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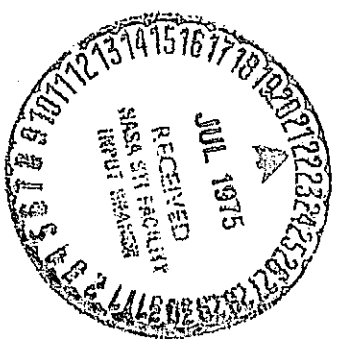

FINAL REPORT

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EFFECT OF DAMPING ON EXCITABILITY OF HIGH-ORDER NORMAL MODES

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ABSTRACT

The effect of localized structural damping on the excitability of higher-order LST spacecraft modes is investigated. A preprocessor computer program is developed to incorporate Voigt structural joint damping models in a NASTRAN finite-element dynamic model. A postprocessor computer program is developed to select critical modes for low-frequency attitude control problems and for higher-frequency fine-stabilization problems. The selection is accomplished by ranking the flexible modes based on coefficients for rate gyro, position gyro, and optical sensor and on image-plane motions due to sinusoidal or random PSD force and torque inputs.

KEY WORDS

finite-element structural model
structural joints
damping
normal modes
attitude control
Large Space Telescope

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1.0 INTRODUCTION

The presence of distributed damping in spacecraft structures may significantly affect the predicted dynamic response of higher-order normal modes. The purpose of this study was to develop and implement a general methodology framework for evaluating the effects of distributed structural damping on spacecraft structures. Identification of potential limitations in the conventional use of uncoupled normal modes for structural dynamic response analyses has resulted from the application of this methodology to the Large Space Telescope control system design.

The methodology is concerned with two general aspects: (1) including distributed damping in a finite-element structural model and (2) selecting critical modes for subsequent dynamic analyses and assessing the effects of modal velocity coupling. The methodology for modeling distributed damping in a NASTRAN structural model is described in Section 2.1. A preprocessor computer program, described in Section 2.1.3 and Appendix II, may be used to generate NASTRAN BULK DATA for modeling distributed structural damping. This computer program was developed for convenience in preparing NASTRAN input, and its use is strictly optional. The methodology for selecting critical modes and assessing modal coupling is described in Section 2.2. A postprocessor computer program, which implements this methodology, is described in Appendix III.

The application of this methodology to the Large Space Telescope (LST) control and fine-stabilization problems is discussed in Section 3.0. The analytical work is performed with the detailed NASTRAN structural model described in Appendix I. Conclusions of the present study and recommendations for further studies are presented in Section 4.0.

Several authors have surveyed the state-of-the-art with respect to material damping and energy dissipation in structural joints[1,2,3,4,5]. Dissipation mechanisms for several types of joints are identified; these include "air pumping" for skin-stringer structures at high frequencies[1], local shear slippage in built-up structures[1,6,7,8], and Coulomb friction for dry lap

joints whose primary motion is parallel to the interface[1,9]. Configuration-related factors which affect structural damping include member stiffness, joint dimensions, fastener spacing, joint interface pressure, and the existence of damping material (oil, viscoelastic films, etc.). Other factors which influence energy dissipation include excitation frequency and amplitude. Structural damping has thus been shown to be a nonlinear function of many factors. Although methods for predicting energy dissipation in some types of structural joints have been proposed, a significant amount of theoretical and experimental work remains to be done to fully understand the mechanisms and dependencies involved. A detailed bibliography of work in the area of structural damping is appended to this report.

2.0 METHODOLOGY DEVELOPMENT

This section describes the methodology developed to treat the two aspects of the subject: structural joint modeling and critical mode selection. Section 2.1 describes methods for defining and incorporating damping and flexibility effects of structural joints in a finite-element model. Section 2.2 describes methods for selecting critical modes for subsequent low-frequency control studies or higher-frequency vibration studies. The methodology was developed specifically for application to the Large Space Telescope (LST).

2.1 STRUCTURAL JOINT MODELING

As indicated in Section 1.0, structural damping is comprised of both material (hysteretic) damping and energy dissipation in structural joints. Material damping may be represented in linear dynamic response analyses by uncoupled modal viscous damping ratios ($\zeta = C/C_c$). Energy dissipation in structural joints, which is a nonlinear function of many parameters, must also be represented by linear models so that linear analysis techniques may be used. Two linear joint models have been used to describe the frequency-dependent effects of distributed joint damping: the Maxwell model and the Voigt model. For a massless structural element and joint supporting a single mass, the Maxwell and Voigt models are essentially equivalent. Since the two-parameter Voigt model is simpler than the three-parameter Maxwell model, the Voigt model is used in the application to the LST control and vibration studies.

2.1.1 Maxwell Joint Model

The three-parameter anelastic model, referred to as the Maxwell model, has been identified in the literature[1,3,4,5,9] as a feasible model for representing hysteretic damping in materials. It is used herein as a general model for representing energy dissipation in structural joints. The Maxwell joint model in series with a structural member is shown schematically in Figure 2-1.

The equations of motion for this single degree-of-freedom arrangement due to

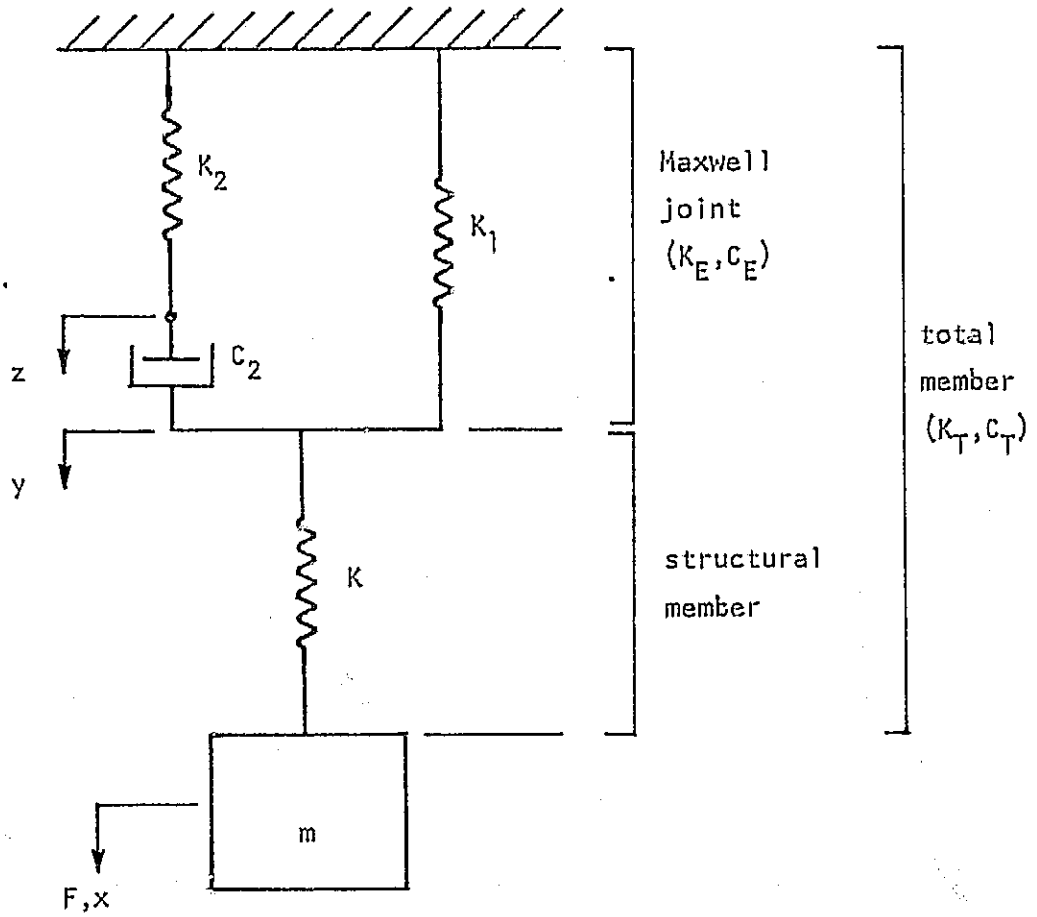


Figure 2-1: Schematic of Single Degree-of-Freedom Maxwell Joint Model

sinusoidal excitation are

$$\begin{bmatrix} m & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \begin{Bmatrix} \ddot{x} \\ \ddot{y} \\ \ddot{z} \end{Bmatrix} + \begin{bmatrix} 0 & 0 & 0 \\ 0 & C_2 & -C_2 \\ 0 & -C_2 & C_2 \end{bmatrix} \begin{Bmatrix} \dot{x} \\ \dot{y} \\ \dot{z} \end{Bmatrix} + \begin{bmatrix} K & -K & 0 \\ -K & K+K_1 & 0 \\ 0 & 0 & K_2 \end{bmatrix} \begin{Bmatrix} x \\ y \\ z \end{Bmatrix} = \begin{Bmatrix} F \\ 0 \\ 0 \end{Bmatrix} \qquad (1)$$

Taking the Laplace transform gives

$$\begin{bmatrix} (ms^2+K) & -K & -C_2 s \\ -K & (C_2 s+K+K_1) & -C_2 s \\ 0 & -C_2 s & C_2 s+K_2 \end{bmatrix} \begin{Bmatrix} x(s) \\ y(s) \\ z(s) \end{Bmatrix} = \begin{Bmatrix} F(s) \\ 0 \\ 0 \end{Bmatrix} \qquad (2)$$

Solving for x(s) and rearranging

$$\left\{ ms^2 + \frac{C_2 s K^2 K_2{}^2}{K_2{}^2(K+K_1)^2 - C_2{}^2 s^2 (K+K_1+K_2)^2} + \frac{KK_1 K_2{}^2 (K+K_1) - C_2{}^2 s^2 [K^2(K_1+K_2) + K(K_1+K_2)^2]}{K_2{}^2(K+K_1)^2 - C_2{}^2 s^2 (K+K_1+K_2)^2} \right\} x(s) = F(s) \qquad (3)$$

For a sinusoidal force at frequency β,

$$s^2 \equiv -\beta^2$$

With this substitution, Equation (3) can be written

$$\left\{ ms^2 + \frac{C_2 K^2 K_2{}^2 s}{K_2{}^2(K+K_1)^2 + C_2{}^2 \beta^2 (K+K_1+K_2)^2} + \frac{KK_1 K_2{}^2 (K+K_1) + C_2{}^2 \beta^2 [K^2(K_1+K_2) + K(K_1+K_2)^2]}{K_2{}^2(K+K_1)^2 + C_2{}^2 \beta^2 (K+K_1+K_2)^2} \right\} x(s) = F(s) \qquad (4)$$

The response equation for the equivalent single degree-of-freedom system is

$$(ms^2 + C_T s + K_T)\, x(s) = F(s) \qquad (5)$$

For the sinusoidal response case, the equivalent damping and stiffness coefficients, C_T and K_T, are functions both of the structural parameters (K, K_1, K_2, C_2) and of the forcing frequency (β):

$$C_T = \frac{C_2 K^2 K_2^2}{K_2^2 (K+K_1)^2 + C_2^2 \beta^2 (K+K_1+K_2)^2} \tag{6}$$

$$K_T = \frac{K K_1 K_2^2 (K+K_1) + C_2^2 \beta^2 [K^2 (K_1+K_2) + K(K_1+K_2)^2]}{K_2^2 (K+K_1)^2 + C_2^2 \beta^2 (K+K_1+K_2)^2} \tag{7}$$

For very low frequencies,

$$C_T(\beta=0) = C_2 \left(\frac{K}{K+K_1} \right)^2 \tag{8}$$

$$K_T(\beta=0) = K_1 \left(\frac{K}{K+K_1} \right) \tag{9}$$

Equation (9) indicates that, at very low frequencies, the total Maxwell joint/member stiffness coefficient is the static stiffness of the series spring arrangement.

For very high frequencies,

$$C_T(\beta=\infty) = 0 \tag{10}$$

$$K_T(\beta=\infty) = \frac{K(K_1+K_2)}{K+K_1+K_2} \tag{11}$$

Equations (10) and (11) indicate that, at very high frequencies, the damper becomes rigid such that the total Maxwell joint/member damping coefficient is zero and the stiffness coefficient is the static stiffness of the series/parallel spring arrangement.

The equivalent damping and stiffness coefficients for the Maxwell unit by itself, without the structural member in series, are obtained by setting the member stiffness (K) to infinity in Equations (6) and (7):

$$C_E = \frac{C_2 K_2^2}{K_2^2 + C_2^2 \beta^2} \tag{12}$$

$$K_E = K_1 + \frac{C_2^2 \beta^2 K_2}{K_2^2 + C_2^2 \beta^2} \tag{13}$$

Examination of these equations reveals the following characteristics of the Maxwell joint model: (1) equivalent damping decreases with increasing frequency, (2) at low frequencies the effective stiffness is approximately equal to K_1, (3) at high frequencies the effective stiffness approaches $K_1 + K_2$. Thus, the effective natural frequency increases and the equivalent damping decreases with increasing forcing frequency.

The effects of Maxwell model parameters on the equivalent stiffness and damping were investigated using Equations (12) and (13) and are shown in Figures 2-2 through 2-4. The damping element (C_2) becomes more effective as the stiffness of the series spring (K_2) is increased. Equivalent viscous damping (ζ_{eq}), however, possesses a maximum as C_2 is increased for given values of K_1 and K_2. Resonant frequency, hence stiffness, also has a maximum value with respect to the ratio of K_2 to K_1 for given values of C_2. Therefore, by varying the three Maxwell model parameters, a wide range of joint transmissibility and damping characteristics can be obtained.

The equivalent joint stiffness and damping coefficients can be written in terms of the Maxwell loss coefficient (η_2) which is the ratio of damping energy to strain energy for the Maxwell unit at a frequency β:

$$\eta_2 = \frac{C_2 \beta}{K_2} \tag{14}$$

$$C_E = \frac{C_2}{1 + \eta_2^2} \tag{15}$$

$$K_E = K_1 + K_2 \frac{\eta_2^2}{1 + \eta_2^2} \tag{16}$$

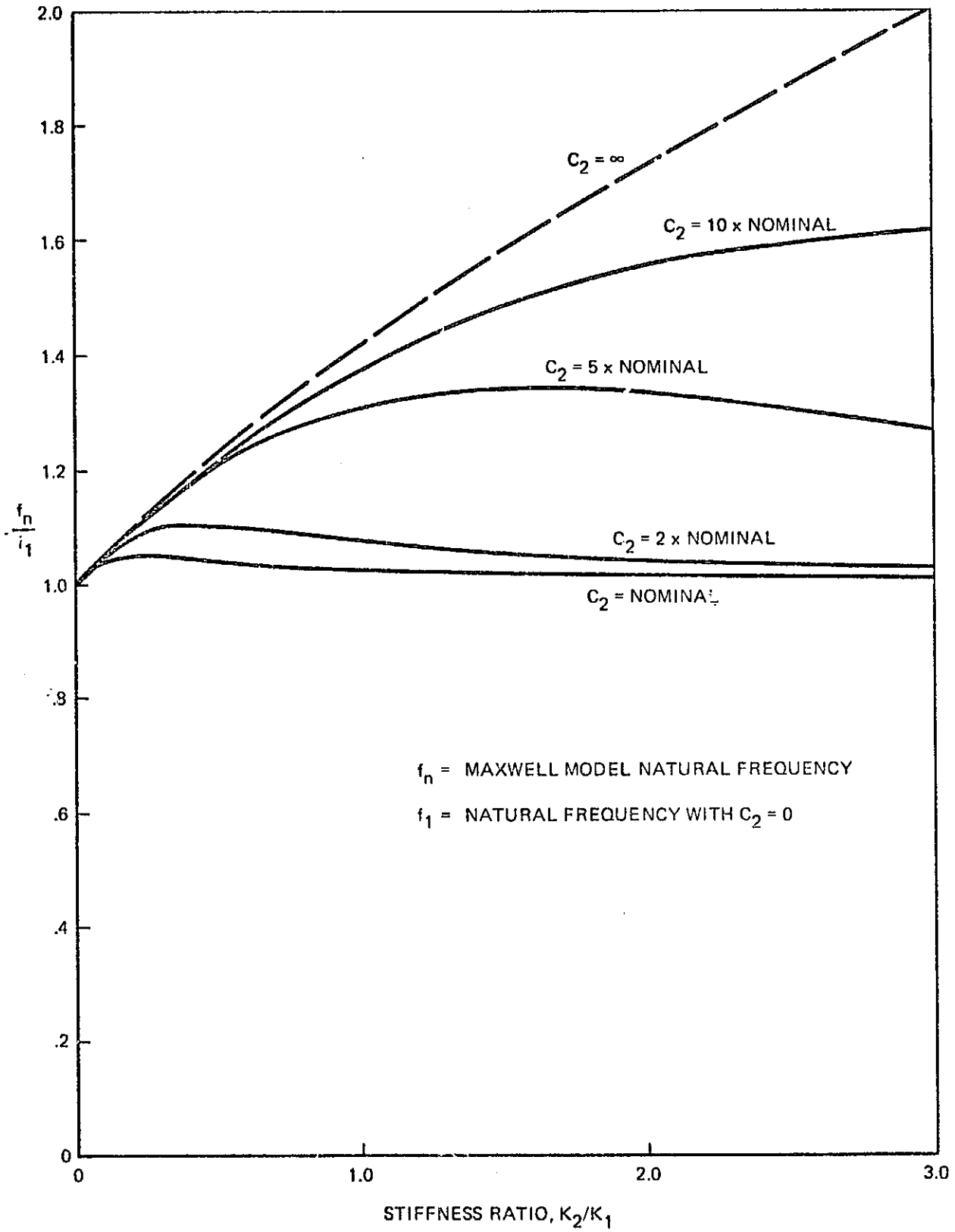


Figure 2-2: Maxwell Model Natural Frequency vs. Stiffness Ratio

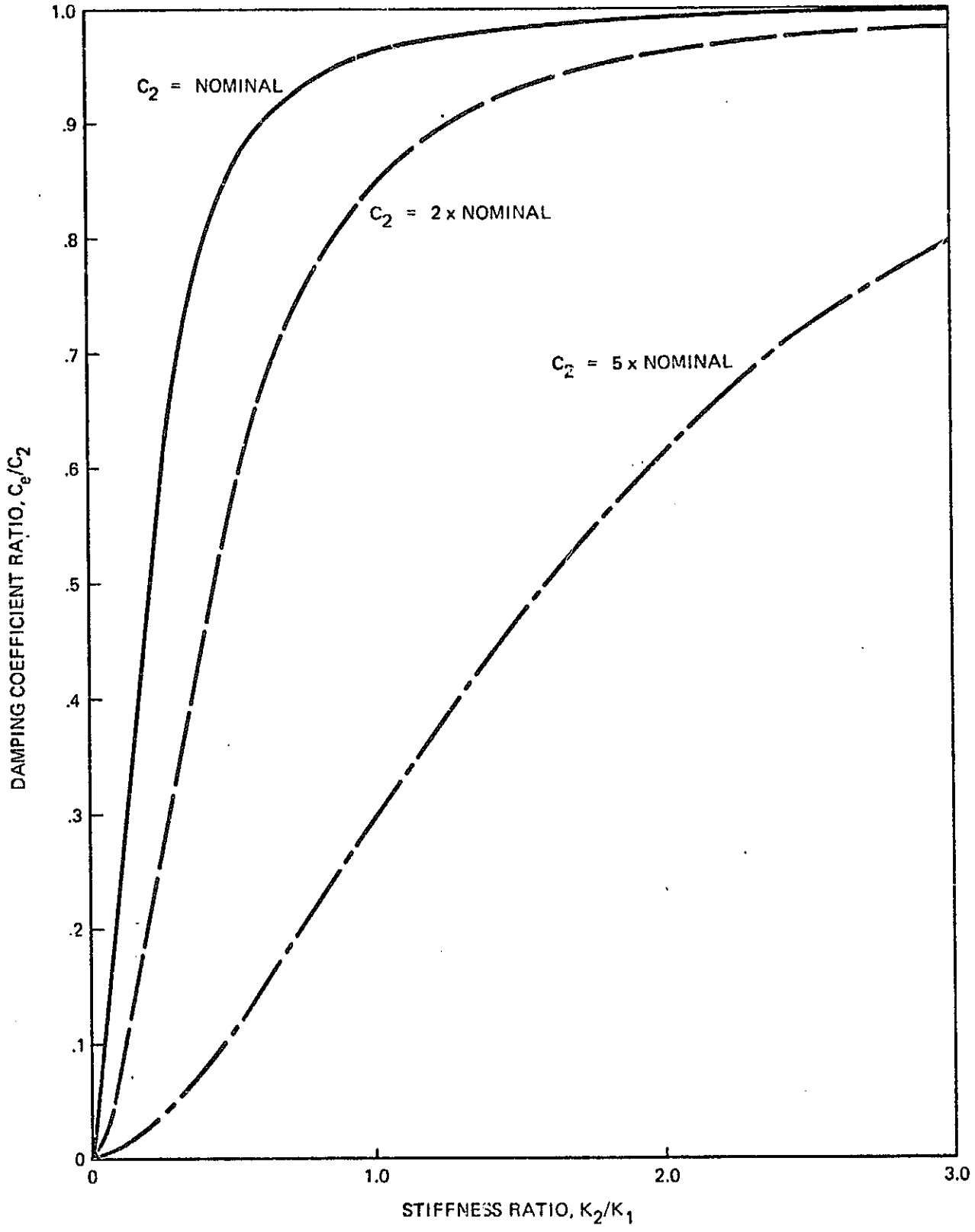


Figure 2-3: *Maxwell Model Equivalent Damping vs. Stiffness Ratio*

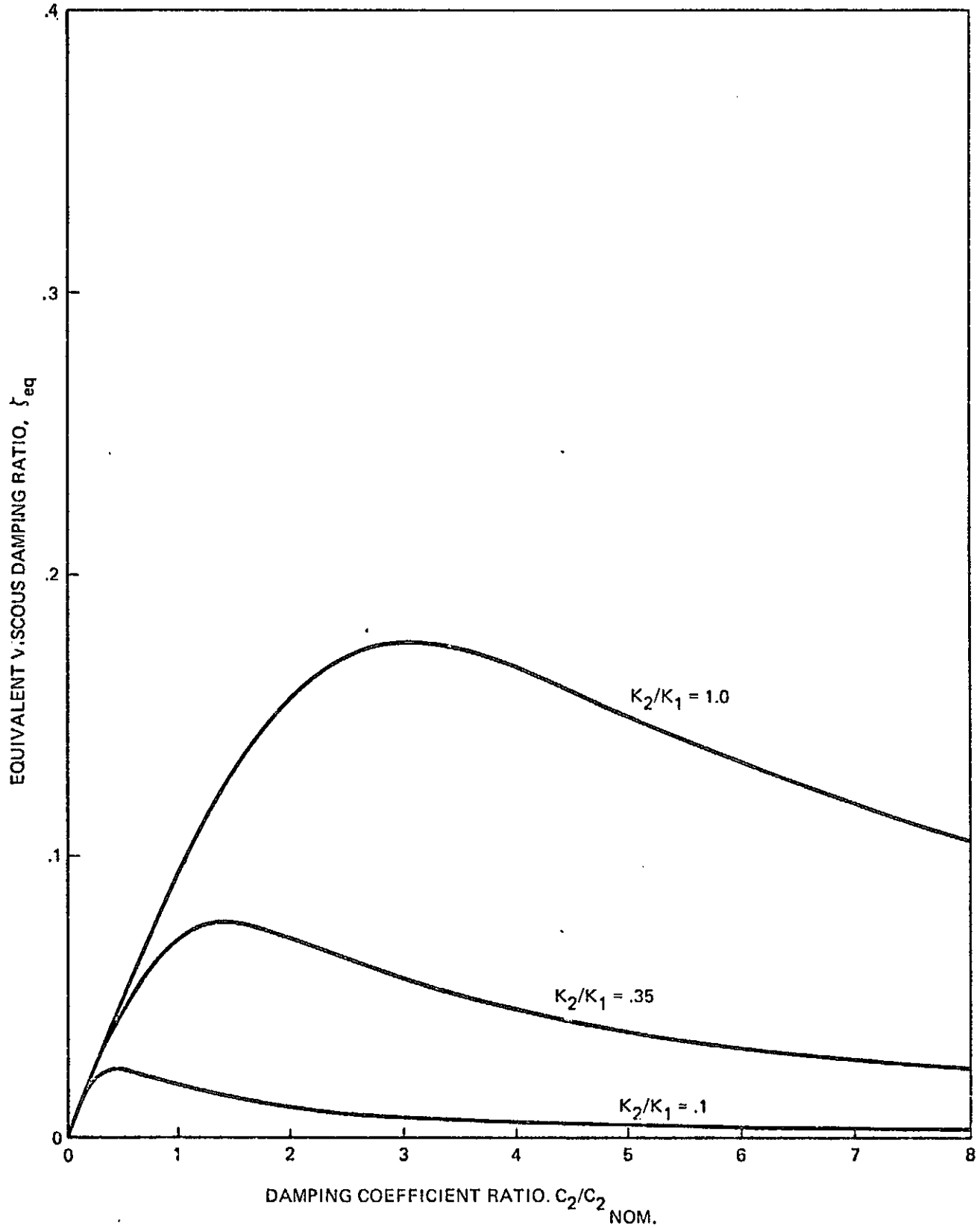


Figure 2-4: Maxwell Model Equivalent Viscous Dampihg vs. Damping Coefficient Ratio

The joint loss coefficient can also be written in terms of the Maxwell loss coefficient as follows:

$$\eta_E = \frac{C_E \beta}{K_E} = \frac{\eta_2}{\frac{K_1}{K_2} + \eta_2^2 \left(1 + \frac{K_1}{K_2}\right)} \tag{17}$$

From Equations (6) and (7), the loss coefficient for the total Maxwell joint/member assembly can also be expressed in terms of the Maxwell loss coefficient (η_2) as follows:

$$\eta_T = \frac{C_T \beta}{K_T} = \frac{K K_2 \eta_2}{(K_1+K_2)(K+K_1+K_2)\eta_2^2 + K_1(K+K_1)} \tag{18}$$

Figure 2-5 shows representative curves of η_E and η_T vs. η_2 for $K=K_2=K_1/10$.

2.1.2 Voigt Joint Model

The two-parameter Voigt unit, shown schematically in Figure 2-6, consists of a spring in parallel with a viscous damper. It is the simplest complex-notation model and possesses hysteretic properties characteristic of damping in materials and structural joints. For sinusoidal excitation, the equivalent damping and stiffness coefficients for the Voigt model, in series with a spring, C_T and K_T, are functions both of the structural parameters (K, K_j, C) and of the forcing frequency (β):

$$C_T = \frac{C K^2}{(K+K_j)^2 + C^2\beta^2} \tag{19}$$

$$K_T = \frac{K K_j (K+K_j) + C^2\beta^2 K}{(K+K_j)^2 + C^2\beta^2} \tag{20}$$

These coefficients may be determined from the more general expressions for the Maxwell model by setting the damper spring stiffness (K_2) to infinity in Equations (6) and (7) and by making the appropriate notation changes.

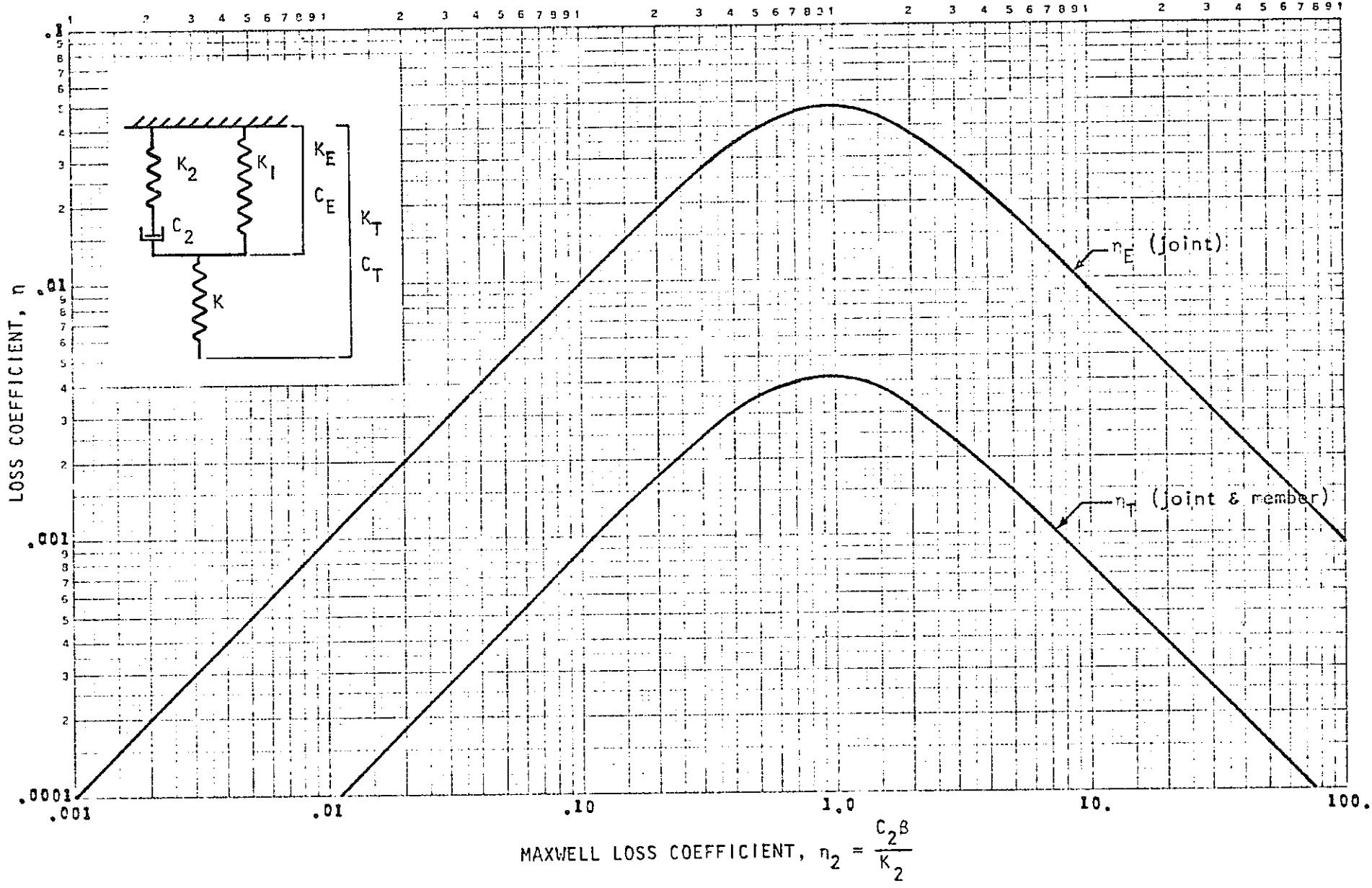


Figure 2-5: Joint and Total Loss Coefficients, Maxwell Joint Model

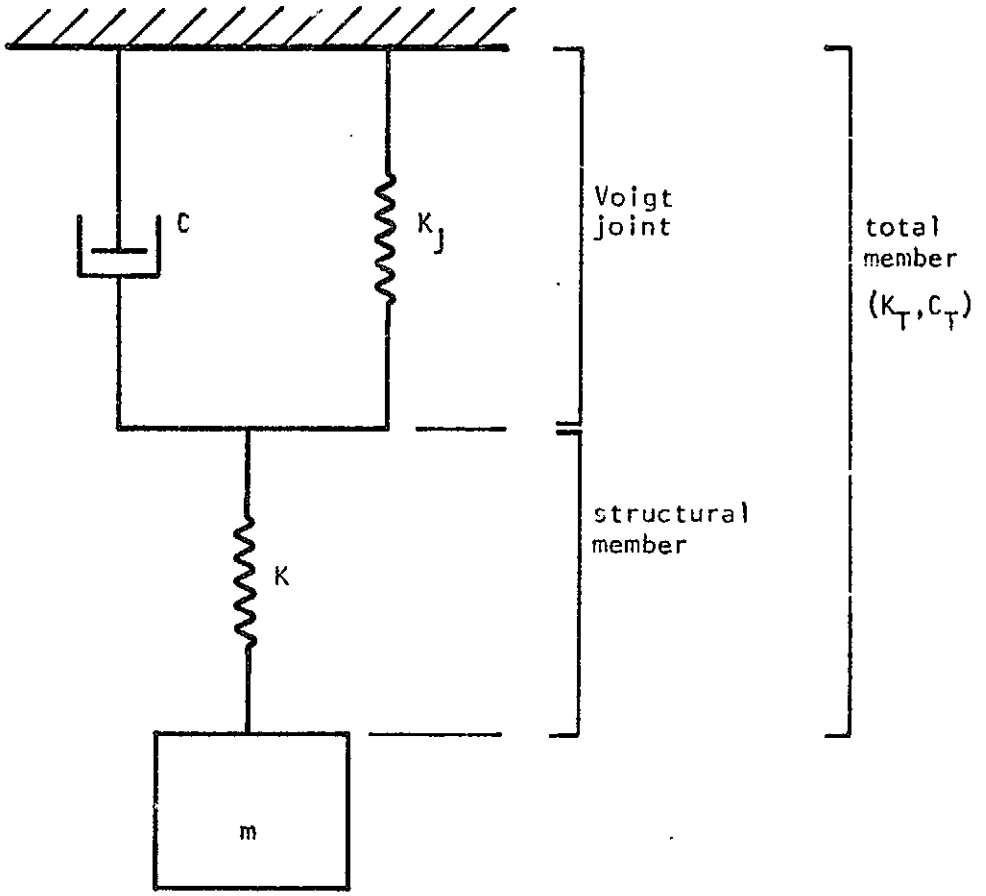


Figure 2-6: Schematic of Single Degree-of-Freedom Voigt Joint Model

For very low frequencies,

$$C_T(\beta=0) = C \left(\frac{K}{K+K_j} \right)^2 \tag{21}$$

$$K_T(\beta=0) = K_j \left(\frac{K}{K+K_j} \right) \tag{22}$$

Equations (21) and (22) are identical to Equations (8) and (9) for the corresponding Maxwell assembly. The total Voigt joint/member stiffness coefficient is again equal to the static stiffness of the series spring arrangement.

For very high frequencies,

$$C_T(\beta=\infty) = 0 \tag{23}$$

$$K_T(\beta=\infty) = K \tag{24}$$

Equations (23) and (24), like Equations (10) and (11) for the Maxwell assembly, indicate that at very high frequencies the damper becomes rigid.

Equations (19) and (20) can be rewritten in terms of the Voigt loss coefficient (η_j) which is the ratio of damping energy to strain energy:

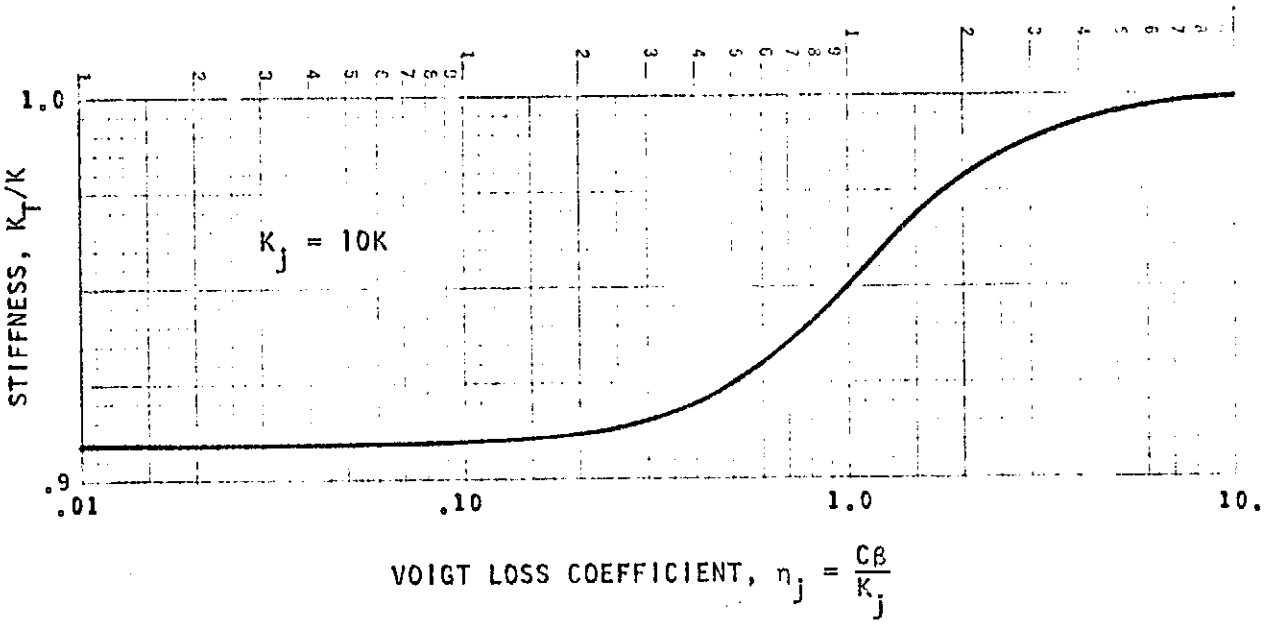
$$C_T = C \left[\frac{K/K_j}{\eta_j^2 + (K/K_j + 1)^2} \right] \tag{25}$$

$$K_T = K \left[\frac{\eta_j^2 + (K/K_j + 1)}{\eta_j^2 + (K/K_j + 1)^2} \right] \tag{26}$$

where $\eta_j = \frac{C\beta}{K_j}$.

Typical curves of C_T and K_T vs. loss coefficient (η_j) are shown in Figure 2-7 for $K_j = 10\ K$.

The total loss coefficient (η_T) for the Voigt joint/member assembly is:



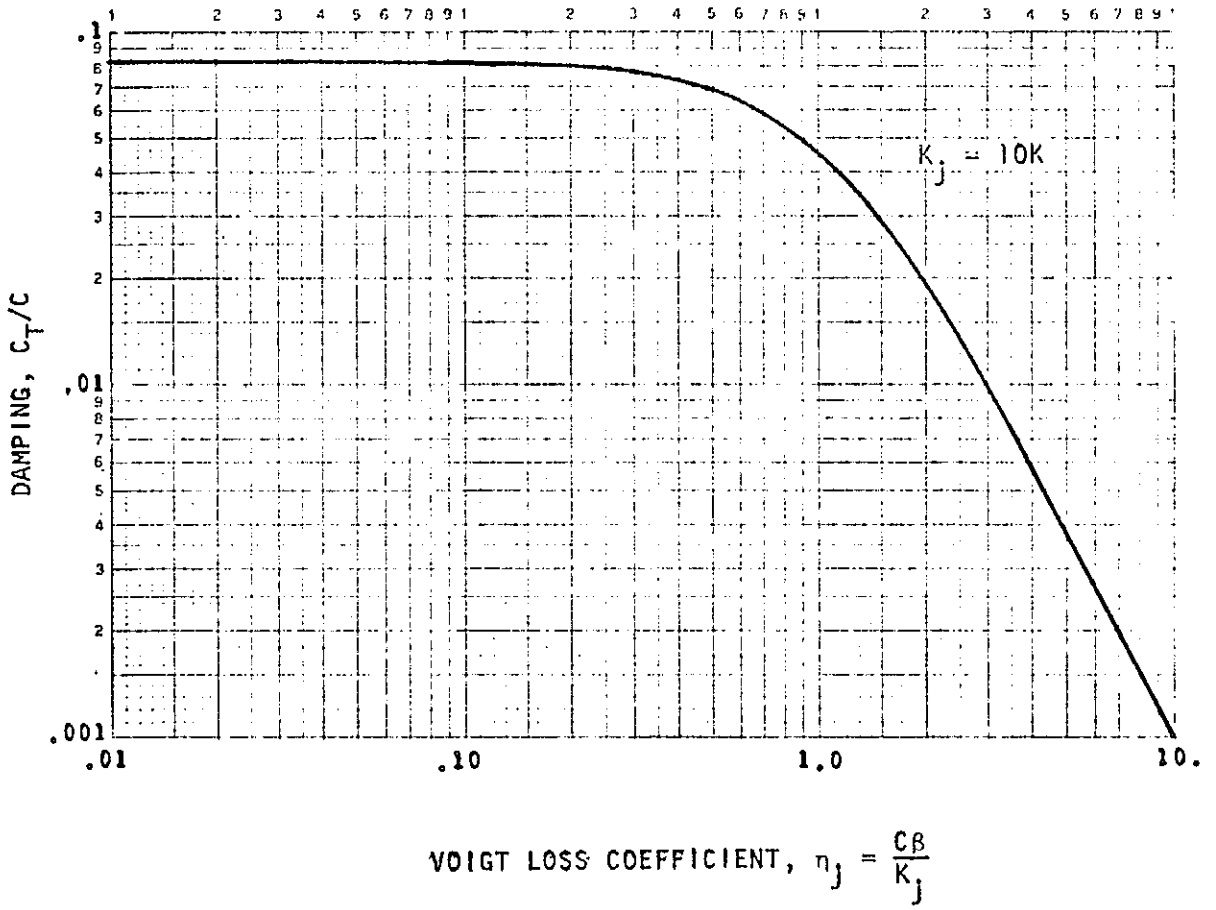


Figure 2-7: Typical Voigt Joint Stiffness and Damping Characteristics

$$\eta_T = \frac{C_T \beta}{K_T} = \frac{(K/K_j)\ \eta_j}{\eta_j^2 + (K/K_j + 1)} \qquad (28)$$

Typical curves of total loss coefficient vs. joint loss coefficient are shown in Figure 2-8 for several stiffness ratios. The similarity between these curves and those for the Maxwell assembly (Figure 2-5) is readily apparent. Since the Voigt joint model and the Maxwell joint model are essentially equivalent, the simpler Voigt model is used for idealizing the transmissibility of LST structural joints.

2.1.3 Preprocessor Procedures

This section describes the preprocessor computer program and the procedures used to add structural joint models to a NASTRAN finite-element structural model. The preprocessor modifies the input data for a conventional finite-element structural model and generates additional inputs necessary to incorporate the Voigt joint damping model at the ends of specified BAR or ROD elements. The damping characteristics of the joints are modeled with the NASTRAN linear viscous damping element (VISC). The preprocessor is presently limited to incorporating joint damping at the ends of BAR and ROD elements defined in a rectangular coordinate system. However, its capability could be extended to incorporate joint damping models at the interfaces between other types of elements defined in cylindrical coordinate systems. A detailed description of the input and output features of the preprocessor is presented in Appendix II.

Schematics of NASTRAN BAR and ROD elements with joint damping models included at one end are shown in Figure 2-9. The original element lies between gridpoints a and b. When the user requests a joint damping model to be included at gridpoint a, the preprocessor establishes the model as follows:

a. Gridpoint c is introduced on the BAR (ROD) axis at a specified distance from gridpoint a.

b. Properties of the BAR (ROD) between gridpoints a and c are altered as specified, either by direct input or by default values, to provide desired stiffness characteristics.

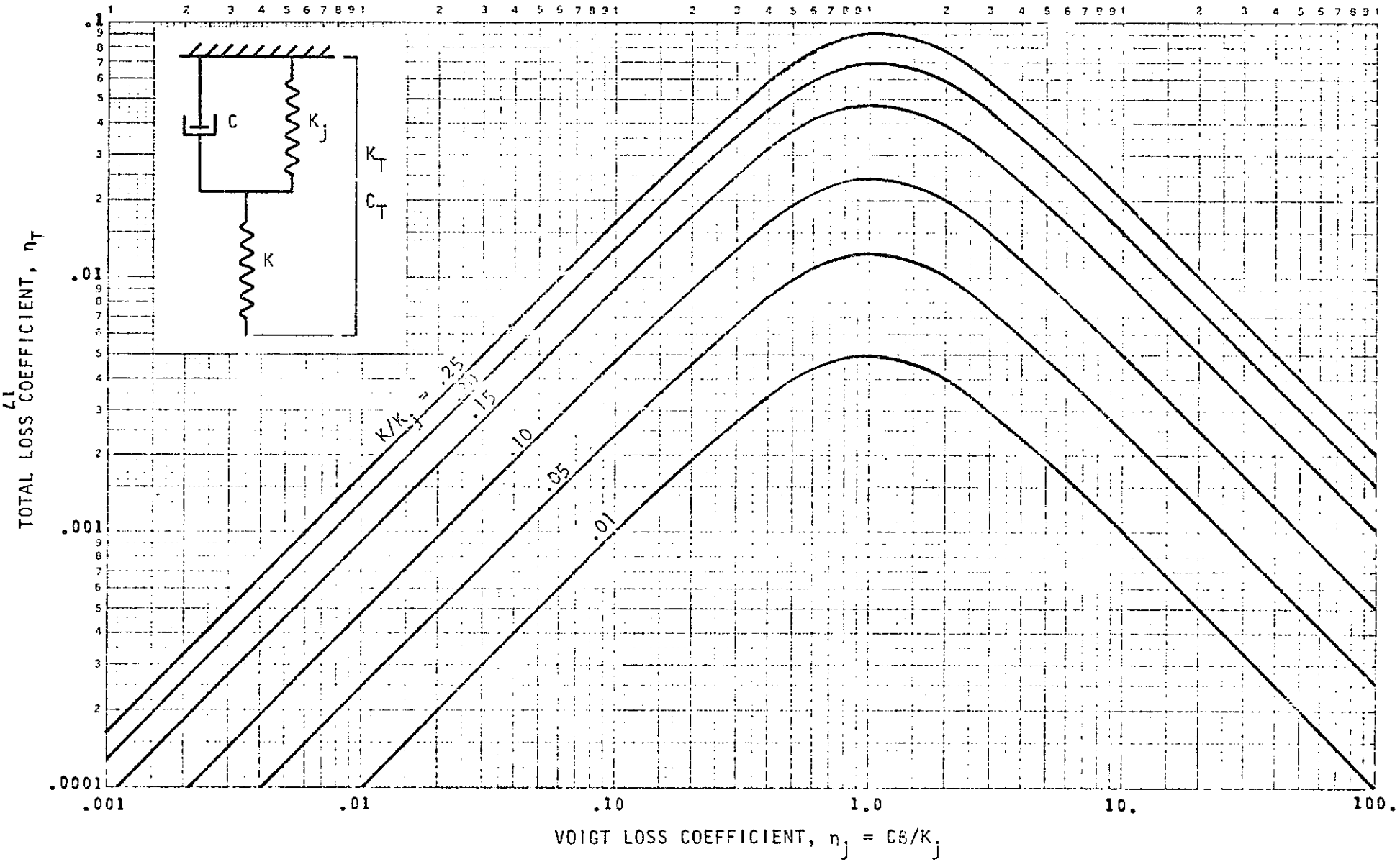
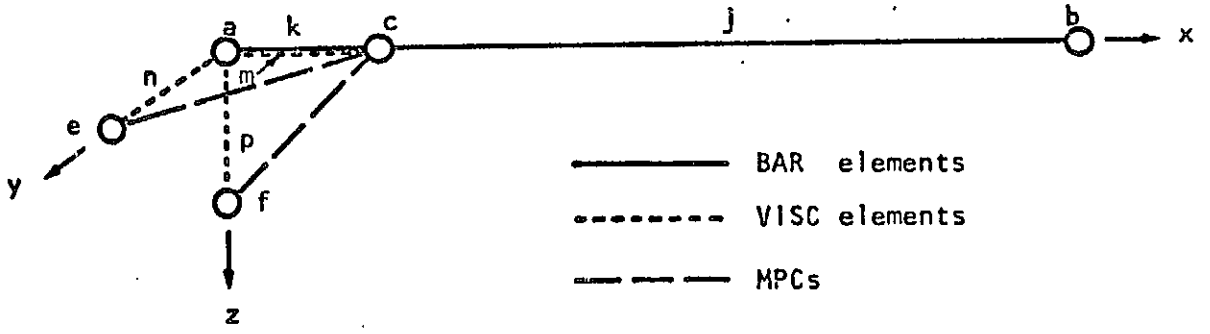
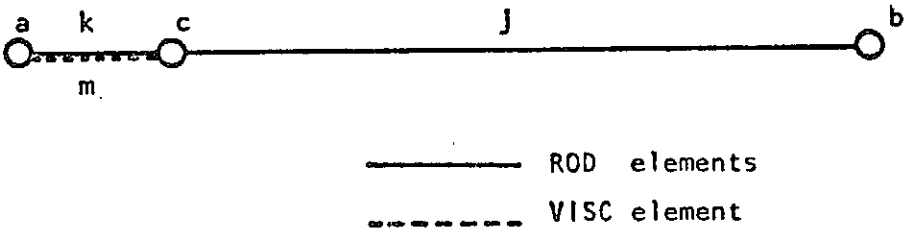


Figure 2-8: Total Loss Coefficient, Voigt Joint Model



a) BAR Joint Schematic



b) ROD Joint Schematic

Figure 2-9: NASTRAN Joint Damping Model Schematics

c. For a BAR element, gridpoints e and f are established such that gridpoints a, b, e and f form an orthogonal axis system at gridpoint a. Gridpoint e is in plane 1 of the BAR element, and gridpoint f is in plane 2. The distances from gridpoint a to gridpoints c, e and f are identical.

d. Viscous damping (VISC) elements (m, n and p) with desired properties are inserted between gridpoints a and c, a and e, and a and f for a BAR element and between a and c only for a ROD element. The VISC elements used with BAR and ROD elements may have translational damping components, in addition to the rotational components, only when the VISC element axis is aligned with an axis of the displacement coordinate system.

e. For a BAR element, gridpoints e and f are multipoint constrained to gridpoint c.

The VISC element provides damping along its axis and in torsion about its axis. Therefore, for a BAR element, three VISC elements are required at each gridpoint to provide damping of all six degrees of freedom. The locations of gridpoints e and f in Figure 2-9(a) are calculated, in the rectangular coordinate system, by vector analysis. $\overline{V}_b$ and $\overline{V}_R$ are defined as position vectors from gridpoint a to gridpoint b and from gridpoint a to the BAR orientation gridpoint, respectively. The components of $\overline{V}_b$, for example, are

$$\begin{Bmatrix} V_{b1} \\ V_{b2} \\ V_{b3} \end{Bmatrix} = \begin{Bmatrix} x_b \\ y_b \\ z_b \end{Bmatrix} - \begin{Bmatrix} x_a \\ y_a \\ z_a \end{Bmatrix} \tag{29}$$

The vector from gridpoint a in the direction of gridpoint f is calculated as the vector cross product

$$\overline{V}_{f_o} = \overline{V}_b \times \overline{V}_R \tag{30}$$

This results in a vector which is perpendicular to plane 1 of the original

BAR element. The vector from gridpoint a to gridpoint f ($\overline{V}_f$) is normalized such that its magnitude is the same as the magnitude of the vector from a to c ($|\overline{V}_c|$).

$$\overline{V}_f = \overline{V}_{f_o} (|\overline{V}_c| / |\overline{V}_{f_o}|) \tag{31}$$

The location of gridpoint f is then calculated by

$$\begin{Bmatrix} x_f \\ y_f \\ z_f \end{Bmatrix} = \begin{Bmatrix} x_a \\ y_a \\ z_a \end{Bmatrix} + \begin{Bmatrix} V_{f1} \\ V_{f2} \\ V_{f3} \end{Bmatrix} \tag{32}$$

The vector from gridpoint a in the direction of gridpoint e is calculated using the cross product of $\overline{V}_f$ and $\overline{V}_b$.

$$\overline{V}_{e_o} = \overline{V}_f \times \overline{V}_b \tag{33}$$

The vector from gridpoint a to gridpoint e ($\overline{V}_e$) is also normalized such that its magnitude is the same as the magnitude of the vector from a to c.

$$\overline{V}_e = \overline{V}_{e_o} (|\overline{V}_c| / |\overline{V}_{e_o}|) \tag{34}$$

The location of gridpoint e is then calculated by

$$\begin{Bmatrix} x_e \\ y_e \\ z_e \end{Bmatrix} = \begin{Bmatrix} x_a \\ y_a \\ z_a \end{Bmatrix} + \begin{Bmatrix} V_{e1} \\ V_{e2} \\ V_{e3} \end{Bmatrix} \tag{35}$$

Default values are automatically specified by the preprocessor for the NASTRAN data describing the structural joints. The default value specifying joint length results in a joint member whose length is ten percent of the original element length. The default values specifying joint member area, moments of inertia, and torsional constant are calculated to give a ten percent reduction in axial, bending, and torsional stiffnesses for a cantilever beam.

This stiffness reduction results in a five percent reduction in the first resonant frequency for a massless cantilever beam with a concentrated mass at the tip. The five-percent frequency reduction is consistent with the lower values measured from actual hardware compared with values predicted from standard finite-element analysis techniques.

The default values for joint cross-sectional area and torsional constant are obtained from the expression for total stiffness of two springs in series:

$$K_T = \frac{K\,K_j}{K+K_j} = \frac{\alpha\,K_o}{\lambda+\alpha(1-\lambda)} \tag{36}$$

where K_o is the original member stiffness

$K = K_o/(1-\lambda)$ is the revised member stiffness

$K_j = \alpha K_o/\lambda$ is the joint stiffness

λ is the ratio of joint length to original member length

α is the ratio of joint area or torsional constant to that of the original member

Solving Equation (36) for α,

$$\alpha = \frac{\lambda}{K_o/K_T - (1-\lambda)} \tag{37}$$

For the ten percent stiffness reduction with the joint length factor (λ) equal to 0.1, the joint factor (α) for cross-sectional area and torsional constant is obtained from Equation (37) as 0.47.

The default values for joint moments of inertia are obtained from the expression for total tip deflection of a cantilever beam due to a unit end load:

$$\delta = \frac{1}{K_T} = \frac{(1-\lambda)^3 \ell_o^3}{3E\,I_o} + \frac{(\lambda\ell_o)^3}{3E\alpha I_o} + \frac{\lambda^2(1-\lambda)\ell_o^3}{E\alpha I_o} + \frac{\lambda(1-\lambda)^2\ell_o^3}{E\alpha I_o} \tag{38}$$

where ℓ_o is the original member length

I_o is the original moment of inertia

λ is the ratio of joint length to original member length

α is the ratio of joint moment of inertia to that of the original member.

Substituting $K_o = 3EI_o/\ell_o^3$ into Equation (38) and solving for α,

$$\alpha = \frac{1 - (1-\lambda)^3}{K_o/K_T - (1-\lambda)^3} \tag{39}$$

For the ten percent stiffness reduction with the joint length factor (λ) equal to 0.1, the joint factor (α) for moments of inertia is obtained from Equation (39) as 0.71. Typical curves of α vs. K_o/K_T for several values of λ are shown in Figure 2-10.

The VISC elements and parameters chosen to define the joint damping characteristics must result in a physical damping matrix which satisfies kinematic compatibility. The compatibility relations for the damping matrix are represented by

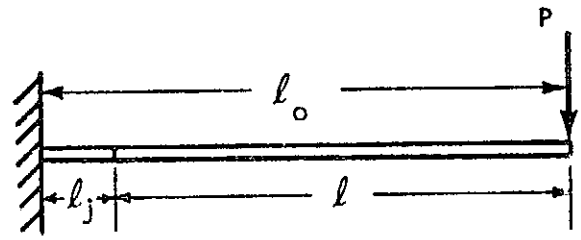
$$[BGG]\{\phi_R\} = \{0\} \tag{40}$$

where [BGG] is the NASTRAN viscous damping matrix in physical coordinates, and $\{\phi_R\}$ is an arbitrary vector of rigid-body translations and rotations. Equation (40) ensures that no damping forces are generated by rigid-body motions. With regard to kinematic compatibility, the NASTRAN VISC damping element is limited to two applications:

a. With translational damping, the compatibility relations are satisfied only when the axis of the VISC element is aligned with an axis of the displacement coordinate system.

b. Without translational damping, the compatibility relations involving only rotational damping are satisfied for any orientation of the VISC element.

For the general case of an arbitrarily oriented element having both translational and rotational damping components, the present NASTRAN VISC element



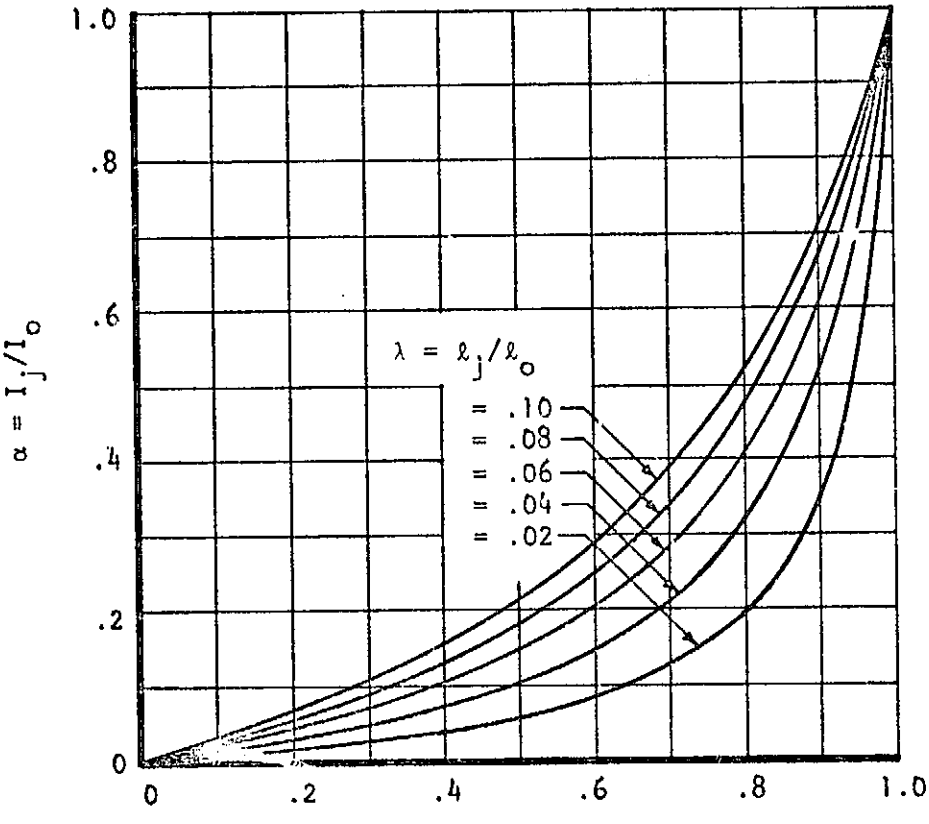


Figure 2-10: Joint Factor vs. Stiffness Ratio for a Cantilever Beam

does not provide the translation/rotation damping coupling terms required by Equation (40).

2.2 MODE SELECTION

Critical mode selection is accomplished by the postprocessor computer program using structural dynamic characteristics, including the coupled modal damping matrix, obtained from the NASTRAN restart tape. The NASTRAN calculation of the modal damping matrix is accomplished with DMAP ALTER statements in the NASTRAN EXECUTIVE CONTROL deck. The postprocessor has two major options. It will select critical modes for (1) low-frequency control problems involving sinusoidal analysis and (2) higher-frequency fine-stabilization problems involving either sinusoidal or random vibration analysis. The methodology determines the critical normal modes in the low-frequency control range by comparing control-system coefficients associated with optical sensors as well as with rate and position gyro sensors. In the higher-frequency fine-stabilization range, the methodology determines the critical normal modes by estimating the image-plane motion due to specified sinusoidal or random power spectral density (PSD) force and torque inputs. These calculations for ranking the modes use only the diagonal terms of the coupled modal damping matrix. The significance of the damping coupling terms is evaluated by numerically considering both the relative magnitudes of the damping terms and the proximity of the modal frequencies corresponding to the off-diagonal and diagonal terms. The methodology for assessing the significance of modal velocity coupling is discussed in Section 2.2.3. The capability to convert between different systems of units is also available; the postprocessor input may be provided in the ISS (inch-slinch-second) or FSS (foot-slug-second) system and the output can be converted to the FSS or MKS (meter-kilogram-second) system. A detailed description of the input and output features of the postprocessor is presented in Appendix III.

2.2.1 Low-Frequency Control Problem

The postprocessor reads the following structural dynamic characteristics from the NASTRAN checkpoint/ estart tape:

$[\phi]$ the matrix of mode shapes for selected modes and freedoms

$\{M\}$ the matrix of generalized masses for selected modes

$[D]$ the matrix of generalized coupled modal damping terms for selected modes

$\{\omega\}$ the matrix of modal frequencies for selected modes

The optical amplification matrix, $[B_o]$, and grid I.D.'s of image train components are input to the postprocessor by punched cards.

The coupled model damping matrix is calculated by applying the modal transformation to the viscous damping matrix [BGG] generated by NASTRAN in physical coordinates

$$[D] = [\phi]^T [BGG] [\phi] = [BHH] \tag{41}$$

Equivalent modal viscous damping(ζ_i) is calculated from the coupled modal damping matrix as follows:

$$\zeta_i = \frac{D_{ii}}{2\,\omega_i\,M_i} \tag{42}$$

Rate or position coefficients for each requested mode are calculated for the selected freedoms and image plane motions as follows:

$$R(3014,\ 3024)_j = \frac{\phi_{3014,j}\ \phi_{3024,j}}{(2\zeta_j)\ \omega_j\ M_j} \tag{43}$$

$$P(3014,\ 3022)_j = \frac{\phi_{3014,j}\ \phi_{3022,j}}{(2\zeta_j)\ \omega_j^2\ M_j} \tag{44}$$

$$P(3014,\ \ \ )_j = [B_o]\ \{\phi_j^B\}\ \frac{\phi_{3014,j}}{(2\zeta_j)\ \omega_j^2\ M_j} \tag{45}$$

where R and P denote rate and position coefficients, respectively. Gridpoint freedoms for the input point and response point are specified in parentheses. The last digit of each I.D. is the input or output freedom specified at the

gridpoint indicated by the preceding digits. For example, $P(3014,\ 3022)_j$ requests a position coefficient to be calculated for the j^{th} mode at gridpoint 302 in the freedom 2(y) direction due to a unit sinusoidal force (torque) at gridpoint 301 in the freedom 4 (θ_x) direction. The three-component vector of displacement response at the image plane due to a unit sinusoidal torque at gridpoint 301 in the freedom 4 (θ_x) direction is calculated as shown in Equation (45). Position and rate coefficients for all selected modes are ranked and listed along with their mode numbers and frequencies.

2.2.2 Higher-Frequency Fine-Stabilization Problem

As in the low-frequency control problem, the structural dynamic characteristics $[\phi]$, $\{M\}$, $[D]$ and $\{\omega\}$ for selected modes and freedoms are read from the NASTRAN checkpoint/restart tape, and the optical amplification matrix $[B_o]$ and grid I.D.'s of the image train components are input by cards. Equivalent modal viscous damping coefficients are calculated using Equation (42).

The inputs which are unique to this option are tables of sinusoidal peak or PSD force and torque levels vs. frequency which are used in the sinusoidal or random analyses, respectively. Since the phase relationships among the sinusoidal force and torque inputs are not well defined, the generalized force for the j^{th} mode is represented by

$$F_j = \max(|\phi^F_{ji}| * F_i) \tag{46}$$

where ϕ^F_{ji} is the j^{th} mode shape at the i^{th} forced freedom
F_i is the peak force (or torque) of the i^{th} forced freedom at the j^{th} mode frequency

The modal displacement at resonance for the j^{th} mode is

$$q_j = \frac{F_j}{2\zeta_j \cdot \omega_j^2 \cdot M_j} \tag{47}$$

Physical displacements for the j^{th} mode are

$$\{x_B\}_j = \{\phi_j^B\}\, q_j \tag{48}$$

where $\{\phi_j^B\}$ is the j^{th} mode shape vector at the response freedoms corresponding to the optic train components.

Physical displacements of the image at the focal plane for the j^{th} mode are

$$\{x_I\}_j = [B_o]\, \{x_B\}_j \tag{49}$$

The optical amplification matrix, $[B_o]$, describes three translations of the image plane in terms of physical translations and rotations of the image train components.

For random force (or torque) inputs, the RMS modal displacements for the j^{th} mode are

$$(q_j)_{RMS} = \frac{1}{2\zeta_j \cdot \omega_j^2 \cdot M_j} [\pi f_j S_j \zeta_j]^{\frac{1}{2}}$$

where

$$S_j = \{\phi_j^F\}^T [S_F(f_j)] \{\phi_j^F\} = \sum_i (\phi_{ij}^F)^2 \cdot S_{Fi}(f_j) \tag{51}$$

and

$S_{Fi}(f_j)$ is the input force (torque) power spectrum at the i^{th} input freedom for frequency f_j

The individual input force PSD's, defined with frequency (f) in Hz, are assumed approximately constant within $\pm 20\zeta_j f_j$ of the j^{th} modal frequency. This frequency band accounts for approximately 98 percent of the RMS modal displacement for a constant PSD. No cross-spectra are assumed so that $[S_F(f_j)]$ is a diagonal matrix constructed, for each frequency, from one value of force PSD and one value of torque PSD.

Equations (48) and (49) are then used to calculate RMS values of physical displacements (x_B) and displacements of the image at the focal plane (x_I) for each mode. These calculated RMS displacements are ranked and listed along with their mode numbers and frequencies.

2.2.3 Assessment of Modal Coupling

For a set of applied force freedoms (m), the degree of modal velocity coupling is assessed by first identifying, for each mode (i), all other modes (j) which potentially couple with it. This is accomplished by comparing modal damping coupling terms and modal frequencies. Potential coupling exists if

$$\left| \frac{D_{ij}}{D_{ii}} \right| > \alpha_1 \tag{52}$$

and if

$$1 - \alpha_2 \zeta_j < \frac{\omega_i}{\omega_j} < 1 + \alpha_2 \zeta_j \tag{53}$$

where α_1 and α_2 are constants used to specify the degree of coupling for the screening process.

Responses from the modal position transfer matrix for each mode (i) are then calculated and compared for all sets of modes having potentially significant modal coupling.

$$[PT_m(\omega_i)] = \{[(\omega_k^2 - \omega_i^2)\, M_{kk}] + J\, \omega_i [D]\}^{-1} \tag{54}$$

$$= ([A] + J[B])^{-1} = ([C] + J[D])$$

where $J = \sqrt{-1}$, and k denotes all modes which potentially couple with mode i (including mode i), and

$$[A] = [(\omega_k^2 - \omega_i^2) M_{kk}] \tag{55}$$

$$[B] = \omega_i [D] \tag{56}$$

$$[D] = -([B] + [A][B]^{-1}[A])^{-1} \tag{57}$$

$$[C] = -[D][A][B]^{-1} \tag{58}$$

The principal rows, corresponding to i=k, from matrices [C] and [D] are output for possible use in subsequent analyses.

Assuming unit applied forces at selected gridpoints, the coupled response of mode i at frequency ω_i is:

$$q_i' = [(\sum_{k=1}^{n} C_{ik} F_k)^2 + (\sum_{k=1}^{n} D_{ik} F_k)^2]^{\frac{1}{2}} \tag{59}$$

where

$$F_k = \sum_{\ell=1}^{m} |\phi_{k\ell}| \quad \text{for m applied force and torque degrees of freedom.}$$

The uncoupled response of mode i at frequency ω_i is

$$q_i = \frac{F_i}{B_{ii}} \tag{60}$$

To assess the importance of modal coupling, the ratio of coupled response to uncoupled response is calculated and output for all modes which were selected as having potentially significant coupling.

$$R_i = \frac{q_i'}{q_i} = \frac{B_{ii}}{F_i} [(\sum_{k=1}^{n} C_{ik} F_k)^2 + (\sum_{k=1}^{n} D_{ik} F_k)^2]^{\frac{1}{2}} \tag{61}$$

Assessment ratios are output as zero for a given mode when no other modes satisfy the inequalities of Equations (52) and (53).

3.0 APPLICATION TO LST CONTROL SYSTEM DESIGN

The application of the preprocessor and postprocessor methodology to the design of the LST control system provides an assessment of the methodology. The analytical basis for the assessment is obtained from a time-domain control simulation and a frequency-domain vibration analysis. These two Boeing computer programs, which use detailed structural models of the LST, are described in Section 3.1. The results of applying these two programs with the preprocessor and postprocessor methodology are described in Section 3.2.

3.1 Technical Approach

LST fine stabilization errors induced by the attitude control system cover a wide frequency spectrum from DC up to 300 Hz. In order to analyze the problem efficiently, it was divided into two efforts on the basis of frequency. Although there is some overlap in frequency, the low-frequency control analysis covers DC up to about 20 Hz, and the vibration frequency analysis covers from 10 Hz to above 100 Hz. Control frequency errors are studied using a time-domain simulation of the control system. A digital, nonlinear, three-axis control simulation (DTACS) is used to obtain the image position at the f/24 focus as a function of time. Included in this three-axis simulation are models of the structure (and optics), fine guidance sensor, reference gyros, control actuators, interface equipment, and software, as well as the disturbances acting on the spacecraft. The vibration frequency analysis is done in the frequency domain. In this case image motion errors are plotted as a function of the frequency of the excitation. The problem treated here is essentially an open-loop problem of actuator output vibrations exciting structural resonances which produce undesirable image motions. The frequency-domain vibration analysis program (VAP) includes elements representing the structure (and optics), shock mount and actuator, and the reaction wheel (RW) vibration signature. The overall fine-stabilization performance is obtained by combining the image motion errors due to the low-frequency and high-frequency sources. A general discussion of this approach may be found in Reference 10.

Figure 3-1 is a block diagram of the three-axis contr simulation. It is divided into four primary elements: the onboard computer software, interface equipment, control hardware, and vehicle dynamics. The digital simulation is programmed in a Boeing macro language called SEAL which is then precompiled into FORTRAN IV. A significant amount of computer coding is devoted to simulation of the onboard computer effects. They include word length, algorithm design and computation speed. An extensive simulation of the interface equipment is also used. The control hardware simulation involves detailed modeling of the reaction wheel (RW) dynamics which are coupled with the shock mount dynamics. The dynamic characteristics of the reference gyros and the fine guidance sensor are modeled including both the optical amplification effects and the output noise signature of these devices. Output torques from the reaction wheel acting through the shock mount are applied to the vehicle dynamics simulation which includes both rigid and flexible body motions. The LST dynamic flexibility is represented by up to eight free-free normal modes. The simulation is called DTACS which stands for Detailed Three-Axis Control Simulation.

The vibration analysis program (VAP) is an open-loop frequency-domain simulation of the excitation and LST structural dynamics as they impact the image motion. As shown in Figure 3-2, a selected rotor speed is used as the key to a calculation of the reaction wheel vibration signature. The equation for the RW output vibration was derived from test data on a RW operated at different speeds. It had been precisely balanced at one speed before the tests. A simple equation was defined which gave a good fit to the data for the five dominant elements in the vibration signature as a function of spin speed. The equation gives the heights of the peaks in the vibration signature:

$$F_x = F_y = F_z = A[1.0 \sin(\omega t) + 7.0 \sin(2\omega t) + 2.5 \sin(3\omega t) + 15.0 \sin(5.7\omega t) + 12.5 \sin(6.6\omega t)] \quad \text{in newtons} \tag{62}$$

$$T_x = T_y = T_z = 0.305\, F_x \quad \text{in newton meters} \tag{63}$$

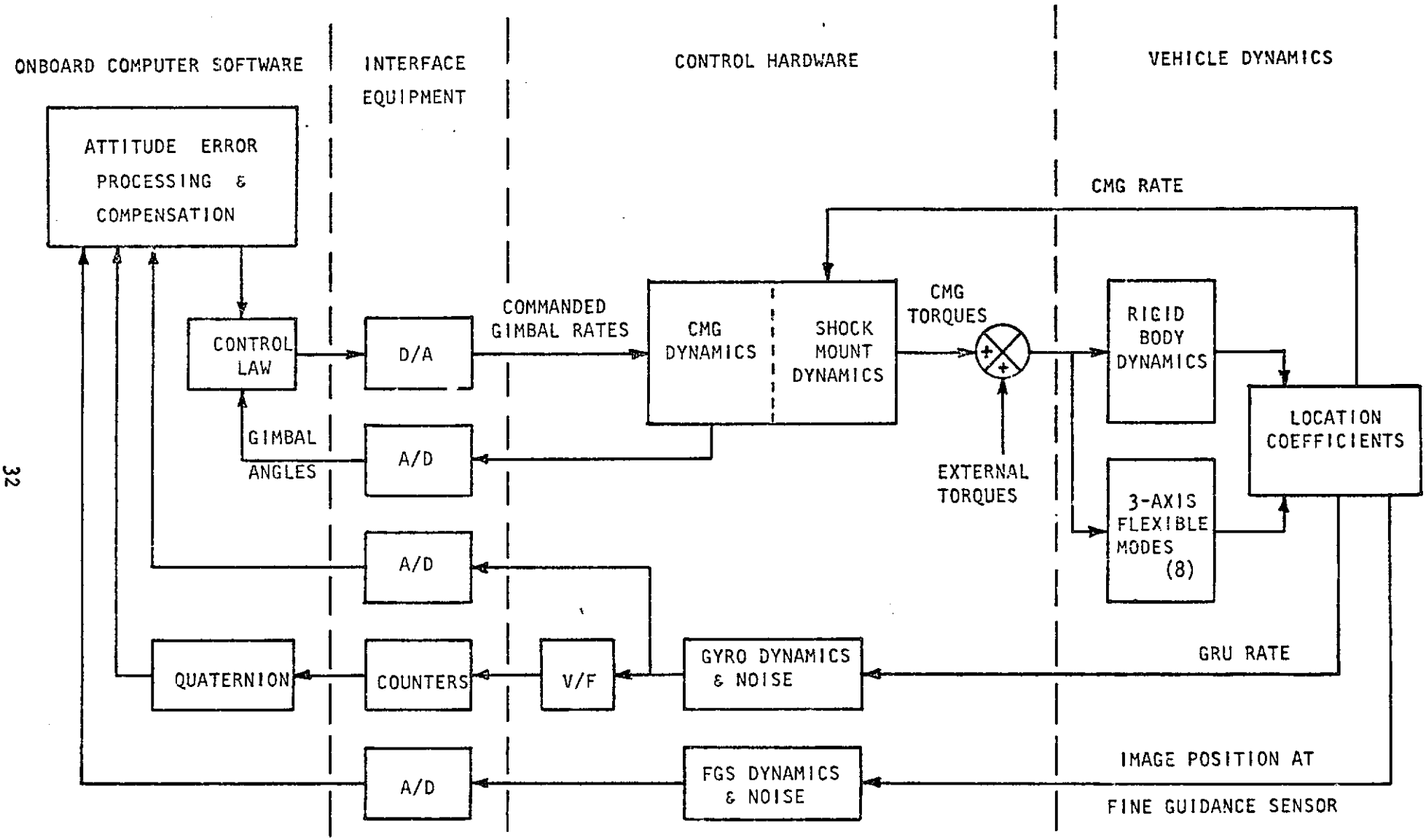


Figure 3-1: Three-Axis Control Simulation

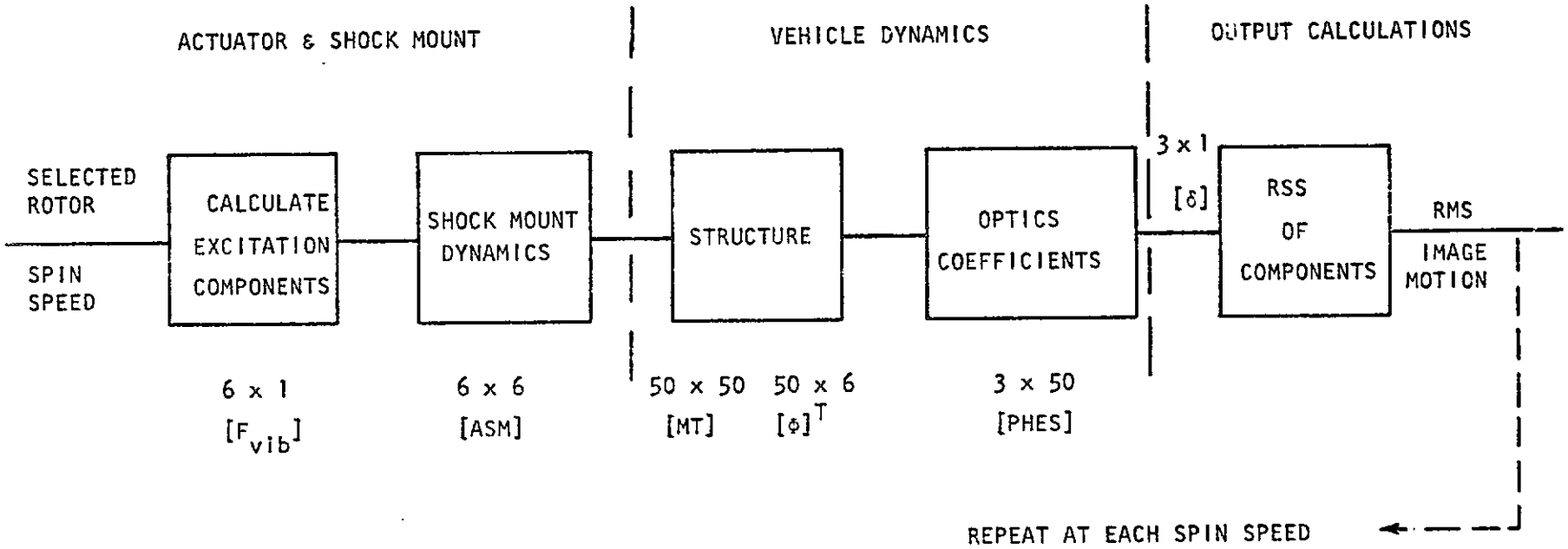


IMAGE DISPLACEMENT AT THE F/24 FOCAL PLANE $[\delta] = [PHES][MT][\Phi]^T[ASM][F_{vib}]$

Figure 3-2: Three-Axis Vibration Analysis Program

where $A = 5.07 \times 10^{-6} \omega^{1.67}$, and ω is the spin speed in radians per second.

This RW vibration signature thus includes three-axis forces and torques, which are applied to the shock mount. The shock mount dynamics are represented by transfer functions for each of the six degrees of freedom of the shock mount. The transfer functions for the three translational degrees of freedom are independent; however, the transfer functions for the rotational degrees of freedom are coupled by the gyroscopic effects of rotor angular momentum. A complex linear model of the shock mount transmissibility characteristics is included. Output forces and torques from the shock mount are applied to the structural dynamic model.

As shown in Figure 3-2 a maximum of fifty normal flexible modes may be used to represent the structural dynamics. The mode transfer function matrix, [MT], represents the response amplitude of each mode at the driven frequency. The matrix $[\phi^T]$ is used to convert the applied excitations to generalized forces. The steady-state generalized coordinate amplitudes, which are the result of the structural dynamic calculation, are converted into image displacements at the f/24 focal plane by the optics coefficient matrix, [PHES]. This calculation produces the steady-state image motion amplitude at the f/24 focal plane in three translational directions due to each of the five excitation frequencies defined by Equations (62) and (63) corresponding to spin speed ω. The response of the image plane in each direction is the root-sum-square of the contributions due to the five excitation frequencies. This computation procedure is repeated for a large number of discrete frequencies within the range of permissible rotor spin speeds. The entire procedure is summarized by the equation at the bottom of Figure 3-2.

For the control system under study the sensor for attitude is the fine guidance sensor which uses light from the main optics. The image at the fine guidance sensor is displaced, not only by rigid-body rotations of the entire spacecraft, but also by flexible body displacements of any of the elements in the optics chain. For example, a rotation of the primary mirror about the Z axis will cause the image at the fine guidance sensor to be

displaced in the Y direction. In general, the image displacement in the Y and Z directions can be shown to be linear functions of the translations and rotations of the primary mirror, secondary mirror, and fine guidance sensor. The translations and rotations are physical coordinates of the system which can be obtained by multiplying rows of the eigenvector matrix times the generalized coordinates for the modes. The linear functional relationships between the three translations of the image plane and the motions of the image train components are expressed by the optical amplification matrix $[B_o]$ previously described in Section 2.2.2. Since the fine guidance sensor is located at the f/24 focus, these image displacements are taken to be the same as image displacements at the scientific instruments. The same optical amplification matrix is used in both DTACS and VAP.

3.2 Results

The postprocessor methodology was applied to two different LST structural models using DTACS and VAP. LST Model 1 is a basic finite-element model having 327 dynamic degrees of freedom. The effects of structural (material) damping are represented by using an equivalent modal viscous damping ratio (ζ) of 0.0005 for all flexible modes. LST Model 2 is the same basic finite-element model modified by the addition of Voigt joint damping models at 26 selected locations throughout the structure. The preprocessor methodology was used for some of the Voigt damping models. The effects of structural damping are represented by adding $\zeta = 0.0005$ material damping for all flexible modes to the coupled modal damping matrix resulting from the discrete Voigt damping models. Both LST structural models are described in detail in Appendix I.

The postprocessor methodology was applied in selecting the critical modes of LST Model 1 for DTACS and VAP and comparing these mode orderings with those obtained by conventional techniques. The mode ordering in Table 3-1 in the column labeled DTACS 1A is determined using the postprocessor to rank modes for LST Model 1 according to Equation (45) as modified by the importance measure shown in Figure 3-3. The mode ordering labeled DTACS 1B is determined by ranking modes for LST Model 1 according to the following equation as modified by the importance measure of Figure 3-3:

Table 3-1: Critical Mode Ordering for Control Simulation (DTACS)

Rank	Mode Number		
	DTACS 1A	DTACS 1B	DTACS 2
1	13	14	13
2	14	19	14
3	11	13	11
4	19	33	19
5	20	34	20
6	7	18	24
7	23	20	23
8	24	7	7

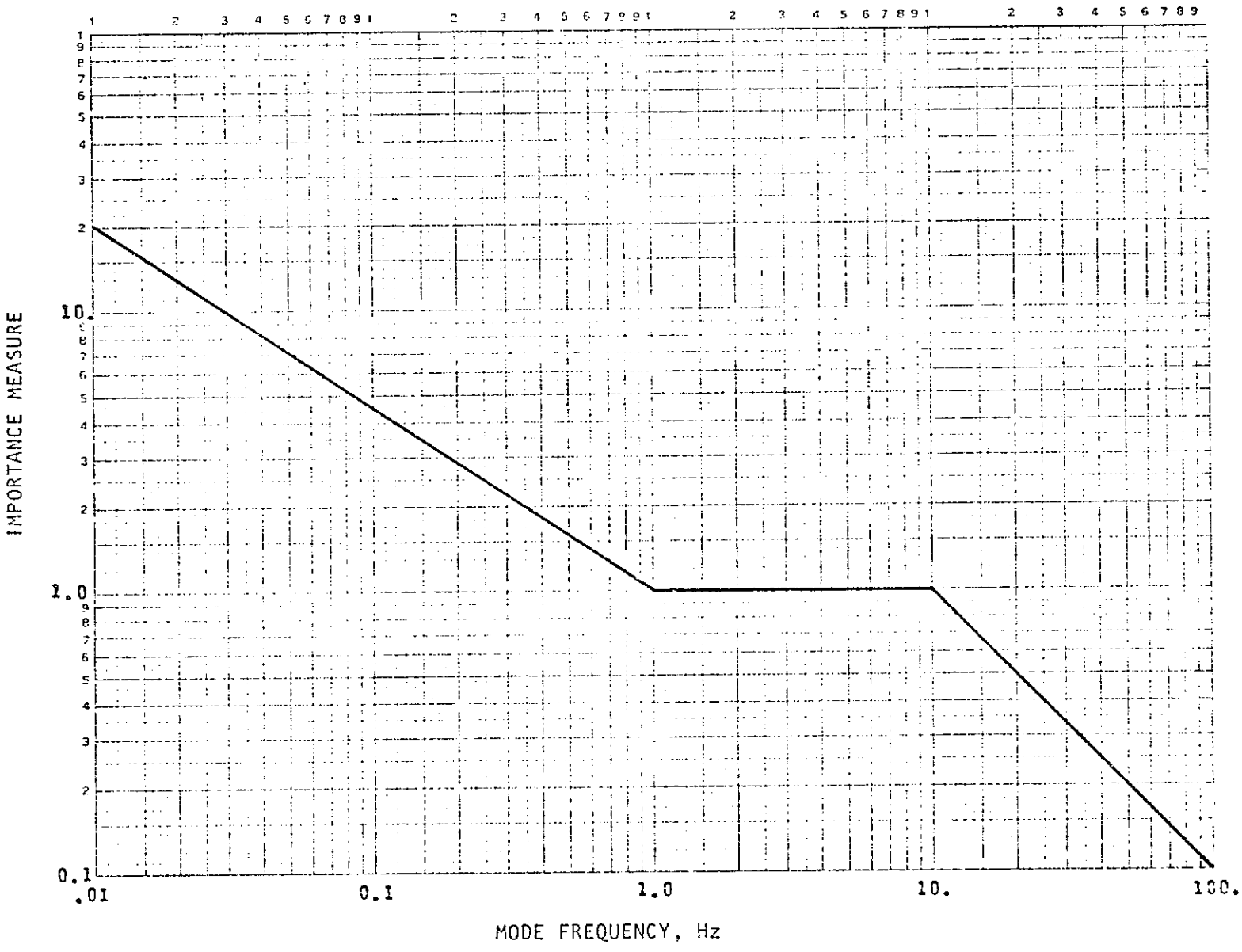


Figure 3-3: Importance Measure for Control Simulation (DTACS) Mode Selection

$$P(r,s)_j = \frac{\phi_{r,j} \cdot \phi_{s,j}}{M_j} \tag{64}$$

where $\phi_{r,j}$ is the j^{th} mode shape for a reaction wheel rotation,
$\phi_{s,j}$ is the j^{th} mode for a fine guidance sensor translation,
M_j is the j^{th} generalized mass.

A comparison of these two orderings shows that the conventional ordering technique omits three of the eight critical modes identified by the post-processor. The results of using these modes in a low-frequency control simulation are shown in Figure 3-4. This plot traces the motion of the image in the YZ plane during the simulation. Since the modes identified by both techniques are the major contributors to the image motion, the postprocessor methodology and the conventional techniques are equivalent for this data set.

The mode ordering in Table 3-2 in the column labeled VAP 1A is determined using the postprocessor to rank modes for LST Model 1 according to Equations (46) through (49) with the following equation for applied sinusoidal forces and torques:

$$F = T = 0.2 \left(\frac{f}{10} \right)^{1.7} \quad \text{for } f \geq 10 \tag{65}$$

where f is frequency in Hz.

The mode ordering labeled VAP 1B is determined by again ranking modes according to Equation (64). A comparison of these two orderings shows that the conventional ordering technique omits 17 of the 20 critical modes identified by the postprocessor. The results of using these modes in a higher-frequency vibration analysis with LST Model 1 are shown in Figures 3-5 and 3-6 for ordering 1A and in Figures 3-7 and 3-8 for ordering 1B.

The preprocessor methodology was applied in generating LST Model 2 with discrete damping components. Figure 3-9 is a plot of the image motion trace from DTACS using LST Model 2. Table 3-1 indicates that the postprocessor orderings for DTACS 1A and DTACS 2 are essentially identical. A comparison of Figure 3-9 with Figure 3-4 indicates that the image motions for the two LST models are nominally identical, despite the fact that the damping of the

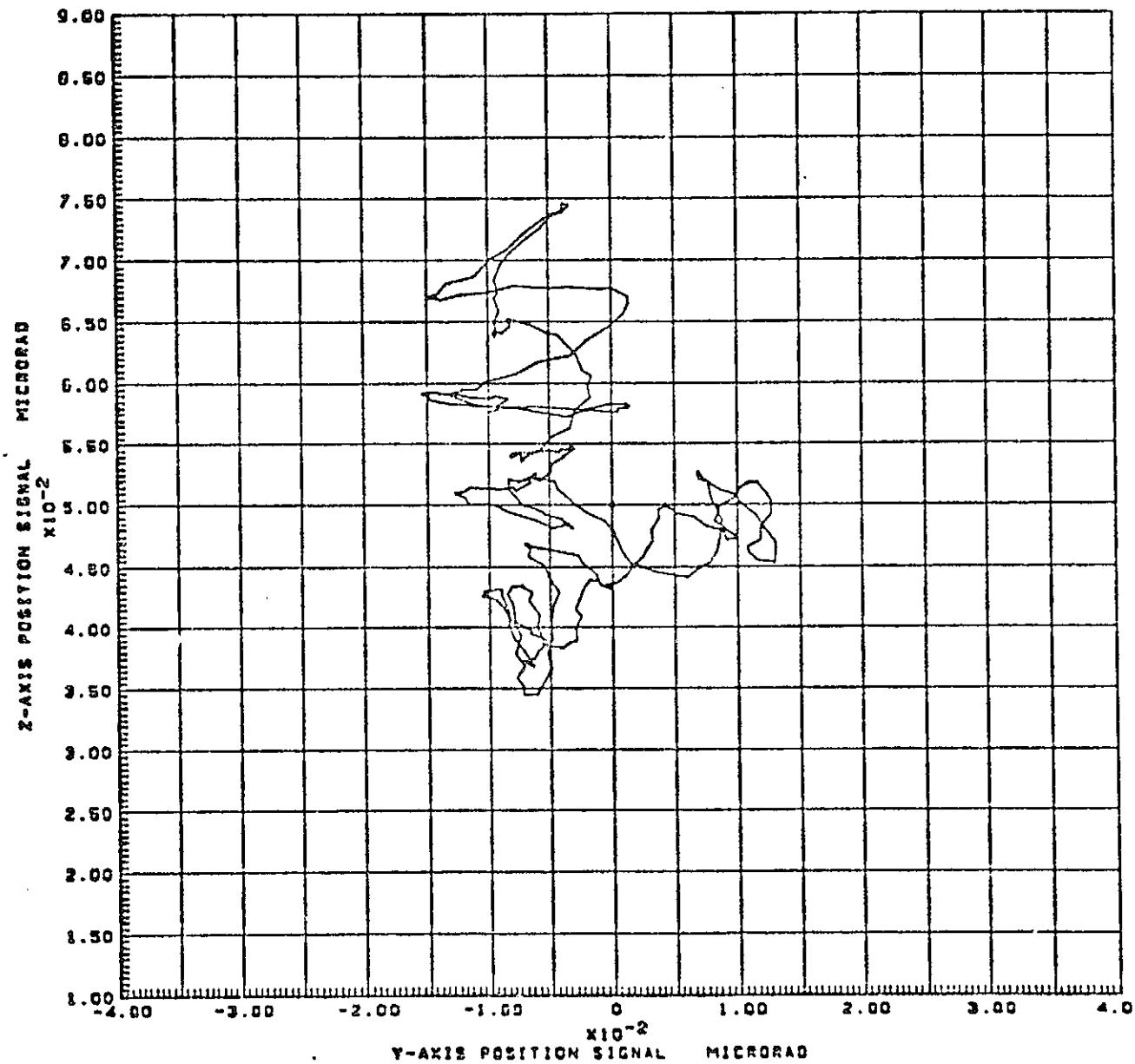


Figure 3-4: Model 1 YZ Image Motion Trace from DTACS

Table 3-2: Critical Mode Ordering for Vibration Simulation (VAP)

Rank	Mode Number		
	VAP 1A	VAP 1B	VAP 2
1	106	71	95
2	98	82	105
3	104	70	100
4	105	63	104
5	103	75	50
6	95	83	106
7	97	91	82
8	24	58	24
9	23	62	51
10	96	96	23
11	102	86	96
12	50	59	97
13	51	14	84
14	82	79	70
15	34	74	33
16	33	78	103
17	20	69	34
18	19	67	98
19	84	97	26
20	101	105	83

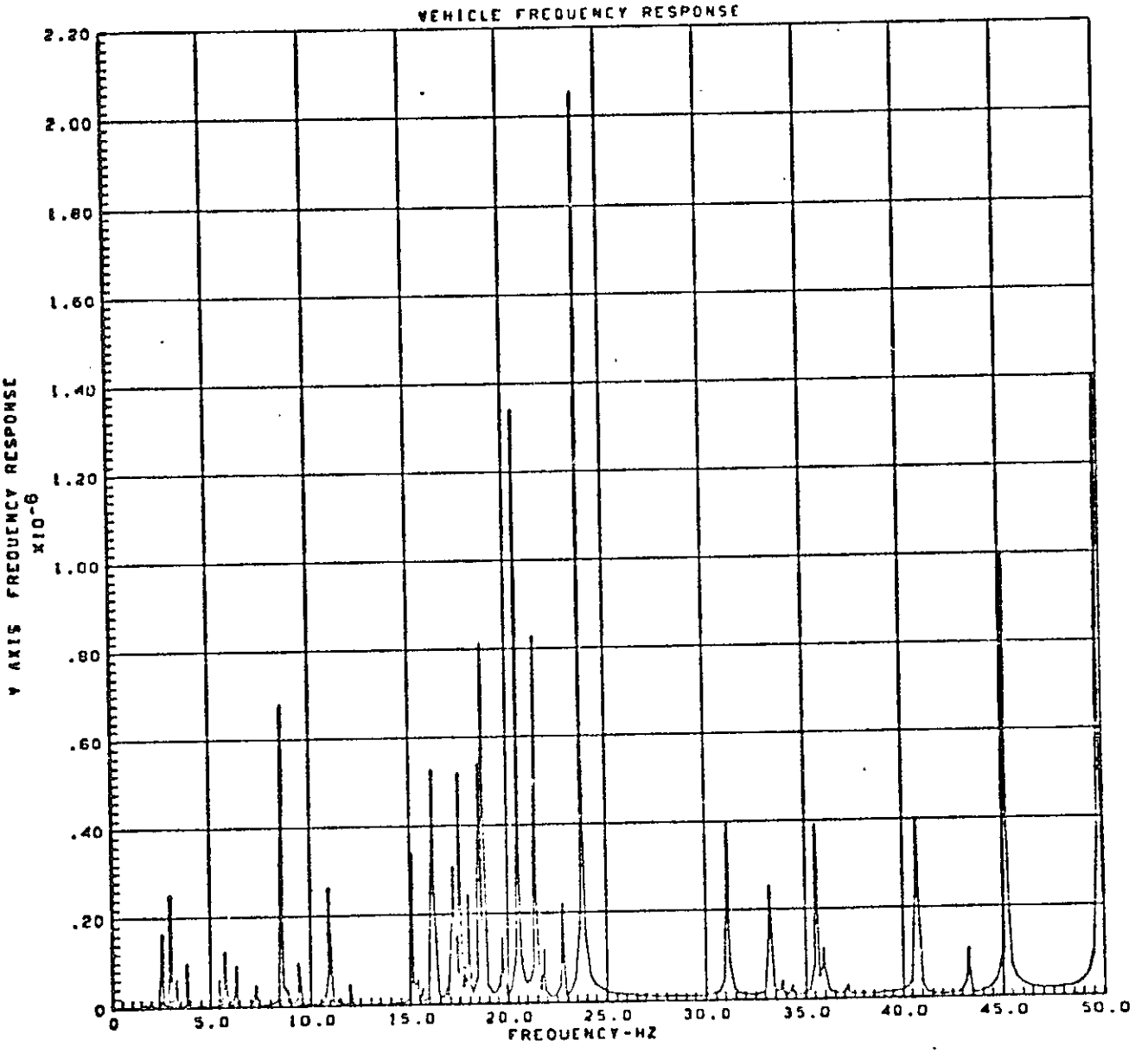


Figure 3-5: Model 1 Y Image Motion vs. Rotor Frequency
20 Modes Selected by Postprocessor

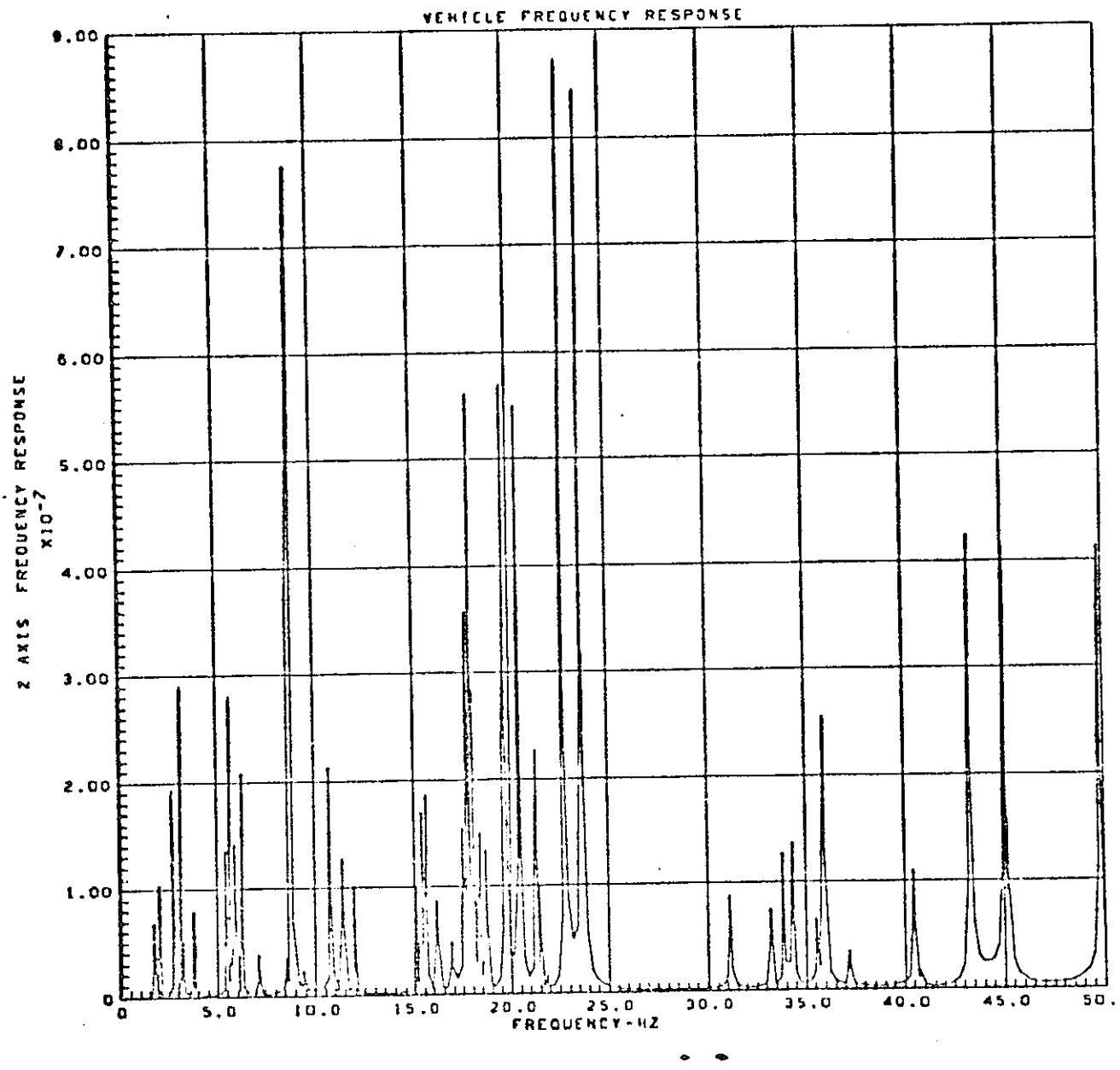


Figure 3-6: Model 1 Z Image Motion vs. Rotor Frequency
20 Modes Selected by Postprocessor

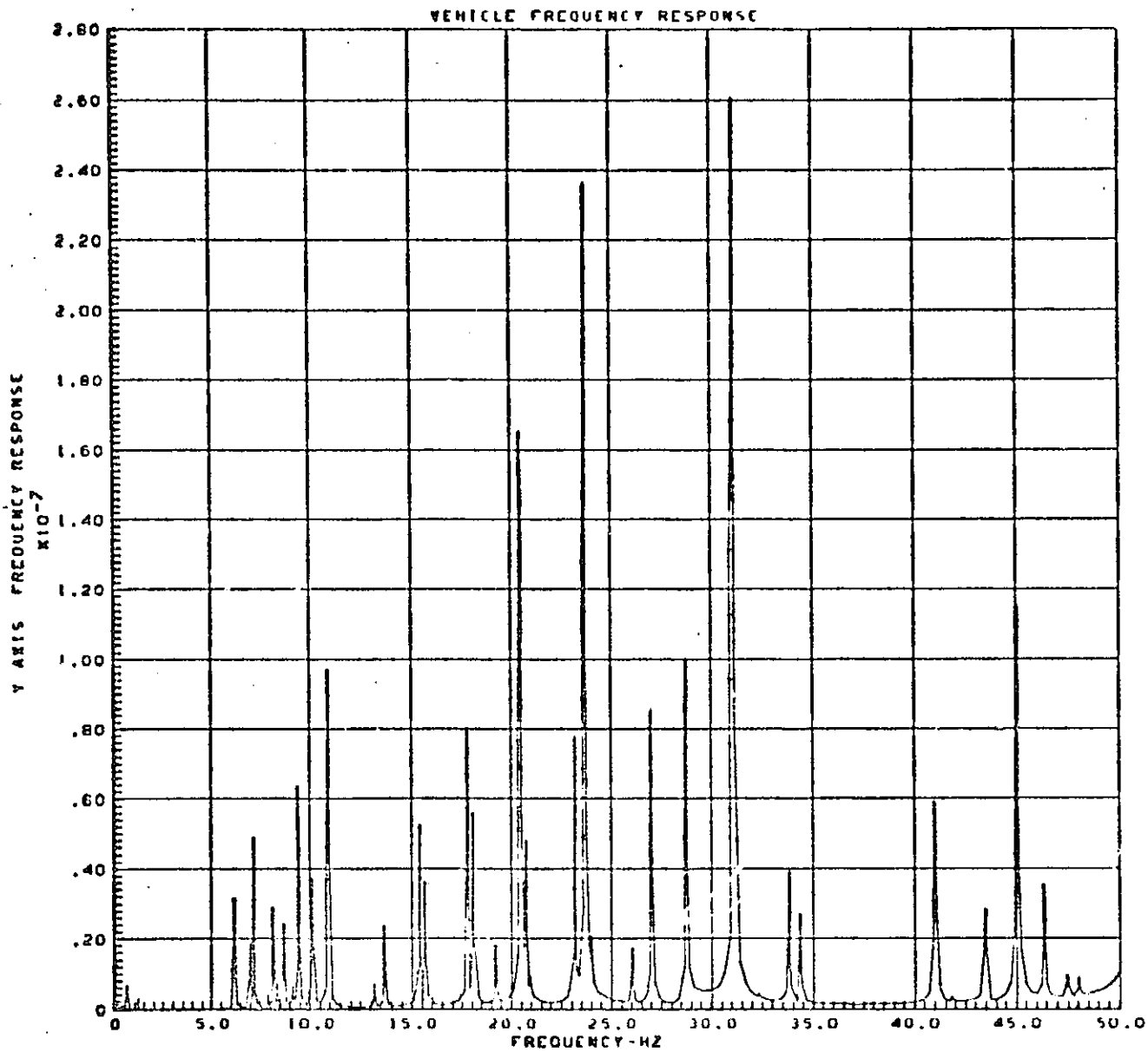


Figure 3-7: Model 1 Y Image Motion vs. Rotor Frequency
20 Modes Selected by $\phi_1 * \phi_2 / M$

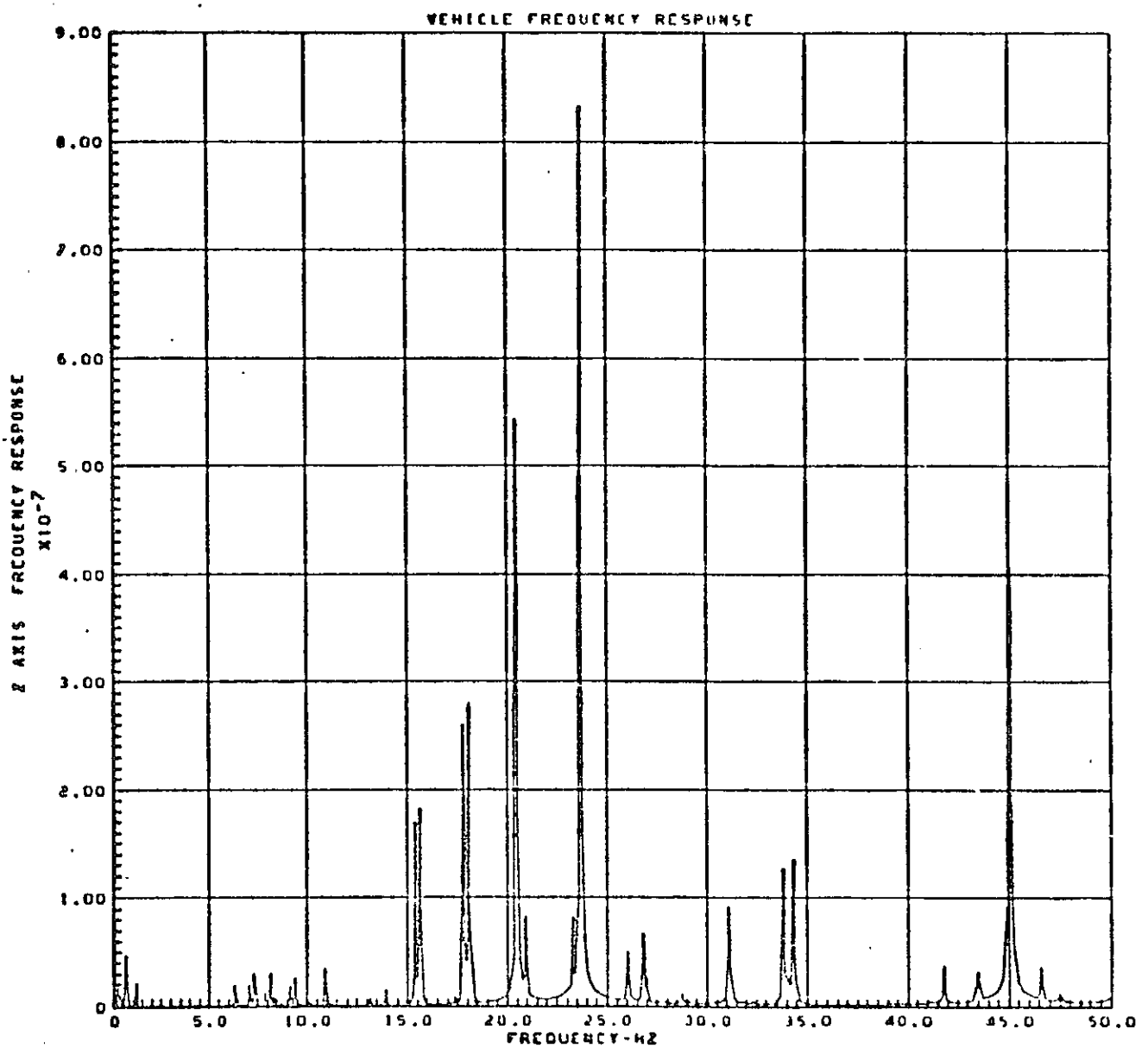


Figure 3-8: Model 1 Z Image Motion vs. Rotor Frequency
20 Modes Selected by $\phi_1 \cdot \phi_2 / M$

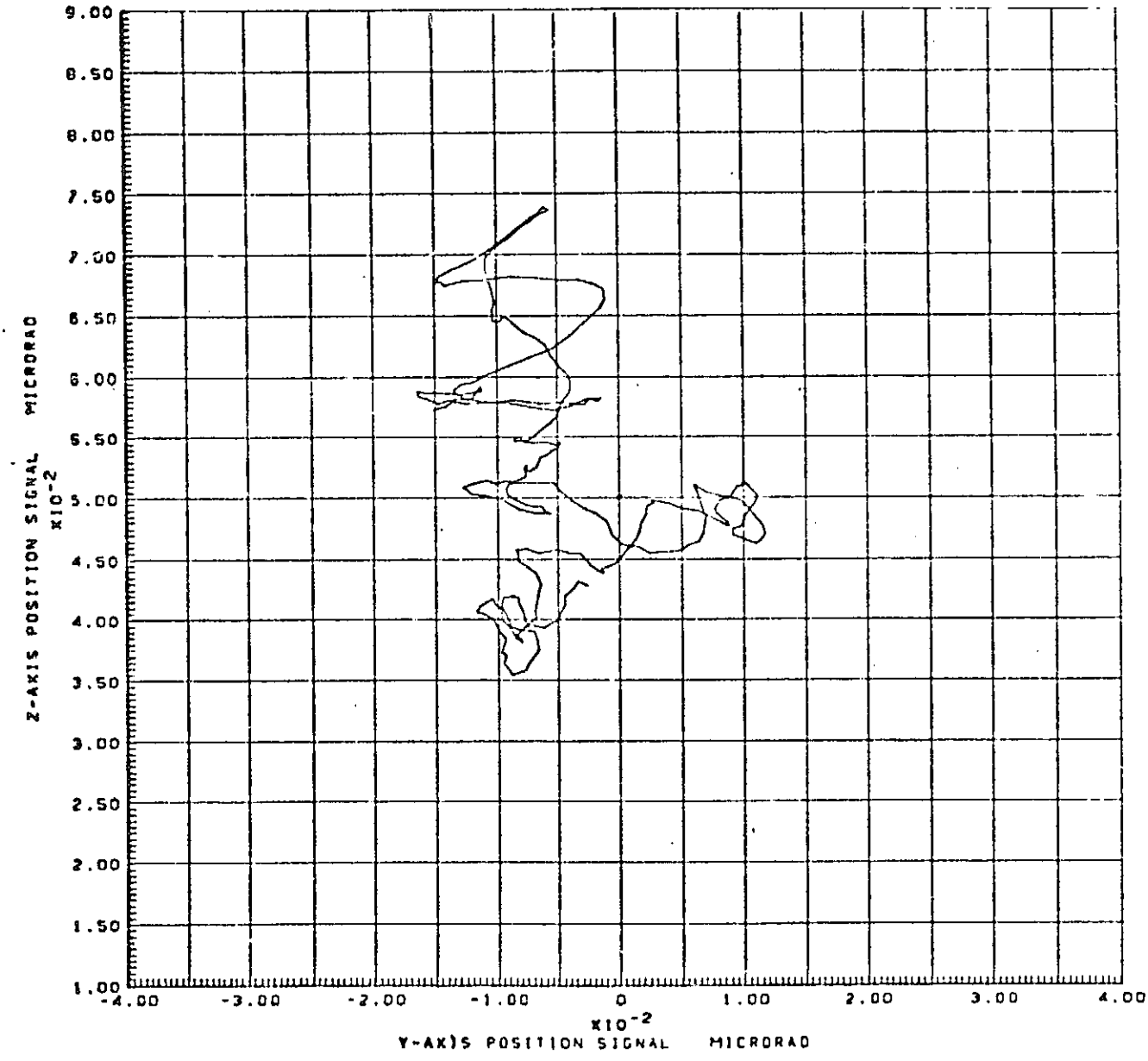


Figure 3-9: Model 2 YZ Image Motion Trace from DTACS

critical low-frequency modes increased an order of magnitude for LST Model 2. The increased modal damping does not significantly affect the results since the control loop used in both cases was designed to be stable for the lower damping. The mode damping impacts the control system design by limiting options for solving other problems, such as gravity-gradient torque rejection, rather than appearing as a difference in mode amplitude in the time-history trace of Figure 3-9. For the VAP sinusoidal vibration simulation, on the other hand, the modal damping effects are very significant. Table 3-2 indicates that the postprocessor orderings for VAP 1A and VAP 2 are very similar. Comparisons of Figure 3-10 with Figure 3-5 and Figure 3-11 with Figure 3-6 indicate noticeable reductions in response amplitudes due to the increase in modal damping from LST Model 1 to LST Model 2.

