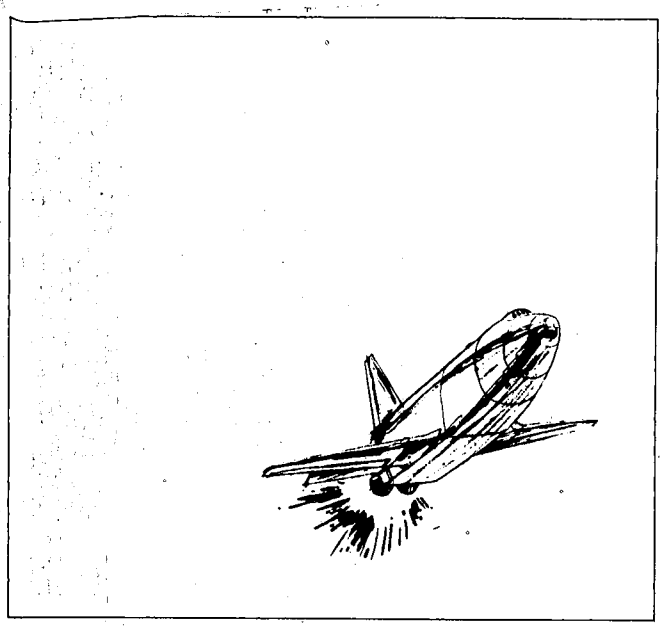

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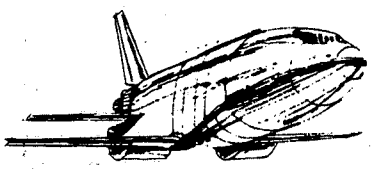

December 1972

MATHEMATICAL MODEL OF A FLEXIBLE SPACE SHUTTLE VEHICLE

Contract No. NAS8-25708

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MATHEMATICAL MODEL
OF A
FLEXIBLE SPACE SHUTTLE VEHICLE

DECEMBER 1972

Prepared under Contract No. NAS8-25708 by

HONEYWELL, INC.
Systems and Research Division
Minneapolis, Minnesota

for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

George C. Marshall Space Flight Center

FOREWORD

This interim report, "Mathematical Model of a Flexible Space Shuttle Vehicle," describes the development of a mathematical model suitable for controller design. The model was prepared under Contract NAS8-25708, "Controller Design Technology for the Space Shuttle Vehicle," for the National Aeronautics and Space Administration, George C. Marshall Space Flight Center.

Dr. S. W. Winder of the Dynamics and Control Division of the Aero-Astrodynamics Laboratory served as technical monitor for the contract. The study was performed in the Research Department of the Systems and Research Division of Honeywell Inc. Dr. E. E. Yore served as program manager. Dr. C. A. Harvey was the principal investigator. Mr. T. Yam performed the necessary computer programming and associated numerical analyses.

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ILLUSTRATIONS

SECTION I
INTRODUCTION AND SUMMARY

This report describes the development of a mathematical model of the lateral motion of a flexible space shuttle vehicle during ascent. The model was developed to perform control system synthesis using stochastic constrained optimization techniques. The goals of the control system synthesis are to demonstrate the applicability of the techniques and to discover any problems peculiar to the flexible nature of a shuttle vehicle.

The equations of motion are derived in Section II. A brief description of the generation of numerical data is given in Section III. Appendixes contain explicit definitions and numerical values of trajectory data and coefficients appearing in the equations of motion.

The "piggy-back" configuration of the Shuttle was assumed for this study. The North American Rockwell phase B study vehicle identified as the 161C-B9U served as the specific example represented numerically. Linearized equations of motion are derived based on a nominal trajectory for which angle of attack was constrained to be zero. Quantitative data for this trajectory are given in Appendix D. Aerodynamics associated with flexure was computed based on slender-body theory and the assumption of no interference between the orbiter and booster. The adoption of this assumption was based on a private communication with aerodynamicists at General Dynamics, Convair, in which they stated that comparison of wind tunnel data using this assumption was good. A modal representation is assumed for gust penetration. The gust disturbances are modeled as a stochastic process.

Three further asumptions were made in developing the model. The first assumption dealt with ordering flexure modes consistently along the trajectory. It was judged that two flexure mode frequencies crossed each other during the interval from maximum dynamic pressure to burn-out. Flexure data at additional points would be required for verification of this assumption. The second assumption concerns inclusion of "local" aerodynamic terms. These terms result from assuming that local normal velocity is the cross-flow velocity. Fortunately, these terms were found to be numerically insignificant so that effort to verify this assumption was not warranted. The final assumption was the incorporation of a gimbal logic. This particular logic provides for the two gimbals of each of the 12 engines to be driven by two command signals. The two commands yield uncoupled roll and yaw moments.

Numerical data for the trajectory, rigid body dynamics, and structural flexure at five mass loadings served as the starting point for generation of the numerical model. In addition to the purely numerical tasks of integration and interpolation, the numerical model generation required significant "bookkeeping" to assure proper identification and consistent dimensions. Finally, "debugging" of the numerical data was required. This debugging task seems to lack a formal methodology. Particular techniques used in this study are briefly described along with the data generation description in Section III.

From a modeling point of view, the number and distribution of mass points for which flexure data were available was insufficient. The question of consistent mode ordering could not be completely resolved and significant subjective judgment was required for interpolation. From a controller design point of view the flexure data were also lacking. The first mass point corresponds to greater than liftoff weight, and the second point corresponds to occurrence of maximum dynamic pressure on the nominal trajectory. At least one intermediate point would be desirable. However, the model developed subject to these limitations is believed to be sufficiently representative for controller synthesis study.

SECTION II
EQUATIONS OF MOTION

Equations are derived for the lateral motion of a flexible space shuttle vehicle during ascent. Two independent assumptions made in the derivation are (1) aerodynamic forces on the orbiter and booster are independent of each other and may be computed using slender-body theory (References 1 and 2), and (2) side gust penetration may be represented in terms of three "mode shapes". The rolling gust is "distributed" over the wing chord with a single mode.

We begin with a discussion of relevant coordinate systems. Then we describe our flexure representation. Linearized equations of motion are then derived using slender-body theory to represent aerodynamic forces.

COORDINATE SYSTEMS

Two body-coordinate systems shown in Figure 1 will be used in this derivation. The (x_1, y_1, z_1) coordinate frame (1-frame) is the No. 1 coordinate system used in the structural mode computer listing provided. The (x_B, y_B, z_B) coordinate frame (B-frame) is a conventionally oriented aircraft body coordinate system with origin at the center of mass, which is located at $(\bar{x}_1, 0, \bar{z}_1)$ in the 1-frame. The vector $r(t; x_1, y_1, z_1)$ depicts the vector from the origin of the earth coordinate system to the point with coordinates (x_1, y_1, z_1) in the 1-frame. As in Reference 3, a pitch (θ), roll (ϕ), yaw (ψ) system of Euler angles is used to relate the B-frame to the earth frame. Thus, B-frame base vectors (i_B, j_B, k_B) are related to earth-frame base vectors (i_e, j_e, k_e) by:

$$\begin{bmatrix} i_B \\ j_B \\ k_B \end{bmatrix} = \begin{bmatrix} (c\theta c\psi + s\theta s\phi s\psi) & (c\phi c\psi) & (-s\theta c\psi + c\theta s\phi s\psi) \\ (-c\theta s\psi + s\theta s\phi c\psi) & (c\phi c\psi) & (s\theta s\psi + c\theta s\phi c\psi) \\ (s\theta c\phi) & (-s\phi) & (c\theta c\phi) \end{bmatrix} \begin{bmatrix} i_e \\ j_e \\ k_e \end{bmatrix}$$

Note that $i_B = -i_1$, $j_B = j_1$, and $k_B = -k_1$.

The rate of angular rotation, ω, of the B-frame relative to the earth frame is:

$$\omega = p\, i_B + q\, j_B + r\, k_B$$

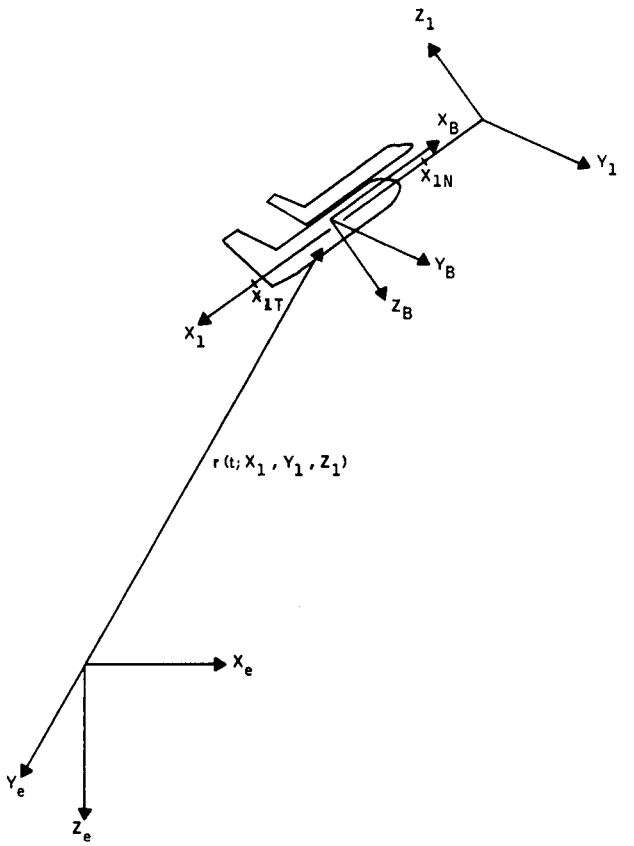

Figure 1. Vehicle Geometry and Coordinate Frames

The rates p, q, and r are related to $\dot{\theta}$, $\dot{\phi}$, and $\dot{\psi}$ by:

$$\begin{bmatrix} p \\ q \\ r \end{bmatrix} = \begin{bmatrix} c\psi & (c\phi)(s\psi) & 0 \\ -s\psi & (c\phi)(c\psi) & 0 \\ 0 & -s\phi & 1 \end{bmatrix} \begin{bmatrix} \dot{\phi} \\ \dot{\theta} \\ \dot{\psi} \end{bmatrix}, \begin{bmatrix} \dot{\phi} \\ \dot{\theta} \\ \dot{\psi} \end{bmatrix} = \begin{bmatrix} c\psi & -s\psi & 0 \\ (s\psi/c\phi) & (c\psi/c\phi) & 0 \\ (\tan\phi)(s\psi) & (\tan\phi)(c\psi) & 1 \end{bmatrix} \begin{bmatrix} p \\ q \\ r \end{bmatrix}$$

The velocity of the center of mass with respect to the earth frame is:

$$\frac{d}{dt}(\bar{r}) = u\, i_B + v\, j_B + w\, k_B$$

where $\bar{r} = r(t; 0, 0, 0) - x_1\, i_B - \bar{z}_1\, k_B$. It will be assumed that u, w, and q are not disturbed from their nominal values of u_o, w_o, and q_o. Also the nominal values of v, ϕ and ψ are zero.

FLEXURE REPRESENTATION

The flexure is represented by a set of natural vibration modes determined from a stick model of the mated vehicles. These modes are defined as lateral oscillations of center lines of the orbiter and booster. The reference center line of the booster is the x_1 axis. The orbiter reference center line is the line $z_1 = z_{10}$, $y_1 = 0$. Thus, the mode shapes are given as functions $Y_i(x_1, z_1)$ defining normalized deflection of the points $(x_1, 0, z_1)$ on the center lines to the points $[x_1, Y_1(x_1, z_1), z_1]$ for discrete values of x_1 and the two values of 0 and z_{10} for z_1. Smooth functions $Y_1(x_1, z_1)$ with respect to x_1 and partials of $Y_1(x_1, z_1)$ with respect to x_1 as needed are generated with spline fits to the discrete data. The total flexure is then represented by:

$$Y(t; x_1, z_1) = \Sigma \eta_i (t)\, Y_i (x_1, z_1)$$

where $\eta_1 (t)$ denotes the magnitude of the deflection of the i-th mode. A typical mode shape is sketched in Figure 2.

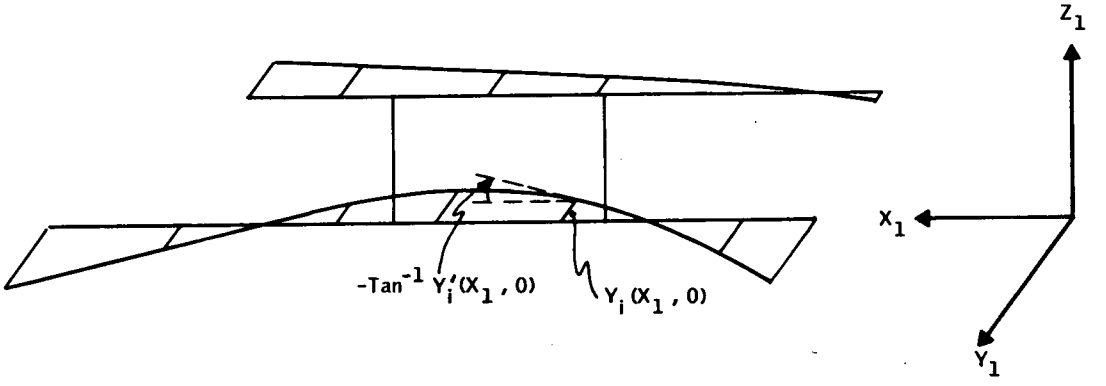

Figure 2. A Mode Shape

The normal modes of vibration and their corresponding frequencies are functions of the mass distribution and structural stiffness of the vehicles. The mass distribution changes as fuel is expended and hence is a function of time along the trajectory. Thus, in fact, the mode shapes are functions of time although we suppress this dependence on t in all of our notation. The mode shapes are considered as "slowly varying" with time. This requirement brings about the need for special consideration of consistent ordering of the modes and uniform normalization of each mode shape all along the trajectory.

The flexure data provided for this study consists of modal frequencies and normalized displacements at a finite set of vehicle stations computed for the 161C-B9U using NASTRAN* for five distinct mass distributions. These mass distributions correspond to approximate times of liftoff, burnout, and intermediate times along the trajectory of 70, 90, and 110 seconds after liftoff. The model consisted of 29 grid points, 27 connecting bars, 18 concentrated masses, and two scalar spring connections.

Although common grid points and structural properties were used, the modal data (frequencies and mode shapes) were computed independently for each mass distribution. In each case the NASTRAN output orders modes by increasing frequency, and the mode shapes are normalized such that the maximum displacement is of unity magnitude.

The lowest four frequencies are shown in Figure 3 for the five mass distributions considered. We are faced with the task of constructing four curves which represent the frequencies as functions of the mass loadings. The lowest and highest frequencies present no apparent problems. However, there is some question for the middle two frequencies, especially for $M_3 \leq M \leq M_4$. That is, there is reasonable doubt as to the correct connections of the points A and B with C and D. The modal masses corresponding to these two sets of frequencies are shown in Figure 4. This appears to be of little help in determining the proper connections. Thus, we turn to the corresponding mode shapes. These are shown in Figures 5 to 8. For completeness, the mode shapes for the lowest and highest frequencies are shown in Figures 9 and 10. The mode shape corresponding to point D appears to be much more likely a successor to point A than point B. So the connections from A to D and from B to C were made. To be certain of the proper connection, data for intermediate mass loadings would be required.

Figures 5 and 8 show normalized shapes of what we call the same mode. But the point on the vehicle at which the shapes are normalized is the orbiter nose for the first four mass loadings and is the nose of the booster at the fifth mass loading. The normalization was changed so that this mode shape had a unit displacement at the nose of the orbiter for all mass loadings. In this way the corresponding η (t) may be interpreted directly as displacement of the orbiter nose in units which are constant along the trajectory. Similar normalization of the other modes was made where necessary.

*"NASTRAN is a general-purpose digital computer program designed to analyze the behavior of elastic structures under a range of loading conditions using a finite-element displacement method approach." Reference 6.

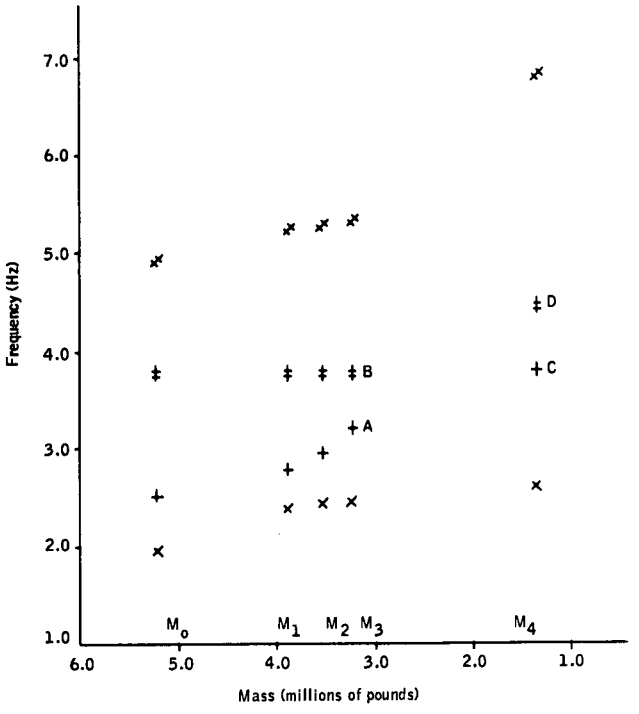

Figure 3. Bending Frequencies for the 161C-B9U

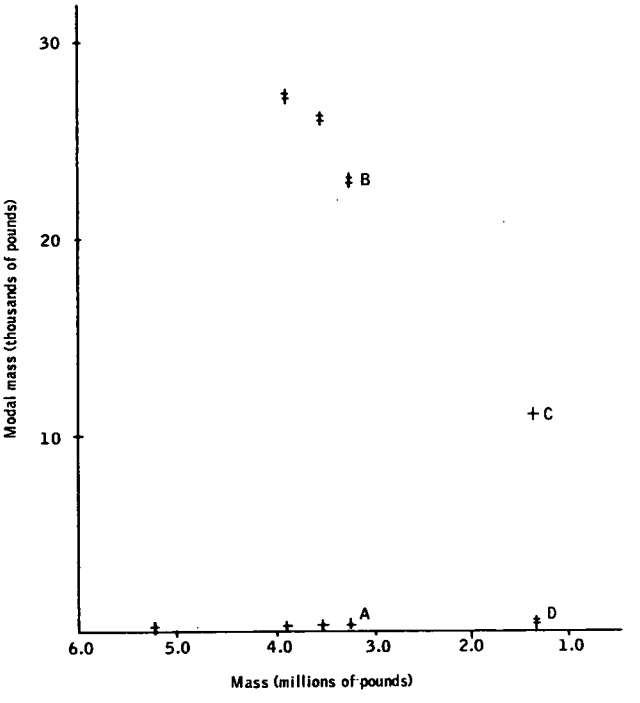

Figure 4. Generalized Masses of Second and Third Bending Modes

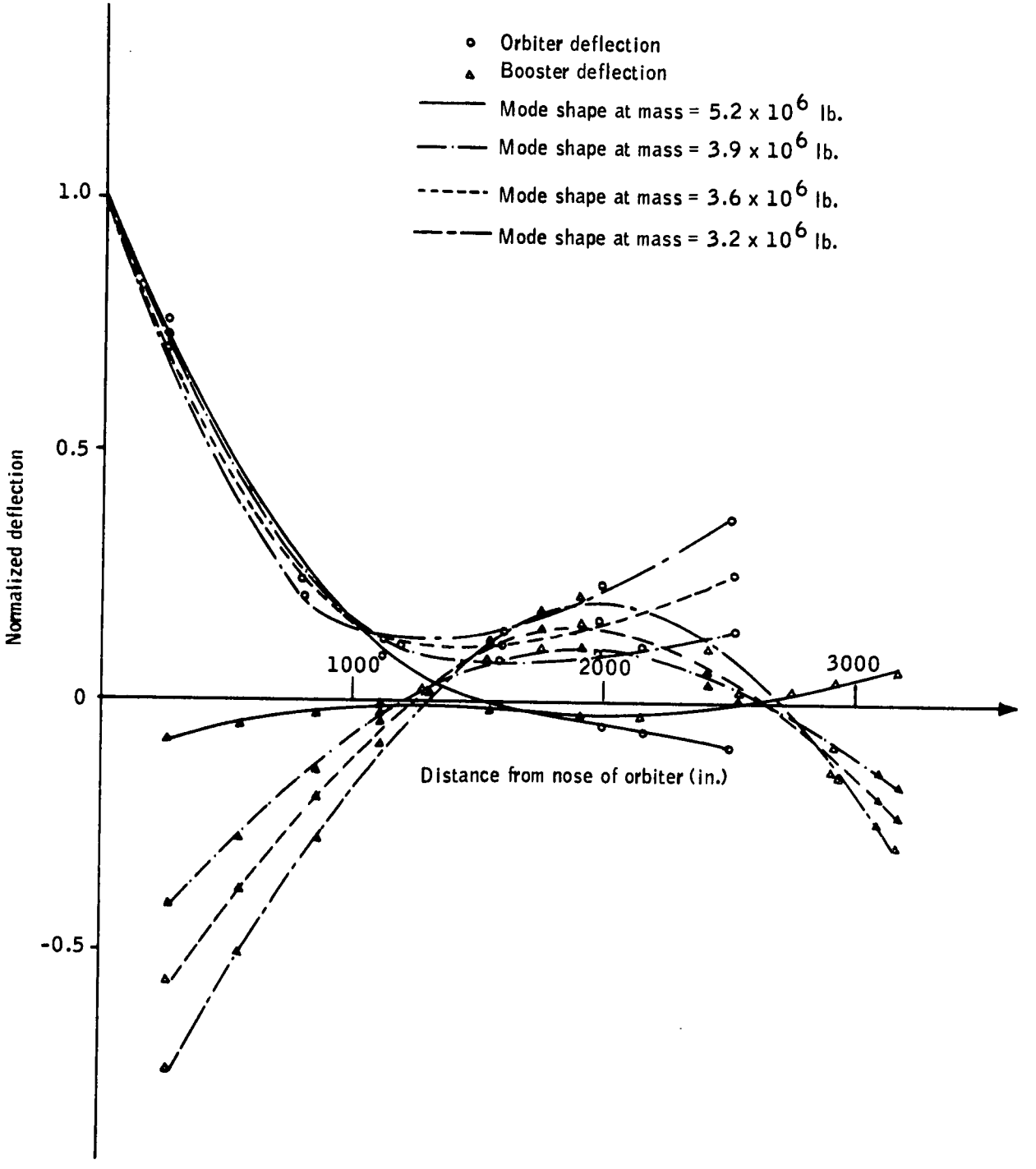

Figure 5. Second Mode Shapes at First Four Mass Points

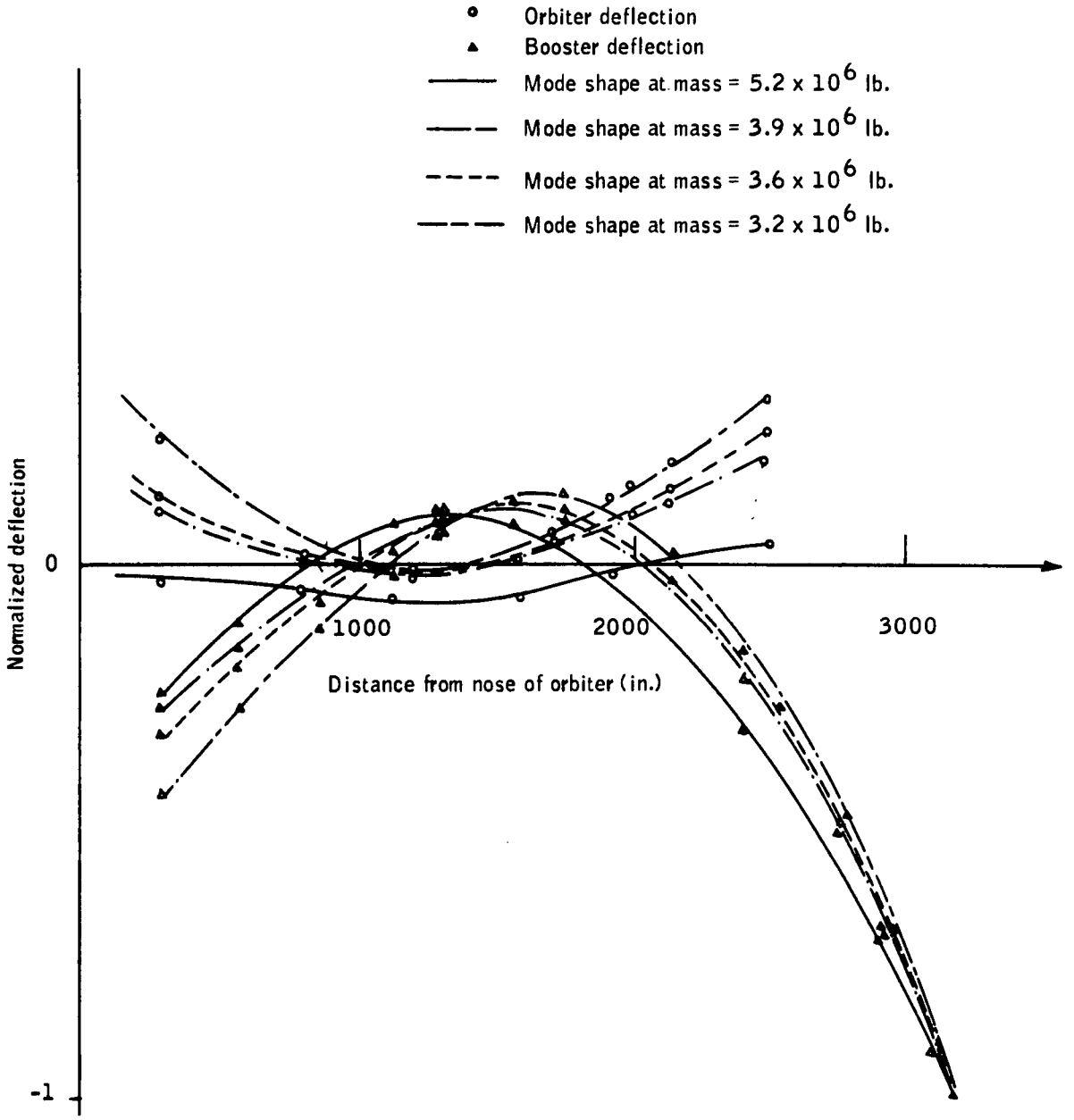

Figure 6. Third Mode Shapes at First Four Mass Points

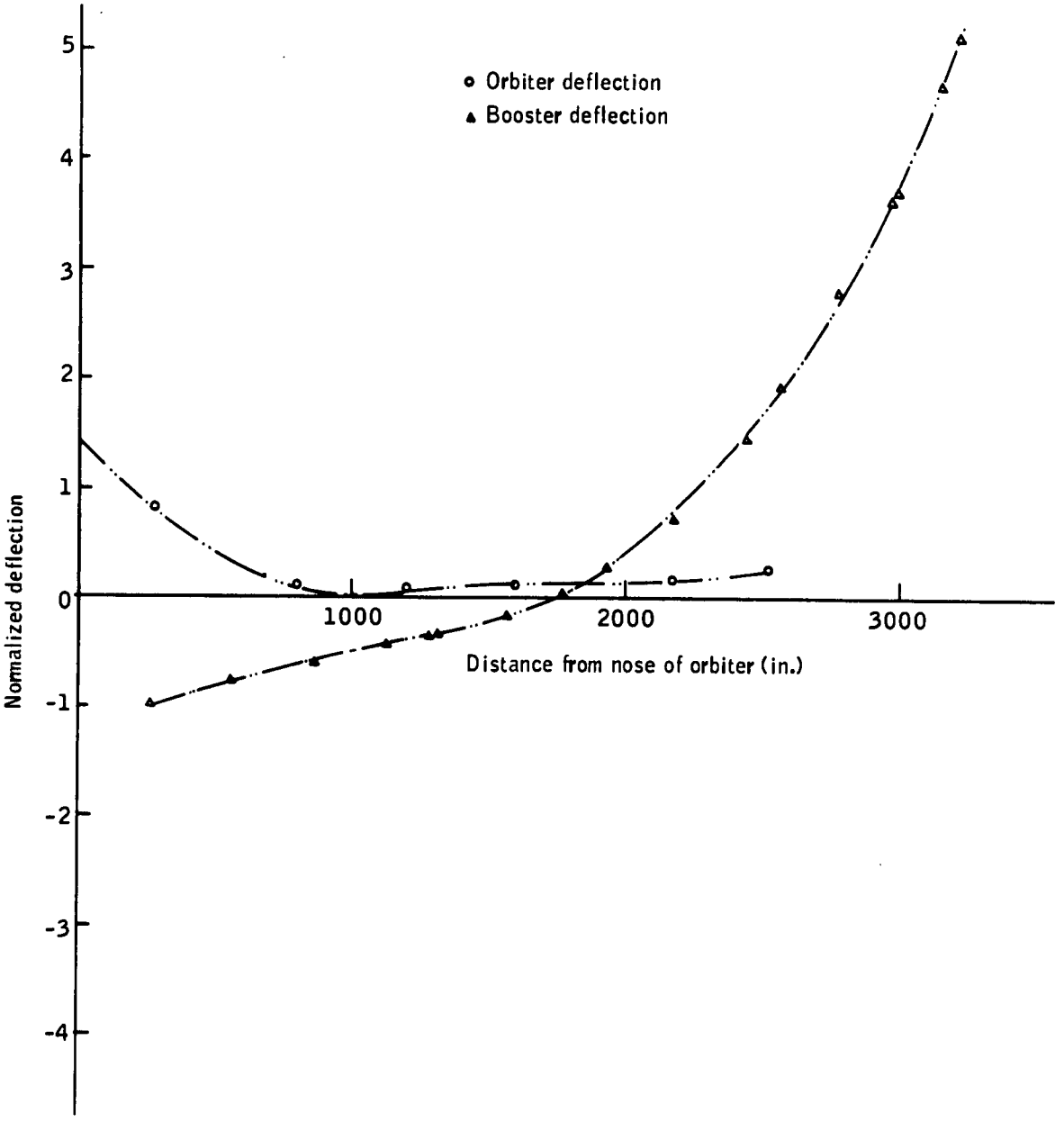

Figure 7. Mode Shape Corresponding to Point C

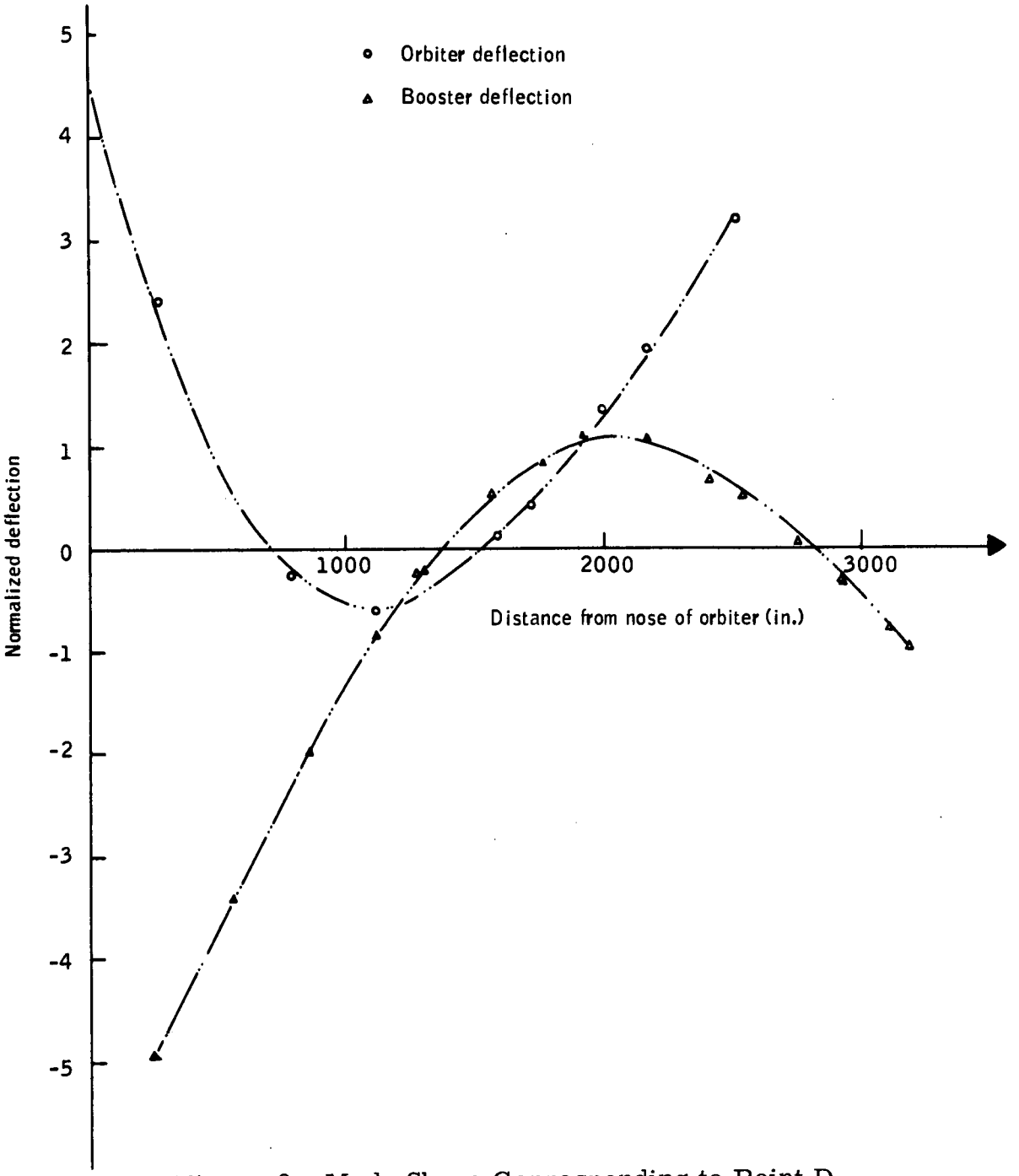

Figure 8. Mode Shape Corresponding to Point D

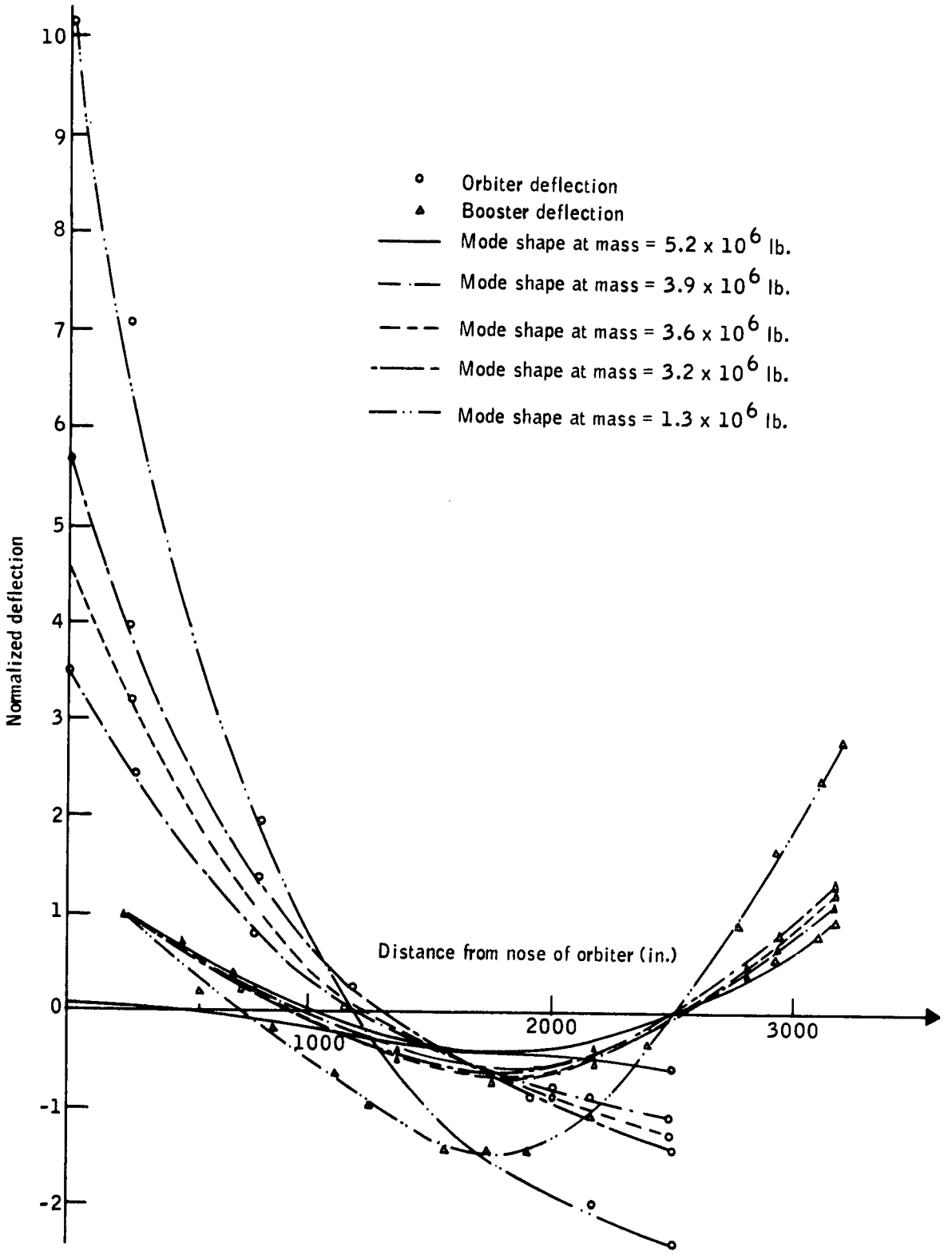

Figure 9. First Mode at Five Mass Points

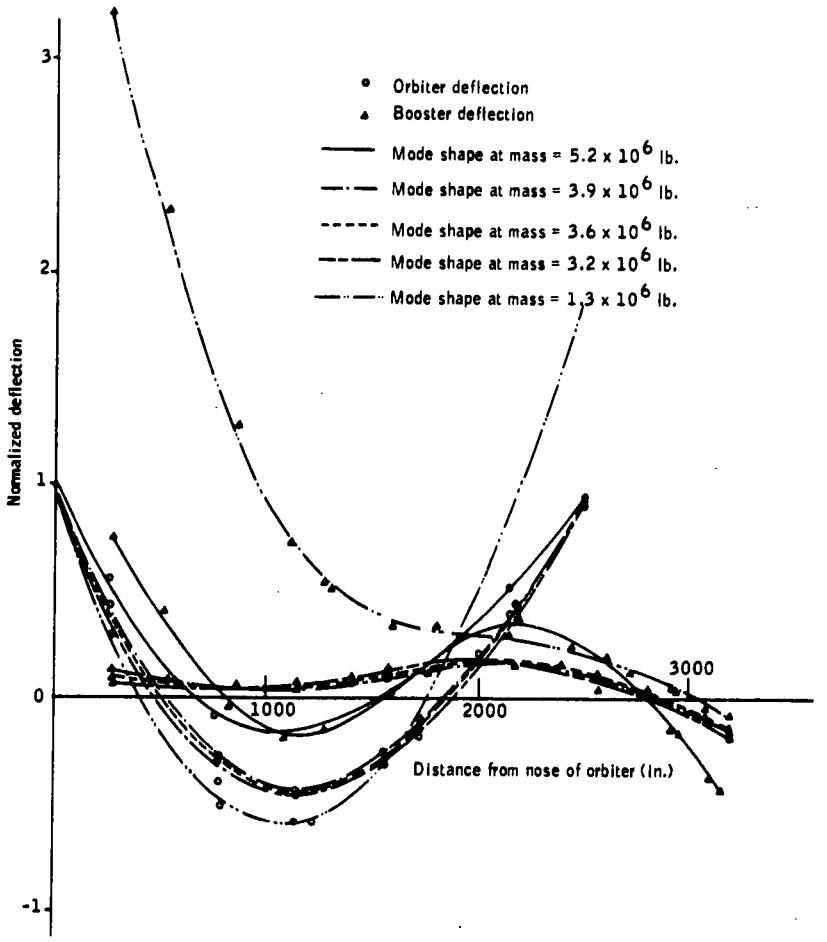

Figure 10. Fourth Mode at Five Mass Points

LINEARIZED EQUATIONS OF MOTION

The linearized kinematic equations are:

$$\dot{\phi} = p - Q_o\psi, \quad \dot{\psi} = r + Q_o\phi, \quad \dot{y}_e = v + u_o\psi - w_o\phi$$

The side-force equation is:

$$\frac{W}{g}(\ddot{\bar{r}} \cdot j_B) = \frac{W}{g}(\dot{v} + u_o r - w_o p)$$

$$= W[\phi \cos\theta_o + \psi \sin\theta_o] + j_B \cdot \left[\sum_{j=1}^{N} F_{T_j} + \sum_{j=1}^{M} F_{\delta_j} + \int_S \int F_A dS\right] \qquad (1)$$

Where F_{T_j} = thrust of the j-th engine, F_{δ_j} = j-th control force, F_A = local aerodynamic pressure, and S denotes the surface of the vehicle.

