

JSC-08964

NASA TECHNICAL MEMORANDUM

NASA TM X-58183
May 1976



NASA

CUBIC SPLINE FUNCTION INTERPOLATION IN ATMOSPHERE
MODELS FOR THE SOFTWARE DEVELOPMENT LABORATORY:
FORMULATION AND DATA

(NASA-TM-X-58183) CUBIC SPLINE FUNCTION
INTERPOLATION IN ATMOSPHERE MODELS FOR THE
SOFTWARE DEVELOPMENT LABORATORY:
FORMULATION AND DATA (NASA) 125 p HC \$5.50

N76-27745

CSCI 04A G3/46 42378

Unclas

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS 77058



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|---|---|--|-----------------------------|
| 1. Report No NASA TM X-58183 | 2. Government Accession No | 3. Recipient's Catalog No | |
| 4. Title and Subtitle CUBIC SPLINE FUNCTION INTERPOLATION IN ATMOSPHERE MODELS FOR THE SOFTWARE DEVELOPMENT LABORATORY: FORMULATION AND DATA | | 5. Report Date May 1976 | |
| | | 6. Performing Organization Code JSC-08964 | |
| 7. Author(s) James C. Kirkpatrick | | 8. Performing Organization Report No | |
| | | 10. Work Unit No. 986-16-00-00-72 | |
| 9. Performing Organization Name and Address Lyndon B. Johnson Space Center Houston, Texas 77058 | | 11. Contract or Grant No | |
| | | 13. Type of Report and Period Covered Technical Memorandum | |
| 12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C. 20546 | | 14. Sponsoring Agency Code | |
| | | 15. Supplementary Notes | |
| 16. Abstract A tabulation of selected altitude-related values of pressure, density, speed of sound, and coefficient of viscosity for each of U.S.A. models of the atmosphere is presented in block data format. Interpolation for the desired atmospheric parameters is performed by using cubic spline functions. The recursive relations necessary to compute the cubic spline function coefficients are derived and implemented in subroutine form. Three companion subprograms, which form the preprocessor and processor, are also presented. These subprograms, together with the data element, compose the spline fit atmosphere package. Detailed FLOWGM flow charts and FORTRAN listings of the atmosphere package are presented in the appendix. | | | |
| 17. Key Words (Suggested by Author(s)) Atmospheric models Tabulation Atmospheric density Subroutines Reference atmospheres Altitude Interpolation Spline functions | | 18. Distribution Statement STAR Subject Category: 46 (Geophysics) | |
| 19. Security Classif. (of this report) Unclassified | 20. Security Classif. (of this page) Unclassified | 21. No. of Pages 125 | 22. Price* \$5.50 |

*For sale by the National Technical Information Service, Springfield, Virginia 22161

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**CUBIC SPLINE FUNCTION INTERPOLATION IN ATMOSPHERE
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SUMMARY

Six standard reference atmosphere models for the years 1962, 1963 (Patrick Air Force Base), and 1966 (for July and January at latitudes 30° and 60° N) are presented in tabular form. The tabulation, which is presented in block data format, is adequate for the accurate representation of the atmospheric parameters of pressure, density, speed of sound, and coefficient of viscosity as functions of altitude. The range of tabulated altitudes extends from 0 to 205 kilometers. Interpolation for the desired parameters is performed by using cubic spline functions. The recursive relations necessary to compute the cubic spline function coefficients are derived and implemented in subroutine form. Detailed FLOWGM flow charts and FORTRAN listings of the atmosphere package are presented in the appendix.

INTRODUCTION

This report presents a tabulation in block data format of selected altitude-correlated values of pressure, density, speed of sound, and coefficient of viscosity for each of six atmosphere models. These values were selected such that they adequately represent their respective functions for accurate interpolation by cubic spline functions throughout the range of tabulated altitudes. Three companion subprograms, which form the preprocessor (subroutines SDAT and SPLN1) and processor (subroutine ATMSPL), are presented. These subprograms, together with the data element, compose the spline fit atmosphere package. In the preprocessor, the data for the desired atmosphere model are selected and processed for proper order and unit consistency before SPLN1 is used to compute the spline function coefficients. In the processor, the data table is searched to establish the interval in which the desired altitude lies, and then the values of the previously mentioned parameters are computed by using the cubic spline function coefficients for the appropriate altitude interval.

The cubic spline technique provides an effective, easy-to-use method for the unerring reproduction of a function from tabulated data. The method also ensures continuity in the function and in its first and second derivatives. After

the cubic spline function coefficients have been computed, they may be stored for repeated use as long as the tabulated data remain unchanged.

SYMBOLS

| | |
|--------------|---|
| a, b, c, d | edges of the beam |
| a_k | defined in equation (37) |
| b_k | defined in equation (38) |
| C_1, C_2 | arbitrary constants of integration |
| c_k | defined in equation (39) |
| $c_1(k)$ | defined in equation (68) |
| $c_2(k)$ | defined in equation (69) |
| $c_3(k)$ | defined in equation (70) |
| dA | differential element of a cross-sectional area of a beam |
| ds | differential element of arc length |
| dx | differential element of the length of the beam |
| $d\theta$ | differential element of the angle through which a cross-sectional surface of a beam is rotated under load |
| d_k | defined in equation (49) |
| E | modulus of elasticity of the beam |
| EI | flexural rigidity (can be taken as unity for any plane curve without loss of generality) |
| ef | original unstressed length of the fiber |
| gh | typical fiber of the beam |
| hk | defined in equation (1) |
| I | area moment of inertia |
| l | distance from the neutral surface to a deformed fiber of a loaded beam |

| | |
|------------|---|
| $M(x)$ | bending moment as a function of the distance x measured from the end of the beam |
| M_k | bending moment at the k th section of the beam or an approximation to the second derivative at the k th section |
| P | load that acts upon the beam |
| Q_k | defined in equation (44) |
| R_1, R_2 | support reactions of the beam |
| S | stress |
| s | arc length of a curve |
| U_k | defined in equation (46) |
| V_k | shear force at the k th section of the beam |
| $y(k)$ | defined in equation (24) |
| $y(x)$ | defined in equation (23) |
| y' | slope of the deformation curve |
| $y'(x)$ | defined in equation (22) |
| ϵ | strain (change in length per unit of length) |
| ρ | radius of curvature of the neutral surface |
| φ | angle that the tangent to a curve makes with the axis of abscissas |

SPLINE FIT ATMOSPHERE MODEL PACKAGE

Model History

The spline fit atmosphere package discussed in this report, was originally developed for the space vehicle dynamic simulator (SVDS) program in November 1972. In February 1973, the package was incorporated with appreciable modification, into the Shuttle optimal abort program (SOAP). The package presented here is from an early version of the SOAP. For implementation into the SOAP, the SVDS version was modified, at the expense of storage, to improve its performance and execution requirements. The spline fit atmosphere package has performed accurately in both programs.

Description of the Models

The spline fit atmosphere package consists of six atmosphere models:

1. The 1962 standard reference atmosphere
2. The 1966 standard reference atmosphere for July at latitude 30° N
3. The 1966 standard reference atmosphere for January at latitude 30° N
4. The 1966 standard reference atmosphere for July at latitude 60° N
5. The 1966 standard reference atmosphere for January at latitude 60° N
6. The 1963 Patrick Air Force Base (AFB) reference atmosphere

Each model consists of a tabulation of altitude-correlated values of the atmospheric parameters of pressure, density, speed of sound, and coefficient of viscosity. All six models are correlated to the same table of altitudes and tabulated in the foregoing sequence. All tabulated atmospheric parameter values are expressed in the meter-kilogram-second (MKS) system of units. Altitude values are given in meters, pressure values are given in millibars, density values are given in kilograms per cubic meter, speed of sound values are given in meters per second, and coefficient of viscosity values are given in kilograms per meter per second. Each atmospheric parameter is represented as a function of altitude by 123 data points. These data have been selected on best-fit considerations, with particular emphasis on those regions in which the tabulation shows that the function is discontinuous in its first derivative. Each model is represented in the 0- to 205-kilometer altitude range. The tabulation was compiled from references 1 to 3.

Because the tabulation for the 1966 atmosphere extends only to 118 kilometers, the last data point is repeated to 205 kilometers for model consistency. If the model altitude boundaries are exceeded, the package returns the last tabulated parameter values at the violated boundary.

Assumptions and Approximations

The spline fit atmosphere model package was developed to accommodate the needs and restrictions of the SVDS program. As a result, temperature, an important atmospheric parameter, was not included in the list of parameters modeled when the package was built. This parameter can be added to any model desired at the cost of tabulating the parameter values required.

The tabulation was performed in the MKS system of units because this system was common to all the references used. A common system of units is advantageous because a single set of conversion factors can be used to place all models in any desired working units. The British engineering system of units was used to convert the atmospheric data in this package (i.e., pressure in pounds-force per square foot, density in slugs per cubic foot, speed of sound in feet per second, and coefficient of viscosity in pounds-mass seconds per square foot).

Atmospheric parameter function values were selected at various altitudes. The increment of altitude was varied as a function of altitude as follows.

| <u>Altitude range, km</u> | <u>Altitude increment, m</u> |
|---------------------------|------------------------------|
| 0 to 3 | 250 |
| 3 to 5 | 500 |
| 5 to 20 | 1000 |
| 20 to 160 | 2000 |
| 160 to 204 | 4000 |
| 204 to 205 | 1000 |

Additional data points were added to mark the location in which the atmospheric parameter functions undergo first-derivative discontinuities. These discontinuities occur only in the speed of sound and coefficient of viscosity functions, which are affected because of temperature variations. As a result, when temperature is added to the atmosphere models, the choice of altitudes should accommodate discontinuities in the first derivative of the temperature functions. Because of the need to intersperse additional points, an ordering scheme is included in the pre-processor SDAT to place all altitude values and associated function values in ascending order of the independent variable. This order must be established before calling subroutine SPLN1 to compute the cubic spline coefficients.

The small altitude increment used at the extremes of the tabulation permitted the approximation of the first derivatives of the function at the initial and terminal boundaries by forming the difference quotient. This assumption of linearity at the extremes of the tabulated function is the only assumption made in the model. (The theoretical arguments on which the algorithm is based result in the additional assumption that the curvature of the function can be represented by its second derivative. The data sample selected is expected to comply with this assumption.)

DERIVATION OF THE RECURSIVE RELATIONS FOR COMPUTING THE COEFFICIENTS OF THE CUBIC SPLINE FUNCTIONS

The mathematical spline is a formal analog of the draftsman's spline, a flexible beam device used to fair out a smooth curve between specified data points. The mechanical spline is anchored on the drawing board at each plotted data point. The curvature of the spline results from the bending moments applied to the beam.

In deriving the recursive relations of the spline algorithm, the elementary theory of elasticity is useful. Consider a simply supported beam (i.e., ends

unrestrained) under the action of an applied load, however distributed. For an elementary analysis, the following assumptions are made:

1. Sections of the beam, which were originally plane, remain plane.
2. The material of the beam is homogeneous and obeys Hooke's law (the deformation is proportional to the applied load).
3. The moduli of elasticity for tension and for compression are equal.
4. The beam is initially straight and is of constant cross section.

Figure 1 shows a uniform homogeneous beam under the action of the load P . The beam is simply supported and is in static equilibrium under the action of the support reactions R_1 and R_2 . The differential element of length dx , bounded by the edges a , b , c , and d , is bent or deformed under load into the exaggerated shape shown in figure 2 where c and d are deflected to c' and d' . The sections ab and cd are shown rotated relative to each other through an angle $d\theta$, but they remain undistorted in accordance with assumption 1. The fibers in the region of ac are contracted, or shortened, in compression, whereas those in the region bd are elongated, or lengthened, in tension. Because the beam is uniform and homogeneous in going from contraction to elongation, a region conceivably exists in which the fibers maintain their original unstressed length. This surface of unstressed fibers is referred to as the neutral surface. In the deformation of a typical fiber gh located at distance ℓ from the neutral surface, the elongation hk is the arc of a circle of radius ℓ , which subtends the angle $d\theta$ and is given by the relation

$$hk = \ell d\theta \quad (1)$$

The strain ϵ (the change in length per unit of length) is found by dividing the deformation hk by the original unstressed length of the fiber ef .

$$\epsilon = \frac{hk}{ef} = \frac{\ell d\theta}{ef} \quad (2)$$

If the radius of curvature of the neutral surface is ρ , the curved length of ef is equal to $\rho d\theta$. The strain can then be expressed as

$$\epsilon = \frac{\ell d\theta}{\rho d\theta} = \frac{\ell}{\rho} \quad (3)$$

Because the material is assumed to be homogeneous and to obey Hooke's law, the stress (force per unit area) in the fiber gh is given by

$$S = E \epsilon = \frac{E}{\rho} \ell \quad (4)$$

where E is the modulus of elasticity defined as the ratio of the stress S to the strain ϵ . Clearly, the sign of S varies with the sign of ℓ : negative or compressive stress for ℓ negative and positive or tensile stress for ℓ positive.

The beam in figure 1 is shown in static equilibrium. As a result, the algebraic sum of all forces and moments acting on the beam must be zero. The bending moment $M(x)$ must be balanced by the resisting moment. The resisting moment is the sum of all stresses S acting on each differential area element of cross section dA multiplied by its moment arm ℓ measured from the neutral axis as shown in figure 3. Hence, the bending moment is

$$M(x) = \int \ell (S \, dA) \quad (5)$$

Replacing S with $E\ell/\rho$ from equation (4) gives

$$M(x) = EI/\rho \quad (6)$$

where I is the area moment of inertia.

$$\frac{1}{\rho} = \frac{M(x)}{EI} \quad (7)$$

The reciprocal of ρ , the radius of curvature of the beam, is called the curvature of the curve. For plane curves, the curvature is defined as the rate at which the tangent to the curve turns compared with the description of arc. Therefore, if φ is the angle that the tangent to a curve makes with the axis of abscissas and s is the element of arc length, then the curvature is defined as

$$\frac{1}{\rho} = \frac{d\varphi}{ds} \quad (8)$$

The slope of the tangent to the curve is

$$y' = \frac{dy}{dx} = \tan \varphi$$

or

$$\varphi = \arctan y' \quad (10)$$

and

$$d\varphi = \frac{dy'}{(1 + y'^2)^{\frac{3}{2}}} dx = \frac{y''}{(1 + y'^2)^{\frac{3}{2}}} dx \quad (11)$$

The differential element of arc length ds is defined as

$$ds = (1 + y'^2)^{\frac{1}{2}} dx \quad (12)$$

Therefore,

$$\frac{1}{\rho} = \frac{d\varphi}{ds} = \frac{y''}{(1 + y'^2)^{\frac{3}{2}}} \quad (13)$$

and

$$\frac{y''}{(1 + y'^2)^{\frac{3}{2}}} = \frac{M(x)}{EI} \quad (14)$$

The assumption is usually made that the slope of the deformation curve y' is small so that y'^2 can be ignored compared to unity. When this assumption is made, the differential equation of the deformation curve can be written as

$$M(x) = EIy''(x) \quad (15)$$

The assumption concerning the elastic behavior of a beam made at the beginning of this discussion can be realized by a mathematical function of one variable. The assumption that the slope of the curve is small and that its square can be neglected can be realized by an arbitrary mathematical function only over relatively short intervals. Under this condition, the curvature can be approximated by the second derivative of the function. This point must be remembered when selecting a set of data points to represent a function for spline fit. Sufficient data points must be chosen in the appropriate concentration such that in the regions where the curvature is large, each section of the curve can be considered as a simply supported beam (adequately supported so that the slope of the deformation curve is negligible).

The following definitions are required for the discussion that follows.

1. The shear at a section of a beam is the algebraic sum of all external forces acting on one side of the section.

2. The bending moment at a section of a beam is the algebraic sum of the moments of all the external forces on one side of the section.

Hence, if a mathematical function is represented in a region of definition by n data points, the region of definition will have been divided into $n - 1$ sections (fig. 4). If each section of the curve between given data points is considered to be a beam deflected under load, then the bending moment in the k th section between the k th and $(k + 1)$ th data points will be given by the equation

$$M(x) = \int_{x_k}^x V_k dx + M_k \quad (16)$$

where V_k and M_k are the shear and bending moments at the k th section. Therefore,

$$M(x) = V_k(x - x_k) + M_k \quad (17)$$

Clearly, where $x = x_k$, $M(x_k) = M_k$ and where $x = x_{k+1}$, $M(x_{k+1}) = M_{k+1}$ or

$$M_{k+1} = V_k(x_{k+1} - x_k) + M_k \quad (18)$$

Solving for V_k gives

$$V_k = \frac{M_{k+1} - M_k}{x_{k+1} - x_k} = \frac{\Delta M_k}{\Delta x_k} \quad (19)$$

Substituting equation (19) into equation (17) gives

$$\begin{aligned} M(x) &= \frac{(M_{k+1} - M_k)}{(x_{k+1} - x_k)} (x - x_k) + M_k \\ &= M_{k+1} \frac{(x - x_k)}{(x_{k+1} - x_k)} + M_k \frac{(x_{k+1} - x)}{(x_{k+1} - x_k)} \end{aligned} \quad (20)$$

Substituting the bending moment $M(x)$ by its equivalent from equation (15) (the product EI is known as the flexural rigidity and can be taken as unity for any plane curve without loss of generality) in equation (20) gives

$$y''(x) = M_{k+1} \frac{(x - x_k)}{\Delta x_k} + M_k \frac{(x_{k+1} - x)}{\Delta x_k} \quad (21)$$

where $\Delta x_k = x_{k+1} - x_k$. Integrating twice gives

$$y'(x) = M_{k+1} \frac{(x - x_k)^2}{2\Delta x_k} - M_k \frac{(x_{k+1} - x)^2}{2\Delta x_k} + C_1 \quad (22)$$

$$y(x) = M_{k+1} \frac{(x - x_k)^3}{6\Delta x_k} + M_k \frac{(x_{k+1} - x)^3}{6\Delta x_k} + C_1 x + C_2 \quad (23)$$

where C_1 and C_2 are constants of integration. At $x = x_k$, $y(x_k) = y_k$; at $x = x_{k+1}$, $y(x_{k+1}) = y_{k+1}$. Substituting y_k and y_{k+1} in equation (23) gives

$$y_k = M_k \frac{\Delta x_k^2}{6} + C_1 x_k + C_2 \quad (24)$$

and

$$y_{k+1} = M_{k+1} \frac{\Delta x_k^2}{6} + C_1 x_{k+1} + C_2 \quad (25)$$

Subtracting equation (24) from equation (25) gives

$$y_{k+1} - y_k = (M_{k+1} - M_k) \frac{\Delta x_k^2}{6} + C_1 \Delta x_k \quad (26)$$

Solving for C_1 from equation (26) gives

$$\begin{aligned} C_1 &= \frac{y_{k+1} - y_k}{\Delta x_k} - \frac{(M_{k+1} - M_k) \Delta x_k}{6} \\ &= \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1} \Delta x_k}{6} \right) - \left(\frac{y_k}{\Delta x_k} - \frac{M_k \Delta x_k}{6} \right) \end{aligned} \quad (27)$$

Substituting for C_1 from equation (27) in equation (25) and solving for C_2 gives

$$C_2 = x_{k+1} \left(\frac{y_k}{\Delta x_k} - \frac{M_k \Delta x_k}{6} \right) - x_k \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1} \Delta x_k}{6} \right) \quad (28)$$

Substituting the expressions for C_1 and C_2 from equations (27) and (28) in equations (22) and (23) gives the expression for the cubic spline function in the k th interval as

$$\begin{aligned} y(x) &= M_{k+1} \frac{(x - x_k)^3}{6\Delta x_k} + M_k \frac{(x_{k+1} - x)^3}{6\Delta x_k} \\ &+ \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1} \Delta x_k}{6} \right) (x - x_k) + \left(\frac{y_k}{\Delta x_k} - \frac{M_k \Delta x_k}{6} \right) (x_{k+1} - x) \end{aligned} \quad (29)$$

and its first derivative is given by

$$\begin{aligned}
 y'(x) = & M_{k+1} \frac{(x - x_k)^2}{2\Delta x_k} - M_k \frac{(x_{k+1} - x)^2}{2\Delta x_k} \\
 & + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1}\Delta x_k}{6} \right) - \left(\frac{y_k}{\Delta x_k} - \frac{M_k\Delta x_k}{6} \right)
 \end{aligned} \tag{30}$$

Equations (21), (29), and (30) provide expressions for the values of the cubic spline function and its first and second derivatives in the k th interval. These expressions can be written for the cubic spline function and its first and second derivatives in the $(k - 1)$ th interval by replacing k with $k - 1$. Therefore, in the $(k - 1)$ th interval,

$$\begin{aligned}
 y(x) = & M_k \frac{(x - x_{k-1})^3}{6\Delta x_{k-1}} + M_{k-1} \frac{(x_k - x)^3}{6\Delta x_{k-1}} \\
 & + \left(\frac{y_k}{\Delta x_{k-1}} - \frac{M_k\Delta x_{k-1}}{6} \right) (x - x_{k-1}) \\
 & + \left(\frac{y_{k-1}}{\Delta x_{k-1}} - \frac{M_{k-1}\Delta x_{k-2}}{6} \right) (x_k - x)
 \end{aligned} \tag{31}$$

$$\begin{aligned}
 y'(x) = & M_k \frac{(x - x_{k-1})^2}{2\Delta x_{k-1}} - M_{k-1} \frac{(x_k - x)^2}{2\Delta x_{k-1}} \\
 & + \left(\frac{y_k}{\Delta x_{k-1}} - \frac{M_k\Delta x_{k-1}}{6} \right) - \left(\frac{y_{k-1}}{\Delta x_{k-1}} - \frac{M_{k-1}\Delta x_{k-1}}{6} \right)
 \end{aligned} \tag{32}$$

$$y''(x) = M_k \frac{(x - x_{k-1})}{\Delta x_{k-1}} + M_{k-1} \frac{(x_k - x)}{\Delta x_{k-1}} \tag{33}$$

A cursory inspection of equations (29) and (31) and equations (21) and (33) will show that neither the cubic spline function nor its second derivative will experience discontinuity in going from the $(k - 1)$ th to the k th interval. This may be shown simply by replacing x with x_k in these expressions. To ensure that the cubic spline functions will experience no discontinuity in the first derivative in going from the $(k - 1)$ th to the k th interval, replace x with x_k in equations (30) and (32) and equate the results. Thus,

$$\begin{aligned} M_k \frac{\Delta x_{k-1}}{2} + \left(\frac{y_k}{\Delta x_{k-1}} - \frac{M_k \Delta x_{k-1}}{6} \right) - \left(\frac{y_{k-1}}{\Delta x_{k-1}} - \frac{M_{k-1} \Delta x_{k-1}}{6} \right) \\ = -M_k \frac{\Delta x_k}{2} + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1} \Delta x_k}{6} \right) - \left(\frac{y_k}{\Delta x_k} - \frac{M_k \Delta x_k}{6} \right) \end{aligned} \quad (34)$$

or

$$\frac{\Delta x_{k-1}}{6} M_{k-1} + \frac{\Delta x_{k-1} + \Delta x_k}{3} M_k + \frac{\Delta x_k}{6} M_{k+1} = \frac{\Delta y_k}{\Delta x_k} - \frac{\Delta y_{k-1}}{\Delta x_{k-1}} \quad (35)$$

where $\Delta y_k = y_{k+1} - y_k$ and $\Delta y_{k-1} = y_k - y_{k-1}$. Equation (35) permits the writing of k equations for the solution of $k + 2$ unknown values of M . Clearly, two second derivative values must be supplied at any two of the tabulated data points. However, if the second derivatives are not known, first derivative values may be used through equation (30). Further, if both the first and second derivatives of the function are known at any one of the tabulated points, the set of simultaneous equations given by equation (35) can still be solved.

Solving for M_{k+1} in equation (35) gives

$$\begin{aligned} M_{k+1} &= -\frac{2(\Delta x_k + \Delta x_{k-1})M_k}{\Delta x_k} - \frac{\Delta x_{k-1}}{\Delta x_k} M_{k-1} + \frac{6}{\Delta x_k} \left(\frac{\Delta y_k}{\Delta x_k} - \frac{\Delta y_{k-1}}{\Delta x_{k-1}} \right) \\ &= a_k M_k + b_k M_{k-1} + c_k \end{aligned} \quad (36)$$

where

$$a_k = -\frac{2(\Delta x_k + \Delta x_{k-1})}{\Delta x_k} \quad (37)$$

$$b_k = -\frac{\Delta x_{k-1}}{\Delta x_k} \quad (38)$$

$$c_k = \frac{6}{\Delta x_k} \left(\frac{\Delta y_k}{\Delta x_k} - \frac{\Delta y_{k-1}}{\Delta x_{k-1}} \right) \quad (39)$$

Assume a solution of the form

$$M_{k+1} = \frac{1}{Q_k} (M_k - U_k) \quad (40)$$

so that in the $(k - 1)$ th interval

$$M_{k-1} = Q_{k-1} M_k + U_{k-1} \quad (41)$$

Substituting equation (41) in equation (36) gives

$$\begin{aligned} M_{k+1} &= a_k M_k + b_k (Q_{k-1} M_k + U_{k-1}) + c_k \\ &= (a_k + b_k Q_{k-1}) M_k + b_k U_{k-1} + c_k \end{aligned} \quad (42)$$

Comparing equations (40) and (42) gives

$$\frac{1}{Q_k} = a_k + b_k Q_{k-1} \quad (43)$$

or

$$Q_k = \frac{1}{a_k + b_k Q_{k-1}} \quad (44)$$

and

$$-\frac{U_k}{Q_k} = b_k U_{k-1} + c_k \quad (45)$$

or

$$U_k = -Q_k (b_k U_{k-1} + c_k) \quad (46)$$

Substituting equations (37), (38), and (39) in equations (44) and (46) gives

$$Q_k = -\frac{\Delta x_k}{2(\Delta x_k + \Delta x_{k-1}) + \Delta x_{k-1} Q_{k-1}} = -\frac{\Delta x_k}{2(x_{k+1} - x_{k-1}) + \Delta x_{k-1} Q_{k-1}} \quad (47)$$

$$\begin{aligned} U_k &= -Q_k \left[-\frac{\Delta x_{k-1}}{\Delta x_k} U_{k-1} + \frac{6}{\Delta x_k} \left(\frac{\Delta y_k}{\Delta x_k} - \frac{\Delta y_{k-1}}{\Delta x_{k-1}} \right) \right] \\ &= \frac{Q_k}{\Delta x_k} \left[\Delta x_{k-1} U_{k-1} + 6 \left(\frac{\Delta y_{k-1}}{\Delta x_{k-1}} - \frac{\Delta y_k}{\Delta x_k} \right) \right] \end{aligned} \quad (48)$$

Equations (40), (41), (47), and (48) are the recursive relations that will be used for the solution of the set of simultaneous linear equations given by equation (35). Before this is done, equations (29) and (30) will be put in a more convenient form by using the following difference operators.

$$d_k = x - x_k \quad (49)$$

$$d_{k+1} = x - x_{k+1} \quad (50)$$

Adding and subtracting x_k to the right-hand side of equation (50) gives

$$d_{k+1} = x - x_{k+1} + x_k - x_k = d_k - \Delta x_k \quad (51)$$

Substituting equations (49) and (50) in equations (29) and (30) gives

$$y(x) = M_{k+1} \frac{d_k^3}{6\Delta x_k} - M_k \frac{d_{k+1}^3}{6\Delta x_k} + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1}\Delta x_k}{6} \right) d_k - \left(\frac{y_k}{\Delta x_k} - \frac{M_k\Delta x_k}{6} \right) d_{k+1} \quad (52)$$

$$\begin{aligned} y'(x) &= M_{k+1} \frac{d_k^2}{2\Delta x_k} - M_k \frac{d_{k+1}^2}{2\Delta x_k} + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1}\Delta x_k}{6} \right) - \left(\frac{y_k}{\Delta x_k} - \frac{M_k\Delta x_k}{6} \right) \\ &= M_{k+1} \frac{d_k^2}{2\Delta x_k} - M_k \frac{d_{k+1}^2}{2\Delta x_k} + \frac{\Delta y_k}{\Delta x_k} - \frac{\Delta M_k \Delta x_k}{6} \end{aligned} \quad (53)$$

where $\Delta M_k = M_{k+1} - M_k$.

From equations (49), (50), and (51), when $x = x_k$, then $d_k = 0$ and $d_{k+1} = -\Delta x_k$; when $x = x_{k+1}$, then $d_k = \Delta x_k$ and $d_{k+1} = 0$. Substituting these results in equation (53) gives, for $x = x_k$,

$$\begin{aligned} y'(x_k) &= -M_k \frac{\Delta x_k}{2} + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1}\Delta x_k}{6} \right) - \left(\frac{y_k}{\Delta x_k} - \frac{M_k\Delta x_k}{6} \right) \\ &= \frac{\Delta y_k}{\Delta x_k} - \frac{\Delta x_k}{6} (M_{k+1} + 2M_k) \end{aligned} \quad (54)$$

and, for $x = x_{k+1}$,

$$\begin{aligned} y'(x_{k+1}) &= M_{k+1} \frac{\Delta x_k}{2} + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1}\Delta x_k}{6} \right) - \left(\frac{y_k}{\Delta x_k} - \frac{M_k\Delta x_k}{6} \right) \\ &= \frac{\Delta y_k}{\Delta x_k} + \frac{\Delta x_k}{6} (M_k + 2M_{k+1}) \end{aligned} \quad (55)$$

The use of these recursive relations is described in the following six cases.

Case 1: Solution of the set of simultaneous equations given by equation (35) when the second derivatives of the function are known at the initial and terminal tabulated boundaries. In this case, $y''(x_1) = M_1$ and $y''(x_n) = M_n$. From equation (41) with $k = 2$, if $Q_1 = 0$, then $M_1 = U_1$. By using these values for Q_1 and U_1 , equations (47) and (48) can be used to generate values of Q_k and U_k , recursively, for all values of k ranging from 2 to $n - 1$. After these values are available, then all values of M_k can be computed by using equation (40) written in the form of equation (41)

$$M_k = Q_k M_{k+1} + U_k \quad (56)$$

and propagating the solution backwards with k ranging from $n - 1$ to 2. As M_n and M_1 are known, all n second-derivative values will be available.

Case 2: Solution of the set of simultaneous equations given by equation (35) when the first derivatives of the function are known at the initial and terminal tabulated boundaries. In this case, $y'(x_1) = D_1$ and $y'(x_n) = D_n$. Substitute $k = 1$ in equation (54) for M_{k+1} from equation (40) and solve for U_1 to get

$$\left. \begin{aligned} y'(x_1) = D_1 &= \frac{\Delta y_1}{\Delta x_1} - \frac{\Delta x_1}{6} \left(\frac{M_1 - U_1}{Q_1} + 2M_1 \right) \\ U_1 &= Q_1 \left[M_1 \left(2 + \frac{1}{Q_1} \right) + \frac{6}{\Delta x_1} \left(D_1 - \frac{\Delta y_1}{\Delta x_1} \right) \right] \end{aligned} \right\} \quad (57)$$

If $Q_1 = -1/2$, then from equation (57),

$$U_1 = \frac{3}{\Delta x_1} \left(\frac{\Delta y_1}{\Delta x_1} - D_1 \right) \quad (58)$$

By using $Q_1 = -1/2$ and the value obtained for U_1 from equation (58), compute all values of Q_k and U_k from equations (47) and (48) for values of k ranging from 2 to $n - 1$. With the value of Q_{n-1} and U_{n-1} thus computed, substitute

equation (41) in equation (55) for M_{n-1} such that at $x = x_n$,

$$y'(x_n) = D_n = \frac{\Delta y_{n-1}}{\Delta x_{n-1}} + \frac{\Delta x_{n-1}}{6} \left(Q_{n-1} M_{n-1} + U_{n-1} + 2M_n \right) \quad (59)$$

Solving for M_n from equation (59) gives

$$M_n = \frac{\frac{6}{\Delta x_{n-1}} \left(D_n - \frac{\Delta y_{n-1}}{\Delta x_{n-1}} \right) - U_{n-1}}{2 + Q_{n-1}} \quad (60)$$

With the value of M_n known, the solution can be propagated backward by using equation (41) with k ranging from $n - 1$ to 1. Thus, M_1 will be computed as the last value.

Case 3: Solution of the set of simultaneous equations given by equation (35) when the first and second derivatives of the function are known, respectively, at the initial and terminal tabulated boundaries. In this case, $y'(x_1) = D_1$ and $y''(x_n) = M_n$. Proceed as in case 2 excluding the computation for M_n , which is not needed.

Case 4: Solution of the set of simultaneous equations given by equation (35) when the first and second derivatives of the function are known, respectively, at the terminal and initial tabulated boundaries. In this case, $y'(x_n) = D_n$ and $y''(x_1) = M_1$. Proceed as in case 1 and compute the value of M_n as in case 2.

Case 5: Solution of the set of simultaneous equations given by equation (35) when the first and second derivatives of the function are known at the initial tabulated boundary. In this case, $y'(x_1) = D_1$ and $y''(x_1) = M_1$. From equation (56), if $Q_1 = 1$, then

$$U_1 = 3M_1 + \frac{6}{\Delta x_1} \left(D_1 - \frac{\Delta y_1}{\Delta x_1} \right) \quad (61)$$

With the value of $Q_1 = 1$ and the value of U_1 given by equation (61), compute all values of Q_k and U_k from equations (47) and (48) for $k = 2$ to $n - 1$. With these values of Q_k and U_k known, compute values for the second derivative from equation (40) by propagating the solution forward for k ranging from 1 to $n - 1$. The last value thus computed is M_n .

Case 6: Solution of the set of simultaneous equations given by equation (35) when the first and second derivatives of the function are known at the terminal tabulated boundary. In this case, $y'(x_n) = D_n$ and $y''(x_n) = M_n$. In equation (55), substitute M_k in equation (41) with $k = n - 1$ and solve for U_{n-1} to get

$$\left. \begin{aligned} y'(x_n) = D_n &= \frac{\Delta y_{n-1}}{\Delta x_{n-1}} + \frac{\Delta x_{n-1}}{6} (Q_{n-1} M_n + U_{n-1} + 2M_n) \\ U_{n-1} &= \frac{6}{\Delta x_{n-1}} \left(D_n - \frac{\Delta y_{n-1}}{\Delta x_{n-1}} \right) - M_n (2 + Q_{n-1}) \end{aligned} \right\} \quad (62)$$

If $Q_{n-1} = 1$, then from equation (62),

$$U_{n-1} = \frac{6}{\Delta x_{n-1}} \left(D_n - \frac{\Delta y_{n-1}}{\Delta x_{n-1}} \right) - 3M_n \quad (63)$$

Solving for Q_{k-1} and U_{k-1} from equations (47) and (48) gives

$$Q_{k-1} = -\frac{1}{\Delta x_{k-1}} \left[\frac{\Delta x_k}{Q_k} + 2(\Delta x_k + \Delta x_{k-1}) \right] = -\frac{1}{\Delta x_{k-1}} \left[\frac{\Delta x_k}{Q_k} + 2(x_{k+1} - x_{k-1}) \right] \quad (64)$$

$$U_{k-1} = \frac{1}{\Delta x_{k-1}} \left[U_k \frac{\Delta x_k}{Q_k} - 6 \left(\frac{\Delta y_{k-1}}{\Delta x_{k-1}} - \frac{\Delta y_k}{\Delta x_k} \right) \right] \quad (65)$$

With $Q_{n-1} = 1$ and U_{n-1} given by equation (63), compute all values of Q_{k-1} and U_{k-1} from equations (64) and (65) for values of k ranging from $n - 1$ to 2. With the values of Q_k and U_k known, compute values for the second derivatives from equation (40) by propagating the solution backwards for k ranging from $n - 1$ to 1. The last value thus computed will be M_1 .

Clearly, the solutions for case 5 and case 6 could have been obtained from equations (54) and (55). In the solution for case 5, M_{k+1} can be obtained from equation (54) and $y'(x_{k+1})$ from equation (55). The solution can be propagated forward recursively with k ranging from 1 to $n - 1$. In the solution for case 6, M_k can be obtained from equation (55) and $y'(x_k)$ from equation (54). The solution can be propagated backward recursively with k ranging from $n - 1$ to 1.

If equation (52) is written with d_{k+1} replaced by its equivalent $d_{k+1} = d_k - \Delta x_k$ given by equation (51), the result is

$$\begin{aligned}
 y(x) = & M_{k+1} \frac{d_k^3}{6\Delta x_k} - M_k \frac{(d_k - \Delta x_k)^3}{6\Delta x_k} + \left(\frac{y_{k+1}}{\Delta x_k} - \frac{M_{k+1}\Delta x_k}{6} \right) d_k \\
 & - \left(\frac{y_k}{\Delta x_k} - \frac{M_k\Delta x_k}{6} \right) (d_k - \Delta x_k) = y_k + \left[\frac{\Delta y_k}{\Delta x_k} - \frac{\Delta x_k}{6} (M_{k+1} + 2M_k) \right] d_k \\
 & + \frac{M_k}{2} d_k^2 + \frac{\Delta M_k}{6\Delta x_k} d_k^3
 \end{aligned} \tag{66}$$

Equation (66) is the equation for the cubic spline function coefficients in the k th interval. If there are n data points in the tabulation, there will be $n - 1$ intervals and $n - 1$ cubic spline functions to cover the range of tabulated data.

For computation purposes, equation (67) is usually written as

$$y(x) = y_k + \left\{ \left[c_3(k)d_k + c_2(k) \right] d_k + c_1(k) \right\} d_k \tag{67}$$

where

$$c_1(k) = \frac{\Delta y_k}{\Delta x_k} - \frac{\Delta x_k}{6} (M_{k+1} + 2M_k) \tag{68}$$

$$c_2(k) = \frac{M_k}{2} \tag{69}$$

$$c_3(k) = \frac{\Delta M_k}{6\Delta x_k} \tag{70}$$

Equations (67) through (70) show that the coefficients are functions of the interval; however, the coefficients need to be computed only once. After the computation is made, the set pertaining to the interval in which the value of the independent variable lies can be brought in to compute the value of the dependent variable needed. Because there are three coefficients for each interval, if there are n data points, there will be $n - 1$ intervals and $3(n - 1)$ coefficients.

CONCLUDING REMARKS AND RECOMMENDATIONS

The atmosphere package for the 1962 and 1966 standard atmosphere models is recommended without reservation. When these models were built, it was possible to conduct comparison checks with the layered versions of these models in 250-meter increments. In both packages, these tests revealed errors that were properly corrected. The package for the 1963 Patrick Air Force Base reference standard model was not subjected to such strenuous tests because the layered version of this model was not available. However, with the other models so thoroughly tested, the choice of altitudes was established as adequate, and the only requirement for the Patrick Air Force Base reference standard model was to ensure that the data were tabulated correctly. The laborious task of comparing (digit for digit) each tabulated number in the model printouts with the numbers in the reference source was performed as carefully as possible, and all errors found were corrected. As a result, the accuracy of this model is reasonably ensured.

To test the accuracy of these models after they have been recoded for use in the Software Development Laboratory, the only requirement is to have the package reproduce the tabulated data. Because the interpolation is to be performed in a different set of units, the output must be converted to the units of the tabulated data for ease of comparison. The results should agree within an error of no greater than 10^{-8} . Additional verification can be obtained by evaluating the parameters of the models at various altitudes and comparing the results with those obtained from established operational sources, such as the space vehicle dynamic simulator and the Shuttle optimal abort programs. These tests should be performed for all models.

It is recommended that where the first and second derivatives are known at the same data point the cubic spline functions be used to interpolate data only in a small neighborhood of this point and not be extended for interpolation over the entire range of tabulated data.

Lyndon B. Johnson Space Center
National Aeronautics and Space Administration
Houston, Texas, June 4, 1976
986-16-00-00-72

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1. United States Committee on Extension to the Standard Atmosphere: U. S. Standard Atmosphere, 1962. U. S. Government Printing Office, 1962.
2. United States Committee on Extension to the Standard Atmosphere: U. S. Standard Atmosphere Supplements, 1966. U. S. Government Printing Office, 1966.
3. Smith, O. E.; and Weidner, Don K.: A Reference Atmosphere for Patrick Air Force Base, Florida, Annual (1963 Revision). NASA TM X-53139, 1964.

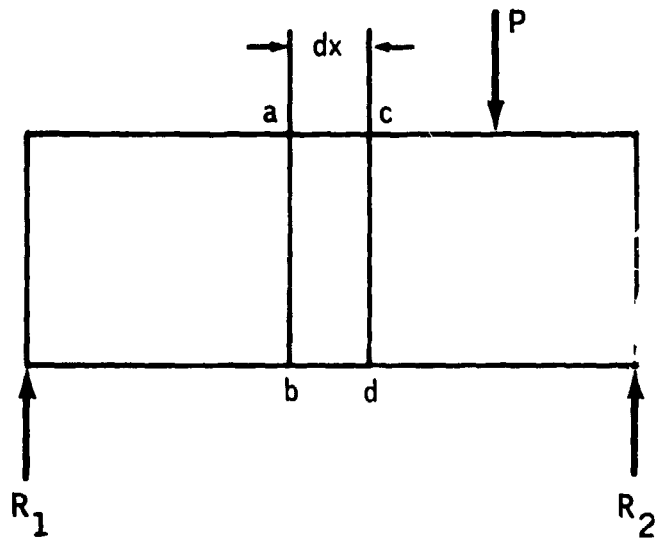


Figure 1.- Undeformed beam.

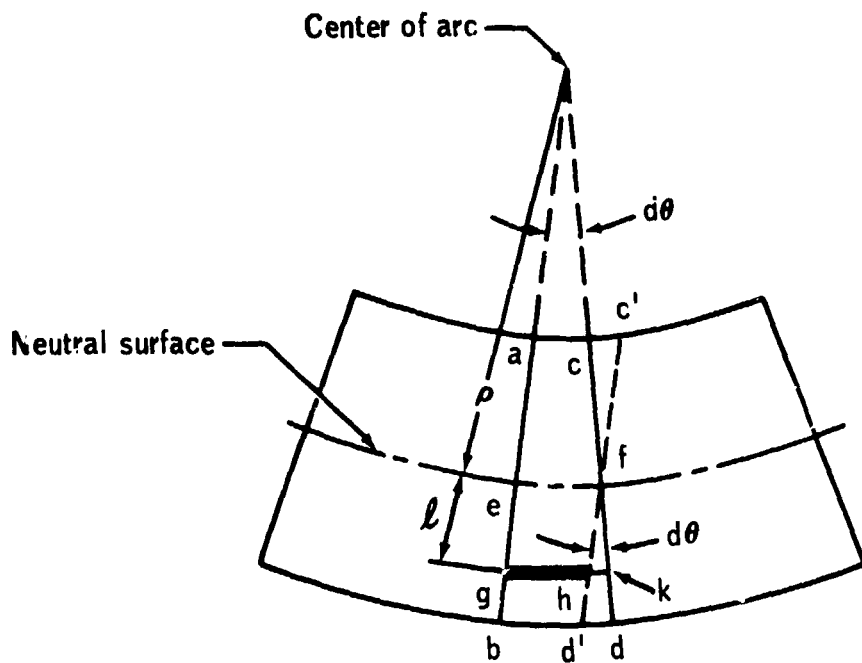


Figure 2.- Deformed section of a beam.

