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User's Guide for a Computer Program for Calculating the Zero-Lift Wave Drag of Complex Aircraft Configurations

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SUMMARY

Supersonic zero-lift wave-drag computer program has been developed to extend the geometry inp . capabilities of previous versions of the program. Highly accurate wave-drag analysis can now be performed because complex geometries can be represented accurately and do not have to be modified to meet the requirements of a restricted-input format.

INTRODUCTION

The ability to numerically define an aircraft concept for analysis or construction of wind-tunnel test models has progressed to the point that very complex and detailed numerical models can be generated easily and quickly with the aid of computer codes and interactive modeling techniques. Frequently, the same numerical model is used throughout the entire design process - from concept and analysis through manufacturing (fig. 1).

Many of the analysis computer codes in use today in research institutions and throughout the aircraft industry were developed in the 1960's and were written to accept as input simple numerical models, which compromised the analysis of the physical models (ref. 1). Often this tends to be restrictive when applied to advanced aircraft concepts currently being designed and evaluated.

Illustrated in figure 2(a) are some of the restrictions imposed on early numerical models. The fuselage and engine nacelles had to be represented by circular sections normal to the X-axis with no camber. Also, the wing could not be cambered. The fins and tails had to have symmetrical root and tip sections relative to the thickness distribution. This geometry description is used in reference 1.

Figure 2(b) illustrates some enhancements to the input geometry that were implemented (ref. 2). The fuselage could be described in either of two formats. One method was by giving the area of circular body sections parallel to the X-axis with the XZ-locations of the sections. The other method allowed the description of an arbitrary body by giving YZ-ordinates on the perimeter of cross sections through the body with their X-locations. Camber was added to the wings, and nonsymmetrical roots and tips were allowed for the fins and tails. The ability to handle more components was also added.

The increase in computer speed and central memory size has made possible the use of very detailed descriptions of a configuration (fig. 2(c)). The aircraft need no longer be described to the computer as wing, body, pods, fins, and canards, but as a collection of components. The fuselage, nacelles, and similar components can be described as general fusiform components. Corresponding points on fusiform component contours must be monotonic (either increasing or decreasing) in X because of the methods used in the analysis of these components, but the contours do not have to be parallel or perpendicular to the X-axis (fig. 3). The nonfusiform type components, such as wings, canards, and fins, can be described by nonintersecting contours in any direction rather than parallel contours as formerly required. It is no longer required that the aircraft be symmetrical about the XZ-plane, so axisymmetric configurations may be simulated.

Wave-drag analysis can now be performed on highly accurate representations of numerical models. The geometry does not have to be manipulated to meet the strict input requirements of the old versions of the program. This document is to serve as a guide for users of this more general version of a zero-lift wave-drag computer program.

PROGRAM DESCRIPTION

Program Availability

A computer program entitled "Computer Program for Calculating the Zero-Lift Wave Drag of Complex Aircraft Designs," which is described in this document, may be obtained at a nominal fee from:

Computer Software Management and Information Center (COSMIC)
112 Barrow Hall
University of Georgia
Athens, Georgia 30602
(404)542-3265

Request the program by the designation LAR-13223.

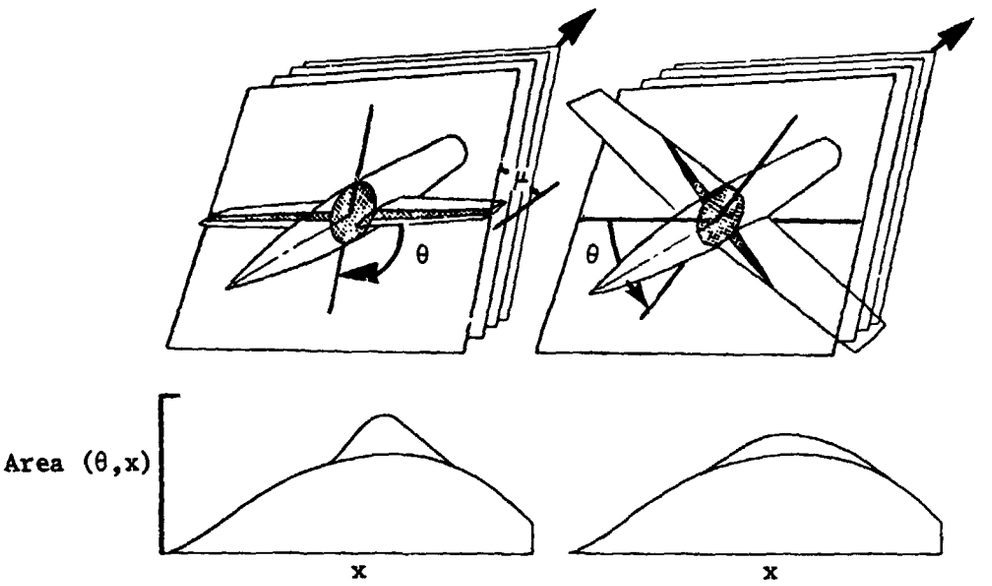
The material from COSMIC includes this document and the card image files of the program source code in Control Data Corporation MODIFY program library format (ref. 3), a sample control stream for compilation and execution of the program, a sample geometry input file, and a sample input file of conditions under which the input geometry is to be analyzed.

Area-Rule Concept

In 1952, Whitcomb proposed and experimentally verified his "area-rule" concept of transonic drag (ref. 4). In this concept, a given wing-body configuration is considered to be intercepted by a series of parallel cutting planes normal to the axis of the aircraft. The intercepted cross-section areas are considered as equivalent-area circles which define an equivalent body of revolution. The area-rule concept states that the equivalent-body wave drag is the same at Mach 1 as that of the complete configuration.

The problem becomes more complex for supersonic speeds. The general theory of Jones requires that the parallel cutting planes be tangent to the Mach cone and that the intercepted areas be projected onto a plane normal to the aircraft axis (ref. 5). There is no longer a single equivalent body, but a series of equivalent bodies - one for each of the many roll angles. A roll angle θ is the angle between a normal to a Mach plane projected onto the YZ-plane and the Y-axis. The integrated average of the equivalent-body wave drags through the full roll range of 360° is the wave drag

of the complete configuration for a given Mach number. Two of the possible roll angles are illustrated in the following sketch:



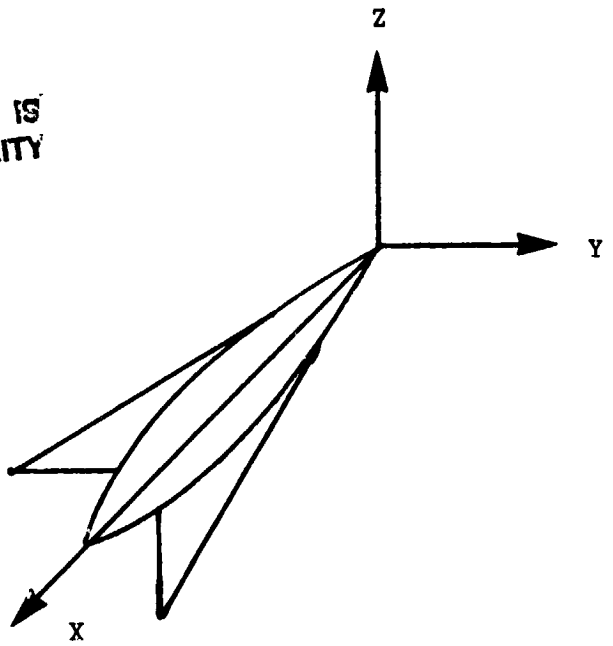
A digital computer program that applied the equivalent-body theoretical approach to the calculation of aircraft wave drag was developed in the 1960's by the Boeing Company and was subsequently adapted at NASA Langley Research Center (ref. 1). The numerical description of a complex aircraft configuration was provided to the computer by systematic specification of fuselage and nacelle radii, along with wing- and tail-surface reference points, with the assumption of linear contours between successive ordinates. Once the aircraft description had been provided to the computer, the equivalent-body area distributions are determined by geometric solutions for the normal projection of areas intercepted by the cutting planes. The wave drag for the resulting equivalent bodies is then evaluated by the method of Eminton and Lord (ref. 6).

The current version of the program described in this report allows a general, arbitrary, numerical model as input to the program.

Computational Details

Data input and initialization.- The program begins with the reading of the geometry input data. The configuration is usually positioned with its longitudinal

axis extending along the X-axis in the positive direction. The right-handed Cartesian coordinate system is used as illustrated in the following sketch:



The first data items read by the program are the vehicle identification, the reference area, and a print code. Next, a set of data is read describing general information about each component of the aircraft. This data set is identical in form for each component and contains the component number, the type of surface, a mirror image code, the number of contours to describe the component, and the number of coordinate points in each contour. Also included are a scale factor and the origin of the component in relation to the entire vehicle, so that a component can be described in a local coordinate system. Then, the x,y,z coordinate points are read for the component.

The program is currently dimensioned to have a maximum of 30 components containing a maximum of 50 contours with a maximum of 50 points per contour. However, this can be modified easily to handle more. The geometry input format is described in detail in a following section.

The next section of the program reads in the case data, which include the case identification, Mach number, angle of attack α in degrees, the $x_r z_r$ coordinate for the angle-of-attack rotation, the number of equal intervals into which the X domain is divided, the number of equal intervals into which the domain of $\theta(-\pi/2, 3\pi/2)$ is divided (must be a multiple of four), a code for the type of data to be read next, and a print code. A detailed explanation of the case information is given subsequently.

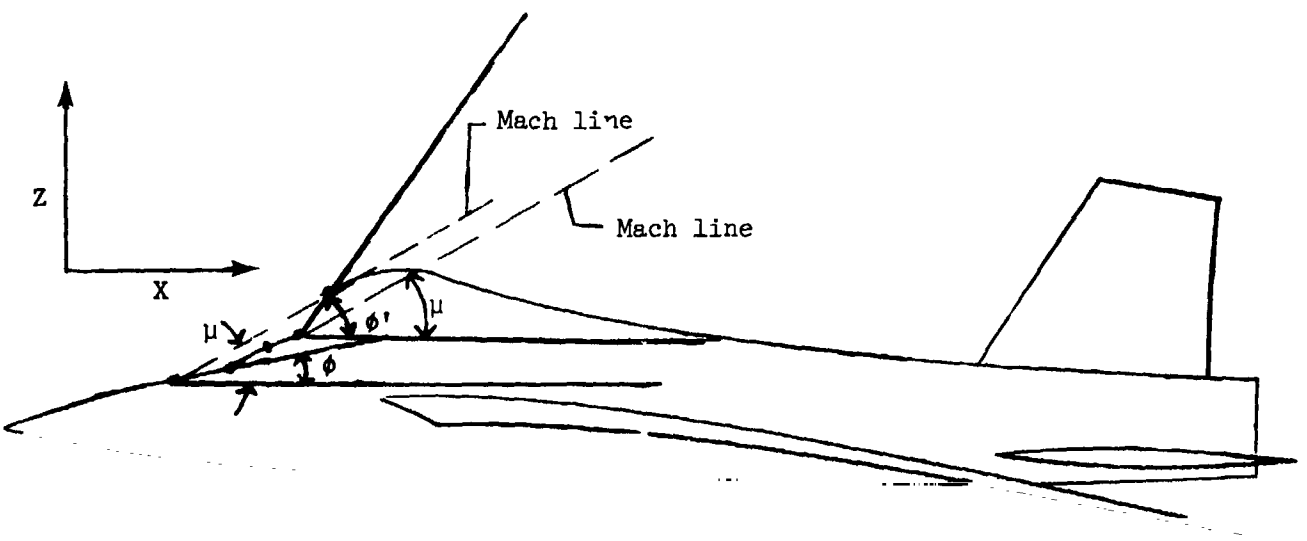
The entire set of geometry data is rotated in angle of attack α about the given rotation coordinate:

$$x' = (x - x_r) \cos \alpha - (z - z_r) \sin \alpha + x_r$$

$$z' = (x - x_r) \sin \alpha + (z - z_r) \cos \alpha + z_r$$

The geometry data are then stored on a scratch file for further use.

Slope test.- The next section of the program checks the slope of each fusiform-body line segment for a slope larger than the Mach angle. This test identifies violations of the slender body theory and can lead to erroneous results. The segments involved are printed, program execution continues, and an appropriate error message is printed at the completion of the case. Judgment must be exercised in deciding to accept the answers by considering the number and extent of the slope violations. The following sketch illustrates an acceptable body angle ϕ that is smaller than the Mach angle μ. The body angle ϕ' in the aircraft windshield area exceeds the Mach angle and violates the theory.



Matrix inversion.- To optimize computer time, the next step in the program is the inversion of the matrix used in the Eminton-Lord solution of the equivalent-body drags (ref. 6). If the same number of X-intervals is used for a large number of area distributions, the matrix need be inverted only once for the solution.

Determine X-intervals for values of θ.- An interval of the X-axis outside of which no Mach plane of this θ-family will intersect any component of the aircraft is associated with each value of θ, and the interval is generally different for each value of θ (ref. 1). The next task is to determine the precise limits of this segment.

The equation of any of the Mach planes associated with the current value of θ is

$$x - (\beta \cos \theta)y - (\beta \sin \theta)z = X$$

where $\beta = \sqrt{M^2 - 1}$, M = Mach number, and X is the X-intercept of the particular plane.

The current Mach plane is forced through the end points of each given line segment, and X minimum (XA) and X maximum (XB) are selected for each component as well as the entire aircraft. The X minimum and X maximum found for each component at each value of θ are used to omit calculations of equivalent-body areas outside of these limits.

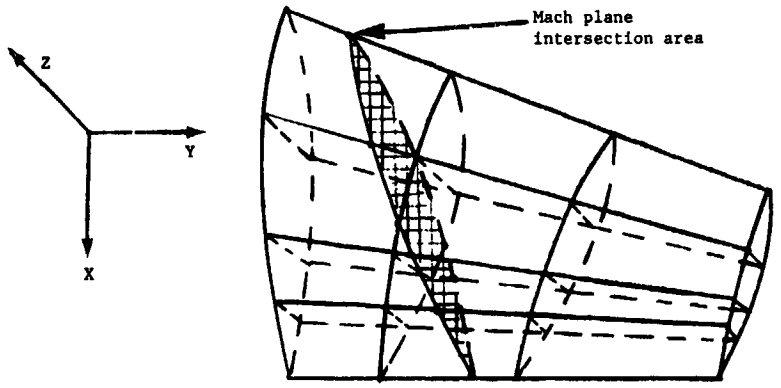
Determine intercepted areas, $S(\theta_i, x_j)$.- The program selects a value of θ, $-\pi/2$ plus some multiple n times $\Delta\theta$, $n = 0, 1, 2, \ldots, n\theta$ where θ varies from $-\pi/2$ to $3\pi/2$ and is divided into $N\theta$ equal subintervals. A flag is set within the program if the entire aircraft is symmetrical with respect to the XZ-plane, so that calculations only for values of θ between $-\pi/2$ and $\pi/2$ need be performed, as the results would be identical for the other half of the vehicle.

The interval between the previously selected X minimum (XA) and X maximum (XB) associated with the current value of θ is now divided into NX equal segments of length Δx, where $\Delta x = (XA - XB)/nX$. The successive values of x used are $x = XA + n\,\Delta x$, $n = 0, 1, 2, \ldots, nX$. For the current θ_i and x_j we have the Mach plane

$$x - (\beta \cos \theta_i)y - (\beta \sin \theta_i)z = x_j$$

The program then begins the task of finding the YZ-projection of the plane intersection with each component of the aircraft.

The fundamental tool is the calculation of the intersection, if one exists, of the current plane with each line segment determined from the contours used to describe the component as illustrated in the following sketch:



The contour formed by the Mach plane intersection across the nonfusiform component elements is determined by matching the end points of the intercepted line segments. The method of computing the projected contour areas is that of summing determinants to find the area inside a closed polygon. If the closed curve is approximated by n points, (x_1,y_1), (x_2,y_2), ..., (x_n,y_n), the area is as follows:

$$\text{AREA} = 1/2[(x_1y_2 + x_2y_3 + \cdots + x_{n-1}y_n + x_ny_1) - (x_2y_1 + x_3y_2 + \cdots + x_ny_{n-1} + x_1y_n)]$$

Note that the first point is used twice to close the intersection contour.

The procedure for finding the projected intercepted areas for the fusiform components is a simple matter. Since the contours must be monotonic in X, the intersections on only the longitudinal lines need be determined, and these intersection points will be in the proper order to form a polygon.

An assumption is made that the cross section at the nose of a fusiform component continues on forward to negative infinity, and its cross section at the base continues on aft to infinity. This means that the most forward point of a longitudinal line is used in the polygon if the Mach plane is before it, and the most aft point is used if the Mach plane passes behind.

Computing wave drag.- After the values of $S_{total}(\theta_i,x_j)$ for all the values of x_j are computed, the $D(\theta)/q$ associated with each θ is computed by the method of reference 6. The values of $D(\theta)/q$ thus obtained are used in the numerical integration

$$D/q = 1/(2\pi) \int_{-\pi/2}^{3\pi/2} D(\theta)/q \, d\theta$$

to yield the aircraft wave drag. The Newton-Cotes five-point formula is used to evaluate this integral (ref. 7).

Program Structure

Program WAVDRAG executes as a batch program with data input from a card image file. The general structure of the program is shown in figure 4. For clarity, this figure omits system utilities and library functions which are provided by the compiler or other system programs.

The following list is a summary of the function of each program element shown in figure 4:

I. WAVDRAG - Sets case default values, initializes some variables, provides I/O buffers, and calls in other parts of the program as required. Does no data processing.

A. CASPRNT - Prints case input values.

B. EMLORD - Uses the technique of Eminton and Lord (ref. 6) to compute the wave drags of the equivalent bodies moving at supersonic speed in the direction of the longitudinal axis.

C. MATINV - Inverts a real square matrix A and optionally solves one or more simultaneous systems of linear equations $AX = B$ and finds the determinant of A.

II. START - Reads geometry data, scales and offsets the data, and stores it in a scratch file for further use.

III. CASREAD - Reads case data, sets various case parameters, and rotates geometry data by the angle of attack if indicated.

IV. SLOPE - Checks body slopes and sets an error flag if any body slope exceeds the Mach angle.

V. XMAT - Computes the matrix used in the Eminton and Lord wave-drag calculation technique, calls MATINV to compute its inverse, and stores on a scratch file the $(NX-1) \times (NX-1)$ matrix required for the drag computations for an initial value of NX.

VI. ENDPTS - Computes the end points (XA and XB) of the segment of the X-axis outside of which the total $S(X,\theta)$ is zero for each value of θ and also the end points (XAC and XBC) for all components at each value of θ.

VII. ADIST - Initializes conditions for computation of the equivalent body area distributions.

A. MIRIMG - Formats a scratch file of the total vehicle area distribution $(-\pi/2 \leq \theta \leq 3\pi/2)$ from the area distribution $(-\pi/2 \leq \theta \leq \pi/2)$ of half of the vehicle when the entire aircraft is symmetrical about the XZ-plane.

B. SFUSI - Calculates the area distribution of a fusiform body.

C. SLIFT - Calculates the area distribution of a nonfusiform body.

D. LEVOUT - Prevents a segment of intersection from being added to the collection of intersection segments.

E. CONECT - Connects matching end points of projected intersection segments to form a polygon of the intersections of a Mach plane and a component.

F. REVERSE - Reverses the order of the end points of an intersection segment.

G. MOVE - Changes the position of an intersection segment in the array of segments.

H. OMIT - Omits an intersection segment from the array.

I. INLAP - Finds the intersection of a line and a plane, where the line is defined by the coordinates (x,y,z) of two points through which it passes and the plane is defined by its coefficients (A,B,C,D) where $Ax + By + Cz = D$ is its equation.

VIII. OUT - Prints the specified area distributions and computes and prints D/Q(θ) and D/Q(Total).

Table I lists alphabetically each program element with its size, the elements it calls, and the elements that call it.

Labeled COMMON

The following list contains the FORTRAN variables appearing in labeled COMMON. These are presented as an aid to program modification.

COMMON label	FORTRAN variable	Description
VEID	IDVIC (8)	Vehicle identification
	NETS	Number of components
	ICOMPA (2,31)	Two computer locations of identification for each component
	ISURFA (31)	A code for each component indica the type of surface: =0, fusiform surface ≠0, nonfusiform surface
	IMAGEA (31)	A code for each component indicating the existence of a mirror image: =0, no mirror image ≠0, mirror image
	REFA	Vehicle reference area
	IFLAG	=0, at least one component does not have a mirror image ≠0, all components have a mirror image
CASE	IDCAS	Ten characters of case identification
	XMACH	Mach number
	ALPHD	Angle of attack α, deg
	XO ZO	Coordinate for α rotation

COMMON label	FORTRAN variable	Description
	ALPHA	Angle of attack α, rad
	NX	Number of X's
	NTHETA	Number of thetas θ
	NCON	=0, continue reading case cards ≠0, read new configuration geometry
	NPR	=0, output regular and debug printing =1, print all $S(X,\theta)$ =N, print every Nth $S(X,\theta)$
	INIT	=0, initial case information to be read ≠0, initial case information has been read
	ALPHSAV	Previous α value
	XSAV	Previous x_o value
	ZSAV	Previous z_o value
SLOPECK	LERR	=0, no error condition found in checking body slopes ≠0, error condition found in checking body slopes
ENDPNTS	XXA(49)	The XA for each theta at which the domain of $X(\theta)$ begins
	XXB(49)	The XB for each theta at which the domain of $X(\theta)$ ends
	XAC(49,30)	The $XA(\theta)$ for each component
	XBC(49,30)	The $XB(\theta)$ for each component

PROGRAM USE

Data Input

Two types of input data are required. The first type of data describes the actual geometry of the aircraft, and the second type is the Mach number and angle of attack of the aircraft at which drag is to be calculated. A single case consists of the wave-drag computation for a single configuration at a single Mach number and angle-of-attack orientation. All input data are to be in list-directed format (ref. 8).

Table II is a listing of a sample input geometry, and the actual configuration is illustrated in figure 5. Each component description is identical in form to that of the others. Each given section is thought of as a closed contour with no saddle points around a component. The program assumes that the last point given is connected to the first for all open contours, as the wave drag calculations are dependent on internal area. Consistency should be observed in the order in which contours are described, as the direction of surface normal vectors is important in other possible applications.

The case input data give the conditions to use in calculating the wave drag of the aircraft with the given geometry description. A sample input for analysis at Mach 1.414 and several angles of attack are given in table III. Usually one aircraft geometry is analyzed under several sets of conditions.

A detailed explanation of the input format as currently implemented follows:

I. Geometry input (on file TAPE5), in list-directed format:

Record	Variable name	Description
1	IDVIC	Vehicle identification (up to 80 characters)
2	REFA	Reference area
	IPR	=0, no optional printing ≠0, optional printing of scaled and offset coordinates
Repeat the following sets of data for each component (30 components maximum) -		
3	IDCOMP	Component identification (up to 20 characters
	NCOMP	Component number (only used for additional identification)
	ISURF	=0, fusiform surface ≠0, nonfusiform surface
	IMAGE	=0, no mirror image ≠0, mirror image
	NPNT	Number of points, 50 maximum
	LINE	Number of lines, 50 maximum
	SCALE	=0 or 1., no scaling =Scale factor
	PO(1)	Component X-origin with respect to the vehicle X-axis

Record	Variable name	Description
	PO(2)	Component Y-origin with respect to the vehicle Y-axis
	PO(3)	Component Z-origin with respect to the vehicle X-axis
4,...	x_1, y_1, z_1, x_2, y_2, z_2	Point coordinates with points input line by line; each line represents a closed contour with no saddle points. Start a new card set for each line. A maximum of 50 lines with a maximum of 50 points is allowed for as many as 30 components.

II. Case input (on file TAPE7), in list-directed format:

Record	Variable name	Description	Default
1	IDCAS	Case identification (up to 10 characters	'CASE 1'
	XMACH	Mach number	1.
	ALPHD	Angle of attack, deg, a positive angle	0.
	XO ZO	Origin for rotation of α	0. 0.
	NX	The number of equal intervals into which that portion of the X-axis between the double Mach cone is divided; ≤ 100	10
	NTHETA	The number of equal intervals into which the domain of θ $(-\pi/2 \leq \theta \leq 3\pi/2)$ is divided; ≤ 48 and must be divisible by 4	4
	NCON	=0, continue reading case cards $\neq 0$, read new geometry	0
	NPR	=0, output regular and debug printing - use with caution, can generate a great amount of printing =1, print all $S(X,\theta)$ =N, print every nth $S(X,\theta)$	4

Data Output

The output file is defined as TAPE6.

I. Geometry output:

The coordinates of all the input components are always printed. Complete printed output of the scaled and offset coordinates and printed output of the coordinates rotated through angle of attack α may be obtained if the input variable IPR is not equal to zero.

II. Case output:

The case input is printed as the heading. An option is provided so that the user may specify the number of values of θ at which printing for the area distribution of each component, as well as the total area distribution, is desired. The component capture area is subtracted from the area distribution of the fusiform components. Many of the intermediate results may be obtained through the use of the print option. The D/Q associated with each value of θ is always printed, as well as D/Q and $C_{D,w}$ (wave-drag coefficient), for the entire aircraft.

An example of the program output for Mach 1.414 with several angle-of-attack variations, as illustrated in table III, is given in table IV.

Operations

This program was written in FORTRAN Version 5 for Control Data Cyber series 6000 computers with the Network Operating System and library tape. Approximately 110 000 octal locations of core storage are required. The source version of the program is set up in CDC MODIFY format and uses the OVERLAY structure for optimum use of core storage.

File usage is as follows:

File	Use
TAPE5	Geometry input data
TAPE6	Output
TAPE7	Case input data
TAPE8,TAPE9, TAPE10,TAPE11, TAPE12	Scratch files

A representative procedure file for executing the program using the compile file from the CDC MODIFY program library is as follows:

```
WAVY5PF,T0700,CM120000.                    R333 U.K.NAME
USER,444444N,PASSWORD.
CHARGE,000000,LRC.
GET,OPL=WAVY5PL/UN=000000N.
MODIFY,F,I=0,L=0.
REWIND,COMPILE.
FTN5,I,L=0.
GET,TAPE7=CASDAT,GEOMDAT.
LGO,GEOMDAT.
```

CONCLUDING REMARKS

A supersonic zero-lift wave-drag computer program has been developed to extend the geometry input capabilities of previous versions of the program. Wave drag analysis can now be performed on highly accurate representations of aircraft design concepts. This document serves as a guide for current and future applications of the program.

Langley Research Center
National Aeronautics and Space Administration
Hampton, VA 23665
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2. Craidon, Charlotte B.: Description of a Digital Computer Program for Airplane Configuration Plots. NASA TM X-2074, 1970.

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4. Whitcomb, Richard T.: A Study of the Zero-Lift Drag-Rise Characteristics of Wing-Body Combinations Near the Speed of Sound. NACA Rep. 1273, 1956. (Supersedes NACA RM L52H08.)

5. Jones, Robert T.: Theory of Wing-Body Drag at Supersonic Speeds. NACA Rep. 1284, 1956. (Supersedes NACA RM A53H18a.)

6. Eminton, E.; and Lord, W. T.: Note on the Numerical Evaluation of the Wave Drag of Smooth Slender Bodies Using Optimum Area Distributions for Minimum Wave Drag. J. R. Aeronaut. Soc., vol. 60, no. 541, Jan. 1956, pp. 61-63.

7. Hildebrand, F. B.: Introduction to Numerical Analysis. McGraw-Hill Book Co., Inc., 1956.

8. FORTRAN Version 5 Reference Manual - CDC Operating Systems: NOS 1, NOS/BE 1, SCOPE 2. Publ. No. 60481300, Control Data Corp., c.1981.

