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MVFC
A COMPUTER PROGRAM FOR CONSTRUCTING FORCE CONSTANT
MATRICES FOR USE IN VALENCE FORCE POTENTIAL FUNCTIONS
IN MOLECULES AND CRYSTALS

By

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MVFC

A COMPUTER PROGRAM FOR CONSTRUCTING FORCE CONSTANT MATRICES FOR USE IN VALENCE FORCE POTENTIAL FUNCTIONS IN MOLECULES AND CRYSTALS[†]

J. K. Boyter and H. L. McMurry

ABSTRACT

The program described here is to become part of a collection of computer programs which provide the means for calculating the slow-neutron scattering by moderators. This scattering depends on the vibrations of the atoms in the moderating materials and these vibrations must first be calculated before the scattering can be determined.

This program automates what has been one of the most time consuming and error producing processes required for preparing input to programs which calculate the vibrations of molecular and crystalline moderators. Specifically, it sets up the force constant matrices which are used when valence force coordinates (changes in bond distances, interbond angles, etc.) are used to express the potential energy changes which occur during the vibrations.

[†]Work performed under the auspices of the U. S. Atomic Energy Commission.

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MVFC

I. INTRODUCTION

This program is one of a set of programs aimed at providing reactor physics parameters which depend on the slow-neutron scattering by moderators. This particular program removes a large piece of tedious and error-prone hand preparation of input data to these programs which calculate the vibrational motions of the atoms in molecular or crystalline moderators.

The theory for the scattering by molecular or crystalline moderators shows how the vibrational modes and frequencies determine the slow-neutron scattering^[1]. Our early work in program development produced two complementary programs. One calculated the normal modes and vibrational frequencies of molecules^[2] with the output in a form which could be used as input to a program which calculated the slow-neutron scattering^[3]. Later the theory for calculating crystal vibrations assuming valence potentials was developed^[4] and computer programs based on this were developed^[5]. These will provide the basis for calculating the slow-neutron scattering by crystalline moderators.

Applications of the programs for calculating the vibrations of molecules and crystals were hampered because much of the input was tedious to prepare and the possibilities for error were large. To circumvent this, two input preparation programs have been written to automate much of this work. The program described here is the second of these.

These programs prepare input for problems in which the potential energy is expressed in terms of valence coordinates, i.e., changes in bond distances and interbond angles. To see what is involved some of

the relevant equations are needed. For molecules the potential energy in terms of valence coordinates is given by

$$2V = \underline{H}^T \underline{F} \underline{H}. \quad (1)$$

Here $\underline{H}$ is a column vector in which the elements are the valence coordinates. The $\underline{F}$ denotes a symmetric matrix in which any element f_{ij} is a force constant which expresses the interaction between the i th and j th coordinates.

The kinetic energy is expressed in terms of the atom velocities. The frequency calculation then requires expressing $\underline{H}$ in terms of the Cartesian displacements of the atoms, or more conveniently, in terms of their mass adjusted displacements. For molecules the relation between $\underline{H}$ and these displacements is

$$\underline{H} = \underline{D} \underline{q}. \quad (2)$$

Here $\underline{q}$ is a column vector containing the $3n$ mass adjusted displacement $\sqrt{m_v} \Delta x_v = q_{vx}$, $\sqrt{m_v} \Delta y_v = q_{vy}$, $\sqrt{m_v} \Delta z_v = q_{vz}$ for all atoms v in the molecule. The $\underline{D}$ matrix contains as many rows as there are elements in $\underline{H}$, and $3n$ columns.

Equations analogous to Eqs. (1,2) but with special features associated with crystalline symmetry apply to crystals.^[4]

The input to the programs for calculating the molecular vibrations requires the $\underline{D}$ matrix from Eq. (2) and the $\underline{F}$ matrix in Eq. (1). For crystals there is a set of $\underline{D}$ and $\underline{F}$ matrices which relate to the way coordinates associated with the atoms in one cell depend on, and couple with, coordinates in adjacent cells. The $\underline{D}$ matrices are particularly burdensome to calculate by hand. Therefore, the first program designed to automate input for calculating crystalline vibrations was designed

to construct the D matrices^[6] in the form suited to the frequency and eigenvector programs^[2,5]. It is safe to say that without this D matrix program^[6] many calculations which are now routine would not be attempted.

The present program constructs the F matrices in a form suited for use in the eigenvalue-eigenvector programs^[2,5]. It removes the largest remaining source of tedious and error-prone hand preparation of input for the eigenvalue-eigenvector programs.

The program has been checked by constructing some elaborate matrices for the ethane molecule, C_2H_6 , and for the Mg_2Sn crystal. The input and output for these problems are presented in this report to illustrate how the program is used.

II. CRITERIA FOR DISTINGUISHING VALENCE COORDINATES

The force constants F_i and f_{ij} are distinguished on the basis of two criteria for characterizing the valence coordinates. The first divides them into types (bond stretching, angle bending, etc.). The second subdivides each type into equivalent sets. Coordinates within a set are those which involve bonds which can be exchanged by a symmetry operation of the molecule or crystal.

The present program permits inserting primary force constants F_i for any of the following coordinate types (same as those considered in the D matrix program^[6]).

1. Stretching coordinates. These are changes in bond distances, usually between nearest neighbor atoms.
2. Bending coordinates. These are changes in interbond angles. Usually the bonds are to the nearest neighbors of the apex atom.
3. Torsional rotations of groups. [The equation defining this coordinate is incorrect. The coordinate has not been used.]

4. Dihedral torsion which is defined in terms of the change in angle between the plane containing bonds connecting atoms i j k and the plane containing bonds connecting atoms j k l . The bond connecting atoms j k is common to both planes and is the axis of rotation.
5. Angle bending between a bond from i to j and a plane defined by bonds from j to k and j to l . Atom j is common to all the bonds.

For programming purposes the sets for a given type of coordinate are numbered 1, 2 ... n , with $n \leq 8$. To illustrate the division of coordinate into types, and the subdivision of types into numbered sets, the ethane molecule is discussed. Its structure is shown in Fig. 1. This molecule has been the subject of an exhaustive hand calculation. [7]

Atoms 1, 2, 3 and 5, 6, 7 are H atoms on the CH_3 groups. They are attached to carbons numbered 4 and 8, respectively.

The types of valence coordinates, and the sets within each type, are shown in Table I.

The MVFC program can construct matrices which exhibit all diagonal force constants for each of the five coordinate types described above.

However, the only non-zero interaction constants f_{ij} which can be located in the matrices are of the stretch-stretch, stretch-angle and angle-angle types. Force constants f_{ij} associated with interactions between stretch or angle deformation coordinates and the other three types (group torsions; dihedral torsions or bending of the angle between a bond and the plane of a bond) are not allowed for. Neither is there allowance for interactions between any of the last three types. These interaction constants are all set equal to zero. This simplification seem reasonable because there are only a limited number of independent force constants (21 in C_2H_6) and it should be possible to account for the effects of the omitted interaction constants by properly selecting values for the f_{ij} allowed for in this program.

Atom Numbering For C_2H_6
Figure 1

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TABLE I

TYPES AND SETS OF VALENCE COORDINATES FOR C_2H_6

<u>Type</u>	<u>Sets*</u>	<u>Atoms Involved</u>	<u>Description</u>
Bond Stretch	1	4-1	C-H Stretch
		4-2	
		4-3	
		8-5	
		8-6	
		8-7	
	2	4-8	C-C Stretch
Angle Bend	1	1-4-2	H-C-H Angle Bend
		1-4-3	
		2-4-3	
		5-8-6	
		5-8-7	
		6-8-7	
	2	1-4-8	H-C-C Angle Bend
		2-4-8	
		3-4-8	
		5-8-4	
		6-8-4	
		7-8-4	
Group Torsion	1	CH ₃ Groups	

* The sets for each type of coordinate are numbered 1, 2 ... n, $n \leq 8$.
Coordinates belonging to a set can be superposed by a symmetry operation.

Not all stretch-stretch, stretch-angle or angle-angle interactions are allowed to have non-zero values. The ones which can have non-zero f_{ij} involve all coordinate pairs with at least one atom in common.

In selecting the f_{ij} to place in matrix location i, j , the program takes account of the sets to which coordinates i and j belong, together with other information such as whether the coordinates have an atom in common, what is the angle between bonds if i, j denotes a stretch-stretch

interaction, or the angle between the planes defined by the angles in an angle-angle interaction. The general scheme for doing this is given in Table II.

TABLE II
INTERACTIONS TYPES AND SPECIFICATIONS

<u>Type</u>	<u>Specifications</u>
Stretch- Stretch	One atom must be common to both bonds. The input designates the sets from which the coordinates come, and the angle between the two bonds. This takes account of cases where the bonds involved may interact at different angles. For example, in Mg_2Sn there are eight equivalent bonds from an Sn to its nearest neighbor Mg atoms. Some of these bonds intersect at the tetrahedral angle ($109^\circ 28.5'$), others at 180° , others at $\pi - 109^\circ 28.5'$. Generally, there is a different f_{ij} for each interaction. The f_{ij} are input.

Stretch- Angle	<u>Case 1.</u> The bond is a leg of the angle. The input data requires only specification of the two sets involved and the f_{ij} .
-------------------	---

Case 2. The bond is not a leg but one terminus of the bond is at the apex atom of the angle. The input requires the set for the bond and for the angle. In addition the angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_b$, and the angle, or the angle supplement whichever is smallest, between $\underline{V}_1 \times \underline{V}_2$ and $\underline{V}_b$. Here $\underline{V}_1$ and $\underline{V}_2$ are vectors from the apex atom along the bonds defining the angle and $\underline{V}_b$ is a vector outward from the apex atom along the bond for the stretching coordinate. Usually, there is a different f_{ij} for each orientation of bond with respect to angle plane.

Table II (continued)

Type	Specifications
Stretch-Angle	<p><u>Case 3.</u> The bond is not a leg, but the bond terminus is at the end of a leg. The input requires the two sets involved, together with angles defined as in Case 1 by $(\underline{V}_1 + \underline{V}_2) \cdot \underline{V}_b$ and $\underline{V}_1 \times \underline{V}_2 \cdot \underline{V}_b$. Here $\underline{V}_1$ and $\underline{V}_2$ are defined as in Case 2 and $\underline{V}_b$ points from the common atom along the bond for the stretching coordinates. There is a different f_{ij} for each orientation of bond with respect to angle plane.</p>
Angle-Angle	<p><u>Case 1.</u> The angles have a common leg and a common apex. Only the sets involved are required, and the f_{ij}.</p>
	<p><u>Case 2.</u> The angles have a common leg but no common apex. The input specifies the sets and the distances between the atoms at the outer ends of the non-common legs. The f_{ij} must be given for each case.</p>
	<p><u>Case 3.</u> Common apex but no common leg. The sets are input and the orientation of the planes is specified by giving the angles between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4$, and $\underline{V}_1 \times \underline{V}_2$ and $\underline{V}_3 \times \underline{V}_4$ in a manner analogous to Case 2 of the stretch-angle interactions. Here $\underline{V}_3$ and $\underline{V}_4$ are vectors out from the common apex along the bonds defining the second angle. The f_{ij} is given for each case.</p>
	<p><u>Case 4.</u> The outer atom of a leg of one bond is also the outer atom of a leg of the second bond. The sets are specified and the distances between the apex atom and the ends of the legs which do not have the common atom. There is an f_{ij} for each case.</p>
	<p><u>Case 5.</u> The outer atom of a leg of one bond angle is the apex atom of the second bond. The sets are specified and the angles between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4$ as in Case 3. There is an f_{ij} for each case.</p>

The coordinate types and sets have been given for C₂H₆ in Table I.

The interactions are given in Table III.

TABLE III

INTERACTIONS IN ETHANE, C₂H₆

Interaction	Sets [*]	Typical Case ^{**}	(millidynes/Å) f_{ij}
Stretch-Stretch	1,1	(C ₄ -H ₁) x (C ₄ -H ₂)	-0.02
	1,2	(C ₄ -H ₁) x (C ₄ -C ₈)	0.00010
Stretch-Angle	1,1	(C ₄ -H ₁) x (H ₁ -C ₄ -H ₈)r ₀	0.00011
	1,1	(C ₄ -H ₁) x (H ₂ -C ₄ -H ₃)r ₀	-0.10
	1,2	(C ₄ -H ₁) x (H ₁ -C ₄ -C ₈)r ₀	-0.035
	1,2	(C ₄ -H ₁) x (H ₂ -C ₄ -C ₈)r ₀	-0.4725
	1,2	(C ₄ -H ₁) x (H ₅ -C ₈ -C ₄)r ₀	-0.065
	1,2	(C ₄ -H ₁) x (H ₆ -C ₈ -C ₄)r ₀	0.0875
	2,1	(C ₄ -C ₈) x (H ₁ -C ₄ -H ₂)r ₀	0.00012
	2,2	(C ₄ -C ₈) x (H ₁ -C ₄ -C ₈)r ₀	0.30
Angle-Angle	1,1	(H ₁ -C ₄ -H ₂) x (H ₁ -C ₄ -H ₃)r ₀ ²	0.00013
	1,1	(H ₁ -C ₄ -H ₂) x (H ₂ -C ₄ -H ₃)r ₀ ²	0.00014
	1,2	(H ₁ -C ₄ -H ₂) x (H ₁ -C ₄ -C ₈)r ₀ ²	0.00015
	1,2	(H ₁ -C ₄ -H ₂) x (H ₃ -C ₄ -C ₈)r ₀ ²	-0.035
	1,2	(H ₁ -C ₄ -H ₂) x (H ₅ -C ₈ -C ₄)r ₀ ²	0.00017
	(1,2)	(H ₁ -C ₄ -H ₂) x (H ₆ -C ₈ -C ₄)r ₀ ²	0.00018
	1,2	(H ₁ -C ₄ -H ₂) x (H ₇ -C ₈ -C ₄)r ₀ ²	.07
	(2,2)	(H ₁ -C ₄ -C ₈) x (H ₂ -C ₄ -C ₈)r ₀ ²	0.015
	(2,2)	(H ₁ -C ₁₁ -C ₈) x (H ₅ -C ₈ -C ₄)r ₀ ²	0.11
	2,2	(H ₁ -C ₁₁ -C ₈) x (H ₆ -C ₈ -C ₄)r ₀ ²	0.00016

* The first entry in the i,j pair refers to the first type in column 1 and the second entry to the second type. Thus, a 1,2 for a stretch-angle interaction denotes set 1 of the stretch sets and set 2 of the angle sets. All magnitudes $\leq 10^{-3}$ were not used in the original C₂H₆ calculation. They are included to illustrate the way the f_{ij} insertions can be made.

** The r₀ and r₀² factors use the r₀ as the equilibrium C-H distance. This makes all f_{ij} have the same units.

III. INPUT-OUTPUT

A.

Table IV lists the card formats for the input to the MVFC program. This program has been adapted from the D matrix program and some of the input format is repeated, as well as part of the output given by the D program.

The input for molecules comprises such quantities as the atomic masses, their positions, the number of groups into which the molecule is subdivided, etc. The illustrative data for C_2H_6 should clarify questions.

For crystals the input data include information about the positions and masses of the atoms in a primitive cell, as well as information needed to give the vector position $\mathbf{r}_v^{(\ell)}$ of atom v in the cell with index ℓ . A brief statement of how cells are indexed is appropriate.

The origin of any primitive cell in the crystal relative to some reference cell is given by

$$\mathbf{r}_\ell = \ell_1 \mathbf{a}_1 + \ell_2 \mathbf{a}_2 + \ell_3 \mathbf{a}_3.$$

The ℓ_1, ℓ_2, ℓ_3 are integers and the $\mathbf{a}_1, \mathbf{a}_2, \mathbf{a}_3$ are the three primitive transition vectors which characterize the crystal lattice. Any set of ℓ_1, ℓ_2, ℓ_3 is given an index ℓ . The theoretical formulas are developed in terms of a prescription which requires the index for $-\ell$ to denote values of ℓ_1, ℓ_2, ℓ_3 which are the negative of those for ℓ . Then it is true that

$$\mathbf{r}_{-\ell} = -\ell_1 \mathbf{a}_1 - \ell_2 \mathbf{a}_2 - \ell_3 \mathbf{a}_3 = -\{\ell_1 \mathbf{a}_1 + \ell_2 \mathbf{a}_2 + \ell_3 \mathbf{a}_3\}$$

or

$$r_{-l} = -r_l.$$

The input data include indices for all the cells containing atoms whose motions alter the valence coordinates in the origin cell.

The illustrative application to the Mg_2Sn crystal which follows in Section IV should explain most questions about the input to MVFC required by a crystal calculation.

TABLE IV

CARD INPUT FOR MVFC

Type	Columns	Mnemonic Name	Format	Meaning
1	1-80		A	Comments.
2	1-5	MI	I	Number of elements in H. $MI \leq 39$.
	6-10	J	I	Number of cells, if molecule a 1 punch in column 10. $J \leq 60$.
	11-15	M	I	Number of atoms/cell or atoms/molecule. $M \leq 30$.
	16-20	JJ	I	Number of groups molecule divided into. If the molecule is considered to be a single group (e.g., CH_4) put $JJ = 1$, insert a blank card for card 3 and omit card 7.
	21-25	ICM	I	A 1 for a crystal, otherwise blank.
	26-30	MN	I	Leave blank in MVFC.
	31-35	LL	I	A 1 punch in col. 35 generates F's on tape (Fortran unit # 9).
	36-40	IC		A 1 punch gives cards.
3*	3-5	I Atoms	I	Number of atoms in group 1

* Omit this card type if crystal. For a molecule with $JJ = 1$ insert a blank card.

Table IV (continued)

Type	Columns	Mnemonic Name	Format	Meaning
3	8-10	I Atoms	I	Number of atoms in group 2.
	13-15	I Atoms	I	Number of atoms in group 3.
	.	.	.	
	.	.	.	
	.	.	.	
4*	1-10	Cell x (1)	F	x component of 1st lattice vector.
	11-20	Cell y (1)	F	y component of 1st lattice vector.
	21-30	Cell z (1)	F	z component of 1st lattice vector.
	1-10	Cell x (2)	F	x component of 2nd lattice vector.
	11-20	Cell y (2)	F	y component of 2nd lattice vector.
	21-30	Cell z (2)	F	z component of 2nd lattice vector.
	1-10	Cell x (3)	F	x component of 3rd lattice vector.
	11-20	Cell y (3)	F	y component of 3rd lattice vector.
	21-30	Cell z (3)	F	z component of 3rd lattice vector.

* Omit this card type if molecule.

5*	1-3	L1 (1)	I	Multiplier of α_1 for cell 1.
	4-6	L2 (1)	I	Multiplier of α_2 for cell 1.
	7-9	L3 (1)	I	Multiplier of α_3 for cell 1.
	.	.	.	
	.	.	.	
	.	.	.	
	75-78	L2 (9)	I	Multiplier of α_2 for cell 9.
	1-3	L3 (9)	I	Multiplier of α_3 for cell 9.
	4-6	L1 (10)	I	Multiplier of α_1 for cell 10.
	.	.	.	(Maximum of 60 triplets. This means
	.	.	.	no more than seven # 5 cards.)
	.	.	.	

* Omit this card type if molecule.

Table IV (continued)

Type	Columns	Mnemonic Name	Format	Meaning
6	1-10	A Mass (1)	F	Mass in atomic units of Atom 1.
	11-20	x (1)	F	x coordinates of Atom 1.
	21-30	y (1)	F	y coordinates of Atom 1.
	31-40	z (1)	F	z coordinates of Atom 1.
	41-50	A Mass (2)	F	Mass of Atom 2.
	.	.	.	
	.	.	.	
	.	.	.	
	1-10	A Mass (3)	F	Mass of Atom 3.
	.	.	.	(Maximum of 30 atoms. No more than 15 #6 cards.)
7*	.	.	.	
	1-5	N1	I	Identification number of 1st atom in group 1.
	6-10	N2	I	Identification number of 2nd atom in group 1.
	.	.	.	
	.	.	.	
	.	.	.	
	21-25	N5	I	Identification number of 5th atom in group 1.
	1-5	N1	I	Identification number of 1st atom in group 2.
	.	.	.	
	.	.	.	
	.	.	.	
	21-25	N5	I	Identification number of 5th atom in group 2.
	1-5	N1	I	Identification number of 1st atom in group 3.
	.	.	.	
	.	.	.	
	.	.	.	