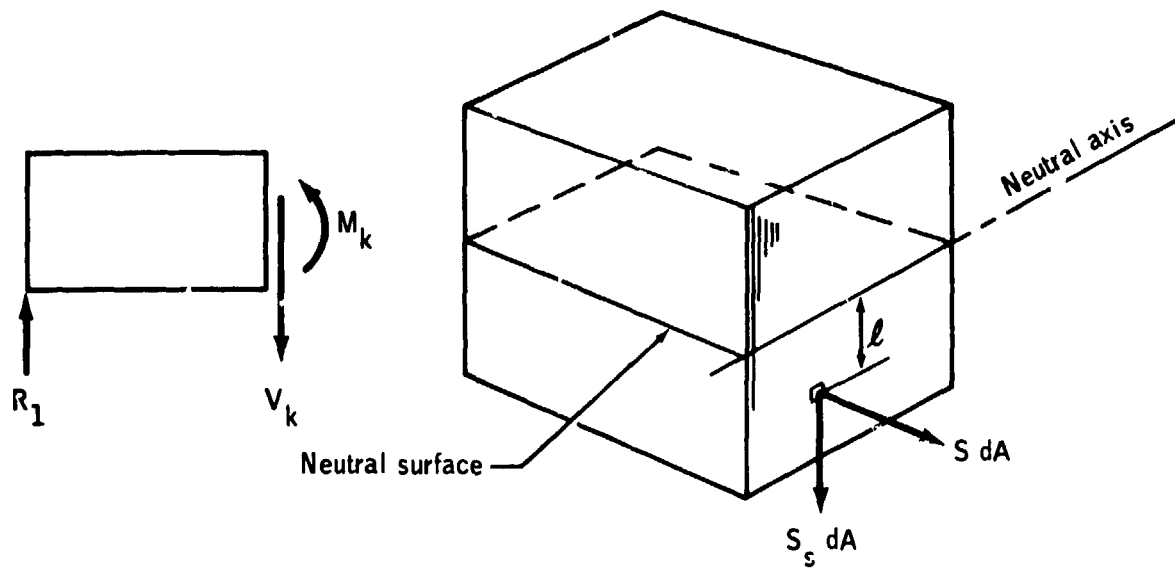


Figure 3.- Element of the cross section of a beam.

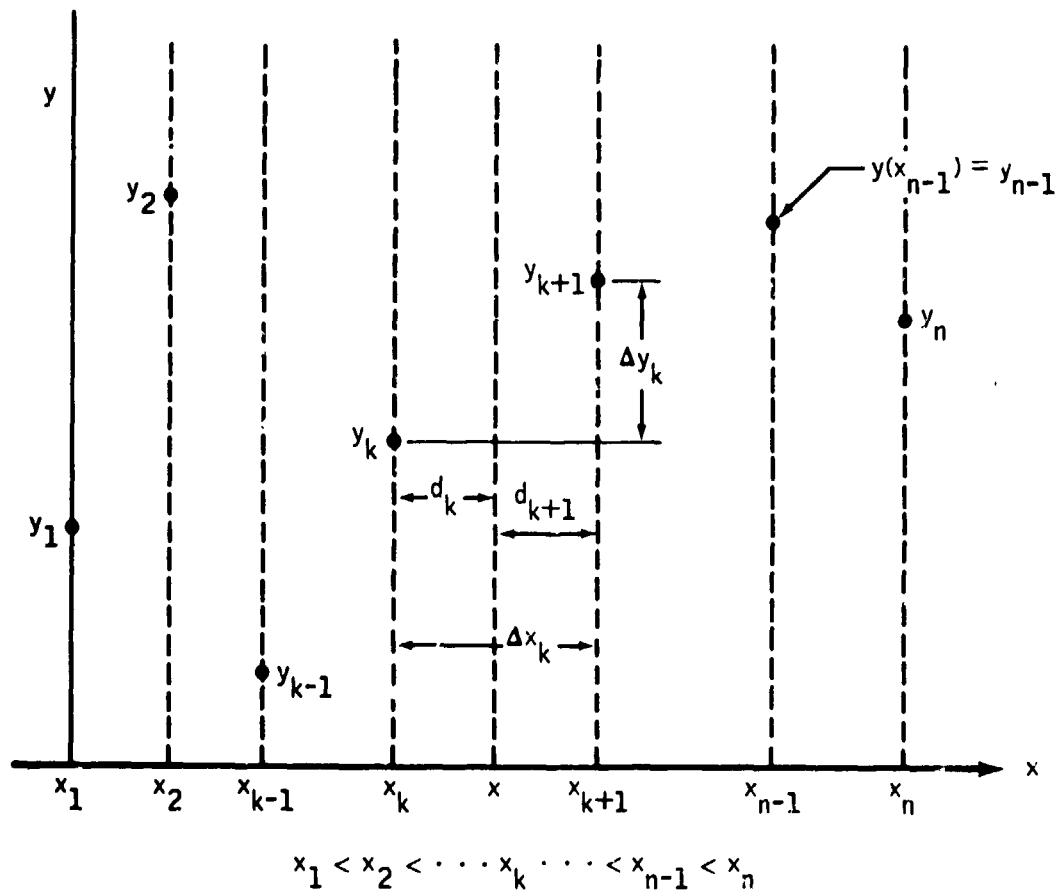


Figure 4.- Graph of a tabulated set of data for cubic spline interpolation.

APPENDIX

PROGRAM FLOW CHARTS AND LISTINGS

Definitions of the symbols used in the program flow charts and listings are as follows.

SYMBOLS USED IN SUBROUTINE SDAT (IOP)

- IOP** an integer parameter used to designate the desired atmosphere based on the following set of values:
- IOP = 0** 1962 standard atmosphere
 - IOP = 1** 1966 standard atmosphere for July at latitude 30° N
 - IOP = 2** 1966 standard atmosphere for January at latitude 30° N
 - IOP = 3** 1966 standard atmosphere for July at latitude 60° N
 - IOP = 4** 1966 standard atmosphere for January at latitude 60° N
 - IOP = 5** 1963 Patrick Air Force Base reference standard atmosphere
- NF** an integer variable used to specify the number of data points used to describe each atmospheric parameter in each model (equal to 123)
- NP64** an integer variable used to specify the total number of data points used to describe all atmospheric parameters in each atmosphere model (equal to $6 \cdot NP$ or $6 \times 123 = 738$)
- NP34** an integer variable used to specify the total number of cubic spline coefficients for each atmospheric parameter (equal to $3 \cdot (NP - 1)$ or $3 \cdot (123 - 1) = 366$)
- PRSLST** a column vector array dimensioned by NP64 or 738 containing all pressure data values (in millibars) for all atmosphere models tabulated
- RHOLST** a column vector array dimensioned by NP64 or 738 containing all density data values (in kilograms per cubic meter) for all atmosphere models tabulated
- SONLST** a column vector array dimensioned by NP64 or 738 containing all speed of sound data values (in meters per second) for all atmosphere models tabulated

VISLST a column vector array dimensioned by NP64 or 738 containing all coefficient of viscosity data values (in kilograms per meter per second) for all atmosphere models tabulated

ALTLST a column vector array dimensioned by NP or 123 containing the altitude data values (in meters) for all atmosphere models tabulated

WORK a column vector array dimensioned by NP or 123 used as a working array for subroutine SPLN1

D a column vector array dimensioned by 2 containing the values of the first (or second) derivative of the function at either or both of the tabulated terminal boundaries (only first-derivative values are used for the atmosphere package)

ALTTAB a column vector array dimensioned by NP or 123 containing altitude values in the working units of the program (feet)

PRSTAB a column vector array dimensioned by NP or 123 containing pressure data values for the selected atmosphere model in the working units of the program (pounds-force per square foot)

RHOTAB a column vector array dimensioned by NP or 123 containing density data values for the selected atmosphere model in the working units of the program (slugs per cubic foot)

SONTAB a column vector array dimensioned by NP or 123 containing speed of sound data values for the selected atmosphere model in the working units of the program (feet per second)

VISTAB a column vector array dimensioned by NP or 123 containing the coefficient of viscosity data values for the selected atmosphere model in the working units of the program (pounds-mass seconds per square foot)

CP a column vector array dimensioned by NP34 or 366 containing the cubic spline function coefficients for the interpolation for pressure in pounds-force per square foot

CR a column vector array dimensioned by NP34 or 366 containing the cubic spline function coefficients for the interpolation for density in slugs per cubic foot

CS a column vector array dimensioned by NP34 or 366 containing the cubic spline function coefficients for the interpolation for the speed of sound in feet per second

- CV** a column vector array dimensioned by NP34 or 366 containing the cubic spline function coefficients for the interpolation for the coefficient of viscosity in pounds-mass seconds per square foot
- J1** an integer variable used to designate the order of the derivative of the function supplied at the initial tabulated boundary (except when $J1 = 4$). It can have the following values:
- J1 = 1** The first derivative of the function at the first tabulated point is supplied in D(1).
- J1 = 2** The second derivative of the function at the first tabulated point is supplied in D(1).
- J1 = 3** The first and second derivatives of the function at the first tabulated point are supplied in D(1) and D(2), respectively.
- J1 = 4** The first and second derivatives of the function at the last tabulated point are supplied in D(1) and D(2), respectively.
- JN** an integer variable used to designate the order of the derivatives of the function supplied at the last tabulated boundary. It can have the following values:
- JN = 1** The first derivative of the function at the last tabulated point is supplied in D(2).
- JN = 2** The second derivative of the function at the last tabulated point is supplied in D(2).
- xs, ys1, ys2, ys3, ys4** Variables used for temporary storage in the ordering process for altitude, pressure, density, speed of sound, and coefficient of viscosity, respectively

SYMBOLS USED IN SUBROUTINE SPLN1(N,X,Y,J1,JN,D,C,W)

- N** an integer variable used to specify the number of data points used to represent the function in the region of definition
- X** a column vector array dimensioned by at least N in the calling element containing the values of the independent variable in ascending order
- Y** a column vector array dimensioned by at least N in the calling element containing the values of the dependent variable in sequence with the values in the X array
- J1** same as J1 defined in SDAT

- JN** same as JN defined in SDAT
- D** same as D defined in SDAT
- C** a column vector array dimensioned by at least $3*(N-1)$ in the calling element containing the cubic spline function coefficients for the first-, second-, and third-degree terms for each interval. A portion of the array is also used to compute and store the values of one of the recursive functions used in the computation of the second derivatives and in the computation of the second-derivative values.
- W** a column vector array dimensioned by at least N in the calling element used as a working array to compute and store the values of one of the recursive functions used in the computation of the second derivatives and in the computation of the cubic spline function coefficients

SYMBOLS USED IN SUBROUTINE ATMSPL(V,FANS)

- V** a real variable used to specify the altitude from the calling element containing the equations of motion at which values of the atmospheric parameters are desired
- IS** an integer variable used to save the interval number in which the specified altitude lies
- FANS** a column vector array dimensioned by 8 containing the following:
- FANS(1) the interpolated value for pressure at V altitude in pounds-force per square foot
 - FANS(2) the interpolated value for density at V altitude in slugs per cubic foot
 - FANS(3) the interpolated value for speed of sound at V altitude in feet per second
 - FANS(4) the interpolated value for coefficient of viscosity at V altitude in pounds-mass seconds per square foot
 - FANS(5) the ratio of the pressure at V altitude and the pressure at 0 altitude
 - FANS(6) the ratio of the density at V altitude and the density at 0 altitude
 - FANS(7) the ratio of the speed of sound at V altitude and the speed of sound at 0 altitude

**FANS(8) the ratio of the coefficient of viscosity at V altitude and the
coefficient of viscosity at 0 altitude**

All other variables are defined in subroutine SDAT.

SUBROUTINE SDAT(IOP)
PARAMETER NP = 123. NP64 = 6*NP. NP34 = 3*NP - 3
DATA J1,JN /1.1/

C IOP.....AN INTEGER VARIABLE RANGING FROM 0 TO 5 USED TO DESIGNATE
C THE ATMOSPHERE MODEL TO BE USED
C IOP = 0 - 1962 STANDARD ATMOSPHERE
C IOP = 1 - 1966 STANDARD FOR JULY AT 30 DEG. N. LATITUDE
C IOP = 2 - 1966 STANDARD FOR JAN. AT 30 DEG. N. LATITUDE
C IOP = 3 - 1966 STANDARD FOR JULY AT 60 DEG. N. LATITUDE
C IOP = 4 - 1966 STANDARD FOR JAN. AT 60 DEG. N. LATITUDE
C IOP = 5 - 1963 PATRICK AFB REFERENCE STANDARD

C SELECT DESIRED ATMOSPHERE INDEX ADJUSTOR

IOP1 = IOP*NP

C TRANSFER PERTINENT ATMOSPHERE DATA FROM STORAGE ARRAY TO WORKING
C ARRAY AND CONVERT TO DESIRED WORKING UNITS (BRITISH ENGINEERING)

DO 1 I = 1, NP - - - - > 2

C TRANSFER ALTITUDE VALUES LIST TO WORKING ARRAY

ALTAB(I) = ALTLST(I)/0.3048

C TRANSFER PRESSURE VALUES LIST TO WORKING ARRAY

PRSTAB(I) = PRSLST(IOP1 + I)*2.11622/1.01325

C TRANSFER DENSITY VALUES LIST TO WORKING ARRAY

RHOTAB(I) = RHOLST(IOP1 + I)*7.6474E-2/(1.225*32.174049)

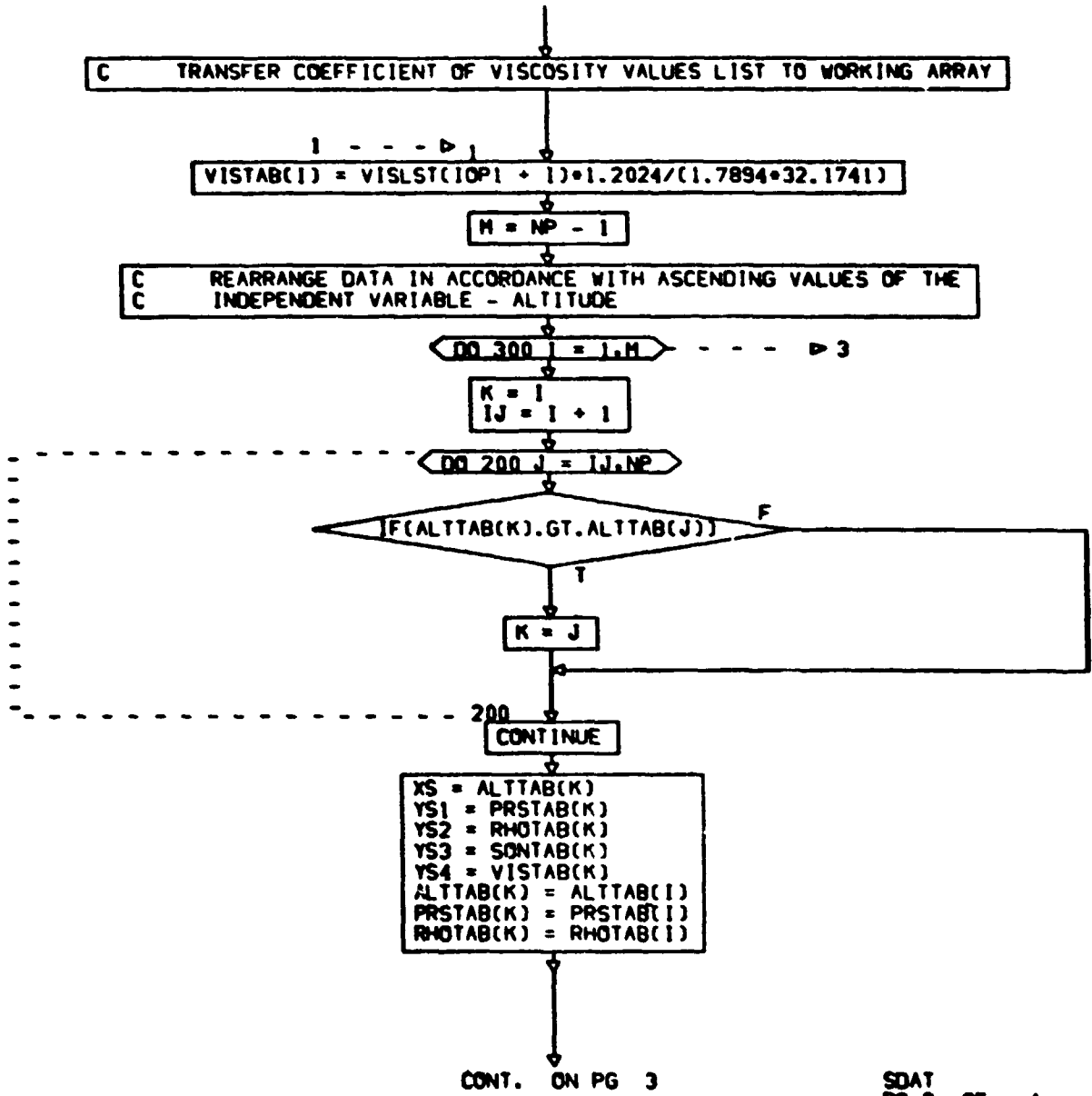
C TRANSFER SPEED OF SOUND VALUES LIST TO WORKING ARRAY

SONTAB(I) = SONLST(IOP1 + I)/0.3048

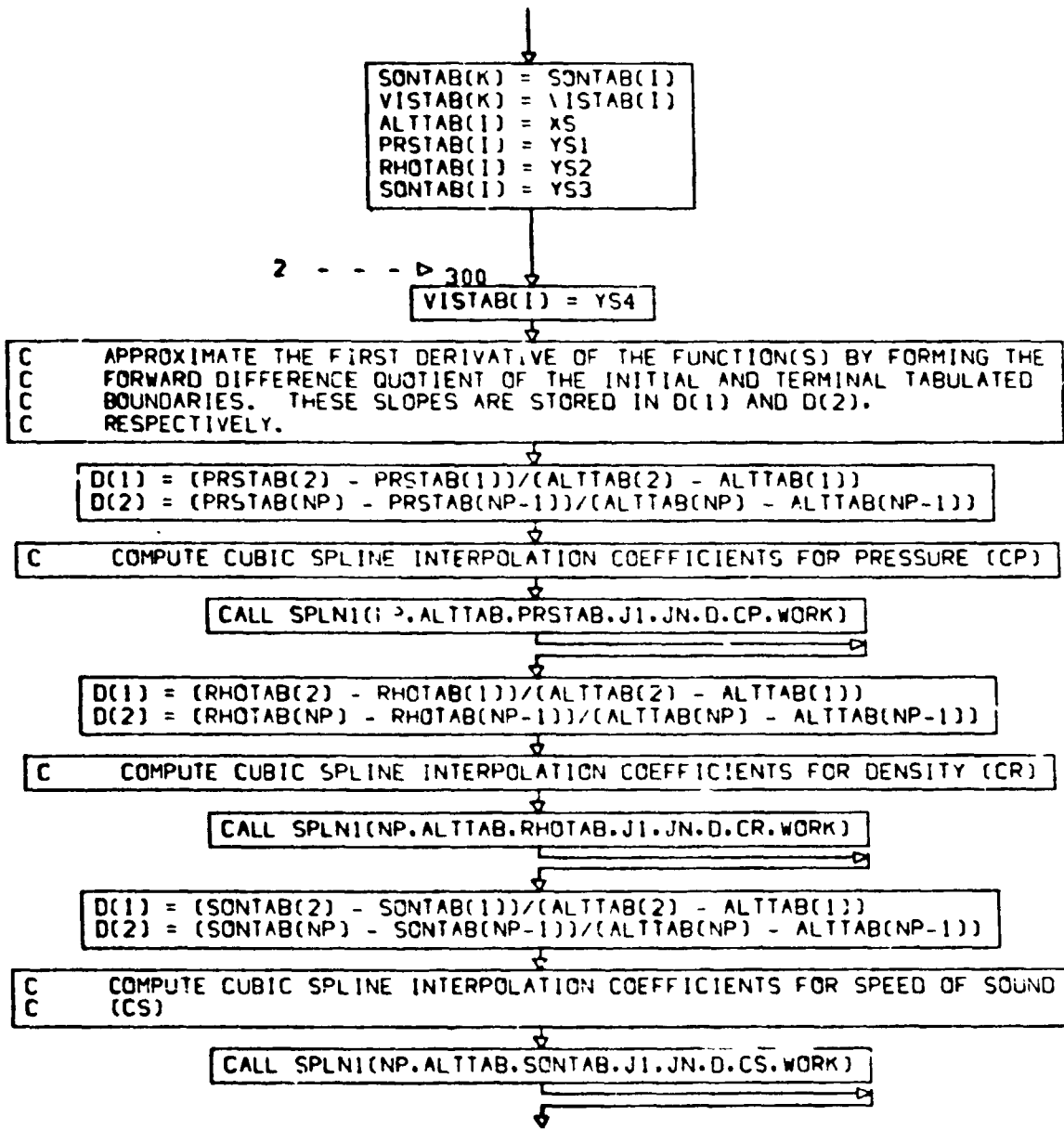
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SDAT
PG 1 OF 4

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SDAT
PG 2 OF 4

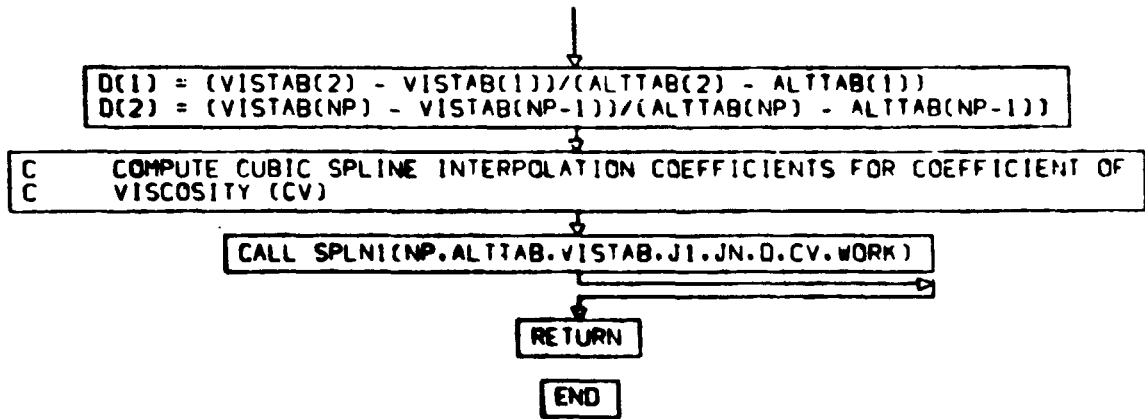


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SDAT
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SUBROUTINE SPLN1(N,X,Y,J1,JN,D,C,W)

C N - AN INTEGER DENOTING THE NUMBER OF DATA POINTS USED TO
 C REPRESENT THE FUNCTION IN THE REGION OF DEFINITION
 C X - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY N CONTAINING THE
 C VALUES OF THE INDEPENDENT VARIABLE IN ASCENDING ORDER
 C Y - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY N CONTAINING THE
 C VALUES OF THE DEPENDENT VARIABLE CORRESPONDING IN
 C SEQUENCE TO THE VALUES IN THE X ARRAY
 C J1,JN - INTEGERS DEFINED AS FOLLOWS

C J1 = 1 - FIRST DERIVATIVE OF THE FUNCTION AT THE FIRST TABULATED
 C DATA POINT IS SUPPLIED IN D(1)
 C J1 = 2 - SECOND DERIVATIVE OF THE FUNCTION AT THE FIRST TABULATED
 C DATA POINT IS SUPPLIED IN D(1)
 C J1 = 3 - FIRST AND SECOND DERIVATIVES OF THE FUNCTION AT THE FIRST
 C DATA POINT ARE SUPPLIED IN D(1) AND D(2), RESPECTIVELY
 C J1 = 4 - FIRST AND SECOND DERIVATIVES OF THE FUNCTION AT THE LAST
 C DATA POINT ARE SUPPLIED IN D(1) AND D(2), RESPECTIVELY

C JN = 1 - FIRST DERIVATIVE OF THE FUNCTION AT THE LAST TABULATED
 C DATA POINT IS SUPPLIED IN D(2)
 C JN = 2 - SECOND DERIVATIVE OF THE FUNCTION AT THE LAST TABULATED
 C DATA POINT IS SUPPLIED IN D(2)
 C D - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY 2 CONTAINING THE
 C VALUES OF THE DERIVATIVES OF THE FUNCTION SPECIFIED IN
 C ACCORDANCE WITH J2 AND JN
 C C - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY 3*(N-1) CONTAINING

C THE CUBIC SPLINE INTERPOLATING COEFFICIENTS FOR EACH
 C INTERVAL
 C W - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY N USED AS A WORKING
 C ARRAY ONLY
 C COMPUTE THE INITIAL VALUES OF THE RECURSIVE RELATIONS IN
 C ACCORDANCE WITH THE SPECIFIED PROPERTY OF THE FUNCTION AT THE
 C INITIAL BOUNDARY

GO TO (1,2,3,4),J1

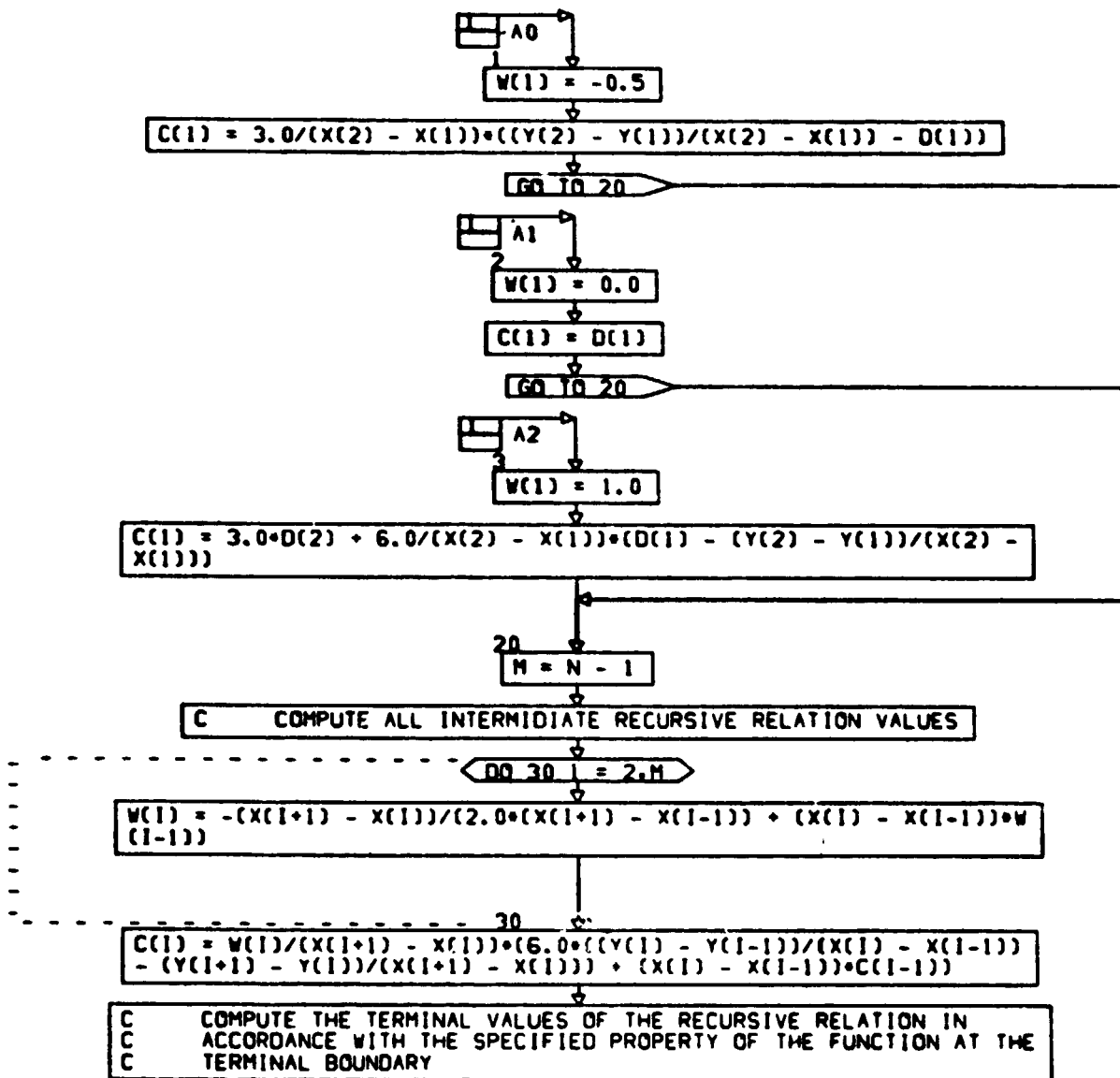
| | | | |
|----|----|----|----|
| 2 | 2 | 2 | 3 |
| A0 | A1 | A2 | A3 |

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SPLN1
 PG 1 OF 5

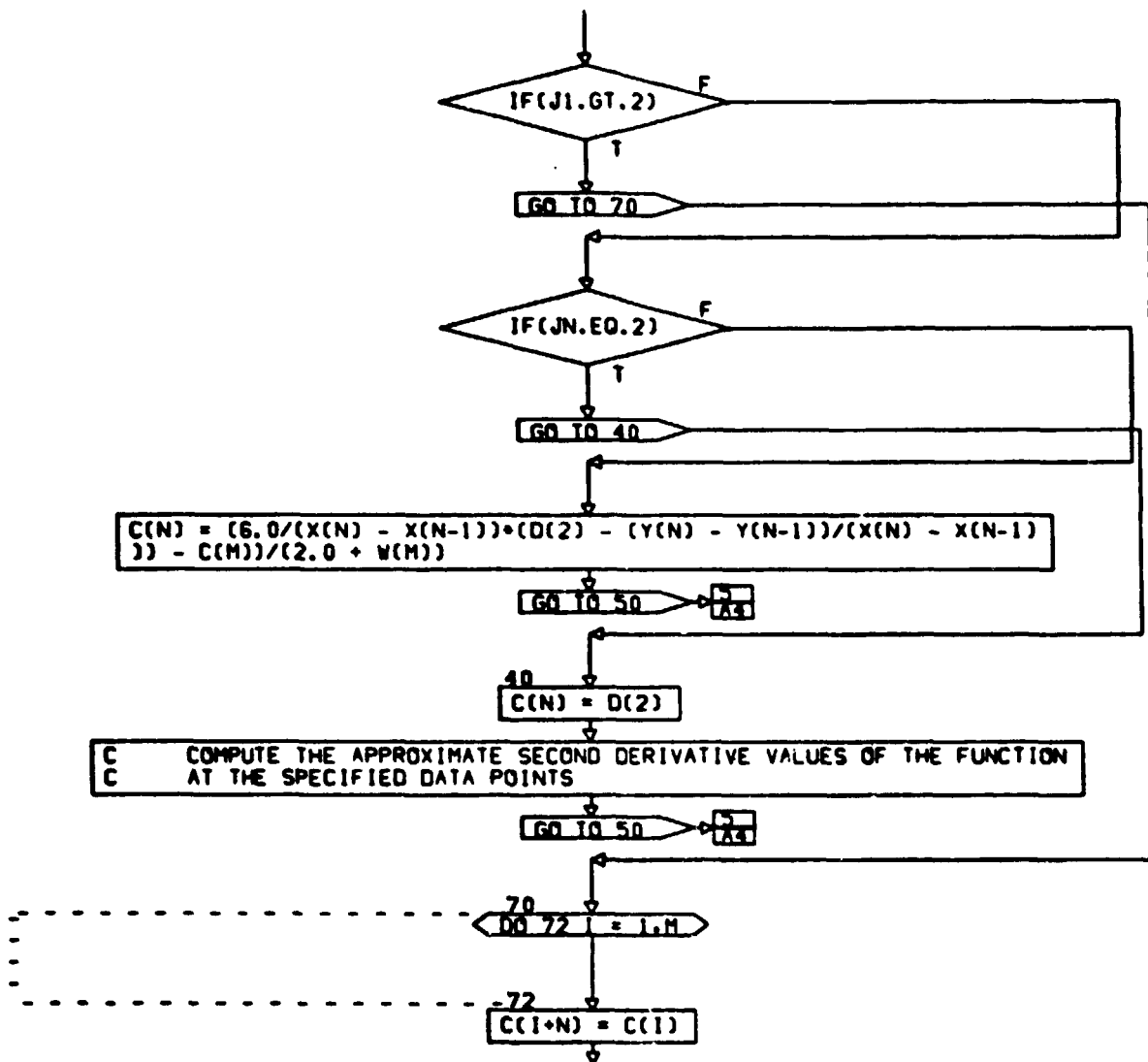
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APPENDIX



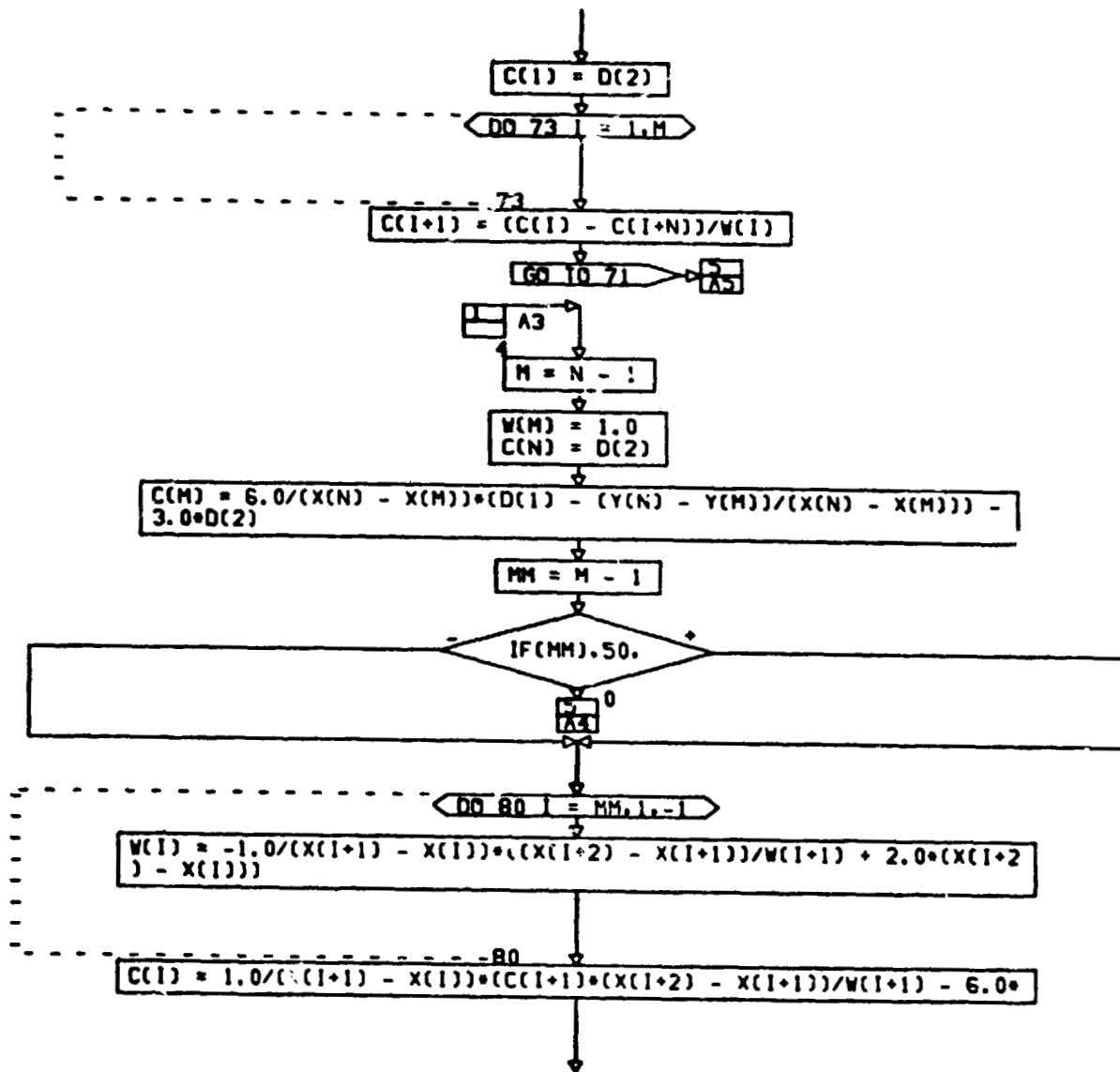
CONT. ON PG 3

SPLNI
PG 2 OF 5



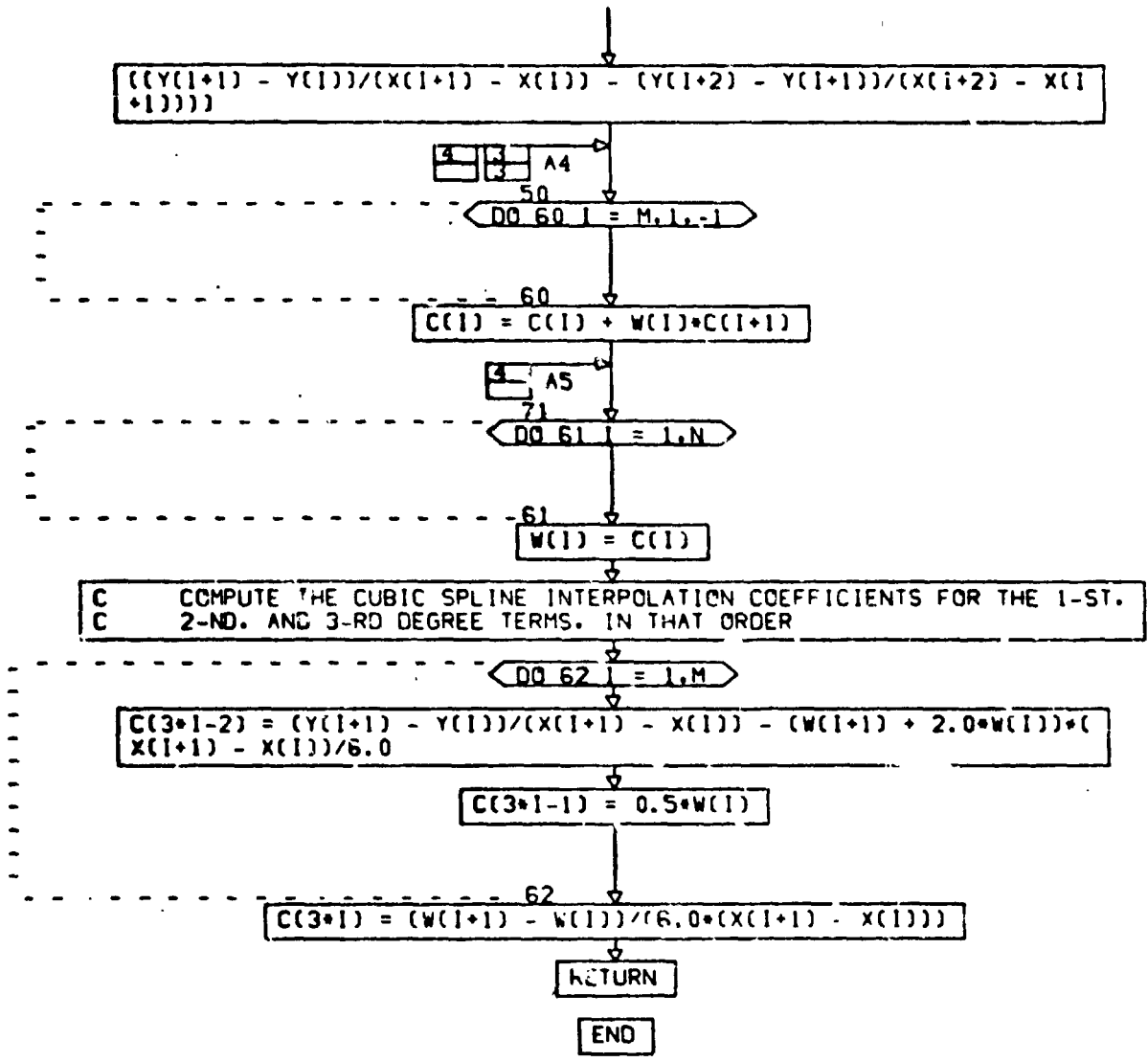
CONT. ON PG 4

SPLN1
PG 3 OF 5



CONT. ON PG 5

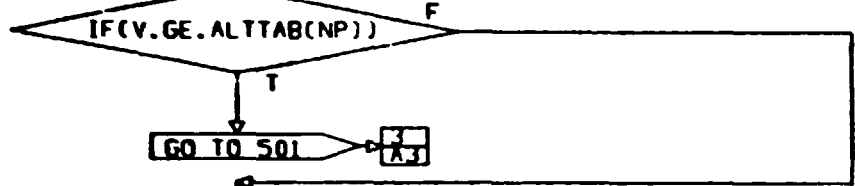
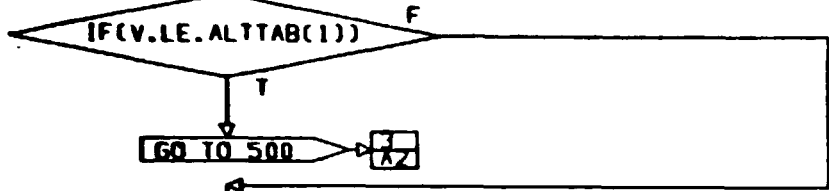
SPLN1
PG 4 OF 5



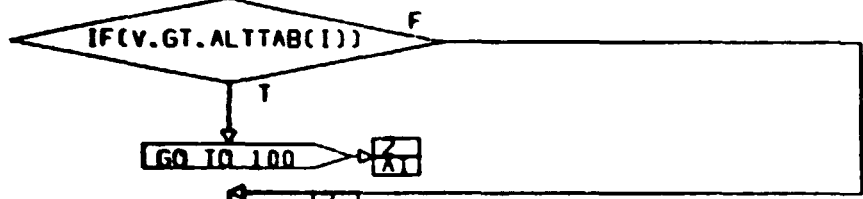
SPLN1
PG 5 FINAL

SUBROUTINE ATMSPL(V,FANS)
PARAMETER NP = 123, MP = 3*NP - 3
DATA IS / 1 /

C ESTABLISH THE INTERVAL IN WHICH THE SPECIFIED ALTITUDE LIES



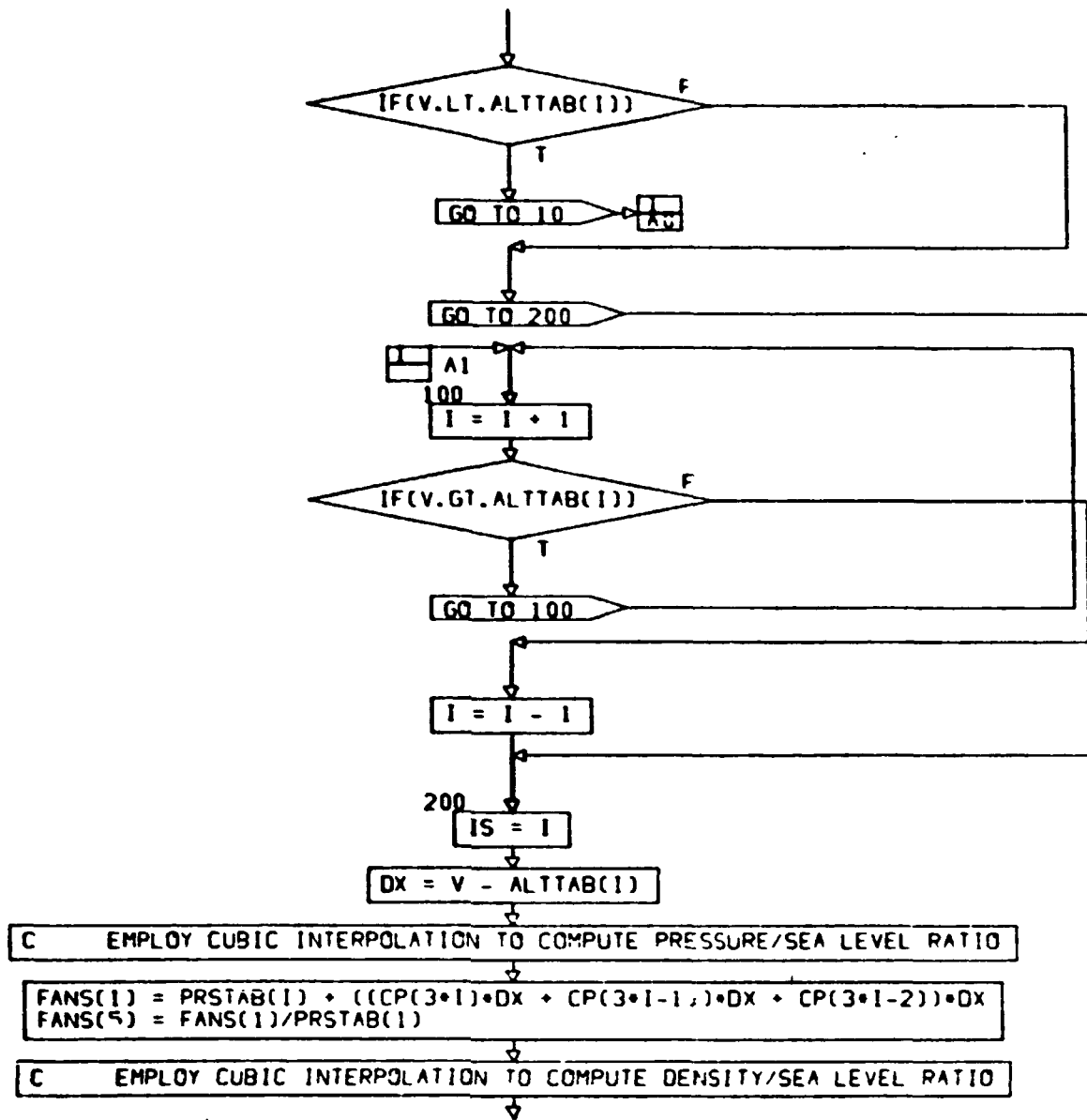
I = IS



I = I - 1

CONT. ON PG 2

ATMSPL
PG 1 OF 4



CONT. ON PG 3

ATMSPL
PG 2 OF 4

FANS(2) = RHOTAB(1) + ((CR(3*1)*DX + CR(3*1-1))*DX + CR(3*1-2))*DX
FANS(6) = FANS(2)/RHOTAB(1)