The j-th engine is located at $(x_{1\delta}, y_{E_j}, z_{E_j})$ in the 1-frame. The thrust of each engine is assumed to have magnitude, T/N and to be directed forward parallel to the "deflected" booster reference line. Variations due to gimbal deflections are contained in the control forces. Thus,

$$F_{T_j} = \frac{T}{N} \left[i_B - j_B \Sigma Y_i'(x_{1\delta}, 0)\, \eta_i \right]$$

The j-th control force is assumed to act at the point $(x_{\delta_j}, y_{\delta_j}, z_{\delta_j})$. With the thrust and control forces acting at these specified points, the moment equations about the x_B and z_B axes are:

$$\begin{bmatrix} I_{xx} & -I_{xz} \\ -I_{xz} & I_{zz} \end{bmatrix} \begin{bmatrix} \dot{p} \\ \dot{r} \end{bmatrix} = Q_o \begin{bmatrix} I_{xz} & I_{yy} - I_{zz} \\ I_{xx} - I_{yy} & -I_{xz} \end{bmatrix} \begin{bmatrix} p \\ r \end{bmatrix} + \begin{bmatrix} 0 \\ \text{M. R.} \end{bmatrix} r$$

$$+ \sum_{j=1}^{N} F_{T_j} \cdot \begin{bmatrix} j_B(z_{E_j} - \bar{z}_1) + k_B \Sigma Y_i(x_{1\delta}, 0)\eta_i \\ j_B(\bar{x}_1 - x_{1\delta}) - i_B \Sigma Y_i(x_{1\delta}, 0)\eta_i \end{bmatrix}$$

$$+ \sum_{j=1}^{M} F_{\delta_j} \cdot \begin{bmatrix} j_B(z_{\delta_j} - \bar{z}_1) + k_B \Sigma Y_i(x_{\delta_j}, 0)\eta_i \\ j_B(\bar{x}_1 - x_{\delta_j}) - i_B \Sigma Y_i(x_{\delta_j}, 0)\eta_i \end{bmatrix} \tag{2}$$

$$+ \iint_S \begin{bmatrix} (z_1 - \bar{z}_1) j_B + y_1 k_B \\ (\bar{x}_1 - x_1) j_B - y_1 i_B \end{bmatrix} \cdot F_A \, dS \tag{3}$$

where M. R. denotes the inertial rate and jet damping term of Reference 3. It is assumed that the $x_1 z_1$ -plane is a plane of symmetry. The equations for the mode deflections are*

$$M_i(\ddot{\eta}_i + 0.02\omega_1\dot{\eta}_i + \omega_i^2\eta_i) = j_B \cdot \sum_{j=1}^{N} F_{T_j} Y_i(x_{1\delta}, 0) + j_B \cdot \sum_{j=1}^{M} F_{\delta_j} Y_i(x_{\delta_j}, 0)$$

$$+ \iint_S j_B \cdot F_A dS \qquad (3+i)$$

The thrust contribution to Equation (3+i) will be neglected since the thrust is assumed always to be normal to each of the mode shapes. The thrust contribution to Equations (1), (2), and (3) are:

$$-T\sum_i Y_i'(x_{1\delta}, 0)\eta_i \qquad (1a)$$

$$-\frac{T}{N}\sum \left[Y_i'(x_{1\delta}, 0)\eta_i \sum_{j=1}^{N} (z_{E_j} - \bar{z}_1)\right] \qquad (2a)$$

$$-T\sum_i \left[(x_1 - x)\, Y_i'(x_{1\delta}, 0) + Y_i(x_{1\delta}, 0)\right]\eta_i \qquad (3a)$$

The control force contributions to the equations are taken directly from Reference 3 for Equations (1), (2), and (3). They are:

$$\bar{q}\, S\, C_{y_{\delta a}}\, \delta a + T\left[\left(\frac{Y_{\delta p}}{T}\right)\delta p + \left(\frac{Y_{\delta r}}{T}\right)\delta r\right] \qquad (1b)$$

$$\bar{q}\, SB\, C_{\ell_{\delta a}}\, \delta a + T\left[\left(\frac{L_{\delta p}}{T}\right)\delta p + \left(\frac{L_{\delta r}}{T}\right)\delta r\right] \qquad (2b)$$

$$\bar{q}\, Sb\, C_{n_{\delta a}}\, \delta a + T\left[\left(\frac{N_{\delta p}}{T}\right)\delta p + \left(\frac{N_{\delta r}}{T}\right)\delta r\right] \qquad (3b)$$

*A structural damping term ($0.2\omega_i\dot{\eta}_i$) was arbitrarily hypothesized.

In these equations δa denotes aileron deflection. The quantities δp and δr denote roll and yaw control gimbal deflections defined as follows. Each engine is assumed to be gimbaled such that δy_j and δz_j represent positive rotations of the j-th engine about axes parallel to the y_B and z_B axes which are centered at $(x_{1\delta}, y_{E_j}, z_{E_j})$. The gimbal deflections of the j-th engine are defined as:

$$\delta y_j = c_{yp_j} \delta p$$

$$\delta z_j = c_{zp_j} \delta p + c_{zr_j} \delta r$$

with

$$c_{yp_j} = -\frac{1}{2} \operatorname{sgn}(y_{E_j}) \text{ where } \operatorname{sgn}(0) = 0 \text{ and } \operatorname{sgn}(x) = \frac{x}{|x|} \text{ if } x \neq 0.$$

Engines of the B9U are arranged as shown in Figure 11 in which the positive x_1 axis is directed out of the paper. The magnitudes of c_{zp_j} and c_{zr_j} are constrained not to exceed unity. The values of the coefficients are determined so that maximum rolling moment per unit δp is to be produced subject to the constraint that δp produces no yawing moment about the velocity vector, and, similarly, maximum yawing moment per unit δr is to be produced subject to the constraint that δr produces no rolling moment about the velocity vector.

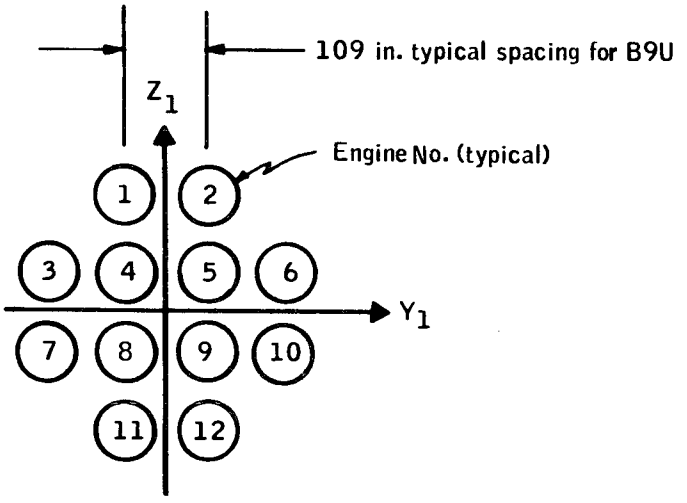

Figure 11. Engine/Vehicle Geometry

The control force contribution to the mode deflection equation (3+i) is:

$$T\, Y_i(x_{i\delta}, 0) \left[\left(\frac{Y_{\delta p}}{T}\right)\delta p + \left(\frac{Y_{\delta r}}{T}\right)\delta r\right] \qquad [(3+i)b]$$

The remaining contributions required are those from the aerodynamic force F_A. It is assumed that the aerodynamic force may be partitioned into two parts, one acting on the orbiter and one acting on the booster. This may be expressed mathematically by setting

$$F_A(t;\, x_1, z_1) = F_o(t;\, x_1)\, \delta(z_1 - z_{10}) + F_b(t,\, x_1)\, \delta(z_1)$$

with the definition that $\int\int_S F(t;\, x, z)\, \delta(z - z_o) dS = \int_L F(t;\, x, z_o)\, dx$.

Slender-body theory yields the following expressions for the local aerodynamic side forces per unit length:

$$F_o(t, x_1) \cdot j_B = \frac{\pi \bar{q}}{2V}\left\{2D_o(x_1)D_o'(x_1)\, v_o(x_1, t) + D_o^2(x_1)\frac{\partial v_o(x_1, t)}{\partial x_1} + \frac{1}{V} D_o^2(x_1)\frac{\partial v_o(x_1, t)}{\partial t}\right\}$$

$$F_b(t, x_1) \cdot j_B = \frac{\pi \bar{q}}{2V}\left\{2D_b(x_1)D_b'(x_1)v_b(x_1, t) + D_b^2(x_1)\frac{\partial v_b(x_1, t)}{\partial x_1} + \frac{1}{V} D_b^2(x_1)\frac{\partial v_o(x_1, t)}{\partial t}\right\}$$

where $D_o(x_1)$ is the cross-sectional dimension of the projection of the orbiter onto the $x_1 z_1$-plane and $v_o(x_1, t)$ denotes the j_B-component of the air velocity with respect to the orbiter. $D_b(x_1)$ and $v_b(x_1, t)$ denote similar quantities related to the booster. Thus,

$$v_o(x_1, t) = -\dot{r}\,(t;\, x_1, o,\, z_{10}) \cdot j_B + v_w\,(t, x_1)$$

$$v_b(x_1, t) = -\dot{r}\,(t;\, x_1,\, 0,\, 0) \cdot j_B + v_w\,(t, x_1)$$

The local cross-wind, $v_w(t, x_1)$, is assumed to be independent of z_1 and represented by penetration states:

$$v_w\ (t, x_1) = \sum_{i=1}^{3} c_i f_i(x_1) x_i(t)$$

where

$$f_1(x) = 1 - \exp(-2.3\ x/L)$$

$$f_2(x) = 1 - [1 - f_1(x)] \cos(2\pi\ x/L)$$

$$f_3(x) = f_2(x) - [1 - f_1(x)] \sin(2\pi\ x/L)$$

and the $x_i(t)$ are states driven by the cross-wind at the nose of the vehicle. That is:

$$\dot{x}_1 = -2.3 \frac{V}{L} \left(x_1 - \frac{v_w}{V} \right)$$

$$\dot{x}_2 = \frac{V}{L} \left(3.99\ x_2 - 6.29\ x_3 + 2.30 \frac{v_w}{V} \right)$$

$$\dot{x}_3 = \frac{V}{L} \left(12.58\ x_2 - 8.59\ x_3 - 3.99 \frac{v_w}{V} \right)$$

with $v_w = v_w(t, x_{1N})$. The choice of the c_1's will be described later. The wind $v_w(t, x_{1N})$ is assumed to be (Reference 5).

$$v_w(t, x_{1N}) = \bar{v} + \sigma_w \omega$$

where

$$\begin{bmatrix} \dot{\omega} \\ \dot{x} \end{bmatrix} = \begin{bmatrix} 0 & \dot{h} \\ -c_5 \dot{h} & -c_4 \dot{h} \end{bmatrix} \begin{bmatrix} \omega \\ x \end{bmatrix} + \sqrt{\dot{h}} \begin{bmatrix} 1.378 \cdot 10^{-2} \\ -0.965 \cdot 10^{-6} \end{bmatrix} n_1$$

with $c_4 = 1.9 \cdot 10^{-4}$, $c_5 = 1.44 \cdot 10^{-8}$,

σ_w = standard deviation of the wind

h = altitude

n_1 = unity white noise

The position vector, $r(t; x_1, 0, z_1)$, is given by

$$r(t;x_1,0,z_1) = r(t;\bar{x}_1,0,\bar{z}_1) + (\bar{x}_1 - x_1)\, i_B + (\bar{z}_1 - z_1)k_B$$

$$+ j_B \sum_i Y_i(x_1, z_1)\, \eta_i$$

where $r(t; \bar{x}_1, 0, \bar{z}_1) = \bar{r}(t)$ and $\dot{\bar{r}}(t) = u_o i_B + v\, j_B + w_o k_B$. Thus

$$\dot{r}(t; x_1, 0, z_1) = u_o i_B + v\, j_B + w_o k_B + \sum_i Y_i(\bar{x}_1, z_1)\, \dot{\eta}_i\, j_B + (\bar{x}_1 - x_1)\dot{i}_B$$

$$+ (\bar{z}_1 - z_1)\dot{k}_B + \dot{j}_B \sum_i Y_i(x_1, z_1)\eta_i.$$

Using the relation (linearization being assumed)

$$\frac{d}{dt}\begin{bmatrix} i_B \\ j_B \\ k_B \end{bmatrix} = \begin{bmatrix} 0 & r & -Q_o \\ -r & 0 & p \\ Q_o & -p & 0 \end{bmatrix} \begin{bmatrix} i_B \\ j_B \\ k_B \end{bmatrix}$$

leads to

$$\dot{r}(t; x_1, 0, z_1) = [u_o + (\bar{z}_1 - z_1)Q_o]i_B$$

$$+ [v + (\bar{x}_1 - x_1)r - (\bar{z}_1 - z_1)p + \sum_i Y_i(x_1, z_1)\dot{\eta}_i]j_B$$

$$+ [w_o - (\bar{x}_1 - x_1)Q_o]\, k_B$$

Thus $\dot{r}(t; x_1, 0, z_1) \cdot j_B = v + (\bar{x}_1 - x_1)r - (\bar{z}_1 - z_1)p + \sum_i Y_i(x_1, z_1)\dot{\eta}_1$

and

$$\frac{d}{dt}[\dot{r}(t; x_1, 0, z_1) \cdot j_B] = \dot{v} + (\bar{x}_1 - x_1)\dot{r} - (\bar{z}_1 - z_1)\dot{p} + \sum Y_1(x_1, z_1)\ddot{\eta}_i$$

The results may be combined to write:

$$\frac{2V}{\pi \bar{q}} F_B(t,x) \cdot j_B = 2D_b(x)D_b'(x)[-v - (\bar{x}_1 - x)r + \bar{z}_1 p - \sum_i Y_i(x,0)\dot{\eta}_i$$

$$+ \sum_{i=1}^{3} c_i f_i(x) x_i] + D_b^2(x)[r - \sum_i Y_i'(x,0)\dot{\eta}_i + \sum_{i=1}^{3} c_i f_i'(x) x_i]$$

$$+ \frac{1}{V} D_b^2(x)[-\dot{v} - (\bar{x} - x)\dot{r} + \bar{z}_1 \dot{p} - \sum_i Y_i(x,0)\ddot{\eta}_i + \sum_{i=1}^{3} c_i f_i(x)\dot{x}_i]$$

A similar expression can be written for the orbiter. These forces may be entered into the integrands in Equations (1), (2), (3), and (3+i).

In this derivation, $v_b(x,t)$ and $v_o(x,t)$ do not contain the terms:

$$u_o \sum_i Y_i'(x_1, o)\eta_i \text{ and } u_o \sum_i Y_i'(x_1, z_{10})\eta_i.$$

These terms appear in Reference 2 and have been included in previous studies. (References 4, 5). This type of term would arise if the local normal velocity is used in the definition of the cross-flow. That is, defining for the booster

$$v_b(x_1,t) = -\dot{r}(t; x_1 0, 0) \cdot [j_B - i_B \sum_i Y_i'(x_1, 0)\eta_i] + v_w$$

and then consider $(\bar{z}_1 Q_o)$ negligible relative to u_o. Such u_o terms were arbitrarily added for the booster and orbiter in the following expansion of equations (1) - (3+i). These terms are underlined. Fortunately, the numerical magnitudes of these terms did not significantly modify the system in the sense that eigenvalues computed with the terms differed insignificantly from eigenvalues computed without these terms. Resolution of the correct treatment of these terms was beyond the scope of this study.

The following form of Equations (1) - (3+i) were obtained by making the appropriate substitutions and using integrals defined in Appendix A.

Equation (1) is:

$$\dot{v}\left(\frac{W}{g} + \frac{H}{V} I_1\right) + \frac{H}{V}\left(-I_2 \dot{p} + I_3 \dot{r} + \sum_{i=1}^{3} c_i I_{3+1} \dot{x}_i + \sum_{i=1}^{4} I_{6+1}\ddot{\eta}_i\right)$$

$$= p(w_o \frac{W}{g} - 2H I_{11}) + r[-u_o \frac{W}{g} + H(I_1 - 2I_{12})] - 2H I_{13} v + \sum_{i=1}^{4} \{\dot{\eta}_i H[\underline{(\cos \alpha_o - 1)} I_{13+i}$$

$$-2I_{17+i}] + \eta_i[\underline{H u_o (I_{21+i} + 2I_{25+i})} - T Y_i'(x_{1\delta}, 0)] + \sum_{i=1}^{3} x_i H c_i (I_{29+i} + 2I_{32+i})$$

$$+ W(\phi \cos \theta_o + \psi \sin \theta_o) + \bar{q} S C_{y_{\delta a}} \delta a + T\left[\left(\frac{Y_{\delta p}}{T}\right)\delta p + \left(\frac{Y_{\delta r}}{T}\right)\delta r\right]$$

where $H = \frac{\pi \bar{q}}{2V}$ and four flexure modes are included.

Equation (2) is:

$$(I_{xx} + \frac{H}{V} I_{36})\dot{p} - (I_{xz} - \frac{H}{V} I_{37})\dot{r} + \frac{H}{V}[I_2\dot{v} - \sum_{i=1}^{3} c_i\dot{x}_i I_{37+i} + \sum_{i=1}^{4} \ddot{\eta}_i I_{40+i}]$$

$$= p(Q_o I_{xz} + 2H I_{45}) + r[Q_o(I_{yy} - I_{zz}) - H(I_2 - 2I_{46})] + 2H I_{11} v$$

$$+ \sum_{1=1}^{4} \{\dot{\eta}_i H[\underline{\cos \alpha_o} - 1)I_{46+i} - 2I_{50+i}] + \underline{\eta_i H u_o(I_{54+i} + 2I_{58+i})}\}$$

$$+ \sum_{i=1}^{3} x_i H c_i(I_{62+i} + 2I_{65+i}) + \bar{q} Sb C_{\ell_{\delta a}} \delta a + T\left[\left(\frac{L_{\delta p}}{T}\right)\delta p\right.$$

$$\left. + \left(\frac{L_{\delta r}}{T}\right)\right]\delta r - \frac{T}{N} \sum_{j=1}^{N} (z_{E_j} - \bar{z}_1) \sum_{=1}^{4} Y_i'(x_{1\delta}, 0)\eta_i$$

Equation (3) is:

$$(I_{zz} + \frac{H}{V} I_{69})\dot{r} - (I_{xz} - \frac{H}{V} I_{37})\dot{p} + \frac{H}{V}[I_3\dot{v} - \sum_{i=1}^{3} c_i\dot{x}_i I_{69+i} + \sum_{i=1}^{3} \ddot{\eta}_i I_{72+i}]$$

$$= p[Q_o(I_{xx} - I_{yy}) - 2H I_{46}] + r[-Q_o I_{xz} + H(I_3 - 2 I_{77})] - 2H I_{12} v$$

$$+ \sum_{i=1}^{4} \dot{\eta}_i H[\underline{(\cos \alpha_o} - 1)I_{77+i} - 2I_{81+i}] + \sum_{i=1}^{4} \eta_i[\underline{H u_o(I_{85+i} + 2I_{89+i})}$$

$$- T(\bar{x}_1 - x_{1\delta})Y_i'(x_{1\delta}, 0) - T Y_i(x_{1\delta}, 0)] + \sum_{i=1}^{3} x_i Hc_i (_{93+i} + 2I_{96+i})$$

$$+ \bar{q} Sb C_{n_{\delta a}} \delta a + (M.R.) r + T\left[\left(\frac{N_{\delta p}}{T}\right)\delta p + \left(\frac{N_{\delta r}}{T}\right)\delta r\right]$$

Equation (3+j) for j = 1, 2, 3, 4 is:

$$\sum_{i=1}^{4} [\delta_{ij} M_j + \frac{H}{V} I_1(i,j)]\ddot{\eta}_i + \frac{H}{V} [I_{40+j}\dot{p} + I_{77+j}\dot{r} + I_{6+j}\dot{v}$$

$$- \sum_{1=1}^{3} c_i \dot{x}_i I_2(i,j)]$$

$$= 2p\, H\, I_{50+j} + r\, H(I_{6+j} - 2I_{81+j}) - 2Hv\, I_{17+j} - M_j [0.02\omega_j \dot{\eta}_j$$

$$+ \omega_j^2 \eta_j] + \sum_{i=1}^{4} \{\dot{\eta}_i H[(\cos \alpha_o - 1)\, I_3(i,j) - 2I_4(i,j)]$$

$$+ \eta_i\, H\, u_o [I_5(i,j) + 2I_6(i,j)]\}$$

$$+ \sum_{i=1}^{3} x_i H\, c_i\, [I_7(i,j) + 2\, I_8(i,j)] + T\, Y_j(x_{1\delta}, 0)\left[\left(\frac{Y_{\delta p}}{T}\right)\delta p + \left(\frac{Y_{\delta r}}{T}\right)\ \delta r\right]$$

Some of the integrals in the above equations represent familiar terms.

For example,

$$I_{11} = \frac{Sb}{\pi}\, C_{\ell_\beta}$$

$$I_{12} = -\frac{Sb}{\pi}\, C_{n_\beta}$$

$$I_{13} = -\frac{S}{\pi}\, C_{y_\beta}$$

with the center of mass being the moment reference points for C_{ℓ_β} and C_{n_β}.

These integrals will be replaced by the wind tunnel data. Noting that for a constant cross-wind input, say $v_w(t) = v_w$, the steadystate value of each of the x_i's is v_w, and observing that in this case the wind input to Equations (1), (2), and (3) are:

$$H \sum_{i=1}^{3} x_i c_i \, (I_{29+i} + 2I_{32+i}) = \frac{v_w}{V} \left(\frac{\pi \bar{q}}{2}\right) \sum_{i=1}^{3} c_i (I_{29+i} + 2\, I_{32+i})$$

$$H \sum_{i=1}^{3} x_i c_i \, (_{62+i} + 2I_{65+i}) = \frac{v_w}{V} \left(\frac{\pi \bar{q}}{2}\right) \sum_{i=1}^{3} c_i (I_{62+i} + 2I_{65+i})$$

$$H \sum_{i=1}^{3} x_i c_i \, (I_{93+i} + 2I_{96+i}) = \frac{v_w}{V} \left(\frac{\pi \bar{q}}{2}\right) \sum_{i/1}^{3} c_i (I_{93+i} + 2I_{96+i})$$

we may satisfy correct steady state side-force, yawing, and rolling moment inputs by choosing the c_i's as solutions of:

$$\frac{\pi \bar{q}}{2} \sum_{i=1}^{3} (I_{29+i} + 2I_{32+i}) c_i = \bar{q}\, S\, C_{y_\beta}$$

$$\frac{\pi \bar{q}}{2} \sum_{i=1}^{3} (I_{62+i} + 2I_{65+i}) c_i = \bar{q}\, Sb\, C_{\ell_\beta}$$

$$\frac{\pi \bar{q}}{2} \sum_{i=1}^{3} (I_{93+i} + 2I_{96+i}) c_i = \bar{q}\, Sb\, C_{n_\beta}$$

The c_i's will be so chosen with C_{y_β}, C_{ℓ_β}, and C_{n_β} representing wind tunnel data with the center of mass being the moment reference point.

The rolling gust is represented by (Reference 3)

$$\dot{p}_g = d_{24,24}\, p_g + f_{24,3}\, n_2$$

where n_2 = unity white noise. The rolling gust is "distributied" by x_4 over the wing chord with steady-state values of x_4 and p_g being identical. Thus,

$$\dot{x}_4 = d_{23,23}\, x_4 + d_{23,24}\, p_g$$

with $d_{23,23} = -d_{23,24}$. The state, x_4, drives the vehicle in the same manner as geometric roll rate p. Hence we may substitute $p + x_4$ for p in the right hand sides of Equations (1), (2), (3), (3+j).

SECTION III
GENERATION OF NUMERICAL COEFFICIENTS

The equations of motion derived above may be viewed in vector form as

$$C\dot{x} = Dx + Eu + Fd$$

where C, D, E, and F are matrices of appropriate dimensions and

$$x = [p, r, v, \phi, \psi, y, \dot{\eta}_1, \eta_1, \dot{\eta}_2, \eta_2, \dot{\eta}_3, \eta_3, \dot{\eta}_4, \eta_4, \delta p, \delta r, \delta a, x_1, x_2, x_3, x, \omega, x_4, p_g]'$$

$$u = [u_1, u_2, u_3]'$$

$$d = [\bar{v}, n_1, n_2]$$

These equations of motion describe perturbation about a nominal trajectory which is assumed to be defined with time as the independent variable. Thus, for a given trajectory, the matrices C, D, E, and F have continuously time-varying elements. For controller synthesis, values of these elements were computed at endpoints of five-second intervals along the nominal trajectory. These data were then used to compute the coefficient matrices at the same time points for the equations of motion in the form

$$\dot{x} = Ax + B_1u + B_2\bar{v} + B_3n$$

with $n = [n_1, n_2]'$. These coefficients, along with those for the response equation

$$r = H_1x + D_1u$$

are listed in Appendix C. The manner in which these coefficients were computed will now be summarized.

The original data consisted of a nominal trajectory, tabulated moments of inertia and center of mass location at four mass points, tabulated rigid body aero data such as $C\ell_\beta$ at 10 values of Mach number, and tabulated mode deflections at discrete points of the booster and orbiter for five mass points. Values of the mass properties and rigid body aero data at intermediate points corresponding to the "five-second" time points on the trajectory were obtained by linear interpolation.

Integrals over the vehicle as listed in Appendix A were computed using cubic spline-fits (Reference 7) to the discrete representation of the mode shapes and cross-sectional diameters. The integrals involving mode shapes or their derivatives were evaluated at the five given mass points. The resulting integrals were then spline-fit to give values at intermediate mass points corresponding to the "five-second" time points. Similar spline-fits were used for all other coefficients involving modal data. The five mass points provided were a minimal number to base the fits on with expectations of confidence in the resulting functions. The fits were quite sensitive to assumed end-point slope conditions. Subjective judgment played a significant role in choosing these conditions. Data for two more points, one near each of the end-points, would have been quite useful in determining these boundary conditions.

After evaluating the necessary integrals, the coefficient matrices C, D, E, and F and, in turn, A, B_1, B_2, and B_3 were computed for the 43 time points: 0, 5, 10, ..., 210 seconds. At each of these time points, a sampled-data version of the system was computed. The sample-data version is of the form

$$x_{k+1} = \hat{A}\, x_k + \hat{B}_1\, u_k + \hat{B}_2\, \bar{v}_k + \hat{B}_3\, n_k$$

where

$$\hat{A} = \exp\,[A(\Delta t)]$$

$$\hat{B}_i = A^{-1}(\hat{A} - I)B_i$$

In the right-hand side of the last equation, $A^{-1}\,(\hat{A} - I)$ denotes the series

$$\Delta t\,\left[I + \frac{(A\Delta t)}{2!} + \frac{(A\Delta t)^2}{3!} + \ldots + \frac{(A\Delta t)^n}{(n+1)!} + \ldots\right]$$

The $\hat{A}$, $\hat{B}_i$ matrices were computed using the series representations and truncating the series after including a sufficient number of terms to guarantee convergence to at least three-digit accuracy. Controller synthesis and analysis was performed using these coefficient matrices with linear interpolation for intermediate points.

Verification of the numerical model is an extremely difficult task. Three specific techniques used in this study were examination of time-varying coefficients for unusual algebraic signs, sign changes, and magnitude variations; eigenvalue comparisons; and response examinations. The first method was useful in finding errors resulting from some keypunch errors, certain algebraic errors in equation derivation or similar errors in programming, and unreasonable effects of assumed slope conditions in spline-fits. The second method consisted of comparing eigenvalues of the A matrix with known rigid body characteristics of similar vehicles and with the uncoupled flexure characteristics. This method proved useful in finding algebraic and programming errors. The third method consisted of determining whether computed responses

could reasonably be expected from the inputs used. This method led to discovery of keypunch, algebraic, programming, and dimensional errors. Unfortunately, human errors do occur, and at this point model verification is a tedious and somewhat unorganized task. Development of standard, objective, and direct techniques for model verification would be of great benefit.

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APPENDIX A
TABLE OF INTEGRALS

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The lower and upper limits of integration are x_{1N} and x_{1T} for each of the following integrals.

$$I_1 = \int [D_o^2(x) + D_b^2(x)]dx$$

$$I_2 = \int [(\bar{z}_1 - z_{10})D_o^2(x) + \bar{z}_1 D_b^2(x)]dx$$

$$I_3 = \int (\bar{x}_1 - x)\,[D_o^2(x) + D_b^2(x)]\,dx$$

$$I_{3+i} = -\int f_i(x)[D_o^2(x) + D_b^2(x)]\,dx \qquad i = 1, 2, 3$$

$$I_{6+i} = \int [Y_i(x, z_{10})D_o^2(x) + Y_i(x, 0)D_b^2(x)]dx \qquad i = 1, 2, 3, 4$$

$$I_{11} = \int [(\bar{z}_1 - z_{10})D_o(x)\,D_o'(x) + \bar{z}_1 D_b(x)\,D_b'(x)]\,dx$$

$$I_{12} = \int (\bar{x}_1 - x)\,[D_o(x)\,D_o'(x) + D_b(x)\,D_b'(x)]\,dx$$

$$I_{13} = \int [D_o(x)\,D_o'(x) + D_b(x)\,D_b'(x)]\,dx$$

$$I_{13+i} = \int [D_o^2(x)\,Y_i'(x, z_{10}) + D_b^2(x)\,Y_i'(x, O)]\,dx \qquad i = 1, 2, 3, 4$$

$$I_{17+i} = \int [D_o(x)\,D_o'(x)\,Y_i(x, z_{10}) + D_b(x)\,D_b'(x)\,Y_i(x, O)]\,dx \qquad i = 1, 2, 3, 4$$

$$I_{21+i} = \int [D_o^2(x)\,Y_i''(x, z_{10}) + D_b^2(x)\,Y_i''(x, O)]\,dx \qquad i = 1, 2, 3, 4$$

$$I_{25+i} = \int [D_o(x)D_o'(x)Y_i'(x, z_{10}) + D_b(x)\,D_b'(x)Y_i'(x, O)]\,dx \qquad i = 1, 2, 3, 4$$

$$I_{29+i} = \int f_i'(x)\,[D_o^2(x) + D_b^2(x)]\,dx \qquad i = 1, 2, 3$$

$$I_{32+i} = \int f_i(x)\,[D_o(x)\,D_o'(x) + D_b(x)\,D_b'(x)]\,dx \qquad i = 1, 2, 3$$

$$I_{36} = \int [(\bar{z}_1 - z_{10})^2\,D_o^2(x) + \bar{z}_1^2\,D_b^2(x)]\,dx$$

$$I_{37} = \int (\bar{x}_1 - x)\,[D_o^2(x)\,(z_{10} - \bar{z}_1) - \bar{z}_1\,D_b^2(x)]\,dx$$

$$I_{37+i} = \int f_i(x)\,[D_o^2(x)\,(z_{10} - \bar{z}_1) - \bar{z}_1\,D_b^2(x)]\,dt \qquad i = 1, 2, 3$$

$$I_{40+i} = \int [Y_i(x, z_{10})D_o^2(x)\,(z_{10} - \bar{z}_1) - Y_i(x, O)\,\bar{z}_1 D_b^2(x)]\,dx \qquad i = 1, 2, 3, 4$$

$$I_{45} = \int [(\bar{z}_1 - z_{10})^2 \, D_o(x) \, D_o'(x) + \bar{z}_1^{\,2} \, D_b(x) \, D_b'(x)] \, dx$$

$$I_{46} = \int (\bar{x}_1 - x) \, [(\bar{z}_1 - z_{10}) \, D_o(x) \, D_o'(x) + \bar{z}_1 \, D_b(x) \, D_b'(x)] \, dx$$

$$I_{46+i} = \int [(z_{10} - \bar{z}_1) Y_i'(x, z_{10}) \, D_o^{\,2}(x) - \bar{z}_1 \, Y_i'(x, O) \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{50+i} = \int [z_{10} - \bar{z}_1) \, Y_i(x, z_{10}) D_o(x) D_o'(x) - \bar{z}_1 Y_i(x, O) \, D_b(x) D_b'(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{54+i} = \int [(z_{10} - \bar{z}) \, Y_i''(x, z_{10}) D_o^{\,2}(x) - \bar{z}_1 Y_i''(x, O) \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{58+i} = \int [(z_{10} - \bar{z}) Y_i'(x, z_{10}) D_o(x) \, D_o'(x) - \bar{z}_1 Y_i'(x, O) D_b(x) D_b'(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{62+i} = \int f_i'(x) \, [(z_{10} - \bar{z}_1) \, D_o^{\,2}(x) - \bar{z}_1 \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3$$

$$I_{65+i} = \int f_i(x) [(z_{10} - \bar{z}_1) \, D_o(x) \, D_o'(x) - \bar{z}_1 \, D_b(x) \, D_b'(x)] \, dt \qquad i = 1, 2, 3$$

$$I_{69} = \int (\bar{x}_1 - x)^2 \, [D_o^{\,2}(x) + D_b^{\,2}(x)] \, dx$$

$$I_{69+i} = \int f_i(x) \, (\bar{x}_1 - x) \, [D_o^{\,2}(x) + D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3$$

$$I_{72+i} = \int (\bar{x}_1 - x) \, [Y_i(x, z_{10}) \, D_o^{\,2}(x) + Y_i(x, O) \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{77} = \int (\bar{x}_1 - x)^2 \, [D_o(x) \, D_o'(x) + D_b(x) \, D_b'(x)] \, dx$$

$$I_{77+i} = \int (\bar{x}_1 - x) \, [Y_i'(x, z_{10}) \, D_o^{\,2}(x) + Y_i'(x, O) \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{81+i} = \int (\bar{x}_1 - x) \, [Y_i(x, z_{10}) \, D_o(x) \, D_o'(x) + Y_i(x, O) \, D_b(x) D_b'(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{85+i} = \int (\bar{x}_1 - x) \, [Y_i''(x, z_{10}) D_o^{\,2}(x) + Y_i''(x, O) \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3, 4$$

$$I_{89+i} = \int (\bar{x}_1 - x) \, [Y_i'(x, z_{10}) D_o(x) D_o'(x) + Y_i'(x, O) D_b(x) D_b'(x)] dx \qquad i = 1, 2, 3, 4$$

$$I_{93+i} = \int f_i'(x) \, (\bar{x}_1 - x) \, [D_o^{\,2}(x) + D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3$$

$$I_{96+i} = \int f_i(x) \, (\bar{x}_1 - x) \, [D_o(x) \, D_o'(x) + D_b(x) \, D_b'(x)] \, dx \qquad i = 1, 2, 3$$

$$I_1(i, j) = \int [Y_i(x, z_{10}) \, Y_j(x, z_{10}) \, D_o^{\,2}(x) + Y_i(x, O) Y_j(x, O) \, D_b^{\,2}(x)] \, dx \qquad j, \, i = 1, 2, 3, 4$$

$$I_2(i, j) = \int f_i(x) \, [Y_j(x, z_{10}) \, D_o^{\,2}(x) + Y_j(x, O) \, D_b^{\,2}(x)] \, dx \qquad i = 1, 2, 3 \quad j = 1, 2, 3, 4$$

$$I_3(i,j) = \int [Y_i'(x, z_{10}) Y_j(x, z_{10})\, D_o^2(x) + Y_i'(x, O)\, Y_j(x, O)\, D_b^2(x)]\, dx \qquad i,j = 1,2,3,4$$

$$I_4(i,j) = \int [Y_i(x, z_{10}) Y_j(x, z_{10}) D_o(x) D_o'(x) + Y_i(x, O)\, Y_j(x, O)\, D_b(x) D_b'(x)]\, dx \qquad i,j = 1,2,3,4$$

$$I_5(i,j) = \int [Y_i''(x, z_{10})\, Y_j(x, z_{10}) D_o^2(x) + Y_i''(x,O) Y_j(x,O) D_b^2(x)]\, dx \qquad i,j = 1,2,3,4$$

$$I_6(i,j) = \int [Y_i'(x, z_{10})\, Y_j(x, z_{10})\, D_o(x)\, D_o'(x) + Y_i'(x, O)\, Y_j(x, O) D_b(x) D_b'(x)]\, dx \qquad i,j = 1,2,3,4$$

$$I_7(i,j) = \int f_i'(x) [Y_j(x, z_{10})\, D_o^2(x) + Y_j(x, O)\, D_b^2(x)]\, dx \qquad i = 1,2,3;\ j = 1,2,3,4$$

$$I_8(i,j) = \int f_i(x)\, [Y_j(x, z_{10})\, D_o(x)\, D_o'(x) + Y_j(x, O)\, D_b(x)\, D_b'(x)]\, dx \qquad i = 1,2,3;\ j = 1,2,3,4$$