TABLE I.- PROGRAM ELEMENTS

Element name	Type	Approximate size (octal)	Calls	Called by
ADIST	Program	25330	MIRIMG,SFUSI, SLIFT	WAVDRAG
CASPRNT	Subroutine	52		CASREAD,SLOPE, ENDPTS,OUT
CASREAD	Program	17222	CASPRNT	WAVDRAG
CONECT	Function	1440	MOVE,OMIT, REVERSE	SLIFT
EMLORD	Subroutine	3305	MATINV	OUT
ENDPTS	Program	17202	CASPRNT	WAVDRAG
INLAP	Function	156		SFUSI,SLIFT
LEVOUT	Function	123		SLIFT
MATINV	Subroutine	447		EMLORD,XMAT
MIRIMG	Subroutine	14366		ADIST
MOVE	Subroutine	47		CONECT
OMIT	Subroutine	47		CONECT
OUT	Program	10007	CASPRNT,EMLORD	WAVDRAG
REVERSE	Subroutine	24		CONECT
SFUSI	Subroutine	5[illegible]	INLAP	ADIST
SLIFT	Subroutine	201[illegible]	CONECT,INLAP, LEVOUT	ADIST
SLOPE	Program	17061	CASPRNT	WAVDRAG
START	Program	17225		WAVDRAG
WAVDRAG	Program	251	START,CASREAD, SLOPE,XMAT, ENDPTS,ADIST, OUT	
XMAT	Program	24337	MATINV	WAVDRAG

TABLE II.- SAMPLE INPUT GEOMETRY


```
 'NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE'
221.22      0
'WING 1'
  1   1   1  21   5   1.0000   0.0000   0.0000   0.0000
  22.7660 10.0000  0.0000   22.9043 10.0000  -.0160   23.1808 10.0000  -.0425
  23.4573 10.0000  -.0620   23.7338 10.0000  -.0755   24.0103 10.0000  -.0820
  24.2868 10.0000  -.0820   24.5633 10.0000  -.0755   24.8398 10.0000  -.0620
  25.1163 10.0000  -.00425  25.5310 10.0000  0.0000   25.1163 10.0000   .0425
  24.8398 10.0000   .0620   24.5633 10.0000   .0755   24.2868 10.0000   .0820
  24.0103 10.0000   .0820   23.7338 10.0000   .0755   23.4573 10.0000   .0620
  23.1808 10.0000   .0425   22.9043 10.0000   .0160   22.7660 10.0000  0.0000
  20.7099  8.3890  0.0000   20.9249  8.3675  -.0204   21.3623  8.3238  -.0537
  21.8098  8.2790  -.0777   22.2680  8.2332  -.0938   22.7370  8.1863  -.1010
  23.2176  8.1382  -.1002   23.7097  8.0890  -.0914   24.2140  8.0386  -.0744
  24.7309  7.9869  -.0505   25.5310  7.9069  0.0000   24.7309  7.9869   .0505
  24.2140  8.0386   .10744  23.7097  8.0890   .0914   23.2176  8.1382   .1002
  22.7370  8.1863   .1010   22.2680  8.2332   .0938   21.8098  8.2790   .0777
  21.3623  8.3238   .0537   20.9249  8.3675   .0040   20.7099  8.3890  0.0000
  18.7317  6.8391  0.0000   19.0169  6.7939  -.0241   19.6019  6.7011  -.0634
  20.2074  6.6051  -.0916   20.8347  6.5056  -.1104   21.4847  6.4026  -.1186
  22.1594  6.2956  -.1173   22.8591  6.1846  -.1067   23.5858  6.0694  -.0865
  24.3409  5.9497  -.0585   25.5310  5.7609  0.0000   24.3409  5.9497   .0585
  23.5858  6.0694   .0865   22.8591  6.1846   .1067   22.1594  6.2956   .1173
  21.4847  6.4026   .1186   20.8347  6.5056   .1104   20.2074  6.6051   .0916
  19.6019  6.7011   .0634   19.0169  6.7939   .0241   18.7317  6.8391  0.0000
  16.7797  5.3097  0.0000   17.1784  5.2776  -.0280   17.9869  5.2125  -.0740
  18.8109  5.1462  -.1076   19.6508  5.0787  -.1305   20.5069  5.0098  -.1411
  21.3807  4.9395  -.1405   22.2710  4.8679  -.1288   23.1791  4.7948  -.1053
  24.1056  4.7202  -.0718   25.5310  4.6056  0.0000   24.1056  4.7202   .0718
  23.1791  4.7948   .1053   22.2710  4.8679   .1288   21.3807  4.9395   .1405
  20.5069  5.0098   .1411   19.6508  5.0787   .1305   18.8109  5.1462   .1076
  17.9869  5.2125   .0740   17.1784  5.2776   .0280   16.7797  5.3097  0.0000
  14.4700  3.5000  0.0000   15.0230  3.5000  -.0320   16.1290  3.5000  -.0850
  17.2350  3.5000  -.1240   18.3410  3.5000  -.1510   19.4470  3.5000  -.1640
  20.5540  3.5000  -.1640   21.6600  3.5000  -.1510   22.7660  3.5000  -.1240
  23.8720  3.5000  -.0850   25.5310  3.5000  0.0000   23.8720  3.5000   .0850
  22.7660  3.5000   .1240   21.6600  3.5000   .1510   20.5540  3.5000   .1640
  19.4470  3.5000   .1640   18.3410  3.5000   .1510   17.2350  3.5000   .1240
  16.1290  3.5000   .0850   15.0230  3.5000   .0320   14.4700  3.5000  0.0000
'WING 2'
  2   1   1  39   2   0.000   0.000   0.000   0.000
 14.470   1.500   0.000  15.023   1.500    .032  15.576   1.500    .060
 16.129   1.500    .085  16.682   1.500    .106  17.235   1.500    .124
 17.788   1.500    .139  18.341   1.500    .151  18.894   1.500    .159
 19.447   1.500    .164  20.001   1.500    .166  20.554   1.500    .164
 21.107   1.500    .159  21.660   1.500    .151  22.213   1.500    .139
 22.766   1.500    .124  23.319   1.500    .106  23.872   1.500    .085
 24.425   1.500    .060  25.531   1.500   0.000  24.425   1.500   -.060
 23.872   1.500   -.085  23.319   1.500   -.106  22.766   1.500   -.124
 22.213   1.500   -.139  21.660   1.500   -.151  21.107   1.500   -.159
 20.554   1.500   -.164  20.001   1.500   -.166  19.447   1.500   -.164
 18.894   1.500   -.159  18.341   1.500   -.151  17.788   1.500   -.139
 17.235   1.500   -.124  16.682   1.500   -.106  16.129   1.500   -.085
 15.576   1.500   -.060  15.023   1.500   -.032  14.470   1.500   0.000
 16.129    .501   0.000  16.5991   .501    .032  17.0692   .501    .060
 17.5393   .501    .085  18.0094   .501    .106  18.4795   .501    .124
 18.9496   .501    .139  19.4197   .501    .151  19.8898   .501    .159
 20.3599   .501    .164  20.830    .501    .166  21.3001   .501    .164
 21.7702   .501    .159  22.2403   .501    .151  22.7104   .501    .139
 23.1805   .501    .124  23.6506   .501    .106  24.1207   .501    .085
 24.5908   .501    .060  25.531    .501   0.000  24.5908   .501   -.060
 24.1207   .501   -.085  23.6506   .501   -.106  23.1805   .501   -.124
 22.7104   .501   -.139  22.2403   .501   -.151  21.7702   .501   -.159
 21.3001   .501   -.164  20.830    .501   -.166  20.3599   .501   -.164
```

TABLE II.- Continued

19.8898	.501	-.159	19.4197	.501	-.151	18.9496	.501	-.139
18.4795	.501	-.124	18.0094	.501	-.106	17.5393	.501	-.085
17.0692	.501	-.060	16.5991	.501	-.032	16.129	.501	0.000
'FUSFLAGE'								
3 0 1 15 14	1.0000	0.0000	0.0000	0.0000				
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
15.2457	0.0000	.2272	15.2445	.0500	.2213	15.2409	.0978	.2036
15.2352	.1396	.1752	15.2278	.1736	.1383	15.2191	.1980	.0951
15.2096	.2116	.0478	15.2000	.2143	0.0000	15.1906	.2064	-.0466
15.1819	.1885	-.0905	15.1741	.1616	-.1288	15.1678	.1277	-.1602
15.1631	.0882	-.1837	15.1602	.0447	-.1980	15.1593	0.0000	-.2027
15.8180	0.0000	.3831	15.8357	.0860	.3783	15.8461	.1693	.3515
15.8487	.2439	.3057	15.8430	.3046	.2430	15.8293	.3476	.1674
15.8092	.3716	.0845	15.7838	.3743	0.0000	15.7550	.3580	-.0814
15.7244	.3234	-.1556	15.6940	.2747	-.2190	15.6652	.2143	-.2689
15.6392	.1461	-.3036	15.6169	.0734	-.3233	15.5993	0.0000	-.3270
16.4079	0.0000	.5200	16.4648	.1182	.5188	16.5209	.2357	.4893
16.5728	.3452	.4334	16.6175	.4406	.3508	16.6509	.5133	.2472
16.6715	.5599	.1275	16.6769	.5749	0.0000	16.6673	.5591	-.1273
16.6427	.5117	-.2465	16.6060	.4388	-.3494	16.5588	.3434	-.4312
16.5055	.2344	-.4864	16.4498	.1175	-.5156	16.3922	0.0000	-.5168
16.8909	0.0000	.6006	16.9679	.1358	.5946	17.0489	.2686	.5575
17.1295	.3914	.4915	17.2066	.4984	.3969	17.2724	.5776	.2783
17.3242	.6265	.1433	17.3595	.6430	0.0000	17.3768	.6273	-.1435
17.3746	.5793	-.2790	17.3537	.5025	-.4003	17.3148	.3999	-.5020
17.2604	.2782	-.5774	17.1919	.1418	-.6201	17.1139	0.0000	-.6268
17.1437	0.0000	.6303	17.2069	.1422	.6218	17.2876	.2784	.5779
17.3802	.4006	.5028	17.4800	.5041	.4017	17.5807	.5826	.2805
17.6779	.6322	.1446	17.7669	.6497	0.0000	17.8424	.6340	-.1450
17.9002	.5860	-.2820	17.9377	.5080	-.4050	17.9536	.4050	-.5080
17.9472	.2820	-.5860	17.9180	.1450	-.6340	17.8675	0.0000	-.6500
17.4644	0.0000	.6447	17.4776	.1439	.6289	17.5169	.2800	.5816
17.5802	.4027	.5054	17.6647	.5064	.4037	17.7659	.5856	.2818
17.8796	.6340	.1450	18.0000	.6500	0.0000	18.1204	.6340	-.1450
18.2342	.5860	-.2820	18.3364	.5080	-.4050	18.4220	.4050	-.5080
18.4868	.2820	-.5860	18.5266	.1450	-.6340	18.5399	0.0000	-.6500
18.0601	0.0000	.6500	18.0734	.1450	.6340	18.1132	.2820	.5860
18.1780	.4050	.5080	18.2636	.5080	.4050	18.3658	.5860	.2820
18.4796	.6340	.1450	18.6000	.6500	0.0000	18.7204	.6340	-.1450
18.8342	.5860	-.2820	18.9364	.5080	-.4050	19.0220	.4050	-.5080
19.0868	.2820	-.5860	19.1266	.1450	-.6340	19.1399	0.0000	-.6500
19.2325	0.0000	.6500	19.3011	.1450	.6340	19.3845	.2820	.5860
19.4791	.4050	.5080	19.5797	.5080	.4050	19.6813	.5860	.2820
19.7785	.6340	.1450	19.8670	.6500	0.0000	19.9424	.6340	-.1450
20.0002	.5860	-.2820	20.0377	.5080	-.4050	20.0536	.4050	-.5080
20.0472	.2820	-.5860	20.0180	.1450	-.6340	19.9675	0.0000	-.6500
21.1819	0.0000	.6500	21.2659	.1450	.6340	21.3512	.2820	.5860
21.4342	.4050	.5080	21.5105	.5080	.4050	21.5764	.5860	.2820
21.6281	.6340	.1450	21.6634	.6500	0.0000	21.6808	.6340	-.1450
21.6789	.5860	-.2820	21.6576	.5080	-.4050	21.6187	.4050	-.5080
21.5641	.2820	-.5860	21.4962	.1450	-.6340	21.4181	0.0000	-.6500
22.9968	0.0000	.6500	23.0608	.1450	.6340	23.1164	.2820	.5860
23.1612	.4050	.5080	23.1931	.5080	.4050	23.2105	.5860	.2820
23.2121	.6340	.1450	23.1978	.6500	0.0000	23.1689	.6340	-.1450
23.1265	.5860	-.2820	23.0725	.5080	-.4050	23.0099	.4050	-.5080
22.9420	.2820	-.5860	22.8721	.1450	-.6340	22.8032	0.0000	-.6500
24.2002	0.0000	.6500	24.2277	.1450	.6340	24.2436	.2820	.5860
24.2471	.4050	.5080	24.2384	.5080	.4050	24.2180	.5860	.2820
24.1865	.6340	.1450	24.1454	.6500	0.0000	24.0972	.6340	-.1450
24.0443	.5860	-.2820	23.9889	.5080	-.4050	23.9342	.4050	-.5080

TABLE II.- Continued

23.8826	.2820	-.5960	23.8372	.1450	-.6340	23.7998	0.0000	-.6500
24.6306	0.0000	.6500	24.6274	.1450	.6340	24.6178	.2820	.5860
24.6021	.4050	.5080	24.5814	.5080	.4050	24.5567	.5860	.2820
24.5291	.6340	.1450	24.5000	.6500	0.0000	24.4709	.6340	-.1450
24.4433	.5860	-.2820	24.4186	.5080	-.4050	24.3979	.4050	-.5080
24.3822	.2820	-.5860	24.3726	.1450	-.6340	24.3694	0.0000	-.6500
25.5300	0.0000	.6500	25.5300	.1450	.6340	25.5300	.2820	.5860
25.5300	.4050	.5080	25.5300	.5080	.4050	25.5300	.5860	.2820
25.5300	.6340	.1450	25.5300	.6500	0.0000	25.5300	.6340	-.1450
25.5300	.5860	-.2820	25.5300	.5080	-.4050	25.5300	.4050	-.5080
25.5300	.2820	-.5860	25.5300	.1450	-.6340	25.5300	0.0000	-.6500
'POD 1'								
4 0 0 25 20	1.0000	5.0000	5.0000	0.0000				
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000						
-1.1997	-2.5000	.2442	-1.1997	-2.4369	.2359	-1.1997	-2.3779	.2121
-1.1998	-2.3272	.1728	-1.1998	-2.2979	.1221	-1.1999	-2.2641	.0631
-1.2000	-2.2558	0.0000	-1.2001	-2.2641	-.0631	-1.2002	-2.2880	-.1221
-1.2002	-2.3273	-.1727	-1.2003	-2.3779	-.2120	-1.2003	-2.4369	-.2358
-1.2003	-2.5000	-.2441	-1.2003	-2.5631	-.2358	-1.2003	-2.6221	-.2120
-1.2002	-2.6727	-.1727	-1.2002	-2.7120	-.1221	-1.2001	-2.7359	-.0631
-1.2000	-2.7442	0.0000	-1.1999	-2.7359	.0631	-1.1998	-2.7121	.1221
-1.1998	-2.6728	.1728	-1.1997	-2.6221	.2121	-1.1997	-2.5631	.2359
-1.1997	-2.5000	.2442						
.4864	-2.5000	.5069	.4728	-2.3694	.4878	.4538	-2.2488	.4351
.4307	-2.1470	.3530	.4053	-2.0707	.2479	.3794	-2.0246	.1274
.3547	-2.0112	0.0000	.3329	-2.0308	-.1257	.3152	-2.0814	-.2417
.3029	-2.1594	-.3406	.2965	-2.2596	-.4163	.2965	-2.3756	-.4644
.3029	-2.5000	-.4817	.3152	-2.6251	-.4669	.3329	-2.7429	-.4207
.3547	-2.8456	-.3456	.3794	-2.9262	-.2461	.4053	-2.9788	-.1283
.4307	-2.9993	0.0000	.4538	-2.9853	.1300	.4728	-2.9374	.2525
.4864	-2.8585	.3585	.4935	-2.7540	.4398	.4935	-2.6314	.4905
.4864	-2.5000	.5069						
2.0466	-2.5000	.7012	2.0044	-2.3197	.6725	1.9560	-2.1545	.5983
1.9050	-2.0151	.4849	1.8547	-1.9115	.3399	1.8087	-1.8487	.1745
1.7696	-1.829[illegible]	0.0000	1.7401	-1.8561	-.1725	1.7216	-1.9244	-.3324
1.7152	-2.0302	-.4698	1.7216	-2.1676	-.5756	1.7401	-2.3275	-.6439
1.7696	-2.5000	-.6702	1.8087	-2.6745	-.6513	1.8547	-2.8[illegible]	-.5885
1.9050	-2.9849	-.4849	1.9560	-3.0983	-.3455	2.0044	-3.1725	-.1803
2.0466	-3.2012	0.0000	2.0703	-3.1806	.1825	2.1001	-3.1123	.3536
2.1073	-3.0009	.5009	2.1001	-2.8536	.6123	2.0793	-2.6825	.6806
2.0466	-2.5000	.7012						
3.8285	-2.5000	.8658	3.7514	-2.2770	.8311	3.6729	-2.0733	.7392
3.5979	-1.9004	.5996	3.5319	-1.7714	.4206	3.4787	-1.6918	.2169
3.4411	-1.6659	0.0000	3.4220	-1.6965	-.2157	3.4221	-1.7797	-.4158
3.4410	-1.9[illegible]00	-.5900	3.4787	-2.0817	-.7246	3.5318	-2.2819	-.8127
3.5980	-2.5000	-.8477	3.6730	-2.7213	-.8245	3.7515	-2.9300	-.7451
3.8285	-3.1124	-.6124	3.8981	-3.2529	-.4346	3.9555	-3.3433	-.2263
3.9966	-3.3762	0.0000	4.0177	-3.3471	.2273	4.0176	-3.2593	.4384
3.9967	-3.1197	.6197	3.9555	-2.9364	.7560	3.8982	-2.7254	.8399
3.8285	-2.5000	.8658						
5.0198	-2.5000	.9387	4.9212	-2.2583	.9013	4.8306	-2.0363	.8029
4.7537	-1.8476	.6524	4.6952	-1.7043	.4595	4.6586	-1.6145	.2375
4.6461	-1.5838	0.0000	4.6586	-1.6145	-.2375	4.6952	-1.7043	-.4595
4.7537	-1.8476	-.6524	4.8306	-2.0363	-.8029	4.9212	-2.2583	-.9013
5.0198	-2.5000	-.9387	5.1194	-2.7441	-.9103	5.2127	-2.9729	-.8190
5.2934	-3.1707	-.6707	5.3558	-3.3237	-.4755	5.3952	-3.4202	-.2468

TABLE II.- Continued

5.4086	-3.4530	0.0000	5.3952	-3.4202	.2468	5.3558	-3.3237	.4755
5.2934	-3.1707	.6707	5.2127	-2.9729	.8190	5.1194	-2.7441	.9103
5.0198	-2.5000	.9387						
6.0868	-2.5000	.9789	5.9864	-2.2475	.9415	5.9052	-2.0143	.8417
5.8481	-1.8146	.6854	5.8184	-1.6612	.4841	5.8184	-1.5645	.2509
5.8478	-1.5301	0.0000	5.9052	-1.5614	-.2517	5.9864	-1.6556	-.4871
6.0869	-1.8083	-.6917	6.1998	-2.0089	-.8514	6.3173	-2.2448	-.9518
6.4316	-2.5000	-.9872	6.5342	-2.7559	-.9544	6.6180	-2.9944	-.8568
6.6774	-3.1998	-.6998	6.7084	-3.3578	-.4949	6.7084	-3.4565	-.2565
6.6774	-3.4895	0.0000	6.6180	-3.4554	.2562	6.5342	-3.3560	.4938
6.4314	-3.1976	.6976	6.3172	-2.9924	.8537	6.2500	-2.8566	.9090
6.0868	-2.5000	.9789						
6.9605	-2.5000	.9935	6.8779	-2.2430	.9585	6.8262	-2.0043	.8590
6.8086	-1.7991	.7009	6.8262	-1.6410	.4957	6.8779	-1.5415	.2570
6.9605	-1.5065	0.0000	7.0686	-1.5392	-.2576	7.1945	-1.6372	-.4980
7.3302	-1.7945	-.7055	7.4664	-2.0002	-.8657	7.5933	-2.2410	-.9660
7.7023	-2.5000	-1.0000	7.7860	-2.7590	-.9660	7.8385	-3.0000	-.8660
7.8564	-3.2070	-.7070	7.8385	-3.3660	-.5000	7.7860	-3.4660	-.2590
7.7023	-3.5000	0.0000	7.5933	-3.4660	.2590	7.4664	-3.3657	.4998
7.3302	-3.2055	.7055	7.1945	-2.9980	.8628	7.0686	-2.7576	.9608
6.9605	-2.5000	.9935						
7.7199	-2.5000	1.0000	7.6788	-2.2410	.9660	7.6789	-2.0000	.8660
7.7200	-1.7930	.7070	7.7992	-1.6340	.5000	7.9112	-1.5340	.2590
8.0486	-1.5000	0.0000	8.2019	-1.5340	-.2590	8.3604	-1.6340	-.5000
8.5135	-1.7930	-.7070	8.6508	-2.0000	-.8660	8.7629	-2.2410	-.9660
8.8422	-2.5000	-1.0000	8.8833	-2.7590	-.9660	8.8832	-3.0000	-.8660
8.8421	-3.2070	-.7070	8.7629	-3.3660	-.5000	8.6509	-3.4660	-.2590
8.5135	-3.5000	0.0000	8.3603	-3.4660	.2590	8.2018	-3.3660	.5000
8.0487	-3.2070	.7070	7.9113	-3.0000	.8660	7.7992	-2.7590	.9660
7.7199	-2.5000	1.0000						
14.0367	-2.5000	1.0000	14.0592	-2.2410	.9660	14.1256	-2.0000	.8660
14.2310	-1.7930	.7070	14.3683	-1.6340	.5000	14.5282	-1.5340	.2590
14.7000	-1.5000	0.0000	14.8718	-1.5340	-.2590	15.0317	-1.6340	-.5000
15.1690	-1.7930	-.7070	15.2744	-2.0000	-.8660	15.3408	-2.2410	-.9660
15.3633	-2.5000	-1.0000	15.3408	-2.7590	-.9660	15.2744	-3.0000	-.8660
15.1690	-3.2070	-.7070	15.0317	-3.3660	-.5000	14.8718	-3.4660	-.2590
14.7000	-3.5000	0.0000	14.5282	-3.4660	.2590	14.3683	-3.3660	.5000
14.2310	-3.2070	.7070	14.1256	-3.0000	.8660	14.0592	-2.7590	.9660
14.0367	-2.5000	1.0000						
20.5367	-2.5000	1.0000	20.5592	-2.2410	.9660	20.6256	-2.0000	.8660
20.7310	-1.7930	.7070	20.8683	-1.6340	.5000	21.0282	-1.5340	.2590
21.2000	-1.5000	0.0000	21.3718	-1.5340	-.2590	21.5317	-1.6340	-.5000
21.6690	-1.7930	-.7070	21.7744	-2.0000	-.8660	21.8408	-2.2410	-.9660
21.8633	-2.5000	-1.0000	21.8408	-2.7590	-.9660	21.7744	-3.0000	-.8660
21.6690	-3.2070	-.7070	21.5317	-3.3660	-.5000	21.3718	-3.4660	-.2590
21.2000	-3.5000	0.0000	21.0282	-3.4660	.2590	20.8683	-3.3660	.5000
20.7310	-3.2070	.7070	20.6256	-3.0000	.8660	20.5592	-2.7590	.9660
20.5367	-2.5000	1.0000						
26.1578	-2.5000	1.0000	26.2371	-2.2410	.9660	26.3492	-2.0000	.8660
26.4865	-1.7930	.7070	26.6396	-1.6340	.5000	26.7981	-1.5340	.2590
26.9514	-1.5000	0.0000	27.0888	-1.5340	-.2590	27.2008	-1.6340	-.5000
27.2800	-1.7930	-.7070	27.3211	-2.0000	-.8660	27.3212	-2.2410	-.9660
27.2801	-2.5000	-1.0000	27.2008	-2.7590	-.9660	27.0887	-3.0000	-.8660
26.9513	-3.2070	-.7070	26.7982	-3.3660	-.5000	26.6397	-3.4660	-.2590
26.4865	-3.5000	0.0000	26.3491	-3.4660	.2590	26.2371	-3.3660	.5000
26.1579	-3.2070	.7070	26.1168	-3.0000	.8660	26.1167	-2.7590	.9660
26.1578	-2.5000	1.0000						
27.2977	-2.5000	1.0000	27.4067	-2.2410	.9660	27.5336	-2.0002	.8657
27.6698	-1.7945	.7055	27.8055	-1.6372	.4980	27.9314	-1.5392	.2576
28.0395	-1.5065	0.0000	28.1221	-1.5415	-.2570	28.1738	-1.6410	-.4957
28.1914	-1.7991	-.7009	28.1738	-2.0043	-.8590	28.1221	-2.2430	-.9585
28.0395	-2.5000	-.9935	27.9314	-2.7576	-.9608	27.8055	-2.9980	-.8628
27.6698	-3.2055	-.7055	27.5336	-3.3657	-.4998	27.4067	-3.4660	-.2590
27.2977	-3.5000	0.0000	27.2140	-3.4660	.2590	27.1615	-3.3660	.5000