Table IV (continued)

Type	Columns	Mnemonic / Name	Format	Meaning
7*	21-25	N5	I	Identification number of 5th atom in group 3.
	.	.	.	
	.	.	.	
	.	.	.	
*Omit this card type if crystal or if there is only one group in the molecule. Maximum of 5 atoms in any group.				
8	1-3	I	I	Index number for coordinate.
	3-6	Itype	I	Index for coordinate type.
	7-9	I1	I	Cell No. - corresponds to indexing of multipliers. Leave blank for molecule.
	10-12	N1	I	Atom number in cell or molecule.
	13-15	I2	I	Cell number. Leave blank for molecule.
	16-18	N2	I	Atom number. Apex atom for angle bending.
	.	.	.	
	.	.	.	
	.	.	.	
	37-39	I5	I	Cell number. Leave blank for molecule.
	40-42	N5	I	Atom number.
	43-54	Ro	F	Gives dimensions to bending coordinates. Required only for valence angle bending, dihedral torsion. If it is equal to zero, it is set = 1.0.
	55-62	Wx	F	x component of unit vector about which torsional rotation takes place.
	63-70	Wy	F	y component.
	71-78	Wz	F	z component.
	79-80	NTOR	I	Numbers of atoms involved in torsional rotation (NTOR > 3).

Table IV (continued)

I TYPE = 1 for bond stretch

= 2 for valence angle bend

= 3 for torsional rotation (Omit option 3. Defining equation is erroneous.)

= 4 for dihedral torsion

= 5 for change of angle between a bond and plane defined by two other bonds.

For valence angle bending I2, N2 are indexes of apex atom.

For dihedral torsional, (I1, N1), (I2, N2), (I3, N3), (I4, N4)

are the indices of atom 1, 2, 3, 4, respectively.

For type 5, (I1, N1) are indices of end atom.

(I2, N2) are indices of an anchor atom.

(I3, N3) are indices of an anchor atom.

(I4, N4) are indices of an apex atom.

Type	Column	Format	Usage
10	1-10	F	A force constant for a group of diagonal interactions belonging to a particular set. For crystals these occur only in F ₀₀ and are the diagonal f _{m,m} force constants.
	11-15	I	The number of the first coordinate in this group. Note: Sometimes the coordinates in a set may not be grouped all together on the #8 cards. In such cases the first and last cards of each group belonging to a set are listed each time they occur. The C ₂ H ₆ input data illustrate this. The set of six C-H stretching coordinates are listed in two groups involving coordinates 1-3 and 7-9, similarly for the H-C-H angle coordinates.
	16-20	I	The number of the last coordinate in this group. (The number of the last coordinate on the last type 10 card must be the total number of coordinates.)

Table IV (continued)

Type	Column	Format	Usage
10	21-25	I	The number (≤ 8) of the equivalent set. (Equivalent coordinates need not be grouped together on the number 8 cards. See Note above.)
11 ^(a)	1-5	I	The number of bond stretch sets which interact with each other. If there is no interaction put a 0 in column 5 and go to card 15.
12 ^(b)	1-5	I	The number of the first set interacting.
	6-10	I	The number of the second set interacting. (Note: members of the set may interact with others in the same set, or in different sets.)
	11-20	F	Force constant for the first way the two sets may interact. (Bonds at different angles require different f_{ij} .)
	21-30	F	Angle (degrees) between the two interacting coordinates.
	31-40	I	Atom number of common atom.
	41-50	F	Force constant for the second way the two sets may interact.
	51-60	F	Same as for columns 21-30 of this card.
	61-70	I	Same as for columns 31-40 of this card.
13 ^(a)	11-20	F	Force constant for the third way the two sets may interact.
	21-30	F	Angle (degrees) between the two interacting coordinates.

(a) Count self interactions in this number. Thus, if there are two sets, it is possible to have three interactions: 1-1, 1-2, 2-2.

(b) For each interaction between sets there must be 12, 13 and 14 cards. All three cards must be present.

Table IV (continued)

Card Type	Column	Format	Usage
13	31-40	I	Atom number of common atom.
	41-50	F	Force constant for the fourth way the two sets may interact.
	51-60	F	Same as for columns 21-30 of this card.
	61-70	I	Same as for columns 31-40 of this card.
14 ^(a)	21-30	F	Force constant for the fifth way the two sets may interact.
	31-40	F	Angle (degrees) between the two interacting coordinates.
	41-50	I	Atom number of common atom.
15	1-5	I	The number of interacting sets where one is a bond stretch, the other an angle bend and the bond is a leg of the angle. If no interaction, put a 0 in col. 5 and go to card 19.
16 [*]	1-5	I	The number of the first set interacting (bond stretch or angle bend).
	6-10	I	The number of the second set interacting.
	11-20	F	The force constant for the sets interacting.
17 [*]	11-20	F	0.0 (must be inserted)
18 [*]	11-20	F	0.0 (must be inserted)
19 ^(c)	1-5	I	The number of interacting sets where one is a bond stretch and the other an angle bend where one terminus of the bond is the apex atom of the angle. If no interaction, put a 0 in col. 5 and go to card 23.

(c) For each interaction between sets there must be 20, 21 and 22 cards.

* For each interaction between sets there must be 16, 17 and 18 cards.

Table IV (continued)

Card Type	Column	Format	Usage
20 ^(c)	1-5	I	The number of the first set interacting.
	6-10	I	The number of the second set interacting.
	11-20	F	Force constant for the first way the sets can interact.
	21-30	F	The angle (degrees) between the vector ($\underline{V}_b$) directed from the common atom along the bond and the vector sum of the vectors ($\underline{V}_1 + \underline{V}_2$) directed from the apex atom along the angle legs. See Table II and footnote (d).
	31-40	F	The smaller angle (degrees) between the vector $\underline{V}_b$ and the vector ($\underline{V}_1 \times \underline{V}_2$)
	41-50	F	Force constant for the second way the sets can interact.
	51-60	F	Angle defined as in columns 21-30 of this card.
	61-70	F	Angle defined as in columns 31-40 of this card.
21 ^(d)	11-20	F	Force constant for the third way the sets can interact.
	21-30	F	Angle defined as in columns 21-30.
	31-40	F	Angle defined as in columns 31-40.
	41-50	F	Force constant for the fourth way the sets can interact.
	51-60	F	Angle defined as in columns 21-30.
	61-70	F	Angle defined as in columns 31-40.
22 ^(d)	11-20	F	Force constant for the fifth way the sets can interact.

(d) These bond-angle interactions are defined in terms of a vector $\underline{V}_b$ extending along the bond from the atom which is common to the two coordinates, and vectors $\underline{V}_1$ and $\underline{V}_2$ along the bond legs out from the apex atom. See figures accompanying Table II.

Table IV (continued)

Card Type	Column	Format	Usage
22	21-30	F	Angle defined as in columns 21-30.
	31-40	F	Angle defined as in columns 31-40.
23 ^(e)	1-5	I	The number of interacting sets where one is a bond stretch and the other an angle bend where one terminus of the bond is the apex atom of the angle. If no interaction, put a 0 in col. 5 and go to card 27.
24 ^(e)			Card types 24, 25 and 26 are identical in format to types 20, 21 and 22.
25 ^(e)			
26 ^(e)			
27 ^(f)	1-5	I	The number distinct set-set interactions where angle bend coordinates interact with a common leg and common apex (cf. footnote to card 12). If no interaction, put a 0 in col. 5 and go to card 31.
28 ^(f)	1-5	I	The number of the first set interacting.
	6-10	I	The number of the second set interacting.
	11-20	F	The force constant for the set interacting.
29 ^(f)	11-20	F	0.0 (must be inserted)
30 ^(f)	11-20	F	0.0 (must be inserted)
31 ^(g)	1-5	I	The number of distinct set-set interactions where angle bend coordinates interact with a common leg but no common apex (cf. footnote to card 12). If no interaction, put a 0 in col. 5 and go to card 35.

(e) Cards 24, 25 and 26 must be present for each interaction between sets.

(f) For each interaction between sets there must be 28, 29 and 30 cards.

(g) For each interaction between sets there must be 32, 33 and 34 cards.

Table IV (continued)

Card Type	Column	Format	Usage
32 ^(g)	1-5	I	The number of the first set interacting.
	6-10	I	The number of the second set interacting.
	11-20	F	The force constant for the first way the sets can interact.
	21-30	F	The distance between the tips of the non-common legs.
	41-50	F	The force constant for the second way the sets can interact.
	51-60	F	The distance between the tips of the non-common legs.
33 ^(g)	11-20	F	The force constant for the third way the sets can interact.
	21-30	F	The distance between the tips of the non-common legs.
	41-50	F	The force constant for the fourth way the sets can interact.
	51-60	F	The distance between the tips of the non-common legs.
34 ^(g)	11-20	F	The force constant for the fifth way the sets can interact.
	21-30	F	The distance between the tips of the non-common legs.
35 ⁽ⁱ⁾	1-5	I	The number of distinct set-set interactions where angle bend coordinates interact with a common apex but no common leg (see footnote, card 12). If no interaction, put a 0 in col. 5 and go to card 39.

(i) Cards 36, 37 and 38 must be present for each interaction between sets.

Table IV (continued)

Card Type	Column	Format	Usage
36 ⁽ⁱ⁾			Card types 36, 37 and 38 are identical in format to types 20, 21 and 22. Here the first angle between planes is the angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4$. The second angle is the angle between $\underline{V}_1 \times \underline{V}_2$ and $\underline{V}_3 \times \underline{V}_4$, or the supplement, whichever is smaller. See Table II and footnote (h).
37 ⁽ⁱ⁾			
38 ⁽ⁱ⁾			
39	1-5	I	The number of distinct set-set interactions where angle bend coordinates interact with a common atom at the tips of a leg of each angle (see footnote card 12). If no interaction, put a 0 in col. 5 and go to card 43.
40 ^(j)	1-5	I	The number of the first set interacting.
	6-10	I	The number of the second set interacting.
	11-20	F	The force constant for the first way the sets can interact.
	21-40	F	The distance between the apex atoms.
	31-40	F	The distance between the most remote atoms on the far legs.
	41-50	F	The force constant for the second way the sets can interact.
	51-60	F	The distance between the apex atoms.
	61-70	F	The distance between the most remote atoms on the far legs.

(h) In defining these interactions use is made of vectors $\underline{V}_1$ and $\underline{V}_2$ which point from the apex atom of the first bond along its legs, and $\underline{V}_3$ and $\underline{V}_4$ which point along the legs of the second bond from its apex.

(j) There are cards 40, 41 and 42 for each interaction between sets.

Table IV (continued)

Card Type	Column	Format	Usage
41 ^(j)	11-20	F	Same as preceeding card except for third and fourth ways angle may interact.
	21-30	F	
	31-40	F	
	41-50	F	
	51-60	F	
	61-70	F	
42 ^(j)	11-20	F	Same as type 41 card except for fifth way angles may interact.
	21-30	F	
	31-40	F	
43 ^(k)	1-5	I	The number of distinct set-set interactions where angle bend coordinates interact with the tip of a leg of one angle being the apex atom of the other angle (see footnote, card 12).
44 ^(k)			Card types 44, 45 and 46 are identical in format to types 36, 37 and 38.
45 ^(k)			
46 ^(k)			

(k) Cards 44, 45 and 46 must be present for each interaction between sets.

IV. ILLUSTRATIVE APPLICATIONS

A. Ethane (C_2H_6)

The $\underline{F}$ matrix for ethane employs the same force constants as were used in a previous hand calculation^[7]. However, some interactions not included in that work are used in this illustration in order to cover more of the available types. These are shown with small force constants $|<10^{-3}|^*$. Table III lists the interactions and the associated constants f_{ij} . The diagonal constants are not in Table III. They are $F_r = 5.35$ for the C-H stretch, $F_R = 4.57$ for the C-C stretch, $F_\phi = 0.51$ for $r_O \Delta \phi_{H_i C H_j}$, $F_X = 0.63$ for $r_O \Delta x_{H_i C_j C_k}$ and $F_\psi = 0.144$ for the torsion coordinates. All limits are millidynes/Å.

The ethane molecule is assumed to have all equilibrium interbond angles equal to the tetrahedral value of $109^\circ 28.5'$. The C-H and C-C distances are 1.102 Å and 1.543 Å . The input data, and the output, are shown in the Appendix.

B. The Mg_2Sn Crystal

The Mg_2Sn crystal is face centered cubic with three atoms per unit cell. In this work the basis vectors $\underline{a}_1, \underline{a}_2, \underline{a}_3$ are of length $\sqrt{2}a$ where $2a$ is the distance between second neighbor Sn atoms on the cube corners. The relation between the vectors $\underline{a}_1, \underline{a}_2$ and $\underline{a}_3$ in terms of distances along the Cartesian directions is

* Actually $\underline{F}$ can be described as fully as possible with only 21 force constants. However, this does not effect the present problem.

$$\begin{bmatrix} \underline{a}_1 \\ \underline{a}_2 \\ \underline{a}_3 \end{bmatrix} = a \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix} \begin{bmatrix} \underline{i} \\ \underline{j} \\ \underline{k} \end{bmatrix} \quad a = 3.3775 \text{ \AA} \\ |\underline{a}_i| = \sqrt{2}a$$

$$\begin{bmatrix} \underline{i} \\ \underline{j} \\ \underline{k} \end{bmatrix} = \frac{1}{2a} \begin{bmatrix} -1 & 1 & 1 \\ 1 & -1 & 1 \\ 1 & 1 & -1 \end{bmatrix} \begin{bmatrix} \underline{a}_1 \\ \underline{a}_2 \\ \underline{a}_3 \end{bmatrix}$$

Here $\underline{i}$, $\underline{j}$, $\underline{k}$ are unit vectors along the Cartesian axis.

The Sn atoms are at the origins of the primitive cells and the Mg atoms in any primitive cell lie at

$$\frac{\underline{a} + \underline{a} + \underline{a}}{4} \quad \text{or} \quad \frac{(\underline{i} + \underline{j} + \underline{k})a}{2} \quad \text{and} \\ \frac{-\underline{a} - \underline{a} + 3\underline{a}}{4} \quad \text{or} \quad \frac{(\underline{i} + \underline{j} - \underline{k})a}{2}$$

relative to the cell origin. The Mg atoms at $\frac{(\underline{i} + \underline{j} + \underline{k})a}{2}$ and $\frac{(\underline{i} + \underline{j} - \underline{k})a}{2}$ are indexed as the number 1 and number 3 atoms in the cell. The Sn atom is number 2.

Table V indexes the cells which are needed to construct the $F_{0\ell}$ matrices for this problem. These are the same as for the diamond problem^[4].

The cells are indexed in two ways. The first uses an integer to denote a set of ℓ_1, ℓ_2, ℓ_3 values for a particular $\underline{r}_\ell = \ell_1 \underline{a}_1 + \ell_2 \underline{a}_2 + \ell_3 \underline{a}_3$. These are chosen so that $-\ell$ indexes $\underline{r}_{-\ell} = -\ell_1 \underline{a}_1 - \ell_2 \underline{a}_2 - \ell_3 \underline{a}_3$, i.e., $-\ell$ corresponds to reversing the signs of the ℓ_i . The computer does not sense negative numbers so the ℓ indices for $\ell \leq 0$ used by the

TABLE V
CELL INDEXING FOR Mg₂Sn

Theory. Prog.

ℓ	ℓ	ℓ_1	ℓ_2	ℓ_3	x_ℓ	y_ℓ	z_ℓ
1	1	1	0	0	0	a	a
2	2	0	1	0	a	0	a
3	3	0	0	1	a	a	0
4	4	0	1	-1	0	-a	a
5	5	-1	1	0	-a	-a	0
6	6	-1	0	1	a	0	-a
0	7	0	0	0	0	0	0
-1	8	-1	0	0	0	-a	-a
-2	9	0	-1	0	-a	0	-a
-3	10	0	0	-1	-a	-a	0
-4	11	0	-1	1	0	a	-a
-5	12	1	-1	0	a	a	0
-6	13	1	0	-1	-a	0	a

$a = 3.3775 \text{ \AA}$ for Mg₂Sn

computer are all positive numbers. The way in which they are used is evident from Table V.

This illustration employs only bond stretching and angle bending coordinates. Bonds emerging from an Sn atom to the nearest neighbor Mg atom are the only bonds included for stretching coordinates. All

such bonds belong to the cell containing the Sn atom. The angle bending coordinates include all those in which an Sn or either of the Mg atoms in a cell is the apex of an angle.

Table VI summarizes the interactions considered in this illustration. Each one has been given an f_{ij} . The numbers are small since the original hand problem started with negligible values with a view toward selecting certain ones to be altered to significant values using the force constant change feature of the computing programs.

The detailed output for C_2H_6 and the Mg_2Sn crystal are shown in the Appendix.

TABLE VI

INTERACTIONS IN Mg_2Sn

<u>Inter-</u> <u>Action</u>	<u>Sets</u> *	<u>Typical Case</u> **	<u>f_{ij}</u>	<u>Description</u>
Stretch- Stretch	1,1	0 0 0 -1 2 1 x 2 1	0.00010	Sn atom common. Interbond angle = 109.475° .
	1,1	0 0 0 0 2 1 x 2 3	0.00011	Sn atom common. Interbond angle = 70.525° .
	1,1	0 0 0 -3 2 1 x 2 3	0.00012	Sn atom common. Interbond angle = 180.0° .
	1,1	0 0 1 0 2 1 x 2 1	0.00013	Mg atom common. Interbond angle = 109.475° .

Table VI (cont)

Inter- Action	Sets *	Typical Case **	f_{ij}	Description
Stretch- Angle	1,1	$\begin{matrix} 0 & 0 & -1 \\ 2 & 1 & 1 \end{matrix} \times$	0.00014	Bond a leg of angle. Sn at apex.
	1,1	$\begin{matrix} 0 & 0 & -1 & 0 & -2 \\ 2 & 1 & 1 & 2 & 1 \end{matrix} \times$	0.00015	Bond is not a leg. Bond terminates at apex atom which is Sn. Angle between $\underline{V}_1 + \underline{V}_2$ and bond vector $\underline{V}_b$ is 125.2625° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 35.2625° .
	1,1	$\begin{matrix} 0 & 0 & 0 & 0 & 4 \\ 2 & 1 & 3 & 2 & 3 \end{matrix} \times$	0.00016	Bond not a leg. Bond terminates at apex Sn atom. Angle between bond vector $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 54.475° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 35.2625° .
	1,1	$\begin{matrix} 0 & 0 & 0 & 0 & -3 \\ 2 & 1 & 3 & 2 & 3 \end{matrix} \times$	0.00017	Bond not a leg. Bond terminates at apex Sn atom. Angle between $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 125.2625° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 90.0° .
Stretch- Angle	1,1	$\begin{matrix} 0 & 0 & 0 & 1 & 1 \\ 2 & 1 & 1 & 2 & 1 \end{matrix} \times$	0.00050	Bond not a leg. Bond terminates at end of leg on an Mg atom. Angle between $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 125.2625° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 90° .
	1,1	$\begin{matrix} 0 & 0 & 0 & 1 & -5 \\ 2 & 1 & 1 & 2 & 1 \end{matrix} \times$	0.00051	Bond not a leg. Bond terminates at end of leg on an Mg atom. Angle between $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 54.7375° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 35.2625° .
Stretch- Angle	1,2	$\begin{matrix} 0 & 0 & 0 & 0 & 1 \\ 2 & 1 & 2 & 1 & 2 \end{matrix} \times$	0.00018	Bond a leg of the angle. Mg atom at apex.
	1,2	$\begin{matrix} 0 & 0 & 1 & 0 & 2 \\ 2 & 1 & 2 & 1 & 2 \end{matrix} \times$	0.00019	Bond not a leg. Bond terminates at apex which is an Mg atom. Angle between $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 125.2625° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 35.2625° .

