General Disclaimer

One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.

- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.

- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.

- This document is paginated as submitted by the original source.

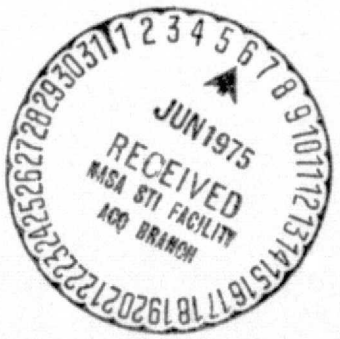
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

JSC-09063

NASA TECHNICAL MEMORANDUM

NASA TM X-58137
December 1974

ATMOSPHERIC TRANSMISSION COMPUTER PROGRAM CP



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS 77058

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TM X-58137		

4. Title and Subtitle	5. Report Date
ATMOSPHERIC TRANSMISSION COMPUTER PROGRAM CP	December 1974
	6. Performing Organization Code: JSC-09063

7. Author(s)	8. Performing Organization Report No.
D. E. Pitts, T. L. Barnett, and C. L. Korb, JSC, and Walter Hanby and Alyce E. Dillinger, LEC	
9. Performing Organization Name and Address	10. Work Unit No.: 951-16-00-00-72
Lyndon B. Johnson Space Center Houston, Texas 77058	11. Contract or Grant No.: EPN-582 EPN-584
12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered: Technical Memorandum
National Aeronautics and Space Administration Washington, D.C. 20546	14. Sponsoring Agency Code

15. Supplementary Notes

The JSC Director waived the use of the International System of Units (SI) for this Technical Memorandum because, in his judgment, the use of SI units would impair the usefulness of the report or result in excessive cost.

16. Abstract

A computer program that allows for the numerical calculation of the effects of carbon dioxide, water, methane, ozone, carbon monoxide, and nitrous oxide in the atmosphere on Earth resources remote-sensing techniques is described, and a flow chart of the program and operating instructions are provided. Comparisons are made between the atmospheric transmission obtained from laboratory and spacecraft spectrometer data and that obtained from a computer prediction by use of a model atmosphere using radiosonde data, and limitations of the model atmosphere data are discussed. The computer program listings and the input card formats and and sample runs for both radiosonde data and laboratory data are included in appendixes.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
*Earth Resources *Remote Sensing *Radiosonde Data *Signature Analysis *Environment Simulation *Absorption Spectra *Emission Spectra *Meteorology	STAR Subject Category: 43 (Earth Resources)

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	188	$7.00

*For sale by the National Technical Information Service, Springfield, Virginia 22151

NASA — JSC

JSC Form 1424 (Rev Jul 74)

NASA TM X-58137

ATMOSPHERIC TRANSMISSION COMPUTER PROGRAM CP

D. E. Pitts, T. L. Barnett, and C. L. Korb
Lyndon B. Johnson Space Center
Houston, Texas 77058

Walter Hanby and Alyce E. Dillinger
Lockheed Electronics Company, Inc.
Houston, Texas 77058

CONTENTS

TABLES

FIGURES

ATMOSPHERE TRANSMISSION COMPUTER PROGRAM CP[1]

By D. E. Pitts, T. L. Barnett, C. L. Korb,
Walter Hanby,* and Alyce E. Dillinger*
Lyndon B. Johnson Space Center

SUMMARY

All Earth resources remote-sensing techniques are affected, to some degree, by the atmosphere lying between the sensor and the test site. The computer program described herein allows the effects of atmospheric absorption and emission by carbon dioxide, water vapor, methane, nitrous oxide, carbon monoxide, and ozone to be assessed so that correction techniques can be devised and tables for atmospheric correction algorithms can be calculated. The absence of carbon monoxide data on the data tape, however, limits calculations to the remaining five gases. The program incorporates data from wavelengths of 0.69 to approximately 20 micrometers, generated by R. Calfee of the National Oceanic and Atmospheric Administration, but can incorporate other line-by-line data in the proper format. The atmosphere is divided into layers (≤ 30), each of equal mass, and is defined by significant levels of either radiosonde data or a model atmosphere. Both upwelling and downwelling emissions are calculated to enable simulation of both terrestrial and spaceborne measurements. The program is designed so that punched cards can be produced for use in other computer programs. Sample runs for both radiosonde data and laboratory data are provided in the appendixes.

INTRODUCTION

The objectives of the NASA Earth Observations Program are to determine the performance capabilities of various sensors, to identify signature criteria of resources, to develop new sensors and systems, to devise analysis systems and procedures, and to demonstrate applications using these tools. The laboratory usually affords the best testing environment for a sensor, but the type of target, the conditions of the signal path, and other testing parameters are limited. Because the laboratory environment is usually restrictive, a successful laboratory test of the sensor is necessary but not sufficient to ensure proper operation of the sensor in the real environment. Therefore, much of the testing is performed in an environment that duplicates the conditions under which the instrument is expected to operate. The success of the testing under such conditions requires that the data concerning the environment between the instrument platform and the test site be as accurate as possible.

---

[1]This report was produced under Skylab EREP contracts EPN-582 and EPN-584.
*Lockheed Electronics Company, Inc.

The magnitude of the effect on the signal caused by interaction between the atmosphere and the signal depends on the type of sensor used, the wavelength employed, and the meteorological conditions prevailing at the time of the measurement. Furthermore, the atmosphere can cause large deleterious effects in some analysis systems (e.g., maximum-likelihood pattern recognition computer programs); thus, the analysis system as well as the sensor and electronics must be evaluated. Therefore, the output from the CP computer program has been arranged so that punched cards can be produced for use in other computer programs to predict the effect of the atmosphere or to correct the data for atmospheric effects for a data collection and analysis system.

The computer program described herein allows the calculation of atmospheric transmission due to carbon dioxide, water vapor, methane, nitrous oxide, ozone, and carbon monoxide. Because no data exist on the data tape for the last of these, however, carbon monoxide calculations are precluded. The program incorporates data from wavelengths of 0.69 to approximately 20 micrometers but can incorporate other line-by-line data in the proper format.

Appreciation is expressed to Dr. R. F. Calfee, who assisted the authors in using his model and data, and to David Anding, who kindly ran his band model for the Salem, Illinois, test case.

SYMBOLS

A — full width at half maximum for triangular slit function, cm^{-1}

BOUND — distance from a line at which the wings of the line must be considered (usually approximately 12 cm^{-1}), cm^{-1}

C_1, C_2 — constants determined from the boundary conditions

CAYBUR — dummy variable

$CONN = \frac{-M*g}{RO}$

c — speed of light, 3.0×10^{10} cm/sec

DELV — the increment in cm^{-1} for calculations of upwelling and downwelling intensity, $\leq \frac{A}{2}$; also distance the center of triangular slit is moved to make the next intensity calculation.

DV — integration step within the triangular slit, cm^{-1}

$E_n(x)$ Kourganoff function, $\int_0^1 \mu^{n-2} e^{-x/\mu} d\mu$

E'' lower rotational energy level of the transition, cm^{-1}

g acceleration due to gravity

$I_{b\nu}(T)$ black-body monochromatic intensity at T and ν, $W/(cm^2 \cdot sr \cdot \mu m)$

$I_{0\nu}$ monochromatic intensity of Sun or other source, $W/(cm^2 \cdot sr \cdot \mu m)$

$I_\nu^+(\tau_\nu, \mu)$ monochromatic upward-welling radiation (intensity or radiance), $W/(cm^2 \cdot sr \cdot \mu m)$

$I_\nu^-(\tau_\nu, \mu)$ monochromatic downward-welling radiation (intensity or radiance), $W/(cm^2 \cdot sr \cdot \mu m)$

$\bar{I}_{\nu_0}$ degraded intensity, $W/(cm^2 \cdot sr \cdot \mu m)$, averaged over frequency

i atmospheric layer index

j dummy variable representing atmospheric layers

K_ν monochromatic mass absorption coefficient, $(molecules/cm^2)^{-1}$

$$K_0 = \frac{S}{\alpha_d}\sqrt{\frac{\ln 2}{\pi}}$$

k Boltzmann constant

ℓ number of integration steps from $\nu_1 - A$ to $\nu_1 + A$, which is equal to $\frac{2A}{DV}$

M mass of molecule, g

M^* molecular weight of the atmosphere, $g/(g \cdot mole)$

m one interval in frequency

NN	number of equal-mass layers in the atmosphere
n	monochromatic refractive index of the atmosphere
P	atmospheric pressure, atm
P_i	ambient atmospheric pressure for layer i, atm
P_0	1 atmosphere pressure, atm (101 325 N/m^2, 1013.25 mbar)
R	radius of planet
RO	universal gas constant based on the carbon-12 atomic weight scale in ergs/(K g·mole)
r	variable factor in equation (19), exponent which is a function of the molecular species
S	line intensity at P and T, $cm^{-1}/(molecule \cdot cm^{-2})$
S_0	line intensity at T_0 and P_0: $cm^{-1}/(g \cdot cm^{-2})$ for water and $cm^{-1}/(molecule \cdot cm)$ for carbon dioxide and other gases
SAY	dummy variable
T	temperature of the atmosphere as a function of z, K
T_0	base temperature for spectral lines = 296 K for Calfee data
T_1	temperature of the target, K
T_i	transmission for ith layer
$T_{i,mono}$	transmission for all line-by-line calculations
t	dummy variable of optical depth
U	optical mass, $\int_0^z \rho(z)dz$, molecules/cm^2
U_i	water-vapor optical mass, molecules/cm^2
Wl_i	water-vapor partial pressure, atm

W_d weighting function for downwelling intensity (unitless), derivative of transmission with respect to altitude times Δz_i

W_u weighting function for upwelling intensity (unitless), derivative of transmission with respect to altitude times Δz_i

w variable factor in equation (18)

$$X = \left| \frac{\nu - \nu_0 \sqrt{\ln 2}}{\alpha_d} \right|$$

$$x = -(t - \tau)$$

$$Y = \frac{\alpha_0 P}{\alpha_d P_0} \sqrt{\ln 2}$$

z altitude, cm

α Lorentz half width at P and T, cm^{-1}

$$\alpha_d = \nu_0 \sqrt{\frac{2kT \ln 2}{Mc^2}}$$

α_0 Lorentz half width at T_0 and P_0, cm^{-1}

Δz_i height of atmospheric layer i

$\Delta \mu_1$ zenith extent of Sun or other source

$\Delta \phi_1$ azimuthal extent of Sun or other source

$\bar{\varepsilon}$ gray-body emissivity assumed between ν_1 and ν_2

ε_ν monochromatic emissivity of target

θ zenith angle, rad

μ cos θ (unitless)

μ_1 position of Sun or other source (unitless)

μ_i cos θ_i, where θ_i = angle through ith layer

ν frequency, cm^{-1}

ν_0 frequency of line center, cm^{-1}

ν_1 frequency at beginning of calculation interval, cm^{-1}

ν_2 frequency at end of calculation interval, cm^{-1}

ρ constituent gas density as a function of z, molecules/cm^3

ρ_ν monochromatic reflectivity of target

$\sigma(\nu)$ normalized instrument function

$\sigma^*(\nu)$ triangular instrument function

$\tau_{0\nu}$ monochromatic optical depth of the entire atmosphere (dimensionless)

τ_ν monochromatic optical depth, $\int_0^z K_\nu \rho \, dz$ (dimensionless)

ϕ azimuthal angle, rad

ϕ_1 azimuthal angle of Sun or other source, rad

Ω plateau function

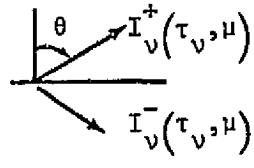
THEORY

In many remote-sensing applications through the Earth atmosphere in which scattering is not an important phenomenon and local thermodynamic equilibrium can be approximated because of the lack of rapid chemical reactions, the equations for radiative heat transfer can be written in the manner of Love (ref. 1), as indicated by the following equations and diagram.

$$\mu \frac{dI_\nu^+(\tau_\nu,\mu)}{d\tau_\nu} = -I_\nu^+(\tau_\nu,\mu) + n^2 I_{b\nu}(T) \tag{1}$$

$$-\mu \frac{dI_\nu^-(\tau_\nu,\mu)}{d\tau_\nu} = -I_\nu^-(\tau_\nu,\mu) + n^2 I_{b\nu}(T) \tag{2}$$

2 Top of the atmosphere $\tau_\nu = \tau_{0\nu}$



1 $\tau_\nu = 0$

where $\mu = \cos\theta$

θ = zenith angle

$I_\nu^+(\tau_\nu,\mu)$ = monochromatic upward-welling radiation (intensity or radiance)

$I_\nu^-(\tau_\nu,\mu)$ = monochromatic downward-welling radiation (intensity or radiance)

τ_ν = optical depth, $\int_0^z K_\nu \rho \, dz$

$\tau_{0\nu}$ = optical depth of the entire atmosphere

K_ν = monochromatic mass absorption coefficient

ρ = constituent gas density as a function of altitude z

ϕ = azimuthal angle

n = refractive index

$I_{b\nu}(T)$ = black-body intensity at atmospheric temperature T

ν = frequency

The solutions to equations (1) and (2) for the case in which atmospheric temperature is a function of altitude require the use of an integrating factor.

$$I_\nu^+\left(\tau_\nu,\mu\right) = C_1 e^{\frac{-\tau_\nu}{\mu}} + n^2\int_0^{\tau_\nu} \frac{e^{\frac{t-\tau_\nu}{\mu}}}{\mu} I_{b\nu}(t)dt \tag{3}$$

$$I_\nu^-\left(\tau_\nu,\mu\right) = C_2 e^{\frac{\tau_\nu-\tau_{0\nu}}{\mu}} + n^2\int_{\tau_\nu}^{\tau_{0\nu}} \frac{e^{\frac{\tau-t}{\mu}}}{\mu} I_{b\nu}(t)dt \tag{4}$$

where C_1 and C_2 are constants determined from the boundary conditions and t is a dummy variable of optical depth. Assuming that the target is a diffuse reflector ρ_ν having an emissivity ε_ν and a temperature T_1 and located at $t_\nu = 0$, that $\rho_2 = 0$ and $I_{b2}(T_2) = 0$ at the top of the atmosphere ($t_\nu = \tau_{\nu 0}$), and that the Sun or other source is illuminating the top of the atmosphere with radiance $I_{0\nu}$ incident over the area represented by $\Delta\mu$ and $\Delta\phi$ at μ_1 and ϕ_1, respectively, the boundary conditions are as follows.

$$I_\nu^+(0,\mu) = \varepsilon_\nu I_{b\nu}\left(T_1\right) + \frac{\rho_\nu}{\pi}\int_0^{2\pi}\int_0^1 I^-(0,\mu')\mu'\, d\mu'\, d\phi' \tag{5}$$

$$I_\nu^-\left(\tau_{0\nu},\mu\right) = \Omega I_{0\nu} \tag{6}$$

where, when the plateau function $\Omega = 0$, $\phi > \phi_1 + \frac{\Delta\phi}{2}$, $\mu > \mu_1 + \frac{\Delta\mu}{2}$, $\phi < \phi_1 - \frac{\Delta\phi}{2}$, and $\mu < \mu_1 - \frac{\Delta\mu}{2}$ (i.e., the function is a rectangular box in the middle of the (ϕ,μ) plane); $\Omega = 1$ otherwise.

Solving for C_1 and C_2 in equations (3) and (4) by using equations (5) and (6) gives the following solutions.

$$I_\nu^+(\tau_\nu,\mu) = \left\{\varepsilon_\nu I_{b\nu}(T_1) + \frac{\rho_\nu}{\pi}\int_0^{2\pi}\int_0^1\left[\Omega I_{0\nu}e^{\frac{-\tau_{0\nu}}{\mu'}} + n^2\int_0^{\tau_{0\nu}}\frac{e^{\frac{\tau-t}{\mu'}}}{\mu'}I_{b\nu}(t)dt\right]\mu'\,d\mu'\,d\phi'\right\}e^{\frac{-\tau_\nu}{\mu}} + n^2\int_0^{\tau_\nu}\frac{e^{\frac{t-\tau}{\mu}}}{\mu}I_{b\nu}(t)dt \quad (7)$$

$$I_\nu^-(\tau_\nu,\mu) = \Omega I_{0\nu}e^{\frac{\tau_\nu-\tau_{0\nu}}{\mu}} + n^2\int_{\tau_\nu}^{\tau_{0\nu}}\frac{e^{\frac{\tau-t}{\mu}}}{\mu}I_{b\nu}(t)dt \quad (8)$$

The two most important cases of remote sensing through an atmosphere are covered by equations (7) and (8): sensing upwelling radiance (eq. (7)) reflected and/or emitted from a target using downward-looking sensors and sensing downwelling radiance (eq. (8)) from targets. In both cases, the equations are general and account for both monochromatic absorption and reradiation by the atmosphere for targets at any altitude in or above the atmosphere (arbitrarily called $\tau_\nu = 0$) and for sensors in or above the atmosphere.

Equation (7) can be simplified somewhat by integrating over the azimuthal direction.

$$I_\nu^+(\tau_\nu,\mu) = \varepsilon_\nu I_{b\nu}(T_1)e^{\frac{-\tau_\nu}{\mu}} + \frac{I_0\rho_\nu\,\Delta\phi\, e^{\frac{-\tau_\nu}{\mu}}}{\pi}\int_{\mu_1-\frac{\Delta\mu}{2}}^{\mu_1+\frac{\Delta\mu}{2}} e^{\frac{-\tau_{0\nu}}{\mu'}}\,\mu'\,d\mu'$$

$$+ 2\rho_\nu n^2 e^{\frac{-\tau_\nu}{\mu}}\int_0^1\int_0^{\tau_{0\nu}} e^{\frac{\tau-t}{\mu'}} I_{b\nu}(t)\,d\mu'\,dt$$

$$+ n^2\int_0^{\tau_\nu}\frac{e^{\frac{t-\tau}{\mu}}}{\mu} I_{b\nu}(t)\,dt \qquad (9)$$

By taking the limit at small $\Delta\mu$ for the upper radiation source and introducing the exponential integral or Kourganoff function (ref. 2)

$$E_n(x) = \int_0^1 \mu^{n-2} e^{\frac{-x}{\mu}}\,d\mu \qquad (10)$$

where $x = -(t - \tau)$, equation (9) then can be written

$$I_\nu^+(\tau_\nu,\mu) = \varepsilon_\nu I_{b\nu}(T_1)e^{\frac{-\tau_\nu}{\mu}} + \frac{I_{0\nu}\rho_\nu e^{\frac{-\tau_\nu}{\mu}}\Delta\phi\, e^{\frac{-\tau_{0\nu}}{\mu_1}}\mu_1\,\Delta\mu_1}{\pi}$$

$$+ 2\rho_\nu n^2 e^{\frac{-\tau_\nu}{\mu}}\int_0^{\tau_{0\nu}} E_2(t - \tau)I_{b\nu}(t)dt$$

$$+ n^2\int_0^{\tau_\nu}\frac{e^{\frac{t-\tau}{\mu}}}{\mu}I_{b\nu}(t)dt \qquad (11)$$

In the case of most natural targets, the value of ε_ν is approximately 0.9 or higher for wavelengths of 4 to 20 micrometers and thus causes ρ_ν to be small. Thus, for remote-sensing measurements, the reflectance of atmospheric downwelling flux usually is negligible except when sensing is being attempted in or very near strongly absorbing bands from low-altitude platforms or when sensing is done at a very large angle from nadir, for which ρ_ν is much larger. Thus, the third term in equation (11)

$$2\rho_\nu n^2 e^{\frac{-\tau_\nu}{\mu}}\int_0^{\tau_{0\nu}} E_2(\tau - t)I_{b\nu}(t)dt$$

can usually be ignored. The second term in equation (11)

$$\frac{I_{0\nu}\rho_\nu e^{\frac{-\tau_\nu}{\mu}}\Delta\phi\, e^{\frac{-\tau_{0\nu}}{\mu_1}}\mu_1\,\Delta\mu_1}{\pi}$$

is usually small as well, but is larger than the third term since the source considered is often the Sun. The second term should always be a strong candidate for inclusion at wavelengths <4 micrometers and should be included for specular reflectances at any wavelength.

For most purposes, it is therefore possible to simplify equation (11) to

$$I_\nu^+(\tau_\nu,\mu) = \varepsilon_\nu I_{b\nu}(T_1)e^{\frac{-\tau_\nu}{\mu}} + \frac{n^2}{\mu}\int_0^{\tau_\nu} e^{\frac{t-\tau_\nu}{\mu}} I_{b\nu}(t)dt \qquad (12)$$

COMPUTER PROGRAM

Program Development

The terms in equations (8) and (12) are calculated in finite difference form by assuming a refractive index of unity. The optical depth τ_ν in finite difference form is

$$\tau_\nu = \sum_{i=1}^{NN} K_{\nu_i}\rho_i\,\Delta z_i \qquad (13)$$

where NN is the number of equal-mass layers i (usually NN $\geq$ 10). The monochromatic intensity transmitted through the atmosphere (where j is a dummy variable representing atmospheric layers and $\bar{\varepsilon}$ is gray-body emissivity assumed between ν_1 and ν_2 is

$$\varepsilon_\nu I_{b\nu}(T_1)e^{\frac{-\tau_\nu}{\mu}} = \bar{\varepsilon}I_{b\nu}(T_1)\prod_{j=1}^{NN} e^{\frac{-\left(K_{\nu_j}\rho_j\,\Delta z_j\right)}{\mu_j}} \qquad (14)$$

The upward-emitted intensity, designated in the printout (appendixes A and B) as "INT UP TOTAL" (for the NN-layer printout) is

$$n^2 \sum_{i=1}^{NN} \frac{I_{b\nu i}}{\mu_i} \prod_{j=i}^{NN} e^{\frac{-\left(K_{\nu_j} \rho_j \Delta z_j\right)}{\mu_j}} \tag{15}$$

and the downward-emitted intensity, designated in the printout (appendixes A and B) as "INT DOWN TOTAL" (for the NN-layer printout), is

$$n^2 \sum_{i=1}^{NN} \frac{I_{b\nu i}}{\mu_i} \prod_{j=1}^{i} e^{\frac{-\left(K_{\nu_j} \rho_j \Delta z_j\right)}{\mu_j}} \tag{16}$$

Thus, the terms in equations (8) and (12) can be calculated for the Lorentz broadening of the line shape, where

$$K_\nu = \frac{S\alpha}{\pi\left[\left(\nu - \nu_0\right)^2 + \alpha^2\right]} \tag{17}$$

where

$$S = S_0 \left(\frac{T_0}{T}\right)^w \exp\left[\frac{-E''\left(T_0 - T\right)}{kT_0T}\right] \tag{18}$$

$$\alpha = \alpha_0 \left(\frac{P}{P_0}\right)\left(\frac{T_0}{T}\right)^r \tag{19}$$

where k is the Boltzmann constant, $T_0 = 296$ K. and $P_0 = 1$ atmosphere = 1013.25×10^2 N/m^2 (1013.25 millibars); r is 0.62, 0.58, 0.5, 0.5, 0.5, and 0.5, and w is 1.5, 1.0, 1.5, 1.5, 1.0, and 1.5, for water, carbon dioxide, ozone, nitrous oxide, carbon monoxide, and methane, respectively; E'' is the

lower rotational energy level of the transition; S_0 is the line intensity in $cm^{-1}/(molecule \cdot cm^{-2})$; α_0 is the Lorentz half width; and ν_0 is the frequency at a line center. These last four parameters are obtained from a magnetic tape containing data for carbon dioxide, water, nitrous oxide, ozone, and methane (ref. 3). These data, a sample of which is shown in appendix C, are obtainable from the authors of this report on request. Other data can be used just as easily with the program, provided that the format and parametric units are the same or that statement 151 of the main program can be changed to accommodate other data tape formats (ref. 4). The relationships between the units for optical mass U, for $K_0(\nu)$, and for S indicated in the list of symbols in this document and the older units are given in table I, taken from reference 5.

Because the absorption at any frequency ν results not only from lines near that frequency but also from the wings of nearby lines, the absorption coefficient must include contributions from these sources. This procedure is accomplished by summing all values of K_ν for $\nu_0 \pm$ BOUND, where BOUND is the distance from a line at which the wings of the line must be considered.

$$K_\nu = \frac{1}{\pi} \sum_{\nu'=\nu_0-\mathrm{BOUND}}^{\nu'=\nu_0+\mathrm{BOUND}} \frac{S_{\nu_0} \alpha_{\nu'}}{(\nu - \nu')^2 + \alpha_{\nu'}^2} \tag{20}$$

For low pressures, the predominant broadening effect is caused by the motion of the molecules (Doppler broadening). To account for this effect and for the transition between Lorentz and Doppler broadening, the Voigt profile (refs. 6 and 7) is used to calculate the absorption coefficient (K_ν) when $\frac{P}{P_0} < 0.25$, $X < 25.0$, and $Y < 5.0$.

$$K_\nu = \frac{K_0 Y}{\pi} \int_{-\infty}^{\infty} \frac{e^{-t}}{Y^2 + (X - t)^2} \, dt \tag{21}$$

where $X = \left| \frac{(\nu - \nu_0)\sqrt{\ln 2}}{\alpha_d} \right|$

$$Y = \frac{\alpha_0 P}{\alpha_d P_0} \sqrt{\ln 2}$$

$$\alpha_d = \nu_0 \sqrt{\frac{2kT \ln 2}{Mc^2}}$$

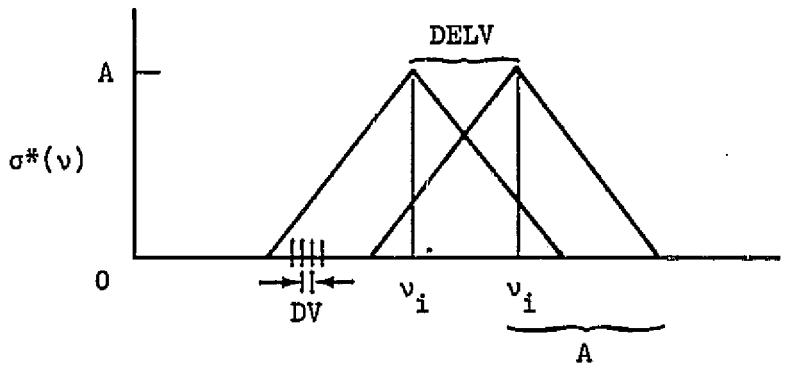
$$K_C = \frac{S}{\alpha_d} \sqrt{\frac{\ln 2}{\pi}}$$

c = speed of light

M = mass of the molecule

For very low pressures, equation (21) approaches Doppler broadening; for higher pressures, it approaches Lorentz broadening.

Because remote sensing is accomplished with instruments of finite bandwidth, equations (14) to (16) are integrated over a triangular instrument function $\sigma^*(\nu) = A - |\nu_i - \nu|$, where $\nu_i - A \leq \nu \leq \nu_i + A$, as indicated by the following diagram, in which A is one-half the width of the slit triangle base, DV is the integration step with the triangular slit, and DELV is the step between printouts.



For example, to find the degraded intensity $\bar{I}_{\nu 0}$ through the atmosphere (ref. 3)

$$\bar{I}_{\nu_0} = \frac{\int_{\nu_i - A}^{\nu_i + A} I_\nu \sigma^*(\nu) d\nu}{\int_{\nu_i - A}^{\nu_i + A} \sigma^*(\nu) d\nu} \qquad (22)$$

where the normalized instrument function $\sigma(\nu)$ is defined by

$$\sigma(\nu) = \frac{\sigma^*(\nu)}{\int_{\nu_i - A}^{\nu_i + A} \sigma^*(\nu)d\nu} = \frac{\sigma^*(\nu)}{A^2} \tag{23}$$

and this step is performed for each ν_0 value from ν_1 to ν_2 so that

$$\bar{I}_{\nu_0} = \int_{\nu_i - A}^{\nu_i + A} I_\nu \sigma(\nu)d\nu \tag{24}$$

Thus, the average intensity transmitted upward through the atmosphere plus that emitted for one position of the filter function at ν_k will be

$$\overline{I^+_{\nu_k}(\tau_\nu, \mu)} = \frac{\Delta\nu\varepsilon}{A^2} \sum_{m=1}^{m=\ell} I_b(T_1) \prod_{j=1}^{NN} e^{\frac{-\left(K_{m_j} \rho_j \Delta z_j\right)}{\mu_j}}$$

$$+ \frac{\Delta\nu n^2}{A^2} \sum_{m=1}^{m=\ell} \sum_{i=1}^{NN} \frac{I_{bm}}{\mu_i} \prod_{j=i}^{NN} e^{\frac{-\left(K_{m_j} \rho_j \Delta z_j\right)}{\mu_j}} \tag{25}$$

For a target of intensity I_0 in or above the atmosphere, the average intensity transmitted through the atmosphere plus that emitted downward for one position of the filter function at ν_k will be

$$\overline{I^-_{\nu_k}(\tau_\nu,\mu)} = \frac{\Delta\nu}{A^2}\sum_{m=1}^{m=\ell} I_{0m} \prod_{j=1}^{NN} e^{\frac{-\left(K_{m_j}\rho_j\,\Delta z_j\right)}{\mu_j}}$$

$$+ \frac{\Delta\nu n^2}{A^2}\sum_{m=1}^{m=\ell}\sum_{i=1}^{NN} \frac{I_{bm}}{\mu_i} \prod_{j=1}^{i} e^{\frac{-\left(K_{m_j}\rho_j\right)}{\mu_j}} \qquad (26)$$

where NN = number of layers chosen for the atmosphere, i = one layer in the atmosphere, ℓ = number of integration steps from $\nu_i - A$ to $\nu_i + A$, $\frac{2A}{DV}$, and m = one interval in frequency.

Thus, equations (25) and (26) describe the degraded intensities $\bar{I}^+_{\nu_0}$ and $\bar{I}^-_{\nu_0}$, which are upwelling and downwelling intensities, respectively, for a gray body with emissivity ε and temperature T_1.

$$\overline{I^+_{\nu_k}(\tau_\nu,\mu)} = \varepsilon\,\overline{I_{b\nu}(T_1)e^{\frac{-\tau_\nu}{\mu}}} + \int_0^{\tau_\nu} \frac{e^{\frac{t-\tau}{\mu}}}{\mu} I_{b\nu}(t)\,dt \qquad (27)$$

$$\overline{I^-_{\nu_k}(\tau_\nu,\mu)} = \Omega\overline{I_{0\nu}e^{\frac{\tau_\nu-\tau_{0\nu}}{\mu}}} + \int_{\tau_\nu}^{\tau_{0\nu}} \frac{e^{\frac{\tau-t}{\mu}}}{\mu} I_{b\nu}(t)\,dt \qquad (28)$$

The two terms in each equation are calculated in finite difference form and are printed and punched out by the computer program. To enable the

calculation of equations (25) and (26), two computer programs were integrated. One of these (ref. 3) is used to calculate a monochromatic atmospheric transmission spectrum for one layer of the atmosphere and then to degrade this spectrum to the desired wavelength resolution as it might be observed with a spectrometer. The other program (ref. 8) affords a self-consistent method for calculating the state of the atmosphere on a refracted path through a spherical atmosphere, between two specified points, on the basis of radiosonde data or model atmosphere data (ref. 9).

The combination of the two programs, using a layered atmosphere (≤ 30 layers), produces high-resolution[2] transmission and emission over any path by using realistic model atmospheres that can then be degraded to the appropriate resolution. The model can be used to correct upward-, sideward-, or downward-looking instruments of either high or low spectral resolution in the frequency range of 0.742 to 1.4415×10^4 cm^{-1}. The data include 15 250 lines of carbon dioxide, water vapor, ozone, nitrous oxide, and methane. Moreover, the model includes all significant levels of water vapor and as many as 30 layers of differing concentrations of carbon dioxide, ozone, nitrous oxide, carbon monoxide, and methane. Furthermore, this computer program is not restricted to the Earth atmosphere. Any atmosphere for which any of the five constituent gases is appropriate may be studied by changing the molecular weight of the gas M*, the radius of the planet R, the acceleration of gravity g, and CONN, which equals $\frac{-M^*g}{RO}$ where RO is the universal gas constant, to the appropriate planetary values in the main program data statement.

Another calculation added was that of weighting functions for downwelling intensity (which is the derivative of transmission with respect to altitude times Δz_i)

$$\overline{W_i d} = \overline{\frac{e^{\frac{t-\tau}{\mu}}}{\mu} dt} = \frac{\Delta\nu n^2}{\mu_i A^2} \sum_{m=1}^{m=\ell} \left[\prod_{j=1}^{i-1} e^{\frac{-\left(K_{m_j} \rho_j\right)}{\mu_j}} - \prod_{j=1}^{i} e^{\frac{-\left(K_{m_j} \rho_j\right)}{\mu_j}} \right] \qquad (29)$$

[2]Resolution should not be pushed beyond 2 or 3 cm^{-1} because Calfee compresses the lines within each 1-cm^{-1} interval into one or two equivalent "compressed" lines for each species.

and for upwelling intensity

$$\overline{W_i u} = \overline{\frac{e^{\frac{\tau-t}{\mu}}}{\mu}\,dt} = \frac{\Delta\nu n^2}{\mu_i A^2}\sum_{m=1}^{m=\ell}\left[\prod_{j=1}^{NN} e^{\frac{-\left(K_{m_j}\rho_j\right)}{\mu_j}} - \prod_{j=i-1}^{NN} e^{\frac{-\left(K_{m_j}\rho_j\right)}{\mu_j}}\right] \qquad (30)$$

These functions are required for inputs to inversion routines that derive temperature structure from the upwelling radiance in the 14- to 15-micrometer wavelength region and water-vapor specific humidity structure from the upwelling radiance at wavelengths of 6.3 to 7.0 micrometers and a knowledge of the temperature structure. Chahine (ref. 10), Barnett (ref. 11), and Smith (ref. 12) have shown that it is necessary to have weighting functions for a class of atmospheric conditions near the solution to ensure rapid convergence.

Continuum

The wave number region between 800 and 1250 per centimeter encompasses the continuum absorption due to water vapor. Calfee has used the continuum absorption coefficient given by Burch (ref. 13) for this region. First, he uses the optical mass of water vapor (U_i in molecules/cm^2) to calculate the partial pressure due to water vapor (Wl_i) for the ith layer.

$$Wl_i = \frac{U_i T \mu_i}{\Delta z_i * 7.349 \times 10^{21}} \qquad (31)$$

$$PH_i = -Wl_i + 0.005 * \left(P_i + Wl_i\right) \qquad (32)$$

$$CAYBUR = -0.0665335 \times 10^{-29}\,\nu^3 + 0.3721108 \times 10^{-26}\nu^2 - 0.5971389 \times 10^{-23}\,\nu + 0.3113485 \times 10^{-20} \qquad (33)$$

$$SAY = U_i * \left(CAY + CAYBUR * PH_i\right) \qquad (34)$$

$$T_i = T_{i,mono} * \exp\,(-SAY) \qquad (35)$$

where T_i = transmission for ith layer

$T_{i,mono}$ = transmission for all line-by-line calculations

ν = frequency, cm^{-1}

CAYBUR = dummy variable

SAY = dummy variable

P_i = ambient atmospheric pressure for layer i, atm

U_i = molecules/cm^2 of water vapor

Δz_i = vertical path length through ith layer

μ_i = cos θ_i, where θ_i = angle through ith layer

$W1_i$ = water-vapor partial pressure, atm

Program Description and Operating Instructions

The CP program uses a Univac 1108 computer with four tape drives. The program tape is on unit C, the data tape is on unit A, and the scratch tape is on unit B. A tape drive is also used to produce microfilm plot results on a General Dynamics 4060 plotter. If plot results are not desired or if the required hardware is not available, FORTRAN statements 335 to 348 should be removed. An option is available for producing results on punched cards, if desired.

The program is written in FORTRAN 5 language and, with storage, requires approximately 44K words. Only standard library routines compatible with FORTRAN 4 are used. No overlays are used. The subroutines MODATM, ATMOS3, INPUT, REFRAC, PATH, COSINV, SININV, Q, ALTITU, PRES, E,.R, and F are routines used to describe the atmospheric properties. These routines are described in reference 8. All these routines are usually used by MODATM, which is the subroutine called by the main program CP. The purpose of each of these subprograms and its arguments are also defined in comment cards placed in the subroutine.

The computer function XK (which is called by the main program CP) calculates the Voigt spectrum line profile (eq. (21)) by means of the routines XK1, XK2, and XK3. The arguments of XK, X and Y, are defined in equation (21).

For detailed calculations involving the solar intensity reflection or the reflection of atmospheric emission as shown in equation (11), multiple

executions of the program are necessary. A separate run is required to calculate equations (14) to (16) for each required path through the atmosphere.

The triangular instrument function is adequate for narrow-band spectrometers; for instruments of wider band pass, it is necessary to place a P in column 1 of card type 1. This step results in punching of two types of cards. The first type will punch ν (cm^{-1}), transmission, and transmitted radiance 1X, F9.2, E13.3, and E13.3. The second type will punch ν (cm^{-1}), downwelling-emitted radiance, and upwelling-emitted radiance 1X, F9.2, E13.3, and E13.3. These cards can then be used with the appropriate filter functions for calculations of the wide-band response of instruments to various concentrations of gases and various model atmospheres.

A source code listing of all required software is given in appendix A. The listing comprises 1355 FORTRAN cards. A detailed flow chart of the CP program is shown in figure 1. The number of input cards required varies from as few as 20 that might be used in a 10-layer prediction of laboratory transmission for one spectral region (5160 to 5200 cm^{-1}) (appendix B, section 2) to approximately 35 that might be encountered when using a 10-layer prediction of atmospheric transmission through a radiosonde-specified atmosphere for three spectral regions (1150 to 1300, 550 to 700, and 700 to 850 cm^{-1}) (appendix B, section 3). Sample runs are provided in these same sections of appendix B for the input cards shown, and the generalized input format is presented in appendix B, section 1.

A small section of the 15 250 lines of data stored on the data tape is presented in appendix C. A typical run of a 10-layer model using radiosonde data for three 150-cm^{-1} spectral regions will require approximately 10 minutes of computer time. However, run time is a function of the number of spectral lines in the chosen spectral interval, and some runs have required as many as 45 minutes on the Univac 1108 computer. The number of pages usually produced is approximately 50 per spectral interval chosen, provided weighting functions are printed. If weighting functions are not printed out, approximately 10 pages would be printed. Because the program is cyclic and returns to read additional spectral interval cards, the terminating conditions usually result from an attempt to read an end-of-file card.

COMPARISONS TO TEST DATA AND LIMITATIONS OF THE MODEL

Comparisons were made with laboratory spectra to perform necessary but insufficient tests of the model. The model reproduces Calfee original water-transmission data (ref. 3) well for 0.01 and 0.1 centimeter of precipitable water at 1 atmosphere pressure at frequencies between 5182 and 5193 per centimeter (figs. 2 and 3). For low pressure, the model underestimated the ozone absorption by a factor of approximately 2 at wave numbers between 940 and

1120 per centimeter (fig. 4). The CP model reproduces carbon dioxide data well for pressures of 1.00, 0.0857, and 0.02053 atmosphere except at wave numbers between 600 and 660 cm^{-1} for the lower pressures (figs. 5 to 7). One set of carbon dioxide lines at wave numbers between 640 and 650 cm^{-1} is evidently missing from the data in figure 7. The comparison of spectra taken from an RB-57F aircraft flying over the Gulf of Mexico to CP predictions from the Lake Charles, Louisiana, radiosonde on April 30, 1970, is shown in figure 8. A comparison of Skylab S191 spectra of Monroe Reservoir to those predicted by the CP program using radiosonde data from nearby Salem, Illinois, for June 10, 1973, is shown in figure 9. Because the amount of ozone in the atmosphere is unknown, test cases were run for optical masses of both 0.0144 and 0.144 atm·cm.

The results of Kunde and others (ref. 19) afford a comparison of a line-by-line model to Nimbus 4 interferometer data of 5 percent in the 425- to 550-per-centimeter water continuum and the 750- to 1200-per-centimeter atmospheric window and 5 to 10 percent in the 667-per-centimeter carbon dioxide absorption region. The absolute accuracy was 5 to 10 percent for each of the parameters: measured radiances, in situ measurements, and atmospheric transmittances. The conclusion was that it is not possible to uniquely determine the error arising from each source and that it is, therefore, very difficult to improve atmospheric transmittances (predicted by a computer program) through the radiance comparison technique. The results shown in figure 9 indicate a comparison within 5 percent for the atmospheric window, but reveal larger errors outside this region. Whether these errors arise from the CP program or the S191 spectrometer or from both is unknown. Some off-band contamination of the 6- to 9- and 13.0- to 15.5-micrometer regions of the S191 data has been identified that causes radiance of these regions to be excessively high. The amount of this correction is currently being determined by the sensor performance personnel at the NASA Lyndon B. Johnson Space Center.

CONCLUDING REMARKS

The results of testing the CP program indicate that the best results can be obtained in the near-infrared water bands. The absorption due to water vapor and carbon dioxide in the thermal infrared band appeared to be less reliable in comparison to spacecraft-acquired data and band models; however, neither of these tests is sufficient. Comparisons of laboratory carbon dioxide transmission in the thermal infrared band show good agreement except in regions where lines are known to be missing. The comparison of ozone transmission at a wavelength of 9.6 micrometers to laboratory data showed unexpectedly large differences.

No testing has been done for the nitrous oxide or methane transmissions. At present, the data used in the program are probably better known for carbon dioxide, nitrous oxide, and water vapor than for ozone and methane. Although tests for all molecules and spectral regions have not been performed, the tests have been sufficient to ensure that the program mechanics are sound and work well on the Univac 1108 computer. Conversion to FORTRAN 4 for CDC or IBM

computers will no doubt require new tape read-and-write software. However, the necessary changes should be simple, few, and obvious, because most FORTRAN coding used here did not involve sophisticated FORTRAN 5 logic.

Lyndon B. Johnson Space Center
National Aeronautics and Space Administration
Houston, Texas, December 27, 1974
951-16-00-00-72

REFERENCES

1. Love, Tom J.: Radiative Heat Transfer. C. E. Merrill Pub. Co., 1968.

2. Kourganoff, V.: Basic Methods in Transfer Problems; Radiative Equilibrium and Neutron Diffusion. Rev. ed., Dover Pub., Inc., 1963.

3. Deutschmann, E. M.; and Calfee, R. F.: Two Computer Programs to Produce Theoretical Absorption Spectra of Water Vapor and Carbon Dioxide. ESSA Technical Report IER 31-ITSA 31, Apr. 1967.

4. McClatchey, R. A.; Benedict, W. S.; Clough, S. A.; Burch, D. E.; Calfee, R. F.; Fox, K.; Rothman, L. S.; and Garing, J. S.: AFCRL Atmospheric Absorption Line Parameters Compilation. AFCRL-TR-73-0096, Jan. 1973.

5. Calfee, R. F.: A Note on Terminologies Used in Gaseous Absorption Processes. NOAA Technical Report ERL 211-WPL 15, Aug. 1971.

6. Korb, C. Laurence; Hunt, Robert H.; and Plyler, Earle K.: Measurement of Line Strengths at Low Pressures - Application to the 2-0 Band of Carbon Monoxide. J. Chem. Phys., vol. 48, no. 9, 1968, pp. 4252-4260.

7. Young, C.: Calculation of the Absorption Coefficient for Lines with Combined Doppler and Lorentz Broadening. J. Quant. Spectr. Radiat. Transfer (GB), vol. 5, no. 3, May-June 1965, pp. 549-552.

8. Pitts, David E.; and Kyle, Kirby D.: A Model Atmosphere for Earth Resources Applications. NASA TM X-58033, 1969.

9. U.S. Committee on Extension to the Standard Atmosphere (COESA): U.S. Standard Atmosphere Supplements. U.S. GPO, 1966.

10. Chahine, Moustafa T.: Determination of the Temperature Profile in an Atmosphere from its Outgoing Radiance. NAS-NRC Atmospheric Exploration by Remote Probes, vol. 2, Jan. 1969, pp. 453-464.

11. Barnett, Thomas L.: Application of a Nonlinear Least-Squares Method to Atmospheric Temperature Sounding. J. Atm. Sci., vol. 26, no. 3, May 1969, pp. 457-461.

12. Smith, W. L.: Iterative Solution of the Radiative Transfer Equation for the Temperature and Absorbing Gas Profile of an Atmosphere. J. Appl. Opt., vol. 9, 1970, pp. 1993-1999.

13. Burch, Darrell E.: Radiative Properties of the Windows. Conference on Atmospheric Radiation, Aug. 7-9, 1972, Ft. Collins, Colorado. Am. Meteorol. Soc., 1972.

14. McCaa, D. J.; and Shaw, J. H.: The Infrared Absorption Bands of Ozone. Ohio State Univ. Research Foundation Contractor Report, AFCRL-67-0137, Sci. Rept. no. 2, 1967.

15. Drayson, S. R.; and Young, C.: The Frequencies and Intensities of Carbon Dioxide Absorption Lines Between 12 and 18 Microns. The Univ. of Mich. Dept. of Engr. (Ann Arbor, Mich.), Rept. 08183-1-T, Nov. 1967.

16. Drayson, S. R.; Li, S. Y.; and Young, C.: Atmospheric Absorption by Carbon Dioxide, Water Vapor and Oxygen. Univ. of Mich. High Altitude Engr. Lab. Rept. 08183-2-F, 178068, Feb. 1968.

17. Burch, Darrell E.; Singleton, Edgar B.; Williams, Dudley; and Gryvnak, David: Infrared Absorption by Carbon Dioxide, Water Vapor, and Minor Atmospheric Constituents. AFCRL-62-698, July 1962.

18. Hamilton, J. N.; Rowe, J. A.; and Anding, D.: Atmospheric Transmission and Emission Program. SAMSO, AF Systems Command, Contract No. F04701-72-C-0073, June 1973.

19. Kunde, V. G.; Conrath, B. J.; Hanel, R. A.; Maguire, W. C.; Prabhakara, C.; and Salomonson, V. V.: The Nimbus 4 Infrared Spectroscopy Experiment. 2: Comparison of Observed and Theoretical Radiance from 425-1450 cm(MINUS 1). NASA TM X-66275, 1973.

TABLE I.- SUMMARY OF UNIT RELATIONSHIPS[a]

[1 precipitable centimeter water = 1 $g \cdot cm^{-2}$ water]

Symbol and previous unit	Multiplying factor (b)	Current unit
U, atm·cm STP	$1.219 \times 10^{-2} \times \frac{M}{\theta}$	$g \cdot cm^{-2}$
U, g/cm^2	$82.06 \times \frac{273}{M}$	atm·cm STP
U, atm·cm STP	2.689×10^{19}	$molecule \cdot cm^{-2}$
U, g/cm^2 water	3.34×10^{22}	$molecule \cdot cm^{-2}$
$K_0(\nu)$, $(atm \cdot cm)^{-1}$ STP	$82.06 \frac{\theta}{M}$	$(g \cdot cm^{-2})^{-1}$
$K_0(\nu)$, $(g \cdot cm^{-2})^{-1}$	$1.219 \times 10^{-2} \frac{M}{273}$	$(atm \cdot cm)^{-1}$ STP
$K_0(\nu)$, $(atm \cdot cm)^{-1}$ STP	3.72×10^{-20}	$(molecule \cdot cm^{-2})^{-1}$
$K_0(\nu)$, $(g \cdot cm^{-2})^{-1}$	$\frac{A}{M}$	$(molecule \cdot cm^{-2})^{-1}$
$K_0(\nu)$, $(atm \cdot cm)^{-1}$ STP	$356.3 \frac{\theta}{M}$	$dB/(g \cdot cm^{-2})$
$K_0(\nu)$, $(atm \cdot cm)^{-1}$ STP	4.343	dB/(atm·cm) STP
$K_0(\nu)$, $(g \cdot cm^{-2})^{-1}$	4.343	$dB/(g \cdot cm^{-2})$
S, $\frac{cm^{-1}}{atm \cdot cm}$ STP	$82.06 \frac{\theta}{M}$	$\frac{cm^{-1}}{g \cdot cm^{-2}}$
S, $\frac{cm^{-1}}{g \cdot cm^{-2}}$	$1.219 \times 10^{-2} \frac{M}{273}$	$\frac{cm^{-1}}{atm \cdot cm}$ STP
S, $\frac{cm^{-1}}{atm \cdot cm}$ STP	3.72×10^{-20}	$\frac{cm^{-1}}{molecule \cdot cm^{-2}}$
S, $\frac{cm^{-1}}{g \cdot cm^{-2}}$	$\frac{M}{A}$	$\frac{cm^{-1}}{molecule \cdot cm^{-2}}$

[a]Data from reference 5.

[b]θ = temperature, K, M = molecular weight, A = Avogadro's number.

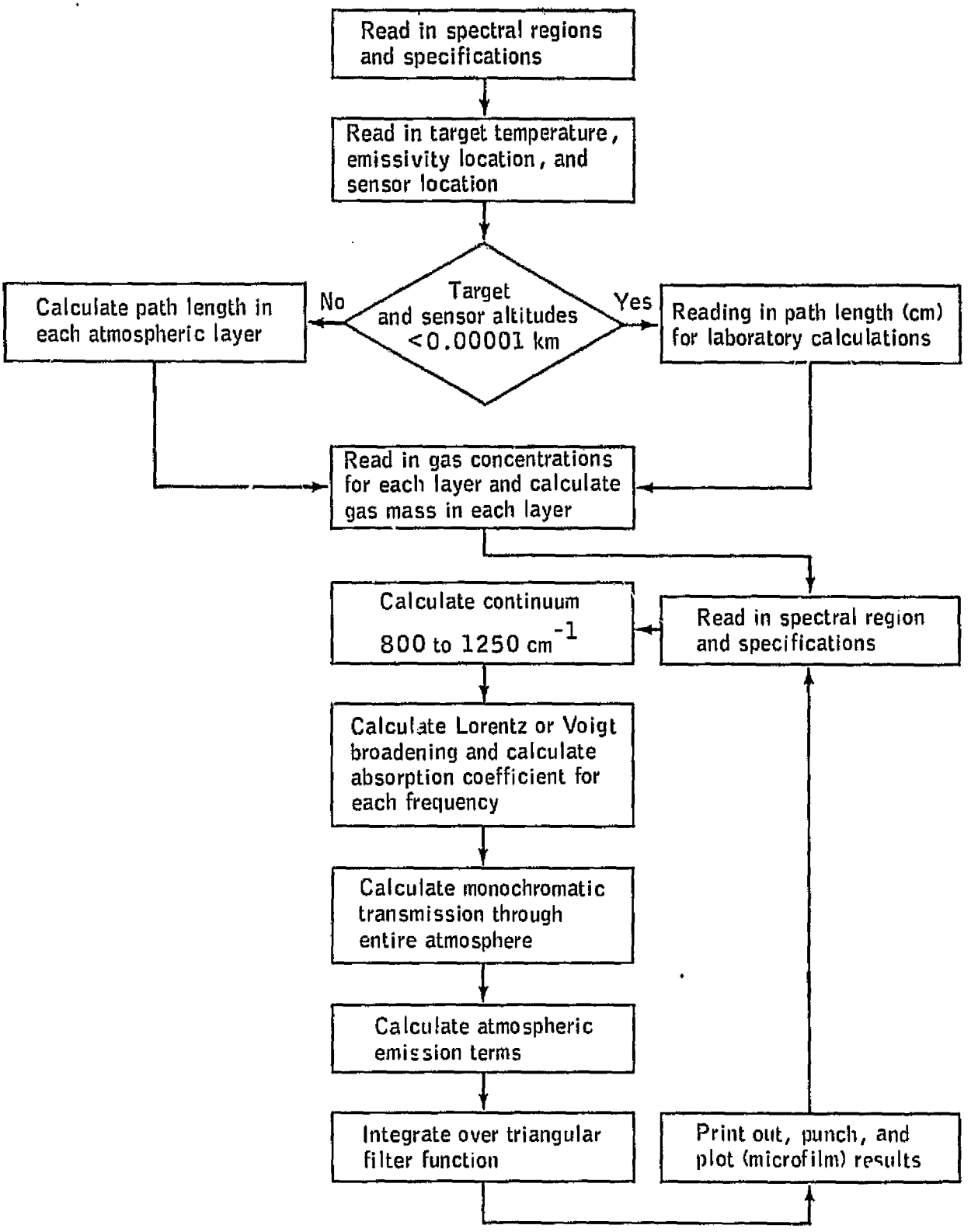


Figure 1.- Flow chart of the CP program.

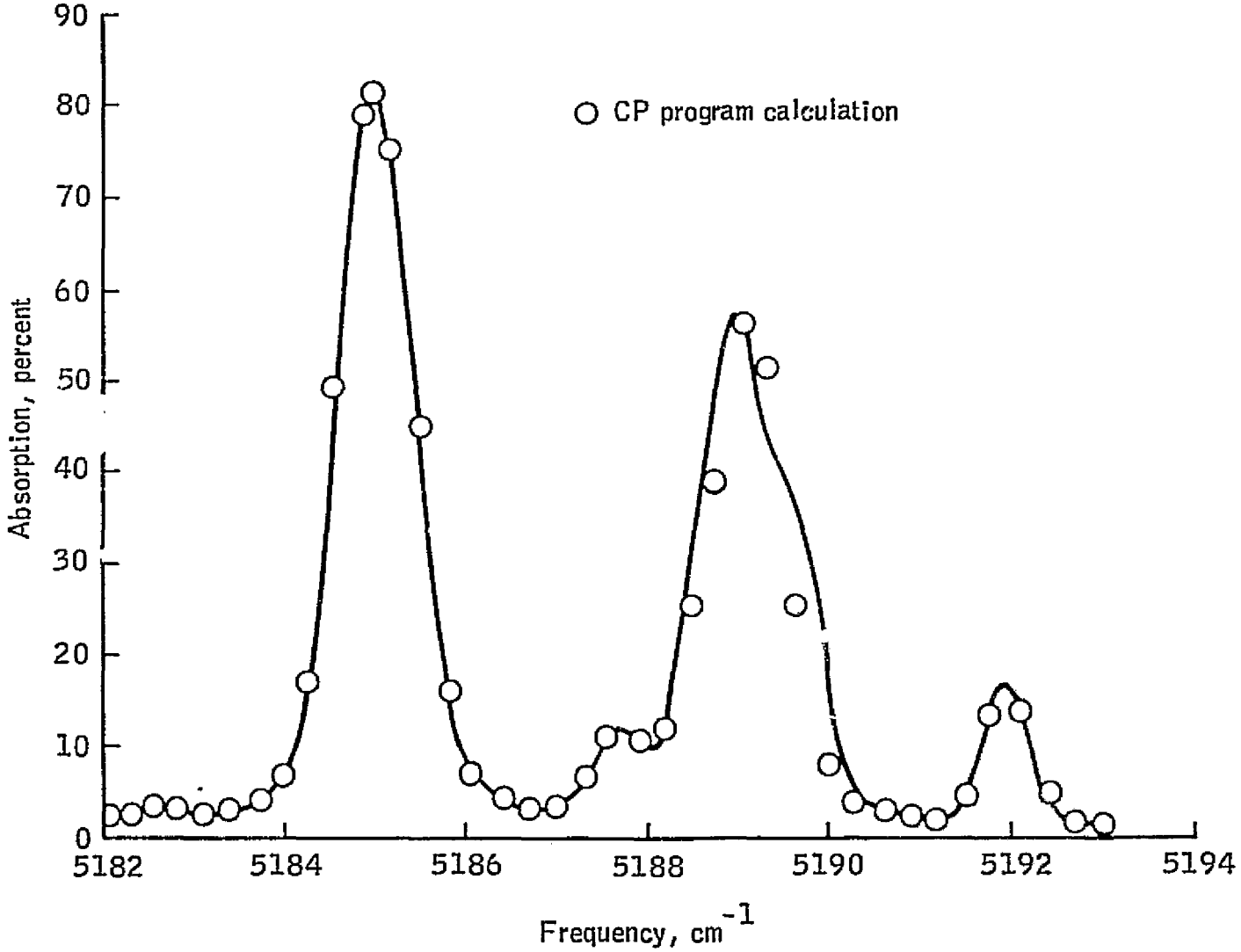


Figure 2.- Comparison of the predicted absorption for program CP with the original Deutschmann and Calfee (ref. 3) single-layer water-vapor-absorption spectrum for the frequency range 5182 to 5193 per centimeter at a pressure of 1.0 atmosphere, at a concentration of 0.01 centimeter of precipitable water vapor for a temperature of 287.7 K, and for a spectral slit width α of 0.5 cm^{-1}.

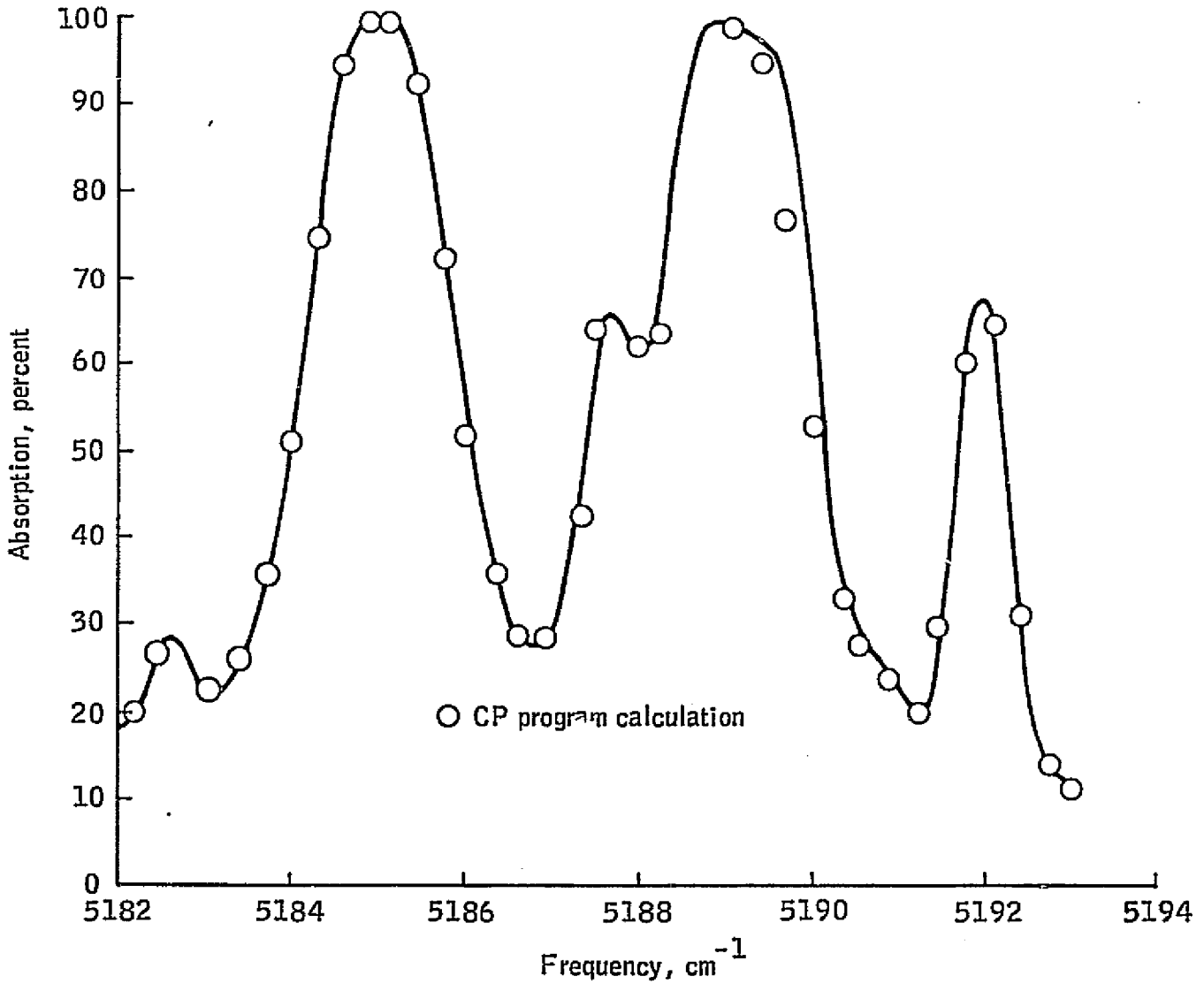


Figure 3.- Comparison of the predicted absorption for program CP with the original Deutschmann and Calfee (ref. 3) single-layer water-vapor-absorption spectrum for the frequency range 5182 to 5193 per centimeter at a pressure of 1.0 atmosphere, at a concentration of 0.1 centimeter of precipitable water vapor for a temperature of 287.7 K, and for a spectral slit width α of 0.5 cm^{-1}.

