

UNCLASSIFIED

AD_ 295 013

*Reproduced
by the*

ARMED SERVICES TECHNICAL INFORMATION AGENCY
ARLINGTON HALL STATION
ARLINGTON 12, VIRGINIA



UNCLASSIFIED

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

CATALOGED BY ASTIA
AS AD NO. 295013

295 013

Aerodynamic Influence Coefficients from Slender-Body Theory: Analytical Development and Computational Procedure

31 OCTOBER 1962

Prepared by WILLIAM P. RODDEN and EDITH F. FARKAS

Aeromechanics Department

Aerodynamics and Propulsion Research Laboratory

and

GEORGE Y. TAKATA

Computation and Data Processing Center

Laboratories Division

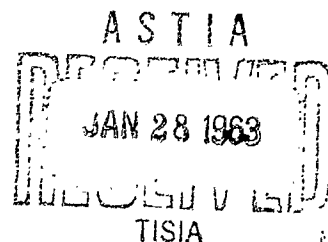
Prepared for COMMANDER SPACE SYSTEMS DIVISION

UNITED STATES AIR FORCE

Inglewood, California



LABORATORIES DIVISION • AEROSPACE CORPORATION
CONTRACT NO. AF 04(695)-169



AERODYNAMIC INFLUENCE COEFFICIENTS FROM
SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT
AND COMPUTATIONAL PROCEDURE

Prepared by

William P. Rodden and Edith F. Farkas
Aeromechanics Department
Aerodynamics and Propulsion and Research Laboratory

and

George Y. Takata
Computation and Data Processing Center
Laboratories Division

AEROSPACE CORPORATION
El Segundo, California

Contract No. AF 04(695)-169

31 October 1962

Prepared for
COMMANDER SPACE SYSTEMS DIVISION
UNITED STATES AIR FORCE
Inglewood, California

ABSTRACT

A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell.

The simplicity of the slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation:

$$\{F(t)\} = (\rho S / \bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{\dot{h} \bar{c} / V\} + [C_{hi}] \{\ddot{h} \bar{c}^2 / V^2\} \right) .$$

The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by

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

and are related to the above definitions through

$$2k_r^2 (\bar{c} s / S) [C_h] = [C_{hs}] + ik_r (\bar{c} / b_r) [C_{hd}] - k_r^2 (\bar{c} / b_r)^2 [C_{hi}] .$$

The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.

CONTENTS

ABSTRACT	ii
SYMBOLS	v
I. FORMULATION OF PROBLEM	1
A. Introduction	1
B. Sign Convention	1
C. Derivation of Equations	1
D. References	12
II. GENERAL DESCRIPTION OF INPUT	13
A. Units	13
B. Classes of Numerical Data and Limitations.	13
III. DATA DECK SETUP	15
A. Loading Order	15
B. Input Data Description.	15
C. Example Key punch Forms	17
IV. PROGRAM OUTPUT	21
A. Printed Output	21
B. Punched Output	27
V. PROCESSING INFORMATION	29
A. Operation	29
B. Estimated Machine Time	29
C. Machine Components Used	29
VI. PROGRAM NOTES	31
A. Subroutines Used	31
B. Generalized Tapes	31

CONTENTS (Continued)

VII.	FLOW DIAGRAM	33
VIII.	SYMBOLIC LISTING	35

FIGURES

1.	Slender-body geometry for AICs	3
2.	Cross section of finned region of slender body.	11
3.	Five-segment body	13

SYMBOLS

b_r	Reference semichord
C_h	Element of oscillatory AIC matrix
C_{hd}	Element of damping AIC matrix
C_{hi}	Element of inertial AIC matrix
C_{hs}	Element of steady AIC matrix
$\bar{c}$	Reference chord
F	Control point force
h	Control point deflection
I	Momentum of cross-flow virtual mass
k_r	Reference reduced frequency, $k_r = \omega b_r / V$
q	Free stream dynamic pressure
R	Body radius in finned region
S	Reference area
$S(x)$	Body cross-sectional area
$S_{n-1/2}, S_{n+1/2}$	Cross-sectional area of aft and forward ends, respectively, of n'th body segment
s	Reference semispan
t	Time
V	Free stream velocity
w	Downwash
x, y, z	Cartesian coordinates
Δ_n	Length of n'th body segment

SYMBOLS (Continued)

ΔV_n	Volume of n'th body segment
ρ	Free stream density
ω	Circular frequency
$[\]$	Square matrix
$ \ $	Column matrix

SECTION I

FORMULATION OF PROBLEM

A. Introduction

The simplest theory available for the estimation of unsteady aerodynamic loads on slender bodies is the momentum theory of Munk¹ as extended to the unsteady case by Miles.^{2,3} The limitations of the so-called slender-body theory have also been summarized by Miles (Ref. 4, Table 2, p. 161). These are: (1) the fineness ratio must be much less than unity; (2) the Mach number must be much less than the reciprocal of the fineness ratio; and (3) the motion must be slowly varying, or, more specifically, in the oscillatory case the reduced frequency must be of order unity. Hence, we see that the slender-body theory can be useful in the supersonic flight regime provided that the body is sufficiently slender and the motion is not violent.

The present formulation is based on the derivation of the oscillatory aerodynamic influence coefficients (AICs) from slender-body theory given by Rodden and Revell.⁵ The simplicity of slender-body theory permits the extension of Ref. 5 to obtain a number of sets of AICs for use in transient analysis, and this extension is made in the present treatment.

B. Sign Convention

The standard NASA stability axis system is used throughout. The positive directions of x , y , and z are forward, starboard, and downward, respectively. Positive rotations are given by applying the right-hand rule to the coordinate directions. The vehicle is assumed to be moving in the positive x -direction; i. e., the relative wind is in the negative x -direction. The force sign convention is the same as the coordinate convention.

C. Derivation of Equations

The derivation of equations for the oscillatory case is given in Ref. 5 (pp. 60-72). However, Ref. 5 contains a mistake in sign that leads to the incorrect sign on the damping terms, so it becomes necessary to repeat the

derivation here with the correction. We shall present the derivation for the oscillatory case since, by properly identifying the various terms, we may indicate the results for the transient case. We define the transient influence coefficients to relate the aerodynamic forces to the body deflections and their first two derivatives by the following

$$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{\dot{h}\bar{c}/V\} + [C_{hi}] \{\ddot{h}\bar{c}^2/V^2\} \right) \quad (1)$$

The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by

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

Equations (1) and (2) must be identical in the oscillatory case, so the following relationship must exist among the various AICs

$$2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}] \quad (3)$$

The equations given by Bisplinghoff, Ashley, and Halfman⁶ provide a convenient basis for deriving the AICs of a slender body. The vertical force acting per unit length of the body is the reaction to the substantial rate of change of the momentum of the virtual mass per unit length of the body

$$\frac{dF}{dx} = - \frac{D}{Dt} \left(\frac{dI}{dx} \right) \quad (4)$$

where the substantial derivative operator is given by

$$\frac{D}{Dt} = -V \frac{\partial}{\partial x} + \frac{\partial}{\partial t} \quad (5)$$

since the relative wind is moving in the negative x-direction (see Fig. 1).

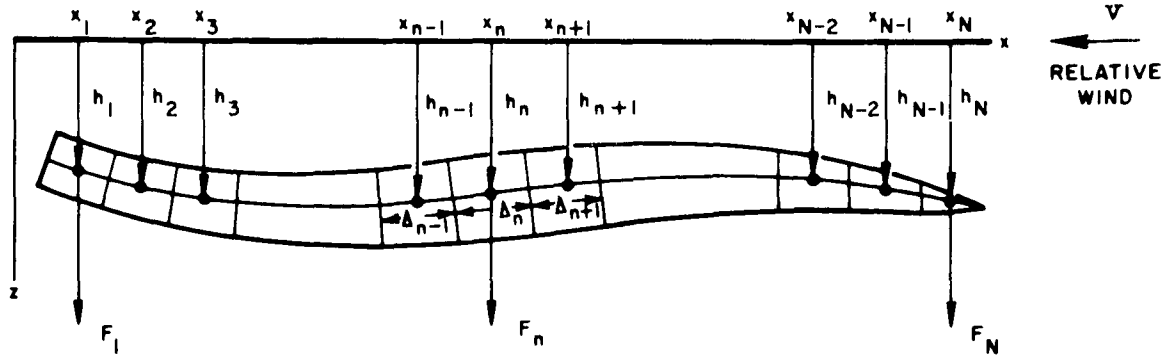


Fig. 1. Slender-body geometry for AICs.

The momentum of the virtual mass per unit length is found from the local cross-sectional area and the downwash

$$\frac{dI}{dx} = \rho S(x)w(x, t) \quad (6)$$

where the downwash is the substantial derivation of the deflection

$$w(x, t) = \frac{Dh}{Dt} \quad (7a)$$

$$= -V \frac{\partial h}{\partial t} + \frac{\partial h}{\partial t} \quad (7b)$$

If we assume harmonic motion and substitute Eqs. (5), (6), and (7b) into Eq. (4), we obtain

$$\frac{dF}{dx} = \rho V \frac{d}{dx} \left\{ S(x) \left(-V \frac{dh}{dx} + i\omega h \right) \right\} - i\omega \rho S(x) \left(-V \frac{dh}{dx} + i\omega h \right) \quad (8)$$

To obtain the force on a specified length of the body, it is necessary to integrate Eq. (8) over that length. We consider the body to be divided into a

number of sections, not necessarily of equal length, as shown in Fig. 1. For the n'th section, the control point is taken at the midpoint of its length Δ_n .*

The aft end of the section is located at $x_{n-1/2} = x_n - \Delta_n/2$ and has the cross-section area $S_{n-1/2}$; the forward end of the section is located at $x_{n+1/2} = x_n + \Delta_n/2$ and has the cross-section area $S_{n+1/2}$. Carrying out the integration of Eq. (8) for the n'th section yields the following

$$F_n = \int_{x_{n-1/2}}^{x_{n+1/2}} \frac{dF}{dx} dx \quad (9a)$$

$$= \rho V \left[S(x) \left(-V \frac{dh}{dx} + i\omega h \right) \right]_{x_{n-1/2}}^{x_{n+1/2}} - i\omega \rho \int_{x_{n-1/2}}^{x_{n+1/2}} S(x) \left(-V \frac{dh}{dx} + i\omega h \right) dx \quad (9b)$$

$$= \rho V \left[-V(S_{n+1/2} h'_{n+1/2} - S_{n-1/2} h'_{n-1/2}) + i\omega(S_{n+1/2} h_{n+1/2} - S_{n-1/2} h_{n-1/2}) \right]$$

$$- i\omega \rho \int_{x_{n-1/2}}^{x_{n+1/2}} S(x) (-Vh' + i\omega h) dx \quad (9c)$$

We resort to Lagrangian interpolation for the evaluation of the terms in Eq. (9c). For the first two terms, we choose parabolic interpolation

$$h = h_{n-1} \frac{(x - x_n)(x - x_{n+1})}{(x_{n-1} - x_n)(x_{n-1} - x_{n+1})} + h_n \frac{(x - x_{n-1})(x - x_{n+1})}{(x_n - x_{n-1})(x_n - x_{n+1})} + h_{n+1} \frac{(x - x_{n-1})(x - x_n)}{(x_{n+1} - x_{n-1})(x_{n+1} - x_n)} \quad (10)$$

* The input to the program must be the coordinates of the endpoints (aft and forward) of each section, from which the control point locations are calculated by averaging. With a given total body length, it is not possible to specify the control point locations a priori.

For evaluation of the integral, we use only linear interpolation

$$h = h_n + h'_n(x - x_n) \quad (11)$$

and

$$S(x) = (1/\Delta_n) \left[S_{n-1/2}(x_{n+1/2} - x) + S_{n+1/2}(x - x_{n-1/2}) \right] \quad (12)$$

The three-point interpolation leads to three elements in each row of the AIC matrix. Therefore, from the definition of Eq. (2),

$$F_n = \rho \omega^2 b_r^2 (C_{hn, n-1} h_{n-1} + C_{hn, n} h_n + C_{hn, n+1} h_{n+1}) \quad (13)$$

By identifying Eq. (13) and Eq. (9c), after evaluating the integral of Eq. (9c) by means of Eqs. (11) and (12), we obtain the following relation for the AICs

$$\begin{aligned} C_{hn, n-1} h_{n-1} + C_{hn, n} h_n + C_{hn, n+1} h_{n+1} = & \left(1/k_r^2 \right) \left[(S_{n-1/2} h'_{n-1/2} - S_{n+1/2} h'_{n+1/2}) \right. \\ & + i(k_r/b_r)(S_{n+1/2} h_{n+1/2} - S_{n-1/2} h_{n-1/2} + h'_n \Delta V_n) \\ & \left. - \left(k_r^2/b_r^2 \right) \left[\left(\Delta_n^2/12 \right) (S_{n-1/2} - S_{n+1/2}) h'_n - h_n \Delta V_n \right] \right] \quad (14) \end{aligned}$$

where ΔV_n is the volume of the n'th section.

If we evaluate the deflections in Eq. (10) at stations $x_{n-1/2}$ and $x_{n+1/2}$, and then, by differentiating Eq. (10), evaluate the slopes at stations $x_{n-1/2}$, x_n , $x_{n+1/2}$, then we may place the right-hand side of Eq. (14) in terms of the control point deflections h_{n-1} , h_n , and h_{n+1} . If we carry out this substitution,

the AICs are found by identifying the coefficients of the control point deflections on both sides of Eq. (14). The following results are obtained

$$C_{hn, n-1} = \left(1/k_r^2 s D_{n-1}\right) \left\{ 2S_{n+1/2}(\Delta_{n+1} - \Delta_n) - 2S_{n-1/2}(3\Delta_n + \Delta_{n+1}) + i(k_r/b_r) \right. \\ \times \left[-S_{n+1/2} \Delta_n \Delta_{n+1} - S_{n-1/2} \Delta_n (2\Delta_n + \Delta_{n+1}) - 2\Delta V_n (\Delta_n + \Delta_{n+1}) \right] \\ \left. - \left(k_r^2/b_r^2\right) \left(\Delta_n^2/6\right) (S_{n+1/2} - S_{n-1/2})(\Delta_n + \Delta_{n+1}) \right\}, \quad (15)$$

where

$$D_{n-1} = (\Delta_{n-1} + \Delta_n)(\Delta_{n-1} + 2\Delta_n + \Delta_{n+1}) \quad ; \quad (16)$$

$$C_{hn, n} = \left(1/k_r^2 s D_n\right) \left\{ 2S_{n+1/2}(\Delta_{n-1} + 2\Delta_n - \Delta_{n+1}) - 2S_{n-1/2}(\Delta_{n-1} - 2\Delta_n - \Delta_{n+1}) \right. \\ \left. + i(k_r/b_r) \left[S_{n+1/2} \Delta_{n+1} (\Delta_{n-1} + 2\Delta_n) - S_{n-1/2} \Delta_{n-1} (2\Delta_n + \Delta_{n+1}) \right. \right. \\ \left. \left. + 2\Delta V_n (\Delta_{n+1} - \Delta_{n-1}) \right] - \left(k_r^2/b_r^2\right) \left[\left(\Delta_n^2/6\right) (S_{n-1/2} - S_{n+1/2})(\Delta_{n+1} - \Delta_{n-1}) - D_n \Delta V_n \right] \right\}, \quad (17)$$

where

$$D_n = (\Delta_{n-1} + \Delta_n)(\Delta_n + \Delta_{n+1}) \quad ; \quad (18)$$

$$C_{hn, n+1} = \left(1/k_r^2 s D_{n+1}\right) \left\{ 2S_{n-1/2}(\Delta_{n-1} - \Delta_n) - 2S_{n+1/2}(\Delta_{n-1} + 3\Delta_n) + i(k_r/b_r) \right. \\ \times \left[S_{n+1/2} \Delta_n (\Delta_{n-1} + 2\Delta_n) + S_{n-1/2} \Delta_{n-1} \Delta_n + 2\Delta V_n (\Delta_{n-1} + \Delta_n) \right] \\ \left. - \left(k_r^2/b_r^2\right) \left(\Delta_n^2/6\right) (S_{n-1/2} - S_{n+1/2})(\Delta_{n-1} + \Delta_n) \right\}, \quad (19)$$

where

$$D_{n+1} = (\Delta_{n-1} + 2\Delta_n + \Delta_{n+1})(\Delta_n + \Delta_{n+1}) \quad (20)$$

The above expressions are applicable for all intermediate sections of the body, sections which are centrally located as far as the interpolation and differentiation are concerned. The exceptions are the first and N'th sections. The counterpart of Eq. (14) for the first section is

$$\begin{aligned} C_{h1,1} h_1 + C_{h1,2} h_2 + C_{h1,3} h_3 = & \left(1/k_r^2 s\right) \left\{ S_{1/2} h'_{1/2} - S_{3/2} h'_{3/2} + i(k_r/b_r) \right. \\ & \times (S_{3/2} h_{3/2} - S_{1/2} h_{1/2} + h'_1 \Delta V_1) - \left. \left(k_r^2/b_r^2\right) \left[(\Delta_1^2/12) (S_{1/2} - S_{3/2}) h'_1 - h_1 \Delta V_1 \right] \right\}. \end{aligned} \quad (21)$$

Carrying out the evaluation of the appropriate deflections and slopes from Eq. (10) in terms of the first three control point deflections leads to the following coefficients for the first row of the AIC matrix

$$\begin{aligned} C_{h1,1} = & \left(1/k_r^2 s D_1\right) \left\{ 2S_{3/2} (3\Delta_2 + \Delta_3) - 2S_{1/2} (4\Delta_1 + 3\Delta_2 + \Delta_3) + i(k_r/b_r) \right. \\ & \times \left[S_{3/2} \Delta_2 (2\Delta_2 + \Delta_3) - S_{1/2} (2\Delta_1 + \Delta_2) (2\Delta_1 + 2\Delta_2 + \Delta_3) - 2\Delta V_1 (2\Delta_1 + 3\Delta_2 + \Delta_3) \right] \\ & \left. - \left(k_r^2/b_r^2\right) \left[(\Delta_1^2/6) (S_{3/2} - S_{1/2}) (2\Delta_1 + 3\Delta_2 + \Delta_3) - D_1 \Delta V_1 \right] \right\}, \end{aligned} \quad (22)$$

where

$$D_1 = D_{n-1} \text{ with } n = 2 \quad ;$$

$$\begin{aligned}
C_{h1,2} = & \left(1/k_r^2 s D_2\right) \left\{ 2S_{3/2}(\Delta_1 - 2\Delta_2 - \Delta_3) + 2S_{1/2}(3\Delta_1 + 2\Delta_2 + \Delta_3) + i(k_r/b_r) \right. \\
& \times \left[S_{3/2} \Delta_1 (2\Delta_2 + \Delta_3) + S_{1/2} \Delta_1 (2\Delta_1 + 2\Delta_2 + \Delta_3) + 2\Delta V_1 (\Delta_1 + 2\Delta_2 + \Delta_3) \right] \\
& \left. - \left(k_r^2/b_r^2\right) \left(\Delta_1^2/6\right) (S_{1/2} - S_{3/2}) (\Delta_1 + 2\Delta_2 + \Delta_3) \right\} , \quad (23)
\end{aligned}$$

where

$$D_2 = D_n \text{ with } n = 2 ;$$

$$\begin{aligned}
C_{h1,3} = & \left(1/k_r^2 s D_3\right) \left\{ 2S_{3/2}(\Delta_2 - \Delta_1) - 2S_{1/2}(3\Delta_1 + \Delta_2) + i(k_r/b_r) \left[-S_{3/2} \Delta_1 \Delta_2 \right. \right. \\
& \left. \left. - S_{1/2} \Delta_1 (2\Delta_1 + \Delta_2) - 2\Delta V_1 (\Delta_1 + \Delta_2) \right] - \left(k_r^2/b_r^2\right) \left(\Delta_1^2/6\right) (S_{3/2} - S_{1/2}) (\Delta_1 + \Delta_2) \right\} , \quad (24)
\end{aligned}$$

where

$$D_3 = D_{n+1} \text{ with } n = 2 .$$

Similarly, the counterpart of Eq. (14) for the N'th section is

$$\begin{aligned}
C_{hN,N-2} h_{N-2} + C_{hN,N-1} h_{N-1} + C_{hN,N} h_N = & \left(1/k_r^2 s\right) \left\{ S_{N-1/2} h'_{N-1/2} \right. \\
& \left. - S_{N+1/2} h'_{N+1/2} + i(k_r/b_r) (S_{N+1/2} h_{N+1/2} - S_{N-1/2} h_{N-1/2} + h'_N \Delta V_N) \right. \\
& \left. - \left(k_r^2/b_r^2\right) \left[(\Delta_N^2/12) (S_{N-1/2} - S_{N+1/2}) h'_N - h_N \Delta V_N \right] \right\} , \quad (25)
\end{aligned}$$

and we obtain the following coefficients for the last (N'th) row of the AIC matrix

$$C_{hN, N-2} = \left(1/k_r^2 s D_{N-2}\right) \left\{ 2S_{N-1/2}(\Delta_{N-1} - \Delta_N) - 2S_{N+1/2}(3\Delta_N + \Delta_{N-1}) \right. \\ \left. + i(k_r/b_r) \left[S_{N+1/2} \Delta_N (2\Delta_N + \Delta_{N-1}) + S_{N-1/2} \Delta_N \Delta_{N-1} + 2\Delta_N V_N (\Delta_N + \Delta_{N-1}) \right] \right. \\ \left. - \left(k_r^2/b_r^2\right) \left(\Delta_N^2/6\right) (S_{N-1/2} - S_{N+1/2})(\Delta_N + \Delta_{N-1}) \right\} , \quad (26)$$

where

$$D_{N-2} = D_{n-1} \text{ with } n = N - 1 ;$$

$$C_{hN, N-1} = \left(1/k_r^2 s D_{N-1}\right) \left\{ 2S_{N+1/2}(3\Delta_N + 2\Delta_{N-1} + \Delta_{N-2}) + 2S_{N-1/2}(\Delta_N - 2\Delta_{N-1} - \Delta_{N-2}) \right. \\ \left. + i(k_r/b_r) \left[-S_{N+1/2} \Delta_N (2\Delta_N + 2\Delta_{N-1} + \Delta_{N-2}) - S_{N-1/2} \Delta_N (2\Delta_{N-1} + \Delta_{N-2}) \right. \right. \\ \left. \left. - 2\Delta_N V_N (\Delta_N + 2\Delta_{N-1} + \Delta_{N-2}) \right] - \left(k_r^2/b_r^2\right) \left(\Delta_N^2/6\right) (S_{N+1/2} - S_{N-1/2})(\Delta_N + 2\Delta_{N-1} + \Delta_{N-2}) \right\} \\ (27)$$

where

$$D_{N-1} = D_n \text{ with } n = N - 1 ;$$

$$C_{hN, N} = \left(1/k_r^2 s D_N\right) \left\{ 2S_{N-1/2}(3\Delta_{N-1} + \Delta_{N-2}) - 2S_{N+1/2}(4\Delta_N + 3\Delta_{N-1} + \Delta_{N-2}) \right. \\ \left. + i(k_r/b_r) \left[S_{N+1/2}(2\Delta_N + \Delta_{N-1})(2\Delta_N + 2\Delta_{N-1} + \Delta_{N-2}) - S_{N-1/2} \Delta_{N-1}(2\Delta_{N-1} + \Delta_{N-2}) \right. \right. \\ \left. \left. + 2\Delta_N V_N (2\Delta_N + 3\Delta_{N-1} + \Delta_{N-2}) \right] - \left(k_r^2/b_r^2\right) \left[\left(\Delta_N^2/6\right) (S_{N-1/2} - S_{N+1/2}) \right. \right. \\ \left. \left. \times (2\Delta_N + 3\Delta_{N-1} + \Delta_{N-2}) - D_N \Delta_N V_N \right] \right\} , \quad (28)$$

where

$$D_N = D_{n+1} \text{ with } n = N - 1$$

To illustrate the assembly of the coefficients into the AIC matrix, we show the format below for a slender body having five degrees of freedom.

$$[C_h] = \begin{bmatrix} C_{h1,1} & C_{h1,2} & C_{h1,3} & 0 & 0 \\ C_{h2,1} & C_{h2,2} & C_{h2,3} & 0 & 0 \\ 0 & C_{h3,2} & C_{h3,3} & C_{h3,4} & 0 \\ 0 & 0 & C_{h4,3} & C_{h4,4} & C_{h4,5} \\ 0 & 0 & C_{h5,3} & C_{h5,4} & C_{h5,5} \end{bmatrix} \quad (29)$$

If we formally write each element of the oscillatory AIC matrix in the form

$$C_{h_{ij}} = \left(1/k_r^2 s D_j\right) \left[A_{ij} + i(k_r/b_r) B_{ij} - (k_r^2/b_r^2) C_{ij} \right] \quad , \quad (30)$$

then the elements of the transient AIC matrices may be identified by comparison with Eq. (3). We see that the elements of the steady AIC matrix are given by

$$C_{hs_{ij}} = 2(\bar{\tau}/S) A_{ij}/D_j \quad , \quad (31)$$

the elements of the damping AIC matrix are given by

$$C_{hd_{ij}} = (2/S) B_{ij}/D_j \quad , \quad (32)$$

and, finally, the elements of the inertial AIC matrix are given by

$$C_{hi_{ij}} = (2/\bar{c}S) C_{ij}/D_j \quad . \quad (33)$$

Before concluding this discussion, we note that, according to Miles (Ref 4, p. 169) the slender-body theory presented above may be applied to finned vehicles if an effective cross-section area in the finned region, whose geometry is shown in Fig. 2, is taken as

$$S_e = \pi(s^2 - R^2 + R^4/s^2) \quad . \quad (34)$$

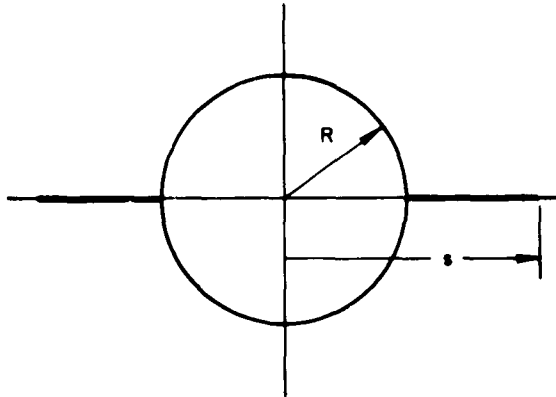


Fig. 2. Cross section of finned region of slender body.