TABLE II.- Continued

27.1436	-3.2070	.7070	27.1615	-3.0000	.8660	27.2140	-2.7590	.9660
27.2977	-2.5000	1.0000						
28.5694	-2.5000	.9872	28.6827	-2.2448	.9518	28.8002	-2.0089	.8514
28.9131	-1.8083	.6917	29.0136	-1.6556	.4871	29.0948	-1.5614	.2517
29.1522	-1.5301	0.0000	29.1816	-1.5645	-.2509	29.1816	-1.6612	-.4841
29.1519	-1.8146	-.6854	29.0948	-2.0143	-.8417	29.0136	-2.2475	-.9415
28.9132	-2.5000	-.9789	28.8003	-2.7545	-.9492	28.6828	-2.9924	-.8537
28.5686	-3.1976	-.6976	28.4658	-3.3560	-.4938	28.3820	-3.4554	-.2562
28.3226	-3.4895	0.0000	28.2916	-3.4565	.2565	28.2916	-3.3578	.4949
28.3226	-3.1998	.6998	28.3820	-2.9944	.8568	28.4658	-2.7559	.9544
28.5694	-2.5000	.9872						
28.9802	-2.5000	.9763	29.0829	-2.2482	.9390	29.1777	-2.0159	.8390
29.2586	-1.8174	.6826	29.3205	-1.6657	.4815	29.3592	-1.5709	.2492
29.3725	-1.5384	0.0000	29.3592	-1.5709	-.2492	29.3205	-1.6657	-.4815
29.2586	-1.8174	-.6826	29.1777	-2.0159	-.8390	29.0829	-2.2482	-.9390
28.9802	-2.5000	-.9763	28.8767	-2.7538	-.9464	28.7797	-2.9915	-.9520
28.6961	-3.1965	-.6965	28.6317	-3.3542	-.4928	28.5915	-3.4529	-.2555
28.5779	-3.4862	0.0000	28.5915	-3.4529	.2555	28.6317	-3.3542	.4928
28.6961	-3.1965	.6965	28.7797	-2.9915	.8520	28.8767	-2.7538	.9464
28.9802	-2.5000	.9763						
31.5009	-2.5000	.8391	31.5663	-2.2841	.8044	31.6190	-2.0859	.7173
31.6562	-1.9160	.5840	31.6750	-1.7870	.4116	31.6750	-1.7047	.2135
31.6561	-1.6744	0.0000	31.6189	-1.7000	-.2147	31.5662	-1.7788	-.4163
31.5009	-1.9065	-.5935	31.4267	-2.0776	-.7317	31.3490	-2.2792	-.8227
31.2724	-2.5000	-.8590	31.2031	-2.7237	-.8338	31.1463	-2.9332	-.7506
31.1054	-3.1152	-.6152	31.0846	-3.2539	-.4352	31.0845	-3.3409	-.2256
31.1054	-3.3699	0.0000	31.1463	-3.3372	.2247	31.2032	-3.2475	.4315
31.2724	-3.1076	.6076	31.3489	-2.9257	.7376	31.4266	-2.7190	.8162
31.5009	-2.5000	.8391						
33.0348	-2.5000	.6921	33.0653	-2.3217	.6649	33.0644	-2.1567	.5944
33.0910	-2.0148	.4852	33.0844	-1.9056	.3433	33.0653	-1.8351	.1783
33.0348	-1.8079	0.0000	32.9945	-1.8274	-.1804	32.9469	-1.8923	-.3510
32.8950	-1.9993	-.5007	32.8423	-2.1432	-.6179	32.7924	-2.3137	-.6944
32.7488	-2.5000	-.7241	32.7150	-2.6886	-.7028	32.6936	-2.8652	-.6323
32.6861	-3.0173	-.5173	32.6936	-3.1323	-.3652	32.7150	-3.2028	-.1886
32.7488	-3.2241	0.0000	32.7924	-3.1944	.1863	32.8423	-3.1179	.3568
32.8950	-3.0007	.5007	32.9469	-2.8510	.6077	32.9945	-2.6804	.6726
33.0348	-2.5000	.6921						
33.7219	-2.5000	.6151	33.7300	-2.3414	.5932	33.7301	-2.1929	.5319
33.7220	-2.0648	.4352	33.7061	-1.9657	.3085	33.6834	-1.9016	.1600
33.6556	-1.8774	0.0000	33.6242	-1.8954	-.1617	33.5912	-1.9546	-.3149
33.5590	-2.0519	-.4481	33.5298	-2.1817	-.5513	33.5058	-2.3348	-.6174
33.4886	-2.5000	-.6413	33.4798	-2.6660	-.6202	33.4797	-2.8211	-.5562
33.4886	-2.9537	-.4537	33.5058	-3.0536	-.3197	33.5299	-3.1148	-.1645
33.5590	-3.1334	0.0000	33.5911	-3.1082	.1627	33.6241	-3.0422	.3130
33.6556	-2.9405	.4405	33.6835	-2.8097	.5364	33.7061	-2.6593	.5957
33.7219	-2.5000	.6151						
36.0004	-2.5000	.2767	36.0004	-2.4284	.2673	36.0003	-2.3616	.2402
36.0003	-2.3042	.1958	36.0002	-2.2598	.1384	36.0001	-2.2326	.0716
36.0000	-2.2232	0.0000	35.9999	-2.2326	-.0716	35.9998	-2.2598	-.1384
35.9997	-2.3042	-.1958	35.9997	-2.3616	-.2402	35.9996	-2.4284	-.2675
35.9996	-2.5000	-.2769	35.9996	-2.5716	-.2675	35.9997	-2.6384	-.2402
35.9997	-2.6958	-.1958	35.9998	-2.7402	-.1384	35.9999	-2.7674	-.0716
36.0000	-2.7768	0.0000	36.0001	-2.7674	.0716	36.0002	-2.7402	.1384
36.0003	-2.6958	.1958	36.0003	-2.6384	.2402	36.0004	-2.5716	.2673
36.0004	-2.5000	.2767						
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000

TABLE II.- Continued

37.5000 -2.5000 0.0000
'POD 2'
5 0 0 25 20 1.0000 0.0000 0.0000 0.0000

-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000						
-1.1997	-2.5000	.2442	-1.1997	-2.4369	.2359	-1.1997	-2.3779	.2121
-1.1998	-2.3272	.1728	-1.1998	-2.2879	.1221	-1.1999	-2.2641	.0631
-1.2000	-2.2558	0.0000	-1.2001	-2.2641	-.0631	-1.2002	-2.2880	-.1221
-1.2002	-2.3273	-.1727	-1.2003	-2.3779	-.2120	-1.2003	-2.4369	-.2358
-1.2003	-2.5000	-.2441	-1.2003	-2.5631	-.2358	-1.2003	-2.6221	-.2120
-1.2002	-2.6727	-.1727	-1.2002	-2.7120	-.1221	-1.2001	-2.7359	-.0631
-1.2000	-2.7442	0.0000	-1.1999	-2.7359	.0631	-1.1998	-2.7121	.1221
-1.1998	-2.6728	.1728	-1.1997	-2.6221	.2121	-1.1997	-2.5631	.2359
-1.1997	-2.5000	.2442						
.4864	-2.5000	.5069	.4728	-2.3694	.4878	.4538	-2.2488	.4351
.4307	-2.1470	.3530	.4053	-2.0707	.2479	.3794	-2.0246	.1274
.3547	-2.0112	0.0000	.3329	-2.0308	-.1257	.3152	-2.0814	-.2417
.3029	-2.1594	-.3406	.2965	-2.2596	-.4163	.2965	-2.3756	-.4644
.3029	-2.5000	-.4817	.3152	-2.6251	-.4669	.3329	-2.7429	-.4207
.3547	-2.8456	-.3456	.3794	-2.9262	-.2461	.4053	-2.9788	-.1283
.4307	-2.9993	0.0000	.4538	-2.9853	.1300	.4728	-2.9374	.2525
.4864	-2.8585	.3585	.4935	-2.7540	.4398	.4935	-2.6314	.4905
.4864	-2.5000	.5069						
2.0466	-2.5000	.7012	2.0044	-2.3197	.6725	1.9560	-2.1545	.5983
1.9050	-2.0151	.4849	1.8547	-1.9115	.3399	1.8087	-1.8487	.1745
1.7696	-1.8298	0.0000	1.7401	-1.8561	-.1725	1.7216	-1.9244	-.3324
1.7152	-2.0302	-.4698	1.7216	-2.1676	-.5756	1.7401	-2.3275	-.6439
1.7696	-2.5000	-.6702	1.8087	-2.6745	-.6513	1.8547	-2.8399	-.5885
1.9050	-2.9849	-.4849	1.9560	-3.0983	-.3455	2.0044	-3.1725	-.1803
2.0466	-3.2012	0.0000	2.0793	-3.1806	.1825	2.1001	-3.1123	.3536
2.1073	-3.0009	.5009	2.1001	-2.8536	.6123	2.0793	-2.6825	.6806
2.0466	-2.5000	.7012						
3.8285	-2.5000	.8658	3.7514	-2.2770	.8311	3.6729	-2.0733	.7392
3.5970	-1.9004	.5996	3.5319	-1.7714	.4206	3.4787	-1.6918	.2169
3.4411	-1.6659	0.0000	3.4220	-1.6965	-.2157	3.4221	-1.7797	-.4158
3.4410	-1.9100	-.5900	3.4787	-2.0817	-.7246	3.5318	-2.2819	-.8127
3.5980	-2.5000	-.8477	3.6730	-2.7213	-.8245	3.7515	-2.9300	-.7451
3.8285	-3.1124	-.6124	3.8981	-3.2529	-.4346	3.9555	-3.3433	-.2263
3.9966	-3.3762	0.0000	4.0177	-3.3471	.2273	4.0176	-3.2593	.4384
3.9967	-3.1197	.6197	3.9555	-2.9364	.7560	3.8982	-2.7254	.8399
3.8285	-2.5000	.8658						
5.0198	-2.5000	.9387	4.9212	-2.2583	.9013	4.8306	-2.0363	.8029
4.7537	-1.8476	.6524	4.6952	-1.7043	.4595	4.6586	-1.6145	.2375
4.6461	-1.5838	0.0000	4.6586	-1.6145	-.2375	4.6952	-1.7043	-.4595
4.7537	-1.8476	-.6524	4.8306	-2.0363	-.8029	4.9212	-2.2583	-.9013
5.0198	-2.5000	-.9387	5.1194	-2.7441	-.9103	5.2127	-2.9729	-.8190
5.2934	-3.1707	-.6707	5.3558	-3.3237	-.4755	5.3952	-3.4202	-.2468
5.4086	-3.4530	0.0000	5.3952	-3.4202	.2468	5.3558	-3.3237	.4755
5.2934	-3.1707	.6707	5.2127	-2.9729	.8190	5.1194	-2.7441	.9103
5.0198	-2.5000	.9387						
6.0868	-2.5000	.9789	5.9864	-2.2475	.9415	5.9052	-2.0143	.8417
5.8481	-1.8146	.6854	5.8184	-1.6612	.4841	5.8184	-1.5645	.2509
5.8478	-1.5301	0.0000	5.9052	-1.5614	-.2517	5.9864	-1.6556	-.4871
6.0869	-1.8083	-.6917	6.1998	-2.0089	-.8514	6.3173	-2.2448	-.9518
6.4316	-2.5000	-.9872	6.5342	-2.7559	-.9544	6.6180	-2.9944	-.8568
6.6774	-3.1998	-.6998	6.7084	-3.3578	-.4949	6.7084	-3.4565	-.2565
6.6774	-3.4895	0.0000	6.6180	-3.4554	.2562	6.5342	-3.3560	.4938

TABLE II.- Continued

6.4314	-3.1976	.6976	6.3172	-2.9924	.8537	6.2500	-2.8566	.9090
6.0868	-2.5000	.9789						
6.9605	-2.5000	.9935	6.8779	-2.2430	.9585	6.8262	-2.0043	.8590
6.8086	-1.7991	.7009	6.8262	-1.6410	.4957	6.8779	-1.5415	.2570
6.9605	-1.5065	0.0000	7.0686	-1.5392	-.2576	7.1945	-1.6372	-.4980
7.3302	-1.7945	-.7055	7.4664	-2.0002	-.8657	7.5933	-2.2410	-.9660
7.7023	-2.5000	-1.0000	7.7860	-2.7590	-.9660	7.8385	-3.0000	-.8660
7.8564	-3.2070	-.7070	7.8385	-3.3660	-.5000	7.7860	-3.4660	-.2590
7.7023	-3.5000	0.0000	7.5933	-3.4660	.2590	7.4664	-3.3657	.4998
7.3302	-3.2055	.7055	7.1945	-2.9980	.8628	7.0686	-2.7576	.9608
6.9605	-2.5000	.9935						
7.7199	-2.5000	1.0000	7.6788	-2.2410	.9660	7.6789	-2.0000	.8660
7.7200	-1.7930	.7070	7.7992	-1.6340	.5000	7.9112	-1.5340	.2590
8.0486	-1.5000	0.0000	8.2019	-1.5340	-.2590	8.3604	-1.6340	-.5000
8.5135	-1.7930	-.7070	8.6508	-2.0000	-.8660	8.7629	-2.2410	-.9660
8.8422	-2.5000	-1.0000	8.8833	-2.7590	-.9660	8.8832	-3.0000	-.8660
8.8421	-3.2070	-.7070	8.7629	-3.3660	-.5000	8.6509	-3.4660	-.2590
8.5135	-3.5000	0.0000	8.3603	-3.4660	.2590	8.2018	-3.3660	.5000
8.0487	-3.2070	.7070	7.9113	-3.0000	.8660	7.7992	-2.7590	.9660
7.7199	-2.5000	1.0000						
14.0367	-2.5000	1.0000	14.0592	-2.2410	.9660	14.1256	-2.0000	.8660
14.2310	-1.7930	.7070	14.3683	-1.6340	.5000	14.5282	-1.5340	.2590
14.7000	-1.5000	0.0000	14.8718	-1.5340	-.2590	15.0317	-1.6340	-.5000
15.1690	-1.7930	-.7070	15.2744	-2.0000	-.8660	15.3408	-2.2410	-.9660
15.3633	-2.5000	-1.0000	15.3408	-2.7590	-.9660	15.2744	-3.0000	-.8660
15.1690	-3.2070	-.7070	15.0317	-3.3660	-.5000	14.8718	-3.4660	-.2590
14.7000	-3.5000	0.0000	14.5282	-3.4660	.2590	14.3683	-3.3660	.5000
14.2310	-3.2070	.7070	14.1256	-3.0000	.8660	14.0592	-2.7590	.9660
14.0367	-2.5000	1.0000						
20.5367	-2.5000	1.0000	20.5592	-2.2410	.9660	20.6256	-2.0000	.8660
20.7310	-1.7930	.7070	20.8683	-1.6340	.5000	21.0282	-1.5340	.2590
21.2000	-1.5000	0.0000	21.3718	-1.5340	-.2590	21.5317	-1.6340	-.5000
21.6690	-1.7930	-.7070	21.7744	-2.0000	-.8660	21.8403	-2.2410	-.9660
21.8633	-2.5000	-1.0000	21.8408	-2.7590	-.9660	21.7744	-3.0000	-.8660
21.6690	-3.2070	-.7070	21.5317	-3.3660	-.5000	21.3718	-3.4660	-.2590
21.2000	-3.5000	0.0000	21.0282	-3.4660	.2590	20.8683	-3.3660	.5000
20.7310	-3.2070	.7070	20.6256	-3.0000	.8660	20.5592	-2.7590	.9660
20.5367	-2.5000	1.0000						
26.1578	-2.5000	1.0000	26.2371	-2.2410	.9660	26.3492	-2.0000	.8660
26.4865	-1.7930	.7070	26.6396	-1.6340	.5000	26.7981	-1.5340	.2590
26.9514	-1.5000	0.0000	27.0888	-1.5340	-.2590	27.2008	-1.6340	-.5000
27.2800	-1.7930	-.7070	27.3211	-2.0000	-.8660	27.3212	-2.2410	-.9660
27.2801	-2.5000	-1.0000	27.2008	-2.7590	-.9660	27.0887	-3.0000	-.8660
26.9513	-3.2070	-.7070	26.7982	-3.3660	-.5000	26.6397	-3.4660	-.2590
26.4865	-3.5000	0.0000	26.3491	-3.4660	.2590	26.2371	-3.3660	.5000
26.1579	-3.2070	.7070	26.1168	-3.0000	.8660	26.1167	-2.7590	.9660
26.1578	-2.5000	1.0000						
27.2977	-2.5000	1.0000	27.4067	-2.2410	.9660	27.5336	-2.0002	.8657
27.6698	-1.7945	.7055	27.8055	-1.6372	.4980	27.9314	-1.5392	.2576
28.0395	-1.5065	0.0000	28.1221	-1.5415	-.2570	28.1738	-1.6410	-.4957
28.1914	-1.7991	-.7009	28.1738	-2.0043	-.8590	28.1221	-2.2430	-.9585
28.0395	-2.5000	-.9935	27.9314	-2.7576	-.9608	27.8055	-2.9980	-.8628
27.6698	-3.2055	-.7055	27.5336	-3.3657	-.4998	27.4067	-3.4660	-.2590
27.2977	-3.5000	0.0000	27.2140	-3.4660	.2590	27.1615	-3.3660	.5000
27.1436	-3.2070	.7070	27.1615	-3.0000	.8660	27.2140	-2.7590	.9660
27.2977	-2.5000	1.0000						
28.5684	-2.5000	.9872	28.6827	-2.2448	.9518	28.8002	-2.0089	.8514
28.9131	-1.8083	.6917	29.0136	-1.6556	.4871	29.0948	-1.5614	.2517
29.1522	-1.5301	0.0000	29.1816	-1.5645	-.2509	29.1816	-1.6612	-.4841
29.1519	-1.8146	-.6854	29.0948	-2.0143	-.8417	29.0136	-2.2475	-.9415
28.9132	-2.5000	-.9789	28.8003	-2.7545	-.9492	28.6828	-2.9924	-.8537
28.5686	-3.1976	-.6976	28.4658	-3.3560	-.4938	28.3820	-3.4554	-.2562
28.3226	-3.4895	0.0000	28.2916	-3.4565	.2565	28.2916	-3.3578	.4949
28.3226	-3.1998	.6998	28.3820	-2.9944	.8568	28.4658	-2.7559	.9544

TABLE II.- Continued

ORIGINAL PAGE IS OF POOR QUALITY

28.5684	-2.5000	.9872						
28.9802	-2.5000	.9763	29.0829	-2.2482	.9390	29.1777	-2.0159	.8390
29.2586	-1.8174	.6826	29.3205	-1.6657	.4815	29.3592	-1.5709	.2492
29.3725	-1.5384	0.0000	29.3592	-1.5709	-.2492	29.3205	-1.6657	-.4815
29.2586	-1.8174	-.6826	29.1777	-2.0159	-.8390	29.0829	-2.2482	-.9390
28.9802	-2.5000	-.9763	28.8767	-2.7538	-.9464	28.7797	-2.9915	-.8520
28.6961	-3.1965	-.6965	28.6317	-3.3542	-.4928	28.5915	-3.4529	-.2555
28.5779	-3.4852	0.0000	28.5915	-3.4529	.2555	28.6317	-3.3542	.4928
28.6961	-3.1965	.6965	28.7797	-2.9915	.8520	28.8767	-2.7538	.9464
28.9802	-2.5000	.9763						
31.5009	-2.5000	.8391	31.5663	-2.2841	.8044	31.6190	-2.0859	.7173
31.6562	-1.9160	.5840	31.6750	-1.7870	.4116	31.6750	-1.7047	.2135
31.6561	-1.6744	0.0000	31.6189	-1.7000	-.2147	31.5662	-1.7788	-.4163
31.5009	-1.9065	-.5935	31.4267	-2.0776	-.7317	31.3490	-2.2792	-.8227
31.2724	-2.5000	-.8590	31.2031	-2.7237	-.8338	31.1463	-2.9332	-.7506
31.1054	-3.1152	-.6152	31.0846	-3.2539	-.4352	31.0845	-3.3409	-.2256
31.1054	-3.3699	0.0000	31.1463	-3.3372	.2247	31.2032	-3.2475	.4315
31.2724	-3.1076	.6076	31.3489	-2.9257	.7376	31.4266	-2.7190	.8162
31.5009	-2.5000	.8391						
33.0348	-2.5000	.6921	33.0653	-2.3217	.6649	33.0844	-2.1567	.5944
33.0910	-2.0148	.4852	33.0844	-1.9056	.3433	33.0653	-1.8351	.1783
33.0348	-1.8079	0.0000	32.9945	-1.8274	-.1804	32.9469	-1.8923	-.3510
32.8950	-1.9993	-.5007	32.8423	-2.1432	-.6174	32.7924	-2.3137	-.6944
32.7488	-2.5000	-.7241	32.7150	-2.6886	-.7028	32.6936	-2.8652	-.6323
32.6861	-3.0173	-.5173	32.6936	-3.1323	-.3652	32.7150	-3.2028	-.1886
32.7488	-3.2241	0.0000	32.7924	-3.1944	.1863	32.8423	-3.1179	.3568
32.8950	-3.0007	.5007	32.9469	-2.8510	.6077	32.9945	-2.6804	.6726
33.0348	-2.5000	.6921						
33.7219	-2.5000	.6151	33.7300	-2.3414	.5932	33.7301	-2.1929	.5319
33.7220	-2.0648	.4352	33.7061	-1.9657	.3085	33.6834	-1.9018	.1600
33.6556	-1.8774	0.0000	33.6242	-1.8954	-.1617	33.5912	-1.9546	-.3149
33.5590	-2.0519	-.4481	33.5298	-2.1817	-.5513	33.5058	-2.3348	-.6174
33.4886	-2.5000	-.6413	33.4798	-2.6660	-.6202	33.4797	-2.8211	-.5562
33.4886	-2.9537	-.4537	33.5058	-3.0536	-.3197	33.5299	-3.1148	-.1645
33.5590	-3.1334	0.0000	33.5511	-3.1082	.1627	33.6241	-3.0422	.3130
33.6556	-2.9405	.4405	33.6835	-2.8097	.5364	33.7061	-2.6593	.5957
33.7219	-2.5000	.6151						
36.0004	-2.5000	.2767	36.0004	-2.4284	.2673	36.0003	-2.3616	.2402
36.0003	-2.3042	.1958	36.0002	-2.2598	.1384	36.0001	-2.2326	.0716
36.0000	-2.2232	0.0000	35.9999	-2.2326	-.0716	35.9998	-2.2598	-.1384
35.9997	-2.3042	-.1958	35.9997	-2.3616	-.2402	35.9996	-2.4284	-.2675
35.9996	-2.5000	-.2769	35.9996	-2.5716	-.2675	35.9997	-2.6384	-.2402
35.9997	-2.6958	-.1958	35.9998	-2.7402	-.1384	35.9999	-2.7674	-.0716
36.0000	-2.7768	0.0000	36.0001	-2.7674	.0716	36.0002	-2.7402	.1384
36.0003	-2.6958	.1958	36.0003	-2.6384	.2402	36.0004	-2.5716	.2673
36.0004	-2.5000	.2767						
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000						

'RIGHT CANARD'

6	1	0	5	5	0.	2.5	0.	0.
3.75	3.112	0.	3.75	3.112	0.	3.75	3.112	0.
3.75	3.112	0.	3.75	3.112	0.			
4.5	3.2	.05	4.5	3.5	.025	4.5	3.88	0.
4.5	3.5	-.025	4.5	3.2	-.05			
5.	3.226	.10	5.	3.75	.05	5.	4.4	0.
5.	3.75	-.05	5.	3.226	-.10			
5.8	3.3	.05	5.8	4.15	.025	5.8	5.18	0.

TABLE II.- Concluded

```
5.8      4.15     -.025    5.8      3.3      -.05
6.25     3.361    0.       6.25     4.4      0.       6.25     5.61     0.
6.25     4.4      0.       6.25     3.361    0.
!LEFT CANARD!
7   1    0   5    5   0.    -2.5    -5.   0.
3.75     1.888    0.       3.75     1.888    0.       3.75     1.888    0.
3.75     1.888    0.       3.75     1.888    0.
4.5      1.8      .05      4.5      1.5      .025     4.5      1.12     0.
4.5      1.5      -.025    4.5      1.8      -.05
5.       1.774    .10      5.       1.25     .05      5.       .6       0.
5.       1.25     -.05     5.       1.774    -.10
5.8      1.7      .05      5.8      .85      .025     5.8      -.18     0.
5.8      .85      -.025    5.8      1.7      -.05
6.25     1.639    0.       6.25     .6       0.       6.25     -.61     0.
6.25     .6       0.       6.25     1.639    0.
!BPACE!
8   1    0   7    4   0.    0.    0.    0.
28.75    -1.549   .259     28.75    1.534    .259     28.75    1.5      0.
28.75    1.534    -.259    28.75    -1.549   -.259    28.75    -1.515   0.
28.75    -1.549   .259
29.1     -1.56    .259     29.1     1.534    .259     29.1     1.5      0.
29.1     1.534    -.259    29.1     -1.56    -.259    29.1     -1.54    0.
29.1     -1.56    .259
29.5     -1.58    .259     29.5     1.534    .259     29.5     1.5      0.
29.5     1.534    -.259    29.5     -1.58    -.259    29.5     -1.55    0.
29.5     -1.58    .259
30.      -1.59    .259     30.      1.534    .259     30.      1.5      0.
30.      1.534    -.259    30.      -1.59    -.259    30.      -1.6     0.
30.      -1.59    .259
```

TABLE III.- SAMPLE CASE INPUT

```
'CHECK 1'  1.414  0.  0.  0.  50  16  0  8
'CHECK 2'  1.414  2.  0.  0.  4*
'CHECK 3'  1.414  2.  20.  -1.  4*
```

TABLE IV.- SAMPLE CASE OUTPUT

ZERO LIFT WAVE DRAG WITH ARBITRARY GEOMETRY INPUT

```
ENTER START

                        CONFIGURATION DESCRIPTION

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE
REFERENCE AREA =    221.2200
PRINT CODE     =           0

   ********************************************************
   ***** COMPONENT- WING 1              ,NUMBER-     1 *****
   ********************************************************
   ISURF=   1  IMAGE=   1
   NPNT =  21  LINE =   5
   SCALE=    1.0000    PO=    0.0000    0.0000    0.0000
INPUT COORDINATES
      X         Y         Z         X         Y         Z         X         Y         Z         X         Y         Z
   22.7660   10.0000    0.0000   22.9043   10.0030   -.0160   23.1808   10.0000   -.0425   23.4573   10.0000   -.0620
   23.7338   10.0000   -.0755   24.0103   10.0000   -.0820   24.2868   10.0000   -.0820   24.5633   10.0000   -.0755
   24.8398   10.0000   -.0620   25.1163   10.0000   -.0043   25.5310   10.0000    0.0000   25.1163   10.0000    .0425
   24.8398   10.0000    .0620   24.5633   10.0000    .0755   24.2868   10.0000    .0820   24.0103   10.0000    .0820
   23.7338   10.0000    .0755   23.4573   10.0000    .0620   23.1808   10.0000    .0425   22.9043   10.0000    .0160
   22.7660   10.0000    0.0000
   20.7099    8.3890    0.0000   20.9249    8.3675   -.0204   21.3623    8.3238   -.0537   21.8098    8.2790   -.0777
   22.2680    8.2332   -.0938   22.7370    8.1863   -.1010   23.2176    8.1382   -.1002   23.7097    8.0891   -.0914
   24.2140    8.0386   -.0744   24.7309    7.9869   -.0505   25.5310    7.9069    0.0000   24.7309    7.9869    .0505
   24.2140    8.0386    .1074   23.7097    8.0890    .0914   23.2176    8.1382    .1002   22.7370    8.1863    .1010
   22.2680    8.2332    .0938   21.8098    8.2790    .0777   21.3623    8.3238    .0537   20.9249    8.3675    .0404
   20.7099    8.3890    0.0000
   18.7317    6.8391    0.0000   19.0169    6.7939   -.0241   19.6019    6.7011   -.0634   20.2074    6.6051   -.0914
   20.8347    6.5056   -.1104   21.4847    6.4026   -.1186   22.1594    6.2956   -.1173   22.8591    6.1846   -.1067
   23.5858    6.0694   -.0865   24.3409    5.9497   -.0585   25.5310    5.7609    0.0000   24.3409    5.9497    .0585
   23.5858    6.0694    .0865   22.8591    6.1846    .1067   22.1594    6.2956    .1173   21.4847    6.4026    .1186
   20.8347    6.5056    .1104   20.2074    6.6051    .0916   19.6019    6.7011    .0634   19.0169    6.7939    .0241
   18.7317    6.8391    0.0000
   16.7797    5.3097    0.0000   17.1784    5.2776   -.0280   17.9869    5.2125   -.0740   18.8109    5.1462   -.1074
   19.6508    5.0787   -.1305   20.5069    5.0098   -.1411   21.3807    4.9395   -.1405   22.2710    4.8679   -.1288
   23.1791    4.7948   -.10.    24.1056    4.7202   -.0718   25.5310    4.6056    0.0000   24.1056    4.7202    .0718
   23.1791    4.7948    .105.   22.2710    4.8679    .1288   21.3807    4.9395    .1405   20.5069    5.0098    .1411
   19.6508    5.0787    .1305   18.8109    5.1462    .1076   17.9869    5.2125    .0740   17.1784    5.2776    .0280
   16.7797    5.3097    0.0000
   14.4700    3.5000    0.0000   15.0230    3.5000   -.0320   16.1290    3.5000   -.0850   17.2350    3.5000   -.1240
   18.3410    3.5000   -.1510   19.4470    3.5000   -.1640   20.5540    3.5000   -.1640   21.6600    3.5000   -.1510
   22.7660    3.5000   -.1240   23.8720    3.5000   -.0850   25.5310    3.5000    0.0000   23.8720    3.5000    .0850
   22.7660    3.5000    .1240   21.6600    3.5000    .1510   20.5540    3.5000    .1640   19.4470    3.5000    .1640
   18.3410    3.5000    .1510   17.2350    3.5000    .1240   16.1290    3.5000    .0850   15.0230    3.5000    .0320
   14.4700    3.5000    0.0000

   ********************************************************
   ***** COMPONENT- WING 2              ,NUMBER-     2 *****
   ********************************************************
   ISURF=   1  IMAGE=   1
   NPNT =  39  LINE =   2
   SCALE=    0.0000    PO=    0.0000    0.0000    0.0000
INPUT COORDINATES
      X         Y         Z         X         Y         Z         X         Y         Z         X         Y         Z
   14.4700    1.5000    0.0000   15.0230    1.5000    .0320   15.5760    1.5000    .0600   16.1290    1.5000    .0850
   16.6820    1.5000    .1060    17.2350    1.5000    .1240   17.7880    1.5000    .1390   18.3410    1.5000    .1510
   18.8940    1.5000    .1590    19.4470    1.5000    .1640   20.0010    1.5000    .1660   20.5540    1.5000    .1640
   21.1070    1.5000    .1590    21.6600    1.5000    .1510   22.2130    1.5000    .1390   22.7660    1.5000    .1240
   23.3190    1.5000    .1060    23.8720    1.5000    .0850   24.4250    1.5000    .0600   25.5310    1.5000    0.0000
```