C EMPLOY CUBIC INTERPOLATION TO COMPUTE SPEED OF SOUND/SEA LEVEL RATIO
C

FANS(3) = SONTAB(1) + ((CS(3*1)*DX + CS(3*1-1))*DX + CS(3*1-2))*DX
FANS(7) = FANS(3)/SONTAB(1)

C EMPLOY CUBIC INTERPOLATION TO COMPUTE COEFFICIENT OF VISCOSITY/SEA LEVEL RATIO
C

FANS(4) = VISTAB(1) + ((CV(3*1)*DX + CV(3*1-1))*DX + CV(3*1-2))*DX
FANS(8) = FANS(4)/VISTAB(1)

RETURN

C INITIAL BOUNDARY VALUES - FUNCTION/SEA LEVEL RATIO

A2
500

FANS(1) = PRSTAB(1)

FANS(2) = RHOTAB(1)
FANS(3) = SONTAB(1)
FANS(4) = VISTAB(1)
FANS(5) = 1.0
FANS(6) = 1.0
FANS(7) = 1.0
FANS(8) = 1.0

RETURN

C TERMINAL BOUNDARY VALUES - FUNCTION/SEA LEVEL RATIO

A3
501

FANS(1) = PRSTAB(NP)

FANS(2) = RHOTAB(NP)

CONT. ON PG 4

ATMSPL
PG 3 OF 4

ORIGINAL PAGE IS
OF POOR QUALITY

FANS(3) = SONTAB(NP)
FANS(4) = VISTAB(NP)
FANS(5) = FANS(1)/PRSTAB(1)
FANS(6) = FANS(2)/RHOTAB(1)
FANS(7) = FANS(3)/SONTAB(1)
FANS(8) = FANS(4)/VISTAB(1)

RETURN

END

ATMSPL
PG 4 FINAL

BLOCK DATA
 PARAMETER NP = 123
 PARAMETER NP11 = 1, NP12 = 114, NP13 = 115, NP14 = 'P'
 PARAMETER NP21=NP11+NP, NP22=NP12+NP, NP23=NP13+NP, NP24=NP14+NP
 PARAMETER NP31=NP21+NP, NP32=NP22+NP, NP33=NP23+NP, NP34=NP24+NP
 PARAMETER NP41=NP31+NP, NP42=NP32+NP, NP43=NP33+NP, NP44=NP34+NP
 PARAMETER NP51=NP41+NP, NP52=NP42+NP, NP53=NP43+NP, NP54=NP44+NP
 PARAMETER NP61=NP51+NP, NP62=NP54+95, NP63=NP54+96, NP64=NP54+NP

C ALTITUDE TABULATION IN METERS

DATA (ALTLIST(I), I=NP11, NP12)/

| | | | | | | |
|---|--------|---------|--------|---------|--------|---------|
| C | 1 | 2 | 3 | 4 | 5 | 6 |
| | 0.0E0. | 2.5E2. | 5.0E2. | 7.5E2. | 1.0E3. | 1.25E3. |
| C | 7 | 8 | 9 | 10 | 11 | 12 |
| | 1.5E3. | 1.75E3. | 2.0E3. | 2.25E3. | 2.5E3. | 2.75E3. |
| C | 13 | 14 | 15 | 16 | 17 | 18 |
| | 3.0E3. | 3.5E3. | 4.0E3. | 4.5E3. | 5.0E3. | 6.0E3. |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| | 7.0E3. | 8.0E3. | 9.0E3. | 1.0E4. | 1.1E4. | 1.2E4. |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 1.3E4. | 1.4E4. | 1.5E4. | 1.6E4. | 1.7E4. | 1.8E4. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 1.9E4. | 2.0E4. | 2.2E4. | 2.4E4. | 2.6E4. | 2.8E4. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |

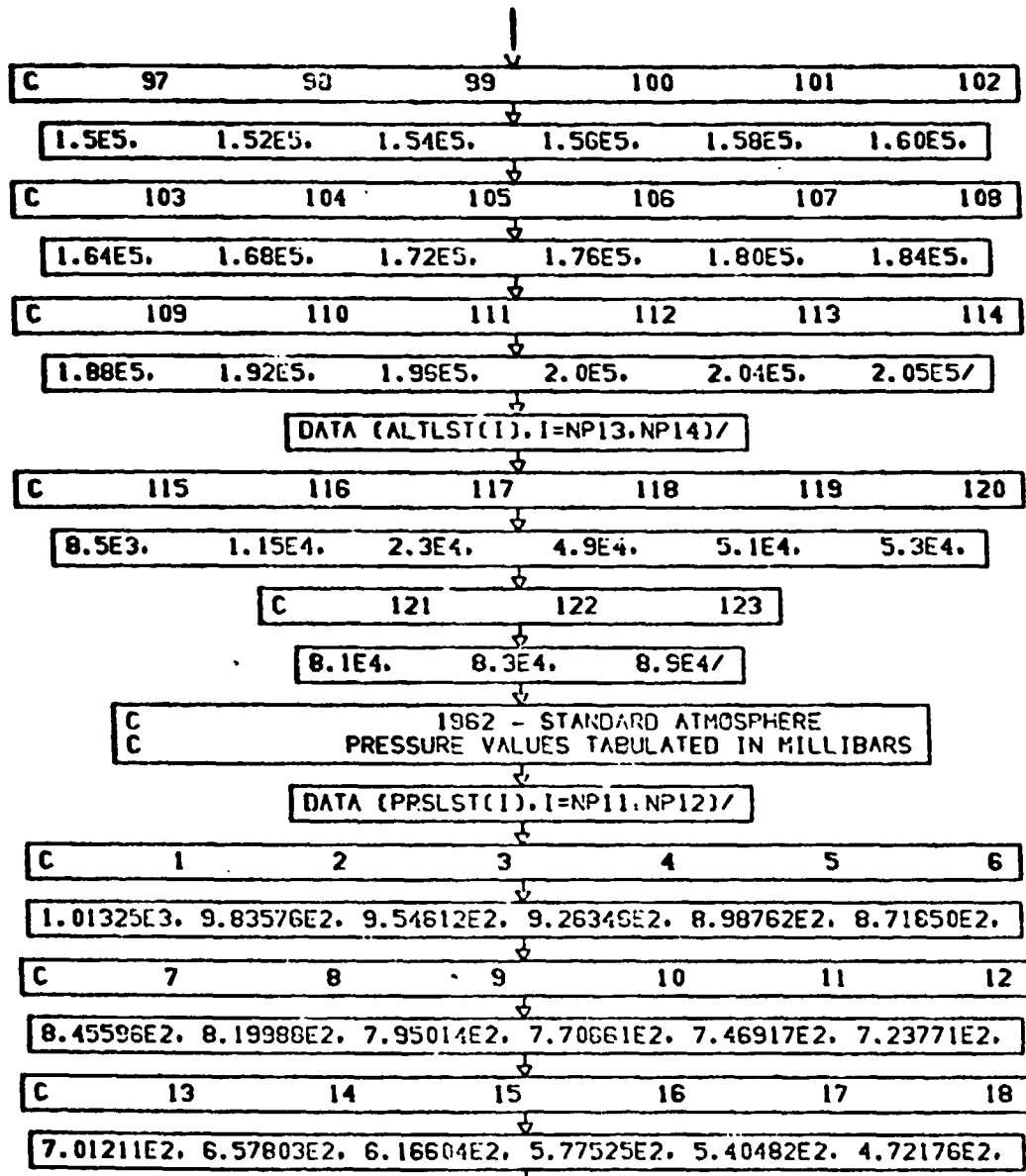
CONT. ON PG 2

PARTS
PG 1 OF 52

| | | | | | | |
|---|---------|---------|---------|---------|---------|---------|
| | 3.0E4. | 3.2E4. | 3.4E4. | 3.6E4. | 3.8E4. | 4.0E4. |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 4.2E4. | 4.4E4. | 4.6E4. | 4.8E4. | 5.0E4. | 5.2E4. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 5.4E4. | 5.6E4. | 5.8E4. | 6.0E4. | 6.2E4. | 6.4E4. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 6.6E4. | 6.8E4. | 7.0E4. | 7.2E4. | 7.4E4. | 7.6E4. |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| | 7.8E4. | 8.0E4. | 8.2E4. | 8.4E4. | 8.6E4. | 8.8E4. |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 9.0E4. | 9.2E4. | 9.4E4. | 9.6E4. | 9.8E4. | 1.0E5. |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| | 1.02E5. | 1.04E5. | 1.06E5. | 1.08E5. | 1.1E5. | 1.12E5. |
| C | 79 | 80 | 81 | 82 | 83 | 84 |
| | 1.14E5. | 1.16E5. | 1.18E5. | 1.20E5. | 1.22E5. | 1.24E5. |
| C | 85 | 86 | 87 | 88 | 89 | 90 |
| | 1.26E5. | 1.28E5. | 1.3E5. | 1.32E5. | 1.34E5. | 1.36E5. |
| C | 91 | 92 | 93 | 94 | 95 | 96 |
| | 1.38E5. | 1.4E5. | 1.42E5. | 1.44E5. | 1.46E5. | 1.48E5. |

CONT. ON PG 3

PARTS
PG 2 OF 52



CONT. ON PG 4

PARTS
PG 3 OF 52

| | | | | | | |
|---|----|----|----|----|----|----|
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| 4.11052E2, 3.56516E2, 3.08007E2, 2.64999E2, 2.26999E2, 1.93994E2, | | | | | | |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| 1.65796E2, 1.41704E2, 1.21118E2, 1.03528E2, 8.84971E1, 7.56522E1, | | | | | | |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| 6.46748E1, 5.52930E1, 4.04749E1, 2.97174E1, 2.18837E1, 1.61619E1, | | | | | | |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| 1.19703E1, 8.89063E0, 6.63412E0, 4.9P522E0, 3.77138E0, 2.87143E0, | | | | | | |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| 2.19967E0, 1.69496E0, 1.31340E0, 1.02296E0, 7.97790E-1, 6.22263E-1, | | | | | | |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| 4.84917E-1, 3.76572E-1, 2.91373E-1, 2.24606E-1, 1.72457E-1, 1.31504E-1, | | | | | | |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| 9.94067E-2, 7.44483E-2, 5.52047E-2, 4.05013E-2, 2.93758E-2, 2.1045E-2, | | | | | | |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| 1.4877E-2, 1.0366E-2, 7.1691E-3, 4.9592E-3, 3.4313E-3, 2.3740E-3, | | | | | | |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| 1.6438E-3, 1.1449E-3, 8.0683E-4, 5.7403E-4, 4.1377E-4, 3.0075E-4, | | | | | | |
| C | 73 | 74 | 75 | 76 | 77 | 78 |

CONT. ON PG 5

PARTS
PG 4 OF 52

| | | | | | | |
|---|---|-----------|-----------|------------|------------|------------|
| | 2.2123E-4 | 1.6500E-4 | 1.2462E-4 | 9.5225E-5 | 7.3544E-5 | 5.7623E-5 |
| C | 79 | 80 | 81 | 82 | 83 | 84 |
| | 4.5919E-5 | 3.7137E-5 | 3.0426E-5 | 2.5217E-5 | 2.1210E-5 | 1.8139E-5 |
| C | 85 | 86 | 87 | 88 | 89 | 90 |
| | 1.5726E-5 | 1.3791E-5 | 1.2214E-5 | 1.0909E-5 | 9.8151E-6 | 8.8882E-6 |
| C | 91 | 92 | 93 | 94 | 95 | 96 |
| | 6.0950E-6 | 7.4194E-6 | 6.8148E-6 | 6.2931E-6 | 5.8331E-6 | 5.4252E-6 |
| C | 97 | 98 | 99 | 100 | 101 | 102 |
| | 5.0617E-6 | 4.7345E-6 | 4.4375E-6 | 4.1671E-6 | 3.9202E-6 | 3.6943E-6 |
| C | 103 | 104 | 105 | 106 | 107 | 108 |
| | 3.2932E-6 | 2.9475E-6 | 2.6479E-6 | 2.3851E-6 | 2.1536E-6 | 1.9491E-6 |
| C | 109 | 110 | 111 | 112 | 113 | 114 |
| | 1.7680E-6 | 1.6070E-6 | 1.4630E-6 | 1.3339E-6 | 1.2179E-6 | 1.1907E-6 |
| | DATA (PRSLST(I), I=NP13, NP14)/ | | | | | |
| C | 115 | 116 | 117 | 118 | 119 | 120 |
| | 3.31541E2 | 2.09848E2 | 3.46686E1 | 9.03367E-1 | 7.04580E-1 | 5.49540E-1 |
| C | 121 | 122 | 123 | | | |
| | 8.6204E-3 | 5.9624E-3 | 1.9756E-3 | | | |
| C | DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER | | | | | |

CONT. ON PG 6

PARTS
PG 5 OF 52

DATA (RHOLST(I), I=NP11, NP12)/

| | | | | | | |
|---|----|----|----|----|----|----|
| C | 1 | 2 | 3 | 4 | 5 | 6 |
| 1.2250E0, 1.1959E0, 1.1673E0, 1.1392E0, 1.1117E0, 1.0846E0. | | | | | | |
| C | 7 | 8 | 9 | 10 | 11 | 12 |
| 1.0581E0, 1.0321E0, 1.0066E0, 9.8151E-1, 9.5695E-1, 9.3287E-1. | | | | | | |
| C | 13 | 14 | 15 | 16 | 17 | 18 |
| 9.0925E-1, 8.6340E-1, 8.1935E-1, 7.7704E-1, 7.3643E-1, 6.6011E-1. | | | | | | |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| 5.9002E-1, 5.2579E-1, 4.6706E-1, 4.1351E-1, 3.6480E-1, 3.1194E-1. | | | | | | |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| 2.6660E-1, 2.2786E-1, 1.9475E-1, 1.6647E-1, 1.4230E-1, 1.2165E-1. | | | | | | |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| 1.0400E-1, 8.8910E-2, 6.4510E-2, 4.6936E-2, 3.4257E-2, 2.5076E-2. | | | | | | |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| 1.8410E-2, 1.3555E-2, 9.8874E-3, 7.2579E-3, 5.3666E-3, 3.9957E-3. | | | | | | |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| 2.9948E-3, 2.2589E-3, 1.7141E-3, 1.3167E-3, 1.0269E-3, 8.0097E-4. | | | | | | |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| 6.3137E-4, 4.9762E-4, 3.9086E-4, 3.0592E-4, 2.3931E-4, 1.8837E-4. | | | | | | |

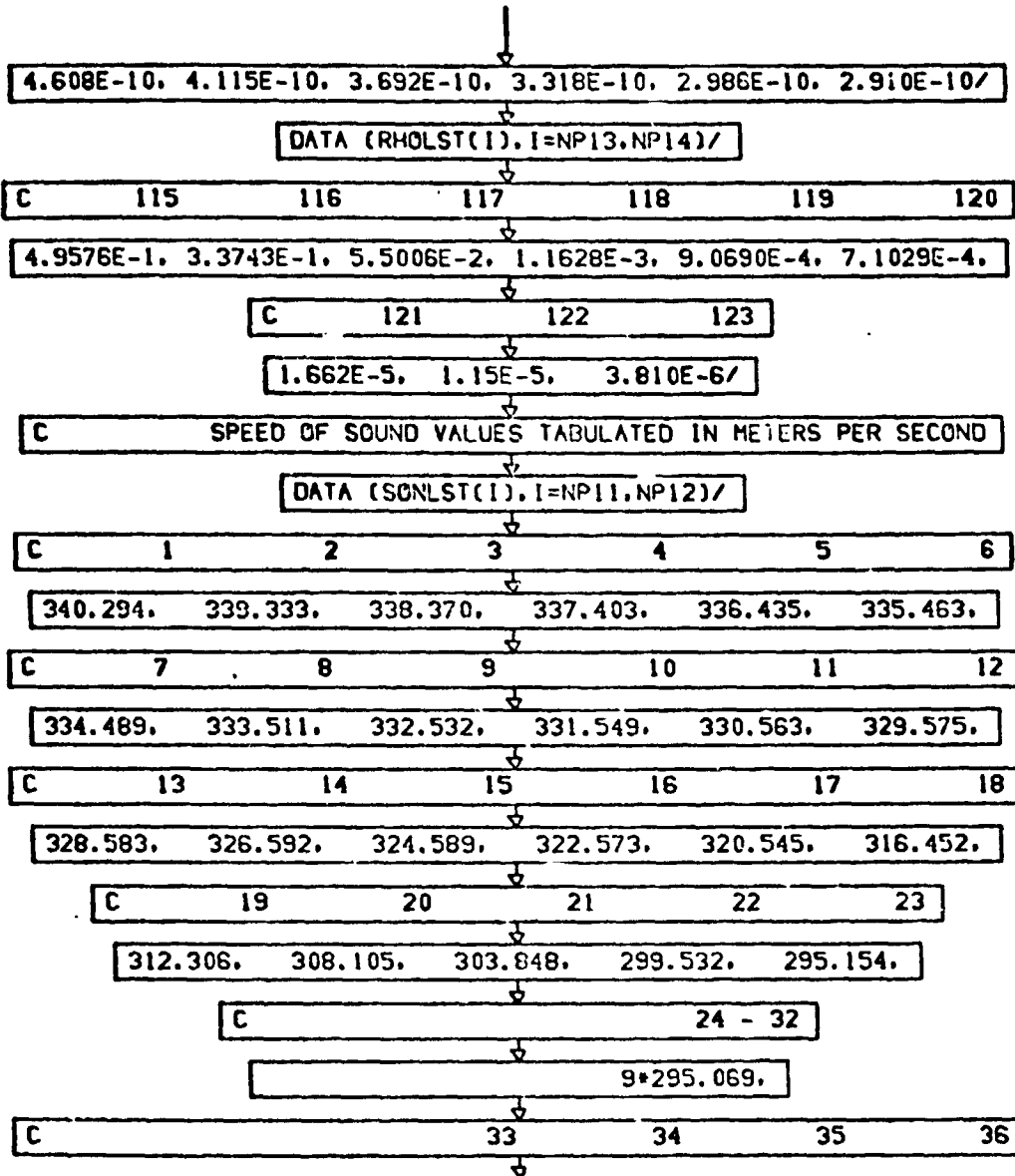
CONT. ON PG 7

PARTS
PG 6 OF 52

| | | | | | | |
|---|-----|-----|-----|-----|-----|-----|
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| 1.4713E-4, 1.1399E-4, 8.7535E-5, 6.6593E-5, 5.0151E-5, 3.736E-5, | | | | | | |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| 2.750E-5, 1.999E-5, 1.382E-5, 9.563E-6, 6.617E-6, 4.579E-6, | | | | | | |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| 3.170E-6, 2.137E-6, 1.459E-6, 1.008E-6, 7.044E-7, 4.974E-7, | | | | | | |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| 3.493E-7, 2.492E-7, 1.804E-7, 1.323E-7, 9.829E-8, 7.153E-8, | | | | | | |
| C | 79 | 80 | 81 | 82 | 83 | 84 |
| 5.321E-8, 4.035E-8, 3.112E-8, 2.436E-8, 1.844E-8, 1.434E-8, | | | | | | |
| C | 85 | 86 | 87 | 88 | 89 | 90 |
| 1.140E-8, 9.226E-9, 7.589E-9, 6.327E-9, 5.337E-9, 4.549E-9, | | | | | | |
| C | 91 | 92 | 93 | 94 | 95 | 96 |
| 3.913E-9, 3.394E-9, 2.965E-9, 2.608E-9, 2.307E-9, 2.053E-9, | | | | | | |
| C | 97 | 98 | 99 | 100 | 101 | 102 |
| 1.836E-9, 1.665E-9, 1.515E-9, 1.382E-9, 1.264E-9, 1.159E-9, | | | | | | |
| C | 103 | 104 | 105 | 106 | 107 | 108 |
| 9.970E-10, 8.624E-10, 7.532E-10, 6.633E-10, 5.858E-10, 5.189E-10, | | | | | | |
| C | 109 | 110 | 111 | 112 | 113 | 114 |

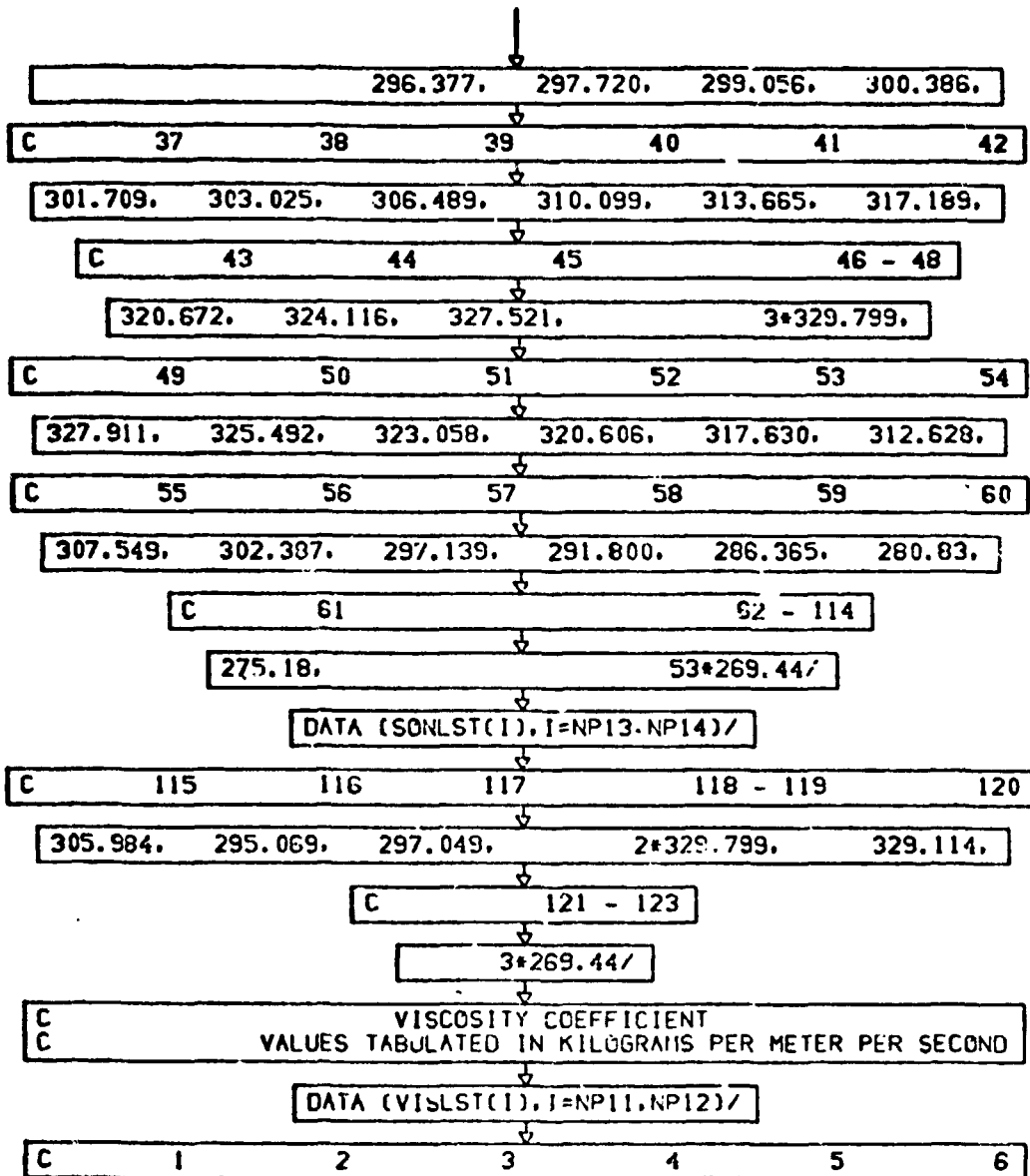
CONT. ON PG 8

PARTS
PG 7 OF 52



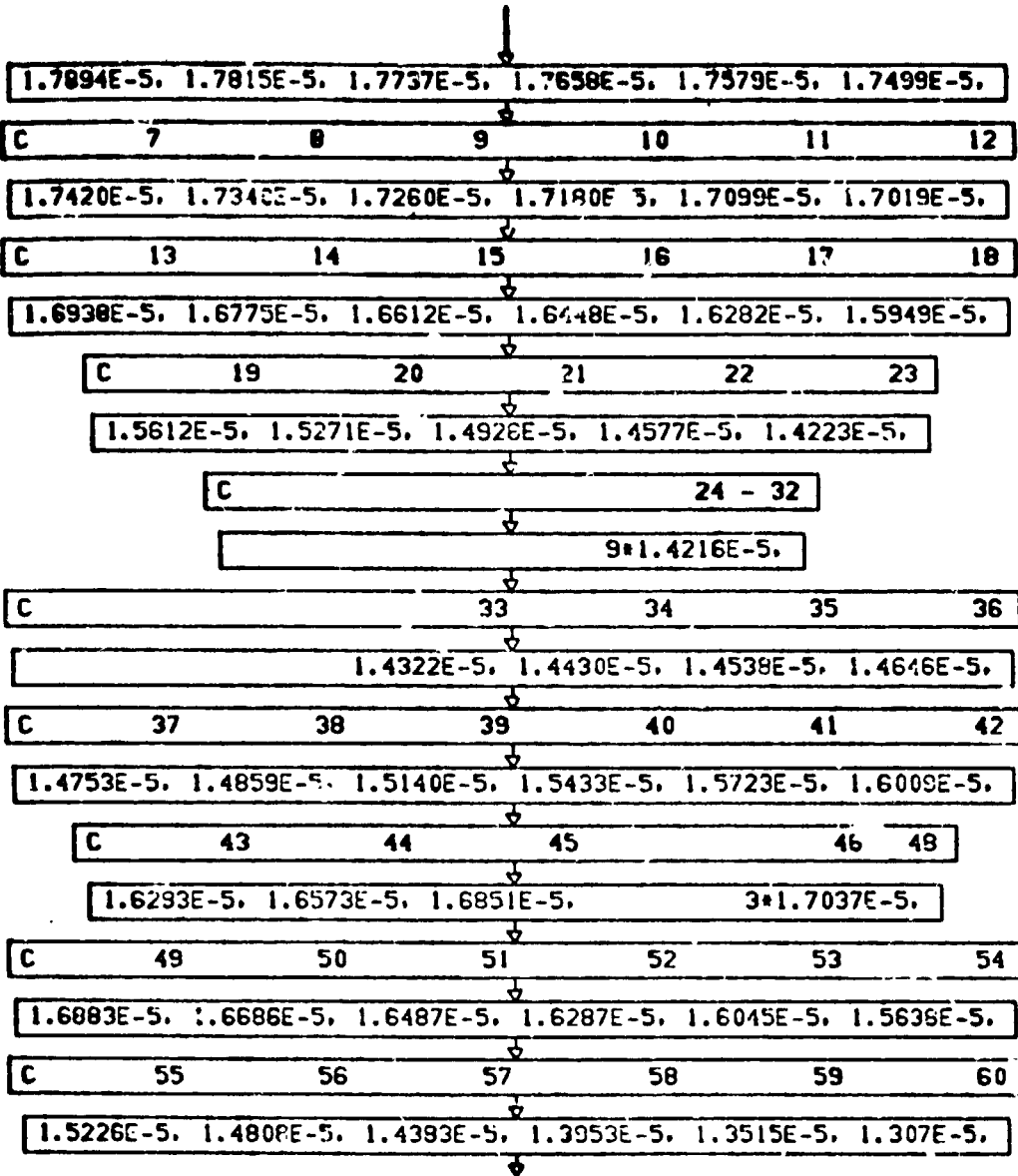
CONT. ON PG 9

PARTS
PG 8 OF 52



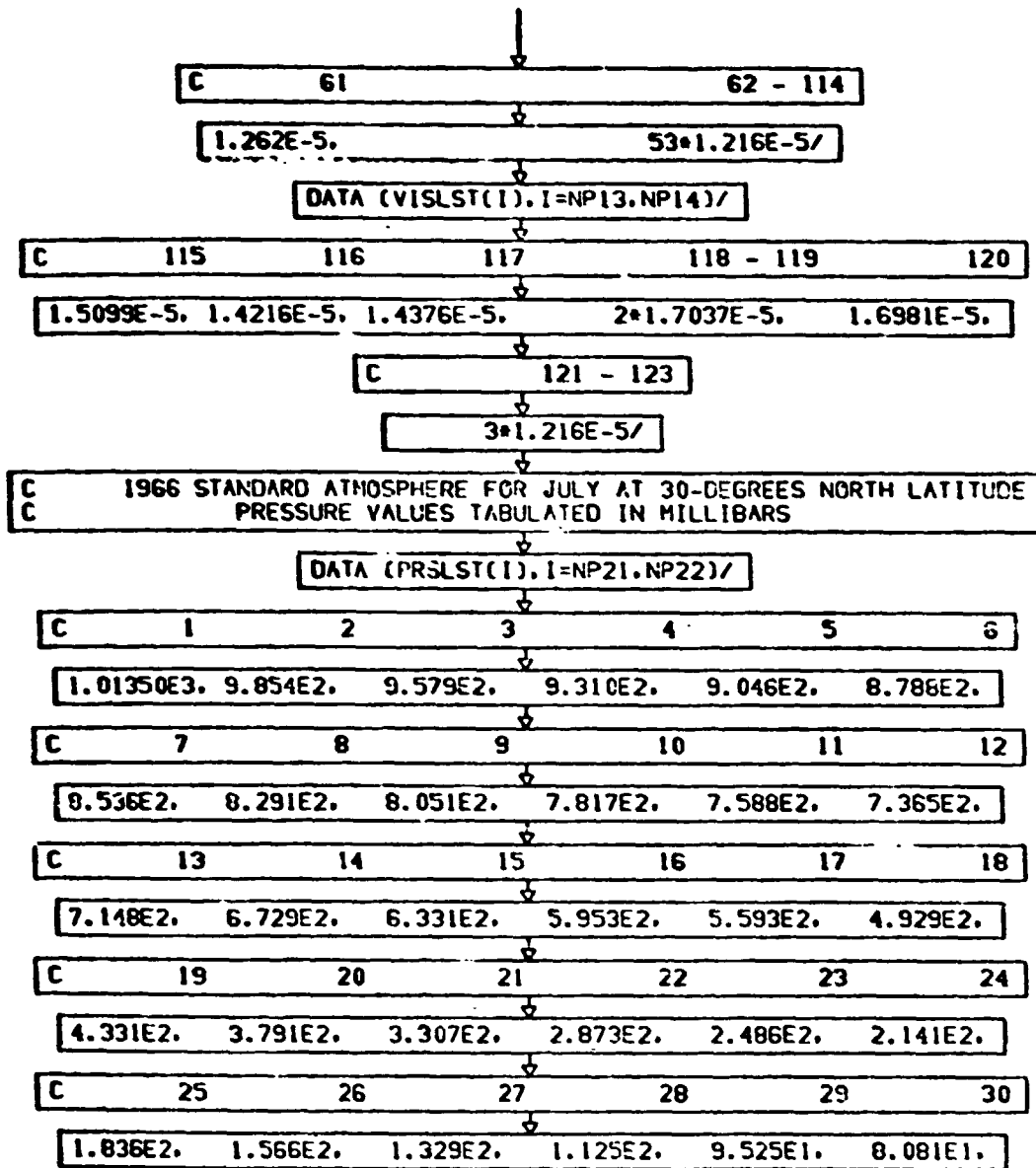
CONT. ON PG 10

PARTS
PG 9 OF 52



CONT. ON PG 11

PARTS
PG 10 OF 52



CONT. ON PG 12

PARTS
PG 11 OF 52

| | | | | | | |
|---|---------------------------------|-----------|--------------|-----------|-----------|-----------|
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 6.067E1. | 5.846E1. | 4.258E1. | 3.121E1. | 2.300E1. | 1.705E1. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 1.270E1. | 9.513E0. | 7.163E0. | 5.425E0. | 4.131E0. | 3.162E0. |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 2.433E0. | 1.881E0. | 1.461E0. | 1.140E0. | 8.908E-1. | 6.959E-1. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 5.424E-1. | 4.212E-1. | 3.259E-1. | 2.512E-1. | 1.924E-1. | 1.462E-1. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 1.102E-1. | 8.226E-2. | 6.083E-2. | 4.450E-2. | 3.224E-2. | 2.306E-2. |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| | 1.629E-2. | 1.135E-2. | 7.792E-3. | 5.301E-3. | 3.607E-3. | 2.455E-3. |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 1.671E-3. | 1.142E-3. | 7.877E-4. | 5.488E-4. | 3.859E-4. | 2.737E-4. |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| | 1.958E-4. | 1.427E-4. | 1.005E-4. | 8.104E-5. | 6.276E-5. | 4.935E-5. |
| C | 79 | 80 | 81 - 114 | | | |
| | 3.955E-5. | 3.240E-5. | 34*2.702E-5/ | | | |
| | DATA (PRSLST(I), I=NP23, NP24)/ | | | | | |

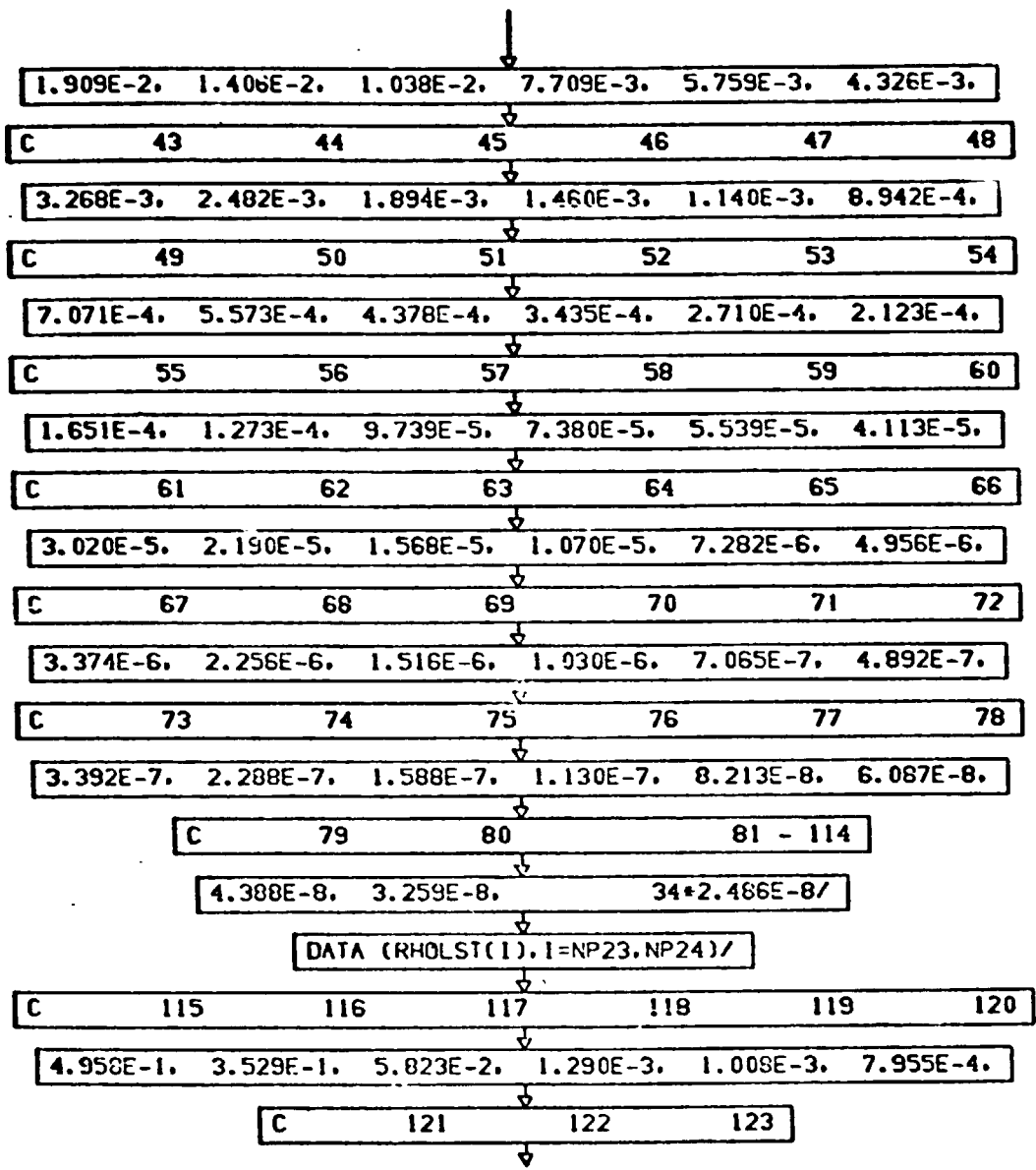
CONT. CN PG 13

PARTS
PG 12 OF 52

| | | | | | | |
|---|---|-----------|-----------|-----------|-----------|-----------|
| C | 115 | 116 | 117 | 118 | 119 | 120 |
| | 3.542E2. | 2.308E2. | 3.643E1. | 1.008E0. | 7.874E-1. | 6.146E-1. |
| C | 121 | 123 | 123 | | | |
| | 9.423E-3. | 6.427E-3. | 2.025E-3/ | | | |
| C | DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER | | | | | |
| | DATA (RHOLST(I), I=NP21, NP22)/ | | | | | |
| C | 1 | 2 | 3 | 4 | 5 | 6 |
| | 1.159E0. | 1.135E0. | 1.112E0. | 1.089E0. | 1.066E0. | 1.041E0. |
| C | 7 | 8 | 9 | 10 | 11 | 12 |
| | 1.016E0. | 9.923E-1. | 9.666E-1. | 9.452E-1. | 9.222E-1. | 8.997E-1. |
| C | 13 | 14 | 15 | 16 | 17 | 18 |
| | 8.776E-1. | 8.348E-1. | 7.937E-1. | 7.540E-1. | 7.159E-1. | 6.443E-1. |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| | 5.814E-1. | 5.232E-1. | 4.634E-1. | 4.199E-1. | 3.742E-1. | 3.324E-1. |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 2.941E-1. | 2.592E-1. | 2.275E-1. | 1.929E-1. | 1.617E-1. | 1.357E-1. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 1.142E-1. | 9.618E-2. | 6.870E-2. | 4.944E-2. | 3.579E-2. | 2.607E-2. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |

CONT. ON PG 14

PARTS
PG 13 OF 52



CONT. ON PG 15

PARTS
PG 14 OF 52

1.856E-5, 1.298E-5, 4.089E-6/

C SPEED OF SOUND VALUES TABULATED IN METERS PER SECOND

DATA (SONLST(I), I=NP21, NP22)/

C 1 2 3 4 5 6

349.9, 348.6, 347.3, 346.0, 344.7, 343.8.

C 7 8 9 10 11 12

342.9, 342.0, 341.1, 340.3, 339.4, 338.5.

C 13 14 15 16 17 18

337.7, 335.9, 334.2, 332.5, 330.7, 327.3.

C 19 20 21 22 23 24

322.9, 318.5, 314.0, 309.5, 304.9, 303.3.

C 25 26 27 28 29 30

295.6, 290.9, 286.0, 285.7, 287.2, 288.7.

C 31 32 33 34 35 36

290.2, 291.7, 294.6, 297.3, 299.9, 302.6.

C 37 38 39 40 41 42

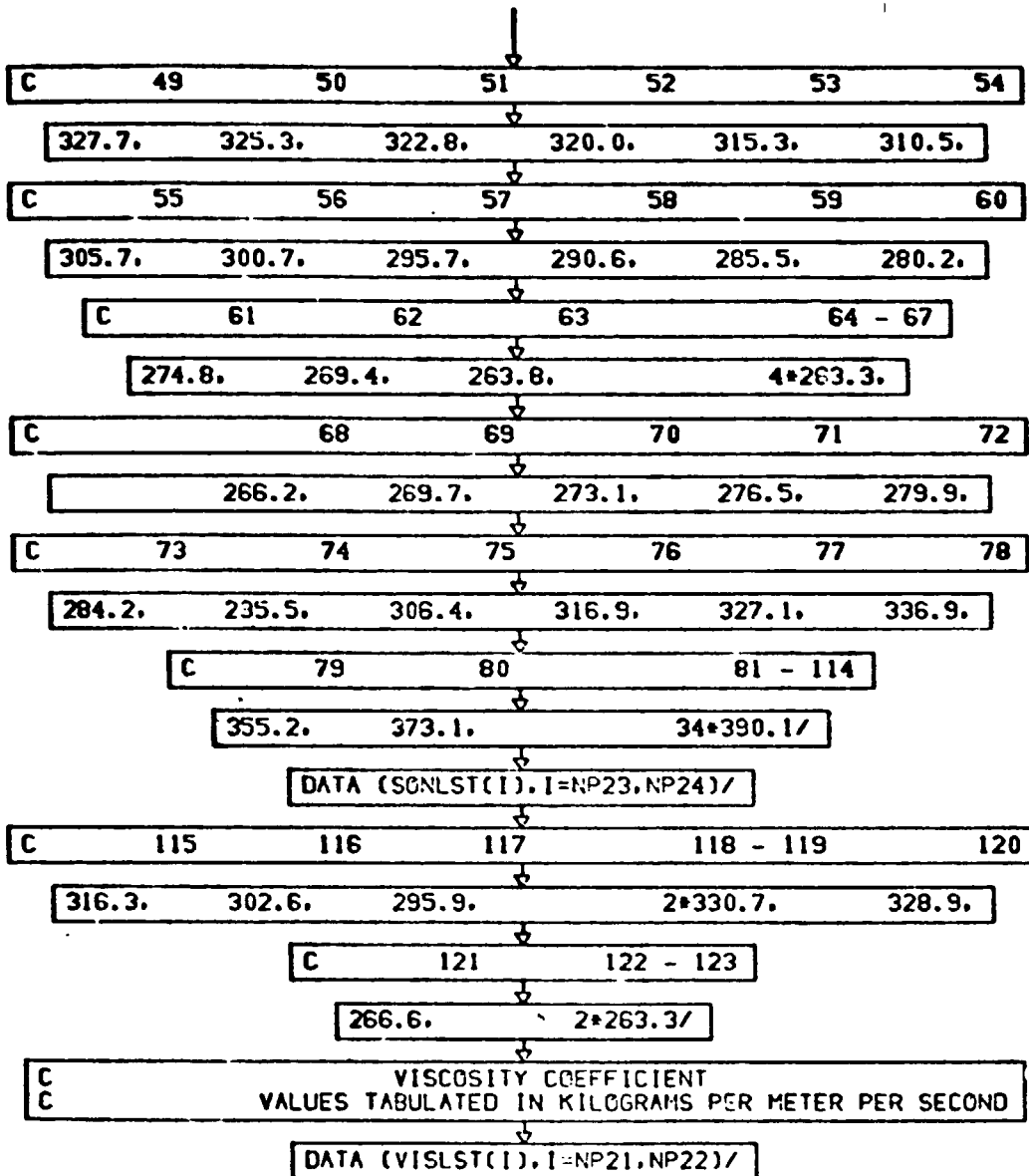
305.2, 307.8, 310.8, 313.9, 316.9, 319.9.