APPENDIX B
EXPLICIT REPRESENTATION OF COEFFICIENT MATRICES

APPENDIX B
EXPLICIT REPRESENTATION OF COEFFICIENT MATRICES

The equations of motion may be written in the form:

$$C\dot{x} = Dx + Eu + Fd$$

where C, D, E and F are matrices of appropriate dimensions

$$x = [p, r, v, \phi, \psi, y, \dot{\eta}_1, \eta_1, \dot{\eta}_2, \eta_2, \dot{\eta}_3, \eta_3, \dot{\eta}_4, \eta_4, \delta p, \delta r, \delta a, x_1, x_2, x_3, x, \omega, x_4, p_g]'$$

$$u = [u_1, u_2, u_3]'$$

$$d = [\bar{v}, n_1, n_2]'$$

The matrices C, D, E, and F are actually quite sparse. In fact, the only nonzero elements of E and F are: $e_{15,1}$, $e_{15,2}$, $e_{17,3}$, $f_{18,1}$, $f_{19,1}$, $f_{20,1}$, $f_{21,2}$, $f_{22,2}$, $f_{24,3}$. The matrix C has 17 rows and 14 columns of an identity matrix, that is, $c_{ij} = \delta_{ij}$ for $i \neq 1, 2, 3, 7, 9, 11, 13$, and $c_{ij} = 0$ for $i = 1, 2, 3, 7, 9, 11, 13$ and $j = 4, 5, 6, 8, 10, 12, 14, 15, 16, 17, 21, 22, 23, 24$. In the D matrix there are four rows with a single nonzero element, namely: $d_{ij} = \delta_{i(j+1)}$ for $i = 8, 10, 12, 14$. Major blocks of zeros in D are:

$$d_{ij} = 0, \quad i \neq 3, 4, 5, 6; \quad j = 4, 5, 6$$

$$d_{ij} = 0, \quad i < 18, \quad j = 21, 22, 24$$

$$d_{ij} = 0, \quad i = 4, 5, 6, \quad j > 5$$

$$d_{ij} = 0, \quad i > 14, \quad j < 15$$

The lower right-hand (10 x 10) submatrix of D is nearly diagonal containing only 17 nonzero elements. The nonzero elements of matrices C, D, E, and F are defined explicitly as follows:

$$c_{44} = c_{55} = c_{66} = c_{88} = c_{10,10} = c_{12,12} = 1$$

$$c_{ii} = 1, \quad i \geq 14$$

$$c_{11} = I_{xx} + \frac{H}{V} I_{36}$$

$$c_{12} = -I_{xz} + \frac{H}{V} I_{37}$$

$$c_{13} = \frac{H}{V} I_2$$

$$c_{1,5+2j} = \frac{H}{V} I_{40+j}, \quad j = 1, 2, 3, 4$$

$$c_{1,17+j} = -\frac{H}{V} c_j I_{37+j}, \quad j = 1, 2, 3$$

$$c_{21} = c_{12}$$

$$c_{22} = I_{zz} + \frac{H}{V} I_{69}$$

$$c_{23} = \frac{H}{V} I_3$$

$$c_{2,5+2j} = \frac{H}{V} I_{72+j}, \quad j = 1, 2, 3, 4$$

$$c_{2,17+j} = -\frac{H}{V} c_j I_{69+j}, \quad j = 1, 2, 3$$

$$c_{31} = -c_{13}$$

$$c_{32} = c_{23}$$

$$c_{33} = \frac{W}{g} + \frac{H}{V} I_1$$

$$c_{3,5+2j} = \frac{H}{V} I_{6+j}, \quad j = 1, 2, 3, 4$$

$$c_{3,17+j} = \frac{H}{V} c_j I_{3+j}, \quad j = 1, 2, 3$$

$$c_{5+2i,1} = \frac{H}{V} I_{40+i}, \quad i = 1, 2, 3, 4$$

$$c_{5+2i,2} = \frac{H}{V} I_{72+i}, \quad i = 1, 2, 3, 4$$

$$c_{5+2i,3} = \frac{H}{V} I_{6+i}, \quad i = 1, 2, 3, 4$$

$$c_{5+2i,\,5+2j} = \delta_{ij} M_i + \frac{H}{V} I_1(j,i), \quad i,j = 1, 2, 3, 4$$

$$c_{5+2i,17+j} = -\frac{H}{V} c_j I_2(j,i), \quad i = 1,2,3,4; \quad j = 1,2,3$$

$$d_{11} = Q_o I_{xz} + 2H I_{45}$$

$$d_{12} = Q_o(I_{yy} - I_{zz}) - H(I_2 - 2I_{46})$$

$$d_{13} = \frac{\bar{q}Sb}{V} C_{\ell_\beta}$$

$$d_{1,5+2j} = H[(\cos \alpha_o - 1)I_{46+j} - 2I_{50+j}], \quad j = 1,2,3,4$$

$$d_{1,6+2j} = Hu_o(I_{54+j} + 2I_{58+j}) - \frac{T}{N} Y_j'(x_{1\delta}, 0) \sum_{k=1}^{N} (z_{E_k} - \bar{z}_1), \quad j=1,2,3,4$$

$$d_{1,15} = T\left(\frac{L_{\delta p}}{T}\right)$$

$$d_{1,16} = T\left(\frac{L_{\delta r}}{T}\right)$$

$$d_{1,17} = \bar{q}\, Sb\, C_{\ell_{\delta a}}$$

$$d_{1,17+j} = Hc_i(I_{62+j} + 2I_{65+j}), \quad j = 1,2,3$$

$$d_{1,23} = 2HI_{45}$$

$$d_{21} = Q_o(I_{xx} - I_{yy}) - 2H I_{46}$$

$$d_{22} = -Q_o I_{xz} + H(I_3 - 2I_{77}) + \text{M.R.}$$

$$d_{23} = \frac{\bar{q}Sb}{V} C_{n_\beta}$$

$$d_{2,5+2j} = H[(\cos \alpha_o - 1) I_{77+j} - 2I_{81+j}], \quad j = 1,2,3,4$$

$$d_{2,6+2j} = Hu_o(I_{85+j} + 2I_{89+j}) - T(\bar{x}_1 - x_{1\delta})Y_j'(x_{1\delta}, 0) - T\, Y_j(x_{1\delta}, 0),$$

$$j = 1,2,3,4$$

$$d_{2,15} = T\left(\frac{N_{\delta p}}{T}\right)$$

$$d_{2,16} = T\left(\frac{N_{\delta r}}{T}\right)$$

$$d_{2,17} = \bar{q}\, Sb\, C_{n_{\delta a}}$$

$$d_{2,17+j} = Hc_j(I_{93+j} + 2I_{96+j}), \quad j = 1,2,3$$

$$d_{2,23} = -2HI_{46}$$

$$d_{31} = w_o\left(\frac{W}{g}\right) - \frac{\bar{q}Sb}{V} C_{\ell_\beta}$$

$$d_{32} = -u_o\left(\frac{W}{g}\right) + \frac{\bar{q}Sb}{V} C_{n_\beta} + HI_1$$

$$d_{33} = \frac{\bar{q}S}{V} C_{y_\beta}$$

$$d_{34} = W \cos \theta_o$$

$$d_{35} = W \sin \theta_o$$

$$d_{3,5+2j} = H[(\cos \alpha_o - 1)I_{13+j} - 2I_{17+j}], \quad j = 1,2,3,4$$

$$d_{3,6+2j} = Hu_o(I_{21+j} + 2I_{25+j}) - T\, Y_j'(x_{1\delta}, 0), \quad j = 1, 2, 3, 4$$

$$d_{3,15} = T\left(\frac{Y_{\delta p}}{T}\right)$$

$$d_{3,16} = T\left(\frac{Y_{\delta r}}{T}\right)$$

$$d_{3,17} = \bar{q}\, S\, C_{y_{\delta a}}$$

$$d_{3,17+j} = H\, c_j(I_{29+j} + 2I_{32+j}), \quad j = 1, 2, 3$$

$$d_{3,23} = -\frac{\bar{q}Sb}{V} C_{\ell_\beta}$$

$$d_{41} = 1$$

$$d_{45} = -Q_o$$

$$d_{52} = 1$$

$$d_{54} = Q_o$$

$$d_{63} = 1$$

$$d_{64} = -w_o$$

$$d_{65} = u_o$$

$$d_{5+2i,1} = 2H\, I_{50+i}, \quad i = 1,2,3,4$$

$$d_{5+2i,2} = H(I_{6+i} - 2I_{81+i}),\ i = 1,2,3,4$$

$$d_{5+2i,3} = -2H\, I_{17+i},\ i = 1,2,3,4$$

$$d_{5+2i,5+2j} = H[(\cos \alpha_o - 1)I_3(j,i) - 2I_4(j,i)] - 0.02\delta_{ij}\omega_i M_i$$
$$i,j = 1,2,3,4$$

$$d_{5+2i,6+2j} = Hu_o[I_5(j,i) + 2I_6(j,i)] - \delta_{ij}\omega_i^2 M_i \quad i,j = 1,2,3,4$$

$$d_{5+2i,15} = T\, Y_i(x_{1\delta}, 0)\left(\frac{Y_{\delta p}}{T}\right),\ i = 1,2,3,4$$

$$d_{5+2i,16} = T\, Y_i(x_{1\delta}, 0)\left(\frac{Y_{\delta r}}{T}\right),\ i = 1,2,3,4$$

$$d_{5+2i,17+j} = H\, c_j[I_7(j,i) + 2I_8(j,i)],\ i = 1,2,3,4;\ j = 1,2,3$$

$$d_{5+2i,23} = d_{5+2i,1}$$

$$d_{15,15} = -31.6$$

$$d_{16,16} = -31.6$$

$$d_{17,17} = -10$$

$$d_{18,18} = -2.3\ V/L$$

$$d_{18,22} = -(\sigma_{v_w}/V)d_{18,18}$$

$$d_{19,19} = 3.99\ V/L$$

$$d_{19,20} = -6.29\ V/L$$

$$d_{8,7} = d_{10,9} = d_{12,11} = d_{14,13} = 1$$

$$d_{19,22} = -(\sigma_{v_w}/V)(d_{19,19} + d_{19,20})$$

$$d_{20,19} = 12.58\ V/L$$

$$d_{20,20} = -8.59\ V/L$$

$$d_{20,22} = -(\sigma_{v_w}/V)(d_{20,19} + d_{20,20})$$

$$d_{22,21} = \dot{h} = \text{altitude rate}$$

$$d_{21,22} = -\dot{h}\,[(0.95)^2 + (0.735)^2]\,10^{-8}$$

$$d_{21,21} = -1.9\dot{h}\ (10^{-4})$$

$$d_{23,23} = -2.3\ V/(r.c.)$$

$$d_{23,24} = -d_{23,23}$$

$$d_{24,24} = -\pi\ V/4b$$

$$e_{15,1} = -d_{15,15}$$

$$e_{16,2} = -d_{16,16}$$

$$e_{17,3} = -d_{17,17}$$

$$f_{18,1} = -d_{18,18}/V$$

$$f_{19,1} = -(d_{19,19} + d_{19,20})/V$$

$$f_{20,1} = -(d_{20,19} + d_{20,20})/V$$

$$f_{21,2} = f_{22,2} \{ [(0.95)^2 + (0.735)^2]^{1/2} - 1.9 \} 10^{-4}$$

$$f_{22,2} = 10^{-2} \sqrt{1.9\,\dot{h}}$$

$$f_{24,3} = \frac{\pi \sigma_p}{4b} \sqrt{\frac{4V}{5L_p}} \left(\frac{\pi L_p}{4b} \right)^{1/6}$$

The inertial rate and jet damping term appearing in d_{22} is:

$$\text{M.R.} = \frac{(x_{1\delta} - \bar{x}_1 + 15)^2}{32.17} \quad \frac{d}{dt} \quad W - \frac{d}{dt} I_{zz}.$$

APPENDIX C
NUMERICAL VALUES OF COEFFICIENT MATRICES

APPENDIX C

NUMERICAL VALUES OF COEFFICIENT MATRICES

In this appendix, the coefficients associated with the equations of motion are displayed at five-second intervals, from 0 to 210 seconds. In Appendix B the equations of motion were written in the form

$$C\dot{x} = Dx + Eu + Fd$$

Multiplying the equation by C^{-1}, and separating d into two components, the following standard state vector representation is obtained:

$$\dot{x} = Ax + B_1 u + B_2 \bar{v} + B_3 n \qquad \text{(C1)}$$

$$C^{-1}D = A$$

$$C^{-1}E = B_1$$

$$C^{-1}F = [B_2\ B_3]$$

$$n = [n_1, n_2]$$

The response vector r is defined to be

$$r = [\phi, \dot{\phi},\ y, \dot{y},\ \delta p, \dot{\delta p},\ \delta r, \dot{\delta r},\ \delta a, \dot{\delta a},\ \bar{q}\beta, \dot{\bar{q}\beta},\ a_y, \dot{a}_y]$$

where

$$\bar{q}\beta = \frac{\bar{q}}{V}[v + \sigma\omega + \bar{v}]$$

$$a_y = \dot{v} + (\bar{x}_1 - 110)\dot{r} - (\bar{z}_1 - 40)\dot{p} + \sum_{i=1}^{4} Y_i(110, z_{10})\ddot{\eta}_i + u_o r - w_o p$$

$$-g(\psi s\theta_o + \phi c\theta_o) + (\bar{x}_1 - 110)Q_o p + (\bar{z}_1 - 40)Q_o r$$

and

σ = standard deviation of wind

$\bar{v}$ = mean value of wind

$\bar{x}_1$ = x_1 coordinate of vehicle center of mass

$\bar{z}_1$ = z_1 coordinate of vehicle center of mass

The response vector is related to the states, control and mean wind via the following equation:

$$r = H_1 x + D_1 u + D_2 \bar{v} \qquad (C2)$$

The structure of the state equations and response equations are displayed in Table C1 and Table C2, respectively. The values of elements of the matrices A, B_1, B_2, B_3, H_1, D_1, D_2 are exhibited from 0 to 210 seconds at five-second intervals in Tables C3 through C8. Elements which are equal to 0 will not be displayed, and the elements which are constant are displayed separately first. Numerical data was provided in English units. To reduce errors these units were maintained.

$a_{4,1} = 1.0$

$a_{5,2} = 1.0$

$a_{6,3} = 1.0$

$a_{8,7} = 1.0$

$a_{10,9} = 1.0$

$a_{12,11} = 1.0$

$a_{14,13} = 1.0$

$a_{15,15} = -31.6$ (1/sec)

$a_{16,16} = -31.6$ (1/sec)

$a_{17,17} = -10.0$ (1/sec)

$b^1_{15,1} = 31.6$ (1/sec)

$b^1_{16,2} = 31.6$ (1/sec)

$b^1_{17,3} = 10.0$ (1/sec)

$h^1_{1,4} = 1.0$

$h^1_{2,1} = 1.0$

$h^1_{3,6} = 1.0$

$h^1_{4,3} = 1.0$

$h^1_{5,15} = 1.0$

$h^1_{6,15} = -31.6$ (1/sec)

$h^1_{7,16} = 1.0$

$h^1_{8,16} = -31.6$ (1/sec)

$h^1_{9,17} = 1.0$

$h^1_{10,17} = -10.0$ (1/sec)

$$d^1_{6,1} = 31.6 \text{ (1/sec)}$$

$$d^1_{8,2} = 31.6 \text{ (1/sec)}$$

$$d^1_{10,3} = 10.0 \text{ (1/sec)}$$

Table C1. State Equations

Table C2. Response Equations

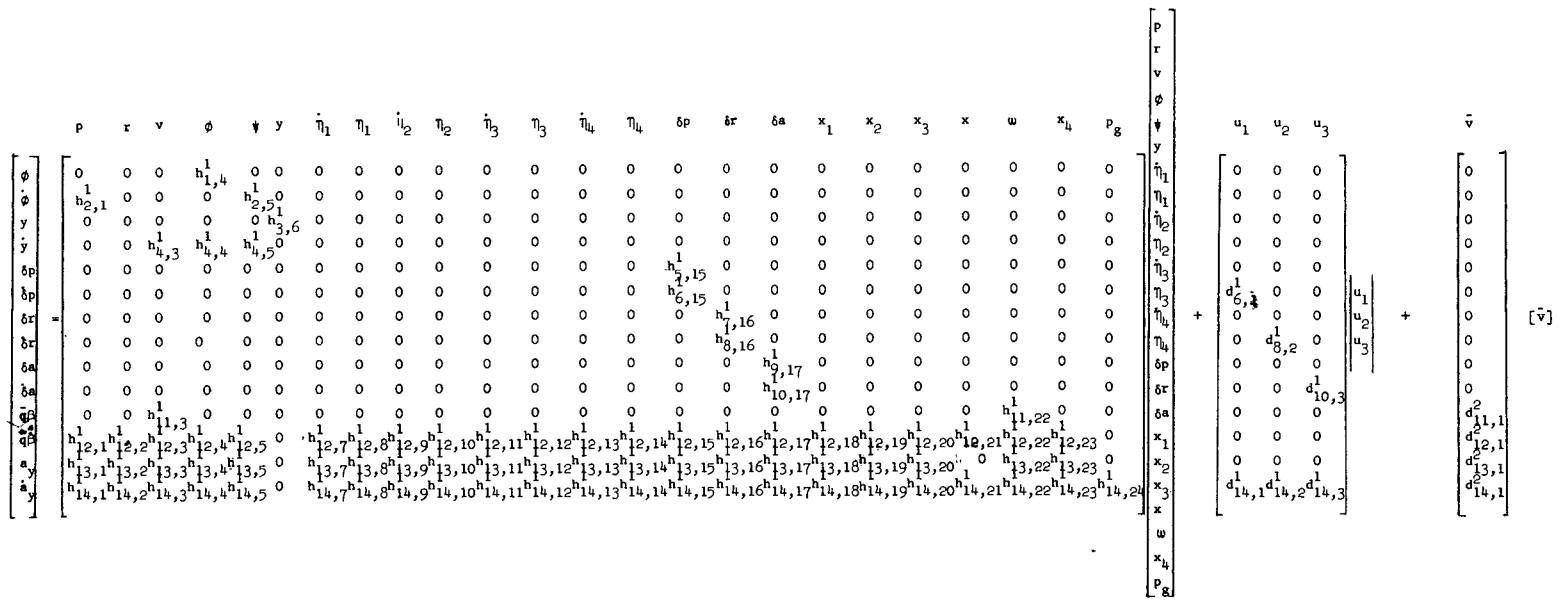

Table C3. A Matrix (continued)

TIME	A(3,10)	A(3,11)	A(3,12)	A(3,13)	A(3,14)	A(3,15)	A(3,16)	A(3,17)	A(3,18)	A(3,19)
	1 SEC^2	1/SEC	1/SEC^2	1/SEC	1/SEC^2	FT/SEC^2-RAD	FT/SEC^2-RAD	FT/SEC^2-RAD	FT/SEC^2	FT/SEC^2
0.	.7523E-02	.1841E-02	.1175E+01	-.1608E-03	.3516E+00	-.5832E-01	-.2456E+02	0.	0.	0.
5.	.1589E-01	-.7345E-03	.1138E+01	-.5394E-03	.3662E+00	-.5847E-01	-.2529E+02	-.2255E-03	-.2944E-02	-.1170E+00
10.	.2438E-01	-.3472E-02	.1142E+01	-.9512E-03	.3817E+00	-.5865E-01	-.2644E+02	-.9585E-03	-.6111E-02	-.2449E+00
15.	.3222E-01	-.6332E-02	.1141E+01	-.1348E-02	.3965E+00	-.5931E-01	-.2657E+02	-.2274E-02	-.9772E-02	-.3832E+00
20.	.3892E-01	-.9286E-02	.1135E+01	-.1846E-02	.4105E+00	-.5974E-01	-.2575E+02	-.4246E-02	-.1333E-01	-.5243E+00
25.	.4437E-01	-.1227E-01	.1122E+01	-.2314E-02	.4241E+00	-.5892E-01	-.2701E+02	-.6666E-02	-.1687E-01	-.6664E+00
30.	.4803E-01	-.1520E-01	.1104E+01	-.2779E-02	.4366E+00	-.5822E-01	-.2764E+02	-.9610E-02	-.2066E-01	-.8130E+00
35.	.4971E-01	-.1802E-01	.1080E+01	-.3234E-02	.4485E+00	-.5798E-01	-.2840E+02	-.1307E-01	-.2299E-01	-.9470E+00
40.	.4890E-01	-.2068E-01	.1052E+01	-.3666E-02	.4588E+00	-.5451E-01	-.2913E+02	-.1594E-01	-.2631E-01	-.1078E+01
45.	.4533E-01	-.2312E-01	.1022E+01	-.4045E-02	.4674E+00	-.5067E-01	-.3009E+02	-.1831E-01	-.2700E-01	-.1197E+01
50.	.3852E-01	-.2526E-01	.9893E+00	-.4419E-02	.4724E+00	-.4931E-01	-.3119E+02	-.2119E-01	-.4093E-01	-.1457E+01
55.	.2826E-01	-.2706E-01	.9568E+00	-.4716E-02	.4734E+00	-.4481E-01	-.3244E+02	-.2244E-01	-.4695E-01	-.1629E+01
60.	.1474E-01	-.2838E-01	.9213E+00	-.4930E-02	.4683E+00	-.4076E-01	-.3361E+02	-.2235E-01	-.5261E-01	-.1784E+01
65.	-.7462E-03	-.2908E-01	.8762E+00	-.5034E-02	.4553E+00	-.3640E-01	-.3489E+02	-.1726E-01	-.6484E-01	-.2030E+01
70.	-.1602E-01	-.2910E-01	.8169E+00	-.5013E-02	.4340E+00	-.3142E-01	-.3617E+02	-.1806E-01	-.1080E+00	-.2591E+01
75.	-.2091E-01	-.2847E-01	.7411E+00	-.4872E-02	.4316E+00	-.2698E-01	-.3752E+02	-.1661E-01	-.3547E-01	-.1564E+01
80.	-.2067E-01	-.2713E-01	.6427E+00	-.4500E-02	.4276E+00	-.2252E-01	-.3888E+02	-.1459E-01	-.2121E-01	-.1286E+01
85.	-.1147E-01	-.2501E-01	.5131E+00	-.4169E-02	.4248E+00	-.1802E-01	-.4050E+02	-.1559E-01	-.1322E-01	-.1051E+01
90.	.1024E-01	-.2220E-01	.3523E+00	-.3606E-02	.4269E+00	-.1409E-01	-.4169E+02	-.1200E-01	-.5988E-02	-.8139E+00
95.	.4524E-01	-.1892E-01	.1652E+00	-.2963E-02	.4232E+00	-.1052E-01	-.4305E+02	-.6094E-02	-.3824E-03	-.5973E+00
100.	.9644E-01	-.1560E-01	-.3152E-01	-.2440E-02	.4309E+00	-.7446E-02	-.4417E+02	-.2540E-02	.3068E-03	-.4630E+00
105.	.1548E+00	-.1285E-01	-.2034E+00	-.2059E-02	.4347E+00	-.5377E-02	-.4534E+02	-.1241E-02	.1154E-02	-.3527E+00
110.	.2214E+00	-.1054E-01	-.3584E+00	-.1791E-02	.4358E+00	-.3833E-02	-.4604E+02	-.7520E-03	.2111E-02	-.2631E+00
115.	.3073E+00	-.8621E-02	-.5096E+00	-.1577E-02	.4199E+00	-.2696E-02	-.4672E+02	-.4758E-03	.2102E-02	-.1976E+00
120.	.3934E+00	-.7062E-02	-.6449E+00	-.1119E-02	.4073E+00	-.1967E-02	-.4755E+02	-.2668E-03	.1919E-02	-.1525E+00
125.	.4803E+00	-.5771E-02	-.7706E+00	-.9639E-03	.3971E+00	-.1382E-02	-.4809E+02	-.1214E-03	.2285E-02	-.1110E+00
130.	.5645E+00	-.4717E-02	-.8858E+00	-.8654E-03	.3892E+00	-.9749E-03	-.4898E+02	-.4482E-04	.1952E-02	-.8572E-01
135.	.6454E+00	-.3865E-02	-.9918E+00	-.8042E-03	.3837E+00	-.6878E-03	-.4955E+02	-.1559E-04	.2009E-02	-.6159E-01
140.	.7207E+00	-.3181E-02	-.1089E+01	-.7612E-03	.3809E+00	-.4848E-03	-.5015E+02	-.6451E-05	.1849E-02	-.4462E-01
145.	.7909E+00	-.2632E-02	-.1178E+01	-.7233E-03	.3813E+00	-.3140E-03	-.5113E+02	-.3673E-05	.1554E-02	-.3435E-01
150.	.8547E+00	-.2193E-02	-.1260E+01	-.7012E-03	.3850E+00	-.2114E-03	-.5216E+02	-.2294E-05	.1702E-02	-.2097E-01
155.	.9127E+00	-.1843E-02	-.1337E+01	-.6775E-03	.3925E+00	-.1334E-03	-.5331E+02	-.1323E-05	.1476E-02	-.1516E-01
160.	.9621E+00	-.1562E-02	-.1404E+01	-.6538E-03	.4033E+00	-.8270E-04	-.5438E+02	-.7189E-06	.1344E-02	-.1027E-01
165.	.9693E+00	-.1334E-02	-.1413E+01	-.6238E-03	.4056E+00	-.3898E-04	-.5305E+02	-.2895E-06	.1436E-02	-.3700E-02
170.	.9698E+00	-.1148E-02	-.1416E+01	-.6033E-03	.4104E+00	-.2339E-04	-.5146E+02	-.1514E-06	.1267E-02	-.1420E-02
175.	.9644E+00	-.9982E-03	-.1415E+01	-.5775E-03	.4174E+00	-.1404E-05	-.5027E+02	-.3055E-07	.1172E-02	.6455E-03
180.	.9542E+00	-.8796E-03	-.1410E+01	-.5549E-03	.4266E+00	.6546E-05	-.4911E+02	.3417E-07	.1213E-02	.3707E-02
185.	.9407E+00	-.7763E-03	-.1404E+01	-.5299E-03	.4369E+00	.1027E-04	-.4724E+02	.4926E-07	.1277E-02	.6647E-02
190.	.9241E+00	-.6864E-03	-.1395E+01	-.5014E-03	.4480E+00	.1220E-04	-.4723E+02	.4848E-07	.1311E-02	.8951E-02
195.	.9053E+00	-.6073E-03	-.1386E+01	-.4719E-03	.4596E+00	.1484E-04	-.4550E+02	.4109E-07	.1368E-02	.1130E-01
200.	.8848E+00	-.5382E-03	-.1375E+01	-.4424E-03	.4723E+00	.1720E-04	-.4435E+02	.6627E-07	.1425E-02	.1358E-01
205.	.8629E+00	-.4768E-03	-.1364E+01	-.4122E-03	.4848E+00	.1654E-04	-.4320E+02	.6534E-07	.1477E-02	.1551E-01
210.	.8399E+00	-.4225E-03	-.1352E+01	-.3821E-03	.4975E+00	.1616E-04	-.4255E+02	.5375E-07	.1488E-02	.1669E-01

Table C3. A Matrix (continued)

TIME	A(2,22)	A(2,23)	A(3, 1)	A(3, 2)	A(3, 3)	A(3, 4)	A(3, 5)	A(3, 7)	A(3, 8)	A(3, 9)
	RAD/SEC^2	RAD/SEC^2	FT/SEC-RAD	FT/SEC-RAD	1/SEC	FT/SEC^2-RAD	FT/SEC^2-RAD	1/SEC	1/SEC^2	1/SEC
0.	.2668E-03	0.	0.	-.151RE-01	0.	.1121E+01	.3174E+02	.5252E-03	-.4045E+00	.4317E-04
5.	.2744E-03	-.5112E-03	.1389E+00	-.4980E+02	-.4724E-02	.1121E+01	.3174E+02	-.1483E-02	-.4164E+00	-.2202E-04
10.	.2800E-03	-.1019E-02	-.1196E-01	-.1030E+03	-.9916E-02	.1293E+01	.3173E+02	-.3698E-02	-.4182E+00	-.4194E-04
15.	.2903E-03	-.1483E-02	.2881E+00	-.1590E+03	-.1535E-01	.1719E+01	.3171E+02	-.6071E-02	-.4144E+00	-.9975E-05
20.	.3129E-03	-.1916E-02	.1812E+01	-.2184E+03	-.2100E-01	.2151E+01	.3159E+02	-.8589E-02	-.4027E+00	.7753E-04
25.	.3249E-03	-.2272E-02	.1429E+01	-.2818E+03	-.2673E-01	.2991E+01	.3142E+02	-.1121E-01	-.3839E+00	.2269E-03
30.	.3467E-03	-.2552E-02	.1949E+01	-.3495E+03	-.3240E-01	.4165E+01	.3150E+02	-.1388E-01	-.3562E+00	.4371E-03
35.	.3821E-03	-.2746E-02	.2543E+01	-.4222E+03	-.3842E-01	.5673E+01	.3137E+02	-.1656E-01	-.3194E+00	.7123E-03
40.	.3877E-03	-.2818E-02	.3223E+01	-.5011E+03	-.4414E-01	.7482E+01	.3040E+02	-.1921E-01	-.2735E+00	.1045E-02
45.	.4077E-03	-.2772E-02	.3858E+01	-.5872E+03	-.5078E-01	.9527E+01	.3034E+02	-.2178E-01	-.2184E+00	.1436E-02
50.	.4948E-03	-.2627E-02	.4456E+01	-.6819E+03	-.5670E-01	.1155E+02	.2945E+02	-.2420E-01	-.1553E+00	.1869E-02
55.	.5426E-03	-.2386E-02	.4751E+01	-.7853E+03	-.6249E-01	.1338E+02	.2888E+02	-.2641E-01	-.8711E-01	.2339E-02
60.	.6082E-03	-.2102E-02	.5548E+01	-.8981E+03	-.6832E-01	.1510E+02	.2804E+02	-.2826E-01	-.1968E-01	.2815E-02
65.	.7046E-03	-.1761E-02	.6443E+01	-.1016E+04	-.7340E-01	.1688E+02	.2703E+02	-.2950E-01	.3267E-01	.3272E-02
70.	.8871E-03	-.1366E-02	.7454E+01	-.1142E+04	-.7897E-01	.1860E+02	.2589E+02	-.3029E-01	.6235E-01	.3671E-02
75.	.5822E-03	-.1102E-02	.6606E+01	-.1275E+04	-.6759E-01	.2022E+02	.2447E+02	-.3036E-01	.7552E-01	.3999E-02
80.	.4332E-03	-.7704E-03	.6688E+01	-.1424E+04	-.6221E-01	.2175E+02	.2335E+02	-.2963E-01	.5851E-01	.4210E-02
85.	.2901E-03	-.4438E-03	.6651E+01	-.1589E+04	-.5441E-01	.2318E+02	.2196E+02	-.2797E-01	.1149E-02	.4269E-02
90.	.1720E-03	-.1382E-03	.6569E+01	-.1771E+04	-.4640E-01	.2446E+02	.2055E+02	-.2540E-01	-.1011E+00	.4147E-02
95.	.1066E-03	.8730E-04	.6464E+01	-.1975E+04	-.3749E-01	.2558E+02	.1916E+02	-.2212E-01	-.2630E+00	.3852E-02
100.	.6810E-04	.2235E-03	.6405E+01	-.2197E+04	-.3015E-01	.2655E+02	.1741E+02	-.1862E-01	-.4572E+00	.3425E-02
105.	.4445E-04	.2956E-03	.6391E+01	-.2438E+04	-.2413E-01	.2738E+02	.1561E+02	-.1557E-01	-.6432E+00	.3000E-02
110.	.2847E-04	.3168E-03	.6494E+01	-.2698E+04	-.1938E-01	.2810E+02	.1527E+02	-.1317E-01	-.8227E+00	.2584E-02
115.	.1774E-04	.2995E-03	.6565E+01	-.2976E+04	-.1513E-01	.2873E+02	.1407E+02	-.1090E-01	-.9899E+00	.2297E-02
120.	.1172E-04	.2825E-03	.6512E+01	-.3272E+04	-.1211E-01	.2925E+02	.1294E+02	-.9071E-02	-.1155E+01	.2001E-02
125.	.7391E-05	.2529E-03	.6450E+01	-.3587E+04	-.9742E-02	.2969E+02	.1131E+02	-.7565E-02	-.1325E+01	.1711E-02
130.	.5039E-05	.2256E-03	.6390E+01	-.3918E+04	-.7774E-02	.3006E+02	.1035E+02	-.6329E-02	-.1501E+01	.1441E-02
135.	.3366E-05	.2000E-03	.6344E+01	-.4267E+04	-.6272E-02	.3037E+02	.1007E+02	-.5326E-02	-.1683E+01	.1202E-02
140.	.2213E-05	.1725E-03	.6296E+01	-.4633E+04	-.4997E-02	.3063E+02	.9253E+01	-.4512E-02	-.1872E+01	.9965E-03
145.	.1508E-05	.1501E-03	.6239E+01	-.5018E+04	-.4012E-02	.3085E+02	.8508E+01	-.3850E-02	-.2070E+01	.8228E-03
150.	.9457E-06	.1315E-03	.6166E+01	-.5420E+04	-.3247E-02	.3103E+02	.7822E+01	-.3311E-02	-.2277E+01	.6783E-03
155.	.6244E-06	.1144E-03	.6087E+01	-.5840E+04	-.2634E-02	.3118E+02	.7192E+01	-.2875E-02	-.2497E+01	.5597E-03
160.	.4110E-06	.1010E-03	.5998E+01	-.6279E+04	-.2156E-02	.3131E+02	.6615E+01	-.2518E-02	-.2723E+01	.4626E-03
165.	.2370E-06	.8748E-04	.5940E+01	-.6729E+04	-.1811E-02	.3141E+02	.6106E+01	-.2221E-02	-.2850E+01	.3834E-03
170.	.1536E-06	.8023E-04	.5848E+01	-.7181E+04	-.1474E-02	.3150E+02	.5628E+01	-.1971E-02	-.2976E+01	.3186E-03
175.	.9300E-07	.7210E-04	.5756E+01	-.7634E+04	-.1237E-02	.3158E+02	.5193E+01	-.1755E-02	-.3100E+01	.2670E-03
180.	.4620E-07	.6403E-04	.5659E+01	-.8090E+04	-.1047E-02	.3164E+02	.4797E+01	-.1599E-02	-.3221E+01	.2261E-03
185.	.1532E-07	.5902E-04	.5562E+01	-.8548E+04	-.9330E-03	.3169E+02	.4435E+01	-.1449E-02	-.3341E+01	.1916E-03
190.	-.2870E-08	.5437E-04	.5465E+01	-.9007E+04	-.8136E-03	.3174E+02	.4105E+01	-.1313E-02	-.3460E+01	.1626E-03
195.	-.1391E-07	.4926E-04	.536RE+01	-.9469E+04	-.7135E-03	.3177E+02	.3805E+01	-.1198E-02	-.3578E+01	.1381E-03
200.	-.1804E-07	.4396E-04	.5273E+01	-.9931E+04	-.6237E-03	.3180E+02	.3531E+01	-.1076E-02	-.3697E+01	.1175E-03
205.	-.1741E-07	.4025E-04	.5178E+01	-.1039E+05	-.5451E-03	.3183E+02	.3283E+01	-.9730E-03	-.3811E+01	.1001E-03
210.	-.1214E-07	.3644E-04	.5087E+01	-.1086E+05	-.4740E-03	.3185E+02	.3057E+01	-.8783E-03	-.3923E+01	.8544E-04

Table C3. A Matrix (continued)

TIME	A(2,11)	A(2,12)	A(2,13)	A(2,14)	A(2,15)	A(2,16)	A(2,17)	A(2,18)	A(2,19)	A(2,20)
	RAD/FT-SEC	RAD/FT-SEC^2	RAD/FT-SEC	RAD/FT-SEC^2	1/SEC^2	1/SEC^2	1/SEC^2	RAD/SEC^2	RAD/SEC^2	RAD/SEC^2
0.	-.7474E-04	-.5787E-01	.1917E-04	.4627E-02	-.3590E-01	.1004E+01	0.	0.	0.	0.
5.	.1744E-04	-.5678E-01	.3940E-05	.3444E-02	-.4011E-01	.1042E+01	-.1552E-03	-.2448E-03	-.2200E-02	.1930E-02
10.	.1144E-03	-.5713E-01	-.9342E-05	.2828E-02	-.4191E-01	.1065E+01	-.6806E-03	-.5048E-03	-.4749E-02	.4000E-02
15.	.2136E-03	-.5691E-01	-.1967E-04	.1858E-02	-.4396E-01	.1082E+01	-.1722E-02	-.8057E-03	-.7476E-02	.6254E-02
20.	.3174E-03	-.5697E-01	-.2707E-04	.8255E-03	-.4828E-01	.1096E+01	-.3455E-02	-.1108E-02	-.1044E-01	.8648E-02
25.	.4173E-03	-.5621E-01	-.3106E-04	-.1311E-03	-.5078E-01	.1069E+01	-.5747E-02	-.1393E-02	-.1315E-01	.1087E-01
30.	.5183E-03	-.5574E-01	-.3189E-04	-.1138E-02	-.5466E-01	.1093E+01	-.9046E-02	-.1718E-02	-.1625E-01	.1333E-01
35.	.6209E-03	-.5550E-01	-.2946E-04	-.2180E-02	-.5842E-01	.1133E+01	-.1366E-01	-.1949E-02	-.1970E-01	.1584E-01
40.	.7048E-03	-.5390E-01	-.2480E-04	-.3030E-02	-.6222E-01	.1147E+01	-.1825E-01	-.2216E-02	-.2200E-01	.1774E-01
45.	.7772E-03	-.5218E-01	-.1824E-04	-.3674E-02	-.6446E-01	.1162E+01	-.2337E-01	-.2259E-02	-.2430E-01	.1939E-01
50.	.8635E-03	-.5174E-01	-.1014E-04	-.4454E-02	-.7318E-01	.1232E+01	-.3152E-01	-.3539E-02	-.3040E-01	.2438E-01
55.	.9117E-03	-.4967E-01	-.2848E-05	-.4749E-02	-.7631E-01	.1267E+01	-.3829E-01	-.4057E-02	-.3343E-01	.2686E-01
60.	.9573E-03	-.4831E-01	.3244E-05	-.4790E-02	-.8159E-01	.1317E+01	-.4449E-01	-.4619E-02	-.3711E-01	.2960E-01
65.	.9814E-03	-.4680E-01	.7021E-05	-.4352E-02	-.8694E-01	.1361E+01	-.4129E-01	-.5782E-02	-.4192E-01	.3374E-01
70.	.9712E-03	-.4418E-01	.7264E-05	-.3581E-02	-.9093E-01	.1394E+01	-.5232E-01	-.9673E-02	-.5003E-01	.4240E-01
75.	.9479E-03	-.4144E-01	.4770E-05	-.3633E-02	-.9577E-01	.1441E+01	-.5964E-01	-.3226E-02	-.3410E-01	.2600E-01
80.	.9001E-03	-.3795E-01	.7715E-06	-.3723E-02	-.1029E+00	.1489E+01	-.6648E-01	-.1958E-02	-.2940E-01	.2156E-01
85.	.8223E-03	-.3332E-01	-.2612E-05	-.4057E-02	-.1088E+00	.1540E+01	-.9416E-01	-.1234E-02	-.2472E-01	.1766E-01
90.	.7213E-03	-.2763E-01	-.3065E-05	-.4892E-02	-.1170E+00	.1582E+01	-.9960E-01	-.5653E-03	-.2023E-01	.1384E-01
95.	.6104E-03	-.2195E-01	-.1140E-05	-.5681E-02	-.1257E+00	.1619E+01	-.7277E-01	-.3662E-04	-.1574E-01	.1032E-01
100.	.4907E-03	-.1530E-01	.1047E-05	-.6614E-02	-.1324E+00	.1640E+01	-.4527E-01	.2922E-04	-.1232E-01	.7954E-02
105.	.3951E-03	-.9866E-02	.2139E-05	-.7378E-02	-.1431E+00	.1667E+01	-.3299E-01	.1097E-03	-.9730E-02	.6108E-02
110.	.3170E-03	-.5055E-02	.1730E-05	-.7932E-02	-.1534E+00	.1680E+01	-.3005E-01	.1997E-03	-.7580E-02	.4595E-02
115.	.2504E-03	-.6243E-03	.6747E-05	-.7959E-02	-.1594E+00	.1686E+01	-.2808E-01	.1952E-03	-.5710E-02	.3418E-02
120.	.2010E-03	.2930E-02	.8267E-05	-.7959E-02	-.1707E+00	.1709E+01	-.2311E-01	.1779E-03	-.4545E-02	.2670E-02
125.	.1599E-03	.6412E-02	.7450E-05	-.7954E-02	-.1799E+00	.1720E+01	-.1577E-01	.2089E-03	-.3466E-02	.1957E-02
130.	.1273E-03	.9332E-02	.5619E-05	-.7924E-02	-.1917E+00	.1736E+01	-.8796E-02	.1761E-03	-.2728E-02	.1518E-02
135.	.1018E-03	.1164E-01	.3388E-05	-.7875E-02	-.2054E+00	.1735E+01	-.4676E-02	.1792E-03	-.2181E-02	.1113E-02
140.	.8278E-04	.1365E-01	.1068E-05	-.7913E-02	-.2168E+00	.1747E+01	-.3006E-02	.1631E-03	-.1605E-02	.9200E-03
145.	.6744E-04	.1539E-01	-.1006E-05	-.8009E-02	-.2307E+00	.1768E+01	-.2691E-02	.1352E-03	-.1249E-02	.6380E-03
150.	.5549E-04	.1680E-01	-.2737E-05	-.8182E-02	-.2471E+00	.1793E+01	-.2673E-02	.1466E-03	-.9270E-03	.4154E-03
155.	.4613E-04	.1778E-01	-.4200E-05	-.8396E-02	-.2625E+00	.1814E+01	-.2595E-02	.1252E-03	-.7174E-03	.3096E-03
160.	.3879E-04	.1864E-01	-.5330E-05	-.8730E-02	-.2815E+00	.1841E+01	-.2435E-02	.1129E-03	-.5540E-03	.2233E-03
165.	.3270E-04	.1820E-01	-.6150E-05	-.8753E-02	-.2853E+00	.1759E+01	-.2104E-02	.1176E-03	-.3748E-03	.1129E-03
170.	.2831E-04	.1733E-01	-.6785E-05	-.8893E-02	-.3047E+00	.1712E+01	-.1954E-02	.1047E-03	-.2895E-03	.7054E-04
175.	.2465E-04	.1683E-01	-.7201E-05	-.9134E-02	-.3194E+00	.1672E+01	-.1870E-02	.9621E-04	-.2102E-03	.3209E-04
180.	.2123E-04	.1561E-01	-.7325E-05	-.9144E-02	-.3213E+00	.1587E+01	-.1674E-02	.9658E-04	-.1257E-03	-.1953E-04
185.	.1892E-04	.1450E-01	-.7514E-05	-.9380E-02	-.3386E+00	.1528E+01	-.1640E-02	.1022E-03	-.5018E-04	-.6995E-04
190.	.1680E-04	.1368E-01	-.7542E-05	-.9693E-02	-.3584E+00	.1526E+01	-.1425E-02	.1050E-03	.1491E-04	-.1118E-03
195.	.1498E-04	.1265E-01	-.7461E-05	-.9953E-02	-.3547E+00	.1471E+01	-.1025E-02	.1093E-03	.7893E-04	-.1532E-03
200.	.1315E-04	.1165E-01	-.7185E-05	-.1013E-01	-.3754E+00	.1421E+01	-.1150E-02	.1116E-03	.1350E-03	-.1907E-03
205.	.1174E-04	.1074E-01	-.6991E-05	-.1048E-01	-.3923E+00	.1390E+01	-.1558E-02	.1162E-03	.1947E-03	-.2279E-03
210.	.1031E-04	.9654E-02	-.6588E-05	-.1062E-01	-.4060E+00	.1352E+01	-.1353E-02	.1155E-03	.2361E-03	-.2510E-03

Table C3. A Matrix (continued)

