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Aerodynamic Influence Coefficients
from Supersonic Strip Theory:
Analytical Development
and Computational Procedure

1 AUGUST 1962

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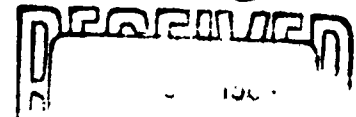
Laboratories Division

Prepared for COMMANDER SPACE SYSTEMS DIVISION

UNITED STATES AIR FORCE

Inglewood, California

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(6) AERODYNAMIC INFLUENCE COEFFICIENTS FROM
SUPERSONIC STRIP THEORY: ANALYTICAL DEVELOPMENT
AND COMPUTATIONAL PROCEDURE ,

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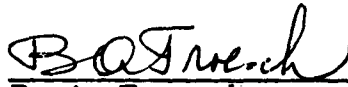
COMMANDER SPACE SYSTEMS DIVISION
UNITED STATES AIR FORCE
Inglewood, California

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AERODYNAMIC INFLUENCE COEFFICIENTS FROM
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AND COMPUTATIONAL PROCEDURE

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ABSTRACT

~~In this report, we~~ ^A review ^{is made of} a method for computing the aerodynamic influence coefficients (AICs) for surfaces with supersonic leading edges. The method is based on the two-dimensional second-order potential solution of Van Dyke. The strip oscillatory coefficients are obtained from the extension of Van Dyke's work by Rodden and Revell to include the effects of sweep and finite span in addition to the effects of thickness, leading to a method that will avoid the unconservatism of linearized theory and will be applicable at Mach numbers below the lower Mach number limit of piston theory.

The influence coefficients relate the aerodynamic forces to the surface deflections through the following definitions. In the oscillatory case,

$$\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$$

and in the steady case,

$$\{F_s\} = (1/2) \rho V^2 (S/\bar{c}) [C_{hs}] \{h\}$$

The Aerospace IBM 7090 Computer Program No. HM10 provides the AICs in printed and optional punched-card output formats. The theoretical formulation is limited to Mach numbers normal to the leading edge greater than 1.25. The program capacity is 25 surface strips, 25 values of Mach number, and 50 values of reduced velocity.

CONTENTS

ABSTRACT	iii
SYMBOLS	v
I. FORMULATION OF PROBLEM.	1
A. Introduction.	1
B. Sign Convention	1
C. Derivation of Equations	2
D. References	9
II. GENERAL DESCRIPTION OF INPUT	11
A. Units	11
B. Classes of Numerical Data and Limitations	11
III. DATA DECK SETUP	13
A. Loading Order	13
B. Input Data Description.	13
C. Example Key punch Forms	16
IV. PROGRAM OUTPUT	22
A. Printed Output	22
B. Punched Output	37
V. PROCESSING INFORMATION.	38
A. Operation	38
B. Estimated Machine Time	38
C. Machine Components Used	38
VI. PROGRAM NOTES	39
A. Subroutines	39
B. Generalized Tapes	39
VII. FLOW DIAGRAM	40
VIII. SYMBOLIC LISTING	41

SYMBOLS

A_n, B_n, C_n, D_n	Coefficients in series expansion for oscillatory aerodynamic coefficients
a_{ij}	Coefficients in series expansion of pressure coefficients
b	Local semichord
b_r	Reference semichord
C_h	Element of oscillatory aerodynamic influence coefficient matrix
C_{hs}	Element of steady aerodynamic influence coefficient matrix
c	Local chord
$\bar{c}$	Mean aerodynamic chord
c_r	Root chord
c_t	Tip chord
d	Distance between forward and aft control points
F	Control point force
f_n	Finite span correction factors
g	Airfoil semithickness
h	Vertical deflection
I_n, J_n, K_n, L_n	Thickness integrals
k	Local reduced frequency, $k = \omega b/V$
k_r	Reference reduced frequency
L_{h_o}, L_{a_o}	Oscillatory leading edge lift coefficients
L_o	Lift referred to leading edge motion
M	Freestream Mach number

$\bar{M}$	Normal Mach number, $\bar{M} = M \cos \Lambda$
M_{h_o}, M_{a_o}	Oscillatory leading edge moment coefficients
M_o	Moment about leading edge
N	$= [(\gamma+1)/2] (M/\beta)^2$
$\bar{N}$	$= [(\gamma+1)/2] (\bar{M}/\bar{\beta})^2$
r	$= \tau_{te}/\tau$
S	Wing area
s	Wing semispan
V	Free stream velocity
$V/b_r \omega$	Reference reduced velocity, $V/b_r \omega = 1/k_r$
x, ξ	Streamwise coordinates
x_m	Chordwise location of point of maximum thickness
α	Angle of attack
β	$= (M^2 - 1)^{1/2}$
$\bar{\beta}$	$= (\bar{M}^2 - 1)^{1/2}$
γ	Specific heat ratio of air ($\gamma = 1.400$)
Δy	Strip width
Λ	Leading edge sweep angle
λ	Trailing edge sweep angle
ρ	Free stream density
τ	Airfoil maximum thickness ratio
τ_{te}	Airfoil trailing edge thickness ratio
ω	Circular frequency
$[\]$	Square matrix
$\{ \}$	Column matrix

SECTION I

FORMULATION OF PROBLEM

A. Introduction

For aeroelastic analyses of surfaces with supersonic leading edges, a strip theory is desirable that will avoid the unconservatism of linearized theory and will be applicable at lower Mach numbers than piston theory. The second-order theory of Van Dyke¹ offers such a possibility, and it can be shown² that both the linearized theory and the piston theory are special cases of this solution.

Van Dyke's analysis is the result of both an iteration and a frequency expansion in the solution of the nonlinear, unsteady potential equation. The iteration has been carried through to obtain the second-order velocity potential (first-order in thickness), and the frequency expansion has been extended to the cubic term. The result has been presented in a series form for the local pressure coefficient on the airfoil; no control surface has been considered.

The present formulation makes use of the pressure coefficient as integrated by Rodden and Revell,² corrected for sweep and finite span. The AICs for strip theory have been discussed in Ref. 3 considering quarter-chord coefficients; a more convenient derivation utilizing leading edge coefficients is given in the present study. The computational aspects of this report are an extension of work previously discussed in Ref. 4.

B. Sign Convention

The flutter sign convention is used in the oscillatory case: forces and deflections are positive down; rotations are positive with leading edge up. The aerodynamic sign convention is used in the steady case: forces and deflections are positive up, rotations are positive with leading edge up.

C. Derivation of Equations

The derivation is based on the defining equation for the matrix of oscillatory AICs

$$\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$$

The steady AICs are defined by

$$\{F_s\} = (1/2) \rho V^2 (S/\bar{c}) [C_{hs}] \{h\}$$

and will be obtained from the limit of the oscillatory case

$$[C_{hs}] = \lim_{k_r \rightarrow 0} 2k_r^2 (s\bar{c}/S) [C_h]$$

We shall derive the aerodynamic matrix for only a single strip since strip theory leads to a partitioned form for the entire surface; e. g. ,

$$[C_h] = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & C_{h1} & 0 & 0 \\ 0 & 0 & C_{h2} & 0 \\ 0 & 0 & 0 & C_{h3} \end{bmatrix}$$

in the case of a three-strip wing where the first null partition is reserved for control points whose aerodynamic forces can be neglected (e. g. , external stores). Each surface partition is of the order 2 x 2 since we consider only

the degrees of freedom in pitching and plunging: the Van Dyke solution has not yet been extended to the control surface degree of freedom. The given and equivalent force systems and geometry are shown in Fig. 1. The forward control point in the equivalent system has been arbitrarily placed in the quarter chord location.

The force equivalence is given by

$$\begin{bmatrix} 1 & 1 \\ b/2 & (d+b/2) \end{bmatrix} \begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix} = \begin{Bmatrix} L_o \\ M_o \end{Bmatrix}$$

from which

$$\begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix} = \begin{bmatrix} (1+b/2d) & -1/d \\ -b/2d & 1/d \end{bmatrix} \begin{Bmatrix} L_o \\ M_o \end{Bmatrix}$$

The leading edge oscillatory coefficients are defined by

$$\begin{Bmatrix} L_o \\ M_o \end{Bmatrix} = 4\rho\omega^2 b^2 \Delta y \begin{bmatrix} 1 & 0 \\ 0 & b \end{bmatrix} \begin{bmatrix} L_{h_o} & L_{a_o} \\ M_{h_o} & M_{a_o} \end{bmatrix} \begin{Bmatrix} h_o \\ b_a \end{Bmatrix}$$

The geometrical equivalence is

$$\begin{Bmatrix} h_o \\ b_a \end{Bmatrix} = \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix} \begin{Bmatrix} h_1 \\ h_2 \end{Bmatrix}$$

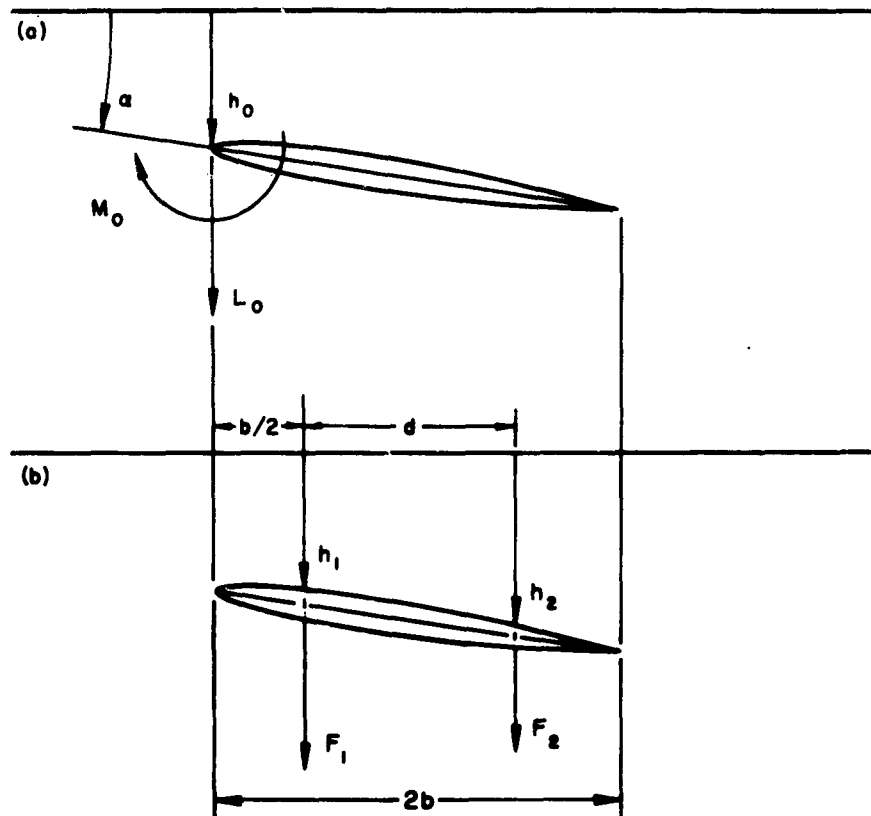


Fig. 1. Original (a) and Equivalent (b)
Force Systems and Geometry.

Cascading the above solutions we find

$$\begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix} = 4\rho\omega^2 b^2 \Delta y \begin{bmatrix} (1+b/2d) & -b/d \\ -b/2d & b/d \end{bmatrix}$$

$$\times \begin{bmatrix} L_{h_o} & L_{a_o} \\ M_{h_o} & M_{a_o} \end{bmatrix} \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix} \begin{Bmatrix} h_1 \\ h_2 \end{Bmatrix}$$

Comparing this result to the definition of the influence coefficient matrix, we find

$$[C_h] = 4(b/b_r)^2 (\Delta y/s) \begin{bmatrix} (1+b/2d) & -b/d \\ -b/2d & b/d \end{bmatrix}$$

$$\times \begin{bmatrix} L_{h_o} & L_{a_o} \\ M_{h_o} & M_{a_o} \end{bmatrix} \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix}$$

We note the pre- and post-multipliers to be mutual transposes. Once the partitions have been obtained for each strip, the total matrix is formed as indicated above.

The steady influence coefficients follow as a limiting case of the oscillatory matrix. From the definitions of both oscillatory and steady matrices we find (since in both sign conventions the forces and deflections are in the same direction)

$$[C_{hs}] = \lim_{k_r \rightarrow 0} 2k_r^2 (s\bar{c}/S) [C_h]$$

We next consider the oscillatory coefficients necessary in the influence coefficient formulation. Space permits only a summary of the results given by Ref. 2. The strip leading edge oscillatory coefficients are given by

$$L_{h_o} = A_2 f_2 + i(A_3 f_1 / k + A_4 f_3 k)$$

$$L_{a_o} = (B_1 f_1 / k^2 + B_2 f_3) + i(B_3 f_2 / k + B_4 f_4 k)$$

$$M_{h_o} = C_2 f_3 + i(C_3 f_2 / k + C_4 f_4 k)$$

$$M_{a_o} = (D_1 f_2 / k^2 + D_2 f_4) + i(D_3 f_3 / k + D_4 f_5 k)$$

where A_n , B_n , C_n , and D_n depend on the Mach number and airfoil thickness integrals, the f_n are finite span correction factors, and the reduced frequency k is based on the local chord.

The basic expressions involved in A_n , B_n , C_n , and D_n can be outlined, but the reader is referred to Ref. 2 for the finite span correction factors f_n (it may be noted that the $f_n = 1$ for all strips inboard of the tip Mach cone, where as the $f_n < 1$ in the region of the tip Mach cone). The basic expressions are

$$A_2 = -(1/8) (a_{22}/2 + J_1 a_{24} + I_2 a_{26})$$

$$A_3 = -(1/8) (a_{12} + I_1 a_{14})$$

$$A_4 = -(1/8) (a_{32}/3 + K_1 a_{34} + J_2 a_{36} + I_3 a_{38})$$

$$B_1 = (1/4) (a_{01} + I_1 a_{02})$$

$$B_2 = (1/4) (a_{21}/3 + K_1 a_{23} + J_2 a_{25} + I_3 a_{27})$$

$$B_3 = (1/4) (a_{11}/2 + J_1 a_{13} + I_2 a_{15})$$

$$B_4 = (1/4) (a_{31}/4 + L_1 a_{33} + K_2 a_{35} + J_3 a_{37} + I_4 a_{39})$$

$$C_2 = -(1/4) (a_{22}/3 + J_2 a_{24} + I_3 a_{26})$$

$$C_3 = -(1/4) (a_{12}/2 + I_2 a_{14})$$

$$C_4 = -(1/4) (a_{32}/4 + K_2 a_{34} + J_3 a_{36} + I_4 a_{38})$$

$$D_1 = (1/2) (a_{01}/2 + I_2 a_{02})$$

$$D_2 = (1/2) (a_{21}/4 + K_2 a_{23} + J_3 a_{25} + I_4 a_{27})$$

$$D_3 = (1/2) (a_{11}/3 + J_2 a_{13} + I_3 a_{15})$$

$$D_4 = (1/2) (a_{31}/5 + L_2 a_{33} + K_3 a_{35} + J_4 a_{37} + I_5 a_{39})$$

where

$$a_{01} = - (4/\bar{\beta}) \cos \Lambda$$

$$a_{02} = - (4/\bar{\beta}^2) (\bar{M}^2 \bar{N} - 2)$$

$$a_{11} = (8/\bar{\beta}^3) (2 - \bar{M}^2) \cos \Lambda$$

$$a_{12} = (8/\bar{\beta}) \cos \Lambda$$

$$a_{13} = (16\bar{M}^2/\bar{\beta}^4) (\bar{N} - 1)$$

$$a_{14} = (8/\bar{\beta}^2) (\bar{M}^2 \bar{N} - 2)$$

$$a_{15} = (8/\bar{\beta}^4) (2 - \bar{M}^2) (\bar{M}^2 \bar{N} - 1)$$

$$a_{21} = (4/\bar{\beta}^5) (\bar{M}^2 + 2) \cos \Lambda$$

$$a_{22} = (16/\bar{\beta}^3) \cos \Lambda$$

$$a_{23} = (8\bar{M}^2/\bar{\beta}^6) [3 (3\bar{M}^2 - 2) \bar{N} - 2 (5\bar{M}^2 - 3)]$$

$$a_{24} = (8\bar{M}^2/\bar{\beta}^4) (4\bar{N} - 5)$$

$$a_{25} = (4\bar{M}^2/\bar{\beta}^6) [(16 - 7\bar{M}^2) \bar{N} + 4 (2\bar{M}^2 - 3)]$$

$$a_{26} = (16\bar{M}^2/\bar{\beta}^4) (\bar{N} - 1)$$

$$a_{27} = (4\bar{M}^2/\bar{\beta}^6) [(\bar{M}^2 + 2) \bar{N} - 4]$$

$$a_{31} = - (8\bar{M}^2/3\bar{\beta}^7) (\bar{M}^2 + 4) \cos \Lambda$$

$$a_{32} = - (24\bar{M}^2/\bar{\beta}^5) \cos \Lambda$$

$$a_{33} = (16\bar{M}^2/\bar{\beta}^8) [(17\bar{M}^4 - 10\bar{M}^2 - 4) \bar{N} - (5\bar{M}^2 - 2) (4\bar{M}^2 - 1)]$$

$$a_{34} = (16\bar{M}^2/\bar{\beta}^6) [6\bar{M}^2 - (5\bar{M}^2 - 2) \bar{N}]$$

$$a_{35} = (16\bar{M}^2/\bar{\beta}^8) [7\bar{M}^2 (2\bar{M}^2 - 1) - (12\bar{M}^4 - 3\bar{M}^2 - 4) \bar{N}]$$

$$a_{36} = (8\bar{M}^2/\bar{\beta}^6) [2(\bar{M}^2 + 1) - (\bar{M}^2 + 8) \bar{N}]$$

$$a_{37} = (8\bar{M}^2/\bar{\beta}^8) [(3\bar{M}^2 + 2) - (3\bar{M}^2 + 4) \bar{N}]$$

$$a_{38} = (8\bar{M}^2/\bar{\beta}^6) [2(\bar{M}^2 + 1) - 3\bar{M}^2\bar{N}]$$

$$a_{39} = (8\bar{M}^2/3\bar{\beta}^8) [(5\bar{M}^2 + 2) - \bar{M}^2\bar{N} (\bar{M}^2 + 4)]$$

and the thickness integrals are defined by

$$I_n = (1/2b)^n \int_0^{2b} x^{n-1} g' dx, \quad n = 1(1)5$$

$$J_n = (1/2b)^{n+1} \int_0^{2b} x^{n-1} g dx, \quad n = 1(1)4$$

$$K_n = (1/2b)^{n+2} \int_0^{2b} x^{n-1} dx \int_0^x g d\xi, \quad n = 1(1)3$$

$$L_n = (1/2b)^{n+3} \int_0^{2b} x^{n-1} dx \int_0^x \xi g d\xi, \quad n = 1(1)2$$

Reference 2 evaluates these thickness integrals for a typical airfoil.