Table VI (cont)

<u>Inter-Action</u>	<u>Sets</u> *	<u>Typical Case</u> **	<u>f_{ij}</u>	<u>Description</u>
Stretch-Angle	1,2	0 0 0 -1 -1 2 1 x 2 1 2	0.00060	Bond not a leg. Bond terminates at end of leg on an Sn atom. Angle between $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 125.2625° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 90° .
	1,2	0 0 0 -1 5 2 1 x 2 1 2	0.00061	Bond not a leg. Bond terminates at end of leg on an Sn atom. Angle between $\underline{V}_b$ and $\underline{V}_1 + \underline{V}_2$ is 54.7375° . Smallest angle between $\underline{V}_b$ and $\pm \underline{V}_1 \times \underline{V}_2$ is 35.2625° .
Angle-Angle	1,1	0 0 -3 0 0 -1 1 2 1 x 1 2 1	0.00024	Common leg and apex. Sn atom at apex.
	1,1	0 0 -3 -1 0 -2 1 2 1 x 1 2 1	0.00025	No leg common. Apex is common Sn atom. Angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4$ is 180.0° . Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\pm \underline{V}_3 \times \underline{V}_4$ is 90.0° .
	1,1	0 0 -3 0 0 -3 1 2 1 x 3 2 3	0.00026	No leg common. Apex is common Sn atom. Angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4$ is 180.0° . Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\pm \underline{V}_3 \times \underline{V}_4$ is 0° .
	1,1	0 0 -3 -6 0 4 1 2 1 x 3 2 3	0.00027	No leg common. Apex is common Sn atom. Angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4$ is 0° . Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\pm \underline{V}_3 \times \underline{V}_4$ is 90° .

Table VI (cont)

Inter- Action	Sets *	Typical Case **	f_{ij}	Description
Angle- Angle	1,1	0 0 -3 x 0 0 4 1 2 1 x 3 2 3	0.00028	No leg common. Angles have common apex (Sn). Angle between $\underline{V}_1 + \underline{V}_1$ and $\underline{V}_3 + \underline{V}_4 = 90^\circ$. Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\underline{V}_3 \times \underline{V}_4 = 60^\circ$.
	1,1	0 0 -3 x 0 3 3 1 2 1 x 1 2 1	0.00070	No leg common. Leg of each angle terminates on a common Mg atom. Distance between extremity atoms = $2\sqrt{2}a = 9.552 \text{ \AA}$. Distance between apex atoms = $\sqrt{2}a = 4.776 \text{ \AA}$.
	1,1	0 0 -3 x 0 3 6 1 2 1 x 1 2 1	0.00071	No leg common. Leg of each angle terminates on a common Mg atom. Distance between extremity atoms = $\sqrt{6}a = 8.2728 \text{ \AA}$. Distance between apex atoms = $\sqrt{2}a = 4.776 \text{ \AA}$.
	1,1	0 0 -3 x 0 2 5 1 2 1 x 1 2 1	0.00072	No leg common. Leg of each angle terminates on a common Mg atom. Distance between extremity atoms = $2a = 6.7550 \text{ \AA}$. Distance between apex atoms = $\sqrt{2}a = 4.776 \text{ \AA}$.
	1,1	0 0 -3 x 0 2 4 1 2 1 x 1 2 1	0.00073	No leg common. Leg of each angle terminates on a common Mg atom. Distance between extremity atoms = $\sqrt{2}a = 4.776 \text{ \AA}$. Distance between apex atoms = $\sqrt{2}a = 4.776 \text{ \AA}$.

Table VI (cont)

Inter-Action	Sets *	Typical Case **	f_{ij}	Description
Angle-Angle	1,2	0 0 -3 1 2 1 x 0 0 3 2 1 2	0.0029	Common leg but no common apex. Distance between extremity atoms = $\sqrt{19} a/2 = 7.3611 \text{ \AA}$.
	1,2	0 0 -3 1 2 1 x 0 0 1 2 1 2	0.00030	Common leg but no common apex. Distance between extremity atoms = $\sqrt{11} a/2 = 5.6009 \text{ \AA}$.
	1,2	0 0 -3 1 2 1 x 1 0 2 2 1 2	0.00080	No leg common. Leg of one angle terminates on apex atom (Mg) of other. Angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4 = 0^\circ$. Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\pm \underline{V}_3 \times \underline{V}_4 = 90^\circ$.
	1,2	0 0 -3 1 2 1 x 1 0 3 2 1 2	0.00081	No leg common. Leg of one angle terminates on apex atom (Mg) of other. Angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4 = 90^\circ$. Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\pm \underline{V}_3 \times \underline{V}_4 = 60^\circ$.
Angle-Angle	2,2	0 0 3 2 1 2 x 0 0 1 2 1 2	0.00020	Leg common to both angles. Apex is Mg.
	2,2	0 0 3 2 1 2 x 1 0 2 2 1 2	0.00021	No common leg. Common apex (Mg). Angle between $\underline{V}_1 + \underline{V}_2$ and $\underline{V}_3 + \underline{V}_4 = 180^\circ$. Smallest angle between $\underline{V}_1 \times \underline{V}_2$ and $\pm \underline{V}_3 \times \underline{V}_4 = 90^\circ$.
	2,2	-3 -3 0 2 1 2 x 0 0 3 2 1 2	0.00075	No common leg or apex. A leg from each angle terminates on common Sn atom. Distance between extremity atoms = $2\sqrt{2} a = 9.552 \text{ \AA}$. Distance between apexes = $\sqrt{2} a = 4.776 \text{ \AA}$.
	2,2	-3 -3 0 2 1 2 x 0 0 2 2 1 2	0.00076	No common leg or apex. A leg from each angle terminates on common Sn atom. Distance between extremity atoms = $\sqrt{6} a = 8.2728 \text{ \AA}$. Distance between apex atoms = $\sqrt{2} a = 4.776 \text{ \AA}$.

Table VI (cont)

<u>Inter-Action</u>	<u>Sets</u> *	<u>Typical Case</u> **	<u>f_{ij}</u>	<u>Description</u>
Angle-Angle	2,2	0 0 3 2 1 2 x 0 -1 5 2 1 2	0.00077	No common leg or apex. A leg from each angle terminates on a common Sn atom. Distance between extremity atoms = 2 a = 6.7550 Å. Distance between apex atoms = $\sqrt{2}$ a = 4.776 Å.
	2,2	0 0 3 2 1 2 x 0 -1 -1 2 1 2	0.00078	No common leg or apex. A leg from each angle terminates on a common Sn atom. Distance between extremity atoms = $\sqrt{2}$ a = 4.776 Å. Distance between apex atoms = $\sqrt{2}$ a = 4.776 Å.

* A set is defined to include all coordinates which can be superposed by a symmetry operation. The sets of coordinates of each type (bond stretch, angle bend, etc.) are numbered 1, 2 --- n with $n < 8$. This illustration for Mg_2Sn uses only one set of stretch coordinates and two sets of angle bend coordinates. The angle bend sets are numbered 1 and 2 with 1 being the set where the Sn at the apex and 2 the set with an Mg at the apex.

** A symbol $(\ell \ell')$ denotes a bond between atom v in cell ℓ and atom v' in cell ℓ' . A symbol $(\ell \ell' \ell'')$ denotes an angle in which atom v in cell ℓ is at the apex and atom v' in cell ℓ' is at the end of one leg, and v'' in cell ℓ'' at the end of the other leg. Angle coordinates are usually multiplied by some equilibrium bond distance r_0 so all f_{ij} have the same units.

REFERENCES

1. See, for example, H. L. McMurry, Nucl. Sci. Eng. 15, 429 (1963).
2. Program number PPCo. 40*0206 which is filed with the Phillips Petroleum Company Computing Center, Idaho Falls, Idaho, 83401, was written in 1964 to calculate normal modes and frequencies of semi-rigid molecules. The output information suits the input needs of the program described in Ref. (3). The theory upon which this program is based is given in Ref. (1) and by H. L. McMurry, Spectrochim. Acta 21, 2091 (1965).
3. H. L. McMurry and L. J. Gannon, "A Machine Program for Calculating Slow Neutron Scattering Cross Sections with Application to Water," IDO-16984, July 1964. Updated versions of this are on file with the Computing Center (Ref. (1)) under numbers PPCo. 40*0517 and PPCo. 40*0828.
4. H. L. McMurry, A. W. Solbrig, Jr., J. K. Boyter and C. Noble, J. Phys. Chem. Solids 28, 2359 (1967).
5. C. Noble, A. W. Solbrig, Jr. and H. L. McMurry, "MACS M, A Program for Computing the Crystal Dynamical Matrix Phonon Dispersion Relations and Structure Factors for Neutron Inelastic Scattering," IN-1125 (October 1967). J. K. Boyter and A. W. Solbrig, Jr., "A Program for Computing Crystal Phonon Dispersion Relations, Structure Factors for Neutron Inelastic Scattering, and Jacobian Matrices," IN-1147 (January 1968). This is a more versatile version of MACS M. With minor exceptions, the input is identical to that for MACS M.

6. J. K. Boyter and H. L. McMurry, "D Matrix, A Computer Program for Calculating Valence Force Coordinates in Terms of Atom Displacements of a Molecule or Crystal," IN-1076 (May 1967).
7. H. L. McMurry, J. Mol. Spectry. 3, 216 (1959).

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APPENDIX

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F MATRIX FOR ETHANE(C2H6) AUG.27.1968

MI	J	M	JJ	ICM	MN	LL	IC
21	1	8	2	0	0	0	1
NU	MASS(NU)	X(NU)	Y(NU)	Z(NU)			
1	1.00810	1.03900	0.00000	1.13880			
2	1.00810	-0.51950	0.89990	1.13880			
3	1.00810	-0.51950	-0.89990	1.13880			
4	12.00390	0.00000	0.00000	0.77150			
5	1.00810	-1.03900	0.00000	-1.13880			
6	1.00810	0.51950	0.89990	-1.13880			
7	1.00810	0.51950	-0.89990	-1.13880			
8	12.00390	0.00000	0.00000	-0.77150			

UNCORRECTED CENTER OF MASS

XBAR = 0.000000

YBAR = 0.000000

ZBAR = -0.000000

CORRECTED COORDINATES OF ATOM NU

NU	X	Y	Z
1	1.03900	-0.00000	1.13880
2	-0.51950	0.89990	1.13880
3	-0.51950	-0.89990	1.13880
4	0.00000	-0.00000	0.77150
5	-1.03900	-0.00000	-1.13880
6	0.51950	0.89990	-1.13880
7	0.51950	-0.89990	-1.13880
8	0.00000	-0.00000	-0.77150

BERMAN SCRIPT B MATRIX

0.000000	-1.143403	0.000000	0.000000	0.143403	0.903437	0.000000	-1.143403	-0.903437	0.000000	-2.672989	-0.000000
0.000000	1.143403	0.000000	0.000000	1.143403	0.903437	0.000000	1.143403	-0.903437	0.000000	2.672989	-0.000000
1.143403	0.000000	1.043199	1.143403	0.000000	0.521600	1.143403	0.000000	0.521600	2.672989	0.000000	0.000000
-1.143403	0.000000	1.043199	-1.143403	0.000000	-0.521600	-1.143403	0.000000	-0.521600	-2.672989	0.000000	0.000000
0.000000	1.043199	0.000000	-0.903437	-0.521600	0.000000	0.903437	-0.521600	0.000000	0.000000	-0.000000	0.000000
0.000000	-1.043199	0.000000	-0.903437	0.521600	0.000000	-0.903437	0.521600	0.000000	0.000000	-0.000000	0.000000

ATOMS IN GROUP NUMBER 1 = 4

ATOMS IN GROUP NUMBER 2 = 4

GROUP NUMBER N1 N2 N3 N4 N5

1 1 2 3 4 0

XBAR(1) YBAR(1) ZBAR(1)

-0.000000 -0.000000 0.845416

GROUP NUMBER	N1	N2	N3	N4	N5
2	5	6	7	9	10
XBAR(I)	YBAR(I)	ZBAR(I)			
0.000000	0.000000	0.849416			

9 SUB J MATRIX

0.000000	0.294570	0.000000	0.000000	0.294570	0.903437	0.000000	0.294570	0.903437	0.000000	0.256094	0.000000
0.000000	0.294570	0.000000	0.000000	0.294570	0.903437	0.000000	0.294570	0.903437	0.000000	0.256094	0.000000
0.294570	0.000000	1.043199	0.294570	0.000000	0.521600	0.294570	0.000000	0.521600	0.256094	0.000000	0.000000
0.294570	0.000000	1.043199	0.294570	0.000000	0.521600	0.294570	0.000000	0.521600	0.256094	0.000000	0.000000
0.000000	1.043199	0.000000	0.903437	0.521600	0.000000	0.903437	0.521600	0.000000	0.000000	0.000000	0.000000
0.000000	1.043199	0.000000	0.903437	0.521600	0.000000	0.903437	0.521600	0.000000	0.000000	0.000000	0.000000

1	TYPE	11	N1	12	N2	13	N3	14	N4	15	N5	16	N6	RD	OMEGAX	OMEGAY	OMEGAZ	NTOR	
1	1	-0	1	-0	4	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0
2	1	-0	2	-0	4	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0
3	1	-0	3	-0	4	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0
4	2	-0	1	-0	4	-0	2	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
5	2	-0	1	-0	4	-0	3	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
6	2	-0	2	-0	4	-0	3	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
7	1	-0	5	-0	8	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0
8	1	-0	6	-0	8	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0
9	1	-0	7	-0	8	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0
10	2	-0	5	-0	8	-0	6	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
11	2	-0	5	-0	8	-0	7	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
12	2	-0	6	-0	8	-0	7	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
13	2	-0	1	-0	4	-0	8	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
14	2	-0	2	-0	4	-0	8	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
15	2	-0	3	-0	4	-0	8	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
16	2	-0	5	-0	8	-0	4	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
17	2	-0	6	-0	8	-0	4	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
18	2	-0	7	-0	8	-0	4	-0	-0	-0	-0	-0	-0	-0	1.10200	-0.00000	-0.00000	-0.00000	-0
19	3	-0	1	-0	2	-0	3	-0	4	-0	-0	-0	-0	-0	-0.00000	0.00000	0.00000	1.00000	4
20	3	-0	5	-0	6	-0	7	-0	8	-0	-0	-0	-0	-0	-0.00000	0.00000	0.00000	1.00000	4
21	1	-0	4	-0	8	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.00000	-0.00000	-0.00000	-0.00000	-0

DIAGONAL TO TYPE

5.35000	1	3	1
0.51000	4	6	1
5.35000	7	9	1
0.51000	10	12	1
0.63000	15	18	2
0.14400	19	20	1
4.57000	21	21	2

2 BOND - BOND INTERACTIONS

1	1	-0.02000	109.47500	-0	-0.00000	-0.00000	-0
		0.00000	-0.00000	-0	-0.00000	-0.00000	-0
		0.00000	-0.00000	-0			
1	2	0.00010	109.47500	-0	-0.00000	-0.00000	-0
		0.00000	-0.00000	-0	-0.00000	-0.00000	-0
		0.00000	-0.00000	-0			

3 BOND - ANGLE INTERACTIONS BOND #3 LEG OF ANGLE

1	1	0.00010	-0.00000
		0.00000	-0.00000
		0.00000	
1	2	-0.03500	-0.00000
		0.00000	-0.00000
		0.00000	

2	2	0,00000		-0,00000
		0,00000		-0,00000
		0,00000		

1	BOND * ANGLE INTERACTIONS			ONE TERMINUS OF BOND IS THE APEX ATOM OF THE ANGLE		
1	1	-0,10000 125,26250 35,26250	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000				
1	2	-0,47250 125,26250 35,26250	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000				
2	1	0,00012 125,26250 35,26250	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000				

1	BOND * ANGLE INTERACTIONS			THE COMMON ATOM IS AT THE END OF ONE LEG		
1	2	-0,06500 125,26250 90,00000	0,00000	54,73750	35,26250	
		0,00000 -0,00000 -0,00000	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000				

1	ANGLE * ANGLE INTERACTIONS			ANGLES HAVE A COMMON LEG AND COMMON APEX		
1	1	0,00013	-0,00000			
		0,00000	-0,00000			
		0,00000				
1	2	0,00015	-0,00000			
		0,00000	-0,00000			
		0,00000				
2	2	0,01500	-0,00000			
		0,00000	-0,00000			
		0,00000				

1	ANGLE * ANGLE INTERACTIONS			ANGLES HAVE A COMMON LEG BUT NO COMMON APEX		
2	2	0,11000 3,06310	0,00016	2,50379		
		0,00000 -0,00000	-0,00000	-0,00000		
		0,00000 -0,00000				

1	ANGLE * ANGLE INTERACTIONS			ANGLES HAVE A COMMON APEX BUT NO COMMON LEG		
1	2	-0,03500 180,00000 90,00000	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000	-0,00000	-0,00000	-0,00000	
		0,00000 -0,00000 -0,00000				

0 ANGLE - ANGLE INTERACTIONS ONLY THE TIPS OF TWO LEGS ARE ON A COMMON ATOM

1 ANGLE - ANGLE INTERACTIONS ONLY THE TIP OF ONE LEG IS COMMON TO THE APEX OF THE OTHER ANGLE

1	2	0.07000	90.00000	60.00000	0.00017	0.00000	90.00000
		0.00000	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000
		0.00000	-0.00000	-0.00000			

0.	0.	3.00000E-01	0.	0.	0.	15	19	3	F00
6.50000E-02	8.75000E-02	8.75000E-02	7.00000E-02	7.00000E-02	1.70000E-04	16	1	6	F00
3.50000E-02	4.72500E-01	4.72500E-01	1.50000E-04	1.50000E-04	3.50000E-02	16	7	6	F00
1.10000E-01	1.60000E-04	1.60000E-04	6.30000E-01	1.50000E-02	1.50000E-02	16	13	6	F00
0.	0.	3.00000E-01	0.	0.	0.	16	19	3	F00
8.75000E-02	8.75000E-02	6.50000E-02	1.70000E-04	7.00000E-02	7.00000E-02	17	1	6	F00
4.72500E-01	3.50000E-02	4.72500E-01	1.50000E-04	3.50000E-02	1.50000E-04	17	7	6	F00
1.60000E-04	1.60000E-04	1.10000E-01	1.50000E-02	6.30000E-01	1.50000E-02	17	13	6	F00
0.	0.	3.00000E-01	0.	0.	0.	17	19	3	F00
8.75000E-02	6.50000E-02	8.75000E-02	7.00000E-02	1.70000E-04	7.00000E-02	18	1	6	F00
4.72500E-01	4.72500E-01	3.50000E-02	3.50000E-02	1.50000E-04	1.50000E-04	18	7	6	F00
1.60000E-04	1.10000E-01	1.60000E-04	1.50000E-02	1.50000E-02	6.30000E-01	18	13	6	F00
0.	0.	3.00000E-01	0.	0.	0.	18	19	3	F00
0.	0.	0.	0.	0.	0.	19	1	6	F00
0.	0.	0.	0.	0.	0.	19	7	6	F00
0.	0.	0.	0.	0.	0.	19	13	6	F00
1.44000E-01	0.	0.	0.	0.	0.	19	19	3	F00
0.	0.	0.	0.	0.	0.	20	1	6	F00
0.	0.	0.	0.	0.	0.	20	7	6	F00
0.	0.	0.	0.	0.	0.	20	13	6	F00
0.	1.44000E-01	0.	0.	0.	0.	20	19	3	F00
1.00000E-04	1.00000E-04	1.00000E-04	1.20000E-04	1.20000E-04	1.20000E-04	21	1	6	F00
1.00000E-04	1.00000E-04	1.00000E-04	1.20000E-04	1.20000E-04	1.20000E-04	21	7	6	F00
3.90000E-01	3.00000E-01	3.00000E-01	3.00000E-01	3.00000E-01	3.00000E-01	21	13	6	F00
0.	0.	4.57000E-00	0.	0.	0.	21	19	3	F00

MVFC INSERTS F

PAGE 2

JOSTM P HLMP991008 25 40+1009 1001 00086 000316 00000000 00,028

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9/9/77

SJO: C MLM991000 25 40-1000

STIME 007

STBJOB

SIBLDR MVFC	01/03/69	9/9/17	MVFC0001
SIBLDR FTI	01/03/69	9/9/17	FTI 0001
SIBLDR ANGLE	01/03/69	9/9/17	ANGL0001
SIBLDR BONDPL	01/03/69	9/9/17	BOND0001
SIBLDR BOND	01/03/69	9/9/17	BOND0001
SIBLDR PLBOND	01/03/69	9/9/17	PLB0001
SIBLDR LBOND	01/03/69	9/9/17	LBON0001
SIBLDR ANPLPL	01/03/69	9/9/17	ANPL0001
SIBLDR ANPL	01/03/69	9/9/17	ANPL0001
SIBLDR BOND	01/03/69	9/9/17	BOND0001
SIBLDR WRIM	01/03/69	9/9/17	WRIM0001
SENTRY			

BLDR ** JOB 000000

02/12/69

PAGE 1

OBJECT PROGRAM IS BEING ENTERED INTO STORAGE.