TIME	A(1,23)	A(2, 1)	A(2, 2)	A(2, 3)	A(2, 4)	A(2, 5)	A(2, 7)	A(2, 8)	A(2, 9)	A(2,10)
	RAD/SEC^2	1/SEC	1/SEC	RAD/FT-SEC	1/SEC^2	1/SEC^2	RAD/FT-SEC	RAD/FT-SEC^2	RAD/FT-SEC	RAD/FT-SEC^2
0.	0.	0.	-.2207E-01	0.	.1843E-03	.5219E-02	-.2740E-04	.3955E-02	-.9442E-06	-.1747E-03
5.	-.4176E-02	-.2755E-03	-.5951E-01	.7310E-04	.1806E-03	.5115E-02	.2020E-04	.4192E-02	-.6928E-06	-.3707E-03
10.	-.8573E-02	.7349E-03	-.1001E+00	.1530E-03	.2072E-03	.5086E-02	.6926E-04	.3462E-02	-.1019E-05	-.5359E-03
15.	-.1301E-01	.6674E-03	-.1381E+00	.2409E-03	.2716E-03	.5011E-02	.1182E-03	.2814E-02	-.2337E-05	-.6583E-03
20.	-.1750E-01	.1381E-02	-.1806E+00	.3367E-03	.3360E-03	.4950E-02	.1688E-03	.1926E-02	-.4697E-05	-.7375E-03
25.	-.2182E-01	.3388E-02	-.2207E+00	.4276E-03	.4520E-03	.4780E-02	.2175E-03	.5539E-03	-.8210E-05	-.7379E-03
30.	-.2582E-01	.4983E-02	-.2571E+00	.5220E-03	.6092E-03	.4607E-02	.2675E-03	-.1103E-02	-.1290E-04	-.6761E-03
35.	-.2954E-01	.6575E-02	-.3027E+00	.6015E-03	.8025E-03	.4423E-02	.3104E-03	-.3151E-02	-.1891E-04	-.5342E-03
40.	-.3263E-01	.8454E-02	-.3329E+00	.7055E-03	.9913E-03	.4094E-02	.3649E-03	-.5538E-02	-.2581E-04	-.2759E-03
45.	-.3512E-01	.9518E-02	-.3538E+00	.8005E-03	.1167E-02	.3715E-02	.4072E-03	-.8404E-02	-.3349E-04	.1075E-03
50.	-.3686E-01	.9064E-02	-.3863E+00	.8908E-03	.1333E-02	.3423E-02	.4598E-03	-.1153E-01	-.4245E-04	.5827E-03
55.	-.3820E-01	.8262E-02	-.4037E+00	.1030E-02	.1396E-02	.3013E-02	.4947E-03	-.1462E-01	-.5094E-04	.1197E-02
60.	-.3847E-01	.8979E-02	-.4136E+00	.1047E-02	.1429E-02	.2653E-02	.5322E-03	-.1795E-01	-.5978E-04	.1958E-02
65.	-.3810E-01	.1013E-01	-.4206E+00	.1296E-02	.1429E-02	.2289E-02	.5606E-03	-.2108E-01	-.6779E-04	.2864E-02
70.	-.3662E-01	.1042E-01	-.4115E+00	.1422E-02	.1374E-02	.1912E-02	.5716E-03	-.2298E-01	-.7348E-04	.3720E-02
75.	-.3425E-01	.1053E-01	-.3965E+00	.1155E-02	.1292E-02	.1577E-02	.5752E-03	-.2449E-01	-.7748E-04	.4231E-02
80.	-.3123E-01	.1089E-01	-.3748E+00	.1017E-02	.1173E-02	.1259E-02	.5638E-03	-.2488E-01	-.7916E-04	.4572E-02
85.	-.2781E-01	.1106E-01	-.3422E+00	.8817E-03	.1016E-02	.9628E-03	.5318E-03	-.2367E-01	-.7700E-04	.4595E-02
90.	-.2380E-01	.1070E-01	-.3000E+00	.6582E-03	.8402E-03	.7060E-03	.4798E-03	-.2059E-01	-.7092E-04	.4135E-02
95.	-.1963E-01	.1039E-01	-.2572E+00	.5149E-03	.6656E-03	.4985E-03	.4163E-03	-.1631E-01	-.6239E-04	.3457E-02
100.	-.1570E-01	.9680E-02	-.2130E+00	.4059E-03	.4988E-03	.3345E-03	.3416E-03	-.9935E-02	-.5126E-04	.2007E-02
105.	-.1253E-01	.9111E-02	-.1753E+00	.2949E-03	.3737E-03	.2253E-03	.2798E-03	-.4249E-02	-.4098E-04	.3880E-03
110.	-.1003E-01	.8593E-02	-.1467E+00	.2177E-03	.2783E-03	.1511E-03	.2291E-03	.1151E-02	-.3191E-04	-.1544E-02
115.	-.8045E-02	.8072E-02	-.1207E+00	.1672E-03	.2057E-03	.1008E-03	.1805E-03	.5894E-02	-.2589E-04	-.3845E-02
120.	-.6483E-02	.7417E-02	-.1022E+00	.1217E-03	.1543E-03	.6829E-04	.1456E-03	.1008E-01	-.2059E-04	-.5091E-02
125.	-.5172E-02	.6704E-02	-.8891E-01	.8999E-04	.1143E-03	.4584E-04	.1170E-03	.1470E-01	-.1580E-04	-.8497E-02
130.	-.4137E-02	.6071E-02	-.7714E-01	.7060E-04	.8470E-04	.3084E-04	.9440E-04	.1898E-01	-.1164E-04	-.1075E-01
135.	-.3297E-02	.5517E-02	-.6609E-01	.4895E-04	.6297E-04	.2087E-04	.7685E-04	.2277E-01	-.8233E-05	-.1277E-01
140.	-.2631E-02	.4991E-02	-.5857E-01	.3472E-04	.4741E-04	.1432E-04	.6309E-04	.2653E-01	-.5719E-05	-.1470E-01
145.	-.2099E-02	.4579E-02	-.5401E-01	.2725E-04	.3576E-04	.9864E-05	.5348E-04	.3024E-01	-.3638E-05	-.1648E-01
150.	-.1685E-02	.4211E-02	-.4948E-01	.1857E-04	.2725E-04	.6871E-05	.4521E-04	.3380E-01	-.2020E-05	-.1807E-01
155.	-.1359E-02	.3749E-02	-.4594E-01	.1544E-04	.2094E-04	.4831E-05	.3871E-04	.3698E-01	-.9093E-06	-.1938E-01
160.	-.1106E-02	.3407E-02	-.4450E-01	.1341E-04	.1630E-04	.3450E-05	.3348E-04	.4029E-01	.1335E-06	-.2057E-01
165.	-.9004E-03	.3071E-02	-.4070E-01	.9045E-05	.1270E-04	.2468E-05	.2907E-04	.4114E-01	.7798E-06	-.2050E-01
170.	-.7486E-03	.2810E-02	-.3537E-01	.8107E-05	.1027E-04	.1835E-05	.2573E-04	.4132E-01	.1356E-05	-.2027E-01
175.	-.6243E-03	.2551E-02	-.3946E-01	.7257E-05	.8345E-05	.1372E-05	.2292E-04	.4229E-01	.1717E-05	-.2013E-01
180.	-.5286E-03	.2285E-02	-.3551E-01	.5198E-05	.6734E-05	.1021E-05	.2015E-04	.4159E-01	.1945E-05	-.1925E-01
185.	-.4508E-03	.2067E-02	-.3077E-01	.4097E-05	.5650E-05	.7907E-06	.1825E-04	.4127E-01	.2153E-05	-.1869E-01
190.	-.3856E-03	.1862E-02	-.3025E-01	.2980E-05	.4748E-05	.6143E-06	.1641E-04	.4163E-01	.2292E-05	-.1823E-01
195.	-.3300E-03	.1813E-02	-.3080E-01	.2116E-05	.3998E-05	.4788E-06	.1485E-04	.4142E-01	.2333E-05	-.1750E-01
200.	-.2812E-03	.1538E-02	-.3006E-01	.8396E-06	.3324E-05	.3691E-06	.1319E-04	.4115E-01	.2301E-05	-.1680E-01
205.	-.2422E-03	.1324E-02	-.3170E-01	.4477E-06	.2838E-05	.2927E-06	.1194E-04	.4128E-01	.2290E-05	-.1625E-01
210.	-.2087E-03	.1277E-02	-.3208E-01	.3170E-06	.2382E-05	.2286E-06	.1046E-04	.4060E-01	.2223E-05	-.1535E-01

Table C3. A Matrix (continued)

TIME	A(1,12)	A(1,13)	A(1,14)	A(1,15)	A(1,16)	A(1,17)	A(1,18)	A(1,19)	A(1,20)	A(1,22)
	RAD/FT-SEC^2	RAD/FT-SEC	RAD/FT-SEC^2	1/SEC^2	1/SEC^2	1/SEC^2	RAD/SEC^2	RAD/SEC^2	RAD/SEC^2	RAD/SEC^2
0.	.1521E-01	.3679E-04	.4092E-01	.2047E+01	-.6582E+00	0.	0.	0.	0.	-.1014E-01
5.	.1483E-01	-.5257E-04	.3929E-01	.2067E+01	-.6754E+00	.8014E-02	.1778E-02	.5552E-01	-.2542E-01	-.9858E-02
10.	.1400E-01	-.1434E-03	.3843E-01	.2073E+01	-.6322E+00	.3407E-01	.3615E-02	.1135E+00	-.5208E-01	-.9888E-02
15.	.1375E-01	-.2332E-03	.3772E-01	.2083E+01	-.6617E+00	.8008E-01	.5673E-02	.1734E+00	-.8013E-01	-.9780E-02
20.	.1368E-01	-.3224E-03	.3735E-01	.2103E+01	-.7998E+00	.1484E+00	.7629E-02	.2327E+00	-.1080E+00	-.9986E-02
25.	.1260E-01	-.4074E-03	.3703E-01	.2119E+01	-.7625E+00	.2391E+00	.9482E-02	.2892E+00	-.1346E+00	-.1018E-01
30.	.1190E-01	-.4860E-03	.3712E-01	.2138E+01	-.7921E+00	.3517E+00	.1143E-01	.3450E+00	-.1612E+00	-.1040E-01
35.	.1147E-01	-.5594E-03	.3784E-01	.2169E+01	-.8380E+00	.4866E+00	.1258E-01	.3956E+00	-.1839E+00	-.1077E-01
40.	.9744E-02	-.6216E-03	.3842E-01	.2186E+01	-.8467E+00	.6360E+00	.1415E-01	.4389E+00	-.2054E+00	-.1084E-01
45.	.7956E-02	-.6732E-03	.3941E-01	.2206E+01	-.8535E+00	.7926E+00	.1428E-01	.4768E+00	-.2215E+00	-.1127E-01
50.	.8024E-02	-.7135E-03	.4094E-01	.2229E+01	-.9062E+00	.9523E+00	.2136E-01	.5623E+00	-.2702E+00	-.1252E-01
55.	.6188E-02	-.7464E-03	.4280E-01	.2263E+01	-.9138E+00	.1128E+01	.2434E-01	.6155E+00	-.2991E+00	-.1362E-01
60.	.5158E-02	-.7607E-03	.4453E-01	.2286E+01	-.9446E+00	.1247E+01	.2694E-01	.6579E+00	-.3209E+00	-.1467E-01
65.	.4144E-02	-.7630E-03	.4620E-01	.2324E+01	-.9696E+00	.1046E+01	.3301E-01	.7299E+00	-.3649E+00	-.1653E-01
70.	.3189E-02	-.7435E-03	.4694E-01	.2349E+01	-.9789E+00	.1342E+01	.5436E-01	.8901E+00	-.4736E+00	-.2045E-01
75.	.2873E-02	-.7074E-03	.4690E-01	.2367E+01	-.1001E+01	.1449E+01	.1763E-01	.5449E+00	-.2603E+00	-.1294E-01
80.	.2716E-02	-.6548E-03	.4597E-01	.2386E+01	-.1025E+01	.1537E+01	.1041E-01	.4429E+00	-.2043E+00	-.9283E-02
85.	.2099E-02	-.5967E-03	.4438E-01	.2425E+01	-.1050E+01	.2086E+01	.6447E-02	.3586E+00	-.1622E+00	-.6067E-02
90.	.2569E-02	-.5223E-03	.4122E-01	.2435E+01	-.1084E+01	.2079E+01	.2887E-02	.2758E+00	-.1203E+00	-.3438E-02
95.	.3144E-02	-.4410E-03	.3701E-01	.2487E+01	-.1110E+01	.1433E+01	.1816E-03	.2012E+00	-.8439E-01	-.2034E-02
100.	.3729E-02	-.3599E-03	.3227E-01	.2517E+01	-.1131E+01	.8542E+00	-.1427E-03	.1525E+00	-.6394E-01	-.1257E-02
105.	.4313E-02	-.2809E-03	.2833E-01	.2539E+01	-.1179E+01	.5833E+00	-.5223E-03	.1138E+00	-.4704E-01	-.7738E-03
110.	.4986E-02	-.2321E-03	.2501E-01	.2575E+01	-.1221E+01	.5029E+00	-.9319E-03	.8411E-01	-.3387E-01	-.4714E-03
115.	.5411E-02	-.1925E-03	.2168E-01	.2590E+01	-.1231E+01	.4552E+00	-.8936E-03	.6144E-01	-.2463E-01	-.2853E-03
120.	.6045E-02	-.1577E-03	.1907E-01	.2623E+01	-.1277E+01	.3542E+00	-.7916E-03	.4653E-01	-.1853E-01	-.1787E-03
125.	.6773E-02	-.1261E-03	.1665E-01	.2645E+01	-.1307E+01	.2314E+00	-.9082E-03	.3365E-01	-.1288E-01	-.1080E-03
130.	.7261E-02	-.9958E-04	.1474E-01	.2683E+01	-.1361E+01	.1229E+00	-.7512E-03	.2550E-01	-.9760E-02	-.7020E-04
135.	.8112E-02	-.7715E-04	.1302E-01	.2717E+01	-.1412E+01	.6175E-01	-.7467E-03	.1845E-01	-.6710E-02	-.4436E-04
140.	.9094E-02	-.5885E-04	.1150E-01	.2750E+01	-.1445E+01	.3808E-01	-.6615E-03	.1340E-01	-.4683E-02	-.2798E-04
145.	.9474E-02	-.4392E-04	.1036E-01	.2779E+01	-.1504E+01	.3236E-01	-.5339E-03	.1014E-01	-.3530E-02	-.1813E-04
150.	.9765E-02	-.3215E-04	.9492E-02	.2817E+01	-.1576E+01	.3044E-01	-.5633E-03	.6759E-02	-.1986E-02	-.1076E-04
155.	.1019E-01	-.2279E-04	.8756E-02	.2854E+01	-.1636E+01	.2817E-01	-.4686E-03	.4974E-02	-.1399E-02	-.6776E-05
160.	.1035E-01	-.1547E-04	.8305E-02	.2896E+01	-.1719E+01	.2503E-01	-.4112E-03	.3598E-02	-.9147E-03	-.4222E-05
165.	.1111E-01	-.9779E-05	.7638E-02	.2826E+01	-.1687E+01	.2082E-01	-.4189E-03	.2143E-02	-.2387E-03	-.2345E-05
170.	.1214E-01	-.5233E-05	.7302E-02	.2799E+01	-.1716E+01	.1794E-01	-.3610E-03	.1475E-02	-.5702E-04	-.1410E-05
175.	.1250E-01	-.1795E-05	.7067E-02	.2752E+01	-.1729E+01	.1625E-01	-.3225E-03	.9287E-03	.1132E-03	-.8081E-06
180.	.1364E-01	.6703E-06	.6654E-02	.2712E+01	-.1697E+01	.1413E-01	-.3214E-03	.3460E-03	.3848E-03	-.3898E-06
185.	.1532E-01	.2834E-05	.6340E-02	.2687E+01	-.1695E+01	.1301E-01	-.3304E-03	-.1678E-03	.6362E-03	-.1215E-06
190.	.1463E-01	.4532E-05	.6719E-02	.2664E+01	-.1763E+01	.1064E-01	-.3314E-03	-.5574E-03	.8197E-03	.2143E-07
195.	.1641E-01	.5663E-05	.6351E-02	.2638E+01	-.1739E+01	.7332E-02	-.3368E-03	-.9229E-03	.1001E-02	.9949E-07
200.	.1719E-01	.6361E-05	.6150E-02	.2597E+01	-.1720E+01	.1003E-01	-.3385E-03	-.1242E-02	.1161E-02	.1247E-06
205.	.1837E-01	.6994E-05	.6083E-02	.2579E+01	-.1729E+01	.1024E-01	-.3438E-03	-.1508E-02	.1295E-02	.1144E-06
210.	.1880E-01	.7305E-05	.6212E-02	.2560E+01	-.1750E+01	.8528E-02	-.3386E-03	-.1666E-02	.1360E-02	.7655E-07

Table C3. A Matrix

TIME	A(1, 1)	A(1, 2)	A(1, 3)	A(1, 4)	A(1, 5)	A(1, 7)	A(1, 8)	A(1, 9)	A(1,10)	A(1,11)
	1/SEC	1/SEC	RAD/FT-SEC	$1/SEC^2$	$1/SEC^2$	RAD/FT-SEC	$RAD/FT-SEC^2$	RAD/FT-SEC	$RAD/FT-SEC^2$	RAD/FT-SEC
0.	0.	.5895E-02	0.	-.2151E-04	-.6052E-03	-.1374E-04	.3516E-03	.3266E-05	.2358E-02	.8642E-05
5.	.4870E-02	.2442E-01	-.7261E-03	-.2818E-04	-.7980E-03	.7331E-04	.2916E-03	-.7868E-05	.2477E-02	.1345E-04
10.	.9963E-02	.4294E-01	-.1497E-02	-.3701E-04	-.9096E-03	.1667E-03	.2950E-03	-.2319E-04	.2620E-02	.2162E-04
15.	.1506E-01	.6279E-01	-.2306E-02	-.5831E-04	-.1076E-02	.2627E-03	.1232E-03	-.4246E-04	.2744E-02	.3132E-04
20.	.2018E-01	.8513E-01	-.3125E-02	-.8468E-04	-.1248E-02	.3615E-03	-.7620E-04	-.6569E-04	.2856E-02	.4153E-04
25.	.2514E-01	.1039E+00	-.3915E-02	-.1249E-03	-.1321E-02	.4622E-03	-.2511E-03	-.9233E-04	.2918E-02	.5004E-04
30.	.2973E-01	.1217E+00	-.4706E-02	-.1882E-03	-.1424E-02	.5579E-03	-.7448E-03	-.1215E-03	.2975E-02	.7401E-04
35.	.3416E-01	.1477E+00	-.5427E-02	-.2798E-03	-.1543E-02	.6491E-03	-.1490E-02	-.1535E-03	.3054E-02	.9438E-04
40.	.3772E-01	.1596E+00	-.6036E-02	-.3649E-03	-.1507E-02	.7376E-03	-.2102E-02	-.1863E-03	.3061E-02	.1118E-03
45.	.4043E-01	.1680E+00	-.6674E-02	-.4550E-03	-.1449E-02	.8178E-03	-.3049E-02	-.2200E-03	.3086E-02	.1309E-03
50.	.4205E-01	.1891E+00	-.7830E-02	-.5826E-03	-.1496E-02	.8710E-03	-.3910E-02	-.2518E-03	.3116E-02	.1364E-03
55.	.4473E-01	.1990E+00	-.8650E-02	-.6442E-03	-.1390E-02	.9335E-03	-.5285E-02	-.2858E-03	.3196E-02	.1644E-03
60.	.4536E-01	.2041E+00	-.9225E-02	-.7018E-03	-.1303E-02	.9667E-03	-.6561E-02	-.3144E-03	.3261E-02	.1747E-03
65.	.4524E-01	.2069E+00	-.1036E-01	-.7425E-03	-.1189E-02	.9882E-03	-.7818E-02	-.3407E-03	.3350E-02	.1871E-03
70.	.4380E-01	.2019E+00	-.1247E-01	-.7491E-03	-.1042E-02	.9840E-03	-.8902E-02	-.3586E-03	.3403E-02	.1978E-03
75.	.4152E-01	.1970E+00	-.7980E-02	-.7446E-03	-.9084E-03	.9501E-03	-.9609E-02	-.3680E-03	.3418E-02	.1977E-03
80.	.3831E-01	.1882E+00	-.6601E-02	-.7126E-03	-.7649E-03	.8930E-03	-.9939E-02	-.3683E-03	.3401E-02	.1841E-03
85.	.3439E-01	.1716E+00	-.5438E-02	-.6504E-03	-.6161E-03	.8227E-03	-.1044E-01	-.3620E-03	.3518E-02	.1820E-03
90.	.2972E-01	.1548E+00	-.4223E-02	-.5740E-03	-.4823E-03	.7211E-03	-.8957E-02	-.3419E-03	.3332E-02	.1634E-03
95.	.2440E-01	.1336E+00	-.3159E-02	-.4817E-03	-.3608E-03	.6078E-03	-.6740E-02	-.3120E-03	.3042E-02	.1553E-03
100.	.1985E-01	.1138E+00	-.2445E-02	-.3845E-03	-.2579E-03	.5017E-03	-.4287E-02	-.2753E-03	.2645E-02	.1440E-03
105.	.1561E-01	.9706E-01	-.1857E-02	-.3111E-03	-.1876E-03	.4123E-03	-.2404E-02	-.2394E-03	.2325E-02	.1244E-03
110.	.1282E-01	.8423E-01	-.1408E-02	-.2499E-03	-.1357E-03	.3445E-03	-.6564E-03	-.2070E-03	.1997E-02	.1077E-03
115.	.1016E-01	.6915E-01	-.1058E-02	-.1922E-03	-.9414E-04	.2750E-03	.1750E-02	-.1812E-03	.1580E-02	.1023E-03
120.	.8121E-02	.6010E-01	-.8178E-03	-.1522E-03	-.6736E-04	.2228E-03	.3640E-02	-.1566E-03	.1203E-02	.8948E-04
125.	.6442E-02	.5369E-01	-.6148E-03	-.1190E-03	-.4773E-04	.1837E-03	.5369E-02	-.1330E-03	.7792E-03	.7708E-04
130.	.5239E-02	.4928E-01	-.4825E-03	-.9418E-04	-.3430E-04	.1539E-03	.6445E-02	-.1123E-03	.6071E-03	.6439E-04
135.	.4238E-02	.4431E-01	-.3652E-03	-.7499E-04	-.2486E-04	.1297E-03	.8023E-02	-.9393E-04	.3349E-03	.5109E-04
140.	.3465E-02	.4069E-01	-.2789E-03	-.5942E-04	-.1795E-04	.1113E-03	.9879E-02	-.7845E-04	-.1036E-04	.4238E-04
145.	.2743E-02	.3877E-01	-.2220E-03	-.4756E-04	-.1312E-04	.9571E-04	.1076E-01	-.6528E-04	.1369E-03	.3326E-04
150.	.2273E-02	.3707E-01	-.1650E-03	-.3848E-04	-.9701E-05	.8285E-04	.1151E-01	-.5454E-04	.4698E-03	.2564E-04
155.	.1935E-02	.3625E-01	-.1323E-03	-.3121E-04	-.7200E-05	.7251E-04	.1260E-01	-.4577E-04	.7563E-03	.1976E-04
160.	.1586E-02	.3671E-01	-.1071E-03	-.2569E-04	-.5437E-05	.6367E-04	.1320E-01	-.3873E-04	.1359E-02	.1472E-04
165.	.1388E-02	.3497E-01	-.9170E-04	-.2100E-04	-.4081E-05	.5635E-04	.1529E-01	-.3282E-04	.1185E-02	.1119E-04
170.	.1179E-02	.3193E-01	-.6720E-04	-.1790E-04	-.3199E-05	.4935E-04	.1777E-01	-.2830E-04	.1295E-02	.7266E-05
175.	.1012E-02	.3758E-01	-.6546E-04	-.1515E-04	-.2492E-05	.4359E-04	.1904E-01	-.2452E-04	.1623E-02	.4647E-05
180.	.9213E-03	.3531E-01	-.4530E-04	-.1287E-04	-.1951E-05	.3959E-04	.2215E-01	-.2160E-04	.1247E-02	.3233E-05
185.	.8203E-03	.3187E-01	-.3689E-04	-.1118E-04	-.1585E-05	.3505E-04	.2642E-01	-.1914E-04	.8892E-03	.1310E-05
190.	.7508E-03	.3299E-01	-.3016E-04	-.9731E-05	-.1259E-05	.3088E-04	.2497E-01	-.1702E-04	.2062E-02	-.2358E-06
195.	.5256E-03	.3380E-01	-.2425E-04	-.8400E-05	-.1006E-05	.2738E-04	.2971E-01	-.1515E-04	.1472E-02	-.1146E-05
200.	.5760E-03	.3473E-01	-.1898E-04	-.7186E-05	-.7979E-06	.2427E-04	.3213E-01	-.1343E-04	.1329E-02	-.1657E-05
205.	.5276E-03	.3806E-01	-.1496E-04	-.6255E-05	-.6451E-06	.2120E-04	.3531E-01	-.1203E-04	.1228E-02	-.2329E-05
210.	.5319E-03	.4046E-01	-.1198E-04	-.5419E-05	-.5200E-06	.1856E-04	.3641E-01	-.1078E-04	.1469E-02	-.2716E-05

Table C3. A Matrix (continued)

TIME	A(3,20)	A(3,22)	A(3,23)	A(4, 5)	A(5, 4)	A(6, 4)	A(6, 5)	A(7, 1)	A(7, 2)	A(7, 3)
	FT/SEC^2	FT/SEC^2	FT/SEC^2	1/SEC	1/SEC	FT/SEC-RAD	FT/SEC-RAD	FT/SEC-RAD	FT/SEC-RAD	1/SEC
0.	0.	.2695E-01	0.	0.	0.	0.	0.	0.	.1565E-01	0.
5.	.2299E-01	.2671E-01	.1674E+00	.3286E-03	-.3286E-03	.2691E-01	.5103E+02	-.1483E+01	.3409E+02	-.1901E+00
10.	.4785E-01	.2749E-01	.3496E+00	.2096E-02	-.2096E-02	.3671E+00	.1056E+03	-.2972E+01	.6917E+02	-.3862E+00
15.	.7632E-01	.2789E-01	.5449E+00	.2597E-02	-.2597E-02	.2612E+00	.1630E+03	-.4553E+01	.1043E+03	-.5823E+00
20.	.1045E+00	.2910E-01	.7438E+00	.3749E-02	-.3749E-02	-.1090E+01	.2239E+03	-.6341E+01	.1392E+03	-.7766E+00
25.	.1327E+00	.3046E-01	.9434E+00	.6494E-02	-.6494E-02	-.4589E+00	.2888E+03	-.7814E+01	.1730E+03	-.9634E+00
30.	.1621E+00	.3189E-01	.1146E+01	.8494E-02	-.8494E-02	-.8085E+00	.3580E+03	-.9379E+01	.2046E+03	-.1137E+01
35.	.1798E+00	.3381E-01	.1332E+01	.1063E-01	-.1063E-01	-.1221E+01	.4321E+03	-.1086E+02	.2330E+03	-.1291E+01
40.	.2083E+00	.3497E-01	.1513E+01	.1264E-01	-.1264E-01	-.1725E+01	.5125E+03	-.1224E+02	.2573E+03	-.1422E+01
45.	.2183E+00	.3753E-01	.1682E+01	.1366E-01	-.1366E-01	-.2195E+01	.6001E+03	-.1342E+02	.2762E+03	-.1522E+01
50.	.3102E+00	.4254E-01	.2004E+01	.1303E-01	-.1303E-01	-.2474E+01	.6960E+03	-.1439E+02	.2892E+03	-.1591E+01
55.	.3611E+00	.4727E-01	.2230E+01	.1203E-01	-.1203E-01	-.2544E+01	.8008E+03	-.1502E+02	.2950E+03	-.1621E+01
60.	.3963E+00	.5239E-01	.2423E+01	.1236E-01	-.1236E-01	-.3154E+01	.9145E+03	-.1536E+02	.2933E+03	-.1611E+01
65.	.4996E+00	.6003E-01	.2709E+01	.1307E-01	-.1307E-01	-.3746E+01	.1034E+04	-.1527E+02	.2828E+03	-.1555E+01
70.	.8118E+00	.7506E-01	.3356E+01	.1283E-01	-.1283E-01	-.4132E+01	.1160E+04	-.1475E+02	.2648E+03	-.1460E+01
75.	.2954E+00	.5048E-01	.2155E+01	.1266E-01	-.1266E-01	-.4487E+01	.1294E+04	-.1375E+02	.2409E+03	-.1328E+01
80.	.1874E+00	.3767E-01	.1805E+01	.1265E-01	-.1265E-01	-.4920E+01	.1442E+04	-.1252E+02	.2130E+03	-.1177E+01
85.	.1249E+00	.2536E-01	.1494E+01	.1224E-01	-.1224E-01	-.5194E+01	.1607E+04	-.1100E+02	.1817E+03	-.1008E+01
90.	.5725E-01	.1494E-01	.1179E+01	.1157E-01	-.1157E-01	-.5427E+01	.1789E+04	-.9311E+01	.1493E+03	-.8320E+00
95.	.9217E-02	.9226E-02	.8900E+00	.1081E-01	-.1081E-01	-.5611E+01	.1992E+04	-.7551E+01	.1176E+03	-.6595E+00
100.	.1018E-02	.5924E-02	.6949E+00	.9997E-02	-.9997E-02	-.5746E+01	.2214E+04	-.5927E+01	.8951E+02	-.5063E+00
105.	-.1091E-01	.3821E-02	.5388E+00	.9302E-02	-.9302E-02	-.5887E+01	.2455E+04	-.4646E+01	.6789E+02	-.3876E+00
110.	-.2125E-01	.2432E-02	.4143E+00	.8709E-02	-.8709E-02	-.6115E+01	.2716E+04	-.3643E+01	.5141E+02	-.2963E+00
115.	-.2128E-01	.1551E-02	.3171E+00	.8116E-02	-.8116E-02	-.6283E+01	.2995E+04	-.2780E+01	.3886E+02	-.2272E+00
120.	-.2140E-01	.1017E-02	.2505E+00	.7417E-02	-.7417E-02	-.6297E+01	.3292E+04	-.2146E+01	.2947E+02	-.1746E+00
125.	-.2475E-01	.6507E-03	.1934E+00	.6676E-02	-.6676E-02	-.6292E+01	.3608E+04	-.1667E+01	.2232E+02	-.1337E+00
130.	-.2159E-01	.4421E-03	.1541E+00	.6114E-02	-.6114E-02	-.6271E+01	.3940E+04	-.1307E+01	.1697E+02	-.1026E+00
135.	-.2253E-01	.2957E-03	.1152E+00	.5576E-02	-.5576E-02	-.6239E+01	.4291E+04	-.1033E+01	.1297E+02	-.7887E-01
140.	-.2104E-01	.1972E-03	.9344E-01	.5093E-02	-.5093E-02	-.6236E+01	.4659E+04	-.8257E+00	.9991E+01	-.6103E-01
145.	-.1803E-01	.1347E-03	.7637E-01	.4628E-02	-.4628E-02	-.6196E+01	.5045E+04	-.6655E+00	.7755E+01	-.4750E-01
150.	-.1912E-01	.8636E-04	.5853E-01	.4246E-02	-.4246E-02	-.6141E+01	.5449E+04	-.5414E+00	.6080E+01	-.3728E-01
155.	-.1658E-01	.577RE-04	.4752E-01	.3834E-02	-.3834E-02	-.6071E+01	.5872E+04	-.4445E+00	.4815E+01	-.2952E-01
160.	-.1491E-01	.3845E-04	.3919E-01	.3457E-02	-.3457E-02	-.5990E+01	.6313E+04	-.3681E+00	.3854E+01	-.2361E-01
165.	-.1565E-01	.2409E-04	.3119E-01	.3176E-02	-.3176E-02	-.5940E+01	.6755E+04	-.3071E+00	.3116E+01	-.1905E-01
170.	-.1376E-01	.1560E-04	.2579E-01	.2897E-02	-.2897E-02	-.5854E+01	.7219E+04	-.2579E+00	.2544E+01	-.1552E-01
175.	-.1260E-01	.9960E-05	.2181E-01	.2628E-02	-.2628E-02	-.5765E+01	.7675E+04	-.2188E+00	.2104E+01	-.1281E-01
180.	-.1298E-01	.5990E-05	.1824E-01	.2389E-02	-.2389E-02	-.5671E+01	.8133E+04	-.1878E+00	.1766E+01	-.1072E-01
185.	-.1348E-01	.3211E-05	.1529E-01	.2180E-02	-.2180E-02	-.5575E+01	.8594E+04	-.1614E+00	.1487E+01	-.9009E-02
190.	-.1377E-01	.1482E-05	.1288E-01	.1983E-02	-.1983E-02	-.5481E+01	.9055E+04	-.1388E+00	.1256E+01	-.7591E-02
195.	-.1424E-01	.3637E-06	.1071E-01	.1806E-02	-.1806E-02	-.5386E+01	.9519E+04	-.1193E+00	.1062E+01	-.6410E-02
200.	-.1483E-01	-.2491E-06	.9089E-02	.1631E-02	-.1631E-02	-.5292E+01	.9984E+04	-.1026E+00	.9002E+00	-.5423E-02
205.	-.1523E-01	-.4847E-06	.7410E-02	.1424E-02	-.1424E-02	-.5198E+01	.1045E+05	-.8818E-01	.7637E+00	-.4594E-02
210.	-.1525E-01	-.4118E-06	.6184E-02	.1417E-02	-.1417E-02	-.5108E+01	.1092E+05	-.7573E-01	.6483E+00	-.3895E-02

Table C3. A Matrix (continued)

TIME	A(7, 4)	A(7, 5)	A(7, 7)	A(7, 8)	A(7, 9)	A(7,10)	A(7,11)	A(7,12)	A(7,13)	A(7,14)
	FT/SEC^2-RAD	FT/SEC^2-RAD	1/SEC	1/SEC^2	1/SEC	1/SEC^2	1/SEC	1/SEC^2	1/SEC	1/SEC^2
0.	-.1879E+00	-.5322E+01	-.2329E+00	-.1198E+03	.2032E-02	.1317E+01	.1402E+00	.1337E+03	-.8337E-01	-.1039E+03
5.	-.1830E+00	-.5182E+01	-.4437E+00	-.1222E+03	-.1916E-02	.3471E+00	-.2228E-01	.1310E+03	-.3185E-01	-.9850E+02
10.	-.2095E+00	-.5143E+01	-.6716E+00	-.1249E+03	-.3216E-02	-.5282E+00	-.1898E+00	.1308E+03	.1808E-01	-.9497E+02
15.	-.2753E+00	-.5078E+01	-.9145E+00	-.1276E+03	-.1947E-02	-.1349E+01	-.3606E+00	.1304E+03	.6667E-01	-.9158E+02
20.	-.3383E+00	-.4984E+01	-.1170E+01	-.1305E+03	.1814E-02	-.2182E+01	-.5338E+00	.1295E+03	.1139E+00	-.8833E+02
25.	-.4578E+00	-.4840E+01	-.1433E+01	-.1335E+03	.4381E-02	-.3000E+01	-.7049E+00	.1279E+03	.1592E+00	-.8498E+02
30.	-.6138E+00	-.4642E+01	-.1695E+01	-.1366E+03	.1720E-01	-.3819E+01	-.8691E+00	.1257E+03	.2015E+00	-.8162E+02
35.	-.7957E+00	-.4386E+01	-.1953E+01	-.1394E+03	.3033E-01	-.4672E+01	-.1022E+01	.1225E+03	.2399E+00	-.7817E+02
40.	-.9848E+00	-.4067E+01	-.2199E+01	-.1431E+03	.4548E-01	-.5544E+01	-.1158E+01	.1185E+03	.2740E+00	-.7466E+02
45.	-.1158E+01	-.3689E+01	-.2425E+01	-.1469E+03	.6448E-01	-.6436E+01	-.1271E+01	.1135E+03	.3022E+00	-.7108E+02
50.	-.1276E+01	-.3276E+01	-.2623E+01	-.1508E+03	.8543E-01	-.7386E+01	-.1359E+01	.1079E+03	.3242E+00	-.6755E+02
55.	-.1320E+01	-.2849E+01	-.2792E+01	-.1551E+03	.1081E+00	-.8352E+01	-.1413E+01	.1016E+03	.3387E+00	-.6403E+02
60.	-.1304E+01	-.2422E+01	-.2931E+01	-.1601E+03	.1304E+00	-.9306E+01	-.1431E+01	.9472E+02	.3451E+00	-.6058E+02
65.	-.1250E+01	-.2002E+01	-.2932E+01	-.1656E+03	.1517E+00	-.1020E+02	-.1404E+01	.8716E+02	.3418E+00	-.5702E+02
70.	-.1156E+01	-.1609E+01	-.2902E+01	-.1717E+03	.1696E+00	-.1094E+02	-.1338E+01	.7908E+02	.3298E+00	-.5334E+02
75.	-.1030E+01	-.1256E+01	-.2804E+01	-.1781E+03	.1806E+00	-.1150E+02	-.1237E+01	.7064E+02	.3104E+00	-.4945E+02
80.	-.8827E+00	-.9476E+00	-.2643E+01	-.1852E+03	.1842E+00	-.1181E+02	-.1112E+01	.6211E+02	.2848E+00	-.4521E+02
85.	-.7242E+00	-.6860E+00	-.2415E+01	-.1923E+03	.1845E+00	-.1178E+02	-.9658E+00	.5341E+02	.2523E+00	-.4027E+02
90.	-.5682E+00	-.4774E+00	-.2138E+01	-.1993E+03	.1751E+00	-.1135E+02	-.8085E+00	.4488E+02	.2145E+00	-.3470E+02
95.	-.4244E+00	-.3178E+00	-.1832E+01	-.2052E+03	.1586E+00	-.1053E+02	-.6494E+00	.3665E+02	.1737E+00	-.2870E+02
100.	-.3052E+00	-.2047E+00	-.1541E+01	-.2127E+03	.1369E+00	-.9404E+01	-.5044E+00	.2925E+02	.1350E+00	-.2307E+02
105.	-.2179E+00	-.1314E+00	-.1308E+01	-.2176E+03	.1156E+00	-.8314E+01	-.3899E+00	.2343E+02	.1041E+00	-.1867E+02
110.	-.1548E+00	-.8406E-01	-.1132E+01	-.2215E+03	.9547E-01	-.7273E+01	-.3004E+00	.1882E+02	.7993E-01	-.1528E+02
115.	-.1103E+00	-.5403E-01	-.9621E+00	-.2255E+03	.8103E-01	-.6477E+01	-.2321E+00	.1538E+02	.6063E-01	-.1208E+02
120.	-.7864E-01	-.3480E-01	-.8412E+00	-.2286E+03	.6715E-01	-.5694E+01	-.1794E+00	.1260E+02	.4621E-01	-.9760E+01
125.	-.5584E-01	-.2239E-01	-.7473E+00	-.2311E+03	.5442E-01	-.4935E+01	-.1381E+00	.1028E+02	.3527E-01	-.8016E+01
130.	-.3972E-01	-.1447E-01	-.6746E+00	-.2333E+03	.4344E-01	-.4236E+01	-.1053E+00	.8391E+01	.2710E-01	-.6700E+01
135.	-.2834E-01	-.9394E-02	-.6195E+00	-.2354E+03	.3422E-01	-.3617E+01	-.8195E-01	.6855E+01	.2098E-01	-.5692E+01
140.	-.2037E-01	-.6152E-02	-.5752E+00	-.2377E+03	.2698E-01	-.3083E+01	-.6354E-01	.5625E+01	.1641E-01	-.4908E+01
145.	-.1473E-01	-.4063E-02	-.5413E+00	-.2395E+03	.2115E-01	-.2627E+01	-.4952E-01	.4633E+01	.1295E-01	-.4282E+01
150.	-.1076E-01	-.2713E-02	-.5150E+00	-.2415E+03	.1640E-01	-.2243E+01	-.3890E-01	.3841E+01	.1034E-01	-.3775E+01
155.	-.7940E-02	-.1832E-02	-.4945E+00	-.2435E+03	.1308E-01	-.1924E+01	-.3082E-01	.3208E+01	.8334E-02	-.3360E+01
160.	-.5924E-02	-.1254E-02	-.4785E+00	-.2454E+03	.1035E-01	-.1659E+01	-.2465E-01	.2701E+01	.6790E-02	-.3013E+01
165.	-.4472E-02	-.8693E-03	-.4658E+00	-.2473E+03	.8250E-02	-.1437E+01	-.1989E-01	.2290E+01	.5583E-02	-.2715E+01
170.	-.3420E-02	-.6111E-03	-.4558E+00	-.2492E+03	.6625E-02	-.1250E+01	-.1620E-01	.1955E+01	.4629E-02	-.2451E+01
175.	-.2659E-02	-.4373E-03	-.4480E+00	-.2509E+03	.5386E-02	-.1097E+01	-.1337E-01	.1687E+01	.3884E-02	-.2226E+01
180.	-.2103E-02	-.3189E-03	-.4423E+00	-.2529E+03	.4441E-02	-.9727E+00	-.1119E-01	.1474E+01	.3302E-02	-.2038E+01
185.	-.1674E-02	-.2342E-03	-.4374E+00	-.2545E+03	.3676E-02	-.8631E+00	-.9397E-02	.1290E+01	.2813E-02	-.1861E+01
190.	-.1339E-02	-.1733E-03	-.4331E+00	-.2559E+03	.3055E-02	-.7660E+00	-.7916E-02	.1131E+01	.2401E-02	-.1695E+01
195.	-.1076E-02	-.1289E-03	-.4298E+00	-.2575E+03	.2546E-02	-.6799E+00	-.6682E-02	.9922E+00	.2051E-02	-.1538E+01
200.	-.8685E-03	-.9643E-04	-.4272E+00	-.2593E+03	.2129E-02	-.6033E+00	-.5652E-02	.8711E+00	.1753E-02	-.1393E+01
205.	-.7031E-03	-.7251E-04	-.4250E+00	-.2607E+03	.1785E-02	-.5352E+00	-.4787E-02	.7651E+00	.1499E-02	-.1257E+01
210.	-.5706E-03	-.5476E-04	-.4230E+00	-.2621E+03	.1500E-02	-.4746E+00	-.4058E-02	.6721E+00	.1281E-02	-.1132E+01

Table C3. A Matrix (continued)