From the oscillatory coefficient expressions we may find the limiting values and the steady matrix for a single strip

$$[C_{hs}] = 8(s\bar{c}/S) (\Delta y/s) \begin{bmatrix} (1+b/2d) & -b/d \\ -b/2d & b/d \end{bmatrix} \\ \times \begin{bmatrix} 0 & B_1 f_1 \\ 0 & D_1 f_2 \end{bmatrix} \begin{bmatrix} (1+b/2d) & -b/2d \\ -b/d & b/d \end{bmatrix}$$

D. References

1. M. D. Van Dyke. "Supersonic Flow Past Oscillating Airfoils Including Nonlinear Thickness Effects." NACA TN 2982, 1953.
2. W. P. Rodden and J. D. Revell. "Oscillatory Aerodynamic Coefficients for a Unified Supersonic Hypersonic Strip Theory." Journal of the Aerospace Sciences, 27 (1960), 451; based on North American Aviation, Inc., Report NA-57-1549, 31 December 1957.

3. W. P. Rodden. "Aerodynamic Influence Coefficients from Strip Theory." Journal of the Aerospace Sciences, 26 (1959), 833.

4. W. P. Rodden, E. F. Farkas, and R. K. Oyama. "Aerodynamic Influence Coefficients by Supersonic Strip Theory: Analytical Development and Procedure for the IBM 7090 Computer." Norair Division, Northrop Corporation, Report NOR-61-56, 14 April 1961.

SECTION II

GENERAL DESCRIPTION OF INPUT

A. Units

Since all dimensional input is geometrical and the aerodynamic matrix is dimensionless, only a consistent set of length units is necessary: inches or feet.

B. Classes of Numerical Data and Limitations

The data required by the program are the geometry, reduced velocities, and Mach numbers. The example illustrates their use.

1. Example Problem

We consider the four-strip wing shown in Fig. 2 at the freestream Mach numbers of 1.8 and 2.5 for the reduced velocities of 4.0 and 8.0 and the steady case. The aerodynamic matrices will be found with and without the tip correction, and the thickness integrals will be generated by the program from the expressions of App. A of Ref. 2 for an assumed airfoil (constant across the span) having 10 percent thickness, maximum thickness at 40 percent chord, and a blunt trailing edge that has a trailing-edge-to-maximum-thickness ratio of 0.15.

2. Program Restrictions and Options

- a. The number of strips into which a wing may be subdivided must be ≤ 25 .
- b. The number of reduced velocities used for any one Mach number must be ≤ 50 .
- c. The number of values of Mach number must be ≤ 25 .
- d. If it is desired to compute the steady matrix $[C_{hs}]$, a zero or negative value of $V/b_r \omega$ must be used and S and $\bar{c}$ must also be supplied.

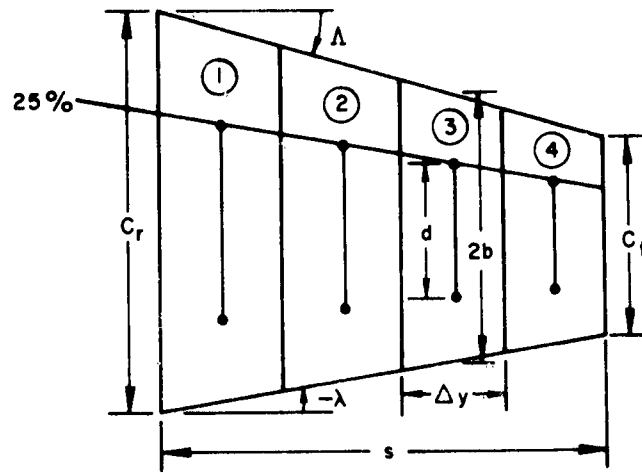


Fig. 2. Example of Four-Strip Wing.

Strip No.	Δy (ft)	b (ft)	d (ft)
1	4.7	12.28125	11.9
2	4.2	9.50000	9.0
3	3.6	7.06250	6.6
4	3.1	4.96875	4.5

$$b_r = 6.5 \text{ ft}$$

$$s = 15.6 \text{ ft}$$

$$c_r = 27.5 \text{ ft}$$

$$c_t = 8.0 \text{ ft}$$

$$\tan \Lambda = 0.75 \text{ (} \cos \Lambda = 0.80 \text{)}$$

$$\tan \lambda = -0.50$$

$$\bar{c} = 21.0 \text{ ft}$$

$$S = 554.0 \text{ sq ft}$$

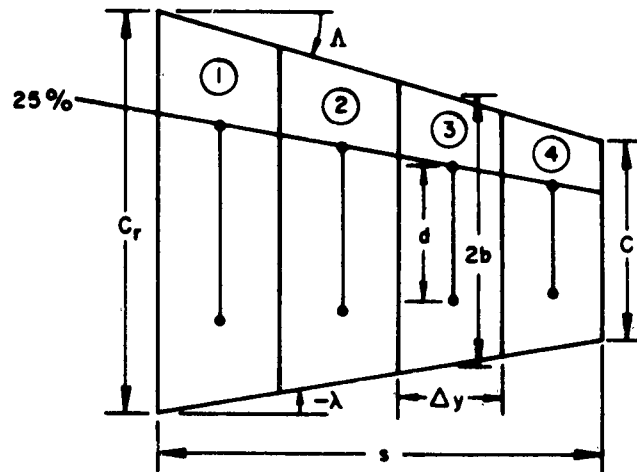


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$$\tan \lambda = -0.50$$

$$\bar{c} = 21.0 \text{ ft}$$

$$S = 554.0 \text{ sq ft}$$

SECTION III
DATA DECK SETUP

A. Loading Order

Input decks punched from keypunch forms are loaded behind column binary deck HM10. Any number of complete decks may be stacked. The data for each deck must be in the following order:

- (1) Heading Card 1
- (2) Heading Card 2
- (3) ISTRIP, JMACH, KVBRW, ISTHK, ISTIP, NO PUNJ
- (4) b_r , s , S , $\bar{c}$, c_t , $\tan \Lambda$, $\tan \lambda$, $\cos \Lambda$
- (5) b_i series
- (6) d_i series
- (7) Δy_i series
- (8) M_j series
- (9) $(V/b_r \omega)_k$ series
- (10) Thickness integrals
 - (a) Provide thickness integrals
 - (b) Input data to compute thickness integrals

B. Input Data Description

- (1) Heading Card 1 may contain any information desired (Columns 2 through 72). Column 1 should be blank.
- (2) Heading Card 2 provides for more information (Columns 2 through 72): vehicle, date, name. Column 1 is blank and all or any of the fields may be blank but the card must be included.

(3) Control card (FORMAT 1814)

- (a) ISTRIP = number of strips
- (b) JMACH = number of Mach numbers
- (c) KVBRW = number of reduced velocities
- (d) ISTHK = 0 if thickness integrals are tabulated
= 1 if x_m/c , τ , and r are constant
= 2 if x_m/c and r are constant and τ varies with each strip
= 3 if x_m/c , τ , and r all vary with each strip
- (e) ISTIP = 0 if tip correction factor is 1.0
≠ 0 if tip correction factor is to be computed by program
- (f) NO PUNJ = 0 or blank if the computed matrices are to be punched in cards
≠ 0 if no punched cards are desired

(4) Single parameters (FORMAT 6E12.8): When computing both steady-state and oscillatory AICs from the same data deck, we use the eight parameters: b_r (semichord), s (semispan), S (surface area), $\bar{c}$ (mean aerodynamic chord), c_t (tip chord), $\tan \Lambda$ (tangent of leading edge sweep angle), $\tan \lambda$ (tangent of trailing edge sweep angle), and $\cos \Lambda$ (cosine of leading edge sweep angle). For computing oscillatory cases, S and $\bar{c}$ may be blank (or included); and for steady cases, b_r and s may be blank (or included). These parameters are tabulated in the same order as defined, and always require two lines (cards).

(5), (6), and (7) Series b_i , d_i , and Δy_i (FORMAT 6E12.8): The number of lines (cards) required by the b_i , d_i , and Δy_i series is controlled by the number of strips. Using the maximum 25 strips would require five cards for each series. Tabulate b_i (local semichords), d_i (distance between control points), and

Δy_i (strip widths) in the order defined with each new series starting on a new card.

- (8) and (9) M_j (freestream Mach number) and $V/b_r \omega$ (reduced velocity) series (FORMAT 6E12.8): The M_j series may be input in any order desired with $j \leq 25$ per deck. $M_j \cos \Lambda$ must be ≥ 1.25 . The $(V/b_r \omega)_k$ series is tabulated only once per deck and will be repeated by the program for each Mach number indicated by the M_j series. For the steady case, tabulate either a zero or negative $V/b_r \omega$.

(10) Thickness integral input (FORMAT 6E12.8)

- (a) $ISTHK = 0$; the thickness integrals must be tabulated in the order: $I_1, I_2, I_3, I_4, I_5, J_1, J_2, J_3, J_4, K_1, K_2, K_3, L_1$, and L_2 (three cards).

- (b) $ISTHK \neq 0$; the thickness integrals are computed by supplying x_m/c (percent chord location of maximum thickness), τ (airfoil maximum thickness ratio), and r (ratio of τ_{te}/τ).
When using this option omit (10. a).

- 1) $ISTHK = 1$; the three ratios are each constant for the surface and tabulated in the order defined. (First field in three separate cards.)

- 2) $ISTHK = 2$; the ratios x_m/c and r are each constant for the surface but τ varies with each strip. Input in the order x_m/c , (Field 1, first thickness integral card), τ series (beginning on a new card), and r (Field 1 of the last card).

- 3) ISTHK = 3; the ratios x_m/c , τ , and r all vary with each strip. Tabulate in order with each new series starting on a new card.

C. Example Keypunch Forms

Example keypunch forms are given on the following pages. Columns 73 through 80 are reserved for data deck identification. This space may be used in any fashion; however, it is suggested that the last three columns be used for sequencing. Only the cards with sequencing in Columns 73 through 80 are to be used in the sample data deck; the lines (cards) with Columns 73 through 80 blank are for clarification of input.

80 COLUMN FREE KEYPUNCH



AEROSPACE CORPORATION

PROGRAMMER _____ KEY PUNCHED _____ DATE _____ SHEET _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
ENTER CHORDWISE DISTANCE BETWEEN CONTROL POINTS (d _i)																																																																																
d ₁	+0119										+011466										+01145										+01										MM100007																																							
d ₇																																																																																
d ₁₃																																																																																
d ₁₉																																																																																
d ₂₅																																																																																
ENTER STRIP WIDTH (Δy _i)																																																																																
Δy ₁	+01142										+01136										+01131										+01										MM100008																																							
Δy ₇																																																																																
Δy ₁₃																																																																																
Δy ₁₉																																																																																
Δy ₂₅																																																																																
MACH NUMBERS (M _i)																																																																																
M ₁	+01125										+01																				MM100009																																																	
M ₇																																																																																
M ₁₃																																																																																
M ₁₉																																																																																
M ₂₅																																																																																

80 COLUMN FREE KEYPUNCH



AEROSPACE CORPORATION

KEYPUNCHED _____ DATE _____ SHEET _____

PROGRAMMER _____

VERIFIED _____

DATE _____

SHEET _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REDUCED VELOCITY $(V/b \cdot \omega)_k = (1/k) \cdot k$																																																																															
IF THICKNESS INTEGRAL CONTROL = 0 ENTER THE FOLLOWING INTEGRAL VALUES																																																																															
I_1 I_2 I_3 I_4 I_5 I_6 I_7 I_8 I_9 I_{10} I_{11} I_{12} I_{13} I_{14} I_{15} I_{16} I_{17} I_{18} I_{19} I_{20} I_{21} I_{22} I_{23} I_{24} I_{25} I_{26} I_{27} I_{28} I_{29} I_{30} I_{31} I_{32} I_{33} I_{34} I_{35} I_{36} I_{37} I_{38} I_{39} I_{40} I_{41} I_{42} I_{43} I_{44} I_{45} I_{46} I_{47} I_{48} I_{49} I_{50} I_{51} I_{52} I_{53} I_{54} I_{55} I_{56} I_{57} I_{58} I_{59} I_{60} I_{61} I_{62} I_{63} I_{64} I_{65} I_{66} I_{67} I_{68} I_{69} I_{70} I_{71} I_{72} I_{73} I_{74} I_{75} I_{76} I_{77} I_{78} I_{79} I_{80}																																																																															
J_1 J_2 J_3 J_4 J_5 J_6 J_7 J_8 J_9 J_{10} J_{11} J_{12} J_{13} J_{14} J_{15} J_{16} J_{17} J_{18} J_{19} J_{20} J_{21} J_{22} J_{23} J_{24} J_{25} J_{26} J_{27} J_{28} J_{29} J_{30} J_{31} J_{32} J_{33} J_{34} J_{35} J_{36} J_{37} J_{38} J_{39} J_{40} J_{41} J_{42} J_{43} J_{44} J_{45} J_{46} J_{47} J_{48} J_{49} J_{50} J_{51} J_{52} J_{53} J_{54} J_{55} J_{56} J_{57} J_{58} J_{59} J_{60} J_{61} J_{62} J_{63} J_{64} J_{65} J_{66} J_{67} J_{68} J_{69} J_{70} J_{71} J_{72} J_{73} J_{74} J_{75} J_{76} J_{77} J_{78} J_{79} J_{80}																																																																															
K_1 K_2 K_3 K_4 K_5 K_6 K_7 K_8 K_9 K_{10} K_{11} K_{12} K_{13} K_{14} K_{15} K_{16} K_{17} K_{18} K_{19} K_{20} K_{21} K_{22} K_{23} K_{24} K_{25} K_{26} K_{27} K_{28} K_{29} K_{30} K_{31} K_{32} K_{33} K_{34} K_{35} K_{36} K_{37} K_{38} K_{39} K_{40} K_{41} K_{42} K_{43} K_{44} K_{45} K_{46} K_{47} K_{48} K_{49} K_{50} K_{51} K_{52} K_{53} K_{54} K_{55} K_{56} K_{57} K_{58} K_{59} K_{60} K_{61} K_{62} K_{63} K_{64} K_{65} K_{66} K_{67} K_{68} K_{69} K_{70} K_{71} K_{72} K_{73} K_{74} K_{75} K_{76} K_{77} K_{78} K_{79} K_{80}																																																																															

80 COLUMN FREE KEYPUNCH



AEROSPACE CORPORATION

SECTION		SERIAL		DATE		TIME	
SAMPLE CASE		WITH TIP CORRECTION		N P R D D E N		HMICACCI	
4	5	1	1	1	1	02	03
+65	+01+156	+02+554	+03+21	+028	101-75	+00	04
-5	+0088	+00					05
b ₁ - 2-8125	+02+91	+01+70625	+01+496875	+01			06
d ₁ - +	+02+9	+01+66	+01+45	+01			07
Δ ₁ +47	+01+42	+01+36	+01+31	+01			08
M ₁ + 8	+01+74	+01					09
Q ₁ +4	+01+16	+01+0	+02				10
Q ₂ -4	+01+16	+01+0					11
- +							12
r - 0							13

SECTION IV
PROGRAM OUTPUT

A. Printed Output

1. All input data.
2. Each group of AICs with the associated Mach number and $V/b_r \omega$.
3. Sequencing number of the first and last punched cards (output) for each group (one $V/b_r \omega$) of influence coefficients.
4. Example problem printed output is given on the following pages.

ACROUSTIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

INPUT DATA

4 STRIPS
2 MACH NUMBERS
3 REDUCED FREQUENCIES

COSINE LAMBDA = 0.8000000E 00
B(R) = 0.64999999E 01
S = 0.1500000E 02
S = 0.5540000E 03
CMAR = 0.2000000E 02
C(T) = 0.8000000E 01
TAN LD = 0.7500000E 00
TAN TR = -0.5000000E 00

WITHOUT TIP CORRECTION

DELTA Y (I)	B(I)	D(I)
0.4699999E 01	0.12281249E 02	0.11900000E 02
0.4199999E 01	0.9500000E 01	0.8000000E 01
0.3599999E 01	0.10675000E 01	0.6599999E 01
0.3099999E 01	0.73607500E 01	0.4500000E 01

1/K (R) = 0.4000000E 01 0.8000000E 01 0.

XR/C = 0.4000000E-00
YAU = 0.0999999E-00

R = 0.1500000E-00

FINITE DIFFERENCES

EL(I)	IZ(I)	I3(K)	I4(K)	I5(K)	J1(K)	J2(K)
0.7499999E-02	-0.2733333E-01	-0.2671665E-01	-0.2341199E-01	-0.2040986E-01	0.3483333E-01	0.1710833E-01

J3(K)	J4(K)	K1(K)	K2(K)	K3(K)	L1(K)	L2(K)
0.3029999E-01	0.0077777E-02	0.1772499E-01	0.1226466E-01	0.9285288E-02	0.6804330E-02	0.5065433E-02

AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE

1/K(R) = 0.4000000E 01

M = 0.1799999E 01

NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.82001874E 01	-0.85972560E 01	-0.94911763E 01	0.40570676E 01
-0.58696458E 01	0.73110541E 01	0.34727361E 01	-0.60698704E 01

CHI 2) SIZE = 2 BY 2

0.85667374E 01	-0.8160885E 01	-0.92178287E 01	0.28994517E 01
-0.14538863E 01	0.18207212E 01	0.14304339E-00	-0.19185340E 01

CHI 3) SIZE = 2 BY 2

0.79666008E 01	-0.39633985E 01	-0.82997753E 01	0.18968119E 01
0.10966189E 01	-0.30490182E-001	-0.10857526E 01	-0.17815797E-001

CHI 4) SIZE = 2 BY 2

0.72746900E 01	-0.24152532E 01	-0.73959825E 01	0.11276747E 01
0.24201058E 01	-0.78480651E 001	-0.25969680E 01	0.31905624E-001

ROUTED CARDS NOS. 1116 0 THRU 1110 8

TELETYPE UNIT

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

CH(1) SIZE = 2 BY 2

0.41085899E 02 -0.17848561E 02I -0.42376889E 02 0.80526985E 01I
0.85083166E 01 -0.32902742E 01I -0.10905226E 02 0.62052464E 00I

0.11986747E 02 -0.40591970E 01I -0.13297591E 02 0.16840269E 01I

CH(3) SIZE = 2 BY 2

CH(4) SIZE = 2 BY 2

0.29772104E 02 -0.48014827E 01I -0.29893397E 02 0.22108020E 01I
0.13175341E 02 -0.24483751E 01I -0.13452203E 02 0.12761046E 01I

STEADY CASE

1/K(R) = 0.

CH(1) SIZE = 2 BY 2
0.81027073E 00 -0.81027073E 00
0.35425846E-00 -0.35425848E-00

0.33116364E-00 -0.33116364E-00

CH(3) SIZE = 2 BY 2

CH(4) SIZE = 2 BY 2
0.55431357E 00 -0.55431357E 00.
0.26746202E-00 -0.26746202E-00

5 AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE
1/K(R) = 0.4000000E 01
M = 0.24999999E 01
NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2
0.61223587E 01 -0.39058710E 01 -0.62933354E 01 0.99004493E 001
0.15446437E 01 0.31125329E-001 -0.20665466E 01 -0.12606335E 011

CHI 2) SIZE = 2 BY 2
0.56652314E 01 -0.27185035E 011 0.57505243E 01 0.71339553E 001
0.19906042E 01 -0.44966330E-011 -0.22760270E 01 -0.74438580E 001

CHI 3) SIZE = 2 BY 2
0.49822141E 01 -0.17355043E 011 -0.49906550E 01 0.46350733E-001
0.206399120E 01 -0.16625692E-001 -0.22060827E 01 -0.51651168E-001

CHI 4) SIZE = 2 BY 2
0.43656130E 01 -0.10551950E 011 -0.43801361E 01 0.29555888E-001
0.20787904E 01 -0.13237961E-001 -0.21390743E 01 -0.23801012E-001

PUNCHED CARDS NOS. MM10 24 THRU MM10 32

ACCOUSTIC INFLUENCE COEFFICIENTS BY SUPER-SONIC STINY THEORY

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

1 = 0.24999999E 01

NUMBER OF STIPES = 4

CHI 1) SIZE = 2 BY 2

0.25403119E 02 -0.78336976E 011 -0.25574115E 02 0.19634566E 011
0.10494554E 02 -0.86506670E 001 -0.11016458E 02 -0.16577762E 011

CHI 2) SIZE = 2 BY 2

0.23111115E 02 -0.54317791E 011 -0.23111115E 02 0.14114305E 011
0.10357052E 02 -0.72755752E 001 -0.10642475E 02 -0.11151575E 011

CHI 3) SIZE = 2 BY 2

0.20402744E 02 -0.34657603E 011 -0.20402744E 02 0.91949302E 001
0.83200000E 01 -0.32197270E 001 -0.32197270E 01 -0.69386080E 001

CHI 4) SIZE = 2 BY 2

0.17530102E 02 -0.21065729E 011 -0.17544626E 02 0.58752020E 001
0.88358944E 01 -0.33709711E-001 -0.88961783E 01 -0.43284714E-001

FINISHED FIBROS NOS. 0010 33 FINISH 0010 41

7
AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

STEADY CASE

1/K(R) = 0.

M = 0.24333091 01
NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 2) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.20614082E-00 -0.20614082E-00

CHI 3) SIZE = 2 BY 2

0.32435972E-00 -0.32435972E-00
0.16648821E-00 -0.16648821E-00

CHI 4) SIZE = 2 BY 2

0.32435972E-00 -0.32435972E-00
0.16648821E-00 -0.16648821E-00

PUNCHED CARDS NO.1. NM10 42 THRU NM10 47

ALGORITHMIC INFLUENCE COEFFICIENTS BY SUPERSONIC SHIP THEORY

INPUT DATA

1. SHIP
2. SHIP NUMBER
3. DESIRED FREQUENCIES

COSINE LAMBDA = 0.80000000E 00
B(R) = 0.64999999E 01
C(T) = 0.80000000E 01
TAN LD = 0.75000000E 00
TAN TR = -0.50000000E 00

SHIP TIP CORRECTION

DELTA Y (I)	B(I)	D(I)
0.46999999E 01	0.12281249E 02	0.11900000E 02
0.51999999E 01	0.95000000E 01	0.89999999E 01
0.56999999E 01	0.78625000E 01	0.73999999E 01
0.61999999E 01	0.64687500E 01	0.58000000E 01

1/K (R) = 0.40000000E 01 0.80000000E 01 0.

SH/C = 0.40000000E 00
SH = 0.40000000E 00

R = 0.15000000E 00

COEFFICIENTS INTEGRALS

J3(K)	J4(K)	K1(K)	K2(K)	K3(K)	L1(K)	L2(K)
0.74999999E-02	-0.27333333E-01	-0.26716665E-01	-0.23411999E-01	-0.20409366E-01	0.34833333E-01	0.17108332E-01
0.10000000E-01	0.88716666E-02	0.11726666E-01	0.17766666E-01	0.92852886E-02	0.58063333E-02	0.50654332E-02

ACCELERATING INFLUENCE COEFFICIENTS BY SUPERSONIC SLIP THEORY

OSCILLATORY CASE

1/K(R) = 0.4000000E 01
N = 0.1799999E 01
NUMBER OF SLIPS = 4

CHI 1) SIZE = 2 BY 2

0.82001874E 01	-0.85972560E 01	-0.94911763E 01	0.40570676E 01
-0.58696458E 01	0.73110541E 01	0.34727361E 01	-0.60698704E 01
CHI 2) SIZE = 2 BY 2			
0.25000000E 01	-0.81057104E 01	-0.22154157E 01	0.28972358E 01
-0.14499702E 01	0.18151077E 01	0.14196405E-00	-0.19130098E 01

CHI 3) SIZE = 2 BY 2

0.10000000E 01	-0.31057104E 01	-0.81057104E 01	0.17002901E 01
0.00000000E 00	-0.27371000E-001	-0.14001600E 01	-0.13547597E-001

CHI 4) SIZE = 2 BY 2

0.60005280E 01	-0.19105424E 01	-0.60936828E 01	0.84950338E 001
0.68430612E 00	-0.25560378E-001	-0.81209405E 00	0.10747413E-001

UNRECORDED CARDS MOD. 10/10 ON TREC II 1010 54

AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

M = 0.1799999E 01

NUMBER OF STRIPS = 4

CH(1) SIZE = 2 BY 2

0.41085899E 02 -0.17848561E 021 -0.42376889E 02 0.80526985E 011
0.85083166E 01 -0.32902742E 011 -0.10905226E 02 0.62052464E 001

CH(2) SIZE = 2 BY 2

0.38913001E 02 -0.12433063E 021 -0.38974453E 02 0.56485263E 011
0.11960503E 02 -0.40507598E 011 -0.13268510E 02 0.16807653E 011

CH(3) SIZE = 2 BY 2

0.33479501E 02 -0.78497550E 011 -0.33789770E 02 0.35371212E 011
0.10972031E 02 -0.28939713E 011 -0.11516255E 02 0.14693199E 011

CH(4) SIZE = 2 BY 2

0.24600406E 02 -0.38357250E 011 -0.246933561E 02 0.16956007E 011
0.45326774E 01 -0.91177386E 001 -0.46604652E 01 0.50467691E 001

PUNCHED CARDS NOS. MM10 57 THRU MM10 65

AERODYNAMIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

STEADY CASE

1/K(R) = 0.

M = 0.1759599E 01
NUMBER OF STRIPS = 4

CH(1) SIZE = 2 BY 2

0.81027073E 00 -0.81027073E 00
0.35425846E-00 -0.35425848E-00

CH(2) SIZE = 2 BY 2

0.73322029E 00 -0.73322029E 00
0.33042052E-00 -0.33042052E-00

CH(3) SIZE = 2 BY 2

0.63104034E 00 -0.63104034E 00
0.24020923E-00 -0.24020923E-00

CH(4) SIZE = 2 BY 2

0.45828220E-00 -0.45828220E-00
0.94819973E-01 -0.94819972E-01

PUNCHED CARDS NOS. MM10 66 THRU MM10 71

OSCILLATORY CASE

1/K(R) = 0.4000000E 01
 R = 0.2000000E 01
 NUMBER OF STEPS = 4

CHI 1) SIZE = 2 BY 2
 0.61223587E 01 -0.39058710E 01 0.62933545E 01 0.99004493E 001
 0.15446437E 01 0.31125329E-001 -0.20665466E 01 -0.12606335E 01

CHI 2) SIZE = 2 BY 2
 0.19906042E 01 -0.44966330E-011 -0.22760270E 01 -0.74438580E 001
 0.61223587E 01 -0.39058710E 01 0.62933545E 01 0.99004493E 001

CHI 3) SIZE = 2 BY 2
 0.38625441E 01 -0.92699184E 001 -0.38768674E 01 0.25476145E-001
 0.10431063E 01 -0.32136280E-011 -0.10783541E 01 -0.15464710E-001

CHI 4) SIZE = 2 BY 2
 0.38625441E 01 -0.92699184E 001 -0.38768674E 01 0.25476145E-001
 0.10431063E 01 -0.32136280E-011 -0.10783541E 01 -0.15464710E-001

UNMATCHED CAPSIDS MSG: MHI0 72 IRRU MHI0 80

ACOUSTIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

OSCILLATORY CASE

1/K(R) = 0.8000000E 01

A = 0.2499999E 01

NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.25403119E 02 -0.78336976E 01 -0.25574115E 02 0.19634566E 01
0.10494554E 02 -0.86506670E 00 -0.11016458E 02 -0.16577762E 01

CHI 2) SIZE = 2 BY 2

0.23101005E 02 -0.34317257E 01 -0.23101005E 02 0.16114305E 01
0.10357052E 02 -0.72755752E 00 -0.10642475E 02 -0.11151575E 01

CHI 3) SIZE = 2 BY 2

0.20004375E 02 -0.34434337E 01 -0.20043153E 02 0.01635434E 00
0.03130550E 01 -0.51303730E 00 -0.00000296E 01 -0.68564665E 00

CHI 4) SIZE = 2 BY 2

0.15526666E 02 -0.18542319E 01 -0.15540989E 02 0.50872150E 00
0.44747236E 01 -0.10564039E-001 -0.4509715E 01 -0.28471817E-001

PUNCHED CARDS NOS. 1010 01 1010 01 1010 01 1010 01

ACROUSTIC INFLUENCE COEFFICIENTS BY SUPERSONIC STRIP THEORY

STEADY CASE

1/K(R) = 0.

N = 0.249979E 01
NUMBER OF STRIPS = 4

CHI 1) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 2) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 3) SIZE = 2 BY 2

0.47505847E-00 -0.47505847E-00
0.22051676E-00 -0.22051676E-00

CHI 4) SIZE = 2 BY 2

0.28739219E-00 -0.28739219E-00
0.84551580E-01 -0.84551579E-01

PUNCHED CARDS NOS. MM10 90 THRU MM10 95

B. Punched Output

1. A deck of punched cards (output) from this program is suitable as an input deck to other programs requiring the use of AICs.
2. All punched output is sequenced in order on Columns 73 through 80 starting with HM100000. The data appear in the following order:
 - a. Card 1 contains $(V/b_r \omega)_1$ and M_1 (FORMAT 6E12.8).
 - b. Card 2 contains m , the size (number of control points) of the AIC matrix and n , the number of strips (partitions) FORMAT (18I4).
 - c. The AIC matrix punched in column binary form and its TRA card make up the remainder of the punched output for $(V/b_r \omega)_1$.
3. The order of statement (2) is repeated for all Mach numbers and reduced velocities per input deck.
4. Each matrix is punched in compact form by columns. Column 1 begins in origin 1 and Column 2 in location $(1 + \text{matrix size})$.
5. The oscillatory matrix is punched in the order: Column 1 (real), Column 1 (imaginary); Column 2 (real), Column 2 (imaginary); Column m (real), Column m (imaginary). In the steady case, all columns are real and are punched in order.