C 43 44 45 46 - 47 48

322.8, 325.8, 328.7, 2*330.7, 330.1.

CONT. ON PG 16

PARTS
PG 15 OF 52



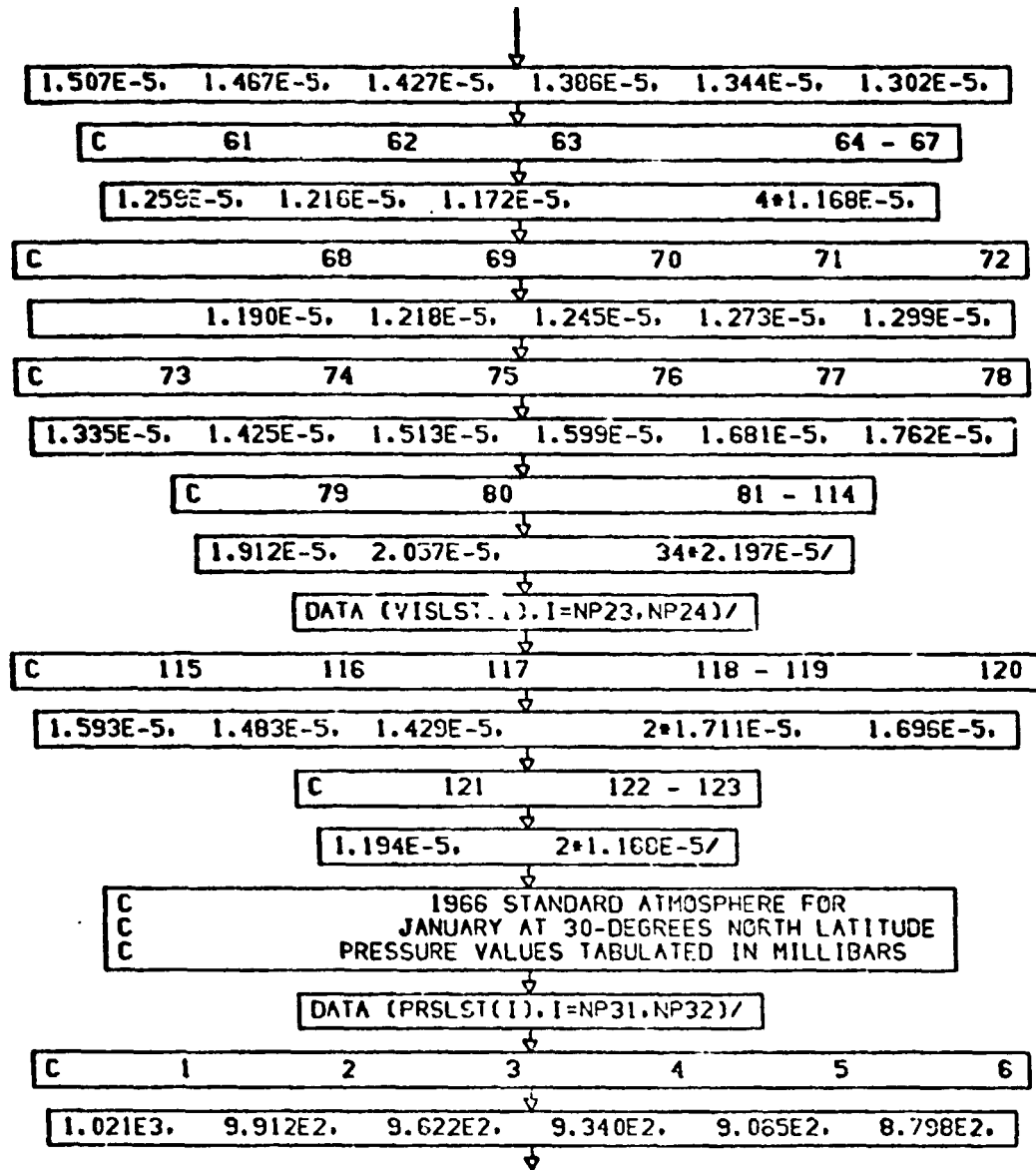
CONT. ON PG 17

PARTS
PG 16 OF 52

| | | | | | | |
|---|----|----|----|---------|----|----|
| C | 1 | 2 | 3 | 4 | 5 | 6 |
| 1.868E-5, 1.857E-5, 1.846E-5, 1.836E-5, 1.825E-5, 1.818E-5, | | | | | | |
| C | 7 | 8 | 9 | 10 | 11 | 12 |
| 1.811E-5, 1.803E-5, 1.796E-5, 1.789E-5, 1.782E-5, 1.775E-5, | | | | | | |
| C | 13 | 14 | 15 | 16 | 17 | 18 |
| 1.768E-5, 1.754E-5, 1.739E-5, 1.725E-5, 1.711E-5, 1.683E-5, | | | | | | |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| 1.648E-5, 1.612E-5, 1.575E-5, 1.539E-5, 1.501E-5, 1.464E-5, | | | | | | |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| 1.426E-5, 1.389E-5, 1.349E-5, 1.346E-5, 1.358E-5, 1.370E-5, | | | | | | |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| 1.302E-5, 1.395E-5, 1.418E-5, 1.439E-5, 1.461E-5, 1.482E-5, | | | | | | |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| 1.504E-5, 1.525E-5, 1.549E-5, 1.574E-5, 1.599E-5, 1.623E-5, | | | | | | |
| C | 43 | 44 | 45 | 46 - 47 | 48 | |
| 1.647E-5, 1.671E-5, 1.694E-5, 2*1.711E-5, 1.706E-5, | | | | | | |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| 1.687E-5, 1.677E-5, 1.647E-5, 1.624E-5, 1.595E-5, 1.547E-5, | | | | | | |
| C | 55 | 56 | 57 | 58 | 59 | 60 |

CONT. ON PG 18

PARTS
PG 17 OF 52



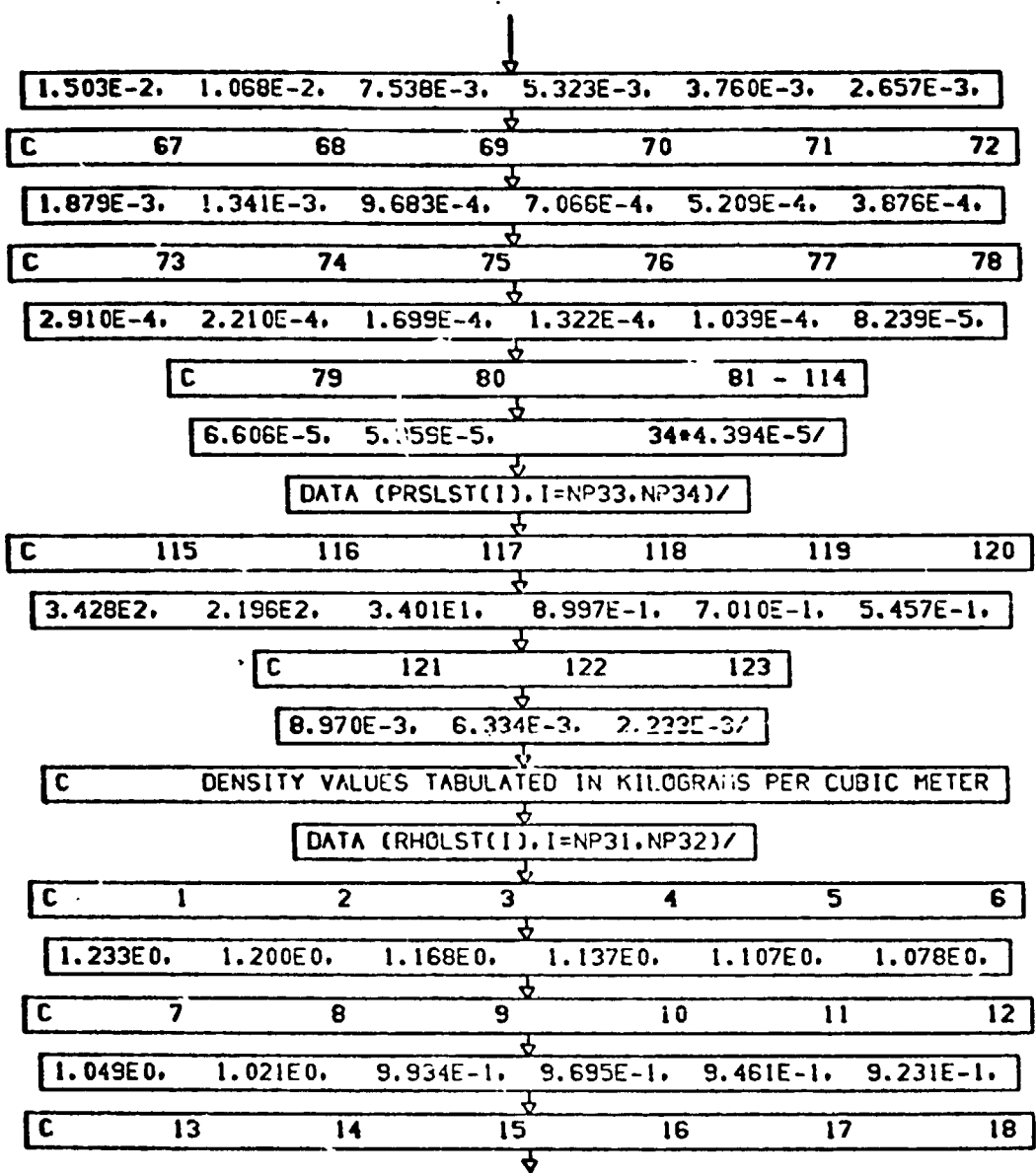
CONT. ON PG 19

PARTS
PG 18 OF 52

| | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| C | 7 | 8 | 9 | 10 | 11 | 12 |
| | 8.538E2. | 8.285E2. | 8.038E2. | 7.798E2. | 7.564E2. | 7.335E2. |
| C | 13 | 14 | 15 | 16 | 17 | 18 |
| | 7.112E2. | 6.682E2. | 6.274E2. | 5.886E2. | 5.517E2. | 4.837E2. |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| | 4.226E2. | 3.679E2. | 3.191E2. | 2.757E2. | 2.372E2. | 2.032E2. |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 1.734E2. | 1.478E2. | 1.257E2. | 1.067E2. | 9.040E1. | 7.650E1. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 6.479E1. | 5.499E1. | 3.984E1. | 2.907E1. | 2.134E1. | 1.575E1. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 1.169E1. | 8.723E0. | 6.544E0. | 4.939E0. | 3.748E0. | 2.860E0. |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 2.194E0. | 1.691E0. | 1.310E0. | 1.019E0. | 7.941E-1. | 6.187E-1. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 4.808E-1. | 3.723E-1. | 2.872E-1. | 2.207E-1. | 1.687E-1. | 1.281E-1. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 9.659E-2. | 7.231E-2. | 5.372E-2. | 3.959E-2. | 2.893E-2. | 2.095E-2. |
| C | 61 | 62 | 63 | 64 | 65 | 66 |

CONT. ON PG 20

PARTS
PG 19 OF 52



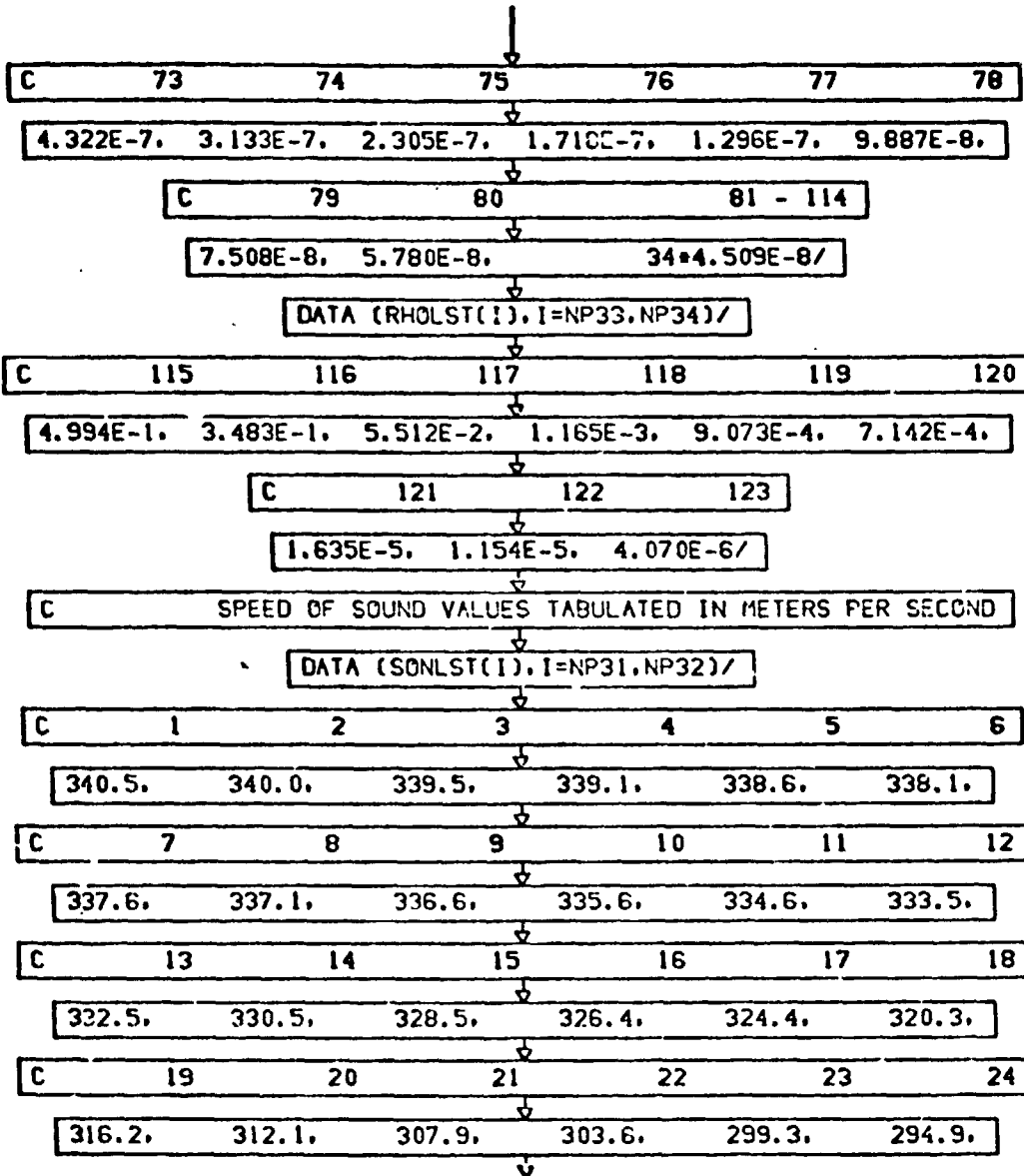
CONT. ON PG 21

PARTS
PG 20 OF 52

| | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| | 9.005E-1, | 8.565E-1, | 8.142E-1, | 7.733E-1, | 7.340E-1, | 6.599E-1, |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| | 5.916E-1, | 5.288E-1, | 4.713E-1, | 4.187E-1, | 3.707E-1, | 3.270E-1, |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 2.828E-1, | 2.439E-1, | 2.101E-1, | 1.805E-1, | 1.549E-1, | 1.312E-1, |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 1.099E-1, | 9.213E-2, | 6.520E-2, | 4.669E-2, | 3.385E-2, | 2.440E-2, |
| C | 37 | 38 | 40 | 40 | 41 | 42 |
| | 1.780E-2, | 1.306E-2, | 9.603E-3, | 7.05E-3, | 5.289E-3, | 3.960E-3, |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 2.981E-3, | 2.257E-3, | 1.717E-3, | 1.319E-3, | 1.028E-3, | 8.038E-4, |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 6.340E-4, | 4.983E-4, | 3.903E-4, | 3.051E-4, | 2.389E-4, | 1.860E-4, |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 1.439E-4, | 1.106E-4, | 8.441E-5, | 6.396E-5, | 4.809E-5, | 3.596E-5, |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| | 2.651E-5, | 1.942E-5, | 1.374E-5, | 9.702E-6, | 6.853E-6, | 4.842E-6, |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 3.386E-6, | 2.335E-6, | 1.630E-6, | 1.152E-6, | 8.231E-7, | 5.942E-7, |

CONT. ON PG 22

PARTS
PG 21 OF 52



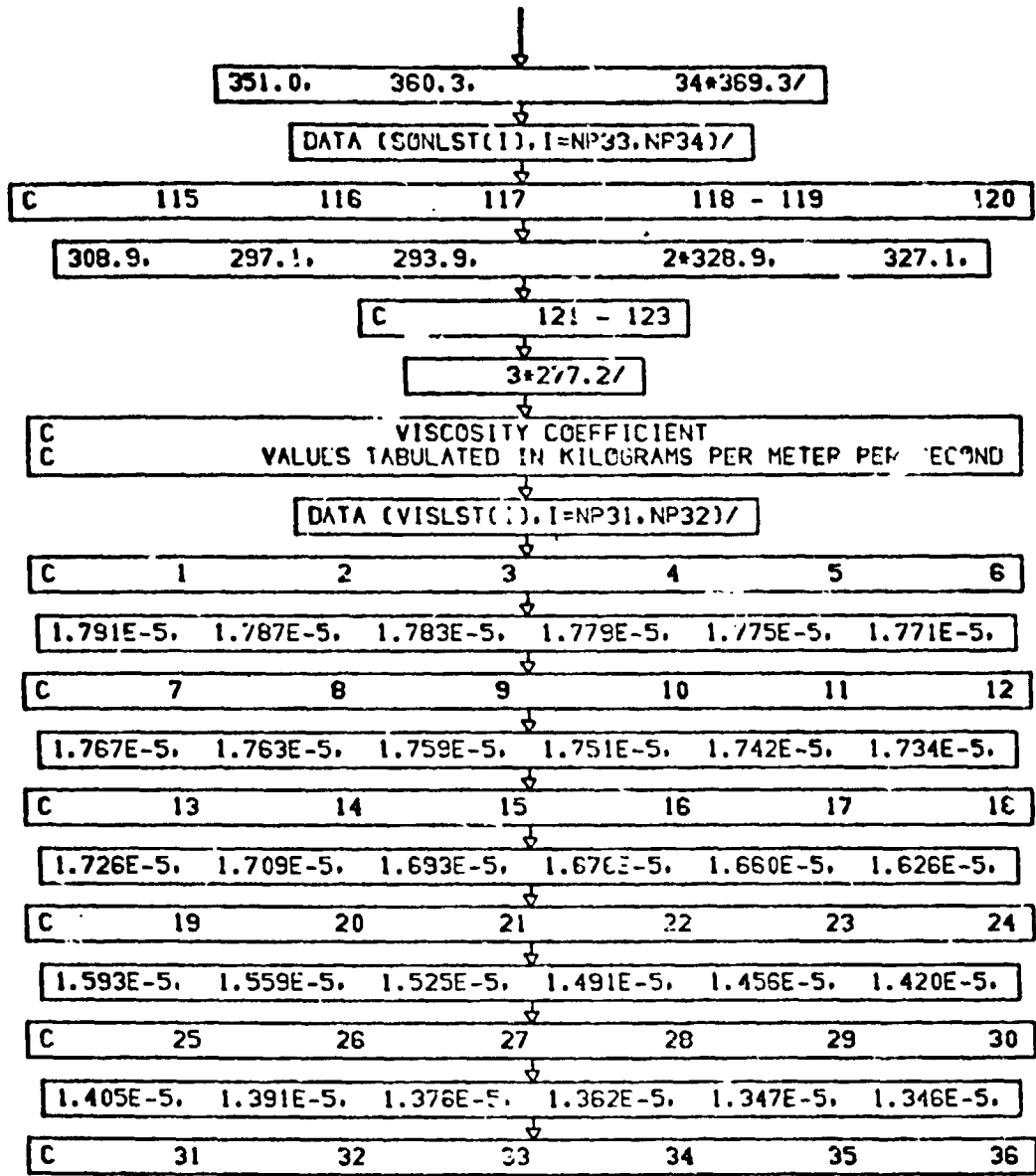
CONT. ON PG 23

PARTS
PG 22 OF 52

| | | | | | | |
|---|--------|--------|--------|----------|--------|----------|
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 293.0. | 291.3. | 289.5. | 287.7. | 285.9. | 285.7. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 287.3. | 289.1. | 292.5. | 295.2. | 297.9. | 300.6. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 303.2. | 305.8. | 308.9. | 311.9. | 315.0. | 318.0. |
| C | 43 | 44 | 45 | 46 - 47 | | 48 |
| | 321.0. | 323.9. | 326.8. | 2*328.9. | | 328.3. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 325.8. | 323.4. | 321.0. | 316.3. | 314.4. | 310.5. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 306.5. | 302.5. | 298.5. | 294.4. | 290.2. | 286.0. |
| C | 61 | 62 | | | | 63 - 66 |
| | 281.7. | 277.4. | | | | 4*277.2. |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 278.7. | 283.6. | 288.4. | 293.0. | 297.7. | 302.2. |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| | 307.0. | 314.3. | 321.3. | 328.2. | 335.0. | 341.6. |
| C | 79 | 80 | | | | 81 - 114 |

CONT. ON PG 24

PARTS
PG 23 OF 52



CONT. ON PG 25

PARIS
PG 24 OF 52

| | | | | | | |
|---|--------------------------------|-----------|--------------|-------------|-----------|-----------|
| | 1.359E-5. | 1.373E-5. | 1.401E-5. | 1.423E-5. | 1.445E-5. | 1.466E-5. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 1.408E-5. | 1.509E-5. | 1.533E-5. | 1.558E-5. | 1.583E-5. | 1.607E-5. |
| C | 43 | 44 | 45 | 46 - 47 | | 48 |
| | 1.632E-5. | 1.656E-5. | 1.679E-5. | 2*1.696E-5. | 1.691E-5. | |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 1.671E-5. | 1.652E-5. | 1.632E-5. | 1.610E-5. | 1.578E-5. | 1.547E-5. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 1.514E-5. | 1.482E-5. | 1.449E-5. | 1.416E-5. | 1.383E-5. | 1.349E-5. |
| C | 61 | 62 | 63 - 66 | | | |
| | 1.314E-5. | 1.280E-5. | 4*1.278E-5. | | | |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 1.290E-5. | 1.329E-5. | 1.368E-5. | 1.405E-5. | 1.443E-5. | 1.475E-5. |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| | 1.518E-5. | 1.577E-5. | 1.634E-5. | 1.691E-5. | 1.746E-5. | 1.800E-5. |
| C | 79 | 80 | 81 - 114 | | | |
| | 1.877E-5. | 1.953E-5. | 34*2.027E-5/ | | | |
| | DATA (VISLST(1),I=NP33, NP34)/ | | | | | |
| C | 115 | 116 | 117 | 118 - 119 | | 120 |

CONT. ON PG 26

PARTS
PG 25 OF 52

ORIGINAL PAGE IS
OF POOR QUALITY

A-43

↓
1.542E-5, 1.438E-5, 1.412E-5, 2*1.696E-5, 1.681E-5,

C 121 - 123

3*1.278E-5/

C 1966 STANDARD ATMOSPHERE FOR JULY AT 60-DEGREES NORTH LATITUDE
C PRESSURE VALUES TABULATED IN MILLIBARS

DATA (PRSLST(I), I=NP41, NP42)/

C 1 2 3 4 5 6

1.010E3, 9.804E2, 9.516E2, 9.234E2, 8.960E2, 8.692E2,

C 7 8 9 10 11 12

8.432E2, 8.177E2, 7.930E2, 7.688E2, 7.453E2, 7.224E2,

C 13 14 15 16 17 18

7.000E2, 6.571E2, 6.164E2, 5.779E2, 5.414E2, 4.740E2,

C 19 20 21 22 23 24

4.134E2, 3.592E2, 3.108E2, 2.677E2, 2.301E2, 1.978E2,

C 25 26 27 28 29 30

1.700E2, 1.461E2, 1.256E2, 1.080E2, 9.285E1, 7.983E1,

C 31 32 33 34 35 36

6.864E1, 5.902E1, 4.364E1, 3.229E1, 2.398E1, 1.788E1,

C 37 38 39 40 41 42

1.338E1, 1.005E1, 7.593E0, 5.775E0, 4.421E0, 3.406E0,

↓
CONT. ON PG 27

PARTS
PG 26 OF 52

| | | | | | | |
|---|-----|-----|----------|-----|-----|-----|
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| 2.640E0, 2.057E0, 1.607E0, 1.259E0, 9.872E-1, 7.742E-1, | | | | | | |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| 6.072E-1, 4.751E-1, 3.704E-1, 2.877E-1, 2.218E-1, 1.694E-1, | | | | | | |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| 1.281E-1, 9.576E-2, 7.075E-2, 5.160E-2, 3.710E-2, 2.627E-2, | | | | | | |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| 1.829E-2, 1.249E-2, 8.380E-3, 5.536E-3, 3.667E-3, 2.430E-3, | | | | | | |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| 1.610E-3, 1.075E-3, 7.297E-4, 5.027E-4, 3.512E-4, 2.485E-4, | | | | | | |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| 1.782E-4, 1.310E-4, 9.889E-5, 7.633E-5, 6.004E-5, 4.801E-5, | | | | | | |
| C | 79 | 80 | 81 - 114 | | | |
| 3.903E-5, 3.224E-5, 34*2.700E-5/ | | | | | | |
| DATA (PRSLST(I), I=NP43, NP44)/ | | | | | | |
| C | 115 | 116 | 117 | 118 | 119 | 120 |
| 3.343E2, 2.133E2, 3.753E1, 1.115E0, 8.742E-1, 6.857E-1, | | | | | | |
| C | 121 | 122 | 123 | | | |
| 1.025E-2, 6.803E-3, 1.978E-3/ | | | | | | |

CONT. ON PG 28

PARTS
PG 27 OF 52

ORIGINAL PAGE IS
OF POOR QUALITY

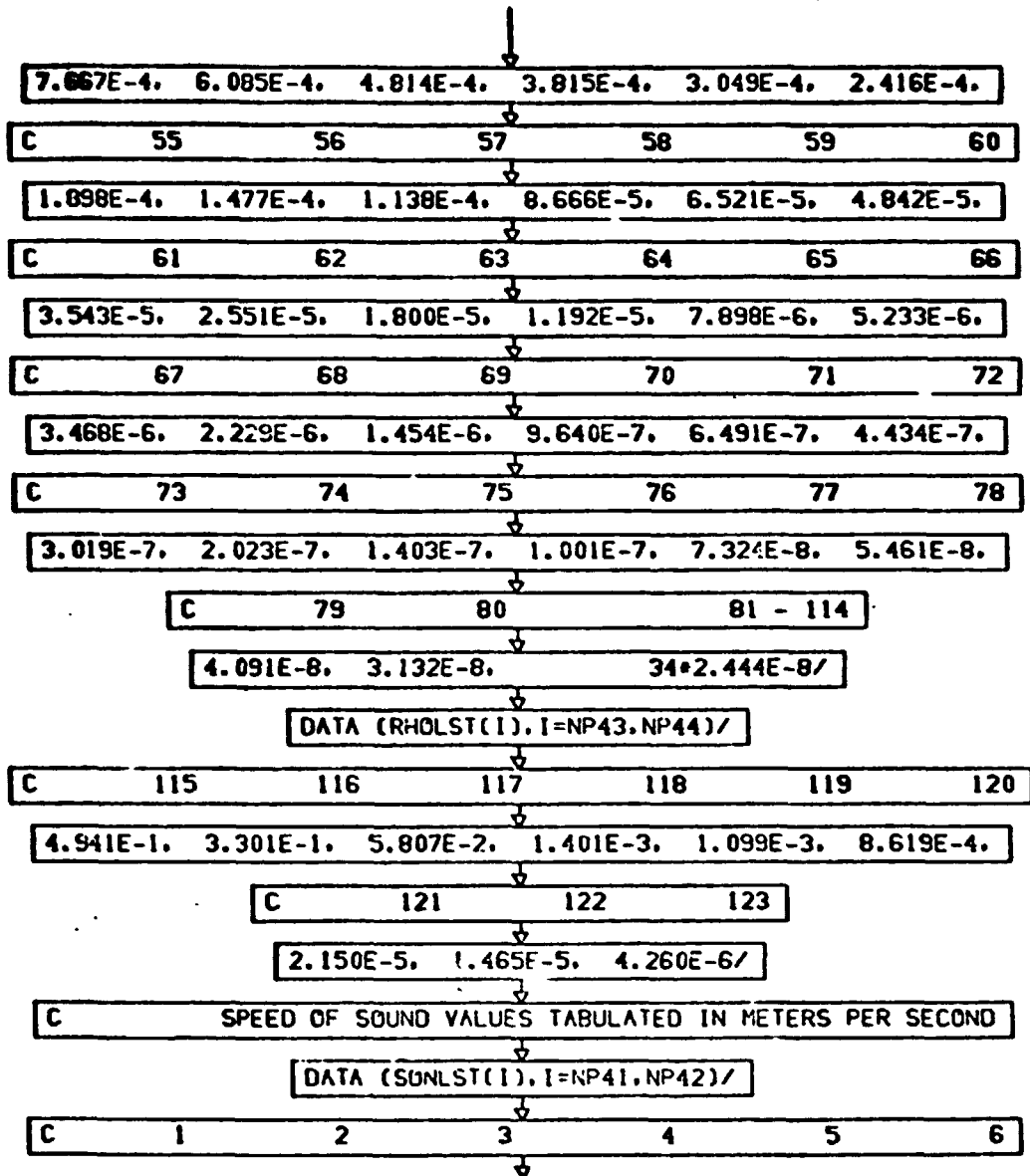
↓

| | | | | | | |
|---|---|-----------|-----------|-----------|-----------|-----------|
| C | DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER | | | | | |
| | DATA (RHOLST(I), I=NP41, NP42)/ | | | | | |
| C | 1 | 2 | 3 | 4 | 5 | 6 |
| | 1.220E0. | 1.190E0. | 1.161E0. | 1.132E0. | 1.104E0. | 1.077E0. |
| C | 7 | 8 | 9 | 10 | 11 | 12 |
| | 1.050E0. | 1.023E0. | 9.971E-1. | 9.716E-1. | 9.467E-1. | 9.223E-1. |
| C | 13 | 14 | 15 | 16 | 17 | 18 |
| | 8.984E-1. | 8.521E-1. | 8.077E-1. | 7.651E-1. | 7.244E-1. | 6.519E-1. |
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| | 5.849E-1. | 5.231E-1. | 4.683E-1. | 4.142E-1. | 3.560E-1. | 3.060E-1. |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 2.631E-1. | 2.261E-1. | 1.944E-1. | 1.671E-1. | 1.437E-1. | 1.235E-1. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 1.062E-1. | 9.132E-2. | 6.753E-2. | 4.965E-2. | 3.639E-2. | 2.678E-2. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 1.979E-2. | 1.469E-2. | 1.083E-2. | 8.041E-3. | 6.013E-3. | 4.528E-3. |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 3.431E-3. | 2.630E-3. | 2.039E-3. | 1.584E-3. | 1.241E-3. | 9.732E-4. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |

↓

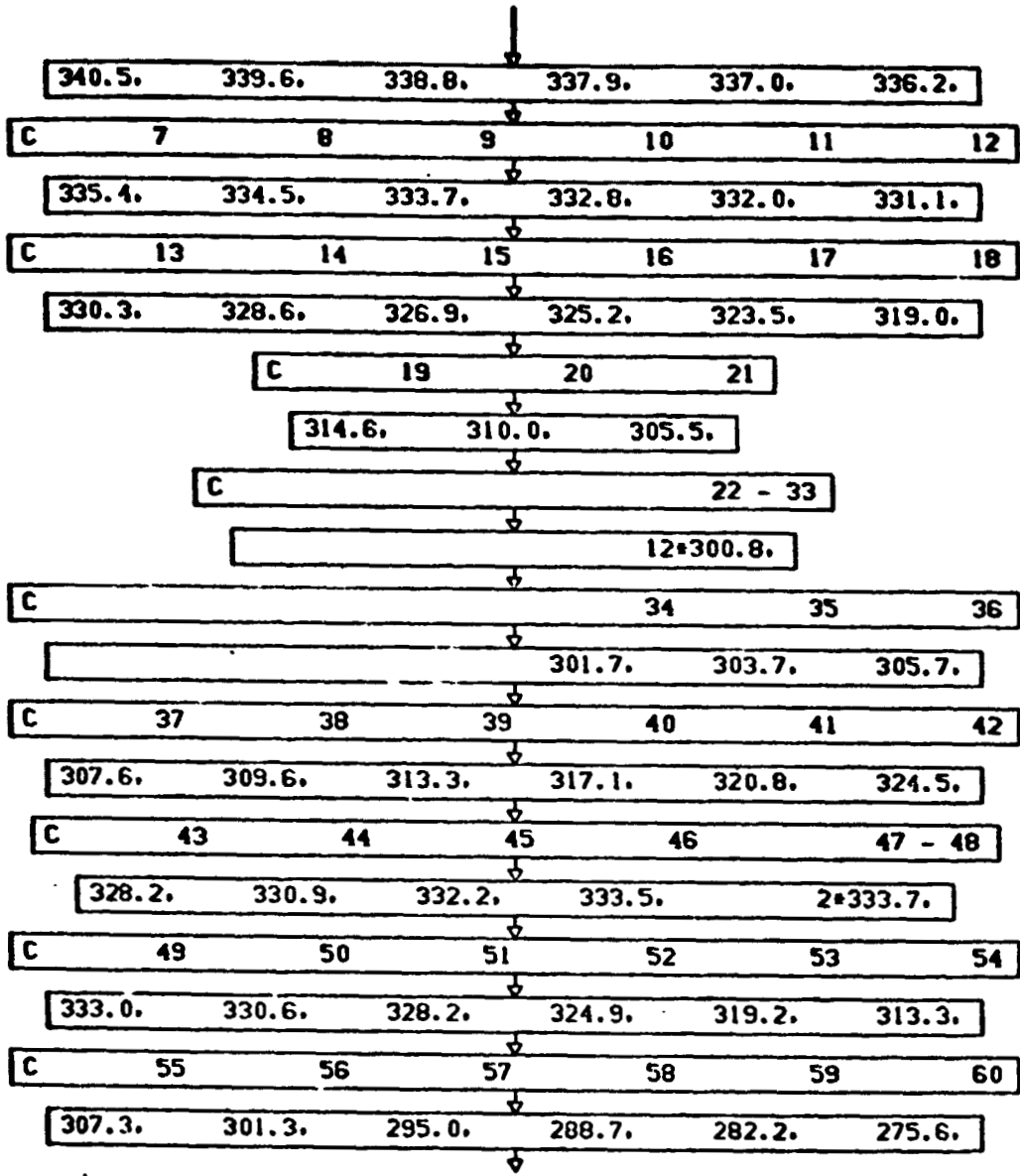
CONT. ON PG 29

PARTS
PG 28 OF 52



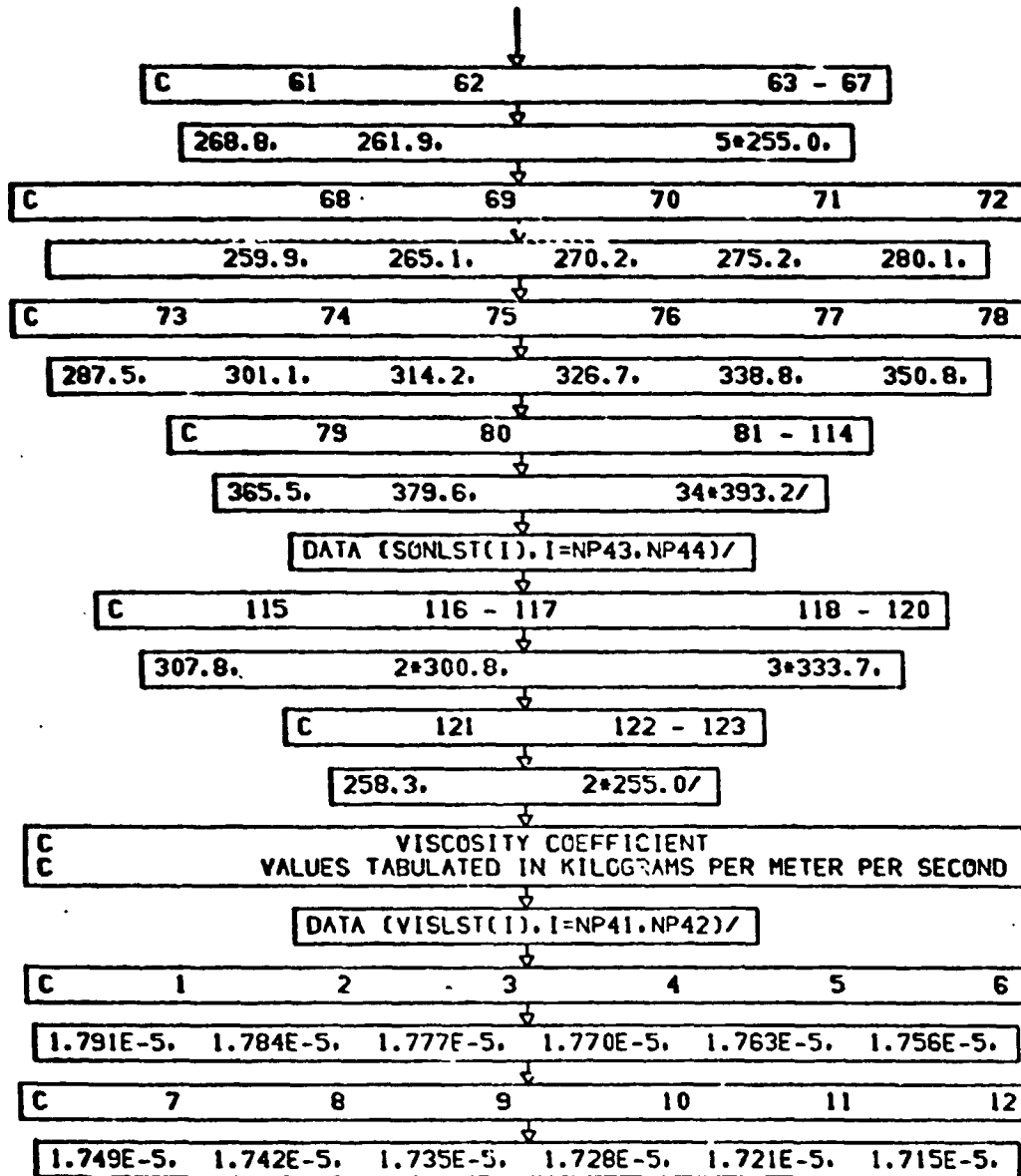
CONT. ON PG 30

PARTS
PG 29 OF 52



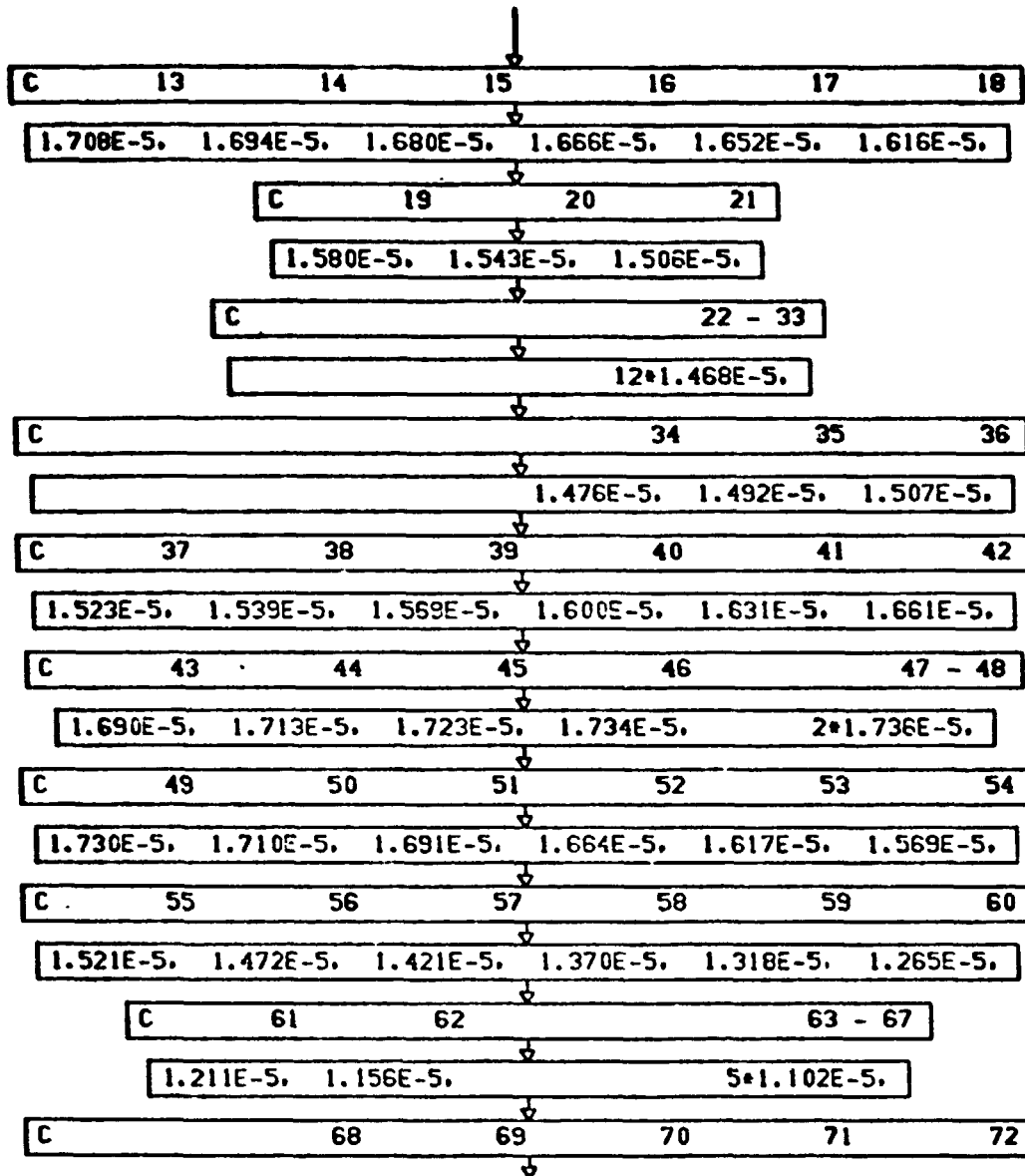
CONT. ON PG 31

PARTS
PG 30 OF 52



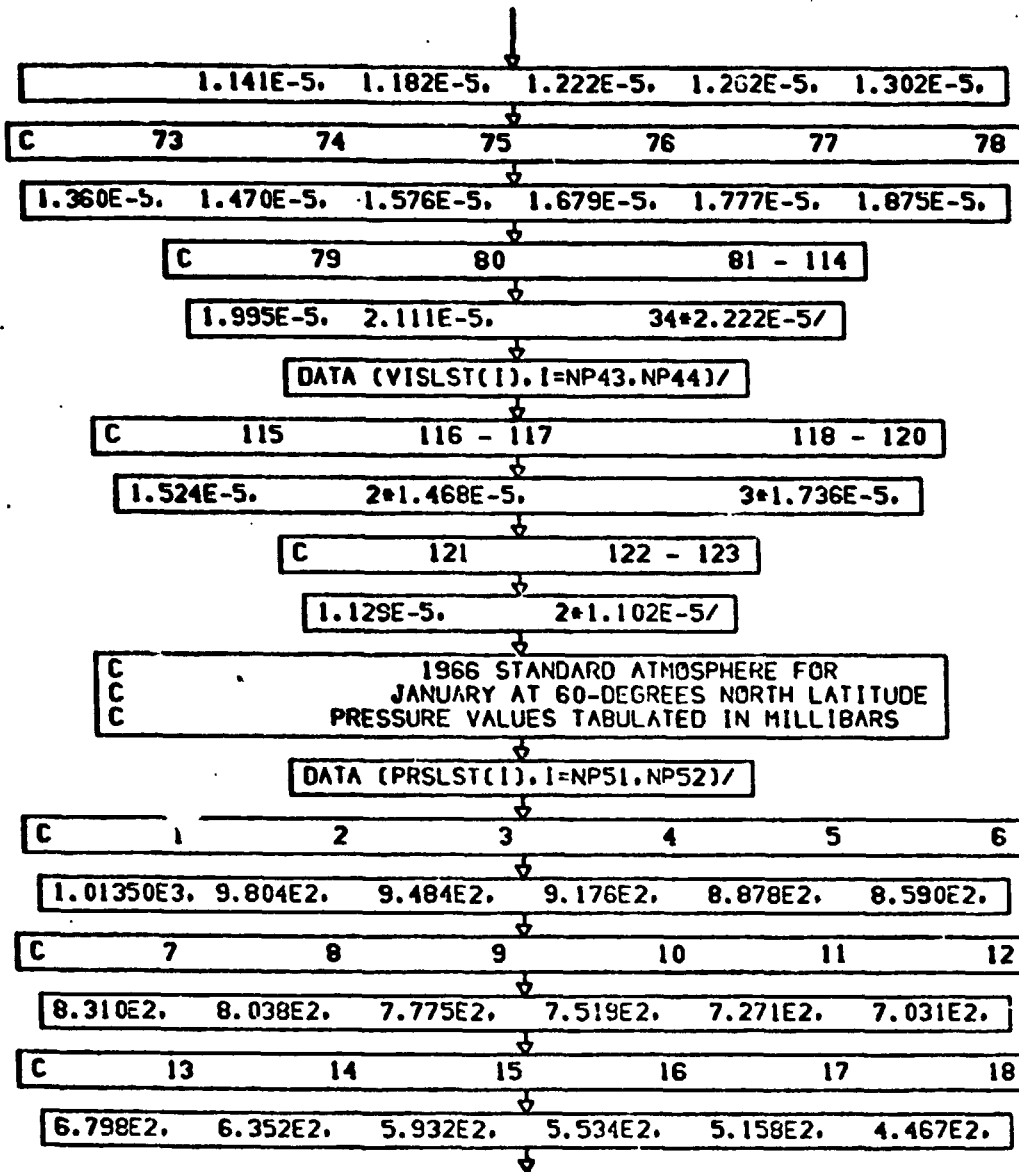
CONT. ON PG 32

PARTS
PG 31 OF 52



CONT. ON PG 33

PARTS
PG 32 OF 52



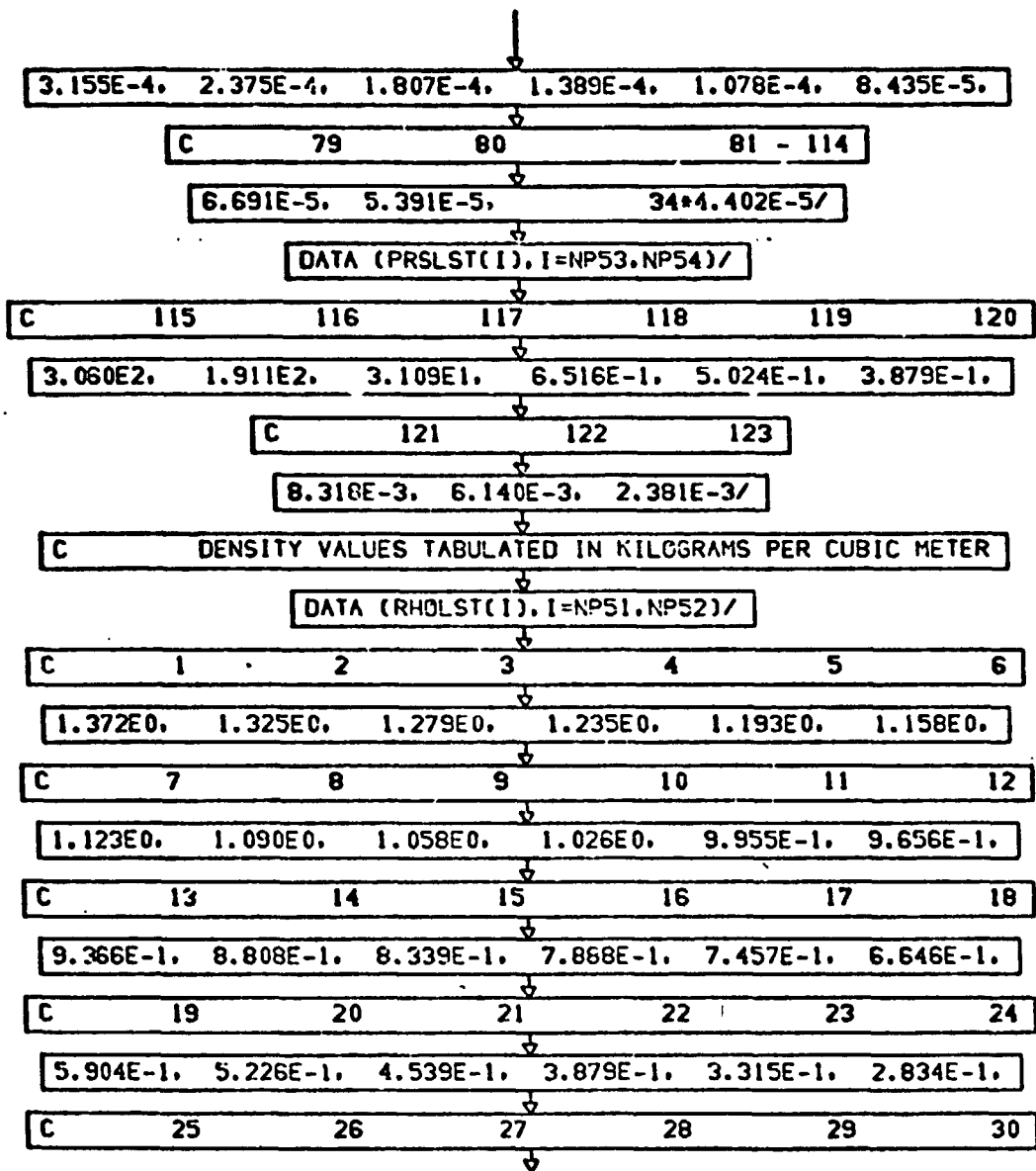
CONT. ON PG 34

PARTS
PG 33 OF 52

| | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| C | 19 | 20 | 21 | 22 | 23 | 24 |
| | 3.853E2. | 3.308E2. | 2.829E2. | 2.418E2. | 2.067E2. | 1.766E2. |
| C | 25 | 26 | 27 | 28 | 29 | 30 |
| | 1.510E2. | 1.291E2. | 1.103E2. | 9.431E1. | 8.058E1. | 6.882E1. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 5.875E1. | 5.014E1. | 3.647E1. | 2.649E1. | 1.922E1. | 1.398E1. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 1.020E1. | 7.464E0. | 5.479E0. | 4.041E0. | 3.001E0. | 2.243E0. |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 1.687E0. | 1.277E0. | 9.714E-1. | 7.434E-1. | 5.719E-1. | 4.414E-1. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 3.408E-1. | 2.629E-1. | 2.021E-1. | 1.548E-1. | 1.184E-1. | 9.050E-2. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 6.909E-2. | 5.271E-2. | 4.017E-2. | 3.051E-2. | 2.306E-2. | 1.735E-2. |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| | 1.298E-2. | 9.661E-3. | 7.152E-3. | 5.263E-3. | 3.851E-3. | 2.800E-3. |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 2.022E-3. | 1.460E-3. | 1.061E-3. | 7.762E-4. | 5.715E-4. | 4.234E-4. |
| C | 73 | 74 | 75 | 76 | 77 | 78 |

CONT. ON PG 35

PARTS
PG 34 OF 52



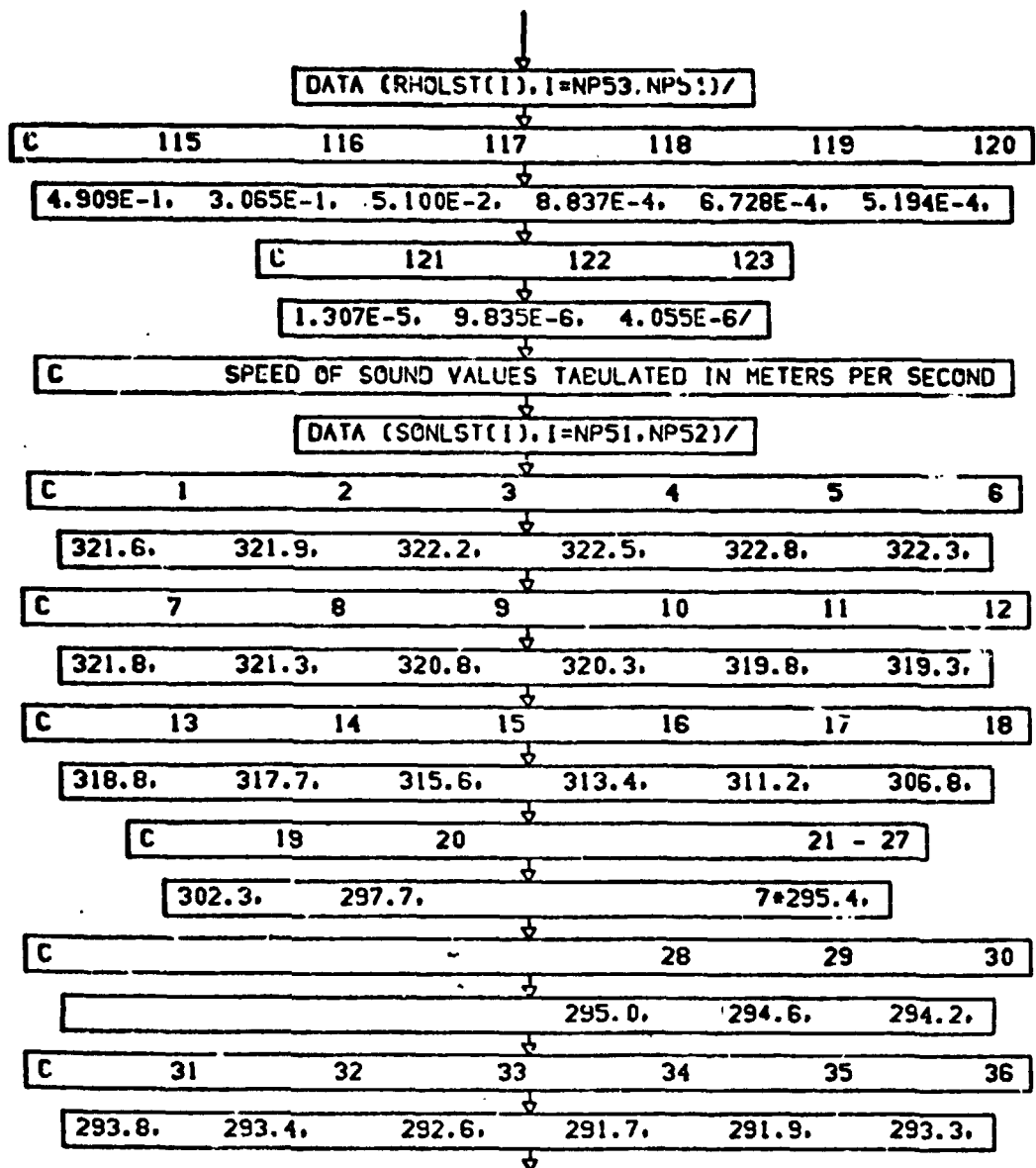
CONT. ON PG 36

PARTS
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| | | | | | | |
|---|-----------|-----------|--------------|-----------|-----------|-----------|
| | 2.422E-1. | 2.071E-1. | 1.770E-1. | 1.517E-1. | 1.300E-1. | 1.113E-1. |
| C | 31 | 32 | 33 | 34 | 35 | 36 |
| | 9.530E-2. | 8.156E-2. | 5.966E-2. | 4.357E-2. | 3.157E-2. | 2.275E-2. |
| C | 37 | 38 | 39 | 40 | 41 | 42 |
| | 1.645E-2. | 1.193E-2. | 8.676E-3. | 6.264E-3. | 4.551E-3. | 3.330E-3. |
| C | 43 | 44 | 45 | 46 | 47 | 48 |
| | 2.453E-3. | 1.819E-3. | 1.357E-3. | 1.018E-3. | 7.682E-4. | 5.911E-4. |
| C | 49 | 50 | 51 | 52 | 53 | 54 |
| | 4.564E-4. | 3.559E-4. | 2.774E-4. | 2.150E-4. | 1.651E-4. | 1.266E-4. |
| C | 55 | 56 | 57 | 58 | 59 | 60 |
| | 9.708E-5. | 7.435E-5. | 5.701E-5. | 4.408E-5. | 3.392E-5. | 2.599E-5. |
| C | 61 | 62 | 63 | 64 | 65 | 66 |
| | 1.981E-5. | 1.503E-5. | 1.134E-5. | 8.516E-6. | 6.357E-6. | 4.717E-6. |
| C | 67 | 68 | 69 | 70 | 71 | 72 |
| | 3.480E-6. | 2.467E-6. | 1.757E-6. | 1.260E-6. | 9.093E-7. | 6.607E-7. |
| C | 73 | 74 | 75 | 76 | 77 | 78 |
| | 4.803E-7. | 3.479E-7. | 2.550E-7. | 1.891E-7. | 1.417E-7. | 1.067E-7. |
| C | 79 | 80 | 81 - 114 | | | |
| | 7.890E-8. | 5.950E-8. | 34*4.567E-8/ | | | |

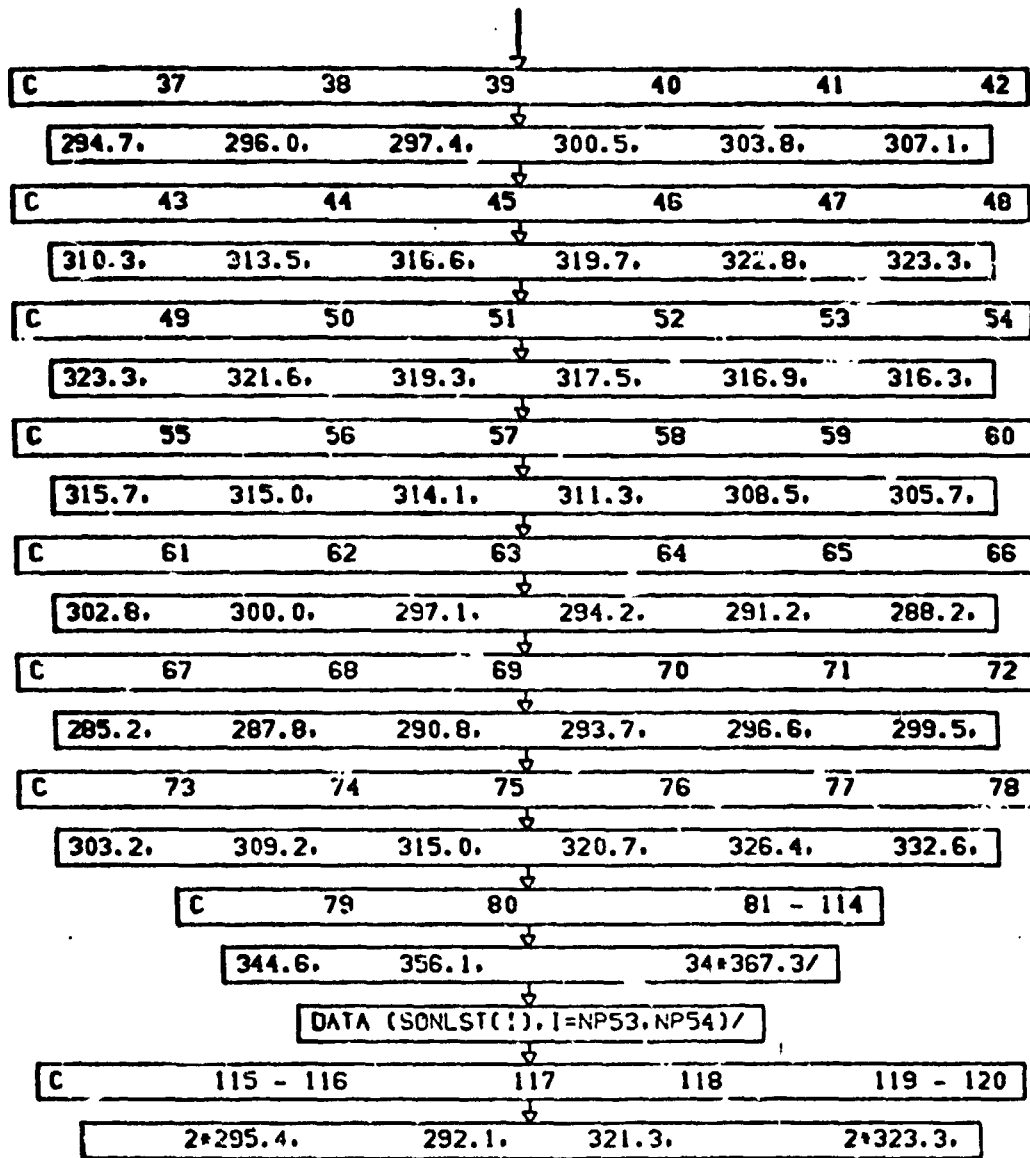
CONT. ON PG 37

PARTS
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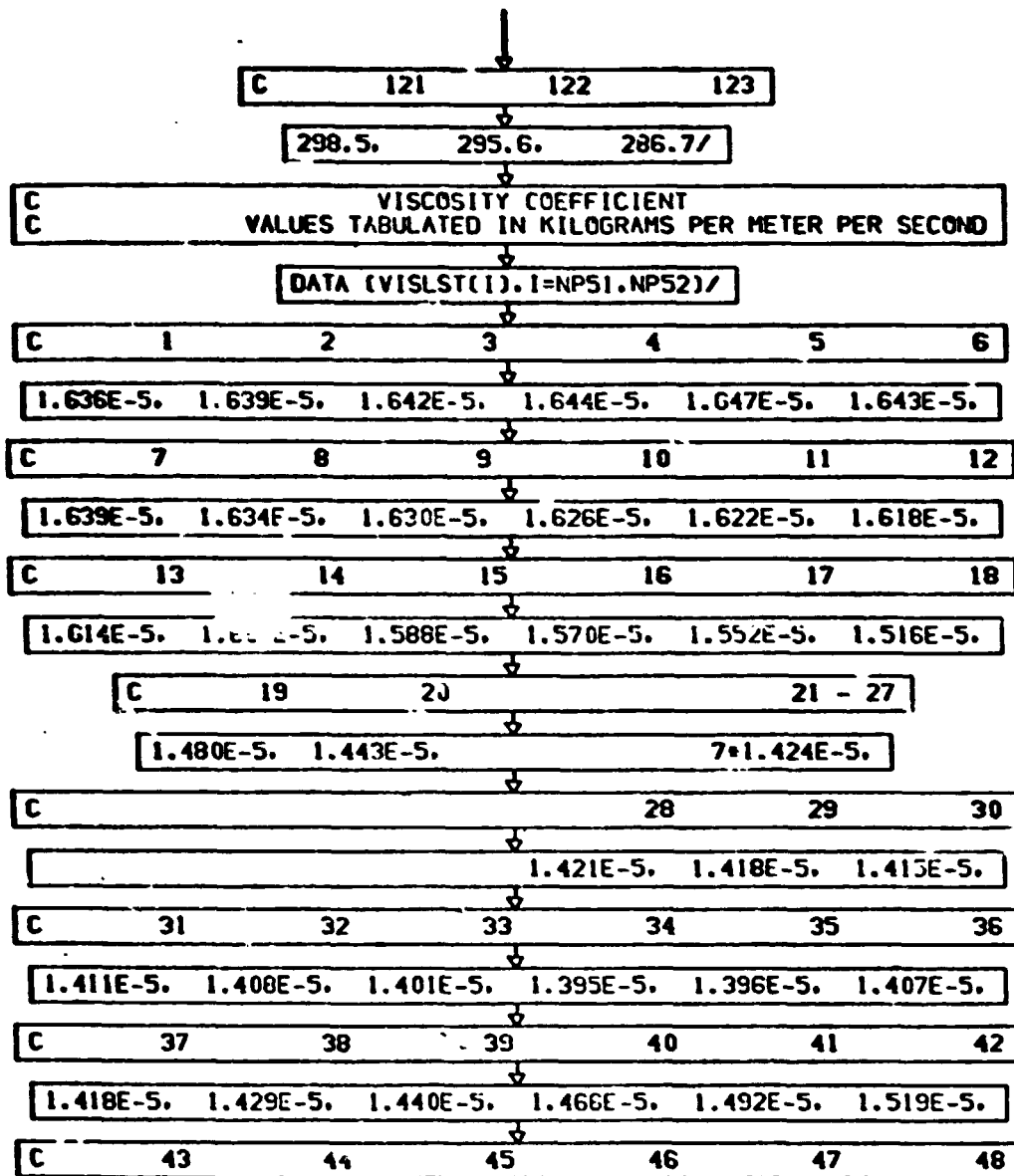
CONT. ON PG 38

PARTS
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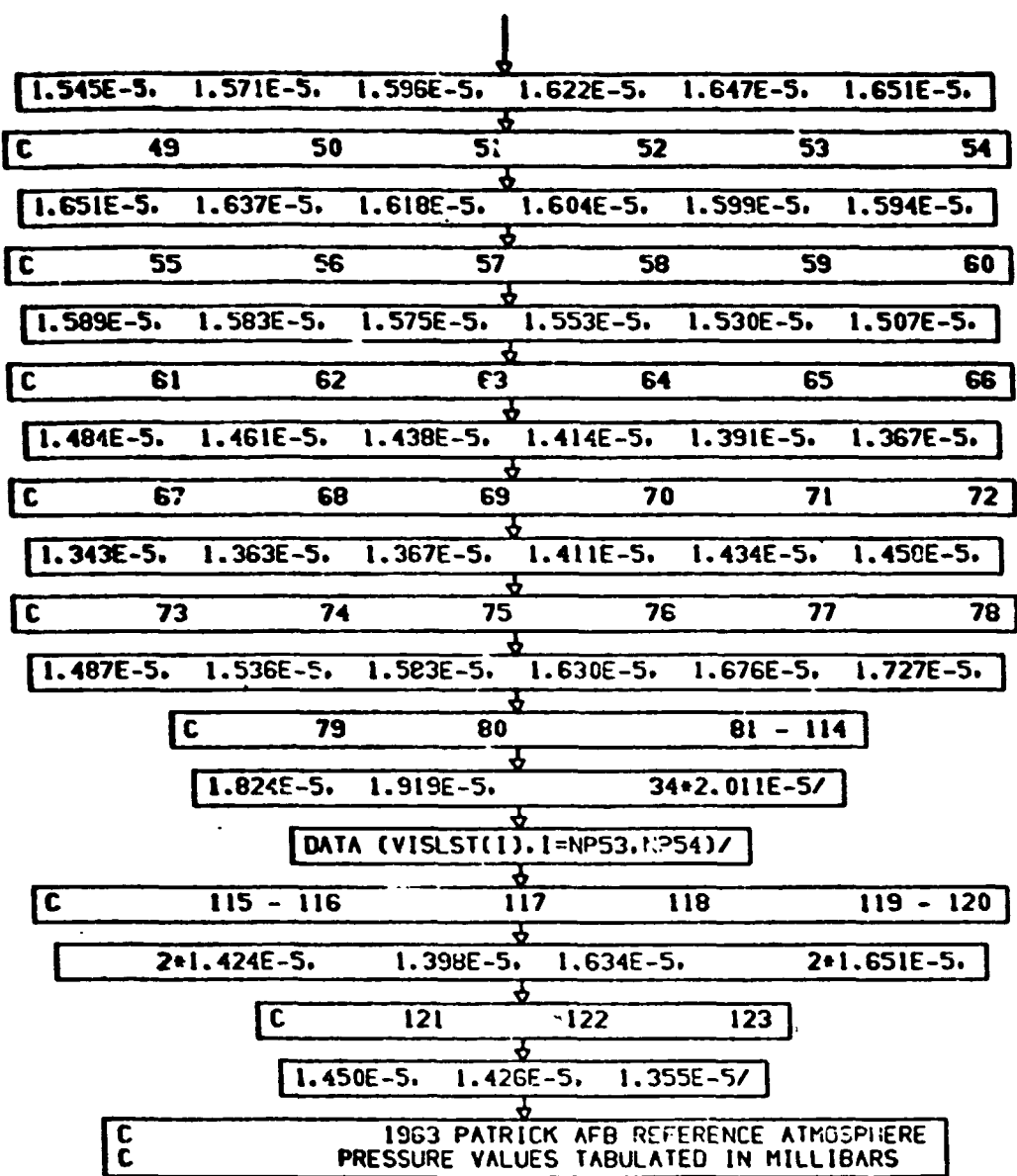
CONT. ON PG 39

PARTS
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CONT. ON PG 40

PARTS
PG 39 OF 52



CONT. ON PG 41

PARTS
PG 40 OF 52

DATA (PRSLST(1),I=NP61, NP62)/

| | | | | | |
|---|----|----|----|----|----|
| C | 1 | 2 | 3 | 4 | 5 |
| 1.0170147E+3.9.8829373E+2.9.6022651E+2.9.3280664E+2.9.0603418E+2. | | | | | |
| C | 6 | 7 | 8 | 9 | 10 |
| 8.7989596E+2.8.5409573E+2.8.2949430E+2.8.0521168E+2.7.8152728E+2. | | | | | |
| C | 11 | 12 | 13 | 14 | 15 |
| 7.5843002E+2.7.3590840E+2.7.1395065E+2.6.7167869E+2.6.3151745E+2. | | | | | |
| C | 16 | 17 | 18 | 19 | 20 |
| 5.9337050E+2.5.5714348E+2.4.9008912E+2.4.2967959E+2.3.7532040E+2. | | | | | |
| C | 21 | 22 | 23 | 24 | 25 |
| 3.2649869E+2.2.8277555E+2.2.4373144E+2.2.0909281E+2.1.7861068E+2. | | | | | |
| C | 26 | 27 | 28 | 29 | 30 |
| 1.5199026E+2.1.2892856E+2.1.0911841E+2.9.2252642E+1.7.8097365E+1. | | | | | |
| C | 31 | 32 | 33 | 34 | 35 |
| 6.6260092E+1.5.6315652E+1.4.0899191E+1.2.9918759E+1.2.2038159E+1. | | | | | |
| C | 36 | 37 | 38 | 39 | 40 |
| 1.6327363E+1.1.2146273E+1.9.0905080E+0.6.8429914E+0.5.1807184E+0. | | | | | |
| C | 41 | 42 | 43 | 44 | 45 |
| 3.9447995E+0.3.0209180E+0.2.3262411E+0.1.8004513E+0.1.3994781E+0. | | | | | |

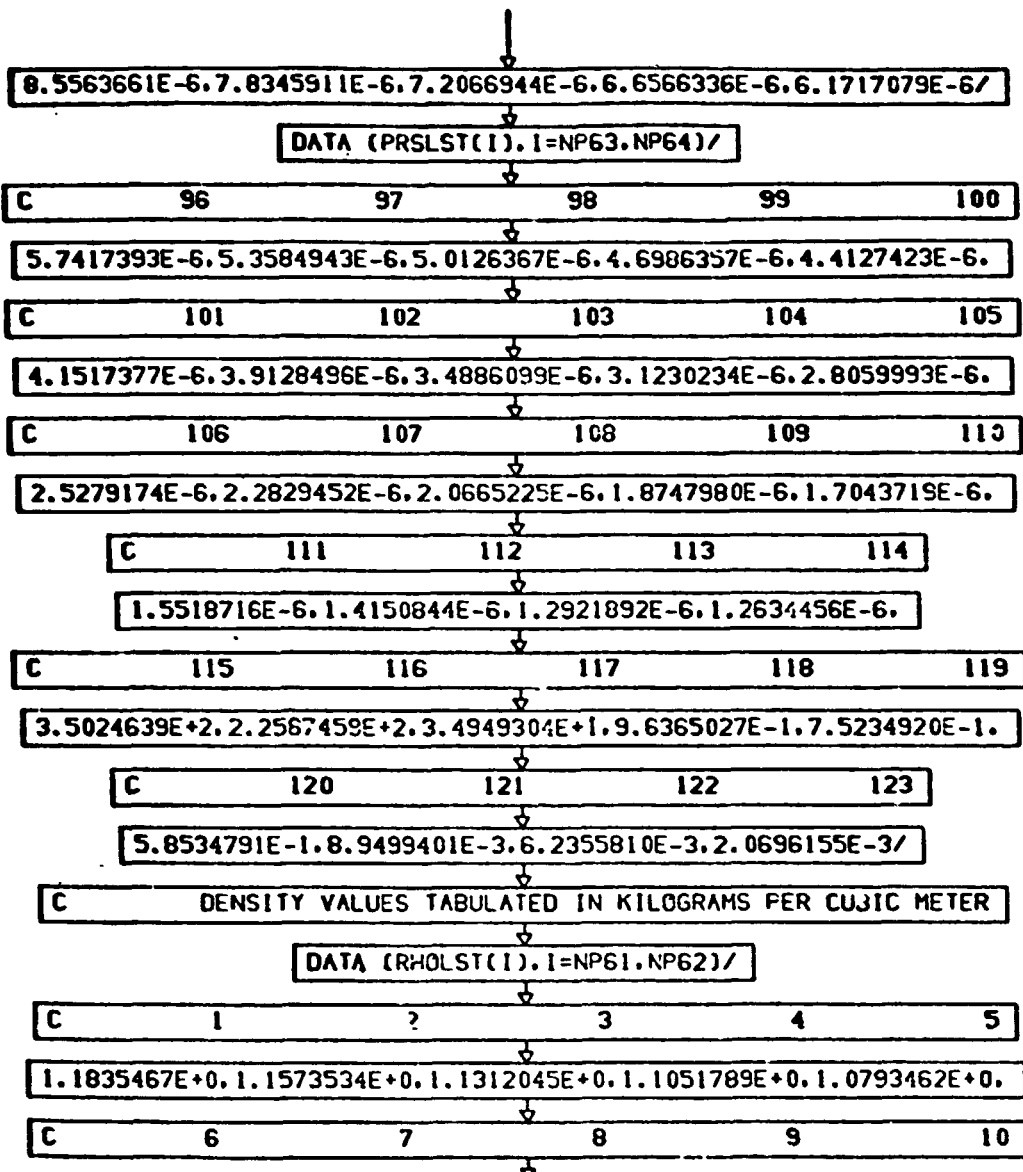
CONT. ON PG 42

PARTS
PG 41 OF 52

| | | | | | |
|---|----|----|----|----|----|
| C | 46 | 47 | 48 | 49 | 50 |
| ↓ | | | | | |
| 1.0910568E+0.8.5180215E-1.6.6393197E-1.5.1553130E-1.3.9852059E-1. | | | | | |
| C | 51 | 52 | 53 | 54 | 55 |
| ↓ | | | | | |
| 3.0651143E-1.2.3442082E-1.1.7818466E-1.1.3454170E-1.1.0086976E-1. | | | | | |
| C | 56 | 57 | 58 | 59 | 60 |
| ↓ | | | | | |
| 7.5059128E-2.5.5414297E-2.4.0576003E-2.2.9458738E-2.2.1200623E-2. | | | | | |
| C | 61 | 62 | 63 | 64 | 65 |
| ↓ | | | | | |
| 1.5119931E-2.1.0684305E-2.7.4793850E-3.5.1678215E-3.3.5914714E-3. | | | | | |
| C | 66 | 67 | 68 | 69 | 70 |
| ↓ | | | | | |
| 2.4869045E-3.1.7224435E-3.1.2003941E-3.8.4635721E-4.6.0330423E-4. | | | | | |
| C | 71 | 72 | 73 | 74 | 75 |
| ↓ | | | | | |
| 4.3449711E-4.3.1597170E-4.2.3253935E-4.1.7351145E-4.1.3111039E-4. | | | | | |
| C | 76 | 77 | 78 | 79 | 80 |
| ↓ | | | | | |
| 1.0022554E-4.7.7438980E-5.6.0696757E-5.4.8386073E-5.3.9145232E-5. | | | | | |
| C | 81 | 82 | 83 | 84 | 85 |
| ↓ | | | | | |
| 3.2082435E-5.2.6597710E-5.2.2377934E-5.1.9141913E-5.1.6599345E-5. | | | | | |
| C | 86 | 87 | 88 | 89 | 90 |
| ↓ | | | | | |
| 1.4560872E-5.1.2898417E-5.1.1522650E-5.1.0369626E-5.9.3925204E-6. | | | | | |
| C | 91 | 92 | 93 | 94 | 95 |
| ↓ | | | | | |

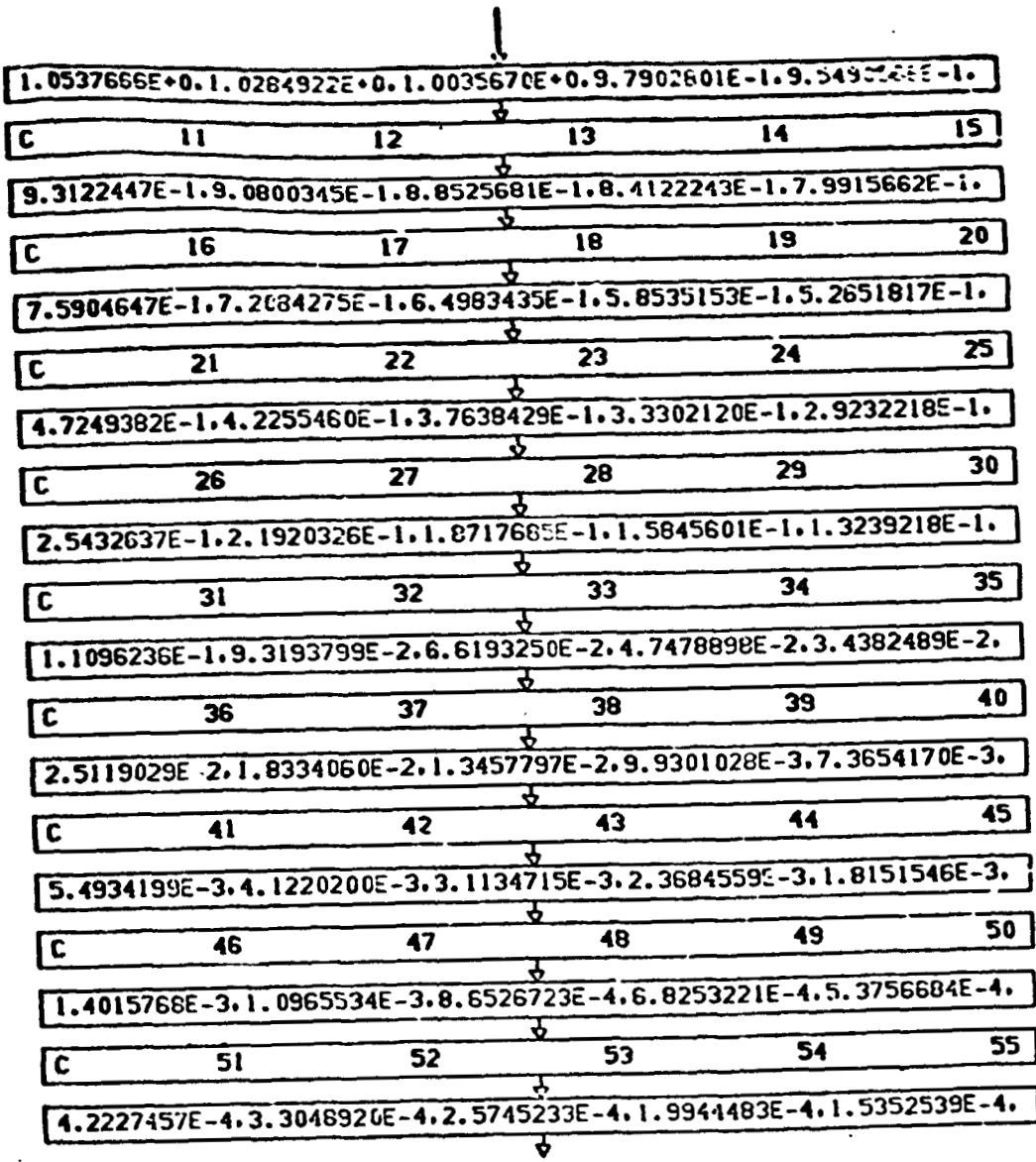
CONT. ON PG 43

PARTS
PG 42 OF 52



CONT. CN PG 44

PARTS
PG 43 OF 52



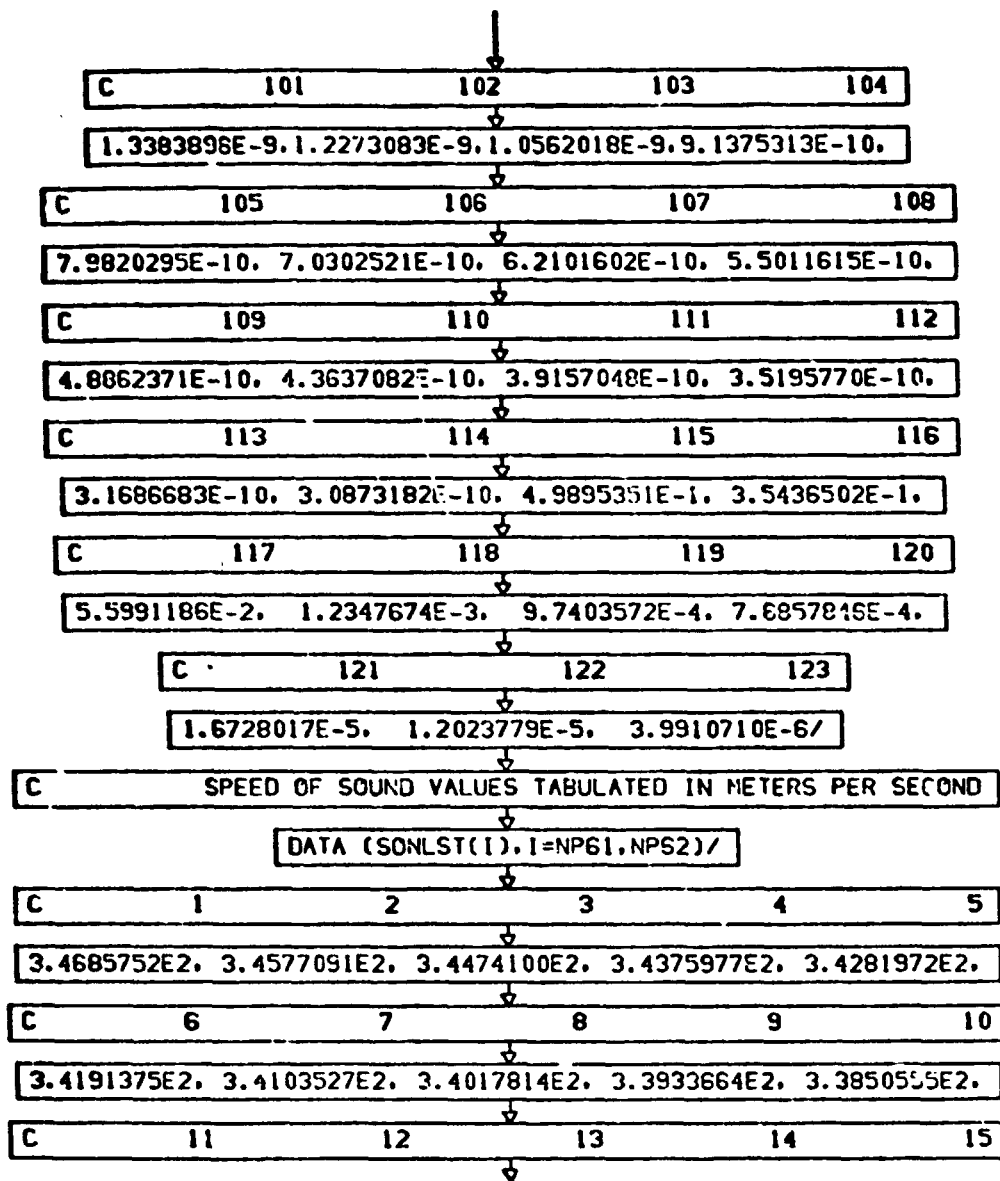
CONT. ON PG 45

PARTS
PG 44 OF 52

| | | | | | |
|---|----|----|----|----|-----|
| C | 56 | 57 | 58 | 59 | 60 |
| 1.1734238E-4.0.6997903E-5.6.6949356E-5.4.9935490E-5.3.6923403E-5. | | | | | |
| C | 61 | 62 | 63 | 64 | 65 |
| 2.7067399E-5.1.9677408E-5.1.4194402E-5.1.0004200E-5.6.9259360E-6. | | | | | |
| C | 66 | 67 | 68 | 69 | 70 |
| 4.7957760E-6.3.3215805E-6.2.2404228E-6.1.5304616E-6.1.0579997E-6. | | | | | |
| C | 71 | 72 | 73 | 74 | 75 |
| 7.3902724E-7.5.2254595E-7.3.6173880E-7.2.6206711E-7.1.8979684E-7. | | | | | |
| C | 76 | 77 | 78 | 79 | 80 |
| 1.3929915E-7.1.0349983E-7.7.5342182E-8.5.6095657E-8.4.2529020E-8. | | | | | |
| C | 81 | 82 | 83 | 84 | 85 |
| 3.2809278E-8.2.5691890E-8.1.9457748E-8.1.5133149E-8.1.2030946E-8. | | | | | |
| C | 86 | 87 | 88 | 89 | 90 |
| 9.7426983E-9.8.0146089E-9.6.6829568E-9.5.6387136E-9.4.8072428E-9. | | | | | |
| C | 91 | 92 | 93 | 94 | 95 |
| 4.1362113E-9.3.5031390E-9.3.1356758E-9.2.7585267E-9.2.4414047E-9/ | | | | | |
| DATA (RHOLST(I), I=NP63, NP64)/ | | | | | |
| C | 96 | 97 | 98 | 99 | 100 |
| 2.1726345E-9.1.9431903E-9.1.7627216E-9.1.6037353E-9.1.4631480E-9. | | | | | |

