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PUBCO-II, AN IBM 704 CODE
FOR COMPUTING THE IDEAL THERMODYNAMIC FUNCTIONS
OF A DIATOMIC GAS MOLECULE



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PUBCO-II, AN IBM 704 CODE
FOR COMPUTING THE IDEAL THERMODYNAMIC FUNCTIONS
OF A DIATOMIC GAS MOLECULE

by

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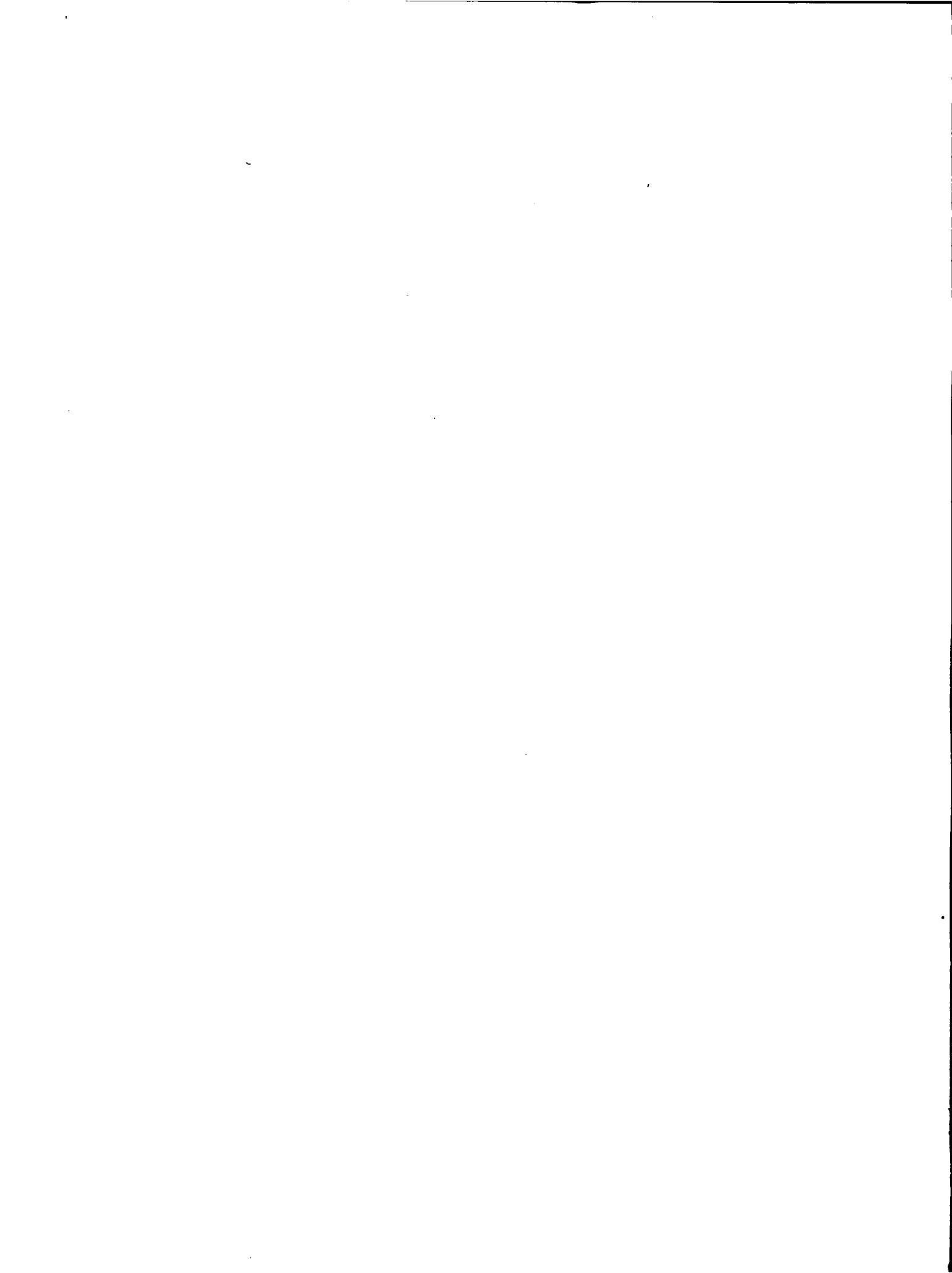
ABSTRACT

This code is a companion code for PUBCO-I, which computes the ideal thermodynamic functions of polyatomic gas molecules and which is described in LA-2278.

The PUBCO-II code is arranged to handle the ground electronic state plus as many as five excited electronic states with their associated vibration and rotation terms. The code normally computes the nonrigid rotator-anharmonic oscillator thermodynamic functions but drops out the correction factors to give the rigid rotator-harmonic oscillator thermodynamic functions if the operator so desires.

The PUBCO-II code is distinguished from other codes which compute thermodynamic functions for diatomic molecules by its treatment of the rotational energy contribution to the partition function. Three different methods of computing this contribution are used, depending on whether the molecule is in a Σ electronic state, a doublet non- Σ electronic state, or a triplet non- Σ electronic state.

Sample calculations which illustrate certain features of the code are given for OH ($^2\Pi$) and C₂ ($^3\Pi$).



CONTENTS

	Page
Abstract	3
1. Introduction	7
2. Thermodynamic Functions of Diatomic Molecules	7
2.1 Partition Functions	7
2.2 Rotational Partition Function for Molecules in the Σ State	12
2.3 Rotational Partition Function for Doublet Molecules with Λ -type Doubling	12
2.4 Rotational Partition Function for Triplet Molecules with Λ -type Doubling	16
2.5 Rigid Rotator-Harmonic Oscillator Thermodynamic Functions	17
2.6 Nonrigid Rotator-Anharmonic Oscillator Thermodynamic Functions	22
3. The Pubco-II Code	23
3.1 General Features	23
3.2 Subroutines	24
3.3 Regions within the Code	28
3.4 Input Data	29
3.5 The Pubco-II Deck	31
References	33
Appendix A IBM Listing for Pubco-II Code	34
Appendix B Thermodynamic Functions of OH molecule ($^2\Pi$)	79
Appendix C Thermodynamic Functions of C_2 Molecule ($^3\Pi$)	81



1. INTRODUCTION

This report, which describes an IBM 704 code to compute the ideal thermodynamic functions of diatomic gas molecules, is intended as a complement to LA-2278, which describes a similar IBM code for calculating the ideal thermodynamic functions of polyatomic gas molecules, and to LA-2110, which describes a code to compute these functions for monatomic gas molecules. The availability of PUBCO-II now makes it possible to compute thermodynamic functions for any type of gas molecule (for which spectral data exist) up to temperatures at which thermal ionization begins to be of importance for that molecule.

By depressing sense switch No. 2, the operator can obtain the thermodynamic functions divided by the gas constant, R, rather than the actual thermodynamic functions.

The equations which are used in the computation of the thermodynamic functions by means of the PUBCO-II code are discussed in Section 2; a general description of the code is given in Section 3; the IBM listing for the code is reproduced in Appendix A; and sample machine printouts for OH ($^2\Pi$) and C₂ ($^3\Pi$) are given in Appendix B and Appendix C, respectively.

2. THERMODYNAMIC FUNCTIONS OF DIATOMIC MOLECULES

2.1 Partition Functions

The thermodynamic functions of any gaseous molecule can be computed by means of the partition function^{1,2} defined as

$$Q = \sum_i g_i e^{-\epsilon_i/kT}, \quad (1)$$

where

g_i = degeneracy of the i th energy level,
 ϵ_i = energy of the i th energy level,
 k = Boltzmann constant,
 T = absolute temperature in degrees Kelvin.

It is possible to factor the total partition function, Q , into an internal and a translational partition function such that

$$Q = Q_{\text{int}} \cdot Q_{\text{tr}}. \quad (2)$$

Moreover, if the various possible interactions are neglected, the internal partition function is separable into an electronic component, a vibrational component, and a rotational component with the result that

$$Q = Q_{\text{tr}} \cdot Q_{\text{el}} \cdot Q_{\text{vib}} \cdot Q_{\text{rot}}. \quad (3)$$

It can be shown that the translational partition function, Q_{tr} , can be expressed as

$$Q_{\text{tr}} = V \left(\frac{2\pi mkT}{h^2} \right)^{3/2}, \quad (4)$$

where

V = molar volume of gas being considered,
 m = absolute mass of the molecule,
 h = Planck constant.

The electronic partition function, Q_{el} , is defined as

$$Q_{\text{el}} = g_{\text{el}} e^{-\epsilon_{\text{el}}/kT}, \quad (5)$$

where

$$g_{el} = \text{degeneracy of the electronic state}, \\ \epsilon_{el} = \text{energy of the electronic state}.$$

The ground electronic state has zero energy so that for the ground state

$$Q_{el} = g_{el}. \quad (6)$$

Each of the excited electronic states will have an electronic partition function as defined by equation (5).

The vibrational partition function for a harmonic oscillator can be expressed as

$$Q_{vib} = \sum_{v=0}^{\infty} g_v e^{-hc\omega/kT}, \quad (7)$$

where

$$g_v = \text{degeneracy of vibrational level } (= 1 \text{ for diatomic molecules}), \\ c = \text{velocity of light}, \\ v = \text{vibrational quantum number } = 0, 1, 2, \dots, \\ \omega = \text{fundamental vibrational frequency } (\text{cm}^{-1}).$$

The vibrational partition function can be simplified to give

$$Q_{vib} = \left(1 - e^{-hc\omega/kT}\right)^{-1}. \quad (8)$$

Normally, in molecular spectra nomenclature, the fundamental frequency, ω , is replaced by the wave number, ν , of the fundamental vibrational band.

The rotational partition function, Q_{rot} , takes the general form

$$Q_{rot} = \sum_J (2J + 1) e^{-\epsilon_J/kT}, \quad (9)$$

where

J = rotational quantum number,

ϵ_J = energy of J th rotational level.

A detailed description of the rotational partition function will be given in Sections 2.2 through 2.4 since different treatments are used to handle the three following cases:

- a. Σ states of any multiplicity,
- b. Doublet states (non- Σ),
- c. Triplet states (non- Σ).

The nonrigid rotator-anharmonic oscillator molecules are treated as rigid rotator-harmonic oscillator molecules with three correction terms³ to take care of the stretching, anharmonicity, and vibration-rotation interaction of the molecules. If some of the spectral data which are required to compute these correction terms are missing, the operator can depress sense switch No. 1 on the 704 console, thereby forcing the code to treat the molecule as a rigid rotator-harmonic oscillator.

The partition function for stretching is expressed as

$$\ln Q_{st} = \rho T, \quad (10)$$

where

$$\rho = 2kD/hcB^2. \quad (11)$$

In equation (11), D is the centrifugal distortion constant of the molecule.

The anharmonicity partition function is

$$\ln Q_{anh} = \frac{\left[2x_e \omega_e - (13/4) y_e \omega_e \right] (hc/kT)}{\left(e^{hc\nu/kT} - 1 \right)^2}, \quad (12)$$

where

$x_e \omega_e$, $y_e \omega_e$ = anharmonicity constants (cm^{-1}),
 ν = fundamental vibrational band wave number.

Here

$$\nu = \omega_e - 2x_e \omega_e + \frac{13}{4} y_e \omega_e . \quad (13)$$

It is convenient to make the replacement

$$u = hc\nu/kT . \quad (14)$$

Equation (12) then simplifies to

$$\ln Q_{\text{anh}} = \frac{[2x_e \omega_e - (13/4) y_e \omega_e] (hc/kT)}{(e^u - 1)^2} . \quad (15)$$

The vibration-rotation interaction partition function can be expressed as

$$\ln Q_{v-r} = \frac{\delta}{(e^u - 1)} , \quad (16)$$

where δ is a dimensionless vibration-rotation interaction constant and is defined as

$$\delta = \alpha_e / B_0 . \quad (17)$$

Here

α_e = small rotation constant used to correct B for various vibration levels (cm^{-1}),

B_0 = rotation constant of molecule (cm^{-1}),

$$B_0 = B_e - \alpha_e / 2 , \quad (18)$$

where

B_e = value of rotational constant at the equilibrium separation of the two atoms.

2.2 Rotational Partition Function for Molecules in the Σ State

The generalized equation (9) for the rotational partition function takes the following form for molecules in the Σ state:

$$Q_{\text{rot}} = \sum_{J=0}^{\infty} (2J + 1) e^{-(J)(J+1)(hcB/kT)} . \quad (19)$$

This equation can be expanded asymptotically to give

$$Q_{\text{rot}} = \frac{1}{\sigma^*} \left[\left(\frac{kT}{hcB_0} \right) + \frac{1}{3} + \frac{1}{15} \left(\frac{hcB_0}{kT} \right) + \frac{4}{315} \left(\frac{hcB_0}{kT} \right)^2 + \frac{1}{315} \left(\frac{hcB_0}{kT} \right)^3 + \dots \right], \quad (20)$$

where σ^* is the symmetry number of the molecule.

To be rigorous in the treatment of molecules in the Σ state, molecules whose multiplicity is greater than unity should be handled somewhat differently. The rigorous treatment of ${}^2\Sigma$ and ${}^3\Sigma$ state molecules is discussed by Herzberg.⁴ Fortunately, the simplified treatment used in the PUBCO-II code gives only slightly inaccurate results at low temperatures and gives the correct results at high temperatures.

One can, of course, treat molecules which are not in the Σ state as if they were in that state by changing Λ to zero and multiplying the electronic degeneracy by 2.

2.3 Rotational Partition Function for Doublet Molecules with Λ -type Doubling

The development of the partition function for doublet molecules with Λ -type doubling is an extension of the method of Haar and Friedman⁵ for ${}^2\Pi$ molecules to cover ${}^2\Delta$ and ${}^2\Gamma$ molecules.

Hill and Van Vleck⁶ have derived expressions for the rotational energies of doublet molecules. For any ${}^2\Lambda$ state

$$F_1(J) = B_0 \left\{ \left(J + \frac{1}{2} \right)^2 - \Lambda^2 - \frac{1}{2} \left[4 \left(J + \frac{1}{2} \right)^2 + \frac{A}{B_0} \left(\frac{A}{B_0} - 4 \right) \Lambda^2 \right]^{1/2} \right\} \\ - D_v J^4, \quad (21)$$

$$F_2(J) = B_0 \left\{ \left(J + \frac{1}{2} \right)^2 - \Lambda^2 + \frac{1}{2} \left[4 \left(J + \frac{1}{2} \right)^2 + \frac{A}{B_0} \left(\frac{A}{B_0} - 4 \right) \Lambda^2 \right]^{1/2} \right\} \\ - D_v (J + 1)^4, \quad (22)$$

where

$F_1(J)$, $F_2(J)$ = energy levels of the lower and upper doublet states,
respectively,

Λ = orbital angular momentum quantum number = 1,
2, 3, ... ,

A = spin coupling constant (cm^{-1}),

D_v = previously defined D ,

J = rotational quantum number = $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \dots$.

In order to refer the rotational energy to the lowest molecular energy as the zero of energy, the lowest molecular energy β must be subtracted from $F_1(J)$ and $F_2(J)$. For normal $^2\Pi$ and inverted $^2\Pi$ molecules, β equals $F_1(1/2)$ and $F_1(3/2)$, respectively; for normal $^2\Delta$ and $^2\Gamma$ molecules, β equals $F_1(3/2)$ and $F_1(5/2)$, respectively. If $0 < A/B_0 < 2$, the lowest rotational level belongs to F_2 even though all the other rotational levels of the same doublet component belong to F_1 ; in such a case, β would be $F_2(1/2)$ for a $^2\Pi$ state.

If one follows the Haar and Friedman development, he arrives at the following expression for the rotational partition function:

$$Q_{\text{rot}} = \frac{2 \exp\{(\text{hc}\beta/kT) + [(2\Lambda + 1)/4] \sigma\}}{\sigma^*} \left(\left\{ \sum_{k=0}^{\infty} g_k \frac{d^k}{d\sigma^k} \left[\sum_{J=\frac{1}{2}, \frac{3}{2}}^{\infty} (2J + 1) e^{-\sigma J(J+1)} \right] \right\} - e^{-\gamma\sigma} \right), \quad (23)$$

where

$$\sigma = \frac{\text{hc}B_0}{kT}, \quad (24)$$

σ^* = symmetry number,

$$g_k = (-1)^k \frac{\sigma^{2k}}{k!} \sum_{n=0}^{\infty} \frac{(n+k)! (\sigma^2 a)^n}{(2n+2k)! n!}, \quad (25)$$

$$a = \left[\left(\frac{A}{2B_0} \right)^2 - \frac{A}{B_0} \right] \Lambda^2 + \frac{1}{4}, \quad (26)$$

$$\gamma = \left(\frac{2\Lambda + 1}{4} \right) - \frac{1}{2B_0} \left[4B_0^2 \left(J + \frac{1}{2} \right)^2 - 4AB_0 \Lambda^2 + A^2 \Lambda^2 \right]^{1/2}. \quad (27)$$

The g_k all converge. In the PUBCO-II code, n is allowed to run only from 0 to 12 and k from 0 to 7 since these limits are sufficiently large to guarantee convergence of the g_k .

The term $e^{-\gamma\sigma}$ in equation (23) must be included to account for the fact that some of the rotational levels are missing. Thus, for a ${}^2\Pi$ molecule, only one level with $J = 1/2$ is present, but in a ${}^2\Delta$ molecule both the $J = 1/2$ levels are missing, as well as one level with $J = 3/2$. Consequently, the coefficient of $e^{-\gamma\sigma}$ for a ${}^2\Pi$ molecule will be unity and J will equal $1/2$; for the case of a ${}^2\Delta$ molecule there will be two sets of $e^{-\gamma\sigma}$ terms, one set corresponding to $J = 1/2$ with a coefficient of 2 and the second corresponding to $J = 3/2$ with a coefficient of 2. If a molecule is encountered with $\Lambda > 3({}^2\Gamma)$,

the code will treat the molecule as one in the $^2\Gamma$ state as far as missing rotational levels are concerned.

Equation (23) differs slightly in form from equation (8) in the Haar and Friedman paper because certain simplifications have not been used in the PUBCO-II code.

The evaluation of the sum

$$\sum_{J=\frac{1}{2}, \frac{3}{2}}^{\infty} (2J + 1) e^{-\sigma J(J+1)}$$

is performed as discussed in the original paper but the summation has been extended to yield additional terms. The following result is obtained:

$$\begin{aligned} \sum_{J=\frac{1}{2}, \frac{3}{2}, \dots}^{\infty} (2J + 1) e^{-\sigma J(J+1)} &= \frac{1}{\sigma} + 8.33333 \times 10^{-2} - (2.70834 \times 10^{-2})\sigma \\ &\quad - (1.07391 \times 10^{-2})\sigma^2 - (3.1731 \times 10^{-3})\sigma^3 \\ &\quad - (1.1649 \times 10^{-3})\sigma^4 - (8.863 \times 10^{-4})\sigma^5. \end{aligned} \tag{28}$$

If the power series in σ in equation (28) is represented as $\Sigma^*(\sigma)$, equation (23) then becomes

$$Q_{\text{rot}} = \frac{2 \exp\{(hc\beta/kT) + [(2\Lambda + 1)/4]\sigma\}}{\sigma^*} \left\{ \left[\sum_{k=0}^7 g_k \frac{d^k}{d\sigma^k} \right. \right. \\ \left. \left. \times \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) \right] - e^{-\gamma\sigma} \right\}. \tag{29}$$

Equation (29) is multiplied by 2 rather than by 4 as in equation (11) of the original Haar and Friedman paper because the other factor of 2 is considered

to be the electronic degeneracy in the PUBCO-II code.

It should be pointed out that the correction term due to the anharmonicity of the molecule has been derived incorrectly in the Haar and Friedman paper although the error resulting from the incorrect expression is not too large.

2.4 Rotational Partition Function for Triplet Molecules with Λ -type Doubling

Budo⁷ has derived expressions for the rotational term values for any degree of spin uncoupling for triplet states on the basis of Hill and Van Vleck's general equations. These expressions are given in Herzberg (Ref. 4, p. 235) in the following form:

$$F_1(J) = B_0 \left[J(J + 1) - \sqrt{Z_1} - 2Z_2 \right] - D_v \left(J - \frac{1}{2} \right)^4 , \quad (30)$$

$$F_2(J) = B_0 \left[J(J + 1) + 4Z_2 \right] - D_v \left(J + \frac{1}{2} \right)^4 , \quad (31)$$

$$F_3(J) = B_0 \left[J(J + 1) + \sqrt{Z_1} - 2Z_2 \right] - D_v \left(J + \frac{3}{2} \right)^4 , \quad (32)$$

where

$$Z_1 = \Lambda^2 \frac{A}{B_0} \left(\frac{A}{B_0} - 4 \right) + \frac{4}{3} + 4J(J + 1) , \quad (33)$$

$$Z_2 = \frac{1}{3Z_1} \left[\Lambda^2 \frac{A}{B_0} \left(\frac{A}{B_0} - 1 \right) - \frac{4}{9} - 2J(J + 1) \right] , \quad (34)$$

and where B_0 has been substituted for B_v in the Herzberg expressions.

As in the case of molecules in the doublet state, it is necessary to subtract the lowest molecular energy β from $F_1(J)$, $F_2(J)$, and $F_3(J)$. For normal $^3\Pi$ and inverted $^3\Pi$ molecules, β equals $F_1(0)$ and $F_1(2)$, respectively; for normal $^3\Delta$ or $^3\Gamma$ molecules, β equals $F_1(1)$ and $F_1(2)$, respectively.

The rotational levels of each of the triplet components can be expressed

by the rigid rotator equation (20) if the spin uncoupling is slight ($A \gg B_0$). However, the effective rotational constant, B_{eff} , for the two rotational levels for which $\Sigma = \pm 1$ is given by

$$B_{\text{eff}} = B_0 \left(1 \pm \frac{2B_0}{\Lambda A} + \dots \right), \quad (35)$$

instead of by B_0 , as is the case for the level where $\Sigma = 0$ ($^3\Pi_1, ^3\Delta_2, \dots$). Even when the spin uncoupling becomes larger, the mean of the three rotational levels for each J still behaves like the rigid rotator equation (20) with the true B_0 .

The rotational partition function for a non- Σ triplet state thus becomes

$$Q_{\text{rot}} = \frac{e^{hc\beta/kT}}{\sigma^*} \left\{ \sum_{i=0}^2 \left[\frac{kT}{hc} \cdot \frac{1}{B_i} + 1 + \frac{1}{15} \left(\frac{hcB_i}{kT} \right) + \frac{4}{315} \left(\frac{hcB_i}{kT} \right)^2 + \frac{1}{315} \left(\frac{hcB_i}{kT} \right)^3 \right] - (2J+1) e^{-hcF_i(J)/kT} \right\}, \quad (36)$$

where

B_i = effective B for each of the three triplet components as defined by equation (35).

Thus equation (36) differs from equation (20) only because equation (36) is summed over the three-component rotational levels of the triplet state and because the contributions of any missing rotational levels are subtracted from the rotational partition function. It is obvious that hcF/kT here is equivalent to $\gamma\sigma$ in the case of the doublet states.

2.5 Rigid Rotator-Harmonic Oscillator Thermodynamic Functions

The four thermodynamic functions are derivable from the partition function by means of the following expressions:

Free energy function

$$-(F^\circ - H_0^\circ)/T = R \ln Q \quad (37)$$

Enthalpy function

$$(H - H_0^\circ)/T = -\frac{R}{T} \frac{Q'}{Q} \quad (38)$$

Entropy

$$S^\circ = (H^\circ - H_0^\circ)/T - (F^\circ - H_0^\circ)/T \quad (39)$$

Heat capacity

$$C_p^\circ = \frac{R}{T^2} \left[\frac{Q''}{Q} - \left(\frac{Q'}{Q} \right)^2 \right] \quad (40)$$

In equations (37) through (40), Q' and Q'' are defined as follows:

$$Q' = \left[\frac{\partial Q}{\partial (1/T)} \right]_p , \quad (41)$$

$$Q'' = \left[\frac{\partial^2 Q}{\partial (1/T)^2} \right]_p . \quad (42)$$

Since the entropy is merely the sum of the free energy function and the enthalpy function, it is left to the reader to obtain the actual expression for the entropy contributions of various modes of freedom; only the expressions for the free energy function, the enthalpy function, and heat capacity will be given.

Expressions (37), (38), and (40) take the following forms when the total partition function Q is separated into its translational component and its remaining internal components:

$$-(F^\circ - H_0^\circ)/T = R \left(\frac{5}{2} \ln T + \frac{3}{2} \ln M + 20.1976 - \ln P + \ln Q_{int} \right) , \quad (43)$$

$$(H^\circ - H^\circ_0)/T = R \left[\frac{5}{2} - \frac{1}{T} \left(\frac{Q'_{\text{int}}}{Q_{\text{int}}} \right) \right], \quad (44)$$

$$C_p^\circ = R \left\{ \frac{5}{2} + \frac{1}{T^2} \left[\frac{Q''_{\text{int}}}{Q_{\text{int}}} - \left(\frac{Q'_{\text{int}}}{Q_{\text{int}}} \right)^2 \right] \right\}. \quad (45)$$

If only the ground electronic state is being considered for a given molecule, it is permissible to separate the internal partition function into its vibrational, rotational, and electronic components and to compute the contribution of each of the components to the thermodynamic functions. However, if additional excited electronic states are being considered, one must compute the total Q_{int} , Q'_{int} , and Q''_{int} for each electronic state and then sum these quantities over all the electronic states under consideration before calculating the thermodynamic functions by means of expressions (43), (44), and (45). The PUBCO-II code treats all problems as if more than one electronic level were being considered.

The vibrational, electronic, and rotational partition functions and their first and second derivatives with respect to $1/T$ are listed below:

$$Q_{\text{vib}} = (1 - e^{-u})^{-1}, \quad (46)$$

$$Q'_{\text{vib}} = (-1) (uT) (1 - e^{-u})^{-2} e^{-u}, \quad (47)$$

$$Q''_{\text{vib}} = (uT)^2 (1 - e^{-u})^{-3} (1 + e^{-u}) e^{-u}, \quad (48)$$

$$Q_{\text{el}} = g_{\text{el}} e^{-hcT_i/kT}, \quad (49)$$

$$Q'_{el} = - \left(\frac{hcT_i}{k} \right) Q_{el}, \quad (50)$$

$$Q''_{el} = \left(\frac{hcT_i}{k} \right)^2 Q_{el}. \quad (51)$$

In expressions (49), (50), and (51), T_i is the energy of the i th electronic state.

For molecules in the Σ state,

$$Q_{rot} = \frac{1}{\sigma^*} \left[\frac{1}{\sigma} + \frac{1}{3} + \frac{1}{15} \sigma + \frac{4}{315} \sigma^2 + \frac{1}{315} \sigma^3 \right], \quad (52)$$

$$Q'_{rot} = \frac{T}{\sigma^*} \left[-\frac{1}{\sigma} + \frac{1}{15} \sigma + \frac{8}{315} \sigma^2 + \frac{3}{315} \sigma^3 \right], \quad (53)$$

$$Q''_{rot} = \frac{T^2}{\sigma^*} \left[\frac{2}{\sigma} + \frac{8}{315} \sigma^2 + \frac{6}{315} \sigma^3 \right]. \quad (54)$$

For molecules in the ${}^2\Lambda$ state,

$$Q_{rot} = \frac{2 \exp\{(hc\beta/kT) + [(2\Lambda + 1)/4]\sigma\}}{\sigma^*} \left\{ \left[\sum_{k=0}^7 g_k \frac{d^k}{d\sigma^k} \times \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) \right] - e^{-\gamma\sigma} \right\}, \quad (55)$$

$$\begin{aligned} Q'_{rot} &= \left[\frac{hc\beta}{k} + \left(\frac{2\Lambda + 1}{4} \right) \frac{hcB_0}{k} \right] (Q_{rot}) \\ &+ \frac{2 \exp\{(hc\beta/kT) + [(2\Lambda + 1)/4]\sigma\}}{\sigma^*} \left[\sum_{k=0}^7 g'_k \frac{d^k}{d\sigma^k} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) \right. \\ &\quad \left. + \sum_{k=0}^7 g_k \sigma T \frac{d^{k+1}}{d\sigma^{k+1}} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) + (\gamma\sigma T) e^{-\gamma\sigma} \right], \end{aligned} \quad (56)$$

$$\begin{aligned}
Q''_{\text{rot}} = & \left[\frac{hc\beta}{k} + \left(\frac{2\Lambda + 1}{4} \right) \frac{hcB_0}{k} \right] (Q'_{\text{rot}}) \\
& + \frac{2 \exp(hc\beta/kT) + [(2\Lambda + 1)/4] \sigma}{\sigma^*} \left\{ \sum_{k=0}^7 g_k'' \frac{d^k}{d\sigma^k} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) \right. \\
& + \left[\frac{hc\beta}{k} + \left(\frac{2\Lambda + 1}{4} \right) \frac{hcB_0}{k} \right] \left[\sum_{k=0}^7 g_k' \frac{d^k}{d\sigma^k} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) \right. \\
& + \sum_{k=0}^7 g_k \sigma T \frac{d^{k+1}}{d\sigma^{k+1}} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) + (\gamma \sigma T) e^{-\gamma \sigma} \Big] \\
& + 2 \sum_{k=0}^7 g_k' \sigma T \frac{d^{k+1}}{d\sigma^{k+1}} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) \\
& \left. \left. + \sum_{k=0}^7 g_k (\sigma T)^2 \frac{d^{k+2}}{d\sigma^{k+2}} \left(\Sigma^*(\sigma) + \frac{hcD}{kT} \frac{d^2}{d\sigma^2} \Sigma^*(\sigma) \right) - (\gamma \sigma T)^2 e^{-\gamma \sigma} \right\}. \quad (57)
\end{aligned}$$

In equations (56) and (57), g_k' and g_k'' are the first and second derivations of g_k with respect to $1/T$.

For molecules in the ${}^3\Lambda$ state,

$$\begin{aligned}
Q_{\text{rot}} = & \frac{e^{hc\beta/kT}}{\sigma^*} \left[\sum_{i=0}^2 \left(\frac{1}{\sigma_i} + 1 + \frac{1}{15} \sigma_i + \frac{4}{315} \sigma_i^2 + \frac{1}{315} \sigma_i^3 \right) \right. \\
& \left. - (2J + 1) e^{-hcF_i(J)/kT} \right], \quad (58)
\end{aligned}$$

$$\begin{aligned}
Q'_{\text{rot}} = & \frac{hc\beta}{k} Q_{\text{rot}} + \frac{e^{hc\beta/kT}}{\sigma^*} \left\{ T \left[\sum_{i=0}^2 \left(-\frac{1}{\sigma_i} + \frac{1}{15} \sigma_i + \frac{8}{315} \sigma_i^2 + \frac{3}{315} \sigma_i^3 \right) \right. \right. \\
& \left. \left. + (2J + 1) \frac{hcF_i(J)}{kT} e^{-hcF_i(J)/kT} \right] \right\}, \quad (59)
\end{aligned}$$

$$Q''_{\text{rot}} = 2 \frac{hc\beta}{k} Q'_{\text{rot}} + \frac{e^{hc\beta/kT}}{\sigma^*} \left\{ T^2 \left[\sum_{i=0}^2 \left(\frac{2}{\sigma_i} + \frac{8}{315} \sigma_i^2 + \frac{6}{315} \sigma_i^3 \right) - (2J+1) \left(\frac{hcF_i(J)}{kT} \right)^2 e^{-hcF_i(J)/kT} \right] \right\} - \left(\frac{hc\beta}{k} \right)^2 Q_{\text{rot}}, \quad (60)$$

where

$$\sigma_i = \frac{hcB_i}{kT}. \quad (61)$$

2.6 Nonrigid Rotator-Anharmonic Oscillator Thermodynamic Functions

The partition functions for the stretching, anharmonicity, and vibration-rotation interactions are

$$\ln Q_{\text{st}} = \rho T, \quad (62)$$

$$Q'_{\text{st}} = -\rho T^2 \cdot Q_{\text{st}}, \quad (63)$$

$$Q''_{\text{st}} = 2\rho T^3 \cdot Q_{\text{st}} - \rho T^2 \cdot Q'_{\text{st}}, \quad (64)$$

$$\ln Q_{\text{anh}} = \frac{\left(2x_e \omega_e - (13/4) y_e \omega_e (hc/kT) \right)}{(e^u - 1)^2}, \quad (65)$$

$$Q'_{\text{anh}} = Q_{\text{anh}} \left(2x_e \omega_e - \frac{13}{4} y_e \omega_e \right) \left(\frac{hc}{k} \right) \left\{ e^u - 1 - 2ue^u \right\} (e^u - 1)^{-3}, \quad (66)$$

$$Q''_{\text{anh}} = 2Q_{\text{anh}} \left(2x_e \omega_e - \frac{13}{4} y_e \omega_e \right) \left(\frac{hc}{k} \right) (uT) e^u \left\{ 2 + u - 2e^u + 2ue^u \right\} (e^u - 1)^{-4} \\ + \left(2x_e \omega_e - \frac{13}{4} y_e \omega_e \right) \left(\frac{hc}{k} \right) \left\{ e^u - 1 - 2ue^u \right\} (e^u - 1)^{-3} \cdot Q'_{\text{anh}}, \quad (67)$$

$$\ln Q_{v-r} = \frac{\delta}{(e^u - 1)}, \quad (68)$$

$$Q'_{v-r} = -\frac{\delta(uT) e^u}{(e^u - 1)^2} \cdot Q_{v-r}, \quad (69)$$

$$Q''_{v-r} = \frac{\delta e^u (uT)^2 (e^u + 1)}{(e^u - 1)^3} \cdot Q_{v-r} - \frac{\delta(uT) e^u}{(e^u - 1)^2} \cdot Q'_{v-r}. \quad (70)$$

3. THE PUBCO-II CODE

3.1 General Features

The IBM cards used at the Los Alamos Scientific Laboratory are punched in columns 1 to 36 and 38 to 72. All discussion will be based upon this punching convention.

The code uses decimal floating point numbers for numerical input and Hollerith alphabetic characters as binary coded decimal (BCD) data for molecular identification. The output is printed by the SHARE-2 board as floating point numbers for all molecular input data and as fixed point numbers for all computational data, i.e., temperature and thermodynamic functions. The molecular formula is printed as Hollerith characters.

Five Los Alamos subroutines and one Los Alamos auxiliary program are used in the course of the program. They will be identified below and discussed in detail in the following section. The identification and function of each subroutine is as follows:

LAS-011	Floating decimal input
LAS-117	General on-line or off-line print
LAS-800	Square root

LAS-816	Floating exponential
LAS-820	Floating natural logarithm
LAA-027	Binary correction card loader

The computation of the thermodynamic functions is performed in two parts. The rigid rotator-harmonic oscillator functions are calculated for all molecules. If the more exact nonrigid rotator-anharmonic oscillator functions are desired, sense switch No. 1 on the 704 console is left up; depression of this switch causes the 704 to transfer to the print routine as soon as the rigid rotator-harmonic oscillator functions have been computed.

If sense switch No. 2 on the console is depressed, all the thermodynamic functions are divided by the gas constant, R, before the results are printed.

3.2 Subroutines

Since the write-ups for some of the subroutines used in the PUBCO-II code are rather lengthy, only those portions of the write-ups which are necessary for the proper utilization of these subroutines will be covered in this report. Only one error stop can occur in the noncomputing subroutines and it is covered in the discussion of LAS-011.

LAS-011. Blocks of eight digit, floating decimal constants (up to seven per card) are loaded by means of this subroutine. It is identified in the code as region 701 and is used to load all molecular data for the problem. It is entered by means of a transition card. This transition card is punched in columns 1 and 2 in the "9" row. The binary location to which the transition is to be made is punched in the "9" row in the appropriate columns from column 22 to column 36. LAS-011 requires a transition to $(2760)_8$ for the first problem of a series and is entered by means of a basic linkage-calling routine in region $110.31(5076)_8$ for all problems except the first of a series. Each group of molecular data requires a control card and one or more data cards.

The control card must be punched as follows:

<u>Card Columns</u>	<u>Punch</u>	<u>Significance</u>
1	8	Control card
2-6	FWA	Initial loading address

The data cards must be punched as follows:

<u>Card Columns</u>	<u>Punch</u>	<u>Significance</u>
1	Blank	Data card
2-9	N_1	1st number
10-11	E_1	1st exponent
12-19	N_2	2nd number
20-21	E_2	2nd exponent
22-29	N_3	3rd number
30-31	E_3	3rd exponent
32-36	N_4	First five digits of 4th number
37	Blank	
38-40	N_4	Last three digits of 4th number
41-42	E_4	4th exponent
43-50	N_5	5th number
51-52	E_5	5th exponent
53-60	N_6	6th number
61-62	E_6	6th exponent
63-70	N_7	7th number
71-72	E_7	7th exponent

All zeros must be punched. If fewer than seven numbers are on a card, the unused field must be left blank. Numbers must be punched consecutively, starting at the left of the card. The signs of the numbers and exponents are punched over the first digit of the number and of the exponent,

respectively. An 11 punch is used for minus but no additional punch is used to designate a positive number. To avoid the necessity of punching several sets of zeros for unused electronic states, it is most convenient to use a control card for each type of molecular input data. In this case the following initial loading addresses are required:

(01950) ₁₀	Electronic degeneracy
(01956) ₁₀	Rotational B
(01962) ₁₀	Fundamental frequency
(01968) ₁₀	$x_e \omega_e$
(01974) ₁₀	Rotational α
(01980) ₁₀	Electronic energy
(01986) ₁₀	Molecular weight and symmetry number
(01988) ₁₀	Λ
(01994) ₁₀	Rotational D
(02000) ₁₀	$y_e \omega_e$
(02006) ₁₀	Rotational coupling, A
(02012) ₁₀	Rotational β

The data card for each type of data must follow immediately behind its control card.

An error stop can occur at (1747)₁₀ or (3323)₈ if a data card is punched incorrectly.

LAS-117. This program prints fixed and/or floating decimal numbers either on-line or off-line. It is used to print on-line in PUBCO-II but it can be modified by 027 correction cards to print off-line. These changes will be discussed later in this section. This subroutine is entered in region 100 at 100.0(4146)₈ to print molecular data in floating point for both rigid rotator-harmonic oscillator molecules and nonrigid rotator-anharmonic oscillator molecules.

For all molecules, the molecular data are printed consecutively (six words per line). This means that each type of input data, i.e., electronic degeneracy, rotational constants, fundamental frequencies, etc., will occupy one line of print. The temperature, the free energy function, enthalpy function, entropy, and heat capacity are printed in this order on one line as fixed point numbers after the computation of the thermodynamic functions has been performed at each desired temperature. The thermodynamic functions are printed with five significant figures following the decimal point; since most spectroscopic data are not sufficiently accurate to permit this degree of precision, it will be desirable in most cases for the user to round off the thermodynamic functions to the appropriate number of figures for a given molecule. The molecular formula is printed at the head of the molecular data and at the head of the thermodynamic functions.

The following changes in the program are required to print off-line with the same format as the on-line printing. The octal designation for the operation PTW is +200000.