SECTION V
PROCESSING INFORMATION

A. Operation

STANDARD FORTRAN MONITOR system

B. Estimated Machine Time

T = time in minutes

ISTRIP = number of strips

JMACH = number of Mach numbers

KVBRW = number of reduced velocities

n = number of sets (decks) of input data

$$T = .5 + .03 \left[(ISTRIP \cdot JMACH \cdot KVBRW)_1 + (ISTRIP \cdot JMACH \cdot KVBRW)_2 \right. \\ \left. + \cdot + \cdot + (ISTRIP \cdot JMACH \cdot KVBRW)_n \right]$$

C. Machine Components Used

Core storage: 6772

Standard FORTRAN input tape (NTAPE 2)

Standard FORTRAN output print tape (NTAPE 3)

Standard FORTRAN punch tape (NTAPE 7)

SECTION VI
PROGRAM NOTES

A. Subroutines Used

RDLN: reads and prints title cards

AEROP3: punch AIC matrix

BINPU: column binary punch

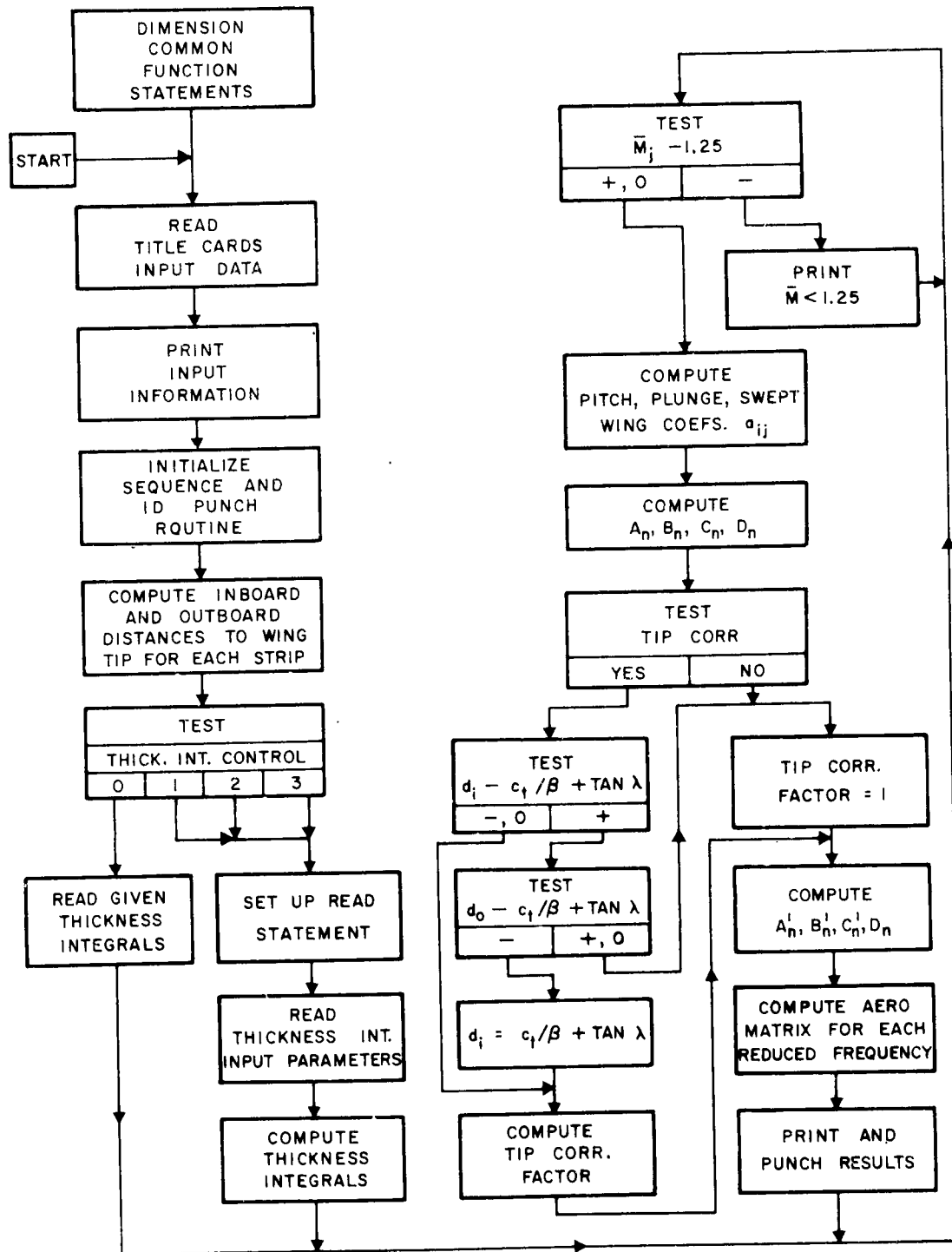
All other subroutines used are on library tapes.

B. Generalized Tapes

Input, print, and punch tapes in this coding are defined as Units 2, 3, and 12 respectively; however, these may be altered by placing the desired units on symbolic cards HM100054, HM100055, and HM100056.

SECTION VII

FLOW DIAGRAM



SECTION VIII

SYMBOLIC LISTING

A partial list of the principal FORTRAN symbols used in the program may be related to the physical notation as follows:

<u>FORTRAN Notation</u>	<u>Physical Notation</u>
BI	b_i
DI	d_i
DELY	Δy
XMACHS	M_N
VBRW	$V/b_r \omega$
XMC	x_m/c
TAU	τ
AR	r
DISTO	d_o
DISTI	d_i
CHI	C_{h_i}
XLHO	L_{h_o}
XLAO	L_{a_o}
XMAO	M_{a_o}
XMHO	M_{h_o}
AI1, AI2, ..., AIN	$I_1, I_2, \dots, I_n$
AJ1, AJ2, ..., AJN	$J_1, J_2, \dots, J_n$
AK1, AK2, ..., AKN	$K_1, K_2, \dots, K_n$

SYMBOLIC LISTING (continued)

<u>FORTRAN Notation</u>	<u>Physical Notation</u>
AL1, AL2,...,ALN	$L_1, L_2, \dots, L_n$
B	β
BB1, BB2,...,BBN	$B_1, B_2, \dots, B_n$
C1, C2,...,CN	$C_1, C_2, \dots, C_n$
D1, D2,...,DN	$D_1, D_2, \dots, D_n$
FF1, FF2,...,FFN	$f_1, f_2, \dots, f_n$
ISTRIP	Number of strips
JMACH	Number of Mach numbers
KVBRW	Number of reduced frequencies
ISTHK	Thickness integral control
ISTIP	Tip correction control
NO PUNJ	Punch control
BR	b_r
SMS	s
CAPS	S
CBAR	$\bar{c}$
CT	c_t
TANLA	$\tan \Lambda$
TANLAM	$\tan \lambda$
COSLA	$\cos \Lambda$

The complete symbolic listing is given on the following pages.

ACRODYNAMIC INFLUENCE COEFFICIENTS

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SUPERSONIC STRIP THEORY

1 HM100001
2 HM100002
3 HM100003
4 HM100004
5 HM100005
6 HM100006
7 HM100007
8 HM100008
9 HM100009
10 HM100010
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ALGEBRAIC INFLUENCE COEFFICIENTS 4/98/62

14 FORMAT (37H1 M BAR IS LESS THAN 1.25, M BAR = 1F6.3) HM100038
 15 FORMAT (1H0 47X, 18H OSCILLATORY CASE) HM100039
 16 FORMAT (1H0 49X, 18H STEADY CASE) HM100040
 17 FORMAT (1H 41X, 9H1/KIR) 1E16.8 / 1H 43X, 7H M 1E16.8 /HM100041
 18 FORMAT (1H 44X, 10HNUMBER OF SERIES = 1E3) HM100042
 19 FORMAT (1H0 44X, 3HCH1 1I2, 15H) SIZE = 2 BY 2) HM100043
 20 FORMAT (1H 36X, 2E17.8) HM100044
 21 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100045
 22 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100046
 23 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100047
 24 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100048
 25 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100049
 26 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100050
 27 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100051
 28 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100052
 29 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100053
 30 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100054
 31 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100055
 32 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100056
 33 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100057
 34 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100058
 35 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100059
 36 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100060
 37 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100061
 38 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100062
 39 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100063
 40 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100064
 41 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100065
 42 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100066
 43 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100067
 44 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100068
 45 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100069
 46 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100070
 47 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100071
 48 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100072
 49 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100073
 50 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100074
 51 FORMAT (1H 19X, 2E16.8, 5H1 2E16.8, 1H1) HM100075

LOGS(FIX)=LOG(FIX)
 SOME(CA,B,C,D,E,F)=DAG K /A*(B C*(D+E*F))

C NTAPE 2 = INPUT TAPE
 C NTAPE 3 = PRINT OUTPUT TAPE
 C NTAPE 7 = PUNCH OUTPUT TAPE

NTAPE2 = 2
 NTAPE3 = 3
 NTAPE7 = 12

JTRD=2
 NCARDS=80
 GAMB=1.4

50 CALL RDLN (NTAPE2, NTAPE3, 1)
 CALL RDLN (NTAPE2, NTAPE3, 2)
 READ INPUT TAPE NTAPE2, 1, ISTRIP, JMACH, KVBW, ISTRK, ISTRIP, NOPUNJ HM100063
 READ INPUT TAPE NTAPE2, 2, BR, SMS, CAPS, CBAR, CT, TANLA, TANLAM, COSL HM100064
 READ INPUT TAPE NTAPE2, 2, (DEL(I), I=1, ISTRIP) HM100065
 READ INPUT TAPE NTAPE2, 2, (DEL(I), I=1, ISTRIP) HM100066
 READ INPUT TAPE NTAPE2, 2, (DEL(I), I=1, ISTRIP) HM100067
 READ INPUT TAPE NTAPE2, 2, (JMACHS(J), J=1, JMACH) HM100068
 READ INPUT TAPE NTAPE2, 2, (VBRW(K), K=1, KVBW) HM100069
 WRITE OUTPUT TAPE NTAPE3, 3 HM100070
 WRITE OUTPUT TAPE NTAPE3, 4, ISTRIP, JMACH, KVBW, COSL A, BR, SMS, HM100071
 CAPS, CBAR, CT, TANLA, TANLAM HM100072
 IF (ISTRIP) 51, 52, 51 HM100073
 51 WRITE OUTPUT TAPE NTAPE3, 5, HM100074
 GOTO. 53 HM100075


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JTAU=1
KGAMA=1
HM100114
HM100115
HM100116
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HM100123
HM100124
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HM100199
HM100200

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145.0*XMC2-20.0*XMC3,XMC6)
ALL(K)=SOMEF(120.0,10.0-5.0*XMC2+2.0*XMC3,ARE,3.0-10.0*XMC(1),
PRO,XMC2-5.0*XMC4-2.0*XMC5)
ALL(2)=SOMEF(240.0,15.0-5.0*XMC2+XMC4,ARE,5.0-16.0*XMC(1),
115.0*XMC2-5.0*XMC6,XMC6)
HM100152
HM100153
HM100154
HM100155
HM100156
HM100157
77 CONTINUE

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~~INCREASE CONCERNS DUE TO PUGH-PUNGE-SWEEP~~

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60 WRITE OUTPUT TAPE NTAPE3, IZ, (A(I),A(2I),A(3I),A(4I),A(5I),A(6I),A(7I),A(8I),A(9I),A(10I))
      , A(11I),A(12I),K=1,JTAU)
1
WRITE OUTPUT TAPE NTAPE3, I3, (AJ3(K),AJ4(K),AK1(K),AK2(K),AK3(K),HM100163
      ,AL1(K),AL2(K),K=1,JTAU)
1

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80 106 351, 352CH
80 352CHS (1) 106CHS 1A
IF (EM 1.25) 70, 71, 71
70 WRITE OUTPUT TAPE NTAPE3, 14, EM
GOTO 106

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01 002-00000
0-50000 (002-1.0)
02-0000
03-02*8
04-02*82
05-02*83
06-03*83
07-03*84

A01=-4.0/8*COSLA	HM100182
A02=-4.0/82*(EM2*EN-2.0)	HM100183
A11=8.0/83*(2.0-EM2)*COSLA	HM100184
A12=8.0/84*COSLA	HM100185
A13=16.0/EM2/85*(EN-1.0)	HM100186
A14=8.0/86*(EM2*EN-2.0)	HM100187
A15=8.0/84*(2.0-EM2)*(EM2*EN-1.0)	HM100188
A21=4.0/85*(EM2+2.0)*COSLA	HM100189
A22=16.0/83*COSLA	

```

      A23=8.0*EM2/B6*(3.0*(3.0*EM2-2.0)*EN-2.0*(5.0*EM2-3.0))
      A24=8.0*EM2/B4*(4.0*EN-5.0)
      A25=8.0*EM2/B6*(15.0*(3.0*EM2-2.0)*EN-9.0*(2.0*EM2-3.0))
      A26=16.0*EM2/B4*(EN-1.0)
      A27=8.0*EM2/B6*(15.0*(3.0*EM2-2.0)*EN-4.0)
      A31=-8.0*EM2/(3.0*86*8)*(EM2+4.0)*COSLA
      A32=-24.0*EM2/B5*COSLA
      A33=16.0*EM2/B8*((17.0*EM2*EM2-10.0*EM2-4.0)*EN-(5.0*EM2
      1-2.0)*16.0*EM2-1.0))
      A34=16.0*EM2/B6*(15.0*EM2-15.0*EM2-2.0)*EN)
      A35=16.0*EM2/B8*(17.0*EM2*(2.0*EM2-1.0)-(17.0*EM2*EM2-3.0*EM2
      1-4.0)*EN)
      A36=8.0*EM2/B6*(2.0*(EM2+1.0)-(EM2+8.0)*EN)
      A37=8.0*EM2/B8*(3.0*EM2+2.0)-(3.0*EM2+4.0)*EN)
      A38=8.0*EM2/B6*(2.0*(EM2+1.0)-3.0*EM2*EM)
      A39=8.0*EM2/(3.0*88)*(15.0*EM2+2.01-EM2*EN*(EM2+4.0))
      DO 72 I=1,JTAU
      A2(I)=-.125*(.5*A22+AJ1(I)*A24+AI2(I)*A26)
      A3(I)=-.125*(A12+AI1(I)*A14)
      A4(I)=-.125*(1.0/3.0*A32+AK1(I)*A34+AJ2(I)*A36+AI3(I)*A38)
      A5(I)=-.25*(A01+AI1(I)*A02)
      A6(I)=-.25*(1.0/3.0*A21+AK1(I)*A23+AJ2(I)*A25+AI3(I)*A27)
      B83(I)=-.25*(.5*AI1+AJ1(I)*AI3+AI2(I)*AI5)
      B84(I)=-.25*(.5*A31+AI1(I)*A33+AK2(I)*A35+AJ3(I)*A37
      1+AI4(I)*A39)
      C2(I)=-.25*(1.0/3.0*EM2+AK2(I)*A28+AI3(I)*A26)
      C3(I)=-.25*(.5*A12+AJ2(I)*AI4)
      C4(I)=-.25*(.5*A32+AK2(I)*A34+AJ3(I)*A36+AI4(I)*A38)
      D1(I)=5*(.5*A01+AI2(I)*A02)
      D2(I)=5*(.25*A21+AK2(I)*A23+AJ3(I)*A25+AI4(I)*A27)
      D3(I)=5*(1.0/3.0*AI1+AJ2(I)*AI3+AI3(I)*AI5)
      D4(I)=5*(1.0/3.0*AI1+AJ2(I)*A23+AK3(I)*A33+AJ4(I)*A37+AI5(I)*A39)
      IF CONTINUE
      TIP CORRECTION
      .636619772 = 2/PI
      DO 90 I=1,ISTRIP

```


ACRODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

R13=BETA3/2*(.5*DIST12*(1./TANL2-1./BETA2)+2./TANL3
1*CT*DIST11(I)-3./TANL4*CT2*LOGEF(CTDO/CTDI)+CT3/TANL4*

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HM100305

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HM100337

HM100338
HM100339

HM100340
HM100341

RMN COMMON

81 CONTINUE

R10=.5*(2.*CT*(DIST11(I)-DISTO(I))-(DIST12-DISTO2)*(BETA+
TANLAM))

R20=1.0/6.0*(3.0*CT2*(DIST11(I)-DISTO(I))-3.0*CT1*TANLAM*(DIST12-
DISTO2)-(DIST13-DISTO3)*(BETA2-TANL2))

R21=BETA*(1.0/3.0*(DIST13-DISTO3)*(BETA+TANLAM)-.5*(DIST12
1-DISTO2)*CT)

R30=1.0/12.0*(4.0*CT3*(DIST11(I)-DISTO(I))-6.0*CT2*TANLAM*
1-DIST12-DISTO2)+.0*CT1*TANL2*(DIST13-DISTO3)-(DIST14-DISTO4)*

R31=BETA/2.0*(.25*(DIST14-DISTO4)*(BETA2-TANL2)+2.0/3.0*(DIST13
1-DISTO3)*CT1*TANLAM-.5*(DIST12-DISTO2)*CT2)

R32=BETA2*(-.25*(DIST14-DISTO4)*(BETA+TANLAM)+1.0/3.0*(DIST13
1-DISTO3)*CT)

R40=.05*(5.0*CT4*(DIST11(I)-DISTO(I))-10.0*CT3*TANLAM*(DIST12
1-DISTO2)+10.0*CT2*TANL2*(DIST13-DISTO3)-5.0*CT1*TANL3*
1-DIST14-DISTO4)-(DIST15-DISTO5)*(BETA4-TANL4))

R41=BETA/3.0*(.2*(DIST15-DISTO5)*(BETA3+TANL3)-.75*(DIST14
1-DISTO4)*CT1*TANL2+(DIST13-DISTO3)*CT2*TANLAM-.5*(DIST12
2-DISTO2)*CT3)

R42=BETA/2.0*(.2*(DIST15-DISTO5)*(BETA2-TANL2)-.5*(DIST14
1-DISTO4)*CT1*TANLAM+1.0/3.0*(DIST13-DISTO3)*CT2)