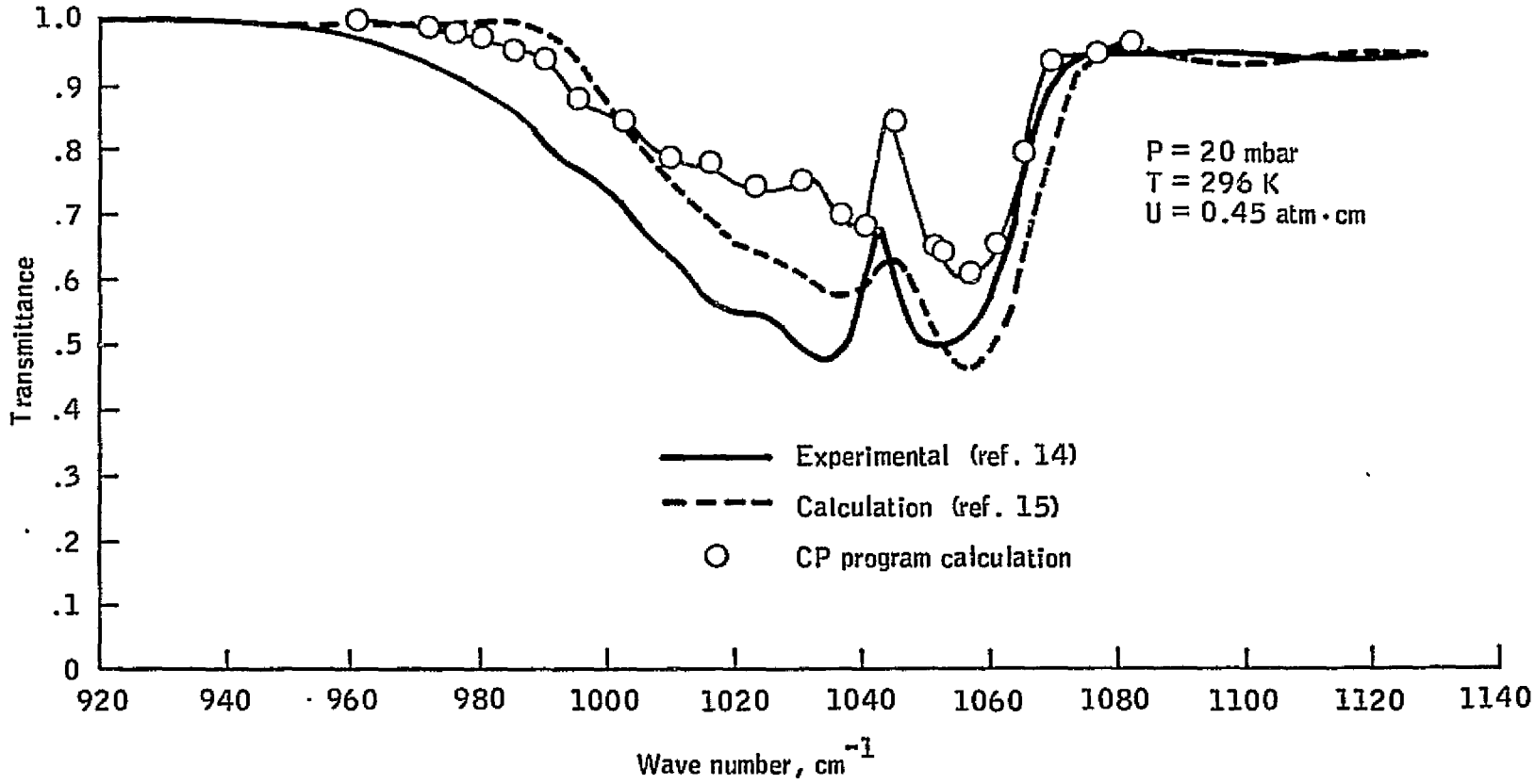


Figure 4.- Comparison of experimental and calculated absorption in the 1042-cm^{-1} ozone band.

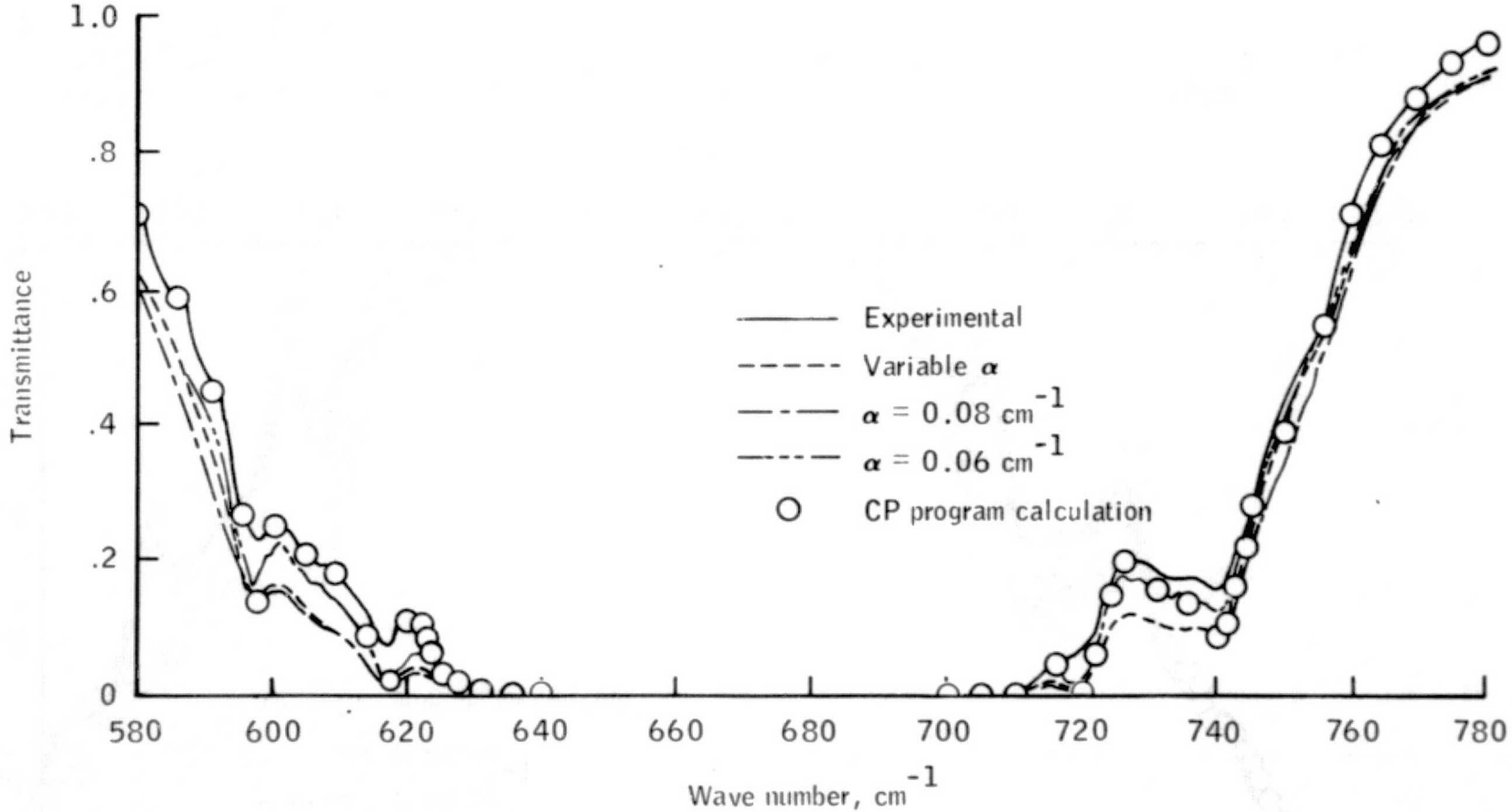


Figure 5.- Comparison of predicted transmission for program CP with the carbon dioxide transmission of Drayson and others (ref. 16) for an equivalent pressure of 1.00 atmosphere and an optical mass of 106.2 $atm \cdot cm_{300\ K}$.

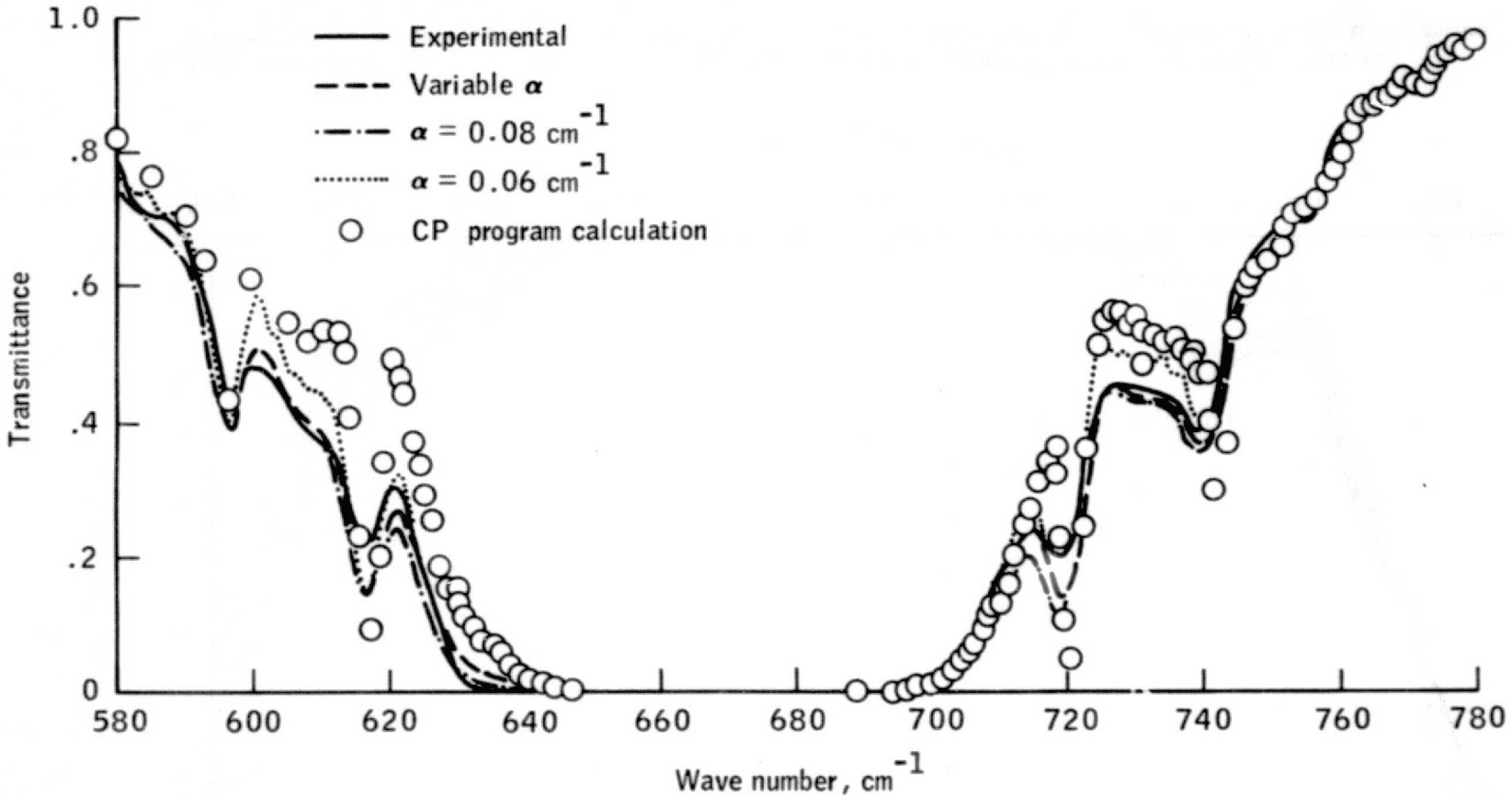


Figure 6.- Comparison of predicted transmission for program CP with the carbon dioxide transmission of Drayson and others (ref. 16) for an equivalent pressure of 0.0857 atmosphere and an optical mass of 212.1 $atm \cdot cm_{300\ K}$.

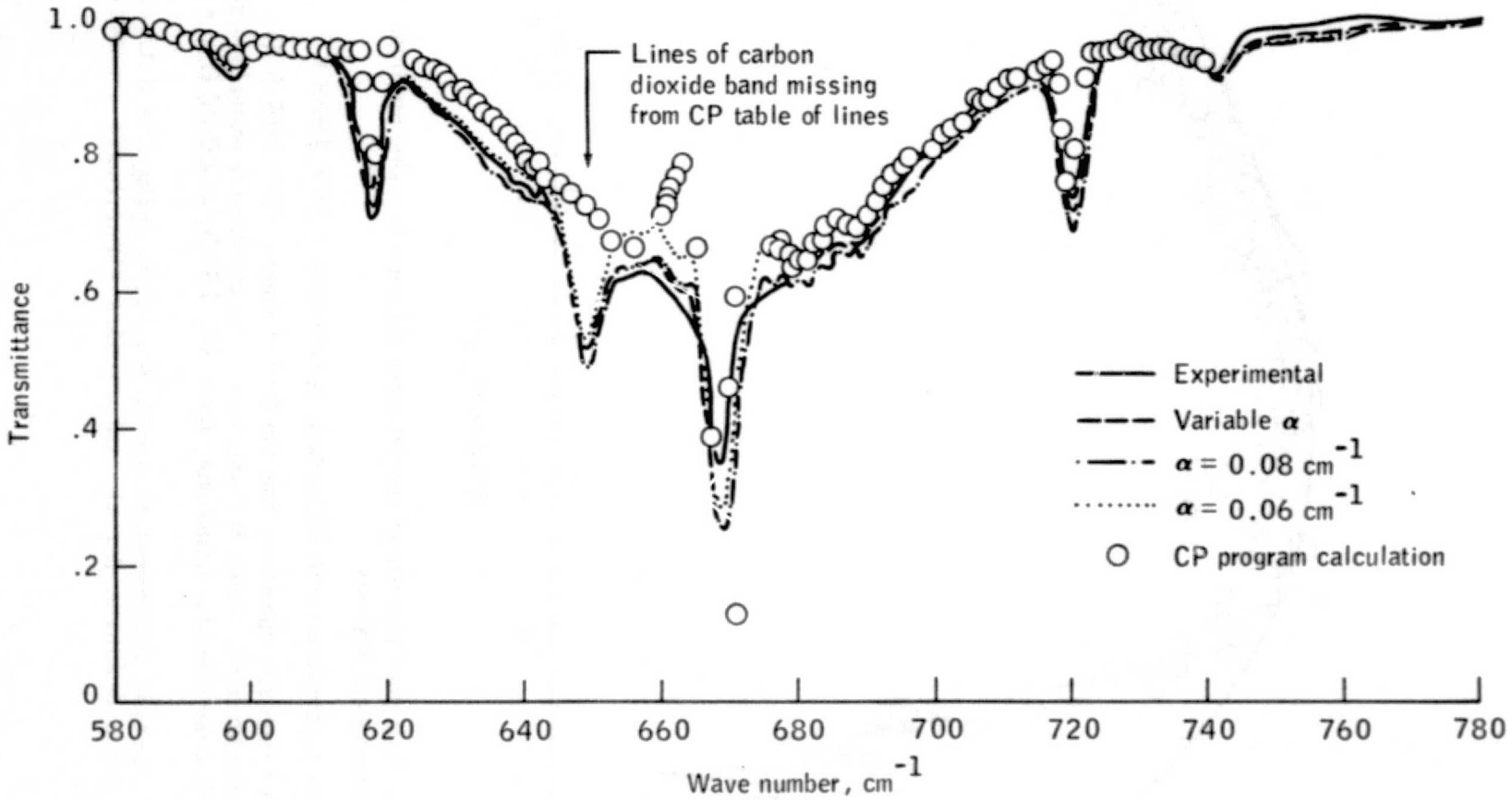
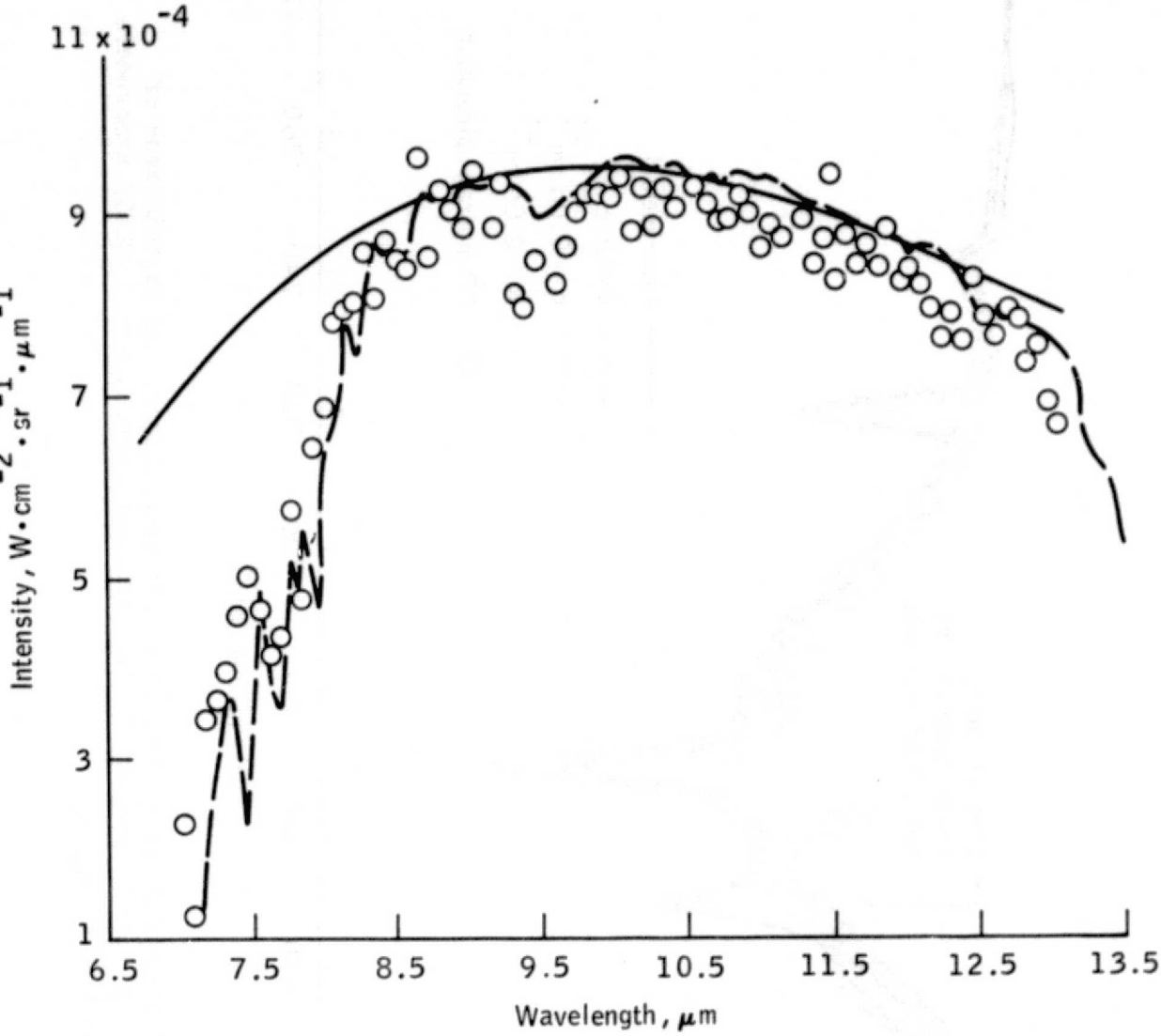


Figure 7.- Comparison of low-resolution spectra (ref. 17) with theoretical calculations of Drayson and others (ref. 16) and CP program for an equivalent pressure of 0.02053 atmosphere and an optical mass of 6.30 $atm \cdot cm_{300\ K}$.



○ Intensity from the filter-wheel spectrometer obtained by using preflight and postflight calibrations

—— Nonlinear least-squares-fit black-body temperature = 297.1966 K

–– Predicted intensity upwelling from the Gulf of Mexico (T = 298.5 K) accounting for transmission and emission of the atmosphere using radiosonde data from Lake Charles, Louisiana, April 30, 1970, at 00:00 G.m.t.

Figure 8.- Calibration performed on April 30, 1970, using the Gulf of Mexico as a source and accounting for the intervening atmospheric transmission and emission.

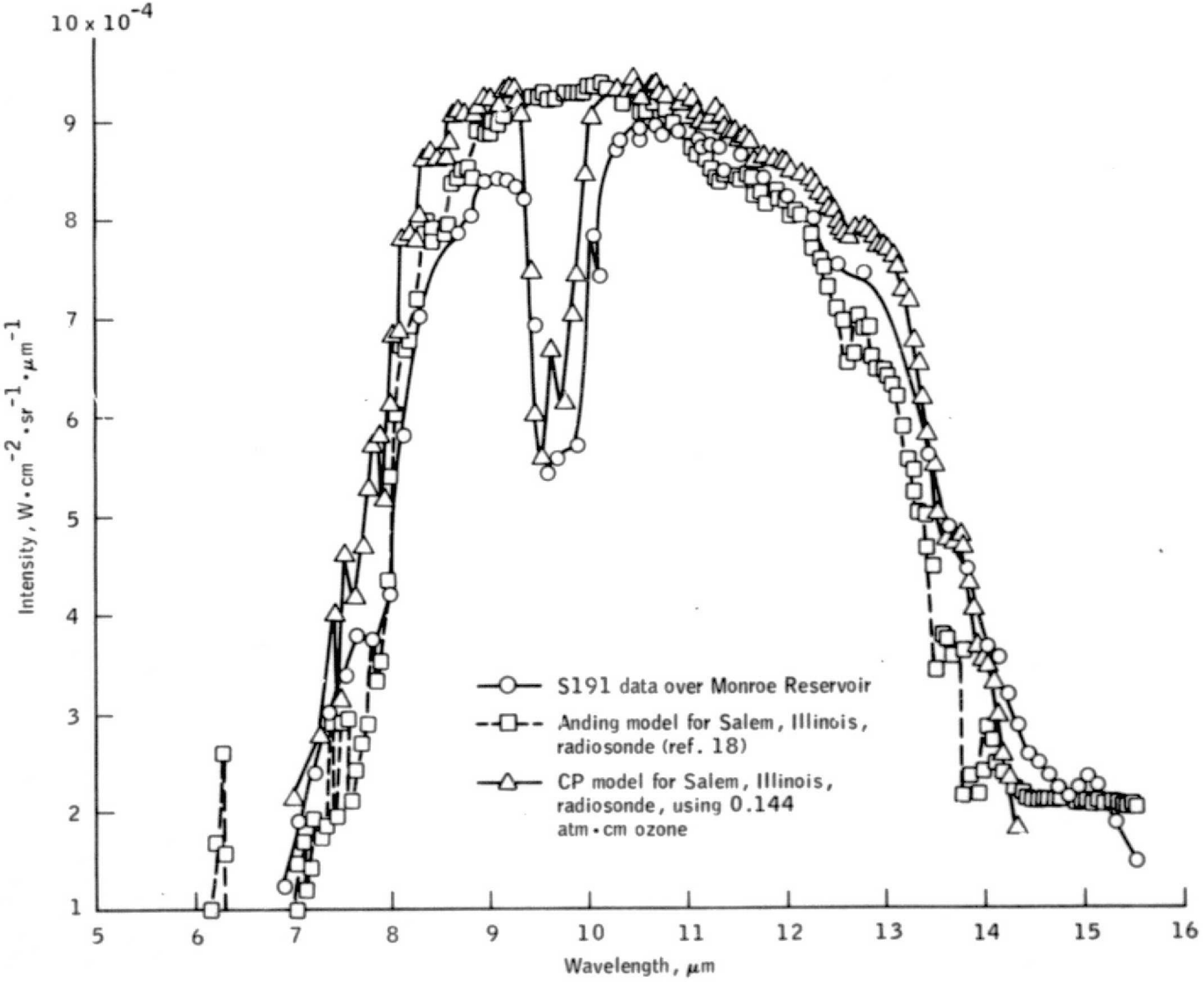


Figure 9.- Comparison of S191 sensor output data for Monroe Reservoir with CP model and Anding model radiosonde data from Salem, Illinois, on June 10, 1973.

APPENDIX A — COMPUTER PROGRAM LISTING

In this appendix, the CP computer program listing is presented. Five gases (ozone, nitrous oxide, carbon monoxide, carbon dioxide, and methane) and precipitable water for as many as 30 atmospheric layers are considered. For the input card format and sample radiosonde and laboratory data runs, see appendix B.

```
0001   001346 614G      0001   001427 634G      0001   001446 647G      0001   001546 675G      0001   001003 68L
0001   001556 700G      0001   001610 713G      0001   000127 75L       0001   000073 77L       0001   002001 775G
0000   030447 8F        0001   001077 81L       0000   030641 842F      0000   031006 843F      0001   001130 89L
0001   001132 95L       0001   001147 99L       0000   031003 9991F     0001   002245 9995L     0001   002314 9999L
0000 R 030222 A         0000 R 030324 AB        0006 R 007640 ALFAO     0006   033354 ANGFTN    0004 R 000000 ANS
0000 R 030322 BBBB      0000 R 030305 BD        0000 R 030223 BOUND     0006 R 037511 CA        0003 R 000000 CAY
0000 R 030311 CAYBUR    0006 R 037517 CNC       0006 R 037707 CNM       0006 R 037613 CNN       0006 R 037555 CNO
0006 R 037651 CNX       0004   000044 CONN      0000 R 000014 CONV      0000 R 030274 CSI       0006 R 037503 CS2
0000 R 000000 C2        0000 R 000006 C3        0005 R 000134 DELP      0000 R 030250 DELPTH    0000 R 030217 DELV
0000 R 030251 DELZ      0000 R 030247 DENBAR    0000 R 030201 DENX      0000 R 030216 DV        0006 R 037500 E
0006 R 037475 EF        0000 R 030236 EMISSF    0000 R 030301 EN        000  R 013560 EPP       0006 R 037467 EVEN
0006 R 000000 GNU       0000 R 030242 GNUBGN    0000 R 030243 GNUEND    0000 I 030212 I         0000 I 030271 IC
0000 I 030314 ICPLT     0000 I 030213 IDAVEI    0000 I 030266 IDIV      0000 I 030252 II        0000 I 030257 I1
0000 I 030272 I5        0000 I 030273 I6        0000 I 030241 J         0000 I 030253 JJ        0000 I 030270 K
0000 I 030245 KBIG      0005 I 000074 KI        0000 I 030260 K3        0000 I 030262 L         0000 I 030313 LDAVE2
0000 I 030267 LL        0000 I 030261 M         0000 I 030256 ML        0006 I 033544 MOL       0000 I 030214 M1
0000 I 030320 NN        0000 I 030264 NUM       0000 I 030316 N1        0000 I 030317 N2        0006 R 037464 ODD
0006 R 033260 P         0005 R 000036 PATHM     0000 R 030255 PDUM      0006 R 033412 PH        0000 R 030233 PHIL
0000 R 030230 PHIS      0000 R 030310 PP        0000 R 030240 PP1       0005 R 000136 PSURF     0000 R 030215 PUNCH
0004   000043 RE        0006 R 003720 S         0000 R 030312 SAY       0000 R 030263 SLIT      0000 R 030265 SLTFTR
0000 R 030204 SQMW      0000 R 030276 SQT       0000 R 030326 SUMDN3    0006 R 037472 SUMT      0000 R 030325 SUMT2
0000 R 030327 SUMUP3    0006 R 033316 TEMP      0000 R 030235 TEMPSF    0000 R 030224 TEMPO     0000 R 030321 TF
0000 R 027671 TFPLT     0000 R 030234 THETAL    0000 R 030231 THETAS    0006 R 017500 TOTAL     0000 R 013601 TPLTI
0000 R 030226 TRANCK    0000 R 030275 TT        0005 R 000135 UCONV1    0000 R 030323 UPWEL     0000 R 030300 V
0000 R 030237 VAVG      0000 R 030315 VI        0000 R 030302 VMBND     0000 R 030225 VOIGT     0000 R 030303 VFBND
0000 R 027361 VPLT      0000 R 000021 VPLTI     0000 R 030277 VV        0000 R 030220 VI        0000 R 030221 V2
0006 R 037745 W         0000 R 000016 WATER     0005   000000 WATERM    0000 R 030246 WATINT    0006 R 040077 W1
0000 R 030306 X         0011 R 000000 XK        0000 R 030307 Y         0000 R 030304 Z         0000 R 030244 ZDUMM
0000 R 030232 ZL        0000 R 030254 ZNEW      0000 R 030227 ZS        0005 R 000075 ZZZ
```

```
00100      1*      C     PROGRAM SLPATH CALCULATES THE TRANSMISSION THROUGH THE ATMOSPHERE
00100      2*      C     DIVIDED INTO LAYERS DENOTED BY KI
00100      3*      C DV IS THEAVERAGING STEP WITHIN THE TRIANGULAR SLIT FUNCTION THAT
00100      4*      C  REPRESENTES THE INSTRUMENT RESPONSE
00100      5*      C DV SHOULD USUALLY BE IN THE RANGE OF .01 TO .03 CM**-1
00100      6*      C     DV=AVERAGING STEP IN TRIANGLE, DELV/DV MUST BE AN INTEGER
00100      7*      C DELV IS THE INCREMENT OF SCAN - SKIP STEP OF TRIANGLE(PRINT OUT INCREMENT)
00100      8*      C V1 IS THE WAVENUMBER OF THE BEGINNING OF THE TEST INTERVAL (CM-1)
00100      9*      C V2 IS THE WAVENUMBER OF THE END
00100     10*      C A IS THE SIZE OF 1/2 OF THE TRIANGLE BASE IN WAVENUMBERS (WIDTH OF THE
00100     11*      C 1/2 POWER POINT OF THE TRIANGLE
00100     12*      C BOUND IS THE DISTANCE AWAY FROM A LINE THAT WINGS SHOULD BE CONSIDERED (CM-1)
00100     13*      C TEMPO IS TEMPERATURE IN DEGREES KELVIN =296.0
00100     14*      C IF TRANCK IS .EQ.0 THEN WEIGHTING FUNCTION AND EMISSION TERMS WILL BE CALC
00100     15*      C DELV USUALLY TAKES A VALUE BETWEEN A/2 AND A
00100     16*      C DV IS SUCH THAT A/DV IS 10 OR MORE, BUT SUCH THAT DV IS NOT LARGER
00100     17*      C  THAN ABOUT 0.05 AT A PRESSURE OF 1 ATMOSPHERE
00100     18*      C (V1-V2+2*A+2*BOUND)/DV MUST  E LESS THAN 2900
00100     19*      C 2*A MUST BE GREATER THAN DELV-DV
00100     20*      C     THIS PROGRAM WILL NOT ACCEPT MORE THAN 2000 CARDS OF LINE DATA
00100     21*      C     II=TOTAL NUMBER OF LINES DETERMINED BY THE COMPUTER
00100     22*      C     P=PRESSURE IN ATMOSPHERES
00100     23*      C ZS IS THE ALTITUDE OF THE SENSOR IN KM
00100     24*      C PHIS IS THE LATITUDE OF THE SENSOR IN DEGREES (NORTH IS POSITIVE)
00100     25*      C THETAS IS THE LONGITUDE OF THE SENSORIN DEGREES (WEST IS POSITIVE)
```

```
00100     26*      C ZL IS THE ALTITUDE OF THE TARGET IN KM
00100     27*      C PHIL IS THE LATITUDE OF THE TARGET IN DEGREES (NORTH IS PLUS)
00100     28*      C THETAL IS THE LONGITUDE OF THE TARGET IN DEGREES (WEST IS POSITIVE)
00100     29*      C TEMPSF IS THE KINETIC TEMPERATURE OF THE TARGET
00100     30*      C EMISSF IS THE GREYBODY EMISSIVITY FOR THE TARGET FOR V1 TO V2
00100     31*      C IF MVRY IS ZERO DTAU/DU NOT WANTED, MVRY =1,2,--6 FOR THE MOLECULAR
00100     32*      C SPECIES FOR WHICH DTAU/DU IS REQUESTED
00100     33*      C
00101     34*            DIMENSION C2(6), C3(6),CONV(2),ANS(35),WATER(3),WATERM(30),
00101     35*           .  PATHM(30),VPLT1(6000),TPLT1(6000),VPLT(200),TFPLT(200),ZZZ(31),
00101     36*           2DENX(3),SQHW(6)
00103     37*            COMMON/KZ/ CAY(6)
00104     38*            COMMON /MATH/ANS,RE,CONN
00105     39*            COMMON/MOATH/WATERM,PATHM,K1,ZZZ,DELP,UCONV1,PSURF
00106     40*            COMMON/SLP/GNU(2000),S(2000),ALFA0(2000),EPP(2000),TOTAL(6000,11,
00106     41*           1P(30),TEMP(30),ANGFTN(30),PH(30,3),MOL(2000),
00106     42*           .  ODD(3), EVEN(3), SUMT(3), EF(3), E(3), CS2(6), CA(6),
00106     43*           4CNC(30),CND(30),CNN(30),CNX(30),CNM(30),W(30,3),W1(30,3)
00107     44*            DATA(CONV(I),I=1,2)/3.34E22,.98692E-3/,UCONV1/2.689E+19/
00112     45*            DATA C2,C3 /1.5,1.0,1.5,1.5,1.0,1.5,.62,.58,.5,.5,.5,.5/
00115     46*            DATA (SQHW(I),I=1,6)/0.23569B,0.15074,0.14434,0.15073,0.18895,
00115     47*           1 0.24966/
00117     48*            B(W,T)=11909./W**5/(EXP(14388./W/T)-1.)
00117     49*      C W=WAVELENGTH IN MICRONS
00117     50*      C T= TEMPERATURE IN DEG KELVIN
00117     51*      C UNITS OF B(W,T) ARE WATTS/(CM**2 * STERADIAN * MICROMETER)
00120     52*          1 FORMAT (1H1,,'LAYERS=',I3,' DV=',F8.3,' DELV=',F10.4,' V1=',
00120     53*           1F10.4,' V2=',F10.4,' A=',F10.4,' BOUND=',F10.4,' TEMPO=',F10.4)
00121     54*           2 FORMAT(1X,F8.2,2E10.5,1PE12.3,10X,0PF10.5)
00122     55*           4 FORMAT(/4X5HLEVEL,3,5X3HP =E15.5,5X6HTEMP =F7.2)
00123     56*           5 FORMAT (1X,'GNU(I) = ',F10.3,5X,' I= ',I0,'   ERROR ERROR ERROR',
00124     57*         406   FORMAT(/,4X,'VOIGT PROFILE USED FOR BROADENING',/)
00125     58*         405   FORMAT(/4X,'LORENTZ BROADENING USED',/)
00126     59*           6 FORMAT(/4X4HFREQ,6X5HTRANS,6X3HABS,2X,'UPWELLING RADIANCE',
00126     60*           14X,'WAVELENGTH',/,4X,'WAVE NO.',4OX,'MICRONS',/)
00127     61*           8 FORMAT(4XBHWATERS =3E15.4)
00130     62*         109 FORMAT (1X,'   THE FOLLOWING ARE ATH-CH FOR LAYER',I3,' FOR CO2,O
00130     63*           13,N2O,CO,AND CH4 RESPECTIVELY',/,1P9E14.4,////////)
00131     64*         401 FORMAT(5E10.0)
00132     65*         402 FORMAT(6F10.0,2F5.2)
00133     66*         403 FORMAT (A1,I9,6F10.0,F8.0,A1,A1)
00134     67*         404 FORMAT (1X,//,' THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FR
00134     68*           1OM MODATM',/,1X,7(1PE15.7,/))
00135     69*        1404 FORMAT (1X,1PE15.7,' PREC CM OF WATER IN LAYER',2X,I5,/)
00136     70*           IDAVE1=0
00137     71*           M1=1
00140     72*           READ 403,PUNCH,K1,DV,DELV,V1,V2,A,BOUND,TEMPO,VOIGT,TRANCK
00155     73*           READ 402, ZS,PHIS,THETAS,ZL,PHIL,THETAL,TEMPSF,EMISSF
00167     74*           VAVG=2.E4/(V1+V2)
00170     75*           IF (ZS.LE..00001.AND.ZL.LE..00001) GO TO 77
00172     76*           CALL PATH(VAVG,ZS,PHIS,THETAS,ZL,PHIL,THETAL)
00173     77*           GO TO 75
00174     78*        77 READ 402,CNC(1)
00174     79*      C CNC IS IN CM MAKING PATHM IN CM,LATER CNC IS CHANGED TO CONC OF CO2
00177     80*           DO 76 I=1,K1
00202     81*        76 PATHM(I)=CNC(1)/FLOAT(K1)
00204     82*           ANS(1)=-1.0
00205     83*           CALL MODATM (0.0,PP1,4HALTI,VAVG)
```

ORIGINAL PAGE IS
OF POOR QUALITY

```
00206     84*          PSURF=ANS(1)
00207     85*          DELP=0.0
00210     86*       75 WRITE (6,3) (PATHM(J),J=1,K1)
00216     87*        3 FORMAT (/////,1X,'THE PATH LENGTH OF EACH LAYER IS (CM) ',/        LIZ
00216     88*         1 6(1X,1PE15.5,/),///)
00217     89*     4681 DO 4685 I=1,6000
00222     90*     4685 TOTAL(I,1)=1.0
00224     91*          READ 403,PUNCH,K1,DV,DELV,V1,V2,A,BOUND,TEMPD,VOIGT,TRANCK
00224     92*     C TEMPSF IS THE TEMPERATURE OF THE TARGET IN DEG KELVIN
00224     93*     C EMISSF IS THE GREYBODY EMISSIVITY FOR THE BANDPASS V1 TO V2
00241     94*          PRINT 1, K1, DV, DELV, V1, V2, A, BOUND, TEMPD
00253     95*          PRINT 1492,   ZS,PHIS,THETAS,ZL,PHIL,THETAL,TEMPSF,EMISSF
00265     96*     1492 FORMAT (1X,//,1'   SATELLITE ALTITUDE=',1PE12.4,'   SATELLITE LATIT
00265     97*         1UDE=',
00265     98*         10PF10.4,'   SATELLITE LONGITUDE=',0PF10.4,///,
00265     99*         2'   TARGET ALTITUDE=',1PE12.4,'   TARGET LATITUDE=',0PF10.4,
00265    100*         3'   TARGET LONGITUDE=',0PF10.4,//,'   SURFACE TEMP=',0PF10.3,'   E
00265    101*         1MISS=',0PF10.8)
00266    102*          GNUBGN=V1-(A+BOUND)
00267    103*          GNUEND=V2+(A+BOUND)
00270    104*          DO 15 I=1,K1
00273    105*          IF (IDAVE).GT.1) GO TO 4682
00275    106*          READ 401, CNC(I),CNO(I),CNN(I),CNX(I),CNM(I)
00275    107*     C CNC=CARBON DIOXIDE IN MOLE FRACTION (E.G. VOLUME PERCENT /100.0)
00275    108*     C CNO=OZONE
00275    109*     C CNN=NITROUS OXIDE
00275    110*     C CNX=CARBON MONOXIDE
00275    111*     C CNM=METHANE
00304    112*     4682 CALL HODATM(ZDUMM,PSURF-(DELP/2.0)-FLOAT(I-1)*DELP,4HPRES,VAVG)
00305    113*          TEMP(I)=ANS(2)
00306    114*          P(I)=ANS(1)*CONV(2)
00307    115*          PRINT 404,ANS
00315    116*          KBIG=8
00316    117*          IF (PATHM(I).GT.10.0E+05) KBIG=398
00320    118*          WATINT=0.
00321    119*          DENBAR=0.0
00322    120*          DELPTH=PATHM(I)/(FLOAT(KBIG+2))
00323    121*          DELZ=(ZZZ(I+1)-ZZZ(I))/(FLOAT(KBIG+2))
00324    122*          DO 11 II=0,KBIG,2
00327    123*          DO 13 JJ=0,2
00332    124*          ZNEW=ZZZ(I)+(FLOAT(II+JJ)*DELZ)
00333    125*          CALL HODATH(ZNEW,PDUM,4HALTI,VAVG)
00334    126*          DENX(JJ+1)=ANS(27)
00335    127*       13 WATER(JJ+1)=ANS(3)*ANS(13)/1000.
00337    128*          DENBAR=DENBAR+(DENX(1)+(4.0*DENX(2))+DENX(3))*DELPTH  /(3.0*UCONV)
00337    129*          )
00340    130*       11 WATINT=WATINT+DELPTH*(WATER(1)+(4*WATER(2))+WATER(3))/3.
00342    131*          PRINT 404,WATINT,I
00346    132*          IF (IDAVE).GT.1) GO TO 4683
00350    133*          CNC(I)=CNC(I)*DENBAR
00351    134*          CNO(I)=CNO(I)*DENBAR
00352    135*          CNN(I)=CNN(I)*DENBAR
00353    136*          CNX(I)=CNX(I)*DENBAR
00354    137*          CNM(I)=CNM(I)*DENBAR
00355    138*          PRINT 107, I,CNC(I),CNO(I),CNN(I),CNX(I),CNM(I)
00365    139*          CNC(I)=CNC(I)*UCONV
00366    140*          CNO(I)=CNO(I)*UCONV
00367    141*          CNN(I) = CNN(I) * UCONV
```

```
00370    142*          CNX(I) = CNX(I) *UCONV1
00371    143*          CNH(I) = CNH(I)*UCONV1
00372    144*     4683   CONTINUE
00373    145*          W(I,1)=WATINT*CONV(I)
00374    146*          IF(GNUBGN.GT.1250..OR.GNUEND.LT.800.) GO TO 15                    TOM
00376    147*          WI(I,1)=(-W(I,1)*TEMP(I))/(PATHM(I)*7.349E21)
00377    148*          DO 14 J=1,M1
00402    149*       14 PH(I,J)=-WI(I,J)+.005*(P(I)+WI(I,J))
00404    150*       15   CONTINUE
00406    151*       16    I = 0
00407    152*       20    I = I+1
00410    153*          READ(1,END=24) GNU(I),S(I),ALFAD(I), EPP(I),NOL(I)
00410    154*     C GNU(I) IS THE FREQUENCY AT LINE CENTER F (CM-1)
00410    155*     C S IS THE LINE INTENSITY IN (CM**-1/(MOLECULES CM**-2)  )
00410    156*     C ALFAD(I) IS THE LORENTZ HALF WIDTH IN CM**-1/ATM
00410    157*     C EPP(I) ISTHE LOWER ROTATIONAL ENERGY LEVEL OF THE TRANSITION (CM-1)
00410    158*     C NOL(I) INDICATES THE GAS
00417    159*          IF(I.GT.2000) GO TO 24
00421    160*          IF(GNU(I).LE.GNUBGN) GO TO 16
00423    161*          IF(GNU(I).GE.GNUEND) GO TO 39
00425    162*          ML=NOL(I)
00426    163*          GO TO (23,19,17,18,19,25), ML
00426    164*     C STATEMENT 23 IS OF HALF WIDTHS THAT ARE READ IN
00426    165*     C STATEMENT 17 IS FOR OZONE
00426    166*     C STATEMENT 18 IS FOR NITROUS OXIDE
00426    167*     C STATEMENT 19 IS FOR CARBON MONOXIDE
00426    168*     C STATEMENT 19 IS ALSO FOR CARBON DIOXIDE
00426    169*     C STATEMENT 25 IS FOR METHANE
00427    170*        25 ALFAD(I)=.10
00430    171*           GO TO 23
00431    172*        17 ALFAD(I)=.086
00432    173*           GO TO 23
00433    174*        18 ALFAD(I)=.15
00434    175*           GO TO 23
00435    176*        19 ALFAD(I)=.08
00436    177*        23 GO TO 20
00437    178*        24 PRINT 5, GNU(I),I
00437    179*     C                    .INITIALIZATIONS.
00443    180*        39 II=I-1
00444    181*           K3 = ((V2 + A)-(V1-A))/DV+ 1.0001
00445    182*           DO 35 M=1,M1
00450    183*           ODD(M)=0.
00451    184*           EVEN(M)=0.
00452    185*        35 SUMT(M)=0.
00454    186*           L=10
00455    187*           SLIT=A+A
00456    188*           NUM=(SLIT/DV)+1.001
00457    189*           SLTFTR=DV/A/A
00460    190*           IDIV=DELV/DV+.01
00461    191*           DO 54 LL=1,6000
00464    192*        54 TOTAL(LL,1)=1.0
00464    193*     C                    .START A LAYER.
00466    194*           DO 140 K=1,K1
00471    195*           IC=0
00472    196*           I5=1
00473    197*           I6=1
00473    198*     C                    .TEMPERATURE CORRECTIONS FOR A LAYER
00474    199*           IF (K.EQ.1) GO TO 68
```

ORIGINAL PAGE IS
OF POOR QUALITY

```
00476   200*          TEMPO=TEMP(K-1)
00477   201*       68 CSI=(TEMPO-TEMP(K))/(TEMPO*TEMP(K)*.6946)
00508   202*          TT=TEMPO/TEMP(K)
00501   203*          SQT=SQRT(TEMP(K))
00502   204*          DO 69 I=1,6
00505   205*          CS2(I)=TT**C2(I)
00506   206*       69 CA(I)=TT**C3(I)
00510   207*          LL=1
00511   208*          VV=V1-0.000001
00512   209*          DO 78 I=1,11
00515   210*          ML=MOL(I)
00516   211*          S(I)=S(I)*CS2(ML)*EXP(-EPP(I)*CSI)
00517   212*       78 ALFAO(I)=ALFAO(I)*CA(ML)
00521   213*          V=V1-A
00521   214*    C                        .CALCULATE ABS COEF FOR EACH V.
00522   215*       81 DO 82 I=1,6
00525   216*       82 CAY(I)=0.
00527   217*          EN=0.
00530   218*          VMBND=V-BOUND
00531   219*          VPBND=V+BOUND
00532   220*          DO 89 I=15,11
00535   221*          IF (VMBND .GT. GNU(I)) GO TO 89
00537   222*          I5=1
00540   223*          GO TO 95
00541   224*       89 CONTINUE
00543   225*       95 DO 99 J=16,11
00546   226*          IF (VPBND .GT. GNU(J)) GO TO 99
00550   227*          I6=J
00551   228*          GO TO 110
00552   229*       99 CONTINUE
00554   230*          I6=11
00555   231*      110 DO 121 I=15,16
00560   232*          ML=MOL(I)
00561   233*          Z=(V-GNU(I))**2
00562   234*          IF (VO.GT.NE.1HV) GO TO 120
00564   235*          IF (P(K).GE.0.25) GO TO 120
00566   236*          BD=0.35787E-06*GNU(I)*SQHW(ML)*SQT
00567   237*          X=ABS(.832550*(V-GNU(I))/BD)                              TOH
00570   238*          IF (X.GE.25.0) GO TO 120
00572   239*          Y=.832550*ALFAO(I)*P(K)/BD                                TOH
00573   240*          IF (Y.GE.5.0) GO TO 120
00575   241*          PP = 0.46972*S(I)/BD
00576   242*          CAY(ML)=CAY(ML)+PP*XK(X,Y)/P(K)                           TOH
00577   243*          GO TO 121
00600   244*      120 IF (Z .LE. 4.0) Z=Z+(ALFAO(I)*P(K))**2
00602   245*          CAY(ML)=CAY(ML)+0.3183*S(I)*ALFAO(I)/Z
00601   246*      121 CONTINUE
00603   247*    C                          .HOH CONTINUUH.
00605   248*          CAYBUR=0.0
00606   249*          IF (V .LT. 800.0) GO TO 125
00610   250*          IF (V .GT. 1250.0) GO TO 125
00612   251*          CAYBUR=((-.066533SE-29*V+.372110BE-26)*V-.597138?E-23)*V
00612   252*         -  +.3113485E-20
00612   253*    C                          .CALCULATE TRANSMISSION.
00613   254*      125 DO 127 H=1,HI
00616   255*          SAY=(W(K,H)*(CAY(1)+CAYBUR*PH(K,H))
00616   256*         .   +CAY(2)*CHC(K)+CAY(3)*CNO(K)+CAY(4)*CNN(K)+CAY(5)*CNX(K)
00616   257*         .+CAY(6)*CNN(K))*P(K)
```

```
00616    258*      C
00617    259*            TOTAL(LL,N)=EXP(-SAY)*TOTAL(LL,M)                                  LIZ
00620    260*       127   CONTINUE                                                          LIZ
00620    261*      C
00620    262*      C
00622    263*            IF (V .LT. VV) GO TO 133
00624    264*            EN=EN+1.0
00625    265*            VV=(V1+EN*DELV)-0.000001
00626    266*        133 LL=LL+1
00627    267*            V=V+DV
00627    268*      C         JUMP IF MORE V S, ELSE PRINT HEADER.
00630    269*            IF (V .LE. V2+A) GO TO 81
00630    270*      C
00630    271*      C WRITE A SCRATCH TAPE WITH ALL TRANSMISSIONS FOR EACH WAVELENGTH
00632    272*            WRITE (2) (TOTAL(LDAVE2,I),LDAVE2=1,LL)
00632    273*      C
00640    274*            PRINT 4,K,P(K),TEMP(K)
00645    275*        140 PRINT 8,(W(K,M),M=1,M1)
00654    276*            END FILE 2
00655    277*            REWIND 2
00656    278*            ICPLT=0
00657    279*            IF(VO.GT.EQ.1HV) GO TO 407
00657    280*      C
00661    281*            PRINT 405
00663    282*            GO TO 408
00663    283*      C
00664    284*       407  PRINT 406
00664    285*      C
00666    286*       408   PRINT 6
00670    287*            V=V1-A
00671    288*            VI=V1
00672    289*            N1=1
00673    290*            N2=NUM
00673    291*      C                    .SAVE TRANSMISSIONS FOR NEXT STEP.
00674    292*        200 DO 206 NN=N1,N2
00677    293*            DO 204 M=1,M1
00702    294*        204 SUMT(M)=SUMT(M)+(A=ABS(V-V1))*TOTAL(NN,M)
00704    295*            VPLT(NN)=V
00705    296*            TPLT(NN)=TOTAL(NN,M)
00706    297*            ICPLT=NN
00707    298*        206 V=V+DV
00711    299*            V=V1
00711    300*      C                    .PRINT TRANSMISSIONS AND INTEGRATE ABSORPTION.
00712    301*            DO 268 M=1,M1
00715    302*            IF   .*SUMT(M1*SLIFTR
00716    303*            IC=IC+1
00717    304*            BBBB=1.0E+04/V
00720    305*            VPLT(IC)=V
00721    306*             TEPLT(IC) = TF
00721    307*      C UPWEL IS THE RADIANCE EMITTED FROM THE TARGET ATTENUATED BY ATMOSPHERE
00721    308*      C UNITS OF UPWEL ARE WATTS/(CM**2  *STERADIAN  * MICROMETER)
00722    309*            UPWEL=TF*EMISSF*B(BBBB,TEMPSF)
00723    310*            E(M)=1.-TF
00724    311*            PRINT 2, V,TF,E(M),UPWEL,BBBB
00733    312*            IF (PUNCH.EQ.1HP) PUNCH 842, V,TF,UPWEL
00741    313*        842 FORMAT (1X,F9.2,1P2E13.3,'TRANSMITTED RADIANCE')
00742    314*            SUMT(M)=0.0
00743    315*            IF(V-V1)102,251,262
```