<u>Location</u>	<u>Operation</u>	<u>Address</u>	<u>Tag</u>	<u>Decrement</u>
$(4150)_8$	PTW	0	0	$(2)_8$
$(4161)_8$	PTW	0	0	$(48)_8$
$(4166)_8$	PTW	0	0	$(48)_8$
$(4177)_8$	PTW	0	0	$(48)_8$
$(4203)_8$	PTW	0	0	$(48)_8$
$(4206)_8$	PTW	0	0	$(1)_8$

LAS-800. This program, which is entered at α by a basic linkage, takes the square root of a normalized number, x , in the accumulator and returns to the main program at $\alpha + 2$ with $\sqrt{|x|}$ in the accumulator. If the $x \leq 0$, the return is to $\alpha + 1$ with $\sqrt{|x|}$ in the accumulator. The PUBCO

code is set up to give a program stop at all $\alpha + 1$ positions in the square root subroutine since there is no situation where x should be a negative number. The square root subroutine is identified in the code as region 704.

LAS-816. This subroutine evaluates the exponential of a floating point number, x , in the accumulator. The 704 requires that $|x| < 87.3$. The entry is at α with x in the accumulator and the normal exit is at $\alpha + 2$ with e^x in the accumulator. Since exponent overflows are possible in the program, the exit for this condition at $\alpha + 1$ is set up to store 10^{30} in the accumulator if $x > 87.3$ and 0 if $x < -87.3$. This subroutine is region 703 of the code.

LAS-820. This program evaluates the natural logarithm of a normalized floating point number, $x > 0$. Entry to the program is at α with x in the accumulator and the normal exit is at $\alpha + 2$ with $\ln x$ in the accumulator. If $x \leq 0$, the exit is at $\alpha + 1$. Some of the $\alpha + 1$ exits are programmed as "halts", while others are "halt and proceed"; the instruction used in a particular calling sequence depends upon whether x can physically be zero in that particular situation. LAS-820 is identified as region 702 in the code.

LAA-027. This self-loading auxiliary routine for binary correction cards is used to load the molecular formula into the IBM 704. The card bearing the molecular identification for a given problem is loaded into 802.63(3735)₈ by LAA-027 after the corresponding decimal data for that problem have been loaded. The BCD punched alphabetic characters are punched in columns 38 to 72. Binary punched correction cards also can be loaded by LAA-027 if it becomes necessary to change some of the instructions of the code itself.

3.3 Regions within the Code

The code is composed of 90 regions. Thirty-five of these regions are used as operational regions and can be identified by the fact that their region

numbers are between 100 and 402; 45 regions are used for the temporary storage of computational results and have region numbers between 500 and 645; five regions are the previously discussed subroutines and are numbered from 700 through 704; and five regions, numbered 800 through 804, contain input data for the problem. Region 1 is used for subroutine erasable storage.

The following list gives the functions of the operational regions.

<u>Region</u>	<u>Function</u>
100	Print input data
101	Calculate translational contribution to the thermodynamic functions
102	Calculate vibrational contribution
103	Calculate rotational contribution for molecules in the Σ state
105	Calculate electronic contribution
106	Calculate stretching contribution
107	Calculate vibration-rotation interaction contribution
108	Calculate anharmonicity contribution
109	Print output of computations
110	Increment temperature
200-213	Calculate rotational contribution for $^2\Lambda$ molecules
300-307	Calculate rotational contribution for $^3\Lambda$ molecules
400	Gather all Q , Q' , and Q'' terms
401	Form total Q , Q' , and Q'' for each electronic level
402	Compute thermodynamic functions

3.4 Input Data

Because the possibility exists that an individual may desire to change one or more pieces of input data, some discussion of the data now stored in the code will be given.

The 800 block contains the values of the physical constants needed in the computation. The constants are those of Cohen, et al.,⁸ with the exception of data pertaining to the gas constant, R, and the Boltzmann constant, k, which are based upon constants used by the National Bureau of Standards.

The order of the physical constants in region 800 is as follows:

<u>Region</u>	<u>Function</u>
800.0	Gas constant, R
800.1	π
800.2	Boltzmann constant, k
800.3	Planck constant, h
800.4	Velocity of light, c
800.5	Avogadro number, N
800.6	Pressure in dynes/cm ²
800.7	Sackur-Tetrode constant
800.8	5/2 R
800.9	R ln P
800.10	3/2 R
800.11	hc/k

The 801 block contains numbers needed in the calculations and will not be discussed. The 802 region contains the molecular data in the following order:

<u>Region</u>	<u>Function</u>
802.0-802.5	Electronic degeneracy, g_{el}
802.6-802.11	Rotational constant, B
802.12-802.17	Wave number of fundamental frequency, ω_e
802.18-802.23	Anharmonicity constant, $x_e \omega_e$

<u>Region</u>	<u>Function</u>
802.24-802.29	Rotational constant, α
802.30-802.35	Electronic energy, T_i
802.36	Molecular weight
802.37	Symmetry number
802.38-802.43	Orbital angular momentum quantum number, Λ
802.44-802.49	Rotational constant, D
802.50-802.55	Anharmonicity constant, $y_e \omega_e$
802.56-802.61	Rotational spin coupling constant, A
802.62	Rotational constant, β , to correct D for different vibrational levels
802.63	Molecular identification

The data in blocks of six are for the ground electronic state and for as many as five excited electronic states, the order of these states being in the order of increasing values of T. There must be a one-to-one correspondence for all data which occupy blocks of six, i.e., as many g_{el} 's as B's as ω_e 's, etc.

Region 803 has various temperatures and temperature increments stored in it so that the code will compute the thermodynamic functions at 50°K intervals from 50°K to 250°K, at 298.16°K, and at 100°K intervals from 300°K through 5000°K. The initial temperature is stored at 803.0; the initial ΔT is at 803.1; the second ΔT is stored at 803.4; and the final test temperature is stored at 803.6. New temperatures can be stored in this region by means of LAS-011 if one wishes to change the temperature scanning routine.

Region 804 contains constants needed in the computations.

3.5 The PUBCO-II Deck

The PUBCO-II deck is formed by the following cards:

LAA-020 self-loading binary card

PUBCO-II binary cards

TNX to $(2760)_8$ transition card (to LAS 011.10)

LAS-011 control cards and decimal data cards for 802 block

LAA-027 self-loading correction card

Binary card with molecular formula in $(3735)_8$

TNX to $(4146)_8$ transition card (to start of problem)

Two blank cards

If several molecules are being computed at the same time, the blank cards should be removed and placed at the end of the cards for the last molecule being computed. Each of the molecules after the first requires the LAS-011 control and data cards, the LAA-027 self-loading correction card and binary card with molecular formula, and a transition card to $(4146)_8$.

ADDENDUM

Region 646 has been added to the operational regions as a catch-all region for corrections made after the report was originally written.

The PUBCO-II code has been checked out on an IBM 709 using IBM 704 Compatibility Package #2.

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Appendix A
IBM LISTING FOR PUBCO-II CODE

ORIGIN TABLE.	SYNECL.FWA	SYMBOL.LWA	OCT.FWA	LWA	DECIM.FWE	LIF
	1.0000.	1.3107.1	1750	77777	1000	32767
	700.0000.	700.3107.1	2114	77777	1100	32767
	701.0000.	701.3107.1	2746	77777	1510	32767
	702.0000.	702.3107.1	3340	77777	1760	32767
	703.0000.	703.3107.1	3410	77777	1800	32767
	704.0000.	704.3107.1	3516	77777	1870	32767
	800.0000.	800.3107.1	3547	77777	1895	32767
	801.0000.	801.3107.1	3566	77777	1910	32767
	802.0000.	802.3107.1	3636	77777	1950	32767
	803.0000.	803.3107.1	3744	77777	2020	32767
	804.0000.	804.3107.1	3756	77777	2030	32767
	100.0000.	100.0029.	4146	4211	2150	2185
	101.0000.	101.0019.	4214	4237	2188	2207
	102.0000.	102.0050.	4242	4332	2210	2266
	103.0003.	103.0070.	4336	4441	2270	2337
	105.0000.	105.0032.	4456	4516	2350	2382
	106.0000.	106.0028.	4521	4561	2385	2417
	107.0000.	107.0025.	4564	4622	2420	2450
	108.0000.	108.0064.	4641	4753	2465	2539
	109.0000.	109.0032.	4766	5031	2550	2585
	110.0000.	110.0032.	5036	5077	2590	2623
	200.0000.	200.0043.	5101	5154	2625	2668
	201.0000.	201.0056.	5170	5260	2680	2736
	202.0000.	202.0018.	5276	5320	2750	2765
	203.0000.	203.0018.	5327	5351	2775	2793
	204.0000.	204.0024.	5377	5430	2815	2840
	205.0000.	205.0112.	5442	5624	2850	2964
	206.0000.	206.0099.	5644	6014	2980	3084
	207.0000.	207.0070.	6015	6126	3085	3158
	208.0000.	208.0153.	6130	6336	3160	3294
	209.0000.	209.0095.	6402	6543	3330	3427
	210.0000.	210.0046.	6560	6640	3440	3488
	211.0000.	211.0022.	6654	6702	3500	3522
	212.0000.	212.0018.	6712	6737	3530	3551
	213.0000.	213.0014.	6750	6766	3560	3574
	300.0000.	300.0045.	6774	7053	3580	3627
	301.0000.	301.0182.	7070	7366	3640	3830
	302.0000.	302.0089.	7412	7562	3850	3954
	303.0000.	303.0100.	7602	7754	3970	4076
	304.0000.	304.0112.	7772	10157	4090	4207
	305.0000.	305.0058.	10174	10267	4220	4279
	306.0000.	306.0040.	10302	10352	4290	4330
	307.0000.	307.0061.	10364	10462	4340	4402
	400.0000.	400.0036.	10472	10536	4410	4446
	401.0000.	401.0061.	10554	10651	4460	4521
	402.0000.	402.0038.	10662	10735	4530	4573
	500.0000.	500.3107.1	10744	77777	4580	32767
	501.0000.	501.3107.1	10756	77777	4590	32767
	502.0000.	502.3107.1	10770	77777	4603	32767
	503.0000.	503.3107.1	11002	77777	4610	32767

504.0000.	504.3107.1	11014	77777	4620	32767
505.0000.	505.3107.1	11026	77777	4630	32767
506.0000.	506.3107.1	11040	77777	4640	32767
507.0000.	507.3107.1	11052	77777	4650	32767
508.0000.	508.3107.1	11064	77777	4660	32767
509.0000.	509.3107.1	11071	77777	4665	32767
503.0000.	503.3107.1	11110	77777	4680	32767
504.0000.	504.3107.1	11127	77777	4695	32767
505.0000.	505.3107.1	11141	77777	4705	32767
506.0000.	506.3107.1	11153	77777	4715	32767
507.0000.	507.3107.1	11160	77777	4720	32767
508.0000.	508.3107.1	11172	77777	4730	32767
509.0000.	509.3107.1	11211	77777	4745	32767
610.0000.	610.3107.1	11223	77777	4755	32767
611.0000.	611.3107.1	11235	77777	4765	32767
612.0000.	612.3107.1	11261	77777	4785	32767
613.0000.	613.3107.1	11317	77777	4815	32767
614.0000.	614.3107.1	11331	77777	4825	32767
615.0000.	615.3107.1	11343	77777	4835	32767
616.0000.	616.3107.1	11425	77777	4885	32767
617.0000.	617.3107.1	11432	77777	4890	32767
618.0000.	618.3107.1	11437	77777	4895	32767
619.0000.	619.3107.1	11451	77777	4905	32767
620.0000.	620.3107.1	11463	77777	4915	32767
621.0000.	621.3107.1	11475	77777	4925	32767
622.0000.	622.3107.1	11507	77777	4935	32767
623.0000.	623.3107.1	11533	77777	4955	32767
624.0000.	624.3107.1	11557	77777	4975	32767
630.0000.	630.3107.1	11603	77777	4995	32767
631.0000.	631.3107.1	11622	77777	5010	32767
632.0000.	632.3107.1	11660	77777	5040	32767
633.0000.	633.3107.1	11716	77777	5070	32767
634.0000.	634.3107.1	11754	77777	5100	32767
635.0000.	635.3107.1	12012	77777	5130	32767
636.0000.	636.3107.1	12036	77777	5150	32767
637.0000.	637.3107.1	12062	77777	5170	32767
642.0000.	642.3107.1	12106	77777	5190	32767
643.0000.	643.3107.1	12132	77777	5210	32767
644.0000.	644.3107.1	12156	77777	5230	32767
645.0000.	645.3107.1	12202	77777	5250	32767
646.0000.	646.0046.	12226	12314	5270	5324

02114	LAS	002723	001750	7	703.	0000.	LAS	117.	0000.	1.	005%	GEN 011-OFF LINE PRINT	1100	02114
02746	LAS	003323	001750	7	701.	0000.	LAS	11.	0000.	1.	0023.	FLOATING DEC INPUT	1510	02746
03340	LAS	003406	001750	7	702.	0000.	LAS	820.	0000.	1.	0002.	FL PT LOG BASE E	1700	03340
03410	LAS	003506	001750	7	703.	0000.	LAS	816.	5770.	1.	0005.	FASTER EXP 2.5 MS	1800	03410
03516	LAS	003545	001750	7	704.	0000.	LAS	800.	2893.	1.	0003.	NORMAL EXIT=(CR+2) LG	1870	03516
03547		201774	570651	3	800.	0000.		0.	0000.	0.	0000.	195725000000 00	1895	03547
03550		202622	077325	3	800.	0001.		0.	0000.	0.	0000.	314159265250 00	1896	03550
03551		114476	235455	3	800.	0002.		0.	0000.	0.	0000.	130044000000-16	1897	03551
03552		052406	346323	3	800.	0003.		0.	0000.	0.	0000.	662517000000-27	1898	03552
03553		243676	563112	3	800.	0004.		0.	0000.	0.	0000.	299792000000 10	1899	03553
03554		317776	136520	3	800.	0005.		0.	0000.	0.	0000.	602320000000 23	1900	03554
03555		224756	600400	3	800.	0006.		0.	0000.	0.	0000.	101250000000 06	1901	03555
03556		205503	122254	3	800.	0007.		0.	0000.	0.	0000.	201975510000 01	1902	03556
03557		203475	753412	3	800.	0008.		0.	0000.	0.	0000.	496812500000 00	1903	03557
03560		205667	544466	3	800.	0009.		0.	0000.	0.	0000.	274610310000 01	1904	03560
03561		202575	432477	3	800.	0010.		0.	0000.	0.	0000.	298087500000 00	1905	03561
03562		201560	252000	3	800.	0011.		0.	0000.	0.	0000.	143879700000 00	1906	03562
03563		137667	633767	3	800.	0012.		0.	0000.	0.	0000.	100000000000-10	1907	03563
03564		236734	654500	3	800.	0013.		0.	0000.	0.	0000.	100000000000 09	1908	03564
03566		000000	000000	3	801.	0000.		0.	0000.	0.	0000.	00000000000000 00	1910	03566
03567		231400	000000	3	801.	0001.		0.	0000.	0.	0000.	100000000000 00	1911	03567
03570		202400	000000	3	801.	0002.		0.	0000.	0.	0000.	200000000000 00	1912	03570
03571		201560	252000	3	801.	0003.		0.	0000.	0.	0000.	143879700000 00	1913	03571
03572		211473	000000	3	801.	0004.		0.	0000.	0.	0000.	315000000000 02	1914	03572
03573		175421	042107	3	801.	0005.		0.	0000.	0.	0000.	666667000000-02	1915	03573
03574		177525	252514	3	801.	0006.		0.	0000.	0.	0000.	333333000000-01	1916	03574
03575		175707	070673	3	801.	0007.		0.	0000.	0.	0000.	111111100000-01	1917	03575
03576		174533	136455	3	801.	0008.		0.	0000.	0.	0000.	423809500000-02	1918	03576
03577		203400	000000	3	801.	0009.		0.	0000.	0.	0000.	400000000000 00	1919	03577
03600		202600	000000	3	801.	0010.		0.	0000.	0.	0000.	300000000000 00	1920	03600
03601		203500	000000	3	801.	0011.		0.	0000.	0.	0000.	500000000000 00	1921	03601
03602		203600	000000	3	801.	0012.		0.	0000.	0.	0000.	600000000000 00	1922	03602
03603		207740	000000	3	801.	0013.		0.	0000.	0.	0000.	120000000000 02	1923	03603
03604		200000	000000	4	801.	0014.		0.	0000.	0.	0000.	050000000000 00 00	1924	03604
03605		204600	000000	3	801.	0015.		0.	0000.	0.	0000.	120000000000 01	1925	03605
03606		205600	000000	3	801.	0016.		0.	0000.	0.	0000.	240000000000 01	1926	03606
03607		177400	000000	3	801.	0017.		0.	0000.	0.	0000.	250000000000-01	1927	03607
03610		205400	000000	3	801.	0018.		0.	0000.	0.	0000.	160000000000 01	1928	03610
03611		206444	000000	3	801.	0019.		0.	0000.	0.	0000.	360000000000 01	1929	03611
03612		203504	000000	3	801.	0020.		0.	0000.	0.	0000.	506250000000 00	1930	03612
03613		205440	000000	3	801.	0021.		0.	0000.	0.	0000.	180000000000 01	1931	03613
03614		201640	000000	3	801.	0022.		0.	0000.	0.	0000.	162500000000 00	1932	03614
03615		202640	000000	3	801.	0023.		0.	0000.	0.	0000.	325000000000 00	1933	03615
03616		201525	252523	3	801.	0024.		0.	0000.	0.	0000.	133333300000 00	1934	03616
03617		177707	070706	3	801.	0025.		0.	0000.	0.	0000.	444444400000-01	1935	03617
03620		204400	000000	3	801.	0026.		0.	0000.	0.	0000.	800000000000 00	1936	03620
03621		206600	000000	3	801.	0027.		0.	0000.	0.	0000.	480000000000 01	1937	03621
03622		206500	000000	3	801.	0028.		0.	0000.	0.	0000.	400000000000 01	1938	03622

03623	207500 000000	3 801. 0029.	0. 0000.	0. 0000.	800000000000 01	1939	03623
03624	203620 000000	3 801. 0030.	0. 0000.	0. 0000.	625000000000 00	1940	03624
03625	204610 000000	3 801. 0031.	0. 0000.	0. 0000.	122500000000 01	1941	03625
03626	205500 000000	3 801. 0032.	0. 0000.	0. 0000.	200000000000 01	1942	03626
03627	203700 000000	3 801. 0033.	0. 0000.	0. 0000.	700000000000 00	1943	03627
03630	204440 000000	3 801. 0034.	0. 0000.	0. 0000.	900000000000 00	1944	03630
03631	204500 000000	3 801. 0035.	0. 0000.	0. 0000.	100000000000 01	1945	03631

03636	202400 000000	3 802. 0000.	0. 0000.	0. 0000.	200000000000 00	1950	03636
03637	202400 000000	3 802. 0001.	0. 0000.	0. 0000.	200000000000 00	1951	03637
03640	203400 000000	3 802. 0002.	0. 0000.	0. 0000.	400000000000 00	1952	03640
03641	202400 000000	3 802. 0003.	0. 0000.	0. 0000.	200000000000 00	1953	03641
03642	202400 000000	3 802. 0004.	0. 0000.	0. 0000.	200000000000 00	1954	03642
03643	000000 000000	3 802. 0005.	0. 0000.	0. 0000.	000000000000 00	1955	03643
03644	204716 477371	3 802. 0006.	0. 0000.	0. 0000.	144570000000 01	1956	03644
03645	204716 477371	3 802. 0007.	0. 0000.	0. 0000.	144570000000 01	1957	03645
03646	204735 136152	3 802. 0008.	0. 0000.	0. 0000.	149120000000 01	1958	03646
03647	204634 304467	3 802. 0009.	0. 0000.	0. 0000.	129870000000 01	1959	03647
03650	204724 101422	3 802. 0010.	0. 0000.	0. 0000.	146290000000 01	1960	03650
03651	000000 000000	3 802. 0011.	0. 0000.	0. 0000.	000000000000 00	1961	03651
03652	214545 546314	3 802. 0012.	0. 0000.	0. 0000.	286160000000 03	1962	03652
03653	214545 546314	3 802. 0013.	0. 0000.	0. 0000.	286160000000 03	1963	03653
03654	214555 100000	3 802. 0014.	0. 0000.	0. 0000.	292100000000 03	1964	03654
03655	214475 640000	3 802. 0015.	0. 0000.	0. 0000.	254250000000 03	1965	03655
03656	214541 006314	3 802. 0016.	0. 0000.	0. 0000.	292410000000 03	1966	03656
03657	000000 000000	3 802. 0017.	0. 0000.	0. 0000.	000000000000 00	1967	03657
03660	207401 146314	3 802. 0018.	0. 0000.	0. 0000.	643000000000 01	1968	03660
03661	207401 146314	3 802. 0019.	0. 0000.	0. 0000.	643000000000 01	1969	03661
03662	207551 463146	3 802. 0020.	0. 0000.	0. 0000.	904000000000 01	1970	03662
03663	211565 631463	3 802. 0021.	0. 0000.	0. 0000.	373800000000 02	1971	03663

03664	207647 146314	3 802. 0022.	0. 0000.	0. 0000.	105800000000 02	1972	03664
03665	000000 000000	3 802. 0023.	0. 0000.	0. 0000.	000000000000 00	1973	03665
03666	200421 320712	3 802. 0024.	0. 0000.	0. 0000.	534000000000-01	1974	03666
03667	200421 320712	3 802. 0025.	0. 0000.	0. 0000.	534000000000-01	1975	03667
03670	200527 024265	3 802. 0026.	0. 0000.	0. 0000.	670000000000-01	1976	03670
03671	177760 507534	3 802. 0027.	0. 0000.	0. 0000.	485000000000-01	1977	03671
03672	200574 733105	3 802. 0028.	0. 0000.	0. 0000.	744000000000-01	1978	03672
03673	000000 000000	3 802. 0029.	0. 0000.	0. 0000.	000000000000 00	1979	03673
03674	000000 000000	3 802. 0030.	0. 0000.	0. 0000.	000000000000 00	1980	03674
03675	205436 314631	3 802. 0031.	0. 0000.	0. 0000.	172000000000 01	1981	03675
03676	217551 561000	3 802. 0032.	0. 0000.	0. 0000.	231500000000 04	1982	03676
03677	217625 350000	3 802. 0033.	0. 0000.	0. 0000.	254900000000 04	1983	03677
03700	217761 150000	3 802. 0034.	0. 0000.	0. 0000.	318210000000 04	1984	03700
03701	000000 000000	3 802. 0035.	0. 0000.	0. 0000.	000000000000 00	1985	03701
03702	204640 446722	3 802. 0036.	0. 0000.	0. 0000.	130180000000 01	1986	03702
03708	201400 000000	3 802. 0037.	0. 0000.	0. 0000.	100000000000 00	1987	03703
03704	200400 000000	3 802. 0038.	0. 0000.	0. 0000.	500000000000-01	1988	03704
03705	200400 000000	3 802. 0039.	0. 0000.	0. 0000.	500000000000-01	1989	03705
03706	201400 001000	3 802. 0040.	0. 0000.	0. 0000.	100000000000 00	1990	03706
03707	201400 000000	3 802. 0041.	0. 0000.	0. 0000.	100000000000 00	1991	03707
03710	201400 000000	3 802. 0042.	0. 0000.	0. 0000.	100000000000 00	1992	03710
03711	201400 000000	3 802. 0043.	0. 0000.	0. 0000.	100000000000 00	1993	03711

03744	206620	000000	3	803.	0000.	0.	0000.	0.	0000.	500000000000	01	2020	03744
03745	206620	000000	3	803.	0001.	0.	0000.	0.	0000.	500000000000	01	2021	03745
03746	211452	122250	3	803.	0002.	0.	0000.	0.	0000.	298160800000	02	2022	03746
03747	211454	000000	3	803.	0003.	0.	0000.	0.	0000.	300000000000	02	2023	03747
03750	207620	000000	3	803.	0004.	0.	0000.	0.	0000.	100000000000	02	2024	03750
03751	210764	000000	3	803.	0005.	0.	0000.	0.	0000.	250000000000	02	2025	03751
03752	215471	100000	3	803.	0006.	0.	0000.	0.	0000.	501000000000	03	2026	03752

03756	175525	252461	3	804.	0000.	0.	0000.	0.	0000.	833333000000	-02	2030	03756
03757	-173673	570015	3	804.	0001.	0.	0000.	0.	0000.	-270834000000	-02	2031	03757
03760	-172537	714146	3	804.	0002.	0.	0000.	0.	0000.	-107391000000	-02	2032	03760
03761	-170637	717105	3	804.	0003.	0.	0000.	0.	0000.	-317310000000	-03	2033	03761
03762	-167461	276166	3	804.	0004.	0.	0000.	0.	0000.	-116490000000	-03	2034	03762
03763	-166720	532260	3	804.	0005.	0.	0000.	0.	0000.	-886300000000	-04	2035	03763
03764	-173537	714146	3	804.	0006.	0.	0000.	0.	0000.	-214782000000	-02	2036	03764
03765	-172467	733264	3	804.	0007.	0.	0000.	0.	0000.	-951930000000	-03	2037	03765
03766	-171461	276166	3	804.	0008.	0.	0000.	0.	0000.	-465960000000	-03	2038	03766
03767	-171442	330356	3	804.	0009.	0.	0000.	0.	0000.	-443150000000	-03	2039	03767
03770	-173467	733264	3	804.	0010.	0.	0000.	0.	0000.	-190386000000	-02	2040	03770
03771	-172712	035261	3	804.	0011.	0.	0000.	0.	0000.	-139788000000	-02	2041	03771
03772	-173442	330356	3	804.	0012.	0.	0000.	0.	0000.	-177260000000	-02	2042	03772
03773	-173712	035261	3	804.	0013.	0.	0000.	0.	0000.	-279576000000	-02	2043	03773
03774	-174663	504545	3	804.	0014.	0.	0000.	0.	0000.	-531780000000	-02	2044	03774
03775	-175663	504545	3	804.	0015.	0.	0000.	0.	0000.	-106356000000	-01	2045	03775
03776	144422	701372	3	804.	0016.	0.	0000.	0.	0000.	200000000000	-09	2046	03776

04146	TSX	007400	402114	100.	0000.	TSX	700.	0000.	C	0.	0000.		2150	04146
04147	PTH	302046	003735	100.	0001.	PTH	802.	0063.		0.	1062.	MOLECULAR IDENTIFIC.	2151	04147
04150	PON	100000	000362	100.	0002.	PON	0.	0242.		0.	0000.	HALF PAGE	2152	04150
04151	SOX	-053400	104210	100.	0003.	SOX	2.	0028.	A	0.	0000.		2153	04151
04152	TSX	007400	402114	100.	0004.	TSX	700.	0000.	C	0.	0000.		2154	04152
04153	SVN	-317523	103700	100.	0005.	SVN	802.	0034.	A	0.	8019.	MULTIPLICITY	2155	04153
04154	SVN	-317547	103701	100.	0006.	SVN	802.	0035.	A	0.	8039.	ROTATION CONSTANT,E	2156	04154
04155	SVN	-317573	103702	100.	0007.	SVN	802.	0036.	A	0.	8059.	OMEGA SUB E'	2157	04155
04156	SVN	-317617	103703	100.	0008.	SVN	802.	0037.	A	0.	8079.	X OMEGA SUB E	2158	04156
04157	SVN	-317643	103704	100.	0009.	SVN	802.	0038.	A	0.	8099.	ALPHA	2159	04157
04160	SVN	-317667	103705	100.	0010.	SVN	802.	0039.	A	0.	8119.	ELECTRONIC TERM VALUE	2160	04160
04161	PON	100000	000000	100.	0011.	PON	0.	0000.		0.	0000.		2161	04161
04162	TX	200006	104152	100.	0012.	TX	2.	0004.	A	0.	0006.		2162	04162
04163	TSX	007400	402114	100.	0013.	TSX	700.	0000.	C	0.	0000.		2163	04163
04164	SVN	-317573	003702	100.	0014.	SVN	802.	0036.		0.	8059.	MOLECULAR WEIGHT	2164	04164
04165	SVN	-317617	003703	100.	0015.	SVN	802.	0037.		0.	8079.	SYMMETRY NUMBER	2165	04165
04166	PON	100000	000000	100.	0016.	PON	0.	0000.		0.	0000.		2166	04166
04167	SOX	-053400	104211	100.	0017.	SOX	2.	0029.	A	0.	0000.		2167	04167
04170	TSX	007400	402114	100.	0018.	TSX	700.	0000.	C	0.	0000.		2168	04170
04171	SVN	-317523	103734	100.	0019.	SVN	802.	0062.	A	0.	8019.	LAMBDA	2169	04171
04172	SVN	-317547	103735	100.	0020.	SVN	802.	0063.	A	0.	8039.	ROTATION CONSTANT,O	2170	04172
04173	SVN	-317573	103736	100.	0021.	SVN	802.	0064.	A	0.	8059.	Y OMEGA SUB E	2171	04173
04174	SVN	-317617	103737	100.	0022.	SVN	802.	0065.	A	0.	8079.	ROT. COUPLING CONST,A	2172	04174
04175	SVN	-317643	103740	100.	0023.	SVN	802.	0066.	A	0.	8099.		2173	04175
04176	SVN	-317667	103741	100.	0024.	SVN	802.	0067.	A	0.	8119.		2174	04176
04177	PON	100000	000000	100.	0025.	PON	0.	0000.		0.	0000.		2175	04177

04200	TX	200006	104170	100.	0025.1	TX	2.	0018.	R	0.	0006.		2176	04200
04201	TSX	007400	402114	100.	0025.2	TSX	700.	0000.	C	0.	0000.		2177	04201
04202	SVM	-317605	003734	100.	0025.3	SVM	802.	0062.		0.	8069.	ROTATIONAL BETR	2178	04202
04203	PON	100000	000000	100.	0026.	PON	0.	0000.		0.	0000.		2179	04203
04204	TSX	007400	402114	100.	0026.1	TSX	700.	0000.	C	0.	0000.		2180	04204
04205	PTH	302046	003735	100.	0026.2	PTH	802.	0063.		0.	1062.	MOLECULAR IDENTIFIC.	2181	04205
04206	PON	100000	000361	100.	0028.3	PON	0.	0241.		0.	0000.	RESTORE PAPER	2182	04206
04207	T	002000	004214	100.	0027.	T	101.	0000.		0.	0000.	CALC. TRANSLAT. FNS.	2183	04207
04210		000042	000000	100.	0028.		0.	0000.		0.	0034.		2184	04210
04211		000030	000000	100.	0029.		0.	0000.		0.	0024.		2185	04211
04214	CR	050000	003744	101.	0000.	CR	803.	0000.		0.	0000.	T ZERO	2188	04214
04215	ST	060100	002005	101.	0001.	ST	1.	0029.		0.	0000.	T WKG	2189	04215
04216	TSX	007400	403340	101.	0002.	TSX	702.	0000.	C	0.	0000.	LN	2190	04216
04217	H	000000	000000	101.	0003.	H	0.	0000.		0.	0000.		2191	04217
04220	LR	076500	000043	101.	0004.	LR	0.	0035.		0.	0000.		2192	04220
04221	FM	026000	003557	101.	0005.	FM	800.	0008.		0.	0000.	5/2 R	2193	04221
04222	ST	060100	011064	101.	0006.	ST	600.	0000.		0.	0000.	LN T	2194	04222
04223	CR	050000	003702	101.	0007.	CR	802.	0036.		0.	0000.	MOLECULAR WEIGHT	2195	04223
04224	TSX	007400	403340	101.	0008.	TSX	702.	0000.	C	0.	0000.	LN	2196	04224
04225	H	000000	000000	101.	0009.	H	0.	0000.		0.	0000.		2197	04225
04226	LR	076500	000043	101.	0010.	LR	0.	0035.		0.	0000.		2198	04226
04227	FM	026000	003561	101.	0011.	FM	900.	0010.		0.	0000.	3/2 R	2199	04227
04230	FR	030000	011064	101.	0012.	FR	600.	0000.		0.	0000.		2200	04230
04231	FR	030000	003556	101.	0013.	FR	800.	0007.		0.	0000.	SACKUR-TETROOE CONST.	2201	04231
04232	FS	030200	002560	101.	0014.	FS	800.	0009.		0.	0000.	R LN P	2202	04232
04233	ST	060100	002006	101.	0015.	ST	1.	0030.		0.	0000.	-F/T TRANS	2203	04233
04234	CR	050000	003557	101.	0016.	CR	800.	0008.		0.	0000.	5/2 R	2204	04234
04235	ST	060100	002007	101.	0017.	ST	1.	0031.		0.	0000.	H/T, TRANS.	2205	04235
04236	ST	060100	002011	101.	0018.	ST	1.	0033.		0.	0000.	C SUB P, TRANS.	2206	04236
04237	T	002000	004242	101.	0019.	T	102.	0000.		0.	0000.	CALC. V184 FNS.	2207	04237
04242	SOX	-053400	104332	102.	0000.	SOX	2.	0050.	R	0.	0000.		2210	04242
04243	CR	050000	103660	102.	0001.	CR	802.	0018.	R	0.	0000.	OMEGA	2211	04243
04244	TZ	010000	010662	102.	0002.	TZ	402.	0000.		0.	0000.	CALC. THERMO. FNS.	2212	04244
04245	LQ	056000	103726	102.	0003.	LQ	802.	0056.	R	0.	0000.	Y OMEGA SU8 E	2213	04245
04246	FM	026000	003614	102.	0004.	FM	801.	0022.		0.	0000.	13/8	2214	04246
04247	FS	030200	103666	102.	0005.	FS	802.	0024.	R	0.	0000.	K OMEGA E	2215	04247
04250	LR	076500	000043	102.	0006.	LR	0.	0035.		0.	0000.		2216	04250
04251	FM	026000	003570	102.	0007.	FM	801.	0002.		0.	0000.	2	2217	04251
04252	FR	030000	103660	102.	0008.	FR	802.	0018.	R	0.	0000.	OMEGA	2218	04252
04253	ST	060100	011075	102.	0009.	ST	601.	0004.		0.	0000.	NU	2219	04253
04254	LQ	056000	002005	102.	0010.	LQ	1.	0029.		0.	0000.	T	2220	04254
04255	FM	026000	002005	102.	0011.	FM	1.	0029.		0.	0000.	T	2221	04255
04256	ST	060100	011116	102.	0012.	ST	603.	0006.		0.	0000.	T S8.	2222	04256
04257	CR	050000	011075	102.	0013.	CR	601.	0004.		0.	0000.	NU	2223	04257
04260	FO	024000	002005	102.	0014.	FO	1.	0029.		0.	0000.	T	2224	04260
04261	FM	026000	003571	102.	0015.	FM	801.	0003.		0.	0000.	HCK	2225	04261
04262	ST	060100	011072	102.	0016.	ST	601.	0001.		0.	0000.	U	2226	04262
04263	CHS	076000	000002	102.	0017.	CHS	0.	0000.		0.	0000.		2227	04263
04264	TSX	007400	403410	102.	0018.	TSX	703.	0000.	C	0.	0000.	EXPON	2228	04264
04265	ST	060100	011073	102.	0019.	ST	601.	0002.		0.	0000.	STORE ZERO	2229	04265
04266	ST	060100	011073	102.	0020.	ST	601.	0002.		0.	0000.	E TO - U	2230	04266
04267	CR	050000	003567	102.	0021.	CR	801.	0001.		0.	0000.	1	2231	04267

04374 FE	020230 011073	102. 0022. FE	602. 0002.	0. 0000.		2232	04379	
04371 ST	050100 011074	102. 0022. ST	601. 0003.	0. 0000.	1-E TO -U	2233	04371	
04377 SQ	010000 002567	102. 0024. SQ	601. 0001.	0. 0000.	1	2234	04377	
04373 FD	024010 011074	102. 0025. FD	601. 0003.	0. 0000.		2235	04373	
04374 SQ	-030000 011077	102. 0026. SQ	601. 0003.	0. 0000.	0.VIE	2236	04374	
04375 FM	026020 011077	102. 0027. FM	601. 0001.	0. 0000.	0	2237	04375	
04373 CH5	073010 011072	102. 0028. CH5	601. 0002.	0. 0000.		2238	04376	
04377 LK	073510 000345	102. 0028. LR	601. 0035.	0. 0000.		2239	04377	
04301 FM	026030 001005	102. 0030. FM	601. 0024.	0. 0000.	T	2240	04300	
04301 LF	076500 001042	102. 0031. LR	601. 0035.	0. 0000.		2241	04301	
04302 FM	028020 011077	102. 0032. FM	601. 0006.	0. 0000.	0	2242	04302	
04303 LK	073550 001044	102. 0033. LR	601. 0035.	0. 0000.		2243	04303	
04304 FM	026020 011073	102. 0034. FM	601. 0002.	0. 0000.	E TO -U	2244	04304	
04305 ST	060150 011120	102. 0035. ST	601. 0007.	0. 0000.	Q PRIME, VIB.	2245	04305	
04306 LK	055000 011073	102. 0036. LK	601. 0002.	0. 0000.		2246	04306	
04307 FM	026010 000556	102. 0038. FM	601. 0002.	0. 0000.		2247	04307	
04310 LP	076500 000303	102. 0039. LR	601. 0035.	0. 0000.		2248	04310	
04311 FM	026000 011077	102. 0040. FM	601. 0006.	0. 0000.	0	2249	04311	
04312 FR	020000 001567	102. 0041. FR	601. 0001.	0. 0000.	1	2250	04312	
04313 LF	076550 000347	102. 0041. LR	601. 0025.	0. 0000.		2251	04313	
04314 FM	023030 011100	102. 0042. FM	601. 0007.	0. 0000.	Q PRIME	2252	04314	
04315 CH5	076000 001032	102. 0043. CH5	601. 0000.	0. 0000.		2253	04315	
04316 LF	076500 000743	102. 0044. LR	601. 0035.	0. 0000.		2254	04316	
04317 FM	026030 011072	102. 0045. FM	601. 0001.	0. 0000.	U	2255	04317	
04320 LR	076300 000043	102. 0046. LR	601. 0035.	0. 0000.		2256	04320	
04321 FM	026000 002005	102. 0047. FM	601. 0029.	0. 0000.	T	2257	04321	
04322 ST	060100 011101	102. 0048. ST	601. 0003.	0. 0000.	Q DUBL PRIME, VIB.	2258	04322	
04323 CP	050000 002734	102. 0048.1 CA	602. 0062.	0. 0000.	ROTATIONAL BETA	2259	04323	
04324 FO	024000 002570	102. 0049.2 FU	601. 0002.	0. 0000.	2	2260	04324	
04325 SQ	-060000 011141	102. 0049.3 SQ	605. 0000.	0. 0000.		2261	04325	
04326 CA	050000 011141	102. 0049.8 CA	605. 0003.	0. 0000.		2262	04326	
04327 FA	020000 103720	102. 0049.8 FA	802. 0050.	A	0. 0000.	2263	04327	
04330 ST	060100 102720	102. 0049.8 SI	802. 0050.	A	0. 0000.	2264	04330	
04331 T	020000 004336	102. 0049.9 T	103. 0003.	0. 0000.	CALC. ROT. FMS.	2265	04331	
04332	030006 000000	102. 0050.	0.	0. 0000.		2266	04332	
04336 CR	050000 103674	103. 0003. CF	802. 0030.	A	0. 0000.	ALPHA SLB 'I	2270	04336
04337 FD	024000 003570	103. 0005. FC	801. 0002.		0. 0000.	2	2271	04337
04340 SQ	-060010 011122	103. 0006. SQ	603. 0010.		0. 0000.		2272	04340
04341 CE	050200 011122	103. 0007. CS	603. 0010.		0. 0000.		2273	04341
04342 FH	030030 104265	103. 0008. FA	802. 0012.	A	0. 0000.	B SUB E	2274	04342
04343 ST	050100 011110	103. 0009. ST	603. 0000.		0. 0000.	B ZERO =E EFFECT14E	2275	04343
04344 FO	024000 002005	103. 0011. FO	601. 0029.		0. 0000.		2276	04344
04345 FM	026000 003571	103. 0012. FM	601. 0003.		0. 0000.	HCB/K	2277	04345
04346 ST	060100 011111	103. 0013. ST	603. 0001.		0. 0000.	HCB/KT = SIGMA	2278	04346
04347 CR	050300 003567	103. 0014. CA	801. 0001.		0. 0000.	ONE	2279	04347
04350 FU	024000 011111	103. 0015. FU	603. 0001.		0. 0000.		2280	04350
04351 SQ	-060000 011112	103. 0016.1 SQ	603. 0002.		0. 0000.	KT/HCB	2281	04351
04352 CR	050000 103712	103. 0016.1 CA	802. 0044.	A	0. 0000.	LAMBDA	2282	04352
04353 TZ	010000 004355	103. 0016.2 TZ	2. 0017.		0. 0000.	SIGMA STATE	2283	04353
04354 T	020000 005121	103. 0016.3 T	200. 0000.		0. 0000.	HIGHER STATE	2284	04354
04355 LK	056000 011111	103. 0017. LK	603. 0001.		0. 0000.		2285	04355
04356 FM	026000 011111	103. 0018. FM	603. 0001.		0. 0000.		2286	04356