D. References

1. M. M. Munk. "The Aerodynamic Forces on Airship Hulls." NACA Report No. 184, 1923.
2. J. W. Miles. "On Non-Steady Motion of Slender Bodies." Aeronautical Quarterly, 2 (1950), 183-194.
3. J. W. Miles. "Virtual Momentum and Slender Body Theory." Quarterly Journal of Mechanics and Applied Mathematics, 6 (1953), 286-289.
4. J. W. Miles. The Potential Theory of Unsteady Supersonic Flow. London: Cambridge University Press, 1959.
5. W. P. Rodden and J. D. Revell. "The Status of Unsteady Aerodynamic Influence Coefficients." Institute of the Aerospace Sciences S.M.F. Fund Paper No. FF-33, 23 January 1962.
6. R. L. Bisplinghoff, H. Ashley, and R. L. Halfman. Aeroelasticity. Reading: Addison-Wesley Publishing Co., Inc., 1955, p. 418.

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 control indicators, geometry, and a set of reduced velocities. The example problem illustrates their use.

1. Example Problem

We consider the five-segment body shown in Fig. 3 computing the oscillatory case for the reduced velocities ($1/k_r$) of 2.0 and 6.0, the transient case (steady, damping, and inertial AICs), and the steady case (steady AICs only).

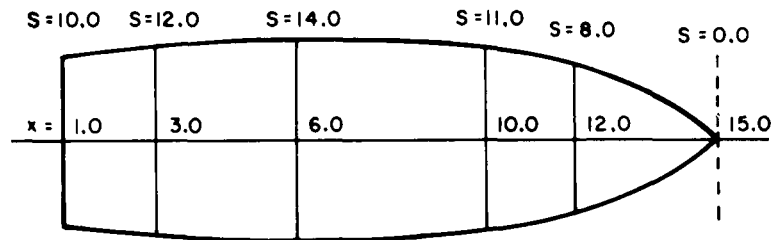


Fig. 3. Five-segment body.

The geometrical data required as input to the program are listed below.

<u>Segment No.</u>	<u>x (ft)</u>	<u>S (sq ft)</u>
1 (aft)	1	10
1 (forward), 2 (aft)	3	12
2 (forward), 3 (aft)	6	14
3 (forward), 4 (aft)	10	11
4 (forward), 5 (aft)	12	8
5 (forward)	15	0

$$\bar{c} = 10.0 \text{ ft}$$

$$b_r = 5.0 \text{ ft}$$

$$s = 20.0 \text{ ft}$$

$$S = 200.0 \text{ sq ft}$$

2. Program Restrictions and Options

a. The maximum number of segments into which a body may be subdivided must be ≤ 50 .

b. The maximum number of $1/k_r$'s for one data deck must be ≤ 50 .

c. If it is desired to compute the steady case, a zero value of $1/k_r$ must be used, to compute the transient case a negative value of $1/k_r$ must be used.

SECTION III

DATA DECK SETUP

A. Loading Order

Input data decks punched from keypunch forms are loaded behind column binary deck HM15. Any number of complete decks may be stacked. The data for each deck must be in the following order:

- (1) Heading card
- (2) IX, KVBRW, IPUNCH
- (3) CBAR, BR, S, SREF
- (4) X(I) series
- (5) LOCAL AREA(I) series
- (6) $(1/k_r)_j$ series

B. Input Data Description

- (1) The heading card may contain any information desired in Columns 2 through 72. Column 1 is always left blank.
- (2) Control card (FORMAT 18I4)
 - (a) IX = the number of control points; also the number of body segments, ≤ 50
 - (b) KVBRW = the number of reduced velocities to be listed in data item (6), ≤ 50
 - (c) IPUNCH = 0 or blank if the computed matrices are to be punched in cards;
 $\neq 0$ if no punched output is desired.

(3) Single parameters card (FORMAT 6E12.8)

- (a) $\text{CBAR} = \bar{c}$, reference chord
- (b) $\text{BR} = b_r$, reference semichord
- (c) $\text{S} = s$, reference semispan
- (d) $\text{SREF} = S$, reference area

The constants are tabulated in the order in which they are defined. CBAR and SREF are used in the steady and transient cases; BR and S (semispan) are necessary for computing oscillatory cases. When only one pair of the constants is needed, the two respective card fields for the other pair may contain zero or be left blank.

(4) $X(I)$ Segment coordinate series, $I \leq 51$ (FORMAT 6E12.8)

The x coordinates ($x_{n-1/2}$ and $x_{n+1/2}$) used in this series locate the aft and forward end of each body segment. The number of terms in the series is one more than the number of control points ($I = 1, IX + 1$). Begin the series with $x_{n-1/2}$ (aft end) of the aft body segment and list the consecutive coordinates through $x_{n+1/2}$ (forward end) of the foremost body segment (nose).

(5) LOCAL AREA (I) series (FORMAT 6E12.8)

These are the local cross-section areas ($S_{n-1/2}$ and $S_{n+1/2}$) at the aft and forward end of each body segment. The number of terms in this series is the same as in $X(I)$. The areas are listed in the same order as the coordinates; begin with $S_{n-1/2}$ for the aft body segment and list the consecutive areas through $S_{n+1/2}$ for the foremost body segment.

(6) $(1/k_r)_j$ series (FORMAT 6E12.8)

This series consists of the reference reduced velocities for the oscillatory case and the codes for obtaining the steady and transient cases. To obtain the steady matrix $[C_{hs}]$ input $1/k_r = 0.0$ and for the

transient case ($[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$) use $1/k_r =$ any negative number.
The number of $1/k_r$'s in the series is set by KVBRW in the control card.

NOTE: Each new series starts on a new line (card).

C. Example Key punch 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. In the example that follows, only the sequenced cards (lines) are to be used in the sample data deck; the lines with blank Columns 73 through 80 are for explanation of the input.

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
HEADING CARD FOR USER OF AIC FROM SLENDER-BODY THEORY																																																																															
Heading card																																																																															
HM150001																																																																															
HM150002																																																																															
HM150003																																																																															
HM150004																																																																															
HM150005																																																																															
HM150006																																																																															
HM150007																																																																															
HM150008																																																																															
HM150009																																																																															
HM150010																																																																															
HM150011																																																																															
HM150012																																																																															
HM150013																																																																															
HM150014																																																																															
HM150015																																																																															
HM150016																																																																															
HM150017																																																																															
HM150018																																																																															
HM150019																																																																															
HM150020																																																																															
HM150021																																																																															
HM150022																																																																															
HM150023																																																																															
HM150024																																																																															
HM150025																																																																															
HM150026																																																																															
HM150027																																																																															
HM150028																																																																															
HM150029																																																																															
HM150030																																																																															
HM150031																																																																															
HM150032																																																																															
HM150033																																																																															
HM150034																																																																															
HM150035																																																																															
HM150036																																																																															
HM150037																																																																															
HM150038																																																																															
HM150039																																																																															
HM150040																																																																															
HM150041																																																																															
HM150042																																																																															
HM150043																																																																															
HM150044																																																																															
HM150045																																																																															
HM150046																																																																															
HM150047																																																																															
HM150048																																																																															
HM150049																																																																															
HM150050																																																																															
HM150051																																																																															
HM150052																																																																															
HM150053																																																																															
HM150054																																																																															
HM150055																																																																															
HM150056																																																																															
HM150057																																																																															
HM150058																																																																															
HM150059																																																																															
HM150060																																																																															
HM150061																																																																															
HM150062																																																																															
HM150063																																																																															
HM150064																																																																															
HM150065																																																																															
HM150066																																																																															
HM150067																																																																															
HM150068																																																																															
HM150069																																																																															
HM150070																																																																															
HM150071																																																																															
HM150072																																																																															
HM150073																																																																															
HM150074																																																																															
HM150075																																																																															
HM150076																																																																															
HM150077																																																																															
HM150078																																																																															
HM150079																																																																															
HM150080																																																																															
HM150081																																																																															
HM150082																																																																															
HM150083																																																																															
HM150084																																																																															
HM150085																																																																															
HM150086																																																																															
HM150087																																																																															
HM150088																																																																															
HM150089																																																																															
HM150090																																																																															
HM150091																																																																															
HM150092																																																																															
HM150093																																																																															
HM150094																																																																															
HM150095																																																																															
HM150096																																																																															
HM150097																																																																															
HM150098																																																																															
HM150099																																																																															
HM150100																																																																															
HM150101																																																																															
HM150102																																																																															
HM150103																																																																															
HM150104																																																																															
HM150105																																																																															
HM150106																																																																															
HM150107																																																																															
HM150108																																																																															
HM150109																																																																															
HM150110																																																																															
HM150111																																																																															
HM150112																																																																															
HM150113																																																																															
HM150114																																																																															
HM150115																																																																															
HM150116																																																																															
HM150117																																																																															
HM150118																																																																															
HM150119																																																																															
HM150120																																																																															
HM150121																																																																															
HM150122																																																																															
HM150123																																																																															
HM150124																																																																															
HM150125																																																																															
HM150126																																																																															
HM150127																																																																															
HM150128																																																																															
HM150129																																																																															
HM150130																																																																															
HM150131																																																																															
HM150132																																																																															
HM150133																																																																															
HM150134																																																																															
HM150135																																																																															
HM150136																																																																															
HM150137																																																																															
HM150138																																																																															
HM150139																																																																															
HM150140																																																																															
HM150141																																																																															
HM150142																																																																															
HM150143																																																																															
HM150144																																																																															
HM150145																																																																															
HM150146																																																																															
HM150147																																																																															
HM150148																																																																															
HM150149																																																																															
HM150150																																																																															
HM150151																																																																															
HM150152																																																																															
HM150153																																																																															
HM150154																																																																															
HM150155																																																																															
HM150156																																																																															
HM150157																																																																															
HM150158																																																																															
HM150159																																																																															
HM150160																																																																															
HM150161																																																																															
HM150162																																																																															
HM150163																																																																															
HM150164																																																																															
HM150165																																																																															
HM150166																																																																															
HM150167																																																																															
HM150168																																																																															
HM150169																																																																															
HM150170																																																																															
HM150171																																																																															
HM150172																																																																															
HM150173																																																																															
HM150174																																																																															
HM150175																																																																															
HM150176																																																																															
HM150177																																																																															
HM150178																																																																															
HM150179																																																																															
HM150180																																																																															
HM150181																																																																															
HM150182																																																																															
HM150183																																																																															
HM150184																																																																															
HM150185																																																																															
HM150186																																																																															
HM150187																																																																															
HM150188																																																																															
HM150189																																																																															
HM150190																																																																															
HM150191																																																																															
HM150192																																																																															
HM150193																																																																															
HM150194																																																																															
HM150195																																																																															
HM150196																																																																															
HM150197																																																																															
HM150198																																																																															
HM150199																																																																															
HM150200																																																																															
HM150201																																																																															
HM150202																																																																															
HM150203																																																																															
HM150204																																																																															
HM150205																																																																															
HM150206																																																																															
HM150207																																																																															
HM150208																																																																															
HM150209																																																																															
HM150210																																																																															
HM150211																																																																															
HM150212																																																																															
HM150213																																																																															
HM150214																																																																															
HM150215																																																																															
HM150216																																																																															
HM150217																																																																															
HM150218																																																																															
HM150219																																																																															
HM150220																																																																															
HM150221																																																																															
HM150222																																																																															
HM150223																																																																															
HM150224																																																																															
HM150225																																																																															
HM150226																																																																															
HM150227																																																																															
HM150228																																																																															
HM150229																																																																															
HM150230																																																																															
HM150231																																																																															
HM150232																																																																															
HM150233																																																																															
HM150234																																																																															
HM150235																																																																															
HM150236																																																																															
HM150237																																																																															
HM150238																																																																															
HM150239																																																																															
HM150240																																																																															
HM150241																																																																															
HM150242																																																																															
HM150243																																																																															
HM150244																																																																															
HM150245																																																																															
HM150246																																																																															
HM150247																																																																															
HM150248																																																																															
HM150249																																																																															
HM150250																																																																															
HM150251																																																																															
HM150252																																																																															
HM150253																																																																															
HM150254																																																																															
HM150255																																																																															
HM150256																																																																															
HM150257																																																																															
HM150258																																																																															
HM150259																																																																															
HM150260																																																																															
HM150261																																																																															
HM150262																																																																															
HM150263																																																																															
HM150264																																																																															
HM150265																																																																															
HM150266																																																																															
HM150267																																																																															
HM150268																																																																															
HM150269																																																																															
HM150270																																																																															
HM150271																																																																															
HM150272																																																																															
HM150273																																																																															
HM150274																																																																															
HM150275																																																																															
HM150276																																																																															
HM150277																																																																															
HM150278																																																																															
HM150279																																																																															
HM150280																																																																															
HM150281																																																																															
HM150282																																																																															
HM150283																																																																															
HM150284																																																																															
HM150285																																																																															
HM150286																																																																															
HM150287																																																																															
HM150288																																																																															
HM150289																																																																															
HM150290																																																																															
HM150291																																																																															
HM150292																																																																															
HM150293																																																																															
HM150294																																																																															
HM150295																																																																															
HM150296																																																																															
HM150297																																																																															
HM150298																																																																															
HM150299																																																																															
HM150300																																																																															
HM150301																																																																															
HM150302																																																																															
HM150303																																																																															
HM150304																																																																															
HM150305																																																																															
HM150306																																																																															
HM150307																																																																															
HM150308																																																																															
HM150309																																																																															
HM150310																																																																															
HM150311																																																																															
HM150312																																																																															
HM150313																																																																															
HM150314																																																																															
HM150315																																																																															
HM150316																																																																															
HM150317																																																																															
HM150318																																																																															
HM150319																																																																															
HM150320																																																																															
HM150321																																																																															
HM150322																																																																															
HM150323																																																																															
HM150324																																																																															
HM150325																																																																															
HM150326																																																																															
HM150327																																																																															
HM150328																																																																															
HM150329																																																																															
HM150330																																																																															
HM150331																																																																															
HM150332																																																																															
HM150333																																																																															
HM150334																																																																															
HM150335																																																																															
HM150336																																																																															
HM150337																																																																															
HM150338																																																																															
HM150339																																																																															
HM150340																																																																															
HM150341																																																																															
HM150342																																																																															
HM150343																																																																															
HM150344																																																																															
HM150345																																																																															
HM150346																																																																															
HM150347																																																																															
HM150348																																																																															
HM150349																																																																															
HM150350																																																																															
HM150351																																																																															
HM150352																																																																															
HM150353																																																																															
HM150354																																																																															
HM150355																																																																															
HM150356																																																																															
HM150357																																																																															
HM150358																																																																															
HM150359																																																																															
HM150360																																																																															
HM150361																																																																															
HM150362																																																																															
HM150363																																																																															
HM150364																																																																															
HM150365																																																																															
HM150366																																																																															
HM150367																																																																															
HM150368																																																																															
HM150369																																																																															
HM150370																																																																															
HM150371																																																																															
HM150372																																																																															
HM150373																																																																															
HM150374																																																																															
HM150375																																																																															
HM150376																																																																															
HM150377																																																																															
HM150378																																																																															
HM150379																																																																															
HM150380																																																																															
HM150381																																																																															
HM150382																																																																															
HM150383																																																																															
HM150384																																																																															
HM150385																																																																															
HM150386																																																																															
HM150387																																																																															
HM150388																																																																															
HM150389																																																																															
HM150390																																																																															
HM150391																																																																															
HM150392																																																																															
HM150393																																																																															
HM150394																																																																															
HM150395																																																																															
HM150396																																																																															
HM150397																																																																															
HM150398																																																																															
HM150399																																																																															
HM150400																																																																															
HM150401																																																																															
HM150402																																																																															
HM150403																																																																															
HM150404																																																																															
HM150405																																																																															
HM150406																																																																															
HM150407																																																																															
HM150408																																																																															
HM150409																																																																															
HM150410																																																																															
HM150411																																																																															
HM150412																																																																															
HM150413																																																																															
HM150414																																																																															
HM150415																																																																															
HM150416																																																																															
HM150417																																																																															
HM150418																																																																															
HM150419																																																																															
HM150420																																																																															
HM150421																																																																															
HM150422																																																																															
HM150423																																																																															
HM150424																																																																															
HM150425																																																																															
HM150426																																																																															
HM150427																																																																															
HM150428																																																																															
HM150429																																																																															
HM150430																																																																															
HM150431																																																																															
HM150432																																																																															
HM150433																																																																															
HM150434																																																																															
HM150435																																																																															
HM150436																																																																															
HM150437																																																																															
HM150438																																																																															
HM150439																																																																															
HM150440																																																																															
HM150441																																																																															
HM150442																																																																															
HM150443																																																																															
HM150444																																																																															
HM150445																																																																															
HM150446																																																																															
HM150447																																																																															
HM150448																																																																															
HM150449																																																																															
HM150450																																																																															
HM150451																																																																															
HM150452																																																																															
HM150453																																																																															
HM150454																																																																															
HM150455																																																																															
HM150456																																																																															
HM150457																																																																															
HM150458																																																																															
HM150459																																																																															
HM150460																																																																															
HM150461																																																																															
HM150462																																																																															
HM150463																																																																															
HM150464																																																																															
HM150465																																																																															
HM150466																																																																															
HM150467																																																																															
HM150468																																																																															
HM150469																																																																															
HM150470																																																																															
HM150471																																																																															
HM150472																																																																															
HM150473																																																																															
HM150474																																																																															
HM150475																																																																															
HM150476																																																																															
HM150477																																																																															
HM150478																																																																															
HM150479																																																																															
HM150480																																																																															
HM150481																																																																															
HM150482																																																																															
HM150483																																																																															
HM150484																																																																															
HM150485																																																																															
HM150486																																																																															
HM150487																																																																															
HM150488																																																																															
HM150489																																																																															

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
X(43)										X(50)										X(51)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

SECTION IV

PROGRAM OUTPUT

A. Printed Output

1. All input data.
2. The segment lengths [DELTA X (I)] and the control point coordinates XN (I), (Δ_n and x_n in Section I.C).
3. Each AIC matrix preceded by the associated $1/k_r$ and the matrix size.
4. Sequencing number of the first and last punched cards (output) for each AIC matrix.
5. Example problem printed output is given on the following pages.

HEADING CARD FOR USER OF AIC FROM SLENDER-BODY THEORY AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY

INPUT DATA

5 SECTIONS
4 REDUCED VELOCITIES

CBAR= 0.09999999E 02
BR= 0.49999999E 01
S= 0.20000000E 02
SREF= 0.20000000E 03

X(I)	LOCAL AREA
0.09999999E 01	0.09999999E 02
0.30000000E 01	0.12000000E 02
0.59999999E 01	0.13999999E 02
0.09999999E 02	0.11000000E 02
0.12000000E 02	0.80000000E 01
0.15000000E 02	0.

OUTPUT DATA

CONTROL PT. NO.	DELTA X(I)	CONTROL POINT XN(I)
1	0.20000000E 01	0.20000000E 01
2	0.30000000E 01	0.45000000E 01
3	0.40000000E 01	0.80000000E 01
4	0.20000000E 01	0.11000000E 02
5	0.30000000E 01	0.13500000E 02

AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY

1./KR= 0.2000000E 01

NUMBER OF CONTROL POINTS= 5

THE OSCILLATORY CASE

	REAL	IMAGINARY	REAL	IMAGINARY	REAL	IMAGINARY
	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6
1	-0.31675555E-00	-0.45599999E-00	0.73234285E 00	0.5985713E 00	-0.37158729E-00	-0.10285714E-00
2	-0.94736665E 00	-0.35799999E-00	0.18154857E 01	0.20800000E-00	-0.79011904E 00	0.19000000E-00
3	0.	0.	-0.95718679E 00	-0.27428570E-00	0.19765714E 01	-0.13238095E-00
4	0.	0.	0.	0.	-0.55121211E 00	-0.11878788E-00
5	0.	0.	0.	0.	-0.50303029E-01	0.50909089E-01
	COLUMN 7	COLUMN 8	COLUMN 9	COLUMN 10	COLUMN	
1	0.	0.	0.	0.		
2	0.	0.	0.	0.		
3	-0.91938459E 00	0.34666666E-00	0.	0.		
4	0.10114666E 01	-0.10266666E-00	-0.42225453E-00	0.16145454E-00		
5	-0.52453332E 00	-0.30399999E-00	0.59883635E 00	0.93090907E-01		

PUNCHED CARDS NOS. HM15 1 THRU HM15 13

NUMBER OF CONTROL POINTS = 5

THE TRANSIENT CASE

THE CHD MATRIX					
	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
1	-0.2279999E-00	0.29042856E-00	-0.51428570E-01	0.	0.
2	-0.17899999E-00	0.10399999E-00	0.94999999E-01	0.	0.
3	0.	-0.13714285E-00	-0.66190474E-01	0.17333332E-00	0.
4	0.	0.	-0.59393939E-01	-0.51333332E-01	0.80727270E-01
5	0.	0.	0.25454544E-01	-0.15200000E-00	0.46545453E-01

THE CHI MATRIX					
	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
1	-0.21622221E-01	-0.45714284E-03	0.79365077E-04	0.	
2	0.34999999E-03	-0.39171427E-01	-0.17857142E-03	0.	
3	0.	-0.52747252E-03	-0.50190474E-01	0.71794869E-03	
4	0.	0.	-0.15151514E-03	-0.19066665E-01	0.21818181E-03
5	0.	0.	0.90909089E-03	-0.43999999E-02	-0.85090906E-02

PUNCHED CARDS NOS. HM15 14 THRU HM15 33

AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY

1./KR= 0.

NUMBER OF CONTROL POINTS = 5

THE STEADY CASE

	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN
1	-0.17999999E-00	0.36571427E-00	-0.18571428E-00	0.	0.	
2	-0.47333332E-00	0.86857141E 00	-0.39523809E-00	0.	0.	
3	0.	-0.47012087E-00	0.93809521E 00	-0.45897435E-00	0.	
4	0.	0.	-0.27575757E-00	0.48666665E-00	-0.21090908E-00	
5	0.	0.	-0.24242423E-01	-0.26666666E-00	0.29090908E-00	

PUNCHED CARDS NOS. HM15 34 THRU HM15 41

AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY

1./KR= 0.59999999E 01

NUMBER OF CONTROL POINTS= 5

THE OSCILLATORY CASE

	REAL	IMAGINARY	REAL	IMAGINARY	REAL	IMAGINARY
	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6
1	-0.31967555E 01	-0.13679999E 01	0.65837713E 01	0.17965714E 01	-0.33430158E 01	-0.30857142E-00
2	-0.85206998E 01	-0.10739999E 01	0.15712628E 02	0.62399999E 00	-0.71139284E 01	0.56999999E 00
3	0.	0.	-0.86231206E 01	-0.82285713E 00	0.16986094E 02	-0.39714285E-00
4	0.	0.	0.	0.	-0.49633332E 01	-0.35636363E-00
5	0.	0.	0.	0.	-0.43818181E-00	0.15272727E-00
	COLUMN 7	COLUMN 8	COLUMN 9	COLUMN 10	COLUMN	
1	0.	0.	0.	0.		
2	0.	0.	0.	0.		
3	-0.82629741E 01	0.10399999E 01	0.	0.		
4	0.87981331E 01	-0.30799999E-00	-0.37967999E 01	0.48436362E-00		
5	-0.47911999E 01	-0.91199999E 00	0.52533817E 01	0.27927272E-00		

PUNCHED CARDS NOS. HMI5 42 THRU HMI5 54

B. Punched Output

1. A deck of punched cards (output) from this program is suitable as an input deck to other programs requiring AICs.
2. All punched output is sequenced in order on Columns 73 through 80 starting with HM150001. The data is punched in the following order:
 - a. Card 1 contains $(1/k_r)$: (FORMAT 6E12.8).
 - b. Card 2 contains IX, the size (number of control points) of the AIC matrix (FORMAT 18I4).
 - c. The AIC matrix punched in column binary form and its TRA card make up the remainder of the punched output for $(1/k_r)$.
3. The order of Statement 2 can be repeated for all reduced velocities per input deck if we note that in the transient case, the three matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$, which must be considered in Statement 2. c, are punched in the order listed with a TRA card after each matrix.
4. Each AIC matrix is punched by columns. Column 1 starts in Origin 1 and Column 2 in Location $(1 + \text{matrix size})$.
5. The oscillatory matrices are punched in the order Column 1 (real), Column 1 (imaginary); Column 2 (real), Column 2 (imaginary); ...; Column IX (real), Column IX (imaginary). In the steady, damping, and inertial matrices 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

IX = number of control points

KVBRW = number of reduced velocities per deck

m = number of decks of input data

$$T = 0.5 + 0.01 \sum_{j=1}^m (IX)_j (KVBRW)_j$$

C. Machine Components Used

A number of core storages

Standard FORTRAN input tape (N1)

Standard FORTRAN output print tape (N2)

Standard FORTRAN output punch tape (N3)

SECTION VI
PROGRAM NOTES

A. Subroutines Used

BINPU: binary punch routine

MPUNCH: punch AIC matrix

MPRINT: prints AIC matrix

B. Generalized Tapes

Input, print, and punch tapes are defined as Units 2, 3, and 5, respectively; however, these may be altered by placing the desired units on symbolic cards HM150007, HM150008, and HM150009.

