886
11	.05022	-.71548	1.07097	1.07097
12	.37488	-.71548	.28396	.28396
13	.69954	-.71548	.08981	.08981
14	.78641	-.71548	.05325	.05325
15	.96335	-.71548	.01608	.01608
16	.05022	-.64129	1.54058	1.54058
17	.37488	-.64129	.35071	.35071
18	.69954	-.64129	.10904	.10904
19	.78641	-.64129	.08206	.08206
20	.96335	-.64129	.02462	.02462
21	.05022	-.56904	1.62667	1.62667
22	.37488	-.56904	.42023	.42023
23	.69954	-.56904	.16831	.16831
24	.78641	-.56904	.10607	.10607
25	.96335	-.56904	.03870	.03870
26	.05022	-.46089	1.69394	1.69394
27	.37488	-.46089	.45858	.45858
28	.69954	-.46089	.19813	.19813
29	.78641	-.46089	.13869	.13869
30	.96335	-.46089	.05410	.05410
31	.05022	-.33333	1.67911	1.67911
32	.37488	-.33333	.49135	.49135
33	.69954	-.33333	.22322	.22322
34	.78641	-.33333	.15964	.15964
35	.96335	-.33333	.06535	.06535
36	.05022	-.20577	1.58515	1.58515
37	.37488	-.20577	.51370	.51370
38	.69954	-.20577	.25310	.25310
39	.78641	-.20577	.18280	.18280
40	.96335	-.20577	.07623	.07623

ORIGINAL PAGE IS
OF POOR QUALITY

41	.05022	1.41918	1.41918
42	.37488	.53383	.53383
43	.69954	.29204	.29204
44	.78641	.21495	.21495
45	.96335	.09266	.09266
46	.05022	1.27368	1.27368
47	.37488	.55062	.55062
48	.69954	.30387	.30387
49	.78641	.26232	.26232
50	.96335	.11806	.11806
51	.05022	1.28377	1.28377
52	.37488	.55039	.55039
53	.69954	.30969	.30969
54	.78641	.25581	.25581
55	.96335	.11703	.11703
56	.05022	1.45768	1.45768
57	.37488	.53493	.53493
58	.69954	.29248	.29248
59	.78641	.21737	.21737
60	.96335	.09548	.09548
61	.05022	1.60695	1.60695
62	.37488	.52583	.52583
63	.69954	.27449	.27449
64	.78641	.20761	.20761
65	.96335	.09430	.09430
66	.05022	1.67733	1.67733
67	.37488	.52379	.52379
68	.69954	.29243	.29243
69	.78641	.24543	.24543
70	.96335	.10937	.10937
71	.05022	1.71145	1.71145
72	.37488	.52421	.52421
73	.69954	.39774	.39774
74	.78641	.34700	.34700
75	.96335	.11332	.11332
76	.05022	1.73390	1.73390
77	.37488	.52548	.52548
78	.69954	.44109	.44109
79	.78641	.36262	.36262
80	.96335	.11140	.11140
81	.05022	1.70883	1.70883
82	.37488	.51680	.51680
83	.69954	.42841	.42841
84	.78641	.33520	.33520
85	.96335	.09074	.09074
86	.05022	1.64726	1.64726
87	.37488	.47002	.47002
88	.69954	.33261	.33261
89	.78641	.26402	.26402

90	.96335	.63487	.05665
91	.05022	.71548	1.16985
92	.37488	.71548	.38220
93	.69954	.71548	.18208
94	.78641	.71548	.10105
95	.96335	.71548	.02728
96	.05022	.83333	.95359
97	.37488	.83333	.22578
98	.69954	.83333	.06866
99	.78641	.83333	.04215
100	.96335	.83333	.01296
101	.05022	.95118	.56820
102	.37488	.95118	.07702
103	.69954	.95118	.02320
104	.78641	.95118	.01193
105	.96335	.95118	.00394

Y/S	CL(RIGHT)	CL(LEFT)	CM	CT	COI	CS*C	CAV
-.95118	.00231	.00231	-.00000	.01110	-.01086	.03262	0.00000
-.83333	.00467	.00467	-.00000	.02245	-.02196	.06599	0.00000
-.71548	.00754	.00754	-.00000	.03628	-.03549	.10662	0.00000
-.64129	.48175	.48175	-.19498	.07626	.02444	.22411	0.00000
-.56904	.54329	.54329	-.17342	.08473	.02886	.24899	0.00000
-.46089	.58399	.58399	-.09988	.08857	.03358	.26030	0.00000
-.33333	.60221	.60221	.00348	.08515	.04095	.25023	0.00000
-.20577	.60082	.60082	.10797	.07413	.05192	.21786	0.00000
-.09763	.58726	.58726	.18646	.05730	.04424	.16839	0.00000
-.02537	.57241	.57241	.23219	.03071	.09028	.09025	0.00000
.01186	.57536	.57536	.22794	.03557	.08593	.10454	0.00000
.11527	.59663	.59663	.17473	.06091	.06454	.17901	0.00000
.21838	.61998	.61998	.09470	.07596	.05412	.22323	0.00000
.30179	.64496	.64496	.01551	.08375	.05147	.24612	0.00000
.36545	.68504	.68504	-.06373	.08111	.06356	.25894	0.00000
.44871	.70068	.70068	-.15575	.09155	.06361	.26905	0.00000
.51611	.68363	.68363	-.25328	.09083	.05988	.26692	0.00000
.53487	.62018	.62018	-.29248	.08388	.05166	.24651	0.00000
.71548	.00873	.00873	-.00000	.04197	-.04106	.12335	0.00000
.83333	.00574	.00574	-.00000	.02763	-.02703	.08120	0.00000
.95118	.00291	.00291	-.00000	.01400	-.01369	.04114	0.00000

*** THE FOLLOWING ARE ATTACHED POTENTIAL FLOW RESULTS ***

TOTAL LIFT COEFFICIENT = .59804
TOTAL INDUCED DRAG COEFFICIENT = .04061
THE INDUCED DRAG PARAMETER = .11355
TOTAL PITCHING MOMENT COEFFICIENT = -.01216

(NOTE. THE INDUCED DRAG COMPUTATION IS FOR SYMMETRICAL LOADING ONLY)

SUMMARY OF ATTACHED FLOW RESULTS AT ALPHA = 12.000 DEG., M = .270

CL(LS) = .59804 CLF = 0.00000 CL = .59804
 CD(LS) = .04061 CDF = 0.00000 CD = .04061
 CM(LS) = -.01216 CMF = 0.00000 CM = -.01216

THE FOLLOWING PARAMETERS ARE USED IN THE METHOD OF SUCTION ANALOGY

CLP = .58008 CLVF = .10276 CLVSE = .00000 CLVAUG = 0.00000
 CDP = .12510 CDVLE = .02184 CDVSE = .00000 CDVAUG = 0.00000
 CMP = -.01216 CMVLE = .02108 CMVSE = -.00000 CMVAUG = 0.00000
 CLDVP = 0.00000 CLDVV = 0.00000 CLF = 0.00000 CL = .68284
 CDDVP = 0.00000 CDDVV = 0.00000 CDF = 0.00000 CD = .14694
 CMDVP = 0.00000 CMDVV = 0.00000 CMF = 0.00000 CM = .00892

CAXP = .00177 CAXV = 0.00000

THE FOLLOWING ROLLING AND YAWING MOMENTS ARE BASED ON
 A REFERENCE SPAN OF 4.15600 AND A REFERENCE AREA OF 8.63617

THE LATERAL CONTROL PARAMETERS DUE TO AILERON DEFLECTION OF 0.000 DEG. AT M = .270

BASED ON STABILITY AXES, AND B/2 = 2.07800

ATTACHED-FLOW RESULTS CL = -.011812 CN = .007812 (WITH TIP-SUCTION EFFECT)
 CL = -.010274 CN = .007485 (WITHOUT TIP-SUCTION EFFECT)
 VORTEX-FLOW RESULTS CL = -.010895 CN = .010473 (WITH TIP-VORTEX EFFECT)
 CL = -.010574 CN = .008204 (WITHOUT TIP-VORTEX EFFECT)

THE FOLLOWING BENDING MOMENT COEFFICIENT IS BASED ON Q*S*(B/2),
 WHERE S = 8.63617 AND B/2 = 3.11700
 (FOR ATTACHED POTENTIAL FLOW ONLY)

Y/S	BM(RIGHT)	BM(LEFT)
-.95118	0.00000	.00009
-.83333	0.00000	.00126
-.71548	0.00000	.00512
-.64129	0.00000	.00776
-.56904	0.00000	.00927
-.46089	0.00000	.01558
-.33333	0.00000	.02954
-.20577	0.00000	.05089
-.09763	0.00000	.07467
-.02537	0.00000	.09348
.03186	.10588	0.00000
.11527	.08242	0.00000
.21838	.05772	0.00000
.30179	.04136	0.00000
.36545	.03096	0.00000
.44871	.02025	0.00000
.55161	.01206	0.00000
.63487	.00938	0.00000
.71548	.00613	0.00000
.83333	.00149	0.00000
.95118	.00011	0.00000

60 THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN AND WING AREA
AT THE WING ROOT • .115653 (RIGHT), • .100610 (LEFT)

3. Sample Case 3

Input Data

F-1068 WITH RUDDER									
1	0	0	2						
-1	0	1	1						
1	10	1	0						
1	1	0	0						0
0.000000									
7	0	2	0						
0									
2.185390	5.292990	.250450	5.143500	1.958300	-0.144600	0.000000			
3	2	5	2	3	0				
1	2	1	0	0	1				
9.391000									
3	2	0	0						
0									
4.268300	5.626240	0.000000	4.553930	5.699020	.200000	90.000000			
0									
4.553930	5.699020	.200000	5.298540	5.888740	.721390	90.000000			
0									
5.298540	5.888740	.721390	5.711000	5.993840	1.010200	90.000000			
0									
5.626240	5.845300	0.000000	5.699020	5.918080	.200000	90.000000			
0									
5.699020	5.918080	.200000	5.888740	6.107800	.721390	90.000000			
0									
5.888740	6.107800	.721390	5.993840	6.212900	1.010200	90.000000			
0.000000	3.489150	2.376000	1.958300	3.535600	0.000000				
2.000000	0.000000	0.000000	0.000000	0.000000					
30.000000	20.000000								
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0									
.001763									
0.000000	0.000000	0.000000							
0									
.001763									
0.000000	0.000000	0.000000							
0.000000	0.000000	0.000000							
1	2	7	15						
-0.374200	5.928300	0.000000	0.000000	0.000000	1.000000				

Note. Total number of unknowns = $1 \times (7+0) + (2+5+2) \times (3+2) + 15 \times 2 = 145$.

Output

 F-106R WITH RUDDER

 1 0 0 2

 CASE NUMBER = 1

INPUT DATA														
-1	0	1	1	1										
1	10	1	1	0										
1	1	0	0	0										
0.000000	0	2	2	0										
2.185390	5.292990	.250450	5.143500	5.143500	1.958300	-0.144600	0.000000							
3	2	5	2	3	0	0								
1	2	1	0	0	1	1								
9.391000	2	0	0	0										
0	0	0	0	0										
4.268300	5.626240	0.000000	4.553930	5.699020	.200000	.289200	90.000000							
0	0	0	0	0										
4.553930	5.699020	.200000	5.298540	5.888740	.721390	.289200	90.000000							
0	0	0	0	0										
5.298540	5.888740	.721390	5.711000	5.993840	1.010200	.289200	90.000000							
0	0	0	0	0										
5.626240	5.845300	0.000000	5.699020	5.918080	.200000	.289200	90.000000							
0	0	0	0	0										
5.699020	5.918080	.200000	5.888740	6.107800	.721390	.289200	90.000000							
0	0	0	0	0										
5.888740	6.107800	.721390	5.993840	6.212900	1.010200	.289200	90.000000							
0.000000	3.489150	2.376000	1.958300	3.535600	0.000000									
2.000000	0.000000	0.000000	0.000000	0.000000										
30.000000	20.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000							
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000							
.001763	0.000000	0.000000	0.000000											
0.000000	0.000000	0.000000	0.000000											
.001763	0.000000	0.000000	0.000000											
0.000000	0.000000	0.000000	0.000000											
0.000000	0.000000	0.000000	0.000000											
-0.374200	5.928300	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000							

HALF SV = .34892E+01
 CPEF = .23760E+01
 15

VORTEX ELEMENT ENDPOINT COORDINATES =

ORIGINAL PAGE IS
OF POOR QUALITY

X1	X2	Y1	Y2	71	72
2.22435	2.35625	.25045	.32762	-.14460	-.14460
2.52438	2.64272	.25045	.32762	-.14460	-.14460
3.06502	3.15894	.25045	.32762	-.14460	-.14460
3.73919	3.80264	.25045	.32762	-.14460	-.14460
4.41336	4.44635	.25045	.32762	-.14460	-.14460
4.95400	4.96256	.25045	.32762	-.14460	-.14460
5.25403	5.24904	.25045	.32762	-.14460	-.14460
2.35625	2.58085	.32762	.45902	-.14460	-.14460
2.64272	2.84424	.32762	.45902	-.14460	-.14460
3.15894	3.31886	.32762	.45902	-.14460	-.14460
3.80264	3.91069	.32762	.45902	-.14460	-.14460
4.44635	4.50253	.32762	.45902	-.14460	-.14460
4.96256	4.97714	.32762	.45902	-.14460	-.14460
5.24904	5.24053	.32762	.45902	-.14460	-.14460
2.58085	2.89482	.45902	.64271	-.14460	-.14460
2.84424	3.12594	.45902	.64271	-.14460	-.14460
3.31886	3.54241	.45902	.64271	-.14460	-.14460
3.91069	4.06173	.45902	.64271	-.14460	-.14460
4.50253	4.58106	.45902	.64271	-.14460	-.14460
4.97714	4.99752	.45902	.64271	-.14460	-.14460
5.24053	5.22865	.45902	.64271	-.14460	-.14460
2.89482	3.27271	.64271	.86380	-.14460	-.14460
3.12594	3.46499	.64271	.86380	-.14460	-.14460
3.54241	3.81147	.64271	.86380	-.14460	-.14460
4.06173	4.24353	.64271	.86380	-.14460	-.14460
4.58106	4.67558	.64271	.86380	-.14460	-.14460
4.99752	5.02206	.64271	.86380	-.14460	-.14460
5.22865	5.21434	.64271	.86380	-.14460	-.14460
3.27271	3.68192	.86380	1.10437	-.14460	-.14460
3.46499	3.83394	.86380	1.10437	-.14460	-.14460
3.81147	4.10426	.86380	1.10437	-.14460	-.14460
4.24353	4.44134	.86380	1.10437	-.14460	-.14460
4.67558	4.77843	.86380	1.10437	-.14460	-.14460
5.02206	5.04875	.86380	1.10437	-.14460	-.14460
5.21434	5.19877	.86380	1.10437	-.14460	-.14460
3.68392	4.09513	1.10437	1.34495	-.14460	-.14460
3.83394	4.20289	1.10437	1.34495	-.14460	-.14460
4.10426	4.39705	1.10437	1.34495	-.14460	-.14460
4.44134	4.63916	1.10437	1.34495	-.14460	-.14460
4.77843	4.88128	1.10437	1.34495	-.14460	-.14460
5.04875	5.07544	1.10437	1.34495	-.14460	-.14460
5.19877	5.18320	1.10437	1.34495	-.14460	-.14460
4.09513	4.47303	1.34495	1.56604	-.14460	-.14460
4.20289	4.54104	1.34495	1.56604	-.14460	-.14460
4.39705	4.66612	1.34495	1.56604	-.14460	-.14460
4.63916	4.82006	1.34495	1.56604	-.14460	-.14460
4.88128	4.97580	1.34495	1.56604	-.14460	-.14460

5.07544	1.34495	1.56604	-1.4460
5.18320	1.34495	1.56604	-1.4460
4.47303	1.56604	1.74973	-1.4460
4.54194	1.56604	1.74973	-1.4460
4.66612	1.56604	1.74973	-1.4460
4.82096	1.56604	1.74973	-1.4460
4.97580	1.56604	1.74973	-1.4460
5.09998	1.56604	1.74973	-1.4460
5.16889	1.56604	1.74973	-1.4460
4.78700	1.74973	1.88113	-1.4460
4.82364	1.74973	1.88113	-1.4460
4.88967	1.74973	1.88113	-1.4460
4.97200	1.74973	1.88113	-1.4460
5.05433	1.74973	1.88113	-1.4460
5.12036	1.74973	1.88113	-1.4460
5.15700	1.74973	1.88113	-1.4460
4.78700	1.74973	1.94961	-1.4460
4.82364	1.74973	1.94961	-1.4460
4.88967	1.74973	1.94961	-1.4460
4.97200	1.74973	1.94961	-1.4460
5.05433	1.74973	1.94961	-1.4460
5.12036	1.74973	1.94961	-1.4460
5.15700	1.74973	1.94961	-1.4460
5.01160	1.88113	1.94961	-1.4460
5.02516	1.88113	1.94961	-1.4460
5.04959	1.88113	1.94961	-1.4460
5.08005	1.88113	1.94961	-1.4460
5.11051	1.88113	1.94961	-1.4460
5.12036	1.88113	1.94961	-1.4460
5.14849	1.88113	1.94961	-1.4460
5.15700	1.88113	1.94961	-1.4460
5.01160	1.94961	1.94961	-1.4460
5.02516	1.94961	1.94961	-1.4460
5.04959	1.94961	1.94961	-1.4460
5.08005	1.94961	1.94961	-1.4460
5.11051	1.94961	1.94961	-1.4460
5.13494	1.94961	1.94961	-1.4460
5.14849	1.94961	1.94961	-1.4460
4.35926	0.00000	1.0000	.28920
4.94727	0.00000	1.0000	.28920
5.53528	0.00000	1.0000	.28920
4.49495	0.00000	1.0000	.28920
5.03687	0.00000	1.0000	.28920
5.57879	0.00000	1.0000	.28920
4.63064	0.00000	1.0000	.28920
5.12647	0.00000	1.0000	.28920
5.62231	0.00000	1.0000	.28920
4.73424	0.00000	1.0000	.28920
5.19489	0.00000	1.0000	.28920
5.65554	0.00000	1.0000	.28920
4.80281	0.00000	1.0000	.28920
5.29960	0.00000	1.0000	.28920
5.65554	0.00000	1.0000	.28920
4.80281	0.00000	1.0000	.28920
5.29960	0.00000	1.0000	.28920
5.70640	0.00000	1.0000	.28920
5.07591	0.00000	1.0000	.28920
5.42051	0.00000	1.0000	.28920
5.76512	0.00000	1.0000	.28920
5.23447	0.00000	1.0000	.28920
5.52523	0.00000	1.0000	.28920
5.81598	0.00000	1.0000	.28920
5.23447	0.00000	1.0000	.28920
5.52523	0.00000	1.0000	.28920
5.81598	0.00000	1.0000	.28920
5.33808	0.00000	1.0000	.28920
5.59364	0.00000	1.0000	.28920
5.84920	0.00000	1.0000	.28920
5.33808	0.00000	1.0000	.28920
5.59364	0.00000	1.0000	.28920
5.84920	0.00000	1.0000	.28920
5.91205	0.00000	1.0000	.28920
5.53401	0.00000	1.0000	.28920
5.72303	0.00000	1.0000	.28920

ORIGINAL PAGE IS
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5.91205	5.96647	.86579	.99085	.28920	.28920
5.65832	5.69471	0.00000	.10000	.28920	.28920
5.81322	5.84961	0.00000	.10000	.28920	.28920
5.69471	5.73110	.10000	.20000	.28920	.28920
5.84961	5.88600	.10000	.20000	.28920	.28920
5.73110	5.75888	.20000	.27636	.28920	.28920
5.88600	5.91378	.20000	.27636	.28920	.28920
5.75888	5.80141	.27636	.39322	.28920	.28920
5.91378	5.95631	.27636	.39322	.28920	.28920
5.80141	5.85051	.39322	.52817	.28920	.28920
5.95631	6.00541	.39322	.52817	.28920	.28920
5.85051	5.89304	.52817	.64503	.28920	.28920
5.89304	6.04794	.52817	.64503	.28920	.28920
6.04794	5.92082	.64503	.72139	.28920	.28920
5.92082	6.07572	.64503	.72139	.28920	.28920
6.07572	5.97337	.72139	.86579	.28920	.28920
5.97337	6.12827	.72139	.86579	.28920	.28920
6.12827	6.01888	.86579	.99085	.28920	.28920
	6.17378	.86579	.99085	.28920	.28920

CONTROL POINT COORDINATES=

XCP	YCP	ZCP	XCP	YCP	ZCP
2.39606	.28504	-.14460	2.81847	.28504	-.14460
3.42888	.28504	-.14460	4.10638	.28504	-.14460
4.71679	.28504	-.14460	5.13920	.28504	-.14460
5.28996	.28504	-.14460	2.56185	.38601	-.14460
2.95877	.38601	-.14460	3.53235	.38601	-.14460
4.16896	.38601	-.14460	4.74254	.38601	-.14460
5.13946	.38601	-.14460	5.28112	.38601	-.14460
2.82319	.54517	-.14460	3.17992	.54517	-.14460
3.69544	.54517	-.14460	4.26762	.54517	-.14460
4.78313	.54517	-.14460	5.13987	.54517	-.14460
5.26719	.54517	-.14460	3.15892	.74964	-.14460
3.46405	.74964	-.14460	3.90497	.74964	-.14460
4.39435	.74964	-.14460	4.83527	.74964	-.14460
5.14040	.74964	-.14460	5.24930	.74964	-.14460
3.54184	.98285	-.14460	3.78809	.98285	-.14460
4.14394	.98285	-.14460	4.53890	.98285	-.14460
4.89474	.98285	-.14460	5.14100	.98285	-.14460
5.22888	.98285	-.14460	3.94092	1.22590	-.14460
4.12582	1.22590	-.14460	4.39300	1.22590	-.14460
4.68955	1.22590	-.14460	4.95673	1.22590	-.14460
5.14162	1.22590	-.14460	5.20761	1.22590	-.14460
4.32384	1.45911	-.14460	4.44986	1.45911	-.14460
4.63197	1.45911	-.14460	4.83409	1.45911	-.14460
5.01620	1.45911	-.14460	5.14222	1.45911	-.14460
5.18719	1.45911	-.14460	4.65957	1.66358	-.14460
4.73398	1.66358	-.14460	4.84145	1.66358	-.14460

4.96083	1.66358	-1.14460	5.06834	1.66358	-1.14460
5.14274	1.66358	-1.14460	5.16930	1.66358	-1.14460
4.92092	1.82274	-1.14460	4.95514	1.82274	-1.14460
5.00459	1.82274	-1.14460	5.05948	1.82274	-1.14460
5.10893	1.82274	-1.14460	5.14315	1.82274	-1.14460
5.15937	1.82274	-1.14460	5.08670	1.92371	-1.14460
5.09544	1.92371	-1.14460	5.10806	1.92371	-1.14460
5.12206	1.92371	-1.14460	5.13468	1.92371	-1.14460
5.14341	1.92371	-1.14460	5.14653	1.92371	-1.14460
4.66589	.05000	.28920	5.31825	.05000	.28920
5.64443	.05000	.28920	4.78210	.15000	.28920
5.38125	.15000	.28920	5.68082	.15000	.28920
4.88079	.23493	.28920	5.43475	.23493	.28920
5.71173	.23493	.28920	4.99167	.33035	.28920
5.49486	.33035	.28920	5.74645	.33035	.28920
5.14315	.46069	.28920	5.57697	.46069	.28920
5.79388	.46069	.28920	5.29462	.59104	.28920
5.65908	.59104	.28920	5.84131	.59104	.28920
5.40550	.68646	.28920	5.71919	.68646	.28920
5.87603	.68646	.28920	5.52999	.79359	.28920
5.78667	.79359	.28920	5.91501	.79359	.28920
5.69780	.93800	.28920	5.87764	.93800	.28920
5.96756	.93800	.28920	5.75396	.05000	.28920
5.86349	.05000	.28920	5.79035	.15000	.28920
5.80988	.15000	.28920	5.82126	.23493	.28920
5.93079	.23493	.28920	5.85598	.33035	.28920
5.96551	.33035	.28920	5.90341	.46069	.28920
6.01294	.46069	.28920	5.95084	.59104	.28920
6.06037	.59104	.28920	5.98556	.68646	.28920
6.09509	.68646	.28920	6.02454	.79359	.28920
6.13407	.79359	.28920	6.07709	.93800	.28920
6.18662	.93800	.28920			

 ANGLE OF ATTACK = 30.000 DEG.

CHORDWISE DISTRIBUTION OF TIP SUCTION COEFFICIENT

X/C	CTIP
.04163	.00000
.31074	.00000
.57986	.00000
.67692	.00000
.94457	.00000

TIP SUCTION COEFFICIENT = .00000 (ONE SIDE ONLY)

THE X-COORDINATE OF CENTROID OF TIP SUCTION = -.00000

ELEMENT	Y/S	GAMMA	GAMAX
1	.14555	-.11538	2.18373
2	.14555	-.40910	.75729
3	.14555	-.74261	.63255
4	.14555	-1.06014	.25161
5	.14555	-1.30538	.17028
6	.14555	-1.41822	.05030
7	.14555	-1.44828	.07864
8	.19711	-.14606	3.38866
9	.19711	-.44483	.89608
10	.19711	-.75956	.43505
11	.19711	-1.06880	.30311
12	.19711	-1.29869	.21972
13	.19711	-1.40801	.17457
14	.19711	-1.43550	.16871
15	.27839	-.15283	4.10722
16	.27839	-.47272	1.29813
17	.27839	-.78866	.61852
18	.27839	-1.06883	.42597
19	.27839	-1.27352	.34346
20	.27839	-1.37200	.30068
21	.27839	-1.39783	.29245
22	.38280	-.15440	4.87106
23	.38280	-.47496	1.66328
24	.38280	-.78203	.91072
25	.38280	-1.03712	.60715
26	.38280	-1.21550	.47097
27	.38280	-1.30218	.41513
28	.38280	-1.32540	.40794
29	.50189	-.14673	5.75711
30	.50189	-.44729	2.03638
31	.50189	-.73259	1.17875
32	.50189	-.96257	.80083
33	.50189	-1.11694	.63846
34	.50189	-1.19222	.56754
35	.50189	-1.21239	.55897
36	.62600	-.13027	6.78244
37	.62600	-.39147	2.41654
38	.62600	-.64205	1.51188
39	.62600	-.84393	1.04477
40	.62600	-.97462	.82301
41	.62600	-1.03898	.73910
42	.62600	-1.05572	.72793
43	.74509	-.10561	8.09568
44	.74509	-.31649	2.88826
45	.74509	-.51547	1.85832
46	.74509	-.68024	1.38885
47	.74509	-.70064	1.11848
48	.74509	-.84337	1.01002

49	.74509	--.85729	.99109
50	.84950	--.07656	9.92151
51	.84950	--.22812	3.54392
52	.84950	--.37097	2.30060
53	.84950	--.48936	1.74356
54	.84950	--.56961	1.47088
55	.84950	--.60983	1.34800
56	.84950	--.62080	1.32895
57	.93078	--.04583	12.93229
58	.93078	--.13626	4.64200
59	.93078	--.22153	3.09581
60	.93078	--.29334	2.40286
61	.93078	--.34240	2.01852
62	.93078	--.36665	1.87361
63	.93078	--.37323	1.85479
64	.98234	--.01756	19.39938
65	.98234	--.05222	6.94831
66	.98234	--.08510	4.63923
67	.98234	--.11383	3.66237
68	.98234	--.13476	3.08994
69	.98234	--.14559	2.79437
70	.98234	--.14854	2.74700
71	.04950	--.00000	.00000
72	.04950	--.00000	.00000
73	.04950	--.00000	--.00000
74	.14849	--.00000	.00000
75	.14849	--.00000	.00000
76	.14849	--.00000	--.00000
77	.23255	--.00000	.00000
78	.23255	--.00000	.00000
79	.23255	--.00000	--.00000
80	.32701	--.00000	.00000
81	.32701	--.00000	.00000
82	.32701	--.00000	.00000
83	.45604	--.00000	.00000
84	.45604	--.00000	.00000
85	.45604	--.00000	.00000
86	.58507	--.00000	.00000
87	.58507	--.00000	.00000
88	.58507	--.00000	.00000
89	.67953	--.00000	.00000
90	.67953	--.00000	.00000
91	.67953	--.00000	.00000
92	.78558	--.00000	.00000
93	.78558	--.00000	.00000
94	.78558	--.00000	.00000
95	.92853	--.00000	.00000
96	.92853	--.06000	.00000
97	.92853	--.00000	.00000

98	.04950	-.00000	-.00000
99	.04950	-.00000	-.00000
100	.14849	-.00000	-.00000
101	.14849	-.00000	-.00000
102	.23255	-.00000	-.00000
103	.23255	-.00000	-.00000
104	.32701	-.00000	.00000
105	.32701	-.00000	.00000
106	.45604	-.00000	.00000
107	.45604	-.00000	.00000
108	.58507	-.00000	.00000
109	.58507	-.00000	.00000
110	.67953	-.00000	.00000
111	.67953	-.00000	.00000
112	.78558	-.00000	.00000
113	.78558	-.00000	.00000
114	.92853	-.00000	.00000
115	.92853	-.00000	.00000

VORTEX-BREAKDOWN CHARACTERISTICS

***FOR SURFACE NUMBER 1 ***

(FOR CAMBERED WING)

CENTROID TO MAX. SUCTION FORCE, YBAR = .34262
 TOTAL SUCTION FORCE TO MAX. $CS * C / (CB * SIN(ALP)) ** 2$ = .97800
 L.E. LENGTH OF MAX. SUCTION CENTROID = .85339

***FOR SURFACE NUMBER 1 ***

(FOR NONCAMBERED WING)

CENTROID TO MAX. SUCTION FORCE, YBAR = .37806
 TOTAL SUCTION FORCE TO MAX. $CS * C / (CB * SIN(ALP)) ** 2$ = 1.28041
 L.E. LENGTH OF MAX. SUCTION CENTROID = .91522

ALPHA FOR VORTEX BREAKDOWN AT T.O.E. = 17.51495 DEG.
 (WITHOUT CAMBER CORRECTION, FOR SYMMETRICAL LOADING)

***FOR SURFACE NUMBER 2 ***

(FOR NONCAMBERED WING)

***THE FOLLOWING ALPHAS FOR VORTEX BREAKDOWN AT T.O.E. HAVE BEEN CORRECTED FOR

CAMBER AND ADVERSE PRESSURE GRADIENT IN VORTEX LIFT AUGMENTATION, IF ANY***

***FOR SURFACE NUMBER 1 ***

REVISED ALPHA BDTE = 21.603DEGRFFS
(FOR SYMMETRICAL LOADING)

***FOR SURFACE NUMBER 2 ***

REVISED ALPHA RDTE = 90.000DEGREES
(FOR SYMMETRICAL LOADING)

XX

PRESSURE DISTRIBUTION AT ALPHA = 30.000 DEG.

AND AILERON ANGLE = 9.391 DEG.

XX

VORTEX	XV	YV	CP(LEFT)	CP(RIGHT)
1	.01254	.14555	3.32732	3.32743
2	.10908	.14555	1.34514	1.34541
3	.28306	.14555	.92167	.92224
4	.50000	.14555	.75692	.75850
5	.71694	.14555	.49797	.50009
6	.89092	.14555	.24789	.24807
7	.98746	.14555	.06812	.06913
8	.01254	.19711	4.44523	4.44586
9	.10908	.19711	1.32452	1.32513
10	.28306	.19711	.95970	.96084
11	.50000	.19711	.76336	.76603
12	.71694	.19711	.50291	.50549
13	.89092	.19711	.25296	.25338
14	.98746	.19711	.07117	.07173
15	.01254	.27839	5.37689	5.37894
16	.10908	.27839	1.56487	1.56617
17	.28306	.27839	1.00463	1.00666
18	.50000	.27839	.75415	.75755
19	.71694	.27839	.50055	.50322
20	.89092	.27839	.25828	.25908
21	.98746	.27839	.07713	.07734
22	.01254	.38280	6.45060	6.45570
23	.10908	.38280	1.94550	1.94808
24	.28306	.38280	1.10742	1.11054
25	.50000	.38280	.77669	.78044
26	.71694	.38280	.50954	.51234
27	.89092	.38280	.26980	.27101
28	.98746	.38280	.08224	.08253

29	.01254	.50189	7.65417	7.66484
30	.10908	.50189	2.44482	2.44940
31	.28306	.50189	1.26445	1.26859
32	.50000	.50189	.84409	.84806
33	.71694	.50189	.54445	.54743
34	.89092	.50189	.29168	.29327
35	.98746	.50189	.08961	.09008
36	.01254	.62600	9.05086	9.06958
37	.10908	.62600	2.98778	2.99491
38	.28306	.62600	1.62578	1.63100
39	.50000	.62600	.96335	.96762
40	.71694	.62600	.61501	.61818
41	.89092	.62600	.33001	.33185
42	.98746	.62600	.10157	.10216
43	.01254	.74509	10.81900	10.84768
44	.10908	.74509	3.64721	3.65744
45	.28306	.74509	2.09307	2.09975
46	.50000	.74509	1.30013	1.30505
47	.71694	.74509	.75230	.75575
48	.89092	.74509	.39499	.39699
49	.98746	.74509	.12130	.12194
50	.01254	.84950	13.28708	13.32798
51	.10908	.84950	4.54229	4.55650
52	.28306	.84950	2.72273	2.73159
53	.50000	.84950	1.78246	1.78859
54	.71694	.84950	1.14353	1.14764
55	.89092	.84950	.64276	.64506
56	.98746	.84950	.24896	.24969
57	.01254	.93078	17.31661	17.37475
58	.10908	.93078	5.98393	6.00399
59	.28306	.93078	3.72474	3.73722
60	.50000	.93078	2.57509	2.58368
61	.71694	.93078	1.72804	1.73362
62	.89092	.93078	1.06523	1.06828
63	.98746	.93078	.54941	.55035
64	.01254	.98234	26.02187	26.11346
65	.10908	.98234	9.06152	9.09323
66	.28306	.98234	5.80113	5.82127
67	.50000	.98234	4.29589	4.31059
68	.71694	.98234	3.10479	3.11497
69	.89092	.98234	1.89055	1.90620
70	.98746	.98234	1.08354	1.08528
71	.05736	.04950	-.05672	.05672
72	.42812	.04950	-.03983	.03983
73	.79828	.04950	-.08122	.08122
74	.87729	.04950	-.05989	.05989
75	.97895	.04950	-.03533	.03533
76	.05663	.14849	-.08403	.08403
77	.42272	.14849	-.03678	.03678

78	.78881	.14849	-.09952	.09952				
79	.86808	.14849	-.09464	.09464				
80	.97737	.14849	-.04697	.04697				
81	.05593	.23255	-.16240	.16240				
82	.41746	.23255	-.00910	.00910				
83	.77809	.23255	-.13858	.13858				
84	.85909	.23255	-.30283	.30283				
85	.07582	.23255	-.06128	.06128				
86	.05501	.32701	-.21773	.21773				
87	.41062	.32701	.00321	-.00321				
88	.76623	.32701	.18216	.18216				
89	.84742	.32701	-.35198	.35198				
90	.97382	.32701	-.07158	.07158				
91	.05348	.45604	-.26667	.26667				
92	.30921	.45604	.00474	-.00474				
93	.74493	.45604	-.20878	.20878				
94	.82704	.45604	-.36970	.36970				
95	.97048	.45604	-.07361	.07361				
96	.05151	.58507	-.29814	.29814				
97	.38446	.58507	-.00033	.00033				
98	.71741	.58507	-.20406	.20406				
99	.80276	.58507	-.35813	.35813				
100	.96616	.58507	-.06252	.06252				
101	.04965	.67953	-.28898	.28898				
102	.37060	.67953	-.01325	.01325				
103	.69154	.67953	-.16505	.16505				
104	.77910	.67953	-.29147	.29147				
105	.96210	.67953	-.04272	.04272				
106	.04695	.78558	-.18947	.18947				
107	.35045	.78558	-.06923	.06923				
108	.65306	.78558	-.08263	.08263				
109	.74471	.78558	-.06795	.06795				
110	.95620	.78558	-.02314	.02314				
111	.04163	.92853	-.17523	.17523				
112	.31074	.92853	-.04844	.04844				
113	.57986	.92853	-.02939	.02939				
114	.67692	.92853	-.02494	.02494				
115	.94457	.92853	-.00922	.00922				
Y/S								
	.14555							
	.19711							
	.27830							
	.38280							
	.50180							
	.62400							
	.74500							
	.84950							
	.93078							
CL(RICHT)								
	.79161							
	.87726							
	.95622							
	1.11278							
	1.32647							
	1.52017							
	2.07498							
	2.79252							
	3.98881							
CL(LEFT)								
	.79059							
	.87580							
	.95409							
	1.10994							
	1.32272							
	1.52420							
	2.06866							
	2.77414							
	3.97704							
CM								
	.11765							
	.09004							
	.04094							
	-.04378							
	-.20025							
	-.42813							
	-.79014							
	-1.30809							
	-2.07452							
CT								
	.10132							
	.15724							
	.21451							
	.30576							
	.42644							
	.58352							
	.84507							
	1.27252							
	2.15727							
CDI								
	.32205							
	.29802							
	.26811							
	.23667							
	.19258							
	.13227							
	.03211							
	-.17033							
	-.67982							
CS*C								
	.48322							
	.72076							
	.82341							
	.48775							
	.55987							
	.50216							
	.57980							
	.51760							
	.40360							
CAV								
	0.00000							
	0.00000							
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	0.00000							
	0.00000							
	0.00000							
	0.00000							
	0.00000							

.98234 6.87681 6.85749 -3.55575 4.86758 -2.49347 .23210 0.00000

THE FOLLOWING ARE THE TAIL CHARACTERISTICS

*** TAIL SURFACE 1 ***

.04950	.05638	-.05638	-.00000	.00000	.00000	0.00000
.14849	.06906	-.06906	-.00000	.00000	.00000	0.00000
.23255	.10315	-.10315	-.00000	.00000	.00000	0.00000
.32701	.12665	-.12665	-.00000	.00000	.00000	0.00000
.45604	.14703	-.14703	-.00000	.00000	.00000	0.00000
.58507	.15521	-.15521	-.00000	.00000	.00000	0.00000
.67953	.14128	-.14128	-.00000	.00000	.00000	0.00000
.78598	.09046	-.09046	-.00000	.00000	.00000	0.00000
.92853	.05623	-.05623	-.00000	.00000	.00000	0.00000

*** THE FOLLOWING ARE ATTACHED POTENTIAL FLOW RESULTS ***

TOTAL LIFT COEFFICIENT = .98398

TOTAL INDUCED DRAG COEFFICIENT = .14476

THE INDUCED DRAG PARAMETER = .14951

TOTAL PITCHING MOMENT COEFFICIENT = -.15209

THE WING LIFT COEFFICIENT = .98398

THE WING INDUCED DRAG COEFFICIENT = .14476

THE WING PITCHING MOMENT COEFFICIENT = -.15209

*** TAIL SURFACE 1 ***

THE TAIL LIFT COEFFICIENT = 0.00000 (BASED ON WING AREA)

THE TAIL INDUCED DRAG COEFFICIENT = 0.00000 (BASED ON WING AREA)

THE TAIL PITCHING MOMENT COEFFICIENT BASED ON REFERENCE WING AREA

AND MEAN WING CHORD, AND REFERRED TO THE Y-AXIS = 0.00000

(NOTE. THE INDUCED DRAG COMPUTATION IS FOR SYMMETRICAL LOADING ONLY)

FUSELAGE AERODYNAMIC CHARACTERISTICS ARE GIVEN BELOW

PRESSURE DISTRIBUTION AT THETA-LOCATIONS IN DEGREES DEFINED BELOW

THETA 1= 12.0 THETA 2= 36.0 THETA 3= 60.0 THETA 4= 84.0 THETA 5=108.0
 THETA 6=135.0 THETA 7=165.0 THETA

X/L	THETA 1	THETA 2	THETA 3	THETA 4	THETA 5	THETA 6	THETA 7
-.61762	.15855	-.01660	-.23000	-.30207	-.13605	.25690	.63504
-.59589	-.06604	-.32037	-.63475	-.75265	-.53762	-.00098	.52088
-.55337	-.03024	-.30592	-.65438	-.80765	-.61644	-.09292	.42607
-.49193	.00996	-.26836	-.62489	-.79453	-.62768	-.13459	.36095
-.41425	.04259	-.24125	-.60878	-.70416	-.64570	-.17218	.30963
-.32373	.07548	-.20996	-.58325	-.78105	-.65147	-.20218	.26025
-.22431	.15374	-.12577	-.50691	-.74453	-.65961	-.21143	.17010
-.12036	.10220	-.06167	-.26032	-.29323	-.03787	.19665	.24454
-.01640	.04483	-.02074	-.11560	-.07590	.09305	.24020	.20547
.08301	.07620	.02772	-.00948	.02622	.15612	.27595	.31282
.17354	.13226	.00594	.06637	.08253	.17411	.27120	.29259
.25122	.17043	.14701	.13290	.15261	.20737	.25067	.27863
.31244	.19020	.16755	.15760	.18309	.22500	.24628	.27112
.35517	.21220	.18026	.17213	.18750	.21962	.22877	.25199
.37600	.03125	.03741	.07017	.14836	.27406	.34973	.41494

TOTAL PRESSURE LOADING AT EACH X-STATION, BASED ON LOCAL RADIUS

X/L	RADIUS	LOADING
-.05562	.00844	.80148
-.03490	.04204	.99010
.00761	.08913	.77953
.06905	.13936	.60799
.14673	.18797	.47160
.23726	.23019	.33804
.33667	.26240	.08151
.44063	.28232	.47586
.54458	.28919	.56318
.64400	.28920	.48163
.73452	.28920	.33348
.81220	.28920	.21881
.87364	.28920	.14101
.91615	.28920	.08553
.93789	.28920	.04276

THE FUSELAGE POTENTIAL LIFT COEFFICIENT = .07645
 THE FUSELAGE POTENTIAL MOMENT COEFFICIENT = .02147
 THE FUSELAGE INDUCED DRAG COEFFICIENT = .03200

ORIGINAL PAGE IS
 OF POOR QUALITY

THE FUSELAGE LIFT COEFFICIENT = .07070
 THE FUSELAGE MOMENT COEFFICIENT = .02412
 THE FUSELAGE INDUCED DRAG COEFFICIENT = .03045

SUMMARY OF ATTACHED FLOW RESULTS AT ALPHA = 30.000 DEG., P = 0.000

CL(LS) = .98398 CLF = .07070 CL = 1.05467
 CD(LS) = .14476 CDF = .03045 CD = .17521
 CM(LS) = -.15309 CMF = .02412 CM = -.12896

THE FOLLOWING PARAMETERS ARE USED IN THE METHOD OF SUCTION ANALOGY

CLP = .89337 CLVLF = .23815 CLVSE = 0.00000 CLVAUG = 0.00000
 CDP = .36884 CDVLE = .13750 CDVSE = 0.00000 CDVAUG = 0.00000
 CMP = -.15309 CMVLE = -.00081 CMVSE = 0.00000 CMVAUG = 0.00000
 CLDVP = 0.00000 CLDVV = 0.00000 CLF = .07070 CL = 1.20222
 CDDVP = 0.00000 CDDVV = 0.00000 CDF = .03045 CD = .53675
 CMDVP = 0.00000 CMDVV = 0.00000 CMF = .02412 CM = -.12977

CAXP = -.05645 CAXV = 0.00000

THE FOLLOWING ROLLING AND YAWING MOMENTS ARE BASED ON
 A REFERENCE SPAN OF 3.91660 AND A REFERENCE AREA OF 6.97830

THE LATERAL CONTROL PARAMETERS DUE TO AILERON DEFLECTION OF 9.391 DEG. AT M = 0.000

BASED ON STABILITY AXES, AND R/Z = 1.95830

ATTACHED-FLOW RESULTS CL = .000791 CN = .007616 (WITH TIP-SUCTION EFFECT)
 CL = .000791 CN = .007616 (WITHOUT TIP-SUCTION EFFECT)
 VORTEX-FLOW RESULTS CL = .000600 CN = .008224 (WITH TIP-VORTEX EFFECT)
 CL = .000593 CN = .008171 (WITHOUT TIP-VORTEX EFFECT)

THE FOLLOWING BENDING MOMENT COEFFICIENT IS BASED ON $0.5 \cdot (R/2)$,
 WHERE S = 2.07830 AND $\theta/2 = 1.95830$
 (FOR ATTACHED POTENTIAL FLOW ONLY)

Y/S	RM(RIGHT)	RM(LEFT)
.14545	.17321	.17270
.12711	.12940	.14614
.27820	.11416	.11580
.39290	.07080	.07056
.50180	.04736	.04722
.62600	.02332	.02328
.74500	.00902	.00898
.84950	.00232	.00231
.93078	.00032	.00031
.98234	.00001	.00001

THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN AND WING AREA (LEFT)
 AT THE WING ROOT = .181715 (RIGHT), = .181186 (LEFT)

THE FOLLOWING ARE THE TAIL CHARACTERISTICS BASED ON WING GEOMETRY,
 WHERE S = 6.97830 AND R/2 = 1.01020

*** TAIL SURFACE 1 ***

.04950	.00590	-.00590
.14849	.00453	-.00453
.23255	.00347	-.00347
.32701	.00242	-.00242
.45604	.00132	-.00132
.58507	.00059	-.00059
.67953	.00029	-.00029
.78558	.00011	-.00011
.92853	.00000	-.00000

THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN AND WING AREA
 AT THE TAIL ROOT = .006637 (RIGHT), = -.006637 (LEFT)

*** ANGLE OF ATTACK = 20.000 DEG. ***

CHORDWISE DISTRIBUTION OF TIP SUCTION COEFFICIENT

X/C	CTIP
.04163	.00000
.31074	.00000
.57086	.00000
.67692	.00000
.64457	.00000

TIP SUCTION COEFFICIENT = .00000 (ONE SIDE ONLY)
 THE X-COORDINATE OF CENTROID OF TIP SUCTION = -.00000

ELFMENT	Y/S	GAMMA	GAMMA
1	.14555	-.07866	1.47124
2	.14555	-.27734	1.50805
3	.14555	-.50510	.42460
4	.14555	-.72268	.16827
5	.14555	-.88029	.12051
6	.14555	-.96733	.03769
7	.10711	-.98785	.05665
8	.10711	-.09849	2.29780
9	.10711	.30144	.61917
10	.10711	.51683	.20978
11	.10711	.72854	.14915
12	.10711	.88549	.11904
13	.10711	.96030	.11465
14	.10711	.97910	.11465
15	.27839	-.10161	2.75540
16	.27839	-.31943	.90021

82	32701	00000	00000
83	45604	00000	00000
84	45604	00000	00000
85	58507	00000	00000
86	58507	00000	00000
87	58507	00000	00000
88	67953	00000	00000
89	67953	00000	00000
90	67953	00000	00000
91	78558	00000	00000
92	78558	00000	00000
93	78558	00000	00000
94	92853	00000	00000
95	92853	00000	00000
96	92853	00000	00000
97	04950	00000	00000
98	04950	00000	00000
99	14849	00000	00000
100	14849	00000	00000
101	23255	00000	00000
102	23255	00000	00000
103	32701	00000	00000
104	32701	00000	00000
105	45604	00000	00000
106	45604	00000	00000
107	58507	00000	00000
108	58507	00000	00000
109	58507	00000	00000
110	67953	00000	00000
111	67953	00000	00000
112	78558	00000	00000
113	78558	00000	00000
114	92853	00000	00000
115	92853	00000	00000

***THE FOLLOWING ALPHAS FOR VORTEX BREAKDOWN AT T.F. HAVE BEEN CORRECTED FOR CP (RIGHT) CP (LEFT) YV YV
 CAMBER AND ADVERSE PRESSURE GRADIENT IN VORTEX LIFT AUGMENTATION, IF ANY***

***FOR SURFACE NUMBER 1 ***
 REVISED ALPHA BOTE = 21.603 DEGREES
 (FOR SYMMETRICAL LOADING)
 ***FOR SURFACE NUMBER 2 ***
 REVISED ALPHA BOTE = 9C.000 DEGREES
 (FOR SYMMETRICAL LOADING)

XX
 PRESSURE DISTRIBUTION AT ALPHA = 20.000 DFG.
 AND AILERON ANGLE = 9.391 DEG.
 XXX

VORTEX	1	2	3	4	5	6	7	8
	YV	01254	14555	14555	14555	14555	14555	19711
	YV	10908	14555	14555	14555	14555	14555	19711
		28306	14555	14555	14555	14555	14555	19711
		50000	14555	14555	14555	14555	14555	19711
		71684	14555	14555	14555	14555	14555	19711
		89092	14555	14555	14555	14555	14555	19711
		98746	14555	14555	14555	14555	14555	19711
		01254	14555	14555	14555	14555	14555	19711
	CP (RIGHT)	2.29946	2.29934	6.8501	6.8501	3.6830	1.8363	3.01274
		00334	00334	5.6182	5.6182	3.6830	1.8363	3.01274
		00368	00368	5.6182	5.6182	3.6830	1.8363	3.01274
		37089	37089	5.6182	5.6182	3.6830	1.8363	3.01274
		18395	18395	5.6182	5.6182	3.6830	1.8363	3.01274
		05140	05140	5.6182	5.6182	3.6830	1.8363	3.01274
		01346	01346	5.6182	5.6182	3.6830	1.8363	3.01274

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87729
97895
05662
42272
78881
86808
97737
05593
77899
97582
05501
76623
84732
97348
05321
74493
82704
97048
05151
38446
78776
06616
96965
37060
67791
06210
35045
67471
95620
04163
31074
87986
94457

04950
14849
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14849
23255
23255
23255
22701
32701
32701
32701
45604
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67953
67953
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78558
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78558
92853
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07051
04163
04163
04163
11530
10120
16315
37255
05637
20144
41440
08398
31558
24552
63661
35109
00025
22165
47363
07362
19431
34316
05307
28151
09720
02720
20630
05703
03460
01085

07051
04163
04163
04163
11530
10120
16315
37255
05637
20144
41440
08398
31558
24552
63661
35109
00025
22165
47363
07362
19431
34316
05307
28151
09720
02720
20630
05703
03460
01085

07051
04163
04163
04163
11530
10120
16315
37255
05637
20144
41440
08398
31558
24552
63661
35109
00025
22165
47363
07362
19431
34316
05307
28151
09720
02720
20630
05703
03460
01085

Y(S
19711
17830
38280
50189
74509
84950
93078
98234

CL(RIGHT)
60197
65097
79718
92625
11060
36264
74088
74959

CL(LEFT)
60073
64957
79325
91037
11051
35125
33315
37275

CM75
02723
03783
03783
14936
31946
57296
87225
21689

CI4642
07288
09225
13227
18463
25987
35644
89369

DI77
14316
13495
15977
19077
05492
00715
12715
25446

CS*CS
18023
27704
34444
40150
42538
41523
27995
15707

CAV
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000036
00140
00250
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THE FOLLOWING ARE THE TAIL CHARACTERISTICS

*** TAIL SURFACE 1 ***

04950
14849
23255
32701

06638
08131
12144
14911

06638
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12144
14911

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.55604
.58507
.67953
.78558
.92853

.17311
.18274
.16633
.10651
.06621

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*** THE FOLLOWING ARE ATTACHED POTENTIAL FLOW RESULTS ***

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TOTAL LIFT COEFFICIENT = .68204
TOTAL INDUCED DRAG COEFFICIENT = .06645
THE INDUCED DRAG PARAMETER = .14285
TOTAL PITCHING MOMENT COEFFICIENT = -.10785
THE WING LIFT COEFFICIENT = .68204
THE WING INDUCED DRAG COEFFICIENT = .06645
THE WING PITCHING MOMENT COEFFICIENT = -.10785
*** TAIL SURFACE 1 ***

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THE TAIL LIFT COEFFICIENT = 0.00000( BASED ON WING AREA)
THE TAIL INDUCED DRAG COEFFICIENT = 0.00000( BASED ON WING AREA)
THE TAIL PITCHING MOMENT COEFFICIENT BASED ON REFERENCE WING AREA
AND MEAN WING CHORD, AND REFERRED TO THE Y-AXIS = 0.00000

```

22 (NOTE. THE INDUCED DRAG COMPUTATION IS FOR SYMPETRICAL LOADING ONLY)

FUSELAGE AERODYNAMIC CHARACTERISTICS ARE GIVEN BELOW

PRESSURE DISTRIBUTION AT THETA-LOCATIONS IN DEGREES DEFINED BELOW

X/L	THETA 1=12.0	THETA 2=36.0	THETA 3= 60.0	THETA 4= 84.0	THETA 5=108.0	THETA 6	THETA 7
-.16418	-.16418	-.16418	-.16418	-.16418	-.16418	-.16418	-.16418
-.05261	-.05261	-.05261	-.05261	-.05261	-.05261	-.05261	-.05261
-.05337	-.05337	-.05337	-.05337	-.05337	-.05337	-.05337	-.05337
-.49193	-.49193	-.49193	-.49193	-.49193	-.49193	-.49193	-.49193
-.23373	-.23373	-.23373	-.23373	-.23373	-.23373	-.23373	-.23373
-.22431	-.22431	-.22431	-.22431	-.22431	-.22431	-.22431	-.22431
-.12036	-.12036	-.12036	-.12036	-.12036	-.12036	-.12036	-.12036
-.01640	-.01640	-.01640	-.01640	-.01640	-.01640	-.01640	-.01640
.08401	.08401	.08401	.08401	.08401	.08401	.08401	.08401
.25122	.25122	.25122	.25122	.25122	.25122	.25122	.25122
.31266	.31266	.31266	.31266	.31266	.31266	.31266	.31266
.35517	.35517	.35517	.35517	.35517	.35517	.35517	.35517
.37690	.37690	.37690	.37690	.37690	.37690	.37690	.37690

TOTAL PRESSURE LOADING AT EACH X-STATION, BASED ON LOCAL RADIUS

```

X/L      RADIUS      LOADING
-.05663  .00844      .59526
-.03490  .04304      .73489

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.00761
 .06905
 .14673
 .23726
 .33667
 .44063
 .54400
 .64452
 .73452
 .81220
 .87364
 .91615
 .93789

 .08913
 .13936
 .18797
 .23019
 .26240
 .28232
 .28919
 .28920
 .28920
 .28920
 .28920
 .28920

THE FUSELAGE POTENTIAL LIFT COEFFICIENT = .05365
 THE FUSELAGE POTENTIAL MOMENT COEFFICIENT = .01593
 THE FUSELAGE INDUCED DRAG COEFFICIENT = .01492

THE FUSELAGE LIFT COEFFICIENT = .05193
 THE FUSELAGE MOMENT COEFFICIENT = .01773

 THE FUSELAGE INDUCED DRAG COEFFICIENT = .01420

 SUMMARY OF ATTACHED FLOW RESULTS AT ALPHA = 20.000 DEG., M = 0.000

CL(LS) = .68204 CLF = .05193 CL = .73397
 CD(LS) = .06645 CDF = .01420 CD = .08065
 CM(LS) = -.10785 CMF = .01773 CM = -.09012

THE FOLLOWING PARAMETERS ARE USED IN THE METHOD OF SUCTION ANALOGY

CLP = .66445 CLVLE = .15777 CLVSE = 0.00000 CLVAUG = 0.00000
 CDP = .14947 CDVLE = .05430 CDVSE = 0.00000 CDVAUG = 0.00000
 CMP = -.10785 CMVLE = -.01191 CMVSE = 0.00000 CMVAUG = 0.00000
 CLDVP = 0.00000 CLDVV = 0.00000 CLF = .05193 CL = .87415
 CDDVP = 0.00000 CDDVV = 0.00000 CDF = .01420 CD = .21797
 CMDVP = 0.00000 CMDVV = 0.00000 CMF = .01773 CM = -.10203

CAXP = -.03746 CAXV = -.00294

THE FOLLOWING ROLLING AND YAWING MOMENTS ARE BASED ON
 A REFERENCE SPAN OF 3.91660 AND A REFERENCE AREA OF 6.97830

THE LATERAL CONTROL PARAMETERS DUE TO AILERON DEFLECTION OF 9.391 DEG. AT M = 0.000

BASED ON STABILITY AXES, AND B/2 = 1.95830

ATTACHED-FLOW RESULTS CL = -.000580 CN = .009192 (WITH TIP-SUCTION EFFECT)
 CL = -.000580 CN = .009192 (WITHOUT TIP-SUCTION EFFECT)

VORTEX-FLOW RESULTS CL = -.000767 CN = .009579 (WITH TIP-VORTEX EFFECT)
 CL = -.000765 CN = .009517 (WITHOUT TIP-VORTEX EFFECT)

THE FOLLOWING BENDING MOMENT COEFFICIENT IS BASED ON $Q \cdot S \cdot (B/2)$,
 WHERE $S = 6.97830$ AND $B/2 = 1.95830$
 (FOR ATTACHED POTENTIAL FLOW ONLY)

Y/S	BM(RIGHT)	BM(LEFT)
.14555	.11698	.11639
.19711	.10051	.10000
.27839	.07736	.07696
.38280	.05250	.05222
.50189	.03065	.03049
.62600	.01477	.01469
.74500	.00549	.00546
.84950	.00138	.00137
.93078	.00018	.00018
.98234	.00000	.00000

THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN AND WING AREA
 AT THE WING ROOT = .122937 (RIGHT), = .122322 (LEFT)

THE FOLLOWING ARE THE TAIL CHARACTERISTICS BASED ON WING GEOMETRY,
 WHERE $S = 6.97830$ AND $B/2 = 1.01020$

*** TAIL SURFACE 1 ***

.04950	.00695	-.00695
.14849	.00534	-.00534
.23255	.00408	-.00408
.32701	.00285	-.00285
.45604	.00155	-.00155
.58507	.00070	-.00070
.67953	.00034	-.00034
.78558	.00013	-.00013
.92853	.00000	-.00000

THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN AND WING AREA
 AT THE TAIL ROOT = .007815 (RIGHT), = -.007815 (LEFT)

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10. White, R.P., Jr., "Wing-Vortex Lift at High Angles of Attack," Paper No. 9, AGARD CP-204, Prediction of Aerodynamic Loading, Feb. 1977.

11. Lamar, J.E. and Frink, N.T., "Experimental and Analytical Study of the Longitudinal Aerodynamic Characteristics of Analytically and Empirically Designed Strake-Wing Configurations at Subcritical Speeds," NASA TP-1803, June 1981.
12. Fox, C.H., Jr., "Subsonic Longitudinal and Lateral-Directional Static Aerodynamic Characteristics of a General Research Fighter Model Employing a Strake-Wing Concept," NASA TM-74071, 1978.

APPENDIX
FORTRAN PROGRAM LISTING

This program was written in Fortran IV language and is operational on CDC Cyber 175 computer system at NASA Langley Research Center. For other computer systems, the library subroutine for matrix inversion may have to be changed. It is located in subroutine INVN.

The following table is an index to the program listing. Subroutines are listed in the order of appearance.

<u>Program or Subroutine</u>	<u>Main Purpose</u>	<u>Page</u>
VORSTAB	executive routine	90
FUR	define fuselage radii	92
SLOP	define derivative of fuselage radius with x and multiplied by radius	93
FUSVOL	calculate fuselage volume effect	93
UNWF	calculate the effect of fuselage on wings	95
FUSELA	set up the normalwash matrix for fuselage due to fuselage	96
ZCDX	define analytical camber slopes	97
TWIST	calculate local twist angles	97
ZCR	define camber shapes	98
ZCAM	cubic spline interpolation of camber slopes	99
VMSEQN	vector method for solving simultaneous equations	100

<u>Program or Subroutine</u>	<u>Main Purpose</u>	<u>Page</u>
PNLEF	determine the location of a point relative to a leading-edge flap	101
GEMTRY	read and manipulate input data	102
GEOFUS	define fuselage geometry	118
PANEL	paneling of lifting surfaces	119
SPLINE	cubic spline subroutine	121
SHAPLE	define curved leading edges	122
SHAPTE	define curved trailing edges	122
DWASH	set up downwash matrix and obtain solutions	123
INVN	invert downwash matrix	133
WING	calculate downwash matrix of wings due to wings	134
UNFW	calculate normalwash coefficient on fuselage due to wings	138
VELFUS	manipulate velocity computations due to fuselage	142
FALONE	calculate the source distribution for the fuselage volume effect	146
SOLUTN	manipulate aerodynamic calculation	146
THRUST	calculate leading-edge thrust	152
GAMAX	calculate streamwise vortex density and side-edge suction	161
AUGVOR	calculate additional loading due to a discrete strake vortex	168

<u>Program or Subroutine</u>	<u>Main Purpose</u>	<u>Page</u>
SPNINT	perform spanwise integration to obtain the strength of a discrete strake vortex	169
LATERL	calculate the effect of lateral- directional motions	170
WBETA	calculate downwash due to additional wake vortices in sideslip	176
VLCTY	calculate downwash due to a discrete vortex	180
VERCOR	estimate the vertical position of the discrete strake vortex. Not used currently.	180
LOAD	compute and output total aerodynamic forces and moments	180
CPFUS	calculate pressure coefficient on fuselage	229
UTFW	calculate velocities on fuselage surface due to wings	232
FUSLFT	calculate fuselage forces and moments	235
CENTRD	calculate vortex-breakdown angles of attack	239
FRATN	determine the fraction of remaining vortex lift	247
REDBD	determine the decrease in alpha of vortex breakdown in the situation with augmented vortex lift	247

<u>Program or Subroutine</u>	<u>Main Purpose</u>	<u>Page</u>
BDPT	determine the location of vortex- breakdown point on the wing	248
BENDIN	calculate bending moment	248
BACKWH	calculate backwash due to image vortices in ground effect	251
DRAG	compute far-field induced drag	254

	PROGRAM VORSTAB(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,	VS	2
	+ TAPE1,TAPE2,TAPE3,TAPE4)	VS	3
	OPTION FORTRAN	VS	4
	FORTRAN NLSTIN	VS	5
C		VS	6
C	QVLN	VS	7
C		VS	8
C	THIS PROGRAM IS BASED ON THE QUASI VORTEX LATTICE METHOD BY	VS	9
C	C. EDWARD LAN OF UNIVERSITY OF KANSAS	VS	10
C		VS	11
C	REFERENCE JOURNAL OF AIRCRAFT VOL. 11, NO. 9, SEPT. 1974, PP.518VS	VS	12
C	-527, AND AIAA PAPER-82-1385.	VS	13
C		VS	14
C	DIMENSION TITLE(13)	VS	15
	COMMON/LOOP/KP,NALP,KALP,TANC2,CLDS,AL,CLIT,ALPII,ALPA(15)	VS	16
	COMMON/SL/ COSA,SINA,MZ,CTX,YBBK,7BK,GW,LATT	VS	17
	COMMON/GD/ TINP(6),BREAK(6,10),TFLP(6,5),RINC(6),NAL(6)	VS	18
	1,YBREAK(6,7),DCOS(6,5),DSIN(6,5),IHING(6),IWGLT(6),IV(6),LPAN1(6)	VS	19
	1,ICAMT(6)	VS	20
	COMMON/GDSL/ DF(6,5),YCN(6,4),NLEF(6),NVRTX(6),SNALP(50),CNALP(50)	VS	21
	1,ALPH(50),AUX(6,5),CRX(6,5),XTILT(6),SLETH(6),YCNTD(6)	VS	22
	1,NVL1(6),NVL2(6),XCNTD(6),CTILT(6),SWPP(6,5),RC(6,50),XREF	VS	23
	1,BUX(6,5),SF(3,6,15),NUR(6),CVR(50),CPAUG(200)	VS	24
	1,ALPBD(6,2),MX(6),ALBDBR(6,2),ALBDRL(6,2),MVRTX(6)	VS	25
	COMMON/SHPLF/ NLE,YSL(15),AOL(14),POL(14),COL(14),DOL(14)	VS	26
	COMMON/SHPTF/ NTE,YST(15),AOT(14),BOT(14),COY(14),OCT(14)	VS	27
	COMMON /AJG/ ALP,J1,CP(200),GAPP(200),GAMR(200),GAMR(200)	VS	28
	1,GAMX(200),ZZCP(200),DZY(200),BMP(6,50),RML(6,50),CSU(50)	VS	29
	COMMON /SSS/ NASYM,NSUR,LPANEL,ICAMP,NUMS,IAGVX,PT	VS	30
	1,NAUG,IBD,PBK,PIS,IDIH,ALPINC,IRL,KT,PI,ALO,AL7	VS	31
	2,NC1,NC2,IBLC	VS	32
	COMMON /EXTPA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT,	VS	33
	1ATT,NC(6),NHING(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS	34
	COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),R2,NCC,CTG(15),STG(15	VS	35
	15),DIST,P,BK,RL,CFF	VS	36
	COMMON /VPDN/ ICOUNT,YBAR(6,2),YCHX(6,2),MSTP(6),YBR(6,2),YBRBR(6,	VS	37
	12),YBRBL(6,2),YD2(6,2),YDR2(6,2),YDL2(6,2),ABD(6,2),ABDR(6,2)	VS	38
	1,ABDL(6,2),YREF(6),YCBR(6,2),YCBL(6,2)	VS	39
	COMMON /DSL/ CTP(6,2),CHORDT(6,4),SCH(200),LAT,CREF,BREF2	VS	40
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),	VS	41
	1XLL(41)	VS	42
	COMMON /GEOH/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),	VS	43
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(200	VS	44
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)	VS	45
	COMMON /AERO/ AH,8,CL(50),CT(50),CD(50),CM(50)	VS	46
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS	47
	1NFP(6),NW(6,2)	VS	48
	COMMON /TWST1/ NYM(6),YTS(6,21),AY(6,20),BY(6,20),CCY(6,20),DY(6,	VS	49
	120)	VS	50
	COMMON /LEFLP/ YLEF(6,10,2),XNF(6,10),YNF(6,10),7NF(6,10),XLF(6,10VS		

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1,4),YLF(6,10,4),SLP1(6,10)	VS	51
COMMON /CAMR/ ICAM(6),IM(6,10),XT(6,10,21),AAH(6,10,20),BBM(6,10,	VS	52
120),CCM(6,10,20),DDM(6,10,20),YT(6,10),CURV(6,10),CHND(6,10)	VS	53
COMMON /FUSRAD/ IFR,IFN,YFF(21),RFF(21),AAF(20),BBF(20),CCF(20),	VS	54
1DDF(20)	VS	55
COMMON /FUS/ XF(20),YCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS	56
INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,ROX,X1	VS	57
COMMON /INOUT/ INPT,JPT	VS	58
DATA YCON /51*0./	VS	59
DATA SWEEP /100*0./	VS	60
DATA XAS /6*0./	VS	61
DATA NKF /5*0/	VS	62
DATA BMR /300*0./	VS	63
DATA BML /300*0./	VS	64
DATA XL /30*0./	VS	65
DATA SE /270*0./	VS	66
DATA DUMT /270*0./	VS	67
DATA HALFB /6*0./	VS	68
DATA YBREAK /42*0./	VS	69
DATA DSIN /30*0./	VS	70
DATA DCOS /30*0./	VS	71
DATA ALPH /50*0./	VS	72
DATA CH /100*0./	VS	73
R FORMAT (1X,40H*****)	VS	74
413 FORMAT (1H1)	VS	75
420 FORMAT (13A6)	VS	76
421 FORMAT (1X,13A6)	VS	77
15 FORMAT (2(6X,I4))	VS	78
16 FORMAT (2X,17HANGLE OF ATTACK =,F8.3,2X,4HDEG.)	VS	79
C	VS	80
C *** CASE TITLE ***	VS	81
C	VS	82
INPT=5	VS	83
JPT=6	VS	84
RAD = 57.29577958	VS	85
20 READ (INPT,420) (TITLE(I),I=1,13)	VS	86
IF (EOF(INPT).NE.0.) GO TO 30	VS	87
WRITE(JPT,413)	VS	88
WRITE(JPT,8)	VS	89
WRITE(JPT,421) (TITLE(I),I=1,13)	VS	90
WRITE(JPT,8)	VS	91
C CALL LLINK(6HLINK11)	VS	92
CALL GENTRY	VS	93
BREAK(6,10)=0.	VS	94
C ALPHA LOOP	VS	95
DO 10 KW=1,NALP	VS	96
KP=KW	VS	97
ALFF = ALPA(KW) * RAD	VS	98
WRITE(JPT,8)	VS	99

	WRITE(JPT,16) ALFF	VS	100
	WRITE(JPT,8)	VS	101
C	CALL LLINK(6HLINK22)	VS	102
	CALL DWASH	VS	103
C	CALL LLINK(6HLINK33)	VS	104
	CALL SOLUTN	VS	105
C	CALL LLINK(6HLINK44)	VS	106
	CALL LOAD	VS	107
C	WRITE(JPT,15) KP,NALP	VS	108
	IF(ABS(AL).LT.0.001) GO TO 12	VS	109
10	CONTINUE	VS	110
12	CONTINUE	VS	111
	GO TO 20	VS	112
30	STOP	VS	113
	END	VS	114
C	FORTRAN NLSTIN	VS	115
	FUNCTION FUR(X)	VS	116
	COMMON /FUSPAD/ IFR,IFN,XFF(21),RFF(21),AAF(20),BBF(20),CCF(20),	VS	117
	10DF(20)	VS	118
	IF (IFR .NE. 0) GO TO 10	VS	119
C		VS	120
C	* DEFINE THE FUSELAGE RADIUS AS A FUNCTION OF X *	VS	121
C		VS	122
C	F106B, ASSUMED TO BE SIMILAR TO THAT OF NASA MEMO-	VS	123
C	10-5-58A FROM NOSE TO C.G.	VS	124
C	IF(X.GT.3.4583) GO TO 2	VS	125
	A1=2.*(X+0.3742)/7.665	VS	126
	A2=(1.-A1)**2	VS	127
	A3=(1.-A2)**0.75	VS	128
	FUR=0.2892*A3	VS	129
	GO TO 5	VS	130
2	FUR=0.2892	VS	131
	GO TO 5	VS	132
10	CONTINUE	VS	133
	K=1	VS	134
12	IF (X.GE.XFF(K) .AND. X.LT.XFF(K+1)) GO TO 15	VS	135
	K=K+1	VS	136
	IF (K .GE. IFN) GO TO 20	VS	137
	GO TO 12	VS	138
15	SM=X-XFF(K)	VS	139
	FUR=AAF(K)*SM**3+BBF(K)*SM**2+CCF(K)*SM+DDF(K)	VS	140
	GO TO 5	VS	141
20	IF (X .LT. XFF(1)) GO TO 25	VS	142
	K=IFN-1	VS	143
	GO TO 15	VS	144
25	K=1	VS	145
	GO TO 15	VS	146
5	RETURN	VS	147
	END	VS	148

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C	FORTRAN NLSTIN	VS	149
	FUNCTION SLOP (X)	VS	150
	COMMON /FUSRAD/ IFR,IFN,XFF(21),RFF(21),AAF(20),BBF(20),CCF(20),	VS	151
	1DDF(20)	VS	152
	IF (IFR .NE. 0) GO TO 10	VS	153
C		VS	154
C	* DEFINE THE DERIVATIVE OF FUSELAGE RADIUS WITH DIMENSIONAL X	VS	155
C	MULTIPLIED BY RADIUS, DR, =R(DR/DX) . *	VS	156
C		VS	157
C	F106B	VS	158
	IF(X.GT.3.4583) GO TO 2	VS	159
	A1=2.*(X+0.3742)/7.665	VS	160
	A2=1.-A1	VS	161
	A3=SQRT(1.-A2*A2)	VS	162
	SLOP=0.032734*A2*A3	VS	163
	GO TO 5	VS	164
	2 SLOP=0.	VS	165
	GO TO 5	VS	166
	10 CONTINUE	VS	167
	K=1	VS	168
	12 IF (X.GE.XFF(K) .AND. X .LT. XFF(K+1)) GO TO 15	VS	169
	K=K+1	VS	170
	IF (K .GE. IFN) GO TO 20	VS	171
	GO TO 12	VS	172
	15 SM=X-XFF(K)	VS	173
	SLOP=3.*AAF(K)*SM**2+2.*BBF(K)*SM+CCF(K)	VS	174
	SLOP=SLOP*FUR(X)	VS	175
	GO TO 5	VS	176
	20 IF (X .LT. XFF(1)) GO TO 25	VS	177
	K=IFN-1	VS	178
	GO TO 15	VS	179
	25 K=1	VS	180
	GO TO 15	VS	181
	5 RETURN	VS	182
	END	VS	183
C	FORTRAN NLSTIN	VS	184
	SUBROUTINE FUSVOL (B,X,Y,Z,WN,WK,GB0,L,HZ,CSD,SSD)	VS	185
C	TO CALCULATE FUSELAGE VOLUME EFFECT BASED ON SOURCE DISTRIBUTION	VS	186
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS	187
	INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,X1	VS	188
	R=SQRT(Y*Y+Z*Z)	VS	189
	PI=3.14159265	VS	190
	IF (Z) 10,20,30	VS	191
	10 THETA=PI-ATAN(Y/ABS(Z))	VS	192
	GO TO 40	VS	193
	20 THETA=PI/2.	VS	194
	GO TO 40	VS	195
	30 THETA=ATAN(Y/ABS(Z))	VS	196
	40 A1=X-XTEF	VS	197