R43=BETA3*(-.2*(DIST15-DISTO5)*(BETA+TANLAM)-.25*
1-DIST14-DISTO4)*CT)

R50=1.0/30.0*(6.0*CT5*(DIST11(I)-DISTO(I))-15.0*CT4*TANLAM*
1-DIST12-DISTO2)+20.0*CT3*TANL2*(DIST13-DISTO3)-15.0*

REFRORYNANJIC INFILUTNCE CBF F I C I E N T S 4/06/62		
TANL5=TANL2*TANL3	HM100380	
TANL6=TANL3*TANL3	HM100381	
TANL7=TANL3*TANL5	HM100382	
TANL8=TANL4*TANL4	HM100383	
TANL9=TANL4*TANL5	HM100384	
TANL10=TANL5*TANL5	HM100385	
TANL11=TANL5*TANL6	HM100386	
TANL12=TANL6*TANL6	HM100387	
TANL13=TANL6*TANL7	HM100388	
TANL14=TANL7*TANL7	HM100389	
TANL15=TANL8*TANL7	HM100390	
	HM100391	
	HM100392	
	HM100393	
	HM100394	
03 CONTINUE	HM100395	
R11=RETA2/2.0*(DISTO2*LOGF(CID07/(BETA*DISTO1))) -DIST12*LOGFF(CID01HM100395	HM100396	
17(BETA*DES1111))-CF2*(1.5*RAT2+TANL4H/3.0*	HM100397	
2RAT3+TANL2/4.0*RAT4+TANL3/5.0*RAT5+TANL4/6.0*RAT6+TANL5/7.0*	HM100398	
3RAT7+TANL6/8.0*RAT8+TANL7/9.0*RAT9+TANL8/10.0*RAT10+TANL9/11.0*	HM100399	
4RAT11))	HM100400	
R12=RETA2*(1.5/RETA1*(DIST12-DISTO2))-CF2*(1.0/3.0*RAT13*	HM100401	
1TANL4H/4.0*RAT4+TANL5/5.0*RAT5+TANL6/6.0*RAT6+TANL7/7.0*RAT7*	HM100402	
2TANL8/8.0*RAT8+TANL9/9.0*RAT9+TANL10/10.0*RAT10+TANL11/11.0*RAT11*	HM100403	
3TANL12/12.0*RAT12))	HM100404	
R13=.5*BETA3*(-.5/RETA2*(DIST12-DISTO2))+1.0/(CID1*CID00)*{	HM100405	
1(DIST14-DISTO4))-DIST11(1)*DISTO1)/CT*TANLAM*(DIST13-DISTO3))-3.0	HM100406	
2*CT2*(1.25*RAT4+TANL4H/5.0*RAT5+TANL5/6.0*RAT6+TANL6/7.0*RAT7	HM100407	
3*TANL7/8.0*RAT8+TANL8/9.0*RAT9+TANL9/10.0*RAT10+TANL11/11.0*RAT11*	HM100408	
4TANL12/12.0*RAT12+TANL9/13.0*RAT13))	HM100409	
R22=BETA2/3.0*(DIST13*LOGF(CID17/(BETA*DIST11))) -DISTO3*	HM100410	
1LOGF(CIDG/(BETA*DISTO1)))+CT3*(1.0/3.0*RAT3+.25*TANLAM*RAT4+	HM100411	
2TANL2/5.0*RAT5+TANL3/6.0*RAT6+TANL4/7.0*RAT7+TANL5/8.0*RAT8+	HM100412	
3TANL6/9.0*RAT9+TANL7/10.0*RAT10+TANL8/11.0*RAT11+TANL9/12.0*RAT12	HM100413	
4TANL10/13.0*RAT13)	HM100414	
R23=BETA3*(-1.0/13.0*BETA)*DIST13-DISTO3)+CF3*(1.25*RAT6+TANL4H	HM100415	
1/5.0*RAT5+TANL2/6.0*RAT6+TANL3/7.0*RAT7+TANL4/8.0*RAT8	HM100416	
2+TANL5/9.0*RAT9+TANL6/10.0*RAT10+TANL7/11.0*RAT11+TANL8/	HM100417	
312.0*RAT12+TANL9/13.0*RAT13))		

C SERIES SOLUTIONS FOR VARIOUS RMN

IF (DISTO1)) 83,84,83

R33=.25*8BETA3*(DISTO4+LOGEF(CTO0/(BETA*DISTO(1)))-DISTI4*
 1LOGEF(CTDI/(BETA*DISTI(1)))-CT4*(.25*RAT4+TANLAM/5.0*RAT5+
 1CTANL2+TANL5/7.0*RAT6+TANL7/11.0*RAT7+TANL8/12.0*RAT8+
 1CTANL9+TANL10.0*RAT9+TANL11.0*RAT10+TANL12.0*RAT11+
 1CTANL13.0*RAT12+TANL14.0*RAT13+TANL15.0*RAT14+TANL16.0*RAT15+
 1CTANL17.0*RAT16+TANL18.0*RAT17+TANL19.0*RAT18+TANL20.0*RAT19+
 1CTANL21.0*RAT20+TANL22.0*RAT21+TANL23.0*RAT22+TANL24.0*RAT23+
 1CTANL25.0*RAT24+TANL26.0*RAT25+TANL27.0*RAT26+TANL28.0*RAT27+
 1CTANL29.0*RAT28+TANL30.0*RAT29+TANL31.0*RAT30+TANL32.0*RAT31+
 1CTANL33.0*RAT32+TANL34.0*RAT33+TANL35.0*RAT34+TANL36.0*RAT35+
 1CTANL37.0*RAT36+TANL38.0*RAT37+TANL39.0*RAT38+TANL40.0*RAT39+
 1CTANL41.0*RAT40+TANL42.0*RAT41+TANL43.0*RAT42+TANL44.0*RAT43+
 1CTANL45.0*RAT44+TANL46.0*RAT45+TANL47.0*RAT46+TANL48.0*RAT47+
 1CTANL49.0*RAT48+TANL50.0*RAT49+TANL51.0*RAT50+TANL52.0*RAT51+
 1CTANL53.0*RAT52+TANL54.0*RAT53+TANL55.0*RAT54+TANL56.0*RAT55+
 1CTANL57.0*RAT56+TANL58.0*RAT57+TANL59.0*RAT58+TANL60.0*RAT59+
 1CTANL61.0*RAT60+TANL62.0*RAT61+TANL63.0*RAT62+TANL64.0*RAT63+
 1CTANL65.0*RAT64+TANL66.0*RAT65+TANL67.0*RAT66+TANL68.0*RAT67+
 1CTANL69.0*RAT68+TANL70.0*RAT69+TANL71.0*RAT70+TANL72.0*RAT71+
 1CTANL73.0*RAT72+TANL74.0*RAT73+TANL75.0*RAT74+TANL76.0*RAT75+
 1CTANL77.0*RAT76+TANL78.0*RAT77+TANL79.0*RAT78+TANL80.0*RAT79+
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 1CTANL753.0*RAT752+TANL754.0*RAT753+TANL755.0*RAT754+TANL756.0*RAT755+
 1CTANL757.0*RAT756+TANL758.0*RAT757+TANL759.0*RAT758+TANL760.0*RAT759+
 1CTANL761.0*RAT760+TANL762.0*RAT761+TANL763.0*RAT762+TANL764.0*RAT763+
 1CTANL765.0*RAT764+TANL766.0*RAT765+TANL767.0*RAT766+TANL768.0*RAT767+
 1CTANL769.0*RAT768+TANL770.0*RAT769+TANL771.0*RAT770+TANL772.0*RAT771+
 1CTANL773.0*RAT772+TANL774.0*RAT773+TANL775.0*RAT774+TANL776.0*RAT775+
 1CTANL777.0*RAT776+TANL778.0*RAT777+TANL779.0*RAT778+TANL780.0*RAT779+
 1CTANL781.0*RAT780+TANL782.0*RAT781+TANL783.0*RAT782+TANL784.0*RAT783+
 1CTANL785.0*RAT784+TANL786.0*RAT785+TANL787.0*RAT786+TANL788.0*RAT787+
 1CTANL789.0*RAT788+TANL790.0*RAT789+TANL791.0*RAT790+TANL792.0*RAT791+
 1CT

4706762
AEROBIC INFLUENCE COEFFICIENTS

Q4=E *R40+E1*R41+E2*R42+E3*R43
Q5=E *R50+E1*R51+E2*R52+E3*R53

HM100456
HM100457

HM100458
HM100459

HM100460
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HM100462
HM100463

HM100464
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HM100466
HM100467

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HM100489

HM100490
HM100491

HM100492
HM100493

FF3=1.-.375/(BI(I)*3*DELY(I))*(Q3+2.*EEE*Q2+EEE*EEE*Q1)
FF4=1.-.25/(BI(I)*4*DELY(I))*(Q4+3.*EEE*Q3+3.*(EEE*EEE)*Q2+
1EEE*(EEE*EEE)*Q1)
Q4=1.-.57/(BI(I)*3*DELY(I))*(Q3+2.*EEE*Q2+EEE*EEE*Q1)
Q5=1.-.25/(BI(I)*4*DELY(I))*(Q4+3.*EEE*Q3+3.*(EEE*EEE)*Q2+
1EEE*(EEE*EEE)*Q1)

86 L=1
IF (JTAU-[STRIP) 89,88,89
88 L=1

A4(I)=FF3*A4(L)
B81(I)=FF1*B81(L)
B82(I)=FF3*B82(L)
C3(I)=FF2*C3(L)
C4(I)=FF4*C4(L)
D1(I)=FF2*D1(L)

90 CONTINUE

91 DO 105 K=1,KVBRW
WRITE OUTPUT TAPE NTAPES, 3
IF (K=1) 93,94
92 WRITE OUTPUT TAPE NTAPES, 15
GOTO 94

93 WRITE OUTPUT TAPE NTAPES, 16

AERODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

94 WRITE OUTPUT TAPE NTAPE3, 17, VBRW(K), XMACHS(J), ISTRIP

DO 103 I=1, ISTRIP

IF (VBRW(K)) 97, 97, 98

C OSCILLATORY AERODYNAMIC COEFFICIENTS-STEADY CASE

97

XLAO(2)=0.

XMHO(1)=0.

XMHO(2)=0.

98

CAY=BI(1)/(VBRW(K)*BR)

GOTO 99

98

XLAO(2)=RB3(1)/CAY+BB4(1)*CAY

XMHO(1)=C2(1)

XMHO(2)=C3(1)/CAY+C4(1)*CAY

99

ZEE=BI(1)/DI(1)

WHY=1.0+.5*ZEE

99

CH(1,N+2,I)=EX*(-.5*ZEE*WHY*XLHO(N)+.5*(ZEE**2)*XMHO(N)+ZEE*WHY

*XLAO(N)-ZEE**2*XMHO(N))

1 CH(2,N,I)=EX*(-.5*ZEE*WHY*XLHO(N)+ZEE*WHY*XMHO(N)+.5*(ZEE**2)

*XLAO(N)-ZEE**2*XMHO(N))

99

99

99

99

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99

AEROODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

1 *XLAO(N)-(ZEE**2)*XMAO(N)) HM100532

CH(2,N+2,1)=EX*((ZEE**2)*(.25*XLHO(N)-.5*(XLAO(N)+XMHO(N)))+ HM100533

HM100534

100 CONTINUE HM100535

HM100536

M=M+1 HM100537

WRITE OUTPUT TAPE NTAPE3, 18, M HM100538

IF (VBRW(K)) 101,101,102 HM100539

101 WRITE OUTPUT TAPE NTAPE3, 19, CH(1,1,1),CH(1,3,1),CH(2,1,1), HM100540

CH(2,3,1) HM100541

1 GOTO 103 HM100542

102 WRITE OUTPUT TAPE NTAPE3, 20, ((CH(1,1,1),12,1),12=1,4),11=1,2) HM100543

HM100544

103 CONTINUE HM100545

IF (NORUN) 105,104,105 HM100546

104 CALL AEROP3 (VBRW(K),XNACHS(I,J),CH,ISTRIP,NCARDS,NTAPE3,NTAPE7) HM100547

HM100548

HM100549

105 CONTINUE HM100550

106 CONTINUE HM100551

HM100552

0010 50

(0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0)

STORAGE NOT USED BY PROGRAM

DEC	OCT	DEC	OCT
5434	12472	11836	76734

STORAGE LOCATIONS FOR VARIABLES APPEARING IN COMMON STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT	
A11	32361	77151	A12	32336	77120	A13	32311	77067
A15	32346	76610	A16	32311	76557	A17	32086	76526
A14	32211	76723	AK1	32186	76672	AR	32286	77036
CH	32036	76444	DELY	32511	77377	DI	32536	77430
DISTO	32261	77005	TAU	32386	77202	VBRW	32461	77315
XMC	32411	77233				BI	32561	77461
						DIST1	32236	76754
						XMACHS	32486	77346

STORAGE LOCATIONS FOR VARIABLES APPEARING IN DIMENSION AND EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT	
A2	5408	12440	A3	5333	12325	A4	5258	12212
AK3	5398	12356	AL1	5203	12243	AL2	5183	12077
BB2	5088	11620	BB3	4933	11585	BB4	4908	11454
C3	5133	12015	C4	5033	11651	DI	5158	12046
D3	4983	11567	D4	4958	11536	XLAO	5308	12274
XMAO	5108	11764	XMHO	5208	12130	XLHO	5383	12407

STORAGE LOCATIONS FOR VARIABLES NOT APPEARING IN COMMON, DIMENSION, OR EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT	
A01	4883	11423	A02	4882	11422	A11	4881	11421
A13	4879	11417	A14	4878	11416	A15	4877	11415
A22	4875	11413	A23	4874	11412	A24	4873	11411
A26	4871	11407	A27	4870	11406	A31	4869	11405
A33	4867	11383	A34	4866	11402	A35	4865	11401
A37	4863	11377	A38	4862	11376	A39	4861	11375
ARE	4859	11373	B2	4858	11372	B3	4857	11371
B5	4855	11367	B6	4854	11366	B8	4853	11365
BETA3	4851	11363	BETA4	4850	11362	BETA5	4849	11361
BR	4847	11357	B	4846	11356	CAPS	4845	11355
						B4	4856	11370
						BETA2	4852	11364
						BETA	4848	11360
						CAY	4844	11354