CONT. ON PG 46

PARTS
PG 45 OF 52



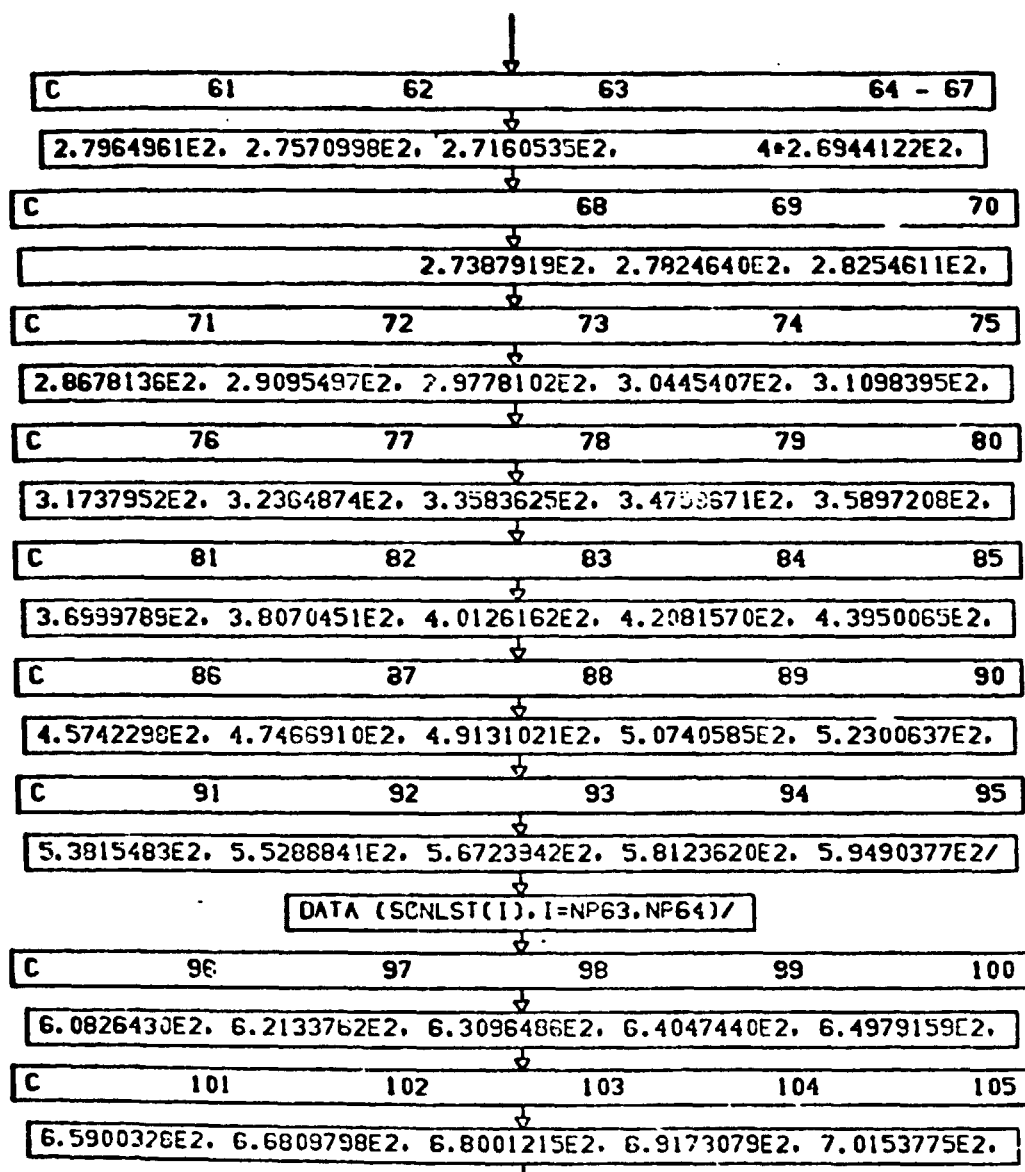
CONT. ON PG 47

PARTS
PG 46 OF 52

| | | | | | |
|---|----|----|----|----|----|
| 3 | 30 | 31 | 32 | 33 | 34 |
| 4 | 35 | 36 | 37 | 38 | 39 |
| 5 | 40 | 41 | 42 | 43 | 44 |
| 6 | 45 | 46 | 47 | 48 | 49 |
| 7 | 50 | 51 | 52 | 53 | 54 |
| 8 | 55 | 56 | 57 | 58 | 59 |
| 9 | 60 | 61 | 62 | 63 | 64 |

CONT. ON PG 48

PARTS
PG 47 OF 52



CONT. ON PG 49

PARTS
PG 48 OF 52

| | | | | | |
|---|---|-----|-----|-----|-----|
| C | 106 | 107 | 108 | 109 | 110 |
| 7.0951229E2, 7.1739818E2, 7.2519835E2, 7.3291548E2, 7.3946609E2. | | | | | |
| C | 111 | 112 | 113 | 114 | 115 |
| 7.4488092E2, 7.5025666E2, 7.5559417E2, 7.5692267E2, 3.1349187E2. | | | | | |
| C | 116 | 117 | 118 | 119 | 120 |
| 2.9879332E2, 2.9577557E2, 3.3054537E2, 3.2884119E2, 3.2653283E2. | | | | | |
| C | 121 | 122 | 123 | | |
| 2.7368549E2, 2.6945229E2, 2.6944122E2/ | | | | | |
| C | VISCOSITY COEFFICIENT VALUES TABULATED IN KILOGRAMS PER METER PER SECOND | | | | |
| C | DATA (VISLST(I), I=NP61, NP62)/ | | | | |
| C | 1 | 2 | 3 | 4 | 5 |
| 1.8302431E-5, 1.8224157E-5, 1.8149999E-5, 1.8079299E-5, 1.8011441E-5. | | | | | |
| C | 6 | 7 | 8 | 9 | 10 |
| 1.7945850E-5, 1.7881991E-5, 1.7819367E-5, 1.7757524E-5, 1.7696042E-5. | | | | | |
| C | 11 | 12 | 13 | 14 | 15 |
| 1.7634541E-5, 1.7572676E-5, 1.7510139E-5, 1.7381977E-5, 1.7248245E-5. | | | | | |
| C | 16 | 17 | 18 | 19 | 20 |
| 1.7107621E-5, 1.6959239E-5, 1.6637781E-5, 1.6284601E-5, 1.5905319E-5. | | | | | |
| C | 21 | 22 | 23 | 24 | 25 |

CONT. ON PG 50

PARTS
PG 49 OF 52

| | | | | | |
|---|---|----|----|---------|----|
| | 1.5509244E-5, 1.5108096E-5, 1.4707842E-5, 1.4335282E-5, 1.4108886E-5, | | | | |
| C | 26 | 27 | 28 | 29 | 30 |
| | 1.3745403E-5, 1.3558590E-5, 1.3457958E-5, 1.3447579E-5, 1.3585386E-5, | | | | |
| C | 31 | 32 | 33 | 34 | 35 |
| | 1.3724675E-5, 1.3867977E-5, 1.4145944E-5, 1.4389370E-5, 1.4587102E-5, | | | | |
| C | 36 | 37 | 38 | 39 | 40 |
| | 1.4748972E-5, 1.4982730E-5, 1.5223539E-5, 1.5474160E-5, 1.5734080E-5, | | | | |
| C | 41 | 42 | 43 | 44 | 45 |
| | 1.5999574E-5, 1.6263778E-5, 1.6516764E-5, 1.6745577E-5, 1.6934206E-5, | | | | |
| C | 46 | 47 | 48 | 49 | 50 |
| | 1.7063446E-5, 1.7034883E-5, 1.6870136E-5, 1.6660460E-5, 1.6414072E-5, | | | | |
| C | 51 | 52 | 53 | 54 | 55 |
| | 1.6138668E-5, 1.5841407E-5, 1.5528854E-5, 1.5206885E-5, 1.4880579E-5, | | | | |
| C | 56 | 57 | 58 | 59 | 60 |
| | 1.4554073E-5, 1.4230412E-5, 1.3911371E-5, 1.3597275E-5, 1.3286809E-5, | | | | |
| C | 61 | 62 | 63 | 64 - 67 | |
| | 1.2976813E-5, 1.2662082E-5, 1.2335131E-5, 4*1.2163172E-5, | | | | |
| C | | | 68 | 69 | 70 |
| | 1.2516126E-5, 1.2864314E-5, 1.3208747E-5, | | | | |

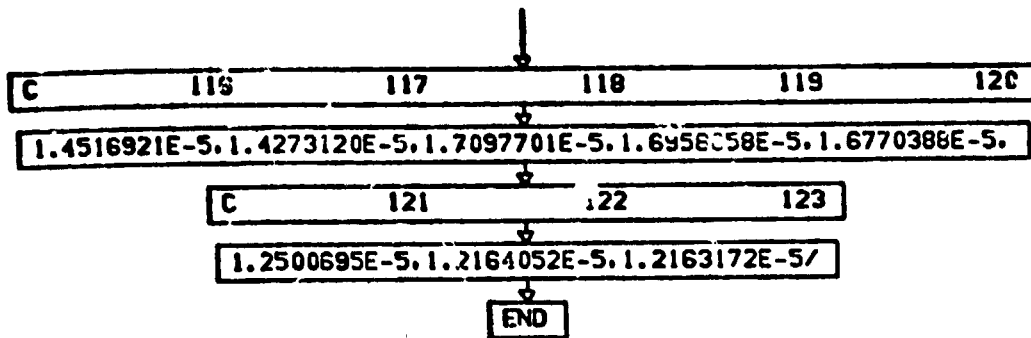
CONT. ON PG 51

PARTS
PG 50 OF 52

| | | | | | |
|--|-----|-----|-----|-----|-----|
| C | 71 | 72 | 73 | 74 | 75 |
| 1.3540638E-5, 1.3884397E-5, 1.4435101E-5, 1.4975097E-5, 1.5504842E-5, | | | | | |
| C | 76 | 77 | 78 | 79 | 80 |
| 1.6024767E-5, 1.6535285E-5, 1.7529632E-5, 1.8490756E-5, 1.9421230E-5, | | | | | |
| C | 81 | 82 | 83 | 84 | 85 |
| 2.0323355E-5, 2.1199197E-5, 2.2879253E-5, 2.4474125E-5, 2.5994216E-5, | | | | | |
| C | 86 | 87 | 88 | 89 | 90 |
| 2.7448117E-5, 2.8842997E-5, 3.0184890E-5, 3.1478926E-5, 3.2729499E-5, | | | | | |
| C | 91 | 92 | 93 | 94 | 95 |
| 3.3940400E-5, 3.5114925E-5, 3.6255956E-5, 3.7366033E-5, 3.8447395E-5, | | | | | |
| DATA (VISLST(1), I=NP63, NP64)/ | | | | | |
| C | 96 | 97 | 98 | 99 | 100 |
| 3.9502050E-5, 4.0531768E-5, 4.1288666E-5, 4.2033057E-5, 4.2765514E-5, | | | | | |
| C | 101 | 102 | 103 | 104 | 105 |
| 4.3486565E-5, 4.4196706E-5, 4.5127375E-5, 4.6040465E-5, 4.6803460E-5, | | | | | |
| C | 106 | 107 | 108 | 109 | 110 |
| 4.7423142E-5, 4.8035293E-5, 4.8640170E-5, 4.9238014E-5, 4.9745032E-5, | | | | | |
| C | 111 | 112 | 113 | 114 | 115 |
| 5.0163831E-5, 5.0579335E-5, 5.0991617E-5, 5.1094193E-5, 5.15708689E-5, | | | | | |

CONT. ON PG 52

PARTS
PG 51 OF 52



PARTS
Pg. 52 FINAL

W FOR SDAT,SDAT
 UNITAC 1104 FURTHER Y EXEC 11 LEVEL 25A -1E2EEN LLVEL 212010012A1
 THIS COMPILATION WAS ON JUN 11 FEB 74 AT 20:52:09

11 FEB 74

20:52:09.03

SUBROUTINE SDAT ENTRY POINT 000275

STORAGE USED: (CODE) 000311; (DATA) 000059; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 ATDATA 004200
 0004 SPLDAT 004037

EXTERNAL REFERENCES (BLOCK, NAME)

C: 1 SPLN1
 C: 14 DEFPSA

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

| | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| 0001 000010 I124 | 0001 000090 I294 | 0001 00005C I226 | 0003 R 005410 ALTLST | 0004 R 000000 ALTTAB |
| 0004 R 001447 CP | 0004 R 001725 CR | 0004 R 001503 CS | 0004 R 001241 CV | 0003 R 004174 D |
| 0000 I 006003 I | 0000 I 000004 IJ | 0000 000027 INJPS | 0000 I 000002 IOP1 | 0000 I 000007 J |
| 0000 I 000001 JH | 0000 I 000000 JI | 0000 I 000005 A | 0000 I 000004 R | 0003 R 000000 PASLST |
| 0004 R 000173 PRSTAB | 0003 R 001342 RHOLST | 0004 R 000364 RHOTAB | 0003 R 002200 S0NLST | 0004 R 000541 S0NTAB |
| 0003 R 004244 VISLST | 0004 R 030754 /1STAB | 0003 R 004003 PORC | 0000 R 000010 R3 | 0000 R 000011 Y31 |
| 0000 R 000012 Y32 | 0000 R 000013 Y33 | 0000 R 000014 Y34 | | |

| | | | |
|-------|-----|---|---|
| 00101 | 10 | | SUBROUTINE SDAT(TOP) |
| 00101 | 20 | C | |
| 00103 | 30 | | PARAMETER NP = 123, NPA = 0*NP, NP3 = 3*NP - 3 |
| 00103 | 40 | C | |
| 00104 | 50 | | COMMON/ATDATA/ |
| 00104 | 60 | | (PRSLST(INP4), RHOLST(INP4), S0NLST(INP4), VISLST(INP4), |
| 00104 | 70 | | ZAL(LST(INP4), R0NC(INP4), D1Z, |
| 00104 | 80 | C | |
| 00105 | 90 | | COMMON /SPLDAT/ |
| 00105 | 100 | | (ALTTAB(INP), PRSTAB(INP), RHOTAB(INP), S0NTAB(INP), Y1STAB(INP), |
| 00105 | 110 | | (CP(INP3), CR(INP3), CS(INP3), CV(INP3), |
| 00105 | 120 | C | |
| 00106 | 130 | | DATA JI, JH /1, 1/ |
| 00106 | 140 | C | |
| 00106 | 150 | C | |
| 00106 | 160 | C | |
| 00106 | 170 | C | TOP.....AN INTEGER VARIABLE RANGING FROM 0 TO 5 USED TO DESIGNATE |
| 00106 | 180 | C | THE ATMOSPHERE MODEL TO BE USED |
| 00106 | 190 | C | |
| 00106 | 200 | C | TOP = 0 - 1962 STANDARD ATMOSPHERE |
| 00106 | 210 | C | |
| 00106 | 220 | C | TOP = 1 - 1964 STANDARD FOR JULY AT 30 DEG. N. LATITUDE |
| 00106 | 230 | C | |

ORIGINAL PAGE IS
 OF POOR QUALITY

C2

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00106 240 C IOP = 2 - 1966 STANDARD FOR JAN. AT 30 DEG. N. LATITUDE
00106 250 C
00106 260 C IOP = 3 - 1966 STANDARD FOR JULY AT 60 DEG. N. LATITUDE
00106 270 C
00106 280 C IOP = 4 - 1966 STANDARD FOR JAN. AT 60 DEG. N. LATITUDE
00106 290 C
00106 300 C IOP = 5 - 1963 PATRICK AFB REFERENCE STANDARD
00106 310 C
00106 320 C
00106 330 C
00106 340 C SELECT DESIRED ATMOSPHERE INDEX ADJUSTOR
00106 350 C
00111 360 C IOP1 = IOP*NP
00111 370 C
00111 380 C TRANSFER PERTINENT ATMOSPHERE DATA FROM STORAGE ARRAY TO WORKING
00111 390 C ARRAY AND CONVERT TO DESIRED WORKING UNITS (BRITISH ENGINEERING)
00111 400 C
00112 410 C DO 1 I = 1, NP
00112 420 C
00112 430 C TRANSFER ALTITUDE VALUES LIST TO WORKING ARRAY
00112 440 C
00115 450 C ALTYAB(I) = ALTST(I)/0.3048
00115 460 C
00115 470 C TRANSFER PRESSURE VALUES LIST TO WORKING ARRAY
00115 480 C
00116 490 C PRSTAB(I) = PRSLST(IOP1 + 1)/2.11622/1.01325
00116 500 C
00116 510 C TRANSFER DENSITY VALUES LIST TO WORKING ARRAY
00116 520 C
00117 530 C RHOYAB(I) = RHOYST(IOP1 + 1)/7.6479E-2/(1.225*32.17409)
00117 540 C
00117 550 C TRANSFER SPEED OF SOUND VALUES LIST TO WORKING ARRAY
00117 560 C
00120 570 C SONTAB(I) = SONLST(IOP1 + 1)/0.3048
00120 580 C
00120 590 C TRANSFER COEFFICIENT OF VISCOSITY VALUES LIST TO WORKING ARRAY
00120 600 C
00121 610 C VISTAB(I) = VISLST(IOP1 + 1)/1.02029/(1.7897*32.1741)
00123 620 C M = NP - 1
00123 630 C
00123 640 C REARRANGE DATA IN ACCORDANCE WITH ASCENDING VALUES OF THE
00123 650 C INDEPENDENT VARIABLE - ALTITUDE
00123 660 C
00124 670 C
00127 680 C DO 300 I = 1, M
00130 690 C K = 1
00131 700 C IJ = 1 + 1
00134 710 C DO 200 J = IJ, NP
00136 720 C IF (ALTYAB(K).GT.ALTYAB(IJ)) K = J
00140 730 C 200 CONTINUE
00141 740 C AS = ALTYAB(K)
00142 750 C YS1 = PRSTAB(K)
00143 760 C YS2 = RHOYAB(K)
00144 770 C YS3 = SONTAB(K)
00145 780 C YS4 = VISTAB(K)
00146 790 C ALTYAB(K) = ALTYAB(IJ)
00147 800 C PRSTAB(K) = PRSTAB(IJ)
00147 810 C RHOYAB(K) = RHOYAB(IJ)
00150 810 C SONTAB(K) = SONTAB(IJ)