A2=SQRT(A1*A1+B*R*R)	VS	198
RFL=A1/A2/R	VS	199
XEF=X-XLEF	VS	200
B2=SQRT(XEF*XEF+B*R*R)	VS	201
RFO=XEF/R/B2	VS	202
FT=-(A1+A2)/R+(XEF+B2)/P	VS	203
FR=(1.+A1/A2)/R*A1/R-(1.+XEF/B2)/P*XEF/R	VS	204
CS=COS(THETA)	VS	205
SN=SIN(THETA)	VS	206
FCOS=CS*CSD-SN*SSD	VS	207
FSIN=SN*CSD+CS*SSD	VS	208
WN=0.	VS	209
IF (M2 .NE. 0) GO TO 70	VS	210
IK=0	VS	211
N1=NKF(1)	VS	212
N2=1	VS	213
FNF=NKF(1)	VS	214
S=XAS(2)-XAS(1)	VS	215
WN=0.	VS	216
DO 50 J=1,NF	VS	217
M=J-IK	VS	218
XS=X-XF(J)	VS	219
XSR=SQRT(XS*XS+B*R*R)	VS	220
RFX=XS/XSR/R	VS	221
WN=WN+(RFL-RFX)*WARD(J)*SNP(N2,M)*S/FNF	VS	222
IF (J .NE. N1 .OR. J .EQ. NF) GO TO 50	VS	223
N2=N2+1	VS	224
IK=N1	VS	225
N1=N1+NKF(N2)	VS	226
S=XAS(N2+1)-XAS(N2)	VS	227
FNF=NKF(N2)	VS	228
50 CONTINUE	VS	229
WN=WN*PI/2.	VS	230
WN=-(WN+(RFL-RFO)*FO)/(4.*PI)	VS	231
WN=WN*FCOS	VS	232
FP=F10	VS	233
S1=SN	VS	234
S2=CS	VS	235
GO TO 76	VS	236
70 FP=GB0	VS	237
IF (WK .GT. 0.9) GO TO 75	VS	238
S1=-CS	VS	239
S2=SN	VS	240
GO TO 76	VS	241
75 S1=SN	VS	242
S2=CS	VS	243
76 CONTINUE	VS	244
WN=WN-FSIN*S1*FT*FP/R/(4.*PI)-FCOS*S2*FR*FP/(4.*PI)	VS	245
60 CONTINUE	VS	246

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	WK=(-SN*FSIN*FT/R-CS*FCOS*FR)/(4.*PI)	VS	247
	RETURN	VS	248
	END	VS	249
C	FORTRAN NLSTIN	VS	250
	SUBROUTINE UNWF (B,X,Y,Z,AW,BW,CSD,SSD)	VS	251
C	TO CALCULATE THE EFFECT OF FUSELAGE ON WINGS	VS	252
	DIMENSION AW(1),BW(1)	VS	253
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS	254
	INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,X1	VS	255
	PI=3.14159265	VS	256
	IBW=BW(1)	VS	257
	R=SQRT(Y*Y+Z*Z)	VS	258
	IF (Z) 10,20,30	VS	259
10	THETA=PI-ATAN(Y/ABS(Z))	VS	260
	GO TO 40	VS	261
20	THETA=PI/2.	VS	262
	GO TO 40	VS	263
30	THETA=ATAN(Y/ABS(Z))	VS	264
40	A1=X-XTEF	VS	265
	A2=SQRT(A1*A1+B*R*R)	VS	266
	C1=COS(THETA)	VS	267
	S1=SIN(THETA)	VS	268
	FCOS=C1*CSD-S1*SSD	VS	269
	FSIN=S1*CSD+C1*SSD	VS	270
	DD 60 N=1,NT	VS	271
	FNF=NKF(1)	VS	272
	IK=0	VS	273
	N1=NKF(1)	VS	274
	N2=1	VS	275
	S=XAS(2)-XAS(1)	VS	276
	FN=N	VS	277
	FLT=0.	VS	278
	FLR=0.	VS	279
	IF (N .GE. 2) GO TO 70	VS	280
	A3=((A1+A2)/R)**N	VS	281
	FLT=-A3/FN	VS	282
	FLR=A1/R*A3/A2	VS	283
70	CONTINUE	VS	284
	DD 50 JJ=1,NF	VS	285
	M=JJ-1K	VS	286
	K=JJ+(N-1)*NF	VS	287
	XS=X-XF(JJ)	VS	288
	XSR=SQRT(XS*XS+B*R*R)	VS	289
	XR=((XS+XSR)/R)**N	VS	290
	FTX=-XR/FN	VS	291
	FRX=XS/P*XR/XSR	VS	292
	P1=S*(FRX-FLR)*SNP(N2,M)/(8.*FNF)	VS	293
	P2=S*(FTX-FLT)*SNP(N2,M)/(8.*FNF)	VS	294
	Q1=COS(FN*THETA)	VS	295

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Q2=SIN(FN*THETA)	VS	296
UR=Q1*P1	VS	297
UT=-FN*Q2*P2	VS	298
VR=Q2*P1	VS	299
VT=FN*Q1*P2	VS	300
VT=VT/R	VS	301
UT=UT/R	VS	302
IF (JJ .NE. N1) GO TO 55	VS	303
N2=N2+1	VS	304
IK=N1	VS	305
N1=N1+NKF(N2)	VS	306
S=XAS(N2+1)-XAS(N2)	VS	307
FNF=NKF(N2)	VS	308
55 IF (IBW .EQ. 1) GO TO 80	VS	309
BW(K)=VR*FCOS-VT*FSIN	VS	310
AW(K)=UR*FCOS-UT*FSIN	VS	311
GO TO 50	VS	312
80 AW(K)=VR*FSIN+VT*FCOS	VS	313
50 CONTINUE	VS	314
60 CONTINUE	VS	315
RETURN	VS	316
END	VS	317
C FORTRAN NLSTIN	VS	318
SUBROUTINE FUSELA(NF,AW,N,I,S,XTEF,XF,XCF,RF,BB,SNP,NKF)	VS	319
C TO SET UP THE DOWNWASH MATRIX FOR FUSELAGE DUE TO FUSELAGE	VS	320
DIMENSION AW(1),XF(1),RF(1),XCF(1),SNP(5,20),S(1),NKF(1)	VS	321
PI=3.14159265	VS	322
IK=0	VS	323
N1=NKF(1)	VS	324
N2=1	VS	325
HL=(S(?)-S(1))/2.	VS	326
FNT=NKF(1)	VS	327
A1=XCF(I)-XTEF	VS	328
A2=SQRT(A1*A1+BB*RF(I)*RF(I))	VS	329
DO 5 JJ=1,NF	VS	330
M=JJ-IK	VS	331
XS=XCF(I)-XF(JJ)	VS	332
XSP=SQRT(XS*XS+BB*RF(I)*RF(I))	VS	333
IF (N .EQ. 0)GO TO 10	VS	334
RFL=1.	VS	335
IF (N .GE. 2)GO TO 15	VS	336
IF (I .EQ. NF) RFL=0.	VS	337
IF (I .NE. NF) PFL=(A1+A2)**N*A1/A2	VS	338
15 CONTINUE	VS	339
RFR=(XS+XSR)**N*XS/XSR	VS	340
GO TO 6	VS	341
10 IF (I .NE. NF) RFL=A1/A2	VS	342
IF (I .EQ. NF) RFL=0.	VS	343
RFR=XS/XSR	VS	344

6	AW(JJ)=-HL*(RFL-RFR)*SNP(N2,M)/(4.*FNT)	VS	345
	IF(JJ.NE.N1.OR.JJ.EO.NF) GO TO 5	VS	346
	N2=N2+1	VS	347
	IK=N1	VS	348
	N1=N1+NKF(N2)	VS	349
	HL=(S(N2+1)-S(N2))/2.	VS	350
	FNT=NKF(N2)	VS	351
5	CONTINUE	VS	352
	RETURN	VS	353
	END	VS	354
C	FORTRAN NLSTIN	VS	355
	SUBROUTINE ZCDX(X,Y,ZCX,DZDY)	VS	356
C	DEFINE THE CAMBER SLOPE, DZDX, AT ANY X,Y LOCATION IN CLOSED FORM,	VS	357
C	WHERE X AND Y ARE DIMENSIONAL COORDINATES REFERRED TO C.G.	VS	358
C		VS	359
C	CONICAL CAMBER FOR F106B	VS	360
	YB=0.46188*(X-1.7516)	VS	361
	YE=0.57735*(X-1.7516)	VS	362
	ZCX=0.	VS	363
	DZDY=0.	VS	364
	IK=0	VS	365
	IF(Y.GT.YE) IK=1	VS	366
	IF(Y.LT.YB) Y=0.	VS	367
	IF(Y.LT.YB) RETURN	VS	368
	IF(Y.GT.YE) Y=YE	VS	369
	R=0.420473*(X-1.7516)	VS	370
	ZC=-R+SORT(R*R-(Y-YB)**2)	VS	371
	ZCX=0.	VS	372
	IF(IK.EQ.1) GO TO 5	VS	373
	ZCX=(0.46188*(Y-YB)-0.420473*ZC)/(ZC+R)	VS	374
	DZDY=-(Y-YB)/(ZC+R)	VS	375
5	CONTINUE	VS	376
	Y=ZC	VS	377
C	Y IS RETURNED AS THE Z COORDINATE.	VS	378
	RETURN	VS	379
	END	VS	380
C	FORTRAN NLSTIN	VS	381
	SUBROUTINE TWIST (Y,ATW,I)	VS	382
C	TO CALCULATE THE LOCAL TWIST ANGLE	VS	383
	COMMON /TWST1/ NYM(6),YTS(6,21),AY(6,20),BY(6,20),CCY(5,20),DY(6,	VS	384
	120)	VS	385
	PI=3.14159265	VS	386
	K=1	VS	387
1	IF (Y.GE.YTS(I,K).AND.Y.LT.YTS(I,K+1)) GO TO 2	VS	388
	K=K+1	VS	389
	IF (K.GE.NYM(I)) GO TO 3	VS	390
	GO TO 1	VS	391
2	SM=Y-YTS(I,K)	VS	392
	ATW=AY(I,K)*SM**3+BY(I,K)*SM*SM+CCY(I,K)*SM+DY(I,K)	VS	393

ATW=ATW*PI/180.	VS	394
GO TO 5	VS	395
3 IF (Y.LT.YTS(I,1)) GO TO 4	VS	396
K=N YM(I)-1	VS	397
GO TO 2	VS	398
4 K=1	VS	399
GO TO 2	VS	400
5 RETURN	VS	401
END	VS	402
C FORTRAN NLSTIN	VS	403
SUBROUTINE ZCR(X,Y,DZDX,ICAM,X1,K, KP, CHORD, DZDY, IST, SWP)	VS	404
C TO DEFINE CAMBER SHAPES	VS	405
COMMON /LEFLP/ YLEF(6,10,2), XNF(6,10), YNF(6,10), ZNF(6,10), XLF(6,10)	VS	406
1,4), YLF(6,10,4), SLP1(6,10)	VS	407
DIMENSION IST(1), ICAM(1)	VS	408
XE=X1	VS	409
KK=DZDX	VS	410
RR=DZDY	VS	411
DZDX=0.	VS	412
DZDY=0.	VS	413
IF (ICAM(K).EQ.1) GO TO 2	VS	414
IF (ICAM(K).NE.3) GO TO 15	VS	415
X1=0.	VS	416
I=1	VS	417
3 IF (Y.GE.YLEF(K,I,1).AND.Y.LE.YLEF(K,I,2)) GO TO 5	VS	418
I=I+1	VS	419
IF (I.GT.IST(K)) GO TO 15	VS	420
IF (I.EQ.11) GO TO 15	VS	421
GO TO 3	VS	422
5 YB=YLF(K,I,1)+SLP1(K,I)*(X-XLF(K,I,1))	VS	423
KCON=0	VS	424
IF(KK.NE.100) GO TO 11	VS	425
XB=XLF(K,I,1)	VS	426
IF (SLP1(K,I).GT.1.E-18) XB=XLF(K,I,1)+(Y-YLF(K,I,1))/SLP1(K,I)	VS	427
DX=RR/(XB-XE)	VS	428
IF(ABS(1.-DX).LE.0.1) KCON=1	VS	429
IF(KCON.EQ.1) GO TO 10	VS	430
11 CONTINUE	VS	431
IF(Y.LT.YB) RETURN	VS	432
10 CONTINUE	VS	433
TEST1=PNLEF (X,Y,XLF,YLF,I,1,2,K)	VS	434
IF(TEST1.LT.0.) RETURN	VS	435
TEST2=PNLEF (X,Y,XLF,YLF,I,4,3,K)	VS	436
IF(TEST2.GT.0.) RETURN	VS	437
DZDX=-XNF(K,I)/ZNF(K,I)	VS	438
DZDY=-YNF(K,I)/ZNF(K,I)	VS	439
D=-XNF(K,I)*XLF(K,I,1)-YNF(K,I)*YLF(K,I,1)	VS	440
X1=-(D+YNF(K,I)*X+YNF(K,I)*Y)/ZNF(K,I)	VS	441
IF(KCON.EQ.0) GO TO 15	VS	442

DZDX=0.5*DZDX	VS	443
DZDY=0.5*DZDY	VS	444
X1=0.	VS	445
GO TO 15	VS	446
2 CALL ZCAM(X,Y,ZR,X1,K,KP,CHORD,IST,DZDY,SWP)	VS	447
DZDX=ZR	VS	448
15 RETURN	VS	449
END	VS	450
C FORTRAN NLSTIN	VS	451
SUBROUTINE ZCAM(X,Y,ZR,X1,KO,KP,CHORD,IST,DZDY,SWP)	VS	452
C TO CALCULATE CAMBER SLOPES	VS	453
COMMON /CAMB/ ICAM(6),IM(6,10),XT(6,10,21),AAM(6,10,20),BBM(6,10,	VS	454
120),CCM(6,10,20),DDM(6,10,20),YT(6,10),CURV(6,10),CHND(6,10)	VS	455
DIMENSION ZZ(2),ZQ(2),C(15),IST(1),ZY(2)	VS	456
K=KO	VS	457
L=KO	VS	458
I=KP	VS	459
ZR=0.	VS	460
3 IF (Y.GE.YT(K,I).AND.Y.LT.YT(K,I+1)) GO TO 2	VS	461
I=I+1	VS	462
IF (I.EQ.IST(K)) GO TO 6	VS	463
GO TO 3	VS	464
6 IF (Y.LT.YT(K,1)) I=1	VS	465
IF (Y.GT.YT(K,IST(K))) I=IST(K)-1	VS	466
2 IK=1	VS	467
XF=0.	VS	468
ICV=CURV(K,I)	VS	469
IF(ICV.NE.2) GO TO 4	VS	470
XF1=XT(K,I,2)*CHND(K,I)	VS	471
IF (ABS(DDM(K,I,1)).LE.0.0001) XF1=XT(K,I,1)*CHND(K,I)	VS	472
XF2=XT(K,I+1,2)*CHND(K,I+1)	VS	473
YF=(Y-YT(K,I))/(YT(K,I+1)-YT(K,I))	VS	474
XF=(XF1+(XF2-XF1)*YF)/CHORD	VS	475
IF(X1.GT.XF) GO TO 4	VS	476
FAC=CHND(K,I+1)	VS	477
IF(FAC.LE.0.0001) FAC=1.	VS	478
DELTA=DDM(K,I,1)*CHND(K,I)+(DDM(K,I+1,1)*FAC-DDM(K,I,1)*CHND(K,I)	VS	479
1)*YF	VS	480
DELTA=DELTA/CHORD	VS	481
IF (IM(K,I).GT.2) ZQ(1)=DDM(K,I,2)*CHND(K,I)	VS	482
IF (IM(K,I).LE.2) ZQ(1)=(CCM(K,I,1)+DDM(K,I,1))*CHND(K,I)	VS	483
IF (IM(K,I+1).GT.2) ZQ(2)=DDM(K,I+1,2)*FAC	VS	484
IF (IM(K,I+1).LE.2) ZQ(2)=(CCM(K,I+1,1)+DDM(K,I+1,1))*FAC	VS	485
DK=(ZQ(1)+(ZQ(2)-ZQ(1))*YF)/CHORD	VS	486
DELTA=DELTA-DK	VS	487
GO TO 16	VS	488
4 K=1	VS	489
1 IF (X.GE.XT(L,I,K).AND.X.LT.XT(L,I,K+1)) GO TO 5	VS	490
K=K+1	VS	491

	IF (K.GE.IM(L,I)) GO TO 10	VS	492
	GO TO 1	VS	493
5	SM=X-XT(L,I,K)	VS	494
	ZZ(IK)=3.*AAM(L,I,K)*SM*SM+2.*BBM(L,I,K)*SM+CCM(L,I,K)	VS	495
	ZY(IK)=AAM(L,I,K)*SM**3+BBM(L,I,K)*SM*SM+CCM(L,I,K)*SM+DDM(L,I,K)	VS	496
	ZY(IK)=ZY(IK)*CHND(L,I)	VS	497
	GO TO 15	VS	498
10	IF (X.LT.XT(L,I,1)) GO TO 20	VS	499
	K=IM(L,I)-1	VS	500
	GO TO 5	VS	501
20	K=1	VS	502
	GO TO 5	VS	503
15	IF(IK.EQ.2) GO TO 25	VS	504
	IF(I.GE.IST(L)) GO TO 60	VS	505
	I=I+1	VS	506
	IK=IK+1	VS	507
	GO TO 4	VS	508
25	YF=(Y-YT(L,I-1))/(YT(L,I)-YT(L,I-1))	VS	509
	GO TO 65	VS	510
60	YF=0.	VS	511
	ZZ(2)=0.	VS	512
65	CONTINUE	VS	513
	ZR=ZZ(1)+(ZZ(2)-ZZ(1))*YF	VS	514
	DY=YT(L,I)-YT(L,I-1)	VS	515
	ZZY=(ZY(2)-ZY(1))/DY	VS	516
	DZDY=-SWP*ZR+ZZY	VS	517
	X1=ZY(1)+(ZY(2)-ZY(1))*YF	VS	518
	GO TO 30	VS	519
16	IF(X.LT.XF) GO TO 45	VS	520
	PI=3.14159265	VS	521
	C(1)=-DELTA	VS	522
	JR=15	VS	523
	DO 40 J=2,JR	VS	524
	XK=(J-1)*PI*XF	VS	525
40	C(J)=-2.*DELTA*SIN(XK)/XK	VS	526
	ZR=0.	VS	527
	DO 50 J=1,JR	VS	528
	XK=(J-1)*PI*X	VS	529
50	ZR=ZR+C(J)*COS(XK)	VS	530
	GO TO 30	VS	531
45	ZR=-DELTA/XF	VS	532
30	CONTINUE	VS	533
	RETURN	VS	534
	END	VS	535
C	FORTRAN NLSTIN	VS	536
	SUBROUTINE VMSEON (NC1,K,AA,A,CA)	VS	537
C	TO SOLVE EQUATIONS WITHOUT MATRIX INVERSION FOR A SINGLE ALPHA	VS	538
	DIMENSION AA(1),CA(1),A(1)	VS	539
	NC=K*NC1	VS	540

	SUM1=0.	VS	541
	K1=K-1	VS	542
	JJ=1	VS	543
	DO 3 J=1,K1	VS	544
	SUM1=SUM1+AA(J)*A(JJ)	VS	545
3	JJ=JJ+NC1+1	VS	546
	SUM1=SUM1+AA(K)	VS	547
	DO 5 I=1,NC1	VS	548
	SUM2=0.	VS	549
	JJ=I+1	VS	550
	DO 4 J=1,K1	VS	551
	SUM2=SUM2+AA(J)*A(JJ)	VS	552
4	JJ=JJ+NC1+1	VS	553
	KK=K+I	VS	554
	SUM2=SUM2+AA(KK)	VS	555
5	CA(I)=-SUM2/SUM1	VS	556
	M=1	VS	557
	L=0	VS	558
	KNC=(K-1)*NC1	VS	559
	DO 8 I=1,NC	VS	560
	IF (I.GT.KNC) GO TO 7	VS	561
	MM=(M-1)*NC1+1	VS	562
	IF (I.EQ.MM) GO TO 9	VS	563
6	KK=KK+1	VS	564
	IL=I+L	VS	565
	A(I)=CA(KK)*BASE+A(IL)	VS	566
	GO TO 8	VS	567
7	II=I-KNC	VS	568
	A(I)=CA(II)	VS	569
8	CONTINUE	VS	570
	GO TO 10	VS	571
9	II=MM+M-1	VS	572
	BASE=A(II)	VS	573
	KK=0	VS	574
	L=L+1	VS	575
	M=M+1	VS	576
	GO TO 6	VS	577
10	CONTINUE	VS	578
	RETURN	VS	579
	END	VS	580
C	FORTRAN NLSTIN	VS	581
	FUNCTION PNLEF(X,Y,XLF,YLF,I,J,K,L)	VS	582
	DIMENSION XLF(6,10,4),YLF(6,10,4)	VS	583
	PNLEF=(X-XLF(L,I,J))*(YLF(L,I,K)-YLF(L,I,J))-(XLF(L,I,K)-XLF(L,I,	VS	584
	1J))*(Y-YLF(L,I,J))	VS	585
	RETURN	VS	586
	END	VS	587
C	LINK LINK11	VS	588
C	FORTRAN NLSTIN	VS	589

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	SUBROUTINE GENTRY	VS	590
	TO INPUT AND MANIPULATE INPUT DATA	VS	591
	DIMENSION XXL(2),YL(2),XXT(2),CPCWL(16),CPSWL(31),AW(50),CA(50)	VS	592
	COMMON /VRDN/ ICDUNT,YBAR(6,2),YCMX(6,2),MSTP(6),YBR(6,2),YBRBR(6,2),	VS	593
	12),YBRBL(6,2),YD2(6,2),YDR2(6,2),YDL2(6,2),ARD(6,2),ARDR(6,2)	VS	594
	1,ABDL(6,2),YREF(6),YCBR(6,2),YCBL(6,2)	VS	595
	COMMON /DSL/ CTP(6,2),CHORDT(6,4),SCH(200),LAT,CREF,BPFF?	VS	596
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),VS	VS	597
	1XLL(41)	VS	598
	COMMON /GEOH/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	VS	599
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	VS	600
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS	VS	601
	COMMON /AERD/ AM,B,CL(50),CT(50),CD(50),CM(50)	VS	602
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS	603
	1NFP(6),NW(6,2)	VS	604
	COMMON /CAMB/ ICAM(6),IM(6,10),XT(6,10,21),AAM(6,10,20),BRM(6,10, VS	VS	605
	120),CCM(6,10,20),DDM(6,10,20),YT(6,10),CURV(6,10),CHND(6,10)	VS	606
	COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT, VS	VS	607
	1ATT,NC(6),NWIN(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS	608
	COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),R2,NGC,CTG(15),STG(1VS	VS	609
	15),DIST,P,BK,RL,CFE	VS	610
	COMMON /LEFLP/ YLEF(6,10,2),XNF(6,10),YNF(6,10),ZNF(6,10),XLF(6,10VS	VS	611
	1,4),YLF(6,10,4),SLP1(6,10)	VS	612
	COMMON /TWST1/ NYM(6),YTS(6,21),AY(6,20),BY(6,20),CCY(6,20),DY(6, VS	VS	613
	120)	VS	614
	COMMON/SHPLE/ NLE,YSL(15),AOL(14),ROL(14),COL(14),DCL(14)	VS	615
	COMMON/SHPTE/ NTE,YST(15),AOT(14),ROT(14),COT(14),DOT(14)	VS	616
	COMMON /AJG/ ALP,J1,CP(200),GAMP(200),GAMP(200),GAHR(200)	VS	617
	1,GAMX(200),ZZCP(200),DZY(200),BMP(6,50),BHL(6,50),CSU(50)	VS	618
	COMMON /SSS/ NASYM,NSUR,L PANEL,ICAMB,NUMS,IAGVX,PT	VS	619
	1,NAUG,IBD,PBK,PIS,IDIH,ALPINC,IRL,KT,PI,ALO,ALZ	VS	620
	2,NC1,NC2,IRLC	VS	621
	COMMON/LOOP/KW,NALP,KALP,TANC2,CLDS,AL,CLII,ALPII,ALPA(15)	VS	622
	COMMON/GD/ TINP(6),BREAK(6,10),TFLP(6,5),RINC(6),NAL(6)	VS	623
	1,YBREAK(6,7),DCDS(6,5),DSIN(6,5),IWIN(6),IWGLT(6),IV(6),LPAN1(6)	VS	624
	1,ICAMT(6)	VS	625
	COMMON/GDSL/ DF(6,5),YCN(6,4),NLEF(6),NVRTX(6),SNALP(50),CNALP(50)VS	VS	626
	1,ALPH(50),AUX(6,5),CRX(6,5),XTILT(6),SLETH(6),YCNTD(6)	VS	627
	1,NVL1(6),NVL2(6),XCNTD(6),CTILT(6),SWPP(6,5),PC(6,50),XREF	VS	628
	1,BUX(6,5),SE(3,6,15),NUR(6),CVR(50),CPAUG(200)	VS	629
	1,ALPRD(6,2),MX(6),ALPDR(6,2),ALBDR(6,2),MVRTX(6)	VS	630
	COMMON /FUSPAD/ IFR,IFN,XFF(21),RFF(21),AAF(20),BBF(20),CCF(20),	VS	631
	1DDF(20)	VS	632
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS	633
	1NCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,X1	VS	634
	COMMON /INDUT/ INPT,JPT	VS	635
	2 FORMAT (8F10.6)	VS	636
	3 FORMAT (8(6X,I4))	VS	637
	4 FORMAT (10X,8HHALF SW=,E12.5,10X,5HCREF=,E12.5)	VS	638

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	6	FORMAT (15H CASE NUMBER = ,I2)	VS	639
	7	FORMAT (6F10.5)	VS	640
	8	FORMAT (1X,40H*****)	VS	641
	400	FORMAT(11HOINPUT DATA)	VS	642
	403	FORMAT(37HOVORTEX ELEMENT ENDPOINT COORDINATES=)	VS	643
	404	FORMAT(27HOCONTROL POINT COORDINATES=)	VS	644
	411	FORMAT(/4X,3HXCP,7X,3HYCP,7X,3HZCP,7X,3HXCP,7Y,3HYCP,7X,3HZCP)	VS	645
	412	FORMAT(/4X,2HX1,8X,2HX2,8X,2HY1,8X,2HY2,8X,2H71,6X,2HZ2)	VS	646
		PI=3.14159265	VS	647
		PIS=PI*2.	VS	648
		PIA=PI/2.	VS	649
		CNET=PI/180.	VS	650
C		FILE (01),BUX(6,5)IS FOR NORMALWASH INFLUENCE COEFFICIENT MATRIX.	VS	651
C		SUBROUTINE WING.	VS	652
C		FILE (02) IS FOR INVERTED INFLUENCE COEFFICIENT MATRIX. SEE	VS	653
C		SUBROUTINE INVN.	VS	654
C		FILE (03) IS FOR WAKE-INDUCED NORMALWASH IN LATERAL-DIRECTIONAL	VS	655
C		MOTION. SEE SUBROUTINE WBETA.	VS	656
C			VS	657
C		*** USER'S CASE NUMBER ***	VS	658
C		NGRD=1 IF THE WING IS IN GROUND EFFECT, =0 OTHERWISE	VS	659
C	**	NASYM=0 IF THE PLANFORM IS SYMMETRICAL ABOUT Y-AXIS	VS	660
C		=1 OTHERWISE. IN THIS CASE, THE WHOLE PLANFORM MUST BE	VS	661
C		DEFINED, STARTING FROM THE LEFT TIP.	VS	662
C		NSUR = NUMBER OF LIFTING SURFACES, SUCH AS WING, CANARD, TAILS,	VS	663
C		ETC. LIMITED TO 5.	VS	664
C			VS	665
		READ (INPT,3) NCASE,NGRD,NASYM,NSUR	VS	666
		WRITE (JPT,3) NCASE,NGRD,NASYM,NSUR	VS	667
		WRITE (JPT,8)	VS	668
		WRITE (JPT,6) NCASE	VS	669
		WRITE (JPT,8)	VS	670
		NCS=0	VS	671
		IPANEL=1	VS	672
		YCON(50)=NASYM	VS	673
		DIST=0.	VS	674
		HALFSH=0.	VS	675
		WRITE (JPT,400)	VS	676
			VS	677
C	**	LAT=-1 IF THE ROLLING MOMENT COEFFICIENT AT A GIVEN AILERON ANGLE	VS	678
C		IS DESIRED	VS	679
C		=0 FOR NO LATERAL MODE OF MOTION	VS	680
C		=1 IF LATERAL-DIRECTIONAL DERIVATIVES ARE TO BE COMPUTED	VS	681
C		FOR ASYMMETRICAL CONFIGURATIONS, (I.E. NASYM=1), SET LAT=0	VS	682
C		IBLC=1 IF A BOUNDARY LAYER CORRECTION IS TO BE APPLIED TO ROLL	VS	683
C		DERIVATIVES. =0, OTHERWISE	VS	684
C		KT=1 IF THE LEADING EDGE IS A ROUNDED ON AND ITS EFFECT ON L.E.	VS	685
C		THRUST WILL BE INCLUDED. =0, OTHERWISE	VS	686
C		IBD = 1 IF THE VORTEX BREAKDOWN EFFECT IS TO BE INCLUDED.	VS	687

	= 0, OTHERWISE.	VS	688
C		VS	689
C	READ (INPT,3) LAT,IBLC,KT,IBD	VS	690
	WRITE(JPT,3) LAT,IBLC,KT,IBD	VS	691
	R2=0.	VS	692
	DO 1415 I=1,6	VS	693
	XTILT(I)=0.	VS	694
	MX(I)=0	VS	695
	DO 1415 J=1,10	VS	696
	BREAK(I,J)=0.	VS	697
1415	CONTINUE	VS	698
	DO 1122 K=1,NSUR	VS	699
	NSS=0	VS	700
C		VS	701
C	NC= NUMBER OF SPANWISE SECTIONS ON A SURFACE	VS	702
C	M1(K,I) = NUMBER OF VORTEX STRIPS IN EACH SECTION	VS	703
C		VS	704
C		VS	705
C	***NWING = THE NUMERICAL ORDER OF LAST WING SPANWISE SECTION ***	VS	706
C	** IWGLT=1 IF A WINGLET TO BE REPRESENTED BY A TAIL IS PRESENT **	VS	707
C	** IWGLT=2 IF THE WINGLET IS AT A LOCATION AWAY FROM THE WING TIP **	VS	708
C	IPOS = WINGLET POSITION INDICATOR AT THE SURFACE TIP. FOR DETAILS,	VS	709
C	SEE INSTRUCTIONS	VS	710
C		VS	711
	READ (INPT,3)K2,(M1(K,I),I=1,K2),NWING(K),IWGLT(K),	VS	712
	1IPOS(K)	VS	713
	NC(K) = K2	VS	714
	WRITE(JPT,3) K2,(M1(K,I),I=1,K2),NWING(K),IWGLT(K),	VS	715
	1IPOS(K)	VS	716
	IF(NWING(K).EQ.0) NWING(K)=1	VS	717
	IWING(K)=0	VS	718
	IF(IWGLT(K).EQ.0) GO TO 1140	VS	719
	NKG=NWING(K)	VS	720
	DO 1141 I=1,NKG	VS	721
	IWING(K)=IWING(K)+M1(K,I)	VS	722
1141	CONTINUE	VS	723
1140	CONTINUE	VS	724
C		VS	725
	K2 = NC(K)	VS	726
	DO 1123 KP=1,K2	VS	727
1123	M1(K,KP)=M1(K,KP)+1	VS	728
C	***NFP=NUMBER OF FLAP SPANS.	VS	729
C	NJW=NUMERICAL ORDERS OF FLAP SPANS AMONG THE SPANWISE SECTIONS*	VS	730
C	* NOTE. THE NUMBER OF FLAP SPANS IS LIMITED TO FIVE *	VS	731
C	FOR A CLEAN OR FULL-SPAN FLAP CONFIGURATION, PUT NFP=NJW(1)=1	VS	732
C	* NVRTX=VORTEX STRIP NUMBER AT AND OUTBOARD OF WHICH THE L.E. VORTEX	VS	733
C	LIFT EFFECT IS NOT INCLUDED. IF IT IS ZERO, TOTAL VORTEX LIFT	VS	734
C	EFFECT IS ASSUMED.	VS	735
C	MVRTX=VORTEX STRIP NUMBER INBOARD OF WHICH THE LE VORTEX LIFT	VS	736

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C	EFFECT IS NOT INCLUDED	VS	737
C	NLEF=1 IF THE FLAPS ARE L.E. FLAPS	VS	738
C	=0 FOR T.E. FLAPS	VS	739
C	IV=1 IF THE CORRESPONDING LIFTING SURFACE HAS DIHEDRAL OF 90-DEG	VS	740
C	AND IS NOT SYMMETRICAL ABOUT X-AXIS	VS	741
C	NAL=NUMERICAL ORDER OF AILERON SPAN (=0 IF LAT=0)	VS	742
C		VS	743
C	READ (INPT,3) K2,(NJW(K,I),I=1,K2),NVRTX(K),MVRTX(K),NLEF(KVS	VS	744
C	1),IV(K),NAL(K)	VS	745
C	NFP(K) = K2	VS	746
C	WRITE (JPT,3) K2,(NJW(K,I),I=1,K2),NVPTX(K),MVRTX(K),NLEF(KVS	VS	747
C	1),IV(K),NAL(K)	VS	748
C		VS	749
C	** FLAP ANGLES IN DEGREES	VS	750
C	K2 = NFP(K)	VS	751
C	READ (INPT,2) (DF(K,I),I=1,K2)	VS	752
C	WRITE(JPT,2) (DF(K,I),I=1,K2)	VS	753
C		VS	754
C	DO 113 I=1,K2	VS	755
C	DF(K,I)=DF(K,I)*PI/180.	VS	756
C	113 TFLP(K,I)=-DF(K,I)	VS	757
C		VS	758
C	*** NW(I)=NUMBER OF CHORDWISE VORTEX ELEMENTS IN CHORDWISE SECTIONS.	VS	759
C	ICAM=0 FOR ZERO CAMBER	VS	760
C	=1 FOR CAMBER ORDINATES TO BE READ IN	VS	761
C	=2 IF CAMBER ORDINATES ARE DEFINED ANALYTICALLY IN SUBROUTINE	VS	762
C	ZCDX FOR WING	VS	763
C	=3 IF THERE ARE PLANE L.E. FLAPS ATTACHED TO A PLANE WING. IN VS	VS	764
C	THIS CASE, IST IS THE NUMBER OF L.E. FLAPS.	VS	765
C	IST=NUMBER OF SPANWISE STATIONS AT WHICH CAMBER ORDINATES ARE READ VS	VS	766
C	IN. LIMITED TO 10	VS	767
C	ICAMT=NUMERICAL ORDER OF THE Y-STATION BEYOND WHICH THE INPUT CAM- VS	VS	768
C	BERS ARE FOR THE WINGLET OR VERTICAL FIN.	VS	769
C	= 0 IF THERE IS NO CAMBER FOR THE WINGLET OR FIN.	VS	770
C		VS	771
C	READ (INPT,3) (NW(K,I),I=1,2),ICAM(K),IST(K),ICAMT(K)	VS	772
C	WRITE(JPT,3) (NW(K,I),I=1,2),ICAM(K),IST(K),ICAMT(K)	VS	773
C		VS	774
C	*** IF ICAM=1, READ IN THE X-COORDINATES AND THE CAMBER ORDINATES	VS	775
C	YT=Y-STATION AT WHICH CAMBER ORDINATES ARE TO BE READ IN	VS	776
C	(DIMENSIONAL)	VS	777
C	XNUM=NUMBER OF CAMBER ORDINATES TO BE READ IN. LIMITED TO 21	VS	778
C	CURV=0. IF CAMBER IS FORMED BY CONNECTING STRAIGHT SEGMENTS	VS	779
C	WITH FIRST SEGMENT BEING L.E. FLAP	VS	780
C	=1. IF CUBIC SPLINE INTERPOLATION IS USED	VS	781
C	=2. IF CUBIC SPLINE INTERPOLATION IS USED, WITH FIRST SEGMENT	VS	782
C	BEING L.E. FLAP	VS	783
C	CHND=CHORD LENGTH AT YT-STATION	VS	784
C	XT=NONDIMENSIONAL X-COORDINATES TO DEFINE CAMBER	VS	785

C	CA=NONDIMENSIONAL CAMBER ORDINATES. IF CHND=0., USE ACTUAL (DIMEN-	VS	786
C	SIGNAL) CAMBER ORDINATE.	VS	787
C		VS	788
	IF(ICAM(K).NE.1) GO TO 191	VS	789
	K2 = IST(K)	VS	790
	DO 192 I=1,K2	VS	791
	JJ=I	VS	792
	READ (INPT,2) YT(K,I),XNUM,CURV(K,I),CHND(K,I)	VS	793
	WRITE(JPT,2) YT(K,I),XNUM,CURV(K,I),CHND(K,I)	VS	794
	IM(K,I)=XNUM	VS	795
	IR=IM(K,I)	VS	796
	ICV=CURV(K,I)	VS	797
	READ (INPT,2) (XT(K,I,J),J=1,IR)	VS	798
	WRITE(JPT,2) (XT(K,I,J),J=1,IR)	VS	799
	READ (INPT,2) (CA(J),J=1,IR)	VS	800
	WRITE(JPT,2) (CA(J),J=1,IR)	VS	801
	DO 194 KO=1,IR	VS	802
194	AW(KO)=XT(K,I,KO)	VS	803
	IF(ICV.EQ.0) GO TO 197	VS	804
	CALL SPLINE (IR,AW,CA,GAMP,GAMX,GAMB,GAMR)	VS	805
	K3 = IR - 1	VS	806
	DO 193 KO=1,K3	VS	807
	AAM(K,I,KO)=GAMP(KO)	VS	808
	BBM(K,I,KO)=GAMX(KO)	VS	809
	CCM(K,I,KO)=GAMB(KO)	VS	810
193	DDM(K,I,KO)=GAMR(KO)	VS	811
	GO TO 192	VS	812
197	DO 198 J=2,IR	VS	813
	AAM(K,I,J-1)=0.	VS	814
	BBM(K,I,J-1)=0.	VS	815
	IF(ABS(AW(J)-AW(J-1)).LE.1.E-20) GO TO 190	VS	816
	CCM(K,I,J-1)=(CA(J)-CA(J-1))/(AW(J)-AW(J-1))	VS	817
190	DDM(K,I,J-1)=CA(J-1)	VS	818
198	CONTINUE	VS	819
192	CONTINUE	VS	820
191	CONTINUE	VS	821
	IF(ICAM(K).NE.3) GO TO 2005	VS	822
C	YLEF(I,1) = EXTREME INBOARD Y-COORDINATE OF A L.E. FLAP.	VS	823
C	YLEF(I,2) = EXTREME OUTBOARD Y-COORDINATE OF A L.E. FLAP.	VS	824
C	X1,Y1,Z1, ETC. ARE CORNER POINT COORDINATES OF A L.E. FLAP, INPUT	VS	825
C	IN CLOCKWISE ORDER, FIRST FROM THE MOST INBOARD POINT.	VS	826
	K2 = IST(K)	VS	827
	DO 2006 I=1,K2	VS	828
	READ (INPT,2) (YLEF(K,I,KO),KO=1,2)	VS	829
	WRITE(JPT,2) (YLEF(K,I,KO),KO=1,2)	VS	830
	READ (INPT,2) XLF(K,I,1),YLF(K,I,1),Z1,XLF(K,I,2),YLF(K,I,2),Z2	VS	831
	WRITE(JPT,2) XLF(K,I,1),YLF(K,I,1),Z1,XLF(K,I,2),YLF(K,I,2),Z2	VS	832
	READ (INPT,2) XLF(K,I,3),YLF(K,I,3),Z3,XLF(K,I,4),YLF(K,I,4),Z4	VS	833
	WRITE(JPT,2) XLF(K,I,3),YLF(K,I,3),Z3,XLF(K,I,4),YLF(K,I,4),Z4	VS	834

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IF(ABS(XLF(K,I,4)-XLF(K,I,1)).GT.1.E-18) SLP1(K,I)=(YLF(K,I,4)-YLF(VS 835
1(K,I,1))/(XLF(K,I,4)-XLF(K,I,1)) VS 836
IF(ABS(XLF(K,I,4)-XLF(K,I,1)).LE.1.E-18) SLP1(K,I)=1.E18 VS 837
XNF(K,I)=(YLF(K,I,4)-YLF(K,I,1))*(Z3-Z2)-(YLF(K,I,3)-YLF(K,I,2))* VS 838
1(Z4-Z1) VS 839
YNF(K,I)=(XLF(K,I,3)-XLF(K,I,2))*(Z4-Z1)-(XLF(K,I,4)-XLF(K,I,1))* VS 840
1(Z3-Z2) VS 841
ZNF(K,I)=(XLF(K,I,4)-XLF(K,I,1))*(YLF(K,I,3)-YLF(K,I,2))-(XLF(K,I, VS 842
13)-XLF(K,I,2))*(YLF(K,I,4)-YLF(K,I,1)) VS 843
IF(ABS(XNF(K,I)).LT.1.E-4.AND.ABS(Z3).GT.1.E-4) GO TO 171 VS 844
IF(ABS(ZNF(K,I)).GT.1.E-3) GO TO 2006 VS 845
171 CONTINUE VS 846
XNF(K,I)=(YLF(K,I,4)-YLF(K,I,1))*(Z2-Z1)-(YLF(K,I,2)-YLF(K,I,1)) VS 847
1*(Z4-Z1) VS 848
YNF(K,I)=(XLF(K,I,2)-XLF(K,I,1))*(Z4-Z1)-(XLF(K,I,4)-XLF(K,I,1))* VS 849
1(Z2-Z1) VS 850
ZNF(K,I)=(XLF(K,I,4)-XLF(K,I,1))*(YLF(K,I,2)-YLF(K,I,1))-(XLF(K,I, VS 851
12)-XLF(K,I,1))*(YLF(K,I,4)-YLF(K,I,1)) VS 852
2006 CONTINUE VS 853
2005 CONTINUE VS 854
IF(ICAM(K).EQ.0) IST(K)=1 VS 855
NKW=NW(K,1) VS 856
L=1 VS 857
CHORDT(K,2)=0. VS 858
CHORDT(K,3)=0. VS 859
CHORDT(K,4)=0. VS 860
105 CONTINUE VS 861
LL=1 VS 862
FN=NKW VS 863
DO 100 I=1,NKW VS 864
FI=I VS 865
CPCWL(I)=0.5*(1.-COS((2.*FI-1.)*PI/(2.*FN))) VS 866
SN(K,I,L)=2.*SORT(CPCWL(I)*(1.-CPCWL(I))) VS 867
100 CPCWL(I)=CPCWL(I)*100. VS 868
K2 = NC(K) VS 869
DO 10 KK=1,K2 VS 870
C VS 871
C IPN=1 IF THE SHAPES OF SECTION LEADING AND TRAILING EDGES ARE VS 872
C DEFINED NUMERICALLY. #0 OTHERWISE VS 873
C VS 874
READ (INPT,3) IPN VS 875
WRITE(JPT,3) IPN VS 876
BREAK(K, KK+5)=IPN VS 877
C VS 878
C *** COORDINATES OF BREAK CHORDS BOUNDING SPANWISE SECTIONS, FROM VS 879
C ROOT TO TIP ON THE RIGHT WING *** VS 880
C * DIHED=THE DIHEDRAL ANGLE IN DEGREES FOR THE SECTION * VS 881
C FOR NASYM=1, DIHED FOR LEFT WING IS MEASURED FROM NEGATIVE Y-AXIS VS 882
C AND IS NEGATIVE UPWARDS VS 883

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		VS	884
		VS	885
C	READ (INPT,2) ((XXL(I),XXT(I),YL(I),I=1,2),ZS,DIHED)	VS	886
	WRITE(JPT,2) ((XXL(I),XXT(I),YL(I),I=1,2),ZS,DIHED)	VS	887
	TANL=0.	VS	888
	TANT=0.	VS	889
	IF(K.NE.1) GO TO 15	VS	890
	IF(L.EQ.1.AND.KK.EQ.1) TANL=(XXL(2)-XXL(1))/(YL(2)-YL(1))	VS	891
	IF(KK.EQ.1) TANT=(XXT(2)-XXT(1))/(YL(2)-YL(1))	VS	892
	15 CONTINUE	VS	893
	IF(L.NE.1) GO TO 101	VS	894
	CRX(K, KK)=XXL(2)-XXL(1)	VS	895
	AUX(K, KK)=XXL(2)	VS	896
	BUX(K, KK)=XXT(2)	VS	897
	101 CONTINUE	VS	898
C	***IF IPN=0, SKIP THE FOLLOWING INPUT DATA	VS	899
	IF(IPN.EQ.0) GO TO 2320	VS	900
C		VS	901
C	***NLE=NUMBER OF INPUT POINTS TO DEFINE THE LE. LIMITED TO 15	VS	902
C	NTE=NUMBER OF INPUT POINTS TO DEFINE THE TE. LIMITED TO 15	VS	903
C	MCVL=1 IF THE CUBIC SPLINE IS USED TO INTERPOLATE THE LE SHAPE	VS	904
C	=0 IF STRAIGHT SEGMENTS ARE ASSUMED FOR THE LE SHAPE	VS	905
C	MCVT=1 IF THE CUBIC SPLINE IS USED TO INTERPOLATE THE TE SHAPE	VS	906
C	=0 IF STRAIGHT SEGMENTS ARE ASSUMED	VS	907
C		VS	908
	READ (INPT,3) NLE,NTE,MCVL,MCVT	VS	909
	WRITE(JPT,3) NLE,NTE,MCVL,MCVT	VS	910
C		VS	911
C	*** CA, YSL=X-AND Y-COORDINATES OF INPUT POINTS TO DEFINE THE LE	VS	912
C	SHAPE RELATIVE TO THE LE OF INBOARD CHORD	VS	913
	READ (INPT,2) (CA(I),I=1,NLE)	VS	914
	WRITE(JPT,2) (CA(I),I=1,NLE)	VS	915
	READ (INPT,2) (YSL(I),I=1,NLE)	VS	916
	WRITE(JPT,2) (YSL(I),I=1,NLE)	VS	917
	IF(MCVL.EQ.0) GO TO 2321	VS	918
	CALL SPLINE (NLE,YSL,CA,AOL,BOL,COL,DOL)	VS	919
	GO TO 2322	VS	920
	2321 DO 2323 I=2,NLE	VS	921
	AOL(I-1)=0.	VS	922
	BOL(I-1)=0.	VS	923
	COL(I-1)=(CA(I)-CA(I-1))/(YSL(I)-YSL(I-1))	VS	924
	2323 DOL(I-1)=CA(I-1)	VS	925
C	CA, YST=X- AND Y-COORDINATES OF INPUT POINTS TO DEFINE THE TE SHAPE	VS	926
C	RELATIVE TO THE TE OF INBOARD CHORD	VS	927
	2322 CONTINUE	VS	928
	READ (INPT,2) (CA(I),I=1,NTE)	VS	929
	WRITE(JPT,2) (CA(I),I=1,NTE)	VS	930
	READ (INPT,2) (YST(I),I=1,NTE)	VS	931
	WRITE(JPT,2) (YST(I),I=1,NTE)	VS	932
	IF(MCVT.EQ.0) GO TO 2324		

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	CALL SPLINE(NTE,YST,CA,AOT,BOT,COT,DOT)	VS	933
	GO TO 2320	VS	934
2324	DO 2325 I=2,NTF	VS	935
	AOT(I-1)=0.	VS	936
	BOT(I-1)=0.	VS	937
	COT(I-1)=(CA(I)-CA(I-1))/(YST(I)-YST(I-1))	VS	938
2325	DOT(I-1)=CA(I-1)	VS	939
2320	CONTINUE	VS	940
	RT2=(XXT(2)-XXT(1))/(YL(2)-YL(1))	VS	941
	IF(NASYM.EQ.1.AND.YL(1).LT.0.) GO TO 2311	VS	942
	SKP=ATAN(RT2)	VS	943
	TPR=(XXT(2)-XXL(2))/(XXT(1)-XXL(1))	VS	944
	CBB=2./3.*(XXT(1)-XXL(1))*(1.+TPR+TPR*TPR)/(1.+TPR)	VS	945
	GO TO 2312	VS	946
2311	IF(ABS(RT2).GT.1.E-7) RT2=-RT2	VS	947
	SKP=ATAN(RT2)	VS	948
	TPR=(XXT(1)-XXL(1))/(XXT(2)-XXL(2))	VS	949
	CBB=2./3.*(XXT(2)-XXL(2))*(1.+TPR+TPR*TPR)/(1.+TPR)	VS	950
2312	CONTINUE	VS	951
	COX=CBB*COS(SKP)	VS	952
	H=YL(2)-YL(1)	VS	953
	COY=H*(1.+2.*TPR)/(1.+TPR)/3.	VS	954
	DUMT(1,K,KK)=SKP	VS	955
	DUMT(2,K,KK)=1.0662*COS(SKP)*(H*COX/(COY*COY))*0.2	VS	956
	YBREAK(K,KK)=YL(2)	VS	957
	FM=M1(K,KK)	VS	958
	NSW=M1(K,KK)	VS	959
	IF(K.EQ.1) XXLF=XXL(1)	VS	960
	IF(K.EQ.1) XXTF=XXT(1)	VS	961
	IF(ABS(YL(1)).LT.0.001.AND.K.EQ.1) DIST=DIST+XXT(1)-XXL(1)	VS	962
	DO 120 J=1,NSW	VS	963
	FJ=J	VS	964
	CPSWL(J)=0.5*(1.-COS((2.*FJ-1.)*PI/(2.*FM)))*100.	VS	965
	YCON(J)=0.5*(1.-COS(FJ*PI/FM))	VS	966
	SJ(K,J,KK)=SIN(FJ*PI/FM)	VS	967
120	CONTINUE	VS	968
	IF(DIHED.GT.5.) IDIH=1	VS	969
	DCOS(K,KK)=COS(DIHED*PI/180.)	VS	970
	DSIN(K,KK)=SIN(DIHED*PI/180.)	VS	971
	IF(KK.EQ.NC(K)) GO TO 130	VS	972
	IF(IWING(K).NE.0.AND.KK.EQ.NWING(K)) GO TO 130	VS	973
	CPSWL(NSW)=100.	VS	974
	IF(NASYM.EQ.1.AND.KK.EQ.1) GO TO 135	VS	975
	CPSWL(1)=0.	VS	976
	GO TO 135	VS	977
130	CPSWL(1)=0.	VS	978
	IF(IWGHT(K).EQ.1.AND.KK.EQ.NWING(K)) CPSWL(NSW)=100.	VS	979
135	IF(KK.EQ.NJW(K,LL)) MJW1(K,L,LL)=IPANEL	VS	980
	NCW=NKW	VS	981

KA=K	VS	982
CALL PANEL(XXL,YL,XXT,CPCWL,CPSWL,NSW,IPANEL,LPANEL,ZS,L,KA,IPN)	VS	983
IPANEL=LPANEL+1	VS	984
NCS=NCS+NSW-1	VS	985
NSS=NSS+NSW-1	VS	986
IF(L.EQ.1.AND.NW(K,2).EQ.0) B2=B2+FLOAT(NSW)-1.	VS	987
IF(L.EQ.2) B2=B2+FLOAT(NSW)-1.	VS	988
IF(KK.EQ.NC(K)) B2=B2+1.	VS	989
WIDTH(K,KK)=YL(2)-YL(1)	VS	990
BREAK(K,KK)=YL(1)	VS	991
IF(KK.EQ.NJW(K,LL)) MJW2(K,L,LL)=LPANFL	VS	992
IF(NASYM.EQ.1.AND.KK.EQ.1) GO TO 2105	VS	993
IF(IWING(K).NE.0.AND.KK.EQ.NWING(K)) GO TO 11	VS	994
IF(KK.NE.NC(K)) GO TO 112	VS	995
11 IF(KK.EQ.NC(K).AND.IWING(K).NE.0) GO TO 9	VS	996
CHORDT(K,L)=XXT(2)-XXL(2)	VS	997
HALFB(K)=YL(2)	VS	998
YCN(K,L)=YXL(2)	VS	999
GO TO 112	VS	1000
2105 CHORDT(K,L+2)=XXT(1)-XXL(1)	VS	1001
YCN(K,L+2)=XXL(1)	VS	1002
GO TO 112	VS	1003
9 CHORDT(K,L+2)=XXT(2)-XXL(2)	VS	1004
HALFBH(K)=YL(2)	VS	1005
YCN(K,L+2)=XXL(2)	VS	1006
112 IF(KK.EQ.NJW(K,LL)) LL=LL+1	VS	1007
10 CONTINUE	VS	1008
IF(L.EQ.2) GO TO 107	VS	1009
LPAN1(K)=LPANEL	VS	1010
IF(NW(K,2).EQ.0) GO TO 106	VS	1011
L=2	VS	1012
NKW=NW(K,2)	VS	1013
GO TO 105	VS	1014
106 K2 = NFP(K)	VS	1015
DO 111 I=1,K2	VS	1016
MJW1(K,2,I)=0	VS	1017
111 MJW2(K,2,I)=0	VS	1018
NSS=NSS*2	VS	1019
107 CONTINUE	VS	1020
LPN(K)=LPANFL	VS	1021
IF(K.EQ.1) NS(K)=NSS/2	VS	1022
IF(K.GT.1) NS(K)=NS(K-1)+NSS/2	VS	1023
C WRITE(JPT,3) NS(K),LPN(K),LPAN1(K),LPANEL	VS	1024
IF(NVRTX(K).EQ.0) NVRTX(K)=NS(K)+1	VS	1025
IF(IWGLT(K).NE.0) IV(K)=0	VS	1026
1122 CONTINUE	VS	1027
TANC2=0.5*(TANL+TANT)	VS	1028
C	VS	1029
C *** AM = MACH NUMBER	VS	1030


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C      HALFSW = REFERENCE HALF WING AREA (IF PLANFORM IS NOT SYMMETRICAL VS 1031
C      ABOUT X-AXIS, SET HALFSW=TOTAL AREA) VS 1032
C      CREF = REFERENCE CHORD VS 1033
C      BREF2=REFERENCE HALF SPAN VS 1034
C      ALPCON=1. IF ALPHA=1. RADIAN (IN THIS CASE,PUT ALPHA=0. AND VS 1035
C      DF =0.). =0. OTHERWISE VS 1036
C      IF ALPCON = 2., THE CALCULATION IS FOR ONE DESIGN LIFT COEFFICIENTVS 1037
C      BASED ON THE ATTACHED-FLOW THEORY VS 1038
C      = 3. IF THE DESIGN LIFT COEFFICIENT IS BASED ON THE VS 1039
C      VORTEX FLOW THEORY VS 1040
C      VS 1041
C      VS 1042
C      READ (INPT,2) AM,HALFSW,CREF,BREF2,XREF,ALPCON VS 1043
C      WRITE(JPT,2) AM,HALFSW,CREF,BREF2,XREF,ALPCON VS 1044
C      IF(AM.GT.1.) GO TO 20 VS 1045
C      GO TO 21 VS 1046
C      20 WRITE(JPT,22) VS 1047
C      22 FORMAT(/2X,34H*** THIS JOB IS ABORTED IN GEMTRY.,/5X,43HA SUPERSONVS 1048
C      1IC MACH NUMBER IS NOT ALLOWED ***) VS 1049
C      STOP VS 1050
C      21 CONTINUE VS 1051
C      VS 1052
C      *** THE FOLLOWING DATA SHOULD BE ALL 0. IF ALPCON=1. VS 1053
C      ALNM=NUMBER OF ALPHA TO BE EVALUATED. VS 1054
C      SNUM=NUMBER OF SPANWISE STATIONS INVOLVING LIFT AUGMENTATION VS 1055
C      DVRTX = 1. IF AN ADDITIONAL DISCRETE VORTEX IS NEEDED TO VS 1056
C      CALCULATE THE AUGMENTED VORTEX LIFT EFFECT. =0. OTHERWISE. VS 1057
C      CLDS = DESIGN LIFT COEFFICIENT IF ALPCON = 2. OR 3. VS 1058
C      = 0 OTHERWISE VS 1059
C      VS 1060
C      SNI,SNE = SPANWISE STRIP NUMBERS AT WHICH AND WITHIN WHICH THE VS 1061
C      LEADING-EDGE VORTEX PRODUCES LIFT AUGMENTATION ON A DOWNSTREAM VS 1062
C      SURFACE. =0. IF THERE IS NO VORTEX LIFT AUGMENTATION. VS 1063
C      CTILT = CHARACTERISTIC LENGTH FOR AUGMENTED VORTEX EFFECT. MAY BE VS 1064
C      POSITIVE OR NEGATIVE. VS 1065
C      SLETH = LE LENGTH VS 1066
C      XCNTD = X-COORDINATE OF THE CENTROID OF AUGMENTED VORTEX LIFT. VS 1067
C      YCNTD=Y-COORDINATE OF THE CENTROID OF AUGMENTED VORTEX LIFT VS 1068
C      XTILT = EQUIVALENT X-DISTANCE CREATING AN ADVERSE PRESSURE VS 1069
C      GRADIENT OVER WHICH THE VORTEX IS ASSUMED TO PASS. VS 1070
C      SR = THE LIFTING-SURFACE NUMBER RECEIVING THE AUGMENTED VORTEX VS 1071
C      LIFT EFFECT. VS 1072
C      VS 1073
C      READ(INPT,2) ALNM,SNUM,DVRTX,CLDS VS 1074
C      WRITE(JPT,2) ALNM,SNUM,DVRTX,CLDS VS 1075
C      ALPI=0. VS 1076
C      ALPINC=0. VS 1077
C      VS 1078
C      KALP=ALPCON VS 1079
C      IF(KALP.GE.2) ALPCON=0. VS 1079

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	IAGVX=DVRTX	VS	1080
	NAUG=IAGVX	VS	1081
	INUM=SNUM	VS	1082
	IF(INUM.EQ.0) INUM=1	VS	1083
	NALP=ALNM	VS	1084
	IF(NALP.EQ.0) NALP=1	VS	1085
C	ANGLES OF ATTACK IN DEGREES. IF THERE ARE CAMBER, L.E.FLAP	VS	1086
C	AND/OR ROUNDED L.F., START WITH A HIGH VALUE OF ANGLES.ALNM NUMBERS	VS	1087
C		VS	1088
	ALPA(1)=0.	VS	1089
	IF(KALP.EQ.1) GO TO 2110	VS	1090
	READ(INPT,2)(ALPA(I),I=1,NALP)	VS	1091
	WRITE(JPT,2)(ALPA(I),I=1,NALP)	VS	1092
	DO 2111 I=1,NALP	VS	1093
2111	ALPA(I)=ALPA(I)*CNET	VS	1094
2110	CONTINUE	VS	1095
	IF(KALP.GE.2) NALP=10	VS	1096
	DO 2090 I=1,INUM	VS	1097
	READ(INPT,2) SNI,SNE,CTILT(I),SLETH(I),XCNTD(I),YCNTD(I),XTILT(I),	VS	1098
	1SR	VS	1099
	WRITE(JPT,2) SNI,SNE,CTILT(I),SLETH(I),XCNTD(I),YCNTD(I),XTILT(I),	VS	1100
	1SR	VS	1101
	IF(SLETH(I).LT.1.E-8) SLETH(I)=1.	VS	1102
	NVL1(I)=SNI	VS	1103
	NVL2(I)=SNE	VS	1104
	NUR(I)=SR	VS	1105
	IF(NUR(I).EQ.0) NUR(I)=1	VS	1106
2090	XCNTD(I)=XCNTD(I)-XREF	VS	1107
	NVL1(INUM+1)=0	VS	1108
	NVL2(INUM+1)=0	VS	1109
	NUMS=SNUM	VS	1110
	ALPI=ALPI*PI/180.	VS	1111
	ALPINC=ALPINC*PI/180.	VS	1112
	ALP=ALPA(1)	VS	1113
	ALO=ALP	VS	1114
	NCS=NS(NSUR)	VS	1115
	IALP=ALPCON	VS	1116
	IF(IALP.EQ.1) IBD=0	VS	1117
	DO 1124 K=1,NSUR	VS	1118
	ALPBD(K,1)=PIA	VS	1119
	ALPBD(K,2)=PIA	VS	1120
	ABD(K,1)=PIA	VS	1121
	ABD(K,2)=PIA	VS	1122
	ALBDBR(K,1)=PIA	VS	1123
	ALBDBR(K,2)=PIA	VS	1124
	ALBDBL(K,1)=PIA	VS	1125
	ALBDBL(K,2)=PIA	VS	1126
	ABDR(K,1)=PIA	VS	1127
	ABDR(K,2)=PIA	VS	1128

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	ABDL(K,1)=PIA	VS 1129
	ABDL(K,2)=PIA	VS 1130
	IF(IALP.EQ.1) KT=0	VS 1131
	K2 = NS(K)	VS 1132
	DO 1118 I=1,K2	VS 1133
1118	RC(K,I)=0.	VS 1134
C	* IF KT = 0, THE FOLLOWING 2 INPUT LISTS MUST BE SKIPPED.	VS 1135
	IF(KT.EQ.0) GO TO 1119	VS 1136
C	*** THE INPUT LEADING-EDGE RADIUS IS DEFINED IN THE STREAMWISE	VS 1137
C	DIRECTION.	VS 1138
C	*** ICNLE = 0 FOR CONSTANT LE RADIUS/LOCAL-CHORD RATIO. IN THIS CASE,	VS 1139
C	THIS RATIO IS THE ONLY INPUT.	VS 1140
C	= 1 FOR CONSTANT LE RADIUS. IN THIS CASE, ONLY THIS VALUE	VS 1141
C	OF RADIUS IS INPUT.	VS 1142
C	= 2 FOR VARIABLE LE RADIUS-CHORD RATIO. IN THIS CASE, ALL	VS 1143
C	VALUES OF THIS RATIO AT SPANWISE CONTROL STATIONS (NCS VALUES)	VS 1144
C	MUST BE READ IN.	VS 1145
	READ (INPT,3) ICNLE(K)	VS 1146
	WRITE(JPT,3) ICNLE(K)	VS 1147
	NMR=1	VS 1148
	IF (ICNLE(K).EQ.2) NMR=NS(K)	VS 1149
C		VS 1150
	READ (INPT,2) (RC(K,I),I=1,NMR)	VS 1151
	WRITE(JPT,2) (RC(K,I),I=1,NMR)	VS 1152
C		VS 1153
1119	CONTINUE	VS 1154
C	THE FOLLOWING INPUT DATA ARE NOT NEEDED IF ALPCON =1.	VS 1155
	IF (IALP .EQ.1) GO TO 1124	VS 1156
C	TWST = 1. IF THERE IS GEOMETRIC TWIST	VS 1157
C	= 0. OTHERWISE	VS 1158
C	RINC = INCIDENCE ANGLE IN DEGREES	VS 1159
C	TINP = INCIDENCE ANGLE OF WINGLET OR VERTICAL FIN IN DEGREES,	VS 1160
C	RELATIVE TO THE ROOT OF THE LIFTING SURFACE	VS 1161
C		VS 1162
	READ (INPT,2) TWST,RINC(K),TINP(K)	VS 1163
	WRITE(JPT,2) TWST,RINC(K),TINP(K)	VS 1164
	ITWST(K)=TWST	VS 1165
	RINC(K)=RINC(K)*PI/180.	VS 1166
	TINP(K)=TINP(K)*PI/180.	VS 1167
	IF (ITWST(K).EQ.0) GO TO 1124	VS 1168
C	*** YNUM=NUMBER OF Y-COORDINATES INPUT TO DESCRIBE TWIST DISTRIBUTION	VS 1169
C	TCURV=0. IF THE TWIST DISTRIBUTION IS PIECEWISE LINEAR	VS 1170
C	=1. IF IT IS CONTINUOUSLY VARYING	VS 1171
C		VS 1172
	READ (INPT,2) YNUM,TCURV	VS 1173
	WRITE(JPT,2) YNUM,TCURV	VS 1174
	NYM(K)=YNUM	VS 1175
	NTCV=TCURV	VS 1176
C	*** YTS=THE NONDIMENSIONAL Y-COORDINATES AT WHICH TWIST ANGLES ARE	VS 1177

C	DEFINED. LIMITE TO 21.	VS	1178
C	FOR WINGLETS OR VERTICAL FINS, THE HALF SPAN OF THE ATTACHED	VS	1179
C	LIFTING SURFACE IS USED TO DEFINE YTS	VS	1180
C	CA=THE CORRESPONDING TWIST ANGLES IN DEGREES.NEGATIVE FOR WASHOUT	VS	1181
C		VS	1182
	K2 = NYM(K)	VS	1183
	READ (INPT,2) (YTS(K,I),I=1,K2)	VS	1184
	WRITE(JPT,2) (YTS(K,I),I=1,K2)	VS	1185
	READ (INPT,2) (CA(I),I=1,K2)	VS	1186
	WRITE(JPT,2) (CA(I),I=1,K2)	VS	1187
	NO=NYM(K)	VS	1188
	DO 1128 KQ=1,NO	VS	1189
1128	AW(KQ)=YTS(K,KQ)	VS	1190
	IF (NTCV.EQ.0) GO TO 1127	VS	1191
	CALL SPLINE(NO,AW,CA,GAMP,GAMX,GAMB,GAMR)	VS	1192
	K2 = NO - 1	VS	1193
	DO 1129 KQ=1,K2	VS	1194
	AY(K,KQ)=GAMP(KQ)	VS	1195
	BY(K,KQ)=GAMX(KQ)	VS	1196
	CCY(K,KQ)=GAMB(KQ)	VS	1197
1129	DY(K,KQ)=GAMR(KQ)	VS	1198
	GO TO 1124	VS	1199
1127	DO 1131 J=2,NO	VS	1200
	AY(K,J-1)=0.	VS	1201
	BY(K,J-1)=0.	VS	1202
	CCY(K,J-1)=(CA(J)-CA(J-1))/(AW(J)-AW(J-1))	VS	1203
1131	DY(K,J-1)=CA(J-1)	VS	1204
1124	CONTINUE	VS	1205
C		VS	1206
C	*** HEIGHT=HEIGHT OF 3/4 CHORD POINT OF M.A.C. FROM GROUND IF NGRD=1,	VS	1207
C	=0. OTHERWISE. ATT=PITCH ATTITUDE OF WING IN DEGREES,	VS	1208
C	=0. IF NGRD=0.	VS	1209
C		VS	1210
	READ (INPT,2) HEIGHT,ATT	VS	1211
	WRITE (JPT,2) HEIGHT,ATT	VS	1212
	ATT=SIN(ATT*PI/180.)	VS	1213
	ICAMB=0	VS	1214
	IF(ICAMB(1).EQ.2) ICAMB=1	VS	1215
	DIST=DIST*2	VS	1216
	IF(DIST.LT.HALFB(1)) DIST=HALFB(1)	VS	1217
C		VS	1218
C	* P=P*B/(2.*V) =MAXIMUM ROLL HELICAL ANGLE IN RADIAN	VS	1219
C	BK=SIDE SLIP ANGLE IN RADIAN	VS	1220
C	RL=R*B/(2.*V) =YAW RATE PARAMETER	VS	1221
C	IF RL=0., THE YAW RATE PARAMETER WILL BE CALCULATED AS P*SIN(ALP)	VS	1222
C	,AND ROLL RATE PARAMETER AS P*COS(ALP).	VS	1223
C	CFF = SKIN FRICTION COEFFICIENT BASED ON MEAN AERODYNAMIC	VS	1224
C	CHORD IF IBLC = 1. =0, OTHERWISE.	VS	1225
C	PBK = 1. IF ROLL DAMPING IS OBTAINED IN A NONZERD SIDESLIP. =0.	VS	1226

C	OTHERWISE	VS 1227
C	P=0.	VS 1228
	BK=0.	VS 1229
	RL=0.	VS 1230
	CFE=0.	VS 1231
	PBK=0.	VS 1232
	PPT = 0.	VS 1233
	IF(LAT .NE. 1) GO TO 1002	VS 1234
	READ (INPT,2) P,BK,RL,CFE,PRK	VS 1235
	WRITE(JPT,2) P,BK,RL,CFE,PBK	VS 1236
1002	CONTINUE	VS 1237
C	IF(LAT.EQ.1 .AND. ABS(P).LT.0.00001) P=0.1	VS 1238
	IF(LAT.EQ.1 .AND. ABS(BK).LT.0.00001) BK=0.1	VS 1239
	P=P+1000.	VS 1240
	MP=P	VS 1241
	P=MP/1000.	VS 1242
	IF(LAT.NE.1) GO TO 50	VS 1243
	BKK=0.	VS 1244
	IF(PBK.GT.0.01) BKK=BK	VS 1245
	PPT=P.	VS 1246
	IF(P.LT.0.05) P=0.05	VS 1247
	DD 51 K=1,NSUR	VS 1248
	K2 = NC(K)	VS 1249
	DD 51 KK=1,K2	VS 1250
	SKK=DUMT(1,K,KK)	VS 1251
	SKP=SKK-BKK	VS 1252
	SKQ=DUMT(2,K,KK)*COS(BKK)*COS(SKP)/(COS(SKK)*P**0.2)	VS 1253
	SKO=ATAN(SKQ)	VS 1254
	SWPP(K,KK)=COS(SKP)/COS(SKO)	VS 1255
C	WRITE(JPT,2) SKP,SKO,SWPP(K,KK)	VS 1256
51	CONTINUE	VS 1257
50	CONTINUE	VS 1258
	LWF=L PANEL	VS 1259
	IF(BREF2.LT.1.E-3) BREF2=HALFB(1)	VS 1260
	N TL=0	VS 1261
	KW=0	VS 1262
	WKN=0.	VS 1263
	RDX=0.	VS 1264
C	*** KF=1 IF THE FUSELAGE IS PRESENT, =0 OTHERWISE. NT=NUMBER OF	VS 1265
C	FOURIER TERMS EXCLUDING THE ZERO-ORDER TERM. NCUM=NUMBER OF CIR-	VS 1266
C	CUMFERENTIAL LOCATIONS AT WHICH PRESSURE LOADING IS TO BE COMPUTED	VS 1267
C	. NF=NUMBER OF CONTROL STATIONS ALONG THE FUSELAGE AXIS ***	VS 1268
C	* FOR MIDWING CONFIGURATIONS, USE EVEN NUMBERS FOR NCUM *	VS 1269
C		VS 1270
	READ(INPT,3) KF,NT,NCUM,NF	VS 1271
	WRITE(JPT,3) KF,NT,NCUM,NF	VS 1272
		VS 1273
		VS 1274
		VS 1275

	KW=1	VS 1276
	NKF(1)=NF	VS 1277
	NKF(2)=0	VS 1278
	IF (KF .EQ. 0) GO TO 1040	VS 1279
	NTL=NT*NF	VS 1280
	KW1=KW+1	VS 1281
C		VS 1282
C	*** X-COORDINATES DEFINING THE FUSELAGE SEGMENTS, INCLUDING THE NOSE	VS 1283
C	AND THE TAIL, FUSIND=0. IF THE FUSELAGE GEOMETRY IS TO BE DEFINED	VS 1284
C	ANALYTICALLY IN FUNCTIONS FUR(X) AND SLOP(X), =1. OTHERWISE.....	VS 1285
C	FUSNO=NUMBER OF FUSELAGE STATIONS TO BE INPUT TO DEFINE THE	VS 1286
C	SHAPE IF FUSIND=1. , =0. OTHERWISE ***	VS 1287
C	*** FSHAP =1. IF THE INPUT FUSELAGE SHAPE IS TO BE INTERPOLATED	VS 1288
C	THROUGH CUBIC SPLINE INTERPOLATION	VS 1289
C	=0. IF INPUT POINTS FOR THE FUSELAGE SHAPE ARE CONNECTED	VS 1290
C	WITH STRAIGHT SEGMENTS	VS 1291
C	= ARBITRARY IF FUSIND=0.	VS 1292
C	* X1=BODY STATION IN FRACTION OF BODY LENGTH AT WHICH THE RATE OF	VS 1293
C	CHANGE OF CROSS-SECTIONAL AREA WITH BODY LENGTH FIRST REACHES	VS 1294
C	MAXIMUM NEGATIVE VALUE. SEE DATCOM *	VS 1295
C		VS 1296
	READ(INPT,2)(XAS(I),I=1,KW1),FUSIND,FUSNO,FSHAP,X1	VS 1297
	WRITE(JPT,2)(XAS(I),I=1,KW1),FUSIND,FUSNO,FSHAP,X1	VS 1298
	IF(X1.LT.0.01) X1=1.	VS 1299
	IF(X1.GT.1.) X1=1.	VS 1300
	IFR=FUSIND	VS 1301
	IFN=FUSNO	VS 1302
	IFSP=FSHAP	VS 1303
C	***IF FUSIND=1., READ IN THE FUSELAGE X-STATIONS AND THE RADII.	VS 1304
C	OTHERWISE, SKIP ***	VS 1305
	IF (IFR .EQ. 0) GO TO 26	VS 1306
	READ(INPT,2) (XFF(I),I=1,IFN)	VS 1307
	READ(INPT,2) (RFF(I),I=1,IFN)	VS 1308
	WRITE(JPT,2) (XFF(I),I=1,IFN)	VS 1309
	WRITE(JPT,2) (RFF(I),I=1,IFN)	VS 1310
	IF(IFSP.EQ.0) GO TO 250	VS 1311
	CALL SPLINE (IFN,XFF,RFF,AAF,BRF,CCF,DDF)	VS 1312
	GO TO 26	VS 1313
250	DD 251 J=2,IFN	VS 1314
	AAF(J-1)=0.	VS 1315
	BRF(J-1)=0.	VS 1316
	CCF(J-1)=(RFF(J)-RFF(J-1))/(XFF(J)-XFF(J-1))	VS 1317
251	DDF(J-1)=RFF(J-1)	VS 1318
26	CONTINUE	VS 1319
	XLFF=XAS(1)	VS 1320
	XTEF=XAS(KW1)	VS 1321
	IF (YN(2,1) .LE. 0.01) GO TO 31	VS 1322
	IF (ZCP(2) .GE. 0.) TH1=PI/2.-ATAN(ZCP(2)/YN(2,1))	VS 1323
	IF (ZCP(2) .LT. 0.) TH1=PI/2.+ATAN(ABS(ZCP(2))/YN(2,1))	VS 1324