AEROBYNAMICS INFORMATION COEFFICIENTS 4/06/62											
CBAR	4843	11353	COSLA	4842	11352	CT2	4841	11351	CT3	4840	11350
CT4	4839	11347	CT5	4838	11346	CT6	4837	11345	CT7	4836	11344
CT8	4835	11343	CT9	4834	11342	CT10	4833	11341	CT11	4832	11340
DEEP	4831	11337	DIST12	4830	11336	DIST13	4829	11335	DIST14	4828	11334
DIST15	4827	11333	DIST16	4826	11332	DIST17	4825	11331	DIST18	4824	11330
DIST19	4823	11327	DIST20	4822	11326	DIST21	4821	11325	DIST22	4820	11324
DIST23	4819	11323	DIST24	4818	11322	DIST25	4817	11321	DIST26	4816	11320
E2	4815	11317	E3	4814	11316	EEE	4813	11315	EM2	4812	11314
EM	4811	11313	EN	4810	11312	EX	4809	11311	FF1	4808	11310
F1	4807	11307	F2	4806	11306	FF1	4805	11305	FF2	4804	11304
FF3	4803	11303	FF4	4802	11302	FF5	4801	11301	GAMA	4800	11300
I	4799	11277	ISTHK	4798	11276	ISTIP	4797	11275	ISTRIP	4796	11274
IXMC	4795	11273	JMACH	4794	11272	JTAU	4793	11271	JTWO	4792	11270
KGAMA	4791	11267	K	4790	11266	KVBRW	4789	11265	L	4788	11264
M	4787	11263	NCARDS	4786	11262	NOFUNG	4785	11261	NTAPE2	4784	11260
NTAPE3	4783	11257	NTAPE7	4782	11256	Q1	4781	11255	Q2	4780	11254
Q3	4779	11253	Q4	4778	11252	Q5	4777	11251	R10	4776	11250
R11	4775	11247	R12	4774	11246	R13	4773	11245	R20	4772	11244
R21	4771	11243	R22	4770	11242	R23	4769	11241	R30	4768	11240
R31	4767	11237	R32	4766	11236	R33	4765	11235	R40	4764	11234
R41	4763	11233	R42	4762	11232	R43	4761	11231	R50	4760	11230
R51	4759	11227	R52	4758	11226	R53	4757	11225	RATIO	4756	11224
RAT11	4755	11223	RAT12	4754	11222	RAT13	4753	11221	RAT14	4752	11220
RAT15	4751	11217	RAT1	4750	11216	RAT2	4749	11215	RAT3	4748	11214
RAT4	4747	11213	RAT5	4746	11212	RAT6	4745	11211	RAT7	4744	11210
RAT8	4743	11207	RAT9	4742	11206	SAVE	4741	11205	SMS	4740	11204
TANL10	4739	11203	TANL11	4738	11202	TANL12	4737	11201	TANL13	4736	11200
TANL14	4735	11197	TANL15	4734	11196	TANL16	4733	11195	TANL17	4732	11194
TANL18	4731	11193	TANL19	4730	11192	TANL20	4729	11191	TANL21	4728	11190
TANL22	4727	11187	TANL23	4726	11186	TANL24	4725	11185	TANL25	4724	11184
TANL26	4723	11183	TANL27	4722	11182	TANL28	4721	11181	TANL29	4720	11180
TANL30	4719	11179	TANL31	4718	11178	TANL32	4717	11177	TANL33	4716	11176
TANL34	4715	11175	TANL35	4714	11174	TANL36	4713	11173	TANL37	4712	11172
TANL38	4711	11171	TANL39	4710	11170	TANL40	4709	11169	TANL41	4708	11168
TANL42	4707	11167	TANL43	4706	11166	TANL44	4705	11165	TANL45	4704	11164
TANL46	4703	11163	TANL47	4702	11162	TANL48	4701	11161	TANL49	4700	11160
TANL50	4699	11159	TANL51	4698	11158	TANL52	4697	11157	TANL53	4696	11156
TANL54	4695	11155	TANL55	4694	11154	TANL56	4693	11153	TANL57	4692	11152
TANL58	4691	11151	TANL59	4690	11150	TANL60	4689	11149	TANL61	4688	11148
TANL62	4687	11147	TANL63	4686	11146	TANL64	4685	11145	TANL65	4684	11144
TANL66	4683	11143	TANL67	4682	11142	TANL68	4681	11141	TANL69	4680	11140
TANL70	4679	11139	TANL71	4678	11138	TANL72	4677	11137	TANL73	4676	11136
TANL74	4675	11135	TANL75	4674	11134	TANL76	4673	11133	TANL77	4672	11132
TANL78	4671	11131	TANL79	4670	11130	TANL80	4669	11129	TANL81	4668	11128
TANL82	4667	11127	TANL83	4666	11126	TANL84	4665	11125	TANL85	4664	11124
TANL86	4663	11123	TANL87	4662	11122	TANL88	4661	11121	TANL89	4660	11120
TANL90	4659	11119	TANL91	4658	11118	TANL92	4657	11117	TANL93	4656	11116
TANL94	4655	11115	TANL95	4654	11114	TANL96	4653	11113	TANL97	4652	11112
TANL98	4651	11111	TANL99	4650	11110	TANL100	4649	11109	TANL101	4648	11108
TANL102	4647	11107	TANL103	4646	11106	TANL104	4645	11105	TANL105	4644	11104
TANL106	4643	11103	TANL107	4642	11102	TANL108	4641	11101	TANL109	4640	11100
TANL110	4639	11099	TANL111	4638	11098	TANL112	4637	11097	TANL113	4636	11096
TANL114	4635	11095	TANL115	4634	11094	TANL116	4633	11093	TANL117	4632	11092
TANL118	4631	11091	TANL119	4630	11090	TANL120	4629	11089	TANL121	4628	11088
TANL122	4627	11087	TANL123	4626	11086	TANL124	4625	11085	TANL125	4624	11084
TANL126	4623	11083	TANL127	4622	11082	TANL128	4621	11081	TANL129	4620	11080
TANL130	4619	11079	TANL131	4618	11078	TANL132	4617	11077	TANL133	4616	11076
TANL134	4615	11075	TANL135	4614	11074	TANL136	4613	11073	TANL137	4612	11072
TANL138	4611	11071	TANL139	4610	11070	TANL140	4609	11069	TANL141	4608	11068
TANL142	4607	11067	TANL143	4606	11066	TANL144	4605	11065	TANL145	4604	11064
TANL146	4603	11063	TANL147	4602	11062	TANL148	4601	11061	TANL149	4600	11060
TANL150	4599	11059	TANL151	4598	11058	TANL152	4597	11057	TANL153	4596	11056
TANL154	4595	11055	TANL155	4594	11054	TANL156	4593	11053	TANL157	4592	11052
TANL158	4591	11051	TANL159	4590	11050	TANL160	4589	11049	TANL161	4588	11048
TANL162	4587	11047	TANL163	4586	11046	TANL164	4585	11045	TANL165	4584	11044
TANL166	4583	11043	TANL167	4582	11042	TANL168	4581	11041	TANL169	4580	11040
TANL170	4579	11039	TANL171	4578	11038	TANL172	4577	11037	TANL173	4576	11036
TANL174	4575	11035	TANL175	4574	11034	TANL176	4573	11033	TANL177	4572	11032
TANL178	4571	11031	TANL179	4570	11030	TANL180	4569	11029	TANL181	4568	11028
TANL182	4567	11027	TANL183	4566	11026	TANL184	4565	11025	TANL185	4564	11024
TANL186	4563	11023	TANL187	4562	11022	TANL188	4561	11021	TANL189	4560	11020
TANL190	4559	11019	TANL191	4558	11018	TANL192	4557	11017	TANL193	4556	11016
TANL194	4555	11015	TANL195	4554	11014	TANL196	4553	11013	TANL197	4552	11012
TANL198	4551	11011	TANL199	4550	11010	TANL200	4549	11009	TANL201	4548	11008
TANL202	4547	11007	TANL203	4546	11006	TANL204	4545	11005	TANL205	4544	11004
TANL206	4543	11003	TANL207	4542	11002	TANL208	4541	11001	TANL209	4540	11000
TANL210	4539	10999	TANL211	4538	10998	TANL212	4537	10997	TANL213	4536	10996
TANL214	4535	10995	TANL215	4534	10994	TANL216	4533	10993	TANL217	4532	10992
TANL218	4531	10991	TANL219	4530	10990	TANL220	4529	10989	TANL221	4528	10988
TANL222	4527	10987	TANL223	4526	10986	TANL224	4525	10985	TANL225	4524	10984
TANL226	4523	10983	TANL227	4522	10982	TANL228	4521	10981	TANL229	4520	10980
TANL230	4519	10979	TANL231	4518	10978	TANL232	4517	10977	TANL233	4516	10976
TANL234	4515	10975	TANL235	4514	10974	TANL236	4513	10973	TANL237	4512	10972
TANL238	4511	10971	TANL239	4510	10970	TANL240	4509	10969	TANL241	4508	10968
TANL242	4507	10967	TANL243	4506	10966	TANL244	4505	10965	TANL245	4504	10964
TANL246	4503	10963	TANL247	4502	10962	TANL248	4501	10961	TANL249	4500	10960
TANL250	4499	10959	TANL251	4498	10958	TANL252	4497	10957	TANL253	4496	10956
TANL254	4495	10955	TANL255	4494	10954	TANL256	4493	10953	TANL257	4492	10952
TANL258	4491	10951	TANL259	4490	10950	TANL260	4489	10949	TANL261	4488	10948
TANL262	4487	10947	TANL263	4486	10946	TANL264	4485	10945	TANL265	4484	10944
TANL266	4483	10943	TANL267	4482	10942	TANL268	4481	10941	TANL269	4480	10940
TANL270	4479	10939	TANL271	4478	10938	TANL272	4477	10937	TANL273	4476	10936
TANL274	4475	10935	TANL275	4474	10934	TANL276	4473	10933	TANL277	4472	10932
TANL278	4471	10931	TANL279	4470	10930	TANL280	4469	10929	TANL281	4468	10928
TANL282	4467	10927	TANL283	4466	10926	TANL284	4465	10925	TANL285	4464	10924
TANL286	4463	10923	TANL287	4462	10922	TANL288	4461	10921	TANL289	4460	10920
TANL290	4459	10919	TANL291	4458	10918	TANL292	4457	10917	TANL293	4456	10916
TANL294	4455	10915	TANL295	4454	10914	TANL296	4453	10913	TANL297	4452	10912
TANL298	4451	10911	TANL299	4450	10910	TANL300	4449	10909	TANL301	4448	10908
TANL302	4447	10907	TANL303	4446	10906	TANL304	4445	10905	TANL305	4444	10904
TANL306	4443	10903	TANL307	4442	10902	TANL308	4441	10901	TANL309	4440	10900
TANL310	4439	10899	TANL311	4438	10898	TANL312	4437	10897	TANL313	4436	10896
TANL314	4435	10895	TANL315	4434	10894	TANL316	4433	10893	TANL317	4432	10892
TANL318	4431	10891	TANL319	4430	10890	TANL320					

ARITHMETIC INFLUENCE COEFFICIENTS 4/06/62

EFN	LOC	EFN	LOC	EFN	LOC
812	11106	813	11106	814	11054
813	11106	814	11106	815	10715
814	10743	815	10743	816	12 10650
815	10743	816	11 10661	817	16 10537
816	10743	817	15 10546	818	20 10473
817	10560	818	19 10477		
818	10560				
819	10560				
820	10560				
821	10560				
822	10560				
823	10560				
824	10560				
825	10560				
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830	10560				
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832	10560				
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897	10560				
898	10560				
899	10560				
900	10560				

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

	DEC	LOC	DEC	LOC	DEC	LOC		
1)	4681	11111	2)	4348	10374	3)	4356	10404
4)	32767	77777	6)	4399	10457	7)	4707	11143
			C1G1	4709	11145	C1G4	4711	11147
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11G8	4712	11146	C1G6	4713	11147			
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11G8	4720	11150	11G0	4722	11151	C1G2	4714	11152
11G4	4724	11152	11G6	4726	11153	11G8	4728	11154
11G0	4728	11154	11G2	4730	11155	11G4	4732	11156
11G6	4732	11156	11G8	4734	11157	11G0	4736	11158
11G2	4736	11158	11G4	4738	11159	11G6	4740	11160
11G8	4740	11162	11G0	4742	11163	11G2	4742	11164
11G4	4744	11164	11G6	4746	11166	11G8	4746	11166
11G0	4748	11166	11G2	4750	11168	11G4	4750	11168
11G6	4752	11170	11G8	4754	11171	11G0	4756	11172
11G2	4756	11172	11G4	4758	11173	11G6	4760	11174
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11G0	4768	11180	11G2	4770	11181	11G4	4766	11179
11G6	4772	11182	11G8	4774	11183	11G0	4768	11180
11G2	4776	11184	11G4	4778	11185	11G6	4770	11181
11G8	4780	11186	11G0	4782	11187	11G2	4772	11182
11G4	4784	11188	11G6	4786	11189	11G8	4774	11183
11G0	4788	11190	11G2	4790	11191	11G4	4776	11184
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11G2	4796	11194	11G4	4798	11195	11G6	4780	11186
11G8	4800	11196	11G0	4802	11197	11G2	4782	11187
11G4	4804	11198	11G6	4806	11199	11G8	4784	11188
11G0	4808	11200	11G2	4810	11201	11G4	4786	11189
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11G8	4840	11216	11G0	4842	11217	11G2	4802	11197
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11G6	4952	11272	11G8	4954	11273	11G0	4858	11225
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11G8	4960	11276	11G0	4962	11277	11G2	4862	11227
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11G2	4976	11284	11G4	4978	11285	11G6	4870	11231
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11G4	4984	11288	11G6	4986	11289	11G8	4874	11233
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11G6	4992	11292	11G8	4994	11293	11G0	4878	11235
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11G8	5000	11296	11G0	5002	11297	11G2	4882	11237
11G4	5004	11298	11G6	5006	11299	11G8	4884	11238
11G0	5008	11300	11G2	5010	11301	11G4	4886	11239
11G6	5012	11302	11G8	5014	11303	11G0	4888	11240
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11G8	5020	11306	11G0	5022	11307	11G2	4892	11242
11G4	5024	11308	11G6	5026	11309	11G8	4894	11243
11G0	5028	11310	11G2	5030	11311	11G4	4896	11244
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11G2	5036	11314	11G4	5038	11315	11G6	4900	11246
11G8	5040	11316	11G0	5042	11317	11G2	4902	11247
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11G0	5048	11320	11G2	5050	11321	11G4	4906	11249
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11G2	5056	11324	11G4	5058	11325	11G6	4910	11251
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11G4	5084	11338	11G6	5086	11339	11G8	4924	11258
11G0	5088	11340	11G2	5090	11341	11G4	4926	11259
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11G2	5096	11344	11G4	5098	11345	11G6	4930	11261
11G8	5100	11346	11G0	5102	11347	11G2	4932	11262
11G4	5104	11348	11G6	5106	11349	11G8	4934	11263
11G0	5108	11350	11G2	5110	11351	11G4	4936	11264
11G6	5112	11352	11G8	5114	11353	11G0	4938	11265
11G2	5116	11354	11G4	5118	11355	11G6	4940	11266
11G8	5120	11356	11G0	5122	11357	11G2	4942	11267
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11G0	5128	11360	11G2	5130	11361	11G4	4946	11269
11G6	5132	11362	11G8	5134	11363	11G0	4948	11270
11G2	5136	11364	11G4	5138	11365	11G6	4950	11271
11G8	5140	11366	11G0	5142	11367	11G2	4952	11272
11G4	5144	11368	11G6	5146	11369	11G8	4954	11273
11G0	5148	11370	11G2	5150	11371	11G4	4956	11274
11G6	5152	11372	11G8	5154	11373	11G0	4958	11275
11G2	5156	11374	11G4	5158	11375	11G6	4960	11276
11G8	5160	11376	11G0	5162	11377	11G2	4962	11277
11G4	5164	11378	11G6	5166	11379	11G8	4964	11278
11G0	5168	11380	11G2	5170	11381	11G4	4966	11279
11G6	5172	11382	11G8	5174	11383	11G0	4968	11280
11G2	5176	11384	11G4	5178	11385	11G6	4970	11281
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11G4	5184	11388	11G6	5186	11389	11G8	4974	11283
11G0	5188	11390	11G2	5190	11391	11G4	4976	11284
11G6	5192	11392	11G8	5194	11393	11G0	4978	11285
11G2	5196	11394	11G4	5198	11395	11G6	4980	11286
11G8	5200	11396	11G0	5202	11397	11G2	4982	11287
11G4	5204	11398	11G6	5206	11399	11G8	4984	11288
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11G6	5212	11402	11G8	5214	11403	11G0	4988	11290
11G2	5216	11404	11G4	5218	11405	11G6	4990	11291
11G8	5220	11406	11G0	5222	11407	11G2	4992	11292
11G4	5224	11408	11G6	5226	11409	11G8	4994	11293
11G0	5228	11410	11G2	5230	11411	11G4	4996	11294
11G6	5232	11412	11G8	5234	11413	11G0	4998	11295
11G2	5236	11414	11G4	5238	11415	11G6	5000	11296
11G8	5240	11416	11G0	5242	11417	11G2	5002	11297
11G4	5244	11418	11G6	5246	11419	11G8	5004	11298
11G0	5248	11420	11G2	5250	11421	11G4	5006	11299
11G6	5252	11422	11G8	5254	11423	11G0	5008	11300
11G2	5256	11424	11G4	5258	11425	11G6	5010	11301

AERODYNAMIC INFLUENCE COEFFICIENTS 4/06/62

EFN	LOC	EFN	LOC	EFN	LOC
811	1 1106	813	3 11104	814	4 11064
812	2 11106	817	7 11374	818	8 10715
813	3 11106	818	8 10715	819	9 10650
814	4 11106	819	9 10650	820	10 10537
815	5 11106	820	10 10537	821	11 10473
816	6 11106	821	11 10473		
817	7 11106	822	12 10473		
818	8 11106	823	13 10473		
819	9 11106	824	14 10473		
820	10 11106	825	15 10473		
821	11 11106	826	16 10473		
822	12 11106	827	17 10473		
823	13 11106	828	18 10473		
824	14 11106	829	19 10473		
825	15 11106	830	20 10473		
826	16 11106				
827	17 11106				
828	18 11106				
829	19 11106				
830	20 11106				