TABLE IV.- Continued

24.4250	1.5000	-.0600	23.8720	1.5000	-.0850	23.3190	1.5000	-.1060	22.7660	1.5000	-.1240
22.2130	1.5000	-.1390	21.6600	1.5000	-.1510	21.1070	1.5000	-.1590	20.5540	1.5000	-.1640
20.0010	1.5000	-.1660	19.4470	1.5000	-.1640	18.8940	1.5000	-.1590	18.3410	1.5000	-.1510
17.7880	1.5000	-.1390	17.2350	1.5000	-.1240	16.6820	1.5000	-.1060	16.1290	1.5000	-.0850
15.5760	1.5000	-.0600	15.0230	1.5000	-.0320	14.4700	1.5000	0.0000			
16.1290	.5010	0.0000	16.5991	.5010	.0320	17.0692	.5010	.0600	17.5393	.5010	.0850
18.0094	.5010	.1060	18.4795	.5010	.1240	18.9496	.5010	.1390	19.4197	.5010	.1510
19.8898	.5010	.1590	20.3599	.5010	.1640	20.8300	.5010	.1660	21.3001	.5010	.1640
21.7702	.5010	.1590	22.2403	.5010	.1510	22.7104	.5010	.1390	23.1805	.5010	.1240
23.6506	.5010	.1060	24.1207	.5010	.0850	24.5908	.5010	.0600	25.5310	.5010	0.0000
24.5908	.5010	-.0600	24.1207	.5010	-.0850	23.6506	.5010	-.1060	23.1805	.5010	-.1240
22.7104	.5010	-.1390	22.2403	.5010	-.1510	21.7702	.5010	-.1590	21.3001	.5010	-.1640
20.8300	.5010	-.1660	20.3599	.5010	-.1640	19.8898	.5010	-.1590	19.4197	.5010	-.1510
18.9496	.5010	-.1390	18.4795	.5010	-.1240	18.0094	.5010	-.1060	17.5393	.5010	-.0850
17.0692	.5010	-.0600	16.5991	.5010	-.0320	16.1290	.5010	0.0000			

****
***** COMPONENT- FUSELAGE ,NUMBER- 3 *****
****

ISURF= 0 IMAGE= 1
NPNT = 15 LINE = 14
SCALE= 1.0000 PO= 0.0000 0.0000 0.0000

INPUT COORDINATES

X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000
14.4700	0.0000	0.0000	14.4700	0.0000	0.0000	14.4700	0.0000	0.0000			
15.2457	0.0000	.2272	15.2445	.0500	.2213	15.2409	.0978	.2036	15.2352	.1396	.1752
15.2278	.1736	.1383	15.2191	.1980	.0951	15.2096	.2116	.0478	15.2000	.2143	0.0000
15.1906	.2064	-.0466	15.1818	.1885	-.0905	15.1741	.1616	-.1288	15.1678	.1277	-.1602
15.1631	.0882	-.1837	15.1602	.0447	-.1980	15.1593	0.0000	-.2027			
15.8180	0.0000	.3831	15.8357	.0860	.3783	15.8461	.1693	.3515	15.8487	.2439	.3057
15.8430	.3046	.2430	15.8293	.3476	.1674	15.8092	.3716	.0845	15.7838	.3743	0.0000
15.7550	.3580	-.0814	15.7244	.3234	-.1556	15.6940	.2747	-.2190	15.6652	.2143	-.2689
15.6392	.1461	-.3036	15.6169	.0734	-.3233	15.5993	0.0000	-.3270			
16.4079	0.0000	.5200	16.4648	.1182	.5188	16.5209	.2357	.4893	16.5728	.3452	.4314
16.6175	.4406	.3508	16.6509	.5133	.2472	16.6715	.5599	.1275	16.6769	.5749	0.0000
16.6673	.5591	-.1273	16.6427	.5117	-.2465	16.6060	.4388	-.3494	16.5588	.3434	-.4312
16.5055	.2344	-.4864	16.4488	.1175	-.5156	16.3922	0.0000	-.5168			
16.8909	0.0000	.6006	16.9679	.1358	.5946	17.0489	.2686	.5575	17.1295	.3914	.4915
17.2066	.4984	.3969	17.2724	.5776	.2783	17.3242	.6265	.1433	17.3595	.6439	0.0000
17.3768	.6273	-.1435	17.3746	.5793	-.2790	17.3537	.5025	-.4003	17.3146	.3990	-.5020
17.2604	.2782	-.5774	17.1919	.1418	-.6201	17.1139	0.0000	-.6268			
17.1437	0.0000	.6303	17.2069	.1422	.6218	17.2876	.2784	.5779	17.3802	.4006	.5028
17.4800	.5041	.4017	17.5807	.5826	.2805	17.6779	.6322	.1446	17.7669	.6497	0.0000
17.8424	.6340	-.1450	17.9002	.5860	-.2820	17.9377	.5080	-.4050	17.9536	.4050	-.5080
17.9472	.2820	-.5860	17.9180	.1450	-.6340	17.8675	0.0000	-.6500			
17.4644	0.0000	.6447	17.4776	.1439	.6289	17.5169	.2800	.5816	17.5802	.4027	.5056
17.6647	.5064	.4037	17.7659	.5856	.2818	17.8796	.6340	.1450	18.0000	.6500	0.0000
18.1204	.6340	-.1450	18.2342	.5860	-.2820	18.3364	.5080	-.4050	18.4220	.4050	-.5080
18.4868	.2820	-.5860	18.5266	.1450	-.6340	18.5399	0.0000	-.6500			
18.0601	0.0000	.6500	18.0734	.1450	.6340	18.1132	.2820	.5860	18.1780	.4050	.5080
18.2636	.5080	.4050	18.3658	.5860	.2820	18.4796	.6340	.1450	18.6030	.6500	0.0000
18.7204	.6340	-.1450	18.8342	.5860	-.2820	18.9364	.5080	-.4050	19.0220	.4050	-.5080
19.0868	.2820	-.5860	19.1266	.1450	-.6340	19.1399	0.0000	-.6500			
19.2325	0.0000	.6500	19.3011	.1450	.6340	19.3845	.2820	.5860	19.4791	.4050	.5080
19.5797	.5080	.4050	19.6813	.5860	.2820	19.7785	.6340	.1450	19.8670	.6500	0.0000
19.9424	.6340	-.1450	20.0002	.5860	-.2820	20.0377	.5080	-.4050	20.0536	.4050	-.5080
20.0472	.2820	-.5860	20.0180	.1450	-.6340	19.9675	0.0000	-.6500			
21.1819	0.0000	.6500	21.2659	.1450	.6340	21.3512	.2820	.5860	21.4342	.4050	.5080
21.5105	.5080	.4050	21.5764	.5860	.2820	21.6281	.6340	.1450	21.6634	.6500	0.0000
21.6808	.6340	-.1450	21.6789	.5860	-.2820	21.6576	.5080	-.4050	21.6187	.4050	-.5080

TABLE IV.- Continued

21.5641	.2820	-.5860	21.4962	.1450	-.6340	21.4181	0.0000	-.6500			
22.9968	0.0000	.6500	23.0608	.1450	.6340	23.1164	.2820	.5860	23.1612	.4050	.5080
23.1931	.5080	.4050	23.2105	.5860	.2820	23.2121	.6340	.1450	23.1978	.6500	0.0000
23.1689	.6340	-.1450	23.1265	.5860	-.2820	23.0725	.5080	-.4050	23.0099	.4050	-.5080
22.9420	.2820	-.5860	22.8721	.1450	-.6340	22.8032	0.0000	-.6500			
24.2002	0.0000	.6500	24.2277	.1450	.6340	24.2436	.2820	.5860	24.2471	.4050	.5080
24.2384	.5080	.4050	24.2180	.5860	.2820	24.1865	.6340	.1450	24.1454	.6500	0.0000
24.0972	.6340	-.1450	24.0443	.5860	-.2820	23.9889	.5080	-.4050	23.9342	.4050	-.5080
23.8826	.2820	-.5860	23.8372	.1450	-.6340	23.7998	0.0000	-.6500			
24.6306	0.0000	.6500	24.6274	.1450	.6340	24.6178	.2820	.5860	24.6021	.4050	.5080
24.5814	.5080	.4050	24.5567	.5860	.2820	24.5291	.6340	.1450	24.5000	.6500	0.0000
24.4709	.6340	-.1450	24.4433	.5860	-.2820	24.4186	.5080	-.4050	24.3979	.4050	-.5080
24.3822	.2820	-.5860	24.3726	.1450	-.6340	24.3694	0.0000	-.6500			
25.5300	0.0000	.6500	25.5300	.1450	.6340	25.5300	.2820	.5860	25.5300	.4050	.5080
25.5300	.5080	.4050	25.5300	.5860	.2820	25.5300	.6340	.1450	25.5300	.6500	0.0000
25.5300	.6340	.1450	25.5300	.5860	-.2820	25.5300	.5080	-.4050	25.5300	.4050	-.5080
25.5300	.2820	-.5860	25.5300	.1450	-.6340	25.5300	0.0000	-.6500			

```
*********************************************************
***** COMPONENT- POD 1                ,NUMBER-     4 *****
*********************************************************
ISURF=   0  IMAGE=   0
NPNT =  25  LINE  =  20
SCALE=    1.0000     PO=     5.0000     5.0000     0.0000
INPUT COORDINATES
```

X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000									
-1.1997	-2.5000	.2442	-1.1997	-2.4369	.2359	-1.1997	-2.3779	.2121	-1.1998	-2.3272	.1728
-1.1998	-2.2879	.1221	-1.1999	-2.2641	.0631	-1.2000	-2.2558	0.0000	-1.2001	-2.2641	-.0631
-1.2002	-2.2880	-.1221	-1.2002	-2.3273	-.1727	-1.2003	-2.3779	-.2120	-1.2003	-2.4369	-.2358
-1.2003	-2.5000	-.2441	-1.2003	-2.5631	-.2358	-1.2003	-2.6221	-.2120	-1.2002	-2.6727	-.1727
-1.2002	-2.7120	-.1221	-1.2001	-2.7359	-.0631	-1.2000	-2.7442	0.0000	-1.1999	-2.7359	.0631
-1.1998	-2.7121	.1221	-1.1998	-2.6728	.1728	-1.1997	-2.6221	.2121	-1.1997	-2.5631	.2359
-1.1997	-2.5000	.2442									
.4864	-2.5000	.5069	.4728	-2.3694	.4878	.4538	-2.2488	.4351	.4307	-2.1470	.3530
.4053	-2.0707	.2479	.3794	-2.0246	.1274	.3547	-2.0112	0.0000	.3329	-2.0308	-.1257
.3152	-2.0814	-.2417	.3029	-2.1594	-.3406	.2965	-2.2596	-.4163	.2965	-2.3756	-.4644
.3029	-2.5000	-.4817	.3152	-2.6251	-.4669	.3329	-2.7429	-.4207	.3547	-2.8456	-.3456
.3794	-2.9262	-.2461	.4053	-2.9788	-.1283	.4307	-2.9993	0.0000	.4538	-2.9853	.1309
.4728	-2.9374	.2525	.4864	-2.8585	.3585	.4935	-2.7540	.4398	.4935	-2.6314	.4905
.4864	-2.5000	.5069									
2.0466	-2.5000	.7012	2.0044	-2.3197	.6725	1.9560	-2.1545	.5983	1.9050	-2.0151	.4849
1.8547	-1.9115	.3399	1.8087	-1.6457	.1745	1.7696	-1.8298	0.0000	1.7401	-1.8561	-.1725
1.7216	-1.9244	-.3324	1.7152	-2.0302	-.4698	1.7216	-2.1676	-.5756	1.7401	-2.3275	-.6433
1.7696	-2.5000	-.6702	1.8087	-2.6745	-.6513	1.8547	-2.8399	-.5865	1.9050	-2.9849	-.4849
1.9560	-3.0983	-.3455	2.0044	-3.1125	-.1803	2.0466	-3.2012	0.0000	2.0793	-3.1806	.1875
2.1001	-3.1123	.3536	2.1073	-3.0009	.5009	2.1001	-2.8536	.6123	2.0793	-2.6825	.5806
2.0466	-2.5000	.7012									
3.8285	-2.5000	.8658	3.7514	-2.2770	.8311	3.6729	-2.0733	.7392	3.5979	-1.9004	.5996
3.5319	-1.7714	.4206	3.4787	-1.6918	.2169	3.4411	-1.6659	0.0000	3.4220	-1.6965	-.2157
3.4221	-1.7797	-.4158	3.4410	-1.9100	-.5900	3.4787	-2.0817	-.7246	3.5318	-2.2819	-.8127
3.5980	-2.5000	-.8477	3.6730	-2.7213	-.8245	3.7515	-2.9300	-.7451	3.8285	-3.1124	-.6174
3.8981	-3.2529	-.4346	3.9555	-3.3433	-.2263	3.9966	-3.3762	0.0000	4.0177	-3.3471	.2273
4.0176	-3.2593	.4384	3.9967	-3.1197	.6197	3.9555	-2.9364	.7560	3.8982	-2.7254	.8399
3.8285	-2.5000	.8658									
5.0198	-2.5000	.9387	4.9212	-2.2583	.9013	4.8306	-2.0363	.8029	4.7537	-1.8476	.6557
4.6952	-1.7043	.4595	4.6586	-1.6145	.2375	4.6461	-1.5838	0.0000	4.6500	-1.6145	-.2375

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE IV.- Continued

4.6952	-1.7043	-.4595	4.7537	-1.8476	-.6524	4.8306	-2.0363	-.8029	4.9212	-2.2583	-.9819
5.0198	-2.5000	-.9387	5.1194	-2.7441	-.9103	5.2127	-2.9729	-.8190	5.2934	-3.1707	-.6707
5.3558	-3.3237	-.4755	5.3952	-3.4202	-.2468	5.4086	-3.4530	0.0000	5.3952	-3.4202	.2468
5.3958	-3.3237	.4755	5.2934	-3.1707	.6707	5.2127	-2.9729	.8190	5.1194	-2.7441	.9103
5.0198	-2.5000	.9387									
6.0868	-2.5000	.9789	5.9864	-2.2475	.9415	5.9052	-2.0143	.8417	5.8481	-1.8146	.6854
5.8184	-1.6612	.4841	5.8184	-1.5665	.2509	5.8478	-1.5301	0.0000	5.9052	-1.5614	.2517
5.9864	-1.6556	-.4871	6.0869	-1.8083	-.6917	6.1998	-2.0089	-.8514	6.3173	-2.2448	-.9515
6.4316	-2.5000	-.9872	6.5342	-2.7559	-.9544	6.6180	-2.9944	-.8568	6.6774	-3.1998	-.6998
6.7084	-3.3578	-.4949	6.7084	-3.4565	-.2565	6.6774	-3.4895	0.0000	6.6180	-3.4554	.2562
6.5342	-3.3560	.4938	6.4314	-3.1976	.6976	6.3172	-2.9924	.8537	6.2500	-2.8564	.9090
6.0868	-2.5000	.9789									
6.9605	-2.5000	.9935	6.8779	-2.2430	.9585	6.8262	-2.0043	.8590	6.8086	-1.7991	.7059
6.8262	-1.6410	.4957	6.8779	-1.5415	.2570	6.9605	-1.5065	0.0000	7.0686	-1.5392	.2576
7.1945	-1.6372	-.4980	7.3302	-1.7945	-.7055	7.4664	-2.0002	-.8657	7.5933	-2.2410	-.9660
7.7023	-2.5000	-1.0000	7.7860	-2.7590	-.9660	7.8385	-3.0000	-.8660	7.8364	-3.2070	-.7070
7.8385	-3.3660	-.5000	7.7860	-3.4660	-.2590	7.7023	-3.5000	0.0000	7.5933	-3.4660	.2590
7.4664	-3.3657	.4998	7.3302	-3.2055	.7055	7.1945	-2.9980	.8628	7.0686	-2.7574	.9668
6.9605	-2.5000	.9935									
7.7199	-2.5000	1.0000	7.6788	-2.2410	.9660	7.6789	-2.0000	.8660	7.7200	-1.7930	.7070
7.7992	-1.6340	.5000	7.9112	-1.5340	.2590	8.0486	-1.5000	0.0000	8.2019	-1.5340	-.2590
8.3604	-1.6340	-.5000	8.5135	-1.7930	-.7070	8.6508	-2.0000	-.8660	8.7629	-2.2410	-.9660
8.8422	-2.5000	-1.0000	8.8833	-2.7590	-.9660	8.8832	-3.0000	-.8660	8.8421	-3.2070	-.7070
8.7629	-3.3660	-.5000	8.6509	-3.4660	-.2590	8.5135	-3.5000	0.0000	8.3603	-3.4660	.2590
8.2018	-3.3660	.5000	8.0487	-3.2070	.7070	7.9113	-3.0000	.8660	7.7992	-2.7590	.9660
7.7199	-2.5000	1.0000									
14.0367	-2.5000	1.0000	14.0592	-2.2410	.9660	14.1256	-2.0000	.8660	14.2310	-1.7930	.7070
14.3683	-1.6340	.5000	14.5282	-1.5340	.2590	14.7000	-1.5000	0.0000	14.8718	-1.5340	-.2590
15.0317	-1.6340	-.5000	15.1690	-1.7930	-.7070	15.2744	-2.0000	-.8660	15.3408	-2.2410	-.9660
15.3633	-2.5000	-1.0000	15.3408	-2.7590	-.9660	15.2744	-3.0000	-.8660	15.1690	-3.2070	-.7070
15.0317	-3.3660	-.5000	14.8718	-3.4660	-.2590	14.7000	-3.5000	0.0000	14.5282	-3.4660	.2590
14.3683	-3.3660	.5000	14.2310	-3.2070	.7070	14.1256	-3.0000	.8660	14.0592	-2.7590	.9660
14.0367	-2.5000	1.0000									
20.5367	-2.5000	1.0000	20.5592	-2.2410	.9660	20.6256	-2.0000	.8660	20.7310	-1.7930	.7070
20.8683	-1.6340	.5000	21.0282	-1.5340	.2590	21.2000	-1.5000	0.0000	21.3718	-1.5340	-.2590
21.5317	-1.6340	-.5000	21.6690	-1.7930	-.7070	21.7744	-2.0000	-.8660	21.8408	-2.2410	-.9660
21.8633	-2.5000	-1.0000	21.8408	-2.7590	-.9660	21.7744	-3.0000	-.8660	21.6690	-3.2070	-.7070
21.5317	-3.3660	-.5000	21.3718	-3.4660	-.2590	21.2000	-3.5000	0.0000	21.0282	-3.4660	.2590
20.8683	-3.3660	.5000	20.7310	-3.2070	.7070	20.6256	-3.0000	.8660	20.5592	-2.7590	.9660
20.5367	-2.5000	1.0000									
26.1578	-2.5000	1.0000	26.2371	-2.2410	.9660	26.3492	-2.0000	.8660	26.4865	-1.7930	.7070
26.6396	-1.6340	.5000	26.7981	-1.5340	.2590	26.9514	-1.5000	0.0000	27.0888	-1.5340	-.2590
27.2008	-1.6340	-.5000	27.2800	-1.7930	-.7070	27.3211	-2.0000	-.8660	27.3212	-2.2410	-.9660
27.2801	-2.5000	-1.0000	27.2008	-2.7590	-.9660	27.0887	-3.0000	-.8660	26.9513	-3.2070	-.7070
26.7982	-3.3660	-.5000	26.6397	-3.4660	-.2590	26.4865	-3.5000	0.0000	26.3491	-3.4660	.2590
26.2371	-3.3660	.5000	26.1579	-3.2070	.7070	26.1168	-3.0000	.8660	26.1167	-2.7590	.9660
26.1578	-2.5000	1.0000									
27.2977	-2.5000	1.0000	27.4067	-2.2410	.9660	27.5336	-2.0002	.8657	27.6698	-1.7945	.7055
27.8055	-1.6372	.4980	27.9314	-1.5392	.2576	28.0395	-1.5065	0.0000	28.1221	-1.5415	-.2570
28.1738	-1.6410	-.4957	28.1914	-1.7991	-.7009	28.1738	-2.0043	-.8590	28.1221	-2.2430	-.9585
28.0395	-2.5000	-.9935	27.9314	-2.7576	-.9608	27.8055	-2.9980	-.8628	27.6698	-3.2055	-.7055
27.5336	-3.3657	-.4998	27.4067	-3.4660	-.2590	27.2977	-3.5000	0.0000	27.2140	-3.4660	.2590
27.1615	-3.3660	.5000	27.1436	-3.2070	.7070	27.1615	-3.0000	.8660	27.2140	-2.7590	.9660
27.2977	-2.5000	1.0000									
28.5684	-2.5000	.9872	28.6827	-2.2448	.9513	28.8002	-2.0089	.8514	28.9131	-1.8083	.6917
29.0136	-1.6556	.4871	29.0948	-1.5614	.2517	29.1522	-1.5301	0.0000	29.1816	-1.5645	-.2509
29.1816	-1.6612	-.4841	29.1519	-1.8146	-.6854	29.0948	-2.0143	-.8417	29.0136	-2.2475	-.9415
28.9132	-2.5000	-.9789	28.8003	-2.7545	-.9492	28.6828	-2.9924	-.8537	28.5686	-3.1976	-.6976
28.4658	-3.3560	-.4938	28.3820	-3.4554	-.2562	28.3226	-3.4895	0.0000	28.2916	-3.4569	.2565
28.2916	-3.3578	.4949	28.3226	-3.1998	.6998	28.3820	-2.9944	.8568	28.4658	-2.7559	.9531
28.5684	-2.5000	.9872									
28.9802	-2.5000	.9763	29.0829	-2.2482	.9390	29.1777	-2.0159	.8390	29.2546	-1.8174	.6826
29.3205	-1.6657	.4815	29.3592	-1.5709	.2492	29.3725	-1.5384	0.0000	29.3592	-1.5709	-.2492
29.3205	-1.6657	-.4815	29.2586	-1.8174	-.6826	29.1777	-2.0159	-.8390	29.0829	-2.2482	-.9390

TABLE IV.- Continued

28.9802	-2.5000	-.9763	28.8767	-2.7538	-.9464	28.7797	-2.9915	-.8520	28.6961	-3.1965	-.6965
28.6317	-3.3542	-.4928	28.5915	-3.4529	-.2555	28.5779	-3.4862	0.0000	28.5915	-3.4529	.2555
28.6317	-3.3542	.4928	28.6961	-3.1965	.6965	28.7797	-2.9915	.8520	28.8767	-2.7538	.9464
28.9802	-2.5000	.9763									
31.5009	-2.5000	.8391	31.5663	-2.2841	.8044	31.6190	-2.0859	.7173	31.6562	-1.9160	.5840
31.6750	-1.7870	.4116	31.6750	-1.7047	.2135	31.6561	-1.6744	0.0000	31.6189	-1.7000	-.2147
31.5662	-1.7788	-.4163	31.5009	-1.9065	-.5935	31.4267	-2.0776	-.7317	31.3490	-2.2792	-.5227
31.2724	-2.5000	-.8590	31.2031	-2.7237	-.8338	31.1463	-2.9332	-.7506	31.1054	-3.1152	-.5152
31.0846	-3.2539	-.4352	31.0845	-3.3409	-.2256	31.1054	-3.3699	0.0000	31.1463	-3.3372	.2247
31.2032	-3.2475	.4315	31.2724	-3.1076	.6076	31.3489	-2.9257	.7376	31.4266	-2.7190	.8162
31.5009	-2.5000	.8391									
33.0348	-2.5000	.6921	33.0653	-2.3217	.6649	33.0844	-2.1567	.5944	33.0910	-2.0148	.4852
33.0844	-1.9056	.3433	33.0653	-1.8351	.1783	33.0348	-1.8079	0.0000	32.9945	-1.8274	-.1804
32.9469	-1.8923	-.3510	32.8950	-1.9993	-.5007	32.8423	-2.1432	-.6179	32.7924	-2.3137	-.5944
32.7488	-2.5000	-.7241	32.7150	-2.6886	-.7028	32.6936	-2.8652	-.6323	32.6861	-3.0173	-.5173
32.6936	-3.1323	-.3652	32.7150	-3.2028	-.1886	32.7488	-3.2241	0.0000	32.7924	-3.1944	.1863
32.8423	-3.1179	.3568	32.8950	-3.0007	.5007	32.9469	-2.8510	.6077	32.9945	-2.6804	.5726
33.0348	-2.5000	.6921									
33.7219	-2.5000	.6151	33.7300	-2.3414	.5932	33.7301	-2.1929	.5319	33.7220	-2.0648	.4352
33.7061	-1.9657	.3085	33.6834	-1.9018	.1600	33.6556	-1.8774	0.0000	33.6242	-1.8954	-.1617
33.5912	-1.9546	-.3149	33.5590	-2.0519	-.4481	33.5298	-2.1817	-.5513	33.5058	-2.3348	-.5174
33.4886	-2.5000	-.6413	33.4798	-2.6660	-.6202	33.4797	-2.8211	-.5562	33.4886	-2.9537	-.4537
33.5058	-3.0536	-.3197	33.5299	-3.1148	-.1645	33.5590	-3.1334	0.0000	33.5911	-3.1082	.1627
33.6241	-3.0422	.3130	33.6556	-2.9405	.4405	33.6835	-2.8097	.5364	33.7061	-2.6593	.5957
33.7219	-2.5000	.6151									
36.0004	-2.5000	.2767	36.0004	-2.4284	.2673	36.0003	-2.3616	.2402	36.0003	-2.3042	.1959
36.0002	-2.2598	.1384	36.0001	-2.2326	.0716	36.0000	-2.2232	0.0000	35.9999	-2.2326	-.2716
35.9998	-2.2598	-.1384	35.9997	-2.3042	-.1958	35.9997	-2.3616	-.2402	35.9996	-2.4284	-.2675
35.9996	-2.5000	-.2769	35.9996	-2.5716	-.2675	35.9997	-2.6384	-.2402	35.9997	-2.6958	-.1959
35.9998	-2.7402	-.1384	35.9999	-2.7674	-.0716	36.0000	-2.7768	0.0000	36.0001	-2.7674	.2716
36.0002	-2.7402	.1384	36.0003	-2.6958	.1958	.0003	-2.6384	.2402	36.0004	-2.5715	.2673
36.0004	-2.5000	.2767									
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000									

```
*********************************************************
***** COMPONENT- POD 2                ,NUMBER-     5 *****
*********************************************************
ISURF=   0  IMAGE=   0
NPNT =  25  LINE =  20
SCALE=     1.0000     PO=     0.0000     0.0000     0.0000
INPUT COORDINATES
```

