

APR 12 1976

AEDC-TR-75-75

Volume I

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THE AEDC THREE-DIMENSIONAL, POTENTIAL FLOW COMPUTER PROGRAM

VOLUME I. METHOD AND COMPUTER PROGRAM

**PROPULSION WIND TUNNEL FACILITY
ARNOLD ENGINEERING DEVELOPMENT CENTER
AIR FORCE SYSTEMS COMMAND
ARNOLD AIR FORCE STATION, TENNESSEE 37389**

February 1976

Final Report for Period November 1971 — November 1974

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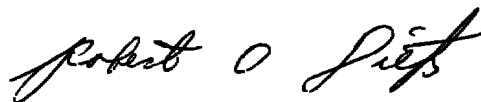
APPROVAL STATEMENT

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



CARLOS TIRRES
Captain, USAF
Research & Development
Division
Directorate of Technology



ROBERT O. DIETZ
Director of Technology

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM									
1. REPORT NUMBER AEDC-TR-75-75 Volume I	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER									
4. TITLE (and Subtitle) THE AEDC THREE-DIMENSIONAL, POTENTIAL FLOW COMPUTER PROGRAM VOLUME I. METHOD AND COMPUTER PROGRAM		5. TYPE OF REPORT & PERIOD COVERED Final Report - November 1971 - November 1974									
7. AUTHOR(s) Donald C. Todd - ARO, Inc.		6. PERFORMING ORG. REPORT NUMBER 8. CONTRACT OR GRANT NUMBER(s)									
9. PERFORMING ORGANIZATION NAME AND ADDRESS Arnold Engineering Development Center (DY) Air Force Systems Command Arnold Air Force Station, Tennessee 37389		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS Program Element 65807F									
11. CONTROLLING OFFICE NAME AND ADDRESS Arnold Engineering Development Center (DYFS) Air Force Systems Command Arnold Air Force Station, Tennessee 37389		12. REPORT DATE February 1976									
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 108									
		15. SECURITY CLASS. (of this report) UNCLASSIFIED									
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A									
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)											
18. SUPPLEMENTARY NOTES Available in DDC											
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">three-dimensional flow</td> <td style="width: 33%;">computer program</td> <td style="width: 33%;">modeling techniques</td> </tr> <tr> <td>flow fields</td> <td>computer analysis</td> <td>potential flow</td> </tr> <tr> <td>subsonic flow</td> <td>mathematical models</td> <td>vortex lattice</td> </tr> </table>			three-dimensional flow	computer program	modeling techniques	flow fields	computer analysis	potential flow	subsonic flow	mathematical models	vortex lattice
three-dimensional flow	computer program	modeling techniques									
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subsonic flow	mathematical models	vortex lattice									
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A complete description of a computer analysis of the potential subsonic flow about complex three-dimensional bodies is presented. The linear, partial differential equation for the compressible velocity gradient is solved for cases where the local Mach number everywhere in the flow field is less than one. The compressible flow equation is transformed, using Goethert similarity parameter, into the equivalent incompressible form represented by Laplace's											

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20. ABSTRACT (Continued)

equation. The solution to the equation is accomplished by representing the body (or model) by a finite number of elements (or singularities). The singularities may be made up of either vortices or sources. The two volumes included in the report give the description of the computer program which is entitled the AEDC Potential Flow Program (PFP) and the computer analysis of several complex bodies. Volume I includes a theoretical development of the equations that lead to the set that are programmed in the PFP. A complete description of the computer program is given along with sample input and output from the program. Volume II includes a discussion concerning the modeling techniques that can be used to represent a wide class of three-dimensional bodies and gives the results of the flow field computed about these bodies using the PFP. Comparisons of some of the theoretical results are made with wind tunnel experimental data.

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PREFACE

The work reported herein was conducted by the Arnold Engineering Development Center (AEDC), Air Force Systems Command (AFSC), under Program Element 65807F. The technical monitoring of the effort was performed by Capt. Carlos Tirres, USAF, Research and Development Division, Directorate of Technology. The results presented were obtained by ARO, Inc. (a subsidiary of Sverdrup & Parcel and Associates, Inc.), contract operator of AEDC, AFSC, Arnold Air Force Station, Tennessee. The majority of the development and information presented was obtained under ARO Project Nos. PW5146, PW5246, PF218, and PF418. The author of this report is Donald C. Toda, ARO, Inc. The report was written under ARO Project No. P33A-36A. The manuscript (ARO Control No. ARO-PWT-TR-75-7, Volume I) was submitted for publication on March 3, 1975.

Acknowledgment is made of the contributions of Messrs. C. R. Fitch, W. C. Armstrong, K. R. Kneile, and E. W. Dorrell, Jr., in early development in the computer program and F. L. Heltsley and R. L. Parker, Jr., in modeling techniques.

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1.0 INTRODUCTION

In January 1971, a research effort was undertaken in the Propulsion Wind Tunnel Facility (PWT) at the Arnold Engineering Development Center (AEDC) to develop a new test technique for testing full-scale inlet/engine systems at high angles of attack and yaw. The steps taken in developing the new techniques were: (1) to determine for a given aircraft configuration the flow field at the inlet, (2) to develop flow shaping devices which are capable of producing the desired flow, and (3) to verify the ability of the device by conducting flow survey tests in the wind tunnel. The success of such an approach obviously depends on the ability to correctly determine the flow field produced by the aircraft and the flow shaping devices. To correctly determine these flow fields required either experimental data from wind tunnel tests or predictions made by analytical procedures. Wind tunnel testing was considered to be both too costly and time consuming because a large number of models would need to be fabricated and tested before the correct flow simulations were obtained. Therefore, it was determined that an analytical method of predicting the flow fields for both the aircraft and the flow shaping devices was needed.

At that time, a three-dimensional potential flow program which used a vortex-lattice to describe the model was in use at AEDC for flow field calculations. A compressibility correction using Goethert's Rule had been incorporated into the program for use at high subsonic Mach numbers. However, this program was fixed to use only 99 horseshoe vortices which restricted its use to very simple models. Since models with considerable detail would be required for the pending flow field analyses, the program was rewritten and expanded to allow the flow field about large models to be analyzed. The flow field calculations made with this program gave excellent agreement with wind tunnel data which ultimately resulted in the development of the testing technique desired. However, the program proved to be extremely slow. Whereas the solution for a model with 99 vortices could be obtained in approximately 30 min, the solution for a model with 570 vortices (the largest tried with this version of the program) took approximately 20 hr. This was considerably less time than required for fabrication and testing of a model; however, the time factor obviously restricted the use of the program. Therefore, a complete rewrite of the potential flow solution was undertaken which resulted in the present Potential Flow Program (PFP). With this program, the solution for a model with 1579 vortices was obtained in 16 hr on the old AEDC IBM-370-155 which should reduce to approximately 4 hr on the present AEDC IBM-370-165.

This volume presents the method of solution, describes the input and output, and provides other information necessary to run PFP. Also documented is a plot program which will plot various views of the model and flow field parameters. A sample run is given, including a complete listing of the run deck, the printed output, and plots.

2.0 METHOD

If flow is irrotational, then the velocity field is derivable from a potential. In particular, if the fluid is incompressible, then the potential satisfies Laplace's equation. The method used by PFP is to induce the flow by N singularities which are known to produce velocities which are derivable from a potential which satisfies Laplace's equation. Boundary conditions are imposed at N distinct points, called control points. This produces a linear set of N algebraic equations in N unknowns, which are the strengths of the singularities. When the strengths have been computed, the velocities anywhere in the field can be computed. The method is extended to compressible flow by using Goethert's compressibility correction.

The method used by PFP is outlined above and detailed in the following sections. The modeling data, i.e., the shape and locations of the singularities and the locations of the control points, are input to PFP. How to best model a particular flow problem has been learned by experience and is covered in Volume II.

2.1 SINGULARITIES

Helmholz's theorem states, if the divergence and vorticity of a vector field is known everywhere in space, then the field is completely specified. Thus, one can picture flow as being induced by its divergence and vorticity. To simplify matters, if one discretizes the divergence, the mathematical ideal, the point source is derived. Similarly, if vorticity is confined to lines, the mathematical concept of a line vortex is formed. These are the singularities used by PFP and are illustrated in Fig. 1.

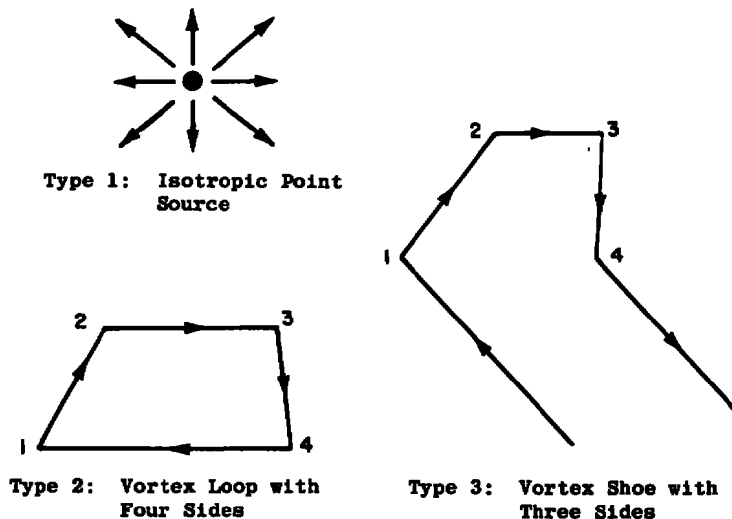
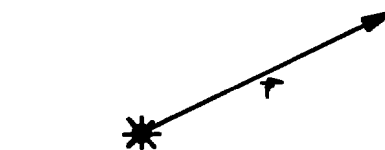


Figure 1. Types of singularities used by PFP.

Type 1 singularity is an isotropic point source or, in the case of negative strength, a point sink. The velocity induced by a point source is given by the equation in Fig. 2 where γ is the strength of the source and $\hat{r}$ is a unit vector in the direction of $\vec{r}$.

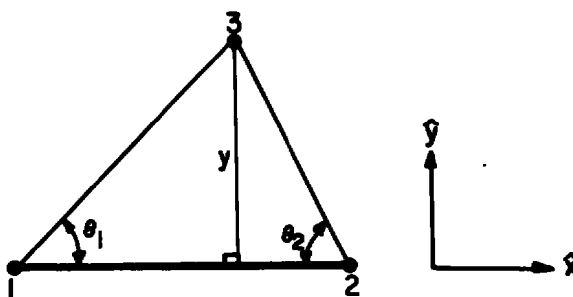
Since by a vector identity, the divergence of the vorticity is zero, it can be proved that a line vortex must either be a loop or else must come from infinity and return to infinity. For ease of reference, the term "shoe" was coined to refer to the latter case. As shown in Fig. 1, PFP restricts a line vortex to either a quadrilateral or a three-sided shoe. The trails of Type 3 singularities are all parallel, the direction being input to PFP. In Fig. 1, the numbers beside the vortices of Types 2 and 3 indicate the order they are input to PFP.



$$\vec{v}(\vec{r}) = \frac{\gamma \hat{r}}{4\pi r^2}$$

Figure 2. Velocity induced by an isotropic point source.

The velocities induced by Types 2 and 3 singularities are formed by adding the velocities induced by the sides and trails. The velocity induced by a vortex line segment is given by the equation in Fig. 3. The vortex is between Points 1 and 2, and the velocity is at Point 3. The unit vectors $\hat{x}$ and $\hat{y}$ are in the plane of the 3 points. The angles (θ_1 and θ_2) are defined by the figure. the strength of the vortex is γ , and y is the distance between Point 3 and the line determined by Points 1 and 2. The velocity induced by a vortex ray or trail is found as a limiting case as one of the angles (θ_1 or θ_2) approaches zero.



$$\vec{v} = \frac{\gamma}{4\pi y} (\cos \theta_1 + \cos \theta_2) (\hat{x} \times \hat{y})$$

Figure 3. Velocity induced by a vortex line segment.

2.2 SYSTEM OF EQUATIONS

The velocity at any point is given by

$$\vec{v} = \vec{v}_{\infty} + \sum_{j=1}^N \gamma_j \vec{u}_j \quad (1)$$

In particular, the velocity at the i^{th} control point is given by

$$\vec{v}_i = \vec{v}_{\infty} + \sum_{j=1}^N \gamma_j \vec{u}_{ij}$$

The boundary condition at the i^{th} control point is that the flow must be perpendicular to the unit normal vector ($\hat{b}_i$) and thus the dot product

$$\vec{v}_i \cdot \hat{b}_i = \vec{v}_{\infty} \cdot \hat{b}_i + \sum_{j=1}^N \gamma_j \vec{u}_{ij} \cdot \hat{b}_i = 0$$

Rearranging, one obtains the system of linear algebraic equations satisfying the B.C.'s at the control points:

$$\sum_{j=1}^N (\vec{u}_{ij} \cdot \hat{b}_i) \gamma_j = -\vec{v}_{\infty} \cdot \hat{b}_i, i = 1, 2, \dots, N$$

which can be solved for the strengths (γ_j). Once the strengths are known, the velocity can be computed at any point by Eq. (1).

2.3 GOETHERT'S RULE

Thus far the analysis applies only to incompressible flow. With certain approximations, compressibility can be accounted for by a transformation called Goethert's Rule¹. The transformation is from the physical plane to a stretched plane in which the transformed velocity potential satisfies Laplace's equation, and thus, in which the method of solution used in the PFP is valid.

The transformation is made properly by PFP independent of the direction of $\vec{v}_{\infty}$; however, for convenience, assume that the free stream is in the x-direction. First, define

$$\beta = \sqrt{1 - M_{\infty}^2}$$

¹See Shapiro, Ascher R. The Dynamics and Thermodynamics of Compressible Fluid Flow. The Ronald Press Co., New York, 1953. Starting on page 394 of Vol. 1.

then the transformation from the physical plane to the stretched plane is given by

$$\bar{x} = x/\beta$$

$$\bar{y} = y$$

$$\bar{z} = z$$

$$\bar{v}_{\infty} = v_{\infty}$$

Velocities are computed in the stretched plane; then the velocities in the physical plane are given by

$$u = (\bar{u} - \bar{v}_{\infty})/\beta^2 + v_{\infty}$$

$$v = \bar{v}/\beta$$

$$w = \bar{w}/\beta$$

For the limits of applicability of Goethert's Rule, see the reference cited in the footnote.

3.0 POTENTIAL FLOW PROGRAM

This section provides the concise, but detailed, information needed for the operation of PFP.

3.1 DATA SETS FOR PFP

Data sets used by PFP are listed below:

<u>Data Set</u>	<u>Description</u>
5	Card input data
6	Printed data
11	Model input data
12	Velocity input data
22	Velocity output data
90	System of equations
91 }	Used in the process of solution of the system of equations; enough space should be allocated to Data Sets 91 and 92 to record the system of equations
92 }	

3.2 CARD INPUT DATA FOR PFP

Four cards are read by PFP as follows:

<u>Card</u>	<u>Variables</u>	<u>Format</u>
1	LABEL	(18A4)
2	AX, AY, AZ, PROX	(4E10.0)
3	FX, FY, FZ, FS, EM, CAY	(6E10.0)
4	LX, LY, LZ, NW	(4I5)

The variables are as follows:

<u>Variable</u>	<u>Definition</u>
LABEL	Title of the shot
AX } AY } AZ }	Angles in degrees the trails of Type 3 singularities make with the three axes
PROX	Proximity of a singularity or part thereof in which its effect is set equal to zero
FX } FY } FZ }	Angles in degrees the free stream makes with the three axes
FS	Magnitude of the free-stream velocity
EM	Free-stream Mach number
CAY	Ratio of specific heats (Set to 1.4 if left blank)
LX } LY } LZ }	Indicates symmetry with respect to respective planes (see below) 0 - no symmetry 1 - symmetry
NW	Left blank if the model input data are to be printed or if the number of singularities is not known; otherwise, it is the number of singularities

Symmetry can be specified with respect to any combination of the three zero planes ($x = 0$, $y = 0$, and $z = 0$) as indicated by the variables (LX, LY, and LZ). If there

is symmetry with respect to one plane, then one-half of the model is input. If there is symmetry with respect to two planes, then one-fourth of the model is input, and if with respect to three planes, then one-eighth of the model is input. Symmetry is easily imposed by combining each input singularity with all its reflections; all parts have the same strength.

3.3 MODEL INPUT DATA FOR PFP

Model data are input to PFP by a data set which is created by a separate program as is explained in Section 5. Each record of the data set supplies data for one singularity of the model and is read by the FORTRAN statement

```
READ (11)  X1,Y1,Z1,X2,Y2,Z2,X3,Y3,Z3,X4,Y4,Z4,
           CX,CY,CZ,BX,BY,BZ,L
```

The variable (L) indicates the type of singularity (1, 2, or 3) (see Fig. 1) or else the last record of the data set by a value of -999.

When $L = 1$, the coordinates of the point source are given in $X1$, $Y1$, and $Z1$.

When $L = 2$ or 3 , the variables $X1$ through $Z4$ are the coordinates of the four vertices of the loop or shoe in the order indicated in Fig. 1.

The variables CX , CY , and CZ are the coordinates of the control point.

If $CX = 1.E50$, then the coordinates are computed by the FORTRAN assignments:

$$CX = .25 * (X1 + X2 + X3 + X4)$$

$$CY = .25 * (Y1 + Y2 + Y3 + Y4)$$

$$CZ = .25 * (Z1 + Z2 + Z3 + Z4)$$

The variables BX , BY , and BZ are the components of the unit normal vector.

If $BX = 1.E50$, then the unit normal vector is computed by taking the normalized vector cross product of the two diagonals of the quadrilateral determined by $X1$ through $Z4$.

If $BX = 1.E51$, then the strength of the singularity is specified by BY .

3.4 VELOCITY INPUT DATA

Velocity input data are instructions to PFP as to what points in the flow field velocities and streamlines are to be computed. As explained in Section 5, this input is by a data set which is created by a separate program. Each record supplies either where a velocity is to be computed or where computation of a streamline is to begin. A record is read by a FORTRAN statement:

```
READ (12)  X,Y,Z,DS,A1,A2,X1,X2,Y1,Y2,Z1,Z2,
           FN,D,D,D,D,D,L
```

The variable (D) is not used.

The variable (L) indicates whether a velocity ($L = 1$) or a streamline ($L = 2$) is to be computed; or else a value of $L = -999$ indicates the last record of the data set.

If $L = 1$, then X, Y, and Z are the coordinates of where the velocity is to be computed. The rest of the data are not used.

If $L = 2$, then X, Y, and Z are where a streamline is to begin. The rest of the data provide control over the accuracy and length of the streamline as follows.

The initial step size is given by DS. The streamline is computed downstream if DS is positive and upstream if DS is negative. The maximum step size is the absolute value of DS.

The variables (A1 and A2) are angles in degrees. If the angle between velocities at the beginning and at the end of a step is less than A1, then the step size is increased. If the angle is greater than A2, then the step size is decreased. If $A2 \leq A1$, then they are set at the default values of 1 deg and 3 deg.

The values of X1 through Z2 are the limits of a rectangular box. Computation of a streamline terminates if it extends outside the box.

Computation of a streamline terminates when the number of steps exceeds FN.

3.5 VELOCITY OUTPUT DATA

Calculation of the flow field velocity is the primary result of PFP; however, from the velocities, various other parameters of interest can be computed. These data are printed and are also recorded on Unit 22 to save for the plot program. Each record is written by a FORTRAN statement

WRITE (22) X,Y,Z,U,V,W,VA,AM,TV,TW,
CP,D,A,A,A,A,A,L

The variable (A) is not used.

The variable (L) is an indicator as follows. A value (L = 1) indicates a velocity. A value (L = 2) indicates the start of a streamline, and the data are a copy of the streamline input data. A value (L = 3) indicates that the record is data for one point of the streamline, and L = 4 indicates the end of the streamline. The last record is indicated by L = -999.

When L = 1 or L = 3, the data of the record are as follows.

<u>Col. No.</u>	<u>Variables</u>	<u>Definition</u>
1	x	Coordinates of the point in the velocity field
2	y	
3	z	
4	U	Components of the velocity
5	V	
6	W	
7	VA (printed as v)	Magnitude of the velocity, $ \vec{v} = \sqrt{u^2 + v^2 + w^2}$
8	AM (printed as M)	Local Mach number, $M = \frac{M_\infty (\vec{v} / \vec{v}_\infty)}{\sqrt{1 + 1/2(k-1)M_\infty^2 [1 - (\vec{v} / \vec{v}_\infty)^2]}}$ where k is the ratio of specific heats
9	TV (printed as A(V,U))	Flow angularity in degrees, $\tan^{-1} [v/u]$
10	TW (printed as A(W,U))	Flow angularity in degrees, $\tan^{-1} [w/u]$
11	CP	Pressure coefficient $C_p = 1 - (\vec{v} / \vec{v}_\infty)^2$
12	D (printed as M-MI)	$M - M_\infty$

These data are computed and printed by the subroutine VELOUT. If alternate parameters are desired or if a format change is needed, only a minor modification of this subroutine would be required.

3.6 ALLOCATION OF MEMORY AND THE GENERAL LOGIC

The large arrays needed during execution of PFP are in COMMON as:

```
COMMON/ARRAYS/L(N), X(4,N), Y(4,N), Z(4,N),CX(N), CY(N),
CZ(N), BX(N), BY(N), BZ(N), H(N)
```

where

<u>Variables</u>	<u>Definitions</u>
L	Types of singularities
X } Y } Z }	Coordinates of the singularities Four locations reserved per singularity, of which only the first is used by Type 1
CX } CY } CZ }	Coordinates of the control points Later the strengths of the singularities are stored in CX
BX } BY } BZ }	Components of unit normal vectors
H	Extra array used in computation of the system of equations

The control points and unit vectors are used only in the computation of the system of equations, and thus, after the system has been computed, the memory beginning with CX(1), and including the remaining memory reserved by the COMMON block, can be used in the solution of the system of equations. It is important that this memory be as large as possible since the larger the memory the quicker the solution is effected.

The reservation of memory is made in subroutine SIZE. To redimension, one needs only to change the two integer constants in this routine, thus the program is easily dimensioned to use whatever memory is available.

The allocation of memory is made in subroutine SCRIMP. An overview of the logic can be obtained by analyzing the main program and the subroutine CHAIN. The functions of the basic subroutines are as follows.

<u>Subroutine</u>	<u>Function</u>
MODEL	Input model data
STRETCH	Transform model according to Goethert's Rule
SYSTEM	Compute the system of equations
LSYSEQ	Solve the system of equations
CHECK	Check the solution
USER	Compute velocities and streamlines as directed by velocity input data

4.0 POTENTIAL FLOW PLOT PROGRAM

It is practically impossible to be certain all singularities are input correctly by checking a tabulation of the coordinates. Similarly, significant trends in the velocities and streamlines can be overlooked if one just looks over a tabulation of the output. Such difficulties are readily resolved by a plot program. Model errors are usually conspicuously evident, and the flow field can be visualized by examining various plots.

The Potential Flow Plot Program was written for the CalComp, Model 765 (hardcopy) or 835 (CRT) plotter. For each view, the program performs a transformation of the three-dimensional data onto a plane, scales it, and plots it. Also available is the capability of producing contour plots of the flow field.

4.1 DATA SETS FOR THE PLOT PROGRAM

Data sets for the plot program are listed below:

<u>Data Set</u>	<u>Description</u>
5	Card input data
6	Printed output
11	Model input data; same as for PFP
12	Velocity input data; same as the velocity output data of PFP
20	Work space; enough space should be allocated to hold both the model and the velocity data

In addition, at AEDC the program output is on tape, PLOTTAPE, which drives the off-line plotter.

4.2 CARD INPUT DATA FOR THE PLOT PROGRAM

The plot program first reads three input cards as follows:

<u>Card</u>	<u>Variables</u>	<u>Format</u>
1	LABEL	(18A4)
2	AN,AT,AV,TX,TY,TZ,VMAX	(7E10.0)
3	LPLOTR,INCHES,LBODY,LTROL, LVELY,LSTRM	(6I5)

<u>Variable</u>	<u>Definition</u>
LABEL	A 72-character title which appears on all plots
AN	Length of normal vectors in model units
AT	Length of trails of Type 3 singularities in model units
AV	Length a unit velocity vector is to be plotted in model units
TX } TY } TZ }	Angles in degrees the trails of Type 3 singularities make with the three axes
VMAX	Velocities greater than this value will not be plotted
LPLOTR	Plotter model 765 - Hard copy 835 - CRT
INCHES	Maximum length of plots in inches; has a default value of 16 if left blank, and a maximum value of 16 if CRT
LBODY	0 - Don't plot model 1 - Plot model
LTROL	0 - Don't plot control points 1 - Plot control points

LVELY	0 - Don't plot velocities 1 - Plot velocities
LSTRM	0 - Don't plot streamlines 1 - Plot streamlines

VIEW DATA. The following data are read for each view to be plotted:

<u>Variables</u>	<u>Format</u>
LVIEW,LSCALE,LPOV	(315)

<u>Variables</u>	<u>Description</u>
LVIEW	1 - YZ view 2 - XZ view 3 - XY view 4 - Isometric 5 - Perspective -1 - Contour plot
LSCALE	0 - Plotting completed 0 - Compute scale 1 - Read scale
LPOV	Used only when LVIEW = 5 0 - Compute point of view 1 - Read point of view

If LVIEW = 5 and LPOV = 1, then the next three cards supply point of view data (see Section 4.3).

If LVIEW = -1, then the next card supplies contour data (see Section 4.4).

If LSCALE = 1, then the next card supplies scale data and is as follows:

<u>Variables</u>	<u>Format</u>
X,Y,DX,DY,WX	(5E10.0)

<u>Variables</u>	<u>Description</u>
X } Y }	Values of the first tic mark on the horizontal and vertical axis, respectively.
DX } DY }	Difference between successive one inch tic marks on the horizontal and vertical axis, respectively
WX	Length in inches of the horizontal axis; must be less than 16 for CRT

When the above data have been read, the view is plotted and a branch is made back to read data for the next view. Description of the data for each view begins at the paragraph labeled "VIEW DATA" above. This loop ends when a value of LVIEW = 0 is read, indicating that all requested plots have been completed.

4.3 PERSPECTIVE PLOTS

The plot program will plot perspective views, that is, views as are seen by the eye. The transformation is the projection of the model from a point onto a plane as is illustrated in Fig. 4. Note that the projection is determined by the three points, labeled A, B, and C, in the figure. The projection plane is perpendicular to the line determined by A and B and is one unit from A toward B. The origin of the axes is the projection of B, and the positive y-axis is determined by the projection of C.

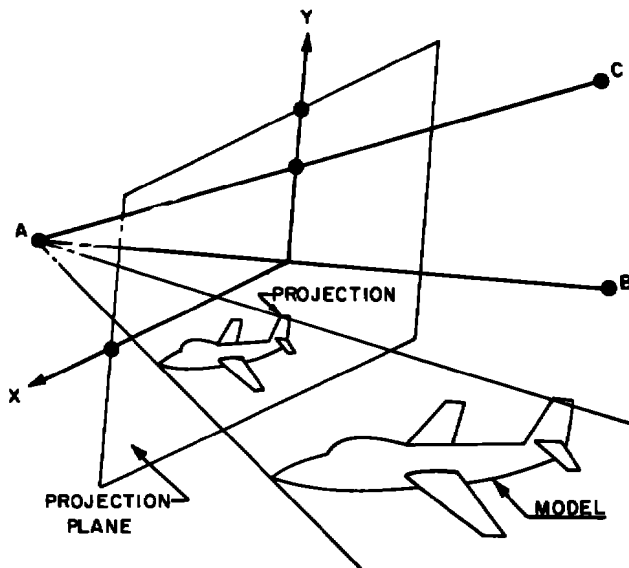


Figure 4. Perspective views.

One can think of the points A, B, and C as determining the point of view. The viewer is at A, looking toward B, and the point C is seen vertically above B. If LPOV = 1, then the coordinates of these three points are read on three cards as follows:

<u>Card</u>	<u>Variables</u>	<u>Format</u>
1	AX,AY,AZ	(3E10.0)
2	BX,BY,BZ	(3E10.0)
3	CX,CY,CZ	(3E10.0)

4.4 CONTOUR PLOTS

In addition to the model and flow field plots, the plot program has the capability of producing contour plots. A contour plot of any parameter Z, of the velocity data set can be plotted as a function of X and Y where X and Y are the horizontal and vertical axes, respectively, of the contour plot and can be any two of the coordinates x, y, or z for a constant value of the third coordinate.

To make a contour plot, the velocity data must be obtained on a uniform grid (net), i.e. - a rectangular array with constant delta X and constant delta Y. The first record of the grid data is always the lower, left-hand corner of the contour plot. Successive records supply data for all the X-values for the first Y-value; then all the X-values for the second Y-value and so on.

The contour card input data are on one card as follows:

<u>Variables</u>	<u>Format</u>
LX,LY,LZ,NX,NY,NZ,NSKIP	(7I5)

<u>Variable</u>	<u>Description</u>
LX } LY }	Values 1, 2, or 3 indicating x, y, or z for the horizontal, X-axis and the vertical Y-axis, respectively
LZ	Which parameter of a velocity data record (see Sec. 3.5) is to be plotted; for example, a value of LZ = 8 would indicate a contour plot of the Mach number

<u>Variable</u>	<u>Description</u>
NX } NY }	The number of X-values and Y-values, respectively
NZ	The approximate number of Z-values to be plotted; there is a default value of 7 if left blank
NSKIP	This is the number of records on the velocity data set before the first record of the grid

5.0 SAMPLE RUN

It has been found that most models run on PFP are so complicated that a special purpose program must be written to prepare the input. The acceptance of this fact resulted in PFP having both general application and simple operation. This was achieved by inputting the model and velocity data via data sets created by a separate program.

The usual procedure used at AEDC in applying PFP is to run three step jobs. The first step executes a program which prepares the input data sets. These sets are passed to the second step which executes PFP. The output of PFP and the model data are passed to the third step which executes the plot program. A complete listing of a run deck for a typical job of this type is given in Appendix A. The printed output of PFP for this sample run is given in Appendix B. Plots produced are given in Figs. B-1 through B-3.

For models such as cylinders and cones, it is usually not difficult to write a program to produce the input to PFP. For irregular shaped models, the subroutine PART of Step 1 of the sample run has been found useful for preparing the input data. When called, it reads card data:

<u>Variables</u>	<u>Format</u>
X(J), Y(J), Z(J)	(3E10.0)

where J = 1 for the first card, J = 2 for the second card, and so on. Reading continues until a value of X = 1.E50 is read. The subroutine then starts reading card data as follows.

<u>Variables</u>	<u>Format</u>
J1, J2, J3, J4, LT	(5I5)

Each record of this second type of data produces a record of model input data (see Sec. 3.3) with

<u>Variables</u>	<u>Values</u>
X1, Y1, Z1	X(J1), Y(J1), Z(J1)
X2, Y2, Z2	X(J2), Y(J2), Z(J2)
X3, Y3, Z3	X(J3), Y(J3), Z(J3)
X4, Y4, Z4	X(J4), Y(J4), Z(J4)
CX, CY, CZ	1.E50, 1.E50, 1.E50
BX, BY, BZ	1.E50, 1.E50, 1.E50
L	LT

This process continues until a blank card is encountered.

In conclusion, it is noted that PFP was written to solve a specific class of problems. Most of the problems for which it is used at AEDC fall within this class and can be run on the program without modification. However, there are endless ways the program could branch to do various things and no attempt was made to include all these as options in the input. Alternatively, the program was written as logically and as modular as possible with the goal that modifications could be made with minimal effort. Documentation also proceeded with this objective in mind. This programming philosophy has resulted in a much shorter and less complicated program. It is urged that for full utility of the method, one become familiar with the coding and not hesitate to make modifications as the occasions arise.

APPENDIX A

SAMPLE RUN DECK LISTING

Following is a listing of the run deck for the sample problem shown in Appendix B.