IF (ZCP(2) .LT. 0.) GO TO 53	VS 1325
IF (ABS(ZCP(2)) .LE. 0.001) GO TO 54	VS 1326
F1=TH1/PI*FLOAT(NCUM)	VS 1327
NH1=F1	VS 1328
IF (NH1 .LT. 2) NH1=2	VS 1329
GO TO 32	VS 1330
53 TH2=PI-TH1	VS 1331
F2=TH2/PI*FLOAT(NCUM)	VS 1332
NH2=F2	VS 1333
IF (NH2 .LT. 2) NH2=2	VS 1334
NH1=NCUM-NH2	VS 1335
GO TO 32	VS 1336
54 NH1=NCUM/2	VS 1337
GO TO 32	VS 1338
31 NH1=0	VS 1339
TH1=0	VS 1340
32 CONTINUE	VS 1341
SNP(5,20)=TH1	VS 1342
SNP(5,19)=NH1	VS 1343
CALL GEUFUS	VS 1344
LWF=L*PANEL+NTL	VS 1345
WKN=-8.*PI*RDY	VS 1346
1040 CONTINUE	VS 1347
IF(LWF.GT.195) GO TO 23	VS 1348
GO TO 24	VS 1349
23 WRITE(JPT,25)	VS 1350
25 FORMAT(/2X,34H*** THIS JOB IS ABORTED IN GEMTRY.,/5X,37HTOTAL NUMBVS	1351
1ER OF UNKNOWNNS EXCEEDS 195.,/5X,56HDIMENSIONS FOR GAMMA AND DQ IN	VS 1352
2DWASH MUST BE CHANGED ***)	VS 1353
STOP	VS 1354
24 CONTINUE	VS 1355
P=PPT	VS 1356
PT=P	VS 1357
IRL=0	VS 1358
IF(ABS(RL).LT.0.0001) IRL=1	VS 1359
WRITE (JPT,4) HALFSW,CREF	VS 1360
WRITE (JPT,403)	VS 1361
WRITE (JPT,412)	VS 1362
WRITE(JPT,7) (XN(I,1),XN(I,2),YN(I,1),YN(I,2),ZN(I,1),ZN(I,2),I=1,	VS 1363
1LPANEL)	VS 1364
WRITE (JPT,404)	VS 1365
WRITE (JPT,411)	VS 1366
WRITE (JPT,7) (XCP(I),YCP(I),ZCP(I),I=1,LPANEL)	VS 1367
J1=LWF+1	VS 1368
B=1.-AM*AM	VS 1369
B2=B	VS 1370
ALZ=ALP*180./PI	VS 1371
REWIND 04	VS 1372
<u>REWIND 02</u>	VS 1373

	ICOUNT=0	VS 1374
	DO 2000 I=1,NCS	VS 1375
2000	CNALP(I)=0.	VS 1376
	NCG=10	VS 1377
	FN=NCG	VS 1378
	DO 2010 I=1,NCG	VS 1379
	FI=I	VS 1380
	AG=(2.*FI-1.)*PI/(2.*FN)	VS 1381
	CTG(I)=COS(AG)	VS 1382
2010	STG(I)=SIN(AG)	VS 1383
	RETURN	VS 1384
	END	VS 1385
C	FORTRAN NLSTIN	VS 1386
	SUBROUTINE GEOFUS	VS 1387
C	TO GENERATE THE FUSELAGE GEOMETRY	VS 1388
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS 1389
	INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,X1	VS 1390
	PI=3.14159265	VS 1391
	S=XTEF-XLEF	VS 1392
	TH1=SNP(5,20)	VS 1393
	NH1=SNP(5,19)	VS 1394
	RDX=SLOP(XLEF)	VS 1395
	NF1=NF+1	VS 1396
	FNT=NT	VS 1397
	DO 20 I=1,NT	VS 1398
	FI=I	VS 1399
	DO 20 K=1,NCUM	VS 1400
	IF (NH1 .NE. 0 .AND. K .LE. NH1) GO TO 10	VS 1401
	FK=K-NH1	VS 1402
	FCUM=NCUM-NH1	VS 1403
	PP=PI-TH1	VS 1404
	TP=TH1	VS 1405
	GO TO 11	VS 1406
10	FK=K	VS 1407
	FCUM=NH1	VS 1408
	PP=TH1	VS 1409
	TP=0.	VS 1410
11	CONTINUE	VS 1411
	TA=(2.*FK-1.)*PP/(2.*FCUM)+TP	VS 1412
20	CSF(I,K)=COS(FI*TA)	VS 1413
	IK=0	VS 1414
	FNF=NKF(1)	VS 1415
	XO=XAS(1)	VS 1416
	N2=1	VS 1417
	N1=NKF(1)	VS 1418
	SL=XAS(2)-XAS(1)	VS 1419
	DO 1 I=1,NF	VS 1420
	M=I-IK	VS 1421
	EI=M	VS 1422

	XF(I)=XO +0.5*SL*(1.-COS((2.*FI-1.)*PI/(2.*FNF)))	VS 1423
	XCF(I)=XO +0.5*SL*(1.-COS(FI*PI/FNF))	VS 1424
	SNP(N2,M)=SIN((2.*FI-1.)*PI/(2.*FNF))	VS 1425
	XC=XCF(I)	VS 1426
	RF(I)=FUR(XC)	VS 1427
	IF(I,NE,N1.OR.I.EQ.NF) GO TO 1	VS 1428
	N2=N2+1	VS 1429
	IK=N1	VS 1430
	N1=N1+NKF(N2)	VS 1431
	SL=XAS(N2+1)-XAS(N2)	VS 1432
	FNF=NKF(N2)	VS 1433
	XO=XAS(N2)	VS 1434
1	CONTINUE	VS 1435
2	FORMAT (8F10.5)	VS 1436
	RETURN	VS 1437
	END	VS 1438
C	FORTRAN NLSTIN	VS 1439
	SUBROUTINE PANEL (XXL,YL,XXT,CPCWL,CPSWL,NSW,IPANEL,LPANEL,	VS 1440
	17S,L,IK,IPN)	VS 1441
C	TO DEFINE SURFACE PANELS FOR LIFTING SURFACES	VS 1442
	DIMENSION XXL(1),YL(1),XXT(1),CPCWL(1),CPSWL(1)	VS 1443
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),	VS 1444
	1XLL(41)	VS 1445
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),	VS 1446
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(200,2),	VS 1447
	ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)	VS 1448
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS 1449
	1NFP(6),NW(6,2)	VS 1450
	COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),B2,NCG,CTG(15),STG(15),	VS 1451
	15),DIST,P,BK,RL,CFE	VS 1452
	PI=3.14159265	VS 1453
	NSW1=NSW-1	VS 1454
	NR=B2	VS 1455
	NASYM=YCON(50)	VS 1456
	IF(IPN.EQ.1) GO TO 20	VS 1457
	DO 1 I=1,2	VS 1458
	C(I)=XXT(I)-XXL(I)	VS 1459
	DO 1 J=1,NCW	VS 1460
1	XL(I,J)=XXL(I)+CPCWL(J)*C(I)/100.	VS 1461
	SPAN=YL(2)-YL(1)	VS 1462
	DO 2 J=1,NCW	VS 1463
	PSI(J)=0.5*(1.-COS(FLOAT(J)*PI/FLOAT(NCW)))	VS 1464
	SLOPE(J)=(XL(2,J)-XL(1,J))/SPAN	VS 1465
2	CONTINUE	VS 1466
	SPN=(XXT(2)-XXT(1))/SPAN	VS 1467
	DO 3 K=1,NSW	VS 1468
	YK=CPSWL(K)*SPAN/100.	VS 1469
	IF(NW(IK,2).EQ.0) GO TO 10	VS 1470
	<u>IF(L,EQ.1) GO TO 12</u>	VS 1471

10	KK=NR+K	VS	1472
	YTG(KK)=YL(1)+YK	VS	1473
	XTG(KK)=XXT(1)+SPN*(YTG(KK)-YL(1))	VS	1474
	ZTG(KK)=ZS	VS	1475
12	CONTINUE	VS	1476
	DO 3 J=1,NCW	VS	1477
	Y(J,K)=YK+YL(1)	VS	1478
	X(J,K)=XL(1,J)+SLOPE(J)*(Y(J,K)-YL(1))	VS	1479
3	CONTINUE	VS	1480
	XLL(1)=XXL(1)	VS	1481
	XTT(1)=XXT(1)	VS	1482
	IF(NASYM.EQ.0) GO TO 16	VS	1483
	XLL(1)=XXL(1)+(XXL(2)-XXL(1))*CPSWL(1)/100.	VS	1484
	XTT(1)=XXT(1)+(XXT(2)-XXT(1))*CPSWL(1)/100.	VS	1485
16	CONTINUE	VS	1486
	DO 15 I=2,NSW	VS	1487
	XLL(I)=XLL(I-1)+(XXL(2)-XXL(1))*(Y(1,I)-Y(1,I-1))/SPAN	VS	1488
15	XTT(I)=XTT(I-1)+(XXT(2)-XXT(1))*(Y(1,I)-Y(1,I-1))/SPAN	VS	1489
	GO TO 25	VS	1490
20	DO 30 J=1,NCW	VS	1491
	FJ=J	VS	1492
30	PSI(J)=0.5*(1.-COS(FJ*PI/FLDAT(NCW)))	VS	1493
	SPAN=YL(2)-YL(1)	VS	1494
	DO 35 K=1,NSW	VS	1495
	YK=CPSWL(K)*SPAN/100.	VS	1496
	YC=YK	VS	1497
	IF(NW(IK,2).EQ.0) GO TO 31	VS	1498
	IF(L.EQ.1) GO TO 32	VS	1499
31	KK=NR+K	VS	1500
	YTG(KK)=YL(1)+YK	VS	1501
	ST=SHAPTE(YC)	VS	1502
	XTG(KK)=XXT(1)+ST	VS	1503
	ZTG(KK)=ZS	VS	1504
32	CONTINUE	VS	1505
	XLL(K)=SHAPLE(YC)+XXL(1)	VS	1506
	ST=SHAPTE(YC)	VS	1507
	XTT(K)=ST+XXT(1)	VS	1508
	CHORD=XTT(K)-XLL(K)	VS	1509
	DO 35 J=1,NCW	VS	1510
	Y(J,K)=YC+YL(1)	VS	1511
	X(J,K)=XLL(K)+CPCWL(J)*CHORD/100.	VS	1512
35	CONTINUE	VS	1513
25	CONTINUE	VS	1514
	DO 6 K=1,NSW1	VS	1515
	KK=NCS+K	VS	1516
	YLE(KK)=YCON(K)*SPAN+YL(1)	VS	1517
	XLE(KK)=XLL(K)+(XLL(K+1)-XLL(K))*(YLE(KK)-Y(1,K))/(Y(1,K+1)-Y(1,K))	VS	1518
1)		VS	1519
	XTE(KK)=XTT(K)+(XTT(K+1)-XTT(K))*(YLE(KK)-Y(1,K))/(Y(1,K+1)-Y(1,K))	VS	1520

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1)	CH(KK)=XTE(KK)-XLE(KK)	VS 1521
	IF(IPN.EQ.1) GO TO 40	VS 1522
	SWEEP(KK)=ATAN((XXL(2)-XXL(1))/SPAN)	VS 1523
	GO TO 45	VS 1524
40	SLP=(XLL(K+1)-XLL(K))/(Y(1,K+1)-Y(1,K))	VS 1525
	SWEEP(KK)=ATAN(SLP)	VS 1526
45	CONTINUE	VS 1527
	DO 6 J=1,NCW	VS 1528
	NPANEL=(K-1)*NCW +J-1+IPANEL	VS 1529
	DO 5 I=1,2	VS 1530
	KI1=K+I-1	VS 1531
4	XN(NPANEL,I)=X(J,KI1)	VS 1532
	YN(NPANEL,I)=Y(J,KI1)	VS 1533
	ZN(NPANEL,I)=ZS	VS 1534
5	CONTINUE	VS 1535
	XCP(NPANEL)=XLE(KK)+PSI(J)*CH(KK)	VS 1536
	YCP(NPANEL)=YLE(KK)	VS 1537
	ZCP(NPANEL)=ZS	VS 1538
	XV(NPANEL)=XLE(KK)+CPCWL(J)*CH(KK)/100.	VS 1539
	YV(NPANEL)=YLE(KK)	VS 1540
6	CONTINUE	VS 1541
	LPANEL=NPANEL	VS 1542
	RETURN	VS 1543
	END	VS 1544
C	FORTRAN NLSTIN	VS 1545
	SUBROUTINE SPLINE(N,X,Y,A,R,C,D)	VS 1546
C	CUBIC SPLINE INTERPOLATION	VS 1547
	DIMENSION S(125),H(22),CA(22),X(1),Y(1)	VS 1548
	DIMENSION A(1),B(1),C(1),D(1)	VS 1549
	I=1	VS 1550
	NI=N+1	VS 1551
	N1=N-1	VS 1552
	H(NI)=0.	VS 1553
	H(1)=X(3)-X(2)	VS 1554
	H(2)=-X(3)+X(1)	VS 1555
	H(3)=X(2)-X(1)	VS 1556
	DO 1 K=4,N	VS 1557
1	H(K)=0.	VS 1558
	DO 5 K=1,N	VS 1559
5	S(K)=-H(K+1)/H(1)	VS 1560
	NJ=N-1	VS 1561
	DO 10 I=2,N	VS 1562
	IF (I .EQ. N) GO TO 12	VS 1563
	H(NI)=-6.*((Y(I+1)-Y(I))/(X(I+1)-X(I))-(Y(I)-Y(I-1))/(X(I)-X(I-1)))	VS 1564
1)	GO TO 14	VS 1565
12	H(NI)=0.	VS 1566
14	DO 15 J=1.N	VS 1567
		VS 1568
		VS 1569

	H(J)=0.	VS 1570
	IF (I .EQ. N) GO TO 20	VS 1571
	IF (J .LT. (I-1) .OR. J .GT. (I+1)) GO TO 15	VS 1572
	H(I-1)=X(I)-X(I-1)	VS 1573
	H(I)=2.*(X(I+1)-X(I-1))	VS 1574
	H(I+1)=X(I+1)-X(I)	VS 1575
	GO TO 15	VS 1576
20	H(N-2)=X(N)-X(N-1)	VS 1577
	H(N-1)=-X(N)+X(N-2)	VS 1578
	H(N)=X(N-1)-X(N-2)	VS 1579
15	CONTINUE	VS 1580
	II=I	VS 1581
	CALL VMSEON(NJ,II,H,S,CA)	VS 1582
	NJ=NJ-1	VS 1583
10	CONTINUE	VS 1584
	DO 25 I=1,N1	VS 1585
	A(I)=(S(I+1)-S(I))/(6.*(X(I+1)-X(I)))	VS 1586
	B(I)=S(I)/2.	VS 1587
	C(I)=(Y(I+1)-Y(I))/(X(I+1)-X(I))-(X(I+1)-X(I))*(2.*S(I)+S(I+1))/	VS 1588
	16.	VS 1589
25	D(I)=Y(I)	VS 1590
	RETURN	VS 1591
	END	VS 1592
C	FORTRAN NLSTIN	VS 1593
	FUNCTION SHAPLE(Y)	VS 1594
C	TO DEFINE CURVED LEADING EDGES	VS 1595
	COMMON/SHPLE/ NLE,YSL(15),AQL(14),BQL(14),COL(14),DOL(14)	VS 1596
	K=1	VS 1597
1	IF(Y.GE.YSL(K).AND.Y.LT.YSL(K+1)) GO TO 2	VS 1598
	K=K+1	VS 1599
	IF(K.GE.NLE) GO TO 3	VS 1600
	GO TO 1	VS 1601
2	SM=Y-YSL(K)	VS 1602
	SHAPLE=AQL(K)*SM**3+BQL(K)*SM*SM+COL(K)*SM+DOL(K)	VS 1603
	GO TO 5	VS 1604
3	IF(Y.LT.YSL(1)) GO TO 4	VS 1605
	K=NLE-1	VS 1606
	GO TO 2	VS 1607
4	K=1	VS 1608
	GO TO 2	VS 1609
5	RETURN	VS 1610
	END	VS 1611
C	FORTRAN NLSTIN	VS 1612
	FUNCTION SHAPTE(Y)	VS 1613
C	TO DEFINE CURVED TRAILING EDGES	VS 1614
	COMMON/SHPTE/ NTE,YST(15),AOT(14),BOT(14),COT(14),DOT(14)	VS 1615
	K=1	VS 1616
1	IF(Y.GE.YST(K).AND.Y.LT.YST(K+1)) GO TO 2	VS 1617
	K=K+1	VS 1618

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	IF(K.GE.NTE) GO TO 3	VS 1619
	GO TO 1	VS 1620
2	SM=Y-YST(K)	VS 1621
	SHAPTE=AQT(K)*SM**3+BQT(K)*SM*SM+CQT(K)*SM+DOT(K)	VS 1622
	GO TO 5	VS 1623
3	IF(Y.LT.YST(1)) GO TO 4	VS 1624
	K=NTE-1	VS 1625
	GO TO 2	VS 1626
4	K=1	VS 1627
	GO TO 2	VS 1628
5	RETURN	VS 1629
	END	VS 1630
C	LINK LINK22,LINK11	VS 1631
C	FORTRAN NLSTIN	VS 1632
	SUBROUTINE DWASH	VS 1633
C	TO SET UP DOWNWASH COEFF. MATRIX AND OBTAIN SOLUTION	VS 1634
C	* IP SHOULD BE CONSISTENT WITH THE DESIRED MATRIX SIZE WITH A	VS 1635
C	MAXIMUM EQUAL TO 200. THE DIMENSION FOR GAMMA SHOULD BE IP*IP.	VS 1636
	DIMENSION GAMMA(38025)	VS 1637
	DIMENSION GAM(200)	VS 1638
C	PARAMETER IP=195	VS 1639
	DIMENSION DO(195,195)	VS 1640
	EQUIVALENCE (DO(1,1),GAMMA(1))	VS 1641
	COMMON /DSL/ CTP(6,2),CHORDT(6,4),SCH(200),LAT,CREF,BREF2	VS 1642
	DIMENSION DMH(200),AW(201),CA(200),RW(200)	VS 1643
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),	VS 1644
	1XLL(41)	VS 1645
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	1646
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	1647
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS	1648
	COMMON /AERO/ AM,B,CL(50),CT(50),CD(50),CM(50)	VS 1649
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS 1650
	1NFP(6),NW(6,2)	VS 1651
	COMMON /CAMB/ ICAM(6),IM(6,10),XT(6,10,21),AAM(6,10,20),RBM(6,10,	VS 1652
	120),CCM(6,10,20),DDM(6,10,20),YT(6,10),CURV(6,10),CHND(6,10)	VS 1653
	COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HFIGHT,	VS 1654
	1ATT,NC(6),NWIN(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS 1655
	COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),B2,NCG,CTG(15),STG(1VS	1656
	15),DIST,P,BK,RL,CFF	VS 1657
	COMMON /LEFLP/ YLEF(6,10,2),XNF(6,10),YNF(6,10),ZNF(6,10),XLF(6,10VS	1658
	1,4),YLF(6,10,4),SLP1(6,10)	VS 1659
	COMMON /TWST1/ NYM(6),YTS(6,21),AY(6,20),BY(6,20),CCY(6,20),DY(6,	VS 1660
	120)	VS 1661
	COMMON/SHPLE/ NLE,YSL(15),AQL(14),BQL(14),COL(14),DOL(14)	VS 1662
	COMMON/SHPTE/ NTE,YST(15),AOT(14),ROT(14),COT(14),DOT(14)	VS 1663
	COMMON/LOOP/KP,NALP,KALP,TANC2,CLDS,AL,CLII,ALPII,ALPA(15)	VS 1664
	COMMON /AJG/ ALP,J1,CP(200),GAMP(200),GAMR(200),GAMR(200)	VS 1665
	1,GAMX(200),ZZCP(200),DZY(200),BMR(6,50),BML(6,50),CSU(50)	VS 1666
	COMMON /SSS/ NASYM,NSUR,LANEL,ICAMB,NUMS,IAGVX,PT	VS 1667

1,NAUG,IBD,PBK,PIS,IDIH,ALPINC,IRL,KT,PI,ALO,ALZ	VS	1668
2,NC1,NC2,IBLC	VS	1669
COMMON/GD/ TINP(6),BREAK(6,10),TFLP(6,5),RINC(6),NAL(6)	VS	1670
1,YBREAK(6,7),DCOS(6,5),DSIN(6,5),IWING(6),IWGLT(6),IV(6),LPAN1(6)	VS	1671
1,ICAMT(6)	VS	1672
COMMON/GDSL/ DF(6,5),YCN(6,4),NLEF(6),NVRTX(6),SNALP(50),CNALP(50)	VS	1673
1,ALPH(50),AUX(6,5),CRX(6,5),XTILT(6),SLETH(6),YCNTD(6)	VS	1674
1,NVL1(6),NVL2(6),XCNTD(6),CTILT(6),SWPP(6,5),RC(6,50),XREF	VS	1675
1,RUX(6,5),SE(3,6,15),NUR(6),CVR(50),CPAUG(200)	VS	1676
1,ALPBD(6,2),MX(6),ALBDBR(6,2),ALBDBL(6,2),MVPTX(6)	VS	1677
COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS	1678
INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,ROX,XU	VS	1679
COMMON /INOUT/ INPT,JPT	VS	1680
2 FORMAT (8F10.6)	VS	1681
3 FORMAT (8(6X,I4))	VS	1682
7 FORMAT (11F10.5)	VS	1683
IP = 195	VS	1684
NPP=NALP	VS	1685
SS=SIN(ALP)	VS	1686
CS=COS(ALP)	VS	1687
IF(IALP.EQ.1) SS=1.	VS	1688
IF(IALP.EQ.1) CS=1.	VS	1689
IF(IALP.EQ.1) GO TO 1001	VS	1690
K=1	VS	1691
KM=1	VS	1692
DO 1005 I=1,NCS	VS	1693
IF (ITWST(K).EQ.1) GO TO 1009	VS	1694
ALPH(I)=ALP+RINC(K)	VS	1695
IF(IWING(K).NE.0.AND. I.GT.IWING(K)) GO TO 1006	VS	1696
SNALP(I)=SIN(ALPH(I))	VS	1697
CNALP(I)=COS(ALPH(I))	VS	1698
GO TO 1010	VS	1699
1009 YC=YLE(KM)/HALFB(K)	VS	1700
IF(IWING(K).NE.0.AND. I.GT.IWING(K)) GO TO 1006	VS	1701
CALL TWIST (YC,ATW,K)	VS	1702
ALPH(I)=ALP+RINC(K)+ATW	VS	1703
SNALP(I)=SIN(ALPH(I))	VS	1704
CNALP(I)=COS(ALPH(I))	VS	1705
GO TO 1010	VS	1706
1006 ALPH(I)=TINP(K)+ALP	VS	1707
SNALP(I)=SIN(ALPH(I))	VS	1708
CNALP(I)=COS(ALPH(I))	VS	1709
1010 KM=KM+1	VS	1710
IF(I.NE.NS(K)) GO TO 1005	VS	1711
IF(NW(K,2).EQ.0) GO TO 1005	VS	1712
IF(K.EQ.1) KM=KM+NS(K)	VS	1713
IF(K.GT.1) KM=KM+NS(K)-NS(K-1)	VS	1714
1005 IF(I.EQ.NS(K)) K=K+1	VS	1715
1001 CONTINUE	VS	1716

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C	SETTING-UP OF BOUNDARY CONDITIONS	VS 1717
	NF2=2*NF	VS 1718
	FO=0.	VS 1719
	F10=0.	VS 1720
	GB0=0.	VS 1721
	IF (KF .EQ. 0) GO TO 99	VS 1722
	FO=4.*PI*CS*RDY	VS 1723
	F10=-8.*PI*SS*POX	VS 1724
	CALL FALONE(B,CS,AW,CA,GAMMA)	VS 1725
C	WRITE(JPT,2) (WARD(I),I=1,NF)	VS 1726
	IF(KP.GT.1) GO TO 99	VS 1727
C		VS 1728
C	* COMPUTE THE INFLUENCE COEFFICIENTS DUE TO THE PRESENCE OF THE	VS 1729
C	FUSELAGE, AND STORE ON FILE (02) *	VS 1730
C		VS 1731
	CALL VELFUS(LPANEL,AW,BW,AM,LPAN1,IWING,NC1,DCOS,DSIN,NASYM,YBREAK	VS 1732
	1,LPN,NS,IWGLT,NC,BREAK)	VS 1733
	REWIND 02	VS 1734
	REWIND 04	VS 1735
	READ (03) (CP(I),I=1,LPANEL)	VS 1736
99	CONTINUE	VS 1737
	IF(KP.EQ.1) REWIND 01	VS 1738
	MM=NW(1,1)	VS 1739
	J1=LWF+1	VS 1740
	IZ=1	VS 1741
	IPN=1	VS 1742
	IF(NW(1,2).EQ.0) GO TO 12	VS 1743
	II=1+NS(1)	VS 1744
	CHORD=CH(1)+CH(II)	VS 1745
	GO TO 13	VS 1746
12	CHORD=CH(1)	VS 1747
13	CONTINUE	VS 1748
	CSD=DCOS(1,1)	VS 1749
	SSD=DSIN(1,1)	VS 1750
	ZB=0.	VS 1751
	YB=BREAK(1,1)	VS 1752
	YBB=BREAK(1,1)	VS 1753
	NC1=0	VS 1754
	NC2=0	VS 1755
	IF(NASYM.EQ.0) GO TO 1370	VS 1756
	K2 = NC(1)	VS 1757
	DO 1371 I=1,K2	VS 1758
	IF(ABS(BREAK(1,I)).GT.0.001) GO TO 1371	VS 1759
	NC1=I-1	VS 1760
1371	CONTINUE	VS 1761
	YB=YBREAK(1,NC1)	VS 1762
	YBB=YB	VS 1763
	NC2=NC(1)-NC1	VS 1764
	IF(NC1.EQ.1) GO TO 1370	VS 1765

	NC11=NC1-1	VS 1766
	DO 1372 I=1,NC11	VS 1767
	ZB=ZB+(YBREAK(1,I)-YBREAK(1,I+1))*DSIN(1,I+1)	VS 1768
1372	YBB=YBB+(YBREAK(1,I)-YBREAK(1,I+1))*DCOS(1,I+1)	VS 1769
	YB=YBREAK(1,1)	VS 1770
1370	CONTINUE	VS 1771
	YBP=YB	VS 1772
	YBBP=YBB	VS 1773
	IF(KP.NE.1) GO TO 181	VS 1774
	CALL WING(AW,BW,LPANEL,1,R,LPAN1,LAT,CSD,SSD,YBREAK,	VS 1775
	1DCOS,DSIN,IWING,ZB,YB,YBB,IWGLT,IV,NC1,ZZCP,KF,BREAK)	VS 1776
181	CONTINUE	VS 1777
	XC=(XCP(1)-XLE(IZ))/CHORD	VS 1778
	IF(ICAM(1).EQ.3) XC=XCP(1)	VS 1779
	IF(IALP.EQ.1) GO TO 1301	VS 1780
	IF(ICAMB.EQ.1) GO TO 1300	VS 1781
	YK1=(YCP(1)-YN(1,1))/(YN(1,2)-YN(1,1))	VS 1782
	XK1=XN(1,1)+(XN(1,2)-XN(1,1))*YK1	VS 1783
	X1=(XK1-XLE(IZ))/CHORD	VS 1784
	TSW=(XN(1,2)-XN(1,1))/(YN(1,2)-YN(1,1))	VS 1785
	CALL ZCR(XC,YCP(1),CAM,ICAM,X1,1,1,CHORD,DZDY,IST,TSW)	VS 1786
	DZY(1)=DZDY	VS 1787
	GO TO 1301	VS 1788
1300	YC=YLE(IZ)	VS 1789
	XC=XCP(1)	VS 1790
	CALL ZCDX(XC,YC,CAM,DZDY)	VS 1791
	DZY(1)=DZDY	VS 1792
1301	CONTINUE	VS 1793
	IF (IALP .EQ. 1) ALPT=1.	VS 1794
	IF (IALP.NE.1) ALPT=SNALP(IZ)	VS 1795
	K=1	VS 1796
	IJ=1	VS 1797
	JZ=?	VS 1798
	NZ=1	VS 1799
	IF (NLEF(K).EQ.1) JZ=1	VS 1800
	IF (NLEF(K).EQ.1) NZ=2	VS 1801
	IF (NLEF(K).EQ.0) GO TO 1231	VS 1802
	IF(IJ.GE.MJW1(1,JZ,1).AND.IJ.LE.MJW2(1,JZ,1)) CAM=CAM+TFLP(1,1)	VS 1803
1231	CONTINUE	VS 1804
	IF (IALP .EQ. 1) CAM=0.	VS 1805
	AW(J1)=ALPT*CSD-CAM*CNALP(IZ)	VS 1806
	BW(J1)=0.	VS 1807
	WN=0.	VS 1808
	IF (KF .EQ. 0) GO TO 1041	VS 1809
	IF(KP.GT.1) GO TO 50	VS 1810
	READ (02) (DMH(LK),LK=1,NTL)	VS 1811
	READ (04) (GAM(LK),LK=1,NTL)	VS 1812
	DO 1043 LK=1,NTL	VS 1813
	KK=LPANEL+LK	VS 1814

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	BW(KK)=GAM(LK)	VS 1815
1043	AW(KK)=DMM(LK)	VS 1816
50	CONTINUE	VS 1817
	XO=XCP(1)	VS 1818
	YO=YBB+(YCP(1)-YB)*CSD	VS 1819
	ZO=ZCP(1)+ZB+(YCP(1)-YB)*SSD	VS 1820
	WK=0.	VS 1821
	CALL FUSVOL (8,XO,YO,ZO,WN,WK,GB0,0,0,CSD,SSD)	VS 1822
	AW(J1)=AW(J1)+WN	VS 1823
	IF(KP.GT.1) GO TO 1041	VS 1824
	DO 141 KK=1,LPANEL	VS 1825
141	AW(KK)=AW(KK)+WK+WKN*CP(KK)	VS 1826
1041	CONTINUE	VS 1827
	IF(NALP.GT.1) CA(1)=AW(J1)	VS 1828
	GAMB(1)=ALPT*CSD+WN	VS 1829
C	WRITE(JPT,2) XC,YCP(1),CAM	VS 1830
	IF(NALP.GT.1) GO TO 182	VS 1831
	IF(NAUG.EQ.1) CA(1)=AW(J1)	VS 1832
	IF(NAUG.EQ.1) GO TO 182	VS 1833
	DO 200 I=1,LWF	VS 1834
200	GAMMA(I)=-AW(I+1)/AW(1)	VS 1835
182	CONTINUE	VS 1836
	IF(KP.GT.1) GO TO 51	VS 1837
	WRITE (01) (AW(JJ),JJ=1,LWF)	VS 1838
	WRITE (01) (BW(JJ),JJ=1,LWF)	VS 1839
51	CONTINUE	VS 1840
	IJ=2	VS 1841
	NJ=LWF-1	VS 1842
	LL=1	VS 1843
	IY=1	VS 1844
	KCH=1	VS 1845
	ISTP=1	VS 1846
205	CONTINUE	VS 1847
	KCH=IZ	VS 1848
	CSD=DCOS(K,IPN)	VS 1849
	SSD=DSIN(K,IPN)	VS 1850
	NN=NW(K,1)	VS 1851
	JZ=2	VS 1852
	NZ=1	VS 1853
	IF(NLEF(K).EQ.1) JZ=1	VS 1854
	IF(NLEF(K).EQ.1) NZ=2	VS 1855
	IF(KP.NE.1) GO TO 183	VS 1856
	CALL WING(AW,BW,LPANEL,IJ,B,LPAN1,LAT,CSD,SSD,YBREAK,	VS 1857
	1DCOS,DSIN,IWING,ZB,YB,YBR,IWGLT,IV,NC1,ZZCP,KF,BREAK)	VS 1858
183	CONTINUE	VS 1859
	IF(NW(K,2).EQ.0) GO TO 14	VS 1860
	IF(K.EQ.1) II=KCH+NS(K)	VS 1861
	IF(K.GT.1) II=KCH+NS(K)-NS(K-1)	VS 1862
	CHORD=CH(KCH)+CH(II)	VS 1863

	GO TO 16	VS 1864
14	CHORD=CH(KCH)	VS 1865
16	CONTINUE	VS 1866
	XC=(XCP(IJ)-XLE(IZ))/CHORD	VS 1867
	IF(ICAM(K).EQ.3) XC=XCP(IJ)	VS 1868
	IF(ISTP.GT.IWING(K).AND.IWING(K).NE.0) GO TO 1013	VS 1869
	LCAM=0	VS 1870
	IF (IALP .EQ. 1) GO TO 1025	VS 1871
	IF(ICAM(K).EQ.2) GO TO 1305	VS 1872
	NP=IJ	VS 1873
1015	YK1=(YCP(NP)-YN(NP,1))/(YN(NP,2)-YN(NP,1))	VS 1874
	XK1=XN(NP,1)+(XN(NP,2)-XN(NP,1))*YK1	VS 1875
	X1=(XK1-XLE(IZ))/CHORD	VS 1876
	TSW=(XN(NP,2)-XN(NP,1))/(YN(NP,2)-YN(NP,1))	VS 1877
	CALL ZCR(XC,YCP(NP),CAM1,ICAM,X1,K,1,CHORD,DZDY,IST,TSW)	VS 1878
	IF(LCAM.EQ.0) DZY(IJ)=DZDY	VS 1879
	IF (LCAM .EQ. 1) GO TO 1035	VS 1880
	CAM=CAM1	VS 1881
	GO TO 1020	VS 1882
1025	CAM=0.	VS 1883
	GO TO 19	VS 1884
1305	YC=YLE(IZ)	VS 1885
	XC=XCP(IJ)	VS 1886
	CALL ZCDY(XC,YC,CAM,DZDY)	VS 1887
	DZY(IJ)=DZDY	VS 1888
1020	CONTINUE	VS 1889
	IF(IJ.GE.MJW1(K,J7,LL).AND.IJ.LE.MJW2(K,JZ,LL)) GO TO 18	VS 1890
	GO TO 17	VS 1891
18	IF(LL.EQ.NAL(K)) GO TO 19	VS 1892
	CAM1=TFLP(K,LL)+CAM	VS 1893
	IF (NLEF(K).EQ.1.AND.IJ.EQ.MM) CAM1=0.5*TFLP(K,LL)+CAM	VS 1894
	CAM=CAM1	VS 1895
	GO TO 19	VS 1896
17	IF(NW(K,2).EQ.0) GO TO 19	VS 1897
	IF(NC(K).GT.1) GO TO 22	VS 1898
	IF(IJ.EQ.MM.AND.NLEF(K).EQ.0) CAM=CAM+0.5*TFLP(K,LL)	VS 1899
	GO TO 19	VS 1900
22	CONTINUE	VS 1901
	IF(IJ.GT.LPAN1(K).AND.IJ.LE.LPN(K)) GO TO 19	VS 1902
	IF(IJ.NE.MM) GO TO 19	VS 1903
	KH=1	VS 1904
	IF(K.GT.1) KH=NS(K-1)+1	VS 1905
	NCH=IJ+(NS(K)-ISTP)*NW(K,1)+(ISTP-KH)*NW(K,2)+1	VS 1906
C	WRITE(JPT,3) IJ,NCH,IZ	VS 1907
	XC=(XCP(NCH)-XLE(IZ))/CHORD	VS 1908
	IF(ICAM(K).EQ.3) XC=XCP(NCH)	VS 1909
	IF(ICAM(K).EQ.2) GO TO 1310	VS 1910
	NP=NCH	VS 1911
	LCAM=1	VS 1912

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GO TO 1015	VS 1913
1310 XC=XCP(NCM)	VS 1914
YC=YLE(IZ)	VS 1915
CALL ZCDX(XC,YC,CAM1,DZDY)	VS 1916
1035 CONTINUE	VS 1917
CAM=0.5*(CAM+CAM1)	VS 1918
IF(IJ.GE.MJW1(K,NZ,LL).AND.IJ.LE.MJW2(K,NZ,LL)) GO TO 23	VS 1919
GO TO 19	VS 1920
23 IF(LL.EQ.NAL(K)) GO TO 19	VS 1921
IF(IJ.EQ.MM.AND.NLEF(K).EQ.0) CAM=CAM+0.5*TFLP(K,LL)	VS 1922
19 CONTINUE	VS 1923
IF(IALP.NE.1) ALPT=SNALP(ISTP)	VS 1924
IF(IALP.EQ.1) ALPT=1.	VS 1925
GO TO 1014	VS 1926
1013 ALPT=SNALP(ISTP)	VS 1927
IF(IALP.EQ.1) ALPT=1.	VS 1928
CAM=0.	VS 1929
IF(IALP.EQ.1) GO TO 1014	VS 1930
IF(ICAMT(K).EQ.0) GO TO 1331	VS 1931
NP=IJ	VS 1932
NCAM=0	VS 1933
1016 YK1=(YCP(NP)-YN(NP,1))/(YN(NP,2)-YN(NP,1))	VS 1934
XK1=XN(NP,1)+(XN(NP,2)-XN(NP,1))*YK1	VS 1935
X1=(XK1-XLE(IZ))/CHORD	VS 1936
ICT=ICAMT(K)	VS 1937
TSW=(XN(NP,2)-XN(NP,1))/(YN(NP,2)-YN(NP,1))	VS 1938
CALL ZCR(XC,YCP(NP),ZR,ICAM,X1,K,ICT,CHORD,DZDY,IST,TSW)	VS 1939
IF(NCAM.EQ.0) DZY(IJ)=DZDY	VS 1940
IF(NCAM.EQ.1) GO TO 1017	VS 1941
CAM=ZR	VS 1942
IF(NW(K,2).EQ.0) GO TO 1331	VS 1943
IF(IJ.GT.LPAN1(K)) GO TO 1331	VS 1944
IF(IJ.NE.MM) GO TO 1331	VS 1945
KH=1	VS 1946
IF(K.GT.1) KH=NS(K-1)+1	VS 1947
NCM=IJ+(NS(K)-ISTP)*NW(K,1)+(ISTP-KH)*NW(K,2)+1	VS 1948
XC=(XCP(NCM)-XLE(IZ))/CHORD	VS 1949
IF(ICAM(K).EQ.3) XC=XCP(NCM)	VS 1950
NP=NCM	VS 1951
NCAM=1	VS 1952
GO TO 1016	VS 1953
1017 CAM1=ZR	VS 1954
CAM=0.5*(CAM+CAM1)	VS 1955
1331 CONTINUE	VS 1956
IF(NLEF(K).EQ.1) GO TO 1018	VS 1957
IF(IJ.GE.MJW1(K,JZ,LL).AND.IJ.LE.MJW2(K,JZ,LL)) GO TO 40	VS 1958
IF(IJ.GE.MJW1(K,NZ,LL).AND.IJ.LE.MJW2(K,NZ,LL)) GO TO 41	VS 1959
GO TO 1014	VS 1960
41 CONTINUE	VS 1961

	IF(IJ.EQ.MM) CAM=CAM+0.5*TFLP(K,LL)	VS 1962
	GO TO 1014	VS 1963
40	CONTINUE	VS 1964
	IF(IJ.GT.LPAN1(K)) CAM=CAM+TFLP(K,LL)	VS 1965
	GO TO 1014	VS 1966
1018	IF(IJ.GT.LPAN1(K)) GO TO 1014	VS 1967
	IF(IJ.EQ.MM) CAM=CAM+0.5*TFLP(K,LL)	VS 1968
1014	CONTINUE	VS 1969
C	BOUNDARY CONDITION	VS 1970
	AW(J1)=ALPT*CSD-CAM*CNALP(ISTP)	VS 1971
	GAMB(IJ)=ALPT*CSD	VS 1972
	BW(J1)=0.	VS 1973
	WN=0.	VS 1974
	IF (KF .EQ. 0) GO TO 1042	VS 1975
	IF(KP.GT.1) GO TO 52	VS 1976
	READ (02) (DMH(LK),LK=1,NTL)	VS 1977
	READ (04) (GAM(LK),LK=1,NTL)	VS 1978
	DO 1044 LK=1,NTL	VS 1979
	KK=L PANEL+LK	VS 1980
	BW(KK)=GAM(LK)	VS 1981
1044	AW(KK)=DMH(LK)	VS 1982
52	CONTINUE	VS 1983
	XO=XCP(IJ)	VS 1984
	YO=YBB+(YCP(IJ)-YB)*CSD	VS 1985
	ZO=ZCP(IJ)+ZB+(YCP(IJ)-YB)*SSD	VS 1986
	WK=0.	VS 1987
	CALL FUSVOL(B,XO,YO,ZO,WN,WK,GB0,0,0,CSD,SSD)	VS 1988
	AW(J1)=AW(J1)+WN	VS 1989
	GAMB(IJ)=GAMB(IJ)+WN	VS 1990
	IF(KP.GT.1) GO TO 1042	VS 1991
	DO 142 KK=1,L PANEL	VS 1992
142	AW(KK)=AW(KK)+WK*WKN*CP(KK)	VS 1993
1042	CONTINUE	VS 1994
	IF(KP.GT.1) GO TO 53	VS 1995
	WRITE (01) (AW(JJ),JJ=1,LWF)	VS 1996
	WRITE (01) (BW(JJ),JJ=1,LWF)	VS 1997
53	CONTINUE	VS 1998
C	WRITE(JPT,2) XC,AW(J1),ALPT,CSD,CAM,CNALP(ISTP)	VS 1999
	IF(NALP.GT.1 .OR. NAUG.EQ.1) CA(IJ)=AW(J1)	VS 2000
	IF(NALP.GT.1) GO TO 184	VS 2001
	IF(NAUG.EQ.1) GO TO 184	VS 2002
	CALL VMSEON (NJ,IJ,AW,GAMMA,CA)	VS 2003
184	CONTINUE	VS 2004
	IF(IJ.GE.LPAN1(K).AND.IJ.LT.LPN(K)) GO TO 1117	VS 2005
	IF(IJ.EQ.MJW2(K,1,LL)) LL=LL+1	VS 2006
	GO TO 1118	VS 2007
1117	NN=NW(K,2)	VS 2008
	IF(IJ.EQ.MJW2(K,2,LL)) LL=LL+1	VS 2009
1118	CONTINUE	VS 2010

	IF(IJ.EQ.LPN(K).AND.IJ.LT.LPANEL) NN=NW(K+1,1)	VS 2011
	IF(IJ.LT.MM) GO TO 25	VS 2012
	IF(NW(K,2).EQ.0) GO TO 1220	VS 2013
	IF(IJ.LE.LPAN1(K)) GO TO 1221	VS 2014
1220	IZO=I7+1	VS 2015
	XLL(IY)=SSD	VS 2016
	XTT(IY)=CSD	VS 2017
	IY=IY+1	VS 2018
1221	CONTINUE	VS 2019
	IZ=IZ+1	VS 2020
	MM=MM+NN	VS 2021
	KCH=KCH+1	VS 2022
	ISTP=ISTP+1	VS 2023
	IF(IWING(K).NE.0.AND.ISTP.EQ.(IWING(K)+1)) GO TO 1113	VS 2024
	IF(IJ.EQ.LPAN1(K).OR.IJ.EQ.LPN(K)) GO TO 1113	VS 2025
	IF(ISTP.EQ.(NS(K)+1)) GO TO 1116	VS 2026
	IF(YLE(IZ).LT.YBREAK(K,IPN)) GO TO 25	VS 2027
1113	CONTINUE	VS 2028
	NI=0	VS 2029
	IF(NASYM.EQ.1.AND.IPN.LT.NC1) NI=1	VS 2030
	IF(NI.EQ.1) IPN=IPN+1	VS 2031
	ZB=7B+(YBREAK(K,IPN)-YB)*DSIN(K,IPN)	VS 2032
	YBR=YBB+(YBREAK(K,IPN)-YB)*DCOS(K,IPN)	VS 2033
	YB=YBREAK(K,IPN)	VS 2034
	IF(IWING(K).NE.0.AND.ISTP.EQ.(IWING(K)+1)) GO TO 1114	VS 2035
	IF(IJ.EQ.LPAN1(K).OR.IJ.EQ.LPN(K)) GO TO 1116	VS 2036
	GO TO 1115	VS 2037
1114	IF(IWGLT(K).EQ.1) GO TO 1115	VS 2038
1116	ZB=0.	VS 2039
	YB=BREAK(K,1)	VS 2040
	YBR=BREAK(K,1)	VS 2041
	IF(NASYM.EQ.1.AND.IJ.EQ.LPAN1(K)) YB=YBP	VS 2042
	IF(NASYM.EQ.1.AND.IJ.EQ.LPAN1(K)) YBB=YBBP	VS 2043
	IF(IJ.EQ.LPN(K).AND.K.LT.6) YB=BREAK(K+1,1)	VS 2044
	IF(IJ.EQ.LPN(K).AND.K.LT.6) YBB=BREAK(K+1,1)	VS 2045
	IF(IJ.EQ.LPN(K)) GO TO 1115	VS 2046
	IF(ISTP.EQ.(NS(K)+1)) GO TO 1115	VS 2047
	IF(IWGLT(K).NE.2) GO TO 1115	VS 2048
	ZB=YBREAK(K,NC(K)-2)*DSIN(K,1)	VS 2049
	YBB=YBREAK(K,NC(K)-2)*DCOS(K,1)	VS 2050
	YB=YBREAK(K,NC(K)-2)	VS 2051
1115	CONTINUE	VS 2052
	IF(NI.NE.1) IPN=IPN+1	VS 2053
	IF(IJ.EQ.LPAN1(K).OR.IJ.EQ.LPN(K)) IPN=1	VS 2054
25	KH=0	VS 2055
	IF(IJ.EQ.LPAN1(K).AND.IJ.NE.LPN(K)) KH=1	VS 2056
	IF(KH.EQ.1.AND.K.EQ.1) IZ=IZ-NS(K)	VS 2057
	IF(KH.EQ.1.AND.K.GT.1) IZ=IZ-NS(K)+NS(K-1)	VS 2058
	IF(IJ.EQ.LPN(K).AND.NW(K,2).NE.0) KH=2	VS 2059

	IF(KH.EQ.2.AND.K.EQ.1) IZ=IZ+NS(K)	VS 2060
	IF(KH.EQ.2.AND.K.GT.1) IZ=IZ+NS(K)-NS(K-1)	VS 2061
	IF(KH.EQ.1.AND.K.EQ.1) ISTEP=ISTP-NS(K)	VS 2062
	IF(KH.EQ.1.AND.K.GT.1) ISTEP=ISTP-NS(K)+NS(K-1)	VS 2063
	IF(IJ.EQ.LPANEL(K)) LL=1	VS 2064
	IJ=IJ+1	VS 2065
	NJ=NJ-1	VS 2066
	IF(IJ.EQ.(LPANEL(K)+1)) K=K+1	VS 2067
	IF (IJ .LE. LPANEL) GO TO 205	VS 2068
	IF (KF .EQ. 0) GO TO 207	VS 2069
	DO 206 KJ=1,NTL	VS 2070
	GAMB(LPANEL+KJ)=0.	VS 2071
	CA(LPANEL+KJ)=0.	VS 2072
	IF(KP.GT.1) GO TO 26	VS 2073
	READ (02) (AW(KK),KK=1,LWF)	VS 2074
	READ (04) (BW(KK),KK=1,LWF)	VS 2075
26	CONTINUE	VS 2076
	AW(J1)=0.	VS 2077
	BW(J1)=0.	VS 2078
	IF (KJ .GT. NF) GO TO 91	VS 2079
	KI=KJ	VS 2080
	XS=XCF(KI)-XTEF	VS 2081
	XR=XCF(KI)-XLEF	VS 2082
	IF (KJ .EQ. NF) RFL=0.	VS 2083
	IF (KJ .NE. NF) RFL=XS/SORT(XS*XS+R*RF(KI)*RF(KI))	VS 2084
	RF1=XS*(1.+RFL)	VS 2085
	RFO=XR*(1.+XR/SORT(XB*XB+B*RF(KI)*RF(KI)))	VS 2086
	WK=-((RF1-RFO)*WKN)/(4.*PI)	VS 2087
	APT=SS*RF(KI)*RF(KI)-((RF1-RFO)*F10)/(4.*PI)	VS 2088
	AW(J1)=APT	VS 2089
	CA(LPANEL+KJ)=APT	VS 2090
	GAMB(LPANEL+KJ)=APT	VS 2091
	IF(KP.GT.1) GO TO 27	VS 2092
	DO 143 KK=1,LPANEL	VS 2093
143	AW(KK)=AW(KK)+WK*CP(KK)	VS 2094
91	CONTINUE	VS 2095
	WRITE (01) (AW(JJ),JJ=1,LWF)	VS 2096
	WRITE (01) (BW(JJ),JJ=1,LWF)	VS 2097
27	CONTINUE	VS 2098
	WRITE(JPT,2) AW(J1)	VS 2099
C	IF (NALP .GT. 1) GO TO 208	VS 2100
	IF (NAUG .EQ. 1) GO TO 208	VS 2101
	CALL VMSEON(NJ,IJ,AW,GAMMA,CA)	VS 2102
208	NJ=NJ-1	VS 2103
206	IJ=IJ+1	VS 2104
207	CONTINUE	VS 2105
	END OF SETTING-UP OF BOUNDARY CONDITIONS	VS 2106
C	NSQ=NCS+NSUR	VS 2107
C	WRITE(JPT,7) (XTG(I),YTG(I),ZTG(I),I=1,NSQ)	VS 2108

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C	WRITE(JPT,2) (CH(I),I=1,NCS)	VS	2109
C	WRITE(JPT,2) (XLE(I),I=1,NCS)	VS	2110
C	WRITE(JPT,2) (XLL(I),XTT(I),I=1,NCS)	VS	2111
	REWIND 02	VS	2112
	DO 195 I=1,LWF	VS	2113
195	DMM(I)=GAMMA(I)	VS	2114
	IF(KP.EQ.1) CALL INVN(DO,CP,AW,LAT,NPP,LWF,IP,NAUG)	VS	2115
	DO 196 I=1,LWF	VS	2116
196	GAMMA(I)=DMM(I)	VS	2117
	REWIND 02	VS	2118
	IF(NAUG.EQ.1) GO TO 903	VS	2119
	IF(NALP.EQ.1) GO TO 185	VS	2120
903	CONTINUE	VS	2121
	DO 186 I=1,LWF	VS	2122
	GAMMA(I)=0.	VS	2123
	GAMP(I)=0.	VS	2124
	READ(02) (AW(K),K=1,LWF)	VS	2125
	DO 186 J=1,LWF	VS	2126
	GAMP(I)=GAMP(I)-AW(J)*GAMB(J)	VS	2127
186	GAMMA(I)=GAMMA(I)-AW(J)*CA(J)	VS	2128
185	CONTINUE	VS	2129
C	WRITE(JPT,7)(GAMMA(I),I=1,LWF)	VS	2130
	DO 115 I=1,LWF	VS	2131
	IF(NALP.EQ.1) GAMP(I)=GAMMA(I)	VS	2132
115	CP(I)=GAMMA(I)	VS	2133
	CPAUG(200)=LWF	VS	2134
	RETURN	VS	2135
	END	VS	2136
C	FORTRAN NLSTIN	VS	2137
	SURROUTINE INVN(DO,CP,AW,LAT,NALP,N,IP,NAUG)	VS	2138
C	TO INVERT THE DOWNWASH COEFF. MATRIX	VS	2139
	DIMENSION IPIVOT(200),IWK(400)	VS	2140
C	ABOVE REQUIRED FOR THE NASA/LARC ROUTINE MATINV.	VS	2141
	DIMENSION DO(IP,IP),CP(1),AW(1)	VS	2142
C		VS	2143
C	SETDIM IS TO SET UP ARRAY TABLE FOR MATRIX INVERSION, AND MAY NOT	VS	2144
C	BE NEEDED IF OTHER INVERSION ROUTINES ARE USED.	VS	2145
C		VS	2146
	IA=IP	VS	2147
C	CALL SETDIM(DO,IA,IA)	VS	2148
	IF(NAUG.EQ.1) GO TO 2	VS	2149
	IF(NALP.EQ.1) GO TO 10	VS	2150
2	CONTINUE	VS	2151
	REWIND 01	VS	2152
	DO 1 I=1,N	VS	2153
	READ(01) (AW(K),K=1,N)	VS	2154
	READ(01) (CP(K),K=1,N)	VS	2155
	DO 1 J=1,N	VS	2156
1	DO(I,J)=AW(J)	VS	2157

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C C C C	DO IS THE MATRIX TO BE INVERTED. AW IS A WORKING ARRAY. THE INVERTED MATRIX IS RETURNED IN DO.	VS 2158 VS 2159 VS 2160 VS 2161 VS 2162 VS 2163 VS 2164 VS 2165 VS 2166 VS 2167 VS 2168 VS 2169 VS 2170 VS 2171 VS 2172 VS 2173 VS 2174 VS 2175 VS 2176 VS 2177 VS 2178 VS 2179 VS 2180 VS 2181 VS 2182 VS 2183 VS 2184 VS 2185 VS 2186 VS 2187 VS 2188 VS 2189
C	CALL HEMINV(DO,N,AW) CALL MATINV(IA,N,DO,0,AW,1,DETERM,ISCALE,IPIVOT,IWK) IF (DETERM.NE.0.) GO TO 102 PRINT 101	VS 2190 VS 2191 VS 2192 VS 2193 VS 2194 VS 2195 VS 2196 VS 2197 VS 2198 VS 2199 VS 2200 VS 2201 VS 2202 VS 2203 VS 2204 VS 2205 VS 2206
101	FORMAT(" SINGULAR MATRIX, CANNOT INVERT, STOP IN INVN") STOP	
102	CONTINUE DO 5 I=1,N 5 WRITE(02) (DO(I,K),K=1,N) 10 IF(LAT.NE.1) GO TO 25 REWIND 01 DO 15 I=1,N READ(01) (AW(K),K=1,N) READ(01) (CP(K),K=1,N) DO 15 J=1,N 15 DO(I,J)=CP(J)	
C	CALL HEMINV(DO,N,AW) CALL MATINV(IA,N,DO,0,AW,1,DETERM,ISCALE,IPIVOT,IWK) IF (DETERM.NE.0.) GO TO 103 PRINT 101 STOP	
103	CONTINUE DO 20 I=1,N 20 WRITE(02) (DO(I,K),K=1,N) 25 RETURN END	
C	FORTRAN NLSTIN SUBROUTINE WING (AW,BW,L PANEL,I, BB,L PAN1,LAT,CS,SS,YK 1,DC,DS,IWING,ZR,YB,YBR,IWGLT,IV,NC1,7ZCP,KF,BREAK)	
C	TO CALCULATE DOWNWASH COEFF. MATRIX OF WINGS DUE TO WINGS DIMENSION AW(1),LPAN1(1),IWING(1),IWGLT(1),IV(1) DIMENSION BW(1),ZZCP(1),WV(4),VW(4),BFAK(6,1) DIMENSION W(2),W1(2),YK(6,1),DC(6,1),DS(6,1),V(2),V1(2) COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLF(100),YLE(100), 1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(200,2),ZN(200,2),WIDTH(6,5),YCON(50),SWEEP(100),HALFB(6),SJ(6,31,5) COMMON /AERO/ AM,B,CL(50),CT(50),CD(50),CM(50) COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5), 1NFP(6),NW(6,2) COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT, 1ATT,NC(6),NWIN(6),IPOS(6),IALP,DUHT(3,6,15),HALFBH(6) LG=1 IF (NGRD .EQ. 1) LG=2 NASYM=YCON(50) W1(1)=0.	

V1(1)=0.	VS 2207
IPN=1	VS 2208
IP=1	VS 2209
B1=BB	VS 2210
IZ=1	VS 2211
IW=1	VS 2212
IFF=1	VS 2213
K=1	VS 2214
NN=NW(K,1)	VS 2215
ZA=0.	VS 2216
YA=BREAK(1,1)	VS 2217
YAA=BREAK(1,1)	VS 2218
IF(NASYM.EQ.0) GO TO 40	VS 2219
YA=YK(1,NC1)	VS 2220
YAA=YA	VS 2221
IF(NC1.EQ.1) GO TO 40	VS 2222
NC11=NC1-1	VS 2223
DO 41 J=1,NC11	VS 2224
ZA=ZA+(YK(K,J)-YK(K,J+1))*DS(K,J+1)	VS 2225
41 YAA=YAA+(YK(K,J)-YK(K,J+1))*DC(K,J+1)	VS 2226
YA=YK(K,1)	VS 2227
40 CONTINUE	VS 2228
YAP=YA	VS 2229
YAAP=YAA	VS 2230
DO 16 J=1,LPANEL	VS 2231
NL=NW(K,1)	VS 2232
COSD=DC(K,IPN)	VS 2233
SIND=DS(K,IPN)	VS 2234
V1(2)=0.	VS 2235
W1(2)=0.	VS 2236
W(2)=0.	VS 2237
V(2)=0.	VS 2238
WV(3)=0.	VS 2239
WV(4)=0.	VS 2240
VW(3)=0.	VS 2241
VW(4)=0.	VS 2242
MI=J-IFF+1	VS 2243
ISN=1	VS 2244
IF (J.GT. LPAN1(K).AND.J.LE.LPN(K)) ISN=2	VS 2245
IF(J.GT.LPAN1(K).AND.J.LE.LPN(K)) GO TO 20	VS 2246
GO TO 21	VS 2247
20 NL=NW(K,2)	VS 2248
21 CONTINUE	VS 2249
FN=NL	VS 2250
NK=NL	VS 2251
IF(J.GE.LPAN1(K).AND.J.LT.LPN(K)) NK=NW(K,2)	VS 2252
IF(J.EQ.LPN(K).AND.J.LT.LPANEL) NK=NW(K+1,1)	VS 2253
X1=XN(J,1)-XCP(I)	VS 2254
X2=XN(J,2)-XCP(I)	VS 2255

X12=XN(J,2)-XN(J,1)	VS 2256
ISM=2	VS 2257
IF (IV(K).EQ.1) ISM=1	VS 2258
IF(NASYM.EQ.1) ISM=1	VS 2259
DO 15 II=1,ISM	VS 2260
IF (II.EQ.1) GO TO 2	VS 2261
N=1	VS 2262
GO TO 3	VS 2263
2 N=2	VS 2264
3 CONTINUE	VS 2265
DO 15 KK=1,LG	VS 2266
KIG=II+KK-1	VS 2267
IF (KK .EQ. 2) KIG=II+KK	VS 2268
IF(ABS(CS-COSD).GT.0.001) GO TO 31	VS 2269
IF(ABS(SS-SIND).GT.0.001) GO TO 31	VS 2270
IF(NC(K).GT.1) GO TO 31	VS 2271
IF (II .EQ. 1 .AND. KK .EQ. 1) GO TO 30	VS 2272
31 CONTINUE	VS 2273
PS=SIND	VS 2274
PC=COSD	VS 2275
QS=SS	VS 2276
QC=CS	VS 2277
GO TO 35	VS 2278
30 PS=0.	VS 2279
PC=1.	VS 2280
QS=0.	VS 2281
QC=1.	VS 2282
35 CONTINUE	VS 2283
Y12=YN(J,2)-YN(J,1)	VS 2284
Z12=ZN(J,2)-ZN(J,1)+Y12*PS	VS 2285
Y12=Y12*PC	VS 2286
YC=(-1.)*N*(YBB+(YCP(I)-YB)*QC)	VS 2287
Y1=YAA+(YN(J,1)-YA)*PC-YC	VS 2288
Y2=YAA+(YN(J,2)-YA)*PC-YC	VS 2289
XYK=X1*Y12-Y1*X12	VS 2290
IF (KK .EQ. 1) GO TO 18	VS 2291
ZC=-2.*(ZCP(I)+ZB+(YCP(I)-YB)*QS+HEIGHT)+ZCP(I)+ZB+(YCP(I)-YB)*QS	VS 2292
FCON=1.	VS 2293
GO TO 19	VS 2294
18 ZC=ZCP(I)+ZB+(YCP(I)-YB)*QS	VS 2295
ZZCP(I)=ZC	VS 2296
FCON=0.	VS 2297
19 CONTINUE	VS 2298
Z1=ZN(J,1)-ZC+ZA+(YN(J,1)-YA)*PS	VS 2299
Z2=ZN(J,2)-ZC+ZA+(YN(J,2)-YA)*PS	VS 2300
XZJ=X1*Z12-Z1*X12	VS 2301
UCOM=-Z1*Y12*(-ATT)*FCON	VS 2302
YZI=Y1*Z12-Z1*Y12	VS 2303
ALB1=XYK*XYK+XZJ*XZJ+B1*YZI*YZI	VS 2304

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R1B1=	SORT(X1*X1+R1*Y1*Y1+B1*Z1*Z1)	VS	2305
R2B1=	SORT(X2*X2+R1*Y2*Y2+B1*Z2*Z2)	VS	2306
UUB1=	(X2*X12+B1*Y2*Y12+B1*Z2*Z12)/R2B1-(Y1*X12+B1*Y1*Y12+B1*Z1*Z12	VS	2307
1)/R1B1		VS	2308
G1B1=	(1.-X1/R1B1)/(Y1*Y1+Z1*Z1)	VS	2309
G2B1=	(1.-X2/R2B1)/(Y2*Y2+Z2*Z2)	VS	2310
F1=	UUB1*(UCOM+YK)/ALB1	VS	2311
F2=	-Y2*G2B1+Y1*G1B1	VS	2312
F3=	-XZJ*UUB1/ALB1	VS	2313
F4=	Z2*G2B1-Z1*G1B1	VS	2314
CKF=	CH(IZ)*SN(K,MI,ISN)/(8.*FN)	VS	2315
WV(KIG)=	Y1*G1B1*QC*CKF	VS	2316
VW(KIG)=	-Z1*G1B1*OS*CKF	VS	2317
IF (IP .EQ. 1 .AND. KF .NE. 0) F2=	-Y2*G2B1	VS	2318
IF (IP .EQ. 1 .AND. KF .NE. 0) F4=	Z2*G2B1	VS	2319
IF (KK .EQ. 2) GO TO	25	VS	2320
W(II)=	(F1+F2)*CH(IZ)*SN(K,MI,ISN)/(8.*FN)	VS	2321
V(II)=	(F3+F4)*CH(IZ)*SN(K,MI,ISN)/(8.*FN)	VS	2322
W(II)=	W(II)*QC	VS	2323
V(II)=	V(II)*OS	VS	2324
GO TO	15	VS	2325
25 W1(II)=	(F1+F2)*CH(IZ)*SN(K,MI,ISN)/(8.*FN)	VS	2326
V1(II)=	(F3+F4)*CH(IZ)*SN(K,MI,ISN)/(8.*FN)	VS	2327
W1(II)=	W1(II)*CC	VS	2328
V1(II)=	V1(II)*OS	VS	2329
15 CONTINUE		VS	2330
AW(J)=	W(1)+W(2)-W1(1)-W1(2)-(V(1)-V(2)+V1(1)-V1(2))	VS	2331
RW(J)=	W(1)-W(2)-W1(1)+W1(2)-(V(1)+V(2)+V1(1)+V1(2))	VS	2332
KVW=	0	VS	2333
IF(IP.EQ.1.AND.KF.NE.0) KVW=	1	VS	2334
IF(KVW.EQ.1.AND.IV(K).EQ.0) BW(J)=	BW(J)+WV(1)-WV(2)-WV(3)+WV(4)	VS	2335
1-(VW(1)+VW(2)+VW(3)+VW(4))		VS	2336
IF(J.LT.NN) GO TO	17	VS	2337
IF(J.EQ.LPANEL) GO TO	16	VS	2338
IP=	IP+1	VS	2339
IZ=	IZ+1	VS	2340
IW=	IW+1	VS	2341
IFF=	NN+1	VS	2342
NN=	NN+NK	VS	2343
IF(IWING(K).NE.0 .AND. IW.EQ.(IWING(K)+1)) GO TO	14	VS	2344
IF(J.EQ.LPAN1(K).OR.J.EQ.LPN(K)) GO TO	32	VS	2345
IF(YLE(IZ).LT.YK(K,IPN)) GO TO	17	VS	2346
14 CONTINUE		VS	2347
NJ=	0	VS	2348
IF(NASYM.EQ.1.AND.IPN.LT.NC1) NJ=	1	VS	2349
IF(NJ.EQ.1) IPN=	IPN+1	VS	2350
ZA=	ZA+(YK(K,IPN)-YA)*DS(K,IPN)	VS	2351
YAA=	YAA+(YK(K,IPN)-YA)*DC(K,IPN)	VS	2352
YA=	YK(K,IPN)	VS	2353

	IF (IWING(K).NE.0.AND.IW.EO.(IWING(K)+1)) GO TO 22	VS 2354
	GO TO 23	VS 2355
22	IF (IWGLT(K).EO.1) GO TO 23	VS 2356
32	ZA=0.	VS 2357
	YA=BREAK(K,1)	VS 2358
	YAA=BREAK(K,1)	VS 2359
	IF(NASYM.EO.1.AND.J.EO.LPAN1(K)) YA=YAP	VS 2360
	IF(NASYM.EO.1.AND.J.EO.LPAN1(K)) YAA=YAAP	VS 2361
	IF(J.EO.LPN(K).AND.K.LT.6) YA=BREAK(K+1,1)	VS 2362
	IF(J.EO.LPN(K).AND.K.LT.6) YAA=BREAK(K+1,1)	VS 2363
	IF(J.EO.LPAN1(K).OR.J.EO.LPN(K)) GO TO 23	VS 2364
	IF (IWGLT(K).NE.2) GO TO 23	VS 2365
	ZA=YK(K,NC(K)-2)*DS(K,1)	VS 2366
	YAA=YK(K,NC(K)-2)*DC(K,1)	VS 2367
	YA=YK(K,NC(K)-2)	VS 2368
23	CONTINUE	VS 2369
	IF(NJ.NE.1) IPN=IPN+1	VS 2370
	IF (J.EO.LPAN1(K).OR.J.EO.LPN(K)) IPN=1	VS 2371
17	KH=0	VS 2372
	IF(J.EO.LPAN1(K).AND.J.NE.LPN(K)) KH=1	VS 2373
	IF(KH.EO.1.AND.K.EO.1) IW=IW-NS(K)	VS 2374
	IF(KH.EO.1.AND.K.GT.1) IW=IW-NS(K)+NS(K-1)	VS 2375
	IF(J.EO.LPAN1(K)) IP=1	VS 2376
	IF(J.EO.LPN(K)) IP=1	VS 2377
16	IF (J.EO.LPN(K)) K=K+1	VS 2378
	RETURN	VS 2379
	END	VS 2380
C	FORTRAN NLSTIN	VS 2381
	SUBROUTINE UNFW (LPANEL,R1,AW,BW,NC1)	VS 2382
C	TO CALCULATE DOWNWASH COEFF. ON FUSELAGE DUE TO WINGS	VS 2383
	DIMENSION SF(10),CF(10),AW(1),W(4),RW(1)	VS 2384
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS 2385
	INCUM,NF,NT,CSF(5,10),YAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,XU	VS 2386
	COMMON /GEM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	2387
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	2388
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS	2389
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS 2390
	INFP(6),NW(6,2)	VS 2391
	COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT,	VS 2392
	1ATT,NC(6),NWING(6),IPDS(6),IALP,DUMT(3,6,15),HALFRH(6)	VS 2393
	COMMON/GD/ TINP(6),BREAK(6,10),TFLP(6,5),RINC(6),NAL(6)	VS 2394
	1,YBREAK(6,7),DCOS(6,5),DSIN(6,5),IWING(6),IWGLT(6),IV(6),LPAN1(6)	VS 2395
	1,ICAMT(6)	VS 2396
	DATA W /4*0./	VS 2397
	PI=3.14159265	VS 2398
	REWIND 03	VS 2399
	LG=1	VS 2400
	IF (NGRD .EO. 1) LG=2	VS 2401
	NASYM=YCON(50)	VS 2402

TH1=SNP(5,20)	VS 2403
NH1=SNP(5,19)	VS 2404
DO 1 I=1,NCUM	VS 2405
IF (NH1 .NE. 0 .AND. I .LE. NH1) GO TO 41	VS 2406
FI=I-NH1	VS 2407
FCUM=NCUM-NH1	VS 2408
PP=PI-TH1	VS 2409
TP=TH1	VS 2410
GO TO 42	VS 2411
41 FI=I	VS 2412
FCUM=NH1	VS 2413
PP=TH1	VS 2414
TP=0.	VS 2415
42 CONTINUE	VS 2416
T=(2.*FI-1.)*PP/(2.*FCUM)+TP	VS 2417
CF(I)=COS(T)	VS 2418
1 SF(I)=SIN(T)	VS 2419
KCON=NF+1	VS 2420
KC=NCUM	VS 2421
DO 5 I=1,KCON	VS 2422
IF (I .EQ. KCON) KC=1	VS 2423
IP=1	VS 2424
IPN=1	VS 2425
IW=1	VS 2426
K=1	VS 2427
IZ=1	VS 2428
IFF=1	VS 2429
NN=NW(K,1)	VS 2430
ZA=0.	VS 2431
YA=BREAK(K,1)	VS 2432
YAA=BREAK(K,1)	VS 2433
IF (NASYM .EQ. 0) GO TO 40	VS 2434
YA=YBREAK(K,NC1)	VS 2435
YAA=YA	VS 2436
IF (NC1 .EQ. 1) GO TO 40	VS 2437
NC11=NC1-1	VS 2438
DO 411 J=1,NC11	VS 2439
ZA=ZA+(YBREAK(K,J)-YBREAK(K,J+1))*DSIN(K,J+1)	VS 2440
411 YAA=YAA+(YBREAK(K,J)-YBREAK(K,J+1))*DCOS(K,J+1)	VS 2441
YA=YBREAK(K,I)	VS 2442
40 CONTINUE	VS 2443
YAP=YA	VS 2444
YAAP=YAA	VS 2445
DO 10 J=1,L PANEL	VS 2446
ISN=1	VS 2447
NL=NW(K,1)	VS 2448
COSD=DCOS(K,IPN)	VS 2449
SIND=DSIN(K,IPN)	VS 2450
MI=J-IFF+1	VS 2451

IF (J .GT. LPAN1(K) .AND. J .LE. LPN(K)) ISN=2	VS 2452
IF (J .GT. LPAN1(K) .AND. J .LE. LPN(K)) NL=NW(K,2)	VS 2453
CHORD=CH(IZ)	VS 2454
FN=NL	VS 2455
NK=NL	VS 2456
IF(J .GE. LPAN1(K) .AND. J .LT. LPN(K)) NK=NW(K,2)	VS 2457
IF(J .EQ. LPN(K) .AND. J .LT. LPANEL) NK=NU(K+1,1)	VS 2458
DO 15 KI=1,KC	VS 2459
IF (I .EQ. KCON) GO TO 22	VS 2460
X=XCF(I)	VS 2461
Y=RF(I)*SF(KI)	VS 2462
Z=RF(I)*CF(KI)	VS 2463
GO TO 23	VS 2464
22 X=XLEF	VS 2465
Y=0.	VS 2466
Z=0.	VS 2467
23 CONTINUE	VS 2468
X1=XN(J,1)-X	VS 2469
X2=XN(J,2)-X	VS 2470
X12=XN(J,2)-XN(J,1)	VS 2471
ISM=2	VS 2472
IF (IV(K) .EQ. 1) ISM=1	VS 2473
IF (NASYM .EQ. 1) ISM=1	VS 2474
DO 15 II=1,ISM	VS 2475
FCP=1.	VS 2476
IF (II .EQ. 2) FCP=-1.	VS 2477
W(II)=0.	VS 2478
W(II+2)=0.	VS 2479
DO 15 KK=1,LG	VS 2480
PS=SIND	VS 2481
PC=COSD	VS 2482
Y12=YN(J,2)-YN(J,1)	VS 2483
Z12=ZN(J,2)-ZN(J,1)+Y12*PS	VS 2484
Y12=Y12*PC	VS 2485
YC=Y*FCP	VS 2486
Y1=YAA+(YN(J,1)-YA)*PC-YC	VS 2487
Y2=YAA+(YN(J,2)-YA)*PC-YC	VS 2488
XYK=X1*Y12-Y1*X12	VS 2489
IF (KK .EQ. 1) GO TO 18	VS 2490
ZC=-2.*(Z+HEIGHT)+Z	VS 2491
FCON=1.	VS 2492
GO TO 19	VS 2493
18 ZC=Z	VS 2494
FCON=0.	VS 2495
19 CONTINUE	VS 2496
Z1=ZN(J,1)-ZC+ZA+(YN(J,1)-YA)*PS	VS 2497
Z2=ZN(J,2)-ZC+ZA+(YN(J,2)-YA)*PS	VS 2498
XZJ=X1*Z12-Z1*X12	VS 2499
UCOM=-Z1*Y12*(-ATT)*FCON	VS 2500