TIME	A(7,15) FT/SEC^2-RAD	A(7,16) FT/SEC^2-RAD	A(7,17) FT/SEC^2-RAD	A(7,18) FT/SEC^2	A(7,19) FT/SEC^2	A(7,20) FT/SEC^2	A(7,22) FT/SEC^2	A(7,23) FT/SEC^2	A(9, 1) FT/SEC-RAD	A(9, 2) FT/SEC-RAD
0.	.3082E+01	-.1743E+04	0.	0.	0.	0.	.4229E+00	0.	0.	-.2645E+00
5.	.4894E+01	-.1765E+04	.1847E-01	.1219E+00	-.4141E+00	.5020E+00	.4144E+00	-.1509E+01	.4368E+01	.1160E+02
10.	.4823E+01	-.1808E+04	.7926E-01	.2464E+00	-.1166E+01	.9759E+00	.4187E+00	-.3074E+01	.9672E+01	.1290E+02
15.	.4735E+01	-.1785E+04	.1820E+00	.3845E+00	-.1705E+01	.1440E+01	.4187E+00	-.4658E+01	.1564E+02	.3064E+01
20.	.4643E+01	-.1702E+04	.3276E+00	.5125E+00	-.2145E+01	.1850E+01	.4310E+00	-.6257E+01	.2218E+02	-.1755E+02
25.	.4547E+01	-.1756E+04	.5074E+00	.6351E+00	-.2515E+01	.2215E+01	.4458E+00	-.7841E+01	.2922E+02	-.4900E+02
30.	.4451E+01	-.1769E+04	.7093E+00	.7619E+00	-.2851E+01	.2559E+01	.4618E+00	-.9374E+01	.3637E+02	-.8983E+02
35.	.4109E+01	-.1785E+04	.9220E+00	.8291E+00	-.2824E+01	.2729E+01	.4822E+00	-.1082E+02	.4363E+02	-.1395E+03
40.	.3837E+01	-.1794E+04	.1116E+01	.9291E+00	-.3070E+01	.2989E+01	.4925E+00	-.1214E+02	.5049E+02	-.1951E+03
45.	.3529E+01	-.1808E+04	.1258E+01	.9313E+00	-.2789E+01	.3021E+01	.5179E+00	-.1328E+02	.5707E+02	-.2550E+03
50.	.3208E+01	-.1821E+04	.1367E+01	.1371E+01	-.4253E+01	.3944E+01	.5796E+00	-.1423E+02	.6308E+02	-.3157E+03
55.	.2895E+01	-.1829E+04	.1428E+01	.1530E+01	-.4743E+01	.4347E+01	.6273E+00	-.1488E+02	.6836E+02	-.3742E+03
60.	.2595E+01	-.1821E+04	.1367E+01	.1657E+01	-.4787E+01	.4545E+01	.6724E+00	-.1519E+02	.7265E+02	-.4256E+03
65.	.2319E+01	-.1804E+04	.1020E+01	.1964E+01	-.6135E+01	.5375E+01	.7428E+00	-.1507E+02	.7551E+02	-.4653E+03
70.	.1810E+01	-.1774E+04	.1039E+01	.3133E+01	-.1128E+02	.9125E+01	.9031E+00	-.1456E+02	.7666E+02	-.4895E+03
75.	.1490E+01	-.1735E+04	.9122E+00	.9801E+00	-.1869E+01	.2921E+01	.5535E+00	-.1357E+02	.7590E+02	-.4970E+03
80.	.1155E+01	-.1691E+04	.7648E+00	.5571E+00	-.9326E-01	.1801E+01	.3854E+00	-.1235E+02	.7308E+02	-.4841E+03
85.	.9247E+00	-.1652E+04	.7955E+00	.3293E+00	.6482E+00	.1161E+01	.2425E+00	-.1086E+02	.6773E+02	-.4497E+03
90.	.8925E+00	-.1595E+04	.5865E+00	.1411E+00	.1361E+01	.5461E+00	.1332E+00	-.9201E+01	.6008E+02	-.3937E+03
95.	.9393E+00	-.1541E+04	.2875E+00	.8488E-02	.1646E+01	.1342E+00	.7641E-01	-.7467E+01	.5041E+02	-.3260E+03
100.	.9500E+00	-.1476E+04	.1148E+00	-.6393E-02	.1378E+01	.4894E-01	.4590E-01	-.5866E+01	.4144E+02	-.2584E+03
105.	.9563E+00	-.1412E+04	.5643E-01	-.2246E-01	.1215E+01	-.4042E-01	.2753E-01	-.4602E+01	.3372E+02	-.2030E+03
110.	.9703E+00	-.1336E+04	.3433E-01	-.3839E-01	.1068E+01	-.1022E+00	.1627E-01	-.3611E+01	.2735E+02	-.1587E+03
115.	.1020E+00	-.1265E+04	.2144E-01	-.3557E-01	.9817E+00	-.1200E+00	.9665E-02	-.2756E+01	.2173E+02	-.1234E+03
120.	.1099E-01	-.1203E+04	.1170E-01	-.3028E-01	.7321E+00	-.1206E+00	.5910E-02	-.2129E+01	.1740E+02	-.9638E+02
125.	.8194E-01	-.1134E+04	.5418E-02	-.3369E-01	.6204E+00	-.1293E+00	.3509E-02	-.1655E+01	.1395E+02	-.7507E+02
130.	.9514E-01	-.1089E+04	.2046E-02	-.2699E-01	.4874E+00	-.1032E+00	.2232E-02	-.1298E+01	.1121E+02	-.5845E+02
135.	.9321E-01	-.1037E+04	.7549E-03	-.2614E-01	.4072E+00	-.9697E-01	.1389E-02	-.1028E+01	.9048E+01	-.4553E+02
140.	.2477E-01	-.9923E+03	.3430E-03	-.2272E-01	.3243E+00	-.8174E-01	.8658E-03	-.8217E+00	.7351E+01	-.3557E+02
145.	.1809E-01	-.9578E+03	.2173E-03	-.1807E-01	.2486E+00	-.6269E-01	.5558E-03	-.6626E+00	.6013E+01	-.2784E+02
150.	.1428E-01	-.9278E+03	.1541E-03	-.1486E-01	.2145E+00	-.6187E-01	.3288E-03	-.5393E+00	.4940E+01	-.2189E+02
155.	.1101E-01	-.9016E+03	.1047E-03	-.1551E-01	.1685E+00	-.4891E-01	.2061E-03	-.4430E+00	.4133E+01	-.1728E+02
160.	.8815E-02	-.8762E+03	.7447E-04	-.1347E-01	.1357E+00	-.4049E-01	.1279E-03	-.3670E+00	.3479E+01	-.1371E+02
165.	.8599E-02	-.8556E+03	.4826E-04	-.1373E-01	.1243E+00	-.4108E-01	.7217E-04	-.3063E+00	.2957E+01	-.1091E+02
170.	.8196E-02	-.8365E+03	.3274E-04	-.1160E-01	.1003E+00	-.3395E-01	.4318E-04	-.2573E+00	.2535E+01	-.8724E+01
175.	.8009E-02	-.8179E+03	.2368E-04	-.1029E-01	.8461E-01	-.2966E-01	.2505E-04	-.2183E+00	.2201E+01	-.7030E+01
180.	.7602E-02	-.8031E+03	.1648E-04	-.1021E-01	.8010E-01	-.2994E-01	.1264E-04	-.1875E+00	.1938E+01	-.5713E+01
185.	.7301E-02	-.8125E+03	.1249E-04	-.1033E-01	.7729E-01	-.3067E-01	.4680E-05	-.1611E+00	.1711E+01	-.4634E+01
190.	.7034E-02	-.8063E+03	.8346E-05	-.1020E-01	.7408E-01	-.3078E-01	.4027E-06	-.1386E+00	.1515E+01	-.3746E+01
195.	.6742E-02	-.5444E+03	.4702E-05	-.1024E-01	.7237E-01	-.3138E-01	-.1963E-05	-.1191E+00	.1342E+01	-.3016E+01
200.	.6396E-02	-.5129E+03	.5274E-05	-.1026E-01	.7155E-01	-.3218E-01	-.2837E-05	-.1025E+00	.1191E+01	-.2415E+01
205.	.6118E-02	-.4787E+03	.4423E-05	-.1024E-01	.7004E-01	-.3249E-01	-.2701E-05	-.8807E-01	.1056E+01	-.1924E+01
210.	.5898E-02	-.4537E+03	.3078E-05	-.9932E-02	.6716E-01	-.3184E-01	-.1823E-05	-.7564E-01	.9361E+00	-.1523E+01

Table C3. A Matrix (continued)

TIME	A(9, 3)	A(9, 4)	A(9, 5)	A(9, 7)	A(9, 8)	A(9, 9)	A(9,10)	A(9,11)	A(9,12)	A(9,13)
	1/SEC	FT/SEC^2-RAD	FT/SEC^2-RAD	1/SEC	1/SEC^2	1/SEC	1/SEC^2	1/SEC	1/SEC^2	1/SEC
0.	0.	-.1797E+00	-.5088E+01	.2399E-01	.1255E+02	-.3630E+00	-.2343E+03	.6788E-01	.6495E+02	-.9422E-01
5.	-.1046E+00	-.1377E+00	-.3898E+01	-.2813E-01	.3357E+01	-.5248E+00	-.2371E+03	.3548E-02	.3468E+02	-.5222E-01
10.	-.1436E+00	-.1184E+00	-.2907E+01	-.3416E-01	-.5071E+01	-.6922E+00	-.2403E+03	.8748E-02	.8116E+01	-.3566E-01
15.	-.1194E+00	-.1060E+00	-.1955E+01	.9640E-03	-.1334E+02	-.8578E+00	-.2437E+03	.9166E-01	-.1663E+02	-.4364E-01
20.	-.2944E-01	-.7231E-01	-.1066E+01	.7304E-01	-.2162E+02	-.1019E+01	-.2476E+03	.2158E+00	-.3910E+02	-.7552E-01
25.	.1252E+00	-.2068E-01	-.2187E+00	.1823E+00	-.3025E+02	-.1173E+01	-.2519E+03	.4100E+00	-.5984E+02	-.1311E+00
30.	.3363E+00	.7315E-01	.5532E+00	.3272E+00	-.3924E+02	-.1316E+01	-.2568E+03	.6536E+00	-.7831E+02	-.2073E+00
35.	.5995E+00	.2267E+00	.1250E+01	.5107E+00	-.4888E+02	-.1449E+01	-.2620E+03	.9417E+00	-.9490E+02	-.3024E+00
40.	.8998E+00	.4432E+00	.1830E+01	.7319E+00	-.5900E+02	-.1573E+01	-.2677E+03	.1259E+01	-.1090E+03	-.4110E+00
45.	.1228E+01	.7190E+00	.2290E+01	.9935E+00	-.6987E+02	-.1698E+01	-.2736E+03	.1598E+01	-.1212E+03	-.5291E+00
50.	.1565E+01	.1015E+01	.2605E+01	.1291E+01	-.8111E+02	-.1797E+01	-.2794E+03	.1940E+01	-.1309E+03	-.6458E+00
55.	.1893E+01	.1292E+01	.2788E+01	.1620E+01	-.9277E+02	-.1901E+01	-.2855E+03	.2272E+01	-.1387E+03	-.7643E+00
60.	.2186E+01	.1527E+01	.2835E+01	.1964E+01	-.1043E+03	-.1936E+01	-.2917E+03	.2569E+01	-.1442E+03	-.8651E+00
65.	.2424E+01	.1721E+01	.2756E+01	.2303E+01	-.1148E+03	-.2075E+01	-.2970E+03	.2806E+01	-.1475E+03	-.9417E+00
70.	.2594E+01	.1844E+01	.2566E+01	.2605E+01	-.1234E+03	-.2133E+01	-.3039E+03	.2962E+01	-.1479E+03	-.9865E+00
75.	.2640E+01	.1885E+01	.2299E+01	.2853E+01	-.1295E+03	-.2149E+01	-.3106E+03	.3042E+01	-.1457E+03	-.1000E+01
80.	.2599E+01	.1827E+01	.1961E+01	.3004E+01	-.1324E+03	-.2168E+01	-.3170E+03	.3001E+01	-.1398E+03	-.9843E+00
85.	.2441E+01	.1669E+01	.1581E+01	.3017E+01	-.1309E+03	-.2117E+01	-.3228E+03	.2856E+01	-.1294E+03	-.9349E+00
90.	.2173E+01	.1431E+01	.1203E+01	.2869E+01	-.1245E+03	-.2009E+01	-.3279E+03	.2599E+01	-.1149E+03	-.8644E+00
95.	.1830E+01	.1150E+01	.8610E+00	.2575E+01	-.1138E+03	-.1848E+01	-.3321E+03	.2254E+01	-.9743E+02	-.7618E+00
100.	.1478E+01	.8780E+00	.5889E+00	.2205E+01	-.1006E+03	-.1659E+01	-.3348E+03	.1873E+01	-.7977E+02	-.6379E+00
105.	.1186E+01	.6616E+00	.3989E+00	.1867E+01	-.8860E+02	-.1430E+01	-.3361E+03	.1537E+01	-.6525E+02	-.5186E+00
110.	.9456E+00	.4934E+00	.2680E+00	.1565E+01	-.7777E+02	-.1340E+01	-.4044E+03	.1247E+01	-.5343E+02	-.4105E+00
115.	.7487E+00	.3655E+00	.1790E+00	.1274E+01	-.6773E+02	-.1289E+01	-.4247E+03	.1020E+01	-.4356E+02	-.3502E+00
120.	.5948E+00	.2708E+00	.1198E+00	.1042E+01	-.5906E+02	-.1100E+01	-.4449E+03	.8248E+00	-.3564E+02	-.2864E+00
125.	.4713E+00	.1998E+00	.8012E-01	.8516E+00	-.5132E+02	-.1009E+01	-.4642E+03	.6635E+00	-.2956E+02	-.2267E+00
130.	.3735E+00	.1474E+00	.5368E-01	.6971E+00	-.4451E+02	-.9332E+00	-.4839E+03	.5243E+00	-.2450E+02	-.1751E+00
135.	.2964E+00	.1089E+00	.3609E-01	.5729E+00	-.3863E+02	-.8738E+00	-.5015E+03	.4209E+00	-.2041E+02	-.1323E+00
140.	.2362E+00	.8080E-01	.2441E-01	.4737E+00	-.3361E+02	-.8271E+00	-.5190E+03	.3347E+00	-.1713E+02	-.9808E-01
145.	.1890E+00	.6024E-01	.1662E-01	.3944E+00	-.2933E+02	-.7914E+00	-.5366E+03	.2662E+00	-.1447E+02	-.7081E-01
150.	.1521E+00	.4525E-01	.1141E-01	.3311E+00	-.2573E+02	-.7640E+00	-.5530E+03	.2114E+00	-.1233E+02	-.4958E-01
155.	.1233E+00	.3426E-01	.7903E-02	.2809E+00	-.2272E+02	-.7439E+00	-.5696E+03	.1700E+00	-.1060E+02	-.3298E-01
160.	.1007E+00	.2618E-01	.5540E-02	.2407E+00	-.2020E+02	-.7299E+00	-.5852E+03	.1367E+00	-.9194E+01	-.2015E-01
165.	.8291E-01	.2020E-01	.3926E-02	.2083E+00	-.1806E+02	-.7195E+00	-.6008E+03	.1104E+00	-.8037E+01	-.1025E-01
170.	.6874E-01	.1576E-01	.2815E-02	.1817E+00	-.1621E+02	-.7107E+00	-.6153E+03	.8948E-01	-.7069E+01	-.2769E-02
175.	.5764E-01	.1247E-01	.2051E-02	.1604E+00	-.1468E+02	-.7056E+00	-.6290E+03	.7317E-01	-.6280E+01	.2857E-02
180.	.4897E-01	.1003E-01	.1520E-02	.1435E+00	-.1345E+02	-.7030E+00	-.6428E+03	.6044E-01	-.5646E+01	.7178E-02
185.	.4159E-01	.8102E-02	.1134E-02	.1287E+00	-.1231E+02	-.7011E+00	-.6556E+03	.4989E-01	-.5091E+01	.1037E-01
190.	.3557E-01	.6576E-02	.8506E-03	.1157E+00	-.1127E+02	-.7000E+00	-.6680E+03	.4115E-01	-.4574E+01	.1269E-01
195.	.3037E-01	.5354E-02	.6411E-03	.1039E+00	-.1031E+02	-.6998E+00	-.6805E+03	.3389E-01	-.4117E+01	.1421E-01
200.	.2597E-01	.4374E-02	.4857E-03	.9349E-01	-.9432E+01	-.7002E+00	-.6927E+03	.2786E-01	-.3706E+01	.1519E-01
205.	.2222E-01	.3583E-02	.3695E-03	.8397E-01	-.8613E+01	-.7011E+00	-.7046E+03	.2298E-01	-.3332E+01	.1560E-01
210.	.1901E-01	.2939E-02	.2821E-03	.7529E-01	-.7853E+01	-.7020E+00	-.7159E+03	.1896E-01	-.2992E+01	.1559E-01

Table C3. A Matrix (continued)

TIME	A(9,14) 1/SEC^2	A(9,15) FT/SEC^2-RAD	A(9,16) FT/SEC^2-RAD	A(9,17) FT/SEC^2-RAD	A(9,18) FT/SEC^2	A(9,19) FT/SEC^2	A(9,20) FT/SEC^2	A(9,22) FT/SEC^2	A(9,23) FT/SEC^2	A(11, 1) FT/SEC-RAD
0.	-.1177E+03	-.3457E+01	-.8943E+03	0.	0.	0.	0.	.4576E+00	0.	0.
5.	-.9884E+02	-.4407E+01	-.8344E+03	-.1736E-01	.5069E-01	.4401E+00	-.8776E+00	.3803E+00	.4370E+01	-.4563E-02
10.	-.8253E+02	-.5312E+01	-.7704E+03	-.3472E-01	.6491E-01	.6953E+00	-.1841E+01	.3200E+00	.9664E+01	-.1049E-01
15.	-.6596E+02	-.6120E+01	.7044E+03	-.5208E-01	.4159E-01	.7853E+00	-.2867E+01	.2549E+00	.1568E+02	-.3049E-01
20.	-.4947E+02	-.6854E+01	.6403E+03	-.6911E+00	-.2386E-01	.8092E+00	-.3962E+01	.1975E+00	.2230E+02	-.7664E-01
25.	-.3266E+02	-.7522E+01	.5782E+03	-.6944E+00	-.1296E+00	.7903E+00	-.5102E+01	.1356E+00	.2933E+02	-.1036E+00
30.	-.1608E+02	-.8169E+01	.5079E+03	-.1388E+01	-.2756E+00	.7607E+00	-.6296E+01	.6925E-01	.3649E+02	-.1532E+00
35.	.3780E+00	-.8643E+01	.4351E+03	-.1940E+01	-.4342E+00	.6636E+00	-.7502E+01	-.2150E-02	.4366E+02	-.2136E+00
40.	.1608E+02	-.8862E+01	.3657E+03	-.2497E+01	-.6364E+00	.6054E+00	-.8556E+01	-.8182E-01	.5058E+02	-.2846E+00
45.	.3107E+02	-.8824E+01	.2956E+03	-.3053E+01	-.7922E+00	.3017E+00	-.9618E+01	-.1705E+00	.5712E+02	-.3634E+00
50.	.4469E+02	-.8855E+01	.2277E+03	-.3750E+01	-.1395E+01	.9155E+00	-.1147E+02	-.2957E+00	.6311E+02	-.4474E+00
55.	.5709E+02	-.8638E+01	.2003E+03	-.4508E+01	-.1821E+01	.1154E+01	-.1282E+02	-.4332E+00	.6837E+02	-.5307E+00
60.	.6773E+02	-.8219E+01	.2219E+03	-.4440E+01	-.2260E+01	.9742E+00	-.1404E+02	-.5881E+00	.7258E+02	-.6159E+00
65.	.7673E+02	-.7722E+01	.3639E+03	-.3541E+01	-.3032E+01	.2189E+01	-.1603E+02	-.7985E+00	.7536E+02	-.6998E+00
70.	.8352E+02	-.7051E+01	.3550E+03	-.4030E+01	-.5411E+01	.8837E+01	-.2131E+02	-.1174E+01	.7646E+02	-.7486E+00
75.	.8810E+02	-.6290E+01	.3894E+03	-.3552E+01	-.1878E+01	-.3430E+01	-.1157E+02	-.8142E+00	.7555E+02	-.7732E+00
80.	.8959E+02	-.5437E+01	.4131E+03	-.3504E+01	-.1168E+01	-.6611E+01	-.8629E+01	-.6440E+00	.7280E+02	-.7841E+00
85.	.8724E+02	-.4552E+01	.4399E+03	-.3817E+01	-.7455E+00	-.8139E+01	-.6187E+01	-.4529E+00	.6746E+02	-.7721E+00
90.	.8067E+02	-.3537E+01	.4358E+03	-.3081E+01	-.3392E+00	-.9748E+01	-.3689E+01	-.2713E+00	.5983E+02	-.7371E+00
95.	.7069E+02	-.2773E+01	.4575E+03	-.1556E+01	-.2135E-01	-.1008E+02	-.1665E+01	-.1665E+00	.5050E+02	-.6837E+00
100.	.5982E+02	-.2041E+01	.4710E+03	-.6928E+00	.1667E-01	-.8942E+01	-.7254E+00	-.1057E+00	.4128E+02	-.6072E+00
105.	.5112E+02	-.1500E+01	.4733E+03	-.3447E+00	.6032E-01	-.8107E+01	-.2318E-01	-.6632E-01	.3359E+02	-.5344E+00
110.	.4426E+02	-.1109E+01	.4655E+03	-.2155E+00	.1057E+00	-.7209E+01	.4289E+00	-.4059E-01	.2725E+02	-.4673E+00
115.	.3567E+02	-.8023E+00	.4596E+03	-.1419E+00	.1005E+00	-.5840E+01	.5890E+00	-.2509E-01	.2156E+02	-.4131E+00
120.	.2981E+02	-.5907E+00	.4534E+03	-.7974E-01	.8765E-01	-.4939E+01	.6459E+00	-.1589E-01	.1734E+02	-.3601E+00
125.	.2560E+02	-.4346E+00	.4445E+03	-.3803E-01	.9968E-01	-.4109E+01	.6961E+00	-.9740E-02	.1390E+02	-.3095E+00
130.	.2251E+02	-.3238E+00	.4394E+03	-.1403E-01	.8124E-01	-.3426E+01	.6199E+00	-.6357E-02	.1118E+02	-.2631E+00
135.	.2025E+02	-.2425E+00	.4315E+03	-.5512E-02	.7964E-01	-.2896E+01	.5947E+00	-.4066E-02	.9026E+01	-.2222E+00
140.	.1856E+02	-.1832E+00	.4241E+03	-.2537E-02	.6970E-01	-.2346E+01	.5288E+00	-.2590E-02	.7335E+01	-.1870E+00
145.	.1731E+02	-.1395E+00	.4197E+03	-.1525E-02	.5551E-01	-.1951E+01	.4482E+00	-.1690E-02	.6001E+01	-.1571E+00
150.	.1636E+02	-.1077E+00	.4157E+03	-.1154E-02	.5750E-01	-.1660E+01	.4212E+00	-.1023E-02	.4951E+01	-.1320E+00
155.	.1570E+02	-.8412E-01	.4124E+03	-.5305E-03	.4695E-01	-.1358E+01	.3545E+00	-.6498E-03	.4127E+01	-.1113E+00
160.	.1522E+02	-.6663E-01	.4082E+03	-.5760E-03	.4011E-01	-.1129E+01	.3046E+00	-.4090E-03	.3474E+01	-.9414E-01
165.	.1486E+02	-.5139E-01	.3860E+03	-.3787E-03	.4001E-01	-.9817E+00	.2860E+00	-.2406E-03	.2953E+01	-.7907E-01
170.	.1454E+02	-.4080E-01	.3643E+03	-.2614E-03	.3288E-01	-.8068E+00	.2407E+00	-.1477E-03	.2532E+01	-.6819E-01
175.	.1431E+02	-.3264E-01	.3458E+03	-.1926E-03	.2822E-01	-.6777E+00	.2084E+00	-.8960E-04	.2199E+01	-.5845E-01
180.	.1420E+02	-.2663E-01	.3285E+03	-.1387E-03	.2695E-01	-.6006E+00	.1956E+00	-.5185E-04	.1936E+01	-.5103E-01
185.	.1402E+02	-.2199E-01	.3075E+03	-.1064E-03	.2609E-01	-.5301E+00	.1841E+00	-.2766E-04	.1710E+01	-.4443E-01
190.	.1379E+02	-.1826E-01	.2992E+03	-.7298E-04	.2447E-01	-.4642E+00	.1713E+00	-.1396E-04	.1514E+01	-.3874E-01
195.	.1348E+02	-.1519E-01	.2805E+03	-.4223E-04	.2322E-01	-.4037E+00	.1603E+00	-.5896E-05	.1341E+01	-.3378E-01
200.	.1312E+02	-.1261E-01	.2674E+03	-.4372E-04	.2180E-01	-.3488E+00	.1504E+00	-.1866E-05	.1190E+01	-.2952E-01
205.	.1269E+02	-.1059E-01	.2525E+03	-.4204E-04	.2025E-01	-.2929E+00	.1389E+00	-.1009E-06	.1056E+01	-.2580E-01
210.	.1218E+02	-.8892E-02	.2422E+03	-.2962E-04	.1814E-01	-.2402E+00	.1257E+00	.2291E-06	.9357E+00	-.2257E-01

Table C3. A Matrix (continued)

TIME	A(11, 2) FT/SEC-RAD	A(11, 3) 1/SEC	A(11, 4) FT/SEC^2-RAD	A(11, 5) FT/SEC^2-RAD	A(11, 7) 1/SEC	A(11, 8) 1/SEC^2	A(11, 9) 1/SEC	A(11,10) 1/SEC^2	A(11,11) 1/SEC	A(11,12) 1/SEC^2
0.	.1229E-02	0.	-.1678E-01	-.4749E+00	.3593E-02	.1844E+01	.1471E-03	.9531E-01	-.5890E+00	-.5605E+03
5.	.3010E+01	-.1190E-01	-.1651E-01	-.4674E+00	-.3918E-02	.1939E+01	-.6215E-05	.5479E-01	-.5971E+00	-.5606E+03
10.	.6258E+01	-.2447E-01	-.1914E-01	-.4700E+00	-.1220E-01	.2089E+01	.4033E-04	.1447E-01	-.6047E+00	-.5603E+03
15.	.9643E+01	-.3757E-01	-.2543E-01	-.4692E+00	-.2114E-01	.2262E+01	.3133E-03	-.2888E-01	-.6170E+00	-.5604E+03
20.	.1313E+02	-.5096E-01	-.3156E-01	-.4650E+00	-.3071E-01	.2465E+01	.8312E-03	-.7497E-01	-.6276E+00	-.5601E+03
25.	.1664E+02	-.6432E-01	-.4313E-01	-.4561E+00	-.4084E-01	.2695E+01	.1621E-02	-.1256E+00	-.6396E+00	-.5601E+03
30.	.2007E+02	-.7727E-01	-.5845E-01	-.4420E+00	-.5134E-01	.2954E+01	.2682E-02	-.1805E+00	-.6498E+00	-.5606E+03
35.	.2336E+02	-.8960E-01	-.7678E-01	-.4232E+00	-.6214E-01	.3247E+01	.4032E-02	-.2420E+00	-.6606E+00	-.5606E+03
40.	.2640E+02	-.1011E+00	-.9657E-01	-.3988E+00	-.7310E-01	.3568E+01	.5645E-02	-.3095E+00	-.6710E+00	-.5606E+03
45.	.2913E+02	-.1113E+00	-.1160E+00	-.3693E+00	-.8404E-01	.3924E+01	.7523E-02	-.3857E+00	-.6809E+00	-.5608E+03
50.	.3147E+02	-.1202E+00	-.1310E+00	-.3364E+00	-.9469E-01	.4301E+01	.9603E-02	-.4699E+00	-.6898E+00	-.5609E+03
55.	.3331E+02	-.1273E+00	-.1399E+00	-.3019E+00	-.1047E+00	.4695E+01	.1185E-01	-.5652E+00	-.6974E+00	-.5609E+03
60.	.3453E+02	-.1322E+00	-.1434E+00	-.2664E+00	-.1134E+00	.5080E+01	.1413E-01	-.6694E+00	-.7034E+00	-.5611E+03
65.	.3491E+02	-.1340E+00	-.1436E+00	-.2300E+00	-.1200E+00	.5408E+01	.1631E-01	-.7806E+00	-.7068E+00	-.5613E+03
70.	.3444E+02	-.1328E+00	-.1395E+00	-.1941E+00	-.1239E+00	.5640E+01	.1820E-01	-.8915E+00	-.7074E+00	-.5615E+03
75.	.3317E+02	-.1282E+00	-.1312E+00	-.1600E+00	-.1249E+00	.5759E+01	.1973E-01	-.1001E+01	-.7052E+00	-.5617E+03
80.	.3110E+02	-.1208E+00	-.1190E+00	-.1278E+00	-.1226E+00	.5763E+01	.2080E-01	-.1098E+01	-.7005E+00	-.5623E+03
85.	.2822E+02	-.1103E+00	-.1036E+00	-.9816E-01	-.1167E+00	.5634E+01	.2133E-01	-.1172E+01	-.6936E+00	-.5626E+03
90.	.2473E+02	-.9735E-01	-.8643E-01	-.7262E-01	-.1071E+00	.5377E+01	.2119E-01	-.1209E+01	-.6836E+00	-.5631E+03
95.	.2087E+02	-.8287E-01	-.6891E-01	-.5161E-01	-.9464E-01	.5014E+01	.2036E-01	-.1205E+01	-.6710E+00	-.5638E+03
100.	.1708E+02	-.6850E-01	-.5305E-01	-.3558E-01	-.8100E-01	.4584E+01	.1877E-01	-.1155E+01	-.6590E+00	-.5644E+03
105.	.1398E+02	-.5664E-01	-.4071E-01	-.2455E-01	-.6923E-01	.4224E+01	.1696E-01	-.1097E+01	-.6490E+00	-.5651E+03
110.	.1142E+02	-.4668E-01	-.3107E-01	-.1688E-01	-.5892E-01	.3896E+01	.1497E-01	-.1027E+01	-.6401E+00	-.5655E+03
115.	.9307E+01	-.3855E-01	-.2372E-01	-.1162E-01	-.4966E-01	.3586E+01	.1390E-01	-.9931E+00	-.6330E+00	-.5658E+03
120.	.7598E+01	-.3183E-01	-.1811E-01	-.8014E-02	-.4195E-01	.3304E+01	.1247E-01	-.9415E+00	-.6270E+00	-.5662E+03
125.	.6186E+01	-.2617E-01	-.1377E-01	-.5523E-02	-.3538E-01	.3037E+01	.1088E-01	-.8762E+00	-.6217E+00	-.5664E+03
130.	.5035E+01	-.2148E-01	-.1047E-01	-.3813E-02	-.2984E-01	.2784E+01	.9266E-02	-.8029E+00	-.6174E+00	-.5667E+03
135.	.4107E+01	-.1764E-01	-.7974E-02	-.2643E-02	-.2524E-01	.2554E+01	.7767E-02	-.7289E+00	-.6135E+00	-.5668E+03
140.	.3363E+01	-.1452E-01	-.6099E-02	-.1843E-02	-.2142E-01	.2345E+01	.6430E-02	-.6570E+00	-.6107E+00	-.5675E+03
145.	.2767E+01	-.1199E-01	-.4689E-02	-.1293E-02	-.1827E-01	.2158E+01	.5271E-02	-.5895E+00	-.6081E+00	-.5676E+03
150.	.2291E+01	-.9955E-02	-.3629E-02	-.9148E-03	-.1567E-01	.1991E+01	.4292E-02	-.5277E+00	-.6063E+00	-.5682E+03
155.	.1911E+01	-.8320E-02	-.2832E-02	-.6532E-03	-.1354E-01	.1847E+01	.3478E-02	-.4727E+00	-.6051E+00	-.5690E+03
160.	.1607E+01	-.7000E-02	-.2229E-02	-.4716E-03	-.1178E-01	.1720E+01	.2810E-02	-.4238E+00	-.6037E+00	-.5690E+03
165.	.1361E+01	-.5927E-02	-.1770E-02	-.3441E-03	-.1030E-01	.1606E+01	.2264E-02	-.3803E+00	-.6029E+00	-.5696E+03
170.	.1160E+01	-.5049E-02	-.1420E-02	-.2537E-03	-.9049E-02	.1500E+01	.1823E-02	-.3412E+00	-.6022E+00	-.5701E+03
175.	.9989E+00	-.4345E-02	-.1154E-02	-.1898E-03	-.8016E-02	.1408E+01	.1474E-02	-.3079E+00	-.6019E+00	-.5708E+03
180.	.8712E+00	-.3785E-02	-.9524E-03	-.1444E-03	-.7178E-02	.1332E+01	.1200E-02	-.2802E+00	-.6014E+00	-.5711E+03
185.	.7607E+00	-.3301E-02	-.7889E-03	-.1104E-03	-.6423E-02	.1256E+01	.9740E-03	-.2545E+00	-.6010E+00	-.5715E+03
190.	.6653E+00	-.2883E-02	-.6560E-03	-.8486E-04	-.5748E-02	.1181E+01	.7891E-03	-.2310E+00	-.6008E+00	-.5717E+03
195.	.5820E+00	-.2519E-02	-.5468E-03	-.6548E-04	-.5137E-02	.1107E+01	.6384E-03	-.2095E+00	-.6004E+00	-.5718E+03
200.	.5098E+00	-.2204E-02	-.4574E-03	-.5079E-04	-.4592E-02	.1036E+01	.5155E-03	-.1899E+00	-.6006E+00	-.5727E+03
205.	.4464E+00	-.1928E-02	-.3833E-03	-.3952E-04	-.4098E-02	.9660E+00	.4164E-03	-.1721E+00	-.6004E+00	-.5731E+03
210.	.3909E+00	-.1687E-02	-.3216E-03	-.3087E-04	-.3653E-02	.8985E+00	.3364E-03	-.1559E+00	-.6003E+00	-.5733E+03

Table C3. A Matrix (continued)

TIME	A(11,13) 1/SEC	A(11,14) 1/SEC^2	A(11,15) FT/SEC^2-RAD	A(11,16) FT/SEC^2-RAD	A(11,17) FT/SEC^2-RAD	A(11,18) FT/SEC^2	A(11,19) FT/SEC^2	A(11,20) FT/SEC^2	A(11,22) FT/SEC^2	A(11,23) FT/SEC^2
0.	-.3293E-02	-.4109E+01	.1224E+00	-.9753E+02	0.	0.	0.	0.	.5036E-01	0.
5.	-.1222E-02	-.3979E+01	.1254E+00	-.1010E+03	.4901E-03	.8854E-02	-.1847E+00	.1188E-01	.4994E-01	-.5521E-02
10.	.8138E-03	-.3893E+01	.1315E+00	-.1058E+03	.2161E-02	.1838E-01	-.3851E+00	.2469E-01	.5129E-01	-.1737E-01
15.	.2782E-02	-.3791E+01	.1358E+00	-.1066E+03	.5222E-02	.2940E-01	-.6026E+00	.4146E-01	.5195E-01	-.3645E-01
20.	.4659E-02	-.3678E+01	.1397E+00	-.1036E+03	.9881E-02	.4010E-01	-.8229E+00	.5779E-01	.5412E-01	-.6340E-01
25.	.6409E-02	-.3549E+01	.1421E+00	-.1094E+03	.1603E-01	.5087E-01	-.1045E+01	.7519E-01	.5659E-01	-.9961E-01
30.	.8005E-02	-.3413E+01	.1432E+00	-.1120E+03	.2355E-01	.6249E-01	-.1274E+01	.9503E-01	.5924E-01	-.1455E+00
35.	.9428E-02	-.3269E+01	.1439E+00	-.1157E+03	.3230E-01	.6979E-01	-.1471E+01	.1006E+00	.6272E-01	-.2014E+00
40.	.1070E-01	-.3124E+01	.1423E+00	-.1193E+03	.4139E-01	.8045E-01	-.1678E+01	.1261E+00	.6498E-01	-.2670E+00
45.	.1181E-01	-.2982E+01	.1394E+00	-.1238E+03	.5011E-01	.8328E-01	-.1846E+01	.1272E+00	.6971E-01	-.3417E+00
50.	.1278E-01	-.2849E+01	.1355E+00	-.1291E+03	.5788E-01	.1271E+00	-.2292E+01	.2322E+00	.7953E-01	-.4244E+00
55.	.1362E-01	-.2731E+01	.1308E+00	-.1349E+03	.6519E-01	.1478E+00	-.2572E+01	.2925E+00	.8857E-01	-.5091E+00
60.	.1433E-01	-.2631E+01	.1241E+00	-.1403E+03	.6769E-01	.1675E+00	-.2805E+01	.3337E+00	.9822E-01	-.5907E+00
65.	.1486E-01	-.2548E+01	.1169E+00	-.1460E+03	.6510E-01	.2087E+00	-.3230E+01	.4675E+00	.1129E+00	-.6634E+00
70.	.1522E-01	-.2482E+01	.1075E+00	-.1514E+03	.6145E-01	.3516E+00	-.4305E+01	.8795E+00	.1428E+00	-.7216E+00
75.	.1542E-01	-.2427E+01	.9696E-01	-.1568E+03	.5936E-01	.1166E+00	-.2335E+01	.2421E+00	.9336E-01	-.7474E+00
80.	.1537E-01	-.2363E+01	.8536E-01	-.1622E+03	.5447E-01	.7040E-01	-.1827E+01	.1220E+00	.6886E-01	-.7598E+00
85.	.1491E-01	-.2262E+01	.7368E-01	-.1649E+03	.5339E-01	.4434E-01	-.1434E+01	.6272E-01	.4595E-01	-.7509E+00
90.	.1394E-01	-.2103E+01	.6157E-01	-.1745E+03	.5215E-01	.2030E-01	-.1038E+01	-.7185E-02	.2680E-01	-.7193E+00
95.	.1246E-01	-.1884E+01	.4991E-01	-.1815E+03	.2876E-01	.1311E-02	-.6992E+00	-.5287E-01	.1640E-01	-.6666E+00
100.	.1067E-01	-.1633E+01	.3935E-01	-.1840E+03	.1336E-01	-.1064E-02	-.5182E+00	-.4973E-01	.1051E-01	-.5963E+00
105.	.9025E-02	-.1412E+01	.3096E-01	-.1948E+03	.7117E-02	-.4035E-02	-.3676E+00	-.5578E-01	.6761E-02	-.5280E+00
110.	.7540E-02	-.1218E+01	.2442E-01	-.1995E+03	.4770E-02	-.7436E-02	-.2485E+00	-.6195E-01	.4287E-02	-.4608E+00
115.	.6329E-02	-.1050E+01	.1931E-01	-.2052E+03	.3342E-02	-.7427E-02	-.1674E+00	-.5565E-01	.2719E-02	-.4081E+00
120.	.5273E-02	-.9071E+00	.1532E-01	-.2111E+03	.2069E-02	-.6797E-02	-.1146E+00	-.5130E-01	.1775E-02	-.3563E+00
125.	.4352E-02	-.7817E+00	.1205E-01	-.2152E+03	.1054E-02	-.8118E-02	-.6495E-01	-.5196E-01	.1128E-02	-.3067E+00
130.	.3570E-02	-.6731E+00	.9505E-02	-.2204E+03	.4859E-03	-.6953E-02	-.4437E-01	-.4426E-01	.7652E-03	-.2609E+00
135.	.2922E-02	-.5806E+00	.7488E-02	-.2236E+03	.1702E-03	-.7178E-02	-.1985E-01	-.4285E-01	.5087E-03	-.2206E+00
140.	.2391E-02	-.5023E+00	.5911E-02	-.2268E+03	.8185E-04	-.6627E-02	-.6831E-02	-.3846E-01	.3379E-03	-.1858E+00
145.	.1959E-02	-.4360E+00	.4677E-02	-.2310E+03	.5449E-04	-.5585E-02	-.2913E-02	-.3248E-01	.2307E-03	-.1561E+00
150.	.1610E-02	-.3805E+00	.3730E-02	-.2349E+03	.4031E-04	-.6134E-02	.1068E-01	-.3245E-01	.1458E-03	-.1313E+00
155.	.1329E-02	-.3341E+00	.2995E-02	-.2390E+03	.2957E-04	-.5334E-02	.1128E-01	-.2770E-01	.9722E-04	-.1107E+00
160.	.1104E-02	-.2953E+00	.2426E-02	-.2421E+03	.2097E-04	-.4869E-02	.1263E-01	-.2443E-01	.6422E-04	-.9372E-01
165.	.9212E-03	-.2623E+00	.1985E-02	-.2343E+03	.1404E-04	-.5208E-02	.1977E-01	-.2472E-01	.3900E-04	-.7964E-01
170.	.7732E-03	-.2339E+00	.1631E-02	-.2251E+03	.9812E-05	-.4600E-02	.1867E-01	-.2143E-01	.2488E-04	-.6793E-01
175.	.6554E-03	-.2102E+00	.1336E-02	-.2177E+03	.7303E-05	-.4256E-02	.1869E-01	-.1931E-01	.1548E-04	-.5845E-01
180.	.5624E-03	-.1908E+00	.1016E-02	-.2103E+03	.5249E-05	-.4399E-02	.2223E-01	-.1947E-01	.8679E-05	-.5086E-01
185.	.4832E-03	-.1731E+00	.8410E-03	-.1999E+03	.4071E-05	-.4626E-02	.2596E-01	-.1983E-01	.3979E-05	-.4429E-01
190.	.4159E-03	-.1570E+00	.6993E-03	-.1975E+03	.2795E-05	-.4736E-02	.2877E-01	-.1993E-01	.1192E-05	-.3842E-01
195.	.3592E-03	-.1422E+00	.5821E-03	-.1879E+03	.1617E-05	-.4929E-02	.3196E-01	-.2030E-01	-.5300E-06	-.3369E-01
200.	.3091E-03	-.1287E+00	.4832E-03	-.1817E+03	.1866E-05	-.5116E-02	.3530E-01	-.2086E-01	-.1352E-05	-.2944E-01
205.	.2648E-03	-.1164E+00	.4054E-03	-.1740E+03	.1609E-05	-.5281E-02	.3798E-01	-.2115E-01	-.1499E-05	-.2574E-01
210.	.2305E-03	-.1051E+00	.3403E-03	-.1693E+03	.1144E-05	-.5296E-02	.3931E-01	-.2095E-01	-.1097E-05	-.2252E-01