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

DEC	LOC	DEC	LOC	DEC	LOC
1)	4681 11111	11)	4700 11134	2)	4348 10374
4)	32767 77777	41)	4701 11135	6)	4399 10457
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C)G3	4713 11146	C)G4	4714 11147	C)G5	4715 11148
C)G6	4716 11149	C)G7	4717 11150	C)G8	4718 11151
C)G9	4719 11152	C)G10	4720 11153	C)G11	4721 11154
C)G12	4722 11155	C)G13	4723 11156	C)G14	4724 11157
C)G15	4725 11158	C)G16	4726 11159	C)G17	4727 11160
C)G18	4728 11161	C)G19	4729 11162	C)G20	4730 11163
C)G21	4731 11164	C)G22	4732 11165	C)G23	4733 11166
C)G24	4734 11167	C)G25	4735 11168	C)G26	4736 11169
C)G27	4737 11170	C)G28	4738 11171	C)G29	4739 11172
C)G30	4740 11173	C)G31	4741 11174	C)G32	4742 11175
C)G33	4743 11176	C)G34	4744 11177	C)G35	4745 11178
C)G36	4746 11179	C)G37	4747 11180	C)G38	4748 11181
C)G39	4749 11182	C)G40	4750 11183	C)G41	4751 11184
C)G42	4752 11185	C)G43	4753 11186	C)G44	4754 11187
C)G45	4755 11188	C)G46	4756 11189	C)G47	4757 11190
C)G48	4758 11191	C)G49	4759 11192	C)G50	4760 11193
C)G49	4761 11194	C)G51	4762 11195	C)G52	4763 11196
C)G53	4764 11197	C)G54	4765 11198	C)G55	4766 11199
C)G56	4767 11200	C)G57	4768 11201	C)G58	4769 11202
C)G59	4770 11203	C)G60	4771 11204	C)G61	4772 11205
C)G62	4773 11206	C)G63	4774 11207	C)G64	4775 11208
C)G65	4776 11209	C)G66	4777 11210	C)G67	4778 11211
C)G68	4779 11212	C)G69	4780 11213	C)G70	4781 11214
C)G71	4782 11215	C)G72	4783 11216	C)G73	4784 11217
C)G74	4785 11218	C)G75	4786 11219	C)G76	4787 11220
C)G77	4788 11221	C)G78	4789 11222	C)G79	4790 11223
C)G80	4791 11224	C)G81	4792 11225	C)G82	4793 11226
C)G83	4794 11227	C)G84	4795 11228	C)G85	4796 11229
C)G86	4797 11230	C)G87	4798 11231	C)G88	4799 11232
C)G89	4800 11233	C)G90	4801 11234	C)G91	4802 11235
C)G92	4803 11236	C)G93	4804 11237	C)G94	4805 11238
C)G95	4806 11239	C)G96	4807 11240	C)G97	4808 11241
C)G98	4809 11242	C)G99	4810 11243	C)G100	4811 11244
C)G101	4812 11245	C)G102	4813 11246	C)G103	4814 11247
C)G104	4815 11248	C)G105	4816 11249	C)G106	4817 11250
C)G107	4818 11251	C)G108	4819 11252	C)G109	4820 11253
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C)G203	4914 11347	C)G204	4915 11348	C)G205	4916 11349
C)G206	4917 11350	C)G207	4918 11351	C)G208	4919 11352
C)G209	4920 11353	C)G210	4921 11354	C)G211	4922 11355
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C)G215	4926 11359	C)G216	4927 11360	C)G217	4928 11361
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C)G227	4938 11371	C)G228	4939 11372	C)G229	4940 11373
C)G230	4941 11374	C)G231	4942 11375	C)G232	4943 11376
C)G233	4944 11377	C)G234	4945 11378	C)G235	4946 11379
C)G236	4947 11380	C)G237	4948 11381	C)G238	4949 11382
C)G239	4950 11383	C)G240	4951 11384	C)G241	4952 11385
C)G242	4953 11386	C)G243	4954 11387	C)G244	4955 11388
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C)G251	4962 11395	C)G252	4963 11396	C)G253	4964 11397
C)G254	4965 11398	C)G255	4966 11399	C)G256	4967 11400
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C)G266	4977 11410	C)G267	4978 11411	C)G268	4979 11412
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C)G275	4986 11419	C)G276	4987 11420	C)G277	4988 11421
C)G278	4989 11422	C)G279	4990 11423	C)G280	4991 11424
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C)G290	5001 11434	C)G291	5002 11435	C)G292	5003 11436
C)G293	5004 11437	C)G294	5005 11438	C)G295	5006 11439
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C)G299	5010 11443	C)G300	5011 11444	C)G301	5012 11445
C)G302	5013 11446	C)G303	5014 11447	C)G304	5015 11448
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C)G308	5019 11452	C)G309	5020 11453	C)G310	5021 11454
C)G311	5022 11455	C)G312	5023 11456	C)G313	5024 11457
C)G314	5025 11458	C)G315	5026 11459	C)G316	5027 11460
C)G317	5028 11461	C)G318	5029 11462	C)G319	5030 11463
C)G320	5031 11464	C)G321	5032 11465	C)G322	5033 11466
C)G323	5034 11467	C)G324	5035 11468	C)G325	5036 11469
C)G326	5037 11470	C)G327	5038 11471	C)G328	5039 11472
C)G329	5040 11473	C)G330	5041 11474	C)G331	5042 11475
C)G332	5043 11476	C)G333	5044 11477	C)G334	5045 11478
C)G335	5046 11479	C)G336	5047 11480	C)G337	5048 11481
C)G338	5049 11482	C)G339	5050 11483	C)G340	5051 11484
C)G341	5052 11485	C)G342	5053 11486	C)G343	5054 11487
C)G344	5055 11488	C)G345	5056 11489	C)G346	5057 11490
C)G347	5058 11491	C)G348	5059 11492	C)G349	5060 11493
C)G350	5061 11494	C)G351	5062 11495	C)G352	5063 11496
C)G353	5064 11497	C)G354	5065 11498	C)G355	5066 11499
C)G356	5067 11500	C)G357	5068 11501	C)G358	5069 11502
C)G359	5070 11503	C)G360	5071 11504	C)G361	5072 11505
C)G362	5073 11506	C)G363	5074 11507	C)G364	5075 11508
C)G365	5076 11509	C)G366	5077 11510	C)G367	5078 11511
C)G368	5079 11512	C)G369	5080 11513	C)G370	5081 11514
C)G371	5082 11515	C)G372	5083 11516	C)G373	5084 11517
C)G374	5085 11518	C)G375	5086 11519	C)G376	5087 11520
C)G377	5088 11521	C)G378	5089 11522	C)G379	5090 11523
C)G380	5091 11524	C)G381	5092 11525	C)G382	5093 11526
C)G383	5094 11527	C)G384	5095 11528	C)G385	5096 11529
C)G386	5097 11530	C)G387	5098 11531	C)G388	5099 11532
C)G389	5100 11533	C)G390	5101 11534	C)G391	5102 11535
C)G392	5103 11536	C)G393	5104 11537	C)G394	5105 11538
C)G395	5106 11539	C)G396	5107 11540	C)G397	5108 11541
C)G398	5109 11542	C)G399	5110 11543	C)G400	5111 11544
C)G401	5112 11545	C)G402	5113 11546	C)G403	5114 11547
C)G404	5115 11548	C)G405	5116 11549	C)G406	5117 11550
C)G407	5118 11551	C)G408	5119 11552	C)G409	5120 11553
C)G410	5121 11554	C)G411	5122 11555	C)G412	5123 11556
C)G413	5124 11557	C)G414	5125 11558	C)G415	5126 11559
C)G416	5127 11560	C)G417	5128 11561	C)G418	5129 11562
C)G419	5130 11563	C)G420	5131 11564	C)G421	5132 11565
C)G422	5133 11566	C)G423	5134 11567	C)G424	5135 11568
C)G425	5136 11569	C)G426	5137 11570	C)G427	5138 11571
C)G428	5139 11572	C)G429	5140 11573	C)G430	5141 11574
C)G431	5142 11575	C)G432	5143 11576	C)G433	5144 11577
C)G434	5145 11578	C)G435	5146 11579	C)G436	5147 11580
C)G437	5148 11581	C)G438	5149 11582	C)G439	5150 11583
C)G440	5151 11584	C)G441	5152 11585	C)G442	5153 11586
C)G443	5154 11587	C)G444	5155 11588	C)G445	5156 11589
C)G446	5157 11590	C)G447	5158 11591	C)G448	5159 11592
C)G449	5160 11593	C)G450	5161 11594	C)G451	5162 11595
C)G452	5163 11596	C)G453	5164 11597	C)G454	5165 11598
C)G455	5166 11599	C)G456	5167 11600	C)G457	5168 11601
C)G458	5169 11602	C)G459	5170 11603	C)G460	5171 11604
C)G461	5172 11605	C)G462	5173 11606	C)G463	5174 11607
C)G464	5175 11608	C)G465	5176 11609	C)G466	5177 11

DEC 4332 10354 DEC 4337 10361
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EXTERNAL FORMULA NUMBERS WITH CORRESPONDING INTERNAL FORMULA NUMBERS AND OCTAL LOCATIONS

EFN	IFN	LFC	EFN	IFN	LFC	EFN	IFN	LFC	EFN	IFN	LFC
50	32	00032	51	69	00236	52	72	00244	53	74	00250
54	86	00312	55	91	00331	56	95	00354	57	96	00361
58	102	00430	59	106	00437	60	110	00446	61	113	00454
64	147	00602	66	148	00606	67	170	01372	68	171	01402
70	184	01474	71	187	01507	72	234	02534	73	237	02551
74	243	02564	75	253	02677	76	254	02705	77	255	02707
78	274	03030	79	280	03032	80	288	03537	81	295	04123
82	311	05117	83	346	05364	84	354	06313	85	362	07142
86	374	07475	88	376	07505	89	377	07511	90	391	07563
91	392	07570	92	395	07607	93	397	07616	94	398	07624
97	403	07671	98	413	07717	99	423	10022	100	430	10177
101	435	10226	102	438	10250	103	445	10275	104	447	10321
105	449	10344	106	450	10350						

4/06/62

HM100554
HM100555

SUBROUTINE RDLN (NTAPE2, NTAPE3, I)
1 FORMAT(80H

HM100556
HM100557
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HM100560
HM100561

READ INPUT TAPE NTAPE2, 1
GOTO (4,5),1

HM100562
HM100563
HM100564
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HM100566
HM100567

5 WRITE OUTPUT TAPE NTAPE3, 3

END(1,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0)

STORAGE NOT USED BY PROGRAM

DEC	OCT	98C	OCT
16 00114	32561	72661	

SYMBOLS AND LOCATIONS FOR SOURCE PROGRAM FORMAT STATEMENTS

EFN	LOC	EFN	LOC	EFN	LOC
011	1 00112	812	2 00073	013	3 00072

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

DEC	OCT	DEC	OCT	DEC	OCT
61	52 00064	C160	75 00112	E11	24 00034

LOCATIONS OF NAMES IN TRANSFER VECTOR

DEC	OCT	DEC	OCT	DEC	OCT
(FIL)	3 00003	(RTN)	1 00001	(STH)	2 00002
				(TSH)	0 00000

ENTRY POINTS TO SUBROUTINES NOT OUTPUT FROM LIBRARY

(FIL)	(RTN)	(STH)	(TSH)
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EXTERNAL FORMULA NUMBERS WITH CORRESPONDING INTERNAL FORMULA NUMBERS AND OCTAL LOCATIONS

EFN	IFN	LOC	EFN	IFN	LOC
4	8 00035	5	10 00044	6	11 00052

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SUBROUTINE AEROP3 (VBRW,XMACH,CH,ISTrip,NSTART,NTAPE3,NTAPE7)
DIMENSION CH(2,4,25), A(22)
1 FORMAT (1Z12.8, 4BX, 4HMM10 114 )
2 FORMAT (11M8 40X, 24H PUNCHED CARDS NDS. MM10 114,
1 10H THRU MM10 114 )
3 FORMAT (214, 64X, 4HMM10 114 )
4 403044010060
100001
15-NSTART
NITS=1
IF (VBRW) 4,4,5
4 NITS=2
5 WRITE OUTPUT TAPE NTAPET, 1, VBRW,XMACH,IS
15-15+1
K=2-ISTrip
WRITE OUTPUT TAPE NTAPE7, 3, K,ISTrip,IS
IS=IS+1
NITS=4
DO 6 I=1,22
6 A(I)=0.
N=0
DO 11 I=1,ISTrip
DO 10 L=1,NITS,NITS
DO 9 J=1,2
N=N+1
IF (N-23) 9,7,7
N=N-22
CALL BINPU (A,22,IORG,BCDZ,IS,NTAPE7)
IORG=IORG+22
IS=IS+1
DO 8 N=1,22
8 A(N)=0.
IF (N-23) 9,7,7
9 A(N)=CH(J,L,I)
ICONFZ=I+J+L
10 M=M+K-2

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11 M=M+2
M=M-K
IF (M) 13,13,17
12 CALL BINPU (A,0,0,BCDZ,IS,NTAPE7)
13 CALL BINPU (A,0,0,BCDZ,IS,NTAPE7)
WRITE OUTPUT TAPE NTAPE3, 2, NSTART, IS
NSTART=IS+1
RETURN
END

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HM100610
HM100611
HM100612
HM100613
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HM100616
HM100617
HM100618

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STORAGE NOT USED BY PROGRAM

DEC	OCT	DEC	OCT
310	00437	325	00437

STORAGE LOCATIONS FOR VARIABLES APPEARING IN DIMENSION AND EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT
310	00437				

STORAGE LOCATIONS FOR VARIABLES NOT APPEARING IN COMMON, DIMENSION, OR EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT
296	00430	293	00437	294	00436
297	00434	291	00433	290	00432
298	00440	287	00437	286	00436

SYMBOLS AND LOCATIONS FOR SOURCE PROGRAM FORMAT STATEMENTS

EFN	LOC	EFN	LOC	EFN	LOC
811	1 00427	812	2 00421	813	3 00401

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

DEC	OCT	DEC	OCT	DEC	OCT
291	00431	21	240 00360	246	00366
290	00430	200	284 00434	285	00435
124	00174				

LOCATIONS OF NAMES IN TRANSFER VECTOR

DEC	OCT	DEC	OCT	DEC	OCT
2	00002	1	00001	0	00000

ENTRY POINTS TO SUBROUTINES NOT OUTPUT FROM LIBRARY

BINPU	(FIL)	(STH)

EFN	IFN	LDC	EFN	IFN	LDC	EFN	IFN	LDC	EFN	IFN	LDC
4	12	00055	5	13	00057	6	22	00120	7	29	00207
8	35	00232	9	37	00242	10	39	00253	11	40	00271
12	43	00319	13	44	00332	14	45	00342	15	46	00352

HM100623
HM100624

2005

Figure 1 consists of two bar charts side-by-side. The left chart is titled '1970s' and the right chart is titled '1980s'. Both charts have a y-axis labeled 'Number of children' ranging from 0 to 10. The x-axis represents the number of children per woman, with categories 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The bars show the frequency of each category. In the 1970s, the highest frequency is for 2 children (around 8.5), followed by 1 child (around 7.5). In the 1980s, the frequency for 2 children is slightly lower (around 8), and the frequency for 3 children is higher (around 7.5) compared to the 1970s.

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HM1G0630

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~~HM100637~~

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[illegible]

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

0.000

1. Name of the person or organization: _____
 2. Address: _____
 3. City: _____ State: _____ Zip: _____
 4. Telephone: _____
 5. E-mail: _____
 6. Date: _____
 7. Signature: _____
 8. Printed name: _____
 9. Title: _____
 10. Organization: _____
 11. Address: _____
 12. City: _____ State: _____ Zip: _____
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 198. Title: _____
 199. Organization: _____
 200. Address: _____
 201. City: _____ State: _____ Zip: _____
 202. Telephone: _____
 203. E-mail: _____
 204. Date: _____
 205. Signature: _____
 206. Printed name: _____
 207. Title: _____
 208. Organization: _____
 209. Address: _____
 210. City: _____ State: _____ Zip: _____
 211. Telephone: _____
 212. E-mail: _____
 213. Date: _____
 214. Signature: _____
 215. Printed name: _____
 216. Title: _____
 217. Organization: _____
 218. Address: _____
 219. City: _____ State: _____ Zip: _____
 220. Telephone: _____
 221. E-mail: _____
 222. Date: _____
 223. Signature: _____
 224. Printed name: _____
 225. Title: _____
 226. Organization: _____
 227. Address: _____
 228. City: _____ State: _____ Zip: _____
 229. Telephone: _____
 230. E-mail: _____
 231. Date: _____
 232. Signature: _____
 233. Printed name: _____
 234. Title: _____
 235. Organization: _____
 236. Address: _____
 237. City: _____ State: _____ Zip: _____
 238. Telephone: _____
 239. E-mail: _____
 240. Date: _____
 241. Signature: _____
 242. Printed name: _____
 243. Title: _____
 244. Organization: _____
 245. Address: _____
 246. City: _____ State: _____ Zip: _____
 247. Telephone: _____
 248. E-mail: _____
 249. Date: _____
 250. Signature: _____
 251. Printed name: _____
 252. Title: _____
 253. Organization: _____
 254. Address: _____
 255. City: _____ State: _____ Zip: _____
 256. Telephone: _____
 257. E-mail: _____
 258. Date: _____
 259. Signature: _____
 260. Printed name: _____
 261. Title: _____
 262. Organization: _____
 263. Address: _____
 264. City: _____ State: _____ Zip: _____
 265. Telephone: _____
 266. E-mail: _____
 267. Date: _____
 268. Signature: _____
 269. Printed name: _____
 270. Title: _____
 271. Organization: _____
 272. Address: _____
 273. City: _____ State: _____ Zip: _____
 274. Telephone: _____
 275. E-mail: _____
 276. Date: _____
 277. Signature: _____
 278. Printed name: _____
 279. Title: _____
 280. Organization: _____
 281. Address: _____
 282. City: _____ State: _____ Zip: _____
 283. Telephone: _____
 284. E-mail: _____
 285. Date: _____
 286. Signature: _____
 287. Printed name: _____
 288. Title: _____
 289. Organization: _____
 290. Address: _____
 291. City: _____ State: _____ Zip: _____
 292. Telephone: _____
 293. E-mail: _____
 294. Date: _____
 295. Signature: _____
 296. Printed name: _____
 297. Title: _____
 298. Organization: _____
 299. Address: _____
 300. City: _____ State: _____ Zip: _____
 301. Telephone: _____
 302. E-mail: _____

1. The first step is to identify the variables that are likely to influence the outcome variable. In this case, the variables are: (a) the type of intervention (e.g., cognitive-behavioral therapy, medication, etc.), (b) the duration of the intervention (e.g., 8 weeks, 12 weeks, etc.), and (c) the baseline level of the outcome variable (e.g., severity of symptoms, etc.).