ORIGINAL PAGE IS
OF POOR QUALITY

```
00746    316*        251 EF(N)=E(N)
00747    317*        262 IF(L-11)267,263,1002
00752    318*        263 ODD(N)=ODD(N)+E(N)
00753    319*            IF(N-N1)268,265,1002
00756    320*        265 L=9
00757    321*            GO TO 268
00760    322*        267 EVEN(N)=EVEN(N)+E(N)
00761    323*        268 CONTINUE
00763    324*            V=V+DELV
00764    325*            N1=N1+1010
00765    326*            N2=N2+1010
00766    327*            L=L+1
00767    328*            IF (V .GT. V2) GO TO 305
00771    329*            V1=V
00772    330*            V=V-A
00773    331*            GO TO 200
00773    332*      C                    .COMPLETE ABSORPTION INTEGRATION.
00774    333*        305 DO 310 N=1,N1
00777    334*            AB=(2.*EVEN(N)+4.*ODD(N)+EF(N)+E(N))*(DELV/3.)
01000    335*            CALL GRID(100,1000,100,1000,GNUBGN,GNUEND,0.,1.0)
01001    336*            CALL PRINT(498,1020,8,0,1),1HWAVE NUMBER)
01002    337*            CALL PRINT(1,400,0,16,16,16HTRANSMISSION PCT)
01003    338*            WRITE(17,3126) GNUBGN,GNUEND
01007    339*         3126 FORMAT('    TRANSMISSION SPECTRUM BETWEEN',F9.2,' AND',F9.2)
01010    340*            CALL PLOTV(1,1,VPLT(1),TPLT(1),1CPLT,1,1H.)
01011    341*            CALL FILMAV(5)
01012    342*            CALL GRID(100,1000,100,1000,V1,V2,0.,1.00)
01013    343*            CALL PRINT(498,1020,8,0,1),1HWAVE NUMBER)
01014    344*            CALL PRINT (1,400,0,16,16,16HTRANSMISSION PCT)
01015    345*            WRITE (17,3125) V1,V2,AB
01022    346*         3125 FORMAT(' BETWEEN',F9.2,' AND',F9.2,' THE ABSORPTANCE IS',E12.3)
01023    347*            CALL PLOTV(1,1,VPLT(1),TPLT(1),IC,.1H.)
01024    348*            CALL FILMAV(5)
01025    349*        310 PRINT 3125,V1,V2,AB
01033    350*            IDAVE1=3
01034    351*            IF (TRANCK.NE.1HW) GO TO 1002
01036    352*            DO 9997 I=1,LL
01041    353*         9997 TPLT1(I)=1.0
01043    354*            DO 9994 I=1,2000
01046    355*            GNU(I)=0.0
01047    356*         9994 S(I)=0.0
01051    357*            DO 1208 K=1,K1
01054    358*            L=1
01055    359*            WRITE (6,5050) K
01060    360*         5050 FORMAT (1H1,'LAYER(1 IS NEAREST GROUND) = ',I2,20X,'UNITS OF RADIA
01060    361*           1NCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)',///,' UNITS OF WEIGHT
01060    362*           1ING FUNCTIONS ARE D(TRANSMISSION)',/,
01060    363*           31X,'FREQ',9X,
01060    364*           1'DOWN INT ',7X,'UP INT ',2X,3X,'DOWN WEIGHT FUNCT',1X,
01060    365*           1'UP WEIGHT FUNCT',2X,'INT DWN TOTAL',,3X,'INT UP TOTAL')
01061    366*            SUMT(1)=0.0
01062    367*            V=V1-A
01063    368*            SUMT2=0.0
01064    369*            V1=V1
01065    370*            N1=1
01066    371*            N2=NUM
01066    372*      C THIS READS IN THE SCRATCH TAPE TOTAL(    ,     ) TRANSMIS PREV CALCULATED
01067    373*            IF (K.EQ.K1) GO TO 9995
```

```
01071    374*          READ (2,END=1002) (VPLT1(LDAVE2),LDAVE2=1,LL)
01077    375*          GO TO 1200
01100    376*     9995 DO 9996 I=1,LL
01103    377*     9996 VPLT1(I)=TOTAL(I,1)
01105    378*     1200 CONTINUE
01106    379*          DO 1206 NN=N1,N2
01111    380*          IF(VPLT1(NN).LT.1.0E-37.OR.TPLT1(NN).LT.1.0E-37) GO TO 9999        LIZ
01111    381*     C
01113    382*          SUMT(1)=SUMT(1)+(A-ABS(V-V1))*TOTAL(NN,1)*(1.0/VPLT1(NN)-1.0/
01113    383*         1TPLT1(NN))*SLTFTR
01114    384*     9999 SUMT2=SUMT2+(A-ABS(V-V1))*(TPLT1(NN)-VPLT1(NN)) *SLTFTR             LIZ
01115    385*     1206 V=V+DV
01117    386*          V=V1
01120    387*          BBBB=B(1.0E+04/V,TEMP(K))
01121    388*          SUMDN3=SUMT2*BBBB
01122    389*          SUMUP3 =SUMT(1)*BBBB
01123    390*          GNU(L)=GNU(L)+SUMDN3
01124    391*          S(L)=S(L)+SUMUP3
01125    392*          WRITE (6,9991) V,SUMDN3,SUMUP3,SUMT2,SUMT(1),GNU(L),S(L)
01125    393*     C GNU IS DOWNWELLING EMITTED FLUX FROM THE ATMOSPHERE
01125    394*     C S(L) IS THE UPWELLING EMITTED FLUX FROM THE ATMOSPHERE
01136    395*     9991 FORMAT (1X,,1P7E16.3)
01137    396*          IF (K.EQ.K).AND.PUNCH.EQ.1HP) PUNCH 843, V,GNU(L),S(L)
01145    397*      843 FORMAT ( 1X,F9.2,1P2E13.3,'ATMOSPHERIC EMISSION TERMS')
01146    398*          L=L+1
01147    399*          SUMT(1)=0.0
01150    400*          SUMT2=0.0
01151    401*          IF (V-V1) 1002,5003,5003
01154    402*     5003 V=V+DELV
01155    403*          N1=N1+IDIV
01156    404*          N2=N2+IDIV
01157    405*          IF (V.GT.V2) GO TO 5051
01161    406*          V1=V
01162    407*          V=V-A
01163    408*          GO TO 1206
01164    409*     5051 DO 1207 NN=1,LL
01167    410*     1207 TPLT1(NN)=VPLT1(NN)
01171    411*     1208 CONTINUE
01173    412*     1002 REWIND 1
01174    413*          REWIND 2
01175    414*          GO TO 4661
01176    415*          END

     END OF COMPILATION:       NO  DIAGNOSTICS.

     CP              SYMBOLIC                    14 JAN 79  23:48:25   0  01436670   14   415  (DELETED)
     CP      CODE    RELOCATABLE                 14 JAN 79  23:48:25   1  01452152   48     1  (DELETED)
                                                                       0  01452232   14   181
```

```
@ FOR MODATM,MODATM                                                    09 NOV 73          21:10:22.396
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E120:0010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:22


   SUBROUTINE MODATM    ENTRY POINT 000701


   STORAGE USED: CODE(1) 000737; DATA(0) 001052; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   MATM   000045


   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   INPUT
    0005   ATMOS3
    0006   PRES
    0007   E
    0010   R
    0011   Q
    0012   SQRT
    0013   ALOG
    0014   NEXP6$
    0015   NERR3$


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

    0001   000521 10L       0001   000142 12L       0001   000036 126G      0001   000062 13L       0001   000155 19L
    0001   000017 15L       0001   000431 16L       0001   000570 17L       0001   000641 21L       0001   000659 22L
    0001   000915 220G      0001   000032 23L       0001   000940 235G      0001   000965 250G      0001   000371 30L
    0001   000906 31L       0001   000533 41L       0001   000963 42L       0001   000545 49L       0001   000565 50L
    0001   000936 51L       0001   000226 52L       0001   000911 7L        0001   000059 9L        0003 R 000000 ANS
    0000 R 000766 BETA      0003 R 000049 CONN      0000 R 000771 CT        0000 R 000776 D         0000 R 000777 DH
    0000 R 001002 DHA       0000 R 001001 DW        0007 R 000000 E         0000 R 000770 G         0000 R 000000 H
    0000 R 000773 HA        0000 I 000774 I         0000 I 000775 II        0000   001033 INJPS     0000 I 000772 M
    0000 R 000144 P         0006 R 000000 PRES      0011 R 000000 Q         0010 R 000000 R         0003 R 000043 RE
    0000 R 000764 RO        0000 R 000767 S         0000 R 000310 T         0000 R 000454 TD        0000 R 000620 TV
    0000 R 001000 W         0000 R 000765 XMO


00101       1*            SUBROUTINE MODATM (Z,PP,TEST,XLAMDA)
00103       2*            DIMENSION H(100),P(100),T(100),TD(100),ANS(35),TV(100)
00104       3*            COMMON /MATM/ANS,RE,CONN
00105       4*            DATA RO/8.31432E+07/,XMO/28.9644/,BETA/1.458E-06/,S/110.4/,RE/6.37
00105       5*           1 1299E+03/,G/980.665/,CONN/-3.41631947E-02/
00105       6*      C
00105       7*      C*****************************************************************************
00105       8*      C
00105       9*      C Z IS IN KM, PP IS IN MB
00105      10*      C ANS IS OUTPUT VARIABLES
00105      11*      C XLAMDA IS THE WAVELENGTH IN MICRONS FOR WHICH YOU ARE CALCULATING
00105      12*      C      ATMOSPHERIC REFRACTION
```

```
00105     13*     C IF TEST .EQ. PRES THEN PRESSURE IS USED AS HEI...  ND CA...
00105     14*     C IF TEST.NE. PRES THEN GEOMETRIC ALTITUDE (KM) IS HEIGHT INDIC ...
00105     15*     C      YOU MUST SET ANS(1)=-1.0 BEFORE ENTERING THE SUBROUT...
00105     16*     C RO IS THE UNIVERSAL GAS CONSTANT BASED ON THE CARBO... I ... ...
00105     17*     C      SCALE IN ERGS/(DEG KELVIN-GM-MOLE)
00105     18*     C XMO IS MOLECULAR WEIGHT OF AIR CALCULATED FROM THE C... ...T...
00105     19*     C      AIR USING THE CARBON 12 ATOMIC WEIGHT SCALE.  FO... IN THE
00105     20*     C      STANDARD ATMOSPHERE 1962, PAGE 9.  GIVEN IN GM/(GM-MO...
00105     21*     C BETA IS A CONSTANT USED IN SUTHERLAND'S VISCOSITY EQUATION.  GIVEN IN
00105     22*     C      KG/SEC-M-(DEG KELVIN**1/2)
00105     23*     C S IS SUTHERLAND'S CONSTANT IN DEG. KELVIN
00105     24*     C RE = THE MEAN RADIUS OF THE EARTH IN METERS AS GIVEN BY THE SMITHSONIA...
00105     25*     C      METEOROLOGICAL TABLES, SIXTH EDITION, PUBLICATION 4014,  ... J.
00105     26*     C      LIST, 1966
00105     27*     C G IS ACCELERATION OF GRAVITY AT A EQUIPOTENTIAL SURFACE LEVEL GIVEN IN
00105     28*     C      CM/SEC**2
00105     29*     C CONN IS A CONSTANT GIVEN AS -M*G/RO WHERE M IS MASS AND G AND RO ARE AS ABOVE
00105     30*     C
00105     31*     C*************************************M*************************************
00105     32*     C
00115     33*           CT=288.15/273.16+1.0
00116     34*           IF(ANS(1).GE.0.0) GO TO 15
00120     35*           ANS(1)=0.0
00121     36*           CALL INPUT (P,T,TD,H,TV,M)
00122     37*        15 IF (TEST.EQ.4HPRES) GO TO 7
00124     38*           HA= RE*Z/(RE+Z)*1000.0
00124     39*     C HA IS GEOPOTENTIAL ALTITUDE IN METERS
00125     40*        23 DO 11 I=1,M
00130     41*           II=I
00131     42*           IF (H(I).GT.HA) GO TO 9
00133     43*           IF(H(I)-HA) 11,12,13
00136     44*        11 CONTINUE
00140     45*         9 CALL ATMOS3(Z,D)                                          LIZ
00141     46*           ANS(9)=0.0
00142     47*           GO TO 52
00143     48*        13 I=II-1
00144     49*           IF(I.LT.1) GO TO 9                                       LIZ
00146     50*           DH=H(I+1)-H(I)
00147     51*           D=(TV(I+1)-TV(I))/DH
00150     52*           W=(T(I+1)-T(I))/DH
00151     53*           DW=(TD(I+1)-TD(I))/DH
00152     54*           DH=HA-H(I)                                               TOH
00152     55*     C
00152     56*     C*]*************************************************************** ***
00152     57*     C
00152     58*     C HEIGHT 'H' IS IN METERS
00152     59*     C HEIGHT 'Z' IS IN KM
00152     60*     C
00152     61*     C ANS( 1) IS PRESSURE
00152     62*     C PRESSURE IS IN MB
00152     63*     C
00152     64*     C ANS( 2) IS TEMPERATURE
00152     65*     C TEMPERATURE IS IN DEG KELVIN
00152     66*     C
00152     67*     C ANS( 3) IS DENSITY
00152     68*     C DENSITY IS IN GM/CC
00152     69*     C
00152     70*     C ANS( 4) IS SPEED OF SOUND
```

```
00152     71*      C SPEED OF SOUND IS IN M/SEC
00152     72*      C
00152     73*      C ANS( 5) IS ACCELERATION OF GRAVITY
00152     74*      C ACCELERATION OF GRAVITY IS IN CM/SEC**2
00152     75*      C
00152     76*      C ANS( 6) IS VIRTUAL TEMPERATURE
00152     77*      C TEMPERATURE IS IN DEG KELVIN
00152     78*      C
00152     79*      C ANS( 7) IS MOLECULAR WEIGHT
00152     80*      C
00152     81*      C ANS( 8) IS COEFFICIENT OF VISCOSITY
00152     82*      C VISCOSITY IS IN KG /(M SEC)
00152     83*      C
00152     84*      C ANS( 9) IS DEW POINT TEMPERATURE
00152     85*      C TEMPERATURE IS IN DEG KELVIN
00152     86*      C
00152     87*      C ANS(10) IS MIXING RATIO R
00152     88*      C MIXING RATIO IS IN PARTS/THOUSAND    I.E. (O/OO)  GM/KG
00152     89*      C
00152     90*      C ANS(11) IS SATURATION MIXING RATIO RS
00152     91*      C SATURATION MIXING RATIO IS IN PARTS/THOUSAND I.E. (O/OO) GM/KG
00152     92*      C
00152     93*      C ANS(12) IS RELATIVE HUMIDITY
00152     94*      C RELATIVE HUMIDITY IS IN PERCENT (O/O)
00152     95*      C
00152     96*      C ANS(13) IS SPECIFIC HUMIDITY
00152     97*      C SPECIFIC HUMIDITY IS IN GM/KG
00152     98*      C
00152     99*      C ANS(14) IS SATURATION SPECIFIC HUMIDITY
00152    100*      C SATURATION SPECIFIC HUMIDITY IS IN GM/KG
00152    101*      C
00152    102*      C ANS(15) IS PRESSURE SCALE HEIGHT
00152    103*      C PRESSURE SCALE HEIGHT IS IN KM
00152    104*      C
00152    105*      C ANS(16) IS DENSITY SCALE HEIGHT
00152    106*      C DENSITY SCALE HEIGHT IS IN KM
00152    107*      C
00152    108*      C ANS(17) IS REFRACTIVE INDEX DEVELOPED BY EDLEN IN TERMS OF WAVELENGTH ALONE
00152    109*      C INDEX IS FOR AIR AT 288 DEG KELVIN AND 760MM HG
00152    110*      C
00152    111*      C ANS(18) IS REFRACTIVE INDEX DEVELOPED BY PENNDORF IN TERMS OF
00152    112*      C     WAVELENGTH, TEMPERATURE, AND PRESSURE
00152    113*      C
00152    114*      C ANS(19) IS THE WATER VAPOR PRESSURE IN MB
00152    115*      C
00152    116*      C ANS(20) IS THE SATURATION WATER VAPOR PRESSURE IN MB
00152    117*      C
00152    118*      C ANS(21) IS THE ZENITH ANGLE FROM GROUNDSTATION IN RADIANS
00152    119*      C
00152    120*      C ANS(22) = THE TOTAL GM/CM**2 OR COLUMNAR MASS ALONG THE SLANT PATH.
00152    121*      C
00152    122*      C ANS(23) = TOTAL GM/CM**2 OF WATER VAPOR ALONG THE SLANT PATH.  IT IS
00152    123*      C     EQUIVALENT TO PRECIPITABLE CM OF WATER
00152    124*      C
00152    125*      C ANS(24) = TOTAL PATH LENGTH IN CM
00152    126*      C
00152    127*      C ANS(25) IS VERTICAL TEMPERATURE GRADIENT , DEG KELVIN/(M)
00152    128*      C
```

```
00152    129*      C ANS(21) THRU ANS(24) ARE CALCULATED IN SUBROUTINE PATH.
00152    130*      C
00152    131*      C ANS(26) IS MOLECULAR WEIGHT
00152    132*      C
00152    133*      C ANS(27) IS NUMBER DENSITY IN PARTICLES/CM**3
00152    134*      C
00152    135*      C*****************************************************************************
00152    136*      C
00153    137*            ANS(2)=T(I)+W*DH                                                    TOM
00154    138*            ANS(6)=TV(I)+D*DH                                                   TOM
00155    139*            ANS(9)=TD(I)+W*DH                                                   TOM
00156    140*            ANS(1)=PRES(P(I),D,TV(I),ANS(6),DH)
00157    141*            GO TO 14
00160    142*         12 I=II
00161    143*            ANS(1)=P(I)
00162    144*            ANS(2)=T(I)
00163    145*            ANS(6)=TV(I)
00164    146*            ANS(9)=TD(I)
00165    147*         14 ANS(5)=G*(RE/(RE+Z))**2
00166    148*            ANS(3)=ANS(1)*XMO/(RO*ANS(6))*1000.0
00167    149*            ANS(4)=SQRT(1.4*RO*ANS(6)/XMO)/100.0
00170    150*            ANS(7)=XMO*ANS(2)/ANS(6)
00171    151*            ANS(8)=BETA*(SQRT(ANS(2)))**3/(ANS(2)+S)
00172    152*            ANS(25)=W
00173    153*         52 ANS(19)=E(ANS(9))
00174    154*            ANS(20)=E(ANS(2))
00175    155*            ANS(10)=R(ANS(19),ANS(1),ANS(2))
00176    156*            ANS(11)=R(ANS(20),ANS(1),ANS(2))
00177    157*            IF (ANS(11).GT.0.0) ANS(12)=(ANS(10)/ANS(11))*100.0
00201    158*            ANS(13)=Q(ANS(1),ANS(9))
00202    159*            ANS(14)=Q(ANS(1),ANS(2))
00203    160*            ANS(15)=RO*ANS(6)/(XMO*ANS(5))*1.0E-05
00204    161*            ANS(16)=ANS(15)/(1.0+RO/(XMO*ANS(5))*0.01)
00205    162*            ANS(26)=XMO*ANS(2)/ANS(6)
00206    163*            ANS(27)=6.02257E+23*ANS(1)*1000.0/(8.31432E+07*ANS(2))
00207    164*            IF (XLAMDA.GE.12500.00) GO TO 30
00207    165*      C THIS MEANS IF XLAMDA IS .GE. 1.25 CM USE MICROWAVE REFRACTIVITY
00211    166*            ANS(17)=1.0+1.0E-08*(6432.8+2949810./(146.-1./(XLAMDA**2))+25540./
00211    167*           1(41.-1./(XLAMDA**2)))
00212    168*            ANS(18)=1.0+(ANS(17)-1.0)*(CT/(1.0+ANS(2)/273.16))*ANS(1)/1013.25
00213    169*            GO TO 31
00214    170*         30 ANS(18) =1.0+1.0E-06*(77.6*ANS(1)/(ANS(2))+373000.0*ANS(19)/(ANS(2
00214    171*           1)**2))
00215    172*            ANS(17)=ANS(18)
00216    173*         31 RETURN
00217    174*          7 DO 16 I=1,M
00217    175*      C      PRESSURE
00222    176*            II=I
00223    177*            IF (PP.GT.P(I)) GO TO 16
00225    178*            IF(PP-P(I)) 16,41,17
00230    179*         16 CONTINUE
00232    180*            HA=0.0
00233    181*            DHA=100.0
00234    182*         51 DO 48 I=1,II
00237    183*            HA=HA+DHA
00240    184*            CALL ATMOS3(HA,D)                                                   L12
00241    185*            IF (ANS(1).LE.0.0) GO TO 42
00243    186*            IF (ANS(1) .LT. PP) GO TO 49
```

```
00245     187*        48 CONTINUE
00247     188*        42 DO 10 I=2,35
00252     189*           IF (I.EQ.21.OR.I.EQ.22.OR.I.EQ.23.OR.I.EQ.24)  GO TO 10
00254     190*           ANS(I)=0.0
00255     191*        10 CONTINUE
00257     192*           ANS(17)=1.0
00260     193*           ANS(18)=1.0
00261     194*           Z=HA
00262     195*           RETURN
00263     196*        41 Z=H(II)*RE/(1000.0*(RE+H(II)/1000.0))
00264     197*           GO TO 12
00265     198*        49 IF (ABS(ANS(I)-PP) .LE. 1.001*PP) GO TO 50
00267     199*           HA=HA-DHA
00270     200*           DHA=DHA/10.0
00271     201*           GO TO 51
00272     202*        50 Z=HA
00273     203*           GO TO 9
00274     204*        17 I=II-1
00275     205*           D=TV(I+1)-TV(I)
00276     206*           IF(D) 20,21,20
00301     207*        20 D=CONN/ALOG(P(I+1)/P(I))*ALOG(TV(I+1)/TV(I))
00302     208*           ANS(6)=TV(I)*(PP/P(I))**(D/CONN)
00303     209*           HA=H(I)+(ANS(6)-TV(I))/D
00304     210*           GO TO 22
00304     211*     C HA IS IN METERS
00305     212*        21 HA=H(I)+TV(I)*ALOG(PP/P(I))/CONN
00306     213*        22 Z=HA*RE/(1000.0*(RE+HA/1000.0))
00307     214*           GO TU 23
00310     215*           END

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR ATMOS3,ATMOS3                                                    09 NOV 73          21:10:25.69
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010D10A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:25

   SUBROUTINE ATMOS3    ENTRY POINT 000351

   STORAGE USED: CODE(1) 000400; DATA(0) 000223; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   MATH   000045

   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   SQRT
    0005   ALOG
    0006   NEXP6S
    0007   EXP
    0010   NERR3$

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

    0001   000155 11L       0001   000023 127G      0001   000242 13L       0001   000276 14L       0001   000056 2L
    0001   000334 214G      0001   000036 3L        0001   000074 4L        0001   000142 5L        0001   000332 50L
    0001   000336 53L       0001   000151 8L        0001   000125 9L        0000 R 000105 A         0003 R 000000 ANS
    0003   000044 CONDUM    0000 R 000164 CONN      0000 R 000000 H         0000 R 000166 HA        0000 I 000170 I
    0000   000206 INJP$     0000 I 000167 M         0000 R 000056 P         0000 R 000165 RE        0003   000043 REDUM
    0000 R 000163 S         0000 R 000027 T         0000 R 000171 W         0000 R 000134 ZZ

00101       1*            SUBROUTINE ATMOS3 (Z,D)
00101       2*      C SUBROUTINE FOR THE 1962 STANDARD
00101       3*      C Z IS ALTITUDE IN KM
00103       4*            DIMENSION H(23),T(23),P(23),ANS(35),A(23),ZZ(23)
00104       5*            COMMON /MATM/ANS,REDUM,CONDUM
00105       6*            DATA H/-5000.,0.0,11000.0,20000.0,32000.0,47000.0,52000.0,61000.0,
00105       7*           1 79000.,88744.2,98452.,108129.8,117777.7,146543.8,156073.6,165574.3
00105       8*           2,184488.55,221972.686,286486.49,376331.361,463556.85,548275.86,
00105       9*           2630594.90/,T/320.65
00105      10*           3,288.15,216.65,216.65,228.65,270.65,270.65,2[illegible],180.65,180.65,
00105      11*           4210.65,260.65,360.65,960.65,1110.65,1210.65,[illegible]65,1550.65,1830.6
00105      12*           55,2160.65,2420.65,2590.65,2700.65/,P/1.77687E+03,1.01325E+03,
00105      13*           62.26320E+02,5.47487E+01,8.68014,1.10905,5.90005E-01,1.82092E-01,
00105      14*           71.0377E-02,1.6438E-03,3.0075E-04,7.3544E-05,2.5217E-05,5.0617E-06,
00105      15*           83.6943E-06,2.7926E-06,1.6852E-06,6.9604E-07,1.8838E-07,4.0304E-08,
00105      16*           91.0957E-08,3.4502E-09,1.1918E-09/ ,A/320.650,
00105      17*           1 288.15,216.65,216.65,228.65,270.65,270.65,252.65,180.65,180.65,
00105      18*           2 210.02,257.0,349.49,892.79,1022.2,1105.5,1205.5,1321.7,1432.1,
00105      19*           31487.4,1499.2,1506.1,1507.6/ ,ZZ/ -5000.,0.0,11000.,20000.,32000.,
00105      20*           447000.,52000.,61000.,79000.,90000.,100000.,110000.,120000.,150000.
00105      21*           5,160000.,170000.,190000.,230000.,300000.,400000.,500000.,600000.,
00105      22*           6700000./
```

```
00113     23*           DATA S/110.4/,CONN/-3.41631947E-02/,RE/6.36E+06/
00117     24*
00117     25*      C
00117     26*      C*****************************************************************************
00117     27*      C
00117     28*      C ZZ IS THE GEOMETRIC ALTITUDE FOR BREAKPOINTS ABOVE 90 KM
00117     29*      C H(I) IS THE ALT IN GEOPOTENTIAL METERS FOR SIGNIFICANT LEVELS
00117     30*      C D IS THE TEMPERATURE GRADIENT IN THE VERTICAL (DEG/GEOPM)
00117     31*      C T(I) IS THE MOLECULAR SCALE TEMPERATURE AT A SIGNIFICANT LEVEL
00117     32*      C A(I) IS THE KINETIC TEMPERATURE AT THE SIGNIFICANT LEVELS
00117     33*      C P(I) IS THE PRESSURE IN LB/FT**2.  ACTUALLY IT WONT MATTER AND PRESSURE CAN
00117     34*      C      BE IN ANY SET OF UNITS SINCE ONLY THE RATIO AT VARIOUS ALTITUDES RELATIVE
00117     35*      C      TO P(2) IS USED
00117     36*      C ANS(1) IS THE RATIO OF PRESSURES (P/PSL)
00117     37*      C ANS(1)*.01325E+03 FOR PRES IN MB
00117     38*      C ANS(2) IS THE RATIO OF TEMPERATURE (T/TSL)
00117     39*      C ANS(2)*288.15 FOR TEMP IN DEG K
00117     40*      C ANS(3) IS THE RATIO OF DENSITIES
00117     41*      C ANS(3)*1.225E-03 FOR DENSITY IN GM/CC
00117     42*      C ANS(4) IS THE RATIO OF SPEED OF SOUND  (C/CSL)
00117     43*      C ANS(4)*340.294 FOR SPEED OF SOUND IN M/SEC
00117     44*      C ANS(5) IS THE ACCELERATION OF GRAVITY (G/GSL)
00117     45*      C ANS(5)*980.665 FOR ACC OF GRAVITY IN CM/(SEC**2)
00117     46*      C ANS(6) IS THE RATIO OS MOLECULAR SCALE TEMPERATURE
00117     47*      C ANS(6)*288.15 FOR TEMP IN DEG K
00117     48*      C ANS(7) IS THE MOLECULAR WEIGHT
00117     49*      C ANS(8) IS THE RATIO OF COEF OF VISCOSITY (MU/MUSL)
00117     50*      C ANS(8)*1.7894E-05 TO COEF IN KM/M-SEC
00117     51*      C W IS THE VERTICAL KINETIC TEMPERATURE GRADIENT
00117     52*      C THIS RADIUS 'RE' IS CHOSEN TO AGREE WITH THE U S STANDARD AT 90 KM, BUT IT
00117     53*      C      ALSO IS A BEST FIT TO ALL LEVELS BELOW 90 KM.  ABOVE 90 KM THE LEVELS
00117     54*      C      THAT ARE BREAK POINTS WERE CALCULATED FROM GEOMETRIC TO GEOP USING 'RE'
00117     55*      C
00117     56*      C*****************************************************************************
00117     57*      C
00117     58*           Z=Z*1000.0
00120     59*           IF (Z-700000.0) 10,50,50
00123     60*        10 CONTINUE
00124     61*           HA=RE*Z/(RE+Z)
00125     62*           ANS(5)=FF**2/((RE+Z)**2)
00126     63*           DO 1 M=1,23
00131     64*           I=M
00132     65*           IF (H(I)-HA) 1,2,3
00135     66*         1 CONTINUE
00137     67*           GO TO 50
00140     68*         3 I=I-1
00141     69*           D=(T(I+1)-T(I))/(H(I+1)-H(I))
00142     70*           W=(A(I+1)-A(I))/(H(I+1)-H(I))
00143     71*           ANS(25)=W
00144     72*           GO TO 4
00145     73*         2 ANS(6)=T(I)/T(2)
00146     74*           ANS(2)=A(I)/A(2)
00147     75*           D=(T(I+1)-T(I))/(H(I+1)-H(I))
00150     76*           GO TO 5
00151     77*         4 IF (90000.0-Z) 7,7,9
00154     78*         7 ANS(6)=(T(I)-(T(I+1)-T(I))/(ZZ(I+1)-ZZ(I))*(ZZ(I)-Z))/T(2)
00155     79*           ANS(2)=(A(I)-(A(I+1)-A(I))/(ZZ(I+1)-ZZ(I))*(ZZ(I)-Z))/A(2)
00156     80*           GO TO 5
```

```
00157     81*          9 ANS(6)=(T(1)-D*(H(1)-HA))/T(2)
00160     82*            ANS(2)=(A(1)-W*(H(1)-HA))/A(2)
00161     83*          5 IF (90000.0-Z ) 8,6,6
00164     84*          6 ANS(7)=28.9644
00165     85*            GO TO 11
00166     86*          8 ANS(7)=28.9644*ANS(2)/ANS(6)
00167     87*         11 ANS(4)= SQRT(ANS(6))
00170     88*            ANS(8)=(T(2)+S)/(ANS(2)*T(2)+S))*SQRT((ANS(2))**3)
00171     89*            IF (D) 12,13,12
00174     90*         12 CONN=D*ALOG(P(I+1)/P(I))/(ALOG(T(I+1)/T(I)))
00175     91*            ANS(1)=P(1)/P(2)*(ANS(6)*T(2)/T(1))**(CONN/D)
00176     92*            GO TO 14
00177     93*         13 CONN=ALOG(P(I+1)/P(I))/(H(I+1)-H(I))*T(I)
00200     94*            ANS(1)=P(1)/P(2)* EXP(CONN*((HA-H(I))/(ANS(6)*T(2))))
00201     95*         14 ANS(3)=ANS(1)/ANS(6)
00202     96*            ANS(1)=ANS(1)*1.01325E+03
00203     97*            ANS(2)=ANS(2)*288.15
00204     98*            ANS(3)=ANS(3)*1.225E-03
00205     99*            ANS(4)=ANS(4)*340.294
00206    100*            ANS(5)=ANS(5)*980.665
00207    101*            ANS(6)=ANS(6)*288.15
00210    102*            ANS(8)=ANS(8)*1.7894E-05
00211    103*            Z=Z/1000.0
00212    104*            GO TO 53
00213    105*         50 DO 51 I=1,8
00216    106*         51 ANS(I)=0.0
00220    107*         53 RETURN
00221    108*            END

        END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR INPUT,INPUT                                                    09 NOV 73          21:10:27 795
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12D10D19A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:27

   SUBROUTINE INPUT      ENTRY POINT 001223

   STORAGE USED: CODE(1) 001276; DATA(0) 000270; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   E
    0004   F
    0005   ALTITU
    0006   PRES
    0007   R
    0010   EXIT
    0011   NRDU$
    0012   NIO1$
    0013   NIO2$
    0014   NWDU$
    0015   NERR3$

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

    0001   000402 11L       0001   000051 114G      0001   000063 123G      0000   000123 13F       0001   000100 131G
    0001   000774 2L        0001   000417 203G      0001   000505 221G      0001   000542 231G      0000   000136 24F
    0000   000025 25F       0001   000733 265G      0000   000111 3F        0000   000029 30F       0001   001037 301G
    0001   001053 307G      0001   001131 31L       0000   000143 32F       0001   001079 33L       0001   001146 35L
    0000   000116 4F        0001   001023 5L        0001   001156 6L        0001   001021 7L        0000   000127 455F
    0000   000151 86F       0001   000607 991L      0001   000540 9 2L      000.   000601 995L      0005 R 000000 ALTITU
    0000 R 000010 CONDE      0000 R 000016 DELT      0003 R 000000 E         0004 R 000000 F         0000 R 000017 GUESS
    0000 R 000014 HZERO      0000 I 000013 I         0000 I 000000 ID        0000   000209 INJP$     0000 I 000015 JJ
    0000 I 000021 L          0000 I 000011 NSATI     0000 R 000012 ON        0006 R 000000 PRES      0000 R 000023 Q
    0007 R 000000 R          0000 R 000022 REL       0000 R 000020 RI


00101      1*            SUBROUTINE INPUT (P,T,TD,H,TV,M)
00103      2*            DIMENSION P(100),T(100),TD(100),H(100),TV(100)
00103      3*      C
00104      4*            DIMENSION ID(8)                                                    LIZ
00104      5*      C*****************************************************************************
00104      6*      C
00104      7*      C THIS INPUT SUBROUTINE IS SET UP TO TAKE STANDARD PRINTOUT OF CODE VV ,
00104      8*      C     (IE SIGNIFICANT LEVELS OF A RADIOSONDE) AND SET ALTITUDES, VIRTUAL TEMP,
00104      9*      C     DEWPOINT TEMPERATURES, AND AMBIENT TEMPERATURES OR IF A BLANK CARD
00104     10*      C     PRECEEDS THE DATA THE INPUT DATA IS OF THE FORM HEIGHT, PRESSURE,
00104     11*      C     TEMPERATURE, AND RELATIVE HUMIDITY
00104     12*      C
00104     13*      C*****************************************************************************
00104     14*      C
00105     15*            CONDE=5H
00106     16*            NSATI=5H
```

```
00107    17*          ON=5H
00110    18*          M=0
00111    19*          H(1)=0.0
00112    20*          READ(5,30)  (ID(I),I=1,8)                                          LIZ
00120    21*     30    FORMAT(8A6)                                                       LIZ
00120    22*     C
00121    23*          WRITE(6,25)  (ID(I), I=1,8)                                        LIZ
00127    24*        25 FORMAT (1X,41X,'EARTH RESOURCES MODEL ATMOSPHERE,1969',
00127    25*       *//,42X,'MODEL LOCATION   ',8A6,                                     LIZ
00127    26*       1 ///,         29X,'THE SIGNIFICANT LEVELS FOR THE MODEL ATMOSPHERE
00127    27*       2ARE AS FOLLOWS',///,27X,'ALT',10X,'PRES',10X,'TEMP',9X,'TD',11X     LIZ
00127    28*       3,'TV',10X,'HZERO'/                                                  LIZ
00127    29*       4,27X,'(M)',10X,'(MB)',10X,'(K)',10X,'(K)',10X,'(K)',10X,'(M)',)     LIZ
00127    30*     C
00127    31*     C*************************************************************************
00127    32*     C
00127    33*     C THIS SECTION INPUTS CODED DATA
00127    34*     C
00130    35*          DO 1 I=1,100
00133    36*          READ(5,3) P(I),T(I),TD(I),H(I)
00141    37*        3 FORMAT(1X,F3.0,1X,F3.0,F2.0,F10.0)
00141    38*     C THIS IS THE FORMAT FOR READING RADIOSONDE DATA
00141    39*     C HZERO IS THE ALTITUDE IN METERS ABOVE MEAN SEA LEVEL OF THE STATION
00141    40*     C FROM WHICH THE RADIOSONDE WAS LAUNCHED
00142    41*          IF (I.EQ.1) HZERO=H(1)
00142    42*     C ALTITUDE IN METERS
00142    43*     C PRESSURE IN MB
00142    44*     C T IN DEG CENTIGRADE
00142    45*     C TD IS TEMPERATURE DEWPOINT DEPRESSION IN DEG CENTIGRADE
00144    46*          IF (P(I).LE.0.0.AND.T(I).LE.0.0.AND.TD(I).LE.0.0) GO TO 11
00146    47*          IF (P(I).LT.0.0) GO TO 2
00150    48*          M=M+1
00151    49*          IF (I.LE.9.AND.P(I).LT.100.0) P(I)=P(I)+1000.0
00153    50*          IF (AMOD(T(I),2.0).GT.0.01) T(I)=-T(I)
00155    51*          T(I)=T(I)*.1
00156    52*          IF (TD(I) .GT. .01 .AND. TD(I) .LE. 50.0) TD(I)=TD(I)*.1
00160    53*          IF(TD(I) .GE. 51.0 .AND. TD(I) .LE. 55.0) WRITE(6,4)
00163    54*        4 FORMAT(1X,'INVALID TD INPUT DATA')
00169    55*          IF (TD(I) .GE. 56.0  .AND. TD(I) .LE. 99.0) TD(I)=TD(I)-50.0
00166    56*          IF (TD(I).LE..01) TD(I)=T(I)+273.16
00170    57*          TD(I)=T(I)-TD(I)
00171    58*          T(I)=T(I)+273.16
00172    59*          TD(I)=TD(I)+273.16
00173    60*          TV(I)=T(I)/(1.0-(0.37803*E(TD(I))*F(P(I),T(I))/P(I)))
00174    61*          IF (I.NE.1) H(I)=ALTITU(TV(I),TV(I-1),P(I),P(I-1),H(I-1))+HZERO
00176    62*        1 CONTINUE
00200    63*          GO TO 2
00200    64*     C
00200    65*     C*************************************************************************
00200    66*     C
00200    67*     C THIS SECTION INPUTS NON-CODED DATA
00200    68*     C
00201    69*       11 M=0
00202    70*          DO 12 I=1,100
00202    71*     C  THIS IS THE FORMAT FOR READING SIGNIFICANT LEVELS IN NON-CODED FORM
00205    72*          READ (5,13) H(I),P(I),T(I),TD(I)
00213    73*       13 FORMAT (E9.3,E12.6,F7.2,F3.0)
00213    74*     C TD(I) HERE, IS RELATIVE HUMIDITY UNTIL A TD(I) IS FOUND BY ITERATION
```

```
00214     75*           IF (P(I).LE.0.0) GO TO 2
00216     76*           IF (I.NE.1) P(I)=PRES(P(I-1),(T(I)-T(I-1))/(H(I)-H(I-1)),T(I-1),T(
          I),H(I)-H(I-1))
00220     78*           DO 851 JJ=1,6
00223     79*           DELT=100.0
00224     80*           GUESS=0.0
00225     81*           R1=R(E(T(I)),P(I),T(I))
00226     82*             IF(R1.LT.1E-6) R1 = 1E-6                                    LIZ
00230     83*       992 DO 990 L=1,11
00233     84*           GUESS=GUESS+DELT
00234     85*           REL=R(E(GUESS),P(I),GUESS)*100.0/R1
00235     86*           Q=REL-TD(I)
00236     87*           IF (Q) 990,991,995
00241     88*       990 CONTINUE
00243     89*           WRITE (6,855)
00245     90*       855 FORMAT (1X,'EXIT DUE TO INABILITY TO FIND TD')
00246     91*           CALL EXIT
00247     92*       995 GUESS=GUESS-DELT
00250     93*           DELT=DELT/10.0
00251     94*       991 IF (ABS(Q).GT..01) GO TO 992
00253     95*           TV(I)=T(I)/(1.0-(0.37803*E(GUESS)*F(P(I),T(I)))/P(I))
00254     96*           IF (I.NE.1) P(I)=PRES(P(I-1),(TV(I)-TV(I-1))/(H(I)-H(I-1)),TV(I-1)
          1,TV(I),H(I)-H(I-1))
00256     97*       851 CONTINUE
00260     98*           TD(I)=GUESS
00261     99*           M=M+1
00262    100*        12 CONTINUE
00262    101*     C
00262    102*     C*****************************************************************
00262    103*     C
00264    104*         2 DO 5 I=1,M
00267    105*           IF(TD(I) .LE. 0.0) GO TO 7
00271    106*           TV(I)=T(I)/(1.0-(0.37803*E(TD(I))*F(P(I),T(I)))/P(I))
00272    107*           IF (I.NE.1) P(I)=PRES(P(I-1),(TV(I)-TV(I-1))/(H(I)-H(I-1)),TV(I-1)
          1,TV(I),H(I)-H(I-1))
00274    108*           GO TO 5
00275    109*         7 TV(I)=T(I)
00276    110*         5 CONTINUE
00300    111*           DO 26 I=M,100
00303    112*           H(I)=H(M)
00304    113*        26 P(I)=P(M)
00306    114*           DO 6 I=1,M
00311    115*           IF (ABS(T(I)-TD(I)).GT.1.0+H(I)*.000777) GO TO 33           LIZ
00313    116*           CONDE=5HCONDE
00314    117*           NSATI=5HNSATI
00315    118*           ON=5HON
00315    119*     C
00316    120*       33  IF(HZERO.LT.1.E-36.OR.1.GT.1) GO TO 31                     LIZ
00316    121*     C
00320    122*        27   WRITE(6,24) H(I),P(I),T(I),TD(I),TV(I),HZERO,CONDE,NSATI,ON  LIZ
00333    123*        24    FORMAT(20X,1P2E13.3,0P4F13.2,1X,3A5)                     LIZ
00333    124*     C
00334    125*           GO TO 35                                                    LIZ
00334    126*     C
00335    127*          31 WRITE (6,32) H(I),P(I),T(I),TD(I),TV(I),CONDE,NSATI,ON    LIZ
00347    128*          32 FORMAT (20X,1P2E13.3,0P3F13.2,14X,3A5)                    LIZ
00347    129*     C
00350    130*       35  IF (CONDE.EQ.5H      ) GO TO 6                            LIZ
```

```
00352    133*          CONDE=5H
00353    134*          NSATI=5H
00354    135*          ON=5H
00355    136*        6 CONTINUE
00357    137*          WRITE (6,86)
00361    138*       86 FORMAT (///)
00362    139*          RETURN
00363    140*          END

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR REFRAC,REFRAC                                                    09 NOV 73          21:10:31.357
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 25A  -(EXECB LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:31

   SUBROUTINE REFRAC    ENTRY POINT 000117

   STORAGE USED: CODE(1) 000142; DATA(0) 000030; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   MATH   000045

   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   MODATM
    0005   SININV
    0006   SIN
    0007   NERR35

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

    0003 R 000000 ANS       0003   000044 CONN      0000 R 000002 DELT      0000 R 000006 D1        0000 R 000009 D2
    0000   000016 IN.PS     0000 R 000003 PP        0003 R 000043 RE        0005 R 000000 SININV    0000 R 000000 S1
    0000 R 000001 S2        0000 R 000007 XN1       0000 R 000005 XN2


00101      1*            SUBROUTINE REFRAC (Z1,Z2,XLAMDA,PHI,PHIPR,PSI,SLANT)
00103      2*            DIMENSION ANS(35)
00104      3*            COMMON /MATH/ANS,RE,CONN
00104      4*       C
00104      5*       C*****************************************************************************
00104      6*       C
00104      7*       C IN ORDER TO CALCULATE A CONTINUOUS PATH YOU MUST EXTERNALLY SET  PHI=PHIPR
00104      8*       C Z1, Z2, PHI, AND XLAMDA ARE INPUT VARIABLES
00104      9*       C Z1 AND Z2 ARE IN KM  AND XLAMDA IS IN MICRONS
00104     10*       C PHIPR, PSI, AND SLANT ARE OUTPUT VARIABLES
00104     11*       C PHI, PHIPR, AND PSI ARE IN RADIANS  AND SLANT IS IN CM
00104     12*       C IF YOU WANT AMOUNT OF GM/CM**2 (COLUMNAR MASS) OF ATMOSPHERE FROM Z1 TO Z2
00104     13*       C      USE ANS(3)*SLANT.   GM/CM**2 OF WATER IS ANS(3)*SLANT*ANS(13)/1000.0.
00104     14*       C      SINCE ALL ANS ARRAY IS IN COMMON, YOU CAN DO THIS EXTERNALLY.
00104     15*       C
00104     16*       C*****************************************************************************
00104     17*       C
00105     18*             S1=RE+Z1
00106     19*             S2=RE+Z2
00107     20*             DELT=(Z2-Z1)/2.0
00110     21*             CALL MODATM(Z2+DELT,PP,4HALT,XLAMDA)
00111     22*             D2=ANS(3)
00112     23*             XN2=ANS(18)
00113     24*             CALL MODATM (Z1+DELT,PP,4HALT,XLAMDA)
00114     25*             D1=ANS(3)
00115     26*             XN1=ANS(18)
```

```
00116     27*           PSI=SININV(S1*SIN(PHI)/S2)
00117     28*           PHIPR=SININV(S1*SIN(PHI)*XN1/(S2*XN2))
00120     29*           SLANT=S1-SIN(PHI-PSI)/SIN(PSI)*1.0E+05
00121     30*           RETURN
00122     31*           END

      END OF COMPILATION:       NO  DIAGNOSTICS.
```

ORIGINAL PAGE IS
OF POOR QUALITY

```
@ FOR PATH,PATH                                                    09 NOV 73          21:10:33. 15
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 25A  -(EXEC8 LEVEL E12D10D10A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:33

   SUBROUTINE PATH      ENTRY POINT 001020

   STORAGE USED: CODE(1) 001112; DATA(0) 000262; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   MATH   000045
    0004   MOATH  000137

   EXTERNAL REFERENCES (BLOCK, NAME)

    0005   MODATH
    0006   COSINV
    0007   SININV
    0010   COS
    0011   SIN
    0012   SQRT
    0013   ATAN2
    0014   NWDUS
    0015   NIO2S
    0016   NIO1S
    0017   NERR3S

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

    0000    000172 104F      0000    000135 105F      0001    000212 144G      0001    000254 165G      0001    000256 170G
    0001    000371 222G      0001    000765 2223L     0001    000521 263G      0001    000543 271G      0001    000771 353G
    0001    000777 83L       0000    000201 87F       0000    000102 88F       0001    000462 89L       0000 R 000000 A
    0000 R 000035 ABD        0003 R 000000 ANS        0000 R 000011 B          0000 R 000014 C          0000 R 000020 CON
    0003    000044 CONN      0006 R 000000 COSINV     0004 R 000134 DELP       0000 R 000043 DELT       0000 R 000074 DUM
    0000 R 000047 D1         0000 R 000067 D2         0000 R 000066 HAFDEL     0000 R 000034 HL         0000 R 000031 HS
    0000 I 000036 I          0000    000230 INJPS     0000 I 000042 J          0000 I 000061 JT         0000 I 000062 JTP
    0004 I 000074 K1         0000 I 000041 K111       0000 I 000037 M          0004 R 000036 PATHM      0000 R 000021 PBAR
    0000 R 000040 PHI        0000 R 000045 PHIINT     0000 R 000073 PHIPR      0000 R 000017 PI         0000 R 000044 PP
    0000 R 000022 PSAT       0000 R 000072 PSI        0004 R 000136 PSURF      0000 R 000075 Q          0000 R 000025 Q1
    0000 R 000026 Q2         0003 R 000043 RE         0007 R 000000 SININV     0000 R 000052 SUM        0000 R 000053 SUM1
    0000 R 000054 SUM2       0000 R 000057 SUM2P      0000 R 000055 SUM3       0000 R 000056 SUM4       0000 R 000060 SUM4P
    0000 R 000064 S1         0000 R 000065 S2         0000 R 000023 TSAT       0000 R 000024 TSURF      0004    000135 UCONV1
    0004 R 000000 WATERM     0000 R 000050 WATER1     0000 R 000070 WATER2     0000 R 000032 XL         0000 R 000051 XN1
    0000 R 000071 XN2        0000 R 000027 XS         0000 R 000033 YL         0000 R 000030 YS         0004 R 000075 ZZZ
    0000 R 000046 Z1         0000 R 000063 Z2

00101      1*            SUBROUTINE PATH (XLAMDA,ZS,PHIS,THETAS,ZL,PHIL,THETAL)
00103      2*            DIMENSION ANS(35),A(3,3),B(3),C(3),WATERM(30),PATHM(30),ZZZ(31)
00104      3*            COMMON /MATH/ANS,RE,CONN
00105      4*            COMMON/MOATH/WATERM,PATHM,K1,ZZZ,DELP,UCONV1,PSURF
00106      5*            DATA PI/3.14159265/,CON/.0174532925/
```

```
00106      6*     C
00106      7*     C*****************************************************************
00106      8*     C
00106      9*     C QUANTITIES ENDING IN S ARE FOR THE SATELLITE
00106     10*     C QUANTITIES ENDING IN L ARE FOR THE GROUND LOCAL
00106     11*     C -Q1- AND -Q2- ARE DUMMY VARIABLES
00106     12*     C -XS, YS, AND HS- ARE THE RECTANGULAR COORDINATES OF THE SPACECRAFT
00106     13*     C -XL, YL, AND HL- ARE THE RECTANGULAR COORDINATES OF THE GROUND LOCAL
00106     14*     C THE ANGLE ABD IS THE ANGLE BETWEEN THE SUBSATELLITE POINT AND TARGET.
00106     15*     C ANGLE ABD IS FOUND BY USING THE DOT PRODUCT AND TAKING THE INVERSE COS
00106     16*     C .0092833 RADIANS IS THE TOTAL REFRACTION ON A PASS THRU U.S. STANDARD
00106     17*     C 'SUM' IS THE TOTAL ANGLE CHANGE DURING REFRACTION
00106     18*     C 'SUM1' IS THE SUM OF ALL D.LTA X1 CALCULATED BY LAW OF SINES
00106     19*     C 'SUM2' IS PRECIPITABLE CM OF WATER OR GM/CM**2 OF WATER VAPOR
00106     20*     C 'SUM3' IS THE TOTAL COLUMNAR MASS IN THE SLANT PATH
00106     21*     C 'SUM4' IS THE TOTAL SLANT PATH IN CM
00106     22*     C PHI IS IN RADIANS
00106     23*     C
00106     24*     C ANS(21) IS THE ZENITH ANGLE FROM GROUNDSTATION IN RADIANS
00106     25*     C
00106     26*     C ANS(22) = THE TOTAL GM/CM**2 OR COLUMNAR MASS ALONG THE SLANT PATH.
00106     27*     C
00106     28*     C ANS(23) = TOTAL GM/CM**2 OF WATER VAPOR ALONG THE SLANT PATH.  IT IS
00106     29*     C     EQUIVALENT TO PRECIPITABLE CM OF WATER.
00106     30*     C
00106     31*     C ANS(24) = TOTAL PATH LENGTH IN CM
00106     32*     C
00106     33*     C*****************************************************************
00106     34*     C
00111     35*           PHIS=PHIS*CON
00112     36*           THETAS=THETAS*(-CON)
00113     37*           PHIL=PHIL*CON
00114     38*           THETAL=THETAL*(-CON)
00115     39*           ANS(1)=-1.0
00116     40*       -   CALL MODATM(ZS,PBAR,9HALT1,XLAMDA)                          LIZ
00117     41*           DELP=ANS(1)
00120     42*           PSAT=ANS(1)
00121     43*           TSAT=ANS(2)
00122     44*           CALL MODATM (ZL,PBAR,9HALT1,XLAMDA)                         LIZ
00123     45*           DELP=ABS(ANS(1)-DELP)/FLOAT(K1)
00124     46*           PSURF=ANS(1)
00125     47*           TSURF=ANS(2)
00126     48*           ZZZ(K1+1)=ZS
00127     49*           ZZZ(1)=ZL
00130     50*           Q1=RE+ZS
00131     51*           Q2=COS(PHIS)
00132     52*           XS=Q1*COS(THETAS)*Q2
00133     53*           YS=Q1*SIN(THETAS)*Q2
00134     54*           HS=Q1*SIN(PHIS)
00135     55*           Q2=COS(PHIL)
00136     56*           Q1=RE+ZL
00137     57*           XL=Q1*COS(THETAL)*Q2
00140     58*           YL=Q1*SIN(THETAL)*Q2
00141     59*           HL=Q1*SIN(PHIL)
00142     60*           ABD=COSINV((XS*XL+YS*YL+HS*HL)/(SQRT(XS**2+YS**2+HS**2)
00142     61*          1*SQRT(XL**2+YL**2+HL**2)))
00143     62*           DO 3 I=1,3
00146     63*         3 C(I)=0.0
```

```
00146     64*     C FROM HERE TO STATEMENT 4 FINDS THE VECTOR (C) FROM THE TARGET TO THE
00146     65*     C      SATELLITE
00150     66*            A(1,1)=SIN(PHIL)*COS(THETAL)
00151     67*            A(2,1)=-SIN(THETAL)
00152     68*            A(3,1)=COS(PHIL)*COS(THETAL)
00153     69*            A(1,2)=SIN(PHIL)*SIN(THETAL)
00154     70*            A(2,2)=COS(THETAL)
00155     71*            A(3,2)=COS(PHIL)*SIN(THETAL)
00156     72*            A(1,3)=-COS(PHIL)
00157     73*            A(2,3)=0.0
00160     74*            A(3,3)=SIN(PHIL)
00161     75*            B(1  )=XS-XL
00162     76*            B(2  )=YS-YL
00163     77*            B(3  )=HS-HL
00164     78*            DO 4 I=1,3
00167     79*            DO 4 M=1,3
00172     80*          4 C(I)=A(I,M)*B(M)+C(I)
00175     81*            PHIL=PHIL/CON
00176     82*            THETAL=THETAL/(-CON)
00177     83*            PHIS=PHIS/CON
00200     84*            THETAS=THETAS/(-CON)
00201     85*            PHI=ATAN2(SQRT(C(1)**2+C(2)**2),C(3))
00202     86*            IF (PHI.GT..017)PHI=PHI-.0092833
00204     87*            IF (PHI/CON.GT.90.0)WRITE (6,88)
00207     88*         88 FORMAT (///,1X,'WARNING,ZENITH ANGLE OF UNREFRACTED PATH EXCEEDS
00207     89*           190.0 DEG',/,1X,'IT IS HIGHLY PROBABLE THAT THE AIRCRAFT OR SPACE
00207     90*           2CRAFT CANNOT SEE THE TARGET',///)
00210     91*            WRITE (6,105)
00212     92*        105 FORMAT (1H1,' FOR THIS MODEL,THE LEVELS ARE CHOSEN AS FOLLOWS',///
00212     93*           1/,16X,'ALTITUDE     PRESSURE        TEMPERATURE',/,16X,
00212     94*           2'   KM           MB                DEG K')
00213     95*            WRITE (6,104) ZZZ(1),PSURF,TSURF
00220     96*            K111=K1-1
00221     97*            DO 1410 J=1,K111
00224     98*            CALL HODATM(ZZZ(J+1),PSURF-DELP*FLOAT(J),4HPRES,XLAMDA)
00225     99*            WRITE (6,104) ZZZ(J+1),ANS(1),ANS(2)
00232    100*        104 FORMAT (1X, 9X,1P3E14.4)
00233    101*       1410 CONTINUE
00235    102*            WRITE (6,104) ZZZ(K1+1),PSAT,TSAT
00242    103*            IF (ABS(PHIS-PHIL).LT..1.AND.ABS(THETAS-THETAL).LT..1) GO TO 2223
00244    104*            DELT=(ZZZ(2)-ZZZ(1))/10.0
00245    105*         89 CALL HODATM (ZL+DELT*.5,PP,4HALTI,XLAMDA)
00246    106*            PHIINT=PHI
00247    107*            ZI=ZL
00250    108*            DI=ANS(3)
00251    109*            WATERI=ANS(13)
00252    110*            XNI=ANS(18)
00253    111*            SUM=0.0
00254    112*            SUM1=0.0
00255    113*            SUM2=0.0
00256    114*            SUM3=0.0
00257    115*            SUM4=0.0
00260    116*            SUM2P=0.
00261    117*            SUM4P=0.
00262    118*            DO 2 J=1,K1
00265    119*            JT=((10*(J-1))+1)
00266    120*            JTP=10*J
00267    121*            DELT=(ZZZ(J+1)-ZZZ(J))/10.0
```

```
00270    122*          DO 1 I=JT,JTP
00273    123*          Z2=Z1+DELT
00274    124*          S1=RE+Z1
00275    125*          S2=RE+Z2
00276    126*          HAFDEL=DELT*.5
00277    127*          IF(I.EQ.(K1+10)) HAFDEL=0.
00301    128*          CALL HODATH (Z2+HAFDEL,PP,4HALT1,XLAMDA)
00302    129*          D2=ANS(3)
00303    130*          WATER2=ANS(13)
00304    131*          XN2=ANS(18)
00305    132*          PSI=SININV(S1*SIN(PHI)/S2)
00306    133*          PHIPR=SININV(S1*SIN(PHI)*XN1/(S2*XN2))
00307    134*          DUM=D1*S1*SIN(PHI-PSI)/SIN(PSI)*1.0E+05
00310    135*          SUM1=SUM1+PHI-PSI
00311    136*          SUM2=SUM2+WATER1*DUM/1000.0
00312    137*          SUM3=SUM3+DUM
00313    138*          SUM4=SUM4+DUM/D1
00314    139*          SUM=SUM+ABS(PHIPR-PSI)
00315    140*          PHI=PHIPR
00316    141*          Z1=Z2
00317    142*          D1=D2
00320    143*          WATER1=WATER2
00321    144*        1 XN1=XN2
00323    145*          WATERH(J)=SUM2-SUM2P
00324    146*          PATHH(J)=SUM4-SUM4P
00325    147*          SUM2P=SUM2
00326    148*        2 SUM4P=SUM4
00330    149*       82 CONTINUE
00331    150*          Q=SUM1-ABD
00332    151*          PHI=PHIINT-Q/2.0
00333    152*          IF (ABS(Q).GE..0001) GO TO 89
00335    153*          ANS(21)=PHI
00336    154*          ANS(22)=SUM3
00337    155*          ANS(23)=SUM2
00340    156*          ANS(24)=SUM4
00341    157*          IF (PHI/CON.LE.90.0) GO TO 83
00343    158*          WRITE (6,87)
00345    159*       87 FORMAT (1X,///,1X,' THE ANGLE FROM ZENITH IS GREATER THAN 90.0')
00346    160*          ANS(22)=0.0
00347    161*          ANS(23)=0.0
00350    162*          ANS(24)=0.0
00351    163*          GO TO 83
00352    164*     2223 DO 2224 I=1,K1
00355    165*     2224 PATHH(I)=(ZZZ(I+1)-ZZZ(I))*100000.0
00357    166*          ANS(21)=0.0
00360    167*       83 RETURN
00361    168*          END

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR COSINV;COSINV                                                    09 NOV 73          21:10:36.73
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:36

   FUNCTION COSINV      ENTRY POINT 000025

   STORAGE USED: CODE(1) 000031; DATA(0) 000011; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   SQRT
    0004   ATAN2
    0005   NERR35

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

    0000 R 000000 COSINV    0000   000002 INJPS


00101      1*           FUNCTION COSINV(A)
00101      2*     C THIS FUNCTION CALCULATES THE INVERSE COSINE OF 'A'.
00103      3*           COSINV=ATAN2(SQRT(1.D-A**2),A)
00104      4*           RETURN
00105      5*           END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR SININV,SININV                                                    09 NOV 73          21:10:37.592
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:37

   FUNCTION SININV      ENTRY POINT 000034

   STORAGE USED: CODE(1) 000044; DATA(0) 000017; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   SQRT
    0004   ATAN2
    0005   NERR35

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

    0001   000007 IL        0000   000001 101F      0000   000011 INJPS     0000 R 000000 SININV



00101      1*            FUNCTION SININV(A)
00101      2*      C THIS FUNCTION CALCULATES THE INVERSE SINE OF 'A'.
00103      3*            IF(A.LT.1.) GO TO 1
00105      4*        101 FORMAT (' ERROR IN SININV - A='F12.9)
00106      5*            A=1.
00107      6*          1 SININV=ATAN2(A,(SQRT(1.0-A**2)))
00110      7*            RETURN
00111      8*            END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR Q,Q                                                    09 NOV 73          21:10:39. 47
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12D10010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:39

   FUNCTION Q           ENTRY POINT 000030

   STORAGE USED: CODE(1) 000036; DATA(0) 000013; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   E
    0004   NERR35

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

    0003 R 000000 E          0000   000005 INJPS     0000 R 000000 Q          0000 R 000001 X


00101      1*            FUNCTION Q(P,T)
00101      2*      C Q = SPECIFIC HUMIDITY WITH UNITS OF  GM/KG
00101      3*      C SPECIFIC HUMIDITY=GM OF WATER VAPOR / (KG OF AIR,INCLUDING WATER VAPOR)
00103      4*            X=E(T)
00104      5*            Q=0.62197*X/(P-0.37803*X)*1000.0
00105      6*            IF (Q.LT.0.0) Q=0.0
00107      7*            RETURN
00110      8*            END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR ALTITU,ALTITU                                                    09 NOV 73          21:10:40.436
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 28A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:40

   FUNCTION ALTITU      ENTRY POINT 000055

   STORAGE USED: CODE(1) 000067; DATA(0) 000016; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   MATH   000045

   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   ALOG
    0005   NERR3$

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

    0001   000033 3L        0001   000045 6L        0000 R 000000 ALTITU    0003   000000 ANS       0003 R 000045 CONN
    0000 R 000001 D         0000   000002 INJP$     0003   000043 RE

00101      1*            FUNCTION ALTITU (TVHIGH,TVLOW,PHIGH,PLOW,HLOW)
00103      2*            DIMENSION ANS(35)
00103      3*      C
00103      4*      C*************************************************************************
00103      5*      C
00103      6*      C GIVEN THE TEMPERATURE AND PRESSURE AT EACH OF 2 POINTS AND THE ALTITUDE OF
00103      7*      C     THE LOWER POINT, THIS FUNCTION CALCULATES THE ALTITUDE OF THE HIGHER POINT
00103      8*      C ALTITU IS IN METERS.  CONN IS A CONSTANT =  -M*G/R
00103      9*      C
00103     10*      C*************************************************************************
00103     11*      C
00104     12*            COMMON /MATH/ANS,RE,CONN
00105     13*            D=TVHIGH-TVLOW
00106     14*            IF(D) 2,3,2
00111     15*          2 D=CONN/(ALOG(PHIGH/PLOW))*ALOG(TVHIGH/TVLOW)
00112     16*            ALTITU =HLOW+(TVHIGH-TVLOW)/D
00113     17*            GO TO 6
00114     18*          3 ALTITU =HLOW*TVLOW*ALOG(PHIGH/PLOW)/CONN
00115     19*          6 RETURN
00116     20*            END

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR PRES,PRES                                                    09 NOV 73          21:10:41.854
UNIVAC 1108 FORTRAN V EXEC II LEVEL 28A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:42

   FUNCTION PRES        ENTRY POINT 000040

   STORAGE USED: CODE(1) 000053; DATA(0) 000013; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   MATH   000045

   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   NEXP6$
    0005   EXP
    0006   NERR3$

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

    0001   000017 3L        0001   000030 4L        0003   000000 ANS       0003 R 000044 CONN      0000   000001 INJP$
    0000 R 000000 PRES      0003   000043 RE

00101      1*            FUNCTION PRES(PLOW,D,TVLOW,TVHIGH,DH)
00103      2*            DIMENSION ANS(35)
00104      3*            COMMON /MATH/ANS,RE,CONN
00104      4*      C
00104      5*      C*************************************************************************
00104      6*      C
00104      7*      C THIS PROGRAM CALCULATES PRESSURE -PRES- AT SOME POINT -DH- ABOVE A
00104      8*      C     POINT IN THE ATMOSPHERE HAVING PRESSURE -PLOW- WHERE -D- IS THE
00104      9*      C     TEMPERATURE GRADIENT AND -TVHIGH- AND -TVLOW- ARE CORRESPONDING
00104     10*      C     TEMPERATURES.  -CONN- IS CONSTANT = -H*G/R
00104     11*      C
00104     12*      C*************************************************************************
00104     13*      C
00105     14*           IF(D) 2,3,2
00110     15*         2 PRES=PLOW*(TVHIGH/TVLOW)**(CONN/D)
00111     16*           GO TO 4
00112     17*         3 PRES=PLOW*EXP( CONN*DH/TVLOW)
00113     18*         4 RETURN
00114     19*           END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
$ FOR E,E                                                    09 NOV 73          21:10:43.106
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:43

   FUNCTION E            ENTRY POINT 000130

   STORAGE  SEQ: CODE(1) 000141; DATA(0) 000032; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003    ALOG10
    0004    NEXP6$
    0005    NERR3$

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

    0001    000043 2L        0001   000117 4L        0001   000120 5L        0000 R 000003 C        0000 R 000000 E
    0000    000022 INJP$     0000 R 000004 T         0000 R 000002 TO        0000 R 000001 TS


00101      1*            FUNCTION E(X)
00103      2*            DATA TS/373.16/,TO/273.16/
00103      3*       C
00103      4*       C*****************************************************************************
00103      5*       C
00103      6*       C THIS ROUTINE CALCULATES VAPOR PRESSURE OVER A PLANE SURFACE OF
00103      7*       C     WATER (C = 0.0) OR OF ICE (C = 273.16) BASED ON TEMPERATURE IN DEG
00103      8*       C     KELVIN.  E(X) IS IN MB
00103      9*       C SET C=273.16 IF YOU WANT VAPOR PRES OVER ICE USED BELOW 273. DEG K
00103     10*       C
00103     11*       C*****************************************************************************
00103     12*       C
00106     13*             C=0.0
00107     14*             T=X-C
00110     15*             IF (X .LE. 1.0) GO TO 4
00112     16*             IF (T) 1,2,2
00112     17*       C   FORMULA FOR VAPOR PRESSURE OVER ICE
00115     18*           1 E=6.1071*10.0**(-9.0971B* (-1.0+TO/X)-3.56654*LOG10(TO/X)+0.876793
00115     19*            1*(1.0-X/TO))
00116     20*             GO TO 5
00116     21*       C
00116     22*       C*****************************************.     .*****************************
00116     23*       C
00116     24*       C   FORMULA FOR VAPOR PRESSURE OVER WATER
00117     25*           2 E=1013.246*10.0**(-7.90298*(-1.0*TS/X)+5.02808*LOG10(TS/X)-1.3816E
00117     26*            1-07*(10.0**(11.344*(1.0-X/TS))-1.0)+8.1328E-03*(10.0**(-3.49149*(-1
00117     27*            2.0*TS/X))-1.0))
00120     28*             GO TO 5
00121     29*           4 E=0.0
00122     30*           5 RETURN
00123     31*             END
```

```
END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR R,R                                                    09 NOV 73          21:10:44.768
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12D10010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:44

   FUNCTION R            ENTRY POINT 000044

   STORAGE USED: CODE(1) 000061; DATA(0) 000012; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003    F
    0004    NERR3$

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

    0001    000033 6L        0003 R 000000 F          0000    000004 INJP$     0000 R 000000 R


00101      1*            FUNCTION R(S,P,X)
00101      2*       C
00101      3*       C*************************************************************************
00101      4*       C
00101      5*       C THIS ROUTINE CALCULATES THE MIXING RATIO (GM OF H2O)/(KG OF DRY AIR)
00101      6*       C      BASED ON X WHICH IS TEMPERATURE IN DEG KELVIN
00101      7*       C R(S,P,X) =0/00 (IE PARTS PER THOUSAND)
00101      8*       C S IS VAPOR PRESSURE OF WATER
00101      9*       C P IS TOTAL ATMOSPHERIC PRESSURE IN MB
00101     10*       C
00101     11*       C*************************************************************************
00101     12*       C
00103     13*             IF (S) 7,6,7
00106     14*           7 CONTINUE
00107     15*             R=18.016*S*F(P,X)/(28.9664*(P-S*F(P,X)))*1000.0
00107     16*       C R IS IN GM/KG
00110     17*             IF (R.LT.0.0) GO TO 6
00112     18*             RETURN
00113     19*           6 R=0.0
00114     20*             RETURN
00115     21*             END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR F,F                                                    09 NOV 73          21:10:46.118
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12D10010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:46

   FUNCTION F            ENTRY POINT 000120

   STORAGE USED: CODE(1) 000127; DATA(0) 000260; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NERR3$

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

    0001   000005 112G      0001   000024 124G      0001   000022 2L        0001   000104 3L        0001   000041 5L
    0000 R 000000 F         0000 R 000240 FA        0000 R 000242 F1        0000 R 000243 F2        0000 I 000239 I
    0000 I 000237 II        0000   000250 INJPS     0000 I 000235 J         0000 I 000241 JJ        0000 R 000015 PE
    0000 R 000236 T         0000 R 000001 TE        0000 R 000030 U


00101      1*            FUNCTION F(P,X)
00103      2*            DIMENSION TE(12),PE(11),U(12,11)
00104      3*            DATA ((U(I,J),J=1,11),I=1,12) /0.,1.,2.,3.,6.,12.,18.,30.,42.,53.,
00104      4*           165.,1.,1.,2.,3.,6.,11.,17.,27.,38.,49.,60.,1.,1.,2.,3.,6.,11.,16.,
00104      5*           226.,36.,46.,55.,1.,2.,3.,4.,6.,11.,15.,24.,34.,43.,52.,1.,2.,4.,
00104      6*           35.,7.,11.,15.,24.,32.,41.,49.,0.,2.,5.,6.,8.,12.,16.,24.,32.,40.,
00104      7*           447.,4*0.,10.,14.,18.,25.,32.,40.,47.,4*0.,12.,16.,20.,27.,34.,41.,
00104      8*           548.,6*0.,23.,30.,37.,44.,50.,6*0.,26.,34.,41.,48.,54.,7*0.,37.,45.
00104      9*           6,52.,59.,8*0.,48.,56.,64./,TE/-50.,-40.,-30.,-20.,-10.,0.,10.,20.,
00104     10*           730.,40.,50.,60./,PE/5.,10.,30.,50.,100.,200.,300.,500.,700.,900.,
00104     11*           8|100./
00104     12*      C
00104     13*      C*************************************************************************
00104     14*      C
00104     15*      C 'F' IS THE CORRECTION FACTOR FOR THE DEPARTURE OF THE MIXTURE OF AIR
00104     16*      C     AND WATER VAPOR FROM THE IDEAL GAS LAW.
00104     17*      C X IS TEMPERATURE IN DEG KELVIN
00104     18*      C P IS TOTAL ATMOSPHERIC PRESSURE IN MB
00104     19*      C
00104     20*      C*************************************************************************
00104     21*      C
00110     22*            T=X-273.16
00111     23*            DO 1 I=1,12
00114     24*            IF (T.LE.TE(I)) GO TO 2
00116     25*              II=I
00117     26*          1 CONTINUE
00121     27*            FA=1.0
00122     28*            GO TO 3
00123     29*          2 DO   J=1,II
00126     30*            IF (P.LE.PE(J)) GO TO 5
00130     31*            JJ=J
00131     32*          4 CONTINUE
```

```
00132     33*          FA=1.0
00134     34*          GO TO 3
00135     35*        5 I=II
00136     36*          J=JJ
00137     37*          F1=(U(I+1,J)-U(I,J))/10.0*(T-TE(I))+U(I,J)
00140     38*          F2=(U(I+1,J+1)-U(I,J+1))/10.0*(T-TE(I))+U(I,J+1)
00141     39*          FA=(F2-F1)/(PE(J+1)-PE(J))*(P-PE(J))+F1
00142     40*          FA=1.0+FA*1.0E-04
00143     41*        3 F=FA
00144     42*          RETURN
00145     43*          END

        END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR XK,XK                                                    09 NOV 73          21:10:47.744
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:47

   FUNCTION XK          ENTRY POINT 000107

   STORAGE USED: CODE(1) 000132; DATA(0) 000014; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   XKK     000025

   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   XK3
    0005   XK2
    0006   XK1
    0007   NERR35

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

    0001   000061 200L      0001   000071 300L      0000   000005 INJPS     0003 R 000012 T          0003 R 000000 W
    0000 R 000000 XK        0006 R 000000 XK1       0005 R 000000 XK2       0004 R 000000 XK3        0003 R 000024 Y2



00101      1*            FUNCTION XK(X,Y)
00101      2*      C     THIS FUNCTION IS THE REAL PART OF THE COMPLEX PROBABILITY FUNCTION
00101      3*      C     OR THE VOIGT  SPECTRUM LINE PROFILE
00103      4*            COMMON /XKK/ W(10),T(10),Y2
00104      5*            DATA W/4.62243670E-1,2.86675505E-1,1.09017206E-1,2.48105209E-2,
00104      6*           1  3.24377334E-3,2.28338636E-4,7.80255648E-6,1.08606937E-7,
00104      7*           2  4.39934099E-10,2.22939365E-13/
00104      8*           3  ,T/0.24534070E0,0.73747372E0,1.23407622E0,1.73853771E0,2.25497400E0,
00104      9*           4  2.78880606E0,3.34785457E0,3.94476404E0,4.60368245E0,5.38748089/
00107     10*            Y2=Y**2
00110     11*            IF(Y.LT.1.0.AND.X.LT.4.0.OR.Y.LT.1.8*(X+1.0)) GO TO 300
00112     12*            IF(Y.LT.2.5.AND.X.LT.4.0) GO TO 200
00114     13*        100 XK=XK3(X,Y)
00115     14*            RETURN
00116     15*        200 XK=XK2(X,Y)
00117     16*            RETURN
00120     17*        300 XK=XK1(X,Y)
00121     18*            RETURN
00122     19*            END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR XK1,XK1                                                    09 NOV 73          21:10:49.267
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:49

   FUNCTION XK1          ENTRY POINT 000261

   STORAGE USED: CODE(1) 000312; DATA(0) 000176; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003    EXP
    0004    COS
    0005    NERR3$

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

    0001    000112 1000L      0001    000161 1200L      0001    000056 1246       0001    000177 1476       0001    000034 2L
    0001    000240 2000L      0001    000242 2500L      0001    000035 5L         0000 D 000113 BN          0000 D 000107 BN01
    0000 D 000111 BN02        0000 D 000001 C           0000 D 000105 COEF        0000 R 000132 DN          0000 R 000125 DN01
    0000 R 000126 DN02        0000 D 000117 F           0000 R 000127 FUNCT       0000 R 000133 G           0000 I 000123 I
    0000 I 000124 II          0000   000161 INJP$       0000 R 000130 Q           0000 R 000122 U1          0000 R 000000 XK1
    0000 D 000115 X1          0000 R 000131 YN          0000 R 000121 Y2
```

```
00101      1*            FUNCTION XK1(X,Y)
00103      2*            DOUBLE PRECISION C(34),COEF,BN01,BN02,BN,X1,F
00103      3*      C           NUMMERS CHEBYSHEV COEFFICIENTS C(1)
00104      4*            DATA C/ .19999999997222900,-.18400000000299980D+1,.1558399999965025
00104      5*           1D0,
00104      6*           1 -.12166400000439880D+0,.8770815999403910D0,-.0585141248086907D0,
00104      7*           2  .0362157301623914D0,-.0208497654398036D0,.0111960116346270D0,
00104      8*           4  -.5623189616710900D-2,.2648763417226500-2,-.1173267075770400-2,
00104      9*           5 .4899519978088D-3,-.1933630801528D-3,.7228774467880-4,
00104     10*           5  -.2565551249790-4,.8662073684D-5,-.2787637971D-5,
00104     11*           7 .8566873627D-6,-.2518433784D-6,.7093602210-7,-.1917322570-7,
00104     12*           8.4980125600-8,-.1244773400-8,.2997777D-9,-.6964500-10,.1562620-10,
00104     13*           9-.3389700-11,.7116D-12,-.1447D-12,.285D-13,-.55D-14,.1D-14,-.2D-15
00104     14*           1   /
00106     15*            F3(T)=EXP(T**2-X**2)
00107     16*            Y2=Y**2
00110     17*            IF((X**2-Y2).GT.70.0)GO TO 2
00112     18*            U1=EXP(-X**2+Y2)*COS(2.*X*Y)
00113     19*            GO TO 5
00114     20*      2     U1=0.0
00115     21*      5     IF(X.GT.5.0) GO TO 1000
00115     22*      C     FROM HERE TO STATEMENT 30 WE CALCULATE DAWSONS FUNCTION
00115     23*      C     CLENSHAWS ALGORITHM AS GIVEN BY HUMMER
00117     24*            BN01=0.000
00120     25*            BN02=0.000
00121     26*            X1=X/5.000
00122     27*            COEF=4.000*x1**2-2.000
00123     28*            DO 20 I=1,34
```

```
00126     29*           II=35-I
00127     30*           BN=COEF*BNO1-BNO2+C(II)
00130     31*           BNO2=BNO1
00131     32*     20    BNO1=BN
00133     33*     30    F=XI*(BN-BNO2)
00134     34*     40    DNO1=1.0-2.0*X*SNGL(F)
00135     35*     1100  DNO2=SNGL(F)
00136     36*           GO TO 1200
00137     37*     1000  DNO1=-(.5/X**2+.75/X**4+1.875/X**6+6.5625/X**8+29.53125/X**10+
00137     38*          1162.4218/X**12+1055.7421/X**14)
00140     39*           DNO2=(1.-DNO1)/(2.*X)
00141     40*     1200  FUNCT=Y*DNO1
00142     41*           IF(Y.LE.1.0E-08)GO TO 2500
00144     42*           Q=1.0
00145     43*           YN=Y
00146     44*           DO 2000 I=2,50
00151     45*           DN=(X*DNO1+DNO2)*(-2.)/FLOAT(I)
00152     46*           DNO2=DNO1
00153     47*           DNO1=DN
00154     48*           IF(MOD(I,2))2000,2000,1500
00157     49*     1500  Q=-Q
00160     50*           YN=YN*Y2
00161     51*           G=DN*YN
00162     52*           FUNCT=FUNCT+Q*G
00163     53*           IF(ABS(G/FUNCT).LE.1.0E-08)GO TO 2500
00165     54*     2000  CONTINUE
00167     55*      2500 XK1=U1-1.12837917*FUNCT
00170     56*           RETURN
00171     57*           END

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR XK2,XK2                                                    09 NOV 73          21:10:51.31
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:51

   FUNCTION XK2          ENTRY POINT 000103


   STORAGE USED: CODE(1) 000113; DATA(0) 000027; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   XKK     000025


   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   ALOG
    0005   ATAN
    0006   NERR3$


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

    0001   000006 I06G      0000 R 000001 G          0000 I 000002 I          0000   000012 INJPS     0000 R 000003 R
    0000 R 000004 S         0003 R 000012 T          0003 R 000000 W          0000 R 000000 XK2       0003 R 000024 Y2



00101      1*            FUNCTION XK2(X,Y)
00103      2*            COMMON /XKK/ W(10),T(10),Y2
00104      3*            G=0.0
00105      4*            DO 100 I=1,10
00110      5*            R=T(I)-X
00111      6*            S=T(I)+X
00112      7*      100   G=G+(4.*T(I)**2-2.1*(R*ATAN(R/Y)+S*ATAN(S/Y)-.5*Y*(ALOG(Y2+R**2)+
00112      8*           1ALOG(Y2+S**2)))*W(I)
00114      9*            XK2=0.31830986*G
00115     10*            RETURN
00116     11*            END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@ FOR X**3,XK3                                                    09 NOV 73          21:10:52.687
UNIVAC 1108 FORTRAN V EXEC II LEVEL 25A  -(EXECB LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 09 NOV 73 AT 21:10:52

   FUNCTION XK3          ENTRY POINT 000042

   STORAGE USED: CODE(1) 000052; DATA(0) 000017; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   XKK     000025

   EXTERNAL REFERENCES (BLOCK, NAME)

    000-   NERR35

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

    0001   000003 I06G      0000 R 000001 G         0000 I 000002 I         0000   000006 INJPS     0003 R 000012 T
    0003 R 000000 W         0000 R 000000 XK3       0003 R 000024 Y2



00101      1*            FUNCTION XK3(X,Y)
00103      2*            COMMON /XKK/ W(10),T(10),Y2
00104      3*            G=0.0
00105      4*            DO 100 I=1,10
00110      5*      100   G=G+(1.0E0/((X-T(I))**2+Y2)+1.0E0/((X+T(I))**2+Y2))*W(I)
00112      6*            XK3=0.318309886*Y*G
00113      7*            RETURN
00114      8*            END

       END OF COMPILATION:        NO  DIAGNOSTICS.
```