MG2SN F. MATRIX FROM PVFC, FEB. 12 1969

MI	J	M	JJ	IM	MN	LL	IC
32	13	3	0	1	-0	-0	-0

CELLX	CELLY	CELLZ
0.000000	3.377500	3.377500
3.377500	0.000000	3.377500
3.377500	3.377500	0.000000

Mg₂Sn valence force
matrix

N	L1(N)	L2(N)	L3(N)
1	1	0	0
2	0	1	0
3	0	0	1
4	0	1	-1
5	-1	1	0
6	-1	0	1
7	0	0	0
8	-1	0	0
9	0	-1	0
10	0	0	-1
11	0	-1	1
12	1	-1	0
13	1	0	-1

NU	MASS(NU)	X(NU)	Y(NU)	Z(NU)
1	24.31000	1.68875	1.68875	1.68875
2	118.71000	0.00000	0.00000	0.00000
3	24.31000	1.68875	1.68875	-1.68875

UNCORRECTED CENTER OF MASS

XBAR =	0.490719	YBAR =	0.490719	ZBAR =	-0.000000
--------	----------	--------	----------	--------	-----------

CORRECTED COORDINATES OF ATOM NU

NU	X	Y	Z
1	1.19803	1.19803	1.68875
2	-0.49072	-0.49072	0.00000
3	1.19803	1.19803	-1.68875

GERMAN SCRIPT B MATRIX

0.000000	-8.326411	9.906915	0.000000	-0.000000	-9.346355	0.000000	8.326411	9.906915
8.326411	0.000000	-9.906915	0.000000	-0.000000	9.346355	-8.326411	0.000000	-9.906915
-9.906915	9.906915	0.000000	9.346355	-9.346355	0.000000	-9.906915	9.906915	0.000000

I	ITYPE	I1	N1	I2	N2	I3	N3	I4	N4	I5	N5	I6	N6	RO	OMEGAX	OMEGAY	OMEGAZ	NTOR	
1	1	7	2	7	1	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
2	1	7	2	8	1	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
3	1	7	2	9	1	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
4	1	7	2	10	1	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
5	1	7	2	7	3	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
6	1	7	2	4	3	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
7	1	7	2	13	3	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
8	1	7	2	10	3	-0	-0	-0	-0	-0	-0	-0	-0	-0	0,00000	0,00000	0,00000	0,00000	-0
9	2	7	1	7	2	8	1	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
10	2	7	1	7	2	9	1	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
11	2	7	1	7	2	10	1	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
12	2	8	1	7	2	9	1	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
13	2	8	1	7	2	10	1	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
14	2	9	1	7	2	10	1	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
15	2	7	3	7	2	4	3	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
16	2	7	3	7	2	10	3	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
17	2	7	3	7	2	13	3	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
18	2	4	3	7	2	10	3	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
19	2	4	3	7	2	13	3	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
20	2	13	3	7	2	10	3	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
21	2	7	2	7	1	1	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
22	2	7	2	7	1	2	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
23	2	7	2	7	1	3	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
24	2	1	2	7	1	2	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
25	2	1	2	7	1	3	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
26	2	2	2	7	1	3	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
27	2	7	2	7	3	3	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
28	2	7	2	7	3	6	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
29	2	7	2	7	3	11	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
30	2	3	2	7	3	6	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
31	2	3	2	7	3	11	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0
32	2	6	2	7	3	11	2	-0	-0	-0	-0	-0	-0	-0	2,92500	0,00000	0,00000	0,00000	-0

DIAGONAL TO TYPE

0,64500 1 8 1
0,13500 9 20 1
0,27000 21 32 2

1 BOND - BOND INTERACTIONS

1	1	0,00010	109,47500	2	0,00011	70,52500	2
		0,00012	180,00000	2	0,00013	109,47500	1
		0,00013	109,47500	3			

2 BOND - ANGLE INTERACTIONS BOND IS LSG OF ANGLE

1	1	0,00014		0,00000	
		0,00000		0,00000	

1	2	0.00000 0.00018 0.00000 0.00000		-0.00000 -0.00000		
2		BOND - ANGLE INTERACTIONS	ONE TERMINUS OF BOND IS THE APEX ATOM OF THE ANGLE			
1	1	0.00015 125.26250 35.26250 0.00017 125.26250 90.00000 0.00000 -0.00000 -0.00000	0.00016 54.47500 35.26250 -0.00000 -0.00000 -0.00000			
1	2	0.00019 125.26250 35.26250 0.00000 -0.00000 -0.00000 0.00000 -0.00000 -0.00000	-0.00000 -0.00000 -0.00000 -0.00000 -0.00000 -0.00000			
2		BOND - ANGLE INTERACTIONS	THE COMMON ATOM IS AT THE END OF ONE LEG			
1	1	0.00050 125.26250 90.00000 0.00000 -0.00000 -0.00000 0.00000 -0.00000 -0.00000	0.00031 54.73750 35.26250 -0.00000 -0.00000 -0.00000			
1	2	0.00000 125.26250 90.00000 0.00000 -0.00000 -0.00000 0.00000 -0.00000 -0.00000	0.00061 54.73750 35.26250 -0.00000 -0.00000 -0.00000			
2		ANGLE - ANGLE INTERACTIONS	ANGLES HAVE A COMMON LEG AND COMMON APEX			
1	1	0.00024 0.00000 0.00000	-0.00000 -0.00000			
2	2	0.00020 0.00000 0.00000	-0.00000 -0.00000			
1		ANGLE - ANGLE INTERACTIONS	ANGLES HAVE A COMMON LEG BUT NO COMMON APEX			
1	2	0.00029 7.36100 0.00000 -0.00000 0.00000 -0.00000	0.00030 5.60000 -0.00000 -0.00000			
2		ANGLE - ANGLE INTERACTIONS	ANGLES HAVE A COMMON APEX BUT NO COMMON LEG			
1	1	0.00025 180.00000 90.00000 0.00027 0.00000 90.00000 0.00000 -0.00000 -0.00000	0.00026 180.00000 0.00000 0.00028 90.00000 60.00000			
1	2	0.00021 180.00000 90.00000 0.00000 -0.00000 -0.00000 0.00000 -0.00000 -0.00000	-0.00000 -0.00000 -0.00000 -0.00000 -0.00000 -0.00000			

		ANGLE - ANGLE INTERACTIONS ONLY THE TIPS OF TWO LEGS ARE ON A COMMON ATOM					
1	1	0,00070	4,77600	9,59200	0,00071	4,77600	8,27200
		0,00072	4,77600	6,79500	0,00073	4,77600	4,77600
	2	0,00000	-0,00000	-0,00000	0,00076	4,77600	8,27200
		0,00075	4,77600	9,59200	0,00078	4,77600	4,77600
		0,00077	4,77600	6,79500			
		0,00000	-0,00000	-0,00000			
		ANGLE - ANGLE INTERACTIONS ONLY THE TIP OF ONE LEG IS COMMON TO THE APEX OF THE OTHER ANGLE					
1	2	0,00080	0,00000	90,00000	0,00081	90,00000	60,00000
		0,00000	-0,00000	-0,00000	-0,00000	-0,00000	-0,00000
		0,00000	-0,00000	-0,00000			

0.	0.	0.	0.	0.	0.	10	31	2	FOL
0.	5,10000E-04	0.	0.	0.	0.	11	1	6	FOL
0.	0.	7,10000E-04	0.	0.	7,20000E-04	11	7	6	FOL
0.	0.	0.	0.	0.	0.	11	13	6	FOL
0.	0.	0.	0.	0.	0.	11	19	6	FOL
0.	0.	0.	0.	0.	0.	11	25	6	FOL
0.	0.	0.	0.	0.	0.	11	31	2	FOL
0.	0.	0.	0.	0.	0.	12	1	6	FOL
0.	0.	0.	0.	0.	0.	12	7	6	FOL
0.	0.	0.	0.	0.	0.	12	13	6	FOL
0.	0.	0.	0.	0.	0.	12	19	6	FOL
0.	0.	0.	0.	0.	0.	12	25	6	FOL
0.	0.	0.	0.	0.	0.	12	31	2	FOL
0.	0.	0.	0.	0.	0.	13	1	6	FOL
0.	0.	0.	0.	0.	0.	13	7	6	FOL
0.	0.	0.	0.	0.	0.	13	13	6	FOL
0.	0.	0.	0.	0.	0.	13	19	6	FOL
0.	0.	0.	0.	0.	0.	13	25	6	FOL
0.	0.	0.	0.	0.	0.	13	31	2	FOL
0.	0.	0.	0.	0.	0.	14	1	6	FOL
0.	0.	0.	0.	0.	0.	14	7	6	FOL
0.	0.	0.	0.	0.	0.	14	13	6	FOL
0.	0.	0.	0.	0.	0.	14	19	6	FOL
0.	0.	0.	0.	0.	0.	14	25	6	FOL
0.	0.	0.	0.	0.	0.	14	31	2	FOL
0.	0.	0.	0.	0.	0.	15	1	6	FOL
0.	0.	0.	0.	0.	0.	15	7	6	FOL
0.	0.	0.	0.	0.	0.	15	13	6	FOL
0.	0.	0.	0.	0.	0.	15	19	6	FOL
0.	0.	0.	0.	0.	0.	15	25	6	FOL
0.	0.	0.	0.	0.	0.	15	31	2	FOL
0.	0.	0.	0.	0.	0.	16	1	6	FOL
0.	0.	0.	0.	0.	0.	16	7	6	FOL
0.	0.	0.	0.	0.	0.	16	13	6	FOL
0.	0.	0.	0.	0.	0.	16	19	6	FOL
0.	0.	0.	0.	0.	0.	16	25	6	FOL
0.	0.	0.	0.	0.	0.	16	31	2	FOL
0.	0.	0.	0.	0.	0.	17	1	6	FOL
0.	5,10000E-04	0.	0.	0.	0.	17	7	6	FOL
0.	0.	7,30000E-04	0.	0.	7,20000E-04	17	13	6	FOL
0.	0.	0.	0.	0.	0.	17	19	6	FOL
0.	0.	0.	0.	0.	0.	17	25	6	FOL
0.	0.	0.	0.	0.	0.	17	31	2	FOL
0.	0.	0.	0.	0.	0.	18	1	6	FOL
0.	0.	0.	0.	0.	0.	18	7	6	FOL
0.	0.	0.	0.	0.	0.	18	13	6	FOL
0.	0.	0.	0.	0.	0.	18	19	6	FOL
0.	0.	0.	0.	0.	0.	18	25	6	FOL
0.	0.	0.	0.	0.	0.	18	31	2	FOL
0.	0.	0.	0.	0.	0.	19	1	6	FOL
0.	5,10000E-04	0.	0.	0.	0.	19	7	6	FOL
0.	0.	7,20000E-04	0.	0.	7,30000E-04	19	13	6	FOL
0.	0.	0.	0.	0.	0.	19	19	6	FOL
0.	0.	0.	0.	0.	0.	19	25	6	FOL
0.	0.	0.	0.	0.	0.	19	31	2	FOL
0.	0.	0.	0.	0.	0.	20	1	6	FOL
0.	5,04000E-04	0.	0.	0.	0.	20	7	6	FOL
0.	0.	7,10000E-04	0.	0.	7,10000E-04	20	13	6	FOL
0.	0.	0.	0.	0.	0.	20	19	6	FOL
0.	0.	0.	0.	0.	0.	20	25	6	FOL

0.	0.	0.	0.	0.	0.	20	31	2	FOL
6,00000E-04	1,80000E-04	6,10000E-04	6,10000E-04	0.	0.	21	1	6	FOL
0.	0.	2,90000E-04	8,10000E-04	8,10000E-04	3,00000E-04	21	7	6	FOL
3,00000E-04	8,00000E-04	0.	8,10000E-04	8,10000E-04	8,10000E-04	21	13	6	FOL
8,10000E-04	0.	7,50000E-04	7,60000E-04	7,60000E-04	0.	21	19	6	FOL
0.	0.	0.	0.	0.	0.	21	25	6	FOL
0.	0.	0.	0.	0.	0.	21	31	2	FOL
0.	1,90000E-04	0.	0.	0.	0.	22	1	6	FOL
0.	0.	8,10000E-04	0.	0.	8,10000E-04	22	7	6	FOL
8,00000E-04	0.	0.	0.	0.	0.	22	13	6	FOL
0.	0.	0.	0.	0.	0.	22	19	6	FOL
0.	0.	0.	0.	0.	0.	22	25	6	FOL
0.	0.	0.	0.	0.	0.	22	31	2	FOL
0.	1,90000E-04	0.	0.	0.	0.	23	1	6	FOL
0.	0.	8,10000E-04	0.	0.	8,00000E-04	23	7	6	FOL
8,10000E-04	0.	0.	0.	0.	0.	23	13	6	FOL
0.	0.	0.	0.	0.	0.	23	19	6	FOL
0.	0.	0.	0.	0.	0.	23	25	6	FOL
0.	0.	0.	0.	0.	0.	23	31	2	FOL
6,10000E-04	1,80000E-04	6,00000E-04	6,10000E-04	0.	0.	24	1	6	FOL
0.	0.	3,00000E-04	8,10000E-04	8,00000E-04	2,90000E-04	24	7	6	FOL
3,00000E-04	8,10000E-04	8,10000E-04	7,60000E-04	8,10000E-04	8,10000E-04	24	13	6	FOL
0.	8,10000E-04	7,60000E-04	7,80000E-04	7,70000E-04	0.	24	19	6	FOL
0.	0.	0.	0.	0.	0.	24	25	6	FOL
0.	0.	0.	0.	0.	0.	24	31	2	FOL
6,10000E-04	1,80000E-04	6,10000E-04	6,00000E-04	0.	0.	25	1	6	FOL
0.	0.	3,00000E-04	8,00000E-04	8,10000E-04	3,00000E-04	25	7	6	FOL
2,90000E-04	8,10000E-04	8,10000E-04	8,10000E-04	0.	0.	25	13	6	FOL
8,10000E-04	8,10000E-04	7,60000E-04	7,70000E-04	7,80000E-04	0.	25	19	6	FOL
0.	0.	0.	0.	0.	0.	25	25	6	FOL
0.	0.	0.	0.	0.	0.	25	31	2	FOL
0.	1,90000E-04	8,00000E-04	0.	0.	0.	26	1	6	FOL
0.	0.	0.	0.	0.	8,10000E-04	26	7	6	FOL
8,10000E-04	0.	0.	0.	0.	0.	26	13	6	FOL
0.	0.	0.	0.	0.	0.	26	19	6	FOL
0.	0.	0.	0.	0.	0.	26	25	6	FOL
0.	0.	0.	0.	0.	0.	26	31	2	FOL
0.	0.	0.	0.	0.	0.	27	1	6	FOL
0.	0.	0.	0.	0.	0.	27	7	6	FOL
0.	0.	0.	0.	0.	0.	27	13	6	FOL
0.	0.	0.	0.	0.	0.	27	19	6	FOL
0.	0.	0.	7,80000E-04	0.	7,60000E-04	27	25	6	FOL
0.	7,70000E-04	0.	0.	0.	0.	27	31	2	FOL
0.	0.	0.	0.	0.	0.	28	1	6	FOL
0.	0.	0.	0.	0.	0.	28	7	6	FOL
0.	0.	0.	0.	0.	0.	28	13	6	FOL
0.	0.	0.	0.	0.	0.	28	19	6	FOL
0.	0.	0.	0.	0.	0.	28	25	6	FOL
0.	0.	0.	0.	0.	0.	28	31	2	FOL
0.	0.	0.	0.	0.	0.	29	1	6	FOL
0.	0.	0.	0.	0.	0.	29	7	6	FOL
0.	0.	0.	0.	0.	0.	29	13	6	FOL
0.	0.	0.	0.	0.	0.	29	19	6	FOL
0.	0.	0.	0.	0.	0.	29	25	6	FOL
0.	0.	0.	0.	0.	0.	29	31	2	FOL
0.	0.	0.	0.	0.	0.	30	1	6	FOL
0.	0.	0.	0.	0.	0.	30	7	6	FOL
0.	0.	0.	0.	0.	0.	30	13	6	FOL
0.	0.	0.	0.	0.	0.	30	19	6	FOL
0.	0.	0.	7,60000E-04	0.	7,50000E-04	30	25	6	FOL

0.	7.60000E-04	0.	0.	0.	0.	30	31	2	FOL
0.	0.	0.	0.	0.	0.	31	1	6	FOL
0.	0.	0.	0.	0.	0.	31	7	6	FOL
0.	0.	0.	0.	0.	0.	31	13	6	FOL
0.	0.	0.	0.	0.	0.	31	19	6	FOL
0.	0.	0.	7.70000E-04	0.	7.60000E-04	31	25	6	FOL
0.	7.80000E-04	0.	0.	0.	0.	31	31	12	FOL
0.	0.	0.	0.	0.	0.	32	1	6	FOL
0.	0.	0.	0.	0.	0.	32	7	6	FOL
0.	0.	0.	0.	0.	0.	32	13	6	FOL
0.	0.	0.	0.	0.	0.	32	19	6	FOL
0.	0.	0.	0.	0.	0.	32	25	6	FOL
0.	0.	0.	0.	0.	0.	32	31	2	FOL