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00151      82°      VISTAB(K) = VISTAB(I)
00152      83°      ALTTAB(I) = AS
00153      84°      PRSTAB(I) = YS1
00154      85°      RHOTAB(I) = YS2
00155      86°      SONTAB(I) = YS3
00156      87°      300 VISTAB(I) = YS4
00156      88°      C
00156      89°      C
00156      90°      C
00156      91°      C
00156      92°      C
00156      93°      C
00156      94°      C
00156      95°      C
00156      96°      C
00156      97°      C
00160      98°      D(1) = (PRSTAB(2) - PRSTAB(1))/(ALTTAB(2) - ALTTAB(1))
00161      99°      D(2) = (PRSTAB(NP) - PRSTAB(NP-1))/(ALTTAB(NP) - ALTTAB(NP-1))
00161     100°      C
00161     101°      C
00161     102°      C
00162     103°      CALL SPLN(INP,ALTTAB,PRSTAB,JI,JN,D,CP,WORK)
00162     104°      C
00162     105°      C
00163     106°      D(1) = (RHOTAB(2) - RHOTAB(1))/(ALTTAB(2) - ALTTAB(1))
00164     107°      D(2) = (RHOTAB(NP) - RHOTAB(NP-1))/(ALTTAB(NP) - ALTTAB(NP-1))
00164     108°      C
00164     109°      C
00164     110°      C
00165     111°      CALL SPLN(INP,ALTTAB,RHOTAB,JI,JN,D,CR,WORK)
00165     112°      C
00165     113°      C
00166     114°      D(1) = (SONTAB(2) - SONTAB(1))/(ALTTAB(2) - ALTTAB(1))
00167     115°      D(2) = (SONTAB(NP) - SONTAB(NP-1))/(ALTTAB(NP) - ALTTAB(NP-1))
00167     116°      C
00167     117°      C
00167     118°      C
00167     119°      C
00170     120°      CALL SPLN(INP,ALTTAB,SONTAB,JI,JN,D,CS,WORK)
00170     121°      C
00170     122°      C
00171     123°      D(1) = (VISTAB(2) - VISTAB(1))/(ALTTAB(2) - ALTTAB(1))
00172     124°      D(2) = (VISTAB(NP) - VISTAB(NP-1))/(ALTTAB(NP) - ALTTAB(NP-1))
00172     125°      C
00172     126°      C
00172     127°      C
00172     128°      C
00173     129°      CALL SPLN(INP,ALTTAB,VISTAB,JI,JN,D,CV,WORK)
00173     130°      C
00173     131°      C
00174     132°      RETURN
00175     133°      END

```

END OF COMPILATION! NO DIAGNOSTICS.

W FOR ATMSPL,ATMSPL
 -NIVAL 1100 FORTSAR V L2EC 11 LEVEL 25A -124ECB LEVEL 112010010A
 THIS COMPILATION WAS DONE ON 11 FEB 74 AT 20:52:11

11 FEB 74

20152111. 13

SUBROUTINE ATMSPL ENTRY POINT 000211

STORAGE USED: CODE(1); 000227; DATA(8); 000021; BLANK COMMON(2); 000000

COMMON BLOCKS:

0003 S PLOAT 000037

EXTERNAL REFERENCES (BLOCK, NAME):

0004 REF225

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

| | | | | | | | | | | | | | | | |
|------|--------|--------|--------|--------|------|--------|--------|------|--------|--------|--------|------|--------|--------|--------|
| 0001 | 000023 | 10L | 0001 | 000035 | 100L | 0001 | 000050 | 200L | 0001 | 200131 | 500L | 0001 | 000151 | 501L | |
| 0002 | R | 000000 | ALTTAB | 0002 | R | 001147 | CP | 0002 | R | 001725 | CR | 0002 | R | 001725 | CS |
| 0000 | R | 000002 | ZI | 0000 | I | 000001 | I | 0000 | 000000 | INJPS | 0000 | I | 0000 | IS | |
| 0002 | R | 000240 | RHDTAB | 0002 | R | 000261 | SOHTAB | 0002 | R | 000754 | VISTAB | 0002 | R | 000773 | PRSTAB |

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00101 10      SUBROUTINE ATMSPL(V,PANS)
00101 20      C
00102 30      C   PARAMETER NP = 123, NP = JUMP + 3
00103 40      C
00104 50      C   DIMENSION
00104 60      C   IFANS(8)
00104 70      C
00105 80      C   COMMON /SPLDAT/
00105 90      C   IALTTAB(NP), PRSTAB(NP), RHDTAB(NP), SOHTAB(NP), VISTAB(NP),
00105 100     C   ZCP(NP), CRINP), CSINP), CV(NP)
00105 110     C
00106 120     C   DATA IS / 1 /
00106 130     C
00106 140     C
00106 150     C   ESTABLISH THE INTERVAL IN WHICH THE SPECIFIED ALTITUDE LIES
00106 160     C
00106 170     C
00110 180     C   IF(V-LE-ALTTAB(1))GO TO 500
00112 190     C   IF(V-GE-ALTTAB(NP))GO TO 501
00114 200     C   I = IS
00115 210     C   IF(V-GT-ALTTAB(1))GO TO 100
00117 220     C   I = I - 1
00120 230     C   IF(V-LT-ALTTAB(1))GO TO 10
00122 240     C   GO TO 200
00123 250     C   100 I = I + 1
00124 260     C   IF(V-GT-ALTTAB(1))GO TO 100
00126 270     C   I = I - 1
00127 280     C   200 IS = I

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00130 290      DX = V - ALTTAB(I)
00130 300      C
00130 310      C   EMPLOY CUBIC INTERPOLATION TO COMPUTE PRESSURE/SEA LEVEL RATIO
00130 320      C
00131 330      FANS(1) = PRSTAB(I) + ((CP(3*1)*DX + CP(3*1-1)*DX + CP(3*1-2))*DX
00132 340      FANS(5) = FANS(1)/PRSTAB(I)
00132 350      C
00132 360      C   EMPLOY CUBIC INTERPOLATION TO COMPUTE DENSITY/SEA LEVEL RATIO
00132 370      C
00133 380      FANS(2) = RHOTAB(I) + ((CR(3*1)*DX + CR(3*1-1)*DX + CR(3*1-2))*DX
00134 390      FANS(6) = FANS(2)/RHOTAB(I)
00134 400      C
00134 410      C   EMPLOY CUBIC INTERPOLATION TO COMPUTE SPEED OF SOUND/SEA LEVEL
01 34 420      C   RATIO
00134 430      C
00135 440      FANS(3) = SONTAB(I) + ((CS(3*1)*DX + CS(3*1-1)*DX + CS(3*1-2))*DX
00136 450      FANS(7) = FANS(3)/SONTAB(I)
00136 460      C
00136 470      C   EMPLOY CUBIC INTERPOLATION TO COMPUTE COEFFICIENT OF VISCOSITY/SEA
00136 480      C   LEVEL RATIO
00136 490      C
00137 500      FANS(4) = VISTAB(I) + ((CV(3*1)*DX + CV(3*1-1)*DX + CV(3*1-2))*DX
00140 510      FANS(8) = FANS(4)/VISTAB(I)
00141 520      RETURN
00141 530      C
00141 540      C
00141 550      C   INITIAL BOUNDARY VALUES - FUNCTION/SEA LEVEL RATIO
00141 560      C
00142 570      500 FANS(1) = PRSTAB(I)
00143 580      FANS(2) = RHOTAB(I)
00144 590      FANS(3) = SONTAB(I)
00145 600      FANS(4) = VISTAB(I)
00146 610      FANS(5) = 1.0
00147 620      FANS(6) = 1.0
00150 630      FANS(7) = 1.0
00151 640      FANS(8) = 1.0
00152 650      RETURN
00152 660      C
00152 670      C
00152 680      C   TERMINAL BOUNDARY VALUES - FUNCTION/SEA LEVEL RATIO
00152 690      C
00153 700      501 FANS(1) = PRSTAB(NP)
00154 710      FANS(2) = RHOTAB(NP)
00155 720      FANS(3) = SONTAB(NP)
00156 730      FANS(4) = VISTAB(NP)
00157 740      FANS(5) = FANS(1)/PRSTAB(I)
00160 750      FANS(6) = FANS(2)/RHOTAB(I)
00161 760      FANS(7) = FANS(3)/SONTAB(I)
00162 770      FANS(8) = FANS(4)/VISTAB(I)
00162 780      C
00162 790      C
00163 800      RETURN
00164 810      END

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END OF COMPILATION: NO DIAGNOSTICS.

M FOR SPLM1,SPLM1
 UNITAC 1100 PONTIAC V LABC 11 LEVEL 264 -IERECC LEVEL (120100104)
 THIS COMPILATION WAS DONE ON 11 FEB 74 AT 20152:12

11 FEB 74

20152112-667

SUBROUTINE SPLM1 ENTRY POINT 000676

SOURCE USES(COOL(1) 000737(DATA(0) 000110(BLANK (COMMON(2) 000000

EXTERNAL REFERENCES (BLOCK, NAME)

0002 HERR20
 0004 HERR20

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

| | | | | | | | | | | | | | | |
|------|--------|------|------|--------|------|------|--------|-------|------|--------|------|------|--------|------|
| 0001 | 000130 | 1L | 0001 | 000230 | 1176 | 0001 | 000291 | 1336 | 0001 | 000301 | 1436 | 0001 | 000473 | 1616 |
| 0001 | 000557 | 1A76 | 0001 | 000574 | 1706 | 0001 | 000152 | 2L | 0001 | 000205 | 2AL | 0001 | 000610 | 2016 |
| 0001 | 000161 | 3L | 0001 | 000367 | 4L | 0001 | 000320 | 40L | 0001 | 000540 | 5AL | 0001 | 000731 | 70L |
| 0001 | 000569 | 71L | 0000 | 000000 | 1 | 0000 | 000019 | 14JPS | 0000 | 000000 | H | 0000 | 000002 | HH |

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00101 10 SUBROUTINE SPLM1(M,X,Y,J1,JN,D,C,0)
00101 20 C
00103 30 DIMENSION R(1),Y(1),D(2),D(1),C(1)
00103 40 C
00103 50 C
00103 60 C M - AN INTEGER DENOTING THE NUMBER OF DATA POINTS USED TO
00103 70 C REPRESENT THE FUNCTION IN THE REGION OF DEFINITION
00103 80 C
00103 90 C X - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY M CONTAINING THE
00103 100 C VALUES OF THE INDEPENDENT VARIABLE IN ASCENDING ORDER
00103 110 C
00103 120 C Y - A ONE-DIMENSIONAL ARRAY DIMENSIONED BY M CONTAINING THE
00103 130 C VALUES OF THE DEPENDENT VARIABLE CORRESPONDING IN
00103 140 C SEQUENCE TO THE VALUES IN THE X ARRAY
00103 150 C
00103 160 C J1,JN - INTEGERS DEFINED AS FOLLOWS
00103 170 C
00103 180 C J1 = 1 - FIRST DERIVATIVE OF THE FUNCTION AT THE FIRST TABULATED
00103 190 C DATA POINT IS SUPPLIED IN D(1)
00103 200 C
00103 210 C J1 = 2 - SECOND DERIVATIVE OF THE FUNCTION AT THE FIRST TABULATED
00103 220 C DATA POINT IS SUPPLIED IN D(1)
00103 230 C
00103 240 C J1 = 3 - FIRST AND SECOND DERIVATIVES OF THE FUNCTION AT THE FIRST
00103 250 C DATA POINT ARE SUPPLIED IN D(1) AND D(2), RESPECTIVELY
00103 260 C
00103 270 C J1 = 4 - FIRST AND SECOND DERIVATIVES OF THE FUNCTION AT THE LAST
00103 280 C DATA POINT ARE SUPPLIED IN D(1) AND D(2), RESPECTIVELY
00103 290 C
00103 300 C JN = 1 - FIRST DERIVATIVE OF THE FUNCTION AT THE LAST TABULATED
00103 310 C DATA POINT IS SUPPLIED IN D(2)

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00103 320 C
00105 330 C JN = 2 = SECOND DERIVATIVE OF THE FUNCTION AT THE LAST TABULATED
00103 340 C DATA POINT IS SUPPLIED IN D(2)
00103 350 C
00103 360 C D = A ONE-DIMENSIONAL ARRAY DIMENSIONED BY 2 CONTAINING THE
00103 370 C VALUES OF THE DERIVATIVES OF THE FUNCTION SPECIFIED IN
00103 380 C ACCORDANCE WITH J2 AND JN
00103 390 C C = A ONE-DIMENSIONAL ARRAY DIMENSIONED BY 3*(N-1) CONTAINING
00103 400 C THE CUBIC SPLINE INTERPOLATING COEFFICIENTS FOR EACH
00103 410 C INTERVAL
00103 420 C
00103 430 C * = A ONE-DIMENSIONAL ARRAY DIMENSIONED BY N USED AS A WORKING
00103 440 C ARRAY ONLY
00103 450 C
00103 460 C
00103 470 C COMPUTE THE INITIAL VALUES OF THE RECURSIVE RELATIONS IN
00103 480 C ACCORDANCE WITH THE SPECIFIED PROPERTY OF THE FUNCTION AT THE
00103 490 C INITIAL BOUNDARY
00103 500 C
00103 510 C
00104 520 GO TO (1,2,3,4),J1
00105 530 1 R(1) = -0.5
00106 540 C(1) = 3.0/(X(2) - X(1))*(Y(2) - Y(1))/(X(2) - X(1)) - D(1)
00107 550 GO TO 20
00110 560 2 R(1) = 0.0
00111 570 C(1) = D(1)
00112 580 GO TO 20
00113 590 3 R(1) = 1.0
00114 600 C(1) = 3.0*D(2) + 6.0/(X(2) - X(1))*(D(1) - (Y(2) - Y(1))/(X(2) -
00114 610 X(1)))
00115 620 20 N = N - 1
00115 630 C
00116 640 C COMPUTE ALL INTERMEDIATE RECURSIVE RELATION VALUES
00116 650 C
00116 660 DO 30 I = 2,N
00121 670 R(I) = -(X(I+1) - X(I))/(2.0*(X(I+1) - X(I-1)) + (X(I) - X(I-1))*R
00121 680 X(I-1))
00122 690 30 C(I) = R(I)/(X(I+1) - X(I)) + (6.0*(Y(I) - Y(I-1))/(X(I) - X(I-1))
00122 700 X - (Y(I+1) - Y(I))/(X(I+1) - X(I))) + (X(I) - X(I-1))*C(I-1)
00122 710 C
00122 720 C COMPUTE THE TERMINAL VALUES OF THE RECURSIVE RELATION IN
00122 730 C ACCORDANCE WITH THE SPECIFIED PROPERTY OF THE FUNCTION AT THE
00122 740 C TERMINAL BOUNDARY
00122 750 C
00124 760 IF(J1.GT.2)GO TO 70
00124 770 IF(JN.EQ.2)GO TO 40
00130 780 C(N) = (6.0/(X(N) - X(N-1))*(D(2) - (Y(N) - Y(N-1))/(X(N) - X(N-1)
00130 790 X) - C(N))/(2.0 + R(N))
00130 800 C
00131 810 GO TO 50
00132 820 40 C(N) = D(2)
00132 830 C
00132 840 C COMPUTE THE APPROXIMATE SECOND DERIVATIVE VALUES OF THE FUNCTION
00132 850 C AT THE SPECIFIED DATA POINTS
00132 860 C
00133 870 GO TO 50
00134 880 70 DO 72 I = 1,N
00137 890 72 C(I+N) = C(I)

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ORIGINAL PAGE
OF POOR QUALITY


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00141  90*      C(I) = D(2)
00142  91*      DO 73 I = 1,M
00145  92*      73 C(I+1) = (C(I) - C(I+M))/M(I)
00147  93*      GO TO 71
00150  94*      * M = N - 1
00151  95*      M(M) = 1.0
00152  96*      C(M) = D(2)
00153  97*      C(M) = 6.0/(X(M) - X(M-1))*(D(1) - (Y(M) - Y(M-1))/(X(M) - X(M-1)) -
00153  98*      X3.0*D(2))
00154  99*      MM = M - 1
00155 100*      IF(MM).50,
00160 101*      DO 80 I = MM,1,-1
00163 102*      W(I) = -1.0/(X(I+1) - X(I))*(X(I+2) - X(I+1))/M(I+1) + 2.0*(X(I+2)
00163 103*      X) - X(I))
00164 104*      80 C(I) = 1.0/(X(I+1) - X(I))*(C(I+1)*(X(I+2) - X(I+1))/M(I+1) - 6.0*
00164 105*      X((Y(I+1) - Y(I))/(X(I+1) - X(I)) - (Y(I+2) - Y(I+1))/(X(I+2) - X(I)
00164 106*      X*(I))))
00166 107*      50 DO 60 I = M,1,-1
00171 108*      60 C(I) = C(I) + W(I)*C(I+1)
00173 109*      71 DO 61 I = 1,M
00176 110*      61 W(I) = C(I)
00176 111*      C
00176 112*      C   COMPUTE THE CUBIC SPLINE INTERPOLATION COEFFICIENTS FOR THE 1-ST,
00176 113*      C   2-ND, AND 3-RD DEGREE TERMS, IN THAT ORDER
00176 114*      C
00200 115*      DO 62 I = 1,M
00203 116*      C(2+I-2) = (Y(I+1) - Y(I))/(X(I+1) - X(I)) - (W(I+1) + 2.0*W(I))*C
00203 117*      IX(I+1) - X(I))/6.0 ,
00204 118*      C(3+I-1) = 0.5*W(I),
00205 119*      62 C(3+I) = (W(I+1) - W(I))/6.0*(X(I+1) - X(I))
00205 120*      C
00207 121*      RETURN
00210 122*      END

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END OF COMPILATION: NO DIAGNOSTICS.

FOR SPARE PARTS, ETC
 UNITAL 1100 FURNISH Y LALC 11 LEVEL 25A -11RECH, LEVEL E12010010A1
 THIS COMPILATION WAS DONE ON 12 DEC 73 AT 13:00:50

12 DEC 73

131 618022

BLOCK DATA

STORAGE USED: (00E11) 000000: DATA0; 000001: BLANK COMMON2; 000000

COMMON BLOCKS:

0003 ATDATA 000200

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0003 R 005010 ALTLST 0003 R 000170 D 0000 I 000000 I 0003 R 000000 PRSLST 0003 R 001302 RWLST
 0003 R 002700 SOLST 0003 R 000200 VISLST 0003 R 000000 WGR

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00101 10  BLOCK DATA
00101 20  C
00102 30  PARAMETER NP = 123
00103 40  PARAMETER NP11 = 1, NP12 = 119, NP13 = 115, NP14 = NP
00104 50  PARAMETER NP21=NP11+NP, NP22=NP12+NP, NP23=NP13+NP, NP24=NP14+NP
00105 60  PARAMETER NP31=NP21+NP, NP32=NP22+NP, NP33=NP23+NP, NP34=NP24+NP
00106 70  PARAMETER NP41=NP31+NP, NP42=NP32+NP, NP43=NP33+NP, NP44=NP34+NP
00107 80  PARAMETER NP51=NP41+NP, NP52=NP42+NP, NP53=NP43+NP, NP54=NP44+NP
00108 90  PARAMETER NP61=NP51+NP, NP62=NP52+NP, NP63=NP53+NP, NP64=NP54+NP
00110 100 C
00111 110 COMMON/ATDATA/
00111 120 (PRSLSTINP(1), RWLSTINP(1), SOLSTINP(1), VISLSTINP(1),
00111 130 2ALTLSTINP(1), WGRINP, 0121)
00111 140 C
00111 150 C
00111 160 C
00111 170 C
00112 180 DATA TALTLST(17,1)=NP11, NP(21)/
00112 190 1 2 3 4 5 6
00112 200 C 20-0E0, 2-5E2, 5-0E2, 7-5E2, 1-0E3, 1-25E3, 1
00112 210 7 8 9 10 11 12
00112 220 C 21-5E3, 1-75E3, 2-0E3, 2-25E3, 2-5E3, 2-75E3, 2
00112 230 13 14 15 16 17 18
00112 240 C 23-0E3, 3-5E3, 4-0E3, 4-5E3, 5-0E3, 6-0E3, 3
00112 250 19 20 21 22 23 24
00112 260 C 27-0E3, 8-0E3, 9-0E3, 1-0E4, 1-1E4, 1-2E4, 4
00112 270 25 26 27 28 29 30
00112 280 C 31-3E4, 1-4E4, 1-5E4, 1-6E4, 1-7E4, 1-8E4, 5
00112 290 31 32 33 34 35 36
00112 300 C 31-9E4, 2-4E4, 2-2E4, 2-7E4, 2-6E4, 2-8E4, 6
00112 310 37 38 39 40 41 42
00112 320 C 33-0E4, 3-2E4, 3-4E4, 3-6E4, 3-8E4, 4-0E4, 7
00112 330 43 44 45 46 47 48
00112 340 C 44-2E4, 4-4E4, 4-6E4, 4-8E4, 5-0E4, 5-2E4, 8
00112 350 49 50 51 52 53 54
00112 360 C 45-4E4, 5-6E4, 5-8E4, 6-0E4, 6-2E4, 6-4E4, 9
00112 370 55 56 57 58 59 60
  
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| | | | | | | | | | | |
|-------|-----|---|--|-------------|-------------|-------------|-------------|-------------|----|--|
| 00112 | 30° | | X6.0E4, | 6.0E4, | 7.0E4, | 7.2E4, | 7.4E4, | 7.6E4, | 10 | |
| 00112 | 30° | C | 01 | 02 | 03 | 04 | 05 | 06 | | |
| 00112 | 40° | | X7.0E4, | 8.0E4, | 8.2E4, | 8.4E4, | 8.6E4, | 8.8E4, | 11 | |
| 00112 | 40° | C | 07 | 08 | 09 | 10 | 11 | 12 | | |
| 00112 | 42° | | X9.0E4, | 9.2E4, | 9.4E4, | 9.6E4, | 9.8E4, | 1.0E5, | 12 | |
| 00112 | 42° | C | 13 | 14 | 15 | 16 | 17 | 18 | | |
| 00112 | 44° | | X1.0E5, | 1.0E5, | 1.06E5, | 1.08E5, | 1.1E5, | 1.12E5, | 13 | |
| 00112 | 44° | C | 19 | 20 | 21 | 22 | 23 | 24 | | |
| 00112 | 46° | | X1.1E5, | 1.1E5, | 1.18E5, | 1.20E5, | 1.22E5, | 1.24E5, | 14 | |
| 00112 | 46° | C | 25 | 26 | 27 | 28 | 29 | 30 | | |
| 00112 | 48° | | X1.2E5, | 1.2E5, | 1.3E5, | 1.32E5, | 1.34E5, | 1.36E5, | 15 | |
| 00112 | 48° | C | 31 | 32 | 33 | 34 | 35 | 36 | | |
| 00112 | 50° | | X1.3E5, | 1.3E5, | 1.42E5, | 1.44E5, | 1.46E5, | 1.48E5, | 16 | |
| 00112 | 50° | C | 37 | 38 | 39 | 40 | 41 | 42 | | |
| 00112 | 52° | | X1.5E5, | 1.52E5, | 1.54E5, | 1.56E5, | 1.58E5, | 1.60E5, | 17 | |
| 00112 | 52° | C | 43 | 44 | 45 | 46 | 47 | 48 | | |
| 00112 | 54° | | X1.6E5, | 1.6E5, | 1.72E5, | 1.74E5, | 1.76E5, | 1.78E5, | 18 | |
| 00112 | 54° | C | 49 | 50 | 51 | 52 | 53 | 54 | | |
| 00112 | 56° | | X1.8E5, | 1.8E5, | 1.96E5, | 2.0E5, | 2.04E5, | 2.08E5, | 19 | |
| 00112 | 56° | C | 55 | 56 | 57 | 58 | 59 | 60 | | |
| 00114 | 58° | | DATA (ALTLST(1),INP13,INP14)/ | | | | | | | |
| 00114 | 58° | C | 115 | 116 | 117 | 118 | 119 | 120 | | |
| 00114 | 60° | | X0.5E3, | 1.15E4, | 2.3E4, | 4.9E4, | 5.1E4, | 5.3E4, | | |
| 00114 | 60° | C | 121 | 122 | 123 | | | | | |
| 00114 | 62° | | X0.1E4, | 0.3E4, | 0.9E4, | | | | | |
| 00114 | 62° | C | | | | | | | | |
| 00114 | 64° | | 1962 - STANDARD ATMOSPHERE | | | | | | | |
| 00114 | 64° | C | | | | | | | | |
| 00114 | 66° | | PRESSURE VALUES TABULATED IN MILLIBARS | | | | | | | |
| 00114 | 66° | C | | | | | | | | |
| 00114 | 68° | | DATA (PRSLST(1),INP11,INP12)/ | | | | | | | |
| 00114 | 68° | C | 1 | 2 | 3 | 4 | 5 | 6 | | |
| 00114 | 70° | | X1.01325E3, | 9.83576E2, | 9.59612E2, | 9.26346E2, | 8.98762E2, | 8.71850E2, | | |
| 00114 | 70° | C | 7 | 8 | 9 | 10 | 11 | 12 | | |
| 00114 | 72° | | X0.55596E2, | 0.19988E2, | 7.95014E2, | 7.70661E2, | 7.46917E2, | 7.23771E2, | | |
| 00114 | 72° | C | 13 | 14 | 15 | 16 | 17 | 18 | | |
| 00114 | 74° | | X7.01211E2, | 6.57403E2, | 6.16609E2, | 5.77525E2, | 5.40482E2, | 5.02176E2, | | |
| 00114 | 74° | C | 19 | 20 | 21 | 22 | 23 | 24 | | |
| 00114 | 76° | | X4.11052E2, | 3.56516E2, | 3.08007E2, | 2.64999E2, | 2.26999E2, | 1.93999E2, | | |
| 00114 | 76° | C | 25 | 26 | 27 | 28 | 29 | 30 | | |
| 00114 | 78° | | X1.65796E2, | 1.41704E2, | 1.21110E2, | 1.03528E2, | 8.84971E1, | 7.56527E1, | | |
| 00114 | 78° | C | 31 | 32 | 33 | 34 | 35 | 36 | | |
| 00114 | 80° | | X0.46748E1, | 5.52930E1, | 4.04749E1, | 2.97174E1, | 2.18837E1, | 1.61619E1, | | |
| 00114 | 80° | C | 37 | 38 | 39 | 40 | 41 | 42 | | |
| 00114 | 82° | | X1.19703E1, | 8.89043E0, | 6.63412E0, | 4.98522E0, | 3.77138E0, | 2.87143E0, | | |
| 00114 | 82° | C | 43 | 44 | 45 | 46 | 47 | 48 | | |
| 00114 | 84° | | X2.19967E0, | 1.67496E0, | 1.31340E0, | 1.02246E0, | 7.97790E-1, | 6.22283E-1, | | |
| 00114 | 84° | C | 49 | 50 | 51 | 52 | 53 | 54 | | |
| 00114 | 86° | | X4.84917E-1, | 3.78572E-1, | 2.91373E-1, | 2.24606E-1, | 1.72457E-1, | 1.31509E-1, | | |
| 00114 | 86° | C | 55 | 56 | 57 | 58 | 59 | 60 | | |
| 00114 | 88° | | X9.94067E-2, | 7.44483E-2, | 5.52047E-2, | 4.05013E-2, | 2.93758E-2, | 2.1045E-2, | | |
| 00114 | 88° | C | 61 | 62 | 63 | 64 | 65 | 66 | | |
| 00114 | 90° | | X1.4877E-2, | 1.0366E-2, | 7.1691E-3, | 4.9542E-3, | 3.4313E-3, | 2.3746E-3, | | |
| 00114 | 90° | C | 67 | 68 | 69 | 70 | 71 | 72 | | |
| 00114 | 92° | | X1.6438E-3, | 1.1449E-3, | 8.0683E-4, | 5.7443E-4, | 4.1377E-4, | 3.0075E-4, | | |
| 00114 | 92° | C | 73 | 74 | 75 | 76 | 77 | 78 | | |
| 00114 | 94° | | X2.2123E-4, | 1.6597E-4, | 1.2462E-4, | 9.5225E-5, | 7.0544E-5, | 5.7623E-5, | | |
| 00114 | 94° | C | 79 | 80 | 81 | 82 | 83 | 84 | | |

| | | | | | | | | |
|-------|------|---|-------------------------------|-----------|-----------|------------|------------|------------|
| 00110 | 96° | | X4.5919E-5 | 3.7137E-5 | 3.0426E-5 | 2.5217E-5 | 2.1210E-5 | 1.8139E-5 |
| 00110 | 97° | C | 85 | 86 | 87 | 88 | 89 | 90 |
| 00110 | 98° | | X1.5720E-5 | 1.3791E-5 | 1.2214E-5 | 1.0909E-5 | 9.8151E-6 | 8.8882E-6 |
| 00110 | 99° | C | 91 | 92 | 93 | 94 | 95 | 96 |
| 00110 | 100° | | X8.0950E-6 | 7.4104E-6 | 6.8148E-6 | 6.2931E-6 | 5.8331E-6 | 5.4252E-6 |
| 00110 | 101° | C | 97 | 98 | 99 | 100 | 101 | 102 |
| 00110 | 102° | | X5.0617E-6 | 4.7345E-6 | 4.4375E-6 | 4.1671E-6 | 3.9202E-6 | 3.6943E-6 |
| 00110 | 103° | C | 103 | 104 | 105 | 106 | 107 | 108 |
| 00110 | 104° | | X3.2932E-6 | 2.9475E-6 | 2.6479E-6 | 2.3851E-6 | 2.1536E-6 | 1.9491E-6 |
| 00110 | 105° | C | 109 | 110 | 111 | 112 | 113 | 114 |
| 00110 | 106° | | X1.740E-6 | 1.6070E-6 | 1.4630E-6 | 1.3339E-6 | 1.2179E-6 | 1.1190E-6 |
| 00110 | 107° | C | | | | | | |
| 00120 | 108° | | DATA (PMSLST(1),I,NP13,NP14)/ | | | | | |
| 00120 | 109° | C | 115 | 116 | 117 | 118 | 119 | 120 |
| 00120 | 110° | | X3.3154E-2 | 2.0964E-2 | 3.4668E-2 | 9.03367E-1 | 7.04580E-1 | 5.49540E-1 |
| 00120 | 111° | C | 121 | 122 | 123 | | | |
| 00120 | 112° | | X8.6204E-3 | 5.9624E-3 | 1.9756E-3 | | | |
| 00120 | 113° | C | | | | | | |
| 00120 | 114° | C | | | | | | |
| 00120 | 115° | C | | | | | | |
| 00120 | 116° | C | | | | | | |
| 00122 | 117° | | DATA (RMOLST(1),I,NP11,NP12)/ | | | | | |
| 00122 | 118° | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00122 | 119° | | X1.2250E0 | 1.1959E0 | 1.1673E0 | 1.1392E0 | 1.1117E0 | 1.0846E0 |
| 00122 | 120° | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00122 | 121° | | X1.0581E0 | 1.0321E0 | 1.0066E0 | 9.8151E-1 | 9.5695E-1 | 9.3287E-1 |
| 00122 | 122° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00122 | 123° | | X9.0925E-1 | 8.6340E-1 | 8.1935E-1 | 7.7704E-1 | 7.3643E-1 | 6.9601E-1 |
| 00122 | 124° | C | 19 | 20 | 21 | 22 | 23 | 24 |
| 00122 | 125° | | X5.9002E-1 | 5.2579E-1 | 4.6706E-1 | 4.1351E-1 | 3.6480E-1 | 3.1194E-1 |
| 00122 | 126° | C | 25 | 26 | 27 | 28 | 29 | 30 |
| 00122 | 127° | | X2.6660E-1 | 2.2780E-1 | 1.9475E-1 | 1.6647E-1 | 1.4230E-1 | 1.2165E-1 |
| 00122 | 128° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00122 | 129° | | X1.0400E-1 | 8.8910E-2 | 6.4510E-2 | 4.6930E-2 | 3.4257E-2 | 2.5076E-2 |
| 00122 | 130° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00122 | 131° | | X1.8410E-2 | 1.3555E-2 | 9.8874E-3 | 7.2579E-3 | 5.3666E-3 | 3.9957E-3 |
| 00122 | 132° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00122 | 133° | | X2.9948E-3 | 2.2589E-3 | 1.7141E-3 | 1.3167E-3 | 1.0269E-3 | 8.0097E-4 |
| 00122 | 134° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00122 | 135° | | X6.3137E-4 | 4.9762E-4 | 3.9086E-4 | 3.0592E-4 | 2.3931E-4 | 1.8837E-4 |
| 00122 | 136° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00122 | 137° | | X1.4713E-4 | 1.1399E-4 | 8.7535E-5 | 6.6593E-5 | 5.0151E-5 | 3.736E-5 |
| 00122 | 138° | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00122 | 139° | | X2.750E-5 | 1.999E-5 | 1.382E-5 | 9.563E-6 | 6.617E-6 | 4.579E-6 |
| 00122 | 140° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00122 | 141° | | X3.170E-6 | 2.137E-6 | 1.459E-6 | 1.008E-6 | 7.044E-7 | 4.974E-7 |
| 00122 | 142° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00122 | 143° | | X3.493E-7 | 2.492E-7 | 1.804E-7 | 1.323E-7 | 9.829E-8 | 7.153E-8 |
| 00122 | 144° | C | 79 | 80 | 81 | 82 | 83 | 84 |
| 00122 | 145° | | X5.321E-8 | 4.035E-8 | 3.112E-8 | 2.436E-8 | 1.844E-8 | 1.434E-8 |
| 00122 | 146° | C | 85 | 86 | 87 | 88 | 89 | 90 |
| 00122 | 147° | | X1.140E-8 | 9.224E-9 | 7.589E-9 | 6.327E-9 | 5.337E-9 | 4.549E-9 |
| 00122 | 148° | C | 91 | 92 | 93 | 94 | 95 | 96 |
| 00122 | 149° | | X3.413E-9 | 3.394E-9 | 2.965E-9 | 2.608E-9 | 2.307E-9 | 2.053E-9 |
| 00122 | 150° | C | 97 | 98 | 99 | 100 | 101 | 102 |
| 00122 | 151° | | X1.836E-9 | 1.666E-9 | 1.515E-9 | 1.382E-9 | 1.264E-9 | 1.159E-9 |
| 00122 | 152° | C | 103 | 104 | 105 | 106 | 107 | 108 |
| 00122 | 153° | | X9.71E-10 | 8.624E-10 | 7.532E-10 | 6.433E-10 | 5.450E-10 | 4.5189E-10 |

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00122 154° C      109      110      111      114      113      114
00122 155°      X4.008E-10, 4.115E-10, 3.692E-10, 3.318E-10, 2.986E-10, 2.910E-10/
00122 156° C
00124 157°      DATA (MOLST(1),I=NP13,NP14)/
00124 158° C      115      116      117      118      119      120
00124 159°      X4.9576E-10, 3.3743E-10, 5.5006E-10, 1.1628E-09, 9.0690E-10, 7.1029E-10,
00124 160° C      121      122      123
00124 161°      X1.662E-05, 1.15E-05, 3.810E-06/
00124 162° C
00124 163° C
00124 164° C
00124 165° C
00126 166°      DATA (SONLST(1),I=NP11,NP12)/
00126 167° C      1      2      3      4      5      6
00126 168°      X340.294, 339.323, 338.370, 337.403, 336.435, 335.463,
00126 169° C      7      8      9      10      11      12
00126 170°      X334.489, 333.511, 332.532, 331.549, 330.563, 329.575,
00126 171° C      13      14      15      16      17      18
00126 172°      X328.583, 328.592, 327.589, 326.573, 325.545, 324.452,
00126 173° C      19      20      21      22      23
00126 174°      X312.306, 308.105, 303.848, 299.532, 295.154,
00126 175° C      24 - 32
00126 176°      X      9.295.069,
00126 177° C      33      34      35      36
00126 178°      X      206.377, 297.720, 259.056, 300.386,
00126 179° C      37      38      39      40      41      42
00126 180°      X301.709, 303.025, 306.489, 310.099, 313.665, 317.189,
00126 181° C      43      44      45      46 - 48
00126 182°      X320.672, 324.116, 327.521, 332.9799,
00126 183° C      49      50      51      52      53      54
00126 184°      X327.911, 325.492, 323.058, 320.606, 317.630, 312.628,
00126 185° C      55      56      57      58      59      60
00126 186°      X307.549, 302.387, 297.139, 291.800, 286.365, 280.83,
00126 187° C      61      62 - 114
00126 188°      X275.18, 53.269.44/
00126 189° C
00130 190°      DATA (SONLST(1),I=NP13,NP14)/
00130 191° C      115      116      117      118 - 119      120
00130 192°      X305.984, 295.069, 297.049, 2.329.799, 329.114,
00130 193° C      121 - 123
00130 194°      X      3.269.44/
00130 195° C
00130 196° C
00130 197° C
00130 198° C
00130 199° C
00132 200°      DATA (VISLST(1),I=NP11,NP12)/
00132 201° C      1      2      3      4      5      6
00132 202°      X1.7894E-5, 1.7615E-5, 1.7337E-5, 1.7658E-5, 1.7579E-5, 1.7499E-5,
00132 203° C      7      8      9      10      11      12
00132 204°      X1.7420E-5, 1.7340E-5, 1.7260E-5, 1.7180E-5, 1.7099E-5, 1.7019E-5,
00132 205° C      13      14      15      16      17      18
00132 206°      X1.6938E-5, 1.6775E-5, 1.6612E-5, 1.6448E-5, 1.6282E-5, 1.5949E-5,
00132 207° C      19      20      21      22      23
00132 208°      X1.5612E-5, 1.5271E-5, 1.4926E-5, 1.4577E-5, 1.4223E-5,
00132 209° C      24 - 32
00132 210°      X      9.1.4218E-5,
00132 211° C      33      34      35      36

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00140 270° C
 00140 271° C
 00140 272° C
 00140 273° C
 00142 274° C
 00142 275° C
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 00146 320° C
 00146 321° C
 00146 322° C
 00146 323° C
 00146 324° C
 00146 325° C
 00146 326° C
 00146 327° C

DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER

DATA (RMOLST(1), I=NP21, NP221/

| | 1 | 2 | 3 | 4 | 5 | 6 |
|------------|-----------|-----------|--------------------------|-----------|-----------|---|
| X1.159E0, | 1.135E0, | 1.112E0, | 1.089E0, | 1.066E0, | 1.041E0, | |
| X1.016E0, | 9.923E-1, | 9.686E-1, | 9.452E-1, | 9.222E-1, | 8.997E-1, | |
| X8.776E-1, | 8.348E-1, | 7.937E-1, | 7.540E-1, | 7.159E-1, | 6.793E-1, | |
| X5.419E-1, | 5.232E-1, | 4.694E-1, | 4.199E-1, | 3.742E-1, | 3.324E-1, | |
| X2.941E-1, | 2.592E-1, | 2.275E-1, | 1.929E-1, | 1.617E-1, | 1.357E-1, | |
| X1.142E-1, | 9.618E-2, | 6.870E-2, | 4.944E-2, | 3.579E-2, | 2.607E-2, | |
| X1.909E-2, | 1.406E-2, | 1.038E-2, | 7.709E-3, | 5.759E-3, | 4.326E-3, | |
| X3.268E-3, | 2.482E-3, | 1.894E-3, | 1.460E-3, | 1.140E-3, | 8.942E-4, | |
| X7.071E-4, | 5.573E-4, | 4.378E-4, | 3.435E-4, | 2.710E-4, | 2.123E-4, | |
| X1.651E-4, | 1.273E-4, | 9.739E-5, | 7.380E-5, | 5.539E-5, | 4.113E-5, | |
| X3.020E-5, | 2.190E-5, | 1.568E-5, | 1.070E-5, | 7.282E-6, | 4.956E-6, | |
| X3.379E-6, | 2.256E-6, | 1.516E-6, | 1.030E-6, | 7.065E-7, | 4.892E-7, | |
| X3.392E-7, | 2.288E-7, | 1.588E-7, | 1.130E-7, | 8.213E-8, | 6.087E-8, | |
| X4.388E-8, | 3.259E-8, | | 81 - 114 39*2.486E-8/ | | | |

DATA (RMOLST(1), I=NP23, NP241/

| | 115 | 116 | 117 | 118 | 119 | 120 |
|------------|-----------|-----------|-----------|-----------|-----------|-----|
| X4.958E-1, | 3.529E-1, | 5.823E-2, | 1.290E-3, | 1.008E-3, | 7.955E-4, | |
| X1.456E-5, | 1.298E-5, | 4.089E-6/ | | | | |

SPEED OF SOUND VALUES TABULATED IN METERS PER SECOND

DATA (SMOLST(1), I=NP21, NP221/

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---------|--------|--------|--------|--------|--------|---|
| X349.9, | 378.8, | 347.3, | 346.0, | 344.7, | 343.8, | |
| X342.9, | 342.0, | 341.1, | 340.3, | 339.4, | 338.5, | |
| X337.7, | 335.9, | 334.2, | 332.5, | 330.7, | 327.3, | |
| X322.9, | 318.5, | 314.0, | 309.5, | 304.9, | 303.3, | |
| X295.6, | 290.9, | 285.0, | 285.7, | 287.2, | 288.7, | |
| X290.2, | 291.7, | 294.6, | 297.3, | 299.9, | 302.6, | |
| X305.2, | 307.8, | 310.8, | 313.9, | 316.9, | 319.9, | |

| | | | | | | | |
|-------|------|---|--------------------------------|-----------|-----------|--------------|-----------|
| 00140 | 320° | C | 43 | 44 | 45 | 46 - 47 | 48 |
| 00140 | 329° | | X322+0. | 325+0. | 327+0. | 2+330+7. | 330+1. |
| 00140 | 330° | C | 49 | 50 | 51 | 52 | 53 |
| 00140 | 331° | | X327+7. | 325+3. | 322+0. | 320+0. | 315+3. |
| 00140 | 332° | C | 55 | 56 | 57 | 58 | 59 |
| 00140 | 333° | | X305+7. | 300+7. | 295+7. | 290+0. | 285+5. |
| 00140 | 334° | C | 61 | 62 | 63 | 64 - 67 | |
| 00140 | 335° | | X274+0. | 269+4. | 2A3+0. | | 2+263+3. |
| 00140 | 336° | C | 68 | 69 | 70 | 71 | 72 |
| 00140 | 337° | | X | 266+2. | 2A9+7. | 273+1. | 270+5. |
| 00140 | 338° | C | 73 | 74 | 75 | 76 | 77 |
| 00140 | 339° | | X284+2. | 295+5. | 3+6+7. | 316+9. | 327+1. |
| 00140 | 340° | C | 79 | 80 | | 81 - 114 | 336+9. |
| 00140 | 341° | | X355+2. | 373+1. | | 34+390+17 | |
| 00140 | 342° | C | | | | | |
| 00150 | 343° | | DATA (SOMLST(1),1+NP23,1+P241/ | | | | |
| 00150 | 344° | C | 115 | 116 | 117 | 118 - 119 | 120 |
| 00150 | 345° | | X310+3. | 302+6. | 295+9. | 2+330+7. | 328+9. |
| 00150 | 346° | C | 121 | 122 - 123 | | | |
| 00150 | 347° | | X266+6. | 2+263+37 | | | |
| 00150 | 348° | C | | | | | |
| 00150 | 349° | C | | | | | |
| 00150 | 350° | C | | | | | |
| 00150 | 351° | C | | | | | |
| 00150 | 352° | C | | | | | |
| 00152 | 353° | | DATA (VISLST(1),1+NP21,1+P221/ | | | | |
| 00152 | 354° | C | 1 | 2 | 3 | 4 | 5 |
| 00152 | 355° | | X1+060E-5. | 1+057E-5. | 1+046E-5. | 1+038E-5. | 1+025E-5. |
| 00152 | 356° | C | 7 | 8 | 9 | 10 | 11 |
| 00152 | 357° | | X1+011E-5. | 1+003E-5. | 1+796E-5. | 1+789E-5. | 1+782E-5. |
| 00152 | 358° | C | 13 | 14 | 15 | 16 | 17 |
| 00152 | 359° | | X1+768E-5. | 1+754E-5. | 1+739E-5. | 1+725E-5. | 1+711E-5. |
| 00152 | 360° | C | 19 | 20 | 21 | 22 | 23 |
| 00152 | 361° | | X1+648E-5. | 1+612E-5. | 1+575E-5. | 1+539E-5. | 1+501E-5. |
| 00152 | 362° | C | 25 | 26 | 27 | 28 | 29 |
| 00152 | 363° | | X1+424E-5. | 1+388E-5. | 1+349E-5. | 1+306E-5. | 1+258E-5. |
| 00152 | 364° | C | 31 | 32 | 33 | 34 | 35 |
| 00152 | 365° | | X1+382E-5. | 1+335E-5. | 1+291E-5. | 1+239E-5. | 1+196E-5. |
| 00152 | 366° | C | 37 | 38 | 39 | 40 | 41 |
| 00152 | 367° | | X1+504E-5. | 1+525E-5. | 1+549E-5. | 1+574E-5. | 1+599E-5. |
| 00152 | 368° | C | 43 | 44 | 45 | 46 - 47 | 48 |
| 00152 | 369° | | X1+647E-5. | 1+671E-5. | 1+694E-5. | 2+1+711E-5. | 1+706E-5. |
| 00152 | 370° | C | 49 | 50 | 51 | 52 | 53 |
| 00152 | 371° | | X1+687E-5. | 1+677E-5. | 1+647E-5. | 1+624E-5. | 1+585E-5. |
| 00152 | 372° | C | 55 | 56 | 57 | 58 | 59 |
| 00152 | 373° | | X1+507E-5. | 1+467E-5. | 1+427E-5. | 1+386E-5. | 1+344E-5. |
| 00152 | 374° | C | 61 | 62 | 63 | 64 - 67 | |
| 00152 | 375° | | X1+259E-5. | 1+216E-5. | 1+172E-5. | 4+1+168E-5. | |
| 00152 | 376° | C | 68 | 69 | 70 | 71 | 72 |
| 00152 | 377° | | X | 1+190E-5. | 1+218E-5. | 1+245E-5. | 1+273E-5. |
| 00152 | 378° | C | 73 | 74 | 75 | 76 | 77 |
| 00152 | 379° | | X1+335E-5. | 1+425E-5. | 1+513E-5. | 1+599E-5. | 1+681E-5. |
| 00152 | 380° | C | 79 | 80 | | 81 - 114 | 1+762E-5. |
| 00152 | 381° | | X1+912E-5. | 2+057E-5. | | 34+2+197E-57 | |
| 00152 | 382° | C | | | | | |
| 00154 | 383° | | DATA (VISLS (1),1+NP23,1+P241/ | | | | |
| 00154 | 384° | C | 115 | 116 | 117 | 118 - 119 | 120 |
| 00154 | 385° | | X1+593E-5. | 1+403E-5. | 1+429E-5. | 2+1+711E-5. | 1+696E-5. |

| Altitude (m) | Pressure (hPa) | Density (kg/m³) |
|--------------|----------------|-----------------|
| 306° | 121 | 122 - 123 |
| 307° | 11.199E-5 | 2.1010E-5 |
| 308° | | |
| 309° | | |
| 310° | | |
| 311° | | |
| 312° | | |
| 313° | | |
| 314° | | |
| 315° | | |
| 316° | | |
| 317° | | |
| 318° | | |
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| 340° | | |
| 341° | | |
| 342° | | |
| 343° | | |

1966 STANDARD ATMOSPHERE FOR
JANUARY AT 30-DEGREES NORTH LATITUDE

PRESSURE VALUES TABULATED IN MILLIBARS

DATA (PRSLST(1),1,NP31,NP32)/

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----------|----------|----------|----------|----------|----------|
| 11.021E3 | 9.912E2 | 9.622E4 | 9.370E2 | 9.065E2 | 8.798E2 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 8.0530E2 | 8.206E2 | 8.038E2 | 7.798E2 | 7.569E2 | 7.335E2 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| 87.112E2 | 8.682E2 | 8.279E2 | 8.000E2 | 8.517E2 | 8.037E2 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 84.226E2 | 8.679E2 | 8.191E2 | 8.757E2 | 8.372E2 | 8.032E2 |
| 25 | 26 | 27 | 28 | 29 | 30 |
| 81.739E2 | 8.478E2 | 8.257E2 | 8.067E2 | 8.090E1 | 7.650E1 |
| 31 | 32 | 33 | 34 | 35 | 36 |
| 80.479E1 | 8.399E1 | 8.984E1 | 8.907E1 | 8.139E1 | 8.575E1 |
| 37 | 38 | 39 | 40 | 41 | 42 |
| 81.169E1 | 8.723E0 | 8.544E0 | 8.939E0 | 8.748E0 | 8.060E0 |
| 43 | 44 | 45 | 46 | 47 | 48 |
| 82.199E0 | 8.691E0 | 8.310E0 | 8.019E0 | 7.941E-1 | 8.187E-1 |
| 49 | 50 | 51 | 52 | 53 | 54 |
| 84.000E-1 | 8.723E-1 | 8.872E-1 | 8.207E-1 | 8.687E-1 | 8.281E-1 |
| 55 | 56 | 57 | 58 | 59 | 60 |
| 89.659E-2 | 8.231E-2 | 8.372E-2 | 8.959E-2 | 8.893E-2 | 8.095E-2 |
| 61 | 62 | 63 | 64 | 65 | 66 |
| 81.503E-2 | 8.068E-2 | 8.538E-3 | 8.323E-3 | 8.760E-3 | 8.657E-3 |
| 67 | 68 | 69 | 70 | 71 | 72 |
| 81.879E-3 | 8.341E-3 | 8.683E-4 | 8.066E-4 | 8.209E-4 | 8.876E-4 |
| 73 | 74 | 75 | 76 | 77 | 78 |
| 82.910E-4 | 8.210E-4 | 8.699E-4 | 8.322E-4 | 8.039E-4 | 8.239E-5 |
| 79 | 80 | 81 - 114 | | | |
| 80.606E-5 | 8.359E-5 | | 8.949E-5 | | |

DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER

DATA (NMOLST(1),1,NP31,NP32)/

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----------|----------|----------|----------|----------|----------|
| 11.233E0 | 1.200E0 | 1.188E0 | 1.137E0 | 1.107E0 | 1.078E0 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 11.049E0 | 1.021E0 | 9.934E-1 | 9.695E-1 | 9.461E-1 | 9.231E-1 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| 89.005E-1 | 8.565E-1 | 8.142E-1 | 7.733E-1 | 7.340E-1 | 6.999E-1 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 85.916E-1 | 8.248E-1 | 8.713E-1 | 8.187E-1 | 8.707E-1 | 8.270E-1 |
| 25 | 26 | 27 | 28 | 29 | 30 |

| | | | | | | | | |
|-------|------|---|---------------------------------|-----------|-----------|--------------|-----------|-----------|
| 00132 | 444° | | X2.020E-1. | 2.439E-1. | 2.101E-1. | 1.805E-1. | 1.549E-1. | 1.312E-1. |
| 00162 | 445° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00162 | 446° | | X1.099E-1. | 9.213E-2. | 6.520E-2. | 4.669E-2. | 3.365E-2. | 2.440E-2. |
| 00162 | 447° | C | 37 | 38 | 40 | 40 | 41 | 42 |
| 00162 | 448° | | X1.780E-2. | 1.306E-2. | 9.603E-3. | 7.105E-3. | 5.289E-3. | 3.960E-3. |
| 00162 | 449° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00162 | 450° | | X2.981E-3. | 2.257E-3. | 1.717E-3. | 1.319E-3. | 1.028E-3. | 8.038E-4. |
| 00162 | 451° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00162 | 452° | | X6.340E-4. | 4.983E-4. | 3.903E-4. | 3.051E-4. | 2.3A9E-4. | 1.860E-4. |
| 00162 | 453° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00162 | 454° | | X1.739E-4. | 1.136E-4. | 8.441E-5. | 6.396E-5. | 4.809E-5. | 3.586E-5. |
| 00162 | 455° | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00162 | 456° | | X2.651E-5. | 1.942E-5. | 1.374E-5. | 9.702E-6. | 6.853E-6. | 4.842E-6. |
| 00162 | 457° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00162 | 458° | | X3.384E-6. | 2.335E-6. | 1.630E-6. | 1.152E-6. | 8.231E-7. | 5.942E-7. |
| 00162 | 459° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00162 | 460° | | X4.322E-7. | 3.133E-7. | 2.305E-7. | 1.718E-7. | 1.296E-7. | 9.887E-8. |
| 00162 | 461° | C | 79 | 80 | | 81 - 114 | | |
| 00162 | 462° | | X7.509E-8. | 5.780E-8. | | 3494.509E-8/ | | |
| 00162 | 463° | C | | | | | | |
| 00164 | 464° | | DATA (RMOLST(1),1=NP33,4=NP34)/ | | | | | |
| 00164 | 465° | C | 115 | 116 | 117 | 118 | 119 | 120 |
| 00164 | 466° | | X4.994E-1. | 3.483E-1. | 5.512E-2. | 1.165E-3. | 9.073E-4. | 7.142E-4. |
| 00164 | 467° | C | 121 | 122 | 123 | | | |
| 00164 | 468° | | X1.635E-5. | 1.154E-5. | 8.070E-6/ | | | |
| 00164 | 469° | C | | | | | | |
| 00164 | 470° | C | | | | | | |
| 00164 | 471° | C | | | | | | |
| 00164 | 472° | C | | | | | | |
| 00164 | 473° | | DATA (SONLST(1),1=NP31,2=NP32)/ | | | | | |
| 00166 | 474° | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00166 | 475° | | X340.5. | 340.0. | 339.5. | 339.1. | 338.6. | 338.1. |
| 00166 | 476° | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00166 | 477° | | X337.6. | 337.1. | 336.6. | 336.0. | 335.6. | 335.5. |
| 00166 | 478° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00166 | 479° | | X332.5. | 330.5. | 328.5. | 326.4. | 324.4. | 320.3. |
| 00166 | 480° | C | 19 | 20 | 21 | 22 | 23 | 24 |
| 00166 | 481° | | X316.2. | 312.1. | 307.9. | 303.6. | 299.3. | 294.9. |
| 00166 | 482° | C | 25 | 26 | 27 | 28 | 29 | 30 |
| 00166 | 483° | | X293.0. | 291.3. | 289.5. | 287.7. | 285.9. | 285.7. |
| 00166 | 484° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00166 | 485° | | X287.3. | 289.1. | 292.5. | 295.2. | 297.9. | 300.6. |
| 00166 | 486° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00166 | 487° | | X303.2. | 305.9. | 308.9. | 311.9. | 315.0. | 318.0. |
| 00166 | 488° | C | 43 | 44 | 45 | | 46 - 47 | 48 |
| 00166 | 489° | | X321.0. | 323.9. | 326.8. | | 20328.9. | 328.3. |
| 00166 | 490° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00166 | 491° | | X325.8. | 323.4. | 321.0. | 318.3. | 314.9. | 310.5. |
| 00166 | 492° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00166 | 493° | | X306.5. | 302.5. | 298.5. | 294.4. | 290.2. | 286.0. |
| 00166 | 494° | C | 61 | 62 | | 63 - 64 | | |
| 00166 | 495° | | X281.7. | 277.4. | | 40277.2. | | |
| 00166 | 496° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00166 | 497° | | X278.7. | 283.6. | 288.4. | 293.0. | 297.7. | 302.2. |
| 00166 | 498° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00166 | 499° | | X307.0. | 314.3. | 321.3. | 328.2. | 335.0. | 341.6. |
| 00166 | 500° | C | 79 | 80 | | 81 - 114 | | |
| 00166 | 501° | | X351.0. | 340.3. | | 340369.3/ | | |

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00170 502° C
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 00170 559° C

DATA (SONLST(1),I=NP33,4,NP34)/
 115 116 117 118 - 119 120
 2308.9, 297.1, 293.9, 20328.9, 327.1
 121 - 123
 30277.27

VISCOSITY COEFFICIENT
 VALUES TABULATED IN KILOGRAMS PER METER PER SECOND

DATA (VISLST(1),I=NP33,4,NP32)/
 1 2 3 4 5 6
 11.791E-5, 1.787E-5, 1.783E-5, 1.779E-5, 1.775E-5, 1.771E-5,
 7 8 9 10 11 12
 11.767E-5, 1.763E-5, 1.759E-5, 1.755E-5, 1.751E-5, 1.739E-5,
 13 14 15 16 17 18
 11.726E-5, 1.722E-5, 1.693E-5, 1.676E-5, 1.660E-5, 1.626E-5,
 19 20 21 22 23 24
 11.593E-5, 1.559E-5, 1.525E-5, 1.491E-5, 1.456E-5, 1.420E-5,
 25 26 27 28 29 30
 11.405E-5, 1.371E-5, 1.376E-5, 1.362E-5, 1.347E-5, 1.346E-5,
 31 32 33 34 35 36