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Y7I=Y1*Z12-Z1*Y12	VS	2501
ALB1=XYK*XYK+X7J*XZJ+B1*YZI*YZI	VS	2502
R1B1=SQRT(X1*X1+B1*Y1*Y1+B1*Z1*Z1)	VS	2503
R2B1=SQRT(X2*X2+B1*Y2*Y2+B1*Z2*Z2)	VS	2504
UUB1=(X2*X12+B1*Y2*Y12+B1*Z2*Z12)/R2B1-(X1*X12+B1*Y1*Y12+B1*Z1*Z12)/R1B1	VS	2505
G1B1=(1.-X1/R1B1)/(Y1*Y1+Z1*Z1)	VS	2506
G2B1=(1.-X2/R2B1)/(Y2*Y2+Z2*Z2)	VS	2507
F12=UUB1*(UCDM+XYK)/ALB1	VS	2508
G12=-Y2*G2B1+Y1*G1B1	VS	2509
IF(IP.EQ.1.AND.IV(K).EQ.1) G12=-Y2*G2B1	VS	2510
IF (I .EQ. KCON) GO TO 30	VS	2511
F13=UUB1*XZJ/ALB1	VS	2512
G13=Z2*G2B1-Z1*G1B1	VS	2513
IF(IP.EQ.1.AND.IV(K).EQ.1) G13=Z2*G2B1	VS	2514
F1=-F13*SF(KI)*FCP+F12*CF(KI)	VS	2515
F2=G13*SF(KI)*FCP+G12*CF(KI)	VS	2516
GO TO 17	VS	2517
30 F1=F12	VS	2518
F2=G12	VS	2519
17 W(II+2)=W(II+2)+(F1+F2)*CHORD*SN(K,MI,ISN)/(R.*FN)	VS	2520
IF (IP .NF. 1) GO TO 16	VS	2521
G12=-Y2*G2B1	VS	2522
G13=Z2*G2B1	VS	2523
F2=G13*SF(KI)*FCP+G12*CF(KI)	VS	2524
IF (I .EQ. KCON) F2=G12	VS	2525
16 W(II)=W(II)+(F1+F2)*CHORD*SN(K,MI,ISN)/(R.*FN)	VS	2526
IF (I .EQ. KCON) GO TO 15	VS	2527
AW(KI)=W(1)+W(2)	VS	2528
BW(KI)=W(3)-W(4)	VS	2529
15 CONTINUE	VS	2530
IF (I .EQ. KCON) GO TO 25	VS	2531
WRITE (03) (AW(KK),KK=1,NCUM)	VS	2532
WRITE (03) (BW(KK),KK=1,NCUM)	VS	2533
GO TO 26	VS	2534
25 AW(J)=W(1)+W(2)	VS	2535
26 CONTINUE	VS	2536
IF (J .LT. NN) GO TO 27	VS	2537
IF (J .EQ. LPANEL) GO TO 10	VS	2538
IP=IP+1	VS	2539
IZ=IZ+1	VS	2540
IFF=NN+1	VS	2541
NN=NN+NK	VS	2542
IW=IW+1	VS	2543
IF(IWING(K) .NE. 0 .AND. IW .EQ. (IWING(K)+1)) GO TO 14	VS	2544
IF (J .EQ. LPAN1(K) .OR. J .EQ. LPN(K)) GO TO 32	VS	2545
IF (YLE(IZ) .LT. YBREAK(K,IPN)) GO TO 27	VS	2546
14 CONTINUE	VS	2547
NJ=0	VS	2548
	VS	2549

	IF (NASYM .EQ. 1 .AND. IPN .LT. NC1) NJ=1	VS 2550
	IF (NJ .EQ. 1) IPN=IPN+1	VS 2551
	ZA=ZA+(YBREAK(K,IPN)-YA)*DSIN(K,IPN)	VS 2552
	YAA=YAA+(YBREAK(K,IPN)-YA)*DCOS(K,IPN)	VS 2553
	YA=YBREAK(K,IPN)	VS 2554
	IF (IWING(K).NE.0 .AND. IW.EQ.(IWING(K)+1)) GO TO 52	VS 2555
	GO TO 53	VS 2556
52	IF (IWGLT(K) .EQ. 1) GO TO 53	VS 2557
32	ZA=0.	VS 2558
	YA=BREAK(K,1)	VS 2559
	YAA=BREAK(K,1)	VS 2560
	IF (NASYM.EQ.1.AND.J.EQ.LPAN1(K)) YA=YAP	VS 2561
	IF (NASYM.EQ.1.AND.J.EQ.LPAN1(K)) YAA=YAAP	VS 2562
	IF (J.EQ.LPN(K).AND.K.LT.6) YA=RPEAK(K+1,1)	VS 2563
	IF (J.EQ.LPN(K).AND.K.LT.6) YAA=BREAK(K+1,1)	VS 2564
	IF (J .EQ. LPAN1(K) .OR. J .EQ. LPN(K)) GO TO 53	VS 2565
	IF (IWGLT(K) .NE. 2) GO TO 53	VS 2566
	ZA=YBREAK(K,NC(K)-2)*DSIN(K,1)	VS 2567
	YAA=YBREAK(K,NC(K)-2)*DCOS(K,1)	VS 2568
	YA=YBREAK(K,NC(K)-2)	VS 2569
53	CONTINUE	VS 2570
	IF (NJ .NE. 1) IPN=IPN+1	VS 2571
	IF (J .EQ. LPAN1(K) .OR. J .EQ. LPN(K)) IPN=1	VS 2572
27	KH=0	VS 2573
	IF (J .EQ. LPAN1(K) .AND. J .NE. LPN(K)) KH=1	VS 2574
	IF (KH .EQ. 1 .AND. K .EQ. 1) IW=IW-NS(K)	VS 2575
	IF (KH .EQ. 1 .AND. K .GT. 1) IW=IW-NS(K)+NS(K-1)	VS 2576
	IF (J.EQ.LPAN1(K)) IP=1	VS 2577
	IF (J.EQ.LPN(K)) IP=1	VS 2578
10	IF (J .EQ. LPN(K)) K=K+1	VS 2579
	IF (I .NE. KCON) GO TO 5	VS 2580
	WRITE (03) (AW(KK),KK=1,LPANEL)	VS 2581
5	CONTINUE	VS 2582
	RETURN	VS 2583
	END	VS 2584
C	FORTRAN NLSTIN	VS 2585
	SUBROUTINE VLFUS (LPANEL,AW,CW,AM,LPAN1,IWING,NC1,DCOS,DSIN,NASYMVS	2586
	1,YK,LPN,NS,IWGLT,NC,PREAK)	VS 2587
C	TO MANIPULATE VELOCITY COMPUTATIONS DUE TO FUSELAGE	VS 2588
	DIMENSION PREAK(6,1)	VS 2589
	DIMENSION DCOS(6,1),DSIN(6,1),YK(6,1),LPN(1),NS(1),IWGLT(1),NC(1)	VS 2590
	DIMENSION AW(1),BW(20),CW(1),SSF(5,10),DW(50),LPAN1(1),IWING(1)	VS 2591
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),	VS 2592
	IXTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	2593
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS	2594
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),NJW2(6,2,5),NJW(6,5),NFVS	2595
	1P(6),NW(6,2)	VS 2596
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS 2597
	INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,XU	VS 2598

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REWIND 02	VS	2599
REWIND 04	VS	2600
B=1.-AM*AM	VS	2601
PI=3.14159265	VS	2602
TH1=SNP(5,20)	VS	2603
NH1=SNP(5,19)	VS	2604
NTL=NT*NF	VS	2605
NG=NF	VS	2606
DO 2 I=1,NT	VS	2607
FI=I	VS	2608
DO 2 K=1,NCUM	VS	2609
IF (NH1 .NE. 0 .AND. K .LE. NH1) GO TO 9	VS	2610
FK=K-NH1	VS	2611
FCUM=NCUM-NH1	VS	2612
PP=PI-TH1	VS	2613
TP=TH1	VS	2614
GO TO 11	VS	2615
9 FK=K	VS	2616
FCUM=NH1	VS	2617
PP=TH1	VS	2618
TP=0.	VS	2619
11 CONTINUE	VS	2620
TA=(2.*FK-1.)*PP/(2.*FCUM)+TP	VS	2621
2 SSF(I,K)=SIN(FI*TA)	VS	2622
IZ=1	VS	2623
ISTP=1	VS	2624
MM=NW(1,1)	VS	2625
NN=NW(1,1)	VS	2626
IPN=1	VS	2627
L=1	VS	2628
ZR=0.	VS	2629
YB=BREAK(1,1)	VS	2630
YBB=BREAK(1,1)	VS	2631
IF(NASYM.EQ.0) GO TO 6	VS	2632
YB=YK(1,NC1)	VS	2633
YBB=YB	VS	2634
IF(NC1.EQ.1) GO TO 6	VS	2635
N11=NC1-1	VS	2636
DO 7 I=1,N11	VS	2637
ZB=ZB+(YK(1,I)-YK(1,I+1))*DSIN(1,I+1)	VS	2638
7 YBB=YBB+(YK(1,I)-YK(1,I+1))*DCOS(1,I+1)	VS	2639
YB=YK(1,1)	VS	2640
6 CONTINUE	VS	2641
YBP=YB	VS	2642
YBBP=YBB	VS	2643
DO 1 I=1,LPANEL	VS	2644
CSD=DCOS(L,IPN)	VS	2645
SSD=DSIN(L,IPN)	VS	2646
X=XCP(I)	VS	2647

Y=YBB+(YCP(I)-YB)*CSD	VS 2648
Z=ZCP(I)+ZB+(YCP(I)-YB)*SSD	VS 2649
CW(1)=0.	VS 2650
CALL UNWF(B,X,Y,Z,AW,CW,CSD,SSD)	VS 2651
WRITE(02) (AW(K),K=1,NTL)	VS 2652
WRITE(04) (CW(K),K=1,NTL)	VS 2653
IF(I.GE.LPAN1(L).AND.I.LT.LPN(L)) NN=NW(L,2)	VS 2654
IF(I.EQ.LPN(L).AND.I.LT.LPANEL) NN=NW(L+1,1)	VS 2655
IF(I.LT.MM) GO TO 8	VS 2656
MM=MM+NN	VS 2657
ISTP=ISTP+1	VS 2658
IZ=IZ+1	VS 2659
IF(IWING(L).NE.0.AND.ISTP.EQ.(IWING(L)+1)) GO TO 33	VS 2660
IF(I.EQ.LPAN1(L).OR.I.EQ.LPN(L)) GO TO 33	VS 2661
IF(ISTP.EQ.(NS(L)+1)) GO TO 36	VS 2662
IF(YLE(IZ).LT.YK(L,IPN)) GO TO 8	VS 2663
33 CONTINUE	VS 2664
NI=0	VS 2665
IF(NASYM.EQ.1.AND.IPN.LT.NC1) NI=1	VS 2666
IF(NI.EQ.1) IPN=IPN+1	VS 2667
ZB=ZB+(YK(L,IPN)-YB)*DSIN(L,IPN)	VS 2668
YBB=YBB+(YK(L,IPN)-YB)*DCOS(L,IPN)	VS 2669
YB=YK(L,IPN)	VS 2670
IF(IWING(L).NE.0.AND.ISTP.EQ.(IWING(L)+1)) GO TO 34	VS 2671
IF(I.EQ.LPAN1(L).OR.I.EQ.LPN(L)) GO TO 36	VS 2672
GO TO 35	VS 2673
34 IF(IWGLT(L).EQ.1) GO TO 35	VS 2674
36 7R=0.	VS 2675
YB=BREAK(L,1)	VS 2676
YBB=BREAK(L,1)	VS 2677
IF(NASYM.EQ.1.AND.I.EQ.LPAN1(L)) YB=YBP	VS 2678
IF(NASYM.EQ.1.AND.I.EQ.LPAN1(L)) YBB=YBBP	VS 2679
IF(I.EQ.LPN(L).AND.L.LT.4) YB=BREAK(L+1,1)	VS 2680
IF(I.EQ.LPN(L).AND.L.LT.6) YBB=BREAK(L+1,1)	VS 2681
IF(I.EQ.LPN(L)) GO TO 35	VS 2682
IF(ISTP.EQ.(NS(L)+1)) GO TO 35	VS 2683
IF(IWGLT(L).NE.2) GO TO 35	VS 2684
ZB=YK(L,NC(L)-2)*DSIN(L,1)	VS 2685
YBB=YK(L,NC(L)-2)*DCOS(L,1)	VS 2686
YB=YK(L,NC(L)-2)	VS 2687
35 CONTINUE	VS 2688
IF(NI.NE.1) IPN=IPN+1	VS 2689
IF(I.EQ.LPAN1(L).OR.I.EQ.LPN(L)) IPN=1	VS 2690
8 KH=0	VS 2691
IF(I.EQ.LPAN1(L).AND.I.NE.LPN(L)) KH=1	VS 2692
IF(KH.EQ.1.AND.L.EQ.1) IZ=IZ-NS(L)	VS 2693
IF(KH.EQ.1.AND.L.GT.1) IZ=IZ-NS(L)+NS(L-1)	VS 2694
IF(I.EQ.LPN(L).AND.NW(L,2).NE.0) KH=2	VS 2695
IF(KH.EQ.2.AND.L.EQ.1) IZ=IZ+NS(L)	VS 2696

	IF(KH.EQ.2.AND.L.GT.1) IZ=IZ+NS(L)-NS(L-1)	VS 2697
	IF(KH.EQ.1.AND.L.EQ.1) ISTEP=ISTP-NS(L)	VS 2698
	IF(KH.EQ.1.AND.L.GT.1) ISTEP=ISTP-NS(L)+NS(L-1)	VS 2699
	IF(I.EQ.LPN(L)) L=L+1	VS 2700
1	CONTINUE	VS 2701
	CALL UNFW (LPANEL,B,AW,DW,NC1)	VS 2702
	DO 5 I=1,NT	VS 2703
	REWIND 03	VS 2704
	N=I	VS 2705
	DO 10 J=1,NF	VS 2706
	JJ=J	VS 2707
	DO 15 K=1,LPANEL	VS 2708
	READ (03) (BW(KK),KK=1,NCUM)	VS 2709
	READ (03) (DW(KK),KK=1,NCUM)	VS 2710
	AN=0.	VS 2711
	BN=0.	VS 2712
	DO 20 KK=1,NCUM	VS 2713
	IF(NH1.NE.0.AND.KK.LE.NH1) GO TO 12	VS 2714
	FCUM=NCUM-NH1	VS 2715
	PP=PI-TH1	VS 2716
	GO TO 13	VS 2717
12	FCUM=NH1	VS 2718
	PP=TH1	VS 2719
13	CONTINUE	VS 2720
	BN=BN+DW(KK)*SSF(I,KK)*PP/FCUM	VS 2721
20	AN=AN+BW(KK)*CSF(I,KK)*PP/FCUM	VS 2722
	AN=AN*2./PI	VS 2723
	BN=BN*2./PI	VS 2724
	CW(K)=BN*RF(J)**(I+1)	VS 2725
15	AW(K)=AN*RF(J)**(I+1)	VS 2726
	CALL FUSELA (NG,BW,N,JJ,XAS,XTEF,XF,XCF,RF,P,SNP,NKF)	VS 2727
	DO 25 KK=1,NTL	VS 2728
	N1=(I-1)*NF+1	VS 2729
	N2=I*NF	VS 2730
	NB=KK+LPANEL	VS 2731
	IF (KK .GE. N1 .AND. KK .LE. N2) GO TO 26	VS 2732
	AW(NB)=0.	VS 2733
	CW(NB)=0.	VS 2734
	GO TO 25	VS 2735
26	NK=KK-N1+1	VS 2736
	AW(NB)=BW(NK)	VS 2737
	CW(NB)=BW(NK)	VS 2738
25	CONTINUE	VS 2739
	WRITE (04) (CW(K),K=1,LWF)	VS 2740
10	WRITE (02) (AW(K),K=1,LWF)	VS 2741
5	CONTINUE	VS 2742
	RETURN	VS 2743
	END	VS 2744
C	FORTRAN NLSTIN	VS 2745

	SUBROUTINE FALONE(B,CS,AW,CA,GAMMA)	VS	2746
	TO CALCULATE THE SOURCE DISTRIBUTION FOR THE FUSELAGE VOLUME	VS	2747
C	EFFECT	VS	2748
C	DIMENSION AW(1),CA(1),GAMMA(1)	VS	2749
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS	2750
	INCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,X1	VS	2751
	N=0	VS	2752
	PI=3.14159265	VS	2753
	NI=NF	VS	2754
	NF1=NF+1	VS	2755
	S=XTEF-XLEF	VS	2756
	DO 5 I=1,NF	VS	2757
	IJ=I	VS	2758
	XS=XCF(IJ)-XTEF	VS	2759
	IF(I.EQ.NF) RFL=0.	VS	2760
	IF(I.NE.NF) RFL=XS/SORT(XS*XS+R*PF(IJ)*PF(IJ))	VS	2761
	CALL FUSELA(NI,AW,N,IJ,XAS,XTEF,XF,XCF,RF,B,SNP,NKF)	VS	2762
	XD=XCF(IJ)	VS	2763
	XEF=XCF(IJ)-XLEF	VS	2764
	AW(NF1)=-SLOP(XD)*CS-(RFL-XEF/SORT(XEF*XEF+R*RF(IJ)*RF(IJ)))	VS	2765
	1*FO/(4.*PI)	VS	2766
	IF(I.NE.1) GO TO 10	VS	2767
	DO 15 K=1,NF	VS	2768
15	GAMMA(K)=-AW(K+1)/AW(1)	VS	2769
	NJ=NF-1	VS	2770
	GO TO 5	VS	2771
10	CALL VMSEQN(NJ,IJ,AW,GAMMA,CA)	VS	2772
	NJ=NJ-1	VS	2773
5	CONTINUE	VS	2774
	DO 12 I=1,NF	VS	2775
12	WARD(I)=GAMMA(I)	VS	2776
	RETURN	VS	2777
	END	VS	2778
C	LINK LINK33,LINK22	VS	2779
C	FORTRAN NLSTIN	VS	2780
	SUBROUTINE SOLUTN	VS	2781
C	TO MANIPULATE AND OBTAIN THE TOTAL AERODYNAMIC RESULTS	VS	2782
	DIMENSION GAMMA(10105)	VS	2783
	DIMENSION AW(200),CA(201),DPM(50)	VS	2784
	COMMON/LOOP/KP,NALP,KALP,TANC2,CLDS,AL,CLII,ALPII,ALPA(15)	VS	2785
	COMMON /DSL/ CTP(6,2),CHOPDT(6,4),SCH(200),LAT,CREF,BREF2	VS	2786
	COMMON/GD/ TINP(6),BREAK(6,10),TFLP(6,5),PINC(6),NAL(6)	VS	2787
	1,YBREAK(6,7),DCOS(6,5),DSIN(6,5),IHING(6),IWGLT(6),IV(6),LPAN1(6)	VS	2788
	1,ICAMT(6)	VS	2789
	COMMON /AJG/ ALP,J1,CP(200),GAMP(200),GAMB(200),GAMR(200)	VS	2790
	1,GAMX(200),ZZCP(200),DZY(200),BMR(6,50),BML(6,50),CSU(50)	VS	2791
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),	VS	2792
	1XLL(41)	VS	2793
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),	VS	2794

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1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS 2795
200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS 2796
COMMON /AERO/ AM,B,CL(50),CT(50),CD(50),CM(50) VS 2797
COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5), VS 2798
1NFP(6),NW(6,2) VS 2799
COMMON /CAMB/ ICAM(6),IM(6,10),XT(6,10,21),AAM(6,10,20),BPM(6,10, VS 2800
120),CCH(6,10,20),DDM(6,10,20),YT(6,10),CURV(6,10),CHND(6,10) VS 2801
COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT, VS 2802
1ATT,NC(6),NWIN(6),IPOS(6),IALP,DUHT(3,6,15),HALFBH(6) VS 2803
COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),B2,NCG,CTG(15),STG(1VS 2804
15),DIST,P,BK,RL,CFE VS 2805
COMMON /LEFLP/ YLEF(6,10,2),XNF(6,10),YNF(6,10),ZNF(6,10),XLF(6,10VS 2806
1,4),YLF(6,10,4),SLP1(6,10) VS 2807
COMMON /TWST1/ NYM(6),YTS(6,21),AY(6,20),BY(6,20),CCY(6,20),DY(6, VS 2808
120) VS 2809
COMMON/SHPLE/ NLE,YSL(15),AQL(14),BOL(14),COL(14),DOL(14) VS 2810
COMMON/SHPTE/ NTE,YST(15),AOT(14),BOT(14),COT(14),DOT(14) VS 2811
COMMON /SSS/ NASYM,NSUR,LPANEL,ICAMB,NUMS,IAGVX,PT VS 2812
1,NAUG,IBD,PRK,PIS,IDIH,ALPINC,IRL,KT,PI,ALO,ALZ VS 2813
2,NC1,NC2,IBLC VS 2814
COMMON/SL/ COSA,SINA,MZ,CTX,YBRK,ZBK,GW,LATT VS 2815
COMMON/GDSL/ DF(6,5),YCN(6,4),NLEF(6),NVRTX(6),SNALP(50),CNALP(50)VS 2816
1,ALPH(50),AUX(6,5),CPX(6,5),XTILT(6),SLETH(6),YCNTD(6) VS 2817
1,NVL1(6),NVL2(6),XCNTD(6),CTILT(6),SWPP(6,5),RC(6,50),XPEF VS 2818
1,BUX(6,5),SE(3,6,15),NUR(6),CVR(50),CPAUG(200) VS 2819
1,ALPBD(6,2),MX(6),ALBDBR(6,2),ALBDRL(6,2),NVRTX(6) VS 2820
COMMON /INDUT/ INPT,JPT VS 2821
2 FORMAT (8F10.6) VS 2822
LWF=CPAUG(200) VS 2823
DO 115 I=1,LWF VS 2824
115 GAMMA(I)=CP(I) VS 2825
NPP=NALP VS 2826
CL(50)=XREF VS 2827
CM(50)=NSUR VS 2828
YCON(50)=NASYM VS 2829
CALL THRUST (LPANEL,GAMMA,SNALP,LPAN1,ICAM,ICAMB,NLEF,NAL, VS 2830
1IV,IWING,YBREAK,DCOS,DSIN,CSU,IWGLT,0,0,0,0, VS 2831
2CNALP,TFLP,NC1,KT,RC,ICAMT,SWPP,IBLC,GAMP,PREAK) VS 2832
WRITE(JPT,2) (CT(I),I=1,NCS) VS 2833
DO 187 I=1,NCS VS 2834
BMP(1,I)=CT(I)-ABS(CSU(I)) VS 2835
BML(1,I)=CM(I) VS 2836
187 Y(1,I)=CD(I) VS 2837
NL=1 VS 2838
KCH=1 VS 2839
K=1 VS 2840
LL=1 VS 2841
C CALCULATION OF SUCTION FROM THRUST VS 2842
DO 2201 I=1,NCS VS 2843

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JZ=2	VS 2844
IF(NLEF(K).EQ.1) JZ=1	VS 2845
SDD=XLL(I)	VS 2846
COD=XTT(I)	VS 2847
IF(NW(K,2).EQ.0) GO TO 2202	VS 2848
IF(K.EQ.1) II=KCH+NS(K)	VS 2849
IF(K.GT.1) II=KCH+NS(K)-NS(K-1)	VS 2850
CHL=CH(KCH)+CH(II)	VS 2851
GO TO 2203	VS 2852
2202 CHL=CH(KCH)	VS 2853
2203 CONTINUE	VS 2854
CHORD=CHL	VS 2855
DZDY=0.	VS 2856
TSW=SIN(SWEEP(KCH))/COS(SWEEP(KCH))	VS 2857
IF(IALP.EQ.1) GO TO 2200	VS 2858
IF(IWING(K).NE.0.AND.I.GT.IWING(K)) GO TO 2205	VS 2859
IF(ICAM(K).EQ.2) GO TO 2210	VS 2860
XC=0.	VS 2861
IF(ICAM(K).EQ.3) XC=XLE(KCH)	VS 2862
Z1=XC	VS 2863
CALL ZCR(XC,YLE(KCH),CAMLE,ICAM,Z1,K,1,CHORD,DZDY,IST,TSW)	VS 2864
IF(NLEF(K).EQ.0) GO TO 2220	VS 2865
IF(LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 2225	VS 2866
GO TO 2220	VS 2867
2225 CAMLE=CAMLE+TFLP(K,NL)	VS 2868
GO TO 2220	VS 2869
2210 YC=YLE(KCH)	VS 2870
XC=XLE(KCH)	VS 2871
CALL ZCDX(XC,YC,CAMLE,DZDY)	VS 2872
Z1=YC	VS 2873
2220 EP=ALPH(I)	VS 2874
XCS=COS(EP)	VS 2875
XSS=SIN(EP)	VS 2876
GO TO 2230	VS 2877
2200 XCS=1.	VS 2878
XSS=0.	VS 2879
CAMLE=0.	VS 2880
GO TO 2230	VS 2881
2205 CAMLE=0.	VS 2882
ICT=ICAM(K)	VS 2883
IF(ICT.NE.0) CALL ZCR(XC,YLE(KCH),CAMLE,ICAM,Z1,K,ICT,	VS 2884
1CHORD,DZDY,IST,TSW)	VS 2885
XCS=COS(ALPH(I))	VS 2886
XSS=SIN(ALPH(I))	VS 2887
IF(NLEF(K).EQ.0) GO TO 2230	VS 2888
IF(LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 2235	VS 2889
GO TO 2230	VS 2890
2235 CAMLE=CAMLE+TFLP(K,NL)	VS 2891
2230 CONTINUE	VS 2892

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CAMY=DZDY	VS 2893
DZDY=0.	VS 2894
IF(ICAM(K).LE.1) Z1=0.	VS 2895
FS=COS(SWEEP(KCH))	VS 2896
SSN=SIN(SWEEP(KCH))	VS 2897
TAN=SSN/FS	VS 2898
FTAN=TAN	VS 2899
F1=SQRT(1.+(CAMLE**2+DZDY**2)*COD*COD)	VS 2900
F2=SQRT((1.+FTAN*FTAN)*COD*COD+((CAMLE*FTAN+DZDY)*COD+SOD)**2)	VS 2901
F12=F1*F2	VS 2902
F3=1.+(DZDY*COD+SOD)*((CAMLE*FTAN+DZDY)*COD+SOD)	VS 2903
F4=-CAMLE*COD*COD+(DZDY*COD+SOD)*FTAN*COD	VS 2904
IF(ABS(COD).GT.0.1)F5=F12/SQRT(F3*F3+F4*F4)	VS 2905
IF(ABS(COD).LE.0.1)F5=1./FS	VS 2906
CSU(I)=CSU(I)*F5	VS 2907
DMM(I)=CSU(I)*CHL	VS 2908
BMR(6,I)=CL(I)/FS*CHL	VS 2909
X(14,I)=F5	VS 2910
X(13,I)=CHL	VS 2911
X(11,I)=XLE(KCH)	VS 2912
KCH=KCH+1	VS 2913
LL=LL+NW(K,1)	VS 2914
IF(I.NE.NS(K)) GO TO 2231	VS 2915
IF(NW(K,2).EQ.0) GO TO 2231	VS 2916
IF(K.EQ.1) GO TO 2232	VS 2917
KCH=KCH+NS(K)-NS(K-1)	VS 2918
LL=LL+(NS(K)-NS(K-1))*NW(K,2)	VS 2919
GO TO 2231	VS 2920
2232 KCH=KCH+NS(K)	VS 2921
LL=LL+NS(K)*NW(K,2)	VS 2922
2231 CONTINUE	VS 2923
IF((LL+NW(K,1)-1).EQ.MJW2(K,2,NL)) NL=NL+1	VS 2924
2201 IF(I.EQ.NS(K)) K=K+1	VS 2925
C WRITE (JPT,2) (DMM(I),I=1,NCS)	VS 2926
DO 901 I=1,LWF	VS 2927
901 CPAUG(I)=0.	VS 2928
DO 908 I=1,NCS	VS 2929
908 CVR(I)=0.	VS 2930
C	VS 2931
C VORTEX LIFT AUGMENTATION	VS 2932
C ONLY ONE INBOARD VORTEX PRODUCING LIFT AUGMENTATION IS ALLOWED.	VS 2933
GW=0.	VS 2934
MZ=0	VS 2935
IF(NUMS.EQ.0) GO TO 900	VS 2936
IF(TALP.EQ.1) GO TO 900	VS 2937
IF(NVL2(1).EQ.NS(1)) GO TO 900	VS 2938
IF(TAGVX.EQ.0) GO TO 900	VS 2939
IF(ALP.LT.0.0001) GO TO 900	VS 2940
DO 906 I=1,NCS	VS 2941

	BMR(3,I)=X(15,I)	VS	2942
906	BMR(2,I)=DMM(I)	VS	2943
	KD=1	VS	2944
	N1=NVL1(1)	VS	2945
	N2=NVL2(1)	VS	2946
	IF(N1.GT.1) KD=2	VS	2947
	X2=AUX(1,KD)	VS	2948
	SLK=SLETH(1)	VS	2949
	Y2=YCNTD(1)	VS	2950
	TAN1=SIN(SWFEP(N1))/COS(SWEEP(N1))	VS	2951
	TAN2=SIN(SWEEP(N2))/COS(SWEEP(N2))	VS	2952
	AP=SNALP(1)*0.5*(TAN1+TAN2)	VS	2953
	ZVV=VERCOR(AP)	VS	2954
	Z2=WIDTH(1,KD)*ZVV	VS	2955
	Z2=0.	VS	2956
C	WRITE(JPT,2) X2,Y2,Z2,B2	VS	2957
	KCOT=1	VS	2958
	KCT=0	VS	2959
904	CONTINUE	VS	2960
	CALL SPNINT(NVL1(1),NVL2(1),NS,DMM,SJ,SWEEP,M1,X,GM,WIDTH,GW)	VS	2961
	IF(KCT.EQ.1) GO TO 896	VS	2962
	GM=GM/SLK	VS	2963
	PSI(KCOT)=GM	VS	2964
C	USE AITKEN'S FORMULA TO EXTRAPOLATE	VS	2965
	IF(KCOT.GE.3) GM=(PSI(KCOT-2)*PSI(KCOT)-PSI(KCOT-1)**2)/(PSI(KCOT	VS	2966
	1-2)-2.*PSI(KCOT-1)+PSI(KCOT))	VS	2967
	PSI(KCOT)=GM	VS	2968
C	WRITE(JPT,2) GM	VS	2969
	CALL AUGVOR(AW,CA,CPAUG,GM,L PANEL,Y2,Y2,Z2,B2,ZZCP,XCP,YCP,0)	VS	2970
	SLOPE(15)=X2	VS	2971
	SLOPE(14)=Y2	VS	2972
	SLOPE(13)=Z2	VS	2973
	SLOPE(12)=GM	VS	2974
	SLOPE(11)=GW	VS	2975
	IF(KCOT.EQ.1) TGM=GM	VS	2976
	MZ=10	VS	2977
	CALL THRUST(L PANEL,CPAUG,SNALP,L PAN1,ICAM,ICAMP,NLEF,NAL,IV,IWING,VS	2978	
	1YBREAK,DCOS,DSIN,CVR,IWGLT,MZ,0.,0.,0.,CNALP,TFLP,NC1,KT,RC,ICAMT,VS	2979	
	2SWPP,IBLC,GAMP,BREAK)	VS	2980
C	WRITE(JPT,2) (CVR(I),I=1,NCS)	VS	2981
	DO 905 I=1,NCS	VS	2982
	FC=1.	VS	2983
	IF(CVR(I).LT.0.) FC=-1.	VS	2984
	FCC=1.	VS	2985
	CUI=CT(I)*X(14,I)	VS	2986
	IF(CUI.LT.0.) FCC=-1.	VS	2987
	CVR(I)=CVR(I)*X(14,I)	VS	2988
	CU=2.*FC+FCC*SQRT(ABS(CUI*CVR(I))+ABS(CVP(I)))	VS	2989
	CVR(I)=FCC*CU	VS	2990

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IF(KCOT.GE.6) GO TO 905	VS	2991
DMM(I)=BMR(2,I)+CVR(I)*X(13,I)	VS	2992
X(15,I)=BMR(3,I)+CL(I)	VS	2993
905 CONTINUE	VS	2994
ERR=1.	VS	2995
IF(KCOT.GE.2) ERR=ABS((PSI(KCOT)-PSI(KCOT-1))/PSI(KCOT-1))	VS	2996
IF(ERR.LE.0.03) GO TO 897	VS	2997
KCOT=KCOT+1	VS	2998
IF(KCOT.LE.6) GO TO 904	VS	2999
897 CONTINUE	VS	3000
KCT=1	VS	3001
GO TO 904	VS	3002
896 CONTINUE	VS	3003
DO 907 I=1,NCS	VS	3004
DMM(I)=BMR(2,I)+CVR(I)*X(13,I)	VS	3005
907 Y(1,I)=Y(1,I)+CD(I)	VS	3006
DO 913 I=1,L PANEL	VS	3007
913 GAMMA(I)=GAMMA(I)+CPAUG(I)	VS	3008
SLOPE(12)=TGM	VS	3009
900 CONTINUE	VS	3010
C	VS	3011
C SIDE-EDGE SUCTION AND STREAMWISE VORTEX DENSITY	VS	3012
C	VS	3013
CM(50)=NSUR	VS	3014
CALL GAMAX (AW,CA,L PANI,L PANEL,GAMMA,BREAK,CHORDT,IWING, YCN,CTP,	VS	3015
1 CTX,IWGLT,0,SE,1)	VS	3016
DO 188 I=1,L PANEL	VS	3017
188 GAMX(I)=CA(I)	VS	3018
DO 1352 I=1,NSUR	VS	3019
NCW=NW(I,1)+NW(I,2)	VS	3020
DO 1352 J=1,NCW	VS	3021
Y(4+I,J)=SE(1,I,J)	VS	3022
1352 IF(IWING(I).NE.0.OR.NASYM.EQ.1) Y(10+I,J)=DUMT(1,I,J)	VS	3023
COSA=COS(ALP)	VS	3024
SINA=SIN(ALP)	VS	3025
IF(IRL.EQ.1) P=PT*COSA	VS	3026
IF(IRL.EQ.1) RL=PT*SINA	VS	3027
IF(RL.LT.1.E-5) RL=0.1	VS	3028
IF(LAT.NE.0) CALL LATERL (GAMMA,AW,CA,LAT,L PANEL,L PANI,DF,NAL,	VS	3029
1 YBREAK,DSIN,DCOS,IWING,IWGLT,NPP,ALP,GAMP,GAMB,GAHR,CP,GAMX,BREAK,	VS	3030
2 CHORDT, YCN,SNALP,CNALP,DZY,NLEF,NC1,SWPP,IRLC,CFF,IV,ICAM,ICAMB,	VS	3031
3 KT,RC,SE,ICAMT,NVL1,NVL2,DMM,ZZCP,MZ,NAUG)	VS	3032
DO 5 I=1,LWF	VS	3033
5 SCH(I)=GAMMA(I)	VS	3034
IF(LAT.NE.(-1)) GO TO 1350	VS	3035
DO 1351 I=1,NCS	VS	3036
1351 GAMP(I)=CD(I)	VS	3037
1350 CONTINUE	VS	3038
IF(LAT.EQ.(-1)) GO TO 117	VS	3039

	DO 118 I=1,LWF	VS 3040
118	SCH(I)=0.	VS 3041
117	CONTINUE	VS 3042
	LATT=LAT	VS 3043
	IF(NASYM.EQ.1.AND.LAT.NE.1) LAT=-1	VS 3044
	DO 914 I=1,NCS	VS 3045
	CT(I)=ABS(CT(I))	VS 3046
914	CL(I)=DMM(I)	VS 3047
	RETURN	VS 3048
	END	VS 3049
C	FORTRAN NLSTIN	VS 3050
	SUBROUTINE THRUST (LPANEL,GAMMA,SNALP,LPAN1,ICAM,ICAMB,NLEF,NAL,	VS 3051
	1IV,IWING,YK,DC,DS,CSU,IWGLT,KZ,P,BK,RL,CNALP,FLP,NC1,KT,RC,ICAMT,	VS 3052
	2 SWPP,IBLC,GAM,BREAK)	VS 3053
C	TO CALCULATE L.E. THRUST	VS 3054
	DIMENSION SWPP(6,1),GAM(1),AW(50),BW(50),BREAK(6,1)	VS 3055
	DIMENSION GAMMA(1),SNALP(1),YK(6,1),DC(6,1),DS(6,1),CSU(1)	VS 3056
	DIMENSION CNALP(1),FLP(6,1),RC(6,1),ICAMT(1)	VS 3057
	DIMENSION ICAM(1),NLEF(1),NAL(1),IV(1),IWING(1),IWGLT(1),LPAN1(1)	VS 3058
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	3059
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	3060
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS	3061
	COMMON /AFRO/ AM,R,CL(50),CT(50),CD(50),CM(50)	VS 3062
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS 3063
	1NFP(6),NW(6,2)	VS 3064
	COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT,	VS 3065
	1ATT,NC(6),NWING(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS 3066
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),VS	3067
	1XLL(41)	VS 3068
	COMMON /INOUT/ INPT,JPT	VS 3069
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS 3070
	1NCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,XU	VS 3071
	NASYM=YCON(50)	VS 3072
	XREF=CL(50)	VS 3073
	GRO=0.	VS 3074
	IF(KZ.NE.10) GO TO 41	VS 3075
	XD=SLOPE(15)	VS 3076
	YD=SLOPE(14)	VS 3077
	ZD=SLOPE(13)	VS 3078
	GM=SLOPE(12)	VS 3079
41	CONTINUE	VS 3080
	IF(KZ.EQ.1) CFF=PSI(29)	VS 3081
	FPC=0.	VS 3082
	IF(KZ.EQ.1) FPC=2.2*SQRT(CFF)	VS 3083
	NL=1	VS 3084
	LG=1	VS 3085
	IF (NGRD .EQ. 1) LG=2	VS 3086
	B1=8	VS 3087
	PI=3.14159265	VS 3088

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ZB=0.	VS 3089
YB=BREAK(1,1)	VS 3090
YBB=BREAK(1,1)	VS 3091
IF(NASYM.EQ.0) GO TO 71	VS 3092
YB=YK(1,NC1)	VS 3093
YBB=YB	VS 3094
IF(NC1.EQ.1) GO TO 71	VS 3095
NC11=NC1-1	VS 3096
DO 72 I=1,NC11	VS 3097
ZB=ZB+(YK(1,I)-YK(1,I+1))*DS(1,I+1)	VS 3098
72 YBB=YBB+(YK(1,I)-YK(1,I+1))*DC(1,I+1)	VS 3099
YB=YK(1,1)	VS 3100
71 CONTINUE	VS 3101
IPM=1	VS 3102
L=1	VS 3103
KM=1	VS 3104
KP=1	VS 3105
DO 1 I=1,NCS	VS 3106
CN=NW(L,1)	VS 3107
CS=DC(L,IPM)	VS 3108
SS=DS(L,IPM)	VS 3109
JZ=2	VS 3110
NZ=1	VS 3111
IF (NLEF(L).EQ.1) JZ=1	VS 3112
IF (NLEF(L).EQ.1) NZ=2	VS 3113
K=1	VS 3114
FCOS=COS(SWEEP(KM))	VS 3115
FTAN=SIN(SWEEP(KM))/FCOS	VS 3116
TSW=FTAN	VS 3117
CST=CS	VS 3118
IF (NW(L,2).EQ.0) GO TO 50	VS 3119
IF(L.EQ.1) I1=KM+NS(L)	VS 3120
IF(L.GT.1) I1=KM+NS(L)-NS(L-1)	VS 3121
CHL=CH(KM)+CH(I1)	VS 3122
GO TO 51	VS 3123
50 CHL=CH(KM)	VS 3124
51 CONTINUE	VS 3125
SRT=SQRT(CH(KM)/CHL)	VS 3126
BB=B	VS 3127
IZ=1	VS 3128
IW=1	VS 3129
MM=0	VS 3130
NM=NW(K,1)	VS 3131
A=0.	VS 3132
BM=0.	VS 3133
KCH=KM	VS 3134
IP=1	VS 3135
IF (KF .EQ. 0) GO TO 90	VS 3136
XO=XLE(KCH)	VS 3137

YQ=YBB+(YLE(KCH)-YB)*CS	VS 3138
ZO=ZCP(KP)+ZB+(YLF(KCH)-YB)*SS	VS 3139
CALL UNWF(B,XQ,YO,ZO,AW,BW,CS,SS)	VS 3140
DO 91 IO=1,NTL	VS 3141
IX=IO+LPANEL	VS 3142
IF(KZ.NE.0) GO TO 95	VS 3143
A=A+AW(IO)*GAMMA(IX)*8.	VS 3144
GO TO 91	VS 3145
95 A=A+BW(IO)*GAMMA(IX)*8.	VS 3146
91 CONTINUE	VS 3147
90 CONTINUE	VS 3148
ZA=0.	VS 3149
YA=BREAK(K,1)	VS 3150
YAA=BREAK(K,1)	VS 3151
IF(NASYM.EQ.0) GO TO 73	VS 3152
YA=YK(K,NC1)	VS 3153
YAA=YA	VS 3154
IF(NC1.EQ.1) GO TO 73	VS 3155
NC1=NC1-1	VS 3156
DO 74 J=1,NC1	VS 3157
ZA=ZA+(YK(K,J)-YK(K,J+1))*DS(K,J+1)	VS 3158
74 YAA=YAA+(YK(K,J)-YK(K,J+1))*DC(K,J+1)	VS 3159
YA=YK(K,1)	VS 3160
73 CONTINUE	VS 3161
YAP=YA	VS 3162
YAAP=YAA	VS 3163
IPN=1	VS 3164
200 FORMAT (5(6X,I4))	VS 3165
DO 30 NN=1,LPANEL	VS 3166
ISN=1	VS 3167
ND=NW(K,1)	VS 3168
COSD=DC(K,IPN)	VS 3169
SIND=DS(K,IPN)	VS 3170
J=NN-MM	VS 3171
IF(NN.GT.LPAN1(K).AND.NN.LE.LPN(K)) GO TO 21	VS 3172
GO TO 22	VS 3173
21 ND=NW(K,2)	VS 3174
IF (NN .GT. LPAN1(K).AND.NN.LE.LPN(K)) ISN=2	VS 3175
22 CONTINUE	VS 3176
FN=ND	VS 3177
NK=ND	VS 3178
IF(NN.GE.LPAN1(K).AND.NN.LT.LPN(K)) NK=NW(K,2)	VS 3179
IF(NN.EQ.LPN(K).AND.NN.LT.LPANEL) NK=NW(K+1,1)	VS 3180
X1=XN(NN,1)-XLE(KCH)	VS 3181
X2=XN(NN,2)-XLE(KCH)	VS 3182
X12=XN(NN,2)-XN(NN,1)	VS 3183
ISM=2	VS 3184
FC=1.	VS 3185
IF (IV(K).EQ.1) ISM=1	VS 3186

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IF(NASYM.EQ.1) ISM=1	VS 3187
DO 35 LM=1,ISM	VS 3188
IF(KZ.NE.0.AND.LM.EQ.2) FC=-1.	VS 3189
IF(KZ.EQ.10) FC=1.	VS 3190
IF(LM.EQ.1) GO TO 36	VS 3191
N1=1	VS 3192
GO TO 37	VS 3193
36 N1=2	VS 3194
37 CONTINUE	VS 3195
DO 35 KK=1,LG	VS 3196
IF(ABS(CS-COSD).GT.0.001) GO TO 31	VS 3197
IF(ABS(SS-SIND).GT.0.001) GO TO 31	VS 3198
IF(NC(K).GT.1) GO TO 31	VS 3199
IF(LM.EQ.1.AND.KK.EQ.1) GO TO 40	VS 3200
31 CONTINUE	VS 3201
PS=SIND	VS 3202
PC=COSD	VS 3203
OS=SS	VS 3204
QC=CS	VS 3205
GO TO 45	VS 3206
40 PS=0.	VS 3207
PC=1.	VS 3208
OS=0.	VS 3209
OC=1.	VS 3210
45 CONTINUE	VS 3211
Y12=YN(NN,2)-YN(NN,1)	VS 3212
Z12=ZN(NN,2)-ZN(NN,1)+Y12*PS	VS 3213
Y12=Y12*PC	VS 3214
YC=(-1.)*N1*(YB+(YLE(KCH)-YB)*OC)	VS 3215
Y1=YAA+(YN(NN,1)-YA)*PC-YC	VS 3216
Y2=YAA+(YN(NN,2)-YA)*PC-YC	VS 3217
XYK=X1*Y12-Y1*X12	VS 3218
IF (KK .EQ. 1) GO TO 18	VS 3219
ZC=-2.*(ZCP(KP)+ZB+(YLE(KCH)-YB)*QS+HEIGHT)+ZCP(KP)+ZB+(YLE(KCH)-	VS 3220
YB)*QS	VS 3221
GE=-1.	VS 3222
FCON=1.	VS 3223
GO TO 19	VS 3224
18 ZC=ZCP(KP)+ZB+(YLE(KCH)-YB)*QS	VS 3225
GE=1.	VS 3226
FCON=0.	VS 3227
19 Z1=ZN(NN,1)-ZC+ZA+(YN(NN,1)-YA)*PS	VS 3228
Z2=ZN(NN,2)-ZC+ZA+(YN(NN,2)-YA)*PS	VS 3229
XZJ=X1*Z12-Z1*X12	VS 3230
UCOM=-Z1*Y12*(-ATT)*FCON	VS 3231
YZI=Y1*Z12-Z1*Y12	VS 3232
ALR1=XYK*XYK+XZJ*XZJ+B1*YZI*YZI	VS 3233
R1B1=SQRT(X1*X1+B1*Y1*Y1+B1*Z1*Z1)	VS 3234
R2B1=SQRT(X2*X2+B1*Y2*Y2+B1*Z2*Z2)	VS 3235

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UUB1=(X2*X12+B1*Y2*Y12+B1*Z2*Z12)/R2B1-(X1*X12+R1*Y1*Y12+B1*Z1*Z12	VS	3236
1)/R1B1	VS	3237
G1B1=(1.-X1/R1B1)/(Y1*Y1+Z1*Z1)	VS	3238
G2B1=(1.-X2/R2B1)/(Y2*Y2+Z2*Z2)	VS	3239
F1=UUB1*(UCOM+XYK)*GE/ALB1	VS	3240
F2=(-Y2*G2B1+Y1*G1B1)*GE	VS	3241
F3=-X2J*UUB1/ALB1*(-1.)*N1	VS	3242
F4=(Z2*G2B1-Z1*G1B1)*(-1.)*N1	VS	3243
IF(KZ.NE.0.AND.IV(K).EQ.0) GO TO 14	VS	3244
IF(KF.EQ.0) GO TO 14	VS	3245
IF(IP.NE.1) GO TO 14	VS	3246
F2=-Y2*G2B1*GE	VS	3247
F4=Z2*G2B1*(-1.)*N1	VS	3248
14 CONTINUE	VS	3249
AP=((F1+F2)*QC-(F3+F4)*QS)*SN(K,J,ISN)*GAMMA(NN)*CH(I7)/FN*FC	VS	3250
BP=((F1+F2)*QC-(F3+F4)*QS)*SN(K,J,ISN)*GAM(NN)*CH(I7)/FN*FC	VS	3251
BM=BM+BP	VS	3252
A=A+AP	VS	3253
35 CONTINUE	VS	3254
IF(NN.LT.NM) GO TO 16	VS	3255
IF(NN.EO.LPANEL) GO TO 30	VS	3256
IW=IW+1	VS	3257
I7=I7+1	VS	3258
IP=IP+1	VS	3259
NM=NM	VS	3260
NM=NM+NK	VS	3261
IF(IWING(K).NE.0.AND.IW.EO.(IWING(K)+1)) GO TO 17	VS	3262
IF(NN.EO.LPAN1(K).OR.NN.EO.LPN(K)) GO TO 10	VS	3263
IF(YLE(I7).LT.YK(K,IPN)) GO TO 16	VS	3264
17 CONTINUE	VS	3265
NJ=0	VS	3266
IF(NASYM.EO.1.AND.IPN.LT.NC1) NJ=1	VS	3267
IF(NJ.EO.1) IPN=JPN+1	VS	3268
ZA=ZA+(YK(K,IPN)-YA)*DS(K,IPN)	VS	3269
YAA=YAA+(YK(K,IPN)-YA)*DC(K,IPN)	VS	3270
YA=YK(K,IPN)	VS	3271
IF(IWING(K).NE.0.AND.IW.EO.(IWING(K)+1)) GO TO 23	VS	3272
GO TO 24	VS	3273
23 IF (IWGLT(K).EQ.1) GO TO 24	VS	3274
10 ZA=0.	VS	3275
YA=BREAK(K,1)	VS	3276
YAA=BREAK(K,1)	VS	3277
IF(NASYM.EO.1.AND.NN.EO.LPAN1(K)) YA=YAP	VS	3278
IF(NASYM.EO.1.AND.NN.EO.LPAN1(K)) YAA=YAAP	VS	3279
IF(NN.EO.LPN(K).AND.K.LT.6) YA=BPEAK(K+1,1)	VS	3280
IF(NN.EO.LPN(K).AND.K.LT.6) YAA=BREAK(K+1,1)	VS	3281
IF(NN.EO.LPAN1(K).OR.NN.EO.LPN(K)) GO TO 24	VS	3282
IF (IWGLT(K).NE.2) GO TO 24	VS	3283
ZA=YK(K,NC(K)-2)*DS(K,1)	VS	3284

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YAA=YK(K,NC(K)-2)*DC(K,1)	VS 3285
YA=YK(K,NC(K)-2)	VS 3286
24 CONTINUE	VS 3287
IF(NJ.NE.1) IPN=IPN+1	VS 3288
IF (NN .EQ. LPAN1(K) .OR. NN .EQ. LPN(K)) IPN=1	VS 3289
16 KH=0	VS 3290
IF(NN.EO.LPAN1(K).AND.NN.NE.LPN(K)) KH=1	VS 3291
IF(KH.EO.1.AND.K.FO.1) IW=IW-NS(K)	VS 3292
IF(KH.EO.1.AND.K.GT.1) IW=IW-NS(K)+NS(K-1)	VS 3293
IF(NN.EO.LPAN1(K)) IP=1	VS 3294
IF(NN.EO.LPN(K)) IP=1	VS 3295
30 IF(NN.EO.LPN(K)) K=K+1	VS 3296
IF(KZ.NE.0) GO TO 61	VS 3297
IF (IALP .EQ. 1) GO TO 65	VS 3298
XC=0.	VS 3299
IF(ICAM(L).EQ.3) XC=XLE(KM)	VS 3300
IF(IWING(L).NE.0.AND.I.GT.IWING(L)) GO TO 68	VS 3301
IF(L.EQ.1 .AND. ICAMB.EQ.1) GO TO 70	VS 3302
CALL ZCR(XC,YLE(KM),CAM,ICAM,XC,L,1,CHL,DZDY,IST,TSW)	VS 3303
IF (NLEF(L).EQ.0) GO TO 62	VS 3304
IF (KP.GE.MJW1(L,JZ,NL).AND.KP.LE.MJW2(L,JZ,NL)) GO TO 60	VS 3305
GO TO 62	VS 3306
60 CAM=CAM+FLP(L,NL)	VS 3307
GO TO 62	VS 3308
70 YC=YLE(KM)	VS 3309
XC=XLE(KM)	VS 3310
CALL ZCDX(XC,YC,CAM,DZDY)	VS 3311
62 ALPT=SNALP(I)	VS 3312
GO TO 63	VS 3313
65 CAM=0.	VS 3314
ALPT=1.	VS 3315
GO TO 63	VS 3316
68 CAM=0.	VS 3317
ALPT=SNALP(I)	VS 3318
IF(ICAMT(L).EQ.0) GO TO 63	VS 3319
ICT=ICAMT(L)	VS 3320
CALL ZCR(XC,YLE(KM),CAM,ICAM,XC,L,ICT,CHL,DZDY,IST,TSW)	VS 3321
IF(NLEF(L).EQ.0) GO TO 63	VS 3322
IF (KP.GE.MJW1(L,JZ,NL).AND.KP.LE.MJW2(L,JZ,NL)) GO TO 4	VS 3323
GO TO 63	VS 3324
4 CAM=CAM+FLP(L,NL)	VS 3325
GO TO 63	VS 3326
61 ZC=ZCP(KP)+ZB+(YLE(KM)-YB)*DS(L,IPM)	VS 3327
YC=YBB+(YLE(KM)-YB)*DC(L,IPM)	VS 3328
XC=XLE(KM)	VS 3329
DSS=DS(L,IPM)	VS 3330
DCC=DC(L,IPM)	VS 3331
IF(KZ.EQ.10) GO TO 52	VS 3332
IF(KZ.EQ.1) GO TO 64	VS 3333

ALPT=0.	VS 3334
CST=1.	VS 3335
CAM=0.	VS 3336
IF (NLEF(L).EQ.0) GO TO 63	VS 3337
IF (KP.GE.MJW1(L,JZ,NAL(L)).AND.KP.LE.MJW2(L,JZ,NAL(L))) CAM=FLP	VS 3338
1(L,NAL(L))	VS 3339
IF(NL.EQ.NAL(L).AND.MJW2(L,2,NAL(L)).EQ.0) CAM=FLP(L,NAL(L))	VS 3340
GO TO 63	VS 3341
64 CONTINUE	VS 3342
WBT=0.	VS 3343
BX=ABS(BK)	VS 3344
RX=ABS(RL)	VS 3345
CSK=SWPP(L,IPM)	VS 3346
PR=P	VS 3347
NSS=NCS	VS 3348
IF(IBLC.EQ.1) PR=P*(1.-CSK*FPC)	VS 3349
IF(BX.GT.0.001 .OR. RX.GT.0.001) CALL WRETA(XC,YC,ZC,WBT,DSS,OCC,	VS 3350
1BK,RL,HALFB,XLL,XTT,NSS,IV,IWING,YK,IWGLT,NASYM,NC1,DS,DC,L,BREAK)	VS 3351
ALPT=PR*(ZC*DS(L,IPM)+YC*DC(L,IPM))/HALFB(1)+BK*DS(L,IPM)-RL*(XLE(VS	VS 3352
1KM) -XREF)/HALFB(1)*DS(L,IPM)+WBT	VS 3353
CAM=0.	VS 3354
CST=1.	VS 3355
63 CONTINUE	VS 3356
WN=0.	VS 3357
IF (KF .EQ. 0) GO TO 93	VS 3358
WK=0.	VS 3359
G=0.	VS 3360
IF (BK .GT. 0.01) G=G80	VS 3361
MP=1	VS 3362
IF(KZ.EQ.0) MP=0	VS 3363
CALL FUSVOL(B,XO,YO,ZO,WN,WK,G,1,MP,CS,SS)	VS 3364
93 CONTINUE	VS 3365
IF(KZ.EQ.0) X(15,I)=ALPT*CST-CAM*CNALP(I)+WN	VS 3366
A=A/8.+ALPT*CST-CAM*CNALP(I)+WN	VS 3367
BM=BM/8.+ALPT*CST+WN	VS 3368
GO TO 53	VS 3369
52 AA=0.	VS 3370
DO 56 J=1,2	VS 3371
IF(J.EQ.2) YC=-YC	VS 3372
W=VLCTY(XC,YC,ZC,XD,YD,ZD,GM,B)	VS 3373
56 AA=AA+W	VS 3374
W=AA	VS 3375
CL(I)=W	VS 3376
A=A/8.+W	VS 3377
53 CONTINUE	VS 3378
A=A*SRT	VS 3379
BM=BM*SRT	VS 3380
TT=SQRT(FTAN*FTAN+BB)	VS 3381
THRT1=A/(CN*TT)	VS 3382

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T1=BM/(CN*TT)	VS 3383
IF(KZ.EQ.10) GO TO 54	VS 3384
AL1=0.	VS 3385
IF(ABS(T1).GT.0.) AL1=(THRT1/T1-1.)*ALPT	VS 3386
IF(ICAM(L).EQ.0) AL1=0.	VS 3387
CD(I)=THRT1	VS 3388
IF(KZ.NE.0) GO TO 69	VS 3389
X(12,I)=0.5*PI*SORT(1.-AM*AM*FCOS*FCOS)/FCOS	VS 3390
CT(I)=X(12,I)*THRT1*THRT1	VS 3391
FCC=1.	VS 3392
IF(T1 .LT. 0.) FCC=-1.	VS 3393
CL(I)=X(12,I)*T1*T1*FCC	VS 3394
CU=CT(I)	VS 3395
CM(I)=0.	VS 3396
GO TO 55	VS 3397
54 CU=PI/2.*SORT(1.-AM*AM*FCOS*FCOS)*THRT1*THRT1/FCOS	VS 3398
55 CONTINUE	VS 3399
IF(KT.EQ.0) GO TO 75	VS 3400
IF(KZ.EQ.10) GO TO 75	VS 3401
IF (ICNLE(L).EQ.0) ROC=RC(L,1)	VS 3402
IF (ICNLE(L).EQ.1) ROC=RC(L,1)/CHL	VS 3403
IF (ICNLE(L).EQ.2) ROC=RC(L,1)	VS 3404
ST=SQRT(1.-AM*AM*FCOS*FCOS)	VS 3405
BX=ALPT*CST+AL1	VS 3406
BY=0.	VS 3407
AS=PI/2.	VS 3408
BXX=ALPT*CST	VS 3409
BYY=0.	VS 3410
ASS=0.5*PI	VS 3411
IF(ABS(THRT1).GT.0.) BY=BX*SQRT(2.*ROC)*FCOS/(ST*THRT1)	VS 3412
BYX=BY	VS 3413
BY=BY-AL1	VS 3414
AS2=0.5*PI	VS 3415
BY2=-BYX-AL1	VS 3416
IF(ABS(BY2).LT.1.) AS2=ATAN(BY2/SQRT(1.-BY2*BY2))	VS 3417
ASS2=0.5*PI	VS 3418
BYY2=-BYY	VS 3419
IF(ABS(BYY2).LT.1.) ASS2=ATAN(BYY2/SQRT(1.-BYY2*BYY2))	VS 3420
IF(ABS(BY).LT.1.) AS=ATAN(BY/SQRT(1.-BY*BY))	VS 3421
IF(ABS(T1).GT.0.) BYY=BXX*SQRT(2.*ROC)*FCOS/(ST*T1)	VS 3422
IF(ABS(BYY).LT.1.) ASS=ATAN(BYY/SQRT(1.-BYY*BYY))	VS 3423
C3=THRT1	VS 3424
101 FORMAT (6X,I4,6F10.5)	VS 3425
A1=0.	VS 3426
A2=ATAN(ALPT/CNALP(I))	VS 3427
ALSS=A2-ASS	VS 3428
A33=SIN(ALSS)	VS 3429
A11=0.	VS 3430
IF(ABS(ALPT).GT.1.E-6.AND.A2.GT.ASS) A11=T1*A33/ALPT	VS 3431

	IF(ABS(ALPT).GT.1.E-6.AND.A2.LT.ASS2) A11=T1*SIN(A2-ASS2)/ALPT	VS	3432
	ALS=A2-AS	VS	3433
	A3=SIN(ALS)+AL1	VS	3434
	ALP1=ALPT+AL1	VS	3435
	IF(ABS(ALP1).GT.1.E-6.AND.A2.GT.AS) A1=THRT1*A3/ALP1	VS	3436
	IF(ABS(ALP1).GT.1.E-6.AND.A2.LT.AS2) A1=THRT1*(SIN(A2-AS2)+AL1)	VS	3437
	1/ALP1	VS	3438
	THRT1=A1	VS	3439
	T1=A11	VS	3440
	FCR=1.	VS	3441
	IF(T1.LT.0.) FCR=-1.	VS	3442
	CL(I)=0.5*PI*ST*T1*T1/FCOS*FCR	VS	3443
	CD(I)=THRT1	VS	3444
	CU=PI/2.*ST*THRT1*THRT1/FCOS	VS	3445
	CM(I)=PI*ROC*FCOS/ST	VS	3446
	BQ=AS2*180./PI	VS	3447
	AQ=AS*180./PI	VS	3448
C	WRITE(JPT,101) I,BQ,AQ,C3,THRT1,AL1,CU	VS	3449
75	CONTINUE	VS	3450
	CD(I)=THRT1	VS	3451
	FCR=1.	VS	3452
	IF(THRT1.LT.0.) FCR=-1.	VS	3453
	CSU(I)=CU*FCR	VS	3454
69	CONTINUE	VS	3455
	KM=KM+1	VS	3456
	KP=KP+NW(L,1)	VS	3457
	IF(I.NE.NS(L)) GO TO 80	VS	3458
	IF(NW(L,2).EQ.0) GO TO 80	VS	3459
	IF(L.EQ.1) GO TO 81	VS	3460
	KM=KM+NS(L)-NS(L-1)	VS	3461
	KP=KP+(NS(L)-NS(L-1))*NW(L,2)	VS	3462
	GO TO 80	VS	3463
81	KM=KM+NS(L)	VS	3464
	KP=KP+NS(L)*NW(L,2)	VS	3465
80	CONTINUE	VS	3466
	IF((KP+NW(L,1)).GT.MJW2(L,JZ,NL)) NL=NL+1	VS	3467
	IF(I.EQ.NS(L)) NL=1	VS	3468
	IF(IWING(L).NE.0.AND.I.EQ.IWING(L)) GO TO 2	VS	3469
	IF(I.EQ.NCS) GO TO 1	VS	3470
	IF(I.EQ.NS(L)) GO TO 2	VS	3471
	IF(YLE(KM).LT.YK(L,IPM)) GO TO 1	VS	3472
2	CONTINUE	VS	3473
	NI=0	VS	3474
	IF(NASYM.EQ.1.AND.IPM.LT.NC1) NI=1	VS	3475
	IF(NI.EQ.1) IPM=IPM+1	VS	3476
	ZB=ZB+(YK(L,IPM)-YB)*DS(L,IPM)	VS	3477
	YBB=YBB+(YK(L,IPM)-YB)*DC(L,IPM)	VS	3478
	YB=YK(L,IPM)	VS	3479
	IF(IWING(L).NE.0.AND.I.EQ.IWING(L)) GO TO 25	VS	3480

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	IF(I.EQ.NS(L)) GO TO 25	VS	3481
	GO TO 26	VS	3482
25	IF (IWGLT(L).EQ.1) GO TO 26	VS	3483
	ZB=0.	VS	3484
	YB=BREAK(L,1)	VS	3485
	YBB=BREAK(L+1,1)	VS	3486
	IF(I.EQ.NS(L).AND.L.LT.6) YB=BREAK(L+1,1)	VS	3487
	IF(I.EQ.NS(L).AND.L.LT.6) YBB=BREAK(L+1,1)	VS	3488
	IF(I.EQ.NS(L)) GO TO 26	VS	3489
	IF (IWGLT(L).NE.2) GO TO 26	VS	3490
	ZB=YK(L,NC(L)-2)*DS(L,1)	VS	3491
	YBB=YK(L,NC(L)-2)*DC(L,1)	VS	3492
	YB=YK(L,NC(L)-2)	VS	3493
26	CONTINUE	VS	3494
	IF(NI.NE.1) IPM=IPM+1	VS	3495
	KQ=KP+NW(L,1)-1	VS	3496
	IF(KO.EQ.LPAN1(L).OR.KO.EQ.LPN(L)) IPM=1	VS	3497
	IF(I.EQ.NS(L)) IPM=1	VS	3498
1	IF(I.EQ.NS(L)) L=L+1	VS	3499
C	WRITE(JPT,11) (CD(J),J=1,NCS)	VS	3500
C	IF(K7.EQ.10) WRITE(JPT,11) XD,YD,ZD,GM	VS	3501
C	IF(K7.EQ.10) WRITE(JPT,11) (CL(J),J=1,NCS)	VS	3502
11	FORMAT(8F10.5)	VS	3503
	RETURN	VS	3504
	END	VS	3505
C	FORTRAN NLSTIN	VS	3506
	SUBROUTINE GAMAX (AW,CA,LPAN1,LANEL,GAMMA,BREAK,CHORDT,IWING	VS	3507
	1,YCN,CTIP,CTX,IWGLT,KZ,SE,IB)	VS	3508
C	TO CALCULATE SIDE-EDGE SUCTION AND STREAMWISE VORTEX DENSITY	VS	3509
	DIMENSION SE(3,6,1)	VS	3510
	DIMENSION AW(1),CA(1),GAMMA(1),BREAK(6,1),LPAN1(1),IWGLT(1),IWING(VS	3511
	11)	VS	3512
	DIMENSION CTIP(6,1),G(6,15,2),CHORDT(6,1),YCN(6,1)	VS	3513
	DIMENSION A(15),F(15),THETA(15)	VS	3514
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),	VS	3515
	IXTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2	VS	3516
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)	VS	3517
	COMMON /AERO/ AM,B,CL(50),CT(50),CD(50),CM(50)	VS	3518
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS	3519
	INFP(6),NW(6,2)	VS	3520
	COMMON /EXTRA/ LPN(6),NS(6),ICNLF(6),ITWST(6),IST(6),NGRD,HEIGHT,	VS	3521
	IATT,NC(6),NWING(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS	3522
	COMMON /INOUT/ INPT,JPT	VS	3523
7	FORMAT (1X,I4,8F10.5)	VS	3524
8	FORMAT (9F10.5)	VS	3525
9	FORMAT (8I4)	VS	3526
	PI=3.14159265	VS	3527
	NASYM=YCON(50)	VS	3528
	NSUR=CH(50)	VS	3529

XREF=CL(50)	VS 3530
NK=0	VS 3531
MK=L PAN1(1)	VS 3532
N=1	VS 3533
DO 1 I=1,NCS	VS 3534
IPS1=IPOS(N)/10	VS 3535
IPS2=IPOS(N)-IPS1*10	VS 3536
NCW=NW(N,1)+NW(N,2)	VS 3537
NA=1	VS 3538
SUMI=0.	VS 3539
NWW=NW(N,1)	VS 3540
ISN=1	VS 3541
FN=NW(N,1)	VS 3542
6 N1=NWW+1	VS 3543
DO 2 J=1,NWW	VS 3544
KK=NK+J	VS 3545
IF (NA .EQ. 2) KK=MK+J	VS 3546
FJ=J	VS 3547
THETA(J)=(2.*FJ-1.)*PI/(2.*FN)	VS 3548
F(J)=GAMMA(KK)*SN(N,J,ISN)	VS 3549
2 CONTINUE	VS 3550
THETA(N1)=PI	VS 3551
DO 3 J=1,N1	VS 3552
A(J)=0.	VS 3553
FJ=J	VS 3554
DO 4 K=1,NWW	VS 3555
4 A(J)=A(J)+F(K)*COS((FJ-1.)*THETA(K))	VS 3556
IF (J .EQ. 1) A(J)=A(J)/FN	VS 3557
IF (J .NE. 1) A(J)=A(J)*2./FN	VS 3558
3 CONTINUE	VS 3559
DO 10 K=1,N1	VS 3560
KK=NK+K	VS 3561
IF (NA .EQ. 2) KK=MK+K	VS 3562
SUM=A(1)*THETA(K)	VS 3563
DO 11 J=1,NWW	VS 3564
FJ=J	VS 3565
11 SUM=SUM+A(J+1)*SIN(FJ*THETA(K))/FJ	VS 3566
IZ=I	VS 3567
IF (NA.EQ.2) I7=I+NS(N)	VS 3568
SUM=-0.5*CH(IZ)*SUM+SUMI	VS 3569
IF (NA .EQ. 1 .AND. K .EQ. N1) GO TO 10	VS 3570
AW(KK)=SUM	VS 3571
10 CONTINUE	VS 3572
IF (NA .EQ. 2) GO TO 31	VS 3573
IF (NCW.EQ.NW(N,1)) GO TO 31	VS 3574
NWW=NW(N,2)	VS 3575
NA=NA+1	VS 3576
ISN=2	VS 3577
FN=NWW	VS 3578

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SUMI=SUM	VS 3579
GO TO 6	VS 3580
31 CONTINUE	VS 3581
NK=NK+NW(N,1)	VS 3582
MK=MK+NW(N,2)	VS 3583
IF(I.NE.NS(N)) GO TO 1	VS 3584
NK=LPN(N)	VS 3585
MK=LPN(N)	VS 3586
IF(NS(N).NE.NCS) MK=LPAN1(N+1)	VS 3587
1 IF(I.EQ.NS(N)) N=N+1	VS 3588
NK1=0	VS 3589
DO 999 N=1,NSUR	VS 3590
IPS1=IPOS(N)/10	VS 3591
IPS2=IPOS(N)-IPS1*10	VS 3592
NK2=LPAN1(N)	VS 3593
K2 = NC(N)	VS 3594
DO 1? I=1,K2	VS 3595
M=M1(N,I)	VS 3596
FM=M	VS 3597
MM=M-1	VS 3598
NCW=NW(N,1)+NW(N,2)	VS 3599
19 DO 14 J=1,NCW	VS 3600
IF (IWING(N).NE.0.AND.I.EQ.NWING(N)) GO TO 72	VS 3601
IF(NASYM.EQ.1.AND.I.EQ.1) GO TO 73	VS 3602
IF(I.EQ.NC(N)) GO TO 72	VS 3603
GO TO 71	VS 3604
72 CONTINUE	VS 3605
IW=1	VS 3606
IPZ=1	VS 3607
IF(I.GT.NWING(N)) IW=2	VS 3608
IF (I.GT.NWING(N)) IPZ=3	VS 3609
GO TO 74	VS 3610
73 IW=2	VS 3611
IPZ=3	VS 3612
74 CONTINUE	VS 3613
G(N,J,IW)=0.	VS 3614
CL(J)=0.	VS 3615
71 CONTINUE	VS 3616
IK=0	VS 3617
IS=0	VS 3618
HAB=HALFB(N)	VS 3619
AA=-1.	VS 3620
BB=1.	VS 3621
FT=1.	VS 3622
BR=BREAK(N,I)	VS 3623
IF (NASYM.EQ.1.AND.BREAK(N,I).LT.0.) HAB=ABS(BREAK(N,1))	VS 3624
IF (J.GT.NW(N,1)) GO TO 16	VS 3625
NK=NK1	VS 3626
LK=0	VS 3627

MK=NW(N,1)	VS 3628
IF (I.GT.NWING(N)) GO TO 95	VS 3629
IF (IPS1 .EQ. 2) IS=1	VS 3630
IF (IPS1 .EQ. 1) GO TO 90	VS 3631
IF (IPS1 .EQ. 2) GO TO 91	VS 3632
GO TO 17	VS 3633
95 IF (IPS2 .EQ. 1) GO TO 92	VS 3634
90 HAB=HALFBH(N)	VS 3635
IF (IWGLT(N).EQ.2) HAB=WIDTH(N,I)	VS 3636
IF (IWGLT(N).EQ.2) BR=0.	VS 3637
GO TO 17	VS 3638
91 HAB=HALFB(N)	VS 3639
GO TO 17	VS 3640
92 HC=HALFBH(N)-HALFB(N)	VS 3641
AA=HALFB(N)/HC	VS 3642
BB=HALFBH(N)/HC	VS 3643
HAB=HC	VS 3644
IK=1	VS 3645
FT=2.	VS 3646
GO TO 17	VS 3647
16 NK=NK2	VS 3648
MK=NW(N,2)	VS 3649
LK=NW(N,1)	VS 3650
JJ=J-NW(N,1)	VS 3651
IF (I.GT.NWING(N)) GO TO 96	VS 3652
IF (IPS1 .EQ. 1) IS=1	VS 3653
IF (IPS1 .EQ. 1) GO TO 91	VS 3654
IF (IPS1 .EQ. 2) GO TO 90	VS 3655
GO TO 17	VS 3656
96 IF (IPS2 .EQ. 2) GO TO 92	VS 3657
GO TO 90	VS 3658
17 IF (J.EQ.1.OR.J.EQ.(NW(N,1)+1)) GO TO 98	VS 3659
GO TO 99	VS 3660
98 CONTINUE	VS 3661
DO 13 JP=1,MM	VS 3662
FJ=JP	VS 3663
YCON(JP)=COS(FJ*PI/FM)	VS 3664
Y=.5*WIDTH(N,I)*(1.-YCON(JP))+BR	VS 3665
13 PSI(JP)=SQRT((BB-Y/HAB)*(Y/HAB-AA))*FT	VS 3666
99 CONTINUE	VS 3667
L1=NK+J-LK	VS 3668
L2=L1+MK	VS 3669
L3=L2+MK	VS 3670
SM=0.	VS 3671
IF(NASYM.EQ.1.AND.I.EQ.1) GO TO 46	VS 3672
IF (IK .EQ. 1) GO TO 46	VS 3673
DO 41 LO=1,MM	VS 3674
LP=L1+(LO-1)*MK	VS 3675
AA=1.	VS 3676