Table C3. A Matrix (continued)

TIME	A(13, 1) FT/SEC-RAD	A(13, 2) FT/SEC-RAD	A(13, 3) 1/SEC	A(13, 4) FT/SEC^{2}RAD	A(13, 5) FT/SEC^2-RAD	A(13, 7) 1/SEC	A(13, 8) 1/SEC^2	A(13, 9) 1/SEC	A(13,10) 1/SEC^2	A(13,11) 1/SEC
0.	0.	-.3059E-02	0.	.7004E-01	.1983E+01	-.9753E-01	-.4978E+02	-.9178E-02	-.5925E+01	-.1501E+00
5.	.4882E+01	-.2115E+02	-.1136E+00	.6384E-01	.1808E+01	.4078E-01	-.5119E+02	-.3643E-02	-.5385E+01	-.2570E-01
10.	.1028E+02	-.4080E+02	-.2434E+00	.6482E-01	.1501E+01	.1929E+00	-.5369E+02	-.1902E-02	-.4895E+01	.1045E+00
15.	.1614E+02	-.5755E+02	-.3894E+00	.7283E-01	.1344E+01	.3591E+00	-.5655E+02	-.5068E-02	-.4314E+01	.2384E+00
20.	.2249E+02	-.7071E+02	-.5498E+00	.7305E-01	.1076E+01	.5413E+00	-.5991E+02	-.1431E-01	-.3658E+01	.3753E+00
25.	.2914E+02	-.7930E+02	-.7260E+00	.7470E-01	.7898E+00	.7409E+00	-.6361E+02	-.3122E-01	-.2894E+01	.5126E+00
30.	.3604E+02	-.8283E+02	-.9129E+00	.6624E-01	.5009E+00	.9567E+00	-.6770E+02	-.5680E-01	-.2044E+01	.6477E+00
35.	.4308E+02	-.8062E+02	-.1109E+01	.3838E-01	.2116E+00	.1184E+01	-.7222E+02	-.9264E-01	-.1082E+01	.7782E+00
40.	.5004E+02	-.7338E+02	-.1306E+01	-.1274E-01	-.5263E-01	.1435E+01	-.7709E+02	-.1387E+00	-.4139E-01	.9027E+00
45.	.5671E+02	-.6123E+02	-.1498E+01	-.8934E-01	-.2845E+00	.1690E+01	-.8249E+02	-.1956E+00	.1105E+01	.1018E+01
50.	.6276E+02	-.4606E+02	-.1676E+01	-.1801E+00	-.4624E+00	.1946E+01	-.8819E+02	-.2608E+00	.2307E+01	.1122E+01
55.	.6784E+02	-.2931E+02	-.1835E+01	-.2705E+00	-.5837E+00	.2191E+01	-.9426E+02	-.3321E+00	.3609E+01	.1211E+01
60.	.7140E+02	-.1421E+02	-.1975E+01	-.3431E+00	-.6371E+00	.2406E+01	-.1004E+03	-.4029E+00	.4970E+01	.1280E+01
65.	.7287E+02	-.2911E+01	-.1944E+01	-.3922E+00	-.6428E+00	.2566E+01	-.1059E+03	-.4662E+00	.6438E+01	.1323E+01
70.	.7200E+02	.1664E+01	-.1930E+01	-.4039E+00	-.5621E+00	.2654E+01	-.1102E+03	-.5135E+00	.7901E+01	.1337E+01
75.	.6899E+02	-.2566E+00	-.1812E+01	-.3794E+00	-.4629E+00	.2664E+01	-.1128E+03	-.5423E+00	.9334E+01	.1322E+01
80.	.6414E+02	-.5751E+01	-.1643E+01	-.3280E+00	-.3521E+00	.2591E+01	-.1133E+03	-.5543E+00	.1047E+02	.1276E+01
85.	.5774E+02	-.1063E+02	-.1439E+01	-.2649E+00	-.2509E+00	.2430E+01	-.1107E+03	-.5523E+00	.1113E+02	.1194E+01
90.	.5032E+02	-.1177E+02	-.1192E+01	-.2047E+00	-.1730E+00	.2188E+01	-.1046E+03	-.5374E+00	.1108E+02	.1076E+01
95.	.4228E+02	-.8475E+01	-.9569E+00	-.1561E+00	-.1149E+00	.1882E+01	-.9527E+02	-.5077E+00	.1037E+02	.9274E+00
100.	.3416E+02	-.3380E+01	-.7536E+00	-.1237E+00	-.8237E-01	.1551E+01	-.8399E+02	-.4544E+00	.9339E+01	.7640E+00
105.	.2705E+02	.1392E+01	-.6038E+00	-.1075E+00	-.6481E-01	.1259E+01	-.7371E+02	-.3878E+00	.8590E+01	.6151E+00
110.	.2096E+02	.4600E+01	-.5019E+00	-.9674E-01	-.5256E-01	.1008E+01	-.6432E+02	-.3150E+00	.8095E+01	.4844E+00
115.	.1743E+02	.8623E+01	-.3831E+00	-.7157E-01	-.3506E-01	.8193E+00	-.5667E+02	-.3005E+00	.6453E+01	.3997E+00
120.	.1402E+02	.1035E+02	-.3040E+00	-.5779E-01	-.2567E-01	.6582E+00	-.4968E+02	-.2625E+00	.5508E+01	.3211E+00
125.	.1087E+02	.1049E+02	-.2492E+00	-.4930E-01	-.1977E-01	.5210E+00	-.4315E+02	-.2136E+00	.5047E+01	.2507E+00
130.	.8201E+01	.9618E+01	-.2037E+00	-.4289E-01	-.1542E-01	.4086E+00	-.3720E+02	-.1642E+00	.4878E+01	.1916E+00
135.	.6041E+01	.8295E+01	-.1795E+00	-.3732E-01	-.1217E-01	.3188E+00	-.3195E+02	-.1202E+00	.4854E+01	.1440E+00
140.	.4382E+01	.6862E+01	-.1549E+00	-.3204E-01	-.9680E-02	.2486E+00	-.2741E+02	-.8451E-01	.4849E+01	.1073E+00
145.	.3134E+01	.5518E+01	-.1340E+00	-.2714E-01	-.7436E-02	.1941E+00	-.2351E+02	-.5686E-01	.4816E+01	.7943E-01
150.	.2226E+01	.4361E+01	-.1157E+00	-.2267E-01	-.5715E-02	.1524E+00	-.2022E+02	-.3665E-01	.4721E+01	.5883E-01
155.	.1572E+01	.3411E+01	-.1000E+00	-.1878E-01	-.4332E-02	.1205E+00	-.1747E+02	-.2221E-01	.4583E+01	.4367E-01
160.	.1108E+01	.2657E+01	-.8631E-01	-.1544E-01	-.3248E-02	.9611E-01	-.1517E+02	-.1230E-01	.4399E+01	.3264E-01
165.	.7803E+00	.2070E+01	-.7444E-01	-.1266E-01	-.2440E-02	.7734E-01	-.1324E+02	-.5659E-02	.4179E+01	.2460E-01
170.	.5517E+00	.1620E+01	-.6414E-01	-.1036E-01	-.1851E-02	.6282E-01	-.1159E+02	-.1404E-02	.3929E+01	.1876E-01
175.	.3932E+00	.1282E+01	-.5552E-01	-.8525E-02	-.1402E-02	.5171E-01	-.1024E+02	.1243E-02	.3681E+01	.1453E-01
180.	.2824E+00	.1029E+01	-.4844E-01	-.7078E-02	-.1073E-02	.4319E-01	-.9136E+01	.2872E-02	.3455E+01	.1145E-01
185.	.2025E+00	.8298E+00	-.4216E-01	-.5869E-02	-.8213E-03	.3622E-01	-.8153E+01	.3784E-02	.3216E+01	.9087E-02
190.	.1444E+00	.6729E+00	-.3664E-01	-.4867E-02	-.6236E-03	.3048E-01	-.7274E+01	.4227E-02	.2975E+01	.7258E-02
195.	.1024E+00	.5488E+00	-.3177E-01	-.4033E-02	-.4830E-03	.2571E-01	-.6487E+01	.4342E-02	.2736E+01	.5833E-02
200.	.7174E-01	.4499E+00	-.2753E-01	-.3345E-02	-.3714E-03	.2173E-01	-.5782E+01	.4266E-02	.2505E+01	.4709E-02
205.	.4970E-01	.3711E+00	-.2391E-01	-.2774E-02	-.2841E-03	.1841E-01	-.5149E+01	.4053E-02	.2282E+01	.3822E-02
210.	.3378E-01	.3078E+00	-.2056E-01	-.2300E-02	-.2207E-03	.1561E-01	-.4581E+01	.3767E-02	.2071E+01	.3115E-02

Table C3. A Matrix (continued)

TIME	A(13,12) 1/SEC^2	A(13,13) 1/SEC	A(13,14) 1/SEC^2	A(13,15) FT/SEC^2-RAD	A(13,16) FT/SEC^2-RAD	A(13,17) FT/SEC^2-RAD	A(13,18) FT/SEC^2	A(13,19) FT/SEC^2	A(13,20) FT/SEC^2	A(13,22) FT/SEC^2
0.	-.1431E+03	-.5804E+00	-.7230E+03	.6524E+01	.1780E+04	0.	0.	0.	0.	-.1554E+0(
5.	-.1402E+03	-.7831E+00	-.7366E+03	.6632E+01	.1802E+04	.2571E-01	.8565E-01	.6174E+00	-.3580E+00	-.1376E+0(
10.	-.1388E+03	-.9912E+00	-.7467E+03	.6915E+01	.1826E+04	.1136E+0(	.1869E+00	.1123E+01	-.7990E+00	-.1174E+0(
15.	-.1369E+03	-.1202E+01	-.7589E+03	.7211E+01	.1778E+04	.2772E+0(	.3161E+00	.1457E+01	-.1340E+01	-.9236E-01
20.	-.1344E+03	-.1411E+01	-.7723E+03	.7531E+01	.1668E+04	.5313E+0(	.4577E+00	.1561E+01	-.1955E+01	-.6661E-01
25.	-.1313E+03	-.1616E+01	-.7876E+03	.7863E+01	.1694E+04	.8804E+0(	.6179E+00	.1375E+01	-.2653E+01	-.3590E-01
30.	-.1276E+03	-.1808E+01	-.8048E+03	.8021E+01	.1680E+04	.1319E+01	.8091E+00	.8777E+00	-.3457E+01	-.4783E-03
35.	-.1233E+03	-.1985E+01	-.8234E+03	.8223E+01	.1670E+04	.1845E+01	.9619E+00	.8217E-01	-.4322E+01	.4185E-01
40.	-.1185E+03	-.2143E+01	-.8426E+03	.8272E+01	.1659E+04	.2406E+01	.1178E+01	-.1138E+01	-.5263E+01	.8852E-01
45.	-.1132E+03	-.2279E+01	-.8629E+03	.8210E+01	.1658E+04	.2950E+01	.1291E+01	-.2551E+01	-.6318E+01	.1455E+00
50.	-.1076E+03	-.2391E+01	-.8825E+03	.8018E+01	.1666E+04	.3426E+01	.2072E+01	-.5167E+01	-.7983E+01	.2191E+00
55.	-.1018E+03	-.2479E+01	-.9017E+03	.7728E+01	.1681E+04	.3850E+01	.2516E+01	-.7709E+01	-.9397E+01	.3020E+00
60.	-.9597E+02	-.2540E+01	-.9193E+03	.7236E+01	.1697E+04	.3947E+01	.2942E+01	-.1016E+02	-.1088E+02	.3899E+00
65.	-.8999E+02	-.2569E+01	-.9367E+03	.6653E+01	.1725E+04	.3136E+01	.3739E+01	-.1356E+02	-.1256E+02	.4966E+00
70.	-.8400E+02	-.2569E+01	-.9531E+03	.5900E+01	.1764E+04	.3371E+01	.6320E+01	-.2026E+02	-.1488E+02	.6548E+00
75.	-.7801E+02	-.2538E+01	-.9682E+03	.5062E+01	.1819E+04	.3099E+01	.2072E+01	-.1043E+02	-.1149E+02	.4502E+00
80.	-.7170E+02	-.2457E+01	-.9836E+03	.4198E+01	.1883E+04	.2703E+01	.1223E+01	-.8063E+01	-.1036E+02	.3327E+00
85.	-.6455E+02	-.2306E+01	-.1000E+04	.3386E+01	.1961E+04	.2913E+01	.7469E+00	-.6470E+01	-.8923E+01	.2195E+00
90.	-.5651E+02	-.2088E+01	-.1018E+04	.2634E+01	.2007E+04	.2231E+01	.3310E+00	-.5056E+01	-.7376E+01	.1275E+00
95.	-.4765E+02	-.1830E+01	-.1036E+04	.1981E+01	.2035E+04	.1142E+01	.2072E-01	-.3998E+01	-.5735E+01	.7949E-01
100.	-.3863E+02	-.1603E+01	-.1053E+04	.1446E+01	.2015E+04	.4910E+00	-.1637E-01	-.3457E+01	-.4494E+01	.5272E-01
105.	-.3074E+02	-.1457E+01	-.1071E+04	.1048E+01	.1951E+04	.2408E+00	-.6104E-01	-.2676E+01	-.3635E+01	.3605E-01
110.	-.2403E+02	-.1368E+01	-.1089E+04	.7572E+00	.1837E+04	.1479E+00	-.1113E+00	-.1810E+01	-.3013E+01	.2462E-01
115.	-.1994E+02	-.1174E+01	-.1093E+04	.5693E+00	.1778E+04	.1000E+00	-.1081E+00	-.1831E+01	-.2154E+01	.1596E-01
120.	-.1613E+02	-.1079E+01	-.1102E+04	.4241E+00	.1690E+04	.5729E-01	-.9706E-01	-.1559E+01	-.1684E+01	.1083E-01
125.	-.1266E+02	-.1039E+01	-.1114E+04	.3090E+00	.1563E+04	.2703E-01	-.1146E+00	-.1057E+01	-.1387E+01	.7270E-02
130.	-.9690E+01	-.1030E+01	-.1131E+04	.2236E+00	.1436E+04	.1024E-01	-.9753E-01	-.6588E+00	-.1181E+01	.5200E-02
135.	-.7243E+01	-.1033E+01	-.1152E+04	.1599E+00	.1293E+04	.3636E-02	-.1003E+00	-.2438E+00	-.1040E+01	.3656E-02
140.	-.5323E+01	-.1037E+01	-.1176E+04	.1142E+00	.1157E+04	.1581E-02	-.9228E-01	.3940E-01	-.9064E+00	.2547E-02
145.	-.3837E+01	-.1041E+01	-.1204E+04	.8133E-01	.1036E+04	.9475E-03	-.7736E-01	.1984E+00	-.7899E+00	.1803E-02
150.	-.2728E+01	-.1042E+01	-.1234E+04	.5840E-01	.9281E+03	.6310E-03	-.8431E-01	.3659E+00	-.6886E+00	.1195E-02
155.	-.1903E+01	-.1042E+01	-.1267E+04	.4219E-01	.8320E+03	.4165E-03	-.7250E-01	.3997E+00	-.5861E+00	.8162E-03
160.	-.1303E+01	-.1042E+01	-.1303E+04	.3085E-01	.7467E+03	.2657E-03	-.6524E-01	.4099E+00	-.4988E+00	.5518E-03
165.	-.8678E+00	-.1041E+01	-.1340E+04	.2196E-01	.6638E+03	.1618E-03	-.6859E-01	.4429E+00	-.4332E+00	.3539E-03
170.	-.5581E+00	-.1040E+01	-.1377E+04	.1609E-01	.5959E+03	.1031E-03	-.5944E-01	.4019E+00	-.3591E+00	.2311E-03
175.	-.3398E+00	-.1040E+01	-.1415E+04	.1193E-01	.4869E+03	.7047E-04	-.5387E-01	.3680E+00	-.3017E+00	.1493E-03
180.	-.1842E+00	-.1042E+01	-.1453E+04	.9046E-02	.4289E+03	.4711E-04	-.5448E-01	.3626E+00	-.2651E+00	.9296E-04
185.	-.7283E-01	-.1044E+01	-.1491E+04	.6950E-02	.3744E+03	.3364E-04	-.5600E-01	.3551E+00	-.2322E+00	.5374E-04
190.	.6603E-02	-.1047E+01	-.1527E+04	.5385E-02	.3412E+03	.2132E-04	-.5602E-01	.3417E+00	-.2028E+00	.2884E-04
195.	.6126E-01	-.1050E+01	-.1563E+04	.4198E-02	.3012E+03	.1157E-04	-.5694E-01	.3304E+00	-.1771E+00	.1264E-04
200.	.9879E-01	-.1053E+01	-.1598E+04	.3273E-02	.2709E+03	.1264E-04	-.5769E-01	.3211E+00	-.1554E+00	.3221E-05
205.	.1223E+00	-.1057E+01	-.1632E+04	.2589E-02	.2424E+03	.1028E-04	-.5813E-01	.3079E+00	-.1347E+00	-.1367E-05
210.	.1360E+00	-.1060E+01	-.1663E+04	.2056E-02	.2209E+03	.6847E-05	-.5690E-01	.2897E+00	-.1161E+00	-.2244E-05

Table C3. A Matrix (continued)

TIME	A(13,23)	A(18,18)	A(18,22)	A(19,19)	A(19,20)	A(19,22)	A(20,19)	A(20,20)	A(20,22)	A(21,21)
	FT/SEC^2	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC
0.	0.	0.	.1223E+00	0.	0.	.1223E+00	0.	0.	-.2122E+00	0.
5.	.4854E+01	-.4047E+00	.1228E+00	.7021E+00	-.1107E+01	.1228E+00	.2214E+01	-.1512E+01	-.2131E+00,	-.9630E-02
10.	.1024E+02	-.8375E+00	.1249E+00	.1453E+01	-.2290E+01	.1249E+00	.4581E+01	-.3128E+01	-.2167E+00,	-.2005E-01
15.	.1606E+02	-.1293E+01	.1254E+00	.2243E+01	-.3535E+01	.1254E+00	.7071E+01	-.4828E+01	-.2176E+00,	-.3093E-01
20.	.2231E+02	-.1776E+01	.1314E+00	.3081E+01	-.4856E+01	.1314E+00	.9713E+01	-.6632E+01	-.2280E+00,	-.4243E-01
25.	.2895E+02	-.2290E+01	.1395E+00	.3973E+01	-.6264E+01	.1395E+00	.1253E+02	-.8554E+01	-.2419E+00,	-.5462E-01
30.	.3581E+02	-.2839E+01	.1483E+00	.4926E+01	-.7765E+01	.1483E+00	.1553E+02	-.1060E+02	-.2573E+00,	-.6741E-01
35.	.4282E+02	-.3427E+01	.1613E+00	.5945E+01	-.9372E+01	.1613E+00	.1874E+02	-.1280E+02	-.2799E+00,	-.8074E-01
40.	.4977E+02	-.4065E+01	.1743E+00	.7051E+01	-.1112E+02	.1743E+00	.2223E+02	-.1518E+02	-.3024E+00,	-.9466E-01
45.	.5644E+02	-.4759E+01	.1952E+00	.8257E+01	-.1302E+02	.1952E+00	.2603E+02	-.1778E+02	-.3385E+00,	-.1097E+00
50.	.6250E+02	-.5520E+01	.2160E+00	.9576E+01	-.1510E+02	.2160E+00	.3019E+02	-.2062E+02	-.3747E+00,	-.1230E+00
55.	.6740E+02	-.6351E+01	.2485E+00	.1102E+02	-.1737E+02	.2485E+00	.3474E+02	-.2372E+02	-.4311E+00,	-.1378E+00
60.	.7120E+02	-.7253E+01	.2862E+00	.1258E+02	-.1984E+02	.2862E+00	.3967E+02	-.2709E+02	-.4965E+00,	-.1527E+00
65.	.7271E+02	-.8201E+01	.3331E+00	.1423E+02	-.2243E+02	.3331E+00	.4485E+02	-.3063E+02	-.5778E+00,	-.1663E+00
70.	.7188E+02	-.9200E+01	.3903E+00	.1596E+02	-.2516E+02	.3903E+00	.5032E+02	-.3436E+02	-.6771E+00,	-.1795E+00
75.	.6830E+02	-.1026E+02	.4293E+00	.1790E+02	-.2807E+02	.4293E+00	.5613E+02	-.3833E+02	-.7448E+00,	-.1896E+00
80.	.6409E+02	-.1144E+02	.4163E+00	.1994E+02	-.3128E+02	.4163E+00	.6255E+02	-.4271E+02	-.7222E+00,	-.1938E+00
85.	.5771E+02	-.1275E+02	.3721E+00	.2211E+02	-.3466E+02	.3721E+00	.6971E+02	-.4760E+02	-.6455E+00,	-.2093E+00
90.	.5030E+02	-.1419E+02	.3005E+00	.2461E+02	-.3830E+02	.3005E+00	.7761E+02	-.5299E+02	-.5214E+00,	-.2179E+00
95.	.4228E+02	-.1580E+02	.2680E+00	.2741E+02	-.4321E+02	.2680E+00	.8641E+02	-.5900E+02	-.4649E+00,	-.2240E+00
100.	.3416E+02	-.1756E+02	.2433E+00	.3046E+02	-.4802E+02	.2433E+00	.9604E+02	-.6558E+02	-.4221E+00,	-.2334E+00
105.	.2706E+02	-.1947E+02	.2214E+00	.3378E+02	-.5325E+02	.2214E+00	.1065E+03	-.7272E+02	-.3841E+00,	-.2309E+00
110.	.2097E+02	-.2154E+02	.2004E+00	.3737E+02	-.5891E+02	.2004E+00	.1178E+03	-.8045E+02	-.3476E+00,	-.2453E+00
115.	.1745E+02	-.2375E+02	.1834E+00	.4131E+02	-.6496E+02	.1834E+00	.1299E+03	-.8871E+02	-.3182E+00,	-.2493E+00
120.	.1403E+02	-.2611E+02	.1665E+00	.4529E+02	-.7140E+02	.1665E+00	.1428E+03	-.9751E+02	-.2889E+00,	-.2520E+00
125.	.1088E+02	-.2862E+02	.1509E+00	.4964E+02	-.7826E+02	.1509E+00	.1565E+03	-.1069E+03	-.2618E+00,	-.2540E+00
130.	.8209E+01	-.3125E+02	.1418E+00	.5421E+02	-.8546E+02	.1418E+00	.1709E+03	-.1167E+03	-.2460E+00,	-.2559E+00
135.	.6048E+01	-.3403E+02	.1329E+00	.5904E+02	-.9307E+02	.1329E+00	.1861E+03	-.1271E+03	-.2305E+00,	-.2553E+00
140.	.4388E+01	-.3695E+02	.1240E+00	.6410E+02	-.1011E+03	.1240E+00	.2021E+03	-.1380E+03	-.2151E+00,	-.2548E+00
145.	.3139E+01	-.4001E+02	.1152E+00	.6941E+02	-.1094E+03	.1152E+00	.2188E+03	-.1494E+03	-.1998E+00,	-.2537E+00
150.	.2231E+01	-.4322E+02	.1063E+00	.7497E+02	-.1182E+03	.1063E+00	.2364E+03	-.1614E+03	-.1844E+00,	-.2519E+00
155.	.1575E+01	-.4657E+02	.9745E-01	.8079E+02	-.1274E+03	.9745E-01	.2547E+03	-.1739E+03	-.1690E+00,	-.2496E+00
160.	.1111E+01	-.5007E+02	.8886E-01	.8686E+02	-.1369E+03	.8886E-01	.2739E+03	-.1870E+03	-.1542E+00,	-.2471E+00
165.	.7836E+00	-.5365E+02	.8027E-01	.9318E+02	-.1467E+03	.8027E-01	.2935E+03	-.2004E+03	-.1393E+00,	-.2439E+00
170.	.5536E+00	-.5725E+02	.7182E-01	.9972E+02	-.1566E+03	.7182E-01	.3132E+03	-.2138E+03	-.1246E+00,	-.2401E+00
175.	.3948E+00	-.6087E+02	.6349E-01	.1056E+03	-.1665E+03	.6349E-01	.3329E+03	-.2273E+03	-.1101E+00,	-.2356E+00
180.	.2837E+00	-.6450E+02	.5529E-01	.1119E+03	-.1764E+03	.5529E-01	.3528E+03	-.2409E+03	-.9592E-01,	-.2306E+00
185.	.2035E+00	-.6816E+02	.4736E-01	.1182E+03	-.1864E+03	.4736E-01	.3728E+03	-.2546E+03	-.8215E-01,	-.2252E+00
190.	.1452E+00	-.7182E+02	.3955E-01	.1246E+03	-.1964E+03	.3955E-01	.3928E+03	-.2682E+03	-.6861E-01,	-.2197E+00
195.	.1031E+00	-.7550E+02	.3203E-01	.1310E+03	-.2065E+03	.3203E-01	.4129E+03	-.2820E+03	-.5557E-01,	-.2140E+00
200.	.7229E-01	-.7918E+02	.2462E-01	.1374E+03	-.2165E+03	.2462E-01	.4331E+03	-.2957E+03	-.4272E-01,	-.2083E+00
205.	.5015E-01	-.8288E+02	.1749E-01	.1438E+03	-.2267E+03	.1749E-01	.4533E+03	-.3095E+03	-.3033E-01,	-.2027E+00
210.	.3415E-01	-.8661E+02	.1048E-01	.1502E+03	-.2369E+03	.1048E-01	.4737E+03	-.3235E+03	-.1818E-01,	-.1972E+00

Table C3. A Matrix (concluded)

TIME	A(21,22)	A(22,21)	A(23,23)	A(23,24)	A(24,24)
	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC
0.	0.	0.	0.	0.	0.
5.	-.7359E-05	.5100E+02	-.1087E+01	.1087E+01	-.2793E+00
10.	-.1522E-04	.1055E+03	-.2249E+01	.2249E+01	-.5779E+00
15.	-.2348E-04	.1628E+03	-.3471E+01	.3471E+01	-.8921E+00
20.	-.3222E-04	.2233E+03	-.4768E+01	.4768E+01	-.1225E+01
25.	-.4147E-04	.2875E+03	-.6150E+01	.6150E+01	-.1581E+01
30.	-.5119E-04	.3548E+03	-.7624E+01	.7624E+01	-.1959E+01
35.	-.6131E-04	.4249E+03	-.9202E+01	.9202E+01	-.2365E+01
40.	-.7180E-04	.4977E+03	-.1091E+02	.1091E+02	-.2805E+01
45.	-.8251E-04	.5719E+03	-.1278E+02	.1278E+02	-.3284E+01
50.	-.9343E-04	.6476E+03	-.1482E+02	.1482E+02	-.3809E+01
55.	-.1047E-04	.7255E+03	-.1705E+02	.1705E+02	-.4383E+01
60.	-.1160E-04	.8037E+03	-.1948E+02	.1948E+02	-.5005E+01
65.	-.1262E-04	.8750E+03	-.2202E+02	.2202E+02	-.5659E+01
70.	-.1356E-04	.9396E+03	-.2470E+02	.2470E+02	-.6349E+01
75.	-.1440E-04	.9980E+03	-.2756E+02	.2756E+02	-.7082E+01
80.	-.1517E-04	.1052E+04	-.3071E+02	.3071E+02	-.7892E+01
85.	-.1589E-04	.1101E+04	-.3422E+02	.3422E+02	-.8795E+01
90.	-.1655E-04	.1147E+04	-.3810E+02	.3810E+02	-.9791E+01
95.	-.1716E-04	.1190E+04	-.4242E+02	.4242E+02	-.1090E+02
100.	-.1772E-04	.1228E+04	-.4715E+02	.4715E+02	-.1212E+02
105.	-.1822E-04	.1263E+04	-.5228E+02	.5228E+02	-.1344E+02
110.	-.1862E-04	.1291E+04	-.5784E+02	.5784E+02	-.1486E+02
115.	-.1893E-04	.1312E+04	-.6378E+02	.6378E+02	-.1639E+02
120.	-.1914E-04	.1326E+04	-.7011E+02	.7011E+02	-.1802E+02
125.	-.1929E-04	.1337E+04	-.7684E+02	.7684E+02	-.1975E+02
130.	-.1937E-04	.1342E+04	-.8391E+02	.8391E+02	-.2156E+02
135.	-.1939E-04	.1344E+04	-.9138E+02	.9138E+02	-.2348E+02
140.	-.1935E-04	.1341E+04	-.9922E+02	.9922E+02	-.2550E+02
145.	-.1927E-04	.1335E+04	-.1074E+03	.1074E+03	-.2761E+02
150.	-.1912E-04	.1326E+04	-.1160E+03	.1160E+03	-.2982E+02
155.	-.1896E-04	.1314E+04	-.1251E+03	.1251E+03	-.3214E+02
160.	-.1876E-04	.1301E+04	-.1344E+03	.1344E+03	-.3455E+02
165.	-.1852E-04	.1284E+04	-.1441E+03	.1441E+03	-.3702E+02
170.	-.1823E-04	.1263E+04	-.1537E+03	.1537E+03	-.3951E+02
175.	-.1789E-04	.1240E+04	-.1634E+03	.1634E+03	-.4201E+02
180.	-.1751E-04	.1213E+04	-.1732E+03	.1732E+03	-.4451E+02
185.	-.1710E-04	.1185E+04	-.1830E+03	.1830E+03	-.4703E+02
190.	-.1668E-04	.1156E+04	-.1928E+03	.1928E+03	-.4956E+02
195.	-.1625E-04	.1126E+04	-.2027E+03	.2027E+03	-.5210E+02
200.	-.1582E-04	.1096E+04	-.2126E+03	.2126E+03	-.5464E+02
205.	-.1539E-04	.1067E+04	-.2225E+03	.2225E+03	-.5719E+02
210.	-.1498E-04	.1038E+04	-.2326E+03	.2326E+03	-.5977E+02

Table C4. B2 Matrix

TIME	B2(1, 1)	B2(2, 1)	B2(3, 1)	B2(7, 1)	B2(9, 1)	B2(11, 1)	B2(13, 1)	B2(18, 1)	B2(19, 1)	B2(20, 1)
	1/FT-SEC-RAD	1/FT-SEC-RAD	1/SEC	1/SEC	1/SEC	1/SEC	1/SEC	1/FT	1/FT	1/FT
0.	-.6578E-03	.1725E-04	.1748E-02	.2743E-01	.2968E-01	.3266E-02	-.1008E-01	.7931E-02	.7931E-02	-.1376E-01
5.	-.6366E-03	.1772E-04	.1725E-02	.2676E-01	.2456E-01	.3225E-02	-.8885E-02	.7931E-02	.7931E-02	-.1376E-01
10.	-.6279E-03	.1778E-04	.1746E-02	.2659E-01	.2032E-01	.3257E-02	-.7453E-02	.7931E-02	.7931E-02	-.1376E-01
15.	-.6185E-03	.1836E-04	.1764E-02	.2647E-01	.1612E-01	.3285E-02	-.5841E-02	.7931E-02	.7931E-02	-.1376E-01
20.	-.6037E-03	.1888E-04	.1757E-02	.2601E-01	.1192E-01	.3266E-02	-.4020E-02	.7931E-02	.7931E-02	-.1376E-01
25.	-.5791E-03	.1847E-04	.1732E-02	.2535E-01	.7712E-02	.3218E-02	-.2041E-02	.7931E-02	.7931E-02	-.1376E-01
30.	-.5569E-03	.1854E-04	.1705E-02	.2469E-01	.3703E-02	.3168E-02	-.2558E-04	.7931E-02	.7931E-02	-.1376E-01
35.	-.5294E-03	.1879E-04	.1662E-02	.2371E-01	-.1057E-03	.3083E-02	.2057E-02	.7931E-02	.7931E-02	-.1376E-01
40.	-.4910E-03	.1764E-04	.1591E-02	.2240E-01	-.3722E-02	.2956E-02	.4027E-02	.7931E-02	.7931E-02	-.1376E-01
45.	-.4582E-03	.1657E-04	.1525E-02	.2105E-01	-.6928E-02	.2833E-02	.5913E-02	.7931E-02	.7931E-02	-.1376E-01
50.	-.4597E-03	.1817E-04	.1562E-02	.2128E-01	-.1086E-01	.2920E-02	.8046E-02	.7931E-02	.7931E-02	-.1376E-01
55.	-.4346E-03	.1732E-04	.1509E-02	.2002E-01	-.1383E-01	.2827E-02	.9640E-02	.7931E-02	.7931E-02	-.1376E-01
60.	-.4056E-03	.1685E-04	.1452E-02	.1863E-01	-.1630E-01	.2721E-02	.1080E-01	.7931E-02	.7931E-02	-.1376E-01
65.	-.3936E-03	.1678E-04	.1429E-02	.1769E-01	-.1901E-01	.2698E-02	.1182E-01	.7931E-02	.7931E-02	-.1376E-01
70.	-.4155E-03	.1803E-04	.1525E-02	.1835E-01	-.2385E-01	.2902E-02	.1331E-01	.7931E-02	.7931E-02	-.1376E-01
75.	-.2391E-03	.1075E-04	.9324E-03	.1023E-01	-.1504E-01	.1725E-02	.8316E-02	.7931E-02	.7931E-02	-.1376E-01
80.	-.1768E-03	.8253E-05	.7176E-03	.7343E-02	-.1227E-01	.1312E-02	.6338E-02	.7931E-02	.7931E-02	-.1376E-01
85.	-.1293E-03	.6183E-05	.5405E-03	.5169E-02	-.9654E-02	.9794E-03	.4678E-02	.7931E-02	.7931E-02	-.1376E-01
90.	-.9072E-04	.4539E-05	.3943E-03	.3515E-02	-.7160E-02	.7072E-03	.3366E-02	.7931E-02	.7931E-02	-.1376E-01
95.	-.6020E-04	.3155E-05	.2730E-03	.2261E-02	-.4927E-02	.4854E-03	.2352E-02	.7931E-02	.7931E-02	-.1376E-01
100.	-.4097E-04	.2220E-05	.1931E-03	.1496E-02	-.3445E-02	.3427E-03	.1719E-02	.7931E-02	.7931E-02	-.1376E-01
105.	-.2771E-04	.1592E-05	.1368E-03	.9861E-03	-.2375E-02	.2421E-03	.1291E-02	.7931E-02	.7931E-02	-.1376E-01
110.	-.1866E-04	.1127E-05	.9628E-04	.6440E-03	-.1611E-02	.1697E-03	.9747E-03	.7931E-02	.7931E-02	-.1376E-01
115.	-.1234E-04	.7670E-06	.6707E-04	.4179E-03	-.1085E-02	.1176E-03	.6899E-03	.7931E-02	.7931E-02	-.1376E-01
120.	-.8509E-05	.5584E-06	.4842E-04	.2815E-03	-.7567E-03	.8454E-04	.5155E-03	.7931E-02	.7931E-02	-.1376E-01
125.	-.5675E-05	.3884E-06	.3420E-04	.1844E-03	-.5119E-03	.5927E-04	.3820E-03	.7931E-02	.7931E-02	-.1376E-01
130.	-.3926E-05	.2818E-06	.2472E-04	.1248E-03	-.3561E-03	.4280E-04	.2908E-03	.7931E-02	.7931E-02	-.1376E-01
135.	-.2647E-05	.2009E-06	.1765E-04	.8291E-04	-.2427E-03	.3036E-04	.2182E-03	.7931E-02	.7931E-02	-.1376E-01
140.	-.1790E-05	.1415E-06	.1261E-04	.5537E-04	-.1656E-03	.2161E-04	.1629E-03	.7931E-02	.7931E-02	-.1376E-01
145.	-.1248E-05	.1039E-06	.9274E-05	.3828E-04	-.1164E-03	.1589E-04	.1241E-03	.7931E-02	.7931E-02	-.1376E-01
150.	-.8027E-06	.7055E-07	.6443E-05	.2453E-04	-.7630E-04	.1088E-04	.8911E-04	.7931E-02	.7931E-02	-.1376E-01
155.	-.5515E-06	.5082E-07	.4702E-05	.1678E-04	-.5289E-04	.7913E-05	.6643E-04	.7931E-02	.7931E-02	-.1376E-01
160.	-.3769E-06	.3668E-07	.3432E-05	.1142E-04	-.3650E-04	.5732E-05	.4925E-04	.7931E-02	.7931E-02	-.1376E-01
165.	-.2317E-06	.2342E-07	.2380E-05	.7131E-05	-.2377E-04	.3853E-05	.3497E-04	.7931E-02	.7931E-02	-.1376E-01
170.	-.1567E-06	.1696E-07	.1723E-05	.4769E-05	-.1631E-04	.2747E-05	.2553E-04	.7931E-02	.7931E-02	-.1376E-01
175.	-.1009E-06	.1162E-07	.1244E-05	.3129E-05	-.1119E-04	.1933E-05	.1865E-04	.7931E-02	.7931E-02	-.1376E-01
180.	-.5591E-07	.6627E-08	.8591E-06	.1813E-05	-.7438E-05	.1245E-05	.1333E-04	.7931E-02	.7931E-02	-.1376E-01
185.	-.2035E-07	.2565E-08	.5378E-06	.7838E-06	-.4632E-05	.6643E-06	.9000E-05	.7931E-02	.7931E-02	-.1376E-01
190.	.4208E-08	-.5754E-09	.2971E-06	.8074E-07	-.2800E-05	.2390E-06	.5783E-05	.7931E-02	.7931E-02	-.1376E-01
195.	.2464E-07	-.3445E-08	.9006E-07	-.4860E-06	-.1460E-05	-.1312E-06	.3129E-05	.7931E-02	.7931E-02	-.1376E-01
200.	.4017E-07	-.5809E-08	-.8023E-07	-.9138E-06	-.6010E-06	-.4355E-06	.1038E-05	.7931E-02	.7931E-02	-.1376E-01
205.	.5191E-07	-.7898E-08	-.2198E-06	-.1225E-05	-.4577E-07	-.6799E-06	-.6198E-06	.7931E-02	.7931E-02	-.1376E-01
210.	.5792E-07	-.9188E-08	-.3116E-06	-.1379E-05	.1734E-06	-.8300E-06	-.1698E-05	.7931E-02	.7931E-02	-.1376E-01

Table C5. B3 Matrix

TIME	B3(21, 1) 1/SEC	B3(22, 1) 1/SEC	B3(24, 2) 1/SEC
0.	0.	0.	0.
5.	-.6879E-05	.9844E-01	.1886E-01
10.	-.9895E-05	.1416E+00	.2759E-01
15.	-.1229E-04	.1759E+00	.3442E-01
20.	-.1439E-04	.2060E+00	.4227E-01
25.	-.1633E-04	.2337E+00	.5095E-01
30.	-.1815E-04	.2596E+00	.6033E-01
35.	-.1986E-04	.2841E+00	.7209E-01
40.	-.2149E-04	.3075E+00	.8485E-01
45.	-.2304E-04	.3296E+00	.1028E+00
50.	-.2451E-04	.3508E+00	.1225E+00
55.	-.2595E-04	.3713E+00	.1512E+00
60.	-.2731E-04	.3908E+00	.1861E+00
65.	-.2850E-04	.4077E+00	.2302E+00
70.	-.2953E-04	.4225E+00	.2858E+00
75.	-.3043E-04	.4355E+00	.3320E+00
80.	-.3124E-04	.4470E+00	.3399E+00
85.	-.3197E-04	.4575E+00	.3207E+00
90.	-.3262E-04	.4668E+00	.2733E+00
95.	-.3322E-04	.4754E+00	.2572E+00
100.	-.3376E-04	.4831E+00	.2461E+00
105.	-.3423E-04	.4898E+00	.2359E+00
110.	-.3461E-04	.4953E+00	.2245E+00
115.	-.3489E-04	.4993E+00	.2158E+00
120.	-.3508E-04	.5020E+00	.2054E+00
125.	-.3522E-04	.5040E+00	.1949E+00
130.	-.3530E-04	.5050E+00	.1914E+00
135.	-.3531E-04	.5053E+00	.1871E+00
140.	-.3528E-04	.5048E+00	.1820E+00
145.	-.3520E-04	.5037E+00	.1759E+00
150.	-.3507E-04	.5019E+00	.1687E+00
155.	-.3492E-04	.4996E+00	.1605E+00
160.	-.3474E-04	.4971E+00	.1518E+00
165.	-.3452E-04	.4939E+00	.1419E+00
170.	-.3424E-04	.4900E+00	.1312E+00
175.	-.3392E-04	.4853E+00	.1196E+00
180.	-.3356E-04	.4802E+00	.1072E+00
185.	-.3317E-04	.4746E+00	.9438E-01
190.	-.3276E-04	.4687E+00	.8091E-01
195.	-.3233E-04	.4626E+00	.6718E-01
200.	-.3190E-04	.4564E+00	.5289E-01
205.	-.3146E-04	.4502E+00	.3843E-01
210.	-.3104E-04	.4441E+00	.2355E-01