The data of LST Model 2 was used with the methodology described in Section 2.2.3 to assess the significance of damping (velocity) coupling among the normal modes. The measure used to assess the degree of coupling is the ratio of coupled response to uncoupled response defined by Equation (61). For the 20 most critical modes listed in the VAP 2 ordering of Table 3-2, the maximum assessment ratio is 1.024. For all 100 modes, the minimum assessment ratio is 0.459 for the 68^{th} mode. These data indicate that modal velocity coupling is a potentially significant effect for high-accuracy structural dynamic analysis.

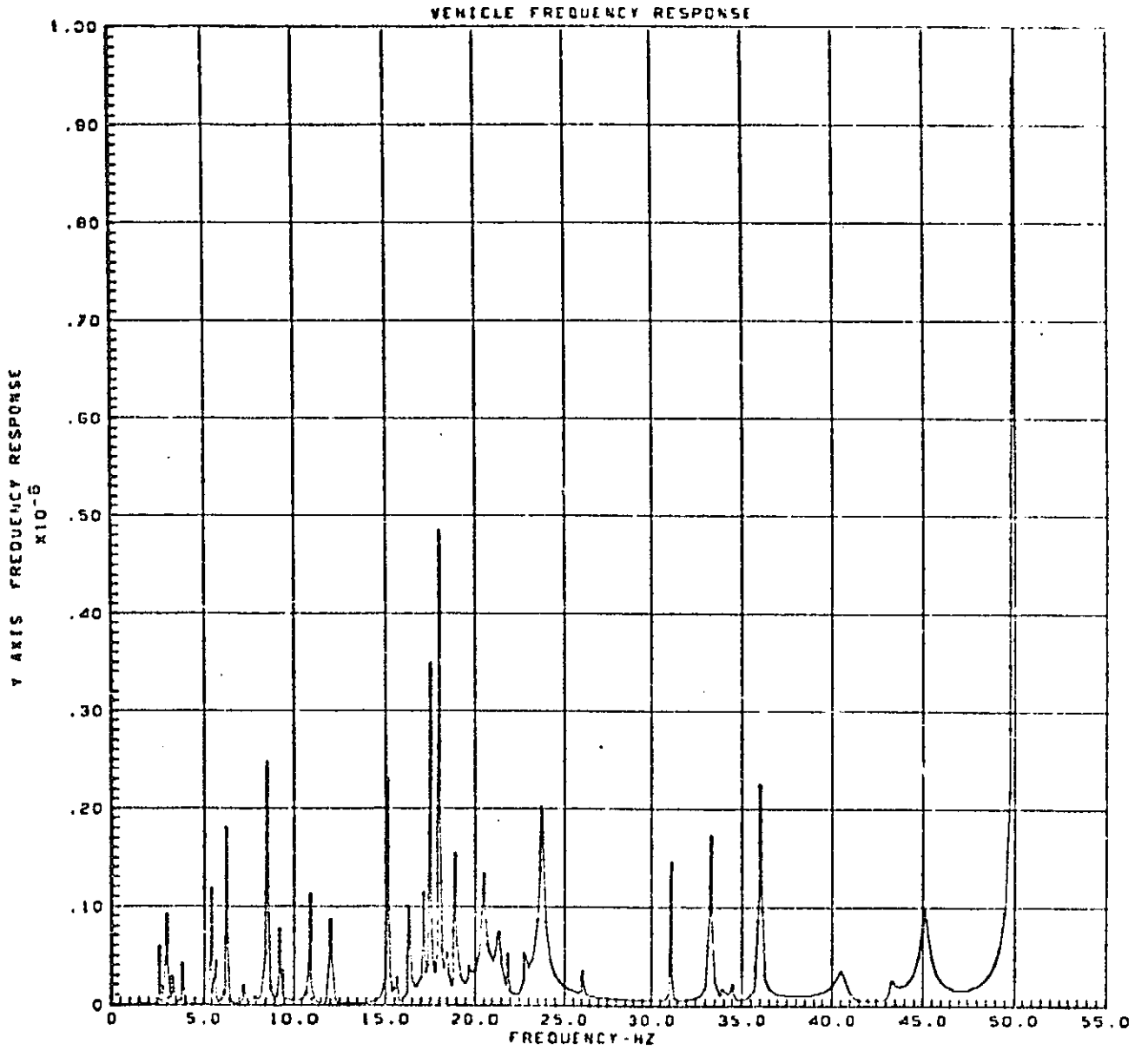


Figure 3-10: Model 2 Y Image Motion vs. Rotor Frequency
20 Modes Selected by Postprocessor

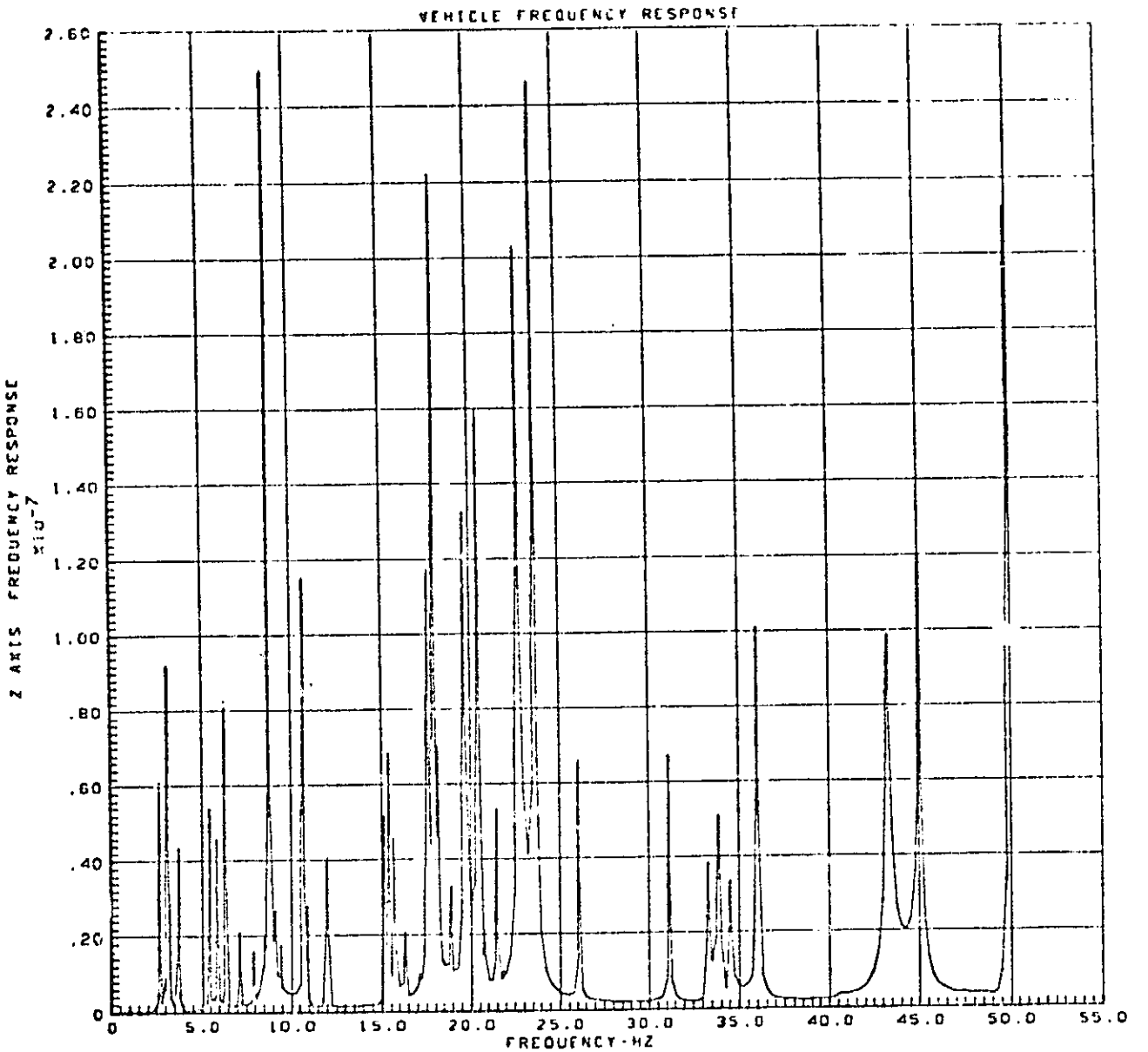


Figure 3-11: Model 2 Z Image Motion vs. Rotor Frequency
20 Modes Selected by Postprocessor

4.0 CONCLUSIONS AND RECOMMENDATIONS

Methodology developed to improve structural joint modeling for distributed damping and to select critical structural modes for subsequent analytical studies has been successfully demonstrated. The NASTRAN viscous damping capability is adequate to represent the general characteristics of localized damping in spacecraft structures similar to LST. The preprocessor computer program automatically generates NASTRAN BULK DATA cards required for a specific class of Voigt joint damping models. The postprocessor methodology is sufficiently general to select critical modes for a broad class of subsequent analytical studies. LST studies indicate that modal velocity coupling resulting from damping in discrete structural joints has a potentially significant effect on dynamic responses.

Recommendations for further work in this area include the following:

a. modify the preprocessor to generate NASTRAN data for joint gridpoints in cylindrical coordinate systems,

b. modify the postprocessor to select critical resonances from complex admittance matrices for specified input and response freedoms;

c. study the effects of distributed damping on other types of aerospace structures.

APPENDIX I

LST STRUCTURAL MODEL

Introduction

A basic NASTRAN structural dynamic model of an Orbiting Telescope System having an aperture of 1.8 meters was developed as part of a Boeing-sponsored research task.[11] This finite-element model was designated LST Model 1. The basic model was modified by incorporating Voigt damping models at 26 selected joints throughout the structure. The additional NASTRAN input was generated partly by the preprocessor. This modified finite-element model, which includes distributed damping, was designated LST Model 2. This appendix presents details of the basic structural model, properties of the added Voigt joint models, and dynamic characteristics including the coupled modal damping matrix for the modified structural model.

Basic LST Model 1

The basic structural dynamics model includes detailed modeling of the Support Systems Module (SSM), the Orbital Telescope Assembly/Science Instruments (OTA/SI) and four deployed appendages. Table I-1 shows the detailed breakdown into numbers of gridpoints, structural elements, and dynamic degrees of freedom for the various substructures making up the complete structural dynamic model. The grid geometry and some of the element connections and gridpoint identifications for the SSM and OTA/SI structural dynamic models are shown in Figures I-1 and I-2, respectively.

The SSM model, shown in Figure I-1, consists of the aft shell, the equipment section including reaction wheels and interface points, the forward shell, and appendages. The aft shell is modeled with coarse-grid plate elements as suggested by Figure I-1. Four ring stiffeners, three on the cylinder and one around the access porthole on the aft end, are modeled with BAR elements. The shell mass is lumped onto the three rings of the cylinder, four places each ring. The forward end of the aft shell is connected to the smaller

Table I-1: Basic Structural Dynamic Model Description

Substructure	No. of Gridpoints*	No. of Structural Elements			No. of Dynamic D.O.F.
		Plate	Bar	Scalar Spring	
SSM Aft Shell	49	45	32		24
SSM Equip. Sect.					54
Inner Shell	75	60			
Ring Frames			45		
Longerons			60		
Reaction Wheels	4		16		24
Shuttle Attach.	4		8		
Fwd SSM Shell	12		11		33
HGA	12		10	12	24
Solar Arrays	20		18	12	48
OTA/SI-SSM Interface & Backup	6		9	6	
Metering Truss	32		80		48
Secondary Mirror & Support	13		12		6
Primary Mirror & Support	40		53		42
Focal Plane Struct.	19		48		24
SI	1		1		
	287	105	403	30	327

*Permanent SPC Gridpoints Excluded

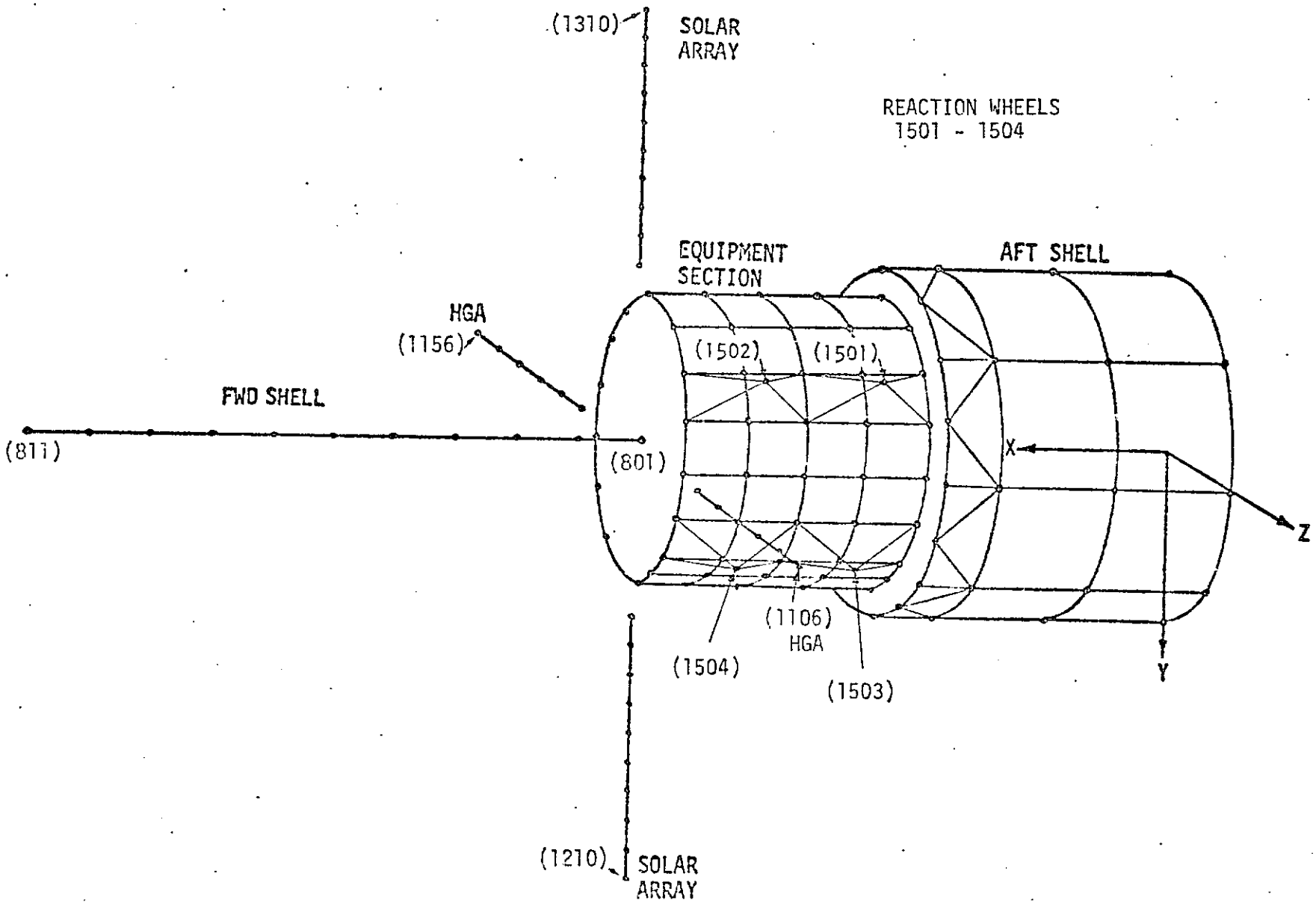


Figure I-1: SSM Finite-Element Model

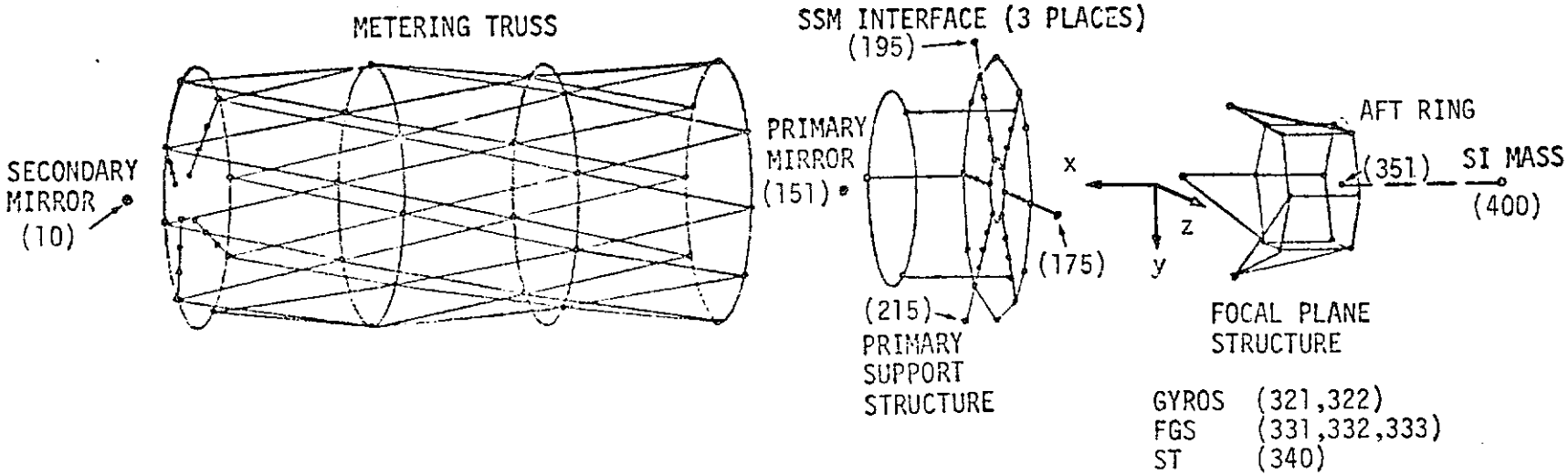


Figure I-2: OTA/SI MATH MODEL

diameter inner shell of the equipment section through multipoint constraint equations. The two aft rings are constrained to the same displacements as the central gridpoints in order to reduce the number of dynamic degrees of freedom.

The equipment section inner shell is modeled with 60 plate elements as shown in Figure I-1. The equipment bays are formed by three large external ring frames and 15 longerons. These rings and longerons, not shown in the figure, are modeled with 105 BAR elements offset radially approximately one-half the bay depth. Bay cover plates are assumed non-structural. SSM equipment and structural mass is lumped onto gridpoints forming the three ring frames. The forward gridpoints of the SSM equipment section are connected to the central gridpoint through multipoint constraint equations. Reaction wheels, located in bays 7 and 11, are each supported by four BAR elements attached to the corners of the forward and aft compartments of these bays as shown in Figure I-1. The four gridpoints representing the reaction wheels have six dynamic degrees of freedom each. The three SSM interface gridpoints are each supported by two stiff BAR elements which distribute the interface loads to the aft and center ring frames at the intersection with the nearest longeron. These BAR elements are not shown in Figure I-1.

The forward shell is modeled as a beam consisting of 11 BAR elements cantilevered from the central gridpoint of the forward end of the equipment section. The mass is lumped on 11 gridpoints. The forward aperture door mass is offset from the forward gridpoint. Modeling of this shell as a beam is reasonable because it behaves as a beam in the frequency band of interest. The fundamental cantilever beam bending frequency of this shell is approximately 45 Hz.

The deployed high gain antennas (HGA) and solar arrays are modeled as beams consisting of 5 and 9 BAR elements each, respectively. The HGA BAR element properties are the same in both planes; rotary inertias are neglected, eliminating torsion modes. The solar array BAR elements are much stiffer in the in-plane bending direction, and rotary inertias are included. The bases of the appendages are connected to the forward end of the SSM equipment section

with 3 rotational and 3 translational scalar spring elements each. The spring rates are computed to give approximately 1 Hz flapping frequencies and 20 Hz shear frequencies. The torsion spring rates are the same as the other rotation spring rates, resulting in higher frequencies in rotation about the solar panel axes than in flapping.

The OTA/SI model, shown in Figure 1-2, consists of the metering truss including the secondary mirror, the primary support structure including the primary mirror and interface flexures, and the focal plane structure including the science instruments. The graphite/epoxy metering truss is modeled with BAR elements as shown in Figure 1-2. The section properties of the truss elements account for the unique laminate characteristics of the graphite/epoxy tubes. The stiffness of the baffling shell is neglected. Mass representing the truss and the baffling shell is lumped onto the second and fourth rings of the truss, eight masses per ring. The secondary mirror is supported by four radial graphite/epoxy beams, each modeled with three BAR elements. The secondary mirror gridpoint, having six degrees of freedom, is connected to the four support points by multipoint constraint equations.

The primary support structure consists of six radial beams connecting inner and outer rings as shown in Figure 1-2. These beams and rings are modeled with 42 BAR elements. The metering truss is connected to the stiff outer ring with BAR's at 8 points which represent the eight fittings. The three primary mirror support gridpoints are connected to three of the radial beams by three axial bar elements. These three gridpoints are connected to the central primary mirror gridpoint through multipoint constraint equations. The mirror mass is lumped onto this central gridpoint which has six dynamic degrees of freedom. The mass of the primary support structure is lumped onto the outer and inner rings, six places each ring. The focal plane support and mirror support members are connected to the same radial members, which are located 60° of angular rotation away from the SSM interface flexure support points. The three interface flexures are each modeled by two scalar spring elements, one providing axial stiffness and the other providing tangential stiffness. These scalar elements connect the SSM interface gridpoints

to three stiff BAR elements extending radially outward from the OTA/SI primary support ring as shown in Figure 1-2.

The focal plane structure consists of two hexagonal rings connected by six axial and six diagonal truss members. This assembly is supported from three points on the primary support ring by nine truss members. The three fine guidance sensors are each supported from the focal plane structure by four BAR elements. The star tracker and two gyro sensors are supported by single stiff BAR elements from the primary support ring. The six gridpoints on the aft hexagonal ring of the focal plane structure are connected to a central gridpoint by multipoint constraint equations. This central gridpoint has six dynamic degrees of freedom. A single gridpoint located aft of the focal plane is used to represent the science instruments. The mass of the SI and cruciform beam support is lumped at this gridpoint. A rigid link (multi-point constraint) connects the aft ring gridpoint to the SI gridpoint.

Structural Joint Models and Damping

For the modified LST model, structural joint damping is included at 26 locations throughout the LST structure. Some joints are incorporated using the preprocessor and others are added manually. The manual data input was for joints in the basic structural model which were modeled using elements other than BARS or RODS. Voigt models were added at the appendage deployment hinges, the star tracker support, the metering truss supports, the OTA/SSM interface flexures, the SI focal plane structure supports, and the SSM forward shell support. The effects of material damping were included by adding an equivalent modal viscous damping ratio (ζ) of 0.0005 for all flexible modes to the modal damping matrix corresponding to the Voigt joint models. This value is an average determined from a survey of material damping values for aluminum and steel reported in Reference 5.

The deployment hinges for the four appendages (two high-gain antennas and two solar arrays) in the basic LST model were idealized using scalar spring (ELAS) elements. The Voigt models were generated for the modified LST model by adding DAMP1 elements in parallel with these ELAS elements to provide joint damping in three rotational degrees of freedom. The DAMP1 damping constant was calculated to provide a damping ratio ($\zeta = C/C_c$) of 0.005

for the first cantilever bending modes. This value was obtained from test data obtained during a modal survey test of a flight-quality solar array for the Mariner Venus/Mercury spacecraft. The decay record suggested that, while damping increased with amplitude for large amplitudes, damping tended toward the asymptotic value of 0.005 for small amplitudes.

Joint damping characteristics for the star tracker, which is cantilevered from the primary support ring, were also input manually. Scalar damping elements (DAMP1) were used to provide damping in the three rotational directions. The damping constant was chosen to provide a damping ratio of 0.005 for its first cantilever bending mode. No damping for the two rate gyros was provided because their cantilever frequency is well beyond the frequency range of interest.

Damping in the eight metering truss/primary mirror support ring fittings was modeled using scalar damping (DAMP1) elements in the axial direction only. Damping constraints were established, using a NASTRAN model of the cantilevered metering truss, such that the damping ratio (ζ) is 0.001 for the first cantilever bending mode. This value is based on unpublished decay data obtained from a test, performed at NASA/Goddard, on a welded titanium metering truss.

Damping in the OTA/SSM interface flexures was modeled using axial scalar damping elements in parallel with the axial scalar spring components. Damping constraints were determined by calculating the generalized damping necessary to provide a damping ratio of 0.0005 in the first cantilever mode of the OTA/SI.

The preprocessor was used to incorporate Voigt structural joint models in the nine BAR elements supporting the SI focal plane structure. The nine VISC elements, with only rotational damping components, were defined at the three gridpoints where the SI connects to the primary support ring. The damping value of the cantilevered SI substructure was estimated to be intermediate between the values used for the metering truss (ζ = 0.001) and those used for the four appendages (ζ = 0.005). Therefore the damping values used in these joints were chosen such that the damping ratio of the first mode is 0.003 when the SI substructure is cantilevered at the three attachment points.

The preprocessor was also used to incorporate a structural joint at the base of the SSM forward shell. Damping constants used were based on the cantilevered rotations of the shell and were calculated to give a damping ratio of 0.001 for its first cantilever bending mode. This value was chosen by assuming that the damping in the forward shell is approximately the same as the damping in the metering truss.

Dynamic Characteristics

Free-free modes, frequencies, generalized masses and the coupled modal damping matrix were determined using NASTRAN. Modal frequencies and generalized masses are shown in Table 1-2 for the first 100 flexible modes. The lowest frequency mode involving motion of the OTA/SI relative to the SSM is an OTA/SI rocking mode at 11.1 Hz. All lower frequencies are the various appendage modes.

Mode shapes at selected points on the structure are given in Table 1-3 for the first 100 flexible modes. The locations for which mode shapes are listed are as follows:

gridpoint	location
10	OTA secondary mirror
151	OTA primary mirror
175, 195, 215	OTA/SSM interface flexures
321, 322	rate gyro sensors
331, 332, 333	fine guidance sensors
340	star tracker
351	SI focal plane structure aft ring
400	SI equipment centroid
801	forward shell attachment point
811	tip of forward shell

Table I-2: LST Modal Frequencies and Generalized Masses

THE FOLLOWING EIGENVALUE DATA HAS BEEN TAKEN FROM THE NASTRAN TAPE FOR THIS ANALYSIS

MODE NUMBER	FREQUENCY*	GENERALIZED MASS**	MODE NUMBER	FREQUENCY*	GENERALIZED MASS**
7	0.55286E 01	0.58898E 02	62	0.29274E 03	0.72612E 02
8	0.58244E 01	0.34604E 02	63	0.29374E 03	0.21480E 03
9	0.59042E 01	0.29695E 02	64	0.29752E 03	0.88205E 01
10	0.59117E 01	0.29185E 02	65	0.29814E 03	0.80214E 01
11	0.59336E 01	0.29258E 02	66	0.29841E 03	0.13510E 02
12	0.61507E 01	0.65068E 02	67	0.29847E 03	0.20165E 02
13	0.63988E 01	0.68647E 02	68	0.29861E 03	0.27271E 02
14	-0.76181E 01	0.11568E 03	69	0.30186E 03	0.57077E 02
15	0.22565E 02	0.12509E 06	70	0.32791E 03	0.73720E 03
16	0.22997E 02	0.12539E 06	71	0.32798E 03	0.73212E 03
17	0.54227E 02	0.54427E 02	72	0.32784E 03	0.62045E 03
18	0.54449E 02	0.54682E 02	73	0.32789E 03	0.61737E 03
19	0.69818E 02	0.51767E 03	74	0.33724E 03	0.35576E 03
20	0.71402E 02	0.52513E 03	75	0.33929E 03	0.30415E 03
21	0.87327E 02	0.87168E 05	76	0.35289E 03	0.86060E 02
22	0.87331E 02	0.87197E 05	77	0.35392E 03	0.92528E 02
23	0.10759E 03	0.40053E 03	78	0.36137E 03	0.13051E 04
24	0.11076E 03	0.34022E 03	79	0.36140E 03	0.12893E 04
25	0.11477E 03	0.20051E 03	80	0.36170E 03	0.19692E 04
26	0.11620E 03	0.31580E 03	81	0.36171E 03	0.19387E 04
27	0.12054E 03	0.51694E 02	82	0.39103E 03	0.13251E 04
28	0.12071E 03	0.46071E 02	83	0.39111E 03	0.13086E 04
29	0.13079E 03	0.10242E 02	84	0.39115E 03	0.14012E 04
30	0.13101E 03	0.97669E 01	85	0.39128E 03	0.13408E 04
31	0.13103E 03	0.97075E 01	86	0.40916E 03	0.26963E 03
32	0.13110E 03	0.97836E 01	87	0.50000E 03	0.83795E 01
33	0.13480E 03	0.75074E 03	88	0.50060E 03	0.80447E 01
34	0.13737E 03	0.22648E 03	89	0.50061E 03	0.87799E 01
35	0.15124E 03	0.83870E 05	90	0.50061E 03	0.84863E 01
36	0.15124E 03	0.83872E 05	91	0.54363E 03	0.19739E 04
37	0.15918E 03	0.89269E 02	92	0.56316E 03	0.24707E 02
38	0.15943E 03	0.90011E 02	93	0.56322E 03	0.24790E 02
39	0.17195E 03	0.11060E 03	94	0.60314E 03	0.16136E 03
40	0.18715E 03	0.93915E 02	95	0.62759E 03	0.10405E 04
41	0.19006E 03	0.20720E 03	96	0.64899E 03	0.53614E 03
42	0.19090E 03	0.79644E 02	97	0.65060E 03	0.93133E 03
43	0.19537E 03	0.88131E 05	98	0.67347E 03	0.56527E 02
44	0.19537E 03	0.88115E 05	99	0.67391E 03	0.50424E 02
45	0.19557E 03	0.11707E 03	100	0.67700E 03	0.47026E 03
46	0.19563E 03	0.13745E 03	101	0.69584E 03	0.24539E 03
47	0.21343E 03	0.11840E 06	102	0.75940E 03	0.27467E 03
48	0.21343E 03	0.11840E 06	103	0.76452E 03	0.26661E 03
49	0.21846E 03	0.55426E 03	104	0.81597E 03	0. 6735 03
50	0.22629E 03	0.18116E 03	105	0.84867E 03	0.68838E 03
51	0.22630E 03	0.17806E 03	106	0.85027E 03	0.81355E 03
52	0.24021E 03	0.42875E 03			
53	0.24405E 03	0.71384E 02			
54	0.24497E 03	0.16329E 03			
55	0.24590E 03	0.17315E 03			
56	0.24657E 03	0.63235E 02			
57	0.25219E 03	0.68049E 02			
58	0.25749E 03	0.35590E 03			
59	0.26285E 03	0.37363E 03			
60	0.27388E 03	0.19965E 03			
61	0.28379E 03	0.73325E 04			

* radians/second

** kilograms

Table 1-3: LST Mode Shapes

MODE NUMBER 7

GRID	T1*	T2*	T3*	R1**	R2**	R3**
10	0.70590E-04	-0.20616E-04	-0.28317E-01	-0.32097E-04	0.21987E-02	-0.44850E-05
151	0.70407E-04	0.24092E-05	-0.17214E-01	-0.32105E-04	0.21827E-02	-0.45915E-05
175	-0.16092E-01	-0.45651E-04	0.28993E-02	-0.46654E-05	-0.21779E-02	-0.32382E-04
195	0.80415E-02	0.13890E-01	-0.13486E-02	-0.18822E-02	0.10922E-02	-0.54943E-04
215	0.80498E-02	-0.13969E-01	-0.13388E-02	0.18868E-02	0.10847E-02	-0.88226E-05
321	0.16372E-02	0.27973E-04	-0.15647E-01	-0.33053E-04	0.21908E-02	-0.45368E-05
322	0.16438E-02	0.27712E-04	-0.15693E-01	-0.31552E-04	0.21912E-02	-0.46864E-05
331	0.67585E-04	0.58882E-05	-0.14821E-01	-0.32022E-04	0.21826E-02	-0.58414E-05
332	-0.10803E-02	-0.10750E-04	-0.14850E-01	-0.32524E-04	0.21815E-02	-0.54501E-05
333	0.12243E-02	0.23165E-04	-0.14850E-01	-0.31519E-04	0.21823E-02	-0.46393E-05
340	-0.27013E-02	-0.33836E-04	-0.14840E-01	-0.32038E-04	0.21814E-02	-0.41046E-05
351	0.70514E-04	0.72052E-05	-0.14397E-01	-0.32050E-04	0.21826E-02	-0.48722E-05
400	0.70514E-04	0.12774E-04	-0.11902E-01	-0.32050E-04	0.21826E-02	-0.48722E-05
801	0.71017E-04	-0.27913E-05	-0.19502E-01	-0.32065E-04	0.21827E-02	-0.43757E-05
811	0.71021E-04	-0.32390E-04	-0.34282E-01	-0.33290E-04	0.21881E-02	-0.43825E-05
1106	0.74994E-01	0.10667E-02	-0.19544E-01	-0.39654E-03	0.27813E-01	-0.43756E-05
1156	-0.73220E-01	-0.11107E-02	-0.19551E-01	-0.41169E-03	0.27203E-01	-0.43914E-05
1210	0.78550E-03	0.30240E-05	0.10000E 01	0.18326F 00	0.23329E-02	-0.11772E-03
1310	0.38458E-03	-0.15276E-05	0.98252E 00	-0.18010E 00	0.23329E-02	0.52920F-04
1501	0.28320E-02	0.43003E-04	-0.16901E-01	-0.29417E-04	0.21803E-02	-0.50461E-05
1502	0.28322E-02	0.39438E-04	-0.18618E-01	-0.30364E-04	0.21796E-02	-0.51239E-05
1503	0.19234E-02	0.28622E-04	-0.16970E-01	-0.360 8E-04	0.21797E-02	-0.27347E-05
1504	0.19235E-02	0.25791E-04	-0.18686E-01	-0.34634E-04	0.21790E-02	-0.24455E-05

MODE NUMBER 8

GRID	T1	T2	T3	R1	R2	R3
10	0.21511E-05	-0.15328E-03	-0.65659E-03	0.54246E-02	0.10249E-03	-0.14215E-05
151	0.21691E-05	-0.14627E-03	-0.13856E-03	0.54213E-02	0.10248E-03	-0.12312E-05
175	-0.87492E-04	0.71632E-02	0.13376E-03	-0.64565E-06	-0.10090E-03	0.54159E-02
195	0.16942E-03	0.70213E-02	-0.65266E-04	-0.87614E-04	0.51797E-04	0.54164E-02
215	-0.82024E-04	0.68697E-02	-0.62060E-04	0.90044E-04	0.49228E-04	0.54165E-02
321	0.74806E-04	-0.40375E-02	-0.39603E-02	0.54178E-02	0.10255E-03	-0.58257E-06
322	0.76383E-04	-0.40373E-02	0.38247E-02	0.54182E-02	0.10126E-03	-0.15290E-05
331	0.14069E-05	-0.14455E-03	-0.33317E-02	0.54185E-02	0.10258E-03	-0.12709E-05
332	-0.51631E-04	0.27161E-02	0.16229E-02	0.54185E-02	0.10258E-03	-0.12122E-05
333	0.56676E-04	-0.30051E-02	0.16230E-02	0.54185E-02	0.10255E-03	-0.12021E-05
340	-0.12803E-03	0.67369E-02	-0.28538E-04	0.54203E-02	0.10268E-03	-0.17284E-05
351	0.21448E-05	-0.14429E-03	-0.77889E-05	0.54185E-02	0.10258E-03	-0.12197E-05
400	0.21448E-05	-0.14288E-03	0.10946E-03	0.54185E-02	0.10258E-03	-0.12197E-05
801	0.21605E-05	-0.14713E-03	-0.24725E-03	0.54163E-02	0.10150E-03	-0.13934E-05
811	0.21607E-05	-0.15672E-03	-0.93051E-03	0.54167E-02	0.10059E-03	-0.14219E-05
1106	0.18710E-01	-0.10000E 01	-0.24783E-03	0.38358E 00	0.71767E-02	-0.13934E-05
1156	-0.18362E-01	0.97919E 00	-0.10429E-02	0.37570F 00	0.70451E-02	-0.13977E-05
1210	0.18136E-03	-0.14929E-03	-0.30564E 00	-0.56534E-01	0.10930E-03	-0.29466E-04
1310	-0.10092E-03	-0.14713E-03	0.31102E 00	-0.57592E-01	0.10930E-03	-0.16830E-04
1501	0.12969E-03	-0.70099E-02	-0.47138E-02	0.54194E-02	0.10142E-03	-0.81972E-06
1502	0.12965E-03	-0.70105E-02	-0.47935E-02	0.54190E-02	0.10128E-03	-0.73079E-06
1503	0.89837E-04	-0.47321E-02	0.67369E-02	0.54195E-02	0.10188E-03	-0.10604E-05
1504	0.89834E-04	-0.47329E-02	0.66565E-02	0.54190E-02	0.10198E-03	-0.96140E-06

* meter/meter

** radian/meter

Table I-3: LST Mode Shapes (Continued)

MODE NUMBER 9

GRID	T1	T2	T3	R1	R2	R3
10	0.42562E-02	-0.60562E-04	0.83470E-04	0.28631E-06	-0.16360E-04	-0.28849E-04
151	0.42556E-02	0.85362E-04	0.66861E-06	0.30076E-06	-0.16213E-04	-0.29024E-04
175	-0.65080E-05	-0.99005E-04	0.42287E-02	-0.29118E-04	0.25339E-04	0.54662E-06
195	-0.81711E-04	0.56440E-04	0.42282E-02	0.28725E-04	0.25711E-04	0.15055E-06
215	0.90624E-04	0.43715E-04	0.42923E-02	0.42802E-06	-0.23341E-04	0.21564E-06
321	0.42221E-02	0.10448E-03	-0.10730E-04	-0.44329E-06	-0.17288E-04	-0.27046E-04
322	0.42639E-02	0.10528E-03	-0.10243E-04	0.10936E-05	-0.16922E-04	-0.31118E-04
331	0.42382E-02	0.11616E-03	-0.16827E-04	0.30972E-06	-0.16277E-04	-0.29145E-04
332	0.42733E-02	0.11629E-03	-0.16595E-04	0.30723E-06	-0.16200E-04	-0.29051E-04
333	0.42562E-02	0.11602E-03	-0.16608E-04	0.30463E-06	-0.16324E-04	-0.29032E-04
340	0.42758E-02	0.11628E-03	-0.17026E-04	0.26545E-06	-0.15894E-04	-0.28606E-04
351	0.42559E-02	0.12207E-03	-0.19981E-04	0.25577E-06	-0.16267E-04	-0.29075E-04
400	0.42559E-02	0.15530E-03	-0.38574E-04	0.25577E-06	-0.16267E-04	-0.29075E-04
801	0.42488E-02	0.54311E-04	0.17935E-04	0.29454E-06	-0.16084E-04	-0.28520E-04
811	0.42491E-02	-0.13893E-03	0.12673E-03	0.30001E-06	-0.16105E-04	-0.28668E-04
1106	-0.97091E 00	-0.12328E-01	0.17979E-04	0.47855E-02	-0.37687E 00	-0.28520E-04
1156	-0.10000E 01	-0.12832E-01	0.18057E-04	-0.49805E-02	0.38813E 00	-0.28763E-04
1210	0.12377E 00	0.54457E-04	-0.17533E-03	-0.34891E-04	-0.17479E-04	-0.19833E-01
1310	0.11510E 00	0.54458E-04	-0.14777E-03	0.29759E-04	-0.17331E-04	0.18406E-01
1501	0.42045E-02	0.87628E-04	-0.12752E-05	0.37580E-06	-0.16031E-04	-0.28600E-04
1502	0.42044E-02	0.65113E-04	0.11408E-04	0.33082E-06	-0.15966E-04	-0.28475E-04
1503	0.42715E-02	0.87840E-04	-0.64373E-06	0.31507E-06	-0.16103E-04	-0.28544E-04
1504	0.42715E-02	0.65380E-04	0.12028E-04	0.29167E-06	-0.15969E-04	-0.28739E-04

MODE NUMBER 10

GRID	T1	T2	T3	R1	R2	R3
10	0.47983E-04	-0.77031E-02	-0.88330E-04	-0.20204E-04	0.17419E-04	-0.26872E-03
151	0.47975E-04	-0.63491E-02	-0.43536E-06	-0.20092E-04	0.17360E-04	-0.26071E-03
175	0.81924E-05	0.61728E-02	0.70362E-04	-0.25747E-03	-0.17150E-04	-0.33916E-04
195	0.53682E-02	-0.31329E-02	-0.26311E-03	0.11330E-03	0.24124E-03	-0.13845E-04
215	-0.53764E-02	-0.31183E-02	0.33649E-03	0.14333E-03	-0.22382E-03	-0.14113E-04
321	-0.12651E-03	-0.61379E-02	0.26507E-04	-0.20955E-04	0.21025E-04	-0.25963E-03
322	0.24743E-03	-0.61377E-02	-0.31468E-05	-0.20488E-04	0.13941E-04	-0.25984E-03
331	-0.11053E-03	-0.60539E-02	0.30940E-04	-0.20337E-04	0.17269E-04	-0.25959E-03
332	0.11810E-03	-0.60646E-02	0.12629E-04	-0.20031E-04	0.17251E-04	-0.25997E-03
333	0.13635E-03	-0.60432E-02	0.12662E-04	-0.20057E-04	0.16931E-04	-0.25977E-03
340	0.25878E-04	-0.60742E-02	0.18639E-04	-0.18874E-04	0.17522E-04	-0.26887E-03
351	0.47975E-04	-0.60011E-02	0.22209E-04	-0.20141E-04	0.17255E-04	-0.25999E-03
400	0.47975E-04	-0.57040E-02	0.41932E-04	-0.20141E-04	0.17255E-04	-0.25999E-03
801	0.47907E-04	-0.66116E-02	-0.18074E-04	-0.20185E-04	0.17311E-04	-0.26772E-03
811	0.47915E-04	-0.84299E-02	-0.13599E-03	-0.20192E-04	0.17337E-04	-0.26929E-03
1106	-0.16756E-01	0.97772E 00	-0.18920E-04	-0.38041E 00	-0.65032E-02	-0.26772E-03
1156	-0.71675E-02	0.10000E 01	-0.24364E-04	0.38904E 00	0.28044E-02	-0.26772E-03
1210	0.44154E-01	-0.66295E-02	0.10958E-02	0.20656E-03	0.18642E-04	-0.72675E-02
1310	-0.41323E-01	-0.66295E-02	-0.76086E-03	0.13944E-03	0.18676E-04	-0.68134E-02
1501	-0.15588E-03	-0.62731E-02	0.19443E-04	-0.19763E-04	0.18412E-04	-0.26496E-03
1502	-0.15607E-03	-0.64319E-02	0.53834E-05	-0.19668E-04	0.18538E-04	-0.26501E-03
1503	0.40073E-03	-0.62815E-02	-0.24969E-04	-0.19357E-04	0.16556E-04	-0.26521E-03
1504	0.40089E-03	-0.64904E-02	-0.37890E-04	-0.19649E-04	0.16286E-04	-0.26476E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 11

GRID	T1	T2	T3	R1	R2	R3
10	0.14148E-03	0.18952E-03	-0.18538E-01	-0.75316E-04	0.36437E-02	0.31829E-04
151	0.14212E-03	0.28748E-04	-0.11742E-03	-0.75286E-04	0.36492E-02	0.31816E-04
175	0.16899E-02	-0.11020E-03	0.48175E-02	0.31706E-04	-0.35814E-02	-0.75315E-04
195	-0.85583E-03	-0.15500E-02	-0.21414E-02	-0.31823E-02	0.17657E-02	-0.69142E-04
215	-0.83336E-03	0.13679E-02	-0.22324E-02	0.31506E-02	0.18202E-02	-0.81129E-04
321	0.27771E-02	0.57112E-04	0.24428E-02	-0.79432E-04	0.36206E-02	0.52879E-04
322	0.27315E-02	0.64107E-04	0.23345E-02	-0.71158E-04	0.36211E-02	0.10112E-04
331	0.16144E-03	-0.50577E-05	0.38302E-02	-0.75122E-04	0.36539E-02	0.30751E-04
332	-0.17968E-02	-0.44674E-04	0.37615E-02	-0.75573E-04	0.36533E-02	0.31691E-04
333	0.20613E-02	0.34728E-04	0.37614E-02	-0.75033E-04	0.36544E-02	0.31715E-04
340	-0.44944E-02	-0.10081E-03	0.37901E-02	-0.75305E-04	0.36575E-02	0.31624E-04
351	0.14198E-03	-0.11439E-04	0.45268E-02	-0.75233E-04	0.36539E-02	0.31925E-04
400	0.14198E-03	-0.47929E-04	0.87032E-02	-0.75233E-04	0.36539E-02	0.31925E-04
801	0.14165E-03	0.62528E-04	-0.39975E-02	-0.75191E-04	0.36055E-02	0.31604E-04
811	0.14166E-03	0.27633E-03	-0.28386E-01	-0.76430E-04	0.36104E-02	0.31650E-04
1106	-0.10000E 01	-0.25272E-01	-0.40073E-02	0.98306E-02	-0.38841E 00	0.31604E-04
1156	0.97329E 00	0.15868E-01	-0.40252E-02	0.61469E-02	-0.37795E 00	0.31844E-04
1210	-0.99983E-03	0.62934E-04	0.37145E-01	0.74323E-02	0.38939E-02	0.18311E-03
1310	0.10813E-01	0.62742E-04	0.30549E-01	-0.62010E-02	0.38939E-02	0.17650E-02
1501	0.47385E-02	0.12019E-03	0.32615E-03	-0.75021E-04	0.36081E-02	0.31394E-04
1502	0.47379E-02	0.14489E-03	-0.25138E-02	-0.74857E-04	0.36077E-02	0.31983E-04
1503	0.31550E-02	0.89105E-04	0.16711E-03	-0.75177E-04	0.36081E-02	0.31863E-04
1504	0.31548E-02	0.11411E-03	-0.26730E-02	-0.75610E-04	0.36075E-02	0.31136E-04

MODE NUMBER 12

GRID	T1	T2	T3	R1	R2	R3
10	-0.20183E-01	0.48730E-04	0.74601E-03	0.10328E-04	-0.14830E-03	0.98568E-05
151	-0.20180E-01	-0.11722E-05	-0.33130E-05	0.10290E-04	-0.14942E-03	0.99612E-05
175	-0.81667E-04	0.19396E-04	-0.20340E-01	0.99747E-05	0.97980E-04	0.10304E-04
195	0.39890E-04	0.77040E-04	-0.20044E-01	0.12422E-03	-0.12884E-03	0.10064E-04
215	0.29356E-04	-0.56346E-04	-0.20066E-01	-0.13428E-03	-0.11200E-03	0.10560E-04
321	-0.20274E-01	-0.13066E-04	-0.11319E-03	0.14546E-04	-0.14294E-03	-0.19143E-05
322	-0.20289E-01	-0.17686E-04	-0.98355E-04	0.60766E-05	-0.14301E-03	0.21888E-04
331	-0.20175E-01	-0.11834E-04	-0.16948E-03	0.10242E-04	-0.14939E-03	0.10375E-04
332	-0.20105E-01	-0.62177E-05	-0.15985E-03	0.10278E-04	-0.14978E-03	0.98359E-05
333	-0.20263E-01	-0.17351E-04	-0.15978E-03	0.10266E-04	-0.14920E-03	0.97681E-05
340	-0.19988E-01	0.14370E-05	-0.16160E-03	0.10365E-04	-0.15165E-03	0.97451E-05
351	-0.20181E-01	-0.13829E-04	-0.19341E-03	0.10522E-04	-0.14945E-03	0.99680E-05
400	-0.20181E-01	-0.25222E-04	-0.36422E-03	0.10522E-04	-0.14945E-03	0.99680E-05
801	-0.20145E-01	0.94063E-05	0.15531E-03	0.10311E-04	-0.14719E-03	0.97888E-05
811	-0.20146E-01	0.77789E-04	0.11510E-02	0.10366E-04	-0.14740E-03	0.10443E-04
1106	0.25310E 00	0.34978E-03	0.15572E-03	-0.13693E-03	0.10571E 00	0.97880E-05
1156	0.23990E 00	-0.57698E-03	0.15818E-03	-0.23194E-03	-0.10045E 00	0.98518E-05
1210	0.10000E 01	0.94259E-05	-0.12246E-02	-0.25182E-03	-0.16096E-03	-0.16935E 00
1310	0.99486E 00	0.94328E-05	-0.60665E-03	0.13444E-03	-0.15968E-03	0.16849E 00
1501	-0.20324E-01	-0.14929E-04	-0.27596E-04	0.98556E-05	-0.14772E-03	0.99100E-05
1502	-0.20324E-01	-0.71034E-05	0.88278E-04	0.10081E-04	-0.14809E-03	0.92456E-05
1503	-0.20283E-01	-0.11084E-04	-0.57355E-05	0.10152E-04	-0.14721E-03	0.96137E-05
1504	-0.20283E-01	-0.35499E-05	0.11618E-03	0.10327E-04	-0.14782E-03	0.10634E-04

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 13

GRID	T1	T2	T3	R1	R2	R3
10	-0.28377E-03	-0.72836E-01	0.27097E-03	-0.13274E-03	-0.53684E-04	-0.14701E-01
151	-0.28371E-03	0.15082E-02	-0.21553E-06	-0.13286E-03	-0.52628E-04	-0.14731E-01
175	-0.27759E-04	-0.89318E-02	-0.35315E-03	-0.14761E-01	0.53385E-04	-0.91887E-04
195	-0.75951E-02	0.42321E-02	-0.16558E-01	0.74284E-02	0.12454E-01	-0.15043E-03
215	0.76227E-02	0.41854E-02	0.16061E-01	0.73379E-02	-0.12509E-01	-0.15108E-03
321	-0.10914E-01	0.11726E-01	0.41797E-04	-0.12139E-03	-0.13219E-03	-0.14757E-01
322	0.10269E-01	0.11726E-01	-0.11735E-03	-0.11977E-03	0.22357E-04	-0.14756E-01
331	-0.92778E-02	0.17241E-01	0.20967E-04	-0.13388E-03	-0.51915E-04	-0.14753E-01
332	0.42410E-02	0.17171E-01	-0.99583E-04	-0.13194E-03	-0.56433E-04	-0.14756E-01
333	0.41855E-02	0.17311E-01	-0.99664E-04	-0.13107E-03	-0.56729E-04	-0.14751E-01
340	-0.21591E-03	0.16981E-01	-0.58042E-04	-0.13571E-03	-0.55852E-04	-0.14576E-01
351	-0.28378E-03	0.20239E-01	-0.70274E-04	-0.13229E-03	-0.52475E-04	-0.14754E-01
400	-0.28378E-03	0.37102E-01	-0.13025E-03	-0.13229E-03	-0.52475E-04	-0.14754E-01
801	-0.28329E-03	-0.14120E-01	0.57872E-04	-0.13322E-03	-0.53810E-04	-0.14513E-01
811	-0.28293E-03	-0.11231E 00	0.42182E-03	-0.13321E-03	-0.53874E-04	-0.14536E-01
1106	0.29745E-02	0.84373E-01	0.58036E-04	-0.38018E-01	0.12877E-02	-0.14513E-01
1156	-0.20825E-01	0.90400E-01	0.26194E-04	0.40486E-01	0.93057E-02	-0.14513E-01
1210	-0.99251E 00	-0.14165E-01	0.26618E-02	0.50864E-03	-0.57738E-04	0.16764E 00
1310	0.10000E 01	-0.14165E-01	-0.31705E-02	0.62141E-03	-0.58621E-04	0.16897E 00
1501	-0.12643E-01	0.31993E-02	0.10516E-03	-0.13370E-03	-0.55186E-04	-0.14527E-01
1502	-0.12642E-01	-0.82350E-02	0.14794E-03	-0.13232E-03	-0.56634E-04	-0.14525E-01
1503	0.18066E-01	0.31435E-02	-0.17273E-03	-0.13321E-03	-0.54038E-04	-0.14526E-01
1504	0.18065E-01	-0.82902E-02	-0.13043E-03	-0.13248E-03	-0.51119E-04	-0.14526E-01

MODE NUMBER 14

GRID	T1	T2	T3	R1	R2	R3
10	0.13694E-03	-0.56992E-02	-0.18834E-01	0.10822E 00	0.33567E-02	-0.27964E-03
151	0.13796E-03	-0.42916E-02	-0.18523E-02	0.10810E 00	0.33614E-02	-0.27079E-03
175	-0.18678E-03	0.14401E 00	0.44191E-02	-0.25029E-03	-0.32640E-02	0.10791E 00
195	0.36736E-02	0.13798E 00	-0.23148E-02	-0.27631E-02	0.18751E-02	0.10795E 00
215	-0.34894E-02	0.13765E 00	-0.16949E-02	0.30740E-02	0.13966E-02	0.10794E 00
321	0.23485E-02	-0.81674E-01	-0.77132E-01	0.10798E 00	0.33442E-02	-0.23507E-03
322	0.27312E-02	-0.81662E-01	0.78042E-01	0.10800E 00	0.33011E-02	-0.29522E-03
331	-0.27662E-04	-0.39827E-02	-0.64099E-01	0.10801E 00	0.33679E-02	-0.27271E-03
332	-0.19583E-02	0.53039E-01	0.34663E-01	0.10801E 00	0.33675E-02	-0.27036E-03
333	0.19977E-02	-0.61002E-01	0.34665E-01	0.10801E 00	0.33670E-02	-0.26985E-03
340	-0.41342E-02	0.13319E 00	0.17497E-02	0.10807E 00	0.33738E-02	-0.26787E-03
351	0.13704E-03	-0.39269E-02	0.24272E-02	0.10801E 00	0.33678E-02	-0.27046E-03
400	0.13704E-03	-0.36178E-02	0.62766E-02	0.10801E 00	0.33678E-02	-0.27046E-03
801	0.13719E-03	-0.45565E-02	-0.53893E-02	0.10793E 00	0.32996E-02	-0.27477E-03
811	0.13721E-03	-0.64248E-02	-0.27612E-01	0.10795E 00	0.32847E-02	-0.27674E-03
1106	-0.20603E-01	0.67408E 00	-0.54110E-02	-0.31890E 00	-0.97467E-02	-0.27477E-03
1156	0.19882E-01	-0.65394E 00	0.20365E-01	-0.30660E 00	-0.93058E-02	-0.27476E-03
1210	-0.42595E-02	-0.45830E-02	-0.97794E 00	-0.20831E 00	0.37560E-02	0.78536E-03
1310	0.34413E-02	-0.45757E-02	0.10000E 01	-0.21429E 00	0.37560E-02	0.60393E-03
1501	0.40900E-02	-0.14104E 00	-0.92895E-01	0.10804E 00	0.32994E-02	-0.25452E-03
1502	0.40883E-02	-0.14124E 00	-0.95486E-01	0.10803E 00	0.32945E-02	-0.25116E-03
1503	0.32785E-02	-0.95644E-01	0.13531E 00	0.10804E 00	0.33142E-02	-0.26272E-03
1504	0.32782E-02	-0.95847E-01	0.13270E 00	0.10803E 00	0.33173E-02	-0.25946E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 15

GRID	T1	T2	T3	R1	R2	R3
10	0.68069E-06	-0.18549E-05	0.15235E-08	0.54633E-08	-0.33243E-09	-0.36432E-06
151	0.67931E-06	0.22656E-07	-0.33607E-09	0.53621E-08	0.46504E-09	-0.37388E-06
175	-0.14949E-08	-0.17602E-06	0.66432E-06	-0.38354E-06	0.23135E-07	0.17792E-07
195	-0.16336E-06	0.98823E-07	0.31626E-06	0.19225E-06	0.25604E-06	-0.13190E-09
215	0.16769E-06	0.98237E-07	0.10147E-05	0.19292E-06	-0.21202E-06	-0.40003E-09
321	0.40561E-06	0.25650E-06	-0.94494E-08	0.69957E-08	-0.27892E-07	-0.37696E-06
322	0.94817E-06	0.25878E-06	0.84274E-08	0.11469E-07	0.22100E-07	-0.38737E-06
331	0.44743E-06	0.40303E-06	-0.40979E-08	0.49562E-08	0.61253E-09	-0.38126E-06
332	0.79587E-06	0.40577E-06	0.94716E-09	0.56022E-08	-0.68289E-09	-0.38203E-06
333	0.79634E-06	0.40028E-06	0.89087E-09	0.58877E-08	-0.10963E-08	-0.38021E-06
340	0.67801E-06	0.38011E-06	-0.10667E-08	0.44718E-08	0.35110E-09	-0.32315E-06
351	0.67987E-06	0.48044E-06	-0.72483E-09	0.53591E-08	0.45452E-09	-0.38124E-06
400	0.67987E-06	0.91620E-06	-0.20531E-09	0.53591E-08	0.45452E-09	-0.38124E-06
801	0.66286E-06	-0.30205E-06	-0.11289E-10	0.50991E-08	-0.30413E-09	-0.30306E-06
811	0.66349E-06	-0.23375E-05	0.21247E-08	0.51073E-08	-0.31923E-09	-0.30975E-06
1106	-0.11862E-06	0.56233E-07	-0.10511E-10	-0.14796E-06	-0.31653E-06	-0.30306E-06
1156	-0.13178E-06	0.51966E-07	0.12479E-08	0.14075E-06	0.35140E-06	-0.30306E-06
1210	-0.58266E-04	-0.31487E-06	-0.74310E-08	-0.34645E-08	-0.39370E 02	0.23439E-03
1310	-0.12806E-04	-0.31486E-06	0.74479E-08	-0.34740E-08	0.39370E 02	-0.52022E-04
1501	0.40522E-06	0.52184E-07	-0.51541E-08	0.52522E-08	-0.48986E-09	-0.30718E-06
1502	0.40543E-06	-0.18858E-06	-0.47605E-08	0.55319E-08	-0.79772E-09	-0.30635E-06
1503	0.10486E-05	0.54610E-07	0.67526E-08	0.52866E-08	-0.44135E-09	-0.30672E-06
1504	0.10480E-05	-0.18584E-06	0.69752E-08	0.53952E-08	0.79836E-09	-0.30731E-06

MODE NUMBER 16

GRID	T1	T2	T3	R1	R2	R3
10	0.38884E-02	-0.10966E-02	-0.60282E 00	0.23029E-01	0.11806E 00	-0.15308E-04
151	0.42139E-02	-0.96624E-03	0.51001E-02	0.22801E-01	0.12096E 00	-0.13495E-04
175	0.60276E-01	0.30245E-01	0.13496E 00	-0.42306E-04	-0.87036E-01	0.22388E-01
195	-0.29193E-01	-0.21163E-01	-0.61761E-01	-0.10780E 00	0.44563E-01	0.25692E-01
215	-0.30743E-01	0.78647E-01	-0.61866E-01	0.10799E 00	0.44661E-01	0.19365E-01
321	0.86338E-01	-0.19015E-01	0.63719E-01	0.20488E-01	0.10656E 00	0.10545E-01
322	0.86421E-01	-0.15496E-01	0.96123E-01	0.24647E-01	0.10682E 00	-0.10908E-01
331	0.41598E-02	-0.77085E-03	0.11494E 00	0.22683E-01	0.12336E 00	-0.56200E-03
332	-0.60996E-01	0.11226E-01	0.13564E 00	0.22459E-01	0.12365E 00	-0.88843E-04
333	0.69271E-01	-0.12679E-01	0.13559E 00	0.22727E-01	0.12362E 00	-0.74326E-04
340	-0.15048E 00	0.27779E-01	0.13159E 00	0.22720E-01	0.12518E 00	-0.25547E-04
351	0.41443E-02	-0.72311E-03	0.15378E 00	0.22626E-01	0.12336E 00	0.28426E-04
400	0.41443E-02	-0.75560E-03	0.29477E 00	0.22626E-01	0.12336E 00	0.28426E-04
801	0.39901E-02	-0.90991E-03	-0.10062E 00	0.22486E-01	0.99073E-01	0.49053E-04
811	0.39933E-02	-0.59557E-03	-0.78156E 00	0.22007E-01	0.12104E 00	0.45529E-04
1106	-0.42280E-01	0.95976E-02	-0.10444E 00	-0.16459E-01	-0.72501E-01	0.49053E-04
1156	0.40439E-01	-0.91779E-02	-0.98883E-01	-0.15337E-01	-0.67585E-01	0.49157E-04
1210	-0.23067E-02	-0.94791E-03	0.39250E-01	0.23510E-01	-0.39370E 02	0.12707E-02
1310	-0.23500E-02	-0.94835E-03	0.10486E 00	-0.54132E-01	-0.39370E 02	-0.10237E-02
1501	0.13021E 00	-0.29689E-01	-0.19007E-02	0.22769E-01	0.10030E 00	-0.96588E-05
1502	0.12992E 00	-0.29696E-01	-0.80381E-01	0.22628E-01	0.10009E 00	0.29233E-03
1503	0.88128E-01	-0.19940E-01	0.45700E-01	0.22759E-01	0.10029E 00	0.18944E-03
1504	0.88031E-01	-0.19822E-01	-0.32917E-01	0.22516E-01	0.10006E 00	-0.16535E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 17

GRID	T1	T2	T3	R1	R2	R3
10	0.10341E-04	-0.30868E-04	-0.22531E-01	-0.23653E-03	0.23442E-02	-0.54686E-05
151	0.11660E-04	0.25504E-04	-0.10116E-01	-0.22554E-03	0.14478E-02	-0.15526E-04
175	-0.75772E-02	-0.26646E-03	0.10720E-02	-0.24687E-04	0.52666E-05	-0.22176E-03
195	0.37413E-02	0.60042E-02	-0.50456E-03	-0.10442E-02	-0.24644E-04	-0.13556E-02
215	0.37897E-02	-0.65580E-02	-0.52393E-03	0.10619E-02	0.72596E-05	0.96011E-03
321	-0.99231E-03	0.89986E-04	-0.72677E-02	-0.32471E-03	0.14136E-02	0.35187E-03
322	0.10205E-02	0.18904E-03	-0.76005E-02	-0.12357E-03	0.14597E-02	-0.39871E-03
331	-0.22980E-05	-0.36468E-04	-0.67718E-02	-0.21123E-03	0.14953E-02	-0.92772E-04
332	-0.77001E-03	-0.13432E-03	-0.69536E-02	-0.24134E-03	0.14324E-02	-0.62748E-04
333	0.81791E-03	0.94719E-04	-0.69730E-02	-0.18276E-03	0.14879E-02	-0.21628E-04
340	-0.18436E-02	-0.26696E-03	-0.67718E-02	-0.21813E-03	0.15216E-02	0.22161E-04
351	0.15069E-04	-0.13158E-04	-0.66017E-02	-0.21298E-03	0.14982E-02	-0.31142E-04
400	0.15069E-04	0.22437E-04	-0.48893E-02	-0.21298E-03	0.14982E-02	-0.31142E-04
801	0.45659E-04	0.73405E-05	-0.73636E-02	-0.20678E-03	0.68346E-03	0.98197E-05
811	0.45841E-04	0.80156E-04	-0.13184E-01	-0.25401E-03	0.88393E-03	0.10900E-04
1106	-0.15146E-03	-0.44932E-04	-0.92403E-02	0.16856E-03	-0.56966E-03	0.98197E-05
1156	0.13698E-03	0.42233E-04	-0.9302CE-02	0.15710E-03	-0.50807E-03	0.98204E-05
1210	-0.16951E-04	0.38318E-05	-0.10000E 01	-0.73795E 00	-0.32324E-03	0.89690E-05
1310	-0.30966E-04	0.83334E-05	-0.91902E 00	0.67819E 00	-0.32324E-03	-0.15645E-04
1501	0.88353E-03	0.25565E-03	-0.65564E-02	-0.71253E-04	0.57731E-03	-0.30931E-04
1502	0.88335E-03	0.25334E-03	-0.69921E-02	-0.12743E-03	0.54333E-03	-0.21507E-04
1503	0.55475E-03	0.12564E-03	-0.70617E-02	-0.42189E-03	0.54206E-03	0.10409E-03
1504	0.56066E-03	0.16758E-03	-0.74622E-02	-0.34013E-03	0.50233E-03	0.10396E-03

MODE NUMBER 18

GRID	T1	T2	T3	R1	R2	R3
10	-0.56063E-05	-0.94196E-03	-0.65345E-02	0.14287E-01	0.96453E-03	-0.69843E-04
151	0.79127E-05	-0.60696E-03	-0.11708E-02	0.13515E-01	0.96975E-03	-0.23923E-05
175	-0.66381E-03	0.16934E-01	0.21785E-03	0.12656E-03	0.44228E-03	0.12304E-01
195	0.71970E-03	0.16885E-01	-0.15786E-03	-0.79814E-03	-0.15690E-03	0.12458E-01
215	-0.70701E-04	0.15659E-01	-0.78644E-04	0.10557E-02	-0.21135E-03	0.12521E-01
321	0.54240E-03	-0.97511E-02	-0.98348E-02	0.12695E-01	0.57565E-03	0.46370E-03
322	0.50770E-03	-0.95983E-02	0.85956E-02	0.12901E-01	0.31045E-03	-0.40723E-03
331	0.30986E-05	-0.47759E-03	-0.80198E-02	0.12914E-01	0.10650E-02	-0.32135E-04
332	-0.56102E-03	0.63437E-02	0.37793E-02	0.12905E-01	0.10498E-02	-0.39060E-05
333	0.56506E-03	-0.72803E-02	0.37819E-02	0.12922E-01	0.10653E-02	0.34509E-05
340	-0.12661E-02	0.15900E-01	-0.37491E-04	0.13297E-01	0.11406E-02	-0.10532E-03
351	0.10980E-05	-0.47026E-03	0.61935E-04	0.12907E-01	0.10649E-02	0.12839E-05
400	0.10980E-05	-0.47173E-03	0.12792E-02	0.12907E-01	0.10649E-02	0.12839E-05
801	0.58934E-05	-0.42380E-03	-0.78379E-03	0.12446E-01	0.80354E-04	-0.24993E-04
811	0.59849E-05	-0.65364E-03	-0.71024E-03	0.12537E-01	-0.42382E-04	-0.35186E-04
1106	-0.17876E-04	0.27014E-02	-0.98561E-03	-0.10159E-01	-0.67445E-04	-0.24993E-04
1156	0.15169E-04	-0.25442E-02	0.27370E-02	-0.94891E-02	-0.55910E-04	-0.24993E-04
1210	-0.20919E-04	-0.54381E-03	0.91949E 00	0.68011E 00	-0.37916E-04	0.10091E-04
1310	0.14731E-04	-0.55026E-03	-0.10000E 01	0.73964E 00	-0.37916E-04	0.69119E-05
1501	0.11748E-03	-0.16405E-01	-0.11334E-01	0.13098E-01	0.70407E-04	0.97710E-04
1502	0.10400E-03	-0.16308E-01	-0.11348E-01	0.13017E-01	0.36070E-04	0.12364E-03
1503	0.98584E-04	-0.11092E-01	0.15264E-01	0.13095E-01	0.15697E-03	0.63519E-04
1504	0.96742E-04	-0.11027E-01	0.15111E-01	0.12999E-01	0.16910E-03	0.78149E-04

Table I-3: LST Mode Shapes (Continued)

MODE NUMBER 19

GRID	T1	T2	T3	R1	R2	R3
10	0.18535E-02	-0.10000E 01	-0.10755E 00	-0.23197E-02	0.14988E-01	-0.14013E 00
151	0.21926E-02	-0.15668E 00	-0.18709E-01	-0.19593E-02	0.16994E-01	-0.14385E 00
175	-0.11780E-01	0.10364E 00	-0.89109E-02	-0.16782E 00	0.26586E-01	-0.10536E-01
195	0.86517E-01	-0.45302E-01	0.80224E-01	0.67636E-01	-0.19642E 00	0.26725E-02
215	-0.74362E-01	-0.65106E-01	-0.67336E-01	0.10303E 00	0.17420E 00	0.17798E-02
321	-0.10400E 00	-0.72170E-01	-0.28490E-01	0.55769E-02	-0.82410E-01	-0.15890E 00
322	0.12070E 00	-0.66357E-01	0.40407E-02	0.15191E-01	0.80225E-01	-0.18480E 00
331	-0.10116E 00	-0.23063E-01	-0.28290E-02	-0.41877E-02	0.20388E-01	-0.16775E 00
332	0.43281E-01	-0.24310E-01	-0.30858E-02	-0.91384E-03	0.13958E-01	-0.17247E 00
333	0.64145E-01	-0.21601E-01	-0.32202E-02	0.71403E-03	0.13116E-01	-0.16457E 00
340	-0.19595E-01	-0.11949E 00	0.19795E-02	-0.72178E-03	0.18471E-01	0.25739E-01
351	0.20870E-02	0.11008E-01	0.47056E-03	-0.14607E-02	0.19634E-01	-0.16894E 00
400	0.20870E-02	0.20410E 00	0.22912E-01	-0.14607E-02	0.19634E-01	-0.16894E 00
801	0.15964E-02	0.49529E-01	0.63101E-02	-0.27886E-02	-0.10421E-01	0.92903E-01
811	0.12649E-02	0.78816E 00	0.88641E-01	-0.22780E-02	-0.12453E-01	0.11228E 00
1106	0.20994E-02	-0.84494E-02	0.95078E-02	0.39039E-01	0.90345E-02	0.92903E-01
1156	0.92390E-03	-0.72012E-02	0.85085E-02	-0.33626E-01	-0.50026E-02	0.92903E-01
1210	0.69591E-01	0.79125E-01	0.30517E-02	0.25553E-02	0.57208E-02	-0.32570E-01
1310	-0.67351E-01	0.79125E-01	0.13665E-01	-0.11591E-01	0.57205E-02	-0.33485E-01
1501	0.68387E-01	-0.60256E-01	-0.23270E-02	-0.21273E-02	-0.76458E-02	0.99611E-01
1502	0.68040E-01	0.15122E-01	0.48981E-02	-0.22860E-02	-0.91761E-02	0.99816E-01
1503	-0.12562E 00	-0.60958E-01	-0.10425E-01	-0.57405E-03	-0.14238E-01	0.10050E 00
1504	-0.12566E 00	0.14489E-01	-0.11096E-02	-0.18686E-02	-0.11789E-01	0.99284E-01

MODE NUMBER 20

GRID	T1	T2	T3	R1	R2	R3
10	0.73054E-02	-0.11967E 00	0.10000E 01	0.28950E-01	-0.13947E 00	-0.16780E-01
151	0.36387E-02	-0.20462E-01	0.16319E 00	0.26416E-01	-0.14360E 00	-0.15919E-01
175	0.89812E-01	0.41899E-01	0.97359E-01	-0.17174E-01	-0.23183E 00	0.22051E-01
195	-0.34696E-01	-0.66097E-01	-0.31738E-01	0.15793E 00	0.88389E-01	0.28927E-01
215	-0.56456E-01	0.11602E 00	-0.47257E-01	-0.13955E 00	0.13017E 00	0.16663E-01
321	-0.63093E-01	-0.54720E-02	0.83050E-01	0.49298E-01	-0.73529E-02	-0.13390E 00
322	-0.39286E-01	-0.42896E-01	0.12351E 00	0.27616E-02	0.52903E-02	0.10014E 00
331	-0.72739E-02	-0.35503E-02	0.80145E-02	0.23187E-01	-0.16979E 00	-0.10176E-01
332	0.99969E-01	0.80626E-02	0.29761E-01	0.27119E-01	-0.16503E 00	-0.16804E-01
333	-0.79884E-01	-0.17267E-01	0.30989E-01	0.22476E-01	-0.17331E 00	-0.17457E-01
340	0.19712E 00	0.16701E-01	-0.10741E-01	0.26025E-01	-0.18933E 00	0.18148E-02
351	0.42724E-02	-0.97630E-03	-0.11328E-01	0.24219E-01	-0.16995E 00	-0.18798E-01
400	0.42724E-02	0.20510E-01	-0.20558E 00	0.24219E-01	-0.16995E 00	-0.18798E-01
801	0.28449E-02	0.62398E-02	-0.56024E-01	0.22549E-01	0.94341E-01	0.10161E-01
811	0.28271E-02	0.87791E-01	-0.80724E 00	0.17645E-01	0.11375E 00	0.12408E-01
1106	-0.22047E-01	0.41556E-02	-0.86418E-01	-0.17967E-01	-0.96734E-01	0.10161E-01
1156	0.21165E-01	-0.60799E-02	-0.78145E-01	-0.26972E-01	-0.92853E-01	0.10161E-01
1210	0.57162E-02	0.10247E-01	-0.29022E-01	-0.24683E-01	-0.54958E-01	-0.28142E-02
1310	-0.88753E-02	0.10247E-01	-0.10793E 00	0.92790E-01	-0.54958E-01	-0.44567E-02
1501	0.12872E 00	-0.34268E-01	0.36578E-01	0.19834E-01	0.97266E-01	0.13502E-01
1502	0.13019E 00	-0.24704E-01	-0.38415E-01	0.21363E-01	0.98126E-01	0.10348E-01
1503	0.70083E-01	-0.25107E-01	0.86960E-01	0.30439E-01	0.98027E-01	0.71848E-02
1504	0.70029E-01	-0.17948E-01	0.11419E-01	0.27714E-01	0.10027E 00	0.10705E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 21

GRID	T1	T2	T3	R1	R2	R3
10	0.83120E-07	0.50612E-06	-0.12656E-07	0.45183E-09	0.14633E-08	0.61919E-07
151	0.80631E-07	0.11293E-06	-0.34916E-08	0.13992E-09	0.18200E-08	0.30794E-07
175	-0.24518E-08	-0.61138E-07	0.53283E-07	-0.35560E-07	0.43414E-07	0.39082E-07
195	-0.51763E-07	0.33241E-07	-0.41488E-08	-0.18778E-07	0.14577E-06	-0.18313E-07
215	0.59281E-07	0.28990E-07	0.11952E-06	-0.15851E-07	-0.73958E-07	-0.16243E-07
321	0.10315E-06	0.59769E-07	0.47458E-08	-0.67155E-08	-0.28027E-07	0.53964E-07
322	0.50795E-07	0.63008E-07	-0.89777E-08	-0.15960E-08	-0.36501E-07	0.32205E-07
331	0.10528E-06	0.54362E-07	-0.12381E-08	0.15765E-08	0.22351E-08	0.36621E-07
332	0.68503E-07	0.54686E-07	-0.18856E-08	-0.55577E-09	0.47243E-08	0.39770E-07
333	0.71215E-07	0.54192E-07	-0.20746E-08	-0.81016E-09	0.54953E-08	0.36605E-07
340	0.76029E-07	0.67788E-07	-0.26239E-08	-0.28572E-08	0.54619E-08	-0.32596E-07
351	0.81643E-07	0.46849E-07	-0.99602E-09	-0.14347E-09	0.26166E-08	0.38476E-07
400	0.81643E-07	0.28705E-08	0.15948E-08	-0.14347E-09	0.26166E-08	0.38476E-07
801	0.52549E-07	-0.70356E-07	0.12714E-08	0.83624E-09	-0.22043E-08	-0.67785E-07
811	0.53608E-07	-0.67962E-06	0.20735E-07	0.11048E-08	-0.29901E-08	-0.94303E-07
1106	-0.10369E-07	0.14978E-07	0.26766E-08	-0.75442E-07	-0.52356E-07	-0.67785E-07
1156	-0.14990E-07	0.14477E-07	0.31206E-08	0.72995E-07	0.75449E-07	-0.67785E-07
1210	-0.71873E-05	-0.16875E-06	0.19599E-08	0.19200E-08	0.39370E 02	-0.22243E-03
1310	-0.15572E-05	-0.16875E-06	0.31699E-10	-0.25893E-10	-0.39370E 02	0.49398E-04
1501	-0.98799E-08	0.16615E-07	-0.47045E-08	0.14945E-08	-0.63912E-08	-0.80809E-07
1502	-0.94200E-08	-0.42653E-07	-0.13420E-08	0.16633E-08	-0.55536E-08	-0.79236E-07
1503	0.14015E-06	0.16964E-07	0.15941E-08	-0.21558E-08	0.10617E-08	-0.79699E-07
1504	0.13941E-06	-0.41505E-07	0.22349E-08	-0.12610E-09	0.62314E-09	-0.80241E-07

MODE NUMBER 22

GRID	T1	T2	T3	R1	R2	R3
10	0.18524E-02	-0.46385E-02	0.18079E 00	0.10028E-01	-0.22116E-01	-0.64566E-03
151	0.12815E-02	-0.12032E-02	0.41935E-01	-0.86240E-02	-0.13680E-01	-0.34616E-04
175	0.22340E-01	0.95084E-02	0.28971E-01	0.35224E-03	-0.50188E-01	0.66590E-02
195	-0.10491E-01	-0.10068E-01	-0.12572E-01	0.14259E-01	0.24649E-01	0.16353E-01
215	-0.11611E-01	0.28958E-01	-0.12518E-01	-0.14057E-01	0.25206E-01	-0.25994E-02
321	-0.14093E-02	-0.24407E-02	0.21091E-01	0.11280E-01	0.69774E-02	-0.19018E-01
322	-0.15647E-02	-0.82447E-02	0.32295E-01	0.39484E-02	0.57957E-02	0.19637E-01
331	0.13764E-02	-0.56220E-04	0.13407E-01	0.74654E-02	-0.17248E-01	0.14988E-02
332	0.10510E-01	0.37195E-02	0.20178E-01	0.81197E-02	-0.16200E-01	0.53817E-03
333	-0.78255E-02	-0.42845E-02	0.20454E-01	0.71373E-02	-0.17588E-01	0.13324E-03
340	0.20429E-01	0.92323E-02	0.12464E-01	0.82504E-02	-0.20974E-01	-0.40514E-03
351	0.13535E-02	-0.31604E-03	0.14586E-01	0.75690E-02	-0.17276E-01	0.61391E-04
400	0.13535E-02	-0.38621E-03	-0.51614E-02	0.75690E-02	-0.17276E-01	0.61391E-04
801	0.55452E-03	0.30350E-03	-0.26737E-01	0.68578E-02	0.25707E-01	0.74771E-04
811	0.56039E-03	0.10309E-02	-0.25442E 00	0.45341E-02	0.34907E-01	0.11141E-03
1106	-0.74482E-02	0.18925E-02	-0.56339E-01	-0.92335E-02	-0.36397E-01	0.74771E-04
1156	0.70937E-02	-0.19859E-02	-0.52902E-01	-0.97043E-02	-0.34610E-01	0.74809E-04
1210	-0.28499E-03	0.72828E-03	-0.13476E-01	-0.13136E-01	0.39370E 02	-0.76375E-04
1310	-0.39041E-03	0.72811E-03	-0.28396E-01	0.27798E-01	0.39370E 02	-0.25360E-03
1501	0.33338E-01	-0.86710E-02	-0.11238E-02	0.61838E-02	0.28136E-01	0.86674E-03
1502	0.33397E-01	-0.82547E-02	-0.22211E-01	0.69330E-02	0.28135E-01	0.30559E-03
1503	0.22801E-01	-0.53656E-02	0.14500E-01	0.98962E-02	0.28674E-01	-0.10454E-02
1504	0.22658E-01	-0.55903E-02	-0.70978E-02	0.85181E-02	0.28988E-01	-0.45591E-03

Table I-3: LST Mode Shapes (Continued)

MODE NUMBER 23

GRID	T1	T2	T3	R1	R2	R3
10	-0.10776E-02	-0.10000E 01	-0.40989E-01	-0.57513E-02	0.60614E-02	-0.14983E 00
151	-0.11665E-02	0.19876E 00	0.10032E-01	-0.64650E-02	-0.35479E-02	0.10164E 00
175	0.49878E-02	-0.76262E-01	0.23402E-05	0.11266E 00	-0.15745E-02	-0.11438E 00
195	-0.67572E-01	0.29458E-01	-0.27755E-01	-0.59804E-01	0.45451E-01	0.44428E-01
215	0.62301E-01	0.32386E-01	0.26948E-01	-0.66251E-01	-0.47750E-01	0.51830E-01
321	0.67404E-01	0.19518E-01	0.29645E-01	-0.12236E-01	0.24847E-01	-0.97073E-01
322	-0.71504E-01	0.16172E-01	-0.23658E-01	-0.20711E-01	-0.22117E-01	0.10021E 00
331	0.94793E-01	-0.82449E-02	0.50503E-02	0.92954E-03	-0.65964E-02	0.14861E 00
332	-0.46102E-01	-0.92447E-02	-0.15862E-02	-0.67357E-02	0.30763E-02	0.16190E 00
333	-0.52076E-01	-0.74972E-02	-0.14856E-02	-0.74596E-02	0.97632E-02	0.14688E 00
340	0.21897E-02	0.61506E-01	-0.20336E-02	-0.25618E-01	0.14094E-03	-0.16152E-01
351	-0.11301E-02	-0.39373E-01	0.67940E-03	-0.44299E-02	-0.54317E-02	0.15659E 00
400	-0.11301E-02	-0.21836E 00	-0.55290E-02	-0.44299E-02	-0.54317E-02	0.15659E 00
801	-0.14111E-03	0.77357E-01	0.28565E-02	-0.35581E-02	-0.83972E-04	-0.24301E-01
811	0.84225E-04	-0.12362E 00	0.41589E-02	-0.36070E-02	-0.18247E-03	-0.31152E-01
1106	0.96121E-04	-0.31309E-01	0.13992E-01	0.17252E 00	0.52750E-03	-0.24301E-01
1156	-0.21932E-02	-0.27758E-01	0.98469E-02	-0.15315E 00	0.12090E-01	-0.24301E-01
1210	-0.21159E-01	0.64799E 00	-0.14311E-02	-0.16337E-02	-0.30129E-04	0.10953E-01
1310	0.21358E-01	0.64799E 00	0.56202E-02	-0.64012E-02	-0.30180E-04	0.11057E-01
1501	-0.17384E-01	0.10156E 00	0.10985E-01	-0.75382E-02	0.67799E-02	-0.15286E-01
1502	-0.17908E-01	0.88971E-01	0.82038E-02	-0.68167E-02	0.69699E-02	-0.16349E-01
1503	0.27408E-01	0.10028E 00	-0.55336E-02	-0.11564E-02	-0.52473E-02	-0.16789E-01
1504	0.27539E-01	0.88965E-01	-0.33142E-02	-0.38434E-02	-0.59996E-02	-0.15680E-01

MODE NUMBER 24

GRID	T1	T2	T3	R1	R2	R3
10	0.19354E-03	0.31405E-01	-0.10000E 01	0.27672E-02	0.15068E 00	0.47494E-02
151	-0.36852E-02	-0.15856E-01	0.30516E 00	0.23949E-02	-0.96992E-01	-0.36709E-02
175	0.92061E-01	0.33216E-02	0.27187E-01	-0.26788E-02	-0.63196E-01	0.56077E-02
195	-0.43260E-01	-0.64747E-01	-0.82742E-02	0.84666E-01	0.14486E-01	-0.76028E-01
215	-0.53016E-01	0.67736E-01	-0.91775E-02	-0.82038E-01	0.18489E-01	0.74824E-01
321	-0.36911E-01	0.21366E-01	0.73297E-01	0.51991E-01	0.12926E-01	-0.62784E-01
322	-0.32851E-01	-0.21092E-01	0.80862E-01	-0.45346E-01	0.95589E-02	0.59386E-01
331	-0.63879E-02	0.24574E-02	0.78738E-02	0.19172E-02	-0.15454E 00	0.11721E-01
332	0.81447E-01	0.49044E-03	0.79337E-02	0.77239E-02	-0.13918E 00	0.17028E-02
333	-0.83033E-01	-0.15539E-02	0.11394E-01	-0.21183E-02	-0.15592E 00	-0.62461E-02
340	0.11829E 00	-0.58259E-03	-0.28649E-01	0.31497E-02	-0.10696E 00	-0.16955E-02
351	-0.26728E-02	0.385845-03	-0.21473E-01	0.19701E-02	-0.15487E 00	-0.58877E-02
400	-0.26728E-02	0.71154E-02	-0.19848E 00	0.19701E-02	-0.15487E 00	-0.58877E-02
801	0.38272E-02	-0.84858E-03	0.79447E-01	0.14413E-02	0.17341E-01	0.61416E-03
811	0.38920E-02	0.47911E-02	-0.49048E-01	0.54859E-03	0.19560E-01	0.86439E-03
1106	-0.11741E-01	0.12098E-02	0.50608E 00	-0.67241E-02	-0.65166E-01	0.61416E-03
1156	0.82505E-02	-0.44604E-03	0.50826E 00	-0.24559E-02	-0.45650E-01	0.61420E-03
1210	-0.22262E-02	-0.12546E-01	0.61238E-01	0.71170E-01	0.55764E-02	0.11746E-02
1310	-0.33311E-02	-0.12541E-01	0.58323E-01	-0.67773E-01	0.55764E-02	-0.17477E-02
1501	0.26569E-01	-0.34806E-02	0.99220E-01	0.59077E-02	0.19011E-01	-0.30833E-03
1512	0.26510E-01	-0.30406E-02	0.85604E-01	0.24127E-02	0.19457E-01	0.12775E-03
1503	0.17036E-01	-0.48460E-02	0.10049E 00	-0.16097E-02	0.17613E-01	0.34715E-02
1504	0.16938E-01	-0.31596E-02	0.88004E-01	0.18871E-02	0.17252E-01	0.37744E-02

Table I-3: LST Mode Shapes (Continued)

MODE NUMBER 25

GRID	T1	T2	T3	R1	R2	R3
10	0.12403E-08	-0.40437E-07	0.13694E-05	-0.16958E-06	-0.21654E-06	-0.63982E-08
151	0.57028E-08	0.42466E-07	-0.93851E-06	-0.12576E-06	0.12102E-06	0.39528E-08
175	-0.20499E-06	-0.12238E-06	-0.42663E-08	-0.28530E-08	0.62680E-07	-0.83348E-07
195	0.94495E-07	-0.13017E-07	-0.41376E-08	-0.63951E-07	-0.89702E-08	-0.61548E-07
215	0.11234E-06	-0.22667E-06	-0.45812E-08	0.51354E-07	-0.13587E-07	-0.97314E-07
321	-0.57993E-07	0.36068E-07	-0.96442E-07	-0.18866E-06	0.39032E-07	0.67755E-07
322	0.55731E-07	0.99854E-07	-0.24452E-06	-0.95438E-08	0.56626E-07	-0.66658E-07
331	0.78907E-08	-0.86272E-08	-0.19771E-07	-0.10205E-06	0.20829E-06	-0.24414E-07
332	-0.10848E-06	-0.56333E-07	-0.10655E-06	-0.11130E-06	0.17758E-06	-0.10568E-07
333	0.11461E-06	0.50472E-07	-0.11384E-06	-0.88576E-07	0.20598E-06	0.83755E-08
340	-0.13749E-06	-0.12085E-06	-0.25745E-07	-0.11535E-06	0.10629E-06	0.83641E-08
351	0.47335E-08	-0.37801E-08	-0.39802E-07	-0.10014E-06	0.20910E-06	0.50862E-08
400	0.47335E-08	-0.95936E-08	0.19920E-06	-0.10014E-06	0.20910E-06	0.50862E-08
801	-0.42646E-08	-0.43269E-12	-0.95633E-07	-0.82532E-07	0.18807E-08	-0.49651E-09
811	-0.43437E-08	-0.51011E-08	-0.21307E-06	-0.88805E-07	0.20062E-07	-0.78431E-09
1106	0.99293E-09	-0.59470E-07	-0.10048E-05	0.33631E-06	0.56975E-08	-0.49651E-09
1156	0.36139E-08	0.58405E-07	-0.12111E-05	0.33025E-06	-0.20516E-07	-0.49650E-09
1210	0.27597E-08	-0.10000E 01	0.55480E-05	-0.19383E-06	0.54738E-09	-0.14552E-08
1310	0.36876E-08	0.10000E 01	-0.12560E-05	-0.14102E-07	0.54725E-09	0.19375E-08
1501	-0.59493E-08	0.11299E-06	-0.29110E-07	-0.99695E-07	-0.45543E-08	-0.62319E-08
1502	-0.50436E-08	0.10849E-06	-0.27081E-07	-0.97835E-07	-0.47767E-08	-0.73509E-08
1503	-0.45593E-08	0.74111E-07	-0.21520E-06	-0.11365E-06	-0.87765E-08	-0.54740E-09
1504	-0.40745E-08	0.71937E-07	-0.20723E-06	-0.10694E-06	-0.10591E-07	-0.37554E-09