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
1	// SEP0341.01,P33A-36A),05569T000.							
2	// MSGLEVEL=1.							
3	// CLASS=C.							5
4	// TIME=5							11
5	// EXEC FTGLNKGU							
6	DIMENSION X(500), Y(500), Z(500), J1(500), J2(500), J3(500), J4(50	A	2					
7	10), L(500)	A	3					
8	CALL PART (X,Y,Z)	A	4					
9	CALL PART (X,Y,Z)	A	5					
10	CALL PART (X,Y,Z)	A	6					
11	CALL PART (X,Y,Z)	A	7					
12	CALL PARTS (X,Y,Z,J1,J2,J3,J4,L)	A	8					
13	CALL CLOSE (11)	A	9					
14	CALL VELY	A	10					
15	CALL CLUSE (12)	A	11					
16	WRITE (6,10)	A	12					
17	STOP	A	13					
18	C	A	14					
19	10 FORMAT (5H0STOP)	A	15					
20	END	A	16-					
21	SUBROUTINE CLOSE (1)	B	1					
22	DIMENSION C(18)	B	2					
23	DATA C/18*0./,L/~999/	B	3					
24	WRITE (1) C,L	B	4					
25	END FILE 1	B	5					
26	REWIND 1	B	6					
27	RETURN	B	7					
28	END	B	8-					
29	SUBROUTINE PART (X,Y,Z)	C	1					
30	DIMENSION X(1), Y(1), Z(1), D(6)	C	2					
31	DATA D/6*1.E50/	C	3					
32	WRITE (6,90)	C	4					
33	DO 10 J=1,100000	C	5					
34	READ (5,50) X(J),Y(J),Z(J)	C	6					
35	WRITE (6,70) J,X(J),Y(J),Z(J)	C	7					
36	IF (X(J).EQ.1.E50) GO TO 20	C	8					
37	10 CONTINUE	C	9					
38	20 CONTINUE	C	10					
39	WRITE (6,100)	C	11					
40	DO 30 J=1,100000	C	12					
41	READ (5,60) J1,J2,J3,J4,L	C	13					
42	WRITE (6,80) J,J1,J2,J3,J4,L	C	14					
43	IF (J1.EQ.0) GO TO 40	C	15					
44	WRITE (11) X(J1),Y(J1),Z(J1),X(J2),Y(J2),Z(J2),X(J3),Y(J3),Z(J3),X	C	16					
45	1(J4),Y(J4),Z(J4),D,L	C	17					
46	30 CONTINUE	C	18					
47	40 CONTINUE	C	19					
48	RETURN	C	20					
49	C	C	21					
50	50 FORMAT (7F10.0)	C	22					
	1234567890123456789012345678901234567890123456789012345678901234567890							

SAMPLE RUN DECK LISTING

PAGE 2

	1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890								
51	60	FORMAT (14I5)						C 23
52	70	FORMAT (19,1P9E12.4)						C 24
53	80	FORMAT (9I9)						C 25
54	90	FORMAT (1H1.7X,5HJ X.11X.1HY.11X.1HZ)						C 26
55	100	FORMAT (1H0.7X.1HJ.7X.2HJ1.7X.2HJ2.7X.2HJ3.7X.2HJ4.8X.1HL)						C 27
56		END						C 28-
57		SUBROUTINE PARTS (X,Y,Z,J1,J2,J3,J4,L)						D 1
58		DIMENSION X(1), Y(1), Z(1), J1(1), J2(1), J3(1), J4(1), L(1), D(6)						D 2
59		DATA D/6*1.E50/						D 3
60		WRITE (6,130)						D 4
61		DO 10 J=1,100000						D 5
62		HEAD (5,90) X(J),Y(J),Z(J)						D 6
63		WRITE (6,110) J,X(J),Y(J),Z(J)						D 7
64		IF (X(J).EQ.1.E50) GO TO 20						D 8
65	10	CONTINUE						D 9
66	20	CONTINUE						D 10
67		N=J-1						D 11
68		WRITE (6,140)						D 12
69		DO 30 J=1,100000						D 13
70		READ (5,100) J1(J),J2(J),J3(J),J4(J),L(J)						D 14
71		WRITE (6,120) J,J1(J),J2(J),J3(J),J4(J),L(J)						D 15
72		IF (J1(J).EQ.0) GO TO 40						D 16
73	30	CONTINUE						D 17
74	40	CONTINUE						D 18
75		M=J-1						D 19
76		DO 70 I=1,2						D 20
77		DO 50 J=1,M						D 21
78	50	WRITE (11) X(J1(J)),Y(J1(J)),Z(J1(J)),X(J2(J)),Y(J2(J)),Z(J2(J)),X						D 22
79		1(J3(J)),Y(J3(J)),Z(J3(J)),X(J4(J)),Y(J4(J)),Z(J4(J)),U,L						D 23
80		IF (I.EQ.2) GO TO 80						D 24
81		DO 60 J=1,M						D 25
82	60	Z(J)=-Z(J)						D 26
83	70	CONTINUE						D 27
84	80	CONTINUE						D 28
85		RETURN						D 29
86	C							D 30
87	90	FORMAT (7E10.0)						D 31
88	100	FORMAT (14I5)						D 32
89	110	FORMAT (19,1P9E12.4)						D 33
90	120	FORMAT (9I9)						D 34
91	130	FORMAT (1H1.7X,5HJ X.11X.1HY.11X.1HZ)						D 35
92	140	FORMAT (1H0.7X.1HJ.7X.2HJ1.7X.2HJ2.7X.2HJ3.7X.2HJ4.8X.1HL)						D 36
93		END						D 37-
94		SUBROUTINE VELY						E 1
95		DIMENSION D(15)						E 2
96		DATA D/.2.2*0.-1..16.-10..10.-10..10..90..5*0./						E 3
97		L=1						E 4
98		DO 10 JX=5,7,2						E 5
99		X=JX						E 6
100		DO 10 JZ=1,9						E 7
123456789012345678901234567890123456789012345678901234567890								

SAMPLE RUN DECK LISTING

PAGE 3

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
101		Z=2.+.5*(JZ-1)					E	8
102		DO 10 JY=1,7					E	9
103		Y=.5*(JY-1)					E	10
104	10	WRITE (12) X,Y,Z,D,L					E	11
105		L=2					E	12
106		X=6.					E	13
107		Z=3.75					E	14
108		DO 20 JY=1,J					E	15
109		Y=.5*JY					E	16
110	20	WRITE (12) X,Y,Z,D,L					E	17
111		RETURN					E	18
112		C					E	19
113		END					E	20-
114		//GO,FT11F001 DO DSN=66BODY.						
115		// UNIT=WORK.						
116		// SPACE=(CYL,(1,1),RLSE,,ROUND).						
117		// DISP=(NEW,PASS)						
118		//GO,FT12F001 DO DSN=66VELI.						
119		// UNIT=WORK.						
120		// SPACE=(CYL,(1,1),RLSE,,ROUND).						
121		// DISP=(NEW,PASS)						
122		//GO,FT05F001 DO *						
123	8.	0.	3.75					
124	8.88	0.	4.17					
125	8.88	.42	4.17					
126	8.88	.42	3.75					
127	8.88	.42	3.33					
128	8.88	0.	3.33					
129	9.78	0.	4.17					
130	9.78	.42	4.17					
131	9.78	.42	3.75					
132	9.78	.42	3.33					
133	9.78	0.	3.33					
134	10.75	0.	4.17					
135	10.75	.42	4.17					
136	10.75	.42	3.75					
137	10.75	.42	3.33					
138	10.75	0.	3.33					
139	11.85	0.	4.17					
140	11.85	.42	4.17					
141	11.85	.42	3.75					
142	11.85	.42	3.33					
143	11.85	0.	3.33					
144	13.21	0.	4.17					
145	13.21	.42	4.17					
146	13.21	.42	3.75					
147	13.21	.42	3.33					
148	13.21	0.	3.33					
149		1.E50						
150	1	2	3	1	2			
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
151	1	3	4	1	2			
152	1	4	5	1	2			
153	1	5	6	1	2			
154	2	7	8	3	2			
155	3	8	9	4	2			
156	4	9	10	5	2			
157	5	10	11	6	2			
158	7	12	13	8	2			
159	8	13	14	9	2			
160	9	14	15	10	2			
161	12	17	18	13	2			
162	13	18	19	14	2			
163	14	19	20	15	2			
164	15	20	21	16	2			
165	17	22	23	18	2			
166	18	23	24	19	2			
167	19	24	25	20	2			
168	20	25	26	21	2			
169								
170	9.78	0.		3.33				
171	9.78	.42		3.33				
172	10.75	.42		3.33				
173	10.75	0.		3.33				
174	9.98	0.		3.0				
175	9.98	.42		3.0				
176	10.45	.42		3.0				
177	10.96	.42		3.0				
178	10.96	0.		3.0				
179	10.29	0.		2.5				
180	10.29	.42		2.5				
181	10.77	.42		2.5				
182	11.26	.42		2.5				
183	11.26	0.		2.5				
184	10.6	0.		2.0				
185	10.6	.42		2.0				
186	11.08	.42		2.0				
187	11.57	.42		2.0				
188	11.57	0.		2.0				
189	10.91	0.		1.5				
190	10.91	.42		1.5				
191	11.4	.42		1.5				
192	11.88	.42		1.5				
193	11.88	0.		1.5				
194	11.21	0.		1.0				
195	11.21	.42		1.0				
196	11.71	.42		1.0				
197	12.19	.42		1.0				
198	12.19	0		1.0				
199	11.53	0		.5				
200	11.53	.5		.5				
	1234567890123456789012345678901234567890123456789012345678901234567890							

	1	2	3	4	5	6	7	8
121456789012345678901234567890123456789012345678901234567890								
201	12.03	.5	.5					
202	12.50	.5	.5					
203	12.50	0.	.5					
204	1.E50							
205	1	5	6	2	2			
206	2	6	7	2	2			
207	2	7	3	2	2			
208	3	7	8	3	2			
209	3	8	9	4	2			
210	5	10	11	6	2			
211	6	11	12	7	2			
212	7	12	13	8	2			
213	8	13	14	9	2			
214	10	15	16	11	2			
215	11	16	17	12	2			
216	12	17	18	13	2			
217	13	18	19	14	2			
218	15	20	21	16	2			
219	16	21	22	17	2			
220	17	22	23	18	2			
221	18	23	24	19	2			
222	20	25	26	21	2			
223	21	26	27	22	2			
224	22	27	28	23	2			
225	23	28	29	24	2			
226	25	30	31	26	2			
227	26	31	32	27	2			
228	27	32	33	28	2			
229	28	33	34	29	2			
230								
231	12.5	0.	-.5					
232	12.13	0.	-.5					
233	11.83	0.	0.					
234	11.53	0.	.5					
235	12.5	.5	-.5					
236	12.13	.5	-.5					
237	11.83	.5	0.					
238	11.53	.5	.5					
239	12.5	.5	-.5					
240	12.27	.5	0.					
241	12.03	.5	.5					
242	13.24	.5	-.5					
243	13.13	.5	0.					
244	12.5	.5	.5					
245	12.5	0.	.5					
246	13.0	.5	.5					
247	13.0	0.	.5					
248	13.82	.5	-.5					
249	13.82	.5	0.					
250	13.82	.5	.5					
123456789012345678901234567890123456789012345678901234567890								

SAMPLE RUN DECK LISTING

PAGE 6

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
251	13.82	0.	.5					
252	1.E50							
253	1	5	6	2	2			
254	2	6	7	3	2			
255	3	7	8	4	2			
256	6	9	10	7	2			
257	7	10	11	8	2			
258	9	12	13	10	2			
259	10	13	14	11	2			
260	12	18	19	13	2			
261	13	19	20	16	2			
262	13	16	14	13	2			
263	14	16	17	15	2			
264	16	20	21	17	2			
265								
266	12.5	0.	-.5					
267	12.5	.5	-.5					
268	13.24	.5	-.5					
269	13.82	.5	-.5					
270	13.82	0.	-.5					
271	12.75	0.	-1.					
272	12.75	.5	-1.					
273	13.32	.5	-1.					
274	13.82	.5	-1.					
275	13.82	0.	-1.					
276	13.0	0.	-1.55					
277	13.0	.5	-1.55					
278	13.4	.5	-1.55					
279	13.82	.5	-1.55					
280	13.82	0.	-1.55					
281	13.1	0.	-2.25					
282	13.1	.42	-2.25					
283	13.47	.42	-2.25					
284	13.82	.42	-2.25					
285	13.82	0.	-2.25					
286	13.2	0.	-2.95					
287	13.2	.42	-2.95					
288	13.55	.42	-2.95					
289	13.82	.42	-2.95					
290	13.82	0.	-2.95					
291	1.E50							
292	1	6	7	2	2			
293	2	7	8	3	2			
294	3	8	9	4	2			
295	4	9	10	5	2			
296	6	11	12	7	2			
297	7	12	13	8	2			
298	8	13	14	9	2			
299	9	14	15	10	2			
300	11	16	17	12	2			
	1234567890123456789012345678901234567890123456789012345678901234567890							

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[illegible]

SAMPLE RUN DECK LISTING

PAGE 8

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
351	22.3	.67	.67					
352	22.06	.33	.67					
353	24.5	.67	0.					
354	24.5	.67	.67					
355	23.97	.33	.67					
356	26.37	.3	0.					
357	26.37	.3	.67					
358	26.37	0.	.67					
359	28.	0.	0.					
360	28.	0.	.67					
361	18.	0.	.67					
362	18.	0.	1.92					
363	18.	0.	3.7					
364	18.	0.	5.77					
365	18.	0.	3.					
366	18.3	.2	.67					
367	18.3	.2	1.92					
368	18.3	.2	3.7					
369	18.3	.2	5.77					
370	18.3	.2	8.0					
371	19.04	.33	.67					
372	19.04	.33	1.92					
373	19.04	.33	3.7					
374	19.04	.33	5.77					
375	19.04	.33	8.					
376	20.36	.33	.67					
377	20.3	.33	1.92					
378	20.22	.33	3.7					
379	20.17	.33	5.77					
380	20.08	.33	8.					
381	22.06	.33	.67					
382	21.95	.33	1.92					
383	21.83	.33	3.7					
384	21.7	.33	5.77					
385	21.54	.33	8.					
386	23.97	.33	.67					
387	23.83	.33	1.92					
388	23.63	.33	3.7					
389	23.4	.33	5.77					
390	23.16	.33	8.0					
391	26.37	0.	.67					
392	26.22	0.	1.92					
393	26.04	0.	3.7					
394	25.82	0.	5.77					
395	25.58	0.	8.0					
396	1.	E50						
397	1	2	3	1	2			
398	1	3	4	1	2			
399	1	4	5	1	2			
400	1	5	6	1	2			
	1234567890123456789012345678901234567890123456789012345678901234567890							

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[illegible]

	1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890								
451	69	74	75	70	2			
452	70	75	76	71	2			
453	71	76	77	72	2			
454	73	78	79	74	2			
455	74	79	80	75	2			
456	75	80	81	76	2			
457	76	81	82	77	2			
458	78	83	84	79	2			
459	79	84	85	80	2			
460	80	85	86	81	2			
461	81	86	87	82	2			
462								
463	//	EXEC FTHLNKGO						37
464	C	POTENTIAL FLOW PROGRAM	DONALD C. TODD	JAN 3, 1975				2
465		COMMON /ALPHA/ LABEL(18)						3
466		COMMON /ARRAYS/ X(1)						4
467		COMMON /FIXED/ NW,LX,LY,LZ						5
468		COMMON /FLUAT/ PROX,AX,AY,AZ,CAY,EM,FS,FX,FY,FZ						6
469		COMMON /SKIMP/ NOIM,NOIM,NEED,LA,LB,LC,LD,LE,LF,LG,LH,LI,LJ,LK						7
470		READ (5,10) LABEL						8
471		READ (5,30) AX,AY,AZ,PROX						9
472		READ (5,30) FX,FY,FZ,FS,EM,CAY						10
473		READ (5,20) LX,LY,LZ,NW						11
474		IF (CAY.EQ.0.) CAY=1.4						12
475		IF (NW.EQ.0) CALL PRNTM (NW)						13
476		CALL INITAL						14
477		CALL CHAIN (X(LA),X(LB),X(LC),X(LD),X(LE),X(LF),X(LG),X(LH),X(LI),						15
478		IX(LJ))						16
479		WRITE (6,40)						17
480		STOP						18
481	C							19
482	10	FORMAT (18A4)						20
483	20	FORMAT (14I5)						21
484	30	FORMAT (7E10.0)						22
485	40	FORMAT (14H0JOB COMPLETED)						23
486		END						24-
487		SUBROUTINE CHAIN (X,Y,Z,CX,CY,CZ,BX,BY,BZ,A)						1
488		DIMENSION X(1), Y(1), Z(1), CX(1), CY(1), CZ(1), BX(1), BY(1), BZ(						2
489		11), A(1)						3
490		CALL MODEL (X,Y,Z,CX,CY,CZ,BX,BY,BZ)						4
491		CALL STRECH (X,Y,Z,CX,CY,CZ,BX,BY,BZ)						5
492		CALL SYSTEM (X,Y,Z,CX,CY,CZ,BX,BY,BZ,A)						6
493		CALL LSYSEQ (CX)						7
494		CALL CHECK (CX,CY)						8
495		CALL USER (X,Y,Z,CX)						9
496		RETURN						10
497		END						11-
498		FUNCTION ATAND (X,Y)						1
499		DATA DPR/57.29578/						2
500		IF (X.NE.0.) GO TO 10						3
1234567890123456789012345678901234567890123456789012345678901234567890								

34

[illegible]

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
601	J1=J+1							I 19
602	P=A(J,J)							I 20
603	DU 50 K=MP1,N							I 21
604	U=A(K,J)							I 22
605	IF (J.EQ.4) GO TO 40							I 23
606	DU 30 L=J1,N							I 24
607	37 Q=Q-A(L,J)*A(K,L)							I 25
608	40 A(K,J)=Q/P							I 26
609	50 CONTINUE							I 27
610	RETURN							I 28
611	END							I 29-
612	SUBROUTINE INITIAL							J 1
613	COMMON /FIXED/ NW,LX,LY,LZ							J 2
614	COMMON /FLOAT/ PS,A(3),CA,EM,FS,F(3),G(3),H(3),EMS,BETA,RB,RBS							J 3
615	COMMON /SKIMP/ MDIM,NDIM,NEED							J 4
616	DATA TUL/1.E-5/							J 5
617	WRITE (6,70)							J 6
618	WRITE (6,50) LX,LY,LZ							J 7
619	WRITE (6,80)							J 8
620	WRITE (6,60) A,PS							J 9
621	WRITE (6,40)							J 10
622	WRITE (6,60) F,FS,EM,CA							J 11
623	DO 10 J=1,J							J 12
624	A(J)=COSD(A(J))							J 13
625	10 F(J)=COSD(F(J))							J 14
626	CALL WIND							J 15
627	AE=1.-(A(1)**2+A(2)**2+A(3)**2)							J 16
628	FF=1.-(F(1)**2+F(2)**2+F(3)**2)							J 17
629	GE=1.-(G(1)**2+G(2)**2+G(3)**2)							J 18
630	HE=1.-(H(1)**2+H(2)**2+H(3)**2)							J 19
631	PS=PS*PS							J 20
632	CA=.5*(CA-1.)							J 21
633	EMS=EM**2							J 22
634	DETA=SQR(1.-EMS)							J 23
635	RR=1./DETA							J 24
636	RBS=RB**2							J 25
637	CALL SIZE (NDIM)							J 26
638	CALL SCRIMP							J 27
639	WRITE (6,100)							J 28
640	WRITE (6,50) NW,NDIM,NDIM,NEED							J 29
641	WRITE (6,110)							J 30
642	WRITE (6,60) PS,CA,EMS,BETA,RB							J 31
643	WRITE (6,120)							J 32
644	WRITE (6,60) A,AE							J 33
645	WRITE (6,130)							J 34
646	WRITE (6,60) F,FE							J 35
647	WRITE (6,60) G,GE							J 36
648	WRITE (6,60) H,HE							J 37
649	LD=0							J 38
650	IF (NDIM.GE.NFED) GO TO 20							J 39

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SAMPLE RUN DECK LISTING

PAGE 14

	1	2	3	4	5	6	7	8
123456789012345678901234567890123456789012345678901234567890								
651								J 40
652								J 41
653	20							J 42
654								J 43
655								J 44
656								J 45
657								J 46
658	30							J 47
659								J 48
660	40							J 49
661								J 50
662								J 51
663	C							J 52
664	50							J 53
665	60							J 54
666	70							J 55
667	80							J 56
668	90							J 57
669	100							J 58
670	110							J 59
671	120							J 60
672	130							J 61
673	140							J 62
674	150							J 63
675								J 64-
676								K 1
677	C							K 2
678	C							K 3
679								K 4
680								K 5
681								K 6
682								K 7
683								K 8
684								K 9
685								K 10
686								K 11
687	10							K 12
688								K 13
689								K 14
690								K 15
691								K 16
692								K 17
693								K 18
694								K 19
695								K 20
696								K 21
697								K 22
698								K 23
699								K 24
700								K 25
123456789012345678901234567890123456789012345678901234567890								

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
701	J1=J1+1							K 26
702	20 IF (LB.EQ.1) GO TO 30							K 27
703	CALL BLKIN (JU1,N1,MA,MM1,M2,LB,LE,A(J1))							K 28
704	CALL ELIMIN (N1,M1,M2,A)							K 29
705	CALL BLKUOT (JU2,N1,N2,M2,O,LE,A(J1))							K 30
706	MM2=MAXO(MM2,M2)							< 31
707	GO TO 20							K 32
708	30 CALL BLKUOT (JU2,N1,N2,M1,I,LE1,A)							K 33
709	WRITE (6,100) JU1,JU2,MM2,N2							< 34
710	IF (LE1.EQ.1) GO TO 50							K 35
711	GU TO 10							K 36
712	40 WRITE (6,70)							< 37
713	STOP							K 38
714	50 CALL XDUT (JU2,N2,A)							K 39
715	WRITE (6,80)							< 40
716	RETURN							K 41
717	C							K 42
718	60 FORMAT (17HOSOLUTION STARTED)							K 43
719	70 FORMAT (14HOMETHOD FAILED)							K 44
720	80 FORMAT (14HOSYSTEM SOLVED)							K 45
721	90 FORMAT (1H0.5X,3HJU1.6X,3HJU2.6X,3HMM2.7X,2HN2)							K 46
722	100 FORMAT (9I9)							< 47
723	END							K 48-
724	SUBROUTINE MODEL (X,Y,Z,CX,CY,CZ,BX,BY,BZ)							L 1
725	DIMENSION X(4), Y(4), Z(4), CX(1), CY(1), CZ(1), BX(1), BY(1)							L 2
726	I), BZ(1)							L 3
727	COMMON /ARRAYS/ ITR(1)							L 4
728	COMMON /FIXED/ NW							L 5
729	NW=0							L 6
730	DO 10 K=1,NW							L 7
731	READ (11) (X(J,K),Y(J,K),Z(J,K),J=1,4),CX(K),CY(K),CZ(K),BX(K),BY(K)							L 8
732	I(K),BZ(K),ITR(K)							L 9
733	IF (BX(K).EQ.1,E51) GO TO 10							L 10
734	IF (CX(K).EQ.1,E50) CALL CONTRL (X(I,K),Y(I,K),Z(I,K),CX(K),CY(K),							L 11
735	ICZ(K))							L 12
736	IF (BX(K).NE.1,E50) GO TO 10							L 13
737	CALL NORMAL (X(I,K),Y(I,K),Z(I,K),BX(K),BY(K),BZ(K),LE)							L 14
738	IF (LE.EQ.0) GO TO 10							L 15
739	NW=NW+1							L 16
740	WRITE (6,20) K							L 17
741	10 CONTINUE							L 18
742	REWIND 11							L 19
743	IF (NW.NE.0) STOP							L 20
744	RETURN							L 21
745	C							L 22
746	20 FORMAT (I9,12H ZERO NORMAL)							L 23
747	END							L 24-
748	SUBROUTINE NORMAL (X,Y,Z,CX,CY,CZ,L)							M 1
749	DIMENSION X(4), Y(4), Z(4)							M 2
750	AX=X(4)-X(2)							M 3

SAMPLE RUN DECK LISTING

PAGE 16

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
751	AY=Y(4)-Y(2)							N 4
752	AZ=Z(4)-Z(2)							N 5
753	BX=X(3)-X(1)							N 6
754	BY=Y(3)-Y(1)							N 7
755	BZ=Z(3)-Z(1)							N 8
756	CX=AY*BZ-AZ*BY							N 9
757	CY=AZ*BX-AX*BZ							N 10
758	CZ=AX*BY-AY*BX							N 11
759	F=SQRT(CX**2+CY**2+CZ**2)							N 12
760	IF (F.EQ.0.) GO TO 10							N 13
761	L=0							N 14
762	F=1./F							N 15
763	CX=F*CX							N 16
764	CY=F*CY							N 17
765	CZ=F*CZ							N 18
766	RETURN							N 19
767	10 L=1							N 20
768	RETURN							N 21
769	END							N 22-
770	SUBROUTINE PAGE (I,J,N)							N 1
771	COMMON /ALPHA/ LABEL(18)							N 2
772	J=J+I							N 3
773	IF (J.LE.N) RETURN							N 4
774	J=I							N 5
775	WRITE (6,10) LABEL							N 6
776	RETURN							N 7
777	C							N 8
778	10 FORMAT (1H1,18A4)							N 9
779	END							N 10-
780	SUBROUTINE POINT (END,A,B,C,X,Y,Z,U,V,W)							O 1
781	COMMON /FLOAT/ PS							O 2
782	RX=X-A							O 3
783	RY=Y-B							O 4
784	RZ=Z-C							O 5
785	RS=RX**2+RY**2+RZ**2							O 6
786	IF (RS.LE.PS) GO TO 10							O 7
787	F=END/(12.56637*RS*SQRT(RS))							O 8
788	U=F*RX							O 9
789	V=F*RY							O 10
790	W=F*RZ							O 11
791	RETURN							O 12
792	10 U=0.							O 13
793	V=0.							O 14
794	W=0.							O 15
795	RETURN							O 16
796	END							O 17-
797	SUBROUTINE PRNTN (N)							P 1
798	DIMENSION C(18)							P 2
799	N=0							P 3
800	K=0							P 4
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
901	J=1000							P 5
902	10 READ (11) C,L							P 6
903	IF (L.EQ.-999) GO TO 30							P 7
904	N=N+1							P 8
905	CALL PAGE (2,J,50)							P 9
906	IF (J.GT.2) GO TO 20							P 10
907	K=K+1							P 11
908	WRITE (6,40) K							P 12
909	20 WRITE (6,50) N,(C(1),I=1,6),(C(1),I=13,15)							P 13
910	WRITE (6,60) L,(C(1),I=7,12),(C(1),I=16,18)							P 14
911	GO TO 10							P 15
912	30 REWIND 11							P 16
913	RETURN							P 17
914	C							P 18
915	40 FORMAT (19H MODEL DATA PAGE,14)							P 19
916	50 FORMAT (16.2X,1P3E12.4,1X,3E12.4,3X,3E12.4)							P 20
917	60 FORMAT (16.1P3E12.4,1X,3E12.4,3X,3E12.4)							P 21
918	END							P 22-
919	SUBROUTINE RAY (G,AX,AY,AZ,EX,EY,EZ,CX,CY,CZ,DX,DY,DZ)							Q 1
920	COMMON /FLUAT/ PS							Q 2
921	FX=CX-AX							Q 3
922	FY=CY-AY							Q 4
923	FZ=CZ-AZ							Q 5
924	FS=FX*FX+FY*FY+FZ*FZ							Q 6
925	IF (FS.EQ.0.) GO TO 10							Q 7
926	DX=EY*FZ-FZ*FY							Q 8
927	DY=EZ*FX-CX*FZ							Q 9
928	DZ=EX*FY-EY*FX							Q 10
929	DS=DX*DX+DY*DY+DZ*DZ							Q 11
930	IF (DS.LE.PS) GO TO 10							Q 12
931	CT1=(EX*FX+EY*FY+EZ*FZ)/SQRT(FS)							Q 13
932	C=G*(CT1+1.)/(12.56637*DS)							Q 14
933	DX=C*DX							Q 15
934	DY=C*DY							Q 16
935	DZ=C*DZ							Q 17
936	RETURN							Q 18
937	10 DX=0.							Q 19
938	DY=0.							Q 20
939	DZ=0.							Q 21
940	RETURN							Q 22
941	END							Q 23-
942	SUBROUTINE SCRIMP							R 1
943	COMMON /FIXED/ NW							R 2
944	COMMON /SKIMP/ NDIM,NDIM,NEED,L(1)							R 3
945	L(1)=1*NW							R 4
946	LA=4*NW							R 5
947	DO 10 K=2,4							R 6
948	10 L(K)=L(K-1)+LA							R 7
949	DO 20 K=5,11							R 8
950	20 L(K)=L(K-1)+NW							R 9

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SAMPLE RUN DECK LISTING

PAGE 18

	1	2	3	4	5	6	7	8
12345678901234567890123456789012345678901234567890123456789012345678901234567890								
851								R 10
852								R 11
853								R 12
854								R 13-
855								S 1
856								S 2
857								S 3
858								S 4
859								S 5
860								S 6
861								S 7
862								S 8
863								S 9
864								S 10
865								S 11
866								S 12
867								S 13
868								S 14
869								S 15
870								S 16
871								S 17
872								S 18
873								S 19
874								S 20
875								S 21
876								S 22
877								S 23
878								S 24
879								S 25
880								S 26
881								S 27
882	10							S 28
883								S 29
884								S 30
885								S 31
886								S 32-
887								T 1
888								T 2
889								T 3
890								T 4
891								T 5-
892								U 1
893								U 2
894								U 3
895								U 4
896								U 5
897								U 6-
898								V 1
899								V 2
900	C							V 3
12345678901234567890123456789012345678901234567890123456789012345678901234567890								

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
901	DIMENSION A(1), A2(1), A3(1), A4(1)				V			4
902	DIMFNSION CODE(B)				V			5
903	DATA CODE/4HN>NX, 4HX<XN, 4HX>XX, 4HY<YN, 4HY>YX, 4HZ<ZN, 4HZ>ZX, 4HD<DN/				V			6
904	J=1000				V			7
905	JPAGE=0				V			8
906	L=1				V			9
907	DSX=ABS(DS0)				V			10
908	DSN=.001*DSX				V			11
909	CX=COSO(AN)				V			12
910	CN=COSO(AX)				V			13
911	DS=DS0				V			14
912	N=0				V			15
913	X=X0				V			16
914	Y=Y0				V			17
915	Z=Z0				V			18
916	CALL VELOCY (A1,A2,A3,A4,X,Y,Z,U,V,W)				V			19
917	CALL PAGE (I,J,50)				V			20
918	IF (J.GT.I) GO TO 20				V			21
919	JPAGE=JPAGE+1				V			22
920	WRITE (6,I40) JSTRM,JPAGE,AN,AX,DS0				V			23
921	CALL VELLAB				V			24
922	CONTINUE				V			25
923	CALL VELOUT (X,Y,Z,U,V,W,J,22)				V			26
924	IF (N.GE.NX) GO TO 120				V			27
925	IF (X.LE.XN) GO TO 110				V			28
926	IF (X.GE.XX) GO TO 100				V			29
927	IF (Y.LE.YN) GO TO 90				V			30
928	IF (Y.GE.YX) GO TO 80				V			31
929	IF (Z.LE.ZN) GO TO 70				V			32
930	IF (Z.GE.ZK) GO TO 60				V			33
931	T=SQRT(U*U+V*V+W*W)				V			34
932	F=DS/T				V			35
933	X1=X+F*X				V			36
934	Y1=Y+F*Y				V			37
935	Z1=Z+F*Z				V			38
936	CALL VELOCY (A1,A2,A3,A4,X1,Y1,Z1,U1,V1,W1)				V			39
937	T1=SQRT(U1*U1+V1*V1+W1*W1)				V			40
938	C=(U*U1+V*V1+W*W1)/(T*T1)				V			41
939	IF (C.GE.CN) GO TO 40				V			42
940	DS=.75*DS				V			43
941	IF (ABS(DS).LE.DSN) GO TO 50				V			44
942	GO TO 30				V			45
943	F=.5*DS				V			46
944	X=X+F*(U/T+U1/T1)				V			47
945	Y=Y+F*(V/T+V1/T1)				V			48
946	Z=Z+F*(W/T+W1/T1)				V			49
947	N=N+1				V			50
948	IF (C.GT.CK) DS=SIGN(AMIN1(DSX,.1+.5*ABS(DS)),DS)				V			51
949	GO TO 10				V			52
950	L=L+1				V			53

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SAMPLE RUN DECK LISTING

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	1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890								
951	00	L=L+1						V 54
952	70	L=L+1						V 55
953	80	L=L+1						V 56
954	90	L=L+1						V 57
955	100	L=L+1						V 58
956	110	L=L+1						V 59
957	120	WRITE (6,130) CODE(L)						V 60
958		RETURN						V 61
959	C							V 62
960	130	FORMAT (8H0 ***** ,A4.6H *****)						V 63
961	140	FORMAT (11H STREAMLINE,14.4X,4HPAGE,14/5H AN =,F6.3,5X,4HAX =,F6.3						V 64
962		1,5X,5HDSO =,1PE12.4)						V 65
963		END						V 66-
964		SUBROUTINE STRECH (X,Y,Z,CX,CY,CZ,BX,BY,BZ)						W 1
965		DIMENSION X(4,1), Y(4,1), Z(4,1), CX(1), CY(1), CZ(1), BX(1), BY(1						W 2
966		1), BZ(1)						W 3
967		COMMON /FIXED/ NW						W 4
968		COMMON /FLOAT/ DM1,AX,AY,AZ,DM,EM,DM2(11),BETA,RB						W 5
969		IF (EM.EQ.0.) RETURN						W 6
970		DO 20 K=1,NW						W 7
971		DO 10 J=1,4						W 8
972	10	CALL STRCH (RB,X(J,K),Y(J,K),Z(J,K))						W 9
973		IF (BX(K).EQ.1.E51) GO TO 20						W 10
974		CALL STRCH (RB,CX(K),CY(K),CZ(K))						W 11
975		CALL STRCH (BETA,BX(K),BY(K),BZ(K))						W 12
976		CALL UNITYZ (BX(K),BY(K),BZ(K))						W 13
977	20	CONTINUE						W 14
978		CALL STRCH (RB,AX,AY,AZ)						W 15
979		CALL UNITYZ (AX,AY,AZ)						W 16
980		WRITE (6,30)						W 17
981		RETURN						W 18
982	C							W 19
983	30	FORMAT (15H0BODY STRETCHED)						W 20
984		END						W 21-
985		SUBROUTINE SYNTRY (PX,PY,PZ,VX,VY,VZ,G,X,Y,Z,L)						X 1
986		DIMENSION X(1), Y(1), Z(1)						X 2
987		COMMON /FIXED/ JDM,LX,LY,LZ						X 3
988		VX=0.						X 4
989		VY=0.						X 5
990		VZ=0.						X 6
991		QX=PX						X 7
992		QY=PY						X 8
993		QZ=PZ						X 9
994		SX=1.						X 10
995		SY=1.						X 11
996		SZ=1.						X 12
997		DO 50 JZ=1,2						X 13
998		DO 30 JY=1,2						X 14
999		DO 10 JX=1,2						X 15
1000		CALL TYPE (QX,QY,QZ,UX,UY,UZ,G,X,Y,Z,L)						X 16
1234567890123456789012345678901234567890123456789012345678901234567890								