CELL MULTIPLIERS (0, 1, 0,)									
0.	0.	1.30000E-04	0.	0.	0.	1	1	6	FOL
0.	0.	0.	5.00000E-04	0.	5.10000E-04	1	7	6	FOL
0.	5.10000E-04	0.	0.	0.	0.	1	13	6	FOL
0.	0.	0.	0.	0.	0.	1	19	6	FOL
0.	0.	0.	0.	0.	0.	1	25	6	FOL
0.	0.	0.	0.	0.	0.	1	31	2	FOL
0.	0.	0.	0.	0.	0.	2	1	6	FOL
0.	0.	0.	0.	0.	0.	2	7	6	FOL
0.	0.	0.	0.	0.	0.	2	13	6	FOL
0.	0.	0.	0.	0.	0.	2	19	6	FOL
0.	0.	0.	0.	0.	0.	2	25	6	FOL
0.	0.	0.	0.	0.	0.	2	31	2	FOL
0.	0.	0.	0.	0.	0.	3	1	6	FOL
0.	0.	0.	0.	0.	0.	3	7	6	FOL
0.	0.	0.	0.	0.	0.	3	13	6	FOL
0.	0.	0.	0.	0.	0.	3	19	6	FOL
0.	0.	0.	0.	0.	0.	3	25	6	FOL
0.	0.	0.	0.	0.	0.	3	31	2	FOL
0.	0.	0.	0.	0.	0.	4	1	6	FOL
0.	0.	0.	0.	0.	0.	4	7	6	FOL
0.	0.	0.	0.	0.	0.	4	13	6	FOL
0.	0.	0.	0.	0.	0.	4	19	6	FOL
0.	0.	0.	0.	0.	0.	4	25	6	FOL
0.	0.	0.	0.	0.	0.	4	31	2	FOL
0.	0.	0.	0.	0.	0.	5	1	6	FOL
0.	0.	0.	0.	0.	0.	5	7	6	FOL
0.	0.	0.	0.	0.	0.	5	13	6	FOL
0.	0.	0.	0.	0.	0.	5	19	6	FOL
0.	0.	0.	0.	0.	0.	5	25	6	FOL
0.	0.	0.	0.	0.	0.	5	31	2	FOL
0.	1.30000E-04	0.	0.	0.	0.	6	1	6	FOL
0.	0.	0.	5.10000E-04	0.	5.00000E-04	6	7	6	FOL
0.	5.10000E-04	0.	0.	0.	0.	6	13	6	FOL
0.	0.	0.	0.	0.	0.	6	19	6	FOL
0.	0.	0.	0.	0.	0.	6	25	6	FOL
0.	0.	0.	0.	0.	0.	6	31	2	FOL
0.	0.	0.	0.	0.	0.	7	1	6	FOL
0.	0.	0.	0.	0.	0.	7	7	6	FOL
0.	0.	0.	0.	0.	0.	7	13	6	FOL
0.	0.	0.	0.	0.	0.	7	19	6	FOL
0.	0.	0.	0.	0.	0.	7	25	6	FOL
0.	0.	0.	0.	0.	0.	7	31	2	FOL
0.	0.	0.	0.	0.	0.	8	1	6	FOL
0.	0.	0.	0.	0.	0.	8	7	6	FOL
0.	0.	0.	0.	0.	0.	8	13	6	FOL
0.	0.	0.	0.	0.	0.	8	19	6	FOL
0.	0.	0.	0.	0.	0.	8	25	6	FOL
0.	0.	0.	0.	0.	0.	8	31	2	FOL
0.	0.	5.10000E-04	0.	0.	0.	9	1	6	FOL
0.	0.	0.	7.10000E-04	0.	7.30000E-04	9	7	6	FOL
0.	7.20000E-04	0.	0.	0.	0.	9	13	6	FOL
0.	0.	0.	0.	0.	0.	9	19	6	FOL
0.	0.	0.	0.	0.	0.	9	25	6	FOL
0.	0.	0.	0.	0.	0.	9	31	2	FOL
0.	0.	5.00000E-04	0.	0.	0.	10	1	6	FOL
0.	0.	0.	7.00000E-04	0.	7.10000E-04	10	7	6	FOL
0.	7.10000E-04	0.	0.	0.	0.	10	13	6	FOL
0.	0.	0.	0.	0.	0.	10	19	6	FOL
0.	0.	0.	0.	0.	0.	10	25	6	FOL

0.	0.	0.	0.	0.	0.	10	31	2	FOL
0.	0.	5,10000E-04	0.	0.	0.	11	1	6	FOL
0.	0.	0.	7,10000E-04	0.	0.	11	7	6	FOL
0.	7,30000E-04	0.	0.	0.	7,20000E-04	11	13	6	FOL
0.	0.	0.	0.	0.	0.	11	19	6	FOL
0.	0.	0.	0.	0.	0.	11	25	6	FOL
0.	0.	0.	0.	0.	0.	11	31	2	FOL
0.	0.	0.	0.	0.	0.	12	1	6	FOL
0.	0.	0.	0.	0.	0.	12	7	6	FOL
0.	0.	0.	0.	0.	0.	12	13	6	FOL
0.	0.	0.	0.	0.	0.	12	19	6	FOL
0.	0.	0.	0.	0.	0.	12	25	6	FOL
0.	0.	0.	0.	0.	0.	12	31	2	FOL
0.	0.	0.	0.	0.	0.	13	1	6	FOL
0.	0.	0.	0.	0.	0.	13	7	6	FOL
0.	0.	0.	0.	0.	0.	13	13	6	FOL
0.	0.	0.	0.	0.	0.	13	19	6	FOL
0.	0.	0.	0.	0.	0.	13	25	6	FOL
0.	0.	0.	0.	0.	0.	13	31	2	FOL
0.	0.	0.	0.	0.	0.	14	1	6	FOL
0.	0.	0.	0.	0.	0.	14	7	6	FOL
0.	0.	0.	0.	0.	0.	14	13	6	FOL
0.	0.	0.	0.	0.	0.	14	19	6	FOL
0.	0.	0.	0.	0.	0.	14	25	6	FOL
0.	0.	0.	0.	0.	0.	14	31	2	FOL
0.	5,10000E-04	0.	0.	0.	0.	15	1	6	FOL
0.	0.	0.	0.	0.	0.	15	7	6	FOL
0.	7,20000E-04	0.	7,30000E-04	0.	7,10000E-04	15	13	6	FOL
0.	0.	0.	0.	0.	0.	15	19	6	FOL
0.	0.	0.	0.	0.	0.	15	25	6	FOL
0.	0.	0.	0.	0.	0.	15	31	2	FOL
0.	0.	0.	0.	0.	0.	16	1	6	FOL
0.	0.	0.	0.	0.	0.	16	7	6	FOL
0.	0.	0.	0.	0.	0.	16	13	6	FOL
0.	0.	0.	0.	0.	0.	16	19	6	FOL
0.	0.	0.	0.	0.	0.	16	25	6	FOL
0.	0.	0.	0.	0.	0.	16	31	2	FOL
0.	0.	0.	0.	0.	0.	17	1	6	FOL
0.	0.	0.	0.	0.	0.	17	7	6	FOL
0.	0.	0.	0.	0.	0.	17	13	6	FOL
0.	0.	0.	0.	0.	0.	17	19	6	FOL
0.	0.	0.	0.	0.	0.	17	25	6	FOL
0.	0.	0.	0.	0.	0.	17	31	2	FOL
0.	5,00000E-04	0.	0.	0.	0.	18	1	6	FOL
0.	0.	0.	0.	0.	0.	18	7	6	FOL
0.	7,10000E-04	0.	7,10000E-04	0.	7,00000E-04	18	13	6	FOL
0.	0.	0.	0.	0.	0.	18	19	6	FOL
0.	0.	0.	0.	0.	0.	18	25	6	FOL
0.	0.	0.	0.	0.	0.	18	31	2	FOL
0.	0.	0.	0.	0.	0.	19	1	6	FOL
0.	5,10000E-04	0.	0.	0.	0.	19	7	6	FOL
0.	0.	0.	7,20000E-04	0.	7,10000E-04	19	13	6	FOL
0.	7,30000E-04	0.	0.	0.	0.	19	19	6	FOL
0.	0.	0.	0.	0.	0.	19	25	6	FOL
0.	0.	0.	0.	0.	0.	19	31	2	FOL
0.	0.	0.	0.	0.	0.	20	1	6	FOL
0.	0.	0.	0.	0.	0.	20	7	6	FOL
0.	0.	0.	0.	0.	0.	20	13	6	FOL
0.	0.	0.	0.	0.	0.	20	19	6	FOL
0.	0.	0.	0.	0.	0.	20	25	6	FOL

0.	0.	0.	0.	0.	0.	20	31	2	FOL
0.	0.	1,90000E-04	0.	0.	0.	21	1	6	FOL
0.	0.	0.	8,10000E-04	0.	8,10000E-04	21	7	6	FOL
0.	8,00000E-04	0.	0.	0.	0.	21	13	6	FOL
0.	0.	0.	0.	0.	0.	21	19	6	FOL
0.	0.	0.	0.	0.	0.	21	25	6	FOL
0.	0.	0.	0.	0.	0.	21	31	2	FOL
6,10000E-04	6,10000E-04	1,80000E-04	6,10000E-04	0.	0.	22	1	6	FOL
0.	0.	8,10000E-04	2,90000E-04	8,10000E-04	3,00000E-04	22	7	6	FOL
8,10000E-04	3,00000E-04	8,10000E-04	8,10000E-04	0.	0.	22	13	6	FOL
8,10000E-04	8,10000E-04	7,60000E-04	7,50000E-04	7,60000E-04	0.	22	19	6	FOL
0.	0.	0.	0.	0.	0.	22	25	6	FOL
0.	0.	0.	0.	0.	0.	22	31	2	FOL
0.	0.	1,90000E-04	0.	0.	0.	23	1	6	FOL
0.	0.	0.	8,10000E-04	0.	8,00000E-04	23	7	6	FOL
0.	8,10000E-04	0.	0.	0.	0.	23	13	6	FOL
0.	0.	0.	0.	0.	0.	23	19	6	FOL
0.	0.	0.	0.	0.	0.	23	25	6	FOL
0.	0.	0.	0.	0.	0.	23	31	2	FOL
6,10000E-04	6,00000E-04	1,80000E-04	6,10000E-04	0.	0.	24	1	6	FOL
0.	0.	8,10000E-04	3,00000E-04	8,00000E-04	2,90000E-04	24	7	6	FOL
8,10000E-04	3,00000E-04	8,10000E-04	0.	8,10000E-04	8,10000E-04	24	13	6	FOL
0.	8,10000E-04	7,80000E-04	7,60000E-04	7,70000E-04	0.	24	19	6	FOL
0.	0.	0.	0.	0.	0.	24	25	6	FOL
0.	0.	0.	0.	0.	0.	24	31	2	FOL
0.	0.	1,90000E-04	0.	0.	0.	25	1	6	FOL
0.	0.	0.	8,00000E-04	0.	8,10000E-04	25	7	6	FOL
0.	8,10000E-04	0.	0.	0.	0.	25	13	6	FOL
0.	0.	0.	0.	0.	0.	25	19	6	FOL
0.	0.	0.	0.	0.	0.	25	25	6	FOL
0.	0.	0.	0.	0.	0.	25	31	2	FOL
6,10000E-04	6,10000E-04	1,80000E-04	6,00000E-04	0.	0.	26	1	6	FOL
0.	0.	8,00000E-04	3,00000E-04	8,10000E-04	3,00000E-04	26	7	6	FOL
8,10000E-04	2,90000E-04	0.	8,10000E-04	8,10000E-04	8,10000E-04	26	13	6	FOL
8,10000E-04	0.	7,70000E-04	7,60000E-04	7,80000E-04	0.	26	19	6	FOL
0.	0.	0.	0.	0.	0.	26	25	6	FOL
0.	0.	0.	0.	0.	0.	26	31	2	FOL
0.	0.	0.	0.	0.	0.	27	1	6	FOL
0.	0.	0.	0.	0.	0.	27	7	6	FOL
0.	0.	0.	0.	0.	0.	27	13	6	FOL
0.	0.	0.	0.	0.	0.	27	19	6	FOL
0.	0.	0.	0.	7,80000E-04	0.	27	25	6	FOL
7,60000E-04	7,70000E-04	0.	0.	0.	0.	27	31	2	FOL
0.	0.	0.	0.	0.	0.	28	1	6	FOL
0.	0.	0.	0.	0.	0.	28	7	6	FOL
0.	0.	0.	0.	0.	0.	28	13	6	FOL
0.	0.	0.	0.	0.	0.	28	19	6	FOL
0.	0.	0.	0.	0.	0.	28	25	6	FOL
0.	0.	0.	0.	0.	0.	28	31	2	FOL
0.	0.	0.	0.	0.	0.	29	1	6	FOL
0.	0.	0.	0.	0.	0.	29	7	6	FOL
0.	0.	0.	0.	0.	0.	29	13	6	FOL
0.	0.	0.	0.	0.	0.	29	19	6	FOL
0.	0.	0.	0.	0.	0.	29	25	6	FOL
0.	0.	0.	0.	0.	0.	29	31	2	FOL
0.	0.	0.	0.	0.	0.	30	1	6	FOL
0.	0.	0.	0.	0.	0.	30	7	6	FOL
0.	0.	0.	0.	0.	0.	30	13	6	FOL
0.	0.	0.	0.	0.	0.	30	19	6	FOL
0.	0.	0.	0.	7,70000E-04	0.	30	25	6	FOL

7.60000E-04	7.80000E-04	0.	0.	0.	0.	30.	31.	2	FOL
0.	0.	0.	0.	0.	0.	31.	1	6	FOL
0.	0.	0.	0.	0.	0.	31.	7	6	FOL
0.	0.	0.	0.	0.	0.	31.	13	6	FOL
0.	0.	0.	0.	0.	0.	31.	19	6	FOL
0.	0.	0.	0.	0.	0.	31.	25	6	FOL
7.30000E-04	7.60000E-04	0.	0.	7.60000E-04	0.	31.	31	2	FOL
0.	0.	0.	0.	0.	0.	32.	1	6	FOL
0.	0.	0.	0.	0.	0.	32.	7	6	FOL
0.	0.	0.	0.	0.	0.	32.	13	6	FOL
0.	0.	0.	0.	0.	0.	32.	19	6	FOL
0.	0.	0.	0.	0.	0.	32.	25	6	FOL
0.	0.	0.	0.	0.	0.	32.	31	2	FOL

CELL MULTIPLIERS (0, 0, 1.)									
0.	0.	0.	1.30000E-04	0.	0.	1	1	6	FOL
0.	0.	0.	0.	5.00000E-04	0.	1	7	6	FOL
5.10000E-04	5.10000E-04	0.	0.	0.	0.	1	13	6	FOL
0.	0.	0.	0.	0.	0.	1	19	6	FOL
0.	0.	0.	0.	0.	0.	1	25	6	FOL
0.	0.	0.	0.	0.	0.	1	31	2	FOL
0.	0.	0.	0.	0.	0.	2	1	6	FOL
0.	0.	0.	0.	0.	0.	2	7	6	FOL
0.	0.	0.	0.	0.	0.	2	13	6	FOL
0.	0.	0.	0.	0.	0.	2	19	6	FOL
0.	0.	0.	0.	0.	0.	2	25	6	FOL
0.	0.	0.	0.	0.	0.	2	31	2	FOL
0.	0.	0.	0.	0.	0.	3	1	6	FOL
0.	0.	0.	0.	0.	0.	3	7	6	FOL
0.	0.	0.	0.	0.	0.	3	13	6	FOL
0.	0.	0.	0.	0.	0.	3	19	6	FOL
0.	0.	0.	0.	0.	0.	3	25	6	FOL
0.	0.	0.	0.	0.	0.	3	31	2	FOL
0.	0.	0.	0.	0.	0.	4	1	6	FOL
0.	0.	0.	0.	0.	0.	4	7	6	FOL
0.	0.	0.	0.	0.	0.	4	13	6	FOL
0.	0.	0.	0.	0.	0.	4	19	6	FOL
0.	0.	0.	0.	0.	0.	4	25	6	FOL
0.	0.	0.	0.	0.	0.	4	31	2	FOL
0.	0.	0.	0.	0.	0.	5	1	6	FOL
0.	1.30000E-04	0.	0.	0.	0.	5	7	6	FOL
0.	0.	0.	5.00000E-04	0.	5.10000E-04	5	13	6	FOL
0.	5.10000E-04	0.	0.	0.	0.	5	19	6	FOL
0.	0.	0.	0.	0.	0.	5	25	6	FOL
0.	0.	0.	0.	0.	0.	5	31	2	FOL
0.	0.	0.	0.	0.	0.	6	1	6	FOL
0.	0.	0.	0.	0.	0.	6	7	6	FOL
0.	0.	0.	0.	0.	0.	6	13	6	FOL
0.	0.	0.	0.	0.	0.	6	19	6	FOL
0.	0.	0.	0.	0.	0.	6	25	6	FOL
0.	0.	0.	0.	0.	0.	6	31	2	FOL
0.	0.	0.	0.	0.	0.	7	1	6	FOL
0.	0.	0.	0.	0.	0.	7	7	6	FOL
0.	0.	0.	0.	0.	0.	7	13	6	FOL
0.	0.	0.	0.	0.	0.	7	19	6	FOL
0.	0.	0.	0.	0.	0.	7	25	6	FOL
0.	0.	0.	0.	0.	0.	7	31	2	FOL
0.	0.	0.	0.	0.	0.	8	1	6	FOL
0.	0.	0.	0.	0.	0.	8	7	6	FOL
0.	0.	0.	0.	0.	0.	8	13	6	FOL
0.	0.	0.	0.	0.	0.	8	19	6	FOL
0.	0.	0.	0.	0.	0.	8	25	6	FOL
0.	0.	0.	0.	0.	0.	8	31	2	FOL
0.	0.	0.	5.10000E-04	0.	0.	9	1	6	FOL
0.	0.	0.	0.	7.10000E-04	0.	9	7	6	FOL
7.10000E-04	7.10000E-04	0.	0.	0.	0.	9	13	6	FOL
0.	0.	0.	0.	0.	0.	9	19	6	FOL
0.	0.	0.	0.	0.	0.	9	25	6	FOL
0.	0.	0.	0.	0.	0.	9	31	2	FOL
0.	0.	0.	5.10000E-04	0.	0.	10	1	6	FOL
0.	0.	0.	0.	7.10000E-04	0.	10	7	6	FOL
7.20000E-04	7.30000E-04	0.	0.	0.	0.	10	13	6	FOL
0.	0.	0.	0.	0.	0.	10	19	6	FOL
0.	0.	0.	0.	0.	0.	10	25	6	FOL

0.	0.	0.	0.	0.	0.	10	31	2	FOL
0.	0.	0.	5.00000E-04	0.	0.	11	1	6	FOL
0.	0.	0.	0.	7.00000E-04	0.	11	7	6	FOL
7.10000E-04	7.10000E-04	0.	0.	0.	0.	11	13	6	FOL
0.	0.	0.	0.	0.	0.	11	19	6	FOL
0.	0.	0.	0.	0.	0.	11	25	6	FOL
0.	0.	0.	0.	0.	0.	11	31	2	FOL
0.	0.	0.	0.	0.	0.	12	1	6	FOL
0.	0.	0.	0.	0.	0.	12	7	6	FOL
0.	0.	0.	0.	0.	0.	12	13	6	FOL
0.	0.	0.	0.	0.	0.	12	19	6	FOL
0.	0.	0.	0.	0.	0.	12	25	6	FOL
0.	0.	0.	0.	0.	0.	12	31	2	FOL
0.	0.	0.	0.	0.	0.	13	1	6	FOL
0.	0.	0.	0.	0.	0.	13	7	6	FOL
0.	0.	0.	0.	0.	0.	13	13	6	FOL
0.	0.	0.	0.	0.	0.	13	19	6	FOL
0.	0.	0.	0.	0.	0.	13	25	6	FOL
0.	0.	0.	0.	0.	0.	13	31	2	FOL
0.	0.	0.	0.	0.	0.	14	1	6	FOL
0.	0.	0.	0.	0.	0.	14	7	6	FOL
0.	0.	0.	0.	0.	0.	14	13	6	FOL
0.	0.	0.	0.	0.	0.	14	19	6	FOL
0.	0.	0.	0.	0.	0.	14	25	6	FOL
0.	0.	0.	0.	0.	0.	14	31	2	FOL
0.	0.	0.	0.	0.	0.	15	1	6	FOL
0.	5.10000E-04	0.	0.	0.	0.	15	7	6	FOL
0.	0.	0.	7.10000E-04	0.	7.30000E-04	15	13	6	FOL
0.	7.20000E-04	0.	0.	0.	0.	15	19	6	FOL
0.	0.	0.	0.	0.	0.	15	25	6	FOL
0.	0.	0.	0.	0.	0.	15	31	2	FOL
0.	0.	0.	0.	0.	0.	16	1	6	FOL
0.	5.00000E-04	0.	0.	0.	0.	16	7	6	FOL
0.	0.	0.	7.00000E-04	0.	7.10000E-04	16	13	6	FOL
0.	7.10000E-04	0.	0.	0.	0.	16	19	6	FOL
0.	0.	0.	0.	0.	0.	16	25	6	FOL
0.	0.	0.	0.	0.	0.	16	31	2	FOL
0.	0.	0.	0.	0.	0.	17	1	6	FOL
0.	5.10000E-04	0.	0.	0.	0.	17	7	6	FOL
0.	0.	0.	7.10000E-04	0.	7.20000E-04	17	13	6	FOL
0.	7.30000E-04	0.	0.	0.	0.	17	19	6	FOL
0.	0.	0.	0.	0.	0.	17	25	6	FOL
0.	0.	0.	0.	0.	0.	17	31	2	FOL
0.	0.	0.	0.	0.	0.	18	1	6	FOL
0.	0.	0.	0.	0.	0.	18	7	6	FOL
0.	0.	0.	0.	0.	0.	18	13	6	FOL
0.	0.	0.	0.	0.	0.	18	19	6	FOL
0.	0.	0.	0.	0.	0.	18	25	6	FOL
0.	0.	0.	0.	0.	0.	18	31	2	FOL
0.	0.	0.	0.	0.	0.	19	1	6	FOL
0.	0.	0.	0.	0.	0.	19	7	6	FOL
0.	0.	0.	0.	0.	0.	19	13	6	FOL
0.	0.	0.	0.	0.	0.	19	19	6	FOL
0.	0.	0.	0.	0.	0.	19	25	6	FOL
0.	0.	0.	0.	0.	0.	19	31	2	FOL
0.	0.	0.	0.	0.	0.	20	1	6	FOL
0.	0.	0.	0.	0.	0.	20	7	6	FOL
0.	0.	0.	0.	0.	0.	20	13	6	FOL
0.	0.	0.	0.	0.	0.	20	19	6	FOL
0.	0.	0.	0.	0.	0.	20	25	6	FOL