ELEMENT TABLE

CP		SYMBOLIC						
CP	CODE	RELOCATABLE	09 NOV 73	21:10:22	0	01436670	14	904
			09 NOV 73	21:10:22	1	01456576	48	1
					0	01451720	14	177
MODATM		SYMBOLIC						
MODATM	CODE	RELOCATABLE	09 NOV 73	21:10:25	0	01456656	14	215
			09 NOV 73	21:10:25	1	01466126	27	1
					0	01464560	14	53
ATMOS3		SYMBOLIC						
ATMOS3	CODE	RELOCATABLE	09 NOV 73	21:10:27	0	01466161	14	108
			09 NOV 73	21:10:27	1	01472173	22	1
					0	01471131	14	39
INPUT		SYMBOLIC						
INPUT	CODE	RELOCATABLE	09 NOV 73	21:10:31	0	01472221	14	140
			09 NOV 73	21:10:31	1	01500265	24	1
					0	01476071	14	87
REFRAC		SYMBOLIC						
REFRAC	CODE	RELOCATABLE	09 NOV 73	21:10:32	0	01500315	14	31
			09 NOV 73	21:10:32	1	01501447	21	1
					0	01501177	14	12
PATH		SYMBOLIC						
PATH	CODE	RELOCATABLE	09 NOV 73	21:10:36	0	01501474	14	168
			09 NOV 73	21:10:36	1	01510116	32	1
					0	01506154	14	71
COSINV		SYMBOLIC						
COSINV	CODE	RELOCATABLE	09 NOV 73	21:10:37	0	01510156	14	5
			09 NOV 73	21:10:37	1	01510354	16	1
					0	01510264	14	4
SININV		SYMBOLIC						
SININV	CODE	RELOCATABLE	09 NOV 73	21:10:38	0	01510374	14	8
			09 NOV 73	21:10:38	1	01510700	16	1
					0	01510554	14	6
Q		SYMBOLIC						
Q	CODE	RELOCATABLE	09 NOV 73	21:10:40	0	01510720	14	8
			09 NOV 73	21:10:40	1	01511170	65	1
					0	01511100	14	4
ALTITU		SYMBOLIC						
ALTITU	CODE	RELOCATABLE	09 NOV 73	21:10:41	0	01511207	14	20
			09 NOV 73	21:10:41	1	01512001	19	1
					0	01511637	14	7
PRES		SYMBOLIC						
PRES	CODE	RELOCATABLE	09 NOV 73	21:10:43	0	01512024	14	19
			09 NOV 73	21:10:43	1	01512544	20	1
					0	01512436	14	5
E		SYMBOLIC						
E	CODE	RELOCATABLE	09 NOV 73	21:10:44	0	01512570	14	31
			09 NOV 73	21:10:44	1	01513722	16	1
					0	01513452	14	12
R		SYMBOLIC						
R	CODE	RELOCATABLE	09 NOV 73	21:10:45	0	01513742	14	21
			09 NOV 73	21:10:45	1	01514534	15	1
					0	01514410	14	6
F		SYMBOLIC						
F	CODE	RELOCATABLE	09 NOV 73	21:10:47	0	015..553	14	43
			09 NOV 73	21:10:47	1	01616641	14	1
					0	01515705	14	34
XK		SYMBOLIC						
XK	CODE	RELOCATABLE	09 NOV 73	21:10:49	0	01516657	14	19
			09 NOV 73	21:10:49	1	01517541	21	1
					0	01517271	14	12
XK1		SYMBOLIC						
XK1	CODE	RELOCATABLE	09 NOV 73	21:10:50	0	01517566	14	57
			09 NOV 73	21:10:50	1	01522070	16	1
					0	01521224	14	30
XK2		SYMBOLIC						
XK2	CODE	RELOCATABLE	09 NOV 73	21:10:52	0	01522110	14	11
			09 NOV 73	21:10:52	1	01522556	20	1
					0	01522342	14	10
XK3		SYMBOLIC						
XK3	CODE	RELOCATABLE	09 NOV 73	21:10:53	0	01522602	14	8
			09 NOV 73	21:10:53	1	01523106	16	1

0 01522762 14 6

ENTRY POINT TABLE

ALTITU	(ALTITU/CODE)	000055	ATMOS3	(ATMOS3/CODE)	000351	COSINV	(COSINV/CODE)	000025
E	(E/CODE)	000130	F	(F/CODE)	000120	INPUT	(INPUT/CODE)	001223
MODATH	(MODATH/CODE)	000701	PATH	(PATH/CODE)	001020	PRES	(PRES/CODE)	000040
Q	(Q/CODE)	000030	R	(R/CODE)	000044	REFRAC	(REFRAC/CODE)	000117
SININV	(SININV/CODE)	000034	XK	(XK/CODE)	000107	XK1	(XK1/CODE)	000261
XK2	(XK2/CODE)	000103	XK3	(XK3/CODE)	000042			

BLOCK TABLE EMPTY

COBOL LIBRARY TABLE EMPTY

PROCEDURE NAME TABLE EMPTY

2. TRA C 21:10:54.572
3. [illegible] C 21:10:56.584
4. TEF C 21:10:57.878
5. TRI C 21:10:57.915

END CUR LCC 1102-0398 L9

09 NOV 73 21:10:58 IDENT T17 ACCOUNT L9727 CARDS IN 1343 CARDS OUT 0 PAGES 47 ELAPSED TIME 0 0 42

-UNIVAC-1108-PROCESSOR-1-EXEC-11-LEVEL-[illegible]-MSC-123-NASA-HOUSTON--*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

APPENDIX B — INPUT CARD FORMAT

AND SAMPLE DATA RUNS

In this appendix, the deck setup (fig. B-1), the format for the input cards, and sample runs of radiosonde test case and laboratory test case data are presented.

SECTION 1 — INPUT CARD FORMAT

Card 1

The following terms are used for card 1.

Y: The term Y denotes a dummy variable. To punch cards for transmitted and emitted radiance, place a P in column 1 (i.e., P is read into Y).

NN: The term NN denotes the number of layers.

GG: The term GG is equivalent to DV, the averaging step within each triangular slit, which should be 0.01 to 0.03 cm^{-1}.

FF: The term FF is equivalent to DELV, which is the increment of printout; the ratio DELV/DV must be an integer, usually A > DELV > A/2.

11: The term 11 is equivalent to ν_1, which is the wave number at the beginning of the test interval expressed as 1 cm^{-1}.

22: The term 22 is equivalent to ν_2, which is the wave number at the end of the test interval expressed as 1 cm^{-1}.

AA: The term AA is equivalent to A, which is one-half the base of the triangle representing the response function of the instrument expressed as 1 cm^{-1}.

BB: The term BB is equivalent to BOUND, which is the distance from a line at which the wings must be considered.

OO: The term OO is equivalent to temperature T_0, which is 296.0 K.

V: To use Voigt broadening in place of Lorentz broadening, put a V in column 79.

W: To print out weighting functions and emitted radiance (intensity for all LL layers), put a W in column 80.

Card 2

The following terms are used for card 2.

ZZ: The term ZZ denotes the altitude of the satellite or aircraft in kilometers.

LL: The term LL denotes the latitude of the satellite in degrees. (North is positive.)

SS: The first term SS denotes the longitude of the satellite in degrees. (West is positive.)

HH: The term HH denotes the altitude of the target in kilometers.

MM: The term MM denotes the latitude of the target in degrees. (North is positive.)

QQ: The term QQ denotes the longitude of the target in degrees. (West is positive.)

SS: The second term SS denotes the kinetic temperature of the target in kelvin.

EE: The term EE denotes the emissivity of the target for the range ν_1 to ν_2.

Card 3

For card 3, the term XX is equivalent to the header comment card for radiosonde data.

The Number 4 Type Card

The number 4 type card can be read in either coded or uncoded form. An example of coded radiosonde data as received from the National Weather Service is shown in tables B-I and B-II. In this case, the input data are coded pressure (millibars), coded temperature (degrees Celsius), and coded dewpoint depression (degrees Celsius). An alternate input can be used by placing a blank card ahead of the first of the set of atmosphere cards (table B-III), which are of the form E9.3 (height in meters), E12.6 (pressure in millibars), F7.2 (temperature in kelvin), and F3.0 (percent relative humidity). In either case, a negative pressure is used to exit this mode. There can be as many as 99 number 4 type cards. The following terms are used for the number 4 type card.

PPP: The term PPP denotes pressure in millibars; however, for any of the first four radiosonde cards, if PPP is less than 100, 1000 is added to PPP (e.g., 016 = 1016 millibars).

TTT: The term TTT denotes temperature in degrees Celsius times 10. The value is positive if the last digit is even, and the value is negative if the last digit is odd (e.g., 321 = -32.1° C).

DD: The term DD denotes the difference between the ambient temperature and the dewpoint temperature. For values from 00 to 50, multiply by 0.1 to obtain temperature in degrees Celsius. Values from 51 to 55 are not used. (If they are used, the message "invalid data input" is written.) For values from 56 to 99, subtract 50 to obtain temperature in degrees Celsius. For example: 02 = 0.2° C, 56 = 6.0° C, 60 = 10.0° C.

The Number 5 Type Card

The number 5 type card is a negative number in the first four columns.

The Number 6 Type Card

The number 6 type card is a repeat of card 1.

The Number 7 Type Card

The following terms are used for the number 7 type card.

33: The term 33 denotes the mole fraction of carbon dioxide for the first label.

44: The term 44 denotes the mole fraction of ozone for the first label.

55: The term 55 denotes the mole fraction of nitrous oxide for the first label.

66: The term 66 denotes the mole fraction of carbon monoxide for the first label.

77: The term 77 denotes the mole fraction of methane for the first label.

The quantity of number 7 type cards is NN, where $NN \leq 30$.

The Number 8 Type Card

For the number 8 type card, use as many cards of the type "card 1" as desired for different frequency intervals having the same atmospheric profile.

Sample Coding Form

The sample coding form shown in table B-IV is presented to illustrate application of previous instructions.

TABLE B-I.- LAKE CHARLES, LOUISIANA, RADIOSONDE AND CODE[a]

May 10 1969 0000Z

TT 60004 72240 99016 23266 01008 00146 21467 00512 85517 08463 35017 70118
04273 32033 50577 13571 29543 40743 26569 27572 30946 38567 27590 20217 519//
15400 589// 10650 673// 88999
66280 27595Ø

VV 6000/ 72240 00016 23266 11970 18068 22831 06662 33813 11075 44609 02171
55400 26569 66290 40166 77243 461// 88227 451// 99193 535// 11100 673// 31313
25069 451// /////Ø

QQ 60000 72240 90012 01008 35512 35007 90346 36009 36013 34524 90789 33530
34031 33031 91246 31535 32539 31534 9205/ 29044 27582 9302/ 27588 27595Ø

2nd Trans

WW 6000/ 72240 70866 661// 50071 633// 30391 551// 20653 497// 10115 411// 07358
403//
88950 681// /////
77999Ø

YY 6000/ 72240 11950 681// 22920 657// 33600 665// 44230 511// 55100 411//
66070 403//Ø

LL 60000 72240 XMTDØ

---

[a]The significant level code is VV. For VV, the code is iippp TTTdd where
ii = identifier of a set of data; the two characters are identical (e.g., 00, 11, 22, 33).
ppp = pressure in mbar except the fourth character from the right is suppressed (e.g., 970 = 970 mbar, and 016 = 1016 mbar).
TTT = temperature in °C, positive if last digit is even and negative if last digit is odd.
dd = dewpoint temperature depression. If 00 to 49, multiply by 0.1 for °C; 50 = 5.0° C; 51 to 55, not used; 56 to 99, subtract 50 for °C (e.g., 02 = 0.2, 56 = 6.0, 60 = 10).
Slashes indicate no data and code 99 should be used.

TABLE B-II.- INPUT DATA CARDS FOR LAKE CHARLES, LOUISIANA,

RADIOSONDE DATA

STATEMENT NUMBER		CONTINUATION	FOI
LOCATION 1 2 3 4 5	6 7	OPERATION 8 9 10 11 12 13 14 15	VARIABLE FIELD 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
0,1,6,	2,3	2,6,6,	
9,7,0,	1,8	0,6,8,	
8,3,1,	0,6	6,6,2,	
8,1,3,	1,1	0,7,5,	
6,0,9,	0,2	1,7,1,	
4,0,0,	2,6	5,6,9,	
2,9,0,	4,0	1,6,6,	
2,4,3,	4,6	1,9,9,	
2,2,7,	4,5	1,9,9,	
1,9,3,	5,3	5,9,9,	
1,0,0,	6,7	3,9,9,	
-1.,			

TABLE B-III.- INPUT DATA CARD FORMAT FOR 15° N ANNUAL

MODEL ATMOSPHERE

STATEMENT NUMBER		CONTINUATION	FORTRAN ST
LOCATION 1 2 3 4 5	6 7	OPERATION 8 9 10 11 12 13 14 15	VARIABLE FIELD 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
			← Blank
0 .0 0 0	E +	0 0 1 . 0 1 3 2 5 0	E + 0 3 2 9 9 . 6 5 7 5 Card
1 .0 0 0	E +	0 3 9 . 0 3 9 0 0 0	E + 0 2 2 9 3 . 6 5 7 5
2 .0 0 0	E +	0 3 8 . 0 4 3 0 0 0	E + 0 2 2 8 7 . 6 5 7 5
2 .2 5 0	E +	0 3 7 . 8 0 9 0 0 0	E + 0 2 2 8 6 . 1 5 7 5
2 .5 0 0	E +	0 3 7 . 5 8 0 0 0 0	E + 0 2 2 8 6 . 9 5 3 5
4 .0 0 0	E +	0 3 6 . 3 2 3 0 0 0	E + 0 2 2 7 6 . 9 0 3 5
6 .0 0 0	E +	0 3 4 . 9 1 1 0 0 0	E + 0 2 2 6 3 . 5 0 3 5
8 .0 0 0	E +	0 3 3 . 7 6 4 0 0 0	E + 0 2 2 5 0 . 1 0 3 0
1 .0 0 0	E +	0 4 2 . 8 4 3 0 0 0	E + 0 2 2 3 6 . 7 0 2 0
		- . 1 0 0 0 0 0	E - 0 5

TABLE B-IV.- SAMPLE CODING FORM

Statement number: Location (1–5)	6	Continuation (7)	FORTRAN statement: Operation (8–15)	Variable field (16–36)	Comments (37–72)	Sequence (77–80)
YNNNN	N	N	NNNGGGGG	GGGGGFFFFFFFFF111111	11112222222222AAAAAAAAAABBBBBBBBBB00	[illegible]
ZZZZZ	Z	Z	ZZZLLLLL	LLLLLSSSSSSSSSHHHHHH	HHHHMMMMMMMMQQQQQQQQQQSSSSSEEEEE	
XXXXX	X	X	XXXXXXXX	XXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXX	
PIP	T	T	TDD			
FFF	T	T	TDD			
=1						
same card	as		card number 1			
33333	3	3	33344444	44444555555555566666	6667777777777	
33333	3	3	33344444	444445555555555666666	66667777777777	
YNNNN	N	N	NNNGGGGG	GGGGGFFFFFFFFF111111	11112222222222AAAAAAAAAABBBBBBBBBB00	[illegible]

ORIGINAL PAGE IS OF POOR QUALITY

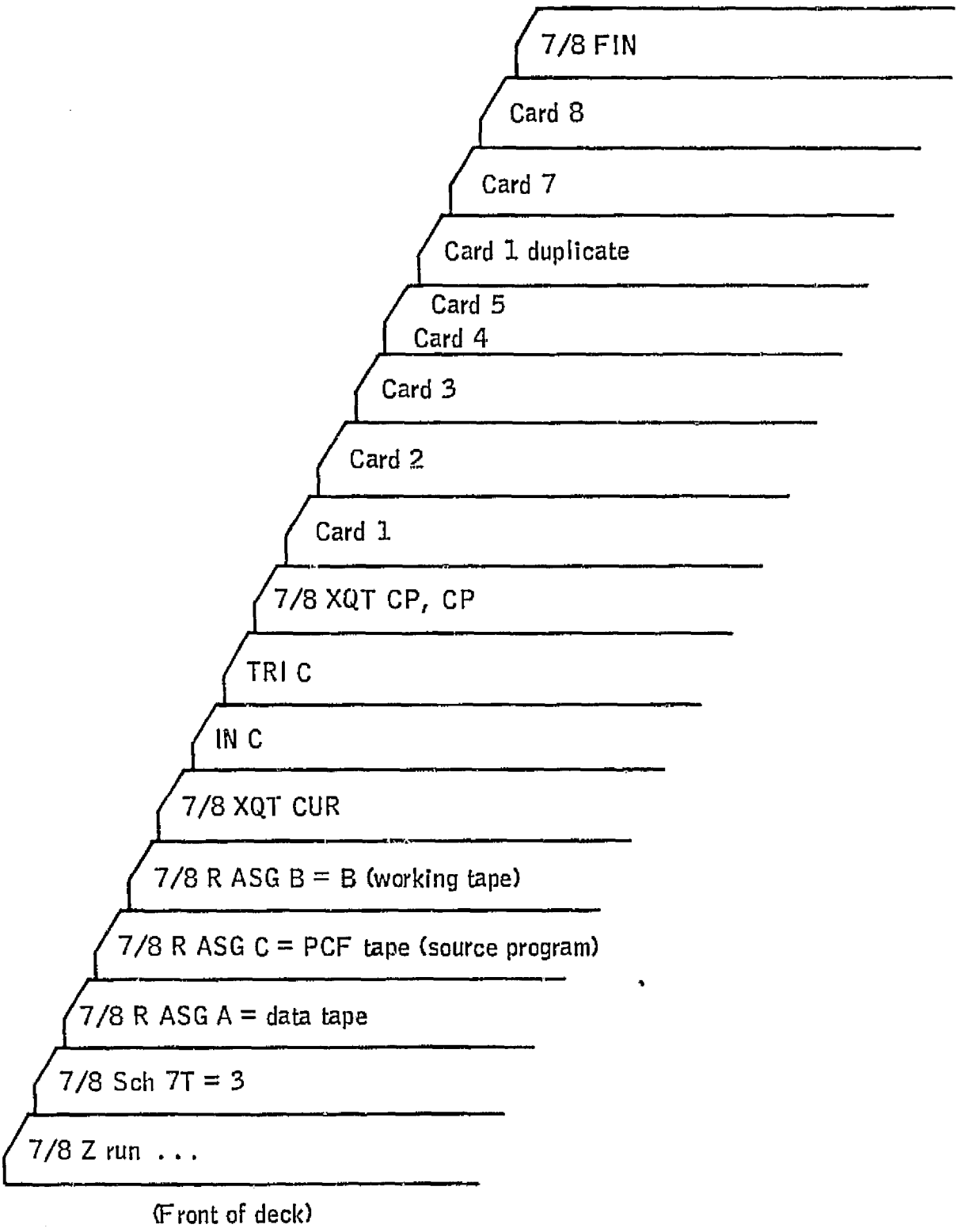


Figure B-1.- Deck setup for atmospheric transmission computer program CP.

SECTION 2 — SAMPLE RUN FOR LABORATORY DATA

This section of appendix B contains a sample run of laboratory data of 5160 to 5199.9 cm^{-1} for 0.1 centimeter of water at a temperature of 287.7 K. The laboratory comparison format is used.

```
Z RUN 002851,TF3,T17,16518,D006,C,10,2                                  PITTS
N MSG      FILE REQ.   TAPE 3   FH432 0    FSTRN 00
 PLT
 ASG C#A10743
 ASG A#A12389
 ASG B#B
 XQT CUR
 TRW C
 IN C
 TRI C
 TOC
 XQT CP,CP
          10 .03        0.3        5160.      5200.      0.5        12.0        296.0
0.0          .0         0.0        0.0        0.0        0.0        298.5 1.0
8037.55
TEST OF WATER VAPOR ABS 5160 CM
 0.00E&001.013250E&03287.70 100
&4.00E&021.013250E&03287.70 100
          -.160000E-05
          10 .03        0.3        5160.      5200.      0.5        12.0        296.0
```

Blank card →

10 blank cards indicating that carbon dioxide, methane, ozone, and nitrous oxide were not considered.

```
EOF
FIN
```

C-2

EARTH RESOURCES MODEL ATMOSPHERE, 1969

MODEL LOCATION TEST OF WATER VAPOR ABS 5160 CM, .1 prec cm H_2O, T = 287.7 K

THE SIGNIFICANT LEVELS FOR THE MODEL ATMOSPHERE ARE AS FOLLOWS

ALT (M)	PRES (MB)	TEMP (K)	TD (K)	TV (K)	HZERO (M)	
0.000	1.013+03	287.70	287.70	289.49		CONDENSATION
4.000+02	9.665+02	287.70	267.70	289.58		CONDENSATION

THE PATH LENGTH OF EACH LAYER IS (CM)

8.03755+02	8.03755+02	8.03755+02	8.03755+02	8.03755+02
8.03755+02	8.03755+02	8.03755+02	8.03755+02	8.03755+02

```
LAYERS= 10 DV=    .030 DELV=    .3000 V1= 5160.0000 V2= 5200.0000 A=    .5000 BOUND=   12.0000 TEMPO= 296.0000

  SATELLITE ALTITUDE=   0.0000      SATELLITE LATITUDE=     .0000   SATELLITE LONGITUDE=     .0000

  TARGET ALTITUDE=   0.0000      TARGET LATITUDE=     .0000   TARGET LONGITUDE=     .0000

  SURFACE TEMP=   298.500   EMISS=1.00000000

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
  1.0132500+03  2.8770000+02  1.2193922-03  3.4107557+02  9.8066500+02
 2.8949495+02  2.8786800+01  1.7872082-05  2.8769999+02  1.0371250+01
 1.0371256+01  9.9999942+01  1.0219247+01  1.0219253+01  8.4732987+00
 8.4732987+00  1.0002730+00  1.0002732+00  1.6545387+01  1.6545396+01
 0.0000000     0.0000000     0.0000000     0.0000000     0.0000000
 2.8786800+01  2.5511258+19  0.0000000     0.0000000     0.0000000
 0.0000000     0.0000000     0.0000000     0.0000000     0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      1

  THE FOLLOWING ARE ATM-CM FOR LAYER  1 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000        0.0000        0.0000        0.0000        0.0000

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
  1.0132500+03  2.8770000+02  1.2193922-03  3.4107557+02  9.8066500+02
 2.8949495+02  2.8786800+01  1.7872082-05  2.8769999+02  1.0371250+01
 1.0371256+01  9.9999942+01  1.0219247+01  1.0219253+01  8.4732987+00
 8.4732987+00  1.0002730+00  1.0002732+00  1.6545387+01  1.6545396+01
 0.0000000     0.0000000     0.0000000     0.0000000     0.0000000
 2.8786800+01  2.5511258+19  0.0000000     0.0000000     0.0000000
 0.0000000     0.0000000     0.0000000     0.0000000     0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      2

  THE FOLLOWING ARE ATM-CM FOR LAYER  2 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000        0.0000        0.0000        0.0000        0.0000

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
  1.0132500+03  2.8770000+02  1.2193922-03  3.4107557+02  9.8066500+02
 2.8949495+02  2.8786800+01  1.7872082-05  2.8769999+02  1.0371250+01
 1.0371256+01  9.9999942+01  1.0219247+01  1.0219253+01  8.4732987+00
 8.4732987+00  1.0002730+00  1.0002732+00  1.6545387+01  1.6545396+01
 0.0000000     0.0000000     0.0000000     0.0000000     0.0000000
 2.8786800+01  2.5511258+19  0.0000000     0.0000000     0.0000000
 0.0000000     0.0000000     0.0000000     0.0000000     0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      3

  THE FOLLOWING ARE ATM-CM FOR LAYER  3 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000        0.0000        0.0000        0.0000        0.0000

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
  1.0132500+03  2.8770000+02  1.2193922-03  3.4107557+02  9.8066500+02
 2.8949495+02  2.8786800+01  1.7872082-05  2.8769999+02  1.0371250+01
```

ORIGINAL PAGE IS
OF POOR QUALITY

```
 1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
 8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
 2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      4

  THE FOLLOWING ARE ATM-CM FOR LAYER  4 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000         0.0000         0.0000         0.0000         0.0000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
 1.0132500+03   2.8770000+02   1.2193922-03   3.4107557+02   9.8066500+02
 2.8949495+02   2.8786800+01   1.7872082-05   2.8769999+02   1.0371250+01
 1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
 8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
 2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      5

  THE FOLLOWING ARE ATM-CM FOR LAYER  5 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000         0.0000         0.0000         0.0000         0.0000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
 1.0132500+03   2.8770000+02   1.2193922-03   3.4107557+02   9.8066500+02
 2.8949495+02   2.8786800+01   1.7872082-05   2.8769999+02   1.0371250+01
 1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
 8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
 2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      6

  THE FOLLOWING ARE ATM-CM FOR LAYER  6 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000         0.0000         0.0000         0.0000         0.0000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
 1.0132500+03   2.8770000+02   1.2193922-03   3.4107557+02   9.8066500+02
 2.8949495+02   2.8786800+01   1.7872082-05   2.8769999+02   1.0371250+01
 1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
 8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
 2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  1.0015808-02 PREC CM OF WATER IN LAYER      7

  THE FOLLOWING ARE ATM-CM FOR LAYER  7 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   0.0000         0.0000         0.0000         0.0000         0.0000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
```

```
 1.0132500+03   2.8770000+02   1.2193922-03   3.4107557+02   9.8066500+02
2.8949495+02   2.8786800+01   1.7872082-05   2.8769999+02   1.0371250+01
1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 1.0015808-02 PREC CM OF WATER IN LAYER      8

 THE FOLLOWING ARE ATM-CM FOR LAYER  8 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
  0.0000         0.0000         0.0000         0.0000         0.0000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
 1.0132500+03   2.8770000+02   1.2193922-03   3.4107557+02   9.8066500+02
2.8949495+02   2.8786800+01   1.7872082-05   2.8769999+02   1.0371250+01
1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 1.0015808-02 PREC CM OF WATER IN LAYER      9

 THE FOLLOWING ARE ATM-CM FOR LAYER  9 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
  0.0000         0.0000         0.0000         0.0000         0.0000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
 1.0132500+03   2.8770000+02   1.2193922-03   3.4107557+02   9.8066500+02
2.8949495+02   2.8786800+01   1.7872082-05   2.8769999+02   1.0371250+01
1.0371256+01   9.9999942+01   1.0219247+01   1.0219253+01   8.4732987+00
8.4732987+00   1.0002730+00   1.0002732+00   1.6545387+01   1.6545396+01
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
2.8786800+01   2.5511258+19   0.0000000      0.0000000      0.0000000
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 1.0015808-02 PREC CM OF WATER IN LAYER     10

 THE FOLLOWING ARE ATM-CM FOR LAYER 10 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
  0.0000         0.0000         0.0000         0.0000         0.0000

 LEVEL  1     P =      .10000+01     TEMP = 287.70
 WATERS =       .3345+21

 LEVEL  2     P =      .10000+01     TEMP = 287.70
 WATERS =       .3345+21

 LEVEL  3     P =      .10000+01     TEMP = 287.70
 WATERS =       .3345+21

 LEVEL  4     P =      .10000+01     TEMP = 287.70
 WATERS =       .3345+21

 LEVEL  5     P =      .10000+01     TEMP = 287.70
 WATERS =       .3345+21
```

LEVEL 6 P = .10000+01 TEMP = 287.70
WATERS = .3345+21

LEVEL 7 P = .10000+01 TEMP = 287.70
WATERS = .3345+21

LEVEL 8 P = .10000+01 TEMP = 287.70
WATERS = .3345+21

LEVEL 9 P = .10000+01 TEMP = 287.70
WATERS = .3345+21

LEVEL 10 P = .10000+01 TEMP = 287.70
WATERS = .3345+21

FREQ WAVE NO.	TRANS	ABS	UPWELLING RADIANCE	WAVELENGTH MICRONS
5160.00	.12134	.87866	8.346-10	1.93798
5160.30	.40550	.59450	2.786-09	1.93787
5160.60	.67246	.32754	4.615-09	1.93776
5160.90	.78491	.21509	5.380-09	1.93765
5161.20	.76685	.23315	5.250-09	1.93753
5161.50	.62413	.37587	4.268-09	1.93742
5161.80	.62173	.37827	4.247-09	1.93731
5162.10	.76354	.23646	5.209-09	1.93720
5162.40	.78609	.21391	5.357-09	1.93708
5162.70	.69911	.30089	4.759-09	1.93697
5163.00	.48740	.51260	3.314-09	1.93686
5163.30	.19313	.80687	1.312-09	1.93675
5163.60	.03497	.96503	2.372-10	1.93663
5163.90	.12912	.87088	8.748-10	1.93652
5164.20	.39766	.60232	2.691-09	1.93641
5164.50	.58111	.41889	3.928-09	1.93630
5164.80	.68669	.31331	4.637-09	1.93618
5165.10	.76636	.23364	5.169-09	1.93607
5165.40	.70462	.29538	4.747-09	1.93596
5165.70	.70203	.29797	4.724-09	1.93585
5166.00	.61436	.38564	4.129-09	1.93573
5166.30	.57796	.42204	3.880-09	1.93562
5166.60	.80155	.19845	5.375-09	1.93551
5166.90	.90962	.09038	6.092-09	1.93540
5167.20	.90820	.09180	6.076-09	1.93528
5167.50	.90286	.09714	6.033-09	1.93517
5167.80	.91290	.08710	6.093-09	1.93506
5168.10	.90577	.09423	6.039-09	1.93495
5168.40	.86356	.13644	5.751-09	1.93483
5168.70	.71382	.28618	4.748-09	1.93472
5169.00	.48202	.51798	3.202-09	1.93461
5169.30	.49228	.50772	3.267-09	1.93450
5169.60	.57462	.42538	3.809-09	1.93439
5169.90	.39558	.60442	2.619-09	1.93427
5170.20	.13159	.86841	8.703-10	1.93416
5170.50	.02619	.97381	1.730-10	1.93405
5170.80	.13232	.86768	8.730-10	1.93394
5171.10	.38811	.61189	2.558-09	1.93382
5171.40	.64025	.35975	4.215-09	1.93371
5171.70	.78064	.21936	5.133-09	1.93360

5172.00	.83865	.16135	5.508-09	1.93349
5172.30	.85040	.14960	5.579-09	1.93338
5172.60	.82934	.17066	5.434-09	1.93326
5172.90	.75836	.24164	4.963-09	1.93315
5173.20	.49261	.50739	3.220-09	1.93304
5173.50	.23614	.76386	1.542-09	1.93293
5173.80	.35185	.64815	2.295-09	1.93282
5174.10	.57653	.42347	3.756-09	1.93270
5174.40	.76769	.23231	4.995-09	1.93259
5174.70	.86338	.13662	5.617-09	1.93248
5175.00	.86514	.13486	5.616-09	1.93237
5175.30	.81832	.18168	5.306-09	1.93226
5175.60	.66212	.33788	4.289-09	1.93214
5175.90	.33976	.66024	2.198-09	1.93203
5176.20	.14055	.85945	9.082-10	1.93192
5176.50	.34354	.65646	2.217-09	1.93181
5176.80	.56845	.43155	3.666-09	1.93170
5177.10	.46695	.53305	3.007-09	1.93158
5177.40	.40481	.59519	2.604-09	1.93147
5177.70	.50676	.49324	3.256-09	1.93136
5178.00	.35286	.64714	2.269-09	1.93125
5178.30	.10990	.89010	7.044-10	1.93114
5178.60	.17500	.82500	1.120-09	1.93102
5178.90	.40558	.59442	2.594-09	1.93091
5179.20	.50845	.49155	3.248-09	1.93080
5179.50	.60198	.39802	3.841-09	1.93069
5179.80	.58615	.41385	3.736-09	1.93058
5180.10	.35097	.64903	2.234-09	1.93046
5180.40	.09725	.90275	6.183-10	1.93035
5180.70	.07740	.92260	4.916-10	1.93024
5181.00	.31681	.68319	2.010-09	1.93013
5181.30	.59432	.40568	3.766-09	1.93002
5181.60	.74493	.25507	4.715-09	1.92991
5181.90	.80395	.19605	5.082-09	1.92979
5182.20	.79311	.20689	5.008-09	1.92968
5182.50	.72277	.27723	4.559-09	1.92957
5182.80	.73247	.26753	4.614-09	1.92946
5183.10	.77408	.22592	4.871-09	1.92935
5183.40	.73617	.26383	4.627-09	1.92924
5183.70	.64959	.35041	4.078-09	1.92912
5184.00	.48905	.51095	3.067-09	1.92901
5184.30	.25178	.74822	1.577-09	1.92890
5184.60	.06108	.93892	3.821-10	1.92879
5184.90	.00288	.99712	1.797-11	1.92868
5185.20	.00489	.99511	3.054-11	1.92857
5185.50	.08271	.91729	5.156-10	1.92845
5185.80	.28244	.71756	1.759-09	1.92834
5186.10	.48235	.51765	3.009-09	1.92823
5186.40	.63298	.36702	3.933-09	1.92812
5186.70	.71822	.28178	4.457-09	1.92801
5187.00	.72221	.27779	4.477-09	1.92790
5187.30	.58671	.41329	3.633-09	1.92779
5187.60	.36717	.63283	2.271-09	1.92767
5187.90	.38152	.61848	2.357-09	1.92756
5188.20	.37614	.62386	2.321-09	1.92745
5188.50	.15466	.84534	9.531-10	1.92734
5188.80	.02925	.97075	1.800-10	1.92723
5189.10	.01082	.98918	6.651-11	1.92712

5189.40	.04060	.95940	2.494-10	1.92701
5189.70	.22286	.77714	1.367-09	1.92689
5190.00	.49220	.50780	3.016-09	1.92678
5190.30	.67434	.32566	4.127-09	1.92667
5190.60	.73305	.26695	4.481-09	1.92656
5190.90	.75766	.24234	4.626-09	1.92645
5191.20	.80115	.19885	4.886-09	1.92634
5191.50	.70671	.29329	4.305-09	1.92623
5191.80	.39599	.60401	2.410-09	1.92611
5192.10	.35925	.64075	2.183-09	1.92600
5192.40	.68695	.31305	4.170-09	1.92589
5192.70	.86006	.13994	5.215-09	1.92578
5193.00	.88668	.11332	5.370-09	1.92567
5193.30	.88801	.11199	5.372-09	1.92556
5193.60	.88732	.11268	5.362-09	1.92545
5193.90	.88032	.11968	5.313-09	1.92534
5194.20	.85902	.14098	5.179-09	1.92522
5194.50	.81796	.18204	4.926-09	1.92511
5194.80	.73543	.26457	4.424-09	1.92500
5195.10	.56422	.43578	3.390-09	1.92489
5195.40	.34997	.65003	2.100-09	1.92478
5195.70	.32098	.67902	1.924-09	1.92467
5196.00	.29772	.70228	1.782-09	1.92456
5196.30	.12643	.87357	7.560-10	1.92445
5196.60	.01776	.98224	1.061-10	1.92434
5196.90	.00232	.99768	1.385-11	1.92422
5197.20	.00477	.99523	2.842-11	1.92411
5197.50	.00405	.99595	2.410-11	1.92400
5197.80	.05299	.94701	3.151-10	1.92389
5198.10	.23346	.76654	1.38[illegible]-09	1.92378
5198.40	.45983	.54017	2.728-09	1.92367
5198.70	.61839	.38161	3.664-09	1.92356
5199.00	.71821	.28179	4.250-09	1.92345
5199.30	.77574	.22426	4.586-09	1.92334
5199.60	.80810	.19190	4.771-09	1.92323
5199.90	.82367	.17633	4.858-09	1.92311

BETWEEN 5160.00 AND 5200.00 THE ABSORPTANCE IS .192+02

SECTION 3 — SAMPLE RUN FOR RADIOSONDE TEST CASE

This section of appendix B contains a sample run of radiosonde data from Salem, Illinois, for June 10, 1973. Three frequency intervals are calculated for atmospheric transmission and emission. For example, to calculate the total upward radiance at 1160 cm^{-1} received at a spacecraft for a ground target at a temperature of 298 K, the upwelling radiance of 7.109×10^{-4} should be added to "INT UP TOTAL" for layer 10 (1.935×10^{-4}).

```
Z RUN 002851,TF3,T17.1651C,D006,C,25,1                          PITTS
N MSG      FILE REQ.   TAPE 3   FH432 0    FSTRN 00
 PLT
 ASG  A#A08055
 ASG  C#A10743
 ASG  B#B
 XQT  CUR
 TRW  C
 IN   C
 TRI  C
 TDC
 XQT  CP,CP
      10 .05       2.0        1150.      1300.      10.        12.0       296.0     W
20.0       29.0        90.0        .0000       29.0       90.0      298.   1.0
SALEM,ILLINOIS 6/10/73
 998 19214
 988 23850
 969 25058
 874 17857
 850 17265
 798 14880
 762 11670
 752 10862
 700 08480
 640 03669
 620 03480
 568 00380
 463 12380
 300 37380
 219 54500
 174 65300
 162 65500
 109 62700
  -1
      10 .05       2.0        1150.      1300.      10.        12.0       296.0     W
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
  3.14-04                                          2.0-06
      10 .05       2.0         550.       700.       10.        12.0       296.0     W
      10 .05       2.0         700.       850.       10.        12.0       296.0     W
EOF
FIN
```

EARTH RESOURCES MODEL ATMOSPHERE,1969

MODEL LOCATION SALEM,ILLINOIS 6/10/73

THE SIGNIFICANT LEVELS FOR THE MODEL ATMOSPHERE ARE AS FOLLOWS

ALT (M)	PRES (MB)	TEMP (K)	TD (K)	TV (K)	HZERO (M)
0.000	9.980+02	292.36	290.96	294.69	
8.756+01	9.880+02	296.96	291.96	299.46	
2.581+02	9.690+02	298.16	290.16	300.49	
1.154+03	8.740+02	290.96	283.96	292.60	
1.392+03	8.500+02	290.36	275.36	291.29	
1.927+03	7.980+02	287.96	257.94	288.22	
2.314+03	7.620+02	284.76	264.76	286.22	
2.425+03	7.520+02	283.96	271.96	284.76	
3.019+03	7.000+02	281.56	251.56	281.73	
3.752+03	6.400+02	276.76	257.76	277.06	
4.009+03	6.200+02	276.56	246.56	276.68	
4.713+03	5.680+02	272.86	242.86	272.95	
6.310+03	4.630+02	260.86	230.86	260.89	
9.462+03	3.000+02	235.86	205.86	235.86	
1.155+04	2.190+02	218.66	.00	218.66	
1.299+04	1.740+02	207.86	.00	207.86	
1.343+04	1.620+02	207.66	.00	207.66	
1.585+04	1.090+02	210.46	.00	210.46	

FOR THIS MODEL,THE LEVELS ARE CHOSEN AS FOLLOWS

ALTITUDE KM	PRESSURE MB	TEMPERATURE DEG K
0.0000	9.9800+02	2.9236+02
8.6599-01	9.0373+02	2.9327+02
1.8070+00	8.0946+02	2.8850+02
2.8426+00	7.1519+02	2.8228+02
3.9994+00	6.2092+02	2.7657+02
5.3168+00	5.2665+02	2.6836+02
6.8359+00	4.3238+02	2.5675+02
8.6370+00	3.3810+02	2.4250+02
1.0877+01	2.4383+02	2.2438+02
1.3942+01	1.4956+02	2.0822+02
2.0000+01	5.5293+01	2.1665+02

THE PATH LENGTH OF EACH LAYER IS (CM)