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
1001								X 17
1002								X 18
1003								X 19
1004								X 20
1005								X 21
1006	10							X 22
1007	20							X 23
1008								X 24
1009	30							X 25
1010	40							X 26
1011								X 27
1012	50							X 28
1013	60							X 29
1014								X 30-
1015								Y 1
1016								Y 2
1017								Y 3
1018								Y 4
1019								Y 5
1020								Y 6
1021								Y 7
1022								Y 8
1023								Y 9
1024								Y 10
1025								Y 11
1026								Y 12
1027								Y 13
1028								Y 14
1029								Y 15
1030	10							Y 16
1031	20							Y 17
1032								Y 18
1033								Y 19
1034	30							Y 20
1035								Y 21
1036								Y 22
1037								Y 23-
1038								Z 1
1039								Z 2
1040								Z 3
1041								Z 4
1042								Z 5
1043								Z 6
1044								Z 7
1045								Z 8
1046								Z 9
1047								Z 10
1048								Z 11
1049								Z 12
1050	10							Z 13
	1234567890123456789012345678901234567890123456789012345678901234567890							

PAGE 22

12345678901234567890123456789012345678901234567890123456789012345678901234567890

	1	2	3	4	5	6	7	8
1101	12345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901
	CALL SEGM	(G,X(4),Y(4),Z(4),X(1),Y(1),Z(1),PX,PY,PZ,WX,WY,WZ)						AB 15
1102		VX=VX+WX						AB 16
1103		VY=VY+WY						AB 17
1104		VZ=VZ+WZ						AB 18
1105		RETURN						AB 19
1106	20	CONTINUE						AB 20
1107		CALL RAY (G,X(4),Y(4),Z(4),AX,AY,AZ,PX,PY,PZ,UX,UY,UZ)						AB 21
1108		CALL RAY (G,X(1),Y(1),Z(1),AX,AY,AZ,PX,PY,PZ,WX,WY,WZ)						AB 22
1109		VX=UX+VX-WX						AB 23
1110		VY=UY+VY-WY						AB 24
1111		VZ=UZ+VZ-WZ						AB 25
1112		RETURN						AB 26
1113		END						AB 27-
1114		SUBROUTINE UNITYZ (X,Y,Z)						AC 1
1115		F=1./SQRT(X**2+Y**2+Z**2)						AC 2
1116		X=F*X						AC 3
1117		Y=F*Y						AC 4
1118		Z=F*Z						AC 5
1119		RETURN						AC 6
1120		END						AC 7-
1121		SUBROUTINE USER (X,Y,Z,G)						AD 1
1122		DIMENSION X(1), Y(1), Z(1), G(18)						AD 2
1123		I=0						AD 3
1124		KPAGE=0						AD 4
1125	10	J=1000						AD 5
1126	20	READ (12) X0,Y0,Z0,D50,A1,A2,X1,X2,Y1,Y2,Z1,Z2,TN,A,B,C,D,E,L						AD 6
1127		IF (L.EQ.-999) GO TO 60						AD 7
1128		IF (L.NE.1) GO TO 40						AD 8
1129		CALL VELOCITY (X,Y,Z,G,X0,Y0,Z0,U,V,W)						AD 9
1130		CALL PAGE (1,J,50)						AD 10
1131		IF (J.GT.1) GO TO 30						AD 11
1132		KPAGE=KPAGE+1						AD 12
1133		WRITE (6,70) KPAGE						AD 13
1134		CALL VELLAB						AD 14
1135	30	CONTINUE						AD 15
1136		CALL VELOCITY (X0,Y0,Z0,U,V,W,L,22)						AD 16
1137		GO TO 20						AD 17
1138	40	IF (L.NE.2) GO TO 20						AD 18
1139		WRITE (22) X0,Y0,Z0,D50,A1,A2,X1,X2,Y1,Y2,Z1,Z2,TN,A,B,C,D,E,L						AD 19
1140		N2=TN						AD 20
1141		IF (A1.LT.A2) GO TO 50						AD 21
1142		A1=1.						AD 22
1143		A2=3.						AD 23
1144	50	I=I+1						AD 24
1145		CALL STREAM (X,Y,Z,G,X0,Y0,Z0,D50,A1,A2,X1,X2,Y1,Y2,Z1,Z2,N2,I)						AD 25
1146		L=4						AD 26
1147		WRITE (22) G,L						AD 27
1148		GO TO 10						AD 28
1149	60	WRITE (22) G,L						AD 29
1150		END FILE 22						AD 30

1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890							
1151		REWIND 22						AD 31
1152		RETURN						AD 32
1153	C							AD 33
1154	70	FORMAT (19H VELOCITIES PAGE,[4])						AD 34
1155		END						AD 35-
1156		SUBROUTINE VELOCITY (X,Y,Z,G,XB,YB,ZB,TU,TV,TW)						AE 1
1157		DIMENSION X(4,1), Y(4,1), Z(4,1), G(1)						AE 2
1158		COMMON /ARRAYS/ ITR(1)						AE 3
1159		COMMON /FIXED/ NW						AE 4
1160		COMMON /FLOAT/ DM1(6),FS,DM2(11),RB,RBS						AE 5
1161		KD=XB						AE 6
1162		YD=YB						AE 7
1163		ZD=ZB						AE 8
1164		CALL STRCH (RB,KD,YD,ZD)						AE 9
1165		TU=0.						AE 10
1166		TV=0.						AE 11
1167		TW=0.						AE 12
1168		DO 10 L=1,NW						AE 13
1169		CALL SYNTRY (KD,YD,ZD,U,V,W,G(L),X(1,L),Y(1,L),Z(1,L),ITR(L))						AE 14
1170		TU=TU+U						AE 15
1171		TV=TV+V						AE 16
1172		TW=TW+W						AE 17
1173	10	CONTINUE						AE 18
1174		CALL TOWIND (TU,TV,TW)						AE 19
1175		TU=TU*RBS+FS						AE 20
1176		TV=TV*RB						AE 21
1177		TW=TW*RB						AE 22
1178		CALL TOBODY (TU,TV,TW)						AE 23
1179		RETURN						AE 24
1180		END						AE 25-
1181		SUBROUTINE VELOUT (KD,YD,ZD,U,V,W,L,I)						AF 1
1182		COMMON /FLOAT/ DM1(4),CA,EN,FS,DM2(9),EMS						AF 2
1183		VS=U**2+V**2+W**2						AF 3
1184		VA=SQRT(VS)						AF 4
1185		R=VA						AF 5
1186		IF (FS.NE.0.) R=VA/FS						AF 6
1187		CP=1.-R**2						AF 7
1188		AM=1.+CA*EMS*CP						AF 8
1189		IF (AM.LE.0.) GO TO 10						AF 9
1190		AM=EN*R/SQRT(AM)						AF 10
1191	10	CONTINUE						AF 11
1192		TV=ATAND(V,U)						AF 12
1193		TW=ATAND(W,U)						AF 13
1194		D=AM-EM						AF 14
1195		WRITE (1) KD,YD,ZD,U,V,W,VA,AM,TV,TW,CP,D,A,A,A,A,A,L						AF 15
1196		WRITE (6,30) KD,YD,ZD,U,V,W,VA,AM,TV,TW,CP,D						AF 16
1197		RETURN						AF 17
1198		ENTRY VELLAS						AF 18
1199		WRITE (6,20)						AF 19
1200		RETURN						AF 20
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890							

	1	2	3	4	5	6	7	8
1201	C							AF 21
1202	20	FORMAT (1H, T4, 1HX, T16, 1HY, T28, 1HZ, T41, 1HU, T51, 1HV, T61, 1HW, T70, 3H,						AF 22
1203		1V), T91, 1HM, T90, 6HA(V,U), T99, 6HA(W,U), T108, 2MCP, T119, 4MM-MI)						AF 23
1204	30	FURMAT (1P3E12.4, 0P5F10.5, F8.2, F9.2, 1PE12.3, E11.3)						AF 24
1205		END						AF 25-
1206		SUBROUTINE WIND						AG 1
1207		COMMON /FLOAT/ DUM(7), FX, FY, FZ, GX, GY, GZ, MX, MY, MZ						AG 2
1208		R=SQRT(FX**2+FY**2)						AG 3
1209		IF (R.GT..001) GO TO 10						AG 4
1210		FX=0.						AG 5
1211		FY=0.						AG 6
1212		FZ=SIGN(1., FZ)						AG 7
1213		GX=0.						AG 8
1214		GY=1.						AG 9
1215		GZ=0.						AG 10
1216		MX=-FZ						AG 11
1217		MY=0.						AG 12
1218		MZ=0.						AG 13
1219		RETURN						AG 14
1220	10	GX=-FY/R						AG 15
1221		GY=FX/R						AG 16
1222		GZ=0.						AG 17
1223		MX=-FZ*GY						AG 18
1224		MY=FZ*GX						AG 19
1225		MZ=R						AG 20
1226		RETURN						AG 21
1227		END						AG 22-
1228		SUBROUTINE XOUT (JU, N, X)						AM 1
1229		DIMENSION X(N, 1)						AM 2
1230		L=0						AM 3
1231	10	READ (JU) N, LB, LE, (X(1, L+K), K=1, N)						AM 4
1232		L=L+N						AM 5
1233		IF (LB.EQ.0) GO TO 10						AM 6
1234		REWIND JU						AM 7
1235		RETURN						AM 8
1236		END						AM 9-
1237		//GO, FT11F001 DD DSN=66BODY.						
1238		// DISP=(OLD, PASS)						97
1239		//GO, FT12F001 DD DSN=66VELI.						
1240		// DISP=(OLD, DELETE)						
1241		//GO, FT90F001 DD UNIT=WORK.						
1242		// SPACE=(CYL.(1, 1), RLSE., ROUND)						
1243		//GO, FT91F001 DD UNIT=WORK.						
1244		// SPACE=(CYL.(1, 1), RLSE., ROUND)						
1245		//GO, FT92F001 DD UNIT=WORK.						
1246		// SPACE=(CYL.(1, 1), RLSE., ROUND)						
1247		//GO, FT22F001 DD DSN=66VELY.						
1248		// UNIT=WORK.						01090
1249		// SPACE=(CYL.(1, 1), RLSE., ROUND).						01100
1250		// DISP=(NEW, PASS)						01120
		1234567890123456789012345678901234567890123456789012345678901234567890						

	1	2	3	4	5	6	7	8
1251	123456789012345678901234567890123456789012345678901234567890							
1252	//GO.FT05F001 DO *							
1253	QUICK TURN WITH STRUT #1	M=.5						
1254	0.	90.	90.	1.0	.50			
1255	0	1	0					
1256	// EXEC FTHLNKGO.							38
1257	// PLOTLIB=PLOT765							04290
1258	C POTENTIAL FLOW PLOT PROGRAM	DONALD C. TODD	JAN 3, 1975					A 2
1259	COMMON /ALPHA/ LABEL(18),ID1(9),ID2(9)							A 3
1260	COMMON /ARRAYS/ C(42),P(400,21)							A 4
1261	COMMON /CVIEW/ LVIEW,LSCALE,LPOV							A 5
1262	COMMON /FIXED/ LPLOTR,INCHES,LBODY,LTROL,LVELY,LSTRM							A 6
1263	COMMON /FLQAT/ AN,AT,AV,TX,TY,TZ,VMAX,RPD,BIG							A 7
1264	DATA NDIM/400/							A 8
1265	READ (5,40) LABEL							A 9
1266	READ (5,50) AN,AT,AV,TX,TY,TZ,VMAX							A 10
1267	READ (5,60) LPLOTR,INCHES,LBODY,LTROL,LVELY,LSTRM							A 11
1268	BIG=1.E50							A 12
1269	RPD=.01745329							A 13
1270	IF (AV.EQ.0.) LVELY=0							A 14
1271	IF (VMAX.LE.0.) VMAX=BIG							A 15
1272	IF (LPLOTR.EQ.835) INCHES=MIN0(INCHES,16)							A 16
1273	IF (INCHES.EQ.0) INCHES=16							A 17
1274	CALL LABELS (ID1,36H	)						A 18
1275	CALL LABELS (ID2,36HDC TODD CCO	)						A 19
1276	CALL DATE							A 20
1277	WRITE (6,70)							A 21
1278	WRITE (6,80) ID1,ID2							A 22
1279	WRITE (6,80) LABEL							A 23
1280	WRITE (6,110)							A 24
1281	WRITE (6,90) AN,AT,AV,TX,TY,TZ,VMAX							A 25
1282	WRITE (6,120)							A 26
1283	WRITE (6,100) LPLOTR,INCHES,LBODY,LTROL,LVELY,LSTRM							A 27
1284	TX=COS(RPD*TX)							A 28
1285	TY=COS(RPD*TY)							A 29
1286	TZ=COS(RPD*TZ)							A 30
1287	TE=1.-(TX**2+TY**2+TZ**2)							A 31
1288	TX=AT*TX							A 32
1289	TY=AT*TY							A 33
1290	TZ=AT*TZ							A 34
1291	WRITE (6,130)							A 35
1292	WRITE (6,90) TX,TY,TZ,TE							A 36
1293	CALL SETUP (P,P(1,19),P(1,20),P(1,21),NDIM)							A 37
1294	CALL OPEN							A 38
1295	DO 20 LV=1,100000							A 39
1296	READ (5,60) LVIEW,LSCALE,LPOV							A 40
1297	IF (LVIEW.EQ.0) GO TO 30							A 41
1298	WRITE (6,140)							A 42
1299	WRITE (6,100) LVIEW,LSCALE,LPOV							A 43
1300	CALL VIEWZ							A 44
	123456789012345678901234567890123456789012345678901234567890							

[illegible]

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	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890							
1401		WRITE (6,170)						E 13
1402		RETURN						E 14
1403	10	CONTINUE						E 15
1404		CALL CONTUL (LX,LY,LC,1DC)						E 16
1405		IF (NSKIP.EQ.0) GO TO 30						E 17
1406		DO 20 J=1,NSKIP						E 18
1407	20	READ (12) C,L						E 19
1408	30	CONTINUE						E 20
1409		DO 60 J=1,NA						E 21
1410		READ (12) C,L						E 22
1411		IF (J.GT.1) GO TO 40						E 23
1412		CL=C(LC)						E 24
1413		X1=C(LX)						E 25
1414		Y1=C(LY)						E 26
1415		GO TO 50						E 27
1416	40	IF (J.LT.NA) GO TO 50						E 28
1417		X2=C(LX)						E 29
1418		Y2=C(LY)						E 30
1419	50	A(J)=C(LZ)						E 31
1420	60	CONTINUE						E 32
1421		REWIND 12						E 33
1422		IF (X2.GE.X1) GO TO 70						E 34
1423		X1=-X1						E 35
1424		X2=-X2						E 36
1425	70	IF (Y2.GE.Y1) GO TO 80						E 37
1426		Y1=-Y1						E 38
1427		Y2=-Y2						E 39
1428	80	DX=(X2-X1)/(NX-1)						E 40
1429		DY=(Y2-Y1)/(NY-1)						E 41
1430		CALL VALUS (NA,A,NZ,Z,F)						E 42
1431		WRITE (6,160) NZ						E 43
1432		WRITE (6,140) (Z(J),J=1,NZ)						E 44
1433		IF (NZ.LE.NDZ) GO TO 90						E 45
1434		WRITE (6,170)						E 46
1435		RETURN						E 47
1436	90	CONTINUE						E 48
1437		CALL SKAL2 (INCHES-2)						E 49
1438		CALL START						E 50
1439		B1=9.5						E 51
1440		B2=9.0						E 52
1441		B3=8.5						E 53
1442		H=.1						E 54
1443		S=(6./7.)*H						E 55
1444		STEP=1.8*H						E 56
1445		A1=-.5-13.0*S						E 57
1446		A2=-.5-9.00*S						E 58
1447		A5=-.5-10.5*S						E 59
1448		CALL SYMBUL (A1,B1,H,1DC,0.,4)						E 60
1449		CALL PLTFLT (A2,B1,H,CL,0.,3)						E 61
1450		ZL=LZ						E 62
	1234567890123456789012345678901234567890123456789012345678901234567890							

	1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890								
1451								E 63
1452								E 64
1453								E 65
1454								E 66
1455								E 67
1456								E 68
1457								E 69
1458								E 70
1459								E 71
1460								E 72
1461								E 73
1462								E 74
1463								E 75
1464	100							E 76
1465								E 77
1466								E 78
1467								E 79
1468	110							E 80
1469								E 81
1470								E 82
1471	C							E 83
1472	120							E 84
1473	130							E 85
1474	140							E 86
1475	150							E 87
1476								E 88
1477	160							E 89
1478	170							E 90
1479	180							E 91
1480	190							E 92
1481								E 93-
1482								F 1
1483								F 2
1484								F 3
1485								F 4
1486								F 5
1487								F 6
1488								F 7
1489								F 8
1490								F 9
1491								F 10
1492								F 11
1493								F 12
1494								F 13
1495	10							F 14
1496								F 15
1497								F 16
1498								F 17
1499	C							F 18
1500	20							F 19
1234567890123456789012345678901234567890123456789012345678901234567890								

	1	2	3	4	5	6	7	8
1501	1234567890123456789012345678901234567890123456789012345678901234567890							
1502	30	FORMAT (1P10E12.4)						F 20
1503		END						F 21-
1504		SUBROUTINE DATE						G 1
1505		DIMENSION KW(7), MN(12), NM(12)						G 2
1506		COMMON /ALPHA/ LAB(18),JOB(3),KAL(6)						G 3
1507		DATA KW/4HSUN ,4HMON ,4HTUE ,4HWED ,4HTHU ,4HFRI ,4HSAT /						G 4
1508		DATA MN/4HJAN ,4HFEB ,4HMAR ,4HAPR ,4HMAY ,4HJUN ,4HJUL ,4HAUG ,4H						G 5
1509		1SEP ,4HOCT ,4HNOV ,4HDEC /						G 6
1510		DATA NM/31,28,31,30,31,30,31,31,30,31,30,31,30,31/						G 7
1511		CALL GETWHO (JOB,JYD)						G 8
1512		JY=JYD/1000						G 9
1513		JD=JYD-1000*JY						G 10
1514		JY=JY+1900						G 11
1515		N=JY+10000						G 12
1516		JW=N+(N+3)/4-(N+99)/100+(N+399)/400+JD-1						G 13
1517		JW=JW-7*((JW-1)/7)						G 14
1518		IF (N.NE.4*(N/4)) GO TO 20						G 15
1519		IF (N.NE.100*(N/100)) GO TO 10						G 16
1520	10	IF (N.NE.400*(N/400)) GO TO 20						G 17
1521		NM(2)=29						G 18
1522	20	GO TO 30						G 19
1523	30	NM(2)=28						G 20
1524		CONTINUE						G 21
1525		DO 40 JM=1,12						G 22
1526	40	IF (JD.LE.NM(JM)) GO TO 50						G 23
1527	50	JD=JD-NM(JM)						G 24
1528		CONTINUE						G 25
1529		J2=JD/10						G 26
1530		J1=JD-10*J2+240						G 27
1531		J2=J2+240						G 28
1532		K4=JY/1000						G 29
1533		JY=JY-1000*K4						G 30
1534		K4=K4+240						G 31
1535		K3=JY/100						G 32
1536		JY=JY-100*K3						G 33
1537		K3=K3+240						G 34
1538		K2=JY/10						G 35
1539		K1=JY-10*K2+240						G 36
1540		K2=K2+240						G 37
1541		KAL(1)=KW(JW)						G 38
1542		KAL(2)=MN(JM)						G 39
1543		KAL(3)=64+256*(107+256*(J1+256*J2))						G 40
1544		KAL(4)=K1+256*(K2+256*(K3+256*K4))						G 41
1545		RETURN						G 42
1546		END						G 43-
1547		SUBROUTINE FILMID (LSE)						H 1
1548		DIMENSION LSE(2)						H 2
1549		COMMON /ALPHA/ LABEL(18),JOB(3),KAL(6),ID2(9)						H 3
1550		CALL SYMBOL (0.,8.,1.,LSE,0.,5)						H 4
		CALL SYMBOL (0.,8.,1.,JOB,0.,8)						H 5
		1234567890123456789012345678901234567890123456789012345678901234567890						

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SAMPLE RUN DECK LISTING

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	1	2	3	4	5	6	7	8
	12345678901	23456789012	34567890123	45678901234	56789012345	67890123456	78901234567	8901234567890
1651								K 22
1652								K 23
1653	20							K 24
1654								K 25
1655								K 26
1656								K 27
1657								K 28
1658								K 29
1659								K 30
1660								K 31
1661								K 32
1662	30							K 33
1663								K 34
1664								K 35
1665								K 36-
1666								L 1
1667								L 2
1668								L 3
1669								L 4
1670	10							L 5
1671								L 6
1672	20							L 7
1673								L 8
1674								L 9
1675								L 10
1676								L 11
1677								L 12-
1678								M 1
1679								M 2
1680								M 3
1681								M 4
1682								M 5
1683								M 6
1684								M 7
1685								M 8
1686	10							M 9
1687								M 10
1688								M 11
1689								M 12
1690								M 13
1691								M 14
1692								M 15
1693								M 16
1694								M 17
1695	20							M 18
1696	30							M 19
1697								M 20
1698								M 21
1699								M 22
1700	40							M 23

1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

AEDC-TR-75-75

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
1701		REWIND 20						N 24
1702		Q(1,1)=X1						N 25
1703		Q(1,2)=X1						N 26
1704		Q(1,3)=X1						N 27
1705		Q(1,4)=X1						N 28
1706		Q(1,5)=X2						N 29
1707		Q(1,6)=X2						N 30
1708		Q(1,7)=X2						N 31
1709		Q(1,8)=X2						N 32
1710		Q(2,1)=Y1						N 33
1711		Q(2,2)=Y1						N 34
1712		Q(2,3)=Y2						N 35
1713		Q(2,4)=Y2						N 36
1714		Q(2,5)=Y1						N 37
1715		Q(2,6)=Y1						N 38
1716		Q(2,7)=Y2						N 39
1717		Q(2,8)=Y2						N 40
1718		Q(3,1)=Z1						N 41
1719		Q(3,2)=Z2						N 42
1720		Q(3,3)=Z1						N 43
1721		Q(3,4)=Z2						N 44
1722		Q(3,5)=Z1						N 45
1723		Q(3,6)=Z2						N 46
1724		Q(3,7)=Z1						N 47
1725		Q(3,8)=Z2						N 48
1726		WRITE (6,50)						N 49
1727		WRITE (6,60) X1,X2,Y1,Y2,Z1,Z2						N 50
1728		RETURN						N 51
1729	C							N 52
1730	50	FORMAT (5H0 X1,10X,2HX2,10X,2HV1,10X,2HV2,10X,2HZ1,10X,2HZ2)						N 53
1731	60	FORMAT (1P10E12.4)						N 54
1732		END						N 55-
1733		SUBROUTINE OPEN						N 1
1734		DIMENSION BUFF(2000)						N 2
1735		COMMON /FIXED/ LPLOTR						N 3
1736		COMMON /FLOAT/ DUM(25),W						N 4
1737		NUFF=8000						N 5
1738		IF (LPLOTR.NE.765) GO TO 10						N 6
1739		CALL PLOTS (BUFF,NUFF)						N 7
1740		RETURN						N 8
1741	10	IF (LPLOTR.NE.835) GO TO 20						N 9
1742		CALL CALCMP (BUFF,NUFF,LTAPE,0)						N 10
1743		CALL CALCMP (.8,.5,0.3)						N 11
1744		CALL CALCMP (IAUXA,IAUXB,30.7)						N 12
1745		CALL FILMID (SHSTART)						N 13
1746		CALL UNCLAS						N 14
1747		CALL CALCMP (IAUXA,IAUXB,16.7)						N 15
1748		RETURN						N 16
1749	20	CONTINUE						N 17
1750		RETURN						N 18
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							

SAMPLE RUN DECK LISTING

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	1	2	3	4	5	6	7	8
	1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890							
1751		ENTRY CLOSE						N 19
1752		IF (LPLOTR.NE.765) GO TO 30						N 20
1753		CALL PLOT (0..0..999)						N 21
1754		RETURN						N 22
1755	30	IF (LPLOTR.NE.835) GO TO 40						N 23
1756		CALL CALCMP (.5..5.0.3)						N 24
1757		CALL CALCMP (IAUXA.1AUXB.30.7)						N 25
1758		CALL UNCLAS						N 26
1759		CALL CALCMP (0..0..0.2)						N 27
1760		CALL FILMID (8HEND)						N 28
1761		CALL CALCMP (0..0..9999.2)						N 29
1762		RETURN						N 30
1763	40	CONTINUE						N 31
1764		RETURN						N 32
1765		END						N 33-
1766		SUBROUTINE PLOD (P.N.J.L.NDIM)						O 1
1767		DIMENSION P(3.6.NDIM), N(NDIM), J(NDIM), L(NDIM)						O 2
1768		COMMON /ARRAYS/ X(9).Y(9)						O 3
1769		DO 10 JR=1.100000						O 4
1770		READ (20) P.N.J.L						O 5
1771		DO 10 JS=1.NDIM						O 6
1772		NJ=N(JS)						O 7
1773		IF (NJ.LE.0) GO TO 20						O 8
1774		CALL VIEW (NJ,P(1.1.JS).X.Y)						O 9
1775	10	CALL LINC (X.Y.NJ.1.J(JS).L(JS))						O 10
1776	20	REWIND 20						O 11
1777		RETURN						O 12
1778		END						O 13-
1779		SUBROUTINE SETUP (P.N.J.L.NDIM)						P 1
1780		DIMENSION P(1), N(1), J(1), L(1)						P 2
1781		COMMON /ARRAYS/ C(18)						P 3
1782		COMMON /FIXED/ LPLOTR.INCHES.LBODY.LTROL.LVELY.LSTRM						P 4
1783		COMMON /FLOAT/ DUM(6).VMAX.RPD.BIG.X1.X2.Y1.Y2.Z1.Z2						P 5
1784		X1=BIG						P 6
1785		X2=-BIG						P 7
1786		Y1=BIG						P 8
1787		Y2=-BIG						P 9
1788		Z1=BIG						P 10
1789		Z2=-BIG						P 11
1790		JSET=1						P 12
1791		IF (LBODY.EQ.0.AND.LTROL.EQ.0) GO TO 80						P 13
1792		NW=0						P 14
1793		DO 60 JR=1.100000						P 15
1794		READ (11) C.LT						P 16
1795		IF (LT.EQ.-999) GO TO 70						P 17
1796		NW=NW+1						P 18
1797		BX=C(16)						P 19
1798		IF (LBODY.EQ.0) GO TO 50						P 20
1799		IF (LT.NE.3) GO TO 10						P 21
1800		CALL SHOE (P.N.J.L.JSET)						P 22

1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

	1	2	3	4	5	6	7	8
	12345678901	23456789012	34567890123	45678901234	56789012345	67890123456	78901234567	8901234567890
1801								P 23
1802	10							P 24
1803								P 25
1804								P 26
1805	20							P 27
1806								P 28
1807								P 29
1808	30							P 30
1809								P 31
1810	40							P 32
1811	50							P 33
1812								P 34
1813								P 35
1814								P 36
1815	60							P 37
1816	70							P 38
1817								P 39
1818	80							P 40
1819								P 41
1820								P 42
1821								P 43
1822								P 44
1823								P 45
1824								P 46
1825								P 47
1826								P 48
1827								P 49
1828	90							P 50
1829								P 51
1830								P 52
1831								P 53
1832	100							P 54
1833	110							P 55
1834	120							P 56
1835	130							P 57
1836								P 58
1837								P 59
1838	C							P 60
1839	140							P 61
1840								P 62-
1841								Q 1
1842								Q 2
1843								Q 3
1844								Q 4
1845								Q 5
1846	10							Q 6
1847								Q 7
1848								Q 8
1849	20							Q 9
1850								Q 10

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	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
1851		J(JSET)=0						Q 11
1852		L(JSET)=0						Q 12
1853		RETURN						Q 13
1854		END						Q 14-
1855		SUBROUTINE SKALE (X1,X2,I,J,M,N)						R 1
1856	C	DC TODD 6/9/71						R 2
1857		XN=X1						R 3
1858		XN=X2						R 4
1859		IA=I						R 5
1860		DX=(XN-XN)/IA						R 6
1861		E=.001*AMAX1(ABS(XN),ABS(XN))						R 7
1862		IF (DX.GT.E) GO TO 10						R 8
1863		DX=E						R 9
1864		IF (DX.EQ.0.) DX=1.						R 10
1865		B=XN+XN						R 11
1866		E=IA*DX						R 12
1867		XN=.5*(B+E)						R 13
1868		XN=.5*(B-E)						R 14
1869	10	E=ALOG10(DX)						R 15
1870		J=E						R 16
1871		IF (J.GT.E) J=J-1						R 17
1872		B=10.**(-J)						R 18
1873		IF (B.GT.1.41) GO TO 20						R 19
1874		M=1						R 20
1875		GO TO 50						R 21
1876	20	IF (B.GT.3.16) GO TO 30						R 22
1877		M=2						R 23
1878		GO TO 50						R 24
1879	30	IF (B.GT.7.08) GO TO 40						R 25
1880		M=5						R 26
1881		GO TO 50						R 27
1882	40	M=1						R 28
1883		J=J+1						R 29
1884	50	DX=M*10.**J						R 30
1885		N=XN/DX						R 31
1886	60	B=N*DX						R 32
1887		IF (B.LE.XN) GO TO 70						R 33
1888		N=N-1						R 34
1889		GO TO 60						R 35
1890	70	I=(XN-B)/DX						R 36
1891	80	E=B+I*DX						R 37
1892		IF (E.GE.XN) GO TO 90						R 38
1893		I=I+1						R 39
1894		GO TO 80						R 40
1895	90	CONTINUE						R 41
1896		RETURN						R 42
1897		END						R 43-
1898		SUBROUTINE SKAL2 (INCHES)						S 1
1899		DIMENSION KDA(3)						S 2
1900		COMMON /CVIEW/ LDUMMY,LSCALE						S 3
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							

	1	2	3	4	5	6	7	8
12345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901
1901	COMMUN	/FLOAT/	DUM(15).	X1,X2,Y1,Y2,X0,Y0,DX,DY,XF,YF,WX				\$ 4
1902	DATA	KDA/1.2.5/						\$ 5
1903	WY=10.							\$ 6
1904	IF	(LSCALE.EQ.0)	GO TO 10					\$ 7
1905	READ	(5.80)	X0,Y0,DX,DY,WX					\$ 8
1906	GO TO 70							\$ 9
1907	10	WX=INCHES						\$ 10
1908		DX=(X2-X1)/WX						\$ 11
1909		DY=(Y2-Y1)/WY						\$ 12
1910		STEP=AMAX1(DX,DY)						\$ 13
1911		IF (STEP.LE.0.)	STEP=.5*(X1+Y1)					\$ 14
1912		IF (STEP.LE.0.)	STEP=1.					\$ 15
1913		E=ALOG10(STEP)						\$ 16
1914		JE=E						\$ 17
1915		IF (E.LT.0.)	JE=JE-1					\$ 18
1916		DO 30 J=1,10						\$ 19
1917		E=10.**JE						\$ 20
1918		DO 20 K=1,3						\$ 21
1919		KO=KDA(K)						\$ 22
1920		STEP=KO*E						\$ 23
1921		SO=X1/STEP						\$ 24
1922		JO=SO						\$ 25
1923		IF (SO.LT.0.)	JO=JO-1					\$ 26
1924		DO=SO-JO						\$ 27
1925		IF (DO.GE..99)	JO=JO+1					\$ 28
1926		XO=JO*STEP						\$ 29
1927		SO=Y1/STEP						\$ 30
1928		JO=SO						\$ 31
1929		IF (SO.LT.0.)	JO=JO-1					\$ 32
1930		DO=SO-JO						\$ 33
1931		IF (DO.GE..99)	JO=JO+1					\$ 34
1932		YO=JO*STEP						\$ 35
1933		V=XO+(WX+.01)*STEP						\$ 36
1934		IF (V.LT.X2)	GO TO 20					\$ 37
1935		V=YO+(WY+.01)*STEP						\$ 38
1936		IF (V.LT.Y2)	GO TO 20					\$ 39
1937		GO TO 40						\$ 40
1938	20	CONTINUE						\$ 41
1939	30	JE=JE+1						\$ 42
1940	40	DO 50 J=1,INCHES						\$ 43
1941		WX=WX-1.						\$ 44
1942		V=XO+(WX+.01)*STEP						\$ 45
1943		IF (V.LT.X2)	GO TO 60					\$ 46
1944		IF (WX.LT.5.0)	GO TO 60					\$ 47
1945	50	CONTINUE						\$ 48
1946	60	WX=WX+1.						\$ 49
1947		DX=STEP						\$ 50
1948		DY=STEP						\$ 51
1949	70	XF=XO+WX*DX						\$ 52
1950		YF=YO+WY*DY						\$ 53
12345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901