X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000	-2.5000	-2.5000	0.0000
-2.5000	-2.5000	0.0000									
-1.1997	-2.5000	.2442	-1.1997	-2.4369	.2359	-1.1997	-2.3779	.2121	-1.1998	-2.3272	.1728
-1.1998	-2.2879	.1221	-1.1999	-2.2641	.0631	-1.2000	-2.2558	0.0000	-1.2001	-2.2641	-.0631
-1.2002	-2.2880	-.1221	-1.2002	-2.3273	-.1727	-1.2003	-2.3779	-.2120	-1.2003	-2.4369	-.2358
-1.2003	-2.5000	-.2441	-1.2003	-2.5631	-.2358	-1.2003	-2.6221	-.2120	-1.2002	-2.6727	-.1727
-1.2002	-2.7120	-.1221	-1.2001	-2.7359	-.0631	-1.2000	-2.7442	0.0000	-1.1999	-2.7359	.0631
-1.1998	-2.7121	.1221	-1.1998	-2.6728	.1728	-1.1997	-2.6221	.2121	-1.1997	-2.5631	.2359
-1.1997	-2.5000	.2442									
.4864	-2.5000	.5069	.4728	-2.3694	.4878	.4538	-2.2488	.4351	.4307	-2.1470	.3530

TABLE IV.- Continued

.4053	-2.0707	.2479	.3794	-2.0246	.1274	.3547	-2.0112	0.0000	.3329	-2.0308	-.1297
.3152	-2.0814	-.2417	.3029	-2.1594	-.3406	.2965	-2.2596	-.4163	.2965	-2.3756	-.4644
.3029	-2.5000	-.4817	.3152	-2.6251	-.4669	.3329	-2.7429	-.4207	.3547	-2.8454	-.3456
.3794	-2.9262	-.2461	.4053	-2.9788	-.1283	.4307	-2.9993	0.0000	.4538	-2.9859	.1300
.4728	-2.9374	.2525	.4864	-2.8585	.3585	.4935	-2.7540	.4398	.4935	-2.6314	.4905
.4864	-2.5000	.5069									
2.0466	-2.5000	.7012	2.0044	-2.3197	.6725	1.9560	-2.1545	.5983	1.9050	-2.0151	.4849
1.8547	-1.9115	.3399	1.8087	-1.8487	.1745	1.7696	-1.8298	0.0000	1.7401	-1.8561	-.1725
1.7216	-1.9244	-.3324	1.7152	-2.0302	-.4698	1.7216	-2.1676	-.5756	1.7401	-2.3279	-.4439
1.7696	-2.5000	-.6702	1.8087	-2.6745	-.6513	1.8547	-2.8399	-.5885	1.9050	-2.9849	-.4849
1.9560	-3.0983	-.3455	2.0044	-3.1725	-.1803	2.0466	-3.2012	0.0000	2.0793	-3.1806	.1825
2.1001	-3.1123	.3536	2.1073	-3.0009	.5009	2.1001	-2.8536	.6123	2.0793	-2.6825	.6806
2.0466	-2.5000	.7012									
3.8285	-2.5000	.8658	3.7514	-2.2770	.8311	3.6729	-2.0733	.7392	3.5979	-1.9004	.5994
3.5319	-1.7714	.4206	3.4787	-1.6918	.2169	3.4411	-1.6659	0.0000	3.4220	-1.6965	-.2197
3.4221	-1.7797	-.4158	3.4610	-1.9100	-.5900	3.4787	-2.0817	-.7246	3.5318	-2.2819	-.4127
3.5980	-2.5000	-.8477	3.6730	-2.7213	-.8245	3.7515	-2.9300	-.7451	3.8285	-3.1124	-.6174
3.8981	-3.2529	-.4346	3.9595	-3.3433	-.2263	3.9966	-3.3762	0.0000	4.0177	-3.3471	.2273
4.0176	-3.2593	.4384	3.9967	-3.1197	.6197	3.9555	-2.9364	.7560	3.8982	-2.7254	.4399
3.8285	-2.5000	.8658									
5.0198	-2.5000	.9387	4.9212	-2.2583	.9013	4.8306	-2.0363	.8029	4.7537	-1.8476	.6524
4.6952	-1.7043	.4595	4.6586	-1.6145	.2379	4.6461	-1.5838	0.0000	4.6586	-1.6145	-.2379
4.6952	-1.7043	-.4595	4.7537	-1.8476	-.6524	4.8306	-2.0363	-.8029	4.9212	-2.2583	-.9013
5.0198	-2.5000	-.9387	5.1194	-2.7441	-.9103	5.2127	-2.9729	-.8190	5.2934	-3.1707	-.6707
5.1558	-3.3237	-.4755	5.3952	-3.4202	-.2468	5.4086	-3.4530	0.0000	5.3952	-3.4202	.2468
5.1558	-3.3237	.4755	5.2934	-3.1707	.6707	5.2127	-2.9729	.8190	5.1194	-2.7441	.9103
5.0198	-2.5000	.9387									
6.0858	-2.5000	.9789	5.9864	-2.2475	.9415	5.9052	-2.0143	.8417	5.8481	-1.8146	.6854
5.8184	-1.6612	.4841	5.8184	-1.5645	.2509	5.8478	-1.5301	0.0000	5.9052	-1.5614	-.2517
5.9864	-1.6556	-.4871	6.0869	-1.8083	-.6917	6.1998	-2.0089	-.6514	6.3173	-2.2448	-.9518
6.4316	-2.5000	-.9872	6.5342	-2.7559	-.9544	6.6180	-2.9944	-.8568	6.6774	-3.1995	-.6998
6.7084	-3.3578	-.4949	6.7084	-3.4565	-.2565	6.6774	-3.4895	0.0000	6.6180	-3.4554	.2562
6.5342	-3.3560	.4938	6.4314	-3.1976	.6976	6.3172	-2.9924	.8537	6.2500	-2.8566	.9030
6.0868	-2.5000	.9789									
6.9605	-2.5000	.9935	6.8779	-2.2430	.9585	6.8262	-2.0043	.8590	6.8086	-1.7991	.7009
6.8262	-1.6410	.4957	6.8779	-1.5415	.2570	6.9605	-1.5065	0.0000	7.0686	-1.5392	-.2574
7.1945	-1.6372	-.4980	7.3302	-1.7945	-.7055	7.4664	-2.0002	-.8657	7.5933	-2.2419	-.9669
7.7023	-2.5000	-1.0000	7.7860	-2.7590	-.9660	7.8385	-3.0000	-.8660	7.8564	-3.2079	-.7079
7.8385	-3.3660	-.5000	7.7860	-3.4660	-.2590	7.7023	-3.5000	0.0000	7.5933	-3.4660	.2590
7.4664	-3.3657	.4998	7.3302	-3.2055	.7055	7.1945	-2.9980	.8628	7.0686	-2.7576	.9608
6.9605	-2.5000	.9935									
7.7199	-2.5000	1.0000	7.6788	-2.2410	.9660	7.6789	-2.0000	.8660	7.7200	-1.7930	.7070
7.7992	-1.6340	.5000	7.9112	-1.5340	.2590	8.0486	-1.5000	0.0000	8.2019	-1.5340	-.2590
8.3604	-1.6340	-.5000	8.5135	-1.7930	-.7070	8.6508	-2.0000	-.8660	8.7629	-2.2410	-.9660
8.8422	-2.5000	-1.0000	8.8833	-2.7590	-.9660	8.8832	-3.0000	-.8660	8.8421	-3.2070	-.7070
8.7629	-3.3660	-.5000	8.6509	-3.4660	-.2590	8.5135	-3.5000	0.0000	8.3603	-3.4660	.2590
8.2018	-3.3660	.5000	8.0487	-3.2070	.7070	7.9113	-3.0000	.8660	7.7992	-2.7590	.9660
7.7199	-2.5000	1.0000									
14.0367	-2.5000	1.0000	14.0592	-2.2410	.9660	14.1256	-2.0000	.8660	14.2310	-1.7930	.7070
14.3683	-1.6340	.5000	14.5282	-1.5340	.2590	14.7000	-1.5000	0.0000	14.8718	-1.5340	-.2590
15.0317	-1.6340	-.5000	15.1690	-1.7930	-.7070	15.2744	-2.0000	-.8660	15.3408	-2.2410	-.9660
15.3633	-2.5000	-1.0000	15.3408	-2.7590	-.9660	15.2744	-3.0000	-.8660	15.1690	-3.2070	-.7070
15.0317	-3.3660	-.5000	14.8718	-3.4660	-.2590	14.7000	-3.5000	0.0000	14.5282	-3.4660	.2590
14.3683	-3.3660	.5000	14.2310	-3.2070	.7070	14.1256	-3.0000	.8660	14.0592	-2.7590	.9660
14.0367	-2.5000	1.0000									
20.5367	-2.5000	1.0000	20.5592	-2.2410	.9660	20.6256	-2.0000	.8660	20.7310	-1.7930	.7070
20.8683	-1.6340	.5000	21.0282	-1.5340	.2590	21.2000	-1.5000	0.0000	21.3718	-1.5340	-.2590
21.5317	-1.6340	-.5000	21.6690	-1.7930	-.7070	21.7744	-2.0000	-.8660	21.8408	-2.2410	-.9660
21.8633	-2.5000	-1.0000	21.8408	-2.7590	-.9660	21.7744	-3.0000	-.8660	21.6690	-3.2070	-.7070
21.5317	-3.3660	-.5000	21.3718	-3.4660	-.2590	21.2000	-3.5000	0.0000	21.0282	-3.4660	.2590
20.8683	-3.3660	.5000	20.7310	-3.2070	.7070	20.6256	-3.0000	.8660	20.5592	-2.7590	.9660
20.5367	-2.5000	1.0000									
26.1578	-2.5000	1.0000	26.2371	-2.2410	.9660	26.3492	-2.0000	.8660	26.4865	-1.7930	.7070
26.6396	-1.6340	.5000	26.7981	-1.5340	.2590	26.9514	-1.5000	0.0000	27.0888	-1.5340	-.2590

TABLE IV.- Continued

27.2008	-1.6340	-.5000	27.2800	-1.7930	-.7070	27.3211	-2.0000	-.8660	27.3212	-2.2419	-.9659
27.2801	-2.5000	-1.0000	27.2008	-2.7590	-.9660	27.0887	-3.0000	-.8660	26.9513	-3.2070	-.7070
26.7982	-3.3660	-.5000	26.6397	-3.4660	-.2590	26.4865	-3.5000	0.0000	26.3491	-3.4660	.2590
26.2371	-3.3660	.5000	26.1579	-3.2070	.7070	26.1168	-3.0000	.8660	26.1167	-2.7590	.9660
26.1578	-2.5000	1.0000									
27.2977	-2.5000	1.0000	27.4067	-2.2410	.9660	27.5336	-2.0002	.8657	27.6698	-1.7945	.7055
27.8055	-1.6372	.4980	27.9314	-1.5392	.2576	28.0395	-1.5065	0.0000	28.1221	-1.5415	-.2570
28.1738	-1.6410	-.4957	28.1914	-1.7991	-.7009	28.1738	-2.0043	-.8590	28.1221	-2.2430	-.9585
28.0395	-2.5000	-.9935	27.9314	-2.7576	-.9608	27.8055	-2.9980	-.8628	27.6698	-3.2055	-.7055
27.5336	-3.3657	-.4998	27.4067	-3.4660	-.2590	27.2977	-3.5000	0.0000	27.2140	-3.4660	.2590
27.1615	-3.3660	.5000	27.1436	-3.2070	.7070	27.1615	-3.0000	.8660	27.2140	-2.7599	.9660
27.2977	-2.5000	1.0000									
28.5684	-2.5000	.9872	28.6827	-2.2448	.9518	28.8102	-2.0089	.8514	28.9131	-1.8083	.6917
29.0136	-1.6556	.4871	29.0948	-1.5614	.2517	[illegible]	-1.5301	0.0000	29.1816	-1.5645	-.2509
29.1816	-1.6612	-.4841	29.1519	-1.8146	-.6854	[illegible]	-2.0143	-.8417	29.0136	-2.2475	-.9415
28.9132	-2.5000	-.9789	28.8003	-2.7545	-.9492	28.6828	-2.9924	-.8537	28.5686	-3.1976	-.5976
28.4658	-3.3560	-.4938	28.3820	-3.4554	-.2562	28.3226	-3.4895	0.0000	28.2916	-3.4565	.2565
28.2916	-3.3578	.4949	28.3226	-3.1998	.6998	28.3820	-2.9944	.8568	28.4658	-2.7559	.9544
28.5684	-2.5000	.9872									
28.9802	-2.5000	.9763	29.0829	-2.2482	.9390	29.1777	-2.0159	.8390	29.2586	-1.8174	.6826
29.3205	-1.6657	.4815	29.3592	-1.5709	.2492	29.3725	-1.5384	0.0000	29.3592	-1.5709	-.2492
29.3205	-1.6657	-.4815	29.2586	-1.8174	-.6826	29.1777	-2.0159	-.8390	29.0829	-2.2482	-.9390
28.9802	-2.5000	-.9763	28.8767	-2.7538	-.9464	28.7797	-2.9915	-.8520	28.6961	-3.1965	-.5965
28.6317	-3.3542	-.4928	28.5915	-3.4529	-.2555	28.5779	-3.4862	0.0000	28.5915	-3.4529	.2555
28.6317	-3.3542	.4928	28.6961	-3.1965	.6965	28.7797	-2.9915	.8520	28.8767	-2.7538	.9464
28.9802	-2.5000	.9763									
31.5009	-2.5000	.8391	31.5663	-2.2841	.8044	31.6190	-2.0859	.7173	31.6562	-1.9160	.5840
31.6750	-1.7870	.4116	31.6750	-1.7047	.2135	31.6561	-1.6744	0.0000	31.6189	-1.7000	-.2147
31.5662	-1.7788	-.4163	31.5009	-1.9065	-.5935	31.4267	-2.0776	-.7317	31.3490	-2.2792	-.9227
31.2724	-2.5000	-.8590	31.2031	-2.7237	-.8338	31.1463	-2.9332	-.7506	31.1054	-3.1152	-.6152
31.0846	-3.2539	-.4352	31.0845	-3.3409	-.2256	31.1054	-3.3699	0.0000	31.1463	-3.3372	.2247
31.2032	-3.2475	.4315	31.2724	-3.1076	.6076	31.3489	-2.9257	.7376	31.4266	-2.7190	.9162
31.5009	-2.5000	.8391									
33.0348	-2.5000	.6921	33.0653	-2.3217	.6649	33.0844	-2.1567	.5944	33.0910	-2.0148	.4852
33.0844	-1.9056	.3433	33.0653	-1.8351	.1783	33.0348	-1.8079	0.0000	32.9945	-1.8274	-.1804
32.9469	-1.8923	-.3510	32.8950	-1.9993	-.5007	32.8423	-2.1432	-.6179	32.7924	-2.3137	-.6944
32.7488	-2.5000	-.7241	32.7150	-2.6886	-.7028	32.6936	-2.8652	-.6323	32.6861	-3.0173	-.5173
32.6936	-3.1323	-.3652	32.7150	-3.2028	-.1886	32.7488	-3.2241	0.0000	32.7924	-3.1944	.1863
32.8423	-3.1179	.3568	32.8950	-3.0007	.5007	32.9469	-2.6510	.6077	32.9945	-2.6804	.5726
33.0348	-2.5000	.6921									
33.7219	-2.5000	.6151	33.7300	-2.3414	.5932	33.7301	-2.1929	.5319	33.7220	-2.0648	.4352
33.7061	-1.9657	.3085	33.6834	-1.9018	.1600	33.6556	-1.8774	0.0000	33.6242	-1.8954	-.1617
33.5912	-1.9546	-.3149	33.5590	-2.0519	-.4481	33.5298	-2.1817	-.5513	33.5058	-2.3348	-.6174
33.4886	-2.5000	-.6413	33.4798	-2.6660	-.6202	33.4797	-2.8211	-.5562	33.4886	-2.9537	-.4537
33.5058	-3.0536	-.3197	33.5299	-3.1148	-.1645	33.5590	-3.1334	0.0000	33.5911	-3.1082	.1627
33.6241	-3.0422	.3130	33.6556	-2.9405	.4405	33.6835	-2.8097	.5364	33.7061	-2.6593	.5957
33.7219	-2.5000	.6151									
36.0004	-2.5000	.2767	36.0004	-2.4284	.2673	36.0003	-2.3616	.2402	36.0003	-2.3042	.1958
36.0002	-2.2598	.1384	36.0001	-2.2326	.0716	36.0000	-2.2232	0.0000	35.9999	-2.2326	-.0716
35.9998	-2.2598	-.1384	35.9997	-2.3042	-.1958	35.9997	-2.3616	-.2402	35.9996	-2.4284	-.2675
35.9996	-2.5000	-.2769	35.9996	-2.5716	-.2675	35.9997	-2.6384	-.2402	35.9997	-2.6958	-.1958
35.9998	-2.7402	-.1384	35.9999	-2.7674	-.0716	36.0000	-2.7768	0.0000	36.0001	-2.7674	.0716
36.0002	-2.7402	.1384	36.0003	-2.6958	.1958	36.0003	-2.6384	.2402	36.0004	-2.5716	.2673
36.0004	-2.5000	.2767									
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000	37.5000	-2.5000	0.0000
37.5000	-2.5000	0.0000									

****

TABLE IV.- Continued

```
***** COMPONENT- RIGHT CANARD          ,NUMBER-     6 *****
*************************************************************
 ISURF=   1  IMAGE=   0
 NPNT =   5  LINE =   5
 SCALE=    0.0000    PO=    2.5000    0.0000    0.0000
INPUT COORDINATES
      X         Y         Z         X         Y         Z         X         Y         Z         X         Y         Z
    3.7500    3.1120    0.0000    3.7500    3.1120    0.0000    3.7500    3.1120    0.0000    3.7500    3.1120    0.0000
    3.7500    3.1120    0.0000
    4.5000    3.2000     .0500    4.5000    3.5000     .0250    4.5000    3.8800    0.0000    4.5000    3.5000    -.0250
    4.5000    3.2000    -.0500
    5.0000    3.2260     .1000    5.0000    3.7500     .0500    5.0000    4.4000    0.0000    5.0000    3.7500    -.0500
    5.0000    3.2260    -.1000
    5.8000    3.3000     .0500    5.8000    4.1500     .0250    5.8000    5.1800    0.0000    5.8000    4.1500    -.0250
    5.8000    3.3000    -.0500
    6.2500    3.3610    0.0000    6.2500    4.4000    0.0000    6.2500    5.6100    0.0000    6.2500    4.4000    0.0000
    6.2500    3.3610    0.0000

*************************************************************
***** COMPONENT- LEFT CANARD           ,NUMBER-     7 *****
*************************************************************
 ISURF=   1  IMAGE=   0
 NPNT =   5  LINE =   5
 SCALE=    0.0000    PO=   -2.5000   -5.0000    0.0000
INPUT COORDINATES
      X         Y         Z         X         Y         Z         X         Y         Z         X         Y         Z
    3.7500    1.8880    0.0000    3.7500    1.8880    0.0000    3.7500    1.8880    0.0000    3.7500    1.8880    0.0000
    3.7500    1.8880    0.0000
    4.5000    1.8000     .0500    4.5000    1.5000     .0250    4.5000    1.1200    0.0000    4.5000    1.5000    -.0250
    4.5000    1.8000    -.0500
    5.0000    1.7740     .1000    5.0000    1.2500     .0500    5.0000     .6000    0.0000    5.0000    1.2500    -.0500
    5.0000    1.7740    -.1000
    5.8000    1.7000     .0500    5.8000     .8500     .0250    5.8000    -.1800    0.0000    5.8000     .8500    -.0250
    5.8000    1.7000    -.0500
    6.2500    1.6390    0.0000    6.2500     .6000    0.0000    6.2500    -.6100    0.0000    6.2500     .6000    0.0000
    6.2500    1.6390    0.0000

*************************************************************
***** COMPONENT- BRACE                 ,NUMBER-     8 *****
*************************************************************
 ISURF=   1  IMAGE=   0
 NPNT =   7  LINE =   4
 SCALE=    0.0000    PO=    0.0000    0.0000    0.0000
INPUT COORDINATES
      X         Y         Z         X         Y         Z         X         Y         Z         X         Y         Z
   28.7500   -1.5490    .2590   28.7500    1.5340    .2590   28.7500    1.5000   0.0000   28.7500    1.5340   -.2590
   28.7500   -1.5490   -.2590   28.7500   -1.5150   0.0000   28.7500   -1.5490    .2590
   29.1000   -1.5600    .2590   29.1000    1.5340    .2590   29.1000    1.5000   0.0000   29.1000    1.5340   -.2590
   29.1000   -1.5600   -.2590   29.1000   -1.5400   0.0000   29.1000   -1.5600    .2590
   29.5000   -1.5800    .2590   29.5000    1.5340    .2590   29.5000    1.5000   0.0000   29.5000    1.5340   -.2590
   29.5000   -1.5800   -.2590   29.5000   -1.5500   0.0000   29.5000   -1.5800    .2590
   30.0000   -1.5900    .2590   30.0000    1.5340    .2590   30.0000    1.5000   0.0000   30.0000    1.5340   -.2590
   30.0000   -1.5900   -.2590   30.0000   -1.6000   0.0000   30.0000   -1.5900    .2590
EXIT START
ENTER CASREAD
```

TABLE IV.- Continued

```
NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

                                        CASE  CHECK 1
      MACH NO.   ALPHA(DEG)    XO          ZO          NX    NTHETA   NCON   NPR
       1.4140      0.0000    0.0000      0.0000      50      16       0      8

EXIT CASREAD
ENTER SLOPE
EXIT SLOPE
ENTER XMAT
EXIT XMAT
ENTER ENDPTS
EXIT ENDPTS
ENTER ADIST
EXIT ADIST
ENTER OUT
```

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 1

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = -90.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-2.500000	0.000000	0.000000	0.000000	0.000000	0.000000
-1.600000	0.000000	0.000000	0.000000	0.000000	.093757
-.700000	0.000000	0.000000	0.000000	0.000000	.336260
.200000	0.000000	0.000000	0.000000	0.000000	.682600
1.100000	0.000000	0.000000	0.000000	0.000000	1.085950
2.000000	0.000000	0.000000	0.000000	0.000000	1.496849
2.900000	0.000000	0.000000	0.000000	.018520	1.912535
3.800000	0.000000	0.000000	0.000000	.190056	2.281599
4.700000	0.000000	0.000000	0.000000	.479747	2.600693
5.600000	0.000000	0.000000	0.000000	.855809	2.838158
6.500000	0.000000	0.000000	0.000000	1.267390	2.988640
7.400000	0.000000	0.000000	0.000000	1.683881	3.069548
8.300000	0.000000	0.000000	0.000000	2.078989	3.101241
9.200000	0.000000	0.000000	0.000000	2.436163	3.105872
10.100000	0.000000	0.000000	0.000000	2.712525	3.105872
11.000000	0.000000	0.000000	0.000000	2.915755	3.105872
11.900000	0.000000	0.000000	0.000000	3.034756	3.105872
12.800000	0.000000	0.000000	0.000000	3.088689	3.105872
13.700000	0.000000	0.000000	0.000000	3.105559	3.105872
14.600000	.001538	.001182	.005191	3.105872	3.105872
15.500000	.093612	.073852	.303271	3.105872	3.105872
16.400000	.311491	.243773	.839341	3.105872	3.105872
17.300000	.630032	.408881	1.210654	3.105872	3.105872
18.200000	1.020261	.530941	1.312198	3.105872	3.105872
19.100000	1.446887	.613391	1.316645	3.105872	3.105872
20.000000	1.860575	.654186	1.316646	3.105872	3.105872
20.900000	2.224756	.653830	1.316646	3.105872	3.105872
21.800000	2.496202	.612660	1.316646	3.105872	3.105872
22.700000	2.595915	.529083	1.316646	3.105872	3.105872
23.600000	2.330699	.406364	1.316646	3.105872	3.105872
24.500000	1.610472	.242016	1.316646	3.105872	3.105872
25.400000	.191764	.031012	1.316646	3.105872	3.105872
26.300000	0.000000	0.000000	1.316646	3.105872	3.105559
27.200000	0.000000	0.000000	1.316646	3.105872	3.089547
28.100000	0.000000	0.000000	1.316646	3.105872	3.037329
29.000000	0.000000	0.000000	1.316646	3.105872	2.894936
29.900000	0.000000	0.000000	1.316646	3.105872	2.684865
30.800000	0.000000	0.000000	1.316646	3.105872	2.401544
31.700000	0.000000	0.000000	1.316646	3.101261	2.074226
32.600000	0.000000	0.000000	1.316646	3.072032	1.694764
33.500000	0.000000	0.000000	1.316646	2.983293	1.273748
34.400000	0.000000	0.000000	1.316646	2.812869	.842768
35.300000	0.000000	0.000000	1.316646	2.565304	.463637
36.200000	0.000000	0.000000	1.316646	2.259653	.187280
37.100000	0.000000	0.000000	1.316646	1.918229	.017836
38.000000	0.000000	0.000000	1.316646	1.510468	0.000000
38.900000	0.000000	0.000000	1.316646	1.081693	0.000000
39.800000	0.000000	0.000000	1.316646	.660382	0.000000
40.700000	0.000000	0.000000	1.316646	.331229	0.000000
41.600000	0.000000	0.000000	1.316646	.090296	0.000000
42.500000	0.000000	0.000000	1.316646	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 1

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = -90.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-2.500000	0.000000	0.000000	0.000000	0.000000
-1.600000	0.000000	0.000000	0.000000	.093757
-.700000	0.000000	0.000000	0.000000	.336260
.200000	0.000000	0.000000	0.000000	.682600
1.100000	0.000000	0.000000	0.000000	1.085950
2.000000	0.000000	.017813	0.000000	1.514662
2.900000	0.000000	.058398	0.000000	1.989453
3.800000	0.000000	0.000000	0.000000	2.471565
4.700000	0.000000	0.000000	0.000000	3.080440
5.600000	0.000000	0.000000	0.000000	3.693968
6.500000	.001839	0.000000	0.000000	4.257869
7.400000	.046852	0.000000	0.000000	4.800301
8.300000	.045949	0.000000	0.000000	5.226198
9.200000	0.000000	0.000000	0.000000	5.542035
10.100000	0.000000	0.000000	0.000000	5.818397
11.000000	0.000000	0.000000	0.000000	6.021627
11.900000	0.000000	0.000000	0.000000	6.140628
12.800000	0.000000	0.000000	0.000000	6.194561
13.700000	0.000000	0.000000	0.000000	6.211431
14.600000	0.000000	0.000000	0.000000	6.219654
15.500000	0.000000	0.000000	0.000000	6.682479
16.400000	0.000000	0.000000	0.000000	7.608349
17.300000	0.000000	0.000000	0.000000	8.461312
18.200000	0.000000	0.000000	0.000000	9.073144
19.100000	0.000000	0.000000	0.000000	9.586668
20.000000	0.000000	0.000000	0.000000	10.043151
20.900000	0.000000	0.000000	0.000000	10.406976
21.800000	0.000000	0.000000	0.000000	10.637252
22.700000	0.000000	0.000000	0.000000	10.653388
23.600000	0.000000	0.000000	0.000000	10.265453
24.500000	0.000000	0.000000	0.000000	9.380878
25.400000	0.000000	0.000000	0.000000	7.751167
26.300000	0.000000	0.000000	0.000000	7.528077
27.200000	0.000000	0.000000	0.000000	7.512085
28.100000	0.000000	0.000000	0.000000	7.459847
29.000000	0.000000	0.000000	1.559047	8.876501
29.900000	0.000000	0.000000	1.113841	8.221224
30.800000	0.000000	0.000000	0.000000	6.824062
31.700000	0.000000	0.000000	0.000000	6.492134
32.600000	0.000000	0.000000	0.000000	6.083442
33.500000	0.000000	0.000000	0.000000	5.573707
34.400000	0.000000	0.000000	0.000000	4.972284
35.300000	0.000000	0.000000	0.000000	4.345584
36.200000	0.000000	0.000000	0.000000	3.763579
37.100000	0.000000	0.000000	0.000000	3.252711
38.000000	0.000000	0.000000	0.000000	2.827114
38.900000	0.000000	0.000000	0.000000	2.398339
39.800000	0.000000	0.000000	0.000000	1.977028
40.700000	0.000000	0.000000	0.000000	1.647875
41.600000	0.000000	0.000000	0.000000	1.406942
42.500000	0.000000	0.000000	0.000000	1.316646