8.65991+04	9.41051+04	1.03559+05	1.15672+05	1.31747+05
1.51910+05	1.80103+05	2.24001+05	3.06467+05	6.05836+05

```
LAYERS= 10 DV=    .050 DELV=    2.0000 V1= 1150.0000 V2= 1300.0000 A=   10.0000 BOUND=   12.0000 TEMPO=  296.0000

   SATELLITE ALTITUDE=   2.0000+01   SATELLITE LATITUDE=   29.0000   SATELLITE LONGITUDE=   90.0000

   TARGET ALTITUDE=   0.0000      TARGET LATITUDE=   29.0000   TARGET LONGITUDE=   90.0000

   SURFACE TEMP=   298.000   EMISS=1.00000000

 THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
   9.5086459+02   2.9682742+02   1.1079745-03   3.4662387+02   9.8053455+02
   2.9899001+02   2.8756886+01   1.8309502-05   2.8901250+02   1.2056196+01
   1.9822314+01   6.0821335+01   1.1860418+01   1.9351536+01   8.7523764+00
   1.1766945+01   1.0002726+00   1.0002519+00   1.8002373+01   2.9240610+01
   0.0000000      0.0000000      0.0000000      0.0000000     -8.0397946-03
   2.8756886+01   2.3204370+19   0.0000000      0.0000000      0.0000000
   0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

    1.1477531+00 PREC CM OF WATER IN LAYER      1

    THE FOLLOWING ARE ATM-CM FOR LAYER  1 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
     2.3508+01      0.0000         0.0000         0.0000         1.4973-01

 THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
   8.5659386+02   2.9052625+02   1.0232307-03   3.4234557+02   9.8025697+02
   2.9165484+02   2.8854311+01   1.8008233-05   2.7774288+02   6.2350341+00
   1.4792157+01   4.2150945+01   6.1722170+00   1.4519362+01   8.5400709+00
   1.0187760+01   1.0002726+00   1.0002295+00   8.4687738+00   1.9821536+01
   0.0000000      0.0000000      0.0000000      0.0000000     -2.5215943-03
   2.8854311+01   2.1357219+19   0.0000000      0.0000000      0.0000000
   0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

    6.1228293-01 PREC CM OF WATER IN LAYER      2

    THE FOLLOWING ARE ATM-CM FOR LAYER  2 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
     2.3445+01      0.0000         0.0000         0.0000         1.4933-01

 THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
   7.6232314+02   2.8478924+02   9.3107337-04   3.3856465+02   9.7995376+02
   2.8524825+02   2.8919789+01   1.7731186-05   2.6469786+02   2.6557821+00
   1.1403800+01   2.3280571+01   2.6395895+00   1.1236030+01   8.3550606+00
   1.0802654+01   1.0002726+00   1.0002063+00   3.2300547+00   1.3678131+01
   0.0000000      0.0000000      0.0000000      0.0000000     -8.2598234-03
   2.8919789+01   1.9389680+19   0.0000000      0.0000000      0.0000000
   0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

    2.3690345-01 PREC CM OF WATER IN LAYER      3

    THE FOLLOWING ARE ATM-CM FOR LAYER  3 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
     2.3396+01      0.0000         0.0000         0.0000         1.4902-01

 THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
   6.6805241+02   2.7704743+02   8.3335295-04   3.3502770+02   9.7961779+02
   2.7922611+02   2.8991688+01   1.7451237-05   2.5480489+02   1.3510472+00
```

```
 8.7732501+00   1.5362068+01   1.3450932+00   8.6799973+00   8.1832311+00
 1.0058457+01   1.0001726+00   1.0001627+00   1.4436724+00   9.2741803+00
 0.0000000      0.0000000      0.0000000      0.0000000     -6.5497397-03
 2.8941888+01   1.7341514+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  1.2941755-01 PREC CM OF WATER IN LAYER      4

  THE FOLLOWING ARE ATM-CM FOR LAYER  4 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   2.3384+01      0.0000         0.0000         0.0000         1.4895-01


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
   5.7373142+02   2.7325521+02   7.3122342-04   3.5144569+02   9.7921946+02
 2.7337251+02   2.4956514+01   1.7147454-05   2.4326527+02   5.4068482-01
 6.7721194+00   8.2704099+00   5.4626493-01   4.7044727+00   8.0132312+00
 9.4834622+00   1.0002726+00   1.0001556+00   5.1484130-01   6.1835446+00
 0.0000000      0.0000000      0.0000000      0.0000000     -5.2505938-03
 2.8956514+01   1.5208475+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  5.2516323-02 PREC CM OF WATER IN LAYER      5

  THE FOLLOWING ARE ATM-CM FOR LAYER  5 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   2.3383+01      0.0000         0.0000         0.0000         1.4894-01


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
   4.7951096+02   3.6287887+02   6.3539241-04   3.2504409+02   9.7880605+02
 2.6292041+02   2.8961824+01   1.6647830-05   2.3287887+02   2.3890877-01
 3.6612651+00   6.5253064+00   2.3830474-01   3.6395379+00   7.7100972+00
 9.9033390+00   1.0002726+00   1.0001351+00   1.8369566-01   2.7997272+00
 0.0000000      0.0000000      0.0000000      0.0000000     -7.5155742-03
 2.8961824+01   1.3212895+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  2.3564659-02 PREC CM OF WATER IN LAYER      6

  THE FOLLOWING ARE ATM-CM FOR LAYER  6 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   2.3389+01      0.0000         0.0000         0.0000         1.4897-01


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
   3.8524021+02   2.4995908+02   5.3690541-04   3.1694282+02   9.7830079+02
 2.4997789+02   2.8964219+01   1.5989152-05   2.1995907+02   7.0804711-02
 1.5369926+00   4.6067048+00   7.0664276-02   1.5316958+00   7.3343462+00
 9.5619678+00   1.0002726+00   1.0001112+00   4.3766664-02   9.4783030-01
 0.0000000      0.0000000      0.0000000      0.0000000     -7.9308712-03
 2.8964219+01   1.1163948+19   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

  7.2534834-03 PREC CM OF WATER IN LAYER      7

  THE FOLLOWING ARE ATM-CM FOR LAYER  7 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
   2.3399+01      0.0000         0.0000         0.0000         1.4904-01


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
```

```
 2.9096949+02   2.3413190+02   4.3296330-04   3.0673420+02   9.7768764+02
2.3413382+02   2.8966161+01   1.5160689-05   1.8517697+02   5.8068511-04
4.4803401-01   1.2960737-01   5.7974321-04   9.4710702-01   6.8737754+00
9.0605068+00   1.0002726+00   1.0000866+00   2.7121490-04   2.0910842-01
0.0000000      0.0000000      0.0000000      0.0000000     -8.2197334-03
2.8966161+01   9.0020619+18   0.0000000      0.0000000      0.0000000
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 9.1956143-04 PREC CM OF WATER IN LAYER      8

 THE FOLLOWING ARE ATM-CM FOR LAYER  8 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
  2.3412+01     0.0000        0.0000        0.0000        1.4912-01

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
   1.9669876+02   2.1354920+02   3.2070129-04   2.9294028+02   9.7690244+02
2.1354920+02   2.8964400+01   1.4045187-05   0.0000000      0.0000000
6.3136979-02   0.0000000      0.0000000      6.3053527-02   6.2744975+00
8.0550575+00   1.0002726+00   1.0000610+00   0.0000000      1.2939990-02
0.0000000      0.0000000      0.0000000      0.0000000     -7.5232757-03
2.8964400+01   6.6720426+18   0.0000000      0.0000000      0.0000000
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 0.0000000    PREC CM OF WATER IN LAYER      9

 THE FOLLOWING ARE ATM-CM FOR LAYER  9 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
  2.3434+01     0.0000        0.0000        0.0000        1.4926-01

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATM
   1.0239689+02   2.1665000+02   1.6465169-04   2.9506950+02   9.7572798+02
2.1665000+02   2.8964400+01   1.4216287-05   0.0000000      0.0000000
1.7852119-01   0.0000000      0.0000000      1.7838173-01   6.3732674+00
6.3732674+00   1.0002726+00   1.0000316+00   0.0000000      2.9364367-02
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
2.8964400+01   3.4236014+18   0.0000000      0.0000000      0.0000000
0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 0.0000000    PREC CM OF WATER IN LAYER     10

 THE FOLLOWING ARE ATM-CM FOR LAYER 10 FOR CO2,O3,N2O,CO,AND CH4 RESPECTIVELY
  2.2623+01     1.4409-01     0.0000        0.0000        1.4409-01

 LEVEL  1      P =       .93843+00      TEMP = 296.83
 WATERS =        .3833+23

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365
```

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

* CHAR UN/FLOW AT 015365

LEVEL 2 P = .84539+00 TEMP = 290.53
WATERS = .2045+23

LEVEL 3 P = .75235+00 TEMP = 284.79
WATERS = .7913+22

LEVEL 4 P = .65931+00 TEMP = 279.05
WATERS = .4172+22

LEVEL 5 P = .56628+00 TEMP = 273.29
WATERS = .1767+22

LEVEL 6 P = .47324+00 TEMP = 262.88
WATERS = .7871+21

LEVEL 7 P = .38020+00 TEMP = 249.96
WATERS = .2423+21

LEVEL 8 P = .28716+00 TEMP = 234.13
WATERS = .3071+20

LEVEL 9 P = .19413+00 TEMP = 213.55
WATERS = .0000

LEVEL 10 P = .10106+00 TEMP = 216.65
WATERS = .0000

FREQ WAVE NO.	TRANS	ABS	UPWELLING RADIANCE	WAVELENGTH MICRONS
1150.00	.69615	.30385	6.492-04	8.69565
1152.00	.69632	.30368	6.487-04	8.68056
1154.00	.72102	.27898	6.710-04	8.66551
1156.00	.74552	.25448	6.931-04	8.65052
1158.00	.75844	.24156	7.044-04	8.63558
1160.00	.76628	.23372	7.109-04	8.62069
1162.00	.76098	.23902	7.052-04	8.60585
1164.00	.73667	.26333	6.819-04	8.59107
1166.00	.69634	.30366	6.439-04	8.57633
1168.00	.66741	.33259	6.165-04	8.56164
1170.00	.63866	.36134	5.892-04	8.54701
1172.00	.61105	.38895	5.631-04	8.53242
1174.00	.59383	.40617	5.466-04	8.51789
1176.00	.61636	.38364	5.667-04	8.50340
1178.00	.63382	.36618	5.820-04	8.48896
1180.00	.63993	.36007	5.869-04	8.47458
1182.00	.64726	.35274	5.929-04	8.46024
1184.00	.64921	.35079	5.940-04	8.44595
1186.00	.63236	.36764	5.778-04	8.43170
1188.00	.63253	.36747	5.773-04	8.41751

1190.00	.64287	.35713	5.860-04	8.40336
1192.00	.65067	.34933	5.923-04	8.38926
1194.00	.66105	.33895	6.010-04	8.37521
1196.00	.67085	.32915	6.091-04	8.36120
1198.00	.66930	.33070	6.069-04	8.34725
1200.00	.68477	.31523	6.200-04	8.33333
1202.00	.69563	.30437	6.290-04	8.31947
1204.00	.67774	.32226	6.120-04	8.30565
1206.00	.64350	.35650	5.803-04	8.29187
1208.00	.60389	.39611	5.438-04	8.27815
1210.00	.53484	.46516	4.809-04	8.26446
1212.00	.46750	.53250	4.198-04	8.25083
1214.00	.44301	.55699	3.972-04	8.23723
1216.00	.42942	.57058	3.845-04	8.22368
1218.00	.40627	.59373	3.632-04	8.21018
1220.00	.40736	.59264	3.637-04	8.19672
1222.00	.41967	.58033	3.741-04	8.18331
1224.00	.42559	.57441	3.788-04	8.16993
1226.00	.45073	.54927	4.006-04	8.15661
1228.00	.50146	.49854	4.450-04	8.14332
1230.00	.53561	.46439	4.745-04	8.13008
1232.00	.55637	.44363	4.922-04	8.11688
1234.00	.55130	.44870	4.869-04	8.10373
1236.00	.50553	.49447	4.458-04	8.09061
1238.00	.44055	.55945	3.879-04	8.07754
1240.00	.37971	.62029	3.338-04	8.06452
1242.00	.33224	.66776	2.916-04	8.05153
1244.00	.30916	.69084	2.709-04	8.03859
1246.00	.32264	.67736	2.822-04	8.02568
1248.00	.35014	.64986	3.057-04	8.01282
1250.00	.37738	.62262	3.290-04	8.00000
1252.00	.37975	.62025	3.305-04	7.98722
1254.00	.35784	.64216	3.109-04	7.97448
1256.00	.31731	.68269	2.752-04	7.96178
1258.00	.25476	.74524	2.206-04	7.94913
1260.00	.18692	.81308	1.616-04	7.93651
1262.00	.13744	.86256	1.186-04	7.92393
1264.00	.10080	.89920	8.682-05	7.91139
1266.00	.07575	.92425	6.512-05	7.89889
1268.00	.07805	.92195	6.698-05	7.88644
1270.00	.10461	.89539	8.962-05	7.87402
1272.00	.13972	.86028	1.195-04	7.86164
1274.00	.18463	.81537	1.576-04	7.84929
1276.00	.22026	.77974	1.877-04	7.83699
1278.00	.23550	.76450	2.003-04	7.82473
1280.00	.21895	.78105	1.859-04	7.81250
1282.00	.18833	.81167	1.596-04	7.80031
1284.00	.15345	.84655	1.298-04	7.78816
1286.00	.13096	.86904	1.105-04	7.77605
1288.00	.11649	.88351	9.814-05	7.76398
1290.00	.12474	.87526	1.049-04	7.75194
1292.00	.14896	.85104	1.250-04	7.73994
1294.00	.16649	.83351	1.395-04	7.72798
1296.00	.16632	.83368	1.390-04	7.71605
1298.00	.16422	.83578	1.370-04	7.70416
1300.00	.14946	.85054	1.245-04	7.69231

BETWEEN 1150.00 AND 1300.00 THE ABSORPTANCE IS .838+02

LAYER(1 IS NEAREST GROUND) = 1

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	2.116-04	1.432-04	2.319-01	1.570-01	2.116-04	1.432-04
1.152+03	2.114-04	1.429-04	2.320-01	1.569-01	2.114-04	1.429-04
1.154+03	1.930-04	1.367-04	2.120-01	1.502-01	1.930-04	1.367-04
1.156+03	1.748-04	1.302-04	1.922-01	1.432-01	1.748-04	1.302-04
1.158+03	1.653-04	1.264-04	1.819-01	1.391-01	1.653-04	1.264-04
1.160+03	1.592-04	1.242-04	1.755-01	1.369-01	1.592-04	1.242-04
1.162+03	1.625-04	1.257-04	1.793-01	1.387-01	1.625-04	1.257-04
1.164+03	1.793-04	1.328-04	1.981-01	1.467-01	1.793-04	1.328-04
1.166+03	2.108-04	1.399-04	2.331-01	1.547-01	2.108-04	1.399-04
1.168+03	2.336-04	1.447-04	2.587-01	1.602-01	2.336-04	1.447-04
1.170+03	2.563-04	1.494-04	2.841-01	1.656-01	2.563-04	1.494-04
1.172+03	2.783-04	1.533-04	3.089-01	1.701-01	2.783-04	1.533-04
1.174+03	2.934-04	1.535-04	3.240-01	1.705-01	2.934-04	1.535-04
1.176+03	2.733-04	1.528-04	3.041-01	1.699-01	2.733-04	1.528-04
1.178+03	2.579-04	1.520-04	2.873-01	1.693-01	2.579-04	1.520-04
1.180+03	2.521-04	1.523-04	2.812-01	1.698-01	2.521-04	1.523-04
1.182+03	2.454-04	1.525-04	2.741-01	1.702-01	2.454-04	1.525-04
1.184+03	2.420-04	1.545-04	2.706-01	1.727-01	2.420-04	1.545-04
1.186+03	2.554-04	1.558-04	2.859-01	1.746-01	2.554-04	1.558-04
1.188+03	2.541-04	1.553-04	2.848-01	1.741-01	2.541-04	1.553-04
1.190+03	2.444-04	1.532-04	2.743-01	1.719-01	2.444-04	1.532-04
1.192+03	2.367-04	1.513-04	2.660-01	1.700-01	2.367-04	1.513-04
1.194+03	2.279-04	1.486-04	2.564-01	1.672-01	2.279-04	1.486-04
1.196+03	2.194-04	1.461-04	2.473-01	1.646-01	2.194-04	1.461-04
1.198+03	2.211-04	1.450-04	2.495-01	1.636-01	2.211-04	1.450-04
1.200+03	2.093-04	1.428-04	2.365-01	1.614-01	2.093-04	1.428-04
1.202+03	2.009-04	1.416-04	2.268-01	1.602-01	2.009-04	1.416-04
1.204+03	2.154-04	1.415-04	2.441-01	1.603-01	2.154-04	1.415-04
1.206+03	2.413-04	1.455-04	2.738-01	1.651-01	2.413-04	1.455-04
1.208+03	2.703-04	1.511-04	3.072-01	1.717-01	2.703-04	1.511-04
1.210+03	3.218-04	1.588-04	3.662-01	1.807-01	3.218-04	1.588-04
1.212+03	3.706-04	1.652-04	4.224-01	1.883-01	3.706-04	1.652-04
1.214+03	3.790-04	1.723-04	4.326-01	1.967-01	3.790-04	1.723-04
1.216+03	3.811-04	1.754-04	4.357-01	2.005-01	3.811-04	1.754-04
1.218+03	3.927-04	1.765-04	4.496-01	2.021-01	3.927-04	1.765-04
1.220+03	3.849-04	1.759-04	4.413-01	2.017-01	3.849-04	1.759-04
1.222+03	3.694-04	1.730-04	4.242-01	1.987-01	3.694-04	1.730-04
1.224+03	3.666-04	1.670-04	4.217-01	1.920-01	3.666-04	1.670-04
1.226+03	3.479-04	1.591-04	4.007-01	1.833-01	3.479-04	1.591-04
1.228+03	3.039-04	1.504-04	3.506-01	1.735-01	3.039-04	1.504-04
1.230+03	2.726-04	1.422-04	3.150-01	1.643-01	2.726-04	1.422-04
1.232+03	2.534-04	1.382-04	2.933-01	1.599-01	2.534-04	1.382-04
1.234+03	2.483-04	1.365-04	2.879-01	1.582-01	2.483-04	1.365-04
1.236+03	2.770-04	1.366-04	3.216-01	1.586-01	2.770-04	1.366-04
1.238+03	3.231-04	1.385-04	3.757-01	1.611-01	3.231-04	1.385-04
1.240+03	3.663-04	1.403-04	4.268-01	1.634-01	3.663-04	1.403-04
1.242+03	3.954-04	1.373-04	4.614-01	1.602-01	3.954-04	1.373-04
1.244+03	4.110-04	1.336-04	4.804-01	1.561-01	4.110-04	1.336-04
1.246+03	3.909-04	1.300-04	4.571-01	1.522-01	3.909-04	1.300-04
1.248+03	3.603-04	1.255-04	4.225-01	1.471-01	3.603-04	1.255-04
1.250+03	3.349-04	1.226-04	3.934-01	1.441-01	3.349-04	1.226-04
1.252+03	3.397-04	1.203-04	3.997-01	1.416-01	3.397-04	1.203-04
1.254+03	3.606-04	1.171-04	4.251-01	1.380-01	3.606-04	1.171-04

1.256+03	4.054-04	1.158-04	4.788-01	1.367-01	4.054-04	1.158-04
1.258+03	4.739-04	1.148-04	5.607-01	1.358-01	4.739-04	1.148-04
1.260+03	5.470-04	1.086-04	6.483-01	1.287-01	5.470-04	1.084-04
1.262+03	5.991-04	1.030-04	7.113-01	1.223-01	5.991-04	1.030-04
1.264+03	6.485-04	9.643-05	7.719-01	1.147-01	6.485-04	9.643-05
1.266+03	6.848-04	8.913-05	8.160-01	1.062-01	6.848-04	8.913-05
1.268+03	6.851-04	8.177-05	8.179-01	9.762-02	6.851-04	8.177-05
1.270+03	6.546-04	8.019-05	7.829-01	9.591-02	6.546-04	8.019-05
1.272+03	6.120-04	8.552-05	7.333-01	1.025-01	6.120-04	8.552-05
1.274+03	5.462-04	9.549-05	6.556-01	1.146-01	5.462-04	9.549-05
1.276+03	4.877-04	1.028-04	5.866-01	1.236-01	4.877-04	1.028-04
1.278+03	4.605-04	1.120-04	5.548-01	1.350-01	4.605-04	1.120-04
1.280+03	4.746-04	1.161-04	5.730-01	1.402-01	4.746-04	1.161-04
1.282+03	5.045-04	1.131-04	6.102-01	1.368-01	5.045-04	1.131-04
1.284+03	5.503-04	1.103-04	6.669-01	1.337-01	5.503-04	1.103-04
1.286+03	5.851-04	1.090-04	7.105-01	1.324-01	5.851-04	1.090-04
1.288+03	6.047-04	1.037-04	7.357-01	1.262-01	6.047-04	1.037-04
1.290+03	5.895-04	1.038-04	7.186-01	1.265-01	5.895-04	1.038-04
1.292+03	5.527-04	1.041-04	6.750-01	1.271-01	5.527-04	1.041-04
1.294+03	5.107-04	9.657-05	6.250-01	1.182-01	5.107-04	9.657-05
1.296+03	4.846-04	8.577-05	5.943-01	1.052-01	4.846-04	8.577-05
1.298+03	4.628-04	7.657-05	5.686-01	9.408-02	4.628-04	7.657-05
1.300+03	4.665-04	6.427-05	5.743-01	7.912-02	4.665-04	6.427-05

LAYER(1 IS NEAREST GROUND) = 2

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150*03	4.098-05	6.395-05	5.072-02	7.915-02	2.526-04	2.071-04
1.152*03	4.098-05	6.416-05	5.078-02	7.951-02	2.524-04	2.071-04
1.154*03	3.836-05	5.773-05	4.760-02	7.163-02	2.313-04	1.949-04
1.156*03	3.570-05	5.125-05	4.435-02	6.367-02	2.105-04	1.815-04
1.158*03	3.421-05	4.754-05	4.256-02	5.914-02	1.995-04	1.739-04
1.160*03	3.341-05	4.509-05	4.162-02	5.617-02	1.927-04	1.693-04
1.162*03	3.419-05	4.595-05	4.264-02	5.730-02	1.967-04	1.717-04
1.164*03	3.726-05	5.181-05	4.653-02	6.471-02	2.166-04	1.846-04
1.166*03	4.027-05	6.120-05	5.036-02	7.653-02	2.511-04	2.011-04
1.168*03	4.223-05	6.784-05	5.288-02	8.496-02	2.759-04	2.126-04
1.170*03	4.413-05	7.443-05	5.534-02	9.333-02	3.004-04	2.238-04
1.172*03	4.575-05	8.075-05	5.746-02	1.014-01	3.241-04	2.341-04
1.174*03	4.591-05	8.496-05	5.774-02	1.062-01	3.393-04	2.380-04
1.176*03	4.558-05	7.949-05	5.740-02	1.001-01	3.189-04	2.322-04
1.178*03	4.526-05	7.577-05	5.707-02	9.556-02	3.032-04	2.278-04
1.180*03	4.534-05	7.450-05	5.727-02	9.409-02	2.975-04	2.260-04
1.182*03	4.529-05	7.283-05	5.729-02	9.211-02	2.907-04	2.253-04
1.184*03	4.603-05	7.243-05	5.830-02	9.175-02	2.880-04	2.269-04
1.186*03	4.670-05	7.597-05	5.926-02	9.638-02	3.021-04	2.318-04
1.188*03	4.672-05	7.550-05	5.936-02	9.592-02	3.008-04	2.308-04
1.190*03	4.618-05	7.271-05	5.876-02	9.252-02	2.905-04	2.259-04
1.192*03	4.575-05	7.054-05	5.831-02	8.989-02	2.826-04	2.218-04
1.194*03	4.481-05	6.773-05	5.719-02	8.646-02	2.727-04	2.163-04
1.196*03	4.388-05	6.504-05	5.610-02	8.315-02	2.633-04	2.111-04
1.198*03	4.344-05	6.514-05	5.562-02	8.340-02	2.646-04	2.101-04
1.200*03	4.228-05	6.176-05	5.423-02	7.920-02	2.516-04	2.046-04
1.202*03	4.171-05	5.991-05	5.358-02	7.631-02	2.421-04	2.010-04
1.204*03	4.206-05	6.281-05	5.412-02	8.080-02	2.575-04	2.093-04
1.206*03	4.425-05	7.013-05	5.703-02	9.037-02	2.856-04	2.257-04
1.208*03	4.708-05	7.859-05	6.077-02	1.014-01	3.179-04	2.297-04
1.210*03	5.137-05	9.283-05	6.642-02	1.200-01	3.731-04	2.516-04
1.212*03	5.546-05	1.063-04	7.182-02	1.376-01	4.261-04	2.715-04
1.214*03	5.998-05	1.113-04	7.781-02	1.443-01	4.390-04	2.836-04
1.216*03	6.284-05	1.129-04	8.166-02	1.467-01	4.990-04	2.883-04
1.218*03	6.508-05	1.157-04	8.471-02	1.505-01	4.578-04	2.921-04
1.220*03	6.621-05	1.135-04	8.633-02	1.479-01	4.511-04	2.894-04
1.222*03	6.634-05	1.084-04	8.665-02	1.417-01	4.357-04	2.815-04
1.224*03	6.498-05	1.097-04	8.385-02	1.370-01	4.307-04	2.717-04
1.226*03	6.090-05	9.762-05	7.983-02	1.280-01	4.088-04	2.568-04
1.228*03	5.823-05	8.522-05	7.696-02	1.119-01	3.621-04	2.356-04
1.230*03	5.659-05	7.572-05	7.438-02	9.961-02	3.291-04	2.179-04
1.232*03	5.579-05	7.070-05	7.352-02	9.317-02	3.092-04	2.089-04
1.234*03	5.799-05	6.986-05	7.650-02	9.224-02	3.063-04	2.063-04
1.236*03	6.172-05	7.620-05	8.163-02	1.008-01	3.387-04	2.128-04
1.238*03	6.586-05	8.665-05	8.727-02	1.148-01	3.889-04	2.251-04
1.240*03	6.990-05	9.635-05	9.267-02	1.279-01	4.361-04	2.366-04
1.242*03	7.324-05	1.014-04	9.742-02	1.349-01	4.687-04	2.387-04
1.244*03	7.477-05	1.038-04	9.964-02	1.384-01	4.858-04	2.374-04
1.246*03	7.720-05	9.971-05	1.031-01	1.331-01	4.676-04	2.297-04
1.248*03	7.836-05	9.397-05	1.048-01	1.257-01	4.386-04	2.194-04
1.250*03	7.836-05	9.064-05	1.050-01	1.215-01	4.132-04	2.133-04
1.252*03	7.666-05	9.018-05	1.029-01	1.211-01	4.163-04	2.105-04
1.254*03	7.609-05	9.031-05	1.024-01	1.215-01	4.367-04	2.074-04

1.256+03	7.356-05	9.490-05	9.917-02	1.279-01	4.770-04	2.107-04
1.258+03	7.014-05	1.027-04	9.474-02	1.387-01	5.940-04	2.175-04
1.260+03	6.568-05	1.062-04	8.889-02	1.438-01	6.127-04	2.198-04
1.262+03	6.213-05	1.084-04	8.426-02	1.470-01	6.612-04	2.114-04
1.264+03	5.495-05	1.097-04	7.466-02	1.490-01	7.035-04	2.061-04
1.266+03	4.835-05	1.094-04	6.583-02	1.490-01	7.331-04	1.986-04
1.268+03	4.512-05	1.035-04	6.156-02	1.412-01	7.303-04	1.853-04
1.270+03	4.582-05	9.820-05	6.265-02	1.343-01	7.004-04	1.784-04
1.272+03	4.936-05	9.649-05	6.762-02	1.322-01	6.614-04	1.820-04
1.274+03	5.914-05	9.571-05	8.119-02	1.314-01	6.053-04	1.912-04
1.276+03	6.924-05	9.337-05	9.524-02	1.284-01	5.570-04	1.962-04
1.278+03	7.558-05	9.753-05	1.042-01	1.344-01	5.361-04	2.096-04
1.280+03	7.682-05	1.025-04	1.061-01	1.417-01	5.514-04	2.187-04
1.282+03	7.586-05	1.044-04	1.050-01	1.445-01	5.804-04	2.175-04
1.284+03	7.031-05	1.081-04	9.753-02	1.500-01	6.206-04	2.184-04
1.286+03	6.410-05	1.116-04	8.912-02	1.552-01	6.493-04	2.207-04
1.288+03	5.988-05	1.090-04	8.343-02	1.519-01	6.646-04	2.122-04
1.290+03	6.140-05	1.076-04	8.573-02	1.503-01	6.509-04	2.114-04
1.292+03	6.500-05	1.034-04	9.096-02	1.446-01	6.177-04	2.075-04
1.294+03	7.163-05	9.263-05	1.005-01	1.299-01	5.823-04	1.892-04
1.296+03	7.903-05	8.109-05	1.111-01	1.140-01	5.637-04	1.669-04
1.298+03	8.631-05	7.160-05	1.216-01	1.008-01	5.491-04	1.482-04
1.300+03	8.840-05	6.294-05	1.248-01	8.886-02	5.549-04	1.272-04

LAYER(1 IS NEAREST GROUND) = 3

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	8.144-06	2.297-05	1.131-02	3.190-02	2.607-04	2.301-04
1.152+03	8.146-06	2.305-05	1.133-02	3.205-02	2.605-04	2.301-04
1.154+03	7.506-06	1.966-05	1.045-02	2.738-02	2.388-04	2.141-04
1.156+03	6.858-06	1.634-05	9.565-03	2.279-02	2.173-04	1.978-04
1.158+03	6.519-06	1.458-05	9.106-03	2.036-02	2.060-04	1.885-04
1.160+03	6.366-06	1.340-05	8.906-03	1.875-02	1.990-04	1.827-04
1.162+03	6.631-06	1.389-05	9.290-03	1.946-02	2.033-04	1.856-04
1.164+03	7.469-06	1.677-05	1.048-02	2.353-02	2.241-04	2.014-04
1.166+03	8.244-06	2.253-05	1.159-02	3.166-02	2.593-04	2.236-04
1.168+03	8.746-06	2.656-05	1.231-02	3.739-02	2.846-04	2.391-04
1.170+03	9.235-06	3.059-05	1.302-02	4.312-02	3.096-04	2.544-04
1.172+03	9.635-06	3.457-05	1.360-02	4.881-02	3.337-04	2.686-04
1.174+03	9.647-06	3.746-05	1.364-02	5.298-02	3.490-04	2.754-04
1.176+03	9.605-06	3.343-05	1.361-02	4.736-02	3.285-04	2.657-04
1.178+03	9.538-06	3.044-05	1.353-02	4.319-02	3.127-04	2.582-04
1.180+03	9.547-06	2.916-05	1.357-02	4.144-02	3.070-04	2.559-04
1.182+03	9.530-06	2.765-05	1.357-02	3.937-02	3.003-04	2.529-04
1.184+03	9.750-06	2.669-05	1.390-02	3.805-02	2.978-04	2.536-04
1.186+03	9.942-06	2.920-05	1.420-02	4.171-02	3.121-04	2.610-04
1.188+03	1.007-05	2.909-05	1.441-02	4.163-02	3.109-04	2.599-04
1.190+03	1.010-05	2.759-05	1.447-02	3.955-02	3.006-04	2.535-04
1.192+03	1.014-05	2.648-05	1.456-02	3.801-02	2.926-04	2.483-04
1.194+03	9.997-06	2.510-05	1.438-02	3.610-02	2.827-04	2.414-04
1.196+03	9.856-06	2.375-05	1.420-02	3.421-02	2.731-04	2.349-04
1.198+03	9.710-06	2.414-05	1.402-02	3.485-02	2.743-04	2.343-04
1.200+03	9.360-06	2.196-05	1.353-02	3.176-02	2.609-04	2.265-04
1.202+03	9.191-06	2.035-05	1.331-02	2.948-02	2.513-04	2.213-04
1.204+03	9.241-06	2.321-05	1.341-02	3.369-02	2.667-04	2.275-04
1.206+03	9.791-06	2.794-05	1.424-02	4.062-02	2.954-04	2.436-04
1.208+03	1.056-05	3.318-05	1.538-02	4.833-02	3.279-04	2.629-04
1.210+03	1.177-05	4.262-05	1.718-02	6.220-02	3.849-04	2.992-04
1.212+03	1.310-05	5.173-05	1.915-02	7.563-02	4.392-04	3.232-04
1.214+03	1.488-05	5.347-05	2.179-02	7.831-02	4.539-04	3.370-04
1.216+03	1.620-05	5.393-05	2.377-02	7.914-02	4.602-04	3.422-04
1.218+03	1.731-05	5.590-05	2.545-02	8.219-02	4.751-04	3.480-04
1.220+03	1.819-05	5.429-05	2.680-02	7.997-02	4.693-04	3.434-04
1.222+03	1.879-05	5.125-05	2.773-02	7.564-02	4.545-04	3.327-04
1.224+03	1.830-05	5.032-05	2.706-02	7.442-02	4.490-04	3.220-04
1.226+03	1.766-05	4.703-05	2.617-02	6.969-02	4.264-04	3.038-04
1.228+03	1.760-05	3.984-05	2.613-02	5.916-02	3.797-04	2.755-04
1.230+03	1.786-05	3.495-05	2.657-02	5.200-02	3.470-04	2.528-04
1.232+03	1.806-05	3.217-05	2.692-02	4.795-02	3.273-04	2.410-04
1.234+03	1.950-05	3.218-05	2.912-02	4.807-02	3.257-04	2.385-04
1.236+03	2.116-05	3.767-05	3.167-02	5.638-02	3.599-04	2.504-04
1.238+03	2.260-05	4.581-05	3.390-02	6.870-02	4.115-04	2.709-04
1.240+03	2.388-05	5.327-05	3.589-02	8.006-02	4.600-04	2.899-04
1.242+03	2.556-05	5.850-05	3.849-02	8.809-02	4.942-04	2.972-04
1.244+03	2.616-05	6.140-05	3.947-02	9.265-02	5.119-04	2.988-04
1.246+03	2.757-05	5.852-05	4.170-02	8.850-02	4.952-04	2.883-04
1.248+03	2.868-05	5.443-05	4.346-02	8.248-02	4.673-04	2.739-04
1.250+03	2.901-05	5.147-05	4.405-02	7.817-02	4.522-04	2.648-04
1.252+03	2.793-05	5.094-05	4.250-02	7.753-02	4.442-04	2.614-04
1.254+03	2.743-05	5.165-05	4.184-02	7.877-02	4.641-04	2.591-04

1.256+03	2.553-05	5.567-05	3.902-02	8.506-02	5.045-04	2.663-04
1.258+03	2.272-05	6.248-05	3.480-02	9.570-02	5.668-04	2.799-04
1.260+03	1.991-05	6.802-05	3.056-02	1.094-01	6.326-04	2.828-04
1.262+03	1.797-05	7.285-05	2.765-02	1.121-01	6.792-04	2.843-04
1.264+03	1.484-05	7.772-05	2.288-02	1.198-01	7.183-04	2.838-04
1.266+03	1.227-05	8.134-05	1.897-02	1.257-01	7.454-04	2.799-04
1.268+03	1.187-05	8.020-05	1.838-02	1.242-01	7.421-04	2.654-04
1.270+03	1.319-05	7.743-05	2.040-02	1.202-01	7.136-04	2.558-04
1.272+03	1.511-05	7.380-05	2.350-02	1.198-01	6.765-04	2.558-04
1.274+03	1.938-05	6.830-05	3.021-02	1.065-01	6.247-04	2.595-04
1.276+03	2.375-05	6.275-05	3.712-02	9.806-02	5.807-04	2.589-04
1.278+03	2.579-05	6.178-05	4.040-02	9.677-02	5.619-04	2.713-04
1.280+03	2.542-05	6.359-05	3.991-02	9.983-02	5.769-04	2.822-04
1.282+03	2.443-05	6.568-05	3.845-02	1.033-01	6.048-04	2.832-04
1.284+03	2.143-05	6.962-05	3.381-02	1.094-01	6.421-04	2.881-04
1.286+03	1.847-05	7.274-05	2.920-02	1.150-01	6.677-04	2.934-04
1.288+03	1.692-05	7.265-05	2.681-02	1.151-01	6.815-04	2.854-04
1.290+03	1.790-05	7.146-05	2.843-02	1.135-01	6.688-04	2.829-04
1.292+03	2.031-05	6.813-05	3.233-02	1.085-01	6.368-04	2.756-04
1.294+03	2.462-05	6.239-05	3.929-02	9.957-02	6.070-04	2.516-04
1.296+03	2.889-05	5.671-05	4.622-02	9.072-02	5.926-04	2.236-04
1.298+03	3.272-05	5.136-05	5.247-02	8.236-02	5.818-04	1.995-04
1.300+03	3.411-05	4.798-05	5.483-02	7.713-02	5.890-04	1.752-04

LAYER(1 IS NEAREST GROUND) = 4

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	2.701-06	1.175-05	4.228-03	1.840-02	2.634-04	2.419-04
1.152+03	2.706-06	1.170-05	4.244-03	1.834-02	2.632-04	2.418-04
1.154+03	2.473-06	9.735-06	3.885-03	1.529-02	2.413-04	2.238-04
1.156+03	2.239-06	7.891-06	3.522-03	1.241-02	2.196-04	2.057-04
1.158+03	2.122-06	7.096-06	3.345-03	1.118-02	2.081-04	1.956-04
1.160+03	2.077-06	6.633-06	3.278-03	1.047-02	2.011-04	1.893-04
1.162+03	2.190-06	7.132-06	3.464-03	1.128-02	2.055-04	1.927-04
1.164+03	2.516-06	8.909-06	3.986-03	1.411-02	2.266-04	2.103-04
1.166+03	2.809-06	1.280-05	4.458-03	2.032-02	2.621-04	2.389-04
1.168+03	2.998-06	1.549-05	4.765-03	2.463-02	2.876-04	2.546-04
1.170+03	3.183-06	1.818-05	5.069-03	2.895-02	3.128-04	2.726-04
1.172+03	3.332-06	2.086-05	5.315-03	3.328-02	3.370-04	2.895-04
1.174+03	3.337-06	2.299-05	5.333-03	3.675-02	3.523-04	2.984-04
1.176+03	3.326-06	1.996-05	5.326-03	3.196-02	3.318-04	2.856-04
1.178+03	3.302-06	1.771-05	5.297-03	2.842-02	3.160-04	2.759-04
1.180+03	3.300-06	1.675-05	5.303-03	2.693-02	3.103-04	2.727-04
1.182+03	3.290-06	1.567-05	5.297-03	2.523-02	3.036-04	2.686-04
1.184+03	3.381-06	1.487-05	5.455-03	2.398-02	3.012-04	2.685-04
1.186+03	3.473-06	1.675-05	5.613-03	2.707-02	3.155-04	2.778-04
1.188+03	3.585-06	1.678-05	5.806-03	2.717-02	3.145-04	2.767-04
1.190+03	3.679-06	1.587-05	5.970-03	2.575-02	3.043-04	2.694-04
1.192+03	3.778-06	1.523-05	6.141-03	2.476-02	2.964-04	2.635-04
1.194+03	3.784-06	1.445-05	6.164-03	2.354-02	2.864-04	2.558-04
1.196+03	3.796-06	1.369-05	6.194-03	2.233-02	2.769-04	2.486-04
1.198+03	3.737-06	1.413-05	6.111-03	2.310-02	2.780-04	2.484-04
1.200+03	3.573-06	1.250-05	5.854-03	2.049-02	2.645-04	2.390-04
1.202+03	3.492-06	1.125-05	5.733-03	1.846-02	2.548-04	2.326-04
1.204+03	3.501-06	1.346-05	5.760-03	2.214-02	2.702-04	2.410-04
1.206+03	3.721-06	1.672-05	6.134-03	2.756-02	2.991-04	2.603-04
1.208+03	4.060-06	2.026-05	6.706-03	3.347-02	3.320-04	2.831-04
1.210+03	4.631-06	2.709-05	7.666-03	4.484-02	3.895-04	3.213-04
1.212+03	5.344-06	3.371-05	8.864-03	5.592-02	4.445-04	3.569-04
1.214+03	6.382-06	3.437-05	1.061-02	5.713-02	4.603-04	3.714-04
1.216+03	7.211-06	3.474-05	1.201-02	5.787-02	4.674-04	3.770-04
1.218+03	7.954-06	3.669-05	1.328-02	6.123-02	4.831-04	3.897-04
1.220+03	8.615-06	3.580-05	1.441-02	5.989-02	4.779-04	3.794-04
1.222+03	9.131-06	3.408-05	1.531-02	5.712-02	4.637-04	3.668-04
1.224+03	8.995-06	3.434-05	1.511-02	5.766-02	4.580-04	3.663-04
1.226+03	8.863-06	3.241-05	1.492-02	5.457-02	4.353-04	3.362-04
1.228+03	9.122-06	2.720-05	1.539-02	4.589-02	3.889-04	3.027-04
1.230+03	9.538-06	2.383-05	1.613-02	4.030-02	3.565-04	2.767-04
1.232+03	9.763-06	2.156-05	1.654-02	3.654-02	3.370-04	2.626-04
1.234+03	1.073-05	2.121-05	1.822-02	3.603-02	3.365-04	2.597-04
1.236+03	1.167-05	2.529-05	1.987-02	4.306-02	3.716-04	2.757-04
1.238+03	1.239-05	3.141-05	2.114-02	5.358-02	4.239-04	3.023-04
1.240+03	1.297-05	3.695-05	2.218-02	6.319-02	4.730-04	3.268-04
1.242+03	1.396-05	4.136-05	2.392-02	7.088-02	5.082-04	3.386-04
1.244+03	1.419-05	4.395-05	2.438-02	7.549-02	5.261-04	3.427-04
1.246+03	1.496-05	4.175-05	2.577-02	7.188-02	5.102-04	3.300-04
1.248+03	1.561-05	3.854-05	2.694-02	6.651-02	4.829-04	3.129-04
1.250+03	1.579-05	3.592-05	2.732-02	6.214-02	4.580-04	3.007-04
1.252+03	1.498-05	3.572-05	2.597-02	6.193-02	4.592-04	2.972-04
1.254+03	1.458-05	3.693-05	2.534-02	6.418-02	4.787-04	2.960-04

1.256+03	1.331-05	4.074-05	2.319-02	7.096-02	5.178-04	3.071-04
1.258+03	1.143-05	4.687-05	1.995-02	8.183-02	5.782-04	3.268-04
1.260+03	9.651-06	5.298-05	1.689-02	9.273-02	6.423-04	3.358-04
1.262+03	8.500-06	5.798-05	1.491-02	1.017-01	6.877-04	3.422-04
1.264+03	6.743-06	6.350-05	1.186-02	1.117-01	7.251-04	3.473-04
1.266+03	5.375-06	6.789-05	9.476-03	1.197-01	7.508-04	3.478-04
1.268+03	5.326-06	6.861-05	9.412-03	1.212-01	7.475-04	3.341-04
1.270+03	6.179-06	6.696-05	1.095-02	1.186-01	7.198-04	3.228-04
1.272+03	7.305-06	6.334-05	1.297-02	1.125-01	6.838-04	3.191-04
1.274+03	9.602-06	5.649-05	1.709-02	1.006-01	6.343-04	3.160-04
1.276+03	1.193-05	5.031-05	2.129-02	8.980-02	5.926-04	3.092-04
1.278+03	1.285-05	4.736-05	2.299-02	8.474-02	5.747-04	3.187-04
1.280+03	1.243-05	4.787-05	2.230-02	8.587-02	5.893-04	3.301-04
1.282+03	1.176-05	4.966-05	2.116-02	8.931-02	6.166-04	3.329-04
1.284+03	1.004-05	5.336-05	1.810-02	9.620-02	6.521-04	3.414-04
1.286+03	8.472-06	5.592-05	1.531-02	1.011-01	6.762-04	3.493-04
1.288+03	7.790-06	5.675-05	1.412-02	1.028-01	6.893-04	3.421-04
1.290+03	8.505-06	5.511-05	1.545-02	1.001-01	6.773-04	3.380-04
1.292+03	1.010-05	5.211-05	1.840-02	9.490-02	6.481-04	3.277-04
1.294+03	1.278-05	4.855-05	2.333-02	8.866-02	6.197-04	3.001-04
1.296+03	1.521-05	4.550-05	2.784-02	8.331-02	6.078-04	2.691-04
1.298+03	1.728-05	4.197-05	3.172-02	7.704-02	5.991-04	2.415-04
1.300+03	1.798-05	4.097-05	3.309-02	7.549-02	6.070-04	2.142-04

LAYERS(1 IS NEAREST GROUND) = 5

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	7.332-07	4.497-06	1.301-03	7.980-03	2.641-04	2.464-04
1.152+03	7.367-07	4.490-06	1.310-03	7.894-03	2.640-04	2.463-04
1.154+03	6.685-07	3.641-06	1.191-03	6.485-03	2.420-04	2.275-04
1.156+03	6.001-07	2.932-06	1.071-03	5.232-03	2.202-04	2.084-04
1.158+03	5.681-07	2.728-06	1.016-03	4.877-03	2.087-04	1.983-04
1.160+03	5.574-07	2.658-06	9.986-04	4.762-03	2.017-04	1.920-04
1.162+03	5.955-07	2.984-06	1.069-03	5.357-03	2.061-04	1.957-04
1.164+03	6.764-07	3.797-06	1.252-03	6.828-03	2.273-04	2.141-04
1.166+03	7.857-07	5.610-06	1.416-03	1.011-02	2.629-04	2.420-04
1.168+03	8.428-07	6.833-06	1.522-03	1.234-02	2.884-04	2.615-04
1.170+03	8.994-07	8.057-06	1.627-03	1.458-02	3.137-04	2.806-04
1.172+03	9.447-07	9.282-06	1.712-03	1.683-02	3.380-04	2.988-04
1.174+03	9.475-07	1.030-05	1.721-03	1.872-02	3.532-04	3.087-04
1.176+03	9.456-07	8.835-06	1.721-03	1.608-02	3.328-04	2.945-04
1.178+03	9.391-07	7.880-06	1.713-03	1.437-02	3.170-04	2.838-04
1.180+03	9.387-07	7.718-06	1.716-03	1.411-02	3.113-04	2.804-04
1.182+03	9.370-07	7.508-06	1.716-03	1.375-02	3.045-04	2.761-04
1.184+03	9.753-07	7.408-06	1.790-03	1.360-02	3.021-04	2.759-04
1.186+03	1.019-06	8.628-06	1.875-03	1.587-02	3.166-04	2.864-04
1.188+03	1.105-06	8.716-06	2.037-03	1.606-02	3.156-04	2.854-04
1.190+03	1.200-06	8.243-06	2.217-03	1.523-02	3.055-04	2.776-04
1.192+03	1.298-06	7.922-06	2.403-03	1.466-02	2.977-04	2.715-04
1.194+03	1.359-06	7.543-06	2.520-03	1.399-02	2.878-04	2.634-04
1.196+03	1.428-06	7.172-06	2.655-03	1.333-02	2.784-04	2.557-04
1.198+03	1.414-06	7.461-06	2.634-03	1.390-02	2.794-04	2.559-04
1.200+03	1.338-06	6.486-06	2.499-03	1.211-02	2.659-04	2.455-04
1.202+03	1.299-06	5.682-06	2.431-03	1.063-02	2.561-04	2.382-04
1.204+03	1.290-06	6.757-06	2.419-03	1.267-02	2.715-04	2.477-04
1.206+03	1.368-06	8.308-06	2.571-03	1.562-02	3.004-04	2.686-04
1.208+03	1.520-06	1.001-05	2.864-03	1.886-02	3.335-04	2.931-04
1.210+03	1.811-06	1.374-05	3.420-03	2.594-02	3.913-04	3.351-04
1.212+03	2.238-06	1.747-05	4.236-03	3.307-02	4.468-04	3.744-04
1.214+03	2.893-06	1.802-05	5.488-03	3.418-02	4.631-04	3.894-04
1.216+03	3.442-06	1.866-05	6.545-03	3.548-02	4.708-04	3.956-04
1.218+03	3.960-06	2.040-05	7.548-03	3.888-02	4.870-04	4.051-04
1.220+03	4.452-06	2.044-05	8.505-03	3.905-02	4.823-04	3.999-04
1.222+03	4.856-06	2.004-05	9.299-03	3.837-02	4.685-04	3.868-04
1.224+03	4.851-06	2.042-05	9.311-03	3.958-02	4.629-04	3.779-04
1.226+03	4.906-06	1.977-05	9.440-03	3.804-02	4.902-04	3.560-04
1.228+03	5.220-06	1.699-05	1.007-02	3.277-02	3.941-04	3.197-04
1.230+03	5.604-06	1.535-05	1.083-02	2.968-02	3.621-04	2.920-04
1.232+03	5.790-06	1.399-05	1.122-02	2.711-02	3.428-04	2.766-04
1.234+03	6.443-06	1.386-05	1.252-02	2.692-02	3.429-04	2.736-04
1.236+03	6.995-06	1.639-05	1.362-02	3.191-02	3.786-04	2.921-04
1.238+03	7.370-06	2.001-05	1.439-02	3.907-02	4.313-04	3.229-04
1.240+03	7.643-06	2.328-05	1.496-02	4.557-02	4.806-04	3.501-04
1.242+03	8.254-06	2.636-05	1.619-02	5.171-02	5.164-04	3.649-04
1.244+03	8.320-06	2.808-05	1.636-02	5.524-02	5.344-04	3.708-04
1.246+03	8.745-06	2.704-05	1.724-02	5.332-02	5.189-04	3.571-04
1.248+03	9.107-06	2.528-05	1.800-02	4.998-02	4.920-04	3.377-04
1.250+03	9.175-06	2.351-05	1.818-02	4.660-02	4.672-04	3.242-04
1.252+03	8.552-06	2.322-05	1.699-02	4.615-02	4.678-04	3.204-04
1.254+03	8.263-06	2.433-05	1.646-02	4.846-02	4.870-04	3.203-04

1.256+03	7.424-06	2.673-05	1.483-02	5.338-02	5.253-04	3.338-04
1.258+03	6.188-06	3.042-05	1.239-02	6.091-02	5.844-04	3.572-04
1.260+03	5.076-06	3.480-05	1.019-02	6.986-02	6.473-04	3.706-04
1.262+03	4.392-06	3.807-05	8.840-03	7.663-02	6.921-04	3.803-04
1.264+03	3.359-06	4.133-05	6.789-03	8.342-02	7.289-04	3.886-04
1.266+03	2.579-06	4.387-05	5.218-03	8.876-02	7.534-04	3.917-04
1.268+03	2.621-06	4.469-05	5.319-03	9.066-02	7.601-04	3.787-04
1.270+03	3.168-06	4.359-05	6.445-03	8.868-02	7.229-04	3.664-04
1.272+03	3.827-06	4.115-05	7.806-03	8.394-02	6.876-04	3.603-04
1.274+03	5.136-06	3.660-05	1.050-02	7.486-02	6.394-04	3.526-04
1.276+03	6.456-06	3.298-05	1.324-02	6.763-02	5.991-04	3.422-04
1.278+03	6.903-06	3.066-05	1.419-02	6.304-02	5.816-04	3.494-04
1.280+03	6.576-06	3.070-05	1.356-02	6.330-02	5.959-04	3.608-04
1.282+03	6.148-06	3.187-05	1.271-02	6.589-02	6.227-04	3.648-04
1.284+03	5.123-06	3.397-05	1.062-02	7.042-02	6.572-04	3.7.4-04
1.286+03	4.259-06	3.509-05	8.854-03	7.295-02	6.805-04	3.844-04
1.288+03	3.967-06	3.583-05	8.271-03	7.470-02	6.933-04	3.779-04
1.290+03	4.491-06	3.481-05	9.388-03	7.276-02	6.818-04	3.728-04
1.292+03	5.571-06	3.336-05	1.168-02	6.994-02	6.537-04	3.611-04
1.294+03	7.284-06	3.166-05	1.531-02	6.866-02	6.270-04	3.328-04
1.296+03	8.737-06	3.255-05	1.842-02	6.862-02	6.165-04	3.016-04
1.298+03	9.937-06	3.183-05	2.101-02	6.729-02	6.090-04	2.733-04
1.300+03	1.031-05	3.248-05	2.186-02	6.886-02	6.173-04	2.486-04

LAYER(1 IS NEAREST GROUND) = 6

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE DITRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	1.765-07	1.349-06	3.982-04	3.044-03	2.643-04	2.477-04
1.152+03	1.782-07	1.325-06	4.029-04	2.997-03	2.641-04	2.476-04
1.154+03	1.816-07	1.078-06	3.664-04	2.444-03	2.421-04	2.285-04
1.156+03	1.454-07	8.755-07	3.302-04	1.969-03	2.203-04	2.095-04
1.158+03	1.386-07	8.584-07	3.157-04	1.955-03	2.088-04	1.992-04
1.160+03	1.373-07	8.822-07	3.13[illegible]	2.013-03	2.018-04	1.929-04
1.162+03	1.486-07	1.029-06	3.399-04	2.354-03	2.063-04	1.967-04
1.164+03	1.753-07	1.317-06	4.019-04	3.020-03	2.274-04	2.154-04
1.166+03	1.980-07	1.918-06	4.551-04	4.408-03	2.431-04	2.439-04
1.168+03	2.121-07	2.292-06	4.888-04	5.281-03	2.887-04	2.637-04
1.170+03	2.266-07	2.666-06	5.233-04	6.158-03	3.139-04	2.833-04
1.172+03	2.382-07	3.043-06	5.515-04	7.045-03	3.382-04	3.018-04
1.174+03	2.395-07	3.366-06	5.560-04	7.811-03	3.535-04	3.121-04
1.176+03	2.400-07	2.869-06	5.584-04	6.674-03	3.330-04	2.973-04
1.178+03	2.389-07	2.659-06	5.572-04	6.202-03	3.172-04	2.865-04
1.180+03	2.394-07	2.834-06	5.597-04	6.627-03	3.115-04	2.832-04
1.182+03	2.402-07	2.993-06	5.630-04	7.015-03	3.047-04	2.791-04
1.184+03	2.562-07	3.185-06	6.020-04	7.485-03	3.029-04	2.791-04
1.186+03	2.767-07	3.820-06	6.518-04	9.000-03	3.168-04	2.902-04
1.188+03	3.292-07	3.892-06	7.775-04	9.193-03	3.159-04	2.893-04
1.190+03	3.927-07	3.661-06	9.299-04	8.669-03	3.059-04	2.813-04
1.192+03	4.589-07	3.496-06	1.089-03	8.299-03	2.981-04	2.750-04
1.194+03	5.103-07	3.308-06	1.215-03	7.874-03	2.883-04	2.667-04
1.196+03	5.696-07	3.128-06	1.359-03	7.464-03	2.789-04	2.589-04
1.198+03	5.690-07	3.229-06	1.361-03	7.726-03	2.800-04	2.591-04
1.200+03	5.347-07	2.789-06	1.283-03	6.690-03	2.669-04	2.483-04
1.202+03	5.166-07	2.429-06	1.243-03	5.843-03	2.566-04	2.407-04
1.204+03	5.076-07	2.779-06	1.224-03	6.702-03	2.720-04	2.505-04
1.206+03	5.368-07	3.312-06	1.298-03	8.008-03	3.010-04	2.719-04
1.208+03	6.095-07	3.923-06	1.478-03	9.510-03	3.341-04	2.971-04
1.210+03	7.612-07	5.476-06	1.851-03	1.331-02	3.921-04	3.405-04
1.212+03	1.004-06	7.102-06	2.448-03	1.731-02	4.478-04	3.815-04
1.214+03	1.385-06	7.633-06	3.385-03	1.866-02	4.645-04	3.971-04
1.216+03	1.709-06	8.218-06	4.189-03	2.014-02	4.725-04	4.038-04
1.218+03	2.022-06	9.293-06	4.969-03	2.284-02	4.890-04	4.144-04
1.220+03	2.326-06	9.619-06	5.732-03	2.371-02	4.847-04	4.095-04
1.222+03	2.580-06	9.755-06	6.376-03	2.411-02	4.711-04	3.966-04
1.224+03	2.600-06	1.008-05	6.444-03	2.498-02	4.655-04	3.870-04
1.226+03	2.677-06	9.849-06	6.652-03	2.448-02	4.429-04	3.658-04
1.228+03	2.897-06	8.965-06	7.219-03	2.234-02	3.970-04	3.286-04
1.230+03	3.140-06	8.644-06	7.847-03	2.160-02	3.653-04	3.007-04
1.232+03	3.247-06	8.240-06	8.137-03	2.065-02	3.461-04	2.848-04
1.234+03	3.618-06	8.601-06	9.092-03	2.162-02	3.465-04	2.822-04
1.236+03	3.899-06	9.974-06	9.827-03	2.514-02	3.825-04	3.021-04
1.238+03	4.080-06	1.168-05	1.031-02	2.953-02	4.354-04	3.340-04
1.240+03	4.207-06	1.322-05	1.066-02	3.350-02	4.848-04	3.633-04
1.242+03	4.555-06	1.493-05	1.158-02	3.796-02	5.210-04	3.798-04
1.244+03	4.575-06	1.572-05	1.167-02	4.008-02	5.390-04	3.865-04
1.246+03	4.809-06	1.568-05	1.230-02	4.009-02	5.237-04	3.727-04
1.248+03	5.009-06	1.521-05	1.285-02	3.901-02	4.970-04	3.529-04
1.250+03	5.042-06	1.442-05	1.297-02	3.710-02	4.722-04	3.386-04
1.252+03	4.658-06	1.422-05	1.202-02	3.668-02	4.724-04	3.346-04
1.254+03	4.481-06	1.510-05	1.160-02	3.908-02	4.915-04	3.354-04

1.256+03	3.993-06	1.616-05	1.037-02	4.195-02	5.293-04	3.500-04
1.258+03	3.278-06	1.778-05	8.534-03	4.628-02	5.876-04	3.750-04
1.260+03	2.695-06	2.018-05	6.908-03	5.269-02	6.500-04	3.908-04
1.262+03	2.268-06	2.190-05	5.940-03	5.736-02	6.944-04	4.022-04
1.264+03	1.702-06	2.308-05	4.470-03	6.065-02	7.301-04	4.117-04
1.266+03	1.282-06	2.391-05	3.379-03	6.301-02	7.546-04	4.156-04
1.268+03	1.333-06	2.427-05	3.523-03	6.416-02	7.514-04	4.030-04
1.270+03	1.656-06	2.348-05	4.390-03	6.225-02	7.246-04	3.899-04
1.272+03	2.029-06	2.202-05	5.396-03	5.856-02	6.896-04	3.823-04
1.274+03	2.752-06	2.002-05	7.342-03	5.340-02	6.422-04	3.726-04
1.276+03	3.472-06	1.878-05	9.291-03	5.027-02	6.026-04	3.610-04
1.278+03	3.687-06	1.769-05	9.899-03	4.750-02	5.853-04	3.671-04
1.280+03	3.476-06	1.768-05	9.361-03	4.762-02	5.993-04	3.785-04
1.282+03	3.220-06	1.852-05	8.699-03	5.003-02	6.259-04	3.833-04
1.284+03	3.640-06	1.933-05	7.155-03	5.238-02	6.599-04	3.947-04
1.286+03	2.176-06	1.950-05	5.917-03	5.301-02	6.826-04	4.039-04
1.288+03	2.047-06	1.995-05	5.583-03	5.492-02	6.954-04	3.979-04
1.290+03	2.364-06	1.976-05	6.468-03	5.407-02	6.842-04	3.926-04
1.292+03	3.001-06	1.951-05	8.238-03	5.354-02	6.567-04	3.806-04
1.294+03	3.974-06	2.042-05	1.094-02	5.624-02	6.310-04	3.532-04
1.296+03	4.753-06	2.193-05	1.313-02	6.059-02	6.213-04	3.235-04
1.298+03	5.380-06	2.306-05	1.491-02	6.392-02	6.144-04	2.964-04
1.300+03	5.552-06	2.433-05	1.544-02	6.765-02	6.229-04	2.730-04