DO 42 LS=1,MM	VS 3677
LN=L1+(LS-1)*MK	VS 3678
IF (LS .EQ. LO) GO TO 42	VS 3679
AA=AA*(BREAK(N,I)-YCP(LN))/(YCP(LP)-YCP(LN))	VS 3680
42 CONTINUE	VS 3681
41 SM=SM+AA*AW(LP)*PSI(LQ)	VS 3682
GAMAD=SM	VS 3683
GO TO 47	VS 3684
46 GAMAD=0.	VS 3685
47 CONTINUE	VS 3686
IF (IS .EQ. 1) GO TO 26	VS 3687
IF (IWING(N).NE.0.AND.I.EQ.NWING(N)) GO TO 28	VS 3688
IF (I.EQ.NC(N)) GO TO 26	VS 3689
GO TO 27	
28 IF(J.GT.NW(N,1)).AND.IPSI.EQ.2) GO TO 27	
GO TO 26	
27 CONTINUE	VS 3690
SM=0.	VS 3691
DO 43 LO=1,MM	VS 3692
LP=L1+(LO-1)*MK	VS 3693
AA=1.	VS 3694
DO 44 LS=1,MM	VS 3695
LN=L1+(LS-1)*MK	VS 3696
IF (LS .EQ. LO) GO TO 44	VS 3697
AA=AA*(BREAK(N,I+1)-YCP(LN))/(YCP(LP)-YCP(LN))	VS 3698
44 CONTINUE	VS 3699
43 SM=SM+AA*AW(LP)*PSI(LQ)	VS 3700
GAMAN=SM	VS 3701
GO TO 30	VS 3702
26 GAMAN=0.	VS 3703
30 DO 18 K=1,MM	VS 3704
LL=NK+(K-1)*MK+J-LK	VS 3705
TAN=(XN(LL,2)-XN(LL,1))/(YN(LL,2)-YN(LL,1))	VS 3706
CA(LL)=0.	VS 3707
DO 20 KK=1,MM	VS 3708
LI=NK+(KK-1)*MK+J-LK	VS 3709
IF (KK .EQ. K) GO TO 22	VS 3710
CA(LL)=CA(LL)+2.*(-1.)**(K+KK)*AW(LI)*PSI(KK)/(WIDTH(N,I)*(YCON(KKVS	VS 3711
1)-YCON(K))	VS 3712
GO TO 20	VS 3713
22 CA(LL)=CA(LL)+AW(LL)*PSI(K)*YCON(K)/(WIDTH(N,I)*SJ(N,K,I)*SJ(N,	VS 3714
1K,I))	VS 3715
20 CONTINUE	VS 3716
IF (IK .EQ. 0) FK=YCP(LL)/(HAB*HAB)	VS 3717
IF (IK.EQ.1) FK=-1.-2.*(YCP(LL)-HALFB(N))/HAB)/(0.5*HAB)	VS 3718
CA(LL)=CA(LL)+GAMAD*(-1.)**K/(1.-YCON(K))/WIDTH(N,I)-GAMAN*(-1.)**VS	VS 3719
1(M+K)/(1.+YCON(K))/WIDTH(N,I)+AW(LL)*FK/PSI(K)	VS 3720
CA(LL)=CA(LL)/PSI(K)	VS 3721
IF (IWING(N).NE.0.AND.I.EQ.NWING(N)) GO TO 51	VS 3722
IF (I.EQ.NC(N)) GO TO 50	VS 3723
IF(NASYM.EQ.1.AND.I.EQ.1) GO TO 50	VS 3724
GO TO 18	VS 3725

51	IF(J.GT.NW(N,1).AND.IPS1.EQ.2) GO TO 18	VS 3726
50	CONTINUE	VS 3727
	IF (CHORDT(N,IPZ).LE.0.001) GO TO 18	VS 3728
	IF(NASYM.EQ.1.AND.I.EQ.1) GO TO 78	VS 3729
	G(N,J,IW)=G(N,J,IW)+AW(LL)*PSI(K)*(-1.)**(K+M)/(1.+YCON(K))	VS 3730
	GO TO 18	VS 3731
78	G(N,J,IW)=G(N,J,IW)+AW(LL)*PSI(K)*(-1.)**K/(1.-YCON(K))	VS 3732
18	CA(LL)=TAN*GAMMA(LL)+CA(LL)	VS 3733
	IF (J.EQ.NW(N,1)) NK1=LL	VS 3734
	IF (I.EQ.NC(N)) GO TO 23	VS 3735
	IF (IWIN(N).NE.0.AND.I.EQ.NWING(N)) GO TO 24	VS 3736
	IF(NASYM.EQ.1.AND.I.EQ.1) GO TO 23	VS 3737
	GO TO 14	
24	IF(J.GT.NW(N,1).AND.IPS1.EQ.2) GO TO 14	VS 3738
23	CONTINUE	VS 3739
	IF (CHORDT(N,IPZ).LE.0.001) GO TO 14	VS 3740
	IF(NASYM.EQ.1.AND.I.EQ.1) GO TO 76	VS 3741
	G(N,J,IW)=2./WIDTH(N,I)*G(N,J,IW)+0.5*(-1.)**M*GAMA0/WIDTH(N,I)	VS 3742
	GO TO 77	VS 3743
76	G(N,J,IW)=2./WIDTH(N,I)*G(N,J,IW)+0.5*(-1.)**M*GAMA0/WIDTH(N,I)	VS 3744
77	CONTINUE	VS 3745
	IF (IK.EQ.0) G(N,J,IW)=G(N,J,IW)+SORT(HAR)/2.828427124	VS 3746
	IF(IK.EQ.1) G(N,J,IW)=G(N,J,IW)+SORT(HAB)/4.	VS 3747
	IF(IW.EQ.2) DUMT(IB,N,J)=G(N,J,IW)	VS 3748
	IF(IW.EQ.2) GO TO 14	VS 3749
	IF (IWIN(N).NE.0) GO TO 85	VS 3750
86	SE(IB,N,J)=G(N,J,IW)	VS 3751
	GO TO 14	VS 3752
85	IF (IPS1.EQ.2.AND.J.GT.NW(N,1)) GO TO 87	VS 3753
	IF(IPS1.EQ.1) GO TO 87	VS 3754
	GO TO 86	VS 3755
87	SE(IB,N,J)=0.	
	G(N,J,IW)=0.	VS 3756
14	CONTINUE	VS 3757
	NK2=LL	VS 3758
12	CONTINUE	VS 3759
	NK1=LPH(N)	VS 3760
999	CONTINUE	VS 3761
	IF(KZ.NE.0) RETURN	VS 3762
	CTP=0.	VS 3763
	CTX=0.	VS 3764
	SUMM=0.	VS 3765
	JP=0	VS 3766
	MM=0	VS 3767
	DO 1000 N=1,NSUR	VS 3768
	MK=LPH(N)-NW(N,1)	VS 3769
	KCH=NS(N)+MM	VS 3770
	NCW=NW(N,1)+NW(N,2)	VS 3771
	IW=1	VS 3772
	IF(NC(N).NE.NWING(N)) IW=2	VS 3773
	IF(NASYM.EQ.1) IW=2	VS 3774
	DO 64 K=1,IW	

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CTIP(N,K)=0.	VS 3775
IPZ=1	VS 3776
IF (K .EQ. 2) IPZ=3	VS 3777
IF (CHORDT(N,IPZ) .LE.0.001) GO TO 64	VS 3778
WRITE (JPT,66)	VS 3779
WRITE (JPT,67)	VS 3780
66 FORMAT(/50H CHORDWISE DISTRIBUTION OF TIP SUCTION COEFFICIENT)	VS 3781
67 FORMAT (/5X,3HX/C,6X,4HCTIP)	VS 3782
CHD=CHORDT(N,IPZ)+CHORDT(N,IPZ+1)	VS 3783
IF(K.EQ.2) GO TO 105	VS 3784
IF(IWING(N).EQ.0) GO TO 105	VS 3785
IN=KCH-NS(N)+IWING(N)	VS 3786
IM=MK-(NS(N)-IWING(N))*NW(N,1)	VS 3787
GO TO 106	VS 3788
105 IN=KCH	VS 3789
IM=MK	VS 3790
106 CHORD=CH(IN)	VS 3791
IF(NW(N,2).EQ.0) GO TO 107	VS 3792
II=NS(N)+IN	VS 3793
IF(N.GT.1) II=NS(N)-NS(N-1)+IN	VS 3794
CHORD=CHORD+CH(II)	VS 3795
107 CONTINUE	VS 3796
DO 65 I=1,NCW	VS 3797
J=IM+I	VS 3798
IF(I.LE.NW(N,1)) GO TO 108	VS 3799
IK=NS(N)	VS 3800
IF(N.GT.1) IK=NS(N)-NS(N-1)	VS 3801
IF(IWING(N).NE.0.AND.K.EQ.1) IK=IWING(N)	
LL=L PAN1(N)+NW(N,2)+(IK-1)+I-NW(N,1)	VS 3802
GO TO 109	VS 3803
108 LL=J	VS 3804
109 CONTINUE	VS 3805
XC=(XV(LL)-XLE(IN))/CHORD	VS 3806
CTDIS=0.	VS 3807
IF (K .EQ. 2) GO TO 80	VS 3808
IF (IPS1 .EQ. 2 .AND. I .GT. NW(N,1)) GO TO 65	VS 3809
IF (IPS1 .EQ. 1) GO TO 65	VS 3810
80 CONTINUE	VS 3811
CTDIS=2.*PI*G(N,I,K)+G(N,I,K)/CHD	VS 3812
65 WRITE (JPT,8) XC,CTDIS	VS 3813
SUM=0.	VS 3814
ISN=1	VS 3815
FN=NW(N,1)	VS 3816
CHD=CHORDT(N,IPZ)	VS 3817
DO 61 I=1,NCW	VS 3818
FCR=1.	VS 3819
IF (G(N,I,K).LT.0.) FCR=-1.	VS 3820
J=I	VS 3821
X1=YCN(N,IPZ)	VS 3822
IF (K .EQ. 2) GO TO 81	VS 3823

	IF (IPSI .EQ. 2 .AND. I.GT.NW(N,1)) GO TO 61	VS 3824
	IF (IPSI .EQ. 1) GO TO 61	VS 3825
81	CONTINUE	VS 3826
	IF (I.LE.NW(N,1)) GO TO 68	VS 3827
	ISN=2	VS 3828
	FN=NW(N,2)	VS 3829
	J=I-NW(N,1)	VS 3830
	X1=YCN(N,IPZ+1)	VS 3831
	CHD=CHORDT(N,IPZ+1)	VS 3832
68	FJ = J	VS 3833
	XM = X1 + 0.5*CHD*(1.-COS((2.*FJ - 1.)*PI/(2.*FN)))	VS 3834
	XM=XM-XREF	VS 3835
	SUM=SUM+CHD*G(N,I,K)*G(N,I,K)*SN(N,J,ISN)*FCR/FN	VS 3836
	SUMM=SUMM+CHD*XM*G(N,I,K)*G(N,I,K)*SN(N,J,ISN)*FCR/FN	VS 3837
61	CONTINUE	VS 3838
	CTX=SUM+CTX	VS 3839
	CTIP(N,K)=SUM*PI*PI/(2.*HALFSW)	VS 3840
	CTP=CTP+CTIP(N,K)	VS 3841
64	CONTINUE	VS 3842
	IF (CHORDT(N,1).GT.0.001.OR.CHORDT(N,3).GT.0.001) JP=JP+1	VS 3843
	IF (NW(N,2).NE.0.AND.N.EQ.1) MM=MM+NS(N)	VS 3844
	IF (NW(N,2).NE.0.AND.N.GT.1) MM=MM+NS(N)-NS(N-1)	VS 3845
1000	CONTINUE	VS 3846
	IF (ABS(CTX).LE.0.00001) GO TO 82	VS 3847
	IF (JP.NE.0) CTX=SUMM/CTX	VS 3848
82	CONTINUE	VS 3849
	CTX=-CTX	VS 3850
	WRITE (JPT,62) CTP	VS 3851
62	FORMAT (/25H TIP SUCTION COEFFICIENT=,F10.5,2X,15H(ONE SIDE ONLY))	VS 3852
	WRITE (JPT,75) CTX	VS 3853
75	FORMAT (/46H THE X-COORDINATE OF CENTROID OF TIP SUCTION =,F10.5)	VS 3854
	WRITE (JPT,69)	VS 3855
69	FORMAT (/8H ELEMENT,2X,3HY/S,6X,5HGAMMA,5X,5HGAMAX)	VS 3856
	N=1	VS 3857
	DO 35 I=1,LPANEL	VS 3858
	ETA=YV(I)/HALFB(N)	VS 3859
	WRITE (JPT,7) I,ETA,AW(I),CA(I)	VS 3860
35	IF (I.EQ.LPN(N)) N=N+1	VS 3861
	RETURN	VS 3862
	END	VS 3863
C	FORTRAN NLSTIN	VS 3864
	SUBROUTINE AUGVOR(AW,CA,GAMMA,GM,LPANEL,X2,Y2,Z2,B2,ZZCP,XCP,YCP	VS 3865
	1,NZ)	VS 3866
	DIMENSION AW(1),CA(1),GAMMA(1),ZZCP(1),XCP(1),YCP(1),W(2)	VS 3867
	REWIND 02	VS 3868
3	FORMAT (10F10.5)	VS 3869
	DO 1 I=1,LPANEL	VS 3870
	DO 2 K=1,2	VS 3871
	F=1.	VS 3872

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	IF(K.EQ.2) F=-1.	VS 3873
	X=XCP(I)	VS 3874
	Y=YCP(I)*F	VS 3875
	Z=ZCP(I)	VS 3876
	2 W(K)=VLCTY(X,Y,Z,X2,Y2,Z2,GM,B2)	VS 3877
	IF(NZ.EQ.0) CA(I)=W(1)+W(2)	VS 3878
	1 IF(NZ.EQ.1) CA(I)=W(1)-W(2)	VS 3879
	IF(NZ.EQ.0) GO TO 15	VS 3880
	DO 16 J=1,LPANEL	VS 3881
	16 READ(O2) (AW(K),K=1,LPANEL)	VS 3882
	15 CONTINUE	VS 3883
	DO 5 I=1,LPANEL	VS 3884
	IF(NZ.EQ.0) GAMMA(I)=0.	VS 3885
	READ(O2) (AW(K),K=1,LPANEL)	VS 3886
	DO 10 J=1,LPANEL	VS 3887
	10 GAMMA(I)=GAMMA(I)-AW(J)*CA(J)	VS 3888
	5 CONTINUE	VS 3889
	RETURN	VS 3890
	END	VS 3891
C	FORTRAN NLSTIN	VS 3892
	SUBROUTINE SPNINT(N1,N2,NS,CSC,SJ,SWEEP,M1,X,GM,WIDTH,GW)	VS 3893
	COMMON /INOUT/ INPT,JPT	VS 3894
	DIMENSION NS(1),CSC(1),SJ(6,31,1),SWEEP(1),M1(6,1),X(15,1),WIDTH(6	VS 3895
	1,1)	VS 3896
	PI=3.14159265	VS 3897
	N=NS(1)	VS 3898
	GM=0.	VS 3899
	GW=0.	VS 3900
	KC=1	VS 3901
	KLL=0	VS 3902
	IF(N1.GT.1) KC=2	VS 3903
	IF(N1.GT.1) KLL=N1-1	VS 3904
	DO 1 I=1,N	VS 3905
	IF(I.GE.N1.AND.I.LE.N2) GO TO 5	VS 3906
	GO TO 1	VS 3907
	5 KL=I-KLL	VS 3908
	FM=M1(1,KC)	VS 3909
	AA=SJ(1,KL,KC)/FM	VS 3910
	GM=GM+CSC(I)/X(15,I)*AA	VS 3911
	GW=GW+CSC(I)*AA	VS 3912
	1 CONTINUE	VS 3913
	GM=0.25*PI*WIDTH(1,KC)*GM	VS 3914
	GW=GW*0.5*WIDTH(1,KC)*PI	VS 3915
C	WRITE(JPT,2) (X(15,I),I=1,N)	VS 3916
C	WRITE(JPT,2) GM,WIDTH(1,KC),GW	VS 3917
C	WRITE(JPT,2) (CSC(I),I=1,N)	VS 3918
	2 FORMAT (5X,10F10.5)	VS 3919
	RETURN	VS 3920
	END	VS 3921

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C	FORTRAN NLSTIN	VS	3922
	SUBROUTINE LATERL(GAMMA,AW,CA,LAT,LPANEL,LPAN1,DF,NAL,YK,DS,DC,IWIVS	VS	3923
	1NG,IWGLT,NALP,ALP,GAMP,GAMB,GAMR,CP,GAMX,BREAK,CHORDT,YCN,	VS	3924
	2SNALP,CNALP,DZY,NLEF,NC1,SWPP,IBLC,CFE,IV,ICAM,ICAMB,KT,PC,SE,ICAMVS	VS	3925
	3T,NVL1,NVL2,DMM,ZZCP,MZ,NAUG)	VS	3926
C	TO CALCULATE THE EFFECT OF LATERAL AND DIRECTIONAL MOTIONS	VS	3927
	DIMENSION NVL1(1),NVL2(1),DMM(1),ZZCP(1)	VS	3928
	DIMENSION DZY(1),SWPP(6,1),IV(1),LPAN1(1),NAL(1),IWIN(1),IWGLT(1)VS	VS	3929
	1,NLEF(1),ICAM(1),RC(6,1),SE(3,6,1),ICAMT(1)	VS	3930
	DIMENSION GAMMA(1),AW(1),CA(1),DF(6,1),YK(6,1),DS(6,1)	VS	3931
	DIMENSION DC(6,1),GAMP(1),GAMB(1),GAMR(1),CP(1),GAMX(1),BREAK(6,1)VS	VS	3932
	1,CHORDT(6,1),YCN(6,1),SNALP(1),CNALP(1)	VS	3933
	COMMON /GEM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	VS	3934
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	VS	3935
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFR(6),SJ(6,31,5)VS	VS	3936
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5), VS	VS	3937
	1NFP(6,2)	VS	3938
	COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),VS	VS	3939
	1XLL(41)	VS	3940
	COMMON /AFRD/ AM,B,CL(50),CT(50),CD(50),CM(50)	VS	3941
	COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),ISP(6),NGRD,HEIGHT, VS	VS	3942
	1ATT,NC(6),NWIN(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS	3943
	COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),P2,NCG,CTG(15),STG(1VS	VS	3944
	15),DIST,PP,BKK,RL,CFEK	VS	3945
	COMMON /FUS/ XF(20),XCF(20),PF(20),SNP(5,20),XLEF,XTEF,WARD(20), VS	VS	3946
	1NCUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,PDX,XU	VS	3947
	COMMON /INOUT/ INPT,JPT	VS	3948
	DIMENSION DUM(200),DUMY(200),DUMZ(200),DUMS(200),DUMC(200)	VS	3949
	DIMENSION DUMX(200)	VS	3950
	L1=LWF+1	VS	3951
	NSUR=CM(50)	VS	3952
	NASYM=YCON(50)	VS	3953
	GMAX(50)=CL(50)	VS	3954
	PI=3.14159265	VS	3955
	IF(LAT.EQ.1) GO TO 30	VS	3956
	REWIND 01	VS	3957
	READ(01) (DUM(I),I=1,LWF)	VS	3958
	READ(01) (AW(I),I=1,LWF)	VS	3959
	AW(L1)=0.	VS	3960
	DO 5 I=1,LWF	VS	3961
5	GAMMA(I)=-AW(I+1)/AW(I)	VS	3962
	NJ=LWF-1	VS	3963
	MM=NW(1,1)	VS	3964
	I7=1	VS	3965
	L=1	VS	3966
	DO 4 IJ=2,LWF	VS	3967
	NN=NW(L,1)	VS	3968
	J7=1	VS	3969
	NX=2	VS	3970

	IF (NLEF(L).EQ.1) JZ=2	VS 3971
	IF (NLEF(L).EQ.1) NX=1	VS 3972
	READ(O1) (DUM(K),K=1,LWF)	VS 3973
	READ(O1) (AW(K),K=1,LWF)	VS 3974
	AW(L1)=0.	VS 3975
	IF(IJ.GT.LPANEL) GO TO 2	VS 3976
	IF(NAL(L).EQ.0) GO TO 2	VS 3977
	IF(IJ.GF.MJW1(L,JZ,NAL(L)).AND.IJ.LE.MJW2(L,JZ,NAL(L))) GO TO 10	VS 3978
	IF(IJ.GE.MJW1(L,NX,NAL(L)).AND.IJ.LE.MJW2(L,NX,NAL(L))) AW(L1)=DF	VS 3979
	1 L,NAL(L))	VS 3980
	IF (NLEF(L).EQ.1.AND.IJ.EQ.MM) AW(L1)=0.5*DF(L,NAL(L))	VS 3981
	GO TO 2	VS 3982
10	IF (IJ.EQ.MM.AND.NLEF(L).EQ.0) AW(L1)=0.5*DF(L,NAL(L))	VS 3983
	IF(NLEF(L).EQ.1) GO TO 2	VS 3984
	IF(MJW1(L,2,NAL(L)).EQ.0) AW(L1)=DF(L,NAL(L))	VS 3985
	2 IK=IJ	VS 3986
	AW(L1)=AW(L1)*CNALP(IZ)	VS 3987
C	WRITE(JPT,15) IJ,AW(L1),CNALP(IZ)	VS 3988
	CALL VMSEON (NJ,IK,AW,GAMMA,CA)	VS 3989
	NJ=NJ-1	VS 3990
	IF(IJ.GT.LPANEL) GO TO 4	VS 3991
	IF(IJ.GF.LPAN1(L).AND.IJ.LT.LPN(L)) NN=NW(L,2)	VS 3992
	IF(IJ.LT.MM) GO TO 3	VS 3993
	MM=MM+NN	VS 3994
	IZ=IZ+1	VS 3995
	3 CONTINUE	VS 3996
	IF(IJ.NE.LPAN1(L)) GO TO 4	VS 3997
	IF(IJ.EQ.LPN(L)) GO TO 4	VS 3998
	IF(L.EQ.1) IZ=1	VS 3999
	IF(L.GT.1) IZ=IZ-NS(L)+NS(L-1)	VS 4000
	4 IF (IJ.EQ.LPN(L)) L=L+1	VS 4001
	KZ=2	VS 4002
	CALL THPUST(LPANEL,GAMMA,SNALP,LPAN1,ICAM,ICAMB,NLEF,NAL,IV,IWING	VS 4003
	1,YK,DC,DS,CA,IWGLT,KZ,0.,0.,0.,CNALP,DF,NCL,KT,RC,ICAPT,SWPP,IBLC,	VS 4004
	2YCON,BREAK)	VS 4005
	CALL GAMAX (AW,CA,LPAN1,LPANEL,GAMMA,BREAK,CHORDT,IWING,YCN,	VS 4006
	1SLOPE,CTX,IWGLT,KZ,SE,2)	VS 4007
	WRITE(JPT,17) (CD(K),K=1,NCS)	VS 4008
C	WRITE(JPT,17) (SE(2,1,K),K=1,NCW)	VS 4009
	RETURN	VS 4010
30	KZ=1	VS 4011
	BK=0.	VS 4012
	P=PP	VS 4013
	GBO=0.	VS 4014
	GRO=0.	VS 4015
	FPC=2.2*SORT(CFF)	VS 4016
	XREF=CL(50)	VS 4017
	RL=0.	VS 4018
	L=1	VS 4019

KM=1	VS	4020
DO 37 I=1,NCS	VS	4021
NWW=NW(L,1)	VS	4022
IF(NW(L,2).NE.0) NWW=NW(L,2)	VS	4023
IF(L.EQ.1) IST=0	VS	4024
IF(L.NE.1 .AND. NW(L,2).EQ.0) IST=LPN(L-1)	VS	4025
IF(NW(L,2).NE.0) IST=LPAN1(L)	VS	4026
IL=0	VS	4027
IF(L.GT.1) IL=NS(L-1)	VS	4028
GMAX(I)=0.	VS	4029
MK=IST+(I-IL-1)*NWW	VS	4030
IK=KM	VS	4031
IF(NW(L,2).NE.0) IK=KM+NS(L)	VS	4032
DO 38 LO=1,NWW	VS	4033
LP=MK+LO	VS	4034
AA=1.	VS	4035
DO 39 LS=1,NWW	VS	4036
LN=MK+LS	VS	4037
IF(LS.EQ.LO) GO TO 39	VS	4038
AA=AA*(XTE(IK)-XV(LN))/(XV(LP)-XV(LN))	VS	4039
39 CONTINUE	VS	4040
101 FORMAT (5(6X,I4))	VS	4041
38 GMAX(I)=GMAX(I)+AA*GMAX(LP)	VS	4042
KM=KM+1	VS	4043
IF(I.NE.NS(L)) GO TO 37	VS	4044
IF(NW(L,2).EQ.0) GO TO 37	VS	4045
IF(L.EQ.1) KM=KM+NS(L)	VS	4046
IF(L.GT.1) KM=KM+NS(L)-NS(L-1)	VS	4047
37 IF(I.EQ.NS(L)) L=L+1	VS	4048
C WRITE(JPT,17) (GMAX(I),I=1,NCS)	VS	4049
IF(MZ.EQ.0) GO TO 31	VS	4050
Y2=SLOPE(15)	VS	4051
Y2=SLOPE(14)	VS	4052
Z2=SLOPE(13)	VS	4053
GM=SLOPE(12)	VS	4054
GW=SLOPE(11)	VS	4055
Z2=0.	VS	4056
31 CONTINUE	VS	4057
DO 35 I=1,3	VS	4058
MM=NW(1,1)	VS	4059
IPN=1	VS	4060
IPM=0	VS	4061
IW=1	VS	4062
IL=1	VS	4063
ZB=0.	VS	4064
YB=BREAK(1,1)	VS	4065
YBB=BREAK(1,1)	VS	4066
IF(NASYM.EQ.0) GO TO 80	VS	4067
YB=YK(1,NC1)	VS	4068

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	YBB=YB	VS	4069
	IF(NC1.EQ.1) GO TO 80	VS	4070
	NC11=NC1-1	VS	4071
	DO 81 J=1,NC11	VS	4072
	ZB=ZB+(YK(1,J)-YK(1,J+1))*DS(1,J+1)	VS	4073
81	YBB=YBB+(YK(1,J)-YK(1,J+1))*DC(1,J+1)	VS	4074
	YB=YK(1,1)	VS	4075
80	CONTINUE	VS	4076
	YBP=YB	VS	4077
	YBBP=YBB	VS	4078
	IF(I.NE.1) REWIND 03	VS	4079
	L=1	VS	4080
C	WRITE(JPT,102) I	VS	4081
102	FORMAT (2X,7HTESTING,I4)	VS	4082
	DO 6 IJ=1,LWF	VS	4083
	CSK=SWPP(L,IPN)	VS	4084
	IF(IJ.GT.LPANEL) GO TO 21	VS	4085
	NN=NW(L,1)	VS	4086
	YC=YBB+(YCP(IJ)-YB)*DC(L,IPN)	VS	4087
	ZC=ZCP(IJ)+ZB+(YCP(IJ)-YB)*DS(L,IPN)	VS	4088
	XC=XCP(IJ)	VS	4089
	WBT=0.	VS	4090
	DSS=DS(L,IPN)	VS	4091
	DCC=DC(L,IPN)	VS	4092
	IF(I.NE.1) CALL WBETA(XC,YC,ZC,WBT,DSS,DCC,BK,RL,HALFB,XLL,XTT,WCSVS	VS	4093
1,	IV,IWING,YK,IWGLT,NASYM,NC1,DS,DC,L,BREAK)	VS	4094
	PHI=ATAN(DZY(IJ))	VS	4095
	COSP=COS(PHI)	VS	4096
	SINP=SIN(PHI)	VS	4097
	SPHI=DS(L,IPN)*COSP+SINP*DC(L,IPN)	VS	4098
	PR=P	VS	4099
	IF(IRLC .EQ. 1) PR=P*(1.-CSK*FPC)	VS	4100
	CA(IJ)=PR*(ZC*DS(L,IPN)+YC*DC(L,IPN))/HALFB(1)+BK*SPHI-RL*(XCP(IJ)	VS	4101
	1-XREF)/HALFB(1)*SPHI+WBT	VS	4102
	WN=0.	VS	4103
	IF(KF.EQ.0) GO TO 20	VS	4104
	WK=0.	VS	4105
	G=0.	VS	4106
	CALL FUSVOL(B,XC,YC,ZC,WN,WK,G,1,1,DCC,DSS)	VS	4107
	GO TO 20	VS	4108
21	II=IJ-LPANEL	VS	4109
	CA(IJ)=0.	VS	4110
	WN=0.	VS	4111
	IF(II.GT.NF) GO TO 20	VS	4112
	XS=XCF(II)-XTEF	VS	4113
	YB=XCF(II)-XLEF	VS	4114
	IF(II.EQ.NF) RFL=0.	VS	4115
	IF(II.NE.NF) RFL=XS/SORT(XS*XS+B*RF(II)*RF(II))	VS	4116
	RF1=XS*(1.+RFL)	VS	4117

	RFO=XB*(1.+Y8/SORT(XB*XB+B*RF(II)*RF(II)))	VS	4118
	WN=(-BK+RL*XCF(II)/HALFB(1))*RF(II)*RF(II)-(RF1-RFO)*(GBO+RL*GRO)/VS	VS	4119
	1(4.*PI)	VS	4120
20	CA(IJ)=CA(IJ)+WN	VS	4121
15	FORMAT (1X,I4,2X,8F10.5)	VS	4122
	IF(IJ.GT.LPANEL) GO TO 6	VS	4123
	IF(I.NE.1) GO TO 11	VS	4124
	DUM(IJ)=DC(L,IPN)*COSP-DS(L,IPN)*SINP	VS	4125
	DUMS(IJ)=SPHI	VS	4126
	DUMC(IJ)=CNALP(IW)	VS	4127
	DUMY(IJ)=YC	VS	4128
	DUMZ(IJ)=ZC	VS	4129
	DUMX(IJ)=SNALP(IW)*SPHI	VS	4130
11	CONTINUE	VS	4131
	IF (IJ .GE.LPANI(L).AND.IJ.LT.LPN(L)) NN=NW(L,2)	VS	4132
	IF(IJ.EO.LPN(L).AND.IJ.LT.LPANEL) NN=NW(L+1,1)	VS	4133
	IF (IJ.LT.MM) GO TO 8	VS	4134
	MM=MM+NN	VS	4135
	IL=IL+1	VS	4136
	IW=IW+1	VS	4137
	IF (IWING(L).NE.O.AND.IW.EO.(IWING(L)+1)) GO TO 7	VS	4138
	IF(IJ.EO.LPANI(L).OR.IJ.EO.LPN(L)) GO TO 16	VS	4139
	IF(YLE(IL).LT.YK(L,IPN)) GO TO 8	VS	4140
7	CONTINUE	VS	4141
	NI=0	VS	4142
	IF(NASYM.EO.1.AND.IPN.LT.NC1) NI=1	VS	4143
	IF(NI.EQ.1) IPN=IPN+1	VS	4144
	ZB=ZB+(YK(L,IPN)-YB)*DS(L,IPN)	VS	4145
	YBB=YBB+(YK(L,IPN)-YB)*DC(L,IPN)	VS	4146
	YB=YK(L,IPN)	VS	4147
	IF (IWING(L).NE.O.AND.IW.EO.(IWING(L)+1)) GO TO 22	VS	4148
	GO TO 23	VS	4149
22	IF (IWGLT(L).EQ.1) GO TO 23	VS	4150
16	ZB=0.	VS	4151
	YB=BREAK(L,1)	VS	4152
	YBB=BREAK(L,1)	VS	4153
	IF(NASYM.EO.1.AND.IJ.EO.LPANI(L)) YB=YBP	VS	4154
	IF(NASYM.EO.1.AND.IJ.EO.LPANI(L)) YBR=YBBP	VS	4155
	IF(IJ.EO.LPN(L).AND.L.LT.6) YB=BREAK(L+1,1)	VS	4156
	IF(IJ.EO.LPN(L).AND.L.LT.6) YBR=BREAK(L+1,1)	VS	4157
	IF(IJ.EO.LPANI(L).OR.IJ.EO.LPN(L)) GO TO 23	VS	4158
	IF(IWGLT(L).NE.2) GO TO 23	VS	4159
	ZB=YK(L,NC(L)-2)*DS(L,1)	VS	4160
	YBB=YK(L,NC(L)-2)*DC(L,1)	VS	4161
	YB=YK(L,NC(L)-2)	VS	4162
23	CONTINUE	VS	4163
	IF(NI.NE.1) IPN=IPN+1	VS	4164
	IF (IJ.EO.LPANI(L).OR.IJ.EO.LPN(L)) IPN=1	VS	4165
8	CONTINUE	VS	4166

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	KH=0	VS 4167
	IF(IJ.EQ.LPANI(L).AND.IJ.NE.LPN(L)) KH=1	VS 4168
	IF(KH.EQ.1.AND.L.EQ.1) IL=IL-NS(L)	VS 4169
	IF(KH.EQ.1.AND.L.GT.1) IL=IL-NS(L)+NS(L-1)	VS 4170
	IF(KH.EQ.1.AND.L.EQ.1) IW=IW-NS(L)	VS 4171
	IF(KH.EQ.1.AND.L.GT.1) IW=IW-NS(L)+NS(L-1)	VS 4172
	IF(IJ.EQ.LPN(L).AND.NW(L,2).NE.0) KH=2	VS 4173
	IF(KH.EQ.2.AND.L.EQ.1) IL=IL+NS(L)	VS 4174
	IF(KH.EQ.2.AND.L.GT.1) IL=IL+NS(L)-NS(L-1)	VS 4175
6	IF(IJ.EQ.LPN(L)) L=L+1	VS 4176
C	IF(I.EQ.2) WRITE(JPT,17) (CA(IJ),IJ=1,LWF)	VS 4177
	REWIND 02	VS 4178
	IF(NAUG.EQ.1) GO TO 41	VS 4179
	IF(NALP.EQ.1) GO TO 40	VS 4180
41	CONTINUE	VS 4181
	DO 45 K=1,LWF	VS 4182
45	READ(02)(AW(J),J=1,LWF)	VS 4183
40	DO 50 J=1,LWF	VS 4184
	GAMMA(J)=0.	VS 4185
	READ(02) (AW(K),K=1,LWF)	VS 4186
	DO 55 K=1,LWF	VS 4187
55	GAMMA(J)=GAMMA(J)-AW(K)*CA(K)	VS 4188
50	CONTINUE	VS 4189
17	FORMAT(10F10.5)	VS 4190
	PSI(29)=CFF	VS 4191
	CALL THRUST(LPANEL,GAMMA,SNALP,LPANI,ICAM,ICAMB,NLEF,NAL,IV,IWING,	VS 4192
	1YK,DC,DS,CA,IWGLT,KZ,P,BK,RL,CNALP,DF,NC1,KT,PC,ICAPT,SWPP,IRLC,	VS 4193
	2YCON,BREAK)	VS 4194
	IA=I	VS 4195
	CALL GAMAX(AW,CA,LPANI,LPANEL,GAMMA,BREAK,CHORDT,IWING,	VS 4196
	1YCN,SLOPE,CTX,IWGLT,KZ,SE,IA)	VS 4197
	IF(I.EQ.1) GO TO 65	VS 4198
	IF(I.EQ.2) GO TO 60	VS 4199
	DO 59 K=1,LWF	VS 4200
	GAMR(K)=GAMMA(K)	VS 4201
	IF(K.LE.LPANEL) GO TO 61	VS 4202
	GO TO 59	VS 4203
61	GAMR(K)=GAMMA(K)*DUMC(K)-YV(K)/HALFB(1)*CP(K)*RL-(XV(K)-XREF)/HALFV	VS 4204
	1B(1)*GAMX(K)*RL*DUM(K)-DUMX(K)*CA(K)	VS 4205
59	CONTINUE	VS 4206
C	WRITE(JPT,17)(GAMR(K),K=1,LWF)	VS 4207
	DO 56 K=1,NCS	VS 4208
56	Y(4,K)=CD(K)	VS 4209
	IF(MZ.EQ.0) GO TO 70	VS 4210
	DO 77 K=1,NCS	VS 4211
	BR=-(X(11,K)-XREF)/HALFB(1)*RLL	VS 4212
77	CD(K)=2.*DMM(K)*BR	VS 4213
	CALL SPNINT(NVL1(1),NVL2(1),NS,CD,SJ,SWEEP,M1,X,GR,WIDTH,GRW)	VS 4214
	GR= GRW*GM/GW	VS 4215

	CALL AUGVOR(AW,CA,GAMR,GR,LPANEL,X2,Y2,Z2,B,ZZCP,XCP,YCP,1)	VS 4216
	GO TO 70	VS 4217
65	DO 58 K=1,LWF	VS 4218
	GAMP(K)=GAMMA(K)	VS 4219
	IF(K.LE.LPANEL) GO TO 62	VS 4220
	GO TO 58	VS 4221
62	GAMP(K)=GAMMA(K)*DUMC(K)+DUM(K)*P*DUMZ(K)/HALFB(1)*GAMX(K)	VS 4222
	1-DUMS(K)*P*DUMY(K)/HALFB(1)*GAMX(K)-DUMX(K)*CA(K)	VS 4223
58	CONTINUE	VS 4224
	DO 63 K=1,NCS	VS 4225
63	Y(2,K)=CD(K)	VS 4226
C	WRITE(JPT,17) (CD(K),K=1,NCS)	VS 4227
C	WRITE(JPT,17)(GAMP(K),K=1,LWF)	VS 4228
	IF(MZ.EQ.0) GO TO 70	VS 4229
	DO 76 K=1,NCS	VS 4230
76	CD(K)=X(12,K)*2.*Y(1,K)*Y(2,K)*X(14,K)*X(13,K)	VS 4231
C	WRITE(JPT,17) (X(12,K),K=1,NCS)	VS 4232
C	WRITE(JPT,17)(X(13,K),K=1,NCS)	VS 4233
C	WRITE(JPT,17) (X(14,K),K=1,NCS)	VS 4234
	CALL SPNINT(NVL1(1),NVL2(1),NS,CD,SJ,SWEEP,M1,X,GP,WIDTH,GPW)	VS 4235
	GP=GPW*GM/GW	VS 4236
	CALL AUGVOR(AW,CA,GAMP,GP,LPANEL,X2,Y2,Z2,B,ZZCP,XCP,YCP,1)	VS 4237
	GO TO 70	VS 4238
60	DO 57 K=1,LWF	VS 4239
	GAMB(K)=GAMMA(K)	VS 4240
	IF(K.LE.LPANEL) GO TO 66	VS 4241
	GO TO 57	VS 4242
66	GAMB(K)=GAMMA(K)*DUMC(K)+BK*GAMX(K)*DUM(K)-DUMX(K)*CA(K)	VS 4243
57	CONTINUE	VS 4244
	DO 67 K=1,NCS	VS 4245
67	Y(3,K)=CD(K)	VS 4246
C	WRITE(JPT,17) (CD(K),K=1,NCS)	VS 4247
C	WRITE(JPT,17)(GAMB(K),K=1,LWF)	VS 4248
	IF(MZ.EQ.0) GO TO 70	VS 4249
	GBR=GM*2.*BKK	VS 4250
	CALL AUGVOR(AW,CA,GAMB,GBR,LPANEL,X2,Y2,Z2,B,ZZCP,XCP,YCP,1)	VS 4251
70	IF(I.EQ.1) GO TO 75	VS 4252
	IF(I.EQ.3) GO TO 35	VS 4253
	RL=RLL	VS 4254
	BK=0.	VS 4255
	GO TO 35	VS 4256
75	BK=BKK	VS 4257
	P=0.	VS 4258
35	CONTINUE	VS 4259
	RETURN	VS 4260
	END	VS 4261
C	FORTRAN NLSTIN	VS 4262
	SUBROUTINE WBETA(X,Y,Z,WN,DSS,DCC,BK,RL,HALFB,DS,DC,NCS,IV,IWING,	VS 4263
	1YK,IWGLT,NASYM,NC1,DSK,DCK,LL,BREAK)	VS 4264

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C	TO CALCULATE DOWNWASH DUE TO ADDITIONAL WAKE VORTICES IN SIDESLIP	VS	4265
	DIMENSION DSK(6,1),DCK(6,1),HALFB(1),IV(1),IHING(1)	VS	4266
	DIMENSION DS(1),DC(1),CON(2),W(2),V(2),YK(6,1)	VS	4267
	DIMENSION IWGLT(1),BREAK(6,1)	VS	4268
	COMMON/BETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),B2,NCG,CTG(15),STG(15)	VS	4269
	15),DIST,PP,BKK,RLL,CFE	VS	4270
	COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT,	VS	4271
	1ATT,NC(6),NHWING(6),IPOS(6),IALP,DUPT(3,6,15),HALFBH(6)	VS	4272
	COMMON /INOUT/ INPT,JPT	VS	4273
	DATA COM/1.,-1./	VS	4274
	DIST2=0.5*DIST	VS	4275
	FN=NCG	VS	4276
	WW=0.	VS	4277
	VV=0.	VS	4278
	XREF=GMAX(50)	VS	4279
	LG=1	VS	4280
	IF(NGRD.EQ.1) LG=2	VS	4281
	ZA=0.	VS	4282
	YA=BREAK(1,1)	VS	4283
	YAA=BREAK(1,1)	VS	4284
	IF(NASYM.EQ.0) GO TO 40	VS	4285
	YA=YK(1,NC1)	VS	4286
	YAA=YA	VS	4287
	IF(NC1.EQ.1) GO TO 40	VS	4288
	NC11=NC1-1	VS	4289
	DO 41 I=1,NC11	VS	4290
	ZA=ZA+(YK(1,I)-YK(1,I+1))*DSK(1,I+1)	VS	4291
	41 YAA=YAA+(YK(1,I)-YK(1,I+1))*DCK(1,I+1)	VS	4292
	YA=YK(1,1)	VS	4293
	40 CONTINUE	VS	4294
	IPN=1	VS	4295
	L=1	VS	4296
	IM=0	VS	4297
	DO 1 I=1,NCS	VS	4298
	W(2)=0.	VS	4299
	V(2)=0.	VS	4300
	IF(ABS(BK).GT.0.0001) PR=BK*DC(I)	VS	4301
	ISM=2	VS	4302
	IF (IV(L).FO.1) ISM=1	VS	4303
C	J=2 FOR LEFT WING EFFECT	VS	4304
	IF(NASYM.EQ.1) ISM=1	VS	4305
	DO 9 J=1,ISM	VS	4306
	W(J)=0.	VS	4307
	V(J)=0.	VS	4308
	ADD=0.	VS	4309
	YC=Y+CON(J)	VS	4310
	NSEG=1	VS	4311
	IH=I+IM	VS	4312
	IHI=I+1+IM	VS	4313

AVX=0.5*(XTG(IH)+XTG(IHI))	VS 4314
KSE=NS(LL)	VS 4315
KSI=0	VS 4316
IF(LL.GT.1) KSI=NS(LL-1)	VS 4317
IF(YC.GT.YTG(IH).AND.YC.LT.YTG(IHI)) GO TO 2	VS 4318
IF(I.GT.KSI.AND.I.LE.KSE) GO TO 3	VS 4319
IF(X.GT.AVX) ADD=X-AVX	VS 4320
GO TO 3	VS 4321
2 IF(I.GT.KSI.AND.I.LE.KSE) GO TO 3	VS 4322
IF(X.LT.AVX) GO TO 3	VS 4323
NSEG=2	VS 4324
3 CONTINUE	VS 4325
DO 4 KY=1,NSEG	VS 4326
DX=DIST2+ADD*0.5	VS 4327
DXX=DIST+ADD	VS 4328
IF(NSEG.EQ.1) GO TO 6	VS 4329
IF(KY.EQ.1) DX=(X-AVX)*0.5	VS 4330
IF(KY.EQ.1) DXX=X-AVX	VS 4331
6 CONTINUE	VS 4332
100 FORMAT (2X,2I4,2X,8F10.5)	VS 4333
XP1=XTG(IH)	VS 4334
XP2=XTG(IHI)	VS 4335
IF(NSEG.EQ.2.AND.KY.EQ.NSEG) XP1=XP1+X-AVX	VS 4336
IF(NSEG.EQ.2.AND.KY.EQ.NSEG) XP2=XP2+X-AVX	VS 4337
DO 5 K=1,NCG	VS 4338
DO 5 KK=1,LG	VS 4339
OX1=XP1+DX*(1.-CTG(K))	VS 4340
OX2=XP2+DX*(1.-CTG(K))	VS 4341
IF(ABS(RL).GT.0.0001) PR=-RL*(0.5*(OX1+OX2)-XREF)/HALFB(1)	VS 4342
IF(ABS(RL).GT. 0.0001) GO TO 10	VS 4343
X1=OX1-X	VS 4344
X2=OX2-X	VS 4345
X12=OX2-OX1	VS 4346
IF(ABS(DCC-DC(I)).GT.0.001) GO TO 26	VS 4347
IF(ABS(DSS-DS(I)).GT.0.001) GO TO 26	VS 4348
IF(NC(L).GT.1) GO TO 26	VS 4349
IF(J.EQ.1.AND.KK.EQ.1) GO TO 25	VS 4350
26 PS=DS(I)	VS 4351
PC=DC(I)	VS 4352
GO TO 27	VS 4353
25 PS=0.	VS 4354
PC=1.	VS 4355
27 CONTINUE	VS 4356
Y12=YTG(IHI)-YTG(IH)	VS 4357
Z12=ZTG(IHI)-ZTG(IH)+Y12*PS	VS 4358
Y12=Y12*PC	VS 4359
Y1=YAA+(YTG(IH)-YA)*PC-YC	VS 4360
Y2=YAA+(YTG(IHI)-YA)*PC-YC	VS 4361
XYK=X1+Y12-Y1+X12	VS 4362

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IF(KK.EQ.1) GO TO 7	VS 4363
ZC=-2.*(Z+HEIGHT)+Z	VS 4364
GE=-1.	VS 4365
FCON=1.	VS 4366
GO TO 8	VS 4367
7 ZC=Z	VS 4368
GE=1.	VS 4369
FCON=0.	VS 4370
8 Z1=ZTG(IH)-ZC+ZA+(YTG(IH)-YA)*PS	VS 4371
Z2=ZTG(IHI)-ZC+ZA+(YTG(IHI)-YA)*PS	VS 4372
XZJ=X1*Z12-Z1*X12	VS 4373
UCOM=-Z1*Y12*(-ATT)*FCON	VS 4374
YZI=Y1*Z12-Z1*Y12	VS 4375
ALB1=XYK*XYK+XZJ*XZJ+B2*YZI*Y7I	VS 4376
RB1=SQRT(X1*X1+B2*Y1*Y1+B2*Z1*Z1)	VS 4377
RB2=SQRT(X2*X2+B2*Y2*Y2+B2*Z2*Z2)	VS 4378
UB=(X2*X12+B2*Y2*Y12+B2*Z2*Z12)/RB2-(X1*Y12+R2*Y1*Y12+B2*Z1*Z12)/	VS 4379
1RB1	VS 4380
GB1=(1.-X1/RB1)/(Y1*Y1+Z1*Z1)	VS 4381
GB2=(1.-X2/RB2)/(Y2*Y2+Z2*Z2)	VS 4382
F1=UB*(UCOM+XYK)*GE/ALB1	VS 4383
F2=(-Y2*GB2+Y1*GB1)*GE	VS 4384
F3=-XZJ*UB/ALB1*CON(J)	VS 4385
F4=(Z2*GB2-Z1*GB1)*CON(J)	VS 4386
P1=-(F3+F4)*STG(K)*GMAX(I)*DXX/FN	VS 4387
P2=-(F1+F2)*STG(K)*GMAX(I)*DXX/FN	VS 4388
WRITE(03) P1,P2	VS 4389
GO TO 11	VS 4390
10 READ(03) P1,P2	VS 4391
11 V(J)=V(J)+P1*PR	VS 4392
5 W(J)=W(J)+P2*PR	VS 4393
4 CONTINUE	VS 4394
9 CONTINUE	VS 4395
IF(ABS(RL).GT.0.0001) GO TO 30	VS 4396
IF(I.EQ.NCS) GO TO 30	VS 4397
IF(I.EQ.NS(L)) GO TO 17	VS 4398
IF (IWING(L).NE.0.AND.I.EQ.IWING(L)) GO TO 17	VS 4399
IF(YTG(IHI).LT.YK(L,IPN)) GO TO 30	VS 4400
17 NJ=0	VS 4401
IF(NASYM.EQ.1.AND.IPN.LT.NC1) NJ=1	VS 4402
IF(NJ.EQ.1) IPN=IPN+1	VS 4403
ZA=ZA+(YK(L,IPN)-YA)*DSK(L,IPN)	VS 4404
YAA=YAA+(YK(L,IPN)-YA)*DCK(L,IPN)	VS 4405
YA=YK(L,IPN)	VS 4406
IF(IWING(L).NE.0.AND.I.EQ.IWING(L)) GO TO 23	VS 4407
IF(I.EQ.NS(L)) GO TO 23	VS 4408
GO TO 24	VS 4409
23 IF (IWGLT(L).EQ.1) GO TO 24	VS 4410
ZA=0.	VS 4411

	YA=BREAK(L,1)	VS 4412
	YAA=BREAK(L,1)	VS 4413
	IF(I.EQ.NS(L).AND.L.LT.6) YA=BREAK(L+1,1)	VS 4414
	IF(I.EQ.NS(L).AND.L.LT.6) YAA=BREAK(L+1,1)	VS 4415
	IF(I.EQ.NS(L)) GO TO 24	VS 4416
	IF (IWGLT(L).NE.2) GO TO 24	VS 4417
	ZA=YK(L,NC(L)-2)*DSK(L,1)	VS 4418
	YAA=YK(L,NC(L)-2)*DCK(L,1)	VS 4419
	YA=YK(L,NC(L)-2)	VS 4420
24	IF(NJ.NE.1) IPN=IPN+1	VS 4421
30	CONTINUE	VS 4422
	IF(I.EQ.NS(L)) IPN=1	VS 4423
	WW=WW+(W(1)-W(2))/8.	VS 4424
	VV=VV+(V(1)-V(2))/8.	VS 4425
	IF(I.EQ.NS(L)) IM=IM+1	VS 4426
	IF(I.EQ.NS(L)) L=L+1	VS 4427
1	CONTINUE	VS 4428
	WN=WW*DCC-VV*DSS	VS 4429
	RETURN	VS 4430
	END	VS 4431
C	FORTRAN NLSTIN	VS 4432
	FUNCTION VLCTY(X,Y,Z,X2,Y2,Z2,GM,B2)	VS 4433
C	TO CALCULATE THE DOWNWASH DUE TO A DISCRETE VORTEX	VS 4434
	PI=3.14159265	VS 4435
	F1=(Y2-Y)**2+(Z2-Z)**2	VS 4436
	F2=SQRT((X2-X)**2+B2*F1)	VS 4437
	VLCTY=-GM/(4.*PI)*(Y2-Y)/F1*(1.-(X2-X)/F2)	VS 4438
	RETURN	VS 4439
	END	VS 4440
C	FORTRAN NLSTIN	VS 4441
	FUNCTION VERCOR(AP)	VS 4442
	IF(AP.LE.1.25) VERCOR=0.24*AP	VS 4443
	IF(AP.GT.1.25.AND.AP.LE.2.) VERCOR=0.1467*AP+0.1167	VS 4444
	IF(AP.GT.2.) VERCOR=0.05*AP+0.31	VS 4445
	RETURN	VS 4446
	END	VS 4447
C	LINK LINK44,LINK33	VS 4448
C	FORTRAN NLSTIN	VS 4449
	SUBROUTINE LOAD	VS 4450
C	TO INTEGRATE THE LOADING AND OBTAIN TOTAL CHARACTERISTICS	VS 4451
	DIMENSION GAMMA(200)	VS 4452
	DIMENSION AW(201),CA(201),DHM(50)	VS 4453
	DIMENSION DYB(6),DYP(6)	VS 4454
	DIMENSION CPCWL(16),CPSWL(31),CLWL(6),CMWL(6),CDWL(6)	VS 4455
	DIMENSION CLS(50),CLY(50),CAVS(50),CPF(10,20)	VS 4456
	DIMENSION FTL(6),CBMR(6),CBTR(6),CBML(6),CBTL(6),CLW(6),CMW(6),	VS 4457
	ICDW(6)	VS 4458
	COMMON/LOOP/KI,NALP,KALP,TANC2,CLDS,AI,CLIT,ALPIT,ALPA(15)	VS 4459
	COMMON /VBDN/ ICOUNT,YBAR(6,2),YCMX(6,2),MSTP(6),YBR(6,2),YBRBR(6,VS 4460	

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12),YBRBL(6,2),YD2(6,2),YDR2(6,2),YDL2(6,2),ABD(6,2),ABDR(6,2) VS 4461
1,ABDL(6,2),YREF(6),YCBR(6,2),YCBL(6,2) VS 4462
COMMON /DSL/ CTP(6,2),CHORDT(6,4),SCH(200),LAT,CREF,RREF2 VS 4463
COMMON/GD/ TINP(6),BREAK(6,10),TFLP(6,5),RINC(6),NAL(6) VS 4464
1,YBREAK(6,7),DCOS(6,5),DSIN(6,5),IHING(6),IWGLT(6),IV(6),LPAN1(6) VS 4465
1,ICAMT(6) VS 4466
COMMON /AJG/ ALP,J1,CP(200),GAMP(200),GAMR(200),GAMR(200) VS 4467
1,GAMX(200),ZTCP(200),DZY(200),BMP(6,50),RML(6,50),CSII(50) VS 4468
COMMON /SCHEME/ C(2),X(15,41),Y(15,41),SLOPE(15),XL(2,15),XTT(41),VS 4469
1XLL(41) VS 4470
COMMON /GDM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS 4471
1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS 4472
200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFR(6),SJ(6,31,5)VS 4473
COMMON /AERD/ AM,B,CL(50),CT(50),CD(50),CM(50) VS 4474
COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5), VS 4475
1NFP(6),NW(6,2) VS 4476
COMMON /CAMB/ ICAM(6),IM(6,10),XT(6,10,21),AAM(6,10,20),BRM(6,10, VS 4477
120),CCM(6,10,20),DDM(6,10,20),YT(6,10),CURV(6,10),CHND(6,10) VS 4478
COMMON /EXTRA/ LPN(6),NS(6),ICNLE(6),ITWST(6),IST(6),NGRD,HEIGHT, VS 4479
1ATT,NC(6),NHING(6),IPOS(6),IALP,DUPT(3,6,15),HALFBH(6) VS 4480
COMMON/RETA/ GMAX(50),XTG(50),YTG(50),ZTG(50),B2,NCG,CTG(15),STG(1VS 4481
15),DIST,P,BK,PL,CFF VS 4482
COMMON /LEFLP/ YLEF(6,10,2),XNF(6,10),YNF(6,10),7NF(6,10),XLF(6,10VS 4483
1,4),YLF(6,10,4),SLP1(6,10) VS 4484
COMMON /TWST1/ NYM(6),YTS(6,21),AY(6,20),PY(6,20),CCY(6,20),DY(6, VS 4485
120) VS 4486
COMMON/SHPLE/ NLE,YSL(15),AQL(14),ROL(14),COL(14),DOL(14) VS 4487
COMMON/SHPTE/ NTF,YST(15),AOT(14),BOT(14),COT(14),DCT(14) VS 4488
COMMON /SSS/ NASYM,NSUR,L PANEL,ICAMB,NUMS,IACVX,PT VS 4489
1,NAUG,IBD,PBK,PIS,TDIH,ALPINC,IRL,KT,PI,ALO,ALZ VS 4490
2,NC1,NC2,IBLC VS 4491
COMMON/GDSL/ DF(6,5),YCN(6,4),NLFF(6),NVRTX(6),SNALP(50),CNALP(50)VS 4492
1,ALPH(50),AUX(6,5),CRX(6,5),XTILT(6),SLETH(6),YCNTD(6) VS 4493
1,NVL1(6),NVL2(6),XCNTD(6),CTILT(6),SWPP(6,5),PC(6,50),XREF VS 4494
1,BUX(6,5),SE(3,6,15),NUR(6),CVR(50),CPAUG(200) VS 4495
1,ALPRD(6,2),MX(6),ALRDRR(6,2),ALBDBL(6,2),MVRTX(6) VS 4496
COMMON /SL/ COSA,SINA,MZ,CTX,YBRK,ZBK,GW,LATT VS 4497
COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),YLEF,XTEF,WARD(20), VS 4498
1NCIUM,NF,NT,CSF(5,10),XAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,PDX,XU VS 4499
COMMON /INOUT/ INPT,JPT VS 4500
DATA DYR /6*0./ VS 4501
DATA DYR /6*0./ VS 4502
DATA CLWL /6*0./ VS 4503
DATA CMWL /6*0./ VS 4504
DATA CDWL /6*0./ VS 4505
DATA CLW /6*0./ VS 4506
DATA CHW /6*0./ VS 4507
DATA CDW /6*0./ VS 4508
2 FORMAT (8F10.6) VS 4509

3	FORMAT (8(6X,I4))	VS	4510
8	FORMAT (1X,40H*****)	VS	4511
	YD2(1,1) = 0.	VS	4512
	CLPP=0.	VS	4513
	CDPP=0.	VS	4514
	CDVL=0.	VS	4515
	CLT=0.	VS	4516
	CMT=0.	VS	4517
	CDT=0.	VS	4518
	CLL=0.	VS	4519
	CLLV=0.	VS	4520
	CNL=0.	VS	4521
	CNLV=0.	VS	4522
	CY=0.	VS	4523
	CNB=0.	VS	4524
	CLB=0.	VS	4525
	CLP=0.	VS	4526
	CYP=0.	VS	4527
	CNP=0.	VS	4528
	CYR=0.	VS	4529
	CLRR=0.	VS	4530
	CNR=0.	VS	4531
	CYBV=0.	VS	4532
	CYBVSE=0.	VS	4533
	CNBV=0.	VS	4534
	CNBVSE=0.	VS	4535
	CLBV=0.	VS	4536
	CLBVSE=0.	VS	4537
	CYPV=0.	VS	4538
	CYPVSE=0.	VS	4539
	CNPV=0.	VS	4540
	CNPVSF=0.	VS	4541
	CLPV=0.	VS	4542
	CLPVSE=0.	VS	4543
	CYRV=0.	VS	4544
	CYRVSE=0.	VS	4545
	CLRRV=0.	VS	4546
	CLRVSE=0.	VS	4547
	CNRV=0.	VS	4548
	CNRVSE=0.	VS	4549
	CSL = 0.	VS	4550
	CSXL = 0.	VS	4551
	CAX=0.	VS	4552
	CAXV=0.	VS	4553
	CPCV=0.	VS	4554
	CRCV=0.	VS	4555
	CBCV=0.	VS	4556
	CSAUG=0.	VS	4557
	CMAUG=0.	VS	4558

CLGM=0.	VS 4559
CDGM=0.	VS 4560
CMGM=0.	VS 4561
CLDV=0.	VS 4562
CDDV=0.	VS 4563
CMDV=0.	VS 4564
CSNW=0.	VS 4565
CYPVA=0.	VS 4566
CLPVA=0.	VS 4567
CNPVA=0.	VS 4568
CYBVA=0.	VS 4569
CNBVA=0.	VS 4570
CLBVA=0.	VS 4571
CYRVA=0.	VS 4572
CLRRVA=0.	VS 4573
CNRVA=0.	VS 4574
DP=0.	VS 4575
DR=0.	VS 4576
DB=0.	VS 4577
KC=1	VS 4578
IJK=0	VS 4579
YCON(50)=NASYM	VS 4580
NCOL=M1(1,1)	VS 4581
KLL=0	VS 4582
MM=0	VS 4583
NCW1=NCW+1	VS 4584
IPN=1	VS 4585
ZB=0.	VS 4586
YB=BREAK(1,1)	VS 4587
YBB=BREAK(1,1)	VS 4588
IF(NASYM.EQ.0) GO TO 1373	VS 4589
YB=YBREAK(1,NC1)	VS 4590
YBB=YB	VS 4591
IF(NC1.EQ.1) GO TO 1373	VS 4592
NC11=NC1-1	VS 4593
DO 1374 I=1,NC11	VS 4594
ZB=ZB+(YBREAK(1,I)-YBREAK(1,I+1))*DSIN(1,I+1)	VS 4595
1374 YBB=YBB+(YBREAK(1,I)-YBREAK(1,I+1))*DCOS(1,I+1)	VS 4596
YB=YBREAK(1,1)	VS 4597
1373 CONTINUE	VS 4598
ZBK=ZB	VS 4599
YBBK=YBB	VS 4600
NCSS=NCS	VS 4601
COW=1.	VS 4602
SOW=0.	VS 4603
LL=1	VS 4604
YCBR(1,2)=0.	VS 4605
DO 5 I=1,LWF	VS 4606
GAMMA(I)=SCH(I)	VS 4607

5	SCH(I)=CP(I)	VS	4608
	DO 10 I=1,NCS	VS	4609
	DMH(I)=CL(I)	VS	4610
	CAVS(I)=BMR(6,I)	VS	4611
10	AW(I)=CL(I)	VS	4612
	GB=SIN(BK)	VS	4613
	GBC=COS(BK)	VS	4614
	GB2=GB*GB	VS	4615
C	VORTEX BREAKDOWN EFFECT	VS	4616
	ALMT=0.0349	VS	4617
	IF (IALP.EQ.1) GO TO 2245	VS	4618
	IF(IBD.EQ.0) GO TO 2245	VS	4619
	IF(ALP.LT.ALMT.AND.ICOUNT.GE.1) ICOUNT=ICOUNT+1	VS	4620
	IF(ALP.GE.ALMT) ICOUNT=ICOUNT+1	VS	4621
	IF(ALP.GE.ALMT.AND.ICOUNT.EQ.1) CALL CENTRD(NS,NSUR,NW,IWING,	VS	4622
	1CREF,HALFB,ALP,YLE,YN,SWEEP,AW,ALPBD,LPN,O.,AM,O,YCPX,MX,MSTP,YBR	VS	4623
	2,BREAK,YREF,MVRTX,M1,NC,IAGVX,SJ,WIDTH,ICAM,CAVS,ABD,NASYM,IV,	VS	4624
	3NLEF,YD2,KF)	VS	4625
	IF(IBD.EQ.0) GO TO 2245	VS	4626
	IF(LAT.NE.1) GO TO 2243	VS	4627
	IF(ICOUNT.NE.1) GO TO 2245	VS	4628
	CALL CENTRD(NS,NSUR,NW,IWING,CREF,HALFR,ALP,YLE,YN,SWEEP,AV,ALBDRVS	VS	4629
	1R,LPN,BK,AM,1,YCBP,MX,MSTP,YBR,BREAK,YREF,MVRTX,M1,NC,IAGVX,SJ,	VS	4630
	2WIDTH,ICAM,CAVS,ABD,NASYM,IV,NLEF,YD2,KF)	VS	4631
	IF(NASYM.EQ.1) GO TO 2245	VS	4632
	CALL CENTRD(NS,NSUR,NW,IWING,CREF,HALFR,ALP,YLE,YN,SWEEP,AW,ALBDRVS	VS	4633
	1L,LPN,BK,AM,2,YCBL,MX,MSTP,YBR,BREAK,YREF,MVRTX,M1,NC,IAGVX,SJ,	VS	4634
	2WIDTH,ICAM,CAVS,ABD,NASYM,IV,NLEF,YD2,KF)	VS	4635
2243	CONTINUE	VS	4636
	WRITE(JPT,8)	VS	4637
	WRITE(JPT,700)	VS	4638
700	FORMAT(2X,76H***THE FOLLOWING ALPHAS FOR VORTEX BREAKDOWN AT T.E.	VS	4639
	1HAVE BEEN CORRECTED FOR/10X,75HCAMBER AND ADVERSE PRESSURE GRADIENTS	VS	4640
	2T IN VORTEX LIFT AUGMENTATION, IF ANY***)	VS	4641
2245	CONTINUE	VS	4642
	JA=0	VS	4643
	DO 2233 K=1,NSUR	VS	4644
	IF(NASYM.EQ.0) GO TO 2145	VS	4645
	YCBL(K,1)=YCBR(K,1)	VS	4646
	YCBL(K,2)=YCBR(K,2)	VS	4647
	ALBDR1(K,1)=ALBDRR(K,1)	VS	4648
	ALBDR1(K,2)=ALBDRR(K,2)	VS	4649
2145	CONTINUE	VS	4650
	IF(IBD.EQ.0) MX(K)=1	VS	4651
	IF(IBD.EQ.0) MSTP(K)=0	VS	4652
	IG=0	VS	4653
	IF(MVRTX(K).NE.0) IG=1	VS	4654
	IF(IBD.NE.0) WRITE(JPT,69) K	VS	4655
69	FORMAT(/2X,21H***FOR SURFACE NUMBER, I3,2X,3H***)	VS	4656

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K2 = MX(K)	VS 4657
DO 2233 I=1,K2	VS 4658
JA=JA+1	VS 4659
IF(JA.GT.6) JA=6	VS 4660
DXTE=0.	VS 4661
YBAR(K,I)=1.	VS 4662
MT=0	VS 4663
MCNT=0	VS 4664
IA=IG+I	VS 4665
NA=YD2(K,I)	VS 4666
IF(I.EQ.2) IA=YD2(K,1)+1	VS 4667
DA=0.	VS 4668
IF(IRD.EQ.0.OR.IALP.EQ.1) GO TO 909	VS 4669
IF(ICOUNT.NE.1) GO TO 909	VS 4670
IF(ABS(XTILT(JA)).LT.1.E-3) GO TO 909	VS 4671
DXR=AUX(K,IA)-CRX(K,IA)	VS 4672
XR=AUX(K,NA)-DXR	VS 4673
DX=0.	VS 4674
IF(XR.GT.1.E-3) DX=ABS(XTILT(JA)/XR)	VS 4675
DA=REDBD(DX)*PI/180.	VS 4676
IF(XTILT(JA).LT.0.) DA=-2.*DA	VS 4677
909 CONTINUE	VS 4678
910 FORMAT(/2X,20HREVISED ALPHA BDTE =,F10.3,7HDEGREES)	VS 4679
IF(IALP.EQ.1) GO TO 2233	VS 4680
IF(IRD.EQ.0) GO TO 2251	VS 4681
IF(ICOUNT.NE.1) GO TO 911	VS 4682
ABD(K,I)=ALPBD(K,I)	VS 4683
ALPBD(K,I)=ALPRD(K,I)-DA	VS 4684
IF(ALPBD(K,I).LT.0.) ALPBD(K,I)=0.	VS 4685
911 CONTINUE	VS 4686
IF(ALP.LT.ALPBD(K,I)) GO TO 2251	VS 4687
ALPDT=(ALP-ALPBD(K,I))*180./PI	VS 4688
2250 CONTINUE	VS 4689
DXTE=BDPT(ALPDT)	VS 4690
IF(MT.EQ.1) GO TO 2254	VS 4691
YBAR(K,I)=1.-DXTE	VS 4692
IF(YBAR(K,I).LT.0.) YBAR(K,I)=0.	VS 4693
IF(ALPDT.LT.8.) GO TO 2251	VS 4694
ALPDT=ALPDT-8.	VS 4695
MT=1	VS 4696
GO TO 2250	VS 4697
2254 CONTINUE	VS 4698
2251 CONTINUE	VS 4699
C WRITE(JPT,2) ALP,ALPBD(K,I),YD2(K,I),ALPDT	VS 4700
AA=ALPBD(K,I)*180./PI	VS 4701
IF(IRD.EQ.1) WRITE(JPT,910) AA	VS 4702
IF (IRD.NE.0) WRITE(JPT,701)	VS 4703
701 FORMAT(5X,25H(FOR SYMMETRICAL LOADING))	VS 4704
YBRBR(K,I)=1.	VS 4705

YBRBL(K,I)=1.	VS 4706
YDR2(K,I)=1.	VS 4707
YDL2(K,I)=1.	VS 4708
IF(IBD.EQ.0) GO TO 2233	VS 4709
IF(LAT.NE.1) GO TO 2233	VS 4710
DXTE=0.	VS 4711
IF(ICOUNT.NE.1) GO TO 912	VS 4712
ABDR(K,I)=ALBDBR(K,I)	VS 4713
ABDL(K,I)=ALBDBL(K,I)	VS 4714
ALBDBR(K,I)=ALBDBR(K,I)-DA	VS 4715
ALBDBL(K,I)=ALBDBL(K,I)-DA	VS 4716
IF(ALBDBR(K,I).LT.0.) ALBDBR(K,I)=0.	VS 4717
IF(ALBDBL(K,I).LT.0.) ALBDBL(K,I)=0.	VS 4718
912 CONTINUE	VS 4719
AA=ALBDBR(K,I)*180./PI	VS 4720
BB=ALBDBL(K,I)*180./PI	VS 4721
WRITE(JPT,910) AA	VS 4722
WRITE(JPT,702)	VS 4723
702 FORMAT(5X,28H(FOR RIGHT WING IN SIDESLIP))	VS 4724
WRITE(JPT,910) BB	VS 4725
WRITE(JPT,703)	VS 4726
703 FORMAT(5X,27H(FOR LEFT WING IN SIDESLIP))	VS 4727
IF(ALP.LT.ALBDBR(K,I)) GO TO 2249	VS 4728
ALPDT=(ALP-ALBDBR(K,I))*180./PI	VS 4729
DXTE=BDPT(ALPDT)	VS 4730
YBRBR(K,I)=1.-DXTE	VS 4731
2249 IF(ALP.LT.ALBDBL(K,I)) GO TO 2248	VS 4732
ALPDT=(ALP-ALBDBL(K,I))*180./PI	VS 4733
DXTE=BDPT(ALPDT)	VS 4734
YBRBL(K,I)=1.-DXTE	VS 4735
2248 CONTINUE	VS 4736
IF(YBRBR(K,I).LT.0.) YBRBR(K,I)=0.	VS 4737
IF(YBRBL(K,I).LT.0.) YBRBL(K,I)=0.	VS 4738
ALPDT=(ALP-ALBDBR(K,I))*180./PI-8.	VS 4739
IF(ALPDT.LT.0.) GO TO 2247	VS 4740
DXTE=BDPT(ALPDT)	VS 4741
YDR2(K,I)=1.-DXTE	VS 4742
2247 ALPDT=(ALP-ALBDBL(K,I))*180./PI-8.	VS 4743
IF(ALPDT.LT.0.) GO TO 2233	VS 4744
DXTE=BDPT(ALPDT)	VS 4745
YDL2(K,I)=1.-DXTE	VS 4746
IF(YDR2(K,I).LT.0.) YDR2(K,I)=0.	VS 4747
IF(YDL2(K,I).LT.0.) YDL2(K,I)=0.	VS 4748
2233 CONTINUE	VS 4749
C WRITE(JPT,2)YBRBR(1,1),YBRBL(1,1),ALBDBR(1,1),ALBDBL(1,1),YBR(1,1)	VS 4750
C WRITE(JPT,3) MX(1),MSTP(1)	VS 4751
C IF(LAT.EQ.1) WRITE(JPT,2) YDR2(1,1),YDL2(1,1)	VS 4752
KCH=1	VS 4753
K=1	VS 4754

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NL=1	VS 4755
JK=0	VS 4756
JWING=IWING(K)	VS 4757
TO=2.	VS 4758
JA=1	VS 4759
LL=1	VS 4760
KY=0	VS 4761
KS=0	VS 4762
KR=0	VS 4763
DR=0.	VS 4764
DRR=0.	VS 4765
SRR=0.	VS 4766
DBB=0.	VS 4767
YBA=0.	VS 4768
YBD=0.	VS 4769
YBC=0.	VS 4770
SYB=HALFB(1)	VS 4771
SYR=HALFB(1)	VS 4772
SSB=HALFB(1)	VS 4773
ICONT=1	VS 4774
ABRN=0.	VS 4775
ABR=0.	VS 4776
YYB=0.	VS 4777
RTK=1.	VS 4778
RTD=1.	VS 4779
RTBR=1.	VS 4780
RTBL=1.	VS 4781
DO 2144 I=1,NSUR	VS 4782
CLW(I)=0.	VS 4783
CMW(I)=0.	VS 4784
CDW(I)=0.	VS 4785
CLWL(I)=0.	VS 4786
CMWL(I)=0.	VS 4787
2144 CDWL(I)=0.	VS 4788
C SPANWISE INTEGRATION	VS 4789
DO 150 I=1,NCS	VS 4790
KN=K	VS 4791
IF(K.GT.1) KN=K-1	VS 4792
IQ=I	VS 4793
IF(K.GT.1) IQ=I-NS(K-1)	VS 4794
IF(I.NE.(NS(KN)+1)) GO TO 2244	VS 4795
KY=0	VS 4796
KS=0	VS 4797
KR=0	VS 4798
ICONT=1	VS 4799
YYB=0.	VS 4800
SYB=HALFB(K)	VS 4801
SYR=HALFB(K)	VS 4802
SSB=HALFB(K)	VS 4803