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	1	2	3	4	5	6	7	8
	12345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901
1951		WRITE (6,90)						S 54
1952		WRITE (6,100) XO,YO,DX,DY,WX						S 55
1953		RETURN						S 56
1954	C							S 57
1955	80	FORMAT (7E10.0)						S 58
1956	90	FORMAT (5H0 XO,10X,2HYO,10X,2HDX,10X,2HXY,10X,2HWX)						S 59
1957	100	FORMAT (1P10E12.4)						S 60
1958		END						S 61-
1959		SUBROUTINE SOURCE (P,N,J,L,JSET)						T 1
1960		DIMENSION P(18,1), N(1), J(1), L(1)						T 2
1961		COMMON /ARRAYS/ C(18)						T 3
1962		DO 10 I=1,3						T 4
1963	10	P(I,JSET)=C(I+3)						T 5
1964		N(JSET)=1						T 6
1965		J(JSET)=1						T 7
1966		L(JSET)=11						T 8
1967		RETURN						T 9
1968		END						T 10-
1969		SUBROUTINE START						U 1
1970		COMMON /ALPHA/ LAB(18),IDS(18),IDX(9),IDY(9)						U 2
1971		COMMON /CVIEW/ LVIEW						U 3
1972		COMMON /FIXED/ LPLOTR						U 4
1973		COMMON /FLOAT/ DUM(19),XO,YO,DX,DY,XF,YF,W						U 5
1974		IF (LPLOTR.NE.765) GO TO 10						U 6
1975		CALL PLOT (0.,-12.0,3)						U 7
1976		CALL PLOT (0.,-11.5,-3)						U 8
1977		IF (LVIEW.LT.0) CALL PLOT (1.5,0.,23)						U 9
1978		GO TO 20						U 10
1979	10	IF (LPLOTR.NE.835) GO TO 20						U 11
1980		CALL CALCMP (0.,0.,0.2)						U 12
1981		X=.5						U 13
1982		IF (LVIEW.LT.0) X=2.						U 14
1983		CALL CALCMP (X,.5,0.3)						U 15
1984	20	CONTINUE						U 16
1985		CALL AXIS (0.,0.,IDX,-36.W,0.,XO,DX,10.)						U 17
1986		CALL AXIS (0.,0.,IDY,36.10.,90.,YO,DY,10.)						U 18
1987		RETURN						U 19
1988		ENTRY FINISH						U 20
1989		CALL SYMBOL (W+.08,10...16.LAB,-90.,72)						U 21
1990		CALL SYMBOL (W+.32,10...16.IDS,-90.,72)						U 22
1991		IF (LPLOTR.EQ.765) CALL PLOT (W+3.,0.,23)						U 23
1992		RETURN						U 24
1993		END						U 25-
1994		SUBROUTINE STRM (P,N,J,L,JSET,NDIM)						V 1
1995		DIMENSION P(3,6,1), N(1), J(1), L(1)						V 2
1996		COMMON /ARRAYS/ C(18)						V 3
1997		K=0						V 4
1998	10	READ (12) C,LV						V 5
1999		IF (LV.EQ.4) GO TO 50						V 6
2000		K=K+1						V 7

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	1	2	3	4	5	6	7	8
2001	20	DO 30 I=1,3					V	8
2002	30	P(I,K,JSET)=C(I)					V	9
2003		IF (K.LT.6) GO TO 10					V	10
2004	40	N(JSET)=K					V	11
2005		J(JSET)=0					V	12
2006		L(JSET)=0					V	13
2007		CALL NEXT (P,N,J,L,JSET,NDIM)					V	14
2008		IF (K.LT.6) RETURN					V	15
2009		K=1					V	16
2010		GO TO 20					V	17
2011	50	IF (K.GT.1) GO TO 40					V	18
2012		RETURN					V	19
2013		END					V	20-
2014		SUBROUTINE UNITYZ (X,Y,Z)					W	1
2015		F=1./SQRT(X**2+Y**2+Z**2)					W	2
2016		X=F*X					W	3
2017		Y=F*Y					W	4
2018		Z=F*Z					W	5
2019		RETURN					W	6
2020		END					W	7-
2021		SUBROUTINE VALUS (N,A,M,V,F)					X	1
2022	C	SELECT CONSTANT VALUES FOR CONTOUR PLOTS DC TODD 7/23/71					X	2
2023		DIMENSION A(1), V(1)					X	3
2024		AB=0.					X	4
2025		AS=0.					X	5
2026		DO 10 I=1,N					X	6
2027		AB=AB+A(I)					X	7
2028	10	AS=AS+A(I)**2					X	8
2029		AB=AB/N					X	9
2030		AS=(AS/N-AB*AB)**.5					X	10
2031		H1=AB-F*AS					X	11
2032		B2=AB+F*AS					X	12
2033		CALL SCALE (B1,B2,M,IEXP,IDX,IMIN)					X	13
2034		M=M+1					X	14
2035		DX=IDX*10.**IEXP					X	15
2036		V(1)=IMIN+DX					X	16
2037		DO 20 I=2,M					X	17
2038	20	V(I)=V(I-1)+DX					X	18
2039		RETURN					X	19
2040		END					X	20-
2041		SUBROUTINE VELY (P,N,J,L,JSET)					V	1
2042		DIMENSION P(3,6,1), N(1), J(1), L(1)					V	2
2043		COMMON /ARRAYS/ C(3,6)					V	3
2044		COMMON /FLOAT/ AN,AT,AV					V	4
2045		DO 10 I=1,3					V	5
2046		P(I,1,JSET)=C(I,1)					V	6
2047	10	P(I,2,JSET)=C(I,1)+AV*C(I,2)					V	7
2048		N(JSET)=2					V	8
2049		J(JSET)=0					V	9
2050		L(JSET)=69					V	10

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	1	2	3	4	5	6	7	8
	12345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901	2345678901
2051								Y 11
2052								Y 12-
2053								Z 1
2054								Z 2
2055								Z 3
2056								Z 4
2057								Z 5
2058								Z 6
2059								Z 7
2060								Z 8
2061								Z 9
2062	10							Z 10
2063								Z 11
2064	20							Z 12
2065								Z 13
2066								Z 14
2067								Z 15
2068	30							Z 16
2069								Z 17
2070	40							Z 18
2071								Z 19
2072								Z 20
2073								Z 21
2074	50							Z 22
2075								Z 23
2076	60							Z 24
2077								Z 25
2078								Z 26
2079								Z 27
2080	70							Z 28
2081								Z 29
2082	80							Z 30
2083								Z 31
2084								Z 32
2085								Z 33
2086								Z 34
2087								Z 35
2088								Z 36
2089								Z 37
2090								Z 38
2091								Z 39
2092	90							Z 40
2093								Z 41
2094	100							Z 42
2095								Z 43
2096								Z 44-
2097								AA 1
2098								AA 2
2099								AA 3
2100								AA 4

	1	2	3	4	5	6	7	8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
2101		COMMON /VIEW4/ TT						AA 5
2102		IF (L.NE.1) GO TO 10						AA 6
2103		CALL LABELS (IDX,36M		Y		)		AA 7
2104		CALL LABELS (IDY,36M		Z		)		AA 8
2105		RETURN						AA 9
2106	10	IF (L.NE.2) GO TO 20						AA 10
2107		CALL LABELS (IDX,36M		X		)		AA 11
2108		CALL LABELS (IDY,36M		Z		)		AA 12
2109		RETURN						AA 13
2110	20	IF (L.NE.3) GO TO 30						AA 14
2111		CALL LABELS (IDX,36M		X		)		AA 15
2112		CALL LABELS (IDY,36M		Y		)		AA 16
2113		RETURN						AA 17
2114	30	IF (L.NE.4) GO TO 40						AA 18
2115		CALL LABELS (IDX,36M	ISOMETRIC			)		AA 19
2116		CALL LABELS (IDY,36M				)		AA 20
2117		TT=TAN(RPD*30.)						AA 21
2118		RETURN						AA 22
2119	40	IF (L.NE.5) GO TO 50						AA 23
2120		CALL LABELS (IDX,36M	PERSPECTIVE			)		AA 24
2121		CALL LABELS (IDY,36M				)		AA 25
2122		CALL VIEW5Z						AA 26
2123		RETURN						AA 27
2124	50	CONTINUE						AA 28
2125		CALL LABELS (IDX,36M				)		AA 29
2126		CALL LABELS (IDY,36M				)		AA 30
2127		RETURN						AA 31
2128		END						AA 32-
2129		SUBROUTINE VIEW5Z						AB 1
2130		COMMON /CVIEW/ LOUMMY(2).LPOV						AB 2
2131		COMMON /FLOAT/ DUM(9),X1,X2,Y1,Y2,Z1,Z2						AB 3
2132		COMMON /VIEWS/ QX,QY,QZ,UX,UY,UZ,VX,VY,VZ,WX,WY,WZ						AB 4
2133		IF (LPOV.EQ.0) GO TO 10						AB 5
2134		READ (5,30) QX,QY,QZ						AB 6
2135		READ (5,30) PX,PY,PZ						AB 7
2136		READ (5,30) QX,QY,QZ						AB 8
2137		GO TO 20						AB 9
2138	10	QX=2.*X1-X2						AB 10
2139		QY=2.*Y2-Y1						AB 11
2140		QZ=2.*Z1-Z2						AB 12
2141		PX=.25*(3.*X1+X2)						AB 13
2142		PY=.5*(Y1+Y2)						AB 14
2143		PZ=.5*(Z1+Z2)						AB 15
2144		QX=PX						AB 16
2145		QY=PY						AB 17
2146		QZ=Z2						AB 18
2147	20	WX=QX-PX						AB 19
2148		WY=QY-PY						AB 20
2149		WZ=QZ-PZ						AB 21
2150		VX=QX-QX						AB 22
	12345678901234567890123456789012345678901234567890123456789012345678901234567890							

SAMPLE RUN DECK LISTING

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	1	2	3	4	5	6	7	8
	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890
2151	VY=QY-QY							AB 23
2152	VZ=QZ-QZ							AB 24
2153	UX=VY+VZ-WZ+VY							AB 25
2154	UY=WZ+VX-WX+VZ							AB 26
2155	UZ=WX+VY-WY+VX							AB 27
2156	CALL UNITYZ (UX,UY,UZ)							AB 28
2157	CALL UNITYZ (WX,WY,WZ)							AB 29
2158	VX=WY+UZ-WZ+UY							AB 30
2159	VY=WZ+UX-WX+UZ							AB 31
2160	VZ=WX+UY-WY+UX							AB 32
2161	WRITE (6,40) '							AB 33
2162	WRITE (6,50) QX,QY,QZ,PX,PY,PZ,QX,QY,QZ							AB 34
2163	RETURN							AB 35
2164	C							AB 36
2165	30 FORMAT (7E10.0)							AB 37
2166	40 FORMAT (5H0 QX,10X,2HQY,10X,2HQZ,10X,2HPX,10X,2HPY,10X,2HPZ,10X,2							AB 38
2167	1HQX,10X,2HQY,10X,2HQZ)							AB 39
2168	50 FORMAT (1P10E12.4)							AB 40
2169	END							AB 41-
2170	//GO.PLOTTAPE DD UNIT=2400-2,LABEL=(,BLP),DSN=TODD,DISP=(,KEEP)							6
2171	//GO.FT20F001 DD UNIT=WORK,							
2172	// SPACF=(CYL,(1,1),RLSE.,ROUND)							
2173	//GO.FT11F001 DD DSN=66BODY,							
2174	// DISP=(OLD,DELETE)							
2175	//GO.FT12F001 DD DSN=66VELY,							
2176	// DISP=(OLD,DELETE)							
2177	//GO.FT05F001 DD *							
2178	QUICK TURN WITH STRUT #1 M=.5							
2179	0. 2. .5 0. 90. 90. 5.							
2180	765 20 1 1 1 1							
2181	1							
2182	2							
2183	3							
2184	4							
2185	5 0 \ 1							
2186	6. 30. 6.							
2187	10. 0. 4.							
2188	10. 0. 0.							
2189	-1							
2190	2 3 9 7 9							
2191	-1							
2192	2 3 10 7 9							
2193	-1							
2194	2 3 9 7 9 0 63							
2195	-1							
2196	2 3 10 7 9 0 63							
2197	0							
2198								

APPENDIX B

SAMPLE PROBLEM

Following is a sample problem for the flow analysis of a sting-strut configuration. The tabulation of the model coordinates and construction pattern of the model lattice following the method described in Section 3.3, Vol. II, is shown in Table B-1. The model data tabulation, which is derived from Table B-1 and that is used as the model input into PFP as described in Section 3.3, is shown in Table B-2. Five views of the model from the Plot Program are shown in Fig. B-1. These views allow the configuration to be checked for possible errors prior to initiating the PFP. The input data for PFP, as described in Sections 3.1 and 3.2, are shown in Table B-3. A tabulation of the velocity data described in Section 3.5 is given in Table B-4. The flow angularity data from Columns 9 and 10 are shown in Fig. B-2. A tabulation of the streamline data described in Section 3.5 is shown in Table B-5. The plots of the streamline data and vector plots of the flow angularity data from the velocity data are shown in Fig. B-3.

Table B-1. Coordinates and Construction Pattern of the Model Lattice

J	X	Y	Z		
1	8.0000E 00	0.0	3.7500E 00		
2	8.8800E 00	0.0	4.1700E 00		
3	8.8800E 00	4.2000E-01	4.1700E 00		
4	8.8800E 00	4.2000E-01	3.7500E 00		
5	8.8800E 00	4.2000E-01	3.3300E 00		
6	8.8800E 00	0.0	3.3300E 00		
7	9.7800E 00	0.0	4.1700E 00		
8	9.7800E 00	4.2000E-01	4.1700E 00		
9	9.7800E 00	4.2000E-01	3.7500E 00		
10	9.7800E 00	4.2000E-01	3.3300E 00		
11	9.7800E 00	0.0	3.3300E 00		
12	1.0750E 01	0.0	4.1700E 00		
13	1.0750E 01	4.2000E-01	4.1700E 00		
14	1.0750E 01	4.2000E-01	3.7500E 00		
15	1.0750E 01	4.2000E-01	3.3300E 00		
16	1.0750E 01	0.0	3.3300E 00		
17	1.1850E 01	0.0	4.1700E 00		
18	1.1850E 01	4.2000E-01	4.1700E 00		
19	1.1850E 01	4.2000E-01	3.7500E 00		
20	1.1850E 01	4.2000E-01	3.3300E 00		
21	1.1850E 01	0.0	3.3300E 00		
22	1.3210E 01	0.0	4.1700E 00		
23	1.3210E 01	4.2000E-01	4.1700E 00		
24	1.3210E 01	4.2000E-01	3.7500E 00		
25	1.3210E 01	4.2000E-01	3.3300E 00		
26	1.3210E 01	0.0	3.3300E 00		
27	1.0000E 50	0.0	0.0		
J	J1	J2	J3	J4	L
1	1	2	3	1	2
2	1	3	4	1	2
3	1	4	5	1	2
4	1	5	6	1	2
5	2	7	8	3	2
6	3	8	9	4	2
7	4	9	10	5	2
8	5	10	11	6	2
9	7	12	13	8	2
10	8	13	14	9	2
11	9	14	15	10	2
12	12	17	18	13	2
13	13	18	19	14	2
14	14	19	20	15	2
15	15	20	21	16	2
16	17	22	23	18	2
17	18	23	24	19	2
18	19	24	25	20	2
19	20	25	26	21	2
20	0	0	0	0	0

Table B-1. Continued

J	X	Y	Z
1	9.7800E 00	0.0	3.3300E 00
2	9.7800E 00	4.2000E-01	3.3300E 00
3	1.0750E 01	4.2000E-01	3.3300E 00
4	1.0750E 01	0.0	3.3300E 00
5	9.9800E 00	0.0	3.0000E 00
6	9.9800E 00	4.2000E-01	3.0000E 00
7	1.0450E 01	4.2000E-01	3.0000E 00
8	1.0960E 01	4.2000E-01	3.0000E 00
9	1.0960E 01	0.0	3.0000E 00
10	1.0290E 01	0.0	2.5000E 00
11	1.0290E 01	4.2000E-01	2.5000E 00
12	1.0770E 01	4.2000E-01	2.5000E 00
13	1.1260E 01	4.2000E-01	2.5000E 00
14	1.1260E 01	0.0	2.5000E 00
15	1.0600E 01	0.0	2.0000E 00
16	1.0600E 01	4.2000E-01	2.0000E 00
17	1.1060E 01	4.2000E-01	2.0000E 00
18	1.1570E 01	4.2000E-01	2.0000E 00
19	1.1570E 01	0.0	2.0000E 00
20	1.0910E 01	0.0	1.5000E 00
21	1.0910E 01	4.2000E-01	1.5000E 00
22	1.1400E 01	4.2000E-01	1.5000E 00
23	1.1880E 01	4.2000E-01	1.5000E 00
24	1.1880E 01	0.0	1.5000E 00
25	1.1210E 01	0.0	1.0000E 00
26	1.1210E 01	4.2000E-01	1.0000E 00
27	1.1710E 01	4.2000E-01	1.0000E 00
28	1.2190E 01	4.2000E-01	1.0000E 00
29	1.2190E 01	0.0	1.0000E 00
30	1.1530E 01	0.0	5.0000E-01
31	1.1530E 01	5.0000E-01	5.0000E-01
32	1.2030E 01	5.0000E-01	5.0000E-01
33	1.2500E 01	5.0000E-01	5.0000E-01
34	1.2500E 01	0.0	5.0000E-01
35	1.0000E 50	0.0	0.0

J	J1	J2	J3	J4	L
1	1	5	6	2	2
2	2	6	7	2	2
3	2	7	3	2	2
4	3	7	8	3	2
5	3	8	9	4	2
6	5	10	11	6	2
7	6	11	12	7	2
8	7	12	13	8	2
9	8	13	14	9	2
10	10	15	16	11	2
11	11	16	17	12	2
12	12	17	18	13	2
13	13	18	19	14	2
14	15	20	21	16	2
15	16	21	22	17	2
16	17	22	23	18	2
17	18	23	24	19	2
18	20	25	26	21	2
19	21	26	27	22	2
20	22	27	28	23	2
21	23	28	29	24	2
22	25	30	31	26	2

Table B-1. Continued

23	26	31	32	27	2
24	27	32	33	28	2
25	28	33	34	29	2
26	0	0	0	0	0

J	X	Y	Z
1	1.2500E 01	0.0	-5.0000E-01
2	1.2130E 01	0.0	-5.0000E-01
3	1.1830E 01	0.0	0.0
4	1.1530E 01	0.0	5.0000E-01
5	1.2500E 01	5.0000E-01	-5.0000E-01
6	1.2130E 01	5.0000E-01	-5.0000E-01
7	1.1830E 01	5.0000E-01	0.0
8	1.1530E 01	5.0000E-01	5.0000E-01
9	1.2500E 01	5.0000E-01	-5.0000E-01
10	1.2270E 01	5.0000E-01	0.0
11	1.2030E 01	5.0000E-01	5.0000E-01
12	1.3240E 01	5.0000E-01	-5.0000E-01
13	1.3130E 01	5.0000E-01	0.0
14	1.2500E 01	5.0000E-01	5.0000E-01
15	1.2500E 01	0.0	5.0000E-01
16	1.3000E 01	5.0000E-01	5.0000E-01
17	1.3000E 01	0.0	5.0000E-01
18	1.3820E 01	5.0000E-01	-5.0000E-01
19	1.3820E 01	5.0000E-01	0.0
20	1.3820E 01	5.0000E-01	5.0000E-01
21	1.3820E 01	0.0	5.0000E-01
22	1.0000E 50	0.0	0.0

J	J1	J2	J3	J4	L
1	1	5	4	2	2
2	2	6	7	3	2
3	3	7	8	4	2
4	6	9	10	7	2
5	7	10	11	8	2
6	9	12	13	10	2
7	10	13	14	11	2
8	12	18	19	13	2
9	13	19	20	16	2
10	13	16	14	13	2
11	14	16	17	15	2
12	16	20	21	17	2
13	0	0	0	0	0

Table B-1. Continued

J	X	Y	Z		
1	1.2500E 01	0.0	-5.0000E-01		
2	1.2500E 01	5.0000E-01	-5.0000E-01		
3	1.3240E 01	5.0000E-01	-5.0000E-01		
4	1.3820E 01	5.0000E-01	-5.0000E-01		
5	1.3820E 01	0.0	-5.0000E-01		
6	1.2750E 01	0.0	-1.0000E 00		
7	1.2750E 01	5.0000E-01	-1.0000E 00		
8	1.3320E 01	5.0000E-01	-1.0000E 00		
9	1.3820E 01	5.0000E-01	-1.0000E 00		
10	1.3820E 01	0.0	-1.0000E 00		
11	1.3000E 01	0.0	-1.5500E 00		
12	1.3000E 01	5.0000E-01	-1.5500E 00		
13	1.3400E 01	5.0000E-01	-1.5500E 00		
14	1.3820E 01	5.0000E-01	-1.5500E 00		
15	1.3820E 01	0.0	-1.5500E 00		
16	1.3100E 01	0.0	-2.2500E 00		
17	1.3100E 01	4.2000E-01	-2.2500E 00		
18	1.3470E 01	4.2000E-01	-2.2500E 00		
19	1.3820E 01	4.2000E-01	-2.2500E 00		
20	1.3820E 01	0.0	-2.2500E 00		
21	1.3200E 01	0.0	-2.9500E 00		
22	1.3200E 01	4.2000E-01	-2.9500E 00		
23	1.3550E 01	4.2000E-01	-2.9500E 00		
24	1.3820E 01	4.2000E-01	-2.9500E 00		
25	1.3820E 01	0.0	-2.9500E 00		
26	1.0000E 50	0.0	0.0		
J	J1	J2	J3	J4	L
1	1	6	7	2	2
2	2	7	8	3	2
3	3	8	9	4	2
4	4	9	10	5	2
5	6	11	12	7	2
6	7	12	13	8	2
7	8	13	14	9	2
8	9	14	15	10	2
9	11	16	17	12	2
10	12	17	18	13	2
11	13	18	19	14	2
12	14	19	20	15	2
13	16	21	22	17	2
14	17	22	23	18	2
15	18	23	24	19	2
16	19	24	25	20	2
17	0	0	0	0	0

Table B-1. Continued

J	X	Y	Z
1	1.2850E 01	0.0	0.0
2	1.3750E 01	3.7000E-01	0.0
3	1.3750E 01	5.6000E-01	1.0000E-01
4	1.3750E 01	2.6000E-01	2.6000E-01
5	1.3750E 01	1.0000E-01	3.6000E-01
6	1.3750E 01	0.0	3.7000E-01
7	1.4270E 01	5.7000E-01	0.0
8	1.4270E 01	5.4000E-01	1.4000E-01
9	1.4270E 01	4.1000E-01	4.1000E-01
10	1.4270E 01	1.4000E-01	5.4000E-01
11	1.4270E 01	0.0	5.7000E-01
12	1.4850E 01	8.0000E-01	0.0
13	1.4850E 01	7.7000E-01	2.1000E-01
14	1.4850E 01	5.6000E-01	5.6000E-01
15	1.4850E 01	2.1000E-01	7.7000E-01
16	1.4850E 01	0.0	8.0000E-01
17	1.5900E 01	8.0000E-01	0.0
18	1.5900E 01	7.7000E-01	2.1000E-01
19	1.5900E 01	5.6000E-01	5.6000E-01
20	1.5900E 01	2.1000E-01	7.7000E-01
21	1.5900E 01	0.0	8.0000E-01
22	1.6030E 01	6.7000E-01	0.0
23	1.6030E 01	6.4000E-01	1.7000E-01
24	1.6030E 01	4.8000E-01	4.8000E-01
25	1.6030E 01	1.7000E-01	6.4000E-01
26	1.6030E 01	0.0	6.7000E-01
27	1.7300E 01	6.7000E-01	0.0
28	1.7300E 01	6.7000E-01	4.5000E-01
29	1.7300E 01	4.5000E-01	6.7000E-01
30	1.7300E 01	0.0	6.7000E-01
31	1.8000E 01	0.0	6.7000E-01
32	1.8300E 01	6.7000E-01	0.0
33	1.8300E 01	6.7000E-01	5.6000E-01
34	1.8300E 01	5.6000E-01	6.7000E-01
35	1.8300E 01	2.0000E-01	6.7000E-01
36	1.9040E 01	6.7000E-01	0.0
37	1.9040E 01	6.7000E-01	6.7000E-01
38	1.9040E 01	3.3000E-01	6.7000E-01
39	2.0500E 01	6.7000E-01	0.0
40	2.0500E 01	6.7000E-01	6.7000E-01
41	2.0360E 01	3.3000E-01	6.7000E-01
42	2.2300E 01	6.7000E-01	0.0
43	2.2300E 01	6.7000E-01	6.7000E-01
44	2.2060E 01	3.3000E-01	6.7000E-01
45	2.4500E 01	6.7000E-01	0.0
46	2.4500E 01	6.7000E-01	6.7000E-01
47	2.3970E 01	3.3000E-01	6.7000E-01
48	2.6370E 01	3.0000E-01	0.0
49	2.6370E 01	3.0000E-01	6.7000E-01
50	2.6370E 01	0.0	6.7000E-01
51	2.8000E 01	0.0	0.0
52	2.8000E 01	0.0	6.7000E-01
53	1.8000E 01	0.0	6.7000E-01
54	1.9000E 01	0.0	1.9200E 00
55	1.8000E 01	0.0	3.7000E 00
56	1.8000E 01	0.0	5.7700E 00
57	1.8000E 01	0.0	8.0000E 00
58	1.8300E 01	2.0000E-01	6.7000E-01
59	1.8300E 01	2.0000E-01	1.9200E 00

Table B-1. Continued

60	1.8300F	01	2.0000E-01	3.7000E	00
61	1.8300E	01	2.0000E-01	5.7700E	00
62	1.8300E	01	2.0000E-01	8.0000E	00
63	1.9040F	01	3.3000E-01	6.7000E-01	
64	1.9040E	01	3.3000E-01	1.9200E	00
65	1.9040E	01	3.3000E-01	3.7000E	00
66	1.9040F	01	3.3000E-01	5.7700E	00
67	1.9040E	01	3.3000F-01	8.0000E	00
68	2.0360F	01	3.3000F-01	6.7000E-01	
69	2.0300E	01	3.3000F-01	1.9200E	00
70	2.0220F	01	3.3000E-01	3.7000F	00
71	2.0170E	01	3.3000F-01	5.7700E	00
72	2.0080E	01	3.3000E-01	8.0000F	00
73	2.2060F	01	3.3000F-01	6.7000E-01	
74	2.1950E	01	3.3000E-01	1.9200E	00
75	2.1830F	01	3.3000E-01	3.7000F	00
76	2.1700E	01	3.3000E-01	5.7700E	00
77	2.1540E	01	3.3000F-01	8.0000E	00
78	2.3970E	01	3.3000F-01	6.7000E-01	
79	2.3830F	01	3.3000E-01	1.9200E	00
80	2.3630E	01	3.3000E-01	3.7000E	00
81	2.3400E	01	3.3000E-01	5.7700E	00
82	2.3160E	01	3.3000E-01	8.0000E	00
83	2.6370E	01	0.0	6.7000E-01	
84	2.6220E	01	0.0	1.9200E	00
85	2.6040E	01	0.0	3.7000E	00
86	2.5820E	01	0.0	5.7700E	00
87	2.5580F	01	0.0	8.0000F	00
89	1.0000E	50	0.0	0.0	
J	J1	J2	J3	J4	L
1	1	2	3	1	2
2	1	3	4	1	2
3	1	4	5	1	2
4	1	5	6	1	2
5	2	7	8	3	2
6	3	8	9	4	2
7	4	9	10	5	2
8	5	10	11	6	2
9	7	12	13	8	2
10	8	13	14	9	2
11	9	14	15	10	2
12	10	15	16	11	2
13	12	17	18	13	2
14	13	18	19	14	2
15	14	19	20	15	2
16	15	20	21	16	2
17	17	22	23	18	2
18	18	23	24	19	2
19	19	24	25	20	2
20	20	25	26	21	2
21	22	27	28	23	2
22	23	28	28	24	2
23	24	28	29	25	2
24	25	29	30	26	2
25	29	31	31	30	2
26	27	32	33	28	2
27	28	33	34	29	2
28	29	34	35	31	2
29	32	36	37	33	2
30	33	37	37	34	2
31	34	37	38	35	2
32	36	39	40	37	2
33	37	40	41	38	2
34	39	42	43	40	2
35	40	43	44	41	2

Table B-1. Concluded

36	42	45	46	43	2
37	43	46	47	44	2
38	45	48	49	46	2
39	46	49	50	47	2
40	48	51	52	49	2
41	49	52	52	50	2
42	53	58	59	54	2
43	54	59	60	55	2
44	55	60	61	56	2
45	56	61	62	57	2
46	58	63	64	59	2
47	59	64	65	60	2
48	60	65	66	61	2
49	61	66	67	62	2
50	63	68	69	64	2
51	64	69	70	65	2
52	65	70	71	66	2
53	66	71	72	67	2
54	68	73	74	69	2
55	69	74	75	70	2
56	70	75	76	71	2
57	71	76	77	72	2
58	73	78	79	74	2
59	74	79	80	75	2
60	75	80	81	76	2
61	76	81	82	77	2
62	78	83	84	79	2
63	79	84	85	80	2
64	80	85	86	81	2
65	81	86	87	82	2
66	0	0	0	0	0
STOP					

Table B-2. Model Input Data Tabulation

QUICK TURN WITH STRUT #1			M-5																	
MODEL	DATA	PAGE	1																	
1	8.0000E	00	0.0	3.7500E	00	8.8800E	00	0.0	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	8.8800E	00	4.2000E-01	4.1700E	00	8.0000E	00	0.0	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	8.0000E	00	0.0	3.7500E	00	8.8800E	00	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	8.8800E	00	4.2000E-01	3.7500E	00	8.0000E	00	0.0	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
3	8.0000E	00	0.0	3.7500E	00	8.8800E	00	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	8.8800E	00	4.2000E-01	3.3300E	00	8.0000E	00	0.0	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
4	8.0000E	00	0.0	3.7500E	00	8.8800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	8.8800E	00	0.0	3.3300E	00	8.0000E	00	0.0	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
5	8.8800E	00	0.0	4.1700E	00	9.7800E	00	0.0	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	9.7800E	00	4.2000E-01	4.1700E	00	8.8800E	00	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
6	8.8800E	00	4.2000E-01	4.1700E	00	9.7800E	00	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	9.7800E	00	4.2000E-01	3.7500E	00	8.8800E	00	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
7	8.8800E	00	4.2000E-01	3.7500E	00	9.7800E	00	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	9.7800E	00	4.2000E-01	3.3300E	00	8.8800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
8	8.8800E	00	4.2000E-01	3.3300E	00	9.7800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	9.7800E	00	0.0	3.3300E	00	8.8800E	00	0.0	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
9	9.7800E	00	0.0	4.1700E	00	1.0750E	01	0.0	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0750E	01	4.2000E-01	4.1700E	00	9.7800E	00	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
10	9.7800E	00	4.2000E-01	4.1700E	00	1.0750E	01	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0750E	01	4.2000E-01	3.7500E	00	9.7800E	00	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
11	9.7800E	00	4.2000E-01	3.7500E	00	1.0750E	01	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0750E	01	4.2000E-01	3.3300E	00	9.7800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
12	1.0750E	01	0.0	4.1700E	00	1.1850E	01	0.0	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.1850E	01	4.2000E-01	4.1700E	00	1.0750E	01	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
13	1.0750E	01	4.2000E-01	4.1700E	00	1.1850E	01	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.1850E	01	4.2000E-01	3.7500E	00	1.0750E	01	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
14	1.0750E	01	4.2000E-01	3.7500E	00	1.1850E	01	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.1850E	01	4.2000E-01	3.3300E	00	1.0750E	01	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
15	1.0750E	01	4.2000E-01	3.3300E	00	1.1850E	01	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.1850E	01	0.0	3.3300E	00	1.0750E	01	0.0	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
16	1.1850E	01	0.0	4.1700E	00	1.3210E	01	0.0	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.3210E	01	4.2000E-01	4.1700E	00	1.1850E	01	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
17	1.1850E	01	4.2000E-01	4.1700E	00	1.3210E	01	4.2000E-01	4.1700E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.3210E	01	4.2000E-01	3.7500E	00	1.1850E	01	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
18	1.1850E	01	4.2000E-01	3.7500E	00	1.3210E	01	4.2000E-01	3.7500E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.3210E	01	4.2000E-01	3.3300E	00	1.1850E	01	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
19	1.1850E	01	4.2000E-01	3.3300E	00	1.3210E	01	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.3210E	01	0.0	3.3300E	00	1.1850E	01	0.0	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
20	9.7800E	00	0.0	3.3300E	00	9.9800E	00	0.0	3.0000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	9.9800E	00	4.2000E-01	3.0000E	00	9.7800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
21	9.7800E	00	4.2000E-01	3.3300E	00	9.9800E	00	4.2000E-01	3.0000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0450E	01	4.2000E-01	3.0000E	00	9.7800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
22	9.7800E	00	4.2000E-01	3.3300E	00	1.0450E	01	4.2000E-01	3.0000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0750E	01	4.2000E-01	3.3300E	00	9.7800E	00	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
23	1.0750E	01	4.2000E-01	3.3300E	00	1.0450E	01	4.2000E-01	3.0000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0960E	01	4.2000E-01	3.0000E	00	1.0750E	01	4.2000E-01	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
24	1.0750E	01	4.2000E-01	3.3300E	00	1.0960E	01	4.2000E-01	3.0000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0960E	01	0.0	3.0000E	00	1.0750E	01	0.0	3.3300E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
25	9.9800E	00	0.0	3.0000E	00	1.0290E	01	0.0	2.5000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50
2	1.0290E	01	4.2000E-01	2.5000E	00	9.9800E	00	4.2000E-01	3.0000E	00	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50	1.0000E	50