LAYER(1 IS NEAREST GROUND) = 7

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	2.485-08	2.245-07	7.767-05	7.015-04	2.643-04	2.479-04
1.152+03	2.526-08	2.201-07	7.917-05	6.899-04	2.642-04	2.478-04
1.154+03	2.300-08	1.783-07	7.230-05	5.603-04	2.422-04	2.287-04
1.156+03	2.083-08	1.469-07	6.566-05	4.630-04	2.203-04	2.096-04
1.158+03	2.011-08	1.529-07	6.359-05	4.834-04	2.088-04	1.993-04
1.160+03	2.019-08	1.657-07	6.402-05	5.255-04	2.018-04	1.930-04
1.162+03	2.214-08	1.993-07	7.041-05	6.337-04	2.063-04	1.969-04
1.164+03	2.627-08	2.557-07	8.378-05	8.156-04	2.275-04	2.156-04
1.166+03	2.981-08	3.574-07	9.469-05	1.143-03	2.632-04	2.493-04
1.168+03	3.163-08	4.093-07	1.015-04	1.313-03	2.887-04	2.642-04
1.170+03	3.378-08	4.614-07	1.087-04	1.486-03	3.140-04	2.838-04
1.172+03	3.555-08	5.144-07	1.147-04	1.660-03	3.383-04	3.023-04
1.174+03	3.595-08	5.601-07	1.164-04	1.813-03	3.535-04	3.126-04
1.176+03	3.629-08	4.738-07	1.178-04	1.538-03	3.331-04	2.978-04
1.178+03	3.641-08	4.618-07	1.186-04	1.504-03	3.172-04	2.869-04
1.180+03	3.725-08	5.384-07	1.217-04	1.759-03	3.115-04	2.838-04
1.182+03	3.879-08	6.122-07	1.269-04	2.006-03	3.048-04	2.797-04
1.184+03	4.544-08	6.944-07	1.493-04	2.282-03	3.024-04	2.798-04
1.186+03	5.403-08	8.508-07	1.781-04	2.805-03	3.169-04	2.911-04
1.188+03	8.080-08	8.909-07	2.672-04	2.946-03	3.160-04	2.902-04
1.190+03	1.145-07	8.622-07	3.799-04	2.860-03	3.060-04	2.821-04
1.192+03	1.500-07	8.489-07	4.993-04	2.825-03	2.983-04	2.758-04
1.194+03	1.813-07	8.285-07	6.052-04	2.765-03	2.885-04	2.675-04
1.196+03	2.180-07	8.143-07	7.300-04	2.727-03	2.792-04	2.597-04
1.198+03	2.208-07	8.319-07	7.417-04	2.794-03	2.802-04	2.599-04
1.200+03	2.068-07	7.246-07	6.969-04	2.442-03	2.666-04	2.490-04
1.202+03	1.997-07	6.566-07	6.751-04	2.220-03	2.568-04	2.413-04
1.204+03	1.944-07	7.512-07	6.593-04	2.548-03	2.722-04	2.513-04
1.206+03	2.064-07	9.048-07	7.024-04	3.079-03	3.012-04	2.728-04
1.208+03	2.916-07	1.098-06	8.249-04	3.747-03	3.344-04	2.982-04
1.210+03	3.181-07	1.558-06	1.089-03	5.337-03	3.924-04	3.421-04
1.212+03	4.455-07	2.096-06	1.531-03	7.202-03	4.482-04	3.836-04
1.214+03	6.448-07	2.481-06	2.223-03	8.551-03	4.652-04	3.995-04
1.216+03	8.136-07	2.848-06	2.814-03	9.849-03	4.733-04	4.067-04
1.218+03	9.782-07	3.359-06	3.394-03	1.165-02	4.900-04	4.178-04
1.220+03	1.140-06	3.682-06	3.970-03	1.282-02	4.858-04	4.132-04
1.222+03	1.276-06	3.955-06	4.458-03	1.382-02	4.724-04	4.006-04
1.224+03	1.293-06	4.105-06	4.533-03	1.439-02	4.668-04	3.911-04
1.226+03	1.349-06	4.168-06	4.743-03	1.466-02	4.442-04	3.700-04
1.228+03	1.474-06	4.206-06	5.199-03	1.484-02	3.984-04	3.328-04
1.230+03	1.601-06	4.462-06	5.670-03	1.580-02	3.669-04	3.051-04
1.232+03	1.652-06	4.551-06	5.870-03	1.617-02	3.477-04	2.894-04
1.234+03	1.836-06	5.101-06	6.546-03	1.818-02	3.484-04	2.873-04
1.236+03	1.961-06	5.929-06	7.015-03	2.121-02	3.844-04	3.080-04
1.238+03	2.040-06	6.753-06	7.322-03	2.424-02	4.374-04	3.408-04
1.240+03	2.097-06	7.500-06	7.551-03	2.701-02	4.869-04	3.708-04
1.242+03	2.276-06	8.474-06	8.226-03	3.062-02	5.233-04	3.883-04
1.244+03	2.284-06	8.834-06	8.284-03	3.204-02	5.413-04	3.954-04
1.246+03	2.407-06	9.100-06	8.760-03	3.312-02	5.261-04	3.818-04
1.248+03	2.511-06	9.104-06	9.172-03	3.325-02	4.995-04	3.620-04
1.250+03	2.531-06	8.753-06	9.275-03	3.208-02	4.748-04	3.474-04
1.252+03	2.329-06	8.542-06	8.566-03	3.142-02	4.748-04	3.431-04
1.254+03	2.237-06	9.122-06	8.257-03	3.367-02	4.937-04	3.445-04

1.256+03	1.987-06	9.520-06	7.362-03	3.526-02	5.312-04	3.595-04
1.258+03	1.621-06	1.014-05	6.025-03	3.768-02	5.893-04	3.851-04
1.260+03	1.298-06	1.140-05	4.842-03	4.252-02	6.513-04	4.022-04
1.262+03	1.109-06	1.234-05	4.152-03	4.620-02	6.955-04	4.145-04
1.264+03	8.253-07	1.259-05	3.101-03	4.733-02	7.309-04	4.243-04
1.266+03	6.187-07	1.268-05	2.333-03	4.782-02	7.553-04	4.282-04
1.268+03	6.562-07	1.278-05	2.484-03	4.835-02	7.521-04	4.158-04
1.270+03	8.325-07	1.221-05	3.162-03	4.640-02	7.254-04	4.021-04
1.272+03	1.032-06	1.130-05	3.935-03	4.308-02	6.907-04	3.934-04
1.274+03	1.409-06	1.064-05	5.391-03	4.073-02	6.436-04	3.833-04
1.276+03	1.778-06	1.050-05	6.828-03	4.032-02	6.044-04	3.715-04
1.278+03	1.878-06	1.007-05	7.241-03	3.881-02	5.872-04	3.771-04
1.280+03	1.758-06	1.008-05	6.804-03	3.902-02	6.011-04	3.886-04
1.282+03	1.616-06	1.075-05	6.278-03	4.174-02	6.275-04	3.940-04
1.284+03	1.309-06	1.095-05	5.104-03	4.268-02	6.612-04	4.057-04
1.286+03	1.073-06	1.083-05	4.198-03	4.239-02	6.837-04	4.148-04
1.288+03	1.014-06	1.123-05	3.982-03	4.409-02	6.964-04	4.071-04
1.290+03	1.180-06	1.143-05	4.653-03	4.508-02	6.854-04	4.040-04
1.292+03	1.514-06	1.162-05	5.993-03	4.598-02	6.582-04	3.922-04
1.294+03	2.011-06	1.292-05	7.986-03	5.133-02	6.330-04	3.661-04
1.296+03	2.388-06	1.477-05	9.521-03	5.889-02	6.237-04	3.383-04
1.298+03	2.685-06	1.644-05	1.075-02	6.579-02	6.171-04	3.128-04
1.300+03	2.756-06	1.779-05	1.107-02	7.146-02	6.256-04	2.907-04

LAYER (1 IS NEAREST GROUND) = 8

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	1.122-09	1.168-08	5.486-06	5.714-05	2.643-04	2.479-04
1.152+03	1.151-09	1.147-08	5.650-06	5.630-05	2.692-04	2.478-04
1.154+03	1.057-09	9.256-09	5.218-06	4.561-05	2.422-04	2.287-04
1.156+03	9.704-10	7.811-09	4.799-06	3.862-05	2.203-04	2.097-04
1.158+03	9.549-10	8.761-09	4.737-06	4.348-05	2.089-04	1.993-04
1.160+03	9.750-10	1.005-08	4.857-06	5.008-05	2.018-04	1.930-04
1.162+03	1.084-09	1.242-08	5.422-06	6.211-05	2.063-04	1.969-04
1.164+03	1.289-09	1.595-08	6.467-06	8.006-05	2.275-04	2.156-04
1.166+03	1.443-09	2.113-08	7.270-06	1.064-04	2.632-04	2.443-04
1.168+03	1.535-09	2.279-08	7.760-06	1.152-04	2.887-04	2.642-04
1.170+03	1.640-09	2.448-08	8.322-06	1.242-04	3.140-04	2.838-04
1.172+03	1.735-09	2.628-08	8.838-06	1.339-04	3.383-04	3.029-04
1.174+03	1.777-09	2.781-08	9.084-06	1.422-04	3.535-04	3.127-04
1.176+03	1.825-09	2.328-08	9.369-06	1.195-04	3.331-04	2.978-04
1.178+03	1.929-09	2.427-08	9.937-06	1.250-04	3.172-04	2.870-04
1.180+03	2.408-09	3.206-08	1.245-05	1.658-04	3.115-04	2.838-04
1.182+03	3.293-09	4.021-08	1.710-05	2.088-04	3.048-04	2.798-04
1.184+03	5.835-09	5.076-08	3.041-05	2.646-04	3.024-04	2.798-04
1.186+03	8.926-09	6.542-08	4.670-05	3.423-04	3.169-04	2.911-04
1.188+03	1.974-08	8.223-08	1.037-04	4.319-04	3.160-04	2.903-04
1.190+03	3.360-08	9.737-08	1.772-04	5.134-04	3.061-04	2.822-04
1.192+03	4.834-08	1.142-07	2.559-04	6.046-04	2.983-04	2.759-04
1.194+03	6.213-08	1.292-07	3.302-04	6.867-04	2.886-04	2.676-04
1.196+03	7.861-08	1.475-07	4.194-04	7.872-04	2.792-04	2.598-04
1.198+03	8.050-08	1.490-07	4.312-04	7.978-04	2.803-04	2.601-04
1.200+03	7.544-08	1.340-07	4.057-04	7.204-04	2.667-04	2.492-04
1.202+03	7.334-08	1.363-07	3.959-04	7.357-04	2.569-04	2.415-04
1.204+03	7.169-08	1.695-07	3.886-04	9.185-04	2.723-04	2.514-04
1.206+03	7.784-08	2.247-07	4.236-04	1.223-03	3.013-04	2.731-04
1.208+03	9.401-08	2.971-07	5.137-04	1.623-03	3.345-04	2.985-04
1.210+03	1.283-07	3.917-07	7.039-04	2.368-03	3.926-04	3.425-04
1.212+03	1.846-07	6.171-07	1.017-03	3.399-03	4.484-04	3.842-04
1.214+03	2.715-07	8.243-07	1.502-03	4.559-03	4.654-04	4.004-04
1.216+03	3.439-07	1.010-06	1.909-03	5.610-03	4.737-04	4.077-04
1.218+03	4.144-07	1.239-06	2.310-03	6.911-03	4.904-04	4.190-04
1.220+03	4.842-07	1.440-06	2.711-03	8.044-03	4.863-04	4.146-04
1.222+03	5.427-07	1.633-06	3.051-03	9.178-03	4.729-04	4.022-04
1.224+03	5.512-07	1.715-06	3.112-03	9.683-03	4.673-04	3.929-04
1.226+03	5.794-07	1.805-06	3.284-03	1.023-02	4.448-04	3.718-04
1.228+03	6.346-07	1.969-06	3.612-03	1.120-02	3.991-04	3.348-04
1.230+03	6.870-07	2.224-06	3.927-03	1.271-02	3.675-04	3.074-04
1.232+03	7.054-07	2.366-06	4.048-03	1.358-02	3.484-04	2.917-04
1.234+03	7.788-07	2.755-06	4.489-03	1.588-02	3.492-04	2.900-04
1.236+03	8.224-07	3.230-06	4.760-03	1.870-02	3.852-04	3.112-04
1.238+03	8.504-07	3.666-06	4.943-03	2.131-02	4.382-04	3.445-04
1.240+03	8.730-07	4.074-06	5.075-03	2.378-02	4.878-04	3.749-04
1.242+03	9.511-07	4.634-06	5.575-03	2.716-02	5.242-04	3.929-04
1.244+03	9.572-07	4.847-06	5.635-03	2.853-02	5.423-04	4.002-04
1.246+03	1.015-06	5.100-06	6.001-03	3.015-02	5.271-04	3.869-04
1.248+03	1.064-06	5.196-06	6.320-03	3.085-02	5.006-04	3.672-04
1.250+03	1.078-06	5.040-06	6.427-03	3.005-02	4.759-04	3.524-04
1.252+03	9.942-07	4.928-06	5.953-03	2.951-02	4.758-04	3.481-04
1.254+03	9.561-07	5.316-06	5.750-03	3.197-02	4.947-04	3.499-04

1.256+03	8.505-07	5.540-06	5.138-03	3.396-02	5.321-04	3.650-04
1.258+03	6.943-07	5.869-06	4.212-03	3.560-02	5.900-04	3.910-04
1.260+03	5.554-07	6.629-06	3.384-03	4.039-02	6.518-04	4.088-04
1.262+03	4.745-07	7.222-06	2.904-03	4.420-02	6.959-04	4.218-04
1.264+03	3.537-07	7.317-06	2.174-03	4.498-02	7.313-04	4.316-04
1.266+03	2.675-07	7.310-06	1.651-03	4.513-02	7.555-04	4.356-04
1.268+03	2.893-07	7.380-06	1.794-03	4.576-02	7.529-04	4.232-04
1.270+03	3.730-07	7.096-06	2.323-03	4.389-02	7.258-04	4.091-04
1.272+03	4.671-07	6.490-06	2.922-03	4.060-02	6.711-04	4.001-04
1.274+03	4.394-07	6.238-06	4.018-03	3.920-02	6.442-04	3.895-04
1.276+03	8.042-07	6.305-06	5.076-03	3.980-02	6.052-04	3.778-04
1.278+03	8.463-07	6.080-06	5.366-03	3.854-02	5.880-04	3.832-04
1.280+03	7.890-07	6.115-06	5.025-03	3.895-02	6.019-04	3.947-04
1.282+03	7.210-07	6.579-06	4.613-03	4.209-02	6.283-04	4.006-04
1.284+03	5.790-07	6.612-06	3.720-03	4.249-02	6.618-04	4.123-04
1.286+03	4.717-07	6.464-06	3.045-03	4.173-02	6.842-04	4.212-04
1.288+03	4.442-07	6.736-06	2.880-03	4.368-02	6.968-04	4.159-04
1.290+03	5.145-07	6.862-06	3.351-03	4.469-02	6.859-04	4.109-04
1.292+03	6.591-07	6.968-06	4.313-03	4.559-02	6.588-04	3.991-04
1.294+03	8.713-07	7.915-06	5.727-03	5.203-02	6.339-04	3.741-04
1.296+03	1.025-06	9.345-06	6.771-03	6.171-02	6.247-04	3.477-04
1.298+03	1.145-06	1.077-05	7.593-03	7.146-02	6.182-04	3.236-04
1.300+03	1.169-06	1.196-05	7.793-03	7.974-02	6.268-04	3.027-04

LAYER(1 IS NEAREST GROUND) = 9

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	0.000	0.000	0.000	0.000	2.643-04	2.479-04
1.152+03	0.000	0.000	0.000	0.000	2.642-04	2.478-04
1.154+03	0.000	0.000	0.000	0.000	2.422-04	2.287-04
1.156+03	0.000	0.000	0.000	0.000	2.203-04	2.097-04
1.158+03	0.000	0.000	0.000	0.000	2.089-04	1.993-04
1.160+03	0.000	0.000	0.000	0.000	2.018-04	1.930-04
1.162+03	0.000	0.000	0.000	0.000	2.063-04	1.969-04
1.164+03	0.000	0.000	0.000	0.000	2.275-04	2.156-04
1.166+03	2.283-15	4.425-15	2.295-11	4.448-11	2.632-04	2.443-04
1.168+03	5.515-14	8.386-14	5.571-10	8.471-10	2.887-04	2.642-04
1.170+03	2.054-13	2.982-13	2.085-09	3.027-09	3.140-04	2.838-04
1.172+03	5.393-13	7.627-13	5.502-09	7.781-09	3.383-04	3.029-04
1.174+03	1.237-12	1.688-12	1.269-08	1.730-08	3.535-04	3.127-04
1.176+03	2.839-12	3.895-12	2.925-08	4.013-08	3.331-04	2.978-04
1.178+03	2.717-11	1.615-10	2.813-07	1.672-06	3.172-04	2.870-04
1.180+03	1.590-10	7.993-10	1.655-06	8.313-06	3.116-04	2.838-04
1.182+03	4.055-10	1.624-09	4.242-06	1.679-05	3.048-04	2.798-04
1.184+03	1.047-09	3.036-09	1.100-05	3.192-05	3.029-04	2.798-04
1.186+03	1.798-09	4.582-09	1.900-05	4.841-05	3.169-04	2.911-04
1.188+03	4.643-09	9.133-09	4.930-05	9.699-05	3.160-04	2.903-04
1.190+03	8.330-09	1.448-08	8.891-05	1.545-04	3.061-04	2.822-04
1.192+03	1.225-08	2.004-08	1.314-04	2.150-04	2.983-04	2.759-04
1.194+03	1.597-08	2.520-08	1.722-04	2.717-04	2.886-04	2.677-04
1.196+03	2.046-08	3.133-08	2.218-04	3.395-04	2.793-04	2.599-04
1.198+03	2.101-08	3.140-08	2.289-04	3.421-04	2.803-04	2.601-04
1.200+03	1.966-08	2.841-08	2.153-04	3.133-04	2.667-04	2.492-04
1.202+03	1.941-08	3.157-08	2.136-04	3.475-04	2.569-04	2.415-04
1.204+03	1.945-08	4.251-08	2.151-04	4.703-04	2.723-04	2.515-04
1.206+03	2.216-08	6.126-08	2.465-04	6.813-04	3.013-04	2.731-04
1.208+03	2.770-08	8.508-08	3.097-04	9.510-04	3.345-04	2.985-04
1.210+03	3.868-08	1.269-07	4.346-04	1.426-03	3.926-04	3.426-04
1.212+03	5.579-08	1.897-07	6.302-04	2.143-03	4.484-04	3.844-04
1.214+03	8.162-08	2.673-07	9.267-04	3.035-03	4.655-04	4.006-04
1.216+03	1.026-07	3.367-07	1.171-03	3.844-03	4.738-04	4.080-04
1.218+03	1.230-07	4.194-07	1.411-03	4.813-03	4.904-04	4.194-04
1.220+03	1.433-07	4.980-07	1.653-03	5.745-03	4.864-04	4.151-04
1.222+03	1.604-07	5.773-07	1.860-03	6.695-03	4.731-04	4.028-04
1.224+03	1.633-07	6.139-07	1.904-03	7.157-03	4.675-04	3.935-04
1.226+03	1.730-07	6.570-07	2.027-03	7.700-03	4.950-04	3.725-04
1.228+03	1.895-07	7.416-07	2.233-03	8.738-03	3.993-04	3.356-04
1.230+03	2.035-07	8.691-07	2.410-03	1.024-02	3.677-04	3.082-04
1.232+03	2.073-07	9.399-07	2.469-03	1.119-02	3.486-04	2.927-04
1.234+03	2.263-07	1.114-06	2.709-03	1.334-02	3.494-04	2.912-04
1.236+03	2.350-07	1.320-06	2.829-03	1.589-02	3.855-04	3.126-04
1.238+03	2.410-07	1.515-06	2.916-03	1.833-02	4.385-04	3.460-04
1.240+03	2.472-07	1.716-06	3.008-03	2.088-02	4.880-04	3.766-04
1.242+03	2.707-07	1.984-06	3.312-03	2.430-02	5.245-04	3.949-04
1.244+03	2.747-07	2.117-06	3.380-03	2.604-02	5.425-04	4.023-04
1.246+03	2.953-07	2.287-06	3.652-03	2.829-02	5.274-04	3.892-04
1.248+03	3.131-07	2.385-06	3.894-03	2.966-02	5.009-04	3.696-04
1.250+03	3.206-07	2.341-06	4.009-03	2.927-02	4.762-04	3.547-04
1.252+03	2.985-07	2.325-06	3.754-03	2.923-02	4.741-04	3.504-04
1.254+03	2.885-07	2.543-06	3.647-03	3.215-02	4.950-04	3.524-04

1.256+03	2.580-07	2.664-06	3.280-03	3.387-02	5.329-04	3.677-04
1.258+03	2.121-07	2.826-06	2.711-03	3.613-02	5.902-04	3.938-04
1.260+03	1.702-07	3.227-06	2.188-03	4.148-02	6.520-04	4.120-04
1.262+03	1.455-07	3.547-06	1.881-03	4.585-02	6.961-04	4.253-04
1.264+03	1.093-07	3.627-06	1.420-03	4.714-02	7.314-04	4.353-04
1.266+03	8.428-08	3.667-06	1.102-03	4.793-02	7.556-04	4.392-04
1.268+03	9.343-08	3.768-06	1.228-03	4.952-02	7.529-04	4.269-04
1.270+03	1.228-07	3.645-06	1.623-03	4.818-02	7.259-04	4.128-04
1.272+03	1.556-07	3.395-06	2.069-03	4.513-02	6.913-04	4.035-04
1.274+03	2.136-07	3.298-06	2.855-03	4.408-02	6.444-04	3.928-04
1.276+03	2.673-07	3.369-06	3.593-03	4.528-02	6.054-04	3.812-04
1.278+03	2.804-07	3.241-06	3.791-03	4.382-02	5.883-04	3.864-04
1.280+03	2.409-07	3.266-06	3.547-03	4.440-02	6.022-04	3.980-04
1.282+03	2.374-07	3.516-06	3.245-03	4.807-02	6.285-04	4.041-04
1.284+03	1.891-07	3.511-06	2.600-03	4.828-02	6.619-04	4.158-04
1.286+03	1.527-07	3.390-06	2.111-03	4.689-02	6.843-04	4.246-04
1.288+03	1.420-07	3.518-06	1.975-03	4.893-02	6.970-04	4.199-04
1.290+03	1.615-07	3.503-06	2.259-03	4.900-02	6.860-04	4.144-04
1.292+03	2.044-07	3.471-06	2.875-03	4.883-02	6.520-04	4.024-04
1.294+03	2.681-07	3.923-06	3.793-03	5.551-02	6.341-04	3.780-04
1.296+03	3.125-07	4.716-06	4.447-03	6.711-02	6.250-04	3.524-04
1.298+03	3.463-07	5.609-06	4.957-03	8.021-02	6.186-04	3.292-04
1.300+03	3.529-07	6.422-06	5.080-03	9.245-02	6.271-04	3.091-04

LAYER(1 IS NEAREST GROUND) = 10

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.150+03	4.755-07	6.818-07	4.115-03	5.901-03	2.648-04	2.486-04
1.152+03	4.377-07	6.363-07	3.806-03	5.533-03	2.646-04	2.485-04
1.154+03	4.226-07	5.978-07	3.691-03	5.222-03	2.426-04	2.293-04
1.156+03	4.111-07	5.628-07	3.608-03	4.939-03	2.208-04	2.102-04
1.158+03	3.913-07	5.254-07	3.450-03	4.632-03	2.092-04	1.999-04
1.160+03	3.700-07	4.896-07	3.277-03	4.337-03	2.022-04	1.935-04
1.162+03	3.454-07	4.595-07	3.074-03	4.089-03	2.066-04	1.974-04
1.164+03	3.079-07	4.280-07	2.753-03	3.827-03	2.278-04	2.161-04
1.166+03	2.659-07	3.933-07	2.389-03	3.533-03	2.634-04	2.497-04
1.168+03	2.317-07	3.569-07	2.091-03	3.221-03	2.889-04	2.645-04
1.170+03	2.015-07	3.295-07	1.827-03	2.993-03	3.142-04	2.841-04
1.172+03	1.727-07	2.917-07	1.573-03	2.658-03	3.384-04	3.027-04
1.174+03	1.419-07	2.500-07	1.299-03	2.288-03	3.537-04	3.129-04
1.176+03	1.167-07	2.034-07	1.073-03	1.871-03	3.332-04	2.980-04
1.178+03	9.013-08	1.562-07	8.331-04	1.443-03	3.173-04	2.871-04
1.180+03	6.242-08	1.076-07	5.797-04	9.994-04	3.116-04	2.839-04
1.182+03	3.777-08	6.370-08	3.525-04	5.945-04	3.048-04	2.798-04
1.184+03	2.343-08	3.591-08	2.197-04	3.368-04	3.025-04	2.799-04
1.186+03	1.252-08	1.984-08	1.180-04	1.870-04	3.169-04	2.912-04
1.188+03	9.159-09	1.680-08	8.673-05	1.591-04	3.160-04	2.903-04
1.190+03	1.149-08	2.082-08	1.094-04	1.982-04	3.061-04	2.823-04
1.192+03	1.629-08	2.786-08	1.558-04	2.664-04	2.984-04	2.760-04
1.194+03	2.078-08	3.420-08	1.997-04	3.286-04	2.886-04	2.677-04
1.196+03	2.633-08	4.191-08	2.542-04	4.047-04	2.793-04	2.599-04
1.198+03	2.655-08	4.106-08	2.577-04	3.985-04	2.804-04	2.602-04
1.200+03	2.430-08	3.650-08	2.370-04	3.560-04	2.667-04	2.492-04
1.202+03	2.365-08	3.923-08	2.318-04	3.845-04	2.569-04	2.415-04
1.204+03	2.349-08	4.980-08	2.313-04	4.905-04	2.723-04	2.515-04
1.206+03	2.599-08	7.085-08	2.572-04	7.014-04	3.013-04	2.732-04
1.208+03	3.211-08	9.913-08	3.194-04	9.862-04	3.345-04	2.986-04
1.210+03	4.481-08	1.529-07	4.481-04	1.529-03	3.926-04	3.428-04
1.212+03	6.161-08	2.373-07	6.191-04	2.384-03	4.485-04	3.847-04
1.214+03	8.627-08	3.476-07	8.713-04	3.511-03	4.656-04	4.010-04
1.216+03	1.061-07	4.498-07	1.077-03	4.566-03	4.739-04	4.085-04
1.218+03	1.252-07	5.628-07	1.277-03	5.742-03	4.907-04	4.200-04
1.220+03	1.429-07	6.727-07	1.466-03	6.898-03	4.866-04	4.158-04
1.222+03	1.574-07	7.929-07	1.62[illegible]-03	8.173-03	4.732-04	4.036-04
1.224+03	1.589-07	8.566-07	1.646-03	8.874-03	4.676-04	3.943-04
1.226+03	1.659-07	9.301-07	1.727-03	9.685-03	4.451-04	3.734-04
1.228+03	1.757-07	1.071-06	1.839-03	1.121-02	3.994-04	3.366-04
1.230+03	1.787-07	1.258-06	1.880-03	1.323-02	3.679-04	3.095-04
1.232+03	1.731-07	1.364-06	1.831-03	1.443-02	3.488-04	2.940-04
1.234+03	1.775-07	1.626-06	1.887-03	1.728-02	3.496-04	2.928-04
1.236+03	1.718-07	1.938-06	1.835-03	2.071-02	3.854-04	3.195-04
1.238+03	1.648-07	2.290-06	1.770-03	2.406-02	4.386-04	3.682-04
1.240+03	1.616-07	2.557-06	1.745-03	2.761-02	4.882-04	3.792-04
1.242+03	1.715-07	2.942-06	1.861-03	3.193-02	5.247-04	3.979-04
1.244+03	1.705-07	3.085-06	1.860-03	3.366-02	5.427-04	4.054-04
1.246+03	1.821-07	3.291-06	1.997-03	3.610-02	5.276-04	3.925-04
1.248+03	1.922-07	3.388-06	2.120-03	3.736-02	5.011-04	3.730-04
1.250+03	1.977-07	3.281-06	2.191-03	3.637-02	4.764-04	3.580-04
1.252+03	1.848-07	3.307-06	2.059-03	3.685-02	4.762-04	3.537-04
1.254+03	1.773-07	3.720-06	1.986-03	4.167-02	4.951-04	3.561-04

1.256+03	1.576-07	3.968-06	1.775-03	4.469-02	5.325-04	3.717-04
1.258+03	1.294-07	4.288-06	1.466-03	4.856-02	5.903-04	3.981-04
1.260+03	1.020-07	5.081-06	1.161-03	5.693-02	6.521-04	4.170-04
1.262+03	8.517-08	5.534-06	9.798-04	6.333-02	6.962-04	4.308-04
1.264+03	6.347-08	5.700-06	7.303-04	6.558-02	7.315-04	4.410-04
1.266+03	4.839-08	5.803-06	5.632-04	6.712-02	7.557-04	4.450-04
1.268+03	5.2e6-08	5.993-06	6.125-04	6.970-02	7.525-04	4.329-04
1.270+03	6.848-08	5.781-06	8.008-04	6.760-02	7.260-04	4.185-04
1.272+03	8.643-08	5.361-06	1.016-03	6.303-02	6.914-04	4.089-04
1.274+03	1.179-07	5.162-06	1.394-03	6.102-02	6.446-04	3.980-04
1.276+03	1.465-07	5.257-06	1.742-03	6.248-02	6.056-04	3.869-04
1.278+03	1.531-07	5.002-06	1.830-03	5.978-02	5.885-04	3.914-04
1.280+03	1.420-07	5.031-06	1.707-03	6.046-02	6.023-04	4.030-04
1.282+03	1.286-07	5.413-06	1.554-03	6.540-02	6.286-04	4.093-04
1.284+03	1.038-07	5.366-06	1.262-03	6.519-02	6.620-04	4.211-04
1.286+03	8.633-08	5.075-06	1.055-03	6.199-02	6.844-04	4.297-04
1.288+03	8.283-08	5.233-06	1.017-03	6.428-02	6.970-04	4.246-04
1.290+03	9.614-08	5.110-06	1.187-03	6.312-02	6.861-04	4.195-04
1.292+03	1.226-07	5.005-06	1.522-03	6.216-02	6.592-04	4.076-04
1.294+03	1.564-07	5.718-06	1.953-03	7.142-02	6.343-04	3.837-04
1.296+03	1.788-07	6.958-06	2.246-03	8.738-02	6.252-04	3.593-04
1.298+03	1.953-07	8.289-06	2.466-03	1.047-01	6.188-04	3.375-04
1.300+03	1.961-07	9.547-06	2.491-03	1.212-01	6.273-04	3.187-04

```
LAYERS= 10 DV=    .050 DELV=    2.0000 V1= 1300.0000 V2= 1450.0000 A=   10.0000 BOUND=   12.0000 TBOUND=  296.0000

 SATELLITE ALTITUDE=   2.0000+01   SATELLITE LATITUDE=   29.0000   SATELLITE LONGITUDE=   90.0000

 TARGET ALTITUDE=   0.00          TARGET LATITUDE=   29.0000   TARGET LONGITUDE=   90.0000

 SURFACE TEMP=   298.000   EMISS=1.00000000


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODTRAN
  9.5086459+02  2.9682742+02  1.1079745-03  3.4662387+02  9.8053455+02
  2.9899001+02  2.8756886+01  1.8309502-05  2.8901250+02  1.2056196+01
  1.9822314+01  6.0821335+01  1.1860418+01  1.9351536+01  8.7523764+00
  1.1765745+01  1.0002726+00  1.0002519+00  1.8002373+01  2.9240810+01
  0.0000000     0.0000000     0.0000000     0.0000000     -8.0397966-03
  2.8756886+01  2.3209437+19  0.0000000     0.0000000     0.0000000
  0.0000000     0.0000000     0.0000000     0.0000000     0.0000000

  1.1477531+00 PREC CM OF WATER IN LAYER      1


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODTRAN
  8.5059386+02  2.9052625+02  1.0232307-03  3.4234557+02  9.8025697+02
  2.9165484+02  2.8854311+01  1.8008233-05  2.7774288+02  6.2350341+00
  1.4792157+01  4.2150945+01  6.1722170+00  1.4519362+01  8.5400704+00
  1.0187760+01  1.0002726+00  1.0002295+00  8.4687738+00  1.9821536+01
  0.0000000     0.0000000     0.0000000     0.0000000     -2.5215943-03
  2.8854311+01  2.1357219+19  0.0000000     0.0000000     0.0000000
  0.0000000     0.0000000     0.0000000     0.0000000     0.0000000

  6.1228293-01 PREC CM OF WATER IN LAYER      2


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODTRAN
  7.6232314+02  2.8478924+02  9.3107337-04  3.3856465+02  9.7995376+02
  2.8524825+02  2.8919789+01  1.7731186-05  2.6469786+02  2.6557821+00
  1.1403800+01  2.3288571+01  2.6395895+00  1.1236030+01  8.3550606+00
  1.0802654+01  1.0002726+00  1.0002063+00  3.2300547+00  1.3678131+01
  0.0000000     0.0000000     0.0000000     0.0000000     -8.2598234-03
  2.8919789+01  1.9389680+19  0.0000000     0.0000000     0.0000000
  0.0000000     0.0000000     0.0000000     0.0000000     0.0000000

  2.3690345-01 PREC CM OF WATER IN LAYER      3


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODTRAN
  6.6805241+02  2.7904783+02  8.3335295-04  3.3500770+02  9.7961794+02
  2.7928611+02  2.8941686+01  1.7451237-05  2.5480489+02  1.3510472+00
  8.7832501+00  1.5382088+01  1.3450932+00  8.6799e-3+00  8.1832311+00
  1.0058457+01  1.0002726+00  1.0001827+00  1.4435729+00  9.2741803+00
  0.0000000     0.0000000     0.0000000     0.0000000     -6.5497397-03
  2.8941686+01  1.7341514+19  0.0000000     0.0000000     0.0000000
  0.0000000     0.0000000     0.0000000     0.0000000     0.0000000
```

1.2491755-01 PREC CH OF WATER IN LAYER 4

THE FOLLOWING DATA ARE 35 ATHOSPHERIC VARIABLES FROM HODATH

5.7378168+02	2.7328521+02	7.3122342-04	3.3144564+02	9.7923946+02
2.7337851+02	2.8956514+01	1.7167484-05	2.4328522+02	5.6008082-01
6.7721046+00	8.2704099+00	5.5826893-01	6.7084782+00	8.0132312+00
9.4839822+00	1.0002726+00	1.0001586+00	5.1484130-01	6.1635948+00
0.0000000	0.0000000	0.0000000	0.0000000	-5.2508938-03
2.8956514+01	1.5208475+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

5.2916323-02 PREC CH OF WATER IN LAYER 5

THE FOLLOWING DATA ARE 35 ATHOSPHERIC VARIABLES FROM HODATH

4.7951096+02	2.6287887+02	6.3539241-04	3.2504409+02	9.7880405+02
2.6292041+02	2.8961824+01	1.6647830-05	2.3278887+02	2.3890877-01
3.6612651+00	6.5253064+00	2.3830474-01	3.6395379+00	7.7100972+00
9.9033390+00	1.0002726+00	1.0001351+00	1.8369566-01	2.7997272+00
0.0000000	0.0000000	0.0000000	0.0000000	-7.5155742-03
2.8961824+01	1.3212895+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

2.3564659-02 PREC CH OF WATER IN LAYER 6

THE FOLLOWING DATA ARE 35 ATHOSPHERIC VARIABLES FROM HODATH

3.8524021+02	2.4995908+02	5.3690541-04	3.1694282+02	9.7830079+02
2.4997789+02	2.8964219+01	1.5989152-05	2.1995907+02	7.0809711-02
1.5369926+00	4.6067048+00	7.0664276-02	1.5316958+00	7.3343462+00
9.5619678+00	1.0002726+00	1.0001112+00	4.3766664-02	9.4783030-01
0.0000000	0.0000000	0.0000000	0.0000000	-7.9308712-03
2.8964219+01	1.1167948+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

7.2534634-03 PREC CH OF WATER IN LAYER 7

THE FOLLOWING DATA ARE 35 ATHOSPHERIC VARIABLES FROM HODATH

2.9096949+02	2.3413190+02	4.3296330-04	3.0673420+02	9.7768964+02
2.3413382+02	2.8966161+01	1.5160689-05	1.8517697+02	5.8068511-04
4.4803401-01	1.2960737-01	5.7974321-04	4.4710702-01	6.8737754+00
9.0605068+00	1.0002726+00	1.0000866+00	2.7121490-04	2.0910842-01
0.0000000	0.0000000	0.0000000	0.0000000	-8.2197334-03
2.8966161+01	9.0020619+18	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

9.1956143-04 PREC CH OF WATER IN LAYER 8

THE FOLLOWING DATA ARE 35 ATHOSPHERIC VARIABLES FROM HODATH

1.9669876+02	2.1354920+02	3.2090129-04	2.9299028+02	9.7690294+02

```
2.1354920+02  2.8966400+01  1.4095187-05  0.0000000  0.0000000
6.3136979-02  0.0000000     0.0000000     6.3053527-02  6.2744975+00
8.0550575+00  1.0002726+00  1.0000610+00  0.0000000  1.9939990-02
0.0000000     0.0000000     0.0000000     0.0000000  -7.5232757-03
2.8966400+01  6.6720426+18  0.0000000     0.0000000  0.0000000
0.0000000     0.0000000     0.0000000     0.0000000  0.0000000

 0.0000000    PREC CM OF WATER IN LAYER     9


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODTRN
 1.0239689+02  2.1665000+02  1.4465169-04  2.9506950+02  9.7572798+02
 2.1665000+02  2.8966400+01  1.4216287-05  0.0000000  0.0000000
 1.7852119-01  0.0000000     0.0000000     1.7838173-01  6.3732674+00
 6.3732674+00  1.0002726+00  1.0000316+00  0.0000000  2.9344367-02
 0.0000000     0.0000000     0.0000000     0.0000000  0.0000000
 2.8966400+01  3.4236014+18  0.0000000     0.0000000  0.0000000
 0.0000000     0.0000000     0.0000000     0.0000000  0.0000000

 0.0000000    PREC CM OF WATER IN LAYER    10


 LEVEL  1     P =      .93843+00     TEMP = 296.83
 WATERS =       .3833+23

 LEVEL  2     P =      .84539+00     TEMP = 290.53
 WATERS =       .2045+23

 LEVEL  3     P =      .75235+00     TEMP = 284.79
 WATERS =       .7913+22

 LEVEL  4     P =      .65931+00     TEMP = 279.05
 WATERS =       .4172+22

 LEVEL  5     P =      .56628+00     TEMP = 273.29
 WATERS =       .1767+22

 LEVEL  6     P =      .47324+00     TEMP = 262.88
 WATERS =       .7871+21

 LEVEL  7     P =      .38020+00     TEMP = 249.96
 WATERS =       .2423+21

 LEVEL  8     P =      .28716+00     TEMP = 234.13
 WATERS =       .3071+20

 LEVEL  9     P =      .19413+00     TEMP = 213.55
 WATERS =       .0000

 LEVEL 10     P =      .10106+00     TEMP = 216.65
 WATERS =       .0000

 FREQ       TRANS      ABS   UPWELLING RADIANCE     WAVELENGTH
 WAVE NO.                                          MICRONS

1300.00    .19891     .85109     1.240-04              7.69231
1302.00    .11949     .88551     9.515-05              7.68049
```

1304.00	.08151	.91849	6.760-05	7.66871
1306.00	.05827	.94173	4.823-05	7.65697
1308.00	.03722	.96278	3.074-05	7.64526
1310.00	.02188	.97812	1.803-05	7.63359
1312.00	.01415	.98585	1.164-05	7.62195
1314.00	.00966	.99034	7.929-06	7.61035
1316.00	.00868	.99132	7.109-06	7.59878
1318.00	.01369	.98631	1.119-05	7.58725
1320.00	.02126	.97874	1.735-05	7.57576
1322.00	.03353	.96647	2.730-05	7.56430
1324.00	.04899	.95101	3.980-05	7.55287
1326.00	.05976	.94025	4.845-05	7.54148
1328.00	.05993	.94007	4.849-05	7.53012
1330.00	.05634	.94366	4.548-05	7.51880
1332.00	.04731	.95269	3.811-05	7.50751
1334.00	.03231	.96769	2.597-05	7.49625
1336.00	.01960	.98040	1.572-05	7.48503
1338.00	.01324	.98674	1.060-05	7.47384
1340.00	.00900	.99100	7.185-06	7.46269
1342.00	.00755	.99245	6.014-06	7.45156
1344.00	.00946	.99054	7.522-06	7.44048
1346.00	.01048	.98952	8.313-06	7.42942
1348.00	.00936	.99064	7.408-06	7.41840
1350.00	.00781	.99219	6.166-06	7.40741
1352.00	.00611	.99389	4.810-06	7.39645
1354.00	.00373	.99627	2.935-06	7.38552
1356.00	.00196	.99804	1.536-06	7.37463
1358.00	.00123	.99877	9.660-07	7.36377
1360.00	.00069	.99931	5.359-07	7.35294
1362.00	.00021	.99979	1.665-07	7.34214
1364.00	.00008	.99992	6.375-08	7.33138
1366.00	.00003	.99997	2.459-08	7.32064
1368.00	.00000	1.00000	3.047-09	7.30994
1370.00	.00000	1.00000	2.178-09	7.29927
1372.00	.00001	.99999	1.140-08	7.28863
1374.00	.00005	.99995	3.469-08	7.27802
1376.00	.00008	.99992	5.843-08	7.26744
1378.00	.00011	.99989	8.252-08	7.25689
1380.00	.00014	.99986	1.067-07	7.24638
1382.00	.00015	.99985	1.113-07	7.23589
1384.00	.00012	.99988	8.785-08	7.22543
1386.00	.00008	.99992	6.347-08	7.21501
1388.00	.00005	.99995	3.919-08	7.20461
1390.00	.00002	.99998	1.503-08	7.19424
1392.00	.00000	1.00000	5.602-10	7.18391
1394.00	.00000	1.00000	9.208-12	7.17360
1396.00	.00000	1.00000	3.338-14	7.16332
1398.00	.00000	1.00000	6.993-12	7.15308
1400.00	.00000	1.00000	1.897-10	7.14286
1402.00	.00000	1.00000	4.409-10	7.13267
1404.00	.00000	1.00000	7.091-10	7.12251
1406.00	.00000	1.00000	1.009-09	7.11238
1408.00	.00000	1.00000	1.293-09	7.10227
1410.00	.00000	1.00000	1.229-09	7.09220
1412.00	.00000	1.00000	1.029-09	7.08215
1414.00	.00000	1.00000	7.923-10	7.07214
1416.00	.00000	1.00000	4.928-10	7.06215
1418.00	.00000	1.00000	2.013-10	7.05219

1420.00	.00000	1.00000	8.248-11	7.04225
1422.00	.00000	1.00000	3.174-11	7.03235
1424.00	.00000	1.00000	7.270-11	7.02247
1426.00	.00000	1.00000	7.231-15	7.01262
1428.00	.00000	1.00000	7.058-15	7.00280
1430.00	.00000	1.00000	5.458-15	6.99301
1432.00	.00000	1.00000	1.097-13	6.98324
1434.00	.00000	1.00000	4.907-11	6.97350
1436.00	.00000	1.00000	1.303-10	6.96379
1438.00	.00000	1.00000	2.114-10	6.95410
1440.00	.00000	1.00000	2.921-10	6.94444
1442.00	.00000	1.00000	3.721-10	6.93481
1444.00	.00000	1.00000	3.555-10	6.92521
1446.00	.00000	1.00000	2.747-10	6.91563
1448.00	.00000	1.00000	1.936-10	6.90608
1450.00	.00000	1.00000	1.129-10	6.89655

BETWEEN 1300.00 AND 1450.00 THE ABSORPTANCE IS .149+03

LAYER(1 IS NEAREST GROUND) = 1

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300*03	4.669-04	6.404-05	5.749-01	7.883-02	4.669-04	6.404-05
1.302*03	5.030-04	5.679-05	6.205-01	7.006-02	5.030-04	5.679-05
1.304*03	5.561-04	5.476-05	6.873-01	6.769-02	5.561-04	5.476-05
1.306*03	6.103-04	5.570-05	7.559-01	6.900-02	6.103-04	5.570-05
1.308*03	6.665-04	5.618-05	8.273-01	6.973-02	6.665-04	5.618-05
1.310*03	7.126-04	5.483-05	8.843-01	6.820-02	7.126-04	5.483-05
1.312*03	7.478-04	4.440-05	9.320-01	5.534-02	7.478-04	4.440-05
1.314*03	7.685-04	3.396-05	9.599-01	4.241-02	7.685-04	3.396-05
1.316*03	7.746-04	2.874-05	9.695-01	3.597-02	7.746-04	2.874-05
1.318*03	7.660-04	3.081-05	9.607-01	3.864-02	7.660-04	3.081-05
1.320*03	7.496-04	3.907-05	9.423-01	4.910-02	7.496-04	3.907-05
1.322*03	7.230-04	5.800-05	9.107-01	7.305-02	7.230-04	5.800-05
1.324*03	6.909-04	8.058-05	8.721-01	1.017-01	6.909-04	8.058-05
1.326*03	6.661-04	9.693-05	8.427-01	1.226-01	6.661-04	9.693-05
1.328*03	6.601-04	1.017-04	8.369-01	1.290-01	6.601-04	1.017-04
1.330*03	6.647-04	9.953-05	8.446-01	1.265-01	6.647-04	9.953-05
1.332*03	6.800-04	8.723-05	8.660-01	1.111-01	6.800-04	8.723-05
1.334*03	7.076-04	6.672-05	9.031-01	8.515-02	7.076-04	6.672-05
1.336*03	7.325-04	4.786-05	9.369-01	6.122-02	7.325-04	4.786-05
1.338*03	7.442-04	3.777-05	9.540-01	4.842-02	7.442-04	3.777-05
1.340*03	7.482-04	3.231-05	9.612-01	4.152-02	7.482-04	3.231-05
1.342*03	7.459-04	3.268-05	9.605-01	4.208-02	7.459-04	3.268-05
1.344*03	7.349-04	3.950-05	9.484-01	5.098-02	7.349-04	3.950-05
1.346*03	7.255-04	4.382-05	9.385-01	5.668-02	7.255-04	4.382-05
1.348*03	7.237-04	4.205-05	9.383-01	5.452-02	7.237-04	4.205-05
1.350*03	7.264-04	3.872-05	9.440-01	5.032-02	7.264-04	3.872-05
1.352*03	7.308-04	3.406-05	9.518-01	4.437-02	7.308-04	3.406-05
1.354*03	7.395-04	2.546-05	9.654-01	3.324-02	7.395-04	2.546-05
1.356*03	7.474-04	1.843-05	9.780-01	2.411-02	7.474-04	1.843-05
1.358*03	7.519-04	1.397-05	9.862-01	1.832-02	7.519-04	1.397-05
1.360*03	7.546-04	9.328-06	9.921-01	1.226-02	7.546-04	9.328-06
1.362*03	7.565-04	5.265-06	9.969-01	6.938-03	7.565-04	5.265-06
1.364*03	7.560-04	3.324-06	9.987-01	4.390-03	7.560-04	3.324-06
1.366*03	7.548-04	2.211-06	9.994-01	2.927-03	7.548-04	2.211-06
1.368*03	7.533-04	1.362-06	9.999-01	1.807-03	7.533-04	1.362-06
1.370*03	7.516-04	1.089-06	1.000+00	1.449-03	7.516-04	1.089-06
1.372*03	7.497-04	1.277-06	9.999-01	1.703-03	7.497-04	1.277-06
1.374*03	7.476-04	2.039-06	9.995-01	2.726-03	7.476-04	2.039-06
1.376*03	7.454-04	2.991-06	9.990-01	4.008-03	7.454-04	2.991-06
1.378*03	7.432-04	4.114-06	9.985-01	5.527-03	7.432-04	4.114-06
1.380*03	7.410-04	5.265-06	9.979-01	7.091-03	7.410-04	5.265-06
1.382*03	7.390-04	5.595-06	9.977-01	7.553-03	7.390-04	5.595-06
1.384*03	7.375-04	4.724-06	9.982-01	6.393-03	7.375-04	4.724-06
1.386*03	7.361-04	3.491-06	9.987-01	4.736-03	7.361-04	3.491-06
1.388*03	7.347-04	2.241-06	9.993-01	3.049-03	7.347-04	2.241-06
1.390*03	7.332-04	1.017-06	9.998-01	1.386-03	7.332-04	1.017-06
1.392*03	7.316-04	2.138-07	1.000+00	2.922-04	7.316-04	2.138-07
1.394*03	7.299-04	1.893-08	1.000+00	2.594-05	7.299-04	1.893-08
1.396*03	7.280-04	6.197-09	1.000+00	8.514-06	7.280-04	6.197-09
1.398*03	7.262-04	1.707-08	1.000+00	2.352-05	7.262-04	1.707-08
1.400*03	7.243-04	1.596-07	1.000+00	2.204-04	7.243-04	1.596-07
1.402*03	7.224-04	3.579-07	1.000+00	4.955-04	7.224-04	3.579-07
1.404*03	7.205-04	5.835-07	1.000+00	8.099-04	7.205-04	5.835-07

1.406+03	7.186-04	8.610-07	1.000+00	1.198-03	7.186-04	8.610-07
1.408+03	7.167-04	1.119-06	1.000+00	1.562-03	7.167-04	1.119-06
1.410+03	7.148-04	1.116-06	1.000+00	1.562-03	7.148-04	1.116-06
1.412+03	7.130-04	1.002-06	1.000+00	1.406-03	7.130-04	1.002-06
1.414+03	7.111-04	8.282-07	1.000+00	1.165-03	7.111-04	8.282-07
1.416+03	7.093-04	5.490-07	1.000+00	7.741-04	7.093-04	5.490-07
1.418+03	7.075-04	2.796-07	1.000+00	3.952-04	7.075-04	2.796-07
1.420+03	7.056-04	1.400-07	1.000+00	1.985-04	7.056-04	1.400-07
1.422+03	7.037-04	5.631-08	1.000+00	8.003-05	7.037-04	5.631-08
1.424+03	7.019-04	3.526-09	1.000+00	5.025-06	7.019-04	3.526-09
1.426+03	7.000-04	3.753-09	1.000+00	5.362-06	7.000-04	3.753-09
1.428+03	6.981-04	3.544-09	1.000+00	5.077-06	6.981-04	3.544-09
1.430+03	6.962-04	2.726-09	1.000+00	3.917-06	6.962-04	2.726-09
1.432+03	6.943-04	3.437-09	1.000+00	4.951-06	6.943-04	3.437-09
1.434+03	6.924-04	6.468-08	1.000+00	9.343-05	6.924-04	6.468-08
1.436+03	6.905-04	1.809-07	1.000+00	2.621-04	6.905-04	1.809-07
1.438+03	6.886-04	2.993-07	1.000+00	4.347-04	6.886-04	2.993-07
1.440+03	6.867-04	4.172-07	1.000+00	6.077-04	6.867-04	4.172-07
1.442+03	6.848-04	5.316-07	1.000+00	7.764-04	6.848-04	5.316-07
1.444+03	6.829-04	5.261-07	1.000+00	7.705-04	6.829-04	5.261-07
1.446+03	6.810-04	4.112-07	1.000+00	6.039-04	6.810-04	4.112-07
1.448+03	6.791-04	2.926-07	1.000+00	4.309-04	6.791-04	2.926-07
1.450+03	6.772-04	1.746-07	1.000+00	2.579-04	6.772-04	1.746-07

LAYER(1 IS NEAREST GROUND) = 2

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DOWN TOTAL	INT UP TOTAL
1.300+03	8.841-05	6.278-05	1.248-01	8.862-02	5.554-04	1.268-04
1.302+03	8.690-05	6.353-05	1.230-01	8.989-02	5.899-04	1.203-04
1.304+03	7.957-05	6.977-05	1.128-01	9.894-02	6.356-04	1.245-04
1.306+03	6.766-05	7.899-05	9.616-02	1.123-01	6.779-04	1.347-04
1.308+03	5.297-05	8.983-05	7.545-02	1.280-01	7.195-04	1.460-04
1.310+03	3.948-05	9.405-05	5.637-02	1.343-01	7.520-04	1.489-04
1.312+03	2.544-05	8.544-05	3.640-02	1.223-01	7.732-04	1.298-04
1.314+03	1.562-05	7.713-05	2.240-02	1.106-01	7.842-04	1.111-04
1.316+03	1.157-05	7.317-05	1.663-02	1.052-01	7.862-04	1.019-04
1.318+03	1.295-05	7.025-05	1.866-02	1.012-01	7.789-04	1.011-04
1.320+03	1.764-05	7.629-05	2.548-02	1.101-01	7.673-04	1.153-04
1.322+03	2.646-05	9.443-05	3.831-02	1.367-01	7.495-04	1.524-04
1.324+03	3.679-05	1.120-04	5.339-02	1.625-01	7.277-04	1.925-04
1.326+03	4.493-05	1.296-04	6.535-02	1.813-01	7.110-04	2.215-04
1.328+03	4.745-05	1.320-04	6.918-02	1.925-01	7.075-04	2.338-04
1.330+03	4.567-05	1.307-04	6.676-02	1.910-01	7.104-04	2.302-04
1.332+03	3.998-05	1.177-04	5.858-02	1.724-01	7.200-04	2.049-04
1.334+03	3.017-05	9.997-05	4.430-02	1.468-01	7.378-04	1.667-04
1.336+03	2.080-05	8.151-05	3.062-02	1.200-01	7.533-04	1.294-04
1.338+03	1.609-05	6.890-05	2.375-02	1.017-01	7.603-04	1.067-04
1.340+03	1.491-05	6.362-05	2.206-02	9.413-02	7.631-04	9.594-05
1.342+03	1.624-05	6.744-05	2.409-02	1.000-01	7.621-04	1.001-04
1.344+03	2.116-05	7.831-05	3.145-02	1.164-01	7.560-04	1.178-04
1.346+03	2.546-05	8.653-05	3.795-02	1.290-01	7.510-04	1.304-04
1.348+03	2.611-05	8.957-05	3.901-02	1.338-01	7.498-04	1.314-04
1.350+03	2.420-05	9.110-05	3.625-02	1.365-01	7.506-04	1.298-04
1.352+03	2.122-05	8.846-05	3.187-02	1.328-01	7.520-04	1.225-04
1.354+03	1.577-05	7.812-05	2.374-02	1.176-01	7.552-04	1.036-04
1.356+03	1.048-05	6.834-05	1.582-02	1.031-01	7.579-04	8.477-05
1.358+03	6.732-06	6.10[illegible]-05	1.019-02	9.242-02	7.587-04	7.505-05
1.360+03	3.990-06	5.018-05	6.053-03	7.613-02	7.586-04	5.951-05
1.362+03	1.773-06	4.052-05	2.697-03	6.163-02	7.582-04	4.579-05
1.364+03	8.679-07	3.628-05	1.323-03	5.533-02	7.569-04	3.961-05
1.366+03	4.560-07	3.417-05	6.971-04	5.225-02	7.553-04	3.639-05
1.368+03	2.318-07	2.967-05	3.553-04	4.547-02	7.536-04	3.103-05
1.370+03	1.750-07	2.756-05	2.690-04	4.236-02	7.518-04	2.865-05
1.372+03	2.248-07	2.691-05	3.464-04	4.146-02	7.499-04	2.818-05
1.374+03	4.307-07	2.791-05	6.655-04	4.312-02	7.480-04	2.995-05
1.376+03	6.780-07	3.229-05	1.050-03	5.002-02	7.461-04	3.528-05
1.378+03	9.597-07	3.902-05	1.491-03	6.060-02	7.442-04	4.313-05
1.380+03	1.250-06	4.462-05	1.946-03	6.949-02	7.422-04	4.989-05
1.382+03	1.348-06	4.655-05	2.104-03	7.269-02	7.404-04	5.215-05
1.384+03	1.132-06	4.259-05	1.772-03	6.667-02	7.386-04	4.731-05
1.386+03	8.348-07	3.283-05	1.310-03	5.154-02	7.369-04	3.632-05
1.388+03	5.371-07	2.252-05	8.455-04	3.545-02	7.352-04	2.476-05
1.390+03	2.421-07	1.338-05	3.822-04	2.113-02	7.335-04	1.440-05
1.392+03	4.344-08	6.446-06	6.875-05	1.020-02	7.317-04	4.660-06
1.394+03	1.521-09	3.068-06	2.413-06	4.869-03	7.299-04	3.087-06
1.396+03	2.045-10	2.715-06	3.255-07	4.321-03	7.280-04	2.721-06
1.398+03	1.277-09	3.374-06	2.039-06	5.383-03	7.262-04	3.391-06
1.400+03	1.885-08	6.921-06	3.017-05	1.107-02	7.243-04	7.080-06
1.402+03	4.277-08	1.216-05	6.862-05	1.951-02	7.224-04	1.251-05
1.404+03	7.012-08	1.771-05	1.128-04	2.850-02	7.206-04	1.830-05

1.406+03	1.038-07	2.478-05	1.675-04	3.999-02	7.187-04	2.565-05
1.408+03	1.354-07	3.098-05	2.191-04	5.014-02	7.168-04	3.210-05
1.410+03	1.343-07	3.151-05	2.179-04	5.113-02	7.150-04	3.262-05
1.412+03	1.205-07	2.898-05	1.761-04	4.716-02	7.131-04	2.998-05
1.414+03	9.952-08	2.469-05	1.624-04	4.030-02	7.112-04	2.552-05
1.416+03	6.576-08	1.696-05	1.076-04	2.776-02	7.094-04	1.751-05
1.418+03	3.309-08	9.879-06	5.430-05	1.621-02	7.075-04	1.014-05
1.420+03	1.663-08	5.790-06	2.738-05	9.531-03	7.056-04	5.930-06
1.422+03	6.565-09	3.246-06	1.084-05	5.359-03	7.037-04	3.303-06
1.424+03	1.245-10	1.859-06	2.062-07	3.077-03	7.019-04	1.862-06
1.426+03	1.029-10	2.257-06	1.708-07	3.747-03	7.000-04	2.261-06
1.428+03	9.830-11	2.118-06	1.637-07	3.527-03	6.981-04	2.122-06
1.430+03	7.575-11	1.648-06	1.265-07	2.752-03	6.962-04	1.650-06
1.432+03	1.498-10	1.495-06	2.510-07	2.505-03	6.943-04	1.499-06
1.434+03	8.716-09	3.235-06	1.464-05	5.434-03	6.924-04	3.300-06
1.436+03	2.455-08	6.930-06	4.136-05	1.168-02	6.905-04	7.111-06
1.438+03	4.049-08	1.119-05	6.842-05	1.883-02	6.886-04	1.144-05
1.440+03	5.635-08	1.549-05	9.550-05	2.625-02	6.867-04	1.591-05
1.442+03	7.193-08	1.922-05	1.223-04	3.268-02	6.848-04	1.975-05
1.444+03	7.070-08	1.920-05	1.205-04	3.274-02	6.829-04	1.973-05
1.446+03	5.504-08	1.531-05	9.413-05	2.618-02	6.810-04	1.572-05
1.448+03	3.909-08	1.096-05	6.705-05	1.879-02	6.792-04	1.125-05
1.450+03	2.323-08	6.634-06	3.997-05	1.141-02	6.773-04	6.809-06