DR=0.	VS 4804
DRB=0.	VS 4805
DRR=0.	VS 4806
SRR=0.	VS 4807
YBA=0.	VS 4808
YBO=0.	VS 4809
YBC=0.	VS 4810
ZB=0.	VS 4811
YB=BREAK(K,1)	VS 4812
YBB=BREAK(K,1)	VS 4813
2244 CONTINUE	VS 4814
BML(5,K)=0.	VS 4815
MA=1	VS 4816
IF(I.GE.MSTP(K).AND.MSTP(K).NE.0) MA=2	VS 4817
NB=YD2(K,MA)	VS 4818
IF(NASYM.EQ.1.AND.MA.EQ.1) NB=NB+1	VS 4819
NO=1	VS 4820
IF(MVRTX(K).NE.0) NO=2	VS 4821
IF(MA.EQ.2) NO=YD2(K,MA-1)+1	VS 4822
WRITE(JPT,3) NO,NB,K,IV(K)	VS 4823
IF(MA.EQ.2.AND.I.EQ.MSTP(K)) KY=0	VS 4824
IF(MA.EQ.2.AND.I.EQ.MSTP(K)) KR=0	VS 4825
IF(MA.EQ.2.AND.I.EQ.MSTP(K)) KS=0	VS 4826
J7=2	VS 4827
IF(NLEF(K).EQ.1) J7=1	VS 4828
COD=DCOS(K,IPN)	VS 4829
SOD=DSIN(K,IPN)	VS 4830
FATR=1.	VS 4831
I1=0	VS 4832
IF(IV(K).EQ.1) FATR=0.5	VS 4833
IF(NW(K,2).EQ.0) GO TO 160	VS 4834
IF(K.EQ.1) I1=KCH+NS(K)	VS 4835
IF(K.GT.1) I1=KCH+NS(K)-NS(K-1)	VS 4836
CHORD=CH(KCH)+CH(I1)	VS 4837
GO TO 161	VS 4838
160 CHORD=CH(KCH)	VS 4839
161 CONTINUE	VS 4840
KH=KCH	VS 4841
IF(I1.NE.0) KH=I1	VS 4842
FS=COS(SWEEP(KCH))	VS 4843
SSN=SIN(SWEEP(KCH))	VS 4844
FTAN=SSN/FS	VS 4845
TAN=FTAN	VS 4846
IF(LAT.NE.1) GO TO 2255	VS 4847
BR=- (XLE(KCH)-XREF)/HALFB(1)*RL	VS 4848
BR2=BR*BR	VS 4849
RG=ABS(DHM(I))*(2.*ABS(GB)+FTAN*GB2)	VS 4850
RGR=ABS(DHM(I))*(2.*ABS(BR)+FTAN*BR2)	VS 4851
RATR=TO*RGR/CHORD	VS 4852

	RAT=TO*PG/CHORD	VS 4853
2255	CONTINUE	VS 4854
	IF(I.EQ.1.OR.I.EQ.MSTP(K)) GO TO 2253	VS 4855
	IF(I.NE.(NS(K)+1)) GO TO 2252	VS 4856
2253	CONTINUE	VS 4857
	IF(IALP.EQ.1.OR.IBD.EQ.0) GO TO 2252	VS 4858
	IF(ICOUNT.LT.1) GO TO 2252	VS 4859
	RTK=FRATN(YCMX(K,MA))	VS 4860
	RTD=RTK	VS 4861
	IF(LAT.NE.1) GO TO 2252	VS 4862
	RTBR =FRATN(YCBB(K,MA))	VS 4863
	RTBL=FRATN(YCBL(K,MA))	VS 4864
	BML(3,K)=RTBR	VS 4865
	BML(2,K)=RTBL	VS 4866
	BMR(2,K)=RTK	VS 4867
C	WRITE(JPT,2) RTK,RTBR,RTBL	VS 4868
2252	CONTINUE	VS 4869
	IF(MX(K).EQ.2) GO TO 2260	VS 4870
	HREF=HALFB(K)-BREAK(K,1)	VS 4871
	YD=BRFAK(K,1)	VS 4872
	GO TO 2261	VS 4873
2260	IF(MVRTX(K).NE.0) GO TO 2262	VS 4874
	HREF=YREF(K)-BRFAK(K,1)	VS 4875
	YD=BREAK(K,1)	VS 4876
	GO TO 2263	VS 4877
2262	HREF=YREF(K)-BREAK(K,2)	VS 4878
	YD=BREAK(K,2)	VS 4879
2263	CONTINUE	VS 4880
	IF(MA.EQ.2) HREF=HALFB(K)-YREF(K)	VS 4881
	IF(MA.EQ.2) YD=YREF(K)	VS 4882
2261	CONTINUE	VS 4883
	IF(NASYM.EQ.1) HREF=HALFB(K)	VS 4884
	IF(NASYM.EQ.1) YD=0.	VS 4885
	HTIP=HREF+YD	VS 4886
	NJL=LL	VS 4887
	IF(MA.EQ.2) NJL=LPN(K)	VS 4888
C	CHECKING THE LOCATION OF VORTEX BREAKDOWN	VS 4889
	YY=(ABS(YLE(KCH))-YD)/HREF	VS 4890
	FF=1.	VS 4891
	IF(YY.GT.YBAR(K,MA)) FF=RTK	VS 4892
	FDR=FF	VS 4893
	IF(I.NE.NS(K)) GO TO 894	VS 4894
	IA=IWING(K)	VS 4895
	IF(IA.EQ.0) IA=NS(K)	VS 4896
	RRT=1.	VS 4897
	IF(CT(IA).GT.0.0001) RRT=ABS(CSU(IA)/CT(IA))	VS 4898
	IF(RRT.GT.1.) RRT=1.	VS 4899
C	WRITE(JPT,2) RRT	VS 4900
	CBMR(K)=RRT	VS 4901

894	CONTINUE	VS	4902
	AB1=ABD(K,MA)	VS	4903
	AB2=ABDR(K,MA)	VS	4904
	AB3=ARDL(K,MA)	VS	4905
	IF(LAT.NE.1) GO TO 2264	VS	4906
	FBR=1.	VS	4907
	FBL=1.	VS	4908
	FRR=1.	VS	4909
	FRL=1.	VS	4910
	KX=0	VS	4911
	YPL=1.	VS	4912
	FPR=1.	VS	4913
	YP=1.	VS	4914
	YR=1.	VS	4915
	FPL=1.	VS	4916
	ID=0	VS	4917
	IF(IAGVX.EQ.1.AND.MA.EQ.2) ID=1	VS	4918
	IF(IRD.EQ.0) GO TO 2266	VS	4919
C	EFFECT OF ROLLING ON VORTEX BREAKDOWN	VS	4920
	YCC=YBB+(YLE(KCH)-YB)*COD	VS	4921
	ZCC=ZCP(MM+1)+ZB+(YLE(KCH)-YB)*SOD	VS	4922
	PALP=P*(ZCC*SOD+YCC*COD)/HALFR(1)	VS	4923
	ALPP=ALP*COD	VS	4924
	ALD1=ALPP+PALP	VS	4925
	ALD2=ALPP-PALP	VS	4926
	BLD1=ALD1	VS	4927
	BLD2=ALD2	VS	4928
	YCC=YRB+(HTIP-YB)*COD	VS	4929
	ZCC=ZCP(NJL)+ZB+(HTIP-YB)*SOD	VS	4930
	PA=P*(ZCC*SOD+YCC*COD)/HALFB(1)	VS	4931
	ALD1=ALPP+PA	VS	4932
	ALD2=ALPP-PA	VS	4933
	IF(MA.EQ.1) ABP1=ALD1	VS	4934
	IF(MA.EQ.1) ABP2=ALD2	VS	4935
	IF(MA.EQ.2) ABP3=ALD1	VS	4936
	IF(MA.EQ.2) ABP4=ALD2	VS	4937
	IF(I.NE.NS(K)) GO TO 2280	VS	4938
	GPR=1.	VS	4939
	GPL=1.	VS	4940
	IF(ALD1.GE.AB1) GPR=RTK	VS	4941
	IF(ALD2.GE.AB1) GPL=RTK	VS	4942
2280	CONTINUE	VS	4943
	YN1=YN(MM+1,1)	VS	4944
	YN2=YN(MM+1,2)	VS	4945
	IF(NASYM.EQ.1.AND.MA.EQ.1) YN1=ABS(YN(MM+1,2))	VS	4946
	IF(NASYM.EQ.1.AND.MA.EQ.1) YN2=ABS(YN(MM+1,1))	VS	4947
	YY1=(YN1-YD)/HREF	VS	4948
	YY2=(YN2-YD)/HREF	VS	4949
	YH1=YN1	VS	4950

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	YH2=YN2	VS	4951
	IF(ALD1.LT.ALPRD(K,MA)) GO TO 2269	VS	4952
	IF(BLD1.LT.ALPRD(K,MA)) GO TO 2269	VS	4953
	ALD1=0.5*(ALD1+BLD1)	VS	4954
	ALD1=(ALD1-ALPRD(K,MA))*180./PI	VS	4955
	DXTE=0.	VS	4956
	IF(ALD1.GT.0.) DXTE=BDPT(ALD1)	VS	4957
	YP=1.-DXTE	VS	4958
	IF (YY2 .LE. YP) GO TO 2269	VS	4959
	IF (YY1 .GT. YP) FPR=RTK	VS	4960
	IF (YY1 .LE. YP .AND. YY2 .GT. YP) FPR=1.-(1.-RTK)*(YY2-YP)/(YY2-YP1)	VS	4961
		VS	4962
		VS	4963
2269	IF(ALD2.LT.ALPRD(K,MA)) GO TO 2268	VS	4964
	IF(BLD2.LT.ALPRD(K,MA)) GO TO 2268	VS	4965
	ALD2=0.5*(ALD2+BLD2)	VS	4966
	ALD2=(ALD2-ALPRD(K,MA))*180./PI	VS	4967
	DXTE=0.	VS	4968
	IF(ALD2.GT.0.) DXTE=BDPT(ALD2)	VS	4969
	YPL=1.-DXTE	VS	4970
	IF (YY2 .LE. YPL) GO TO 2268	VS	4971
	IF (YY1 .GT. YPL) FPL=RTK	VS	4972
	IF(YY1.LE.YPL.AND.YY2.GT.YPL) FPL=1.-(1.-RTK)*(YY2-YPL)/(YY2-YY1)	VS	4973
2268	CONTINUE	VS	4974
C	EFFECT OF SIDESLIP ON VORTEX BREAKDOWN	VS	4975
	IF(YY.GT.YRRBR(K,MA)) FBR=RTBR	VS	4976
	IF(YY.GT.YRRBL(K,MA)) FBL=RTBL	VS	4977
	FSD=1.	VS	4978
	IF(ALP.GT.AB2.AND.ALPRD.LT.AB1) FSD=1.-(1.-PTRR)*(ALP-AB2)/(AB1-AB2)	VS	4979
	IF(ALP.GE.AB1) FSD=RTBR	VS	4980
	FSDL=1.	VS	4981
	IF(ALP.GE.AB3)FSDL=RTBL	VS	4982
C	EFFECT OF YAWING ON VORTEX BREAKDOWN	VS	4983
	IFBL=0	VS	4984
	IFBR=0	VS	4985
	RK=RTAL	VS	4986
	BLR=-BR	VS	4987
	IF(PBK.GT.0.01) BLR=-BK-PR	VS	4988
	BB=BLR	VS	4989
	BLR=ABS(BLR)	VS	4990
	BA1=ALPRD(K,MA)	VS	4991
	BA2=ALBDRD(K,MA)	VS	4992
	BA3=ALBDBR(K,MA)	VS	4993
	GRL=BA1-(BA2-BA1)/BK*BB	VS	4994
	IF(PBK.LT.0.01) GRL=BA1-(BA1-BA3)/BK*BB	VS	4995
	DRL=BA1+(BA2-BA1)/BK*BB	VS	4996
	IF(PBK.GT.0.01) DRL=BA1+(BA1-BA3)/BK*BB	VS	4997
	ARL=GRL	VS	4998
	CRL=ARL	VS	4999
	BLR=(AUX(K,NB)-XREF)/HALFB(1)*RL	VS	4999

IF(PBK.GT.0.01) BLR=-BK+BLR	VS 5000
AA=RLR	VS 5001
BLR=ABS(BLR)	VS 5002
ERL=BA1+(BA2-BA1)/BK*AA	VS 5003
HRL=BA1-(BA2-BA1)/BK*AA	VS 5004
IF(PBK.GT.0.01) ERL=BA1+(BA1-BA3)/BK*AA	VS 5005
IF(PBK.LT.0.01) HRL=BA1-(BA1-BA3)/BK*AA	VS 5006
ARL=HRL	VS 5007
CRR=CRL	VS 5008
YEY=ABS(YLF(KCH))	VS 5009
BZ=(ERL-DRL)/(HTIP-YEY)	VS 5010
BDR1=DRL+BZ*(YH1-YEY)	VS 5011
BDR2=DRL+BZ*(YH2-YEY)	VS 5012
B7=(HRL-GRL)/(HTIP-YEY)	VS 5013
BDL1=GRL+B7*(YH1-YEY)	VS 5014
BDL2=GRL+B7*(YH2-YEY)	VS 5015
KX=0	VS 5016
IF(MA.EQ.1) ABR2=APL	VS 5017
IF(MA.EQ.1) ABR1=ERL	VS 5018
IF(MA.EQ.2) ABR3=APL	VS 5019
IF(MA.EQ.2) ABR4=ERL	VS 5020
IF(ALP.GT.CRL.OR.ALP.GT.DRL) GO TO 2265	VS 5021
IF(ALP.GT.ERL.OR.ALP.GT.HRL) GO TO 2265	VS 5022
GO TO 2266	VS 5023
20 CONTINUE	VS 5024
DXTE=0.	VS 5025
APD=(ALP-ARL)*180./PI	VS 5026
IF(ALP.GT.ARL) DXTE=BDPT(APD)	VS 5027
YR=1.-DXTE	VS 5028
IF(YR.LT.0.) YR=0.	VS 5029
IF(YR.LT.YY1) YR=YY1	VS 5030
IF(YR.GT.YY2) YR=YY2	VS 5031
DXT=0.	VS 5032
APD=(ALP-ARL1)*180./PI	VS 5033
IF(ALP.GT.ARL1) DXT=BDPT(APD)	VS 5034
YR1=1.-DXT	VS 5035
IF(YR1.GT.YY2) YR1=YY2	VS 5036
IF(YR1.LT.YY1) YR1=YY1	VS 5037
YR=0.5*(YR+YR1)	VS 5038
IF(YY2.LE.YR) GO TO 23	VS 5039
RP=RTBR	VS 5040
RM=1.	VS 5041
IF(KX.EQ.2) RP=RTL	VS 5042
IF(KX.EQ.1.AND.PBK.GT.0.01) RP=RTBL	VS 5043
IF(KX.EQ.1.AND.YY1.GT.YR) FRL=RP	VS 5044
IF(KX.EQ.2.AND.YY1.GT.YR) FRR=RP	VS 5045
IF(YY1.LE.YR.AND.YY2.GT.YR) RM=1.-((1.-RP)*(YY2-YR)/(YY2-YY1))	VS 5046
KY=0	VS 5047
IF(YY1.LE.YR.AND.YY2.GT.YR) KY=1	VS 5048

	IF (KY .EQ. 1 .AND. KX .EQ.1) FRL=RM	VS 5049
	IF (KY .EQ. 1 .AND. KX .EQ. 2) FRR=RM	VS 5050
	IF (PBK .LT. 0.01 .AND. KX .EQ. 1) PMM=(1.-RM)/(1.-RP)	VS 5051
	IF (PBK .GT. 0.01 .AND. KX .EQ. 2) RMM=(1.-RM)/(1.-RP)	VS 5052
23	CONTINUE	VS 5053
	IF(KX.EQ.1) GO TO 21	VS 5054
	GO TO 2266	VS 5055
2265	CONTINUE	VS 5056
C	WRITE(JPT,2) HRL,GRL	VS 5057
	IF(ALP.LT.HRL.AND.ALP.LT.BDL2) GO TO 21	VS 5058
	KX=1	VS 5059
	ARL=0.5*(BDL2+HRL)	VS 5060
	ARL1=0.5*(BDL1+HRL)	VS 5061
	GO TO 20	VS 5062
21	CONTINUE	VS 5063
	IF(ALP.LT.ERL.AND.ALP.LT.DRL) GO TO 2266	VS 5064
	KX=2	VS 5065
	ARL=0.5*(BDR1+ERL)	VS 5066
	ARL1=0.5*(BDR2+ERL)	VS 5067
	GO TO 20	VS 5068
2266	CONTINUE	VS 5069
	IF (ABS(FPR-RTK) .GT. 0.01) GO TO 883	VS 5070
	IF (PRK .GT. 0.01 .AND. ARS(FRR-RTKL) .GT. 0.01) FRR=RTK	VS 5071
883	CONTINUE	VS 5072
	IF(ID.EQ.1) GO TO 882	VS 5073
	GO TO 893	VS 5074
882	CONTINUE	VS 5075
C	STRAKE EFFECT	VS 5076
	IF(ALP.LE.ALBDDBR(K,1)) FBR=1.	VS 5077
	IF(ABP1.LE.ALPRD(K,1)) FPR=1.	VS 5078
	IF(ALP.LE.ABR1) FRR=1.	VS 5079
C	WRITE(JPT,2) ARP1,ABP2,ABP3,ABR1,ABR2,ABR3	VS 5080
	IF(ALP.GT.ALBDDBL(K,2).AND.ALP.LE.ALBDDBL(K,1)) FBL=1.-(1.-FBL)*(ALPVS	VS 5081
	1-ALBDDBL(K,2))/(ALBDDBL(K,1)-ALBDDBL(K,2))	VS 5082
	IF(ARP2.GT.ALPRD(K,2).AND.ARP2.LE.ALPRD(K,1)) FPL=1.-(1.-FPL)*(ARPVS	VS 5083
	12-ALPRD(K,2))/(ALPRD(K,1)-ALPRD(K,2))	VS 5084
	IF(ALP.GT.ABR3.AND.ALP.LE.ABR2) FRL=1.-(1.-FRL)*(ALP-ABP3)/(ABR2-	VS 5085
	1 ABR3)	VS 5086
893	CONTINUE	VS 5087
	IF(I.EQ.NS(K)) BML(4,K)=0.5*(GPR+GPL)	VS 5088
	IF(I.EQ.NS(K)) XL(1,K)=0.5*(FSD+FSDL)	VS 5089
	IF(I.EQ.NS(K)) CA(K)=FSDL	VS 5090
	IF(ABS(1.-FBR).GT.0.01) RATR=TO*ABS(DMM(I))/CHORD	VS 5091
	IF(ABS(1.-FRL).GT.0.01) RATR=TO*ABS(DMM(I))/CHORD	VS 5092
	IF(PBK.GT.0.01.AND.ABS(1.-FRR).GT.0.01) RATR=TO*ABS(DMM(I))/CHORD	VS 5093
C	IF(I.EQ.NS(K)) WRITE(JPT,2) BML(4,K),XL(1,K),XL(2,K)	VS 5094
2264	CONTINUE	VS 5095
	IF(I.EQ.NS(K)) CPCWL(K)=RRT	VS 5096
	IF(I.EQ.NS(K).AND.ALP.GE.AB1)CPCWL(K)=RTK+RRT	VS 5097

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CML=0.	VS 5098
CLS(I)=0.	VS 5099
CL(I)=0.	VS 5100
CD(I)=0.	VS 5101
PIC=PI/CHORD	VS 5102
CLG1=0.	VS 5103
CDG1=0.	VS 5104
CMG1=0.	VS 5105
CYS=0.	VS 5106
CNS=0.	VS 5107
CLBS=0.	VS 5108
CLPS=0.	VS 5109
CLPVS=0.	VS 5110
CYPS=0.	VS 5111
CNPS=0.	VS 5112
CYRS=0.	VS 5113
CLRS=0.	VS 5114
CNRS=0.	VS 5115
CNR1=0.	VS 5116
CYS1=0.	VS 5117
CLBS1=0.	VS 5118
CYR1=0.	VS 5119
CNR1=0.	VS 5120
CLR1=0.	VS 5121
CLY(I)=0.	VS 5122
CDPPS=0.	VS 5123
CLPPS=0.	VS 5124
CAXL=0.	VS 5125
CAVS(I)=0.	VS 5126
NCW=NW(K,1)+NW(K,2)	VS 5127
IF(LAT.NE.1) GO TO 2275	VS 5128
IF(IO.LE.MVRTX(K).AND.MVRTX(K).NE.0) GO TO 2275	VS 5129
IF(BUX(K,NB).LE.AUX(K,NB)) GO TO 2275	VS 5130
DXR=AUX(K,NO)-CRX(K,NO)	VS 5131
CRR=AUX(K,NR)-DXR	VS 5132
XEE=CRR*(YEY-BREAK(K,NO))/(YBREAK(K,NB)-BREAK(K,NO))+DXR	VS 5133
IF(KY.EQ.0) DYB(K)=YYB	VS 5134
IF(KY.EQ.1) GO TO 2272	VS 5135
XE=XEE+ABS(RG)*TQ	VS 5136
IF(XE.LT.AUX(K,NR)) GO TO 2271	VS 5137
KY=1	VS 5138
IF(YBA.LT.1.E-20)XBA=DXR	VS 5139
IF(YBA.LT.1.E-20)YBA=RPEAK(K,NO)	VS 5140
SY=YBA+(YLE(KCH)-YBA)*(AUX(K,NB)-XBA)/(XE-XBA)	VS 5141
SB=SY	VS 5142
IF(SB.LT.0.) SB=0.	VS 5143
DYB(K)=0.5*(YBREAK(K,NB)-SB)	VS 5144
SYB=SB	VS 5145
DBR=DYB(K)	VS 5146

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		VS	5147
		VS	5148
2271	XBA=XE	VS	5149
	YBA=YLE(KCH)	VS	5150
	Q1=AUX(K,NB)-XE	VS	5151
	Q2=CRR	VS	5152
	IF((Q1-Q2).LT.1.E-9) GO TO 2272	VS	5153
	IF(Q2.LT.1.E-5) GO TO 2272	VS	5154
	DL=YBREAK(K,NB)-RBREAK(K,NO)-(YEY-BREAK(K,NO))/(1.-Q1/Q2)	VS	5155
	SYB=YBREAK(K,NB)-DL	VS	5156
	IF(SYB.LT.0.) SYB=0.	VS	5157
	DBB=0.5*DL	VS	5158
	DYB(K)=0.5*DL	VS	5159
2272	CONTINUE	VS	5160
	IF(KR.EQ.0) DYR(K)=DPR	VS	5161
C	WRITE(JPT,2) XE,AUX(K,NB),SYB,DBB	VS	5162
	IF(KR.EQ.1) GO TO 2273	VS	5163
	XE=XEE+ABS(RGR)*TO	VS	5164
	IF(XE.LT.AUX(K,NB)) GO TO 2274	VS	5165
	KR=1	VS	5166
	IF(YBD.LT.1.E-20)XBD=DXR	VS	5167
	IF(YBD.LT.1.E-20)YBD=BREAK(K,NO)	VS	5168
	SR=YBD+(YEY-YBD)*(AUX(K,NB)-XBD)/(XE-XBD)	VS	5169
	DYR(K)=YBREAK(K,NB)-SR	VS	5170
	SRR=SR	VS	5171
	DYR(K)=0.5*DYR(K)	VS	5172
	SYR=SRR	VS	5173
	GO TO 2273	VS	5174
2274	XBD=XE	VS	5175
	YBD=YLE(KCH)	VS	5176
	Q1=AUX(K,NB)-XE	VS	5177
	Q2=CRR	VS	5178
	IF((Q1-Q2).LT.1.E-9) GO TO 2273	VS	5179
	IF(Q2.LT.1.E-5) GO TO 2273	VS	5180
	DL=YBREAK(K,NB)-RBREAK(K,NO)-(YEY-BREAK(K,NO))/(1.-Q1/Q2)	VS	5181
	SYR=YBREAK(K,NB)-DL	VS	5182
	IF(SYR.LT.0.) SYR=0.	VS	5183
2273	CONTINUE	VS	5184
	IF(KS.EQ.1) GO TO 2277	VS	5185
	XE=XEE+ABS(DMM(I))	VS	5186
	IF(XE.LT.AUX(K,NB)) GO TO 2276	VS	5187
	KS=1	VS	5188
	IF(YBC.LT.1.E-20)XBC=DXR	VS	5189
	IF(YBC.LT.1.E-20)YBC=BREAK(K,NO)	VS	5190
	SR=YBC+(YEY-YBC)*(AUX(K,NB)-XBC)/(XE-XBC)	VS	5191
	SSB=SR	VS	5192
	IF(SSB.LT.0.) SSB=0.	VS	5193
	DBY=0.5*(YBREAK(K,NB)-SR)	VS	5194
	GO TO 2277	VS	5195
2276	XBC=XE		

YBC=YLE(KCH)	VS	5196
DBY=DBB	VS	5197
Q1=AUX(K,NB)-XE	VS	5198
Q2=CRR	VS	5199
IF((Q1-Q2).LT.1.E-9) GO TO 2277	VS	5200
IF(Q2.LT.1.E-5) GO TO 2277	VS	5201
DL=YBREAK(K,NB)-BREAK(K,NO)-(YEY-BREAK(K,NO))/(1.-Q1/Q2)	VS	5202
SSB=YBREAK(K,NB)-DL	VS	5203
IF(SSB.LT.0.) SSB=0.	VS	5204
2277 XAV=0.5*(AUX(K,NR)+BUX(K,NB))	VS	5205
IF(ID.EQ.1.AND.ALP.LT.ALBDBR(K,1)) GO TO 2275	VS	5206
BRL=(AUX(K,NB)-XREF)/HALFB(1)*RL	VS	5207
BRT=(XAV-XREF)/HALFB(1)*RL	VS	5208
ALL=AB1-(AB1-AB2)/BK*BRT	VS	5209
BLL=AB1-(AB1-AB2)/BK*BRL	VS	5210
IF(BRL.LT.0.) RLL=AB1	VS	5211
ALL=0.5*(ALL+BLL)	VS	5212
IF(ALP.GT.BLL) SYR=SSB	VS	5213
IF(ALP.GT.ALL.AND.ALP.LT.BLL) SYR=SYR+(ALP-ALL)*(SSB-SYR)/(RLL-	VS	5214
1ALL)	VS	5215
IF(ALP.GE.AB2.AND.SYB.GT.SSB) SYR=SYR+(ALP-AB2)*(SSB-SYB)/(AB1-AB2	VS	5216
1)	VS	5217
IF(ALP.GE.AB1) SYB=SSB	VS	5218
2275 CONTINUE	VS	5219
C WRITE(JPT,2) SYB,SYR,SSB,DBB,DYB(K),DP,DYR(K)	VS	5220
C CHORDWISE INTEGRATION	VS	5221
DO 155 J=1,NCW	VS	5222
EPL=0.	VS	5223
NN=J+MM	VS	5224
IF(NW(K,2).EQ.0) GO TO 151	VS	5225
IF(J.LE.NW(K,1)) GO TO 151	VS	5226
IK=0	VS	5227
IF(K.GT.1) IK=NS(K-1)	VS	5228
LL=(PANI(K)+NW(K,2)*(I-IK-1)+NN-NW(K,1))*(I-IK)	VS	5229
IL=I1	VS	5230
JLL=J-NW(K,1)	VS	5231
L=2	VS	5232
FN=NW(K,2)	VS	5233
GO TO 152	VS	5234
151 LL=NN+JK	VS	5235
IL=KCH	VS	5236
JLL=J	VS	5237
L=1	VS	5238
FN=NW(K,1)	VS	5239
152 CONTINUE	VS	5240
ECH=0.	VS	5241
XC=(XV(LL)-XLE(KCH))/CHORD	VS	5242
IF(ICAM(K).EQ.3) XC=XV(LL)	VS	5243
Z1=XC	VS	5244

	TSW=(XN(LL,2)-XN(LL,1))/(YN(LL,2)-YN(LL,1))	VS 5245
	IF(IWING(K).NE.0.AND.I.GT.IWING(K)) GO TO 311	VS 5246
	IF (IALP .EQ. 1) GO TO 305	VS 5247
	IF(K.EQ.1.AND.ICAMB.EQ.1) GO TO 1315	VS 5248
	CALL ZCR(XC,YV(LL),CAM,ICAM,Z1,K,1,CHORD,DZDY,IST,TSW)	VS 5249
	IF(LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 300	VS 5250
	GO TO 296	VS 5251
1315	YC=YLE(KCH)	VS 5252
	XCC=XC	VS 5253
	XC=XV(LL)	VS 5254
	CALL ZCDX (XC,YC,CAM,DZDY)	VS 5255
	Z1=YC	VS 5256
	XC=XCC	VS 5257
	IF(LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 300	VS 5258
296	EP=ALPH(I)	VS 5259
	IF(NL.EQ.NAL(K).AND.MJW1(K,2,NL).EQ.0) GO TO 300	VS 5260
	CS=COS(EP)	VS 5261
	SS=SIN(EP)	VS 5262
	GO TO 310	VS 5263
300	IF(NL.EQ.NAL(K)) EP=ALPH(I)	VS 5264
	IF (NL.NE.NAL(K)) EP=ALPH(I)-TFLP(K,NL)	VS 5265
	IF(NL.EQ.NAL(K)) EPL=-TFLP(K,NL)	VS 5266
	IF(NASYM.EQ.1) EPL=-TFLP(K,NL)	VS 5267
	IF(NL.NE.NAL(K)) ECM=TFLP(K,NL)	VS 5268
	CS=COS(EP)	VS 5269
	SS=SIN(EP)	VS 5270
	GO TO 310	VS 5271
311	IF(IALP.EQ.1) GO TO 305	VS 5272
	CAM=0.	VS 5273
	ICT=ICAMT(K)	VS 5274
	IF(ICT.NE.0) CALL ZCR(XC,YV(LL),CAM,ICAM,Z1,K,ICT,CHORD,	VS 5275
	1DZDY,IST,TSW)	VS 5276
	IF(LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 300	VS 5277
	GO TO 296	VS 5278
305	CS=1.	VS 5279
	SS=1.	VS 5280
	CAM=0.	VS 5281
310	CONTINUE	VS 5282
	AXCAM=CAM+ECM	VS 5283
	U1=0.	VS 5284
	U2=0.	VS 5285
	V1=0.	VS 5286
	V2=0.	VS 5287
	IF (NGRD .EQ. 0) GO TO 512	VS 5288
	ZCW=-2.*(ZN(LL,1)+ZB+(YCP(LL)-YB)*SOD+HEIGHT)+ZN(LL,1)+ZB+(YCP(LL)	VS 5289
	1-YB)*SOD	VS 5290
	CALL BACKWH(XV(LL),YV(LL),ZCW,LPANEL,B,LPAN1,NW,CP,U1,LAT,COD,SOD,	VS 5291
	1YBREAK,DCOS,DSIN,V1,IWING,ZB,YB,YBB,NCSS,IWGLT,IV,NC1,KF,BREAK)	VS 5292
	IF(LAT.NE.(-1)) GO TO 512	VS 5293

CALL BACKWH(XV(LL),YV(LL),ZCW,LPANEL,B,LPAN1,NW,GAMMA,U2,LAT,COD,	VS	5294
1SOD,YBREAK,DCOS,DSIN,V2,IWING,7B,YR,YRB,NCSS,IWGLT,IV,NC1,KF,BREAK	VS	5295
2)	VS	5296
512 CONTINUE	VS	5297
IF (IALP .EQ. 0) GO TO 513	VS	5298
GAK=CP(LL)*(1.+U1*ALP)+CP(LL)*ALP*U1-GAMX(LL)*(V1*ALP+SOD*ALP)*2.	VS	5299
GBK=GAMMA(LL)	VS	5300
CP(LL)=GAK	VS	5301
GO TO 514	VS	5302
513 CONTINUE	VS	5303
ST=SQRT(1.+DZDY*DZDY)	VS	5304
SD=SOD/ST+DZDY/ST*COD	VS	5305
CK=CS	VS	5306
CS=(CAM*SS+CK)/SQRT(1.+CAM*CAM)	VS	5307
PCA=0.	VS	5308
IF (COD.GT..98) PCA=GAMX(LL)*(V1+SD*SNALP(I))	VS	5309
GAK=CP(LL)*(1.+U1)*CS-PCA	VS	5310
GBK=GAMMA(LL)*(1.+U1+U2)*CS-GAMX(LL)*(V2+V1)	VS	5311
CP(LL)=GAK	VS	5312
CS=CK	VS	5313
GAMMA(LL)=GBK	VS	5314
514 CONTINUE	VS	5315
GBS=GAK*SN(K,JLL,L)*CH(IL)/FN	VS	5316
WBS=GBK*SN(K,JLL,L)*CH(IL)/FN	VS	5317
WAS=0.	VS	5318
FT=SQRT((1.+CAM*CAM)*COD*COD+(SOD+DZDY*COD)**2)	VS	5319
PL=(CAM*SS+CS)*COD/FT	VS	5320
PD=(-CAM*CS+SS)*COD/FT	VS	5321
PM=(XV(LL)+Z1*CAM-XREF)*COD/FT	VS	5322
CL(I)=CL(I)+GBS*PL	VS	5323
CD(I)=CD(I)+GBS*PD	VS	5324
CML=CML-GBS*PM	VS	5325
CLPPS=CLPPS+GBS*PL	VS	5326
CDPPS=CDPPS+GBS*PD	VS	5327
WGS=CPAUG(LL)*SN(K,JLL,L)*CH(IL)/FN	VS	5328
CLG1=CLG1+WGS*PL	VS	5329
CDG1=CDG1+WGS*PD	VS	5330
CMG1=CMG1-WGS*PM	VS	5331
CLS(I)=CLS(I)+WBS	VS	5332
CLY(I)=CLY(I)+GBS*CS	VS	5333
CAXL=CAXL+GBS*(-AXCAM)*COD/FT	VS	5334
IF(LAT.EQ.0) GO TO 155	VS	5335
FZ=SN(K,JLL,L)*CH(IL)/FN	VS	5336
IF(LAT.EQ.(-1)) GO TO 1353	VS	5337
WP=GAMP(LL)*FZ*(1.+U1)	VS	5338
WB=GAMB(LL)*FZ*(1.+U1)	VS	5339
WR=GAMR(LL)*FZ*(1.+U1)	VS	5340
FBC=1.	VS	5341
IF(YCP(LL).GT.SYR.OR.YY.GT.YBAR(K,MA)) FBC=0.	VS	5342

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	FWR=1.	VS 5343
	IF(XC.LT.RAT.AND.XV(LL).LT.AUX(K,NB)) FWR=0.	VS 5344
	IF(YN(LL,1).GT.SYB.AND.XV(LL).GT.AUX(K,NR)) FWR=0.	VS 5345
	IF(SYB.GT.YN(LL,1).AND.SYB.LT.YN(LL,2)) GO TO 521	VS 5346
	GO TO 522	VS 5347
521	IF(XV(LL).LE.AUX(K,NB)) GO TO 522	VS 5348
	FWB=(SYB-YN(LL,1))/(YN(LL,2)-YN(LL,1))	VS 5349
522	CONTINUE	VS 5350
	FWR=ABS(FWB)	VS 5351
	WBB=GAMB(LL)*FZ*(1.+U1)*FWR	VS 5352
	FWR=1.	VS 5353
	IF(XC.LT.RATR.AND.XV(LL).LT.AUX(K,NB)) FWR=0.	VS 5354
	IF(YN(LL,1).GT.SYR.AND.XV(LL).GT.AUX(K,NB)) FWR=0.	VS 5355
	IF(SYR.GT.YN(LL,1).AND.SYR.LT.YN(LL,2)) GO TO 523	VS 5356
	GO TO 524	VS 5357
523	IF(XV(LL).LE.AUX(K,NB)) GO TO 524	VS 5358
	FWR=(SYR-YN(LL,1))/(YN(LL,2)-YN(LL,1))	VS 5359
524	CONTINUE	VS 5360
	FWR=ABS(FWR)	VS 5361
	WRR=GAMR(LL)*FZ*(1.+U1)*FWR	VS 5362
1353	CONTINUE	VS 5363
	P1=DZDY*COD+SDD	VS 5364
	YCV=P1*(XV(LL)-XREF)/FT	VS 5365
	ZCV=P1*(ZCP(LL)+ZB+(YCP(LL)-YB)*SDD)+COD*(YBB+(YCP(LL)-YR)*COD)	VS 5366
	ZCV=ZCV/FT	VS 5367
	IF(LAT.EQ.1) GO TO 1354	VS 5368
	EPP=EPL	VS 5369
	EPL=EPL-CAM	VS 5370
	IF(NASYM.EQ.1) WBS=GBS	VS 5371
	CLBS=CLBS-WBS*ZCV*COS(EPL)	VS 5372
	CNS=CNS+WBS*YCV+GBS*SIN(EPP)*YLF(KCH)*COD/FT	VS 5373
	GO TO 155	VS 5374
1354	CONTINUE	VS 5375
	CYS=CYS-WB*P1/FT-GBS*(-CAM*CS+SS)*COD/FT*BK*CO5A	VS 5376
	CNS=CNS+WR*YCV+GBS*(-CAM*CS+SS)*COD/FT*BK*(XV(LL)-XREF)*CO5A	VS 5377
	CLBS=CLBS-WB*ZCV	VS 5378
	CYPS=CYPS-WP*P1/FT	VS 5379
	CLPS=CLPS-WP*ZCV	VS 5380
	CNPS=CNPS+WP*YCV	VS 5381
	CYRS=CYRS-WR*P1/FT+GBS*SS*(XV(LL)-XREF)/HALFB(1)*COD/FT*RL	VS 5382
	CLRS=CLRS-WR*ZCV	VS 5383
	CNRS=CNRS+WR*YCV-GBS*SS*(XV(LL)-XREF)/HALFR(1)*COD/FT*RL*(XV(LL)-	VS 5384
	1XREF)	VS 5385
	CLPVS=CLPVS-(WP-GBS/CS*P*ZCV*SINA/HALFB(1))*ZCV	VS 5386
	CNB1=CNB1+WBB*YCV	VS 5387
	GBS=GBS*FBC	VS 5388
	CYS1=CYS1-WBB*P1/FT-GBS*(-CAM*CS+SS)*COD/FT*RK*CO5A	VS 5389
	CLBS1=CLBS1-WBR*ZCV	VS 5390
	CYR1=CYR1-WRR*P1/FT	VS 5391

	CNR1=CNR1+WPR*YCV	VS 5392
	CLR1=CLR1-WRR*ZCV	VS 5393
	CNR1=CNB1+GBS*(-CAM*CS+SS)*COD/FT*BK*(XV(LL)-XREF)*COSA	VS 5394
155	CONTINUE	VS 5395
C	END OF CHORDWISE INTEGRATION	VS 5396
	DZDY=0.	VS 5397
	TSW=SIN(SWEEP(KCH))/COS(SWEEP(KCH))	VS 5398
	IF (IALP .EQ. 1) GO TO 316	VS 5399
	IF(IWING(K).NF.O.AND.I.GT.IWING(K)) GO TO 320	VS 5400
	IF(K.EQ.1.AND.ICAMB.EQ.1) GO TO 1325	VS 5401
	XC = 0.	VS 5402
	IF(ICAM(K).EQ.3) XC=XLE(KCH)	VS 5403
	Z1=XC	VS 5404
	CALL ZCR(XC,YLE(KCH),CAMLE,ICAM,Z1,K,1,CHORD,DZDY,IST,TSW)	VS 5405
	IF(NLEF(K).EQ.0) GO TO 318	VS 5406
	IF (LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 315	VS 5407
	GO TO 318	VS 5408
315	CAMLE=CAMLE+TFLP(K,NL)	VS 5409
	GO TO 318	VS 5410
1325	YC=YLF(KCH)	VS 5411
	XC=XLE(KCH)	VS 5412
	CALL ZCDX(XC,YC,CAMLE,DZDY)	VS 5413
	Z1=YC	VS 5414
318	EP=ALPH(I)	VS 5415
	XCS=COS(EP)	VS 5416
	XSS=SIN(EP)	VS 5417
	GO TO 317	VS 5418
316	XCS=1.	VS 5419
	XSS=0.	VS 5420
	CAMLE=0.	VS 5421
	GO TO 317	VS 5422
320	CAMLE=0.	VS 5423
	ICT=ICAMT(K)	VS 5424
	IF(ICT.NE.0) CALL ZCR(XC,YLE(KCH),CAMLE,ICAM,Z1,K,ICT,	VS 5425
	1CHORD,DZDY,IST,TSW)	VS 5426
	XCS=COS(ALPH(I))	VS 5427
	XSS=SIN(ALPH(I))	VS 5428
	IF(NLEF(K).EQ.0) GO TO 317	VS 5429
	IF (LL.GE.MJW1(K,JZ,NL).AND.LL.LE.MJW2(K,JZ,NL)) GO TO 295	VS 5430
	GO TO 317	VS 5431
295	CAMLE=CAMLE+TFLP(K,NL)	VS 5432
317	CONTINUE	VS 5433
	CAMV=DZDY	VS 5434
	DZDY=0.	VS 5435
	IF(ICAM(K).LE.1) Z1=0.	VS 5436
	F1=SQRT(1.+CAMLE**2)	VS 5437
	F2=SQRT((1.+FTAN*FTAN)*COD*COD+(CAMLE*FTAN+SOD)**2)	VS 5438
	F12=F1*F2	VS 5439
	F3=COD*COD+CAMLE*(CAMLE*FTAN+SOD)	VS 5440

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F4=-CAMLE*COD+FTAN*SOD*COD	VS 5441
IF(ABS(COD).GT.0.1)F5=F12/SQRT(F3*F3+F4*F4)	VS 5442
IF(ABS(COD).LE.0.1)F5=1./FS	VS 5443
FT=SQRT(1.+CAMLE**2)	VS 5444
FL=XSS-XCS*CAMLE	VS 5445
FD=-XCS-XSS*CAMLE	VS 5446
CLPPS=CLPPS*PI/CHORD+BMR(1,I)*FL/FT	VS 5447
CL(I)=CL(I)*PI/CHORD+CT(I)*FL/FT	VS 5448
CM(I)=CML*PI/(CREF*CHORD)	VS 5449
DIFF=BMR(1,I)-BML(1,I)	VS 5450
IF(DIFF.LT.0.) DIFF=0.	VS 5451
BMR(1,I)=REMAINING L.E.THRUST	VS 5452
DIFF=REMAINING THRUST-L.E.DRAG	VS 5453
CDPPS=CDPPS*PI/CHORD+DIFF*FD/FT	VS 5454
CD(I)=CD(I)*PI/CHORD+CT(I)*FD/FT	VS 5455
CLS(I)=CLS(I)*PI/CHORD	VS 5456
CLY(I)=CLY(I)*PI/CHORD+CT(I)*FL/FT	VS 5457
CAXL=CAXL*PIC	VS 5458
CLG1=CLG1*PIC	VS 5459
CDG1=CDG1*PIC	VS 5460
CMG1=CMG1*PIC/CREF	VS 5461
IF(LAT.EQ.0) GO TO 220	VS 5462
CONST=PI/CHORD	VS 5463
CTH=PI/2.*SQRT(1.-AM*AM*FS*FS)/FS	VS 5464
IF(LAT.EQ.(-1)) GO TO 1355	VS 5465
FBSR=FF	VS 5466
FBSL=FF	VS 5467
FRSR=1.	VS 5468
FRSL=1.	VS 5469
IF(YY.GT.YBPBR(K,MA)) FBSR=RTK	VS 5470
IF(YY.GT.YBPBL(K,MA)) FBSL=RTK	VS 5471
FRSR=FRR	VS 5472
IF(ABS(FPR-RTK).GT.0.01) GO TO 887	VS 5473
IF(PBK.LT.0.01.AND.ABS(FRR-RTBL).GT.0.01) FRR=RTBR	VS 5474
887 CONTINUE	VS 5475
RT=1.	VS 5476
IF(RTBL.LT.1.) RT=1.-(1.-RTK)*(1.-FRL)/(1.-RTBL)	VS 5477
IF((1.-FRL).GT.0.01) FRSL=RT	VS 5478
IF(MA.EQ.1) FZ7=FF	VS 5479
IF(MA.EQ.1) FRI=FRR	VS 5480
IF(MA.EQ.1) FPI=FPL	VS 5481
IF(PBK.LT.0.01) GO TO 888	VS 5482
IF(ABS(FRR-RTBL).LT.0.01) FRSL=RTK	VS 5483
IF(ABS(FRL-RTBL).LT.0.01) FRSP=RTK	VS 5484
IF(ABS(FPR-RTK).GT.0.01) GO TO 889	VS 5485
RO=1.	VS 5486
IF(RTBL.LT.1.) RO=1.-(1.-RTK)*(1.-FRR)/(1.-RTBL)	VS 5487
IF((FRR-RTBL).GT.0.01) FRSR=RO	VS 5488
GO TO 889	VS 5489

888	IF (ABS(FRR-RTBL) .LT. 0.01) FRSR=FRR	VS 5490
	IF (ABS(FRL-RTRR) .LT. 0.01) FRSL=FRL	VS 5491
	IF(F7Z.GT.0.95) GO TO 889	VS 5492
	FRSR=FRSR*FR1	VS 5493
	FRSL=FRSL*FR1	VS 5494
889	CONTINUE	VS 5495
	IF(ID.EQ.0) GO TO 892	VS 5496
	FBSR=1.	VS 5497
	FBSL=1.	VS 5498
	FRSR=1.	VS 5499
	FRSL=1.	VS 5500
892	CONTINUE	VS 5501
	CYS=CYS*CONST	VS 5502
	CNS=CNS*CONST	VS 5503
	CLBS=CLBS*CONST	VS 5504
	CYPS=CYPS*CONST	VS 5505
	CNPS=CNPS*CONST	VS 5506
	CLPS=CLPS*CONST	VS 5507
	CYRS=CYRS*CONST	VS 5508
	CNRS=CNRS*CONST	VS 5509
	CLRS=CLRS*CONST	VS 5510
	CLPVS=CLPVS*CONST	VS 5511
	CNR1=CNR1*CONST	VS 5512
	CYS1=CYS1*CONST	VS 5513
	CLBS1=CLBS1*CONST	VS 5514
	CYR1=CYR1*CONST	VS 5515
	CNR1=CNR1*CONST	VS 5516
	CLR1=CLR1*CONST	VS 5517
	SUM1=Y(2,I)*Y(2,I)	VS 5518
	SUM2=Y(3,I)*Y(3,I)	VS 5519
	SUM3=Y(4,I)*Y(4,I)	VS 5520
	SM11=Y(1,I)+Y(2,I)	VS 5521
	SM12=Y(1,I)-Y(2,I)	VS 5522
	SM21=Y(1,I)+Y(3,I)	VS 5523
	SM22=Y(1,I)-Y(3,I)	VS 5524
	SM31=Y(1,I)+Y(4,I)	VS 5525
	SM32=Y(1,I)-Y(4,I)	VS 5526
	IF(SM11.GE.0. .AND. SM12.GE.0.) SUM1=0.	VS 5527
	IF(SM11.LT.0. .AND. SM12.LT.0.) SUM1=0.	VS 5528
	IF(SM21.GE.0. .AND. SM22.GE.0.) SUM2=0.	VS 5529
	IF(SM21.LT.0. .AND. SM22.LT.0.) SUM2=0.	VS 5530
	IF(SM31.GE.0. .AND. SM32.GE.0.) SUM3=0.	VS 5531
	IF(SM31.LT.0. .AND. SM32.LT.0.) SUM3=0.	VS 5532
	S21=1.	VS 5533
	S22=1.	VS 5534
	S23=1.	VS 5535
	IF (SM11.LT.0.) S21=-1.	VS 5536
	IF (SM21.LT.0.) S22=-1.	VS 5537
	IF (SM31.LT.0.) S23=-1.	VS 5538

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PBETA=2.*Y(1,I)*FTAN*GR*Y(2,I)*PBK	VS 5539
PRL=0.	VS 5540
SIDE=CTH*(2.*Y(1,I)*Y(2,I)+SUM1)*S21*F5	VS 5541
SIDFP=SIDE	VS 5542
SIDE=SIDE*(FPR+FPL)*0.5	VS 5543
SIDFPB=CTH*(PBETA+PRL)*F5*(FPR+FPL)*0.5	VS 5544
SIDEB=CTH*(2.*Y(1,I)*Y(3,I)+SUM2)*S22*F5	VS 5545
SIDBB=SIDER	VS 5546
SIDER=CTH*(2.*Y(1,I)*Y(4,I)+SUM3)*S23*F5	VS 5547
SIDRR=SIDER	VS 5548
FCRL=0.5*(FRSR+FRSL)	VS 5549
FBU=1.	VS 5550
FBUL=1.	VS 5551
IF(ALP.GT.AB2.AND.ALPT.AB1)FBU=1.-(1.-RTK)*(ALP-AB2)/(AB1-AB2)	VS 5552
IF(ALP.GE.AB1) FBU=RTK	VS 5553
IF(ALP.GE.AB3) FBUL=RTK	VS 5554
IF(I.EQ.NS(K)) BMR(4,K)=0.5*(FBU+FBUL)	VS 5555
IF(I.EQ.NS(K))BMR(5,K)=0.5*(FRSR+1.)*RRT	VS 5556
SIDER=SIDER-2.*RL*YLE(KCH)/HALFB(1)*CSU(I)*FCRL	VS 5557
SIDRPB=0.	VS 5558
FDRL=0.5*(FRL+FRR)	VS 5559
IF(PRK.GT.0.01) SIDRPB=CTH*2.*Y(1,I)*FTAN*GR*Y(4,I)*PBK*F5*FDRL	VS 5560
SRG=DMM(I)*2.*GR/CHORD	VS 5561
RRG=DMM(I)*2.*BR/CHORD	VS 5562
SIRR=SIDER+RRG*FRSR	VS 5563
SIRL=SIDER+RRG*FPSL	VS 5564
SIDR1=(SIRR+FRR+SIRL*FRL)*0.5	VS 5565
SIBR=SIDEB+SRG*FBSR	VS 5566
SIBL=SIDEB+SRG*FBSL	VS 5567
SIDB1=(SIBR*FBR+SIBL*FBL)*0.5	VS 5568
ER=1.	VS 5569
EL=1.	VS 5570
IF(FRR.LT.0.95) FR=0.	VS 5571
IF(FRL.LT.0.95) EL=0.	VS 5572
IF(PRK.GT.0.01) SIDR1=SIDR1+(SIBR*(1.-FBR)*ER+SIBL*(1.-FBL)*EL)	VS 5573
1 *0.5	VS 5574
C WRITE(JPT,2) SIDER,SIDB1,SIDER,SIDR1,FBR,FBL,FPR,FRL	VS 5575
C WRITE(JPT,2) FRSR,FRSL,FCRL,SIDRPB,FPR,FPL	VS 5576
C ADDITIONAL VORTEX LIFT ON THE LEFT OUTBOARD PANEL	VS 5577
FBB=1.	VS 5578
IY=1	VS 5579
IF (IAGVX.NE.0) IY=MA	VS 5580
IF(ID.EQ.1.AND.ALPT.ALBDBR(K,1)) GO TO 1355	VS 5581
IF(ALP.GE.ALPRD(K,IY).AND.ALPLF.ALBDBL(K,IY)) FBB=1.-(1.-RTBL)*	VS 5582
1 (ALP-ALPRD(K,IY))/(ALBDBL(K,IY)-ALPRD(K,IY))	VS 5583
IF(ALP.GT.ALBDBL(K,IY)) FBB=RTBL	VS 5584
FBR=FBB*RTBL	VS 5585
IF(MA.EQ.1.AND.IY.GT.YBRBL(K,1)) FBB=0.	VS 5586
IF(ID.EQ.1.AND.ALPLF.ALBDBL(K,1)) FBB=0.	VS 5587

	FBC=FBB	VS	5588
	IF(MA.EQ.2.AND.IAGVX.EQ.0) FBC=0.	VS	5589
	SIDB1=SIDB1+0.5*(FBC-FBL*FBSL*FBB)*SRG -0.5*(1.-FF)*CSU(I)*FBB	VS	5590
C	WRITE(JPT,2) SIDE,SIDB1,SIDR1,FBB	VS	5591
1355	CONTINUE	VS	5592
	YE=YBB+(YLE(KCH)-YB)*COD	VS	5593
	KA=LL	VS	5594
	ZYF=SOD*(ZCP(KA)+ZB+(YLE(KCH)-YB)*SOD)+COD*(YBB+(YLE(KCH)-YB)*COD)	VS	5595
	F6=(CAMLE*CDD*(CAMLE*TAN*COD+SOD)+TAN*COD*COD)/F12	VS	5596
	FD=FD*COD	VS	5597
	IF(LAT.EQ.1) GO TO 1356	VS	5598
	S1=1.	VS	5599
	IF(Y(1,I).LT.0.) S1=-1.	VS	5600
	S2=1.	VS	5601
	IF(NASYM.EQ.1) GO TO 1365	VS	5602
	IF((Y(1,I)+GAMP(I)).LT.0.) S2=-1.	VS	5603
	SUM=GAMP(I)*GAMP(I)	VS	5604
	SM1=Y(1,I)+GAMP(I)	VS	5605
	SM2=Y(1,I)-GAMP(I)	VS	5606
	IF(SM1.GE.0..AND.SM2.GE.0.) SUM=0.	VS	5607
	IF(SM1.LT.0..AND.SM2.LT.0.) SUM=0.	VS	5608
	SIDE=CTH*(2.*Y(1,I)*GAMP(I)+SUM)*S2*F5	VS	5609
1365	CONTINUE	VS	5610
	IF(NASYM.EQ.1) SIDE=CTH*Y(1,I)*Y(1,I)*S1*F5	VS	5611
	CLB1=CLBS*CONST-SIDE*ZYE/F1	VS	5612
	CNR1=CNS*CONST+SIDE*SDD*(XLE(KCH)-XREF)	VS	5613
	CLB=CNS*CONST-SIDE*ZYE*F4/F12	VS	5614
	CNS=CNS*CONST-SIDE*(YE*F3/F12+(XLE(KCH)-XREF)*F6)	VS	5615
	IF(IO.GE.NVRTX(K).AND.NVRTX(K).NE.0) GO TO 253	VS	5616
	IF(IO.LE.MVRTX(K).AND.MVRTX(K).NE.0) GO TO 253	VS	5617
	GO TO 220	VS	5618
253	CLB1=CLBS	VS	5619
	CNR1=CNS	VS	5620
	GO TO 220	VS	5621
1356	CONTINUE	VS	5622
	YYP=ABS(SIDEP)*CHORD*SSN	VS	5623
	YYPR=0.	VS	5624
	YYB=ABS(SIDBB)*CHORD*GRC	VS	5625
	YYR=ABS(SIDRR)*CHORD*SSN	VS	5626
	IF(PBK.GT.0.01) YYP=ABS(SIDEP+SIDBB)*CHORD*SSN	VS	5627
	IF(PBK.GT.0.01) YYR=ABS(SIDBB+SIDRR)*CHORD*SSN	VS	5628
	RP=DMH(I)	VS	5629
	IF(RP.GT.CHORD) RP=CHORD	VS	5630
	DXPP=RP*FS*SSN	VS	5631
	IF(YYP.GT.DXPP) YYP=DXPP	VS	5632
	IF(YYR.GT.DXPP) YYR=DXPP	VS	5633
	IF(DRR.LT.YYR) DRP=YYR	VS	5634
	IF(IRL.EQ.1.AND.YYR.LT.YYP) YYP=YYP	VS	5635
	IF(DR.LT.YYP) DR=YYP	VS	5636

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IF(I.EO.NS(K)) BML(5,K)=DR	VS	5637
YEP=SOD*(ZCP(KA)+ZB+(YLE(KCH)-YYP-YB)*SOD)+COD*(YBB+(YLE(KCH)-YYP	VS	5638
1-YB)*COD)	VS	5639
YEB=SOD*(ZCP(KA)+ZB+(YLE(KCH)-YYB-YB)*SOD)+COD*(YBB+(YLE(KCH)-YYB	VS	5640
1-YB)*COD)	VS	5641
YER=SOD*(ZCP(KA)+ZB+(YLE(KCH)-YYP-YB)*SOD)+COD*(YBB+(YLE(KCH)-YYP	VS	5642
1-YB)*COD)	VS	5643
YEPB=SOD*(ZCP(KA)+ZB+(YLE(KCH)-YYP-YB)*SOD)+COD*(YBB+(YLE(KCH)-	VS	5644
1YYPB-YB)*COD)	VS	5645
CYB1=CYS1-SIDR1*SOD/F1	VS	5646
CNB1=CNB1+SIDR1*SOD*(XLE(KCH)-XREF)	VS	5647
CLB1=CLBS1-SIDB1*YER/F1	VS	5648
CYP1=CYP5-(SIDE+SIDEPB)*SOD/F1	VS	5649
CNP1=CNPS+(SIDE+SIDEPB)*SOD*(XLE(KCH)-XREF)	VS	5650
CLPVS=CLPS-SIDE*YEP/F1-SIDEPB*YEPB/F1	VS	5651
CPCVS=(SIDE+SIDEPB)/F1	VS	5652
CRCVS=(SIDR+SIDRPB)/F1	VS	5653
CBCVS=SIDB1/F1	VS	5654
CYR1=CYR1-(SIDR1+SIDRPB)*SOD/F1	VS	5655
CNR1=CNR1+(SIDR1+SIDRPB)*SOD*(XLE(KCH)-XREF)	VS	5656
CLR1=CLR1-SIDR1*YER/F1-SIDRPB*YEPB/F1	VS	5657
SIDE=SIDEP	VS	5658
CYPS=CYP5+SIDE*F6	VS	5659
CNPS=CNPS-SIDE*YE*F3/F12	VS	5660
CNPS=CNPS-SIDE*(XLE(KCH)-XREF)*F6	VS	5661
CLPS=CLPS-SIDE*ZE*F4/F12	VS	5662
CYS=CYS+SIDEB*F6-CT(I)*FD/FT*BK	VS	5663
CNS=CNS-SIDEB*YE*F3/F12+CT(I)*FD/FT*BK*(XLE(KCH)-XREF)	VS	5664
CNS=CNS-SIDEB*(XLE(KCH)-XREF)*F6	VS	5665
CLBS=CLBS-SIDEB*ZE*F4/F12	VS	5666
CYRS=CYRS+SIDR*F6+CT(I)*FD/FT*(XLE(KCH)-XREF)/HALFB(1)*RL	VS	5667
CNRS=CNRS-SIDR*YE*F3/F12-CT(I)*FD/FT*(XLE(KCH)-XREF)/HALFB(1)*RL	VS	5668
1(XLE(KCH)-XREF)	VS	5669
CNRS=CNRS-SIDR*(XLE(KCH)-XREF)*F6	VS	5670
CLRS=CLRS-SIDR*ZE*F4/F12	VS	5671
IF(IO.GE.NVRTX(K).AND.NVRTX(K).NE.0) GO TO 250	VS	5672
IF(IO.LE.MVRTX(K).AND.MVRTX(K).NE.0) GO TO 250	VS	5673
GO TO 251	VS	5674
250 CYB1=CYS	VS	5675
CNB1=CNS	VS	5676
CLB1=CLRS	VS	5677
CYP1=CYP5	VS	5678
CNP1=CNPS	VS	5679
CLPVS=CLPS	VS	5680
CYR1=CYRS	VS	5681
CNR1=CNRS	VS	5682
CLR1=CLPS	VS	5683
251 CONTINUE	VS	5684
220 CONTINUE	VS	5685

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	IF (I .LT. NCOL) GO TO 210	VS 5686
	KLL=NCOL-1	VS 5687
	KC=KC+1	VS 5688
	IF(K.GT.1.AND.I.EQ.(NS(K-1)+1)) KC=1	VS 5689
	NCOL=NCOL+I(K,KC)-1	VS 5690
210	KL=I-KLL	VS 5691
	FM=M1(K,KC)	VS 5692
	AA=CHORD*SJ(K,KL,KC)*WIDTH(K,KC)/FM	VS 5693
	AA=AA*FATR	VS 5694
	CLT=CLT+CL(I)*AA	VS 5695
	CMT=CMT+CM(I)*AA	VS 5696
	CDT=CDT+CD(I)*AA	VS 5697
	CLPP=CLPP+CLPPS*AA	VS 5698
	CDPP=CDPP+CDPPS*AA	VS 5699
	CLGM=CLGM+CLG1*AA	VS 5700
	CDGM=CDGM+CDG1*AA	VS 5701
	CMGM=CMGM+CMG1*AA	VS 5702
	IF(IO.GE.NVRTX(K).AND.NVRTX(K).NE.0) DMM(I)=0.	VS 5703
	IF(IO.LE.MVRTX(K).AND.MVRTX(K).NE.0) DMM(I)=0.	VS 5704
	IF(IO.GE.NVRTX(K).AND.NVRTX(K).NE.0) GO TO 252	VS 5705
	IF(IO.LE.MVRTX(K).AND.MVRTX(K).NE.0) GO TO 252	VS 5706
	YC=YLE(KCH)	VS 5707
	RR=ABS(CSU(I))*CHORD	VS 5708
	XC=XLE(KCH)+RR	VS 5709
	IF(XC.LT.XTE(KCH)) GO TO 2100	VS 5710
	CAMLE=0.	VS 5711
	CAMY=0.	VS 5712
	GO TO 2101	VS 5713
2100	XY=RR/CHORD	VS 5714
	DZ=XLE(KCH)	VS 5715
	CAMLE=100.	VS 5716
	CAMY=RR	VS 5717
	IF(ICAM(K).LE.1) CALL ZCR(XY,YC,CAMLE,ICAM,DZ,K,1,CHORD,CAMY,IST,	VS 5718
	1TSW)	VS 5719
	IF(ICAM(K).EQ.3) CALL ZCR(XC,YC,CAMLE,ICAM,DZ,K,1,CHORD,CAMY,IST,	VS 5720
	1TSW)	VS 5721
	IF(ICAM(K).EQ.2) CALL ZCDX(XC,YC,CAMLE,CAMY)	VS 5722
2101	CONTINUE	VS 5723
	FT=SQRT((1.+CAMLE*CAMLE)*COD*COD+(SOD+CAMY*COD)**2)	VS 5724
	DXA=0.	VS 5725
	EFFC=1.	VS 5726
	EFFB=1.	VS 5727
	EFFD=1.	VS 5728
	IF(I.GE.NVL1(JA).AND.I.LE.NVL2(JA)) GO TO 261	VS 5729
	GO TO 262	VS 5730
261	IF(I.NE.NVL1(JA)) GO TO 263	VS 5731
C	AUGMENTED VORTEX LIFT EFFECT	VS 5732
	IF(IBD.EQ.0) GO TO 263	VS 5733
	XRR=AUX(K,NO)-CRX(K,NO)	VS 5734

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	XR=AUX(K,NB)-XRR	VS 5735
	DX=0.	VS 5736
	IF(ABS(XR).GT.1.E-3) DX=ABS(XTILT(JA)/XR)	VS 5737
	DA=REDBD(DX)	VS 5738
	ABRN=ALPBD(K,MA)-DA*PI/180.	VS 5739
	ABRNB=ALBDBR(K,MA)-DA*PI/180.	VS 5740
	ABRNL=ALBDBL(K,MA)-DA*PI/180.	VS 5741
	IF(ABRNB.LT.0.) ABRNB=0.	VS 5742
	IF(ABRNL.LT.0.) ABRNL=0.	VS 5743
263	CONTINUE	VS 5744
	EFFC=1.	VS 5745
	EFFB=1.	VS 5746
	EFFD=1.	VS 5747
	XMV=0.	VS 5748
	XMVB=0.	VS 5749
	XCT=XTILT(JA)	VS 5750
	IF(IBD.EQ.0) GO TO 274	VS 5751
	IF(ALP.LT.ABRN) GO TO 269	VS 5752
	IF(ALP.GE.ALPBD(K,MA)) GO TO 264	VS 5753
	DAP=(ALP-ABRN)*180./PI	VS 5754
	DXP=BDPT(DAP)	VS 5755
	FRTN=1.	VS 5756
	IF(ABS(XCT).GT.1.E-3) FRTN=DXP*XR/XCT	VS 5757
	IF(FRTN.GT.1.) FRTN=1.	VS 5758
	GO TO 265	VS 5759
264	FRTN=1.	VS 5760
265	CONTINUE	VS 5761
	XMV=0.5*(1.-FRTN)**2+FRTN*(1.-0.5*FRTN)*RTK	VS 5762
	XMVB=(XMV/(1.-FRTN+FRTN*RTK)-0.5)*CTILT(JA)	VS 5763
	EFFC=1.-FRTN+FRTN*RTK	VS 5764
	IF(EFFC.GT.1.) EFFC=1.	VS 5765
	IF(EFF.LT.1.) EFFC=1.	VS 5766
269	IF(LAT.NE.1) GO TO 272	VS 5767
	DAQ=(ALP-ABRNL)*180./PI	VS 5768
	DXP=0.	VS 5769
	DAP=(ALP-ABRNB)*180./PI	VS 5770
	IF(DAP.GT.0.) DXP=BDPT(DAP)	VS 5771
	DXQ=0.	VS 5772
	IF(DAQ.GT.0.) DXQ=BDPT(DAQ)	VS 5773
	FTN=1.	VS 5774
	IF(ABS(XCT).GT.1.E-3) FTN=DXP*XR/XCT	VS 5775
	IF(FTN.GT.1.) FTN=1.	VS 5776
	FTNL=1.	VS 5777
	IF(ABS(XCT).GT.1.E-3) FTNL=DXQ*XR/XCT	VS 5778
	IF(FTNL.GT.1.) FTNL=1.	VS 5779
	IF(ALP.LT.ABRNB) GO TO 272	VS 5780
	IF(ALP.GE.ALBDBR(K,MA)) FTN=1.	VS 5781
	IF(ALP.GE.ALBDBL(K,MA)) FTNL=1.	VS 5782
271	XMVB=0.5*(1.-FTN)**2+FTN*(1.-0.5*FTN)*RTBR	VS 5783

	XMVB=(XMVB/(1.-FTN+FTN*RTBR)-0.5)*CTILT(JA)	VS 5784
	EFB=1.-FTN+FTN*RTBR	VS 5785
	EFFD=1.-FTNL+FTNL*RTBL	VS 5786
	EFFB=0.5*(EFB+EFFD)	VS 5787
	IF(EFFB.GT.1.) EFFB=1.	VS 5788
	IF(FBR.LT.1. .OR. FBL.LT.1.) EFFB=1.	VS 5789
272	CONTINUE	VS 5790
	IF(NVL2(JA).EQ.NS(K).AND.I.EQ.NS(K)) GO TO 273	VS 5791
	GO TO 262	VS 5792
273	BMR(3,K)=XMV	VS 5793
	GO TO 262	VS 5794
274	IF(I.NE.NS(K)) GO TO 262	VS 5795
	BMR(3,K)=0.	VS 5796
	BMR(3,K)=0.	VS 5797
	CPCWL(K)=RRT	VS 5798
	BML(4,K)=RRT	VS 5799
	BMR(5,K)=RRT	VS 5800
	BMR(4,K)=RRT	VS 5801
	XL(1,K)=1.	VS 5802
262	CONTINUE	VS 5803
	CSU(I)=CSU(I)*FF	VS 5804
	DMM(I)=CSU(I)*CHORD	VS 5805
	CDVL=CDVL+CSU(I)*(-CAMLE*XCS+XSS)/FT*COD*AA	VS 5806
	AUGM=CSU(I)*(CAMLE*XSS+XCS)/FT*COD*AA	VS 5807
	CSL=CSL+AUGM	VS 5808
	CAX=CAX+CAXL*AA	VS 5809
	CAXV=CAXV+CSU(I)*(-CAMLE)*COD/FT*AA	VS 5810
	CAVS(I)=CSU(I)*(-CAMLE)*COD/FT*AA	VS 5811
	PM=XLE(KCH)+71*CAMLE-XREF	VS 5812
	CSXL=CSXL-CSU(I)*PM*AA*COD/FT	VS 5813
	IF(JA.EQ.1) CSNW=CSNW+(CSU(I)+CVR(I)*FF)*AA*EFFC	VS 5814
	IF(MZ.NF.10) GO TO 902	VS 5815
	CU=CVR(I)*FF	VS 5816
	DMM(I)=DMM(I)+CU*CHORD	VS 5817
	CLDV=CLDV+CU*(CAMLE*XSS+XCS)/FT*COD*AA	VS 5818
	CMDV=CMDV-CU*PM*AA*COD/FT	VS 5819
	CDDV=CDDV+CU*(-CAMLE*XCS+XSS)/FT*COD*AA	VS 5820
902	CONTINUE	VS 5821
C	WRITE(JPT,2) EFFC,FF,YY,XTE(KH),AUX(K,IPN),FATR	VS 5822
	IF(I.GE.NVL1(JA).AND.I.LE.NVL2(JA)) GO TO 266	VS 5823
	GO TO 252	VS 5824
266	CONTINUE	VS 5825
	CSAUG=CSAUG+AUGM*EFFC*CTILT(JA)/SLETH(JA)	VS 5826
	CMAUG=CMAUG-AUGM*EFFC*(XCNTD(JA)+XMV)*CTILT(JA)/SLETH(JA)	VS 5827
252	CONTINUE	VS 5828
	IF(LAT.EQ.0) GO TO 221	VS 5829
	IF(LAT.EQ.1) GO TO 1357	VS 5830
	CLL=CLL+CLRS*AA	VS 5831
	CLLV=CLLV+CLB1*AA	VS 5832

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	CNL=CNL+CNS*AA	VS 5833
	CNLV=CNLV+CNB1*AA	VS 5834
	WRITE(JPT,2) CLL,CLLV,CNL,CNLV	VS 5835
	GO TO 221	VS 5836
1357	CONTINUE	VS 5837
	CY=CY+CYS*AA	VS 5838
	CNB=CNB+CNS*AA	VS 5839
	CLB=CLB+CLBS*AA	VS 5840
	CYP=CYP+CYP*AA	VS 5841
	CNP=CNP+CNPS*AA	VS 5842
	CLP=CLP+CLPS*AA	VS 5843
	CYP=CYP+CYRS*AA	VS 5844
	CNR=CNR+CNRS*AA	VS 5845
	CLRR=CLRR+CLRS*AA	VS 5846
	CLPV=CLPV+CLPVS*AA	VS 5847
	CYPV=CYPV+CYPI*AA	VS 5848
	CNPV=CNPV+CNPI*AA	VS 5849
	CYRV=CYRV+CYRI*AA	VS 5850
	CNRV=CNRV+CNRI*AA	VS 5851
	CLRRV=CLRRV+CLRI*AA	VS 5852
	CYRV=CYRV+CYBI*AA	VS 5853
	CNRV=CNRV+CNBI*AA	VS 5854
	CLBV=CLBV+CLBI*AA	VS 5855
	IF(I.GE.NVL1(JA).AND.I.LE.NVL2(JA)) GO TO 2091	VS 5856
	GO TO 221	VS 5857
2091	FAUG=CTILT(JA)/SLETH(JA)	VS 5858
	FAUGB=FAUG*FFFF	VS 5859
	IF(YB.LT.DBR) YB=DBR	VS 5860
	YAUGB=FAUGB*(YCNTD(JA)-YB)/HALFB(1)	VS 5861
	XAUGB=FAUGB*(XCNTD(JA)+XMB)/HALFB(1)	VS 5862
	FAUG=FAUG*EFFC	VS 5863
	YAUG=FAUG*(YCNTD(JA)-YYP)/HALFB(1)	VS 5864
	XAUG=FAUG*(XCNTD(JA)+XMV)/HALFB(1)	VS 5865
	CYPVA=CYPVA-CPCVS*AA*FAUG*SOD	VS 5866
	CLPVA=CLPVA-CPCVS*AA*YAUG	VS 5867
	CNPVA=CNPVA+CPCVS*AA*XAUG*SOD	VS 5868
	CYRVA=CYRVA-CBCVS*AA*FAUGB*SOD	VS 5869
	CLBVA=CLBVA-CBCVS*AA*YAUGB	VS 5870
	CNBVA=CNBVA+CBCVS*AA*XAUGB*SOD	VS 5871
	CYRVA=CYRVA-CRCVS*AA*FAUG*SOD	VS 5872
	YAUG=FAUG*(YCNTD(JA)-YR)/HALFB(1)	VS 5873
	CLRRVA=CLRRVA-CRCVS*AA*YAUG	VS 5874
	CNRVA=CNRVA+CRCVS*AA*XAUG*SOD	VS 5875
221	CONTINUE	VS 5876
	IF(I.EQ.NVL2(JA)) JA=JA+1	VS 5877
	MM=MM+NW(K,1)	VS 5878
	IF(I.EQ.NS(K)) CPSWL(K)=IPN	VS 5879
	IF(IWING(K).NE.O.AND.I.EQ.IWING(K)) GO TO 217	VS 5880
	IF(I.EQ.NCS) GO TO 215	VS 5881