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HM100644

HM100645

949007W

1000
 900
 800
 700
 600
 500
 400
 300
 200
 100
 0

HW100649

HM100650

HM100651

Parameter	Value	Unit
Temperature	25	°C
Pressure	1	atm
Time	10	min
Concentration	0.1	M
Volume	10	ml
Wavelength	254	nm
Path length	1	cm
Reagent	0.1% KMnO ₄	
Sample	0.1% KMnO ₄	
Blank	0.1% KMnO ₄	
Result	0.1	abs

[illegible][illegible]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	52
--	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----

68

BINPU ROUTINE TO WRITE GOL BIN CARDS ON TAPE. FINI

4/06/62 PAGE 2

00016	C402	00	0	00325	SUB	D1	HM100652
00017	0622	00	0	00066	STD	LOCN	HM100653
00020	0634	00	0	00061	SXA	COUNT,0	HM100654
00021	0500	00	4	00000	CLP*	3,4	HM100655
00022	0711	00	0	00012	REL	18	HM100656
00023	-0120	00	0	00025	THI	**2	HM100657
00024	-0501	00	0	00266	ORA	REL	HM100658
00025	-0501	00	0	00334	ORA	IMAGE	HM100659
00026	0002	00	0	77740	SLW	CIMAGE	HM100660

* TEST FOR FOURTH AND ON FIFTH ARGUMENTS.							
* DETERMINE WHETHER ARGUMENT REFERS TO ID OR SEQ NUMBER							
* AND SET CELLS FROM CALLING SEQUENCE.							

00027	0774	00	2	00002	BNF	2+2	HM100661
00030	-0625	00	0	00302	SLW	BLSEQ	HM100662
00031	-0500	00	4	00004	CLP	4,4	HM100663
00032	-0320	00	0	00265	ANA	MSKPD1	HM100664
00033	0322	00	0	00307	FRA	MSKTSX	HM100665
00034	-0100	00	0	00054	TNZ	G2	HM100666
00035	0500	00	4	00004	CLP*	4,4	HM100667
00036	-0340	00	0	00262	SLW	BLSEQ	HM100668
00037	0030	00	0	00041	SLW	BLSEQ	HM100669
00040	0600	00	0	00302	STZ	BLSEQ	HM100670
00041	-0100	00	0	00043	TNZ	**2	HM100671
00042	-0754	00	0	00000	PXD		HM100672
00043	-0130	00	0	00200	NGL		HM100673
00044	0034	00	4	00043	SLW	**2,4	HM100674
00045	0074	00	4	00172	SLW	CONV,4	HM100675
00046	0774	00	4	00000	AXT	**4	HM100676
00047	0602	00	0	00267	SLW	SEQNO	HM100677
00050	1 77777	4	00053		TXI	G5,4,-1	HM100678
00051	0001	00	0	00305	SFO	BCD10	HM100679
00052	1 77777	4	00053		TXI	G5,4,-1	HM100680
00053	2 00001	2	00031		TXI	G4,2,1	HM100681
00054	0634	00	4	00144	SXA	X4,4	HM100682
00055	-0520	00	0	77776	NZT	END	HM100683
00056	0020	00	0	00152	TRA	TRCD	HM100684

SET UP CONTROL WORD							
ADD RELATIVE BIT							
7-9, WORD COUNT=22							
CONTROL WORD ESTABLISHED.							

SET BLSEQ TO ITS NORMAL STATE							
TEST FOR 4TH, 5TH ARGS							
NO MORE TSXES							
BIG, THIS IS ID							
EQUAL, FLAG BLANK SEQ. NO.							
IS SEQ NO NON-ZERO.							
NO							
SMALL, THIS IS SEQ NO.							
CONVERT SEQ NO TO BCD							
SAVE							
MOVE TO NEXT ARGUMENT							
AT NEXT 2 EXTRA ARGS.							
IS WORD COUNT ZERO							
MUST BE A TRANSFER CARD							

BINPU ROUTINE TO WRITE COL BIN CARDS ON TAPE- FIBII

4/06/62 PAGE 3

```

*
*
* ***** BUILD THE CARD IMAGE. *****
*
00057 0774 00 2 00026 NEXT AXT 22,2
00060 -0754 00 0 00000 PXD
00061 0774 00 4 00000 COUNT AXT
00062 0500 00 0 00000 ARRAY LDQ
00063 0400 00 2 77770 STD CIMAGE+24,2
00064 0301 00 2 77770 ACL CIMAGE+24,2
00065 1 00001 4 00066 TXI **1,4,1
00066 3 00000 4 00160 TXH OUT,4,**
00067 2 00001 2 00062 TIX ARRAY,2,1
00070 0604 00 4 00061 IN SNA EOCNT**
00071 0301 00 0 77740 ACL CIMAGE
00072 0602 00 0 77741 SLW CIMAGE+1
*
* ***** EDIT THE IDENTIFICATION FIELD. *****
*
00073 -0500 00 0 00267 EDIT CAL SECOND
00074 0560 00 0 00327 LDQ L(1)
00075 -0765 00 0 00022 LGR 18
00076 -0500 00 0 00305 CAL BCDID
00077 -0703 00 0 00004 LCL 6
00100 -0400 00 0 00326 STD IDLED
00101 -0130 00 0 00000 XCL
00102 0634 00 1 00120 SXA SVI,1
00103 0774 00 2 00004 AXT 4,2
00104 0774 00 4 00002 AXT 2,4
00105 -0774 00 1 00003 ABC AXT 3,1
00106 -0704 00 0 00000 PBD
00107 -0114 01 0 00330 CAP TABS,1
00110 -2 00001 1 00113 TNX **3,1,1
00111 0767 00 0 00014 ALS 12
00112 0020 00 0 00107 TRA *-3
*
*
* ***** CLEAR AC FOR CHECKSUM. *****
*
00100690
00100691
00100692
00100693
00100694
00100695
00100696
00100697
00100698
00100699
00100700
00100701
00100702
00100703
00100704
00100705
00100706
00100707
00100708
00100709
00100710
00100711
00100712
00100713
00100714
00100715
00100716
00100717
00100718
00100719
00100720
00100721
00100722
00100723
00100724
00100725
00100726
00100727

```

BINPU ROUTINE TO WRITE COL BIN CARDS ON TAPE. FIBII

```

00113 0602 00 2 77734 SLW LAST+4,2 COL RIN AT LAST TO LAST+3 HM100728
00114 1 77777 2 00115 TXI **1,2,-1 HM100729
00115 2 00001 3 00109 TEE ABC-1,1,1 FINISH W/SAVED CEMOI. HM100730
00116 0500 00 0 00106 LHM IDIGO HM100731
00117 3 00000 2 00104 FHM ABC-1,2,0 HM100732
00120 0774 00 1 00000 SVI **1 HM100733
* HM100734
***** HM100735
* THE ENTIRE CARD IMAGE IS BUILT, WITH THE BOBBY HM100736
* AT CIMAGE THRU CIMAGE+23. AND ID AT LAST THRU LAST+3. HM100737
* NOW ***** WRITE THE CARD ON TAPE. ***** HM100738
***** HM100739
***** HM100740
00121 0761 00 0 00000 WRITE NOP HM100741
00122 -0500 00 0 00331 WRITE1 CAL 140 ESTABLISH I/O FOR TAPE I/O. HM100742
00123 0074 00 0 00000 CMLL (EOS) HM100743
00124 0522 60 0 00001 REC* (EMER) HM100744
00125 -0774 00 0 00213 ABC PUNEND,4 HM100745
00126 0522 60 0 00002 REC* (STRCH) HM100746
00127 0754 00 4 00000 PXA 0,4 SET (WER) FOR RETRY. HM100747
00130 0621 60 0 00003 STA* 3(WTC) HM100748
00131 0074 00 0 00004 SPIES TSK SEWER,4 HM100749
00132 -0500 00 0 00333 CAL SEQNO HM100750
00133 0400 00 0 00307 ADD LIT HM100751
00134 0114 06 0 00215 CVR TBL,6 HM100752
00135 0602 00 0 00267 SLW SEQNO HM100753
00136 0520 00 0 77776 ZET END HM100754
00137 0000 00 0 00100 TBA SWITCH HM100755
00138 -0500 00 0 00131 CAL WPFS HM100756
00141 0402 00 0 00005 SLW* (FIBII) HM100757
00142 0774 00 1 00000 X1 AXT **1 ALL DONE. EXIT HM100758
00143 0774 00 2 00000 X2 AXT **2 HM100759
00144 0774 00 4 00000 X4 AXT **4 HM100760
00145 0070 00 0 00005 TBA *** HM100761
***** HM100762
***** HM100763
00146 -0500 00 0 77740 SWITCH CAL CIMAGE UPDATE THE CARD ORIGIN. HM100764
00147 0361 00 0 00333 ACL A22 HM100765
00150 0602 00 0 77740 SLW CIMAGE

```

 BINAR ROUTINE TO WRITE CON BIN CARDS ON TAPE. FIRST

00151	0020 00 0 00057	TRA	NEXT	*****	HM100766
00152	0076 00 2 00057	INCO	RTX	23.2	HM100767
00153	0000 00 2 11770	STZ	CIMAGE+24.2	*****	HM100768
00154	2 00001 2 00153	TIX	*-1,2,1	CLEAR REST OF	HM100769
00155	0500 00 0 00322	CLA	ZWC	CARD IMAGE.	HM100770
00156	0622 00 0 77740	STD	CIMAGE	*****	HM100771
00157	0070 00 0 00073	TRA	COIT	STORE ZERO WORD COUNT	HM100772
00158	0000 00 0 00073	*****	*****	*****	HM100773
00159	0000 00 0 00073	*****	*****	*****	HM100774
00160	0600 00 0 77776	OUT	STZ	*****	HM100775
00161	-2 00001 2 00070	TNX	END	*****	HM100776
00162	0002 00 0 77777	STN	COMMON	WORD COUNT EXHAUSTED	HM100777
00163	-0754 00 2 00000	PRD	0.2	RETURN IF CARD IS FULL	HM100778
00164	0402 00 0 77740	SUB	CIMAGE	SAVE CHECKSUM.	HM100779
00165	0622 00 0 77740	STD	CIMAGE	CORRECT WORD COUNT	HM100780
00166	-0500 00 0 77777	CAL	COMMON	*****	HM100781
00167	-3 00000 2 00070	TXL	IN,2,0	*****	HM100782
00170	0400 00 2 77770	STZ	CIMAGE+24.2	RETURN CHECKSUM.	HM100783
00171	1 77771 2 00167	TNI	*-2,2,-1	CLEAR REST 3F CARD.	HM100784
00172	-0754 00 0 00000	PRD	RTX	*****	HM100785
00173	-0520 00 0 00302	RTX	CUSEQX	*****	HM100786
00174	0020 00 0 00211	TRA	18	*****	HM100787
00175	0765 00 0 00022	LRS	TEN	*****	HM100788
00176	0221 00 0 00332	UVP	COMMON	*****	HM100789
00177	0401 00 0 77777	PRD	TEN	*****	HM100790
00200	-0754 00 0 00000	PRD	6	*****	HM100791
00201	0421 00 0 00332	DVP	COMMON	*****	HM100792
00202	0767 00 0 00006	ALS	6	*****	HM100793
00203	-0602 00 0 77777	ORS	COMMON	*****	HM100794
00204	-0754 00 0 00000	PRD	*****	*****	HM100795

 * THIS ROUTINE CONVERTS A BINARY INTEGER TO BCD. (4 DIGITS DECR-MQ)

 TEST IF BLENKS DESIRED.

 RIGHT ADJUST BIN INTEGER

31

4/05/67

PAGE 6

00205

0221 00 0 00332

DVP

IEN

HM100804

00206

0767 00 0 00014

ALS

I2

HM100805

00207

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100806

00208

0000 00 0 00000

TRA

1,4

HM100807

00209

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100808

00210

0000 00 0 00000

TRA

1,4

HM100809

00211

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100810

00212

0020 00 4 00001

TRA

1,4

HM100811

00213

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100812

00214

0000 00 0 00000

TRA

1,4

HM100813

00215

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100814

00216

0000 00 0 00000

TRA

1,4

HM100815

00217

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100816

00218

0000 00 0 00000

TRA

1,4

HM100817

00219

0000 00 0 00000

COMMON

REPORT ADJUSTED SEQ. NO.

HM100818

00220

0300 00 0 00215

FAD

TB1

HM100819

00221

0400 00 0 00215

ADD

TB1

HM100820

00222

0500 00 0 00215

CLA

TB1

HM100821

00223

0600 00 0 00215

STG

TB1

HM100822

00224

0700 00 0 00215

CTY

TB1

HM100823

00225

0800 00 0 00215

TR1

TB1

HM100824

00226

1 10000 0 00215

TX1

TB1,0,4096

HM100825

00227

0000 00 0 00216

HTR

TB

0 WITH CARRY

HM100826

00228

0000 00 0 00216

HTR

TB

0 WITH CARRY

HM100827

00229

0000 00 0 00216

HTR

TB

0 WITH CARRY

HM100828

00230

0000 00 0 00216

HTR

TB

0 WITH CARRY

HM100829

00231

0000 00 0 00216

HTR

TB

0 WITH CARRY

HM100830

00232

+0000000000000000

HM100831

00233

+0000000000000000

HM100832

00234

+0000000000000000

HM100833

00235

+0000000000000000

HM100834

00236

+0000000000000000

HM100835

00237

+0000000000000000

HM100836

00238

+0000000000000000

HM100837

00239

+0000000000000000

HM100838

00240

+0000000000000000

HM100839

00241

+0000000000000000

HM100840

00242

-377777770000

MSK2CH OCT 777777770000,102,42

HM100841

00311 +0000000001400
00312 +0000000001200

00316 +0000000001010
00317 +0000000001004
00320 +0000000001002

HM100849
HM100850

00324 +0000000001042
00325 0 00001 0 00000
00326 0 00000 0 00000 IDLCD PZE 0.0.1

HM100854
HM100855
HM100856

00332 +00000000000012 YEN DEC 10
00333 0000 00 0 00026 A22 HTR 22
00334 +0005260000000 IMAGE OCT 0005260000000 CONTROL WORD SKELETON

HM100860
HM100861

77776 END SYN COMMON-1
END

4/06/62

POST PROCESSOR ASSEMBLY DATA

335 IS THE FIRST LOCATION NOT USED BY THIS PROGRAM

330 5A
325 D1 16
54 G2 34
70 IN 161, 167
216 T8 227
142 X1 6

333 A22 147
105 ABC 115, 117
77776 END 15, 55, 136, 160

230 TAB 107
215 T81 134, 215, 216, 217, 220, 221, 222, 223, 224, 225, 226
332 TEN 176, 201, 205

77730 LAST 113, 214
66 LOCN 17
327 L(1) 74, 133

305 BCDID 51, 76
6 BINPU 0
306 BLANK 211

4/06/82

POST PROCESSOR ASSEMBLY DATA

131 BPTES 140
326 IDLCD 100, 116
334 IMAGE 25
267 SEQNO 47, 73, 132, 135
2 (RCH) 126
5 (TES) 141
4 (WER) 131
77777 COMMON 162, 166, 177, 203, 207, 335
211 COSEQX 174
242 MSK2CH
209 MSK2CH 32
207 MSK2CH 35
213 MSK2CH 135
122 WRITE1

NO ERROR IN ABOVE ASSEMBLY.

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