0.	0.	0.	0.	0.	0.	20	31	2	FOL
0.	0.	0.	1,90000E-04	0.	0.	21	1	6	FOL
0.	0.	0.	0.	8,10000E-04	0.	21	7	6	FOL
0,10000E-04	8,00000E-04	0.	0.	0.	0.	21	13	6	FOL
0.	0.	0.	0.	0.	0.	21	19	6	FOL
0.	0.	0.	0.	0.	0.	21	25	6	FOL
0.	0.	0.	0.	0.	0.	21	31	2	FOL
0.	0.	0.	1,90000E-04	0.	0.	22	1	6	FOL
0.	0.	0.	0.	8,10000E-04	0.	22	7	6	FOL
8,40000E-04	8,10000E-04	0.	0.	0.	0.	22	13	6	FOL
0.	0.	0.	0.	0.	0.	22	19	6	FOL
0.	0.	0.	0.	0.	0.	22	25	6	FOL
0.	0.	0.	0.	0.	0.	22	31	2	FOL
6,10000E-04	6,10000E-04	6,10000E-04	1,80000E-04	0.	0.	23	1	6	FOL
0.	8,10000E-04	8,10000E-04	8,10000E-04	2,90000E-04	8,00000E-04	23	7	6	FOL
3,00000E-04	3,00000E-04	8,10000E-04	0.	8,10000E-04	8,10000E-04	23	13	6	FOL
0.	8,10000E-04	7,60000E-04	7,60000E-04	7,90000E-04	0.	23	19	6	FOL
0.	0.	0.	0.	0.	0.	23	25	6	FOL
0.	0.	0.	0.	0.	0.	23	31	2	FOL
0.	0.	0.	1,90000E-04	0.	0.	24	1	6	FOL
0.	0.	0.	0.	8,00000E-04	0.	24	7	6	FOL
8,10000E-04	8,10000E-04	0.	0.	0.	0.	24	13	6	FOL
0.	0.	0.	0.	0.	0.	24	19	6	FOL
0.	0.	0.	0.	0.	0.	24	25	6	FOL
0.	0.	0.	0.	0.	0.	24	31	2	FOL
6,10000E-04	6,00000E-04	6,10000E-04	1,80000E-04	0.	0.	25	1	6	FOL
0.	0.	8,10000E-04	8,00000E-04	3,00000E-04	8,10000E-04	25	7	6	FOL
2,90000E-04	3,00000E-04	8,10000E-04	8,10000E-04	0.	0.	25	13	6	FOL
8,10000E-04	8,10000E-04	7,80000E-04	7,70000E-04	7,60000E-04	0.	25	19	6	FOL
0.	0.	0.	0.	0.	0.	25	25	6	FOL
0.	0.	0.	0.	0.	0.	25	31	2	FOL
6,10000E-04	8,10000E-04	6,00000E-04	1,80000E-04	0.	0.	26	1	6	FOL
0.	0.	8,00000E-04	8,10000E-04	3,00000E-04	8,10000E-04	26	7	6	FOL
3,10000E-04	2,90000E-04	0.	8,10000E-04	8,10000E-04	8,10000E-04	26	13	6	FOL
8,10000E-04	0.	7,70000E-04	7,80000E-04	7,60000E-04	0.	26	19	6	FOL
0.	0.	0.	0.	0.	0.	26	25	6	FOL
0.	0.	0.	0.	0.	0.	26	31	2	FOL
0.	0.	0.	0.	6,00000E-04	6,10000E-04	27	1	6	FOL
6,10000E-04	1,80000E-04	8,10000E-04	8,10000E-04	0.	0.	27	7	6	FOL
8,10000E-04	8,10000E-04	8,10000E-04	2,90000E-04	8,10000E-04	3,00000E-04	27	13	6	FOL
8,10000E-04	3,00000E-04	0.	0.	0.	0.	27	19	6	FOL
0.	0.	7,90000E-04	7,60000E-04	7,60000E-04	0.	27	25	6	FOL
0.	0.	0.	0.	0.	0.	27	31	2	FOL
0.	0.	0.	0.	0.	0.	28	1	6	FOL
0.	1,90000E-04	0.	0.	0.	0.	28	7	6	FOL
0.	0.	0.	8,10000E-04	0.	8,00000E-04	28	13	6	FOL
0.	8,10000E-04	0.	0.	0.	0.	28	19	6	FOL
0.	0.	0.	0.	0.	0.	28	25	6	FOL
0.	0.	0.	0.	0.	0.	28	31	2	FOL
0.	0.	0.	0.	0.	0.	29	1	6	FOL
0.	1,90000E-04	0.	0.	0.	0.	29	7	6	FOL
0.	0.	0.	8,10000E-04	0.	8,10000E-04	29	13	6	FOL
0.	8,00000E-04	0.	0.	0.	0.	29	19	6	FOL
0.	0.	0.	0.	0.	0.	29	25	6	FOL
0.	0.	0.	0.	0.	0.	29	31	2	FOL
0.	0.	0.	0.	6,10000E-04	6,10000E-04	30	1	6	FOL
6,00000E-04	1,80000E-04	0.	8,10000E-04	8,10000E-04	8,10000E-04	30	7	6	FOL
8,10000E-04	0.	8,00000E-04	3,00000E-04	8,10000E-04	3,00000E-04	30	13	6	FOL
8,10000E-04	2,90000E-04	0.	0.	0.	0.	30	19	6	FOL
0.	0.	7,60000E-04	7,80000E-04	7,70000E-04	0.	30	25	6	FOL

0.	0.	0.	0.	0.	0.	30	31	2	FOL
0.	0.	0.	0.	6,10000E-04	6,00000E-04	31	1	6	FOL
6,10000E-04	1,80000E-04	8,10000E-04	0.	8,10000E-04	8,10000E-04	31	7	6	FOL
0.	8,10000E-04	8,10000E-04	3,00000E-04	8,00000E-04	2,90000E-04	31	13	6	FOL
8,10000E-04	3,00000E-04	0.	0.	0.	0.	31	19	6	FOL
0.	0.	7,60000E-04	7,70000E-04	7,80000E-04	0.	31	25	6	FOL
0.	0.	0.	0.	0.	0.	31	31	2	FOL
0.	0.	0.	0.	0.	0.	32	1	6	FOL
0.	1,90000E-04	0.	0.	0.	0.	32	7	6	FOL
0.	0.	0.	8,00000E-04	0.	8,10000E-04	32	13	6	FOL
0.	8,10000E-04	0.	0.	0.	0.	32	19	6	FOL
0.	0.	0.	0.	0.	0.	32	25	6	FOL
0.	0.	0.	0.	0.	0.	32	31	2	FOL

CELL MULTIPLIERS (0, 1, -1)															
0.	0.	0.	0.	0.	0.	0.	0.	1	1	6	FOL	1	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	1	7	6	FOL	1	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	1	13	6	FOL	1	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	1	19	6	FOL	1	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	1	25	6	FOL	1	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	1	31	2	FOL	1	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	0.	2	1	6	FOL	2	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	2	7	6	FOL	2	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	2	13	6	FOL	2	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	2	19	6	FOL	2	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	2	25	6	FOL	2	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	2	31	2	FOL	2	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	0.	3	1	6	FOL	3	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	3	7	6	FOL	3	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	3	13	6	FOL	3	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	3	19	6	FOL	3	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	3	25	6	FOL	3	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	3	31	2	FOL	3	31	2	FOL
0.	0.	0.	1.0000E-04	0.	0.	0.	0.	4	1	6	FOL	4	1	6	FOL
0.	0.	0.	0.	5.1000E-04	0.	0.	5.1000E-04	4	7	6	FOL	4	7	6	FOL
0.	5.0000E-04	0.	0.	0.	0.	0.	0.	4	13	6	FOL	4	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	4	19	6	FOL	4	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	4	25	6	FOL	4	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	4	31	2	FOL	4	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	0.	5	1	6	FOL	5	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	5	7	6	FOL	5	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	5	13	6	FOL	5	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	5	19	6	FOL	5	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	5	25	6	FOL	5	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	5	31	2	FOL	5	31	2	FOL
6.1000E-04	6.1000E-04	0.	0.	0.	0.	0.	0.	6	1	6	FOL	6	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	6	7	6	FOL	6	7	6	FOL
0.	0.	0.	5.0000E-04	5.1000E-04	5.1000E-04	0.	0.	6	13	6	FOL	6	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	6	19	6	FOL	6	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	6	25	6	FOL	6	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	6	31	2	FOL	6	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	0.	7	1	6	FOL	7	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	7	7	6	FOL	7	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	7	13	6	FOL	7	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	7	19	6	FOL	7	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	7	25	6	FOL	7	25	6	FOL
6.1000E-04	6.0000E-04	0.	0.	0.	0.	0.	0.	7	31	2	FOL	7	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	0.	8	1	6	FOL	8	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	8	7	6	FOL	8	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	8	13	6	FOL	8	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	8	19	6	FOL	8	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	8	25	6	FOL	8	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	8	31	2	FOL	8	31	2	FOL
6.0000E-04	6.1000E-04	0.	0.	0.	0.	0.	0.	9	1	6	FOL	9	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	9	7	6	FOL	9	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	9	13	6	FOL	9	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	9	19	6	FOL	9	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	9	25	6	FOL	9	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	9	31	2	FOL	9	31	2	FOL
8.1000E-04	8.1000E-04	0.	0.	0.	0.	0.	0.	10	1	6	FOL	10	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	7	6	FOL	10	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	13	6	FOL	10	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	19	6	FOL	10	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	25	6	FOL	10	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	31	2	FOL	10	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	37	6	FOL	10	37	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	43	6	FOL	10	43	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	49	6	FOL	10	49	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	55	6	FOL	10	55	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	61	6	FOL	10	61	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	67	6	FOL	10	67	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	73	6	FOL	10	73	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	79	6	FOL	10	79	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	85	6	FOL	10	85	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	91	6	FOL	10	91	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	97	6	FOL	10	97	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	103	6	FOL	10	103	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	109	6	FOL	10	109	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	115	6	FOL	10	115	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	121	6	FOL	10	121	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	127	6	FOL	10	127	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	133	6	FOL	10	133	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	139	6	FOL	10	139	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	145	6	FOL	10	145	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	151	6	FOL	10	151	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	157	6	FOL	10	157	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	163	6	FOL	10	163	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	169	6	FOL	10	169	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	175	6	FOL	10	175	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	181	6	FOL	10	181	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	187	6	FOL	10	187	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	193	6	FOL	10	193	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	199	6	FOL	10	199	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	205	6	FOL	10	205	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	211	6	FOL	10	211	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	217	6	FOL	10	217	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	223	6	FOL	10	223	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	229	6	FOL	10	229	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	235	6	FOL	10	235	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	241	6	FOL	10	241	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	247	6	FOL	10	247	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	253	6	FOL	10	253	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	259	6	FOL	10	259	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	265	6	FOL	10	265	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	271	6	FOL	10	271	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	277	6	FOL	10	277	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	283	6	FOL	10	283	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	289	6	FOL	10	289	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	295	6	FOL	10	295	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	301	6	FOL	10	301	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	307	6	FOL	10	307	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	313	6	FOL	10	313	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	319	6	FOL	10	319	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	325	6	FOL	10	325	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	331	6	FOL	10	331	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	337	6	FOL	10	337	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	343	6	FOL	10	343	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	349	6	FOL	10	349	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	355	6	FOL	10	355	6	FOL
0.	0.	0.	0.	0.	0.	0.	0.	10	361	6	FOL	10	361	6	FOL
0.	0.	0.	0.	0.</											

0.	8.10000E-04	0.	0.	0.	0.	10	31	2	FOL
0.	0.	5.10000E-04	0.	0.	0.	11	1	6	FOL
0.	0.	0.	7.30000E-04	0.	7.20000E-04	11	7	6	FOL
0.	7.10000E-04	0.	0.	0.	0.	11	13	6	FOL
0.	0.	0.	0.	0.	0.	11	19	6	FOL
0.	0.	0.	0.	8.10000E-04	0.	11	25	6	FOL
8.10000E-04	0.	0.	0.	0.	0.	11	31	2	FOL
0.	0.	0.	0.	0.	0.	12	1	6	FOL
0.	0.	0.	0.	0.	0.	12	7	6	FOL
0.	0.	0.	0.	0.	0.	12	13	6	FOL
0.	0.	0.	0.	0.	0.	12	19	6	FOL
0.	0.	0.	0.	8.10000E-04	0.	12	25	6	FOL
8.10000E-04	0.	0.	0.	0.	0.	12	31	2	FOL
0.	5.10000E-04	0.	0.	0.	0.	13	1	6	FOL
0.	0.	0.	7.20000E-04	0.	7.30000E-04	13	7	6	FOL
7.10000E-04	0.	0.	0.	0.	0.	13	13	6	FOL
0.	0.	0.	0.	0.	0.	13	19	6	FOL
0.	0.	0.	0.	8.10000E-04	0.	13	25	6	FOL
8.10000E-04	0.	5.00000E-04	0.	0.	0.	13	31	2	FOL
0.	0.	0.	7.10000E-04	0.	7.10000E-04	14	1	6	FOL
0.	0.	0.	0.	0.	0.	14	7	6	FOL
0.	7.00000E-04	0.	0.	0.	0.	14	13	6	FOL
0.	0.	0.	0.	0.	0.	14	19	6	FOL
0.	0.	0.	0.	0.	0.	14	25	6	FOL
8.10000E-04	8.10000E-04	0.	0.	0.	0.	14	31	2	FOL
0.	0.	0.	0.	5.00000E-04	0.	15	1	6	FOL
0.	0.	0.	7.10000E-04	7.10000E-04	0.	15	7	6	FOL
0.	0.	7.00000E-04	7.10000E-04	0.	0.	15	13	6	FOL
0.	0.	0.	8.10000E-04	2.90000E-04	8.00000E-04	15	19	6	FOL
3.00000E-04	3.00000E-04	0.	0.	0.	0.	15	25	6	FOL
0.	0.	0.	0.	0.	0.	15	31	2	FOL
0.	0.	0.	0.	0.	0.	16	1	6	FOL
0.	0.	0.	0.	0.	0.	16	7	6	FOL
0.	0.	0.	0.	0.	0.	16	13	6	FOL
0.	0.	0.	0.	0.	0.	16	19	6	FOL
8.10000E-04	8.00000E-04	0.	0.	8.10000E-04	0.	16	25	6	FOL
0.	0.	0.	0.	0.	0.	16	31	2	FOL
0.	0.	0.	0.	0.	0.	17	1	6	FOL
0.	0.	0.	0.	0.	0.	17	7	6	FOL
0.	0.	0.	0.	0.	0.	17	13	6	FOL
0.	0.	0.	0.	0.	0.	17	19	6	FOL
8.00000E-04	8.10000E-04	0.	0.	8.10000E-04	0.	17	25	6	FOL
0.	0.	0.	0.	5.10000E-04	0.	17	31	2	FOL
0.	0.	0.	0.	0.	0.	18	1	6	FOL
0.	0.	0.	0.	0.	0.	18	7	6	FOL
0.	0.	7.10000E-04	7.30000E-04	7.20000E-04	0.	18	13	6	FOL
0.	0.	0.	0.	0.	0.	18	19	6	FOL
0.	8.10000E-04	8.00000E-04	8.00000E-04	3.00000E-04	8.10000E-04	18	25	6	FOL
2.90000E-04	3.00000E-04	0.	0.	0.	0.	18	31	2	FOL
0.	0.	0.	0.	5.10000E-04	0.	19	1	6	FOL
0.	0.	0.	0.	0.	0.	19	7	6	FOL
0.	0.	7.10000E-04	7.20000E-04	7.30000E-04	0.	19	13	6	FOL
0.	0.	0.	0.	0.	0.	19	19	6	FOL
0.	0.	8.00000E-04	8.10000E-04	3.00000E-04	8.10000E-04	19	25	6	FOL
3.00000E-04	2.90000E-04	0.	0.	0.	0.	19	31	2	FOL
0.	0.	0.	0.	0.	0.	20	1	6	FOL
0.	0.	0.	0.	0.	0.	20	7	6	FOL
0.	0.	0.	0.	0.	0.	20	13	6	FOL
0.	0.	0.	0.	0.	0.	20	19	6	FOL
0.	0.	0.	0.	8.00000E-04	0.	20	25	6	FOL