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 1

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 90.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-2.500000	0.000000	0.000000	0.000000	0.000000	0.000000
-1.600000	0.000000	0.000000	0.000000	0.000000	.093757
-.700000	0.000000	0.000000	0.000000	0.000000	.335104
.200000	0.000000	0.000000	0.000000	0.000000	.685123
1.100000	0.000000	0.000000	0.000000	0.000000	1.081096
2.000000	0.000000	0.000000	0.000000	0.000000	1.501731
2.900000	0.000000	0.000000	0.000000	.018520	1.907551
3.800000	0.000000	0.000000	0.000000	.189751	2.284499
4.700000	0.000000	0.000000	0.000000	.477838	2.598095
5.600000	0.000000	0.000000	0.000000	.857105	2.834448
6.500000	0.000000	0.000000	0.000000	1.271625	2.988400
7.400000	0.000000	0.000000	0.000000	1.683922	3.073509
8.300000	0.000000	0.000000	0.000000	2.080012	3.100089
9.200000	0.000000	0.000000	0.000000	2.439501	3.105838
10.100000	0.000000	0.000000	0.000000	2.711742	3.105872
11.000000	0.000000	0.000000	0.000000	2.916598	3.105872
11.900000	0.000000	0.000000	0.000000	3.034408	3.105872
12.800000	0.000000	0.000000	0.000000	3 088050	3.105872
13.700000	0.000000	0.000000	0.000000	3.105291	3.105872
14.600000	.001538	.001182	.005172	3.105872	3.105872
15.500000	.093612	.073852	.305715	3.105872	3.105872
16.400000	.[illegible]491	.245773	.843054	3.105872	3.105872
17.300000	.630032	.408881	1.202976	3.105872	3.105872
18.200000	1.020261	.530941	1.310605	3.105872	3.105872
19.100000	1.446706	.613391	1.316646	3.105872	3.105872
20.000000	1.860520	.654186	1.316646	3.105872	3.105872
20.900000	2.224953	.653830	1.316646	3.105872	3.105872
21.800000	2.496393	.612660	1.316646	3.105872	3.105872
22.700000	2.596029	.529083	1.316646	3.105872	3.105872
23.600000	2.341270	.406364	1.316646	3.105872	3.105872
24.500000	1.572137	.242016	1.316646	3.105872	3.105872
25.400000	.186059	.031012	1.316646	3.105872	3.105872
26.300000	0.000000	0.000000	1.316646	3.105872	3.105291
27.200000	0.000000	0.000000	1.316646	3.105872	3.088050
28.100000	0.000000	0.000000	1.316646	3.105872	3.039135
29.000000	0.000000	0.000000	1.316646	3.105872	2.892704
29.900000	0.000000	0.000000	1.316646	3.105872	2.678517
30.800000	0.000000	0.000000	1.316646	3.105838	2.406286
31.700000	0.000000	0.000000	1.316646	3.100089	2.078775
32.600000	0.000000	0.000000	1.316646	3.074114	1.695085
33.500000	0.000000	0.000000	1.316646	2.983488	1.284143
34.400000	0.000000	0.000000	1.316646	2.805129	.837185
35.300000	0.000000	0.000000	1.316646	2.559409	.461139
36.200000	0.000000	0.000000	1.316646	2.266221	.187180
37.100000	0.000000	0.000000	1.316646	1.917897	.017834
38.000000	0.000000	0.000000	1.316646	1.516856	0.000000
38.900000	0.000000	0.000000	1.316646	1.085942	0.000000
39.800000	0.000000	0.000000	1.316646	.656312	0.000000
40.700000	0.000000	0.000000	1.316646	.329735	0.000000
41.600000	0.000000	0.000000	1.316646	.090287	0.000000
42.500000	0.000000	0.000000	1.316646	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 1

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 90.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-2.500000	0.000000	0.000000	0.000000	0.000000
-1.600000	0.000000	0.000000	0.000000	.093757
-.700000	0.000000	0.000000	0.000000	.335104
.200000	0.000000	0.000000	0.000000	.685123
1.100000	0.000000	0.000000	0.000000	1.081096
2.000000	0.000000	.017813	0.000000	1.519544
2.900000	0.000000	.056095	0.000000	1.982166
3.800000	0.000000	0.000000	0.000000	2.474750
4.700000	0.000000	0.000000	0.000000	3.075033
5.600000	0.000000	0.000000	0.000000	3.691554
6.500000	.001839	0.000000	0.000000	4.261864
7.400000	.046852	0.000000	0.000000	4.804234
8.300000	.045949	0.000000	0.000000	5.226049
9.200000	0.000000	0.000000	0.000000	5.545338
10.100000	0.000000	0.000000	0.000000	5.817614
11.000000	0.000000	0.000000	0.000000	6.022430
11.900000	0.000000	0.000000	0.000000	6.140280
12.800000	0.000000	0.000000	0.000000	6.193922
13.700000	0.000000	0.000000	0.000000	6.211163
14.600000	0.000000	0.000000	0.000000	6.219635
15.500000	0.000000	0.000000	0.000000	6.684922
16.400000	0.000000	0.000000	0.000000	7.612062
17.300000	0.000000	0.000000	0.000000	8.453634
18.200000	0.000000	0.000000	0.000000	9.073551
19.100000	0.000000	0.000000	0.000000	9.568488
20.000000	0.000000	0.000000	0.000000	10.043095
20.900000	0.000000	0.000000	0.000000	10.407173
21.800000	0.000000	0.000000	0.000000	10.637443
22.700000	0.000000	0.000000	0.000000	10.653501
23.600000	0.000000	0.000000	0.000000	10.276024
24.500000	0.000000	0.000000	0.000000	9.342543
25.400000	0.000000	0.000000	0.000000	7.745462
26.300000	0.000000	0.000000	0.000000	7.527809
27.200000	0.000000	0.000000	0.000000	7.510568
28.100000	0.000000	0.000000	0.000000	7.461653
29.000000	0.000000	0.000000	1.559047	8.974270
29.900000	0.000000	0.000000	1.113841	8.214875
30.800000	0.000000	0.000000	0.000000	6.828770
31.700000	0.000000	0.000000	0.000000	6.495510
32.600000	0.000000	0.000000	0.000000	6.085845
33.500000	0.000000	0.000000	0.000000	5.584277
34.400000	0.000000	0.000000	0.000000	4.958961
35.300000	0.000000	0.000000	0.000000	4.337194
36.200000	0.000000	0.000000	0.000000	3.770046
37.100000	0.000000	0.000000	0.000000	3.252378
38.000000	0.000000	0.000000	0.000000	2.833402
38.900000	0.000000	0.000000	0.000000	2.402588
39.800000	0.000000	0.000000	0.000000	1.972958
40.700000	0.000000	0.000000	0.000000	1.646381
41.600000	0.000000	0.000000	0.000000	1.406933
42.500000	0.000000	0.000000	0.000000	1.316646

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 1

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	.	0	8

S(X) FOR EACH COMPONENT AT THE . . = 270.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-2.500000	0.000000	0.000000	0.000000	0.000000	0.000000
-1.600000	0.000000	0.000000	0.000000	0.000000	.093757
-.700000	0.000000	0.000000	0.000000	0.000000	.336260
.200000	0.000000	0.000000	0.000000	0.000000	.682600
1.100000	0.000000	0.000000	0.000000	0.000000	1.085950
2.000000	0.000000	0.000000	0.000000	0.000000	1.496849
2.900000	0.000000	0.000000	0.000000	.018520	1.912535
3.800000	0.000000	0.000000	0.000000	.190056	2.281509
4.700000	0.000000	0.000000	0.000000	.479747	2.600693
5.600000	0.000000	0.000000	0.000000	.855809	2.836158
6.500000	0.000000	0.000000	0.000000	1.267390	2.988640
7.400000	0.000000	0.000000	0.000000	1.683881	3.069548
8.300000	0.000000	0.000000	0.000000	2.078989	3.101261
9.200000	0.000000	0.000000	0.000000	2.436163	3.105872
10.100000	0.000000	0.000000	0.000000	2.712525	3.105872
11.000000	0.000000	0.000000	0.000000	2.915755	3.105872
11.900000	0.000000	0.000000	0.000000	3.034756	3.105872
12.800000	0.000000	0.000000	0.000000	3.088689	3.105872
13.700000	0.000000	0.000000	0.000000	3.105559	3.105872
14.600000	.001538	.001182	.005191	3.105872	3.105872
15.500000	.093612	.073952	.303271	3.105872	3.105872
16.400000	.311491	.245773	.839341	3.105872	3.105872
17.300000	.630032	.408881	1.210654	3.105872	3.105872
18.200000	1.020261	.530941	1.312198	3.105872	3.105872
19.100000	1.446887	.613391	1.316646	3.105872	3.105872
20.000000	1.860575	.654186	1.316646	3.105872	3.105872
20.900000	2.224756	.653830	1.316646	3.105872	3.105872
21.800000	2.496202	.612660	1.316646	3.105872	3.105872
22.700000	2.595915	.529083	1.316646	3.105872	3.105872
23.600000	2.330699	.406364	1.316646	3.105872	3.105872
24.500000	1.610472	.242016	1.316646	3.105872	3.105872
25.400000	.191754	.031012	1.316646	3.105872	3.105872
26.300000	0.000000	0.000000	1.316646	3.105872	3.105549
27.200000	0.000000	0.000000	1.316646	3.105872	3.089567
28.100000	0.000000	0.000000	1.316646	3.105872	3.037329
29.000000	0.000000	0.000000	1.316646	3.105872	2.894936
29.900000	0.000000	0.000000	1.316646	3.105872	2.684865
30.800000	0.000000	0.000000	1.316646	3.105872	2.401544
31.700000	0.000000	0.000000	1.316646	3.101261	2.074226
32.600000	0.000000	0.000000	1.316646	3.072032	1.694754
33.500000	0.000000	0.000000	1.316646	2.983293	1.273768
34.400000	0.000000	0.000000	1.316646	2.812869	.842768
35.300000	0.000000	0.000000	1.316646	2.565301	.463637
36.200000	0.000000	0.000000	1.316646	2.259653	.187280
37.100000	0.000000	0.000000	1.316646	1.918229	.017836
38.000000	0.000000	0.000000	1.316646	1.510463	0.000000
38.900000	0.000000	0.000000	1.316646	1.081693	0.000000
39.800000	0.000000	0.000000	1.316646	.660382	0.000000
40.700000	0.000000	0.000000	1.316646	.331229	0.000000
41.600000	0.000000	0.000000	1.316646	.090296	0.000000
42.500000	0.000000	0.000000	1.316646	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 1

MACH NO.	ALPHA(DEG)	XC	ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 270.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-2.500000	0.000000	0.000000	0.000000	0.000000
-1.600000	0.000000	0.000000	0.000000	.093757
-.700000	0.000000	0.000000	0.000000	.336260
.200000	0.000000	0.000000	0.000000	.682600
1.100000	0.000000	0.000000	0.000000	1.085750
2.000000	0.000000	.017813	0.000000	1.514662
2.900000	0.000000	.058398	0.000000	1.989453
3.800000	0.000000	0.000000	0.000000	2.471565
4.700000	0.000000	0.000000	0.000000	3.080440
5.600000	0.000000	0.000000	0.000000	3.693968
6.500000	.001839	0.000000	0.000000	4.257869
7.400000	.046852	0.000000	0.000000	4.800301
8.300000	.045949	0.000000	0.000000	5.226198
9.200000	0.000000	0.000000	0.000000	5.542035
10.100000	0.000000	0.000000	0.000000	5.818397
11.000000	0.000000	0.000000	0.000000	6.021627
11.900000	0.000000	0.000000	0.000000	6.140628
12.800000	0.000000	0.000000	0.000000	6.194561
13.700000	0.000000	0.000000	0.000000	6.211431
14.600000	0.000000	0.000000	0.000000	6.219654
15.500000	0.000000	0.000000	0.000000	6.682479
16.400000	0.000000	0.000000	0.000000	7.608349
17.300000	0.000000	0.000000	0.000000	8.461312
18.200000	0.000000	0.000000	0.000000	9.075144
19.100000	0.000000	0.000000	0.000000	9.588668
20.000000	0.000000	0.000000	0.000000	10.043151
20.900000	0.000000	0.000000	0.000000	10.406976
21.800000	0.000000	0.000000	0.000000	10.637252
22.700000	0.000000	0.000000	0.000000	10.653388
23.600000	0.000000	0.000000	0.000000	10.265453
24.500000	0.000000	0.000000	0.000000	9.380878
25.400000	0.000000	0.000000	0.000000	7.751167
26.300000	0.000000	0.000000	0.000000	7.528077
27.200000	0.000000	0.000000	0.000000	7.512085
28.100000	0.000000	0.000000	0.000000	7.459847
29.000000	0.000000	0.000000	1.559047	8.876501
29.900000	0.000000	0.000000	1.113841	8.221224
30.800000	0.000000	0.000000	0.000000	6.824062
31.700000	0.000000	0.000000	0.000000	6.492134
32.600000	0.000000	0.000000	0.000000	6.083442
33.500000	0.000000	0.000000	0.000000	5.573707
34.400000	0.000000	0.000000	0.000000	4.972284
35.300000	0.000000	0.000000	0.000000	4.345584
36.200000	0.000000	0.000000	0.000000	3.763579
37.100000	0.000000	0.000000	0.000000	3.252711
38.000000	0.000000	0.000000	0.000000	2.827114
38.900000	0.000000	0.000000	0.000000	2.398339
39.800000	0.000000	0.000000	0.000000	1.977028
40.700000	0.000000	0.000000	0.000000	1.647875
41.600000	0.000000	0.000000	0.000000	1.406942
42.500000	0.000000	0.000000	0.000000	1.316646

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

MACH NO.	ALPHA(DEG)	CASE XO	CHECK 1 ZO	NX	NTHETA	NCON	NPR
1.4140	0.0000	0.0000	0.0000	50	16	0	8

D/Q ASSOCIATED WITH VARIOUS VALUES OF THETA

N	THETA	D/Q
0	-90.000	8.01409
1	-67.500	4.46527
2	-45.000	2.60781
3	-22.500	1.80310
4	0.000	1.82456
5	22.500	1.81127
6	45.000	2.61164
7	67.500	4.52150
8	90.000	7.89783
9	112.500	4.38069
10	135.000	2.08889
11	157.500	1.15584
12	180.000	1.15471
13	202.500	1.15050
14	225.000	2.07327
15	247.500	4.39572
16	270.000	8.01409

D/Q = 3.15263 = .31526293E+01

CDW = .01425 = .14251104E-01

EXIT OUT

SUCCESS STOP REACHED.

ENTER CASREAD

TABLE IV.- Continued

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NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

                                    CASE  CHECK 2
     MACH NO.   ALPHA(DEG)          XO        ZO        NX    NTHETA   NCON    NPR
      1.4140      2.0000        0.0000    0.0000      50      16       0       8