FLOW DIAGRAM

SECTION VIII

SYMBOLIC LISTING

Some of the symbols used in the program are defined as follows:

<u>FORTRAN symbols</u>	<u>Definition</u>
A (I, J) .	$[C_{hs}]$, also the associated working array
B (I, J)	$[C_{hd}]$, also the associated working array
BR	b_r
CBAR	$\bar{c}$
C (I, J)	$[C_{hi}]$, also the associated working array
CH (I, J), CH (I, J + 1)	Respective real and imaginary parts of the oscillatory AIC Matrix
DF1, DF2, . . . , DF9	$D_1, D_2, D_3, D_{N-2}, D_{N-1}, D_N, D_{n-1}, D_n$, and D_{n+1} , respectively
DELTAX (I)	Δ_n for segment i, $i = n$
DELVOL (I)	ΔV_n for segment i, $i = n$
IX	Number of control points
S	s
LOCAL AREA (I)	Used in printed output only, see SVAR (below)
SREF	S
SVAR (I)	$S_{n-1/2}$ for segment i ($i = 1, IX$) and $S_{n+1/2}$ for segment IX
SVMINU (I)	$S_{n-1/2}$ for segment i
KVBRW	Number of reduced velocities included in the data deck

FORTTRAN symbolsDefinition

X (I)	$x_{n-1/2}$ for segment i ($i = 1, IX$) and $x_{n+1/2}$ for segment IX
XKR (J)	$1/k_r$ for reduced velocity j, $j = 1, KVBRW$
XN (I)	Control point coordinate, segment i
XMINUS (I)	$X_{n-1/2}$ for segment i
XPLUS (I)	$X_{n+1/2}$ for segment i

The complete symbolic listing is given on the following pages.

AERODYNAMIC INFLUENCE COEFFICIENTS

```

1  DIMENSION SVAR(51),SVPLUS(50),SVMINU(50),X(51),XN(50),
    1 DELVOL(50),DELTAX(50),XPLUS(50),XMINUS(50),A(50,50),B(50,50),
    2 CH(50,50),C(50,50),TITLE(12),XKR(50)
    C  DEFINE N1 TAPE TO BE READ INPUT TAPE NUMBER
    C  DEFINE N2 TAPE TO BE WRITE OUTPUT TAPE NUMBER
    C  DEFINE N3 TAPE TO BE PUNCH TAPE NUMBER
    2  N1=2
    N2=3
    N3=5
    M1=1
    READ INPUT TAPE N1,1,(TITLE(I),I=1,12)
    1  FORMAT(12A6)
    READ INPUT TAPE N1,3,IX,KVBRW,IPUNCH
    3  FORMAT(18I4)
    IX1=IX+1
    READ INPUT TAPE N1,40,CBAR,BR,S,SREF,
    1(X(I),I=1,IX1)
    40  FORMAT(4E12.8/(6E12.8))
    READ INPUT TAPE N1,41,(SVAR(I),I=1,IX1)
    41  FORMAT(6E12.8)
    131 READ INPUT TAPE N1,131,(XKR(L),L=1,KVBRW)
    FORMAT(6E12.8)
    REWIND N3
    DO 21 I=1,IX
    N=I+1
    XPLUS(I)=X(N)
    XMINUS(I)=X(I)
    DELTAX(I)=XPLUS(I)-XMINUS(I)
    XN(I)=(XPLUS(I)+XMINUS(I))/2.
    SVPLUS(I)=SVAR(N)
    SVMINU(I)=SVAR(I)
    DELVOL(I)=(SVPLUS(I)+SVMINU(I))/2.*DELTAX(I)
    21  CONTINUE
    J1=0
    IF(M1-1)109,109,112
    109 WRITE OUTPUT TAPE N2,501,(TITLE(I),I=1,12)
    501 FORMAT(1H1 31X,12A6 //)

```

HM150001
HM150002
HM150003
HM150004
HM150005
HM150006
HM150007
HM150008
HM150009
HM150010
HM150011
HM150012
HM150013
HM150014
HM150015
HM150016
HM150017
HM150018
HM150019
HM150020
HM150021
HM150022
HM150023
HM150024
HM150025
HM150026
HM150027
HM150028
HM150029
HM150030
HM150031
HM150032
HM150033
HM150034
HM150035
HM150036
HM150037

```

      WRITE OUTPUT TAPE N2,813
      FORMAT(1H 29X,35H AERODYNAMIC INFLUENCE COEFFICIENTS
1 25H FROM SLENDER-BODY THEORY//)
      FORMAT(1H1 29X,35H AERODYNAMIC INFLUENCE COEFFICIENTS
1 25H FROM SLENDER-BODY THEORY//)
      WRITE OUTPUT TAPE N2,4,IX,KVBRW,CBAR,BR,S,SREF
      FORMAT(1H 49X,11H INPUT DATA//47X,114,9H SECTIONS/
1 47X,114,19H REDUCED VELOCITIES//49X,6H CBAR=1E15.8
2 /51X,4H BR=1E15.8/52X,3H S=1E15.8/49X,6H SREF=1E15.8//)
      WRITE OUTPUT TAPE N2,115,(X(I),SVAR(I),I=1,IX1)
      FORMAT(1H 39X,5H X(I),24X,12H LOCAL AREA//
1 (35X,1E15.8,18X,1E15.8))
      WRITE OUTPUT TAPE N2,140
      FORMAT( // 52X,12H OUTPUT DATA //)
      WRITE OUTPUT TAPE N2,45,((I,DELTA(I),XN(I)),
1I=1,IX)
      FORMAT(1H 17X, 16H CONTROL PT. NO. 17X,10H DELTA(I)
1 14X,20H CONTROL POINT XN(I),/(23X,114,22X,
2 1E15.8,13X,1E15.8))
112 J2=1
      DO 22 I=1,IX
      DO 22 J=1,IX
      A(I,J)=0.
      B(I,J)=0.
      C(I,J)=0.
      CONTINUE
      M1=2
      DO 999 L=1,KVBRW
      COEFA=XKR(L)**2/S
      KS=IX**2
      DO 100 I=1,IX
      M=I-1
      N=I+1
      IF(I-1)6,5,6
      DF1=(DELTA(1)+DELTA(2))*(DELTA(1)+2.*DELTA(2)+DELTA(3))
      DF2=(DELTA(1)+DELTA(2))*(DELTA(2)+DELTA(3))
      DF3=(DELTA(1)+2.*DELTA(2)+DELTA(3))*(DELTA(2)+DELTA(3))
      A(1,1)=(2.*SVPLUS(1))*(3.*DELTA(2)+DELTA(3))-

```

HM150038
 HM150039
 HM150040
 HM150041
 HM150042
 HM150043
 HM150044
 HM150045
 HM150046
 HM150047
 HM150048
 HM150049
 HM150050
 HM150051
 HM150052
 HM150053
 HM150054
 HM150055
 HM150056
 HM150057
 HM150058
 HM150059
 HM150060
 HM150061
 HM150062
 HM150063
 HM150064
 HM150065
 HM150066
 HM150067
 HM150068
 HM150069
 HM150070
 HM150071
 HM150072
 HM150073
 HM150074
 HM150075

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

```

12.*SVMINU(1)*(4.*DELTA(1)+3.*DELTA(2)+DELTA(3))/DF1
A(1,2)=(2.*SVPLUS(1)*DELTA(1)-2.*DELTA(2)-DELTA(3))
1+2.*SVMINU(1)*(3.*DELTA(1)+2.*DELTA(2)+DELTA(3))/DF2
A(1,3)=(-2.*SVPLUS(1)*DELTA(1)-DELTA(2))-2.*
1SVMINU(1)*(3.*DELTA(1)+DELTA(2))/DF3
IF(XKR(L))25,100,26
25 B(1,1)=(SVPLUS(1)*DELTA(2)*(2.*DELTA(2))+
1DELTA(3))-SVMINU(1)*(2.*DELTA(1)+DELTA(2))*(2.*
2DELTA(1)+2.*DELTA(2)+DELTA(3))-2.*DELVOL(1)*(2.*DELTA(1)
3+3.*DELTA(2)+DELTA(3))/DF1
B(1,2)=(SVPLUS(1)*DELTA(1)*(2.*DELTA(2)+DELTA(3))
1+SVMINU(1)*DELTA(1)*(2.*DELTA(1)+2.*DELTA(2)+DELTA(3))
2+2.*DELVOL(1)*DELTA(1)+2.*DELTA(2)+DELTA(3))/DF2
B(1,3)=-1./DF3*(SVPLUS(1)*DELTA(1)+DELTA(2)+SVMINU(1)
1*DELTA(1)*(2.*DELTA(1)+DELTA(2))+2.*DELVOL(1)*(DELTA(1)
2*DELTA(2)))
C(1,1)=1./DF1*(DELVOL(1)-DELTA(1))*2/6.*(SVPLUS(1)-
1SVMINU(1))*(2.*DELTA(1)+3.*DELTA(2)+DELTA(3))*(-1.)
C(1,2)=-1./DF2*(DELTA(1))*2/6.*(SVPLUS(1)-SVMINU(1))*
1(DELTA(1)+2.*DELTA(2)+DELTA(3))
C(1,3)=+1./DF3*(DELTA(1))*2/6.*(SVPLUS(1)-SVMINU(1))*
1(DELTA(1)+DELTA(2))
GO TO 100
6 IF(I-IX)7,8,8
7 DO 97 J=1,IX
9 IF (J-M)97,9,10
DF7=(DELTA(M)+DELTA(I))*(DELTA(M)+2.*DELTA(I)+DELTA(N))
A(I,J)=1./DF7*(-2.*SVPLUS(I)*(DELTA(I)-DELTA(N))
1-2.*SVMINU(I)*(3.*DELTA(I)+DELTA(N)))
IF(XKR(L))30,97,30
30 B(I,J)=-1./DF7*(SVPLUS(I)*DELTA(I)+DELTA(N)+SVMINU(I)*
1DELTA(I)*(2.*DELTA(I)+DELTA(N))+2.*DELVOL(I)*(DELTA(I)
2+DELTA(N)))
C(I,J)=+1./DF7*(DELTA(I))*2/6.*(SVPLUS(I)-
1SVMINU(I))*(DELTA(I)+DELTA(N))
GO TO 97
10 IF(J-(M+1))11,11,12
11 DF8=(DELTA(M)+DELTA(I))*(DELTA(I)+DELTA(N))

```

HM150076
 HM150077
 HM150078
 HM150079
 HM150080
 HM150081
 HM150082
 HM150083
 HM150084
 HM150085
 HM150086
 HM150087
 HM150088
 HM150089
 HM150090
 HM150091
 HM150092
 HM150093
 HM150094
 HM150095
 HM150096
 HM150097
 HM150098
 HM150099
 HM150100
 HM150101
 HM150102
 HM150103
 HM150104
 HM150105
 HM150106
 HM150107
 HM150108
 HM150109
 HM150110
 HM150111
 HM150112
 HM150113

```

A(I,J)=1./DF8*(2.*SVPLUS(I)*(DELTA(M)+2.*DELTA(I)
1-DELTA(N))-2.*SVMINU(I)*(DELTA(M)-2.*DELTA(I)-DELTA(N)))
IF(XKR(L))31,97,31
31 B(I,J)=1./DF8*(SVPLUS(I)*DELTA(N)*(DELTA(M)+2.*
1DELTA(I))-SVMINU(I)*DELTA(M)*{2.*DELTA(I)+DELTA(N)}
2+2.*DELVOL(I)*(DELTA(N)-DELTA(M)))
C(I,J)=1./DF8*(DF8*DELVOL(I)+DELTA(I))*2/6.*
1(SVPLUS(I)-SVMINU(I))*(DELTA(N)-DELTA(M))*{-1.}
GO TO 97
12 IF (J-(M+2))13,13,100
13 DF9=(DELTA(M)+2.*DELTA(I)+DELTA(N))*(DELTA(I)+DELTA(N))
A(I,J)=1./DF9*{-2.*SVPLUS(I)*(DELTA(M)+3.*DELTA(I))+
12.*SVMINU(I)*(DELTA(M)-DELTA(I))}
IF(XKR(L))14,97,14
14 B(I,J)=1./DF9*(SVPLUS(I)*DELTA(I)*(DELTA(M)+2.*
1DELTA(I))+SVMINU(I)*DELTA(M)*DELTA(I)+2.*DELVOL(I)*
2(DELTA(M)+DELTA(I)))
C(I,J)=1./DF9*(DELTA(I))*2/6.*{SVPLUS(I)-SVMINU(I)}
1*(DELTA(M)+DELTA(I))*{-1.}
97 CONTINUE
GO TO 100
8 DF4=(DELTA(IX-2)+DELTA(IX-1))*(DELTA(IX-2)+2.*
1DELTA(IX-1)+DELTA(IX))
A(IX,IX-2)=1./DF4*{-2.*SVPLUS(IX)*(3.*DELTA(IX)+
1DELTA(IX-1))-2.*SVMINU(IX)*(DELTA(IX)-DELTA(IX-1)))
DF5=(DELTA(IX-2)+DELTA(IX-1))*(DELTA(IX-1)+DELTA(IX))
A(IX,IX-1)=1./DF5*{2.*SVPLUS(IX)*(3.*DELTA(IX)+2.*
1DELTA(IX-1)+DELTA(IX-2))+2.*SVMINU(IX)*(DELTA(IX)-2.*
2DELTA(IX-1)-DELTA(IX-2)))
DF6=(DELTA(IX-2)+2.*DELTA(IX-1)+DELTA(IX))*(DELTA(IX-1)
1+DELTA(IX))
A(IX,IX)=1./DF6*{-2.*SVPLUS(IX)*(4.*DELTA(IX)+
13.*DELTA(IX-1)+DELTA(IX-2))+2.*SVMINU(IX)*(3.*DELTA(IX)
2-1)+DELTA(IX-2)))
IF(XKR(L))32,100,32
32 B(IX,IX-2)=1./DF4*{SVPLUS(IX)*DELTA(IX)*(2.*
1DELTA(IX)+DELTA(IX-1))+SVMINU(IX)*DELTA(IX)*DELTA(IX-1)+
22.*DELVOL(IX)*(DELTA(IX)+DELTA(IX-1))}

```

HM150114

HM150115

HM150116

HM150117

HM150118

HM150119

HM150120

HM150121

HM150122

HM150123

HM150124

HM150125

HM150126

HM150127

HM150128

HM150129

HM150130

HM150131

HM150132

HM150133

HM150134

HM150135

HM150136

HM150137

HM150138

HM150139

HM150140

HM150141

HM150142

HM150143

HM150144

HM150145

HM150146

HM150147

HM150148

HM150149

HM150150

HM150151

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

```

      B(IX,IX-1)=-1./DF5*(SVPLUS(IX)*DELTA(IX)*2.*
1DELTA(IX)+2.*DELTA(IX-1)+DELTA(IX-2))+SVMINU(1)*DELTA(IX)
2*(2.*DELTA(IX-1)+DELTA(IX-2))+2.*DELVOL(IX)*DELTA(IX)+
32.*DELTA(IX-1)+DELTA(IX-2)))
      B(IX,IX)=1./DF6*(SVPLUS(IX)*{2.*DELTA(IX)+DELTA(IX-1)}
1*(2.*DELTA(IX)+2.*DELTA(IX-1)+DELTA(IX-2))-SVMINU(IX)*
2DELTA(IX-1)*{2.*DELTA(IX-1)+DELTA(IX-2))+2.*DELVOL(IX)
3*(2.*DELTA(IX)+3.*DELTA(IX-1)+DELTA(IX-2)))
      C(IX,IX-2)=1./DF4*(DELTA(IX)*2/6.*(SVPLUS(IX)
1-SVMINU(IX))*{DELTA(IX)+DELTA(IX-1)}*(-1.))
      C(IX,IX-1)=1./DF5*(DELTA(IX)*2/6.*(SVPLUS(IX)-
1SVMINU(IX))*{DELTA(IX)+2.*DELTA(IX-1)+DELTA(IX-2)}))
      C(IX,IX)=1./DF6*(DELVOL(IX)+DELTA(IX)*2/6.
1*(SVPLUS(IX)-SVMINU(IX))*{2.*DELTA(IX)+3.*DELTA(IX-1)
2+DELTA(IX-2)})*(-2.))
100  CONTINUE
      WRITE OUTPUT TAPE N3,86,XKR(L),J}
86  FORMAT(1E12.8,65X,J13)
      J1=J1+1
34  WRITE OUTPUT TAPE N3,34,IX,J1
      FORMAT(1I4,73X,J13)
      J1=J1+1
46  COEFZ=2./SREF
      IF(XKR(L))46,46,71
      DO 47 I=1,IX
47  DO 47 J=1,IX
      A(I,J)=COEFZ*CBAR*A(I,J)
      IF(XKR(L))80,70,80
80  DO 81 I=1,IX
      DO 81 J=1,IX
      C(I,J)=COEFZ/CBAR*C(I,J)
81  B(I,J)=COEFZ*B(I,J)
      CONTINUE
81  IF(XKR(L))82,70,71
82  WRITE OUTPUT TAPE N2,814
      WRITE OUTPUT TAPE N2,78,XKR(L),IX
78  FORMAT(1H 49X,7H 15/KR=1E15.8//46X,10H NUMBER OF
1 17H CONTROL POINTS =113//49X,14H THE TRANSIENT

```

HM150152
HM150153
HM150154
HM150155
HM150156
HM150157
HM150158
HM150159
HM150160
HM150161
HM150162
HM150163
HM150164
HM150165
HM150166
HM150167
HM150168
HM150169
HM150170
HM150171
HM150172
HM150173
HM150174
HM150175
HM150176
HM150177
HM150178
HM150179
HM150180
HM150181
HM150182
HM150183
HM150184
HM150185
HM150186
HM150187
HM150188
HM150189

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

```

2  5H CASE//)
  WRITE OUTPUT TAPE N2,820
  FORMAT(1H 49X,15H THE CHS MATRIX / )
  CALL MPRINT(A,IX,IX,50,N2)
  IF(IPUNCH)302,301,302
301 IF(J1-2)833,834,833
834 J1=J2
  GO TO 702
833 J1=J2+1
702 J2=J1+(IX+IX/22)*3+4
302 WRITE OUTPUT TAPE N2,66
66  FORMAT( // 49X,15H THE CHD MATRIX / )
  CALL MPRINT(B,IX,IX,50,N2)
  WRITE OUTPUT TAPE N2,67
67  FORMAT(// 49X,15H THE CHI MATRIX //)
  CALL MPRINT(C,IX,IX,50,N2)
  WRITE OUTPUT TAPE N2,229,J1,J2
  GO TO 800
70  WRITE OUTPUT TAPE N2,814
  WRITE OUTPUT TAPE N2,72,XKR(L),IX
72  FORMAT(1H 49X,7H 1: /KR=1E15.8//46X,10H NUMBER OF
      1 17H CONTROL POINTS =113//49X,16H THE STEADY CASE//)
  CALL MPRINT(A,IX,IX,50,N2)
  IF(IPUNCH)999,845,999
845 IF(J1-2)847,846,843
846 J1=J2
  GO TO 888
847 J1=J2+1
888 J2=J1+IX+IX/22*IX+2
  WRITE OUTPUT TAPE N2,229,J1,J2
800 CONTINUE
  CHS=606060233062
  CALL MPUNCH(A,IX,IX,0,0,1,CHS,50,N3)
  IF(XKR(L))79,999,79
79 CONTINUE
  CHD=606060233024
  CHI=606060233031
  CALL MPUNCH(B,IX,IX,0,0,1,CHD,50,N3)

```

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

```

229 CALL MPUNCH(C,IX,IX,0,0,1,CHI,50,N3)
    FORMAT(/38X,24H PUNCHED CARDS NOS. HM15113,
1 10H THRU HM15113)
    GO TO 999
71  WRITE OUTPUT TAPE N2,814
    WRITE OUTPUT TAPE N2,85,XKR(L),IX
85  FORMAT(1H 49X,7H 11/KR=1E15.8//46X,10H NUMBER OF
1 16H CONTROL POINTS=113//48X,16H THE OSCILLATORY
2 5H CASE//)
    WRITE OUTPUT TAPE N2,919
919 FORMAT(1H 12X,4HREAL 11X,9HIMAGINARY 11X,4HREAL 10X,
1 9HIMAGINARY 10X,4HREAL 11X,9HIMAGINARY //)
    IX2=2*IX
    DO 35 I=1,IX
    DO 35 J=1,IX2,2
    KZ=J/2+1
    CH(I,J)=COEFA*A(I,KZ)-(1./(BR**2*S))*C(I,KZ))
    CH(I,J+1)=XKR(L)/(BR*S)*B(I,KZ)
35  CONTINUE
    CALL MPRINT(CH,IX,IX2,50,N2)
    IF(IPUNCH)999,65,999
65  CONTINUE
    CHM=606060233044
    CALL MPUNCH(CH,IX,IX2,0,0,1,CHM,50,N3)
    IF(J1-2)887,889,887
889 J1=J2
    GO TO 631
887 J1=J2+1
631 J2=J1+2+(IX+IX/22)*2
    WRITE OUTPUT TAPE N2,229,J1,J2
999 CONTINUE
    END FILE N3
    GO TO 2
    END(1,1,0,0,0,0,0,1,0,1,0,0,0,0,0,0)

```

STORAGE NOT USED BY PROGRAM

DEC OCT
12468 30264
32561 77461

STORAGE LOCATIONS FOR VARIABLES APPEARING IN DIMENSION AND EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT
A 11953	27261	B 9453	22355	CH 6953	15451
DELTA	12165 27605	DELVOL	12215 27667	SVAR	12467 30263
SVPLUS	12416 30200	TITLE	12015 27357	XKR	12003 27343
XN 12265	27751	XPLUS	12115 27523	X	12316 30034

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

DEC	OCT	DEC	OCT	DEC	OCT
BR 1953	03641	CBAR	1952 03640	CHD	1951 03637
CHM 1949	03635	CHS	1948 03634	COEFA	1947 03633
DF1 1945	03631	DF2	1944 03630	DF3	1943 03627
DF5 1941	03625	DF6	1940 03624	DF7	1939 03623
DF9 1937	03621	IPUNCH	1936 03620	I	1935 03617
IX2 1933	03615	IX	1932 03614	J1	1931 03613
J 1929	03611	KS	1928 03610	KVBRW	1927 03607
M1 1925	03605	M	1924 03604	N1	1923 03603
N3 1921	03601	N	1920 03600	SREF	1919 03577

SYMBOLS AND LOCATIONS FOR SOURCE PROGRAM FORMAT STATEMENTS

EFN	LOC	EFN	LOC	EFN	LOC
811	1 03547	813	3 03546	814	4 03473
8118	40 03545	8119	41 03542	81D	45 03410
8123	67 03307	8128	72 03302	812E	78 03351
812M	86 03357	813J	115 03434	8143	131 03540
8175	229 03257	81FL	501 03536	81PD	813 03533
81RK	820 03322	81SN	919 03213		

EFN	IFN	LDC	EFN	IFN	LDC	EFN	IFN	LDC	EFN	IFN	LDC	EFN	IFN	LDC
2	25	00020	21	63	00213	109	66	00224	112	87	00350			
22	93	00373	5	102	00452	25	109	00606	6	116	01043			
7	117	01047	9	119	01070	30	122	01134	10	125	01212			
11	126	01221	31	129	01265	12	132	01355	13	133	01371			
14	136	01434	97	138	01515	8	140	01525	32	147	01665			
100	153	02133	46	162	02207	47	164	02222	80	166	02236			
81	170	02260	82	172	02270	301	179	02326	834	180	02334			
833	182	02337	702	183	02342	302	184	02362	602	187	02400			

	AERODYNAMIC			INFLUENCE	COEFFICIENTS	10/11/62	PAGE 10				
70	193	02435	845	199	02470	846	200	02475	847	202	02500
888	203	02503	800	206	02532	79	211	02555	71	219	02621
35	229	02751	65	233	03006	889	238	03033	887	240	03036
631	241	03041	999	244	03100						

AERODYNAMIC INFLUENCE COEFFICIENTS				10/11/62	PAGE 11
00000	-342647633460	00	(FPT)	BCD 1(FPT)	PZE 8)3
00001	-346362303460	00	(TSH)	BCD 1(TSH)	STR
00002	-345163453460	00	(RTN)	BCD 1(RTN)	STQ IX
00003	-345166633460	00	(RWT)	BCD 1(RWT)	STR
00004	-346263303460	00	(STH)	BCD 1(STH)	STQ KVBWR
00005	-342631433460	00	(FIL)	BCD 1(FIL)	STR
00006	-044751314563	00	MPRINT	BCD IMPRINT	STQ IPUNCH
00007	-044764452330	00	MPUNCH	BCD IMPUNCH	TSX (RTN) 4
00010	-342526633460	00	(EFT)	BCD 1(EFT)	TSX A)102 4
00011	+050000000002	00	\$	CLA 2	LXD C)102 2
00012	+060100003171	010		STO 6)+5	LXD IX 4
00013	+050000000000	010		CLA (FPT)	SXD C)G5 4
00014	+060100000010	00		STO 8	CLA IX
00015	+060000077462	010		STZ 4)-205	ADD 2)+3
00016	-053400203570	010	B)601	LXD C)102 2	STO IX1
00017	-053400403566	010	B)401	LXD C)G5 4	CAL N1
00020	+050000003142	010	25A	CLA 2)	SXD 6)+4 4
00021	+060100003603	010		STO N1	TSX (TSH) 4
00022	+050000003143	010	26A	CLA 2)+1	PZE 8)18
00023	+060100003602	010		STO N2	LXD 6)+4 4
00024	+050000003144	010	27A	CLA 2)+2	STR
00025	+060100003601	010		STO N3	STQ CBAR
00026	+050000003145	010	28A	CLA 2)+3	STR
00027	+060100003605	010		STO M1	STQ BR
00030	-050000003603	010	29A	CAL N1	STR S
00031	-063400403170	010		SXD 6)+4 4	STQ S
00032	+007400400001	010		TSX (TSH) 4	STR
00033	+000000003547	010		PZE 8)1	STQ SREF
00034	-053400403170	010		LXD 6)+4 4	LXD 2)+3 1
00035	-053400103145	010	30A	LXD 2)+3 1	CLA IX1
00036	-100000000000	00	31A	STR	STD 40A2
00037	-060000127360	010		STQ TITLE+1 1	STR
00040	+100001100041	010	31A1	TXI *+1 1 1	STQ X+1 1 1
00041	-300014100036	010	31A2	TXL 31A 1 1 12	TXI *+1 1 1 1
			33A	BSS	TXL 40A 1
00042	+007400400002	010		TSX (RTN) 4	SXD 6)+4 4 4
00043	-050000003603	010	34A	CAL N1	TSX (RTN) 4
00044	+007400400001	010		TSX (TSH) 4	LXD 6)+4 4 4