04357 ST 080100 011113 103. 0015. ST 603. 0003. 0. 0000. HOPKIN SQ 2287 04357
 04360 LR 073500 000043 103. 0020. LR 0. 0035. 0. 0000. 2288 04360
 04361 FM 026000 011111 103. 0021. FM 603. 0001. 0. 0000. 2289 04361
 04362 ST 060100 011114 103. 0022. ST 603. 0004. 0. 0000. CUBED 2290 04362
 04363 FO 024000 003572 103. 0023. FO 801. 0004. 0. 0000. 315 2291 04363
 04364 SQ -060000 011115 103. 0024. SQ 603. 0005. 0. 0000. 2292 04364
 04365 CA 050000 011113 103. 0025. CA 603. 0003. 0. 0000. 2293 04365
 04366 FO 024000 003572 103. 0026. FO 801. 0004. 0. 0000. 2294 04366
 04367 FM 026000 003572 103. 0027. FM 801. 0003. 0. 0000. 4 2295 04367
 04370 FR 030000 011115 103. 0028. FR 603. 0005. 0. 0000. 2296 04370
 04371 FR 030000 003574 103. 0029. FR 801. 0006. 0. 0000. 1/3 2297 04371
 04372 ST 060100 011115 103. 0030. ST 603. 0003. 0. 0000. 2298 04372
 04373 LQ 056000 011111 103. 0031. LQ 603. 0001. 0. 0000. 2299 04373
 04374 FM 026000 003572 103. 0032. FM 801. 0005. 0. 0000. 1/15 2300 04374
 04375 FA 030000 011115 103. 0033. FA 603. 0005. 0. 0000. 2301 04375
 04376 FR 030000 011112 103. 0034. FR 603. 0002. 0. 0000. 2302 04376
 04377 FO 024000 003573 103. 0031. FO 802. 0037. 0. 0000. SYMMETRY NUMBER 2303 04377
 04400 SQ -060000 011117 103. 0036. SQ 603. 0007. 0. 0000. Q 2304 04400
 04401 LQ 056000 011111 103. 0040. LQ 603. 0001. 0. 0000. 2305 04401
 04402 FM 026000 003573 103. 0041. FM 801. 0005. 0. 0000. 1/15 2306 04402
 04403 FS 030200 011112 103. 0042. FS 603. 0002. 0. 0000. 1/ SIGMA 2307 04403
 04404 ST 060100 011122 103. 0043. ST 603. 0010. 0. 0000. 2308 04404
 04405 CA 050000 011113 103. 0044. CA 603. 0003. 0. 0000. SIGMA SQ. 2309 04405
 04406 FO 024000 003572 103. 0045. FO 801. 0004. 0. 0000. 315 2310 04406
 04407 FM 026000 003577 103. 0046. FM 801. 0009. 0. 0000. 4 2311 04407
 04410 LR 076500 000043 103. 0047. LR 0. 0035. 0. 0000. 2312 04410
 04411 FM 026000 003570 103. 0048. FM 801. 0002. 0. 0000. 2313 04411
 04412 ST 060100 011123 103. 0049. ST 603. 0011. 0. 0000. 2314 04412
 04413 FR 030000 011122 103. 0050. FR 603. 0010. 0. 0000. 2315 04413
 04414 ST 060100 011122 103. 0051. ST 603. 0010. 0. 0000. 2316 04414
 04415 CA 050000 011114 103. 0052. CA 603. 0004. 0. 0000. SIGMA CUBED 2317 04415
 04416 FO 024000 003572 103. 0053. FO 801. 0004. 0. 0000. 315 2318 04416
 04417 FM 026000 003600 103. 0054. FM 801. 0010. 0. 0000. 3 2319 04417
 04420 ST 060100 011124 103. 0055. ST 603. 0012. 0. 0000. 2320 04420
 04421 FR 030000 011122 103. 0056. FR 603. 0010. 0. 0000. 2321 04421
 04422 LR 076500 000043 103. 0057. LR 0. 0035. 0. 0000. 2322 04422
 04423 FM 026000 002005 103. 0058. FM 1. 0029. 0. 0000. T 2323 04423
 04424 FO 024000 003703 103. 0058.1 FO 802. 0037. 0. 0000. SYMMETRY NUMBER 2324 04424
 04425 SQ -060000 011120 103. 0059. SQ 603. 0008. 0. 0000. Q PRIME, ROTATION 2325 04425
 04426 CA 050000 003570 103. 0060. CA 801. 0002. 0. 0000. 2 2326 04426
 04427 FD 024000 011111 103. 0061. FD 603. 0001. 0. 0000. SIGMA 2327 04427
 04430 SQ -060000 011122 103. 0062. SQ 603. 0010. 0. 0000. 2328 04430
 04431 LQ 056000 011124 103. 0063. LQ 603. 0012. 0. 0000. 2329 04431
 04432 FM 026000 003570 103. 0064. FM 801. 0002. 0. 0000. 2 2330 04432
 04433 FR 030000 011123 103. 0065. FR 603. 0011. 0. 0000. 2331 04433
 04434 FA 030000 011122 103. 0066. FA 603. 0010. 0. 0000. 2332 04434
 04435 LR 076500 000043 103. 0067. LR 0. 0035. 0. 0000. 2333 04435
 04436 FM 026000 011116 103. 0068. FM 603. 0006. 0. 0000. T SQ. 2334 04436
 04437 FO 024000 003703 103. 0068.1 FO 802. 0037. 0. 0000. SYMMETRY NUMBER 2335 04437
 04440 SQ -060000 011121 103. 0069. SQ 603. 0009. 0. 0000. Q. QUBL PRIME, ROTATION 2336 04440
 04441 T 002000 004456 103. 0070. T 105. 0000. 0. 0000. CALC. ELECTRONIC FNS. 2337 04441

04456 CR	050000 103702	105. 0000.	CR	802. 0034.	R	0. 0000.	T SUE EYE	2350	04456
04457 FG	024000 002003	105. 0031.	FG	1. 0021.		0. 0000.	TEMP	2351	04457
04460 FM	026000 003571	105. 0002.	FM	801. 0003.		0. 0000.	HC/K	2352	04460
04461 ST	050100 011127	105. 0003.	ST	604. 0000.		0. 0000.		2353	04461
04462 CS	050200 011127	105. 0004.	CS	604. 0000.		0. 0000.		2354	04462
04463 TSX	007400 403410	105. 0005.	TSX	703. 0000.	C	0. 0000.	EXPN	2355	04463
04464 ST	060100 011130	105. 0006.	ST	604. 0001.		0. 0000.	STORE ZERO	2356	04464
04465 ST	060100 011130	105. 0007.	ST	604. 0001.		0. 0000.		2357	04465
04466 LO	056000 103644	105. 0008.	LO	802. 0006.	A	0. 0000.	G SUB EYE, ELECTRONIC	2358	04466
04467 FM	026000 011130	105. 0009.	FM	604. 0001.		0. 0000.		2359	04467
04470 ST	060100 011131	105. 0010.	ST	604. 0002.		0. 0000.	Q. ELECT.	2360	04470
04471 LQ	056000 011127	105. 0011.	LQ	604. 0000.		0. 0000.		2361	04471
04472 FM	026000 002005	105. 0012.	FM	1. 0029.		0. 0000.	T	2362	04472
04473 CHS	076000 000002	105. 0013.	CHS	0. 0000.		0. 0000.		2363	04473
04474 ST	060100 011127	105. 0014.	ST	604. 0000.		0. 0000.		2364	04474
04476 LR	076500 000043	105. 0015.	LR	0. 0035.		0. 0000.		2365	04475
04478 FM	026000 011131	105. 0016.	FM	604. 0002.		0. 0000.	Q	2366	04476
04477 ST	060100 011132	105. 0017.	ST	604. 0003.		0. 0000.	Q PRIME, ELECTRONIC	2367	04477
04500 LR	076500 000043	105. 0018.	LR	0. 0035.		0. 0000.		2368	04500
04501 FM	026000 011127	105. 0019.	FM	604. 0000.		0. 0000.		2369	04501
04502 ST	060100 011133	105. 0020.	ST	604. 0004.		0. 0000.	Q DUBL PRIME,ELECTR.	2370	04502
04503 TL	-076000 000141	105. 0021.	TL	0. 0097.		0. 0000.	TEST LIGHT NO. 1	2371	04503
04504 T	002000 004507	105. 0022.	T	2. 0025.		0. 0000.		2372	04504
04505 CA	050000 003600	105. 0023.	CA	801. 0010.		0. 0000.	3	2373	04505
04506 ST	060100 103644	105. 0024.	ST	802. 0006.	A	0. 0000.	RESTORE ORIGINAL G.EL	2374	04506
04507 TL	-076000 000142	105. 0025.	TL	0. 0098.		0. 0000.	TEST LIGHT NO. 2	2375	04507
04510 T	002000 004514	105. 0026.	T	2. 0030.		0. 0000.		2376	04510
04511 CR	050000 103644	105. 0027.	CR	802. 0006.	A	0. 0000.	G, ELECTRONIC	2377	04511
04512 FO	024000 003570	105. 0028.	FO	801. 0002.		0. 0000.		2378	04512
04513 SQ	-060000 103644	105. 0029.	SQ	802. 0006.	A	0. 0000.	RESTORE ORIGINAL G.EL	2379	04513
04514 SE	076000 000161	105. 0030.	SE	0. 0113.		0. 0000.	TEST SENSE SWITCH 1	2380	04514
04515 T	002000 304521	105. 0031.	T	106. 0000.		0. 0000.	CALC CORRECTION TERMS	2381	04515
04516 T	062000 0112510	105. 0032.	T	646. 0041.		0. 0000.	STORE 1. FIX. LUR. C	2382	04516
04521 CR	050000 103720	106. 0000.	CR	802. 0050.	R	0. 0000.	O	2385	04521
04522 FO	024000 011111	106. 0001.	FO	603. 0001.		0. 0000.	SIGMA .	2386	04522
04523 FM	026000 003570	106. 0002.	FM	801. 0002.		0. 0000.	2	2387	04523
04524 FO	024000 011111	106. 0003.	FO	603. 0001.		0. 0000.	SIGMA	2388	04524
04525 FM	026000 003571	106. 0004.	FM	801. 0003.		0. 0000.	HC/K	2389	04525
04526 FD	024000 002005	106. 0005.	FD	1. 0029.		0. 0000.	T	2390	04526
04527 SQ	-060000 011141	106. 0006.	SQ	605. 0000.		0. 0000.	RHO T	2391	04527
04528 CS	050200 011141	106. 0010.	CS	605. 0000.		0. 0000.	RHO T	2392	04528
04529 LR	076500 000043	106. 0011.	LR	0. 0035.		0. 0000.		2393	04529
04532 FM	026000 002005	106. 0012.	FM	1. 0029.		0. 0000.	T	2394	04532
04533 ST	060100 011142	106. 0013.	ST	805. 0004.		0. 0000.	Q PRIME,STRETCH	2395	04533
04534 CHS	076000 000002	106. 0013.1	CHS	0. 0000.		0. 0000.		2396	04534
04535 LR	076500 000043	106. 0014.	LR	0. 0035.		0. 0000.		2397	04535
04536 FM	026000 002005	106. 0015.	FM	1. 0029.		0. 0000.		2398	04536
04537 LR	076500 000043	106. 0016.	LR	0. 0035.		0. 0000.		2399	04537
04540 FM	026000 003570	106. 0017.	FM	801. 0002.		0. 0000.		2400	04540
04541 ST	060100 011143	106. 0018.	ST	805. 0002.		0. 0000.	Q DUBL PRIME,STRETCH	2401	04541
04542 CR	050000 003776	106. 0018.1	CR	804. 0016.		0. 0000.	2 TIMES 10 TO - 9	2402	04542
04543 FS	030200 011073	106. 0018.2	FS	601. 0002.		0. 0000.	E TD - 4	2403	04543
04544 TP	012000 004557	106. 0018.2	TP	2. 0026.		0. 0000.		2404	04544
04545 CR	050000 003567	106. 0019.	CR	801. 0001.		0. 0000.	1	2405	04545
04546 FO	024000 011073	106. 0020.	FO	601. 0002.		0. 0000.	E TD - II	2406	04546

04547	SQ	-060000	011102	106.	0021.	SQ	601.	0009.	0.	0000.		2407	04547
04550	CA	050000	011102	106.	0022.	CA	601.	0009.	0.	0000.	1	2408	04550
04551	FS	030200	003567	106.	0023.	FS	801.	0001.	0.	0000.		2409	04551
04552	ST	060100	011103	106.	0024.	ST	601.	0010.	0.	0000.	E TO U MINUS 1	2410	04552
04553	LR	076500	000043	106.	0024.1	LR	0.	0035.	0.	0000.		2411	04553
04554	FM	026000	011103	106.	0024.2	FM	601.	0010.	0.	0000.		2412	04554
04555	ST	060100	011104	106.	0024.3	ST	601.	0011.	0.	0000.	E TO U MINUS 1 SQ.	2413	04555
04556	T	002000	012226	106.	0025.	T	646.	0000.	0.	0000.	CALC. EXTRA TERMS	2414	04556
04557	CA	050000	003564	106.	0025.	CA	800.	0013.	0.	0000.	10 TO NINTH POWER	2415	04557
04560	ST	060100	011102	106.	0027.	ST	601.	0009.	0.	0000.		2416	04560
04561	T	002000	004550	106.	0028.	T	2.	0022.	0.	0000.	CONTINUE CALC.	2417	04561

04564	CR	050000	103674	107.	0000.	CR	802.	0030.	R	0.	0000.	ALPHR	2420	04564
04565	FO	024000	011110	107.	0001.	FO	603.	0000.		0.	0000.	8 ZERO	2421	04565
04566	SQ	-060000	011153	107.	0002.	SQ	606.	0000.		0.	0000.	DELTR	2422	04566
04567	CR	050000	011153	107.	0002.1	CR	606.	0000.		0.	0000.		2423	04567
04570	FO	024000	011103	107.	0003.	FO	601.	0010.		0.	0000.	E TO U -1	2424	04570
04571	SQ	-060000	011154	107.	0004.	SQ	606.	0001.		0.	0000.		2425	04571
04572	CS	050200	011153	107.	0008.	CS	606.	0000.		0.	0000.	DELTR	2426	04572
04573	FO	024000	011103	107.	0009.	FO	601.	0010.		0.	0000.		2427	04573
04574	FM	026000	011072	107.	0010.	FM	601.	0001.		0.	0000.	U	2428	04574
04575	FO	024000	011103	107.	0011.	FO	601.	0010.		0.	0000.		2429	04575
04576	FM	026000	011102	107.	0012.	FM	601.	0009.		0.	0000.	E TO U	2430	04576
04577	LR	076500	000043	107.	0012.1	LR	0.	0035.		0.	0000.		2431	04577
04600	FM	026000	002005	107.	0012.2	FM	1.	0029.		0.	0000.	T	2432	04600
04601	ST	060100	011155	107.	0013.	ST	606.	0002.		0.	0000.	Q PRIME,V-R	2433	04601
04602	LQ	056000	011155	107.	0014.	LQ	606.	0002.		0.	0000.		2434	04602
04603	FM	026000	011072	107.	0015.	FM	601.	0001.		0.	0000.	U	2435	04603
04604	LR	076500	000043	107.	0015.1	LR	0.	0035.		0.	0000.		2436	04604
04605	FM	026000	002005	107.	0015.2	FM	1.	0029.		0.	0000.	T	2437	04605
04606	ST	060100	011156	107.	0016.	ST	606.	0003.		0.	0000.	1ST TERM,Q DUBL PRIME	2438	04606
04607	LQ	056000	011155	107.	0017.	LQ	606.	0002.		0.	0000.		2439	04607
04610	FM	026000	003570	107.	0018.	FM	801.	0002.		0.	0000.	2	2440	04610
04611	FO	024000	011103	107.	0019.	FO	601.	0010.		0.	0000.	E TO U -1	2441	04611
04612	FM	026000	011072	107.	0020.	FM	601.	0001.		0.	0000.	U	2442	04612
04613	LR	076500	000043	107.	0020.1	LR	0.	0035.		0.	0000.		2443	04613
04614	FM	026000	002005	107.	0020.2	FM	1.	0029.		b.	0000.	T	2444	04614
04615	LR	076500	000043	107.	0021.	LR	0.	0035.		0.	0000.		2445	04615
04616	FM	026000	011102	107.	0022.	FM	601.	0009.		0.	0000.	E TO U	2446	04616
04617	CHS	076000	000002	107.	0022.1	CHS	0.	0000.		0.	0000.		2447	04617
04620	FR	030000	011156	107.	0023.	FR	606.	0003.		0.	0000.		2448	04620
04621	ST	060100	011156	107.	0024.	ST	606.	0003.		0.	0000.	Q DUBL PRIME,V-R	2449	04621
04622	T	002000	012246	107.	0025.	T	648.	0012.		0.	0000.	CALC. EXTRA TERMS	2450	04622

04641	LQ	056000	103726	108.	0000.	LQ	802.	0056.	R	0.	0000.	Y OMEGA E	2455	04641
04642	FM	026000	003615	108.	0001.	FM	301.	0023.		0.	0000.	13/4	2466	04642
04643	CHS	076000	000002	108.	0002.	CHS	0.	0000.		0.	0000.		2467	04643
04644	FR	030000	103666	108.	0003.	FR	802.	0024.	R	0.	0000.	X OMEGA E	2468	04644
04645	FR	030000	103666	108.	0004.	FR	802.	0024.	R	0.	0000.		2469	04645
04646	FO	024000	002005	108.	0005.	FO	1.	0029.		0.	0000.	T	2470	04646
04647	FM	026000	003571	108.	0006.	FM	601.	0003.		0.	0000.	HCK.	2471	04647
04650	ST	060100	011161	108.	0007.	ST	607.	0001.		0.	0000.	ANHARMONICITY CORR.	2472	04650
04651	CR	050000	011161	108.	0008.	CR	607.	0001.		0.	0000.		2473	04651

04652 FN 024000 011104 108. 0003. FQ 601. 0011. 0. 0000. CE TO UD-1 SQUARED 3474 04652
 04653 SQ -060000 011162 108. 0010. SQ 607. 0002. 0. 0000. 2475 04653
 04654 LQ 056000 011161 108. 0013.1 LQ 607. 0001. 0. 0000. 2476 04654
 04655 FM 026000 002005 108. 0013.2 FM 1. 0029. 0. 0000. ANHARMONICITY CORR. 2477 04655
 04656 ST 060100 011163 108. 0014. ST 607. 0003. 0. 0000. T 2478 04656
 04657 ZS 060000 011164 108. 0015. ZS 607. 0004. 0. 0000. B PRIME 2479 04657
 04660 LQ 056000 003571 108. 0016. LQ 601. 0003. 0. 0000. B DUBL PRIME 2480 04660
 04661 FM 026000 003570 108. 0017. FM 601. 0002. 0. 0000. HC/K 2481 04661
 04662 LR 076500 000043 108. 0018. LR 0. 0035. 0. 0000. Z 2482 04662
 04663 FM 026000 011075 108. 0019. FM 601. 0004. 0. 0000. HU 2483 04663
 04664 LR 076500 000043 108. 0020. LR 0. 0035. 0. 0000. 2484 04664
 04665 FM 026000 011102 108. 0021. FM 601. 0003. 0. 0000. 2485 04665
 04666 LR 076500 000043 108. 0022. LR 0. 0035. 0. 0000. 2486 04666
 04667 FM 026000 011103 108. 0023. FM 601. 0010. 0. 0000. CE TO UD-1 2487 04667
 04670 ST 060100 011165 108. 0024. ST 607. 0001. 0. 0000. A PRIME 2488 04670
 04671 CR 050000 011103 108. 0025. CR 601. 0010. 0. 0000. 2489 04671
 04672 FA 030000 011102 108. 0026. FA 601. 0009. 0. 0000. E TO U 2490 04672
 04673 LR 076500 000043 108. 0027. LR 0. 0035. 0. 0000. 2491 04673
 04674 FM 026000 011102 108. 0028. FM 601. 0009. 0. 0000. 2492 04674
 04675 LR 076500 000043 108. 0029. LR 0. 0035. 0. 0000. 2493 04675
 04676 FM 026000 011072 108. 0030. FM 601. 0001. 0. 0000. U 2494 04676
 04677 LR 076500 000043 108. 0030.1 LR 0. 0035. 0. 0000. 2495 04677
 04700 FM 026000 002005 108. 0031. FM 1. 0029. 0. 0000. T 2496 04700
 04701 LR 076500 000043 108. 0031.1 LR 0. 0035. 0. 0000. 2497 04701
 04702 FM 026000 011072 108. 0032. FM 601. 0001. 0. 0000. 2498 04702
 04703 LR 076500 000043 108. 0032.1 LR 0. 0035. 0. 0000. 2499 04703
 04704 FM 026000 002005 108. 0032. FM 1. 0029. 0. 0000. T 2500 04704
 04705 LP 076500 000043 108. 0033.1 LR 0. 0035. 0. 0000. 2501 04705
 04706 FM 026000 003570 108. 0034. FM 80Y. 0002. 0. 0000. 2502 04706
 04707 ST 060100 011166 108. 0035. ST 607. 0006. 0. 0000. A DUBL PRIME 2503 04707
 04710 LQ 056000 011104 108. 0035.1 LQ 601. 0011. 0. 0000. R 2504 04710
 04711 FM 026000 011104 108. 0035.2 FM 601. 0011. 0. 0000. A 2505 04711
 04712 ST 060100 011105 108. 0035.3 ST 601. 0012. 0. 0000. A SQUARE 2506 04712
 04713 LQ 056000 011161 108. 0036. LQ 607. 0001. 0. 0000. B 2507 04713
 04714 FM 026000 011165 108. 0037. FM 607. 0005. 0. 0000. A PRIME 2508 04714
 04715 ST 060100 011167 108. 0038. ST 607. 0007. 0. 0000. 8 PRIME 2509 04715
 04716 LQ 056000 011163 108. 0039. LQ 607. 0003. 0. 0000. A 2510 04716
 04717 FM 026000 011104 108. 0040. FM 601. 0011. 0. 0000. 2511 04717
 04720 FS 030200 011167 108. 0041. FS 607. 0007. 0. 0000. A SQUARE 2512 04720
 04721 FO 024000 011105 108. 0042. FO 601. 0012. 0. 0000. A PRIME,ANHARM. 2513 04721
 04722 SQ -060000 011167 108. 0044. SQ 607. 0007. 0. 0000. A DUBL PRIME 2514 04722
 04723 LR 056000 011166 108. 0045. LQ 607. 0006. 0. 0000. 8 2515 04723
 04724 FM 026000 011161 108. 0049. FM 607. 0001. 0. 0000. 2516 04724
 04725 LR 076500 000043 108. 0050. LR 0. 0035. 0. 0000. 2517 04725
 04726 FM 026000 011104 108. 0051. FM 601. 0011. 0. 0000. A 2518 04726
 04727 ST 060100 011170 108. 0052. ST 607. 0008. 0. 0000. A PRIME 2519 04727
 04730 LQ 056000 011165 108. 0053. LQ 607. 0005. 0. 0000. 2520 04730
 04731 FM 026000 011165 108. 0054. FM 607. 0005. 0. 0000. 2521 04731
 04732 LR 076500 000043 108. 0055. LR 0. 0035. 0. 0000. 2522 04732
 04733 FM 026000 011161 108. 0056. FM 607. 0001. 0. 0000. 8 2523 04733
 04734 ST 060100 011171 108. 0057. ST 607. 0009. 0. 0000. 2524 04734
 04735 LQ 056000 011163 108. 0058. LQ 607. 0003. 0. 0000. 8 PRIME 2525 04735
 04736 FM 026000 011165 108. 0058.1 FM 607. 0009. 0. 0000. A PRIME 2526 04736
 04737 LR 076500 000043 108. 0058.2 LR 0. 0035. 0. 0000. 2527 04737
 04740 FM 026000 011104 108. 0059.3 FM 601. 0011. 0. 0000. A 2528 04740
 04741 CHS 076000 000002 108. 0058.4 CHS 0. 0000. 0. 0000. 2529 04741
 04742 FA 030000 011171 108. 0058.5 FA 607. 0009. 0. 0000. 2530 04742

04743 LR	076500	000043	108.	0058.6	LR	0.	0035.	0.	0000.		2531	04743
04744 FM	026000	003570	108.	0058.7	FM	801.	0002.	0.	0000.	2	2532	04744
04745 FS	030200	011170	108.	0058.8	FS	607.	0006.	0.	0000.		2533	04745
04746 FD	024000	011105	108.	0059.	FD	601.	0012.	0.	0000.	A SQ	2534	04746
04747 SQ	-060000	011170	108.	0060.	SQ	607.	0008.	0.	0000.		2535	04747
04750 CR	050000	011170	108.	0061.	CR	607.	0008.	0.	0000.		2536	04750
04751 FO	024000	011104	108.	0062.	FO	601.	0011.	0.	0000.	A	2537	04751
04752 SQ	-060000	011170	108.	0063.	SQ	607.	0008.	0.	0000.	Q DUBL PRIME,ANHARM.	2538	04752
04753 T	002000	012266	108.	0064.	T	646.	0024.	0.	0000.	CALC. EXTRR TERMS	2539	04753
04766 CR	050000	002006	109.	0000.	CR	1.	0030.	0.	0000.	FPEE ENERGY	2550	04766
04767 ST	060100	005011	109.	0001.	ST	2.	0016.	0.	0000.		2551	04767
04770 CA	050000	002007	109.	0002.	CA	1.	0031.	0.	0000.	ENTHALPY	2552	04770
04771 ST	060100	005012	109.	0003.	ST	2.	0017.	0.	0000.		2553	04771
04772 CA	050000	002010	109.	0004.	CA	1.	0032.	0.	0000.	ENTROPY	2554	04772
04773 ST	060100	005013	109.	0005.	ST	2.	0018.	0.	0000.		2555	04773
04774 CA	050000	002011	109.	0006.	CA	1.	0033.	0.	0000.	HEAT CAPACITY	2556	04774
04775 ST	060100	005014	109.	0007.	ST	2.	0019.	0.	0000.		2557	04775
04776 SE	076000	000162	109.	0007.1	SE	0.	0114.	0.	0000.	TEST 3.5. 2	2558	04776
04777 T	002000	005001	109.	0007.2	T	2.	0008.	0.	0000.		2559	04777
05000 T	002000	005015	109.	0007.3	T	2.	0026.	0.	0000.		2560	05000
05001 TSX	007400	002114	109.	0008.	TSX	700.	0000.	0.	0000.	LRS S 117 FXO PT PRIN	2561	05001
05002 SIX	-203744	011052	109.	0009.	SIX	507.	0000.	0.	0020.	TEMPERATURE	2562	05002
05003 SIX	-211660	005011	109.	0010.	SIX	2.	0016.	0.	5040.		2563	05003
05004 SIX	-211704	005012	109.	0011.	SIX	2.	0017.	0.	5060.		2564	05004
05005 SIX	-211730	005013	109.	0012.	SIX	2.	0018.	0.	5080.		2565	05005
05006 SIX	-211754	005014	109.	0013.	SIX	2.	0019.	0.	5100.		2566	05006
05007 PON	100000	000000	109.	0014.	PON	0.	0000.	0.	0000.		2567	05007
05010 T	002000	005036	109.	0015.	T	110.	0000.	0.	0000.	INCRENSE TEMP	2568	05010
05011 H	000000	000000	109.	0016.	H	0.	0000.	0.	0000.		2569	05011
05012 H	000000	000000	109.	0017.	H	0.	0000.	0.	0000.		2570	05012
05013 H	000000	000000	109.	0018.	H	0.	0000.	0.	0000.		2571	05013
05014 H	000000	000000	109.	0019.	H	0.	0000.	0.	0000.		2572	05014
05015 CR	050000	005011	109.	0020.	CR	2.	0016.	0.	0000.		2573	05015
05016 FO	024000	003547	109.	0021.	FO	300.	0000.	0.	0000.	R	2574	05016
05017 SQ	-060000	005011	109.	0022.	SQ	2.	0016.	0.	0000.		2575	05017
05020 CR	050000	005012	109.	0023.	CR	2.	0017.	0.	0000.		2576	05020
05021 FO	024000	003547	109.	0024.	FO	300.	0000.	0.	0000.	R	2577	05021
05022 SQ	-060000	005012	109.	0025.	SQ	2.	0017.	0.	0000.		2578	05022
05023 CR	050000	005013	109.	0026.	CR	2.	0018.	0.	0000.		2579	05023
05024 FO	024000	003547	109.	0027.	FO	300.	0000.	0.	0000.	R	2580	05024
05025 SQ	-060000	005013	109.	0028.	SQ	2.	0018.	0.	0000.		2581	05025
05026 CR	050000	005014	109.	0029.	CR	2.	0019.	0.	0000.		2582	05026
05027 FO	024000	003547	109.	0030.	FO	301.	0000.	0.	0000.	P	2583	05027
05030 SQ	-060000	005014	109.	0031.	SQ	2.	0019.	0.	0000.		2584	05030
05031 T	002000	005001	109.	0032.	T	2.	0008.	0.	0000.	PRIINT	2585	05031
05036 CR	050000	011052	110.	0000.	CR	507.	0000.	0.	0000.	T, TEMPORARY	2590	05036
05037 FS	020200	003751	110.	0001.	FS	303.	0005.	0.	0000.	250 DEGREES	2591	05037
05040 TM	-012000	005056	110.	0002.	TM	2.	0018.	0.	0000.	T LESS 250	2592	05040
05041 CR	050000	011052	110.	0003.	CR	507.	0000.	0.	0000.	T	2593	05041

05042	FS	030200	003746	110.	0004.	FS	803.	0002.	0.	0000.	293.16	2594	05042	
05043	TM	-012000	005062	110.	0005.	TM	2.	0020.	0.	0000.	T EQUAL 250	2595	05043	
05044	CR	050000	011052	110.	0006.	CR	507.	0000.	0.	0000.	T	2596	05044	
05045	FS	030200	003746	110.	0007.	FS	803.	0002.	0.	0000.		2597	05045	
05046	TZ	010000	005065	110.	0008.	TZ	2.	0023.	0.	0000.		2598	05046	
05047	CR	050000	011052	110.	0009.	CR	507.	0000.	0.	0000.	T	2599	05047	
05050	FR	030000	003750	110.	0010.	FR	803.	0004.	0.	0000.	INC T BY 100	2600	05050	
05051	ST	060100	002005	110.	0011.	ST	1.	0029.	0.	0000.		2601	05051	
05052	FS	030200	003752	110.	0012.	FS	803.	0006.	0.	0000.	5010 DEG	2602	05052	
05053	TP	012000	005070	110.	0013.	TP	2.	0026.	0.	0000.		2603	05053	
05054	CR	050000	002005	110.	0014.	CR	1.	0029.	0.	0000.		2604	05054	
05055	T	002000	004216	110.	0015.	T	101.	0002.	0.	0000.	RECYCLE	2605	05055	
05056	CR	050000	011052	110.	0016.	CR	507.	0000.	0.	0000.	T	2606	05056	
05057	FR	030000	003745	110.	0017.	FR	803.	0001.	0.	0000.	INC T BY 50	2607	05057	
05060	ST	060100	002005	110.	0018.	ST	1.	0029.	0.	0000.		2608	05060	
05061	T	002000	004216	110.	0019.	T	101.	0002.	0.	0000.	RECYCLE	2609	05061	
05062	CR	050000	003746	110.	0020.	CR	803.	0002.	0.	0000.	298.16	2610	05062	
05063	ST	060100	002005	110.	0021.	ST	1.	0029.	0.	0000.		2611	05063	
05064	T	002000	004216	110.	0022.	T	101.	0002.	0.	0000.	RECYCLE	2612	05064	
05065	CR	050000	003747	110.	0023.	CR	803.	0003.	0.	0000.	300	2613	05065	
05066	ST	060100	002005	110.	0024.	ST	1.	0029.	0.	0000.		2614	05066	
05067	T	002000	004216	110.	0025.	T	101.	0002.	0.	0000.	RECYCLE	2615	05067	
05070	RO	076200	000361	110.	0026.	RO	0.	0241.	0.	0000.		2616	05070	
05071	SE	076000	000361	110.	0027.	SE	0.	0241.	0.	0000.	SKIP PAGE	2617	05071	
05072	SOX	-053400	405077	110.	0028.	SOX	2.	0032.	C	0.	0000.	62	2618	05072
05073	ZS	060000	403736	110.	0029.	ZS	802.	0064.	C	0.	0000.	STORE ZEROS	2619	05073
05074	TX	200001	405073	110.	0030.	TX	2.	0029.	C	0.	0001.		2620	05074
05075	SE	076000	000140	110.	0030.1	SE	0.	0096.	0.	0000.	TURN OFF ALL LIGHTS	2621	05075	
05076	T	002000	002760	110.	0031.	T	701.	0010.	0.	0000.	DECIMAL LOAD	2622	05076	
05077		000100	000000	110.	0032.		0.	0000.	0.	0064.		2623	05077	
05101	LQ	056000	103712	200.	0000.	LQ	802.	0044.	R	0.	0000.	LAMBDA	2625	05101
05102	FM	026000	103712	200.	0001.	FM	802.	0044.	R	0.	0000.		2626	05102
05103	ST	060100	011172	200.	0002.	ST	608.	0000.	R	0.	0000.	SQ.	2627	05103
05104	LQ	056000	103712	200.	0003.	LQ	802.	0044.	R	0.	0000.		2628	05104
05105	FM	026000	003570	200.	0004.	FM	801.	0002.		0.	0000.	2	2629	05105
05106	FA	030000	003567	200.	0005.	FA	801.	0001.		0.	0000.	1	2630	05106
05107	ST	060100	011173	200.	0006.	ST	608.	0001.		0.	0000.		2631	05107
05110	LQ	056000	011110	200.	0007.	LQ	603.	0000.		0.	0000.	8	2632	05110
05111	FM	026000	011110	200.	0008.	FM	603.	0000.		0.	0000.		2633	05111
05112	ST	060100	011174	200.	0009.	ST	608.	0002.		0.	0000.	SQ.	2634	05112
05113	LQ	056000	011110	200.	0010.	LQ	603.	0000.		0.	0000.	8	2635	05113
05114	FM	028000	103734	200.	0011.	FM	802.	0062.	R	0.	0000.	A	2636	05114
05115	LR	076500	000043	200.	0012.	LR	0.	0035.		0.	0000.		2637	05115
05116	FM	026000	003577	200.	0013.	FM	801.	0009.		0.	0000.	4	2638	05116
05117	ST	060100	011175	200.	0014.	ST	603.	0003.		0.	0000.	4AB	2639	05117
05120	LQ	056000	103734	200.	0015.	LQ	802.	0062.	R	0.	0000.	A	2640	05120
05121	FM	026000	103734	200.	0016.	FM	802.	0062.	R	0.	0000.		2641	05121
05122	ST	060100	011176	200.	0017.	ST	608.	0004.		0.	0000.	SQ.	2642	05122
05123	FS	030200	011175	200.	0018.	FS	608.	0003.		0.	0000.		2643	05123
05124	LR	076500	000043	200.	0019.	LR	0.	0035.		0.	0000.		2644	05124
05125	FM	026000	011172	200.	0020.	FM	608.	0000.		0.	0000.	LAMBDA SQ.	2645	05125
05126	ST	060100	011177	200.	0021.	ST	608.	0005.		0.	0000.	CR SQ.-4ABD LAMBDA SQ	2646	05126