EXIT CASREAD
ENTER SLOPE
```

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCUM	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

****** FUSELAGE ****** BODY SLOPE ERROR ******

X1	Y1	Z1	PHI1	X2	Y2	Z2	PHI2	THETA
14.46119	0.00000	-.50500	0.00000	15.24294	.05000	-.31086	170.86258	-90.000
14.46119	0.00000	-.50500	0.00000	15.23872	.09780	-.32842	163.41721	-90.000
14.46119	0.00000	-.50500	0.00000	15.23872	.09780	-.32842	163.41721	-67.500
14.46119	0.00000	-.50500	0.00000	15.23203	.13960	-.35661	158.62131	-90.000
14.46119	0.00000	-.50500	0.00000	15.23203	.13960	-.35661	158.62131	-67.500
14.46119	0.00000	-.50500	0.00000	15.22335	.17360	-.39323	156.17972	-90.000
14.46119	0.00000	-.50500	0.00000	15.22335	.17360	-.39323	156.17972	-67.500
14.46119	0.00000	-.50500	0.00000	15.21315	.19800	-.43610	155.58064	-90.000
14.46119	0.00000	-.50500	0.00000	15.21315	.19800	-.43610	155.58064	-67.500
14.46119	0.00000	-.50500	0.00000	15.21315	.19800	-.43610	155.58064	-45.000
14.46119	0.00000	-.50500	0.00000	15.20200	.21160	-.48304	156.34360	-90.000
14.46119	0.00000	-.50500	0.00000	15.20200	.21160	-.48304	156.34360	-67.500
14.46119	0.00000	-.50500	0.00000	15.20200	.21160	-.48304	156.34360	-45.000
14.46119	0.00000	-.50500	0.00000	15.19074	.21430	-.53047	158.00230	-90.000
14.46119	0.00000	-.50500	0.00000	15.19074	.21430	-.53047	158.00230	-67.500
14.46119	0.00000	-.50500	0.00000	15.19074	.21430	-.53047	158.00230	-45.000
14.46119	0.00000	-.50500	0.00000	15.17972	.20640	-.57672	160.30830	-90.000
14.46119	0.00000	-.50500	0.00000	15.17972	.20640	-.57672	160.30830	-67.500
14.46119	0.00000	-.50500	0.00000	15.17972	.20640	-.57672	160.30830	-45.000
14.46119	0.00000	-.50500	0.00000	15.16939	.18850	-.62028	163.09629	-90.000
14.46119	0.00000	-.50500	0.00000	15.16939	.18850	-.62028	163.09629	-67.500
14.46119	0.00000	-.50500	0.00000	15.16939	.18850	-.62028	163.09629	-45.000
14.46119	0.00000	-.50500	0.00000	15.16036	.16160	-.65829	166.20751	-90.000
14.46119	0.00000	-.50500	0.00000	15.16036	.16160	-.65829	166.20751	-67.500
14.46119	0.00000	-.50500	0.00000	15.16036	.16160	-.65829	166.20751	-45.000
14.46119	0.00000	-.50500	0.00000	15.15297	.12770	-.68945	169.50660	-90.000
14.46119	0.00000	-.50500	0.00000	15.15297	.12770	-.68945	169.50660	-67.500
14.46119	0.00000	-.50500	0.00000	15.15297	.12770	-.68945	169.50660	-45.000
14.46119	0.00000	-.50500	0.00000	15.14745	.08820	-.71277	172.94596	-90.000
14.46119	0.00000	-.50500	0.00000	15.14745	.08820	-.71277	172.94596	-67.500
14.46119	0.00000	-.50500	0.00000	15.14745	.08820	-.71277	172.94596	-45.000
14.46119	0.00000	-.50500	0.00000	15.14405	.04470	-.72696	176.48139	-90.000
14.46119	0.00000	-.50500	0.00000	15.14405	.04470	-.72696	176.48139	-67.500
14.46119	0.00000	-.50500	0.00000	15.14405	.04470	-.72696	176.48139	-45.000

EXIT SLOPE
ENTER ENDPTS
EXIT ENDPTS
ENTER ADIST
EXIT ADIST
ENTER OUT

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	MX	NTHETA	NCON	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = -90.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-2.411255	0.000000	0.000000	0.000000	0.000000	0.000000
-1.543203	0.000000	0.000000	0.000000	0.000000	.098004
-.675151	0.000000	0.000000	0.000000	0.000000	.350645
.192900	0.000000	0.000000	0.000000	0.000000	.710119
1.060952	0.000000	0.000000	0.000000	0.000000	1.129511
1.929004	0.000000	0.000000	0.000000	0.000000	1.554026
2.797055	0.000000	0.000000	0.000000	.019359	1.984788
3.665107	0.000000	0.000000	0.000000	.198070	2.365444
4.533159	0.000000	0.000000	0.000000	.500281	2.694035
5.401210	0.000000	0.000000	0.000000	.890054	2.938528
6.269262	0.000000	0.000000	0.000000	1.316338	3.095774
7.137314	0.000000	0.000000	0.000000	1.748242	3.180186
8.005366	0.000000	0.000000	0.000000	2.156026	3.214423
8.873417	0.000000	0.000000	0.000000	2.523439	3.220182
9.741469	0.000000	0.000000	0.000000	2.810726	3.220182
10.609521	0.000000	0.000000	0.000000	3.019320	3.220182
11.477572	0.000000	0.000000	0.000000	3.142883	3.220182
12.345624	0.000000	0.000000	0.000000	3.200287	3.220182
13.213676	0.000000	0.000000	0.000000	3.219386	3.220182
14.081727	.001595	.001226	.005498	3.220182	3.220182
14.949779	.097093	.076502	.318796	3.220182	3.220182
15.817831	.323033	.254890	.872665	3.220182	3.220182
16.685882	.653325	.423987	1.249438	3.220182	3.220182
17.553934	1.057922	.550493	1.360116	3.220182	3.220182
18.421986	1.500166	.635890	1.365105	3.220182	3.220182
19.290037	1.928958	.676170	1.365105	3.220182	3.220182
20.158089	2.306445	.677814	1.365105	3.220182	3.220182
21.026141	2.587803	.635105	1.365105	3.220182	3.220182
21.894192	2.691338	.548518	1.365105	3.220182	3.220182
22.762244	2.416389	.421368	1.365105	3.220182	3.220182
23.630296	1.671768	.251024	1.365105	3.220182	3.220182
24.498348	.199166	.032171	1.346300	3.220182	3.220182
25.366399	0.000000	0.000000	1.315844	3.220182	3.219396
26.234451	0.000000	0.000000	1.315844	3.220182	3.201471
27.102503	0.000000	0.000000	1.315844	3.220182	3.144645
27.970554	0.000000	0.000000	1.315844	3.220182	2.997028
28.838606	0.000000	0.000000	1.315844	3.220182	2.784017
29.706658	0.000000	0.000000	1.315844	3.220182	2.489062
30.574709	0.000000	0.000000	1.315844	3.214423	2.150039
31.442761	0.000000	0.000000	1.315844	3.183018	1.759833
32.310813	0.000000	0.000000	1.315844	3.088722	1.322223
33.178864	0.000000	0.000000	1.315844	2.912720	.878304
34.046916	0.000000	0.000000	1.315844	2.661616	.483164
34.914968	0.000000	0.000000	1.315844	2.341531	.195212
35.783019	0.000000	0.000000	1.315844	1.988734	.018639
36.651071	0.000000	0.000000	1.315844	1.567720	0.000000
37.519123	0.000000	0.000000	1.315844	1.124204	0.000000
38.387174	0.000000	0.000000	1.315844	.688216	0.000000
39.255226	0.000000	0.000000	1.315844	.345168	0.000000
40.123278	0.000000	0.000000	1.315844	.094359	0.000000
40.991329	0.000000	0.000000	1.315844	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = -90.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-2.411255	0.000000	0.000000	0.000000	0.000000
-1.543203	0.000000	0.000000	0.000000	.098004
-.675151	0.000000	0.000000	0.000000	.350645
.192900	0.000000	0.000000	0.000000	.710119
1.060952	0.000000	0.000000	0.000000	1.129511
1.929004	0.000000	.018539	0.000000	1.572565
2.797055	0.000000	.060632	0.000000	2.064779
3.665107	0.000000	0.000000	0.000000	2.563514
4.533159	0.000000	0.000000	0.000000	3.194316
5.401210	0.000000	0.000000	0.000000	3.828562
6.269262	.001903	0.000000	0.000000	4.414015
7.137314	.089211	0.000000	0.000000	5.017638
8.005366	.047565	0.000000	0.000000	5.418015
8.873417	0.000000	0.000000	0.000000	5.743622
9.741469	0.000000	0.000000	0.000000	6.030911
10.609521	0.000000	0.000000	0.000000	6.239503
11.477572	0.000000	0.000000	0.000000	6.363065
12.345624	0.000000	0.000000	0.000000	6.420469
13.213676	0.000000	0.000000	0.000000	6.439569
14.081727	0.000000	0.000000	0.000000	6.448683
14.949779	0.000000	0.000000	0.000000	6.932856
15.817831	0.000000	0.000000	0.000000	7.890953
16.685882	0.000000	0.000000	0.000000	8.767115
17.553934	0.000000	0.000000	0.000000	9.408895
18.421986	0.000000	0.000000	0.000000	9.941525
19.290037	0.000000	0.000000	0.000000	10.412598
20.158089	0.000000	0.000000	0.000000	10.789729
21.026141	0.000000	0.000000	0.000000	11.028373
21.894192	0.000000	0.000000	0.000000	11.045326
22.762244	0.000000	0.000000	0.000000	10.643227
23.630296	0.000000	0.000000	0.000000	9.728261
24.498348	0.000000	0.000000	0.000000	8.018001
25.366399	0.000000	0.000000	0.000000	7.755413
26.234451	0.000000	0.000000	0.000000	7.737497
27.102503	0.000000	0.000000	0.000000	7.680671
27.970554	0.000000	0.000000	1.562540	9.0[illegible]5594
28.838606	0.000000	0.000000	1.133060	8.453099
29.706658	0.000000	0.000000	0.000000	7.025089
30.574709	0.000000	0.000000	0.000000	6.680306
31.442761	0.000000	0.000000	0.000000	6.258696
32.310813	0.000000	0.000000	0.000000	5.726789
33.178864	0.000000	0.000000	0.000000	5.106868
34.046916	0.000000	0.000000	0.000000	4.460624
34.914968	0.000000	0.000000	0.000000	3.852586
35.783019	0.000000	0.000000	0.000000	3.323217
36.651071	0.000000	0.000000	0.000000	2.883564
37.519123	0.000000	0.000000	0.000000	2.440048
38.387174	0.000000	0.000000	0.000000	2.004060
39.255226	0.000000	0.000000	0.000000	1.661012
40.123278	0.000000	0.000000	0.000000	1.410203
40.991329	0.000000	0.000000	0.000000	1.315844

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCOM	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 90.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-2.585699	0.000000	0.000000	0.000000	0.000000	0.000000
-1.654848	0.000000	0.000000	0.000000	0.000000	.090012
-.723996	0.000000	0.000000	0.000000	0.000000	.322467
.206856	0.000000	0.000000	0.000000	0.000000	.660614
1.137708	0.000000	0.000000	0.000000	0.000000	1.042157
2.068560	0.000000	0.000000	0.000000	0.000000	1.450856
2.999411	0.000000	0.000000	0.000000	.017780	1.841453
3.930263	0.000000	0.000000	0.000000	.182686	2.209951
4.861115	0.000000	0.000000	0.000000	.459827	2.513237
5.791967	0.000000	0.000000	0.000000	.826748	2.743591
6.722819	0.000000	0.000000	0.000000	1.227463	2.891949
7.653670	0.000000	0.000000	0.000000	1.626076	2.973729
8.584522	0.000000	0.000000	0.000000	2.010919	2.998329
9.515374	0.000000	0.000000	0.000000	2.360169	3.002913
10.446226	0.000000	0.000000	0.000000	2.623641	3.002932
11.377078	0.000000	0.000000	0.000000	2.821883	3.002932
12.307929	0.000000	0.000000	0.000000	2.936985	3.002932
13.238781	0.000000	0.000000	0.000000	2.986959	3.002932
14.169633	0.000000	0.000000	0.000000	3.002561	3.002932
15.100485	.001486	.001142	.004911	3.002932	3.002932
16.031337	.090480	.071379	.291673	3.002932	3.002932
16.962188	.301104	.237569	.812814	3.002932	3.002932
17.893040	.609065	.395283	1.167732	3.002932	3.002932
18.823892	.986353	.513333	1.267929	3.002932	3.002932
19.754744	1.398747	.593124	1.273008	3.002932	3.002932
20.685596	1.798935	.632578	1.273008	3.002932	3.002932
21.616447	2.151353	.632223	1.273008	3.002932	3.002932
22.547299	2.413865	.592443	1.273008	3.002932	3.002932
23.478151	2.510075	.511583	1.273008	3.002932	3.002932
24.409003	2.263085	.392861	1.273008	3.002932	3.002932
25.339855	1.520945	.233912	1.273008	3.002932	3.002932
26.270706	.179982	.029971	1.288600	3.002932	3.002932
27.201558	0.000000	0.000000	1.315844	3.002932	3.002561
28.132410	0.000000	0.000000	1.315844	3.002932	2.986959
29.063262	0.000000	0.000000	1.315844	3.002932	2.942329
29.994114	0.000000	0.000000	1.315844	3.002932	2.800599
30.924966	0.000000	0.000000	1.315844	3.002932	2.589856
31.855817	0.000000	0.000000	1.315844	3.002913	2.327495
32.786669	0.000000	0.000000	1.315844	2.998323	2.010733
33.717521	0.000000	0.000000	1.315844	2.973865	1.637022
34.648373	0.000000	0.000000	1.315844	2.886838	1.239645
35.579225	0.000000	0.000000	1.315844	2.714761	.806199
36.510076	0.000000	0.000000	1.315844	2.473424	.444053
37.440928	0.000000	0.000000	1.315844	2.192682	.180117
38.371780	0.000000	0.000000	1.315844	1.852837	.017127
39.302632	0.000000	0.000000	1.315844	1.464891	0.000000
40.233484	0.000000	0.000000	1.315844	1.047774	0.000000
41.164335	0.000000	0.000000	1.315844	.632011	0.000000
42.095187	0.000000	0.000000	1.315844	.317508	0.000000
43.026039	0.000000	0.000000	1.315844	.086703	0.000000
43.956891	0.000000	0.000000	1.315844	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 90.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-2.585699	0.000000	0.000000	0.000000	0.000000
-1.654848	0.000000	0.000000	0.000000	.090012
-.723996	0.000000	0.000000	0.000000	.322467
.206856	0.000000	0.000000	0.000000	.660614
1.137708	0.000000	0.000000	0.000000	1.042157
2.068560	0.000000	.017163	0.000000	1.468019
2.999411	0.000000	.054314	0.000000	1.913547
3.930263	0.000000	0.000000	0.000000	2.392637
4.861115	0.000000	0.000000	0.000000	2.973064
5.791967	0.000000	0.000000	0.000000	3.570339
6.722819	.001781	0.000000	0.000000	4.121193
7.653670	.045383	0.000000	0.000000	4.645188
8.584522	.044491	0.000000	0.000000	5.053733
9.515374	0.000000	0.000000	0.000000	5.363082
10.446226	0.000000	0.000000	0.000000	5.626774
11.377078	0.000000	0.000000	0.000000	5.824815
12.307929	0.000000	0.000000	0.000000	5.939917
13.238781	0.000000	0.000000	0.000000	5.989891
14.169633	0.000000	0.000000	0.000000	6.005493
15.100485	0.000000	0.000000	0.000000	6.013403
16.031337	0.000000	0.000000	0.000000	6.459396
16.962188	0.000000	0.000000	0.000000	7.357351
17.893040	0.000000	0.000000	0.000000	8.177945
18.823892	0.000000	0.000000	0.000000	8.773480
19.754744	0.000000	0.000000	0.000000	9.270743
20.685596	0.000000	0.000000	0.000000	9.710385
21.616447	0.000000	0.000000	0.000000	10.062448
22.547299	0.000000	0.000000	0.000000	10.285181
23.478151	0.000000	0.000000	0.000000	10.300530
24.409003	0.000000	0.000000	0.000000	9.934818
25.339855	0.000000	0.000000	0.000000	9.033730
26.270706	0.000000	0.000000	0.000000	7.504417
27.201558	0.000000	0.000000	0.000000	7.321337
28.132410	0.000000	0.000000	0.000000	7.305735
29.063262	0.000000	0.000000	0.000000	7.261105
29.994114	0.000000	0.000000	1.533961	8.653336
30.924966	0.000000	0.000000	1.098697	8.0 7330
31.855817	0.000000	0.000000	0.000000	6.646252
32.786669	0.000000	0.000000	0.000000	6.324900
33.717521	0.000000	0.000000	0.000000	5.926731
34.648373	0.000000	0.000000	0.000000	5.444327
35.579225	0.000000	0.000000	0.000000	4.836805
36.510076	0.000000	0.000000	0.000000	4.233320
37.440928	0.000000	0.000000	0.000000	3.688642
38.371780	0.000000	0.000000	0.000000	3.185807
39.302632	0.000000	0.000000	0.000000	2.780735
40.233484	0.000000	0.000000	0.000000	2.363618
41.164335	0.000000	0.000000	0.000000	1.947855
42.095187	0.000000	0.000000	0.000000	1.633352
43.026039	0.000000	0.000000	0.000000	1.402547
43.956891	0.000000	0.000000	0.000000	1.315844

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

MACH NO.	ALPHA(DEG)	CASE	CHECK 2					
		XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 270.000

X	WING 1	WING 2	FUSELAGE SCAP = 0.000000	POD 1 SCAP = 0.000000	POD 2 SCAP = 0.000000
-2.411255	0.000000	0.000000	0.000000	0.000000	0.000000
-1.543203	0.000000	0.000000	0.000000	0.000000	0.000000
-.675151	0.000000	0.000000	0.000000	0.000000	.098004
.192900	0.000000	0.000000	0.000000	0.000000	.350645
1.060952	0.000000	0.000000	0.000000	0.000000	.710119
1.929004	0.000000	0.000000	0.000000	0.000000	1.129511
2.797055	0.000000	0.000000	0.000000	0.000000	1.554026
3.665107	0.000000	0.000000	0.000000	.019359	1.984798
4.533159	0.000000	0.000000	0.000000	.198070	2.365444
5.401210	0.000000	0.000000	0.000000	.500281	2.694035
6.269262	0.000000	0.000000	0.000000	.890054	2.938598
7.137314	0.000000	0.000000	0.000000	1.316338	3.095774
8.005366	0.000000	0.000000	0.000000	1.748242	3.180186
8.873417	0.000000	0.000000	0.000000	2.156026	3.214423
9.741469	0.000000	0.000000	0.000000	2.523439	3.220182
10.609521	0.000000	0.000000	0.000000	2.810728	3.220182
11.477572	0.000000	0.000000	0.000000	3.019320	3.220182
12.345624	0.000000	0.000000	0.000000	3.142883	3.220182
13.213676	0.000000	0.000000	0.000000	3.200287	3.220182
14.081727	0.000000	0.000000	0.000000	3.219386	3.220182
14.949779	.001595	0.000000	.005498	3.220182	3.220182
15.817831	.097093	.001226	.318796	3.220182	3.220182
16.685882	.323033	.076602	.872665	3.220182	3.220182
17.553934	.653325	.254890	1.249438	3.220182	3.220182
18.421986	1.057922	.423987	1.360116	3.220182	3.220182
19.290037	1.500166	.550493	1.365105	3.220182	3.220182
20.158089	1.928958	.635890	1.365105	3.220182	3.220182
21.026141	2.306445	.676170	1.365105	3.220182	3.220182
21.894192	2.587803	.677814	1.365105	3.220182	3.220182
22.762244	2.691338	.635105	1.365105	3.220182	3.220182
23.630296	2.416389	.548518	1.365105	3.220182	3.220182
24.498348	1.671768	.421368	1.365105	3.220182	3.220182
25.366399	.199166	.251024	1.365105	3.220182	3.220182
26.234451	0.000000	.032171	1.346300	3.220182	3.220182
27.102503	0.000000	0.000000	1.315844	3.220182	3.220182
27.970554	0.000000	0.000000	1.315844	3.220182	3.220182
28.838606	0.000000	0.000000	1.315844	3.220182	3.220182
29.706658	0.000000	0.000000	1.315844	3.220182	3.220182
30.574709	0.000000	0.000000	1.315844	3.220182	3.220182
31.442761	0.000000	0.000000	1.315844	3.220182	3.220182
32.310813	0.000000	0.000000	1.315844	3.220182	3.220182
33.178864	0.000000	0.000000	1.315844	3.214423	3.220182
34.046916	0.000000	0.000000	1.315844	3.183018	3.220182
34.914968	0.000000	0.000000	1.315844	3.083722	3.220182
35.783019	0.000000	0.000000	1.315844	2.912720	3.220182
36.651071	0.000000	0.000000	1.315844	2.661616	3.220182
37.519123	0.000000	0.000000	1.315844	2.341531	3.220182
38.387174	0.000000	0.000000	1.315844	1.968734	3.219386
39.255226	0.000000	0.000000	1.315844	1.567720	3.201471
40.123278	0.000000	0.000000	1.315844	1.124204	3.144645
40.991329	0.000000	0.000000	1.315844	.688216	2.997028
				.345168	2.784012
				.094359	2.489042
				0.000000	2.150030
					1.759833
					1.322273
					.878304
					.483164
					.195212
					.018639
					0.000000
					0.000000
					0.000000
					0.000000
					0.000000
					0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 270.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-2.411255	0.000000	0.000000	0.000000	0.000000
-1.543203	0.000000	0.000000	0.000000	.098004
-.675151	0.000000	0.000000	0.000000	.350645
.192900	0.000000	0.000000	0.000000	.710119
1.060952	0.000000	0.000000	0.000000	1.129511
1.929004	0.000000	.018539	0.000000	1.572565
2.797055	0.000000	.060632	0.000000	2.064779
3.665107	0.000000	0.000000	0.000000	2.563514
4.533159	0.000000	0.000000	0.000000	3.194316
5.401210	0.000000	0.000000	0.000000	3.828582
6.269262	.001903	0.000000	0.000000	4.414015
7.137314	.089211	0.000000	0.000000	5.017638
8.005366	.047565	0.000000	0.000000	5.418015
8.873417	0.000000	0.000000	0.000000	5.743622
9.741469	0.000000	0.000000	0.000000	6.030911
10.609521	0.000000	0.000000	0.000000	6.239503
11.477572	0.000000	0.000000	0.000000	6.363065
12.345624	0.000000	0.000000	0.000000	6.420469
13.213676	0.000000	0.000000	0.000000	6.439569
14.081727	0.000000	0.000000	0.000000	6.448683
14.949779	0.000000	0.000000	0.000000	6.932856
15.817831	0.000000	0.000000	0.000000	7.890953
16.685882	0.000000	0.000000	0.000000	8.767115
17.553934	0.000000	0.000000	0.000000	9.408895
18.421986	0.000000	0.000000	0.000000	9.941525
19.290037	0.000000	0.000000	0.000000	10.412598
20.158089	0.000000	0.000000	0.000000	10.789729
21.026141	0.000000	0.000000	0.000000	11.028378
21.894192	0.000000	0.000000	0.000000	11.049326
22.762244	0.000000	0.000000	0.000000	10.643227
23.630296	0.000000	0.000000	0.000000	9.726261
24.498348	0.000000	0.000000	0.000000	8.018001
25.366399	0.000000	0.000000	0.000000	7.755413
26.234451	0.000000	0.000000	0.000000	7.737497
27.102503	0.000000	0.000000	0.000000	7.680671
27.970554	0.000000	0.000000	1.562540	9.095594
28.838606	0.000000	0.000000	1.133060	8.453099
29.706658	0.000000	0.000000	0.000000	7.025089
30.574709	0.000000	0.000000	0.000000	6.680306
31.442761	0.000000	0.000000	0.000000	6.258696
32.310813	0.000000	0.000000	0.000000	5.726789
33.178864	0.000000	0.000000	0.000000	5.106868
34.046916	0.000000	0.000000	0.000000	4.460624
34.914968	0.000000	0.000000	0.000000	3.852586
35.783019	0.000000	0.000000	0.000000	3.323217
36.651071	0.000000	0.000000	0.000000	2.883564
37.519123	0.000000	0.000000	0.000000	2.440048
38.387174	0.000000	0.000000	0.000000	2.004060
39.255226	0.000000	0.000000	0.000000	1.661012
40.123278	0.000000	0.000000	0.000000	1.410203
40.991329	0.000000	0.000000	0.000000	1.315644

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 2

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	0.0000	0.0000	50	16	0	8

D/Q ASSOCIATED WITH VARIOUS VALUES OF THETA

N	THETA	D/Q
0	-90.000	8.94298
1	-67.500	4.74100
2	-45.000	2.72934
3	-22.500	1.90443
4	0.000	1.82910
5	22.500	1.73194
6	45.000	2.45239
7	67.500	4.28751
8	90.000	7.04826
9	112.500	4.20001
10	135.000	1.99596
11	157.500	1.10900
12	180.000	1.16545
13	202.500	1.20942
14	225.000	2.16458
15	247.500	4.57042
16	270.000	8.94298

D/Q = 3.16119 = .31611894E+01

CDW = .01429 = .14289709E-01

EXIT OUT

BODY SLOPE EQUALS OR EXCEEDS MACH ANGLE.
ANY SIMILARITY BETWEEN THE COMPUTED DRAG AND THE
CORRECT VALUE IS PURELY COINCIDENTAL.

ENTER CASREAD

TABLE IV.- Continued

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NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

                                        CASE  CHECK 3
     MACH NO.  ALPHA(DEG)     XO          ZO        NX    NTHETA   NCON    NPR
      1.4140      2.0000  20.0000     -1.0000      50        16      0      8

EXIT CASREAD
ENTER SLOPE
EXIT SLOPE
ENTER ENDPTS
EXIT ENDPTS
ENTER ADIST
EXIT ADIST
ENTER OUT
```

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	20.0000	-1.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = -90.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-1.667002	0.000000	0.000000	0.000000	0.000000	0.000000
-.798950	0.000000	0.000000	0.000000	0.000000	.098004
.069102	0.000000	0.000000	0.000000	0.000000	.350645
.937153	0.000000	0.000000	0.000000	0.000000	.710119
1.805205	0.000000	0.000000	0.000000	0.000000	1.129511
2.673257	0.000000	0.000000	0.000000	0.000000	1.554026
3.541309	0.000000	0.000000	0.000000	.019359	1.984788
4.409360	0.000000	0.000000	0.000000	.198070	2.365444
5.277412	0.000000	0.000000	0.000000	.50028.	2.694035
6.145464	0.000000	0.000000	0.000000	.890054	2.938528
7.013515	0.000000	0.000000	0.000000	1.316338	3.095774
7.881567	0.000000	0.000000	0.000000	1.749242	3.180186
8.749619	0.000000	0.000000	0.000000	2.156026	3.214423
9.617670	0.000000	0.000000	0.000000	2.523439	3.220182
10.485722	0.000000	0.000000	0.000000	2.810728	3.220182
11.353774	0.000000	0.000000	0.000000	3.019320	3.220182
12.221825	0.000000	0.000000	0.000000	3.142883	3.220182
13.089877	0.000000	0.000000	0.000000	3.200287	3.220182
13.957929	0.000000	0.000000	0.000000	3.219386	3.220182
14.825980	.001599	.001226	.005498	3.220182	3.220182
15.694032	.097093	.076602	.318796	3.220182	3.220182
16.562084	.323033	.254890	.872665	3.220182	3.220182
17.430135	.653325	.423987	1.249438	3.220182	3.220182
18.298187	1.057922	.550493	1.360116	3.220182	3.220182
19.166239	1.500166	.635890	1.365105	3.220182	3.220182
20.034291	1.928958	.678170	1.365105	3.220182	3.220182
20.902342	2.306445	.677814	1.365105	3.220182	3.220182
21.770394	2.587833	.635105	1.365105	3.220182	3.220182
22.638446	2.691538	.548518	1.365105	3.220182	3.220182
23.506497	2.616369	.421368	1.365105	3.220182	3.220182
24.374549	1.671768	.251024	1.365105	3.220182	3.220182
25.242601	.199166	.032171	1.346300	3.220182	3.220182
26.110652	0.000000	0.000000	1.315844	3.220182	3.219386
26.978704	0.000000	0.000000	1.315844	3.220182	3.201471
27.846756	0.000000	0.000000	1.315844	3.220182	3.144645
28.714807	0.000000	0.000000	1.315844	3.220162	2.997028
29.582859	0.000000	0.000000	1.315844	3.220182	2.784017
30.450911	0.000000	0.000000	1.315844	3.220182	2.489062
31.318962	0.000000	0.000000	1.315844	3.214423	2.150039
32.187014	0.000000	0.000000	1.315844	3.183018	1.759833
33.055066	0.000000	0.000000	1.315844	3.088722	1.322223
33.923117	0.000000	0.000000	1.315844	2.912720	.878304
34.791169	0.000000	0.000000	1.315844	2.661616	.483164
35.659221	0.000000	0.000000	1.315844	2.341531	.195217
36.527272	0.000000	0.000000	1.315844	1.988734	.018639
37.395324	0.000000	0.000000	1.315844	1.567720	0.000000
38.263376	0.000000	0.000000	1.315844	1.124204	0.000000
39.131428	0.000000	0.000000	1.315844	.688216	0.000000
39.999479	0.000000	0.000000	1.315844	.345168	0.000000
40.867531	0.000000	0.000000	1.315844	.094359	0.000000
41.735583	0.000000	0.000000	1.315844	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XD	ZD	NX	NTHETA	NCON	NPR
1.4140	2.0000	20.0000	-1.0000	50	16	0	2

S(X) FOR EACH COMPONENT AT THETA = -90.000

X	RIGHT CANARD	LEFT CANARD	WRACE	TOTAL AREA
-1.667002	0.000000	0.000000	0.000000	0.000000
-.798950	0.000000	0.000000	0.000000	.098094
.069102	0.000000	0.000000	0.000000	.350645
.937153	0.000000	0.000000	0.000000	.710119
1.805205	0.000000	0.000000	0.000000	1.129511
2.673257	0.000000	.018539	0.000000	1.572565
3.541309	0.000000	.060632	0.000000	2.064779
4.409360	0.000000	0.000000	0.000000	2.563514
5.277412	0.000000	0.000000	0.000000	3.194316
6.145464	0.000000	0.000000	0.000000	3.828582
7.013515	.001903	0.000000	0.000000	4.414015
7.881567	.089211	0.000000	0.000000	5.017638
8.749619	.047565	0.000000	0.000000	5.418015
9.617670	0.000000	0.000000	0.000000	5.743622
10.485722	0.000000	0.000000	0.000000	6.030911
11.353774	0.000000	0.000000	0.000000	6.239503
12.221825	0.000000	0.000000	0.000000	6.363065
13.089877	0.000000	0.000000	0.000000	6.420469
13.957929	0.000000	0.000000	0.000000	6.439569
14.825980	0.000000	0.000000	0.000000	6.448683
15.694032	0.000000	0.000000	0.000000	6.932856
16.562084	0.000000	0.000000	0.000000	7.890953
17.430135	0.000000	0.000000	0.000000	8.767115
18.298187	0.000000	0.000000	0.000000	9.408895
19.166239	0.000000	0.000000	0.000000	9.941525
20.034291	0.000000	0.000000	0.000000	10.412598
20.902342	0.000000	0.000000	0.000000	10.789729
21.770394	0.000000	0.000000	0.000000	11.028378
22.638446	0.000000	0.000000	0.000000	11.045326
23.506497	0.000000	0.000000	0.000000	10.643227
24.374549	0.000000	0.000000	0.000000	9.728261
25.242601	0.000000	0.000000	0.000000	8.018001
26.110652	0.000000	0.000000	0.000000	7.735413
26.978704	0.000000	0.000000	0.000000	7.7[illegible]97
27.846756	0.000000	0.000000	0.000000	7.68[illegible]71
28.714807	0.000000	0.000000	1.562540	9.095594
29.582859	0.000000	0.000000	1.133060	8.453099
30.450911	0.000000	0.000000	0.000000	7.025089
31.318962	0.000000	0.000000	0.000000	6.680306
32.187014	0.000000	0.000000	0.000000	6.258696
33.055066	0.000000	0.000000	0.000000	5.726789
33.923117	0.000000	0.000000	0.000000	5.106868
34.791169	0.000000	0.000000	0.000000	4.460624
35.659221	0.000000	0.000000	0.000000	3.852586
36.527272	0.000000	0.000000	0.000000	3.323217
37.395324	0.000000	0.000000	0.000000	2.883564
38.263376	0.000000	0.000000	0.000000	2.440048
39.131428	0.000000	0.000000	0.000000	2.004060
39.999479	0.000000	0.000000	0.000000	1.661012
40.867531	0.000000	0.000000	0.000000	1.410203
41.735583	0.000000	0.000000	0.000000	1.315844

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	20.0000	-1.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 90.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-3.235787	0.000000	0.000000	0.000000	0.000000	0.000000
-2.304935	0.000000	0.000000	0.000000	0.000000	.090012
-1.374083	0.000000	0.000000	0.000000	0.000000	.322467
-.443231	0.000000	0.000000	0.000000	0.000000	.660614
.487621	0.000000	0.000000	0.000000	0.000000	1.042157
1.418472	0.000000	0.000000	0.000000	0.000000	1.450856
2.349324	0.000000	0.000000	0.000000	.017780	1.841453
3.280176	0.000000	0.000000	0.000000	.182686	2.209951
4.211028	0.000000	0.000000	0.000000	.459827	2.513237
5.141880	0.000000	0.000000	0.000000	.826748	2.743591
6.072731	0.000000	0.000000	0.000000	1.227463	2.891949
7.003583	0.000000	0.000000	0.000000	1.626076	2.973729
7.934435	0.000000	0.000000	0.000000	2.010919	2.998323
8.865287	0.000000	0.000000	0.000000	2.360169	3.002913
9.796139	0.000000	0.000000	0.000000	2.623841	3.002932
10.726990	0.000000	0.000000	0.000000	2.821883	3.002932
11.657842	0.000000	0.000000	0.000000	2.936985	3.002932
12.588694	0.000000	0.000000	0.000000	2.986959	3.002932
13.519546	0.000000	0.000000	0.000000	3.002561	3.002932
14.450398	.001486	.001142	.004911	3.002932	3.002932
15.381249	.090480	.071379	.291673	3.002932	3.002932
16.312101	.301104	.237569	.812814	3.002932	3.002932
17.242953	.609065	.395283	1.167732	3.002932	3.002932
18.173805	.986353	.513333	1.267929	3.002932	3.002932
19.104657	1.398747	.593124	1.273008	3.002932	3.002932
20.035508	1.798935	.632578	1.273008	3.002932	3.002932
20.966360	2.151353	.632223	1.273008	3.002932	3.002932
21.897212	2.413865	.592443	1.273008	3.002932	3.002932
22.828064	2.510075	.511583	1.273008	3.002932	3.002932
23.758916	2.263085	.392861	1.273008	3.002932	3.002932
24.689768	1.520945	.233912	1.273008	3.002932	3.002932
25.620619	.179982	.029971	1.288600	3.002932	3.002932
26.551471	0.000000	0.000000	1.315844	3.002932	3.002561
27.482323	0.000000	0.000000	1.315844	3.002932	2.986959
28.413175	0.000000	0.000000	1.315844	3.002932	2.942329
29.344027	0.000000	0.000000	1.315844	3.002932	2.800599
30.274878	0.000000	0.000000	1.315844	3.002932	2.589854
31.205730	0.000000	0.000000	1.315844	3.002913	2.327495
32.136582	0.000000	0.000000	1.315844	2.998323	2.010793
33.067434	0.000000	0.000000	1.315844	2.973865	1.637022
33.998286	0.000000	0.000000	1.3158[illegible]	2.888838	1.239645
34.929137	0.000000	0.000000	1.31584[illegible]	2.714761	.806190
35.859989	0.000000	0.000000	1.315844	2.473424	.444053
36.790841	0.000000	0.000000	1.315844	2.197682	.180117
37.721693	0.000000	0.000000	1.315844	1.852837	.017127
38.652545	0.000000	0.000000	1.315844	1.464891	0.000000
39.583396	0.000000	0.000000	1.315844	1.047774	0.000000
40.514248	0.000000	0.000000	1.315844	.632011	0.000000
41.445100	0.000000	0.000000	1.315844	.317508	0.000000
42.375952	0.000000	0.000000	1.315844	.086703	0.000000
43.306804	0.000000	0.000000	1.315844	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	20.0000	-1.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 90.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-3.235787	0.000000	0.000000	0.000000	0.000000
-2.304935	0.000000	0.000000	0.000000	.090012
-1.374083	0.000000	0.000000	0.000000	.322467
-.443231	0.000000	0.000000	0.000000	.660614
.487621	0.000000	0.000000	0.000000	1.042157
1.418472	0.000000	.017163	0.000000	1.468019
2.349324	0.000000	.054314	0.000000	1.913547
3.280176	0.000000	0.000000	0.000000	2.392637
4.211028	0.000000	0.000000	0.000000	2.973064
5.141880	0.000000	0.000000	0.000000	3.570339
6.072731	.001781	0.000000	0.000000	4.121193
7.003583	.045383	0.000000	0.000000	4.645188
7.934435	.044491	0.000000	0.000000	5.053733
8.865287	0.000000	0.000000	0.000000	5.363082
9.796139	0.000000	0.000000	0.000000	5.626774
10.726990	0.000000	0.000000	0.000000	5.824815
11.657842	0.000000	0.000000	0.000000	5.939917
12.588694	0.000000	0.000000	0.000000	5.989891
13.519546	0.000000	0.000000	0.000000	6.005493
14.450398	0.000000	0.000000	0.000000	6.013403
15.381249	0.000000	0.000000	0.000000	6.459396
16.312101	0.000000	0.000000	0.000000	7.357351
17.242953	0.000000	0.000000	0.000000	8.177995
18.173805	0.000000	0.000000	0.000000	8.773480
19.104657	0.000000	0.000000	0.000000	9.270743
20.035508	0.000000	0.000000	0.000000	9.710385
20.966360	0.000000	0.000000	0.000000	10.062448
21.897212	0.000000	0.000000	0.000000	10.285181
22.828064	0.000000	0.000000	0.000000	10.300530
23.758916	0.000000	0.000000	0.000000	9.934818
24.689768	0.000000	0.000000	0.000000	9.033730
25.620619	0.000000	0.000000	0.000000	7.504417
26.551471	0.000000	0.000000	0.000000	7.321337
27.482323	0.000000	0.000000	0.000000	7.305735
28.413175	0.000000	0.000000	0.000000	7.261105
29.344027	0.000000	0.000000	1.533961	8.653336
30.274878	0.000000	0.000000	1.098697	8.007330
31.205730	0.000000	0.000000	0.000000	6.646252
32.136582	0.000000	0.000000	0.000000	6.324900
33.067434	0.000000	0.000000	0.000000	5.926731
33.998286	0.000000	0.000000	0.000000	5.444327
34.929137	0.000000	0.000000	0.000000	4.836805
35.859989	0.000000	0.000000	0.000000	4.233320
36.790841	0.000000	0.000000	0.000000	3.688642
37.721693	0.000000	0.000000	0.000000	3.185807
38.652545	0.000000	0.000000	0.000000	2.780735
39.583396	0.000000	0.000000	0.000000	2.363618
40.514248	0.000000	0.000000	0.000000	1.947855
41.445100	0.000000	0.000000	0.000000	1.633352
42.375952	0.000000	0.000000	0.000000	1.402547
43.306804	0.000000	0.000000	0.000000	1.315844

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.4140	2.0000	20.0000	-1.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 270.000