00113	-050000003603	010	43A	CAL N1	00161	+060100003617	010	STO I
00114	-063400403170	010		SXD 6)+4,4	00162	+050000003617	010	CLA I
00115	+007400400001	010		TSX (TSH),4	00163	+040000003145	010	ADD 2)+3
00116	+000000003542	010		PZE 8)19	00164	+060100003600	010	STO N
00117	-053400403170	010		LXD 6)+4,4	00165	-053400203600	010	LXD N,2
00120	-053400103145	010	44A	LXD 2)+3,1	00166	-063400203564	010	SXD C)G2,2
00121	+050000003616	010		CLA IX1	00167	+050000230035	010	CLA X+1,2
00122	+062200000126	010		STD 45A2	00170	+060100127524	010	STO XPLUS+1,1
00123	-100000000000	00	45A	STR	00171	+050000130035	010	CLA X+1,1
00124	-060000130264	011		STQ SVAR+1,1	00172	+060100127442	010	STO XMINUS+1,1
00125	+100001100126	010	45A1	TXI *+1,1,1	00173	+050000127524	010	CLA XPLUS+1,1
00126	-300000100123	010	45A2	TXL 45A,1	00174	+030200127442	010	FSB XMINUS+1,1
00127	-063400403170	010	47A	SXD 6)+4,4	00175	+060100127606	010	STO DELTAX+1,1
00130	+007400400002	010		TSX (RTN),4	00176	+050000127524	010	CLA XPLUS+1,1
00131	-053400403170	010		LXD 6)+4,4	00177	+030000127442	010	FAD XMINUS+1,1
00132	-050000003603	010	48A	CAL N1	00200	+024100003152	010	FDP 3)
00133	-063400403170	010		SXD 6)+4,4	00201	-060000127752	010	STQ XN+1,1
00134	+007400400001	010		TSX (TSH),4	00202	+050000230264	011	CLA SVAR+1,2
00135	+000000003540	010		PZE 8)43	00203	+060100130201	010	STO SVPLUS+1,1
00136	-053400403170	010		LXD 6)+4,4	00204	+050000130264	011	CLA SVAR+1,1
00137	-053400103145	010	49A	LXD 2)+3,1	00205	+060100130117	010	STO SVMINU+1,1
00140	+050000003607	010		CLA KVBW	00206	+050000130201	010	CLA SVPLUS+1,1
00141	+062200000145	010		STD 50A2	00207	+030000130117	010	FAD SVMINU+1,1
00142	-100000000000	00	60A	STR	00210	+024100003152	010	FDP 3)
00143	-060000127344	010		STQ XKR+1,1	00211	+026000127606	010	FMP DELTAX+1,1
00144	+100001100145	010	50A1	TXI *+1,1,1	00212	+060100127670	010	STO DELVOL+1,1
00145	-300000100142	010	50A2	TXL 50A,1				BSS
00146	-063400403170	010	52A	SXD 6)+4,4	00213	+100001100214	010	TXI *+1,1,1
00147	+007400400002	010		TSX (RTN),4	00214	-063400103617	010	SXD I,1
00150	-053400403170	010		LXD 6)+4,4	00215	-300000100162	010	TXL 55A,1
00151	-050000003601	010	53A	CAL N3	00216	+050000003146	010	CLA 2)+4
00152	-063400403170	010		SXD 6)+4,4	00217	+060100003613	010	STO J1
00153	+007400400003	010		TSX (RWT),4	00220	+050000003605	010	CLA M1
00154	-053400403170	010		LXD 6)+4,4	00221	+040200003145	010	SUB 2)+3
00155	-053400103145	010	54A	LXD 2)+3,1	00222	+010000000224	010	TZE 66A
00156	+050000003614	010		CLA IX	00223	+012000000350	010	TPL 87A
00157	+062200000215	010		STD 63A2	00224	-050000003602	010	CAL N2
00160	-075400100000	00		PXD 0,1	00225	-063400403170	010	SXD 6)+4,4

AERODYNAMIC			INFLUENCE	COEFFICIENTS		10/11/62	PAGE 13
00226	+007400400004	010	TSX (STH),4	00274	-063400403170	010	SXD 6)+4,4
00227	+000000003536	010	PZE 8)FL	00275	+007400400004	010	TSX (STH),4
00230	-053400403170	010	LXD 6)+4,4	00276	+000000003434	010	PZE 8)3J
00231	-053400103145	010	LXD 2)+3,1	00277	-053400403170	010	LXD 6)+4,4
00232	+056000127360	010	LDQ TITLE+1,1	00300	-053400103145	010	LXD 2)+3,1
00233	-100000000000	00	STR	00301	+050000003616	010	CLA IX
00234	+100001100235	010	TXI **1,1,1	00302	+062200000310	010	STD 76A2
00235	-300014100232	010	TXL 68A,1,12	00303	+056000130035	010	LDQ X+1,1
00236	-063400403170	010	SXD 6)+4,4	00304	-100000000000	00	STR
00237	+007400400005	010	TSX (FIL),4	00305	+056000130264	011	LDQ SVAR+1,1
00240	-053400403170	010	LXD 6)+4,4	00306	-100000000000	00	STR
00241	-050000003602	010	CAL N2	00307	+100001100310	010	TXI **1,1,1
00242	-063400403170	010	SXD 6)+4,4	00310	-300000100303	010	TXL 76A,1
00243	+007400400004	010	TSX (STH),4	00311	-063400403170	010	SXD 6)+4,4
00244	+000000003533	010	PZE 8)PD	00312	+007400400005	010	TSX (FIL),4
00245	+007400400005	010	TSX (FIL),4	00313	-053400403170	010	LXD 6)+4,4
00246	-053400403170	010	LXD 6)+4,4	00314	-050000003602	010	CAL N2
00247	-050000003602	010	CAL N2	00315	-063400403170	010	SXD 6)+4,4
00250	-063400403170	010	SXD 6)+4,4	00316	+007400400004	010	TSX (STH),4
00251	+007400400004	010	TSX (STH),4	00317	+000000003415	010	PZE 8)4C
00252	+000000003473	010	PZE 8)4	00320	+007400400005	010	TSX (FIL),4
00253	-053400403170	010	LXD 6)+4,4	00321	-053400403170	010	LXD 6)+4,4
00254	+056000003614	010	LDQ IX	00322	-050000003602	010	CAL N2
00255	-100000000000	00	STR	00323	-063400403170	010	SXD 6)+4,4
00256	+056000003607	010	LDQ KVBRW	00324	+007400400004	010	TSX (STH),4
00257	-100000000000	00	STR	00325	+000000003410	010	PZE 8)1D
00260	+056000003640	010	LDQ CBAR	00326	-053400403170	010	LXD 6)+4,4
00261	-100000000000	00	STR	00327	-053400103145	010	LXD 2)+3,1
00262	+056000003641	010	LDQ BR	00330	+050000003614	010	CLA IX
00263	-100000000000	00	STR	00331	+062200000344	010	STD 84A2
00264	+056000003576	010	LDQ S	00332	-075400100000	00	PXD 0,1
00265	-100000000000	00	STR	00333	+060100003617	010	STD I
00266	+056000003577	010	LDQ SREF				BSS
00267	-100000000000	00	STR	00334	+056000003617	010	LDQ I
00270	-063400403170	010	SXD 6)+4,4	00335	-100000000000	00	STR
00271	+007400400005	010	TSX (FIL),4	00336	+056000127606	010	LDQ DELTAX+1,1
00272	-053400403170	010	LXD 6)+4,4	00337	-100000000000	00	STR
00273	-050000003602	010	CAL N2	00340	+056000127752	010	LDQ XN+1,1

00341	-100000000000	00	STR	00405	+0622000003102	010	STD 244A2
00342	+100001100343	010 84A1	TXI **+1,1,1	00406	-053400203570	010 D1200	LXD C102,2
00343	-063400103617	010	SXD 1,1	00407	+056000127344	010 96A	LDQ XKR+1,1
00344	-300000100334	010 84A2	TXL 82A,1	00410	+026000127344	010	FMP XKR+1,1
00345	-063400403170	010 86A	SXD 61+4,4	00411	+024100003576	010	FDP S
00346	+007400400005	010	TSX (FIL) 4	00412	-060000003633	010	STQ COEFA
00347	-053400403170	010	LXD 61+4,4	00413	+056000003614	010 97A	LDQ IX
00350	+050000003145	010 87A	CLA 21+3	00414	+020000003614	010	MPY IX
00351	+060100003612	010	STO J2	00415	+076700000021	00	ALS 17
00352	-053400103145	010 88A	LXD 21+3,1	00416	+060100003610	010	STD KS
00353	+050000003614	010	CLA IX	00417	-053400103145	010 98A	LXD 21+3,1
00354	+062200000377	010	STD 93A4	00420	-063400103567	010	SXD C100,1
00355	+056000003614	010	LDQ IX	00421	+056000003614	010	LDQ IX
00356	+020000003147	010	MPY 21+5	00422	+020000003147	010	MPY 21+5
00357	+076700000021	00	ALS 17	00423	+076700000021	00	ALS 17
00360	+062200000374	010	STD 93A2	00424	+062200001522	010	STD 138A3
00361	+056000003614	010	LDQ IX	00425	-053400103145	010	LXD 21+3,1
00362	+020000003147	010	MPY 21+5	00426	-063400103562	010	SXD C100,1
00363	+076700000021	00	ALS 17	00427	+050000003614	010	CLA IX
00364	+062200000375	010	STD 93A3	00430	+062200002141	010	STD 153A2
00365	+050000003153	010 89A	BSS	00431	-075400100000	00	PXD 0,1
00366	+060100127262	010 90A	CLA 31+1	00432	+060100003617	010	STD I
00367	+050000003153	010 91A	STD A+1,1	00433	+050000003617	010 99A	CLA I
00370	+060100122356	010	CLA 31+1	00434	+040200003145	010	SUB 21+3
00371	+050000003153	010 92A	STD B+1,1	00435	+060100003604	010	STD M
00372	+060100110546	010	CLA 31+1	00436	-053400203604	010	LXD M,2
00373	+100062100374	010 93A	STD C+1,1	00437	-063400203565	010	SXD C1G4,2
00374	-300000100365	010 93A1	BSS	00440	+050000003617	010 100A	CLA I
00375	+200000100376	010 93A2	TXI **+1,1,50	00441	+040000003145	010	ADD 21+3
00376	+100001100377	010 93A3	TXL 90A,1	00442	+060100003600	010	STD N
00377	-300000100365	010 93A4	TXI **+1,1	00443	-053400203600	010	LXD N,2
00400	+050000003142	010 94A	TXL 89A,1	00444	-063400203564	010	SXD C1G2,2
00401	+060100003605	010	CLA 21	00445	+050000003617	010 101A	CLA I
00402	-053400103145	010 95A	STD M1	00446	+040200003145	010	SUB 21+3
00403	-063400103563	010	LXD 21+3,1	00447	+010000000452	010 101A1	TZE 102A
00404	+050000003607	010	SXD C1G1,1	00450	+012000001043	010	TPL 116A
			CLA KVBW	00451	+002000001043	010	TRA 116A
				00452	+0560000003152	010 102A	LDQ 3)

10/11/62

COEFFICIENTS

INFLUENCE

AERODYNAMIC

00453	+0260000027604	010	FMP DELTAX-1	00521	+060100003553	010	STO 1)+3
00454	+0300000027605	010	FAD DELTAX	00522	+050000003551	010	CLA 1)+1
00455	+0300000027603	010	FAD DELTAX-2	00523	+0300000027603	010	FAD DELTAX-2
00456	+060100003551	010	STO 1)+1	00524	+013100000000	00	XCA
00457	+0500000027605	010	CLA DELTAX	00525	+026000003152	010	FMP 3)
00460	+0300000027604	010	FAD DELTAX-1	00526	+013100000000	00	XCA
00461	+013100000000	00	XCA	00527	+0260000030200	010	FMP SVPLUS
00462	+026000003551	010	FMP 1)+1	00530	+030200003553	010	FSB 1)+3
00463	+060100003631	010	STO DF1	00531	+024100003631	010	FDP DF1
00464	+0500000027604	010	CLA DELTAX-1	00532	-0600000027261	010	STQ A
00465	+0300000027603	010	FAD DELTAX-2	00533	+056000003152	010	LDQ 3)
00466	+060100003551	010	STO 1)+1	00534	+0260000027604	010	FMP DELTAX-1
00467	+0500000027605	010	CLA DELTAX	00535	+060100003551	010	STO 1)+1
00470	+0300000027604	010	FAD DELTAX-1	00536	+056000003154	010	LDQ 3)+2
00471	+013100000000	00	XCA	00537	+0260000027605	010	FMP DELTAX
00472	+026000003551	010	FMP 1)+1	00540	+030000003551	010	FAD 1)+1
00473	+060100003630	010	STO DF2	00541	+0300000027603	010	FAD DELTAX-2
00474	+0500000027604	010	CLA DELTAX-1	00542	+013100000000	00	XCA
00475	+0300000027603	010	FAD DELTAX-2	00543	+026000003152	010	FMP 3)
00476	+060100003551	010	STO 1)+1	00544	+013100000000	00	XCA
00477	+056000003152	010	LDQ 3)	00545	+0260000030116	010	FMP SVMINU
00500	+0260000027604	010	FMP DELTAX-1	00546	+060100003553	010	STO 1)+3
00501	+0300000027605	010	FAD DELTAX	00547	+0500000027605	010	CLA DELTAX
00502	+0300000027603	010	FAD DELTAX-2	00550	+030200003551	010	FSB 1)+1
00503	+013100000000	00	XCA	00551	+0302000027603	010	FSB DELTAX-2
00504	+026000003551	010	FMP 1)+1	00552	+013100000000	00	XCA
00505	+060100003627	010	STO DF3	00553	+026000003152	010	FMP 3)
00506	+056000003154	010	LDQ 3)+2	00554	+013100000000	00	XCA
00507	+0260000027604	010	FMP DELTAX-1	00555	+0260000030200	010	FMP SVPLUS
00510	+060100003551	010	STO 1)+1	00556	+030000003553	010	FAD 1)+3
00511	+056000003155	010	LDQ 3)+3	00557	+024100003630	010	FDP DF2
00512	+0260000027605	010	FMP DELTAX	00560	-0600000027177	010	STQ A-50
00513	+030000003551	010	FAD 1)+1	00561	+056000003154	010	LDQ 3)+2
00514	+0300000027603	010	FAD DELTAX-2	00562	+0260000027605	010	FMP DELTAX
00515	+013100000000	00	XCA	00563	+0300000027604	010	FAD DELTAX-1
00516	+026000003152	010	FMP 3)	00564	+013100000000	00	XCA
00517	+013100000000	00	XCA	00565	+026000003152	010	FMP 3)
00520	+0260000030116	010	FMP SVMINU	00566	+013100000000	00	XCA

AERODYNAMIC		INFLUENCE		COEFFICIENTS		10/11/62	
i08A i08A1 i09A	FMP SVMINU	00567	+0260000030116	010	00635	+0260000030116	010
	STO 1)+2	00570	+060100003552	010	00636	+013100000000	00
	CLA DELTAX	00571	+0500000027605	010	00637	+026000003557	010
	FSB DELTAX-1	00572	+0302000027604	010	00640	+060100003560	010
	XCA	00573	+013100000000	00	00641	+050000003555	010
	FMP 3)	00574	+026000003152	010	00642	+0300000027603	010
	XCA	00575	+013100000000	00	00643	+013100000000	00
	FMP SVPLUS	00576	+0260000030200	010	00644	+0260000030200	010
	CHS	00577	+076000000002	00	00645	+013100000000	00
	FSB 1)+2	00600	+030200003552	010	00646	+0260000027604	010
	FDP DF3	00601	+024100003627	010	00647	+030200003560	010
	STQ A-100	00602	-0600000027115	010	00650	+030200003554	010
	LXD CIG1,2	00603	-0534000203563	010	00651	+024100003631	010
	CLA XKR+1,2	00604	+0500000227344	010	00652	-060000022355	010
	TZE 153A	00605	+010000002133	010	00653	+056000003152	010
	LDQ 3)+2	00606	+056000003154	010	00654	+0260000027604	010
	FMP DELTAX-1	00607	+0260000027604	010	00655	+060100003551	010
	STO 1)+1	00610	+060100003551	010	00656	+0300000027605	010
	LDQ 3)	00611	+056000003152	010	00657	+0300000027603	010
	FMP DELTAX	00612	+0260000027605	010	00660	+013100000000	00
STO 1)+2	00613	+060100003552	010	00661	+026000003152	010	
FAD 1)+1	00614	+030000003551	010	00662	+013100000000	00	
FAD DELTAX-2	00615	+0300000027603	010	00663	+0260000027667	010	
XCA	00616	+013100000000	00	00664	+060100003553	010	
FMP 3)	00617	+026000003152	010	00665	+056000003152	010	
XCA	00620	+013100000000	00	00666	+0260000027605	010	
FMP DELVOL	00621	+0260000027667	010	00667	+030000003551	010	
STO 1)+4	00622	+060100003554	010	00670	+0300000027603	010	
LDQ 3)	00623	+056000003152	010	00671	+013100000000	00	
FMP DELTAX-1	00624	+0260000027604	010	00672	+0260000030116	010	
STO 1)+5	00625	+060100003555	010	00673	+013100000000	00	
FAD 1)+2	00626	+030000003552	010	00674	+0260000027605	010	
FAD DELTAX-2	00627	+0300000027603	010	00675	+060100003555	010	
STO 1)+6	00630	+060100003556	010	00676	+050000003551	010	
CLA 1)+2	00631	+050000003552	010	00677	+0300000027603	010	
FAD DELTAX-1	00632	+0300000027604	010	00700	+013100000000	00	
STO 1)+7	00633	+060100003557	010	00701	+0260000030200	010	
LDQ 1)+6	00634	+056000003556	010	00702	+013100000000	00	

	FMP DELTAX	00703 +0260000027605	010	00751 +0300000027603	010	FAD DELTAX-2
	FAD 1)+5	00704 +0300000003555	010	00752 +060100003553	010	STO 1)+3
	FAD 1)+3	00705 +0300000003553	010	00753 +050000030200	010	CLA SVPLUS
	FDP DF2	00706 +024100003630	010	00754 +030200030116	010	FSB SVMINU
	STQ B-50	00707 -060000022273	010	00755 +060100003554	010	STO 1)+4
111A	CLA DELTAX	00710 +050000027605	010	00756 +056000027605	010	LDQ DELTAX
	FAD DELTAX-1	00711 +0300000027604	010	00757 +0260000027605	010	FMP DELTAX
	XCA	00712 +013100000000	00	00760 +060100003555	010	STO 1)+5
	FMP 3)	00713 +026000003152	010	00761 +0560000003553	010	LDQ 1)+3
	XCA	00714 +013100000000	00	00762 +0260000003555	010	FMP 1)+5
	FMP DELVOL	00715 +026000027667	010	00763 +024100003157	010	FDP 3)+5
	STO 1)+2	00716 +060100003552	010	00764 +0260000003554	010	FMP 1)+4
	LDQ 3)	00717 +0560000003152	010	00765 +060100003556	010	STO 1)+6
	FMP DELTAX	00720 +026000027605	010	00766 +0560000003631	010	LDQ DF1
	FAD DELTAX-1	00721 +030000027604	010	00767 +026000027667	010	FMP DELVOL
	XCA	00722 +013100000000	00	00770 +0302000003556	010	FSB 1)+6
	FMP SVMINU	00723 +0260000030116	010	00771 +060100003557	010	STO 1)+7
	XCA	00724 +013100000000	00	00772 +0560000003551	010	LDQ 1)+1
	FMP DELTAX	00725 +0260000027605	010	00773 +0260000003156	010	FMP 3)+4
	STO 1)+4	00726 +060100003554	010	00774 +0241000003631	010	FDP DF1
	LDQ DELTAX-1	00727 +056000027604	010	00775 +0260000003557	010	FMP 1)+7
	FMP SVPLUS	00730 +0260000030200	010	00776 +060100010545	010	STO C
113A	XCA	00731 +013100000000	00	00777 +0560000003152	010	LDQ 3)
	FMP DELTAX	00732 +0260000027605	010	01000 +0260000027604	010	FMP DELTAX-1
	FAD 1)+4	00733 +0300000003554	010	01001 +0300000027605	010	FAD DELTAX
	FAD 1)+2	00734 +0300000003552	010	01002 +0300000027603	010	FAD DELTAX-2
	FDP DF3	00735 +024100003627	010	01003 +060100003551	010	STO 1)+1
	FMP 3)+4	00736 +0260000003156	010	01004 +0500000030200	010	CLA SVPLUS
	CHS	00737 +076000000002	00	01005 +0302000030116	010	FSB SVMINU
	STO B-100	00740 +060100022211	010	01006 +060100003552	010	STO 1)+2
112A	CLS 3)+4	00741 +0502000003156	010	01007 +0560000027605	010	LDQ DELTAX
	STO 1)+1	00742 +060100003551	010	01010 +0260000027605	010	FMP DELTAX
	LDQ 3)+2	00743 +0560000003154	010	01011 +0601000003553	010	STO 1)+3
	FMP DELTAX-1	00744 +0260000027604	010	01012 +0560000003551	010	LDQ 1)+1
	STO 1)+2	00745 +060100003552	010	01013 +0260000003553	010	FMP 1)+3
	LDQ 3)	00746 +0560000003152	010	01014 +024100003157	010	FDP 3)+5
	FMP DELTAX	00747 +0260000027605	010	01015 +0260000003552	010	FMP 1)+2
	FAD 1)+2	00750 +0300000003552	010	01016 +0241000003630	010	FDP DF2

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

INFLUENCE	COEFFICIENTS	10/11/62	PAGE 18
01017	+026000003156	010	FMP 3)+4
01020	+076000000002	00	CHS
01021	+060100010463	010	STO C-50
01022	+050000027605	010	CLA DELTAX
01023	+030000027604	010	FAD DELTAX-1
01024	+060100003551	010	STO 1)+1
01025	+050000030200	010	CLA SVPLUS
01026	+030200030116	010	FSB SVMINU
01027	+060100003552	010	STO 1)+2
01030	+056000027605	010	LDQ DELTAX
01031	+026000027605	010	FMP DELTAX
01032	+060100003553	010	STO 1)+3
01033	+056000003551	010	LDQ 1)+1
01034	+026000003553	010	FMP 1)+3
01035	+024100003157	010	FDP 3)+5
01036	+026000003552	010	FMP 1)+2
01037	+024100003627	010	FDP DF3
01040	+026000003156	010	FMP 3)+4
01041	+060100010401	010	STO C-100
01042	+002000002133	010	TRA 153A
01043	+050000003617	010	CLA 1
01044	+040200003614	010	SUB IX
01045	+010000001525	010	TZE 140A
01046	+012000001525	010	TPL 140A
01047	+0534000103145	010	LXD 2)+3,1
01050	+0634000103574	010	SXD C)202,1
01051	+050000003614	010	CLA IX
01052	+062200001521	010	STD 138A2
01053	+075400100000	00	PXD 0,1
01054	+060100003611	010	STO J
01055	+0534000203166	010	LXD 6)+2,2
01056	+0634000203575	010	SXD C)900,2
01057	+0534000403567	010	LXD C)100,4
01060	+050000003611	010	CLA J
01061	+040200003604	010	SUB M
01062	+010000001065	010	TZE E)V
01063	+012000001207	010	TPL E)11
01064	+002000001515	010	TRA 138A
01065	-0634000403567	010	E)V
01066	-0634000203575	010	SXD C)100,4
01067	-0634000103574	010	SXD C)900,2
01070	+056000003152	010	LDQ 3)
01071	-0534000103562	010	LXD C)G0,1
01072	+0260000127606	010	FMP DELTAX+1,1
01073	-0534000203565	010	LXD C)G4,2
01074	+0300000227606	010	FAD DELTAX+1,2
01075	-0534000403564	010	LXD C)G2,4
01076	+0300000427606	010	FAD DELTAX+1,4
01077	+060100003551	010	STO 1)+1
01100	+0500000227606	010	CLA DELTAX+1,2
01101	+0300000127606	010	FAD DELTAX+1,1
01102	+013100000000	00	XCA
01103	+026000003551	010	FMP 1)+1
01104	+060100003623	010	STO DF7
01105	+056000003154	010	LDQ 3)+2
01106	+0260000127606	010	FMP DELTAX+1,1
01107	+0300000427606	010	FAD DELTAX+1,4
01110	+013100000000	00	XCA
01111	+026000003152	010	FMP 3)
01112	+013100000000	00	XCA
01113	+0260000130117	010	FMP SVMINU+1,1
01114	+060100003552	010	STO 1)+2
01115	+0500000127606	010	CLA DELTAX+1,1
01116	+0302000427606	010	FSB DELTAX+1,4
01117	+013100000000	00	XCA
01120	+026000003152	010	FMP 3)
01121	+013100000000	00	XCA
01122	+0260000130201	010	FMP SVPLUS+1,1
01123	+076000000002	00	CHS
01124	+030200003552	010	FSB 1)+2
01125	+024100003623	010	FDP DF7
01126	+026000003156	010	FMP 3)+4
01127	-0534000203567	010	LXD C)100,2
01130	+0601000227262	010	STO A+1,2
01131	-0534000203563	010	LXD C)G1,2
01132	+0500000227344	010	CLA XKR+1,2