MODE NUMBER 26

GRID	T1	T2	T3	R1	R2	R3
10	0.55578E-03	-0.37889E 00	-0.87239E-02	-0.11145E-02	0.13298E-02	-0.62994E-01
151	0.49382E-03	0.37958E 00	0.95348E-02	-0.39466E-02	-0.77245E-03	0.30985E-01
175	0.25068E-02	-0.37934E-01	0.34093E-03	0.95731E-02	-0.26817E-03	0.23659E-01
195	-0.67599E-01	0.17425E-01	0.87398E-02	-0.57454E-02	0.46957E-02	-0.11449E-01
215	0.65264E-01	0.17820E-01	-0.81337E-02	-0.63579E-02	-0.33026E-02	-0.91648E-02
321	0.15527E-01	0.35848E-01	0.16149E-01	-0.28665E-02	-0.25234E-01	0.16888E-01
322	-0.15597E-01	0.33990E-01	-0.13967E-01	-0.70620E-02	0.22634E-01	0.18412E-01
331	0.35771E-01	0.35430E-01	-0.76014E-03	0.29681E-02	-0.87354E-03	0.48237E-01
332	-0.16992E-01	0.36331E-01	-0.40801E-02	-0.48697E-02	0.29183E-02	0.58872E-01
333	-0.17212E-01	0.35710E-01	-0.48148E-02	-0.32168E-02	0.10213E-01	0.50293E-01
340	0.14759E-02	0.31519E-01	-0.20143E-02	-0.37958E-01	-0.11387E-02	0.56457E-01
351	0.51708E-03	0.25112E-01	-0.26187E-02	-0.17198E-02	-0.21496E-03	0.56989E-01
400	0.51708E-03	-0.40027E-01	-0.28644E-02	-0.17199E-02	-0.21496E-03	0.56989E-01
801	0.26492E-03	0.24567E-01	0.15950E-03	-0.49955E-03	0.70943E-04	0.85289E-02
811	0.11840E-03	0.13544E 00	-0.69571E-03	-0.52964E-03	0.13946E-03	0.17779E-01
1106	-0.21601E-03	-0.15233E-01	0.21934E-02	0.87221E-01	-0.12352E-02	0.85289E-02
1156	0.11203E-02	-0.14452E-01	0.55963E-03	-0.82770E-01	-0.64135E-02	0.85289E-02
1210	0.78821E-02	-0.10000E 01	-0.40156E-03	-0.49227E-03	0.20107E-04	-0.40985E-02
1310	-0.82887E-02	-0.10000E 01	0.66465E-03	-0.80168E-03	0.20121E-04	-0.43125E-02
1501	0.50314E-02	0.23588E-01	-0.17990E-02	-0.11656E-02	-0.35863E-02	0.94576E-03
1502	0.55018E-02	0.24885E-01	-0.49159E-03	-0.14550E-02	-0.39090E-02	0.11991E-02
1503	-0.77180E-02	0.23026E-01	0.13452E-02	-0.33070E-02	0.28694E-02	0.18699E-02
1504	-0.80476E-02	0.24846E-01	0.31744E-03	-0.20316E-02	0.34166E-02	0.56975E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 27

GRID	T1	T2	T3	R1	R2	R3
10	-0.27022E-03	0.83265E-03	-0.47006E-01	0.20481E-03	0.78309E-02	0.13857E-03
151	-0.28028E-03	-0.18719E-02	0.95438E-01	0.16747E-03	-0.17175E-02	-0.26326E-04
175	0.11602E-01	0.19885E-03	-0.43928E-02	0.19784E-05	0.14700E-02	0.22027E-03
195	-0.52527E-02	-0.10065E-02	0.23553E-02	-0.59911E-02	-0.13319E-02	0.98279E-02
215	-0.58028E-02	0.12247E-02	0.23528E-02	0.60420E-02	-0.11965E-02	-0.97718E-02
321	-0.28681E-02	0.13205E-02	0.83946E-02	0.61113E-02	-0.10082E-01	0.22922E-03
322	-0.28262E-02	-0.13946E-02	0.87935E-02	-0.56117E-02	-0.10195E-01	-0.54170E-03
331	-0.10002E-03	0.12255E-02	0.61399E-02	0.43667E-03	-0.51573E-02	0.16456E-02
332	0.24851E-02	0.10038E-02	0.58266E-02	0.78097E-03	-0.30956E-02	0.13527E-02
333	-0.32221E-02	0.63888E-03	0.62958E-02	-0.84569E-03	-0.43931E-02	-0.27592E-03
340	0.37369E-03	0.10252E-03	0.44577E-02	-0.15840E-03	0.26722E-02	-0.48098E-03
351	-0.27873E-03	0.91421E-03	0.52167E-02	0.13147E-03	-0.52226E-02	0.25870E-03
400	-0.27673E-03	0.51851E-03	-0.75283E-03	0.13147E-03	-0.52226E-02	0.25870E-03
801	0.52636E-05	-0.38844E-04	-0.26150E-02	0.95118E-04	-0.35015E-02	0.12032E-04
811	0.52260E-05	0.67609E-04	0.34948E-01	0.76986E-03	-0.59102E-02	0.16678E-04
1106	0.39013E-02	0.13940E-03	-0.10000E 01	-0.81154E-03	0.22692E-01	0.12032E-04
1156	-0.38376E-02	-0.71516E-04	-0.99135E 00	-0.41163E-03	0.22320E-01	0.12015E-04
1210	0.77016E-05	0.38382E-03	-0.21461E-02	-0.26624E-02	-0.94865E-03	-0.39856E-05
1310	-0.16183E-04	0.38394E-03	-0.23641E-02	0.29333E-02	-0.94865E-03	-0.84574E-05
1501	-0.41256E-02	-0.19444E-03	-0.59169E-02	-0.12150E-02	-0.30761E-02	0.31453E-03
1502	-0.41934E-02	-0.16499E-03	-0.37419E-02	-0.38698E-03	-0.30252E-02	0.31932E-03
1503	-0.25283E-02	0.41879E-03	-0.51162E-02	0.17166E-02	-0.26799E-02	-0.83826E-03
1504	-0.25593E-02	0.10370E-03	-0.33138E-02	0.71652E-03	-0.24847E-02	-0.10257E-02

MODE NUMBER 28

GRID	T1	T2	T3	R1	R2	R3
10	-0.43006E-05	-0.14039E-03	0.11674E-03	-0.23091E-02	-0.28862E-04	-0.23958E-04
151	-0.26475E-05	0.40395E-03	-0.56100E-03	-0.16339E-02	0.23109E-04	0.13244E-05
175	-0.74038E-04	-0.15107E-02	-0.60586E-04	-0.92255E-04	0.10946E-03	-0.92071E-03
195	0.47850E-05	-0.14951E-02	0.41679E-04	-0.52771E-04	-0.59943E-04	-0.10880E-02
215	0.75706E-04	-0.15366E-02	0.84492E-05	-0.80745E-04	-0.49640E-04	-0.96131E-03
321	-0.13028E-04	0.87213E-03	0.81803E-03	-0.12492E-02	-0.91923E-04	0.73545E-05
322	0.21918E-04	0.89446E-03	-0.56661E-03	-0.11806E-02	0.13110E-03	-0.71669E-04
331	0.68035E-05	0.16702E-04	0.71973E-03	-0.12647E-02	0.53129E-04	-0.35980E-05
332	-0.34852E-04	-0.64862E-03	-0.43157E-03	-0.12754E-02	0.37628E-04	0.41714E-05
333	0.23711E-04	0.68371E-03	-0.43912E-03	-0.12613E-02	0.60418E-04	0.93778E-05
340	-0.26221E-04	-0.15788E-02	-0.21511E-04	-0.15068E-02	0.11868E-04	0.88181E-04
351	-0.85907E-06	0.16188E-04	-0.40237E-04	-0.12637E-02	0.54029E-04	0.12837E-04
400	-0.85907E-06	0.15153E-05	0.21519E-04	-0.12637E-02	0.54029E-04	0.12837E-04
801	-0.15636E-05	-0.28025E-04	0.12055E-03	-0.10173E-02	-0.51293E-04	0.92951E-05
811	-0.17209E-05	0.56307E-04	0.33195E-03	-0.10498E-02	-0.20709E-04	0.13272E-04
1106	0.59503E-04	-0.11287E-02	-0.99281E 00	0.65701E-02	0.34641E-03	0.92951E-05
1156	-0.53806E-04	0.11574E-02	0.10000E 01	0.67340E-02	0.31312E-03	0.92948E-05
1210	0.10509E-04	0.26904E-03	-0.10650E-02	-0.13250E-02	-0.13985E-04	-0.54852E-05
1310	-0.79856E-05	0.26908E-03	0.12736E-02	-0.15841E-02	-0.13885E-04	-0.41558E-05
1501	-0.71633E-04	0.13626E-02	0.96075E-03	-0.13069E-02	-0.57735E-04	-0.66498E-04
1502	-0.67657E-04	0.13088E-02	0.98446E-03	-0.12709E-02	-0.42905E-04	-0.70284E-04
1503	-0.56593E-04	0.89364E-03	-0.13288E-02	-0.13572E-02	-0.10434E-03	-0.23820E-04
1504	-0.55506E-04	0.86391E-03	-0.12362E-02	-0.12866E-02	-0.11614E-03	-0.37138E-04

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 29

GRID	T1	T2	T3	R1	R2	R3
10	-0.10898E-03	-0.42038E-02	-0.99307E-04	-0.3361.E-03	0.3091CE-04	-0.90049E-03
151	-0.10279E-03	-0.23347E-01	-0.14277E-02	-0.86722E-06	-0.76303E-04	0.16127E-02
175	0.83075E-04	-0.37732E-02	0.20931E-04	0.37365E-02	-0.86397E-04	-0.54201E-02
195	-0.60426E-03	0.14778E-02	-0.13450E-02	-0.18359E-02	0.60057E-03	0.20628E-02
215	0.48329E-03	0.17269E-02	0.12420E-02	-0.21908E-02	-0.88643E-03	0.23492E-02
321	0.15404E-02	0.19718E-02	-0.11824E-03	-0.23645E-03	0.33629E-02	0.26409E-02
322	-0.16770E-02	0.19538E-02	0.33486E-03	-0.20935E-03	-0.27944E-02	0.26632E-02
331	0.97464E-03	0.10221E-02	0.41229E-03	-0.24411E-03	-0.17061E-03	0.21852E-02
332	-0.54056E-03	0.87653E-03	0.33274E-03	0.94118E-04	-0.67669E-05	0.19153E-02
333	-0.74410E-03	0.10296E-02	0.41374E-03	-0.13347E-03	-0.31998E-03	0.19063E-02
340	-0.49231E-04	0.40791E-02	0.12285E-03	0.24777E-02	0.11587E-03	-0.61549E-02
351	-0.10294E-03	0.57269E-03	0.36265E-03	-0.93191E-04	-0.16809E-03	0.18090E-02
400	-0.10294E-03	-0.14950E-02	0.17052E-03	-0.93191E-04	-0.16809E-03	0.18090E-02
801	-0.13864E-04	0.48695E-02	0.20282E-03	-0.15086E-03	0.17401E-04	-0.10662E-02
811	0.59384E-06	-0.36170E-02	0.10380E-03	-0.15584E-03	0.16383E-04	-0.13629E-02
1106	-0.35619E-03	-0.21020E 00	-0.11754E-02	0.12837E 01	-0.21750E-02	-0.10662E-02
1156	-0.90361F-02	-0.19419E 00	-0.56738E-03	-0.11860E 01	0.55186E-01	-0.10663E-02
1210	-0.11904E-02	-0.16675F-01	0.51613E-05	0.64499F-05	0.51392E-05	0.62313E-03
1310	0.12159E-02	-0.16675E-01	0.44682F-03	-0.59156E-03	0.51373E-05	0.63658E-03
1501	-0.67114E-03	0.57728E-02	0.72134E-03	-0.48564E-03	0.52014E-03	-0.45742E-03
1502	-0.70305E-03	0.53483F-02	0.50507E-03	-0.44222E-03	0.52615E-03	-0.54180E-03
1503	0.11576E-02	0.57219E-02	-0.22491E-03	0.20925E-04	-0.35386E-03	-0.56715E-03
1504	0.11603E-02	0.52477F-02	-0.90716E-04	-0.19137E-03	-0.39339E-03	-0.50469E-03

MODE NUMBER 30

GRID	T1	T2	T3	R1	R2	R3
10	0.11080E-03	0.13793E-04	0.23614E-02	0.71047E-05	-0.43388E-03	0.79845E-05
151	0.12260E-03	-0.33572E-04	0.83755E-02	-0.34871E-05	0.57185E-03	-0.68077E-05
175	-0.30707E-03	0.48206E-04	-0.15079E-03	-0.29645E-04	0.41085E-04	0.13669E-04
195	0.21314E-03	0.10931E-02	0.16252E-03	-0.12459E-02	0.18205E-03	0.14971E-02
215	0.21313E-03	-0.11287E-02	0.87346E-04	0.12883E-02	0.27175E-03	-0.14982E-02
321	0.12436E-03	-0.19760F-04	-0.46343E-03	0.33866E-03	-0.11219E-02	0.27846E-03
322	0.15183E-03	-0.62957E-04	-0.48434E-03	-0.33164F-03	-0.10320E-02	-0.37940E-03
331	0.14484E-03	0.10155E-03	-0.33149E-03	0.53795E-04	0.64931E-03	0.16713E-04
332	-0.22402E-03	0.10301E-03	-0.36351F-03	0.22341E-04	0.74232E-03	0.83464E-04
333	0.44234F-03	0.70266E-04	-0.34646E-03	-0.65320E-04	0.75156E-03	-0.29044E-04
340	-0.75584E-03	-0.31022E-04	-0.24868F-03	-0.58515F-04	0.10808E-02	0.21590E-04
351	0.12092E-03	0.90352E-04	-0.20312F-03	0.28385E-05	0.64523E-03	0.29323E-04
400	0.12092E-03	0.56836E-04	0.53438F-03	0.28385F-05	0.64523E-03	0.29323E-04
801	0.10370E-05	-0.15499E-05	-0.22703E-02	0.28284F-05	-0.72735E-04	0.35101E-04
811	0.25517F-06	0.45670E-03	-0.37713E-02	-0.76161E-04	0.26066E-03	0.74157E-04
1106	0.21035F 00	0.11736E-01	0.12872E-01	-0.72047E-01	0.12959E 01	0.35101E-04
1156	-0.19226E 00	-0.46095E-02	0.12868E-01	-0.28178E-01	0.11753E 01	0.34363E-04
1210	0.38770F-04	0.51747F-05	-0.25421E-02	-0.33688E-02	-0.21582E-04	-0.20295E-04
1310	-0.40682E-04	0.52200E-05	-0.25505E-02	0.33798E-02	-0.21582E-04	-0.21303E-04
1501	-0.56044E-04	-0.44075E-04	-0.23550E-02	-0.15072E-03	-0.57478E-04	0.74761E-04
1502	-0.60007E-04	-0.15521F-04	-0.23160E-02	-0.19804E-04	-0.81375E-04	0.56603F-04
1503	-0.66102E-04	0.30772E-04	-0.22711E-02	0.14464E-03	0.45984E-05	-0.71989F-04
1504	-0.67465E-04	0.14389F-04	-0.22808E-02	-0.13022E-06	0.15197E-04	-0.81340F-04

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 31

GRID	T1	T2	T3	R1	R2	R3
10	0.23657E-02	0.25039E-04	-0.23655E-03	0.18309E-05	0.26921E-04	0.16397E-05
151	0.21851E-02	-0.13326E-03	0.24053E-03	0.44415E-05	0.80591E-05	0.14513E-04
175	0.21855E-03	-0.25910E-04	0.64088E-03	0.30841E-04	0.23824E-02	-0.30730E-04
195	0.18590E-03	0.37464E-04	0.68711E-03	-0.20680E-04	0.23670E-02	0.14676E-04
215	0.20177E-03	-0.88185E-05	0.75736E-03	-0.82002E-05	0.22802E-02	0.15367E-04
321	0.19384E-02	-0.88237E-04	-0.85522E-05	-0.18286E-03	-0.23954E-03	0.56332E-03
322	0.19096E-02	0.11506E-03	-0.10614E-04	0.17981E-03	-0.30140E-03	-0.51502E-03
331	0.22619E-02	0.15149E-04	-0.31001E-05	0.54100E-05	-0.19872E-04	0.99321E-05
332	0.22513E-02	0.54937E-05	-0.13759E-04	0.64121E-05	0.10450E-04	0.33813E-04
333	0.22325E-02	0.16069E-04	-0.15044E-04	-0.10286E-05	-0.26926E-04	0.29870E-04
340	0.20579E-02	0.42016E-04	-0.54647E-04	0.12245E-04	0.14714E-03	-0.55524E-04
351	0.22471E-02	0.75019E-05	-0.13125E-04	-0.95559E-05	-0.17003E-04	0.21615E-04
400	0.22471E-02	-0.17204E-04	-0.32559E-04	-0.95559E-05	-0.17003E-04	0.21615E-04
801	0.47760E-03	-0.11503E-04	-0.29531E-04	0.90532E-06	-0.13654E-04	-0.33862E-04
811	0.49117E-03	-0.51306E-03	0.11514E-03	0.36382E-05	-0.22854E-04	-0.84910E-04
1106	0.19241E 00	-0.52989E-02	0.16700E-03	0.32396E-01	0.11763E 01	-0.33862E-04
1156	0.21037E 00	-0.43313E-02	0.16579E-03	-0.26480E-01	-0.12861E 01	-0.33054E-04
1210	0.47882E-03	0.38771E-04	-0.31814E-04	-0.42164E-04	-0.40538E-05	0.25250E-03
1310	-0.40214E-03	0.38772E-04	-0.34485E-04	0.45707E-04	-0.40541E-05	-0.21236E-03
1501	0.46115E-03	0.14907E-04	-0.37525E-04	0.18842E-04	-0.99457E-05	-0.50579E-04
1502	0.44985E-03	-0.15480E-04	-0.24536E-04	0.11602E-04	0.62100E-05	-0.19093E-04
1503	0.52587E-03	0.31814E-04	-0.40761E-04	0.79410E-05	-0.32615E-04	-0.10959E-04
1504	0.52372E-03	0.13010E-04	-0.27003E-04	-0.63567E-06	-0.22262E-05	-0.60540E-04

MODE NUMBER 32

GRID	T1	T2	T3	R1	R2	R3
10	-0.81912E-05	0.10699E-03	-0.46449E-03	-0.41787E-02	0.74668E-04	0.23099E-04
151	-0.93169E-05	0.37288E-03	-0.12201E-02	-0.26913E-02	-0.72567E-04	-0.33697E-04
175	0.41695E-04	-0.22491E-02	-0.59241E-04	-0.19007E-03	0.12074E-03	-0.13378E-02
195	0.12837E-04	-0.25024E-02	0.46803E-04	0.40555E-04	-0.93731E-04	-0.17152E-02
215	-0.50344E-04	-0.22046E-02	0.20648E-05	-0.29077E-03	-0.65373E-04	-0.12688E-02
321	-0.74566E-04	0.13053E-02	0.14132E-02	-0.19215E-02	-0.76292E-04	-0.84920E-04
322	0.30052E-04	0.13161E-02	-0.13243E-02	-0.18281E-02	0.30547E-03	-0.75551E-04
331	-0.33776E-04	-0.38395E-04	0.12320E-02	-0.19807E-02	-0.73276E-04	-0.46572E-04
332	0.44263E-04	-0.10804E-02	-0.55924E-03	-0.19836E-02	-0.96800E-04	-0.58543E-04
333	-0.29407E-04	0.10008E-02	-0.56981E-03	-0.19646E-02	-0.80195E-04	-0.40020E-04
340	0.10248E-03	-0.25193E-02	0.43714E-04	-0.23914E-02	-0.13567E-03	0.10639E-03
351	-0.52305E-05	-0.30195E-04	0.17303E-04	-0.19701E-02	-0.72535E-04	-0.44428E-04
400	-0.52305E-05	0.20585E-04	-0.65604E-04	-0.19701E-02	-0.72535E-04	-0.44428E-04
801	0.10688E-05	-0.96356E-04	0.43479E-03	-0.15007E-02	-0.59385E-04	0.79316E-05
811	0.11076E-05	-0.97061E-04	0.74313E-03	-0.15526E-02	-0.29323E-04	-0.97036E-06
1106	-0.79581E-02	0.19380E 00	-0.24429E-02	-0.11852E 01	-0.48668E-01	0.79316E-05
1156	0.78379E-02	-0.21040E 00	-0.43717E-03	-0.12867E 01	-0.47934E-01	0.79617E-05
1210	0.80015E-05	0.32339E-03	-0.17292E-02	-0.22953E-02	-0.17660E-04	-0.41853E-05
1310	-0.59745E-05	0.32342E-03	0.27074E-02	-0.35922E-02	-0.17660E-04	-0.52265E-05
1501	-0.95370E-04	0.19912E-02	0.17198E-02	-0.20248E-02	-0.57946E-04	-0.12775E-03
1502	-0.78978E-04	0.18910E-02	0.17255E-02	-0.19587E-02	-0.26192E-04	-0.13222E-03
1503	-0.62672E-04	0.12799E-02	-0.17162E-02	-0.21250E-02	-0.15716E-03	-0.39720E-04
1504	-0.60717E-04	0.12266E-02	-0.15733E-02	-0.19807E-02	-0.18004E-03	-0.62147E-04

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 33

GRID	T1	T2	T3	R1	R2	R3
10	-0.30367E-02	0.24258E-01	0.33403E 00	-0.11606E-01	-0.71805E-01	0.53845E-02
151	0.87035E-03	0.44850E-01	0.90065E 00	-0.79812E-02	0.88828E-01	-0.47935E-02
175	-0.96067E-01	-0.10723E-01	-0.67004E-01	-0.12608E-01	0.57879E-01	-0.72142E-02
195	0.55972E-01	0.16106E 00	0.34903E-01	-0.16101E 00	-0.20136E-01	0.15881E 00
215	0.50477E-01	-0.18976E 00	0.27105E-01	0.17471E 00	-0.16883E-01	-0.17496E 00
321	-0.44634E-03	-0.13063E-01	-0.11086E 00	0.23004E-01	-0.15946E 00	0.52351E-01
322	0.10882E-01	-0.65830E-02	-0.12515E 00	-0.34268E-01	-0.13364E 00	-0.78234E-01
331	0.34202E-03	0.52435E-02	-0.84684E-01	0.14768E-02	0.11539E 00	-0.10095E-01
332	-0.60066E-01	0.39892E-02	-0.52970E-01	-0.58510E-02	0.12032E 00	0.23358E-02
333	0.60015E-01	0.58435E-02	-0.92610E-01	-0.11562E-01	0.12872E 00	-0.82530E-02
340	-0.13077E 00	-0.21512E-01	-0.62041E-01	-0.20072E-01	0.15774E 00	0.14666E-01
351	0.90104E-04	0.64793E-02	-0.65602E-01	-0.53015E-02	0.11502E 00	-0.10878E-02
400	0.90104E-04	0.77227E-02	0.65870E-01	-0.53015E-02	0.11502E 00	-0.10878E-02
801	-0.33489E-02	-0.19722E-01	-0.24391E 00	-0.37107E-02	-0.44774E-01	0.27346E-02
811	-0.34674E-02	-0.53794E-02	0.69324E-01	-0.14966E-02	-0.47865E-01	0.21768E-02
1106	-0.14730E 00	-0.36144E-01	0.99639E 00	0.22461E 00	-0.91645E 00	0.27346E-02
1156	0.12700E 00	-0.59005E-01	0.10000E 01	-0.36686E 00	-0.79025E 00	0.27351E-02
1210	0.65367E-02	0.53222E-01	-0.31942E 00	-0.43311E 00	-0.14985E-01	-0.34392E-02
1310	-0.42678E-05	0.53227E-01	-0.30695E 00	0.41618E 00	-0.14985E-01	0.97854E-05
1501	-0.60507E-01	-0.16422E-01	-0.30021E 00	-0.20271E-01	-0.55783E-01	0.48977E-02
1502	-0.55924E-01	-0.15257E-01	-0.26262E 00	-0.55625E-02	-0.58185E-01	0.29663E-02
1503	-0.42231E-01	-0.10521E-01	-0.29920E 00	0.63168E-02	-0.47162E-01	-0.10045E-01
1504	-0.41675E-01	-0.14052E-01	-0.26705E 00	-0.72444E-02	-0.45889E-01	-0.10893E-01

MODE NUMBER 34

GRID	T1	T2	T3	R1	R2	R3
10	0.10845E-02	0.19079E 00	-0.17732E-01	0.18301E-01	0.38007E-02	0.43007E-01
151	0.78118E-03	0.46310E 00	-0.28383E-01	0.63792E-02	-0.39176E-02	-0.49975E-01
175	0.29624E-02	0.12864E 00	0.37741E-02	-0.94021E-01	-0.39352E-02	0.11495E 00
195	0.52339E-01	-0.59855E-01	0.26441E-01	0.58078E-01	-0.13691E-01	-0.49644E-01
215	-0.55592E-01	-0.41566E-01	-0.29762E-01	0.44281E-01	0.20510E-01	-0.35504E-01
321	-0.45175E-01	-0.85395E-01	0.35915E-02	0.72451E-02	-0.66200E-01	-0.76207E-01
322	0.45193E-01	-0.84348E-01	0.63675E-02	0.15277E-01	0.73375E-01	-0.67208E-01
331	-0.38550E-01	-0.62942E-01	-0.61767E-02	0.78520E-02	-0.33765E-02	-0.70693E-01
332	0.21954E-01	-0.57929E-01	0.74361E-03	0.26698E-02	-0.10059E-01	-0.69190E-01
333	0.18915E-01	-0.64617E-01	-0.12013E-02	0.98498E-02	-0.54660E-02	-0.64120E-01
340	0.83528E-02	-0.13253E 00	0.25873E-02	-0.47338E-01	-0.14015E-01	0.14354E 00
351	0.76469E-03	-0.48111E-01	-0.37143E-02	0.64277E-02	-0.37349E-02	-0.65138E-01
400	0.76469E-03	0.26341E-01	-0.79832E-02	0.64277E-02	-0.37349E-02	-0.65138E-01
801	0.91679E-04	-0.14035E 00	0.11402E-01	0.64237E-02	0.29175E-02	0.21585E-01
811	-0.13972E-03	-0.12767E-01	-0.10289E-01	0.64498E-02	0.32651E-02	0.19473E-01
1106	0.55529E-02	-0.21507E 00	-0.39009E-01	0.13523E 01	0.34963E-01	0.21585E-01
1156	-0.12619E-01	-0.19142E 00	-0.44236E-01	-0.12034E 01	0.79390E-01	0.21585E-01
1210	0.26782E-01	0.33253E 00	0.28313E-01	0.38993E-01	0.11005E-02	-0.14055E-01
1310	-0.26969E-01	0.33253E 00	0.43113E-02	-0.59270E-02	0.11006E-02	-0.14153E-01
1501	0.18809E-01	-0.16830E 00	0.20159E-02	0.18844E-01	-0.64773E-02	0.13190E-01
1502	0.19116E-01	-0.15677E 00	0.38317E-02	0.16669E-01	-0.61746E-02	0.15372E-01
1503	-0.22594E-01	-0.16602E 00	0.28484E-01	0.49132E-02	0.11004E-01	0.16208E-01
1504	-0.22305E-01	-0.15339E 00	0.23121E-01	0.10305E-01	0.11216E-01	0.15956E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 35

GRID	T1	T2	T3	R1	R2	R3
10	0.81484E-07	-0.61759E-07	0.12000E-07	-0.13977E-07	-0.48002E-08	-0.18743E-07
151	0.72941E-07	-0.97581E-07	0.26622E-07	-0.56202E-08	0.54505E-08	0.18450E-07
175	-0.15190E-09	-0.54166E-07	-0.24557E-08	0.28693E-07	0.11490E-06	-0.19124E-07
195	-0.20452E-07	0.32646E-07	-0.75875E-08	-0.22903E-07	0.11938E-06	0.69624E-08
215	0.47861E-07	0.67355E-08	0.29286E-07	-0.90291E-08	0.79546E-07	0.21939E-08
321	0.77614E-07	0.38116E-07	-0.78004E-08	-0.13108E-07	0.47883E-08	0.54677E-07
322	0.45745E-07	0.47659E-07	-0.16509E-07	0.50222E-09	-0.41192E-07	-0.43930E-08
331	0.93152E-07	0.36073E-07	-0.59232E-08	-0.31510E-08	0.68805E-08	0.26861E-07
332	0.63456E-07	0.35494E-07	-0.11054E-07	-0.35071E-08	0.10907E-07	0.30587E-07
333	0.70780E-07	0.39629E-07	-0.10768E-07	-0.54614E-08	0.10221E-07	0.26760E-07
340	0.59328E-07	0.60930E-07	-0.12004E-07	0.81498E-08	0.17937E-07	-0.53284E-07
351	0.75734E-07	0.32094E-07	-0.72939E-08	-0.46163E-08	0.73194E-08	0.28430E-07
400	0.75734E-07	-0.40106E-09	0.10722E-08	-0.46163E-08	0.73194E-08	0.28430E-07
801	-0.29405E-08	0.28070E-07	-0.75909E-08	-0.29750E-08	-0.56414E-08	-0.15681E-07
811	-0.24713E-08	-0.20896E-06	0.77043E-07	-0.75985E-09	-0.13710E-07	-0.39148E-07
1106	-0.47873E-08	0.15072E-07	0.13483E-07	-0.10077E-06	-0.32075E-07	-0.15681E-07
1156	0.37071E-08	0.11523E-07	0.14740E-07	0.76965E-07	-0.24855E-07	-0.15681E-07
1210	-0.11073E-05	-0.39274E-07	-0.46400E-07	-0.69124E-07	-0.39370E 02	0.22366E-03
1310	-0.21149E-06	-0.39274E-07	-0.15250E-07	0.22714E-07	0.39370E 02	-0.49633E-04
1501	-0.23719E-07	0.53574E-07	-0.11564E-07	-0.72779E-08	-0.68181E-08	-0.21889E-07
1502	-0.23552E-07	0.39044E-07	-0.69693E-08	-0.61850E-08	-0.62687E-08	-0.20574E-07
1503	0.13667E-07	0.52792E-07	-0.20158E-07	-0.52563E-08	-0.99736E-08	-0.19901E-07
1504	0.13172E-07	0.38789E-07	-0.14176E-07	-0.59406E-08	-0.83838E-08	-0.22148E-07

MODE NUMBER 36

GRID	T1	T2	T3	R1	R2	R3
10	-0.48292E-03	-0.12535E-02	0.17245E-01	-0.72089E-02	-0.52250E-02	-0.30978E-03
151	-0.18786E-03	-0.25788E-02	0.25759E-01	-0.35523E-02	0.50666E-02	0.37029E-03
175	-0.10747E-01	-0.31228E-02	-0.66082E-02	0.15855E-03	0.76834E-02	-0.21915E-02
195	0.46387E-02	0.95036E-02	0.29406E-02	-0.78519E-02	-0.34367E-02	0.25061E-02
215	0.63834E-02	-0.13962E-01	0.31160E-02	0.70664E-02	-0.38261E-02	-0.42621E-02
321	0.14948E-03	0.10947E-02	-0.10099E-01	-0.21517E-02	-0.79312E-02	0.50245E-02
322	-0.20011E-03	0.23279E-02	-0.13818E-01	-0.25119E-02	-0.72357E-02	-0.49778E-02
331	0.30871E-03	0.80335E-03	-0.86933E-02	-0.18929E-02	0.78637E-02	-0.38733E-03
332	-0.46449E-02	-0.15648E-03	-0.10824E-01	-0.25454E-02	0.74720E-02	0.64431E-03
333	0.36451E-02	0.20304E-02	-0.10994E-01	-0.23289E-02	0.85875E-02	0.45115E-03
340	-0.75018E-02	-0.16761E-02	-0.74965E-02	-0.30028E-02	0.86828E-02	-0.74548E-03
351	-0.22967E-03	0.86295E-03	-0.85615E-02	-0.22490E-02	0.78774E-02	0.78635E-03
400	-0.22967E-03	-0.35850E-04	0.44235E-03	-0.22490E-02	0.78774E-02	0.78635E-03
801	-0.13640E-03	0.64733E-03	-0.67819E-02	-0.14545E-02	-0.48153E-02	-0.12274E-03
811	-0.13902E-03	-0.30367E-03	0.66117E-01	0.51438E-03	-0.11630E-01	-0.14945E-03
1106	-0.29633E-02	0.11819E-02	0.12046E-01	-0.79195E-02	-0.19873E-01	-0.12274E-03
1156	0.27947E-02	-0.55323E-03	0.12660E-01	-0.37182E-02	-0.18746E-01	-0.12274E-03
1210	-0.16830E-04	-0.90596E-03	-0.35157E-01	-0.52375E-01	0.39370E 02	-0.21460E-03
1310	0.38083E-03	-0.90573E-03	-0.19926E-01	0.29682E-01	0.39370E 02	0.15162E-03
1501	-0.66933E-02	0.29651E-02	-0.12338E-01	-0.25008E-02	-0.68705E-02	-0.25962E-03
1502	-0.67135E-02	0.27227E-02	-0.78859E-02	-0.20023E-02	-0.68712E-02	-0.39604E-03
1503	-0.43654E-02	0.23419E-02	-0.15730E-01	-0.27159E-02	-0.69447E-02	-0.39105E-03
1504	-0.42386E-02	0.20461E-02	-0.11102E-01	-0.26242E-02	-0.68921E-02	-0.38960E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 37

GRID	T1	T2	T3	R1	R2	R3
10	-0.78822E-04	-0.15225E-02	0.18679E-02	-0.46305E-01	-0.64065E-03	-0.41748E-03
151	-0.39555E-04	-0.19159E-02	0.23213E-02	-0.19117E-01	0.54907E-03	0.32800E-03
175	-0.12764E-02	-0.13325E-01	-0.81833E-03	-0.93108E-03	0.94263E-03	-0.55037E-02
195	0.61292E-04	-0.10574E-01	0.31748E-03	-0.28091E-02	-0.47118E-03	-0.53106E-02
215	0.13880E-02	-0.13323E-01	0.42195E-03	-0.12977E-02	-0.48349E-03	-0.55332E-02
321	-0.52545E-05	0.83772E-02	0.63166E-02	-0.10603E-01	-0.21753E-02	0.62549E-03
322	-0.56155E-04	0.84192E-02	-0.93286E-02	-0.10867E-01	0.50926E-03	-0.56484E-03
331	0.32695E-03	0.85951E-03	0.56698E-02	-0.11433E-01	0.88978E-03	0.44076E-03
332	-0.66900E-03	-0.51860E-02	-0.47739E-02	-0.11528E-01	0.84804E-03	0.54242E-03
333	0.27334E-03	0.68389E-02	-0.48443E-02	-0.11519E-01	0.10878E-02	0.46092E-03
340	-0.83922E-03	-0.12539E-01	-0.95059E-03	-0.14829E-01	0.98662E-03	-0.13124E-02
351	-0.14255E-04	0.74239E-03	-0.11246E-02	-0.11443E-01	0.90014E-03	0.56124E-03
400	-0.14255E-04	0.10090E-03	-0.95725E-04	-0.11443E-01	0.90014E-03	0.56124E-03
801	-0.18107E-04	0.81744E-03	-0.53266E-03	-0.65286E-02	-0.59409E-03	-0.11157E-03
811	-0.18213E-04	0.53227E-03	0.93469E-03	-0.69378E-02	-0.78786E-04	-0.37138E-04
1106	-0.26974E-03	0.31807E-02	0.73059E-03	-0.22093E-01	-0.18741E-02	-0.11157E-03
1156	0.76148E-03	-0.25550E-02	0.28604E-02	-0.17763E-01	-0.18170E-02	-0.11157E-03
1210	-0.19316E-03	-0.90934E-03	0.10000E 01	0.15546E 01	0.33952E-03	0.10200E-03
1310	0.25251E-03	-0.91613E-03	-0.89020E 00	0.13684E 01	0.33952E-03	0.13345E-03
1501	-0.10978E-02	0.11007E-01	0.48963E-02	-0.11077E-01	-0.68682E-03	-0.14602E-02
1502	-0.10140E-02	0.99141E-02	0.50627E-02	-0.10080E-01	-0.43961E-03	-0.15225E-02
1503	-0.38966E-03	0.76137E-02	-0.11187E-01	-0.11666E-01	-0.16950E-02	-0.77829E-03
1504	-0.37747E-03	0.69035E-02	-0.97902E-02	-0.10349E-01	-0.18949E-02	-0.95955E-03

MODE NUMBER 38

GRID	T1	T2	T3	R1	R2	R3
10	-0.10475E-03	-0.82047E-03	0.29610E-01	0.56486E-02	-0.83684E-02	-0.21246E-03
151	-0.11709E-03	-0.19048E-02	0.29593E-01	0.22548E-02	0.63186E-02	0.26320E-03
175	-0.16070E-01	0.12506E-02	-0.28482E-02	0.25458E-03	0.26651E-02	-0.45143E-03
195	0.72106E-02	0.17466E-01	0.11635E-02	-0.78839E-02	-0.14669E-03	0.33910E-02
215	0.91653E-02	-0.14228E-01	0.12092E-02	0.84728E-02	-0.67163E-03	-0.98517E-03
321	0.12467E-02	-0.16291E-02	-0.17181E-01	0.13698E-02	-0.72034E-02	0.38834E-02
322	0.10505E-02	-0.65656E-03	-0.16282E-01	0.59384E-03	-0.65989E-02	-0.42725E-02
331	0.63985E-03	0.54740E-03	-0.16093E-01	0.18999E-02	0.98893E-02	-0.97093E-03
332	-0.54047E-02	0.16513E-02	-0.14902E-01	0.94835E-03	0.92039E-02	0.47005E-03
333	0.50396E-02	-0.56494E-04	-0.15176E-01	0.13691E-02	0.10766E-01	0.35971E-03
340	-0.87375E-02	0.24236E-02	-0.12334E-01	0.14026E-02	0.96433E-02	-0.16843E-03
351	0.68810E-04	0.75824E-03	-0.13384E-01	0.13899E-02	0.99148E-02	0.75085E-03
400	0.88810E-04	-0.99996E-04	-0.20512E-02	0.13899E-02	0.99148E-02	0.75085E-03
801	-0.18476E-03	0.33010E-03	-0.15545E-01	0.78309E-03	-0.14260E-02	-0.87287E-04
811	-0.18922E-03	-0.72567E-03	-0.25397E-01	0.28566E-04	0.18256E-02	-0.17179E-03
1106	-0.69151E-03	-0.22986E-03	0.21168E-01	0.16023E-02	-0.49083E-02	-0.87287E-04
1156	0.55879E-03	0.45279E-03	0.20914E-01	0.31464E-02	-0.38890E-02	-0.87285E-04
1210	0.12939E-03	-0.36225E-03	0.87082E 00	0.13680E 01	0.79180E-03	-0.68850E-04
1310	0.48061E-03	-0.36592E-03	0.10000E 01	-0.15566E 01	0.79180E-03	0.25442E-03
1501	-0.27333E-02	-0.73676E-03	-0.19907E-01	0.13918E-02	-0.34228E-02	0.12005E-03
1502	-0.25629E-02	-0.66350E-03	-0.17688E-01	0.17158E-02	-0.37575E-02	-0.13980E-03
1503	-0.17029E-02	-0.26799E-03	-0.17946E-01	0.41487E-03	-0.31306E-02	-0.10211E-03
1504	-0.15841E-02	-0.33448E-03	-0.15883E-01	0.65532E-04	-0.32446E-02	0.11400E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 39

GRID	T1	T2	T3	R1	R2	R3
10	0.41414E-02	-0.15670E-01	-0.16857E-01	0.30901E-02	0.47509E-02	-0.43435E-02
151	0.18634E-02	-0.22651E-01	-0.23589E-01	-0.92227E-03	-0.22984E-02	0.18514E-02
175	0.14602E-01	-0.78799E-02	-0.14745E-02	-0.41573E-02	-0.43799E-02	-0.18499E-01
195	-0.16163E-01	-0.32030E-02	-0.45636E-03	0.17143E-02	0.20771E-01	-0.67222E-02
215	0.39067E-02	0.12241E-01	-0.20892E-02	0.10658E-01	0.34751E-02	0.25614E-01
321	-0.28221E-02	0.60580E-02	0.11735E-01	0.73763E-02	-0.21727E-01	-0.49051E-02
322	0.14532E-02	0.19548E-03	0.78432E-02	-0.91795E-02	0.10904E-01	-0.80651E-02
331	0.93853E-02	0.65157E-02	0.58950E-02	0.20834E-02	-0.13024E-01	0.12860E-01
332	0.49828E-02	0.66610E-02	0.54580E-02	0.10711E-02	-0.81446E-02	0.14773E-01
333	-0.38352E-02	0.51961E-02	0.61230E-02	-0.81222E-03	-0.90866E-02	0.97185E-02
340	0.14369E-02	0.69420E-02	0.40451E-02	-0.18565E-02	0.10577E-01	0.75249E-02
351	0.18279E-02	0.36027E-02	0.36969E-02	0.65831E-03	-0.12843E-01	0.12766E-01
400	0.18279E-02	-0.10418E-01	-0.10983E-01	0.65831E-03	-0.12843E-01	0.12266E-01
801	-0.19158E-02	0.11158E-01	0.11292E-01	0.24758F-03	0.26332E-02	-0.25038E-02
811	-0.18938E-02	-0.23499E-01	-0.25264E-01	-0.81415E-03	0.59847E-02	-0.57780E-02
1106	0.35920E-03	0.27714E-02	-0.11145E-01	-0.20270E-01	0.26560E-02	-0.25038E-02
1156	-0.11703E-02	0.29293E-02	-0.11203E-01	0.21429E-01	0.85893E-02	-0.25038E-02
1210	-0.30285E-02	-0.93189E-02	-0.31120E-01	-0.51650E-01	-0.72254E-03	0.16010E-02
1310	0.13310E-01	-0.93188E-02	-0.29437E-01	0.48857E-01	-0.72254E-03	0.70595E-02
1501	-0.50016E-03	0.13028E-01	0.15377E-01	-0.35953E-03	0.41639E-02	-0.14340E-02
1502	-0.36265E-03	0.11991E-01	0.12779E-01	-0.12849E-02	0.48963E-02	-0.20913E-02
1503	0.28270E-02	0.12479E-01	0.14205E-01	0.51046E-03	0.27914E-02	-0.14814E-02
1504	0.28727E-02	0.11351E-01	0.12552E-01	0.81139E-03	0.21367E-02	-0.77042E-03

MODE NUMBER 40

GRID	T1	T2	T3	R1	R2	R3
10	0.84613E-01	0.21224E-02	-0.69376E-02	-0.38855E-02	0.13468E-02	0.55054E-03
151	0.67686E-01	0.41130E-03	-0.59724E-03	0.22931E-03	0.56485E-03	0.13031E-03
175	0.15028E-01	-0.81765E-04	-0.29542E-01	0.49170E-03	0.15021E 00	0.12197E-02
195	0.11765E-01	-0.26807E-03	-0.26777E-01	0.27943E-05	0.14871E 00	-0.14023E-02
215	0.11431E-01	0.56705E-03	-0.25580E-01	-0.78064E-03	0.14791E 00	0.12355E-02
321	0.51551E-01	-0.62159E-02	0.83974E-03	-0.12178E-01	-0.14581E-01	0.34539E-01
322	0.51009E-01	0.68786E-02	0.10109E-02	0.12219E-01	-0.16802E-01	-0.33271E-01
331	0.71800E-01	0.49213E-03	0.15681E-02	0.12003E-03	-0.14227E-02	-0.68967E-03
332	0.72529E-01	-0.22137E-03	0.81157E-03	0.28136E-03	0.38662E-03	0.63348E-03
333	0.71179E-01	0.65069E-03	0.71606E-03	-0.11113E-03	-0.21409E-02	0.61517E-03
340	0.59284E-01	0.38924E-03	-0.35711E-02	-0.56051E-05	0.12145E-01	-0.99478E-03
351	0.71743E-01	0.27857E-03	0.82206E-03	-0.74814E-03	-0.12494E-02	-0.56161E-04
400	0.71743E-01	0.34276E-03	-0.60601E-03	-0.74814E-03	-0.12494E-02	-0.56161E-04
801	-0.39852E-01	-0.92567E-03	-0.19556E-03	0.21893E-03	-0.32367E-04	-0.42273E-03
811	-0.42061E-01	0.97395E-03	0.37051E-02	0.42243E-03	-0.67898E-03	0.96913E-03
1106	-0.81513E-02	-0.24469E-03	0.14196E-03	0.19120E-02	-0.63629E-01	-0.42273E-03
1156	-0.81144E-02	-0.13383E-03	0.10416E-03	-0.10427E-02	0.63340E-01	-0.42277E-03
1210	0.52481E 00	0.58304E-03	-0.11626E-03	-0.20752E-03	0.14057E-04	-0.27925E 00
1310	0.53850E 00	0.56304E-03	0.69309E-03	-0.12376E-02	0.13606E-04	0.28653E 00
1501	-0.39977E-01	-0.90806E-03	-0.22196E-03	0.14097E-02	-0.12552E-02	-0.26023E-02
1502	-0.40219E-01	-0.16887E-02	-0.71924E-04	0.10671E-02	-0.31639E-03	-0.58500E-03
1503	-0.39651E-01	-0.36623E-03	0.10975E-03	0.27362E-03	-0.13707E-02	0.25018E-02
1504	-0.39363E-01	-0.44339E-03	0.29617E-03	0.70067E-04	0.79131E-04	-0.85444E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 41

GRID	T1	T2	T3	R1	R2	R3
10	0.36486E-03	0.82467E-02	0.14712E-03	-0.10122E 01	0.13939E-02	0.35062E-02
151	0.15680E-03	0.48394E-02	-0.11572E-02	0.45561E-01	-0.11863E-02	-0.16383E-02
175	-0.22266E-02	0.52736E-01	0.70881E-02	-0.12986E-01	-0.86494E-02	0.98300E-01
195	0.40174E-02	0.41936E-01	-0.17116E-02	-0.13582E-01	0.29532E-02	0.10355E 00
215	-0.68792E-02	0.47928E-01	-0.49067E-02	-0.17556E-01	0.53918E-02	0.96900E-01
321	-0.12030E-02	-0.20995E-01	-0.13408E-01	0.14712E-01	-0.73654E-02	-0.63542E-02
322	0.33098E-02	-0.20927E-01	0.21778E-01	0.16677E-01	0.16680E-01	0.22585E-02
331	-0.16786E-02	-0.62259E-02	-0.10422E-01	0.23485E-01	-0.20470E-02	-0.22300E-02
332	0.19726E-02	0.61631E-02	0.11208E-01	0.23869E-01	-0.22372E-02	-0.29127E-02
333	-0.17421E-03	-0.18452E-01	0.11340E-01	0.24014E-01	-0.30199E-02	-0.22358E-02
340	0.22856E-02	0.24931E-01	0.25556E-02	0.32766E-01	-0.41009E-02	-0.56896E-02
351	0.11582E-04	-0.56928E-02	0.35345E-02	0.23568E-01	-0.21040E-02	-0.27727E-02
400	0.11582E-04	-0.25237E-02	0.11297E-02	0.23568E-01	-0.21040E-02	-0.27727E-02
801	0.59841E-04	-0.23269E-02	-0.79448E-02	0.65892E-01	0.53476E-02	0.39687E-03
811	0.96659E-04	-0.10060E-01	-0.19956E-01	0.71522E-01	-0.97445E-04	-0.14244E-02
1106	0.13367E-02	-0.16786E-01	0.54767E-02	0.13322E 00	0.10610E-01	0.39687E-03
1156	-0.13068E-02	0.15557E-01	-0.53270E-02	0.12351E 00	0.10374E-01	0.39687E-03
1210	0.25968E-01	0.14001E-02	-0.10394E 00	-0.18813E 00	-0.33149E-02	-0.13822E-01
1310	-0.33340E-01	0.14007E-02	0.12612E 00	-0.22828E 00	-0.33149E-02	-0.17747E-01
1501	0.63877E-02	-0.82860E-01	-0.57759E-01	0.10271E 00	0.70510E-02	-0.81145E-02
1502	0.66889E-02	-0.87226E-01	-0.63374E-01	0.11016E 00	0.76469E-02	-0.53431E-02
1503	0.44974E-02	-0.57525E-01	0.80421E-01	0.96116E-01	0.52409E-02	-0.20873E-02
1504	0.40994E-02	-0.59304E-01	0.78939E-01	0.10654E 00	0.41819E-02	-0.84592E-03

MODE NUMBER 42

GRID	T1	T2	T3	R1	R2	R3
10	0.46608E-04	0.12386E-01	0.49117E-03	-0.20376E-01	-0.16749E-03	0.48526E-02
151	-0.84048E-04	0.62200E-02	0.82764E-03	-0.[illegible]832E-02	-0.23702E-04	-0.21200E-02
175	-0.10361E-02	0.78121E-02	0.21517E-03	-0.23835E-02	0.10249E-03	-0.26768E-02
195	0.70166E-02	-0.21680E-02	0.81117E-03	0.11477E-02	-0.54781E-03	0.51623E-02
215	-0.60441E-02	-0.22698E-02	-0.10233E-02	0.43805E-03	0.62524E-03	0.35584E-02
321	-0.16536E-02	-0.81508E-02	-0.10354E-02	-0.39928E-03	-0.21577E-02	-0.29953E-02
322	0.19151E-02	-0.74816E-02	0.68967E-04	0.15723E-02	0.27764E-02	-0.25975E-02
331	-0.23380E-02	-0.81631E-02	-0.77008E-03	0.36279E-03	0.47252E-03	-0.38666E-02
332	0.10287E-02	-0.78350E-02	0.66708E-04	0.49493E-03	-0.42804E-03	-0.44519E-02
333	0.15588E-02	-0.82543E-02	-0.65911E-04	0.10086E-02	-0.48590E-03	-0.33790E-02
340	0.37917E-03	-0.95742E-02	0.12103E-03	-0.52522E-03	-0.12090E-02	0.67248E-02
351	0.83070E-04	-0.73045E-02	-0.31016E-03	0.62000E-03	0.40308E-03	-0.39629E-02
400	0.83070E-04	-0.27749E-02	0.15057E-03	0.62000E-03	0.40308E-03	-0.39629E-02
801	-0.59406E-05	-0.24923E-02	-0.37453E-03	0.14416E-02	0.82662E-04	0.38078E-03
811	-0.22442E-03	0.49362E-01	0.21232E-03	0.16004E-02	-0.14651E-03	0.92109E-02
1106	0.19139E-04	-0.84441E-03	0.25444E-03	0.67091E-02	0.15250E-03	0.38078E-03
1156	-0.38911E-04	-0.14273E-03	0.21501E-04	-0.11196E-02	0.30930E-03	0.38078E-03
1210	-0.54196E 00	0.14801E-02	-0.19656E-02	-0.35712E-02	-0.60848E-04	0.28854E 00
1310	0.52819E 00	0.14901E-02	0.29969E-02	-0.54456E-02	-0.60342E-04	0.28121E 00
1501	0.89252E-03	-0.63167E-02	-0.12271E-02	0.27966E-02	0.61747E-03	0.21678E-02
1502	0.77161E-03	-0.50974E-02	-0.14595E-02	0.28644E-02	0.71101E-03	0.21616E-02
1503	-0.98853E-03	-0.56864E-02	0.13131E-02	0.26874E-02	-0.23957E-03	0.21474E-02
1504	-0.86785E-03	-0.44959E-02	0.13964E-02	0.26833E-02	-0.44858E-03	0.23504E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 43

GRID	T1	T2	T3	R1	R2	R3
10	0.11789E-02	0.36114E-02	0.75676E-02	0.22323E-01	-0.26141E-02	0.16714E-02
151	0.38639E-03	0.67647E-02	-0.19580E-02	-0.31786E-02	0.31246E-02	0.15079E-02
175	0.18673E-02	-0.58424E-03	-0.24297E-02	0.58497E-02	0.59544E-03	0.57804E-02
195	0.59303E-02	0.16452E-03	-0.99188E-03	-0.10788E-01	0.12807E-02	-0.17190E-01
215	-0.64438E-02	-0.62930E-02	0.10364E-02	0.26147E-02	0.60370E-02	0.18265E-02
321	0.29613E-02	0.30802E-02	-0.31020E-02	0.50148E-02	0.37217E-02	0.97103E-02
322	-0.21932E-02	-0.36280E-03	-0.65342E-03	-0.65596E-02	-0.15392E-01	0.25682E-02
331	-0.18352E-02	-0.11166E-02	-0.21819E-02	-0.20720E-02	-0.87090E-03	-0.64448E-03
332	0.20867E-02	-0.25082E-02	-0.37590E-02	-0.49405E-03	0.35435E-03	-0.28283E-02
333	0.81034E-03	-0.57717E-03	-0.32708E-02	-0.22503E-02	-0.21990E-02	-0.27595E-02
340	-0.57703E-02	-0.36062E-02	-0.27079E-02	0.90809E-03	0.13549E-01	-0.70138E-02
351	0.34951E-03	-0.96134E-03	-0.32164E-02	-0.16362E-02	-0.10387E-02	-0.34875E-02
400	0.34951E-03	0.30[illegible]9E-02	-0.44036E-02	-0.16362E-02	-0.10387E-02	-0.34875E-02
801	-0.95516E-03	-0.33[illegible]6E-02	0.56798E-03	-0.21661E-02	0.10085E-03	0.48722E-03
811	-0.10664E-02	0.94281E-02	0.32113E-01	-0.67182E-03	-0.54697E-02	0.22465E-02
1106	-0.15707E-03	-0.11852E-03	-0.35798E-03	0.94008E-03	-0.12685E-02	0.48722E-03
1156	-0.22620E-03	-0.11318E-02	-0.33250E-04	-0.91636E-02	0.18287E-02	0.48722E-03
1210	-0.16758E-01	0.18434E-02	0.27748E-02	0.51456E-02	-0.39370E 02	0.91534E-02
1310	-0.39572E-02	0.18433E-02	-0.42534E-02	0.70883E-02	-0.39368E 02	-0.20575E-02
1501	-0.11183E-02	-0.62337E-03	0.14473E-02	-0.27503E-02	-0.13410E-02	-0.98218E-05
1502	-0.87516E-03	-0.49165E-03	0.20321E-02	-0.32195E-02	-0.12922E-02	-0.17872E-03
1503	-0.16847E-02	-0.18964E-02	-0.30389E-02	-0.45884E-02	-0.10032E-02	0.40794E-03
1504	-0.16256E-02	-0.17023E-02	-0.24539E-02	-0.38121E-02	-0.66832E-03	0.68210E-03

MODE NUMBER 44

GRID	T1	T2	T3	R1	R2	R3
10	-0.52032E-06	0.28170E-07	0.37214E-06	0.10094E-05	-0.14041E-06	0.12822E-07
151	-0.39748E-06	0.97690E-08	0.15056E-06	-0.17587E-06	0.43385E-07	-0.70396E-08
175	-0.28483E-06	-0.73705E-07	0.20454E-06	-0.68884E-08	-0.94025E-06	-0.16177E-06
195	0.28942E-07	0.27724E-07	0.21964E-06	-0.19231E-07	-0.96237E-06	-0.19853E-06
215	0.97126E-08	-0.25003E-06	0.20832E-06	0.43506E-07	-0.95390E-06	-0.24294E-07
321	-0.29124E-06	0.48759E-07	-0.13926E-06	0.11335E-07	0.37074E-07	-0.20652E-06
322	-0.27492E-06	-0.25168E-07	-0.25486E-06	-0.13387E-06	0.72551E-07	0.16740E-06
331	-0.42926E-06	-0.33077E-07	-0.16453E-06	-0.68576E-07	0.10824E-06	-0.35013E-07
332	-0.47806E-06	-0.60351E-07	-0.22334E-06	-0.84049E-07	0.74484E-07	-0.26504E-07
333	-0.36348E-06	0.86432E-08	-0.22959E-06	-0.67112E-07	0.11754E-06	-0.16414E-07
340	-0.40489E-06	-0.11818E-06	-0.13705E-06	-0.11922E-06	-0.30624E-07	0.30241E-07
351	-0.42295E-06	-0.22485E-07	-0.18594E-06	-0.67451E-07	0.10754E-06	-0.11511E-07
400	-0.42295E-06	-0.93276E-08	-0.63024E-07	-0.67451E-07	0.10754E-06	-0.11511E-07
801	0.29094E-06	-0.29271E-08	-0.46736E-07	-0.93550E-07	-0.98571E-08	0.32702E-08
811	0.30743E-06	0.24532E-06	0.11698E-05	-0.40219E-07	-0.20910E-06	0.39434E-07
1106	0.52770E-07	0.21535E-07	0.29456E-07	-0.17477E-06	0.42634E-06	0.32702E-08
1156	0.57234E-07	-0.22230E-07	0.43480E-07	-0.18038E-06	-0.46257E-06	0.32705E-08
1210	-0.78504E-05	0.16228E-08	0.21260E-06	0.39429E-06	0.39368E 02	-0.21990E-03
1310	0.76513E-06	0.16219E-08	-0.90928E-07	0.16861E-06	-0.39370E 02	0.50156E-04
1501	0.27356E-06	0.11165E-06	-0.63757E-09	-0.15195E-06	-0.28098E-07	0.26510E-07
1502	0.27684E-06	0.12159E-06	0.20423E-07	-0.15930E-06	-0.34594E-07	0.74375E-08
1503	0.27061E-06	0.64364E-07	-0.21595E-06	-0.18770E-06	-0.35890E-07	-0.18725E-08
1504	0.27106E-06	0.70992E-07	-0.18824E-06	-0.17815E-06	-0.50914E-07	0.22149E-07

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 45

GRID	T1	T2	T3	R1	R2	R3
10	0.37879E-02	0.12284E-01	-0.96927E-02	-0.35066E-01	0.49795E-02	0.56161E-02
151	0.12927E-02	0.20665E-01	-0.18820E-01	0.80547E-02	0.41775E-02	0.39317E-02
175	0.22392E-01	0.87322E-02	-0.47753E-02	0.16044E-01	0.12829E-03	0.28800E-01
195	0.10389E-01	-0.32340E-02	-0.36607E-02	-0.27717E-01	0.45494E-02	-0.26292E-01
215	-0.28828E-01	0.45105E-02	0.17250E-02	0.34804E-02	0.17945E-01	0.76543E-02
321	0.75196E-02	0.39529E-02	0.33934E-02	0.19838E-01	0.15331E-01	-0.24673E-01
322	-0.67462E-02	-0.61271E-02	0.21640E-01	-0.12157E-01	-0.38795E-01	0.10621E-01
331	-0.56176E-02	-0.43071E-02	0.82096E-02	0.63676E-03	-0.11547E-01	0.44179E-04
332	0.11195E-01	-0.50931E-02	0.10162E-01	0.65486E-02	-0.65896E-02	-0.80448E-02
333	-0.20984E-02	-0.68116E-02	0.12145E-01	0.55227E-03	-0.16296E-01	-0.81494E-02
340	-0.97721E-02	-0.37922E-02	0.75035E-02	0.13703E-01	0.32067E-01	-0.18935E-01
351	0.11418E-02	-0.41550E-02	0.79673E-02	0.24563E-02	-0.12093E-01	-0.10605E-01
400	0.11418E-02	0.79670E-02	-0.58553E-02	0.24563E-02	-0.12093E-01	-0.10605E-01
801	-0.28041E-02	-0.95255E-02	0.60479E-02	0.29983E-02	0.12178E-02	0.13995E-02
811	-0.31256E-02	0.25312E-01	-0.23499E-01	0.20094E-02	0.49476E-02	0.61328E-02
1106	-0.24313E-03	-0.25079E-02	-0.37990E-02	0.20307E-01	-0.19565E-02	0.13995E-02
1156	-0.87482E-03	-0.11076E-02	-0.42470E-02	-0.39336E-02	0.70852E-02	0.13995E-02
1210	-0.46689E-01	0.52620E-02	-0.12711E-01	-0.23597E-01	0.18846E-01	0.24878E-01
1310	-0.11491E-01	0.52621E-02	-0.30034E-02	0.55771E-02	0.18845E-01	-0.61190E-02
1501	-0.10710E-02	-0.14172E-01	0.40541E-02	0.66649E-02	0.12311E-03	0.17352E-03
1502	-0.66945E-03	-0.13717E-01	0.34954E-02	0.62150E-02	0.35774E-03	0.27972E-03
1503	-0.32856E-02	-0.13355E-01	0.12130E-01	0.56293E-02	0.16472E-02	0.59409E-03
1504	-0.33300E-02	-0.12856E-01	0.11094E-01	0.69189E-02	0.27377E-02	0.12223E-02

MODE NUMBER 46

GRID	T1	T2	T3	R1	R2	R3
10	-0.36685E-02	0.76177E-02	0.71988E-02	0.52801E-02	-0.42806E-02	0.44026E-02
151	-0.16885E-02	0.15980E-01	-0.15786E-01	-0.56333E-03	-0.45259E-02	0.4911[illegible]-02
175	-0.22561E-01	0.16047E-02	0.43811E-02	0.16374E-01	-0.26732E-02	0.13836E-01
195	0.26504E-01	0.95231E-03	-0.12406E-02	0.28115E-02	-0.14204E-01	0.91892E-02
215	-0.79574E-02	-0.53682E-02	0.38338E-02	-0.24219E-01	-0.71683E-02	-0.29197E-01
321	0.56105E-02	-0.47593E-02	-0.17666E-01	-0.16854E-01	0.33850E-01	0.99606E-02
322	-0.77769E-02	0.65931E-02	-0.52218E-02	0.16738E-01	-0.10794E-01	0.22976E-01
331	-0.76852E-02	-0.97864E-02	-0.39404E-02	-0.44722E-02	0.81017E-02	-0.81644E-02
332	-0.29904E-02	-0.10653E-01	-0.28206E-02	-0.82842E-03	0.75481E-03	-0.13106E-01
333	0.57599E-02	-0.78282E-02	-0.34584E-02	0.21139E-02	0.36737E-03	-0.44319E-02
340	0.88969E-02	-0.63944E-02	-0.34680E-02	0.13084E-01	-0.28258E-01	-0.15074E-01
351	-0.16182E-02	-0.78300E-02	-0.26357E-02	-0.92943E-03	0.78157E-02	-0.93862E-02
400	-0.16182E-02	0.28984E-02	0.62976E-02	-0.92943E-03	0.78157E-02	-0.93862E-02
801	0.29120E-02	-0.40524E-02	-0.66765E-02	-0.85228E-03	-0.10104E-02	0.52311E-03
811	0.30031E-02	0.16190E-01	0.19129E-01	0.18016E-03	-0.43757E-02	0.35353E-02
1106	0.30423E-03	-0.55015E-03	0.39020E-02	0.45186E-02	0.24946E-02	0.52311E-03
1156	0.73960E-03	-0.93669E-03	0.40214E-02	-0.77113E-02	-0.60914E-02	0.52311E-03
1210	0.12635E-01	0.21086E-02	0.97027E-02	0.18345E-01	-0.78723E-03	-0.67346E-02
1310	0.19665E-01	0.21086E-02	0.70285E-02	-0.13289E-01	-0.78721E-03	0.10485E-01
1501	0.22906E-02	-0.34112E-02	-0.74282E-02	-0.11884E-02	-0.11390E-02	0.14276E-04
1502	0.20941E-02	-0.34109E-02	-0.55568E-02	-0.35222E-03	-0.18462E-02	0.57296E-03
1503	0.18988E-02	-0.32202E-02	-0.87170E-02	-0.14576E-02	-0.81410E-03	-0.28343E-04
1504	0.17813E-02	-0.31454E-02	-0.81633E-02	-0.20554E-02	-0.82915E-03	-0.60424E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 47

GRID	T1	T2	T3	R1	R2	R3
10	-0.43487E-04	0.58908E-03	-0.12547E-01	-0.47334E-02	0.52881E-02	0.25274E-03
151	-0.36860E-04	0.22852E-03	-0.24756E-02	0.41955E-02	-0.75204E-03	-0.62370E-04
175	0.39873E-02	0.12599E-02	-0.58060E-03	0.18481E-03	0.71734E-03	0.87919E-03
195	-0.15625E-02	-0.11309E-02	0.32092E-03	0.13106E-03	-0.50675E-03	0.41342E-02
215	-0.23292E-02	0.34370E-02	0.32591E-03	0.39817E-03	-0.52472E-03	-0.25000E-02
321	-0.34061E-03	-0.59269E-03	0.28751E-02	0.11814E-02	0.50506E-03	-0.51352E-05
322	-0.38305E-03	-0.72380E-03	0.47557E-02	0.81767E-03	-0.25327E-03	0.20945E-03
331	-0.15316E-03	-0.37002E-04	0.35632E-02	0.10194E-02	-0.19204E-02	0.60185E-03
332	0.10160E-02	0.40387E-03	0.45534E-02	0.13783E-02	-0.14195E-02	0.14793E-03
333	-0.10510E-02	-0.74627E-03	0.47317E-02	0.10240E-02	-0.20739E-02	-0.57475E-04
340	0.85130E-03	0.76172E-03	0.35387E-02	0.18274E-02	-0.15041E-03	0.66941E-03
351	-0.63281E-04	-0.18770E-03	0.39210E-02	0.11371E-02	-0.19408E-02	-0.95677E-04
400	-0.63281E-04	-0.78339E-04	0.17027E-02	0.11371E-02	-0.19408E-02	-0.95677E-04
801	0.74597E-05	0.97052E-05	0.85868E-03	0.70697E-03	-0.55855E-03	0.26254E-05
811	0.87015E-05	-0.11623E-03	-0.21885E-01	-0.64863E-03	0.40769E-02	-0.23459E-04
1106	-0.11941E-03	-0.15110E-03	-0.41398E-03	0.13199E-02	-0.10431E-02	0.26254E-05
1156	0.11963E-03	0.15160E-03	-0.49503E-03	0.13242E-02	-0.10449E-02	0.26257E-05
1210	0.71781E-05	-0.42021E-05	-0.22758E-02	-0.45700E-02	-0.39367E 02	0.21963E-03
1310	0.22962E-04	-0.41921E-05	0.15709E-04	-0.31340E-04	-0.39370E 02	0.61883E-04
1501	-0.54450E-03	-0.11117E-02	-0.45810E-04	0.10379E-02	-0.37775E-03	0.29143E-03
1502	-0.57834E-03	-0.99317E-03	0.17365E-03	0.12185E-02	-0.33316E-03	0.34694E-03
1503	-0.32153E-03	-0.58997E-03	0.18820E-02	0.25856E-02	-0.12824E-03	-0.20369E-03
1504	-0.33497E-03	-0.60270E-03	0.18750E-02	0.20118E-02	0.13337E-05	-0.26834E-03

MODE NUMBER 48

GRID	T1	T2	T3	R1	R2	R3
10	-0.34866E-06	0.40420E-08	-0.50750E-06	-0.21296E-06	0.21899E-06	0.46083E-08
151	-0.23314E-06	0.10340E-07	-0.11012E-06	0.18721E-06	-0.34620E-07	-0.26520E-08
175	0.11265E-06	0.57925E-07	0.17812E-06	0.79994E-08	-0.64112E-06	0.39514E-07
195	-0.12142E-06	-0.48284E-07	0.20979E-06	0.13473E-08	-0.69140E-06	0.17859E-06
215	-0.15765E-06	0.15075E-06	0.20030E-06	0.21766E-07	-0.68028E-06	-0.10589E-06
321	-0.17290E-06	0.31984E-08	0.12348E-06	0.11255E-06	0.87221E-07	-0.15206E-06
322	-0.17463E-06	-0.64644E-07	0.20805E-06	-0.22572E-07	0.57070E-07	0.16035E-06
331	-0.25795E-06	-0.36976E-08	0.14872E-06	0.45584E-07	-0.80685E-07	0.29635E-07
332	-0.20680E-06	0.19100E-07	0.19666E-06	0.61370E-07	-0.65591E-07	0.26626E-08
333	-0.29463E-06	-0.36716E-07	0.20529E-06	0.46352E-07	-0.84632E-07	-0.67274E-08
340	-0.15814E-06	0.31074E-07	0.17072E-06	0.83510E-07	-0.63249E-07	0.34996E-07
351	-0.25275E-06	-0.95199E-08	0.16812E-06	0.54660E-07	-0.82448E-07	-0.55713E-08
400	-0.25275E-06	-0.31519E-08	0.73800E-07	0.54660E-07	-0.82448E-07	-0.55713E-08
801	0.24803E-06	0.67692E-08	0.43709E-07	0.31607E-07	-0.24361E-07	0.43952E-08
811	0.26631E-06	-0.24083E-07	-0.59820E-06	-0.29687E-07	0.18487E-06	-0.11032E-07
1106	0.38013E-07	-0.56497E-08	-0.21068E-07	0.49387E-07	0.33071E-06	0.43952E-08
1156	0.48262E-07	0.76821E-08	-0.24692E-07	0.68824E-07	-0.42024E-06	0.43955E-08
1210	-0.13867E-05	-0.29247E-08	-0.10473E-06	-0.21834E-06	-0.39370E 02	0.22422E-03
1310	0.11508E-06	-0.29242E-08	-0.62855E-08	0.12631E-07	0.39367E 02	-0.49545E-04
1501	0.23043E-06	-0.48115E-07	0.33754E-08	0.43759E-07	-0.66036E-08	0.31305E-07
1502	0.22878E-06	-0.37413E-07	0.12779E-07	0.51175E-07	-0.83070E-08	0.24478E-07
1503	0.23322E-06	-0.25985E-07	0.90056E-07	0.11565E-06	0.54891E-08	-0.20847E-07
1504	0.23036E-06	-0.23809E-07	0.89006E-07	0.91761E-07	0.28853E-08	-0.82734E-08

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 49

GRID	T1	T2	T3	R1	R2	R3
10	0.44219E 00	0.16182E-01	-0.71269E-01	0.77190E-02	0.24489E-01	0.28251E-02
151	0.27710E 00	-0.32726E-02	0.13188E-02	-0.73042E-02	0.23386E-02	0.70887E-03
175	0.79495E-01	-0.70022E-02	-0.27036E 00	-0.24409E-03	0.84498E 00	0.50770E-02
195	0.61569E-01	-0.88645E-05	-0.26042E 00	0.42046E-02	0.84191E 00	0.13278E-02
215	0.74044E-01	0.51603E-03	-0.24873E 00	-0.42441E-02	0.82749E 00	-0.86198E-02
321	0.18514E 00	-0.31398E-01	0.55144E-02	-0.75580E-01	-0.81800E-01	0.19284E 00
322	0.18385E 00	0.45888E-01	0.56963E-03	0.71753E-01	-0.85864E-01	-0.19047E 00
331	0.30349E 00	0.88258E-02	0.10231E-01	-0.14660E-02	-0.46381E-02	-0.16916E-02
332	0.30134E 00	0.39018E-02	0.36603E-02	-0.18191E-02	0.48509E-02	0.78839E-02
333	0.29756E 00	0.11090E-01	0.27312E-02	-0.29267E-02	-0.70635E-02	0.72424E-02
340	0.23112E 00	0.91191E-02	-0.16247E-01	-0.51167E-02	0.74898E-01	-0.12171E-01
351	0.30029E 00	0.70265E-02	0.51134E-02	-0.66963E-02	-0.34830E-02	0.43510E-02
400	0.30029E 00	0.20533E-02	0.11324E-02	-0.66963E-02	-0.34830E-02	0.43510E-02
801	-0.32520E 00	-0.83749E-02	-0.96046E-02	-0.88533E-03	0.18596E-03	-0.51148E-02
811	-0.35023E 00	0.28294E-02	0.45607E-01	0.22447E-02	-0.98248E-02	0.94131E-02
1106	-0.56487E-01	-0.12655E-02	0.43309E-02	0.11235E-01	-0.50174E 00	-0.51148E-02
1156	-0.56355E-01	-0.16424E-02	0.44259E-02	-0.14594E-01	0.50057E 00	-0.51152E-02
1210	-0.5497 00	0.34001E-02	0.15111E-01	0.31000E-01	-0.30743E-04	0.29394E 00
1310	-0.57107 00	0.34001E-02	0.12038E-01	-0.24696E-01	-0.30582E-04	-0.30536E 00
1501	-0.33443E 00	0.27199E-03	-0.92831E-02	0.11134E-02	-0.14299E-01	-0.25902E-01
1502	-0.33378E 00	-0.73834E-02	-0.88254E-02	0.25632E-02	-0.99785E-02	-0.14205E-01
1503	-0.32531E 00	0.76864E-03	-0.11345E-01	-0.43309E-02	-0.13910E-01	0.14843E-01
1504	-0.32223E 00	-0.34149E-02	-0.10745E-01	-0.55509E-02	-0.34532E-02	-0.47836E-02

MODE NUMBER 50

GRID	T1	T2	T3	R1	R2	R3
10	0.12371E-01	0.32191E 00	0.89815E 00	-0.12756E-02	-0.39325E 00	0.14032E 00
151	0.55057E-02	0.70422E-02	0.22606E-01	0.15199E-02	0.73331E-02	-0.19700E-02
175	-0.34473E-01	0.16442E-02	0.72055E-02	0.36017E-02	0.13469E-01	-0.46096E-01
195	0.26456E-01	0.45170E-02	-0.16571E-01	0.86374E-02	0.21048E-01	-0.72125E-01
215	0.68778E-02	-0.50275E-02	-0.80630E-02	-0.13950E-01	0.18165E-01	0.11427E 00
321	0.99004E-02	-0.14477E-01	-0.31855E-01	-0.21718E-02	0.16139E-01	0.48922E-03
322	0.13324E-01	-0.12250E-01	-0.34713E-01	0.23693E-02	0.16568E-01	-0.72299E-02
331	0.41051E-02	-0.16713E-01	-0.39383E-01	0.63715E-03	0.10903E-01	-0.83691E-02
332	0.17970E-02	-0.15479E-01	-0.37949E-01	-0.12365E-02	0.59608E-02	-0.68399E-02
333	0.13770E-01	-0.15435E-01	-0.39444E-01	0.24831E-02	0.91582E-02	-0.28346E-02
340	-0.50617E-02	-0.90229E-02	-0.33615E-01	-0.13415E-02	0.84848E-02	-0.33719E-02
351	0.65319E-02	-0.14541E-01	-0.37312E-01	0.38869E-03	0.10954E-01	-0.43593E-02
400	0.65319E-02	-0.95582E-02	-0.24791E-01	0.38869E-03	0.10954E-01	-0.43593E-02
801	-0.62981E-02	0.15496E-01	0.40071E-01	0.25670E-04	0.66684E-02	-0.27074E-02
811	-0.67062E-02	-0.42201E-02	-0.14082E-01	-0.14107E-02	0.89006E-02	-0.31948E-02
1106	0.33818E-03	0.27161E-02	-0.16384E-01	-0.24867E-01	0.31373E-02	-0.27074E-02
1156	-0.24100E-02	0.27271E-02	-0.16386E-01	0.24988E-01	0.22121E-01	-0.27074E-02
1210	-0.40307E-02	-0.57425E-02	-0.68466E-01	-0.14510E 00	-0.23274E-03	0.21537E-02
1310	-0.12752E-01	-0.57422E-02	-0.68359E-01	0.14487E 00	-0.23274E-03	-0.68313E-02
1501	-0.22295E-02	0.14781E-01	0.52934E-01	0.10547E-01	0.16658E-01	-0.45221E-03
1502	0.18501E-02	0.15392E-01	0.45665E-01	-0.13300E-02	0.18345E-01	0.58615E-03
1503	0.14544E-04	0.10917E-01	0.43720E-01	-0.93144E-02	0.31142E-02	0.10681E-01
1504	-0.24745E-03	0.13862E-01	0.41805E-01	0.17572E-03	0.17922E-02	0.11471E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 51

GRID	T1	T2	T3	R1	R2	R3
10	-0.68098E-02	0.89577E 00	-0.31595E 00	0.92590E-02	0.13849E 00	0.39073E 00
151	-0.23282E-02	0.21332E-01	-0.72695E-02	-0.22901E-01	-0.21581E-02	-0.67400E-02
175	0.95228E-02	0.53224E-03	-0.30530E-02	-0.62714E-02	-0.47867E-02	-0.11491E 00
195	0.25596E-01	-0.62192E-02	-0.67412E-02	-0.15059E-01	-0.54149E-02	0.88433E-01
215	-0.36107E-01	-0.29702E-02	0.15551E-01	-0.42933E-02	-0.10840E-01	0.14316E-01
321	-0.10497E-01	-0.29657E-01	0.12860E-01	-0.22137E-02	-0.85998E-02	-0.12054E-01
322	0.21951E-02	-0.27675E-01	0.56445E-02	0.28679E-02	-0.14767E-02	-0.10271E-01
331	-0.91191E-02	-0.36416E-01	0.17816E-01	-0.55487E-02	-0.41886E-02	-0.54377E-02
332	0.28665E-02	-0.39342E-01	0.15781E-01	-0.22599E-02	-0.52404E-02	-0.10809E-01
333	-0.17072E-02	-0.34414E-01	0.16225E-01	-0.24418E-02	-0.90751E-02	-0.74071E-02
340	0.12287E-02	-0.30934E-01	0.15061E-01	-0.10476E-01	-0.32745E-02	-0.15797E-01
351	-0.26442E-02	-0.35275E-01	0.15259E-01	-0.33460E-02	-0.46388E-02	-0.10208E-01
400	-0.26442E-02	-0.23608E-01	0.99569E-02	-0.33460E-02	-0.46388E-02	-0.10208E-01
801	0.22141E-02	0.40438E-01	-0.15278E-01	-0.12697E-02	-0.26663E-02	-0.67613E-02
811	0.26830E-02	-0.93615E-02	0.63922E-02	-0.83206E-03	-0.35174E-02	-0.84872E-02
1106	-0.10864E-03	0.73774E-02	0.62462E-02	-0.67607E-01	-0.17439E-02	-0.67613E-02
1156	0.12379E-02	0.68526E-02	0.63696E-02	0.62601E-01	-0.11358E-01	-0.67613E-02
1210	0.13836E-01	-0.14983E-01	0.28741E-01	0.60912E-01	0.92939E-04	-0.74184E-02
1310	-0.79380E-02	-0.14983E-01	0.23441E-01	-0.49680E-01	0.92940E-04	-0.42605E-02
1501	-0.33417E-02	0.41807E-01	-0.10260E-01	-0.20719E-01	0.87293E-02	0.81845E-02
1502	-0.35860E-02	0.43378E-01	-0.12340E-01	-0.14231E-01	0.85642E-02	0.55027E-02
1503	0.60332E-02	0.42901E-01	-0.25050E-01	0.70997E-02	-0.13666E-01	0.32424E-03
1504	0.58375E-02	0.42508E-01	-0.20358E-01	-0.46312E-02	-0.14159E-01	0.18798E-02

MODE NUMBER 52

GRID	T1	T2	T3	R1	R2	R3
10	0.90988E-02	-0.38506E-01	0.20500E-01	0.66421E-01	-0.87719E-02	-0.14484E-01
151	-0.42737E-03	0.31317E-02	-0.80767E-02	-0.10642E 01	-0.16494E-02	-0.31999E-02
175	0.21416E-01	0.21954E-01	0.12397E-01	-0.90057E-01	-0.14409E-01	0.84715E-01
195	0.11444E-01	-0.15404E-03	-0.15359E-02	-0.11999E 00	0.17478E-02	0.11699E 00
215	-0.30024E-01	0.19422E-01	-0.54099E-02	-0.11107E 00	0.67291E-02	0.64831E-01
321	-0.24759E-01	0.11616E-02	0.45589E-01	0.57367E-02	-0.14953E 00	-0.50176E-01
322	0.27107E-01	-0.25055E-02	-0.18849E-02	-0.57031E-03	0.16244E 00	-0.31574E-01
331	-0.70245E-02	-0.13727E-01	0.54770E-01	-0.49917E-01	-0.12108E-01	-0.75617E-03
332	0.68983E-02	-0.42048E-01	0.12043E-01	-0.46774E-01	-0.10407E-01	-0.72363E-02
333	-0.60703E-02	0.95933E-02	0.11279E-01	-0.48623E-01	-0.14814E-01	-0.63604E-02
340	-0.17695E-02	0.12323E 00	0.28919E-01	0.19514E 00	0.22669E-01	-0.41563E 00
351	-0.22044E-02	-0.14545E-01	0.23465E-01	-0.48185E-01	-0.12374E-01	-0.77242E-02
400	-0.22044E-02	-0.57164E-02	0.93214E-02	-0.48185E-01	-0.12374E-01	-0.77242E-02
801	0.17866E-02	0.28644E-02	-0.21909E-01	0.69177E-01	0.77669E-02	0.33328E-03
811	0.20501E-02	-0.10047E-01	0.57143E-02	0.81740E-01	-0.88110E-02	-0.25216E-02
1106	0.21350E-02	-0.15475E-01	0.76367E-02	0.15000E 00	0.20686E-01	0.33328E-03
1156	-0.14418E-02	0.16250E-01	0.89016E-02	0.15749E 00	0.13982E-01	0.33327E-03
1210	0.13088E-02	-0.91589E-03	-0.23404E 00	-0.52458E 00	-0.52935E-04	-0.70187E-03
1310	0.20700E-02	-0.91412E-03	0.39951E 00	-0.89550E 00	-0.52935E-04	0.11113E-02
1501	0.11591E-01	-0.76337E-01	-0.68263E-01	0.14290E 00	0.18316E-01	-0.20361E-01
1502	0.11707E-01	-0.86082E-01	-0.79466E-01	0.17087E 00	0.18922E-01	-0.14816E-01
1503	0.93137E-02	-0.51745E-01	0.70294E-01	0.13377E 00	0.83546E-02	-0.72839E-02
1504	0.83630E-02	-0.56448E-01	0.69830E-01	0.16119E 00	0.45599E-02	-0.54165E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 53

GRID	T1	T2	T3	R1	R2	R3
10	0.10000E 01	-0.72610E-02	-0.17771E-02	-0.11989E-03	0.20910E-03	-0.13619E-02
151	-0.15649E-01	-0.71369E-03	0.44896E-03	-0.12366E-03	-0.15661E-03	0.16639E-03
175	-0.11600E-02	-0.41641E-03	-0.55327E-02	-0.40225E-03	-0.40052E-02	0.33352E-02
195	0.44223E-03	0.69555E-03	-0.57684E-02	0.33287E-02	-0.26041E-02	-0.37957E-02
215	0.37860E-02	-0.17233E-03	-0.57144E-02	-0.27024E-02	-0.26376E-02	0.67643E-03
321	-0.12315E-01	0.28251E-02	-0.19302E-02	0.24529E-02	0.11236E-02	-0.77344E-02
322	-0.12511E-01	-0.45271E-03	-0.22430E-02	-0.27676E-02	0.13481E-02	0.79739E-02
331	-0.17318E-01	0.16763E-02	-0.28270E-02	0.13271E-02	0.10990E-02	0.23657E-03
332	-0.18677E-01	0.24475E-02	-0.20791E-02	0.91818E-03	0.66971E-03	0.65032E-03
333	-0.17517E-01	0.13461E-02	-0.20634E-02	0.11603E-02	0.16626E-02	0.45900E-03
340	-0.16441E-01	0.24571E-02	0.44902E-02	-0.49109E-03	0.11516E-01	-0.22558E-02
351	-0.17864E-01	0.17430E-02	-0.20887E-02	0.99469E-03	0.11068E-02	0.80748E-03
400	-0.17864E-01	0.82003E-03	-0.82365E-03	0.99469E-03	0.11068E-02	0.80748E-03
801	-0.77162E-02	-0.14070E-02	0.64333E-03	-0.28667E-04	0.20206E-03	-0.15152E-04
811	-0.84865E-02	0.98297E-03	0.88882E-03	0.39162E-04	-0.68827E-04	0.66259E-03
1106	-0.14558E-02	-0.26741E-03	-0.21518E-03	0.26239E-02	-0.14284E-01	-0.15152E-04
1156	-0.15507E-02	-0.28098E-03	-0.21290E-03	-0.27573E-02	0.15218E-01	-0.15161E-04
1210	-0.67342E-02	0.43229E-03	-0.38705E-02	-0.88082E-02	-0.96679E-06	0.36163E-02
1310	-0.67663E-02	0.43231E-03	-0.43118E-02	0.98122E-02	-0.96655E-06	-0.36335E-02
1501	-0.77067E-02	-0.10669E-02	0.67976E-03	0.11177E-02	-0.52939E-03	-0.13921E-02
1502	-0.76923E-02	-0.14152E-02	0.67345E-03	0.66438E-03	-0.38405E-03	-0.81414E-03
1503	-0.76508E-02	-0.11572E-02	0.90995E-03	-0.81345E-03	0.89606E-04	0.56196E-03
1504	-0.75691E-02	-0.12778E-02	0.74652E-03	-0.17739E-03	0.44885E-03	-0.17379E-03

MODE NUMBER 54

GRID	T1	T2	T3	R1	R2	R3
10	0.56565E-02	0.48998E-02	-0.58084E-01	-0.22137E-01	0.94998E-02	0.24746E-02
151	0.14840E-03	-0.47800E-03	0.27698E-02	0.29953E 00	-0.49910E-03	0.50469E-03
175	-0.80667E-02	-0.61920E-03	-0.41264E-02	0.78827E-02	0.44859E-02	-0.34308E-01
195	0.11109E-02	0.55113E-03	0.10224E-03	0.58541E-02	0.11165E-02	-0.35921E-01
215	0.61401E-02	-0.21263E-03	0.22491E-02	0.28041E-02	-0.26714E-02	-0.21706E-01
321	0.12129E-02	-0.51138E-02	-0.16708E-01	0.40635E-02	0.46256E-02	0.26260E-02
322	-0.24562E-02	-0.36385E-02	0.72223E-03	0.74288E-02	-0.10963E-01	-0.20853E-02
331	0.77900E-03	-0.11985E-04	-0.17956E-01	0.14472E-01	0.46480E-02	-0.18247E-02
332	-0.23410E-02	0.81501E-02	-0.52882E-02	0.13472E-01	0.31615E-02	-0.16099E-03
333	0.26688E-02	-0.66698E-02	-0.54197E-02	0.14572E-01	0.49162E-02	0.52009E-03
340	0.44665E-03	-0.19027E-01	-0.93247E-02	-0.35745E-01	-0.68960E-02	0.75919E-01
351	0.38427E-03	0.62254E-03	-0.86988E-02	0.13953E-01	0.46992E-02	0.53017E-03
400	0.38427E-03	0.16556E-04	-0.33275E-02	0.13953E-01	0.46992E-02	0.53017E-03
801	-0.61067E-03	0.75128E-03	0.58711E-02	-0.17021E-01	-0.23978E-02	-0.36178E-03
811	-0.68399E-03	0.22687E-02	-0.62417E-02	-0.20707E-01	0.32406E-02	0.34835E-03
1106	-0.69814E-03	0.42510E-02	-0.19448E-02	-0.41941E-01	-0.68860E-02	-0.36178E-03
1156	-0.46382E-03	-0.38771E-02	-0.60374E-03	-0.38259E-01	-0.45787E-02	-0.36178E-03
1210	-0.14941E-03	-0.22813E-03	0.11267E 00	0.25732E 00	0.10582E-04	0.79761E-04
1310	-0.90024E-03	-0.22902E-03	-0.20258E 00	0.46267E 00	0.10582E-04	-0.48400E-03
1501	-0.37899E-02	0.18870E-01	0.16169E-01	-0.34666E-01	-0.57526E-02	0.74118E-02
1502	-0.37864E-02	0.22299E-01	0.19735E-01	-0.43831E-01	-0.59929E-02	0.57295E-02
1503	-0.28753E-02	0.13277E-01	-0.17072E-01	-0.30942E-01	-0.33531E-02	0.29422E-02
1504	-0.25706E-02	0.15027E-01	-0.16785E-01	-0.40485E-01	-0.20471E-02	0.27469E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 55

GRID	T1	T2	T3	R1	R2	R3
10	-0.87441E 00	-0.18386E-01	-0.81454E-02	-0.20813E-03	0.57527E-03	-0.39781E-02
151	0.53014E-01	-0.29499E-02	0.24988E-02	-0.49409E-02	0.15460E-02	0.57522E-03
175	-0.25006E-02	-0.15664E-02	-0.27670E-01	-0.22147E-02	0.12774E 00	0.14316E-01
195	0.25285E-02	0.39417E-02	-0.26767E-01	0.87238E-02	0.13225E 00	-0.18278E-01
215	0.16605E-01	-0.12660E-02	-0.26083E-01	-0.71368E-02	0.13189E 00	0.75771E-02
321	0.34329E-01	-0.35543E-02	-0.73048E-02	-0.21930E-01	-0.34907E-01	0.73889E-02
322	0.33808E-01	0.13233E-01	-0.94694E-02	0.21065E-01	-0.33425E-01	-0.69168E-02
331	0.62655E-01	0.78682E-02	-0.54759E-02	0.23975E-02	0.35378E-02	-0.11941E-02
332	0.57077E-01	0.79618E-02	-0.10313E-01	0.59484E-03	0.55820E-02	0.43375E-02
333	0.61237E-01	0.80681E-02	-0.10952E-01	0.11214E-02	0.45600E-02	0.35807E-02
340	0.30549E-01	0.10354E-01	0.72894E-02	-0.79758E-03	0.84524E-01	-0.97770E-02
351	0.60108E-01	0.75835E-02	-0.93140E-02	-0.40865E-03	0.40186E-02	0.35936E-02
400	0.60108E-01	0.34760E-02	-0.47208E-02	-0.40865E-03	0.40186E-02	0.35936E-02
801	-0.36842E-01	-0.59076E-02	0.37156E-02	0.60077E-03	0.61593E-03	-0.22364E-03
811	-0.40574E-01	0.43975E-02	-0.21898E-02	0.46516E-03	0.97574E-03	0.29942E-02
1106	-0.71645E-02	-0.13180E-02	-0.12188E-02	0.13027E-01	-0.70795E-01	-0.22364E-03
1156	-0.74508E-02	-0.10285E-02	-0.12657E-02	-0.10160E-01	0.73629E-01	-0.22369E-03
1210	-0.30878E-01	0.17807E-02	-0.43080E-01	-0.98750E-01	-0.25083E-05	0.16597E-01
1310	-0.31334E-01	0.17809E-02	-0.28994E-01	0.66460E-01	-0.25072E-05	-0.16832E-01
1501	-0.37583E-01	-0.50898E-02	0.26963E-02	0.67484E-02	-0.35217E-02	-0.67117E-02
1502	-0.37379E-01	-0.67870E-02	0.30388E-02	0.47403E-02	-0.25593E-02	-0.40517E-02
1503	-0.36853E-01	-0.53617E-02	0.50320E-02	-0.22476E-02	-0.12120E-02	0.26749E-02
1504	-0.36418E-01	-0.59929E-02	0.49267E-02	0.12250E-02	0.74006E-03	-0.65550E-03

MODE NUMBER 56

GRID	T1	T2	T3	R1	R2	R3
10	0.24642E-01	0.25365E-02	-0.81013E-01	-0.17395E-02	0.26984E-01	0.84439E-03
151	-0.95530E-03	-0.16765E-02	0.22117E-01	-0.38794E-01	0.44679E-02	0.59481E-03
175	-0.57989E-01	0.33541E-02	-0.29385E-02	-0.22516E-02	-0.36400E-02	-0.67190E-03
195	0.21973E-01	0.24556E-01	0.77507E-03	0.11222E-01	-0.14702E-03	-0.62395E-01
215	0.32899E-01	-0.19805E-01	0.74168E-03	-0.18970E-01	0.10685E-03	0.78972E-01
321	-0.14027E-02	-0.67016E-02	-0.52111E-01	-0.79367E-02	-0.13780E-01	0.16895E-02
322	-0.32149E-03	-0.26981E-02	-0.59150E-01	0.55001E-02	-0.18551E-02	-0.53849E-02
331	-0.33844E-04	-0.41678E-02	-0.68608E-01	0.24775E-02	0.31108E-01	-0.15371E-01
332	-0.17961E-01	-0.39794E-03	-0.67097E-01	-0.51108E-02	0.19007E-01	-0.58968E-02
333	0.15854E-01	-0.13613E-02	-0.70991E-01	0.34996E-02	0.33139E-01	-0.69504E-04
340	-0.17756E-02	0.11525E-01	-0.60521E-01	0.11149E-01	-0.35715E-01	-0.18021E-01
351	-0.72677E-03	-0.24884E-03	-0.63368E-01	0.22655E-03	0.31518E-01	0.28823E-04
400	-0.72677E-03	-0.28178E-03	-0.27343E-01	0.22655E-03	0.31518E-01	0.28823E-04
801	0.15308E-03	0.39876E-03	0.27633E-01	0.39758E-02	-0.60133E-03	-0.14862E-05
811	0.17807E-03	-0.74643E-03	-0.68373E-01	-0.19485E-02	0.17456E-01	-0.22185E-03
1106	-0.11653E-03	-0.89415E-03	-0.90014E-02	0.68766E-02	-0.11572E-02	-0.14862E-05
1156	0.17531E-03	0.10350E-02	-0.93095E-02	0.10272E-01	-0.17396E-02	-0.14655E-05
1210	0.12980E-03	-0.12171E-03	-0.38949E 00	-0.89513E 00	0.23129E-05	-0.69738E-04
1310	0.12681E-03	-0.11908E-03	-0.27412E 00	0.62998E 00	0.23129E-05	0.69126E-04
1501	-0.27522E-02	-0.47008E-02	0.19941E-01	0.24882E-01	-0.80387E-02	-0.22643E-02
1502	-0.17396E-02	-0.44421E-02	0.23260E-01	0.13268E-01	-0.54422E-02	-0.18854E-02
1503	-0.33181E-02	-0.70759E-02	0.25019E-01	-0.52942E-02	-0.12389E-01	0.72906E-02
1504	-0.28937E-02	-0.56993E-02	0.31016E-01	0.10319E-01	-0.11977E-01	0.94179E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 57

GRID	T1	T2	T3	R1	R2	R3
10	-0.34460E-02	-0.18281E-01	-0.22362E-02	-0.23370E-01	-0.16530E-02	-0.48397E-02
151	0.54500E-03	0.58753E-02	0.17870E-02	-0.18930E 00	0.60380E-03	-0.12029E-02
175	-0.50746E-02	0.29315E-01	0.35405E-02	-0.90979E-02	-0.38315E-02	0.44252E-02
195	0.18538E-01	0.20608E-01	-0.19546E-02	-0.18715E-01	0.51533E-02	0.43897E-01
215	-0.13579E-01	0.10935E-01	-0.18880E-02	-0.20349E-01	0.26037E-02	0.48561E-01
321	-0.31899E-02	-0.24302E-01	-0.11210E-01	0.12882E-01	-0.22390E-01	-0.77461E-02
322	0.53404E-02	-0.22783E-01	0.48856E-02	0.18115E-01	0.24076E-01	-0.38918E-02
331	-0.54402E-02	-0.20636E-01	-0.93226E-02	0.85305E-02	0.16379E-02	-0.77701E-02
332	0.21114E-02	-0.15861E-01	0.81603E-03	0.98390E-02	-0.16754E-02	-0.10901E-01
333	0.39004E-02	-0.24985E-01	0.24619E-03	0.11385E-01	-0.28953E-02	-0.63390E-02
340	-0.35560E-03	0.38380E-01	-0.37341E-03	0.12832E 00	0.11855E-02	-0.81182E-01
351	0.12265E-03	-0.18815E-01	-0.30457E-02	0.97565E-02	0.13422E-02	-0.91392E-02
400	0.12265E-03	-0.83687E-02	-0.15116E-02	0.97565E-02	0.13422E-02	-0.91392E-02
801	-0.17877E-03	0.90284E-02	-0.37834E-02	0.25536E-01	0.28895E-02	-0.58375E-03
811	-0.36818E-04	-0.10994E-01	-0.98129E-02	0.29531E-01	-0.43129E-03	-0.37598E-02
1106	0.71813E-03	-0.47516E-02	0.11637E-02	0.48183E-01	0.72779E-02	-0.58325E-03
1156	-0.75047E-03	0.84378E-02	-0.70454E-03	0.85981E-01	0.76050E-02	-0.58325E-03
1210	0.39637E-03	-0.25639E-02	0.30174E 00	0.70869E 00	-0.70629E-05	-0.21390E-03
1310	-0.66624E-03	-0.25662E-02	-0.39636E 00	0.90745E 00	-0.70629E-05	-0.35903E-03
1501	0.42473E-02	-0.28220E-01	-0.22276E-01	0.75130E-01	0.82930E-02	0.38199E-02
1502	0.40355E-02	-0.26370E-01	-0.25328E-01	0.76121E-01	0.77147E-02	0.51601E-02
1503	0.19516E-02	-0.17212E-01	0.33143E-01	0.75031E-01	0.35749E-02	0.53988E-02
1504	0.17367E-02	-0.15116E-01	0.31290E-01	0.75421E-01	0.28083E-02	0.75184E-02

MODE NUMBER 58

GRID	T1	T2	T3	R1	R2	R3
10	0.87635E-02	0.21485E 00	0.96319E-02	-0.23861E-01	-0.10994E-02	0.32981E-01
151	-0.61056E-02	-0.90779E-01	-0.10069E-01	-0.93651E-01	-0.40753E-02	0.97580E-02
175	0.41204E-01	-0.49998E-01	0.10644E-01	-0.98145E-01	-0.25373E-01	0.57085E 00
195	-0.26163E 00	0.55086E-01	0.15864E-01	0.49198E-01	-0.64270E-01	-0.23908E 00
215	0.21622E 00	0.57089E-01	-0.74208E-02	0.47646E-01	0.24418E-01	-0.20936E 00
321	-0.31098E-02	0.21212E 00	0.33411E-01	0.51280E-01	-0.22547E-01	-0.74571E-02
322	-0.54680E-02	0.18070E 00	0.94069E-02	-0.31285E-01	0.33422E-01	0.38920E-02
331	0.81234E-01	0.32271E 00	0.14750E-02	0.36921E-01	-0.91047E-02	0.10504E 00
332	-0.45473E-01	0.33532E 00	-0.66653E-02	0.81629E-02	0.37997E-01	0.16623E 00
333	-0.55046E-01	0.30399E 00	-0.31467E-02	-0.10293E-01	0.67171E-01	0.54979E-01
340	-0.44790E-02	0.38936E 00	-0.20505E-01	-0.16576E-01	0.12148E-01	-0.40115E 00
351	-0.64977E-02	0.29643E 00	0.51147E-02	0.11428E-01	-0.36790E-02	0.14116E 00
400	-0.64977E-02	0.13508E 00	0.90953E-03	0.11428E-01	-0.36790E-02	0.14116E 00
801	0.92897E-02	-0.17817E 00	-0.52313E-02	0.19595E-01	0.20852E-02	0.18568E-01
811	0.76673E-02	0.14038E 00	-0.54025E-02	0.23068E-01	-0.11827E-02	0.58891E-01
1106	0.27464E-02	-0.46884E-01	0.15275E-02	0.48371E 00	0.28339E-01	0.18568E-01
1156	0.55132E-03	-0.35886E-01	0.16669E-03	-0.37011E 00	-0.56783E-02	0.18568E-01
1210	-0.90859E-02	0.48224E-01	0.70712E-01	0.16947E 00	-0.34404E-05	0.19135E-02
1310	0.21959E-01	0.48223E-01	-0.11113E 00	0.26633E 00	-0.34404E-05	0.11843E-01
1501	0.59496E-02	-0.17925E 00	-0.61742E-01	0.14527E 00	-0.72634E-01	-0.81085E-01
1502	0.83964E-02	-0.20396E 00	-0.41513E-01	0.14338E 00	-0.79446E-01	-0.65492E-01
1503	0.71973E-02	-0.17110E 00	0.53966E-01	0.23912E-01	0.66544E-01	-0.59901E-01
1504	0.67582E-02	-0.19012E 00	0.35408E-01	0.77579E-01	0.75661E-01	-0.66815E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 59