05127	LQ	056000	011110	200.	0022.	LQ	603.	0000.	0.	0000.	E	2647	05127
05130	FM	026000	003570	200.	0023.	FM	801.	0002.	0.	0000.	2	2648	05130
05131	ST	060100	011200	200.	0024.	ST	608.	0006.	0.	0000.	28	2649	05131
05132	LQ	056000	011174	200.	0025.	LQ	608.	0002.	0.	0000.	B SQ.	2650	05132
05133	FM	026000	003577	200.	0026.	FM	801.	0009.	0.	0000.	4	2651	05133
05134	ST	060100	011201	200.	0027.	ST	608.	0007.	0.	0000.		2652	05134
05135	CR	050000	011177	200.	0028.	CR	602.	0005.	0.	0000.		2653	05135
05136	FO	024000	011201	200.	0029.	FO	608.	0007.	0.	0000.		2654	05136
05137	SQ	-060000	011202	200.	0030.	SQ	608.	0008.	0.	0000.		2655	05137
05140	CR	050000	003607	200.	0031.	CR	801.	0017.	0.	0000.	1/4	2656	05140
05141	FR	030000	011202	200.	0032.	FR	608.	0008.	0.	0000.		2657	05141
05142	ST	060100	011203	200.	0033.	ST	608.	0009.	0.	0000.	LITTLE A	2658	05142
05143	CR	050000	103644	200.	0034.	CR	802.	0006.	R	0.	G, ELECTRONIC	2659	05143
05144	FS	030200	003570	200.	0035.	FS	801.	0002.	0.	0000.	2	2660	05144
05145	TNZ	-010000	006774	200.	0036.	TNZ	300.	0000.	0.	0000.	TRIPLET STATE	2661	05145
05146	CR	050000	103712	200.	0037.	CR	802.	0044.	R	0.	LAMBOA	2662	05146
05147	FS	030200	003561	200.	0038.	FS	800.	0010.	0.	0000.	2,38	2663	05147
05150	TP	012000	005236	200.	0039.	TP	201.	0038.	0.	0000.	GRAMMA STATE	2664	05150
05151	CR	050000	103712	200.	0040.	CR	802.	0044.	R	0.	0000.	2665	05151
05152	FS	030200	003547	200.	0041.	FS	800.	0000.	0.	0000.	1.98	2666	05152
05153	TP	012000	005213	200.	0042.	TP	201.	0019.	0.	0000.	OELTRA STATE	2667	05153
05154	T	002000	005170	200.	0043.	T	201.	0000.	0.	0000.	P1 STATE	2668	05154
05170	LQ	056000	011174	201.	0000.	LQ	608.	0002.	0.	0000.	B SQ.	2680	05170
05171	FM	026000	003577	201.	0001.	FM	801.	0009.	0.	0000.	4	2681	05171
05172	FR	030000	011177	201.	0002.	FR	608.	0005.	0.	0000.		2682	05172
05173	TSX	007400	403516	201.	0003.	TSX	704.	0000.	C	0.	SQ. ROOT	2683	05173
05174	HP	042000	000000	201.	0004.	HP	0.	0000.	0.	0000.		2684	05174
05175	FO	024000	011200	201.	0005.	FO	608.	0006.	0.	0000.	28	2685	05175
05176	SQ	-060000	011211	201.	0006.	SQ	609.	0000.	0.	0000.		2686	05176
05177	CR	050000	011173	201.	0007.	CR	608.	0001.	0.	0000.	2 LAMBDA PLUS ONE	2687	05177
05200	FO	024000	003577	201.	0008.	FO	801.	0009.	0.	0000.	4	2688	05200
05201	SQ	-060000	011212	201.	0009.	SQ	609.	0001.	0.	0000.		2689	05201
05202	CR	050000	011212	201.	0010.	CR	609.	0001.	0.	0000.		2690	05202
05203	FS	030200	011211	201.	0011.	FS	609.	0000.	0.	0000.		2691	05203
05204	ST	060100	011213	201.	0012.	ST	609.	0002.	0.	0000.	GAMMA ONE	2692	05204
05205	LQ	056000	011213	201.	0013.	LQ	609.	0002.	0.	0000.		2693	05205
05206	FM	026000	011111	201.	0014.	FM	603.	0001.	0.	0000.	SIGMA .	2694	05206
05207	CHS	076000	000002	201.	0015.	CHS	704.	0000.	0.	0000.		2695	05207
05210	ST	060100	011216	201.	0016.	ST	609.	0005.	0.	0000.		2696	05210
05211	ST	060100	011213	201.	0017.	ST	609.	0002.	0.	0000.	- GAMMA SIGMA ONE	2697	05211
05212	T	002000	005276	201.	0018.	T	202.	0000.	0.	0000.	CALC. G.S. SUM	2698	05212
05213	LQ	056000	011174	201.	0019.	LQ	608.	0002.	0.	0000.	8 SQ.	2699	05213
05214	FM	026000	003610	201.	0020.	FM	801.	0018.	0.	0000.	16	2700	05214
05215	FR	030000	011177	201.	0021.	FR	608.	0005.	0.	0000.		2701	05215
05216	TSX	007400	403516	201.	0022.	TSX	704.	0000.	C	0.	SQ. ROOT	2702	05216
05217	HP	042000	000000	201.	0023.	HP	0.	0000.	0.	0000.		2703	05217
05220	FO	024000	011200	201.	0024.	FO	608.	0006.	0.	0000.	28	2704	05220
05221	SQ	-060000	011211	201.	0025.	SQ	609.	0000.	0.	0000.		2705	05221
05222	CR	050000	011173	201.	0026.	CR	608.	0001.	0.	0000.	2 LAMBDA PLUS ONE	2706	05222
05223	FO	024000	003577	201.	0027.	FO	801.	0009.	0.	0000.	4	2707	05223
05224	SQ	-060000	011212	201.	0028.	SQ	609.	0001.	0.	0000.		2708	05224
05225	CR	050000	011212	201.	0029.	CR	609.	0004.	0.	0000.		2709	05225

05226	FS	030200	011211	201.	0030.	FS	609.	0000.	0.	0000.		2710	05226	
05227	ST	060100	011214	201.	0031.	ST	609.	0003.	0.	0000.	GAMMA TWO	2711	05227	
05230	LR	076500	000043	201.	0032.	LR	0.	0035.	0.	0000.		2712	05230	
05231	FM	026000	011111	201.	0033.	FM	603.	0001.	0.	0000.	SIGMA	2713	05231	
05232	CHS	076000	000002	201.	0034.	CHS	0.	0000.	0.	0000.		2714	05232	
05233	ST	060100	011214	201.	0035.	ST	609.	0003.	0.	0000.	GAMMA SIGMA TWO	2715	05233	
05234	ST	060100	011217	201.	0036.	ST	609.	0006.	0.	0000.		2716	05234	
05235	T	002000	005170	201.	0037.	T	2.	0000.	0.	0000.	CALC. G.S. ONE	2717	05235	
05236	LQ	056000	011174	201.	0038.	LQ	608.	0002.	0.	0000.	8 SQ.	2718	05236	
05237	FM	026000	003611	201.	0039.	FM	801.	0019.	0.	0000.	3G	2719	05237	
05240	FR	030000	011177	201.	0040.	FR	608.	0005.	0.	0000.		2720	05240	
05241	TSX	007400	403516	201.	0041.	TSX	704.	0000.	C	0.	0000.	SQ. ROOT	2721	05241
05242	HP	042000	000000	201.	0042.	HP	0.	0000.		0.	0000.		2722	05242
05243	FO	024000	011200	201.	0043.	FO	608.	0006.		0.	0000.	2B	2723	05243
05244	SQ	-060000	011211	201.	0044.	SQ	609.	0000.		0.	0000.		2724	05244
05245	CR	050000	011173	201.	0045.	CR	608.	0001.		0.	0000.	2 LAMBDA PLUS ONE	2725	05245
05246	FD	024000	003577	201.	0046.	FD	801.	0009.		0.	0000.	4	2726	05246
05247	SQ	-060000	011212	201.	0047.	SQ	609.	0001.		0.	0000.		2727	05247
05250	CR	050000	011212	201.	0048.	CR	609.	0001.		0.	0000.		2728	05250
05251	FS	030200	011211	201.	0049.	FS	609.	0000.		0.	0000.		2729	05251
05252	ST	060100	011215	201.	0050.	ST	609.	0004.		0.	0000.	GAMMA THREE	2730	05252
05253	LR	076500	000043	201.	0051.	LR	0.	0035.		0.	0000.		2731	05253
05254	FM	026000	011111	201.	0052.	FM	603.	0001.		0.	0000.	SIGMA	2732	05254
05255	CHS	076000	000002	201.	0053.	CHS	0.	0000.		0.	0000.		2733	05255
05256	ST	060100	011215	201.	0054.	ST	609.	0004.		0.	0000.	GAMMA SIGMA THREE	2734	05256
05257	ST	060100	011220	201.	0055.	ST	609.	0007.		0.	0000.		2735	05257
05260	T	002000	005213	201.	0056.	T	2.	0019.		0.	0000.	CALC G.S. TWO	2736	05260
05276	CR	050000	103712	202.	0000.	CR	802.	0044.	R	0.	0000.	LAMBDA	2750	05276
05277	FS	030200	003561	202.	0001.	FS	800.	0010.		0.	0000.	2.9B	2751	05277
05300	TP	012000	005310	202.	0002.	TP	2.	0010.		0.	0000.		2752	05300
05301	CR	050000	103712	202.	0003.	CR	802.	0044.	R	0.	0000.		2753	05301
05302	FS	030200	003547	202.	0004.	FS	800.	0000.		0.	0000.	1.98	2754	05302
05303	TP	012000	005306	202.	0005.	TP	2.	0008.		0.	0000.		2755	05303
05304	SOX	-053400	205316	202.	0006.	SOX	2.	0016.	8	0.	0000.		2756	05304
05305	T	002000	005312	202.	0007.	T	2.	0012.		0.	0000.		2757	05305
05306	SOX	-053400	205317	202.	0008.	SOX	2.	0017.	8	0.	0000.		2758	05306
05307	T	002000	005342	202.	0009.	T	203.	0011.		0.	0000.		2759	05307
05310	SOX	-053400	205320	202.	0010.	SOX	2.	0018.	B	0.	0000.		2760	05310
05311	T	002000	005327	202.	0011.	T	203.	0000.		0.	0000.		2761	05311
05312	CR	050000	011216	202.	0012.	CR	609.	0005.		0.	0000.		2762	05312
05313	ST	060100	011220	202.	0013.	ST	609.	0007.		0.	0000.		2763	05313
05314	ZS	060000	011217	202.	0014.	ZS	609.	0006.		0.	0000.		2764	05314
05315	T	002000	005327	202.	0015.	T	203.	0000.		0.	0000.		2765	05315
05316		000001	000000	202.	0016.		0.	0000.		0.	0001.		2766	05316
05317		000002	000000	202.	0017.		0.	0000.		0.	0002.		2767	05317
05320		000003	000000	202.	0018.		0.	0000.		0.	0003.		2768	05320

05327	CR	050000	011220	203.	0000.	CA	609.	0007.	C	0.	0000.	- GAMMA SIGMA	2775	05327
05330	TSX	007400	403410	203.	0001.	TSX	703.	0000.	C	0.	0000.	EXPONENTIAL	2776	05330
05331	HF	042000	000000	203.	0002.	HP	0.	0000.		0.	0000.		2777	05331
05332	ST	060100	211231	203.	0003.	ST	610.	0006.	B	0.	0000.	E TO - GAMMA SIGMA	2778	05332
05333	LR	076500	000043	203.	0004.	LR	0.	0035.		0.	0000.		2779	05333
05334	FM	026000	011220	203.	0005.	FM	609.	0007.		0.	0000.		2780	05334
05335	ST	060100	211412	203.	0006.	ST	615.	0039.	B	0.	0000.	E TO - G.S. PRIME	2781	05335
05336	LR	076500	000043	203.	0007.	LR	0.	0035.		0.	0000.		2782	05336
05337	FM	026000	011220	203.	0008.	FM	609.	0007.		0.	0000.		2783	05337
05340	ST	060100	211420	203.	0009.	ST	615.	0045.	B	0.	0000.	E TO - G.S. OUB PRIME	2784	05340
05341	TX	200001	205342	203.	0010.	TX	2.	0011.	B	0.	0001.		2785	05341
05342	CR	050000	011217	203.	0011.	CA	609.	0006.		0.	0000.		2786	05342
05343	ST	060100	011220	203.	0012.	ST	609.	0007.		0.	0000.		2787	05343
05344	CR	050000	011216	203.	0013.	CA	609.	0005.		0.	0000.		2788	05344
05345	ST	060100	011217	203.	0014.	ST	609.	0006.		0.	0000.		2789	05345
05346	ZS	060000	011216	203.	0015.	ZS	609.	0005.		0.	0000.		2790	05346
05347	CR	050000	011220	203.	0016.	CA	609.	0007.		0.	0000.		2791	05347
05350	TZ	010000	005377	203.	0017.	TZ	204.	0000.		0.	0000.	CALC POWERS OF SIGMA	2792	05350
05351	T	002000	005327	203.	0018.	T	2.	0000.		0.	0000.	CALC NEXT E TO - G.S.	2793	05351
05377	SOX	-053400	405425	204.	0000.	SOX	2.	0021.	C	0.	0000.	13	2815	05377
05400	CR	050000	011203	204.	0001.	CR	608.	0009.		0.	0000.	LITTLE R	2816	05400
05401	ST	060100	011235	204.	0002.	ST	611.	0000.		0.	0000.		2817	05401
05402	LQ	056000	011203	204.	0003.	LQ	608.	0009.		0.	0000.		2818	05402
05403	FM	026000	411252	204.	0004.	FM	611.	0013.	C	0.	0000.		2819	05403
05404	ST	060100	411253	204.	0005.	ST	611.	0014.	C	0.	0000.	R TO N POWER	2820	05404
05405	TX	200001	405402	204.	0006.	TX	2.	0003.	C	0.	0001.		2821	05405
05406	LQ	056000	103720	204.	0007.	LQ	802.	0050.	A	0.	0000.	ROTATIONAL O	2822	05406
05407	FM	026000	003571	204.	0008.	FM	801.	0003.		0.	0000.	HCK	2823	05407
05410	FO	024000	002005	204.	0009.	FO	1.	0029.		0.	0000.	T	2824	05410
05411	SQ	-060000	011253	204.	0010.	SQ	611.	0014.		0.	0000.	HCO/KT	2825	05411
05412	SOX	-053400	405426	204.	0011.	SOX	2.	0022.	C	0.	0000.	25	2826	05412
05413	CR	050000	003567	204.	0012.	CR	801.	0001.		0.	0000.	1	2827	05413
05414	ST	060100	011261	204.	0013.	ST	612.	0000.		0.	0000.	SIGMA TO ZERO POWER	2828	05414
05415	CR	050000	011111	204.	0014.	CR	603.	0001.		0.	0000.	1SIGMA	2829	05415
05416	ST	060100	011262	204.	0015.	ST	612.	0001.		0.	0000.		2830	05416
05417	LQ	056000	011111	204.	0016.	LQ	603.	0001.		0.	0000.	SIGMA	2831	05417
05420	FM	026000	411313	204.	0017.	FM	612.	0026.	C	0.	0000.		2832	05420
05421	TF	014000	005427	204.	0017.1	TF	2.	0023.		0.	0000.		2833	05421
05422	ST	060100	411314	204.	0018.	ST	612.	0027.	C	0.	0000.	SIGMA TO N POWER	2834	05422
05423	TX	200001	405417	204.	0019.	TX	2.	0016.	C	0.	0001.		2835	05423
05424	T	002000	005442	204.	0020.	T	205.	0000.		0.	0000.	CALC. ROTATIONAL SUM	2836	05424
05425		000015	000000	204.	0021.		0.	0000.		0.	0013.		2837	05425
05426		000031	000000	204.	0022.		0.	0000.		0.	0025.		2838	05426
05427	ZS	060000	411314	204.	0023.	ZS	612.	0027.	C	0.	0000.		2839	05427
05430	T	002000	005423	204.	0024.	T	2.	0019.		0.	0000.		2840	05430
05442	CR	050000	011112	205.	0000.	CR	603.	0002.		0.	0000.	1SIGMA	2850	05442
05443	FA	030000	003756	205.	0001.	FA	804.	0000.		0.	0000.		2851	05443
05444	ST	060100	011603	205.	0002.	ST	630.	0000.		0.	0000.		2852	05444
05445	LQ	056000	011111	205.	0003.	LQ	603.	0001.		0.	0000.	SIGMA	2853	05445
05446	FM	026000	003757	205.	0004.	FM	804.	0001.		0.	0000.		2854	05446
05447	FR	030000	011603	205.	0005.	FR	630.	0000.		0.	0000.		2855	05447
05450	ST	060100	011603	205.	0006.	ST	630.	0000.		0.	0000.		2856	05450
05451	LQ	056000	011263	205.	0007.	LQ	612.	0002.		0.	0000.	SIGMA SQUARED	2857	05451
05452	FM	026000	003760	205.	0008.	FM	904.	0002.		0.	0000.		2858	05452

05453	FA	030000 011603	205. 0009.	FR	630. 0000.	0. 0000.		2859	05453
05454	ST	060100 011603	205. 0010.	ST	630. 0000.	0. 0000.	SIGMA CU8EO	2860	05454
05455	LQ	056000 011264	205. 0011.	LQ	612. 0003.	0. 0000.		2861	05455
05456	FM	026000 003761	205. 0012.	FM	804. 0003.	0. 0000.		2862	05456
05457	FR	030000 011603	205. 0013.	FR	630. 0000.	0. 0000.	SIGMA FOURTH	2863	05457
05460	ST	060100 011603	205. 0014.	ST	630. 0000.	0. 0000.		2864	05460
05461	LQ	056000 011265	205. 0015.	LQ	612. 0004.	0. 0000.		2865	05461
05462	FM	026000 003762	205. 0016.	FM	804. 0004.	0. 0000.	SIGMA FIFTH	2866	05462
05463	FR	030000 011603	205. 0017.	FR	630. 0000.	0. 0000.		2867	05463
05464	ST	060100 011603	205. 0018.	ST	630. 0000.	0. 0000.		2868	05464
05465	LQ	056000 011266	205. 0019.	LQ	612. 0005.	0. 0000.	SUM OVER ROT. LEVELS	2869	05465
05466	FM	026000 003763	205. 0020.	FM	804. 0005.	0. 0000.	1	2870	05466
05467	FR	030000 011603	205. 0021.	FR	630. 0000.	0. 0000.	SIGMA SQUARED	2871	05467
05470	ST	060100 011603	205. 0022.	ST	630. 0000.	0. 0000.		2872	05470
05471	CS	050200 003567	205. 0023.	CS	801. 0001.	0. 0000.		2873	05471
05472	FO	024000 011263	205. 0024.	FO	612. 0002.	0. 0000.	SIGMA	2874	05472
05473	SQ	-060000 011604	205. 0025.	SQ	630. 0001.	0. 0000.		2875	05473
05474	CR	050000 011604	205. 0026.	CR	630. 0001.	0. 0000.		2876	05474
05475	FR	030000 003757	205. 0027.	FR	804. 0001.	0. 0000.		2877	05475
05476	ST	060100 011604	205. 0028.	ST	630. 0001.	0. 0000.		2878	05476
05477	LQ	056000 011111	205. 0029.	LQ	603. 0001.	0. 0000.	SIGMA	2879	05477
05500	FM	026000 003764	205. 0030.	FM	804. 0006.	0. 0000.		2880	05500
05501	FR	030000 011604	205. 0031.	FR	630. 0001.	0. 0000.		2881	05501
05502	ST	060100 011604	205. 0032.	ST	630. 0001.	0. 0000.	SIGMA SQUARED	2882	05502
05503	LQ	056000 011263	205. 0033.	LQ	612. 0002.	0. 0000.		2883	05503
05504	FM	026000 003765	205. 0034.	FM	804. 0007.	0. 0000.		2884	05504
05505	FR	030000 011604	205. 0035.	FR	630. 0001.	0. 0000.		2885	05505
05506	ST	060100 011604	205. 0036.	ST	630. 0001.	0. 0000.	SIGMA CU8EO	2886	05506
05507	LQ	056000 011264	205. 0037.	LQ	612. 0003.	0. 0000.		2887	05507
05510	FM	026000 003766	205. 0038.	FM	804. 0008.	0. 0000.		2888	05510
05511	FR	030000 011604	205. 0039.	FR	630. 0001.	0. 0000.		2889	05511
05512	ST	060100 011604	205. 0040.	ST	630. 0001.	0. 0000.	SIGMA FOURTH	2890	05512
05513	LQ	056000 011265	205. 0041.	LQ	612. 0004.	0. 0000.		2891	05513
05514	FM	026000 003767	205. 0042.	FM	804. 0009.	0. 0000.		2892	05514
05515	FR	030000 011604	205. 0043.	FR	630. 0001.	0. 0000.	OCSUMD/O SIGMA	2893	05515
05516	ST	060100 011604	205. 0044.	ST	630. 0001.	0. 0000.	2	2894	05516
05517	OR	050000 003570	205. 0045.	CR	801. 0002.	0. 0000.	SIGMA CU8EO	2895	05517
05520	FO	024000 011264	205. 0046.	FO	612. 0003.	0. 0000.		2896	05520
05521	SQ	-060000 011605	205. 0047.	SQ	630. 0002.	0. 0000.		2897	05521
05522	CR	050000 011605	205. 0048.	CR	630. 0002.	0. 0000.		2898	05522
05523	FR	030000 003764	205. 0049.	FR	804. 0006.	0. 0000.		2899	05523
05524	ST	060100 011605	205. 0050.	ST	630. 0002.	0. 0000.		2900	05524
05525	LQ	056000 011111	205. 0051.	LQ	603. 0001.	0. 0000.	SIGMA	2901	05525
05526	FM	026000 003770	205. 0052.	FM	804. 0010.	0. 0000.		2902	05526
05527	FR	030000 011605	205. 0053.	FR	630. 0002.	0. 0000.		2903	05527
05530	ST	060100 011605	205. 0054.	ST	630. 0002.	0. 0000.	SIGMA SQUARED	2904	05530
05531	LQ	056000 011263	205. 0055.	LQ	612. 0002.	0. 0000.		2905	05531
05532	FM	026000 003771	205. 0056.	FM	804. 0011.	0. 0000.		2906	05532
05533	FR	030000 011605	205. 0057.	FR	630. 0002.	0. 0000.		2907	05533
05534	ST	060100 011605	205. 0058.	ST	630. 0002.	0. 0000.	SIGMA CU8EO	2908	05534
05535	LQ	056000 011264	205. 0059.	LQ	612. 0003.	0. 0000.		2909	05535
05536	FM	026000 003772	205. 0060.	FM	804. 0012.	0. 0000.		2910	05536
05537	FR	030000 011605	205. 0061.	FR	630. 0002.	0. 0000.	O2CSUMD/O SIGMA 2	2911	05537
05540	ST	060100 011605	205. 0062.	ST	630. 0002.	0. 0000.	6	2912	05540
05541	CS	050200 003602	205. 0063.	CS	801. 0012.	0. 0000.	SIGMA FOURTH	2913	05541
05542	FO	024000 011265	205. 0064.	FO	612. 0004.	0. 0000.		2914	05542
05543	SQ	-060000 011606	205. 0065.	SQ	630. 0003.	0. 0000.		2915	05543

05544	CR	050000	011606	205.	0065.	CR	630.	0003.	0.	0000.	2916	05544
05545	FR	030000	003770	205.	0067.	FR	804.	0010.	0.	0000.	2917	05545
05546	ST	060100	011606	205.	0068.	ST	630.	0003.	0.	0000.	2918	05546
05547	LQ	056000	011111	205.	0069.	LQ	603.	0001.	0.	0000.	2919	05547
05550	FM	026000	003773	205.	0070.	FM	804.	0013.	0.	0000.	2920	05550
05551	FA	030000	011606	205.	0071.	FA	630.	0003.	0.	0000.	2921	05551
05552	ST	060100	011606	205.	0072.	ST	630.	0003.	0.	0000.	2922	05552
05553	LQ	056000	011263	205.	0073.	LQ	612.	0002.	0.	0000.	2923	05553
05554	FM	026000	003774	205.	0074.	FM	804.	0014.	0.	0000.	2924	05554
05555	FA	030000	011606	205.	0075.	FA	630.	0003.	0.	0000.	2925	05555
05556	ST	060100	011606	205.	0076.	ST	630.	0003.	0.	0000.	2926	05556
05557	CR	050000	003606	205.	0077.	CR	801.	0016.	0.	0000.	2927	05557
05560	FO	024000	011266	205.	0078.	FO	612.	0005.	0.	0000.	2928	05560
05561	SQ	-060000	011607	205.	0079.	SQ	630.	0004.	0.	0000.	2929	05561
05562	LQ	056000	011111	205.	0080.	LQ	603.	0001.	0.	0000.	2930	05562
05563	FM	026000	003775	205.	0081.	FM	804.	0015.	0.	0000.	2931	05563
05564	FA	030000	011607	205.	0082.	FA	630.	0004.	0.	0000.	2932	05564
05565	FA	030000	003773	205.	0083.	FA	804.	0013.	0.	0000.	2933	05565
05566	ST	060100	011607	205.	0084.	ST	630.	0004.	0.	0000.	2934	05566
05567	CS	050200	003606	205.	0085.	CS	801.	0016.	0.	0000.	2935	05567
05570	FO	024000	011267	205.	0086.	FO	612.	0005.	0.	0000.	2936	05570
05571	FM	026000	003601	205.	0087.	FM	801.	0011.	0.	0000.	2937	05571
05572	FR	030000	003775	205.	0088.	FR	804.	0015.	0.	0000.	2938	05572
05573	ST	060100	011610	205.	0089.	ST	630.	0005.	0.	0000.	2939	05573
05574	LQ	056000	003622	205.	0090.	LQ	801.	0028.	0.	0000.	2940	05574
05575	FM	026000	003613	205.	0091.	FM	801.	0021.	0.	0000.	2941	05575
05576	ST	060100	011614	205.	0092.	ST	630.	0009.	0.	0000.	2942	05576
05577	CR	050000	011614	205.	0093.	CR	630.	0009.	0.	0000.	2943	05577
05600	FO	024000	011270	205.	0094.	FO	612.	0007.	0.	0000.	2944	05600
05601	SQ	-060000	011611	205.	0095.	SQ	630.	0006.	0.	0000.	2945	05601
05602	LQ	056000	011614	205.	0096.	LQ	630.	0009.	0.	0000.	2946	05602
05603	FM	026000	003627	205.	0097.	FM	801.	0033.	0.	0000.	2947	05603
05604	CHS	076000	000002	205.	0097.	CHS	0.	0000.	0.	0000.	2948	05604
05605	FO	024000	011271	205.	0098.	FO	612.	0008.	0.	0000.	2949	05605
05606	SQ	-060000	011612	205.	0099.	SQ	630.	0007.	0.	0000.	2950	05606
05607	LQ	056000	011614	205.	0100.	LQ	630.	0009.	0.	0000.	2951	05607
05610	FM	026000	003620	205.	0101.	FM	801.	0026.	0.	0000.	2952	05610
05611	FO	024000	011272	205.	0102.	FO	612.	0009.	0.	0000.	2953	05611
05612	FM	026000	003627	205.	0102.	FM	801.	0033.	0.	0000.	2954	05612
05613	ST	060100	011613	205.	0103.	ST	630.	0008.	0.	0000.	2955	05613
05614	CS	050200	011613	205.	0104.	CS	630.	0008.	0.	0000.	2956	05614
05615	FO	024000	011111	205.	0105.	FO	603.	0004.	0.	0000.	2957	05615
05616	FM	026000	003630	205.	0106.	FM	801.	0034.	0.	0000.	2958	05616
05617	ST	060100	011614	205.	0107.	ST	630.	0009.	0.	0000.	2959	05617
05620	CS	050200	011614	205.	0108.	CS	630.	0009.	0.	0000.	2960	05620
05621	FO	024000	011111	205.	0109.	FO	603.	0001.	0.	0000.	2961	05621
05622	FM	026000	003631	205.	0110.	FM	801.	0035.	0.	0000.	2962	05622
05623	ST	060100	011615	205.	0111.	ST	630.	0010.	0.	0000.	2963	05623
05624	T	002000	005644	205.	0112.	T	206.	0000.	0.	0000.	2964	05624
05644	CR	050000	003567	206.	0000.	CR	801.	0001.	0.	0000.	2980	05644
05645	ST	060100	011622	206.	0001.	ST	631.	0000.	0.	0000.	2981	05645
05646	ST	060100	011623	206.	0002.	ST	631.	0001.	0.	0000.	2982	05646
05647	ST	060100	011653	206.	0003.	ST	631.	0025.	0.	0000.	2983	05647
05650	SOX	-053400	405774,	206.	0004.	SOX	2.	0083.	C	0.0000.	2984	05650

05651 CR 050000 011653	206. 0005.	CR 631. 0025.	0. 0000.	N	2985	05651
05652 FA 030000 003567	206. 0006.	FA 801. 0001.	0. 0000.	1	2986	05652
05653 ST 060100 011653	206. 0007.	ST 631. 0025.	0. 0000.		2987	05653
05654 LR 076500 000043	206. 0008.	LR 0. 0035.	0. 0000.		2988	05654
05655 FM 026000 411652	206. 0009.	FM 631. 0024.	C 0. 0000.		2989	05655
05656 ST 060100 411653	206. 0010.	ST 631. 0025.	C 0. 0000.	N FACTORIAL	2990	05656
05657 TX 200001 405651	206. 0011.	TX 2. 0005.	C 0. 0001.		2991	05657
05660 XSD -063400 106004	206. 0012.	XSD 2. 0091.	R 0. 0000.	SAVE R INOEX	2992	05660
05661 SOX -053400 105776	206. 0013.	SOX 2. 0085.	R 0. 0000.		2993	05661
05662 SOX -053400 206002	206. 0014.	SOX 2. 0089.	8 0. 0000.		2994	05662
05663 SOX -053400 405775	206. 0015.	SOX 2. 0084.	C 0. 0000.		2995	05663
05664 CR 050000 411653	206. 0016.	CR 631. 0025.	C 0. 0000.	CN+K) FACTORIAL	2996	05664
05665 FO 024000 211654	206. 0017.	FO 631. 0026.	8 0. 0000.	C2N+K) FACTORIAL	2997	05665
05666 FM 026000 111251	206. 0018.	FM 611. 0012.	R 0. 0000.	A TO N	2998	05666
05667 FO 024000 111637	206. 0019.	FO 631. 0013.	R 0. 0000.	N FACTORIAL	2999	05667
05670 FM 026000 211313	206. 0020.	FM 612. 0026.	8 0. 0000.	SIGMA TO C2N+2K)	3000	05670
05671 TF 014000 006007	206. 0020.	TF 2. 0094.	0. 0000.		3001	05671
05672 ST ; 060100 411711	206. 0021.	ST 632. 0025.	C 0. 0000.		3002	05672
05673 TX 200001 405674	206. 0022.	TX 2. 0023.	C 0. 0001.		3003	05673
05674 TX 200001 105675	206. 0023.	TX 2. 0024.	R 0. 0001.		3004	05674
05675 TX 200002 205664	206. 0024.	TX 2. 0016.	8 0. 0002.		3005	05675
05676 SOX -053400 405777	206. 0025.	SOX 2. 0086.	C 0. 0000.		3006	05676
05677 SOX -053400 106005	206. 0026.	SOX 2. 0092.	R 0. 0000.	11	3007	05677
05700 CR 050000 411674	206. 0027.	CR 632. 0012.	C 0. 0000.		3008	05700
05701 FR 030000 411675	206. 0028.	FR 632. 0013.	C 0. 0000.		3009	05701
05702 TX 200001 405701	206. 0029.	TX 2. 0028.	C 0. 0001.		3010	05702
05703 ST 060100 112123	206. 0030.	ST 642. 0013.	R 0. 0000.	G SUB K	3011	05703
05704 ZS 060000 111676	206. 0031.	ZS 632. 0014.	R 0. 0000.		3012	05704
05705 XSD -063400 106005	206. 0032.	XSD 2. 0092.	R 0. 0000.	SAVE R INOEX	3013	05705
05706 SOX -053400 105776	206. 0033.	SOX 2. 0085.	R 0. 0000.		3014	05706
05707 SOX -053400 206002	206. 0034.	SOX 2. 0089.	8 0. 0000.		3015	05707
05710 SOX -053400 405775	206. 0035.	SOX 2. 0084.	C 0. 0000.		3016	05710
05711 CR 050000 411653	206. 0036.	CR 631. 0025.	C 0. 0000.	CN+K) FACTORIAL	3017	05711
05712 FO 024000 211653	206. 0037.	FO 631. 0025.	B 0. 0000.	C2N+2K-1) FACTORIAL	3018	05712
05713 FM 026000 111251	206. 0038.	FM 611. 0012.	R 0. 0000.	A TO N	3019	05713
05714 FO 024000 111637	206. 0039.	FO 631. 0013.	R 0. 0000.	N FACTORIAL	3020	05714
05715 FM 026000 211313	206. 0040.	FM 612. 0026.	8 0. 0000.	SIGMA TO C2N+2K)	3021	05715
05716 TF 014000 006011	206. 0040.	TF 2. 0096.	0. 0000.		3022	05716
05717 ST 060100 411747	206. 0041.	ST 633. 0025.	C 0. 0000.		3023	05717
05720 TX 200001 405721	206. 0042.	TX 2. 0043.	C 0. 0001.		3024	05720
05721 TX 200001 105722	206. 0043.	TX 2. 0044.	R 0. 0001.		3025	05721
05722 TX 200002 205711	206. 0044.	TX 2. 0036.	8 0. 0002.		3026	05722
05723 SOX -053400 405777	206. 0045.	SOX 2. 0086.	C 0. 0000.	11	3027	05723
05724 SDX -053400 106005	206. 0046.	SOX 2. 0092.	R 0. 0000.		3028	05724
05725 CR 050000 411732	206. 0047.	CR 633. 0012.	C 0. 0000.		3029	05725
05726 FR 030000 411733	206. 0048.	FR 633. 0013.	C 0. 0000.		3030	05726
05727 TX 200001 405726	206. 0049.	TX 2. 0048.	C 0. 0001.		3031	05727
05730 ST 060100 112147	206. 0050.	ST 643. 0013.	R 0. 0000.	G.SUB K, PRIME	3032	05730
05731 ZS 060000 111734	206. 0051.	ZS 633. 0014.	R 0. 0000.		3033	05731
05732 XSD -063400 106005	206. 0052.	XSD 2. 0092.	R 0. 0000.	SAVE R INDEX	3034	05732
05733 SOX -053400 105776	206. 0053.	SOX 2. 0085.	R 0. 0000.		3035	05733
05734 SOX -053400 206002	206. 0054.	SOX 2. 0089.	8 0. 0000.		3036	05734
05735 SOX -053400 405775	206. 0055.	SOX 2. 0084.	C 0. 0000.		3037	05735
05736 CR 050000 411653	206. 0056.	CR 631. 0025.	C 0. 0000.	CN+K) FACTORIAL	3038	05736
05737 FO 024000 211652	206. 0057.	FO 631. 0024.	8 0. 0000.	C2N+2K-2) FACTORIAL	3039	05737
05740 FM 026000 111251	206. 0058.	FM 611. 0012.	R 0. 0000.	A TO N	3040	05740
05741 FO 024000 111637	206. 0059.	FO 631. 0013.	R 0. 0000.	N FACTORIAL	3041	05741
05742 FM 026000 211313	206. 0060.	FM 612. 0026.	8 0. 0000.	SIGMA TO C2N+2K)	3042	05742
05743 TF 014000 006013	206. 0060.	TF 2. 0098.	0. 0000.		3043	05743
05744 ST 060100 412005	206. 0061.	ST 634. 0025.	C 0. 0000.		3044	05744
05745 TX 200001 405746	206. 0062.	TX 2. 0063.	C 0. 0001.		3045	05745

05746	TX	200001	105747	206.	0063.	TX	2.	0064.	R	0.	0001.		3046	05746
05747	TX	200002	205736	206.	0064.	TX	2.	0056.	R	0.	0002.		3047	05747
05750	SOX	-053400	405777	206.	0065.	SOX	2.	0086.	C	0.	0000.	11	3048	05750
05751	SOX	-053400	106005	206.	0066.	SOX	2.	0092.	R	0.	0000.	13	3049	05751
05752	CR	050000	411770	206.	0067.	CR	634.	0012.	C	0.	0000.		3050	05752
05753	FR	030000	411771	206.	0068.	FR	634.	0013.	C	0.	0000.		3051	05753
05754	TX	200001	405753	206.	0069.	TX	2.	0068.	C	0.	0001.		3052	05754
05755	ST	060100	112173	206.	0070.	ST	644.	0013.	R	0.	0000.		3053	05755
05756	ZS	060000	111772	206.	0071.	ZS	634.	0014.	R	0.	0000.		3054	05756
05757	CR	050000	005775	206.	0072.	CR	2.	0084.		0.	0000.		3055	05757
05760	S	040200	006000	206.	0073.	S	2.	0087.		0.	0000.	1	3056	05760
05761	ST	060100	005775	206.	0074.	ST	2.	0084.		0.	0000.		3057	05761
05762	CR	050000	006002	206.	0075.	CR	2.	0089.		0.	0000.		3058	05762
05763	S	040200	006001	206.	0076.	S	2.	0088.		0.	0000.	2	3059	05763
05764	ST	060100	006002	206.	0077.	ST	2.	0089.		0.	0000.		3060	05764
05765	TX	200001	105766	206.	0078.	TX	2.	0079.	R	0.	0001.		3061	05765
05766	XSO	-063400	106005	206.	0079.	XSO	2.	0092.	R	0.	0000.		3062	05766
05767	TGX	300001	105661	206.	0080.	TGX	2.	0013.	R	0.	0001.		3063	05767
05770	SOX	-053400	106004	206.	0081.	SOX	2.	0091.	R	0.	0000.		3064	05770
05771	CR	050000	006006	206.	0081.1	CR	2.	0093.		0.	0000.		3065	05771
05772	ST	060100	006005	206.	0081.2	ST	2.	0092.		0.	0000.		3066	05772
05773	T	002000	006015	206.	0082.	T	207.	0000.		0.	0000.		3067	05773
05774		000027	000000	206.	0083.		0.	0000.		0.	0023.		3068	05774
05775		000030	000000	206.	0084.		0.	0000.		0.	0024.		3069	05775
05776		000014	000000	206.	0085.		0.	0000.		0.	0012.		3070	05776
05777		000013	000000	206.	0086.		0.	0000.		0.	0011.		3071	05777
06000		000001	000000	206.	0087.		0.	0000.		0.	0001.		3072	06000
06001		000002	000000	206.	0088.		0.	0000.		0.	0002.		3073	06001
06002		000030	000000	206.	0089.		0.	0000.		0.	0024.		3074	06002
06003		000030	000000	206.	0090.		0.	0000.		0.	0024.		3075	06003
06004		000000	000000	206.	0091.		0.	0000.		0.	0000.		3076	06004
06005		000015	000000	206.	0092.		0.	0000.		0.	0013.		3077	06005
06006		000015	000000	206.	0093.		0.	0000.		0.	0013.		3078	06006
06007	ZS	060000	411711	206.	0094.	ZS	632.	0025.	C	0.	0000.		3079	06007
06010	T	002000	005673	206.	0095.	T	2.	0022.		0.	0000.		3080	06010
06011	ZS	060000	411747	206.	0096.	ZS	633.	0025.	C	0.	0000.		3081	06011
06012	T	002000	005720	206.	0097.	T	2.	0042.		0.	0000.		3082	06012
06013	ZS	060000	412005	206.	0098.	ZS	634.	0025.	C	0.	0000.		3083	06013
06014	T	002000	005745	206.	0099.	T	2.	0062.		0.	0000.		3084	06014
06015	CR	050000	006003	207.	0000.	CR	206.	0090.		0.	0000.	24	3085	06015
06016	ST	060100	006002	207.	0001.	ST	206.	0089.		0.	0000.		3086	06016
06017	ST	060100	005775	207.	0002.	ST	206.	0084.		0.	0000.		3087	06017
06020	CR	050000	003567	207.	0003.	CR	801.	0001.		0.	0000.	1	3088	06020
06021	ST	060100	012012	207.	0004.	ST	635.	0000.		0.	0000.		3089	06021
06022	SOX	-053400	406045	207.	0005.	SOX	2.	0022.	C	0.	0000.		3090	06022
06023	SOX	-053400	206046	207.	0006.	SOX	2.	0023.	R	0.	0000.	24	3091	06023
06024	CR	050000	411637	207.	0007.	CR	631.	0013.	C	0.	0000.		3092	06024
06025	FO	024000	211654	207.	0008.	FO	631.	0026.	R	0.	0000.		3093	06025
06026	FM	026000	211313	207.	0009.	FM	612.	0026.	R	0.	0000.		3094	06026
06027	TF	014000	006121	207.	0009.1	TF	2.	0065.		0.	0000.		3095	06027
06030	ST	060100	412027	207.	0010.	ST	635.	0013.	C	0.	0000.		3096	06030
06031	TX	200002	206032	207.	0011.	TX	2.	0012.	R	0.	0002.		3097	06031
06032	TX	200001	406024	207.	0012.	TX	2.	0007.		0.	0001.		3098	06032
06033	SOX	-053400	406045	207.	0013.	SOX	2.	0022.	C	0.	0000.	12	3099	06033
06034	SOX	-053400	206046	207.	0014.	SOX	2.	0023.	B	0.	0000.	24	3100	06034
06035	CR	050000	411637	207.	0015.	CR	631.	0013.	C	0.	0000.		3101	06035
06036	FO	024000	211653	207.	0016.	FO	631.	0025.	R	0.	0000.		3102	06036
06037	FM	026000	211313	207.	0017.	FM	612.	0026.	R	0.	0000.		3103	06037
06040	TF	014000	006123	207.	0017.1	TF	2.	0067.		0.	0000.		3104	06040
06041	ST	060100	412053	207.	0018.	ST	636.	0013.	C	0.	0000.		3105	06041
06042	TX	200002	206043	207.	0019.	TX	2.	0020.	R	0.	0002.		3106	06042