LAYER(1 IS NEAREST GROUND) = 3

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	3.411-05	4.808-05	5.484-02	7.729-02	5.895-04	1.749-04
1.302+03	3.277-05	4.984-05	5.281-02	8.032-02	6.227-04	1.702-04
1.304+03	2.931-05	5.528-05	4.572-02	8.931-02	6.639-04	1.798-04
1.306+03	2.223-05	6.479-05	3.599-02	1.049-01	7.001-04	1.995-04
1.308+03	1.567-05	7.836-05	2.543-02	1.272-01	7.352-04	2.244-04
1.310+03	1.009-05	8.808-05	1.642-02	1.433-01	7.621-04	2.370-04
1.312+03	5.486-06	9.249-05	8.949-03	1.509-01	7.787-04	2.223-04
1.314+03	2.794-06	9.564-05	4.570-03	1.564-01	7.870-04	2.067-04
1.316+03	1.893-06	9.610-05	3.103-03	1.576-01	7.881-04	1.980-04
1.318+03	2.316-06	9.093-05	3.807-03	1.495-01	7.812-04	1.920-04
1.320+03	3.420-06	8.839-05	5.637-03	1.457-01	7.707-04	2.037-04
1.322+03	5.306-06	8.991-05	8.766-03	1.485-01	7.548-04	2.423-04
1.324+03	7.639-06	8.923-05	1.265-02	1.478-01	7.353-04	2.818-04
1.326+03	9.513-06	8.892-05	1.580-02	1.477-01	7.206-04	3.105-04
1.328+03	1.001-05	9.159-05	1.666-02	1.525-01	7.175-04	3.254-04
1.330+03	9.560-06	9.031-05	1.596-02	1.508-01	7.199-04	3.205-04
1.332+03	8.315-06	8.322-05	1.392-02	1.393-01	7.283-04	2.881-04
1.334+03	6.067-06	7.654-05	1.018-02	1.284-01	7.438-04	2.432-04
1.336+03	3.959-06	6.858-05	6.661-03	1.154-01	7.573-04	1.980-04
1.338+03	2.893-06	5.969-05	4.880-03	1.007-01	7.632-04	1.664-04
1.340+03	2.538-06	5.658-05	4.292-03	9.570-02	7.656-04	1.525-04
1.342+03	2.658-06	6.100-05	4.507-03	1.035-01	7.648-04	1.611-04
1.344+03	3.514-06	6.819-05	5.975-03	1.159-01	7.596-04	1.860-04
1.346+03	4.260-06	7.483-05	7.262-03	1.276-01	7.552-04	2.052-04
1.348+03	4.298-06	8.139-05	7.347-03	1.391-01	7.541-04	2.130-04
1.350+03	3.878-06	8.733-05	6.647-03	1.497-01	7.545-04	2.172-04
1.352+03	3.308-06	8.913-05	5.686-03	1.532-01	7.553-04	2.117-04
1.354+03	2.350-06	8.563-05	4.050-03	1.476-01	7.576-04	1.892-04
1.356+03	1.438-06	8.126-05	2.486-03	1.404-01	7.593-04	1.680-04
1.358+03	8.533-07	7.936-05	1.479-03	1.375-01	7.595-04	1.544-04
1.360+03	4.723-07	7.398-05	8.208-04	1.286-01	7.591-04	1.335-04
1.362+03	1.676-07	7.018-05	2.921-04	1.223-01	7.584-04	1.160-04
1.364+03	6.416-08	7.297-05	1.121-04	1.276-01	7.570-04	1.126-04
1.366+03	2.594-08	7.606-05	4.546-05	1.333-01	7.553-04	1.129-04
1.368+03	7.693-09	7.384-05	1.352-05	1.298-01	7.536-04	1.049-04
1.370+03	5.632-09	7.411-05	9.925-06	1.306-01	7.518-04	1.028-04
1.372+03	1.188-08	7.357-05	2.100-05	1.300-01	7.499-04	1.018-04
1.374+03	3.014-08	7.140-05	5.341-05	1.265-01	7.481-04	1.013-04
1.376+03	4.991-08	7.610-05	8.870-05	1.352-01	7.462-04	1.114-04
1.378+03	7.080-08	8.355-05	1.262-04	1.489-01	7.443-04	1.267-04
1.380+03	9.196-08	8.644-05	1.644-04	1.545-01	7.423-04	1.363-04
1.382+03	9.747-08	8.726-05	1.747-04	1.564-01	7.405-04	1.394-04
1.384+03	7.911-08	8.451-05	1.422-04	1.519-01	7.387-04	1.318-04
1.386+03	5.768-08	7.140-05	1.040-04	1.287-01	7.370-04	1.077-04
1.388+03	3.632-08	5.669-05	6.567-05	1.025-01	7.352-04	8.145-05
1.390+03	1.509-08	4.515-05	2.737-05	8.187-02	7.335-04	5.955-05
1.392+03	1.630-09	3.371-05	2.964-06	6.130-02	7.317-04	4.037-05
1.394+03	2.847-11	2.559-05	5.193-08	4.668-02	7.299-04	2.868-05
1.396+03	5.060-13	2.359-05	9.257-10	4.315-02	7.280-04	2.631-05
1.398+03	2.189-11	2.539-05	4.017-08	4.659-02	7.262-04	2.878-05
1.400+03	4.879-10	3.354-05	8.978-07	6.172-02	7.243-04	4.062-05
1.402+03	1.120-09	4.702-05	2.068-06	8.679-02	7.229-04	5.954-05
1.404+03	1.818-09	5.911-05	3.366-06	1.094-01	7.206-04	7.741-05

1.406+03	2.631-09	7.363-05	4.885-06	1.367-01	7.187-04	9.927-05
1.408+03	3.398-09	8.504-05	6.329-06	1.584-01	7.168-04	1.171-04
1.410+03	3.285-09	8.463-05	6.136-06	1.581-01	7.150-04	1.173-04
1.412+03	2.838-09	7.665-05	5.317-06	1.436-01	7.131-04	1.066-04
1.414+03	2.257-09	6.589-05	4.242-06	1.238-01	7.112-04	9.141-05
1.416+03	1.494-09	4.725-05	2.723-06	8.908-02	7.094-04	6.476-05
1.418+03	6.557-10	3.175-05	1.240-06	6.003-02	7.075-04	4.191-05
1.420+03	3.030-10	2.369-05	5.748-07	4.494-02	7.056-04	2.962-05
1.422+03	1.177-10	1.972-05	2.240-07	3.751-02	7.037-04	2.302-05
1.424+03	5.286-13	1.885-05	1.009-09	3.597-02	7.019-04	2.071-05
1.426+03	1.565-13	2.250-05	2.995-10	4.306-02	7.000-04	2.476-05
1.428+03	1.516-13	2.174-05	2.912-10	4.175-02	6.981-04	2.386-05
1.430+03	1.171-13	1.809-05	2.255-10	3.484-02	6.962-04	1.974-05
1.432+03	7.762-13	1.672-05	1.500-09	3.230-02	6.943-04	1.822-05
1.434+03	1.742-10	1.972-05	3.377-07	3.822-02	6.924-04	2.302-05
1.436+03	4.755-10	2.736-05	9.245-07	5.320-02	6.905-04	3.447-05
1.438+03	7.770-10	3.909-05	1.516-06	7.625-02	6.886-04	5.053-05
1.440+03	1.077-09	5.197-05	2.107-06	1.017-01	6.867-04	6.788-05
1.442+03	1.373-09	6.111-05	2.695-06	1.200-01	6.848-04	8.086-05
1.444+03	1.328-09	6.126-05	2.615-06	1.206-01	6.829-04	8.099-05
1.446+03	1.029-09	5.174-05	2.032-06	1.022-01	6.810-04	6.746-05
1.448+03	7.272-10	3.904-05	1.441-06	7.738-02	6.792-04	5.029-05
1.450+03	4.276-10	2.648-05	8.502-07	5.264-02	6.773-04	3.329-05

LAYER(1 IS NEAREST GROUND) = 4

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DOWN TOTAL	INT UP TOTAL
1.300+03	1.798-05	4.131-05	3.309-02	7.602-02	6.074-04	2.162-04
1.302+03	1.699-05	4.275-05	3.126-02	7.888-02	6.396-04	2.129-04
1.304+03	1.417-05	4.722-05	2.621-02	8.737-02	6.781-04	2.270-04
1.306+03	1.079-05	5.625-05	1.993-02	1.044-01	7.109-04	2.557-04
1.308+03	7.219-06	6.946-05	1.343-02	1.292-01	7.424-04	2.938-04
1.310+03	4.305-06	8.201-05	8.029-03	1.530-01	7.664-04	3.190-04
1.312+03	2.126-06	9.483-05	3.977-03	1.773-01	7.808-04	3.172-04
1.314+03	9.848-07	1.046-04	1.847-03	1.961-01	7.879-04	3.113-04
1.316+03	6.410-07	1.078-04	1.205-03	2.027-01	7.887-04	3.058-04
1.318+03	8.305-07	1.047-04	1.566-03	1.974-01	7.821-04	2.967-04
1.320+03	1.287-06	9.831-05	2.434-03	1.859-01	7.720-04	3.020-04
1.322+03	2.020-06	8.902-05	3.829-03	1.688-01	7.568-04	3.314-04
1.324+03	2.942-06	7.854-05	5.593-03	1.493-01	7.382-04	3.603-04
1.326+03	3.999-06	7.090-05	7.052-03	1.352-01	7.242-04	3.814-04
1.328+03	3.890-06	6.854-05	7.436-03	1.310-01	7.214-04	3.939-04
1.330+03	3.697-06	6.663-05	7.088-03	1.277-01	7.236-04	3.872-04
1.332+03	3.212-06	6.352-05	6.176-03	1.221-01	7.316-04	3.516-04
1.334+03	2.318-06	6.262-05	4.470-03	1.207-01	7.462-04	3.059-04
1.336+03	1.478-06	6.089-05	2.857-03	1.177-01	7.587-04	2.588-04
1.338+03	1.048-06	5.535-05	2.031-03	1.073-01	7.642-04	2.217-04
1.340+03	8.946-07	5.339-05	1.740-03	1.038-01	7.665-04	2.059-04
1.342+03	9.136-07	5.726-05	1.781-03	1.114-01	7.657-04	2.184-04
1.344+03	1.217-06	6.093-05	2.380-03	1.192-01	7.608-04	2.449-04
1.346+03	1.484-06	6.525-05	2.910-03	1.280-01	7.567-04	2.704-04
1.348+03	1.495-06	7.175-05	2.941-03	1.411-01	7.556-04	2.848-04
1.350+03	1.340-06	7.768-05	2.693-03	1.532-01	7.558-04	2.948-04
1.352+03	1.135-06	8.001-05	2.295-03	1.583-01	7.564-04	2.917-04
1.354+03	7.963-07	8.021-05	1.580-03	1.591-01	7.584-04	2.694-04
1.356+03	4.741-07	7.944-05	9.435-04	1.581-01	7.598-04	2.475-04
1.358+03	2.723-07	8.020-05	5.435-04	1.601-01	7.598-04	2.346-04
1.360+03	1.472-07	8.012-05	2.996-04	1.604-01	7.592-04	2.136-04
1.362+03	4.750-08	8.230-05	9.536-05	1.652-01	7.585-04	1.983-04
1.364+03	1.647-08	9.019-05	3.317-05	1.816-01	7.570-04	2.028-04
1.366+03	6.273-09	9.648-05	1.267-05	1.949-01	7.553-04	2.089-04
1.368+03	1.489-09	9.946-05	3.017-06	2.015-01	7.536-04	2.043-04
1.370+03	1.083-09	1.030-04	2.201-06	2.093-01	7.518-04	2.058-04
1.372+03	2.742-09	1.039-04	5.629-06	2.118-01	7.500-04	2.057-04
1.374+03	7.437-09	9.998-05	1.520-05	2.044-01	7.481-04	2.013-04
1.376+03	1.241-08	1.028-04	2.544-05	2.107-01	7.462-04	2.141-04
1.378+03	1.758-08	1.061-04	3.616-05	2.182-01	7.443-04	2.328-04
1.380+03	2.280-08	1.045-04	4.705-05	2.157-01	7.429-04	2.409-04
1.382+03	2.407-08	1.044-04	4.981-05	2.161-01	7.405-04	2.438-04
1.384+03	1.938-08	1.068-04	4.033-05	2.217-01	7.387-04	2.386-04
1.386+03	1.409-08	1.008-04	2.934-05	2.099-01	7.370-04	2.085-04
1.388+03	8.822-09	9.257-05	1.893-05	1.934-01	7.352-04	1.740-04
1.390+03	3.591-09	8.736-05	7.524-06	1.831-01	7.335-04	1.469-04
1.392+03	3.214-10	7.761-05	6.757-07	1.631-01	7.317-04	1.180-04
1.394+03	4.715-12	6.703-05	9.943-09	1.414-01	7.299-04	9.571-05
1.396+03	4.443-14	6.258-05	9.399-11	1.324-01	7.280-04	8.889-05
1.398+03	3.622-12	6.390-05	7.687-09	1.356-01	7.262-04	9.268-05
1.400+03	8.671-11	7.131-05	1.846-07	1.518-01	7.243-04	1.119-04
1.402+03	1.996-10	8.576-05	4.263-07	1.831-01	7.224-04	1.453-04
1.404+03	3.229-10	9.725-05	6.917-07	2.084-01	7.206-04	1.747-04

1.406+03	4.643-10	1.089-04	9.978-07	2.340-01	7.187-04	2.081-04
1.408+03	5.979-10	1.165-04	1.289-06	2.511-01	7.168-04	2.336-04
1.410+03	5.741-10	1.130-04	1.242-06	2.444-01	7.150-04	2.303-04
1.412+03	4.907-10	1.014-04	1.065-06	2.200-01	7.131-04	2.080-04
1.414+03	3.859-10	9.040-05	8.403-07	1.968-01	7.112-04	1.818-04
1.416+03	2.946-10	7.290-05	5.343-07	1.592-01	7.094-04	1.377-04
1.418+03	1.079-10	5.962-05	2.354-07	1.307-01	7.075-04	1.015-04
1.420+03	4.804-11	5.607-05	1.056-07	1.233-01	7.056-04	8.569-05
1.422+03	1.859-11	5.808-05	4.101-08	1.281-01	7.037-04	8.110-05
1.424+03	6.183-14	6.171-05	1.368-10	1.366-01	7.019-04	8.242-05
1.426+03	1.169-14	7.072-05	2.595-11	1.570-01	7.000-04	9.548-05
1.428+03	1.136-14	7.121-05	2.532-11	1.586-01	6.981-04	9.507-05
1.430+03	8.778-15	6.491-05	1.962-11	1.451-01	6.962-04	8.465-05
1.432+03	9.308-14	6.263-05	2.088-10	1.405-01	6.943-04	8.085-05
1.434+03	2.830-11	6.296-05	6.368-08	1.417-01	6.924-04	8.597-05
1.436+03	7.641-11	6.514-05	1.725-07	1.471-01	6.905-04	9.962-05
1.438+03	1.245-10	7.613-05	2.820-07	1.725-01	6.886-04	1.267-04
1.440+03	1.722-10	8.937-05	3.915-07	2.031-01	6.867-04	1.572-04
1.442+03	2.195-10	9.665-05	5.007-07	2.204-01	6.848-04	1.775-04
1.444+03	2.113-10	9.779-05	4.835-07	2.238-01	6.829-04	1.788-04
1.446+03	1.634-10	9.116-05	3.753-07	2.093-01	6.810-04	1.586-04
1.448+03	1.154-10	7.733-05	2.658-07	1.782-01	6.792-04	1.276-04
1.450+03	6.760-11	6.346-05	1.563-07	1.467-01	6.773-04	9.474-05

LAYER(1 IS NEAREST GROUND) = 5

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	1.031-05	3.287-05	2.185-02	6.970-02	6.178-04	2.491-04
1.302+03	9.552-06	3.349-05	2.031-02	7.120-02	6.492-04	2.464-04
1.304+03	7.779-06	3.471-05	1.659-02	7.401-02	6.859-04	2.617-04
1.306+03	5.741-06	3.767-05	1.228-02	8.056-02	7.166-04	2.934-04
1.308+03	3.696-06	4.255-05	7.926-03	9.125-02	7.461-04	3.364-04
1.310+03	2.038-06	4.811-05	4.384-03	1.035-01	7.685-04	3.671-04
1.312+03	9.047-07	5.583-05	1.952-03	1.204-01	7.817-04	3.730-04
1.314+03	3.712-07	6.213-05	8.030-04	1.344-01	7.883-04	3.739-04
1.316+03	2.261-07	6.496-05	4.906-04	1.410-01	7.889-04	3.708-04
1.318+03	3.207-07	6.490-05	6.979-04	1.412-01	7.824-04	3.616-04
1.320+03	5.326-07	6.181-05	1.163-03	1.349-01	7.725-04	3.638-04
1.322+03	8.421-07	5.483-05	1.844-03	1.208-01	7.576-04	3.842-04
1.324+03	1.236-06	4.738-05	2.714-03	1.040-01	7.395-04	4.077-04
1.326+03	1.570-06	4.175-05	3.458-03	9.195-02	7.258-04	4.231-04
1.328+03	1.651-06	3.911-05	3.647-03	8.640-02	7.231-04	4.330-04
1.330+03	1.557-06	3.770-05	3.450-03	8.354-02	7.252-04	4.249-04
1.332+03	1.352-06	3.699-05	3.005-03	8.221-02	7.329-04	3.886-04
1.334+03	9.673-07	3.808-05	2.156-03	8.490-02	7.471-04	3.439-04
1.336+03	6.008-07	3.892-05	1.343-03	8.702-02	7.593-04	2.978-04
1.338+03	4.122-07	3.736-05	9.244-04	8.379-02	7.646-04	2.591-04
1.340+03	3.483-07	3.716-05	7.837-04	8.360-02	7.669-04	2.431-04
1.342+03	3.502-07	3.992-05	7.902-04	9.008-02	7.661-04	2.583-04
1.344+03	4.742-07	4.142-05	1.073-03	9.375-02	7.613-04	2.883-04
1.346+03	5.885-07	4.355-05	1.336-03	9.889-02	7.573-04	3.140-04
1.348+03	5.996-07	4.732-05	1.366-03	1.078-01	7.562-04	3.321-04
1.350+03	5.376-07	5.038-05	1.228-03	1.151-01	7.564-04	3.452-04
1.352+03	4.559-07	5.129-05	1.045-03	1.176-01	7.569-04	3.430-04
1.354+03	3.202-07	5.240-05	7.362-04	1.205-01	7.587-04	3.218-04
1.356+03	1.876-07	5.301-05	4.326-04	1.223-01	7.600-04	3.005-04
1.358+03	1.040-07	5.356-05	2.407-04	1.239-01	7.599-04	2.882-04
1.360+03	5.495-08	5.477-05	1.276-04	1.271-01	7.593-04	2.684-04
1.362+03	1.609-08	5.729-05	3.749-05	1.334-01	7.585-04	2.556-04
1.364+03	4.889-09	6.183-05	1.142-05	1.444-01	7.570-04	2.646-04
1.366+03	1.760-09	6.476-05	4.124-06	1.518-01	7.553-04	2.737-04
1.368+03	3.699-10	6.729-05	8.696-07	1.582-01	7.536-04	2.716-04
1.370+03	2.683-10	6.914-05	6.329-07	1.631-01	7.518-04	2.749-04
1.372+03	7.042-10	6.921-05	1.666-06	1.638-01	7.500-04	2.749-04
1.374+03	1.925-09	6.627-05	4.571-06	1.573-01	7.481-04	2.676-04
1.376+03	3.227-09	6.670-05	7.677-06	1.589-01	7.462-04	2.808-04
1.378+03	4.572-09	6.639-05	1.093-05	1.587-01	7.443-04	2.992-04
1.380+03	5.931-09	6.425-05	1.422-05	1.541-01	7.429-04	3.051-04
1.382+03	6.269-09	6.435-05	1.508-05	1.548-01	7.405-04	3.082-04
1.384+03	5.048-09	6.770-05	1.218-05	1.634-01	7.388-04	3.063-04
1.386+03	3.671-09	6.775-05	8.889-06	1.641-01	7.370-04	2.763-04
1.388+03	2.300-09	6.695-05	5.588-06	1.627-01	7.352-04	2.410-04
1.390+03	9.390-10	6.769-05	2.289-06	1.650-01	7.335-04	2.196-04
1.392+03	8.394-11	6.443-05	2.053-07	1.576-01	7.317-04	1.824-04
1.394+03	1.018-12	5.905-05	2.498-09	1.449-01	7.299-04	1.548-04
1.396+03	7.407-15	5.666-05	1.824-11	1.395-01	7.280-04	1.456-04
1.398+03	7.779-13	5.723-05	1.922-09	1.414-01	7.262-04	1.499-04
1.400+03	1.907-11	5.971-05	4.728-08	1.480-01	7.243-04	1.716-04
1.402+03	4.392-11	6.556-05	1.093-07	1.631-01	7.224-04	2.109-04
1.404+03	7.096-11	6.973-05	1.771-07	1.740-01	7.206-04	2.494-04

1.406+03	1.018-10	7.289-05	2.550-07	1.826-01	7.187-04	2.810-04
1.408+03	1.309-10	7.423-05	3.291-07	1.866-01	7.168-04	3.078-04
1.410+03	1.255-10	7.109-05	3.164-07	1.793-01	7.150-04	3.013-04
1.412+03	1.068-10	6.422-05	2.703-07	1.625-01	7.131-04	2.722-04
1.414+03	8.367-11	6.028-05	2.125-07	1.531-01	7.112-04	2.421-04
1.416+03	5.284-11	5.422-05	1.346-07	1.382-01	7.094-04	1.919-04
1.418+03	2.292-11	5.215-05	5.861-08	1.282-01	7.075-04	1.517-04
1.420+03	1.013-11	5.211-05	2.598-08	1.337-01	7.056-04	1.378-04
1.422+03	3.919-12	5.793-05	1.008-08	1.492-01	7.037-04	1.390-04
1.424+03	1.166-14	6.237-05	3.013-11	1.612-01	7.019-04	1.448-04
1.426+03	1.822-15	7.008-05	4.725-12	1.817-01	7.000-04	1.656-04
1.428+03	1.774-15	7.221-05	4.616-12	1.879-01	6.981-04	1.673-04
1.430+03	1.370-15	6.914-05	3.578-12	1.806-01	6.962-04	1.538-04
1.432+03	1.778-14	6.794-05	4.661-11	1.781-01	6.943-04	1.488-04
1.434+03	6.039-12	6.643-05	1.587-08	1.747-01	6.924-04	1.524-04
1.436+03	1.623-11	6.260-05	4.283-08	1.652-01	6.905-04	1.622-04
1.438+03	2.641-11	6.506-05	6.995-08	1.723-01	6.886-04	1.917-04
1.440+03	3.651-11	6.885-05	9.707-08	1.830-01	6.867-04	2.241-04
1.442+03	4.651-11	6.965-05	1.241-07	1.858-01	6.848-04	2.472-04
1.444+03	4.468-11	7.075-05	1.196-07	1.894-01	6.829-04	2.495-04
1.446+03	3.454-11	7.095-05	9.283-08	1.907-01	6.810-04	2.296-04
1.448+03	2.436-11	6.554-05	6.571-08	1.768-01	6.792-04	1.932-04
1.450+03	1.426-11	5.973-05	3.859-08	1.617-01	6.773-04	1.565-04

LAYER(1 IS NEAREST GROUND) = 6

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	5.550-06	2.450-05	1.543-02	6.812-02	6.233-04	2.736-04
1.302+03	5.070-06	2.496-05	1.414-02	6.963-02	6.542-04	2.714-04
1.304+03	4.051-06	2.439-05	1.134-02	6.827-02	6.899-04	2.861-04
1.306+03	2.941-06	2.322-05	8.259-03	6.520-02	7.196-04	3.166-04
1.308+03	1.844-06	2.210-05	5.197-03	6.227-02	7.479-04	3.585-04
1.310+03	9.651-07	2.154-05	2.728-03	6.089-02	7.694-04	3.886-04
1.312+03	3.995-07	2.233-05	1.133-03	6.333-02	7.821-04	3.953-04
1.314+03	1.524-07	2.340-05	4.338-04	6.660-02	7.885-04	3.968-04
1.316+03	8.897-08	2.426-05	2.540-04	6.926-02	7.890-04	3.951-04
1.318+03	1.387-07	2.485-05	3.975-04	7.118-02	7.825-04	3.864-04
1.320+03	2.450-07	2.466-05	7.043-04	7.070-02	7.728-04	3.885-04
1.322+03	3.897-07	2.288-05	1.124-03	6.599-02	7.580-04	4.091-04
1.324+03	5.747-07	2.084-05	1.663-03	6.032-02	7.401-04	4.285-04
1.326+03	7.355-07	1.937-05	2.136-03	5.625-02	7.266-04	4.425-04
1.328+03	7.739-07	1.867-05	2.255-03	5.440-02	7.239-04	4.517-04
1.330+03	7.255-07	1.810-05	2.121-03	5.291-02	7.259-04	4.430-04
1.332+03	6.296-07	1.792-05	1.847-03	5.258-02	7.335-04	4.066-04
1.334+03	4.473-07	1.857-05	1.317-03	5.468-02	7.476-04	3.625-04
1.336+03	2.722-07	1.911-05	8.043-04	5.646-02	7.596-04	3.169-04
1.338+03	1.805-07	1.909-05	5.350-04	5.659-02	7.648-04	2.782-04
1.340+03	1.492-07	1.978-05	4.439-04	5.884-02	7.670-04	2.629-04
1.342+03	1.461-07	2.166-05	4.363-04	6.467-02	7.662-04	2.800-04
1.344+03	2.003-07	2.267-05	6.002-04	6.792-02	7.615-04	3.110-04
1.346+03	2.523-07	2.394-05	7.586-04	7.197-02	7.575-04	3.329-04
1.348+03	2.596-07	2.570-05	7.832-04	7.754-02	7.565-04	3.578-04
1.350+03	2.332-07	2.662-05	7.062-04	8.060-02	7.566-04	3.718-04
1.352+03	1.983-07	2.660-05	6.026-04	8.082-02	7.571-04	3.696-04
1.354+03	1.397-07	2.667-05	4.260-04	8.132-02	7.588-04	3.485-04
1.356+03	8.109-08	2.647-05	2.482-04	8.100-02	7.601-04	3.269-04
1.358+03	4.385-08	2.587-05	1.347-04	7.945-02	7.599-04	3.140-04
1.360+03	2.277-08	2.582-05	7.019-05	7.960-02	7.593-04	2.992-04
1.362+03	6.121-09	2.594-05	1.894-05	8.029-02	7.585-04	2.815-04
1.364+03	1.615-09	2.670-05	5.014-06	8.288-02	7.570-04	2.913-04
1.366+03	5.471-10	2.672-05	1.705-06	8.326-02	7.553-04	3.004-04
1.368+03	1.056-10	2.684-05	3.304-07	8.395-02	7.536-04	2.985-04
1.370+03	7.655-11	2.660-05	2.403-07	8.351-02	7.518-04	3.015-04
1.372+03	1.860-10	2.602-05	5.859-07	8.196-02	7.500-04	3.009-04
1.374+03	5.060-10	2.470-05	1.600-06	7.809-02	7.481-04	2.923-04
1.376+03	8.502-10	2.477-05	2.698-06	7.860-02	7.462-04	3.056-04
1.378+03	1.209-09	2.450-05	3.852-06	7.804-02	7.443-04	3.237-04
1.380+03	1.571-09	2.392-05	5.023-06	7.648-02	7.429-04	3.290-04
1.382+03	1.670-09	2.445-05	5.360-06	7.846-02	7.405-04	3.326-04
1.384+03	1.353-09	2.600-05	4.357-06	8.376-02	7.388-04	3.323-04
1.386+03	9.855-10	2.638-05	3.186-06	8.530-02	7.370-04	3.027-04
1.388+03	6.205-10	2.671-05	2.014-06	8.667-02	7.352-04	2.677-04
1.390+03	2.584-10	2.754-05	8.417-07	8.970-02	7.335-04	2.421-04
1.392+03	2.615-11	2.673-05	8.549-08	8.740-02	7.317-04	2.091-04
1.394+03	2.397-13	2.510-05	7.866-10	8.238-02	7.299-04	1.799-04
1.396+03	1.602-15	2.452-05	5.278-12	8.078-02	7.280-04	1.701-04
1.398+03	1.815-13	2.475-05	6.002-10	8.183-02	7.262-04	1.747-04
1.400+03	4.449-12	2.520-05	1.477-08	8.366-02	7.243-04	1.968-04
1.402+03	1.023-11	2.649-05	3.409-08	8.827-02	7.224-04	2.373-04
1.404+03	1.652-11	2.717-05	5.527-08	9.089-02	7.206-04	2.716-04

1.406+03	2.370-11	2.742-05	7.959-08	9.209-02	7.187-04	3.084-04
1.408+03	3.048-11	2.723-05	1.027-07	9.179-02	7.168-04	3.351-04
1.410+03	2.919-11	2.693-05	9.878-08	8.773-02	7.150-04	3.273-04
1.412+03	2.486-11	2.367-05	8.496-08	8.040-02	7.131-04	2.959-04
1.414+03	1.949-11	2.305-05	6.645-08	7.860-02	7.112-04	2.651-04
1.416+03	1.231-11	2.197-05	4.213-08	7.522-02	7.094-04	2.139-04
1.418+03	5.348-12	2.152-05	1.838-08	7.397-02	7.075-04	1.732-04
1.420+03	2.372-12	2.324-05	8.184-09	8.819-02	7.056-04	1.610-04
1.422+03	9.164-13	2.699-05	3.179-09	9.177-02	7.037-04	1.655-04
1.424+03	2.625-15	2.864-05	9.127-12	9.958-02	7.019-04	1.739-04
1.426+03	3.864-16	3.194-05	1.349-12	1.115-01	7.000-04	1.975-04
1.428+03	3.761-16	3.314-05	1.318-12	1.162-01	6.981-04	2.004-04
1.430+03	2.904-16	3.232-05	1.022-12	1.137-01	6.962-04	1.841-04
1.432+03	4.098-15	3.191-05	1.448-11	1.127-01	6.943-04	1.801-04
1.434+03	1.438-12	3.103-05	5.100-09	1.101-01	6.924-04	1.834-04
1.436+03	3.865-12	2.855-05	1.376-08	1.016-01	6.905-04	1.908-04
1.438+03	6.286-12	2.896-05	2.247-08	1.017-01	6.886-04	2.202-04
1.440+03	8.688-12	2.878-05	3.118-08	1.033-01	6.867-04	2.549-04
1.442+03	1.106-11	2.826-05	3.987-08	1.019-01	6.848-04	2.754-04
1.444+03	1.062-11	2.870-05	3.843-08	1.039-01	6.829-04	2.782-04
1.446+03	8.207-12	2.963-05	2.982-08	1.077-01	6.810-04	2.592-04
1.448+03	5.786-12	2.831-05	2.110-08	1.033-01	6.792-04	2.215-04
1.450+03	3.384-12	2.670-05	1.239-08	9.778-02	6.773-04	1.832-04

LAYER (1 IS NEAREST GROUND) = 7

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	2.755-06	1.781-05	1.107-02	7.157-02	6.261-04	2.914-04
1.302+03	2.486-06	1.838-05	1.003-02	7.411-02	6.563-04	2.897-04
1.304+03	1.958-06	1.755-05	7.929-03	7.106-02	6.911-04	3.037-04
1.306+03	1.407-06	1.532-05	5.719-03	6.228-02	7.210-04	3.319-04
1.308+03	8.678-07	1.241-05	3.541-03	5.062-02	7.488-04	3.709-04
1.310+03	4.378-07	9.826-06	1.793-03	4.025-02	7.699-04	3.984-04
1.312+03	1.735-07	7.831-06	7.132-04	3.220-02	7.823-04	4.031-04
1.314+03	6.398-08	6.606-06	2.641-04	2.727-02	7.885-04	4.039-04
1.316+03	3.709-08	6.286-06	1.537-04	2.605-02	7.890-04	4.013-04
1.318+03	6.339-08	6.625-06	2.637-04	2.756-02	7.836-04	3.930-04
1.320+03	1.172-07	7.206-06	4.897-04	3.010-02	7.729-04	3.957-04
1.322+03	1.873-07	7.601-06	7.854-04	3.187-02	7.582-04	4.167-04
1.324+03	2.769-07	7.888-06	1.166-03	3.321-02	7.403-04	4.369-04
1.326+03	3.553-07	8.225-06	1.502-03	3.476-02	7.269-04	4.507-04
1.328+03	3.738-07	8.459-06	1.586-03	3.590-02	7.242-04	4.601-04
1.330+03	3.487-07	8.321-06	1.486-03	3.545-02	7.262-04	4.513-04
1.332+03	3.017-07	8.222-06	1.291-03	3.517-02	7.338-04	4.198-04
1.334+03	2.131-07	8.410-06	9.151-04	3.612-02	7.478-04	3.709-04
1.336+03	1.277-07	8.583-06	5.506-04	3.701-02	7.597-04	3.255-04
1.338+03	8.172-08	8.951-06	3.538-04	3.875-02	7.649-04	2.871-04
1.340+03	6.510-08	9.757-06	2.830-04	4.242-02	7.671-04	2.726-04
1.342+03	6.136-08	1.093-05	2.678-04	4.770-02	7.663-04	2.909-04
1.344+03	8.461-08	1.163-05	3.708-04	5.095-02	7.615-04	3.226-04
1.346+03	1.076-07	1.235-05	4.735-04	5.433-02	7.577-04	3.503-04
1.348+03	1.113-07	1.299-05	4.920-04	5.739-02	7.566-04	3.708-04
1.350+03	1.001-07	1.295-05	4.442-04	5.746-02	7.567-04	3.848-04
1.352+03	8.525-08	1.265-05	3.798-04	5.636-02	7.572-04	3.922-04
1.354+03	6.011-08	1.211-05	2.689-04	5.417-02	7.589-04	3.906-04
1.356+03	3.464-08	1.138-05	1.556-04	5.110-02	7.601-04	3.783-04
1.358+03	1.841-08	1.036-05	8.303-05	4.671-02	7.600-04	3.544-04
1.360+03	9.436-09	9.600-06	4.274-05	4.349-02	7.593-04	3.038-04
1.362+03	2.352-09	8.542-06	1.070-05	3.886-02	7.585-04	2.900-04
1.364+03	5.329-10	7.908-06	2.432-06	3.612-02	7.570-04	2.992-04
1.366+03	1.658-10	7.122-06	7.607-07	3.267-02	7.553-04	3.075-04
1.368+03	2.771-11	6.340-06	1.277-07	2.920-02	7.536-04	3.048-04
1.370+03	2.000-11	5.589-06	9.252-08	2.585-02	7.618-04	3.071-04
1.372+03	3.984-11	5.065-06	1.851-07	2.353-02	7.500-04	3.059-04
1.374+03	1.070-10	4.671-06	4.991-07	2.179-02	7.481-04	2.970-04
1.376+03	1.820-10	4.784-06	8.528-07	2.241-02	7.462-04	3.109-04
1.378+03	2.613-10	5.009-06	1.229-06	2.357-02	7.443-04	3.287-04
1.380+03	3.411-10	5.242-06	1.612-06	2.477-02	7.429-04	3.343-04
1.382+03	3.693-10	5.689-06	1.752-06	2.700-02	7.405-04	3.383-04
1.384+03	3.041-10	5.946-06	1.449-06	2.834-02	7.388-04	3.383-04
1.386+03	2.229-10	5.749-06	1.067-06	2.752-02	7.370-04	3.084-04
1.388+03	1.424-10	5.573-06	6.895-07	2.678-02	7.352-04	2.732-04
1.390+03	6.257-11	5.475-06	3.020-07	2.643-02	7.336-04	2.476-04
1.392+03	8.250-12	5.069-06	4.000-08	2.458-02	7.317-04	2.142-04
1.394+03	4.026-14	4.690-06	1.961-10	2.284-02	7.299-04	1.846-04
1.396+03	2.364-16	4.609-06	1.156-12	2.254-02	7.280-04	1.797-04
1.398+03	2.696-14	4.644-06	1.324-10	2.281-02	7.262-04	1.793-04
1.400+03	6.550-13	4.684-06	3.232-09	2.311-02	7.243-04	2.015-04
1.402+03	1.503-12	4.822-06	7.496-09	2.389-02	7.224-04	2.422-04
1.404+03	2.427-12	4.846-06	1.208-08	2.412-02	7.206-04	2.764-04

1.406+03	3.485-12	4.823-06	1.742-08	2.411-02	7.187-04	3.133-04
1.408+03	4.482-12	4.750-06	2.250-08	2.385-02	7.168-04	3.398-04
1.410+03	4.294-12	4.525-06	2.166-08	2.282-02	7.150-04	3.318-04
1.412+03	3.666-12	4.187-06	1.857-08	2.121-02	7.131-04	3.001-04
1.414+03	2.880-12	3.196-06	1.465-08	2.135-02	7.112-04	2.693-04
1.416+03	1.822-12	4.113-06	9.314-09	2.102-02	7.094-04	2.180-04
1.418+03	7.981-13	4.134-06	4.097-09	2.122-02	7.075-04	1.773-04
1.420+03	3.580-13	4.522-06	1.846-09	2.332-02	7.056-04	1.656-04
1.422+03	1.383-13	5.177-06	7.164-10	2.681-02	7.037-04	1.707-04
1.424+03	3.892-16	5.581-06	2.025-12	2.904-02	7.019-04	1.790-04
1.426+03	5.684-17	6.190-06	2.972-13	3.235-02	7.000-04	2.037-04
1.428+03	5.533-17	6.408-06	2.905-13	3.364-02	6.981-04	2.068-04
1.430+03	4.270-17	6.285-06	2.282-13	3.315-02	6.962-04	1.924-04
1.432+03	6.578-16	6.247-06	3.485-12	3.309-02	6.943-04	1.869-04
1.434+03	2.232-13	6.101-06	1.188-09	3.297-02	6.924-04	1.895-04
1.436+03	6.020-13	5.622-06	3.219-09	3.006-02	6.905-04	1.964-04
1.438+03	9.797-13	5.579-06	5.242-09	2.996-02	6.886-04	2.258-04
1.440+03	1.354-12	5.578-06	7.305-09	3.009-02	6.867-04	2.605-04
1.442+03	1.723-12	5.403-06	9.341-09	2.928-02	6.848-04	2.808-04
1.444+03	1.657-12	5.448-06	9.020-09	2.966-02	6.829-04	2.837-04
1.446+03	1.280-12	5.639-06	7.001-09	3.084-02	6.810-04	2.648-04
1.448+03	9.023-13	5.419-06	4.958-09	2.978-02	6.792-04	2.269-04
1.450+03	5.281-13	5.147-06	2.915-09	2.845-02	6.773-04	1.883-04

LAYER(1 IS NEAREST GROUND) = 8

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	1.169-06	1.197-05	7.792-03	7.975-02	6.272-04	3.033-04
1.302+03	1.045-06	1.263-05	7.000-03	8.457-02	6.578-04	3.024-04
1.304+03	8.161-07	1.223-05	5.489-03	8.225-02	6.927-04	3.159-04
1.306+03	5.839-07	1.055-05	3.946-03	7.128-02	7.216-04	3.425-04
1.308+03	3.579-07	8.104-06	2.430-03	5.502-02	7.491-04	3.790-04
1.310+03	1.778-07	5.870-06	1.213-03	4.004-02	7.701-04	4.043-04
1.312+03	7.003-08	3.932-06	4.798-04	2.694-02	7.824-04	4.071-04
1.314+03	2.651-08	2.601-06	1.825-04	1.791-02	7.886-04	4.060-04
1.316+03	1.609-08	2.117-06	1.113-04	1.464-02	7.891-04	4.035-04
1.318+03	2.861-08	2.301-06	1.988-04	1.599-02	7.826-04	3.953-04
1.320+03	5.377-08	2.780-06	3.754-04	1.941-02	7.729-04	3.985-04
1.322+03	8.619-08	3.333-06	6.047-04	2.338-02	7.583-04	4.200-04
1.324+03	1.274-07	3.828-06	8.983-04	2.698-02	7.405-04	4.403-04
1.326+03	1.631-07	4.292-06	1.155-03	3.040-02	7.271-04	4.550-04
1.328+03	1.716-07	4.569-06	1.221-03	3.251-02	7.244-04	4.647-04
1.330+03	1.597-07	4.532-06	1.142-03	3.241-02	7.264-04	4.558-04
1.332+03	1.375-07	4.472-06	9.881-04	3.213-02	7.340-04	4.193-04
1.334+03	9.672-08	4.552-06	6.982-04	3.286-02	7.479-04	3.755-04
1.336+03	5.759-08	4.647-06	4.177-04	3.371-02	7.598-04	3.301-04
1.338+03	3.576-08	4.966-06	2.607-04	3.620-02	7.649-04	2.921-04
1.340+03	2.708-08	5.511-06	1.983-04	4.036-02	7.671-04	2.781-04
1.342+03	2.431-08	6.172-06	1.789-04	4.545-02	7.663-04	2.971-04
1.344+03	3.328-08	6.531-06	2.461-04	4.830-02	7.616-04	3.292-04
1.346+03	4.230-08	6.860-06	3.143-04	5.098-02	7.577-04	3.571-04
1.348+03	4.368-08	7.054-06	3.262-04	5.268-02	7.566-04	3.778-04
1.350+03	3.916-08	6.820-06	2.939-04	5.118-02	7.567-04	3.916-04
1.352+03	3.327-08	6.521-06	2.509-04	4.917-02	7.572-04	3.887-04
1.354+03	2.338-08	6.036-06	1.772-04	4.574-02	7.589-04	3.666-04
1.356+03	1.338-08	5.434-06	1.019-04	4.138-02	7.601-04	3.437-04
1.358+03	7.056-09	4.661-06	5.399-05	3.567-02	7.600-04	3.291-04
1.360+03	3.598-09	4.049-06	2.767-05	3.114-02	7.593-04	3.079-04
1.362+03	8.627-10	3.197-06	6.667-06	2.471-02	7.585-04	2.932-04
1.364+03	1.797-10	2.624-06	1.396-06	2.038-02	7.570-04	3.018-04
1.366+03	5.308-11	2.095-06	4.148-07	1.597-02	7.553-04	3.096-04
1.368+03	7.363-12	1.470-06	5.776-08	1.153-02	7.536-04	3.063-04
1.370+03	5.268-12	9.773-07	4.153-08	7.705-03	7.518-04	3.081-04
1.372+03	8.878-12	6.844-07	7.035-08	5.423-03	7.500-04	3.066-04
1.374+03	2.433-11	5.773-07	1.937-07	4.597-03	7.481-04	2.975-04
1.376+03	4.249-11	6.816-07	3.401-07	5.455-03	7.462-04	3.111-04
1.378+03	6.182-11	9.243-07	4.973-07	7.435-03	7.443-04	3.296-04
1.380+03	8.123-11	1.182-06	6.547-07	9.552-03	7.424-04	3.355-04
1.382+03	9.015-11	1.442-06	7.[illegible]-07	1.171-02	7.405-04	3.398-04
1.384+03	7.580-11	1.399-06	[illegible]-07	1.143-02	7.388-04	3.397-04
1.386+03	5.600-11	1.144-06	[illegible]-07	9.393-03	7.370-04	3.095-04
1.388+03	3.640-11	8.900-07	3.003-07	7.342-03	7.352-04	2.741-04
1.390+03	1.698-11	6.423-07	1.408-07	5.326-03	7.335-04	2.483-04
1.392+03	2.770-12	3.823-07	2.309-08	3.187-03	7.317-04	2.146-04
1.394+03	5.385-15	2.646-07	4.512-11	2.217-03	7.299-04	1.848-04
1.396+03	1.272-17	2.552-07	1.071-13	2.149-03	7.280-04	1.749-04
1.398+03	1.336-15	2.536-07	1.130-11	2.147-03	7.262-04	1.796-04
1.400+03	3.207-14	2.518-07	2.728-10	2.142-03	7.243-04	2.018-04
1.402+03	7.333-14	2.541-07	6.271-10	2.173-03	7.224-04	2.424-04
1.404+03	1.189-13	2.516-07	1.018-09	2.163-03	7.206-04	2.767-04

1.406+03	1.704-13	2.494-07	1.472-09	2.155-03	7.187-04	3.135-04
1.408+03	2.193-13	2.457-07	1.904-09	2.134-03	7.168-04	3.401-04
1.410+03	2.103-13	2.353-07	1.836-09	2.054-03	7.150-04	3.320-04
1.412+03	1.802-13	2.214-07	1.582-09	1.943-03	7.131-04	3.003-04
1.414+03	1.421-13	2.280-07	1.254-09	2.011-03	7.112-04	2.696-04
1.416+03	9.022-14	2.270-07	8.001-10	2.013-03	7.094-04	2.182-04
1.418+03	4.002-14	2.316-07	3.568-10	2.064-03	7.075-04	1.776-04
1.420+03	1.824-14	2.553-07	1.635-10	2.287-03	7.056-04	1.658-04
1.422+03	7.054-15	2.930-07	6.354-11	2.647-03	7.037-04	1.710-04
1.424+03	1.959-17	3.161-07	1.774-13	2.843-03	7.019-04	1.793-04
1.426+03	2.922-18	3.518-07	2.661-14	3.203-03	7.000-04	2.040-04
1.428+03	2.842-18	3.653-07	2.602-14	3.343-03	6.981-04	2.072-04
1.430+03	2.192-18	3.617-07	2.017-14	3.328-03	6.962-04	1.928-04
1.432+03	5.792-17	3.702-07	5.357-13	3.425-03	6.943-04	1.873-04
1.434+03	1.266-14	3.779-07	1.178-10	3.514-03	6.924-04	1.899-04
1.436+03	3.577-14	3.672-07	3.344-10	3.433-03	6.905-04	1.968-04
1.438+03	5.885-14	3.798-07	5.531-10	3.570-03	6.886-04	2.241-04
1.440+03	8.169-14	3.953-07	7.719-10	3.735-03	6.867-04	2.609-04
1.442+03	1.042-13	3.894-07	9.896-10	3.699-03	6.848-04	2.812-04
1.444+03	1.020-13	3.846-07	9.743-10	3.674-03	6.829-04	2.841-04
1.446+03	7.912-14	3.858-07	7.598-10	3.705-03	6.810-04	2.652-04
1.448+03	5.604-14	3.648-07	5.410-10	3.522-03	6.792-04	2.273-04
1.450+03	3.321-14	3.360-07	3.223-10	3.261-03	6.773-04	1.886-04

LAYE(1 IS NEAREST GROUND) = 9

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	3.539-07	6.395-06	5.087-03	9.207-02	6.276-04	3.097-04
1.302+03	3.144-07	6.960-06	4.552-03	1.008-01	6.581-04	3.093-04
1.304+03	2.443-07	6.936-06	3.558-03	1.010-01	6.930-04	3.229-04
1.306+03	1.750-07	6.080-06	2.564-03	8.907-02	7.217-04	3.486-04
1.308+03	1.078-07	4.656-06	1.588-03	6.861-02	7.492-04	3.837-04
1.310+03	5.367-08	3.342-06	7.954-04	4.953-02	7.701-04	4.077-04
1.312+03	2.162-08	2.168-06	3.223-04	3.232-02	7.824-04	4.092-04
1.314+03	8.650-09	1.323-06	1.297-04	1.983-02	7.886-04	4.074-04
1.316+03	5.616-09	9.913-07	8.471-05	1.495-02	7.891-04	4.045-04
1.318+03	1.002-08	1.100-06	1.521-04	1.670-02	7.826-04	3.964-04
1.320+03	1.888-08	1.377-06	2.881-04	2.101-02	7.730-04	3.998-04
1.322+03	3.038-08	1.699-06	4.664-04	2.608-02	7.583-04	4.217-04
1.324+03	4.481-08	1.981-06	6.921-04	3.059-02	7.405-04	4.422-04
1.326+03	5.704-08	2.247-06	8.861-04	3.491-02	7.271-04	4.572-04
1.328+03	6.806-08	2.394-06	9.386-04	3.742-02	7.245-04	4.671-04
1.330+03	5.580-08	2.367-06	8.773-04	3.722-02	7.265-04	4.582-04
1.332+03	4.770-08	2.334-06	7.544-04	3.691-02	7.340-04	4.216-04
1.334+03	3.344-08	2.375-06	5.321-04	3.779-02	7.479-04	3.778-04
1.336+03	1.985-08	2.423-06	3.177-04	3.879-02	7.598-04	3.325-04
1.338+03	1.193-08	2.588-06	1.921-04	4.167-02	7.649-04	2.947-04
1.340+03	8.475-09	2.831-06	1.373-04	4.586-02	7.671-04	2.810-04
1.342+03	7.158-09	3.113-06	1.167-04	5.074-02	7.663-04	3.002-04
1.344+03	9.612-09	3.210-06	1.576-04	5.263-02	7.616-04	3.324-04
1.346+03	1.212-08	3.286-06	2.000-04	5.421-02	7.577-04	3.604-04
1.348+03	1.293-08	3.282-06	2.063-04	5.447-02	7.567-04	3.811-04
1.350+03	1.197-08	3.088-06	1.848-04	5.156-02	7.567-04	3.947-04
1.352+03	9.343-09	2.863-06	1.569-04	4.809-02	7.572-04	3.916-04
1.354+03	6.519-09	2.588-06	1.101-04	4.373-02	7.589-04	3.672-04
1.356+03	3.692-09	2.259-06	6.278-05	3.842-02	7.601-04	3.460-04
1.358+03	1.933-09	1.866-06	3.307-05	3.192-02	7.600-04	3.309-04
1.360+03	9.238-10	1.571-06	1.693-05	2.705-02	7.593-04	3.094-04
1.362+03	2.336-10	1.188-06	4.028-06	2.057-02	7.585-04	2.995-04
1.364+03	4.711-11	9.361-07	8.279-07	1.631-02	7.570-04	3.028-04
1.366+03	1.397-11	6.981-07	2.449-07	1.224-02	7.553-04	3.103-04
1.368+03	1.677-12	4.746-07	2.958-08	8.373-03	7.536-04	3.068-04
1.370+03	1.189-12	2.849-07	2.111-08	5.056-03	7.518-04	3.084-04
1.372+03	2.332-12	1.757-07	4.165-08	3.139-03	7.500-04	3.068-04
1.374+03	6.942-12	1.667-07	1.248-07	2.996-03	7.481-04	2.977-04
1.376+03	1.233-11	2.493-07	2.230-07	4.509-03	7.462-04	3.113-04
1.378+03	1.796-11	3.869-07	3.268-07	7.039-03	7.443-04	3.300-04
1.380+03	2.358-11	5.281-07	4.317-07	9.670-03	7.424-04	3.360-04
1.382+03	2.618-11	6.645-07	4.823-07	1.224-02	7.405-04	3.404-04
1.384+03	2.199-11	6.277-07	4.076-07	1.164-02	7.388-04	3.403-04
1.386+03	1.623-11	4.837-07	3.028-07	9.025-03	7.370-04	3.100-04
1.388+03	1.054-11	3.398-07	1.979-07	6.379-03	7.352-04	2.745-04
1.390+03	4.924-12	1.979-07	9.302-08	3.738-03	7.335-04	2.485-04
1.392+03	7.995-13	5.908-08	1.520-08	1.123-03	7.317-04	2.146-04
1.394+03	1.286-15	4.266-09	2.459-11	8.162-05	7.299-04	1.848-04
1.396+03	2.176-19	2.346-09	4.190-15	4.517-05	7.280-04	1.749-04
1.398+03	1.403-19	1.431-09	2.719-15	2.773-05	7.262-04	1.796-04
1.400+03	6.403-20	5.947-10	1.298-15	1.160-05	7.243-04	2.018-04
1.402+03	2.327-22	2.634-11	4.566-18	5.168-07	7.224-04	2.424-04
1.404+03	2.005-22	8.054-13	3.960-18	1.570-08	7.206-04	2.767-04

1.404+03	1.517-22	5.045-13	3.015-18	1.003-08	7.187-04	3.135-04
1.408+03	1.035-22	2.801-13	2.070-18	5.601-09	7.168-04	3.401-04
1.410+03	5.486-23	1.328-13	1.124-18	2.673-09	7.150-04	3.320-04
1.412+03	8.915-24	2.718-14	1.806-19	5.506-10	7.131-04	3.003-04
1.414+03	2.214-36	6.131-14	4.514-32	1.250-09	7.112-04	2.696-04
1.416+03	1.395-25	3.342-13	2.862-21	6.857-09	7.094-04	2.182-04
1.418+03	8.857-23	2.756-12	1.829-18	5.690-08	7.075-04	1.776-04
1.420+03	2.507-22	7.599-12	5.210-18	1.579-07	7.056-04	1.658-04
1.422+03	4.107-22	1.919-11	8.591-18	2.968-07	7.037-04	1.710-04
1.424+03	5.687-22	7.378-11	1.197-17	1.553-06	7.019-04	1.793-04
1.426+03	7.244-22	7.833-10	1.535-17	1.660-05	7.000-04	2.040-04
1.428+03	7.074-22	1.595-09	1.508-17	3.401-05	6.981-04	2.072-04
1.430+03	5.453-22	2.681-09	1.170-17	5.755-05	6.962-04	1.928-04
1.432+03	9.282-18	7.022-09	2.005-13	1.517-04	6.943-04	1.873-04
1.434+03	3.535-16	1.393-08	7.687-12	3.029-04	6.924-04	1.899-04
1.436+03	1.606-15	2.052-08	3.515-11	4.492-04	6.905-04	1.968-04
1.438+03	2.883-15	2.691-08	6.352-11	5.928-04	6.886-04	2.262-04
1.440+03	4.144-15	3.406-08	9.189-11	7.552-04	6.867-04	2.609-04
1.442+03	5.370-15	3.683-08	1.199-10	8.220-04	6.848-04	2.812-04
1.444+03	5.939-15	3.485-08	1.333-10	7.830-04	6.829-04	2.841-04
1.446+03	4.722-15	3.251-08	1.068-10	7.352-04	6.810-04	2.653-04
1.448+03	3.444-15	3.012-08	7.841-11	6.856-04	6.792-04	2.273-04
1.450+03	2.184-15	2.530-08	5.003-11	5.798-04	6.773-04	1.887-04

LAYER(1 IS NEAREST GROUND) = 10

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.300+03	1.986-07	9.943-06	2.522-03	1.263-01	6.278-04	3.197-04
1.302+03	1.733-07	1.079-05	2.213-03	1.378-01	6.582-04	3.201-04
1.304+03	1.339-07	1.065-05	1.713-03	1.368-01	6.931-04	3.335-04
1.306+03	9.483-08	9.241-06	1.225-03	1.193-01	7.210-04	3.578-04
1.308+03	5.759-08	6.957-06	7.480-04	9.036-02	7.493-04	3.906-04
1.310+03	2.813-08	4.875-06	3.675-04	6.368-02	7.701-04	4.125-04
1.312+03	1.130-08	3.029-06	1.485-04	3.979-02	7.824-04	4.123-04
1.314+03	4.638-09	1.749-06	6.127-05	2.310-02	7.886-04	4.091-04
1.316+03	3.165-09	1.247-06	4.205-05	1.657-02	7.891-04	4.057-04
1.318+03	5.650-09	1.429-06	7.550-05	1.910-02	7.826-04	3.979-04
1.320+03	1.095-08	1.830-06	1.471-04	2.460-02	7.730-04	4.017-04
1.322+03	1.805-08	2.293-06	2.439-04	3.099-02	7.584-04	4.240-04
1.324+03	2.676-08	2.669-06	3.638-04	3.629-02	7.405-04	4.449-04
1.326+03	3.413-08	3.052-06	4.666-04	4.172-02	7.272-04	4.603-04
1.328+03	3.652-08	3.252-06	5.021-04	4.471-02	7.245-04	4.703-04
1.330+03	3.418-08	3.213-06	4.727-04	4.443-02	7.265-04	4.619-04
1.332+03	2.904-08	3.176-06	4.039-04	4.418-02	7.341-04	4.248-04
1.334+03	2.053-08	3.215-06	2.872-04	4.498-02	7.479-04	3.811-04
1.336+03	1.233-08	3.260-06	1.734-04	4.588-02	7.598-04	3.358-04
1.338+03	7.192-09	3.527-06	1.018-04	4.992-02	7.649-04	2.982-04
1.340+03	4.870-09	3.979-06	6.932-05	5.664-02	7.671-04	2.849-04
1.342+03	4.059-09	4.491-06	5.812-05	6.430-02	7.663-04	3.047-04
1.344+03	5.321-09	4.800-06	7.664-05	6.913-02	7.616-04	3.372-04
1.346+03	6.696-09	5.084-06	9.701-05	7.366-02	7.577-04	3.655-04
1.348+03	6.866-09	5.212-06	1.000-04	7.595-02	7.567-04	3.863-04
1.350+03	6.129-09	4.922-06	8.985-05	7.215-02	7.568-04	3.996-04
1.352+03	5.187-09	4.581-06	7.647-05	6.755-02	7.572-04	3.962-04
1.354+03	3.629-09	4.114-06	5.376-05	6.101-02	7.589-04	3.733-04
1.356+03	2.067-09	3.529-06	3.084-05	5.265-02	7.601-04	3.495-04
1.358+03	1.094-09	2.821-06	1.642-05	4.234-02	7.600-04	3.337-04
1.360+03	5.597-10	2.344-06	8.450-06	3.539-02	7.593-04	3.118-04
1.362+03	1.357-10	1.731-06	2.061-06	2.629-02	7.585-04	2.961-04
1.364+03	3.006-11	1.324-06	4.593-07	2.023-02	7.570-04	3.091-04
1.366+03	9.118-12	9.731-07	1.401-07	1.496-02	7.553-04	3.112-04
1.368+03	1.028-12	6.653-07	1.589-08	1.029-02	7.536-04	3.074-04
1.370+03	7.314-13	3.898-07	1.138-08	6.063-03	7.518-04	3.087-04
1.372+03	1.353-12	2.351-07	2.118-08	3.679-03	7.500-04	3.070-04
1.374+03	3.875-12	2.390-07	6.100-08	3.763-03	7.481-04	2.979-04
1.376+03	6.813-12	3.682-07	1.079-07	5.830-03	7.462-04	3.117-04
1.378+03	9.903-12	5.778-07	1.578-07	9.206-03	7.443-04	3.306-04
1.380+03	1.299-11	7.915-07	2.082-07	1.269-02	7.424-04	3.368-04
1.382+03	1.439-11	1.001-06	2.320-07	1.614-02	7.405-04	3.414-04
1.384+03	1.206-11	9.431-07	1.956-07	1.530-02	7.388-04	3.413-04
1.386+03	8.893-12	7.249-07	1.451-07	1.183-02	7.370-04	3.108-04
1.388+03	5.766-12	5.082-07	9.468-08	8.346-03	7.352-04	2.750-04
1.390+03	2.676-12	2.943-07	4.421-08	4.862-03	7.335-04	2.487-04
1.392+03	4.257-13	8.369-08	7.076-09	1.391-03	7.317-04	2.197-04
1.394+03	7.253-16	3.080-09	1.213-11	5.151-05	7.299-04	1.848-04
1.396+03	1.955-19	1.818-09	3.290-15	3.068-05	7.280-04	1.749-04
1.398+03	1.262-19	1.127-09	2.136-15	1.909-05	7.262-04	1.796-04
1.400+03	5.767-20	4.824-10	9.824-16	8.217-06	7.243-04	2.018-04
1.402+03	1.605-22	1.515-11	2.752-18	2.596-07	7.224-04	2.424-04
1.404+03	1.386-22	5.507-13	2.391-18	9.497-09	7.206-04	2.767-04