AERODYNAMIC			INFLUENCE		COEFFICIENTS		10/11/62		PAGE 19	
TZE D)718			TZE D)718		TZE D)718		TZE D)718		TZE D)718	
01133	+010000001512	010	121A1	010	121A1	010	121A1	010	121A1	010
01134	+050000127606	010	122A	010	122A	010	122A	010	122A	010
01135	+030000427606	010								
01136	+013100000000	00								
01137	+026000003152	010								
01140	+013100000000	00								
01141	+026000127670	010								
01142	+060100003552	010								
01143	+056000003152	010								
01144	+026000127606	010								
01145	+030000427606	010								
01146	+013100000000	00								
01147	+026000130117	010								
01150	+013100000000	00								
01151	+026000127606	010								
01152	+060100003554	010								
01153	+056000427606	010								
01154	+026000130201	010								
01155	+013100000000	00								
01156	+026000127606	010								
01157	+030000003554	010								
01160	+030000003552	010								
01161	+024100003623	010								
01162	+026000003156	010								
01163	+076000000002	00								
01164	-053400203567	010								
01165	+060100222356	010								
01166	+050000127606	010	123A	010	123A	010	123A	010	123A	010
01167	+030000427606	010								
01170	+060100003551	010								
01171	+050000130201	010								
01172	+030200130117	010								
01173	+060100003552	010								
01174	+056000127606	010								
01175	+026000127606	010								
01176	+060100003553	010								
01177	+056000003551	010								
01200	+026000003553	010								
01201	+024100003157	010								
01202	+026000003552	010								
01203	+024100003623	010								
01204	+026000003156	010								
01205	+060100210546	010								
01206	+002000001512	010	124A	010	124A	010	124A	010	124A	010
01207	-063400403567	010	E)11	010	E)11	010	E)11	010	E)11	010
01210	-063400203575	010								
01211	-063400103574	010								
01212	+050000003604	010	125A	010	125A	010	125A	010	125A	010
01213	+040000003145	010								
01214	+076000000002	00								
01215	+040000003611	010								
01216	+010000001220	010	125A1	010	125A1	010	125A1	010	125A1	010
01217	+012000001355	010								
01220	-053400103562	010	D)112	010	D)112	010	D)112	010	D)112	010
01221	+050000127606	010	126A	010	126A	010	126A	010	126A	010
01222	-053400203564	010								
01223	+030000227606	010								
01224	+060100003551	010								
01225	-053400403565	010								
01226	+050000427606	010								
01227	+030000127606	010								
01230	+013100000000	00								
01231	+026000003551	010								
01232	+060100003622	010								
01233	+056000003152	010	127A	010	127A	010	127A	010	127A	010
01234	+026000127606	010								
01235	+060100003551	010								
01236	+076000000002	00								
01237	+030000427606	010								
01240	+030200227606	010								
01241	+013100000000	00								
01242	+026000003152	010								
01243	+013100000000	00								
01244	+026000130117	010								
01245	+060100003553	010								
01246	+050000427606	010								

FDP 3)+5
 FMP 1)+2
 FDP DF7
 FMP 3)+4
 STO C)+1,2
 TRA D)718
 SXD C)100,4
 SXD C)900,2
 SXD C)202,1
 CLA M
 ADD 2)+3
 CHS
 ADD J
 TZE D)112
 TPL 132A
 LX D C)G0,1
 CLA DELTAX+1,1
 LX D C)G2,2
 FAD DELTAX+1,2
 STO 1)+1
 LX D C)G4,4
 CLA DELTAX+1,4
 FAD DELTAX+1,1
 XCA
 FMP 1)+1
 STO DF8
 LDQ 3)
 FMP DELTAX+1,1
 STO 1)+1
 CHS
 FAD DELTAX+1,4
 FSB DELTAX+1,2
 XCA
 FMP 3)
 XCA
 FMP SVMINU+1,1
 STO 1)+3
 CLA DELTAX+1,4

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

INFLUENCE	COEFFICIENTS	AERODYNAMIC
01247	+030000003551	010
01250	+030200227606	010
01251	+013100000000	00
01252	+026000003152	010
01253	+013100000000	00
01254	+026000130201	010
01255	+030200003553	010
01256	+024100003622	010
01257	+026000003156	010
01260	-053400103567	010
01261	+060100127262	010
01262	-053400103563	010
01263	+050000127344	010
01264	+010000001512	010
01265	+050000227606	010
01266	+030200427606	010
01267	+013100000000	00
01270	+026000003152	010
01271	+013100000000	00
01272	-053400103562	010
01273	+026000127670	010
01274	+060100003552	010
01275	+056000003152	010
01276	+026000127606	010
01277	+060100003553	010
01300	+030000227606	010
01301	+013100000000	00
01302	+026000130117	010
01303	+013100000000	00
01304	+026000427606	010
01305	+060100003555	010
01306	+050000427606	010
01307	+030000003553	010
01310	+013100000000	00
01311	+026000130201	010
01312	+013100000000	00
01313	+026000227606	010
01314	+030200003555	010
01315	+030000003552	010
01316	+024100003622	010
01317	+026000003156	010
01320	-053400103567	010
01321	+060100122356	010
01322	+050200003156	010
01323	+060100003551	010
01324	+050000227606	010
01325	+030200427606	010
01326	+060100003552	010
01327	-053400403562	010
01330	+050000430201	010
01331	+030200430117	010
01332	+060100003553	010
01333	+056000427606	010
01334	+026000427606	010
01335	+060100003554	010
01336	+056000003552	010
01337	+026000003554	010
01340	+024100003157	010
01341	+026000003553	010
01342	+060100003555	010
01343	+056000003622	010
01344	+026000427670	010
01345	+030000003555	010
01346	+060100003556	010
01347	+056000003551	010
01350	+026000003156	010
01351	+024100003622	010
01352	+026000003556	010
01353	+060100110546	010
01354	+002000001512	010
01355	+050000003604	010
01356	+040000003142	010
01357	+076000000002	00
01360	+040000003611	010
01361	+010000001370	010
01362	+012000001364	010

AERODYNAMIC			INFLUENCE		COEFFICIENTS		10/11/62		PAGE 21	
01363	+002000001370	010	TRA D1116	01431	-0534000203563	010	LXD C1G1,2			
01364	-063400201365	010	SXD 132A3,2	01432	+0500000227344	010	CLA XKR+1,2			
01365	+200000401366	010	TIX **1,4	01433	+010000001512	010	TZE D1718			
01366	-063400403567	010	SXD C1100,4	01434	+0500000427606	010	CLA DELTAX+1,4			
01367	+002000002131	010	TRA D151C	01435	+0300000127606	010	FAD DELTAX+1,1			
01370	-053400103562	010	LXD C1G0,1	01436	+0131000000000	00	XCA			
01371	+050000127606	010	CLA DELTAX+1,1	01437	+026000003152	010	FMP 3)			
01372	-053400203564	010	LXD C1G2,2	01440	+0131000000000	00	XCA			
01373	+030000227606	010	FAD DELTAX+1,2	01441	+0260000127670	010	FMP DELVOL+1,1			
01374	+060100003551	010	STO 1)+1	01442	+060100003552	010	STO 1)+2			
01375	+056000003152	010	LDQ 3)	01443	+0560000127606	010	LDQ DELTAX+1,1			
01376	+0260000127606	010	FMP DELTAX+1,1	01444	+0260000130117	010	FMP SVMINU+1,1			
01377	-053400403565	010	LXD C1G4,4	01445	+0131000000000	00	XCA			
01400	+030000427606	010	FAD DELTAX+1,4	01446	+0260000427606	010	FMP DELTAX+1,4			
01401	+030000227606	010	FAD DELTAX+1,2	01447	+060100003553	010	STO 1)+3			
01402	+013100000000	00	XCA	01450	+056000003152	010	LDQ 3)			
01403	+026000003551	010	FMP 1)+1	01451	+0260000127606	010	FMP DELTAX+1,1			
01404	+060100003621	010	STO DF9	01452	+0300000427606	010	FAD DELTAX+1,4			
01405	+050000427606	010	CLA DELTAX+1,4	01453	+0131000000000	00	XCA			
01406	+030200127606	010	FSB DELTAX+1,1	01454	+0260000130201	010	FMP SVPLUS+1,1			
01407	+013100000000	00	XCA	01455	+0131000000000	00	XCA			
01410	+026000003152	010	FMP 3)	01456	+0260000127606	010	FMP DELTAX+1,1			
01411	+013100000000	00	XCA	01457	+030000003553	010	FAD 1)+3			
01412	+0260000130117	010	FMP SVMINU+1,1	01460	+030000003552	010	FAD 1)+2			
01413	+060100003552	010	STO 1)+2	01461	+024100003621	010	FDP DF9			
01414	+056000003154	010	LDQ 3)+2	01462	+026000003156	010	FMP 3)+4			
01415	+0260000127606	010	FMP DELTAX+1,1	01463	-053400203567	010	LXD C1100,2			
01416	+030000427606	010	FAD DELTAX+1,4	01464	+060100222356	010	STO B+1,2			
01417	+013100000000	00	XCA	01465	+050200003156	010	CLS 3)+4			
01420	+026000003152	010	FMP 3)	01466	+060100003551	010	STO 1)+1			
01421	+013100000000	00	XCA	01467	+050000427606	010	CLA DELTAX+1,4			
01422	+0260000130201	010	FMP SVPLUS+1,1	01470	+0300000127606	010	FAD DELTAX+1,1			
01423	+076000000002	00	CHS	01471	+060100003552	010	STO 1)+2			
01424	+030000003552	010	FAD 1)+2	01472	+0500000130201	010	CLA SVPLUS+1,1			
01425	+024100003621	010	FDP DF9	01473	+0302000130117	010	FSB SVMINU+1,1			
01426	+026000003156	010	FMP 3)+4	01474	+060100003553	010	STO 1)+3			
01427	-053400203567	010	LXD C1100,2	01475	+0560000127606	010	LDQ DELTAX+1,1			
01430	+060100227262	010	STO A+1,2	01476	+0260000127606	010	FMP DELTAX+1,1			

10/11/62

COEFFICIENTS

INFLUENCE

AERODYNAMIC

COEFFICIENTS	INFLUENCE	AERODYNAMIC
01473 +060100003554 010	01544 +0260000430117 010	STO 1)+4
01500 +056000003552 010	01545 +060100003552 010	LDQ 1)+2
01501 +026000003554 010	01546 +056000003154 010	FMP 1)+4
01502 +024100003157 010	01547 +0260000427606 010	FDP 3)+5
01503 +026000003553 010	01550 +0300000427607 010	FMP 1)+3
01504 +060100003555 010	01551 +013100000000 00	STO 1)+5
01505 +056000003551 010	01552 +026000003152 010	LDQ 1)+1
01506 +026000003156 010	01553 +013100000000 00	FMP 3)+4
01507 +024100003621 010	01554 +0260000430201 010	FDP DF9
01510 +026000003555 010	01555 +076000000002 00	FMP 1)+5
01511 +060100210546 010	01556 +030200003552 010	STO C+1,2
01512 -0534000403567 010	01557 +024100003626 010	LXD C)100,4
01513 -0534000203575 010	01560 +026000003156 010	LXD C)900,2
01514 -053400103574 010	01561 -0534000203570 010	LXD C)202,1
	01562 +060100227426 010	BSS
01515 +100062401516 010	01563 +0500000427607 010	TXI *+1,4,50
01516 +100001101517 010	01564 +0300000427606 010	TXI *+1,1,1
01517 -063400103611 010	01565 +060100003551 010	SXD J,1
01520 +100062201521 010	01566 +0500000427610 010	TXI *+1,2,50
01521 -300000101060 010	01567 +0300000427607 010	TXL }18A,1
01522 +200000401523 010	01570 +013100000000 00	TXI *+1,4
01523 -0634000403567 010	01571 +026000003551 010	SXD C)100,4
01524 +002000002131 010	01572 +060100003625 010	TRA D)51C
01525 +056000003152 010	01573 +056000003152 010	LDQ 3)
01526 +0260000427607 010	01574 +0260000427607 010	FMP DELTAX+2,4
01527 +0300000427610 010	01575 +060100003551 010	FAD DELTAX+3,4
01530 +0300000427606 010	01576 +076000000002 00	FAD DELTAX+1,4
01531 +060100003551 010	01577 +0300000427606 010	STO 1)+1
01532 +0500000427610 010	01600 +0302000427610 010	CLA DELTAX+3,4
01533 +0300000427607 010	01601 +013100000000 00	FAD DELTAX+2,4
01534 +013100000000 00	01602 +026000003152 010	XCA
01535 +026000003551 010	01603 +013100000000 00	FMP 1)+1
01536 +060100003626 010	01604 +0260000430117 010	STO DF4
01537 +0500000427606 010	01605 +060100003553 010	CLA DELTAX+1,4
01540 +0302000427607 010	01606 +056000003154 010	FSB DELTAX+2,4
01541 +013100000000 00	01607 +0260000427606 010	XCA
01542 +026000003152 010	01610 +030000003551 010	FMP 3)
01543 +013100000000 00	01611 +0300000427610 010	XCA

10/11/62

INFLUENCE COEFFICIENTS

AERODYNAMIC

01612	+013100000000	00	XCA		01660	+0260000003156	010	FMP 3)+4
01613	+0260000003152	010	FMP 3)		01661	+060100227262	010	STO A+1,2
01614	+013100000000	00	XCA		01662	-053400103563	010	LXD CjGI,1
01615	+0260000430201	010	FMP SVPLUS+1,4		01663	+050000127344	010	CLA XKR+1,1
01616	+0300000003553	010	FAD 1)+3		01664	+010000002132	010	TZE D11C
01617	+024100003625	010	FDP DF5		01665	+050000427606	010	CLA DELTAX+1,4
01620	+0260000003156	010	FMP 3)+4		01666	+030000427607	010	FAD DELTAX+2,4
01621	+060100227344	010	STO A+51,2		01667	+013100000000	00	XCA
01622	+050000427607	010	CLA DELTAX+2,4		01670	+0260000003152	010	FMP 3)
01623	+030000427606	010	FAD DELTAX+1,4		01671	+013100000000	00	XCA
01624	+060100003551	010	STO 1)+1		01672	+0260000427670	010	FMP DELVOL+1,4
01625	+0560000003152	010	LDQ 3)		01673	+060100003552	010	STO 1)+2
01626	+0260000427607	010	FMP DELTAX+2,4		01674	+0560000427607	010	LDQ DELTAX+2,4
01627	+030000427610	010	FAD DELTAX+3,4		01675	+0260000430117	010	FMP SYMINU+1,4
01630	+030000427606	010	FAD DELTAX+1,4		01676	+013100000000	00	XCA
01631	+013100000000	00	XCA		01677	+0260000427606	010	FMP DELTAX+1,4
01632	+0260000003551	010	FMP 1)+1		01700	+060100003553	010	STO 1)+3
01633	+060100003624	010	STO DF6		01701	+0560000003152	010	LDQ 3)
01634	+0560000003154	010	LDQ 3)+2		01702	+0260000427606	010	FMP DELTAX+1,4
01635	+0260000427607	010	FMP DELTAX+2,4		01703	+0300000427607	010	FAD DELTAX+2,4
01636	+060100003551	010	STO 1)+1		01704	+013100000000	00	XCA
01637	+030000427610	010	FAD DELTAX+3,4		01705	+0260000430201	010	FMP SVPLUS+1,4
01640	+013100000000	00	XCA		01706	+013100000000	00	XCA
01641	+0260000003152	010	FMP 3)		01707	+0260000427606	010	FMP DELTAX+1,4
01642	+013100000000	00	XCA		01710	+0300000003553	010	FAD 1)+3
01643	+0260000430117	010	FMP SYMINU+1,4		01711	+0300000003552	010	FAD 1)+2
01644	+060100003553	010	STO 1)+3		01712	+024100003626	010	FDP DF4
01645	+0560000003155	010	LDQ 3)+3		01713	+0260000003156	010	FMP 3)+4
01646	+0260000427606	010	FMP DELTAX+1,4		01714	+060100222522	010	STO B+101,2
01647	+0300000003551	010	FAD 1)+1		01715	+0560000003152	010	LDQ 3)
01650	+030000427610	010	FAD DELTAX+3,4		01716	+0260000427607	010	FMP DELTAX+2,4
01651	+013100000000	00	XCA		01717	+060100003551	010	STO 1)+1
01652	+0260000003152	010	FMP 3)		01720	+0300000427606	010	FAD DELTAX+1,4
01653	+013100000000	00	XCA		01721	+0300000427610	010	FAD DELTAX+3,4
01654	+0260000430201	010	FMP SVPLUS+1,4		01722	+013100000000	00	XCA
01655	+076000000002	00	CHS		01723	+0260000003152	010	FMP 3)
01656	+0300000003553	010	FAD 1)+3		01724	+013100000000	00	XCA
01657	+0241000003624	010	FDP DF6		01725	+0260000427670	010	FMP DELVOL+1,4

AERODYNAMIC			INFLUENCE		COEFFICIENTS		10/11/62		PAGE 24	
01726	+060100003553	010	STO 1)+3	01774	+060100003555	010	STO 1)+5			
01727	+050000003551	010	CLA 1)+1	01775	+030000427610	010	FAD DELTAX+3,4			
01730	+030000427610	010	FAD DELTAX+3,4	01776	+013100000000	00	XCA			
01731	+013100000000	00	XCA	01777	+026000430117	010	FMP SVMINU+1,4			
01732	-053400103562	010	LXD C)GO,1	02000	+013100000000	00	XCA			
01733	+026000130117	010	FMP SVMINU+1,1	02001	+026000427607	010	FMP DELTAX+2,4			
01734	+013100000000	00	XCA	02002	+060100003557	010	STO 1)+7			
01735	+026000427606	010	FMP DELTAX+1,4	02003	+050000003552	010	CLA 1)+2			
01736	+060100003555	010	STO 1)+5	02004	+030000003555	010	FAD 1)+5			
01737	+056000003152	010	LDQ 3)	02005	+030000427610	010	FAD DELTAX+3,4			
01740	+026000427606	010	FMP DELTAX+1,4	02006	+060100003560	010	STO 1)+8			
01741	+030000003551	010	FAD 1)+1	02007	+050000003552	010	CLA 1)+2			
01742	+030000427610	010	FAD DELTAX+3,4	02010	+030000427607	010	FAD DELTAX+2,4			
01743	+013100000000	00	XCA	02011	+060100003561	010	STO 1)+9			
01744	+026000430201	010	FMP SVPLUS+1,4	02012	+056000003560	010	LDQ 1)+8			
01745	+013100000000	00	XCA	02013	+026000430201	010	FMP SVPLUS+1,4			
01746	+026000427606	010	FMP DELTAX+1,4	02014	+013100000000	00	XCA			
01747	+030000003555	010	FAD 1)+5	02015	+026000003561	010	FMP 1)+9			
01750	+030000003553	010	FAD 1)+3	02016	+030200003557	010	FSB 1)+7			
01751	+024100003625	010	FDP DF5	02017	+030000003554	010	FAD 1)+4			
01752	+026000003156	010	FMP 3)+4	02020	+024100003624	010	FDP DF6			
01753	+076000000002	00	CHS	02021	+026000003156	010	FMP 3)+4			
01754	+060100222440	010	STO B+51,2	02022	+060100222356	010	STO B+1,2			
01755	+056000003154	010	LDQ 3)+2	02023	+050200003156	010	CLS 3)+4			
01756	+026000427607	010	FMP DELTAX+2,4	02024	+060100003551	010	STO 1)+1			
01757	+060100003551	010	STO 1)+1	02025	+050000427606	010	CLA DELTAX+1,4			
01760	+056000003152	010	LDQ 3)	02026	+030000427607	010	FAD DELTAX+2,4			
01761	+026000427606	010	FMP DELTAX+1,4	02027	+060100003552	010	STO 1)+2			
01762	+060100003552	010	STO 1)+2	02030	+050000430201	010	CLA SVPLUS+1,4			
01763	+030000003551	010	FAD 1)+1	02031	+030200430117	010	FSB SVMINU+1,4			
01764	+030000427610	010	FAD DELTAX+3,4	02032	+060100003553	010	STO 1)+3			
01765	+013100000000	00	XCA	02033	+056000427606	010	LDQ DELTAX+1,4			
01766	+026000003152	010	FMP 3)	02034	+026000427606	010	FMP DELTAX+1,4			
01767	+013100000000	00	XCA	02035	+060100003554	010	STO 1)+4			
01770	+026000427670	010	FMP DELVOL+1,4	02036	+056000003552	010	LDQ 1)+2			
01771	+060100003554	010	STO 1)+4	02037	+026000003554	010	FMP 1)+4			
01772	+056000003152	010	LDQ 3)	02040	+024100003157	010	FDP 3)+5			
01773	+026000427607	010	FMP DELTAX+2,4	02041	+026000003553	010	FMP 1)+3			

AERODYNAMIC			INFLUENCE		COEFFICIENTS		10/11/62		PAGE 25	
02042	+060100003555	010	STO 1)+5	02110	+0260000427606	010	FMP	DELTA X+1,4		
02043	+056000003551	010	LDQ 1)+1	02111	+060100003555	010	STO 1)+5			
02044	+026000003156	010	FMP 3)+4	02112	+056000003553	010	LDQ 1)+3			
02045	+024100003626	010	FDP DF4	02113	+026000003555	010	FMP 1)+5			
02046	+026000003555	010	FMP 1)+5	02114	+024100003157	010	FDP 3)+5			
02047	+060100210712	010	STO C+101,2	02115	+026000003554	010	FMP 1)+4			
02050	+056000003152	010	LDQ 3)	02116	+060100003556	010	STO 1)+6			
02051	+0260000427607	010	FMP DELTAX+2,4	02117	+056000003624	010	LDQ DF6			
02052	+0300000427606	010	FAD DELTAX+1,4	02120	+0260000427670	010	FMP DELVOL+1,4			
02053	+0300000427610	010	FAD DELTAX+3,4	02121	+030000003556	010	FAD 1)+6			
02054	+060100003551	010	STO 1)+1	02122	+060100003557	010	STO 1)+7			
02055	+0500000430201	010	CLA SVPLUS+1,4	02123	+056000003551	010	LDQ 1)+1			
02056	+0302000430117	010	FSB SVMINU+1,4	02124	+026000003156	010	FMP 3)+4			
02057	+060100003552	010	STO 1)+2	02125	+024100003624	010	FDP DF6			
02060	+0560000427606	010	LDQ DELTAX+1,4	02126	+026000003557	010	FMP 1)+7			
02061	+0260000427606	010	FMP DELTAX+1,4	02127	+060100210546	010	STO C+1,2			
02062	+060100003553	010	STO 1)+3	02130	+002000002133	010	TRA 153A			
02063	+056000003551	010	LDQ 1)+1	02131	-0534000403566	010	D)51C			
02064	+026000003553	010	FMP 1)+3	02132	-053400103562	010	D)11C			
02065	+024100003157	010	FDP 3)+5				153A			
02066	+026000003552	010	FMP 1)+2	02133	-053400203567	010	LXD C)100,2			
02067	+024100003625	010	FDP DF5	02134	+100001202135	010	153A1			
02070	+026000003156	010	FMP 3)+4	02135	-063400203567	010	SXD C)100,2			
02071	+060100210630	010	STO C+51,2	02136	+100001102137	010	TXI *+1,1,1			
02072	+050200003156	010	CLS 3)+4	02137	-063400103562	010	SXD C)G0,1			
02073	+060100003551	010	STO 1)+1	02140	-063400103617	010	SXD 1,1			
02074	+056000003154	010	LDQ 3)+2	02141	-300000100433	010	153A2			
02075	+0260000427607	010	FMP DELTAX+2,4	02142	-050000003601	010	154A			
02076	+060100003552	010	STO 1)+1	02143	-0634000403170	010	CAL N3			
02077	+056000003152	010	LDQ 3)	02144	+007400400004	010	SXD 6)+4,4			
02100	+0260000427606	010	FMP DELTAX+1,4	02145	+000000003357	010	TSX (STH),4			
02101	+030000003552	010	FAD 1)+2	02146	-0534000403170	010	PZE 8)2M			
02102	+0300000427610	010	FAD DELTAX+3,4	02147	-053400203563	010	LXD 6)+4,4			
02103	+060100003553	010	STO 1)+3	02150	+056000227344	010	LXD C)G1,2			
02104	+0500000430201	010	CLA SVPLUS+1,4	02151	-100000000000	00	LDQ XKR+1,2			
02105	+0302000430117	010	FSB SVMINU+1,4	02152	+056000003613	010	STR			
02106	+060100003554	010	STO 1)+4	02153	-100000000000	00	LDQ J1			
02107	+0560000427606	010	LDQ DELTAX+1,4	02154	-0634000403170	010	STR			
							SXD 6)+4,4			

152A

151A

10/11/62

AERODYNAMIC INFLUENCE COEFFICIENTS

INFLUENCE	COEFFICIENTS	10/11/62	AERODYNAMIC	INFLUENCE	COEFFICIENTS	10/11/62	AERODYNAMIC
02155	+007400400005	010	TSX (FIL),4	02222	+0560000127262	010	LDQ A+1,1
02156	-053400403170	010	LXD 6)+4,4	02223	+026000003632	010	FMP COEFZ
02157	+050000003613	010	CLA J1	02224	+013100000000	00	XCA
02160	+040000003145	010	ADD 2)+3	02225	+026000003640	010	FMP CBAR
02161	+060100003613	010	STD J1	02226	+060100127262	010	STD A+1,1
02162	-050000003601	010	CAL N3	02227	+100062102230	010	TXI *+1,1,50
02163	-063400403170	010	SXD 6)+4,4	02230	-300000102222	010	TXL 164A,1
02164	+007400400004	010	TSX (STH),4	02231	+200000102232	010	TIX *+1,1
02165	+000000003354	010	PZE 8)12	02232	+100001102233	010	TXI *+1,1,1
02166	-053400403170	010	LXD 6)+4,4	02233	-300000102222	010	TXL 163A,1
02167	+056000003614	010	LDQ IX	02234	+050000227344	010	CLA XKR+1,2
02170	-100000000000	00	STR	02235	+010000002435	010	TZE 193A
02171	+056000003613	010	LDQ J1	02236	-053400103145	010	LXD 2)+3,1
02172	-100000000000	00	STR	02237	+050000003614	010	CLA IX
02173	-063400403170	010	SXD 6)+4,4	02240	+062200002264	010	STD 170A4
02174	+007400400005	010	TSX (FIL),4	02241	+056000003614	010	LDQ IX
02175	-053400403170	010	LXD 6)+4,4	02242	+020000003147	010	MPY 2)+5
02176	+050000003613	010	CLA J1	02243	+076700000021	00	ALS 17
02177	+040000003145	010	ADD 2)+3	02244	+062200002261	010	STD 170A2
02200	+060100003613	010	STD J1	02245	+056000003614	010	LDQ IX
02201	+050000003152	010	CLA 3)	02246	+020000003147	010	MPY 2)+5
02202	+024100003577	010	FDP SREF	02247	+076700000021	00	ALS 17
02203	-060000003632	010	STQ COEFZ	02250	+062200002262	010	STD 170A3
02204	+050000227344	010	CLA XKR+1,2				BSS
02205	+010000002207	010	TZE 162A	02251	+050000003632	010	CLA COEFZ
02206	+012000002621	010	TPL 219A	02252	+024100003640	010	FDP CBAR
02207	-053400103145	010	LXD 2)+3,1	02253	+026000110546	010	FMP C+1,1
02210	+050000003614	010	CLA IX	02254	+060100110546	010	STD C+1,1
02211	+062200002233	010	STD 164A4	02255	+056000003632	010	LDQ COEFZ
02212	+056000003614	010	LDQ IX	02256	+026000122356	010	FMP B+1,1
02213	+020000003147	010	MPY 2)+5	02257	+060100122356	010	STD B+1,1
02214	+076700000021	00	ALS 17				BSS
02215	+062200002230	010	STD 164A2	02260	+100062102261	010	TXI *+1,1,50
02216	+056000003614	010	LDQ IX	02261	-300000102251	010	TXL 168A,1
02217	+020000003147	010	MPY 2)+5	02262	+200000102263	010	TIX *+1,1
02220	+076700000021	00	ALS 17	02263	+100001102264	010	TXI *+1,1,1
02221	+062200002231	010	STD 164A3	02264	-300000102251	010	TXL 167A,1
			BSS	02265	+050000227344	010	CLA XKR+1,2