06043 TX 200001 406035 207. 0020. TX 2. 0015. C 0. 0001.
 06044 T 002000 006047 207. 0021. T 2. 0024. C 0. 0000.
 06045 000014 000000 207. 0022. 0. 0000. C 0. 0012.
 06046 000030 000000 207. 0023. 0. 0000. C 0. 0024.
 06047 SOX -053400 406117 207. 0024. SOX 2. 0063. C 0. 0000.
 06050 CR 050000 412123 207. 0025. CR 642. 0013. C 0. 0000.
 06051 FR 030000 412027 207. 0026. FR 635. 0013. C 0. 0000.
 06052 FO 024000 411637 207. 0027. FO 631. 0013. C 0. 0000.
 06053 SQ -060000 412123 207. 0028. SQ 642. 0013. C 0. 0000.
 06054 TX 200001 406050 207. 0029. TX 2. 0025. C 0. 0001.
 06055 SOX -053400 406120 207. 0030. SOX 2. 0064. C 0. 0000.
 06056 CS 050200 412122 207. 0031. CS 642. 0012. C 0. 0000.
 06057 ST 060100 412122 207. 0032. ST 642. 0012. C 0. 0000.
 06060 TX 200002 406056 207. 0033. TX 2. 0031. C 0. 0002.
 06061 SOX -053400 406045 207. 0034. SOX 2. 0022. C 0. 0000.
 06062 SOX -053400 206046 207. 0035. SOX 2. 0023. B 0. 0000.
 06063 CR 050000 411637 207. 0036. CR 631. 0013. C 0. 0000.
 06064 FO 024000 211652 207. 0037. FO 631. 0024. B 0. 0000.
 06065 FM 026000 211313 207. 0038. FM 612. 0026. B 0. 0000.
 06066 TF 014000 006125 207. 0039. TF 2. 0069. C 0. 0000.
 06067 ST 060100 412077 207. 0040. ST 637. 0013. C 0. 0000.
 06070 TX 200002 206071 207. 0040. TX 2. 0041. B 0. 0002.
 06071 TX 200001 406063 207. 0041. TX 2. 0036. C 0. 0001.
 06072 SOX -053400 406117 207. 0042. SOX 2. 0063. C 0. 0000.
 06073 CR 050000 412147 207. 0043. CR 643. 0013. C 0. 0000.
 06074 FR 030000 412053 207. 0044. FR 636. 0013. C 0. 0000.
 06075 FO 024000 411637 207. 0045. FO 631. 0013. C 0. 0000.
 06076 SQ -060000 412147 207. 0046. SQ 643. 0013. C 0. 0000.
 06077 TX 200001 406073 207. 0047. TX 2. 0043. C 0. 0001.
 06100 SOX -053400 406120 207. 0048. SOX 2. 0064. C 0. 0000.
 06101 CS 050200 412146 207. 0049. CS 643. 0012. C 0. 0000.
 06102 ST 060100 412146 207. 0050. ST 643. 0012. C 0. 0000.
 06103 TX 200002 406101 207. 0051. TX 2. 0049. C 0. 0002.
 06104 SOX -053400 406117 207. 0052. SOX 2. 0063. C 0. 0000.
 06105 CR 050000 412173 207. 0053. CR 644. 0013. C 0. 0000.
 06106 FR 030000 412077 207. 0054. FR 637. 0013. C 0. 0000.
 06107 FO 024000 411637 207. 0055. FO 631. 0013. C 0. 0000.
 06110 SQ -060000 412173 207. 0056. SQ 644. 0013. C 0. 0000.
 06111 TX 200001 406105 207. 0057. TX 2. 0053. C 0. 0001.
 06112 SDX -053400 406120 207. 0058. SDX 2. 0064. C 0. 0000.
 06113 CS 050200 412172 207. 0059. CS 644. 0012. C 0. 0000.
 06114 ST 060100 412172 207. 0060. ST 644. 0012. C 0. 0000.
 06115 TX 200002 406113 207. 0061. TX 2. 0059. C 0. 0002.
 06116 TR 002000 006130 207. 0062. TR 603. 0000. C 0. 0000.
 06117 000015 000000 207. 0063. 0. 0000. C 0. 0013.
 06120 000013 000000 207. 0064. 0. 0000. C 0. 0011.
 06121 ZS 060000 412027 207. 0065. ZS 635. 0013. C 0. 0000.
 06122 T 002000 006031 207. 0066. T 2. 0011. C 0. 0000.
 06123 ZS 060000 412053 207. 0067. ZS 636. 0013. C 0. 0000.
 06124 T 002000 006042 207. 0068. T 2. 0019. C 0. 0000.
 06125 ZS 060000 412077 207. 0069. ZS 637. 0013. C 0. 0000.
 06126 T 002000 006070 207. 0070. T 2. 0040. C 0. 0000.

CONTINUE CALCULATION

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 3154 06122
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 3156 06124
 3157 06125
 3158 06126

06130	CR	05000C	C11253	208.	0000.	CR	611.	0014.	0.	0000.	HCO/KT	3160	06130
06131	FD	024000	011111	208.	0001.	FD	603.	0001.	0.	0000.	HC8-1-T	3161	06131
06132	SQ	-06000C	C12207	208.	0002.	SQ	645.	0005.	0.	0000.	D/8	3162	06132
06133	ZS	06000C	C11331	208.	0002.1	ZS	614.	0000.	0.	0000.		3163	06133
06134	SOX	-05349C	4C6336	208.	0003.	SOX	2.	0153.	0.	0000.	7	3164	06134
06135	LQ	056000	411614	208.	0004.	LQ	630.	0009.	0.	0000.	2ND DERIV. OF SUM	3165	06135
06136	FM	026000	C11253	208.	0005.	FM	611.	0014.	0.	0000.	HCO/KT	3166	06136
06137	FA	030000	411612	208.	0006.	FA	630.	0007.	0.	0000.	ROTATIONAL SUM	3167	06137
06140	ST	060100	C12204	208.	0007.	ST	645.	0002.	0.	0000.		3168	06140
06141	LQ	056000	411613	208.	0008.	LQ	630.	0009.	0.	0000.	1ST DERIV. OF SUM	3169	06141
06142	FM	026000	012207	208.	0009.	FM	645.	0005.	0.	0000.	0/B	3170	06142
06143	LR	076500	CC0042	208.	0010.	LR	0.	0035.	0.	0000.		3171	06143
06144	FM	026000	C11331	208.	0011.	FM	614.	0000.	0.	0000.	N-1	3172	06144
06145	FA	030000	C12204	208.	0012.	FA	645.	0002.	0.	0000.		3173	06145
06146	LR	076500	CC0043	208.	0013.	LR	0.	0035.	0.	0000.		3174	06146
06147	FM	026000	412115	208.	0014.	FM	642.	0007.	0.	0000.	G SUB K	3175	06147
06150	FA	030000	C12202	208.	0015.	FA	645.	0000.	0.	0000.		3176	06150
06151	ST	060100	C12202	208.	0016.	ST	645.	0000.	0.	0000.		3177	06151
06152	CR	050000	C11331	208.	0017.	CR	614.	0000.	0.	0000.	N-1	3178	06152
06153	FR	030000	CC3567	208.	0018.	FR	801.	0001.	0.	0000.	1	3179	06153
06154	ST	060100	C11331	208.	0019.	ST	614.	0000.	0.	0000.		3180	06154
06155	TX	200001	4C6135	208.	0020.	TX	2.	0004.	0.	0001.		3181	06155
06156	CR	050000	C12202	208.	0021.	CR	645.	0000.	0.	0000.		3182	06156
06157	ST	060100	C11317	208.	0022.	ST	613.	0000.	0.	0000.	Q INTERNAL, RGT.	3183	06157
06160	ZS	060000	012202	208.	0023.	ZS	645.	0000.	0.	0000.		3184	06160
06161	CR	050000	CC3567	208.	0024.	CR	801.	0001.	0.	0000.	1	3185	06161
06162	ST	060100	011332	208.	0025.	ST	614.	0001.	0.	0000.	N	3186	06162
06163	SDX	-053490	4C6326	208.	0026.	SDX	2.	0152.	0.	0000.	7	3187	06163
06164	LQ	056000	411615	208.	0027.	LQ	630.	0010.	0.	0000.	3RD DERIV. OF SUM	3188	06164
06165	FM	026000	C11252	208.	0028.	FM	611.	0014.	0.	0000.	HCO/KT	3189	06165
06166	FA	030000	411613	208.	0029.	FA	630.	0008.	0.	0000.	1ST DERIV. OF SUM	3190	06166
06167	ST	060100	C12204	208.	0030.	ST	645.	0002.	0.	0000.		3191	06167
06170	LR	056000	C12207	208.	0031.	LR	645.	0005.	0.	0000.	0/B	3192	06170
06171	FM	026000	411614	208.	0032.	FM	630.	0009.	0.	0000.	2ND DERIV. OF SUM	3193	06171
06172	LR	076500	CC0042	208.	0033.	LR	0.	0035.	0.	0000.		3194	06172
06173	FM	026000	C11332	208.	0034.	FM	614.	0001.	0.	0000.	N	3195	06173
06174	FA	030000	C12204	208.	0035.	FA	645.	0002.	0.	0000.		3196	06174
06175	LR	076500	CC0043	208.	0036.	LR	0.	0035.	0.	0000.		3197	06175
06176	FM	026000	C11111	208.	0037.	FM	603.	0001.	0.	0000.	SIGMA	3198	06176
06177	LR	076500	CC0043	208.	0038.	LR	0.	0035.	0.	0000.		3199	06177
06200	FM	026000	412115	208.	0039.	FM	642.	0007.	0.	0000.	G SLQ K	3200	06200
06201	ST	060100	C12204	208.	0040.	ST	645.	0002.	0.	0000.		3201	06201
06202	LW	056000	411614	208.	0041.	LW	630.	0009.	0.	0000.	2ND DERIV. OF SUM	3202	06202
06203	FM	026000	C11252	208.	0042.	FM	611.	0014.	0.	0000.	HCO/KT	3203	06203
06204	FR	030000	411612	208.	0043.	FR	630.	0017.	0.	0000.	ROTATIONAL SUM	3204	06204
06205	ST	060100	C12205	208.	0044.	ST	645.	0003.	0.	0000.		3205	06205
06206	ZS	060000	C11331	208.	0045.	ZS	614.	0000.	0.	0000.		3206	06206
06207	LQ	056000	C11331	208.	0046.	LQ	614.	0000.	0.	0000.	N-1	3207	06207
06213	FM	026000	411612	208.	0047.	FM	630.	0008.	0.	0000.	1ST DERIV. OF SUM	3208	06210
06211	LR	076500	CC0042	208.	0048.	LR	0.	0035.	0.	0000.		3209	06211
06212	FM	026000	C12207	208.	0049.	FM	645.	0005.	0.	0000.	0/B	3210	06212
06213	FR	J3000C	C12205	208.	0050.	FR	645.	0003.	0.	0000.		3211	06213
06214	LR	076500	CC0042	208.	0051.	LR	0.	0033.	0.	0000.		3212	06214
06215	FM	026000	412141	208.	0052.	FM	643.	0007.	0.	0000.	G SU [~] K, PRIME	3213	06215
06216	FR	030000	C12204	208.	0053.	FR	645.	0002.	0.	0000.		3214	06216
06217	FR	030000	012203	208.	0054.	FR	645.	0001.	0.	0000.		3215	06217

06220	ST	060100	C12203	208.	0055.	ST	645.	0001.	0.	0000.	N-1	3216	06220
06221	CR	050000	C11331	208.	0056.	CR	614.	0000.	0.	0000.	1	3217	06221
06222	FR	030000	C03567	208.	0057.	FR	801.	0001.	0.	0000.		3218	06222
06223	ST	060100	C11371	208.	0058.	ST	614.	0000.	0.	0000.		3219	06223
06224	CR	050000	C11332	208.	0059.	CR	614.	0001.	0.	0000.	N	3220	06224
06225	FA	030000	C03567	208.	0060.	FR	801.	0001.	0.	0000.	1	3221	06225
06226	ST	060100	C11332	208.	0061.	ST	614.	0001.	0.	0000.		3222	06226
06227	TX	200001	4C6164	208.	0062.	TX	2.	0027.	D	0.0001.		3223	06227
06228	LQ	056000	C12203	208.	0063.	LQ	645.	0001.	0.	0000.		3224	06230
06229	FM	026000	C02005	208.	0064.	FM	1.	0029.	0.	0000.	T	3225	06231
06230	ST	060100	C11320	208.	0065.	ST	613.	0001.	0.	0000.	Q PRIME INTERNAL.ROT.	3226	06232
06231	ZS	060000	C12203	208.	0066.	ZS	645.	0001.	0.	0000.		3227	06233
06232	CR	050000	C03570	208.	0067.	CR	801.	0002.	0.	0000.	2	3228	06234
06233	ST	060100	C11332	208.	0068.	ST	614.	0002.	0.	0000.	N+1	3229	06235
06234	CR	050000	C03567	208.	0069.	CR	801.	0001.	0.	0000.	1	3230	06236
06235	ST	060100	C11332	208.	0070.	ST	614.	0001.	0.	0000.	N	3231	06237
06236	ZS	060000	C11331	208.	0070.	ZS	614.	0000.	0.	0000.		3232	06240
06237	SOX	-0532400	4C6336	208.	0071.	SOX	2.	0153.	C	0.0000.	7	3233	06241
06238	LQ	056000	411616	208.	0072.	LQ	630.	0011.	C	0.0000.	4TH DERIV. OF SUM	3234	06242
06239	FM	026000	011253	208.	0073.	FM	611.	0014.	0.	0000.	HCO/KT	3235	06243
06240	FR	030000	411614	208.	0074.	FR	630.	0009.	C	0.0000.	2ND DERIV. OF SUM	3236	06244
06241	ST	060100	C12205	208.	0075.	ST	645.	0003.	0.	0000.		3237	06245
06242	ZS	056000	411615	208.	0076.	LQ	630.	0010.	C	0.0000.	3RD DERIV. OF SUM	3238	06246
06243	FM	026000	C12207	208.	0077.	FM	645.	0005.	0.	0000.	0/B	3239	06247
06244	LR	076500	000043	208.	0078.	LR	0.	0035.	0.	0000.		3240	06250
06245	FM	026000	C11333	208.	0079.	FM	614.	0002.	0.	0000.	N+1	3241	06251
06246	FR	030000	C12205	208.	0080.	FR	645.	0003.	0.	0000.		3242	06252
06247	LR	076500	000043	208.	0081.	LR	0.	0035.	0.	0000.		3243	06253
06248	FM	026000	C11263	208.	0082.	FM	612.	0002.	0.	0000.	SIGMA SQUARED	3244	06254
06249	LR	076500	000043	208.	0089.	LR	0.	0035.	0.	0000.		3245	06255
06250	FM	026000	412115	208.	0090.	FM	642.	0007.	C	0.0000.	G SUB K	3246	06256
06251	ST	060100	C12205	208.	0091.	ST	645.	0003.	0.	0000.		3247	06257
06252	LQ	056000	411615	208.	0092.	LQ	630.	0010.	C	0.0000.	3RD DERIV. OF SUM	3248	06260
06253	FM	026000	C11253	208.	0093.	FM	611.	0014.	0.	0000.	HCO/KT	3249	06261
06254	FR	030000	411613	208.	0094.	FR	630.	0008.	C	0.0000.	1ST DERIV. OF SUM	3250	06262
06255	ST	060100	C12206	208.	0095.	ST	645.	0004.	0.	0000.		3251	06263
06256	ZS	056000	411614	208.	0096.	LQ	630.	0009.	C	0.0000.	2ND DERIV. OF SUM	3252	06264
06257	FM	026000	C12207	208.	0097.	FM	645.	0005.	0.	0000.	0/A	3253	06265
06258	LR	076500	000042	208.	0098.	LR	0.	0035.	0.	0000.		3254	06266
06259	FM	026000	C11332	208.	0099.	FM	614.	0001.	0.	0000.	N	3255	06267
06260	FR	030000	C12206	208.	0100.	FR	645.	0004.	0.	0000.		3256	06270
06261	LR	076500	000042	208.	0101.	LR	0.	0035.	0.	0000.		3257	06271
06262	FM	026000	C11111	208.	0102.	FM	603.	0001.	0.	0000.	SIGMA	3258	06272
06263	LR	076500	000043	208.	0103.	LR	0.	0035.	0.	0000.		3259	06273
06264	FM	026000	412141	208.	0106.	FM	643.	0007.	C	0.0000.	G SUB K, PRIME	3260	06274
06265	LR	076500	000043	208.	0107.	LR	0.	0035.	0.	0000.		3261	06275
06266	FM	026000	C03570	208.	0108.	FM	801.	0002.	0.	0000.	2	3262	06276
06267	FR	030000	C12205	208.	0109.	FR	645.	0003.	0.	0000.		3263	06277
06268	ST	060100	C12205	208.	0110.	ST	645.	0003.	0.	0000.		3264	06300
06269	LQ	056000	411614	208.	0111.	LQ	630.	0009.	C	0.0000.	2ND DERIV. OF SUM	3265	06301
06270	FM	026000	C11253	208.	0112.	FM	611.	0014.	0.	0000.	HCO/KT	3266	06302
06271	FR	030000	411612	208.	0113.	FR	630.	0007.	C	0.0000.	ROTATIONAL SUM	3267	06303
06272	ST	060100	C12204	208.	0114.	ST	645.	0004.	0.	0000.		3268	06304
06273	LQ	056000	411613	208.	0115.	LQ	630.	0008.	C	0.0000.	1ST DERIV. OF SUM	3269	06305

06306 FM	02600C C121C7	208. 0112.	FM	645. 0005.	0. 0000.	0-E	3270	06307
06307 LR	0765JC CCC04:	208. 0117.	FR	0. 0035.	0. 0000.		3271	06307
06310 FM	02600C C11281	208. 0118.	FM	614. 0000.	0. 0000.	M-1	3272	06310
06311 FA	03000C C12208	208. 0119.	FR	645. 0004.	0. 0000.		3273	06311
06312 LR	07650C CCC043	208. 0120.	LR	0. 0035.	0. 0000.		3274	06312
06313 FM	02600C 412165	208. 0121.	FM	644. 0007.	0. 0000.	G SUE IN CUE EFFECT	3275	06313
06314 FA	03000C C12205	208. 0122.	FR	645. 0003.	0. 0000.		3276	06314
06315 FA	03000G C12210	208. 0123.	FR	645. 0006.	0. 0000.		3277	06315
06316 ST	06010C C12210	208. 0124.	ST	645. 0006.	0. 0000.		3278	06316
06317 CR	05000C C11331	208. 0125.	CR	614. 0000.	0. 0000.		3279	06317
06320 FR	03000C CC3567	208. 0126.	FR	801. 0001.	0. 0000.		3280	06320
06321 ST	06010C C11331	208. 0127.	ST	614. 0000.	0. 0000.	M-1	3281	06321
06322 CR	05000G C11332	208. 0128.	CR	614. 0001.	0. 0000.		3282	06322
06323 FR	03000G CC3567	208. 0129.	FR	801. 0001.	0. 0000.		3283	06323
06324 ST	06010C C11332	208. 0130.	ST	614. 0001.	0. 0000.	M	3284	06324
06325 CR	05000C C11333	208. 0131.	CR	614. 0002.	0. 0000.		3285	06325
06326 FR	03000G CC3567	208. 0132.	FR	801. 0001.	0. 0000.		3286	06326
06327 ST	06010C C11233	208. 0133.	ST	614. 0002.	0. 0000.	M+1	3287	06327
06330 TX	200001 406242	208. 0134.	TX	2. 0072.	0. 0001.		3288	06330
06331 LQ	05600C C12210	208. 0135.	LQ	645. 0006.	0. 0000.		3289	06331
06332 FM	02600G C11116	208. 0149.	FM	603. 0006.	0. 0000.	T SQUARED	3290	06332
06333 ST	06010C C11321	208. 0150.	ST	613. 0002.	0. 0000.	Q DUE PRIME TH1..ROT	3291	06333
06334 ZS	060000 C12210	208. 0151.	ZS	645. 0004.	0. 0000.		3292	06334
06335 T	002000 CC6102	208. 0152.	T	209. 0000.	0. 0000.	CALC TOTAL Q ROTAT.	3293	06335
06336	000007 CCC000	208. 0153.		0. 0000.	0. 0007.		3294	06336

57

06402 CR	050000 103712	209. 0000.	CR	802. 0044.	R	0. 0000.	LAMBDA	3330	06402
06403 FS	030200 003561'	209. 0001.	FS	800. 0010.		0. 0000.	2.98	3331	06403
06404 TP	012000 006426	209. 0002.	TP	2. 0020.		0. 0000.	GAMMA STATE	3332	06404
06405 CR	050000 103712	209. 0003.	CR	802. 0044.	R	0. 0000.		3333	06405
06406 FS	030200 003547	209. 0004.	FS	800. 0000.		0. 0000.		3334	06406
06407 TP	012000 006414	209. 0005.	TP	2. 0010.		0. 0000.	DELTA STATE	3335	06407
06410 CS	050200 011230	209. 0006.	CS	610. 0005.		0. 0000.	E TO - GAMMA SIGMA 1	3336	06410
06411 FA	030000 011317	209. 0007.	FR	613. 0000.		0. 0000.	INTERNAL ROT. Q	3337	06411
06412 ST	060100 011331	209. 0008.	ST	614. 0000.		0. 0000.	TOTAL SUM FOR PI STAT	3338	06412
06413 T	002000 006750	209. 0009.	T	213. 0000.		0. 0000.	SET UP JCI+1J + 1/4	3339	06413
06414 LQ	056000 011230	209. 0010.	LQ	610. 0005.		0. 0000.	E-TO - G.S. 1	3340	06414
06415 FM	026000 003570	209. 0011.	FM	801. 0002.		0. 0000.	2	3341	06415
06416 ST	060100 011230	209. 0012.	ST	610. 0005.		0. 0000.		3342	06416
06417 LQ	056000 011227	209. 0013.	LQ	610. 0004.		0. 0000.	E TO - G.S. 2	3343	06417
06420 FM	026000 003570	209. 0014.	FM	801. 0002.		0. 0000.	2	3344	06420
06421 FA	030000 011230	209. 0015.	FR	610. 0005.		0. 0000.		3345	06421
06422 CHS	076000 000002	209. 0016.	CHS	0. 0000.		0. 0000.		3346	06422
06423 FA	030000 011317	209. 0017.	FR	613. 0000.		0. 0000.	INTERNAL ROT. Q	3347	06423

06424	ST	060100	011331	209.	0018.	ST	614.	0000.	0.	0000.	TOTAL SUM FOR DELTA	3348	06424
06425	T	002000	006755	209.	0019.	T	213.	0005.	0.	0000.	SET UP $J(J+1)$ + 1/4	3349	06425
06426	LQ	056000	011230	209.	0020.	LQ	610.	0005.	0.	0000.	E TO - G.S. 1	3350	06426
D6427	FM	026000	003570	209.	0021.	FM	901.	0002.	0.	0000.	2	3351	06427
06430	ST	060100	011230	209.	0022.	ST	610.	0005.	0.	0000.		3352	06430
06431	LQ	056000	011227	209.	0023.	LQ	610.	0004.	0.	0000.	E TO - G.S. 2	3353	06431
06432	FM	026000	003577	209.	0024.	FM	801.	0009.	0.	0000.	4	3354	06432
06433	ST	060100	011227	209.	0025.	ST	610.	0004.	0.	0000.		3355	06433
06434	LQ	056000	011226	209.	0026.	LQ	610.	0003.	0.	0000.	E TO - G.S. 3	3356	06434
06435	FM	026000	003600	209.	0027.	FM	801.	0010.	0.	0000.	3	3357	06435
06436	CHS	076000	000002	209.	0028.	CHS	0.	0000.	0.	0000.		3358	06436
06437	FS	030200	011227	209.	0029.	FS	610.	0004.	0.	0000.		3359	06437
06440	FS	030200	011230	209.	0030.	FS	610.	0005.	0.	0000.		3360	06440
06441	FR	030000	011317	209.	0031.	FR	613.	0000.	0.	0000.	INTERNAL ROT. Q	3361	06441
06442	ST	060100	011331	209.	0032.	ST	614.	0000.	0.	0000.	TOTAL GAMMA STATE SUM	3362	06442
06443	T	002000	006762	209.	0032.1	T	213.	0010.	0.	0000.	SET UP $J(J+1)$ + 1/4	3363	06443
06444	CR	050000	103734	209.	0033.	CR	802.	0062.	R	0.	SPIN COUPLING R	3364	06444
06445	TM	-012000	006475	209.	0034.	TM	2.	0059.	0.	0000.	INVERTED STATE, J=3/2	3365	06445
06446	CR	050000	011432	209.	0036.	CR	617.	0000.	0.	0000.	$J(J+1)$ + 1/4	3366	06446
06447	FS	030200	011172	209.	0037.	FS	608.	0000.	0.	0000.	LAMBDA SQ.	3367	06447
06450	ST	060100	011332	209.	0038.	ST	614.	0001.	0.	0000.		3368	06450
06451	CR	050000	011432	209.	0039.	CR	617.	0000.	0.	0000.	$J(J+1)$ + 1/4	3369	06451
06452	FR	030000	011202	209.	0040.	FR	609.	0008.	0.	0000.		3370	06452
06453	TSX	007400	403516	209.	0041.	TSX	704.	0000.	C	0.	SQ. ROOT	3371	06453
06454	HP	042000	000000	209.	0042.	HP	0.	0000.	0.	0000.		3372	06454
06455	CHS	076000	000002	209.	0043.	CHS	0.	0000.	0.	0000.		3373	06455
06456	FR	030000	011332	209.	0044.	FR	614.	0001.	0.	0000.	$J(J+1)$ + 1/4	3374	06456
06457	LR	076500	000043	209.	0045.	LR	0.	0035.	0.	0000.		3375	06457
06460	FM	026000	011110	209.	0046.	FM	603.	0000.	0.	0000.	B EFFECTIVE	3376	06460
06461	ST	060100	011332	209.	0047.	ST	614.	0001.	0.	0000.		3377	06461
06462	CR	050000	011432	209.	0048.	CR	617.	0000.	0.	0000.	$J(J+1)$ + 1/4	3378	06462
06463	FS	030200	003607	209.	0049.	FS	801.	0017.	0.	0000.	1/4	3379	06463
06464	ST	060100	011333	209.	0050.	ST	614.	0002.	0.	0000.		3380	06464
06465	LR	076500	000043	209.	0051.	LR	0.	0035.	0.	0000.		3381	06465
06466	FM	026000	011333	209.	0052.	FM	614.	0002.	0.	0000.		3382	06466
06467	LR	076500	000043	209.	0053.	LR	0.	0035.	0.	0000.		3383	06467
06470	FM	026000	103720	209.	0054.	FM	802.	0050.	R	0.	ROTATIONAL O	3384	06470
06471	CHS	076000	000002	209.	0055.	CHS	0.	0000.	0.	0000.		3385	06471
06472	FR	030000	011332	209.	0056.	FR	614.	0001.	0.	0000.		3386	06472
06473	ST	060100	011332	209.	0057.	ST	614.	0001.	0.	0000.	BETA, NORMAL	3387	06473
06474	T	002000	006523	209.	0058.	T	2.	0079.	0.	0000.		3388	06474
06475	CR	050000	011433	209.	0059.	CR	617.	0001.	0.	0000.	$J(J+1)$ + 1/4	3389	06475
06476	FS	030200	011172	209.	0060.	FS	608.	0000.	0.	0000.	LAMBDA SQ.	3390	06476
06477	ST	060100	011332	209.	0061.	ST	614.	0001.	0.	0000.		3391	06477
06500	CR	050000	011433	209.	0062.	CR	617.	0001.	0.	0000.	$J(J+1)$ + 1/4	3392	06500
06501	FR	030000	011202	209.	0063.	FR	608.	0008.	0.	0000.		3393	06501
06502	TSX	007400	403516	209.	0064.	TSX	704.	0000.	C	0.	SQ. ROOT	3394	06502
06503	HP	042000	000000	209.	0065.	HP	0.	0000.	0.	0000.		3395	06503
06504	CHS	076000	000002	209.	0066.	CHS	0.	0000.	0.	0000.		3396	06504
06505	FR	030000	011332	209.	0067.	FR	614.	0001.	0.	0000.		3397	06505
06506	LR	076500	000043	209.	0068.	LR	0.	0035.	0.	0000.		3398	06506
06507	FM	026000	011110	209.	0069.	FM	603.	0000.	0.	0000.	B EFFECTIVE	3399	06507
06510	ST	060100	011332	209.	0070.	ST	614.	0001.	0.	0000.		3400	06510
06511	CR	050000	011433	209.	0071.	CR	617.	0001.	0.	0000.	$J(J+1)$ + 1/4	3401	06511
06512	FS	030200	003607	209.	0072.	FS	801.	0017.	0.	0000.	1/4	3402	06512

06513	ST	060100	011333	209.	0072.	ST	614.	0002.	0.	0000.	3403	06513	
06514	LR	076500	000043	209.	0074.	LR	0.	0035.	0.	0000.	3404	06514	
06515	FM	026000	011333	209.	0074.1	FM	614.	0002.	0.	0000.	3405	06515	
06516	LR	076500	000043	209.	0074.2	LR	0.	0035.	0.	0000.	3406	06516	
06517	FM	026000	103720	209.	0075.	FM	802.	0050.	R	0.0000.	ROTATIONAL 0	3407	06517
06520	CHS	076000	000002	209.	0076.	CHS	0.	0000.	0.	0000.	3408	06520	
06521	FA	030000	011332	209.	0077.	FA	614.	0001.	0.	0000.	3409	06521	
06522	ST	060100	011332	209.	0078.	ST	614.	0001.	0.	0000.	3410	06522	
06523	CA	050000	011332	209.	0079.	CA	614.	0001.	0.	0000.	3411	06523	
06524	FD	024000	002005	209.	0080.	FD	1.	0029.	0.	0000.	3412	06524	
06525	FM	026000	003571	209.	0081.	FM	801.	0003.	0.	0000.	3413	06525	
06526	ST	060100	011332	209.	0082.	ST	614.	0001.	0.	0000.	3414	06526	
06527	CA	050000	011173	209.	0083.	CA	606.	0001.	0.	0000.	2 LAMBDA + 1	3415	06527
06530	FO	024000	003577	209.	0084.	FO	801.	0009.	0.	0000.	3416	06530	
06531	FM	026000	011111	209.	0085.	FM	603.	0001.	0.	0000.	SIGMA	3417	06531
06532	FA	030000	011332	209.	0086.	FA	614.	0001.	0.	0000.	CHC/KTBETA	3418	06532
06533	TSX	007400	403410	209.	0087.	TSX	703.	0000.	C	0.0000.	EXPONENTIAL	3419	06533
06534	HP	042000	000000	209.	0088.	HP	0.	0000.	0.	0000.	3420	06534	
06535	ST	060100	011333	209.	0089.	ST	614.	0002.	0.	0000.	E TO BETA	3421	06535
06536	LR	076500	000043	209.	0090.	LR	0.	0035.	0.	0000.	3422	06536	
06537	FM	026000	011331	209.	0091.	FM	614.	0000.	0.	0000.	TOTAL SUM, ROTATION	3423	06537
06540	LR	076500	000043	209.	0092.	LR	0.	0035.	0.	0000.	3424	06540	
06541	FM	026000	003570	209.	0093.	FM	801.	0002.	0.	0000.	3425	06541	
06542	ST	060100	011117	209.	0094.	ST	603.	0007.	0.	0000.	Q, ROTATION, TOTAL	3426	06542
06543	T	002000	006560	209.	0095.	T	210.	0000.	0.	0000.	CALC. Q PRIME, ROT.	3427	06543

06560	CR	050000	103712	210.	0000.	CR	802.	0044.	R	0.0000.	LAMBDA	3440	06560
06561	FS	030200	003561	210.	0001.	FS	800.	0010.	0.	0000.	2.98	3441	06561
06562	TP	012000	006606	210.	0002.	TP	2.	0022.	0.	0000.	GAMMA STATE	3442	06562
06563	CR	050000	103712	210.	0003.	CR	802.	0044.	R	0.0000.	3443	06563	
06564	FS	030200	003547	210.	0004.	FS	800.	0000.	0.	0000.	1.98	3444	06564
06565	TP	012000	006573	210.	0005.	TP	2.	0011.	0.	0000.	DELTA STATE	3445	06565
06566	CR	050000	011411	210.	0006.	CR	615.	0038.	0.	0000.	3446	06566	
06567	ST	060100	011412	210.	0007.	ST	615.	0039.	0.	0000.	T G.S. SUM	3447	06567
06570	CR	050000	011417	210.	0008.	CR	615.	0044.	0.	0000.	3448	06570	
06571	ST	060100	011413	210.	0009.	ST	615.	0040.	0.	0000.	T SQ. G.S. SUM	3449	06571
06572	T	002000	006630	210.	0010.	T	2.	0038.	0.	0000.	3450	06572	
06573	CR	050000	011411	210.	0011.	CR	615.	0038.	0.	0000.	3451	06573	
06574	FA	030000	011410	210.	0012.	FA	615.	0037.	0.	0000.	3452	06574	
06575	LP	076500	000043	210.	0013.	LR	0.	0035.	0.	0000.	3453	06575	
06576	FM	026000	003570	210.	0014.	FM	801.	0002.	0.	0000.	2	3454	06576
06577	ST	060100	011412	210.	0015.	ST	615.	0039.	0.	0000.	T G.S. SUM	3455	06577
06600	CR	050000	011417	210.	0016.	CR	615.	0044.	0.	0000.	3456	06600	
06601	FA	030000	011416	210.	0017.	FA	615.	0043.	0.	0000.	3457	06601	
06602	LR	076500	000043	210.	0018.	LR	0.	0025.	0.	0000.	3458	06602	
06603	FM	026000	003570	210.	0019.	FM	801.	0002.	0.	0000.	2	3459	06603
06604	ST	060100	011413	210.	0020.	ST	615.	0040.	0.	0000.	T SQ. G.S. SUM	3460	06604
06605	T	002000	006630	210.	0021.	T	2.	0038.	0.	0000.	3461	06605	
06606	LQ	056000	011407	210.	0022.	LQ	615.	0036.	0.	0000.	3462	06606	
06607	FM	026000	003600	210.	0023.	FM	801.	0010.	0.	0000.	3	3463	06607
06610	ST	060100	011407	210.	0024.	ST	515.	0036.	0.	0000.	3464	06610	
06611	LQ	056000	011410	210.	0025.	LQ	615.	0037.	0.	0000.	3465	06611	
06612	FM	026000	003577	210.	0026.	FM	801.	0009.	0.	0000.	4	3466	06612
06613	FA	030000	011407	210.	0027.	FA	615.	0036.	0.	0000.	3467	06613	