	IF(I.EQ.NS(K)) GO TO 217	VS 5882
	IF(YLE(KCH+1).LT.YBREAK(K,IPN)) GO TO 215	VS 5883
217	CONTINUE	VS 5884
	NI=0	VS 5885
	IF(NASYM.EQ.1.AND.IPN.LT.NC1) NI=1	VS 5886
	IF(NI.EQ.1) IPN=IPN+1	VS 5887
	ZB=ZB+(YBREAK(K,IPN)-YB)*DSIN(K,IPN)	VS 5888
	YBB=YBB+(YBREAK(K,IPN)-YB)*DCOS(K,IPN)	VS 5889
	YB=YBREAK(K,IPN)	VS 5890
	IF(IWING(K).NE.0.AND.I.EQ.IWING(K)) GO TO 218	VS 5891
	IF(I.EQ.NS(K)) GO TO 218	VS 5892
	GO TO 219	VS 5893
218	SOW=SOD	VS 5894
	COW=COD	VS 5895
	YPRW=YBB	VS 5896
	YRW=YB	VS 5897
	ZPRW=ZB	VS 5898
	YBKW=YBREAK(K,IPN)	VS 5899
	IF(IWGLT(K).EQ.1) GO TO 219	VS 5900
	ZB=0.	VS 5901
	YB=BREAK(K,1)	VS 5902
	YBB=BREAK(K,1)	VS 5903
	IF(I.EQ.NS(K).AND.K.LT.6) YB=BREAK(K+1,1)	VS 5904
	IF(I.EQ.NS(K).AND.K.LT.6) YBB=BREAK(K+1,1)	VS 5905
	IF(IWGLT(K).NE.2) GO TO 219	VS 5906
	ZB=YBREAK(K,NC(K)-2)*DSIN(K,1)	VS 5907
	YBB=YBREAK(K,NC(K)-2)*DCOS(K,1)	VS 5908
	YB=YBREAK(K,NC(K)-2)	VS 5909
	YPRW=YBB	VS 5910
	YRW=YB	VS 5911
	ZPRW=ZB	VS 5912
219	CONTINUE	VS 5913
	IF(NI.NE.1) IPN=IPN+1	VS 5914
215	CONTINUE	VS 5915
	IF(I.EQ.NS(K)) IPN=1	VS 5916
	IF(LL.EQ.MJW2(K,2,NL)) NL=NL+1	VS 5917
	IF(LL.EQ.LPN(K)) NL=1	VS 5918
	IF(I.NE.NS(K)) GO TO 1401	VS 5919
	X(K,1)=ZPPW	VS 5920
	X(K,2)=YPRW	VS 5921
	X(K,3)=SOD	VS 5922
	X(K,4)=COD	VS 5923
	X(K,5)=SOW	VS 5924
	X(K,6)=COW	VS 5925
	X(K,7)=YRW	VS 5926
	X(K,8)=YBKW	VS 5927
	X(K,9)=YBB	VS 5928
	X(K,10)=YB	VS 5929
	X(K,11)=ZB	VS 5930

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1401	CONTINUE	VS 5931
	- KCH=KCH+1	VS 5932
	IF(IWING(K).EQ.0) GO TO 2102	VS 5933
	IF(I.NE.IWING(K)) GO TO 2102	VS 5934
	CLWL(K)=CLT	VS 5935
	CMWL(K)=CMT	VS 5936
	CDWL(K)=CDT	VS 5937
2102	CONTINUE	VS 5938
	IF(I.NE.NS(K)) GO TO 150	VS 5939
	CLW(K)=CLT	VS 5940
	CMW(K)=CMT	VS 5941
	CDW(K)=CDT	VS 5942
	IF(NW(K,2).EQ.0) GO TO 153	VS 5943
	IF(K.EQ.1) KCH=KCH+NS(K)	VS 5944
	IF(K.GT.1) KCH=KCH+NS(K)-NS(K-1)	VS 5945
153	CONTINUE	VS 5946
	MM=0	VS 5947
	JK=LPN(K)	VS 5948
150	IF(LL.EQ.LPN(K)) K=K+1	VS 5949
	IF(LAT.EQ.0) GO TO 135R	VS 5950
C	WRITE(JPT,2) SDW,COW,SOD,COD,YBREAK(1,IPN),YB8,YB,ZB	VS 5951
C	WRITE(JPT,2) DYB(1),DYR(1)	VS 5952
	IF(LAT.EQ.(-1)) GO TO 135R	VS 5953
	CYRVSE=CYBV	VS 5954
	CNRVSE=CNPV	VS 5955
	CLRVSE=CLRV	VS 5956
	CYPVSE=CYPV	VS 5957
	CNPVSE=CNPV	VS 5958
	CLPVSE=CLPV	VS 5959
	CYRVSE=CYRV	VS 5960
	CNRVSE=CNRV	VS 5961
	CLRVSE=CLRV	VS 5962
135R	CONTINUE	VS 5963
C		VS 5964
C	SIDE-EDGE EFFECT	VS 5965
C		VS 5966
	CDVS=0.	VS 5967
	CLVS=0.	VS 5968
	CMVS=0.	VS 5969
	CLNSE=CLL	VS 5970
	CNNSE=CNL	VS 5971
	CLNSEV=CLLV	VS 5972
	CNNSEV=CNLV	VS 5973
	CX=1.	VS 5974
	IF(ABS(CTX).GT.0.001) CX=CTX	VS 5975
	DO 189 I=1,NSUP	VS 5976
C	WRITE(JPT,2) CPCWL(I),DYB(I),DYR(I)	VS 5977
	IF(INVRTX(I).NE.(NS(I)+1)) GO TO 189	VS 5978
	CTIP=CTP(I,1)*DCOS(I,NWING(I))	VS 5979

CTIP=CTIP*CPCWL(I)	VS 5980
CTIPP=0.	VS 5981
IF(IWGLT(I).NE.0) CTIPP=CTP(I,2)*DCOS(I,NWING(I)+1)	VS 5982
IF(NASYM.EQ.1) CTIP=CTIP+CTP(I,2)*DCOS(I,NC(I))	VS 5983
KK=NS(I)	VS 5984
IF(IWING(I).NE.0) KK=IWING(I)	VS 5985
CDVS=CDVS+CTIP*SNALP(KK)+CTIPP*SNALP(NS(I))	VS 5986
CLVS=CLVS+CTIP*CNALP(KK)+CTIPP*CNALP(NS(I))	VS 5987
CMVS=CMVS+CTIP*(1.-BMR(3,I)/CX)+CTIPP	VS 5988
189 CONTINUE	VS 5989
IF(LAT.EQ.0) GO TO 222	VS 5990
DO 1321 K=1,NSUP	VS 5991
RRT=CBMR(K)	VS 5992
MA=1	VS 5993
IF(MSTP(K).NE.0) MA=2	VS 5994
NCNT=1	VS 5995
IF (IWING(K).NE.0.OR.NASYM.EQ.1) NCNT=2	VS 5996
DO 223 KK=1,NCNT	VS 5997
FATR=1.	VS 5998
IF (IV(K).EQ.1) FATR=0.5	VS 5999
K1=KK	VS 6000
IF(NASYM.EQ.1) GO TO 229	VS 6001
IF(IWING(K).EQ.0) GO TO 229	VS 6002
IF(KK.EQ.2) GO TO 229	VS 6003
SS=X(K,5)	VS 6004
CS=X(K,6)	VS 6005
YB2=X(K,2)	VS 6006
YR1=X(K,7)	VS 6007
ZR1=X(K,1)	VS 6008
YKP=X(K,8)	VS 6009
IF(KK.EQ.1) GO TO 224	VS 6010
229 CONTINUE	VS 6011
IF(KK.EQ.2) K1=KK+1	VS 6012
IF(KK.EQ.1) GO TO 1366	VS 6013
IF(NASYM.EQ.0) GO TO 1366	VS 6014
SS=DSIN(K,1)	VS 6015
CS=DCOS(K,1)	VS 6016
YB2=YBBK	VS 6017
YB1=YBREAK(K,1)	VS 6018
ZR1=ZBK	VS 6019
YKP=BREAK(K,1)	VS 6020
GO TO 224	VS 6021
1366 CONTINUE	VS 6022
SS=X(K,3)	VS 6023
CS=X(K,4)	VS 6024
YR2=X(K,9)	VS 6025
YR1=X(K,10)	VS 6026
ZB1=X(K,11)	VS 6027
IPN=CPSWL(K)	VS 6028

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	YKP=YBREAK(K,IPN)	VS	6029
224	ISN=1	VS	6030
	FN=NW(K,1)	VS	6031
	NCW=NW(K,1)+NW(K,2)	VS	6032
	DO 225 J=1,NCW	VS	6033
	JJ=J	VS	6034
	IF(J.LE.NW(K,1)) GO TO 226	VS	6035
	ISN=2	VS	6036
	FN=NW(K,2)	VS	6037
	JJ=J-NW(K,1)	VS	6038
	K1=KK+1	VS	6039
	IF(KK.EQ.2) K1=KK+2	VS	6040
226	FJJ=JJ	VS	6041
C	WRITE(JPT,2) SS,CS,YB2,YR1,ZB1,YKP	VS	6042
	XYZ=Y(4+K,J)	VS	6043
	IF(KK.FO.2) XYZ=Y(10+K,J)	VS	6044
	ZCV=CS*(ZB1+(YKP-YB1)*SS)-SS*(YB2+(YKP-YB1)*CS)	VS	6045
	YCV=SS*(ZB1+(YKP-YB1)*SS)+CS*(YB2+(YKP-YB1)*CS)	VS	6046
	XO=YCN(K,K1)+0.5*CHORDT(K,K1)*(1.-COS((2.*FJJ-1.)*PI/(2.*FN)))	VS	6047
	XO=XO-XREF	VS	6048
	IF(LAT.EQ.1) GO TO 1359	VS	6049
	FKN=0.	VS	6050
	IF(NASYM.EQ.0) FKN=SE(2,K,J)	VS	6051
	IF(NASYM.EQ.0.AND.KK.EQ.2) FKN=DUMT(2,K,J)	VS	6052
	S1=1.	VS	6053
	S3=1.	VS	6054
	IF(NASYM.EQ.0) GO TO 1367	VS	6055
	IF(XYZ.LT.0..AND.KK.EQ.1) S1=-1.	VS	6056
	IF(XYZ.GT.0..AND.KK.EQ.2) S1=-1.	VS	6057
	IF(XYZ.LT.0.) S3=-1.	VS	6058
	GO TO 1368	VS	6039
1367	CONTINUE	VS	6060
	S2=1.	VS	6061
	IF((XYZ+FKN).LT.0.) S2=-1.	VS	6062
	SUM=FKN*FKN	VS	6063
	SM1=XYZ+FKN	VS	6064
	SM2=XYZ-FKN	VS	6065
	IF(SM1.GE.0..AND.SM2.GE.0.) SUM=0.	VS	6066
	IF(SM1.LT.0..AND.SM2.LT.0.) SUM=0.	VS	6067
1368	CONTINUE	VS	6068
	IF(NASYM.EQ.0) CK=CHORDT(K,K1)*(2.*XYZ+FKN+SUM)*S2*SN(K,JJ,ISN)/FNVS	VS	6069
	IF(NASYM.EQ.1) CK=CHORDT(K,K1)*XYZ*XYZ*S1*SN(K,JJ,ISN)/FN	VS	6070
	CK=CK*FATR*CS	VS	6071
	CLL=CLL+CK/CS*ZCV*PIS	VS	6072
	CNL=CNL-CK*XO*PIS	VS	6073
	CLLV=CLLV-CK/CS*YCV*PIS*S1*S3	VS	6074
	CNLV=CNLV+CK/CS*SS*PIS*XO*S1*S3	VS	6075
	GO TO 225	VS	6076
1359	CONTINUE	VS	6077

S1=1.	VS 6078
IF(NASYM.EQ.1 .AND. KK.EQ.2) S1=-1.	VS 6079
SE1=SE(1,K,J)	VS 6080
SE2=SE(2,K,J)	VS 6081
SE3=SE(3,K,J)	VS 6082
IF(KK.EQ.1) GO TO 1389	VS 6083
SE1=DUMT(1,K,J)	VS 6084
SE2=DUMT(2,K,J)	VS 6085
SE3=DUMT(3,K,J)	VS 6086
1389 CONTINUE	VS 6087
SUM1=SE1*SE1	VS 6088
SUM2=SE2*SE2	VS 6089
SUM3=SE3*SE3	VS 6090
SM11=XYZ+SE1	VS 6091
SM12=XYZ-SE1	VS 6092
SM21=XYZ+SE2	VS 6093
SM22=XYZ-SE2	VS 6094
SM31=XYZ+SE3	VS 6095
SM32=XYZ-SE3	VS 6096
IF(SM11.GE.0. .AND. SM12.GE.0.) SUM1=0.	VS 6097
IF(SM11.LT.0. .AND. SM12.LT.0.) SUM1=0.	VS 6098
IF(SM21.GE.0. .AND. SM22.GE.0.) SUM2=0.	VS 6099
IF(SM21.LT.0. .AND. SM22.LT.0.) SUM2=0.	VS 6100
IF(SM31.GE.0. .AND. SM32.GE.0.) SUM3=0.	VS 6101
IF(SM31.LT.0. .AND. SM32.LT.0.) SUM3=0.	VS 6102
S21=1.	VS 6103
S22=1.	VS 6104
S23=1.	VS 6105
IF(SM11.LT.0.) S21=-1.	VS 6106
IF(SM21.LT.0.) S22=-1.	VS 6107
IF(SM31.LT.0.) S23=-1.	VS 6108
CK=CHORDT(K,K1)*(2.*XYZ*SF1+SUM1)*SN(K, JJ, ISN)/FN	VS 6109
CK2=CHORDT(K,K1)*(2.*XYZ*SF2+SUM2)*SN(K, JJ, ISN)/FN	VS 6110
YRF=HALFR(K)	VS 6111
IF (NASYM.EQ.1 .AND. KK.EQ.2) YRF=PBREAK(K,1)	VS 6112
IF (NASYM.EQ.0 .AND. KK.EQ.2) YRF=YBREAK(K,NC(K))	VS 6113
SUM3=SUM3-2.*RL*YRF/HALFB(1)*XYZ*XY7*BMR(5,K)	VS 6114
CK3=CHORDT(K,K1)*(2.*XYZ*SF3+SUM3)*SN(K, JJ, ISN)/FN	VS 6115
CK=CK*RRT	VS 6116
CK2=CK2*RRT	VS 6117
CK3=CK3*RRT	VS 6118
CK=CK*FATR*CS*S1*S21	VS 6119
CK2=CK2*FATR*CS*S1*S22	VS 6120
CK3=CK3*FATR*CS*S1*S23	VS 6121
CY=CY+CK2*PIS	VS 6122
CNB=CNB-CK2*YQ*PIS	VS 6123
CLB=CLB+CK2/CS*ZCV*PIS	VS 6124
CYP=CYP+CK*PIS	VS 6125
CNP=CNP-CK*YQ*PIS	VS 6126

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	CLP=CLP+CK/CS*ZCV*PIS	VS 6127
	CYR=CYR+CK3*PIS	VS 6128
	CNR=CNR-CK3*XO*PIS	VS 6129
	CLRR=CLRR+CK3/CS*ZCV*PIS	VS 6130
C	WRITE(JPT,2) XY7,SE1,SUM1,SUM2,SUM3,7CV,YCV	VS 6131
	CYBVSE=CYBVSE+CK2*PIS	VS 6132
	CNBVSE=CNBVSE-CK2*XO*PIS	VS 6133
	CLBVSE=CLBVSE+CK2/CS*ZCV*PIS	VS 6134
	CYPVSE=CYPVSE+CK*PIS	VS 6135
	CNPVSE=CNPVSE-CK*PIS*XO	VS 6136
	CLPVSE=CLPVSE+CK/CS*ZCV*PIS	VS 6137
	CYRSE=CYRSE+CK3*PIS	VS 6138
	CNRVSE=CNRVSE-CK3*PIS*XO	VS 6139
	CLRVSE=CLRVSE+CK3/CS*ZCV*PIS	VS 6140
C	EFFECT OF VORTEX BREAKDOWN	VS 6141
	BR=-XO/HALFB(1)*RL	VS 6142
	BLR=BR	VS 6143
	IF(IRD.EQ.0) GO TO 1369	VS 6144
	IF(PBK.GT.0.01) BLR=-BK*BR	VS 6145
	BLR=ABS(BLR)	VS 6146
	AB1=ABD(K,MA)	VS 6147
	AB2=ABDR(K,MA)	VS 6148
	AB3=ABDL(K,MA)	VS 6149
	AB4=ALBDBL(K,1)	VS 6150
	ARL=AB1-(AB1-AB2)/BK*BLR	VS 6151
	NB=NWING(K)	VS 6152
	BLR=(AUX(K,NB)-YREF)/HALFB(1)*RL	VS 6153
	BLR=ABS(BLR)	VS 6154
	CRL=AB1-(AB1-AR2)/RK*BLR	VS 6155
	RTBR=BML(3,K)	VS 6156
	RTBL=BML(2,K)	VS 6157
	FA=1.	VS 6158
	IF(ALP.GE.CRL.AND.ALPT.AB1) FA=1.-(1.-RTBL)*(ALP-CRL)/(AB1-CRL)	VS 6159
	IF(ALP.GE.AB1) FA=PTBL	VS 6160
	XL(2,K)=1.	VS 6161
	IF(ALP.GT.ARL.AND.ALPT.CRL) XL(2,K)=0.5*(RTBR+1.)	VS 6162
	IF(ALP.GE.CRL) XL(2,K)=0.5*(RTBR+FA)	VS 6163
	RTK=BMR(2,K)	VS 6164
	FB=1.	VS 6165
	IF(ALP.GE.CRL.AND.ALPT.AB1) FB=1.-(1.-RTK)*(ALP-CRL)/(AB1-CRL)	VS 6166
	IF(ALP.GE.AB1) FB=RTK	VS 6167
	ABC=CBMR(K)	VS 6168
	IF(ALP.GT.ARL.AND.ALPT.CRL) ABC=0.5*(RTK+1.)*CBMR(K)	VS 6169
	IF(ALP.GE.CRL) ABC=0.5*(RTK+FB)*CBMR(K)	VS 6170
	GO TO 1388	VS 6171
1369	XL(2,K)=1.	VS 6172
	ABC=CBMR(K)	VS 6173
1388	CONTINUE	VS 6174
C	WRITE(JPT,2) CK,CK2,CK3,XYZ,SE2,SE3,BMR(5,K)	VS 6175

	IF(NVRTX(K).NE.(NS(K)+1)) GO TO 223	VS	6176
	B1=CHORDT(K,K1)*2.*XYZ*XY7*BMP(4,K)*GB*SN(K,JJ,ISN)/FN*FATR*CS*S1	VS	6177
	CK2=CK2+B1	VS	6178
	PB1=CHORDT(K,K1)*2.*XY7*GB*SE1*SN(K,JJ,ISN)/FN*FATR*CS*S1	VS	6179
	IF(PBK.GT.0.01) CK2=CK2+PB1	VS	6180
	R1=CHORDT(K,K1)*2.*XYZ*XY7*ABC*BR*SN(K,JJ,ISN)/FN*FATR*CS*S1	VS	6181
	CK3=CK3+R1	VS	6182
	RB1=CHORDT(K,K1)*2.*XY7*GR*SE3*SN(K,JJ,ISN)/FN*FATR*CS*S1	VS	6183
	IF(PBK.GT.0.01) CK3=CK3+RB1	VS	6184
	DR=BML(5,K)	VS	6185
C	WRITE(JPT,2) ARL,CRL,RTBR,RTBL,DR,BMR(4,K)	VS	6186
C	WRITE(JPT,2) CK2,CK3,BML(4,K),XL(1,K),XL(2,K)	VS	6187
	CK=CK*BML(4,K)	VS	6188
	CK2=CK2*XL(1,K)	VS	6189
	CK3=CK3*XL(2,K)	VS	6190
C	ADDITIONAL VORTEX LIFT ON THE LEFT OUTBOARD PANEL	VS	6191
	FBB=1.	VS	6192
	ID=0	VS	6193
	IF(MA.EQ.2.AND.IAGVX.EQ.1) ID=1	VS	6194
	IF(ID.EQ.1.AND.ALP.GT.AB3) FBB=CA(K)	VS	6195
	IF(ALP.GE.ALPRD(K,1).AND.IAGVX.EQ.0) FBB=0.	VS	6196
	GG=CPCVL(K)	VS	6197
	IF(ID.EQ.0) GO TO 891	VS	6198
	IF(ALP.GT.AB2) GG=PTK	VS	6199
	IF(ALP.GT.AB3) FBB=0.	VS	6200
891	CONTINUE	VS	6201
	FBB=FBB*CA(K)	VS	6202
	FBC=FBB	VS	6203
	IF(MA.EQ.2.AND.IAGVX.EQ.0) FBC=0.	VS	6204
	TB1=0.5*(FBC-CA(K)*FBB)*B1	VS	6205
	TB2=CHORDT(K,K1)*XYZ*XY7*SN(K,JJ,ISN)/FN*FATR*CS	VS	6206
	TB3=0.5*(1.-GG)*TB2*FBB*S1	VS	6207
	CK2=CK2+TB1-TB3	VS	6208
C	WRITE(JPT,2) CK2,TB1,TB3,TB2	VS	6209
916	CONTINUE	VS	6210
	CYBV=CYBV-CK2/CS*SS*PIS	VS	6211
	CNBV=CNBV+CK2/CS*SS*PIS*XO	VS	6212
	CLBV=CLBV-CK2/CS*(YCV-DYB(K))*PIS	VS	6213
	CYPV=CYPV-CK/CS*SS*PIS	VS	6214
	CNPV=CNPV+CK/CS*SS*PIS*XO	VS	6215
	CYRV=CYPV-CK3/CS*SS*PIS	VS	6216
	CNRV=CNRV+CK3/CS*SS*PIS*XO	VS	6217
	CLRRV=CLRRV-CK3/CS*(YCV-DYR(K))*PIS	VS	6218
	CLPV=CLPV-CK/CS*(YCV-DR)*PIS	VS	6219
225	CONTINUE	VS	6220
223	CONTINUE	VS	6221
1321	CONTINUE	VS	6222
222	CONTINUE	VS	6223
	IF(ABS(CSL).GT.0.0001) XLERAR=CSXL/CSL	VS	6224

	IF(ABS(CSAUG).GT.0.0001) XAUGB=CMAUG/CSAUG	VS	6225
	CSNW=CSNW*0.5*PI	VS	6226
	FTN=1.	VS	6227
	IF(GW.GT.1.E-5) FTN=CSNW/GW	VS	6228
C	WRITE(JPT,2) CSNW,FTN,GW	VS	6229
	PISW=0.5*PI/HALFSW	VS	6230
	CLT=CLT*PISW	VS	6231
	CMT=CMT*PISW	VS	6232
	CDT=CDT*PISW	VS	6233
	CLGM=CLGM*PISW*FTN	VS	6234
	CDGM=CDGM*PISW*FTN	VS	6235
	CMGM=CMGM*PISW*FTN	VS	6236
	CLDV=CLDV*PISW*FTN*FTN	VS	6237
	CDDV=CDDV*PISW*FTN*FTN	VS	6238
	CMDV=CMDV*PISW/CREF*FTN*FTN	VS	6239
	DO 1399 I=1,NSUR	VS	6240
	CLW(I)=CLW(I)*PISW	VS	6241
	CMW(I)=CMW(I)*PISW	VS	6242
	CDW(I)=CDW(I)*PISW	VS	6243
	CLWL(I)=CLWL(I)*PISW	VS	6244
	CMWL(I)=CMWL(I)*PISW	VS	6245
	CDWL(I)=CDWL(I)*PISW	VS	6246
1399	CONTINUE	VS	6247
	CLPP=CLPP*PI/(2.*HALFSW)	VS	6248
	CDPP=CDPP*PI/(2.*HALFSW)	VS	6249
	CDVL=CDVL*PI/(2.*HALFSW)	VS	6250
	CSL=CSL*PI/(2.*HALFSW)	VS	6251
	CSXL=CSXL*PI/(2.*HALFSW*CREF)	VS	6252
	CSAUG=CSAUG*PI/(2.*HALFSW)	VS	6253
	CAX=CAX*PI/(2.*HALFSW)	VS	6254
	CAXV=CAXV*PI/(2.*HALFSW)	VS	6255
	CLAUG=CSAUG	VS	6256
	CDAUG=CLAUG*SINA/COSA	VS	6257
	CMAUG=CMAUG*PI/(2.*HALFSW*CREF)	VS	6258
	IF(ABS(CLT).GT.0.0001) XBP=CMT/CLT*CREF	VS	6259
	IF(IALP.EQ.1) GO TO 166	VS	6260
	CDVS=CDVS*2.	VS	6261
	CLVS=CLVS*2.	VS	6262
	CMVS=CMVS*CTX*2./CREF	VS	6263
166	CONTINUE	VS	6264
	CDCL2=0.	VS	6265
	IF(LAT.EQ.0) GO TO 227	VS	6266
	CONST=PI/(2.*HALFSW)	VS	6267
	CONTR=CONST/(2.*HALFR(1))	VS	6268
	IF(LAT.EQ.1) GO TO 1360	VS	6269
	C1=CLL*CONTR	VS	6270
	C2=CLLV*CONTR	VS	6271
	C3=CNL*CONTR	VS	6272
	C4=CNLV*CONTR	VS	6273

CLL=C1*COSA+C3*SINA	VS 6274
CLLV=C2*COSA+C4*SINA	VS 6275
CNL=C3*COSA-C1*SINA	VS 6276
CNLV=C4*COSA-C2*SINA	VS 6277
C5=CLNSE*CONTR	VS 6278
C6=CNNSE*CONTR	VS 6279
C7=CLNSEV*CONTR	VS 6280
C8=CNNSEV*CONTR	VS 6281
CLNSE=C5*COSA+C6*SINA	VS 6282
CNNSE=C6*COSA-C5*SINA	VS 6283
CLNSEV=C7*COSA+C8*SINA	VS 6284
CNNSEV=C8*COSA-C7*SINA	VS 6285
GO TO 227	VS 6286
1360 CONTINUE	VS 6287
FTN2=FTN*FTN	VS 6288
RTP=CONST/P*0.5*FTN2	VS 6289
RTB=CONST/BK*0.5*FTN2	VS 6290
RTR=CONST/RL*0.5*FTN2	VS 6291
CY=C*CONST/BK	VS 6292
CNR=CNB*CONTR/BK	VS 6293
CLR=CLB*CONTR/BK	VS 6294
CYP=CYP*CONST/P	VS 6295
CNP=CNP*CONTR/P	VS 6296
CLP=CLP*CONTR/P	VS 6297
CYP=CYP*CONST/P	VS 6298
CNR=CNR*CONTR/RL	VS 6299
CLRR=CLRR*CONTR/RL	VS 6300
CLPV=CLPV*CONTR/P+CLPVA*RTP	VS 6301
CYRV=CYBV*CONST/BK+CYBVA*RTB	VS 6302
CYBVSE=CYBVSE*CONST/RK+CYBVA*PTB	VS 6303
CNBV=CNBV*CONTR/BK+CNBVA*RTB	VS 6304
CNBVSE=CNBVSE*CONTR/BK+CNBVA*RTB	VS 6305
CLBV=CLBV*CONTR/RK+CLBVA*RTB	VS 6306
CLBVSE=CLBVSE*CONTR/RK+CLBVA*RTB	VS 6307
CYPV=CYPV*CONST/P+CYPVA*RTP	VS 6308
CYPVSE=CYPVSE*CONST/P+CYPVA*RTP	VS 6309
CNPV=CNPV*CONTR/P+CNPVA*RTP	VS 6310
CNPVSE=CNPVSE*CONTR/P+CNPVA*RTP	VS 6311
CLPVSE=CLPVSE*CONTR/P+CLPVA*RTP	VS 6312
CYRV=CYRV*CONST/RL+CYRVA*RTR	VS 6313
CYRSE=CYRSE*CONST/RL+CYRVA*RTR	VS 6314
CLRRV=CLRRV*CONTR/RL+CLRRVA*RTR	VS 6315
CLRVSE=CLRVSE*CONTR/PL+CLRRVA*RTR	VS 6316
CNRV=CNRV*CONTR/RL+CNRVA*RTR	VS 6317
CNRVSE=CNRVSE*CONTR/RL+CNRVA*RTR	VS 6318
227 CONTINUE	VS 6319
AI=1.	VS 6320
C WRITE(JPT,3) KALP,KI,NALP	VS 6321
IF(KALP.LT.2) GO TO 90	VS 6322

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	CLF=BREAK(6,10)	VS 6323
	IF(KALP.EQ.2) CLTOT=CLT+CLF	VS 6324
	IF(KALP.EQ.3) CLTOT=CLPP+CSL+CLVS+CLAUG+CLGM+CLDV+CLF	VS 6325
	IF(KI.GT.1) GO TO 91	VS 6326
	AR=2.*HALFB(1)*HALFB(1)/HALFSW	VS 6327
	BB2=1.-AM*AM	VS 6328
	SAT=SQRT(AR*AR*BB2*(1.+TANC2/BB2)+4.)	VS 6329
	ASP=2.*PI*AR/(2.+SAT)	VS 6330
	GO TO 92	VS 6331
91	AI=CLTOT-CLII	VS 6332
	IF(ABS(AI).LT.0.001) GO TO 90	VS 6333
	ASP=AI/(ALP-ALPII)	VS 6334
92	ALPINC=(CLDS-CLTOT)/ASP	VS 6335
	IF(KI.EQ.NALP) GO TO 90	VS 6336
	GO TO 341	VS 6337
90	CONTINUE	VS 6338
	IF(ABS(CLT) .LE. 0.001) GO TO 44	VS 6339
	CDCL2=CDT/(CLT*CLT)	VS 6340
44	CONTINUE	VS 6341
C	WRITE(JPT,3) NC1,NC2,NASYM	VS 6342
	SWS=HALFSW	VS 6343
	IF(NASYM.EQ.1) HALFSW=0.5*HALFSW	VS 6344
	IF(LAT.EQ.(-1)) GO TO 71	VS 6345
	CALL BENDIN(NC,CLY,BMR,IWING,BREAK,CBMR,CBTR,NWING,HALFSH,HALFBH,DVS	VS 6346
	1DCOS,DSIN,IWGLT,FTL,NASYM,NC2,0,NSUR,NS)	VS 6347
	DO 1402 I=1,NSUR	VS 6348
	IF(IWGLT(I).EQ.2) CBMR(I)=CBMR(I)+FTL(I)*(X(I,3)*X(I,1)+X(I,4)*X(I,2)	VS 6349
	1,2))/HALFB(I)+CBTR(I)	VS 6350
C	WRITE(JPT,2) FTL(I),X(I,3),X(I,1),X(I,4),X(I,2)	VS 6351
	CBML(I)=CBMR(I)	VS 6352
	CBTL(I)=CBTR(I)	VS 6353
	IF(NASYM.EQ.1) CBMR(I)=CBTR(I)	VS 6354
	KA=NS(I)	VS 6355
	IF(I.GT.1) KA=KA-NS(I-1)	VS 6356
	DO 72 K=1,KA	VS 6357
72	BML(I,K)=BMR(I,K)	VS 6358
1402	CONTINUE	VS 6359
	GO TO 73	VS 6360
71	IF(LAT.EQ.1) GO TO 73	VS 6361
	DO 74 I=1,NCS	VS 6362
74	YCON(I)=CLY(I)+CLS(I)	VS 6363
	CALL BENDIN(NC,YCON,BMR,IWING,BREAK,CBMR,CBTR,NWING,HALFSH,HALFBH,VS	VS 6364
	1DCOS,DSIN,IWGLT,FTL,NASYM,NC2,1,NSUR,NS)	VS 6365
	DO 1403 I=1,NSUR	VS 6366
	IF(IWGLT(I).EQ.2) CBMR(I)=CBMR(I)+FTL(I)*(X(I,3)*X(I,1)+X(I,4)*X(I,2)	VS 6367
	1,2))/HALFB(I)+CBTR(I)	VS 6368
1403	CONTINUE	VS 6369
	DO 75 I=1,NCS	VS 6370
75	YCON(I)=CLY(I)-CLS(I)	VS 6371

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CALL BENDIN(NC,YCON,RML,IWING,BREAK,CBML,CBTL,NWING,HALFSH,HALFBH,VS 6372
IDCOS,DSIN,IWGLT,FTL,NASYM,NC1,2,NSUR,NS) VS 6373
DO 1404 I=1,NSUR VS 6374
IF(IWGLT(I).EQ.2) CBML(I)=CBML(I)+FTL(I)*(X(I,3)*X(I,1)+X(I,4)*X(I,VS 6375
1,2))/HALFB(I)+CBTL(I) VS 6376
1404 CONTINUE VS 6377
73 CONTINUE VS 6378
HALFSW=SWS VS 6379
ALP=ALP*180./PI VS 6380
WRITE (JPT,51) VS 6381
IF (IALP .EQ. 1) WRITE (JPT,59) VS 6382
IF(IALP .EQ. 1) GO TO 76 VS 6383
WRITE (JPT,52) ALP VS 6384
AF=0. VS 6385
DO 2315 I=1,NSUR VS 6386
IF(NAL(I).NE.0.AND.ABS(AF).LT.0.01) AF=DF(I,NAL(I))*180./PI VS 6387
2315 CONTINUE VS 6388
IF(LAT .EQ. (-1)) WRITE(JPT,77) AF VS 6389
76 CONTINUE VS 6390
77 FORMAT(/20X,19HAND AILERON ANGLE =,F8.3,2X,4HDFG.) VS 6391
WRITE (JPT,51) VS 6392
51 FORMAT(/20X,42HXYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY) VS 6393
52 FORMAT(/20X,32HPRESSURE DISTRIBUTION AT ALPHA =,F8.3,2X,4HDFG.) VS 6394
59 FORMAT (/20X,43HPRESSURE DISTIRUTION AT ALPHA = 1.0 RADIAN) VS 6395
IF(LAT.NE.(-1)) WRITE(JPT,53) VS 6396
IF(LAT.EQ.(-1)) WRITE(JPT,55) VS 6397
53 FORMAT (/3X,6HVORTEX,14X,2HXV,17X,2HYV,19X,2HCP) VS 6398
55 FORMAT(/3X,6HVORTEX,14X,2HXV,17X,2HYV,17X,8HCP(LEFT),12X, 9HCP(RIGVS 6399
HT)) VS 6400
K1=0 VS 6401
JJ1=0 VS 6402
JK=0 VS 6403
K=1 VS 6404
KCH=1 VS 6405
DO 60 I=1,NCS VS 6406
HAR=HALFB(K) VS 6407
IF (NW(K,2).EQ.0) GO TO 62 VS 6408
IF(K.EQ.1) I1=KCH+NS(K) VS 6409
IF(K.GT.1) I1=KCH+NS(K)-NS(K-1) VS 6410
CHORD=CH(KCH)+CH(I1) VS 6411
GO TO 63 VS 6412
62 CHORD=CH(KCH) VS 6413
63 CONTINUE VS 6414
NCW=NW(K,1)+NW(K,2) VS 6415
DO 61 J=1,NCW VS 6416
JJ=JJ1+J VS 6417
KK=K1+J VS 6418
IF (NW(K,2).EQ.0) GO TO 64 VS 6419
IF (J.LE.NW(K,1)) GO TO 64 VS 6420

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	IK=0	VS 6421
	IF(K.GT.1) IK=NS(K-1)	VS 6422
	LL=LPAN1(K)+NW(K,2)*(I-IK-1)+JJ-NW(K,1)*(I-IK)	VS 6423
	GO TO 65	VS 6424
64	LL=JJ+JK	VS 6425
65	CONTINUE	VS 6426
	XI=(XV(LL)-XLE(KCH))/CHORD	VS 6427
	ETA=YV(LL)/HALFB(K)	VS 6428
	IF(LAT.NE.(-1)) GO TO 66	VS 6429
	CPR=(CP(LL)+GAMMA(LL))*2.	VS 6430
	CPL=(CP(LL)-GAMMA(LL))*2.	VS 6431
	WRITE (JPT,54) KK,XI,ETA,CPL,CPR	VS 6432
	GO TO 61	VS 6433
66	CPK=2.*CP(LL)	VS 6434
	WRITE(JPT,54) KK,XI,ETA,CPK	VS 6435
61	CONTINUE	VS 6436
	JJ1=JJ1+NW(K,1)	VS 6437
	K1=K1+NCW	VS 6438
	KCH=KCH+1	VS 6439
	IF(I.NE.NS(K)) GO TO 60	VS 6440
	IF(NW(K,2).EQ.0) GO TO 67	VS 6441
	IF(K.EQ.1) KCH=KCH+NS(K)	VS 6442
	IF(K.GT.1) KCH=KCH+NS(K)-NS(K-1)	VS 6443
67	CONTINUE	VS 6444
	JJ1=0	VS 6445
	JK=LPN(K)	VS 6446
60	IF(I.EQ.NS(K)) K=K+1	VS 6447
54	FORMAT (6X,I3,4(10X,F10.5))	VS 6448
	WRITE (JPT,30)	VS 6449
30	FORMAT (/9X,3HY/S,11X,9HCL(RIGHT),6X,8HCL(LEFT),10X,2HCM,12X,2HCT, 113X,3HCDI,12X,4HCS*C,10X,3HCAV)	VS 6450
325	FORMAT (/4X,42HTHE FOLLOWING ARE THE TAIL CHARACTERISTICS)	VS 6451
327	FORMAT (/4X,45HTHE FOLLOWING ARE THE WINGLET CHARACTERISTICS)	VS 6452
	K=1	VS 6453
	NSP=0	VS 6454
	KCH=1	VS 6455
	DO 31 I=1,NCS	VS 6456
	JWING=IWING(K)	VS 6457
	IF (IWGLT(K).EQ.0) GO TO 326	VS 6458
	IF (I.EQ. (JWING+1)) WRITE (JPT,327)	VS 6459
	GO TO 328	VS 6460
326	CONTINUE	VS 6461
	IF(I.EQ.(NSP+1).AND.K.EQ.2) WRITE(JPT,325)	VS 6462
	KB=K-1	VS 6463
	IF(I.EQ.(NSP+1).AND.K.GT.1) WRITE(JPT,1397) KB	VS 6464
	IF(I.EQ.(NSP+1).AND.K.GT.1) WRITE(JPT,1213)	VS 6465
328	CONTINUE	VS 6466
	YE=YLE(KCH)/HALFB(K)	VS 6467
	KCH=KCH+1	VS 6468
		VS 6469

	IF (I .NE. NS(K)) GO TO 361	VS 6470
	IF (NW(K,2) .EQ. 0) GO TO 361	VS 6471
	IF (K .EQ. 1) KCH=KCH+NS(K)	VS 6472
	IF (K .GT. 1) KCH=KCH+NS(K)-NS(K-1)	VS 6473
361	CONTINUE	VS 6474
	TEM=CLS(I)	VS 6475
	IF(I.EQ.NS(K)) NSP=NS(K)	VS 6476
	IF (I.EQ.NS(K)) K=K+1	VS 6477
	IF(LAT.NE.(-1)) TEM=0.	VS 6478
	CLRT=CL(I)+TEM	VS 6479
	CLLT=CL(I)-TEM	VS 6480
31	WRITE (JPT,32) YE,CLRT,CLLT,CM(I),CT(I),CD(I),DMM(I),CAVS(I)	VS 6481
32	FORMAT (8(5X,F10.5))	VS 6482
	WRITE(JPT,1303)	VS 6483
1303	FORMAT(/2X,57H*** THE FOLLOWING ARE ATTACHED POTENTIAL FLOW RESULTVS	VS 6484
	1S ***)	VS 6485
	WRITE (JPT,33) CLT	VS 6486
33	FORMAT (/2X,24HTOTAL LIFT COEFFICIENT =F10.5)	VS 6487
	WRITE (JPT,24) CDT	VS 6488
24	FORMAT (/2X,32HTOTAL INDUCED DRAG COEFFICIENT =,F10.5)	VS 6489
	WRITE (JPT,35) CDCL2	VS 6490
35	FORMAT (/2X,28HTHE INDUCED DRAG PARAMETER =,F10.5)	VS 6491
	WRITE (JPT,42) CMT	VS 6492
42	FORMAT(/2X,35HTOTAL PITCHING MOMENT COEFFICIENT =,F10.5)	VS 6493
	IF(NSUR.GT.1) GO TO 330	VS 6494
	IF(IWING(1).NE.0) GO TO 330	VS 6495
	IF(NASYM.EQ.1) GO TO 48	VS 6496
	IF(ARS(CLT).LE.0.001) GO TO 48	VS 6497
	IF(NGRD.NE.0) GO TO 48	VS 6498
	IF(IDIH.NE.0) GO TO 48	VS 6499
	IF(KF.NE.0) GO TO 48	VS 6500
	CALL DRAG(CLT,YBREAK,NC,TFLP,NAL)	VS 6501
	GO TO 48	VS 6502
330	WRITE(JPT,331) CLW(1)	VS 6503
	WRITE(JPT,332) CDW(1)	VS 6504
	WRITE(JPT,333) CMW(1)	VS 6505
	IF(IWING(1).EQ.0) GO TO 2103	VS 6506
	CLWLT=CLW(1)-CLWL(1)	VS 6507
	CMWLT=CMW(1)-CMWL(1)	VS 6508
	CDWLT=CDW(1)-CDWL(1)	VS 6509
	WRITE(JPT,2104) CLWLT	VS 6510
	WRITE(JPT,2106) CDWLT	VS 6511
	WRITE(JPT,2105) CMWLT	VS 6512
2104	FORMAT(/5X,30HTHE WINGLET LIFT COEFFICIENT =,F10.6,20H(BASED ON WIVS	VS 6513
	ING AREA))	VS 6514
2105	FORMAT(/5X,41HTHE WINGLET PITCHING MOMENT COEFFICIENT =,F10.6,/10XVS	VS 6515
	1,29H(BASED ON REFERENCE GEOMETRY))	VS 6516
2106	FORMAT(/5X,38HTHE WINGLET INDUCED DRAG COEFFICIENT =,F10.6,20H(BASVS	VS 6517
	IED ON WING AREA))	VS 6518

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2103	CONTINUE	VS	6519
1397	FORMAT (/5X,16H*** TAIL SURFACE,I3,4H ***/)	VS	6520
	IF(NSUR.EQ.1) GO TO 48	VS	6521
	K2 = NSUR - 1	VS	6522
	DO 1398 I=1,K2	VS	6523
	WRITE(JPT,1397) I	VS	6524
	CLTLW=CLW(I+1)-CLW(I)	VS	6525
	CMTAIL=CMW(I+1)-CMW(I)	VS	6526
	CDTL=CDW(I+1)-CDW(I)	VS	6527
	WRITE(JPT,334) CLTLW	VS	6528
	WRITE(JPT,329) CDTL	VS	6529
	WRITE(JPT,335)	VS	6530
	WRITE(JPT,336) CMTAIL	VS	6531
1398	CONTINUE	VS	6532
48	CONTINUE	VS	6533
	WRITE(JPT,81)	VS	6534
	IF (IALP .EQ. 0) GO TO 341	VS	6535
	WRITE (JPT,8)	VS	6536
	CTIP = CTIP*2	VS	6537
	WRITE (JPT,345)	VS	6538
	WRITE(JPT,342) CLT,CSL,CTIP,CSAUG	VS	6539
	WRITE(JPT,343) XBP,XLEBAR,CTX,XAUGB	VS	6540
	WRITE (JPT,8)	VS	6541
	GO TO 346	VS	6542
342	FORMAT(/2X,4HKP =,F10.5,3X,6HKVLE =,F10.5,3X,6HKVSE =,F10.5,3X,	VS	6543
	17HKVAUG =,F10.5)	VS	6544
343	FORMAT(/2X,5HXBP =,F10.5,3X,6HXBLE =,F10.5,3X,6HXBSE =,F10.5,3X,	VS	6545
	17HXBAUG =,F10.5)	VS	6546
345	FORMAT (/2X,66HTHE FOLLOWING PARAMETERS ARE USED IN THE METHOD OF	VS	6547
	1SUCTION ANALOGY)	VS	6548
341	CONTINUE	VS	6549
	CLF=0.	VS	6550
	CMF=0.	VS	6551
	CDF=0.	VS	6552
	IF (KF .EQ. 0) GO TO 362	VS	6553
	S=XTEF-XLEF	VS	6554
	SS=SINA	VS	6555
	CS=COSA	VS	6556
	CALL CPFUS(NCUM,NT,SCH,CPF,NF,S,XLEF,XF,XAS,LPANEL,LPAN1,NKF,NW,	VS	6557
	1B,AM,SS,CS,SNP,FO,F10,WARD,IWING,CREF,O,NC1,YPPEAK,DCOS,DSIN,IV,	VS	6558
	2LPN,NS,NGRD,HEIGHT,ATT,IWGLT,NC,BREAK)	VS	6559
	CALL FUSLFT(CPF,HALFSW,CREF,SS,CS,O,XREF,CLF,CMF,CDF)	VS	6560
	BREAK(6,10)=CLF	VS	6561
	IF(KALP.GE.2.AND.ABS(AI).GT.0.001) GO TO 93	VS	6562
	IF (LAT .NE. 1) GO TO 362	VS	6563
	G10=0.	VS	6564
	SS=0.	VS	6565
	CS=1.	VS	6566
	CALL CPFUS(NCUM,NT,GAMB,CPF,NF,S,XLEF,XF,XAS,LPANEL,LPAN1,NKF,NW,	VS	6567

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1B,AM,SS,CS,SNP,FO,G10,WARD,IWING,CREF,2,NC1,YBREAK,DCDS,DSIN,IV, VS 6568
2LPN,NS,NGRD,HEIGHT,ATT,IWGLT,NC,BREAK) VS 6569
CALL FUSLFT(CPF,HALFSW,CREF,SS,CS,2,XREF,CYF,CNBF,CKF) VS 6570
C WRITE(JPT,2) CYF,CNBF VS 6571
PX=CYF/BK VS 6572
PY=CNBF/BK*CREF/(2.*HALFB(1)) VS 6573
CY=CY+PX VS 6574
CNB=CNB+PY VS 6575
CYBVSE=CYBVSE+PX VS 6576
CNBVSE=CNBVSE+PY VS 6577
CYBV=CYBV+PX VS 6578
CNBV=CNBV+PY VS 6579
SS=0. VS 6580
CS=1. VS 6581
CALL CPFUS(NCUM,NT,GAMR,CPF,NF,S,XLEF,XF,XAS,LPANEL,LPANI,NKF,NW, VS 6582
1B,AM,SS,CS,SNP,FO,G10,WARD,IWING,CREF,3,NC1,YBREAK,DCDS,DSIN,IV, VS 6583
2LPN,NS,NGRD,HEIGHT,ATT,IWGLT,NC,BREAK) VS 6584
CALL FUSLFT(CPF,HALFSW,CREF,SS,CS,3,XREF,CYRF,CNRF,CKF) VS 6585
C PY=CNRF/RL*CREF/(2.*HALFR(1)) VS 6586
WRITE(JPT,2) CYRF,CNRF VS 6587
CYR=CYR+CYRF VS 6588
CNR=CNR+PY VS 6589
CYRSE=CYRSE+SS VS 6590
CNRVSE=CNRVSE+PY VS 6591
CYRV=CYRV+SS VS 6592
CNRV=CNRV+PY VS 6593
362 CONTINUE VS 6594
IF(KALP.GE.2.AND.ABS(AI).GT.0.001) GO TO 92 VS 6595
WRITE(JPT,8) VS 6596
WRITE(JPT,920) ALP,AM VS 6597
WRITE(JPT,8) VS 6598
CLTT=CLT+CLF VS 6599
CDTT=CDT+CDF VS 6600
CMTT=CMT+CMF VS 6601
WRITE(JPT,921) CLT,CLF,CLTT VS 6602
WRITE(JPT,922) CDT,CDF,CDTT VS 6603
WRITE(JPT,923) CMT,CMF,CMTT VS 6604
920 FORMAT(/2X,43HSUMMARY OF ATTACHED FLOW RESULTS AT ALPHA =,F7.3,2X, VS 6605
15HDEG.,,2X,3HM =,F7.3) VS 6606
921 FORMAT(/4X,8HCL(LS) =,F10.5,3X,5HCLF =,F10.5,3X,4HCL =,F10.5) VS 6607
922 FORMAT(/4X,8HCD(LS) =,F10.5,3X,5HCDF =,F10.5,3X,4HCD =,F10.5) VS 6608
923 FORMAT(/4X,8HCM(LS) =,F10.5,3X,5HCMF =,F10.5,3X,4HCM =,F10.5) VS 6609
CLT=CLPP+CSL+CLVS+CLAUG+CLGM+CLDV+CLF VS 6610
CDT=CDPP+CDVL+CDVS+CDAUG+CDGM+CDDV+CDF VS 6611
CMT=CMT+CSXL+CMVS+CMAUG+CMGM+CMDV+CMF VS 6612
WRITE(JPT,8) VS 6613
WRITE(JPT,345) VS 6614
WRITE(JPT,347) CLPP,CSL,CLVS,CLAUG VS 6615
WRITE(JPT,348) CDPP,CDVL,CDVS,CDAUG VS 6616

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WRITE(JPT,349) CMT,CSXL,CMVS,CHAUG	VS	6617
WRITE(JPT,355) CLGM,CLDV,CLF,CLT	VS	6618
WRITE(JPT,356) CDGM,CDDV,CDF,CDT	VS	6619
WRITE(JPT,357) CMGM,CMDV,CMF,CMTT	VS	6620
WRITE(JPT,354) CAX,CAXV	VS	6621
WRITE(JPT,8)	VS	6622
346 CONTINUE	VS	6623
347 FORMAT(/2X,5HCLP =,F10.5,3X,7HCLVLE =,F10.5,3X,7HCLVSE =,F10.5,3X,VS	VS	6624
18HCLVAUG =,F10.5)	VS	6625
348 FORMAT(/2X,5HCDP =,F10.5,3X,7HCDVLE =,F10.5,3X,7HCDVSE =,F10.5,3X,VS	VS	6626
18HCDVAUG =,F10.5)	VS	6627
349 FORMAT(/2X,5HCM P =,F10.5,3X,7HCMVLE =,F10.5,3X,7HCHVSE =,F10.5,3X,VS	VS	6628
18HCMVAUG =,F10.5)	VS	6629
354 FORMAT(/2X,6HCAXP =,F10.5,3X,6HCAXV =,F10.5)	VS	6630
355 FORMAT(/2X,7HCLDVP =,F10.5,2X,7HCLDVV =,F10.5,2X,5HCLF =,F10.5,2X,VS	VS	6631
14HCL =,F10.5)	VS	6632
356 FORMAT(/2X,7HCDDVP =,F10.5,2X,7HCDDVV =,F10.5,2X,5HCDF =,F10.5,2X,VS	VS	6633
14HCD =,F10.5)	VS	6634
357 FORMAT(/2X,7HCM DVP =,F10.5,2X,7HCM DVV =,F10.5,2X,5HCMF =,F10.5,2X,VS	VS	6635
14HCM =,F10.5)	VS	6636
331 FORMAT(/5X,27HTHE WING LIFT COEFFICIENT =,F10.5)	VS	6637
332 FORMAT(/5X,35HTHE WING INDUCED DRAG COEFFICIENT =,F10.5)	VS	6638
333 FORMAT(/5X,38HTHE WING PITCHING MOMENT COEFFICIENT =,F10.5)	VS	6639
334 FORMAT(/5X,27HTHE TAIL LIFT COEFFICIENT =,F10.5,21H(BASED ON WINGVS	VS	6640
1 AREA))	VS	6641
329 FORMAT(/5X,35HTHE TAIL INDUCED DRAG COEFFICIENT =,F10.5,21H(BASEDVS	VS	6642
1 ON WING AREA))	VS	6643
335 FORMAT(/5X,65HTHE TAIL PITCHING MOMENT COEFFICIENT BASED ON REFEREVS	VS	6644
1NCE WING AREA)	VS	6645
336 FORMAT(/10X,49HAND MEAN WING CHORD, AND REFERRED TO THE Y-AXIS =, VS	VS	6646
1F10.5)	VS	6647
81 FORMAT(/5X,68H(NOTE. THE INDUCED DRAG COMPUTATION IS FOR SYMMETRICVS	VS	6648
1AL LOADING ONLY))	VS	6649
HW=2.*HALFSW	VS	6650
IF(NASYM.EQ.1) HW=HALFSW	VS	6651
HSH=HW	VS	6652
FACTOR=HALFB(1)/BREF2	VS	6653
FBREF=2.*BREF2	VS	6654
IF (LAT .EQ. 0) GO TO 45	VS	6655
WRITE(JPT,2021) FBREF,HW	VS	6656
2021 FORMAT(2X,53HTHE FOLLOWING ROLLING AND YAWING MOMENTS ARE BASED ONVS	VS	6657
1,/5X,19HA REFERENCE SPAN OF,F10.5,2X,23HAND A REFERENCE AREA OF, VS	VS	6658
2F10.5)	VS	6659
IF(LAT.NE.(-1)) GO TO 1361	VS	6660
WRITE(JPT,46) AF,AM	VS	6661
WRITE(JPT,1364)BREF2	VS	6662
CLL=CLL*FACTOR	VS	6663
CNL=CNL*FACTOR	VS	6664
CLLV=CLLV*FACTOR	VS	6665

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CNLV=CNLV*FACTOR VS 6666
CLNSF=CLNSF*FACTOR VS 6667
CNNSE=CNNSE*FACTOR VS 6668
CLNSEV=CLNSEV*FACTOR VS 6669
CNNSEV=CNNSEV*FACTOR VS 6670
WRITE(JPT,1362) CLL,CNL VS 6671
WRITE(JPT,1375) CLNSF,CNNSE VS 6672
WRITE(JPT,1363) CLLV,CNLV VS 6673
WRITE(JPT,1376) CLNSEV,CNNSEV VS 6674
1362 FORMAT(/2X,21HATTACHED-FLOW RESULTS,5X,4HCL =,F10.6,2X,4HCN =, VS 6675
1F10.6,2X,25H(WITH TIP-SUCTION EFFECT)) VS 6676
1363 FORMAT(/2X,19HVORTEX-FLOW RESULTS,7X,4HCL =,F10.6,2X,4HCN =,F10.6, VS 6677
12X,24H(WITH TIP-VORTEX EFFECT)) VS 6678
1375 FORMAT(/28X,4HCL =,F10.6,2X,4HCN =,F10.6,2X,28H(WITHOUT TIP-SUCTIOVS 6679
1N EFFECT)) VS 6680
1376 FORMAT(/28X,4HCL =,F10.6,2X,4HCN =,F10.6,2X,27H(WITHOUT TIP-VORTEXVS 6681
1 EFFECT)) VS 6682
1361 CONTINUE VS 6683
IF(LAT.NE.1) GO TO 45 VS 6684
WRITE(JPT,8) VS 6685
WRITE(JPT,241) VS 6686
WRITE(JPT,8) VS 6687
241 FORMAT(/2X,48H*STABILITY DERIVATIVES BY POTENTIAL FLOW THEORY*) VS 6688
242 FORMAT(/2X,51H*STABILITY DERIVATIVES WITH EDGE VORTEX SEPAPATION*)VS 6689
KA=1 VS 6690
239 CONTINUE VS 6691
IF(KA.GT.3) GO TO 45 VS 6692
WRITE(JPT,230) ALZ VS 6693
230 FORMAT(/2X,45H***STABILITY DERIVATIVES EVALUATED AT ALPHA =,F8.3,VS 6694
12X,7HDEGREES) VS 6695
WRITE(JPT,231) AM VS 6696
231 FORMAT(5X,16HAND AT MACH NO.=,F5.2,37H,BASED ON BODY AXES(IN PER PVS 6697
1ADIAN)***)) VS 6698
IF(KA.EQ.2) WRITE(JPT,238) VS 6699
IF(KA.FO.3) WRITE(JPT,237) VS 6700
CLR=CLB*FACTOR VS 6701
CNR=CNB*FACTOR VS 6702
CLP=CLP*FACTOR VS 6703
CNP=CNP*FACTOR VS 6704
CLRR=CLRR*FACTOR VS 6705
CNR=CNR*FACTOR VS 6706
WRITE(JPT,232) CY,CLB,CNB VS 6707
WRITE(JPT,233) CYP,CLP,CNP VS 6708
WRITE(JPT,234) CYR,CLRR,CNR VS 6709
232 FORMAT(/5X,5HCYR =,F12.7,2X,5HCLB =,F12.7,2X,5HCNB =,F12.7) VS 6710
233 FORMAT(/5X,5HCYP =,F12.7,2X,5HCLP =,F12.7,2X,5HCNP =,F12.7) VS 6711
234 FORMAT(/5X,5HCYR =,F12.7,2X,5HCLR =,F12.7,2X,5HCNR =,F12.7) VS 6712
WRITE(JPT,235) VS 6713
235 FORMAT(/2X,51H***STABILITY DERIVATIVES BASED ON STABILITY AXES***VS 6714

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1)	CYBR=CY	VS 6715
	CLBB=CLB*COA+CNB*SINA	VS 6716
	CNBB=CNB*COA-CLR*SINA	VS 6717
	CYPP=CYP*COA+CYR*SINA	VS 6718
	CLPP=CLP*COA*COA+(CLRR+CNP)*COA*SINA+CNR*SINA*SINA	VS 6719
	CNPP=CNP*COA*COA+(CNR-CLP)*COA*SINA-CLRR*SINA*SINA	VS 6720
	CYRR=CYP*COA-CYP*SINA	VS 6721
	CLRL=CLRR*COA*COA+(CNR-CLP)*SINA*COA-CNP*SINA*SINA	VS 6722
	CNRR=CNR*COA*COA-(CLRR+CNP)*SINA*COA+CLP*SINA*SINA	VS 6723
	WRITE(JPT,232) CYBB,CLBB,CNBR	VS 6724
	WRITE(JPT,233) CYPP,CLPP,CNPP	VS 6725
	WRITE(JPT,234) CYRR,CLPL,CNRR	VS 6726
	IF(KA.EQ.1) WRITE(JPT,8)	VS 6727
	IF(KA.EQ.1) WRITE(JPT,242)	VS 6728
	IF(KA.EQ.1) WRITE(JPT,8)	VS 6729
238	FORMAT(/5X,4RH**INCLUDING THE EFFECT OF LE AND SE VORTEX LIFT*)	VS 6730
237	FORMAT(/5X,40H**INCLUDING THE EFFECT OF LE VORTEX LIFT*)	VS 6731
	IF(KA.GT.2) GO TO 45	VS 6732
	KA=KA+1	VS 6733
	IF(KA.EQ.2) GO TO 236	VS 6734
	CY=CYRVSE	VS 6735
	CNB=CNBVSE	VS 6736
	CLB=CLBVSE	VS 6737
	CYP=CYPVSE	VS 6738
	CLP=CLPVSE	VS 6739
	CNP=CNPVSE	VS 6740
	CYR=CYRVSE	VS 6741
	CLRR=CLRVSE	VS 6742
	CNR=CNRVSE	VS 6743
	GO TO 239	VS 6744
236	CY=CYRV	VS 6745
	CNB=CNBV	VS 6746
	CLB=CLBV	VS 6747
	CYP=CYPV	VS 6748
	CLP=CLPV	VS 6749
	CNP=CNPV	VS 6750
	CYR=CYRV	VS 6751
	CLRR=CLRRV	VS 6752
	CNR=CNRV	VS 6753
	GO TO 239	VS 6754
46	FORMAT(/2X,59H THE LATERAL CONTROL PARAMETERS DUE TO AILERON DEFLECTION OF FB.3,2X,4H DEG.,2X,6HAT M =,FB.3)	VS 6755
1364	FORMAT(/5X,34H BASED ON STABILITY AXES, AND B/2 =,F10.5)	VS 6756
45	CONTINUE	VS 6757
	WRITE(JPT,337) HW,HALFB(1)	VS 6758
337	FORMAT(/164H THE FOLLOWING BENDING MOMENT COEFFICIENT IS BASED ON 10*S*(B/2),/15X,9H WHERE S =,F10.5,2X,9H AND B/2 =,F10.5)	VS 6759
	WRITE(JPT,359)	VS 6760
		VS 6761
		VS 6762
		VS 6763

359	FORMAT(10X,34H(FOP ATTACHED POTENTIAL FLOW ONLY))	VS	6764
	WRITE (JPT,338)	VS	6765
338	FORMAT (/9X,3HY/S,11X,9HBM(RIGHT),6X,8HBM(LEFT))	VS	6766
340	FORMAT(/4X,66HTHE FOLLOWING ARE THE TAIL CHARACTERISTICS BASED ON	VS	6767
	1 WING GEOMETRY, /10X,9HWHERE S =,F10.5,2X,9HAND B/2 =,F10.5)	VS	6768
351	FORMAT(/4X,68HTHE FOLLOWING ARE THE WINGLET CHARACTERISTICS BASED	VS	6769
	1 ON WING GEOMETRY, /10X,9HWHERE S =,F10.5,2X,9HAND B/2 =,F10.5)	VS	6770
	KCH=1	VS	6771
	DO 1396 K=1,NSUR	VS	6772
	HAR=HALFB(K)	VS	6773
	KA=NS(K)	VS	6774
	IF(K.GT.1) KA=KA-NS(K-1)	VS	6775
	IF(K.EQ.2) WRITE(JPT,340) HW,HAB	VS	6776
	IF(K.GT.1) WRITE(JPT,1213)	VS	6777
	KB=K-1	VS	6778
	IF(K.GT.1) WRITE(JPT,1397) KB	VS	6779
	IF(K.GT.1) WRITE(JPT,1213)	VS	6780
	DO 339 I=1,KA	VS	6781
	JWING=IWING(K)	VS	6782
	IF (IWGLT(K).EQ.0) GO TO 350	VS	6783
	IF (I .EQ. (JWING+1)) WRITE (JPT,351) HW,HALFR(1)	VS	6784
350	CONTINUE	VS	6785
	IF (IWING(K).NE.0.AND.I.GT.IWING(K)) HAR=HALFRH(K)	VS	6786
	IF (I.GT.IWING(K).AND.IWGLT(K).EQ.2) HAR=HALFR(K)	VS	6787
	YE=YLE(KCH)/HAR	VS	6788
	KCH=KCH+1	VS	6789
	IF(I.NE.KA) GO TO 339	VS	6790
	IF(NW(K,2).EQ.0) GO TO 339	VS	6791
	IF(K.EQ.1) KCH=KCH+NS(K)	VS	6792
	IF(K.GT.1) KCH=KCH+NS(K)-NS(K-1)	VS	6793
339	WRITE(JPT,32) YF,BMR(K,I),BML(K,I)	VS	6794
	WRITE (JPT,1213)	VS	6795
1213	FORMAT (1H0)	VS	6796
	IF(K.EQ.1) WRITE(JPT,1210) CBMP(K),CBML(K)	VS	6797
1210	FORMAT(69H THE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAN VS	VS	6798
	1 AND WING AREA, /15X,18HAT THE WING ROOT =,F10.6,2X,8H(RIGHT),,2X, VS	VS	6799
	21H=,F10.6,2X,6H(LEFT))	VS	6800
	WRITE (JPT,1213)	VS	6801
	IF(K.GT.1) WRITE(JPT,1411) CBMR(K),CBML(K)	VS	6802
	IF(IWING(K).NE.0.AND.IWGLT(K).NE.1) WRITE(JPT,1211)CBTR(K),CBTL(K)VS	VS	6803
1211	FORMAT(68H THE BENDING MOMENT COEFFICIENT BASED ON FIN HALF SPAN VS	VS	6804
	1 ND WING AREA, /15X,17HAT THE FIN ROOT =,F10.6,2X,8H(RIGHT),,2X,1H=VS	VS	6805
	2,F10.6,2X,6H(LEFT))	VS	6806
	IF(IWGLT(K).EQ.1) WRITE(JPT,1214) CBTR(K),CBTL(K)	VS	6807
1214	FORMAT(2X,68HTHE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAVS	VS	6808
	1 N AND WING AREA/10X,21HAT THE WINGLET ROOT =,F10.6,2X,8H(RIGHT),, VS	VS	6809
	22X,1H=,F10.6,2X,6H(LEFT))	VS	6810
1411	FORMAT(2X,68HTHE BENDING MOMENT COEFFICIENT BASED ON WING HALF SPAVS	VS	6811
	1 N AND WING AREA/10X,18HAT THE TAIL ROOT =,F10.6,2X,PH(RIGHT),,2X. VS	VS	6812

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	21H=, F10.6, 2X, 6H(LEFT))	VS	6813
1396	CONTINUE	VS	6814
93	CONTINUE	VS	6815
	ALPII=ALP	VS	6816
	CLII=CLTOT	VS	6817
	ALP=ALO+ALPING	VS	6818
	IF(KALP.LT.2.AND.KI.LT.NALP) ALP=ALPA(KI+1)	VS	6819
	ALO=ALP	VS	6820
	ALZ=ALO*180./PI	VS	6821
	LAT=LATT	VS	6822
	RETURN	VS	6823
	END	VS	6824
C	FORTRAN NLSTIN	VS	6825
	SUBROUTINE CPFUS(NT,N,B,CPF,NF,S,XLEF,XF,XAS,LPANEL,LPANI,NKF,NW,	VS	6826
	1BB,AM,SS,CS,SNP,FO,F10,WARD,IVING,CREF,L,NC1,YK,DC,DS,IV,LPN,NS,	VS	6827
	2NGRD,HEIGHT,ATT,IWGLT,NC,BREAK)	VS	6828
C	CALCULATE PRESSURE COEFF. ON FUSELAGE	VS	6829
	DIMENSION B(1),XF(1),PF(20),SNP(5,20),WARD(1),NKF(1),XAS(1)	VS	6830
	DIMENSION CPF(10,20),U(R),V(R),LPANI(1),NW(6,1)	VS	6831
	DIMENSION IIVING(1),YK(6,1),DC(6,1),DS(6,1),IV(1),LPN(1),NS(1)	VS	6832
	DIMENSION IWGLT(1),NC(1),BREAK(6,1)	VS	6833
36	FORMAT (8(6X,I4))	VS	6834
	PI=3.14159265	VS	6835
	PI4=4.*PI	VS	6836
	FNT=NF	VS	6837
	XTEF=XLEF+S	VS	6838
	NF1=NF-1	VS	6839
	TH1=SNP(5,20)	VS	6840
	NH1=SNP(5,19)	VS	6841
	NZ=1	VS	6842
	IF (L .NE. 0) NZ=2	VS	6843
	FL=0.	VS	6844
	FL1=0.	VS	6845
	FNK=NKF(1)	VS	6846
	SL=XAS(2)-XAS(1)	VS	6847
	MM=NKF(1)	VS	6848
	ND=1	VS	6849
	NN=0	VS	6850
	DO 15 I=1,NF	VS	6851
	II=I+LPANEL	VS	6852
	IP=I-NN	VS	6853
	XC=XF(I)	VS	6854
	RF(I)=FUR(XC)	VS	6855
	FL1=FL1+8(II)*SNP(ND,IP)*SL/FNK	VS	6856
	FL=FL+WARD(I)*SNP(ND,IP)*SL/FNK	VS	6857
	IF (I .LT. MM .OR. I .EQ. NF) GO TO 15	VS	6858
	ND=ND+1	VS	6859
	NN=MM	VS	6860
	MM=MM+NKF(ND)	VS	6861

SL=XAS(ND+1)-XAS(ND)	VS 6862
FNK=NKF(ND)	VS 6863
15 CONTINUE	VS 6864
FL=F0+0.5*PI*FL	VS 6865
FL1=F10+0.5*PI*FL1	VS 6866
DO 1 I=1,NF	VS 6867
A1=XF(I)-XTEF	VS 6868
A2=SQRT(A1*A1+BB*RF(I)*RF(I))	VS 6869
XP=XF(I)-XLEF	VS 6870
A6=SQRT(XP*XP+BB*RF(I)*RF(I))	VS 6871
RFTL=-((A1+A2)/RF(I))	VS 6872
RFT0=-((XP+A6)/RF(I))	VS 6873
J=0	VS 6874
IF (L .NE. 0) J=1	VS 6875
2 CONTINUE	VS 6876
II=I+NF*(J-1)+LPANEL	VS 6877
FNK=NKF(1)	VS 6878
SL=XAS(2)-XAS(1)	VS 6879
MM=NKF(1)	VS 6880
ND=1	VS 6881
NN=0	VS 6882
FJ=J	VS 6883
U(J+1)=0.	VS 6884
V(J+1)=0.	VS 6885
IF (J .GT. 2 .AND. I .EQ. NF) GO TO 20	VS 6886
RFL=-((A1+A2)/RF(I))*J/A2	VS 6887
RFO=-((XP+A6)/RF(I))*J/A6	VS 6888
IF (J .LT. 2) GO TO 16	VS 6889
RFTL=0.	VS 6890
RFT0=0.	VS 6891
16 CONTINUE	VS 6892
DO 10 KC=1,NF	VS 6893
IP=KC-NN	VS 6894
B1=XF(I)-XF(KC)	VS 6895
B2=SQRT(B1*B1+BB*RF(I)*RF(I))	VS 6896
RFX=-((B1+B2)/RF(I))*J/R2	VS 6897
KK=KC+NF*(J-1)+LPANEL	VS 6898
IF (J.EQ. 0) GO TO 12	VS 6899
U(J+1)=U(J+1)-(B(KK)-B(II))*RFX*SNP(ND,IP)*SL/FNK	VS 6900
IF (J .EQ. 0) GO TO 11	VS 6901
RFTX=-((B1+B2)/RF(I))*J/FJ	VS 6902
V(J+1)=V(J+1)+B(KK)*SNP(ND,IP)*(RFTX-RFTL)*SL/FNK	VS 6903
GO TO 11	VS 6904
12 U(J+1)=U(J+1)-(WARD(KC)-WARD(I))*PFX*SNP(ND,IP)*SL/FNK	VS 6905
11 IF (KC .LT. MM .OR. KC .EQ. NF) GO TO 10	VS 6906
ND=ND+1	VS 6907
NN=MM	VS 6908
MM=MM+NKF(ND)	VS 6909
SL=XAS(ND+1)-XAS(ND)	VS 6910

FNK=NKF(ND)	VS 6911
10 CONTINUE	VS 6912
IF (J .EQ. 1) V(J+1)=(-V(J+1)*0.5*PI+(RFTL-RFT0)*F10)/(4.*PI)	VS 6913
IF(J.GT.1) V(J+1)=-V(J+1)*0.125	VS 6914
IF(J.EQ.0) U(J+1)=-((FL*RFL-F0*RFO+U(J+1)*0.5*PI-WARD(I)*ALOC((A1	VS 6915
1+A2)/(XP+A6)))/PI4	VS 6916
IF (J .EQ. 1) U(J+1)=-((FL1*RFL-F10*RFO+U(J+1)*0.5*PI+B(II)/FJ*(RFLV	VS 6917
1*A2-RFO*A6)))/(4.*PI)	VS 6918
IF (J .GT. 1) U(J+1)=-((U(J+1)*0.5*PI+B(II)/FJ*(RFL*A2-RFO*A6)))/(4.	VS 6919
1*PI)	VS 6920
V(J+1)=V(J+1)/RF(I)	VS 6921
20 CONTINUE	VS 6922
J=J+1	VS 6923
IF (J .LE. N) GO TO 2	VS 6924
N1=2	VS 6925
IF (L .NE. 0) N1=N+1	VS 6926
DO 25 K=1,NT	VS 6927
IF (NH1 .NE. 0 .AND. K .LE. NH1) GO TO 45	VS 6928
FK=K-NH1	VS 6929
FT=NT-NH1	VS 6930
PP=PI-TH1	VS 6931
TP=TH1	VS 6932
GO TO 46	VS 6933
45 FK=K	VS 6934
FT=NH1	VS 6935
PP=TH1	VS 6936
TP=0.	VS 6937
46 CONTINUE	VS 6938
THETA=(2.*FK-1.)*PP/(2.*FT)+TP	VS 6939
SINTA=SIN(THETA)	VS 6940
COSTA=COS(THETA)	VS 6941
PHIX=0.	VS 6942
PHIT=0.	VS 6943
DO 30 J=NZ,N1	VS 6944
FJ=J	VS 6945
IF (L .LE. 1) PHIX=PHIX+U(J)*COS((FJ-1.)*THETA)	VS 6946
IF (L .GT. 1) PHIX=PHIX+U(J)*SIN((FJ-1.)*THETA)	VS 6947
IF (L .LE. 1) PHIT=PHIT+V(J)*(FJ-1.)*SIN((FJ-1.)*THETA)	VS 6948
30 IF (L .GT. 1) PHIT=PHIT-V(J)*(FJ-1.)*COS((FJ-1.)*THETA)	VS 6949
X=XF(I)	VS 6950
Y=RF(I)*SINTA	VS 6951
Z=RF(I)*COSTA	VS 6952
CALL UTFW(X,Y,Z,SINTA,COSTA,L,PANEL,BB,LPAN1,NW,B,VX,VT,IWING,L,NC1VS	VS 6953
1,YK,DC,DS,IV,LPN,NS,NGRD,HEIGHT,ATT,IWGLT,NC,BREAK)	VS 6954
PHIX=PHIX+VX	VS 6955
PHIT=PHIT+VT	VS 6956
IF (L .NE. 0) GO TO 40	VS 6957
DRX=SLOP(X)	VS 6958
DRX=DRX/RF(I)	VS 6959