GRID	T1	T2	T3	R1	R2	R3
10	-0.23074E-02	0.93793E-02	-0.15051E 00	-0.11234E-01	0.24570E-02	0.78539E-03
151	-0.31365E-03	-0.88160E-02	0.74006E-01	-0.31741E-01	0.52861E-02	0.31583E-02
175	-0.22257E 00	0.90929E-02	0.33859E-01	-0.27771E-02	-0.70018E-01	-0.28900E-02
195	0.69176E-01	0.46103E-01	-0.18222E-01	0.10120E 00	0.33065E-01	-0.38584E 00
215	0.13452E 00	-0.27886E-01	-0.16841E-01	-0.10933E 00	0.35240E-01	0.41707E 00
321	0.39455E-02	-0.21947E-01	-0.18893E 00	-0.37729E-01	-0.90224E-02	-0.13630E-01
322	0.32779E-02	-0.80598E-02	-0.21570E 00	0.25302E-01	0.13447E-01	0.62991E-02
331	0.72433E-02	-0.12044E-01	-0.27373E 00	0.16404E-01	0.11632E 00	-0.65059E-01
332	-0.63088E-01	0.76363E-02	-0.26278E 00	-0.17209E-01	0.63457E-01	-0.22905E-01
333	0.63737E-01	-0.20745E-02	-0.27544E 00	0.21422E-01	0.12514E 00	0.28555E-02
340	0.25883E-01	0.46148E-01	-0.27498E 00	0.33360E-01	-0.29237E 00	-0.42397E-01
351	0.73569E-02	0.48757E-02	-0.25164E 00	0.62632E-02	0.11837E 00	0.31098E-02
400	0.23589E-02	0.13212E-02	-0.11635E 00	0.62632E-02	0.11837E 00	0.31098E-02
801	0.67047E-03	-0.28668E-02	0.16232E 00	0.73344E-02	0.25842E-01	0.43232E-03
811	0.71338E-03	0.11637E-02	-0.63191E-01	-0.16748E-03	0.38228E-01	0.70829E-03
1106	0.82659E-02	-0.30351E-02	-0.45039E-01	0.31954E-01	0.87099E-01	0.43232E-03
1156	-0.77960E-02	0.15171E-02	-0.45523E-01	0.15987E-01	0.82105E-01	0.43224E-03
1210	0.45272E-04	0.74273E-03	0.39472E 00	0.96524E 00	-0.29439E-04	-0.50828E-04
1310	0.76248E-03	0.74073E-03	0.35418E 00	-0.86610E 00	-0.29439E-04	0.41135E-03
1501	0.39144E-01	-0.14061E-01	0.20476E 00	0.12072E 00	0.68753E-01	-0.16005E-01
1502	0.38454E-01	-0.13616E-01	0.17706E 00	0.33045E-01	0.81137E-01	-0.92737E-02
1503	0.17544E-01	-0.31351E-01	0.20419E 00	-0.36837E-01	0.48017E-01	0.46796E-01
1504	0.15793E-01	-0.19054E-01	0.18769E 00	0.48836E-01	0.44590E-01	0.54601E-01

MODE NUMBER 60

GRID	T1	T2	T3	R1	R2	R3
10	0.48947E-02	-0.24259E-03	-0.11524E-03	0.12216E-03	-0.84331E-04	0.32153E-03
151	-0.10867E-03	-0.37670E-03	0.60813E-04	-0.63475E-03	0.34686E-04	0.34905E-03
175	-0.20565E-03	0.23473E-03	0.41767E-04	-0.35106E-02	-0.17732E-03	-0.18742E-02
195	0.14061E-02	-0.59051E-04	-0.24538E-03	0.13459E-02	0.13100E-03	0.78449E-03
215	-0.11918E-02	-0.14555E-03	0.20232E-03	0.12322E-02	-0.32796E-03	0.13971E-02
321	-0.20976E-03	0.46571E-04	-0.37940E-03	0.19670E-02	-0.31637E-02	0.14203E-02
322	0.10341E-03	0.53021E-04	0.42977E-04	0.19672E-02	0.33424E-02	0.14511E-02
331	-0.17988E-03	0.13144E-03	-0.50563E-04	-0.15425E-03	0.61475E-04	0.97658E-04
332	-0.11464E-03	0.65535E-04	-0.89519E-04	0.21998E-04	-0.76930E-05	-0.10335E-03
333	-0.79091E-04	0.14615E-03	-0.55867E-04	-0.33805E-04	-0.14006E-03	0.50376E-04
340	-0.68553E-04	-0.78425E-02	-0.25634E-03	-0.81038E-02	-0.51496E-03	0.19793E-01
351	-0.12367E-03	0.10432E-03	-0.55895E-04	-0.50571E-04	0.37426E-04	-0.67134E-04
400	-0.12367E-03	0.18106E-03	-0.13117E-04	-0.50571E-04	0.37426E-04	-0.67134E-04
801	-0.11660E-05	0.13906E-03	0.89378E-04	0.74100E-04	0.28189E-04	-0.81046E-04
811	-0.41578E-05	0.36917E-03	-0.41883E-04	0.85167E-04	0.16819E-04	0.55789E-04
1106	0.11520E-04	0.17096E-04	-0.22444E-04	-0.18664E-03	0.12621E-03	-0.81046E-04
1156	-0.53933E-05	0.79227E-04	-0.26870E-04	0.86692E-03	0.59100E-04	-0.81046E-04
1210	0.53345E-04	-0.32728E-04	0.22618E-03	0.57611E-03	-0.16041E-07	-0.28891E-04
1310	-0.54633E-04	-0.32730E-04	0.14964E-05	-0.35491E-05	-0.16042E-07	-0.29586E-04
1501	-0.11857E-05	0.66123E-04	0.14842E-03	0.19918E-03	0.26336E-03	-0.33849E-04
1502	0.10896E-05	0.49632E-04	0.71187E-04	0.20992E-03	0.27258E-03	-0.81113E-05
1503	0.10821E-03	0.81940E-04	0.15943E-03	0.30420E-03	-0.11090E-03	0.10957E-04
1504	0.93096E-04	0.72809E-04	0.18326E-03	0.32001E-03	-0.11580E-03	0.70329E-04

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 61

GRID	T1	T2	T3	R1	R2	R3
10	-0.19381E-02	-0.32095E-02	0.62887E-03	0.47360E-01	0.22503E-02	0.23135E-01
151	-0.12587E-02	-0.21181E-01	-0.14295E-02	-0.33279E-01	0.10460E-02	-0.29634E-01
175	0.12230E-01	0.55910E-02	0.19853E-01	-0.68856E-01	-0.29101E-01	0.13346E 00
195	-0.71470E-01	0.34910E-02	-0.18368E-01	-0.43422E-01	-0.17630E-01	0.19746E 00
215	0.46974E-01	0.53726E-02	0.65851E-02	-0.52941E-01	0.24910E-01	0.25115E 00
321	-0.19297E-01	0.32889E-01	0.35141E-01	-0.18582E-01	-0.70311E-02	-0.44206E-01
322	0.24799E-01	0.19272E-01	-0.20354E-01	-0.52350E-01	0.23228E-01	-0.28742E-01
331	0.19392E-01	0.75070E-01	-0.31919E-02	0.20766E-01	0.19882E-02	0.23502E-01
332	-0.13761E-01	0.78009E-01	-0.19295E-01	-0.52803E-02	0.30954E-01	0.43211E-01
333	-0.10650E-01	0.71830E-01	-0.17225E-01	-0.14139E-01	0.30623E-01	0.78932E-02
340	0.15208E-01	-0.38643E 00	-0.76680E-01	-0.39370E 02	-0.16172E 00	-0.10356E 02
351	-0.11437E-02	0.69872E-01	-0.84434E-02	-0.58671E-02	0.29833E-02	0.31185E-01
400	-0.11437E-02	0.34227E-01	-0.50333E-02	-0.58671E-02	0.29833E-02	0.31185E-01
801	0.28980E-02	-0.23152E-01	-0.14174E-01	0.58719E-01	0.12365E-01	-0.30558E-02
811	0.24862E-02	0.47785E-01	0.80385E-02	0.75157E-01	-0.95292E-02	0.14512E-01
1106	0.10033E-01	-0.52914E-01	0.32711E-02	0.59921E 00	0.11362E 00	-0.30558E-02
1156	-0.62096E-02	0.26154E-01	0.48024E-04	0.29627E 00	0.70337E-01	-0.30558E-02
1210	0.32415E-02	0.50401E-02	0.51876E-01	0.11696E 00	-0.40101E-05	-0.17567E-02
1310	-0.38649E-03	0.50396E-02	-0.78401E-01	0.20699E 00	-0.40101E-05	-0.21217E-03
1501	0.14038E-01	-0.83615E-01	-0.50775E-01	0.27187E 00	0.34044E-01	-0.56431E-01
1502	0.14302E-01	-0.10006E 00	-0.64406E-01	0.31406E 00	0.30217E-01	-0.41693E-01
1503	0.22547E-01	-0.63632E-01	0.76237E-01	0.20955E 00	0.30533E-01	-0.24468E-01
1504	0.19662E-01	-0.73331E-01	0.69942E-01	0.27472E 00	0.25904E-01	-0.17952E-01

MODE NUMBER 62

GRID	T1	T2	T3	R1	R2	R3
10	0.38608E-04	-0.12359E-01	-0.55884E-03	0.36713E-02	0.44382E-02	-0.47241E-01
151	0.43712E-03	0.15943E-01	0.38414E-02	-0.47800E-02	0.11604E-02	0.18818E-02
175	-0.20867E-01	0.28423E-01	-0.13000E-02	0.20940E-01	0.15417E-02	-0.11967E 00
195	0.7[illegible]10E-01	-0.17525E-01	0.46086E-02	-0.14239E-01	0.32605E-02	0.63136E-01
215	-0.[illegible]3E-01	-0.18813E-01	-0.74704E-02	-0.15829E-01	0.69331E-04	0.49661E-01
321	0.2[illegible]6E-02	-0.70442E-01	-0.12453E-01	-0.32735E-01	-0.21744E-02	0.90603E-02
322	-0.59698E-03	-0.56982E-01	-0.55536E-02	0.45999E-02	0.37345E-03	0.73143E-02
331	-0.30163E-01	-0.12006E 00	-0.82427E-02	-0.12023E-01	0.63133E-02	-0.38761E-01
332	0.12505E-01	-0.12296E 00	-0.18455E-02	-0.31799E-02	-0.16699E-01	-0.62188E-01
333	0.19711E-01	-0.11239E 00	-0.45745E-02	0.80605E-02	-0.25260E-01	-0.30662E-01
340	0.15625E-01	-0.28418E 00	-0.35862E-01	-0.43889E 00	-0.14972E 00	0.56339E 00
351	0.72112E-03	-0.10978E 00	-0.81393E-02	-0.23001E-02	0.40890E-02	-0.49926E-01
400	0.72112E-03	-0.52712E-01	-0.34656E-02	-0.23001E-02	0.40890E-02	-0.49926E-01
801	-0.15413E-02	0.33473E-01	0.85103E-03	-0.48111E-04	0.10380E-03	0.22202E-02
811	-0.61229E-03	-0.56132E-01	-0.33550E-03	-0.12493E-03	0.21770E-03	-0.19477E-01
1106	-0.21066E-02	0.57162E-01	-0.18267E-03	-0.66692E 00	-0.24508E-01	0.22202E-02
1156	-0.32524E-02	0.56991E-01	-0.18025E-03	0.66492E 00	0.37947E-01	0.22201E-02
1210	-0.13931E-02	-0.78342E-02	0.62365E-03	0.16994E-02	-0.21126E-07	0.10281E-02
1310	0.50888E-03	-0.78342E-02	0.71265E-03	-0.19420E-02	-0.21079E-07	0.27790E-03
1501	0.69631E-02	0.22487E-01	0.11134E-01	-0.34464E-01	0.20792E-01	0.49619E-01
1502	0.57297E-02	0.35453E-01	0.59393E-02	-0.38862E-01	0.23358E-01	0.41958E-01
1503	-0.11087E-01	0.21877E-01	-0.62274E-02	0.10365E-01	-0.16956E-01	0.42119E-01
1504	-0.99853E-02	0.35761[illegible]01	-0.29069E-02	-0.11174E-01	-0.20870E-01	0.41941E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 63

GRID	T1	T2	T3	R1	R2	R3
10	-0.27211E-02	0.20974E-02	-0.21653E-01	-0.60264E-02	0.76503E-01	0.81726E-02
151	-0.33010E-02	-0.67512E-02	0.33671E-01	-0.67596E-02	-0.28973E-02	0.18138E-02
175	-0.12408E 00	0.37298E-02	0.30710E-02	-0.26623E-02	-0.32079E-01	-0.10758E-01
195	0.16554E-01	0.45926E-01	-0.51465E-02	0.62100E-01	-0.89625E-02	-0.16957E 00
215	0.84816E-01	-0.34444E-01	-0.38166E-02	-0.60653E-01	-0.81421E-02	0.19173E 00
321	-0.25847E-02	-0.95672E-02	-0.11064E 00	-0.13055E-01	-0.22204E-01	0.23757E-02
322	-0.29249E-02	-0.13786E-01	-0.14121E 00	0.13635E-03	-0.10204E-01	-0.12316E-01
331	0.12517E-01	-0.80735E-03	-0.21686E 00	0.15781E-01	0.91850E-01	-0.55079E-01
332	-0.49182E-01	0.17159E-01	-0.21017E 00	-0.18709E-01	0.47537E-01	-0.14828E-01
333	0.51826E-01	0.83872E-02	-0.22617E 00	0.13854E-01	0.10647E 00	0.30200E-02
340	0.28236E 00	0.73502E-01	-0.10300E 01	0.10164E 00	-0.28225E 01	-0.11881E 00
351	0.50948E-02	0.14561E-01	-0.20141E 00	0.33615E-02	0.94156E-01	0.70258E-02
400	0.50948E-02	0.65309E-02	-0.93789E-01	0.33615E-02	0.94156E-01	0.70258E-02
801	-0.17630E-02	-0.25148E-02	0.66744E-01	0.28695E-02	0.45080E-02	-0.21068E-03
811	-0.20992E-02	0.36306E-02	-0.52996E-01	-0.51827E-02	0.22307E-01	0.13553E-02
1106	0.67761E-02	-0.11008E-01	-0.14214E-01	0.12887E 00	0.79335E-01	-0.21068E-03
1156	-0.12980E-01	0.16261E-02	-0.14359E-01	0.19044E-01	0.15196E 00	-0.21077E-03
1210	-0.67110E-03	0.50877E-03	0.54238E-01	0.14832E 00	-0.87033E-06	0.36358E-03
1310	-0.89680E-03	0.50846E-03	0.49000E-01	-0.13400E 00	-0.87031E-06	-0.48632E-03
1501	0.39491E-02	-0.69544E-02	0.74206E-01	0.10827E 00	0.13643E-01	-0.11718E-01
1502	0.46648E-02	-0.65747E-02	0.69974E-01	0.27553E-01	0.23551E-01	-0.78186E-02
1503	-0.11455E-02	-0.15366E-01	0.73556E-01	-0.38908E-01	0.20784E-02	0.27029E-01
1504	-0.14507E-02	-0.10066E-01	0.74494E-01	0.41563E-01	0.30137E-02	0.32813E-01

MODE NUMBER 64

GRID	T1	T2	T3	R1	R2	R3
10	-0.37145E-05	-0.12356E-03	-0.87205E-04	-0.48894E-03	-0.48829E-03	-0.47510E-03
151	-0.38762E-04	0.20363E-03	-0.40007E-04	-0.65882E-03	-0.17622E-03	0.18106E-04
175	-0.35502E-03	0.65939E-03	-0.23667E-02	0.33051E-03	0.28050E-02	-0.12586E-02
195	0.57949E-03	0.12160E-03	0.69581E-03	-0.58166E-04	-0.12872E-02	0.49473E-03
215	-0.52599E-03	0.52447E-03	0.14189E-02	-0.57323E-03	-0.22774E-02	0.15546E-02
321	-0.44358E-03	-0.12588E-02	-0.60417E-03	-0.40770E-03	-0.97811E-03	0.13002E-02
322	-0.47224E-03	-0.61992E-03	-0.20761E-03	0.79344E-03	-0.99360E-03	-0.11221E-02
331	-0.19631E-03	-0.12592E-02	-0.62316E-03	0.29655E-03	0.32513E-03	-0.59622E-03
332	0.55520E-04	-0.10382E-02	-0.17488E-03	0.28932E-03	-0.64448E-04	-0.68866E-03
333	0.42942E-03	-0.13502E-02	-0.25272E-03	0.53659E-03	0.25827E-04	-0.29049E-03
340	0.59867E-02	0.37007E-02	-0.17858E-01	-0.15247E-02	-0.59358E-01	-0.13251E-01
351	0.96916E-04	-0.11144E-02	-0.34173E-03	0.37010E-03	0.31298E-03	-0.48433E-03
400	0.96916E-04	-0.50079E-03	0.16013E-04	0.37010E-03	0.31298E-03	-0.48433E-03
801	-0.75544E-04	-0.86641E-04	0.36430E-02	0.25753E-03	-0.17047E-02	-0.29175E-03
811	-0.11072E-03	0.16033E-02	-0.12553E-01	-0.16130E-02	0.34038E-02	0.38854E-03
1106	-0.56335E-04	-0.10498E-01	-0.79464E-03	0.12444E 00	-0.66776E 00	-0.29175E-03
1156	0.53116E-01	0.57600E-02	-0.80731E-03	0.68276E-01	-0.62961E 00	-0.29135E-03
1210	0.11829E-03	0.17070E-04	0.30562E-02	0.84688E-02	0.27299E-06	-0.64438E-04
1310	-0.18318E-03	0.17052E-04	0.26090E-02	-0.72296E-02	0.27299E-06	-0.99642E-04
1501	-0.28704E-02	-0.16411E-03	0.14477E-02	0.13138E-02	-0.56082E-02	-0.71546E-04
1502	-0.26066E-02	-0.29012E-03	0.30554E-02	0.11784E-03	-0.44159E-02	0.10509E-03
1503	-0.13859E-02	-0.17604E-03	0.20402E-02	0.41175E-02	-0.65731E-02	-0.11325E-02
1504	-0.12806E-02	-0.39235E-03	0.37485E-02	0.57277E-02	-0.54787E-02	-0.87169E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 65

GRID	T1	T2	T3	R1	R2	R3
10	-0.23466E-03	-0.31085E-03	0.26139E-03	-0.38814E-02	-0.72351 -03	-0.10199E-02
151	-0.16145E-03	0.67817E-03	-0.20353E-03	-0.47956E-02	0.15081E-03	-0.36872E-05
175	0.44932E-03	0.40661E-02	0.43374E-03	0.44196E-03	-0.12881E-02	-0.57596E-03
195	0.88334E-03	0.25357E-02	-0.76917E-03	-0.16917E-02	-0.73648E-03	0.57541E-02
215	-0.22197E-02	0.38287E-02	0.24182E-03	-0.87752E-03	-0.14564E-02	0.15053E-0?
321	0.93412E-04	-0.38128E-02	-0.75853E-03	0.18193E-02	0.35811E-03	0.89999E-?
322	0.25709E-03	-0.29729E-02	0.23708E-02	0.33084E-02	0.16634E-02	-0.61838E-0?
331	-0.57362E-03	-0.28111E-02	0.20460E-03	0.27655E-02	-0.63468E-03	-0.41682E-03
332	0.89359E-03	-0.13773E-02	0.31518E-02	0.32508E-02	-0.72244E-03	-0.12698E-02
333	0.23473E-03	-0.43451E-02	0.32346E-02	0.32475E-02	-0.15399E-02	-0.66869E-03
340	0.17169E-01	0.38278E-01	-0.52219E-01	-0.13036E-02	-0.17742E 00	-0.12138E 00
351	0.17990E-03	-0.27093E-02	0.19807E-02	0.30448E-02	-0.68759E-03	-0.11909E-02
400	0.17990E-03	-0.13481E-02	0.11943E-02	0.30448E-02	-0.68759E-03	-0.11909E-02
801	-0.77166E-04	0.25050E-03	-0.12313E-02	0.19614E-02	0.29899E-03	-0.29901E-03
811	-0.10419E-03	0.12656E-02	0.22508E-03	0.25939E-02	-0.46212E-03	0.25144E-03
1106	-0.62068E-02	0.46271E-01	0.25340E-03	-0.54957E 00	-0.73647E-01	-0.29901E-03
1156	0.78680E-02	-0.56226E-01	0.15742E-03	-0.66780E 00	-0.93448E-01	-0.29895E-03
1210	0.12069E-03	-0.49072E-04	0.78968E-03	0.21930E-02	-0.46472E-07	-0.65756E-04
1310	-0.18652E-03	-0.49080E-04	-0.25928E-02	0.72001E-02	-0.46474E-07	-0.10147E-03
1501	0.25147E-03	-0.30836E-02	-0.28129E-02	0.17686E-01	0.14187E-02	0.75010E-03
1502	0.19984E-03	-0.27620E-02	-0.30516E-02	0.16804E-01	0.85027E-03	0.12156E-02
1503	0.67561E-03	-0.17716E-02	0.26360E-02	0.21257E-01	0.19582E-02	0.23712E-04
1504	0.56334E-03	-0.16575E-02	0.18665E-02	0.16706E-01	0.19927E-02	0.55687E-03

MODE NUMBER 66

GRID	T1	T2	T3	R1	R2	R3
10	-0.12754E-02	0.15955E-02	0.30471E-03	-0.97895E-03	-0.96117E-03	0.47191E-02
151	-0.18043E-02	-0.21587E-02	-0.72941E-03	-0.32347E-04	-0.16165E-03	-0.46140E-03
175	0.27811E-02	-0.12593E-02	0.42062E-02	-0.52962E-02	-0.93998E-02	0.22061E-01
195	-0.10894E-01	0.14081E-02	0.72760E-02	0.21714E-02	-0.15370E-01	-0.91617E-02
215	0.56520E-03	0.23091E-02	0.15902E-02	0.32561E-02	-0.51111E-02	-0.10428E-01
321	-0.12459E-02	0.89480E-02	0.21860E-02	0.53791E-02	0.49029E-04	-0.31145E-02
322	-0.15114E-03	0.65277E-02	0.26889E-02	-0.11692E-02	0.29652E-02	-0.10015E-03
331	0.1 444E-02	0.15628E-01	0.21525E-02	0.19543E-02	-0.12641E-02	0.50970E-02
332	-0.31810E-02	0.16202E-01	0.16716E-02	0.86403E-03	0.19051E-02	0.79915E-02
333	-0.46066E-02	0.14327E-01	0.21112E-02	-0.74335E-03	0.29682E-02	0.36891E-02
340	0.53484E-02	0.44392E-01	-0.20555E-01	0.40747E-01	-0.68264E-01	-0.10424E 00
351	-0.19438E-02	0.14265E-01	0.23380E-02	0.73915E-03	-0.98442E-03	0.63106E-02
400	-0.19438E-02	0.70517E-02	0.12128E-02	0.73915E-03	-0.98442E-03	0.63106E-02
801	0.48987E-02	-0.30050E-02	-0.28275E-03	0.29294E-03	-0.19130E-03	0.24512E-02
811	0.57371E-02	-0.85069E-02	-0.99267E-03	0.23527E-03	0.14421E-03	-0.16724E-02
1106	-0.36189E-01	0.40424E-01	0.58069E-04	-0.48055E 00	-0.65797E 00	0.24512E-02
1156	-0.54671E-01	0.32081E-01	0.43740E-04	0.38042E 00	0.6499 E 00	0.24508E-02
1210	0.82805E-03	0.58758E-03	0.45382E-04	0.12617E-03	0.29370E-07	-0.44705E-03
1310	0.33401E-02	0.58758E-03	-0.49829E-03	0.12739E-02	0.29325E-07	0.18146E-02
1501	0.67587E-02	-0.61668E-02	-0.25262E-02	0.11516E-01	-0.49641E-02	0.59131E-02
1502	0.64572E-02	-0.44677E-02	-0.13005E-02	0.84914E-02	-0.53721E-02	0.51128E-02
1503	0.17130E-02	-0.58374E-02	0.12695E-02	0.15023E-02	0.43887E-02	0.47115E-02
1504	0.21163E-02	-0.41390E-02	0.56217E-03	0.36539E-02	0.48725E-02	0.31659E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 67

GRID	T1	T2	T3	R1	R2	R3
10	-0.20033E-02	-0.17609E-02	0.29177E-02	0.27991E-02	-0.89109E-02	-0.47748E-02
151	-0.26301E-02	0.24664E-02	-0.35155E-02	0.90144E-03	0.13067E-02	0.32172E-03
175	-0.10671E-01	-0.80915E-03	0.25107E-02	0.54716E-02	-0.10722E-01	-0.20014E-01
195	0.34102E-02	-0.90418E-02	0.33343E-03	-0.94594E-02	-0.12570E-01	0.35638E-01
215	-0.20737E-01	0.29279E-02	0.49810E-02	0.50300E-02	-0.22579E-01	-0.19413E-01
321	0.86026E-03	-0.72240E-02	0.15101E-01	-0.48588E-02	0.10349E-01	0.85866E-02
322	-0.37004E-03	-0.21064E-02	0.17450E-01	0.11693E-02	0.54311E-02	-0.41700E-02
331	-0.43410E-02	-0.13670E-01	0.28301E-01	-0.54739E-02	-0.94556E-02	0.24014E-02
332	0.72808E-02	-0.17191E-01	0.26081E-01	-0.30771E-03	-0.70850E-02	-0.55397E-02
333	-0.29303E-02	-0.13001E-01	0.28146E-01	-0.27120E-02	-0.15035E-01	-0.35296E-02
340	0.12044E 00	-0.84853E-01	-0.36255E 00	-0.61494E-01	-0.12591E 01	0.21972E 00
351	0.74825E-04	-0.14456E-01	0.25531E-01	-0.25823E-02	-0.99033E-02	-0.64537E-02
400	0.74825E-04	-0.70793E-02	0.14211E-01	-0.25823E-02	-0.99033E-02	-0.64537E-02
801	0.26504E-02	0.40895E-02	-0.99996E-02	-0.89289E-03	-0.31259E-03	-0.21116E-02
811	0.40014E-02	0.70071E-02	0.99169E-02	0.52583E-03	-0.37564E-02	0.76183E-03
1106	-0.24715E-01	-0.56176E-01	0.20444E-02	0.66795E 00	-0.29387E 00	-0.21116E-02
1156	-0.38305E-01	-0.32587E-01	0.20868E-02	-0.39222E 00	0.45545E 00	-0.21119E-02
1210	0.22083E-02	-0.79934E-03	-0.80340E-02	-0.22336E-01	0.47921E-07	-0.12001E-02
1310	0.45503E-04	-0.79929E-03	-0.64998E-02	0.18071E-01	0.47860E-07	0.22762E-04
1501	0.84876E-03	0.82265E-02	-0.83014E-02	-0.33362E-01	0.43286E-02	-0.34368E-02
1502	0.87775E-03	0.64433E-02	-0.90981E-02	-0.15678E-01	0.30170E-02	-0.34903E-02
1503	0.86515E-02	0.91450E-02	-0.12577E-01	0.22609E-02	-0.33844E-02	-0.99160E-02
1504	0.95443E-02	0.66812E-02	-0.12164E-01	-0.13606E-01	-0.42986E-02	-0.93518E-02

MODE NUMBER 68

GRID	T1	T2	T3	R1	R2	R3
10	0.32150E-03	-0.17238E-02	-0.33410E-02	-0.85312E-03	0.10396E-01	-0.58260E-02
151	0.38592E-03	0.24942E-02	0.47344E-02	-0.16931E-02	-0.11424E-02	0.89456E-03
175	-0.18694E-01	0.38665E-02	0.36840E-02	0.70154E-02	-0.20054E-02	-0.31668E-01
195	0.19024E-01	0.57109E-02	0.80639E-03	0.32559E-02	0.10400E-01	-0.10949E-01
215	0.31457E-02	-0.73685E-02	0.66735E-02	-0.11694E-01	-0.29500E-03	0.41812E-01
321	-0.36613E-03	-0.11985E-01	-0.19256E-01	-0.37598E-02	-0.67798E-02	-0.84616E-02
322	-0.17873E-02	-0.14742E-01	-0.21689E-01	-0.14730E-02	-0.77753E-02	0.11626E-01
331	-0.80425E-02	-0.22920E-01	-0.31127E-01	0.97713E-03	0.11464E-01	-0.13393E-01
332	-0.69419E-02	-0.20607E-01	-0.27951E-01	-0.11902E-02	0.17590E-02	-0.13212E-01
333	0.55206E-02	-0.20880E-01	-0.30201E-01	0.46384E-02	0.70977E-02	-0.53258E-02
340	-0.13833E 00	-0.20701E-01	0.41728E 00	-0.48525E-01	0.14281E 01	0.58016E-01
351	-0.32096E-02	-0.19081E-01	-0.28805E-01	0.13525E-02	0.11193E-01	-0.84471E-02
400	-0.32096E-02	-0.94280E-02	-0.15811E-01	0.13525E-02	0.11193E-01	-0.84471E-02
801	0.45349E-02	0.56890E-02	0.11011E-01	0.46278E-03	0.14681E-03	-0.24532E-02
811	0.51873E-02	0.73926E-02	-0.11239E-01	-0.13047E-02	0.42720E-02	0.47414E-03
1106	-0.42430E-01	-0.46203E-01	-0.22579E-02	0.54962E 00	-0.50473E 00	-0.24532E-02
1156	-0.44526E-01	-0.56155E-01	-0.22804E-02	-0.66801E 00	0.52968E 00	-0.24535E-02
1210	0.37804E-02	-0.11107E-02	0.84200E-02	0.23420E-01	-0.22213E-07	-0.17279E-02
1310	0.67108E-03	-0.11108E-02	0.76260E-02	-0.21212E-01	-0.22304E-07	0.36186E-03
1501	0.32765E-02	0.69187E-02	0.13702E-01	0.63423E-02	0.72467E-02	-0.36858E-02
1502	0.36378E-02	0.60436E-02	0.12287E-01	-0.55818E-02	0.96754E-02	-0.30826E-02
1503	0.73034E-02	0.56653E-02	0.97422E-02	-0.16567E-02	-0.70390E-02	-0.65411E-03
1504	0.67839E-02	0.52408E-02	0.11467E-01	0.72285E-02	-0.72474E-02	0.27294E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 69

GRID	T1	T2	T3	R1	R2	R3
10	0.34344E-03	0.31747E-02	-0.45287E-03	0.23438E-02	0.16174E-02	0.11429E-01
151	-0.72985E-04	-0.11536E-01	0.13837E-03	-0.25818E-01	-0.23602E-03	-0.67233E-03
175	0.24025E-02	-0.64955E-02	0.26630E-02	-0.12908E-01	-0.35236E-02	0.49603E-01
195	-0.15486E-01	0.54942E-02	0.60195E-02	0.15956E-01	0.34182E-02	-0.96849E-02
215	0.13502E-01	0.34107E-02	-0.90110E-02	0.11753E-01	0.20509E-02	0.10436E-01
321	-0.13158E-02	0.22952E-01	0.53449E-04	0.80717E-02	-0.55543E-02	-0.63458E-02
322	0.17027E-02	0.17799E-01	-0.19852E-02	-0.43414E-02	0.67029E-02	-0.30331E-02
331	0.94846E-02	0.37427E-01	-0.38298E-02	0.14925E-02	0.13624E-02	0.87805E-02
332	-0.52606E-02	0.37703E-01	-0.85062E-02	-0.26067E-02	0.66831E-02	0.17952E-01
333	-0.40675E-02	0.36715E-01	-0.79568E-02	-0.49302E-02	0.11820E-01	0.87933E-02
340	-0.11998E-01	-0.10000E 01	0.29206E-01	-0.75936E 00	0.12482E 00	0.31465E 01
351	0.73875E-04	0.34906E-01	-0.50471E-02	-0.19327E-02	0.19507E-02	0.15117E-01
400	0.73875E-04	0.17627E-01	-0.28175E-02	-0.19327E-02	0.19507E-02	0.15117E-01
801	-0.95608E-04	-0.23533E-02	-0.79681E-03	0.70133E-02	0.19711E-02	0.34554E-02
811	0.81174E-04	-0.14800E-01	0.11082E-02	0.93266E-02	-0.11579E-02	-0.30283E-02
1106	-0.40495E-02	0.19195E-01	0.15940E-03	-0.23074E 00	-0.48679E-01	0.34554E-02
1156	0.57676E-02	-0.10540E-01	-0.17430E-03	-0.12669E 00	-0.69334E-01	0.34555E-02
1210	-0.17554E-02	0.44925E-03	0.52740E-02	0.14836E-01	-0.25539E-06	0.95622E-03
1310	0.16766E-02	0.44920E-03	-0.64025E-02	0.18010E-01	-0.25636E-06	0.91341E-03
1501	0.49374E-02	-0.12939E-01	-0.67005E-02	0.68402E-01	-0.54203E-03	-0.13733E-02
1502	0.44833E-02	-0.12734E-01	-0.74254E-02	0.67812E-01	-0.13873E-02	-0.11085E-02
1503	-0.25105E-02	-0.10825E-01	0.12604E-01	0.32185E-01	0.14266E-01	0.62073E-02
1504	-0.20941E-02	-0.95072E-02	0.10141E-01	0.52216E-01	0.12824E-01	0.37035E-02

MODE NUMBER 70

GRID	T1	T2	T3	R1	R2	R3
10	-0.26624E-03	-0.20034E-03	0.53952E-03	0.20814E-02	0.16369E-02	0.72759E-04
151	-0.23129E-03	0.28679E-03	0.20627E-03	-0.20179E-02	0.11163E-02	-0.43132E-03
175	0.12849E-03	-0.25520E-02	0.90445E-02	0.16030E-02	-0.11974E-01	-0.62764E-02
195	0.14679E-02	-0.55312E-03	-0.26232E-02	-0.24809E-02	0.28159E-02	0.58560E-02
215	-0.16462E-02	-0.24706E-02	-0.42840E-02	0.88350E-03	0.46204E-02	-0.38440E-02
321	0.22355E-02	0.10008E-02	0.20938E-02	-0.48138E-03	0.50521E-02	-0.26286E-02
322	0.14536E-02	-0.34327E-04	0.96664E-03	-0.22940E-02	0.39096E-02	0.39258E-02
331	-0.95375E-03	-0.21792E-02	0.34400E-02	-0.22741E-02	-0.11409E-02	0.60564E-03
332	0.73498E-03	-0.34715E-02	0.19576E-02	-0.13724E-02	-0.81313E-03	-0.91086E-03
333	-0.55216E-03	-0.13393E-02	0.21729E-02	-0.18496E-02	-0.21667E-02	-0.51314E-03
340	-0.99741E-03	0.13946E-02	0.48228E-04	0.59934E-02	-0.22816E-02	-0.14274E-01
351	-0.24697E-03	-0.22910E-02	0.22358E-02	-0.17773E-02	-0.12361E-02	-0.10447E-02
400	-0.24697E-03	-0.10968E-02	0.82286E-03	-0.17773E-02	-0.12361E-02	-0.10447E-02
801	0.52183E-03	0.26189E-02	-0.92244E-02	0.35179E-03	0.47778E-02	0.33436E-03
811	0.72550E-03	-0.35289E-02	0.24148E-01	0.54178E-02	-0.75197E-02	-0.14064E-02
1106	-0.13907E-02	-0.49041E-03	0.15376E-02	0.63905E-02	-0.18108E-01	0.33430E-03
1156	0.11506E-02	-0.67622E-03	0.15237E-02	-0.88099E-02	-0.14981E-01	0.33440E-03
1210	0.40321E-04	-0.42352E-03	-0.70744E-02	-0.21696E-01	-0.20265E-06	-0.21761E-04
1310	0.31199E-03	-0.42348E-03	-0.77307E-02	0.23709E-01	-0.20265E-06	0.17060E-03
1501	0.91854E-02	-0.16414E 00	-0.11380E 00	0.28894E 02	0.86238E-02	0.31339E-01
1502	0.72509E-02	-0.16505E-01	-0.21729E-01	0.27991E 01	-0.32717E-01	0.66857E-01
1503	0.49745E-02	0.15205E 00	-0.23168E 00	-0.39370E 02	-0.18814E-01	-0.23477E-01
1504	0.33550E-02	0.20923E-01	-0.37211E-01	-0.38671E 01	-0.93846E-01	-0.54539E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 71

GRID	T1	T2	T3	R1	R2	R3
10	0.30315E-03	-0.85270E-05	-0.25429E-03	0.60277E-02	-0.23686E-02	-0.10060E-02
151	0.88956E-04	0.62407E-03	-0.89776E-03	0.57661E-02	-0.24477E-03	0.50054E-04
175	0.23618E-02	-0.58049E-02	-0.11563E-01	0.18786E-02	0.15523E-01	-0.85946E-02
195.	0.13503E-02	-0.47693E-02	0.11764E-02	-0.32034E-02	-0.14684E-02	0.63054E-02
215	-0.29478E-02	-0.55087E-02	0.88217E-02	0.19851E-02	-0.11617E-01	-0.85971E-02
321	-0.16336E-02	0.11157E-02	0.39328E-02	-0.57035E-02	-0.25734E-02	0.58545E-02
322	-0.23820E-02	0.31578E-02	-0.18034E-02	-0.31515E-02	-0.80385E-02	-0.41543E-02
331	-0.54565E-03	-0.23801E-02	0.74706E-02	-0.58812E-02	-0.13694E-02	0.66653E-03
332	0.12646E-02	-0.56054E-02	0.28875E-02	-0.49257E-02	-0.10344E-02	-0.87648E-03
333	-0.22841E-03	0.21692E-03	0.31031E-02	-0.53084E-02	-0.22923E-02	-0.53224E-03
340	0.13626E-02	-0.16850E-02	-0.18847E-03	0.16697E-01	-0.13273E-01	-0.11335E-01
351	0.18795E-03	-0.25951E-02	0.41467E-02	-0.52443E-02	-0.14609E-02	-0.10208E-02
400	0.18795E-03	-0.14284E-02	0.24788E-02	-0.52443E-02	-0.14609E-02	-0.10208E-02
801	-0.73628E-03	-0.17523E-02	0.12408E-01	-0.69897E-02	-0.75934E-02	-0.27284E-02
811	-0.11343E-02	0.12175E-01	-0.29059E-01	-0.15614E-01	0.10187E-01	0.34386E-02
1106	0.21843E-02	-0.14698E-02	-0.20674E-02	0.19138E-01	0.28448E-01	-0.27284E-02
1156	-0.19614E-02	0.22134E-02	-0.17904E-02	0.28823E-01	0.25543E-01	-0.27285E-02
1210	0.85940E-03	0.28325E-03	0.34429E-02	0.10561E-01	0.32126E-06	-0.47131E-03
1310	-0.13563E-02	0.28324E-03	0.16499E-01	-0.50610E-01	0.32124E-06	-0.74261E-03
1501	-0.16190E-01	-0.22039E 00	-0.14584E 00	0.39370E 02	-0.10645E 00	0.87243E-01
1502	-0.13254E-01	0.15537E-01	0.20736E-01	-0.27077E 01	-0.13869E 00	0.16947E 00
1503	-0.49858E-02	-0.10691E 00	0.15962E 00	0.28793E 02	0.48485E-02	0.21720E-01
1504	-0.51307E-02	0.58207E-02	-0.25660E-02	-0.15281E 01	0.69833E-01	0.72111E-01

MODE NUMBER 72

GRID	T1	T2	T3	R1	R2	R3
10	-0.36904E-03	-0.15958E-04	0.32703E-03	0.56173E-03	0.24027E-02	0.18735E-03
151	-0.29155E-03	-0.77277E-04	0.85635E-03	0.58398E-03	0.46764E-03	0.13460E-03
175	-0.23444E-02	-0.63634E-03	0.12192E-01	0.21586E-03	-0.16693E-01	-0.13711E-02
195	0.47607E-03	-0.53209E-03	-0.39773E-02	0.17102E-02	0.46562E-02	-0.48894E-02
215	0.12589E-02	-0.35396E-03	-0.53921E-02	-0.18925E-02	0.64638E-02	0.51373E-02
321	0.21502E-02	0.99349E-03	-0.26873E-03	0.59051E-03	0.55921E-02	-0.50041E-02
322	0.19902E-02	-0.89202E-03	-0.12437E-02	-0.17201E-02	0.58466E-02	0.50765E-02
331	-0.32964E-03	-0.48319E-03	-0.28746E-02	-0.35173E-03	0.95928E-03	-0.79655E-03
332	-0.82488E-03	-0.50993E-03	-0.32172E-02	-0.74742E-03	0.23621E-03	-0.45316E-03
333	0.22550E-03	-0.59060E-04	-0.34541E-02	-0.33991E-03	0.96023E-03	-0.67626E-04
340	-0.15124E-02	0.12677E-02	0.78434E-03	0.22344E-02	0.11426E-01	-0.50300E-02
351	-0.30753E-03	-0.22127E-03	-0.30362E-02	-0.46963E-03	0.97662E-03	-0.11364E-03
400	-0.30753E-03	-0.91377E-04	-0.19219E-02	-0.46863E-03	0.97662E-03	-0.11364E-03
801	0.82693E-03	0.10127E-02	-0.11657E-01	0.27485E-03	0.70001E-02	0.42265E-03
811	0.10452E-02	-0.24085E-02	0.34040E-01	0.73192E-02	-0.10353E-01	-0.84710E-03
1106	-0.20269E-02	-0.15082E-03	0.19388E-02	0.19676E-02	-0.26419E-01	0.42265E-03
1156	0.16483E-02	-0.29425E-03	0.19279E-02	-0.38371E-02	-0.21482E-01	0.42267E-03
1210	0.10722E-03	-0.16349E-03	-0.91626E-02	-0.28131E-01	-0.29293E-06	-0.58224E-04
1310	0.44982E-03	-0.16344E-03	-0.96789E-02	0.29716E-01	-0.29294E-06	0.24594E-03
1501	0.13673E-01	0.12109E-01	0.77481E-02	-0.25751E 01	0.11300E 00	-0.10024E 00
1502	0.11300E-01	-0.11964E 00	-0.88759E-01	0.21342E 02	0.12378E 00	-0.14110E 00
1503	0.81938E-02	-0.99593E-02	0.13550E-01	0.35615E 01	0.22623E 00	0.12531E 00
1504	0.65664E-02	0.14882E 00	-0.23060E 00	-0.39370E 02	0.27616E 00	0.17339E 00

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 73

GRID	T1	T2	T3	R1	R2	R3
10	0.16076E-03	0.10046E-03	-0.26938E-03	0.91082E-02	-0.20105E-02	-0.20385E-02
151	-0.11283E-03	0.10590E-02	-0.66600E-03	0.86285E-02	-0.28165E-03	0.51746E-05
175	-0.12988E-02	-0.88534E-02	-0.96011E-02	0.32816E-02	0.12412E-01	-0.15101E-01
195	0.28530E-02	-0.74839E-02	-0.33230E-02	-0.31273E-02	0.40636E-02	0.51819E-02
215	-0.35984E-02	-0.79538E-02	0.13006E-01	0.79876E-03	-0.17576E-01	-0.65500E-02
321	-0.12457E-02	0.15933E-02	0.52267E-02	-0.84602E-02	0.19150E-03	0.56156E-02
322	-0.24189E-02	0.35093E-02	-0.43624E-02	-0.56861E-02	-0.92378E-02	-0.27615E-02
331	-0.11302E-02	-0.46406E-02	0.79494E-02	-0.87513E-02	-0.91390E-03	-0.85744E-04
332	0.10358E-02	-0.92503E-02	0.11649E-02	-0.77917E-02	-0.12808E-02	-0.19821E-02
333	0.65994E-04	-0.47599E-03	0.12059E-02	-0.77791E-02	-0.23516E-02	-0.93637E-03
340	0.10072E-02	-0.51453E-02	0.61324E-03	0.23854E-01	-0.96285E-02	-0.77356E-02
351	0.10890E-04	-0.46340E-02	0.30850E-02	-0.79138E-02	-0.10335E-02	-0.17653E-02
400	0.10890E-04	-0.26162E-02	0.19037E-02	-0.79138E-02	-0.10335E-02	-0.17653E-02
801	-0.72114E-05	-0.80941E-02	0.11718E-01	-0.57649E-02	-0.66374E-02	-0.59472E-02
811	-0.70863E-03	0.30492E-01	-0.26431E-01	-0.13416E-01	0.92653E-02	0.91896E-02
1106	0.17480E-02	0.26474E-03	-0.19484E-02	-0.34665E-02	0.22786E-01	-0.59472E-02
1156	-0.20219E-02	0.32687E-02	-0.17204E-02	0.42624E-01	0.26359E-01	-0.59473E-02
1210	0.24072E-02	0.13059E-02	0.40599E-02	0.12466E-01	0.27736E-06	-0.13190E-02
1310	-0.24121E-02	0.13058E-02	0.14898E-01	-0.45746E-01	0.27730E-06	-0.13216E-02
1501	-0.18098E-01	-0.88503E-02	-0.46095E-02	0.19122E 01	0.69995E-01	-0.19436E 00
1502	-0.14696E-01	-0.22052E 00	-0.13463E 00	0.39370E 02	0.12184E 00	-0.23233E 00
1503	0.29984E-02	-0.48067E-02	0.82660E-02	0.20549E 01	-0.14694E 00	-0.10679E 00
1504	0.16169E-02	-0.81872E-01	0.12225E 00	0.21321E 02	-0.16438E 00	-0.10491E 00

MODE NUMBER 74

GRID	T1	T2	T3	R1	R2	R3
10	0.64027E-02	-0.19365E-02	-0.73627E-02	-0.69682E-01	-0.39372E-01	0.71798E-02
151	0.65129E-02	-0.20868E-02	-0.12371E-01	-0.58347E-01	-0.92810E-02	0.97256E-03
175	0.32446E-01	0.61198E-01	-0.21342E 00	-0.84732E-02	0.29385E 00	0.61418E-01
195	-0.11893E-01	0.60567E-01	0.11147E 00	-0.23065E-01	-0.13008E 00	0.90069E-01
215	-0.11844E-01	0.56453E-01	0.43154E-01	0.26195E-01	-0.42188E-01	-0.45243E-01
321	-0.38079E-01	-0.43720E-01	-0.35911E-01	0.30849E-01	-0.12407E 00	0.81977E-01
322	-0.34107E-01	-0.98942E-02	0.46329E-01	0.76476E-01	-0.80224E-01	-0.90001E-01
331	0.70955E-02	0.12645E-01	0.36465E-02	0.60161E-01	-0.10893E-01	0.90275E-02
332	0.11501E-01	0.42115E-01	0.56342E-01	0.64903E-01	-0.15009E-02	0.77444E-02
333	-0.58301E-03	-0.20687E-01	0.60244E-01	0.59730E-01	-0.10677E-01	0.21898E-02
340	0.22109E-01	0.14344E-01	-0.56999E-02	-0.16252E 00	-0.13585E 00	0.94101E-01
351	0.57145E-02	0.94766E-02	0.38704E-01	0.60088E-01	-0.11096E-01	0.28907E-02
400	0.57145E-02	0.61726E-02	0.26022E-01	0.60088E-01	-0.11096E-01	0.28907E-02
801	-0.19218E-01	0.48343E-01	0.25274E 00	0.27585E-01	-0.12717E 00	0.25538E-01
811	-0.19520E-01	-0.13666E 00	-0.64002E 00	-0.10369E 00	0.20091E 00	-0.43257E-01
1106	0.28149E-01	-0.25478E-02	-0.39524E-01	0.34233E-01	0.37729E 00	0.25538E-01
1156	-0.20323E-01	-0.13279E-01	-0.40550E-01	-0.17805E 00	0.27232E 00	0.25538E-01
1210	-0.15825E-01	-0.73781E-02	0.31299E 00	0.99089E 00	0.36740E-05	0.86780E-02
1310	0.36455E-02	-0.73798E-02	0.24278E 00	-0.76862E 00	0.36745E-05	0.20132E-02
1501	-0.21050E 00	-0.36342E-01	0.46932E-02	-0.51994E 00	0.12359E 01	0.69613E 00
1502	-0.18288E 00	0.69650E-02	0.16797E 00	-0.40568E-01	-0.98225E 00	0.56740E 00
1503	-0.21148E 00	-0.29586E-01	0.92024E-01	-0.12707E 01	-0.12357E 01	-0.79661E-01
1504	-0.18192E 00	0.18489E-02	0.23950E 00	-0.16488E 01	-0.93778E 00	-0.58375E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 75

GRID	T1	T2	T3	R1	R2	R3
10	0.35610E-02	-0.75108E-02	0.13119E-02	0.26403E-01	0.63868E-02	0.36331E-01
151	0.34854E-02	-0.10592E-01	0.13212E-02	0.24266E-01	0.19588E-02	0.99346E-02
175	-0.39877E-02	-0.19890E-01	0.18991E-01	-0.17646E-01	-0.15969E-01	-0.59166E-01
195	-0.22016E-01	-0.23443E-01	0.13171E 00	0.13832E-01	-0.16248E 00	-0.61035E-01
215	0.25500E-01	-0.23187E-01	-0.19353E 00	0.64735E-02	0.26117E 00	-0.35001E-01
321	0.87144E-02	0.38094E-01	0.42026E-02	-0.10606E-02	-0.32214E-01	-0.16048E-01
322	0.49438E-02	0.31261E-01	0.45923E-03	-0.14345E-01	0.58806E-01	-0.73473E-03
331	0.16110E-01	0.32237E-01	0.85778E-02	-0.21231E-01	0.76895E-03	0.47127E-02
332	0.24968E-02	0.20609E-01	-0.14025E-01	-0.22476E-01	0.37242E-02	0.94627E-02
333	0.27332E-02	0.42275E-01	-0.13949E-01	-0.25280E-01	0.67262E-02	0.45346E-02
340	-0.88439E-03	0.12584E 00	-0.61813E-02	0.11458E 00	0.17626E-01	-0.50174E 00
351	0.51846E-02	0.30558E-01	-0.51861E-02	-0.22737E-01	0.11608E-02	0.80681E-02
400	0.51846E-02	0.21336E-0	-0.38592E-02	-0.22737E-01	0.11608E-02	0.80681E-02
801	-0.15919E-01	0.24900E 00	-0.44748E-01	-0.12066E-01	0.21838E-01	0.11923E 00
811	-0.16589E-02	-0.63584E 00	0.11767E 00	0.95236E-02	-0.35780E-01	-0.21202E 00
1106	-0.15855E-02	-0.41120E-01	0.69065E-02	0.55486E 00	-0.21350E-01	0.11923E 00
1156	0.10904E-01	-0.30676E-01	0.73495E-02	-0.49493E 00	-0.14709E 00	0.11923E 00
1210	-0.49860E-01	-0.37568E-01	-0.71904E-01	-0.22915E 00	-0.58606E-06	0.27382E-01
1310	0.39898E-01	-0.37568E-01	-0.37721E-01	0.12021E 00	-0.58488E-06	0.21927E-01
1501	0.16132E 00	0.75444E-01	0.10156E-01	0.43134E 00	-0.15929E 00	0.12998E 01
1502	0.13236E 00	0.21958E 00	-0.14271E-01	0.93053E 00	-0.12831E 00	0.97608E 00
1503	-0.20349E 00	0.62846E-01	-0.34351E-01	0.59121E 00	0.61889E 00	0.11712E 01
1504	-0.17097E 00	0.20786E 00	-0.62378E-01	0.89986E 00	0.48385E 00	0.87183E 00

MODE NUMBER 76

GRID	T1	T2	T3	R1	R2	R3
10	-0.78932E-04	0.51111E-04	0.21239E-04	-0.98776E-02	-0.11411E-04	-0.19304E-03
151	0.12128E-03	-0.45621E-05	-0.43180E-04	-0.64358E-02	0.10083E-03	-0.17279E-03
175	0.64614E-04	0.76332E-02	-0.46C80E-04	-0.25408E-03	0.36545E-03	0.39902E-02
195	-0.23075E-03	0.75714E-02	-0.65361E-03	-0.13795E-03	0.11148E-02	0.42323E-02
215	-0.26921E-03	0.72313E-02	0.91823E-03	0.51768E-03	-0.98494E-03	0.25125E-02
321	-0.17304E-03	-0.46406E-02	-0.43813E-02	0.61132E-02	-0.13222E-02	-0.30607E-03
322	0.35715E-03	-0.44116E-02	0.48276E-02	0.66087E-02	0.93717E-03	-0.12196E-03
331	0.44272E-05	0.19298E-03	-0.44953E-02	0.83796E-02	-0.17043E-03	0.55166E-04
332	0.45901E-05	0.45483E-02	0.27757E-02	0.83994E-02	0.18045E-03	0.30728E-03
333	-0.19024E-03	-0.40099E-02	0.29617E-02	0.82766E-02	-0.19657E-03	0.10205E-03
340	0.16016E-04	0.12452E-02	-0.44376E-03	-0.16474E-01	-0.13014E-02	0.18580E-01
351	-0.10063E-03	0.20854E-03	0.40389E-03	0.81470E-02	-0.17227E-03	0.11263E-03
400	-0.10063E-03	0.79805E-04	0.2C658E-03	0.81470E-02	-0.17227E-03	0.11263E-03
801	0.75549E-04	-0.15778E-02	-0.34980E-03	0.29331E-02	-0.94149E-05	-0.50217E-03
811	-0.51349E-05	0.28603E-02	-0.30362E-02	0.35908E-02	0.24110E-03	0.10793E-02
1106	-0.74660E-05	0.58660E-03	0.49631E-04	-0.82253E-02	-0.10479E-03	-0.50217E-03
1156	-0.23886E-04	-0.21264E-03	-0.49353E-04	-0.29781E-02	0.33513E-03	-0.50217E-03
1210	0.19684E-03	0.21839E-03	-0.42666E 00	-0.14200E 01	0.15810E-09	-0.10844E-03
1310	-0.15306E-03	0.22149E-03	0.52541E 00	-0.17487E 01	0.15338E-09	-0.84398E-04
1501	-0.57699E-03	-0.70614E-02	-0.46558E-02	-0.43704E-01	-0.12289E-01	0.14186E-01
1502	-0.45253E-03	-0.62654E-02	-0.36829E-02	-0.36780E-01	-0.17697E-01	0.22821E-01
1503	0.88430E-03	-0.48739E-02	0.53630E-02	-0.44939E-01	0.12087E-01	0.38746E-02
1504	0.72768E-03	-0.46236E-02	0.43169E-02	-0.35745E-01	0.20048E-01	0.11581E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 77

GRID	T1	T2	T3	R1	R2	R3
10	0.56624E-03	0.30729E-04	-0.13055E-02	-0.12163E-01	-0.49989E-02	-0.16855E-03
151	0.65073E-03	-0.80989E-04	-0.86968E-03	-0.77650E-02	-0.26492E-02	-0.11915E-03
175	0.91295E-03	0.93218E-02	-0.26121E-01	-0.25893E-03	0.34736E-01	0.43140E-02
195	-0.97471E-03	0.69766E-02	0.94596E-02	0.20764E-02	-0.10233E-01	0.44668E-04
215	0.15659E-03	0.11043E-01	0.10889E-01	-0.16003E-02	-0.12163E-01	0.85018E-02
321	-0.54554E-02	-0.79207E-02	-0.74724E-02	0.37693E-02	-0.14479E-01	0.93330E-02
322	-0.48749E-02	-0.36817E-02	0.31276E-02	0.11298E-01	-0.11389E-01	-0.10045E-01
331	0.45111E-03	-0.11827E-03	-0.76147E-02	0.10393E-01	0.12562E-02	-0.17123E-02
332	-0.25796E-03	0.55387E-02	0.14406E-02	0.96596E-02	0.29353E-03	-0.29502E-03
333	0.11902E-02	-0.49217E-02	0.12743E-02	0.10622E-01	0.14055E-02	0.16781E-03
340	0.30560E-02	0.20502E-02	0.76101E-03	-0.19793E-01	-0.31534E-02	0.22127E-01
351	0.47489E-03	0.27592E-03	-0.14453E-02	0.99470E-02	0.12993E-02	0.14301E-03
400	0.47489E-03	0.11245E-03	0.39726E-04	0.99470E-02	0.12993E-02	0.14301E-03
801	-0.17877E-02	-0.14728E-02	0.40087E-01	0.35545E-02	-0.15902E-01	-0.43198E-03
811	-0.22794E-02	0.22325E-02	-0.76831E-01	-0.14894E-01	0.26984E-01	0.10359E-02
1106	0.23496E-02	0.64731E-03	-0.56524E-02	-0.91024E-02	0.33035E-01	-0.43198E-03
1156	-0.19121E-02	-0.30266E-03	-0.57717E-02	-0.42523E-02	0.26877E-01	-0.43200E-03
1210	-0.36544E-03	0.20205E-03	-0.52121E 00	-0.17403E 01	0.24810E-06	0.20048E-03
1310	-0.66481E-03	0.20446E-03	-0.42480E 00	0.14184E 01	0.24811E-06	-0.36551E-03
1501	-0.29784E-01	-0.73818E-02	0.11347E-01	-0.35194E-01	-0.31485E 00	0.24288E 00
1502	-0.25186E-01	-0.57379E-02	0.30689E-01	-0.34556E-02	-0.23592E 00	0.19474E 00
1503	-0.19573E-01	-0.71424E-02	0.24156E-01	-0.75278E-01	-0.44478E 00	-0.19855E 00
1504	-0.16795E-01	-0.70201E-02	0.41645E-01	-0.10529E 00	-0.31365E 00	-0.13699E 00

MODE NUMBER 78

GRID	T1	T2	T3	R1	R2	R3
10	0.21001E-03	-0.10789E-02	0.51707E-03	0.11456E-01	0.23285E-02	0.46559E-02
151	0.43889E-04	-0.11305E-02	0.56175E-03	0.65770E-02	0.50129E-03	0.14438E-02
175	-0.56801E-03	-0.73405E-02	0.11248E-01	-0.20965E-02	-0.14384E-01	0.47560E-02
195	-0.19516E-02	-0.87842E-02	0.14013E-01	0.26808E-02	-0.17699E-01	-0.12364E-01
215	0.32456E-02	-0.75120E-02	-0.28228E-01	-0.10506E-02	0.36654E-01	-0.15934E-02
321	0.26831E-02	0.81475E-02	0.39286E-02	-0.37481E-02	0.90920E-03	-0.54301E-02
322	0.18293E-02	0.57579E-02	-0.33723E-02	-0.75349E-02	0.11383E-01	0.36158E-02
331	0.31664E-03	0.29554E-02	0.30655E-02	-0.89056E-02	0.59671E-03	0.25442E-05
332	-0.12405E-03	-0.16510E-02	-0.51726E-02	-0.92459E-02	0.28817E-03	0.45626E-03
333	0.46163E-03	0.74548E-02	-0.53906E-02	-0.92785E-02	0.12523E-02	0.29457E-03
340	-0.70537E-03	0.62538E-02	-0.83462E-03	0.19196E-01	0.57883E-02	-0.51648E-01
351	0.42660E-03	0.29098E-02	-0.22790E-02	-0.89367E-02	0.64720E-03	0.64361E-03
400	0.42660E-03	0.21742E-02	-0.15393E-02	-0.89367E-02	0.64720E-03	0.64361E-03
801	-0.12384E-02	0.26438E-01	-0.13914E-01	0.17870E-02	0.82690E-02	0.15280E-01
811	0.82175E-03	-0.68270E-01	0.29420E-01	0.10883E-01	-0.10913E-01	-0.24638E-01
1106	-0.85768E-03	-0.26416E-02	0.18774E-02	0.37954E-01	-0.12307E-01	0.15280E-01
1156	0.14515E-02	-0.30618E-02	0.18201E-02	-0.43984E-01	-0.20839E-01	0.15280E-01
1210	-0.54424E-02	-0.38070E-02	0.16726E-01	0.57168E-01	-0.99616E-07	0.30049E-02
1310	0.47550E-02	-0.38071E-02	0.22499E-01	-0.76900E-01	-0.99486E-07	0.26266E-02
1501	0.30563E-01	0.89646E-02	0.10838E-02	0.16581E 00	0.12508E 02	-0.18418E 02
1502	0.25207E-01	0.24535E-01	-0.84936E-02	-0.19004E 00	0.94295E 01	-0.13901E 02
1503	-0.19119E-01	0.77111E-02	-0.67734E-02	0.30951E 00	-0.39370E 02	-0.26191E 02
1504	-0.15510E-01	0.25392E-01	-0.16199E-01	-0.42711E 00	-0.29335E 02	-0.19523E 02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 79

GRID	T1	T2	T3	R1	R2	R3
10	0.83534E-03	-0.74855E-03	-0.10713E-02	-0.75466E-02	-0.48162E-02	0.26794E-02
151	0.84324E-03	-0.43404E-03	-0.12959E-02	-0.41484E-02	-0.78466E-03	0.12043E-02
175	0.34741E-02	0.45606E-02	-0.28209E-01	0.30177E-03	0.38784E-01	-0.27226E-02
195	-0.67103E-03	0.71554E-02	0.21692E-01	-0.43481E-02	-0.25710E-01	0.13313E-01
215	-0.13307E-02	0.39216E-02	-0.23992E-02	0.43219E-02	0.47502E-02	-0.10026E-01
321	-0.43209E-02	-0.42064E-02	-0.49161E-02	0.24033E-02	-0.17796E-01	0.11434E-01
322	-0.50832E-02	0.51629E-03	0.50071E-02	0.88264E-02	-0.96899E-02	-0.11532E-01
331	0.46905E-03	0.61041E-03	0.18229E-02	0.55529E-02	-0.15025E-02	0.12896E-02
332	0.17963E-02	0.32440E-02	0.70533E-02	0.67423E-02	-0.42082E-03	0.24269E-03
333	0.76331E-04	-0.27218E-02	0.76479E-02	0.59282E-02	-0.22636E-02	0.57917E-04
340	0.18023E-02	0.57685E-02	0.75165E-03	-0.90466E-02	-0.12186E-01	-0.10883E-01
351	0.74770E-03	0.17672E-03	0.52550E-02	0.59009E-02	-0.15988E-02	-0.30006E-03
400	0.74770E-03	0.51968E-03	0.34276E-02	0.59009E-02	-0.15988E-02	-0.30006E-03
801	-0.31399E-02	0.16420E-01	0.30049E-01	0.38095E-02	-0.17008E-01	0.86192E-02
811	-0.25426E-02	-0.39175E-01	-0.69663E-01	-0.13540E-01	0.23821E-01	-0.13957E-01
1106	0.23337E-02	-0.11946E-02	-0.40539E-02	0.17173E-01	0.33500E-01	0.86192E-02
1156	-0.14582E-02	-0.20902E-02	-0.41761E-02	-0.30024E-01	0.20921E-01	0.86192E-02
1210	-0.37470E-02	-0.21981E-02	-0.48318E-01	-0.16516E 00	0.20424E-06	0.20676E-02
1310	0.20043E-02	-0.21979E-02	-0.36060E-01	0.12326E 00	0.20434E-06	0.11085E-02
1501	-0.22214E-01	-0.11806E-02	0.15867E-02	0.23699E 00	0.26193E 02	-0.39370E 02
1502	-0.19283E-01	0.13324E-01	0.23228E-01	-0.45141E 00	0.19162E 02	-0.28798E 02
1503	-0.37999E-01	-0.15823E-02	0.10711E-01	-0.13818E 00	0.18307E 02	0.12454E 02
1504	-0.32224E-01	0.66268E-02	0.31235E-01	0.17637E 00	0.13745E 02	0.93424E 01

MODE NUMBER 80

GRID	T1	T2	T3	R1	R2	R3
10	0.38407E-04	-0.19338E-04	-0.34306E-04	-0.37906E-03	-0.14870E-03	0.82465E-04
151	-0.40739E-04	-0.25759E-04	-0.37013E-04	-0.20520E-03	-0.45973E-04	-0.64812E-06
175	0.12041E-03	0.33083E-03	-0.89473E-03	-0.11515E-03	0.12560E-02	0.52522E-03
195	-0.94622E-04	0.23161E-03	0.62815E-03	0.18776E-04	-0.70761E-03	0.60895E-04
215	0.31024E-04	0.22080E-03	-0.18551E-03	0.13358E-03	0.35219E-03	-0.23916E-03
321	-0.16834E-03	-0.16348E-03	-0.20313E-03	0.17535E-03	-0.60625E-03	0.29302E-03
322	-0.12486E-03	-0.35233E-04	0.19018E-03	0.35115E-03	-0.23782E-03	-0.40482E-03
331	0.71017E-04	0.15263E-03	-0.91167E-04	0.31326E-03	-0.19103E-04	0.27521E-04
332	0.38974E-04	0.30843E-03	0.15738E-03	0.30759E-03	0.26694E-04	0.72858E-04
333	0.16831E-04	-0.10122E-04	0.17085E-03	0.28761E-03	0.21102E-04	0.23734E-04
340	0.77886E-04	0.27679E-03	-0.14456E-04	-0.39970E-03	-0.27544E-03	-0.17255E-03
351	0.40521E-04	0.14040E-03	0.85672E-04	0.29327E-03	-0.16587E-04	0.48680E-04
400	0.40521E-04	0.84763E-04	0.64113E-04	0.29327E-03	-0.16587E-04	0.48680E-04
801	0.12175E-04	-0.12282E-02	0.14419E-02	0.14328E-02	-0.56956E-03	-0.28602E-03
811	-0.55885E-04	0.17682E-02	-0.40486E-02	0.10493E-02	0.11033E-02	0.74200E-03
1106	0.66070E-04	0.29189E-03	-0.19418E-03	-0.41947E-02	0.94905E-03	-0.28602E-03
1156	-0.73961E-04	-0.43288E-04	-0.24008E-03	-0.61993E-03	0.10625E-02	-0.28602E-03
1210	0.98661E-04	0.16413E-03	-0.41693E-02	-0.14265E-01	0.67767E-08	-0.54483E-04
1310	-0.91913E-04	0.16415E-03	0.27005E-03	-0.92388E-03	0.67744E-08	-0.50769E-04
1501	-0.44836E-03	0.14801E-02	0.81284E-03	0.12398E 00	-0.17793E 02	0.26630E 02
1502	-0.16822E-02	0.16822E-02	0.22771E-02	-0.13189E 00	0.24231E 02	-0.36305E 02
1503	-0.11485E-02	0.12578E-02	-0.69507E-03	0.13193E 00	0.25697E 02	0.19858E 02
1504	0.51194E-03	0.12065E-02	-0.98752E-03	-0.14329E 00	-0.39370E 02	-0.26331E 02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 81

GRID	T1	T2	T3	R1	R2	R3
10	0.83184E-04	-0.55971E-05	-0.57736E-04	-0.27025E-03	-0.29257E-03	-0.18822E-04
151	0.80249E-04	0.23696E-04	-0.98636E-04	-0.15500E-03	0.34059E-04	0.11670E-04
175	-0.32308E-03	0.13609E-03	-0.19428E-02	0.80494E-04	0.27654E-02	-0.93282E-04
195	0.98342E-04	0.47527E-03	0.42538E-03	-0.57662E-03	-0.36297E-03	0.15659E-02
215	-0.23509E-03	-0.51675E-04	0.58352E-03	0.49860E-03	-0.58967E-03	-0.12688E-02
321	-0.26010E-03	-0.25670E-03	-0.10712E-03	-0.28232E-05	-0.68192E-03	0.87417E-03
322	-0.28543E-03	0.84410E-04	0.27956E-03	0.40753E-03	-0.94550E-03	-0.79395E-03
331	0.47997E-04	-0.30841E-04	0.50891E-03	0.16122E-03	-0.21187E-03	0.19095E-03
332	0.22230E-03	0.13301E-04	0.68605E-03	0.29941E-03	-0.47031E-04	0.42810E-04
333	-0.14937E-04	-0.17855E-03	0.75151E-03	0.18341E-03	-0.28410E-03	-0.96478E-05
340	0.70829E-04	-0.59466E-04	0.23259E-04	-0.43344E-03	-0.12084E-02	0.43558E-03
351	0.83848E-04	-0.89958E-04	0.81264E-03	0.20756E-03	-0.22165E-03	-0.38595E-04
400	0.83848E-04	-0.45844E-04	0.35930E-03	0.20756E-03	-0.22165E-03	-0.38595E-04
801	-0.60421E-04	-0.17173E-03	-0.64855E-03	0.34520E-04	-0.84403E-04	-0.60713E-04
811	-0.86425E-04	0.30366E-03	0.16564E-03	0.11780E-03	-0.16531E-03	0.12403E-03
1106	0.16000E-04	0.21218E-04	0.87336E-04	-0.30506E-03	0.22993E-03	-0.60713E-04
1156	-0.51816E-05	0.13145E-04	0.86230E-04	0.18909E-03	0.74363E-04	-0.60713E-04
1210	0.34832E-05	0.22953E-04	0.82189E-03	0.28121E-02	0.10034E-08	-0.19553E-05
1310	-0.36967E-04	0.22950E-04	0.92864E-03	-0.31774E-02	0.10035E-08	-0.20385E-04
1501	-0.12217E-02	0.70392E-03	0.12567E-02	0.11708E 00	-0.19426E 02	0.29049E 02
1502	0.53389E-03	0.24315E-02	0.20648E-02	-0.14890E 00	0.26336E 02	-0.39370E 02
1503	-0.10769E-02	-0.11791E-03	0.10931E-02	-0.10687E 00	-0.26499E 02	-0.17693E 02
1504	0.59109E-03	-0.14276E-02	0.25215E-02	0.13852E 00	0.35973E 02	0.24010E 02

MODE NUMBER 82

GRID	T1	T2	T3	R1	R2	R3
10	0.28377E-03	-0.91214E-03	-0.19340E-06	0.15087E-01	0.23334E-03	0.40547E-02
151	-0.94301E-04	-0.35482E-03	0.35186E-03	0.38283E-02	-0.67247E-03	0.44576E-02
175	-0.24792E-02	-0.12724E-01	0.10843E-02	0.73079E-02	-0.14470E-02	-0.22924E-01
195	0.20329E-02	-0.35781E-02	0.10850E-01	-0.28445E-02	-0.12049E-01	0.52263E-02
215	0.10613E-02	0.23716E-03	-0.15810E-01	-0.83513E-02	0.19513E-01	0.16597E-01
321	0.29740E-02	0.41447E-02	0.10015E-02	-0.73279E-02	-0.19952E-03	0.26005E-02
322	-0.28401E-02	0.52366E-02	-0.36918E-02	-0.32510E-02	0.25563E-02	0.40124E-02
331	-0.14780E-02	-0.68330E-02	0.16650E-02	-0.87258E-02	0.12709E-02	-0.20750E-02
332	0.63710E-03	-0.10862E-01	-0.38113E-02	-0.76611E-02	-0.22393E-02	-0.48589E-02
333	0.20372E-02	-0.22838E-02	-0.44347E-02	-0.61240E-02	-0.24708E-02	-0.63656E-03
340	0.84288E-03	-0.21344E-02	0.15053E-02	0.59217E-02	0.27244E-02	-0.22149E-01
351	0.44135E-03	-0.61460E-02	-0.24878E-02	-0.73012E-02	0.10342E-02	-0.30100E-02
400	0.44135E-03	-0.27056E-02	-0.13057E-02	-0.73012E-02	0.10342E-02	-0.30100E-02
801	-0.86444E-03	0.17436E-01	-0.19276E-02	0.10543E-02	0.22398E-02	0.83078E-02
811	0.48453E-03	-0.33189E-01	0.48036E-02	0.34757E-02	-0.21165E-02	-0.13848E-01
1106	-0.12579E-03	-0.11566E-02	0.22090E-03	0.17972E-01	-0.19513E-02	0.83078E-02
1156	0.38656E-03	-0.13313E-02	0.19217E-03	-0.20684E-01	-0.60030E-02	0.83078E-02
1210	-0.26632E-02	-0.20246E-02	0.17031E-03	0.63707E-03	-0.10397E-07	0.14814E-02
1310	0.22387E-02	-0.20246E-02	0.72476E-03	-0.27112E-02	-0.10333E-07	0.12459E-02
1501	-0.12344E 00	0.17441E-01	-0.13682E-01	0.16911E-01	-0.39376E 02	-0.26365E 02
1502	-0.86959E-02	0.13403E-01	0.99705E-03	0.10151E-01	-0.75029E 01	-0.50560E 01
1503	0.11249E 00	0.21489E-01	0.94266E-02	0.96761E-02	0.24330E 02	-0.36490E 02
1504	0.86850E-02	0.13223E-01	-0.22592E-02	0.71511E-02	0.50240E 01	-0.75868E 01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 83

GRID	T1	T2	T3	R1	R2	R3
10	-0.75191E-03	0.18737E-03	0.57451E-02	0.15880E-01	0.26046E-02	-0.72586E-03
151	-0.85986E-03	0.14354E-03	0.40974E-03	0.40623E-02	0.10978E-02	-0.25867E-03
175	-0.10771E-02	-0.56265E-02	0.15754E-01	-0.51994E-03	-0.22273E-01	0.10098E-03
195	0.38057E-03	-0.51359E-02	-0.57007E-02	-0.12020E-02	0.46403E-02	0.35930E-03
215	-0.28841E-03	-0.60055E-02	0.70137E-03	-0.10893E-02	-0.33684E-02	0.12621E-02
321	0.26357E-02	0.51280E-02	0.50706E-02	-0.33279E-02	0.88488E-02	-0.56561E-02
322	0.26495E-02	0.23083E-02	-0.36575E-02	-0.83769E-02	0.58424E-02	0.59621E-02
331	-0.87341E-03	-0.15304E-03	0.44224E-02	-0.80337E-02	-0.15919E-03	0.53361E-03
332	-0.76601E-03	-0.43698E-02	-0.25402E-02	-0.79662E-02	-0.13440E-03	-0.34922E-04
333	-0.95276E-03	0.37366E-02	-0.26639E-02	-0.81535E-02	0.87487E-05	-0.15429E-03
340	-0.15095E-02	-0.45837E-02	-0.90249E-04	0.82698E-02	0.26697E-02	-0.47516E-02
351	-0.81197E-03	-0.26605E-03	-0.28513E-03	-0.77661E-02	-0.16298E-03	-0.28014E-04
400	-0.81197E-03	-0.23403E-03	-0.47141E-03	-0.77661E-02	-0.16298E-03	-0.28014E-04
801	0.27116E-02	-0.37816E-02	-0.12020E-01	0.36539E-03	0.77433E-02	-0.21258E-02
811	0.31202E-02	0.84178E-02	0.23170E-01	0.90631E-02	-0.95369E-02	0.31182E-02
1106	-0.84128E-03	0.30038E-03	0.13769E-02	-0.46677E-02	-0.13063E-01	-0.21258E-02
1156	0.40532E-03	0.23986E-03	0.13669E-02	0.37281E-02	-0.62880E-02	-0.21258E-02
1210	0.12926E-02	0.43895E-03	0.26871E-02	0.10054E-01	-0.35545E-07	-0.71798E-03
1310	0.38654E-04	0.43895E-03	0.28787E-02	-0.10771E-01	-0.35583E-07	0.20291E-04
1501	-0.11141E 00	-0.28551E-02	0.23196E-03	-0.80637E-02	-0.37387E 02	-0.24930E 02
1502	0.30599E-01	-0.11035E-01	0.25283E-03	-0.85311E-02	0.31091E 01	0.21289E 01
1503	-0.11497E 00	-0.16623E-02	-0.48522E-02	0.90825E-02	-0.26340E 02	0.39370E 02
1504	0.16333E-01	0.49662E-02	-0.44741E-02	0.26682E-02	-0.11113E 01	0.16140E 01

MODE NUMBER 84

GRID	T1	T2	T3	R1	R2	R3
10	0.32180E-04	0.44226E-03	0.10421E-04	-0.59668E-02	-0.13702E-03	-0.19894E-02
151	0.78379E-04	0.71288E-04	-0.30143E-03	-0.14602E-02	0.72324E-03	-0.31555E-02
175	0.24066E-02	0.82350E-02	-0.19864E-02	-0.65521E-02	0.31412E-02	0.20650E-01
195	-0.17540E-02	0.93986E-03	-0.43151E-02	0.16754E-02	0.45882E-02	-0.39086E-02
215	-0.43816E-03	-0.27805E-02	0.59627E-02	0.69653E-02	-0.66569E-02	-0.15007E-01
321	-0.22662E-02	-0.12918E-02	0.38852E-03	0.41859E-02	-0.15268E-02	-0.17348E-02
322	0.21440E-02	-0.21387E-02	0.19745E-02	0.71063E-03	-0.80631E-03	-0.39568E-02
331	0.15437E-02	0.61509E-02	0.87981E-03	0.38553E-02	-0.11804E-02	0.19953E-02
332	-0.11251E-03	0.76793E-02	0.24950E-02	0.31408E-02	0.18011E-02	0.40523E-02
333	-0.14377E-02	0.39517E-02	0.30024E-02	0.17100E-02	0.18983E-02	0.54440E-03
340	-0.76451E-03	0.12920E-02	-0.13887E-02	-0.85509E-03	-0.25565E-02	0.80239E-02
351	-0.19975E-04	0.54754E-02	0.23626E-02	0.28173E-02	-0.99188E-03	0.25018E-02
400	-0.19975E-04	0.26159E-02	0.12289E-02	0.28173E-02	-0.99188E-03	0.25018E-02
801	0.10298E-03	-0.66384E-02	0.40275E-03	-0.68702E-03	-0.14192E-02	-0.30680E-02
811	-0.46771E-03	0.12350E-01	-0.25546E-02	-0.20316E-02	0.10453E-02	0.52088E-02
1106	0.11135E-03	0.41605E-03	-0.46127E-04	-0.64674E-02	0.17287E-02	-0.30680E-02
1156	-0.17572E-03	0.52982E-03	-0.27412E-04	0.82337E-02	0.27292E-02	-0.30680E-02
1210	0.93001E-03	0.77042E-03	0.86781E-04	0.32475E-03	0.65423E-08	-0.51741E-03
1310	-0.87946E-03	0.77042E-03	-0.27303E-03	0.10217E-02	0.65205E-08	-0.48938E-03
1501	-0.33536E-01	-0.28402E-01	0.30975E-01	-0.28619E-01	-0.56595E 01	-0.37475E 01
1502	0.12893E 00	-0.24247E-01	0.23531E-01	-0.23668E-01	0.39370E 02	0.26306E 02
1503	0.45993E-01	-0.37376E-01	-0.21293E-01	-0.10749E-01	0.67599E 01	-0.10061E 02
1504	-0.12854E 00	-0.31711E-01	-0.15884E-01	-0.77845E-02	-0.25768E 02	0.38555E 02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 85

GRID	T1	T2	T3	R1	R2	R3
10	0.33043E-03	-0.85680E-04	-0.40829E-03	-0.12758E-01	-0.18580E-02	0.33224E-03
151	0.44349E-03	-0.78944E-04	-0.29130E-03	-0.32456E-02	-0.83999E-03	0.73548E-04
175	0.61948E-03	0.45815E-02	-0.10271E-01	0.35056E-03	0.14077E-01	-0.14347E-04
195	-0.43405E-03	0.39981E-02	0.42635E-02	0.11133E-02	-0.40986E-02	-0.65980E-03
215	0.68131E-04	0.47962E-02	0.12042E-02	0.81591E-03	-0.26192E-03	-0.76709E-03
321	-0.19089E-02	-0.35786E-02	-0.38792E-02	0.29825E-02	-0.59188E-02	0.35899E-02
322	-0.17980E-02	-0.21557E-02	0.28756E-02	0.62379E-02	-0.40659E-02	-0.38829E-02
331	0.39272E-03	0.13235E-03	-0.36663E-02	0.64525E-02	0.15247E-03	-0.42557E-03
332	-0.25148E-03	0.35346E-02	-0.19070E-02	0.63468E-02	0.11790E-03	0.62701E-04
333	0.42898E-03	-0.29800E-02	0.19986E-02	0.65079E-02	0.93460E-04	0.11139E-03
340	0.10359E-02	0.34932E-02	0.20577E-03	-0.66410E-02	-0.16341E-02	0.49712E-02
351	0.31794E-03	0.23390E-03	0.10709E-03	0.62245E-02	0.15809E-03	0.59423E-04
400	0.31794E-03	0.16598E-03	0.28778E-03	0.62245E-02	0.15809E-03	0.59423E-04
801	-0.23970E-02	0.16127E-02	0.68259E-02	-0.27577E-03	-0.56790E-02	0.11622E-02
811	-0.29076E-02	-0.44356E-02	-0.15835E-01	-0.61841E-02	0.62782E-02	-0.14633E-02
1106	0.64528E-03	-0.13796E-03	-0.78127E-03	0.21445E-02	0.10024E-01	0.11622E-02
1156	-0.27449E-03	-0.92338E-04	-0.77376E-03	-0.14360E-02	0.42595E-02	0.11622E-02
1210	-0.93[illegible]E-03	-0.18706E-03	-0.14995E-02	-0.56135E-02	0.25939E-07	0.51676E-03
1310	-0.24550E-03	-0.18706E-03	-0.16433E-02	0.61518E-02	0.25968E-07	-0.13553E-03
1501	-0.17392E-01	-0.91988E-02	0.19255E-01	0.15875E-01	0.81347E 00	0.49060E 00
1502	0.11249E 00	-0.65630E-02	0.21667E-01	0.10049E-01	0.38504E 02	0.25724E 02
1503	-0.18540E-01	0.14862E-01	0.16001E-01	-0.29891E-01	0.45437E 00	-0.62001E 00
1504	0.11495E 00	0.14748E-01	0.17871E-01	-0.20178E-01	0.26307E 02	-0.39370E 02

MODE NUMBER 86

GRID	T1	T2	T3	R1	R2	R3
10	0.96036E-03	-0.41398E-04	-0.46871E-03	0.68023E 00	-0.27127E-02	-0.13476E-03
151	-0.28567E-02	0.18262E-03	-0.33359E-03	0.58662E-01	-0.20122E-02	-0.30028E-03
175	0.40596E-02	-0.45877E-01	-0.11624E-01	-0.36113E-01	0.79134E-02	0.17112E 00
195	0.54186E-02	-0.51712E-01	0.53208E-02	-0.48318E-01	-0.13902E-01	0.14190E 00
215	-0.10869E-02	-0.48929E-01	0.51320E-02	-0.50981E-01	-0.12464E-01	0.14894E 00
321	-0.58617E-02	0.62195E-01	0.60255E-01	-0.89252E-01	-0.15755E-01	0.73517E-02
322	-0.27279E-02	0.56406E-01	-0.63226E-01	-0.10136E 00	0.10506E-01	-0.83594E-02
331	0.15260E-02	0.33656E-02	0.75055E-01	-0.13015E 00	0.47319E-03	0.28999E-02
332	0.45981E-03	-0.64967E-01	-0.37698E-01	-0.13076E 00	-0.25360E-02	-0.11818E-02
333	0.11568E-02	0.66653E-01	-0.40924E-01	-0.13045E 00	0.44554E-02	-0.12915E-02
340	0.91054E-03	-0.71522E-01	0.64719E-02	0.11068E 00	0.63302E-02	-0.95944E-01
351	0.18668E-02	0.16610E-02	-0.10089E-02	-0.12630E 00	0.68382E-03	0.72649E-03
400	0.18668E-02	0.83063E-03	-0.22721E-03	-0.12630E 00	0.68382E-03	0.72649E-03
801	-0.10568E-03	-0.91752E-02	0.20687E-01	0.55984E-01	-0.59009E-02	-0.16140E-02
811	-0.80496E-03	0.96237E-02	-0.82113E-01	0.65172E-01	0.15572E-01	0.51789E-02
1106	0.44811E-03	0.47757E-02	-0.21636E-02	-0.77539E-01	0.72748E-02	-0.16140E-02
1156	-0.45031E-03	-0.35144E-02	-0.35563E-02	-0.57042E-01	0.73105E-02	-0.16140E-02
1210	0.42565E-03	0.98553E-03	-0.11457E-01	-0.45362E-01	0.15924E-07	-0.23801E-03
1310	-0.47474E-03	0.98556E-03	0.58108E-02	-0.22926E-01	0.15914E-07	-0.26536E-03
1501	-0.20242E-01	-0.61558E-01	-0.44590E-01	0.11510E 00	0.27042E 00	0.22751E 00
1502	-0.14495E-01	-0.82463E-01	-0.37038E-01	-0.15417E 00	0.16590E 00	0.14071E 00
1503	-0.48067E-02	-0.50384E-01	0.73712E-01	-0.93873E-01	0.63059E-01	0.19602E-01
1504	-0.42040E-02	-0.61727E-01	0.56087E-01	-0.15858E 00	0.76848E-01	-0.85700E-02

Table I-3: LST Mode Shapes (Continued)

MODE NUMBER 87

GRID	T1	T2	T3	R1	R2	R3
10	-0.21804E-06	0.55501E-07	0.52959E-06	-0.87997E-05	0.72609E-05	-0.10177E-05
151	-0.21652E-05	0.74195E-07	0.44085E-06	0.68297E-05	0.35068E-05	-0.16489E-05
175	0.20674E-06	-0.14150E-04	0.25737E-04	-0.64291E-05	-0.36716E-04	0.89086E-05
195	0.16668E-05	-0.16955E-04	-0.97724E-05	-0.48206E-05	0.44725E-05	-0.23296E-05
215	-0.11929E-05	-0.20451E-04	-0.69707E-05	-0.10719E-05	0.20376E-05	-0.14015E-05
321	0.40626E-05	0.14215E-04	0.16348E-04	-0.82794E-05	0.17180E-04	-0.85480E-05
322	0.62717E-05	0.78096E-05	-0.13193E-04	-0.22894E-04	0.13261E-04	0.42214E-05
331	0.72352E-06	0.21825E-05	0.21336E-04	-0.36716E-04	-0.58275E-06	0.25302E-05
332	0.53486E-06	-0.17312E-04	-0.10114E-04	-0.36790E-04	-0.17922E-07	0.63665E-06
333	-0.12449E-06	0.18939E-04	-0.11140E-04	-0.37837E-04	0.18091E-05	-0.88726E-06
340	-0.33327E-05	-0.19356E-04	-0.16920E-05	0.12014E-04	0.45738E-05	-0.16267E-04
351	0.72980E-06	0.11528E-05	0.13584E-06	-0.35259E-04	-0.47627E-06	0.53320E-06
400	0.72980E-06	0.54332E-06	-0.40854E-06	-0.35259E-04	-0.47627E-06	0.53320E-06
801	-0.60051E-06	0.14425E-05	-0.11085E-03	0.11539E-05	-0.42662E-04	-0.82586E-05
811	-0.22830E-05	0.13072E-04	-0.85728E-05	0.10001E-04	-0.20667E-04	0.62112E-05
1106	0.13505E 00	-0.38023E-03	0.78781E-05	0.75269E-02	0.26733E 01	-0.82588E-05
1156	-0.13439E 00	-0.75214E-02	0.78633E-05	-0.14889E 00	0.26604E 01	-0.99294E-05
1210	0.20027E-05	-0.11396E-06	0.53853E-05	0.27283E-04	0.11782E-10	-0.11506E-05
1310	-0.22613E-05	-0.11394E-06	0.55088E-05	-0.27908E-04	0.11736E-10	-0.12968E-05
1501	0.31932E-04	-0.87965E-05	-0.31710E-04	-0.23505E-04	-0.15125E-03	-0.22043E-04
1502	-0.28196E-04	-0.16603E-04	-0.10191E-03	-0.29358E-04	-0.35973E-04	0.70728E-05
1503	0.22719E-04	0.10555E-04	-0.57190E-04	0.41568E-04	-0.12649E-03	0.11408E-04
1504	-0.94650E-05	0.19583E-04	-0.12410E-03	0.54340E-04	-0.27718E-04	-0.26775E-05

MODE NUMBER 88

GRID	T1	T2	T3	R1	R2	R3
10	0.83523E-05	-0.47162E-06	-0.14482E-06	-0.24057E-03	-0.16254E-05	0.48498E-05
151	-0.48362E-04	-0.69068E-06	-0.13862E-08	0.18622E-03	-0.51465E-05	0.37325E-05
175	0.17398E-04	-0.47203E-03	-0.44562E-05	-0.96500E-04	-0.12095E-03	0.61517E-04
195	0.31949E-04	-0.47098E-03	0.98871E-05	-0.12797E-03	-0.14894E-03	0.26757E-04
215	-0.56908E-05	-0.46714E-03	-0.11565E-04	-0.12195E-03	-0.12098E-03	0.33756E-04
321	-0.21281E-04	0.35006E-03	0.39187E-03	-0.36570E-03	0.11355E-03	0.58390E-04
322	-0.25372E-04	0.31440E-03	-0.40045E-03	-0.49372E-03	-0.56956E-05	-0.10072E-03
331	0.24523E-04	0.18361E-04	0.57615E-03	-0.10146E-02	-0.76431E-06	0.35328E-04
332	0.24944E-04	-0.51270E-03	-0.27153E-03	-0.10147E-02	-0.34100E-04	-0.22888E-04
333	0.26006E-04	0.48834E-03	-0.30602E-03	-0.10125E-02	0.31410E-04	-0.16627E-04
340	0.26966E-05	-0.50799E-03	0.48927E-04	0.30981E-03	0.74198E-04	-0.44230E-03
351	0.34649E-04	-0.17676E-05	-0.14083E-05	-0.96420E-03	0.68307E-06	-0.10368E-05
400	0.34649E-04	-0.58255E-06	-0.62760E-06	-0.96420E-03	0.68307E-06	-0.10368E-05
801	0.17614E-08	0.96459E-06	0.92583E-05	0.25770E-04	0.91088E-06	-0.19857E-05
811	-0.24145E-06	0.27935E-05	-0.32183E-04	0.42114E-04	0.22113E-05	0.11189E-05
1106	-0.47230E-02	0.12898E 00	-0.65803E-06	-0.25532E 01	-0.93496E-01	-0.19857E-05
1156	0.24474E-02	-0.13505E 00	-0.10089E-05	-0.26733E 01	-0.48449E-01	-0.19553E-05
1210	0.51298E-06	-0.76187E-07	-0.18334E-05	-0.92883E-05	-0.23479E-12	-0.29466E-06
1310	-0.51222E-06	-0.76188E-07	0.92348E-06	-0.46783E-05	-0.24687E-12	-0.29423E-06
1501	-0.31163E-04	0.25065E-03	0.90174E-04	0.22742E-03	0.17117E-04	0.20504E-03
1502	-0.21338E-04	0.60835E-04	0.18572E-04	0.64547E-04	-0.10712E-04	0.20490E-03
1503	0.94994E-05	0.15705E-03	-0.18003E-03	0.26384E-03	0.10386E-03	0.10266E-03
1504	0.10572E-04	0.38918E-04	-0.28255E-04	0.75259E-04	0.11130E-03	0.12582E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 89

GRID	T1	T2	T3	R1	R2	R3
10	-0.31633E-04	-0.11149E-06	0.15401E-06	-0.67760E-05	0.22054E-05	0.11479E-04
151	-0.20134E-04	-0.78038E-06	0.13310E-06	0.50048E-05	-0.41178E-05	0.13487E-04
175	-0.24619E-04	-0.36365E-04	0.20917E-03	-0.18207E-04	-0.34172E-03	-0.44067E-04
195	-0.16570E-04	-0.23873E-05	0.22668E-03	-0.16018E-04	-0.36674E-03	0.26268E-04
215	-0.11574E-04	-0.43023E-05	0.18478E-03	-0.11702E-04	-0.32257E-03	0.54685E-05
321	0.36862E-04	0.41204E-04	0.31831E-05	0.36597E-04	0.63716E-04	-0.48587E-04
322	0.19318E-04	-0.17634E-05	-0.96213E-05	-0.59857E-04	0.61248E-04	0.69037E-04
331	-0.43320E-04	-0.85581E-05	0.12894E-04	-0.29672E-04	0.12853E-05	0.60899E-05
332	-0.39498E-04	-0.20392E-04	-0.35821E-05	-0.25426E-04	-0.10630E-04	-0.94025E-05
333	-0.38897E-04	0.37885E-05	-0.38657E-05	-0.23184E-04	-0.44656E-05	-0.15180E-05
340	0.87468E-05	-0.10234E-04	0.41159E-04	0.48036E-05	0.21378E-04	-0.16585E-04
351	-0.39945E-04	-0.81728E-05	0.74357E-06	-0.21395E-04	-0.33347E-07	-0.40184E-05
400	-0.39945E-04	-0.35797E-05	0.72546E-06	-0.21395E-04	-0.33347E-07	-0.40184E-05
801	0.19584E-03	0.44034E-04	-0.11522E-04	-0.24069E-05	-0.20931E-05	0.26036E-04
811	0.32098E-03	-0.45718E-04	0.45168E-05	-0.70471E-06	-0.36508E-05	-0.84566E-04
1106	0.13505E 00	0.32635E-01	0.82505E-06	-0.64605E 00	0.26733E 01	0.26036E-04
1156	0.13399E 00	0.28875E-01	0.84851E-06	0.57160E 00	-0.26525E 01	0.27701E-04
1210	0.35441E-04	-0.34781E-05	0.69984E-06	0.35454E-05	0.16587E-11	-0.20303E-04
1310	0.48883E-04	-0.34781E-05	0.44235E-06	-0.22410E-05	0.24292E-12	0.28024E-04
1501	0.26454E-03	0.53275E-04	0.27764E-04	0.25552E-04	-0.87813E-04	-0.43454E-04
1502	0.24678E-03	0.51674E-04	0.11539E-04	0.20668E-04	-0.81997E-04	-0.39433E-04
1503	0.21289E-03	0.62835E-04	-0.16887E-04	0.20438E-04	-0.30031E-04	0.37672E-04
1504	0.19460E-03	0.67146E-04	-0.15997E-04	0.24554E-04	-0.26663E-04	0.48526E-04

MODE NUMBER 90

GRID	T1	T2	T3	R1	R2	R3
10	0.11418E-04	-0.40427E-05	-0.21265E-06	-0.33215E-04	0.50413E-07	0.64549E-04
151	0.69124E-07	-0.44876E-05	0.14823E-05	-0.24930E-04	0.23410E-05	0.73246E-04
175	-0.21484E-04	-0.18201E-03	-0.67022E-04	0.95160E-04	0.91885E-04	-0.22029E-03
195	0.88490E-05	-0.47923E-05	0.56314E-04	-0.78356E-04	-0.38022E-04	0.11760E-03
215	0.35911E-04	-0.91638E-05	-0.19307E-03	-0.76240E-04	0.22835E-03	0.91245E-04
321	0.35909E-04	0.83416E-04	0.17199E-04	-0.89238E-04	-0.10132E-04	0.82543E-04
322	-0.58524E-04	0.11350E-03	-0.45573E-04	-0.20655E-04	-0.15691E-04	0.21944E-04
331	0.20875E-05	-0.42724E-04	0.77658E-04	-0.15470E-03	0.27470E-05	0.77644E-05
332	0.22418E-04	-0.12073E-03	-0.27207E-04	-0.13345E-03	-0.27223E-04	-0.38500E-04
333	0.25333E-04	0.28443E-04	-0.33558E-04	-0.12459E-03	-0.42047E-04	0.61744E-05
340	-0.18854E-05	-0.50136E-04	0.10585E-04	0.21944E-04	-0.32446E-05	-0.92788E-04
351	0.17802E-04	-0.43710E-04	0.50679E-06	-0.13187E-03	-0.18042E-06	-0.21744E-04
400	0.17802E-04	-0.18856E-04	0.30057E-06	-0.13187E-03	-0.18042E-06	-0.21744E-04
801	-0.64145E-04	0.32517E-03	-0.20055E-05	-0.63335E-05	-0.72710E-06	0.86982E-04
811	-0.46211E-04	-0.34926E-03	0.72812E-05	-0.11070E-04	-0.81889E-07	-0.24231E-03
1106	-0.26400E-01	0.13504E 00	0.14253E-06	-0.26733E 01	-0.52261E 00	0.86982E-04
1156	-0.34145E-01	0.12928E 00	0.16839E-06	0.25593E 01	0.67594E 00	0.86558E-04
1210	-0.36264E-04	-0.25684E-04	0.43738E-06	0.22151E-05	-0.90915E-12	0.20813E-04
1310	0.86448E-05	-0.25684E-04	-0.24022E-06	0.12171E-05	0.14097E-12	0.49837E-05
1501	0.40972E-04	0.37246E-03	0.10600E-03	0.21725E-03	-0.81208E-04	-0.15578E-03
1502	0.14330E-04	0.42084E-03	0.64276E-04	0.20967E-03	-0.60928E-04	-0.22192E-04
1503	-0.24914E-03	0.31852E-03	-0.12096E-03	0.12472E-03	0.10563E-03	-0.22456E-03
1504	-0.19506E-03	0.37413E-03	-0.73336E-04	0.12818E-03	0.74197E-04	-0.48523E-04

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 91

GRID	T1	T2	T3	R1	R2	R3
10	-0.25799E-01	0.73089E-03	0.77773E-04	0.23237E 00	0.14792E-01	-0.11363E-02
151	0.18610E 00	0.12971E-02	0.11553E-02	-0.28752E 00	0.30238E-01	0.11925E-01
175	-0.18091E-01	0.59694E 00	0.17238E-01	0.34953E 00	0.51988E 00	-0.85035E 00
195	-0.19894E-02	0.67525E 00	-0.20997E-01	0.38915E 00	0.61477E 00	-0.62111E 00
215	0.11260E 00	0.61116E 00	0.65271E-02	0.40314E 00	0.56894E 00	-0.72429E 00
321	0.10742E 00	-0.54213E 00	-0.75995E 00	0.61736E 00	-0.24902E 00	-0.27738E 00
322	0.62189E-01	-0.54129E 00	0.72028E 00	0.81256E 00	-0.17202E 00	0.42212E 00
331	-0.11961E 00	-0.60038E-01	-0.12493E 01	0.22361E 01	0.70448E-03	-0.73467E-01
332	-0.11229E 00	0.11103E 01	0.59415E 00	0.22479E 01	0.79282E-01	0.51071E-01
333	-0.11853E 00	-0.10702E 01	0.69412E 00	0.22394E 01	-0.95541E-01	0.41954E-01
340	-0.46633E-01	0.96290E 00	-0.72481E-01	-0.41986E 00	-0.31365E 00	0.69671E 00
351	-0.14175E 00	-0.81303E-02	0.11850E-01	0.21122E 01	-0.56533E-02	-0.32745E-02
400	-0.14175E 00	-0.43875E-02	0.53883E-02	0.21122E 01	-0.56533E-02	-0.32745E-02
801	-0.63418E-02	0.26505E-01	-0.72329E-01	-0.26569E 00	-0.92089E-02	0.47490E-02
811	-0.49163E-02	-0.24940E-01	0.35620E 00	-0.54697E 00	0.15516E-01	-0.21079E-01
1106	-0.53660E-03	0.10423E-01	0.44354E-02	-0.22350E 00	-0.11504E-01	0.47490E-02
1156	0.82991E-04	-0.85073E-02	0.83196E-02	-0.18245E 00	-0.17834E-02	0.47490E-02
1210	-0.28635E-02	-0.18885E-02	0.30899E-01	0.17446E 00	0.94211E-09	0.16673E-02
1310	-0.15495E-03	-0.18886E-02	-0.18392E-01	0.10384E 00	0.10312E-08	-0.88790E-04
1501	0.66491E-01	0.17305E 00	0.16968E 00	0.11825E 00	-0.10058E 00	-0.20028E 00
1502	0.20975E-01	0.38532E 00	0.20489E 00	0.28671E 00	-0.17653E-01	-0.13411E 00
1503	-0.76324E-02	0.19326E 00	-0.30363E 00	0.92372E-01	-0.90321E-01	-0.66840E-01
1504	-0.13024E-01	0.30053E 00	-0.47429E 00	0.30707E 00	-0.69193E-01	-0.36843E-01

MODE NUMBER 92

GRID	T1	T2	T3	R1	R2	R3
10	-0.72609E-04	0.29008E-05	-0.83608E-06	0.34409E-03	-0.52304E-03	0.20245E-04
151	0.58992E-03	-0.73305E-05	-0.24100E-04	-0.50994E-03	-0.54898E-03	0.64500E-04
175	0.54277E-03	0.77830E-03	-0.72461E-03	0.87894E-03	0.24421E-02	-0.26442E-02
195	-0.17539E-03	0.27419E-03	0.32004E-03	0.17516E-02	0.17034E-02	-0.28437E-02
215	0.54179E-03	0.16819E-02	0.32401E-03	0.12164E-03	0.16741E-02	-0.96755E-03
321	-0.37731E-04	-0.93157E-03	-0.11812E-02	0.90297E-03	-0.10187E-02	-0.92140E-03
322	-0.19582E-03	-0.10618E-02	0.14497E-02	0.14691E-02	-0.96657E-03	0.12446E-02
331	-0.39925E-03	-0.25780E-03	-0.29052E-02	0.47929E-02	0.12956E-03	-0.51364E-03
332	-0.47407E-03	0.23224E-02	0.10256E-02	0.46527E-02	-0.32487E-04	-0.57041E-04
333	-0.32970E-03	-0.22944E-02	0.11649E-02	0.48641E-02	-0.72028E-04	0.95059E-04
340	0.44109E-03	0.19721E-02	0.50836E-03	-0.69816E-03	-0.10321E-02	0.13146E-02
351	-0.45083E-03	-0.39348E-04	-0.23968E-03	0.44773E-02	0.12033E-03	-0.16539E-04
400	-0.45883E-03	-0.20444E-04	-0.10215E-03	0.44773E-02	0.12033E-03	-0.16539E-04
801	-0.66594E-04	0.10402E-03	0.10871E-02	-0.66960E-03	-0.56030E-03	0.17648E-04
811	-0.95552E-04	-0.10223E-03	0.47176E-03	-0.39286E-02	0.13717E-02	-0.74589E-04
1106	-0.13098E-04	0.16120E-04	-0.62709E-04	-0.35763E-03	-0.29060E-03	0.17648E-04
1156	0.10224E-04	-0.11848E-04	-0.53521E-04	-0.26294E-03	-0.22689E-03	0.17648E-04
1210	-0.22771E-04	-0.70705E-05	0.99514E-02	0.58922E-01	0.42160E-10	0.13348E-04
1310	-0.11797E-04	-0.70666E-05	0.48008E-01	-0.28426E 00	0.42941E-10	-0.69084E-05
1501	-0.59055E-03	0.12493E-02	0.26699E-02	0.10259E-02	-0.15751E-03	-0.21352E-03
1502	-0.51520E-03	0.14041E-02	0.24112E-02	0.12697E-02	-0.60078E-03	-0.19631E-03
1503	-0.50033E-03	0.81482E-03	0.84573E-03	-0.22760E-04	0.25559E-04	-0.15534E-04
1504	-0.38641E-03	0.82589E-03	0.53023E-03	0.21610E-03	-0.38093E-03	0.29963E-03