-09

06614	FR	030000	011411	210.	0028.	FR	615.	0038.	0.	0000.	3468	06614
06615	FR	030000	011411	210.	0028.1	FR	615.	0038.	0.	0000.	3469	06615
06616	ST	060100	011412	210.	0029.	ST	615.	0039.	0.	0000.	3470	06616
06617	LQ	056000	011415	210.	0030.	LQ	615.	0042.	0.	0000.	3471	06617
06620	FM	026000	003600	210.	0031.	FM	801.	0010.	0.	0000.	3472	06620
06621	ST	060100	011415	210.	0032.	ST	615.	0042.	0.	0000.	3473	06621
06622	LQ	056000	011416	210.	0033.	LQ	615.	0043.	0.	0000.	3474	06622
06623	FM	026000	003577	210.	0034.	FM	801.	0009.	0.	0000.	3475	06623
06624	FR	030000	011415	210.	0035.	FR	615.	0042.	0.	0000.	3476	06624
06625	FR	030000	011417	210.	0036.	FR	615.	0044.	0.	0000.	3477	06625
06626	FR	030000	011417	210.	0036.1	FR	615.	0044.	0.	0000.	3478	06626
06627	ST	060100	011413	210.	0037.	ST	615.	0040.	0.	0000.	3479	06627
06630	LQ	056000	011412	210.	0038.	LQ	615.	0039.	0.	0000.	3480	06630
06631	FM	026000	002005	210.	0039.	FM	1.	0029.	0.	0000.	3481	06631
06632	ST	060100	011412	210.	0040.	ST	615.	0039.	0.	0000.	3482	06632
06633	LQ	056000	011413	210.	0041.	LQ	615.	0040.	0.	0000.	3483	06633
06634	FM	026000	003005	210.	0042.	FM	1.	0039.	0.	0000.	3484	06634
06635	LR	076500	000043	210.	0043.	LR	0.	0035.	0.	0000.	3485	06635
06636	FM	026000	002005	210.	0044.	FM	1.	0029.	0.	0000.	3486	06636
06637	ST	060100	011413	210.	0045.	ST	615.	0040.	0.	0000.	3487	06637
06640	T	002000	006654	210.	0046.	T	211.	0000.	0.	0000.	3488	06640
06654	CR	050000	011173	211.	0000.	CR	608.	0001.	0.	0000.	3500	06654
06655	FO	024000	003577	211.	0001.	FO	801.	0009.	0.	0000.	3501	06655
06656	FM	026000	011111	211.	0002.	FM	603.	0001.	0.	0000.	3502	06656
06657	FR	030000	011332	211.	0003.	FR	614.	0001.	0.	0000.	3503	06657
06660	LR	076500	000043	211.	0004.	LR	0.	0035.	0.	0000.	3504	06660
06661	FM	026000	002005	211.	0005.	FM	1.	0029.	0.	0000.	3505	06661
06662	ST	060100	011343	211.	0006.	ST	615.	0000.	0.	0000.	3506	06662
06663	LR	076500	000043	211.	0007.	LR	0.	0035.	0.	0000.	3507	06663
06664	FM	026000	011331	211.	0008.	FM	614.	0000.	0.	0000.	3508	06664
06665	ST	060100	011344	211.	0009.	ST	615.	0001.	0.	0000.	3509	06665
06666	LR	076500	000043	211.	0010.	LR	0.	0035.	0.	0000.	3510	06666
06667	FM	026000	011343	211.	0011.	FM	615.	0000.	0.	0000.	3511	06667
06670	ST	060100	011345	211.	0012.	ST	615.	0002.	0.	0000.	3512	06670
06671	CR	050000	011320	211.	0013.	CR	613.	0001.	0.	0000.	3513	06671
06672	FS	030200	011412	211.	0014.	FS	615.	0039.	0.	0000.	3514	06672
06673	ST	060100	011346	211.	0015.	ST	615.	0003.	0.	0000.	3515	06673
06674	FR	030000	011344	211.	0016.	FR	615.	0001.	0.	0000.	3516	06674
06675	LR	076500	000043	211.	0017.	LR	0.	0035.	0.	0000.	3517	06675
06676	FM	026000	011333	211.	0018.	FM	614.	0002.	0.	0000.	3518	06676
06677	LR	076500	000043	211.	0019.	LR	0.	0035.	0.	0000.	3519	06677
06700	FM	026000	003570	211.	0020.	FM	801.	0002.	0.	0000.	3520	06700
06701	ST	060100	011120	211.	0021.	ST	603.	0008.	0.	0000.	3521	06701
06702	T	002000	006712	211.	0022.	T	212.	0000.	0.	0000.	3522	06702
06712	CR	050000	011321	212.	0000.	CR	613.	0002.	0.	0000.	3530	06712
06713	FS	030200	011413	212.	0001.	FS	615.	0040.	0.	0000.	3531	06713
06714	ST	060100	011425	212.	0002.	ST	616.	0000.	0.	0000.	3532	06714
06715	LQ	056000	011343	212.	0003.	LQ	615.	0000.	0.	0000.	3533	06715
06716	FM	026000	003570	212.	0004.	FM	801.	0002.	0.	0000.	3534	06716
06717	LR	076500	000043	212.	0005.	LR	0.	0035.	0.	0000.	3535	06717
06720	FM	026000	011346	212.	0006.	FM	615.	0003.	0.	0000.	3536	06720
06721	FR	030000	011345	212.	0007.	FR	615.	0002.	0.	0000.	3537	06721

06722	FA	030000	011425	212.	0008.	FR	61e.	0000.	0.	0000.		3538	06722	
06723	LR	076500	000043	212.	0009.	LR	0.	0035.	0.	0000.		3539	06723	
06724	FM	026000	011333	212.	0010.	FM	614.	0002.	0.	0000.		3540	06724	
06725	LR	076500	000043	212.	0011.	LR	0.	0035.	0.	0000.	EXPONENTIAL	3541	06725	
06726	FM	026000	003570	212.	0012.	FM	801.	0002.	0.	0000.	2	3542	06726	
06727	ST	060100	011121	212.	0013.	ST	603.	0009.	0.	0000.	Q DUBL PRIME ROT.	3543	06727	
06730	SQX	-053400	406737	212.	0014.	SQX	2.	0018.	C	0.	0000.	3544	06730	
06731	ZS	060000	412214	212.	0015.	ZS	645.	0010.	C	0.	0000.	CLEAR TEMPORARY STOR	3545	06731
06732	TX	200001	406731	212.	0016.	TX	2.	0015.	C	0.	0001.	3546	06732	
06733	CR	050000	011117	212.	0016.1	CR	603.	0007.	0.	0000.	Q, ROTATION	3547	06733	
06734	FO	024000	003703	212.	0016.2	FO	802.	0037.	0.	0000.	SYMMETRY NUMBER	3548	06734	
06735	SQ	-060000	011117	212.	0016.3	SQ	603.	0007.	0.	0000.	CORR. Q, ROTATION	3549	06735	
06736	T	002000	004456	212.	0017.	T	105.	0000.	0.	0000.	CALC. ELECTRONIC FNS	3550	06736	
06737		001022	000000	212.	0018.		0.	0000.	0.	0530.		3551	06737	

06750	CA	050000	003567	213.	0000.	CA	801.	0001.	0.	0000.	1	3560	06750
06751	ST	060100	011432	213.	0001.	ST	617.	0000.	0.	0000.		3561	06751
06752	CA	050000	003577	213.	0002.	CA	801.	0009.	0.	0000.	4	3562	06752
06753	ST	060100	011433	213.	0003.	ST	617.	0001.	0.	0000.		3563	06753
06754	T	002000	006444	213.	0004.	T	209.	0033.	0.	0000.	CALC. BETA	3564	06754
06755	CA	050000	003577	213.	0005.	CA	801.	0009.	0.	0000.	4	3565	06755
06756	ST	060100	011432	213.	0006.	ST	617.	0000.	0.	0000.		3566	06756
06757	CA	050000	003630	213.	0007.	CA	801.	0034.	0.	0000.	9	3567	06757
06760	ST	060100	011433	213.	0008.	ST	617.	0001.	0.	0000.		3568	06760
06761	T	002000	006444	213.	0009.	T	209.	0033.	0.	0000.	CALC. BETA	3569	06761
06762	CA	050000	003630	213.	0010.	CA	801.	0034.	0.	0000.	9	3570	06762
06763	ST	060100	011432	213.	0011.	ST	617.	0000.	0.	0000.		3571	06763
06764	CA	050000	003610	213.	0012.	CA	801.	0018.	0.	0000.	16	3572	06764
06765	ST	060100	011433	213.	0013.	ST	617.	0001.	0.	0000.		3573	06765
06766	T	002000	006444	213.	0014.	T	209.	0033.	0.	0000.	CALC. BETA	3574	06766

06774	CA	050000	103644	300.	0000.	CA	802.	0006.	A	0.	0000.	MULTIPLICITY	3580	06774
06775	FS	030200	003600	300.	0001.	FS	901.	0010.	0.	0000.	3	3581	06775	
06776	TNZ	-010000	007047	300.	0002.	TNZ	2.	0041.	0.	0000.	NON-TRIPLET STATE	3582	06776	
06777	CA	050000	103724	300.	0003.	CA	802.	0042.	A	0.	0000.	A	3583	06777
07000	FO	024000	011110	300.	0004.	FO	803.	0000.	0.	0000.	B SUB V	3584	07000	
07001	SQ	-060000	011437	300.	0005.	SQ	618.	0000.	0.	0000.	Y	3585	07001	
07002	CA	050000	003570	300.	0006.	CA	801.	0002.	0.	0000.	2	3586	07002	
07003	FO	024000	011437	300.	0007.	FO	618.	0000.	0.	0000.		3587	07003	
07004	SQ	-060000	011440	300.	0008.	SQ	618.	0001.	0.	0000.		3588	07004	
07005	CA	050000	011440	300.	0009.	CA	618.	0061.	0.	0000.		3589	07005	
07006	FO	024000	103712	300.	0010.	FO	902.	0044.	A	0.	0000.	LAM80A	3590	07006
07007	SQ	-060000	011440	300.	0011.	SQ	518.	0001.	0.	0000.	2B-A LAM80A	3591	07007	
07010	CA	050000	003567	300.	0012.	CA	801.	0001.	0.	0000.	1	3592	07010	
07011	FS	030200	011440	300.	0013.	FS	618.	0001.	0.	0000.		3593	07011	
07012	LR	076500	000043	300.	0014.	LR	0.	0035.	0.	0000.		3594	07012	
07013	FM	026000	011111	300.	0015.	FM	603.	0001.	0.	0000.	SIGMA FOR F1	3595	07013	
07014	ST	060100	011441	300.	0016.	ST	618.	0002.	0.	0000.		3596	07014	
07015	CA	050000	003567	300.	0017.	CA	901.	0001.	0.	0000.		3597	07015	
07016	FM	030000	011440	300.	0018.	FM	618.	0001.	0.	0000.		3598	07016	
07017	LR	076500	000043	300.	0019.	LR	0.	0035.	0.	0000.		3599	07017	
07020	FM	026000	011111	300.	0020.	FM	603.	0001.	0.	0000.	SIGMA FOR F3	3600	07020	
07021	ST	060100	011443	300.	0021.	ST	618.	0004.	0.	0000.	SIGMA FOR F SUB 3	3601	07021	

07050	FM	026000	003570	300.	0042.	FM	801.	0002.	R	0.	0000.	2		3624	07050
07051	ST	060100	103644	300.	0043.	ST	802.	0003.	R	0.	0000.			3625	07051
07052	SE	076000	000142	300.	0044.	SE	0.	0093.		0.	0000.	TUR11 OH LIGHT NO. 2		3626	07052
07053	T	002000	004355	300.	0045.	T	103.	0017.		0.	0000.	CALC ROTATION PART.FIJ		3627	07053
07022	CR	050000	011111	300.	0021.1	CR	603.	0001.		0.	0000.			3602	07022
07023	ST	060100	011442	300.	0021.2	ST	618.	0003.		0.	0000.	SIGMA FOR F SUB.2		3603	07023
07024	CR	050000	011437	300.	0022.	CR	618.	0000.		0.	0000.	Y		3604	07024
07025	FS	030200	003567	300.	0023.	FS	801.	0001.		0.	0000.	Y-1		3605	07025
07026	LR	076500	000043	300.	0024.	LR	0.	0035.		0.	0000.			3606	07026
07027	FM	026000	011437	300.	0025.	FM	618.	0000.		0.	0000.	Y		3607	07027
07030	ST	060100	011444	300.	0026.	ST	618.	0005.		0.	0000.	YCY-12		3608	07030
07031	LR	076500	000043	300.	0027.	LR	0.	0035.		0.	0000.			3609	07031
07032	FM	026000	011172	300.	0028.	FM	608.	0000.		0.	0000.	LAM80A 50		3610	07032
07033	FS	030200	003617	300.	0029.	FS	801.	0025.		0.	0000.	4/9		3611	07033
07034	ST	050100	011445	300.	0030.	ST	618.	0006.		0.	0000.	C3Z1>Z2 FOR J=0		3612	07034
07035	CR	050000	011437	300.	0031.	CR	618.	0000.		0.	0000.	Y		3613	07035
07036	FS	030200	003577	300.	0032.	FS	801.	0009.		0.	0000.	4		3614	07036
07037	LR	076500	000043	300.	0033.	LR	0.	0035.		0.	0000.			3615	07037
07040	FM	026000	011437	300.	0034.	FM	618.	0000.		0.	0000.			3616	07040
07041	ST	060100	011446	300.	0035.	ST	618.	0007.		0.	0000.	YCY-40		3617	07041
07042	LR	076500	000043	300.	0036.	LR	0.	0835.		0.	0000.			3618	07042
07043	FM	026000	011172	300.	0037.	FM	608.	0000.		0.	0000.			3619	07043
07044	FA	030000	003616	300.	0038.	FA	801.	0024.		0.	0000.	4/3		3620	07044
07045	ST	050100	011447	300.	0039.	ST	618.	0008.		0.	0000.	Z 1. FOR J=0		3621	07045
07046	T	002000	007070	300.	0040.	T	301.	0000.		0.	0000.	CALC BETA		3622	07046
07047	LQ	056000	103644	300.	0041.	LQ	302.	0006.	R	0.	0000.	MULTIPLICITY		3623	07047

07070	CA	050000	103712	301.	0000.	CA	802.	0044.	R	0.	0000.	LAME0A		3640	07070
07071	FS	030200	003561	301.	0001.	FS	800.	0010.		0.	0000.	2.98		3641	07071
07072	TP	012000	007260	301.	0002.	TP	2.	0113.		0.	0000.	GAMMA STATE		3642	07072
07073	CA	050000	103712	301.	0003.	CA	802.	0044.	R	0.	0000.	LAMB0A		3643	07073
07074	FS	030200	003547	301.	0004.	FS	800.	0000.		0.	0000.	1.98		3644	07074
07075	TP	012000	007162	301.	0005.	TP	2.	0054.		0.	0000.	DELTA STATE		3645	07075
07076	CA	050000	103734	301.	0006.	CA	802.	0062.	R	0.	0000.	A		3646	07076
07077	TM	-012000	007126	301.	0007.	TM	2.	0027.		0.	0000.	INVERTED STATE		3647	07077
07100	CA	050000	011447	301.	0008.	CA	618.	0009.	C	0.	0000.	Z ONE		3648	07100
07101	TSX	007400	403516	301.	0009.	TSX	704.	0009.	C	0.	0000.	SQ ROOT		3649	07101
07102	H	000000	000000	301.	0010.	H	0.	0000.		0.	0000.			3650	07102
07103	CHS	076000	000002	301.	0011.	CHS	0.	0000.		0.	0000.			3651	07103
07104	ST	060100	011452	301.	0012.	ST	619.	0001.		0.	0000.			3652	07104
07105	CS	050200	011445	301.	0013.	CS	618.	0006.		0.	0000.			3653	07105
07106	FO	024000	011447	301.	0014.	FO	618.	0008.		0.	0000.			3654	07106
07107	FM	026000	003570	301.	0015.	FM	801.	0002.		0.	0000.	2		3655	07107
07110	FO	024000	003600	301.	0016.	FO	801.	0010.		0.	0000.	3		3656	07110
07111	SQ	-060000	011453	301.	0017.	SQ	619.	0002.		0.	0000.			3657	07111
07112	LQ	056000	003607	301.	0018.	LQ	801.	0017.		0.	0000.	1/4		3658	07112
07113	FM	026000	003607	301.	0019.	FM	801.	0017.		0.	0000.			3659	07113
07114	LR	076500	000043	301.	0020.	LR	0.	0035.		0.	0000.			3660	07114
07115	FM	1026000	103720	301.	0021.	FM	802.	0050.	R	0.	0000.			3661	07115
07116	ST	060100	011454	301.	0021.1	ST	619.	0003.		0.	0000.			3662	07116
07117	CR	050000	011453	301.	0022.	CR	619.	0002.		0.	0000.			3663	07117
07120	FR	030000	011452	301.	0023.	FR	619.	0001.		0.	0000.			3664	07120
07121	LR	076500	000043	301.	0024.	LR	0.	0035.		0.	0000.			3665	07121
07122	FM	026000	011441	301.	0025.	FM	618.	0002.		0.	0000.	B EFFECTIVE		3666	07122

07123	FS	030200	011454	301.	0025.1	FS	619.	0000.	0.	0000.		3667	07123	
07124	ST	060100	011451	301.	0026.	ST	619.	0000.	0.	0000.	BETA, NORMAL CJ=0	3668	07124	
07125	T	002000	007354	301.	0028.1	T	2.	0172.	0.	0000.	CALC. E TO BETA	3669	07125	
07126	LQ	056000	003612	301.	0027.	LQ	801.	0020.	0.	0000.	81x16	3670	07126	
07127	FM	026000	103720	301.	0028.	FM	802.	0050.	R	0.	0000.	0	3671	07127
07130	ST	060100	011452	301.	0029.	ST	619.	0001.	0.	0000.		3672	07130	
07131	CR	050000	011445	301.	0030.	CR	618.	0006.	0.	0000.		3673	07131	
07132	FS	030200	003605	301.	0031.	FS	801.	0015.	0.	0000.	12	3674	07132	
07133	LR	076500	000043	301.	0032.	LR	0.	0035.	0.	0000.		3675	07133	
07134	FM	026000	003574	301.	0033.	FM	801.	0002.	0.	0000.	2	3676	07134	
07135	ST	060100	011453	301.	0034.	ST	619.	0002.	0.	0000.		3677	07135	
07136	CR	050000	011447	301.	0035.	CR	618.	0003.	0.	0000.		3678	07136	
07137	FR	030000	003606	301.	0036.	FR	801.	0016.	0.	0000.	24	3679	07137	
07140	LR	076500	000043	301.	0037.	LR	0.	0035.	0.	0000.		3680	07140	
07141	FM	026000	003600	301.	0038.	FM	801.	0010.	0.	0000.	3	3681	07141	
07142	ST	060100	011454	301.	0039.	ST	619.	0003.	0.	0000.		3682	07142	
07143	TS	050200	011453	301.	0040.	TS	619.	0002.	0.	0000.		3683	07143	
07144	FO	024000	011454	301.	0041.	FO	619.	0003.	0.	0000.		3684	07144	
07145	SQ	-060000	011453	301.	0042.	SQ	619.	0002.	0.	0000.		3685	07145	
07146	CR	050000	011447	301.	0043.	CR	618.	0008.	0.	0000.		3686	07146	
07147	FR	030000	003606	301.	0044.	FR	801.	0016.	0.	0000.	24	3687	07147	
07150	TSX	007400	403516	301.	0045.	TSX	704.	0000.	C	0.	0000.	SQ. ROOT	3688	07150
07151	H	000000	000000	301.	0046.	H	0.	0000.	0.	0000.		3689	07151	
07152	CHS	076000	000002	301.	0047.	CHS	0.	0000.	0.	0000.		3690	07152	
07153	FR	030000	011453	301.	0048.	FR	619.	0002.	0.	0000.		3691	07153	
07154	FR	030000	003602	301.	0049.	FR	801.	0012.	0.	0000.	6	3692	07154	
07155	LR	076500	000043	301.	0050.	LR	0.	0035.	0.	0000.		3693	07155	
07156	FM	026000	011441	301.	0051.	FM	618.	0002.	0.	0000.	8 EFFECTIVE	3694	07156	
07157	FS	030200	011452	301.	0052.	FS	619.	0001.	0.	0000.		3695	07157	
07160	ST	060100	011451	301.	0053.	ST	619.	0000.	0.	0000.	BETA, INVERTED CJ=2	3696	07160	
07161	T	002000	007354	301.	0053.1	T	2.	0172.	R	0.	0000.	CALC. E TO BETA	3697	07161
07162	CR	050000	103734	301.	0054.	CR	B02.	0062.	R	0.	0000.	A	3698	07162
07163	TM	-012000	007222	301.	0055.	TM	2.	0086.	0.	0000.	INVERTED STATE	3699	07163	
07164	LQ	056000	003607	301.	0056.	LQ	801.	0017.	0.	0000.	1/4	3700	07164	
07165	FM	026000	003607	301.	0057.	FM	801.	0017.	0.	0000.		3701	07165	
07166	LR	076500	000043	301.	0058.	LR	0.	0035.	0.	0000.		3702	07166	
07167	FM	026000	103720	301.	0059.	FM	802.	0050.	R	0.	0000.	0	3703	07167
07170	ST	060100	011452	301.	0060.	ST	619.	0001.	0.	0000.		3704	07170	
07171	CR	050000	011445	301.	0061.	CR	618.	0006.	0.	0000.		3705	07171	
07172	FS	030200	003577	301.	0062.	FS	801.	0009.	0.	0000.	4	3706	07172	
07173	LR	076500	000043	301.	0062.1	LR	0.	0035.	0.	0000.		3707	07173	
07174	FM	026000	003570	301.	0063.	FM	801.	0002.	0.	0000.		3708	07174	
07175	ST	060100	011453	301.	0064.	ST	619.	0002.	0.	0000.		3709	07175	
07176	CR	050000	011447	301.	0065.	CR	619.	0008.	0.	0000.		3710	07176	
07177	FR	030000	003620	301.	0066.	FR	801.	0026.	0.	0000.	8	3711	07177	
07200	LR	076500	000042	301.	0067.	LR	0.	0035.	0.	0000.		3712	07200	
07201	FM	026000	003600	301.	0068.	FM	801.	0010.	0.	0000.	3	3713	07201	
07202	ST	060100	011454	301.	0069.	ST	619.	0003.	0.	0000.		3714	07202	
07203	CS	050200	011453	301.	0070.	CS	619.	0002.	0.	0000.		3715	07203	
07204	FO	024000	011454	301.	0071.	FO	619.	0003.	0.	0000.		3716	07204	
07205	SQ	-060000	011453	301.	0072.	SQ	619.	0002.	0.	0000.		3717	07205	
07206	CR	050000	011447	301.	0073.	CR	618.	0008.	0.	0000.		3718	07206	
07207	FR	030000	003620	301.	0074.	FR	801.	0026.	0.	0000.	8	3719	07207	
07210	TSX	007400	403516	301.	0075.	TSX	704.	0000.	C	0.	0000.	SQ. ROOT	3720	07210
07211	H	000000	000000	301.	0076.	H	0.	0000.	0.	0000.		3721	07211	

07212	CHS	076000	000002	301.	0077.	CHS	0.	0000.	0.	0000.		3722	07212	
07213	FR	030000	011453	301.	0078.	FR	619.	0002.	0.	0000.		3723	07213	
07214	FR	030000	003570	301.	0079.	FR	801.	0002.	0.	0000.	2	3724	07214	
07215	LR	076500	000043	301.	0080.	LR	0.	0035.	0.	0000.		3725	07215	
07216	FM	026000	011441	301.	0081.	FM	618.	0002.	0.	0000.	8 EFFECTIVE	3726	07216	
07217	FS	030200	011452	301.	0082.	FS	619.	0001.	0.	0000.		3727	07217	
07220	ST	060100	011451	301.	0083.	ST	619.	0000.	0.	0000.	BETA, NORMAL	3728	07220	
07221	T	002000	007354	301.	0084.	T	2.	0172.	0.	0000.	CALC. E TO BETA	3729	07221	
07222	LQ	056000	003624	301.	0085.	LQ	801.	0030.	0.	0000.	6.25	3730	07222	
07223	FM	026000	003624	301.	0087.	FM	801.	0030.	0.	0000.		3731	07223	
07224	LR	076500	000043	301.	0088.	LR	0.	0035.	0.	0000.		3732	07224	
07225	FM	026000	103720	301.	0089.	FM	802.	0050.	A	0.	0000.	0	3733	07225
07226	ST	060100	011452	301.	0090.	ST	619.	0001.	0.	0000.		3734	07226	
07227	CA	050000	011445	301.	0091.	CA	618.	0006.	0.	0000.		3735	07227	
07230	FS	030200	003606	301.	0092.	FS	801.	0016.	0.	0000.	24	3736	07230	
07231	LR	076500	000043	301.	0093.	LR	0.	0035.	0.	0000.		3737	07231	
07232	FM	026000	003570	301.	0094.	FM	801.	0002.	0.	0000.	2	3738	07232	
07233	ST	060100	011453	301.	0095.	ST	619.	0002.	0.	0000.		3739	07233	
07234	CA	050000	011447	301.	0096.	CA	618.	0008.	0.	0000.		3740	07234	
07235	FR	030000	003621	301.	0097.	FR	801.	0027.	0.	0000.	48	3741	07235	
07236	LR	076500	000043	301.	0098.	LR	0.	0035.	0.	0000.		3742	07236	
07237	FM	026000	003600	301.	0099.	FM	801.	0010.	0.	0000.	3	3743	07237	
07240	ST	060100	011454	301.	0099.1	ST	619.	0093.	0.	0000.		3744	07240	
07241	CA	050000	011453	301.	0100.	CA	619.	0002.	0.	0000.		3745	07241	
07242	FO	024000	011454	301.	0100.1	FO	619.	0003.	0.	0000.		3746	07242	
07243	SQ	-060000	011453	301.	0101.	SQ	619.	0002.	0.	0000.		3747	07243	
07244	CA	050000	011447	301.	0102.	CA	618.	0009.	0.	0000.		3748	07244	
07245	FR	030000	003621	301.	0103.	FR	801.	0027.	0.	0000.	48	3749	07245	
07246	TSX	007400	403516	301.	0104.	TSX	704.	0000.	C	0.	0000.	SQ ROOT	3750	07246
07247	H	000000	000000	301.	0105.	H	0.	0000.	0.	0000.		3751	07247	
07250	CHS	076000	000002	301.	0106.	CHS	0.	0000.	0.	0000.		3752	07250	
07251	FS	030200	011453	301.	0107.	FS	619.	0002.	0.	0000.		3753	07251	
07252	FR	030000	003605	301.	0108.	FR	801.	0015.	0.	0000.	12	3754	07252	
07253	LR	076500	000043	301.	0109.	LR	0.	0035.	0.	0000.		3755	07253	
07254	FM	026000	011441	301.	0110.	FM	618.	0002.	0.	0000.	8 EFFECTIVE	3756	07254	
07255	FS	030200	011452	301.	0111.	FS	619.	0001.	0.	0000.		3757	07255	
07256	ST	060100	011451	301.	0112.	ST	619.	0000.	0.	0000.	BETA, INVERTEO	3758	07256	
07257	T	002000	007354	301.	0112.1	T	2.	0172.	A	0.	0000.	CALC. E TO BETA	3759	07257
07260	CR	050000	103734	301.	0113.	CR	802.	0062.	A	0.	0000.	A	3760	07260
07261	TM	-012000	007317	301.	0114.	TM	2.	0143.	0.	0000.		3761	07261	
07262	CR	050000	011445	301.	0115.	CR	618.	0006.	0.	0000.		3762	07262	
07263	FS	030200	003605	301.	0116.	FS	801.	0015.	0.	0000.	12	3763	07263	
07264	LR	076500	000043	301.	0117.	LR	0.	0035.	0.	0000.		3764	07264	
07265	FM	026000	003570	301.	0118.	FM	801.	0002.	0.	0000.	2	3765	07265	
07266	ST	060100	011452	301.	0119.	ST	619.	0001.	0.	0000.		3766	07266	
07267	CR	050000	011447	301.	0120.	CR	618.	0008.	0.	0000.		3767	07267	
07270	FR	030000	003600	301.	0121.	FR	801.	0016.	0.	0000.	24	3768	07270	
07271	LR	076500	000043	301.	0122.	LR	0.	0035.	0.	0000.		3769	07271	
07272	FM	026000	003600	301.	0123.	FM	801.	0010.	0.	0000.	3	3770	07272	
07273	ST	060100	011453	301.	0124.	ST	619.	0002.	0.	0000.		3771	07273	
07274	CS	050200	011452	301.	0125.	CS	619.	0001.	0.	0000.		3772	07274	
07275	FO	024000	011452	301.	0126.	FO	618.	0002.	0.	0000.		3773	07275	
07276	SQ	-060000	011452	301.	0127.	SQ	619.	0001.	0.	0000.		3774	07276	
07277	LQ	056000	003612	301.	0128.	LQ	801.	0020.	0.	0000.	81116	3775	07277	
07300	FM	026000	103720	301.	0129.	FM	802.	0050.	A	0.	0000.	0	3776	07300

07301	CHS	076000	000002	301.	0130.	CHS	0.	0000.	0.	0000.	3777	07301	
07302	ST	060100	011454	301.	0131.	ST	619.	0003.	0.	0000.	3778	07302	
07303	CR	050000	011447	301.	0133.	CR	618.	0008.	0.	0000.	3779	07303	
07304	FR	030000	003606	301.	0134.	FR	801.	0016.	0.	0000.	3780	07304	
07305	TSX	007400	403516	301.	0135.	TSX	704.	0000.	C	0.	0000.	3781	07305
07306	H	000000	000000	301.	0136.	H	0.	0000.	0.	0000.	3782	07306	
07307	CHS	076000	000002	301.	0137.	CHS	0.	0000.	0.	0000.	3783	07307	
07310	FR	030000	011452	301.	0138.	FR	619.	0001.	0.	0000.	3784	07310	
07311	FR	030000	003602	301.	0139.	FR	801.	0012.	0.	0000.	3785	07311	
07312	LR	076500	000043	301.	0140.	LR	0.	0035.	0.	0000.	3786	07312	
07313	FM	026000	011441	301.	0141.	FM	618.	0002.	0.	0000.	3787	07313	
07314	FR	030000	011454	301.	b141.1	FR	619.	0003.	0.	0000.	3788	07314	
07315	ST	060100	011451	301.	0142.	ST	619.	0000.	0.	0000.	3789	07315	
07316	T	002000	007354	301.	0142.1	T	2.	0172.	0.	0000.	3790	07316	
07317	LQ	056000	003625	301.	0143.	LQ	801.	0031.	0.	0000.	3791	07317	
07320	FM	026000	003625	301.	0144.	FM	801.	0031.	0.	0000.	3792	07320	
07321	LR	076500	000042	301.	0145.	LR	0.	0035.	0.	0000.	3793	07321	
07322	FM	026000	103720	301.	0146.	FM	802.	0050.	R	0.	0000.	3794	07322
07323	ST	060100	011452	301.	0147.	ST	619.	0001.	0.	0000.	3795	07323	
07324	CR	050000	011445	301.	0148.	CR	618.	0006.	0.	0000.	3796	07324	
07325	FS	030200	003622	301.	0149.	FS	901.	0028.	0.	0000.	3797	07325	
07326	LR	076500	000043	301.	0150.	LR	0.	0035.	0.	0000.	3798	07326	
07327	FM	026000	003570	301.	0151.	FM	801.	0002.	0.	0000.	3799	07327	
07330	ST	060100	011453	301.	0152.	ST	619.	0002.	0.	0000.	3800	07330	
07331	CR	050000	011447	301.	0153.	CR	619.	0008.	0.	0000.	3801	07331	
07332	FR	030000	003623	301.	0154.	FR	801.	0029.	0.	0000.	3802	07332	
07333	LR	076500	000043	301.	0155.	LR	0.	0035.	0.	0000.	3803	07333	
07334	FM	026000	003600	301.	0156.	FM	801.	0010.	0.	0000.	3804	07334	
07335	ST	060100	011454	301.	0156.1	ST	619.	0003.	0.	0000.	3805	07335	
07336	CR	050000	011453	301.	0157.	CR	619.	0002.	0.	0000.	3806	07336	
07337	FO	024000	011454	301.	b157.1	FO	619.	0003.	0.	0000.	3807	07337	
07340	SQ	-060000	011453	301.	0158.	SQ	619.	0002.	0.	0000.	3808	07340	
07341	CR	050000	011447	301.	0159.	CR	618.	0008.	0.	0000.	3809	07341	
07342	FR	030200	003623	301.	0160.	FR	801.	0029.	0.	0000.	3810	07342	
07343	TSX	007400	403516	301.	0161.	TSX	704.	0000.	C	0.	0000.	3811	07343
07344	H	000000	000000	301.	0162.	H	0.	0000.	0.	0000.	3812	07344	
07345	CHS	076000	000002	301.	b163.	CHS	0.	0000.	0.	0000.	3813	07345	
07346	FS	030200	011453	301.	0164.	FS	619.	0002.	0.	0000.	3814	07346	
07347	FR	030000	003626	301.	0165.	FR	801.	0032.	0.	0000.	3815	07347	
07350	LR	076500	000043	301.	0166.	LR	0.	0035.	0.	0000.	3816	07350	
07351	FM	026000	011441	301.	0167.	FM	618.	0002.	0.	0000.	3817	07351	
07352	FS	030200	011452	301.	0168.	FS	619.	0001.	0.	0000.	3818	07352	
07353	ST	060100	011451	301.	0171.	ST	619.	0000.	0.	0000.	3819	07353	
07354	CR	050000	011451	301.	0172.	CR	619.	0000.	0.	0000.	3820	07354	
07355	TSX	007400	403410	301.	0173.	TSX	703.	0000.	C	0.	0000.	3821	07355
07356	HP	042000	000000	301.	0174.	HP	0.	0000.	0.	0000.	3822	07356	
07357	ST	060100	011452	301.	0175.	ST	619.	0001.	0.	0000.	3823	07357	
07360	LQ	056000	011451	301.	0176.	LQ	619.	0000.	0.	0000.	3824	07360	
07361	FM	026000	002005	301.	0177.	FM	1.	0029.	0.	0000.	3825	07361	
07362	ST	060100	011453	301.	0178.	ST	619.	0002.	0.	0000.	3826	07362	
07363	LR	076500	000043	301.	0179.	LR	0.	0035.	0.	0000.	3827	07363	
07364	FM	026000	011453	301.	0180.	FM	619.	0002.	0.	0000.	3828	07364	
07365	ST	060100	011454	301.	0181.	ST	619.	0003.	0.	0000.	3829	07365	
07366	T	002000	007412	301.	0182.	T	302.	0000.	0.	0000.	3830	07366	

07412	LQ	056030	003612	302.	0000.	LG	201.	0020.		0.	0000.	E1-16	3850	07412
07413	FM	026000	103720	302.	0001.	FM	202.	0050.	R	0.	0000.	D	3851	07413
07414	CHS	076000	000002	302.	0002.	CHS	0.	0000.		0.	0000.		3852	07414
07415	ST	060100	011463	302.	0003.	ST	620.	0000.		0.	0000.		3853	07415
07416	CR	050000	011447	302.	0004.	CR	618.	0008.		0.	0000.		3854	07416
07417	TSX	007400	403516	302.	0005.	TSX	704.	0000.	C	0.	0000.	SQ. ROOT	3855	07417
07420	H	000000	000000	302.	0006.	H	0.	0000.		0.	0000.		3856	07420
07421	ST	060100	011464	302.	0007.	ST	620.	001.		0.	0000.		3857	07421
07422	CR	050000	103724	302.	0007.1	CR	502.	0062.	R	0.	0000.	A,ROTATIONAL COUPLING	3858	07422
07423	TM	-012000	007547	302.	0007.2	TM	2.	0084.		0.	0000.	INVERTED STATE	3859	07423
07424	CR	050000	011445	302.	0008.	CR	618.	0006.		0.	0003.		3860	07424
07425	F0	024000	011447	302.	0009.	F0	618.	0008.		0.	0000.		3861	07425
07426	FM	026000	003570	302.	0010.	FM	801.	0002.		0.	0000.	2	3862	07426
07427	F0	024000	003600	302.	0011.	F0	801.	0010.		0.	0000.	3	3863	07427
07430	SO	-060000	011465	302.	0012.	SO	620.	0002.		0.	0000.		3864	07430
07431	CR	050000	011464	302.	0013.	CR	620.	0001.		0.	0000.		3865	07431
07432	FS	030200	011465	302.	0014.	FS	620.	0002.		0.	0000.		3866	07432
07433	LR	076500	000043	302.	0015.	LR	0.	0035.		0.	0000.		3867	07433
07434	FM	026000	011443	302.	0016.	FM	618.	0004.		0.	0000.	SIGMA 3	3868	07434
07435	FA	030000	011463	302.	0017.	FA	620.	0000.		0.	0000.		3869	07435
07436	ST	060100	011463	302.	0018.	ST	620.	0000.		0.	0000.	F3CO	3870	07436
07437	LQ	056000	011465	302.	0019.	LQ	620.	0002.		0.	0000.		3871	07437
07440	FM	026000	003570	302.	0020.	FM	801.	0002.		0.	0000.	2	3872	07440
07441	LR	076500	000043	302.	0021.	LR	0.	0035.		0.	0000.		3873	07441
07442	FM	026000	011442	302.	0022.	FM	618.	0003.		0.	0000.	SIGMA 2	3874	07442
07443	ST	060100	011465	302.	0023.	ST	620.	0002.		0.	0000.		3875	07443
07444	LQ	056000	003607	302.	0024.	LQ	601.	0017.		0.	0000.	1/4	3876	07444
07445	FM	026000	003607	302.	0025.	FM	801.	0017.		0.	0000.		3877	07445
07446	LR	076500	000043	302.	0026.	LR	0.	0035.		0.	0000.		3878	07446
07447	FM	026000	103716	302.	0027.	FM	802.	0050.	R	0.	0000.	0	3879	07447
07450	ST	060100	011464	302.	0028.	ST	620.	0001.		0.	0000.		3880	07450
07451	CA	050000	011465	302.	0029.	CA	620.	0002.		0.	0000..		3881	07451
07452	FS	030200	011464	302.	0030.	FS	620.	0001.		0.	0000.		3882	07452
07453	ST	060100	011507	302.	0030.1	ST	622.	0003.		0.	0000.		3883	07453
07454	FA	030000	011463	302.	0031.	FA	620.	0000.		0.	0000.		3884	07454
07455	ST	060100	011463	302.	0032.	ST	620.	0000.		0.	0000.	F2CO+F3CO	3885	07455
07456	CHS	076000	000002	302.	0033.	CHS	0.	0000.		0.	0000.		3886	07456
07457	TSX	007400	403410	302.	0034.	TSX	703.	0000.	C	0.	0000.	EXPONENTIAL	3887	07457
07460	HP	042000	000000	302.	0035.	HP	0.	0000.		0.	0000.		3888	07460
07461	CHS	076000	000002	302.	0035.1	CHS	0.	0000.		0.	0000.		3889	07461
07462	ST	060100	011475	302.	0036.	ST	621.	0000.		0.	0000.	GAMMA CO, PI STATE	3890	07462
07463	CR	050000	011447	302.	0037.	CR	618.	0008.		0.	0000.		3891.	07463
07464	FA	030000	003420	302.	0038.	FA	501.	0026.		0.	0000.	8	3892	07464
07465	TSX	007400	403516	302.	0039.	TSX	704.	0000.	C	0.	0000.	SQ. ROOT	3893	07465
07466	H	000000	000000	302.	0040.	H	0.	0000.		0.	0000.		3894	07466
07467	ST	060100	011464	302.	0041.	ST	620.	0003.		0.	0000.		3895	07467
07470	CR	050000	103724	302.	0041.1	CR	302.	0062.	R	0.	0000.	A,ROTATIONAL COUPLING	3896	07470
07471	TM	-012000	007580	302.	0041.2	TM	2.	0087.		0.	0000.	INVERTED STATE	3897	07471
07472	CR	050000	011445	302.	0042.	CR	618.	0006.		0.	0000.		3898	07472
07473	FS	030200	003577	302.	0043.	FS	601.	0009.		0.	0000.	4	3899	07473
07474	F0	024000	003600	302.	0044.	F0	601.	0010.		0.	0000.	3	3900	07474
07475	FM	026000	003570	302.	0045.	FM	801.	0002.		0.	0000.	2	3901	07475
07476	ST	060100	011467	302.	0046.	ST	620.	0004.		0.	0000.		3902	07476
07477	CR	050000	011447	302.	0047.	CR	618.	0008.		0.	0000.		3903	07477
07500	FA	030000	003420	302.	0048.	FA	601.	0026.		0.	0000.	9	3904	07500