02266	+010000002435	010	171A1	TZE	193A	02333	-063400403566	010	E)1Q	SXD	C)G5,4
02267	+012000002621	010		TPL	219A	02334	+050000003612	010	180A	CLA	J2
02270	-050000003602	010	172A	CAL	N2	02335	+060100003613	010		STO	J1
02271	+007400400004	010		TSX	(STH),4	02336	+002000002342	010	181A	TRA	183A
02272	+000000003513	010		PZE	8)PE	02337	+050000003612	010	182A	CLA	J2
02273	+007400400005	010		TSX	(FIL),4	02340	+040000003145	010		ADD	2)+3
02274	-050000003602	010	173A	CAL	N2	02341	+060100003613	010		STO	J1
02275	+007400400004	010		TSX	(STH),4	02342	+050000003614	010	183A	CLA	IX
02276	+000000003351	010		PZE	8)2E	02343	+076500000043	00		LRS	35
02277	+056000227344	010	174A	LDQ	XKR+1,2	02344	+022100003150	010		DVP	2)+6
02300	-100000000000	00		STR		02345	+076000000000	00		CLM	
02301	+056000003614	010		LDQ	IX	02346	+076300000022	00		LRS	18
02302	-100000000000	00		STR		02347	-060000003551	010		STQ	1)+1
02303	+007400400005	010		TSX	(FIL),4	02350	+050000003614	010		CLA	IX
02304	-050000003602	010	175A	CAL	N2	02351	+040000003551	010		ADD	1)+1
02305	+007400400004	010		TSX	(STH),4	02352	+013100000000	00		XCA	
02306	+000000003322	010		PZE	8)PK	02353	+020000003143	010		MPY	2)+1
02307	+007400400005	010		TSX	(FIL),4	02354	+076700000021	00		ALS	17
02310	+007400400006	010	176A	BSS		02355	+040000003613	010		ADD	J1
02311	+007400027261	010	177A	TSX	MPRINT,4	02356	+040000003151	010		ADD	2)+7
02312	+007400003614	010		TSX	A	02357	+060100003612	010		STO	J2
02313	+007400003614	010		TSX	IX	02360	+002000002362	010		TRA	184A
02314	+007400003147	010		TSX	IX	02361	-063400403566	010	E)1T	SXD	C)G5,4
02315	+007400003602	010		TSX	2)+5	02362	-050000003602	010	184A	CAL	N2
02316	+007400403110	010		TSX	N2	02363	+007400400004	010		TSX	(STH),4
02317	-053400103570	010		TSX	A)102,4	02364	+000000003315	010		PZE	8)22
02320	-053400403614	010		LXD	C)102,1	02365	+007400400005	010		TSX	(FIL),4
02321	-053400403614	010		LXD	IX,4				185A	BSS	
02322	+050000003620	010	178A	LXD	IX,4	02366	+007400400006	010	186A	TSX	MPRINT,4
02323	+010000002326	010	178A1	CLA	IPUNCH	02367	+007400022355	010		TSX	B
02324	+012000002361	010		TZE	179A	02370	+007400003614	010		TSX	IX
02324	+012000002361	010		TPL	E)1T	02371	+007400003614	010		TSX	IX
02325	+002000002361	010		TRA	E)1T	02372	+007400003147	010		TSX	2)+5
02326	+050000003613	010	179A	CLA	J1	02373	+007400003602	010		TSX	N2
02327	+040200003142	010		SUB	2)	02374	+007400403110	010		TSX	A)102,4
02330	+010000002333	010	179A1	TZE	E)1Q	02375	-053400103570	010		LXD	C)102,1
02331	+012000002337	010		TPL	182A	02376	-053400403614	010		LXD	IX,4
02332	+002000002337	010		TRA	182A	02377	-053400403614	010		LXD	IX,4

02400	-050000003602	010	187A	CAL N2	02446	+056000003614	010	LDQ IX
02401	-063400403170	010		SXD 6)+4,4	02447	-100000000000	00	STR
02402	+007400400004	010		TSX (STH),4	02450	+007400400005	010	TSX (FIL),4
02403	+000000003307	010		PZE 8)23				BSS
02404	+007400400005	010		TSX (FIL),4	02451	+007400400006	010	TSX MPRINT,4
02405	+007400400006	010	189A	TSX MPRINT,4	02452	+007400027261	010	TSX A
02406	+007400010545	010		TSX C	02453	+007400003614	010	TSX IX
02407	+007400003614	010		TSX IX	02454	+007400003614	010	TSX IX
02410	+007400003614	010		TSX IX	02455	+007400003147	010	TSX 2)+5
02411	+007400003147	010		TSX 2)+5	02456	+007400003602	010	TSX N2
02412	+007400003602	010		TSX N2	02457	+007400403110	010	TSX A)102,4
02413	+007400403110	010		TSX A)102,4	02460	-053400103570	010	LXD C)102,1
02414	-053400103570	010		LXD C)102,1	02461	-053400403614	010	LXD IX,4
02415	-053400403170	010		LXD 6)+4,4	02462	-053400403614	010	LXD IX,4
02416	-053400403614	010		LXD IX,4	02463	-063400403566	010	SXD C)G5,4
02417	-053400403614	010		LXD IX,4	02464	+050000003620	010	CLA IPUNCH
02420	-050000003602	010	190A	CAL N2	02465	+010000002470	010	TZE 199A
02421	-063400403170	010		SXD 6)+4,4	02466	+012000003074	010	TPL D)32E
02422	+007400400004	010		TSX (STH),4	02467	+002000003074	010	TRA D)32E
02423	+000000003257	010		PZE 8)75	02470	+050000003613	010	CLA J1
02424	-053400403170	010		LXD 6)+4,4	02471	+040200003142	010	SUB 2)
02425	+056000003613	010	191A	LDQ J1	02472	+010000002475	010	TZE 200A
02426	-100000000000	00		STR	02473	+012000002500	010	TPL 202A
02427	+056000003612	010		LDQ J2	02474	+002000002500	010	TRA 202A
02430	-100000000000	00		STR	02475	+050000003612	010	CLA J2
02431	-063400403170	010		SXD 6)+4,4	02476	+060100003613	010	STO J1
02432	+007400400005	010		TSX (FIL),4	02477	+002000002503	010	TRA 203A
02433	-053400403170	010		LXD 6)+4,4	02500	+050000003612	010	CLA J2
02434	+002000002532	010	192A	TRA 206A	02501	+040000003145	010	ADD 2)+3
02435	-050000003602	010	193A	CAL N2	02502	+060100003613	010	STO J1
02436	+007400400004	010		TSX (STH),4	02503	+050000003614	010	CLA IX
02437	+000000003513	010		PZE 8)PE	02504	+076500000043	00	LRS 35
02440	+007400400005	010		TSX (FIL),4	02505	+022100003150	010	DVP 2)+6
02441	-050000003602	010	194A	CAL N2	02506	+076000000000	00	CLM
02442	+007400400004	010		TSX (STH),4	02507	+076300000022	00	LLS 18
02443	+000000003302	010		PZE 8)28	02510	+020000003614	010	MPY IX
02444	+0560000227344	010	195A	LDQ XKR+1,2	02511	+076700000021	00	ALS 17
02445	-100000000000	00		STR	02512	+040000003614	010	ADD IX

AERODYNAMIC			INFLUENCE		COEFFICIENTS		10/11/62		PAGE 29	
02513	+0400000003613	010	ADD J1	02556	+0602000003637	010	SLW CHD			
02514	+0400000003142	010	ADD 2)	02557	-0500000003162	010	CAL 3)+8			
02515	+0601000003612	010	STO J2	02560	+0602000003636	010	SLW CHI			
02516	-0500000003602	010	CAL N2			214A	BSS			
02517	-0634004003170	010	SXD 6)+4,4	02561	+0074004000007	010	TSX MPUNCH,4			
02520	+0074004000004	010	TSX (STH),4	02562	+0074000022355	010	TSX B			
02521	+0000000003257	010	PZE 8)75	02563	+0074000003614	010	TSX IX			
02522	-0534004003170	010	LXD 6)+4,4	02564	+0074000003614	010	TSX IX			
02523	+0560000003613	010	LDQ J1	02565	+0074000003146	010	TSX 2)+4			
02524	-1000000000000	00	STR	02566	+0074000003146	010	TSX 2)+4			
02525	+0560000003612	010	LDQ J2	02567	+0074000003145	010	TSX 2)+3			
02526	-1000000000000	00	STR	02570	+0074000003637	010	TSX CHD			
02527	-0634004003170	010	SXD 6)+4,4	02571	+0074000003147	010	TSX 2)+5			
02530	+0074004000005	010	TSX (FIL),4	02572	+0074000003601	010	TSX N3			
02531	-0534004003170	010	LXD 6)+4,4	02573	+0074004003110	010	TSX A)102,4			
		206A	BSS	02574	-0534000103570	010	LXD C)102,1			
02532	-0500000003160	010	CAL 3)+6	02575	-0534004003614	010	LXD IX,4			
02533	+0602000003634	010	SLW CHS	02576	-0534004003614	010	LXD IX,4			
		208A	BSS	02577	-0634004003170	010	SXD 6)+4,4			
02534	+0074004000007	010	TSX MPUNCH,4	02600	+0074004000007	010	TSX MPUNCH,4			
02535	+0074000027261	010	TSX A	02601	+0074000010545	010	TSX C			
02536	+0074000003614	010	TSX IX	02602	+0074000003614	010	TSX IX			
02537	+0074000003614	010	TSX IX	02603	+0074000003614	010	TSX IX			
02540	+0074000003146	010	TSX 2)+4	02604	+0074000003146	010	TSX 2)+4			
02541	+0074000003146	010	TSX 2)+4	02605	+0074000003146	010	TSX 2)+4			
02542	+0074000003145	010	TSX 2)+3	02606	+0074000003145	010	TSX 2)+3			
02543	+0074000003634	010	TSX CHS	02607	+0074000003636	010	TSX CHI			
02544	+0074000003147	010	TSX 2)+5	02610	+0074000003147	010	TSX 2)+5			
02545	+0074000003601	010	TSX N3	02611	+0074000003601	010	TSX N3			
02546	+0074004003110	010	TSX A)102,4	02612	+0074004003110	010	TSX A)102,4			
02547	-0534000103570	010	LXD C)102,1	02613	-0534000103570	010	LXD C)102,1			
02550	-0534004003614	010	LXD IX,4	02614	-0534004003170	010	LXD 6)+4,4			
02551	-0534004003614	010	LXD IX,4	02615	-0534004003614	010	LXD IX,4			
02552	-0634004003566	010	SXD C)G5,4	02616	-0534004003614	010	LXD IX,4			
02553	+0500000227344	010	CLA XKR+1,2	02617	-0634004003566	010	SXD C)G5,4			
02554	+0100000003074	010	TZE D)32E	02620	+0020000003074	010	TRA D)32E			
		210A	BSS	02621	-0500000003602	010	CAL N2			
02555	-0500000003161	010	CAL 3)+7	02622	+0074004000004	010	TSX (STH),4			

10/11/62

AERODYNAMIC

INFLUENCE

COEFFICIENTS

INFLUENCE	COEFFICIENTS	INFLUENCE	COEFFICIENTS	INFLUENCE	COEFFICIENTS	INFLUENCE	COEFFICIENTS
02623	+000000003513	010	02671	-053400403553	010	LXD 1)+3,4	
02624	+007400400005	010	02672	-063400403571	010	SXD C)103,4	
02625	-050000003602	010 220A	02673	-053400403145	010	LXD 2)+3,4	
02626	+007400400004	010	02674	-063400403573	010	SXD C)201,4	
02627	+000000003242	010	02675	+050000003614	010	CLA IX	
02630	+056000227344	010 221A	02676	+062200002770	010	STD 229A4	
02631	-100000000000	00	02677	-075400400000	00	PXD 0,4	
02632	+056000003614	010	02700	+060100003617	010	STD I	
02633	-100000000000	00	02701	-053400103563	010 D)526	LXD C)G1,1	
02634	+007400400005	010	02702	-053400403567	010 D)426	LXD C)100,4	
02635	-050000003602	010 222A	02703	-053400203145	010 225A	LXD 2)+3,2	
02636	+007400400004	010	02704	-063400203572	010	SXD C)200,2	
02637	+000000003213	010	02705	+050000003615	010	CLA IX2	
02640	+007400400005	010	02706	+062200002756	010	STD 229A2	
02641	+056000003142	010 223A	02707	-075400200000	00	PXD 0,2	
02642	+020000003614	010	02710	+060100003611	010	STD J	
02643	+076700000021	00	02711	+050000003611	010 226A	CLA J	
02644	+060100003615	010	02712	+076500000043	00	LRS 35	
02645	-053400103145	010 224A	02713	+022100003142	010	DVP 2)	
02646	-063400103567	010	02714	+076000000000	00	CLM	
02647	+050000003615	010	02715	+076300000022	00	LLS 18	
02650	+040200003145	010	02716	+013100000000	00	XCA	
02651	+040000003142	010	02717	+040000003145	010	ADD 2)+3	
02652	+076500000043	00	02720	+060100003606	010	STD KZ	
02653	+022100003142	010	02721	-063400403170	010	SXD 6)+4,4	
02654	+020000003142	010	02722	+007400403125	010	TSX A)103,4	
02655	+076500000022	00	02723	-053400203571	010	LXD C)103,2	
02656	+020000003147	010	02724	-053400403170	010	LXD 6)+4,4	
02657	+076300000043	00	02725	+056000003641	010 227A	LDQ BR	
02660	+062200002757	010	02726	+026000003641	010	FMP BR	
02661	+050000003167	010	02727	+013100000000	00	XCA	
02662	+060100003553	010	02730	+026000003576	010	FMP S	
02663	+056000003606	010	02731	+060100003552	010	STD 1)+2	
02664	+020000003147	010	02732	+050000003156	010	CLA 3)+4	
02665	+076700000021	00	02733	+024100003552	010	FDP 1)+2	
02666	+040200003147	010	02734	+026000210546	010	FMP C+1,2	
02667	+040000003553	010	02735	+060100003553	010	STD 1)+3	
02670	+060100003553	010	02736	+0560000003633	010	LDQ COEFA	

AERODYNAMIC			INFLUENCE			COEFFICIENTS			10/11/62		
FMP A+1,2			03003			+0100000003006			010 232A1		
02737	+0260000227262	010	03004			+0120000003077			010		
02740	+0302000003553	010	03005			+0020000003077			010		
02741	+060100415452	010	03006			-0500000003163			010 233A		
02742	+0560000003641	010	03007			+0602000003635			010 234A		
02743	+0260000003576	010	03010			+0074004000007			010 235A		
02744	+0601000003551	010	03011			+0074000015451			010 236A		
02745	+050000127344	010	03012			+0074000003614			010		
02746	+0241000003551	010	03013			+0074000003615			010		
02747	+0260000222356	010	03014			+0074000003146			010		
02750	+060100415370	010	03015			+0074000003146			010		
229A			03016			+0074000003145			010		
02751	+100144402752	010	03017			+0074000003635			010		
02752	-053400203572	010	03020			+0074000003147			010		
02753	+100002202754	010	03021			+0074000003601			010		
02754	-063400203572	010	03022			+0074004003110			010		
02755	-063400203611	010	03023			-053400203570			010		
02756	-300000202711	010	03024			-0534004003614			010		
02757	+200000402760	010	03025			-0634004003566			010		
02760	+100001402761	010	03026			+0500000003613			010 237A		
02761	-053400203571	010	03027			+0402000003142			010		
02762	+100001202763	010	03030			+0100000003033			010 237A1		
02763	-063400203571	010	03031			+0120000003036			010		
02764	-053400203573	010	03032			+0020000003036			010		
02765	+100001202766	010	03033			+0500000003612			010 238A		
02766	-063400203573	010	03034			+0601000003613			010		
02767	-063400203617	010	03035			+0020000003041			010 239A		
02770	-300000202703	010	03036			+0500000003612			010 240A		
229A4			03037			+0400000003145			010		
02771	+0074004000006	010	03040			+0601000003613			010		
02772	+0074000015451	010	03041			+0500000003614			010 241A		
02773	+0074000003614	010	03042			+0765000000043			00		
02774	+0074000003615	010	03043			+0221000003150			010		
02775	+0074000003147	010	03044			+0760000000000			00		
02776	+0074000003602	010	03045			+0763000000022			00		
02777	+0074004003110	010	03046			-06000000003551			010		
03000	-053400203570	010									
03001	-0534004003614	010									
03002	+05000000003620	010									

TZE 233A
 TPL E112E
 TRA E112E
 BSS
 CAL 3)+9
 SLW CHM
 BSS
 TSX MPUNCH,4
 TSX CH
 TSX IX
 TSX IX2
 TSX 2)+4
 TSX 2)+4
 TSX 2)+3
 TSX CHM
 TSX 2)+5
 TSX N3
 TSX A1102,4
 LXD C1102,2
 LXD IX,4
 SXD C1G5,4
 CLA J1
 SUB 2)
 TZE 238A
 TPL 240A
 TRA 240A
 CLA J2
 STD J1
 TRA 241A
 CLA J2
 ADD 2)+3
 STD J1
 CLA IX
 LRS 35
 DVP 2)+6
 CLM
 LLS 18
 STQ 1)+1

10/11/62

COEFFICIENTS

INFLUENCE

AERODYNAMIC

03047	03050	03051	03052	03053	03054	03055	03056	03057	03060	03061	03062	03063	03064	03065	03066	03067	03070	03071	03072	03073	03074	03075	03076	03077	03100	03101	03102	03103	03104	03105	03106	03107	03110	03111	03112	03113		
+050000003614	+040000003551	+013100000000	+020000003142	+076700000021	+040000003142	+040000003613	+060100003612	-050000003602	-063400403170	+007400400004	+000000003257	-053400403170	+056000003613	-100000000000	+056000003612	-100000000000	-063400403170	+007400400005	-053400403170	+002000003100	-053400103563	-053400203570	+002000003100	-063400403566	+100001103101	-063400103563	-300000100407	-050000003601	-063400403170	+007400400010	-053400403170	+002000000020	+050000003167	+060100003553	+050000003614	+040200003167		
010	010	00	010	00	010	010	010	010	010	010	010	010	00	00	010	00	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	010	
CLA IX	ADD 1)+1	XCA	MPY 2)	ALS 17	ADD 2)	ADD J1	STO J2	CAL N2	SXD 6)+4,4	TSX (STH),4	PZE 8)75	LXD 6)+4,4	LDQ J1	STR	LDQ J2	STR	SXD 6)+4,4	TSX (FIL),4	LXD 6)+4,4	TRA 244A	LXD C)G1,1	LXD C)102,2	TRA 244A	SXD C)G5,4	BSS	TXI **+1,1,1	SXD C)G1,1	TXL 96A,1	CAL N3	SXD 6)+4,4	TSX (EFT),4	LXD 6)+4,4	TRA 25A	CLA 6)+3	STO 1)+3	CLA IX	SUB 6)+3	
03114	03115	03116	03117	03120	03121	03122	03123	03124	03125	03126	03127	03130	03131	03132	03133	03134	03135	03136	03137	03140	03141	03142	03143	03144	03145	03146	03147	03150	03151	03152	03153	03154	03155	03156	03157	03160	03161	
+040000003553	+060100003553	+056000003614	+020000003147	+076700000021	+040200003147	+040000003553	+060100003570	+002000400001	+050000003167	+060100003553	+050000003617	+040200003167	+040000003553	+060100003553	+056000003606	+020000003147	+076700000021	+040200003147	+040000003553	+060100003571	+002000400001	+000002000000	+000003000000	+000005000000	+000001000000	+000000000000	+000006200000	+000026000000	+000004000000	+020400000000	+000000000000	+020600000000	+020400000000	+000000000000	+020600000000	+020600000000	+020600000000	
010	010	010	010	00	010	010	010	00	010	010	010	010	010	010	010	010	00	010	010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
ADD 1)+3	STO 1)+3	LDQ IX	MPY 2)+5	ALS 17	SUB 2)+5	ADD 1)+3	STO C)102	TRA 1,4	CLA 6)+3	STO 1)+3	CLA 1	SUB 6)+3	ADD 1)+3	STO 1)+3	LDQ KZ	MPY 2)+5	ALS 17	SUB 2)+5	ADD 1)+3	STO C)103	TRA 1,4	02)	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

AERODYNAMIC INFLUENCE COEFFICIENTS

03162	-206060233031	00	DCT -206060233031	03230	-206001063060	00	BCD 1 16H
03163	-206060233044	00	DCT -206060233044	03231	-206060606060	00	BCD 1
03164	+233000000000	00	DCT +233000000000	03232	-206060606060	00	BCD 1
03165	+000000377777	00	DCT +000000377777	03233	-206060606060	00	BCD 1
03166	+000000000000	00	DCT +000000000000	03234	+222551604626	00	BCD 1BER OF
03167	+000001000000	00	DCT +000001000000	03235	+003060456444	00	BCD 10H NUM
03170	+000000000000	00	DCT +000000000000	03236	-210406677301	00	BCD 1/46X,1
03171	+000000000000	00	DCT +000000000000	03237	+250105331061	00	BCD 1E15.8/
03172	-213460606060	00	BCD 1/)	03240	+336142511301	00	BCD 1./KR=1
03173	-052151706061	00	BCD 1NARY /	03241	-277307306001	00	BCD 1X,7H 1
03174	+303144212731	00	BCD 1HIMAGI	03242	-340130600411	00	BCD 1(1H 49
03175	-200101677311	00	BCD 1 11X,9	03243	+010501310334	00	BCD 115113}
03176	+043051252143	00	BCD 14HREAL	03244	+305164603044	00	BCD 1HRU HM
03177	-306001006773	00	BCD 1Y 10X,	03245	-200100306063	00	BCD 1 10H T
03200	+212731452151	00	BCD 1AGINAR	03246	-206060606060	00	BCD 1
03201	-206011303144	00	BCD 1 9HIM	03247	-206060606060	00	BCD 1
03202	-206060606060	00	BCD 1	03250	-206060606060	00	BCD 1
03203	-206060606060	00	BCD 1	03251	-336060606060	00	BCD 1,
03204	+010067736060	00	BCD 110X,	03252	-040105013103	00	BCD 1M15113
03205	+305125214360	00	BCD 1HREAL	03253	-054662336030	00	BCD 1NOS. H
03206	-200101677304	00	BCD 1 11X,4	03254	+232151246260	00	BCD 1CARDS
03207	+273145215170	00	BCD 1GINARY	03255	-052330252460	00	BCD 1NCHED
03210	-331130314421	00	BCD 1,9HIMA	03256	+020430604764	00	BCD 124H PU
03211	+214360010167	00	BCD 1AL 11X	03257	-346103106773	00	BCD 1(138X,
03212	-277304305125	00	BCD 1X,4HRE	03260	-222561613460	00	BCD 1SE//)
03213	-340130600102	00	BCD 1(1H 12	03261	+212470602321	00	BCD 1ADY CA
03214	+216225616134	00	BCD 1ASE//)	03262	+302560626325	00	BCD 1HE STE
03215	-206005306023	00	BCD 1 5H C	03263	-330106306063	00	BCD 1,16H T
03216	-206060606060	00	BCD 1	03264	+036161041167	00	BCD 13//49X
03217	-206060606060	00	BCD 1	03265	-236260130131	00	BCD 1TS =11
03220	-306060606060	00	BCD 1Y	03266	-036047463145	00	BCD 1L POIN
03221	-034321634651	00	BCD 1LLATOR	03267	+234645635146	00	BCD 1CONTRD
03222	+256046622331	00	BCD 1E OSCI	03270	-206001073060	00	BCD 1 17H
03223	+010630606330	00	BCD 116H TH	03271	-206060606060	00	BCD 1
03224	-216104106773	00	BCD 1//48X,	03272	-206060616360	00	BCD 1
03225	-236213013103	00	BCD 1TS=113	03273	-206060606060	00	BCD 1
03226	-036047463145	00	BCD 1L POIN	03274	+222551624626	00	BCD 1BER OF
03227	+234645635146	00	BCD 1CONTRD	03275	+003060456444	00	BCD 10H NUM

8)