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 93

GRID	T1	T2	T3	R1	R2	R3
10	0.24037E-03	-0.59674E-05	0.19449E-05	-0.10638E-02	-0.50014E-03	-0.10126E-03
151	-0.18524E-02	-0.98955E-05	-0.31029E-04	0.15832E-02	-0.69965E-03	-0.23611E-03
175	-0.55917E-03	-0.23794E-02	-0.59448E-03	-0.28138E-02	-0.51180E-02	0.77373E-02
195	-0.96301E-03	-0.39193E-02	0.27117E-03	-0.22507E-02	-0.65199E-02	0.49000E-02
215	-0.15869E-02	-0.21361E-02	0.26683E-03	-0.34814E-02	-0.63262E-02	0.74685E-02
321	-0.13105E-02	0.23253E-02	0.50547E-02	-0.40529E-02	0.19231E-02	0.31859E-02
322	-0.72943E-03	0.32368E-02	-0.39669E-02	-0.38621E-02	0.19775E-02	-0.44235E-02
331	0.13619E-02	0.42178E-03	0.80022E-02	-0.14719E-01	0.71024E-04	0.15637E-03
332	0.11863E-02	-0.72522E-02	-0.40685E-02	-0.14582E-01	-0.60224E-03	-0.40633E-03
333	0.13450E-02	0.70426E-02	-0.48732E-02	-0.14765E-01	0.83946E-03	-0.28057E-03
340	0.99426E-03	-0.56381E-02	0.32319E-03	0.21162E-02	0.34256E-02	-0.38033E-02
351	0.14710E-02	0.11343E-03	-0.29229E-03	-0.13912E-01	0.14270E-03	0.51462E-04
400	0.14710E-02	0.54605E-04	-0.12918E-03	-0.13912E-01	0.14270E-03	0.51462E-04
801	0.38387E-04	-0.31398E-03	0.14628E-02	0.20845E-02	-0.19484E-03	-0.55641E-04
811	-0.22358E-04	0.30019E-03	-0.32758E-02	0.34421E-02	0.50657E-03	0.29279E-03
1106	-0.33755E-05	-0.49933E-04	-0.84368E-04	0.11079E-02	-0.74920E-04	-0.55641E-04
1156	0.50051E-05	0.37025E-04	-0.11296E-03	0.82177E-03	-0.11105E-03	-0.55641E-04
1210	0.27270E-04	0.21788E-04	0.47992E-01	0.23419E 00	0.15730E-10	-0.15996E-04
1310	-0.73365E-05	0.21500E-04	-0.58089E-02	0.58560E-01	0.14940E-10	-0.43153E-05
1501	-0.76474E-03	-0.36003E-02	-0.67289E-03	-0.20202E-02	0.75484E-03	0.54272E-03
1502	-0.20744E-03	-0.39162E-02	-0.61265E-03	-0.24351E-02	-0.41552E-03	-0.22894E-03
1503	-0.30928E-03	-0.33441E-02	0.54777E-02	-0.27900E-02	0.34319E-03	-0.42653E-04
1504	-0.18027E-03	-0.32632E-02	0.57426E-02	-0.34736E-02	-0.15296E-03	-0.38733E-03

MODE NUMBER 94

GRID	T1	T2	T3	R1	R2	R3
10	-0.21659E-01	0.55987E-03	0.40686E-03	-0.11618E-01	-0.14083E-01	0.71426E-03
151	-0.18112E 00	-0.38667E-03	-0.27079E-03	0.21544E-01	-0.16094E-01	-0.54475E-03
175	0.27957E 00	-0.59172E-01	0.10404E-02	-0.32253E-01	0.62063E 00	0.54733E-01
195	0.25300E 00	-0.66705E-01	0.66893E-02	0.72506E-02	0.70220E 00	0.43450E-01
215	0.25579E 00	-0.54158E-01	0.36123E-02	-0.81382E-01	0.70655E 00	0.49461E-01
321	0.47629E-01	0.21303E 00	0.14215E-01	0.18819E 00	-0.22127E 00	-0.45892E 00
322	0.55409E-01	-0.11520E 00	-0.11708E 00	-0.31834E 00	-0.19933E 00	0.43733E 00
331	-0.15961E 00	-0.30959E-02	0.69429E-01	-0.13426E 00	0.68584E-02	0.18316E-01
332	-0.16215E 00	-0.64515E-01	-0.43060E-01	-0.13906E 00	-0.33206E-01	-0.14779E-01
333	-0.15854E 00	0.65634E-01	-0.44270E-01	-0.13224E 00	0.25181E-01	-0.17307E-01
340	-0.49239E-01	-0.84339E-01	0.22110E 00	0.29740E-01	-0.41837E 00	-0.48092E-01
351	-0.15951E 00	0.33854E-03	-0.66818E-02	-0.12360E 00	0.28450E-02	0.16339E-03
400	-0.15951E 00	0.15179E-03	-0.26300E-02	-0.12360E 00	0.28450E-02	0.16339E-03
801	-0.30746E-02	-0.89268E-03	0.83036E-02	0.19106E-01	0.44229E-02	-0.74454E-03
811	-0.77560E-02	0.19682E-02	-0.34977E-01	0.75340E-01	-0.12058E-01	0.42087E-02
1106	0.15232E-04	-0.19004E-03	-0.42703E-03	0.45041E-02	0.36213E-03	-0.74454E-03
1156	-0.66665E-04	0.17047E-03	-0.66073E-03	0.40410E-02	0.15791E-02	-0.74454E-03
1210	-0.77046E-03	0.57286E-04	0.66954E-03	0.39658E-02	-0.18668E-09	0.45836E-03
1310	-0.13996E-02	0.57202E-04	-0.25320E-03	0.16474E-02	-0.15325E-05	-0.83310E-03
1501	-0.75823E-02	0.19900E-02	0.52780E-03	0.28973E-02	0.49107E-02	0.13650E-01
1502	-0.12091E-02	-0.24450E-01	-0.82157E-02	-0.13262E-01	-0.37354E-02	0.96309E-02
1503	-0.11851E-02	-0.59416E-02	0.24168E-01	-0.30424E-02	0.70230E-02	0.64718E-02
1504	0.19646E-02	-0.19959E-01	0.41420E-01	-0.19819E-01	0.12975E-02	0.71916E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 95

GRID	T1	T2	T3	R1	R2	R3
10	-0.38801E-02	-0.93394E-02	-0.13969E-02	-0.17511E-02	0.36830E-01	-0.22449E 00
151	0.51326E-02	0.84446E-02	-0.14949E-02	0.65892E-02	0.55147E-01	-0.26049E 00
175	0.10050E 00	0.33917E 00	0.16873E-01	-0.34034E 00	0.33059E-01	0.45206E 00
195	0.93536E-01	-0.99297E-01	-0.76472E-01	0.78675E-01	0.19373E-01	-0.74595E-01
215	-0.12596E 00	-0.22160E 00	0.12970E 00	0.22234E 00	-0.55787E-01	-0.13878E 00
321	-0.13996E 00	-0.14838E 00	0.75666E-01	0.13159E 00	-0.67535E-01	-0.19591E 00
322	0.19170E 00	-0.25341E 00	-0.53219E-01	-0.14871E 00	0.65684E-01	-0.18826E 00
331	0.13370E-01	0.89991E-01	0.63764E-01	-0.33321E-01	-0.16110E-01	0.26394E-03
332	-0.17149E-01	0.56743E-01	-0.35067E-01	-0.79612E-01	0.81680E-01	0.90825E-01
333	-0.36130E-01	0.96505E-01	-0.26991E-01	-0.12407E 00	0.12752E 00	-0.49327E-01
340	-0.58494E-01	-0.16423E 00	-0.73902E-01	0.60007E-01	0.18458E-02	-0.88635E-01
351	-0.12260E-01	0.78583E-01	0.15898E-01	-0.72443E-01	-0.80435E-02	0.39820E-01
400	-0.12260E-01	0.33074E-01	0.67043E-02	-0.72443E-01	-0.80435E-02	0.39820E-01
801	0.17161E-01	-0.91931E-01	-0.31503E-01	-0.33476E-01	-0.33926E-01	-0.58887E-01
811	-0.66885E-01	0.19110E 00	0.10936E 00	-0.33531E 00	0.86606E-01	0.23090E 00
1106	-0.11702E-03	-0.33711E-03	0.15196E-02	0.82723E-02	-0.28870E-02	-0.58887E-01
1156	0.40387E-03	-0.76770E-03	0.19037E-02	-0.18876E-01	-0.99356E-02	-0.58887E-01
1210	0.43746E-01	0.57195E-02	-0.69719E-03	-0.47961E-02	0.21761E-08	-0.26307E-01
1310	-0.26612E-01	0.57195E-02	0.36147E-04	-0.24376E-03	0.10042E-08	-0.16008E-01
1501	0.19608E 00	-0.65722E 00	0.64406E 00	-0.83865E-02	-0.27520E 00	-0.22721E 00
1502	0.21686E 00	-0.30306E 00	0.27776E 00	-0.63762E-02	-0.47539E 00	-0.36188E 00
1503	-0.16377E 00	-0.65842E 00	-0.81049E 00	0.59189E-01	0.22231E 00	-0.26081E 00
1504	-0.22400E 00	-0.32578E 00	-0.39173E 00	0.47383E-01	0.42216E 00	-0.46886E 00

MODE NUMBER 96

GRID	T1	T2	T3	R1	R2	R3
10	-0.28870E-02	-0.21770E-02	0.85549E-02	0.37148E-02	-0.17238E 00	-0.50822E-01
151	-0.17296E-01	-0.11733E-02	-0.68956E-02	-0.98092E-02	-0.23225E 00	-0.54171E-01
175	0.10351E 00	0.49203E-01	-0.19634E-02	-0.30218E-01	-0.16632E 00	-0.12687E 00
195	-0.19385E 00	-0.30344E 00	0.17446E-01	0.35589E 00	-0.85334E-01	-0.38079E 00
215	-0.38740E-01	0.23670E 00	0.46866E-01	-0.19272E 00	-0.70838E-01	0.14577E 00
321	-0.11094E 00	-0.10393E 00	0.17264E 00	-0.94427E-01	0.56339E-01	-0.48435E-01
322	-0.45146E-01	-0.62731E-01	0.13130E 00	0.72339E-01	0.79185E-01	-0.34296E-01
331	0.20975E-01	-0.27979E-01	-0.15168E 00	0.17450E 00	0.30522E-01	-0.14548E 00
332	-0.14170E-01	0.84228E-01	-0.24031E-01	0.10095E 00	-0.52505E-01	-0.34694E-01
333	0.27646E-01	-0.70259E-01	-0.49422E-01	0.17390E 00	0.57936E-01	-0.22675E-02
340	0.23758E 00	0.70031E-01	0.15315E 00	-0.27237E-02	0.53468E-01	0.35911E-01
351	0.96250E-02	0.10158E-01	-0.73140E-01	0.13926E 00	0.35962E-01	0.58868E-02
400	0.96250E-02	0.34290E-02	-0.32035E-01	0.13926E 00	0.35962E-01	0.58868E-02
801	0.65034E-02	-0.76113E-02	0.65902E-02	-0.24174E-01	0.55283E-01	-0.62907E-02
811	0.54156E-02	0.18624E-01	-0.42432E-01	0.33687E 00	-0.13309E 00	0.18717E-01
1106	0.33938E-03	0.94464E-04	-0.30902E-03	-0.23689E-02	0.85007E-02	-0.62907E-02
1156	-0.25788E-03	-0.17008E-03	-0.39411E-04	-0.42589E-02	0.64635E-02	-0.62907E-02
1210	0.89814E-02	0.46787E-03	-0.14893E-03	-0.10510E-02	-0.82891E-09	-0.54253E-02
1310	-0.65506E-03	0.46787E-03	0.25471E-03	-0.17976E-02	-0.11028E-08	-0.39693E-03
1501	0.24848E-01	0.71150E-02	-0.54855E-01	0.23781E 00	0.56147E-01	-0.40194E-01
1502	0.47632E-01	0.57371E-01	0.23593E-01	0.11685E 00	0.52108E-01	-0.46206E-01
1503	0.56038E-01	0.24799E 00	-0.16966E 00	-0.13871E 00	0.60168E-01	0.91091E-01
1504	0.96317E-01	0.87203E-01	-0.44492E-01	-0.49099E-01	0.30268E-01	0.14589E 00

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 97

GRID	T1	T2	T3	R1	R2	R3
10	-0.36757E-02	0.29132E-02	0.63024E-02	-0.51581E-02	-0.12646E 00	0.53574E-01
151	0.19627E-01	-0.23585E-02	-0.20859E-02	0.17175E-01	-0.92074E-01	0.52752E-01
175	-0.70718E-01	-0.29072E-01	-0.89181E-01	-0.15036E-01	0.14622E 00	0.21730E 00
195	0.42299E-01	0.19937E-02	0.76260E-01	-0.44470E-01	0.45092E-01	0.28204E 00
215	0.93206E-01	0.12404E 00	0.31694E-01	-0.20913E 00	0.63898E-01	0.29318E 00
321	-0.16705E-01	0.87232E-01	0.53957E-01	0.58435E-02	-0.76553E-01	-0.16540E-01
322	-0.68689E-01	0.33156E-01	-0.58569E-01	-0.62469E-01	-0.53669E-01	0.68826E-01
331	-0.31587E-01	-0.13938E-01	0.14939E 00	-0.31026E 00	0.10664E-01	-0.58230E-02
332	-0.32505E-01	-0.16427E 00	-0.78138E-01	-0.31490E 00	-0.59985E-01	-0.43928E-01
333	-0.18760E-01	0.12651E 00	-0.10429E 00	-0.28519E 00	0.48719E-02	-0.13540E-02
340	0.74788E-01	-0.24933E-01	0.16134E 00	-0.61135E-02	-0.81832E-01	-0.87043E-02
351	-0.23098E-01	-0.13777E-01	-0.14555E-01	-0.27703E 00	0.94246E-02	-0.72138E-02
400	-0.23098E-01	-0.55319E-02	-0.37828E-02	-0.27703E 00	0.94246E-02	-0.72138E-02
801	-0.83814E-02	0.10886E-01	-0.90490E-01	0.35136E-01	-0.10862E 00	0.17231E-01
811	0.10051E-01	-0.46957E-01	0.19733E 00	-0.86606E 00	0.29329E 00	-0.57214E-01
1106	-0.55149E-03	-0.11806E-03	0.41265E-02	0.30124E-02	-0.14055E-01	0.17231E-01
1156	0.44764E-03	0.21102E-03	0.37454E-02	0.53761E-02	-0.11415E-01	0.17231E-01
1210	-0.26902E-01	-0.66209E-03	-0.33946E-03	-0.24581E-02	0.96694E-09	0.16330E-01
1310	0.11349E-01	-0.66207E-03	-0.79665E-03	0.57687E-02	0.17233E-08	0.68910E-02
1501	-0.20808E 00	-0.13984E 00	-0.98677E 00	-0.59556E-01	0.24529E 00	0.50048E-01
1502	-0.32560E 00	-0.74830E-01	-0.49473E 00	-0.67180E-01	0.47670E 00	0.10784E 00
1503	0.30505E-02	0.26897E 00	-0.30728E-01	-0.14179E 00	-0.35187E-01	0.88833E-01
1504	-0.30594E-01	0.10166E 00	-0.49980E-01	-0.50078E-01	0.44464E-02	0.15049E 00

MODE NUMBER 98

GRID	T1	T2	T3	R1	R2	R3
10	-0.17243E-02	0.12231E-02	0.31075E-03	-0.84934E-05	-0.55427E-02	0.18733E-01
151	-0.24007E-02	-0.61238E-03	0.23968E-03	-0.19379E-03	-0.51936E-02	0.27417E-01
175	-0.13422E-01	-0.33316E-01	0.63553E-02	0.32848E-01	-0.17695E-01	-0.28415E-01
195	-0.50914E-02	0.14793E-01	0.35034E-02	-0.13555E-01	-0.32691E-02	0.17386E-01
215	0.17677E-01	0.16833E-01	0.13855E-01	-0.20382E-01	-0.33110E-01	0.35197E-02
321	0.19898E-01	0.19006E-01	-0.91506E-02	-0.77592E-02	0.24513E-01	0.32765E-01
322	-0.14659E-01	0.27192E-01	0.18973E-04	0.68549E-02	0.18570E-02	0.73714E-02
331	-0.47062E-02	-0.74892E-02	-0.10333E-02	-0.48374E-02	0.10951E-02	0.34137E-02
332	-0.15843E-02	-0.81223E-02	0.35010E-02	0.80760E-03	-0.89327E-02	-0.87054E-02
333	-0.32779E-03	-0.53780E-02	0.27972E-02	0.47122E-02	-0.13076E-01	0.50465E-02
340	0.11014E-01	0.18711E-01	0.11688E-01	-0.60635E-02	0.51392E-02	0.13364E-01
351	-0.21091E-02	-0.70898E-02	0.92396E-04	0.85316E-03	0.15783E-03	-0.35294E-02
400	-0.21051E-02	-0.30557E-02	0.27280E-03	0.85316E-03	0.15783E-03	-0.35294E-02
801	0.32801E-02	0.35880E-02	-0.36460E-03	0.31198E-03	-0.44027E-03	-0.14624E-01
811	-0.21970E-01	0.35042E-01	-0.23163E-03	-0.59423E-03	0.36622E-03	0.50807E-01
1106	0.94914E-05	0.10986E-04	0.15780E-04	-0.28860E-03	0.24928E-03	-0.14624E-01
1156	0.24321E-04	0.13184E-04	0.12568E-04	0.34652E-03	-0.63918E-03	-0.14624E-01
1210	0.10000E 01	-0.21464E-03	-0.17754E-06	-0.13604E-05	0.31066E-07	-0.61291E 00
1310	-0.66411E 00	-0.21464E-03	-0.28104E-05	0.21393E-04	0.47252E-08	-0.42930E 00
1501	-0.13153E-01	0.66831E-01	-0.19698E-01	0.15052E-01	0.11695E-01	0.11494E-01
1502	-0.23567E-01	0.30640E-01	-0.77031E-02	0.76577E-02	0.21340E-01	0.25319E-01
1503	0.27342E-01	0.59255E-01	0.19569E-01	0.66110E-02	-0.10257E-01	0.15699E-01
1504	0.39027E-01	0.28627E-01	0.71784E-02	0.34943E-02	-0.17991E-01	0.33606E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 99

GRID	T1	T2	T3	R1	R2	R3
10	-0.31356E-03	-0.59461E-04	0.16411E-04	0.61937E-05	-0.26421E-03	-0.95698E-03
151	-0.45677E-03	0.21579E-04	-0.99382E-05	-0.12317E-04	-0.35074E-03	-0.99657E-03
175	0.32329E-03	0.10959E-02	0.13268E-02	-0.10760E-02	-0.29199E-02	0.69447E-03
195	0.99304E-04	-0.56121E-03	0.14364E-02	0.72903E-03	-0.36873E-02	-0.17624E-03
215	-0.40420E-03	-0.40049E-03	0.16780E-02	0.55474E-03	-0.32516E-02	-0.60149E-03
321	0.11575E-03	-0.58925E-03	0.44005E-03	0.12299E-02	0.24547E-02	0.16080E-02
322	0.13346E-02	-0.10529E-02	0.10979E-03	-0.12243E-02	0.29784E-02	-0.29860E-02
331	-0.32508E-03	0.19745E-03	-0.71270E-04	0.14934E-03	-0.27281E-05	-0.13749E-03
332	-0.44918E-03	0.33772E-03	-0.54993E-04	-0.80969E-04	0.59687 -04	0.16687E-03
333	-0.45304E-03	0.88922E-04	-0.55156E-04	-0.93953E-04	0.5253(-03	-0.21146E-03
340	0.13548E-02	-0.41745E-03	0.42498E-03	0.16158E-03	0.14887E-02	-0.27089E-03
351	-0.39262E-03	0.22125E-03	-0.13939E-04	0.10343E-03	0.19092E-04	0.11778E-03
400	-0.39262E-03	0.86628E-04	0.78833E-05	0.10343E-03	0.19092E-04	0.11778E-03
801	0.63604E-03	-0.22768E-03	-0.12764E-04	-0.23783E-04	-0.22912E-04	0.10117E-03
811	0.29405E-02	-0.74171E-03	-0.10727E-03	0.33095E-03	-0.11587E-03	-0.22119E-02
1106	0.20527E-05	-0.67958E-06	0.55189E-06	0.17861E-04	0.53963E-04	0.10117E-03
1156	0.21325E-05	-0.84628E-06	0.79649E-06	-0.22257E-04	-0.56075E-04	0.10117E-03
1210	-0.68044E 00	0.13617E-04	-0.15155E-06	-0.11540E-05	-0.21135E-07	0.41713E 00
1310	-0.10000E 01	0.13617E-04	0.47601E-07	-0.36280E-06	0.69001E-08	-0.61303E 00
1501	0.14436E-02	-0.22359E-02	0.10590E-02	-0.55727E-03	-0.58074E-03	-0.40320E-03
1502	0.15208E-02	-0.12192E-02	0.49565E-03	-0.31261E-03	-0.94726E-03	-0.85567E-03
1503	0.60922E-03	-0.18638E-02	-0.56866E-03	-0.19420E-03	0.24021E-03	-0.37035E-03
1504	0.19460E-03	-0.86022E-03	-0.18185E-03	-0.10851E-03	0.41300E-03	-0.80116E-03

MODE NUMBER 100

GRID	T1	T2	T3	R1	R2	R3
10	0.17577E-01	-0.10903E-01	-0.29828E-02	-0.70131E-06	0.51462E-01	-0.16503E 00
151	0.25304E-01	0.50124E-02	-0.19295E-02	0.18187E-02	0.48554E-01	-0.22626E 00
175	0.10905E 00	0.26644E 00	-0.61259E-01	-0.26645E 00	0.17009E 00	0.21307E 00
195	0.36929E-01	-0.11743E 00	-0.46918E-01	0.10532E 00	0.62603E-01	-0.13521E 00
215	-0.14549E 00	-0.13497E 00	-0.11759E 00	0.16550E 00	0.29405E 00	-0.10307E-01
321	-0.17262E 00	-0.15636E 00	0.75904E-01	0.49633E-01	-0.23546E 00	-0.30418E 00
322	0.11142E 00	-0.22131E 00	-0.37969E-02	-0.45898E-01	-0.54708E-01	-0.23926E-01
331	0.43496E-01	0.59375E-01	0.10234E-01	0.38127E-01	-0.92023E-02	-0.28404E-01
332	0.18624E-01	0.62499E-01	-0.29469E-01	-0.77967E-02	0.74873E-01	0.71375E-01
333	0.82177E-02	0.43531E-01	-0.23803E-01	-0.40143E-01	0.10535E 00	-0.40980E-01
340	-0.11047E 00	-0.15170E 00	-0.10348E 00	0.48676E-01	-0.61244E-01	-0.10586E 00
351	0.22448E-01	0.55919E-01	-0.84479E-03	-0.58013E-02	-0.14746E-02	0.28181E-01
400	0.22448E-01	0.23709E-01	-0.25303E-02	-0.98013E-02	-0.14746E-02	0.28181E-01
801	-0.26550E-01	-0.25206E-01	0.27968E-02	-0.12197E-02	0.29739E-02	0.10681E 00
811	0.19465E 00	-0.28327E 00	0.23812E-02	-0.79061E-03	-0.33164E-03	-0.43114E 00
1106	-0.75842E-04	-0.77480E-04	-0.12011E-03	0.20457E-02	-0.20020E-02	0.10681E 00
1156	-0.17823E-03	-0.85723E-04	-0.10765E-03	-0.22640E-02	0.47073E-02	0.10681E 00
1210	0.10000E 01	0.15048E-02	0.59477E-05	0.45680E-04	0.31034E-07	-0.61384E 00
1310	-0.65578E 00	0.15048E-02	0.15631E-04	-0.11990E-03	0.44929E-08	-0.40254E 00
1501	-0.93062E-01	-0.53069E 00	0.13627E 00	-0.12183E 00	-0.86411E-01	-0.89291E-01
1502	0.17316E 00	-0.23993E 00	0.51922E-01	-0.61596E-01	-0.15705E 00	-0.19382E 00
1503	-0.20949E 00	-0.46490E 00	-0.14504E 00	-0.56015E-01	0.77663E-01	-0.12024E 00
1504	-0.29651E 00	-0.22386E 00	-0.52249E-01	-0.29757E-01	0.13724E 00	-0.25784E 00

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 101

GRID	T1	T2	T3	R1	R2	R3
10	0.25234E-01	0.39563E-02	-0.28685E-02	-0.51778E-03	0.43589E-01	0.53185E-01
151	0.47849E-01	-0.11773E-02	0.50144E-03	0.10562E-02	0.44879E-01	0.69125E-01
175	-0.48527E-01	-0.79573E-01	-0.28134E-01	0.76318E-01	0.12368E 00	-0.53131E-01
195	-0.43826E-01	0.35009E-01	-0.63413E-01	-0.58133E-01	0.21354E 00	-0.20993E-01
215	-0.51012E-02	0.24671E-01	-0.30399E-01	-0.30101E-01	0.12702E 00	0.60490E-01
321	-0.35100E-01	0.40422E-01	-0.30066E-01	-0.13152E 00	-0.30019E 00	-0.28932E 00
322	-0.11945E 00	0.75428E-01	-0.13536E-01	0.12458E 00	-0.35013E 00	0.38486E 00
331	0.39985E-01	-0.12999E-01	0.25560E-02	0.18296E-02	-0.82868E-03	0.82524E-02
332	0.43508E-01	-0.21403E-01	0.35072E-02	0.17898E-01	0.56697E-02	-0.62625E-02
333	0.47903E-01	-0.79407E-02	0.45928E-02	0.15524E-01	-0.39800E-01	0.16844E-01
340	-0.16939E 00	0.33205E-01	-0.56795E-01	-0.11146E-01	-0.16501E 00	0.26016E-01
351	0.43293E-01	-0.15299E-01	0.54956E-03	-0.24803E-02	-0.18937E-02	-0.78865E-02
400	0.43293E-01	-0.62851E-02	-0.16149E-02	-0.24803E-02	-0.18937E-02	-0.78865E-02
801	0.46342E-01	-0.32806E-02	0.20959E-02	0.10498E-02	-0.13274E-02	-0.36393E-01
811	0.49002E-01	0.10241E 00	-0.63034E-02	0.10333E-01	-0.14951E-02	0.11637E 00
1106	0.11864E-03	-0.11556E-04	-0.86482E-04	0.31350E-03	0.32157E-02	-0.36393E-01
1156	0.14874E-03	-0.58253E-05	-0.96785E-04	-0.15765E-03	-0.40320E-02	-0.36393E-01
1210	-0.78765E-01	0.19427E-03	0.90381E-05	0.72164E-04	-0.24383E-08	0.48751E-01
1310	-0.24878E-02	0.19427E-03	0.29196E-05	-0.23310E-04	0.28113E-10	-0.15466E-02
1501	0.52492E-02	0.15698E 00	-0.49812E-01	0.49929E-01	0.23408E-01	0.19998E-01
1502	-0.18391E-01	0.67131E-01	-0.19074E-01	0.22075E-01	0.47754E-01	0.53431E-01
1503	0.11951E 00	0.15004E 00	0.28831E-01	0.10303E-01	-0.26781E-01	0.54130E-01
1504	0.14035E 00	0.54834E-01	0.16059E-01	0.17075E-02	-0.34175E-01	0.81227E-01

MODE NUMBER 102

GRID	T1	T2	T3	R1	R2	R3
10	0.18857E-02	0.12956E-01	-0.15819E 00	-0.46810E-03	0.18066E 01	0.15177E 00
151	-0.18718E-01	0.31664E-02	0.50480E-02	0.68641E-03	-0.78058E 00	0.41724E-01
175	0.33477E 00	0.94934E-02	0.10960E 00	0.47109E-01	0.40968E 00	-0.92133E-03
195	0.99411E-03	0.15554E 00	-0.47905E-01	-0.50744E 00	-0.13324E 00	-0.74889E 00
215	-0.33610E 00	-0.18299E 00	-0.68850E-01	0.45457E 00	-0.19512E 00	0.74198E 00
321	0.33617E 00	0.19354E 00	-0.63551E-01	0.59611E 00	0.21002E 00	0.17185E 00
322	0.28611E 00	-0.18090E 00	0.50494E-01	-0.52363E 00	0.19330E 00	-0.10366E 00
331	-0.23290E-02	0.51955E-01	0.95819E-02	0.15995E-01	-0.26708E-01	0.20196E 00
332	0.24751E-01	0.13040E-01	-0.25676E-01	0.82405E-01	0.19607E 00	0.11378E 00
333	-0.24843E-01	0.29607E-02	0.25973E-01	-0.78768E-01	-0.83906E-03	-0.27521E-01
340	-0.65975E 00	-0.13805E 00	-0.68202E 00	0.23347E-01	0.14076E 00	-0.78309E-01
351	-0.14797E-02	0.68007E-02	0.14864E-01	0.67994E-03	-0.31339E-01	0.86919E-03
400	-0.14797E-02	0.58073E-02	-0.20957E-01	0.67994E-03	-0.31339E-01	0.86919E-03
801	0.24536E-02	0.67115E-02	0.38059E-01	0.29457E-02	0.22529E-01	0.14991E-03
811	-0.78537E-02	0.56080E-02	-0.92598E-02	0.16169E-01	0.53002E-02	0.15686E-01
1106	0.36595E-04	0.53813E-05	-0.13949E-02	-0.15808E-03	0.10826E-02	0.14991E-03
1156	-0.28789E-04	0.13923E-04	-0.14206E-02	0.41091E-03	0.65255E-03	0.14992E-03
1210	-0.44883E-03	-0.39951E-03	0.50279E-04	0.45731E-03	-0.89297E-10	0.28621E-03
1310	-0.51949E-03	-0.39952E-03	0.43046E-04	-0.39153E-03	-0.71706E-10	-0.33122E-03
1501	0.21713E-01	0.84092E-02	-0.34284E-01	-0.55185E-02	0.14621E-01	0.61850E-02
1502	0.15879E-01	0.57641E-02	0.25724E-01	0.26458E-02	0.20206E-01	0.62928E-02
1503	0.81755E-02	0.27880E-01	-0.19711E-01	0.50462E-02	0.14705E-01	-0.64750E-02
1504	0.17891E-01	0.84669E-02	0.45157E-01	-0.10256E-01	0.10710E-01	0.43087E-02

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 103

GRID	T1	T2	T3	R1	R2	R3
10	0.25276E-03	0.17434E 00	0.12043E-01	-0.46987E-03	-0.13840E 00	0.19647E 01
151	0.47793E-03	-0.41657E-02	0.26771E-02	-0.94575E-03	-0.41219E-01	0.72872E 00
175	-0.18095E 00	-0.15789E 00	-0.14771E-01	0.50744E 00	-0.23443E-01	0.97020E 00
195	0.33661E 00	0.89166E-01	0.10661E 00	-0.19596E 00	0.33352E 00	-0.45042E 00
215	-0.16412E 00	0.54346E-01	-0.11048E 00	-0.28247E 00	-0.27877E 00	-0.45513E 00
321	0.39777E 00	0.36587E 00	-0.34828E 00	0.19040E-01	0.91566E-01	0.45979E 00
322	-0.43576E 00	0.46729E 00	0.17127E 00	0.26226E 00	-0.16621E 00	0.44937E 00
331	-0.25456E-01	0.82050E-02	-0.95944E-02	-0.76466E-01	0.12300E-01	0.12669E 00
332	0.11419E-01	-0.19524E-01	0.29182E-01	0.57301E-01	-0.68693E-01	-0.69403E-01
333	0.13138E-01	0.19598E-01	0.39952E-01	0.38904E-01	-0.19907E 00	0.99359E-01
340	0.36150E-01	-0.39959E-01	0.37091E-01	-0.27964E-01	-0.60892E-02	-0.49081E-01
351	-0.37472E-03	-0.77457E-02	0.61934E-02	0.58047E-02	-0.68739E-03	-0.27221E-01
400	-0.37472E-03	0.23368E-01	0.54077E-02	0.58047E-02	-0.68739E-03	-0.27221E-01
801	-0.64009E-02	-0.55547E-01	0.55336E-02	-0.37843E-02	-0.16054E-02	0.28872E-01
811	0.26996E-01	-0.25785E-01	-0.69644E-02	0.15392E-01	-0.44312E-02	-0.45463E-01
1106	-0.11106E-04	-0.71566E-04	-0.20109E-03	0.21224E-02	-0.32975E-03	0.28872E-01
1156	-0.16164E-04	-0.82044E-04	-0.16838E-03	-0.24345E-02	0.47926E-03	0.28872E-01
1210	0.75414E-02	0.33157E-02	0.20036E-05	0.18584E-04	0.24017E-09	-0.48161E-02
1310	-0.51794E-02	0.33157E-02	0.10759E-04	-0.98907E-04	0.40885E-10	-0.33063E-02
1501	0.12216E-01	-0.16051E 00	0.75101E-01	-0.21351E-01	-0.40802E-02	0.39015E-02
1502	0.51517E-01	-0.13610E 00	0.30676E-01	-0.27431E-01	-0.39893E-01	-0.33601E-01
1503	-0.54806E-01	-0.14819E 00	-0.11487E 00	0.76953E-02	0.12321E-01	-0.61461E-02
1504	-0.92467E-01	-0.12507E 00	-0.37765E-01	-0.82002E-02	0.40924E-01	-0.50782E-01

MODE NUMBER 104

GRID	T1	T2	T3	R1	R2	R3
10	0.91687E-03	-0.70568E-02	0.68736E-01	-0.21183E-02	-0.70517E 00	-0.68835E-01
151	-0.10990E-01	0.47029E-02	0.38123E-02	-0.77235E-03	0.19866E 00	-0.87134E-01
175	-0.34839E 00	-0.44283E-02	-0.28604E 00	-0.27630E-01	0.31198E 00	-0.15698E 00
195	0.34981E 00	0.84517E-01	0.20428E 00	-0.75830E-01	-0.23946E 00	-0.21341E 00
215	-0.11068E 00	-0.34668E 00	0.12088E 00	0.24558E 00	-0.13115E 00	-0.15736E 00
321	-0.64476E-01	-0.91134E-01	-0.31257E 00	-0.12265E 00	-0.31737E 00	0.13912E 00
322	0.19349E-01	0.77727E-01	-0.19739E 00	0.13043E 00	-0.29217E 00	-0.22591E 00
331	0.56660E-02	0.57609E-01	-0.87795E-02	0.10074E 00	-0.22347E-01	0.10144E 00
332	0.20790E-01	0.83055E-01	0.49775E-01	0.16212E 00	0.10906E 00	0.79604E-01
333	-0.10809E-01	-0.16534E-01	0.97072E-01	0.82590E-01	-0.12566E-01	-0.72967E-03
340	-0.16114E 00	-0.26615E 00	-0.24322E 00	0.54043E-01	0.72729E-01	-0.15252E 00
351	0.22484E-02	0.24661E-01	0.54053E-01	0.97221E-01	-0.22745E-01	0.11985E-01
400	0.22484E-02	0.10962E-01	0.28056E-01	0.97221E-01	-0.22745E-01	0.11985E-01
801	-0.10686E-02	0.58453E-01	0.25368E 00	0.12114E 00	-0.25968E 00	0.30146E-01
811	-0.13729E 00	-0.27082E-01	-0.73299E 00	0.77473E 00	0.56666E-01	0.65369E-01
1106	-0.23638E-03	-0.56037E-04	-0.87092E-02	0.17878E-02	-0.75067E-02	0.30146E-01
1156	0.22222E-03	0.16098E-03	-0.96785E-02	0.51047E-02	-0.70591E-02	0.30146E-01
1210	0.40333E-02	-0.36660E-02	0.25329E-03	0.25722E-02	0.54279E-09	-0.26404E-02
1310	-0.38005E-02	-0.36661E-02	0.53654E-04	-0.95104E-03	0.44319E-09	-0.24878E-02
1501	-0.40576E 00	0.57073E-01	-0.26196E 00	0.38404E-01	0.12569E 00	0.73155E-01
1502	-0.45943E 00	-0.62493E-01	0.35320E-01	0.31642E-02	0.17658E 00	0.68253E-01
1503	-0.34552E 00	0.27384E 00	-0.65726E 00	0.17571E 00	0.15651E 00	-0.50976E-01
1504	-0.38035E 00	-0.12032E 00	0.40355E 00	-0.15054E 00	0.19392E 00	-0.47433E-01

Table 1-3: LST Mode Shapes (Continued)

MODE NUMBER 105

GRID	T1	T2	T3	R1	R2	R3
10	0.29683E-02	0.37628E-01	-0.14510E 00	0.12335E-03	0.14198E 01	0.36623E 00
151	0.61652E-02	-0.33860E-02	-0.82192E-02	-0.34619E-03	-0.46878E-01	0.26554E-01
175	-0.67114E 00	-0.31652E-01	-0.19123E-01	0.28407E-01	0.17002E 00	-0.12332E 00
195	-0.50319E 00	-0.19821E 00	-0.48780E-01	0.11705E-01	-0.10244E-01	-0.17102E-01
215	-0.10533E 00	0.22477E 00	-0.43290E-01	-0.30351E-01	-0.40199E-01	0.11085E 00
321	-0.40780E-01	0.11121E 00	0.44844E 00	0.28445E 00	0.26337E 00	0.24131E-01
322	0.12959E-01	-0.18462E 00	0.27876E 00	-0.38497E 00	0.22532E 00	-0.47728E-06
331	0.46340E-02	-0.52008E-01	-0.53906E-01	0.39591E-01	0.20972E-01	-0.10826E 00
332	-0.15073E-01	-0.16508E-01	-0.48285E-01	-0.41692E-01	-0.40665E-01	-0.38173E-01
333	0.92147E-02	-0.32985E-01	-0.79886E-01	-0.11095E-02	0.54940E-01	-0.23182E-01
340	0.39406E-01	0.15390E 00	0.67251E-01	-0.19232E-01	-0.22596E-01	0.78946E-01
351	-0.63968E-04	-0.14879E-01	-0.61230E-01	0.17064E-02	0.22421E-01	-0.76580E-02
400	-0.63968E-04	-0.61256E-02	-0.35603E-01	0.17064E-02	0.22421E-01	-0.76580E-02
801	-0.48050E-02	-0.16535E-01	0.22798E-01	-0.23152E-02	0.80541E-02	-0.13284E-01
811	0.31031E-01	0.60070E-02	-0.13392E-01	0.19733E-01	0.96855E-03	-0.23904E-01
1106	0.21699E-05	-0.10387E-04	-0.73570E-03	0.34103E-03	0.72274E-04	-0.13284E-01
1156	-0.67197E-05	-0.13603E-04	-0.71793E-03	-0.44724E-03	0.22176E-03	-0.13284E-01
1210	-0.94016E-03	0.10959E-02	0.10111E-04	0.10929E-03	-0.38048E-10	0.62521E-03
1310	0.17591E-02	0.10959E-02	0.12334E-04	-0.13325E-03	-0.20874E-10	0.11713E-02
1501	-0.80666E-01	0.18136E 00	-0.16348E 00	0.32288E 00	0.74127E-01	-0.97763E-02
1502	-0.79428E-01	0.16485E 00	-0.40529E-01	0.16856E 00	0.91705E-01	-0.21846E-01
1503	0.22731E 00	0.86362E 00	0.75374E 00	-0.26019E 00	-0.51245E-01	0.13716E 00
1504	0.37149E 00	0.29996E 00	0.44705E 00	-0.15209E 00	-0.13751E 00	0.29555E 00

MODE NUMBER 106

GRID	T1	T2	T3	R1	R2	R3
10	0.16200E-01	-0.26024E 00	-0.38275E-01	-0.70103E-03	0.36527E 00	-0.25411E 01
151	-0.35487E-01	-0.10866E-01	0.11126E-01	-0.10687E-02	0.12367E 00	0.47871E 00
175	-0.77236E 00	-0.44626E 00	-0.14834E 00	0.31208E 00	0.24784E 00	0.45431E 00
195	-0.26317E 00	0.32536E 00	-0.38473E 00	-0.21258E 00	0.39528E 00	-0.26558E 00
215	0.99853E 00	0.48547E-01	0.18954E 00	-0.10065E 00	-0.38062E-01	-0.22798E 00
321	0.23850E 00	0.27171E 00	-0.36225E 00	-0.61369E 00	-0.79278E-03	0.28715E 00
322	-0.23061E 00	0.72683E 00	-0.41104E 00	0.43774E 00	-0.28551E 00	0.64237E-01
331	-0.28991E-01	-0.83728E-01	0.41058E-01	-0.96421E-01	-0.93665E-02	0.13214E 00
332	0.25035E-01	-0.12551E 00	0.11287E 00	0.18390E-01	-0.12313E 00	-0.10906E 00
333	0.27502E-01	-0.42064E-01	0.11280E 00	0.94450E-01	-0.28552E 00	0.11887E 00
340	-0.10503E 00	0.76606E 00	0.69285E-01	-0.14120E 00	-0.51737E-01	0.46252E 00
351	0.74304E-02	-0.10106E 00	0.51031E-01	0.35508E-03	-0.24246E-01	-0.44640E-01
400	0.74304E-02	-0.50040E-01	0.23317E-01	0.35508E-03	-0.24246E-01	-0.44640E-01
801	-0.82417E-01	-0.32540E 00	0.87854E-01	-0.22396E-01	-0.41098E-01	-0.20423E 00
811	0.56195E 00	0.10493E 00	-0.13893E 00	0.17991E 00	-0.10078E-01	-0.41406E 00
1106	-0.87897E-04	-0.21858E-03	-0.28305E-02	0.71914E-02	-0.28978E-02	-0.20423E 00
1156	0.35426E-05	-0.24937E-03	-0.26588E-02	-0.82098E-02	-0.12167E-03	-0.20423E 00
1210	-0.13599E-01	0.21626E-01	0.32009E-04	0.34802E-03	-0.38164E-09	0.90482E-02
1310	0.27516E-01	0.21626E-01	0.53287E-04	-0.57743E-03	-0.14762E-09	0.18335E-01
1501	-0.59359E 00	0.53750E 00	-0.12309E 00	0.15741E 00	0.15288E 00	0.14345E 00
1502	-0.57493E 00	-0.24391E 00	-0.79337E-01	-0.57498E-01	0.16034E 00	0.16277E 00
1503	0.19079E 00	0.26968E 00	-0.22438E 00	0.12904E 00	-0.26835E-01	0.11729E 00
1504	0.22964E 00	-0.33214E 00	0.14682E 00	-0.77085E-01	-0.16604E-01	0.12775E 00

gridpoint	location
1106, 1156	tip of high gain antennas
1210, 1310	tip of solar arrays
1501, 1502, 1503, 1504	reaction wheels

These gridpoints are located schematically in Figures I-1 and I-2.

The coupled modal damping matrix (BHH) generated by NASTRAN and written on the restart tape for use by the postprocessor is listed in Table I-4. This matrix contains joint damping only. The postprocessor adds the desired modal viscous damping to the diagonal terms of the matrix to represent the additional effects of material damping.

Table I-4: Coupled Modal Damping Matrix

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES (newton/meter/second)							
7	0.32177E-14	0.10938E-14	0.11907E-13	-0.84416E-06	-0.13038E-07	-0.24112E-07	0.23864E 01	0.70229E-04
	0.10283E-03	-0.11250E-03	-0.21780E-01	0.61591E-03	0.16075E-03	-0.81714E-03	-0.30886E-06	-0.72048E-01
	0.71047E 01	0.23574E 00	-0.93925E-01	0.78635E 00	-0.30662E-06	-0.13912E 00	-0.21284E-01	-0.54441E 00
	0.60363E-06	-0.19046E-04	0.91912E-02	-0.41670E-03	-0.68593E-02	-0.31666E 00	0.10417E-01	0.73556E-02
	-0.74528E-01	0.20715E-01	-0.16070E-06	0.16376E 00	0.93691E 00	0.12984E 02	-0.60178E 00	0.10307E-01
	0.24945E 00	0.11922E-01	0.38352E 00	0.13291E-04	-0.22031E 00	0.23867E 00	-0.27887E 00	-0.12582E-04
	0.39613E 00	-0.19144E 01	0.73190E 00	0.18815E 01	-0.91099E-01	-0.94422E 00	-0.77276E 00	-0.70063E 01
	-0.72529E 00	-0.30610E 00	-0.44146E 01	-0.40758E-03	-0.14250E-01	-0.10469E-01	-0.67207E 00	0.30861E 00
	0.53475E-01	0.12070E-01	0.75219E-01	-0.13186E 00	0.37844E-01	0.29819E 00	-0.40087E 00	0.38296E 00
	-0.38327E 00	-0.12900E 02	0.26269E 01	-0.24182E 01	0.25508E 02	-0.10869E 01	0.23464E 01	0.10931E 00
	-0.46770E-01	-0.20602E-01	-0.13193E 00	0.42011E-02	0.74251E-01	0.71157E-01	0.44060E 00	-0.55709E-02
	0.72573E-02	0.11466E-01	0.50353E 01	0.29324E 02	0.19666E 02	0.29553E 00	-0.70053E 00	0.11843E 00
	-0.14767E 01	-0.76088E-02	0.47154E-02	0.33786E-01	0.22746E-01	0.28900E 00	0.37674E-01	0.15006E 01
	0.13064E 00	0.43844E 00						
8	0.23442E-15	-0.42217E-15	-0.50690E-15	0.30237E-06	0.17261E-06	0.41502E-07	0.70229E-04	0.18629E 01
	-0.28196E-05	0.20913E-03	0.68725E-03	-0.73639E-04	0.76525E-03	-0.35043E 00	-0.21516E-07	-0.42914E-01
	-0.82285E-01	0.24556E 01	-0.19437E-01	0.15351E 00	0.14977E-07	0.20864E-01	-0.38664E-01	0.15611E-01
	-0.11672E-05	-0.99737E-02	0.12135E-02	-0.23431E-01	-0.23769E 00	0.10433E 00	-0.93918E-02	0.47329E 01
	0.34582E 00	-0.38451E 00	0.15075E-06	0.77507E-01	-0.43190E 01	0.31356E 00	0.95657E-03	-0.87751E-03
	0.18227E 00	0.29714E-02	0.15270E-01	0.40695E-06	0.47485E-02	-0.12896E-02	-0.10880E-01	-0.46731E-06
	-0.20725E-02	-0.57138E-02	0.26345E-02	0.13856E 01	-0.17198E-02	-0.86613E 00	0.37006E-01	0.32215E 00
	-0.26986E 01	-0.97414E 00	-0.27965E 00	-0.28800E-02	-0.35557E 01	0.63287E-01	-0.60483E 00	-0.67145E 00
	0.48583E 01	0.43776E 00	-0.11558E 01	0.42033E 00	0.14651E 01	0.15617E-01	-0.27211E 00	0.14014E-01
	-0.22263E 00	0.10027E 01	-0.51484E 00	-0.87328E 01	-0.77563E 00	-0.39999E-01	-0.71283E-01	-0.26367E-01
	-0.77517E-03	0.19408E-02	0.91540E-03	-0.15190E-02	-0.70508E-03	0.22092E 00	-0.48325E-01	-0.63483E 01
	-0.10438E 00	-0.20224E 00	-0.79911E 01	0.67404E 01	-0.10067E 02	-0.17623E 00	0.16221E 00	0.88470E-01
	-0.10343E 00	-0.21196E-02	0.18358E-03	0.16360E-02	-0.12778E-02	-0.93816E-03	0.18703E-02	0.40201E-01
	-0.78200E-03	-0.28161E-03						
9	-0.56469E-14	-0.75710E-14	0.97575E-14	0.16142E-08	0.79045E-07	0.80268E-07	0.10283E-03	-0.28196E-05
	0.17024E 01	-0.16249E-05	0.21976E-06	-0.59197E-03	0.10286E-04	-0.13781E-04	-0.48168E-05	-0.11984E-02
	-0.12846E-02	0.71004E-04	0.42167E-02	-0.62782E-02	0.15154E-04	0.12343E-02	-0.19437E-01	-0.24957E-01
	0.38519E-07	0.51884E-02	-0.22422E-03	0.50021E-04	-0.17456E 00	0.14614E 00	0.48145E 01	-0.24188E-02
	-0.22014E 00	-0.16921E 00	0.17546E-04	-0.43749E-02	-0.18147E-03	-0.41092E-02	-0.13107E-01	0.99269E-01
	-0.34334E-02	-0.27850E-01	-0.26325E-01	0.16701E-04	-0.65804E-01	0.48664E-01	0.22879E-02	0.12940E-04
	-0.46192E 01	-0.85644E-01	0.50142E-01	0.27854E-01	-0.13163E 00	-0.92086E-02	-0.64284E 00	0.41264E-02
	-0.39303E-03	0.10379E 00	0.75377E-02	0.32379E-03	0.15442E 00	-0.18809E 00	-0.31834E 00	-0.79965E-01
	0.83030E-01	-0.53042E 01	-0.31058E 01	-0.42619E 01	0.95253E-01	-0.10694E-01	0.84751E-02	-0.16196E-01
	-0.13598E-01	0.33634E 00	0.40588E 00	-0.11852E-02	0.13362E-01	0.25105E-01	0.35177E-01	-0.30120E-03
	0.48457E-03	0.91258E-02	-0.15437E-01	-0.22137E-02	0.13152E-01	0.28918E-03	0.84224E-01	0.56868E-01
	-0.66295E 01	0.14077E 01	0.26002E-01	-0.46626E-02	-0.40163E-02	0.59753E-02	-0.59522E-01	-0.22050E-01
	0.37127E-01	-0.26930E 00	0.11560E 01	-0.21589E 00	-0.20050E-01	-0.22101E-02	0.11574E-01	0.23096E-01
	0.13408E-02	-0.23856E-01						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (8HHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
10	0.74796E-15	-0.36242E-14	0.55283E-15	-0.16828E-06	0.23789E-08	0.22816E-06	-0.11250E-03	0.20913E-03
	-0.16249E-05	0.16776E 01	-0.49346E-05	-0.70547E-05	0.24795E-03	0.10270E-02	-0.11226E-05	0.11040E-02
	0.16622E-02	-0.78984E-02	0.74102E-01	0.83751E-02	0.34158E-05	-0.35888E-02	0.30544E 00	-0.49434E-02
	0.43733E-08	0.24741E 00	-0.32856E-03	-0.39942E-03	0.48287E 01	-0.57841E-01	0.17308E 00	0.25391E 00
	0.12314E 01	0.56483E 01	0.35727E-05	-0.78952E-02	0.26995E-02	-0.35576E-02	-0.14174E 00	0.87649E-02
	0.29186E-01	-0.16703E 00	0.40261E-01	0.25946E-05	0.10381E 00	0.46973E-01	-0.25295E-02	0.20128E-05
	0.49471E-01	-0.21080E 00	-0.54755E 00	-0.58035E-01	0.21521E-01	-0.78932E-02	0.91343E-01	-0.98352E-02
	-0.16475E 00	0.36915E 01	0.71667E-01	-0.46136E-02	0.12347E 01	-0.55131E 01	0.44717E 00	0.19303E 00
	0.53658E 00	-0.35751E 01	0.42809E 01	0.49230E 01	-0.40420E 00	0.55963E-01	-0.38525E-01	0.20979E-01
	-0.17567E 00	0.78402E 00	0.37729E 01	0.94119E-02	-0.74297E-02	0.26324E 00	0.15326E 00	-0.10891E-01
	-0.15496E-02	0.97631E-01	-0.21704E-01	-0.37024E-01	0.95730E-02	-0.39789E-01	-0.22976E 00	-0.22194E 00
	0.14386E 01	0.65487E 01	0.15222E 00	-0.14763E-01	0.33608E-01	-0.32102E-02	-0.25002E 00	-0.20409E-01
	0.40667E-01	-0.42348E 00	-0.64909E-01	-0.35367E 00	-0.18037E-01	0.61410E-02	-0.38542E-01	0.63272E-01
	-0.24393E-01	-0.42096E 00						
11	-0.22137E-14	-0.29299E-13	0.26073E-14	-0.25443E-07	0.26575E-06	0.10604E-07	-0.21780E-01	0.68725E-03
	0.21976E-06	-0.49346E-05	0.16934E 01	0.36615E-05	-0.24075E-04	0.33536E-02	-0.45760E-06	0.19212E 00
	0.27055E 00	-0.17772E-01	-0.65625E-01	0.51719E 00	-0.33582E-06	-0.68158E 00	0.14882E-01	-0.76760E-01
	0.11235E-07	-0.13156E-01	0.55547E-01	0.53495E-03	0.75939E-01	0.48696E 01	-0.15210E 00	-0.90206E-01
	-0.38251E 01	0.22646E 00	0.28466E-06	0.67331E 00	0.69654E-01	0.44945E 00	0.24941E-01	0.16204E-01
	0.69316E-01	0.23545E-01	0.77564E 00	0.22514E-04	0.10074E-01	-0.55646E-02	-0.48552E 00	-0.21324E-04
	-0.65196E-01	0.66680E-01	-0.36017E-01	0.19117E 00	-0.20211E-03	-0.74088E-01	-0.24139E-01	-0.28344E 00
	0.57292E-01	0.70027E-01	0.10097E 01	0.91046E-03	0.74340E 00	0.79043E-01	0.93491E 00	-0.53678E 01
	-0.58200E 00	-0.12296E 00	0.58069E 00	0.27550E-01	-0.43938E 00	-0.90711E-01	0.15037E 00	-0.13735E 00
	0.13815E 00	0.12481E 01	-0.42104E 00	-0.69018E-03	0.10825E 01	-0.10655E 00	0.17689E 00	0.82239E-02
	-0.11300E-02	-0.10453E-01	-0.14509E-01	0.46067E-02	0.10030E-01	0.18430E-03	-0.66970E 01	0.42861E-01
	-0.12580E 00	-0.20639E 00	0.26618E 00	0.10266E 01	0.83580E 00	0.23892E-01	-0.91563E-01	0.15253E 00
	-0.38156E 00	0.51600E-01	0.59009E-01	0.27894E-01	0.29698E-02	0.11572E 00	-0.85315E-02	-0.95140E 00
	0.37059E-01	-0.75233E-01						
12	0.36972E-13	0.42278E-13	-0.50951E-13	0.44600E-08	-0.52287E-08	0.64554E-06	0.61591E-03	-0.73639E-04
	-0.59197E-03	-0.70547E-05	0.36615E-05	0.40427E 01	0.28234E-05	-0.36922E-03	-0.45308E-04	-0.90046E-02
	-0.79387E-02	0.24620E-02	-0.42545E-03	-0.20964E-01	0.14307E-03	0.30458E-01	0.20949E-02	-0.23742E-01
	0.25169E-07	-0.33766E-02	-0.60759E-03	-0.50976E-05	0.28854E-01	-0.93165E-01	-0.12997E 01	-0.75030E-03
	0.13364E 00	0.24778E-01	0.16389E-03	-0.31877E-01	-0.54350E-02	-0.93437E-02	0.55013E-01	0.50307E 01
	-0.32106E-01	-0.75299E-01	-0.12434E 00	0.12668E-03	-0.25221E 00	0.13389E 00	0.21168E-01	0.92155E-04
	-0.35374E 01	-0.45184E-01	0.12583E-01	0.57773E-02	-0.16465E-01	-0.13721E-02	-0.64030E-01	0.85461E-02
	-0.21886E-02	0.52090E-02	-0.12875E-01	-0.89593E-04	-0.44306E-01	0.65819E-01	0.69544E-01	0.80362E-01
	-0.19571E-01	0.14531E 01	0.81984E 00	0.11397E 01	-0.19551E-01	0.42725E-02	-0.49018E-02	0.67326E-02
	0.24086E-02	-0.11878E 00	-0.12775E 00	-0.64623E-02	-0.35549E-01	-0.53091E-02	-0.15217E-01	-0.11281E-03
	-0.15115E-03	-0.21797E-02	0.50377E-02	0.40574E-03	-0.41664E-02	-0.17197E-04	0.52430E-01	-0.13017E-01
	0.17804E 01	-0.40001E 00	-0.39341E-02	-0.23657E-01	-0.31737E-01	0.15991E-01	-0.81803E-01	-0.45115E-01
	0.89618E-01	-0.19594E 01	0.10286E 02	-0.21438E 01	0.58596E 00	-0.76343E-03	-0.18750E-01	0.41940E-02
	-0.13362E-01	-0.13723E 00						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
13	-0.10474E-13	0.13090E-12	-0.34570E-13	0.20385E-07	0.81498E-08	-0.27160E-06	0.16025E-03	0.76525E-03
	0.10286E-04	0.24795E-03	-0.24075E-04	0.28234E-05	0.46129E 01	0.39189E-02	-0.32976E-04	-0.43047E-02
	-0.14043E-02	-0.27673E-01	-0.30541E 01	-0.34439E 00	-0.10432E-03	0.90494E-02	0.87727E 00	-0.20602E-01
	0.22642E-07	-0.28640E 00	-0.11513E-02	-0.34807E-03	0.52936E 00	-0.74337E-01	0.66409E-01	0.40111E-01
	0.73706E-01	-0.26693E 00	-0.12019E-03	-0.83767E-02	0.54063E-01	-0.36201E-02	0.12099E 00	0.94912E-01
	-0.32215E 00	0.52782E 01	0.46036E-01	-0.76748E-04	0.15982E 00	0.36907E-01	0.81537E-02	-0.64626E-04
	-0.19757E-01	0.74158E-02	0.26078E-01	-0.48090E-01	0.99686E-03	0.21673E-01	0.56911E-02	-0.40066E-02
	0.12656E-01	0.41887E-01	-0.17485E-01	0.17923E-02	0.12758E 00	-0.61955E 00	-0.29483E-01	0.99093E-01
	0.83163E-01	-0.46428E 00	0.44154E 00	0.51481E 00	-0.10236E 00	-0.83522E-03	0.57502E-01	-0.58501E-02
	0.11719E 00	-0.53742E 00	-0.23825E 01	0.10855E 00	0.91171E-02	-0.33595E 00	-0.19077E 00	0.63157E-02
	0.13156E-02	-0.19382E 00	0.49705E-01	0.72060E-01	-0.27450E-01	0.33451E-01	0.72030E-01	-0.40281E-01
	0.85063E-01	0.68128E 00	-0.28739E-01	-0.83707E-01	0.10832E 00	0.22581E-01	0.19016E 01	0.21044E 00
	-0.67356E 00	0.11503E 02	0.21563E 01	0.84217E 01	0.36558E 00	0.65753E-02	-0.73762E 00	-0.62741E 00
	0.26547E 00	0.46732E 01						
14	0.62296E-14	0.13547E-14	-0.14220E-13	0.52156E-06	0.68030E-06	-0.12472E-07	-0.81714E-03	-0.35043E 00
	-0.13781E-04	0.10270E-02	0.33536E-02	-0.36922E-03	0.39189E-02	0.92271E 01	0.47225E-06	0.83110E-01
	-0.41557E 00	0.12916E 02	-0.21584E 00	0.15461E 01	-0.35761E-06	-0.86219E 00	-0.13973E 00	0.41262E-01
	-0.28193E-05	-0.13660E-01	0.45448E-02	-0.20738E-01	0.28439E 00	-0.55170E-01	0.10166E-01	-0.53673E 01
	-0.53821E 00	0.60578E 00	0.83851E-06	0.13160E 01	-0.22779E 02	0.17068E 01	0.27693E-01	0.26483E-01
	0.84513E 01	0.21250E 00	0.94950E 00	0.23971E-04	0.37266E 00	-0.99579E-01	-0.65492E 00	-0.28736E-04
	-0.11146E 00	-0.23659E-01	-0.19235E 00	0.16893E 02	-0.10630E-01	-0.69489E 01	0.28608E 00	0.22282E 01
	-0.94907E 01	-0.11819E 01	0.13939E 00	0.47801E-02	0.65143E 01	-0.97545E-01	0.83969E 00	0.70176E 00
	-0.53359E 01	-0.49165E 00	0.12596E 01	-0.42260E 00	-0.11773E 01	0.26162E-01	-0.49060E 00	0.19972E-01
	-0.41312E 00	0.30659E 01	-0.15171E 01	-0.44416E 02	-0.40432E 01	-0.25848E 00	-0.46506E 00	-0.18145E 00
	-0.49971E-02	0.52610E-02	-0.15711E-02	-0.36274E-02	0.64303E-03	0.12209E 01	-0.31985E-01	0.71293E 01
	0.12087E 00	0.25357E 00	-0.40800E 02	0.34206E 02	-0.51004E 02	-0.62618E 00	0.27040E 00	0.51926E-01
	0.42122E-01	0.65834E-01	0.54697E-02	0.25818E-01	0.14094E-01	0.10395E 00	-0.84869E-01	0.29392E 01
	-0.55338E-01	-0.50005E 00						
15	-0.66890E-13	0.23224E-16	0.12882E-16	0.10677E-10	-0.49440E-11	-0.41325E-09	-0.30886E-06	-0.21516E-07
	-0.48168E-05	-0.11276E-05	-0.45760E-06	-0.45308E-04	0.32976E-04	0.47225E-06	0.70255E 05	0.12085E-04
	-0.23230E-07	0.46128E-06	-0.43921E-03	-0.32597E-04	0.10508E 06	0.20106E 00	0.25495E-03	0.90677E-05
	0.99272E-10	-0.83325E-04	-0.78939E-07	-0.93894E-07	0.10670E-04	-0.36128E-06	0.60931E-05	-0.85968E-07
	-0.34042E-04	-0.16373E-03	0.10748E 06	-0.30707E 00	0.11902E-05	0.18932E-06	0.14400E-04	-0.17582E-02
	-0.43787E-04	0.84985E-03	-0.32023E 01	0.10301E 06	0.16045E-02	-0.83730E-04	-0.27381E 01	0.62914E 05
	0.24974E-02	0.44259E-04	0.15754E-04	-0.65753E-05	0.23389E-04	0.36662E-05	0.10992E-03	-0.67916E-06
	0.31774E-05	-0.11809E-03	-0.51018E-05	0.67682E-06	0.23940E-05	-0.15911E-04	0.26651E-05	-0.20273E-05
	0.19784E-05	-0.25086E-04	0.92052E-05	0.79355E-05	-0.19603E-04	-0.24083E-05	0.17611E-04	-0.31163E-05
	0.37262E-04	-0.14949E-03	-0.74804E-03	0.27021E-05	0.27461E-05	-0.98356E-04	-0.54324E-04	0.19397E-05
	0.42178E-06	-0.54501E-04	0.14071E-04	-0.20360E-04	-0.72453E-05	0.10812E-04	0.26269E-06	0.14358E-06
	-0.48495E-05	0.28071E-05	-0.42653E-04	0.52312E-06	-0.68224E-06	-0.25398E-05	0.54518E-03	0.75818E-04
	-0.21873E-03	0.37647E-02	-0.38859E-02	0.30359E-02	-0.14829E-03	0.29900E-05	-0.19093E-03	-0.15932E-03
	0.72256E-04	-0.12701E-02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (OHHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
16	-0.12813E-11	-0.14473E-10	0.12310E-11	0.15958E-05	-0.88593E-06	0.11700E-04	-0.72048E-01	-0.42914E-01
	-0.11984E-02	0.11040E-02	0.19212E 00	-0.90046E-02	-0.43047E-02	0.83110E-01	-0.12085E-04	0.70599E 05
	0.22172E 01	0.15131E 01	-0.13720E 02	0.11215E 03	-0.10982E-01	0.10540E 06	-0.25852E 00	0.50936E 02
	0.68531E-05	0.13404E 00	-0.92893E 01	-0.13703E 00	0.11377E 00	0.18842E 01	-0.91342E-01	-0.69180E 00
	-0.94125E 02	0.55575E 01	-0.11726E 00	-0.10776E 06	-0.46171E 01	-0.42401E 01	0.64995E 01	-0.19278E-01
	0.86344E 01	0.15983E 00	-0.10327E 06	-0.30489E 01	0.51462E 02	-0.35690E 01	0.63065E 05	0.27447E 01
	0.14855E 01	0.22791E 02	-0.90681E 01	0.26125E 02	0.75086E 00	-0.82061E 01	0.20741E 01	-0.24666E 01
	0.77704E 01	0.57634E 01	-0.76699E 02	0.87100E-01	0.36401E 02	-0.37290E 00	-0.11602E 02	-0.70911E 01
	0.86915E-01	-0.67657E 00	-0.53855E 00	0.45937E 00	0.53001E 01	0.13445E 02	-0.21398E 02	0.19654E 02
	-0.18701E 02	-0.35680E 03	0.61206E 02	-0.46763E 01	-0.42061E 02	0.22844E 02	-0.47074E 02	-0.15922E 01
	-0.18416E 00	0.62035E 01	0.21378E 02	-0.39117E 01	-0.15694E 02	-0.16031E 02	-0.29366E 01	0.70858E 00
	-0.44595E-01	-0.52154E-01	-0.28361E 02	0.49377E 01	-0.35385E 01	0.13034E 02	-0.92792E 02	0.14657E 03
	-0.29757E 03	-0.10335E 01	-0.11883E 00	0.66768E 01	-0.50762E 01	0.72881E 02	-0.34626E 01	-0.69336E 03
	0.20414E 02	-0.99602E 02						
17	0.15783E-12	-0.54130E-12	0.79786E-12	-0.24726E-05	-0.11406E-06	-0.10933E-05	0.71047E 01	-0.92285E-01
	-0.12846E-02	0.16622E-02	0.27059E 00	-0.79387E-02	-0.14043E-02	-0.41557E 00	-0.23230E-07	0.22172E 01
	0.21246E 02	-0.35646E-01	-0.22496E 00	0.18485E 01	-0.28315E-06	0.28971E 01	-0.37411E-01	-0.14042E 01
	0.16624E-05	0.16911E-02	0.50426E-01	0.12024E-02	-0.14383E-03	0.17605E-01	0.13481E-04	0.56547E-02
	-0.10840E 01	0.10924E 00	-0.33486E-05	-0.30378E 01	0.41031E 01	0.38662E 02	-0.18430E 01	0.32657E-01
	0.34260E 00	0.31049E-01	-0.22174E 01	-0.57866E-04	-0.73190E 00	0.76649E 00	0.12091E 01	0.51807E-04
	0.12556E 01	-0.55927E 01	0.21500E 01	0.47639E 01	-0.26539E 00	-0.24555E 01	-0.23033E 01	-0.21072E 02
	-0.15683E 01	-0.81576E 00	0.13206E 02	0.10822E-02	-0.14691E-01	-0.84057E-02	-0.18605E 01	-0.13534E 00
	0.35871E-01	0.67355E-02	0.34932E 00	-0.30163E 00	-0.90767E-02	0.84908E 00	-0.11007E 01	0.10864E 01
	-0.10601E 01	-0.37918E 02	0.77642E 01	-0.46558E 01	0.76490E 02	-0.32717E 01	0.71077E 01	0.33907E 00
	-0.14242E 00	-0.67416E-01	-0.42186E 00	0.15788E-01	0.24149E 00	-0.17249E 00	-0.11160E-01	-0.51483E-02
	0.18457E-03	-0.42984E-03	0.17287E 02	0.85596E 02	0.51678E 02	0.90273E 00	-0.21841E 01	0.40701E 00
	-0.44999E 01	-0.10206E-01	-0.84128E-03	0.60798E-01	0.80013E-02	0.22422E 01	-0.16473E-01	0.39482E 01
	0.15075E 01	0.16477E 01						
18	0.31251E-13	-0.31334E-12	0.29359E-13	0.12404E-05	0.12103E-05	0.31788E-06	0.23574E 00	0.24556E 01
	0.71004E-04	-0.78984E-02	-0.17772E-01	0.24620E-02	-0.27673E-01	0.12916E 02	0.46128E-06	0.15131E 01
	-0.35646E-01	0.22807E 02	-0.29309E 00	0.22059E 01	0.28833E-06	0.84514E 00	-0.25634E 00	-0.71811E-02
	-0.59102E-05	-0.32272E-01	0.14404E-01	-0.67603E-01	0.37848E-02	-0.71757E-02	0.73421E-03	-0.30214E 00
	-0.11926E 00	0.22116E 00	0.24655E-06	-0.13044E 00	-0.40069E 02	0.42762E 01	-0.72214E-01	0.47023E-01
	0.12659E 02	0.27914E 00	-0.68409E 09	-0.24527E-04	0.46763E 00	-0.74838E-01	0.28800E 00	0.12775E-04
	-0.99158E-01	-0.20618E 00	-0.20574E 00	0.27034E 02	-0.22333F-01	-0.11614E 02	0.40758E 00	0.30660E 01
	-0.18247E 02	-0.33468E 01	0.91148E-01	0.24212E-02	0.37690E 01	-0.35216E-02	0.10622E 00	-0.54788E-01
	-0.48754E-01	0.60932E-02	-0.13511E-01	0.89123E-02	0.62273E 00	0.85988E-01	-0.11803E 01	0.79018E-01
	-0.98783E 00	0.49822E 01	-0.28069E 01	-0.79045E 02	-0.46057E 01	-0.55978E 00	-0.53526E 00	-0.29572E 00
	-0.11050E-01	0.70859E-02	-0.26654E-01	-0.54580E-02	0.16175E-01	0.21354E 01	0.64206E-02	0.30376E 00
	0.46800E-02	0.87917E-02	-0.71378E 02	0.63610E 02	-0.88622E 02	-0.11431E 01	0.56171E 00	0.92440E-01
	-0.26946E 00	0.13164E-01	0.29065E-03	-0.83572E-01	-0.22676E-01	0.70143E 00	-0.13094E 00	0.47421E 01
	-0.80281E-02	-0.23654E 00						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
19	-0.12203E-10	0.14321E-09	-0.34426E-10	0.46267E-04	0.18269E-04	0.16259E-04	-0.93925E-01	-0.19437E-01
	0.42167E-02	0.74102E-01	-0.65625E-01	-0.42545E-03	-0.30541E 01	-0.21584E 00	-0.43921E-03	-0.13720E 02
	-0.22496E 00	-0.29308E 00	0.10271E 03	0.18559E-01	-0.63858E-03	-0.23827E 02	-0.15284E 02	-0.33636E 00
	-0.10509E-05	0.29083E 01	0.26598E 00	0.89143E-02	-0.70515E 00	-0.11252E 00	-0.34760E-01	0.56696E-01
	0.37681E 01	0.12137E 02	-0.58165E-03	0.22469E 02	0.48649E 00	-0.93306E 00	-0.16269E 02	0.46105E 00
	-0.86847E 00	-0.31868E 01	0.26879E 02	0.36094E-04	0.15011E 02	0.13246E 02	-0.13115E 02	-0.92379E-03
	-0.90691E 00	0.22978E 01	0.61022E 01	0.10261E 01	0.12542E 00	0.96933E 00	0.23065E 00	-0.76744E 00
	-0.91436E 00	0.22377E 02	-0.63380E 01	0.64419E 00	-0.39619E 02	-0.64834E 01	-0.55019E 01	-0.29828E-01
	-0.40641E 00	0.27849E 01	-0.18307E 01	-0.29415E 01	0.56764E 01	-0.16662E 00	-0.10530E 01	-0.27441E 00
	-0.28094E 01	0.20785E 02	0.56798E 02	0.10083E 01	-0.42671E 00	0.70509E 01	0.50744E 01	0.22759E 00
	0.55385E-01	0.32780E 01	-0.15567E 01	-0.64607E 00	0.85124E 00	-0.19192E 00	0.19468E 00	-0.60809E-01
	-0.13528E-02	-0.13673E 00	0.14059E 01	-0.20836E 01	0.45221E 00	0.15978E 00	0.27289E 02	-0.91176E 01
	-0.59613E 01	-0.15850E 02	-0.12273E 01	0.58550E 02	-0.23166E 02	0.21224E 02	-0.13807E 03	0.58871E 02
	-0.49555E 02	-0.44068E 01						
20	0.50240E-11	0.17505E-09	-0.45471E-10	-0.13552E-04	0.20074E-04	-0.85881E-04	0.78635E 00	0.15351E 00
	-0.62782E-02	0.83751E-02	0.51719E 00	-0.20964E-01	-0.34439E 00	0.15481E 01	-0.32597E-04	0.11215E 03
	0.18485E 01	0.22059E 01	0.18559E-01	0.11344E 03	-0.69725E-04	0.20156E 03	-0.22671E 01	0.13414E 02
	-0.57094E-05	0.92208E 00	-0.16717E 01	-0.34645E-01	-0.67940E-01	0.14274E 01	-0.90432E-01	-0.44953E 00
	-0.27999E 02	0.47815E 01	-0.25025E-03	-0.18803E 03	-0.44553E 01	0.41195E 01	0.14746E 02	-0.76447E 00
	0.31174E 01	-0.81787E 00	-0.17067E 03	-0.52930E-02	0.19997E 02	-0.13549E 02	0.10841E 03	0.47002E-02
	-0.82878E 01	-0.76838E 01	0.29715E 01	0.66812E 01	-0.14022E 01	-0.20417E 01	-0.23357E 01	0.68679E 00
	-0.10531E 01	0.78146E 01	0.28035E 02	0.61930E-01	0.54114E 01	-0.17173E 01	0.21511E 02	-0.21927E 01
	-0.31184E 00	0.41134E 00	0.36159E-01	-0.10034E 01	0.21190E 01	0.25379E 01	-0.43671E 01	0.39957E 01
	-0.40225E 01	-0.66199E 02	0.18621E 02	-0.96983E 01	0.72983E 00	0.46185E 01	-0.72831E 01	-0.18762E 00
	-0.69839E 00	0.12354E 01	0.36839E 01	-0.82996E 00	-0.26325E 01	-0.24532E 01	-0.20125E 01	0.53173E 00
	-0.13712E-01	-0.63599E-01	-0.17462E 02	0.16778E 02	-0.31932E 01	-0.75520E 01	-0.53796E 01	0.52678E 02
	-0.22996E 02	-0.34241E 01	-0.27268E 00	0.21825E 02	0.11584E 02	-0.14975E 03	-0.21238E 02	-0.52997E 02
	-0.26278E 02	-0.11498E 03						
21	-0.10004E-12	-0.11399E-15	0.59362E-16	-0.24256E-10	-0.25155E-10	-0.58319E-09	-0.30662E-06	0.14977E-07
	0.15154E-04	0.34158E-05	-0.33582E-06	0.14307E-03	-0.10432E-03	-0.35761E-06	0.10508E 06	-0.10982E-01
	-0.28315E-06	0.28833E-06	-0.63858E-C3	-0.69725E-04	0.15716E 06	0.28430E 00	0.35953E-03	0.33532E-05
	0.15038E-09	-0.11901E-03	0.13185E-05	-0.11017E-06	0.12615E-04	-0.40668E-06	0.29711E-05	-0.66288E-07
	-0.31144E-04	-0.22877E-03	0.16076E 06	-0.44749E 00	0.26845E-05	0.14850E-05	0.30195E-04	-0.23684E-02
	-0.57929E-04	0.10903E-02	-0.47734E 01	0.15407E 06	0.23579E-02	-0.12741E-03	-0.41050E 01	0.94098E 05
	0.34981E-02	0.56872E-04	0.17140E-04	-0.14642E-04	0.33308E-04	0.57304E-05	0.15345E-03	-0.16539E-06
	0.44628E-05	-0.18898E-03	-0.17139E-04	0.39469E-06	0.26738E-04	-0.12603E-04	0.40604E-05	-0.35262E-05
	-.27219E-05	-0.28770E-04	0.15633E-04	0.15531E-04	-0.32438E-04	-0.56010E-05	0.28964E-04	-0.76136E-05
	0.57011E-04	-0.15890E-03	-0.10674E-02	0.43192E-05	0.11064E-04	-0.14502E-03	-0.70432E-04	0.27485E-05
	0.64949E-06	-0.78557E-04	0.16828E-04	0.29192E-04	-0.78415E-05	0.17772E-04	0.12379E-06	0.33848E-07
	-0.79355E-07	-0.99733E-06	-0.53875E-04	-0.13637E-07	0.31437E-06	-0.61985E-05	0.73753E-03	0.81795E-04
	-0.24520E-03	0.51482E-02	-0.53325E-02	0.40842E-02	-0.19187E-03	-0.37055E-05	-0.12098E-03	-0.14985E-03
	0.14165E-03	-0.17415E-02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
22	-0.97847E-12	0.27182E-10	-0.10871E-10	-0.33102E-05	0.42756E-05	-0.15218E-05	-0.13912E 00	0.20864E-01
	0.12343E-02	-0.35888E-02	-0.68158E 00	0.30458E-01	0.90494E-02	-0.86219E 00	0.20106E 00	0.10540E 06
	0.28571E 01	0.84514E 00	-0.23827E 02	0.20156E 03	0.28430E 00	0.15736E 06	-0.54935E 00	0.78549E 02
	0.11130E-04	0.40288E 00	-0.14477E 02	-0.21194E 00	0.60880E-01	0.54135E-01	-0.66843E-01	-0.30571E 00
	-0.14535E 03	0.89994E 01	0.13250E 00	-0.16088E 06	-0.47544E 01	-0.70992E 01	0.14690E 02	-0.27821E 00
	0.12436E 02	0.64518E-01	-0.15417E 06	-0.42571E 01	0.82263E 02	-0.98387E 01	0.94154E 05	0.42777E 01
	-0.53375E 00	0.31487E 02	-0.12744E 02	0.37915E 02	0.70998E 00	-0.11581E 02	0.24098E 01	-0.25410E 01
	0.12901E 02	0.10419E 02	0.12270E 03	0.12700E 00	0.55751E 02	0.22320E 00	0.23510E 02	-0.78119E 01
	0.12194E 01	-0.79786E 00	-0.14265E 01	0.63863E 00	0.88449E 01	0.20865E 02	-0.33206E 02	0.30601E 02
	-0.29023E 02	-0.55316E 03	0.95319E 02	-0.25287E 01	-0.65697E 02	0.35508E 02	-0.72971E 02	-0.24303E 01
	-0.48348E 00	0.95316E 01	0.33107E 02	-0.60712E 01	-0.24269E 02	-0.24866E 02	-0.57858E 00	0.12107E 00
	-0.75034E-02	-0.12817E-01	-0.41683E 02	0.28129E 01	-0.10050E 01	0.17517E 02	-0.14097E 03	0.23482E 03
	-0.45029E 03	-0.20461E 01	-0.11831E 00	0.14362E 02	-0.34518E 01	0.56749E 02	-0.65991E 01	-0.10500E 04
	0.19579E 02	-0.18257E 03						
23	-0.85811E-11	-0.49367E-10	0.40425E-10	-0.13909E-05	0.12766E-05	0.10360E-04	-0.21294E-01	-0.38664E-01
	-0.19437E-01	0.30564E 00	0.14882E-01	0.20949E-02	0.87727E 00	-0.13973E 00	0.25495E-03	-0.25852E 00
	-0.37411E-01	-0.25634E 00	-0.15284E 02	-0.22671E 01	0.35953E-03	-0.54935E 00	0.75951E 02	-0.89572E-01
	0.59585E-08	0.25867E 02	0.29243E-01	0.66470E-02	0.17979E 01	0.29663E-03	-0.33245E-02	0.12814E-01
	-0.38304E 01	-0.26496E 02	0.37935E-03	0.63193E 00	0.68523E 00	0.56447E-01	0.78959E 01	-0.11099E 00
	-0.60069E 00	-0.18328E 00	-0.26109E 01	0.36847E-03	-0.86447E 01	-0.61705E 01	-0.27717E 00	0.20334E-03
	0.17964E 01	0.48323E 01	0.10438E 02	-0.40777E 01	0.79748E-01	0.84817E 00	0.67040E 00	0.56499E 00
	-0.22803E 01	0.32743E 02	0.40932E 01	-0.41539E 00	0.45517E 02	-0.57886E 01	0.48678E 01	0.26490E-01
	0.17238E 00	-0.17444E 00	0.34653E-01	0.59725E 00	-0.32724E 01	-0.98988E-01	0.97253E-01	0.27242E-01
	0.24737E 00	-0.20878E 01	-0.54076E 01	0.96594E 00	-0.51033E-01	-0.87152E 00	-0.65845E 00	-0.38608E-01
	-0.11631E-01	-0.13341E 00	0.19291E 00	-0.21516E 00	-0.98902E-01	0.36536E 00	-0.88972E-01	-0.11360E-01
	0.35165E 00	0.12965E 01	-0.32545E 01	-0.97507E 00	0.99092E 00	0.43396E 00	-0.50352E 01	0.12796E 02
	0.24082E 01	0.41773E 01	0.38860E 00	-0.12553E 02	0.40253E 01	-0.28178E 02	-0.22740E 03	-0.40322E 02
	0.14456E 02	0.28947E 03						
24	0.40072E-10	0.15586E-10	-0.43961E-10	0.67294E-06	-0.95227E-05	-0.35954E-03	-0.54441E 00	0.15611E-01
	-0.24957E-01	-0.49434E-02	-0.76760E-01	-0.23742E-01	-0.20602E-01	0.41262E-01	0.70677E-05	0.50936E 02
	-0.14042E 01	-0.71811E-02	-0.33636E 00	0.13414E 02	0.33532E-05	0.78549E 02	-0.89572E-01	0.79473E 02
	-0.10607E-03	-0.89425E-01	0.27623E 01	-0.20061E-01	-0.36521E-01	-0.44367E 00	-0.33138E-01	0.56749E-01
	-0.48730E 02	0.37877E 01	-0.78591E-04	-0.83896E 02	-0.72283E 00	-0.67143E 01	0.80008E 01	0.15608E 01
	0.43739E 00	-0.28061E 00	-0.75424E 02	-0.23185E-02	0.86652E 01	-0.66678E 01	0.47803E 02	0.20833E-02
	0.53713E 01	0.11685E 02	-0.50345E 01	0.34084E 01	-0.75842E 00	-0.16540E 01	0.34417E 00	-0.76648E 01
	-0.44210E 00	0.57913E 01	-0.28543E 02	-0.26919E-01	-0.32002E 00	-0.22139E 01	-0.97801E 00	0.21124E 00
	0.56873E 00	0.64330E 00	0.42627E 01	-0.57499E 01	0.45503E 00	0.25395E 00	-0.35498E 00	0.27959E 00
	-0.41850E 00	-0.38416E 01	0.25544E 01	0.23782E 00	-0.69338E 01	0.10487E 01	-0.16761E 01	-0.49636E-01
	-0.75528E-01	-0.21988E-01	0.57300E 00	0.68914E-01	-0.41480E 00	-0.46879E 00	0.20503E 00	-0.21222E-01
	0.81454E-01	-0.36642E-01	-0.10621E 02	-0.66138E 01	-0.48319E 01	-0.14179E 02	0.97587E 01	0.12071E 02
	-0.20825E 02	-0.29776E 01	-0.16011E 00	0.25843E 02	0.11669E 02	0.23073E 03	-0.29218E 02	-0.11954E 03
	0.18963E 03	-0.83381E 02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
25	-0.47567E-16	0.12890E-16	0.12119E-15	-0.59264E-11	0.14844E-10	0.46424E-09	0.60363E-06	-0.11672E-05
	0.30519E-07	0.43733E-08	0.11235E-07	0.25145E-07	0.22642E-07	-0.28193E-05	0.99272E-10	0.68531E-05
	0.16624E-05	-0.59102E-05	-0.10509E-05	-0.57094E-05	0.15038E-09	0.11130E-04	0.59585E-08	-0.10607E-03
	0.15087E-09	0.24518E-06	-0.48914E-05	0.53891E-07	0.84880E-07	0.22160E-06	0.71979E-07	-0.15154E-05
	0.51970E-04	-0.34022E-05	0.14765E-09	-0.52663E-05	0.11211E-04	0.72112E-05	-0.85194E-05	-0.18008E-05
	-0.33350E-05	0.31666E-06	-0.10295E-04	-0.40939E-10	-0.95533E-05	0.75658E-05	0.44060E-05	0.28704E-09
	-0.62779E-05	-0.15269E-04	0.69896E-05	-0.98777E-05	0.95125E-06	0.48277E-05	0.99822E-08	0.11781E-04
	0.62347E-05	-0.11224E-04	0.47304E-04	0.17550E-07	0.82876E-05	0.55174E-05	0.84120E-05	0.35578E-06
	-0.22822E-05	-0.13999E-05	-0.61487E-05	0.90905E-05	-0.20352E-05	-0.57560E-06	0.90340E-06	-0.46431E-06
	0.10260E-05	0.64064E-05	-0.41321E-05	0.20116E-04	0.10464E-04	-0.13509E-05	0.24307E-05	0.16522E-06
	0.25964E-08	0.42635E-06	-0.82641E-06	-0.47846E-06	0.59652E-06	0.16237E-05	0.98676E-07	0.20139E-05
	-0.96065E-07	0.11487E-06	0.10676E-05	-0.84623E-05	0.29046E-04	0.16738E-04	-0.28659E-04	0.71009E-05
	0.20987E-04	0.50172E-05	0.18730E-06	-0.43420E-04	-0.15850E-04	-0.35798E-03	0.42959E-04	0.13959E-03
	-0.23877E-03	0.11799E-03						
26	-0.10740E-10	-0.14471E-10	0.30599E-10	0.13565E-05	0.25057E-06	-0.71883E-06	-0.19046E-04	-0.99737E-02
	0.51884E-02	0.24741E 00	-0.13156E-01	-0.33766E-02	-0.28640E 00	-0.13680E-01	-0.83323E-04	0.13404E 00
	0.16911E-02	-0.32272E-01	0.29083E 01	0.92708E 00	-0.11901E-03	0.40288E 00	0.25867E 02	-0.89425E-01
	0.24518E-06	0.11221E 02	0.58431E-02	0.49481E-02	0.79409E 00	-0.40297E-01	0.39337E-01	0.15364E-01
	-0.39032E 00	-0.54783E 01	-0.11393E-03	-0.23242E 00	0.13430E 00	0.88694E-01	0.13262E 01	0.40537E-01
	-0.22736E 00	-0.53495E 00	-0.87035E 00	-0.12151E-03	-0.18123E 01	-0.15544E 01	0.13559E 00	-0.62803E-04
	0.87852E 00	0.18445E 01	0.37205E 01	-0.79544E 00	0.85712E-01	0.44308E-01	0.47699E 00	0.79816E 00
	-0.99215E 00	0.17465E 02	0.41423E 01	-0.75640E-01	0.18671E 02	-0.41906E 01	0.43708E 01	0.47133E-01
	-0.27716E-01	-0.14149E 00	-0.35334E 00	0.64756E 00	0.73490E 00	-0.12504E 00	-0.13733E 00	0.73167E-01
	-0.89903E-01	-0.16640E 01	-0.21917E 01	0.13639E 00	0.35843E-01	-0.24905E 00	-0.42589E 00	0.16235E-01
	-0.21885E-01	-0.27918E 00	0.80482E-01	0.12672E 00	-0.44407E-01	0.24003E 00	0.14063E-01	-0.53018E-02
	0.18529E 00	0.92372E 00	-0.50870E 01	-0.96251E-01	0.19815E 00	0.55429E 00	0.92004E 01	0.11979E 02
	0.42861E-01	-0.19979E 01	-0.65553E-01	0.10600E 02	-0.43712E 01	-0.16030E 02	-0.11197E 03	-0.16535E 02
	0.99253E 01	0.81242E 02						
27	-0.19304E-14	-0.64519E-11	-0.93596E-11	0.68623E-06	-0.62257E-06	-0.99327E-05	0.91912E-02	0.12135E-02
	-0.22422E-03	-0.32856E-03	0.55547E-01	-0.60759E-03	-0.11513E-02	0.45448E-02	-0.78939E-07	-0.92873E 01
	0.50426E-01	0.14484E-01	0.26598E 00	-0.16717E 01	0.13185E-05	-0.14477E 02	0.29243E-01	0.27623E 01
	-0.48914E-05	0.58431E-02	0.29259E 00	-0.11271E-02	0.19212E-02	0.16221E 00	-0.47123E-02	-0.24457E-02
	0.41671E 00	-0.77152E-01	0.15582E-04	0.14417E 02	-0.96533E-02	-0.46505E-03	-0.99276E-01	-0.83034E-03
	-0.53366E-02	-0.10922E-01	0.13778E 02	0.40727E-03	-0.71158E-01	-0.12351E-02	-0.84275E 01	-0.36986E-03
	-0.80986E-03	0.38771E 00	-0.22004E 00	0.15187E 00	-0.16702E-01	-0.90336E-01	-0.84509E-01	-0.60485E 00
	-0.10132E 00	0.98846E 00	-0.21755E 01	0.19662E-02	-0.82761E 00	-0.49650E 00	-0.88485E 00	-0.18773E 00
	-0.33761E-02	0.81708E-01	0.24429E 00	-0.40949E 00	0.12731E 00	0.14964E-01	0.33498E-02	-0.96509E-02
	-0.17076E-01	-0.67040E-01	0.25959E 00	-0.33667E-01	0.67221E-01	0.14132E-01	0.20698E-01	-0.17322E-02
	0.12850E-01	-0.66110E-01	0.35153E-02	0.65799E-01	-0.29838E-02	-0.54761E-01	-0.21741E 00	-0.18346E-03
	-0.39026E-02	-0.88715E-02	0.42353E 01	0.17072E 00	0.42934E-01	-0.26843E-01	0.29698E 01	-0.30586E 01
	-0.56266E 00	-0.29060E 00	-0.27383E-04	0.24509E 01	0.30925E 00	0.15679E 02	-0.20863E 01	-0.12760E 01
	0.50845E 01	-0.47038E 01						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
28	-0.35326E-13	-0.15852E-12	0.16093E-12	-0.11911E-07	-0.10815E-07	0.80797E-07	-0.41670E-03	-0.23431E-01
	0.30021E-04	-0.39942E-03	0.53495E-03	-0.50976E-05	-0.34807E-03	-0.20738E-01	-0.93894E-07	-0.13703E 00
	0.12024E-02	-0.67603E-01	0.89143E-02	-0.34645E-01	-0.11017E-06	-0.21194E 00	0.66470E-02	-0.20061E-01
	0.53891E-07	0.49481E-02	-0.11271E-02	0.40573E-03	0.10025E-02	0.42269E-03	0.14404E-03	-0.47270E-01
	0.20123E-02	0.46963E-02	0.96224E-07	0.21012E 00	0.11948E 00	-0.10187E-01	-0.58247E-02	0.48295E-04
	-0.25905E-01	-0.64500E-03	0.20029E 00	0.58584E-05	-0.69935E-02	0.54110E-02	-0.12336E 00	-0.54479E-05
	0.21869E-02	0.19549E-02	0.25012E-02	-0.45172E-01	0.34154E-03	0.24214E-01	0.91587E-04	-0.47271E-02
	0.65238E-01	0.14501E-01	0.11111E-01	0.23614E-04	0.69361E-01	0.31713E-02	0.91007E-02	0.54835E-02
	-0.49421E-01	-0.40446E-02	0.86948E-02	-0.28475E-02	-0.18201E-01	-0.17476E-02	0.68254E-02	-0.20851E-02
	0.58558E-02	0.11321E-01	0.51201E-02	0.23649E 00	0.21086E-01	-0.12853E-03	0.56606E-02	0.96728E-03
	0.16237E-03	0.36905E-03	-0.14281E-02	-0.15221E-03	0.96806E-03	0.63840E-02	-0.14476E-02	0.63723E-01
	0.45472E-03	0.35566E-03	-0.85C88E-01	-0.18752E 00	0.27106E 00	0.86590E-02	0.78409E-02	-0.18086E-01
	0.74161E-01	-0.24528E-03	-0.22284E-04	-0.60492E-02	-0.13216E-01	-0.51142E-01	-0.45188E-01	-0.21382E-01
	-0.74398E-02	0.59367E-01						
29	0.36734E-12	-0.10460E-11	-0.12243E-11	-0.50546E-06	0.14710E-06	0.12773E-05	-0.68593E-02	-0.23769E 00
	-0.17456E 00	0.48287E 01	0.75939E-01	0.28854E-01	0.52936E 00	0.28439E C0	0.10670E-04	0.11377E 00
	-0.14383E-03	0.37848E-02	-0.70515E 00	-0.87940E-01	0.12615E-04	0.60880E-01	0.17979E 01	-0.36521E-01
	0.84880E-07	0.79409E 00	0.19212E-02	0.10025E-02	0.14040E 02	0.13610E-01	-0.24104E-02	0.10115E-01
	0.32569E 01	-0.15730E 02	0.11460E-04	-0.10328E 00	-0.38053E-01	-0.14414E-01	-0.21645E 00	0.50942E-01
	0.24038E 00	0.11279E 00	-0.95567E-02	0.10294E-04	0.17743E 00	0.36623E-01	0.39357E-01	0.87958E-05
	0.56245E 00	-0.57002E 00	-0.14880E 01	-0.E4748E-02	0.72174E-01	-0.59132E-01	0.32259E 00	-0.57584E-01
	-0.42017E 00	0.10941E 02	0.75471E-01	-0.20892E-01	0.41722E 01	-0.16003E 02	0.12878E 01	0.43641E 00
	0.79134E 00	-0.98563E 01	0.12928E 02	0.14572E 02	-0.15667E 01	0.15888E 00	-0.60795E-01	0.47408E-01
	-0.44462E 00	0.22065E 01	0.10288E 02	-0.24114E-01	-0.41410E-01	0.67348E 00	0.40698E 00	-0.33152E-01
	-0.29857E-02	0.24599E 00	-0.51022E-01	-0.98101E-01	0.21165E-01	-0.10784E 00	-0.95738E 00	0.31789E 00
	0.43532E 01	0.18803E 02	0.68084E 00	-0.22602E-01	0.23323E-01	-0.44127E-01	-0.96175E 00	-0.52303E 00
	-0.12878E-01	0.21513E 00	0.14466E-01	-0.79648E 00	0.36131E 00	0.35954E 00	-0.65656E 00	0.27897E 00
	-0.60138E 00	0.34638E 01						
30	-0.44007E-12	-0.54394E-12	-0.32821E-12	0.59820E-07	0.91288E-06	0.14767E-05	-0.31666E 00	0.10433E 00
	0.14614E 00	-0.57841E-01	0.48696E 01	-0.93165E-01	-0.74337E-01	-0.55170E-01	-0.36128E-06	0.18842E 01
	0.17605E-01	-0.71757E-02	-0.11252E 00	0.14274E 01	-0.40668E-06	0.54135E-01	0.29663E-03	-0.44367E 00
	0.22160E-06	-0.40297E-01	0.16221E 00	0.42269E-03	0.13610E-01	0.14057E 02	-0.26614E-02	0.12239E-01
	-0.10634E 02	0.40051E 00	-0.60004E-06	-0.86068E-01	-0.18187E-01	-0.55725E-01	0.10303E 00	-0.63647E-01
	0.13935E 00	0.39564E-03	0.24359E 00	0.69917E-05	0.22435E-01	-0.29649E-01	-0.18285E 00	-0.77992E-05
	-0.53603E 00	0.34083E 00	-0.14567E 00	0.31867E 00	0.16290E-02	-0.11410E 00	-0.41438E-01	-0.10012E-01
	0.14438E 00	0.14907E 00	0.25188E 01	0.31096E-02	0.17979E 01	0.37225E 00	0.27144E 01	-0.15516E 02
	-0.14053E 01	-0.68200E 00	C.11298E 01	-0.44031E 00	-0.11396E 01	-0.30332E 00	0.47387E 00	-0.43411E 00
	0.43898E 00	0.52293E 01	-0.15970E 01	0.33012E-02	0.40213E 00	-0.20461E 00	0.28506E 00	0.13077E-01
	0.22149E-02	-0.35915E-01	-0.39501E-01	0.19565E-01	0.29555E-01	0.18703E-01	-0.19286E 02	-0.24113E 00
	-0.10296E 01	-0.71339E 00	-0.79460E-02	0.25080E-01	0.15925E-01	0.11922E 00	-0.44775E-01	0.31999E 00
	-0.10696E 01	-0.13194E-01	0.63247E-03	0.62238E-01	-0.17029E 00	-0.30356E 00	-0.43122E-01	-0.18450E 01
	-0.71750E 00	-0.55924E 00						