79

07501 ST 060100 011470	302. 0043.	ST 620. 0005.	0. 0000.		3905	07501
07502 CS 050200 011467	302. 0050.	CS 620. 0004.	0. 0000.		3906	07502
07503 FO 024000 011470	302. 0051.	FO 620. 0005.	0. 0000.		3907	07503
07504 SQ -060000 011467	302. 0052.	SQ 620. 0004.	0. 0000.		3908	07504
07505 CR 050000 003570	302. 0053.	CR 801. 0002.	0. 0000.	2	3909	07505
07506 FA 020000 011466	302. 0053.1	FA 620. 0003.	0. 0000.		3910	07506
07507 FA 030000 011467	302. 0054.	FA 620. 0004.	0. 0000.		3911	07507
07510 LR 076500 000043	302. 0055.	LR 0. 0035.	0. 0000.		3912	07510
07511 FM 026000 011443	302. 0056.	FM 618. 0004.	0. 0000.	SIGMA 3	3913	07511
07512 ST 060100 011467	302. 0057.	ST 620. 0004.	0. 0000.		3914	07512
07513 LQ 056000 003624	302. 0058.	LQ 801. 0030.	0. 0000.	6.25	3915	07513
07514 FM 026000 003624	302. 0059.	FM 801. 0030.	0. 0000.		3916	07514
07515 LR 076500 000043	302. 0060.	LR 0. 0035.	0. 0000.		3917	07515
07516 FM 026000 103720	302. 0061.	FM 802. 0050.	A 0. 0000.	B	3918	07516
07517 CHS 076000 000002	302. 0062.	CHS 0. 0000.	0. 0000.		3919	07517
07520 FA 030000 011467	302. 0063.	FA 620. 0004.	0. 0000.		3920	07520
07521 ST 060100 011465	302. 0063.1	ST 620. 0002.	0. 0000.	F3C10	3921	07521
07522 CHS 076000 000002	302. 0064.	CHS 0. 0000.	0. 0000.		3922	07522
07523 TSX 007400 403410	302. 0065.	TSX 703. 0000.	C 0. 0000.	EXPONENTIAL	3923	07523
07524 HP 042000 000000	302. 0066.	HP 0. 0000.	0. 0000.		3924	07524
07525 LR 076500 000043	302. 0067.	LR 0. 0035.	0. 0000.		3925	07525
07526 FM 026000 003600	302. 0068.	FM 801. 0010.	0. 0000.	3	3926	07526
07527 CHS 076000 000002	302. 0069.	CHS 0. 0000.	0. 0000.		3927	07527
07530 ST 060100 011476	302. 0070.	ST 621. 0001.	0. 0000.	GAMMA 10, PI STATE	3928	07530
07531 CR 050000 103712	302. 0071.	CR 802. 0044.	A 0. 0000.	LAMBDA	3929	07531
07532 FS 030200 003567	302. 0072.	FS 801. 0001.	0. 0000.	1	3930	07532
07533 TNZ -010000 007541	302. 0073.	TNZ 2. 0078.	0. 0000.		3931	07533
07534 CR 050000 011475	302. 0074.	CR 621. 0000.	0. 0000.		3932	07534
07535 FA 030000 011476	302. 0075.	FA 621. 0001.	0. 0000.		3933	07535
07536 ST 060100 011501	302. 0076.	ST 621. 0004.	0. 0000.	TOTAL GAMMA, PI STATE	3934	07536
07537 ZS 060000 011467	302. 0076.1	ZS 620. 0004.	0. 0000.		3935	07537
07540 T 002000 010174	302. 0077.	T 305. 0000.	0. 0000.		3936	07540
07541 LQ 056000 003607	302. 0078.	LQ 801. 0017.	0. 0000.	1/4	3937	07541
07542 FM 026000 003607	302. 0079.	FM 801. 0017.	0. 0000.		3938	07542
07543 LR 076500 000043	302. 0080.	LR 0. 0035.	0. 0000.		3939	07543
07544 FM 026000 103720	302. 0081.	FM 802. 0050.	A 0. 0000.	0	3940	07544
07545 ST 060100 011464	302. 0082.	ST 620. 0001.	0. 0000.		3941	07545
07546 T 002000 007602	302. 0083.	T 303. 0000.	0. 0000.		3942	07546
07547 CS 050200 011464	302. 0084.	CS 620. 0001.	0. 0000.		3943	07547
07550 ST 060100 011464	302. 0085.	ST 620. 0001.	0. 0000.	PUT IN F1C00FOR F3C00	3944	07550
07551 CR 050000 011443	302. 0085.1	CR 618. 0004.	0. 0000.		3945	07551
07552 ST 060100 011437	302. 0085.2	ST 618. 0000.	0. 0000.		3946	07552
07553 CR 050000 011441	302. 0085.3	CR 618. 0002.	0. 0000.		3947	07553
07554 ST 060100 011443	302. 0085.4	ST 618. 0004.	0. 0000.		3948	07554
07555 CR 050000 011437	302. 0085.5	CR 618. 0000.	0. 0000.		3949	07555
07556 ST 060100 011441	302. 0085.6	ST 618. 0002.	0. 0000.		3950	07556
07557 T 002000 007424	302. 0086.	T 2. 0008.	0. 0000.		3951	07557
07560 CS 050200 011466	302. 0087.	CS 620. 0003.	0. 0000.		3952	07560
07561 ST 060100 011466	302. 0088.	ST 620. 0003.	0. 0000.	FUT IN F1C10FOR F3C10	3953	07561
07562 T 002000 007472	302. 0089.	T 2. 0042.	0. 0000.		3954	07562

07602 CR	050000 011447	303. 0000.	CR 618. 0008.	C	0. 0000.	SQ. ROOT	3970	07602
07603 TSX	007400 403516	303. 0001.	TSX 704. 0000.	C	0. 0000.	SQ. ROOT	3971	07603
07604 H	000000 000000	303. 0002.	H 0. 0000.		0. 0000.		3972	07604
07605 CHS	076000 000002	303. 0003.	CHS 0. 0000.		0. 0000.		3973	07605
07606 ST	060100 011466	303. 0004.	ST 620. 0003.	R	0. 0000.	R, ROTATIONAL COUPLING	3974	07606
07607 CR	050000 103734	303. 0004.1	CR 602. 0062.	R	0. 0000.	INVERTED STATE	3975	07607
07610 TM	-012000 007747	303. 0004.2	TM 1. 2. 0095.		0. 0000.		3976	07610
07611 CS	050200 011445	303. 0005.	CS 618. 0006.		0. 0000.		3977	07611
07612 FO	024000 011447	303. 0006.	FO 618. 0008.		0. 0000.		3978	07612
07613 FM	026000 003570	303. 0007.	FM 801. 0002.		0. 0000.	2	3979	07613
07614 FO	024000 003600	303. 0008.	FO 801. 0010.		0. 0000.	3	3980	07614
07615 SQ	-060000 011467	303. 0009.	SQ 620. 0004.		0. 0000.		3981	07615
07616 CR	050000 011466	303. 0010.	CR 620. 0003.		0. 0000.		3982	07616
07617 FR	030000 011467	303. 0011.	FR 620. 0004.		0. 0000.		3983	07617
07620 LR	076500 000043	303. 0012.	LR 0. 0035.		0. 0000.		3984	07620
07621 FM	026000 011441	303. 0013.	FM 618. 0002.		0. 0000.	SIGMA 1	3985	07621
07622 FS	030200 011464	303. 0014.	FS 620. 0001.		0. 0000.		3986	07622
07623 ST	060100 011464	303. 0015.	ST 620. 0001.		0. 0000.	F1(C0)	3987	07623
07624 FR	030000 011463	303. 0016.	FR 620. 0000.		0. 0000.	F1(C0)+F2(C0)+F3(C0)	3988	07624
07625 ST	060100 011463	303. 0017.	ST 620. 0000.		0. 0000.		3989	07625
07626 CHS	076000 000002	303. 0018.	CHS 0. 0000.	C	0. 0000.	EXponential	3990	07626
07627 TSX	007400 403410	303. 0019.	TSX 703. 0000.	C	0. 0000.		3991	07627
07630 HP	042000 000000	303. 0020.	HP 0. 0000.		0. 0000.		3992	07630
07631 CHS	076000 000002	303. 0020.1	CHS 0. 0000.		0. 0000.		3993	07631
07632 ST	060100 011475	303. 0021.	ST 621. 0000.		0. 0000.	GAMMA (C0), DELTA STATE	3994	07632
07633 CR	050000 011447	303. 0022.	CR 618. 0008.		0. 0000.		3995	07633
07634 FR	030000 003620	303. 0023.	FR 801. 0026.		0. 0000.	8	3996	07634
07635 LR	076500 000043	303. 0024.	LR 0. 0035.		0. 0000.		3997	07635
07636 FM	026000 003600	303. 0025.	FM 801. 0010.		0. 0000.	3	3998	07636
07637 ST	060100 011466	303. 0026.	ST 620. 0003.		0. 0000.		3999	07637
07640 CR	050000 011445	303. 0027.	CR 618. 0006.		0. 0000.		4000	07640
07641 FS	030200 003577	303. 0028.	FS 801. 0009.		0. 0000.	4	4001	07641
07642 FO	024000 011466	303. 0029.	FO 620. 0003.		0. 0000.		4002	07642
07643 FM	026000 003577	303. 0030.	FM 801. 0009.		0. 0000.	4	4003	07643
07644 FR	030000 003570	303. 0030.1	FR 801. 0002.		0. 0000.	2	4004	07644
07645 LR	076500 000043	303. 0031.	LR 0. 0035.		0. 0000.		4005	07645
07646 FM	026000 011442	303. 0032.	FM 618. 0003.		0. 0000.	SIGMA 2	4006	07646
07647 ST	060100 011466	303. 0033.	ST 620. 0003.		0. 0000.		4007	07647
07650 LQ	056000 003612	303. 0034.	LQ 801. 0020.	R	0. 0000.	8/16	4008	07650
07651 FM	026000 103720	303. 0035.	FM 802. 0050.	R	0. 0000.	0	4009	07651
07652 CHS	076000 000002	303. 0036.	CHS 0. 0000.		0. 0000.		4010	07652
07653 FR	030000 011466	303. 0037.	FR 620. 0003.		0. 0000.		4011	07653
07654 ST	060100 011466	303. 0038.	ST 620. 0003.		0. 0000.	F2(C1)	4012	07654
07655 FR	030000 011465	303. 0039.	FR 620. 0002.		0. 0000.	F3(C1)	4013	07655
07656 ST	060100 011465	303. 0040.	ST 620. 0002.		0. 0000.		4014	07656
07657 CHS	076000 000002	303. 0041.	CHS 0. 0000.		0. 0000.		4015	07657
07660 TSX	007400 403410	303. 0042.	TSX 703. 0000.	C	0. 0000.	EXponential	4016	07660
07661 HP	042000 000000	303. 0043.	HP 0. 0000.		0. 0000.		4017	07661
07662 ST	060100 011477	303. 0044.	ST 621. 0002.		0. 0000.		4018	07662
07663 CHS	076000 000002	303. 0045.	CHS 0. 0000.		0. 0000.		4019	07663
07664 LR	076500 000043	303. 0046.	LR 0. 0035.		0. 0000.		4020	07664
07665 FM	026000 003600	303. 0047.	FM 801. 0010.		0. 0000.	3	4021	07665
07666 ST	060100 011476	303. 0048.	ST 621. 0001.		0. 0000.	GAMMA (C1), DELTA STATE	4022	07666
07667 CR	050000 011447	303. 0049.	CR 618. 0008.		0. 0000.		4023	07667
07670 FR	030000 003606	303. 0050.	FR 801. 0016.		0. 0000.	24	4024	07670

07671	TSX	007400	403516	303.	0051.	TSX	704.	0000.	C	0.	0000.	SQ.ROOT	4025	07671
07672	HP	042000	000000	303.	0052.	HP	0.	0000.		0.	0000.		4026	07672
07673	ST	060100	011467	303.	0053.	ST	620.	0004.		0.	0000.		4027	07673
07674	CR	050000	103734	303.	0053.1	CR	602.	0062.	A	0.	0000.	R, ROTATIONAL COUPLING	4028	07674
07675	TM	-012000	007752	303.	0053.2	TM	2.	0098.		0.	0000.	INVERTED STATE	4029	07675
07676	FR	030000	003602	303.	0054.	FR	801.	0012.		0.	0000.	6	4030	07676
07677	ST	060100	011467	303.	0055.	ST	620.	0004.		0.	0000.		4031	07677
07700	CR	050000	011445	303.	0056.	CR	618.	0006.		0.	0000.		4032	07700
07701	FS	030200	003605	303.	0057.	FS	801.	0015.		0.	0000.	12	4033	07701
07702	FO	024000	003600	303.	0058.	FO	801.	0010.		0.	0000.	3	4034	07702
07703	FM	026000	003570	303.	0059.	FM	801.	0002.		0.	0000.	2	4035	07703
07704	ST	060100	011470	303.	0060.	ST	620.	0005.		0.	0000.		4036	07704
07705	CR	050000	011447	303.	0061.	CR	618.	0008.		0.	0000.		4037	07705
07706	FA	030000	003606	303.	0062.	FA	801.	0016.		0.	0000.	24	4038	07706
07707	ST	060100	011471	303.	0063.	ST	620.	0006.		0.	0000.		4039	07707
07710	CS	050200	011470	303.	0064.	CS	620.	0005.		0.	0000.		4040	07710
07711	FO	024000	011471	303.	0065.	FO	620.	0006.		0.	0000.		4041	07711
07712	SQ	-060000	011470	303.	0066.	SQ	620.	0005.		0.	0000.		4042	07712
07713	CR	050000	011470	303.	0067.	CR	620.	0005.		0.	0000.		4043	07713
07714	FA	030000	011467	303.	0068.	FA	620.	0004.		0.	0000.		4044	07714
07715	LR	076500	000043	303.	0069.	LR	0.	0035.		0.	0000.		4045	07715
07716	FM	026000	011443	303.	0070.	FM	618.	0004.		0.	0000.	SIGMA 3	4046	07716
07717	ST	060100	011467	303.	0071.	ST	620.	0004.		0.	0000.		4047	07717
07720	LQ	056000	003625	303.	0072.	LQ	801.	0031.		0.	0000.	12.25	4048	07720
07721	FM	026000	003625	303.	0073.	FM	801.	0031.		0.	0000.		4049	07721
07722	LR	076500	000043	303.	0074.	LR	0.	0035.		0.	0000.	12.25	4050	07722
07723	FM	026000	103720	303.	0075.	FM	802.	0050.	A	0.	0000.	0	4051	07723
07724	CHS	076000	000002	303.	0076.	CHS	0.	0000.		0.	0000.		4052	07724
07725	FR	030000	011467	303.	0077.	FR	620.	0004.		0.	0000.		4053	07725
07726	ST	060100	011467	303.	0078.	ST	620.	0004.		0.	0000.	F3C2)	4054	07726
07727	CHS	076000	000002	303.	0079.	CHS	0.	0000.		0.	0000.		4055	07727
07730	TSX	007400	403410	303.	0080.	TSX	703.	0000.	C	0.	0000.	EXPONENTIAL	4056	07730
07731	HP	042000	000000	303.	0081.	HP	0.	0000.		0.	0000.		4057	07731
07732	ST	060100	011470	303.	0082.	ST	620.	0005.		0.	0000.		4058	07732
07733	CHS	076000	000002	303.	0083.	CHS	0.	0000.		0.	0000.		4059	07733
07734	LR	076500	000043	303.	0084.	LR	0.	0035.		0.	0000.		4060	07734
07735	FM	026000	003601	303.	0085.	FM	801.	0011.		0.	0000.	5	4061	07735
07736	ST	060100	011477	303.	0086.	ST	621.	0002.		0.	0000.	GAMMA C2)	4062	07736
07737	CR	050000	103712	303.	0087.	CR	802.	0044.	A	0.	0000.	LAMBDA	4063	07737
07740	FS	030200	003570	303.	0088.	FS	801.	0002.		0.	0000.	2	4064	07740
07741	THZ	-010000	007722*	303.	0089.	TNZ	304.	0000.		0.	0000.	GAMMA STATE	4065	07741
07742	CR	050000	011477	303.	0090.	CR	621.	0002.		0.	0000.		4066	07742
07743	FR	030000	011476	303.	0091.	FR	621.	0001.		0.	0000.		4067	07743
07744	FR	030000	011475	303.	0092.	FR	621.	0000.		0.	0000.		4068	07744
07745	ST	060100	011501	303.	0093.	ST	621.	0004.		0.	0000.	TOTAL GAMMA, DELTA ST	4069	07745
07746	T	002000	010174	303.	0094.	T	305.	0000.		0.	0000.		4070	07746
07747	CS	050200	011466	303.	0095.	CS	620.	0003.		0.	0000.		4071	07747
07750	ST	060100	011466	303.	0096.	ST	620.	0003.		0.	0000.	PUT IN F3C0FOR F1C0	4072	07750
07751	T	002000	007611	303.	0097.	T	2.	0005.		0.	0000.		4073	07751
07752	CS	050200	011467	303.	0098.	CS	620.	0004.		0.	0000.		4074	07752
07753	ST	060100	011467	303.	0099.	ST	620.	0004.		0.	0000.	PUT IN F1C2FOR F3C2	4075	07753
07754	T	002000	007676	303.	0100.	T	2.	0054.		0.	0000.		4076	07754

07772	CR	050000	011447	304.	0002.	CR	613.	0003.	0.	0000.	4090	07772	
07773	FQ	030000	002620	304.	0001.	FQ	601.	0026.	0.	0000.	4091	07773	
07774	TSX	007400	403516	304.	0002.	TSX	704.	0009.	0.	0000.	4092	07774	
07775	HP	042300	000000	304.	0003.	HP	0.	0000.	0.	0000.	4093	07775	
07776	CHS	076000	000002	304.	0004.	CHS	0.	0000.	0.	0000.	4094	07776	
07777	FQ	030000	003570	304.	0005.	FQ	801.	0002.	0.	0000.	4095	07777	
10000	ST	060100	011470	304.	0006.	ST	620.	0005.	0.	0000.	4096	10000	
10001	CR	050000	103734	304.	0006.	CR	802.	0062.	A	0.0000.	A,ROTATIONAL COUPLING	4097	10001
10002	TM	-012000	010152	304.	0006.	TM	2.	0107.	0.	0000.	4098	10002	
10003	CR	050000	011447	304.	0007.	CR	619.	0008.	0.	0000.	4099	10003	
10004	FQ	030000	003620	304.	0008.	FQ	801.	0026.	0.	0000.	4100	10004	
10005	LR	076500	000043	304.	0009.	LR	0.	0035.	0.	0000.	4101	10005	
10006	FM	026000	003600	304.	0010.	FM	801.	0010.	0.	0000.	4102	10006	
10007	FQ	024000	003570	304.	0011.	FQ	801.	0002.	0.	0000.	4103	10007	
10010	SQ	-060000	011471	304.	0012.	SQ	620.	0006.	0.	0000.	4104	10010	
10011	CR	050000	011445	304.	0013.	CR	618.	0006.	0.	0000.	4105	10011	
10012	FS	030200	003577	304.	0014.	FS	801.	0009.	0.	0000.	4106	10012	
10013	FQ	024000	011471	304.	0015.	FQ	620.	0006.	0.	0000.	4107	10013	
10014	SQ	-060000	011471	304.	0016.	SQ	620.	0006.	0.	0000.	4108	10014	
10015	CS	050200	011471	304.	0017.	CS	620.	0006.	0.	0000.	4109	10015	
10016	FQ	030200	011470	304.	0018.	FQ	620.	0005.	0.	0000.	4110	10016	
10017	LR	076500	000043	304.	0019.	LR	0.	0035.	0.	0000.	4111	10017	
10020	FM	026000	011441	304.	0020.	FM	618.	0002.	0.	0000.	4112	10020	
10021	ST	060100	011470	304.	0021.	ST	620.	0005.	0.	0000.	4113	10021	
10022	LQ	056000	003607	304.	0022.	LQ	801.	0017.	0.	0000.	4114	10022	
10023	FM	026000	003607	304.	0023.	FM	801.	0017.	0.	0000.	4115	10023	
10024	LR	075500	000043	304.	0024.	LR	0.	0035.	0.	0000.	4116	10024	
10025	FM	026000	103720	304.	0025.	FM	802.	0050.	R	0.0000.	0	4117	10025
10026	CHS	076000	000002	304.	0026.	CHS	0.	0000.	0.	0000.	4118	10026	
10027	FQ	030000	011470	304.	0027.	FQ	620.	0005.	0.	0000.	4119	10027	
10030	ST	060100	011470	304.	0028.	ST	620.	0005.	0.	0000.	4120	10030	
10031	FQ	030000	011465	304.	0029.	FQ	620.	0002.	0.	0000.	4121	10031	
10032	ST	060100	011465	304.	0030.	ST	620.	0002.	0.	0000.	4122	10032	
10033	CHS	076000	000002	304.	0031.	CHS	0.	0000.	0.	0000.	4123	10033	
10034	TSX	007400	403410	304.	0032.	TSX	703.	0000.	E	0.0000.	EXPONENTIAL	4124	10034
10035	HP	042000	000000	304.	0033.	HP	0.	0000.	0.	0000.	4125	10035	
10036	ST	060100	011476	304.	0034.	ST	621.	0001.	0.	0000.	4126	10036	
10037	CHS	076000	000002	304.	0025.	CHS	0.	0000.	0.	0000.	4127	10037	
10040	LR	076500	000043	304.	0036.	LR	0.	0035.	0.	0000.	4128	10040	
10041	FM	026000	002600	304.	0037.	FM	801.	0010.	0.	0000.	4129	10041	
10042	ST	060100	011476	304.	0038.	ST	621.	0001.	0.	0000.	4130	10042	
10043	CR	050000	011447	304.	0039.	CR	618.	0003.	0.	0000.	4131	10043	
10044	FQ	030000	003606	304.	0041.	FQ	801.	0015.	0.	0000.	4132	10044	
10045	LR	076500	000043	304.	0041.	LR	0.	0035.	0.	0000.	4133	10045	
10046	FM	026000	003600	304.	0042.	FM	801.	0010.	0.	0000.	4134	10046	
10047	ST	060100	011471	304.	0043.	ST	620.	0006.	0.	0000.	4135	10047	
10050	CR	050000	011445	304.	0044.	CR	618.	0003.	0.	0000.	4136	10050	
10051	FQ	030200	003605	304.	0045.	FQ	801.	0015.	0.	0000.	4137	10051	
10052	FQ	024000	011471	304.	0045.	FQ	620.	0003.	0.	0000.	4138	10052	
10053	FM	026000	003577	304.	0047.	FM	801.	0003.	0.	10000.	4139	10053	
10054	FQ	030000	003602	304.	0048.	FQ	801.	0012.	0.	0000.	4140	10054	
10055	LR	076500	001447	304.	0048.	LR	0.	0035.	0.	0000.	4141	10055	
10056	FM	030300	011442	304.	0050.	FM	618.	0003.	0.	0000.	4142	10056	
10057	ST	060100	011471	304.	0051.	ST	620.	0003.	0.	0000.	4143	10057	
10060	LQ	0256000	003724	304.	0052.	LQ	801.	0010.	0.	0000.	4144	10060	

10061	FM	026000	003624	304.	0053.	FM	601.	0030.	0.	0000.		4145	10061		
10062	LR	076500	000043	304.	0054.	LR	6.	0035.	0.	0000.		4145	10062		
10063	FM	026000	103720	304.	0055.	FM	802.	0050.	A	0.	0000.	0	4147	10063	
10064	CHS	076000	000002	304.	0056.	CHS	6.	0000.	0.	0000.			4148	10064	
10065	FA	030000	011471	304.	0057.	FA	620.	0006.	0.	0000.			4149	10065	
10066	ST	060100	011471	304.	0058.	ST	620.	0006.	0.	0000.	F2C2		4150	10066	
10067	FA	030000	011467	304.	0059.	FA	620.	0004.	0.	0000.	F3C2		4151	10067	
10070	ST	060100	011467	304.	0060.	ST	620.	0004.	0.	0000.			4152	10070	
10071	CHS	076000	000002	304.	0060.	1	CHS	6.	0000.	0.	0000.			4153	10071
10072	TSX	007400	403410	304.	0061.	TSX	703.	0000.	C	0.	0000.	EXPONENTIAL	4154	10072	
10073	HP	042000	000000	304.	0062.	HP	6.	0000.	0.	0000.			4155	10073	
10074	CHS	076000	000002	304.	0063.	CHS	6.	0000.	0.	0000.			4156	10074	
10075	LR	076500	000043	304.	0064.	LR	6.	0035.	0.	0000.			4157	10075	
10076	FM	026000	003601	304.	0065.	FM	801.	0011.	0.	0000.	5		4158	10076	
10077	ST	060100	011477	304.	0066.	ST	620.	0002.	0.	0000.	GAMMA C2, GAMMA STATE		4159	10077	
10100	CR	050000	011447	304.	0067.	CR	618.	0008.	0.	0000.			4160	10100	
10101	FA	030000	003621	304.	0068.	FA	801.	0027.	0.	0000.	48		4161	10101	
10102	TSX	007400	403516	304.	0069.	TSX	704.	0000.	C	0.	0000.	SQ. ROOT	4162	10102	
10103	HP	042000	000000	304.	0070.	HP	6.	0000.	0.	0000.			4163	10103	
10104	ST	060100	011472	304.	0071.	ST	620.	0007.	0.	0000.			4164	10104	
10105	CR	050000	103734	304.	0071.	1	CR	802.	0062.	A	0.	0000.	A, ROTATIONAL COUPLING	4165	10105
10106	TM	-012000	010155	304.	0071.	2	TM	6.	0110.	0.	0000.	INVERTED STATE	4166	10106	
10107	CR	050000	011447	304.	0072.	CR	619.	0008.	0.	0000.			4167	10107	
10110	FA	030000	003621	304.	0073.	FA	801.	0027.	0.	0000.	48		4168	10110	
10111	FO	024000	003570	304.	0074.	FO	801.	0002.	0.	0000.			4169	10111	
10112	FM	026000	003600	304.	0075.	FM	801.	0010.	0.	0000.	7		4170	10112	
10113	ST	060100	011473	304.	0076.	ST	620.	0008.	0.	0000.			4171	10113	
10114	CR	050000	011445	304.	0077.	CR	618.	0006.	0.	0000.			4172	10114	
10115	FS	030200	003606	304.	0078.	FS	801.	0016.	0.	0000.	24		4173	10115	
10116	FO	024000	011473	304.	0079.	FO	620.	0008.	0.	0000.			4174	10116	
10117	SQ	-060000	011473	304.	0080.	SQ	620.	0008.	0.	0000.			4175	10117	
10120	CR	050000	003605	304.	0081.	CR	801.	0015.	0.	0000.	12		4176	10120	
10121	FA	030000	011472	304.	0082.	FA	620.	0007.	0.	0000.			4177	10121	
10122	FS	030200	011473	304.	0083.	FS	620.	0006.	0.	0000.			4178	10122	
10123	LR	076500	000043	304.	0084.	LR	6.	0035.	0.	0000.			4179	10123	
10124	FM	026000	011443	304.	0085.	FM	618.	0004.	0.	0000.	SIGMA 3		4180	10124	
10125	ST	060100	011472	304.	0086.	ST	620.	0007.	0.	0000.			4181	10125	
10126	LQ	056000	003625	304.	0087.	LQ	801.	0031.	0.	0000.	12.25		4182	10126	
10127	FM	026000	003625	304.	0088.	FM	801.	0031.	0.	0000.			4183	10127	
10130	LR	076500	000043	304.	0089.	LR	6.	0035.	0.	0000.			4184	10130	
10131	FM	026000	103720	304.	0090.	FM	802.	0050.	A	0.	0000.	0		4185	10131
10132	CHS	076000	000002	304.	0091.	CHS	6.	0000.	0.	0000.			4186	10132	
10133	FA	030000	011472	304.	0092.	FA	620.	0007.	0.	0000.			4187	10133	
10134	ST	060100	011472	304.	0093.	ST	620.	0007.	0.	0000.	F3C3		4188	10134	
10135	CHS	076000	000002	304.	0094.	CHS	6.	0000.	0.	0000.			4189	10135	
10136	TSX	007400	403410	304.	0095.	TSX	703.	0000.	C	0.	0000.	EXPONENTIAL	4190	10136	
10137	HP	042000	000000	304.	0096.	HP	6.	0000.	0.	0000.			4191	10137	
10140	CHS	076000	000002	304.	0097.	CHS	6.	0000.	0.	0000.			4192	10140	
10141	ST	060100	011500	304.	0098.	ST	621.	0003.	0.	0000.			4193	10141	
10142	LR	076500	000043	304.	0099.	LR	6.	0035.	0.	0000.			4194	10142	
10143	FM	026000	003627	304.	0100.	FM	801.	0033.	0.	0000.	7		4195	10143	
10144	ST	060100	011500	304.	0101.	ST	621.	0003.	0.	0000.	GAMMA C30		4196	10144	
10145	FA	030000	011477	304.	0102.	FA	621.	0002.	0.	0000.			4197	10145	
10146	FA	030000	011476	304.	0103.	FA	621.	0001.	0.	0000.			4198	10146	
10147	FA	030000	011475	304.	0104.	FA	621.	0000.	0.	0000.			4199	10147	

10150 ST	060100 011501	304. 0105.	ST	621. 0004.	0. 0000.		4200	10150
10151 T	062000 011514	304. 0105.	T	625. 0020.	0. 0000.		4201	10151
10152 CS	050200 011470	304. 0107.	CS	620. 0005.	0. 0000.		4202	10152
10153 ST	060100 011470	304. 0108.	ST	620. 0035.	0. 0000.	PUT IN F3C10FOR F1C13	4203	10153
10154 T	062000 010003	304. 0109.	T	621. 0007.	0. 0000.		4204	10154
10155 CS	050200 011472	304. 0110.	CS	620. 0007.	0. 0000.		4205	10155
10156 ST	060100 011472	304. 0111.	ST	620. 0007.	0. 0000.	PUT IN F1C30FOR F3C32	4206	10156
10157 T	062000 010107	304. 0112.	T	621. 0072.	0. 0000.		4207	10157
10174 CR	050000 002567	305. 0000.	CR	618. 0001.	0. 0000.	1	4220	10174
10175 FO	024000 011441	305. 0001.	FO	618. 0002.	0. 0000.	SIGMA 1	4221	10175
10176 SQ	-060000 011507	305. 0002.	SQ	622. 0000.	0. 0000.		4222	10176
10177 CR	050000 002567	305. 0003.	CR	618. 0001.	0. 0000.		4223	10177
10200 FO	024000 011442	305. 0004.	FO	618. 0003.	0. 0000.	SIGMA 2	4224	10200
10201 SQ	-060000 011510	305. 0005.	SQ	622. 0001.	0. 0000.		4225	10201
10202 CR	050000 002567	305. 0006.	CR	618. 0001.	0. 0000.		4226	10202
10203 FO	024000 011443	305. 0007.	FO	618. 0004.	0. 0000.	SIGMA 3	4227	10203
10204 SQ	-060000 011511	305. 0008.	SQ	622. 0002.	0. 0000.		4228	10204
10205 CR	050000 011502	305. 0009.	CR	622. 0000.	0. 0000.		4229	10205
10206 FR	030000 011510	305. 0010.	FR	622. 0001.	0. 0000.		4230	10206
10207 FR	030000 011511	305. 0011.	FR	622. 0002.	0. 0000.		4231	10207
10210 ST	060100 011512	305. 0012.	ST	622. 0003.	0. 0000.	SUM OF 1/SIGMAS	4232	10210
10211 CR	050000 011441	305. 0013.	CR	618. 0002.	0. 0000.		4233	10211
10212 FR	030000 011442	305. 0014.	FR	618. 0003.	0. 0000.		4234	10212
10213 FR	030000 011443	305. 0015.	FR	618. 0004.	0. 0000.		4235	10213
10214 LP	076500 000043	305. 0016.	LR	0. 0035.	0. 0000.		4236	10214
10215 FM	026000 003573	305. 0017.	FM	601. 0005.	0. 0000.	1/15	4237	10215
10216 ST	060100 011513	305. 0018.	ST	622. 0004.	0. 0000.		4238	10216
10217 LQ	056000 011441	305. 0019.	LQ	618. 0002.	0. 0000.		4239	10217
10220 FM	026000 011441	305. 0020.	FM	618. 0002.	0. 0000.		4240	10220
10221 ST	060100 011514	305. 0021.	ST	622. 0005.	0. 0000.	SIGMA 1 SQ	4241	10221
10222 LQ	056000 011442	305. 0022.	LQ	618. 0003.	0. 0000.		4242	10222
10223 FM	026000 011442	305. 0023.	FM	618. 0003.	0. 0000.		4243	10223
10224 ST	060100 011515	305. 0024.	ST	622. 0006.	0. 0000.	SIGMA 2 SQ	4244	10224
10225 LQ	056000 011443	305. 0025.	LQ	618. 0004.	0. 0000.		4245	10225
10226 FM	026000 011443	305. 0026.	FM	618. 0004.	0. 0000.		4246	10226
10227 ST	060100 011516	305. 0027.	ST	622. 0007.	0. 0000.	SIGMA 3 SQ	4247	10227
10230 LQ	056000 011514	305. 0028.	LQ	622. 0005.	0. 0000.		4248	10230
10231 FM	026000 011441	305. 0029.	FM	618. 0002.	0. 0000.		4249	10231
10232 ST	060100 011517	305. 0030.	ST	622. 0008.	0. 0000.	SIGMA 1 CUBE0	4250	10232
10233 LQ	056000 011515	305. 0031.	LQ	622. 0006.	0. 0000.		4251	10233
10234 FM	026000 011442	305. 0032.	FM	618. 0003.	0. 0000.		4252	10234
10235 ST	060100 011520	305. 0033.	ST	622. 0009.	0. 0000.	SIGMA 2 CUBED	4253	10235
10236 LQ	056000 011516	305. 0034.	LQ	622. 0007.	0. 0000.		4254	10236
10237 FM	026000 011443	305. 0035.	FM	618. 0004.	0. 0000.		4255	10237
10240 ST	060100 011521	305. 0036.	ST	622. 0010.	0. 0000.	SIGMA 3 CUBE0	4256	10240
10241 FR	030000 011520	305. 0037.	FR	622. 0009.	0. 0000.		4257	10241
10242 FR	030000 011517	305. 0038.	FR	622. 0008.	0. 0000.		4258	10242
10243 ST	060100 011517	305. 0039.	ST	622. 0008.	0. 0000.		4259	10243
10244 FO	024000 002572	305. 0040.	FO	601. 0004.	0. 0000.	315	4260	10244
10245 SQ	-060000 011520	305. 0041.	SQ	622. 0009.	0. 0000.	SUM SIGMA CUBE0/315	4261	10245
10246 CR	050000 011516	305. 0042.	CR	622. 0007.	0. 0000.		4262	10246
10247 FR	030000 011515	305. 0043.	FR	622. 0006.	0. 0000.		4263	10247

10250	FA	030000	011514	305.	0044.	FA	622.	0005.	0.	0000.		4264	10250
10251	FO	024000	003572	305.	0045.	FO	801.	0014.	0.	0000.	315	4265	10251
10252	FM	026000	003577	305.	0046.	FM	801.	0009.	0.	0000.	4	4266	10252
10253	ST	060100	011514	305.	0047.	ST	622.	0005.	0.	0000.	SUM SIGMA SQ(4-315)	4267	10253
10254	FA	030000	003567	305.	0048.	FA	801.	0001.	0.	0000.	1	4268	10254
10255	FA	030000	011512	305.	0049.	FA	622.	0003.	0.	0000.		4269	10255
10256	FA	030000	011520	305.	0050.	FA	622.	0009.	0.	0000.		4270	10256
10257	FR	030000	011513	305.	0051.	FR	622.	0004.	0.	0000.		4271	10257
10260	ST	060100	011521	305.	0052.	ST	622.	0010.	0.	0000.	QF1+QF2+QF3	4272	10260
10261	FA	030000	011501	305.	0053.	FA	621.	0004.	0.	0000.		4273	10261
10262	ST	060100	011117	305.	0054.	ST	603.	0007.	0.	0000.	Q,ROT.	4274	10262
10263	LR	076500	000043	305.	0055.	LR	0.	0035.	0.	0000.		4275	10263
10264	FM	026000	011452	305.	0056.	FM	619.	0001.	0.	0000.	E TO BETA	4276	10264
10265	FO	024000	003703	305.	0056.1	FO	802.	0037.	0.	0000.	SYMMETRY NUMBER	4277	10265
10266	SQ	-060000	011117	305.	0057.	SQ	603.	0007.	0.	0000.	Q, ROTATION	4278	10266
10267	T	002000	010302	305.	0058.	T	306.	0000.	0.	0000.	CALC. Q PRIME.ROT.	4279	10267
10302	LQ	056000	011475	306.	0000.	LQ	621.	0000.	0.	0000.	GAMMA CO ₁	4290	10302
10303	FM	026000	002005	306.	0001.	FM	1.	0029.	0.	0000.	T	4291	10303
10304	LR	076500	000043	306.	0002.	LR	0.	0035.	0.	0000.		4292	10304
10305	FM	026000	011463	306.	0003.	FM	620.	0000.	0.	0000.	F OF CO ₁	4293	10305
10306	ST	060100	011533	306.	0004.	ST	623.	0000.	0.	0000.	GAMMA CO ₁ PRIME	4294	10306
10307	LR	076500	000043	306.	0005.	LR	0.	0035.	0.	0000.		4295	10307
10310	FM	026000	002005	306.	0006.	FM	1.	0029.	0.	0000.	T	4296	10310
10311	LR	076500	000043	306.	0007.	LR	0.	0035.	0.	0000.		4297	10311
10312	FM	026000	011463	306.	0008.	FM	620.	0000.	0.	0000.	F(CO ₁)	4298	10312
10313	ST	060100	011537	306.	0009.	ST	623.	0004.	0.	0000.	GAMMA CO ₁ DUBL PRIME	4299	10313
10314	LQ	056000	011476	306.	0010.	LQ	621.	0001.	0.	0000.	GAMMA C1 ₂	4300	10314
10315	FM	026000	002005	306.	0011.	FM	1.	0029.	0.	0000.		4301	10315
10316	LR	076500	000043	306.	0012.	LR	0.	0035.	0.	0000.		4302	10316
10317	FM	026000	011465	306.	0013.	FM	620.	0005.	0.	0000.	F(C1 ₂)	4303	10317
10320	ST	060100	011534	306.	0014.	ST	623.	0001.	0.	0000.	GAMMA C1 ₂ PRIME	4304	10320
10321	LR	076500	000043	306.	0015.	LR	0.	0035.	0.	0000.		4305	10321
10322	FM	026000	002005	306.	0016.	FM	1.	0029.	0.	0000.	T	4306	10322
10323	LR	076500	000043	306.	0017.	LR	0.	0035.	0.	0000.		4307	10323
10324	FM	026000	011465	306.	0018.	FM	620.	0002.	0.	0000.		4308	10324
10325	ST	060100	011540	306.	0019.	ST	623.	0005.	0.	0000.	GAMMA C1 ₂ DUBL PRIME	4309	10325
10326	LQ	056000	011477	306.	0020.	LQ	621.	0002.	0.	0000.	GAMMA C2 ₀	4310	10326
10327	FM	026000	002005	306.	0021.	FM	1.	0029.	0.	0000.	T	4311	10327
10330	LR	076500	000043	306.	0022.	LR	0.	0035.	0.	0000.		4312	10330
10331	FM	026000	011467	306.	0023.	FM	620.	0004.	0.	0000.	F(C2 ₀)	4313	10331
10332	ST	060100	011535	306.	0024.	ST	623.	0002.	0.	0000.	GAMMA C2 ₀ PRIME	4314	10332
10333	LR	076500	000043	306.	0025.	LR	0.	0035.	0.	0000.		4315	10333
10334	FM	026000	002005	306.	0026.	FM	1.	0029.	0.	0000.	T	4316	10334
10335	LR	076500	000043	306.	0027.	LR	0.	0035.	0.	0000.		4317	10335
10336	FM	026000	011467	306.	0028.	FM	620.	0004.	0.	0000.		4318	10336
10337	ST	060100	011541	306.	0029.	ST	623.	0006.	0.	0000.	GAMMA C2 ₀ DUBL PRIME	4319	10337
10340	LQ	056000	011500	306.	0030.	LQ	621.	0003.	0.	0000.	GAMMA C3 ₀	4320	10340
10341	FM	026000	002005	306.	0031.	FM	1.	0029.	0.	0000.	T	4321	10341
10342	LR	076500	000043	306.	0032.	LR	0.	0035.	0.	0000.		4322	10342
10343	FM	026000	011472	306.	0033.	FM	620.	0007.	0.	0000.	F(C3 ₀)	4323	10343
10344	ST	060100	011536	306.	0034.	ST	623.	0003.	0.	0000.	GAMMA C3 ₀ PRIME	4324	10344
10345	LR	076500	000043	306.	0035.	LR	0.	0035.	0.	0000.		4325	10345