8.10000E+04	8.10000E+04	0.	0.	0.	0.	20	31	2	FOL
0.	0.	0.	0.	0.	0.	21	1	6	FOL
0.	0.	0.	0.	0.	0.	21	7	6	FOL
0.	0.	0.	0.	0.	0.	21	13	6	FOL
0.	0.	0.	0.	0.	0.	21	19	6	FOL
0.	0.	0.	0.	0.	0.	21	25	6	FOL
0.	0.	0.	0.	0.	0.	21	31	2	FOL
0.	0.	0.	0.	0.	0.	22	1	6	FOL
0.	0.	0.	0.	0.	0.	22	7	6	FOL
0.	0.	0.	0.	0.	0.	22	13	6	FOL
0.	0.	0.	0.	7.80000E+04	0.	22	19	6	FOL
7.20000E+04	7.60000E+04	0.	0.	0.	0.	22	25	6	FOL
0.	0.	0.	0.	0.	0.	22	31	2	FOL
0.	0.	0.	0.	0.	0.	23	1	6	FOL
0.	0.	0.	0.	0.	0.	23	7	6	FOL
0.	0.	0.	0.	0.	0.	23	13	6	FOL
0.	0.	0.	0.	0.	0.	23	19	6	FOL
0.	0.	0.	0.	0.	0.	23	25	6	FOL
0.	0.	0.	0.	0.	0.	23	31	2	FOL
0.	0.	0.	0.	0.	0.	24	1	6	FOL
0.	0.	0.	0.	0.	0.	24	7	6	FOL
0.	0.	0.	0.	0.	0.	24	13	6	FOL
0.	0.	0.	0.	7.70000E+04	0.	24	19	6	FOL
7.30000E+04	7.60000E+04	0.	0.	0.	0.	24	25	6	FOL
0.	0.	0.	0.	0.	0.	24	31	2	FOL
0.	0.	0.	0.	0.	0.	25	1	6	FOL
0.	0.	0.	0.	0.	0.	25	7	6	FOL
0.	0.	0.	0.	0.	0.	25	13	6	FOL
0.	0.	0.	0.	0.	0.	25	19	6	FOL
0.	0.	0.	0.	0.	0.	25	25	6	FOL
0.	0.	0.	0.	0.	0.	25	31	2	FOL
0.	0.	0.	0.	0.	0.	26	1	6	FOL
0.	0.	0.	0.	0.	0.	26	7	6	FOL
0.	0.	0.	0.	0.	0.	26	13	6	FOL
0.	0.	0.	0.	7.50000E+04	0.	26	19	6	FOL
7.50000E+04	7.50000E+04	0.	0.	0.	0.	26	25	6	FOL
0.	0.	0.	0.	0.	0.	26	31	2	FOL
0.	0.	0.	0.	0.	0.	27	1	6	FOL
0.	0.	0.	0.	0.	0.	27	7	6	FOL
0.	0.	0.	0.	0.	0.	27	13	6	FOL
0.	0.	0.	0.	0.	0.	27	19	6	FOL
0.	0.	0.	0.	7.60000E+04	0.	27	25	6	FOL
7.40000E+04	7.70000E+04	0.	0.	0.	0.	27	31	2	FOL
0.	0.	0.	0.	0.	0.	28	1	6	FOL
0.	0.	0.	0.	0.	0.	28	7	6	FOL
0.	0.	0.	0.	0.	0.	28	13	6	FOL
0.	0.	0.	0.	0.	0.	28	19	6	FOL
0.	0.	0.	0.	7.60000E+04	0.	28	25	6	FOL
7.70000E+04	7.80000E+04	0.	0.	0.	0.	28	31	2	FOL
0.	0.	0.	0.	0.	0.	29	1	6	FOL
0.	0.	0.	0.	0.	0.	29	7	6	FOL
0.	0.	0.	0.	0.	0.	29	13	6	FOL
0.	0.	0.	0.	0.	0.	29	19	6	FOL
0.	0.	0.	0.	7.50000E+04	0.	29	25	6	FOL
7.80000E+04	7.60000E+04	0.	0.	0.	0.	29	31	2	FOL
0.	0.	0.	0.	0.	0.	30	1	6	FOL
0.	0.	0.	0.	0.	0.	30	7	6	FOL
0.	0.	0.	0.	0.	0.	30	13	6	FOL
0.	0.	0.	0.	0.	0.	30	19	6	FOL
0.	0.	0.	0.	0.	0.	30	25	6	FOL

0.	0.	0.	0.	0.	0.	30	31	2	FOL
0.	0.	0.	0.	0.	0.	31	1	6	FOL
0.	0.	0.	0.	0.	0.	31	7	6	FOL
0.	0.	0.	0.	0.	0.	31	13	6	FOL
0.	0.	0.	0.	0.	0.	31	19	6	FOL
0.	0.	0.	0.	0.	0.	31	25	6	FOL
0.	0.	0.	0.	0.	0.	31	31	2	FOL
0.	0.	0.	0.	0.	0.	32	1	6	FOL
0.	0.	0.	0.	0.	0.	32	7	6	FOL
0.	0.	0.	0.	0.	0.	32	13	6	FOL
0.	0.	0.	0.	0.	0.	32	19	6	FOL
0.	0.	0.	0.	0.	0.	32	25	6	FOL
0.	0.	0.	0.	0.	0.	32	31	2	FOL

CELL MULTIPLIERS (-1. 1. 0.)										
0.	0.	0.	0.	0.	0.	0.	1	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	1	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	1	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	1	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	1	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	1	31	2	FOL
0.	0.	1.30000E-04	0.	0.	0.	0.	2	1	6	FOL
0.	0.	0.	5.10000E-04	0.	0.	5.00000E-04	2	7	6	FOL
0.	5.10000E-04	0.	0.	0.	0.	0.	2	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	2	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	2	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	2	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	3	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	3	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	3	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	3	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	3	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	3	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	4	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	4	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	4	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	4	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	4	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	4	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	5	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	5	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	5	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	5	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	5	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	5	31	2	FOL
1.30000E-04	0.	0.	0.	0.	0.	0.	6	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	6	7	6	FOL
0.	0.	0.	0.	0.	5.10000E-04	0.	6	13	6	FOL
5.00000E-04	5.10000E-04	0.	0.	0.	0.	0.	6	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	6	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	6	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	7	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	7	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	7	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	7	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	7	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	7	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	8	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	8	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	8	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	8	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	8	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	8	31	2	FOL
0.	0.	5.10000E-04	0.	0.	0.	0.	9	1	6	FOL
0.	0.	0.	7.30000E-04	0.	0.	7.10000E-04	9	7	6	FOL
0.	7.20000E-04	0.	0.	0.	0.	0.	9	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	9	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	9	25	6	FOL
0.	0.	0.	0.	0.	0.	0.	9	31	2	FOL
0.	0.	0.	0.	0.	0.	0.	10	1	6	FOL
0.	0.	0.	0.	0.	0.	0.	10	7	6	FOL
0.	0.	0.	0.	0.	0.	0.	10	13	6	FOL
0.	0.	0.	0.	0.	0.	0.	10	19	6	FOL
0.	0.	0.	0.	0.	0.	0.	10	25	6	FOL

0.	0.	0.	0.	0.	0.	10	31	2	FOL
0.	0.	0.	0.	0.	0.	11	1	6	FOL
0.	0.	0.	0.	0.	0.	11	7	6	FOL
0.	0.	0.	0.	0.	0.	11	13	6	FOL
0.	0.	0.	0.	0.	0.	11	19	6	FOL
0.	0.	0.	0.	0.	0.	11	25	6	FOL
0.	0.	0.	0.	0.	0.	11	31	2	FOL
0.	0.	5.00000E-04	0.	0.	0.	12	1	6	FOL
0.	0.	0.	7.10000E-04	0.	7.00000E-04	12	7	6	FOL
0.	7.10000E-04	0.	0.	0.	0.	12	13	6	FOL
0.	0.	0.	0.	0.	0.	12	19	6	FOL
0.	0.	0.	0.	0.	0.	12	25	6	FOL
0.	0.	0.	0.	0.	0.	12	31	2	FOL
0.	0.	5.10000E-04	0.	0.	0.	13	1	6	FOL
0.	0.	0.	7.20000E-04	0.	7.10000E-04	13	7	6	FOL
0.	7.30000E-04	0.	0.	0.	0.	13	13	6	FOL
0.	0.	0.	0.	0.	0.	13	19	6	FOL
0.	0.	0.	0.	0.	0.	13	25	6	FOL
0.	0.	0.	0.	0.	0.	13	31	2	FOL
0.	0.	0.	0.	0.	0.	14	1	6	FOL
0.	0.	0.	0.	0.	0.	14	7	6	FOL
0.	0.	0.	0.	0.	0.	14	13	6	FOL
0.	0.	0.	0.	0.	0.	14	19	6	FOL
0.	0.	0.	0.	0.	0.	14	25	6	FOL
0.	0.	0.	0.	0.	0.	14	31	2	FOL
0.	0.	0.	0.	0.	0.	15	1	6	FOL
5.10000E-04	0.	0.	0.	0.	0.	15	7	6	FOL
0.	0.	0.	0.	7.30000E-04	0.	15	13	6	FOL
7.10000E-04	7.20000E-04	0.	0.	0.	0.	15	19	6	FOL
0.	0.	0.	0.	0.	0.	15	25	6	FOL
0.	0.	0.	0.	0.	0.	15	31	2	FOL
0.	0.	0.	0.	0.	0.	16	1	6	FOL
0.	0.	0.	0.	0.	0.	16	7	6	FOL
0.	0.	0.	0.	0.	0.	16	13	6	FOL
0.	0.	0.	0.	0.	0.	16	19	6	FOL
0.	0.	0.	0.	0.	0.	16	25	6	FOL
0.	0.	0.	0.	0.	0.	16	31	2	FOL
0.	0.	0.	0.	0.	0.	17	1	6	FOL
0.	0.	0.	0.	0.	0.	17	7	6	FOL
0.	0.	0.	0.	0.	0.	17	13	6	FOL
0.	0.	0.	0.	0.	0.	17	19	6	FOL
0.	0.	0.	0.	0.	0.	17	25	6	FOL
0.	0.	0.	0.	0.	0.	17	31	2	FOL
0.	0.	0.	0.	0.	0.	18	1	6	FOL
5.10000E-04	0.	0.	0.	0.	0.	18	7	6	FOL
0.	0.	0.	0.	7.20000E-04	0.	18	13	6	FOL
7.10000E-04	7.30000E-04	0.	0.	0.	0.	18	19	6	FOL
0.	0.	0.	0.	0.	0.	18	25	6	FOL
0.	0.	0.	0.	0.	0.	18	31	2	FOL
0.	0.	0.	0.	0.	0.	19	1	6	FOL
5.00000E-04	0.	0.	0.	0.	0.	19	7	6	FOL
0.	0.	0.	0.	7.10000E-04	0.	19	13	6	FOL
7.00000E-04	7.10000E-04	0.	0.	0.	0.	19	19	6	FOL
0.	0.	0.	0.	0.	0.	19	25	6	FOL
0.	0.	0.	0.	0.	0.	19	31	2	FOL
0.	0.	0.	0.	0.	0.	20	1	6	FOL
0.	0.	0.	0.	0.	0.	20	7	6	FOL
0.	0.	0.	0.	0.	0.	20	13	6	FOL
0.	0.	0.	0.	0.	0.	20	19	6	FOL
0.	0.	0.	0.	0.	0.	20	25	6	FOL

0.	0.	0.	0.	0.	0.	20	31	2	FOL
0.	0.	0.	0.	0.	0.	21	1	6	FOL
0.	0.	0.	0.	0.	0.	21	7	6	FOL
0.	0.	0.	0.	0.	0.	21	13	6	FOL
0.	0.	0.	0.	0.	0.	21	19	6	FOL
0.	0.	0.	0.	0.	0.	21	25	6	FOL
0.	0.	0.	0.	0.	0.	21	31	2	FOL
0.	0.	0.	0.	0.	0.	22	1	6	FOL
0.	0.	0.	0.	0.	0.	22	7	6	FOL
0.	0.	0.	0.	0.	0.	22	13	6	FOL
0.	0.	7.80000E-04	0.	0.	7.60000E-04	22	19	6	FOL
7.50000E-04	0.	0.	0.	0.	0.	22	25	6	FOL
0.	0.	0.	0.	0.	0.	22	31	2	FOL
0.	0.	0.	0.	0.	0.	23	1	6	FOL
0.	0.	0.	0.	0.	0.	23	7	6	FOL
0.	0.	0.	0.	0.	0.	23	13	6	FOL
0.	0.	0.	0.	0.	0.	23	19	6	FOL
0.	0.	0.	0.	0.	0.	23	25	6	FOL
0.	0.	0.	0.	0.	0.	23	31	2	FOL
0.	0.	0.	0.	0.	0.	24	1	6	FOL
0.	0.	0.	0.	0.	0.	24	7	6	FOL
0.	0.	0.	0.	0.	0.	24	13	6	FOL
0.	0.	7.60000E-04	0.	0.	7.50000E-04	24	19	6	FOL
7.50000E-04	0.	0.	0.	0.	0.	24	25	6	FOL
0.	0.	0.	0.	0.	0.	24	31	2	FOL
0.	0.	0.	0.	0.	0.	25	1	6	FOL
0.	0.	0.	0.	0.	0.	25	7	6	FOL
0.	0.	0.	0.	0.	0.	25	13	6	FOL
0.	0.	0.	0.	0.	0.	25	19	6	FOL
0.	0.	0.	0.	0.	0.	25	25	6	FOL
0.	0.	0.	0.	0.	0.	25	31	2	FOL
0.	0.	0.	0.	0.	0.	26	1	6	FOL
0.	0.	0.	0.	0.	0.	26	7	6	FOL
0.	0.	0.	0.	0.	0.	26	13	6	FOL
0.	0.	7.70000E-04	0.	0.	7.60000E-04	26	19	6	FOL
7.50000E-04	0.	0.	0.	0.	0.	26	25	6	FOL
0.	0.	0.	0.	0.	0.	26	31	2	FOL
0.	0.	0.	0.	0.	0.	27	1	6	FOL
0.	0.	0.	0.	0.	0.	27	7	6	FOL
0.	0.	0.	0.	0.	0.	27	13	6	FOL
0.	0.	0.	0.	0.	0.	27	19	6	FOL
0.	0.	0.	0.	0.	0.	27	25	6	FOL
0.	0.	0.	0.	0.	0.	27	31	2	FOL
0.	0.	0.	0.	0.	0.	28	1	6	FOL
0.	0.	0.	0.	0.	0.	28	7	6	FOL
0.	0.	0.	0.	0.	0.	28	13	6	FOL
0.	0.	0.	0.	0.	0.	28	19	6	FOL
0.	0.	0.	0.	0.	0.	28	25	6	FOL
7.70000E-04	7.60000E-04	0.	0.	7.80000E-04	0.	28	31	2	FOL
0.	0.	0.	0.	0.	0.	29	1	6	FOL
0.	0.	0.	0.	0.	0.	29	7	6	FOL
0.	0.	0.	0.	0.	0.	29	13	6	FOL
0.	0.	0.	0.	0.	0.	29	19	6	FOL
0.	0.	0.	0.	0.	0.	29	25	6	FOL
0.	0.	0.	0.	0.	0.	29	31	2	FOL
0.	0.	0.	0.	0.	0.	30	1	6	FOL
0.	0.	0.	0.	0.	0.	30	7	6	FOL
0.	0.	0.	0.	0.	0.	30	13	6	FOL
0.	0.	0.	0.	0.	0.	30	19	6	FOL
0.	0.	0.	0.	7.70000E-04	0.	30	25	6	FOL

7.80000E-04	7.60000E-04	0.	0.	0.	0.	30	31	2	FOL
0.	0.	0.	0.	0.	0.	31	1	6	FOL
0.	0.	0.	0.	0.	0.	31	7	6	FOL
0.	0.	0.	0.	0.	0.	31	13	6	FOL
0.	0.	0.	0.	0.	0.	31	19	6	FOL
0.	0.	0.	0.	0.	0.	31	25	6	FOL
0.	0.	0.	0.	0.	0.	31	31	2	FOL
0.	0.	0.	0.	0.	0.	32	1	6	FOL
0.	0.	0.	0.	0.	0.	32	7	6	FOL
0.	0.	0.	0.	0.	0.	32	13	6	FOL
0.	0.	0.	0.	0.	0.	32	19	6	FOL
0.	0.	0.	0.	0.	0.	32	25	6	FOL
7.80000E-04	7.50000E-04	0.	0.	7.60000E-04	0.	32	31	2	FOL

CELL MULTIPLIERS (-1, 0, 1,)									
0.	0.	0.	0.	0.	0.	1	1	6	FOL
0.	0.	0.	0.	0.	0.	1	7	6	FOL
0.	0.	0.	0.	0.	0.	1	13	6	FOL
0.	0.	0.	0.	0.	0.	1	19	6	FOL
0.	0.	0.	0.	0.	0.	1	25	6	FOL
0.	0.	0.	0.	0.	0.	1	31	2	FOL
0.	0.	0.	0.	1.30000E-04	0.	2	1	6	FOL
0.	0.	0.	0.	0.	5.10000E-04	2	7	6	FOL
5.00000E-04	5.10000E-04	0.	0.	0.	0.	2	13	6	FOL
0.	0.	0.	0.	0.	0.	2	19	6	FOL
0.	0.	0.	0.	0.	0.	2	25	6	FOL
0.	0.	0.	0.	0.	0.	2	31	2	FOL
0.	0.	0.	0.	0.	0.	3	1	6	FOL
0.	0.	0.	0.	0.	0.	3	7	6	FOL
0.	0.	0.	0.	0.	0.	3	13	6	FOL
0.	0.	0.	0.	0.	0.	3	19	6	FOL
0.	0.	0.	0.	0.	0.	3	25	6	FOL
0.	0.	0.	0.	0.	0.	3	31	2	FOL
0.	0.	0.	0.	0.	0.	4	1	6	FOL
0.	0.	0.	0.	0.	0.	4	7	6	FOL
0.	0.	0.	0.	0.	0.	4	13	6	FOL
0.	0.	0.	0.	0.	0.	4	19	6	FOL
0.	0.	0.	0.	0.	0.	4	25	6	FOL
0.	0.	0.	0.	0.	0.	4	31	2	FOL
1.30000E-04	0.	0.	0.	0.	0.	5	1	6	FOL
0.	0.	0.	0.	0.	0.	5	7	6	FOL
0.	0.	0.	0.	5.00000E-04	0.	5	13	6	FOL
5.10000E-04	5.10000E-04	0.	0.	0.	0.	5	19	6	FOL
0.	0.	0.	0.	0.	0.	5	25	6	FOL
0.	0.	0.	0.	0.	0.	5	31	2	FOL
0.	0.	0.	0.	0.	0.	6	1	6	FOL
0.	0.	0.	0.	0.	0.	6	7	6	FOL
0.	0.	0.	0.	0.	0.	6	13	6	FOL
0.	0.	0.	0.	0.	0.	6	19	6	FOL
0.	0.	0.	0.	0.	0.	6	25	6	FOL
0.	0.	0.	0.	0.	0.	6	31	2	FOL
0.	0.	0.	0.	0.	0.	7	1	6	FOL
0.	0.	0.	0.	0.	0.	7	7	6	FOL
0.	0.	0.	0.	0.	0.	7	13	6	FOL
0.	0.	0.	0.	0.	0.	7	19	6	FOL
0.	0.	0.	0.	0.	0.	7	25	6	FOL
0.	0.	0.	0.	0.	0.	7	31	2	FOL
0.	0.	0.	0.	0.	0.	8	1	6	FOL
0.	0.	0.	0.	0.	0.	8	7	6	FOL
0.	0.	0.	0.	0.	0.	8	13	6	FOL
0.	0.	0.	0.	0.	0.	8	19	6	FOL
0.	0.	0.	0.	0.	0.	8	25	6	FOL
0.	0.	0.	0.	0.	0.	8	31	2	FOL
0.	0.	0.	0.	5.10000E-04	0.	9	1	6	FOL
0.	0.	0.	0.	0.	7.30000E-04	9	7	6	FOL
7.10000E-04	7.20000E-04	0.	0.	0.	0.	9	13	6	FOL
0.	0.	0.	0.	0.	0.	9	19	6	FOL
0.	0.	0.	0.	0.	0.	9	25	6	FOL
0.	0.	0.	0.	0.	0.	9	31	2	FOL
0.	0.	0.	0.	0.	0.	10	1	6	FOL
0.	0.	0.	0.	0.	0.	10	7	6	FOL
0.	0.	0.	0.	0.	0.	10	13	6	FOL
0.	0.	0.	0.	0.	0.	10	19	6	FOL
0.	0.	0.	0.	0.	0.	10	25	6	FOL