OR

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
31	-0.19082E-11	-0.20498E-11	0.24483E-11	-0.19309E-06	0.25068E-06	-0.98772E-06	0.10417E-01	-0.93918E-02
	0.48145E 01	0.17308E 00	-0.15210E 00	-0.12997E 01	0.66409E-01	0.10166E-01	0.60931E-05	-0.91342E-01
	0.13481E-04	0.73421E-03	-0.34760E-01	-0.90432E-01	0.29711E-05	-0.66843E-01	-0.33245E-02	-0.33138E-01
	0.71979E-07	0.39337E-01	-0.47123E-02	0.14404E-03	-0.24104E-02	-0.26614E-02	0.14070E 02	0.36554E-03
	-0.22182E 00	0.70466E-01	0.31941E-05	0.52896E-01	-0.86919E-03	-0.59477E-02	-0.63913E-01	-0.10196E 01
	0.90528E-03	0.11579E-02	0.13482E-01	0.11963E-04	-0.93842E-01	0.91501E-01	-0.26549E-01	0.80101E-05
	-0.10181E 02	-0.22049E 00	0.66549E-01	0.61340E-01	-0.30649E 00	-0.23182E-01	-0.14680E 01	-0.66944E-02
	-0.20190E-01	0.61731E 00	-0.79764E-01	0.24031E-03	0.53422E 00	-0.11321E 01	-0.92704E 00	0.25774E 00
	0.32499E 00	-0.15850E 02	-0.86293E 01	-0.11954E 02	0.26071E 00	-0.19589E-01	0.11750E-01	-0.37704E-01
	-0.68191E-01	0.99578E 00	0.16508E 01	-0.61286E-02	0.48083E-01	0.10490E 00	0.12354E 00	-0.17535E-02
	0.25699E-02	0.39304E-01	-0.58775E-01	-0.89841E-02	0.44257E-01	0.21642E-02	0.80165E 00	0.17517E 00
	-0.19158E 02	0.48147E 01	-0.25500E 00	0.96492E-04	0.32680E-02	-0.38706E 00	-0.14010E 00	0.77955E-02
	0.79214E-01	0.52905E-01	-0.22675E-02	-0.61197E 00	-0.22835E 01	0.37730E 00	0.52465E-01	0.86553E-01
	-0.32844E 00	0.62825E 00						
32	-0.24920E-14	-0.22808E-12	0.21926E-12	0.44421E-06	0.46002E-07	-0.54751E-07	0.76556E-02	0.47329E 01
	-0.24188E-02	0.25391E 00	-0.90206E-01	-0.75030E-03	0.40111E-01	-0.53673E 01	-0.85968E-07	-0.69180E 00
	0.56547E-02	-0.30214E 00	0.56696E-01	-0.44953E 00	-0.66288E-07	-0.30571E 00	0.12814E-01	0.56749E-01
	-0.15154E-05	0.15364E-01	-0.24457E-02	-0.47270E-01	0.10115E-01	0.12239E-01	0.36554E-03	0.14257E 02
	0.14546E 01	-0.38191E 00	0.33433E-06	0.32995E 00	0.56235E 00	-0.62212E-01	-0.38480E-01	-0.84285E-02
	-0.36869E 01	-0.77200E-01	0.32643E 00	0.11078E-04	-0.15516E 00	0.59044E-01	-0.16250E 00	-0.71867E-05
	0.78884E-01	-0.31260E-01	0.17939E-01	-0.48407E 01	0.39096E-02	0.12636E 01	-0.32770E-01	-0.30851E 00
	-0.19893E 01	-0.12744E 01	-0.80492E 00	-0.10094E-01	-0.11685E 02	-0.63131E 00	-0.18812E 01	-0.16698E 01
	0.14619E 02	0.78008E 00	-0.28228E 01	0.19886E 01	0.41186E 01	0.38341E-01	-0.43917E 00	0.33823E-01
	-0.37574E 00	0.10040E 01	0.63940E-01	0.33025E 00	0.85993E-01	0.68028E-01	0.75184E-01	0.22484E-01
	0.45253E-03	0.17670E-01	-0.75356E-03	-0.81320E-02	-0.35507E-03	-0.41740E-01	0.22088E 00	-0.19067E 02
	-0.80419E-01	0.38701E 00	-0.12367E 00	-0.20669E 00	0.30239E 00	-0.13409E 00	0.25205E 00	0.14330E 00
	-0.13406E 00	-0.18386E-02	-0.53573E-04	-0.29713E-02	-0.13129E-01	0.73986E-01	0.49378E-01	-0.14262E 01
	0.16296E 00	0.22416E 00						
33	-0.47562E-10	-0.74889E-10	-0.12377E-10	0.66754E-05	0.90260E-05	0.24952E-03	-0.74528E-01	0.34582E 00
	-0.22014E 00	0.12314E 01	-0.38251E 01	0.13364E 00	0.73706E-01	-0.53821E 00	-0.34042E-04	-0.94125E 02
	-0.10840E 01	-0.11926E 00	0.37681E 01	-0.27995E 02	-0.31144E-04	-0.14535E 03	-0.38304E 01	-0.48730E 02
	0.51970E-04	-0.39032E 00	0.41671E 00	0.20123E-02	0.32559E 01	-0.10634E 02	-0.22182E 00	0.14546E 01
	0.70789E 02	0.15247E 01	0.11381E-03	0.14924E 03	0.57100E 00	0.18976E 01	-0.93456E 01	-0.19878E 01
	-0.13607E 01	0.59157E-01	0.13742E 03	0.41161E-02	-0.86479E 01	0.61153E 01	-0.85594E 02	-0.37464E-02
	-0.80897E 01	-0.70169E 01	0.91996E 00	-0.44574E 01	0.63577E 00	0.17501E 01	-0.11425E 01	0.75126E 01
	-0.56555E 00	0.83230E 01	0.11546E 02	0.69180E-01	-0.10939E 02	-0.78142E 01	-0.19255E 00	0.12184E 02
	0.22321E 01	-0.11082E 01	-0.17727E 01	0.75153E 01	0.32146E 01	-0.59400E 00	0.48973E 00	-0.70865E 00
	0.19912E 00	0.16771E 02	0.21987E 01	0.93331E 00	-0.15251E 01	-0.51669E 00	0.21709E 01	0.49495E-01
	-0.16633E 00	-0.70694E 00	-0.10918E 01	0.66226E 00	0.78952E 00	-0.91998E 00	0.14950E 02	-0.17610E 01
	0.22370E 01	0.50348E 01	0.10958E 02	-0.43617E 01	-0.21227E 01	0.15914E 02	0.23118E 02	-0.22751E 02
	0.89791E 01	-0.13059E 01	0.16449E 00	0.67359E 01	-0.11297E 02	-0.84725E 02	0.77634E 01	0.11487E 03
	-0.11068E-03	-0.24792E 02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
34	0.96989E-12	0.43248E-10	0.21131E-10	-0.24009E-05	-0.48341E-05	-0.32401E-04	0.20715E-01	-0.38451E 00
	-0.16921E 00	0.56483E 01	0.22646E 00	0.24778E-01	-0.26693E 00	0.60578E 00	-0.16373E-03	0.55575E 01
	0.10924E 00	0.22116E 00	0.12137E 02	0.47815E 01	-0.22877E-03	0.89994E 01	-0.26496E 02	0.37877E 01
	-0.34022E-05	-0.54783E 01	-0.77152E-01	0.46963E-02	0.15730E 02	0.40051E 00	0.70466E-01	-0.38191E 00
	0.15247E 01	0.36095E 02	-0.24596E-03	-0.91471E 01	-0.55839E 00	-0.79523E-01	-0.43801E 01	0.23751E 00
	0.89887E 00	-0.40108E 00	-0.65573E 01	-0.47401E-03	0.52381E 01	0.24895E 01	0.51019E 01	0.86901E-04
	0.28454E-01	-0.12389E 01	-0.53612E 01	0.36359E 01	0.43546E-01	-0.12495E 01	0.26032E 00	0.52570E 00
	0.93008E 00	-0.17978E 01	0.35231E 01	0.19794E 00	0.27846E 01	-0.13781E 02	0.46821E 01	-0.84449E-01
	0.35181E 00	-0.11996E 02	0.14975E 02	0.17945E 02	0.12248E 01	0.25920E 00	-0.54735E 00	0.28157E 00
	-0.12445E 01	0.22031E 01	0.22967E 02	-0.89081E 00	0.10735E 00	0.23458E 01	0.90737E-00	-0.35016E-01
	-0.47567E-01	0.10959E 01	-0.17192E 00	-0.40730E 00	0.63977E-01	-0.29821E 00	-0.16732E 01	0.91379E 00
	0.55205E 01	0.21901E 02	-0.65032E 01	0.10572E 01	-0.50733E 00	0.23111E 00	0.47115E 00	0.98097E 01
	0.19355E 01	-0.33652E 01	-0.38123E 00	0.73123E 01	-0.39426E 01	-0.57392E 00	0.50682E 02	-0.82978E 01
	0.19106E 02	-0.12160E 03						
35	-0.10239E-12	-0.12078E-15	0.11347E-15	-0.81515E-11	-0.12890E-10	-0.59530E-09	-0.16070E-06	0.15075E-06
	0.17546E-04	0.35727E-05	0.28466E-06	0.16389E-03	-0.12019E-03	0.83851E-06	0.10748E 06	-0.11726E 00
	-0.33486E-05	0.24655E-06	-0.58165E-03	-0.25025E-03	0.16076E 06	0.13250E 00	0.37935E-03	-0.78591E-04
	0.14765E-09	-0.11393E-03	0.15582E-04	0.96224E-07	0.11460E-04	-0.60004E-06	0.31941E-05	0.33433E-06
	0.11381E-03	-0.24596E-03	0.16443E 06	-0.29077E 00	0.59899E-05	0.88157E-05	0.14324E-04	-0.23919E-02
	-0.70815E-04	0.10990E-02	-0.47275E 01	0.15760E 06	0.23353E-02	-0.11871E-03	-0.42936E 01	0.96250E 05
	0.36039E-02	0.26713E-04	0.36215E-04	-0.52719E-04	0.34532E-04	0.17909E-04	0.16219E-03	0.28206E-05
	-0.10242E-04	-0.18336E-03	-0.13706E-03	0.43895E-06	-0.38960E-04	-0.17164E-04	-0.16159E-04	0.11367E-04
	0.15456E-05	-0.26626E-04	0.15167E-04	0.10905E-04	-0.39908E-04	-0.26316E-04	0.61548E-04	-0.37932E-04
	0.85126E-04	0.39264E-03	-0.11722E-02	0.37982E-05	0.75875E-04	-0.17909E-03	0.25793E-05	0.52855E-05
	0.10642E-05	-0.87715E-04	-0.16387E-04	0.35354E-04	0.16385E-04	0.42683E-04	0.10308E-05	-0.25937E-06
	-0.50528E-06	-0.27386E-05	-0.25430E-04	-0.60859E-06	-0.20528E-05	-0.36193E-04	0.90200E-03	-0.14555E-03
	0.19670E-03	0.52239E-02	-0.54146E-02	0.41362E-02	-0.25408E-03	-0.94145E-04	-0.23231E-03	0.92310E-03
	0.87406E-04	0.20152E-02						
36	-0.22941E-11	-0.48515E-11	0.49060E-11	0.52652E-06	-0.20091E-06	0.14666E-04	0.16376E 00	0.77507E-01
	-0.43749E-02	-0.78952E-02	0.67331E 00	-0.31477E-01	-0.83767E-02	0.13160E 01	-0.30707E 00	-0.10776E 06
	-0.30378E 01	-0.13044E 00	0.22469E 02	-0.18803E 03	-0.44249E 00	-0.16088E 06	0.63193E 00	-0.83096E 02
	-0.52663E-05	-0.23242E 00	0.14417E 02	0.21012E 00	-0.10323E 00	-0.86068E-01	0.52896E-01	0.32995E 00
	0.14924E 03	-0.91471E 01	-0.29077E 00	0.16447E 06	0.34443E 01	0.77136E 01	-0.12813E 02	-0.40077E-01
	-0.12060E 02	-0.13060E 00	0.15762E 06	0.42034E 01	-0.81725E 02	0.79427E 01	-0.96258E 05	-0.44642E 01
	-0.16015E 01	-0.34338E 02	0.13730E 02	-0.37643E 02	-0.90620E 00	0.11499E 02	-0.29132E 01	0.38912E 01
	-0.13627E 02	-0.94408E 01	-0.11872E 03	-0.12863E 00	-0.55794E 02	-0.56136E 00	-0.20003E 02	0.79353E 01
	-0.12099E 01	0.89973E 00	0.10146E 01	-0.36083E 00	-0.86286E 01	-0.20929E 02	0.33228E 02	-0.30628E 02
	0.29047E 02	0.55488E 03	-0.95652E 02	-0.21280E 00	0.65935E 02	-0.35643E 02	0.73196E 02	0.24392E 01
	0.38392E 00	-0.96336E 01	-0.33217E 02	0.61071E 01	0.24369E 02	0.25064E 02	0.67523E 00	-0.16331E 00
	0.10769E-01	-0.32730E-01	0.39097E 02	-0.50206E 00	-0.19736E 01	-0.17839E 02	0.14367E 03	-0.23233E 03
	0.45810E 03	0.18739E 01	0.10997E 00	-0.12700E 02	0.49176E 01	-0.99541E 02	0.64304E 01	0.10735E 04
	-0.37826E-02	-0.16966E 03						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
37	-0.81927E-12	-0.33907E-11	0.18760E-11	-0.26077E-05	-0.21835E-05	0.17111E-05	0.93691E 00	-0.43190E 01
	-0.18147E-03	0.26995E-02	0.69654E-01	-0.54350E-02	0.54063E-01	-0.22779E 02	0.11902E-05	-0.46171E 01
	0.41031E 01	-0.40069E 02	0.48649E 00	-0.44553E 01	0.26845E-05	-0.47544E 01	0.68523E 00	-0.72283E 00
	0.11211E-04	0.13430E 00	-0.96533E-02	0.11948E 00	-0.38053E-01	-0.18187E-01	-0.86919E-03	0.56235E 00
	0.57180E 00	-0.55839E 00	0.59899E-05	0.34443E 01	0.71181E 02	-0.13247E 00	-0.35439E 00	-0.87772E-01
	-0.22196E 02	-0.47534E 00	0.43049E 01	0.14140E-03	-0.11821E 01	0.39265E 00	-0.24748E 01	-0.10658E-03
	0.40396E 00	-0.67830E 00	0.81081E 00	-0.46332E 02	-0.12980E-02	0.19846E 02	-0.11441E 01	-0.93213E 01
	0.31791E 02	0.58526E 01	0.23619E 01	-0.55963E-02	-0.62835E 01	-0.13702E-01	-0.59670E 00	-0.77370E-01
	0.12113E 00	0.22271E-01	0.68530E-02	-0.03930E-01	-0.11863E 01	-0.20650E-01	0.19075E 01	0.25582E-01
	0.15757E 01	-0.15265E 02	0.61768E 01	0.13797E 03	0.22713E 02	0.30728E 00	0.23762E 01	0.58688E 00
	-0.24545E-02	-0.37905E-01	-0.68335E-01	0.21734E-01	0.42146E-01	-0.35194E 01	0.40292E-01	-0.57358E 00
	-0.18144E-01	-0.59062E-01	0.12448E 03	-0.95484E 02	0.16743E 03	0.23804E 01	-0.10375E 01	-0.73905E 00
	0.62663E 00	0.11074E-02	0.52552E-02	0.89516E-01	-0.17396E 00	-0.90489E 00	-0.49665E 00	-0.68975E 01
	-0.25265E 00	0.22041E 01						
38	-0.32297E-11	-0.17056E-11	0.75577E-11	-0.43720E-05	0.16604E-05	0.16829E-04	0.12984E 02	0.31356E 00
	-0.41092E-02	-0.35576E-02	0.44945E 00	-0.93437E-02	-0.36201E-02	0.17068E 01	0.18932E-06	-0.42401E 01
	0.38662E 02	0.42762E 01	-0.93306E 00	0.41195E 01	0.14850E-05	-0.70992E 01	0.56447E-01	-0.67143E 01
	0.72112E-05	0.88694E-01	-0.46505E-03	-0.10187E-01	-0.14414E-01	-0.55725E-01	-0.59477E-02	-0.62212E-01
	0.18976E 01	-0.79523E-01	0.88157E-05	0.77136E 01	-0.13247E 00	0.71520E 02	-0.35939E 01	-0.11682E 00
	0.29806E 01	0.11414E 00	0.82644E 01	0.26348E-03	-0.17022E 01	0.14683E 01	-0.54250E 01	-0.23653E-03
	0.13679E 01	-0.10846E 02	0.40602E 01	0.13378E 02	-0.45427E 00	-0.64959E 01	-0.42111E 01	-0.36847E 02
	-0.63389E 01	-0.17356E 01	0.26960E 02	0.22584E-02	0.61925E 00	-0.16164E 00	-0.18821E 01	-0.86555E-01
	-0.14974E-02	0.33307E-01	0.12440E 00	-0.18946E 00	0.22737E 00	0.14737E 01	-0.21750E 01	0.19278E 01
	-0.20604E 01	-0.66715E 02	0.13100E 02	-0.23526E 02	0.13864E 03	-0.61774E 01	0.12998E 02	0.56993E 00
	-0.26787E 00	-0.16719E 00	-0.85137E 00	0.46607E-01	0.50721E 00	0.89015E 00	0.14069E 00	-0.64273E-01
	0.94855E-02	-0.15350E-01	0.17963E 02	0.16798E 03	0.95439E 02	0.25551E 01	-0.39064E 01	0.29733E 01
	-0.81935E 01	0.27490E-01	0.19395E-01	-0.28936E 00	-0.75390E 00	-0.11584E 02	0.32297E 00	0.15485E 02
	-0.49250E 01	0.10325E 01						
39	-0.67109E-11	-0.30522E-10	-0.35403E-10	-0.76448E-05	-0.10261E-05	-0.72550E-04	-0.60178E 00	0.56657E-03
	-0.13107E-01	-0.14174E 00	0.24941E-01	0.55013E-01	0.12099E 00	0.27693E-01	0.14400E-04	0.64995E 01
	-0.18430E 01	-0.72214E-01	-0.16269E 02	0.14746E 02	0.30195E-04	0.14690E 02	0.78959E 01	0.80008E 01
	-0.85194E-05	0.13262E 01	-0.99276E-01	-0.58247E-02	-0.21645E 00	0.10303E 00	-0.63913E-01	-0.38480E-01
	-0.93456E 01	-0.43001E 01	0.14324E-04	-0.12813E 02	-0.35439E 00	-0.35939E 01	0.88104E 01	0.42445E 00
	0.24962E 00	-0.13331E 00	-0.11787E 02	-0.33134E-03	0.41975E 00	-0.64670E 01	0.72722E 01	0.33060E-03
	0.17346E 01	0.41729E 00	-0.18931E 00	-0.14575E 00	-0.10928E 00	0.93094E-01	0.56533E 00	0.75647E 00
	-0.35673E-01	0.22820E 01	-0.17185E 01	-0.68608E-01	0.45923E 00	-0.10341E 01	-0.26741E-01	-0.23113E 00
	0.38974E-01	0.34612E 00	0.46908E 00	-0.12943E 01	0.10133E 00	0.28330E 00	-0.21752E 00	0.38838E 00
	0.59242E-01	-0.74420E 01	-0.71952E 01	0.47097E 00	-0.75255E 01	-0.18289E 00	-0.23823E 01	-0.86224E-01
	-0.74640E-01	-0.48327E 00	0.76947E 00	0.11628E 00	-0.50926E 00	-0.21271E 00	-0.17690E 00	0.37457E-01
	-0.49224E-01	-0.56038E 00	-0.58279E 01	-0.72850E 01	-0.51110E 01	0.11828E 00	-0.27298E 01	0.37987E 01
	-0.22186E 01	0.12405E 01	0.15494E 00	-0.67565E 01	0.41641E 01	-0.16450E 02	0.17498E 02	-0.14248E 02
	-0.41258E 01	-0.44556E 01						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
40	-0.11880E-09	-0.12282E-09	0.15159E-09	-0.10934E-04	0.31540E-05	-0.67756E-04	0.10307E-01	0.87751E-03
	0.99269E-01	0.87649E-02	0.16204E-01	0.50307E 01	0.94912E-01	0.26483E-01	-0.17582E-02	-0.19278E-01
	0.32657E-01	0.47023E-01	0.46105E 00	-0.76447E 00	-0.23684E-02	-0.27821E 00	-0.11099E 00	0.15608E 01
	-0.18008E-05	0.40537E-01	-0.83034E-03	0.48295E-04	0.50942E-01	-0.63647E-01	-0.10196E 01	-0.84285E-02
	-0.19878E 01	0.23751E 00	-0.23919E-02	-0.40077E-01	-0.87772E-01	-0.11682E 00	0.42445E 00	0.26227E 02
	0.32166E-02	0.43280E-01	0.11256E 00	-0.24676E-02	0.23209E 00	-0.33665E 00	-0.50038E-01	-0.15041E-02
	0.10538E 03	0.24626E 01	-0.12280E 01	-0.27100E 00	0.35644E 01	0.62621E-01	0.20355E 02	-0.10360E 01
	0.50383E-02	-0.31189E 01	-0.22847E 01	-0.14515E-02	-0.33336E 00	0.34774E 00	0.21202E 01	0.13427E 00
	0.19410E 00	0.36073E 00	0.17993E 01	-0.17449E 01	-0.17531E 00	-0.14903E 00	0.17806E 00	-0.26649E 00
	0.37931E-01	0.49625E 01	0.32198E 01	-0.17566E 00	0.46592E 00	0.19454E 00	0.70553E 00	0.35906E-01
	0.80678E-01	0.24842E 00	-0.75184E 00	0.55643E-01	0.32204E 00	0.29018E 00	0.81137E-02	0.51531E-02
	0.18098E 01	-0.35871E 00	-0.22805E 02	0.12463E 00	0.12711E 00	-0.26427E 02	-0.48499E 00	0.44754E 01
	-0.16608E 01	0.17794E 01	0.13674E 02	-0.48277E 02	-0.12544E 03	0.22428E 02	0.48473E 00	-0.47995E 01
	0.18996E 02	0.31727E 02						
41	0.11808E-11	0.10940E-11	-0.15448E-11	-0.37323E-06	-0.56817E-07	-0.10145E-05	0.24945E 00	0.18227E 00
	-0.34334E-02	0.29186E-01	0.69316E-01	-0.32106E-01	-0.32215E 00	0.84513E 01	-0.43737E-04	0.86344E 01
	0.34260E 00	0.12659E 02	-0.86847E 00	0.31174E 01	-0.57929E-04	0.12436E 02	-0.60069E 00	0.43739E 00
	-0.33350E-05	-0.22736E 00	-0.53366E-02	-0.25905E-01	0.24038E 00	0.13935E 00	0.90528E-03	-0.36869E 01
	-0.13607E 01	0.89887E 00	-0.70815E-04	-0.12060E 02	-0.22196E 02	0.29806E 01	0.24962E 00	0.32166E-02
	0.80783E 01	-0.18516E 00	-0.11739E 02	-0.40908E-03	0.46069E 00	-0.28895E 00	0.71143E 01	0.27549E-03
	0.94712E-01	-0.31683E 00	-0.64775E-01	0.16989E 02	-0.44628E-01	-0.72527E 01	0.13296E 00	0.12071E 01
	-0.93245E 01	-0.30255E 01	0.41969E 00	0.10601E-02	0.68352E 01	0.60924E 00	0.34355E 00	0.23560E 00
	-0.39991E 01	-0.45169E 00	0.11163E 01	-0.24176E 00	-0.90712E 00	0.21480E 00	-0.75059E 00	0.24823E 00
	-0.65441E 00	-0.14500E 01	-0.52038E-01	-0.43812E 02	-0.16656E 01	-0.94883E-01	-0.56173E 00	-0.18503E 00
	-0.18325E-01	0.16082E 00	0.16031E 00	-0.10610E 00	-0.11844E 00	0.11150E 01	-0.27796E 00	0.48809E 01
	0.96918E-01	0.23631E 00	-0.41890E 02	0.36657E 02	-0.47904E 02	-0.22824E 00	-0.26308E 01	-0.16489E 00
	-0.36346E 00	-0.43248E 00	-0.24528E 00	-0.31350E 01	0.97200E 00	-0.86390E-02	0.54017E 01	-0.86633E 00
	0.14988E 00	0.27427E 00						
42	0.95471E-12	0.34749E-11	0.15848E-11	-0.34743E-06	-0.33821E-06	0.21245E-06	0.11922E-01	0.29714E-02
	-0.27850E-01	-0.16703E 00	0.28545E-01	-0.75299E-01	0.52782E 01	0.21290E 00	0.84985E-03	0.15983E 00
	0.31049E-01	0.27914E 00	-0.31888E 01	-0.81787E 00	0.10903E-02	0.64518E-01	-0.18328E 00	-0.28061E 00
	0.31666E-06	-0.53495E 00	-0.10922E-01	-0.64500E-03	0.11279E 00	0.39564E-03	0.11579E-02	-0.77200E-01
	0.59157E-01	-0.40108E 00	0.10990E-02	-0.13060E 00	-0.47534E 00	0.11414E 00	-0.13331E 00	0.43288E-01
	-0.18516E 00	0.62606E 01	-0.69960E-01	0.10957E-02	0.20739E 00	0.28594E 00	0.85019E-01	0.65340E-03
	0.31117E 00	0.31365E-01	0.22536E-01	0.41424E 00	0.11245E-01	-0.16185E 00	0.29547E-01	0.58267E-01
	-0.12171E 00	-0.17696E 01	0.12781E 00	0.78513E-02	0.99430E 00	0.29051E 00	0.10311E-01	0.37669E-01
	-0.43259E-01	-0.30145E 00	0.26552E 00	0.38489E 00	-0.38372E 00	-0.23927E-01	0.18407E 00	-0.36125E-01
	0.41846E 00	-0.15789E 01	-0.82912E 01	-0.92899E 00	0.10835E 00	-0.10258E 01	-0.52638E 00	0.17084E-01
	0.68030E-02	-0.45449E 00	0.11866E 00	-0.13703E 00	-0.62940E-01	0.15360E 00	-0.84461E-02	0.10447E 00
	0.29345E-01	0.11094E 00	-0.14311E 01	0.88970E 00	-0.97982E 00	-0.12550E-01	-0.65132E 00	-0.18229E-01
	0.10325E 00	0.13394E 02	0.22774E 01	0.89666E 01	0.44821E 00	-0.58081E 00	0.50557E 01	-0.31868E 01
	0.17984E-01	-0.17286E 02						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
43	0.42483E-12	0.27862E-10	-0.12631E-10	0.10809E-05	0.35150E-06	-0.20911E-04	0.38352E 00	0.15270E-01
	-0.26325E-01	0.40261E-01	0.77564E 00	-0.12434E 00	0.46036E-01	0.94950E 00	-0.32023E 01	-0.10327E 06
	-0.22174E 01	-0.68409E 00	0.26879E 02	-0.17067E 03	-0.47734E 01	-0.15417E 06	-0.26109E 01	-0.75424E 02
	-0.10295E-04	-0.87035E 00	0.13778E 02	0.20029E 00	-0.95567E-02	0.24359E 00	0.13482E-01	0.32643E 00
	0.13742E 03	-0.65573E 01	-0.47275E 01	0.15762E 06	0.43049E 01	0.82644E 01	-0.11737E 02	0.11256E 00
	-0.11739E 02	-0.69560E-01	0.15105E 06	-0.23574E 00	-0.74423E 02	0.71489E 01	-0.92247E 05	-0.68823E 01
	-0.89437E 00	-0.33084E 02	0.13247E 02	-0.35770E 02	-0.97897E 00	0.10974E 02	-0.28154E 01	0.23253E 01
	-0.12526E 02	-0.92070E 01	-0.11404E 03	-0.90452E-01	-0.55324E 02	-0.43795E 00	-0.19330E 02	-0.71661E 01
	-0.11164E 01	0.84598E 00	0.16109E 01	-0.81210E 00	-0.82068E 01	-0.19793E 02	0.31482E 02	-0.29025E 02
	0.27411E 02	0.52628E 03	-0.87126E 02	0.14433E 01	0.65250E 02	-0.33503E 02	0.70002E-02	0.23513E 01
	0.31502E 00	-0.89531E 01	-0.31608E 02	0.57277E 01	0.23174E 02	0.23619E 02	0.15395E 00	-0.16824E 00
	0.87687E-01	0.13981E 00	0.41650E 02	0.93955E 00	0.22090E 01	-0.17094E 02	0.13699E 03	-0.22055E 03
	0.43616E 03	0.14464E 01	-0.12729E 00	-0.77728E 01	0.52040E 01	-0.97062E 02	0.28922E 01	0.10231E 04
	-0.35748E 02	0.15485E 03						
44	-0.97309E-13	0.81566E-15	-0.73892E-15	0.67264E-10	-0.43266E-10	0.84299E-11	0.13291E-04	0.40695E-06
	0.16701E-04	0.25946E-05	0.22514E-04	0.12668E-03	-0.76748E-04	0.23971E-04	0.10301E 06	-0.30489E 01
	-0.57866E-04	-0.24527E-04	0.36094E-04	-0.52930E-02	0.15407E 06	-0.42571E 01	0.36847E-03	-0.23185E-02
	-0.40939E-10	-0.12151E-03	0.40727E-03	0.58584E-05	0.10294E-04	0.69917E-05	0.11963E-04	0.11078E-04
	0.41161E-02	-0.47401E-03	0.15760E 06	0.42034E 01	0.14140E-03	0.26348E-03	-0.33134E-03	-0.24676E-02
	-0.40908E-03	0.10957E-02	-0.23574E 00	0.15105E 06	0.28449E-04	0.99656E-04	-0.67384E 01	0.92250E 05
	0.26709E-02	-0.92946E-03	0.41767E-03	-0.10860E-02	-0.17932E-04	0.33540E-03	-0.70079E-04	0.81861E-04
	-0.36468E-03	-0.42414E-03	-0.33246E-02	-0.29503E-05	-0.15412E-02	-0.30896E-04	-0.55870E-03	0.21484E-03
	-0.31517E-04	-0.79961E-05	0.35811E-04	0.14476E-04	-0.27510E-03	-0.59202E-03	0.96126E-03	-0.86523E-03
	0.87266E-03	0.15349E-01	-0.37846E-02	0.64242E-04	0.19676E-02	-0.11513E-02	0.19921E-02	0.71996E-04
	0.10308E-04	-0.35007E-03	-0.91258E-03	0.19981E-03	0.67541E-03	0.71876E-03	0.56767E-05	-0.69481E-05
	-0.13142E-04	0.21000E-05	0.12583E-02	0.41802E-04	0.10598E-03	-0.35225E-03	0.47626E-02	-0.64364E-02
	0.12671E-01	0.51395E-02	-0.52482E-02	0.40397E-02	0.77974E-03	-0.29362E-02	-0.34874E-04	0.29976E-01
	-0.91838E-03	0.63297E-02						
45	0.34039E-11	0.76622E-10	-0.55386E-10	0.31320E-05	0.16115E-05	-0.69721E-04	-0.22031E 00	0.47485E-02
	-0.65804E-01	0.10381E 00	-0.10074E-01	-0.25221E 00	0.15982E 00	0.37266E 00	0.16043E-02	0.51462E 02
	-0.73190E 00	0.46763E 00	0.15011E 02	0.19997E 02	0.23579E-02	0.82263E 02	-0.86447E 01	0.86652E 01
	-0.95533E-05	-0.18123E 01	-0.71158E-01	-0.69935E-02	0.17743E 00	0.22435E-01	-0.93842E-01	-0.15516E 00
	-0.86479E 01	0.52381E 01	0.23353E-02	-0.81725E 02	-0.11821E 01	-0.17022E 01	0.41975E 00	0.23209E 00
	0.46069E 00	0.20739E 00	-0.74423E 02	0.28449E-04	0.94637E 01	-0.41038E 00	0.47485E 02	0.34869E-02
	0.99630E 00	-0.29473E 00	0.18885E 00	0.21365E 01	-0.18518E 00	-0.68546E 00	0.17267E 00	-0.65148E 00
	-0.25972E-02	-0.59036E 00	-0.30803E 01	0.93705E-01	-0.62484E 01	0.12919E 00	-0.20403E 01	-0.13192E 00
	-0.35668E-02	0.57545E-01	0.14342E 01	-0.10961E 01	0.25141E 00	0.49224E 00	-0.70818E 00	0.52560E 00
	-0.90375E 00	-0.57114E 01	0.10390E 02	-0.17253E 01	-0.37747E 01	0.18521E 01	-0.74086E 00	-0.14161E-01
	-0.85861E-01	0.71598E 00	0.42241E 00	-0.25375E 00	-0.34656E 00	-0.73962E 00	-0.10501E 00	0.21087E 00
	0.23972E 00	0.40939E 00	0.57911E 01	-0.12306E 01	-0.41018E 01	0.17366E 01	-0.42592E 00	-0.25039E 00
	-0.68683E 01	-0.80528E 00	-0.63004E 00	0.10989E 02	0.79727E 00	-0.72821E 01	-0.63731E 01	0.57704E 00
	-0.12817E 02	-0.11696E 02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
46	0.53223E-11	0.26617E-10	0.12630E-10	0.55024E-05	-0.26646E-06	0.49667E-04	0.23867E 00	-0.12896E-02
	0.48664E-01	0.46973E-01	-0.55646E-02	0.13389E 00	0.36907E-01	-0.99579E-01	-0.83730E-04	-0.35690E 01
	0.76649E 00	-0.74838E-01	0.13246E 02	-0.13549E 02	-0.12741E-03	-0.98367E 01	-0.61705E 01	-0.66678E 01
	0.75658E-05	-0.15544E 01	-0.12351E-02	0.54110E-02	0.36623E-01	-0.29649E-01	0.91501E-01	0.59044E-01
	0.61153E 01	0.24895E 01	-0.11871E-03	0.79427E 01	0.39265E 00	0.14683E 01	-0.64670E 01	-0.33665E 00
	-0.28895E 00	0.28594E 00	0.71485E 01	0.99656E-04	-0.41038E 00	0.53566E 01	-0.44388E 01	-0.26477E-03
	-0.29055E 01	0.31014E-01	0.51719E 00	-0.31666E-01	0.34757E-01	0.61021E-01	-0.70305E 00	-0.35919E 00
	0.26465E 00	-0.49728E 01	-0.95860E 00	0.60121E-01	-0.45943E 01	0.20600E 01	-0.25561E 01	0.12180E 00
	0.20475E-01	-0.34259E 00	-0.16300E 00	0.81765E 00	-0.64855E 00	-0.22518E 00	0.36304E 00	-0.42268E 00
	0.17206E 00	0.80602E 01	0.44263E 01	0.25938E 00	0.35215E 01	0.97137E-01	0.18070E 01	0.60623E-01
	0.83255E-01	0.52100E 00	-0.63172E 00	-0.21105E 00	0.41998E 00	0.28965E 00	0.65021E-01	-0.68008E-01
	-0.87171E-01	0.27079E 00	0.96441E 00	0.25339E 01	0.25705E 01	-0.19420E 01	-0.62104E 01	-0.71903E 01
	0.45492E 01	0.30299E 00	0.38994E 00	-0.28936E 01	-0.92892E 00	0.50341E 01	0.56392E 01	0.13918E 02
	-0.76598E 01	0.24552E 02						
47	0.59664E-12	-0.56784E-12	-0.60756E-11	0.89949E-07	0.11637E-06	-0.17402E-05	-0.27387E 00	-0.10880E-01
	0.22879E-02	-0.25295E-02	-0.48552E 00	0.21160E-01	0.81537E-02	-0.65492E 00	-0.27381E 01	0.63065E 05
	0.12091E 01	0.28800E 00	-0.13115E 02	0.10841E 03	-0.41050E 01	0.94154E 05	-0.27737E 00	0.47803E 02
	0.44060E-05	0.13599E 00	-0.84275E 01	-0.12336E 00	0.39357E-01	-0.18285E 00	-0.26549E-01	-0.16250E 00
	-0.85594E 02	0.51019E 01	-0.42936E 01	-0.96258E 05	-0.24748E 01	-0.54250E 01	0.72722E 01	-0.50038E-01
	0.71143E 01	0.85019E-01	-0.92247E 05	-0.67384E 01	0.47485E 02	-0.44368E 01	0.56336E 05	-0.14406E-03
	0.59269E 00	0.20099E 02	-0.80310E 01	0.21954E 02	0.55383E 00	-0.67031E 01	0.17198E 01	-0.16237E 01
	0.78023E 01	0.55767E 01	0.68793E 02	0.75991E-01	0.32170E 02	0.25865E 00	0.11156E 02	-0.43646E 01
	0.75404E 00	-0.48927E 00	-0.67829E 00	0.23511E 00	0.50924E 01	0.12183E 02	-0.19348E 02	0.17818E 02
	-0.16910E 02	-0.32232E 03	0.55433E 02	-0.45775E 00	-0.40531E 02	0.20843E 02	-0.42849E 02	-0.14338E 01
	-0.20939E 00	0.55979E 01	0.19376E 02	-0.35429E 01	-0.14214E 02	-0.14601E 02	-0.59811E-01	0.55346E-01
	-0.43162E-02	0.61289E-03	-0.22088E 02	-0.14285E 01	-0.13088E 01	0.10980E 02	-0.83575E 02	0.13414E 03
	-0.26802E 03	-0.10749E 01	-0.59737E-01	0.73170E 01	-0.27784E 01	0.57950E 02	-0.31732E 01	-0.62338E 03
	0.18108E 02	-0.96650E 02						
48	-0.59327E-13	0.53291E-15	-0.94484E-15	0.53196E-10	-0.17025E-10	-0.12604E-09	-0.12582E-04	-0.46731E-06
	0.12940E-04	0.20128E-05	-0.21324E-04	0.92155E-04	-0.64626E-04	-0.28736E-04	0.62914E 05	0.27447E 01
	0.51807E-04	0.12775E-04	-0.92379E-03	0.47002E-02	0.94098E 05	0.42777E 01	0.20334E-03	0.20833E-02
	0.28704E-09	-0.62803E-04	-0.36686E-03	-0.54479E-05	0.87958E-05	-0.77992E-05	0.80101E-05	-0.71867E-05
	-0.37464E-02	0.86901E-04	0.96250E 05	-0.44642E 01	-0.10658E-03	-0.23653E-03	0.33060E-03	-0.15041E-02
	0.27549E-03	0.65340E-03	-0.68823E 01	0.92250E 05	0.34869E-02	-0.26477E-03	-0.14406E-03	0.56340E 05
	0.16017E-02	0.90008E-03	-0.33151E-03	0.95088E-03	0.27560E-04	-0.28913E-03	0.71736E-04	-0.65957E-04
	0.34238E-03	0.15394E-03	0.29958E-02	0.37334E-05	0.14120E-02	-0.17149E-06	0.47849E-03	-0.18905E-03
	0.33508E-04	-0.42522E-04	-0.30508E-04	0.24026E-04	0.20485E-03	0.52869E-03	-0.82799E-03	0.77404E-03
	-0.70467E-03	-0.14175E-01	0.17689E-02	-0.17442E-04	-0.17661E-02	0.82384E-03	-0.19138E-02	-0.61010E-04
	-0.91438E-05	0.19710E-03	0.85854E-03	-0.13761E-03	-0.62616E-03	-0.62781E-03	-0.25934E-05	0.25689E-05
	-0.12325E-04	0.18805E-05	-0.92297E-03	-0.64580E-04	-0.60349E-04	0.59950E-03	-0.31983E-02	0.58811E-02
	-0.11835E-01	0.30054E-02	-0.31032E-02	0.29829E-02	0.32930E-03	0.24214E-02	-0.27188E-03	-0.27251E-01
	0.77363E-03	-0.32943E-02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
49	-0.66077E-09	-0.70141E-09	0.84792E-09	-0.61584E-04	0.16420E-04	-0.35851E-03	0.39613E 00	-0.20725E-04
	-0.46192E 01	-0.49471E-01	-0.65176E-01	-0.35374E 01	-0.19757E-01	-0.11146E 00	0.24974E-02	0.14855E 01
	0.12558E 01	-0.99158E-01	-0.90691E 00	-0.82878E 01	0.34981E-02	-0.53375E 00	0.17964E 01	0.53713E 01
	-0.62779E-05	0.87852E 00	-0.80986E-03	0.21869E-02	0.56245E 00	-0.53603E 00	-0.10181E 02	0.78884E-01
	-0.80897E 01	0.28454E-01	0.36039E-02	-0.16015E 01	0.40396E 00	0.13679E 01	0.17346E 01	-0.10538E 03
	0.94712E-01	0.31117E 00	-0.89437E 00	0.26709E-02	0.99630E 00	-0.29055E 01	0.59269E 00	0.16017E-02
	0.62340E 03	0.13642E 02	-0.68666E 01	-0.19721E 01	0.19837E 02	0.49546E 00	0.11495E 03	-0.66932E 01
	0.11508E 00	-0.15982E 02	-0.11476E 02	-0.33758E-01	-0.82487E 00	-0.12535E 01	0.12008E 02	0.82841E 00
	0.11063E 01	0.69205E 01	0.12755E 02	-0.54722E 01	-0.10147E 01	-0.76421E 00	0.95499E 00	-0.13612E 01
	0.29260E 00	0.23070E 02	0.14648E 02	0.82601E-01	0.63269E 01	0.51191E 00	0.38375E 01	0.20525E 00
	0.46050E 00	0.10822E 01	-0.40566E 01	0.43578E 00	0.17193E 01	-0.16335E 01	-0.39348E-01	-0.18580E 00
	0.16341E 02	-0.32215E 01	-0.13162E 03	0.39493E 01	0.53186E 01	-0.15159E 03	0.80285E-01	0.22674E 02
	-0.80911E 01	0.24113E 02	-0.80125E 01	-0.24604E 03	-0.68706E 03	0.12287E 03	0.23700E 01	-0.27284E 02
	-0.10143E 03	-0.17726E 03						
50	-0.92626E-11	0.35243E-11	0.73110E-10	0.72029E-06	0.17545E-06	-0.62334E-04	-0.19144E 01	-0.57138E-02
	-0.85644E-01	-0.21080E 00	0.66680E-01	-0.45184E-01	0.74158E-02	-0.23659E-01	0.44259E-04	0.22791E 02
	-0.55927E 01	-0.20618E 00	0.22978E 01	-0.76838E 01	0.56872E-04	0.31487E 02	0.48323E 01	0.11685E 02
	-0.15269E-04	0.18445E 01	0.33771E 00	0.19549E-02	-0.57002E 00	0.34083E 00	-0.22049E 00	-0.31260E-01
	-0.70169E 01	-0.12389E 01	0.26713E-04	-0.34330E 02	-0.67830E 00	-0.10846E 02	0.41729E 00	0.24626E 01
	-0.31683E 00	0.31305E-01	-0.33084E 02	-0.92946E-03	-0.29423E 00	0.31014E-01	0.20099E 02	0.90006E-03
	0.13642E 02	0.57085E 01	-0.75885E 00	-0.17821E 01	0.53745E 00	0.63415E 00	0.32620E 01	0.57707E 01
	0.67868E 00	-0.19729E 01	-0.15630E 01	-0.31418E-01	0.60515E 01	0.25210E 01	0.61318E 01	-0.31454E 00
	-0.11287E 00	0.31365E 00	-0.87836E 00	0.39190E 00	-0.83939E 00	-0.54669E 00	0.50594E 00	-0.51708E 00
	0.50953E 00	0.14356E 02	-0.25254E 01	0.20699E 01	-0.19654E 02	0.72136E 00	-0.14017E 01	-0.67022E-01
	0.53960E-01	0.41735E 00	-0.26841E 00	-0.31725E 00	0.18260E 00	0.38991E 00	-0.52111E 00	0.34799E-01
	0.12076E 00	-0.90038E 00	-0.12532E 02	-0.23591E 02	-0.15450E 02	-0.66376E 01	-0.99221E 01	0.17423E 02
	0.57088E 01	0.13867E 01	-0.67306E-01	-0.11918E 02	-0.15965E 02	0.19626E 02	-0.17376E 02	-0.43546E 02
	0.56804E 02	0.26886E 02						
51	0.91390E-11	0.28040E-10	-0.29729E-10	0.16588E-05	0.32449E-06	0.31133E-04	0.73190E 00	0.26345E-02
	0.50142E-01	-0.54755E 00	-0.36017E-01	0.12583E-01	0.26078E-01	-0.19235E 00	0.15754E-04	-0.90681E 01
	0.21500E 01	-0.20574E 00	0.61022E 01	0.29715E 01	0.17140E-04	-0.12744E 02	0.10438E 02	-0.50345E 01
	0.69896E-05	0.37205E 01	-0.22004E 00	0.25012E-02	-0.14880E 01	-0.14567E 00	0.66549E-01	0.17939E-01
	0.91996E 00	-0.53612E 01	0.36215E-04	0.13730E 02	0.81081E 00	0.40602E 01	-0.18931E 00	-0.12280E 01
	-0.64775E-01	0.22536E-01	0.13247E 02	0.41767E-03	0.18865E 00	0.51719E 00	-0.80310E 01	-0.33151E-03
	-0.68686E 01	-0.75865E 00	0.40878E 01	0.96767E 00	-0.32663E 00	-0.24856E 00	-0.18424E 01	-0.23244E 01
	0.22244E 00	-0.30800E 01	0.13812E 00	-0.15443E-01	0.60993E 01	0.44046E 01	-0.37855E 01	0.10558E 00
	0.74172E-01	0.84956E 00	-0.85030E 00	-0.16327E 01	-0.15302E 01	0.30906E 00	-0.10210E 00	0.18210E 00
	-0.82757E-01	-0.48649E 01	0.23941E 01	0.17017E 00	-0.76057E 01	-0.20680E-01	0.87020E 00	-0.38131E-01
	-0.10643E-01	0.64684E 00	0.45655E-01	-0.43959E 00	-0.48923E-01	0.17759E 00	0.32905E 00	-0.58141E-01
	-0.65382E 00	-0.20852E 01	-0.34447E 01	0.82198E 01	0.71022E 01	0.24973E 01	-0.15080E 02	-0.10738E 02
	0.37158E 01	0.16849E 01	-0.69481E-03	-0.10998E 02	0.11063E 02	-0.17226E-02	-0.21002E 02	0.72192E 01
	-0.26377E 02	0.10198E 03						

Table J-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
52	-0.20997E-10	-0.12764E-09	0.21184E-10	-0.70426E-05	-0.78624E-05	-0.10630E-04	0.18815E 01	0.13856E 01
	0.27854E-01	-0.58035E-01	0.19117E 00	0.57773E-02	-0.48090E-01	0.16893E 02	-0.65753E-05	0.26125E 02
	0.47639E 01	0.27034E 02	0.10261E 01	0.68812E 01	-0.14642E-04	0.37915E 02	-0.40777E 01	0.34084E 01
	-0.98777E-05	-0.79544E 00	0.15187E 00	-0.45172E-01	-0.84748E-02	0.31867E 00	0.61340E-01	-0.48407E 01
	-0.44574E 01	0.36359E 01	-0.52739E-04	-0.37643E 02	-0.46332E 02	0.13378E 02	-0.14575E 00	-0.27100E 00
	0.16989E 02	0.41424E 00	-0.35770E 02	-0.10860E-02	0.21365E 01	-0.31666E-01	0.21954E 02	0.95088E-03
	-0.19721E 01	-0.17821E 01	0.96767E 00	0.65608E 02	-0.43673E 00	-0.24411E 02	-0.90682E 00	-0.20200E 01
	-0.15473E 02	-0.60804E 01	-0.20823E 01	-0.72437E-03	0.18487E 02	0.11926E 01	-0.44128E 01	0.70925E-01
	-0.43003E 01	-0.35700E 00	0.23643E 01	-0.19955E 01	-0.42453E 01	0.83182E 00	-0.19455E 01	0.81107E 00
	-0.17521E 01	-0.12032E 02	0.29085E 01	-0.94896E 02	0.10310E 02	-0.38154E 00	-0.60251E-01	-0.33760E 00
	-0.49633E-01	0.64418E 00	0.71810E 00	-0.28059E 00	-0.56839E 00	0.10673E 02	-0.55389E 00	0.65003E 01
	-0.52540E-01	0.32420E-01	-0.32712E 03	0.94170E 02	-0.89231E 02	0.92691E 01	0.10676E 02	-0.33485E 02
	0.44376E 02	-0.52571E-01	-0.13672E-01	0.77473E 00	0.24029E 01	0.18626E 02	0.71046E 01	-0.22637E 02
	-0.88751E 01	-0.45116E 01						
53	-0.19142E-10	-0.26348E-10	0.26372E-10	-0.13174E-05	0.27918E-05	0.30543E-04	-0.91099E-01	-0.17198E-02
	-0.13163E 00	0.21521E-01	-0.20211E-03	-0.16465E-01	0.99680E-03	-0.10630E-01	0.23884E-04	0.75086E 00
	-0.26539E 00	-0.22333E-01	0.12542E 00	-0.14022E 01	0.33308E-04	0.70998E 00	0.79748E-01	-0.75842E 00
	0.95125E-06	0.85712E-01	-0.16702E-01	0.34154E-03	0.72174E-01	0.16290E-02	-0.30649E 00	0.39096E-02
	0.63577E 00	0.43546E-01	0.34532E-04	-0.90620E 00	-0.12980E-02	-0.45427E 00	-0.10928E 00	0.35644E 01
	-0.44628E-01	0.11245E-01	-0.97897E 00	-0.17932E-04	-0.18518E 00	0.34757E-01	0.55383E 00	0.27560E-04
	0.19837E 02	0.53745E 00	-0.32663E 00	-0.43673E 00	0.31262E 01	0.13555E 00	0.16040E 01	0.40808E 00
	0.57968E-02	-0.36730E-01	0.30509E 00	0.15362E-01	-0.75057E 00	-0.22724E 00	0.13392E 00	-0.19914E-02
	-0.48776E-01	0.17360E 00	-0.20658E 00	0.60600E 00	0.10428E 00	-0.82938E-01	0.46759E-01	-0.75742E-01
	0.23261E-01	0.17020E 01	0.11637E 00	0.17068E 00	-0.80372E 00	0.32402E-02	0.55529E-01	0.35176E-02
	0.15482E-01	-0.17070E-01	-0.13550E 00	0.27460E-01	0.77141E-01	-0.33003E 00	-0.21638E-01	-0.14847E-01
	0.52661E 00	-0.25530E-01	0.24825E 02	-0.10844E 01	-0.92594E 00	0.27966E 02	0.45977E 01	0.41033E 01
	0.66440E 01	0.35029E 01	0.52884E 00	-0.38593E 02	-0.93348E 02	0.66966E 01	-0.34779E 00	-0.31109E 00
	0.64326E 01	0.15295E 02						
54	0.57142E-11	0.32717E-10	0.18781E-12	0.26835E-06	0.39563E-05	0.55604E-05	-0.94422E 00	-0.86613E 00
	-0.92086E-02	-0.78932E-02	-0.74088E-01	-0.13721E-02	0.21673E-01	-0.69489E 01	0.36662E-05	-0.82061E 01
	-0.24555E 01	-0.11614E 02	0.96933E 00	-0.20417E 01	0.57304E-05	-0.11581E 02	0.84817E 00	-0.16540E 01
	0.48277E-05	0.44308E-01	-0.90336E-01	0.24214E-01	-0.59132E-01	-0.11410E 00	-0.23182E-01	0.12636E 01
	0.17501E 01	-0.12495E 01	0.17909E-04	0.11499E 02	0.19846E 02	-0.64959E 01	0.93094E-01	0.62621E-01
	-0.72527E 01	-0.16185E 00	0.10974E 02	0.33540E-03	-0.68546E 00	0.61021E-01	-0.67031E 01	-0.28913E-03
	0.49546E 00	0.63415E 00	-0.24856E 00	-0.24411E 02	0.13555E 00	0.12180E 02	0.26575E 00	0.12845E 01
	0.69149E 01	0.19415E 01	0.77787E 00	0.39388E-02	-0.44280E 01	-0.79803E-01	0.17812E 01	0.26753E-01
	0.10174E 01	0.13083E 00	-0.81186E 00	0.63049E 00	0.10865E 01	-0.29709E 00	0.85735E 00	-0.30521E 00
	0.77396E 00	0.44585E 01	0.12742E 00	0.40779E 02	-0.61356E 01	0.53066E 00	-0.21596E 00	0.13105E 00
	0.18021E-01	-0.40156E-01	-0.15476E 00	0.12336E-01	0.12160E 00	-0.28639E 01	0.19669E 00	-0.16728E 01
	0.22072E-02	-0.10129E 00	0.76029E 02	-0.42251E 02	0.37647E 02	-0.16850E 01	-0.41100E 01	0.84240E 01
	-0.74141E 01	0.22884E 00	0.10173E-01	-0.20266E 01	-0.10455E 01	-0.10269E 02	0.80963E 00	0.29647E 01
	-0.17954E 01	-0.60863E 01						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
55	-0.98737E-10	-0.13619E-09	0.16726E-09	-0.87383E-05	-0.13435E-05	-0.15206E-03	-0.77276E 00	0.37006E-01
	-0.64284E 00	0.91343E-01	-0.24139E-01	-0.64030E-01	0.56911E-02	0.28608E 00	0.10992E-03	0.20741E 01
	-0.23033E 01	0.40758E 00	0.23065E 00	-0.23357E 01	0.15345E-03	0.24098E 01	0.67040E 00	0.34417E 00
	0.99822E-08	0.47699E 00	-0.84509E-01	0.91587E-04	0.32259E 00	-0.41438E-01	-0.14680E 01	-0.2770E-01
	-0.11425E 01	0.26032E 00	0.16219E-03	-0.29132E 01	-0.11441E 01	-0.42111E 01	0.56533E 00	0.1355E 02
	0.13296E 00	0.29547E-01	-0.28154E 01	-0.70079E-04	0.17267E 00	-0.70305E 00	0.17198E 01	0.736E-04
	0.11495E 03	0.32620E 01	-0.18424E 01	-0.90682E 00	0.16040E 01	0.26575E 00	0.26135E 02	0.18272E 01
	-0.23870E 00	-0.85418E 00	-0.12339E 01	-0.22088E-01	-0.48881E 00	-0.88607E 00	0.50726E 01	-0.14658E 00
	0.11911E 00	0.69043E 00	0.17928E 01	-0.94213E 00	0.19304E 00	-0.38284E 00	0.30527E 00	-0.45267E 00
	0.15110E 00	0.10549E 02	0.21419E 01	-0.88189E 00	-0.77679E 01	0.46673E 00	0.35057E-01	0.44639E-02
	0.10022E 00	0.16641E 00	-0.87493E 00	0.13410E 00	0.39475E 00	0.54093E 00	-0.64970E-01	0.38927E-01
	0.25190E 01	-0.15358E 00	-0.39695E 02	-0.83616E 01	-0.78630E 01	-0.46492E 02	-0.14294E 01	0.82455E 01
	-0.61090E 01	0.16600E 00	-0.46945E 00	-0.36844E 01	-0.42149E 02	0.79592E 00	-0.80822E 01	-0.10760E 02
	0.22540E 02	0.35785E 01						
56	-0.75934E-11	0.29502E-10	0.12027E-09	0.14913E-05	0.90538E-05	0.41136E-04	-0.70063E 01	0.32215E 00
	0.41264E-02	-0.98352E-02	-0.26344E 00	0.85461E-02	-0.40066E-02	0.27282E 01	-0.67916E-06	-0.24666E 01
	-0.21072E 02	0.30660E 01	-0.76744E 00	0.68679E 00	-0.16539E-06	-0.25410E 01	0.56499E 00	-0.76648E 01
	0.11781E-04	0.79816E 00	-0.60485E 00	-0.47271E-02	-0.57584E-01	-0.10012E-01	-0.66944E-02	-0.30851E 00
	0.75126E 01	0.52970E 00	0.28206E-05	0.38912E 01	-0.93213E 01	-0.36847E 02	0.75647E 00	-0.10360E 01
	0.12071E 01	0.58267E-01	0.23253E 01	0.81861E-04	-0.65148E 00	-0.35919E 00	-0.16237E 01	-0.65957E-04
	-0.66932E 01	0.57707E 01	-0.23244E 01	-0.20200E 01	0.40808E 00	0.12845E 01	0.18272E 01	0.27098E 02
	-0.40575E 00	0.21731E 00	0.89124E 01	-0.22109E-01	0.75691E 01	0.10731E 01	0.19294E 02	0.36785E 00
	-0.67860E 00	-0.27792E 00	-0.38913E 01	0.45479E 01	0.14357E 00	-0.14380E 01	0.95347E 00	-0.12024E 01
	0.10319E 01	0.42637E 02	-0.98067E 01	-0.59520E 01	-0.75018E 02	0.23780E 01	-0.67595E 01	-0.33790E 00
	0.45912E-01	0.30467E 00	0.62263E-01	-0.32013E 00	0.39906E-01	0.15062E 01	0.67996E-01	0.39742E 00
	-0.79228E-02	-0.12179E-01	-0.45284E 02	-0.76263E 02	-0.72674E 02	0.12757E 00	-0.64007E 01	0.40015E 02
	0.11902E 02	0.47977E 00	0.74418E-01	-0.46652E 01	-0.65156E 01	-0.79140E 02	-0.99229E 01	-0.26263E 02
	0.27850E 02	-0.33254E 02						
57	-0.14411E-12	-0.13928E-11	0.16118E-10	-0.35855E-05	-0.32780E-05	0.30701E-06	-0.72529E 00	-0.26986E 01
	-0.39303E-03	-0.16475E 00	0.57292E-01	-0.21886E-02	0.12656E-01	-0.94907E 01	0.31774E-05	0.77704E 01
	-0.15683E 01	0.18247E 02	-0.91436E 00	-0.10531E 01	0.44628E-05	0.12901E 02	-0.22803E 01	-0.44210E 00
	0.62347E-05	-0.99215E 00	-0.10132E 00	0.65238E-01	-0.42017E 00	0.14438E 00	-0.20190E-01	-0.19893E 01
	-0.56555E 00	0.93008E 00	-0.10242E-04	-0.13627E 02	0.31791E 02	-0.63389E 01	0.35573E-01	0.50383E-02
	-0.93245E 01	-0.12171E 00	-0.12526E 02	-0.36488E-03	-0.25972E-02	0.26465E 00	0.78023E 01	0.34238E-03
	0.11508E 00	0.67868E 00	0.22244E 00	-0.15473E 02	0.57968E-02	0.69149E 01	-0.23870E 00	-0.40575E 00
	0.16749E 02	-0.46304E 01	0.43424E 00	-0.13041E-01	0.18040E 01	0.37089E 01	0.79175E 00	0.64484E-01
	-0.21710E 01	-0.26006E 00	0.33281E 00	0.46457E-01	-0.27094E 01	-0.76794E-02	0.10337E 01	-0.25642E-01
	0.93209E 00	-0.34484E 01	0.14868E 01	0.63656E 02	-0.22756E 01	0.77958E 00	-0.34415E 00	0.18934E 00
	0.13433E-01	0.41293E 00	0.18843E 00	-0.32231E 00	-0.13308E 00	-0.62221E 00	-0.21689E 00	0.27513E 01
	-0.10411E 00	-0.58192E 00	0.24341E 02	-0.57447E 02	0.66619E 02	0.29643E 01	-0.11235E 02	-0.21200E 01
	0.92974E 01	0.13666E 01	-0.40685E-01	-0.11032E 02	0.22042E 01	-0.91759E 01	0.20312E 02	-0.15587E 02
	0.27302E 01	0.15632E 02						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (OHHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1CCOE 01