Table C6. D1 Matrix

TIME	D1(14, 1)	D1(14, 2)	D1(14, 3)
	FT/SEC^3-RAD	FT/SEC^3-RAD	FT/SEC^3-RAD
0.	.2224E+04	-.1716E+05	0.
5.	.2231E+04	-.1778E+05	.2737E+01
10.	.2224E+04	-.1876E+05	.1157E+02
15.	.2219E+04	-.1944E+05	.2700E+02
20.	.2224E+04	-.1966E+05	.4962E+02
25.	.2224E+04	-.2141E+05	.7939E+02
30.	.2228E+04	-.2242E+05	.1159E+03
35.	.2243E+04	-.2459E+05	.1592E+03
40.	.2246E+04	-.2629E+05	.2067E+03
45.	.2255E+04	-.2818E+05	.2562E+03
50.	.2253E+04	-.3006E+05	.3044E+03
55.	.2277E+04	-.3147E+05	.3589E+03
60.	.2284E+04	-.3367E+05	.3940E+03
65.	.2306E+04	-.3500E+05	.3439E+03
70.	.2314E+04	-.3610E+05	.4181E+03
75.	.2312E+04	-.3705E+05	.4476E+03
80.	.2310E+04	-.3809E+05	.4705E+03
85.	.2336E+04	-.3971E+05	.6354E+03
90.	.2332E+04	-.4152E+05	.6245E+03
95.	.2325E+04	-.4343E+05	.4237E+03
100.	.2319E+04	-.4612E+05	.2488E+03
105.	.2299E+04	-.4807E+05	.1670E+03
110.	.2290E+04	-.4913E+05	.1415E+03
115.	.2269E+04	-.5134E+05	.1261E+03
120.	.2251E+04	-.5284E+05	.9512E+02
125.	.2225E+04	-.5359E+05	.6156E+02
130.	.2213E+04	-.5431E+05	.3206E+02
135.	.2180E+04	-.5449E+05	.1567E+02
140.	.2151E+04	-.5462E+05	.9421E+01
145.	.2118E+04	-.5508E+05	.7808E+01
150.	.2086E+04	-.5556E+05	.7131E+01
155.	.2053E+04	-.5611E+05	.6410E+01
160.	.2015E+04	-.5668E+05	.5510E+01
165.	.1897E+04	-.5453E+05	.4421E+01
170.	.1754E+04	-.5218E+05	.3556E+01
175.	.1635E+04	-.5031E+05	.3054E+01
180.	.1540E+04	-.4856E+05	.2540E+01
185.	.1394E+04	-.4602E+05	.2135E+01
190.	.1300E+04	-.4536E+05	.1642E+01
195.	.1174E+04	-.4300E+05	.1032E+01
200.	.1077E+04	-.4149E+05	.1316E+01
205.	.9522E+03	-.3957E+05	.1196E+01
210.	.8587E+03	-.3839E+05	.9047E+00

Table C7. D2 Matrix

TIME	D2(1, 1) LB-SEC-RAD/FT^3	D2(2, 1) LB-RAD/FT^3	D2(3, 1) 1/SEC	D2(4, 1) 1/SEC^2
0.	0.	0.	-.5051E-02	-.4462E-02
5.	.5840E-01	.1007E-03	-.4087E-02	.1987E-01
10.	.1195E+00	.2087E-03	-.3151E-02	.4257E-01
15.	.1810E+00	.3194E-03	-.2207E-02	.6405E-01
20.	.2423E+00	.4256E-03	-.1249E-02	.8379E-01
25.	.3012E+00	.5216E-03	-.3799E-03	.1011E+00
30.	.3569E+00	.6068E-03	.4380E-03	.1173E+00
35.	.4052E+00	.6735E-03	.1045E-02	.1326E+00
40.	.4478E+00	.7125E-03	.1642E-02	.1481E+00
45.	.4824E+00	.7357E-03	.2067E-02	.1545E+00
50.	.5045E+00	.7942E-03	.2482E-02	.1699E+00
55.	.5250E+00	.7922E-03	.2516E-02	.1810E+00
60.	.5308E+00	.7707E-03	.2563E-02	.1894E+00
65.	.5240E+00	.7488E-03	.2475E-02	.1973E+00
70.	.5060E+00	.7701E-03	.2563E-02	.2054E+00
75.	.4757E+00	.4436E-03	.1540E-02	.1532E+00
80.	.4345E+00	.3132E-03	.1345E-02	.1272E+00
85.	.3874E+00	.2094E-03	.1047E-02	.1020E+00
90.	.3316E+00	.1307E-03	.8796E-03	.7845E-01
95.	.2729E+00	.7450E-04	.7110E-03	.5717E-01
100.	.2178E+00	.4206E-04	.5735E-03	.4113E-01
105.	.1739E+00	.2379E-04	.4490E-03	.2939E-01
110.	.1346E+00	.1335E-04	.3325E-03	.2094E-01
115.	.1105E+00	.7412E-05	.2569E-03	.1724E-01
120.	.8821E-01	.4271E-05	.2013E-03	.1396E-01
125.	.7015E-01	.2399E-05	.1463E-03	.1105E-01
130.	.5574E-01	.1378E-05	.1056E-03	.7981E-02
135.	.4433E-01	.7623E-06	.7569E-04	.5797E-02
140.	.3537E-01	.4460E-06	.5311E-04	.3900E-02
145.	.2833E-01	.2627E-06	.3838E-04	.2338E-02
150.	.2241E-01	.1470E-06	.2509E-04	.1669E-02
155.	.1849E-01	.8696E-07	.1756E-04	.8774E-03
160.	.1510E-01	.5184E-07	.1207E-04	.4217E-03
165.	.1242E-01	.2956E-07	.7226E-05	.4207E-03
170.	.1029E-01	.1772E-07	.4758E-05	.2242E-03
175.	.8614E-02	.1072E-07	.2904E-05	.1742E-03
180.	.7306E-02	.6277E-08	.1156E-05	.3279E-03
185.	.6209E-02	.3339E-08	-.2943E-06	.5436E-03
190.	.5287E-02	.1571E-08	-.1349E-05	.7407E-03
195.	.4506E-02	.4058E-09	-.2247E-05	.9878E-03
200.	.3845E-02	-.3085E-09	-.3062E-05	.1246E-02
205.	.3243E-02	-.7217E-09	-.3841E-05	.1495E-02
210.	.2804E-02	-.8737E-09	-.3997E-05	.1660E-02

Table C8. H1 Matrix

TIME	H1(2, 5)	H1(4, 4)	H1(4, 5)	H1(11, 3)	H1(11,22)	H1(12, 1)	H1(12, 2)	H1(12, 3)	H1(12, 4)	H1(12, 5)
	1/SEC	FT/SEC-RAD	FT/SEC-RAD	LB-SEC-RAD/FT^3	LB-RAD/FT^2	LB/FT^2	LB/FT^2	LB-RAD/FT^3	LB/FT^2-SEC	LB/FT^2 SEC
0.	0.	0.	0.	0.	0.	0.	0.	.1168E-01	0.	0.
5.	.3286E-03	.2891E-01	.5103E+02	.5840E-01	.9043E+00	.8111E-02	-.2908E+01	.1165E-01	.6546E-01	.1854E+01
10.	.2096E-02	.3671E+00	.1056E+03	.1195E+00	.1982E+01	-.1429E-02	-.1231E+02	.1116E-01	.1545E+00	.3792E+01
15.	.2597E-02	.2612E+00	.1630E+03	.1810E+00	.2863E+01	.5216E-01	-.2879E+02	.9524E-02	.3112E+00	.5741E+01
20.	.3749E-02	-.1080E+01	.2239E+03	.2423E+00	.4014E+01	.4390E+00	-.5291E+02	.7005E-02	.5211E+00	.7677E+01
25.	.6494E-02	-.4889E+00	.2888E+03	.3012E+00	.5296E+01	.4304E+00	-.8487E+02	.3357E-02	.9008E+00	.9523E+01
30.	.8494E-02	-.8085E+00	.3580E+03	.3559E+00	.6655E+01	.6936E+00	-.1244E+03	-.1156E-02	.1482E+01	.1121E+02
35.	.1063E-01	-.1221E+01	.4321E+03	.4052E+00	.8243E+01	.1031E+01	-.1711E+03	-.6528E-02	.2299E+01	.1267E+02
40.	.1264E-01	-.1725E+01	.5125E+03	.4478E+00	.9843E+01	.1443E+01	-.2244E+03	-.1202E-01	.3350E+01	.1384E+02
45.	.1366E-01	-.2195E+01	.6001E+03	.4824E+00	.1187E+02	.1861E+01	-.2833E+03	-.1840E-01	.4596E+01	.1464E+02
50.	.1303E-01	-.2474E+01	.6960E+03	.5045E+00	.1385E+02	.2266E+01	-.3467E+03	-.2454E-01	.5873E+01	.1508E+02
55.	.1203E-01	-.2544E+01	.8008E+03	.5250E+00	.1645E+02	.2494E+01	-.4123E+03	-.3052E-01	.7024E+01	.1516E+02
60.	.1236E-01	-.3154E+01	.9145E+03	.5308E+00	.1916E+02	.2945E+01	-.4767E+03	-.3627E-01	.8015E+01	.1488E+02
65.	.1307E-01	-.3746E+01	.1034E+04	.5240E+00	.2200E+02	.3376E+01	-.5324E+03	-.4109E-01	.8845E+01	.1416E+02
70.	.1283E-01	-.4132E+01	.1160E+04	.5050E+00	.2445E+02	.3764E+01	-.5767E+03	-.4217E-01	.9393E+01	.1307E+02
75.	.1266E-01	-.4487E+01	.1294E+04	.4757E+00	.2575E+02	.3143E+01	-.6066E+03	-.3899E-01	.9619E+01	.1174E+02
80.	.1265E-01	-.4920E+01	.1442E+04	.4365E+00	.2291E+02	.2919E+01	-.6215E+03	-.3605E-01	.9493E+01	.1019E+02
85.	.1224E-01	-.5194E+01	.1607E+04	.3874E+00	.1817E+02	.2576E+01	-.6155E+03	-.3169E-01	.8979E+01	.8507E+01
90.	.1157E-01	-.5427E+01	.1789E+04	.3316E+00	.1256E+02	.2178E+01	-.5872E+03	-.2699E-01	.8110E+01	.6814E+01
95.	.1081E-01	-.5611E+01	.1992E+04	.2729E+00	.9222E+01	.1764E+01	-.5390E+03	-.2201E-01	.6981E+01	.5229E+01
100.	.9997E-02	-.5746E+01	.2214E+04	.2178E+00	.6681E+01	.1395E+01	-.4785E+03	-.1654E-01	.5782E+01	.3879E+01
105.	.9302E-02	-.5887E+01	.2455E+04	.1739E+00	.4856E+01	.1112E+01	-.4240E+03	-.1200E-01	.4762E+01	.2872E+01
110.	.8709E-02	-.6115E+01	.2716E+04	.1386E+00	.3502E+01	.9002E+00	-.3740E+03	-.9002E-02	.3895E+01	.2117E+01
115.	.8116E-02	-.6283E+01	.2995E+04	.1105E+00	.2556E+01	.7255E+00	-.3289E+03	-.6654E-02	.3175E+01	.1555E+01
120.	.7417E-02	-.6297E+01	.3292E+04	.8821E-01	.1852E+01	.5744E+00	-.2886E+03	-.5070E-02	.2580E+01	.1141E+01
125.	.6676E-02	-.6292E+01	.3608E+04	.7015E-01	.1335E+01	.4525E+00	-.2516E+03	-.3916E-02	.2083E+01	.8355E+00
130.	.6114E-02	-.6271E+01	.3940E+04	.5574E-01	.9966E+00	.3562E+00	-.2184E+03	-.2995E-02	.1675E+01	.6103E+00
135.	.5576E-02	-.6259E+01	.4291E+04	.4433E-01	.7427E+00	.2812E+00	-.1891E+03	-.2296E-02	.1346E+01	.4464E+00
140.	.5093E-02	-.6236E+01	.4659E+04	.3537E-01	.5531E+00	.2227E+00	-.1639E+03	-.1761E-02	.1083E+01	.3273E+00
145.	.4628E-02	-.6196E+01	.5045E+04	.2833E-01	.4113E+00	.1767E+00	-.1421E+03	-.1359E-02	.8738E+00	.2410E+00
150.	.4246E-02	-.6141E+01	.5449E+04	.2281E-01	.3058E+00	.1407E+00	-.1236E+03	-.1047E-02	.7078E+00	.1784E+00
155.	.3834E-02	-.6071E+01	.5872E+04	.1849E-01	.2272E+00	.1126E+00	-.1080E+03	-.8115E-03	.5767E+00	.1330E+00
160.	.3457E-02	-.5990E+01	.6313E+04	.1510E-01	.1692E+00	.9059E-01	-.9484E+02	-.6334E-03	.4729E+00	.1001E+00
165.	.3176E-02	-.5940E+01	.6765E+04	.1242E-01	.1257E+00	.7378E-01	-.8358E+02	-.5002E-03	.3902E+00	.7584E-01
170.	.2897E-02	-.5854E+01	.7219E+04	.1029E-01	.9315E-01	.6016E-01	-.7387E+02	-.3936E-03	.3240E+00	.5789E-01
175.	.2628E-02	-.5765E+01	.7675E+04	.8614E-02	.6895E-01	.4958E-01	-.6576E+02	-.3038E-03	.2720E+00	.4473E-01
180.	.2389E-02	-.5671E+01	.8133E+04	.7306E-02	.5094E-01	.4134E-01	-.5911E+02	-.2449E-03	.2312E+00	.3505E-01
185.	.2180E-02	-.5577E+01	.8594E+04	.6209E-02	.3707E-01	.3453E-01	-.5307E+02	-.2071E-03	.1968E+00	.2754E-01
190.	.1983E-02	-.5481E+01	.9055E+04	.5287E-02	.2636E-01	.2889E-01	-.4762E+02	-.1735E-03	.1678E+00	.2170E-01
195.	.1806E-02	-.5386E+01	.9519E+04	.4506E-02	.1820E-01	.2419E-01	-.4266E+02	-.1470E-03	.1431E+00	.1714E-01
200.	.1631E-02	-.5292E+01	.9984E+04	.3845E-02	.1194E-01	.2028E-01	-.3819E+02	-.1230E-03	.1223E+00	.1358E-01
205.	.1424E-02	-.5198E+01	.1045E+05	.3283E-02	.7239E-02	.1700E-01	-.3411E+02	-.1093E-03	.1045E+00	.1078E-01
210.	.1417E-02	-.5108E+01	.1092E+05	.2804E-02	.3706E-02	.1426E-01	-.3045E+02	-.9717E-04	.8931E-01	.8572E-02

Table C8. H1 Matrix (continued)

TIME	H1(12, 7) LB-RAD/FT^3	H1(12, 8) LB-RAD/FT^3-SEC	H1(12, 9) LB-RAD/FT^3	H1(12,10) LB-RAD/FT^3-SEC	H1(12,11) LB-RAD/FT^3	H1(12,12) LB-RAD/FT^3-SEC	H1(12,13) LB-RAD/FT^3	H1(12,14) LB-RAD/FT^3-SEC	H1(12,15) LB/FT^2-SEC	H1(12,16) LB/FT^2-SEC
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5.	-.8660E-04	-.2432E-01	-.1286E-05	.9279E-03	-.4289E-04	.6646E-01	-.3144E-04	.2138E-01	-.3414E-02	-.1477E+01
10.	-.4419E-03	-.4998E-01	-.5012E-05	.2914E-02	-.4149E-03	.1365E+00	-.1137E-03	.4562E-01	-.7009E-02	-.3160E+01
15.	-.1099E-02	-.7502E-01	-.1806E-05	.5833E-02	-.1146E-02	.2066E+00	-.2513E-03	.7178E-01	-.1074E-01	-.4810E+01
20.	-.2081E-02	-.9755E-01	.1878E-04	.9428E-02	-.2250E-02	.2750E+00	-.4472E-03	.9944E-01	-.1447E-01	-.6238E+01
25.	-.3376E-02	-.1156E+00	.6834E-04	.1336E-01	-.3695E-02	.3379E+00	-.6969E-03	.1277E+00	-.1775E-01	-.8135E+01
30.	-.4939E-02	-.1268E+00	.1555E-03	.1709E-01	-.5409E-02	.3929E+00	-.9890E-03	.1554E+00	-.2072E-01	-.9836E+01
35.	-.6711E-02	-.1294E+00	.2886E-03	.2014E-01	-.7302E-02	.4376E+00	-.1311E-02	.1817E+00	-.2350E-01	-.1151E+02
40.	-.8602E-02	-.1225E+00	.4680E-03	.2190E-01	-.9261E-02	.4711E+00	-.1642E-02	.2055E+00	-.2441E-01	-.1304E+02
45.	-.1051E-01	-.1054E+00	.6928E-03	.2187E-01	-.1115E-01	.4930E+00	-.1961E-02	.2255E+00	-.2444E-01	-.1452E+02
50.	-.1231E-01	-.7897E-01	.9503E-03	.1959E-01	-.1284E-01	.5030E+00	-.2247E-02	.2402E+00	-.2507E-01	-.1586E+02
55.	-.1386E-01	-.4573E-01	.1228E-02	.1484E-01	-.1421E-01	.5023E+00	-.2476E-02	.2485E+00	-.2352E-01	-.1703E+02
60.	-.1500E-01	-.1045E-01	.1494E-02	.7824E-02	-.1506E-01	.4890E+00	-.2617E-02	.2486E+00	-.2163E-01	-.1784E+02
65.	-.1561E-01	.1712E-01	.1714E-02	-.3910E-03	-.1524E-01	.4591E+00	-.2638E-02	.2386E+00	-.1907E-01	-.1828E+02
70.	-.1530E-01	.3149E-01	.1854E-02	-.8090E-02	-.1470E-01	.4125E+00	-.2532E-02	.2192E+00	-.1587E-01	-.1827E+02
75.	-.1444E-01	.3593E-01	.1902E-02	-.9948E-02	-.1354E-01	.3526E+00	-.2318E-02	.2055E+00	-.1284E-01	-.1785E+02
80.	-.1293E-01	.2554E-01	.1838E-02	-.9022E-02	-.1184E-01	.2805E+00	-.2003E-02	.1866E+00	-.9829E-02	-.1697E+02
85.	-.1083E-01	.4451E-03	.1654E-02	-.4443E-02	-.9688E-02	.1988E+00	-.1611E-02	.1646E+00	-.6980E-02	-.1569E+02
90.	-.8422E-02	-.3352E-01	.1375E-02	.3395E-02	-.7361E-02	.1168E+00	-.1196E-02	.1416E+00	-.4672E-02	-.1382E+02
95.	-.6036E-02	-.7177E-01	.1051E-02	.1235E-01	-.5163E-02	.4508E-01	-.8168E-03	.1169E+00	-.2871E-02	-.1175E+02
100.	-.4065E-02	-.9958E-01	.7440E-03	.2100E-01	-.3398E-02	-.6865E-02	-.5314E-03	.9385E-01	-.1622E-02	-.9620E+01
105.	-.2725E-02	-.1119E+00	.5218E-03	.2692E-01	-.2235E-02	-.3538E-01	-.3581E-03	.7561E-01	-.9352E-03	-.7886E+01
110.	-.1826E-02	-.1140E+00	.3582E-03	.3069E-01	-.1461E-02	-.4968E-01	-.2483E-03	.6041E-01	-.5313E-03	-.6382E+01
115.	-.1205E-02	-.1094E+00	.2539E-03	.3396E-01	-.9528E-03	-.5632E-01	-.1517E-03	.4641E-01	-.2980E-03	-.5163E+01
120.	-.8002E-03	-.1019E+00	.1765E-03	.3470E-01	-.6230E-03	-.5689E-01	-.9871E-04	.3593E-01	-.1735E-03	-.4195E+01
125.	-.5307E-03	-.9295E-01	.1200E-03	.3369E-01	-.4048E-03	-.5406E-01	-.6755E-04	.2786E-01	-.9695E-04	-.3373E+01
130.	-.3528E-03	-.8366E-01	.8032E-04	.3146E-01	-.2629E-03	-.4937E-01	-.4823E-04	.2169E-01	-.5434E-04	-.2730E+01
135.	-.2361E-03	-.7460E-01	.5328E-04	.2861E-01	-.1713E-03	-.4396E-01	-.3565E-04	.1701E-01	-.3049E-04	-.2196E+01
140.	-.1596E-03	-.6622E-01	.3525E-04	.2549E-01	-.1125E-03	-.3852E-01	-.2693E-04	.1347E-01	-.1644E-04	-.1774E+01
145.	-.1091E-03	-.5863E-01	.2331E-04	.2240E-01	-.7455E-04	-.3337E-01	-.2066E-04	.1080E-01	-.8894E-05	-.1448E+01
150.	-.7553E-04	-.5194E-01	.1547E-04	.1950E-01	-.5003E-04	-.2874E-01	-.1600E-04	.8782E-02	-.4822E-05	-.1190E+01
155.	-.5317E-04	-.4618E-01	.1035E-04	.1688E-01	-.3409E-04	-.2473E-01	-.1253E-04	.7259E-02	-.2467E-05	-.9859E+00
160.	-.3803E-04	-.4113E-01	.6967E-05	.1453E-01	-.2359E-04	-.2121E-01	-.9875E-05	.6091E-02	-.1249E-05	-.8213E+00
165.	-.2759E-04	-.3540E-01	.4762E-05	.1204E-01	-.1657E-04	-.1755E-01	-.7823E-05	.5038E-02	-.4839E-06	-.6589E+00
170.	-.2028E-04	-.3061E-01	.3277E-05	.9976E-02	-.1181E-04	-.1457E-01	-.6206E-05	.4222E-02	-.2406E-06	-.5294E+00
175.	-.1520E-04	-.2670E-01	.2300E-05	.8307E-02	-.8598E-05	-.1219E-01	-.4974E-05	.3595E-02	-.7239E-07	-.4330E+00
180.	-.1168E-04	-.2353E-01	.1652E-05	.6971E-02	-.6426E-05	-.1030E-01	-.4054E-05	.3117E-02	.4885E-07	-.3588E+00
185.	-.8997E-05	-.2074E-01	.1190E-05	.5841E-02	-.4820E-05	-.8717E-02	-.3284E-05	.2712E-02	.6377E-07	-.2933E+00
190.	-.6941E-05	-.1829E-01	.8596E-06	.4885E-02	-.3629E-05	-.7375E-02	-.2651E-05	.2368E-02	.6450E-07	-.2497E+00
195.	-.5353E-05	-.1612E-01	.6222E-06	.4079E-02	-.2736E-05	-.6245E-02	-.2126E-05	.2071E-02	.6686E-07	-.2050E+00
200.	-.4137E-05	-.1422E-01	.4518E-06	.3402E-02	-.2069E-05	-.5287E-02	-.1701E-05	.1816E-02	.6614E-07	-.1713E+00
205.	-.3195E-05	-.1251E-01	.3287E-06	.2833E-02	-.1565E-05	-.4478E-02	-.1353E-05	.1592E-02	.5431E-07	-.1418E+00
210.	-.2463E-05	-.1100E-01	.2396E-06	.2355E-02	-.1185E-05	-.3791E-02	-.1071E-05	.1395E-02	.4531E-07	-.1193E+00

Table C8. H1 Matrix (continued)

TIME	H1(12,17)	H1(12,18)	H1(12,19)	H1(12,20)	H1(12,21)	H1(12,22)	H1(12,23)	H1(13, 1)	H1(13, 2)	H1(13, 3)
	LB/FT^2-SEC	LB-RAD/FT^2-SEC	LB-RAD/FT^2-SEC	LB-RAD/FT^2-SEC	LB-RAD/FT^2-SEC	LB-RAD/FT^2-SEC	LB-RAD/FT^2-SEC	FT/SEC-RAD	FT/SEC-RAD	1/SEC
0.	0.	0.	0.	0.	0.	.1801E+00	0.	0.	-.1366E+01	0.
5.	-.1323E-04	-.1719E-03	-.6832E-02	.1343E-02	.4612E+02	.1885E+00	.9776E-02	.1842E+01	.1008E+02	-.1103E+00
10.	-.1145E-03	-.7303E-03	-.2927E-01	.5718E-02	.1985E+03	.2003E+00	.4178E-01	.3740E+01	.2326E+02	-.2252E+00
15.	-.4117E-03	-.1769E-02	-.6938E-01	.1382E-01	.4661E+03	.2119E+00	.9865E-01	.5519E+01	.3833E+02	-.3449E+00
20.	-.1029E-02	-.3229E-02	-.1270E+00	.2532E-01	.8962E+03	.2556E+00	.1802E+00	.7041E+01	.5467E+02	-.4644E+00
25.	-.2008E-02	-.5081E-02	-.2007E+00	.3997E-01	.1523E+04	.2696E+00	.2841E+00	.8481E+01	.7190E+02	-.5811E+00
30.	-.3420E-02	-.7352E-02	-.2843E+00	.5769E-01	.2361E+04	.3083E+00	.4078E+00	.9521E+01	.8958E+02	-.6930E+00
35.	-.5296E-02	-.9316E-02	-.3838E+00	.7266E-01	.3502E+04	.3284E+00	.5398E+00	.1016E+02	.1063E+03	-.7961E+00
40.	-.7138E-02	-.1178E-01	-.4827E+00	.9328E-01	.4899E+04	.3796E+00	.6775E+00	.1040E+02	.1226E+03	-.8836E+00
45.	-.8843E-02	-.1303E-01	-.5775E+00	.1053E+00	.6789E+04	.4169E+00	.8114E+00	.1026E+02	.1371E+03	-.9562E+00
50.	-.1077E-01	-.2076E-01	-.7409E+00	.1577E+00	.8967E+04	.4704E+00	.1019E+01	.9976E+01	.1486E+03	-.1035E+01
55.	-.1178E-01	-.2465E-01	-.8562E+00	.1896E+00	.1193E+05	.5729E+00	.1171E+01	.9401E+01	.1573E+03	-.1080E+01
60.	-.1196E-01	-.2792E-01	-.9449E+00	.2103E+00	.1540E+05	.5735E+00	.1286E+01	.8669E+01	.1619E+03	-.1108E+01
65.	-.9044E-02	-.3398E-01	-.1054E+01	.2618E+00	.1926E+05	.6339E+00	.1430E+01	.8056E+01	.1621E+03	-.1114E+01
70.	-.9120E-02	-.5454E-01	-.1368E+01	.4100E+00	.2335E+05	.5042E+00	.1695E+01	.7888E+01	.1574E+03	-.1141E+01
75.	-.7902E-02	-.1687E-01	-.7440E+00	.1405E+00	.2570E+05	-.1887E+00	.1025E+01	.6097E+01	.1508E+03	-.9523E+00
80.	-.6368E-02	-.9258E-02	-.5613E+00	.8180E-01	.2410E+05	-.7791E+00	.7878E+00	.5097E+01	.1407E+03	-.8557E+00
85.	-.6039E-02	-.5121E-02	-.4071E+00	.4638E-01	.2001E+05	-.1127E+01	.5787E+00	.4016E+01	.1302E+03	-.7607E+00
90.	-.3979E-02	-.1986E-02	-.2694E+00	.1896E-01	.1441E+05	-.9026E+00	.3909E+00	.2741E+01	.1191E+03	-.6679E+00
95.	-.1643E-02	-.1044E-03	-.1630E+00	.2515E-02	.1097E+05	-.5502E+00	.2426E+00	.1470E+01	.1048E+03	-.5697E+00
100.	-.5532E-03	.6682E-04	-.1068E+00	.2217E-03	.8204E+04	-.4355E+00	.1513E+00	.5142E+00	.9087E+02	-.4761E+00
105.	-.2158E-03	.2007E-03	-.6135E-01	-.1898E-02	.6133E+04	-.3114E+00	.9371E-01	-.9626E-01	.7836E+02	-.3936E+00
110.	-.1042E-03	.2926E-03	-.3647E-01	-.2946E-02	.4521E+04	-.2258E+00	.5743E-01	-.4536E+00	.6810E+02	-.3206E+00
115.	-.5258E-04	.2323E-03	-.2184E-01	-.2352E-02	.3354E+04	-.1605E+00	.3505E-01	-.8117E+00	.6046E+02	-.2733E+00
120.	-.2364E-04	.1693E-03	-.1345E-01	-.1888E-02	.2456E+04	-.1224E+00	.2210E-01	-.9311E+00	.5349E+02	-.2284E+00
125.	-.8516E-05	.1603E-03	-.7787E-02	-.1736E-02	.1785E+04	-.8296E-01	.1350E-01	-.9379E+00	.4761E+02	-.1856E+00
130.	-.2498E-05	.1088E-03	-.4778E-02	-.1203E-02	.1337E+04	-.5731E-01	.8533E-02	-.8873E+00	.4309E+02	-.1449E+00
135.	-.6955E-06	.8905E-04	-.2730E-02	-.9986E-03	.9982E+03	-.4397E-01	.5284E-02	-.8105E+00	.4076E+02	-.1182E+00
140.	-.2285E-06	.6540E-04	-.1578E-02	-.7442E-03	.7417E+03	-.3262E-01	.3312E-02	-.7289E+00	.3924E+02	-.9330E-01
145.	-.1040E-06	.4402E-04	-.9730E-03	-.5107E-03	.5491E+03	-.2439E-01	.2163E-02	-.6405E+00	.3738E+02	-.7361E-01
150.	-.5233E-07	.3883E-04	-.6784E-03	-.4362E-03	.4035E+03	-.1815E-01	.1335E-02	-.5661E+00	.3721E+02	-.5792E-01
155.	-.2447E-07	.2730E-04	-.2804E-03	-.3066E-03	.2986E+03	-.1344E-01	.8844E-03	-.4995E+00	.3850E+02	-.4575E-01
160.	-.1046E-07	.2030E-04	-.1551E-03	-.2252E-03	.2202E+03	-.9992E-02	.5919E-03	-.4367E+00	.3905E+02	-.3633E-01
165.	-.3596E-08	.1784E-04	-.4546E-04	-.1944E-03	.1614E+03	-.7512E-02	.3874E-03	-.3899E+00	.4007E+02	-.2909E-01
170.	-.1567E-08	.1303E-04	-.1461E-04	-.1415E-03	.1176E+03	-.5600E-02	.2653E-03	-.3443E+00	.4138E+02	-.2335E-01
175.	-.4363E-09	.1010E-04	.5560E-05	-.1085E-03	.8550E+02	-.4146E-02	.1853E-03	-.3043E+00	.4329E+02	-.1848E-01
180.	.2496E-09	.8852E-05	.2708E-04	-.9483E-04	.6178E+02	-.3138E-02	.1333E-03	-.2746E+00	.4492E+02	-.1576E-01
185.	.3049E-09	.7929E-05	.4127E-04	-.8370E-04	.4393E+02	-.2436E-02	.9438E-04	-.2479E+00	.4766E+02	-.1310E-01
190.	.2563E-09	.6931E-05	.4732E-04	-.7280E-04	.3048E+02	-.1865E-02	.6809E-04	-.2222E+00	.4922E+02	-.1096E-01
195.	.1851E-09	.6164E-05	.5091E-04	-.6416E-04	.2049E+02	-.1426E-02	.4826E-04	-.1914E+00	.5070E+02	-.9195E-02
200.	.2548E-09	.5479E-05	.5222E-04	-.5702E-04	.1308E+02	-.1080E-02	.3495E-04	-.1788E+00	.5340E+02	-.7791E-02
205.	.2152E-09	.4849E-05	.5092E-04	-.5000E-04	.7724E+01	-.8218E-03	.2433E-04	-.1623E+00	.5994E+02	-.6568E-02
210.	.1507E-09	.4172E-05	.4690E-04	-.4276E-04	.3846E+01	-.6220E-03	.1726E-04	-.1500E+00	.5965E+02	-.5541E-02

Table C8. H1 Matrix (continued)

TIME	H1(13, 4) FT/SEC^2-RAD	H1(13, 5) FT/SEC^2-RAD	H1(13, 7) 1/SEC	H1(13, 8) 1/SEC^2	H1(13, 9) 1/SEC	H1(13,10) 1/SEC^2	H1(13,11) 1/SEC	H1(13,12) 1/SEC^2	H1(13,13) 1/SEC	H1(13,14) 1/SEC^2
0.	-.9680E-01	-.2681E+01	-.2216E-01	-.1040E+02	-.1512E+00	-.9758E+02	.2447E-01	.2399E+02	-.5720E-01	-.7228E+02
5.	-.9528E-01	-.2638E+01	-.1017E+00	-.2459E+02	-.2196E+00	-.9882E+02	-.1577E-01	.2634E+02	-.3585E-01	-.6482E+02
10.	-.1100E+00	-.2660E+01	-.2048E+00	-.3860E+02	-.2904E+00	-.1002E+03	-.5786E-01	.3007E+02	-.1245E-01	-.5744E+02
15.	-.1477E+00	-.2689E+01	-.3382E+00	-.5299E+02	-.3598E+00	-.1019E+03	-.1039E+00	.3472E+02	.1352E-01	-.4904E+02
20.	-.1853E+00	-.2703E+01	-.5054E+00	-.6773E+02	-.4260E+00	-.1040E+03	-.1558E+00	.3978E+02	.4152E-01	-.3987E+02
25.	-.2569E+00	-.2700E+01	-.7100E+00	-.8328E+02	-.4866E+00	-.1064E+03	-.2139E+00	.4513E+02	.7138E-01	-.2971E+02
30.	-.3528E+00	-.2651E+01	-.9476E+00	-.9945E+02	-.5390E+00	-.1091E+03	-.2782E+00	.5054E+02	.1020E+00	-.1890E+02
35.	-.4683E+00	-.2571E+01	-.1220E+01	-.1167E+03	-.5822E+00	-.1122E+03	-.3482E+00	.5576E+02	.1327E+00	-.7408E+01
40.	-.5937E+00	-.2442E+01	-.1517E+01	-.1348E+03	-.6155E+00	-.1156E+03	-.4219E+00	.6064E+02	.1629E+00	.4289E+01
45.	-.7142E+00	-.2271E+01	-.1836E+01	-.1546E+03	-.6375E+00	-.1192E+03	-.4953E+00	.6482E+02	.1918E+00	.1620E+02
50.	-.8011E+00	-.2054E+01	-.2159E+01	-.1754E+03	-.6491E+00	-.1230E+03	-.5667E+00	.6839E+02	.2188E+00	.2762E+02
55.	-.8516E+00	-.1829E+01	-.2478E+01	-.1981E+03	-.6506E+00	-.1270E+03	-.6292E+00	.7115E+02	.2432E+00	.3856E+02
60.	-.8525E+00	-.1582E+01	-.2767E+01	-.2226E+03	-.6422E+00	-.1312E+03	-.6769E+00	.7280E+02	.2649E+00	.4838E+02
65.	-.8279E+00	-.1326E+01	-.3003E+01	-.2490E+03	-.6236E+00	-.1354E+03	-.7012E+00	.7325E+02	.2828E+00	.5729E+02
70.	-.7870E+00	-.1046E+01	-.3168E+01	-.2772E+03	-.5975E+00	-.1394E+03	-.7035E+00	.7259E+02	.2973E+00	.6487E+02
75.	-.7126E+00	-.8643E+00	-.3255E+01	-.3071E+03	-.5659E+00	-.1435E+03	-.6805E+00	.7098E+02	.3074E+00	.7108E+02
80.	-.6301E+00	-.6722E+00	-.3259E+01	-.3389E+03	-.5265E+00	-.1473E+03	-.6393E+00	.6931E+02	.3090E+00	.7646E+02
85.	-.5374E+00	-.5051E+00	-.3172E+01	-.3715E+03	-.4768E+00	-.1508E+03	-.5826E+00	.6828E+02	.2981E+00	.8185E+02
90.	-.4450E+00	-.3750E+00	-.3005E+01	-.4041E+03	-.4177E+00	-.1539E+03	-.5150E+00	.6851E+02	.2748E+00	.8779E+02
95.	-.3602E+00	-.2651E+00	-.2773E+01	-.4374E+03	-.3534E+00	-.1566E+03	-.4373E+00	.6992E+02	.2440E+00	.9480E+02
100.	-.2816E+00	-.1844E+00	-.2518E+01	-.4699E+03	-.2963E+00	-.1587E+03	-.3590E+00	.7149E+02	.2182E+00	.1028E+03
105.	-.2199E+00	-.1313E+00	-.2302E+01	-.4999E+03	-.2547E+00	-.1602E+03	-.2911E+00	.7293E+02	.2060E+00	.1118E+03
110.	-.1680E+00	-.8328E-01	-.2117E+01	-.5274E+03	-.2266E+00	-.1615E+03	-.2321E+00	.7353E+02	.2024E+00	.1213E+03
115.	-.1249E+00	-.6468E-01	-.1978E+01	-.5635E+03	-.1910E+00	-.1636E+03	-.1809E+00	.8119E+02	.1700E+00	.1254E+03
120.	-.1039E+00	-.4841E-01	-.1861E+01	-.5956E+03	-.1713E+00	-.1651E+03	-.1359E+00	.8605E+02	.1577E+00	.1314E+03
125.	-.7979E-01	-.2624E-01	-.1763E+01	-.6246E+03	-.1612E+00	-.1656E+03	-.9699E-01	.8862E+02	.1561E+00	.1391E+03
130.	-.5927E-01	-.1761E-01	-.1683E+01	-.6509E+03	-.1571E+00	-.1655E+03	-.6452E-01	.8919E+02	.1605E+00	.1486E+03
135.	-.4218E-01	-.1063E-01	-.1620E+01	-.6755E+03	-.1558E+00	-.1649E+03	-.3864E-01	.8807E+02	.1679E+00	.1599E+03
140.	-.3020E-01	-.8972E-02	-.1570E+01	-.6989E+03	-.1555E+00	-.1636E+03	-.1884E-01	.8559E+02	.1761E+00	.1728E+03
145.	-.1834E-01	-.5493E-02	-.1531E+01	-.7196E+03	-.1550E+00	-.1620E+03	-.4629E-02	.8171E+02	.1851E+00	.1876E+03
150.	-.1404E-01	-.3930E-02	-.1501E+01	-.7394E+03	-.1539E+00	-.1597E+03	.5055E-02	.7679E+02	.1940E+00	.2039E+03
155.	-.1219E-01	-.3004E-02	-.1480E+01	-.7583E+03	-.1519E+00	-.1571E+03	.1074E-01	.7084E+02	.2033E+00	.2222E+03
160.	-.4825E-02	-.2113E-02	-.1465E+01	-.7756E+03	-.1491E+00	-.1540E+03	.1323E-01	.6402E+02	.2130E+00	.2422E+03
165.	-.8350E-02	-.6480E-03	-.1454E+01	-.7920E+03	-.1457E+00	-.1506E+03	.1332E-01	.5658E+02	.2227E+00	.2636E+03
170.	-.5942E-02	-.4615E-03	-.1446E+01	-.8074E+03	-.1418E+00	-.1469E+03	.1170E-01	.4883E+02	.2323E+00	.2857E+03
175.	.4314E-03	-.3780E-04	-.1442E+01	-.8213E+03	-.1375E+00	-.1430E+03	.8719E-02	.4102E+02	.2419E+00	.3085E+03
180.	-.1388E-02	.1852E-03	-.1441E+01	-.8355E+03	-.1329E+00	-.1391E+03	.4622E-02	.3311E+02	.2520E+00	.3318E+03
185.	-.3466E-02	-.2818E-03	-.1442E+01	-.8485E+03	-.1283E+00	-.1350E+03	.2152E-03	.2539E+02	.2618E+00	.3555E+03
190.	.2581E-02	-.3319E-03	-.1443E+01	-.8604E+03	-.1234E+00	-.1307E+03	-.4499E-02	.1779E+02	.2716E+00	.3790E+03
195.	-.4463E-02	.9527E-04	-.1446E+01	-.8727E+03	-.1187E+00	-.1266E+03	-.9200E-02	.1060E+02	.2810E+00	.4025E+03
200.	-.5744E-02	-.3536E-03	-.1451E+01	-.8859E+03	-.1138E+00	-.1222E+03	-.1403E-01	.3619E+01	.2903E+00	.4261E+03
205.	-.2153E-02	.4485E-03	-.1457E+01	-.8977E+03	-.1091E+00	-.1180E+03	-.1860E-01	-.2859E+01	.2994E+00	.4491E+03
210.	-.4436E-02	.9304E-04	-.1463E+01	-.9097E+03	-.1043E+00	-.1136E+03	-.2298E-01	-.8934E+01	.3080E+00	.4712E+03

Table C8. H1 Matrix (continued)