X	WING 1	WING 2	FUSELAGE	POD 1	POD 2
			SCAP = 0.000000	SCAP = 0.000000	SCAP = 0.000000
-1.667002	0.000000	0.000000	0.000000	0.000000	0.000000
-.798950	0.000000	0.000000	0.000000	0.000000	.098034
.069102	0.000000	0.000000	0.000000	0.000000	.350645
.937153	0.000000	0.000000	0.000000	0.000000	.710119
1.805205	0.000000	0.000000	0.000000	0.000000	1.129511
2.673257	0.000000	0.000000	0.000000	0.000000	1.554076
3.541309	0.000000	0.000000	0.000000	.019359	1.984744
4.409360	0.000000	0.000000	0.000000	.198070	2.365444
5.277412	0.000000	0.000000	0.000000	.506281	2.694035
6.145464	0.000000	0.000000	0.000000	.890054	2.938528
7.013515	0.000000	0.000000	0.000000	1.316338	3.095774
7.881567	0.000000	0.000000	0.000000	1.748242	3.180186
8.749619	0.000000	0.000000	0.000000	2.156026	3.214473
9.617670	0.000000	0.000000	0.000000	2.523439	3.220182
10.485722	0.000000	0.000000	0.000000	2.810728	3.220182
11.353774	0.000000	0.000000	0.000000	3.019320	3.220182
12.221825	0.000000	0.000000	0.000000	3.142883	3.220182
13.089877	0.000000	0.000000	0.000000	3.200287	3.220182
13.957929	0.000000	0.000000	0.000000	3.219386	3.220182
14.825980	.001595	.001226	.005498	3.220182	3.220182
15.694032	.097093	.076602	.318796	3.220182	3.220182
16.562084	.323033	.254890	.872665	3.220182	3 0182
17.430135	.653325	.423987	1.249438	3.220182	.220182
18.298187	1.057922	.550493	1.360116	3.220182	.20182
19.166239	1.500166	.635890	1.365105	3.220182	3.220182
20.034291	1.928958	.678170	1.365105	3.220182	3.220182
20.902342	2.306445	.677814	1.365105	3.220182	3.220182
21.770394	2.587803	.635105	1.365105	3.220182	3.220182
22.638446	2.691338	.548518	1.365105	3.220182	3.220182
23.506497	2.416389	.421368	1.365105	3.220182	3.220182
24.374549	1.671768	.251024	1.365105	3.220182	3.220182
25.242601	.199166	.032171	1.346300	3.220182	3.220182
26.110652	0.000000	0.000000	1.315844	3.220182	3.219386
26.978704	0.000000	0.000000	1.315844	3.220182	3.201471
27.846756	0.000000	0.000000	1.315844	3.220182	3.144645
28.714807	0.000000	0.000000	1.315844	3.220182	2.997028
29.582859	0.000000	0.000000	1.315844	3.220182	2.784012
30.450911	0.000000	0.000000	1.315844	3.220182	2.489067
31.318962	0.000000	0.000000	1.315844	3.214423	2.150039
32.187014	0.000000	0.000000	1.315844	3.183018	1.759833
33.055066	0.000000	0.000000	1.315844	3.088722	1.322223
33.923117	0.000000	0.000000	1.315844	2.912720	.878304
34.791169	0.000000	0.000000	1.315844	2.661616	.483164
35.659221	0.000000	0.000000	1.315844	2.341531	.195212
36.527272	0.000000	0.000000	1.315844	1.988734	.018639
37.395324	0.000000	0.000000	1.315844	1.567720	0.000000
38.263376	0.000000	0.000000	1.315844	1.124204	0.000000
39.131428	0.000000	0.000000	1.315844	.688216	0.000000
39.999479	0.000000	0.000000	1.315844	.345168	0.000000
40.867531	0.000000	0.000000	1.315844	.094359	0.000000
41.735583	0.000000	0.000000	1.315844	0.000000	0.000000

TABLE IV.- Continued

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCON	NPR
1.3140	2.0000	20.0000	-1.0000	50	16	0	8

S(X) FOR EACH COMPONENT AT THETA = 270.000

X	RIGHT CANARD	LEFT CANARD	BRACE	TOTAL AREA
-1.667002	0.000000	0.000000	0.000000	0.000000
-.798950	0.000000	0.000000	0.000000	.098004
.069102	0.000000	0.000000	0.000000	.350645
.937153	0.000000	0.000000	0.000000	.710119
1.805205	0.000000	0.000000	0.000000	1.129511
2.673257	0.000000	.018539	0.000000	1.572565
3.541309	0.000000	.060632	0.000000	2.064779
4.409360	0.000000	0.000000	0.000000	2.563514
5.277412	0.000000	0.000000	0.000000	3.194316
6.145464	0.000000	0.000000	0.000000	3.828582
7.013515	.001903	0.000000	0.000000	4.414015
7.881567	.089211	0.000000	0.000000	5.017638
8.749619	.047565	0.000000	0.000000	5.418015
9.617670	0.000000	0.000000	0.000000	5.743622
10.485722	0.000000	0.000000	0.000000	6.030911
11.353774	0.000000	0.000000	0.000000	6.239503
12.221825	0.000000	0.000000	0.000000	6.363065
13.089877	0.000000	0.000000	0.000000	6.420469
13.957929	0.000000	0.000000	0.000000	6.439569
14.825980	0.000000	0.000000	0.000000	6.448683
15.694032	0.000000	0.000000	0.000000	6.932856
16.562084	0.000000	0.000000	0.000000	7.890953
17.430135	0.000000	0.000000	0.000000	8.767115
18.298187	0.000000	0.000000	0.000000	9.408895
19.166239	0.000000	0.000000	0.000000	9.941525
20.034291	0.000000	0.000000	0.000000	10.412598
20.902342	0.000000	0.000000	0.000000	10.769729
21.770394	0.000000	0.000000	0.000000	11.028378
22.638446	0.000000	0.000000	0.000000	11.045326
23.506497	0.000000	0.000000	0.000000	10.643227
24.374549	0.000000	0.000000	0.000000	9.726261
25.242601	0.000000	0.000000	0.000000	8.018001
26.110652	0.000000	0.000000	0.000000	7.755413
26.978704	0.000000	0.000000	0.000000	7.737497
27.846756	0.000000	0.000000	0.000000	7.686671
28.714807	0.000000	0.000000	1.562540	9.095594
29.582859	0.000000	0.000000	1.133060	8.453099
30.450911	0.000000	0.000000	0.000000	7.025089
31.318962	0.000000	0.000000	0.000000	6.680306
32.187014	0.000000	0.000000	0.000000	6.258696
33.055066	0.000000	0.000000	0.000000	5.726780
33.923117	0.000000	0.000000	0.000000	5.106668
34.791169	0.000000	0.000000	0.000000	4.460624
35.659221	0.000000	0.000000	0.000000	3.852586
36.527272	0.000000	0.000000	0.000000	3.323217
37.395324	0.000000	0.000000	0.000000	2.883564
38.263376	0.000000	0.000000	0.000000	2.440048
39.131428	0.000000	0.000000	0.000000	2.004060
39.999479	0.000000	0.000000	0.000000	1.661012
40.867531	0.000000	0.000000	0.000000	1.410203
41.735583	0.000000	0.000000	0.000000	1.315844

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE IV.- Concluded

NONSYMMETRICAL TWIN BODY GEOMETRY SAMPLE

CASE CHECK 3

MACH NO.	ALPHA(DEG)	XO	ZO	NX	NTHETA	NCJN	NPR
1.4140	2.0000	20.0000	-1.0000	50	16	0	8

D/Q ASSOCIATED WITH VARIOUS VALUES OF THETA

N	THETA	D/Q
0	-90.000	8.94298
1	-67.500	4.74100
2	-45.000	2.72934
3	-22.500	1.90443
4	0.000	1.82910
5	22.500	1.73194
6	45.000	2.45239
7	67.500	4.28751
8	90.000	7.04826
9	112.500	4.20001
10	135.000	1.99596
11	157.500	1.10849
12	180.000	1.16545
13	202.500	1.20999
14	225.000	2.16458
15	247.500	4.57042
16	270.000	8.94298

D/Q = 3.16119 = .31611945E+01

CDW = .01429 = .14289822E-01

EXIT OUT

SUCCESS STOP REACHED.

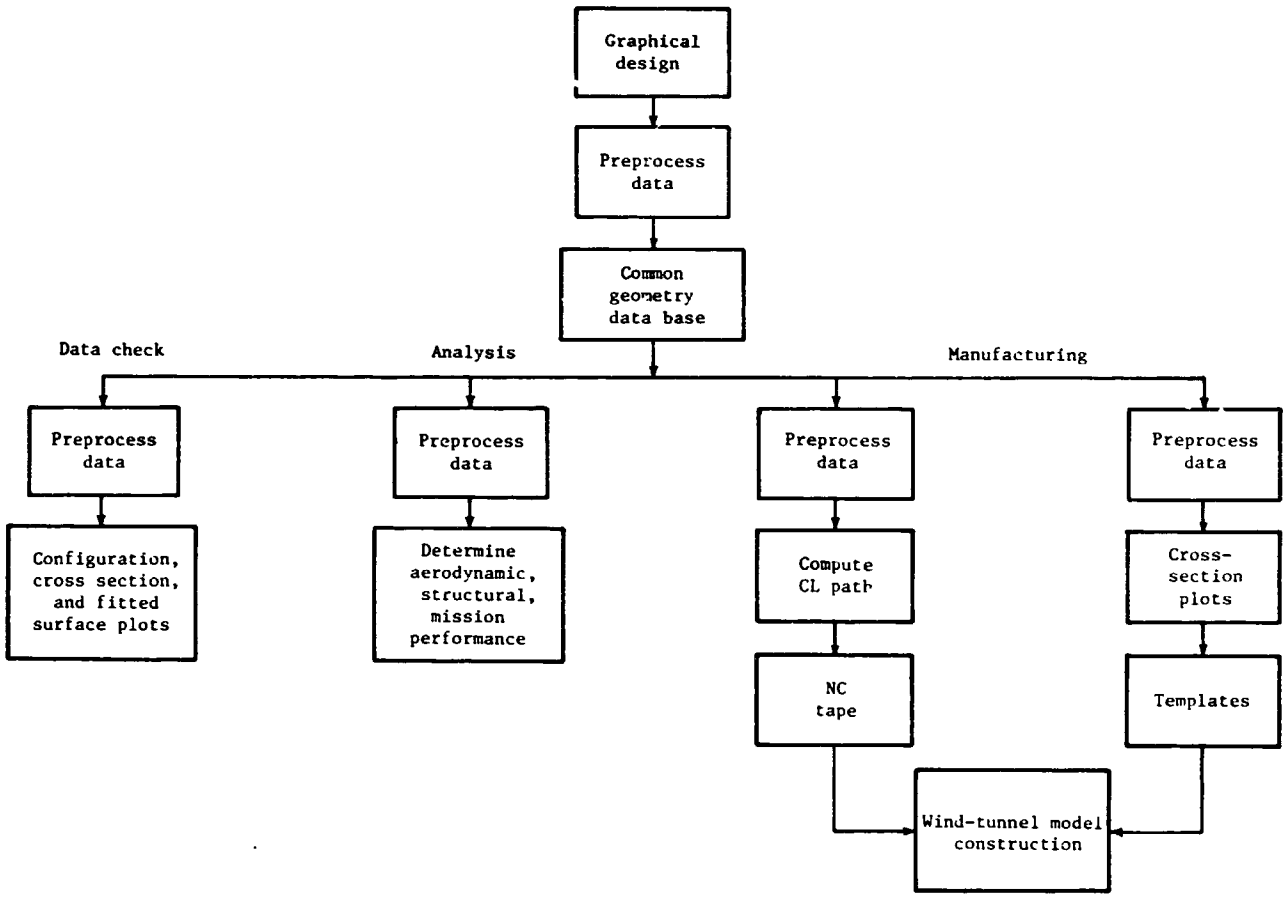
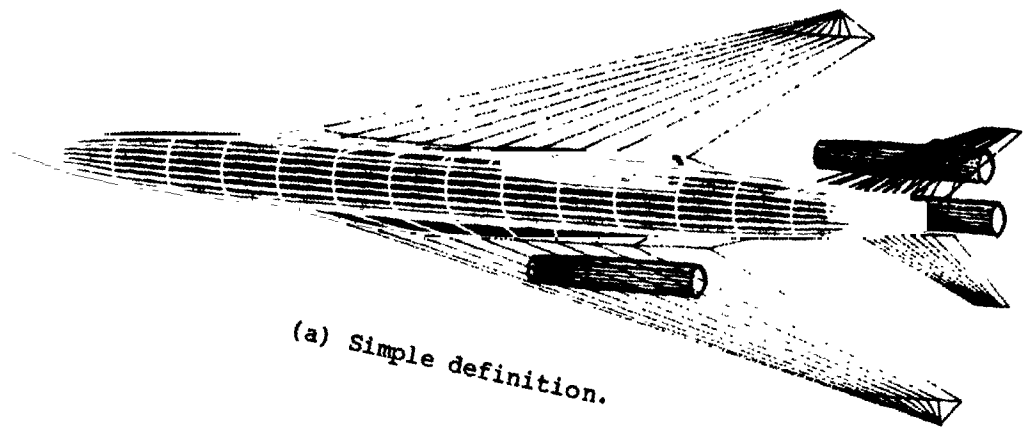
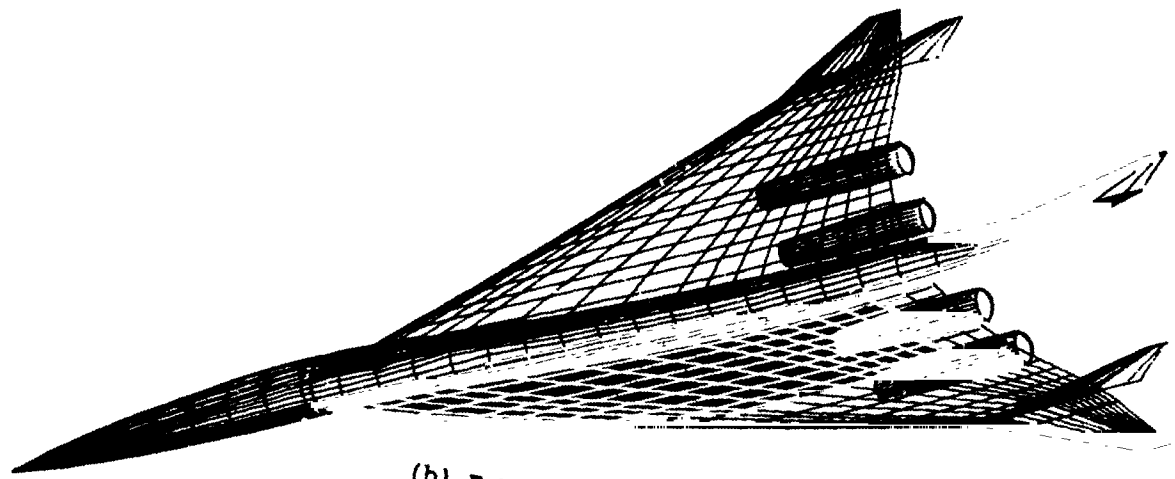


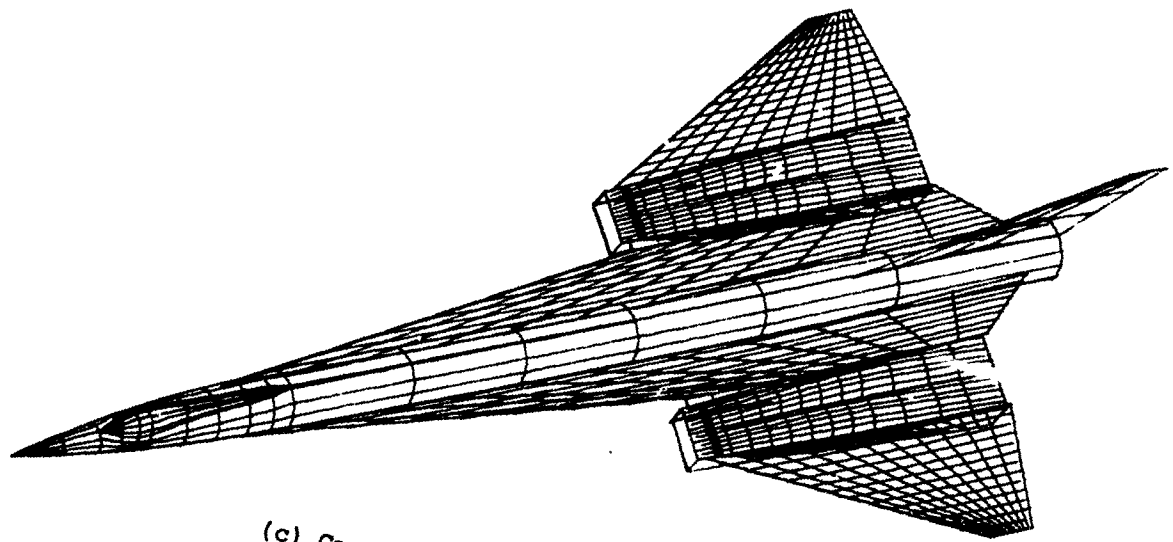
Figure 1.- Design process.



(a) Simple definition.

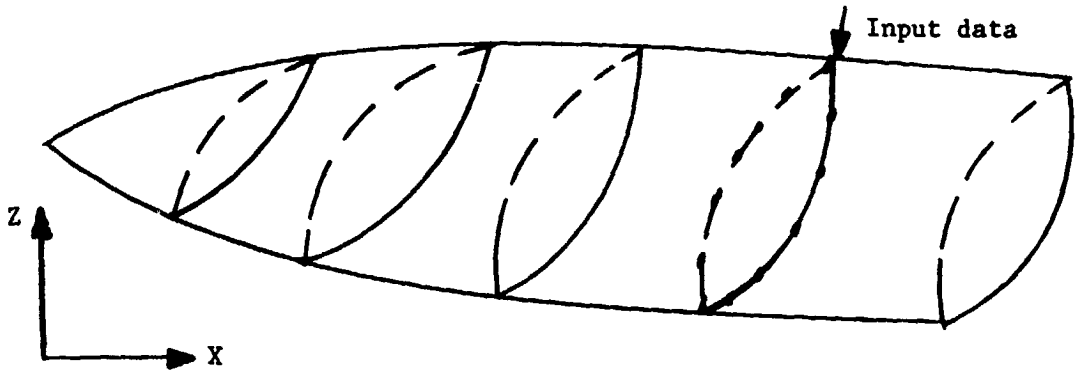


(b) Enhanced definition.

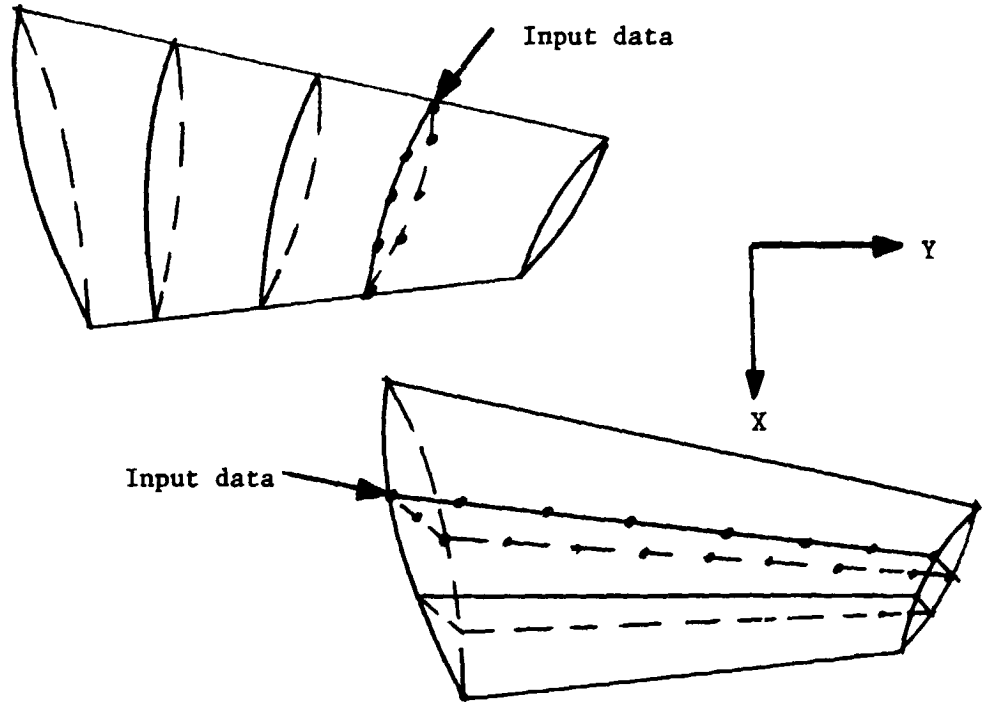


(c) Completely arbitrary definition.

Figure 2.- Evolution of aircraft geometry enhancements.



(a) Fusiform type contours.



(b) Nonfusiform type contours.

Figure 3.- Acceptable forms for component input geometry.

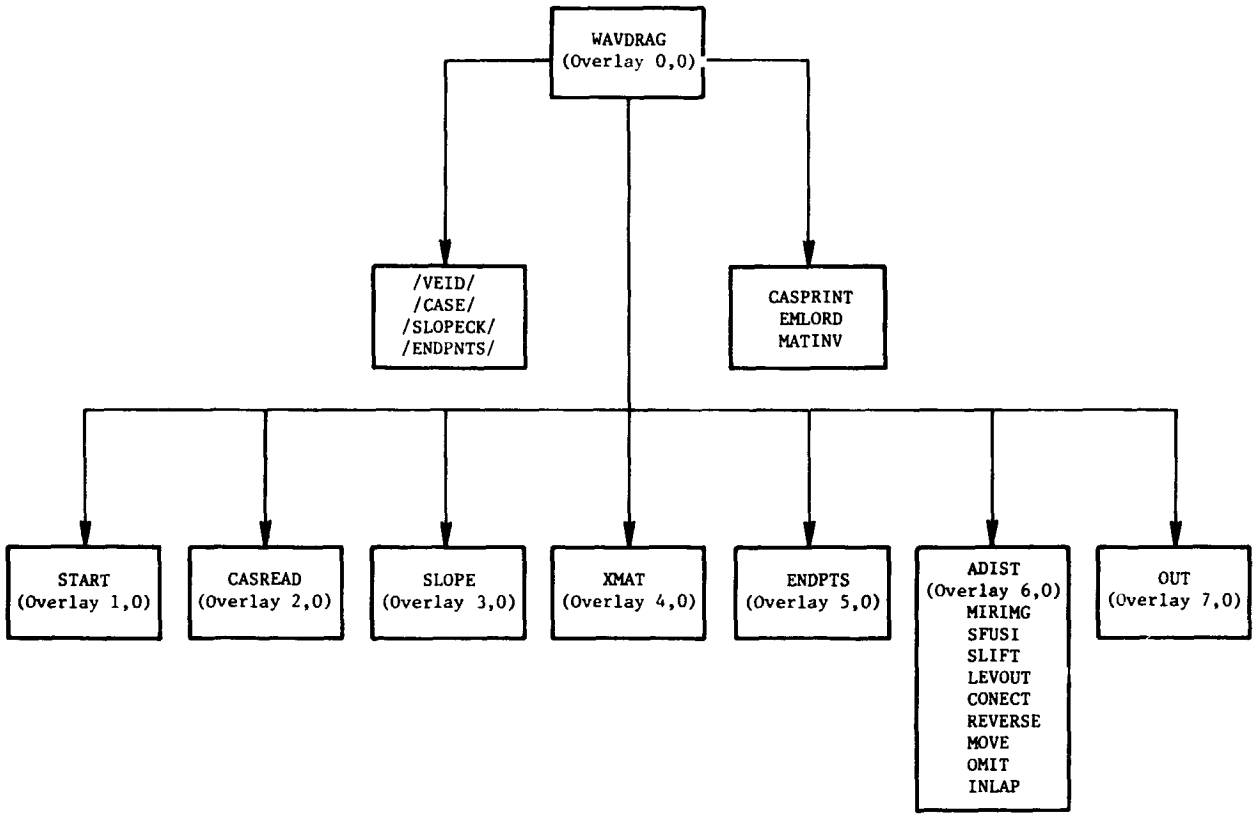
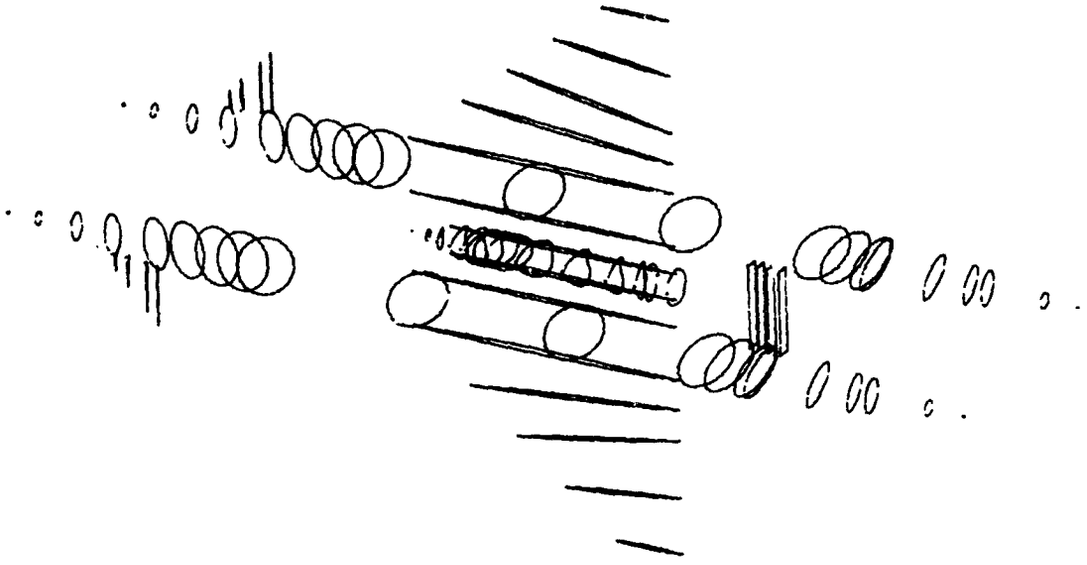
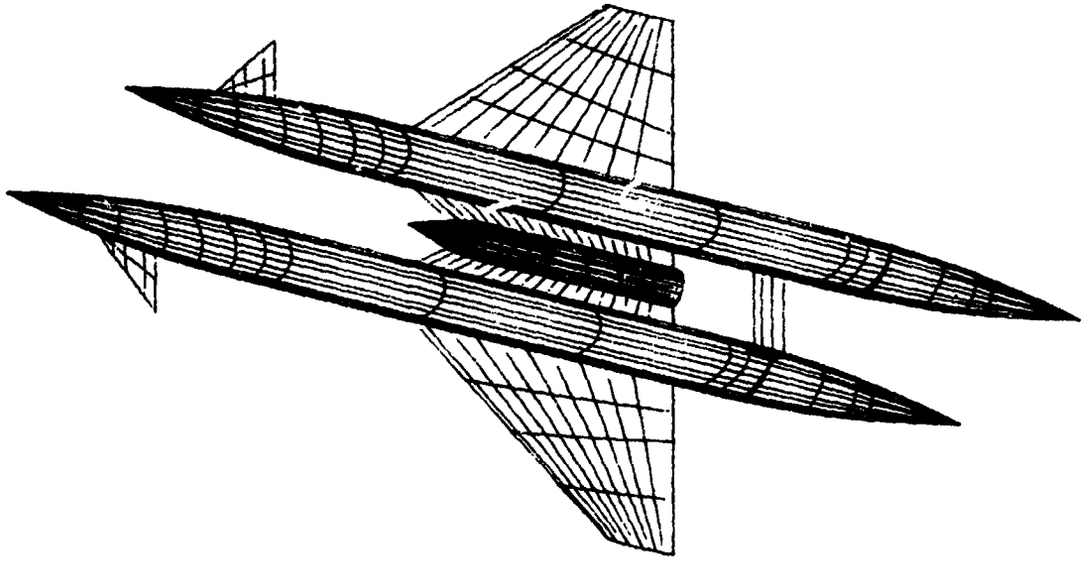


Figure 4.- Program structure.



(a) Input contours.



(b) Input contours with corresponding points on adjoining contours connected and hidden lines removed.

Figure 5.- Sample case input configuration.