MODE	VALUES							
58	-0.79597E-10	-0.24683E-09	-0.18046E-10	0.34358E-04	0.22110E-04	0.20056E-04	-0.30610E 00	-0.97414E 00
	0.10379E 00	0.36915E 01	0.70027E-01	0.52090E-02	0.41887E-01	-0.11819E 01	-0.11809E-03	0.57634E 01
	-0.81576E 00	-0.33468E 01	0.22377E 02	0.78146E 01	-0.18898E-03	0.10419E 02	0.32743E 02	0.57913E 01
	-0.11224E-04	0.17465E 02	0.98846E 00	0.14501E-01	0.10941E 02	0.14907E 00	0.61731E 00	-0.12744E 01
	0.83230E 01	-0.17978E 01	-0.18336E-03	-0.94408E 01	0.58526E 01	-0.17356E 01	0.22820E 01	-0.31189E 01
	-0.30255E 01	-0.17696E 01	-0.92070E 01	-0.42414E-03	-0.59036E 00	-0.49728E 01	0.55787E 01	0.15394E-03
	-0.15982E 02	-0.19729E 01	-0.30800E 01	-0.60804E 01	-0.36730E-01	0.19415E 01	-0.85418E 00	0.21731E 00
	-0.46304E 01	-0.13707E 03	0.14165E 01	0.18126E 00	-0.42525E 02	-0.66102E 02	0.12236E 02	-0.20104E 00
	-0.21396E 01	-0.95091E 00	0.22953E 01	0.10588E 01	0.16911E 02	-0.10600E 01	-0.17330E 01	0.23533E 00
	-0.31529E 01	0.99642E 00	0.25656E 02	0.11937E 02	-0.27853E 01	0.29476E 01	-0.74183E-00	0.14579E 00
	-0.11255E 00	-0.50243E 01	0.21618E 00	0.45126E 01	-0.96235E-01	-0.11237E 00	-0.79596E 00	-0.19467E 01
	0.27902E 01	0.14497E 02	0.66083E 01	-0.12629E 02	0.10885E 02	0.12626E 01	0.21561E 03	0.34142E 02
	-0.50370E 02	-0.26340E 02	0.68396E 00	0.20928E 03	-0.38305E 02	0.59052E 02	-0.37483E 03	0.84187E 02
	-0.25852E 02	-0.42647E 03						
59	-0.33206E-10	0.16719E-09	0.54516E-09	-0.98431E-05	0.33630E-04	0.81778E-04	0.44146E 01	-0.27965E 00
	0.75377E-02	0.71667E-01	0.10097E 01	-0.12875E-01	-0.17485E-01	0.13939E 00	-0.51018E-05	0.76699E 02
	0.13206E 02	0.91148E-01	-0.63380E 01	0.28035E 02	-0.17139E-04	0.12270E 03	0.40932E 01	-0.28543E 02
	0.47304E-04	0.41423E 01	-0.21755E 01	0.11111E-01	0.75471E-01	0.25188E 01	-0.79764E-01	-0.80492E 00
	0.11546E 02	0.35231E 01	-0.13706E-03	-0.11872E 03	0.23619E 01	0.26960E 02	-0.17185E 01	-0.22847E 01
	0.41969E 00	0.12781E 00	-0.11404E 03	-0.33246E-02	-0.30803E 01	-0.95860E 00	0.68793E 02	0.29998E-02
	-0.11476E 02	-0.15630E 01	0.13812E 00	-0.20823E 01	0.30509E 00	0.77787E 00	-0.12339E 01	0.89124E 01
	0.43424E 00	0.14165E 01	0.10737E 03	-0.10482E 00	0.35109E 02	0.38312E 01	0.78868E 02	-0.28225E
	-0.22750E 01	-0.15110E 01	-0.14006E 02	0.16977E 02	0.11981E 01	-0.92578E-01	-0.36459E 01	0.31285E 01
	-0.28704E 01	-0.60305E 02	0.71573E 01	-0.30974E 01	0.47295E 02	-0.11774E 00	-0.97161E 00	0.97249E-01
	-0.62657E 00	0.16690E 01	0.91589E 00	-0.17683E 01	-0.57620E 00	0.71654E 00	-0.33578E 01	0.10318E 01
	-0.17919E-01	0.20624E 00	-0.36955E 02	0.54744E 02	0.38782E 02	-0.11208E 02	-0.34474E 02	0.19155E 03
	0.42344E 02	0.14708E 01	0.27710E 00	-0.15004E 02	-0.27998E 02	-0.34472E 03	-0.54534E 02	-0.20049E 03
	0.15497E 03	-0.17285E 03						
60	-0.36943E-12	-0.37699E-12	-0.12126E-11	0.27924E-06	0.80544E-07	0.40031E-06	0.40758E-03	-0.28800E-02
	0.32379E-03	-0.46136E-02	0.91046E-03	-0.89593E-04	0.17923E-02	0.47801E-02	0.67682E-06	0.87100E-01
	0.10822E-02	0.24212E-02	0.64419E 00	0.61930E-01	0.39469E-06	0.12700E 00	-0.41539E 00	-0.26919E-01
	0.17550E-07	-0.75640E-01	0.19662E-02	0.23614E-04	-0.20892E-01	0.31096E-02	0.24031E-03	-0.10094E-01
	0.69180E-01	0.19794E 00	0.43855E-05	-0.12863E 00	-0.55963E-02	0.22584E-02	-0.68618E-01	-0.14515E-02
	0.10601E-02	0.78513E-02	-0.90452E-01	-0.29503E-05	0.93705E-01	0.60121E-01	0.75991E-01	0.37334E-05
	-0.33475E-01	-0.31418E-01	-0.15443E-01	-0.72437E-03	0.15362E-01	0.39388E-02	-0.22088E-01	-0.22109E-01
	-0.13041E-01	0.18126E 00	-0.10482E 00	0.84052E-02	-0.78777E 00	-0.11484E 00	-0.10815E 00	-0.52869E-02
	-0.19125E-01	0.32423E-01	-0.21002E-01	-0.55145E-01	0.13660E 00	-0.10390E-02	-0.10150E-01	-0.10310E-02
	-0.23070E-01	0.11395E 00	0.36597E 00	-0.80850E-02	0.25836E-02	0.45876E-01	0.29908E-01	0.16389E-02
	0.23329E-03	0.48266E-02	-0.83091E-02	0.92037E-02	0.45574E-02	-0.21011E-01	-0.28100E-02	0.12987E-01
	-0.50114E-02	-0.17196E-01	0.58283E 00	0.12465E-01	-0.10211E-01	0.13311E 00	0.60074E 00	-0.17598E 00
	-0.21643E 00	-0.73533E-01	0.69052E-02	0.55850E 00	-0.70775E 00	0.42073E 00	0.47214E 00	0.11412E 01
	-0.90266E 00	-0.24650E 01						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
61	0.95492E-11	0.78259E-10	0.35337E-09	-0.35500E-04	0.19636E-04	0.12486E-04	-0.14250E-01	-0.35557E 01
	-0.15442E 00	0.12347E 01	0.74340E 00	-0.44306E-01	0.12758E 00	0.65143E 01	0.23940E-05	-0.36401E 02
	-0.14691E-01	0.37690E 01	-0.39619E 02	0.54114E 01	0.26739E-04	0.55751E 02	0.45517E 02	-0.32002E 00
	0.82876E-05	0.18671E 02	-0.82761E 00	0.69361E-01	0.41722E 01	0.17979E 01	0.53427E 00	-0.11685E 02
	-0.10939E 02	0.27846E 01	-0.38960E-04	-0.55794E 02	-0.62835E 01	0.61925E 00	0.45923E 00	-0.33336E 00
	0.68352E 01	0.99430E 00	-0.55324E 02	-0.15412E-02	-0.62484E 01	-0.45943E 01	0.32170E 02	0.14120E-02
	-0.82487E 00	0.60515E 01	0.60993E 01	0.18487E 02	-0.75057E 00	-0.44280E 01	-0.48881E 00	0.75691E 01
	0.18040E 01	-0.42525E 02	0.35109E 02	-0.78777E 00	0.44264E 03	0.31114E 02	0.30246E 02	-0.24383E 00
	-0.10738E 02	-0.95080E 01	0.66958E 01	0.12977E 02	-0.25939E 02	0.98213E 00	0.71334E 00	0.14442E 01
	0.28116E 01	-0.40814E 02	-0.36900F 02	-0.13892E 02	-0.36426E 01	-0.28997E 01	-0.67977E 01	-0.31909E 00
	-0.18581E 00	0.28098E 01	0.31185E 01	-0.32207E 01	-0.21881E 01	0.27801E 02	-0.30310E 01	0.16060E 02
	0.65548E 00	0.54492E 01	-0.77039E 03	0.86490E 01	-0.86696E 01	0.36226E 02	-0.56093E 02	0.16552E 02
	0.16924E 03	0.10274E 02	-0.16191E 00	-0.74975E 02	0.21158F 02	-0.15336E 03	-0.31412E 03	-0.31035E 03
	0.18692E 03	0.44728F 03						
62	0.39406E-10	0.14489E-09	0.34601E-10	-0.12951E-04	-0.78613E-05	-0.48378E-05	-0.10469E-01	0.63287E-01
	-0.18809E 00	-0.55131E 01	0.79043E-01	0.65819E-01	-0.61955E 00	-0.97545E-01	-0.15911E-04	0.37290E 00
	-0.84057E-02	-0.35216F-02	-0.64834E 01	-0.17173E 01	-0.12603F-04	0.22320E 00	-0.57886E 01	-0.22139E 01
	0.55174E-05	-0.41906E 01	-0.49650E 00	0.31713E-02	-0.16003E 02	0.37225E 00	-0.11321E 01	-0.63131E 00
	-0.78142E 01	-0.13781E 02	-0.17164E-04	-0.56136E 00	-0.13702E-01	-0.16164E 00	-0.10341E 01	0.34774E 00
	0.60924E 00	0.29051E 00	-0.43795E 00	-0.30896E-04	0.12919F 00	0.20600E 01	0.25865E 00	-0.17149E-06
	0.12535E 01	0.25210F 01	0.44346E 01	0.11926E 01	-0.22724E 00	-0.79803E-01	-0.88607E 00	0.10731E 01
	0.37089E 01	-0.66102E 02	0.38212F 01	-0.11484E 00	0.31114F 02	0.43218E 02	-0.18955E 01	-0.65059E 00
	-0.97658E 00	0.91867E 01	-0.11076E 02	-0.10882E 02	-0.74411E 01	0.35983E 00	0.68361E 00	0.15652E-01
	0.15302E 01	-0.36038E 01	-0.14786E 02	-0.39835E-01	0.58508E-01	-0.10680E 01	-0.15567E 00	-0.42102E-01
	0.21921F-01	0.25673E 01	0.24647E-01	-0.22574E 01	-0.30777E-01	0.95727E-01	0.42106E 00	0.46423F 00
	-0.39830E 01	-0.21761E 02	-0.79887E 01	-0.70321E-01	-0.42027F-04	-0.36539E 01	-0.98412E 02	-0.37268E 01
	0.24486E 02	0.11197E 02	-0.37515E 00	-0.93026E 02	0.20645E 02	-0.43179F 02	0.11372E 03	-0.56753E 02
	0.25413E 02	0.22540E 03						
63	-0.39592E-10	0.99901E-10	0.55941E-09	-0.46483E-05	0.27423E-04	-0.13682F-04	-0.67207E 00	-0.60483E 00
	-0.31834E 00	0.44717E 00	0.93491E 00	0.69544E-01	0.29483E-01	0.83969E 00	0.26651E-05	0.11602E 02
	-0.18605E 01	0.10622E 00	-0.55019E 01	0.21511E 02	0.40604E-05	0.23510E 02	0.48678E 01	-0.97801E 00
	0.84120E-05	0.43708E 01	-0.88485E 00	0.91007E-02	0.12876E 01	0.27144E 01	-0.92704E 00	-0.18812E 01
	-0.10255E 00	0.46021E 01	-0.16159E-04	-0.20003E 02	-0.59670E 00	-0.18821E 01	-0.26741E-01	0.21202E 01
	0.34356E 00	0.10311E-01	-0.19330E 02	-0.55870E-03	-0.20403E 01	-0.25561E 01	0.11156E 02	0.47849E-03
	0.12008E 02	0.61318E 01	-0.37855E 01	-0.44128F 01	0.13392E 00	0.17812E 01	0.50726E 01	0.19294E 02
	0.79175E 00	0.12236F 02	0.78868E 02	-0.10815E 00	0.30246E 02	-0.18956E 01	0.80096E 02	-0.25145E 01
	-0.28707E 01	-0.69280F 00	-0.77390E 01	0.11937E 02	0.10467E 01	-0.10622E 01	-0.21223E 01	0.15667E 01
	-0.16586E 01	-0.20251F 02	0.25233E 01	-0.38668E 00	-0.63461E 01	0.18405E 01	-0.45138E 01	-0.83593E-01
	-0.44959E 00	0.10439E 01	0.63615E 00	-0.11170E 01	-0.39441E 00	0.19867E 01	-0.38717E 01	0.25149E 01
	0.16190E 01	0.14401E 01	-0.12168E 03	-0.69039E 01	-0.43889E 01	-0.10378E 03	-0.13350E 02	0.18025E 03
	0.12175E 02	-0.50361E 00	0.47406E 00	-0.69025E 00	-0.53185E 02	-0.17663E 03	-0.81577E 02	-0.19921E 03
	0.22007E 03	-0.22216F 03						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
67	0.39839E-12	0.17357E-12	-0.69996E-10	-0.29460E-05	-0.72981E-05	-0.20003E-04	0.75219E-01	-0.11558E 01
	-0.31058E 01	0.42809E 01	0.58069E 00	0.81984E 00	0.44154E 00	0.12696E 01	0.92052E-05	-0.53855E 00
	0.34932E 00	-0.13511E-01	-0.18307E 01	0.36159E-01	0.15633E-04	-0.14265E 01	0.34658E-01	0.42627E 01
	-0.61487E-05	-0.35334E 00	0.24429E 00	0.86940E-02	0.12928E 02	0.11298E 01	-0.86293E 01	-0.28228E 01
	-0.17727E 01	0.14975E 02	0.15167E-04	0.10146E 01	0.68530E-02	0.12440E 00	0.46908E 00	0.17993E 01
	0.11163E 01	0.26552E 00	0.16109E 01	0.35811E-04	0.14342E 01	-0.16300E 00	-0.67829E 00	-0.30508E-04
	0.12755E 02	-0.87836E 00	-0.85C3CE C0	0.23643E 01	-0.20658E 0C	-0.81186E 00	0.17928E 01	-0.38913E 01
	0.33201E 00	0.72953E 01	-0.14006E 02	-0.21002E-01	0.66958E 01	-0.11076E 02	-0.77390E 01	-0.60698E 00
	-0.19959E 01	0.16668E 00	0.22087E C2	0.16625E 02	-0.40835E 01	0.47526E 00	0.48618E 00	-0.14142E 00
	0.22863E 00	0.19298E 01	0.47758E 01	0.11985E 00	0.81992E 00	-0.41885E-01	0.57675E 00	-0.29415E-01
	0.63595E-01	0.15008E 00	0.82477E-01	-0.64950E-01	-0.97794E-01	0.73213E-01	-0.29814E-01	0.39677E 01
	0.16165E 02	0.14213E 02	-0.32548E C2	0.10146E 01	0.15554E 01	-0.46057E 02	-0.11043E 02	-0.28222E 02
	-0.10921E 02	0.18530E 01	0.26567E-01	-0.14340E 02	-0.93686E 00	0.49773E 02	0.25697E 02	-0.23384E 02
	-0.25136E 02	0.66447E 02						
68	0.25192E-10	0.52509E-10	0.66060E-10	-0.24979E-05	0.40244E-05	0.29506E-04	-0.13186E 00	0.42033E 00
	-0.42619E 01	0.49230E 01	0.27550E-01	0.11397E 01	0.51481E 00	-0.42260E 00	0.79355E-05	0.45937E 00
	-0.38163E 00	0.89123E-02	-C.29415E C1	-0.10034E 01	0.15531E-04	0.63863E 00	0.59725E 00	-0.57499E 01
	0.90905E-05	0.64756E 00	-0.40949E 00	-0.28475E-02	0.14572E 02	-0.44031E 00	-0.11954E 02	0.19826E 01
	0.75153E 01	0.17945E 02	0.10905E-04	-0.38083E 00	-0.83930E-01	-0.18946E 00	-0.12943E 01	-0.17449E 01
	-0.24176E 00	0.38489E 00	-0.81210E 00	0.14476E-04	-0.10961E 01	0.81765E 00	0.23511E 00	0.24026E-04
	-0.54722E 01	0.39190E 00	-0.16327E 01	-0.19955E 01	0.60600E 00	0.63049E 00	-0.94213E 00	0.45479E 01
	0.46457E-01	0.10588E 01	0.16977E 02	-0.55145E-01	0.12977E 02	-0.10882E 02	0.11937E 02	0.54277E 00
	0.22699E 01	0.24389E 01	0.16625E 02	0.31723E 02	-0.23762E 01	-0.41332E-01	-0.23946E 00	0.27556E 00
	-0.25325E 00	-0.10687E 01	0.34909E 01	-0.58551E-01	-0.97270E 00	0.12466E 00	-0.42925E 00	-0.43907E-01
	-0.72606E-01	0.67000E 00	0.44863E-01	-0.69805E 00	0.71324E-02	-0.29546E 00	-0.99582E 00	-0.24658E 01
	0.21304E 02	0.15600E 02	0.41293E 02	-0.12293E 01	-0.15973E 01	0.55917E 02	-0.22503E 02	0.27202E 02
	0.20615E 02	0.17539E 01	-0.96446E-01	-0.11063E 02	0.20141E 02	-0.69842E 02	0.16553E 02	-0.44094E 02
	0.32847E 02	0.12520E 02						
69	-0.15210E-10	-0.50691E-10	-0.62960E-11	0.38160E-05	0.21030E-06	-0.28635E-05	0.37644E-01	0.14651E 01
	0.95253E-01	-0.40420E 00	-0.43938E 00	-0.19551E-01	-0.10236E 00	-0.11773E 01	-0.19603E-04	0.53001E 01
	-0.90767E-02	0.62273E 00	0.56764E 01	0.21190E 01	-0.32438E-04	0.88449E 01	-0.32724E 01	0.45503E 00
	-0.20352E-05	0.73450E C0	0.12731E 00	-0.18201E-01	-0.15667E 01	-0.11396E 01	0.26071E 00	0.41186E 01
	0.32146E 01	0.12248E 01	-0.39988E-04	-0.86286E 01	-0.11363E 01	0.22737E 00	0.10133E 00	-0.17531E 00
	-0.90712E 00	-0.38372E 00	-C.82068E 01	-C.27510E-03	0.25141E 00	-0.64855E 00	0.50924E 01	0.20485E-03
	-0.10147E 01	-0.83939E 00	-0.15302E 01	-0.42453E 01	0.10428E 00	0.10865E 01	0.19304E 00	0.14357E 00
	-0.27094E 01	0.16911E 02	0.11981E 01	-0.13660E 00	-0.25909E 02	-0.74411E 01	0.16467E 01	0.57557E 00
	0.38443E 01	0.22946E 01	-0.40835E 01	-0.23762E 01	0.78054E 01	-0.12516E 00	-0.85915E 00	0.22866E 00
	-0.11947E 01	-0.54432E 00	0.10062E 02	-0.23465E 01	-0.41001E 00	0.13574E 01	0.79189E-01	0.67207E-02
	-0.32862E-01	-0.58998E 00	-0.62469E-01	0.74233E 00	0.37436E-01	-0.13896E 01	0.17655E 01	-0.55445E 01
	-0.78908E 00	-0.16496E 01	0.33171E C2	0.20247E 01	-0.29234E 01	0.19745E 01	0.38415E 02	0.10797E 02
	-0.14422E 02	-0.40918E 01	0.82117E-01	0.37202E 02	-0.94051E 01	0.91969E 01	-0.24280E 02	0.23596E 02
	-0.72408E 01	-0.14006E 03						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
70	0.23911E-11	0.65504E-11	-0.97193E-11	-0.69010E-06	-0.11390E-05	-0.11740E-05	0.29819E 00	0.15617E-01
	-0.10694E-01	0.55963E-01	-0.90711E-01	0.42725E-02	-0.83522E-03	0.26167E-01	-0.24083E-05	0.13445E 02
	0.84908E 00	0.85988E-01	-0.16662E 00	0.25379E 01	-0.56010E-05	0.20865E 02	-0.98988E-01	0.25395E 00
	-0.57560E-06	-0.12504E 00	0.14964E-01	-0.17476E-02	0.15888E 00	-0.30332E 00	-0.19589E-01	0.38341E-01
	-0.59400E 00	0.25920E 00	-0.26316E-04	-0.20929E 02	-0.20650E-01	0.14737E 01	0.28330E 00	-0.14903E 00
	0.21480E 00	-0.23927E-01	-0.19793E 02	-0.59202E-03	0.49224E 00	-0.22518E 00	0.12183E 02	0.52889E-03
	-0.76421E 00	-0.54669E 00	0.30906E 00	0.83102E 00	-0.82938E-01	-0.29709E 00	-0.30284E 00	-0.14380E 01
	-0.76794E-02	-0.10600E 01	-0.92570E-01	-0.10390E-02	0.98213E 00	0.35983E 00	-0.10622E 01	0.19499E 00
	0.13283E 00	-0.11797E 00	0.47526E 00	-0.41332E-01	-0.12516E 00	0.40570E 00	-0.49691E 00	0.50891E 00
	-0.46014E 00	-0.98194E 01	0.25147E 01	-0.54474E 00	0.20298E 01	0.41938E 00	-0.66849E 00	-0.32677E-01
	-0.18616E-01	0.19477E 00	0.40695E 00	-0.12042E 00	-0.29261E 00	-0.62078E 00	0.39056E 00	-0.44138E-01
	0.98675E-01	0.22130E 00	0.15182E 01	0.37623E 01	0.21282E 01	-0.23583E 00	-0.13333E 01	-0.24796E 01
	0.20810E 01	0.18948E 00	-0.26719E-01	-0.15928E 01	0.20710E 01	-0.85771E 00	0.32962E 01	-0.88691E 01
	-0.38518E 01	0.31419E 01						
71	0.31664E-12	-0.96197E-11	-0.10720E-10	-0.41354E-06	-0.37607E-06	0.21602E-05	-0.40087E 00	-0.27231E 00
	0.84751E-02	-0.38525E-01	0.15037E 00	-0.49018E-02	0.57502E-01	-0.49060E 00	0.17611E-04	-0.21398E 02
	-0.11007E 01	-0.11803E 01	-0.10530E 01	-0.43671E 01	0.28964E-04	-0.33206E 02	0.97253E-01	-0.35498E 00
	0.90340E-06	-0.13733E 00	0.33498E-02	0.68754E-02	-0.60795E-01	0.47387E 00	0.11750E-01	-0.43917E 00
	0.40973E 00	-0.54735E 00	0.61548E-04	0.33228E 02	0.19075E 01	-0.21750E 01	-0.21752E 00	0.17806E 00
	-0.75059E 00	0.18407E 00	0.31482E 02	0.96126E-03	-0.70818E 00	0.36384E 00	-0.19348E 02	-0.82799E-03
	0.95499E 00	0.50594E 00	-0.10210E 00	-0.19455E 01	0.46759E-01	0.85735E 00	0.30527E 00	0.95347E 00
	0.10337E 01	-0.17330E 01	-0.36459E 01	-0.10158E-01	0.71334E 00	0.68361E 00	-0.21223E 01	-0.25137E 00
	-0.47947E 00	-0.15540E 00	0.48618E 00	-0.23946E 00	-0.85915E 00	-0.49691E 00	0.99975E 00	-0.81323E 00
	-0.10294E 01	0.13809E 02	-0.69737E 01	0.44512E 01	-0.23179E 01	-0.10635E 01	0.98260E 00	0.63039E-01
	0.49791E-01	-0.35055E 00	-0.53499E 00	0.15357E 00	0.38779E 00	0.96020E 00	-0.63333E 00	0.58724E 00
	-0.70042E-01	-0.13715E 00	-0.33348E 01	-0.79231E 01	0.14374E 01	-0.30123E 00	-0.36001E 01	-0.67483E 01
	-0.14856E 01	0.62875E 00	0.31484E-01	-0.34530E 01	0.36841E 00	0.93670E 01	0.75294E 01	0.17406E 02
	-0.37166E 01	0.26606E 02						
72	0.16734E-11	0.10370E-10	0.73458E-11	-0.70423E-06	-0.36416E-06	-0.22213E-05	0.38296E 00	0.14014E-01
	-0.16196E-01	0.20979E-01	-0.13235E 00	0.67326E-02	-0.58501E-02	0.19972E-01	-0.31163E-05	0.19654E 02
	0.10864E 01	0.79018E-01	-0.27441E 00	0.39957E 01	-0.76136E-05	0.30601E 02	0.27242E-01	0.27959E 00
	-0.46431E-06	0.73167E-01	-0.96509E-02	-0.20851E-02	0.47408E-01	-0.43411E 00	-0.37704E-01	0.33823E-01
	-0.70865E 00	0.28157E 00	-0.37932E-04	-0.30628E 02	0.25587E-01	0.19278E 01	0.30838E 00	-0.26649E 00
	0.24823E 00	-0.36125E-01	-0.29025E 02	-0.86523E-03	0.52560E 00	-0.42268E 00	0.17819E 02	0.77404E-03
	-0.13612E 01	-0.51708E 00	0.18210E 00	0.81107E 00	-0.75742E-01	-0.30521E 00	-0.45267E 00	-0.12024E 01
	-0.25642E-01	0.23533E 00	0.31295E 01	-0.10310E-02	0.14442E 01	0.15652E-01	0.15667E 01	0.26728E 00
	0.85854E-01	0.17239E-01	-0.14142E 00	0.27556E 00	0.22866E 00	0.50891E 00	-0.81323E 00	0.78997E 00
	-0.73959E 00	-0.14870E 02	0.33485E 01	-0.60310E 00	0.24707E 01	0.64797E 00	-0.11900E 01	-0.47799E-01
	-0.43821E-01	0.22257E 00	0.60621E 00	-0.14840E 00	-0.42095E 00	-0.91628E 00	0.57036E 00	-0.39883E-01
	0.94399E-01	0.83539E-01	0.31089E 01	0.47605E 01	0.28458E 01	0.16824E 00	0.42412E 00	0.43907E 01
	0.36618E 01	-0.10558E 00	-0.14792E-01	0.76212E 00	0.12182E 01	-0.92738E 01	-0.16067E 01	-0.20262E 02
	0.32935E-01	-0.11577E 02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
73	0.22060E-11	-0.71283E-11	-0.73051E-11	-0.15834E-05	-0.78755E-06	0.13445E-05	-0.38327E 00	-0.22283E 00
	-0.13598E-01	-0.17567E 00	0.13315E 00	0.24086E-02	0.11719E 00	-0.41312E 00	0.37262E-04	-0.18701E 02
	-0.10601E 01	-0.98783E 00	-0.28094E 01	-0.40225E 01	0.57011E-04	-0.29023E 02	0.24737E 00	-0.41850E 00
	0.10260E-05	-0.89903E-01	-0.17076E-01	0.58558E-02	-0.44462E 00	0.43898E 00	-0.69191E-01	-0.37574E 00
	0.19912E 00	-0.12445E 01	0.85126E-04	0.29047E 02	0.15757E 01	-0.20604E 01	0.59242E-01	0.37931E-01
	-0.65441E 00	0.41840E 00	0.27411E 02	0.87266E-03	-0.90375E 00	0.17206E 00	-0.16910E 02	-0.70467E-03
	0.29260E 00	0.50953E 00	-0.82757E-01	-0.17521E 01	0.23261E-01	0.77390E 00	0.15110E 00	0.10319E 01
	0.93209E 00	-0.31529E 01	-0.28704E 01	-0.23070E-01	-0.28116E 01	0.15302E 01	-0.16586E 01	-0.23711E 00
	-0.40639E 00	0.34766E-01	0.22803E 00	-0.25325E 00	-0.11947E 01	-0.46014E 00	0.10294E 01	-0.73959E 00
	0.12543E 01	0.10864E 02	-0.12736E 02	0.37795E 01	-0.23487E 01	-0.16765E 01	0.40840E 00	0.61509E-01
	0.45974E-01	-0.59403E 00	-0.36311E 00	0.19180E 00	0.28378E 00	0.10137E 01	-0.56564E 00	-0.49227E 00
	-0.98136E-01	-0.68592E 00	-0.55572E 01	-0.72004E 01	0.81590E 00	-0.11745E 00	-0.66677E 01	-0.57079E 01
	0.43021E-01	0.10754E 01	0.71098E-01	-0.48767E 01	0.17023E 01	0.58664E 01	0.12176E 02	0.10744E 02
	-0.75127E 00	0.39148E 02						
74	-0.35647E-10	-0.13964E-09	-0.99349E-10	0.24548E-04	0.14578E-04	0.47001E-04	-0.12900E 02	0.10037E 01
	0.33634E 00	0.78402E 00	0.12481E 01	-0.11878E 00	-0.53742E 00	0.30655E 01	-0.14949E-03	-0.35688E 03
	-0.37918E 02	0.49822E 01	0.20705E 02	-0.66199E 02	-0.15890E-03	-0.55316E 03	-0.20878E 01	-0.38416E 01
	0.64064E-05	-0.16640E 01	-0.67040E-01	0.11321E-01	0.22065E 01	0.52293E 01	0.99978E 00	0.10040E 01
	0.16771E 02	0.22031E 01	0.39264E-03	0.55488E 03	-0.15265E 02	-0.66715E 02	-0.74420E 01	0.49625E 01
	-0.14500E 01	-0.15769E 01	0.52628E 03	0.15349E-01	-0.57114E 01	0.80602E 01	-0.32232E 03	-0.14175E-01
	0.23070E 02	0.14356E 02	-0.48649E 01	-0.12032E 02	0.17020E 01	0.44585E 01	0.10549E 02	0.42637E 02
	-0.34484E 01	0.99642E 00	-0.60385E 02	0.11395E 00	-0.40814E 02	-0.36838E 01	-0.20251E 02	-0.20251E 01
	0.27027E 00	-0.15490E 01	0.19258E 01	-0.10687E 01	-0.54432E 00	-0.98194E 01	0.13809E 02	-0.14670E 02
	0.10864E 02	0.31532E 03	-0.10127E 02	-0.75344E 01	-0.11148E 03	-0.23446E 01	0.19003E 02	0.42141E 00
	0.82308E 00	-0.78473E 00	-0.11634E 02	0.15752E 01	0.81312E 01	0.15260E 02	-0.60881E 01	-0.13656E 01
	-0.04787E 00	0.30515E 01	-0.50925E 02	-0.14155E 03	-0.12964E 03	0.51923E 00	0.31369E 01	-0.58303E 02
	-0.71070E 02	-0.10246E 01	-0.19049E 00	-0.12206E 02	-0.27501E 02	0.14365E 03	-0.79403E 01	0.37964E 03
	-0.57941E 02	0.84691E 02						
75	-0.41228E-10	0.32912E-10	0.18443E-10	0.26596E-04	0.13473E-04	0.88031E-05	0.26269E 01	-0.51484E 00
	0.40588E 00	0.37729E 01	-0.42104E 00	-0.12775E 00	-0.23625E 01	-0.15171E 01	-0.74804E-03	0.61206E 02
	0.77742E 01	-0.28069E 01	0.56758E 02	0.18621E 02	-0.10874E-02	0.95319E 02	-0.54076E 01	0.25544E 01
	-0.41321E-05	-0.21917E 01	0.25959E 00	0.51201E-02	0.10288E 02	-0.15970E 01	0.16588E 01	0.63940E-01
	0.21987E 01	0.22967E 02	-0.11722E-02	-0.95652E 02	0.61768E 01	0.13100E 02	-0.71952E 01	0.32198E 01
	-0.52038E-01	-0.82912E 01	-0.87126E 02	-0.37840E-02	0.10390E 02	0.44263E 01	0.55433E 02	0.17689E-02
	0.14648E 02	-0.25254E 01	0.23941E 01	0.29085E 01	0.11637E 00	0.12742E 00	0.21419E 01	-0.98067E 01
	0.14868E 01	0.25656E 02	0.71573E 01	0.36597E 00	-0.36900E 02	-0.14786E 02	0.25233E 01	0.84164E 00
	0.90088E-01	-0.45613E 01	0.47758E 01	0.34909E 01	0.10062E 02	0.25147E 01	-0.69737E 01	0.33485E 01
	-0.12736E 02	-0.10127E 02	0.21815E 03	0.69879E 01	0.23154E 02	0.25321E 02	0.11268E 02	-0.32812E 00
	-0.23607E 00	0.11429E 02	-0.14443E 01	-0.35991E 01	0.39450E 00	-0.49043E 01	0.15125E 01	0.23857E 00
	0.16040E 01	0.14871E 02	-0.39527E 01	0.23812E 02	0.33677E 02	-0.93082E 01	0.62555E 02	0.82628E 01
	-0.20100E 01	-0.11504E 02	-0.16440E 01	0.12773E 02	-0.30944E 02	0.75487E 01	-0.12827E 03	0.33856E 02
	-0.47042E 02	-0.42219E 03						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
76	0.44563E-12	0.19070E-11	-0.30288E-11	-0.31699E-05	-0.44946E-05	0.32638E-07	-0.24182E 01	-0.87328E 01
	-0.11852E-02	0.94119E-02	-0.69018E-03	-0.64623E-02	0.10855E 00	-0.44416E 02	0.22021E-05	-0.46763E 01
	-0.46558E 01	-0.79045E 02	0.10083E 01	-0.96983E 01	0.43192E-05	-0.25287E 01	0.96594E 00	0.23782E 00
	0.20116E-04	0.13639E 00	-0.33667E-01	0.23649E 00	-0.24114E-01	0.33012E-02	-0.61286E-02	0.33025E 00
	0.93331E 00	-0.89061E 00	0.37982E-05	-0.21280E 00	0.13797E 03	-0.23526E 02	0.47097E 00	-0.17566E 00
	-0.43812E 02	-0.92899E 00	0.14433E 01	0.64242E-04	-0.17253E 01	0.25938E 00	-0.45775E 00	-0.17442E-04
	0.82601E-01	0.20699E 01	0.17017E 00	-0.94896E 02	0.17068E 00	0.40779E 02	-0.88189E 00	-0.59520E 01
	0.63656E 02	0.11937E 02	-0.38974E 01	-0.80850E-02	-0.13892E 02	-0.39835E-01	-0.38668E 00	-0.41587E-01
	-0.57532E 00	-0.52688E-01	0.11985E 00	-0.58551E-01	-0.23465E 01	-0.54474E 00	0.44512E 01	-0.60310E 00
	0.37795E 01	-0.75344E 01	0.68879E 01	0.27511E 03	-0.11056E 01	0.24790E 01	0.37731E 00	0.95498E 00
	0.82085E-01	-0.10568E 00	0.11198E 00	0.64122E-01	-0.52869E-01	-0.76988E 01	-0.58182E-02	-0.98829E-01
	-0.10370E-01	-0.67974E-01	0.25382E 03	-0.23980E 03	0.29327E 03	0.44185E 01	-0.16110E 01	-0.62475E 00
	-0.23031E 00	-0.24909E-01	0.93813E-02	0.50776E 00	0.55927E-01	0.26046E 00	0.52826E 00	-0.14135E 02
	-0.28348E 00	0.32971E 01						
77	-0.29292E-11	-0.95850E-11	0.97698E-11	-0.80124E-05	0.21028E-05	0.42988E-05	0.25508E 02	-0.77563E 00
	0.13362E-01	-0.74297E-02	0.10825E 01	-0.35549E-01	0.91171E-02	-0.40432E 01	0.27461E-05	-0.42061E 02
	0.76490E 02	-0.46057E 01	-0.42671E 00	0.72983E 00	0.11064E-04	-0.65697E 02	-0.51033E-01	-0.69838E 01
	0.10464E-04	0.35843E-01	0.67221E-01	0.21086E-01	-0.41410E-01	0.40213E 00	0.48683E-01	0.85993E-01
	-0.15251E 01	0.10735E 00	0.75875E-04	0.65935E 02	0.22713E 02	0.13864E 03	-0.75255E 01	0.46592E 00
	-0.16656E 01	0.10835E 00	0.65250E 02	0.19676E-02	-0.37747E 01	0.35215E 01	-0.40531E 02	-0.17661E-02
	0.63269E 01	-0.19654E 02	0.76057E 01	0.10310E 02	-0.80372E 00	-0.61356E 01	-0.77679E 01	-0.75018E 02
	-0.22756E 01	-0.27053E 01	0.47295E 02	0.25836E-02	-0.36426E 01	0.58589E-01	-0.63461E 01	-0.43614E 00
	0.36764E-01	-0.40969E-01	0.81992E 00	-0.97270E 00	-0.41001E 00	0.20298E 01	-0.23179E 01	0.24707E 01
	-0.23487E 01	-0.11148E 03	0.23154E 02	-0.11056E 01	0.27933E 03	-0.13231E 02	0.28808E 02	0.14108E 01
	-0.46827E 00	-0.61228E 00	-0.28219E 01	0.27628E 00	0.17912E 01	0.18979E 01	-0.44582E 00	-0.93498E-01
	-0.94268E-01	-0.58756E-01	0.79664E 02	0.29545E 03	0.23937E 03	0.47173E 01	-0.10778E 02	0.21339E 01
	-0.23183E 02	0.17365E 00	0.31615E-01	-0.15886E 01	-0.26683E 01	0.93342E 01	0.64262E 00	0.48461E 02
	0.54622E 01	0.19136E 02						
78	-0.38836E-11	0.93511E-11	0.81330E-11	0.30759E-05	0.14174E-05	-0.14515E-05	-0.10869E 01	-0.39999E-01
	0.25105E-01	0.26324E 00	-0.10655E 00	-0.53091E-02	-0.33595E 00	-0.25848E 00	-0.98356E-04	0.22844E 02
	-0.32717E 01	-0.55978E 00	0.70509E 01	0.46185E 01	-0.14502E-03	0.35508E 02	-0.87152E 00	0.10487E 01
	-0.13509E-05	-0.24905E 00	0.14132E-01	-0.12853E-03	0.67348E 00	-0.20461E 00	0.10490E 00	0.68028E-01
	-0.51669E 00	0.23458E 01	-0.17909E-03	-0.35643E 02	0.30728E 00	-0.61774E 01	-0.18289E 00	0.19454E 00
	-0.94883E-01	-0.10258E 01	-0.33503E 02	-0.11513E-02	0.18521E 01	0.97137E-01	0.20843E 02	0.82384E-03
	0.51191E 00	0.72136E 00	-0.20680E-01	-0.38154E 00	0.37402E-02	0.53066E 00	0.46673E 00	0.28780E 01
	0.77950E 00	0.29476E 01	-0.11774E 00	0.45876E-01	-0.28097E 01	-0.10680E 01	0.18405E 01	-0.15722E-01
	0.40001E-01	-0.75184E-01	-0.41885E-01	0.12466E 00	0.13574E 01	0.41938E 00	-0.10635E 01	0.64797E 00
	-0.16765E 01	-0.23446E 01	0.25321E 02	0.24790E 01	-0.13231E 02	0.41102E 01	-0.11244E 01	-0.14003E 00
	-0.24655E-01	0.14965E 01	0.34497E 00	-0.52278E 00	-0.30472E 00	-0.96356E 00	0.21479E 00	-0.63556E-01
	0.12427E 00	0.10143E 01	-0.92914E 01	-0.14636E 02	-0.72190E 01	-0.17615E 01	0.77711E 01	0.38469E 01
	0.31849E 01	-0.15331E 01	-0.21385E 00	0.22638E 01	-0.28345E 01	-0.53932E 01	-0.15855E 02	-0.10539E 02
	-0.31355E 01	-0.56686E 02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
79	-0.45811E-11	-0.13582E-10	-0.17706E-10	0.27280E-05	0.18616E-05	0.82821E-05	0.23464E 01	-0.71283E-01
	0.35177E-01	0.15328E 00	0.17689E 00	-0.15217E-01	-0.19077E 00	-0.46506E 00	-0.54324E-04	-0.47074E 02
	0.71077E 01	-0.53526E 00	0.50744E 01	-0.72831E 01	-0.70432E-04	-0.72971E 02	-0.66845E 00	-0.16761E 01
	0.24307E-05	-0.42589E 00	0.20698E-01	0.56606E-02	0.40698E 00	0.28506E 00	0.12354E 00	0.75184E-01
	0.21709E 01	0.90737E 00	0.25793E-05	0.73196E 02	0.23762E 01	0.12998E 02	-0.23823E 01	0.70553E 00
	-0.56173E 00	-0.52638E 00	0.70062E 02	0.19921E-02	-0.74086E 00	0.18070E 01	-0.42849E 02	-0.19138E-02
	0.38375E 01	-0.14017E 01	0.87020E 00	-0.60251E-01	0.55529E-01	-0.21596E 00	0.35057E-01	-0.67595E 01
	-0.34415E 00	-0.74183E 00	-0.97161E 00	0.29908E-01	-0.67977E 01	-0.15567E 00	-0.45138E 01	0.67615E-01
	0.23937E-01	-0.15726E 00	0.57675E 00	-0.42925E 00	0.79189E-01	-0.66849E 00	0.98260E 00	-0.11900E 01
	0.40846E 00	0.19003E 02	0.11268E 02	0.37731E 00	0.28808E 02	-0.11244E 01	0.66386E 01	0.24058E 00
	0.25284E-01	0.35993E 00	-0.17850E 01	0.27965E-01	0.11935E 01	0.16999E 01	-0.35803E 00	-0.87612E-01
	-0.24523E-01	0.59061E 00	0.77879E 01	0.26861E 02	0.22612E 02	0.63521E 00	-0.57042E 00	-0.96180E 01
	-0.10490E 02	-0.37021E 00	-0.11048E 00	-0.31580E 01	-0.32333E 01	0.19922E 02	-0.21954E 01	0.53210E 02
	-0.11787E 02	0.45812E 01						
80	-0.29810E-12	-0.49414E-12	-0.17194E-12	0.91157E-07	0.12572E-06	0.19237E-07	0.10931E 00	-0.26367E-01
	-0.30120E-03	-0.10891E-01	0.82239E-02	-0.11281E-03	0.63157E-02	-0.18145E 00	0.19397E-05	-0.15922E 01
	0.33907E 00	-0.29572E 00	0.22759E 00	-0.16762E 00	0.27485E-05	-0.24303E 01	-0.38608E-01	-0.49636E-01
	0.16522E-06	0.16235E-01	-0.17322E-02	0.96728E-03	-0.33152E-01	0.13077E-01	-0.17535E-02	0.22484E-01
	0.49495E-01	-0.35016E-01	0.52855E-05	0.24392E 01	0.58688E 00	0.56993E 00	-0.86224E-01	0.35906E-01
	-0.18503E 00	0.17084E-01	0.23513E 01	0.71996E-04	-0.14161E-01	0.60623E-01	-0.14338E 01	-0.61010E-04
	0.20525E 00	-0.67022E-01	0.38131E-01	-0.33760E 00	0.35176E-02	0.13105E 00	0.44639E-02	-0.33790E 00
	0.18934E 00	0.14579E 00	0.97249E-01	0.16389E-02	-0.31909E 00	-0.42102E-01	-0.83593E-01	-0.11020E-02
	0.14491E-01	0.28912E-01	-0.29415E-01	-0.43907E-01	0.67207E-02	-0.32677E-01	0.63039E-01	-0.47799E-01
	0.61509E-01	0.42141E 00	-0.32812E 00	0.95498E 00	0.14106E 01	-0.14003E 00	0.24058E 00	0.16624E-01
	0.10464E-03	-0.37743E-01	-0.59249E-01	0.21667E-01	0.41265E-01	0.60833E-01	-0.13048E-01	-0.29714E-01
	-0.90627E-02	-0.43991E-01	0.11386E 01	0.53186E 00	0.21268E 01	0.37106E-01	0.49226E-02	-0.36746E-01
	-0.67396E 00	-0.20026E-01	0.71827E-02	0.33030E 00	-0.25506E 00	0.49437E 00	-0.35026E 00	0.19131E 01
	-0.14864E 00	0.96247E 00						
81	-0.37409E-12	-0.17274E-11	-0.17758E-11	0.79310E-07	-0.21153E-06	0.33672E-06	-0.48770E-01	-0.77517E-03
	0.48457E-03	-0.15496E-02	-0.11300E-02	-0.15115E-03	0.13156E-02	-0.49971E-02	0.42178E-06	-0.18416E 00
	-0.14242E 00	-0.11050E-01	0.55385E-01	-0.69839E 00	0.64949E-06	-0.48348E 00	-0.11631E-01	-0.75528E-01
	0.25964E-08	-0.21865E-01	0.12350E-01	0.16237E-03	-0.29857E-02	0.22149E-02	0.25699E-02	0.45253E-03
	0.16633E 00	-0.47567E-01	0.10642E-05	0.38392E 00	-0.24545E-02	-0.26787E 00	-0.74640E-01	0.80678E-01
	-0.18325E-01	0.68030E-02	0.31502E 00	0.10308E-04	-0.85861E-01	0.83255E-01	-0.20939E 00	-0.91438E-05
	0.46050E 00	0.53960E-01	-0.10643E-01	-0.49633E-01	0.15402E-01	0.18021E-01	0.10022E 00	0.45912E-01
	0.13433E-01	-0.11255E 00	-0.62657E 00	0.23329E-03	-0.18581E 00	0.21921E-01	-0.44959E 00	0.44586E-02
	0.51287E-02	-0.42814E-02	0.63595E-01	-0.72606E-01	-0.32862E-01	-0.18616E-01	0.49791E-01	-0.43871E-01
	0.45974E-01	0.82308E 00	-0.23687E 00	0.82085E-01	-0.46827E 00	-0.24655E-01	0.25284E-01	0.10464E-03
	0.73206E-02	-0.14566E-01	-0.27011E-01	0.11763E-01	0.18512E-01	0.12019E-01	-0.20422E-02	-0.60722E-03
	-0.34015E-02	-0.54472E-02	0.19369E 00	-0.62527E 00	-0.37155E 00	-0.10617E 00	0.58091E-02	-0.11216E 01
	-0.13212E 00	0.34678E-01	0.15621E-02	-0.27324E 00	-0.25350E 00	0.17951E 01	0.51040E 00	0.14919E 01
	-0.93908E 00	0.21544E 01						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
82	0.19698E-11	0.18333E-10	0.13683E-10	-0.10303E-06	0.39361E-06	-0.11971E-05	-0.20802E-01	0.19408E-02
	0.91258E-02	0.97631E-01	-0.10453E-01	-0.21797E-02	-0.19382E 00	0.52610E-02	-0.54501E-04	0.62035E 01
	-0.67416E-01	0.70859E-02	0.32780E 01	0.12354E 01	-0.78557E-04	0.95316E 01	-0.13341E 00	-0.21988E-01
	0.42635E-06	-0.27918E 00	-0.66110E-01	0.36905E-03	0.24599E 00	-0.35915E-01	0.39304E-01	0.17670E-01
	-0.70693E 00	0.10959E 01	-0.87715E-04	-0.96336E 01	-0.37905E-01	-0.16719E 00	-0.48327E 00	0.24842E 00
	0.16082E 00	-0.45449E 00	-0.89331E 01	-0.35007E-03	0.71598E 00	0.52100E 00	0.55979E 01	0.19710E-03
	0.10822E 01	0.41735E 00	0.64684E 00	0.64418E 00	-0.17070E-01	-0.40156E-01	0.16641E 00	0.30467E 00
	0.41293E 00	-0.50243E 01	0.16680E 01	0.48266E-02	0.28098E 01	0.25673E 01	-0.10439E 01	-0.47647E-02
	0.60645E-01	-0.37001E 00	0.15008E 00	0.67000E 00	-0.58998E 00	0.19477E 00	-0.35055E 00	0.22257E 00
	-0.59403E 00	-0.78473E 00	0.11429E 02	-0.10568E 00	-0.61228E 00	0.14965E 01	0.35993E 00	-0.37743E-01
	-0.14566E-01	0.10507E 01	-0.25176E-01	-0.53847E 00	-0.21023E-01	0.53788E-01	0.20491E-01	-0.92025E-02
	0.45030E-01	0.36965E 00	-0.11897E 02	-0.24980E 00	-0.13620E 00	-0.10887E 01	-0.98279E 01	0.17497E 01
	0.49626E 01	0.67877E 00	-0.15247E 00	-0.11140E 02	0.71074E 00	-0.87259E 01	0.51703E 01	-0.96944E 01
	0.27089E 01	-0.80978E 01						
83	0.43180E-11	0.50874E-11	-0.30471E-11	-0.12357E-05	-0.94396E-06	-0.30252E-06	-0.13193E 00	0.91540E-03
	-0.15437E-01	-0.21704E-01	-0.14509E-01	0.50377E-02	0.49705E-01	-0.15711E-02	0.14071E-04	0.21378E 02
	-0.42186E 00	-0.26654E-01	-0.15567E 01	0.36839E 01	0.16828E-04	0.33107E 02	0.19291E 00	0.57300E 00
	-0.82641E-06	0.80482E-01	0.35153E-02	-0.14281E-02	-0.51022E-01	-0.39501E-01	-0.58775E-01	-0.75356E-03
	-0.10918E 01	-0.17192E 00	-0.16387E-04	-0.33217E 02	-0.68335E-01	-0.85137E 00	0.76947E 00	-0.75184E 00
	0.16031E 00	0.11866E 00	-0.31608E 02	-0.91258E-03	0.42241E 00	-0.63172E 00	0.19376E 02	0.85854E-03
	-0.40566E 01	-0.26841E 00	0.45655E-01	0.71810E 00	-0.13550E 00	-0.15476E 00	-0.87493E 00	0.02263E-01
	0.18043E 00	0.21618E 00	0.91589E 00	-0.83091E-02	0.31185E 01	0.24647E-01	0.63615E 00	-0.12978E 00
	0.32422E-01	0.60170E-01	0.82477E-01	0.44863E-01	-0.62469E-01	0.40695E 00	-0.53499E 00	0.60621E 00
	-0.36311E 00	-0.11634E 02	-0.14443E 01	0.11198E 00	-0.28219E 01	0.34497E 00	-0.17850E 01	-0.59249E-01
	-0.27011E-01	-0.25176E-01	0.68069E 00	-0.49545E-01	-0.46378E 00	-0.42975E 00	0.35798E-01	0.21355E-02
	0.46226E-01	-0.90630E-01	-0.81894E 01	-0.16563E 01	-0.10489E 01	0.39876E 00	0.29650E 00	0.10890E 01
	0.35867E 01	0.51536E-01	0.11100E-01	0.13867E 01	0.33979E 01	-0.55528E 01	0.12135E 01	-0.17128E 02
	0.62898E 00	-0.22537E 01						
84	-0.37710E-11	-0.16725E-10	-0.11061E-10	0.80795E-06	-0.20856E-07	0.76088E-06	0.42011E-02	-0.15190E-02
	-0.22137E-02	-0.37024E-01	0.46067E-02	0.40574E-03	0.72060E-01	-0.36274E-02	0.20368E-04	-0.39117E 01
	0.15760E-01	-0.54580E-02	-0.64607E 00	-0.82996E 00	0.29192E-04	-0.60712E 01	-0.21516E 00	0.68914E-01
	-0.47846E-06	0.12672E 00	0.65799E-01	-0.15221E-03	-0.98101E-01	0.19565E-01	-0.89841E-02	-0.81320E-02
	0.66276E 00	-0.40730E 00	0.35354E-04	0.61071E 01	0.21734E-01	0.46607E-01	0.11628E 00	0.55643E-01
	-0.10610E 00	0.13703E 00	0.57277E 01	0.19981E-03	-0.25375E 00	-0.21105E 00	-0.35429E 01	-0.13761E-03
	0.43578E 00	-0.31725E 00	-0.43959E 00	-0.28059E 00	0.27460E-01	0.12336E-01	0.13410E 00	-0.32013E 00
	-0.32231E 00	0.45126E 01	-0.17683E 01	0.92037E-02	-0.32207E 01	-0.22574E 01	-0.11170E 01	-0.45581E-02
	-0.46828E-01	0.31933E 00	-0.64950E-01	-0.69805E 00	0.74233E 00	-0.12042E 00	0.15357E 00	-0.14840E 00
	0.19186E 00	0.15752E 01	-0.35991E 01	0.64122E-01	0.27628E 00	-0.52278E 00	0.27965E-01	0.21667E-01
	0.11763E-01	-0.53847E 00	-0.49545E-01	0.34473E 00	0.46799E-01	0.94436E-02	-0.10301E-01	0.47123E-02
	-0.22664E-01	-0.14071E 00	0.48483E 01	0.33614E-01	0.33144E-01	0.52716E-01	0.96436E 01	-0.23791E 01
	-0.38577E 01	-0.88907E 00	0.75834E-01	0.92386E 01	-0.19309E 01	0.86889E 01	-0.72088E 01	0.10359E 02
	-0.45005E 01	-0.15992E 02						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
85	-0.18473E-11	-0.22504E-11	0.99478E-12	0.92337E-06	0.64012E-06	0.11364E-05	0.74251E-01	-0.70508E-03
	0.13152E-01	0.95730E-02	0.10030E-01	-0.41664E-02	-0.27450E-01	0.64303E-03	-0.72453E-05	-0.15694E 02
	0.24140E 00	0.16175E-01	0.95124E 00	-0.26325E 01	-0.78415E-05	-0.24269E 02	-0.98902E-01	-0.41480E 00
	0.59652E-06	-0.44407E-01	-0.29838E-02	0.96806E-03	0.21165E-01	0.29555E-01	0.44257E-01	-0.35507E-03
	0.78952E 00	0.63977E-01	0.16385E-04	0.24369E 02	0.42146E-01	0.50221E 00	-0.50926E 00	0.32204E 00
	-0.11844E 00	-0.62940E-01	0.23174E 02	0.67541E-03	-0.34656E 00	0.41998E 00	-0.14214E 02	-0.62616E-03
	0.17193E 01	0.16260E 00	-0.48923E-01	-0.56039E 00	0.77141E-01	0.12160E 00	0.39475E 00	0.39906E-01
	-0.13308E 00	-0.96235E-01	-0.57620E 00	0.45574E-02	-0.21881E 01	-0.30777E-01	-0.39441E 00	0.90111E-01
	-0.27468E-01	-0.36389E-01	-0.97794E-01	0.71324E-02	0.37436E-01	-0.29261E 00	0.38779E 00	-0.42895E 00
	0.28378E 00	0.81312E 01	0.39450E 00	-0.52869E-01	0.17912E 01	-0.30472E 00	0.11935E 01	0.41265E-01
	0.18512E-01	-0.21023E-01	-0.46378E 00	0.46799E-01	0.32004E 00	0.27144E 00	-0.26200E-01	-0.13166E-02
	-0.46223E-01	0.44117E-01	0.71459E 01	0.93048E 00	0.57668E 00	0.22841E 00	-0.25599E 00	-0.47619E 00
	-0.27032E 01	-0.38030E-01	-0.64907E-02	-0.65905E 00	-0.15952E 01	0.35444E 01	-0.71118E 00	0.11908E 02
	-0.21153E 00	0.17501E 01						
86	-0.18062E-10	-0.10174E-09	0.51991E-10	-0.78926E-05	0.14600E-05	0.18082E-05	0.71157E-01	0.22092E 00
	0.28918E-03	-0.39789E-01	0.18430E-03	-0.17197E-04	0.33451E-01	0.12209E 01	0.10812E-04	-0.16031E 02
	0.17249E 00	0.21354E 01	-0.19192E 00	-0.24532E 01	0.17772E-04	-0.24866E 02	0.36536E 00	-0.46879E 00
	0.16237E-05	0.24003E 00	-0.94761E-01	0.63840E-02	-0.10734E 00	0.18703E-01	0.21642E-02	-0.41740E-01
	0.91998E 00	-0.29821E 00	0.42603E-04	0.25064E 02	-0.35194E 01	0.89015E 00	-0.21271E 00	0.29018E 00
	0.11150E 01	0.15360E 00	0.23619E 02	0.71876E-03	-0.73962E 00	0.28965E 00	-0.14601E 02	-0.62781E-03
	0.16335E 01	0.38991E 00	0.17759E 00	0.10673E 02	-0.33003E 00	-0.28639E 01	0.54083E 00	0.15062E 01
	-0.62221E 00	-0.11237E 00	0.71654E 00	-0.21011E-01	0.27801E 02	0.95727E-01	0.19867E 01	0.31332E 00
	0.11897E-01	0.62384E-01	0.73213E-01	-0.29546E 00	-0.13896E 01	-0.62078E 00	0.96020E 00	-0.91628E 00
	0.10137E 01	0.15260E 02	-0.49043E 01	-0.76908E 01	0.18979E 01	-0.96356E 00	0.15999E 01	0.60833E-01
	0.12019E-01	0.53708E-01	-0.42975E 00	0.94436E-02	0.27144E 00	0.97144E 01	0.16279E-01	0.15545E 00
	-0.32238E-01	-0.13388E 00	-0.24426E 03	0.59953E 01	-0.61332E 01	-0.10292E 02	0.21645E 01	-0.10637E 02
	0.21989E 02	0.17893E 00	0.52204E-01	-0.41405E 00	-0.27753E 01	-0.16697E 01	-0.13405E 01	0.73409E 01
	0.35147E 01	0.12633E 02						
87	-0.64282E-14	-0.28111E-13	0.10587E-13	-0.25553E-08	-0.10584E-05	0.18181E-07	0.44060E 00	-0.48325E-01
	0.84224E-01	-0.22976E 00	-0.66970E 01	0.52430E-01	0.72030E-01	-0.31985E-01	0.26269E-06	-0.29366E 01
	-0.11160E-01	0.64206E-02	0.19468E 00	-0.20125E 01	0.12379E-06	-0.57858E 00	-0.68972E-01	0.20503E 00
	0.98676E-07	0.14063E-01	-0.21741E 00	-0.14476E-02	-0.95738E 00	-0.19286E 02	0.80165E 00	0.22088E 00
	0.14950E 02	-0.16732E 01	0.10308E-05	0.67523E 00	0.40292E-01	0.14069E 00	-0.17690E 00	0.81137E-02
	-0.27796E 00	-0.84461E-02	0.15395E 00	0.56767E-05	-0.10501E 00	0.65021E-01	-0.59811E-01	-0.25936E-05
	0.39348E-01	-0.52111E 00	0.32905E 00	-0.55389E 00	-0.21638E-01	0.19669E 00	-0.64970E-01	0.67996E-01
	-0.21689E 00	-0.79596E 00	-0.33578E 01	-0.28100E-02	-0.30310E 01	0.42106E 00	-0.38717E 01	0.21252E 02
	0.21342E 01	0.71716E 00	-0.29814E 01	-0.99982E 00	0.17655E 01	0.39056E 00	-0.63333E 00	0.57036E 00
	-0.56564E 00	-0.68881E 01	0.15125E 01	-0.58182E-02	-0.44582E 00	0.21479E 00	-0.35803E 00	-0.13048E-01
	-0.20422E-02	0.20491E-01	0.35798E-01	-0.10301E-01	-0.26200E-01	0.16279E-01	0.26577E 02	-0.70590E-05
	0.17499E-04	0.20285E-04	-0.10683E 00	0.27236E-01	0.17724E-01	-0.44995E-01	0.31478E 00	-0.62351E 00
	0.12757E 01	-0.55319E-02	0.56675E-03	0.47111E-01	-0.62584E-02	-0.33377E 00	0.39525E-01	0.41091E 01
	-0.13150E 00	0.59966E 00						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
88	-0.21707E-12	-0.94070E-12	0.59570E-12	-0.73213E-06	-0.12409E-06	-0.24715E-06	-0.55709E-02	-0.63483E 01
	0.56868E-01	-0.22194E 00	0.42861E-01	-0.13017E-01	-0.40281E-01	0.71293E 01	0.14358E-06	0.70858E 00
	-0.51483E-02	0.30376E 00	-0.60809E-01	0.53173E 00	0.33848E-07	0.12107E 00	-0.11360E-01	-0.21222E-01
	0.20139E-05	-0.53018E-02	-0.18346E-03	0.63723E-01	0.31789E 00	-0.24113E 00	0.17517E 00	-0.19067E 02
	-0.17616E 01	0.91379E 00	-0.25937E-06	-0.16331E 00	-0.57358E 00	0.64273E-01	0.37457E-01	0.51531E-02
	0.40809E 01	0.10447E 00	-0.16824E 00	-0.69481E-05	0.21087E 00	-0.68008E-01	0.55346E-01	0.25689E-05
	-0.18580E 00	0.34799E-01	-0.58141E-01	0.65003E 01	-0.14847E-01	-0.16728E 01	0.38927E-01	0.39742E 00
	0.27513E 01	0.19467E 01	0.10318E 01	0.12987E-01	0.16060E 02	0.46423E 00	0.25149E 01	0.24957E 01
	-0.19504E 02	-0.14654E 01	0.39677E 01	-0.24658E 01	-0.55445E 01	-0.44138E-01	0.58724E 00	-0.39883E-01
	0.49227E 00	-0.13656E 01	0.23857E 00	-0.98829E-01	-0.93498E-01	-0.63556E-01	-0.87612E-01	-0.29714E-01
	-0.60722E-03	-0.92025E-02	0.21355E-02	0.47123E-02	-0.13166E-02	0.15545E 00	-0.70590E-05	0.25514E 02
	-0.74340E-04	-0.14051E-03	-0.28399E 01	-0.41821E-02	0.17217E-01	-0.14249E 00	-0.29535E 00	-0.39144E 00
	0.71652E 00	0.60938E-02	-0.18062E-03	-0.32072E-01	-0.11753E-01	0.77930E-02	-0.50268E-01	0.14858E 01
	-0.18584E-01	-0.27727E 00						
89	0.16084E-12	0.21583E-12	-0.24536E-12	-0.14935E-06	-0.32351E-06	0.43064E-06	0.72573E-02	-0.10438E 00
	-0.66295E 01	0.14386E 01	-0.12580E 00	0.17804E 01	0.85063E-01	0.12087E 00	-0.48495E-05	-0.44595E-01
	0.18457E-03	0.46800E-02	-0.13528E-02	-0.13712E-01	-0.79355E-07	-0.75034E-02	0.35165E 00	0.81454E-01
	-0.96065E-07	0.18529E 00	-0.39026E-02	0.45472E-03	0.48532E 01	-0.10296E 01	-0.19158E 02	-0.80419E-01
	0.22370E 01	0.55205E 01	-0.50528E-06	0.10769E-01	-0.18144E-01	0.94855E-02	-0.49224E-01	0.18098E 01
	0.96918E-01	0.29345E-01	0.37697E-01	-0.13142E-04	0.23972E 00	-0.87171E-01	-0.43162E-02	-0.12325E-04
	0.16341E 02	0.12076E 00	-0.65382E 00	-0.52546E-01	0.52661E 00	0.22072E-02	0.25190E 01	-0.79228E-02
	-0.10411E 00	0.27902E 01	-0.17919E-01	-0.50114E-02	0.65548E 00	-0.39830E 01	0.16190E 01	0.95733E 00
	-0.14836E 00	0.18200E 02	0.16165E 02	0.21304E 02	-0.78908E 00	0.98675E-01	-0.70042E-01	0.94399E-01
	-0.98136E-01	-0.84787E 00	0.16340E 01	-0.10370E-01	-0.94268E-01	0.12427E 00	-0.24523E-01	-0.90627E-02
	-0.34015E-02	0.45030E-01	0.46226E-01	-0.22664E-01	-0.46223E-01	-0.32238E-01	0.17499E-04	-0.74340E-04
	0.27350E 02	-0.10381E-03	0.45754E-01	0.14366E-02	0.17411E-02	0.10264E 00	0.76673E-02	0.30732E-01
	-0.15615E-01	0.40126E-01	0.31358E-02	-0.32822E 00	0.23574E 00	-0.93715E-02	-0.67357E-01	0.64616E-01
	-0.54174E-01	-0.36684E 00						
90	-0.26705E-13	-0.67963E-14	0.12448E-12	-0.69571E-06	0.29792E-07	0.76494E-06	0.11466E-01	-0.20224E 00
	0.14077E 01	0.65487E 01	-0.20639E 00	-0.40001E 00	0.68128E 00	0.25357E 00	0.28071E-05	-0.52154E-01
	-0.42984E-03	0.87917E-02	-0.13673E 00	-0.63599E-01	-0.99733E-06	-0.12817E-01	0.12965E 01	-0.36642E-01
	0.11487E-06	0.92372E 00	-0.88715E-02	0.35586E-03	0.18803E 02	-0.71339E 00	0.48147E 01	0.38701E 00
	0.50348E 01	0.21901E 02	-0.27386E-05	-0.32730E-01	-0.59062E-01	-0.15350E-01	-0.56038E 00	-0.35871E 00
	0.23631E 00	0.11094E 00	0.13981E 00	0.21000E-05	0.40939E 00	0.22079E 00	0.61238E-03	0.18805E-05
	-0.32215E 01	-0.90038E 00	-0.20852E 01	0.32420E-01	-0.25530E-01	-0.10129E 00	-0.15358E 00	-0.12179E-01
	-0.58192E 00	0.14497E 02	0.20624E 00	-0.17196E-01	0.54492E 01	-0.21761E 02	0.14401E 01	0.14359E 01
	0.16180E 01	-0.18599E 02	0.14213E 02	0.15600E 02	-0.16496E 01	0.22130E 00	-0.13715E 00	0.83539E-01
	-0.68592E 00	0.30515E 01	0.14871E 02	-0.67974E-01	-0.58756E-01	0.10143E 01	0.59061E 00	-0.43991E-01
	-0.54472E-02	0.36965E 00	-0.90630E-01	-0.14071E 00	0.44117E-01	-0.13388E 00	0.20285E-04	-0.14051E-03
	-0.10381E-03	0.26920E 02	0.10601E 00	-0.76412E-03	0.20318E-02	-0.85544E-01	-0.85555E 00	-0.14110E 00
	0.20650E 00	0.22921E-01	-0.39717E-02	-0.21891E 00	-0.38052E-01	-0.19701E-01	-0.90640E-01	0.30648E 00
	-0.75047E-01	-0.70206E 00						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
91	0.77115E-09	0.24811E-C8	-0.20555E-C8	0.25503E-03	0.16129E-04	0.32439E-03	0.50353E 01	-0.79911E 01
	0.26002E-01	0.15222E 00	0.26618E 00	-0.39341E-02	-0.28739E-01	-0.40800E 02	-0.42653E-04	-0.78361E 02
	0.17287E 02	-0.71378E 02	0.14059E 01	-0.17462E 02	-0.53875E-04	-0.41683E 02	-0.32545E 01	-0.10621E 02
	0.10676E-05	-0.50870E 01	0.12393E 01	-0.85088E-01	0.68084E 00	-0.79460E-02	-0.2550BE 00	-0.12367E 00
	0.10958E 02	-0.65032E 01	-0.25430E-04	0.39097E 02	0.12448E 03	0.17963E 02	-0.58279E 01	-0.22805E 02
	-0.41890E 02	-0.14311E 01	0.4165CE 02	0.12583E-02	0.57911E 01	0.96441E 00	-0.22888E 02	-0.92297E-03
	-0.13162E 03	-0.12532E 02	-0.34447E 01	-0.32712E 03	0.24825E 02	0.76029E 02	-0.39695E 02	-0.45284E 02
	0.24341E 02	0.66063E 01	-0.36955E 02	0.58283E 00	-0.77039E 03	-0.79887E 01	-0.12168E 03	-0.31442E 01
	-0.61481E 01	-0.79031E 00	-0.32548E 02	0.41293E 02	0.33171E 02	0.15182E 01	-0.33348E 01	0.31089E 01
	-0.55572E 01	-0.50975E 02	-0.39527E 01	0.25387E 03	0.79664E 02	-0.92914E 01	0.77379E 01	0.11386E 01
	0.19369E 00	-0.11897E 02	-0.81854E 01	0.48403E 01	0.71458E 01	-0.24426E 03	-0.10688E 00	-0.28399E 01
	0.45754E-01	0.10601E 00	0.77454E 04	-0.11199E 03	0.27067E 03	0.14915E 04	-0.78905E 02	0.22115E 03
	-0.69412E 03	-0.35753E 01	-0.68177E 00	0.26207E 02	0.78291E 02	0.15444E 03	0.59904E 02	0.46631E 03
	-0.87044E 02	-0.48637E 02						
92	0.21420E-11	0.63910F-11	-0.26245E-11	-0.64967E-05	0.36339E-05	0.77567E-06	0.29324E 02	0.67404E 01
	-0.46626E-02	-0.14763F-01	0.10266F 01	-0.23657E-01	-0.83707E-01	0.34206E 02	0.52312E-06	0.49377E 01
	0.85596E 02	0.63610E 02	-0.20836E 01	0.16778E 02	-0.13637E-C7	C.28129E 01	-0.97507E 00	-0.66138E 01
	-0.88623F-05	-0.96251E-01	0.17072E 00	-0.18752E 00	-0.22602F-01	0.25080E-01	0.96492E-04	-0.20669E 00
	-0.43617E 01	0.10572E 01	-0.60859E-06	-0.50206E 00	-0.95484E 02	0.16798E 03	-0.72650E 01	0.12463E 00
	0.36657F 02	0.88970E 00	0.93955E 00	0.41802E-04	-0.12306E 01	0.25339E 01	-0.14285E 01	-0.64580E-04
	0.39493E 01	-0.23591E 02	C.82198E C1	0.94170E 02	-0.10844E 01	-0.42251E 02	-0.83616E 01	-0.76263E 02
	-0.57447E 02	-0.12629E 02	0.54744E 02	0.12465F-01	0.86490E 01	-0.70321E-01	-0.69039E 01	-0.46982F 00
	0.62332F 00	0.97403F-01	0.10146F 01	-0.12293E 01	0.20247E 01	0.37623E 01	-0.79231E 01	0.47605E 01
	-0.72004E 01	-0.14155F 03	0.23812E 02	-0.23980E 03	0.29545F 03	-0.14636E 02	0.26861E 02	0.53186E 00
	-0.62527E 00	-0.24980E 00	-0.16563E 01	0.33614E-01	0.93848F C0	0.59953F 01	0.27236E-01	-0.41821E-02
	0.14366E-02	-0.76412E-03	-C.11159E C3	0.52325E 03	0.88905E 00	0.56540E 01	-0.69282E 01	0.30545E 01
	-0.18533F 02	-0.38178E-01	-0.397C9E-02	0.28622E 00	0.39403E 00	0.26052F 01	0.64011E-01	0.28059E 02
	0.22378F 01	0.22478E 01						
93	-0.72203E-11	-0.16762E-10	0.20549E-10	-0.13878E-04	-0.50926E-05	-0.41625E-05	0.19666E 02	-0.10067E 02
	-0.40163F-02	C.33668F-01	0.83580E 00	-0.31737E-01	0.10832E 00	-0.51004F 02	-0.68224E-06	-0.35385F 01
	0.61678E 02	-0.88622E 02	C.45221F 0C	-0.31932E 01	0.31437F-06	-0.10050F 01	0.99092E 00	-0.48319F 01
	0.29046E-04	0.19815E 00	0.62934E-01	0.27106E 00	0.23323F-01	0.15925E-01	0.32680E-02	0.30239E 00
	-0.21227E 01	-0.50733E 00	-0.20528E-05	-0.19736E 01	0.16743E 03	0.95439E 02	-0.51110E 01	0.12711E 00
	-0.47904E 02	-0.97962E 00	0.27090E 01	0.10598E-03	-0.41018E 01	0.25705E 01	-0.13098E 01	-0.60349E-04
	0.53186E 01	-0.15450E 02	0.71022E 01	-0.89231E 02	-0.92594E 00	0.37647E 02	-0.78630E 01	-0.72674E 02
	0.606196 02	0.10885E C2	0.38782E 02	-0.10211E-01	-0.86696E 01	-0.42027E-04	-0.43887E 01	-0.40810E 00
	-0.56121E 00	-0.74295E-01	0.15554E 01	-0.15973E 01	-0.29234E 01	0.21282E 01	0.14374E 01	0.28458E 01
	0.81590E 00	-0.12964E 03	0.33677E 02	0.29327E 03	0.23937F 03	-0.72190E 01	0.22612E 02	0.21268E 01
	-0.37155E 00	-0.13620E 00	-0.10489E 01	0.33144E-01	0.57668E 00	-0.61332E 01	0.17724E-01	0.17217E-01
	0.17411E-02	0.20318F-02	0.27067E 03	0.88905E 00	0.52311E 03	-0.93650E 01	-0.80740E 01	-0.50272E-01
	-0.75540E 01	-0.38539E-01	0.74196E-02	0.26C84E 00	-0.60784E 00	-0.36095E 00	-0.26192E 00	-0.96462E 01
	0.30485E 01	-0.59774E 01						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
94	0.48843E-09	-0.37807E-09	-0.98903E-09	0.20216E-04	0.32060E-04	0.49923E-03	0.29553E 00	-0.17623E 00
	0.59753E-02	-0.32102E-02	0.23892E-01	0.15991E-01	0.22581E-01	-0.62618E 00	-0.25398E-05	0.13034E 02
	0.90273E 00	-0.11431E 01	0.15978E 00	-0.75520E 01	-0.61985E-05	0.17517E 02	0.43396E 00	-0.14179E 02
	0.16738E-04	0.55429E 00	-0.26343E-01	0.86590E-02	-0.44127E-01	0.11922E 00	-0.38706E 00	-0.13409E 00
	0.15914E 02	0.23111E 00	-0.36193E-04	-0.17939E 02	0.23804E 01	0.25551E 01	0.11828E 00	-0.26427E 02
	-0.22824E 00	-0.12550E-01	-0.17054E 02	-0.35225E-03	0.17366E 01	-0.19420E 01	0.10980E 02	0.59950E-03
	-0.15159E 03	-0.66376E 01	0.24973E 01	0.92691E 01	0.27966E 02	-0.16850E 01	-0.46492E 02	0.12757E 00
	0.29643E 01	0.12626E 01	-0.11208E 02	0.13311E 00	0.36226E 02	-0.36539E 01	-0.10378E 03	-0.20402E 01
	-0.65100E 01	-0.86328E 00	-0.46057E 02	0.55917E 02	0.19745E 01	-0.23583E 00	-0.30123E 00	0.16824E 00
	-0.11745E 00	0.51923E 00	-0.93082E 01	0.44105E 01	0.47173E 01	-0.17615E 01	0.63521E 00	0.37106E-01
	-0.10617E 00	-0.10887E 01	0.39876E 00	0.52716E-01	0.22841E 00	-0.10292E 02	-0.44995E-01	-0.14249E 00
	0.10264E 00	-0.85544E-01	0.14915E 04	0.56540E 01	-0.93650E 01	0.21161E 04	0.12077E 03	-0.18735E 03
	0.32617E 03	-0.17158E 00	0.64904E-01	-0.17019E 01	-0.46122E 02	-0.13500E 02	-0.78773E 01	-0.44859E 02
	0.16330E 02	-0.47999E 02						
95	-0.17573E-09	-0.69958E-09	-0.18036E-09	0.53725E-04	0.23609E-04	0.15532E-03	-0.70053E 00	0.16221E 00
	-0.59522E-01	-0.25002E 00	-0.91563E-01	-0.81803E-01	0.19016E 01	0.27040E 00	0.54518E-03	-0.92792E 02
	-0.21641E 01	0.56171E 00	0.27289E 02	-0.53796E 01	0.73753E-03	-0.14097E 03	-0.50352E 01	0.97587E 01
	-0.28659E-04	0.92004E 01	0.29698E 01	0.78409E-02	-0.96175E 00	-0.44775E-01	-0.14010E 00	0.25205E 00
	0.23118E 02	0.47115E 00	0.90200E-03	0.14367E 03	-0.10375E 01	-0.39064E 01	-0.27298E 01	-0.48499E 00
	-0.26308E 01	-0.65132E 00	0.13699E 03	0.47626E-02	-0.42592E 00	-0.62104E 01	-0.83575E 02	-0.31983E-02
	0.80285E-01	-0.59221E 01	-0.15808E 02	0.10676E 02	0.45977E 01	-0.41100E 01	-0.14294E 01	-0.64007E 01
	-0.11235E 02	0.21561E 03	-0.34474E 02	0.60074E 00	-0.56093E 02	-0.58412E 02	-0.13350E 02	-0.14489E 01
	-0.24100E 01	0.14767E 02	-0.11043E 02	-0.22503E 02	0.38415E 02	-0.13333E 01	-0.36001E 01	0.42412E 00
	-0.66677E 01	0.31309E 01	0.62555E 02	-0.16110E 01	-0.10778E 02	0.77711E 01	-0.57042E 00	0.49226E-02
	0.58091E-02	-0.98279E 01	0.29650E 00	0.96436E 01	-0.25599E 00	0.21645E 01	0.31478E 00	-0.29535E 00
	0.76673E-02	-0.85055E 00	-0.78405E 02	-0.69282E 01	-0.80740E 01	0.12077E 03	0.55385E 03	-0.10237E 03
	0.10790E 03	-0.43588E 02	0.26791E 01	0.38644E 03	-0.19925E 03	0.30195E 03	-0.59174E 03	0.92568E 02
	-0.93763E 02	-0.11922E 04						
96	-0.12581E-09	0.59634E-09	0.12226E-08	0.62753E-05	0.79036E-04	-0.22108E-03	0.11843E 00	0.88470E-01
	-0.22050E-01	-0.20409E-01	0.15253E 00	-0.45115E-01	0.21044E 00	0.51926E-01	0.75818E-04	-0.14657E 03
	0.40701E 00	0.92440E-01	-0.91176E 01	0.52678E 02	0.81795E-04	0.23482E 03	0.12796E 02	0.12071E 02
	0.71009E-05	0.11979E 02	-0.30586E 01	-0.18086E-01	-0.52303E 00	0.31999E 00	0.77955E-02	0.14330E 00
	-0.22751E 02	0.98097E 01	-0.14559E-03	-0.73233E 03	-0.73905E 00	0.29733E 01	0.37987E 01	0.44754E 01
	-0.16489E 00	-0.18229E-01	-0.22055E 03	-0.64364E-02	-0.25039E 00	-0.71903E 01	0.13414E 03	0.58811E-02
	0.22674E 02	0.17423E 02	-0.10738E 02	-0.33485E 02	0.41033E 01	0.84240E 01	0.82455E 01	0.40015E 02
	-0.21200E 01	0.34142E 02	0.19155E 03	-0.17598E 00	0.16552E 02	-0.37268E 01	0.18025E 03	-0.48069E 00
	-0.21685E 01	-0.82532E 00	-0.28222E 02	0.27202E 02	0.10797E 02	-0.24796E 01	-0.67483E 01	0.43907E 01
	-0.57079E 01	-0.59303E 02	0.82628E 01	-0.62475E 00	0.21339E 01	0.38469E 01	-0.96100E 01	-0.36746E-01
	-0.11216E 01	0.17497E 01	0.10890E 01	-0.23791E 01	-0.47619E 00	-0.10637E 02	-0.62351E 00	-0.39144E 00
	0.30732E-01	-0.14110E 00	0.22115E 03	0.30545E 01	-0.50272E-01	-0.18735E 03	-0.10237E 03	0.60150E 03
	-0.22280E 03	0.21657E 01	0.20454E 01	-0.38410E 02	-0.22963E 03	-0.59996E 03	-0.25121E 03	-0.30340E 03
	-0.51510E 03	-0.45012E 03						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
97	-0.98196E-11	-0.38174E-09	0.33285E-09	-0.56232E-04	-0.11925E-04	0.11243E-03	-0.14767E 01	-0.10343E 00
	0.37127E-01	0.40667E-01	-0.38156E 00	0.89618E-01	-0.67356E 00	0.42122E-01	-0.21873E-03	-0.29757E 03
	-0.44999E 01	-0.26946E 00	-0.59613E 01	-0.22996E 02	-0.24520E-03	-0.45029E 03	0.24082E 01	-0.20825E 02
	0.29987E-04	0.42861E-01	-0.56266E 00	0.74161E-01	-0.12878E-01	-0.10696E 01	0.79214E-01	-0.13406E 00
	0.89791E 01	0.19355E 01	0.19670E-03	0.45810E 03	0.62663E 00	-0.81935E 01	-0.22186E 01	-0.16608E 01
	-0.36346E 00	0.10325E 00	0.43616E 03	0.12671E-01	-0.68683E 01	0.45492E 01	-0.26802E 03	-0.11835E-01
	-0.80911E 01	0.57088E 01	0.37158E 01	0.44376E 02	0.66440E 01	-0.74141E 01	-0.61090E 01	0.11902E 02
	0.92974E 01	-0.50370E 02	0.42344E 02	-0.21643E 00	0.16924E 03	0.24486E 02	0.12175E 02	-0.52372E-01
	-0.10843E 01	-0.43453E 01	-0.10921E 02	0.20615E 02	-0.14422E 02	0.20810E 01	-0.14856E 01	0.36636E 01
	0.43021E-01	-0.71070E 02	-0.20160E 01	-0.23031E 00	-0.23183E 02	0.31849E 01	-0.10490E 02	-0.67390E 00
	-0.13212E 00	0.49626E 01	0.35867E 01	-0.38577E 01	-0.27032E 01	0.21989E 02	0.12757E 01	0.71652E 00
	-0.15615E-01	0.20650E 00	-0.69412E 03	-0.18533E 02	-0.75540E 01	0.32617E 03	0.10790E 03	-0.22280E 03
	0.79722E 03	0.15398E 02	0.16318E 00	-0.14762E 03	-0.10447E 03	-0.24466E 03	0.96411E 02	-0.76024E 03
	0.68031E 02	0.10268E 03						
98	-0.20850E-10	0.28826E-10	0.45497E-10	-0.11357E-04	0.95230E-07	0.53395E-04	-0.76088E-02	-0.21196E-02
	-0.26930E 00	-0.42348E 00	0.51600E-01	-0.19594E 01	0.11503E 02	0.65834E-01	0.37647E-02	-0.10335E 01
	-0.10206E-01	0.13164E-01	-0.15850E 02	-0.34241E 01	0.51482E-02	-0.20461E 01	0.41773E 01	-0.29776E 01
	0.50172E-05	-0.19979E 01	-0.29060E 00	-0.24528E-03	0.21513E 00	-0.13194E-01	0.52985E-01	-0.18386E-02
	-0.13059E 01	-0.33652E 01	0.52239E-02	0.18739E 01	0.11074E-02	0.27490E-01	0.12405E 01	0.17794E 01
	-0.43248E 00	0.13394E 02	0.14464E 01	0.51395E-02	-0.80528E 00	0.30299E 00	-0.10749E 01	0.30054E-02
	0.24113E 02	0.13887E 01	0.16949E 01	-0.52571E-01	0.35029E 01	0.22894E 00	0.16600E 00	0.47977E 00
	0.13666E 01	-0.26340E 02	0.14708E 01	-0.73533E-01	0.10774E 02	0.11197E 02	-0.50361E 00	0.17697E 00
	0.38416E 00	-0.18583E 01	0.18530E 01	0.17539E 01	-0.48918E-01	0.18948E 00	0.62875E 00	-0.10558E 00
	0.10754E 01	-0.10246E 01	-0.11504E 02	-0.24909E-01	0.17365E 00	-0.15331E 01	-0.37021E 00	-0.20026E-01
	0.34676E-01	0.67877E 00	0.51536E-01	-0.88907E 00	-0.38030E-01	0.17898E 00	-0.55319E-02	0.60938E-02
	0.40126E-01	0.22921E-01	-0.35753E 01	-0.38170E-01	-0.38539E-01	-0.17158E 00	-0.43588E 02	0.21857E 01
	0.15398E 02	0.41239E 02	0.97621E 00	-0.85045E 02	-0.11638E 03	-0.17273E 02	0.70047E 02	-0.21450E 02
	0.58461E 01	0.16941E 03						
99	-0.78309E-11	-0.46909E-11	0.91010E-11	-0.29367E-06	0.10988E-05	0.11467E-04	0.47194E-02	0.18358E-03
	0.11560E 01	-0.64909E-01	0.59009E-01	0.10286E 02	0.21563E 01	0.54697E-02	-0.38859E-02	-0.11883E 00
	-0.84128E-03	0.29065E-03	-0.12273E 01	-0.27268E 00	-0.53325E-02	-0.11831E 00	0.38860E 00	-0.16011E 00
	0.18730E-06	-0.65553E-01	-0.27383E-04	-0.22284E-04	0.14466E-01	0.63247E-03	-0.22675E-02	-0.53573E-04
	0.16449E 00	-0.38123E 00	-0.54146E-02	0.10997E 00	0.52552E-02	0.19395E-01	0.15494E 00	0.13674E 02
	-0.24528E 00	0.22774E 01	-0.12729E 00	-0.52482E-02	-0.63004E 00	0.38994E 00	-0.59737E-01	-0.31832E-02
	-0.80125E 01	-0.67306E-01	0.69481E-03	-0.13672E-01	0.52884E 00	0.10173E-01	-0.46945E 00	0.74418E-01
	-0.40685E-01	0.68396E 00	0.27710E 00	0.69052E-02	-0.16191E 00	-0.37515E 00	0.47406E 00	0.73050E-02
	0.36202E-02	0.11073E-01	0.26567E-01	-0.96446E-01	0.82117E-01	-0.26719E-01	0.31484E-01	-0.14792E-01
	0.71096E-01	-0.19049E 00	-0.16440E 01	0.93813E-02	0.31615E-01	-0.21385E 00	-0.11048E 00	0.71827E-02
	0.15621E-02	-0.15247E 00	0.11108E-01	0.75834E-01	-0.64907E-02	0.52204E-01	0.56675E-03	-0.18062E-03
	0.31358E-02	-0.39717E-02	-0.68177E 00	-0.39709E-02	0.74196E-02	0.64904E-01	0.26791E 01	0.20454E 01
	0.16318E 00	0.97621E 00	0.28152E 02	-0.10379E 02	-0.22712E 02	0.18693E 01	-0.24729E 01	0.44684E 00
	0.14089E 01	0.36709E 01						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (6HH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
100	0.28936E-09	-0.16659E-09	-0.50806E-09	0.10104E-03	-0.14448E-04	-0.59109E-03	0.33786E-01	0.16360E-02
	-0.71589E 00	-0.35367E 00	0.22894E-01	-0.21438E 01	0.84217E 01	0.25818E-01	0.30359E-02	0.66768E 01
	0.60788E-01	-0.83572E-01	0.58550E 02	0.21825E 02	0.40842E-02	0.14362E 02	-0.12553E 02	0.25843E 02
	-0.43420E-04	0.10600E 02	0.24505E 01	-0.60492E-02	-0.79648E 00	0.62238E-01	-0.61197E 00	-0.29713E-02
	0.67359E 01	0.73123E 01	0.41362E-02	-0.12700E 02	0.89516E-01	-0.28936E 00	-0.67565E 01	-0.48277E 02
	-0.31350E 01	0.89666E 01	-0.77728E 01	0.40397E-02	0.10989E 02	-0.28936E 01	0.73170E 01	0.29829E-02
	-0.24604E 03	-0.11918E 02	-0.10998E 02	0.77473E 00	-0.38593E 02	-0.20266E 01	-0.36844E 01	-0.46652E 01
	-0.11032E 02	0.20928E 03	-0.15004E 02	0.55850E 00	-0.74975E 02	-0.93026E 02	-0.69025E 00	-0.13459E 01
	-0.30792E 01	0.14100E 02	-0.14340E 02	-0.11063E 02	0.37202E 02	-0.15928E 01	-0.34530E 01	0.76212E 00
	-0.48767E 01	-0.12206E 02	0.12773E 02	0.50776E 00	-0.15886E 01	0.22638E 01	-0.31580E 01	0.33030E 00
	-0.27324E 00	-0.11140E 02	0.13867E 01	0.92386E 01	-0.65905E 00	-0.41405E 00	0.47111E-01	-0.32072E-01
	-0.32822E 00	-0.21891E 00	0.26207E 02	0.28622E 00	0.26084E 00	-0.17019E 01	0.38644E 03	-0.38410E 02
	-0.14762E 03	-0.85645E 02	-0.10379E 02	0.10562E 04	0.13256E 04	0.11605E 03	-0.60400E 03	0.14328E 03
	-0.52935E 02	-0.13008E 04						
101	0.11382E-08	0.74982E-09	-0.13460E-08	0.67412E-04	-0.13060E-03	-0.12443E-02	0.22746E-01	-0.12778E-02
	-0.20050E-01	-0.18037E-01	0.29698E-02	0.58596E 00	0.36558E 00	0.14094E-01	-0.14829E-03	-0.50762E 01
	0.80013E-02	-0.72676E-01	-0.23166E 02	0.11504E 02	-0.19187E-03	-0.34518E 01	0.40253E 01	0.11669E 02
	-0.15850E-04	-0.43712E 01	0.30925E 00	-0.13216E-01	0.36131E 00	-0.17029E 00	-0.22835E 01	-0.13129E-01
	-0.11297E 02	-0.39426E 01	-0.25408E-03	0.49176E 01	-0.17396E 00	-0.75390E 00	0.41641E 01	-0.12544E 03
	0.97200E 00	0.44821E 00	0.52040E 01	0.77974E-03	0.79727E 00	-0.92892E 00	-0.27784E 01	0.32930E-03
	-0.68706E 03	-0.15965E 02	0.11063E 02	0.24029E 01	-0.93348E 02	-0.18455E 01	-0.42149E 02	-0.65156E 01
	0.22042E 01	-0.38305E 02	-0.27998E 02	-0.70775E 00	0.21158E 02	0.20645E 02	-0.53185E 02	-0.46421E 00
	-0.70113E 00	0.29511E 01	-0.93686E 00	0.20141E 02	-0.94051E 01	0.20710E 01	0.36841E 00	0.12182E 01
	0.17023E 01	-0.27501E 02	-0.30944E 02	0.55927E-01	-0.26683E 01	-0.28345E 01	-0.32333E 01	-0.25506E 00
	-0.25350E 00	0.71074E 00	0.33979E 01	-0.19309E 01	-0.15952E 01	-0.27753E 01	-0.62584E-02	-0.11753E-01
	0.23574E 00	-0.38052E-01	0.78291E 02	0.39407E 00	-0.60784E 00	-0.46122E 02	-0.19925E 03	-0.22963E 03
	-0.10447E 03	-0.11638E 03	-0.22712E 02	0.13756E 04	0.33711E 04	-0.25283E 03	0.12695E 03	-0.44733E 02
	-0.16855E 03	-0.36262E 03						
102	0.31672E-09	-0.12137E-08	-0.91454E-09	0.66779E-04	-0.12413E-03	0.16566E-03	0.28900E 00	-0.93816E-03
	-0.22101E-02	0.61410E-02	0.11572E 00	-0.76343E-03	0.65753E-02	0.10395E 00	0.29900E-05	0.72861E 02
	0.22422E 01	0.70143E 00	0.21224E 02	-0.14975E 03	-0.37055E-05	0.56749E 02	-0.28178E 02	0.23073E 03
	-0.35798E-03	-0.16030E 02	0.15679E 02	-0.51142E-01	0.35954E 00	-0.30356E 00	0.37730E 00	0.73906E-01
	-0.84725E 02	-0.57392E 00	-0.94145E-04	-0.99541E 02	-0.90469E 00	-0.11584E 02	-0.16450E 02	0.22428E 02
	-0.86390E-02	-0.58081E 00	-0.97062E 02	-0.29362E-02	-0.72821E 01	0.50341E 01	0.57950E 02	0.24214E-02
	0.12287E 03	0.19626E 02	-0.17226E 02	0.18626E 02	0.66966E 01	-0.10269E 02	0.79592E 00	-0.79140E 02
	-0.91759E 01	0.59052E 02	-0.34472E 03	0.42073E 00	-0.15336E 03	-0.43179E 02	-0.17663E 03	0.87276E 00
	0.41965E 01	0.79266E 01	0.49773E 02	-0.69642E 02	0.91969E 01	-0.85771E 00	0.93670E 01	-0.92738E 01
	0.58564E 01	0.14365E 03	0.75487E 01	0.26046E 00	0.93342E 01	-0.53932E 01	0.19922E 02	0.49437E 00
	-0.17951E 01	-0.87259E 01	-0.55528E 01	0.86089E 01	0.35444E 01	-0.16697E 01	-0.33377E 00	0.77930E-02
	-0.93715E-02	-0.19701E-01	0.15444E 03	0.26052E 01	-0.36095E 00	-0.13500E 02	0.30195E 03	-0.59996E 03
	-0.24466E 03	-0.17273E 02	0.18693E 01	0.11605E 03	-0.25283E 03	0.25948E 04	0.18235E 02	0.38020E 03
	0.39677E-03	-0.34976E 03						

Table 1-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1CCCE 01

MODE	VALUES							
103	0.22211E-09	-0.18922E-09	-0.51318E-09	-0.16701E-03	-0.12688E-03	-0.11760E-06	0.37674E-01	0.18703E-02
	0.11574E-01	-0.38542E-01	-0.85315E-02	-0.18750E-01	-0.73762E 00	-0.84869E-01	-0.19093E-03	-0.34626E 01
	-0.16473E-01	-0.13094E 00	-0.13807E 03	-0.21238E 02	-0.12098E-03	-0.65991E 01	-0.22740E 03	-0.29219E 02
	0.42959E-04	-0.11197E 03	-0.20863E 01	-0.45188E-01	-0.65656E 00	-0.43122E-01	0.52465E-01	0.49378E-01
	0.77634E 01	-0.50682E 02	-0.23231E-03	0.64304E 01	-0.49665E 00	0.32297E 00	0.17498E 02	0.48473E 00
	0.54017E 01	0.50557E 01	0.28922E 01	-0.34874E-04	-0.63731E 01	0.56392E 01	-0.31732E 01	-0.27188E-03
	0.23700E 01	-0.17376E 02	-0.21002E 02	0.71046E 01	-0.34779E 00	0.80963E 00	-0.80822E 01	-0.99229E 01
	0.20312E 02	-0.37403E 03	-0.54534E 02	0.47214E 00	-0.31412E 03	-0.11372E 03	-0.81577E 02	-0.12790E 01
	0.27026E 01	-0.18007E 02	0.25697E 02	0.16553E 02	-0.24230E 02	0.32932E 01	0.75294E 01	-0.16067E 01
	0.12176E 02	-0.79403E 01	-0.12827E 03	0.52826E 00	0.64262E 00	-0.15855E 02	-0.21954E 01	-0.35026E 00
	0.51040E 00	0.51703E 01	0.12135E 01	-0.72088E 01	-0.71118E 00	-0.13405E 01	0.39525E-01	-0.50268E-01
	-0.67357E-01	-0.90640E-01	0.59904E 02	0.64011E-01	-0.26192E 00	-0.78773E 01	-0.59174E 03	-0.25121E 03
	0.96411E 02	0.70847E 02	-0.24729E 01	-0.60400E 03	0.12695E 03	0.18235E 02	0.23057E 04	0.11117E 03
	-0.26179E 03	0.39017E 03						
104	-0.15348E-09	-0.39327E-09	-0.16787E-08	0.72915E-04	0.12304E-04	0.77031E-03	0.15006E 01	0.40201E-01
	0.23096E-01	0.63272E-01	-0.95140E 00	0.41940E-02	-0.62741E 00	0.29392E 01	-0.15932E-03	-0.69336E 03
	0.39482E 01	0.47421E 01	0.58871E 02	-0.52997E 02	-0.14985E-03	-0.10500E 04	-0.40322E 02	-0.11954E 03
	0.13959E-03	-0.16535E 02	-0.12760E 01	-0.21382E-01	0.27957E 00	-0.18450E 01	0.86553E-01	-0.14262E 01
	0.11487E 03	-0.82978E 01	0.92310E-03	0.10735E 04	-0.68975E 01	0.15485E 02	-0.14248E 02	-0.47995E 01
	-0.86633E 00	-0.31868E 01	0.10231E 04	0.29976E-01	0.57704E 00	0.13918E 02	-0.62338E 03	-0.27251E-01
	-0.27284E 02	-0.43546E 02	0.72192E 01	-0.22637E 02	-0.31109E 00	0.29647E 01	-0.10760E 02	-0.26263E 02
	-0.15587E 02	0.84187E 02	-0.20049E 03	0.11412E 01	-0.31035E 03	-0.56753E 02	-0.19921E 03	0.71726E 01
	-0.70462E 00	0.11157E 02	0.23384E 02	-0.44094E 02	0.23596E 02	-0.88691E 01	0.17406E 02	-0.20262E 02
	0.10744E 02	0.37964E 03	0.33856E 02	-0.14135E 02	0.48461E 02	-0.10539E 02	0.53210E 02	0.19131E 01
	0.14919E 01	-0.96944E 01	-0.17128E 02	0.10359E 02	0.11908E 02	0.73409E 01	0.41091E 01	0.14858E 01
	0.64616E-01	0.30648E 00	0.46631E 03	0.28059E 02	-0.96462E 01	-0.44859E 02	0.92568E 02	-0.30340E 03
	-0.76024E 03	-0.21450E 02	0.44684E 00	0.14328E 03	-0.44733E 02	0.38020E 03	0.11117E 03	0.18704E 04
	-0.10608E 04	0.98937E 02						
105	0.19107E-09	0.16947E-09	0.18722E-08	-0.13797E-04	0.26216E-04	-0.66864E-03	0.13064E 00	-0.78200E-03
	0.13408E-02	-0.24393E-01	0.37059E-01	-0.13362E-01	0.26547E 00	-0.55338E-01	0.72256E-04	0.20414E 02
	0.15075E 01	0.80281E-02	-0.49555E 02	-0.26270E 02	0.14165E-03	0.19579E 02	0.14456E 02	0.18963E 03
	-0.23877E-03	0.93253E 01	0.50845E 01	-0.74398E-02	-0.60138E 00	-0.71750E 00	0.32844E 00	0.16296E 00
	-0.11068E 03	0.19106E 02	0.87406E-04	-0.37826E 02	-0.25265E 00	-0.49250E 01	-0.41258E 01	0.18996E 02
	0.14988E 00	0.17984E 01	-0.35748E 02	-0.91838E-03	-0.12817E 02	-0.76598E 01	0.18108E 02	0.77363E-03
	0.10143E 03	0.56804E 02	-0.26377E 02	-0.88751E 01	0.64320E 01	0.17954E 01	0.22540E 02	0.27850E 02
	0.27302E 01	-0.25852E 02	0.15497E 03	-0.90266E 00	0.18692E 03	0.25413E 02	0.22007E 03	0.85207E 00
	-0.10797E 01	-0.64563E 01	-0.25136E 02	0.32847E 02	-0.72408E 01	-0.38510E 01	-0.37166E 01	0.32935E 01
	-0.75127E 00	-0.57941E 02	-0.47042E 02	-0.28848E 00	0.54622E 01	-0.31355E 01	-0.11787E 02	-0.14864E 00
	-0.93908E 00	0.27089E 01	0.62898E 00	-0.45005E 01	-0.21153E 00	0.35147E 01	-0.13150E 00	-0.18584E-01
	-0.54174E-01	-0.75047E-01	-0.87044E 02	0.22378E 01	0.30485E 01	0.16330E 02	-0.93763E 02	0.51510E 03
	0.68031E 02	0.58461E 01	0.14089E 01	-0.52935E 02	-0.16855E 03	0.39677E 03	-0.26179E 03	-0.10608E 04
	-0.14453E 04	-0.57722E 03						

Table I-4: Coupled Modal Damping Matrix (Continued)

NASTRAN MODAL DAMPING MATRIX (BHH), SCALED BY THE FACTORS 0.1751E 03 AND 0.1000E 01

MODE	VALUES							
106	0.78196E-10	0.12690E-08	-0.90871E-09	-0.10637E-03	-0.71753E-04	0.28451E-03	0.43844E 00	-0.28161E-03
	0.23856E-01	-0.42096E 00	-0.75233E-01	-0.13723E 00	0.46732E 01	-0.50005E 00	0.12701E-02	-0.99602E 02
	0.16477E 01	-0.23654E 00	-0.44068E 01	-0.11498E 03	0.17415E-02	-0.18257E 03	0.28947E 03	-0.83381E 02
	0.11799E-03	0.81242E 02	-0.47088E 01	0.59367E-01	0.34638E 01	-0.55924E 00	0.62825E 00	0.22416E 00
	-0.24792E 02	-0.12160E 03	0.20153E-02	0.16966E 03	0.22041E 01	0.10325E 01	0.44556E 01	0.31727E 02
	0.27427E 00	0.17286E 02	0.15485E 03	0.63297E-02	-0.11696E 02	0.24552E 02	-0.96650E 02	-0.32943E-02
	0.17726E 03	0.26886E 02	0.10158E 03	-0.45116E 01	0.15295E 02	0.60863E 01	0.35785E 01	-0.33254E 02
	-0.15632E 02	-0.42647E 03	-0.17285E 03	-0.24650E 01	0.44728E 03	0.22540E 03	-0.22216E 03	0.57703E 01
	0.11708E 02	-0.36656E 02	0.66447E 02	0.12520E 02	-0.14006E 03	0.31419E 01	0.26606E 02	-0.11577E 02
	0.39148E 02	0.84691E 02	-0.42219E 03	0.32971E 01	0.19136E 02	-0.56686E 02	0.45812E 01	0.96247E 00
	0.21544E 01	0.80978E 01	-0.22537E 01	-0.15992E 02	0.17501E 01	0.12633E 02	0.59966E 00	-0.27727E 00
	-0.36684E 00	-0.70206E 00	-0.48637E 02	0.22428E 01	0.59774E 01	-0.47999E 02	-0.11922E 04	-0.45012E 03
	0.10268E 03	0.16941E 03	0.36709E 01	-0.13009E 04	-0.36262E 03	-0.34976E 03	0.39017E 03	0.98937E 02
	-0.57722E 03	-0.59028E 04						

APPENDIX II

PREPROCESSOR (STRUCTURAL JOINT MODELING) COMPUTER PROGRAM

Introduction

This program, written in FORTRAN IV, was developed to incorporate structural joint damping models at selected points in a NASTRAN finite-element model. The user specifies the location and properties of the desired structural joint. The locations for joints are limited to the ends of BAR and ROD elements defined in a rectangular coordinate system. The preprocessor reads the NASTRAN BULK DATA deck for the original model and outputs a revised data deck containing additional BULK DATA card images necessary for the inclusion of the specified Voigt damping models. The revised BULK DATA is used by NASTRAN to calculate modal characteristics of the structural model and the coupled generalized modal damping matrix using rigid format 3.

The number of structural joints which can be implemented is limited to 100 BAR joints or 200 ROD joints. If both types of joints are used, the number of BAR joints, B, and the number of ROD joints, R, must satisfy both of the following inequalities:

$$3B + R \leq 300$$
$$B + R \leq 200$$

Gridpoint and element identification numbers from 7000 through 7999 are used by the preprocessor for the gridpoints and elements of the joint models and cannot be used in the original structural model.

Input Description

The input data required by the preprocessor consists of a NASTRAN BULK DATA card set describing a structural model and punched cards which describe the locations and properties of the structural joints to be incorporated into the model. The DMAP ALTER statements which must be included in the NASTRAN EXECUTIVE CONTROL deck to generate and output the coupled generalized damping matrix are shown in Table II-1.

Table II-1: DMAP ALTER Statements
for Damping Matrix Formulation

NASTRAN EXECUTIVE CONTROL DECK

```
ID    LST,MODES 1
APP   DISPLACEMENT
SOL   3,0
CHKPNT YES
TIME 30
ALTER   28,29
SMA2  CSTM,MPT,ECPT,GPCT,DIT/MGG,BGG/V,Y,WTMASS=1.0/V,N,NOMGG/V,N,NOBGG/
      V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/V,
      Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPODPLT/V,Y,CPTRPLT/V,
      Y,CPTRBSC 1
SAVE  NOMGG,NOBGG $
ALTER 74
MATGPR GPL,USET,SIL,MAA//C,N,A$
MATGPR GPL,USET,SIL,PGG//C,N,G$
ALTER   96
MPYAD PHIG,PGG,/XX/C,N,1/C,N,1/C,N,0 $
MPYAD XX,PHIG,/PHH/C,N,0/C,N,1/C,N,0  $
CHKPNT PHH $
MATPRN PHH,,,,,,//-1$
ENDALTER
CEND
```

Structural joint damping models for BAR and ROD elements are shown schematically in Figure 11-1. The location of a structural joint is specified by giving the element identification and gridpoint identification numbers for the desired joint location. The location of the added gridpoint c is specified in terms of the location of the gridpoints at the ends of the structural element:

$$G(c) = G(a) + KG\ [G(b) - G(a)]$$

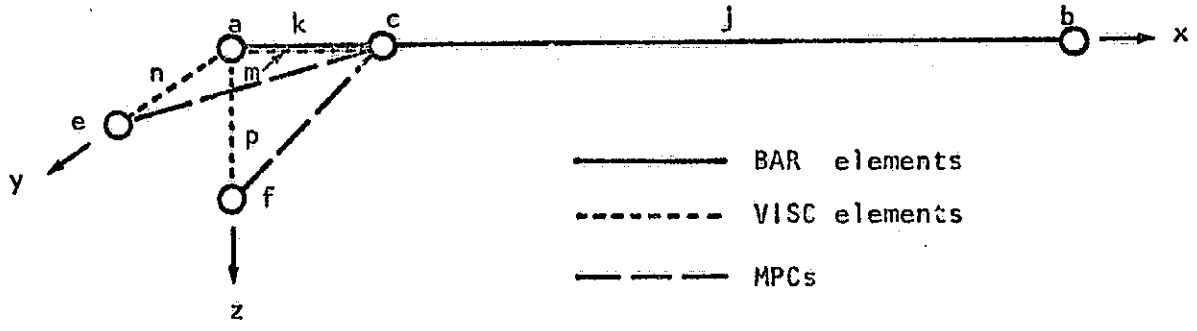
where G(a), G(b) and G(c) are the locations of gridpoints a, b, and c, respectively, and KG is a factor specified either by the user or by default. The formation sequence of the added gridpoint (c) is reidentified using the SEQGP feature of NASTRAN to improve matrix bandwidth.

Section properties of the revised element k are specified by multiplying the original element section properties by appropriate factors specified either by the user or by default:

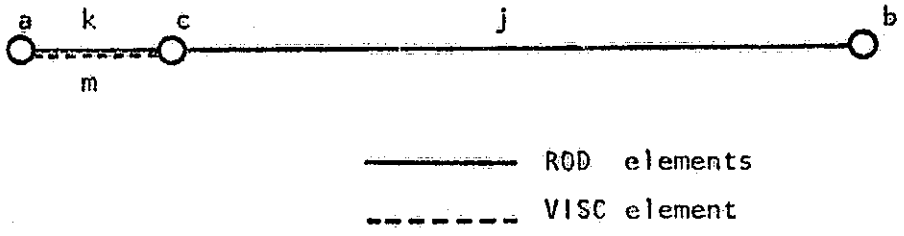
$$\begin{aligned} A(k) &= KA \cdot A(j) \\ J(k) &= KJ \cdot J(j) \\ I1(k) &= KI1 \cdot I1(j) \\ I2(k) &= KI2 \cdot I2(j) \end{aligned}$$

where A(j), J(j), I1(j) and I2(j) are the cross sectional area, torsional constant, and area moments of inertia of the original element (j). Damping values are input by specifying the C1 (axial) and C2 (torsional) damping constants for each VISC element denoted by m, n and p in Figure 11-1.

Gridpoint I.D.'s for the added gridpoints (c, e, and f) and element I.D.'s for the revised BAR and ROD elements (k) and the VISC elements (m, n, and p) are automatically established by the preprocessor. The numbering system for these I.D.'s is as follows:



a) BAR Joint Schematic



b) ROD Joint Schematic

Figure II-1: NASTRAN Joint Damping Model Schematics

	I.D. Series
GRID	7000 - 7299
CBAR and CRØD	7300 - 7499
PBAR and PRØD	7500 - 7699
CVISC	7700 - 7999

Therefore the user must ensure that these I.D.'s are not used in the original NASTRAN structural model.

If, in the original structural model, freedoms are deleted from the analysis set by the use of an ØMIT set, the new freedoms introduced in the joint models may also be omitted by inputting "ØMIT" in the proper field on the $BAR and $RØD cards. If "ASET" is used in the original model the new freedoms will automatically be omitted if the "ØMIT" field is left blank.

To preclude spurious damping forces resulting from rigid-body rotations, each VISC element may have a translational damping component only when its element axis is aligned with an axis of the displacement coordinate system. This is because the present NASTRAN VISC element does not contain the translation/rotation coupling terms required for general kinematic compatibility. Rotational damping components are acceptable for any orientation of the VISC element axis.

Detailed preprocessor input descriptions and examples for BAR element and ROD element joint damping models are shown in the following pages. The card format is the NASTRAN single-field format. The "$BAR" and "$ROD" must begin in column one, but the rest of the input may be located anywhere within the 8 column fields. The element I.D. and gridpoint I.D. are integers and the rest is decimal input. The default values represent joint flexibility corresponding to a five percent reduction in the first mode frequency for a cantilever beam with a lumped mass at the tip. The preprocessor data cards may be placed anywhere in the NASTRAN BULK DATA deck.

Input Data Card $BAR Joint Damping Element (BAR)

Description: Defines a Voigt damping model to be included at the end of a BAR element.

Format and Example:

1	2	3	4	5	6	7	8	9	10
$BAR	IDBR	IDGB	C1m	C1n	C1p	C2m	C2n	C2p	abc
$BAR	801	185	8090.	8090.	8090.	512906.	512906.	512906.	+D801

+bc	KG	KA	KJ	KI1	KI2	MFC ID	ØMTB		
+D801	.703								

Field	Contents
IDBR	Identification number of the BAR element to which a joint is being added
IDGB	Gridpoint identification number which defines the location of the joint
C1m,C1n,C1p	Translational damping constants for the joint in the local element x, y and z directions, respectively
C2m,C2n,C2p	Rotational damping constants for the joint in the local element RX, RY and RZ directions, respectively
KG	Joint length factor (default = .1)
KA	Joint area factor (default = .47)

Field	Contents
KJ	Joint torsional constant factor (default = .47)
KI1,KI2	Joint area moment of inertia factors (default = .71)
MPC ID	Set I.D. into which generated MPC's will be placed (default = 1)
ØMTB	Indicator used to include joint freedoms in the ØMIT set: ØMIT - include joint freedoms in ØMIT set blank - do not include joint freedoms in ØMIT set

Remarks:

1. Every input on the first card is required; no default values exist.

2. The second card is optional; default values are provided for blank fields.

3. Joint factors (KG,KA,KJ,KI1,KI2) are used to define joint properties:

   length of joint = KG * length of original element
   area of joint = KA * area of original element
   etc.

4. Freedoms generated for the joint should not be included in the analysis set. If an ØMIT set is used for other freedoms in the model, input "ØMIT" in field 8 of card 2. If an ASET is used elsewhere in the model, leave this field blank.

5. Identification numbers for the gridpoints, BAR elements, BAR properties, and VISC elements generated by the preprocessor are in the range 7000-7999. These I.D. numbers may not be used in the original NASTRAN structural model.

6. Multipoint constraint sets must be selected in the CASE CONTROL deck (MPC = SID) to be used by NASTRAN.

7. Values of C1 and C2 must be less than 10^7 due to format limitations.

Input Data Card $RØD Joint Damping Element (ROD)

Description: Defines a Voigt damping model to be included at the end of a RØD element.

Format and Example:

1	2	3	4	5	6	7	8	9	10
$RØD	IDR	IDGR	C1	C2	KG	KA	KJ	ØMIT	
$RØD	4	3	26.1	92.7	.2		.4	ØMIT	

Field	Contents
IDR	Identification number of the ROD element to which a joint is being added
IDGR	Gridpoint identification number which defines the location of the joint
C1,C2	Axial and torsional damping constants for the ROD joint
KG	Joint length factor (default = .1)
KA	Joint area factor (default = .47)
KJ	Joint torsional constant factor (default = .47)
ØMIT	Indicator used to include joint freedoms in the ØMIT set: ØMIT - include joint freedoms in ØMIT set blank - do not include joint freedoms in ØMIT set

Remarks: 1. Joint factors (KG, KA, KJ) are used to define joint properties:

length of joint = KG * length of original element

area of joint = KA * area of original element, etc.

2. Freedoms generated for the joint should not be included in the analysis set. If an ØMIT set is used for other freedoms in the model input "ØMIT" in field 9. If an ASET is used elsewhere in the model, leave this field blank.

3. Identification numbers for the grid point, ROD element, ROD properties, and VISC element generated by the preprocessor are in the range 7000-7999. These I.D. numbers may not be used in the original NASTRAN structural model.