TIME	H1(13,15) FT/SEC^2-RAD	H1(13,16) FT/SEC^2-RAD	H1(13,17) FT/SEC^2-RAD	H1(13,18) FT/SEC^2	H1(13,19) FT/SEC^2	H1(13,20) FT/SEC^2	H1(13,22) FT/SEC^2	H1(13,23) FT/SEC^2	H1(14, 1) FT/SEC^2-RAD	H1(14, 2) FT/SEC^2-RAD
0.	.7039E+02	-.5430E+03	0.	0.	0.	0.	-.7765E-01	0.	-.9640E-01	-.2611E+01
5.	.7050E+02	-.5628E+03	.2737E+00	.9201E-01	.1776E+01	-.1024E+01	-.6299E-01	.1523E+01	-.1085E+01	-.3002E+01
10.	.7037E+02	-.5937E+03	.1157E+01	.1874E+00	.3426E+01	-.2019E+01	-.4964E-01	.3042E+01	-.2386E+01	.7073E+00
15.	.7023E+02	-.6151E+03	.2700E+01	.2948E+00	.4940E+01	-.2981E+01	-.3485E-01	.4522E+01	-.4005E+01	.9042E+01
20.	.7037E+02	-.6221E+03	.4962E+01	.3951E+00	.6324E+01	-.3883E+01	-.2150E-01	.5848E+01	-.5107E+01	.2159E+02
25.	.7038E+02	-.6176E+03	.7939E+01	.4897E+00	.7552E+01	-.4689E+01	-.6543E-02	.6918E+01	-.7149E+01	.3786E+02
30.	.7050E+02	-.7252E+03	.1159E+02	.5861E+00	.8699E+01	-.5432E+01	.8094E-02	.7696E+01	-.7972E+01	.5817E+02
35.	.7046E+02	-.7781E+03	.1592E+02	.6363E+00	.9850E+01	-.6091E+01	.2216E-01	.8179E+01	-.7753E+01	.8103E+02
40.	.7109E+02	-.8320E+03	.2067E+02	.7095E+00	.1063E+02	-.6530E+01	.3608E-01	.8174E+01	-.6242E+01	.1077E+03
45.	.7135E+02	-.8918E+03	.2562E+02	.7074E+00	.1158E+02	-.6935E+01	.5095E-01	.7846E+01	-.3372E+01	.1418E+03
50.	.7131E+02	-.9511E+03	.3044E+02	.1034E+01	.1263E+02	-.7546E+01	.6767E-01	.7485E+01	.4472E+00	.2006E+03
55.	.7205E+02	-.1012E+04	.3589E+02	.1160E+01	.1349E+02	-.7837E+01	.7881E-01	.6808E+01	.5311E+01	.2690E+03
60.	.7227E+02	-.1062E+04	.3940E+02	.1258E+01	.1419E+02	-.7949E+01	.9276E-01	.6044E+01	.1092E+02	.3627E+03
65.	.7296E+02	-.1107E+04	.3439E+02	.1505E+01	.1470E+02	-.8038E+01	.1037E+00	.5491E+01	.1386E+02	.4796E+03
70.	.7324E+02	-.1142E+04	.4181E+02	.2443E+01	.1475E+02	-.8229E+01	.1260E+00	.5410E+01	.1554E+02	.6686E+03
75.	.7317E+02	-.1173E+04	.4476E+02	.7832E+00	.1163E+02	-.5734E+01	.8958E-01	.3774E+01	.1838E+02	.8291E+03
80.	.7309E+02	-.1205E+04	.4705E+02	.4623E+00	.9782E+01	-.4555E+01	.6998E-01	.2946E+01	.1802E+02	.7052E+03
85.	.7392E+02	-.1257E+04	.6354E+02	.2904E+00	.7936E+01	-.3480E+01	.4907E-01	.2112E+01	.1624E+02	.7823E+03
90.	.7379E+02	-.1314E+04	.6245E+02	.1333E+00	.6272E+01	-.2517E+01	.3334E-01	.1118E+01	.1342E+02	.8469E+03
95.	.7356E+02	-.1390E+04	.4237E+02	.8595E-02	.4775E+01	-.1694E+01	.2404E-01	.1310E+00	.1068E+02	.8760E+03
100.	.7336E+02	-.1459E+04	.2498E+02	-.6978E-02	.3569E+01	-.1111E+01	.1760E-01	-.5358E+00	.7870E+01	.8710E+03
105.	.7275E+02	-.1521E+04	.1670E+02	-.2610E-01	.2678E+01	-.7090E+00	.1252E-01	-.9263E+00	.5811E+01	.8374E+03
110.	.7247E+02	-.1555E+04	.1415E+02	-.4708E-01	.2017E+01	-.4438E+00	.8404E-02	-.1105E+01	.4143E+01	.7802E+03
115.	.7181E+02	-.1625E+04	.1261E+02	-.4716E-01	.1690E+01	-.3416E+00	.6039E-02	-.1318E+01	.2948E+01	.7524E+03
120.	.7132E+02	-.1672E+04	.9612E+01	-.4234E-01	.1396E+01	-.2562E+00	.4223E-02	-.1330E+01	.2070E+01	.7040E+03
125.	.7046E+02	-.1696E+04	.6156E+01	-.4910E-01	.1131E+01	-.1922E+00	.2784E-02	-.1250E+01	.1454E+01	.6354E+03
130.	.7002E+02	-.1719E+04	.3206E+01	-.4060E-01	.8542E+00	-.1182E+00	.1908E-02	-.1120E+01	.1018E+01	.5620E+03
135.	.6898E+02	-.1724E+04	.1567E+01	-.3998E-01	.6516E+00	-.7258E-01	.1267E-02	-.9893E+00	.7156E+00	.4890E+03
140.	.6806E+02	-.1728E+04	.9421E+00	-.3494E-01	.4730E+00	-.3297E-01	.8306E-03	-.8543E+00	.5043E+00	.4209E+03
145.	.6703E+02	-.1743E+04	.7808E+00	-.2785E-01	.3267E+00	.1292E-02	.5567E-03	-.7396E+00	.3600E+00	.3603E+03
150.	.6602E+02	-.1758E+04	.7131E+00	-.2887E-01	.2486E+00	.5027E-02	.3361E-03	-.6342E+00	.2681E+00	.3071E+03
155.	.6498E+02	-.1776E+04	.6410E+00	-.2360E-01	.1672E+00	.1893E-01	.2155E-03	-.5497E+00	.2012E+00	.2616E+03
160.	.6378E+02	-.1791E+04	.5510E+00	-.2027E-01	.1149E+00	.2393E-01	.1351E-03	-.4738E+00	.1646E+00	.2234E+03
165.	.6003E+02	-.1726E+04	.4421E+00	-.2031E-01	.9763E-01	.1413E-01	.7313E-04	-.4099E+00	.1296E+00	.1916E+03
170.	.5550E+02	-.1651E+04	.3556E+00	-.1659E-01	.6893E-01	.1403E-01	.4308E-04	-.3541E+00	.1143E+00	.1641E+03
175.	.5175E+02	-.1592E+04	.3054E+00	-.1435E-01	.5411E-01	.1040E-01	.2323E-04	-.3076E+00	.1048E+00	.1414E+03
180.	.4874E+02	-.1537E+04	.2540E+00	-.1400E-01	.5612E-01	.5917E-03	.8057E-05	-.2705E+00	.9579E-01	.1243E+03
185.	.4411E+02	-.1456E+04	.2135E+00	-.1357E-01	.6265E-01	-.1107E-01	-.1758E-05	-.2371E+00	.8824E-01	.1092E+03
190.	.4115E+02	-.1435E+04	.1642E+00	-.1307E-01	.6939E-01	-.2124E-01	-.6728E-05	-.2042E+00	.8677E-01	.9609E+02
195.	.3714E+02	-.1361E+04	.1032E+00	-.1257E-01	.7977E-01	-.3294E-01	-.9236E-05	-.1825E+00	.8031E-01	.8447E+02
200.	.3407E+02	-.1313E+04	.1316E+00	-.1227E-01	.9175E-01	-.4463E-01	-.9506E-05	-.1606E+00	.6975E-01	.7485E+02
205.	.3013E+02	-.1252E+04	.1196E+00	-.1170E-01	.1034E+00	-.5576E-01	-.8118E-05	-.1411E+00	.7176E-01	.6553E+02
210.	.2717E+02	-.1215E+04	.9047E-01	-.1108E-01	.1106E+00	-.6322E-01	-.5284E-05	-.1243E+00	.6748E-01	.5766E+02

Table C8. H1 Matrix (continued)

TIME	H1(14, 3) $1/SEC^2$	H1(14, 4) FT/SEC^3-RAD	H1(14, 5) FT/SEC^3-RAD	H1(14, 7) $1/SEC^2$	H1(14, 8) $1/SEC^3$	H1(14, 9) $1/SEC^2$	H1(14,10) $1/SEC^3$	H1(14,11) $1/SEC^2$	H1(14,12) $1/SEC^3$	H1(14,13) $1/SEC^2$
0.	0.	.2667E-01	.7551E+00	-.1039E+02	.3621E+01	-.9753E+02	.3574E+02	.2357E+02	-.1824E+02	-.7223E+02
5.	.4647E-01	-.7421E-01	-.2126E+01	-.2454E+02	.1358E+02	-.9870E+02	.5226E+02	.2635E+02	-.7734E+01	-.6478E+02
10.	.1260E+00	-.2046E+00	-.5158E+01	-.3845E+02	.2777E+02	-.1000E+03	.6994E+02	.3014E+02	.3474E+01	-.5742E+02
15.	.2403E+00	-.4409E+00	-.8262E+01	-.5266E+02	.4721E+02	-.1016E+03	.8808E+02	.3489E+02	.1578E+02	-.4907E+02
20.	.3963E+00	-.7613E+00	-.1137E+02	-.6713E+02	.7258E+02	-.1036E+03	.1064E+03	.4010E+02	.2933E+02	-.3996E+02
25.	.5981E+00	-.1339E+01	-.1435E+02	-.8226E+02	.1046E+03	-.1058E+03	.1245E+03	.4554E+02	.4417E+02	-.2988E+02
30.	.8492E+00	-.2246E+01	-.1716E+02	-.9787E+02	.1430E+03	-.1085E+03	.1418E+03	.5132E+02	.6040E+02	-.1917E+02
35.	.1149E+01	-.3536E+01	-.1965E+02	-.1144E+03	.1882E+03	-.1114E+03	.1581E+03	.5687E+02	.7601E+02	-.7798E+01
40.	.1496E+01	-.5202E+01	-.2162E+02	-.1316E+03	.2389E+03	-.1147E+03	.1733E+03	.6216E+02	.9702E+02	.3766E+01
45.	.1869E+01	-.7216E+01	-.2309E+02	-.1503E+03	.2954E+03	-.1183E+03	.1867E+03	.6640E+02	.1169E+03	.1553E+02
50.	.2234E+01	-.9600E+01	-.2472E+02	-.1700E+03	.3549E+03	-.1221E+03	.1982E+03	.7046E+02	.1377E+03	.2681E+02
55.	.2569E+01	-.1176E+02	-.2544E+02	-.1915E+03	.4165E+03	-.1262E+03	.2079E+03	.7408E+02	.1579E+03	.3750E+02
60.	.2798E+01	-.1385E+02	-.2576E+02	-.2150E+03	.4770E+03	-.1304E+03	.2152E+03	.7611E+02	.1751E+03	.4729E+02
65.	.2905E+01	-.1589E+02	-.2548E+02	-.2407E+03	.5317E+03	-.1348E+03	.2193E+03	.7678E+02	.1898E+03	.5612E+02
70.	.2810E+01	-.1846E+02	-.2572E+02	-.2685E+03	.5772E+03	-.1349E+03	.2198E+03	.7614E+02	.2000E+03	.6364E+02
75.	.2549E+01	-.1679E+02	-.2051E+02	-.2986E+03	.6106E+03	-.1431E+03	.2174E+03	.7435E+02	.2038E+03	.6985E+02
80.	.2199E+01	-.1655E+02	-.1779E+02	-.3308E+03	.6310E+03	-.1470E+03	.2105E+03	.7235E+02	.2027E+03	.7528E+02
85.	.1807E+01	-.1601E+02	-.1518E+02	-.3644E+03	.6330E+03	-.1506E+03	.1978E+03	.7027E+02	.1951E+03	.8050E+02
90.	.1413E+01	-.1514E+02	-.1273E+02	-.3981E+03	.6170E+03	-.1537E+03	.1794E+03	.6781E+02	.1841E+03	.8693E+02
95.	.1056E+01	-.1374E+02	-.1030E+02	-.4326E+03	.5850E+03	-.1565E+03	.1570E+03	.6532E+02	.1653E+03	.9414E+02
100.	.7468E+00	-.1209E+02	-.8117E+01	-.4662E+03	.5447E+03	-.1586E+03	.1355E+03	.6256E+02	.1428E+03	.1023E+03
105.	.5139E+00	-.1042E+02	-.6288E+01	-.4970E+03	.5070E+03	-.1602E+03	.1195E+03	.7378E+02	.1201E+03	.1113E+03
110.	.3439E+00	-.8784E+01	-.4776E+01	-.5251E+03	.4729E+03	-.1614E+03	.1087E+03	.7415E+02	.9840E+02	.1209E+03
115.	.2633E+00	-.7699E+01	-.3771E+01	-.5617E+03	.4493E+03	-.1636E+03	.9488E+02	.5185E+02	.7695E+02	.1251E+03
120.	.1894E+00	-.6579E+01	-.2911E+01	-.5941E+03	.4280E+03	-.1651E+03	.8740E+02	.8639E+02	.5737E+02	.1312E+03
125.	.1301E+00	-.5446E+01	-.2185E+01	-.6234E+03	.4097E+03	-.1656E+03	.8391E+02	.8887E+02	.4004E+02	.1389E+03
130.	.8632E-01	-.4436E+01	-.1616E+01	-.6498E+03	.3945E+03	-.1655E+03	.8331E+02	.8936E+02	.2526E+02	.1484E+03
135.	.5512E-01	-.3564E+01	-.1182E+01	-.6746E+03	.3829E+03	-.1648E+03	.8424E+02	.8819E+02	.1335E+02	.1597E+03
140.	.3410E-01	-.2842E+01	-.8587E+00	-.6980E+03	.3747E+03	-.1636E+03	.8574E+02	.8567E+02	.4219E+01	.1726E+03
145.	.2013E-01	-.2258E+01	-.6228E+00	-.7188E+03	.3681E+03	-.1619E+03	.8741E+02	.8176E+02	-.2277E+01	.1874E+03
150.	.1105E-01	-.1791E+01	-.4516E+00	-.7387E+03	.3640E+03	-.1596E+03	.8866E+02	.7682E+02	-.6579E+01	.2037E+03
155.	.5319E-02	-.1423E+01	-.3282E+00	-.7575E+03	.3618E+03	-.1571E+03	.8952E+02	.7047E+02	-.1069E+02	.2220E+03
160.	.1735E-02	-.1136E+01	-.2403E+00	-.7749E+03	.3609E+03	-.1539E+03	.8980E+02	.6403E+02	-.9618E+01	.2420E+03
165.	-.6026E-03	-.9125E+00	-.1774E+00	-.7913E+03	.3609E+03	-.1505E+03	.8972E+02	.5659E+02	-.9169E+01	.2634E+03
170.	-.1866E-02	-.7348E+00	-.1313E+00	-.8067E+03	.3617E+03	-.1468E+03	.8908E+02	.4854E+02	-.7880E+01	.2854E+03
175.	-.2571E-02	-.5990E+00	-.9850E-01	-.8207E+03	.3631E+03	-.1430E+03	.8804E+02	.4102E+02	-.5870E+01	.3082E+03
180.	-.3021E-02	-.4983E+00	-.7555E-01	-.8349E+03	.3658E+03	-.1390E+03	.8685E+02	.3311E+02	-.3340E+01	.3316E+03
185.	-.3179E-02	-.4150E+00	-.5808E-01	-.8479E+03	.3684E+03	-.1349E+03	.8526E+02	.2540E+02	-.6445E+00	.3552E+03
190.	-.3214E-02	-.3480E+00	-.4500E-01	-.8598E+03	.3707E+03	-.1306E+03	.8345E+02	.1741E+02	.2192E+01	.3787E+03
195.	-.3121E-02	-.2921E+00	-.3500E-01	-.8721E+03	.3738E+03	-.1265E+03	.8161E+02	.1052E+02	.4983E+01	.4022E+03
200.	-.2995E-02	-.2478E+00	-.2752E-01	-.8853E+03	.3778E+03	-.1231E+03	.7953E+02	.3634E+01	.7851E+01	.4258E+03
205.	-.2792E-02	-.2091E+00	-.2157E-01	-.8970E+03	.3816E+03	-.1179E+03	.7732E+02	-.2842E+01	.1059E+02	.4488E+03
210.	-.2555E-02	-.1768E+00	-.1698E-01	-.9091E+03	.3852E+03	-.1136E+03	.7508E+02	-.9915E+01	.1313E+02	.4709E+03

Table C8. H1 Matrix (continued)

TIME	H1(14,14) 1/SEC^3	H1(14,15) FT/SEC^3-RAD	H1(14,16) FT/SEC^3-RAD	H1(14,17) FT/SEC^3-RAD	H1(14,18) FT/SEC^3	H1(14,19) FT/SEC^3	H1(14,20) FT/SEC^3	H1(14,21) FT/SEC^3	H1(14,22) FT/SEC^3	H1(14,23) FT/SEC^3
0.	.6134E+02	-.2224E+04	.1723E+05	0.	0.	0.	0.	0.	-.6881E-01	0.
5.	.5825E+02	-.2227E+04	.1803E+05	-.2723E+01	-.6284E-01	-.9804E+00	-.2940E+00	-.3213E+01	.3077E+00	-.2666E+01
10.	.5306E+02	-.2216E+04	.1920E+05	-.1145E+02	-.2265E+00	-.3857E+01	-.1299E+01	-.5237E+01	.6720E+00	-.9325E+01
15.	.4498E+02	-.2209E+04	.2007E+05	-.2660E+02	-.5212E+00	-.8822E+01	-.2776E+01	-.5673E+01	.1013E+01	-.1986E+02
20.	.3434E+02	-.2211E+04	.2048E+05	-.4870E+02	-.9384E+00	-.1598E+02	-.4635E+01	-.4801E+01	.1388E+01	-.3381E+02
25.	.2082E+02	-.2209E+04	.2252E+05	-.7765E+02	-.1486E+01	-.2513E+02	-.6930E+01	-.1881E+01	.1778E+01	-.5006E+02
30.	.4845E+01	-.2211E+04	.2433E+05	-.1132E+03	-.2203E+01	-.3638E+02	-.9831E+01	.2872E+01	.2193E+01	-.6704E+02
35.	-.1321E+02	-.2226E+04	.2637E+05	-.1554E+03	-.2897E+01	-.4933E+02	-.1424E+02	.9414E+01	.2698E+01	-.8274E+02
40.	-.3296E+02	-.2230E+04	.2847E+05	-.2021E+03	-.3845E+01	-.6260E+02	-.1939E+02	.1796E+02	.3145E+01	-.9569E+02
45.	-.5392E+02	-.2240E+04	.3081E+05	-.2510E+03	-.4502E+01	-.7686E+02	-.2796E+02	.2914E+02	.3602E+01	-.1042E+03
50.	-.7535E+02	-.2241E+04	.3315E+05	-.2994E+03	-.7653E+01	-.9545E+02	-.3754E+02	.4382E+02	.4628E+01	-.1101E+03
55.	-.9696E+02	-.2267E+04	.3553E+05	-.3542E+03	-.9810E+01	-.1106E+03	-.5224E+02	.5718E+02	.5670E+01	-.1101E+03
60.	-.1185E+03	-.2277E+04	.3752E+05	-.3903E+03	-.1205E+02	-.1233E+03	-.7125E+02	.7455E+02	.6834E+01	-.1068E+03
65.	-.1406E+03	-.2301E+04	.3924E+05	-.3417E+03	-.1604E+02	-.1344E+03	-.9167E+02	.9075E+02	.8287E+01	-.1052E+03
70.	-.1632E+03	-.2310E+04	.4048E+05	-.4157E+03	-.2850E+02	-.1491E+03	-.1044E+03	.1134E+03	.1011E+02	-.1157E+03
75.	-.1856E+03	-.2312E+04	.4143E+05	-.4476E+03	-.9951E+01	-.1647E+03	-.1114E+03	.8940E+02	.8296E+01	-.8339E+02
80.	-.2030E+03	-.2312E+04	.4235E+05	-.4719E+03	-.6360E+01	-.8914E+02	-.1142E+03	.7362E+02	.6678E+01	-.7131E+02
85.	-.2113E+03	-.2340E+04	.4376E+05	-.6391E+03	-.4320E+01	-.6734E+02	-.1129E+03	.5402E+02	.4757E+01	-.5364E+02
90.	-.2088E+03	-.2339E+04	.4527E+05	-.6305E+03	-.2148E+01	-.4297E+02	-.1108E+03	.3824E+02	.2973E+01	-.2651E+02
95.	-.1981E+03	-.2335E+04	.4732E+05	-.4292E+03	-.1507E+00	-.1822E+02	-.1066E+03	.2861E+02	.1932E+01	.7351E+01
100.	-.1896E+03	-.2329E+04	.4911E+05	-.2525E+03	.1329E+00	-.1625E+00	-.9871E+02	.2141E+02	.1262E+01	.3515E+02
105.	-.1911E+03	-.2310E+04	.5072E+05	-.1697E+03	.5413E+00	.1314E+02	-.9119E+02	.1542E+02	.8205E+00	.5601E+02
110.	-.1985E+03	-.2302E+04	.5145E+05	-.1437E+03	.1064E+01	.2187E+02	-.8323E+02	.1085E+02	.5291E+00	.6964E+02
115.	-.1692E+03	-.2281E+04	.5342E+05	-.1282E+03	.1166E+01	.2403E+02	-.7948E+02	.7923E+01	.3988E+00	.8838E+02
120.	-.1611E+03	-.2262E+04	.5470E+05	-.9769E+02	.1142E+01	.2564E+02	-.7467E+02	.5680E+01	.2932E+00	.9646E+02
125.	-.1643E+03	-.2236E+04	.5524E+05	-.6253E+02	.1442E+01	.2529E+02	-.6795E+02	.3722E+01	.2103E+00	.9842E+02
130.	-.1742E+03	-.2223E+04	.5578E+05	-.3255E+02	.1294E+01	.2559E+02	-.5924E+02	.2560E+01	.1427E+00	.9574E+02
135.	-.1878E+03	-.2190E+04	.5580E+05	-.1591E+02	.1382E+01	.2462E+02	-.5146E+02	.1703E+01	.9713E-01	.9168E+02
140.	-.2026E+03	-.2161E+04	.5580E+05	-.9567E+01	.1307E+01	.2345E+02	-.4334E+02	.1114E+01	.6098E-01	.8818E+02
145.	-.2193E+03	-.2129E+04	.5616E+05	-.7929E+01	.1124E+01	.2286E+02	-.3602E+02	.7432E+00	.3397E-01	.8010E+02
150.	-.2366E+03	-.2097E+04	.5656E+05	-.7248E+01	.1256E+01	.1979E+02	-.3029E+02	.4456E+00	.2237E-01	.7463E+02
155.	-.2554E+03	-.2065E+04	.5706E+05	-.6524E+01	.1105E+01	.1834E+02	-.2469E+02	.2832E+00	.1078E-01	.6912E+02
160.	-.2758E+03	-.2028E+04	.5749E+05	-.5616E+01	.1019E+01	.1656E+02	-.2028E+02	.1756E+00	.4724E-02	.6393E+02
165.	-.2970E+03	-.1910E+04	.5537E+05	-.4513E+01	.1093E+01	.1328E+02	-.1723E+02	.9340E-01	.4257E-02	.5926E+02
170.	-.3187E+03	-.1767E+04	.5296E+05	-.3643E+01	.9527E+00	.1129E+02	-.1386E+02	.5441E-01	.2030E-02	.5456E+02
175.	-.3415E+03	-.1650E+04	.5105E+05	-.3140E+01	.8759E+00	.9227E+01	-.1143E+02	.2851E-01	.1395E-02	.5038E+02
180.	-.3655E+03	-.1555E+04	.4926E+05	-.2619E+01	.9051E+00	.6538E+01	-.1009E+02	.9774E-02	.2286E-02	.4693E+02
185.	-.3899E+03	-.1411E+04	.4668E+05	-.2217E+01	.9267E+00	.3325E+01	-.8903E+01	-.2043E-02	.3246E-02	.4346E+02
190.	-.4144E+03	-.1319E+04	.4601E+05	-.1715E+01	.9406E+00	.3460E+00	-.7968E+01	-.7777E-02	.3693E-02	.4020E+02
195.	-.4390E+03	-.1193E+04	.4362E+05	-.1085E+01	.9508E+00	-.3111E+01	-.7215E+01	-.1040E-01	.3989E-02	.3705E+02
200.	-.4639E+03	-.1097E+04	.4208E+05	-.1395E+01	.9731E+00	-.6688E+01	-.6692E+01	-.1042E-01	.3868E-02	.3418E+02
205.	-.4888E+03	-.9761E+03	.4015E+05	-.1291E+01	.9722E+00	-.1038E+02	-.6193E+01	-.8661E-02	.3297E-02	.3143E+02
210.	-.5124E+03	-.8833E+03	.3896E+05	-.9867E+00	.9621E+00	-.1330E+02	-.5766E+01	-.5445E-02	.2193E-02	.2893E+02

Table C8. H1 Matrix (concluded)

TIME	H1(14,24) FT/SEC^3
0.	0.
5.	.1655E+01
10.	.6887E+01
15.	.1570E+02
20.	.2784E+02
25.	.4255E+02
30.	.5867E+02
35.	.7462E+02
40.	.8918E+02
45.	.1008E+03
50.	.1109E+03
55.	.1161E+03
60.	.1181E+03
65.	.1209E+03
70.	.1336E+03
75.	.1040E+03
80.	.9171E+02
85.	.7226E+02
90.	.4259E+02
95.	.5556E+01
100.	-.2526E+02
105.	-.4843E+02
110.	-.6393E+02
115.	-.8408E+02
120.	-.9325E+02
125.	-.9603E+02
130.	-.9398E+02
135.	-.9040E+02
140.	-.8526E+02
145.	-.7944E+02
150.	-.7415E+02
155.	-.6876E+02
160.	-.6368E+02
165.	-.5907E+02
170.	-.5442E+02
175.	-.5027E+02
180.	-.4685E+02
185.	-.4339E+02
190.	-.4014E+02
195.	-.3700E+02
200.	-.3414E+02
205.	-.3140E+02
210.	-.2890E+02

APPENDIX D
TRAJECTORY DATA

APPENDIX D
TRAJECTORY DATA

The nominal trajectory is described quantitatively in Table D1.

Table D1. Trajectory Data

TIME SEC	ALTITUDE FT	VELOCITY FT/SEC	ATTITUDE DEGREES	ALPHA DEGREES	THRUST LB	MACH NO.	WEIGHT LB	GAMMA DEGREES	IXX FT-LB	IYY FT-LB
0.0	-.1221E-03	0.	.8798E+02	0.	.6600E+07	0.	.5048E+07	.8798E+02	.3660E+08	.5700E+09
5.0	.1260E+03	.5103E+02	.8798E+02	-.3246E-01	.6603E+07	.4487E-01	.4965E+07	.8801E+02	.3630E+08	.5550E+09
10.0	.5160E+03	.1056E+03	.8767E+02	-.1992E+00	.6612E+07	.9297E-01	.4883E+07	.8787E+02	.3625E+08	.5400E+09
15.0	.1185E+04	.1630E+03	.8690E+02	-.9181E-01	.6627E+07	.1438E+00	.4800E+07	.8699E+02	.3620E+08	.5340E+09
20.0	.2149E+04	.2239E+03	.8612E+02	.2764E+00	.6647E+07	.1983E+00	.4718E+07	.8585E+02	.3600E+08	.5200E+09
25.0	.3425E+04	.2888E+03	.8460E+02	.9699E-01	.6674E+07	.2569E+00	.4635E+07	.8450E+02	.3590E+08	.5150E+09
30.0	.5030E+04	.3580E+03	.8247E+02	.1294E+00	.6706E+07	.3200E+00	.4553E+07	.8234E+02	.3580E+08	.5110E+09
35.0	.6979E+04	.4321E+03	.7972E+02	.1619E+00	.6742E+07	.3886E+00	.4470E+07	.7956E+02	.3555E+08	.4920E+09
40.0	.9286E+04	.5125E+03	.7639E+02	.1928E+00	.6783E+07	.4641E+00	.4388E+07	.7620E+02	.3550E+08	.4910E+09
45.0	.1197E+05	.6001E+03	.7257E+02	.2096E+00	.6827E+07	.5479E+00	.4305E+07	.7236E+02	.3545E+08	.4900E+09
50.0	.1502E+05	.6960E+03	.6872E+02	.2037E+00	.6872E+07	.6418E+00	.4223E+07	.6851E+02	.3542E+08	.4790E+09
55.0	.1846E+05	.8008E+03	.6514E+02	.1820E+00	.6918E+07	.7476E+00	.4140E+07	.6496E+02	.3515E+08	.4720E+09
60.0	.2229E+05	.9145E+03	.6170E+02	.1976E+00	.6964E+07	.8669E+00	.4058E+07	.6151E+02	.3510E+08	.4660E+09
65.0	.2650E+05	.1034E+04	.5802E+02	.2076E+00	.7009E+07	.9988E+00	.3975E+07	.5781E+02	.3480E+08	.4590E+09
70.0	.3105E+05	.1160E+04	.5430E+02	.2041E+00	.7051E+07	.1145E+01	.3893E+07	.5410E+02	.3470E+08	.4550E+09
75.0	.3591E+05	.1294E+04	.5066E+02	.1987E+00	.7088E+07	.1309E+01	.3810E+07	.5047E+02	.3468E+08	.4440E+09
80.0	.4105E+05	.1442E+04	.4703E+02	.1955E+00	.7122E+07	.1493E+01	.3728E+07	.4683E+02	.3465E+08	.4340E+09
85.0	.4645E+05	.1607E+04	.4345E+02	.1852E+00	.7150E+07	.1696E+01	.3645E+07	.4327E+02	.3430E+08	.4300E+09
90.0	.5210E+05	.1789E+04	.4004E+02	.1738E+00	.7174E+07	.1909E+01	.3563E+07	.3987E+02	.3410E+08	.4200E+09
95.0	.5796E+05	.1992E+04	.3683E+02	.1614E+00	.7192E+07	.2122E+01	.3480E+07	.3667E+02	.3385E+08	.4120E+09
100.0	.6403E+05	.2214E+04	.3385E+02	.1487E+00	.7205E+07	.2328E+01	.3398E+07	.3370E+02	.3360E+08	.4020E+09
105.0	.7028E+05	.2455E+04	.3109E+02	.1374E+00	.7216E+07	.2552E+01	.3315E+07	.3095E+02	.3350E+08	.3950E+09
110.0	.7670E+05	.2716E+04	.2851E+02	.1290E+00	.7223E+07	.2794E+01	.3233E+07	.2838E+02	.3320E+08	.3880E+09
115.0	.8324E+05	.2995E+04	.2610E+02	.1202E+00	.7229E+07	.3054E+01	.3150E+07	.2598E+02	.3310E+08	.3820E+09
120.0	.8965E+05	.3292E+04	.2387E+02	.1096E+00	.7233E+07	.3333E+01	.3068E+07	.2376E+02	.3285E+08	.3720E+09
125.0	.9655E+05	.3608E+04	.2185E+02	.9992E-01	.7236E+07	.3620E+01	.2985E+07	.2175E+02	.3270E+08	.3650E+09
130.0	.1033E+06	.3940E+04	.2001E+02	.9119E-01	.7238E+07	.3916E+01	.2903E+07	.1992E+02	.3240E+08	.3550E+09
135.0	.1101E+06	.4291E+04	.1834E+02	.8357E-01	.7239E+07	.4221E+01	.2820E+07	.1825E+02	.3220E+08	.3480E+09
140.0	.1168E+06	.4659E+04	.1681E+02	.7669E-01	.7241E+07	.4535E+01	.2738E+07	.1673E+02	.3195E+08	.3360E+09
145.0	.1236E+06	.5045E+04	.1542E+02	.7037E-01	.7241E+07	.4859E+01	.2655E+07	.1535E+02	.3180E+08	.3320E+09
150.0	.1302E+06	.5449E+04	.1415E+02	.6457E-01	.7242E+07	.5194E+01	.2573E+07	.1408E+02	.3160E+08	.3260E+09
155.0	.1369E+06	.5872E+04	.1299E+02	.5924E-01	.7242E+07	.5541E+01	.2490E+07	.1293E+02	.3140E+08	.3150E+09
160.0	.1434E+06	.6313E+04	.1195E+02	.5437E-01	.7228E+07	.5906E+01	.2408E+07	.1189E+02	.3115E+08	.3100E+09
165.0	.1499E+06	.6765E+04	.1100E+02	.5031E-01	.6977E+07	.6282E+01	.2327E+07	.1094E+02	.3100E+08	.3000E+09
170.0	.1563E+06	.7219E+04	.1013E+02	.4646E-01	.6736E+07	.6670E+01	.2249E+07	.1008E+02	.3065E+08	.2920E+09
175.0	.1626E+06	.7675E+04	.9339E+01	.4304E-01	.6505E+07	.7086E+01	.2174E+07	.9296E+01	.3045E+08	.2850E+09
180.0	.1688E+06	.8133E+04	.8621E+01	.3995E-01	.6283E+07	.7549E+01	.2101E+07	.8581E+01	.3010E+08	.2800E+09
185.0	.1748E+06	.8594E+04	.7967E+01	.3718E-01	.6070E+07	.8030E+01	.2031E+07	.7929E+01	.2980E+08	.2700E+09
190.0	.1807E+06	.9055E+04	.7371E+01	.3468E-01	.5863E+07	.8528E+01	.1963E+07	.7336E+01	.2955E+08	.2620E+09
195.0	.1864E+06	.9519E+04	.6829E+01	.3242E-01	.5665E+07	.9043E+01	.1898E+07	.6796E+01	.2920E+08	.2680E+09
200.0	.1920E+06	.9984E+04	.6336E+01	.3037E-01	.5473E+07	.9573E+01	.1834E+07	.6305E+01	.2900E+08	.2520E+09
205.0	.1974E+06	.1045E+05	.5888E+01	.2850E-01	.5288E+07	.1012E+02	.1773E+07	.5859E+01	.2870E+08	.2420E+09
210.0	.2076E+06	.1092E+05	.5482E+01	.2680E-01	.5109E+07	.1067E+02	.1714E+07	.5455E+01	.2850E+08	.2360E+09

Table D1. Trajectory Data (concluded)

TIME SEC	IZZ FT-LB	IXZ FT-LB	CLB PER DEG	CNB PER DEG	CYB PER DEG	CLDA PER DEG	XCG FT	ZCG FT	DYN PRESS PSF
0.0	.5400E+09	-.9700E+07	-.7000E-02	.3000E-01	-.2900E-01	.1400E-02	.1759E+03	.3742E+02	0.
5.0	.5300E+09	-.1050E+08	-.7050E-02	.3010E-01	-.2920E-01	.1404E-02	.1760E+03	.3750E+02	.2980E+01
10.0	.5240E+09	-.1070E+08	-.7100E-02	.3070E-01	-.2940E-01	.1407E-02	.1783E+03	.3758E+02	.1262E+02
15.0	.5190E+09	-.1140E+08	-.7200E-02	.3100E-01	-.2950E-01	.1411E-02	.1791E+03	.3767E+02	.2951E+02
20.0	.5090E+09	-.1210E+08	-.7250E-02	.3120E-01	-.2960E-01	.1413E-02	.1796E+03	.3779E+02	.5424E+02
25.0	.5050E+09	-.1240E+08	-.7300E-02	.3150E-01	-.2970E-01	.1415E-02	.1808E+03	.3792E+02	.8698E+02
30.0	.4960E+09	-.1300E+08	-.7400E-02	.3180E-01	-.3000E-01	.1415E-02	.1817E+03	.3800E+02	.1274E+03
35.0	.4830E+09	-.1380E+08	-.7450E-02	.3200E-01	-.3070E-01	.1412E-02	.1825E+03	.3804E+02	.1751E+03
40.0	.4800E+09	-.1400E+08	-.7550E-02	.3260E-01	-.3080E-01	.1405E-02	.1833E+03	.3817E+02	.2295E+03
45.0	.4780E+09	-.1430E+08	-.7700E-02	.3400E-01	-.3200E-01	.1385E-02	.1846E+03	.3825E+02	.2895E+03
50.0	.4620E+09	-.1550E+08	-.8500E-02	.3420E-01	-.3300E-01	.1356E-02	.1847E+03	.3833E+02	.3539E+03
55.0	.4600E+09	-.1580E+08	-.9000E-02	.3600E-01	-.3425E-01	.1340E-02	.1850E+03	.3842E+02	.4204E+03
60.0	.4510E+09	-.1640E+08	-.9510E-02	.3650E-01	-.3590E-01	.1279E-02	.1854E+03	.3850E+02	.4854E+03
65.0	.4420E+09	-.1680E+08	-.1060E-01	.4040E-01	-.3800E-01	.9966E-03	.1867E+03	.3858E+02	.5418E+03
70.0	.4380E+09	-.1720E+08	-.1300E-01	.4150E-01	-.3860E-01	.1124E-02	.1875E+03	.3871E+02	.5858E+03
75.0	.4300E+09	-.1780E+08	-.9070E-02	.3900E-01	-.3650E-01	.1152E-02	.1883E+03	.3883E+02	.6156E+03
80.0	.4220E+09	-.1840E+08	-.8250E-02	.3770E-01	-.3560E-01	.1191E-02	.1891E+03	.3896E+02	.6294E+03
85.0	.4150E+09	-.1880E+08	-.7600E-02	.3620E-01	-.3410E-01	.1615E-02	.1900E+03	.3900E+02	.6225E+03
90.0	.4080E+09	-.1960E+08	-.7000E-02	.3350E-01	-.3300E-01	.1674E-02	.1904E+03	.3925E+02	.5932E+03
95.0	.3970E+09	-.2020E+08	-.6400E-02	.3230E-01	-.3180E-01	.1246E-02	.1929E+03	.3942E+02	.5436E+03
100.0	.3920E+09	-.2080E+08	-.6200E-02	.3130E-01	-.3080E-01	.8289E-03	.1938E+03	.3967E+02	.4822E+03
105.0	.3850E+09	-.2180E+08	-.5950E-02	.2970E-01	-.3000E-01	.6345E-03	.1950E+03	.3983E+02	.4270E+03
110.0	.3780E+09	-.2260E+08	-.5700E-02	.2850E-01	-.2940E-01	.6124E-03	.1958E+03	.4004E+02	.3765E+03
115.0	.3710E+09	-.2290E+08	-.5400E-02	.2720E-01	-.2800E-01	.6272E-03	.1967E+03	.4025E+02	.3310E+03
120.0	.3600E+09	-.2350E+08	-.5255E-02	.2600E-01	-.2730E-01	.5498E-03	.1983E+03	.4042E+02	.2904E+03
125.0	.3520E+09	-.2400E+08	-.5050E-02	.2520E-01	-.2690E-01	.4088E-03	.1988E+03	.4067E+02	.2531E+03
130.0	.3450E+09	-.2470E+08	-.4950E-02	.2450E-01	-.2620E-01	.2467E-03	.1996E+03	.4083E+02	.2196E+03
135.0	.3380E+09	-.2560E+08	-.4800E-02	.2350E-01	-.2580E-01	.1414E-03	.2008E+03	.4108E+02	.1902E+03
140.0	.3280E+09	-.2590E+08	-.4650E-02	.2240E-01	-.2500E-01	.9944E-04	.2020E+03	.4133E+02	.1648E+03
145.0	.3200E+09	-.2660E+08	-.4600E-02	.2170E-01	-.2430E-01	.9649E-04	.2029E+03	.4150E+02	.1429E+03
150.0	.3120E+09	-.2740E+08	-.4350E-02	.2080E-01	-.2380E-01	.1029E-03	.2038E+03	.4167E+02	.1243E+03
155.0	.3040E+09	-.2800E+08	-.4250E-02	.2020E-01	-.2290E-01	.1076E-03	.2050E+03	.4183E+02	.1086E+03
160.0	.2960E+09	-.2880E+08	-.4150E-02	.1980E-01	-.2220E-01	.1071E-03	.2058E+03	.4200E+02	.9535E+02
165.0	.2900E+09	-.2930E+08	-.4000E-02	.1910E-01	-.2190E-01	.1000E-03	.2067E+03	.4233E+02	.8403E+02
170.0	.2800E+09	-.3050E+08	-.3900E-02	.1850E-01	-.2080E-01	.9500E-04	.2088E+03	.4275E+02	.7426E+02
175.0	.2720E+09	-.3130E+08	-.3800E-02	.1800E-01	-.2000E-01	.9500E-04	.2096E+03	.4308E+02	.6611E+02
180.0	.2700E+09	-.3200E+08	-.3750E-02	.1750E-01	-.1980E-01	.9000E-04	.2108E+03	.4342E+02	.5942E+02
185.0	.2610E+09	-.3290E+08	-.3700E-02	.1740E-01	-.1970E-01	.9000E-04	.2125E+03	.4400E+02	.5336E+02
190.0	.2540E+09	-.3400E+08	-.3600E-02	.1700E-01	-.1950E-01	.8000E-04	.2138E+03	.4400E+02	.4787E+02
195.0	.2460E+09	-.3440E+08	-.3550E-02	.1680E-01	-.1940E-01	.6000E-04	.2150E+03	.4458E+02	.4289E+02
200.0	.2420E+09	-.3500E+08	-.3500E-02	.1600E-01	-.1920E-01	.9000E-04	.2158E+03	.4492E+02	.3839E+02
205.0	.2340E+09	-.3560E+08	-.3400E-02	.1580E-01	-.1900E-01	.1000E-03	.2167E+03	.4542E+02	.3431E+02
210.0	.2320E+09	-.3680E+08	-.3300E-02	.1560E-01	-.1870E-01	.9084E-04	.2175E+03	.4567E+02	.3062E+02