QUICK TURN WITH STRUT #1

M=.5

MODEL	DATA	PAGE	3
51	1.2270E 01	5.0000E-01	0.0
2	1.2500E 01	5.0000E-01	5.0000E-01
52	1.3240E 01	5.0000E-01	-5.0000E-01
2	1.3820E 01	5.0000E-01	0.0
53	1.3130E 01	5.0000E-01	0.0
2	1.3820E 01	5.0000E-01	5.0000E-01
54	1.3130E 01	5.0000E-01	0.0
2	1.2500E 01	5.0000E-01	5.0000E-01
55	1.2500E 01	5.0000E-01	5.0000E-01
2	1.3000E 01	0.0	5.0000E-01
56	1.3000E 01	5.0000E-01	5.0000E-01
2	1.3820E 01	0.0	5.0000E-01
57	1.2500E 01	0.0	-5.0000E-01
2	1.2750E 01	5.0000E-01	-1.0000E 00
58	1.2500E 01	5.0000E-01	-5.0000E-01
2	1.3320E 01	5.0000E-01	-1.0000E 00
59	1.3240E 01	5.0000E-01	-5.0000E-01
2	1.3820E 01	5.0000E-01	-1.0000E 00
60	1.3820E 01	5.0000E-01	-5.0000E-01
2	1.3820E 01	0.0	-1.0000E 00
61	1.2750E 01	0.0	-1.0000E 00
2	1.3000E 01	5.0000E-01	-1.5500E 00
62	1.2750E 01	5.0000E-01	-1.0000E 00
2	1.3400E 01	5.0000E-01	-1.5500E 00
63	1.3320E 01	5.0000E-01	-1.0000E 00
2	1.3820E 01	5.0000E-01	-1.5500E 00
64	1.3820E 01	5.0000E-01	-1.0000E 00
2	1.3820E 01	0.0	-1.5500E 00
65	1.3000E 01	0.0	-1.5500E 00
2	1.3100E 01	4.2000E-01	-2.2500E 00
66	1.3000E 01	5.0000E-01	-1.5500E 00
2	1.3470E 01	4.2000E-01	-2.2500E 00
67	1.3400E 01	5.0000E-01	-1.5500E 00
2	1.3820E 01	4.2000E-01	-2.2500E 00
68	1.3820E 01	5.0000E-01	-1.5500E 00
2	1.3820E 01	0.0	-2.2500E 00
69	1.3100E 01	0.0	-2.2500E 00
2	1.3200E 01	4.2000E-01	-2.9500E 00
70	1.3100E 01	4.2000E-01	-2.2500E 00
2	1.3550E 01	4.2000E-01	-2.9500E 00
71	1.3470E 01	4.2000E-01	-2.2500E 00
2	1.3820E 01	4.2000E-01	-2.9500E 00
72	1.3820E 01	4.2000E-01	-2.2500E 00
2	1.3820E 01	0.0	-2.9500E 00
73	1.2850E 01	0.0	0.0
2	1.3750E 01	3.6000E-01	1.0000E-01
74	1.2850E 01	0.0	0.0
2	1.3750E 01	2.6000E-01	2.6000E-01
75	1.2850E 01	0.0	0.0
2	1.3750E 01	1.0000E-01	3.6000E-01

Table B-2. Continued

1.3130E 01	5.0000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50
1.2030E 01	5.0000E-01	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3130E 01	5.0000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	5.0000E-01	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	5.0000E-01	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3130E 01	5.0000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	5.0000E-01	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.2500E 01	0.0	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	0.0	5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.2750E 01	0.0	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.2500E 01	5.0000E-01	-5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.2750E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3240E 01	5.0000E-01	-5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3320E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	0.0	-5.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	0.0	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.2750E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	5.0000E-01	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3320E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3400E 01	5.0000E-01	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	0.0	-1.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3100E 01	0.0	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3000E 01	5.0000E-01	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50	1.0000E 50
1.3400E-01	5.0000E-01	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	5.0000E-01	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	0.0	-1.5500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3200E 01	0.0	-2.9500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3100E 01	4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3200E 01	4.2000E-01	-2.9500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3470E 01	4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3550E 01	4.2000E-01	-2.9500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	4.2000E-01	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	4.2000E-01	-2.9500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3820E 01	0.0	-2.2500E 00	1.0000E 50	1.0000E 50	1.0000E 50
1.3700E-01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50
3.7000E-01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50
3.6000E-01	1.0000E-01	1.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50
0.0	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50
2.6000E-01	2.6000E-01	2.6000E-01	1.0000E 50	1.0000E 50	1.0000E 50
0.0	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50

Table B-2. Continued

QUICK TURN WITH STRUT #1 M=.5
MODEL DATA PAGE 4

76	1.2850E	01	0.0	0.0	1.3750E	01	1.0000E-01	3.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.3750E	01	0.0	3.7000E-01	1.2850E	01	0.0	0.0	1.0000E	50	1.0000E	50	1.0000E	50
77	1.3750E	01	3.7000E-01	0.0	1.4270E	01	5.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4270E	01	5.4000E-01	1.4000E-01	1.3750E	01	3.6000E-01	1.0000E-01	1.0000E	50	1.0000E	50	1.0000E	50
78	1.3750E	01	3.6000E-01	1.0000E-01	1.4270E	01	5.4000E-01	1.4000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4270E	01	4.1000E-01	4.1000E-01	1.3750E	01	2.6000E-01	2.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
79	1.3750E	01	2.6000E-01	2.6000E-01	1.4270E	01	4.1000E-01	4.1000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4270E	01	1.4000E-01	5.4000E-01	1.3750E	01	1.0000E-01	3.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
80	1.3750E	01	1.0000E-01	3.6000E-01	1.4270E	01	1.4000E-01	5.4000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4270E	01	0.0	5.7000E-01	1.3750E	01	0.0	3.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
81	1.4270E	01	5.7000E-01	0.0	1.4850E	01	8.0000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4850E	01	7.7000E-01	2.1000E-01	1.4270E	01	5.4000E-01	1.4000E-01	1.0000E	50	1.0000E	50	1.0000E	50
82	1.4270E	01	5.4000E-01	1.4000E-01	1.4850E	01	7.7000E-01	2.1000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4850E	01	5.6000E-01	5.6000E-01	1.4270E	01	4.1000E-01	4.1000E-01	1.0000E	50	1.0000E	50	1.0000E	50
83	1.4270E	01	4.1000E-01	4.1000E-01	1.4850E	01	5.6000E-01	5.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4850E	01	2.1000E-01	7.7000E-01	1.4270E	01	1.4000E-01	5.4000E-01	1.0000E	50	1.0000E	50	1.0000E	50
84	1.4270E	01	1.4000E-01	5.4000E-01	1.4850E	01	2.1000E-01	7.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.4850E	01	0.0	8.0000E-01	1.4270E	01	0.0	5.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
85	1.4850E	01	8.0000E-01	0.0	1.5900E	01	8.0000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.5900E	01	7.7000E-01	2.1000E-01	1.4850E	01	7.7000E-01	2.1000E-01	1.0000E	50	1.0000E	50	1.0000E	50
86	1.4850E	01	7.7000E-01	2.1000E-01	1.5900E	01	7.7000E-01	2.1000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.5900E	01	5.6000E-01	5.6000E-01	1.4850E	01	5.6000E-01	5.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
87	1.4850E	01	5.6000E-01	5.6000E-01	1.5900E	01	5.6000E-01	5.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.5900E	01	2.1000E-01	7.7000E-01	1.4850E	01	2.1000E-01	7.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
88	1.4850E	01	2.1000E-01	7.7000E-01	1.5900E	01	2.1000E-01	7.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.5900E	01	0.0	8.0000E-01	1.4850E	01	0.0	8.0000E-01	1.0000E	50	1.0000E	50	1.0000E	50
89	1.5900E	01	8.0000E-01	0.0	1.6030E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.6030E	01	6.4000E-01	1.7000E-01	1.5900E	01	7.7000E-01	2.1000E-01	1.0000E	50	1.0000E	50	1.0000E	50
90	1.5900E	01	7.7000E-01	2.1000E-01	1.6030E	01	6.4000E-01	1.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.6030E	01	4.8000E-01	4.8000E-01	1.5900E	01	5.6000E-01	5.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
91	1.5900E	01	5.6000E-01	5.6000E-01	1.6030E	01	4.8000E-01	4.8000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.6030E	01	1.7000E-01	6.4000E-01	1.5900E	01	2.1000E-01	7.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
92	1.5900E	01	2.1000E-01	7.7000E-01	1.6030E	01	1.7000E-01	6.4000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.6030E	01	0.0	6.7000E-01	1.5900E	01	0.0	8.0000E-01	1.0000E	50	1.0000E	50	1.0000E	50
93	1.6030E	01	6.7000E-01	0.0	1.7300E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.7300E	01	6.7000E-01	4.5000E-01	1.6030E	01	6.4000E-01	1.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
94	1.6030E	01	6.4000E-01	1.7000E-01	1.7300E	01	6.7000E-01	4.5000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.7300E	01	6.7000E-01	4.5000E-01	1.6030E	01	4.8000E-01	4.8000E-01	1.0000E	50	1.0000E	50	1.0000E	50
95	1.6030E	01	4.8000E-01	4.8000E-01	1.7300E	01	6.7000E-01	4.5000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.7300E	01	4.5000E-01	6.7000E-01	1.6030E	01	1.7000E-01	6.4000E-01	1.0000E	50	1.0000E	50	1.0000E	50
96	1.6030E	01	1.7000E-01	6.4000E-01	1.7300E	01	4.5000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.7300E	01	0.0	6.7000E-01	1.6030E	01	0.0	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
97	1.7300E	01	4.5000E-01	6.7000E-01	1.8000E	01	0.0	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8000E	01	0.0	6.7000E-01	1.7300E	01	0.0	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
98	1.7300E	01	6.7000E-01	0.0	1.8300E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	6.7000E-01	5.6000E-01	1.7300E	01	6.7000E-01	4.5000E-01	1.0000E	50	1.0000E	50	1.0000E	50
99	1.7300E	01	6.7000E-01	5.6000E-01	1.8300E	01	6.7000E-01	5.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	5.6000E-01	6.7000E-01	1.7300E	01	4.5000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
100	1.7300E	01	4.5000E-01	6.7000E-01	1.8300E	01	5.6000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	2.0000E-01	6.7000E-01	1.8000E	01	0.0	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50

Table B-2. Continued

QUICK TURN WITH STRUT #1 M=.5

MODEL	DATA	PAGE	5											
101	1.8300E	01	6.7000E-01	0.0	1.9040E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	6.7000E-01	6.7000E-01	1.8300E	01	6.7000E-01	5.6000E-01	1.0000E	50	1.0000E	50	1.0000E	50
102	1.8300E	01	6.7000E-01	5.6000E-01	1.9040E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	6.7000E-01	6.7000E-01	1.8300E	01	5.6000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
103	1.8300E	01	5.6000E-01	6.7000E-01	1.9040E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	3.3000E-01	6.7000E-01	1.8300E	01	2.0000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
104	1.9040E	01	6.7000E-01	0.0	2.0500E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	2.0500E	01	6.7000E-01	6.7000E-01	1.9040E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
105	1.9040E	01	6.7000E-01	6.7000E-01	2.0500E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	2.0360E	01	3.3000E-01	6.7000E-01	1.9040E	01	3.3000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
106	2.0500E	01	6.7000E-01	0.0	2.2300E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	2.2300E	01	6.7000E-01	6.7000E-01	2.0500E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
107	2.0500E	01	6.7000E-01	6.7000E-01	2.2300E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	2.2060E	01	3.3000E-01	6.7000E-01	2.0360E	01	3.3000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
108	2.2300E	01	6.7000E-01	0.0	2.4500E	01	6.7000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	2.4500E	01	6.7000E-01	6.7000E-01	2.2300E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
109	2.2300E	01	6.7000E-01	6.7000E-01	2.4500E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	2.3970E	01	3.3000E-01	6.7000E-01	2.2060E	01	3.3000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
110	2.4500E	01	6.7000E-01	0.0	2.6370E	01	3.0000E-01	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	2.6370E	01	3.0000E-01	6.7000E-01	2.4500E	01	6.7000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
111	2.4500E	01	6.7000E-01	6.7000E-01	2.6370E	01	3.0000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	2.6370E	01	0.0	6.7000E-01	2.3970E	01	3.3000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
112	2.6370E	01	3.0000E-01	0.0	2.8000E	01	0.0	0.0	1.0000E	50	1.0000E	50	1.0000E	50
2	2.8000E	01	0.0	6.7000E-01	2.6370E	01	3.0000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
113	2.6370E	01	3.0000E-01	6.7000E-01	2.8000E	01	0.0	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	2.8000E	01	0.0	6.7000E-01	2.6370E	01	0.0	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
114	1.8000E	01	0.0	6.7000E-01	1.8300E	01	2.0000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	2.0000E-01	1.9200E 00	1.8000E	01	0.0	1.9200E 00	1.0000E	50	1.0000E	50	1.0000E	50
115	1.8000E	01	0.0	1.9200E 00	1.8300E	01	2.0000E-01	1.9200E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	2.0000E-01	3.7000E 00	1.8000E	01	0.0	3.7000E 00	1.0000E	50	1.0000E	50	1.0000E	50
116	1.8000E	01	0.0	3.7000E 00	1.8300E	01	2.0000E-01	3.7000E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	2.0000E-01	5.7700E 00	1.8000E	01	0.0	5.7700E 00	1.0000E	50	1.0000E	50	1.0000E	50
117	1.8000E	01	0.0	5.7700E 00	1.8300E	01	2.0000E-01	5.7700E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	1.8300E	01	2.0000E-01	8.0000E 00	1.8000E	01	0.0	8.0000E 00	1.0000E	50	1.0000E	50	1.0000E	50
118	1.8300E	01	2.0000E-01	6.7000E-01	1.9040E	01	3.3000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	3.3000E-01	1.9200E 00	1.8300E	01	2.0000E-01	1.9200E 00	1.0000E	50	1.0000E	50	1.0000E	50
119	1.8300E	01	2.0000E-01	1.9200E 00	1.9040E	01	3.3000E-01	1.9200E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	3.3000E-01	3.7000E 00	1.8300E	01	2.0000E-01	3.7000E 00	1.0000E	50	1.0000E	50	1.0000E	50
120	1.8300E	01	2.0000E-01	3.7000E 00	1.9040E	01	3.3000E-01	3.7000E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	3.3000E-01	5.7700E 00	1.8300E	01	2.0000E-01	5.7700E 00	1.0000E	50	1.0000E	50	1.0000E	50
121	1.8300E	01	2.0000E-01	5.7700E 00	1.9040E	01	3.3000E-01	5.7700E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	1.9040E	01	3.3000E-01	8.0000E 00	1.8300E	01	2.0000E-01	8.0000E 00	1.0000E	50	1.0000E	50	1.0000E	50
122	1.9040E	01	3.3000E-01	6.7000E-01	2.0360E	01	3.3000E-01	6.7000E-01	1.0000E	50	1.0000E	50	1.0000E	50
2	2.0360E	01	3.3000E-01	1.9200E 00	1.9040E	01	3.3000E-01	1.9200E 00	1.0000E	50	1.0000E	50	1.0000E	50
123	1.9040E	01	3.3000E-01	1.9200E 00	2.0360E	01	3.3000E-01	1.9200E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	2.0220E	01	3.3000E-01	3.7000E 00	1.9040E	01	3.3000E-01	3.7000E 00	1.0000E	50	1.0000E	50	1.0000E	50
124	1.9040E	01	3.3000E-01	3.7000E 00	2.0220E	01	3.3000E-01	3.7000E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	2.0170E	01	3.3000E-01	5.7700E 00	1.9040E	01	3.3000E-01	5.7700E 00	1.0000E	50	1.0000E	50	1.0000E	50
125	1.9040E	01	3.3000E-01	5.7700E 00	2.0170E	01	3.3000E-01	5.7700E 00	1.0000E	50	1.0000E	50	1.0000E	50
2	2.0080E	01	3.3000E-01	8.0000E 00	1.9040E	01	3.3000E-01	8.0000E 00	1.0000E	50	1.0000E	50	1.0000E	50

Table B-2. Continued

QUICK MODEL	TURN DATA	WITH STRUT #1 PAGE	M=5 6	TABLE D-2 CONTINUED							
126		2.0360E 01	3.3000E-01	6.7000E-01	2.2060E 01	3.3000E-01	6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.1950E 01	3.3000E-01	1.9200E 00	2.0300E 01	3.3000E-01	1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50	
127		2.0300E 01	3.3000E-01	1.9200E 00	2.1950E 01	3.3000E-01	1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.1830E 01	3.3000E-01	3.7000E 00	2.0220E 01	3.3000E-01	3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
128		2.0220E 01	3.3000E-01	3.7000E 00	2.1830E 01	3.3000E-01	3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.1700E 01	3.3000E-01	5.7700E 00	2.0170E 01	3.3000E-01	5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50	
129		2.0170E 01	3.3000E-01	5.7700E 00	2.1700E 01	3.3000E-01	5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.1540E 01	3.3000E-01	8.0000E 00	2.0080E 01	3.3000E-01	8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
130		2.2060E 01	3.3000E-01	6.7000E-01	2.3970E 01	3.3000E-01	6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.3830E 01	3.3000E-01	1.9200E 00	2.1950E 01	3.3000E-01	1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50	
131		2.1950E 01	3.3000E-01	1.9200E 00	2.3830E 01	3.3000E-01	1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.3630E 01	3.3000E-01	3.7000E 00	2.1830E 01	3.3000E-01	3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
132		2.1830E 01	3.3000E-01	3.7000E 00	2.3630E 01	3.3000E-01	3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.3400E 01	3.3000E-01	5.7700E 00	2.1700E 01	3.3000E-01	5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50	
133		2.1700E 01	3.3000E-01	5.7700E 00	2.3400E 01	3.3000E-01	5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.3160E 01	3.3000E-01	8.0000E 00	2.1540E 01	3.3000E-01	8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
134		2.3970E 01	3.3000E-01	6.7000E-01	2.6370E 01	0.0	6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.6220E 01	0.0	1.9200E 00	2.3830E 01	3.3000E-01	1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50	
135		2.3830E 01	3.3000E-01	1.9200E 00	2.6220E 01	0.0	1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.6040E 01	0.0	3.7000E 00	2.3630E 01	3.3000E-01	3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
136		2.3630E 01	3.3000E-01	3.7000E 00	2.6040E 01	0.0	3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.5820E 01	0.0	5.7700E 00	2.3400E 01	3.3000E-01	5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50	
137		2.3400E 01	3.3000E-01	5.7700E 00	2.5820E 01	0.0	5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50	
2		2.5580E 01	0.0	8.0000E 00	2.3160E 01	3.3000E-01	8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50	
138		1.2850E 01	0.0	0.0	1.3750E 01	3.7000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.3750E 01	3.6000E-01	-1.0000E-01	1.2850E 01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
139		1.2850E 01	0.0	0.0	1.3750E 01	3.6000E-01	-1.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.3750E 01	2.6000E-01	-2.6000E-01	1.2850E 01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
140		1.2850E 01	0.0	0.0	1.3750E 01	2.6000E-01	-2.6000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.3750E 01	1.0000E-01	-3.6000E-01	1.2850E 01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
141		1.2850E 01	0.0	0.0	1.3750E 01	1.0000E-01	-3.6000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.3750E 01	0.0	-3.7000E-01	1.2850E 01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
142		1.3750E 01	3.7000E-01	0.0	1.4270E 01	5.7000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4270E 01	5.4000E-01	-1.4000E-01	1.3750E 01	3.6000E-01	-1.0000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
143		1.3750E 01	3.6000E-01	-1.0000E-01	1.4270E 01	5.4000E-01	-1.4000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4270E 01	4.1000E-01	-4.1000E-01	1.3750E 01	2.6000E-01	-2.6000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
144		1.3750E 01	2.6000E-01	-2.6000E-01	1.4270E 01	4.1000E-01	-4.1000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4270E 01	1.4000E-01	-5.4000E-01	1.3750E 01	1.0000E-01	-3.6000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
145		1.3750E 01	1.0000E-01	-3.6000E-01	1.4270E 01	1.4000E-01	-5.4000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4270E 01	0.0	-5.7000E-01	1.3750E 01	0.0	-3.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
146		1.4270E 01	5.7000E-01	0.0	1.4850E 01	8.0000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4850E 01	7.7000E-01	-2.1000E-01	1.4270E 01	5.4000E-01	-1.4000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
147		1.4270E 01	5.4000E-01	-1.4000E-01	1.4850E 01	7.7000E-01	-2.1000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4850E 01	5.6000E-01	-5.6000E-01	1.4270E 01	4.1000E-01	-4.1000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
148		1.4270E 01	4.1000E-01	-4.1000E-01	1.4850E 01	5.6000E-01	-5.6000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4850E 01	2.1000E-01	-7.7000E-01	1.4270E 01	1.4000E-01	-5.4000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
149		1.4270E 01	1.4000E-01	-5.4000E-01	1.4850E 01	2.1000E-01	-7.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.4850E 01	0.0	-8.0000E-01	1.4270E 01	0.0	-5.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50	
150		1.4850E 01	8.0000E-01	0.0	1.5900E 01	8.0000E-01	0.0	1.0000E 50	1.0000E 50	1.0000E 50	
2		1.5900E 01	7.7000E-01	-2.1000E-01	1.4850E 01	7.7000E-01	-2.1000E-01	1.0000E 50	1.0000E 50	1.0000E 50	

QUICK TURN WITH STRUT #1 M=.5

MODEL DATA PAGE 7

7

 $M = 0.5$ **Table B-2. Continued**

151		1.4850E-01	7.7000E-01	-2.1000E-01	1.5900E-01	7.7000E-01	-2.1000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.5900E-01	5.6000E-01	-5.6000E-01	1.4850E-01	5.6000E-01	-5.6000E-01	1.0000E-50	1.0000E-50	1.0000E-50
152		1.4850E-01	5.6000E-01	-5.6000E-01	1.5900E-01	5.6000E-01	-5.6000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.5900E-01	2.1000E-01	-7.7000E-01	1.4850E-01	2.1000E-01	-7.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
153		1.4850E-01	2.1000E-01	-7.7000E-01	1.5900E-01	2.1000E-01	-7.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.5900E-01	0.0	-8.0000E-01	1.4850E-01	0.0	-8.0000E-01	1.0000E-50	1.0000E-50	1.0000E-50
154		1.5900E-01	8.0000E-01	0.0	1.6030E-01	6.7000E-01	0.0	1.0000E-50	1.0000E-50	1.0000E-50
2		1.6030E-01	6.4000E-01	-1.7000E-01	1.5900E-01	7.7000E-01	-2.1000E-01	1.0000E-50	1.0000E-50	1.0000E-50
155		1.5900E-01	7.7000E-01	-2.1000E-01	1.6030E-01	6.4000E-01	-1.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.6030E-01	4.8000E-01	-4.8000E-01	1.5900E-01	5.6000E-01	-5.6000E-01	1.0000E-50	1.0000E-50	1.0000E-50
156		1.5900E-01	5.6000E-01	-5.6000E-01	1.6030E-01	4.8000E-01	-4.8000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.6030E-01	1.7000E-01	-6.4000E-01	1.5900E-01	2.1000E-01	-7.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
157		1.5900E-01	2.1000E-01	-7.7000E-01	1.6030E-01	1.7000E-01	-6.4000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.6030E-01	0.0	-6.7000E-01	1.5900E-01	0.0	-8.0000E-01	1.0000E-50	1.0000E-50	1.0000E-50
158		1.6030E-01	6.7000E-01	0.0	1.7300E-01	6.7000E-01	0.0	1.0000E-50	1.0000E-50	1.0000E-50
2		1.7300E-01	6.7000E-01	-4.5000E-01	1.6030E-01	6.4000E-01	-1.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
159		1.6030E-01	6.4000E-01	-1.7000E-01	1.7300E-01	6.7000E-01	-4.5000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.7300E-01	6.7000E-01	-4.5000E-01	1.6030E-01	4.8000E-01	-4.8000E-01	1.0000E-50	1.0000E-50	1.0000E-50
160		1.6030E-01	4.8000E-01	-4.8000E-01	1.7300E-01	6.7000E-01	-4.5000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.7300E-01	4.5000E-01	-6.7000E-01	1.6030E-01	1.7000E-01	-6.4000E-01	1.0000E-50	1.0000E-50	1.0000E-50
161		1.6030E-01	1.7000E-01	-6.4000E-01	1.7300E-01	4.5000E-01	-6.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.7300E-01	0.0	-6.7000E-01	1.6030E-01	0.0	-6.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
162		1.7300E-01	4.5000E-01	-6.7000E-01	1.8000E-01	0.0	-6.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.8000E-01	0.0	-6.7000E-01	1.7300E-01	0.0	-6.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50
163		1.7300E-01	6.7000E-01	0.0	1.8300E-01	6.7000E-01	0.0	1.0000E-50	1.0000E-50	1.0000E-50
2		1.8300E-01	6.7000E-01	-5.6000E-01	1.7300E-01	6.7000E-01	-4.5000E-01	1.0000E-50	1.0000E-50	1.0000E-50
164		1.7300E-01	6.7000E-01	-4.5000E-01	1.8300E-01	6.7000E-01	-5.6000E-01	1.0000E-50	1.0000E-50	1.0000E-50
2		1.8300E-01	5.6000E-01	-6.7000E-01	1.7300E-01	4.5000E-01	-6.7000E-01	1.0000E-50	1.0000E-50	1.0000E-50

Table B-2. Continued

QUICK TURN WITH STRUT #1 M=.5
MODEL DATA PAGE 8

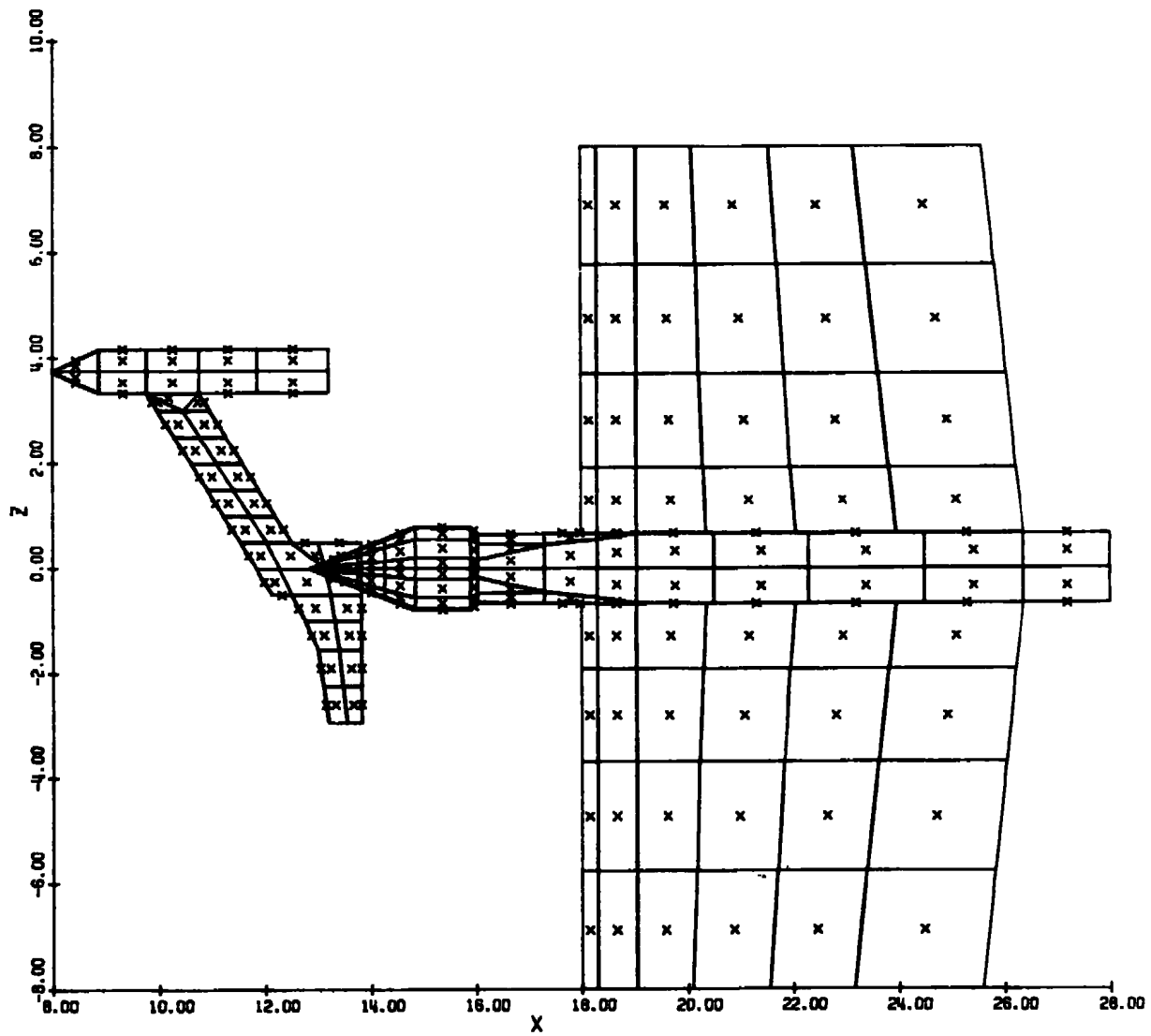
176	2.4500E 01	6.7000E-01	-6.7000E-01	2.6370E 01	3.0000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	2.6370E 01	0.0	-6.7000E-01	2.3970E 01	3.3000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
177	2.6370E 01	3.0000E-01	0.0	2.8000E 01	0.0	0.0	1.0000E 50	1.0000E 50	1.0000E 50
2	2.8000E 01	0.0	-6.7000E-01	2.6370E 01	3.0000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
178	2.6370E 01	3.0000E-01	-6.7000E-01	2.8000E 01	0.0	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	2.8000E 01	0.0	-6.7000E-01	2.6370E 01	0.0	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
179	1.8000E 01	0.0	-6.7000E-01	1.8300E 01	2.0000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	1.8300E 01	2.0000E-01	-1.9200E 00	1.8000E 01	0.0	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
180	1.8000E 01	0.0	-1.9200E 00	1.8300E 01	2.0000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	1.8300E 01	2.0000E-01	-3.7000E 00	1.8000E 01	0.0	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
181	1.8000E 01	0.0	-3.7000E 00	1.8300E 01	2.0000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	1.8300E 01	2.0000E-01	-5.7700E 00	1.8000E 01	0.0	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
182	1.8000E 01	0.0	-5.7700E 00	1.8300E 01	2.0000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	1.8300E 01	2.0000E-01	-8.0000E 00	1.8000E 01	0.0	-8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
183	1.8300E 01	2.0000E-01	-6.7000E-01	1.9040E 01	3.3000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	1.9040E 01	3.3000E-01	-1.9200E 00	1.8300E 01	2.0000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
184	1.8300E 01	2.0000E-01	-1.9200E 00	1.9040E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	1.9040E 01	3.3000E-01	-3.7000E 00	1.8300E 01	2.0000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
185	1.8300E 01	2.0000E-01	-3.7000E 00	1.9040E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	1.9040E 01	3.3000E-01	-5.7700E 00	1.8300E 01	2.0000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
186	1.8300E 01	2.0000E-01	-5.7700E 00	1.9040E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	1.9040E 01	3.3000E-01	-8.0000E 00	1.8300E 01	2.0000E-01	-8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
187	1.9040E 01	3.3000E-01	-6.7000E-01	2.0360E 01	3.3000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	2.0360E 01	3.3000E-01	-1.9200E 00	1.9040E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
188	1.9040E 01	3.3000E-01	-1.9200E 00	2.0300E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.0220E 01	3.3000E-01	-3.7000E 00	1.9040E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
189	1.9040E 01	3.3000E-01	-3.7000E 00	2.0220E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.0170E 01	3.3000E-01	-5.7700E 00	1.9040E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
190	1.9040E 01	3.3000E-01	-5.7700E 00	2.0170E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.0080E 01	3.3000E-01	-8.0000E 00	1.9040E 01	3.3000E-01	-8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
191	2.0360E 01	3.3000E-01	-6.7000E-01	2.2060E 01	3.3000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	2.1950E 01	3.3000E-01	-1.9200E 00	2.0300E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
192	2.0300E 01	3.3000E-01	-1.9200E 00	2.1950E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.1830E 01	3.3000E-01	-3.7000E 00	2.0220E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
193	2.0220E 01	3.3000E-01	-3.7000E 00	2.1830E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.1700E 01	3.3000E-01	-5.7700E 00	2.0170E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
194	2.0170E 01	3.3000E-01	-5.7700E 00	2.1700E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.1540E 01	3.3000E-01	-8.0000E 00	2.0080E 01	3.3000E-01	-8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
195	2.2060E 01	3.3000E-01	-6.7000E-01	2.3970E 01	3.3000E-01	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	2.3830E 01	3.3000E-01	-1.9200E 00	2.1950E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
196	2.1950E 01	3.3000E-01	-1.9200E 00	2.3830E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.3630E 01	3.3000E-01	-3.7000E 00	2.1830E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
197	2.1830E 01	3.3000E-01	-3.7000E 00	2.3630E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.3400E 01	3.3000E-01	-5.7700E 00	2.1700E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
198	2.1700E 01	3.3000E-01	-5.7700E 00	2.3400E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.3160E 01	3.3000E-01	-8.0000E 00	2.1540E 01	3.3000E-01	-8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50
199	2.3970E 01	3.3000E-01	-6.7000E-01	2.6370E 01	0.0	-6.7000E-01	1.0000E 50	1.0000E 50	1.0000E 50
2	2.6220E 01	0.0	-1.9200E 00	2.3830E 01	3.3000E-01	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
200	2.3830E 01	3.3000E-01	-1.9200E 00	2.6220E 01	0.0	-1.9200E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.6040E 01	0.0	-3.7000E 00	2.3630E 01	3.3000E-01	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50