0.	0.	0.	0.	0.	0.	10	31	2	FOL
0.	0.	0.	0.	0.	0.	11	1	6	FOL
0.	0.	0.	0.	0.	0.	11	7	6	FOL
0.	0.	0.	0.	0.	0.	11	13	6	FOL
0.	0.	0.	0.	0.	0.	11	19	6	FOL
0.	0.	0.	0.	0.	0.	11	25	6	FOL
0.	0.	0.	0.	0.	0.	11	31	2	FOL
0.	0.	0.	0.	5.10000E-04	0.	12	1	6	FOL
0.	0.	0.	0.	0.	7.20000E-04	12	7	6	FOL
0.	0.	0.	0.	0.	0.	12	13	6	FOL
7.10000E-04	7.30000E-04	0.	0.	0.	0.	12	19	6	FOL
0.	0.	0.	0.	0.	0.	12	25	6	FOL
0.	0.	0.	0.	0.	0.	12	31	2	FOL
0.	0.	0.	0.	5.00000E-04	0.	13	1	6	FOL
0.	0.	0.	0.	0.	7.10000E-04	13	7	6	FOL
7.00000E-04	7.10000E-04	0.	0.	0.	0.	13	13	6	FOL
0.	0.	0.	0.	0.	0.	13	19	6	FOL
0.	0.	0.	0.	0.	0.	13	25	6	FOL
0.	0.	0.	0.	0.	0.	13	31	2	FOL
0.	0.	0.	0.	0.	0.	14	1	6	FOL
0.	0.	0.	0.	0.	0.	14	7	6	FOL
0.	0.	0.	0.	0.	0.	14	13	6	FOL
0.	0.	0.	0.	0.	0.	14	19	6	FOL
0.	0.	0.	0.	0.	0.	14	25	6	FOL
0.	0.	0.	0.	0.	0.	14	31	2	FOL
0.	0.	0.	0.	0.	0.	15	1	6	FOL
5.10000E-04	0.	0.	0.	0.	0.	15	7	6	FOL
0.	0.	0.	0.	0.	7.10000E-04	15	13	6	FOL
7.30000E-04	7.20000E-04	0.	0.	0.	0.	15	19	6	FOL
0.	0.	0.	0.	0.	0.	15	25	6	FOL
0.	0.	0.	0.	0.	0.	15	31	2	FOL
0.	0.	0.	0.	0.	0.	16	1	6	FOL
5.10000E-04	0.	0.	0.	0.	0.	16	7	6	FOL
7.40000E-04	7.30000E-04	0.	0.	0.	7.10000E-04	16	13	6	FOL
0.	0.	0.	0.	0.	0.	16	19	6	FOL
0.	0.	0.	0.	0.	0.	16	25	6	FOL
0.	0.	0.	0.	0.	0.	16	31	2	FOL
0.	0.	0.	0.	0.	0.	17	1	6	FOL
5.00000E-04	0.	0.	0.	0.	0.	17	7	6	FOL
0.	0.	0.	0.	0.	7.00000E-04	17	13	6	FOL
7.10000E-04	7.10000E-04	0.	0.	0.	0.	17	19	6	FOL
0.	0.	0.	0.	0.	0.	17	25	6	FOL
0.	0.	0.	0.	0.	0.	17	31	2	FOL
0.	0.	0.	0.	0.	0.	18	1	6	FOL
0.	0.	0.	0.	0.	0.	18	7	6	FOL
0.	0.	0.	0.	0.	0.	18	13	6	FOL
0.	0.	0.	0.	0.	0.	18	19	6	FOL
0.	0.	0.	0.	0.	0.	18	25	6	FOL
0.	0.	0.	0.	0.	0.	18	31	2	FOL
0.	0.	0.	0.	0.	0.	19	1	6	FOL
0.	0.	0.	0.	0.	0.	19	7	6	FOL
0.	0.	0.	0.	0.	0.	19	13	6	FOL
0.	0.	0.	0.	0.	0.	19	19	6	FOL
0.	0.	0.	0.	0.	0.	19	25	6	FOL
0.	0.	0.	0.	0.	0.	19	31	2	FOL
0.	0.	0.	0.	0.	0.	20	1	6	FOL
0.	0.	0.	0.	0.	0.	20	7	6	FOL
0.	0.	0.	0.	0.	0.	20	13	6	FOL
0.	0.	0.	0.	0.	0.	20	19	6	FOL
0.	0.	0.	0.	0.	0.	20	25	6	FOL

0.	0.	0.	0.	0.	0.	20	31	2	FOL
0.	0.	0.	0.	0.	0.	21	1	6	FOL
0.	0.	0.	0.	0.	0.	21	7	6	FOL
0.	0.	0.	0.	0.	0.	21	13	6	FOL
0.	0.	0.	0.	0.	0.	21	19	6	FOL
0.	0.	0.	0.	0.	0.	21	25	6	FOL
0.	0.	0.	0.	0.	0.	21	31	2	FOL
0.	0.	0.	0.	0.	0.	22	1	6	FOL
0.	0.	0.	0.	0.	0.	22	7	6	FOL
0.	0.	0.	0.	0.	0.	22	13	6	FOL
0.	0.	0.	0.	0.	0.	22	19	6	FOL
0.	0.	0.	0.	0.	0.	22	25	6	FOL
0.	0.	0.	0.	0.	0.	22	31	2	FOL
0.	0.	0.	0.	0.	0.	23	1	6	FOL
0.	0.	0.	0.	0.	0.	23	7	6	FOL
0.	0.	0.	0.	0.	0.	23	13	6	FOL
7,90000E-04	0.	7,80000E-04	0.	0.	7,70000E-04	23	19	6	FOL
0.	0.	0.	0.	0.	0.	23	25	6	FOL
0.	0.	0.	0.	0.	0.	23	31	2	FOL
0.	0.	0.	0.	0.	0.	24	1	6	FOL
0.	0.	0.	0.	0.	0.	24	7	6	FOL
0.	0.	0.	0.	0.	0.	24	13	6	FOL
0.	0.	0.	0.	0.	0.	24	19	6	FOL
0.	0.	0.	0.	0.	0.	24	25	6	FOL
0.	0.	0.	0.	0.	0.	24	31	2	FOL
0.	0.	0.	0.	0.	0.	25	1	6	FOL
0.	0.	0.	0.	0.	0.	25	7	6	FOL
0.	0.	0.	0.	0.	0.	25	13	6	FOL
7,50000E-04	0.	7,60000E-04	0.	0.	7,60000E-04	25	19	6	FOL
0.	0.	0.	0.	0.	0.	25	25	6	FOL
0.	0.	0.	0.	0.	0.	25	31	2	FOL
0.	0.	0.	0.	0.	0.	26	1	6	FOL
0.	0.	0.	0.	0.	0.	26	7	6	FOL
0.	0.	0.	0.	0.	0.	26	13	6	FOL
7,50000E-04	0.	7,70000E-04	0.	0.	7,80000E-04	26	19	6	FOL
0.	0.	0.	0.	0.	0.	26	25	6	FOL
0.	0.	0.	0.	0.	0.	26	31	2	FOL
1,90000E-04	0.	0.	0.	0.	0.	27	1	6	FOL
0.	0.	0.	0.	0.	0.	27	7	6	FOL
8,00000E-04	8,10000E-04	0.	0.	8,10000E-04	0.	27	13	6	FOL
0.	0.	0.	0.	0.	0.	27	19	6	FOL
0.	0.	0.	0.	0.	0.	27	25	6	FOL
0.	0.	0.	0.	0.	0.	27	31	2	FOL
1,50000E-04	6,10000E-04	8,10000E-04	0.	6,00000E-04	6,10000E-04	28	1	6	FOL
0.	8,10000E-04	8,10000E-04	8,10000E-04	8,10000E-04	8,10000E-04	28	7	6	FOL
3,00000E-04	3,00000E-04	0.	0.	2,90000E-04	8,00000E-04	28	13	6	FOL
0.	0.	7,60000E-04	0.	0.	0.	28	19	6	FOL
0.	0.	0.	0.	7,50000E-04	7,60000E-04	28	25	6	FOL
0.	0.	0.	0.	0.	0.	28	31	2	FOL
1,90000E-04	0.	0.	0.	0.	0.	29	1	6	FOL
0.	0.	0.	0.	0.	0.	29	7	6	FOL
8,10000E-04	8,00000E-04	0.	0.	8,10000E-04	0.	29	13	6	FOL
0.	0.	0.	0.	0.	0.	29	19	6	FOL
0.	0.	0.	0.	0.	0.	29	25	6	FOL
0.	0.	0.	0.	0.	0.	29	31	2	FOL
1,50000E-04	6,00000E-04	0.	0.	6,10000E-04	6,10000E-04	30	1	6	FOL
8,10000E-04	0.	8,00000E-04	8,10000E-04	8,10000E-04	8,10000E-04	30	7	6	FOL
3,00000E-04	2,90000E-04	0.	0.	3,00000E-04	8,10000E-04	30	13	6	FOL
0.	0.	7,80000E-04	7,60000E-04	7,70000E-04	0.	30	19	6	FOL
						30	25	6	FOL

0.	0.	0.	0.	0.	0.	30	31	2	FOL
0.	0.	0.	0.	0.	0.	31	1	6	FOL
1.00000E-04	0.	0.	0.	0.	0.	31	7	6	FOL
0.	0.	0.	0.	8.00000E-04	0.	31	13	6	FOL
8.10000E-04	8.10000E-04	0.	0.	0.	0.	31	19	6	FOL
0.	0.	0.	0.	0.	0.	31	25	6	FOL
0.	0.	0.	0.	0.	0.	31	31	2	FOL
0.	0.	0.	0.	6.10000E-04	6.00000E-04	32	1	6	FOL
1.00000E-04	6.10000E-04	8.10000E-04	8.10000E-04	0.	0.	32	7	6	FOL
8.10000E-04	8.10000E-04	8.10000E-04	8.00000E-04	3.00000E-04	8.10000E-04	32	13	6	FOL
2.00000E-04	3.00000E-04	0.	0.	0.	0.	32	19	6	FOL
0.	0.	7.70000E-04	7.60000E-04	7.80000E-04	0.	32	25	6	FOL
0.	0.	0.	0.	0.	0.	32	31	2	FOL

0.	0.	0.	0.	0.	0.	10	31	2	F00
0.	0.	0.	0.	0.	0.	11	1	6	F00
0.	0.	0.	0.	1,35000E-01	2,50000E-04	11	7	6	F00
2,40000E-04	2,40000E-04	2,80000E-04	2,60000E-04	2,80000E-04	2,80000E-04	11	13	6	F00
2,70000E-04	2,80000E-04	3,00000E-04	3,00000E-04	2,90000E-04	8,00000E-04	11	19	6	F00
8,10000E-04	8,10000E-04	0.	8,10000E-04	8,10000E-04	0.	11	25	6	F00
0.	0.	0.	0.	0.	0.	11	31	2	F00
0.	0.	0.	0.	0.	0.	12	1	6	F00
0.	0.	0.	0.	0.	1,35000E-01	12	7	6	F00
2,40000E-04	2,40000E-04	2,80000E-04	2,70000E-04	2,80000E-04	2,80000E-04	12	13	6	F00
2,60000E-04	2,80000E-04	8,10000E-04	8,10000E-04	8,00000E-04	0.	12	19	6	F00
0.	0.	0.	8,10000E-04	8,10000E-04	0.	12	25	6	F00
0.	0.	0.	0.	0.	0.	12	31	2	F00
0.	0.	0.	0.	0.	0.	13	1	6	F00
0.	0.	0.	0.	0.	0.	13	7	6	F00
1,35000E-01	2,40000E-04	2,80000E-04	2,80000E-04	2,60000E-04	2,70000E-04	13	13	6	F00
2,80000E-04	2,80000E-04	8,10000E-04	8,00000E-04	8,10000E-04	0.	13	19	6	F00
0.	0.	8,10000E-04	0.	8,10000E-04	0.	13	25	6	F00
0.	0.	0.	0.	0.	0.	13	31	2	F00
0.	0.	0.	0.	0.	0.	14	1	6	F00
0.	0.	0.	0.	0.	0.	14	7	6	F00
0.	1,35000E-01	2,60000E-04	2,80000E-04	2,80000E-04	2,80000E-04	14	13	6	F00
2,80000E-04	2,70000E-04	8,00000E-04	8,10000E-04	8,10000E-04	0.	14	19	6	F00
0.	0.	8,10000E-04	8,10000E-04	0.	0.	14	25	6	F00
0.	0.	0.	0.	0.	0.	14	31	2	F00
0.	0.	0.	0.	0.	0.	15	1	6	F00
0.	0.	0.	0.	0.	0.	15	7	6	F00
0.	0.	1,35000E-01	2,40000E-04	2,40000E-04	2,40000E-04	15	13	6	F00
2,40000E-04	2,50000E-04	0.	8,10000E-04	8,10000E-04	0.	15	19	6	F00
0.	0.	3,00000E-04	3,00000E-04	2,90000E-04	8,00000E-04	15	25	6	F00
8,10000E-04	8,10000E-04	0.	0.	0.	0.	15	31	2	F00
0.	0.	0.	0.	0.	0.	16	1	6	F00
0.	0.	0.	0.	0.	0.	16	7	6	F00
0.	0.	0.	1,35000E-01	2,40000E-04	2,40000E-04	16	13	6	F00
2,80000E-04	2,40000E-04	8,10000E-04	8,10000E-04	0.	8,10000E-04	16	19	6	F00
0.	0.	2,90000E-04	3,00000E-04	3,00000E-04	8,10000E-04	16	25	6	F00
8,10000E-04	8,00000E-04	0.	0.	0.	0.	16	31	2	F00
0.	0.	0.	0.	0.	0.	17	1	6	F00
0.	0.	0.	0.	1,35000E-01	2,50000E-04	17	7	6	F00
0.	0.	0.	0.	0.	0.	17	13	6	F00
2,40000E-04	2,40000E-04	8,10000E-04	0.	8,10000E-04	0.	17	19	6	F00
0.	0.	3,00000E-04	2,90000E-04	3,00000E-04	8,10000E-04	17	25	6	F00
8,10000E-04	8,10000E-04	0.	0.	0.	0.	17	31	2	F00
0.	0.	0.	0.	0.	0.	18	1	6	F00
0.	0.	0.	0.	0.	1,35000E-01	18	7	6	F00
0.	0.	0.	0.	0.	0.	18	13	6	F00
2,40000E-04	2,40000E-04	8,10000E-04	0.	8,10000E-04	0.	18	19	6	F00
0.	0.	8,10000E-04	8,00000E-04	8,10000E-04	0.	18	25	6	F00
0.	0.	0.	0.	0.	0.	18	31	2	F00
0.	0.	0.	0.	0.	0.	19	1	6	F00
0.	0.	0.	0.	0.	0.	19	7	6	F00
0.	0.	0.	0.	0.	0.	19	13	6	F00
1,35000E-01	2,40000E-04	8,10000E-04	8,10000E-04	0.	0.	19	19	6	F00
0.	0.	8,00000E-04	8,10000E-04	8,10000E-04	0.	19	25	6	F00
0.	0.	0.	0.	0.	0.	19	31	2	F00
0.	0.	0.	0.	0.	0.	20	1	6	F00
0.	0.	0.	0.	0.	0.	20	7	6	F00
0.	0.	0.	0.	0.	0.	20	13	6	F00
0.	1,35000E-01	0.	8,10000E-04	8,10000E-04	0.	20	19	6	F00
0.	0.	8,10000E-04	8,10000E-04	8,00000E-04	0.	20	25	6	F00

0.	0.	0.	0.	0.	0.	20	31	2	F00
0.	0.	0.	0.	0.	0.	21	1	6	F00
0.	0.	0.	0.	0.	0.	21	7	6	F00
0.	0.	0.	0.	0.	0.	21	13	6	F00
0.	0.	0.	0.	0.	0.	21	19	6	F00
2,00000E-04	2,10000E-04	2,70000E-01	2,00000E-04	2,00000E-04	2,00000E-04	21	25	6	F00
0.	0.	0.	0.	0.	0.	21	31	2	F00
0.	0.	0.	0.	0.	0.	22	1	6	F00
0.	0.	0.	0.	0.	0.	22	7	6	F00
0.	0.	0.	0.	0.	0.	22	13	6	F00
0.	0.	0.	0.	0.	0.	22	19	6	F00
2,10000E-04	2,00000E-04	0.	0.	0.	0.	22	25	6	F00
0.	0.	0.	0.	0.	0.	22	31	2	F00
0.	0.	0.	0.	0.	0.	23	1	6	F00
0.	0.	0.	0.	0.	0.	23	7	6	F00
0.	0.	0.	0.	0.	0.	23	13	6	F00
0.	0.	0.	0.	0.	0.	23	19	6	F00
2,00000E-04	2,00000E-04	0.	0.	2,70000E-01	2,10000E-04	23	25	6	F00
0.	0.	0.	0.	0.	0.	23	31	2	F00
0.	0.	0.	0.	0.	0.	24	1	6	F00
0.	0.	0.	0.	0.	0.	24	7	6	F00
0.	0.	0.	0.	0.	0.	24	13	6	F00
0.	0.	0.	0.	0.	2,70000E-01	24	19	6	F00
2,00000E-04	2,00000E-04	0.	0.	0.	0.	24	25	6	F00
0.	0.	0.	0.	0.	0.	24	31	2	F00
0.	0.	0.	0.	0.	0.	25	1	6	F00
0.	0.	0.	0.	0.	0.	25	7	6	F00
0.	0.	0.	0.	0.	0.	25	13	6	F00
0.	0.	0.	0.	0.	0.	25	19	6	F00
2,70000E-01	2,00000E-04	0.	0.	0.	0.	25	25	6	F00
0.	0.	0.	0.	0.	0.	25	31	2	F00
0.	0.	0.	0.	0.	0.	26	1	6	F00
0.	0.	0.	0.	0.	0.	26	7	6	F00
0.	0.	0.	0.	0.	0.	26	13	6	F00
0.	0.	0.	0.	0.	0.	26	19	6	F00
0.	2,70000E-01	0.	0.	0.	0.	26	25	6	F00
0.	0.	0.	0.	0.	0.	26	31	2	F00
0.	0.	0.	0.	0.	0.	27	1	6	F00
0.	0.	0.	0.	0.	0.	27	7	6	F00
0.	0.	0.	0.	0.	0.	27	13	6	F00
0.	0.	0.	0.	0.	0.	27	19	6	F00
0.	0.	2,70000E-01	2,00000E-04	2,00000E-04	2,00000E-04	27	25	6	F00
2,00000E-04	2,10000E-04	0.	0.	0.	0.	27	31	2	F00
0.	0.	0.	0.	0.	0.	28	1	6	F00
0.	0.	0.	0.	0.	0.	28	7	6	F00
0.	0.	0.	0.	0.	0.	28	13	6	F00
0.	0.	0.	0.	0.	0.	28	19	6	F00
0.	0.	0.	2,70000E-01	2,00000E-04	2,00000E-04	28	25	6	F00
2,10000E-04	2,00000E-04	0.	0.	0.	0.	28	31	2	F00
0.	0.	0.	0.	0.	0.	29	1	6	F00
0.	0.	0.	0.	0.	0.	29	7	6	F00
0.	0.	0.	0.	0.	0.	29	13	6	F00
0.	0.	0.	0.	0.	0.	29	19	6	F00
0.	0.	0.	0.	2,70000E-01	2,10000E-04	29	25	6	F00
2,00000E-04	2,00000E-04	0.	0.	0.	0.	29	31	2	F00
0.	0.	0.	0.	0.	0.	30	1	6	F00
0.	0.	0.	0.	0.	0.	30	7	6	F00
0.	0.	0.	0.	0.	0.	30	13	6	F00
0.	0.	0.	0.	0.	0.	30	19	6	F00
0.	0.	0.	0.	0.	2,70000E-01	30	25	6	F00

2.00000E+04	2.00000E+04	0.	0.	0.	0.	31	31	2	F00
0.	0.	0.	0.	0.	0.	31	1	6	F00
0.	0.	0.	0.	0.	0.	31	7	6	F00
0.	0.	0.	0.	0.	0.	31	13	6	F00
0.	0.	0.	0.	0.	0.	31	19	6	F00
0.	0.	0.	0.	0.	0.	31	25	6	F00
2.70000E+01	2.00000E+04	0.	0.	0.	0.	31	31	2	F00
0.	0.	0.	0.	0.	0.	32	1	6	F00
0.	0.	0.	0.	0.	0.	32	7	6	F00
0.	0.	0.	0.	0.	0.	32	13	6	F00
0.	0.	0.	0.	0.	0.	32	19	6	F00
0.	0.	0.	0.	0.	0.	32	25	6	F00
0.	2.70000E+01	0.	0.	0.	0.	32	31	2	F00

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