	SPX=1./SQRT(1.+DPX*DPX)	VS 6960
	DRX=(CS+U(1))*DRX*SRX	VS 6961
	UVEL=CS+PHIX	VS 6962
	VDL=DRX**2+(-SS*SINTA+PHIT)**2	VS 6963
	VOIF=1.-UVEL**2-VDL	VS 6964
35	FORMAT (8F10.5)	VS 6965
	GO TO 41	VS 6966
40	CONTINUE	VS 6967
	VDIF=-2.*PHIX	VS 6968
41	CONTINUE	VS 6969
	IF (AM .LE. 0.1) GO TO 26	VS 6970
	IF (L .NE. 0) GO TO 26	VS 6971
	AC=1.+0.2*AM*AM*VDIF	VS 6972
	IF (AC .LT. 0.) GO TO 34	VS 6973
	CPF(K,I)=2./(1.4*AM*AM)*(AC**3.5-1.)	VS 6974
	GO TO 25	VS 6975
34	CPF(K,I)=VDIF+AM*AM*PHIX*PHIX+AM*AM*PHIX*VDL+AM*AM*0.25*VDL*VDL	VS 6976
	GO TO 25	VS 6977
26	CPF(K,I)=VDIF	VS 6978
25	CONTINUE	VS 6979
1	CONTINUE	VS 6980
	RETURN	VS 6981
	END	VS 6982
C	FORTRAN NLSTIN	VS 6983
	SUBROUTINE UTFW(X,Y,Z,SF,CF,LPADEL,R1,LPA1,NW,GAMMA,VX,VT,IWING,LVS	VS 6984
1	,NC1,YK,DC,DS,IV,LPN,NS,NGRD,HEIGHT,ATT,IWGLT,NC,BREAK)	VS 6985
C	TO CALCULATE VELOCITIES ON FUSELAGE DUE TO WINGS	VS 6986
	DIMENSION W(2),NW(6,1),GAMMA(1),U(2),IWGLT(1),NC(1)	VS 6987
	DIMENSION LPA1(1),YK(6,1),DC(6,1),DS(6,1),IV(1),LPN(1),NS(1)	VS 6988
	DIMENSION IWING(1),BREAK(6,1)	VS 6989
	COMMON /GDM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLF(100),YLE(100),VS	VS 6990
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	VS 6991
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFR(6),SJ(6,31,5)VS	VS 6992
	PI=3.14159265	VS 6993
	IP=1	VS 6994
	IZ=1	VS 6995
	IFF=1	VS 6996
	ISN=1	VS 6997
	K=1	VS 6998
	LG=1	VS 6999
	IF (NGRD .EQ. 1) LG=2	VS 7000
	NASYM=YCON(50)	VS 7001
	IW=1	VS 7002
	MP=NW(K,1)	VS 7003
	NN=NW(K,1)	VS 7004
	FACTOR=1.	VS 7005
	IF (L .GE. 2) FACTOR=-1.	VS 7006
	VX=0.	VS 7007
	VT=0.	VS 7008

ZA=0.	VS 7009
YA=BREAK(1,1)	VS 7010
YAA=BREAK(1,1)	VS 7011
IF (NASYM .EQ. 0) GO TO 73	VS 7012
YA=YK(1,NC1)	VS 7013
YAA=YA	VS 7014
IF (NC1 .EQ. 1) GO TO 73	VS 7015
NC11=NC1-1	VS 7016
DO 74 J=1,NC11	VS 7017
ZA=ZA+(YK(K,J)-YK(K,J+1))*DS(K,J+1)	VS 7018
74 YAA=YAA+(YK(K,J)-YK(K,J+1))*DC(K,J+1)	VS 7019
YA=YK(K,1)	VS 7020
73 CONTINUE	VS 7021
YAP=YA	VS 7022
YAAP=YAA	VS 7023
IPN=1	VS 7024
DO 10 J=1,LPANEL	VS 7025
ISN=1	VS 7026
MI=J-IPN+1	VS 7027
COSD=DC(K,IPN)	VS 7028
SIND=DS(K,IPN)	VS 7029
IF (J.GT.LPANEL(K).AND.J.LE.LPN(K)) ISN=2	VS 7030
IF (J.EQ.LPN(K).AND.J.LT.LPANEL) NN=NW(K+1,1)	VS 7031
IF (J .GE. LPANEL(K) .AND. J .LT. LPN(K)) NN=NW(K,2)	VS 7032
FN=NN	VS 7033
CHORD=CH(IZ)	VS 7034
X1=XN(J,1)-X	VS 7035
X2=XN(J,2)-X	VS 7036
X12=XN(J,2)-XN(J,1)	VS 7037
Y12=YN(J,2)-YN(J,1)	VS 7038
ISM=2	VS 7039
IF (IV(K) .EQ. 1) ISM=1	VS 7040
IF (NASYM .EQ. 1) ISM=1	VS 7041
DO 16 II=1,ISM	VS 7042
FCP=1.	VS 7043
IF (II .EQ. 2) FCP=-1.	VS 7044
W(II)=0.	VS 7045
U(II)=0.	VS 7046
DO 16 KK=1,LG	VS 7047
Z12=ZN(J,2)-ZN(J,1)+Y12*SIND	VS 7048
Y12=Y12*COSD	VS 7049
YC=Y*FCP	VS 7050
Y1=YAA+(YN(J,1)-YA)*COSD-YC	VS 7051
Y2=YAA+(YN(J,2)-YA)*COSD-YC	VS 7052
IF(KK .EQ. 1) GO TO 18	VS 7053
ZC=-2.*(7+HEIGHT)+7	VS 7054
GE=-1.	VS 7055
FCON=1.	VS 7056
GO TO 19	VS 7057

18	ZC=Z	VS	7058
	GE=1.	VS	7059
	FCON=0.	VS	7060
19	CONTINUE	VS	7061
	Z1=7N(J,1)-ZC+ZA+(YN(J,1)-YA)*SIND	VS	7062
	Z2=7N(J,2)-ZC+ZA+(YN(J,2)-YA)*SIND	VS	7063
	UCOM=-Z1*Y12*(-ATT)*FCON	VS	7064
	XZJ=X1*Z12-Z1*X12	VS	7065
	XYK=X1*Y12-Y1*X12	VS	7066
	YZI=Y1*Z12-Z1*Y12	VS	7067
	ALR1=XYK*XYK+XZJ*XZJ+B1*Y7I*Y7I	VS	7068
	R1B1=SQRT(X1*X1+B1*Y1*Y1+B1*Z1*Z1)	VS	7069
	R2B1=SQRT(X2*X2+B1*Y2*Y2+B1*Z2*Z2)	VS	7070
	UUB1=(X2*X12+B1*Y2*Y12+B1*Z2*Z12)/R2B1-(X1*X12+B1*Y1*Y12+R1*Z1*Z12	VS	7071
	1)/R1B1	VS	7072
	IF (IP .EQ. 1) GO TO 35	VS	7073
37	CONTINUE	VS	7074
	G1B1=(1.-X1/R1B1)/(Y1*Y1+Z1*Z1)	VS	7075
	GO TO 36	VS	7076
35	IF (L.GE.2.AND.IV(K).EQ.0) GO TO 37	VS	7077
	G1A1=0.	VS	7078
36	CONTINUE	VS	7079
	G2B1=(1.-X2/R2B1)/(Y2*Y2+Z2*Z2)	VS	7080
	F12=UUB1*(UCOM+XYK)/ALR1*GE	VS	7081
	G12=(-Y2*G2B1+Y1*G1B1)*GE	VS	7082
	F13=-UUR1*XZJ/ALB1	VS	7083
	G13=Z2*G2B1-Z1*G1B1	VS	7084
	F1=F13*CF*FCP-F12*SF	VS	7085
	F2=G13*CF*FCP-G12*SF	VS	7086
	F3=UUB1*Y7I/ALB1	VS	7087
	U(II)=U(II)+F3*CHORD*SN(K,MI,ISN)*CAMMA(J)/(R.*FN)	VS	7088
16	W(II)=W(II)+(F1+F2)*CHORD*SN(K,MI,ISN)*GAMMA(J)/(R.*FN)	VS	7089
	VT=W(1)+FACTOR*W(2)+VT	VS	7090
	VX=U(1)+FACTOR*U(2)+VX	VS	7091
	IF (J .LT. MM) GO TO 17	VS	7092
	IF (J .EQ. LPANEL) GO TO 10	VS	7093
	IP=IP+1	VS	7094
	IZ=IZ+1	VS	7095
	IW=IW+1	VS	7096
	IFF=MM+1	VS	7097
	MM=MM+NN	VS	7098
	IF(IWING(K).NE.0 .AND.IW.EQ.(IWING(K)+1)) GO TO 14	VS	7099
	IF(J.EQ.LPAN1(K).OR.J.EQ.LPN(K)) GO TO 32	VS	7100
	IF(YLE(IZ).LT.YK(K,IPN)) GO TO 17	VS	7101
14	CONTINUE	VS	7102
	NJ=0	VS	7103
	IF(NASYM.EQ.1.AND.IPN.LT.NC1) NJ=1	VS	7104
	IF(NJ.EQ.1) IPN=IPN+1	VS	7105
	ZA=ZA+(YK(K,IPN)-YA)*DS(K,IPN)	VS	7106

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	YAA=YAA+(YK(K,IPN)-YA)*DC(K,IPN)	VS 7107
	YA=YK(K,IPN)	VS 7108
	IF (IWING(K).NE.0.AND.IW.EQ.(IWING(K)+1)) GO TO 22	VS 7109
	GO TO 23	VS 7110
22	IF (IWGLT(K).EQ.1) GO TO 23	VS 7111
32	ZA=0.	VS 7112
	YA=BREAK(K,1)	VS 7113
	YAA=BREAK(K,1)	VS 7114
	IF(NASYM.EQ.1.AND.J.EQ.LPAN1(K)) YA=YAP	VS 7115
	IF(NASYM.EQ.1.AND.J.EQ.LPAN1(K)) YAA=YAAP	VS 7116
	IF(J.EQ.LPN(K).AND.K.LT.6) YA=BREAK(K+1,1)	VS 7117
	IF(J.EQ.LPN(K).AND.K.LT.6) YAA=BREAK(K+1,1)	VS 7118
	IF(J.EQ.LPAN1(K).OR.J.EQ.LPN(K)) GO TO 23	VS 7119
	IF (IWGLT(K).NE.2) GO TO 23	VS 7120
	ZA=YK(K,NC(K)-2)*DS(K,1)	VS 7121
	YAA=YK(K,NC(K)-2)*DC(K,1)	VS 7122
	YA=YK(K,NC(K)-2)	VS 7123
23	CONTINUE	VS 7124
	IF(NJ.NE.1) IPN=IPN+1	VS 7125
	IF (J.EQ.LPAN1(K).OR.J.EQ.LPN(K)) IPN=1	VS 7126
17	KH=0	VS 7127
	IF(J.FO.LPAN1(K).AND.J.NE.LPN(K)) KH=1	VS 7128
	IF(KH.EQ.1.AND.K.EQ.1) IW=IW-NS(K)	VS 7129
	IF(KH.EQ.1.AND.K.GT.1) IW=IW-NS(K)+NS(K-1)	VS 7130
	IF(J.EQ.LPAN1(K)) IP=1	VS 7131
	IF(J.EQ.LPN(K)) IP=1	VS 7132
10	IF (J .EQ. LPN(K)) K=K+1	VS 7133
	RETURN	VS 7134
	END	VS 7135
C	FORTRAN NLSTIN	VS 7136
	SUBROUTINE FUSLFT(CPF,HALFSW,CREF,SS,CS,L,XREF,CLLF,SPH,CDL)	VS 7137
C	TO CALCULATE FUSELAGE FORCES AND MOMENTS	VS 7138
	DIMENSION AW(21),CST(15),CTL(20),RP(20),CPF(10,20),CA(20)	VS 7139
	DIMENSION RW(21),CB(20)	VS 7140
	COMMON /FUS/ XF(20),XCF(20),RF(20),SNP(5,20),XLEF,XTEF,WARD(20),	VS 7141
	INCUM,NF,NT,CSF(5,10),YAS(6),NKF(5),FO,F10,KF,NTL,LWF,WKN,RDX,X1	VS 7142
	COMMON /INOUT/ INPT,JPT	VS 7143
	DATA CST /15*0./	VS 7144
	PI=3.14159265	VS 7145
	SLENTH=XTEF-XLEF	VS 7146
	TH1=SNP(5,20)	VS 7147
	NH1=SNP(5,19)	VS 7148
	DO 1 I=1,NF	VS 7149
	XC=XF(I)	VS 7150
1	RP(I)=FUR(XC)	VS 7151
	FCUM=NCUM	VS 7152
	IF (L .NF. 0) GO TO 40	VS 7153
	WRITE (JPT,15)	VS 7154
15	FORMAT(//1X,58H***FUSELAGE AERODYNAMIC CHARACTERISTICS ARE GIVEN BVS	VS 7155

1	ELOW***)	VS	7156
	WRITE (JPT,21)	VS	7157
21	FORMAT (/5X,65HPRESSURE DISTRIBUTION AT THETA-LOCATIONS IN DEGREES	VS	7158
1	DEFINED BELOW)	VS	7159
	DO 22 I=1,NCUM	VS	7160
	IF (NH1 .NE. 0 .AND. I .LE. NH1) GO TO 70	VS	7161
	FI=I-NH1	VS	7162
	FCUM=NCUM-NH1	VS	7163
	PP=(PI-TH1)*180./PI	VS	7164
	TP=TH1*180./PI	VS	7165
	GO TO 71	VS	7166
70	FI=I	VS	7167
	FCUM=NH1	VS	7168
	PP=TH1*180./PI	VS	7169
	TP=0.	VS	7170
71	CONTINUE	VS	7171
22	AW(I)=(2.*FI-1.)*PP/(2.*FCUM)+TP	VS	7172
	WRITE (JPT,23) (I,AW(I),I=1,NCUM)	VS	7173
23	FORMAT (/ 5(3X,5HTHETA,I2,1H=,F5.1))	VS	7174
	WRITE (JPT,24) (I,I=1,NCUM)	VS	7175
24	FORMAT (/5X,3HX/L,9X,5HTHETA,I2,9(5X,5HTHETA,I2))	VS	7176
	DO 11 I=1,NF	VS	7177
	XC=(XF(I)-XREF)/SLENTH	VS	7178
11	WRITE (JPT,26)XC , (CPF(K,I),K=1,NCUM)	VS	7179
26	FORMAT (11F12.5)	VS	7180
40	CONTINUE	VS	7181
	CNF=0.	VS	7182
	CAF=0.	VS	7183
	CMF=0.	VS	7184
	DO 7 I=1,NCUM	VS	7185
	IF (NH1 .NE. 0 .AND. I .LE. NH1) GO TO 72	VS	7186
	FI=I-NH1	VS	7187
	FCUM=NCUM-NH1	VS	7188
	PP=PI-TH1	VS	7189
	TP=TH1	VS	7190
	GO TO 73	VS	7191
72	FI=I	VS	7192
	FCUM=NH1	VS	7193
	PP=TH1	VS	7194
	TP=0.	VS	7195
73	CONTINUE	VS	7196
	THETA=(2.*FI-1.)*PP/(2.*FCUM)+TP	VS	7197
	IF (L .GE. 2) CST(I)=SIN(THETA)	VS	7198
7	IF (L .LT. 2) CST(I)=COS(THETA)	VS	7199
	SL=XAS(2)-XAS(1)	VS	7200
	FNK=NKF(1)	VS	7201
	MM=NKF(1)	VS	7202
	NC=1	VS	7203
	NN=0	VS	7204

DO 20 I=1,NF	VS 7205
CPTL=0.	VS 7206
CPTD=0.	VS 7207
IP=I-NN	VS 7208
DO 25 K=1,NCUM	VS 7209
IF (NH1 .NE. 0 .AND. K .LE. NH1) GO TO 74	VS 7210
FCUM=NCUM-NH1	VS 7211
PP=PI-TH1	VS 7212
GO TO 75	VS 7213
74 FCUM=NH1	VS 7214
PP=TH1	VS 7215
75 CONTINUE	VS 7216
CPTD=CPTD+CPF(K,I)*PP/FCUM	VS 7217
25 CPTL=CPTL+CPF(K,I)*CST(K)*PP/FCUM	VS 7218
CTL(I)=-2.*CPTL	VS 7219
IF (I.EQ.NF.AND.ABS(CTL(I)).GT.ABS(CTL(I-1))) CTL(I)=0.5*CTL(I-1)	VS 7220
CPTD=2.*CPTD	VS 7221
GD=RP(I)*SNP(NC,IP)*CPTD*SL/(2.*FNK)	VS 7222
GB=RP(I)*SNP(NC,IP)*CTL(I)*SL/(2.*FNK)	VS 7223
CA(I)=GB*FNK/SL	VS 7224
X=YF(I)	VS 7225
S=SLENTH	VS 7226
DRX=SLOP(X)/RP(I)	VS 7227
SO=SQRT(1.+DRX*DRX)	VS 7228
CA(I)=CA(I)/SO	VS 7229
CB(I)=GD*FNK/(SL*SO)*DRX	VS 7230
CAF=CAF+GD*DRX/SO	VS 7231
CNF=CNF+GB/SO	VS 7232
CNF=CNF+GB*(XF(I)-XREF)/SO	VS 7233
IF (I .LT. MM .OR. I .EQ. NF) GO TO 20	VS 7234
NC=NC+1	VS 7235
NN=MM	VS 7236
MM=MM+NKF(NC)	VS 7237
SL=XAS(NC+1)-XAS(NC)	VS 7238
FNK=NKF(NC)	VS 7239
20 CONTINUE	VS 7240
ICK=0	VS 7241
IF (ABS((XAS(2)-XTEF)/SLENTH) .GT. 0.01) GO TO 54	VS 7242
ICK=1	VS 7243
FNF=NF	VS 7244
NF1=NF+1	VS 7245
DO 51 J=1,NF1	VS 7246
AW(J)=0.	VS 7247
BW(J)=0.	VS 7248
FJ=J	VS 7249
DO 52 K=1,NF	VS 7250
FK=K	VS 7251
CK=COS((FJ-1.)*(2.*FK-1.)*PI/(2.*FNF))	VS 7252
BW(J)=BW(J)+CB(K)*CK	VS 7253

		VS	7254
	52 AW(J)=AW(J)+CA(K)*CK	VS	7255
	IF (J .EQ. 1) AW(J)=AW(J)/FNF	VS	7256
	IF (J .NE. 1) AW(J)=AW(J)*2./FNF	VS	7257
	IF(J.EQ.1) BW(J)=BW(J)/FNF	VS	7258
	IF(J.NE.1) BW(J)=BW(J)*2./FNF	VS	7259
	51 CONTINUE	VS	7260
C		VS	7261
G	* EMPIRICAL METHOD TO FIND THE STATION AT WHICH THE FLOW CEASES TO	VS	7262
C	POTENTIAL. SEE DATCOM *	VS	7263
	XO=0.378+0.527*X1	VS	7264
	TH=ACOS(1.-2.*XO)	VS	7265
	SUM=AW(1)*TH	VS	7266
	SA=BW(1)*TH	VS	7267
	SMM=-AW(1)*SIN(TH)-0.5*AW(2)*(TH+0.5*SIN(2.*TH))	VS	7268
	DO 53 J=1,NF	VS	7269
	FJ=J	VS	7270
	IF (J.GE.2) SMM=SMM-0.5*AW(J+1)*(SIN((FJ-1.)*TH)/(FJ-1.)+SIN((FJ+1	VS	7271
	1.)*TH)/(FJ+1.))	VS	7272
	SK=SIN(FJ*TH)	VS	7273
	SA=SA+BW(J+1)*SK/FJ	VS	7274
	53 SUM=SUM+AW(J+1)*SK/FJ	VS	7275
	SMM=SMM+SUM	VS	7276
	SUM=SUM*SLENTH/(2.*HALFSW)	VS	7277
	SMM=-SMM*SLENTH**2/(4.*HALFSW*CREF)	VS	7278
	SMM=SMM-(XLEF-XREF)/CREF*SUM	VS	7279
	SA=SA*SLENTH/(2.*HALFSW)	VS	7280
	54 CONTINUE	VS	7281
	IF (L .NE. 0) GO TO 42	VS	7282
	WRITE (JPT,31)	VS	7283
	31 FORMAT (/5X,63HTOTAL PRESSURE LOADING AT EACH X-STATION, BASED ON	VS	7284
	1LOCAL RADIUS)	VS	7285
	WRITE (JPT,32)	VS	7286
	32 FORMAT (/5X,3HX/L,9X,6HRADIUS,6X,7HLOADING)	VS	7287
	DO 33 I=1,NF	VS	7288
	XC=YF(I)/SLENTH	VS	7289
	33 WRITE (JPT,26) XC,RP(I),CTL(I)	VS	7290
	42 CONTINUE	VS	7291
	CLF=CNF*CS-CAF*SS	VS	7292
	CDF=CNF*SS+CAF*CS	VS	7293
	CDF=CDF*PI/(2.*HALFSW)	VS	7294
	CLF=CLF*PI/(2.*HALFSW)	VS	7295
	CMF=-CMF*PI/(2.*HALFSW*CREF)	VS	7296
	CLLF=SUM*CS-SA*SS	VS	7297
	CDL=SUM*SS+SA*CS	VS	7298
	SS=CLF	VS	7299
	CS=CMF	VS	7300
	IF (ICK .EQ. 0) GO TO 60	VS	7301
	CLF=SUM	VS	7302
	SS=CLF		

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	CS=SMM	VS 7303
	IF(L.EQ.0) GO TO 60	VS 7304
	CLLF=SUM	VS 7305
60	CONTINUE	VS 7306
	IF (L .NE. 0) GO TO 43	VS 7307
	WRITE (JPT,36) CLF	VS 7308
	WRITE (JPT,35) CMF	VS 7309
	WRITE(JPT,37) CDF	VS 7310
	WRITE(JPT,38)	VS 7311
	WRITE(JPT,39) CLLF	VS 7312
	WRITE(JPT,44) SMM	VS 7313
	WRITE(JPT,37) CDL	VS 7314
43	CONTINUE	VS 7315
35	FORMAT(/5X,43HTHE FUSELAGE POTENTIAL MOMENT COEFFICIENT =,F10.5)	VS 7316
36	FORMAT (/5X,41HTHE FUSELAGE POTENTIAL LIFT COEFFICIENT =,F10.5)	VS 7317
37	FORMAT (/5X,39HTHE FUSELAGE INDUCED DRAG COEFFICIENT =,F10.5)	VS 7318
38	FORMAT(2X,/45HTHE FOLLOWING VALUES ARE OBTAINED BY IGNORING/46HTHE	VS 7319
	1 AFT VISCOSITY-DOMINATED REGION. SEE DATCOM)	VS 7320
39	FORMAT(/5X,31HTHE FUSELAGE LIFT COEFFICIENT =,F10.5)	VS 7321
44	FORMAT(/5X,33HTHE FUSELAGE MOMENT COEFFICIENT =,F10.5)	VS 7322
	RETURN	VS 7323
	END	VS 7324
C	FORTRAN NLSTIN	VS 7325
	SUBROUTINE CENTRD(NS,NSUR,NW,IWING,CB,HALFR,ALP,YLE,YN,SWEEP,CS	VS 7326
	1,ALPBD,LPN,BETA,AM,KB,YCMX,MX,MSTP,YRR,BRFK,YA,MVRTX,M1,NC,IAGVX,	VS 7327
	2SSJ,WIDTH,ICAM,GAS,ABD,NASYM,IV,NLEF,YD2,KF)	VS 7328
C	TO CALCULATE VORTEX BREAKDOWN ALPHAS	VS 7329
	COMMON /INOUT/ INPT,JPT	VS 7330
	DIMENSION BREAK(6,1),YA(1),MVRTX(1),M1(6,1),NC(1)	VS 7331
	DIMENSION LPN(1),YCMX(6,2),MX(1),MSTP(1),YRR(6,2)	VS 7332
	DIMENSION YN(200,2),CS(1),YLE(1),A(30),NW(6,1),C(50),T(50)	VS 7333
	DIMENSION SWEEP(1),NS(1),ALPBD(6,2),IWING(1),HALFB(1)	VS 7334
	DIMENSION SJ(6,31,5),WIDTH(6,5),SK(30),ICAM(1),GAS(1),GK(2,2)	VS 7335
	DIMENSION ARD(6,1),SL(30),IV(1),NLEF(1),YD2(6,1)	VS 7336
	PI=3.14159265	VS 7337
	SN2=SIN(ALP)**2	VS 7338
	GB=SIN(BETA)	VS 7339
	GB2=GB*GB	VS 7340
	BK=BETA	VS 7341
	NK=0	VS 7342
	N=1	VS 7343
	WRITE(JPT,68)	VS 7344
68	FORMAT(/5X,32HVORTEX-BREAKDOWN CHARACTERISTICS)	VS 7345
	DO 5 K=1,NSUR	VS 7346
	IG=1	VS 7347
	IF(MVRTX(K).NE.0) IG=2	VS 7348
	IPP=BREAK(K,IG+5)	VS 7349
	IE=IG	VS 7350

IF(K.EQ.1) NK=NK+MVRTX(K)	VS 7351
IF(K.GT.1.AND.MVRTX(K).NE.0) NK=NK+MVRTX(K)-NS(K-1)	VS 7352
IP=0	VS 7353
IF(K.GT.1) IP=NS(K-1)	VS 7354
M=NS(K)	VS 7355
IF(K.GT.1) M=NS(K)-NS(K-1)	VS 7356
IF(IWING(K).NE.0.AND.K.EC.1) M=IWING(K)	VS 7357
IF(IWING(K).NE.0.AND.K.GT.1) M=M+NS(K)+IWING(K)	VS 7358
M2=0	VS 7359
IR=M	VS 7360
IF(K.EQ.1) IP=M-MVRTX(K)	VS 7361
IF(K.GT.1.AND.MVRTX(K).NE.0) IP=M-MVRTX(K)+NS(K-1)	VS 7362
IF(NC(K).EQ.1) GO TO 4	VS 7363
IF(NC(K).EQ.2 .AND. MVRTX(K).NE.0) GO TO 4	VS 7364
IF(IPP.EQ.1) GO TO 1	VS 7365
K2 = M - 1	VS 7366
DO 6 I=1,K2	VS 7367
M2=M2+1	VS 7368
KH=I+NK	VS 7369
IF(ABS(SWEEP(KH)-SWEEP(KH+1)).GT.0.1) GO TO 7	VS 7370
6 CONTINUE	VS 7371
4 CONTINUE	VS 7372
MSTP(K)=0	VS 7373
M=IR	VS 7374
MX(K)=1	VS 7375
HREF=HALFB(K)-BREAK(K,IG)	VS 7376
YREF=BREAK(K,IG)	VS 7377
YA(K)=BREAK(K,IG)	VS 7378
GO TO 8	VS 7379
1 M2=M1(K,IG)-1	VS 7380
KH=NK+M2	VS 7381
7 MX(K)=2	VS 7382
M=M2	VS 7383
MSTP(K)=KH+1	VS 7384
IF=1	VS 7385
11 CONTINUE	VS 7386
IF(YLE(KH).GT.BREAK(Y,IF).AND.YLE(KH).LT.BREAK(K,IF+1)) GO TO 13	VS 7387
IF=IF+1	VS 7388
GO TO 11	VS 7389
13 HREF=BREAK(K,IF+1)-BREAK(Y,IG)	VS 7390
YREF=BREAK(K,IG)	VS 7391
YA(K)=BREAK(K,IF+1)	VS 7392
IF(NASYM.EQ.0) GO TO 8	VS 7393
IF(YREF.LT.0.) YREF=BREAK(K,IF+1)	VS 7394
IF(YA(K).LT.0.) YA(K)=-BREAK(K,IG)	VS 7395
IF(YA(K).LT.0.) YA(K)=-BREAK(K,IF)	VS 7396
8 CONTINUE	VS 7397
MI=MVRTX(K)	VS 7398
IF(K.GT.1.AND.MVRTX(K).NE.0) MI=MVRTX(K)-NS(K-1)	VS 7399
NI=N+MI+NV(K,1)	VS 7400

	IF(NASYM.EQ.1) NI=(M-1)*NW(K,1)-MI*NW(K,1)+N	VS 7401
	N=NI	VS 7402
C	WRITE(JPT,3) N,NK,IR	VS 7403
	IF(KB.EQ.0) YD2(K,1)=IE	VS 7404
	MII=MI	VS 7405
	IXY=1	VS 7406
	ICLK=0	VS 7407
	IF(ICAM(K).NE.0.OR.NLEF(K).EQ.1) ICHK=1	VS 7408
	IF(ICLK.EQ.1) IXY=2	VS 7409
	IF(KB.NE.0) IXY=1	VS 7410
	IE=IG	VS 7411
	KHH=KH	VS 7412
	MN=M	VS 7413
	NKK=NK	VS 7414
	IEE=IE	VS 7415
	YRFF=YREF	VS 7416
	HRFF=HREF	VS 7417
	DO 21 KJ=1,IXY	VS 7418
	IF(KJ.EQ.1) NX=N	VS 7419
	IF(KJ.EQ.2) N=NX	VS 7420
	IF(KJ.EQ.1) GO TO 33	VS 7421
	NK=NKK	VS 7422
	IE=IEE	VS 7423
	KH=KHH	VS 7424
	M=MN	VS 7425
	MI=MIJ	VS 7426
	YRFF=YRFF	VS 7427
	HRFF=HRFF	VS 7428
33	CONTINUE	VS 7429
	WRITE(JPT,40) K	VS 7430
60	FORMAT(/2Y,21H***FOR SURFACE NUMBER, I3,2Y,3P***)	VS 7431
	IF(KJ.EQ.1.AND.IXY.EQ.2) WRITE(JPT,67)	VS 7432
	IF(KJ.EQ.1.AND.IXY.EQ.1) WRITE(JPT,66)	VS 7433
	IF(KJ.EQ.2.AND.IXY.EQ.2) WRITE(JPT,66)	VS 7434
67	FORMAT(/,5X,19H(FOR CAMBERED WING))	VS 7435
66	FORMAT(/,5X,22H(FOR NONCAMBERED WING))	VS 7436
	K2 = MX(K)	VS 7437
	DO 9 ID=1,K2	VS 7438
	IF(ID.EQ.2) M=IR-M2	VS 7439
	IF(ID.EQ.2) MI=M2+MI	VS 7440
	IF(ID.EQ.2) YREF=HREF+YREF	VS 7441
	IF(ID.EQ.2) HREF=HALFB(K)-YREF	VS 7442
	IF(NASYM.EQ.1.AND.ID.EQ.2) YREF=0.	VS 7443
	IF(NASYM.EQ.1.AND.ID.EQ.2) HREF=HALFB(K)	VS 7444
	IF(IV(K).EQ.1) GO TO 90	VS 7445
	IF(KB.NE.0) GO TO 17	VS 7446
C	WRITE(JPT,3) M2,KH,M,MI,NK,IE,MX(K)	VS 7447
C	WRITE(JPT,2) YREF,HREF	VS 7448
	3 FORMAT(8(6X,T4))	VS 7449

	IF(ID.EQ.1) YF=YREF	VS 7450
	DO 10 I=1,M	VS 7451
	II=I+NK	VS 7452
	IF(YLE(II).LT.0.) II=M-II+1	VS 7453
	TT=1.-(ABS(YLE(II))-YREF)*2./HREF	VS 7454
	T(I)=ACOS(TT)	VS 7455
	SL(I)=SIN(T(I))	VS 7456
	SK(I)=SL(I)	VS 7457
	Y=YLF(II)	VS 7458
C	WRITE(6,100) II,Y,SK(I),TT,SL(I)	VS 7459
100	FORMAT(6X,I4,4F10.5)	VS 7460
	AS=CS(II)	VS 7461
	IF (KJ .EQ. 2) AS=GAS(II)	VS 7462
10	C(I)=AS*SK(I)/(CB*SN2)	VS 7463
C	WRITE(JPT,2)(C(I),I=1,M)	VS 7464
	T(M+1)=PI	VS 7465
	DO 15 I=1,M	VS 7466
	KC=IF+ID-1	VS 7467
	NCOL=M1(K,KC)	VS 7468
	KLL=0	VS 7469
	A(I)=0.	VS 7470
	DO 16 J=1,M	VS 7471
	IF(J.LT.NCOL) GO TO 24	VS 7472
	KLL=NCOL-1	VS 7473
	KC=KC+1	VS 7474
	NCOL=NCOL+M1(K,KC)-1	VS 7475
24	KL=J-KLL	VS 7476
	IF(NASYM.EQ.1.AND.ID.EQ.1) KL=M-(J-KLL)+1	VS 7477
	FM=M1(K,KC)	VS 7478
	JJ=J	VS 7479
	IF(NASYM.EQ.1.AND.ID.EQ.1) JJ=M-J+1	VS 7480
	TG=T(JJ)	VS 7481
	AC=WIDTH(K,KC)/HREF+C(JJ)/SL(JJ)*SJ(K,KL,KC)*COS((I-1.)*TG)/FM	VS 7482
16	A(I)=A(I)+AC	VS 7483
15	IF(I.NE.1)A(I)=2.*A(I)	VS 7484
	IE=KC	VS 7485
	IF(ID.EQ.2.AND.KR.EQ.0) YC2(K,2)=KC	VS 7486
	DO 20 I=1,M	VS 7487
	C(I)=A(I)	VS 7488
	K3 = M - 1	VS 7489
	DO 23 IJ=1,K3	VS 7490
23	C(I)=C(I)+A(IJ+1)*COS(IJ*T(I))	VS 7491
20	C(I)=C(I)/SK(I)	VS 7492
	II=1+IP+MI	VS 7493
	IK=IP+M+MI	VS 7494
C	WRITE(JPT,2) (CS(I),I=II,IK)	VS 7495
C	WRITE(JPT,2) (C(I),I=1,M)	VS 7496
2	FORMAT (8F10.5)	VS 7497
	IPK=0.	VS 7498

	ICN=0	VS 7499
	DO 14 I=2,M	VS 7500
	IF(I.GT.2.AND.C(I).LT.C(I-1)) ICN=0	VS 7501
	IF(C(I).GT.C(I-1)) ICN=ICN+1	VS 7502
	IF(I.FO.2.AND.C(I).LT.C(I-1)) ICN=ICN+1	VS 7503
	IF(ICN.EO.1) GO TO 19	VS 7504
	IF(C(I).GT.C(I-1)) GO TO 14	VS 7505
	ICN=0	VS 7506
	GO TO 14	VS 7507
	19 IPK=IPK+1	VS 7508
	14 CONTINUE	VS 7509
	IF(NC(K).EO.1) IPK=1	VS 7510
C	WRITE(JPT,3) IPK	VS 7511
	IN=1	VS 7512
	IL=1	VS 7513
	ICN=0	VS 7514
	DO 12 I=2,M	VS 7515
	IF(C(I).LT.C(I-1)) ICN=ICN+1	VS 7516
	IF(ICN.EO.1) IL=IL+1	VS 7517
	IF(C(I).GE.C(I-1)) IN=IN+1	VS 7518
	IF(C(I).LT.C(I-1).AND.IL.LE.IPK) IN=IN+1	VS 7519
	IF(C(I).GE.C(I-1)) ICN=0	VS 7520
	12 CONTINUE	VS 7521
	IF(IN.EO.1) IN=2	VS 7522
	TI=T(IN-1)	VS 7523
	TIC=2.*(T(IN+1)-T(IN-1))/M	VS 7524
	CMAx=C(IN-1)	VS 7525
	TT=TI	VS 7526
C	WRITE(JPT,2) TI,TIC,CMAx	VS 7527
	DO 55 I=1,M	VS 7528
	TI=TI+TIC	VS 7529
	D=A(1)	VS 7530
	K3 = M - 1	VS 7531
	DO 56 IJ=1,K3	VS 7532
56	D=D+A(IJ+1)*COS(IJ*TI)	VS 7533
	D=D/SIN(TI)	VS 7534
	IF(D.LT.CMAx) GO TO 60	VS 7535
	CMAx=D	VS 7536
	55 TT=TI	VS 7537
60	YY=0.5*(1.-COS(TT))	VS 7538
	GC=A(1)*TT	VS 7539
	GM=A(1)*(TT-SIN(TT))-A(2)*0.5*(TT-0.5*SIN(2.*TT))	VS 7540
	K3 = M - 1	VS 7541
	DO 65 L=1,K3	VS 7542
	ST=SIN(L*TT)/L	VS 7543
	GC=GC+A(L+1)*ST	VS 7544
	GM=GM+A(L+1)*ST	VS 7545
	IF(L.NE.1) GM=GM-0.5*A(L+1)*(SIN((L-1.)*TT)/((L-1.)+SIN((L+1.)*TT))	VS 7546
	1/((L+1.))	VS 7547

		VS 7548
65	CONTINUE	VS 7549
	GC=0.5*GC	VS 7550
	GM=GM*0.25	VS 7551
	YBAR=GM/GC	VS 7552
	GK(KJ, ID)=GC	VS 7553
	YBR(K, ID)=YBAR	VS 7554
	WRITE(JPT,70) YBAR	VS 7555
70	FORMAT (/2X,38HCENTROID TO MAX. SUCTION FORCE, YBAR =,F10.5)	VS 7556
	WRITE(JPT,72) GC	VS 7557
72	FORMAT (/2X,50HTOTAL SUCTION FORCE TO MAX. CS*C/(CB*SIN(ALP)**2)=,VS 7558	
	1F10.5)	VS 7559
	GO TO 18	VS 7560
17	YBAR=YBR(K, ID)	VS 7561
18	CONTINUE	VS 7562
	YBARL=0.	VS 7563
	BA=0.	VS 7564
	BC=0.	VS 7565
	ICC=0	VS 7566
	DD 40 I=1,M	VS 7567
	KH=I+NK	VS 7568
	IF(NASYM.EQ.1.AND.ID.EQ.1) KH=M-KH+1	VS 7569
	IF(KB.EQ.0.AND.I.EQ.1) FST=COS(SWEEP(KH))	VS 7570
	SWO=SWEEP(KH)	VS 7571
	IF(NASYM.EQ.1.AND.ID.EQ.1) GO TO 31	VS 7572
	IF(KB.EQ.1.AND.I.EQ.1) FST=COS(SWEEP(KH)-BK)	VS 7573
	IF(KB.EQ.2.AND.I.EQ.1) FST=COS(SWEEP(KH)+BK)	VS 7574
	GO TO 32	VS 7575
31	SWO=-SWO	VS 7576
	IF(KB.EQ.1.AND.I.EQ.1) FST=COS(SWO+BK)	VS 7577
32	CONTINUE	VS 7578
	IF(KB.EQ.0) GO TO R1	VS 7579
	FSS=COS(SWEEP(KH))	VS 7580
	FT=0.	VS 7581
	IF(FSS.GT.0.001) FT=SIN(SWO)/FSS	VS 7582
	SN=1.	VS 7583
	IF(KB.EQ.2) SN=-1.	VS 7584
	BA=BA+1.+2.*GB*SN+FT*GR2	VS 7585
	BC=BC+1.	VS 7586
R1	CONTINUE	VS 7587
	YY1=YN(N,1)	VS 7588
	YY2=YN(N,2)	VS 7589
	IF(NASYM.EQ.1.AND.ID.EQ.1)YY1=ABS(YN(N,2))	VS 7590
	IF(NASYM.EQ.1.AND.ID.EQ.1) YY2=ABS(YN(N,1))	VS 7591
C	WRITE(JPT,3) N,KH,M,NK	VS 7592
	RY1=(YY1-YREF)/HREF	VS 7593
	IF(RY1.GT.YBAR) GO TO 45	VS 7594
	RY2=(YY2-YREF)/HREF	VS 7595
	IF(KB.EQ.0) SWP=SWO	VS 7596
	IF(KB.EQ.1) SWP=SWO-BK	

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KZ=0	VS 7597
IF(NASYM.EQ.1.AND.ID.EQ.1) KZ=1	VS 7598
IF(K7.EQ.1.AND.KR.EQ.1) SWP=SWO+BK	VS 7599
IF(KB.EQ.2) SWP=SWEET(KH)+BK	VS 7600
IF(ABS(SWP-PI/2.).LT.0.001.OR.SWP.GT.PI/2.) GO TO 43	VS 7601
FS=COS(SWP)	VS 7602
IF(RY1.LT.YBAR.AND.RY2.GT.YBAR) GO TO 42	VS 7603
DY=(YY2-YY1)/FS	VS 7604
YBARL=YBARL+DY/HREF	VS 7605
NI=N+NW(K,1)	VS 7606
IF(NASYM.EQ.1.AND.ID.EQ.1) NI=N-NW(K,1)	VS 7607
N=NI	VS 7608
ICC=ICC+1	VS 7609
40 CONTINUE	VS 7610
42 DY=(YBAR-(YY1-YREF)/HREF)/FS	VS 7611
YBARL=YBARL+DY	VS 7612
GO TO 45	VS 7613
43 YBARL=10.	VS 7614
45 CONTINUE	VS 7615
IF(IAGVX.NE.0.AND.ID.EQ.2) GO TO 46	VS 7616
IF(KF.EQ.1.AND.ID.EQ.1) GO TO 48	VS 7617
GO TO 47	VS 7618
46 HH=HALFR(K)	VS 7619
YBARL=YBARL+HREF/HH+(YREF-YYF)/(HH*FST)	VS 7620
GO TO 47	VS 7621
48 HH=HREF+YREF	VS 7622
IF(KB.EQ.2.OR.KB.EQ.0) YBARL=YBARL+HREF/HH+YREF/(HH*FST)	VS 7623
47 CONTINUE	VS 7624
N=N+NW(K,1)*(M-ICC)	VS 7625
IF(NASYM.EQ.1.AND.ID.EQ.1) N=M*NW(K,1)+1	VS 7626
IF(ICC.LT.M) KH=KH+M-ICC-1	VS 7627
IF(NASYM.EQ.1.AND.ID.EQ.1) KH=M	VS 7628
NK=KH	VS 7629
WRITE (JPT,71) YBARL	VS 7630
71 FORMAT (/2X,38HL.E. LENGTH OF MAX. SUCTION CENTROID =,F10.5)	VS 7631
IF (KJ .EQ. 1 .AND. IXY .EQ. 2) GO TO 9	VS 7632
Y=YBARL	VS 7633
YCMX(K, ID)=Y	VS 7634
IF (Y.LT.2.5) ALPRD(K, ID)=9.195-Y*(23.734-Y*(60.81-Y*(33.533-1	VS 7635
Y*(7.391-0.581*Y))))	VS 7636
IF (Y.GE.2.5) ALPRD(K, ID)=38.	VS 7637
IF(KB.EQ.0) GO TO 82	VS 7638
BA=SORT(BA/BC)	VS 7639
DA=SIN(ALPBD(K, ID)*PI/180.)	VS 7640
DA=DA/BA	VS 7641
ALPRD(K, ID)=ATAN(DA/SORT(1.-DA*DA))*180./PI	VS 7642
82 CONTINUE	VS 7643
WRITE(JPT,75) ALPBD(K, ID)	VS 7644
IF(KB.EQ.0) WRITE(JPT,76)	VS 7645

IF(KB.EQ.1) WRITE(JPT,77)	VS	7646
IF(KB.EQ.2) WRITE(JPT,78)	VS	7647
76 FORMAT(5X,52H(WITHOUT CAMBER CORRECTION, FOR SYMMETRICAL LOADING))	VS	7648
77 FORMAT(5X,55H(WITHOUT CAMBER CORRECTION, FOR RIGHT WING IN SIDESLIPS	VS	7649
1P))	VS	7650
78 FORMAT(5X,54H(WITHOUT CAMBER CORRECTION, FOR LEFT WING IN SIDESLIPS	VS	7651
1))	VS	7652
75 FORMAT (/2X,36HALPHA FOR VORTEX BREAKDOWN AT T.E. =,F10.5,2X,4HDEGVS	VS	7653
1.)	VS	7654
ALPBD(K,ID)=ALPBD(K,ID)*PI/180.	VS	7655
GO TO 9	VS	7656
90 ALPBD(K,ID)=0.5*PI	VS	7657
YCMX(K,ID)=10.	VS	7658
9 CONTINUE	VS	7659
21 CONTINUE	VS	7660
IF(IV(K).EQ.1) GO TO 22	VS	7661
IF(ICHK.EQ.1) GO TO 26	VS	7662
IF (IXY .EQ. 1) GO TO 22	VS	7663
26 CONTINUE	VS	7664
K2 = MX(K)	VS	7665
DO 25 ID=1,K2	VS	7666
IF (KB .NE. 0) GO TO 27	VS	7667
GG=GK(1,ID)/GK(2,ID)	VS	7668
SA=SIN(ALP)*SOPT(GG)	VS	7669
SB=1.-SA*SA	VS	7670

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	PA=ALP	VS 7671
	IF (SB .GT. 0.) PA=ACDS(SQRT(SB))	VS 7672
	PB=ALP-PA	VS 7673
	ALPBD(K,ID)=ALPBD(K,ID)+PB	VS 7674
	IF (KB .EQ. 0) ABD(K,ID)=PB	VS 7675
	GO TO 25	VS 7676
27	ALPBD(K,ID)=ALPBD(K,ID)+ABD(K,ID)	VS 7677
25	CONTINUE	VS 7678
22	CONTINUE	VS 7679
	IF(IWING(K).NE.0) NK=NK+NS(K)-IWING(K)	VS 7680
	IF(NW(K,2).EQ.0) GO TO 80	VS 7681
	IF(K.EQ.1) NK=NK+NS(K)	VS 7682
	IF(K.GT.1) NK=NK+NS(K)-NS(K-1)	VS 7683
80	CONTINUE	VS 7684
C	WRITE(JPT,3) NK,KH	VS 7685
	5 N=LPN(K)+1	VS 7686
	RETURN	VS 7687
	END	VS 7688
C	FORTRAN NLSTIN	VS 7689
	FUNCTION FRATN(Y)	VS 7690
C	DETERMINING THE FRACTION OF REMAINING VORTEX LIFT	VS 7691
	IF(Y.LT.1.49) FRATN=0.131+0.384*Y	VS 7692
	IF(Y.GE.1.49.AND.Y.LT.3.72) FRATN=0.951-0.208*Y+0.028*Y^2	VS 7693
	IF(Y.GE.3.72) FRATN=0.5	VS 7694
	RETURN	VS 7695
	END	VS 7696
C	FORTRAN NLSTIN	VS 7697
	FUNCTION REDBD(DX)	VS 7698
C	DETERMINING THE DECREASE IN ALPHA(BDTE) IN THE SITUATION WITH	VS 7699
C	AUGMENTED VORTEX LIFT	VS 7700
	COMMON /INOUT/ INPT,JPT	VS 7701
	K=1	VS 7702
	IF(DX.GE.0.72) GO TO 1	VS 7703
	IF(DX.GE.0.6) DA=6.	VS 7704
	IF(DX.GE.0.45.AND.DX.LT.0.6) DA=3.	VS 7705
	IF(DX.LT.0.45) DA=1.	VS 7706
2	CONTINUE	VS 7707
	DF=0.45697446-0.32302748*DA+0.09099042*DA*DA-0.01087976*DA**3	VS 7708
1	+0.0004601*DA**4	VS 7709
	FA=DA*(0.45697446-DA*(0.16151374-DA*(0.03033014-DA*(0.00271994	VS 7710
1	-DA*0.0009202)))) -DX	VS 7711
	DB=DA-FA/DF	VS 7712
	IF(ABS(DB-DA).LT.0.001) GO TO 5	VS 7713
	DA=DB	VS 7714
	K=K+1	VS 7715
	IF(K.EQ.11) GO TO 5	VS 7716
	GO TO 2	VS 7717
1	DB=8.+(DX-0.72)/0.0226	VS 7718
5	REDBD=DB	VS 7719

C	WRITE(JPT,3) K,DR	VS 7720
	3 FORMAT (3X,3HK =,I4,2X,11HDELTA ALP =,F10.5)	VS 7721
	RETURN	VS 7722
	END	VS 7723
C	FORTRAN NLSTIN	VS 7724
	FUNCTION BDPT(ALPDT)	VS 7725
C	DETERMINING THE LOCATION OF VORTEX-BREAKDOWN POINT ON THE WING	VS 7726
	IF(ALPDT.GE.8.) GO TO 1	VS 7727
	BDPT=ALPDT*(0.45697446-ALPDT*(0.16151374-ALPDT*(0.03033014	VS 7728
	1-ALPDT*(0.00271994-ALPDT*0.00009202)))	VS 7729
	GO TO 5	VS 7730
	1 BDPT=0.72+0.0226*(ALPDT-8.)	VS 7731
	5 RETURN	VS 7732
	END	VS 7733
C	FORTRAN NLSTIN	VS 7734
	SUBROUTINE BENDIN(NC,CL,BM,IWING,BREAK,CBMR,CPTR,NWING,HALFSH,HALFVS	VS 7735
	1BH,DC,DS,IWGLT,FL,NASYM,NNC,KPL,NSUR,NS)	VS 7736
C	TO CALCULATE BENDING MOMENT DISTRIBUTION ON LIFTING SURFACES	VS 7737
	DIMENSION A(30),BM(6,1),H(30),PHI(30),BREAK(6,1),CL(1)	VS 7738
	DIMENSION DC(6,1),DS(6,1),IWING(1),NWING(1),HALFRH(1),IWGLT(1)	VS 7739
	DIMENSION NC(1),NS(1),CBMR(1),CBTP(1),FL(1)	VS 7740
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	VS 7741
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	VS 7742
	200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFR(6),SJ(8,31,5)VS	VS 7743
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS 7744
	INFP(6),NW(6,2)	VS 7745
	COMMON /INOUT/ INPT,JPT	VS 7746
	PI=3.14159265	VS 7747
	KO=0	VS 7748
	KD=0	VS 7749
	DD 12 L=1,NSUR	VS 7750
	KOT=0	VS 7751
	KA=NS(L)	VS 7752
	IF(L.GT.1) KA=KA-NS(L-1)	VS 7753
	NST=KA-M1(L,NC(L))+1	VS 7754
	IF(NASYM.EQ.1 .AND. KPL.EQ.2) NST=0	VS 7755
	NKC=NC(L)-NNC	VS 7756
	NI=0	VS 7757
	IF(NASYM.EQ.1 .AND. KRL.EQ.0) NI=1	VS 7758
	SUMF=0.	VS 7759
	SUMH=0.	VS 7760
	SUMS=0.	VS 7761
	FTL=0.	VS 7762
	AREA=HALFSW	VS 7763
	HAB=HALFB(L)	VS 7764
	IF (IWGLT(L).EQ.1) HAB=HALFB(L)	VS 7765
	IF (IWGLT(L).EQ.2) AREA=HALFSW	VS 7766
	IF (IWGLT(L).EQ.2) HAB=HALFB(L)	VS 7767
	K2 = NC(L)	VS 7768

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DO 1 I=1,K2	VS 7769
M=NC(L)-I+1	VS 7770
IP=0	VS 7771
IF(NI.EQ.1 .AND. I.GT.NNC) GO TO 6	VS 7772
IF(NASYM.EQ.1 .AND. KRL.EQ.2) GO TO 6	VS 7773
IF(I.EQ.NNC) GO TO 8	VS 7774
IF (I.NE.NC(L)) DIHEFC=DC(L,M)*DC(L,M-1)+DS(L,M)*DS(L,M-1)	VS 7775
IF(I.NE.NC(L)) DIHEFS=DS(L,M)*DC(L,M-1)-DC(L,M)*DS(L,M-1)	VS 7776
IF (I.EQ.NC(L)) GO TO 8	VS 7777
GO TO 7	VS 7778
6 AREA=HALFSW	VS 7779
HAB=HALFB(L)	VS 7780
M=I	VS 7781
IP=1	VS 7782
IF(KRL.EQ.0) M=I-NNC	VS 7783
IF(KRL.EQ.0 .AND. M.EQ.NNC) GO TO 8	VS 7784
IF(KRL.NE.0 .AND. I.EQ.NNC) GO TO 8	VS 7785
DIHEFC=DC(L,M)*DC(L,M+1)+DS(L,M)*DS(L,M+1)	VS 7786
DIHEFS=DS(L,M)*DC(L,M+1)-DC(L,M)*DS(L,M+1)	VS 7787
GO TO 7	VS 7788
8 DIHEFC=1.	VS 7789
DIHEFS=0.	VS 7790
7 CONTINUE	VS 7791
WSPAN=WIDTH(L,M)*0.5	VS 7792
MM=M1(L,M)-1	VS 7793
MM1=M1(L,M)	VS 7794
FM=MM1	VS 7795
IF (M.EQ.NWING(L)) AREA=HALFSW	VS 7796
IF (M.EQ.NWING(L)) HAB=HALFB(L)	VS 7797
IF(NASYM.EQ.0) GO TO 18	VS 7798
IF(KRL.EQ.0) GO TO 18	VS 7799
IF(I.GT.NNC) GO TO 19	VS 7800
18 CONTINUE	VS 7801
DO 2 J=1,MM	VS 7802
FJ=J	VS 7803
JJ=NST+J+KD	VS 7804
KM=NST+J+KQ	VS 7805
IF(NW(L,2).EQ.0) GO TO 40	VS 7806
IF(L.EQ.1) II=KM+NS(L)	VS 7807
IF(L.GT.1) II=KM+NS(L)-NS(L-1)	VS 7808
CHORD=CH(KM)+CH(II)	VS 7809
GO TO 41	VS 7810
40 CHORD=CH(KM)	VS 7811
41 CONTINUE	VS 7812
C WRITE(JPT,100) NST,KD,KM,II,JJ	VS 7813
PHI(J)=FJ*PI/FM	VS 7814
H(J)=CL(JJ)*CHORD*SJ(L,J,M)	VS 7815
2 CONTINUE	VS 7816
DO 3 J=1,MM1	VS 7817

	A(J)=0.	VS 7818
	FJ=J	VS 7819
	DO 4 K=1,MM	VS 7820
	4 A(J)=A(J)+H(K)*COS((FJ-1.)*PHI(K))	VS 7821
	IF (J .EQ. 1) A(J)=A(J)/FM	VS 7822
	IF (J .NE. 1) A(J)=A(J)*2./FM	VS 7823
	3 CONTINUE	VS 7824
	19 CONTINUE	VS 7825
	DO 10 K=1,MM1	VS 7826
	JK=MM1-K	VS 7827
	IF(NASYM.EQ.1 .AND. KRL.EQ.2) JK=K	VS 7828
	IF(NI.EQ.1 .AND. I.GT.NNC) JK=K	VS 7829
	KK=JK+NST	VS 7830
	KL=KK+KQ	VS 7831
C	WRITE(JPT,100) KK,KL,KQ,JK	VS 7832
100	FORMAT (5(6X,I4))	VS 7833
	IF(NASYM.EQ.0) GO TO 25	VS 7834
	IF(KRL.EQ.0) GO TO 25	VS 7835
	IF(I.GT.NNC) GO TO 26	VS 7836
	25 CONTINUE	VS 7837
	IF(K.EQ.MM1) GO TO 15	VS 7838
	BSPAN=BREAK(L,M)-YLE(KL)+WSPAN	VS 7839
	SNAM=0.	VS 7840
	IF(IP.EQ.1) SNAM=(A(1)*BSPAN-0.5*A(2)*WSPAN)*PI*WSPAN/(2.*AREA*HAB)	VS 7841
	1) SUM=A(1)*((PI-PHI(JK))*BSPAN+SIN(PHI(JK))*WSPAN)-0.5*A(2)*WSPAN*(VS 7842
	PI-PHI(JK)-SIN(2.*PHI(JK))/2.)-A(2)*SIN(PHI(JK))*BSPAN	VS 7843
	DO 11 J=2,MM	VS 7844
	FJ=J	VS 7845
	11 SUM=SUM-BSPAN*A(J+1)*SIN(FJ*PHI(JK))/FJ+WSPAN*0.5*A(J+1)*(SIN((FJ+VS	7846
	11.)*PHI(JK))/(FJ+1.)+SIN((FJ-1.)*PHI(JK))/(FJ-1.))	VS 7847
	BM(L,KK)=WSPAN*SUM/(2.*AREA*HAB)+SUMM+SUMF*(BREAK(L,(M+1-IP))-YLE(VS	7848
	1KL))*(-1.))*IP-SNAM	VS 7849
	GO TO 10	VS 7850
	15 BSPAN=WSPAN	VS 7851
	IF(IP.EQ.1) BSPAN=-WSPAN	VS 7852
	SUM=(A(1)*BSPAN-0.5*A(2)*WSPAN)*PI	VS 7853
	IF(IP.EQ.1) SUM=-SUM	VS 7854
	SUMM=WSPAN*SUM/(2.*AREA*HAB)+SUMM+SUMF*(BREAK(L,M+1)-BREAK(L,M))	VS 7855
	GO TO 10	VS 7856
	26 BM(L,KK)=0.	VS 7858
	10 CONTINUE	VS 7859
	KQT=KQT+MM1-1	VS 7860
C	WRITE(JPT,50) (A(K),K=1,MM1)	VS 7861
C	WRITE(JPT,50) WSPAN,SUM,AREA,HAB,SUMM,SUMF	VS 7862
	IF(NASYM.EQ.0) GO TO 27	VS 7863
	IF(KRL.EQ.0) GO TO 27	VS 7864
	IF(I.GT.NNC) GO TO 29	VS 7865
	27 CONTINUE	VS 7866

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	P1=A(1)*PI*WSPAN/(2.*AREA*HAB)	VS	7867
	SUMF=(SUMF+P1)*DIHEFC-SUMS*DIHEFS	VS	7868
	SUMS=(SUMF+P1)*DIHEFS+SUMS*DIHEFC	VS	7869
29	CONTINUE	VS	7870
	IF (M.EQ.(NWIN(L)+1).AND.IWIN(L).NE.0) GO TO 16	VS	7871
	GO TO 17	VS	7872
16	SUMT=SUMM	VS	7873
	FTL=SUMF	VS	7874
	IF (IWGLT(L).EQ.1) GO TO 17	VS	7875
	SUMM=0.	VS	7876
	SUMF=0.	VS	7877
	SUMS=0.	VS	7878
17	CONTINUE	VS	7879
	IF (NI.EQ.1 .AND. I.EQ.NNC) GO TO 30	VS	7880
	IF (I.EQ.NC(L)) GO TO 20	VS	7881
	IF (NASYM.EQ.1 .AND. KRL.EQ.2) GO TO 28	VS	7882
	IF (NI.EQ.1 .AND. I.GT.NNC) GO TO 28	VS	7883
	NST=NST-M1(L,M-1)+1	VS	7884
	GO TO 1	VS	7885
28	NST=NST+M1(L,M)-1	VS	7886
	GO TO 1	VS	7887
20	NST=0	VS	7888
	GO TO 1	VS	7889
30	SUMT=SUMM	VS	7890
	FTL=SUMF	VS	7891
	SUMM=0.	VS	7892
	SUMF=0.	VS	7893
	SUMS=0.	VS	7894
	NST=0	VS	7895
1	CONTINUE	VS	7896
	CBMR(L)=SUMM	VS	7897
	CBTR(L)=SUMT	VS	7898
	FL(L)=FTL	VS	7899
	KQ=KOT+KQ	VS	7900
	KD=KD+KOT	VS	7901
	IF (NW(L,2).NE.0 .AND. L.EQ.1) KQ=KQ+NS(L)	VS	7902
	IF (NW(L,2).NE.0 .AND. L.GT.1) KQ=KQ+NS(L)-NS(L-1)	VS	7903
12	CONTINUE	VS	7904
50	FORMAT (5F10.5)	VS	7905
51	FORMAT (5(6X,I4))	VS	7906
	RETURN	VS	7907
	END	VS	7908
C	FORTRAN NLSTIN	VS	7909
	SUBROUTINE BACKWH (X,Y,Z,LPANEL,B,LPAN1,NW,GAMMA,VX,LAT,CD,SD,YK,	VS	7910
	1DC,DS,VT,IWING,ZB,YB,YBB,NCS,IWGLT,IV,NC1,KF,BREAK)	VS	7911
C	TO CALCULATE BACKWASH DUE TO IMAGE VORTICES IN GROUND EFFECT	VS	7912
	DIMENSION NW(6,1),GAMMA(1),U(2),YK(6,1),DC(6,1),DS(6,1)	VS	7913
	1,LPAN1(1),IWING(1),IV(1),IWGLT(1),BREAK(6,1)	VS	7914
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),VS	VS	7915

1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(2VS	7916
200,2),ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFB(6),SJ(6,31,5)VS	7917
COMMON /EXTRA/ LPN(6),NS(6),ICNLF(6),ITWST(6),IST(6),NGRD,HEIGHT, VS	7918
1ATT,NC(6),NWIN(6),IPOS(6),IALP,DUMT(3,6,15),HALFBH(6)	VS 7919
B1=8	VS 7920
IZ=1	VS 7921
IFF=1	VS 7922
IPN=1	VS 7923
IW=1	VS 7924
NASYM=YCON(50)	VS 7925
ZA=0.	VS 7926
YA=BREAK(1,1)	VS 7927
YAA=BRFAK(1,1)	VS 7928
IF(NASYM.EQ.0) GO TO 30	VS 7929
YA=YK(1,NC1)	VS 7930
YAA=YA	VS 7931
IF(NC1.EQ.1) GO TO 30	VS 7932
NC11=NC1-1	VS 7933
DO 31 J=1,NC11	VS 7934
ZA=ZA+(YK(1,J)-YK(1,J+1))*DS(1,J+1)	VS 7935
31 YAA=YAA+(YK(1,J)-YK(1,J+1))*DC(1,J+1)	VS 7936
YA=YK(1,1)	VS 7937
30 CONTINUE	VS 7938
YAP=YA	VS 7939
YAAP=YAA	VS 7940
MM=NW(1,1)	VS 7941
L=1	VS 7942
IP=1	VS 7943
VX=0.	VS 7944
VT=0.	VS 7945
DO 10 J=1,LPANEL	VS 7946
ISN=1	VS 7947
NN=NW(L,1)	VS 7948
COSD=DC(L,IPN)	VS 7949
SIND=DS(L,IPN)	VS 7950
JJ=J	VS 7951
MI=J-IFF+1	VS 7952
IF (J.GT.LPAN1(L).AND.J.LE.LPN(L)) ISN=2	VS 7953
IF (J.GT.LPAN1(L).AND.J.LE.LPN(L)) NN=NW(L,2)	VS 7954
FN=NN	VS 7955
NK=NN	VS 7956
IF (J.GE.LPAN1(L).AND.J.LT.LPN(L)) NK=NW(L,2)	VS 7957
IF (J.EQ.LPN(L).AND.J.LT.LPANEL) NK=NW(L+1,1)	VS 7958
X1=XN(J,1)-X	VS 7959
X2=XN(J,2)-X	VS 7960
X12=XN(J,2)-XN(J,1)	VS 7961
Y12=YN(J,2)-YN(J,1)	VS 7962
Z12=ZN(J,2)-ZN(J,1)+Y12*SIND	VS 7963
Y12=Y12*COSD	VS 7964

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Z1=ZN(J,1)-(Z+ZB+(Y-YB)*SD)+ZA+(YN(J,1)-YA)*SIND	VS	7965
Z2=ZN(J,2)-(Z+ZB+(Y-YB)*SD)+ZA+(YN(J,2)-YA)*SIND	VS	7966
XZJ=X1*Z12-Z1*Y12	VS	7967
ISM=2	VS	7968
IF (IV(L).EQ.1) ISM=1	VS	7969
IF(NASYM.EQ.1) ISM=1	VS	7970
DO 16 II=1,ISM	VS	7971
FCP=1.	VS	7972
IF (II .EQ. 2) FCP=-1.	VS	7973
YC=FCP*(YBR+(Y-YB)*CD)	VS	7974
Y1=YAA+(YN(J,1)-YA)*COSD-YC	VS	7975
Y2=YAA+(YN(J,2)-YA)*COSD-YC	VS	7976
XYK=X1*Y12-Y1*X12	VS	7977
YZI=Y1*Z12-Z1*Y12	VS	7978
ALR1=XYK*XYK+XZJ*XZJ+B1*YZI*YZI	VS	7979
R1B1=SQRT(X1*X1+B1*Y1*Y1+B1*Z1*Z1)	VS	7980
R2B1=SQRT(X2*X2+B1*Y2*Y2+B1*Z2*Z2)	VS	7981
UUB1=(X2*X12+B1*Y2*Y12+B1*Z2*Z12)/R2B1-(X1*X12+B1*Y1*Y12+B1*Z1*Z12	VS	7982
1)/R1B1	VS	7983
G1=(1.-X1/R1B1)/(Y1*Y1+Z1*Z1)	VS	7984
G2=(1.-X2/R2B1)/(Y2*Y2+Z2*Z2)	VS	7985
IF(LAT.NE.0.AND.IV(L).EQ.0) GO TO 14	VS	7986
IF(KF.EQ.0) GO TO 14	VS	7987
IF(IP.NE.1) GO TO 14	VS	7988
G1=0.	VS	7989
14 CONTINUE	VS	7990
F1=UUB1*XYK/ALR1	VS	7991
F2=-Y2*G2+Y1*G1	VS	7992
F4=-XZJ*UUB1/ALB1	VS	7993
F5=Z2*G2-Z1*G1	VS	7994
F12=-(F1+F2)	VS	7995
F45=F4+F5	VS	7996
IF (LAT .EQ. 0) F45=F45*FCP	VS	7997
IF (LAT .NE. 0) F12=F12*FCP	VS	7998
F3=UUB1*YZI/ALB1	VS	7999
IF (LAT .NE. 0) F3=F3*FCP	VS	8000
U(II)=F3*CH(IZ)*SN(L,MI,ISN)*GAMMA(JJ)/(8.*FN)	VS	8001
VT=VT+(F12*SD+F45*CD)*CH(IZ)*SN(L,MI,ISN)*GAMMA(JJ)/(8.*FN)	VS	8002
16 CONTINUE	VS	8003
VX=U(1)+U(2)+VX	VS	8004
IF(J.LT.MM) GO TO 6	VS	8005
IF(J.EQ.LPANEL) GO TO 10	VS	8006
IZ=IZ+1	VS	8007
IW=IW+1	VS	8008
IFF=MM+1	VS	8009
MM=MM+NK	VS	8010
IF (IHING(L).NE.0.AND.IW.EQ.(IHING(L)+1)) GO TO 17	VS	8011
IF(J.EQ.LPANI(L).OR.J.EQ.LPN(L)) GO TO 5	VS	8012
IF (YLE(IZ).LT.YK(L,IPN)) GO TO 6	VS	8013

17	CONTINUE	VS	8014
	NJ=0	VS	8015
	IF(NASYM.EQ.1.AND.IPN.LT.NC1) NJ=1	VS	8016
	IF(NJ.EQ.1) IPN=IPN+1	VS	8017
	ZA=ZA+(YK(L,IPN)-YA)*DS(L,IPN)	VS	8018
	YAA=YAA+(YK(L,IPN)-YA)*DC(L,IPN)	VS	8019
	YA=YK(L,IPN)	VS	8020
	IF (IWING(L).NE.O.AND.IW.EQ.(IWING(L)+1)) GO TO 20	VS	8021
	GO TO 21	VS	8022
20	IF (IWGLT(L).EQ.1) GO TO 21	VS	8023
5	ZA=0.	VS	8024
	YA=BREAK(L,1)	VS	8025
	YAA=BREAK(L,1)	VS	8026
	IF(NASYM.EQ.1.AND.J.EQ.LPAN1(L)) YA=YAP	VS	8027
	IF(NASYM.EQ.1.AND.J.EQ.LPAN1(L)) YAA=YAAP	VS	8028
	IF(J.EQ.LPN(L).AND.L.LT.6) YA=RPEAK(L+1,1)	VS	8029
	IF(J.EQ.LPN(L).AND.L.LT.6) YAA=RPEAK(L+1,1)	VS	8030
	IF(J.EQ.LPAN1(L).OR.J.EQ.LPN(L)) GO TO 21	VS	8031
	IF (IWGLT(L).NE.2) GO TO 21	VS	8032
	ZA=YK(L,NC(L)-2)*DS(L,1)	VS	8033
	YAA=YK(L,NC(L)-2)*DC(L,1)	VS	8034
	YA=YK(L,NC(L)-2)	VS	8035
21	CONTINUE	VS	8036
	IF(NJ.NE.1) IPN=IPN+1	VS	8037
	IF (J.EQ.LPAN1(L).OR.J.EQ.LPN(L)) IPN=1	VS	8038
6	CONTINUE	VS	8039
	KH=0	VS	8040
	IF(J.EQ.LPAN1(L).AND.J.NE.LPN(L)) KH=1	VS	8041
	IF(KH.EQ.1.AND.L.EQ.1) IW=IW-NS(L)	VS	8042
	IF(KH.EQ.1.AND.L.GT.1) IW=IW-NS(L)+NS(L-1)	VS	8043
	IF(J.EQ.LPAN1(L)) IP=1	VS	8044
	IF(J.EQ.LPN(L)) IP=1	VS	8045
10	IF (J.EQ.LPN(L)) L=L+1	VS	8046
	RETURN	VS	8047
	END	VS	8048
C	FORTRAN NLSTIN	VS	8049
	SUBROUTINE DRAG (CLT,YBREAK,NC,TFLP,NAL)	VS	8050
C	TO CALCULATE THE FAR-FIELD INDUCED DRAG	VS	8051
	DIMENSION ALPHI(50),YBREAK(6,1),TFLP(6,1),YK(50),YK(50),NC	VS	8052
	I(1),NAL(1)	VS	8053
	COMMON /GEOM/ HALFSW,XCP(200),YCP(200),ZCP(200),XLE(100),YLE(100),	VS	8054
	1XTE(100),PSI(30),CH(100),XV(200),YV(200),SN(6,15,2),XN(200,2),YN(200,2),	VS	8055
	ZN(200,2),WIDTH(6,5),YCON(51),SWEEP(100),HALFR(6),SJ(6,31,5)	VS	8056
	COMMON /AERD/ AM,B,CL(50),CT(50),CD(50),CM(50)	VS	8057
	COMMON /CONST/ NCS,NCW,M1(6,5),MJW1(6,2,5),MJW2(6,2,5),NJW(6,5),	VS	8058
	INFP(6),NW(6,2)	VS	8059
	COMMON /INOUT/ INPT,JPT	VS	8060
	M=41	VS	8061
	PI=3.14159265	VS	8062

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NS=(M+1)/2-1	VS 8063
MM1=M-1	VS 8064
FM=M	VS 8065
DO 3 I=1,NS	VS 8066
FI=I	VS 8067
J=M-I	VS 8068
XK(I)=SIN(FI*PI/FM)	VS 8069
XK(J)=XK(I)	VS 8070
YK(I)=-COS(FI*PI/FM)	VS 8071
3 YK(J)=-YK(I)	VS 8072
DO 4 I=1,NCS	VS 8073
4 CH(I)=SORT(1.-(YLE(I)/HALFB(1))**2)	VS 8074
IC=1	VS 8075
BREAK=YBREAK(1,1)	VS 8076
MST=1	VS 8077
MEND=M1(1,1)-1	VS 8078
DO 5 I=1,NS	VS 8079
YCON(I)=0.	VS 8080
CD(I)=0.	VS 8081
II=NS+I	VS 8082
BB=YK(II)*HALFB(1)	VS 8083
IF (BB .LE. BREAK) GO TO 12	VS 8084
NK=M1(1,IC)-1	VS 8085
IC=IC+1	VS 8086
NO=M1(1,IC)-1	VS 8087
BREAK=YBREAK(1,IC)	VS 8088
MST=MST+NK	VS 8089
MEND=MEND+NO	VS 8090
12 CONTINUE	VS 8091
DO 6 J=MST,MEND	VS 8092
IF (NW(1,2).EQ.0) GO TO 60	VS 8093
J1=J+NCS	VS 8094
CHORD=CH(J)+CH(J1)	VS 8095
GO TO 61	VS 8096
60 CHORD=CH(J)	VS 8097
61 CONTINUE	VS 8098
A=1.	VS 8099
DO 7 K=MST,MEND	VS 8100
IF (K .EQ. J) GO TO 7	VS 8101
A=A*(BB-YLE(K))/(YLE(J)-YLE(K))	VS 8102
7 CONTINUE	VS 8103
CD(I)=CD(I)+A*CL(J)*CH(J)	VS 8104
6 YCON(I)=YCON(I)+A*CHORD	VS 8105
CD(I)=CD(I)/SORT(1.-YK(II)**2)	VS 8106
5 CONTINUE	VS 8107
DO 10 I=1,NS	VS 8108
ALPHI(I)=0.	VS 8109
IN=NS+I	VS 8110
DO 15 J=1,MM1	VS 8111

IF (J .EQ. IN) GO TO 20	VS 8112
INDEX=IABS(J-IN)	VS 8113
FACTOR=2.*((-1.)**INDEX-1.)*XK(J)/(FM*(YK(J)-YK(IN))**2)	VS 8114
GO TO 25	VS 8115
20 FACTOR=FM/XK(J)	VS 8116
25 IF (J .GT. NS) GO TO 30	VS 8117
JJ=M-J-NS	VS 8118
GO TO 35	VS 8119
30 JJ=J-NS	VS 8120
35 ALPHI(I)=ALPHI(I)+CD(JJ)*YCON(JJ)*FACTOR	VS 8121
15 CONTINUE	VS 8122
ALPHI(I)=ALPHI(I)/(16.*HALFB(1))	VS 8123
10 CONTINUE	VS 8124
CDI=0.	VS 8125
DO 40 I=1,NS	VS 8126
IN=NS+I	VS 8127
40 CDI=CDI+CD(I)*YCON(I)*ALPHI(I)*XK(IN)	VS 8128
CDI=CDI*HALFB(1)*PI/(HALFSW*FM)	VS 8129
CDL2=CDI/(CLT*CLT)	VS 8130
WRITE (JPT,45) CDI	VS 8131
WRITE (JPT,50) CDL2	VS 8132
45 FORMAT (/2X,23HFAR-FIELD INDUCED DRAG=,F10.5)	VS 8133
50 FORMAT (/2X,33HFAR-FIELD INDUCED DRAG PARAMETER=,F10.5)	VS 8134
RETURN	VS 8135
END	VS 8136

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