8)SN

8)2L

8)75

AERODYNAMIC			INFLUENCE		COEFFICIENTS		10/11/62		PAGE 34	
03276	-210406677301	00	BCD 1/46X,1	03344	+003060456444	00	BCD 10H NUM	BCD 10H NUM		
03277	+250105331061	00	BCD 1E15.8/	03345	-210406677301	00	BCD 1/46X,1	BCD 1/46X,1		
03300	+336142511301	00	BCD 1.0/KR=1	03346	+250105331061	00	BCD 1E15.8/	BCD 1E15.8/		
03301	-277307306001	00	BCD 1X,7H 1	03347	+336142511301	00	BCD 1.0/KR=1	BCD 1.0/KR=1		
03302	-340130600411	00	BCD 1(1H 49	03350	-277307306001	00	BCD 1X,7H 1	BCD 1X,7H 1		
03303	+316760616134	00	BCD 1IX ///	03351	-340130600411	00	BCD 1(1H 49	BCD 1(1H 49		
03304	+316044216351	00	BCD 1I MATR	03352	+346060606060	00	BCD 1	BCD 1		
03305	-233025602330	00	BCD 1THE CH	03353	+036773013103	00	BCD 13X,113	BCD 13X,113		
03306	-277301053060	00	BCD 1X,15H	03354	-340131047307	00	BCD 1(114,7	BCD 1(114,7		
03307	-346161600411	00	BCD 1(// 49	03355	+013103346060	00	BCD 1113	BCD 1113		
03310	+346060606060	00	BCD 1	03356	+107306056773	00	BCD 18,65X,9	BCD 18,65X,9		
03311	-113167606160	00	BCD IRIX /	03357	-340125010233	00	BCD 1(1E12,9	BCD 1(1E12,9		
03312	+302460442163	00	BCD 1HD MAT	03360	+103434606060	00	BCD 18	BCD 18		
03313	-206330256023	00	BCD 1 THE C	03361	-330125010533	00	BCD 1,1E15,9	BCD 1,1E15,9		
03314	+116773010530	00	BCD 19X,15H	03362	+331073010367	00	BCD 1.8,13X	BCD 1.8,13X		
03315	-346061616004	00	BCD 1(// 4	03363	-206001250105	00	BCD 1 1E15	BCD 1 1E15		
03316	+316760616034	00	BCD 1IX /	03364	-206060606060	00	BCD 1	BCD 1		
03317	-226044216351	00	BCD 1S MATR	03365	-206060606060	00	BCD 1	BCD 1		
03320	-233025602330	00	BCD 1THE CH	03366	-206060606060	00	BCD 1	BCD 1		
03321	-277301053060	00	BCD 1X,15H	03367	+026773606060	00	BCD 12X,9	BCD 12X,9		
03322	-340130600411	00	BCD 1(1H 49	03370	-330131047302	00	BCD 1,114,2	BCD 1,114,2		
03323	+216225616134	00	BCD 1ASE//	03371	-216174020367	00	BCD 1/(23X	BCD 1/(23X		
03324	-206005306023	00	BCD 1 5H C	03372	-274574313473	00	BCD 1XN(1),9	BCD 1XN(1),9		
03325	-206060606060	00	BCD 1	03373	-074631456360	00	BCD IPOINT	BCD IPOINT		
03326	-206060606060	00	BCD 1	03374	-056351464360	00	BCD INTRDL	BCD INTRDL		
03327	-206060606060	00	BCD 1	03375	+020030602346	00	BCD 120H CO	BCD 120H CO		
03330	-056231254563	00	BCD 1NSIENT	03376	-206001046773	00	BCD 1 14X,9	BCD 1 14X,9		
03331	+302560635121	00	BCD 1HE TRA	03377	-206060606060	00	BCD 1	BCD 1		
03332	-330104306063	00	BCD 1,14H T	03400	-206060606060	00	BCD 1	BCD 1		
03333	+036161041167	00	BCD 13//49X	03401	-277431346060	00	BCD 1X(1)	BCD 1X(1)		
03334	-236260130131	00	BCD 1TS =11	03402	-202425436321	00	BCD 1 DELTA	BCD 1 DELTA		
03335	-036047463145	00	BCD 1L POIN	03403	+076773010030	00	BCD 17X,10H	BCD 17X,10H		
03336	+234645635146	00	BCD 1CONTR	03404	-204546336001	00	BCD 1 NO, 1	BCD 1 NO, 1		
03337	-206001073060	00	BCD 1 17H	03405	-064360476333	00	BCD 10L PI,	BCD 10L PI,		
03340	-206060606060	00	BCD 1	03406	-202346456351	00	BCD 1 CONTR	BCD 1 CONTR		
03341	-206060606060	00	BCD 1	03407	-277360010630	00	BCD 1X, 16H	BCD 1X, 16H		
03342	-206060606060	00	BCD 1	03410	-340130600107	00	BCD 1(1H 17	BCD 1(1H 17		
03343	+222551604626	00	BCD 1BER OF	03411	-206161346060	00	BCD 1 //	BCD 1 //		

AERODYNAMIC INFLUENCE COEFFICIENTS			10/11/62	PAGE 35
03412	-236024216321	00	BCD 1T DATA	BCD 1114,19
03413	-204664634764	00	BCD 1 OUTPU	BCD 1 47X,
03414	+026773010230	00	BCD 12X,12H	BCD 1
03415	-346061616005	00	BCD 1(// 5	BCD 1
03416	+331034346060	00	BCD 1.8)	BCD 1S/
03417	-277301250105	00	BCD 1X,1E15	BCD 1ECTION
03420	+053310730110	00	BCD 15.8,18	BCD 14,9H S
03421	+056773012501	00	BCD 15X,1E1	BCD 147X,11
03422	-206060607403	00	BCD 1 (3	BCD 1DATA//
03423	-206060606060	00	BCD 1	BCD 1INPUT
03424	-206060606060	00	BCD 1	BCD 1X,11H
03425	-206060606060	00	BCD 1	BCD 11H 49
03426	-216060606060	00	BCD 1/	BCD 1//)
03427	-202151252161	00	BCD 1 AREA/	BCD 1THEORY
03430	-204346232143	00	BCD 1 LOCAL	BCD 1-BODY
03431	-277301023060	00	BCD 1X,12H	BCD 1LENDER
03432	-343134730204	00	BCD 1(1),24	BCD 1FROM S
03433	-277305306067	00	BCD 1X,5H X	BCD 1 25H
03434	-340130600311	00	BCD 1(1H 39	BCD 1
03435	-216134606060	00	BCD 1//)	BCD 1
03436	+012501053310	00	BCD 11E15.8	BCD 1IENTS
03437	-206251252613	00	BCD 1 SREF=	BCD 1OEFFIC
03440	+041167730630	00	BCD 149X,6H	BCD 1ENCE C
03441	+250105331061	00	BCD 1E15.8/	BCD 1 INFLU
03442	+033060621301	00	BCD 13H S=1	BCD 1YNAMIC
03443	+106105026773	00	BCD 18/52X,	BCD 1 AEROD
03444	+130125010533	00	BCD 1=1E15.	BCD 19X,35H
03445	-330430602251	00	BCD 1,4H BR	BCD 1(1H1 2
03446	-206061050167	00	BCD 1 /51X	BCD 1//)
03447	-206060606060	00	BCD 1	BCD 1THEORY
03450	-206060606060	00	BCD 1	BCD 1-BODY
03451	+010533106060	00	BCD 115.8	BCD 1LENDER
03452	+222151130125	00	BCD 1BAR=1E	BCD 1FROM S
03453	-277306306023	00	BCD 1X,6H C	BCD 1 25H
03454	+256261610411	00	BCD 1ES//49	BCD 1
03455	-034623316331	00	BCD 1LOCITI	BCD 1
03456	+232524606525	00	BCD 1CED VE	BCD 1ENTS
03457	+306051252464	00	BCD 1H REDU	BCD 1EFFICI
03460	+013104730111	00	03460	03460
03461	-206004076773	00	03461	03461
03462	-206060606060	00	03462	03462
03463	-206060606060	00	03463	03463
03464	-226160606060	00	03464	03464
03465	+252363314645	00	03465	03465
03466	+047311306062	00	03466	03466
03467	+040767730131	00	03467	03467
03470	+242163216161	00	03470	03470
03471	+314547646360	00	03471	03471
03472	-277301013060	00	03472	03472
03473	-340130600411	00	03473	03473
03474	-216134606060	00	03474	03474
03475	-233025465170	00	03475	03475
03476	-002246247060	00	03476	03476
03477	-032545242551	00	03477	03477
03500	+265146446062	00	03500	03500
03501	-206002053060	00	03501	03501
03502	-206060606060	00	03502	03502
03503	-206060606060	00	03503	03503
03504	+312545636260	00	03504	03504
03505	-062526263123	00	03505	03505
03506	+254523256023	00	03506	03506
03507	-203145264364	00	03507	03507
03510	-304521443123	00	03510	03510
03511	-202125514624	00	03511	03511
03512	+116773030530	00	03512	03512
03513	-340130016002	00	03513	03513
03514	-216134606060	00	03514	03514
03515	-233025465170	00	03515	03515
03516	-002246247060	00	03516	03516
03517	-032545242551	00	03517	03517
03520	+265146446062	00	03520	03520
03521	-206002053060	00	03521	03521
03522	-206060606060	00	03522	03522
03523	-206060606060	00	03523	03523
03524	+254563626060	00	03524	03524
03525	+252626312331	00	03525	03525

03526	-052325602346	00	BCD	INCE CO
03527	+314526436425	00	BCD	INFLUE
03530	-052144312360	00	BCD	INAMIC
03531	+212551462470	00	BCD	1AERODY
03532	-277303053060	00	BCD	IX,35H
03533	-340130600211	00	BCD	1(1H 29
03534	+066061613460	00	BCD	16 //}
03535	+016773010221	00	BCD	11X,12A
03536	-340130016003	00	BCD	1(1H1 3
03537	+103460606060	00	BCD	18)
03540	-340625010233	00	BCD	1(6E12。
03541	+103460606060	00	BCD	18)
03542	-340625010233	00	BCD	1(6E12。
03543	+023310343460	00	BCD	12。8)}
03544	+106174062501	00	BCD	18/(6E1
03545	-340425010233	00	BCD	1(4E12。
03546	-340110310434	00	BCD	1(1814)
03547	-340102210634	00	BCD	1(12A6)

8)PD
8)FL
8)43
8)19
8)18
8)3
8)1

BEGIN COMPILATION 14.507

MPRINT

10/11/62

PAGE 1

```

C      SUBROUTINE MPRINT (A,M,N,MA,NTAPE )
C
C      A = MATRIX TO BE PRINTED
C      M = NUMBER OF ROWS
C      N = NUMBER OF COLUMNS
C      MA = DIMENSIONED NUMBER OF ROWS
C      NTAPE = TAPE NUMBER FOR PRINTING
C
C      SUBROUTINE MPRINT (A,M,N,MD,NTAPE )
C      LIST8
C      DIMENSION A(1), IT(6), C(6)
C      EQUIVALENCE (IT,C)
C
C      2 FORMAT (1H , 4X, 6( 6X, 7HCOLUMN 114 ) /// )
C      3 FORMAT (1H 114, X, {6E 17.8} )
C
C      N1=N
C      N2=6
C      N3=6
C      N4=1
C      4 IF (N3-N1) 6,6,5
C      5 N2=N1-N3+6
C      N3=N1
C      6 K=0
C      DO 7 I= N4,N3
C      K=K+1
C      7 IT(K)=I
C      WRITEOUTPUTTAPE NTAPE, 2, (IT(I), I=1,N2)
C      DO 9 I=1,M
C      K=0
C      L=MD*(N4-1)+I
C      DO 8 J=N4,N3
C      K=K+1
C      C(K)=A(L)
C      L=L+MD
C      8 WRITEOUTPUTTAPE NTAPE, 3, I, (C(K), K=1,N2)
C      9 IF (N3-N1) 10,11,11
C      10 N3=N3+6
C      N4=N4+6
C      GOTO 4

```

MPRINT01
MPRINT02
MPRINT03
MPRINT04
MPRINT05
MPRINT06
MPRINT07
MPRINT08
MPRINT09
MPRINT10
MPRINT11
MPRINT12
MPRINT13
MPRINT14
MPRINT15
MPRINT16
MPRINT17
MPRINT18
MPRINT19
MPRINT20
MPRINT21
MPRINT22
MPRINT23
MPRINT24
MPRINT25
MPRINT27
MPRINT28
MPRINT29
MPRINT30
MPRINT31
MPRINT32
MPRINT33
MPRINT34
MPRINT35
MPRINT36
MPRINT37
MPRINT38
MPRINT39

MPRINT

11 RETURN

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

10/11/62

PAGE 2

MPRINT40

STORAGE NOT USED BY PROGRAM

DEC	OCT	DEC	OCT
192	00300	32561	77461

STORAGE LOCATIONS FOR VARIABLES APPEARING IN DIMENSION AND EQUIVALENCE STATEMENTS

DEC	OCT	DEC	OCT	DEC	OCT
C	191 00277	IT	191 00277		

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

DEC	OCT	DEC	OCT	DEC	OCT
I	185 00271	K	184 00270	L	183 00267
N2	181 00265	N3	180 00264	N4	179 00263
				N1	182 00266

SYMBOLS AND LOCATIONS FOR SOURCE PROGRAM FORMAT STATEMENTS

EFN	LOC	EFN	LOC	EFN	LOC
812	2 00254	813	3 00244		

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

DEC	OCT	DEC	OCT	DEC	OCT
11	174 00256	21	151 00227	61	154 00232
C160	176 00260	C162	177 00261	C1202	178 00262
				E1E	139 00213

LOCATIONS OF NAMES IN TRANSFER VECTOR

DEC	OCT	DEC	OCT	DEC	OCT
(FIL)	1 00001	(STH)	0 00000		

ENTRY POINTS TO SUBROUTINES NOT OUTPUT FROM LIBRARY

(FIL)	(STH)
-------	-------

MPRINT

10/11/62 PAGE 4

EXTERNAL FORMULA NUMBERS WITH CORRESPONDING INTERNAL FORMULA NUMBERS AND OCTAL LOCATIONS

EFN	IFN	LOC	EFN	IFN	LOC	EFN	IFN	LOC
4	11	00040	5	12	00045	6	14	00053
8	29	00153	9	30	00161	10	37	00214
						7	17	00071
						11	40	00223

MPRINT

10/11/62

PAGE 5

00000	-346263303460	00	{STH}	BCD 1(STH)	00046	+0402000000264	010	SUB N3
00001	-342631433460	00	{FIL}	BCD 1(FIL)	00047	+040000000227	010	ADD 2)
00002	+000000000000	00	\$	PZE	00050	+0601000000265	010	STD N2
00003	+000000000000	00		PZE	00051	+0500000000266	010	CLA N1
00004	+000000000000	00		PZE	00052	+0601000000264	010	STD N3
00005	-044751314563	00		BCD 1MPRINT	00053	+0500000000231	010	CLA 2)+2
00006	-063400100002	010		SXD \$,1	00054	+0601000000270	010	STD K
00007	-063400200003	010		SXD \$+1,2	00055	-053400100270	010	LXD K,1
00010	-063400400004	010		SXD \$+2,4	00056	-063400100260	010	SXD C)G0,1
00011	+050000400001	00		CLA 1,4	00057	-053400200263	010	LXD N4,2
00012	+040000000255	010		ADD 9)	00060	+0500000000264	010	CLA N3
00013	+062100000151	010		STA 1A+83	00061	+0622000000075	010	STD 17A2
00014	+050000400002	00		CLA 2,4	00062	-075400200000	00	PXD 0,2
00015	+062100000117	010		STA 1A+57	00063	+060100000271	010	STD I
00016	+050000400003	00		CLA 3,4	00064	+050000000270	010	CLA K
00017	+062100000030	010		STA 1A+2	00065	+0400000000230	010	ADD 2)+1
00020	+050000400004	00		CLA 4,4	00066	+0601000000270	010	STD K
00021	+062100000154	010		STA 1A+86	00067	-053400400270	010	LXD K,4
00022	+062100000132	010		STA 1A+68	00070	-063400400260	010	SXD C)G0,4
00023	+050000400005	00		CLA 5,4	00071	+050000000271	010	CLA I
00024	+062100000161	010		STA 1A+91	00072	+060100400300	011	STD IT+1,4
00025	+062100000076	010		STA 1A+40	00073	+100001200074	010	TXI *+1,2,1
00026	+050000000002	00	1A	CLA 2	00074	-063400200271	010	SXD I,2
00027	+060100000237	010		STD 6)+5	00075	-300000200064	010	TXL 16A,2
00030	+050000000000	00	7A	CLA N	00076	-050000000000	00	CAL NTAPE
00031	+060100000266	010		STD N1	00077	-063400400236	010	SXD 6)+4,4
00032	+050000000227	010	8A	CLA 2)	00100	+007400400000	010	TSX {STH},4
00033	+060100000265	010		STD N2	00101	+000000000254	010	PZE 8)2
00034	+050000000227	010	9A	CLA 2)	00102	-053400400236	010	LXD 6)+4,4
00035	+060100000264	010		STD N3	00103	-053400100230	010	LXD 2)+1,1
00036	+050000000230	010	10A	CLA 2)+1	00104	+0500000000265	010	CLA N2
00037	+060100000263	010		STD N4	00105	+062200000111	010	STD 20A2
00040	+050000000264	010	11A	CLA N3	00106	+056000100300	011	LDQ IT+1,1
00041	+040200000266	010		SUB N1	00107	-100000000000	00	STR
00042	+010000000053	010	11A1	TZE 14A	00110	+100001100111	010	TXI *+1,1,1
00043	+012000000045	010		TPL 12A	00111	-300000100106	010	TXL 20A,1
00044	+002000000053	010		TRA 14A	00112	-063400400236	010	SXD 6)+4,4
00045	+050000000266	010	12A	CLA N1	00113	+007400400001	010	TSX (FIL),4

MPRINT	10/11/62	PAGE 6
00114 -053400400236 010	00162 -063400400236 010	SXD 6)+4,4
00115 -053400100230 010 23A	00163 +007400400000 010	TSX (STH),4
00116 -063400100262 010	00164 +000000000244 010	PZE 8)3
00117 +050000000000 00	00165 -053400400236 010	LXD 6)+4,4
00120 +062200000206 010	00166 +056000000271 010 31A	LDQ I
00121 -075400100000 00	00167 -100000000000 00	STR
00122 +060100000271 010	00170 -053400100230 010 32A	LXD 2)+1,1
00123 +050000000231 010 24A	00171 +050000000265 010	CLA N2
00124 +060100000270 010	00172 +062200000176 010	STD 33A2
00125 -053400200270 010	00173 +056000100300 011 33A	LDQ C+1,1
00126 -063400200260 010	00174 -100000000000 00	STR
00127 +050000000263 010 25A	00175 +100001100176 010 33A1	TXI *+1,1,1
00130 +040200000230 010	00176 -300000100173 010 33A2	TXL 33A,1
00131 +060100000257 010	00177 -063400400236 010 35A	SXD 6)+4,4
00132 +056000000000 00	00200 +007400400001 010	TSX (FIL),4
00133 +020000000257 010	00201 -053400400236 010	LXD 6)+4,4
00134 +076700000021 00	00202 -053400100262 010	LXD C)202,1
00135 +040000000271 010	00203 +100001100204 010 35A1	TXI *+1,1,1
00136 +060100000267 010	00204 -063400100262 010	SXD C)202,1
00137 -053400400267 010	00205 -063400100271 010	SXD I,1
00140 -063400400261 010	00206 -300000100123 010 35A2	TXL 24A,1
00141 -053400200263 010 26A	00207 +050000000264 010 36A	CLA N3
00142 +050000000264 010	00210 +040200000266 010	SUB N1
00143 +062200000160 010	00211 +010000000223 010 36A1	TZE 40A
00144 +050000000270 010 27A	00212 +012000000223 010	TPL 40A
00145 +040000000230 010	00213 -063400400261 010 E)E	SXD C)G2,4
00146 +060100000270 010	00214 +050000000264 010 37A	CLA N3
00147 -053400100270 010	00215 +040000000227 010	ADD 2)
00150 -063400100260 010	00216 +060100000264 010	STO N3
00151 +050000000000 00 28A	00217 +050000000263 010 38A	CLA N4
00152 +060100100300 011	00220 +040000000227 010	ADD 2)
00153 +050000000267 010 29A	00221 +060100000263 010	STO N4
00154 +040000000000 00	00222 +002000000040 010 39A	TRA 11A
00155 +060100000267 010	00223 -053400100002 010 40A	LXD \$,1
00156 -053400400267 010	00224 -053400200003 010	LXD \$+1,2
00157 +100001200160 010 29A1	00225 -053400400004 010	LXD \$+2,4
00160 -3000000200144 010 29A2	00226 +002000400006 00	TRA 6,4
00161 -050000000000 00 30A	00227 +000000600000 00 2)	DCT +00000060000000

00230	+000001000000	00	OCT +000001000000
00231	+000000000000	00	OCT +000000000000
00232	+233000000000	00	OCT +233000000000
00233	+000000377777	00	OCT +000000377777
00234	+000000000000	00	OCT +000000000000
00235	+000001000000	00	OCT +000001000000
00236	+000000000000	00	OCT +000000000000
00237	+000000000000	00	OCT +000000000000
00240	+331034606034	00	BCD 1-8))
00241	-340625600107	00	BCD 1(6E 17
00242	-206773606060	00	BCD 1 X,
00243	-206001310473	00	BCD 1 114,
00244	-206060740130	00	BCD 1 (1H
00245	-216060606034	00	BCD 1/)
00246	+346060606161	00	BCD 1) //
00247	-200131046060	00	BCD 1 114
00250	-036444456060	00	BCD 1LUMN
00251	-336007302346	00	BCD 1, 7HCD
00252	-200674600667	00	BCD 1 6(6X
00253	-207360046773	00	BCD 1 , 4X,
00254	-206060740130	00	BCD 1 (1H
00255	+000000000001	00	OCT +000000000001

* FAP

BEGIN ASSEMBLY 14.514
CARD-COUNT ESTIMATE MISSING.

BINPU002

00016	0402	00	0	00325	SUB	D1	BINPU030
00017	0622	00	0	00066	STD	LOCN	BINPU031
00020	0634	00	0	00061	SXA	COUNT,0	BINPU032
00021	0500	60	4	00003	CLA*	3,4	BINPU033
00022	0771	00	0	00022	ARS	18	BINPU034
00023	-0120	00	0	00025	TMI	**2	BINPU035
00024	-0501	00	0	00266	ORA	REL	BINPU036
00025	-0501	00	0	00334	ORA	IMAGE	BINPU037
00026	0602	00	0	77740	SLW	CIMAGE	BINPU038
*****							BINPU039
* TEST FOR FOURTH AND-OR FIFTH ARGUMENTS.							BINPU040
* DETERMINE WHETHER ARGUMENT REFERS TO ID OR SEQ NUMBER							BINPU041
* AND SET CELLS FROM CALLING SEQUENCE.							BINPU042
*****							BINPU043
00027	0774	00	2	00002	AXT	2,2	BINPU044
00030	-0625	00	0	00302	STL	BLSEQ	BINPU045
00031	-0500	00	4	00004	CAL	4,4	BINPU046
00032	-0320	00	0	00265	ANA	MSKPD1	BINPU047
00033	0322	00	0	00307	ERA	MSKTSX	BINPU048
00034	-0100	00	0	00054	TNZ	G2	BINPU049
00035	0500	60	4	00004	CLA*	4,4	BINPU050
00036	-0340	00	0	00262	LAS	BC18	BINPU051
00037	0020	00	0	00051	TRA	G3	BINPU052
00040	0600	00	0	00302	STZ	BLSEQ	BINPU053
00041	-0100	00	0	00043	TNZ	**2	BINPU054
00042	-0754	00	0	00000	PXD		BINPU055
00043	-0130	00	0	00000	XCL		BINPU056
00044	0634	00	4	00046	SXA	**2,4	BINPU057
00045	0074	00	4	00172	TSX	COSEQ,4	BINPU058
00046	0774	00	4	00000	AXT	**4	BINPU059
00047	0602	00	0	00267	SLW	SEQNO	BINPU060
00050	1 77777	4	00053		TXI	G5,4,-1	BINPU061
00051	0601	00	0	00305	STD	BCDID	BINPU062
00052	1 77777	4	00053		TXI	G5,4,-1	BINPU063
00053	2 00001	2	00031		TIK	G4,2,1	BINPU064
00054	0634	00	4	00144	SXA	X4,4	BINPU065
00055	-0520	00	0	77776	NZT	END	BINPU066
00056	0020	00	0	00152	TRA	TRCD	BINPU067

BINPU ROUTINE TO WRITE COL BIN CARDS ON TAPE. FIBII

PAGE 4

10/11/62

```

00113 0602 00 2 77734
00114 1 77777 2 00115
00115 2 00001 4 00105
00116 0560 00 0 00326
00117 3 00000 2 00104
00120 0774 00 1 00000

SV1
*
*****
* THE ENTIRE CARD IMAGE IS BUILT, WITH THE BODY
* AT CIMAGE THRU CIMAGE+23, AND ID AT LAST THRU LAST+3.
* NOW ***** WRITE THE CARD ON TAPE. *****
*****
WRITE NOP
WRITE1 CAL 14D
CALL (IOS)
XEC* $(WRS)
AXC PUNCMD,4
XEC* $(RCH)
PXA 0,4
STA* $(WTC)
TSX $(WER),4
CAL SEQNO
ADD L(1)
CVR TBI,,6
SLW SEQNO
ZET END
TRA SWITCH
CAL BPTES
SLW* $(TES)
X1 AXT **,1
X2 AXT **,2
X4 AXT **,4
TRA 5,4
*
*****
SWTCH CAL CIMAGE
ACL A22
SLW CIMAGE

00121 0761 00 0 00000
00122 -0500 00 0 00331
00123 0074 00 4 00000
00124 0522 60 0 00001
00125 -0774 00 4 00213
00126 0522 60 0 00002
00127 0754 00 4 00000
00130 0621 60 0 00003
00131 0074 00 4 00004
00132 -0500 00 0 00267
00133 0400 00 0 00327
00134 0114 06 0 00215
00135 0602 00 0 00267
00136 0520 00 0 77776
00137 0020 00 0 00146
00140 -0500 00 0 00131
00141 0602 60 0 00005
00142 0774 00 1 00000
00143 0774 00 2 00000
00144 0774 00 4 00000
00145 0020 00 4 00005

00146 -0500 00 0 77740
00147 0361 00 0 00333
00150 0602 00 0 77740

COL BIN AT LAST TO LAST+3

FINISH W/SAVED C(MQ).

*****
UPDATE THE CARD ORIGIN.
*****
BINPU106
BINPU107
BINPU108
BINPU109
BINPU110
BINPU111
BINPU112
BINPU113
BINPU114
BINPU115
BINPU116
BINPU117
BINPU118
BINPU119
BINPU120
BINPU121
BINPU122
BINPU123
BINPU124
BINPU125
BINPU126
BINPU127
BINPU128
BINPU129
BINPU130
BINPU131
BINPU132
BINPU133
BINPU134
BINPU135
BINPU136
BINPU137
BINPU138
BINPU139
BINPU140
BINPU141
BINPU142
BINPU143