 11.359E-5, 1.373E-5, 1.401E-5, 1.423E-5, 1.445E-5, 1.466E-5,
 37 38 39 40 41 42
 11.488E-5, 1.509E-5, 1.533E-5, 1.558E-5, 1.583E-5, 1.607E-5,
 43 44 45 46 = 47 48
 11.632E-5, 1.656E-5, 1.679E-5, 2.01696E-5, 1.691E-5,
 49 50 51 52 53 54
 11.671E-5, 1.652E-5, 1.632E-5, 1.610E-5, 1.578E-5, 1.547E-5,
 55 56 57 58 59 60
 11.514E-5, 1.492E-5, 1.449E-5, 1.416E-5, 1.383E-5, 1.349E-5,
 61 62 63 = 66
 11.319E-5, 1.280E-5, 4.01278E-5,
 67 68 69 70 71 72
 11.290E-5, 1.329E-5, 1.368E-5, 1.405E-5, 1.443E-5, 1.479E-5,
 73 74 75 76 77 78
 11.518E-5, 1.577E-5, 1.634E-5, 1.691E-5, 1.746E-5, 1.800E-5,
 79 80 81 = 114
 11.877E-5, 1.953E-5, 3.92027E-5/

DATA (VISLST(1),I=NP33,4,NP34)/
 115 116 117 118 - 119 120
 11.542E-5, 1.436E-5, 1.412E-5, 2.01696E-5, 1.681E-5,
 121 - 123
 3.01278E-5/

1966 STANDARD ATMOSPHERE FOR JULY AT 60-DEGREES NORTH LATITUDE

PRESSURE VALUES TABULATED IN MILLIBARS

DATA (PRSLST(1),I=NP41,4,NP42)/
 1 2 3 4 5 6
 11.010E2, 9.804E2, 9.516E2, 9.234E2, 8.960E2, 8.692E2,
 7 8 9 10 11 12
 8.432E2, 8.177E2, 7.930E2, 7.688E2, 7.453E2, 7.224E2,
 13 14 15 16 17 18

| | | | | | | | | |
|-------|------|---|--------------------------------|----------|-----------|--------------|----------|----------|
| 00176 | 560° | | X7.000E2 | 6.571E2 | 6.164E2 | 5.779E2 | 5.414E2 | 4.740E2 |
| 00176 | 561° | C | 19 | 25 | 21 | 22 | 23 | 24 |
| 00176 | 562° | | X4.134E2 | 3.592E2 | 3.108E2 | 2.677E2 | 2.301E2 | 1.978E2 |
| 00176 | 563° | C | 25 | 26 | 27 | 28 | 29 | 30 |
| 00176 | 564° | | X1.700E2 | 1.401E2 | 1.256E2 | 1.080E2 | 9.285E1 | 7.983E1 |
| 00176 | 565° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00176 | 566° | | X6.064E1 | 5.902E1 | 4.364E1 | 3.229E1 | 2.398E1 | 1.788E1 |
| 00176 | 567° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00176 | 568° | | X1.338E1 | 1.009E1 | 7.593E0 | 5.775E0 | 4.421E0 | 3.406E0 |
| 00176 | 569° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00176 | 570° | | X2.040E0 | 2.057E0 | 1.807E0 | 1.259E0 | 9.872E-1 | 7.742E-1 |
| 00176 | 571° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00176 | 572° | | X6.072E-1 | 4.751E-1 | 3.704E-1 | 2.877E-1 | 2.218E-1 | 1.694E-1 |
| 00176 | 573° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00176 | 574° | | X1.281E-1 | 9.578E-2 | 7.075E-2 | 5.160E-2 | 3.710E-2 | 2.627E-2 |
| 00176 | 575° | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00176 | 576° | | X1.829E-2 | 1.249E-2 | 8.360E-3 | 5.530E-3 | 3.447E-3 | 2.430E-3 |
| 00176 | 577° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00176 | 578° | | X1.610E-3 | 1.075E-3 | 7.297E-4 | 5.027E-4 | 3.5.2E-4 | 2.485E-4 |
| 00176 | 579° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00176 | 580° | | X1.782E-4 | 1.310E-4 | 9.889E-5 | 7.633E-5 | 6.004E-5 | 4.801E-5 |
| 00176 | 581° | C | 79 | 80 | 81 - 114 | | | |
| 00176 | 582° | | X3.903E-5 | 3.224E-5 | | 34*2.700E-5/ | | |
| 00176 | 583° | C | | | | | | |
| 00200 | 584° | | DATA (PRSLST(I),I=NP43, NP44)/ | | | | | |
| 00200 | 585° | C | 115 | 116 | 117 | 118 | 119 | 120 |
| 00200 | 586° | | X3.343E2 | 2.133E2 | 3.753E1 | 1.115E0 | 8.742E-1 | 6.857E-1 |
| 00200 | 587° | C | 121 | 122 | 123 | | | |
| 00200 | 588° | | X1.025E-2 | 6.803E-3 | 1.978E-3/ | | | |
| 00200 | 589° | C | | | | | | |
| 00200 | 590° | C | | | | | | |
| 00200 | 591° | C | | | | | | |
| 00200 | 592° | C | | | | | | |
| 00200 | 593° | C | | | | | | |
| 00200 | 594° | | DATA (KHOLST(I),I=NP41, NP42)/ | | | | | |
| 00200 | 595° | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00200 | 596° | | X1.220E0 | 1.190E0 | 1.161E0 | 1.132E0 | 1.104E0 | 1.077E0 |
| 00200 | 597° | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00200 | 598° | | X1.050E0 | 1.023E0 | 9.971E-1 | 9.716E-1 | 9.467E-1 | 9.223E-1 |
| 00200 | 599° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00200 | 600° | | X8.984E-1 | 8.521E-1 | 8.077E-1 | 7.651E-1 | 7.244E-1 | 6.851E-1 |
| 00200 | 601° | C | 19 | 20 | 21 | 22 | 23 | 24 |
| 00200 | 602° | | X5.849E-1 | 5.231E-1 | 4.663E-1 | 4.142E-1 | 3.660E-1 | 3.200E-1 |
| 00200 | 603° | C | 25 | 26 | 27 | 28 | 29 | 30 |
| 00200 | 604° | | X2.631E-1 | 2.261E-1 | 1.944E-1 | 1.671E-1 | 1.437E-1 | 1.235E-1 |
| 00200 | 605° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00200 | 606° | | X1.062E-1 | 9.132E-2 | 8.753E-2 | 8.965E-2 | 8.639E-2 | 8.278E-2 |
| 00200 | 607° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00200 | 608° | | X1.979E-2 | 1.469E-2 | 1.083E-2 | 8.091E-3 | 6.013E-3 | 4.528E-3 |
| 00200 | 609° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00200 | 610° | | X3.431E-3 | 2.600E-3 | 2.039E-3 | 1.584E-3 | 1.241E-3 | 9.732E-4 |
| 00200 | 611° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00200 | 612° | | X7.867E-4 | 6.085E-4 | 4.814E-4 | 3.815E-4 | 3.049E-4 | 2.416E-4 |
| 00200 | 613° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00200 | 614° | | X1.898E-4 | 1.477E-4 | 1.138E-4 | 8.666E-5 | 6.521E-5 | 4.842E-5 |
| 00200 | 615° | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00200 | 616° | | X3.543E-5 | 2.501E-5 | 1.800E-5 | 1.192E-5 | 7.998E-6 | 5.233E-6 |
| 00200 | 617° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00200 | 618° | | X3.464E-6 | 2.729E-6 | 1.954E-6 | 9.640E-7 | 6.491E-7 | 4.434E-7 |

DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER

DATA (KHOLST(I),I=NP41, NP42)/

| | | | | | |
|-----------|----------|----------|----------|----------|----------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| X1.220E0 | 1.190E0 | 1.161E0 | 1.132E0 | 1.104E0 | 1.077E0 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| X1.050E0 | 1.023E0 | 9.971E-1 | 9.716E-1 | 9.467E-1 | 9.223E-1 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| X8.984E-1 | 8.521E-1 | 8.077E-1 | 7.651E-1 | 7.244E-1 | 6.851E-1 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| X5.849E-1 | 5.231E-1 | 4.663E-1 | 4.142E-1 | 3.660E-1 | 3.200E-1 |
| 25 | 26 | 27 | 28 | 29 | 30 |
| X2.631E-1 | 2.261E-1 | 1.944E-1 | 1.671E-1 | 1.437E-1 | 1.235E-1 |
| 31 | 32 | 33 | 34 | 35 | 36 |
| X1.062E-1 | 9.132E-2 | 8.753E-2 | 8.965E-2 | 8.639E-2 | 8.278E-2 |
| 37 | 38 | 39 | 40 | 41 | 42 |
| X1.979E-2 | 1.469E-2 | 1.083E-2 | 8.091E-3 | 6.013E-3 | 4.528E-3 |
| 43 | 44 | 45 | 46 | 47 | 48 |
| X3.431E-3 | 2.600E-3 | 2.039E-3 | 1.584E-3 | 1.241E-3 | 9.732E-4 |
| 49 | 50 | 51 | 52 | 53 | 54 |
| X7.867E-4 | 6.085E-4 | 4.814E-4 | 3.815E-4 | 3.049E-4 | 2.416E-4 |
| 55 | 56 | 57 | 58 | 59 | 60 |
| X1.898E-4 | 1.477E-4 | 1.138E-4 | 8.666E-5 | 6.521E-5 | 4.842E-5 |
| 61 | 62 | 63 | 64 | 65 | 66 |
| X3.543E-5 | 2.501E-5 | 1.800E-5 | 1.192E-5 | 7.998E-6 | 5.233E-6 |
| 67 | 68 | 69 | 70 | 71 | 72 |
| X3.464E-6 | 2.729E-6 | 1.954E-6 | 9.640E-7 | 6.491E-7 | 4.434E-7 |

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00202 018° C      73      74      75      76      77      78
00202 019° C      X3.019E-7, 2.023E-7, 1.703E-7, 1.001E-7, 7.324E-8, 5.401E-8,
00202 020° C      79      80      81 - 119
00202 021° C      X9.091E-8, 3.132E-8, 34*2.444E-8/
00202 022° C
00204 023° C      DATA (MHO LST(1),I=NP43,4P44)/
00204 024° C      115      116      117      118      119      120
00204 025° C      X4.941E-1, 3.301E-1, 5.407E-2, 1.701E-3, 1.099E-3, 8.619E-4,
00204 026° C      121      122      123
00204 027° C      X2.150E-5, 1.465E-5, 4.263E-6/
00204 028° C
00204 029° C
00204 030° C
00204 031° C
00204 032° C
00206 033° C      DATA (SONLST(1),I=NP41,4P42)/
00206 034° C      1      2      3      4      5      6
00206 035° C      X340.5, 339.8, 338.8, 337.9, 337.0, 336.2,
00206 036° C      7      8      9      10      11      12
00206 037° C      X335.4, 334.5, 333.7, 332.8, 332.0, 331.1,
00206 038° C      13      14      15      16      17      18
00206 039° C      X330.3, 328.6, 326.9, 325.2, 323.5, 319.0,
00206 040° C      19      20      21
00206 041° C      X314.8, 310.0, 307.5,
00206 042° C      R      22 - 33
00206 043° C      X      12*300.0,
00206 044° C      R      34      35      36
00206 045° C      X      301.7, 303.7, 305.7,
00206 046° C      37      38      39      40      41      42
00206 047° C      X307.8, 309.6, 313.3, 317.1, 320.8, 324.5,
00206 048° C      43      44      45      46      47 - 48
00206 049° C      X328.2, 330.9, 332.2, 333.5, 2*333.7,
00206 050° C      49      50      51      52      53      54
00206 051° C      X333.0, 330.6, 328.2, 324.9, 319.2, 313.3,
00206 052° C      55      56      57      58      59      60
00206 053° C      X307.3, 301.3, 295.0, 288.7, 282.2, 275.6,
00206 054° C      61      62      63 - 67
00206 055° C      X268.8, 261.9, 5*255.0,
00206 056° C      R      68      69      70      71      72
00206 057° C      X      259.9, 245.1, 270.2, 275.2, 280.1,
00206 058° C      73      74      75      76      77      78
00206 059° C      X287.5, 301.1, 314.2, 326.7, 338.8, 350.8,
00206 060° C      79      80      81 - 119
00206 061° C      X365.5, 379.6, 34*393.2/
00210 062° C      DATA (SONLST(1),I=NP43,4P44)/
00210 063° C      115      116 - 117      118 - 120
00210 064° C      X307.8, 2*300.0, 3*333.7,
00210 065° C      121      122 - 123
00210 066° C      X258.3, 2*255.0/
00210 067° C
00210 068° C
00210 069° C
00210 070° C
00210 071° C
00212 072° C      DATA (VISLST(1),I=NP41,4P42)/
00212 073° C      1      2      3      4      5      6
00212 074° C      X1.791E-5, 1.704E-5, 1.777E-5, 1.770E-5, 1.743E-5, 1.756E-5,
00212 075° C      7      8      9      10      11      12

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| | | | | | | | | |
|-------|------|---|----------------------------------|----------|-------------|-------------|------------|------------|
| 00212 | 676° | | X1.749E-5 | 1.742E-5 | 1.735E-5 | 1.728E-5 | 1.721E-5 | 1.715E-5 |
| 00212 | 677° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00212 | 678° | | X1.708E-5 | 1.694E-5 | 1.680E-5 | 1.666E-5 | 1.652E-5 | 1.638E-5 |
| 00212 | 679° | C | 19 | 20 | | | | |
| 00212 | 680° | | X1.580E-5 | 1.543E-5 | 1.506E-5 | | | |
| 00212 | 681° | C | | | 22 = 33 | | | |
| 00212 | 682° | X | | | 1201.468E-5 | | | |
| 00212 | 683° | C | | | | 34 | 35 | 36 |
| 00212 | 684° | X | | | | 1.476E-5 | 1.492E-5 | 1.507E-5 |
| 00212 | 685° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00212 | 686° | | X1.523E-5 | 1.539E-5 | 1.569E-5 | 1.600E-5 | 1.631E-5 | 1.661E-5 |
| 00212 | 687° | C | 43 | 44 | 45 | 46 | 47 = 48 | |
| 00212 | 688° | | X1.690E-5 | 1.713E-5 | 1.723E-5 | 1.734E-5 | | 201.736E-5 |
| 00212 | 689° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00212 | 690° | | X1.730E-5 | 1.710E-5 | 1.691E-5 | 1.664E-5 | 1.617E-5 | 1.569E-5 |
| 00212 | 691° | C | 55 | 54 | 57 | 58 | 59 | 60 |
| 00212 | 692° | | X1.521E-5 | 1.472E-5 | 1.421E-5 | 1.370E-5 | 1.318E-5 | 1.265E-5 |
| 00212 | 693° | C | 61 | 62 | | 63 = 67 | | |
| 00212 | 694° | | X1.211E-5 | 1.156E-5 | | 501.102E-5 | | |
| 00212 | 695° | C | | 68 | 69 | 70 | 71 | 72 |
| 00212 | 696° | X | | 1.141E-5 | 1.182E-5 | 1.222E-5 | 1.262E-5 | 1.302E-5 |
| 00212 | 697° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00212 | 698° | | X1.360E-5 | 1.470E-5 | 1.576E-5 | 1.679E-5 | 1.777E-5 | 1.875E-5 |
| 00212 | 699° | C | 79 | 80 | | 81 = 114 | | |
| 00212 | 700° | | X1.995E-5 | 2.111E-5 | | 3402.222E-5 | | |
| 00212 | 701° | C | | | | | | |
| 00214 | 702° | | DATA (VISLST(11, 10NP43, NP44) / | | | | | |
| 00214 | 703° | C | 115 | | 116 = 117 | | 118 = 120 | |
| 00214 | 704° | | X1.524E-5 | | 201.468E-5 | | 301.736E-5 | |
| 00214 | 705° | C | 121 | | 122 = 123 | | | |
| 00214 | 706° | | X1.129E-5 | | 201.102E-5 | | | |
| 00214 | 707° | C | | | | | | |
| 00214 | 708° | C | | | | | | |
| 00214 | 709° | C | | | | | | |
| 00214 | 710° | C | | | | | | |
| 00214 | 711° | C | | | | | | |
| 00214 | 712° | C | | | | | | |
| 00214 | 713° | C | | | | | | |
| 00214 | 714° | | DATA (PRSLST(11, 10NP51, NP52) / | | | | | |
| 00214 | 715° | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00214 | 716° | | X1.01350E3 | 9.804E2 | 9.484E2 | 9.176E2 | 8.878E2 | 8.590E2 |
| 00214 | 717° | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00214 | 718° | | X8.310E2 | 8.038E2 | 7.775E2 | 7.519E2 | 7.271E2 | 7.031E2 |
| 00214 | 719° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00214 | 720° | | X6.794E2 | 6.332E2 | 5.932E2 | 5.534E2 | 5.158E2 | 4.807E2 |
| 00214 | 721° | C | 19 | 20 | 21 | 22 | 23 | 24 |
| 00214 | 722° | | X3.853E2 | 3.304E2 | 2.829E2 | 2.418E2 | 2.067E2 | 1.766E2 |
| 00214 | 723° | C | 25 | 26 | 27 | 28 | 29 | 30 |
| 00214 | 724° | | X1.510E2 | 1.291E2 | 1.103E2 | 9.431E1 | 8.058E1 | 6.882E1 |
| 00214 | 725° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00214 | 726° | | X5.875E1 | 5.014E1 | 3.647E1 | 2.649E1 | 1.922E1 | 1.398E1 |
| 00214 | 727° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00214 | 728° | | X1.020E1 | 7.404E0 | 5.479E0 | 4.041E0 | 3.001E0 | 2.243E0 |
| 00214 | 729° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00214 | 730° | | X1.667E0 | 1.277E0 | 9.714E-1 | 7.434E-1 | 5.719E-1 | 4.414E-1 |
| 00214 | 731° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00214 | 732° | | X3.408E-1 | 2.629E-1 | 2.021E-1 | 1.548E-1 | 1.184E-1 | 9.050E-2 |
| 00214 | 733° | C | 55 | 56 | 57 | 58 | 59 | 60 |

1966 STANDARD ATMOSPHERE FOR
 JANUARY AT 60-DEGREES NORTH LATITUDE
 PRESSURE VALUES TABULATED IN MILLIBARS

NO. 10-10-60
 NATIONALITY

| | | | | | | | | |
|-------|------|---|---|-----------|-----------|--------------|-----------|-----------|
| 00210 | 7300 | | X6.707E-2, | 5.271E-2, | 4.017E-2, | 3.051E-2, | 2.350E-2, | 1.735E-2, |
| 00210 | 7350 | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00210 | 7360 | | X1.278E-2, | 9.661E-3, | 7.152E-3, | 5.203E-3, | 3.851E-3, | 2.800E-3, |
| 00210 | 7370 | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00210 | 7380 | | X2.022E-3, | 1.460E-3, | 1.061E-3, | 7.762E-4, | 5.715E-4, | 4.234E-4, |
| 00210 | 7390 | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00210 | 7400 | | X3.156E-4, | 2.375E-4, | 1.807E-4, | 1.389E-4, | 1.078E-4, | 8.435E-5, |
| 00210 | 7410 | C | 79 | 80 | 81 - 114 | | | |
| 00210 | 7420 | | X6.691E-5, | 5.391E-5, | | 3494.402E-5/ | | |
| 00210 | 7430 | C | | | | | | |
| 00220 | 7440 | | DATA (P)SLST(1), (M)P53, (N)P54/ | | | | | |
| 00220 | 7450 | C | 115 | 116 | 117 | 118 | 119 | 120 |
| 00220 | 7460 | | X3.060E2, | 1.911E2, | 3.109E1, | 6.516E-1, | 5.029E-1, | 3.879E-1, |
| 00220 | 7470 | C | 121 | 122 | 123 | | | |
| 00220 | 7480 | | X8.310E-3, | 6.190E-3, | 2.381E-3/ | | | |
| 00220 | 7490 | C | | | | | | |
| 00220 | 7500 | C | | | | | | |
| 00220 | 7510 | C | DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER | | | | | |
| 00220 | 7520 | C | | | | | | |
| 00222 | 7530 | | DATA (R)HOLST(1), (M)P51, (N)P52/ | | | | | |
| 00222 | 7540 | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00222 | 7550 | | X1.372E0, | 1.325E0, | 1.279E0, | 1.235E0, | 1.193E0, | 1.158E0, |
| 00222 | 7560 | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00222 | 7570 | | X1.123E0, | 1.090E0, | 1.058E0, | 1.026E0, | 9.955E-1, | 9.656E-1, |
| 00222 | 7580 | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00222 | 7590 | | X9.366E-1, | 8.808E-1, | 8.339E-1, | 7.888E-1, | 7.457E-1, | 6.946E-1, |
| 00222 | 7600 | C | 19 | 20 | 21 | 22 | 23 | 24 |
| 00222 | 7610 | | X6.909E-1, | 5.226E-1, | 4.539E-1, | 3.879E-1, | 3.315E-1, | 2.834E-1, |
| 00222 | 7620 | C | 25 | 26 | 27 | 28 | 29 | 30 |
| 00222 | 7630 | | X2.422E-1, | 2.071E-1, | 1.770E-1, | 1.517E-1, | 1.300E-1, | 1.113E-1, |
| 00222 | 7640 | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00222 | 7650 | | X9.530E-2, | 8.156E-2, | 5.966E-2, | 4.357E-2, | 3.157E-2, | 2.275E-2, |
| 00222 | 7660 | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00222 | 7670 | | X1.845E-2, | 1.193E-2, | 8.676E-3, | 6.264E-3, | 4.551E-3, | 3.330E-3, |
| 00222 | 7680 | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00222 | 7690 | | X2.453E-3, | 1.819E-3, | 1.357E-3, | 1.010E-3, | 7.682E-4, | 5.911E-4, |
| 00222 | 7700 | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00222 | 7710 | | X4.564E-4, | 3.559E-4, | 2.774E-4, | 2.150E-4, | 1.651E-4, | 1.266E-4, |
| 00222 | 7720 | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00222 | 7730 | | X9.708E-5, | 7.435E-5, | 5.701E-5, | 4.400E-5, | 3.302E-5, | 2.599E-5, |
| 00222 | 7740 | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00222 | 7750 | | X1.981E-5, | 1.503E-5, | 1.134E-5, | 8.510E-6, | 6.357E-6, | 4.717E-6, |
| 00222 | 7760 | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00222 | 7770 | | X3.480E-6, | 2.467E-6, | 1.757E-6, | 1.260E-6, | 9.093E-7, | 6.607E-7, |
| 00222 | 7780 | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00222 | 7790 | | X4.805E-7, | 3.479E-7, | 2.550E-7, | 1.891E-7, | 1.417E-7, | 1.047E-7, |
| 00222 | 7800 | C | 79 | 80 | 81 - 114 | | | |
| 00222 | 7810 | | X7.890E-8, | 5.950E-8, | | 3494.567E-8/ | | |
| 00222 | 7820 | C | | | | | | |
| 00224 | 7830 | | DATA (R)HOLST(1), (M)P53, (N)P54/ | | | | | |
| 00224 | 7840 | C | 115 | 116 | 117 | 118 | 119 | 120 |
| 00224 | 7850 | | X4.909E-1, | 3.065E-1, | 5.100E-2, | 8.837E-3, | 6.728E-3, | 5.194E-3, |
| 00224 | 7860 | C | 121 | 122 | 123 | | | |
| 00224 | 7870 | | X1.307E-5, | 9.835E-6, | 4.055E-6/ | | | |
| 00224 | 7880 | C | | | | | | |
| 00224 | 7890 | C | | | | | | |
| 00224 | 7900 | C | | | | | | |
| 00224 | 7910 | C | SPEED OF SOUND VALUES TABULATED IN METERS PER SECOND | | | | | |

| 00224 | 792° | | DATA (SONLST(1),I=NP51,NP52)/ | | | | | |
|-------|------|---|-------------------------------|-----------|-----------|-----------|-------------|-----------|
| 00224 | 793° | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00224 | 794° | | X321.4, | 321.9, | 322.2, | 322.5, | 322.8, | 322.3, |
| 00224 | 795° | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00224 | 796° | | X321.8, | 321.3, | 320.8, | 320.3, | 319.8, | 319.3, |
| 00224 | 797° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00224 | 798° | | X318.8, | 317.7, | 315.6, | 313.4, | 311.2, | 308.8, |
| 00224 | 799° | C | 19 | 20 | | | 21 - 27 | |
| 00224 | 800° | | X302.3, | 297.7, | | | 7*295.4, | |
| 00224 | 801° | C | | | | 28 | 29 | 30 |
| 00224 | 802° | | X | | | 295.0, | 294.6, | 294.2, |
| 00224 | 803° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00224 | 804° | | X293.8, | 293.4, | 292.6, | 291.7, | 291.9, | 293.3, |
| 00224 | 805° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00224 | 806° | | X294.7, | 296.0, | 297.4, | 300.5, | 303.8, | 307.1, |
| 00224 | 807° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00224 | 808° | | X310.3, | 313.5, | 316.6, | 319.7, | 322.8, | 323.3, |
| 00224 | 809° | C | 49 | 50 | 51 | 52 | 53 | 54 |
| 00224 | 810° | | X323.3, | 321.6, | 319.3, | 317.5, | 316.9, | 316.3, |
| 00224 | 811° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00224 | 812° | | X315.7, | 315.0, | 314.1, | 311.3, | 308.5, | 305.7, |
| 00224 | 813° | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00224 | 814° | | X302.8, | 300.0, | 297.1, | 294.2, | 291.2, | 288.2, |
| 00224 | 815° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00224 | 816° | | X285.2, | 287.8, | 290.8, | 293.7, | 296.6, | 299.5, |
| 00224 | 817° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00224 | 818° | | X303.2, | 309.2, | 315.0, | 320.7, | 325.4, | 332.6, |
| 00224 | 819° | C | 79 | 80 | | 81 - 114 | | |
| 00224 | 820° | | X344.6, | 356.1, | | 34*367.3/ | | |
| 00224 | 821° | C | | | | | | |
| 00230 | 822° | | DATA (SONLST(1),I=NP53,NP54)/ | | | | | |
| 00230 | 823° | C | 115 - 116 | | 117 | 118 | | 119 - 120 |
| 00230 | 824° | | X | 2*295.4, | 292.1, | 321.3, | | 2*323.3, |
| 00230 | 825° | C | 121 | 122 | 123 | | | |
| 00230 | 826° | | X298.5, | 295.6, | 286.7/ | | | |
| 00230 | 827° | C | | | | | | |
| 00230 | 828° | C | | | | | | |
| 00230 | 829° | C | | | | | | |
| 00230 | 830° | C | | | | | | |
| 00230 | 831° | C | | | | | | |
| 00232 | 832° | | DATA (VISLST(1),I=NP51,NP52)/ | | | | | |
| 00232 | 833° | C | 1 | 2 | 3 | 4 | 5 | 6 |
| 00232 | 834° | | X1.638E-5, | 1.639E-5, | 1.642E-5, | 1.644E-5, | 1.647E-5, | 1.643E-5, |
| 00232 | 835° | C | 7 | 8 | 9 | 10 | 11 | 12 |
| 00232 | 836° | | X1.639E-5, | 1.638E-5, | 1.630E-5, | 1.626E-5, | 1.622E-5, | 1.618E-5, |
| 00232 | 837° | C | 13 | 14 | 15 | 16 | 17 | 18 |
| 00232 | 838° | | X1.619E-5, | 1.605E-5, | 1.588E-5, | 1.570E-5, | 1.552E-5, | 1.516E-5, |
| 00232 | 839° | C | 19 | 20 | | | 21 - 27 | |
| 00232 | 840° | | X1.480E-5, | 1.443E-5, | | | 7*1.424E-5, | |
| 00232 | 841° | C | | | | 28 | 29 | 30 |
| 00232 | 842° | | X | | | 1.421E-5, | 1.418E-5, | 1.415E-5, |
| 00232 | 843° | C | 31 | 32 | 33 | 34 | 35 | 36 |
| 00232 | 844° | | X1.411E-5, | 1.408E-5, | 1.401E-5, | 1.395E-5, | 1.396E-5, | 1.407E-5, |
| 00232 | 845° | C | 37 | 38 | 39 | 40 | 41 | 42 |
| 00232 | 846° | | X1.418E-5, | 1.429E-5, | 1.440E-5, | 1.466E-5, | 1.492E-5, | 1.519E-5, |
| 00232 | 847° | C | 43 | 44 | 45 | 46 | 47 | 48 |
| 00232 | 848° | | X1.545E-5, | 1.571E-5, | 1.596E-5, | 1.622E-5, | 1.647E-5, | 1.651E-5, |
| 00232 | 849° | C | 49 | 50 | 51 | 52 | 53 | 54 |

VISCOSITY COEFFICIENT
 VALUES TABULATED IN KILOGRAMS PER METER PER SECOND

| | | | | | | | | |
|-------|------|---|---|-----------|--------------|--------------|-----------|-----------|
| 00232 | 850° | | X1.051E-5, | 1.637E-5, | 1.618E-5, | 1.604E-5, | 1.599E-5, | 1.594E-5, |
| 00232 | 850° | C | 55 | 56 | 57 | 58 | 59 | 60 |
| 00232 | 852° | | X1.589E-5, | 1.583E-5, | 1.575E-5, | 1.553E-5, | 1.530E-5, | 1.507E-5, |
| 00232 | 853° | C | 61 | 62 | 63 | 64 | 65 | 66 |
| 00232 | 854° | | X1.484E-5, | 1.461E-5, | 1.438E-5, | 1.414E-5, | 1.391E-5, | 1.367E-5, |
| 00232 | 855° | C | 67 | 68 | 69 | 70 | 71 | 72 |
| 00232 | 856° | | X1.343E-5, | 1.363E-5, | 1.387E-5, | 1.411E-5, | 1.434E-5, | 1.458E-5, |
| 00232 | 857° | C | 73 | 74 | 75 | 76 | 77 | 78 |
| 00232 | 858° | | X1.487E-5, | 1.536E-5, | 1.583E-5, | 1.630E-5, | 1.676E-5, | 1.727E-5, |
| 00232 | 859° | C | 79 | 80 | 81 - 114 | | | |
| 00232 | 860° | | X1.024E-5, | 1.919E-5, | 3432.011E-5/ | | | |
| 00232 | 861° | C | | | | | | |
| 00234 | 862° | | DATA (V1SLST11), I=NP53, W=PS41/ | | | | | |
| 00234 | 863° | C | 115 - 116 | 117 | 118 | 119 - 120 | | |
| 00234 | 864° | | X 2.01424E-5, | 1.398E-5, | 1.634E-5, | 2.91.651E-5, | | |
| 00234 | 865° | C | 121 | 122 | 123 | | | |
| 00234 | 866° | | X1.450E-5, | 1.426E-5, | 1.355E-5/ | | | |
| 00234 | 867° | C | | | | | | |
| 00234 | 868° | C | | | | | | |
| 00234 | 869° | C | | | | | | |
| 00234 | 870° | C | | | | | | |
| 00234 | 871° | C | | | | | | |
| 00234 | 872° | C | | | | | | |
| 00236 | 873° | | DATA (PRSLST11), I=NP61, W=P62/ | | | | | |
| 00236 | 874° | C | 1 | 2 | 3 | 4 | 5 | |
| 00236 | 875° | | X1.0170147E+3.9.0829373E+2.9.0022651E+2.9.3280864E+2.9.0603418E+2. | | | | | |
| 00236 | 876° | C | 6 | 7 | 8 | 9 | 10 | |
| 00236 | 877° | | X8.7989596E+2.8.5438573E+2.8.2949430E+2.8.0521168E+2.7.8152728E+2. | | | | | |
| 00236 | 878° | C | 11 | 12 | 13 | 14 | 15 | |
| 00236 | 879° | | X7.58433002E+2.7.3590840E+2.7.1395065E+2.6.7167869E+2.6.3151745E+2. | | | | | |
| 00236 | 880° | C | 16 | 17 | 18 | 19 | 20 | |
| 00236 | 881° | | X5.9337050E+2.5.5714348E+2.4.9008912E+2.4.2967959E+2.3.7532040E+2. | | | | | |
| 00236 | 882° | C | 21 | 22 | 23 | 24 | 25 | |
| 00236 | 883° | | X3.2649869E+2.2.8277555E+2.2.4373144E+2.2.0909281E+2.1.7861068E+2. | | | | | |
| 00236 | 884° | C | 26 | 27 | 28 | 29 | 30 | |
| 00236 | 885° | | X1.5199024E+2.1.2852856E+2.1.0911341E+2.9.2252642E+1.7.8097365E+1. | | | | | |
| 00236 | 886° | C | 31 | 32 | 33 | 34 | 35 | |
| 00236 | 887° | | X6.6260092E+1.5.6315652E+1.4.0899191E+1.2.9918759E+1.2.2038159E+1. | | | | | |
| 00236 | 888° | C | 36 | 37 | 38 | 39 | 40 | |
| 00236 | 889° | | X1.6327363E+1.1.2146273E+1.9.0905300E+0.6.8429914E+0.5.1807184E+0. | | | | | |
| 00236 | 890° | C | 41 | 42 | 43 | 44 | 45 | |
| 00236 | 891° | | X3.9447995E+0.3.0209180E+0.2.3262411E+0.1.6004513E+0.1.399781E+0. | | | | | |
| 00236 | 892° | C | 46 | 47 | 48 | 49 | 50 | |
| 00236 | 893° | | X1.0910568E+0.8.5180215E-1.6.6393197E-1.5.1553130E-1.3.9852059E-1. | | | | | |
| 00236 | 894° | C | 51 | 52 | 53 | 54 | 55 | |
| 00236 | 895° | | X3.0651143E-1.2.3442082E-1.1.7818466E-1.1.3454170E-1.1.0086976E-1. | | | | | |
| 00236 | 896° | C | 56 | 57 | 58 | 59 | 60 | |
| 00236 | 897° | | X7.5059128E-2.5.5414297E-2.4.0576003E-2.2.9458748E-2.2.1200623E-2. | | | | | |
| 00236 | 898° | C | 61 | 62 | 63 | 64 | 65 | |
| 00236 | 899° | | X1.5119031E-2.1.0684305E-2.7.4793850E-3.5.1878215E-3.3.5914714E-3. | | | | | |
| 00236 | 900° | C | 66 | 67 | 68 | 69 | 70 | |
| 00236 | 901° | | X2.4869045E-3.1.7224435E-3.1.2003841E-3.8.4635721E-4.6.0330423E-4. | | | | | |
| 00236 | 902° | C | 71 | 72 | 73 | 74 | 75 | |
| 00236 | 903° | | X4.3449711E-4.3.1597170E-4.2.3253935E-4.1.7351148E-4.1.3111039E-4. | | | | | |
| 00236 | 904° | C | 76 | 77 | 78 | 79 | 80 | |
| 00236 | 905° | | X1.0027554E-4.7.7438980E-5.6.0696757E-5.4.8080073E-5.3.9145232E-5. | | | | | |
| 00236 | 906° | C | 81 | 82 | 83 | 84 | 85 | |
| 00236 | 907° | | X3.2082435E-5.2.6597710E-5.2.2377934E-5.1.9141913E-5.1.6599345E-5. | | | | | |

| | | | | | | | | |
|-------|------|---|---|----------------|----------------|----------------|----------------|--|
| 00236 | 908° | C | 86 | 87 | 88 | 89 | 90 | |
| 00236 | 909° | | X1.4560872E-5 | 0.12898417E-5 | 0.1522650E-5 | 0.0369426E-5 | 0.93925204E-6 | |
| 00236 | 910° | C | 91 | 92 | 93 | 94 | 95 | |
| 00236 | 911° | | X8.5583661E-6 | 0.70345911E-6 | 0.72066944E-6 | 0.46566336E-6 | 0.601717079E-6 | |
| 00236 | 912° | C | | | | | | |
| 00240 | 913° | | DATA (PRSLST(1),1,1,HP63,1,HP64)/ | | | | | |
| 00240 | 914° | C | 96 | 97 | 98 | 99 | 100 | |
| 00240 | 915° | | X5.7417393E-6 | 0.53584943E-6 | 0.50126367E-6 | 0.406986357E-6 | 0.404127423E-6 | |
| 00240 | 916° | C | 101 | 102 | 103 | 104 | 105 | |
| 00240 | 917° | | X4.1517377E-6 | 0.39128496E-6 | 0.304886099E-6 | 0.31230234E-6 | 0.208059993E-6 | |
| 00240 | 918° | C | 106 | 107 | 108 | 109 | 110 | |
| 00240 | 919° | | X2.5279174E-6 | 0.2029452E-6 | 0.20665225E-6 | 0.18747980E-6 | 0.107093719E-6 | |
| 00240 | 920° | C | 111 | 112 | 113 | 114 | | |
| 00240 | 921° | | X1.5518716E-6 | 0.14150844E-6 | 0.12921892E-6 | 0.12634456E-6 | | |
| 00240 | 922° | C | 115 | 116 | 117 | 118 | 119 | |
| 00240 | 923° | | X3.5024639E-6 | 0.202587459E-6 | 0.230449304E-6 | 0.196365027E-6 | 0.175234920E-6 | |
| 00240 | 924° | C | 120 | 121 | 122 | 123 | | |
| 00240 | 925° | | X5.8534791E-6 | 0.809499401E-6 | 0.602355810E-6 | 0.20696155E-6 | | |
| 00240 | 926° | C | | | | | | |
| 00240 | 927° | C | | | | | | |
| 00240 | 928° | C | DENSITY VALUES TABULATED IN KILOGRAMS PER CUBIC METER | | | | | |
| 00240 | 929° | C | | | | | | |
| 00242 | 930° | | DATA (RHOLST(1),1,1,HP61,1,HP62)/ | | | | | |
| 00242 | 931° | C | 1 | 2 | 3 | 4 | 5 | |
| 00242 | 932° | | X1.1835467E+0 | 0.1573534E+0 | 0.1312045E+0 | 0.1051789E+0 | 0.10793462E+0 | |
| 00242 | 933° | C | 6 | 7 | 8 | 9 | 10 | |
| 00242 | 934° | | X1.0537666E+0 | 0.10284922E+0 | 0.10035670E+0 | 0.90792801E-1 | 0.95490568E-1 | |
| 00242 | 935° | C | 11 | 12 | 13 | 14 | 15 | |
| 00242 | 936° | | X9.03122447E-1 | 0.9000345E-1 | 0.80525681E-1 | 0.804122243E-1 | 0.79915662E-1 | |
| 00242 | 937° | C | 16 | 17 | 18 | 19 | 20 | |
| 00242 | 938° | | X7.5909447E-1 | 0.72084275E-1 | 0.64983435E-1 | 0.58535153E-1 | 0.5265817E-1 | |
| 00242 | 939° | C | 21 | 22 | 23 | 24 | 25 | |
| 00242 | 940° | | X4.7249382E-1 | 0.4225460E-1 | 0.37638429E-1 | 0.33302120E-1 | 0.29232218E-1 | |
| 00242 | 941° | C | 26 | 27 | 28 | 29 | 30 | |
| 00242 | 942° | | X2.5432637E-1 | 0.203226E-1 | 0.18717895E-1 | 0.15445601E-1 | 0.13239218E-1 | |
| 00242 | 943° | C | 31 | 32 | 33 | 34 | 35 | |
| 00242 | 944° | | X1.1096236E-1 | 0.3193799E-2 | 0.6193250E-2 | 0.407478898E-2 | 0.30382489E-2 | |
| 00242 | 945° | C | 36 | 37 | 38 | 39 | 40 | |
| 00242 | 946° | | X2.5119029E-2 | 0.10334060E-2 | 0.13457797E-2 | 0.909301028E-3 | 0.703654170E-3 | |
| 00242 | 947° | C | 41 | 42 | 43 | 44 | 45 | |
| 00242 | 948° | | X5.4934199E-3 | 0.1220200E-3 | 0.1134715E-3 | 0.203684559E-3 | 0.18151546E-3 | |
| 00242 | 949° | C | 46 | 47 | 48 | 49 | 50 | |
| 00242 | 950° | | X1.4015768E-3 | 0.10965534E-3 | 0.86526723E-4 | 0.8253221E-4 | 0.53756684E-4 | |
| 00242 | 951° | C | 51 | 52 | 53 | 54 | 55 | |
| 00242 | 952° | | X4.2227457E-4 | 0.3048920E-4 | 0.25745233E-4 | 0.19944483E-4 | 0.15352539E-4 | |
| 00242 | 953° | C | 56 | 57 | 58 | 59 | 60 | |
| 00242 | 954° | | X1.1734236E-4 | 0.8997983E-5 | 0.6949356E-5 | 0.49935490E-5 | 0.36923403E-5 | |
| 00242 | 955° | C | 61 | 62 | 63 | 64 | 65 | |
| 00242 | 956° | | X2.7067389E-5 | 0.19677466E-5 | 0.14194402E-5 | 0.10004256E-5 | 0.69258360E-6 | |
| 00242 | 957° | C | 66 | 67 | 68 | 69 | 70 | |
| 00242 | 958° | | X4.7957760E-6 | 0.30321580E-6 | 0.2404222E-6 | 0.15304616E-6 | 0.10579997E-6 | |
| 00242 | 959° | C | 71 | 72 | 73 | 74 | 75 | |
| 00242 | 960° | | X7.3962724E-7 | 0.52254595E-7 | 0.36173880E-7 | 0.26206711E-7 | 0.18979684E-7 | |
| 00242 | 961° | C | 76 | 77 | 78 | 79 | 80 | |
| 00242 | 962° | | X1.3929915E-7 | 0.10349963E-7 | 0.75342182E-8 | 0.5606657E-8 | 0.4259020E-8 | |
| 00242 | 963° | C | 81 | 82 | 83 | 84 | 85 | |
| 00242 | 964° | | X3.2809278E-8 | 0.2501890E-8 | 0.19457748E-8 | 0.15133149E-8 | 0.10203946E-8 | |
| 00242 | 965° | C | 86 | 87 | 88 | 89 | 90 | |

ORIGINAL PAGE
OF POOR QUALITY

| | | | | |
|-------|-------|---|--|--------------|
| 00242 | 966° | | X9.7426983E-9.8.0.146089E-9.6.6029560E-9.5.638713 | -8J72428E-9. |
| 00242 | 967° | L | 91 92 93 94 95 | |
| 00242 | 968° | | X4.1362113E-9.3.5481306E-9.3.1356750E-9.2.7585267. | 14047E-9/ |
| 00242 | 969° | C | | |
| 00244 | 970° | | DATA (MMOLST(1),I=NP63,NP64)/ | |
| 00244 | 971° | C | 96 97 98 99 100 | |
| 00244 | 972° | | X2.1726345E-9.1.9431903E-9.1.7627216E-9.1.6037353E-9.1.4631550E-9. | |
| 00244 | 973° | C | 101 102 103 104 | |
| 00244 | 974° | | X1.3383898E-9.1.2273083E-9.1.0562018E-9.9.1375313E-10. | |
| 00244 | 975° | C | 105 106 107 108 | |
| 00244 | 976° | | X7.9820295E-10.7.0302521E-10.6.2101002E-10.5.5011615E-10. | |
| 00244 | 977° | C | 109 110 111 112 | |
| 00244 | 978° | | X4.4002371E-10.4.3637082E-10.3.9157098E-10.3.5195770E-10. | |
| 00244 | 979° | C | 113 114 115 116 | |
| 00244 | 980° | | X3.1696683E-10.3.0873182E-10.4.9895351E-10.3.5436502E-10. | |
| 00244 | 981° | C | 117 118 119 120 | |
| 00244 | 982° | | X5.5991186E-2.1.2347674E-3.9.7403572E-4.7.6857846E-4. | |
| 00244 | 983° | C | 121 122 123 | |
| 00244 | 984° | | X1.6728017E-5.1.2023770E-5.3.9910710E-6/ | |
| 00244 | 985° | C | | |
| 00244 | 986° | C | | |
| 00244 | 987° | C | | |
| 00244 | 988° | C | | |
| 00244 | 989° | C | | |
| 00244 | 990° | | SPEED OF SOUND VALUES TABULATED IN METERS PER SECOND | |
| 00244 | 991° | | DATA (SONLST(1),I=NP61,NP62)/ | |
| 00244 | 992° | C | 1 2 3 4 5 | |
| 00244 | 993° | | X3.4685752E2.3.4577091E2.3.4474100E2.3.4375977E2.3.4281972E2. | |
| 00244 | 994° | C | 6 7 8 9 10 | |
| 00244 | 995° | | X3.4191375E2.3.4103527E2.3.4017814E2.3.3933604E2.3.3850555E2. | |
| 00244 | 996° | C | 11 12 13 14 15 | |
| 00244 | 997° | | X3.3768001E2.3.3685564E2.3.3602846E2.3.3535175E2.3.3462585E2. | |
| 00244 | 998° | C | 16 17 18 19 20 | |
| 00244 | 999° | | X3.3083264E2.3.2891940E2.3.2794679E2.3.2057962E2.3.1891021E2. | |
| 00244 | 1000° | C | 21 22 23 24 25 | |
| 00244 | 1001° | | X3.1103836E2.3.0609732E2.3.0115374E2.2.9654540E2.2.9250004E2. | |
| 00244 | 1002° | C | 26 27 28 29 30 | |
| 00244 | 1003° | | X2.8922838E2.2.86490521E2.2.8565248E2.2.8552323E2.2.8723862E2. | |
| 00244 | 1004° | C | 31 32 33 34 35 | |
| 00244 | 1005° | | X2.6897076E2.2.9075108E2.2.9419972E2.2.9721502E2.2.9966127E2. | |
| 00244 | 1006° | C | 36 37 38 39 40 | |
| 00244 | 1007° | | X3.0166194E2.3.0454826E2.3.0751834E2.3.1060615E2.3.1380529E2. | |
| 00244 | 1008° | C | 41 42 43 44 45 | |
| 00244 | 1009° | | X3.1706789E2.3.2031579E2.3.2342147E2.3.2622854E2.3.2854145E2. | |
| 00244 | 1010° | C | 46 47 48 49 50 | |
| 00244 | 1011° | | X3.3012557E2.3.277550E2.3.275595E2.3.2518452E.3.2216108E2. | |
| 00244 | 1012° | C | 51 52 53 54 55 | |
| 00244 | 1013° | | X3.1877907E2.3.1512538E2.3.1121960E2.3.0731304E2.3.0328736E2. | |
| 00244 | 1014° | C | 56 57 58 59 60 | |
| 00244 | 1015° | | X2.9925283E2.2.9524650E2.2.9128985E2.2.8738653E2.2.8351977E2. | |
| 00244 | 1016° | C | 61 62 63 64 67 | |
| 00244 | 1017° | | X2.7964461E2.2.7570998E2.2.7180535E2.4.2.6944122E2. | |
| 00244 | 1018° | C | 68 69 70 | |
| 00244 | 1019° | | X 2.7387919E2.2.7824640E2.2.8254611E2. | |
| 00244 | 1020° | C | 71 72 73 74 75 | |
| 00244 | 1021° | | X2.8678136E2.2.909549752.2.9778102E2.3.0445407E2.3.1098395E2. | |
| 00244 | 1022° | C | 76 77 78 79 80 | |
| 00244 | 1023° | | X3.1737952E2.3.2364874E2.3.3583625E2.3.475967E2.3.5897208E2. | |
| 00244 | 1024° | C | 81 82 83 84 85 | |
| 00244 | 1025° | | X3.6999789E2.3.4070451E2.4.0126162E2.4.2081570E2.4.3950065E2. | |

| | | | 36 | 87 | 88 | 89 | 90 |
|-------|-------|---|--------------------------------|-------------|-------------|--------------|--------------|
| 00246 | 1024° | C | X4.5742298E2 | 4.7466910E2 | 4.9131021E2 | 5.0740585E2 | 5.2300637E2 |
| 00246 | 1025° | C | 91 | 92 | 93 | 94 | 95 |
| 00246 | 1026° | C | X5.3815483E2 | 5.5288841E2 | 5.6717742E2 | 5.812320E2 | 5.94900377E2 |
| 00250 | 1029° | | DATA (SONLST(1),1,INP63,LP64)/ | | | | |
| 00250 | 1030° | C | 96 | 97 | 98 | 99 | 100 |
| 00250 | 1031° | C | X6.082670E2 | 6.2133762E2 | 6.3096486E2 | 6.4004440E2 | 6.4979159E2 |
| 00250 | 1032° | C | 101 | 102 | 103 | 104 | 105 |
| 00250 | 1033° | C | X6.5900328E2 | 6.6600798E2 | 6.8001215E2 | 6.9173079E2 | 7.0153775E2 |
| 00250 | 1034° | C | 106 | 107 | 108 | 109 | 110 |
| 00250 | 1035° | C | X7.0951229E2 | 7.1739818E2 | 7.2519035E2 | 7.3291548E2 | 7.3946609E2 |
| 00250 | 1036° | C | 111 | 112 | 113 | 114 | 115 |
| 00250 | 1037° | C | X7.4488092E2 | 7.5025666E2 | 7.5559417E2 | 7.5692267E2 | 7.6134917E2 |
| 00250 | 1039° | C | 116 | 117 | 118 | 119 | 120 |
| 00250 | 1039° | C | X2.9579332E2 | 2.9577557E2 | 3.0054537E2 | 3.02884119E2 | 3.02853783E2 |
| 00250 | 1040° | C | 121 | 122 | 123 | | |
| 00250 | 1041° | C | X2.7368549E2 | 2.6545229E2 | 2.6944122E2 | | |
| 00250 | 1042° | C | | | | | |
| 00250 | 1043° | C | | | | | |
| 00250 | 1044° | C | | | | | |
| 00250 | 1045° | C | | | | | |
| 00250 | 1046° | C | | | | | |
| 00252 | 1047° | C | | | | | |
| 00252 | 1048° | C | | | | | |
| 00252 | 1049° | C | | | | | |
| 00252 | 1050° | C | | | | | |
| 00252 | 1051° | C | | | | | |
| 00252 | 1052° | C | | | | | |
| 00252 | 1053° | C | | | | | |
| 00252 | 1054° | C | | | | | |
| 00252 | 1055° | C | | | | | |
| 00252 | 1056° | C | | | | | |
| 00252 | 1057° | C | | | | | |
| 00252 | 1058° | C | | | | | |
| 00252 | 1059° | C | | | | | |
| 00252 | 1060° | C | | | | | |
| 00252 | 1061° | C | | | | | |
| 00252 | 1062° | C | | | | | |
| 00252 | 1063° | C | | | | | |
| 00252 | 1064° | C | | | | | |
| 00252 | 1065° | C | | | | | |
| 00252 | 1066° | C | | | | | |
| 00252 | 1067° | C | | | | | |
| 00252 | 1068° | C | | | | | |
| 00252 | 1069° | C | | | | | |
| 00252 | 1070° | C | | | | | |
| 00252 | 1071° | C | | | | | |
| 00252 | 1072° | C | | | | | |
| 00252 | 1073° | C | | | | | |
| 00252 | 1074° | C | | | | | |
| 00252 | 1075° | C | | | | | |
| 00252 | 1076° | C | | | | | |
| 00252 | 1077° | C | | | | | |
| 00252 | 1078° | C | | | | | |
| 00252 | 1079° | C | | | | | |
| 00252 | 1080° | C | | | | | |
| 00252 | 1081° | C | | | | | |

VISCOSITY COEFFICIENT
VALUES TABULATED IN KILOGRAMS PER METER PER SECOND

| | | | 1 | 2 | 3 | 4 | 5 |
|-------|-------|---|----------------|---------------|---------------|----------------|---------------|
| 00252 | 1047° | C | X1.0302431E-5 | 1.03224157E-5 | 1.03499999E-5 | 1.038079299E-5 | 1.0414441E-5 |
| 00252 | 1049° | C | 6 | 7 | 8 | 9 | 10 |
| 00252 | 1051° | C | X1.7745850E-5 | 1.7881991E-5 | 1.7819367E-5 | 1.775524E-5 | 1.7696042E-5 |
| 00252 | 1052° | C | 11 | 12 | 13 | 14 | 15 |
| 00252 | 1053° | C | X1.7634541E-5 | 1.7572676E-5 | 1.7510139E-5 | 1.7381977E-5 | 1.7248245E-5 |
| 00252 | 1054° | C | 16 | 17 | 18 | 19 | 20 |
| 00252 | 1055° | C | X1.7107621E-5 | 1.6592239E-5 | 1.6637791E-5 | 1.6284601E-5 | 1.5905319E-5 |
| 00252 | 1056° | C | 21 | 22 | 23 | 24 | 25 |
| 00252 | 1057° | C | X1.5509244E-5 | 1.5108096E-5 | 1.4707842E-5 | 1.4335282E-5 | 1.4008886E-5 |
| 00252 | 1058° | C | 26 | 27 | 28 | 29 | 30 |
| 00252 | 1059° | C | X1.3745403E-5 | 1.3553590E-5 | 1.3457958E-5 | 1.3344759E-5 | 1.3358386E-5 |
| 00252 | 1060° | C | 31 | 32 | 33 | 34 | 35 |
| 00252 | 1061° | C | X1.03724675E-5 | 1.0387977E-5 | 1.04145944E-5 | 1.04389370E-5 | 1.04587102E-5 |
| 00252 | 1062° | C | 36 | 37 | 38 | 39 | 40 |
| 00252 | 1063° | C | X1.4748972E-5 | 1.4982730E-5 | 1.5223539E-5 | 1.5474160E-5 | 1.5734080E-5 |
| 00252 | 1064° | C | 41 | 42 | 43 | 44 | 45 |
| 00252 | 1065° | C | X1.5999574E-5 | 1.6263778E-5 | 1.6516764E-5 | 1.6745577E-5 | 1.6954206E-5 |
| 00252 | 1066° | C | 46 | 47 | 48 | 49 | 50 |
| 00252 | 1067° | C | X1.7063446E-5 | 1.7034883E-5 | 1.6870136E-5 | 1.6660460E-5 | 1.6414072E-5 |
| 00252 | 1068° | C | 51 | 52 | 53 | 54 | 55 |
| 00252 | 1069° | C | X1.38668E-5 | 1.5841407E-5 | 1.552885E-5 | 1.5206885E-5 | 1.4860579E-5 |
| 00252 | 1070° | C | 56 | 57 | 58 | 59 | 60 |
| 00252 | 1071° | C | X1.4554073E-5 | 1.4230412E-5 | 1.3911371E-5 | 1.3597275E-5 | 1.3286809E-5 |
| 00252 | 1072° | C | 61 | 62 | 63 | 64 | 67 |
| 00252 | 1073° | C | X1.2976813E-5 | 1.2662082E-5 | 1.2335131E-5 | | 1.2163172E-5 |
| 00252 | 1074° | C | | | | | |
| 00252 | 1075° | C | | | | | |
| 00252 | 1076° | C | | | | | |
| 00252 | 1077° | C | | | | | |
| 00252 | 1078° | C | | | | | |
| 00252 | 1079° | C | | | | | |
| 00252 | 1080° | C | | | | | |
| 00252 | 1081° | C | | | | | |

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00252 1002° C          86          87          88          89          90
00252 1063° C          91          92          93          94          95
00252 1084° C          96          97          98          99          100
00252 1086° C          101          102          103          104          105
00252 1087° C          106          107          108          109          110
00252 1088° C          111          112          113          114          115
00252 1089° C          116          117          118          119          120
00252 1090° C          121          122          123
00252 1091° C          12500495E-5.1.2147052E-5.1.2163172E-5/
00252 1092° C          DATA (V:SLST(1),104P63,NP64)/
00252 1093° C          96          97          98          99          100
00252 1094° C          101          102          103          104          105
00252 1095° C          106          107          108          109          110
00252 1096° C          111          112          113          114          115
00252 1097° C          116          117          118          119          120
00252 1098° C          121          122          123
00252 1099° C          12500495E-5.1.2147052E-5.1.2163172E-5/
00252 1100° C          ENL
00252 1101°

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END OF COMPILATION: NO DIAGNOSTICS.