Table B-2. Concluded

QUICK TURN WITH STRUT #1 M=.5

MODEL DATA PAGE 9

201	2.3630E 01	3.3000E-01	-3.7000E 00	2.6040E 01	0.0	-3.7000E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.5820E 01	0.0	-5.7700E 00	2.3400E 01	3.3000E-01	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
202	2.3400E 01	3.3000E-01	-5.7700E 00	2.5820E 01	0.0	-5.7700E 00	1.0000E 50	1.0000E 50	1.0000E 50
2	2.5580E 01	0.0	-8.0000E 00	2.3160E 01	3.3000E-01	-8.0000E 00	1.0000E 50	1.0000E 50	1.0000E 50

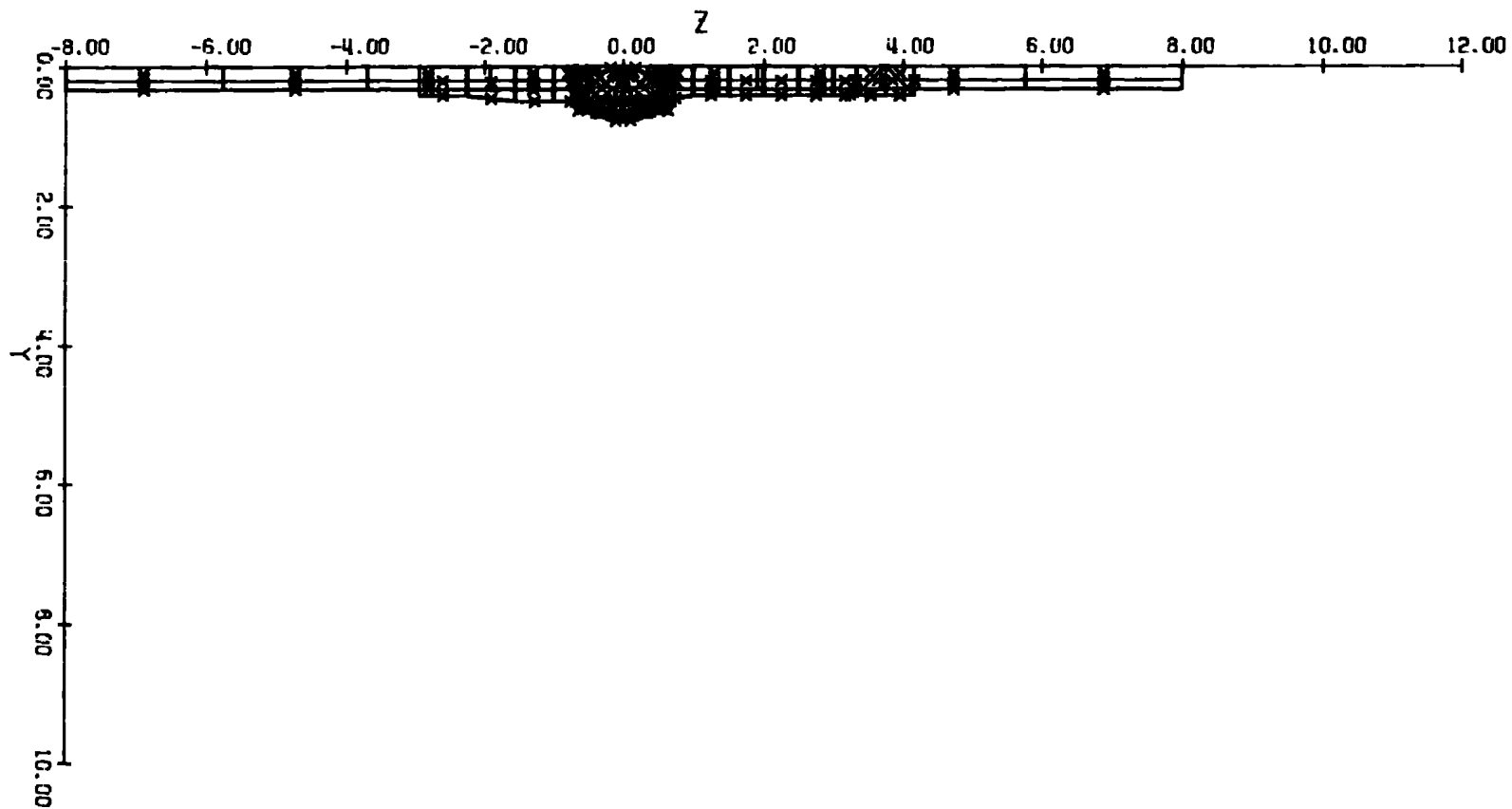


a. Side view

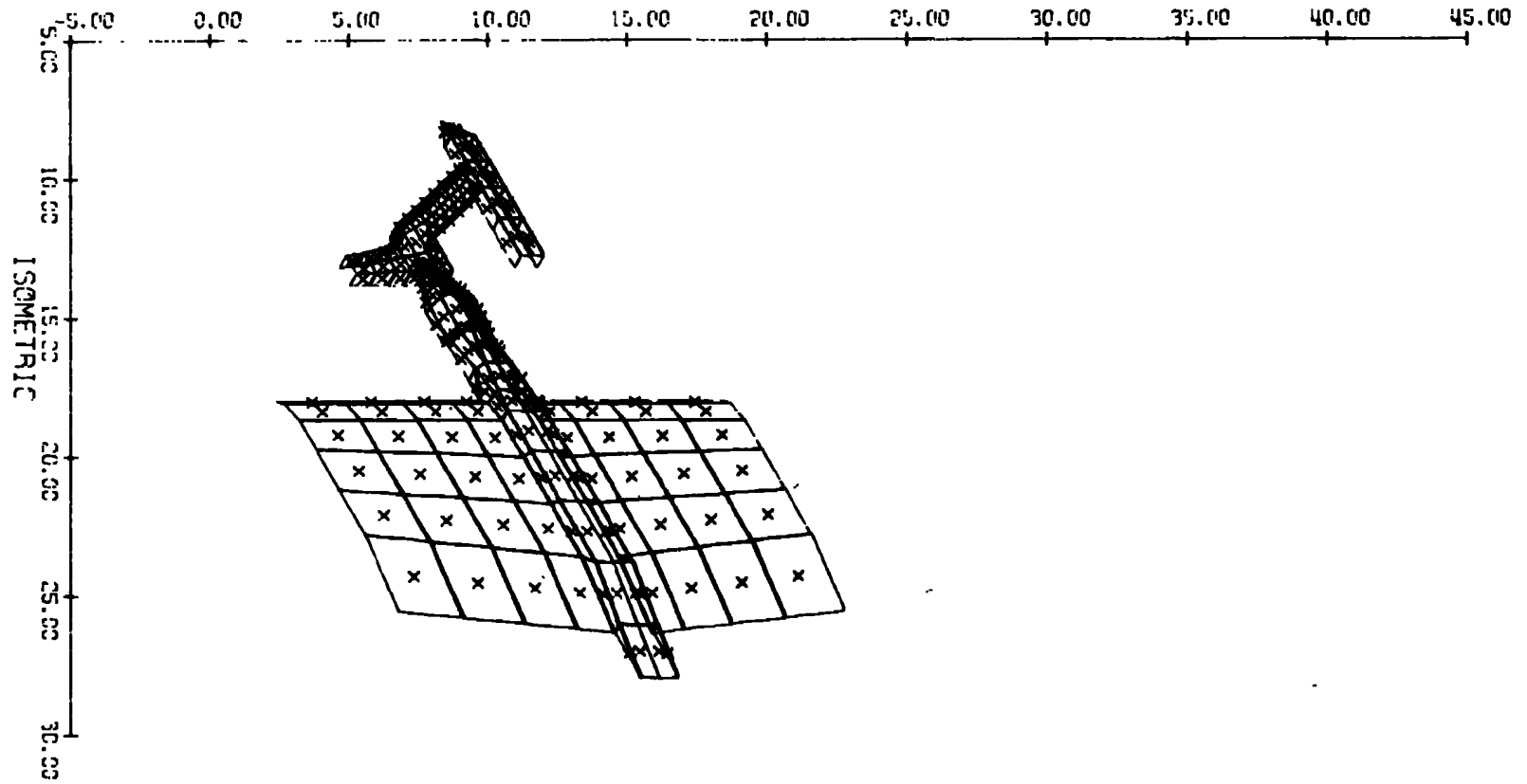
Figure B-1. Mathematical model for sample problem (sting-strut configuration).



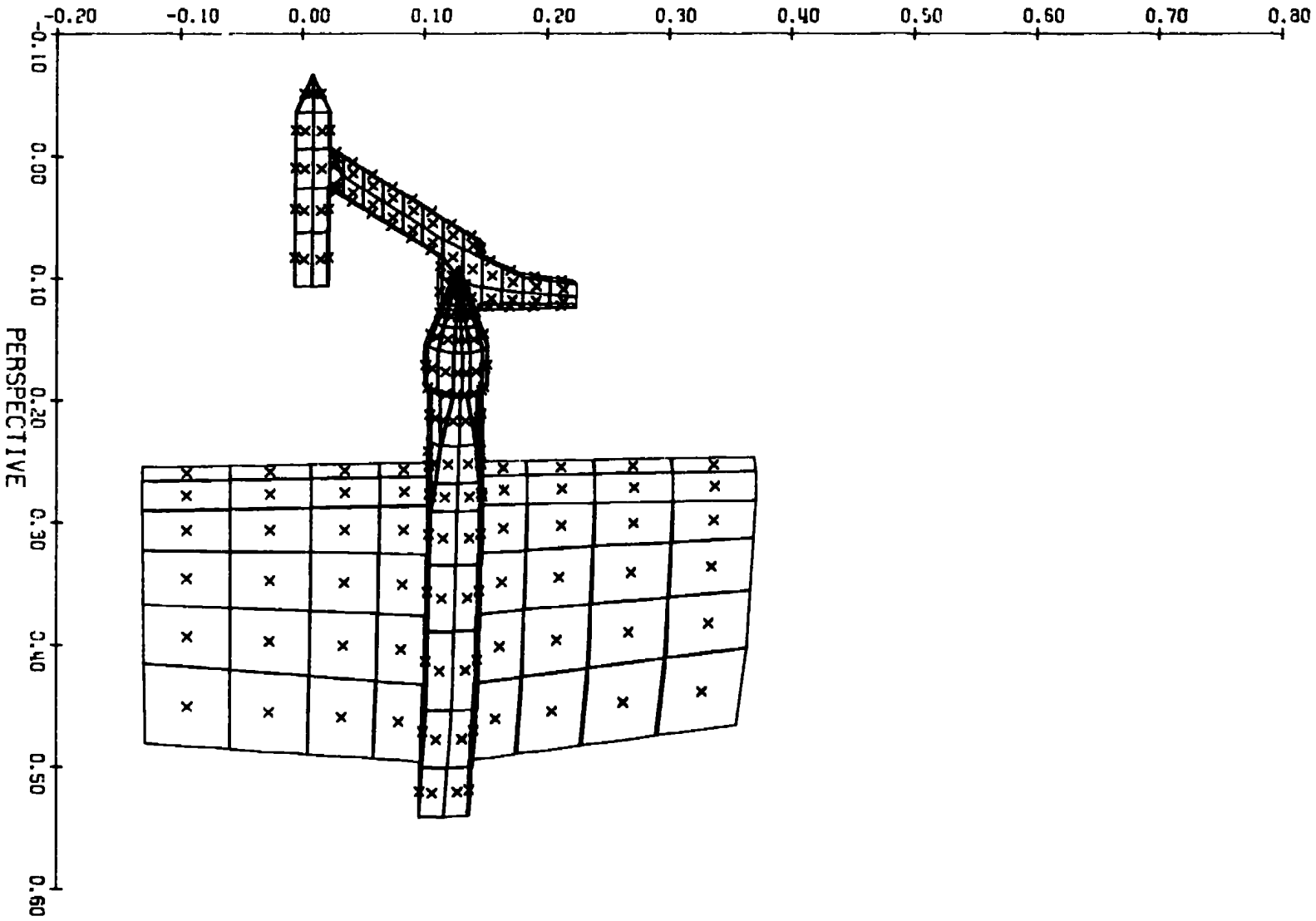
b. Top view
Figure B-1. Continued.



c. Front view
Figure B-1. Continued.



d. Isometric view
Figure B-1. Continued.



e. Perspective
Figure B-1. Concluded.

Table B-3. Input Data for PFP

LX 0	LY 1	LZ 0			
AX 0.0	AY 9.000000E 01	AZ 9.000000E 01	PROX 0.0		
FX 0.0	FY 9.000000E 01	FZ 9.000000E 01	FS 1.000000E 00	MI 5.000000E-01	K 1.400000E 00
NW 202	MDIM 12374	NDIM 15000	NEED 4041		
PS 0.0	CA 1.999998E-01	MM*2 2.500000E-01	BETA 8.660254E-01	1/BETA 1.154700E 00	
TRAIL VECTOR 1.000000E 00	0.0	0.0	E 0.0		
BODY - WIND TRANSFORMATION MATRIX 1.000000E 00	0.0	0.0	E 0.0		
0.0	1.000000E 00	0.0	0.0		
0.0	0.0	1.000000E 00	0.0		

BODY STRETCHED

SYSTEM STARTED

SYSTEM COMPUTED

SOLUTION STARTED

JU1	JU2	MM2	N2
91	92	30	203
92	91	30	173
91	92	30	143
92	91	30	113
91	92	60	83
92	91	60	23
91	92	180	1

SYSTEM SOLVED

RELATIVE ERROR OF SOLUTION 2.65E-04

Table B-4. Velocity Data Tabulation

QUICK TURN WITH STRUT #1												M=.5	
VELOCITIES												PAGE 1	
X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-M1		
5.0000E 00	0.0	2.0000E 00	0.98844	0.0	-0.00074	0.98844	0.49394	0.0	-0.04	2.299E-02	-6.063E-03		
5.0000E 00	5.0000E-01	2.0000E 00	0.98861	0.00106	-0.00070	0.98862	0.49403	0.06	-0.04	2.264E-02	-5.972E-03		
5.0000E 00	1.0000E 00	2.0000E 00	0.98911	0.00203	-0.00061	0.98911	0.49429	0.12	-0.04	2.166E-02	-5.711E-03		
5.0000E 00	1.5000E 00	2.0000E 00	0.98986	0.00283	-0.00048	0.98986	0.49468	0.16	-0.03	2.017E-02	-5.319E-03		
5.0000E 00	2.0000E 00	2.0000E 00	0.99076	0.00344	-0.00032	0.99077	0.49516	0.20	-0.02	1.836E-02	-4.842E-03		
5.0000E 00	2.5000E 00	2.0000E 00	0.99174	0.00384	-0.00017	0.99175	0.49567	0.22	-0.01	1.644E-02	-4.330E-03		
5.0000E 00	3.0000E 00	2.0000E 00	0.99271	0.00407	-0.00003	0.99272	0.49618	0.23	-0.00	1.450E-02	-3.819E-03		
5.0000E 00	0.0	2.5000E 00	0.98803	0.0	0.00002	0.98803	0.49372	0.0	0.00	2.380E-02	-6.280E-03		
5.0000E 00	5.0000E-01	2.5000E 00	0.98822	0.00112	0.00004	0.98822	0.49382	0.06	0.00	2.342E-02	-6.178E-03		
5.0000E 00	1.0000E 00	2.5000E 00	0.98877	0.00213	0.00010	0.98877	0.49411	0.12	0.01	2.232E-02	-5.688E-03		
5.0000E 00	1.5000E 00	2.5000E 00	0.98960	0.00296	0.00020	0.98960	0.49454	0.17	0.01	2.069E-02	-5.455E-03		
5.0000E 00	2.0000E 00	2.5000E 00	0.99058	0.00357	0.00030	0.99059	0.49506	0.21	0.02	1.873E-02	-4.936E-03		
5.0000E 00	2.5000E 00	2.5000E 00	0.99163	0.00396	0.00039	0.99164	0.49562	0.23	0.02	1.664E-02	-4.385E-03		
5.0000E 00	3.0000E 00	2.5000E 00	0.99267	0.00410	0.00046	0.99268	0.49616	0.24	0.03	1.459E-02	-3.843E-03		
5.0000E 00	0.0	3.0000E 00	0.98786	0.0	0.00089	0.98786	0.49363	0.0	0.05	2.413E-02	-6.368E-03		
5.0000E 00	5.0000E-01	3.0000E 00	0.98807	0.00115	0.00090	0.98807	0.49374	0.07	0.05	2.372E-02	-6.258E-03		
5.0000E 00	1.0000E 00	3.0000E 00	0.98866	0.00219	0.00093	0.98866	0.49405	0.13	0.05	2.255E-02	-5.948E-03		
5.0000E 00	1.5000E 00	3.0000E 00	0.98953	0.00302	0.00096	0.98954	0.49451	0.18	0.06	2.081E-02	-5.487E-03		
5.0000E 00	2.0000E 00	3.0000E 00	0.99058	0.00363	0.00098	0.99058	0.49506	0.21	0.06	1.875E-02	-4.940E-03		
5.0000E 00	2.5000E 00	3.0000E 00	0.99167	0.00401	0.00099	0.99168	0.49563	0.23	0.06	1.657E-02	-4.366E-03		
5.0000E 00	3.0000E 00	3.0000E 00	0.99273	0.00419	0.00099	0.99274	0.49619	0.24	0.06	1.446E-02	-3.807E-03		
5.0000E 00	0.0	3.5000E 00	0.98802	0.0	0.00184	0.98802	0.49372	0.0	0.11	2.382E-02	-6.285E-03		
5.0000E 00	5.0000E-01	3.5000E 00	0.98823	0.00115	0.00183	0.98823	0.49383	0.07	0.11	2.340E-02	-6.172E-03		
5.0000E 00	1.0000E 00	3.5000E 00	0.98883	0.00218	0.00180	0.98884	0.49414	0.13	0.10	2.220E-02	-5.856E-03		
5.0000E 00	1.5000E 00	3.5000E 00	0.98972	0.00301	0.00175	0.98973	0.49461	0.17	0.10	2.046E-02	-5.389E-03		
5.0000E 00	2.0000E 00	3.5000E 00	0.99077	0.00360	0.00169	0.99078	0.49516	0.21	0.10	1.835E-02	-4.837E-03		
5.0000E 00	2.5000E 00	3.5000E 00	0.99187	0.00397	0.00161	0.99188	0.49574	0.23	0.09	1.618E-02	-4.261E-03		
5.0000E 00	3.0000E 00	3.5000E 00	0.99293	0.00414	0.00152	0.99294	0.49630	0.24	0.09	1.407E-02	-3.705E-03		
5.0000E 00	0.0	4.0000E 00	0.98853	0.0	0.00275	0.98853	0.49399	0.0	0.16	2.280E-02	-6.014E-03		
5.0000E 00	5.0000E-01	4.0000E 00	0.98874	0.00111	0.00272	0.98874	0.49409	0.06	0.16	2.239E-02	-5.905E-03		
5.0000E 00	1.0000E 00	4.0000E 00	0.98932	0.00211	0.00264	0.98932	0.49440	0.12	0.15	2.124E-02	-5.601E-03		
5.0000E 00	1.5000E 00	4.0000E 00	0.99017	0.00291	0.00252	0.99018	0.49485	0.17	0.15	1.954E-02	-5.151E-03		
5.0000E 00	2.0000E 00	4.0000E 00	0.99118	0.00348	0.00237	0.99119	0.49538	0.20	0.14	1.754E-02	-4.621E-03		
5.0000E 00	2.5000E 00	4.0000E 00	0.99224	0.00383	0.00220	0.99225	0.49593	0.22	0.13	1.545E-02	-4.068E-03		
5.0000E 00	3.0000E 00	4.0000E 00	0.99325	0.00400	0.00202	0.99326	0.49646	0.23	0.12	1.343E-02	-3.537E-03		
5.0000E 00	0.0	4.5000E 00	0.98937	0.0	0.00353	0.98938	0.49443	0.0	0.20	2.113E-02	-5.573E-03		
5.0000E 00	5.0000E-01	4.5000E 00	0.98956	0.00104	0.00348	0.98956	0.49453	0.06	0.20	2.076E-02	-5.475E-03		
5.0000E 00	1.0000E 00	4.5000E 00	0.99009	0.00198	0.00336	0.99009	0.49480	0.11	0.19	1.972E-02	-5.197E-03		
5.0000E 00	1.5000E 00	4.5000E 00	0.99086	0.00274	0.00318	0.99087	0.49521	0.16	0.18	1.817E-02	-4.788E-03		
5.0000E 00	2.0000E 00	4.5000E 00	0.99179	0.00328	0.00295	0.99180	0.49570	0.19	0.17	1.634E-02	-4.304E-03		
5.0000E 00	2.5000E 00	4.5000E 00	0.99275	0.00362	0.00270	0.99276	0.49620	0.21	0.16	1.443E-02	-3.798E-03		
5.0000E 00	3.0000E 00	4.5000E 00	0.99368	0.00378	0.00245	0.99369	0.49669	0.22	0.14	1.257E-02	-3.310E-03		
5.0000E 00	0.0	5.0000E 00	0.99044	0.0	0.00410	0.99045	0.49499	0.0	0.24	1.901E-02	-5.010E-03		
5.0000E 00	5.0000E-01	5.0000E 00	0.99060	0.00095	0.00405	0.99061	0.49507	0.05	0.23	1.865E-02	-4.926E-03		
5.0000E 00	1.0000E 00	5.0000E 00	0.99105	0.00180	0.00390	0.99106	0.49531	0.10	0.23	1.779E-02	-4.688E-03		
5.0000E 00	1.5000E 00	5.0000E 00	0.99173	0.00250	0.00367	0.99174	0.49567	0.14	0.21	1.645E-02	-4.335E-03		
5.0000E 00	2.0000E 00	5.0000E 00	0.99253	0.00301	0.00339	0.99254	0.49609	0.17	0.20	1.486E-02	-3.914E-03		
5.0000E 00	2.5000E 00	5.0000E 00	0.99337	0.00334	0.00309	0.99338	0.49653	0.19	0.18	1.319E-02	-3.471E-03		
5.0000E 00	3.0000E 00	5.0000E 00	0.99420	0.00351	0.00279	0.99421	0.49696	0.20	0.16	1.155E-02	-3.040E-03		
5.0000E 00	0.0	5.5000E 00	0.99162	0.0	0.00444	0.99163	0.49561	0.0	0.26	1.667E-02	-4.390E-03		

QUICK TURN WITH STRUT #1
VELOCITIES PAGE 2

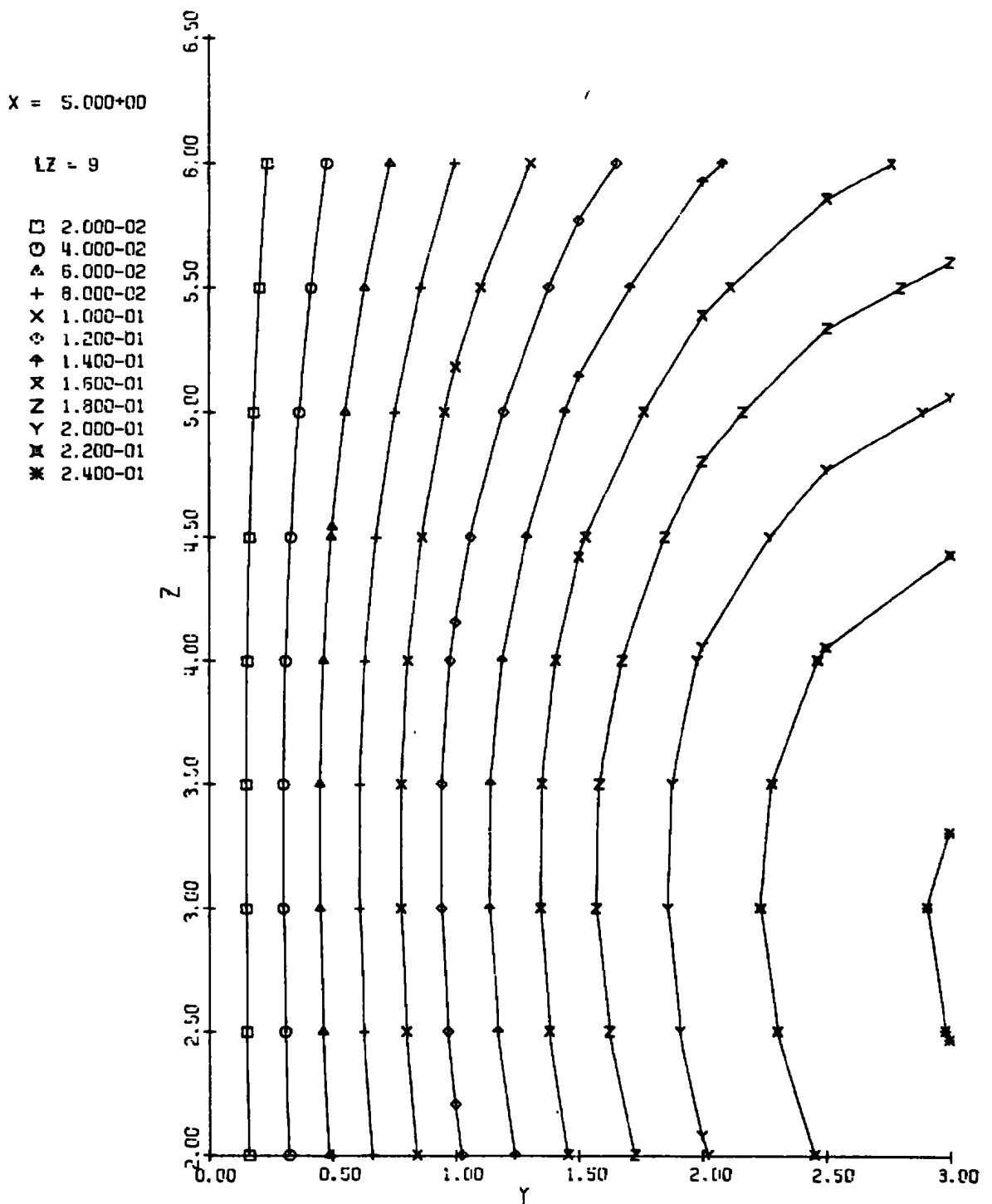
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Table B-4. Continued