10346	FM	026000	002005	306.	0030.	FM	1.	0029.	0.	0000.		4326	10346
10347	LR	076500	000043	306.	0037.	LR	0.	0035.	0.	0000.		4327	10347
10350	FM	026000	011472	306.	0038.	FM	620.	0007.	0.	0000.		4328	10350
10351	ST	060100	011542	306.	0039.	ST	623.	0007.	0.	0000.	GAMMA (3) DUBL FFIME	4329	10351
10352	T	002000	010364	306.	0040.	T	307.	0000.	0.	0000.	CALC. Q PRIME SUE F	4330	10352
10364	LQ	056000	011520	307.	0000.	LQ	622.	0009.	0.	0000.		4340	10364
10365	FM	026000	003600	307.	0001.	FM	301.	0010.	0.	0000.	3	4341	10365
10366	ST	060100	011543	307.	0002.	ST	623.	0008.	0.	0000.	SIGMA CUBE0 PRIME	4342	10366
10367	LR	076500	000043	307.	0003.	LR	0.	0035.	0.	0000.		4343	10367
10370	FM	026000	003570	307.	0004.	FM	301.	0002.	0.	0000.	2	4344	10370
10371	ST	060100	011544	307.	0005.	ST	623.	0009.	0.	0000.	SIGMA CUBE0 DUBL FRIM	4345	10371
10372	LQ	056000	011514	307.	0006.	LQ	622.	0005.	0.	0000.		4346	10372
10373	FM	026000	003570	307.	0007.	FM	301.	0002.	0.	0000.	2	4347	10373
10374	ST	060100	011545	307.	0008.	ST	623.	0010.	0.	0000.	SIGMA SQ. PRIME	4348	10374
10375	FR	030000	011543	307.	0009.	FR	623.	0009.	0.	0000.		4349	10375
10376	FR	030000	011513	307.	0010.	FR	622.	0004.	0.	0000.		4350	10376
10377	FS	030200	011512	307.	0011.	FS	622.	0003.	0.	0000.		4351	10377
10400	LR	076500	000043	307.	0012.	LR	0.	0035.	0.	0000.		4352	10400
10401	FM	026000	002005	307.	0013.	FM	1.	0029.	0.	0000.		4353	10401
10402	ST	060100	011120	307.	0014.	ST	603.	0008.	0.	0000.	Q PRIME F	4354	10402
10403	CR	050000	011544	307.	0015.	CR	623.	0009.	0.	0000.		4355	10403
10404	FR	030000	011545	307.	0016.	FR	623.	0010.	0.	0000.		4356	10404
10405	FR	030000	011512	307.	0017.	FR	622.	0003.	0.	0000.		4357	10405
10406	FR	030000	011512	307.	0018.	FR	622.	0003.	0.	0000.		4358	10406
10407	LR	076500	000043	307.	0019.	LR	0.	0035.	0.	0000.		4359	10407
10410	FM	026000	011116	307.	0020.	FM	603.	0006.	0.	0000.	T SO	4360	10410
10411	ST	060100	011121	307.	0021.	ST	603.	0009.	0.	0000.	Q-DUBL PRIME F	4361	10411
10412	FR	030000	011537	307.	0022.	FR	623.	0004.	0.	0000.	GAMMA (0) DUBL PRIME	4362	10412
10413	FR	030000	011540	307.	0023.	FR	623.	0005.	0.	0000.	GAMMA (1) DUBL PRIME	4363	10413
10414	FR	030000	011541	307.	0024.	FR	623.	0006.	0.	0000.	GAMMA (2) DUBL PRIME	4364	10414
10415	FR	030000	011542	307.	0025.	FR	623.	0007.	0.	0000.	GAMMA (3) DUBL PRIME	4365	10415
10416	FO	024000	003703	307.	0025.1	FO	802.	0037.	0.	0000.	SYMMETRY NUMBER 1	4366	10416
10417	SQ	-060000	011121	307.	0026.	SQ	603.	0009.	0.	0000.	Q-DUBL PRIME, ROTATION	4367	10417
10420	CR	050000	011120	307.	0027.	CR	603.	0008.	0.	0000.	Q PRIME, F	4368	10420
10421	FR	030000	011533	307.	0028.	FR	623.	0000.	0.	0000.	GAMMA (0) PRIME	4369	10421
10422	FR	030000	011534	307.	0029.	FR	623.	0001.	0.	0000.	GAMMA (1) PRIME	4370	10422
10423	FR	030000	011525	307.	0030.	FR	623.	0002.	0.	0000.	GAMMA (2) PRIME	4371	10423
10424	FR	030000	011536	307.	0031.	FR	623.	0003.	0.	0000.	GAMMA (3) PRIME	4372	10424
10425	FO	024000	003703	307.	0031.1	FO	802.	0037.	0.	0000.	SYMMETRY NUMBER	4373	10425
10426	FM	026000	011452	307.	0034.	FM	619.	0001.	0.	0000.	E TO BETA	4374	10426
10427	ST	060100	011557	307.	0035.	ST	624.	0000.	0.	0000.		4375	10427
10430	LQ	056000	011117	307.	0036.	LQ	603.	0007.	0.	0000.	Q, ROTATION	4376	10430
10431	FM	026000	011453	307.	0037.	FM	619.	0002.	0.	0000.	8BETA PRIME	4377	10431
10432	ST	060100	011560	307.	0038.	ST	624.	0001.	0.	0000.		4378	10432
10433	LP	076500	000043	307.	0039.	LR	0.	0035.	0.	0000.		4379	10433
10434	FM	026000	011453	307.	0040.	FM	619.	0002.	0.	0000.		4380	10434
10435	ST	060100	011561	307.	0041.	ST	624.	0002.	0.	0000.		4381	10435
10436	CR	050000	011557	307.	0042.	CR	624.	0000.	0.	0000.		4382	10436
10437	FR	030000	011560	307.	0043.	FR	624.	0001.	0.	0000.		4383	10437

10440	ST	060100	011120	307.	0044.	ST	603.	0009.	0.	0000.	Q PRIME, ROTATION	4384	10440
10441	LQ	056000	011557	307.	0045.	LQ	624.	0009.	0.	0000.		4385	10441
10442	FM	026000	011453	307.	0046.	FM	619.	0002.	0.	0000.	BETA PRIME	4386	10442
10443	LP	076500	000443	307.	0047.	LR	0.	0035.	0.	0000.		4387	10443
10444	FM	026000	002570	307.	0048.	FM	601.	0002.	0.	0000.	Z	4388	10444
10445	FR	030000	011561	307.	0049.	FR	624.	0002.	0.	0000.		4389	10445
10446	SY	030100	011562	307.	0050.	ST	624.	0003.	0.	0000.		4390	10446
10447	LQ	096000	011121	307.	0051.	LQ	603.	0009.	0.	0000.	Q DUBL PRIME, F	4391	10447
10450	FM	026000	011452	307.	0052.	FM	619.	0001.	0.	0000.	E TO BETP	4392	10450
10451	FR	030000	011562	307.	0053.	FR	624.	0002.	0.	0000.		4393	10451
10452	ST	060100	011121	307.	0054.	ST	603.	0009.	0.	0000.	Q DUBL PRIME-ROTATION	4394	10452
10453	CR	050000	003570	307.	0055.	CR	601.	0002.	0.	0000.	Z	4395	10453
10454	ST	060100	103644	307.	0056.	ST	602.	0006.	A	0.	G, ELECTROMIC	4396	10454
10455	SOX	-053400	410462	307.	0057.	SOX	2.	0061.	C	0.	85	4397	10455
10456	ZS	060000	411564	307.	0058.	ZS	624.	0005.	C	0.	CLEAR TEMPORARY STOR.	4398	10456
10457	TX	200001	410456	307.	0059.	TX	2.	0058.	C	0.	0001.	4399	10457
10460	SE	076000	000141	307.	0060.	SE	0.	0097.	0.	0000.	TURN ON LIGHT NO. 1	4400	10460
10461	T	002000	004456	307.	0060.	T	105.	0000.	0.	0000.	CALC. ELECTRONIC FN.	4401	10461
10462		080125	000000	307.	0061.		0.	0000.	0.	0095.		4402	10462
10472	CR	050000	011144	400.	0000.	CR	605.	0003.	0.	0000.	Q STRETCH	4410	10472
10473	ST	060100	010747	400.	0001.	ST	500.	0003.	0.	0000.		4411	10473
10474	CR	050000	011157	400.	0002.	CR	606.	0004.	0.	0000.	Q M18 ROT INTER	4412	10474
10475	ST	060100	010750	400.	0003.	ST	500.	0004.	0.	0000.		4413	10475
10476	CR	050000	011164	400.	0004.	CR	607.	0004.	0.	0000.	Q ANHARMON	4414	10476
10477	ST	060100	010751	400.	0005.	ST	500.	0005.	0.	0000.		4415	10477
10500	CR	050000	011077	400.	0006.	CR	601.	0006.	0.	0000.	Q VUB2A	4416	10500
10501	ST	060100	010744	400.	0007.	ST	500.	0000.	0.	0000.		4417	10501
10502	CR	050000	011117	400.	0008.	CR	603.	0007.	0.	0000.	Q ROTATION	4418	10502
10503	ST	060100	010745	400.	0009.	ST	500.	0001.	0.	0000.		4419	10503
10504	CR	050000	011131	400.	0010.	CR	604.	0002.	0.	0000.	Q ELECTRIC	4420	10504
10505	ST	060100	010746	400.	0011.	ST	500.	0002.	0.	0000.		4421	10505
10506	CR	050000	011100	400.	0012.	CR	601.	0007.	0.	0000.	Q PRIME, VIB.	4422	10506
10507	ST	060100	010756	400.	0013.	ST	501.	0000.	0.	0000.		4423	10507
10510	CR	050000	011120	400.	0014.	CR	603.	0006.	0.	0000.	Q PRIME, ROT.	4424	10510
10511	ST	060100	010757	400.	0015.	ST	501.	0001.	0.	0000.		4425	10511
10512	CR	050000	011132	400.	0016.	CR	604.	0003.	0.	0000.	Q PRIME, ELECT.	4426	10512
10513	ST	060100	010760	400.	0017.	ST	501.	0002.	0.	0000.		4427	10513
10514	CR	050000	011142	400.	0018.	CR	605.	0001.	0.	0000.	STRETCH CONTRIBUTION	4428	10514
10515	ST	060100	010761	400.	0019.	ST	501.	0003.	0.	0000.		4429	10515
10516	CR	050000	011155	400.	0020.	CR	606.	0002.	0.	0000.	VIB-ROT	4430	10516
10517	ST	060100	010762	400.	0021.	ST	501.	0004.	0.	0000.		4431	10517
10520	CR	050000	011167	400.	0022.	CR	607.	0007.	0.	0000.	ANHARMONICITY	4432	10520
10521	ST	060100	010763	400.	0023.	ST	501.	0005.	0.	0000.		4433	10521
10522	CR	050000	011101	400.	0024.	CR	601.	0008.	0.	0000.	Q DUBL PRIME, VIB.	4434	10522
10523	ST	060100	010770	400.	0025.	ST	502.	0000.	0.	0000.		4435	10523
10524	CR	050000	011121	400.	0026.	CR	603.	0009.	0.	0000.	Q DUBL PRIME, ROT.	4436	10524
10525	ST	060100	010771	400.	0027.	ST	502.	0001.	0.	0000.		4437	10525
10526	CR	050000	011133	400.	0028.	CR	604.	0004.	0.	0000.	Q DUBL PRIME, ELECT.	4438	10526
10527	ST	060100	010772	400.	0029.	ST	502.	0002.	0.	0000.		4439	10527
10530	CR	050000	011143	400.	0030.	CR	605.	0002.	0.	0000.	STRETCH CONTRIBUTION	4440	10530
10531	ST	060100	010773	400.	0031.	ST	502.	0003.	0.	0000.		4441	10531
10532	CR	050000	011156	400.	0032.	CR	606.	0003.	0.	0000.	VIB-ROT	4442	10532

10533 ST	060100 010774	400. 0033.	ST	502. 0004.	0. 0000.		4443	10533
10534 CR	050000 011170	400. 0034.	CR	607. 0008.	0. 0000.	ANHARMONICITY	4444	10534
10535 ST	060100 010775	400. 0035.	ST	502. 0005.	0. 0000.		4445	10535
10536 T	002000 010554	400. 0036.	T	401. 0000.	0. 0000.	CALC. TOTAL PART. FH.	4446	10536

97

10554 SOX	-053400 410647	401. 0000.	SOX	2. 0059.	C	0. 0000.	5	4460	10554
10555 LQ	056000 410751	401. 0001.	LQ	500. 0005.	C	0. 0000.	Q	4461	10555
10556 FM	026000 410752	401. 0002.	FM	500. 0006.	C	0. 0000.		4462	10556
10557 LR	076500 000043	401. 0003.	LR	0. 0035.		0. 0000.		4463	10557
10560 TX	200001 410556	401. 0004.	TX	2. 0002.	C	0. 0001.		4464	10560
10561 FM	026000 0023567	401. 0005.	FM	801. 0001.		0. 0000.	1	4465	10561
10562 ST	060100 010764	401. 0006.	ST	501. 0006.		0. 0000.	Q	4466	10562
10563 FA	030000 010752	401. 0007.	FA	500. 0006.		0. 0000.		4467	10563
10564 ST	060100 010752	401. 0008.	ST	500. 0006.		0. 0000.		4468	10564
10565 SOX	-053400 410651	401. 0009.	SOX	2. 0061.	C	0. 0000.		4469	10565
10566 CA	050000 410764	401. 0010.	CA	501. 0006.	C	0. 0000.		4470	10566
10567 FOB	024100 410752	401. 0011.	FOB	500. 0006.	C	0. 0000.		4471	10567
10570 SQ	-060000 411010	401. 0012.	SQ	503. 0006.	C	0. 0000.		4472	10570
10571 TX	200001 410566	401. 0013.	TX	2. 0010.	C	0. 0001.		4473	10571
10572 SOX	-053400 410647	401. 0014.	SOX	2. 0059.	C	0. 0000.	5	4474	10572
10573 CR	050000 411007	401. 0015.	CR	503. 0005.	C	0. 0000.		4475	10573
10574 FR	030000 411010	401. 0016.	FR	503. 0006.	C	0. 0000.		4476	10574
10575 TX	200001 410574	401. 0017.	TX	2. 0016.	C	0. 0001.		4477	10575
10576 ST	060100 011010	401. 0018.	ST	503. 0006.		0. 0000.		4478	10576
10577 LR	076500 000043	401. 0019.	LR	0. 0035.		0. 0000.		4479	10577
10600 FM	026000 010764	401. 0020.	FM	501. 0006.		0. 0000.		4480	10600
10601 FA	030000 010753	401. 0021.	FA	500. 0007.		0. 0000.		4481	10601
10602 ST	060100 010753	401. 0022.	ST	500. 0007.		0. 0000.		4482	10602
10603 SOX	-053400 410651	401. 0023.	SOX	2. 0061.	C	0. 0000.		4483	10603
10604 CR	050000 410776	401. 0024.	CR	502. 0006.	C	0. 0000.		4484	10604
10605 FOB	024100 410752	401. 0025.	FOB	500. 0006.	C	0. 0000.		4485	10605
10606 SQ	-060000 411022	401. 0026.	SQ	504. 0006.	C	0. 0000.		4486	10606
10607 TX	200001 410604	401. 0027.	TX	2. 0024.	C	0. 0001.		4487	10607
10610 SOX	-053400 410647	401. 0028.	SOX	2. 0059.	C	0. 0000.	5	4488	10610
10611 CR	050000 411021	401. 0029.	CR	504. 0005.	C	0. 0000.		4489	10611
10612 FR	030000 411022	401. 0030.	FR	504. 0006.	C	0. 0000.		4490	10612
10613 TX	200001 410612	401. 0031.	TX	2. 0030.	C	0. 0001.		4491	10613
10614 ST	060100 011020	401. 0032.	ST	504. 0004.		0. 0000.		SUM OF Q OUBL PRIME/Q	10614
10615 SOX	-053400 210647	401. 0033.	SOX	2. 0059.	8	0. 0000.		4492	10615
10616 SOX	-053400 410650	401. 0034.	SOX	2. 0060.	C	0. 0000.	5	4493	10615
10617 LQ	056000 211007	401. 0035.	LQ	503. 0005.	8	0. 0000.		4494	10616
10620 FM	026000 411010	401. 0036.	FM	503. 0006.	C	0. 0000.		4495	10617
10621 FR	030000 011026	401. 0037.	FR	505. 0000.		0. 0000.		4496	10620
10622 ST	060100 011026	401. 0038.	ST	505. 0000.		0. 0000.		4497	10621
10623 TX	200001 410617	401. 0039.	TX	2. 0035.	C	0. 0001.		4498	10622
10624 TX	200001 210625	401. 0040.	TX	2. 0041.	8	0. 0001.		4499	10623
10625 XSO	-063400 210650	401. 0041.	XSO	2. 0060.	8	0. 0000.		4500	10624
10626 TXG	300001 210616	401. 0042.	TXG	2. 0034.	8	0. 0001.		4501	10625
10627 LQ	056000 011006	401. 0043.	LQ	503. 0004.	8	0. 0000.		4502	10626
								4503	10627

10630	FM	026000	011007	401.	0044.	FM	503.	0005.	0.	0000.	4504	10630
10631	FR	030000	011026	401.	0045.	FR	505.	0000.	0.	0000.	4505	10631
10632	ST	060100	011026	401.	0046.	ST	505.	0000.	0.	0000.	4506	10632
10633	LQ	056000	011026	401.	0047.	LQ	505.	0000.	0.	0000.	4507	10633
10634	FM	026000	003570	401.	0048.	FM	801.	0002.	0.	0000.	4508	10634
10635	FR	030000	011020	401.	0049.	FR	504.	0004.	0.	0000.	SUM OF Q DUBL PRIME/Q	4509
10636	LR	076500	000043	401.	0050.	LR	0.	0035.	0.	0000.	4510	10636
10637	FM	026000	010764	401.	0051.	FM	501.	0006.	0.	0000.	4511	10637
10640	FR	030000	010754	401.	0052.	FR	500.	0008.	0.	0000.	4512	10640
10641	ST	060100	010754	401.	0053.	ST	500.	0008.	0.	0000.	4513	10641
10642	ZS	060000	011026	401.	0054.	ZS	505.	0000.	0.	0000.	4514	10642
10643	CA	050000	010647	401.	0055.	CA	2.	0059.	0.	0000.	RESTORE INDEX	4515
10644	ST	060100	010650	401.	0056.	ST	2.	0060.	0.	0000.	IN C	4516
10645	TX	200001	104243	401.	0057.	TX	102.	0001.	R	0.0001.	GO TO NEXT ELECT.LEVL	4517
10646	T	002000	010662	401.	0058.	T	402.	0000.	0.	0000.	CALC. THERMO. FNS.	4518
10647		000005	000000	401.	0059.		0.	0000.	0.	0005.	4519	10647
10650		000005	000000	401.	0060.		0.	0000.	0.	0005.	4520	10650
10651		000006	000000	401.	0061.		0.	0000.	0.	0006.	4521	10651

10662	CR	050000	010752	402.	0003.	CR	500.	0006.	C	0.	0000.	Q INTERNAL	4530	10662
10663	TSX	007400	403340	402.	0001.	TSX	702.	0000.		0.	0000.	LN.	4531	10663
10664	HP	042000	000000	402.	0002.	HP	0.	0000.		0.	0000.		4532	10664
10665	LR	076500	000043	402.	0002.1	LR	0.	0035.		0.	0000.		4533	10665
10666	FM	026000	003547	402.	0002.2	FM	800.	0000.		0.	0000.	R	4534	10666
10667	FR	030000	002006	402.	0003.	FR	1.	0030.		0.	0000.	-F/T,TRANS.	4535	10667
10670	ST	060100	002006	402.	0004.	ST	1.	0030.		0.	0000.	-FT,TOTAL	4536	10670
10671	CR	050000	010753	402.	0005.	CR	500.	0007.		0.	0000.	Q PRIME,INTERNAL	4537	10671
10672	FD	024000	010752	402.	0006.	FO	500.	0006.		0.	0000.		4538	10672
10673	FM	026000	003547	402.	0007.	FM	800.	0000.		0.	0000.	R	4539	10673
10674	CHS	076000	000002	402.	0008.	CHS	0.	0000.		0.	0000.		4540	10674
10675	FO	024000	002005	402.	0008.1	FO	1.	0029.		0.	0000.	T	4541	10675
10676	SQ	-060000	011040	402.	0008.2	SQ	506.	0000.		0.	0000.		4542	10676
10677	CR	050000	011040	402.	0008.3	CR	506.	0000.		0.	0000.		4543	10677
10700	FR	030000	002007	402.	0009.	FR	1.	0031.		0.	0000.	H/T,TRANS.	4544	10700
10701	ST	060100	002007	402.	0010.	ST	1.	0031.		0.	0000.	H/T,TOTAL	4545	10701
10702	FR	030000	002006	402.	0011.	FR	1.	003b.		0.	0000.		4546	10702
10703	ST	060100	002010	402.	0012.	ST	1.	0022.		0.	0000.	S,TOTAL	4547	10703
10704	CR	050000	010754	402.	0013.	CR	500.	0008.		0.	0000.		4548	10704
10705	FO	024000	010752	402.	0014.	FO	500.	0006.		0.	0000.		4549	10705
10706	SQ	-060000	011055	402.	0015.	SQ	507.	0003.		0.	0000.		4550	10706
10707	CR	050000	010753	402.	0016.	CR	500.	0007.		0.	0000.		4551	10707
10710	FO	024000	010752	402.	0017.	FO	500.	0006.		0.	0000.		4552	10710
10711	SQ	-060000	011056	402.	0018.	SQ	507.	0004.		0.	0000.		4553	10711
10712	LQ	056000	011056	402.	0019.	LQ	507.	0004.		0.	0000.		4554	10712
10713	FM	026000	011056	402.	0020.	FM	507.	0004.		0.	0000.		4555	10713
10714	CHS	076000	000002	402.	0021.	CHS	0.	0000.		0.	0000.		4556	10714
10715	FR	030000	011055	402.	0022.	FR	507.	0003.		0.	0000.		4557	10715
10716	FD	024000	011116	402.	0023.	FO	603.	0006.		0.	0000.	T SQ.	4558	10716
10717	FM	026000	003547	402.	0024.	FM	800.	0000.		0.	0000.	R	4559	10717
10720	FR	030000	002011	402.	0025.	FR	1.	0033.		0.	0000.	C SUB P,TRANS.	4560	10720
10721	ST	060100	002011	402.	0026.	ST	1.	0033.		0.	0000.	C SUB P,TOTAL	4561	10721
10722	DR	050000	002005	402.	0027.	CR	1.	0029.		0.	0000.	T	4562	10722

10723 ST	060100 011052	402. 0028.	ST	507. 0000.	0. 0000.	T, TEMPORARY	4563	10723
10724 SOX	-053400 410735	402. 0029.	SOX	2. 0038.	C 0. 0000.	9	4564	10724
10725 ZS	060000 410755	402. 0030.	ZS	500. 0009.	C 0. 0000.		4565	10725
10726 ZS	060000 410767	402. 0031.	ZS	501. 0009.	C 0. 0000.		4566	10726
10727 ZS	060000 411001	402. 0032.	ZS	502. 0009.	C 0. 0000.		4567	10727
10730 ZS	060000 411013	402. 0033.	ZS	503. 0009.	C 0. 0000.		4568	10730
10731 ZS	060000 411025	402. 0034.	ZS	504. 0009.	C 0. 0000.		4569	10731
10732 ZS	060000 411223	402. 0035.	ZS	609. 0010.	C 0. 0000.		4570	10732
10733 TX	200001 410725	402. 0036.	TX	2. 0030.	C 0. 0001.		4571	10733
10734 T	002000 004766	402. 0037.	T	1.09. 0000.	0. 0000.	PRINT	4572	10734
10735	000011 000000	402. 0038.		0. 0000.	D 0. 0009.		4573	10735
12226 CR	050000 011141	646. 0000.	CR	605. 0000.	0. 0000.	LN Q, STRETCH	5270	12226
12227 TSX	007400 403410	646. 0001.	TSX	703. 0000.	C 0. 0000.	EXPONENTIAL	5271	12227
12230 HP	042000 000000	646. 0002.	HP	0. 0000.	0. 0000.		5272	12230
12231 ST	060100 011144	646. 0003.	ST	605. 0003.	0. 0000.	Q, STRETCH	5273	12231
12232 LR	076500 000043	646. 0004.	LR	0. 0035.	0. 0000.		5274	12232
12233 FM	026000 011142	646. 0005.	FM	605. 0001.	0. 0000.	Q PRIME	5275	12233
12234 ST	060100 011142	646. 0006.	ST	605. 0001.	0. 0000.	CORR. Q PRIME	5276	12234
12235 CR	050000 011142	646. 0007.	CR	605. 0001.	0. 0000.		5277	12235
12236 FOB	024100 011144	646. 0007.1	FOB	605. 0003.	0. 0000.	Q	5278	12236
12237 FM	026000 011142	646. 0007.2	FM	605. 0001.	0. 0000.	Q PRIME	5279	12237
12240 ST	060100 011145	646. 0007.3	ST	605. 0004.	0. 0000.		5280	12240
12241 LQ	056000 011144	646. 0007.4	LQ	605. 0003.	0. 0000.	Q	5281	12241
12242 FM	026000 011143	646. 0008.	FM	605. 0002.	0. 0000.	Q DOUBLE PRIME	5282	12242
12243 FR	030000 011145	646. 0009.	FR	605. 0004.	0. 0000.		5283	12243
12244 ST	060100 011143	646. 0010.	ST	605. 0002.	0. 0000.	CORR. Q DOUBLE PRIME	5284	12244
12245 T	002000 004564	646. 0011.	T	107. 0000.	0. 0000.	CALC. VIB-ROT INTER.	5285	12245
12246 CR	050000 011154	646. 0012.	CR	606. 0001.	0. 0000.	LN Q, VIB-ROT.	5286	12246
12247 TSX	007400 403410	646. 0013.	TSX	703. 0000.	C 0. 0000.	EXPONENTIAL	5287	12247
12250 HP	042000 000000	646. 0014.	HP	0. 0000.	0. 0000.		5288	12250
12251 ST	060100 011157	646. 0015.	ST	606. 0004.	0. 0000.	Q, VIB-ROT.	5289	12251
12252 LR	076500 000043	646. 0016.	LR	0. 0035.	0. 0000.		5290	12252
12253 FM	026000 011155	646. 0017.	FM	606. 0002.	0. 0000.	Q PRIME	5291	12253
12254 ST	060100 011155	646. 0018.	ST	606. 0002.	0. 0000.	CORR. Q PRIME	5292	12254
12255 LQ	056000 011156	646. 0019.	LQ	606. 0003.	0. 0000.	Q DOUBLE PRIME	5293	12255
12256 FM	026000 011157	646. 0020.	FM	606. 0004.	0. 0000.	Q, VIB-ROT.	5294	12256
12257 ST	060100 011156	646. 0020.1	ST	606. 0003.	0. 0000.		5295	12257
12260 CR	050000 011155	646. 0020.2	CR	606. 0002.	0. 0000.	Q PRIME	5296	12260
12261 FOB	024100 011157	646. 0020.3	FOB	606. 0004.	0. 0000.	Q, VIB-ROT.	5297	12261
12262 FM	026000 011155	646. 0020.4	FM	606. 0002.	0. 0000.		5298	12262
12263 FR	030000 011156	646. 0021.	FR	606. 0003.	0. 0000.	CORR. Q DOUBLE PRIME	5299	12263
12264 ST	060100 011156	646. 0022.	ST	606. 0003.	0. 0000.		5300	12264
12265 T	002000 004641	646. 0023.	T	108. 0000.	0. 0000.	CALC. ANHARM. Q	5301	12265
12266 CR	050000 011162	646. 0024.	CR	607. 0002.	0. 0000.	LN Q, ANHARM.	5302	12266
12267 TSX	007400 403410	646. 0025.	TSX	703. 0000.	C 0. 0000.	EXPONENTIAL	5303	12267
12270 HP	042000 000000	646. 0026.	HP	0. 0000.	0. 0000.	Q, ANHARMONICITY	5304	12270
12271 ST	060100 011164	646. 0027.	ST	607. 0004.	0. 0000.		5305	12271
12272 LR	076500 000043	646. 0028.	LR	0. 0035.	0. 0000.		5306	12272
12273 FM	026000 011167	646. 0029.	FM	607. 0007.	0. 0000.	Q PRIME	5307	12273
12274 ST	060100 011167	646. 0030.	ST	607. 0007.	0. 0000.	CORR. Q PRIME	5308	12274
12275 LQ	056000 011170	646. 0031.	LQ	607. 0008.	0. 0000.	Q DOUBLE PRIME	5309	12275
12276 FM	026000 011164	646. 0032.	FM	607. 0004.	0. 0000.	Q, ANHARM.	5310	12276
12277 ST	060100 011170	646. 0033.	ST	607. 0008.	0. 0000.		5311	12277
12300 LQ	056000 011167	646. 0034.	LQ	607. 0007.	0. 0000.	Q PRIME, ANHARM.	5312	12300
12301 FM	026000 011167	646. 0035.	FM	607. 0007.	0. 0000.		5313	12301
12302 FOB	024100 011164	646. 0036.	FOB	607. 0004.	0. 0000.	Q	5314	12302
12303 SQ	-060000 011171	646. 0037.	SQ	607. 0009.	0. 0000.		5315	12303
12304 CR	050000 011171	646. 0038.	CR	607. 0009.	0. 0000.		5316	12304
12305 FR	030000 011170	646. 0039.	FR	607. 0008.	0. 0000.		5317	12305
12306 ST	060100 011170	646. 0040.	ST	607. 0008.	0. 0000.	CORR. Q DOUBL PRIME, R	5318	12306
12307 T	002000 010472	646. 0041.	T	400. 0000.	0. 0000.	GATHER PARTITION FNS.	5319	12307
12310 CR	050000 003567	646. 0042.	CR	801. 0001.	0. 0000.	1	5320	12310
12311 ST	060100 010747	646. 0043.	ST	500. 0003.	0. 0000.		5321	12311
12312 ST	060100 010750	646. 0044.	ST	500. 0004.	0. 0000.		5322	12312
12313 ST	060100 010751	646. 0045.	ST	500. 0005.	0. 0000.		5323	12313
12314 T	002000 010500	646. 0046.	T	400. 0006.	0. 0000.	CALC RIG ROT FNS	5324	12314

Appendix B
THERMODYNAMIC FUNCTIONS OF OH MOLECULE (²H)

^{OH}					
2.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
1.8871000 01	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
3.7352099 03	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
8.2810000 01	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
7.1399999-01	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
		I.7008000 01	1.0000000 00		
1.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
1.8800000-03	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
-1.3969999 02	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
			0.0000000 00		

79-

^{OH}				
50.00	25.02448	5.71423	30.73871	6.96183
100.00	29.28919	6.55990	35.84908	7.56445
150.00	32.01961	6.87685	38.89647	7.43863
200.00	34.01746	6.99896	41.01642	7.30199
250.00	35.58557	7.04951	42.63509	7.21072
298.16	36.82962	7.07044	43.90007	7.15380
300.00	36.87311	7.07094	43.94405	7.15206
400.00	38.90950	7.08188	45.99139	7.08869
500.00	40.48977	7.08012	47.56990	7.06526
600.00	41.78045	7.07759	48.85804	7.07206
700.00	42.87156	7.07889	49.95045	7.10865
800.00	43.81728	7.08620	50.90348	7.17287
900.00	44.65271	7.10032	51.75303	7.25927
1000.00	45.40186	7.12107	52.52294	7.36094
1100.00	46.08182	7.14774	53.22956	7.47129
1200.00	46.70512	7.17933	53.88444	7.58494
1300.00	47.28118	7.21480	54.49598	7.69795
1400.00	47.81727	7.25316	55.07044	7.80769
1500.00	48.31909	7.29357	55.61266	7.91252
1600.00	48.79116	7.33531	56.12646	8.01157
1700.00	49.23715	7.37778	56.61493	8.10447
1800.00	49.66009	7.42052	57.08061	8.19122
1900.00	50.06246	7.46317	57.52563	8.27199
2000.00	50.44637	7.50545	57.95182	8.34711
2100.00	50.81359	7.54716	58.36075	8.41696
2200.00	51.16565	7.58813	58.75379	8.48195

2300.00	51.50387	7.62827	59.13214	8.54249
2400.00	51.82937	7.66751	59.49688	8.59896
2500.00	52.14317	7.70578	59.84895	8.65175
2600.00	52.44614	7.74308	60.18922	8.70119
2700.00	52.73907	7.77939	60.51846	8.74760
2800.00	53.02264	7.81471	60.83736	8.79126
2900.00	53.29749	7.84906	61.14655	8.83244
3000.00	53.56416	7.88246	61.44662	8.87137
3100.00	53.82317	7.91492	61.73809	8.90825
3200.00	54.07497	7.94647	62.02145	8.94329
3300.00	54.31998	7.97715	62.29714	8.97664
3400.00	54.55858	8.00699	62.56557	9.00846
3500.00	54.79112	8.03600	62.82712	9.03889
3600.00	55.01791	8.06424	63.08214	9.06805
3700.00	55.23925	8.09171	63.33096	9.09605
3800.00	55.45540	8.11847	63.57387	9.12298
3900.00	55.66663	8.14453	63.81116	9.14894
4000.00	55.87317	8.16993	64.04309	9.17402
4100.00	56.07522	8.19468	64.26991	9.19827
4200.00	56.27299	8.21883	64.49182	9.22177
4300.00	56.46667	8.24239	64.70907	9.24458
4400.00	56.65644	8.26540	64.92183	9.26674
4500.00	56.84244	8.28786	65.13031	9.28832
4600.00	57.02485	8.30982	65.33467	9.30935
4700.00	57.20380	8.33128	65.53508	9.32987
4800.00	57.37943	8.35227	65.73170	9.34992
4900.00	57.55187	8.37280	65.92467	9.36954
5000.00	57.72124	8.39291	66.11414	9.38875

Appendix C
THERMODYNAMIC FUNCTIONS OF C₂ MOLECULE (³Π)

C ₂					
3.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
1.6325999 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
1.6413499 03	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
1.1669999 01	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
1.6829999-02	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
		2.4020000 01	2.0000000 00		
1.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
7.0199999-06	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
-1.6399999 01	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00	0.0000000 00
		0.0000000 00			

-81-

50.00	28.93181	7.83394	36.76575	7.16576
100.00	34.29680	7.40783	41.70463	7.00034
150.00	37.28193	7.25869	44.54062	6.97586
200.00	39.36323	7.18394	46.54717	6.97064
250.00	40.96313	7.14049	48.10362	6.98103
298.16	42.21978	7.11624	49.33602	7.01391
300.00	42.26357	7.11559	49.37916	7.01569
400.00	44.30918	7.10667	51.41585	7.16685
500.00	45.89833	7.13973	53.03806	7.38686
600.00	47.20532	7.20017	54.40548	7.61869
700.00	48.32088	7.27531	55.59619	7.83062
800.00	49.29770	7.35633	56.65403	8.01235
900.00	50.16893	7.43786	57.60679	8.16402
1000.00	50.95675	7.51691	58.47366	8.28947
1100.00	51.67677	7.59199	59.26875	8.39329
1200.00	52.34043	7.66245	60.00288	8.47965
1300.00	52.95640	7.72816	60.68456	8.55205
1400.00	53.53139	7.78925	61.32064	8.61329
1500.00	54.67076	7.84597	61.91672	8.66557
1600.00	54.57883	7.89863	62.47746	8.71063
1700.00	55.05917	7.94757	63.00674	8.74983
1800.00	55.51475	7.99311	63.50786	8.78423
1900.00	55.94807	8.03556	63.98363	8.81467
2000.00	56.36126	8.07521	64.43647	8.84184
2100.00	56.75616	8.11231	64.86847	8.86628
2200.00	57.13436	8.14709	65.28144	8.88841
2300.00	57.49724	8.17976	65.67700	8.90860
2400.00	57.84602	8.21052	66.05654	8.92713
2500.00	58.18178	8.23953	66.42132	8.94424

2600.00	58.50548	8.26695	66.77243	8.96013
2700.00	58.81797	8.29290	67.11087	8.97498
2800.00	59.12001	8.31751	67.43752	8.98890
2900.00	59.41229	8.34089	67.75319	9.00203
3000.00	59.69544	8.36314	68.05858	9.01446
3100.00	59.97001	8.38434	68.35436	9.02628
3200.00	60.23653	8.40458	68.64111	9.03755
3300.00	60.49545	8.42393	68.91938	9.04834
3400.00	60.74720	8.44245	69.18965	9.05870
3500.00	60.99219	8.46020	69.45239	9.06868
3600.00	61.23076	8.47724	69.70739	9.07832
3700.00	61.46325	8.49361	69.95686	9.08766
3800.00	61.68997	8.50937	70.19933	9.09672
3900.00	61.91120	8.52454	70.43574	9.10553
4000.00	62.12720	8.53917	70.66638	9.11411
4100.00	62.33823	8.55330	70.89153	9.12249
4200.00	62.54451	8.56695	71.11146	9.13069
4300.00	62.74625	8.58016	71.32641	9.13872
4400.00	62.94365	8.59294	71.53659	9.14659
4500.00	63.13690	8.60533	71.74223	9.15433
4600.00	63.32616	8.61735	71.94351	9.16194
4700.00	63.51161	8.62902	72.14063	9.16942
4800.00	63.69340	8.64036	72.33376	9.17680
4900.00	63.87167	8.65138	72.52305	9.18408
5000.00	64.04656	8.66211	72.70867	9.19127