```


00205	0221	00	0	00332	DVP	TEN	RIGHT ADJUSTED SEQ NO.	BINPU182
00206	0767	00	0	00014	ALS	12		BINPU183
00207	-0501	00	0	77777	ORA	COMMON		BINPU184
00210	0020	00	4	00001	TRA	1,4		BINPU185
00211	-0500	00	0	00306	COSEQX CAL	BLANK		BINPU186
00212	0020	00	4	00001	TRA	1,4		BINPU187
								BINPU188
								BINPU189
								BINPU190
00213	-0	00030	0	77740	PUNCMD IOCP	CIMAGE,0,24		BINPU191
00214	0	00003	0	77730	IOCD	LAST,0,3		BINPU192
								BINPU193
								BINPU194
								BINPU195
00215	0000	00	0	00215	TB1	TB1	0	BINPU196
00216	0100	00	0	00215	TZE	TB1	1	BINPU197
00217	0200	00	0	00215	MPY	TB1	2	BINPU198
00220	0300	00	0	00215	FAD	TB1	3	BINPU199
00221	0400	00	0	00215	ADD	TB1	4	BINPU200
00222	0500	00	0	00215	CLA	TB1	5	BINPU201
00223	0600	00	0	00215	STZ	TB1	6	BINPU202
00224	0700	00	0	00215	CPY	TB1	7	BINPU203
00225	1	00000	0	00215	TXI	TB1	8	BINPU204
00226	1	10000	0	00215	TXI	TB1,0,4096	9	BINPU205
00227	0000	00	0	00216	HTR	TB	0 WITH CARRY	BINPU206
								BINPU207
								BINPU208
00230	+0000000001000							BINPU209

MSK2CH OCT 777777770000,102,42

BINPU210

417

BINPU ROUTINE TO WRITE COL BIN CARDS ON TAPE. FIBII

10/11/62

PAGE 7

00243	+000000000102					
00244	+000000000042					
00245	+000000000000	ID123	OCT	0,0,0		BINPU211
00246	+000000000000					
00247	+000000000000					
00250	+000000004000					
00251	+000000004400					
00252	+000000004200					
00253	+000000004100					
00254	+000000004040					
00255	+000000004020					
00256	+000000004010					
00257	+000000004004					
00260	+000000004002					
00261	+000000004001					
00262	106060606060	BCI8	BCI	1,8		BINPU213
00263	+000000004102		OCT	4102,4042		BINPU214
00264	+000000004042					
00265	-3 77777 7 00000					
00266	0400 00 0 00000					
00267	606060606060					
00270	+000000002000					
00271	+000000002400					
00272	+000000002200					
00273	+000000002100					
00274	+000000002040					
00275	+000000002020					
00276	+000000002010					
00277	+000000002004					
00300	+000000002002					
00301	+000000002001					
00302	0 0000 0 00000					
00303	+000000002102					
00304	+000000002042					
00305	606060606060					
00306	606060606060					
00307	0074 00 0 00000					
00310	+000000000000					
		BLSEQ	OCT	2102,2042		BINPU219
						BINPU220
		BCDID	BCI	1,		BINPU221
		BLANK	BCI	1,		BINPU222
		MSKTSX	TSX	,0		BINPU223
			OCT	0,1400,1200,1100,1040,1020,1010,1004,1002,1001		BINPU224

A

[illegible]

BINPU ROUTINE TO WRITE COL BIN CARDS ON TAPE. FIBII
POST PROCESSOR ASSEMBLY DATA

302	BLSEQ	30,	40,	173
131	BPTES	140		
172	COSEQ	45		
61	COUNT	20,	70	
245	ID123			
326	IDLCD	100,	116	
334	IMAGE	25		
267	SEQNO	47,	73,	132, 135
146	SWICH	137		
121	WRITE			
0	(IOS)	123		
2	(RCH)	126		
5	(TES)	141		
4	(WER)	131		
1	(WRS)	124		
3	(WTC)	130		
77740	CIMAGE	26,	63,	64,
77777	COMMON	162,	166,	177,
211	COSEQX	174	71,	72,
242	MSK2CH		203,	207,
265	MSKPDT	32	146,	150,
307	MSKTSX	33	153,	156,
213	PUNCMD	125	164,	170,
122	WRITE1		213,	335

NO ERROR IN ABOVE ASSEMBLY.

BEGIN COMPILATION 14.516

10/11/62

MPUNCH

```

C MATRIX COLUMN BINARY PUNCH SUBROUTINE
C CALLING SEQUENCE.....
C CALL MPUNCH (A,M,N,IOUT,ITRA,IORG,BCDZ,MAXM,NTAPE )
C
C A = MATRIX TO BE PUNCHED      IORG = ORIGIN OF FIRST CARD
C M = NUMBER OF ROWS            BCDZ = BCD IDENTIFICATION WRD
C N = NUMBER OF COLUMNS        MAXM = DIMENSIONED NUMBER OF
C IOUT = 0, PUNCH BY COLUMNS   ROWS
C                               = 1, PUNCH BY ROWS
C ITRA = 0, TRA CARD AFTER WHOLE MATRIX
C                               = 1, TRA CARD AFTER EACH ROW OR COLUMN
C

```

```

SUBROUTINE MPUNCH (A, M, N, IOUT, ITRA, IORG, BCDZ, MAXM, NTAPE)
LIST8
DIMENSION A(1), J(22)

```

```

IS = 0
MN = MAXM*N
IF ( IOUT ) 8,2,8

```

C PUNCH BY COLUMNS

```

2 J = 1
J1= IORG
DO 5 I=1,N
CALL BINPU (A(J), M, J1, BCDZ, IS, NTAPE )
J = J+MAXM
IS= IS+1+M/22
IF ( ITRA ) 3,4,3

```

C PUNCH TRA CARD AFTER EACH COLUMN

```

3 CALL BINPU (A, 0, 0, BCDZ, IS, NTAPE )
IS=IS+1
GOTO 5

```

4 J1=J1+M

MPUNCH01
MPUNCH02
MPUNCH03
MPUNCH04
MPUNCH05
MPUNCH06
MPUNCH07
MPUNCH08
MPUNCH09
MPUNCH10
MPUNCH11
MPUNCH12
MPUNCH13
MPUNCH14
MPUNCH15
MPUNCH16
MPUNCH17
MPUNCH18
MPUNCH19
MPUNCH20
MPUNCH21
MPUNCH22
MPUNCH23
MPUNCH24
MPUNCH25
MPUNCH26
MPUNCH27
MPUNCH28
MPUNCH29
MPUNCH30
MPUNCH31
MPUNCH32
MPUNCH33
MPUNCH34
MPUNCH35
MPUNCH36
MPUNCH37
MPUNCH38

MPUNCH

10/11/62

PAGE 2

```
5 CONTINUE
  IF ( ITRA ) 16,6,16
C PUNCH TRA CARD AFTER WHOLE MATRIX
  6 CALL BINPU (A, 0, 0, BCDZ, IS, NTAPE)
  GOTO 16

C PUNCH MATRIX BY ROWS.
  8 J=0
  J1=IORG
  DO 14 I=1,M
  DO 10 K=1,MN,MAXM
    J=J+1
    T(J)=A(K)
    IF (J-22) 10,9,9
  9 CALL BINPU (T,22,31,BCDZ,IS,NTAPE)
    J1=J1+22
    IS=IS+1
    J=0
  10 CONTINUE

  IF ( J ) 12,12,12
  11 CALL BINPU (T,J,J1,BCDZ,IS,NTAPE )
    J1=J1+J
    IS=IS+1
  12 IF ( ITRA ) 13,14,13

C PUNCH TRA CARD AFTER EVERY ROW
  13 CALL BINPU (T,0,0,BCDZ,IS,NTAPE )
    IS=IS+1
    J1=IORG
  14 J=0

C OR AFTER ENTIRE MATRIX
  IF ( ITRA ) 16,15,16
```

MPUNCH39
MPUNCH40
MPUNCH41
MPUNCH42
MPUNCH43
MPUNCH44
MPUNCH45
MPUNCH46
MPUNCH47
MPUNCH48
MPUNCH49
MPUNCH50
MPUNCH51
MPUNCH52
MPUNCH53
MPUNCH54
MPUNCH55
MPUNCH56
MPUNCH57
MPUNCH60
MPUNCH61
MPUNCH62
MPUNCH63
MPUNCH64
MPUNCH65
MPUNCH66
MPUNCH67
MPUNCH68
MPUNCH69
MPUNCH70
MPUNCH71
MPUNCH72
MPUNCH73
MPUNCH74
MPUNCH75
MPUNCH76
MPUNCH77
MPUNCH78

MPUNCH

15 CALL BINPU (A,0,0,0,BCDZ,IS,NTAPE)

16 RETURN

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

10/11/62

PAGE 3

MPUNCH79

MPUNCH80

MPUNCH81

MPUNCH82

STORAGE NOT USED BY PROGRAM

DEC OCT
279 00427
32561 77461

STORAGE LOCATIONS FOR VARIABLES APPEARING IN DIMENSION AND EQUIVALENCE STATEMENTS

DEC OCT
T 278 00426
DEC OCT
J 253 00375

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

DEC OCT
I 256 00400
MN 252 00374
DEC OCT
IS 255 00377
J1 254 00376
J 253 00375

LOCATIONS FOR OTHER SYMBOLS NOT APPEARING IN SOURCE PROGRAM

DEC OCT
1) 249 00371
C)60 251 00373
DEC OCT
2) 238 00356
E)4 114 00162
6) 241 00361
E)6 120 00170
9) 247 00367
E)H 215 00327

LOCATIONS OF NAMES IN TRANSFER VECTOR

DEC OCT
BINPU 0 00000
DEC OCT

ENTRY POINTS TO SUBROUTINES NOT OUTPUT FROM LIBRARY

BINPU

EXTERNAL FORMULA NUMBERS WITH CORRESPONDING INTERNAL FORMULA NUMBERS AND OCTAL LOCATIONS

EFN	IFN	LOC	EFN	IFN	LOC	EFN	IFN	LOC
2	7	00105	3	15	00147	4	19	00163
6	22	00175	8	25	00205	9	32	00241
11	39	00271	12	43	00310	13	44	00312
15	50	00343	16	52	00352	14	48	00330
197						5	20	00166
						10	37	00263

10/11/62

MPUNCH

00000	+223145476460	00	00	BINPU	BCD	IBINPU	00046	+062100000347	010	STA 1A+174
00001	+000000000000	00	00	\$	PZE		00047	+062100000316	010	STA 1A+149
00002	+000000000000	00	00		PZE		00050	+062100000275	010	STA 1A+132
00003	+000000000000	00	00		PZE		00051	+062100000246	010	STA 1A+109
00004	-044764452330	00	00		BCD	IMPUNCH	00052	+062100000201	010	STA 1A+72
00005	-063400100001	010	010		SXD	\$,1	00053	+062100000153	010	STA 1A+50
00006	-063400200002	010	010		SXD	\$+1,2	00054	+062100000124	010	STA 1A+27
00007	-063400400003	010	010		SXD	\$+2,4	00055	+050000400010	00	CLA 8,4
00010	+050000400001	00	00		CLA	1,4	00056	+062100000223	010	STA 1A+90
00011	+062100000344	010	010		STA	1A+171	00057	+062100000130	010	STA 1A+31
00012	+040000000367	010	010		ADD	9)	00060	+062100000075	010	STA 1A+4
00013	+062100000232	010	010		STA	1A+97	00061	+050000400011	00	CLA 9,4
00014	+040000000370	010	010		ADD	9)+1	00062	+062100000351	010	STA 1A+176
00015	+062100000176	010	010		STA	1A+69	00063	+062100000320	010	STA 1A+151
00016	+062100000150	010	010		STA	1A+47	00064	+062100000277	010	STA 1A+134
00017	+062100000121	010	010		STA	1A+24	00065	+062100000250	010	STA 1A+111
00020	+040000000367	010	010		ADD	9)	00066	+062100000203	010	STA 1A+74
00021	+062100000115	010	010		STA	1A+20	00067	+062100000155	010	STA 1A+52
00022	+050000400002	00	00		CLA	2,4	00070	+062100000126	010	STA 1A+29
00023	+062100000214	010	010		STA	1A+83	00071	+050000000002	00	CLA 2
00024	+062100000164	010	010		STA	1A+59	00072	+060100000366	010	STO 6)+5
00025	+062100000133	010	010		STA	1A+34	00073	+050000000356	010	CLA 2)
00026	+062100000122	010	010		STA	1A+25	00074	+060100000377	010	STO IS
00027	+050000400003	00	00		CLA	3,4	00075	+056000000000	00	LDQ MAXM
00030	+062100000113	010	010		STA	1A+18	00076	+020000000000	00	MPY N
00031	+062100000076	010	010		STA	1A+5	00077	+076700000021	00	ALS 17
00032	+050000400004	00	00		CLA	4,4	00100	+060100000374	010	STO MN
00033	+062100000101	010	010		STA	1A+8	00101	+050000000000	00	CLA IQUT
00034	+050000400005	00	00		CLA	5,4	00102	+010000000105	010	TZE 7A
00035	+062100000337	010	010		STA	1A+166	00103	+012000000205	010	IPL 25A
00036	+062100000310	010	010		STA	1A+143	00104	+002000000205	010	TRA 25A
00037	+062100000171	010	010		STA	1A+64	00105	+050000000357	010	CLA 2)+1
00040	+062100000145	010	010		STA	1A+44	00106	+060100000375	010	STO J
00041	+050000400006	00	00		CLA	6,4	00107	-053400100375	010	LXD J,1
00042	+062100000324	010	010		STA	1A+155	00110	+050000000000	00	CLA IORG
00043	+062100000211	010	010		STA	1A+80	00111	+060100000376	010	STO J1
00044	+062100000110	010	010		STA	1A+15	00112	-053400200357	010	LXD 2)+1,2
00045	+050000400007	00	00		CLA	7,4	00113	+050000000000	00	CLA N

MPUNCH

10/11/62

PAGE 6

00114	+062200000167	010	STD 20A2
00115	+075400100000	00	PXA A+1,1
00116	+040200000115	010	SUB *-1
00117	+062100000121	010	STA 11A+1
00120	+007400400000	010	TSX BINPU,4
00121	+007400000000	00	TSX A
00122	+007400000000	00	TSX M
00123	+007400000376	010	TSX J1
00124	+007400000000	00	TSX BCDZ
00125	+007400000377	010	TSX IS
00126	+007400000000	00	TSX NTAPE
00127	+050000000375	010	CLA J
00130	+040000000000	00	ADD MAXM
00131	+060100000375	010	STD J
00132	+053400100375	010	LXD J,1
00133	+050000000000	00	CLA M
00134	+076500000043	00	LRS 35
00135	+022100000360	010	DVP 2)+2
00136	+076000000000	00	CLM
00137	+076300000022	00	LLS 18
00140	+060000000372	010	STQ 1)+1
00141	+050000000377	010	CLA IS
00142	+040000000357	010	ADD 2)+1
00143	+040000000372	010	ADD 1)+1
00144	+060100000377	010	STD IS
00145	+050000000000	00	CLA ITRA
00146	+010000000162	010	TZE E)4
00147	+007400400000	010	BSS
00150	+007400000000	00	TSX BINPU,4
00151	+007400000356	010	TSX A
00152	+007400000356	010	TSX 2)
00153	+007400000000	00	TSX 2)
00154	+007400000377	010	TSX BCDZ
00155	+007400000000	00	TSX IS
00156	+050000000377	010	TSX NTAPE
00157	+040000000357	010	CLA IS
00160	+060100000377	010	ADD 2)+1
			STD IS
00161	+0020000000166	010	18A
00162	+063400100373	010	E)4
00163	+050000000376	010	19A
00164	+040000000000	00	
00165	+060100000376	010	
00166	+100001200167	010	20A
00167	+300000200115	010	20A1
00170	+063400100373	010	20A2
00171	+050000000000	00	E)6
00172	+010000000175	010	21A
00173	+012000000352	010	21A1
00174	+0020000000352	010	
00175	+007400400000	010	22A
00176	+007400000000	00	23A
00177	+007400000356	010	
00200	+007400000356	010	
00201	+007400000000	00	
00202	+007400000377	010	
00203	+007400000000	00	
00204	+002000000352	010	24A
00205	+050000000356	010	25A
00206	+060100000375	010	
00207	+053400100375	010	
00210	+050000000000	00	
00211	+050000000000	00	26A
00212	+060100000376	010	
00213	+053400200357	010	27A
00214	+050000000000	00	
00215	+0622000000336	010	
00216	+075400200000	00	
00217	+060100000400	010	
00220	+053400400400	010	28A
00221	+050000000374	010	
00222	+062200000264	010	
00223	+050000000000	00	
00224	+0622000000263	010	
TRA 20A			
SXD C)G0,1			
CLA J1			
ADD M			
STD J1			
BSS			
TXI *+1,2,1			
TXL 10A,2			
SXD C)G0,1			
CLA ITRA			
TZE 22A			
TPL 52A			
TRA 52A			
BSS			
TSX BINPU,4			
TSX A			
TSX 2)			
TSX 2)			
TSX BCDZ			
TSX IS			
TSX NTAPE			
TRA 52A			
CLA 2)			
STD J			
LXD J,1			
SXD C)G0,1			
CLA IORG			
STD J1			
LXD 2)+1,2			
CLA M			
STD 48A2			
PXD 0,2			
STD I			
LXD I,4			
CLA MN			
STD 37A2			
CLA MAXM			
STD 37A1			

MRUNCH	10/11/62	PAGE 7
00225 +050000000375 010 29A	00271 +007400400000 010 40A	TSX BINPU,4
00226 +040000000357 010	00272 +007400000426 010	TSX T
00227 +060100000375 010	00273 +007400000375 010	TSX J
00230 -053400100375 010	00274 +007400000376 010	TSX J1
00231 -063400100373 010	00275 +007400000000 00	TSX BCDZ
00232 +050000400000 00 30A	00276 +007400000377 010	TSX IS
00233 +060100100427 011	00277 +007400000000 00	TSX NTAPE
00234 +050000000375 010 31A	00300 -053400100375 010	LXD J,1
00235 +040200000360 010	00301 -063400100373 010	SXD CIG0,1
00236 +010000000241 010 31A1	00302 +050000000376 010 41A	CLA J1
00237 +012000000241 010	00303 +040000000375 010	ADD J
00240 +002000000263 010	00304 +060100000376 010	STO J1
00241 -063400400365 010 32A	00305 +050000000377 010 42A	CLA IS
00242 +007400400000 010 33A	00306 +040000000357 010	ADD 2)+1
00243 +007400000426 010	00307 +060100000377 010	STO IS
00244 +007400000360 010	00310 +050000000000 00 43A	CLA ITRA
00245 +007400000376 010	00311 +010000000327 010 43A1	TZE E)H
00246 +007400000000 00		BSS
00247 +007400000377 010	00312 +007400400000 010 45A	TSX BINPU,4
00250 +007400000000 00	00313 +007400000426 010	TSX T
00251 -053400400365 010	00314 +007400000356 010	TSX 2)
00252 +050000000376 010 34A	00315 +007400000356 010	TSX 2)
00253 +040000000360 010	00316 +007400000000 00	TSX BCDZ
00254 +060100000376 010	00317 +007400000377 010	TSX IS
00255 +050000000377 010 35A	00320 +007400000000 00	TSX NTAPE
00256 +040000000357 010	00321 +050000000377 010 46A	CLA IS
00257 +060100000377 010	00322 +040000000357 010	ADD 2)+1
00260 +050000000356 010 36A	00323 +060100000377 010	STO IS
00261 +060100000375 010	00324 +050000000000 00 47A	CLA IORG
00262 -053400100375 010	00325 +060100000376 010	STO J1
	00326 +002000000330 010	TRA 48A
00263 +100000400264 010 37A	00327 -063400100373 010 E)H	SXD CIG0,1
00264 -300000400225 010 37A2	00330 +050000000356 010 48A	CLA 2)
00265 +050000000375 010 38A	00331 +060100000375 010	STO J
00266 +010000000310 010 38A1	00332 -053400100375 010	LXD J,1
00267 +012000000271 010	00333 -063400100373 010	SXD CIG0,1
00270 +002000000310 010 39A	00334 +100001200335 010 48A1	TXI *+1,2,1
	00335 -063400200400 010	SXD I,2

MPUNCH

00336	-300000200220	010	48A2	TXL 28A,2
00337	+050000000000	00	49A	CLA ITRA
00340	+010000000343	010	49A1	TZE 50A
00341	+012000000352	010		TPL 52A
00342	+002000000352	010		TRA 52A
			50A	BSS
00343	+007400400000	010	51A	TSX BINPU,4
00344	+007400000000	00		TSX A
00345	+007400000356	010		TSX 2)
00346	+007400000356	010		TSX 2)
00347	+007400000000	00		TSX BCDZ
00350	+007400000377	010		TSX IS
00351	+007400000000	00		TSX NTAPE
00352	-053400100001	010	52A	LXD \$,1
00353	-053400200002	010		LXD \$+1,2
00354	-053400400003	010		LXD \$+2,4
00355	+002000400012	00		TRA 10,4
00356	+000000000000	00	2)	OCT +000000000000
00357	+000001000000	00		OCT +000001000000
00360	+000026000000	00		OCT +000026000000
00361	+233000000000	00	6)	OCT +233000000000
00362	+000000377777	00		OCT +000000377777
00363	+000000000000	00		OCT +000000000000
00364	+000001000000	00		OCT +000001000000
00365	+000000000000	00		OCT +000000000000
00366	+000000000000	00		OCT +000000000000
00367	+000000000001	00	9)	OCT +000000000001
00370	-000000000001	00		OCT -000000000001

ENTRY POINTS TO SUBROUTINES REQUESTED FROM LIBRARY,											
(FPT)	(TSHM)	(RTN)	(RWT)	(STHM)	(FIL)	(EFT)	(IOS)	(WRS)			
(RCH)	(WTC)	(WER)	(TES)	NOISE RECORDS		TOTAL REDUNDANCIES		POSITIONING			
		TOTAL	TOTAL	WRITING	READING	WRITING	READING	WRITING	READING		
MACHINE TAPE		WRITES	READS								
A 1		0	522	0	0	0	0	0	0	0	0
B 2		536	554	0	0	0	0	0	0	0	0
B 3		91	102	0	0	0	0	0	0	0	0
A 4		372	405	0	0	0	0	0	0	0	0
A 2		0	635	0	0	0	0	0	0	0	0
A 3		793	3	0	0	0	0	0	0	0	0
B 4		141	145	0	0	0	0	0	0	0	0

EXECUTION 14.527

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)
--------------	--

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)	UNCLASSIFIED
--------------	--	--------------

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)
--------------	--

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)	UNCLASSIFIED
--------------	--	--------------

$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\} \bar{c}/V \right) + [C_{hi}] \{h\} \bar{c}^2/V^2$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.	UNCLASSIFIED
--	--------------

$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\} \bar{c}/V \right) + [C_{hi}] \{h\} \bar{c}^2/V^2$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.	UNCLASSIFIED
--	--------------

$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\} \bar{c}/V \right) + [C_{hi}] \{h\} \bar{c}^2/V^2$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.	UNCLASSIFIED
--	--------------

$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\} \bar{c}/V \right) + [C_{hi}] \{h\} \bar{c}^2/V^2$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.	UNCLASSIFIED
--	--------------

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)
--------------	--

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)
--------------	--

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)
--------------	--

UNCLASSIFIED	Aerospace Corporation, El Segundo, California. AERODYNAMIC INFLUENCE COEFFICIENTS FROM SLENDER-BODY THEORY: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE, prepared by W. P. Rodden, E.F. Farkas, and G. Y. Takata. 31 October 1962. [107]p. incl. illus. (Report TDR-169(3230-11)TN-6; SSD-TDR-62-149) (Contract AF 04(695)-169) Unclassified report A method is reviewed for computing the aerodynamic influence coefficients (AICs) for slender bodies. The method is based on the unsteady slender-body theory by Miles and its extension to obtain the AICs by Rodden and Revell. The simplicity of a slender-body theory permits the definition of a number of sets of AICs for use in transient analysis. The influence coefficients relating the transient aerodynamic forces to the body deflections and their first two derivatives are defined by the following relation: (over)
--------------	--

UNCLASSIFIED	$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\bar{c}/V\} + [C_{hi}] \{h\bar{c}^2/V^2\} \right)$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.
UNCLASSIFIED	

UNCLASSIFIED	$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\bar{c}/V\} + [C_{hi}] \{h\bar{c}^2/V^2\} \right)$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.
UNCLASSIFIED	

UNCLASSIFIED	$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\bar{c}/V\} + [C_{hi}] \{h\bar{c}^2/V^2\} \right)$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.
UNCLASSIFIED	

UNCLASSIFIED	$\{F(t)\} = (qS/\bar{c}) \left([C_{hs}] \{h\} + [C_{hd}] \{h\bar{c}/V\} + [C_{hi}] \{h\bar{c}^2/V^2\} \right)$ The matrices $[C_{hs}]$, $[C_{hd}]$, and $[C_{hi}]$ are seen to be steady, damping, and inertial AICs, respectively. The oscillatory AICs are defined by $\{F\} = \rho \omega^2 b_r^2 s [C_h] \{h\}$ and are related to the above definitions through $2k_r^2 (\bar{c}s/S) [C_h] = [C_{hs}] + ik_r (\bar{c}/b_r) [C_{hd}] - k_r^2 (\bar{c}/b_r)^2 [C_{hi}]$ The Aerospace IBM 7090 Computer Program No. HM15 provides the AICs in printed and optional punched-card output formats. The program capacity is 50 control points and, in the oscillatory case, 50 values of reduced velocity.
UNCLASSIFIED	