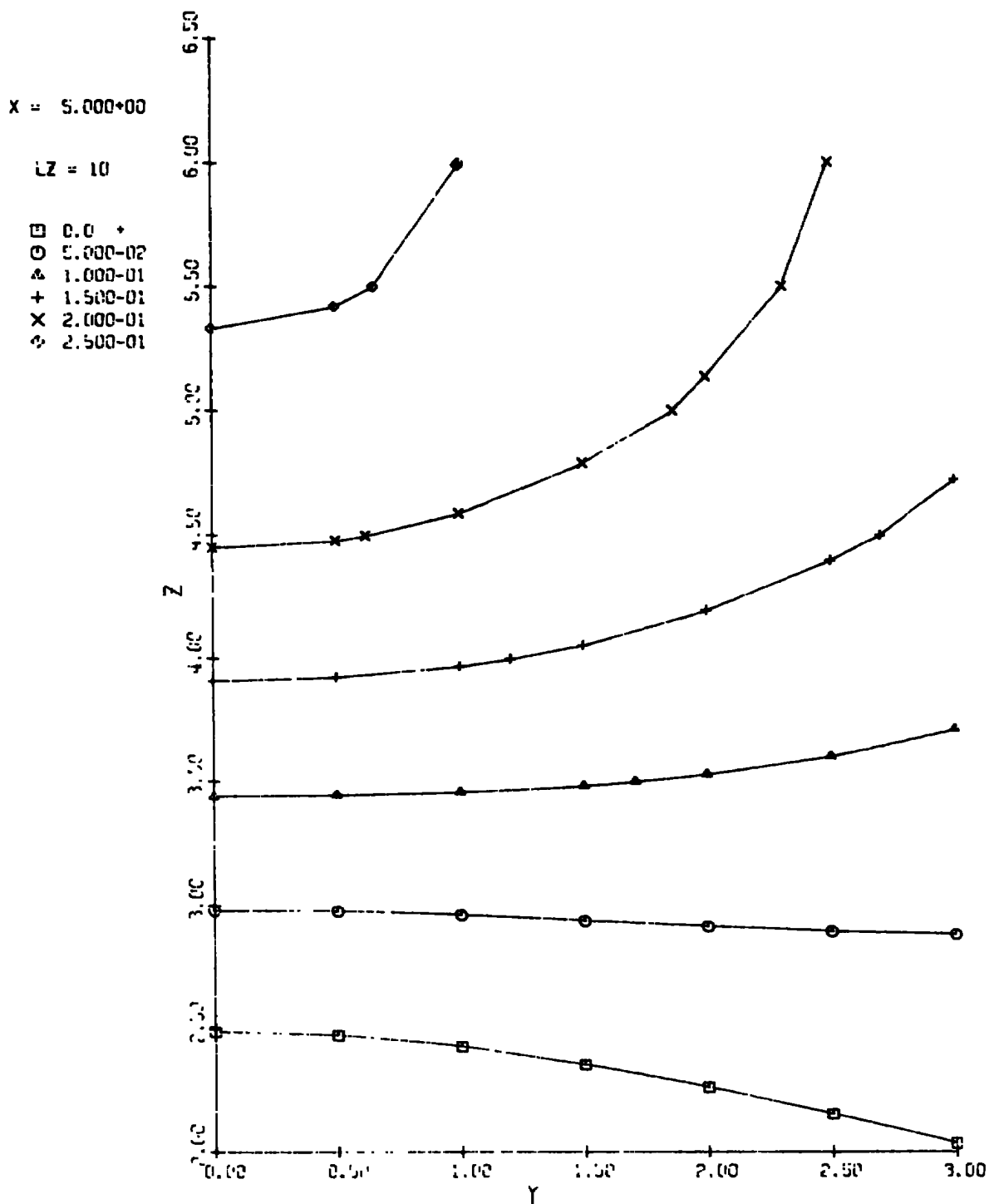
X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	P-MI
5.0000E 00	5.0000E-01	5.5000E 00	0.99175	0.00084	0.00438	0.99176	0.49568	0.05	0.25	1.641E-02	-4.322E-03
5.0000E 00	1.0000E 00	5.5000E 00	0.99212	0.00160	0.00422	0.99213	0.49587	0.09	0.24	1.567E-02	-4.127E-03
5.0000E 00	1.5000E 00	5.5000E 00	0.99268	0.00223	0.00397	0.99269	0.49616	0.13	0.23	1.457E-02	-3.836E-03
5.0000E 00	2.0000E 00	5.5000E 00	0.99335	0.00270	0.00367	0.99336	0.49651	0.16	0.21	1.324E-02	-3.486E-03
5.0000E 00	2.5000E 00	5.5000E 00	0.99406	0.00302	0.00334	0.99407	0.49689	0.17	0.19	1.183E-02	-3.114E-03
5.0000E 00	3.0000E 00	5.5000E 00	0.99476	0.00320	0.00302	0.99477	0.49725	0.18	0.17	1.044E-02	-2.747E-03
5.0000E 00	0.0	6.0000E 00	0.99280	0.0	0.00455	0.99281	0.49623	0.0	0.26	1.433E-02	-3.774E-03
5.0000E 00	5.0000E-01	6.0000E 00	0.99290	0.00073	0.00450	0.99291	0.49628	0.04	0.26	1.413E-02	-3.721E-03
5.0000E 00	1.0000E 00	6.0000E 00	0.99315	0.00139	0.00434	0.99320	0.49643	0.08	0.25	1.355E-02	-3.568E-03
5.0000E 00	1.5000E 00	6.0000E 00	0.99363	0.00195	0.00409	0.99364	0.49666	0.11	0.24	1.268E-02	-3.336E-03
5.0000E 00	2.0000E 00	6.0000E 00	0.99417	0.00239	0.00379	0.99418	0.49694	0.14	0.22	1.161E-02	-3.056E-03
5.0000E 00	2.5000E 00	6.0000E 00	0.99475	0.00268	0.00347	0.99476	0.49725	0.15	0.20	1.046E-02	-2.752E-03
5.0000E 00	3.0000E 00	6.0000E 00	0.99532	0.00287	0.00314	0.99533	0.49755	0.16	0.18	9.312E-03	-2.449E-03
7.0000E 00	0.0	2.0000E 00	0.97045	0.0	-0.00333	0.97050	0.48455	0.0	-0.55	5.813E-02	-1.545E-02
7.0000E 00	5.0000E-01	2.0000E 00	0.97177	0.00528	-0.00863	0.97183	0.48524	0.31	-0.51	5.555E-02	-1.476E-02
7.0000E 00	1.0000E 00	2.0000E 00	0.97517	0.00922	-0.00688	0.97524	0.48703	0.54	-0.40	4.891E-02	-1.297E-02
7.0000E 00	1.5000E 00	2.0000E 00	0.97946	0.01134	-0.00480	0.97954	0.48927	0.66	-0.28	4.051E-02	-1.073E-02
7.0000E 00	2.0000E 00	2.0000E 00	0.98363	0.01194	-0.00297	0.98371	0.49146	0.70	-0.17	3.232E-02	-8.544E-03
7.0000E 00	2.5000E 00	2.0000E 00	0.98720	0.01158	-0.00159	0.98727	0.49332	0.67	-0.09	2.531E-02	-6.679E-03
7.0000E 00	3.0000E 00	2.0000E 00	0.99005	0.01075	-0.00065	0.99011	0.49481	0.62	-0.04	1.968E-02	-5.189E-03
7.0000E 00	0.0	2.5000E 00	0.96380	0.0	-0.00856	0.96384	0.48107	0.0	-0.51	7.101E-02	-1.893E-02
7.0000E 00	5.0000E-01	2.5000E 00	0.96590	0.00678	-0.00769	0.96595	0.48217	0.40	-0.46	6.694E-02	-1.783E-02
7.0000E 00	1.0000E 00	2.5000E 00	0.97106	0.01144	-0.00560	0.97115	0.48488	0.68	-0.33	5.688E-02	-1.512E-02
7.0000E 00	1.5000E 00	2.5000E 00	0.97711	0.01344	-0.00332	0.97721	0.48806	0.79	-0.19	4.506E-02	-1.194E-02
7.0000E 00	2.0000E 00	2.5000E 00	0.98253	0.01353	-0.00144	0.98262	0.49089	0.79	-0.09	3.445E-02	-9.112E-03
7.0000E 00	2.5000E 00	2.5000E 00	0.98681	0.01264	-0.00027	0.98689	0.49312	0.73	-0.02	2.605E-02	-6.876E-03
7.0000E 00	3.0000E 00	2.5000E 00	0.99002	0.01140	0.00045	0.99005	0.49480	0.66	0.03	1.973E-02	-5.201E-03
7.0000E 00	0.0	3.0000E 00	0.95645	0.0	-0.00491	0.95650	0.47724	0.0	-0.29	8.511E-02	-2.276E-02
7.0000E 00	5.0000E-01	3.0000E 00	0.95962	0.00840	-0.00412	0.95967	0.47889	0.50	-0.25	7.904E-02	-2.111E-02
7.0000E 00	1.0000E 00	3.0000E 00	0.96704	0.01367	-0.00232	0.96714	0.48279	0.81	-0.14	6.464E-02	-1.721E-02
7.0000E 00	1.5000E 00	3.0000E 00	0.97514	0.01536	-0.00051	0.97526	0.48704	0.90	-0.03	4.886E-02	-1.296E-02
7.0000E 00	2.0000E 00	3.0000E 00	0.98184	0.01482	0.00076	0.98195	0.49054	0.86	0.04	3.578E-02	-9.464E-03
7.0000E 00	2.5000E 00	3.0000E 00	0.98675	0.01338	0.00147	0.98684	0.49310	0.78	0.09	2.614E-02	-6.901E-03
7.0000E 00	3.0000E 00	3.0000E 00	0.99022	0.01175	0.00177	0.99029	0.49491	0.68	0.10	1.932E-02	-5.092E-03
7.0000E 00	0.0	3.5000E 00	0.95212	0.0	0.00253	0.95213	0.47496	0.0	0.15	9.345E-02	-2.504E-02
7.0000E 00	5.0000E-01	3.5000E 00	0.95605	0.00942	0.00277	0.95610	0.47703	0.56	0.17	8.586E-02	-2.297E-02
7.0000E 00	1.0000E 00	3.5000E 00	0.96512	0.01497	0.00325	0.96524	0.48180	0.89	0.19	6.831E-02	-1.820E-02
7.0000E 00	1.5000E 00	3.5000E 00	0.97460	0.01632	0.00360	0.97474	0.48676	0.96	0.21	4.988E-02	-1.324E-02
7.0000E 00	2.0000E 00	3.5000E 00	0.98202	0.01530	0.00366	0.98215	0.49064	0.89	0.21	3.535E-02	-9.359E-03
7.0000E 00	2.5000E 00	3.5000E 00	0.98721	0.01351	0.00350	0.98731	0.49334	0.78	0.20	2.523E-02	-6.658E-03
7.0000E 00	3.0000E 00	3.5000E 00	0.99072	0.01168	0.00320	0.99079	0.49517	0.68	0.19	1.833E-02	-4.830E-03
7.0000E 00	0.0	4.0000E 00	0.95471	0.0	0.01145	0.95478	0.47634	0.0	0.69	8.840E-02	-2.366E-02
7.0000E 00	5.0000E-01	4.0000E 00	0.95851	0.00910	0.01089	0.95861	0.47834	0.54	0.65	8.106E-02	-2.166E-02
7.0000E 00	1.0000E 00	4.0000E 00	0.96726	0.01442	0.00955	0.96741	0.48293	0.85	0.57	6.411E-02	-1.707E-02
7.0000E 00	1.5000E 00	4.0000E 00	0.97635	0.01566	0.00800	0.97651	0.48769	0.92	0.47	4.643E-02	-1.231E-02
7.0000E 00	2.0000E 00	4.0000E 00	0.98340	0.01462	0.00661	0.98353	0.49137	0.85	0.39	3.266E-02	-8.634E-03
7.0000E 00	2.5000E 00	4.0000E 00	0.98827	0.01286	0.00547	0.98837	0.49390	0.75	0.32	2.313E-02	-6.102E-03
7.0000E 00	3.0000E 00	4.0000E 00	0.99152	0.01109	0.00455	0.99160	0.49559	0.64	0.26	1.674E-02	-4.409E-03
7.0000E 00	0.0	4.5000E 00	0.96368	0.0	0.01752	0.96384	0.48107	0.0	1.04	7.102E-02	-1.893E-02
7.0000E 00	5.0000E-01	4.5000E 00	0.96649	0.00753	0.01649	0.96666	0.48254	0.45	0.98	6.557E-02	-1.746E-02

Table B-4. Concluded.

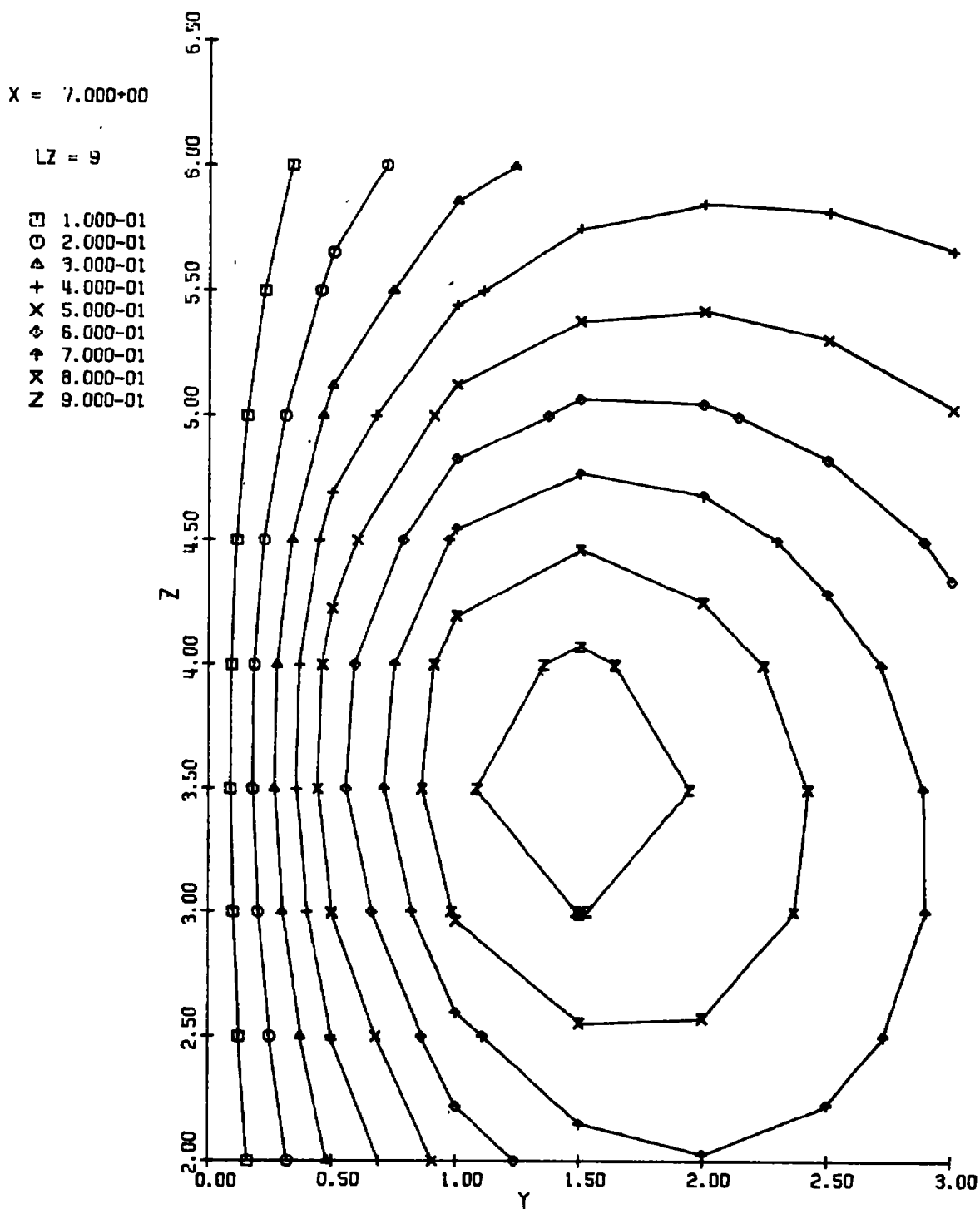
QUICK TURN WITH STRUT #1				M=.5							
VELOCITIES				PAGE 3							
X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-M1
7.0000E 00	1.0000E 00	4.5000E 00	0.97308	0.01216	0.01402	0.97325	0.48599	0.72	0.83	5.278E-02	-1.401E-02
7.0000E 00	1.5000E 00	4.5000E 00	0.98014	0.01351	0.01123	0.98030	0.48967	0.79	0.66	3.902E-02	-1.033E-02
7.0000E 00	2.0000E 00	4.5000E 00	0.98581	0.01288	0.00884	0.98593	0.49262	0.75	0.51	2.794E-02	-7.379E-03
7.0000E 00	2.5000E 00	4.5000E 00	0.98983	0.01152	0.00698	0.98992	0.49471	0.67	0.40	2.006E-02	-5.289E-03
7.0000E 00	3.0000E 00	4.5000E 00	0.99257	0.01006	0.00559	0.99264	0.49614	0.58	0.32	1.467E-02	-3.863E-03
7.0000E 00	0.0	5.0000E 00	0.97435	0.0	0.01900	0.97454	0.48666	0.0	1.12	5.028E-02	-1.334E-02
7.0000E 00	5.0000E-01	5.0000E 00	0.97603	0.00553	0.01799	0.97621	0.48753	0.32	1.06	4.702E-02	-1.247E-02
7.0000E 00	1.0000E 00	5.0000E 00	0.98009	0.00922	0.01547	0.98026	0.48965	0.54	0.90	3.905E-02	-1.035E-02
7.0000E 00	1.5000E 00	5.0000E 00	0.98470	0.01068	0.01253	0.98484	0.49205	0.62	0.73	3.005E-02	-7.950E-03
7.0000E 00	2.0000E 00	5.0000E 00	0.98864	0.01059	0.00990	0.98875	0.49410	0.61	0.57	2.237E-02	-5.901E-03
7.0000E 00	2.5000E 00	5.0000E 00	0.99161	0.00978	0.00780	0.99168	0.49564	0.56	0.45	1.656E-02	-4.363E-03
7.0000E 00	3.0000E 00	5.0000E 00	0.99372	0.00876	0.00621	0.99378	0.49674	0.50	0.36	1.240E-02	-3.264E-03
7.0000E 00	0.0	5.5000E 00	0.98303	0.0	0.01738	0.98319	0.49118	0.0	1.01	3.334E-02	-8.816E-03
7.0000E 00	5.0000E-01	5.5000E 00	0.98391	0.00381	0.01661	0.98406	0.49164	0.22	0.97	3.162E-02	-8.357E-03
7.0000E 00	1.0000E 00	5.5000E 00	0.98614	0.00659	0.01465	0.98627	0.49280	0.38	0.85	2.728E-02	-7.202E-03
7.0000E 00	1.5000E 00	5.5000E 00	0.98883	0.00799	0.01222	0.98894	0.49420	0.46	0.71	2.201E-02	-5.804E-03
7.0000E 00	2.0000E 00	5.5000E 00	0.99131	0.00830	0.00990	0.99140	0.49549	0.48	0.57	1.713E-02	-4.514E-03
7.0000E 00	2.5000E 00	5.5000E 00	0.99332	0.00797	0.00795	0.99338	0.49653	0.46	0.46	1.319E-02	-3.472E-03
7.0000E 00	3.0000E 00	5.5000E 00	0.99484	0.00737	0.00640	0.99489	0.49732	0.42	0.37	1.020E-02	-2.682E-03
7.0000E 00	0.0	6.0000E 00	0.98890	0.0	0.01468	0.98901	0.49424	0.0	0.85	2.185E-02	-5.763E-03
7.0000E 00	5.0000E-01	6.0000E 00	0.98935	0.00259	0.01417	0.98945	0.49447	0.15	0.82	2.098E-02	-5.533E-03
7.0000E 00	1.0000E 00	6.0000E 00	0.99051	0.00462	0.01281	0.99060	0.49507	0.27	0.74	1.871E-02	-4.930E-03
7.0000E 00	1.5000E 00	6.0000E 00	0.99200	0.00584	0.01103	0.99208	0.49585	0.34	0.64	1.577E-02	-4.154E-03
7.0000E 00	2.0000E 00	6.0000E 00	0.99349	0.00634	0.00922	0.99355	0.49662	0.37	0.53	1.285E-02	-3.383E-03
7.0000E 00	2.5000E 00	6.0000E 00	0.99478	0.00635	0.00760	0.99483	0.49729	0.37	0.44	1.031E-02	-2.713E-03
7.0000E 00	3.0000E 00	6.0000E 00	0.99583	0.00608	0.00624	0.99586	0.49783	0.35	0.36	8.255E-03	-2.171E-03



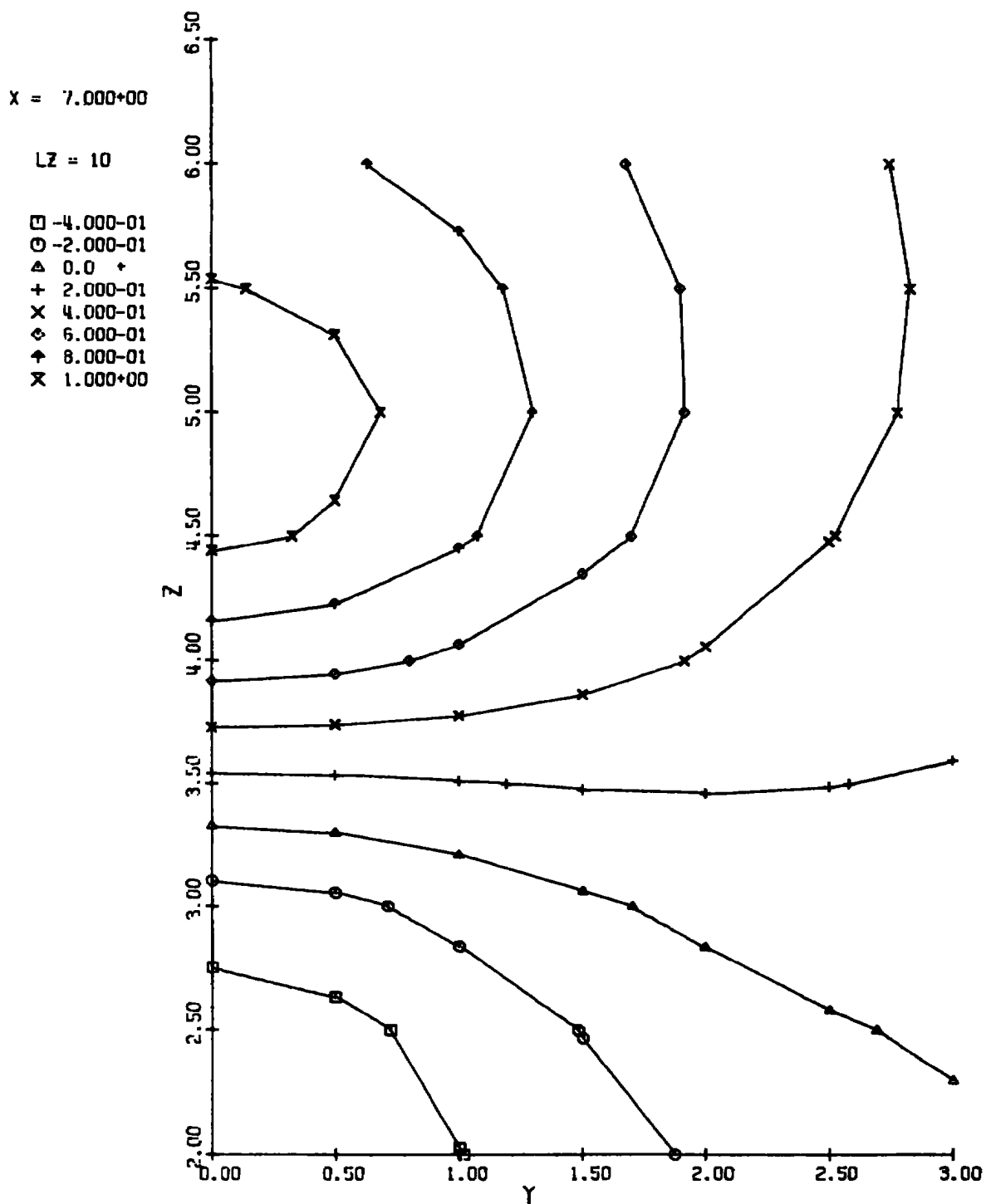
a. Lines of constant sidewash at X-station 5
 Figure B-2. Flow angularity data.



b. Lines of constant upwash at X-station 5
Figure B-2. Continued.



c. Lines of constant sidewash at X-station 7
 Figure B-2. Continued.



d. Lines of constant upwash at X-station 7
 Figure B-2. Concluded.

QUICK TURN WITH STRUT #1
STREAMLINE 1 PAGE 1
AN = 1.000 AX = 3.000 DSO =

Table B-5. Streamline Data Tabulation

X	Y	Z	U	V	W	V	M	A(V,U)	A(M,U)	CP	M-MI
6.0000E 00	5.0000E-01	3.7500E 00	0.98021	0.00268	0.00373	0.98022	0.48963	0.16	0.22	3.917E-02	-1.037E-02
6.2000E 00	5.0061E-01	3.7508E 00	0.97742	0.00331	0.00417	0.97744	0.48817	0.19	0.24	4.461E-02	-1.183E-02
6.4000E 00	5.0138E-01	3.7517E 00	0.97397	0.00417	0.00469	0.97399	0.48637	0.25	0.28	5.135E-02	-1.363E-02
6.6000E 00	5.0236E-01	3.7527E 00	0.96959	0.00535	0.00531	0.96962	0.48409	0.32	0.31	5.983E-02	-1.591E-02
6.8000E 00	5.0364E-01	3.7539E 00	0.96396	0.00704	0.00607	0.96401	0.48115	0.42	0.36	7.065E-02	-1.885E-02
7.0000E 00	5.0537E-01	3.7553E 00	0.95655	0.00953	0.00700	0.95662	0.47730	0.57	0.42	8.488E-02	-2.270E-02
7.1999E 00	5.0777E-01	3.7569E 00	0.94655	0.01333	0.00818	0.94668	0.47212	0.81	0.50	1.038E-01	-2.788E-02
7.3999E 00	5.1126E-01	3.7588E 00	0.93273	0.01941	0.00972	0.93298	0.46499	1.19	0.60	1.296E-01	-3.501E-02
7.5998E 00	5.1657E-01	3.7611E 00	0.91315	0.02961	0.01181	0.91371	0.45498	1.86	0.74	1.651E-01	-4.502E-02
7.7996E 00	5.2519E-01	3.7641E 00	0.88504	0.04774	0.01482	0.88645	0.44087	3.09	0.96	2.142E-01	-5.913E-02
7.9989E 00	5.4020E-01	3.7680E 00	0.84543	0.08179	0.01936	0.84959	0.42187	5.53	1.31	2.782E-01	-7.813E-02
8.1106E 00	5.5336E-01	3.7709E 00	0.81844	0.11366	0.02291	0.82661	0.41007	7.91	1.60	3.167E-01	-8.993E-02
8.1938E 00	5.6680E-01	3.7734E 00	0.78821	0.14683	0.02618	0.81202	0.40260	10.42	1.88	3.406E-01	-9.740E-02
8.2558E 00	5.7954E-01	3.7756E 00	0.78549	0.17828	0.02901	0.80599	0.39951	12.79	2.11	3.504E-01	-1.005E-01
8.3171E 00	5.9502E-01	3.7780E 00	0.77813	0.21589	0.03214	0.80817	0.40062	15.51	2.37	3.469E-01	-9.938E-02
8.3775E 00	6.1348E-01	3.7806E 00	0.78061	0.25918	0.03550	0.82328	0.40836	18.37	2.60	3.222E-01	-9.164E-02
8.4370E 00	6.3480E-01	3.7834E 00	0.79855	0.30593	0.03889	0.85603	0.42518	20.96	2.79	2.672E-01	-7.482E-02
8.4957E 00	6.5837E-01	3.7863E 00	0.83772	0.35130	0.04202	0.90937	0.45273	22.75	2.87	1.730E-01	-4.727E-02
8.5538E 00	6.8309E-01	3.7892E 00	0.90202	0.38752	0.04453	0.98275	0.49096	23.25	2.83	3.420E-02	-9.044E-03
8.6417E 00	7.1876E-01	3.7933E 00	1.04258	0.40226	0.04654	1.11846	0.56277	21.10	2.56	-2.510E-01	6.277E-02
8.6919E 00	7.3674E-01	3.7955E 00	1.13457	0.37710	0.04657	1.19650	0.60481	18.39	2.35	-4.316E-01	1.048E-01
8.7301E 00	7.4848E-01	3.7970E 00	1.20119	0.33927	0.04609	1.24903	0.63345	15.77	2.20	-5.601E-01	1.334E-01
8.7592E 00	7.5607E-01	3.7981E 00	1.24567	0.30034	0.04550	1.28217	0.65166	13.56	2.09	-6.440E-01	1.517E-01
8.7885E 00	7.6249E-01	3.7991E 00	1.28248	0.25338	0.04475	1.30804	0.66596	11.18	2.00	-7.11CE-01	1.660E-01
8.8181E 00	7.6767E-01	3.8001E 00	1.30918	0.20005	0.04387	1.32510	0.67544	8.69	1.92	-7.559E-01	1.754E-01
8.8478E 00	7.7154E-01	3.8011E 00	1.32391	0.14266	0.04293	1.33226	0.67942	6.15	1.86	-7.749E-01	1.754E-01
8.8777E 00	7.7410E-01	3.8021E 00	1.32559	0.08396	0.04197	1.32891	0.67756	3.62	1.81	-7.660E-01	1.776E-01
8.9077E 00	7.7536E-01	3.8030E 00	1.31417	0.02692	0.04107	1.31508	0.66987	1.17	1.79	-7.294E-01	1.699E-01
8.9377E 00	7.7537E-01	3.8039E 00	1.29056	-0.02566	0.04028	1.29144	0.65678	-1.14	1.79	-6.678E-01	1.568E-01
8.9677E 00	7.7423E-01	3.8049E 00	1.25652	-0.07137	0.03967	1.25917	0.63901	-3.25	1.81	-5.855E-01	1.390E-01
8.9977E 00	7.7205E-01	3.8058E 00	1.21447	-0.10841	0.03929	1.21993	0.61755	-5.10	1.85	-4.882E-01	1.176E-01
9.0275E 00	7.6899E-01	3.8068E 00	1.16711	-0.13569	0.03920	1.17562	0.59351	-6.63	1.92	-3.821E-01	9.351E-02
9.0573E 00	7.6523E-01	3.8078E 00	1.11718	-0.15283	0.03945	1.12827	0.56802	-7.79	2.02	-2.730E-01	6.802E-02
9.0870E 00	7.6097E-01	3.8089E 00	1.06721	-0.16004	0.04007	1.07989	0.54220	-8.53	2.15	-1.662E-01	4.220E-02
9.1315E 00	7.5421E-01	3.8107E 00	0.99689	-0.15373	0.04177	1.00953	0.50501	-8.77	2.40	-1.916E-02	5.009E-03
9.1983E 00	7.4487E-01	3.8138E 00	0.91213	-0.11312	0.04607	0.92027	0.45839	-7.07	2.89	-1.531E-01	-4.161E-02
9.2487E 00	7.3982E-01	3.8165E 00	0.87017	-0.06588	0.05052	0.87412	0.43451	-4.33	3.32	-2.359E-01	-6.549E-02
9.2866E 00	7.3782E-01	3.8188E 00	0.85211	-0.02500	0.05435	0.85421	0.42425	-1.68	3.65	-2.703E-01	-7.575E-02
9.3245E 00	7.3767E-01	3.8213E 00	0.84572	0.01792	0.05836	0.84792	0.42101	1.21	3.95	-2.810E-01	-7.899E-02
9.3623E 00	7.3942E-01	3.8240E 00	0.85084	0.06066	0.06232	0.85527	0.42479	4.08	4.19	-2.685E-01	-7.521E-02
9.4001E 00	7.4298E-01	3.8269E 00	0.86708	0.10107	0.06595	0.87544	0.43519	6.65	4.35	-2.336E-01	-6.481E-02
9.4376E 00	7.4805E-01	3.8297E 00	0.89386	0.13705	0.06899	0.90693	0.45147	8.72	4.41	-1.775E-01	-4.853E-02
9.4750E 00	7.5427E-01	3.8326E 00	0.93024	0.16649	0.07122	0.94770	0.47265	10.15	4.38	-1.019E-01	-2.735E-02
9.5123E 00	7.6119E-01	3.8354E 00	0.97485	0.18730	0.07247	0.99532	0.49754	10.88	4.25	-9.342E-03	-2.457E-03
9.5681E 00	7.7182E-01	3.8394E 00	1.05249	0.19826	0.07226	1.07343	0.53877	10.67	3.93	-1.523E-01	3.877E-02
9.6524E 00	7.8546E-01	3.8447E 00	1.17153	0.16066	0.06718	1.18439	0.59825	7.81	3.28	-4.028E-01	9.825E-02
9.7001E 00	7.9088E-01	3.8473E 00	1.22406	0.11109	0.06209	1.23066	0.62340	5.19	2.90	-5.145E-01	1.234E-01
9.7360E 00	7.9343E-01	3.8490E 00	1.24996	0.06380	0.05751	1.25290	0.63557	2.92	2.63	-5.698E-01	1.356E-01
9.7721E 00	7.9451E-01	3.8506E 00	1.26133	0.01150	0.05252	1.26248	0.64082	0.52	2.38	-5.938E-01	1.408E-01
9.8081E 00	7.9408E-01	3.8520E 00	1.25703	-0.04175	0.04734	1.25861	0.63870	-1.90	2.16	-5.841E-01	1.387E-01

Table B-5. Continued

QUICK TURN WITH STRUT #1 M=.5											
STREAMLINE 1		PAGE 2									
AN = 1.000		AX = 3.000		DSO = 2.0000E-01							
X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-MI
9.8441E 00	7.9215E-01	3.8533E 00	1.23754	-0.09175	0.04225	1.24165	0.62941	-4.24	1.96	-5.417E-01	1.294E-01
9.8800E 00	7.8882E-01	3.8545E 00	1.20485	-0.13479	0.03750	1.21295	0.61375	-6.38	1.78	-4.712E-01	1.137E-01
9.9158E 00	7.8425E-01	3.8556E 00	1.16216	-0.16805	0.03334	1.17472	0.59302	-8.23	1.64	-3.800E-01	9.302E-02
9.9514E 00	7.7864E-01	3.8566E 00	1.11323	-0.18986	0.02997	1.12970	0.56879	-9.68	1.54	-2.762E-01	6.879E-02
9.9869E 00	7.7228E-01	3.8575E 00	1.06190	-0.19971	0.02758	1.08086	0.54272	-10.65	1.49	-1.682E-01	4.272E-02
1.0040E 01	7.6210E-01	3.8589E 00	0.98779	-0.19313	0.02612	1.00683	0.50359	-11.06	1.51	-1.370E-02	3.587E-03
1.0120E 01	7.4783E-01	3.8612E 00	0.89949	-0.14434	0.02888	0.91145	0.45381	-9.12	1.84	1.693E-01	-4.619E-02
1.0165E 01	7.4150E-01	3.8628E 00	0.86692	-0.10290	0.03273	0.87362	0.43425	-6.77	2.16	2.368E-01	-6.575E-02
1.0199E 01	7.3812E-01	3.8642E 00	0.85151	-0.06783	0.03640	0.85498	0.42465	-4.55	2.45	2.690E-01	-7.535E-02
1.0233E 01	7.3613E-01	3.8657E 00	0.84396	-0.03082	0.04046	0.84549	0.41976	-2.09	2.74	2.852E-01	-8.024E-02
1.0267E 01	7.3565E-01	3.8675E 00	0.84419	0.00689	0.04461	0.84539	0.41971	0.47	3.02	2.853E-01	-8.029E-02
1.0302E 01	7.3668E-01	3.8693E 00	0.85206	0.04415	0.04853	0.85458	0.42444	2.97	3.26	2.697E-01	-7.556E-02
1.0336E 01	7.3913E-01	3.8713E 00	0.86740	0.07981	0.05191	0.87261	0.43372	5.26	3.42	2.386E-01	-6.628E-02
1.0370E 01	7.4286E-01	3.8734E 00	0.88999	0.11279	0.05447	0.89876	0.44723	7.22	3.50	1.922E-01	-5.277E-02
1.0404E 01	7.4762E-01	3.8755E 00	0.91953	0.14189	0.05596	0.93209	0.46453	8.77	3.48	1.312E-01	-3.547E-02
1.0437E 01	7.5316E-01	3.8775E 00	0.95559	0.16587	0.05618	0.97150	0.48507	9.85	3.36	5.619E-02	-1.493E-02
1.0471E 01	7.5917E-01	3.8794E 00	0.99743	0.18341	0.05500	1.01564	0.50822	10.42	3.16	-3.152E-02	8.220E-03
1.0521E 01	7.6841E-01	3.8820E 00	1.06850	0.19480	0.05043	1.08728	0.54613	10.33	2.70	-1.822E-01	4.613E-02
1.0597E 01	7.8079E-01	3.8850E 00	1.18123	0.17105	0.03734	1.19414	0.60353	8.24	1.81	-4.260E-01	1.035E-01
1.0655E 01	7.8762E-01	3.8864E 00	1.25416	0.11847	0.02318	1.25996	0.63944	5.40	1.06	-5.875E-01	1.394E-01
1.0698E 01	7.9070E-01	3.8870E 00	1.29218	0.06244	0.01077	1.29373	0.65804	2.77	0.48	-6.737E-01	1.580E-01
1.0741E 01	7.9170E-01	3.8871E 00	1.31009	-0.00247	-0.00256	1.31009	0.66710	-0.11	-0.11	-7.163E-01	1.671E-01
1.0785E 01	7.9051E-01	3.8868E 00	1.30536	-0.06961	-0.01620	1.30732	0.66556	-3.05	-0.71	-7.091E-01	1.656E-01
1.0828E 01	7.8714E-01	3.8860E 00	1.27875	-0.13194	-0.02953	1.28588	0.65371	-5.89	-1.32	-6.535E-01	1.537E-01
1.0871E 01	7.8175E-01	3.8848E 00	1.23408	-0.18348	-0.04193	1.24835	0.63308	-8.46	-1.95	-5.584E-01	1.331E-01
1.0914E 01	7.7459E-01	3.8831E 00	1.17714	-0.22034	-0.05293	1.19875	0.60603	-10.60	-2.57	-4.370E-01	1.060E-01
1.0956E 01	7.6605E-01	3.8810E 00	1.11425	-0.24104	-0.06213	1.14171	0.57524	-12.21	-3.19	-3.035E-01	7.524E-02
1.0998E 01	7.5655E-01	3.8784E 00	1.05108	-0.24615	-0.06931	1.08174	0.54319	-13.18	-3.77	-1.702E-01	4.319E-02
1.1040E 01	7.4659E-01	3.8755E 00	0.99196	-0.23757	-0.07435	1.02271	0.51195	-13.47	-4.29	-4.595E-02	1.195E-02
1.1103E 01	7.3196E-01	3.8704E 00	0.91663	-0.20463	-0.07799	0.94242	0.46990	-12.58	-4.86	1.118E-01	-3.010E-02
1.1167E 01	7.1912E-01	3.8648E 00	0.86054	-0.15532	-0.07745	0.87787	0.43644	-10.23	-5.14	2.293E-01	-6.356E-02
1.1215E 01	7.1155E-01	3.8605E 00	0.83123	-0.11181	-0.07484	0.84205	0.41800	-7.66	-5.14	2.910E-01	-8.200E-02
1.1251E 01	7.0741E-01	3.8573E 00	0.81612	-0.07694	-0.07194	0.82289	0.40816	-5.39	-5.04	3.228E-01	-9.184E-02
1.1287E 01	7.0478E-01	3.8541E 00	0.80672	-0.04091	-0.06846	0.81066	0.40190	-2.90	-4.85	3.428E-01	-9.810E-02
1.1324E 01	7.0376E-01	3.8511E 00	0.80302	-0.00424	-0.06459	0.80563	0.39932	-0.30	-4.60	3.510E-01	-1.007E-01
1.1360E 01	7.0440E-01	3.8483E 00	0.80519	0.03255	-0.06053	0.80811	0.40060	2.31	-4.30	3.470E-01	-9.940E-02
1.1397E 01	7.0669E-01	3.8456E 00	0.81359	0.06885	-0.05649	0.81845	0.40589	4.84	-3.97	3.301E-01	-9.411E-02
1.1433E 01	7.1051E-01	3.8432E 00	0.82876	0.10393	-0.05264	0.83691	0.41536	7.15	-3.63	2.996E-01	-8.464E-02
1.1469E 01	7.1569E-01	3.8410E 00	0.85127	0.13677	-0.04916	0.86359	0.42907	9.13	-3.30	2.542E-01	-7.093E-02
1.1505E 01	7.2198E-01	3.8391E 00	0.88159	0.16606	-0.04619	0.89828	0.44699	10.67	-3.00	1.931E-01	-5.301E-02
1.1541E 01	7.2907E-01	3.8373E 00	0.91989	0.19016	-0.04384	0.94036	0.46882	11.68	-2.73	1.157E-01	-3.118E-02