4. Values of C1 and C2 must be less than 10^7 due to format limitations.

Preprocessor Program Listing (SRU 1108)

```
ASG,T   3,F2///500
ASG,T   4,F2///500
ASG,T   9,F2///500
ASG,T   1,F2///10
FOR,1S MAIN,MAIN
C
C **  NASTRAN PRE PROCESSOR PROGRAM FOR CREATING FLEXIBLE JOINTS
C
C
      INTEGERCD, BULK, HDR(2,17),XCD(80)
      INTEGER   OMIT
      INTEGER   OMTB
      COMMON/ IMAGE / CD(2,10)
      EQUIVALENCE (XCD(1),CD(1,1))
      COMMON/ BROD / IDR(20), IDGR(20), RPARM(20,5), OMIT(20), NROD
      COMMON/ BGRID / IGD(1000), IPGG(1000), GCD(1000,3), NGD
      COMMON/ BCROD / IORD(1000,4), NCRD
      COMMON/ BPROD / IDPRD(1000), IDMP(1000), JPRDP(1000,4), NRPD
      COMMON/ BNEW  / NGRD, IDEX, IPEX, IEDCM, IDCV
      COMMON/ BCOMM / XC(3,5), I1, I2, INCP
      COMMON/ BDEFLT / AKGPD, AKGSD, AKMD, AKAPD, AKASD, BKMD, BKGPD,
     1 BKGSD, BKAPD, BKASD, BKJPD, BKJSD, BKI1PD, BKI1SD, BKI2PD, BKI2SD
      COMMON/ BSQGP / NWGRD(40), SEGMX(40), NSQGP
      COMMON/ BIMG / NIMG(20,35), IMG
      COMMON/ BCBAR / IDB(1000), IPB(1000), IBA(1000), IBB(1000),
     1 IBREC(1000), NBAR, NBREC
      COMMON/ BBAR / IDBR(20), IDGB(20), BPARM(20,12), OMTB(20), NBR
      COMMON/ BPBAR / IDPB(1000), IPREC(1000), NPBAR, NPREC
      COMMON/ZZZZZ/Z
      INTEGER Z
      DATA HDR / 4HSROD,1H , 4HSBAR,1H , 4HCROD,1H , 4HPROD,1H ,
     1 4HGRID,1H , 4HCBAR,1H , 4HPBAR,1H , 4HPROD,1H*, 4HGRID,1H*,
     2 4HCBAR,1H*, 4HPBAR,1H*, 4HPROD,4H   *, 4HGRID,4H   *,
     3 4HCBAR,4H   *,4HPBAR,4H   *,4HENDD,4HATA ,4H END,4HDATA /
      Z=1
      CALL INIT
C
 10   CONTINUE
C
C **  READ NASTRAN DECK CARD IMAGES
C
      READ(5,7000,END=200) CD
 15   CONTINUE
      GO TO 30
 20   CONTINUE
C
C **  WRITE CARD IMAGE ON DISK DATA SET FOR INPUT TO NASTRAN
C
      WRITE(9,7000) CD
      GO TO 10
 30   CONTINUE
C
C **  TEST CARD IMAGE FOR DESIRED BULK DATA SUBSET
C
      DO 50 I1= 1, 17
```

```
      I=II
      IF(CD(1,1).NE.HDR(1,I)) GO TO 50
      IF(CD(2,1).EQ.HDR(2,I)) GO TO 60
   50 CONTINUE
C
C **  NOT ONE OF DESIRED SUBSET
C
      GO TO 20
   60 CONTINUE
      IF(I .GE. 16) GO TO 10
      IF(I .GE. 12) I = I - 4
      WRITE(2,7000) CD
      REWIND 2
      CALL RADJ(I, IDX)
      GO TO (130, 140, 90, 100, 80, 110, 120, 100, 80, 110, 120), I
   80 CONTINUE
C **  GRID CARD
      CALL GRID(IDX, I)
      GO TO 10
   90 CONTINUE
C **  CROD CARD
      CALL CROD
      GO TO 10
  100 CONTINUE
C **  PROD CARD
      CALL PROD(I, IDX)
      GO TO 10
  110 CONTINUE
C **  CBAR CARD
      CALL CBAR(I, IDX, $500,$200)
      GO TO 10
  120 CONTINUE
C **  PBAR CARD
      CALL PBAR(I, IDX, $500,$200)
      GO TO 10
  130 CONTINUE
C **  $ROD CARD
      CALL ROD
      GO TO 10
C **  $BAR CARD
  140 CONTINUE
      CALL BAR(I, IDX, $500)
      GO TO 10
  200 CONTINUE
C
C **  CREATE NEW BULK DATA CARDS FOR ROD JOINTS
C
      WRITE(6,7010) NROD, NBR
      IF(NROD.LE.0) GO TO 211
      WRITE(6,7100)
      DO 210 I=1,NROD
      WRITE(6,7110) I, IDR(I), IDGR(I),(RPARM(I,J),J=1,5), OMIT(I)
  210 CONTINUE
  211 CONTINUE
      IF(NBR.LE.0) GO TO 221
```

```
      WRITE(6,7120)
      DO 220 I = 1, NBR
      WRITE(6,7130) I, IDBR(I), IDGB(I), (BPARM(I,J), J=1,12), OMTB(I)
  220 CONTINUE
  221 CONTINUE
      CALL RODJT
C
C **  CREATE NEW BULK DATA CARDS FOR BAR JOINTS
C
      CALL BARJT
C
C **  CLEAN UP
C
C
C **  WRITE CBAR IMAGES ON DISK
C
      REWIND 3
      IRC = 0
  300 DO 350 IQQQQ=1,NBREC
      READ(3,7000) CD
      IF(CD(1,1).EQ.HDR(1, 6) .AND. CD(2,1).EQ.HDR(2, 6)) GO TO 310
      IF(CD(1,1).EQ.HDR(1,10) .AND. CD(2,1).EQ.HDR(2,10)) GO TO 305
      IF(.NOT.
     X  (CD(1,1).EQ.HDR(1,14) .AND. CD(2,1).EQ.HDR(2,14))) GO TO 320
  305 CONTINUE
C **  DOUBLE FIELD IMAGE
      IRC = IRC + 1
      WRITE(Z,7001) (CD(1,L),CD(2,L),L=1,5), IBA(IRC), IBB(IRC),
     X   CD(1,10),CD(2,10)
      REWIND Z
      READ(Z,7000) CD
      REWIND Z
      GO TO 320
  310 CONTINUE
C **  SINGLE FIELD IMAGE
      IRC = IRC + 1
      WRITE(Z,7002) (CD(1,L),CD(2,L),L=1,3),IBA(IRC),IBB(IRC),
     X    (CD(1,L),CD(2,L),L=6,10)
      REWIND Z
      READ(Z,7000) CD
      REWIND Z
  320 CONTINUE
C **  WRITE CARD IMAGE ON DISK
      WRITE(9,7000) CD
  350 CONTINUE
C
C **  WRITE CROD IMAGES ON DISK
C
      IF(NCRD .LE. 0) GO TO 450
      DO 400 I = 1, NCRD
      WRITE(Z,7004) HDR(1,3),HDR(2,3), (IDRD(I,L),L=1,4)
      REWIND Z
      IMG = 0
      CALL STORE( 10 )
      WRITE(9,7003) (NIMG(L,1),L=1,20)
```

```
  400  CONTINUE
  450  CONTINUE
C
C **   PUT ENDDATA IMAGE AT END OF DATA SET ON DISK
C
       IMG = 0
       WRITE(Z,7000) HDR(1,16),HDR(2,16)
       REWIND Z
       CALL STORE( 2 )
       WRITE(9,7003) (NIMG(L,1),L=1,20)
       END FILE 9
       REWIND 9
       WRITE(6,7201)
  480  READ(9, 7000,END=485) CD
       WRITE(6,7202) CD
       GO TO 480
  485  REWIND 9
 7201  FORMAT(17H1NEW NASTRAN DECK  /1X)
 7202  FORMAT( 5X,20A4 )
       STOP
  500  WRITE(Z,7005) XCD
       REWIND Z
       READ(Z,7000) CD
       REWIND Z
       GO TO 15
C
 7000  FORMAT(20A4)
 7001  FORMAT(10A4,2I16,2A4)
 7002  FORMAT(6A4, 2I8, 10A4)
 7003  FORMAT(20A4)
 7004  FORMAT(2A4,4I8)
 7005  FORMAT( 80A1 )
 7010  FORMAT(1H1/1H0, 65(2H* ) /1H0,46X,38HNO. ROD ELEMENT JOINTS TO BE
     1MODIFIED ,I2/47X,38HNO. BAR ELEMENT JOINTS TO BE MODIFIED ,I2 /
     2 1H0,65(2H* ) )
 7100  FORMAT(1H0,54X,22H***   ROD JOINTS   *** /)
 7110  FORMAT(20X,I2,2I10, 5F13.3, I5)
 7120  FORMAT(1H0/55X,22H***   BAR JOINTS   *** /)
 7130  FORMAT(22X,I2, 2I10, 5F13.3 /21X, 6F13.3, 4X,A4,I5)
       END
FOR,IS DATA,DATA
       SUBROUTINE INIT
C
       INTEGER   OMIT
       INTEGER   OMTB
       COMMON/ BROD / IDR(20), IDGR(20), RPARM( 100), OMIT(20), NROD
       COMMON/ BGRID / IGD(1000), IPCG(1000), GCD(1000,3), NGD
       COMMON/ BCROD / IDRD(1000,4), NCRD
       COMMON/ BPROD / IDPRD(1000), IDMP(1000), JPRDP(1000,4), NRPD
       COMMON/ BNEW  / NGRD, IDEX, IPEX, IEDCM, IDCV
       COMMON/ BCONM / XC(3,5), I1, I2, INCP
       COMMON/ BDEFLT / AKGPD, AKGSD, AKMD, AKAPD, AKJPD, BKMD, BKGPD,
     1 BKGSD, BKAPD, BKASD, BKJPD, BKJSD, BKI1PD, BKI1SD, BKI2PD, BKI2SD
       COMMON/ BSQGP / NWGRD(40), SEGMX(40), NSQGP
       COMMON/ BIMG / NIMG(20,35), IMG
```

```
      COMMON/ BCBAR / IDB(1000), IPB(1000), IBA(1000), IBB(1000),
     1 IBREC(1000), NBAR, NBREC
      COMMON/ BBAR / IDBR(20), IDGB(20), BPARM( 240 ), OMTB(20), NBR
      COMMON/ BPBAR / IDPB(1000), IPREC(1000), NPBAR, NPREC
C
      NCRD=0
      NGD=0
      NRDD=0
      NRPD=0
      NSQGP=0
      NBAR=0
      NBREC=0
      NBR=0
      NPBAR=0
      NPREC=0
      DO 2 I=1,20
      OMIT(I)=0
    2 OMTB(I)=0
      DO 4 I=1,100
    4 RPARM(I)=-1.0
      DO 6 I=1,240
    6 BPARM(I)=-1.0
      NGRD=7000
      ICEX=7300
      IPEX=7500
      IEDCM=7600
      IDCV=7700
      AKGPD=.1
      AKJPD=.47
      AKMD=.1
      AKAPD=.47
      BKGPD=.1
      BKAPD=.47
      BKJPD=.47
      BKI1PD=.71
      BKI2PD=.71
      BKMD  =.1
      BKGSD =.1
      BKASD =.1
      BKJSD =.1
      BKI1SD=.1
      BKI2SD=.1
      RETURN
      END
"FOR,IS RADJ,RADJ
      SUBROUTINE RADJ(II, IDX)
C
C **  RIGHT ADJUST NASTRAN BULK DATA IN FIELD
C
      INTEGER   CD, CC(64), DMY(4), BLNK
      COMMON/ IMAGE / CD(80)
      COMMON/ZZZZZ/Z
      INTEGER Z
      DATA DMY /1H0, 1H., 1H1, 1H- /, BLNK / 1H  /
      DO 10 I = 1, 64
```

```
      CC(I) = BLNK
   10 CONTINUE
C
C **  TEST FOR SINGLE OR DOUBLE FIELD
C
      IF(II .GT. 7) GO TO 20
C **  SINGLE FIELD
      IDX = 8
      IDY = 8
      GO TO 30
   20 CONTINUE
C **  DOUBLE FIELD
      IDX = 4
      IDY = 16
   30 CONTINUE
C
      READ(Z,7000) CD
      REWIND Z
C
C **  RIGHT ADJUST DATA IN FIELDS
C
      DO 100 J = 1, IDX
      IBLNK = 0
      K2 = J * IDY
      K1 = K2 + 8
      DO 50 L = 1, IDY
      IF(CD(K1) .EQ. BLNK) GO TO 40
      IBLNK = 1
      CC(K2) = CD(K1)
      K2 = K2 - 1
   40 K1 = K1 - 1
   50 CONTINUE
      IF(II .GT. 2) GO TO 100
      IF(IBLNK .NE. 0) GO TO 100
      DO 60 L = 1, 4
      CC(K2) = DMY(L)
      K2 = K2 - 1
   60 CONTINUE
  100 CONTINUE
      DO 120 J = 1, 64
      CD(J+8) = CC(J)
  120 CONTINUE
      WRITE(Z,7000) CD
      REWIND Z
      RETURN
 7000 FORMAT(80A1)
 7010 FORMAT(26X, 80A1)
      END
FOR,IS SEQGEN,SEQGEN
      SUBROUTINE SEQGEN(IDG, IGC)
      COMMON/ BSQGP / NWGRD(40), SEQMX(40), NSQGP
      COMMON/ZZZZZZ/Z
      INTEGER Z
      DATA TLC / 6HSEQGP    /
      IF(NSQGP .EQ. 0) GO TO 130
```

```
      DO 120 L = 1, NSQGP
      IF(IDG .NE. NWGRD(L)) GO TO 120
      LS = L
      GO TO 140
  120 CONTINUE
  130 CONTINUE
      NSQGP = NSQGP + 1
      NWGRD(NSQGP) = IDG
      SEQMX(NSQGP) = IDG
      LS = NSQGP
  140 CONTINUE
      SEQC = SEQMX(LS) + 0.1
      SEQMX(LS) = SEQC
      WRITE(Z,7000) TLC,IGC, SEQC
      REWIND Z
      CALL STORE( 6 )
      RETURN
C
 7000 FORMAT(A6, 2X, I8, F8.1)
      END
 FOR,IS GRID,GRID
      SUBROUTINE GRID(IDX, II)
      DIMENSION B(5)
      DOUBLE PRECISION BB(4)
      INTEGER A(2),CONT(2)
      COMMON/ IMAGE / CARD(80)
      COMMON/ BGRID / IDG(1000), ICP(1000), GCD(1000,3), NGD
      COMMON/ZZZZZ/Z
      INTEGER Z
      DATA MAX / -1 /
C
      IF(IDX .EQ. 4) GO TO 20
      READ(Z,7001) A, B
      REWIND Z
      GO TO 50
C
C **  DOUBLE FIELD CARD
C
   20 CONTINUE
      READ(Z,7002) A, BB, CONT
      REWIND Z
      DO 30 I = 1, 4
      B(I) = BB(I)
   30 CONTINUE
      WRITE(9,7000) CARD
      READ(5,7000,END=200) CARD
      WRITE(Z,7000) CARD
      REWIND Z
      CALL RADJ(II, IDX)
      READ(Z,7002) A, BB
      REWIND Z
      B(5) = BB(1)
   50 CONTINUE
C
C **  STORE DATA IN COMMON
```

```
C
      NGD = NGD + 1
      IF(NGD .LE. 1000) GO TO 75
      IF(MAX .GE. 0) GO TO 100
      MAX = 1
      WRITE(6,7003)
      GO TO 100
 75   IDG(NGD) = B(1)
      ICP(NGD) = B(2)
      GCD(NGD,1) = B(3)
      GCD(NGD,2) = B(4)
      GCD(NGD,3) = B(5)
 100  WRITE(9,7000) CARD
      RETURN
C **  SUBROUTINE GRID -INSERT
 200  CONTINUE
      WRITE(6,7010) A, BB, CONT
      STOP
 7000 FORMAT(80A1)
 7001 FORMAT(2A4,5F8.0)
 7002 FORMAT(2A4,4F16.0,2A4)
 7003 FORMAT(1H0,22X,86H***   MORE THAN 1000 GRID POINTS. NO MORE WILL B
     1E STORED FOR JOINT PRE-PROCESSOR   *** /1H0)
 7010 FORMAT(1H0,46X,40H***   END OF FILE ON INPUT IN GRID   *** /
     1 26X,2A4, 4F16.5,2A4)
      END
FOR,IS OMTC,OMTC
      SUBROUTINE OMTC(N, OMTI, OM)
      INTEGER   OMTI(1),OMTF,OMTC
      INTEGER   OM(8), OMT(4), BLNK
      DATA OMTC, BLNK / 4HOMIT, 1H /
      EQUIVALENCE (OMT(1), OMTF)
C
      K1 = 8
      K2 = 4
 65   IF(K1 .EQ. 0) GO TO 100
      IF(OM(K1) .EQ. BLNK) GO TO 70
      OMT(K2) = OM(K1)
      K2 = K2 - 1
      IF(K2 .EQ. 0) GO TO 80
 70   K1 = K1 - 1
      GO TO 65
 80   CONTINUE
C
      IF(OMTF .EQ. OMTC) OMTI(N) = 1
C
 100  CONTINUE
      RETURN
      END
FOR,IS ROD,ROD
      SUBROUTINE ROD
      INTEGER   OMIT
      COMMON/ BROD / IDR(20), IDGR(20), RPARM(20,5), OMIT(20), NROD
      COMMON/ZZZZZ/Z
      INTEGER Z
```

```
      DIMENSION B(9)
      INTEGER   OM(8)
C
      READ(Z,7000) B, OM
      REWIND Z
      NROD = NROD + 1
      IF(NROD .LE. 20) GO TO 50
      WRITE(6,7001) NROD, B, OM
      GO TO 100
 50   IDR(NROD) = B(3)
      IDGR(NROD) = B(4)
      DO 60 I = 1, 5
      RPARM(NROD,I) = B(I+4)
 60   CONTINUE
      CALL OMTC(NROD, OMT, OM)
 100  RETURN
 7000 FORMAT(2A4, 7F8.0, 8A1)
 7001 FORMAT(1H0, 39H***    THE NUMBER OF ROD ELEMENT JOINTS ,I2,1X,
     116HEXCEEDS 20  *** / 2X,2A4,7F8.4,8A1//)
      END
FOR,IS BAR,BAR
      SUBROUTINE BAR(II, IDX, *)
      INTEGER   OMTB
      INTEGER   CARD, PLUS
      INTEGER   C(8), BLNK
      COMMON/ IMAGE / CARD(80)
      COMMON/ BBAR / IDBR(20), IDGB(20), BPARM(20,12), OMTB(20), NBAR
      COMMON/ZZZZZ/Z
      INTEGER Z
      REAL  A(2)
      DIMENSION B(8), BO(6)
      EQUIVALENCE (B(1), BO(1))
      DATA PLUS/ 1H+ /
      DATA BLNK / 1H  /
C
      READ(Z,7000) A, B, C
      REWIND Z
      NBAR = NBAR + 1
      IF(NBAR .LE. 20) GO TO 25
      WRITE(6,7010) NBAR, B
      GO TO 200
 25   CONTINUE
      IDBR(NBAR) = B(1)
      IDGB(NBAR) = B(2)
      DO 40 I = 1, 6
      BPARM(NBAR,I) = B(I+2)
 40   CONTINUE
C
C **  CONTINUATION CARD
C
      READ(5,7001,END=300) CARD
      IF(CARD(1) .NE. PLUS) RETURN 3
      WRITE(7,7001) CARD
      REWIND Z
      CALL RADJ(II, IDX)
```

```
      READ(Z,7002) A, BO, C
      REWIND Z
      DO 125 I = 1,6
      BPARM(NBAR,I+6) = B(I)
  125 CONTINUE
      CALL ONTC(NBAR, OMTB, C)
  200 RETURN
C
C **  CONTINUATION CARD EXPECTED - END OF FILE ON INPUT DATA SET
C
  300 CONTINUE
      WRITE(6,7020) A, B, C
      STOP
 7000 FORMAT(2A4,8F8.0, 8A1)
 7001 FORMAT(80A1)
 7002  FORMAT(2A4,5F8.0,4X,A4, 8A1)
 7010 FORMAT(1H0,39H***   THE NUMBER OF BAR ELEMENT JOINTS ,I2,
     117H EXCEEDS 20   *** / 2X,8F8.4)
 7020 FORMAT(1H0,46X,39H*** END OF FILE ON INPUT IN BAR  *** /
     126X,2A4,8F8.4, 8A1)
      END
FOR,IS CROD,CROD
      SUBROUTINE CROD
      REAL  A(2)
      COMMON/ IMAGE / CD(80)
      COMMON/ BCROD / ID(1000,4), NCRD
      COMMON/ZZZZZ/Z
      INTEGER Z
      DIMENSION B(8)
      DATA MFLG / -1 /
C
      READ(Z,7000) A, B
      REWIND Z
      I1 = -4
   10 CONTINUE
      I1 = I1 + 4
      IF(I1 .GT. 4) GO TO 75
      IF(B(I1+1) .EQ. 0.0) GO TO 75
      NCRD = NCRD + 1
      IF(NCRD .GT. 1000) GO TO 50
      DO 25 I = 1, 4
      ID(NCRD,I) = B(+++1)
   25 CONTINUE
      GO TO 10
   50 CONTINUE
C
C **  TABLE FULL
C
      IF(MFLG .GE. 0) GO TO 75
      WRITE(6,7010) CD
      MFLG = 1
   75 WRITE(9,7001) CD
  100 RETURN
 7000 FORMAT(2A4,8F8.0)
 7001 FORMAT(80A1)
```

```
 7010 FORMAT(1H0,31X,69H***  CROD STORAGE FULL - NO MORE CROD CARD DATA
     1 WILL BE STORED   *** /26X, 80A1)
       END
 FOR,IS PROD,PROD
       SUBROUTINE PROD(II, IDX)
       COMMON/ IMAGE / CD(80)
       COMMON/ BPROD / IDP(1000), IDM(1000), PROP(1000,4), NPRD
       COMMON/ZZZZZ/Z
       INTEGER Z
       REAL  A(2)
       DIMENSION B(5)
       DATA MFLG / -1 /
C
       READ(Z,7000) A, B
       REWIND Z
       NPRD = NPRD + 1
       IF(NPRD .GT. 1000) GO TO 200
       IDP(NPRD) = B(1)
       IDM(NPRD) = B(2)
       DO 25 I = 1, 4
       PROP(NPRD,I) = B(I+2)
  25   CONTINUE
       GO TO 250
  200  CONTINUE
       IF(MFLG .GE. 0) GO TO 250
       WRITE(6,7010) CD
       MFLG = 1
  250  CONTINUE
C
C **   WRITE PROD IMAGE ON DISK
C
       WRITE(9,7001) CD
  300  RETURN
  7000 FORMAT(2A4,5F8.0)
  7001 FORMAT(80A1)
  7010 FORMAT(1H0,31X,69H***   PROD STORAGE FULL - NO MORE PROD CARD DATA
     1 WILL BE STORED   *** /26X,80A1)
       END
 FOR,IS CBAR,CBAR
       SUBROUTINE CBAR(II, IDX, *, *)
       INTEGER   CD, PLUS, STAR
       COMMON/ IMAGE / CD(80)
       COMMON/ BCBAR / IDB(1000), IPB(1000), IBA(1000), IBB(1000),
     1 IBREC(1000), NBAR, NBREC
       COMMON/ZZZZZ/Z
       INTEGER Z
       REAL A(2),B0(4)
       DIMENSION B(4)
       DATA PLUS, STAR / 1H+, 1H* /, MFLG / -1 /
C
       IF(IDX .EQ. 4) GO TO 20
C      SINGLE FIELD CARD
       READ(Z,7001) A, B
       REWIND Z
       GO TO 40
```

```
   20   CONTINUE
C       DOUBLE FIELD CARD
        READ(Z,7002) A, BB
        REWIND Z
        DO 30 I = 1, 4
        B(I) = BB(I)
   30   CONTINUE
   40   CONTINUE
        NBAR = NBAR + 1
        IF(NBAR .LE. 1000) GO TO 75
        IF(MFLG .GE. 0) GO TO 60
        WRITE(6,7010) CD
        MFLG = 1
   60   CONTINUE
        WRITE(9,7000) CD
        RETURN
   75   CONTINUE
        IDB(NBAR) = B(1)
        IPB(NBAR) = B(2)
        IBA(NBAR) = B(3)
        IBB(NBAR) = B(4)
        IBREC(NBAR) = NBREC + 1
C
C **    SEARCH FOR CONTINUATION CARDS
C
   80   CONTINUE
        NBREC = NBREC + 1
        WRITE(3,7000) CD
        READ(5,7000,END=200) CD
        IF(CD(1) .EQ. PLUS) GO TO 100
        IF(CD(1) .EQ. STAR) GO TO 100
        RETURN 3
  100   CONTINUE
        WRITE(Z,7000) CD
        REWIND Z
        CALL RADJ(II, IDX)
        GO TO 80
  200   CONTINUE
C
C **    END OF BULK DATA SET
C
        RETURN 4
 7000   FORMAT(80A1)
 7001   FORMAT(2A4,4F8.0)
 7002   FORMAT(2A4,4F16.0)
 7010   FORMAT(1H0,35X,61H***   CBAR TABLE FULL - NO MORE CBAR DATA WILL B
     1E SAVED   *** /26X, 80A1)
        END
FOR,IS PBAR,PBAR
        SUBROUTINE PBAR(II, IDX, *, *)
        INTEGER   CD, PLUS, STAR
        COMMON/ IMAGE / CD(80)
        COMMON/ BPBAR / IDP(1000), IPREC(1000), NPBR, NPREC
        COMMON/ZZZZZ/Z
        INTEGER Z
```

```
      REAL  A(2)
      DATA PLUS, STAR, MFLG / 1H+, 1H*, -1 /
C
      IF(IDX .EQ. 4)  GO TO 20
C **  SINGLE FIELD CARD
      READ(Z,7001) A, I
      REWIND Z
      GO TO 40
 20   CONTINUE
      READ(Z,7002) A, I
      REWIND Z
 40   CONTINUE
      NPBR = NPBR + 1
      IF(NPBR .LE. 1000) GO TO 75
      IF(MFLG .LT. 0) GO TO 50
      MFLG = 1
      WRITE(6,7010) CD
 50   CONTINUE
      WRITE(9,7000) CD
      RETURN
 75   CONTINUE
      IDP(NPBR) = I
      IPREC(NPBR) = NPREC + 1
 80   CONTINUE
C
C **  WRITE PBAR IMAGE ON DISK
C
      WRITE(9,7000) CD
C
C **  SEARCH FOR CONTINUATION CARDS
C
      NPREC = NPREC + 1
      WRITE(4,7000) CD
      READ(5,7000,END=100) CD
      IF(CD(1) .EQ. PLUS) GO TO 90
      IF(CD(1) .EQ. STAR) GO TO 90
      RETURN 3
 90   CONTINUE
      WRITE(Z,7000) CD
      REWIND Z
      CALL RADJ(II,IDX)
      GO TO 80
 100  CONTINUE
C
C **  END OF BULK DATA SET
C
      RETURN 4
 7000 FORMAT(80A1)
 7001 FORMAT(2A4,I8)
 7002 FORMAT(2A4,I16)
 7010 FORMAT(1H0,35X,61H***   PBAR TABLE FULL - NO MORE PBAR DATA WILL B
     1E SAVED   *** /26X,80A1)
      END
FOR,IS RODJT,RODJT
      SUBROUTINE RODJT
```

```
      INTEGER   OMIT,CD
      COMMON/ IMAGE / CD(80)
      COMMON/ BROD / IDR(20), IDGR(20), RPARM(20,5), OMIT(20), NROD
      COMMON/ BGRID / IGRD(1000), IPCS(1000), GCD(1000,3),NGD
      COMMON/ BCROD / IDRD(1000,4), NCRD
      COMMON/ BPROD / IDPRD(1000), IDMP(1000), PROP(1000,4), NPRD
      COMMON/ BNEW / NGRD, IDEX, IPEX, IEDCM, IDCV
      COMMON/ BCOMM / XC(3,5), I1, I2, INCP
      COMMON/ BDEFLT / AKGPD, AKGSD, AKMD, AKAPD, AKJPD
      COMMON/ BSQGP / NHGRD(40), SEQMX(40), NSQGP
      COMMON/ BIMG / NIMG(20,35), IMG
      COMMON/ZZZZZ/Z
      INTEGER Z
      REAL    TLC(9)
      DATA TLC / 6HGRID     , 6HCROD     , 6HCONM2    , 6HOMIT1    ,
     1   6H123456, 6HSEQGP   , 6HPROD     , 6HCVISC    , 6HPVISC    /
C
      IF(NROD .LE. 0) RETURN
C
C **  START LOOP THROUGH NO. OF ROD ELEMENT JOINTS TO BE MODIFIED
C
      DO 500 NR = 1, NROD
      IMG = 0
      IDE = IDR(NR)
      IDG = IDGR(NR)
      DO 20 L = 1, NCRD
      IF(IDE .NE. IDRD(L,1)) GO TO 20
      LL = L
      GO TO 30
   20 CONTINUE
      WRITE(6,7010) IDE
      GO TO 500
   30 CONTINUE
      IGA = IDRD(LL,3)
      IGB = IDRD(LL,4)
      CALL COORD(IGA, IGB, IDG, *500)
      AKGP = RPARM(NR,3)
      IF(AKGP .LT. 0.0) AKGP = AKGPD
C
C **  COMPUTE NEW GRID POINT COORDINATES
C
      DO 50 L = 1, 3
      XC(L,3) = XC(L,I1) + AKGP * (XC(L,I2) - XC(L,I1))
   50 CONTINUE
      IGC = NGRD
      NGRD = NGRD + 1
      WRITE(Z,7001) TLC(1), IGC, INCP,(XC(L,3),L=1,3)
      REWIND Z
      CALL STORE( 12 )
C
C **  INSERT NEW GRID POINT I.D. IN ELEMENT J
C
      IF(I1 .EQ. 2) GO TO 60
      IDRD(LL,3) = IGC
      GO TO 70
```

```
   60   IDRD(LL,4) = IGC
   70   CONTINUE
C
C **  GENERATE ELEMENT CARDS FOR NEW CROD ELEMENTS
C
        WRITE(Z,7003) TLC(2), IDEX, IPEX, IDG, IGC
        REWIND Z
        CALL STORE( 10 )
C
C **  TEST FOR OMIT CARD GENERATION
C
        IF(OMIT(NR) .EQ. 0) GO TO 100
        WRITE(Z,7004) TLC(4), TLC(5), IGC
        REWIND Z
        CALL STORE( 6 )
  100   CONTINUE
C
C **  GENERATE SEQGP CARD
C
        CALL SEQGEN(IDG, IGC)
C
        IDP = IDRD(LL,2)
        IF(IDP .EQ. 0) IDP = IDE
C
C **  SEARCH FOR PROD CARD IMAGE
C
        DO 150 L = 1, NPRD
        IF(IDP .NE. IDPRD(L)) GO TO 150
        LP = L
        GO TO 160
  150   CONTINUE
        WRITE(6,7020) IDP
        GO TO 500
  160   CONTINUE
        AKAP = RPARM(NR,4)
        IF(AKAP .LT. 0.0) AKAP= AKAPD
        AKJP = RPARM(NR, 5)
        IF(AKJP .LT. 0.0) AKJP = AKJPD
        AC = AKAP * PRDP(LP,1)
        TC = AKJP * PRDP(LP,2)
        WRITE(Z,7005) TLC(7), IPEX, IDMP(LP), AC, TC, (PRDP(LP,L),L=3,4)
        REWIND Z
        CALL STORE( 14 )
C
C **  GENERATE CVISC CARD IMAGE
C
        WRITE(Z,7006) TLC(8), IDCV, IDCV, IDG, IGC
        REWIND Z
        CALL STORE( 10 )
C
C **  GENERATE PVISC CARD IMAGE
C
        WRITE(Z,7007) TLC(9), IDCV, RPARM(NR,1) ,RPARM(NR,2)
        REWIND Z
        CALL STORE( 8 )
```

```
      WRITE(6,7050) NR
      WRITE(6,7080)
      DO 200 L = 1, IMG
      WRITE(9,7002) (NIMG(K,L),K=1,20)
      WRITE(6,7090) L,(NIMG(K,L),K=1,20)
  200 CONTINUE
      IDEX = IDEX + 1
      IPEX = IPEX + 1
      IDCV = IDCV + 1
  500 CONTINUE
      RETURN
C
C **  FORMATS
C
 7001 FORMAT(A6,2X,2I8,3F8.2)
 7002 FORMAT(20A4)
 7003 FORMAT(A6,2X,8I8)
 7004 FORMAT(A6,4X,A6,7I8)
 7005 FORMAT(A6,2X,2I8,4F8.2)
 7006 FORMAT(A6,2X,4I8)
 7007 FORMAT(A6,2X,I3,2F8.1)
 7010 FORMAT(1H0,33X,31H***   SPECIFIED ROD ELEMENT ID ,I5,39H  DOES NOT
     1MATCH ANY CROD ELEMENTS   ***/)
 7020 FORMAT(1H0,32X,24H***   SPECIFIED PBAR ID ,I5,38HDOES NOT MATCH AN
     1Y PBAR ELEMENTS   *** /)
 7050 FORMAT(1H1,47X,28H*****   ROD ELEMENT JOINT - ,I2, 8H   ***** /)
 7080 FORMAT(1H0,46X,39H* * * * *   NEW CARD IMAGES   * * * * * /)
 7090 FORMAT(20X,I2,10X,20A4)
      END
FOR,IS BARJT,BARJT
      SUBROUTINE BARJT
      INTEGER   CD, STAR
      INTEGER   OMTB
      COMMON/ IMAGE / CD(80)
      COMMON/ BCBAR / IDB(1000), IPB(1000), IBA(1000), IBB(1000),
     1 IBREC(1000), NBAR, NBREC
      COMMON/ BBAR / IDBR(20), IDGB(20), BPARM(20,12), OMTB(20), NBR
      COMMON/ BGRID / IDGN(1000), ICP(1000), GCD(1000,3), NGD
      COMMON/ BDEFLT / RDFLT(5), BKND, BKGPD, BKGSD, BKAPD, BKASD,
     1 BKJPD, BKJSD, BKI1PD, BKI1SD, BKI2PD, BKI2SD
      COMMON/ BIMG / NIMG(20,35), IMG
      COMMON/ BCOMM / XC(3,5), I1, I2, INCP
      COMMON/ BNEW / NGRD, IDEX, IPEX, IEDCM, IDCV
      COMMON/ BPBAR / IDPB(1000), IPREC(1000), NPBAR, NPREC
      COMMON/ZZZZZZ/Z
      INTEGER Z
      EQUIVALENCE (IHID,HID),(IDFLT,DFLT)
      REAL   TLC(6),  BB(4), A1(2)
      REAL   RLC(2)
      DIMENSION B(8)
      DATA RLC / 6HUMIT1   ,   6H123456 /
      DATA TLC / 6HGRID    , 6HCBAR    , 6H        , 6HPBAR    ,
     1 6HCVISC   , 6HPVISC      /
      DATA STAR / 1H* /
      DATA ONE, DFLT / 4H   1, 4H-1.0 /
```

```
C
      IF(NBR .LE. 0) RETURN
C
C **  START LOOP THROUGH BAR ELEMENT JOINTS
C
      DO 400 NB = 1, NBR
      IMG = 0
      IDE = IDBR(NB)
      IDG = IDGB(NB)
      DO 20 L = 1, NBAR
      IF(IDE .NE. IDB(L)) GO TO 20
      LL = L
      GO TO 30
   20 CONTINUE
      WRITE(6,7010) IDE
      GO TO 400
   30 CONTINUE
      IGA = IBA(LL)
      IGB = IBB(LL)
      CALL COORD(IGA, IGB, IDG, $400)
      BKGP = BPARM(NB,7)
      IF(BKGP .LT. 0.0) BKGP = BKGPD
C
C **  COMPUTE NEW GRID POINT -C- COORDINATES
C
      DO 40 L = 1, 3
      XC(L,3) = XC(L,I1) + BKGP * (XC(L,I2) - XC(L,I1))
   40 CONTINUE
      IGC = NGRD
      NGRD = NGRD + 1
      WRITE(Z,7001) TLC(1), IGC, INCP, (XC(L,3),L =1,3)
      REWIND Z
      CALL STORE( 12 )
C
C **  ESTABLISH GRID POINTS E + F
C
      IGE = NGRD
      IGF = NGRD + 1
      NGRD = NGRD + 2
C
      CALL SEQGEN(IDG, IGC)
      CALL SEQGEN(IDG, IGE)
      CALL SEQGEN(IDG, IGF)
C
C **  TEST FOR OMIT CARD GENERATION
C
      IF(OMTB(NB) .EQ. 0) GO TO 50
      WRITE(Z,7003) RLC(1), RLC(2), IGC, IGE, IGF
      REWIND Z
      CALL STORE(10 )
   50 CONTINUE
C
C
C **  CALCULATE E + F COORDINATES
C
```

```
      CALL EFC( LL, B, BB, $400)
C
      WRITE(Z,7001) TLC(1), IGE, INCP, (XC(L,4),L=1,3)
      REWIND Z
      CALL STORE(12)
      WRITE(Z,7001) TLC(1), IGF, INCP, (XC(L,5),L=1,3)
      REWIND Z
      CALL STORE( 12 )
C
C **  INSERT NEW GRID POINT I.D. IN ELEMENT LL
C
      IF(I1 .NE. 1) GO TO 60
      IBA(LL) = IGC
      GO TO 70
 60   IBB(LL) = IGC
 70   CONTINUE
C
C **  GENERATE ELEMENT CARD FOR NEW BAR ELEMENT
C
      I3 = B(8)
      IF(I3 .EQ. 2) GO TO 87
      WRITE(Z,7002) TLC(2), IDEX, IPEX, IDG, IGC, (B(L+4),L=1,4)
      REWIND Z
      GO TO 89
 87   CONTINUE
      IDP = B(5)
      WRITE(Z,7009) TLC(2), IDEX, IPEX, IDG, IGC, IDP, I3
      REWIND Z
 89   CONTINUE
      CALL STORE( 18 )
C
C **  ESTABLISH PROPERTIES OF THE NEW ELEMENTS
C
      IDP = IPB(LL)
      IF(IDP .LE. 0) IDP = IDE
C **  SEARCH FOR CBAR IMAGE
      DO  90 L = 1, NPBAR
      IF(IDP .NE. IDPB(L)) GO TO 90
      LP = L
      GO TO 100
 90   CONTINUE
      WRITE(6,7020) IDP
      GO TO 400
100   CONTINUE
      NRECD = IPREC(LP)
      REWIND  4
      DO 120 L = 1, NRECD
      READ(4,7004) CD
120   CONTINUE
      WRITE(Z,7004) CD
      REWIND Z
      IF(CD(5) .EQ. STAR) GO TO 140
      IF(CD(8) .EQ. STAR) GO TO 140
C **  SINGLE FIELD WORD
      READ(Z,7005) A1, B
```

```
      REWIND Z
      GO TO  180
  140 CONTINUE
C **  DOUBLE FIELD WORD
      READ(Z,7006) A1, BB
      REWIND Z
      DO 145 L = 1, 4
      B(L) = BB(L)
  145 CONTINUE
      READ(4,7004) CD
      WRITE(Z,7004) CD
      REWIND Z
      READ(Z,7006) A1, BB
      REWIND Z
      DO 150 L = 1, 4
      B(L+4) = BB(L)
  150 CONTINUE
      NRECD = NRECD + 1
  180 CONTINUE
      BKAP = BPARM(NB,8)
      BKJP = BPARM(NB,9)
      BKI1P = BPARM(NB,10)
      BKI2P = BPARM(NB,11)
      IF(BKAP .LT. 0.0) BKAP = BKAPD
      IF(BKJP .LT. 0.0) BKJP = BKJPD
      IF(BKI1P .LT. 0.0) BKI1P = BKI1PD
      IF(BKI2P .LT. 0.0) BKI2P = BKI2PD
      I3 = B(2)
      B(1) = B(3) * BKAP
      B(2) = B(4) * BKI1P
      B(3) = B(5) * BKI2P
      B(4) = B(6) * BKJP
C
      WRITE(Z,7001) TLC(4), IPEX, I3, (B(L),L= 1,4)
      REWIND Z
      CALL STORE( 14 )
C
C **  GENERATE CVISC + PVISC CARD IMAGES
C
      I2 = 1
      I1 = IGC
      DO 200 L = 1, 3
      WRITE(Z,7007) TLC(5), IDCV, ICCV, IDG, I1
      REWIND Z
      CALL STORE( 10 )
      WRITE(Z,7008) TLC(6), IDCV, BPARM(NB,I2), BPARM(NB,I2+3)
      REWIND Z
      CALL STORE( 8 )
      IDCV = IDCV + 1
      I2 = I2 + 1
      IF( L .EQ. 1) I1 = IGE
      IF(L .EQ. 2) I1 = IGF
  200 CONTINUE
C
C **  GENERATE MULTIPOINT CONSTRAINT CARDS
```

```
C
      HID = BPARM(NB, 12)
      IF(IHID.EQ.IDFLT) HID = ONE
      CALL MPCGEN(IGC, IGE, IGF, HID)
C
C **  PRINT OUT JOINT INFORMATION AND NEW BULK DATA CARDS
C
      WRITE(6,7100) NB
      WRITE(6,7130)
      DO 300 L = 1, IMG
      WRITE(9,7000) (NIMG(K,L),K=1,20)
      WRITE(6,7140) L, (NIMG(K,L),K=1,20)
  300 CONTINUE
      IDEX = IDEX + 1
      IPEX = IPEX + 1
  400 CONTINUE
      RETURN
C
C **          FORMATS
C
 7000 FORMAT(20A4)
 7001 FORMAT(A6,2X,2I8,4F8.2)
 7002 FORMAT(A6,2X,4I8,4F8.3)
 7003 FORMAT(A6,4X,A6,7I8)
 7004 FORMAT(80A1)
 7005 FORMAT(2A4,8F8.0)
 7006 FORMAT(2A4,4F16.0)
 7007 FORMAT(A6,2X,4I8)
 7008 FORMAT(A6,2X,I8,2F8.1)
 7009 FORMAT(A6,2X,5I8,124)
 7010 FORMAT(1H0,28X,31H***   SPECIFIED BAR ELEMENT ID , I5,
     140H  DOES NOT MATCH ANY CBAR ELEMENTS   *** /)
 7020 FORMAT(1H0,25X,36H***   SPECIFIED PROPERTY ELEMENT ID , I5,
     140H  DOES NOT MATCH ANY PBAR ELEMENTS   *** /)
 7100 FORMAT(1H1,47X,28H*****   BAR ELEMENT JOINT - ,I2, 8H   ***** /)
 7130 FORMAT(1H0,46X,39H* * * * *   NEW CARD IMAGES   * * * * * /)
 7140 FORMAT(20X,I2, 10X, 20A4)
      END
FOR,IS EFC,EFC
      SUBROUTINE EFC( LL, B, BB, *)
      COMMON/ BCBAR / IDB(1000), IPB(1000), IBA(1000), IBB(1000),
     1 IBREC(1000), NBAR, NBREC
      COMMON/ BGRID / IDGN(1000), ICP(1000), GCD(1000,3), NGD
      COMMON/ BCOMM / XC(3,5), I1, I2
      COMMON / IMAGE / CD(80)
      COMMON/ZZZZZ/Z
      INTEGER Z
      INTEGER   CD, STAR
      REAL      BB(4)
      INTEGER A1(2)
      DIMENSION B(8), V1(3), V2(3), V3(3)
      DATA STAR / 1H* /
C
C **  SEARCH FOR CBAR
C
```

```
      IDP = IBREC(LL)
      REWIND 3
      DO 10 L = 1, IDP
      READ(3,7000) CD
   10 CONTINUE
      IF(CD(5) .EQ. STAR) GO TO 30
      IF(CD(9) .EQ. STAR) GO TO 30
C **  SINGLE FIELD CARD
      WRITE(2,7000) CD
      REWIND 2
      READ(2,7001) A1, B
      REWIND 2
      GO TO 50
   30 CONTINUE
C **  DOUBLE FIELD
      READ(3,7000) CD
      WRITE(2,7000) CD
      REWIND 2
      READ(2,7002) A1, BB
      REWIND 2
      DO 40 L = 1, 4
      B(L+4) = BB(L)
   40 CONTINUE
   50 CONTINUE
      IDP = B(8)
      IF(IDP .EQ. 2) GO TO 60
      V2(1) = B(5)
      V2(2) = B(6)
      V2(3) = B(7)
      GO TO 70
   60 CONTINUE
      IDP = B(5)
      DO 65 L = 1, NGD
      IF(IDP .NE. IDGN(L)) GO TO 65
      V2(1) = GCD(L,1) - XC(1,I1)
      V2(2) = GCD(L,2) - XC(2,I1)
      V2(3) = GCD(L,3) - XC(3,I1)
      GO TO 70
   65 CONTINUE
      WRITE(6,7010) IDP
      RETURN 4
   70 CONTINUE
      V1(1) = XC(1,I2) - XC(1,I1)
      V1(2) = XC(2,I2) - XC(2,I1)
      V1(3) = XC(3,I2) - XC(3,I1)
C
C **  F COORDINATES
C
      AC=SQRT((XC(1,3)-XC(1,I1))**2+(XC(2,3)-XC(2,I1))**2+(XC(3,3)-XC(3,
     1I1))**2)
      V3(1) = V1(2) * V2(3) - V1(3) * V2(2)
      V3(2) = V1(3) * V2(1) - V1(1) * V2(3)
      V3(3) = V1(1) * V2(2) - V1(2) * V2(1)
      AMG=SQRT(V3(1)**2+V3(2)**2+V3(3)**2)
      XC(1,5) = XC(1,I) + V3(1)*AC/AMG
```

```
      XC(2,5) = XC(2,I1) + V3(2)*AC/AMG
      XC(3,5) = XC(3,I1) + V3(3)*AC/AMG
C
C **  E COORDINATES
C
      V2(1) =              V3(2) * V1(3) - V3(3) * V1(2)
      V2(2) =              V3(3) * V1(1) - V3(1) * V1(3)
      V2(3) =              V3(1) * V1(2) - V3(2) * V1(1)
      AMG=SQRT(V2(1)**2+V2(2)**2+V2(3)**2)
      XC(1,4) = XC(1,I1) + V2(1)*AC/AMG
      XC(2,4) = XC(2,I1) + V2(2)*AC/AMG
      XC(3,4) = XC(3,I1) + V2(3)*AC/AMG
      RETURN
 7000 FORMAT(80A1)
 7001 FORMAT(2A4,8F8.0)
 7002 FORMAT(2A4,4F16.0)
 7010 FORMAT(1H0,13X,94H***   COULD NOT LOCATE GRID POINT FOR REFERENCE
     1COORDINATE SYSTEM - SUBROUTINE EFC - GRID NO. ,I5, 6H   *** /)
      END
$ENTRY,IS COORD,COORD
      SUBROUTINE COORD(IGA, IGB, IDG, *)
      COMMON/ BGRID /IDGR(1000), ICP(1000), GCD(1000,3), NGD
      COMMON/ BCOMM / XC(3,5), I1, I2, INCP
C
C **  COMPARE INPUT GRID POINTS FOR VALIDITY AND ORDER
C
      I1 = 1
      I2 = 2
      IF(IDG .EQ. IGA) GO TO 20
      I1 = 2
      I2 = 1
      IF(IDG .EQ. IGB) GO TO 20
      WRITE(6,7000) IDG, IGA, IGB
      RETURN 4
 20   CONTINUE
C
C **  SEARCH GRID TABLE FOR COORDINATES
C
      DO 30 L = 1,NGD
      IF(IGA .NE. IDGR(L)) GO TO 30
      DO 25 K = 1, 3
      XC(K,I1) = GCD(L,K)
 25   CONTINUE
      IF(I1 .EQ. 1) INCP = ICP(L)
      GO TO 40
 30   CONTINUE
      WRITE(6,7010) IGA
      RETURN 4
 40   CONTINUE
      DO 50 L = 1, NGD
      IF(IGB .NE. IDGR(L)) GO TO 50
      DO 45 K = 1, 3
      XC(K,I2) = GCD(L,K)
 45   CONTINUE
      IF(I2 .EQ. 1) INCP = ICP(L)
```

```
      GO TO 60
   50 CONTINUE
      WRITE(6,7010) IGB
      RETURN 4
   60 CONTINUE
      RETURN
 7000 FORMAT(1HO,29X,72H***  ELEMENT GRID POINTS DO NOT COMPARE WITH SP
     1ECIFIED GRID POINT   *** /38X,12HSPECIFIED = ,I5, 10X,12HELEMENT -
     2 A ,I5, 7H     B ,I5 /)
 7010 FORMAT(1HO,18X,48H***  NO MATCH FOUND FOR THE ELEMENT GRID POINT
     1 , I5,42H  IN THE GRID POINT COORDINATE TABLE   *** /)
      END
$FOR,IS MPCGEN,MPCGEN
      SUBROUTINE MPCGEN(IC, IE, IF, HID)
      COMMON/ BCOMM / XC(3,5), I1, I2
      COMMON/ZZZZZ/Z
      INTEGER Z
      DIMENSION C(3)
      DIMENSION TLC(10)
      DATA TLC / 4HMPC , 4H   1, 4H MPC, 4H+MPC, 4H   1, 4H   2, 4H   3,
     1 4H   4, 4H   5 , 4H   6 /
      DATA ICNT, A1, A2 / 990, 1.0, -1.0 /
C
      I1 = IE
      I2 = 4
      DO  100 I = 1, 2
C
      N1 = 5
      N2 = 3
      N3 = 10
      N4 = 9
      N5 = 2
C
      DO 10 L = 1, 3
      C(L) = XC(L,3) - XC(L,I2)
   10 CONTINUE
      C(2) = -C(2)
C
      DO 50 J = 1, 3
      ICNT = ICNT + 10
C
C **  FIRST/THIRD/FIFTH CARD IMAGES
C
      WRITE(Z,7001) TLC(1),    HID, I1, TLC(N1), A1, IC, TLC(N1),
     1 A2, TLC(3), ICNT
      REWIND Z
      CALL STORE( 20 )
C
C **  SECOND/FOURTH/SIXTH CARD IMAGES
C
      ICNT1 = ICNT
      ICNT = ICNT + 10
      WRITE(Z,7002) TLC(4), ICNT1, IC, TLC(N4), C(N2), IC, TLC(N3),C(N5)
      REWIND Z
      CALL STORE( 18 )
```

```
C
      N1 = N1 + 1
      IF(J .GT. 1) GO TO 40
      N5 = N5 - 1
      N4 = N4 - 1
      C(3) = -C(3)
      GO TO 50
 40   CONTINUE
      N3 = N3 - 1
      N2 = N2 - 1
      C(1) = -C(1)
      C(2) = -C(2)
 50   CONTINUE
C
C **  SEVENTH/EIGHTH/NINTH CARD IMAGES
C
      DO 75 J = 8, 10
      WRITE(Z,7001) TLC(1),    HID, I1, TLC(J), A1, IC, TLC(J), A2
      REWIND Z
      CALL STORE( 16 )
 75   CONTINUE
      I1 = IF
      I2 = 5
C
 100  CONTINUE
      RETURN
 7001 FORMAT(A4, A12, I8, A8, F8.1, I8, A8, F8.1, 8X,A4,I4)
 7002 FORMAT(A4, I4, I16, A8, F8.3, I8, A8, F8.3, 8X,A4,I4)
      END
FOR,IS STORE.STORE
      SUBROUTINE STORE( N )
      COMMON/ BIMG / NIMG(20,35), IMG
      COMMON/ZZZZZ/Z
      INTEGER Z
      DATA IBLNK/ 4H     /
C
      IMG = IMG + 1
      IF(N - 20) 20, 40, 10
 10   CONTINUE
C **  N GT 20 NOT PERMITTED
      N = 20
      GO TO 40
 20   CONTINUE
C **  BLANK OUT UNUSED PART OF IMAGE
      I1 = N + 1
      DO 30  L = I1, 20
      NIMG(L,IMG) = IBLNK
 30   CONTINUE
 40   CONTINUE
C
C **  READ IN CURRENT CARD IMAGE
C
      READ(Z,7000) (NIMG(L, IMG), L= 1,N)
      REWIND Z
      RETURN
```

```
7000 FORMAT(20A4)
     END
MAP,IS  SYM,ABS
LIB     SYS$*MSFC$.
SEG  A
IN   MAIN
SEG  B*,(A)
IN   RADJ,GRID,OMTC,ROD,BAR,CROD,PROD,CBAR,PBAR
SEG  C*,(A)
IN   SEQGEN,COORD,STORE
SEG  D*,(C)
IN   BARJT,MPCGEN
SEG  E*,(C)
IN   RODJT
XQT,IS  ABS
$ROD     99      401     .01     .03     .09     .05     .04
$BAR     801     185     8090.0  8090.0  8090.0  512906. 512906. 512906. +D801
+D801    .073
$BAR     807     185     8090.0  8090.0  8090.0  512906. 512906. 512906. +D807
+D807    .052
$BAR     802     185     8090.0  8090.0  8090.0  512906. 512906. 512906. +D802
+D802    .028
$BAR     803     100     8090.0  8090.0  8090.0  512906. 512906. 512906. +D803
+D803    .073
$BAR     804     100     8090.0  8090.0  8090.0  512906. 512906. 512906. +D804
+D804    .028
$BAR     808     100     8090.0  8090.0  8090.0  512906. 512906. 512906. +D808
+D808    .052
$BAR     805     225     8090.0  8090.0  8090.0  512906. 512906. 512906. +D805
+D805    .073
$BAR     809     225     8090.0  8090.0  8090.0  512906. 512906. 512906. +D809
+D809    .052
$BAR     806     225     8090.0  8090.0  8090.0  512906. 512906. 512906. +D806
+D806    .028
$
ID    SI MODES
SOL 3,0
TIME 15
APP DISPLACEMENT
CHKPNT YES
ALTER   28,29
SMA2  CSTM,MPT,DCPT,GPCT,DIT/MGG,BGG/V,Y,WTMASS=1.0/V,N,NOMGG/V,N,NOBGG/
      V,Y,COUPMASS  Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/V,
      Y,CPTRIA1/V  ,CPTRIA2/V,Y,CPTUBE/V,Y,CPQDPLT/V,Y,CPTRPLT/V,
      Y,CPTRBSC $
SAVE  NOMGG,NOBGG $
ALTER 74
MATGPR GPL,USET,SIL,MAA//C,N,A$
MATGPR GPL,USET,SIL,BGG//C,N,G$
ALTER    6
MPYAD PHIG,BGG,/XX/C,N,1/C,N,1/C,N,0  $
MPYAD XX,PHIG,/BHH/C,N,0/C,N,1/C,N,0  $
CHKPNT  BHH $
MATPRN  BHH,,,,// $
ENDALTER
```

```
CEND
      TITLE SI MODES FOR CHECKOUT
      METHOD=1
      SPC=1
      MPC=1
      OUTPUT
      DISPLACEMENT=ALL
      BEGIN BULK
ASET1   123456  351
CBAR    801     51      185     308     401     0       0       2
CBAR    802     51      185     318     401     0       0       2
CBAR    803     51      100     309     401     0       0       2
CBAR    804     51      100     320     401     0       0       2
CBAR    805     51      225     310     401     0       0       2
CBAR    806     51      225     324     401     0       0       2
CBAR    807     51      185     319     401     0       0       2
CBAR    808     51      100     323     401     0       0       2
CBAR    809     51      225     325     401     0       0       2
CBAR    811     51      301     308     400     0       0       2
CBAR    812     51      308     303     400     0       0       2
CBAR    813     51      303     309     400     0       0       2
CBAR    814     51      309     305     400     0       0       2
CBAR    815     51      305     310     400     0       0       2
CBAR    816     51      310     301     400     0       0       2
CBAR    821     51      318     319     400     0       0       2
CBAR    822     51      319     320     400     0       0       2
CBAR    823     51      320     323     400     0       0       2
CBAR    824     51      323     324     400     0       0       2
CBAR    825     51      324     325     400     0       0       2
CBAR    826     51      325     318     400     0       0       2
CBAR    831     51      301     318     400     0       0       2
CBAR    832     51      308     319     400     0       0       2
CBAR    833     51      303     320     400     0       0       2
CBAR    834     51      309     323     400     0       0       2
CBAR    835     51      305     324     400     0       0       2
CBAR    836     51      310     325     400     0       0       2
CBAR    841     51      308     318     400     0       0       2
CBAR    842     51      303     318     400     0       0       2
CBAR    843     51      309     320     400     0       0       2
CBAR    844     51      305     323     400     0       0       2
CBAR    845     51      310     324     400     0       0       2
CBAR    846     51      301     325     400     0       0       2
CBAR    851     51      331     308     400     0       0       2
CBAR    852     51      331     303     400     0       0       2
CBAR    853     51      332     309     400     0       0       2
CBAR    854     51      332     305     400     0       0       2
CBAR    855     51      333     310     400     0       0       2
CBAR    856     51      333     301     400     0       0       2
CBAR    861     51      331     319     400     0       0       2
CBAR    862     51      331     320     400     0       0       2
CBAR    863     51      332     323     400     0       0       2
CBAR    864     51      332     324     400     0       0       2
CBAR    865     51      333     325     400     0       0       2
CBAR    866     51      333     318     400     0       0       2
CBAR    01      52      351     400     81      0       0       2
```

```
CONM2  *873              400              0              .200000E 04      *C100032
*C100032     0.0              0.0              0.0                          *C100033
*C100033     0.248000E 06     0.0              0.942660E 07     0.0         *C100034
*C100034     0.0              0.942660E 07
CONM2    891      318      0        188.0000
CONM2    892      319      0        188.0000
CONM2    893      320      0        188.0000
CONM2    894      323      0        188.0000
CONM2    895      324      0        188.0000
CONM2    896      325      0        188.0000
CORMIC   1        1        2        3
CVISC    951      91       301      310
EIGR   *1                GIV              .0              .200000E 03      *C100001
*C100001                 6                6               0    0.999999E-06*C100002
*C100002         MAX                                                        *C100003
*C100003
GRID     1        0        .0       .0       .0       0        123456
GRID     2        0        250.0000.0        .0       0        123456
GRID     3        0        250.0000.0        250.00000         123456
GRID     81       1        43.5000  .0       226.22000
GRID     82       1        43.5000  45.0000  226.22000
GRID     83       1        43.5000  90.0000  226.22000
GRID     84       1        43.5000  135.0000226.22000
GRID     86       1        43.5000  225.0000226.22000
GRID     87       1        43.5000  270.0000226.22000
GRID     88       1        43.5000  315.0000226.22000
GRID     100      0        226.220    0.0000-43.50   0
GRID     135      0        226.220  -37.672  21.75    0
GRID     194      1        43.5000  120.0000226.22000
GRID     214      1        43.5000  240.0000226.22000
GRID     225      0        226.220  37.672002 1.75    0
GRID     301      1        20.0000  .0       212.00000
GRID     303      1        20.0000  120.0000212.00000
GRID     305      1        20.0000  240.0000212.00000
GRID     308      0        212.000  -23.340  13.5     0
GRID     309      0        212.000    0.0000-27.0     0
GRID     310      0        212.000  23.38000 13.5     0
GRID     318      0        196.000  .0       27.0     0
GRID     31       0        196.000  -23.340  13.50    0
GRID     320      0        196.000  -23.3400-13.5     0
GRID     323      0        196.000    0.0000-27.0     0
GRID     324      0        196.000  23.38000-13.5     0
GRID     325      0        196.000  23.3800013.50     0
GRID     331      1        24.0000  90.0000  204.00000
GRID     332      1        24.0000  210.0000204.00000
GRID     333      1        24.0000  330.0000204.00000
GRID     351      1        .0       .0       196.00000
GRID     400      1        .0       .0       151.00000
GRID     401      0        151.     .0         .00000
MAT1   *21                .160000E 08      .620000E 07      .300000E 00      *C100004
*C100004     0.0              0.0              0.700000E 02
MAT1   *22                .105000E 08      .400000E 07                       *C100006
*C100006     0.0              0.0              0.700000E 02
MPC      1        318      1        -1.0000 351      1        1.0000         +C100007
+C100007                 351      5 20.0000        351      6  0.0
```

```
MPC     1       318     2       -1.0000 351     2       1.0000          +C100008
+C100008                351     4-20.0000       351     6  0.0
MPC     1       318     3       -1.0000 351     3       1.0000          +C100009
+C100009                351     4  0.0          351     5  0.0
MPC     1       319     1       -1.0000 351     1       1.0000          +C100010
+C100010                351     5 10.0000       351     6 17.3205
MPC     1       319     2       -1.0000 351     2       1.0000          +C100011
+C100011                351     4-10.0000       351     6  0.0
MPC     1       319     3       -1.0000 351     3       1.0000          +C100012
+C100012                351     4-17.3205       351     5  0.0
MPC     1       320     1       -1.0000 351     1       1.0000          +C100013
+C100013                351     5-10.0000       351     6 17.3205
MPC     1       320     2       -1.0000 351     2       1.0000          +C100014
+C100014                351     4 10.0000       351     6  0.0
MPC     1       320     3       -1.0000 351     3       1.0000          +C100015
+C100015                351     4-17.3205       351     5  0.0
MPC     *1              323             1                       -0.100000E 01   *C100016
*C100016                351             1       0.100000E 01                    *C100017
*C100017                                351                     5  -0.200000E 02*C100018
*C100018                351             6       0.316319E-04
MPC     1       323     2       -1.0000 351     2       1.0000          +C100019
+C100019                351     4 20.0000       351     6  0.0
MPC     *1              323             3                       -0.100000E 01   *C100020
*C100020                351             3       0.100000E 01                    *C100021
*C100021                                351                     4  -0.316319E-04*C100022
*C100022                351             5       0.0
MPC     1       324     1       -1.0000 351     1       1.0000          +C100023
+C100023                351     5-10.0000       351     6-17.3205
MPC     1       324     2       -1.0000 351     2       1.0000          +C100024
+C100024                351     4 10.0000       351     6  0.0
MPC     1       324     3       -1.0000 351     3       1.0000          +C100025
+C100025                351     4 17.3205       351     5  0.0
MPC     1       325     1       -1.0000 351     1       1.0000          +C100026
+C100026                351     5 10.0000       351     6-17.3205
MPC     1       325     2       -1.0000 351     2       1.0000          +C100027
+C100027                351     4-10.0000       351     6  0.0
MPC     1       325     3       -1.0000 351     3       1.0000          +C100028
+C100028                351     4 17.3205       351     5  0.0
MPC     1       400     1       -1.0000 351     1       1.0000          +C100029
+C100029                351     5  0.0          351     6  0.0
MPC     1       400     2       -1.0000 351     2       1.0000          +C100030
+C100030                351     4  0.0          351     6-45.0000
MPC     1       400     3       -1.0000 351     3       1.0000          +C100031
+C100031                351     4  0.0          351     5 45.0000
MPC     1       400     4       -1.0000 351     4       1.0000
MPC     1       400     5       -1.0000 351     5       1.0000
MPC     1       400     6       -1.0000 351     6       1.0000
PARAM   GRDPNT  80
PARAM   WTMASS  .002588
PBAR    51      21      3.5000  6.000   6.000   12.000  .0                      +C100040
+C100040  0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0           +C100041
+C100041  0.5000  0.5000
PBAR    *52             22                      .960000E 01     .277300E 04     *C100042
*C100042    0.277300E 04    0.300000E 00    0.0                                 *C100043
*C100043   0.0             0.0             0.0             0.0                 *C100044
```

```
*C100044    0.0                 0.0                 0.0                 0.0          *C100045
*C100045    0.500000E 00        0.500000E 00                                         *C100046
*C100046
PVISC  *91                      .100000E-01         .0                               *C100005
*C100005
SPC1     1          123456  81
SPC1     1          123456  82
SPC1     1          123456  83
SPC1     1          123456  84
SPC1     1          123456  86
SPC1     1          123456  87
SPC1     1          123456  88
SPC1     1          123456  100
SPC1     1          123456  185
SPC1     1          123456  194
SPC1     1          123456  214
SPC1     1          123456  225
SPC1     1          123456  401
CROD      99         10       401      324
PROD      10         22       2.       5.
ENDDATA
 PMD,E
 FIN
```

Output Description

The output of the preprocessor is a revised and amended NASTRAN BULK DATA set which includes the data necessary to incorporate structural joint damping models at the ends of specified BAR and ROD elements. Intermediate printed outputs are as follows:

1. listing of the preprocessor input deck

2. the number of BAR and ROD element joints to be modified

3. listing of new NASTRAN card images generated for each joint.

APPENDIX III

POSTPROCESSOR (MODE SELECTION) COMPUTER PROGRAM

Introduction

This program, written in Fortran IV, was developed to provide a rational means of selecting critical modes for low-frequency control-system studies and for higher-frequency fine-stabilization studies. Mode selection for the control-system studies is accomplished with calculated rate and position coefficients for gyro sensors and/or position coefficients for an optical sensor. Mode selection for the fine-stabilization studies is accomplished with calculated peak image motions due to sinusoidal excitation or root-mean-square (RMS) image motions due to random power-spectral density (PSD) excitation. Since these calculations are performed using uncoupled normal modes, the program includes a provision for assessing the effects of a coupled modal viscous damping matrix. The program also includes a provision for converting the dimensional units of the NASTRAN modal data on the restart tape. The general logic flow of the postprocessor computer program is shown in Figure III-1.

The program is limited to a maximum of 100 gridpoints of interest and of 300 eigenvectors taken from the NASTRAN restart tape. A maximum of 20 pairs of numbers may be used to define the ranges of eigenvectors of interest for selection from the NASTRAN tape. A maximum of 20 gridpoints (120 degrees of freedom) may be used to define the optical amplification matrix. There are no limitations to the number of rate (gyro), position (gyro), and position (optical) gain coefficients which may be calculated in Options 1 or 3. A maximum of 20 gridpoints (120 degrees of freedom) may be loaded by sinusoidal or random (PSD) loads in Options 2 or 3. The input load PSD is defined with frequency in Hz.

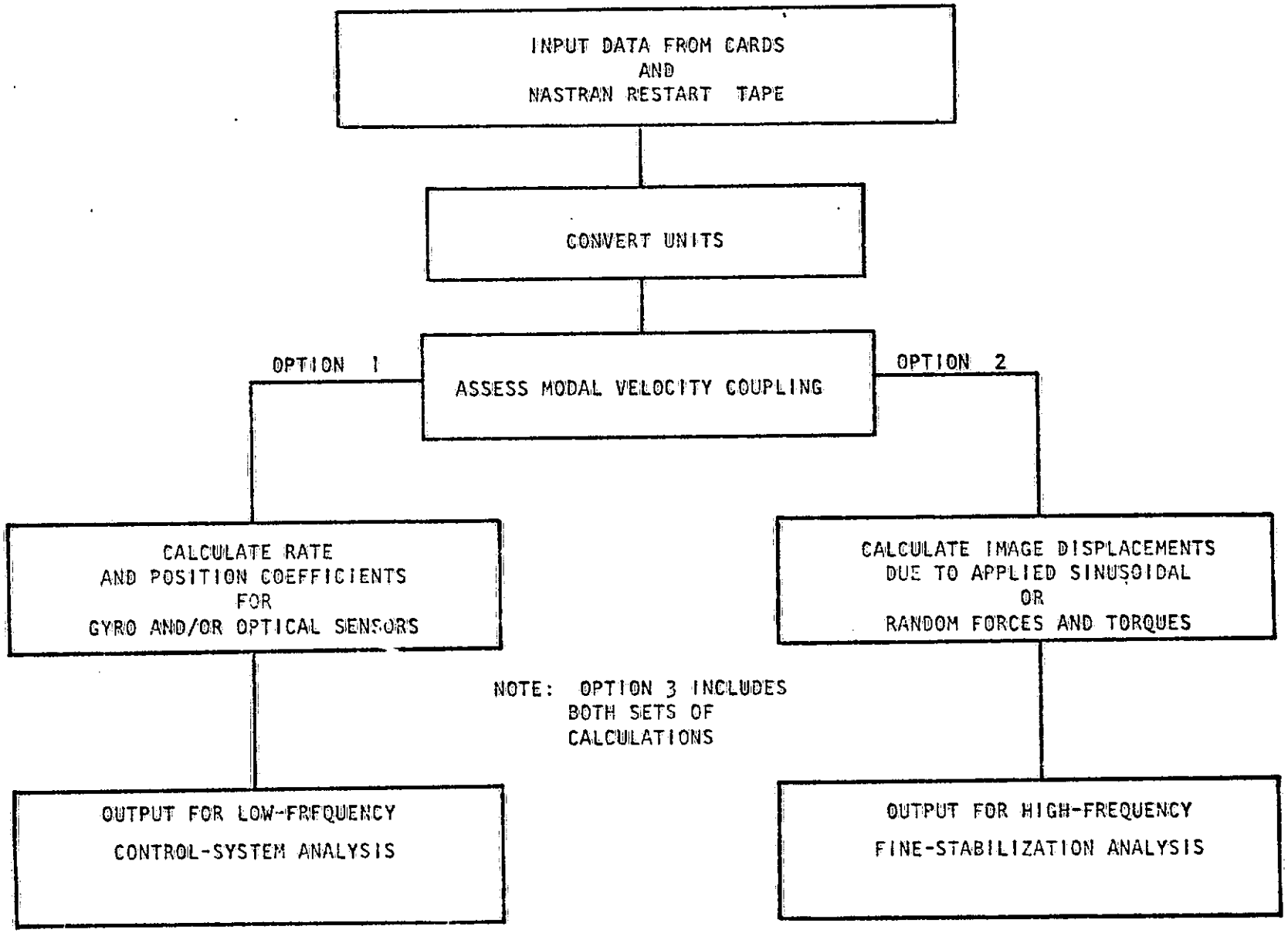


Figure III-1: Postprocessor Program Flow

Input Description

The input data required by the postprocessor consist of punched cards and a NASTRAN restart tape. The NASTRAN tape contains the following structural dynamic data in matrix format:

a. modal frequencies in radians per second
b. eigenvectors
c. generalized masses
d. generalized modal viscous damping terms.

The NASTRAN run which generates the modal data must include one or more discrete viscous damping elements and sufficient DMAP instructions to calculate and output the coupled generalized damping matrix. The necessary DMAP ALTER statements are included in the EXECUTIVE CONTROL deck as shown in Table III-1.

The punched-card input required for the postprocessor is prepared in nine distinct data sets as follows:

1. Overall problem control card. Format (2I10, 3F10.0)

   A. NOPT = 1, perform low-frequency control-system calculations

   = 2, perform higher-frequency fine-stabilization calculations

   = 3, perform both of above calculations

   B. NCONV = 0, no conversion of units

   = 1, convert from inch-slinch-second to foot-slug second

Table III-1: DMAP ALTER Statements for Damping Matrix Formulation

```
                    N A S T R A N   E X E C U T I V E   C O N T R O L   D E C K

ID    LST,MODES
APP   DISPLACEMENT
SOL   3,0
CHKPNT YES
TIME 30
ALTER   29,29
SMA2  CSTM,MPT,ECPT,GPCT,DIT/PGG,KGG/V,Y,MTMASS=1.0/V,N,NOMGG/V,N,NOPGG/
      V,Y,COUPMASS/V,Y,CPBAR/V,Y,CPROD/V,Y,CPQUAD1/V,Y,CPQUAD2/V,
      Y,CPTRIA1/V,Y,CPTRIA2/V,Y,CPTUBE/V,Y,CPQDPLT/V,Y,CPTRPLT/V,
      Y,CPTRBSC $
SAVE  NOMGG,NOBGG $
ALTER 74
MATGPR CPL,USET,SIL,KAA//C,N,A $
MATGPR CPL,USET,SIL,PGG//C,N,G $
ALTER   96
MPYAD PHIG,PGG,/XX/C,N,1/C,N,1/C,N,0 $
MPYAD XX,PHIG,/PHH/C,N,0/C,N,1/C,N,0 $
CHKPNT  PHH $
MATPRN PHH,,,,// $
ENDALTER
CEND
```

= 2, convert from inch-slinch-second to meter-kilogram-second

= 3, convert from foot-slug-second to meter-kilogram-second

C. DFAC: Multiplying factor for modifying the damping matrix obtained from the NASTRAN restart tape.

D. ALF1: Damping magnitude ratio for potential modal velocity coupling (typical value is 0.01).

E. ALF2: Frequency factor for potential modal velocity coupling (typical value is 100.0).

Feature B converts units only for the modal data obtained from the NASTRAN restart tape.

2. A list of gridpoint ID's used to select the row subset of the [Ø] matrix of eigenvectors on the NASTRAN tape. Only the rows corresponding to the six degrees of freedom for each of the gridpoints of this list will be retained by the postprocessor. All other rows of [Ø] are discarded to save core storage. Note that every gridpoint of interest and used in subsequent data sets must be given in this list. Format (8I10 until a blank field is encountered. If a row ID occurs in column 80 of a card, a blank card must follow).

3. A set of data used to select the column subset of eigenvectors from the [ϕ] matrix from the NASTRAN tape. Columns are selected by giving pairs of numbers which indicate either a range of mode numbers or a range of frequency values.

C-3

A. Control parameters: IMODE, LMODES. Format (2I10). If IMODE is input as 1, pairs of mode numbers must be given. If IMODE is input as 2, frequencies in radians per second must be given. LMODES is the number of pairs of values to be input.

B. Pairs of numbers to select columns from the [Ø] matrix. Format (2I10 or 2F10.0 depending upon the value of IMODE).

4. A set of user-supplied damping coefficients for adding modal viscous damping terms to the damping matrix obtained from the NASTRAN restart tape. Four terms per card are input giving mode number (i) and damping value ($\zeta_i = C_i/C_c$) for each mode. The term $C_i = 2\zeta_i \omega_i M_i$ is calculated automatically and added to the diagonal of the modal damping matrix. If no user-supplied damping is desired, insert a blank card. Format (4(I10, F10.0) until a blank field is encountered).

5. A set of gridpoint ID's denoting degrees of freedom for calculating a generalized damping force (F_k) used in assessing the degree of modal velocity coupling. Six degrees of freedom per gridpoint are assumed.

$$F_k = \sum_{\ell=1}^{m} |\phi_{k\ell}| \quad , \quad m = \text{number of degrees of freedom,}$$

$$k = \text{mode number}$$

Format (8I10 until a blank field is encountered).

6. The optical amplification matrix (B_o) input by rows.

A. List of gridpoint ID's identifying the columns of the matrix. Six degrees of freedom per gridpoint are assumed. Format (8I10 until a blank field is encountered).

B. The three rows of the matrix. The units for the optical amplification matrix must agree with the output system of units specified by NCONV on the first control card. Each row must begin a new card. Format (8F10.0).

7. If NOPT input on the first control card is 2 or 3, applied load data is read next. This data is used to form generalized forces for calculating image motions due to sinusoidal or random (PSD) excitations.

A. List of gridpoint ID's that are loaded. Format (8I10 until a blank field is encountered).

B. Length of force vs. frequency tables and type indicator. Input type = 0 for sinusoidal loads and type = 1 for PSD loads. Format (2I10).

C. Table of frequencies in radians per second, table of forces, and table of torques. Each table must begin a new card. The units for the force and torque tables must agree with the output system of units specified by NCONV on the first control card. The PSD is defined with frequency in Hz. Format (8F10.0).

8. If NOPT input on the first control card is 1 or 3, groups of 4 integers are read next. These integers indicate freedoms for which rate coefficients are calculated. Values for M1, M2, M3, and M4 are input. If no rate coefficients are desired, insert a blank card. If M2=M4=0, then rate coefficient R(M1, M3) is calculated. Otherwise the following rate coefficients are calculated:

R(M1, M3), R(M1, M3+1), R(M1, M3+2), ···, R(M1, M4)
R(M1+1, M3), R(M1+1, M3+1), · · ·, R(M1+1, M4)
·
·
·
R(M2, M3), R(M2, M3+1), · · ·, R(M2, M4)

Groups of M1, M2, M3, M4 are read in the 4I10 format until a blank card is encountered.

9. In NOPT input on the first control card is 1 or 3, groups of 4 integers are again read. These integers indicate freedoms for which position coefficients are calculated. Values for M1, M2, M3 and M4 are input. If no position coefficients are desired, insert a blank card. The following calculations are made, depending upon the combination of nonzero values for M1, M2, M3 and M4.

A. M2=M4=0, M1 and M3 nonzero. Position coefficient P(M1, M3) is calculated.

B. M1, M2, M3, and M4 nonzero. The following position coefficients are calculated:

P(M1, M3), P(M1, M3+1), ···, P(M1, M4)
P(M1+1, M3), P(M1+1, M3+1), ···, P(M1+1, M4)
·
·
·
P(M2, M3), P(M2, M3+1), ···, P(M2, M4)

C. M2=M3=M4=0, M1 nonzero. The position coefficients using optical sensors P(M1,) is calculated.

D. M3=M4=0, M1 and M2 nonzero. The following position coefficients using optical sensors are calculated

$$P(M1,), P(M1+1,), \cdots , P(M2,)$$

Format (4I10 until a blank card is encountered).

Postprocessor Program Listing (SRU 1108)

```
ASG,T  1,T,31358
ASG,T   9,F2///500
ASG,T  20,F2///500
ASG,T  21,F2///500
ASG,T  22,F2///500
FOR,IS MAIN,MAIN
      DIMENSION A1(2),A2(2),A3(2),A4(2),AA(2)
      DATA  A1/ 4HBHH ,1H  /
      DATA  A2/ 4HLAMA,1H  /
      DATA  A3/ 4HPHIG,1H  /
      DATA  A4/ 4HEQEX,2HIN /
      DIMENSION IDFREQ(300),FREQ(300),GMASS(300),XX(18000),DAMP(300)
      DIMENSION FK(300)
      DIMENSION KMODES(20,2),XMODES(20,2)
      DIMENSION S1(1803),S2(4000),Z(4000),KGRID(100,2),KDUM(8),IZ(1)
      DIMENSION IDFF(20)
      DIMENSION IDBR(20),IDBRX(20)
      EQUIVALENCE (Z(1),IZ(1),XX(6001)),(KMODES(1,1),XMODES(1,1))
      EQUIVALENCE (XX(1),S1(1)),(XX(2001),S2(1))
      COMMON/NOUTU/ KKK
      COMMON/SYSCTL/ NOPT,NOPLOT,KINDF
      COMMON/XSPECS/ SS(75),BB(126)
      COMMON/WORK/XX
      COMMON/FACTOR/DFAC,ALF1,ALF2
      DIMENSION ISS(1)
      EQUIVALENCE (ISS(1),SS(1))
      NBUF=1603
      NBUF=1803
      NBUF=871
      READ(5,101) NOPT,       NCONV,DFAC,ALF1,ALF2
      NOPLOT=1
  101 FORMAT( 2I10,3F10.0 )
    1 FORMAT( 8I10 )
    2 FORMAT( 8F10.0 )
C
C     IF NOPT=1, PERFORM LOW-FREQUENCY CONTROL CALCULATIONS
C            =2, PERFORM HI-FREQ FINE STABILIZATION CALCS
C            =3, DO BOTH
C     IF NOPLOT=1, DO NOT PRODUCE PLOTS
C              =0, PRODUCE PLOTS
C     IF NCONV=0,  DO NOT CONVERT UNITS FOR PHI,MASS,DAMPING
C              =1,  CONVERT  I-S-S  TO  F-S-S
C              =2,  CONVERT  I-S-S  TO  M-K-S
C              =3,  CONVERT  F-S-S  TO  M-K-S
C
      IF(NOPLOT.GT.0) GO TO 3
C
C     INITIALIZE FOR PLOTTING
C
      DO 3001 I=1,75
 3001 SS(I)=0.
      DO 3002 I=1,126
 3002 BB(I)=0.
C
```

```
C      CALL STSPEC(SS,PLOTID)
C      CALL SC420N(SS)
C
    3 CONTINUE
      F1=1.
      F2=1.
      IF(NCONV-1) 3012,3006,3008
 3006 F1=12.
      F2=12.
      GO TO 3012
 3008 IF(NCONV.NE.2) GO TO 3010
      F1=39.37008
      F2=175.1268
      GO TO 3012
 3010 F1=3.28084
      F2=14.5939
 3012 CONTINUE
C
C      INPUT LIST OF GRIDS OF INTEREST
C
      LG=0
    4 READ(5,1) KDUM
      DO 8 I=1,8
      IF(KDUM(I).LE.0) GO TO 10
      LG=LG+1
      KGRID(LG,1)=KDUM(I)
      KGRID(LG,2)=200000
    8 CONTINUE
      GO TO 4
   10 CONTINUE
C
C      GET TABLE RELATING GRID TO POSITION IN GROSS MATRICESS (EQEXIN)
C
      CALL NTREAD(NBUF,A4,Z,I,J,1500,1,S1,1,S2,K,1,2)
      IF(K.LT.0) GO TO 900
      L=1501
      I=I/2
      DO 20 K=1,I
      JJ=IZ(L)
      DO 14 J=1,LG
      IF(JJ.NE.KGRID(J,1)) GO TO 14
      KGRID(J,2)=IZ(L+1)/10
      GO TO 15
   14 CONTINUE
   15 CONTINUE
      L=L+2
   20 CONTINUE
C
C      ORDER GRIDS BASED ON INTERNAL ORDER OF NASTRAN MATRICES
C
      CALL ARASSL(LG,KGRID(1,2),KGRID(1,1))
   22 IF(KGRID(LG,2).LT.200000) GO TO 30
      WRITE(6,24) KGRID(LG,1)
   24 FORMAT( 12HOGRID NUMBER, I11,  62H  REMOVED FROM LIST BECAUSE IT W
```

```
     *AS NOT PRESENT IN NASTRAN LIST.)
      LG=LG-1
      GO TO 22
   30 CONTINUE
      IF(LG.LE.0) STOP
C
C     PRINT TABLE OF GRIDS
C
      WRITE(6,32) (KGRID(I,1),KGRID(I,2),  I=1,LG)
   32 FORMAT( 39H1INPUT TABLE OF GRID POINTS OF INTEREST /
     *        39H0                    LOCATION OF TERMS     /
     *        39H    GRID ID          IN NASTRAN MATRICES   / (I10,I17))
      LG6=6*LG
C
C     INPUT DATA TO INDICATE WHICH MODES ARE OF INTEREST
C        READ CONTROL FLAG, IMODE, AND NUMBER OF PAIRS, LMODES
C        IF IMODE=1, READ PAIRS OF INTEGERS FOR RANGE OF MODE NUMBERS
C                =2, READ PAIRS OF FREQUENCIES FOR RANGE OF MODES
C
      READ(5,1) IMODE,LMODES
      IF(IMODE.NE.1) GO TO 35
      DO 34 I=1,LMODES
   34 READ(5,1) KMODES(I,1),KMODES(I,2)
      GO TO 50
   35 IF(IMODE.NE.2) GO TO 38
      DO 37 I=1,LMODES
   37 READ(5,2) XMODES(I,1),XMODES(I,2)
      GO TO 50
   38 CONTINUE
      WRITE(6,49) IMODE ,LMODES
   49 FORMAT( 44H1*ERROR* BAD VALUE FOR IMODE.  IMODE,LMODES= , 2I10 )
      GO TO 999
   50 CONTINUE
C
C     READ TABLE OF EIGENVALUE DATA, LAMA
C
      CALL NTREAD(NBUF,A2,Z,I,J,2500,0,S1,1,S2,K,1,2)
      IF(K.LT.0) GO TO 900
      LFREQ=0
      I=I+2500
      J=2501
   53 CONTINUE
      MODEN=IZ(J)
      OMEGA=Z(J+3)
      GENMAS=Z(J+5)
      GO TO (56,60), IMODE
   56 CONTINUE
      DO 58 K=1,LMODES
      IF(MODEN.GE.KMODES(K,1) .AND. MODEN.LE.KMODES(K,2)) GO TO 66
   58 CONTINUE
      GO TO 70
   60 CONTINUE
      DO 64 K=1,LMODES
      IF(OMEGA.GE.XMODES(K,1) .AND. OMEGA.LE.XMODES(K,2)) GO TO 66
```

```
   64 CONTINUE
      GO TO 70
   66 CONTINUE
      LFREQ=LFREQ+1
      IDFREQ(LFREQ)=MODEN
      FREQ(LFREQ)=OMEGA
      GMASS(LFREQ)=GENMAS*F2
   70 CONTINUE
      J=J+7
      IF(J.LT.I) GO TO 53
C
C     PRINT TABLE OF EIGENVALUE DATA
C
      WRITE(6,72) (IDFREQ(I),FREQ(I),GMASS(I), I=1,LFREQ)
   72 FORMAT( 54H1THE FOLLOWING EIGENVALUE DATA HAS BEEN TAKEN FROM THE
     *   /     31H NASTRAN TAPE FOR THIS ANALYSIS   /
     *         44HOMODE NUMBER    FREQUENCY   GENERALIZED MASS   /
     *    (I7,E19.5,E15.5))
C
C     COPY MODE SHAPES TO SCRATCH UNIT KKK=50
C
      KKK=20
      REWIND KKK
      CALL NTREAD(NBUF,A3,Z,I,J,4000,0,S1,1,S2,K,1,3)
      REWIND KKK
      IF(K.LT.0) GO TO 900
C
C     COPY DAMPING MATRIX TO SCRATCH UNIT KKK=52
C
      KKK=22
      REWIND KKK
      CALL NTREAD(NBUF,A1,Z,I,J,4000,0,S1,1,S2,K,1,3)
      REWIND KKK
      IF(K.LT.0) GO TO 900
C
C     ADD ANY USER SUPPLIED DAMPING TERMS TO MATRIX AND
C     REWRITE TO UNIT 51
C
      CALL DADD(22,21,Z,Z(500),Z(1000),IDFREQ,LFREQ,F2,FREQ,GMASS)
C
C     BUILD A  LG6 BY LFREQ  SUBMATRIX OF MODE SHAPES FROM PHIG
C
      KKK=20
      KK=1
      JJ=0
   80 CONTINUE
      READ(KKK,END=120) AA,J,K,L
      IF(L.EQ.0) GO TO 80
      READ(KKK) (XX(JJ+I),I=1,L)
C
C     SEE IF THIS MODE IS DESIRED
C
      IF(J.LT.IDFREQ(KK)) GO TO 80
      IF(J.EQ.IDFREQ(KK)) GO TO 84
```

```
      STOP 98
   84 CONTINUE
      JJX=JJ
      DO 88 I=1,LG
      J=KGRID(I,2)
      XX(JJ+1)=XX(JJX+J)
      XX(JJ+2)=XX(JJX+J+1)
      XX(JJ+3)=XX(JJX+J+2)
      XX(JJ+4)=XX(JJX+J+3)*FI
      XX(JJ+5)=XX(JJX+J+4)*FI
      XX(JJ+6)=XX(JJX+J+5)*FI
      JJ=JJ+6
   88 CONTINUE
      KK=KK+1
      IF(KK.LE.LFREQ) GO TO 80
  120 CONTINUE
C
C     PRINT MATRIX OF MODE SHAPES
C
      WRITE(6,121)
  121 FORMAT( 74H1 THE FOLLOWING SUBSET OF MODE SHAPES HAS BEEN TAKEN FR
     *OM THE NASTRAN TAPE  )
      JJ=1
      DO 124 I=1,LFREQ
      CALL COLPRT(XX(JJ),LG,IDFREQ(I),KGRID)
  124 JJ=JJ+LG6
C
C     ROUTINE MVD CALCULATES EQUIVALENT MODAL VISCOUS DAMPING AND
C     RETURNS LFREQ VALUES IN ARRAY DAMP
C
      KKK=21
      CALL FKCALC(XX,LG6,LFREQ,KGRID,LG,FK)
      CALL MVD(KKK,XX(JJ+1),IDFREQ,FREQ,GMASS,DAMP,LFREQ,XX(JJ+1),FK)
C
C     INPUT OPTICAL AMPLIFICATION MATRIX,  BR (3 BY LBR6).
C     FIRST INPUT LIST OF GRID IDS DEFINING COLUMNS,
C     THEN MATRIX BY ROWS.   STORE MATRIX  BR(TRANSPOSE) FROM
C     XX(IBR) BY COLMNS (EQUIV TO BR BY ROWS).
C
      IBR=JJ+1
      LBR=0
  128 READ(5,1) KDUM
      DO 130 I=1,8
      IF(KDUM(I).LE.0) GO TO 132
      LBR=LBR+1
      IDBR(LBR)=KDUM(I)
  130 CONTINUE
      GO TO 128
  132 CONTINUE
      LBR6=6*LBR
      DO 135 I=1,3
      READ(5,2) (XX(JJ+K), K=1,LBR6)
      JJ=JJ+LBR6
  135 CONTINUE
```

```
C
C       ROUTINE  BREORD  REORDERS THE BR MATRIX TO COINCIDE WITH
C       NASTRAN MATRIX ORDER
C
        CALL BREORD(XX(IBR),XX(JJ+1),LBR6,IDBR,KGRID(1,1),LG,ILBRX)
        LIDFF=0
        IFTBL=JJ+1
        IF(NOPT.EQ.1) GO TO 181
C
C       READ IN GRIDS THAT ARE LOADED
C
  238   READ(5,1) KDUM
        DO 240 I=1,8
        IF(KDUM(I).LE.0)GO TO 242
        LIDFF=LIDFF+1
        IDFF(LIDFF)=KDUM(I)
  240   CONTINUE
        GO TO 238
  242   CONTINUE
C
C       READ IN FREQUENCY, FORCE, AND TORQUE TABLES.  STORE FROM XX(IFTBL)
C          IF KINDF=0, TABELS ARE ORDINARY LOADS
C                  =1, TABLES ARE FORCE PSD
C
        READ(5,1) LTBL,KINDF
        DO 180 I=1,3
        READ(5,2)(XX(JJ+K), K=1,LTBL)
  180   JJ=JJ+LTBL
        IF(NOPT.EQ.2) GO TO 330
  181   CONTINUE
C
C       SCRATCH AREA NOW FROM XX(JJ+1)
C
C       READ IN GROUPS OF 4 INTEGERS INDICATING FREEDOMS FOR RATE
C       CALCULATION   M1,M2,M3,M4
C           IF M2=M4=0, CALCULATE RATE (M1,M3)
C           OTHERWISE, CALCULATE RATE  (M1,M3),(M1,M3+1),(M1,M3+2),...
C                                      (M1+1,M3),(M1+1,M3+1),...
C
        KJUMP=1
  182   READ(5,1)M1,M2,M3,M4
        IF(M1.LE.0) GO TO 230
        I=M1
  184   MX1=I/10
        NX1=MOD(I,10)
        J=M3
  186   MX3=J/10
        NX3=MOD(J,10)
C
C       FORM RATE CALC. FOR GRID/FREEDOM   (MX1/NX1,MX3/NX3)   FOR ALL
C       MODE SHAPES
C
        JJ1=0
        JJ2=0
```

```
      DO 190 II=1,LG
      IF(KGRID(II,1).EQ.MX1) JJ1=(II-1)*6 + NX1
      IF(KGRID(II,1).EQ.MX3) JJ2=(II-1)*6 + NX3
      IF(JJ1.GT.0 .AND. JJ2.GT.0) GO TO 196
  190 CONTINUE
      WRITE(6,192) MX1,MX3
  192 FORMAT( 80H1*ERROR* ATTEMPT TO CALCULATE RATE AT GRID NOT IDENTIFI
     *ED AS A POINT OF INTEREST ,  2I6  )
      GO TO 224
  196 CONTINUE
      DO 220 II=1,LFREQ
      KK=(II-1)*L36
      XX(JJ+II)=XX(KK+JJ1)*XX(KK+JJ2)/(2.*DAMP(II)*FREQ(II)*GMASS(II))
      IF(KJUMP.EQ.1) GO TO 220
C
C     CHANGE RATE CALCULATION TO POSITION GAIN
C
      XX(JJ+II)=XX(JJ+II)/FREQ(II)
  220 CONTINUE
C
C     ROUTINE  PRPLT  PRINTS AND PLOTS RATE AS FUNCTION OF FREQUENCY
C
      CALL PRPLT(     KJUMP,XX(JJ+1),FREQ,IDFREQ,LFREQ,MX1,NX1,MX3,NX3)
  224 CONTINUE
      J=J+1
      IF(J.LE.M4) GO TO 186
      I=I+1
      IF(I.LE.M2) GO TO 184
      GO TO (182,282), KJUMP
  230 CONTINUE
      KJUMP=2
C
C     READ IN PAIRS OF INTEGERS INDICATING FREEDOMS FOR POSITION
C     COEFFICIENT CALCULATION
C
  282 READ(5,1)M1,M2,M3,M4
      IF(M1.LE.0) GO TO 330
      I=M1
      IF(M3.GT.0) GO TO 184
  284 MX1=I/10
      NX1=MOD(I,10)
      CALL POSN(XX(1),LG6,LFREQ,XX(IBR),IDBR,LBR6,XX(IFTBL),LTBL,KGRID,
     X    IDFF,LIDFF,
     X    DAMP,FREQ,IDFREQ,GMASS,XX(JJ+1),MX1,NX1)
      I=I+1
      IF(I.LE.M2) GO TO 284
      GO TO 282
  330 CONTINUE
      IF(NOPT.EQ.1) GO TO 400
      CALL POSN(XX(1),LG6,LFREQ,XX(IBR),IDBR,LBR6,XX(IFTBL),LTBL,KGRID,
     X    IDFF,LIDFF,
     X    DAMP,FREQ,IDFREQ,GMASS,XX(JJ+1),0,0)
  400 CONTINUE
  900 CONTINUE
```

```
  999 CONTINUE
      STOP
      END
 FOR,IS MVD,MVD
      SUBROUTINE MVD(KKK,X,IDFREQ,FREQ,GMASS,DAMP,LFREQ,IX,F)
C
C     ROUTINE TO FROM EQUIVALENT MODAL VISCOUS DAMPING
C
C     KKK - UNIT CONTAINING NTREAD COPY OF DAMPING MATRIX BHH
C     X,IX   - SCRATCH ARRAY
C     IDFREQ,FREQ,GMASS - ARRAYS CONTAINING MODE NOS.,FREQUENCIES,
C           AND GENERALIZED MASS.   LENGTH = LFREQ
C     DAMP- DAMPING COEFFICIENTS RETURNED HERE
C
      COMMON/FACTOR/DFAC,ALF1,ALF2
      DIMENSION  X(1),IDFREQ(1),FREQ(1),GMASS(1),DAMP(1),IX(1)
      DIMENSION F(1)
      DOUBLE PRECISION AA
    3 FORMAT( 33H1EQUIVALENT MODAL VISCOUS DAMPING  /  1X  /
     * 40HO MODE        DAMPING            COUPLED/UNCOUPLED            /
     * 48H NUMBER    COEFFICIENT          RESPONSE RATIO                )
   30 FORMAT( I5, E17.5, E24.5)
      WRITE(6,1)
    1 FORMAT(1H1)
      L=1
      LLMAX=0
   18 ID=IDFREQ(L)
   20 READ(KKK,END=90) AA,J,K,LL
      IF(LL.EQ.0) GO TO 20
      READ(KKK) (X(I),I=1,LL)
      IF(J.LT.ID) GO TO 20
      IF(J.EQ.ID) GO TO 23
      STOP 99
   23 CONTINUE
      IF(LL.GT.LLMAX) LLMAX=LL
      DAMP(L)=X(J)/(2.*FREQ(L)*GMASS(L))
      L=L+1
      IF(L.LE.LFREQ) GO TO 18
   90 CONTINUE
C
C     CALCULATE COUPLED/UNCOUPLED VELOCITY RESPONSE
C     STORE FROM X(JRI+1)
C
      JRI=LLMAX
      KO=JRI+LFREQ
      K1=KO+LFREQ
      DO 200 L=1,LFREQ
      X(JRI+L)=0.
      ID=IDFREQ(L)
      REWIND KKK
  120 READ(KKK,END=220) AA,I,K,LL
      IF(LL.EQ.0) GO TO 120
      READ(KKK) (X(J), J=1,LL)
      IF(I.NE.ID) GO TO 120
```

```
C
C     FIND MODES WHICH POTENTIALLY COUPLE WITH I-TH MODE
C     STORE INDICES FROM IX(K1+1)
C
      NC=0
      DO 124 J=1,LFREQ
      IF(FREQ(L)/FREQ(J) .LT. (1.-ALF2*DAMP(J))) GO TO 124
      IF(FREQ(L)/FREQ(J) .GT. (1.+ALF2*DAMP(J))) GO TO 124
      JJ=IDFREQ(J)
      IF(X(I).EQ.0.) GO TO 124
      IF(X(JJ)/X(I) .LT. ALF1) GO TO 124
      NC=NC+1
      X(KO+NC)=F(J)
      IX(K1+NC)=JJ
  124 CONTINUE
      IF(NC.LE.1) GO TO 200
C
C     THERE ARE NC NODE NUMBERS WHICH COUPLE STORED FROM IX(K1+1)
C
      IF(NC.LE.20) GO TO 128
      WRITE(6,126) NC,ID
  126 FORMAT(I5,23H TERMS COUPLE WITH MODE, I4,
     X  56H.  MATRIX INVERSION LIMITED TO 20.  ADJUST ALF1 AND ALF2 )
      GO TO 200
  128 CONTINUE
      REWIND KKK
      K2=K1+NC
      KD=K2+1
      DO 140 J=1,NC
      JJ=IX(K1+J)
  130 READ(KKK,END=301) AA,II,K,LL
      IF(LL.EQ.0) GO TO 130
      READ(KKK) (X(K),K=1,LL)
      IF(II.NE.JJ) GO TO 130
      DO 136 K=1,NC
      JJ=IX(K1+K)
      K2=K2+1
      X(K2)=X(JJ)*FREQ(L)
  136 CONTINUE
  140 CONTINUE
C
C     A NC BY NC DAMPING MATRIX IS NOW STORED AT X(KD)
C
      KM=KD+NC*NC
      K2=KM-1
      DO 160 K=1,NC
      JJ=IX(K1+K)
      DO 144 LL=1,LFREQ
      IF(IDFREQ(LL).NE.JJ) GO TO 144
      XM=GMASS(LL)
      XF=FREQ(LL)
      GO TO 146
  144 CONTINUE
  146 CONTINUE
```

```
      LL=(K-1)*NC+K+2
      X(LL)=XM*(XF**2-FREQ(L)**2)
  160 CONTINUE
C
C     A NC BY NC DIAGONAL MASS MATRIX IS NOW STORED FROM X(KM)
C
      LL=KM+NC*NC
      K=LL+NC*NC
      JJ=K+NC*NC
C                        A      B      S1    S2         S3      S4
      CALL MCRAP(X(KM),X(KD),X(LL),X(K),NC,X(JJ),X(JJ+NC),X(JRI+L),
     X     X(KD+1),
     X    IX(K1+1),ID)
  200 CONTINUE
  220 CONTINUE
      WRITE(6,3)
      DO 300 I=1,LFREQ
  300 WRITE(6,30) IDFREQ(I),DAMP(I),X(JRI+I)
  301 CONTINUE
      RETURN
      END
 FOR,IS MCRAP,MCRAP
      SUBROUTINE MCRAP(A,B,S1,S2,NC,S3,S4,RI,F,
     X    IW,ID)
      DIMENSION A(NC,NC),B(NC,NC),S1(NC,NC),S2(NC,NC),S3(NC),S4(NC)
      DIMENSION F(1)
      INTEGER S3,IW(1)
      S3(1)=NC
      S3(2)=0
C
C     INVERT B INTO S1
C
      DO 10 I=1,NC
      DO 10 J=1,NC
   10 S1(I,J)=B(I,J)
      CALL MATINV(S1,NC,NC,DET)
C
C     FORM  A*B(INV) IN S1  ( A IS DIAGONAL )
C
      DO 20 I=1,NC
      DO 20 J=1,NC
   20 S1(I,J)=A(I,I)*S1(I,J)
C
C     FORM   ( B + S1*A )  IN S2
C
      DO 30 I=1,NC
      DO 30 J=1,NC
   30 S2(I,J)=B(I,J)+S1(I,J)*A(J,J)
C
C     INVERT S2 IN S2
C
      S3(1)=NC
      S3(2)=0
      CALL MATINV(S2,NC,NC,DET)
```

```
      DO 40 I=1,NC
      DO 40 J=1,NC
      A(I,J)=0.
      DO 40 K=1,NC
   40 A(I,J)=A(I,J) + S2(I,K)*S1(K,J)
      DO 44 I=1,NC
      DO 44 J=1,NC
   44 S2(I,J)=-S2(I,J)
C
C     MATRIX  C  IS IN A,  MATRIX  D  IS IN S2
C
      DO 46 J=1,NC
      IF(IW(J).NE.ID) GO TO 46
      I=J
      GO TO 48
   46 CONTINUE
   48 CONTINUE
      SUM1=0.
      SUM2=0.
      DO 50 J=1,NC
      SUM1=SUM1+A(I,J)*F(J)
      SUM2=SUM2+S2(I,J)*F(J)
   50 CONTINUE
      RI=B(I,I)*SQRT(SUM1**2 + SUM2**2)/F(I)
      CALL MMPRNT(IW,ID,NC,A,4HC    )
      CALL MMPRNT(IW,ID,NC,S2,4HD    )
      RETURN
      END
FOR,IS MMPRNT,MMPRNT
      SUBROUTINE MMPRNT(IW,ID,NC,A,XNAM)
C
C     MATRIX PRINT
C
      DIMENSION IW(NC),A(NC,NC)
      WRITE(6,1) XNAM,ID
    1 FORMAT( 20HOI-TH ROW OF MATRIX , A2, 16HFOR MODE I,  I =, I3 )
      DO 10 I=1,NC
      IF(IW(I).NE.ID) GO TO 10
      J=I
      GO TO 12
   10 CONTINUE
      RETURN
   12 CONTINUE
      J1=1
    8 J2=J1+7
      IF(J2.GT.NC) J2=NC
      WRITE(6,2) (IW(I),I=J1,J2)
    2 FORMAT(  9HOMODE NO.,   I11, 7I13  /  )
      WRITE(6,3) (A(J,I), I=J1,J2)
    3 FORMAT(  6H VALUE, 6X, 8E13.5  )
      J1=J2+1
      IF(J1.LE.NC) GO TO 8
      RETURN
      END
```

```
FOR,IS COLPRT,COLPRT
      SUBROUTINE COLPRT(A,N,ID,KGRID)
C
C     ROUTINE TO PRINT ONE COLUMN OF MODE SHAPE MATRIX
C
      DIMENSION A(6,N),KGRID(N)
      WRITE(6,20)ID,(KGRID(J),(A(I,J), I=1,6), J=1,N)
   20 FORMAT(  1H0 /13H0 MODE NUMBER, I5 /
     * 7H0  GRID,  11X,2HT1,13X,2HT2,13X,2HT3,13X,2HR1,13X,2HR2,13X,2HR3
     *  / ( I7, 2X, 6E15.5 ))
      RETURN
      END
FOR,IS FKCALC,FKCALC
      SUBROUTINE FKCALC(PHI,LL,LFREQ,KGRID,LG,FK)
C
C     INPUT A LIST OF GRID IDS FOR CALCULATING A
C     GENERALIZED DAMPING FORCE, AND CALCULATE THE FORCE IN FK
C
      DIMENSION PHI(LL,LFREQ),KGRID(100,2),FK(1),KDUM(8)
      DO 8 I=1,LFREQ
    8 FK(I)=0.
C
C
C
   10 READ(5,11) KDUM
   11 FORMAT( 8I10)
      DO 28 I=1,8
      IF(KDUM(I).LE.0) GO TO 40
      DO 16 J=1,LG
      IF(KDUM(I).NE.KGRID(J,1)) GO TO 16
      K=(J-1)*6
      GO TO 18
   16 CONTINUE
      GO TO 28
   18 CONTINUE
      DO 22 J=1,LFREQ
      DO 22 JJ=1,6
      FK(J)=FK(J)+ABS(PHI(K+JJ,J))
   22 CONTINUE
   28 CONTINUE
      GO TO 10
   40 CONTINUE
      RETURN
      END
FOR,IS PRPLT,PRPLT
      SUBROUTINE PRPLT(KK,X,FREQ,IDFREQ,LFREQ,M1,N1,M2,N2)
C
C     ROUTINE TO PRINT AND PLOT ARRAY X AS FUNCTION OF FREQUENCY
C     ROUTINE USES WRITE/READ 9 TO FORM PLOT TITLES
C
      DIMENSION     X(LFREQ,1),FREQ(LFREQ),IDFREQ(LFREQ),T(12),TL(3)
      DATA TR1/ 4H RAT /,  TP1B 4H PUS /
      EQUIVALENCE (IQ,Q),(J,AJ)
      COMMON/SYSCTL/ NOPT,NOPLOT
```

```
      COMMON/XSPECS/ SS(75),BB(126)
      IF(KK.GT.2) GO TO 10
      IF(KK.EQ.2) GO TO 2000
      WRITE(6,1) M1,N1,M2,N2
    1 FORMAT( 23H1RATE COEFFICIENTS,  R(,  I4,I1, 1H, I4,I1, 2H ), 12X )
      T(1)=TR1
      GO TO 2008
 2000 CONTINUE
      WRITE(6,1006) M1,N1,M2,N2
C
C     WRITE(0,1006) M1,N1,M2,N2
C     READ(0,3) T
C
      T(1)=TP1
 1006 FORMAT( 33H1POSITION (GYRO) COEFFICIENTS, P(, I4,I1,1H,,I4,I1,4H )
     X    )
 2008 CONTINUE
      WRITE(6,1001)
 1001 FORMAT(  46H0  FREQUENCY   MODE NO.     COEFFICIENT   RANK  )
    2 FORMAT(  E13.5, I7, 6X, E13.5, I6 )
    3 FORMAT( 20A4 )
      DO 4 I=1,LFREQ
    4 X(I,2)=ABS(X(I,1))
      IF(NOPLOT.GT.0) GO TO 7
      X1=1.
      IX2=FREQ(LFREQ)
      X2=FLOAT(IX2+99)
      Y1= 1.E20
      Y2=-1.E20
      DO 5 I=1,LFREQ
      IF(X(I,2).GT.Y2) Y2=X(I,2)
      IF(X(I,2).LT.Y1) Y1=X(I,2)
    5 CONTINUE
C
C     CALL STSUBJ(X1,X2,Y1,Y2,SS)
C     CALL STNPTS(LFREQ,SS)
C     CALL GDLGLG(BB,SS)
C     CALL STSYMB( 1,SS)
C     CALL STCHSZ(.014,.014,SS)
C     CALL PSLGLG(FREQ,X(1,2),BB,SS)
C     CALL STNCHR(48,SS)
C     CALL TITLEB(T,BB,SS)
C     CALL STNCHR(12,SS)
C     CALL TITLEL(TL,BB,SS)
C     CALL ADVANC (1.0,SS)
C
    7 CONTINUE
      DO 6 I=1,LFREQ
      J=I
    6 X(I,3)=AJ
      CALL ARASLS(LFREQ,X(1,2),X(1,3))
      J=1
    9 Q=X(J,3)
      X(IQ,2)=AJ
```

```
      J=J+1
      IF(J.LE.LFREQ) GO TO 9
      WRITE(6,2) (FREQ(I),IDFREQ(I),X(I,1),X(I,2), I=1,LFREQ)
      GO TO 80
   10 CONTINUE
      IF(KK.NE.3) GO TO 30
      WRITE(6,11) M1,N1

C     WRITE(0,11) M1,N1
C     READ(0,3) T
C
      T(1)=TP1
      WRITE(6,1011)
   11 FORMAT( 36H1POSITION (OPTICAL) COEFFICIENTS, P(, I4,I1,7H, U )    )
 1011 FORMAT(  1H0, 24X, 3(15H   COEFFICIENTS, 6X)   /
     X 23H   FREQUENCY   MODE NO., 7X, 12HU=X     RANK, 9X,
     X 12HU=Y     RANK, 9X, 12HU=Z     RANK     )
      DO 14 I=1,LFREQ
      DO 14 K=1,3
   14 X(I,K+3)=ABS(X(I,K))
      IF(NOPLOT.GT.0) GO TO 17
      X1=1.
      IX2=FREQ(LFREQ)
      X2=FLOAT(IX2+99)
      Y1= 1.E20
      Y2=-1.E20
      DO 15 I=1,LFREQ
      DO 15 J=4,6
      IF(X(I,J).GT.Y2) Y2=X(I,J)
      IF(X(I,J).LT.Y1) Y1=X(I,J)
   15 CONTINUE
C
C     CALL STSUBJ(X1,X2,Y1,Y2,SS)
C     CALL STNPTS(LFREQ,SS)
C     CALL GDLGLG(BB,SS)
C     CALL STSYMB( 1,SS)
C     CALL STCHSZ(.014,.014,SS)
C     CALL PSLGLG(FREQ,X(1,4),BB,SS)
C     CALL STSYMB( 4,SS)
C     CALL PSLGLG(FREQ,X(1,5),BB,SS)
C     CALL STSYMB( 5,SS)
C     CALL PSLGLG(FREQ,X(1,6),BB,SS)
C     CALL STNCHR(48,SS)
C     CALL TITLEB(T,BB,SS)
C     CALL STNCHR(12,SS)
C     CALL TITLEL(TL,BB,SS)
C     CALL ADVANC (1.0,SS)
C
   17 CONTINUE
      DO 25 K=1,3
      DO 20 I=1,LFREQ
      J=I
   20 X(I,7)=AJ
      CALL ARASLS(LFREQ,X(1,K+3),X(1,7))
```

```
      J=1
   22 Q=X(J,7)
      X(IQ,K+3)=AJ
      J=J+1
      IF(J.LE.LFREQ) GO TO 22
   25 CONTINUE
      DO 28 I=1,LFREQ
      WRITE(6,27) FREQ(I),IDFREQ(I),X(I,1),X(I,4),X(I,2),X(I,5),
     X      X(I,3),X(I,6)
   27 FORMAT(  E13.5, I7, 5X, 3( E12.5, I4, 5X) )
   28 CONTINUE
      GO TO 80
   30 CONTINUE
      IF(KK.NE.4) GO TO 80
      WRITE(6,31)
   31 FORMAT( 14HIIMAGE MOTIONS    /
     X  23HO  FREQUENCY   MODE NO.,  7X, 12H X       RANK,  9X,
     X  12H Y       RANK, 9X, 12H Z       RANK     )
      DO 34 I=1,LFREQ
      DO 34 K=1,3
   34 X(I,K+3)=ABS(X(I,K))
      GO TO 17
   80 CONTINUE
      RETURN
      END
FOR,IS BREORD,BREORD
      SUBROUTINE BREORD(BR,X,NN,IDBR,KGRID,LG,ISCR)
C
C     ROUTINE TO REORDER THE ROWS OF BR (IN 6 ROW BLOCKS) TO
C     COINCIDE WITH THE GRID ORDER OF KGRID.  GRID IDS FOR BR
C     ARE GIVEN IN IDBR.  X AND ISCR ARE SCRATCH ARRAYS.
C
      DIMENSION BR(NN,3),X(NN,3),IDBR(1),KGRID(1),ISCR(1)
      NBR=NN/6
      L=0
      K1=0
      DO 80 KK=1,LG
      DO 20 J=1,NBR
      IF(IDBR(J).NE.KGRID(KK)) GO TO 20
      L=L+1
      ISCR(L)=IDBR(J)
      IDBR(J)=-1
      J1=(J-1)*6 + 1
      J2=J1+5
      DO 16 I=J1,J2
      K1=K1+1
      X(K1,1)=BR(I,1)
      X(K1,2)=BR(I,2)
      X(K1,3)=BR(I,3)
   16 CONTINUE
   20 CONTINUE
   80 CONTINUE
      IF(L.EQ.NBR)GO TO 90
      WRITE(6,82)
```

```
C     LOCATE POSITION IN PHI FOR FREEDOM  M1/N1
C
      DO 20 I=1,LG
      IF(KGRID(I).NE.M1) GO TO 20
      KMN=(I-1)*6+N1
      GO TO 26
   20 CONTINUE
      WRITE(6,22) M1,N1
   22 FORMAT( 63H1*ERROR* POSITION COEFFICIENT REQUESTED AT NON-EXISTING
     X FREEDOM,  I5,I2  )
      RETURN
   26 CONTINUE
      DO 200 J=1,NFREQ
C
C     FORM (BR)(PHI) FOR J-TH MODE
C
      DO 50 I=1,3
      X(I)=0.
      K1=0
      L1=1
      DO 40 K=1,LBR
      DO 30 L=L1,LG
      IF(KGRID(L).NE.IDBR(K)) GO TO 30
      K2=(L-1)*6
      L1=L+1
      GO TO 32
   30 CONTINUE
   32 CONTINUE
      DO 34 L=1,6
   34 X(I)=X(I)+BR(K1+L,I)*PHI(K2+L,J)
      K1=K1+6
   40 CONTINUE
   50 CONTINUE
      IF(M1.GT.0) GO TO 98
C
C     FORM LOAD FOR MODE J (SCRIPT F)
C
      SCRIPF=0.
      XS=FTABLE(1,1)
      N=1
      FF=TBLP(FTABLE(1,1),FTABLE(1,2),FREQ(J),XS,LFTBL,N,M)
      QQ=TBLP(FTABLE(1,1),FTABLE(1,3),FREQ(J),XS,LFTBL,N,M)
      DO 80 I=1,LID
      DO 70 K=1,LG
      IF(KGRID(K).NE.IDF(I)) GO TO 70
C     FORM PSD LOAD
      K1=(K-1)*6
      DO 60 L=1,3
      IF(KINDF.LE.0) GO TO 56
C
C
      SCRIPF=SCRIPF+FF*PHI(K1+L,J)**2+QQ*PHI(K1+L+3,J)**2
      GO TO 60
   56 CONTINUE
```

```
C
C       ORDINARY LOADS
C
        SCRIPF=AMAX1(SCRIPF,ABS(PHI(K1+L,J))*FF)
        SCRIPF=AMAX1(SCRIPF,ABS(PHI(K1+3+L,J))*QQ)
   60 CONTINUE
        GO TO 80
   70 CONTINUE
   80 CONTINUE
   96 CONTINUE
        IF(KINDF.LE.0) GO TO 98
        SCRIPF=SQRT( 0.5*FREQ(J)*DAMP(J)*SCRIPF )
   98 CONTINUE
        A=SCRIPF/(2.*DAMP(J)*FREQ(J)*FREQ(J)*GMASS(J))
        IF(M1.NE.0) A=A*PHI(KMN,J)
        DO 100 I=1,3
  100 SCR(J,I)=X(I)*A
  200 CONTINUE
        IF(M1.EQ.0) GO TO 220
        CALL PRPLT(     3,SCR,FREQ,IDFREQ,NFREQ,M1,N1,0,0)
        GO TO 300
  220 CALL PRPLT(      4,SCR,FREQ,IDFREQ,NFREQ,0,0,0,0)
  300 CONTINUE
        RETURN
        END
 FOR,IS DADD,DADD
        SUBROUTINE DADD(DIN,DOUT,ID,D,X,IDFREQ,LFREQ,F2,FREQ,GMASS)
C
C       ROUTINE TO READ USER SUPPLIED DAMPING AND ADD TO
C       DAMPING MATRIX FROM NASTRAN
C
C        DIN-UNIT CONTAINING NASTRAN MATRIX BHH
C       DOUT-UNIT TO CONTAIN NEW MATRIX
C       ID,D,X-SCRATCH ARRAYS
C
        INTEGER DIN,DOUT
        DIMENSION FREQ(1),GMASS(1)
        DIMENSION ID(1),D(1),X(1),IDFREQ(1),JJ(4),BB(4)
        DOUBLE PRECISION AA
C
C       READ IN USER SUPPLIED DAMPING
C
        COMMON/FACTOR/DFAC,ALF1,ALF2
        LID=0
    8 READ(5,9) (JJ(I),BB(I), I=1,4)
    9 FORMAT( 4(I10,F10.0) )
        DO 14 I=1,4
        IF(JJ(I).LE.0) GO TO 20
        LID=LID+1
        ID(LID)=JJ(I)
        D(LID)=BB(I)
   14 CONTINUE
        GO TO 8
   20 CONTINUE
```

```
      IF(LID.EQ.0) GO TO 24
      DO 21 I=1,LID
      DO 201 J=1,LFREQ
      IF(ID(I).NE.IDFREQ(J))GO TO 201
      D(I)=D(I)*FREQ(J)*GMASS(J)*2.
      GO TO 21
  201 CONTINUE
   21 CONTINUE
      WRITE(6,22) (ID(I),D(I), I=1,LID)
   22 FORMAT( 28H1USER SUPPLIED DAMPING TERMS  /
     X        28H     ID        VALUE              /  ( I6,E15.5))
   24 CONTINUE
      REWIND DIN
      REWIND DOUT
      L=1
   28 IDX=IDFREQ(L)
   30 READ(DIN,END=90) AA,J,K,LL
      IF(LL.EQ.0) GO TO 30
      READ(DIN) (X(I),I=1,LL)
      IF(J.LT.IDX)GO TO 30
      IF(J.EQ.IDX)GO TO 33
      STOP 98
   33 CONTINUE
      DO 37 I=1,LL
   37 X(I)=X(I)*F2*DFAC
      IF(LID.EQ.0) GO TO 50
      DO 40 I=1,LID
      IF(ID(I).NE.IDX)GO TO 40
      X(J)=X(J)+ D(I)
      GO TO 50
   40 CONTINUE
   50 WRITE(DOUT) AA,J,K,LL
      WRITE(DOUT) (X(I),I=1,LL)
      L=L+1
      IF(L.LE.LFREQ) GO TO 28
   90 END FILE DOUT
      REWIND DOUT
      RETURN
      END
FOR,IS NTREAD,NTREAD
      SUBROUTINE NTREAD(MO,AA,AS,I,J,IDIM,IRWD,SS,IU,S2,ISUC,IPREC,KIND)
      COMMON/NOUTU/IOUT
      COMMON/ XXUNPA / LSP
      INTEGER AA(2),AS(IDIM,1),SS(1),S2(1),COLEND
      DATA IEOF/'EOF '/,IEND/'ENDD'/,COLEND/0000011111111  /
      DATA  K1/4/,    IPRNTI/6/,    ITRLR/0000000200000  /
      EQUIVALENCE (IPRINT,IPRNTI)
      M1=MO-3
      MEND=M1-2
      K1=2
      IF(IRWD.EQ.0)GO TO 22
      CALL NTRAN(IU,10)
   20 CONTINUE
      CALL RX(SS(1),M1,IU,II)
```

```
      K1=2
      IF(II.LT.0)GO TO 960
   22 CONTINUE
      NBLOCK=SS(1)
   30 CONTINUE
      LL=SS(K1)
      L=LL
      IF(L.EQ.0) GO TO 47
      IF(L.NE.2)GO TO 38
C  ENCOUNTERED FILE NAME---COMPARE WITH AA
      WRITE(IPRNT1,1)SS(K1+1),SS(K1+2)
    1 FORMAT( '0FOUND FILE ', 2A4 )
   38 CONTINUE
      IF(SS(K1+1).NE.AA(1))GO TO 40
C  POSSIBILITY OF NAME BEING CONTINUED TO NEXT BLOCK
      IF(L.NE.1) GO TO 39
      IF(K1.NE.(MEND-1)) GO TO 39
C  INPUT NEXT BLOCK
      CALL RX(SS(1),M1,IU,II)
      IF(II.LT.0)GO TO 960
      NBLOCK=SS(1)
      K1=2
      LL=SS(4)
      L=LL
      IF(L .EQ.0) GO TO 47
      IF(SS(K1+1).EQ.AA(2)) GO TO 60
      GO TO 40
   39 CONTINUE
      IF(SS(K1+2).EQ.AA(2))GO TO 60
   40 CONTINUE
      IF(LL.NE.IEOF)GO TO 46
      WRITE(IPRNT1,2)
    2 FORMAT( '0** EOF **' )
      K1=K1+1
      GO TO 48
   46 CONTINUE
      IF(LL.EQ.IEND)GO TO 20
C  SKIP OVER LOGICAL RECORD
   47 CONTINUE
      K1=K1+L+2
   48 CONTINUE
      IF(K1.LT.MEND)GO TO 30
C  CHECK POSSIBILITY OF UNUSED WORDS AT END OF BLOCK
      DO 50 II=K1,M1
      L=SS(II)
      IF(L.EQ.IEOF) WRITE(IPRNT1,2)
      IF(L.EQ.IEND) GO TO 20
   50 CONTINUE
      GO TO 20
   60 CONTINUE
C
C*    FOUND REQUESTED FILE
C
      WRITE(IPRNT1,3) AA,NBLOCK
```

```
    3 FORMAT( '0BEGIN PROCESSING FILE ', 2A4, '  BLOCK NO. =', I4 )
      I=0
      J=0
      K1=K1+L+2
      IF(K1.LT.MEND)GO TO 61
      CALL RX(SS(1),M1,IU,II)
      IF(II.LT.0)GO TO 960
      K1=2
   61 CONTINUE
      L=SS(K1)
      IF(L.EQ.IEOF)GO TO 800
      GO TO (62,200,62,200), KIND
   62 CONTINUE
C
C*    PROCESS FILE AS PACKED MATRIX
C
   63 CONTINUE
      KK=1
      IF(L.EQ.0) GO TO 70
   64 CONTINUE
      K1=K1+1
      L=L-1
      JJ=SS(K1)
C  STORE TERM IN SCRATCH
      S2(KK)=JJ
      KK=KK+1
      IF(L.GT.0) GO TO 64
      IF(K1.LT.MEND) GO TO 68
      IF(MOD(SS(K1+1),2).NE.0) GO TO 84
   68 IF(S2(1).GT.4) GO TO 100
   70 CONTINUE
      S2(KK)=COLEND
      J=J+1
      IF(KIND.EQ.3)GO TO 74
C  UNPACK COLUMN J, STORE IN AS
      CALL XXUNP(AS(1,J),S2(1),M,IDIM,IPREC)
      IF(M.GT.I)I=M
      GO TO 80
   74 CONTINUE
C  UNPACK COLUMN J, OUTPUT ON UNIT IOUT
      CALL XXUNP(AS(1,1),S2(1),M,IDIM,IPREC)
      IF(M.GT.I)I=M
      WRITE(IOUT) AA,J,IPREC,M
      WRITE(6,2000) AA,J,IPREC,M
 2000 FORMAT(' WROTE MATRIX ROW  ', 2A4, 3I6 )
      IF(LSP.EQ.0)GO TO 80
      WRITE(IOUT) (AS(N,1),N=1,LSP)
      WRITE(6,2001) (AS(N,1),N=1,LSP)
 2001 FORMAT( 10E13.5)
   80 CONTINUE
      IF(L.GT.0) GO TO 62
      K1=K1+1
   82 K1=K1+1
      L=SS(K1)
```

```
      IF(L.EQ.IEOF)GO TO 100
      IF(K1.LT.MEND) GO TO 62
C  INPUT NEXT BLOCK
   64 CONTINUE
      CALL RX(SS(1),M1,IU,II)
      IF(II.LT.0)GO TO 960
      K1=2
      L=SS(K1)
      GO TO 64
  100 CONTINUE
C  GET ROW SIZE FROM MATRIX TRAILER
      I=MOD(S2(1),ITRLR)
      GO TO 800
  200 CONTINUE
C
C*    PROCESS FILE AS TABLE
C
      J=J+1
      M=J
      IF(KIND.EQ.4)M=1
      KK=0
  202 CONTINUE
      K1=K1+1
      L=L-1
      IF(L.LT.0)GO TO 220
      KK=KK+1
      IF(IDIM.LT.KK)  GO TO 940
      AS(KK,M)=SS(K1)
      GO TO 202
  220 CONTINUE
      JJ=SS(K1)
      IF(KK.GT.I)I=KK
      K1=K1+1
      L=SS(K1)
      IF(L.EQ.IEOF)GO TO 250
      IF(K1.LT.MEND)GO TO 230
      CALL RX(SS(1),M1,IU,II)
      IF(II.LT.0)GO TO 960
      K1=2
      L=SS(K1)
C  CHECK IF LAST RECORD WAS CONTINUED
      II=MOD(JJ,2)
      IF(II.NE.0)GO TO 202
  230 CONTINUE
      IF(KIND.EQ.2)GO TO 200
      WRITE(IOUT) AA,J,KK
      WRITE(IOUT) (AS(II,1), II=1,KK)
      GO TO 200
  250 CONTINUE
      IF(KIND.EQ.2)GO TO 800
      WRITE(IOUT) AA,J,KK
      WRITE(IOUT) (AS(II,1), II=1,KK)
  800 CONTINUE
      WRITE(IPRNT1,4)
```

```
    4 FORMAT( 'OFINISHED PROCESSING' )
      IF(KIND.LE.2) GO TO 999
      END FILE 1OUT
      GO TO 999
  900 CONTINUE
CC    WRITE(IPRNT1,5)
      WRITE(IPRINT,5) IU
CC  5 FORMAT( 00** END OF DATA ON TAPE **0 )
    5 FORMAT( '0** END OF DATA ON TAPE ** UNIT=',I3 )
      GO TO 996
  940 CONTINUE
      WRITE(IPRINT,7) AA,IU,IDIM
    7 FORMAT( '0** SCRATCH SPACE REQUIRED BY NTREAD TO PROCESS ',2A4,
     X  ' ON TAPE UNIT',I3,' IS GREATER THAN ',I10,'WORDS' )
      GO TO 996
  960 CONTINUE
CC    WRITE(IPRNT1,6)
      WRITE(IPRINT,6)  IU
CC  6 FORMAT( 00** PHYSICAL END OF FILE **0 )
    6 FORMAT( '0** PHYSICAL END OF FILE ** UNIT=',I3 )
  996 CONTINUE
      ISUC=-1
      RETURN
  999 CONTINUE
      ISUC=1
      RETURN
      END
FOR,IS RX,RX
      SUBROUTINE RX(A,K,IU,II)
      DIMENSION A(K)
      II=1
      KK=K
   20 CALL NTRAN(IU,2,KK,A,L)
   22 IF(L+1)  9,22,30
   30 CONTINUE
      RETURN
    9 II=-1
      RETURN
      END
FOR,IS XXUNP,XXUNP
      SUBROUTINE XXUNP(C,S,LC,IMAX,IPREC)
C
C     ROUTINE TO UNPACK NASTRAN COLUMN IN S AND PLACE IN C
C     ACCUMULATE LC AS MAX LENGTH OF COLUMN
C
      DIMENSION C(1),S(1)
      INTEGER C,S
      DIMENSION JAA(2)
      DOUBLE PRECISION AA
      EQUIVALENCE (A,AA,JAA(1))
      DATA IX/ 000000200000 /
      DATA IBIG/ 000100000000 /
      DATA IEND/ 000011111111  /
      COMMON/ XXUNPA / LSP
```

```
      LSP=0
      LC=0
      DO 20 I=1,IMAX
   20 C(I)=0
      IF(S(1).EQ.IEND)GO TO 96
      IB=IPREC+2*S(1)-2
      IF(IB.GT.4)GO TO 100
      GO TO (22,23,24,25), IB
C     S.P. TO S.P.
   22 K1=1
      K2=1
      GO TO 28
C     S.P. TO D.P.
   23 K1=1
      K2=2
      GO TO 28
C     D.P. TO S.P.
   24 K1=2
      K2=1
      GO TO 28
C     D.P. TO D.P.
   25 K1=2
      K2=2
   28 CONTINUE
      J=MOD(S(2),IX)
      II=(J-1)*K2+1
      I=3-K1
   30 CONTINUE
      I=I+K1
   32 CONTINUE
      J=S(I)
      IF(J.EQ.IEND)GO TO 90
      IF(J.LE.0)GO TO 40
      IF(J.GT.IBIG)GO TO 40
      J=MOD(J,IX)
      II=(J-1)*K2+1
      I=I+1
      GO TO 32
   40 CONTINUE
      C(II)=J
      IF(IB.LT.3) GO TO 50
      IF(IB.NE.4)GO TO 42
      C(II+1)=S(I+1)
      GO TO 50
   42 CONTINUE
      IF(IB.NE.3) GO TO 43
      JAA(1)=J
      JAA(2)=S(I+1)
      A=AA
      C(II)=JAA(1)
      GO TO 50
   43 CONTINUE
      GO TO (44,45,46,47), IBB
   44 C(II+1)=S(I+1)
```

```
      GO TO 50
   45 C(II+2)=S(I+1)
      GO TO 50
   46 C(II+1)=S(I+2)
      GO TO 50
   47 C(II+1)=S(I+1)
      C(II+2)=S(I+2)
      C(II+3)=S(I+3)
   50 CONTINUE
      II=II+K2
      GO TO 30
   90 CONTINUE
      LSP=II-1
      LC=LSP/K2
   96 CONTINUE
      RETURN
  100 IBB=IB-4
      GO TO (122,123,124,125), IBB
C     COMPLEX S.P. TO S.P.
  122 K1=2
      K2=2
      GO TO 28
C     COMPLEX S.P. TO D.P.
  123 K1=2
      K2=4
      GO TO 28
C     COMPLEX D.P. TO S.P.
  124 K1=4
      K2=2
      GO TO 28
C     COMPLEX D.P. TO D.P.
  125 K1=4
      K2=4
      GO TO 28
      END
 FOR,IS   TBLP,TBLP
      REAL FUNCTION TBLP(X,Y,X1,D1,LX,D2,M)
      DIMENSION X(1),Y(1)
      IF(X1.LE.X(1)) GO TO 96
      IF(X1.GE.X(LX))GO TO 80
      DO 20 I=1,LX
      IF(X1.LT.X(I)) GO TO 20
      TBLP=Y(I)+(Y(I+1)-Y(I))*(X1-X(I))/(X(I+1)-X(I))
      GO TO 90
   20 CONTINUE
   80 TBLP=X(LX)
   90 RETURN
   96 TBLP=X(1)
      GO TO 90
      END
 MAP,IS  SYM,ABS
 LIB  SYS$*MSFC$.
 XQT  ABS
```

```
      3         2        1.0       0.01      100.0
    318       323       324        325       331       333       351       400

      1         1
      1         6
      1    .0005          2   .0005              3   .0005              4   .0005
      2    .0005          6   .0005
    333       351
    323       400       318
 -55.2         0.        0.         0.        0.        0.       56.2       0.
      0.        0.        0.         0.       -1.        0.        0.        0.
      0.        0.
      0.       7.5        0.         0.        0.      86.4        0.       -6.5
      0.        0.        0.      -12.8        0.        -1.       0.        0.
      0.        0.
      0.        0.       7.5         0.     -86.4         0.        0.        0.
   -6.5         0.       12.8        0.        0.        0.       -1.        0.
      0.        0.
    333       351
      2         0
    0.0    1500.0
    0.0    1500.0
    0.0    1500.0
   3314      3316      3334       3336
   3314      3316      3511       3513

   3181      3183      3334       3336
   3334      3336

PMD,E
```

Output Description

The postprocessor output consists of a printed echo of selected input and printed output of the calculated values in selecting the critical modes for the subsequent low-frequency control-system studies and higher-frequency fine-stabilization studies. The printout of selected input consists of the following:

a. gridpoints of interest,

b. modal frequencies in radians per second and modal generalized masses in the specified output system of units,

c. damping terms obtained by multiplying the user-supplied damping coefficients (C/C_c) by the product of twice the frequency times the generalized mass,

d. The subset of eigenvectors of interest, in the specified output system of units, for the gridpoints of interest selected from the NASTRAN restart tape,

e. the optical amplification matrix.

The printout of calculated values consists of the following for all options:

a. the principal rows of the real and imaginary coupled modal displacement matrices used to assess the degree of modal velocity coupling,

b. equivalent modal viscous damping coefficients (C/C_c) calculated from the diagonal terms of the generalized modal viscous damping matrix.

For Option 1, the additional printout is the specified rate, position (gyro), and position(optical) coefficients for each mode ranked according to magnitude. For Option 2, the additional printout is the three-component vector of image displacement for each mode. Each of the three components are ranked according to magnitude. Both sets of calculated data are printed for Option 3.

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