***** N>NX *****

QUICK TURN WITH STRUT #1 M=.5

STRUT LINE 2 PAGE 1

AN = 1.000 AX = 3.000 CSO = 2.0000E-01

Table B-5. Continued

X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-MI
6.0000E 00	1.0000E 00	3.7500E 00	0.96208	0.00485	0.00359	0.98209	0.49061	0.28	0.21	3.545E-02	-9.388E-03
6.2000E 00	1.0011E 00	3.7503E 00	0.97989	0.00590	0.00400	0.97991	0.48947	0.34	0.23	3.977E-02	-1.053E-02
6.4000E 00	1.0024E 00	3.7516E 00	0.97728	0.00727	0.00448	0.97731	0.48811	0.43	0.26	4.486E-02	-1.189E-02
6.6000E 00	1.0041E 00	3.7526E 00	0.97415	0.00909	0.00504	0.97420	0.48648	0.53	0.30	5.093E-02	-1.352E-02
6.8000E 00	1.0062F 00	3.7537E 00	0.97038	0.01157	0.00572	0.97046	0.48453	0.68	0.34	5.82CE-02	-1.547E-02
6.9999E 00	1.0090E 00	3.7550E 00	0.96584	0.01500	0.00653	0.96598	0.48218	0.89	0.39	6.685E-02	-1.782E-02
7.1999E 00	1.0126E 00	3.7564E 00	0.96042	0.01982	0.00751	0.96066	0.47941	1.18	0.45	7.713E-02	-2.059E-02
7.3998E 00	1.0175E 00	3.7581E 00	0.95413	0.02673	0.00874	0.95454	0.47621	1.60	0.52	8.885E-02	-2.379E-02
7.5997E 00	1.0241E 00	3.7601E 00	0.94727	0.03673	0.01027	0.94803	0.47282	2.22	0.62	1.012E-01	-2.718E-02
7.7995E 00	1.0334E 00	3.7625E 00	0.94099	0.05113	0.01222	0.94246	0.46992	3.11	0.74	1.118E-01	-3.008E-02
7.9990E 00	1.0464E 00	3.7654E 00	0.93829	0.07116	0.01471	0.94110	0.46921	4.34	0.90	1.143E-01	-3.079E-02
8.1982E 00	1.0641E 00	3.7688E 00	0.94545	0.09601	0.01781	0.95048	0.47409	5.80	1.08	9.659E-02	-2.591E-02
8.3969E 00	1.0864E 00	3.7729E 00	0.97115	0.11822	0.02145	0.97855	0.48876	6.94	1.27	4.244E-02	-1.124E-02
8.5954E 00	1.1102E 00	3.7775E 00	1.01574	0.11588	0.02524	1.02310	0.51215	6.73	1.42	-4.673E-02	-1.215E-02
8.7943E 00	1.1302E 00	3.7827E 00	1.05326	0.08786	0.02878	1.05731	0.53022	4.77	1.57	-1.175E-01	3.022E-02
8.9938E 00	1.1429E 00	3.7885E 00	1.05177	0.04593	0.03232	1.05326	0.52808	2.50	1.76	-1.094E-01	2.808E-02
9.1935E 00	1.1504E 00	3.7951E 00	1.02797	0.03240	0.03644	1.02912	0.51532	1.81	2.03	-5.905E-02	1.532E-02
9.3933E 00	1.1577E 00	3.8026E 00	1.02438	0.04281	0.04040	1.02607	0.51371	2.39	2.26	-5.282E-02	1.371E-02
9.5929E 00	1.1659F 00	3.8105E 00	1.04705	0.04254	0.04198	1.04876	0.52569	2.33	2.30	-9.989E-02	2.569E-02
9.7927E 00	1.1718E 00	3.8183E 00	1.06246	0.01869	0.03995	1.06337	0.53343	1.01	2.15	-1.308E-01	3.343E-02
9.9925E 00	1.1734E 00	3.8254E 00	1.05041	-0.00144	0.03577	1.05102	0.52689	-0.08	1.95	-1.046E-01	2.689E-02
1.0192E 01	1.1736E 00	3.8318E 00	1.03639	0.00403	0.03104	1.03686	0.51940	0.22	1.72	-7.507E-02	1.940E-02
1.0392E 01	1.1757E 00	3.8371E 00	1.04838	0.01783	0.03464	1.04882	0.52572	0.97	1.33	-1.000E-01	2.572E-02
1.0592E 01	1.1783E 00	3.8407E 00	1.07747	0.00974	0.01320	1.07759	0.54098	0.52	0.70	-1.612E-01	4.098E-02
1.0792E 01	1.1771E 00	3.8418E 00	1.08728	-0.02387	-0.00181	1.08754	0.54627	-1.26	-0.10	-1.827E-01	4.627E-02
1.0992E 01	1.1701E 00	3.8401E 00	1.06108	-0.05132	-0.01608	1.06244	0.53294	-2.77	-0.87	-1.288E-01	3.294E-02
1.1192E 01	1.1606E 00	3.8361E 00	1.02540	-0.04813	-0.02540	1.02684	0.51412	-2.69	-1.42	-5.440E-02	1.412E-02
1.1392E 01	1.1534E 00	3.8307E 00	1.01274	-0.02500	-0.02938	1.01348	0.50708	-1.41	-1.66	-2.714E-02	7.083E-03
1.1591E 01	1.1498E 00	3.8249E 00	1.02980	-0.01169	-0.03047	1.03032	0.51595	-0.65	-1.69	-6.155E-02	1.555E-02
1.1791E 01	1.1458E 00	3.8190E 00	1.05023	-0.03000	-0.03096	1.05111	0.52694	-1.64	-1.69	-1.048E-01	2.694E-02
1.1991E 01	1.1369E 00	3.8131E 00	1.03704	-0.06376	-0.03083	1.03946	0.52078	-3.52	-1.70	-8.047E-02	2.078E-02
1.2191E 01	1.1234E 00	3.8072E 00	0.99495	-0.07361	-0.02885	0.99808	0.49899	-4.23	-1.66	3.825E-03	-1.006E-03
1.2390E 01	1.1108E 00	3.8017E 00	0.96068	-0.04969	-0.02502	0.96229	0.48026	-2.96	-1.49	7.406E-02	-1.974E-02
1.2590E 01	1.1046E 00	3.7970E 00	0.95597	-0.01023	-0.02051	0.95625	0.47710	-0.61	-1.23	8.555E-02	-2.290E-02
1.2790E 01	1.1058E 00	3.7931E 00	0.98486	0.02178	-0.01654	0.98524	0.49226	1.27	-0.96	2.930E-02	-7.740E-03
1.2990E 01	1.1101E 00	3.7901E 00	1.03682	0.02102	-0.01399	1.03712	0.51955	1.16	-0.77	-7.563E-02	1.955E-02
1.3190E 01	1.1098E 00	3.7875E 00	1.07322	-0.02458	-0.01299	1.07358	0.53885	-1.31	-0.69	-1.526E-01	3.885E-02
1.3390E 01	1.1032E 00	3.7857E 00	1.06565	-0.06930	-0.01266	1.06798	0.53588	-3.72	-0.68	-1.406E-01	3.588E-02
1.3489E 01	1.0913E 00	3.7840E 00	1.03315	-0.09854	-0.01207	1.03791	0.51996	-5.45	-0.67	-7.726E-02	1.996E-02
1.3639E 01	1.0764E 00	3.7823E 00	0.99595	-0.10444	-0.01104	1.00147	0.50077	-5.99	-0.63	-2.941E-03	7.716E-04
1.3837E 01	1.0568E 00	3.7802E 00	0.96236	-0.08848	-0.00927	0.96646	0.48244	-5.25	-0.55	6.595E-02	-1.756E-02
1.4037E 01	1.0407E 00	3.7785E 00	0.94960	-0.06535	-0.00760	0.95187	0.47482	-3.94	-0.46	9.394E-02	-2.518E-02
1.4236E 01	1.0290E 00	3.7770E 00	0.94886	-0.04559	-0.00632	0.94998	0.47383	-2.75	-0.38	9.754E-02	-2.617E-02
1.4436E 01	1.0210E 00	3.7758E 00	0.95285	-0.03111	-0.00545	0.95341	0.47563	-1.87	-0.33	9.100E-02	-2.437E-02
1.4636E 01	1.0155E 00	3.7747E 00	0.95803	-0.02097	-0.00493	0.95827	0.47816	-1.25	-0.29	8.172E-02	-2.184E-02
1.4836E 01	1.0119E 00	3.7737E 00	0.96280	-0.01387	-0.00469	0.96292	0.48058	-0.83	-0.28	7.279E-02	-1.942E-02
1.5036E 01	1.0096E 00	3.7727E 00	0.96675	-0.00877	-0.00466	0.96680	0.48261	-0.52	-0.28	6.530E-02	-1.739E-02
1.5236E 01	1.0081E 00	3.7717E 00	0.96978	-0.00495	-0.00480	0.96981	0.48418	-0.29	-0.28	5.948E-02	-1.582E-02
1.5436E 01	1.0074E 00	3.7707E 00	0.97197	-0.00191	-0.00505	0.97199	0.48532	-0.11	-0.30	5.524E-02	-1.468E-02
1.5636E 01	1.0073E 00	3.7696E 00	0.97342	0.00067	-0.00538	0.97343	0.48608	0.04	-0.32	5.243E-02	-1.392E-02

Table B-5. Continued

QUICK TURN WITH STRUT #1 M=.5
 STREAMLINE 2 PAGE 2
 AN = 1.000 AX = 3.000 DSO = 2.0000E-01

X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-MI
1.5836E 01	1.0077E 00	3.7685E 00	0.97423	0.00307	-0.00578	0.97425	0.48651	0.18	-0.34	5.084E-02	-1.349E-02
1.6036E 01	1.0086E 00	3.7673E 00	0.97448	0.00548	-0.00623	0.97452	0.48665	0.32	-0.37	5.032E-02	-1.335E-02

***** X>XX *****

QUICK TURN WITH STRUT #1

M=.5

STREAMLINE 3 PAGE 1

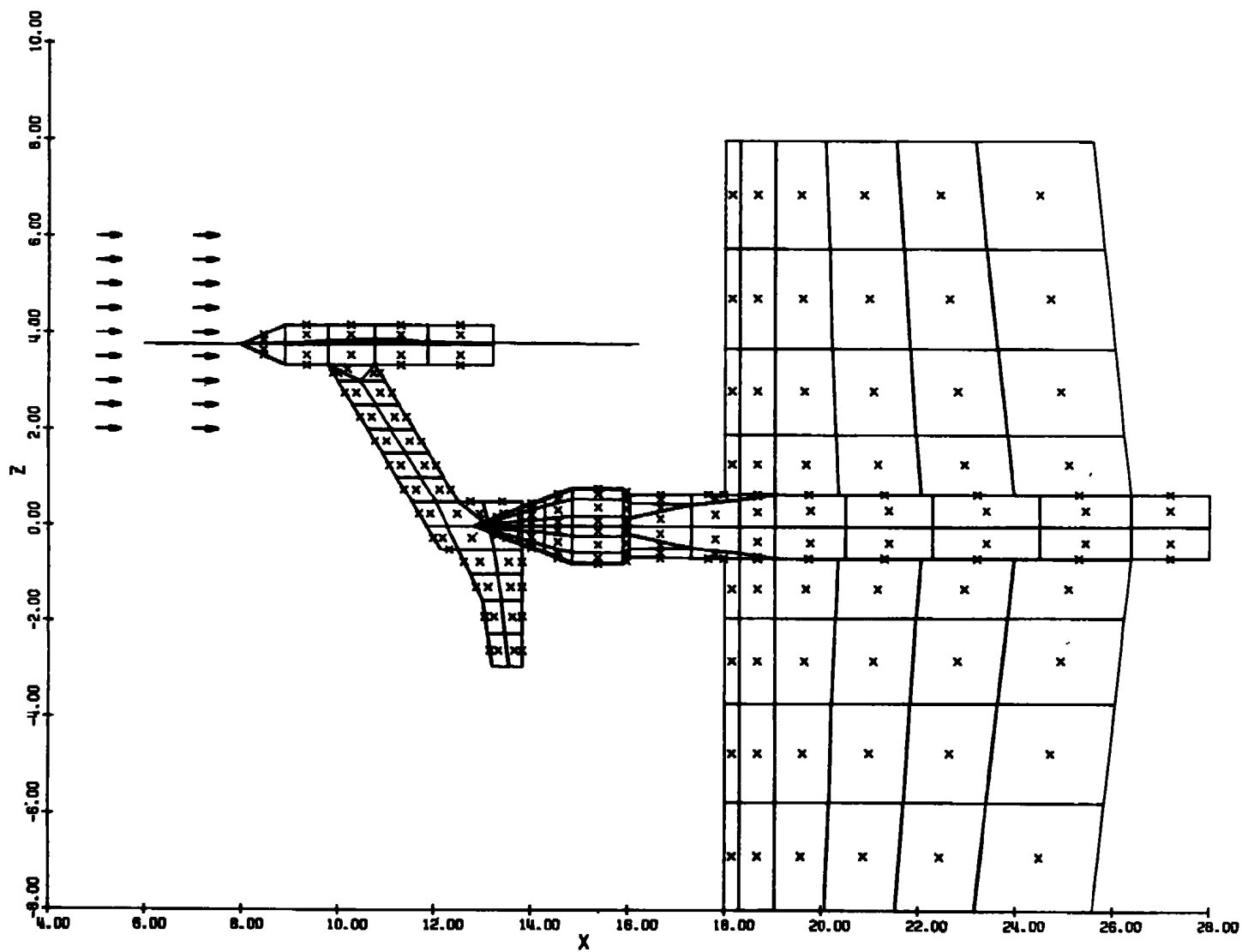
Table B-5. Continued

AN = 1.000 AX = 3.000 DSO = 2.0000E-01

X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-M1
6.0000E 00	1.5000E 00	3.7500E 00	0.98457	0.00625	0.00339	0.98460	0.49192	0.36	0.20	3.056E-02	-8.076E-03
6.2000E 00	1.5014E 00	3.7507E 00	0.98307	0.00743	0.00376	0.98311	0.49114	0.43	0.22	3.350E-02	-8.858E-03
6.4000E 00	1.5031E 00	3.7515E 00	0.98139	0.00891	0.00417	0.98144	0.49027	0.52	0.24	3.674E-02	-9.732E-03
6.6000E 00	1.5051E 00	3.7524E 00	0.97952	0.01078	0.00466	0.97959	0.48930	0.63	0.27	4.040E-02	-1.070E-02
6.8000E 00	1.5075E 00	3.7534E 00	0.97750	0.01315	0.00522	0.97760	0.48826	0.77	0.31	4.430E-02	-1.174E-02
6.9999E 00	1.5105E 00	3.7546E 00	0.97537	0.01619	0.00589	0.97552	0.48717	0.95	0.35	4.836E-02	-1.283E-02
7.1999E 00	1.5142E 00	3.7559E 00	0.97328	0.02006	0.00667	0.97351	0.48612	1.18	0.39	5.228E-02	-1.388E-02
7.3998E 00	1.5189E 00	3.7573E 00	0.97151	0.02496	0.00759	0.97186	0.48526	1.47	0.45	5.549E-02	-1.474E-02
7.5997E 00	1.5246E 00	3.7590E 00	0.97053	0.03101	0.00868	0.97107	0.48484	1.83	0.51	5.703E-02	-1.516E-02
7.7996E 00	1.5317E 00	3.7609E 00	0.97111	0.03814	0.00998	0.97191	0.48528	2.25	0.59	5.539E-02	-1.472E-02
7.9994E 00	1.5404E 00	3.7631E 00	0.97426	0.04583	0.01150	0.97540	0.48711	2.69	0.68	4.859E-02	-1.289E-02
8.1991E 00	1.5504E 00	3.7657E 00	0.98089	0.05276	0.01326	0.98240	0.49077	3.08	0.77	3.489E-02	-9.228E-03
8.3988E 00	1.5615E 00	3.7685E 00	0.99101	0.05685	0.01523	0.99275	0.49620	3.28	0.88	1.444E-02	-3.802E-03
8.5984E 00	1.5729E 00	3.7718E 00	1.00265	0.05613	0.01736	1.00437	0.50229	3.20	0.99	-6.759E-03	2.295E-03
8.7981E 00	1.5834E 00	3.7755E 00	1.01232	0.05075	0.01956	1.01378	0.50724	2.87	1.11	-2.775E-02	7.241E-03
8.9979E 00	1.5927E 00	3.7795E 00	1.01785	0.04366	0.02172	1.01901	0.51000	2.46	1.22	-3.838E-02	9.995E-03
9.1977E 00	1.6007E 00	3.7840E 00	1.02079	0.03803	0.02369	1.02178	0.51145	2.13	1.33	-4.402E-02	1.145E-02
9.3975E 00	1.6078E 00	3.7887E 00	1.02437	0.03396	0.02516	1.02524	0.51328	1.90	1.41	-5.112E-02	1.328E-02
9.5973E 00	1.6139E 00	3.7937E 00	1.02938	0.02930	0.02577	1.03012	0.51585	1.63	1.43	-6.115E-02	1.585E-02
9.7972E 00	1.6190E 00	3.7986E 00	1.03390	0.02320	0.02523	1.03447	0.51814	1.29	1.40	-7.013E-02	1.814E-02
9.9971E 00	1.6229E 00	3.8033E 00	1.03679	0.01712	0.02346	1.03719	0.51958	0.95	1.30	-7.577E-02	1.958E-02
1.0197E 01	1.6257E 00	3.8076E 00	1.03944	0.01214	0.02046	1.03972	0.52091	0.67	1.13	-8.101E-02	2.091E-02
1.0397E 01	1.6275E 00	3.8111E 00	1.04327	0.00684	0.01628	1.04342	0.52287	0.38	0.89	-8.872E-02	2.287E-02
1.0597E 01	1.6281E 00	3.8137E 00	1.04678	-0.00082	0.01106	1.04684	0.52468	-0.05	0.61	-9.588E-02	2.468E-02
1.0797E 01	1.6271E 00	3.8153E 00	1.04674	-0.01040	0.00523	1.04681	0.52466	-0.57	0.29	-9.581E-02	2.466E-02
1.0997E 01	1.6243E 00	3.8157E 00	1.04195	-0.01876	-0.00048	1.04211	0.52218	-1.03	-0.03	-8.600E-02	2.218E-02
1.1197E 01	1.6202E 00	3.8151E 00	1.03488	-0.02338	-0.00538	1.03515	0.51851	-1.29	-0.30	-7.154E-02	1.851E-02
1.1397E 01	1.6155E 00	3.8137E 00	1.02910	-0.02491	-0.00909	1.02944	0.51549	-1.39	-0.51	-5.975E-02	1.549E-02
1.1597E 01	1.6105E 00	3.8117E 00	1.02561	-0.02627	-0.01159	1.02601	0.51368	-1.47	-0.65	-5.270E-02	1.368E-02
1.1797E 01	1.6051E 00	3.8093E 00	1.02209	-0.02924	-0.01305	1.02259	0.51188	-1.64	-0.73	-4.568E-02	1.188E-02
1.1997E 01	1.5991E 00	3.8067E 00	1.01585	-0.03232	-0.01361	1.01646	0.50865	-1.82	-0.77	-3.318E-02	8.650E-03
1.2196E 01	1.5927E 00	3.8040E 00	1.00751	-0.03229	-0.01341	1.00812	0.50426	-1.84	-0.76	-1.630E-02	4.264E-03
1.2396E 01	1.5867E 00	3.8014E 00	1.00081	-0.02794	-0.01262	1.00128	0.50067	-1.60	-0.72	-2.551E-03	6.694E-04
1.2596E 01	1.5818E 00	3.7990E 00	0.99926	-0.02150	-0.01150	0.99956	0.49977	-1.23	-0.66	8.885E-04	-2.332E-04
1.2796E 01	1.5779E 00	3.7969E 00	1.00337	-0.01722	-0.01030	1.00357	0.50188	-0.98	-0.59	-7.155E-03	1.876E-03
1.2996E 01	1.5743E 00	3.7949E 00	1.00990	-0.01861	-0.00922	1.01011	0.50531	-1.06	-0.52	-2.032E-02	5.311E-03
1.3196E 01	1.5700E 00	3.7932E 00	1.01340	-0.02573	-0.00833	1.01376	0.50723	-1.45	-0.47	-2.770E-02	7.230E-03
1.3396E 01	1.5640E 00	3.7916E 00	1.01021	-0.03454	-0.00756	1.01082	0.50569	-1.96	-0.43	-2.176E-02	5.687E-03
1.3596E 01	1.5566E 00	3.7902E 00	1.00143	-0.04005	-0.00682	1.00225	0.50118	-2.29	-0.39	-4.506E-03	1.182E-03
1.3796E 01	1.5486E 00	3.7889E 00	0.99126	-0.04015	-0.00609	0.99209	0.49585	-2.32	-0.35	1.576E-02	-4.150E-03
1.3996E 01	1.5409E 00	3.7877E 00	0.98314	-0.03600	-0.00543	0.98381	0.49151	-2.10	-0.32	3.211E-02	-8.488E-03
1.4195E 01	1.5341E 00	3.7867E 00	0.97819	-0.02983	-0.00488	0.97865	0.48881	-1.75	-0.29	4.224E-02	-1.119E-02
1.4395E 01	1.5287E 00	3.7857E 00	0.97595	-0.02337	-0.00449	0.97624	0.48755	-1.37	-0.26	4.655E-02	-1.245E-02
1.4595E 01	1.5245E 00	3.7848E 00	0.97551	-0.01751	-0.00426	0.97567	0.48725	-1.03	-0.25	4.806E-02	-1.275E-02
1.4795E 01	1.5214E 00	3.7840E 00	0.97604	-0.01250	-0.00419	0.97613	0.48749	-0.73	-0.25	4.716E-02	-1.251E-02
1.4995E 01	1.5193E 00	3.7831E 00	0.97700	-0.00830	-0.00425	0.97705	0.48797	-0.49	-0.25	4.538E-02	-1.203E-02
1.5195E 01	1.5180E 00	3.7822E 00	0.97806	-0.00478	-0.00442	0.97808	0.48851	-0.28	-0.26	4.336E-02	-1.149E-02
1.5395E 01	1.5173E 00	3.7813E 00	0.97903	-0.00173	-0.00468	0.97904	0.48901	-0.10	-0.27	4.148E-02	-1.099E-02
1.5595E 01	1.5172E 00	3.7803E 00	0.97985	0.00100	-0.00501	0.97986	0.48944	0.06	-0.29	3.987E-02	-1.056E-02
1.5795E 01	1.5177E 00	3.7792E 00	0.98050	0.00358	-0.00539	0.98052	0.48979	0.21	-0.31	3.858E-02	-1.021E-02

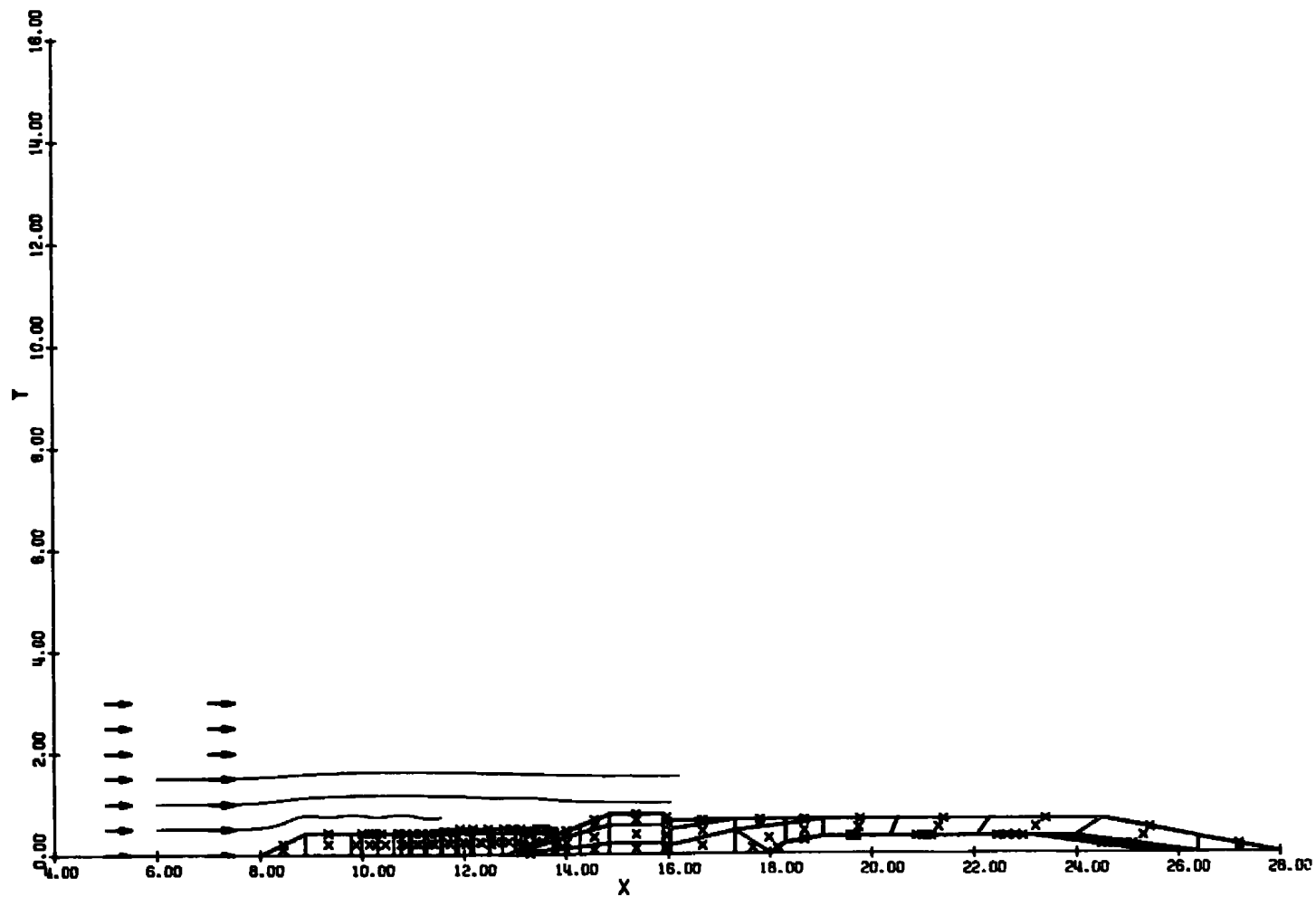
Table B-5. Concluded

QUICK TURN WITH STRUT #1											
M=.5											
STREAMLINE 3 PAGE 2											
AN = 1.000 AX = 3.000 DSO = 2.0000E-01											
X	Y	Z	U	V	W	V	M	A(V,U)	A(W,U)	CP	M-MI
1.5995E 01	1.5187E 00	3.7781E 00	0.98102	0.00615	-0.00581	0.98105	0.49007	0.36	-0.34	3.753E-02	-9.932E-03
1.6195E 01	1.5202E 00	3.7768E 00	0.98146	0.00883	-0.00627	0.98152	0.49031	0.52	-0.37	3.661E-02	-9.687E-03
***** X>XX *****											
JOB COMPLETED											

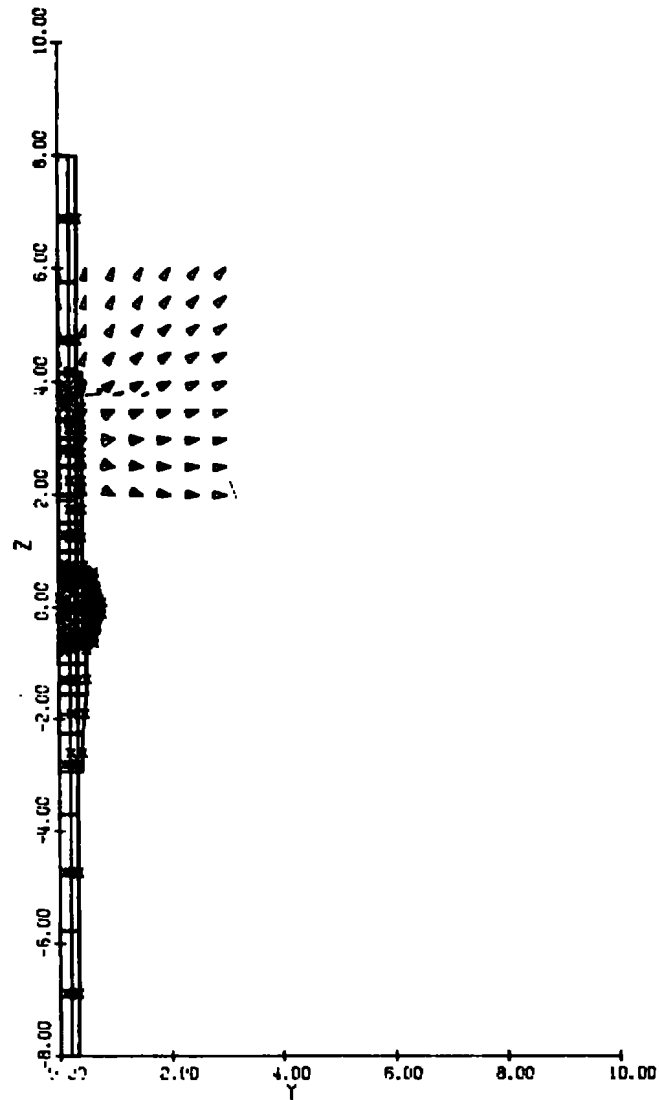


a. Side view

Figure B-3. Flow streamlines and velocity vectors.



b. Top view
Figure B-3. Continued.



c. Front view
Figure B-3. Concluded.

NOMENCLATURE

$\hat{b}_i$	Unit normal vector at i^{th} control point
M	Mach number
M_∞	Free-stream Mach number
N	Number of singularities
$\vec{r}$	Position vector
u	x-component of velocity
$\vec{u}_j$	Velocity induced by j^{th} singularity when its strength is 1
$\vec{u}_{ij}$	Velocity at i^{th} control point, induced by j^{th} singularity when its strength is 1
v	y-component of velocity
$\vec{v}$	Velocity
$\vec{v}_i$	Velocity at the i^{th} control point
$\vec{v}_\infty$	Free-stream velocity
w	z-component of velocity
x, y, z	Cartesian coordinates
β	Stretching factor for Goethert's Rule, $\sqrt{1 - M_\infty^2}$
γ_j	Strength of j^{th} singularity