1.406+03	1.049-22	3.484-13	1.820-18	6.046-09	7.187-04	3.135-04
1.408+03	7.160-23	1.952-13	1.250-18	3.408-09	7.168-04	3.401-04
1.410+03	3.870-23	9.089-14	6.798-19	1.597-09	7.150-04	3.320-04
1.412+03	6.247-24	1.795-14	1.104-19	3.174-10	7.131-04	3.003-04
1.414+03	1.504-36	3.847-14	2.674-32	6.843-10	7.112-04	2.696-04
1.416+03	8.089-26	2.006-13	1.448-21	3.590-09	7.094-04	2.182-04
1.418+03	5.138-23	1.612-12	9.253-19	2.904-08	7.075-04	1.776-04
1.420+03	1.454-22	4.433-12	2.636-18	8.034-08	7.056-04	1.658-04
1.422+03	2.383-22	8.271-12	4.346-18	1.508-07	7.037-04	1.710-04
1.424+03	3.300-22	5.596-11	6.056-18	1.027-06	7.019-04	1.793-04
1.426+03	4.205-22	8.063-10	7.764-18	1.489-05	7.000-04	2.090-04
1.428+03	4.107-22	1.731-09	7.631-18	3.217-05	6.981-04	2.072-04
1.430+03	3.166-22	2.812-09	5.920-18	5.259-05	6.962-04	1.928-04
1.432+03	1.163-17	7.617-09	2.188-13	1.433-04	6.943-04	1.873-04
1.434+03	3.485-16	1.557-08	6.600-12	2.948-04	6.929-04	1.809-04
1.436+03	1.619-15	2.315-08	3.085-11	4.411-04	6.905-04	1.908-04
1.438+03	2.908-15	3.034-08	5.577-11	5.819-04	6.886-04	2.262-04
1.440+03	4.182-15	3.904-08	8.070-11	7.535-04	6.867-04	2.609-04
1.442+03	5.416-15	4.305-08	1.052-10	8.362-04	6.848-04	2.813-04
1.444+03	6.007-15	4.154-08	1.174-10	8.119-04	6.829-04	2.841-04
1.446+03	4.772-15	4.034-08	9.386-11	7.936-04	6.810-04	2.653-04
1.448+03	3.482-15	3.918-08	6.893-11	7.757-04	6.792-04	2.273-04
1.450+03	2.209-15	3.448-08	4.400-11	6.870-04	6.773-04	1.887-04

LAYERS= 10 DV= .050 DELV= 2.0000 V1= 1450.0000 V2= 1600.0000 A= 10.0000 BOUND= 12.0000 TEMPO= 296.0000

SATELLITE ALTITUDE= 2.0000+01 SATELLITE LATITUDE= 29.0000 SATELLITE LONGITUDE= 90.0000

TARGET ALTITUDE= 0.0000 TARGET LATITUDE= 29.0000 TARGET LONGITUDE= 90.0000

SURFACE TEMP= 298.000 EMISS=1.00000000

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH

9.5086459+02	2.9682742+02	1.1079745-03	3.4662387+02	9.8053455+02
2.9899001+02	2.8756886+01	1.8309502-05	2.8901250+02	1.2056196+01
1.9822314+01	6.0821335+01	1.1860418+01	1.9351536+01	8.7523764+00
1.1765745+01	1.0002726+00	1.0002519+00	1.8002373+01	2.9240610+01
0.0000000	0.0000000	0.0000000	0.0000000	-8.0397966-03
2.8756886+01	2.3209370+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

1.1477531+00 PREC CM OF WATER IN LAYER 1

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH

8.5659386+02	2.9052625+02	1.0232307-03	3.4234557+02	9.8025697+02
2.9165484+02	2.8854311+01	1.8008233-05	2.7774288+02	6.2350341+00
1.4792157+01	4.2150945+01	6.1722170+00	1.4519362+01	8.5400704+00
1.0187760+01	1.0002726+00	1.0002295+00	8.4687738+00	1.9821536+01
0.0000000	0.0000000	0.0000000	0.0000000	-2.5215943-03
2.8854311+01	2.1357219+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

6.1228293-01 PREC CM OF WATER IN LAYER 2

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH

7.6232314+02	2.8478924+02	9.3107337-04	3.3856465+02	9.7995376+02
2.8529825+02	2.8919789+01	1.7731186-05	2.6469786+02	2.6557821+00
1.1403800+01	2.3288571+01	2.6395895+00	1.1236030+01	8.3550606+00
1.0802654+01	1.0002726+00	1.0002063+00	3.2300547+00	1.3678131+01
0.0000000	0.0000000	0.0000000	0.0000000	-8.2598234-03
2.8919789+01	1.9389680+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

2.3690345-01 PREC CM OF WATER IN LAYER 3

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH

6.6805241+02	2.7904783+02	8.3335295-04	3.3500770+02	9.7961799+02
2.7928611+02	2.8941686+01	1.7451237-05	2.5480489+02	1.3510472+00
8.7832501+00	1.5382088+01	1.3450932+00	8.6799973+00	8.1832311+00
1.0058457+01	1.0002726+00	1.0001827+00	1.4435729+00	9.2741803+00
0.0000000	0.0000000	0.0000000	0.0000000	-6.5497397-03
2.8941686+01	1.7341514+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

1.2491755-01 PREC CM OF WATER IN LAYER 4

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM HODATH

5.7378168+02	2.7328521+02	7.3122342-04	3.3144564+02	9.7923946+02
2.7337851+02	2.8956514+01	1.7167484-05	2.4328522+02	5.6008082-01
6.7721046+00	8.2704099+00	5.5826893-01	6.7084782+00	8.0152312+00
9.4839822+00	1.0002726+00	1.0001586+00	5.1484130-01	6.1635948+00
0.0000000	0.0000000	0.0000000	0.0000000	-5.2508938-03
2.8956514+01	1.5208475+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

5.2916323-02 PREC CM OF WATER IN LAYER 5

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM HODATH

4.7951096+02	2.6287887+02	6.3539241-04	3.2504409+02	9.7880605+02
2.6292041+02	2.8961824+01	1.6647830-05	2.3287887+02	2.3890877-01
3.6612651+00	6.5253064+00	2.3830474-01	3.6395379+00	7.7100972+00
9.9033390+00	1.0002726+00	1.0001351+00	1.8369566-01	2.7997272+00
0.0000000	0.0000000	0.0000000	0.0000000	-7.5155742-03
2.8961824+01	1.3212895+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

2.3564659-02 PREC CM OF WATER IN LAYER 6

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM HODATH

3.8524021+02	2.4995908+02	5.3690541-04	3.1694282+02	9.7830079+02
2.4997789+02	2.8964219+01	1.5989152-05	2.1995907+02	7.0804711-02
1.5369926+00	4.6067048+00	7.0664276-02	1.5316958+00	7.3343462+00
9.5619678+00	1.0002726+00	1.0001112+00	4.3766649-02	9.4783030-01
0.0000000	0.0000000	0.0000000	0.0000000	-7.9308712-03
2.8964219+01	1.1163948+19	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

7.2534834-03 PREC CM OF WATER IN LAYER 7

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM HODATH

2.9096949+02	2.3413190+02	4.3296330-04	3.0673420+02	9.7768964+02
2.3413382+02	2.8966161+01	1.5160689-05	1.8517697+02	5.8068511-04
4.4803401-01	1.2960737-01	5.7974321-04	4.4710702-01	6.8737754+00
9.0605068+00	1.0002726+00	1.0000866+00	2.7121490-04	2.0910842-01
0.0000000	0.0000000	0.0000000	0.0000000	-8.2197334-03
2.8966161+01	9.0020619+18	0.0000000	0.0000000	0.0000000
0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

9.1956143-04 PREC CM OF WATER IN LAYER 8

THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM HODATH

1.9669876+02	2.1354920+02	3.2090129-04	2.9294028+02	9.7690294+02

```
 2.1354920+02   2.8966400+01   1.4045187-05   0.0000000      0.0000000
 6.3136779-02   0.0000000      0.0000000      6.3053527-02   6.2744975+00
 8.0550575+00   1.0002726+00   1.0000610+00   0.0000000      1.9949990+02
 0.0000000      0.0000000      0.0000000      0.0000000      -7.5232757-03
 2.8966400+01   6.6720426+18   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 0.0000000    PREC CM OF WATER IN LAYER      9


THE FOLLOWING DATA ARE 35 ATMOSPHERIC VARIABLES FROM MODATH
 1.0239689+02   2.1465000+02   1.6465169-04   2.9506450+02   9.7572798+02
 2.1665000+02   2.8964400+01   1.4216287-05   0.0000000      0.0000000
 1.7852119-01   0.0000000      0.0000000      1.7838173-01   6.3732674+00
 6.3732674+00   1.0002726+00   1.0000316+00   0.0000000      2.9364367-02
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000
 2.8966400+01   3.4236014+18   0.0000000      0.0000000      0.0000000
 0.0000000      0.0000000      0.0000000      0.0000000      0.0000000

 0.0000000    PREC CM OF WATER IN LAYER     10


 LEVEL  1      P =      .93843+00      TEMP = 296.83
 WATERS =        .3833+23

 LEVEL  2      P =      .84539+00      TEMP = 290.53
 WATERS =        .4045+23

 LEVEL  3      P =      .75235+00      TEMP = 284.79
 WATERS =        .7913+22

 LEVEL  4      P =      .65931+00      TEMP = 279.05
 WATERS =        .4172+22

 LEVEL  5      P =      .56628+00      TEMP = 273.29
 WATERS =        .1767+22

 LEVEL  6      P =      .47324+00      TEMP = 262.88
 WATERS =        .7871+21

 LEVEL  7      P =      .38020+00      TEMP = 249.96
 WATERS =        .2423+21

 LEVEL  8      P =      .28716+00      TEMP = 234.13
 WATERS =        .3071+20

 LEVEL  9      P =      .19413+00      TEMP = 213.55
 WATERS =        .0000

 LEVEL 10      P =      .10106+00      TEMP = 216.65
 WATERS =        .0000

 FREQ        TRANS      ABS   UPWELLING RADIANCE     WAVELENGTH
 WAVE NO.                                           MICRONS

1450.00     .00000    1.00000     1.085-10             6.89655
1452.50     .00000    1.00000     3.033-11             6.88705
```

1454.00	.00000	1.00000	3.150-13	6.87758
1456.00	.00000	1.00000	7.234-21	6.86813
1458.00	.00000	1.00000	3.769-21	6.85871
1460.00	.00000	1.00000	3.308-22	6.84932
1462.00	.00000	1.00000	8.204-27	6.83995
1464.00	.00000	1.00000	1.325-26	6.83060
1466.00	.00000	1.00000	1.827-26	6.82128
1468.00	.00000	1.00000	2.326-26	6.81199
1470.00	.00000	1.00000	1.483-18	6.80272
1472.00	.00000	1.00000	7.358-19	6.79348
1474.00	.00000	1.00000	4.171-17	6.78426
1476.00	.00000	1.00000	1.061-16	6.77507
1478.00	.00000	1.00000	1.701-16	6.76590
1480.00	.00000	1.00000	2.308-16	6.75676
1482.00	.00000	1.00000	2.825-16	6.74764
1484.00	.00000	1.00000	2.779-16	6.73854
1486.00	.00000	1.00000	2.135-16	6.72948
1488.00	.00000	1.00000	1.495-16	6.72043
1490.00	.00000	1.00000	8.729-17	6.71141
1492.00	.00000	1.00000	2.972-17	6.70241
1494.00	.00000	1.00000	1.665-20	6.69344
1496.00	.00000	1.00000	5.696-36	6.66449
1498.00	.00000	1.00000	4.048-36	6.67557
1500.00	.00000	1.00000	2.405-36	6.66667
1502.00	.00000	1.00000	7.736-37	6.65779
1504.00	.00000	1.00000	0.000	6.64894
1506.00	.00000	1.00000	0.000	6.64011
1508.00	.00000	1.00000	0.000	6.63130
1510.00	.00000	1.00000	0.000	6.62252
1512.00	.00000	1.00000	0.000	6.61376
1514.00	.00000	1.00000	0.000	6.60502
1516.00	.00000	1.00000	0.000	6.59631
1518.00	.00000	1.00000	0.000	6.58762
1520.00	.00000	1.00000	1.263-33	6.57895
1522.00	.00000	1.00000	1.112-32	6.57030
1524.00	.00000	1.00000	2.092-32	6.56168
1526.00	.00000	1.00000	3.066-32	6.55308
1528.00	.00000	1.00000	4.039-32	6.54450
1530.00	.00000	1.00000	4.749-32	6.53595
1532.00	.00000	1.00000	3.764-32	6.52742
1534.00	.00000	1.00000	2.784-32	6.51890
1536.00	.00000	1.00000	1.810-32	6.51042
1538.00	.00000	1.00000	8.419-33	6.50195
1540.00	.00000	1.00000	2.786-36	6.49351
1542.00	.00000	1.00000	0.000	6.48508
1544.00	.00000	1.00000	0.000	6.47668
1546.00	.00000	1.00000	0.000	6.46831
1548.00	.00000	1.00000	0.000	6.45995
1550.00	.00000	1.00000	0.000	6.45161
1552.00	.00000	1.00000	0.000	6.44330
1554.00	.00000	1.00000	0.000	6.43501
1556.00	.00000	1.00000	0.000	6.42674
1558.00	.00000	1.00000	0.000	6.41849
1560.00	.00000	1.00000	0.000	6.41026
1562.00	.00000	1.00000	0.000	6.40205
1564.00	.00000	1.00000	0.000	6.39386
1566.00	.00000	1.00000	0.000	6.38570
1568.00	.00000	1.00000	0.000	6.37755

1570.00	.00000	1.00000	1.195-30	6.36943
1572.00	.00000	1.00000	9.473-18	6.36132
1574.00	.00000	1.00000	1.013-13	6.35324
1576.00	.00000	1.00000	5.508-10	6.34518
1578.00	.00001	.99999	5.996-09	6.33714
1580.00	.00027	.99973	1.527-07	6.32911
1582.00	.00059	.99941	3.336-07	6.32111
1584.00	.00091	.99909	5.135-07	6.31313
1586.00	.00122	.99878	6.912-07	6.30517
1588.00	.00152	.99848	8.585-07	6.29723
1590.00	.00143	.99857	8.043-07	6.28931
1592.00	.00130	.99870	7.273-07	6.28141
1594.00	.00117	.99883	6.505-07	6.27353
1596.00	.00103	.99897	5.744-07	6.26566
1598.00	.00091	.99909	5.027-07	6.25782
1600.00	.00083	.99917	4.556-07	6.25000

BETWEEN 1450.00 AND 1600.00 THE ABSORPTANCE IS .151+03

ORIGINAL PAGE IS
OF POOR QUALITY

LAYER(1 IS NEAREST GROUND) = 1

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	6.772-04	1.708-07	1.000+00	2.529-04	6.772-04	1.708-07
1.452+03	6.753-04	5.626-08	1.000+00	8.332-05	6.753-04	5.626-08
1.454+03	6.735-04	1.923-09	1.000+00	2.856-06	6.735-04	1.923-09
1.456+03	6.716-04	4.491-12	1.000+00	6.689-09	6.716-04	4.491-12
1.458+03	6.696-04	2.370-12	1.000+00	3.540-09	6.696-04	2.370-12
1.460+03	6.677-04	2.810-13	1.000+00	4.210-10	6.677-04	2.810-13
1.462+03	6.658-04	7.987-15	1.000+00	1.200-11	6.658-04	7.987-15
1.464+03	6.639-04	1.269-14	1.000+00	1.912-11	6.639-04	1.269-14
1.466+03	6.620-04	1.737-14	1.000+00	2.625-11	6.620-04	1.737-14
1.468+03	6.601-04	2.203-14	1.000+00	3.338-11	6.601-04	2.203-14
1.470+03	6.582-04	1.740-11	1.000+00	2.644-08	6.582-04	1.740-11
1.472+03	6.563-04	7.880-11	1.000+00	1.201-07	6.563-04	7.880-11
1.474+03	6.544-04	1.981-10	1.000+00	3.028-07	6.544-04	1.981-10
1.476+03	6.525-04	3.659-10	1.000+00	5.916-07	6.525-04	3.659-10
1.478+03	6.506-04	5.737-10	1.000+00	8.821-07	6.506-04	5.737-10
1.480+03	6.487-04	7.264-10	1.000+00	1.120-06	6.487-04	7.264-10
1.482+03	6.467-04	7.910-10	1.000+00	1.223-06	6.467-04	7.910-10
1.484+03	6.448-04	7.406-10	1.000+00	1.149-06	6.448-04	7.406-10
1.486+03	6.429-04	5.539-10	1.000+00	8.618-07	6.429-04	5.539-10
1.488+03	6.410-04	3.661-10	1.000+00	5.712-07	6.410-04	3.661-10
1.490+03	6.391-04	1.961-10	1.000+00	3.069-07	6.391-04	1.961-10
1.492+03	6.372-04	7.008-11	1.000+00	1.100-07	6.372-04	7.008-11
1.494+03	6.353-04	1.109-12	1.000+00	1.746-09	6.353-04	1.109-12
1.496+03	6.334-04	9.497-19	1.000+00	1.500-15	6.334-04	9.497-19
1.498+03	6.315-04	6.834-19	1.000+00	1.082-15	6.315-04	6.834-19
1.500+03	6.296-04	4.186-19	1.000+00	6.651-16	6.296-04	4.186-19
1.502+03	6.276-04	1.534-19	1.000+00	2.445-16	6.276-04	1.534-19
1.504+03	6.257-04	1.467-20	1.000+00	2.345-17	6.257-04	1.467-20
1.506+03	6.238-04	1.071-20	1.000+00	1.718-17	6.238-04	1.071-20
1.508+03	6.219-04	6.784-21	1.000+00	1.091-17	6.219-04	6.784-21
1.510+03	6.200-04	2.878-21	1.000+00	4.643-18	6.200-04	2.878-21
1.512+03	6.181-04	2.227-24	1.000+00	3.403-21	6.181-04	2.227-24
1.514+03	6.162-04	0.000	1.000+00	0.000	6.162-04	0.000
1.516+03	6.143-04	0.000	1.000+00	0.000	6.143-04	0.000
1.518+03	6.124-04	3.176-24	1.000+00	5.187-21	6.124-04	3.176-24
1.520+03	6.105-04	2.115-18	1.000+00	3.466-15	6.105-04	2.115-18
1.522+03	6.086-04	1.681-17	1.000+00	2.763-14	6.086-04	1.681-17
1.524+03	6.067-04	3.147-17	1.000+00	5.189-14	6.067-04	3.147-17
1.526+03	6.048-04	4.605-17	1.000+00	7.616-14	6.048-04	4.605-17
1.528+03	6.029-04	6.053-17	1.000+00	1.004-13	6.029-04	6.053-17
1.530+03	6.009-04	7.078-17	1.000+00	1.178-13	6.009-04	7.078-17
1.532+03	5.990-04	5.615-17	1.000+00	9.376-14	5.990-04	5.615-17
1.534+03	5.971-04	4.149-17	1.000+00	6.949-14	5.971-04	4.149-17
1.536+03	5.952-04	2.691-17	1.000+00	4.523-14	5.952-04	2.691-17
1.538+03	5.933-04	1.243-17	1.000+00	2.096-14	5.933-04	1.243-17
1.540+03	5.915-04	6.340-20	1.000+00	1.072-16	5.915-04	6.340-20
1.542+03	5.896-04	8.925-22	1.000+00	1.514-18	5.896-04	8.925-22
1.544+03	5.877-04	1.305-21	1.000+00	2.221-18	5.877-04	1.305-21
1.546+03	5.858-04	1.715-21	1.000+00	2.928-18	5.858-04	1.715-21
1.548+03	5.839-04	2.006-21	1.000+00	3.436-18	5.839-04	2.006-21
1.550+03	5.820-04	1.588-21	1.000+00	2.729-18	5.820-04	1.588-21
1.552+03	5.801-04	1.173-21	1.000+00	2.022-18	5.801-04	1.173-21
1.554+03	5.782-04	7.603-22	1.000+00	1.315-18	5.782-04	7.603-22

1.556+03	5.763-04	3.505-22	1.000+00	6.083-19	5.763-04	3.505-22
1.558+03	5.744-04	0.000	1.000+00	0.000	5.744-04	0.000
1.560+03	5.725-04	0.000	1.000+00	0.000	5.725-04	0.000
1.562+03	5.707-04	0.000	1.000+00	0.000	5.707-04	0.000
1.564+03	5.688-04	1.198-23	1.000+00	2.018-20	5.688-04	1.198-23
1.566+03	5.669-04	2.571-23	1.000+00	4.536-20	5.669-04	2.571-23
1.568+03	5.650-04	3.985-23	1.000+00	7.054-20	5.650-04	3.985-23
1.570+03	5.632-04	5.750-18	1.000+00	1.021-14	5.632-04	5.750-18
1.572+03	5.613-04	1.270-11	1.000+00	2.263-08	5.613-04	1.270-11
1.574+03	5.594-04	8.555-10	1.000+00	1.530-06	5.594-04	8.555-10
1.576+03	5.575-04	1.218-07	1.000+00	2.186-04	5.575-04	1.218-07
1.578+03	5.554-04	6.819-07	9.998-01	1.227-03	5.554-04	6.819-07
1.580+03	5.525-04	2.551-06	9.979-01	4.607-03	5.525-04	2.551-06
1.582+03	5.494-04	4.752-06	9.957-01	8.612-03	5.494-04	4.752-06
1.584+03	5.463-04	7.002-06	9.935-01	1.273-02	5.463-04	7.002-06
1.586+03	5.433-04	9.047-06	9.913-01	1.651-02	5.433-04	9.047-06
1.588+03	5.407-04	1.025-05	9.898-01	1.876-02	5.407-04	1.025-05
1.590+03	5.390-04	9.969-06	9.901-01	1.831-02	5.390-04	9.969-06
1.592+03	5.372-04	9.923-06	9.902-01	1.829-02	5.372-04	9.923-06
1.594+03	5.354-04	9.759-06	9.904-01	1.805-02	5.354-04	9.759-06
1.596+03	5.337-04	9.626-06	9.905-01	1.787-02	5.337-04	9.626-06
1.598+03	5.317-04	9.867-06	9.903-01	1.838-02	5.317-04	9.867-06
1.600+03	5.302-04	9.192-06	9.909-01	1.718-02	5.302-04	9.192-06

LAYER(1 IS NEAREST GROUND) = 2

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	2.265-08	6.538-06	3.896-05	1.125-02	6.773-04	6.709-06
1.452+03	7.195-09	2.508-06	1.242-05	4.328-03	6.754-04	2.564-06
1.454+03	1.649-10	3.551-07	2.854-07	6.147-04	6.735-04	3.571-07
1.456+03	2.497-14	9.116-08	4.335-11	1.583-04	6.716-04	9.117-08
1.458+03	1.309-14	5.030-08	2.279-11	8.759-05	6.696-04	5.030-08
1.460+03	1.342-15	1.306-08	2.344-12	2.281-05	6.677-04	1.306-08
1.462+03	1.321-17	9.054-09	2.314-14	1.586-05	6.658-04	9.054-09
1.464+03	2.119-17	1.218-08	3.724-14	2.140-05	6.639-04	1.218-08
1.466+03	2.913-17	1.537-08	5.135-14	2.709-05	6.620-04	1.537-08
1.468+03	3.702-17	1.852-08	6.546-14	3.276-05	6.601-04	1.852-08
1.470+03	2.878-13	7.006-08	5.105-10	1.243-04	6.582-04	7.008-08
1.472+03	1.344-12	2.269-07	2.392-09	4.037-04	6.563-04	2.270-07
1.474+03	3.796-12	4.504-07	6.776-09	8.039-04	6.544-04	4.506-07
1.476+03	7.798-12	7.819-07	1.396-08	1.400-03	6.525-04	7.823-07
1.478+03	1.179-11	1.119-06	2.118-08	2.011-03	6.506-04	1.120-06
1.480+03	1.519-11	1.352-06	2.738-08	2.437-03	6.487-04	1.353-06
1.482+03	1.706-11	1.372-06	3.083-08	2.480-03	6.467-04	1.373-06
1.484+03	1.615-11	1.260-06	2.929-08	2.285-03	6.448-04	1.261-06
1.486+03	1.217-11	9.327-07	2.213-08	1.697-03	6.429-04	9.333-07
1.488+03	8.174-12	5.916-07	1.492-08	1.080-03	6.410-04	5.920-07
1.490+03	4.483-12	3.040-07	8.207-09	5.565-04	6.391-04	3.042-07
1.492+03	1.565-12	1.232-07	2.873-09	2.263-04	6.372-04	1.233-07
1.494+03	1.629-14	8.396-09	3.001-11	1.538-05	6.353-04	8.397-09
1.496+03	1.092-22	3.190-10	2.019-19	5.897-07	6.334-04	3.190-10
1.498+03	7.827-23	2.553-10	1.451-19	4.734-07	6.315-04	2.553-10
1.500+03	4.751-23	1.919-10	8.838-20	3.570-07	6.296-04	1.919-10
1.502+03	1.678-23	1.207-10	3.132-20	2.252-07	6.276-04	1.207-10
1.504+03	1.142-24	5.957-11	2.138-21	1.116-07	6.257-04	5.957-11
1.506+03	8.335-25	4.350-11	1.566-21	8.171-08	6.238-04	4.350-11
1.508+03	5.276-25	2.756-11	9.945-22	5.194-08	6.219-04	2.756-11
1.510+03	2.237-25	1.173-11	4.231-22	2.217-08	6.200-04	1.173-11
1.512+03	1.353-28	3.825-14	2.566-25	7.258-11	6.181-04	3.825-14
1.514+03	3.098-36	0.000	5.898-33	0.000	6.162-04	0.000
1.516+03	2.457-36	0.000	4.693-33	0.000	6.143-04	0.000
1.518+03	5.999-29	3.768-14	1.149-25	7.220-11	6.124-04	3.768-14
1.520+03	5.603-22	1.039-10	1.077-18	1.997-07	6.105-04	1.039-10
1.522+03	9.655-21	5.308-10	8.979-18	1.024-06	6.086-04	5.308-10
1.524+03	8.730-21	9.629-10	1.690-17	1.864-06	6.067-04	9.629-10
1.526+03	1.278-20	1.392-09	2.481-17	2.703-06	6.048-04	1.392-09
1.528+03	1.680-20	1.818-09	3.273-17	3.543-06	6.029-04	1.818-09
1.530+03	1.970-20	2.038-09	3.851-17	3.985-06	6.009-04	2.038-09
1.532+03	1.561-20	1.620-09	3.063-17	3.177-06	5.990-04	1.620-09
1.534+03	1.154-20	1.187-09	2.271-17	2.337-06	5.971-04	1.187-09
1.536+03	7.490-21	7.583-10	1.479-17	1.498-06	5.952-04	7.583-10
1.538+03	3.469-21	3.326-10	6.875-18	6.591-07	5.933-04	3.326-10
1.540+03	8.099-24	1.389-11	1.610-20	2.761-08	5.915-04	1.389-11
1.542+03	9.023-27	1.098-11	1.800-23	2.191-08	5.896-04	1.098-11
1.544+03	1.318-26	1.607-11	2.639-23	3.218-08	5.877-04	1.607-11
1.546+03	1.731-26	2.113-11	3.478-23	4.246-08	5.858-04	2.113-11
1.548+03	2.020-26	2.482-11	4.072-23	5.004-08	5.839-04	2.482-11
1.550+03	1.598-26	1.966-11	3.233-23	3.977-08	5.820-04	1.966-11
1.552+03	1.180-26	1.453-11	2.395-23	2.949-08	5.801-04	1.453-11
1.554+03	7.639-27	9.434-12	1.556-23	1.922-08	5.782-04	9.434-12

1.556+03	3.510-27	4.375-12	7.175-24	8.943-09	5.763-04	4.375-12
1.558+03	9.670-28	0.000	9.581-25	0.000	5.744-04	0.000
1.560+03	1.294-27	0.000	2.663-24	0.000	5.725-04	0.000
1.562+03	2.115-27	0.000	4.369-24	0.000	5.707-04	0.000
1.564+03	4.007-27	4.366-13	8.306-24	9.050-10	5.688-04	4.366-13
1.566+03	6.179-27	9.774-13	1.284-23	2.033-09	5.669-04	9.774-13
1.568+03	7.411-27	1.514-12	1.547-23	3.162-09	5.650-04	1.514-12
1.570+03	1.771-20	2.606-11	3.711-17	5.460-08	5.632-04	2.606-11
1.572+03	6.569-13	2.429-08	1.381-09	5.107-05	5.613-04	2.430-08
1.574+03	7.508-11	2.777-07	1.584-07	5.860-04	5.594-04	2.786-07
1.576+03	3.182-08	2.377-06	6.739-05	5.034-03	5.575-04	2.499-06
1.578+03	1.986-07	8.077-06	4.221-04	1.716-02	5.556-04	8.759-06
1.580+03	8.296-07	1.611-05	1.769-03	3.862-02	5.533-04	2.066-05
1.582+03	1.573-06	2.945-05	3.367-03	6.304-02	5.510-04	3.421-05
1.584+03	2.324-06	4.142-05	4.992-03	8.897-02	5.487-04	4.842-05
1.586+03	3.018-06	5.047-05	6.506-03	1.088-01	5.463-04	5.951-05
1.588+03	3.450-06	5.275-05	7.464-03	1.141-01	5.441-04	6.300-05
1.590+03	3.359-06	5.055-05	7.293-03	1.098-01	5.423-04	6.052-05
1.592+03	3.377-06	4.899-05	7.359-03	1.068-01	5.406-04	5.871-05
1.594+03	3.371-06	4.562-05	7.372-03	9.977-02	5.388-04	5.538-05
1.596+03	3.376-06	4.296-05	7.411-03	9.430-02	5.370-04	5.258-05
1.598+03	3.495-06	4.364-05	7.701-03	9.614-02	5.352-04	5.350-05
1.600+03	3.291-06	4.046-05	7.278-03	8.946-02	5.335-04	4.965-05

LAYER (1 IS NEAREST GROUND) = 3

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	4.136-10	2.624-05	8.224-07	5.218-02	6.773-04	3.295-05
1.452+03	1.226-10	1.422-05	2.445-07	2.836-02	6.754-04	1.678-05
1.454+03	1.789-12	6.537-06	3.580-09	1.308-02	6.735-04	6.894-06
1.456+03	1.324-18	3.723-06	2.659-15	7.474-03	6.716-04	3.814-06
1.458+03	6.905-19	2.485-06	1.391-15	5.005-03	6.696-04	2.535-06
1.460+03	6.246-20	1.633-06	1.263-16	3.299-03	6.677-04	1.696-06
1.462+03	1.694-23	1.854-06	3.430-20	3.758-03	6.658-04	1.863-06
1.464+03	2.729-23	2.111-06	5.550-20	4.295-03	6.639-04	2.124-06
1.466+03	3.758-23	2.388-06	7.670-20	4.874-03	6.620-04	2.404-06
1.468+03	4.781-23	2.694-06	9.790-20	5.414-03	6.601-04	2.663-06
1.470+03	9.279-17	3.242-06	1.906-13	6.659-03	6.582-04	3.312-06
1.472+03	4.523-16	5.059-06	9.321-13	1.043-02	6.563-04	5.286-06
1.474+03	1.859-15	7.836-06	3.845-12	1.620-02	6.544-04	8.287-06
1.476+03	4.373-15	1.217-05	9.073-12	2.526-02	6.525-04	1.296-05
1.478+03	6.873-15	1.673-05	1.431-11	3.482-02	6.506-04	1.785-05
1.480+03	9.174-15	1.968-05	1.916-11	4.110-02	6.487-04	2.103-05
1.482+03	1.093-14	1.977-05	2.291-11	4.144-02	6.467-04	2.115-05
1.484+03	1.062-14	1.829-05	2.233-11	3.847-02	6.448-04	1.955-05
1.486+03	8.111-15	1.380-05	1.711-11	2.911-02	6.429-04	1.473-05
1.488+03	5.611-15	8.848-06	1.188-11	1.873-02	6.410-04	9.440-06
1.490+03	3.216-15	4.850-06	6.832-12	1.030-02	6.391-04	5.154-06
1.492+03	1.098-15	2.363-06	2.340-12	5.037-03	6.372-04	2.487-06
1.494+03	3.216-18	6.488-07	6.878-15	1.388-03	6.353-04	6.571-07
1.496+03	3.958-31	3.634-07	8.494-28	7.798-04	6.334-04	3.637-07
1.498+03	2.812-31	3.238-07	6.006-28	6.972-04	6.315-04	3.240-07
1.500+03	1.675-31	2.844-07	3.619-28	6.156-04	6.296-04	2.846-07
1.502+03	5.442-32	2.267-07	1.180-28	4.895-04	6.276-04	2.259-07
1.504+03	2.479-34	1.410-07	5.394-31	3.047-04	6.257-04	1.410-07
1.506+03	1.809-34	1.029-07	3.951-31	2.247-04	6.238-04	1.030-07
1.508+03	1.145-34	6.523-08	2.508-31	1.429-04	6.219-04	6.526-08
1.510+03	4.848-35	2.780-08	1.066-31	6.113-05	6.200-04	2.782-08
1.512+03	5.060-39	1.419-10	1.116-35	3.131-07	6.181-04	1.420-10
1.514+03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516+03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518+03	3.795-39	1.089-10	8.462-36	2.428-07	6.124-04	1.089-10
1.520+03	2.047-29	6.637-08	4.580-26	1.485-04	6.105-04	6.647-08
1.522+03	1.789-28	2.433-07	4.018-25	5.912-04	6.086-04	2.438-07
1.524+03	3.364-28	4.651-07	7.579-25	1.048-03	6.067-04	4.661-07
1.526+03	4.927-28	6.655-07	1.114-24	1.505-03	6.048-04	6.669-07
1.528+03	6.478-28	8.642-07	1.470-24	1.961-03	6.029-04	8.660-07
1.530+03	7.621-28	9.320-07	1.736-24	2.123-03	6.009-04	9.341-07
1.532+03	6.037-28	7.414-07	1.380-24	1.695-03	5.990-04	7.430-07
1.534+03	4.463-28	5.395-07	1.024-24	1.238-03	5.971-04	5.407-07
1.536+03	2.900-28	3.391-07	6.676-25	7.808-04	5.952-04	3.399-07
1.538+03	1.348-28	1.419-07	3.114-25	3.279-04	5.933-04	1.422-07
1.540+03	8.843-32	2.286-08	2.051-28	5.300-05	5.915-04	2.287-08
1.542+03	6.513-37	3.119-08	1.516-33	7.258-05	5.896-04	3.120-08
1.544+03	9.503-37	4.567-08	2.220-33	1.067-04	5.877-04	4.569-08
1.546+03	1.247-36	6.005-08	2.924-33	1.406-04	5.858-04	6.007-08
1.548+03	1.451-36	7.061-08	3.413-33	1.661-04	5.839-04	7.064-08
1.550+03	1.147-36	5.592-08	2.710-33	1.320-04	5.820-04	5.594-08
1.552+03	8.462-37	4.133-08	2.006-33	9.796-05	5.801-04	4.134-08
1.554+03	5.472-37	2.685-08	1.302-33	6.387-05	5.782-04	2.686-08

1.556+03	2.503-37	1.247-08	5.977-34	2.977-05	5.743-04	1.247-08
1.558+03	6.272-39	0.000	1.503-35	0.000	5.744-04	0.000
1.560+03	1.732-38	0.000	4.166-35	0.000	5.725-04	0.000
1.562+03	2.829-38	0.000	6.831-35	0.000	5.707-04	0.000
1.564+03	5.785-38	2.327-09	1.402-34	5.638-06	5.688-04	2.327-09
1.566+03	9.215-38	5.208-09	2.241-34	1.267-05	5.669-04	5.209-09
1.568+03	1.139-37	8.067-09	2.781-34	1.969-05	5.650-04	8.069-09
1.570+03	6.891-27	1.987-08	1.689-23	4.869-05	5.632-04	1.989-08
1.572+03	4.421-16	5.783-07	1.087-12	1.422-03	5.613-04	6.026-07
1.574+03	6.148-13	3.031-06	1.518-09	7.483-03	5.594-04	3.310-06
1.576+03	1.203-09	9.257-06	2.981-06	2.294-02	5.575-04	9.176-05
1.578+03	9.761-09	2.017-05	2.428-05	5.018-02	5.556-04	2.893-05
1.580+03	7.433-08	3.521-05	1.856-04	8.793-02	5.538-04	5.587-05
1.582+03	1.528-07	5.127-05	3.830-04	1.285-01	5.519-04	8.548-05
1.584+03	2.311-07	6.611-05	5.815-04	1.663-01	5.489-04	1.145-04
1.586+03	3.068-07	7.528-05	7.749-04	1.901-01	5.466-04	1.398-04
1.588+03	3.680-07	7.635-05	9.330-04	1.936-01	5.445-04	1.394-04
1.590+03	3.580-07	7.315-05	9.109-04	1.862-01	5.427-04	1.337-04
1.592+03	3.531-07	6.962-05	9.019-04	1.778-01	5.409-04	1.285-04
1.594+03	3.474-07	6.398-05	8.909-04	1.641-01	5.392-04	1.194-04
1.596+03	3.423-07	6.007-05	8.811-04	1.546-01	5.374-04	1.126-04
1.598+03	3.433-07	6.064-05	8.871-04	1.564-01	5.356-04	1.140-04
1.600+03	3.215-07	5.749-05	8.341-04	1.491-01	5.338-04	1.071-04

LAYER.1 IS NEAREST GROUND) = 4

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICRONETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	6.523-11	6.338-05	1.508-07	1.465-01	6.773-04	9.634-05
1.452+03	1.892-11	4.711-05	4.388-08	1.093-01	6.754-04	6.389-05
1.454+03	2.417-13	3.920-05	5.626-10	7.961-02	6.735-04	4.109-05
1.456+03	3.453-20	2.556-05	8.067-17	5.970-02	6.716-04	2.937-05
1.458+03	1.799-20	2.085-05	4.217-17	4.886-02	6.696-04	2.338-05
1.460+03	1.596-21	1.961-05	3.755-18	4.613-02	6.677-04	2.126-05
1.462+03	1.259-25	2.348-05	2.971-22	5.543-02	6.658-04	2.535-05
1.464+03	2.031-25	2.503-05	4.811-22	5.928-02	6.639-04	2.715-05
1.466+03	2.798-25	2.667-05	6.650-22	6.340-02	6.620-04	2.908-05
1.468+03	3.559-25	2.790-05	8.490-22	6.654-02	6.601-04	3.056-05
1.470+03	4.213-18	2.717-05	1.008-14	6.503-02	6.582-04	3.048-05
1.472+03	2.072-17	2.775-05	4.977-14	6.665-02	6.563-04	3.304-05
1.474+03	9.877-17	3.335-05	2.381-13	8.038-02	6.544-04	4.163-05
1.476+03	2.415-16	4.410-05	5.842-13	1.067-01	6.525-04	5.706-05
1.478+03	3.834-16	5.625-05	9.307-13	1.365-01	6.506-04	7.410-05
1.480+03	5.160-16	6.396-05	1.257-12	1.558-01	6.487-04	8.499-05
1.482+03	6.234-16	6.481-05	1.524-12	1.586-01	6.467-04	8.596-05
1.484+03	6.092-16	6.089-05	1.495-12	1.494-01	6.448-04	8.044-05
1.486+03	4.666-16	4.861-05	1.149-12	1.197-01	6.429-04	6.334-05
1.488+03	3.247-16	3.369-05	8.024-13	8.326-02	6.410-04	4.313-05
1.490+03	1.879-16	2.235-05	4.660-13	5.543-02	6.391-04	2.750-05
1.492+03	6.396-17	1.557-05	1.592-13	3.877-02	6.372-04	1.806-05
1.494+03	1.277-19	1.119-05	3.191-16	2.794-02	6.353-04	1.184-05
1.496+03	4.079-34	9.286-06	1.023-30	2.328-02	6.334-04	9.650-06
1.498+03	2.896-34	8.793-06	7.287-31	2.213-02	6.315-04	9.117-06
1.500+03	1.721-34	8.304-06	4.348-31	2.097-02	6.296-04	8.588-06
1.502+03	5.554-35	7.161-06	1.408-31	1.815-02	6.276-04	7.386-06
1.504+03	8.751-38	4.776-06	2.226-34	1.215-02	6.257-04	4.917-06
1.506+03	6.387-38	3.486-06	1.631-34	8.903-03	6.238-04	3.589-06
1.508+03	4.039-38	2.210-06	1.035-34	5.664-03	6.219-04	2.275-06
1.510+03	1.709-38	9.429-07	4.398-35	2.426-03	6.200-04	9.708-07
1.512+03	0.000	6.238-09	0.000	1.611-05	6.181-04	6.380-09
1.514+03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516+03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518+03	0.000	3.982-09	0.000	1.090-05	6.124-04	4.091-09
1.520+03	4.722-32	1.290-06	1.237-28	3.381-03	6.105-04	1.356-06
1.522+03	4.143-31	4.547-06	1.090-27	1.196-02	6.086-04	4.811-06
1.524+03	7.787-31	7.901-06	2.056-27	2.086-02	6.067-04	8.367-06
1.526+03	1.140-30	1.123-05	3.022-27	2.976-02	6.048-04	1.190-05
1.528+03	1.499-30	1.453-05	3.989-27	3.866-02	6.029-04	1.539-05
1.530+03	1.764-30	1.529-05	4.710-27	4.082-02	6.009-04	1.622-05
1.532+03	1.397-30	1.215-05	3.744-27	3.257-02	5.990-04	1.289-05
1.534+03	1.032-30	8.795-06	2.778-27	2.367-02	5.971-04	9.336-06
1.536+03	6.708-31	5.466-06	1.812-27	1.476-02	5.952-04	5.806-06
1.538+03	3.118-31	2.221-06	8.453-28	6.021-03	5.933-04	2.363-06
1.540+03	1.376-34	5.617-07	3.744-31	1.529-03	5.915-04	5.846-07
1.542+03	0.000	8.264-07	5.101-37	2.258-03	5.896-04	8.576-07
1.544+03	0.000	1.208-06	7.469-37	3.313-03	5.877-04	1.254-06
1.546+03	0.000	1.586-06	9.836-37	4.368-03	5.858-04	1.647-06
1.548+03	0.000	1.856-06	1.148-36	5.129-03	5.839-04	1.926-06
1.550+03	0.000	1.968-06	9.108-37	4.074-03	5.820-04	1.529-06
1.552+03	0.000	1.084-06	6.741-37	3.019-03	5.801-04	1.125-06
1.554+03	0.000	7.025-07	4.359-37	1.964-03	5.782-04	7.294-07

1.556+03	0.000	3.240-07	1.991-37	9.094-04	5.763-04	3.365-07
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	4.991-39	0.000	5.707-04	0.000
1.564+03	0.000	0.000	8.800-39	0.000	5.688-04	2.327-09
1.566+03	0.000	0.000	2.844-38	0.000	5.669-04	8.209-09
1.568+03	0.000	0.000	3.770-38	0.000	5.650-04	1.042-07
1.570+03	3.122-29	1.839-07	9.006-26	5.305-04	5.632-04	2.038-07
1.572+03	2.425-17	3.150-06	7.025-14	9.125-03	5.613-04	3.753-06
1.574+03	8.039-14	1.095-05	2.338-10	3.039-02	5.594-04	1.376-05
1.576+03	2.362-10	2.191-05	6.897-07	6.396-02	5.575-04	3.366-05
1.578+03	2.097-09	3.695-05	6.148-06	1.083-01	5.556-04	6.589-05
1.580+03	2.050-08	5.454-05	6.034-05	1.605-01	5.534-04	1.104-04
1.582+03	4.300-08	6.913-05	1.270-04	2.043-01	5.512-04	1.546-04
1.584+03	6.539-08	7.849-05	1.940-04	2.328-01	5.490-04	1.930-04
1.586+03	8.722-08	8.237-05	2.598-04	2.453-01	5.467-04	2.172-04
1.588+03	1.058-07	8.165-05	3.163-04	2.442-01	5.446-04	2.210-04
1.590+03	1.024-07	7.816-05	3.075-04	2.347-01	5.428-04	2.118-04
1.592+03	9.980-08	7.506-05	3.008-04	2.263-01	5.410-04	2.036-04
1.594+03	9.706-08	7.206-05	2.938-04	2.181-01	5.393-04	1.914-04
1.596+03	9.443-08	7.038-05	2.870-04	2.139-01	5.375-04	1.830-04
1.598+03	9.316-08	7.042-05	2.843-04	2.199-01	5.357-04	1.845-04
1.600+03	8.701-08	6.925-05	2.666-04	2.122-01	5.339-04	1.744-04

LAYER(1 IS NEAREST GROUND) = 5

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	1.374-11	6.089-05	3.720-08	1.648-01	6.773-04	1.572-04
1.452+03	3.952-12	5.150-05	1.074-08	1.399-01	6.754-04	1.154-04
1.454+03	4.792-14	4.327-05	1.307-10	1.180-01	6.735-04	8.436-05
1.456+03	3.530-21	3.588-05	9.661-18	9.819-02	6.716-04	6.525-05
1.458+03	1.838-21	3.209-05	5.049-18	8.814-02	6.696-04	5.547-05
1.460+03	1.621-22	3.339-05	4.470-19	9.206-02	6.677-04	5.465-05
1.462+03	7.669-27	4.027-05	2.122-23	1.114-01	6.658-04	6.562-05
1.464+03	1.237-26	4.190-05	3.437-23	1.164-01	6.639-04	6.905-05
1.466+03	1.704-26	4.334-05	4.751-23	1.208-01	6.620-04	7.242-05
1.468+03	2.168-26	4.392-05	6.066-23	1.229-01	6.601-04	7.548-05
1.470+03	5.354-19	4.017-05	1.509-15	1.128-01	6.582-04	7.655-05
1.472+03	2.691-18	3.562-05	7.446-15	1.004-01	6.563-04	6.866-05
1.474+03	1.342-17	3.816-05	3.798-14	1.080-01	6.544-04	7.980-05
1.476+03	3.331-17	4.601-05	9.460-14	1.307-01	6.525-04	1.031-04
1.478+03	5.306-17	5.580-05	1.513-13	1.591-01	6.506-04	1.299-04
1.480+03	7.161-17	6.226-05	2.049-13	1.782-01	6.487-04	1.472-04
1.482+03	8.693-17	6.400-05	2.497-13	1.838-01	6.467-04	1.500-04
1.484+03	8.512-17	6.115-05	2.454-13	1.763-01	6.448-04	1.416-04
1.486+03	6.525-17	5.192-05	1.889-13	1.503-01	6.429-04	1.153-04
1.488+03	4.550-17	3.924-05	1.322-13	1.140-01	6.410-04	8.237-05
1.490+03	2.641-17	3.018-05	7.703-14	8.803-02	6.391-04	5.768-05
1.492+03	8.983-18	2.553-05	2.630-14	7.476-02	6.372-04	4.359-05
1.494+03	1.538-20	2.338-05	4.521-17	6.873-02	6.353-04	3.523-05
1.496+03	1.100-35	2.074-05	3.244-32	6.120-02	6.334-04	3.039-05
1.498+03	7.803-36	1.992-05	2.311-32	5.901-02	6.315-04	2.904-05
1.500+03	4.636-36	1.911-05	1.378-32	5.682-02	6.296-04	2.770-05
1.502+03	1.492-36	1.671-05	4.454-33	4.987-02	6.276-04	2.409-05
1.504+03	0.000	1.123-05	4.337-36	3.366-02	6.257-04	1.615-05
1.506+03	0.000	8.189-06	3.177-36	2.463-02	6.238-04	1.178-05
1.508+03	0.000	5.178-06	2.016-36	1.564-02	6.219-04	7.453-06
1.510+03	0.000	2.189-06	8.554-37	6.637-03	6.200-04	3.140-06
1.512+03	0.000	3.045-09	0.000	9.268-06	6.181-04	9.425-09
1.514+03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516+03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518+03	0.000	3.761-09	0.000	1.158-05	6.124-04	7.852-09
1.520+03	1.784-33	2.469-06	5.516-36	7.634-03	6.105-04	3.825-06
1.522+03	1.567-32	8.406-06	4.864-29	2.609-02	6.086-04	1.322-05
1.524+03	2.945-32	1.454-05	9.177-29	4.531-02	6.067-04	2.291-05
1.526+03	4.312-32	2.062-05	1.349-28	6.453-02	6.048-04	3.252-05
1.528+03	5.668-32	2.665-05	1.780-28	8.373-02	6.029-04	4.204-05
1.530+03	6.666-32	2.762-05	2.102-28	8.773-02	6.009-04	4.404-05
1.532+03	5.278-32	2.212-05	1.671-28	7.004-02	5.990-04	3.501-05
1.534+03	3.900-32	1.599-05	1.240-28	5.082-02	5.971-04	2.532-05
1.536+03	2.533-32	9.901-06	8.087-29	3.161-02	5.952-04	1.571-05
1.538+03	1.177-32	3.933-06	3.774-29	1.241-02	5.933-04	6.296-06
1.540+03	9.436-36	6.684-07	1.428-32	2.151-03	5.915-04	1.253-06
1.542+03	0.000	7.910-07	6.803-39	2.556-03	5.896-04	1.699-06
1.544+03	0.000	1.150-06	1.146-38	3.729-03	5.877-04	2.403-06
1.546+03	0.000	1.505-06	1.507-38	4.903-03	5.858-04	3.152-06
1.548+03	0.000	1.732-06	1.749-38	5.663-03	5.839-04	3.658-06
1.550+03	0.000	1.367-06	1.388-38	4.489-03	5.820-04	2.891-06
1.552+03	0.000	1.006-06	8.942-39	3.316-03	5.801-04	2.131-06
1.554+03	0.000	6.469-07	5.795-39	2.142-03	5.782-04	1.376-06

1.556+03	0.000	2.913-07	1.721-37	9.683-04	5.741-04	6.277-07
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	0.000	0.000	5.707-04	0.000
1.564+03	0.000	0.000	0.000	0.000	5.688-04	2.327-09
1.566+03	0.000	0.000	0.000	0.000	5.669-04	5.209-09
1.568+03	0.000	0.000	0.000	0.000	5.650-04	8.069-09
1.570+03	1.481-30	3.449-07	5.087-27	1.180-03	5.632-04	2.486-07
1.572+03	3.286-18	4.052-06	1.129-14	1.392-02	5.613-04	7.804-06
1.574+03	1.571-14	1.111-05	5.421-11	3.833-02	5.594-04	2.487-05
1.576+03	5.466-11	2.048-05	1.894-07	7.096-02	5.575-04	5.414-05
1.578+03	5.056-10	3.137-05	1.759-06	1.092-01	5.556-04	9.725-05
1.580+03	5.612-09	4.281-05	1.961-05	1.496-01	5.534-04	1.532-04
1.582+03	1.185-08	4.940-05	4.158-05	1.733-01	5.512-04	2.040-04
1.584+03	1.805-08	5.151-05	6.362-05	1.815-01	5.490-04	2.445-04
1.586+03	2.411-08	5.098-05	8.533-05	1.804-01	5.468-04	2.681-04
1.588+03	2.937-08	4.953-05	1.044-04	1.760-01	5.446-04	2.705-04
1.590+03	2.834-08	4.718-05	1.011-04	1.684-01	5.428-04	2.590-04
1.592+03	2.748-08	4.598-05	9.851-05	1.648-01	5.411-04	2.496-04
1.594+03	2.660-08	4.582-05	9.576-05	1.649-01	5.393-04	2.372-04
1.596+03	2.575-08	4.605-05	9.309-05	1.665-01	5.375-04	2.291-04
1.598+03	2.523-08	4.567-05	9.160-05	1.658-01	5.357-04	2.301-04
1.600+03	2.357-08	4.606-05	8.595-05	1.679-01	5.340-04	2.225-04

LAYER (1 IS NEAREST GROUND) = 6

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450*03	3.261-12	2.752-05	1.194-08	1.008-01	6.773-04	1.847-04
1.452*03	9.366-13	2.407-05	3.444-09	8.850-02	6.754-04	1.394-04
1.454*03	1.120-14	2.105-05	4.135-11	7.773-02	6.735-04	1.054-04
1.456*03	6.508-22	1.817-05	2.413-18	6.737-02	6.716-04	8.342-05
1.458*03	3.387-22	1.691-05	1.261-18	6.294-02	6.696-04	7.238-05
1.460*03	2.980-23	1.834-05	1.114-19	6.856-02	6.677-04	7.299-05
1.462*03	1.211-27	2.247-05	4.545-24	8.434-02	6.658-04	8.809-05
1.464*03	1.953-27	2.338-05	7.361-24	8.812-02	6.639-04	9.243-05
1.466*03	2.689-27	2.401-05	1.018-23	9.087-02	6.620-04	9.643-05
1.468*03	3.419-27	2.410-05	1.299-23	9.159-02	6.601-04	9.859-05
1.470*03	1.065-19	2.162-05	4.064-16	8.250-02	6.582-04	9.227-05
1.472*03	5.257-19	1.825-05	2.014-15	6.991-02	6.563-04	8.690-05
1.474*03	2.733-18	1.871-05	1.051-14	7.200-02	6.544-04	9.851-05
1.476*03	6.812-18	2.176-05	2.632-14	8.408-02	6.525-04	1.248-04
1.478*03	1.086-17	2.590-05	4.214-14	1.005-01	6.506-04	1.558-04
1.480*03	1.467-17	2.885-05	5.715-14	1.124-01	6.487-04	1.761-04
1.482*03	1.783-17	3.011-05	6.975-14	1.178-01	6.467-04	1.801-04
1.484*03	1.746-17	2.920-05	6.861-14	1.147-01	6.448-04	1.708-04
1.486*03	1.338-17	2.560-05	5.281-14	1.010-01	6.429-04	1.409-04
1.488*03	9.336-18	2.016-05	3.699-14	7.986-02	6.410-04	1.025-04
1.490*03	5.422-18	1.632-05	2.158-14	6.495-02	6.391-04	7.400-05
1.492*03	1.843-18	1.455-05	7.366-15	5.813-02	6.372-04	5.814-05
1.494*03	3.024-21	1.412-05	1.213-17	5.666-02	6.353-04	4.935-05
1.496*03	1.323-36	1.285-05	5.331-33	5.178-02	6.334-04	4.324-05
1.498*03	9.383-37	1.256-05	3.798-33	5.082-02	6.315-04	4.160-05
1.500*03	5.571-37	1.226-05	2.266-33	4.986-02	6.296-04	3.996-05
1.502*03	1.792-37	1.096-05	7.315-34	4.476-02	6.276-04	3.506-05
1.504*03	0.000	7.498-06	6.082-37	3.074-02	6.257-04	2.365-05
1.506*03	0.000	5.474-06	4.455-37	2.254-02	6.238-04	1.725-05
1.508*03	0.000	3.468-06	2.818-37	1.434-02	6.219-04	1.092-05
1.510*03	0.000	1.480-06	1.168-37	6.148-03	6.200-04	4.640-06
1.512*03	0.000	2.193-09	0.000	9.149-06	6.181-04	1.162-08
1.514*03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516*03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518*03	0.000	2.462-09	0.000	1.091-05	6.124-04	1.031-08
1.520*03	2.381-34	1.462-06	1.011-30	6.206-03	6.105-04	5.287-06
1.522*03	2.091-33	4.860-06	8.919-30	2.072-02	6.086-04	1.808-05
1.524*03	3.928-33	8.370-06	1.682-29	3.584-02	6.067-04	3.128-05
1.526*03	5.749-33	1.185-05	2.472-29	5.096-02	6.048-04	4.437-05
1.528*03	7.553-33	1.529-05	3.263-29	6.607-02	6.029-04	5.734-05
1.530*03	8.881-33	1.586-05	3.853-29	6.882-02	6.009-04	5.990-05
1.532*03	7.029-33	1.260-05	3.063-29	5.493-02	5.990-04	4.762-05
1.534*03	5.192-33	9.094-06	2.273-29	3.981-02	5.971-04	3.492-05
1.536*03	3.371-33	5.614-06	1.482-29	2.469-02	5.952-04	2.132-05
1.538*03	1.566-33	2.209-06	6.916-30	9.755-03	5.933-04	8.505-06
1.540*03	5.604-37	4.126-07	2.486-33	1.830-03	5.915-04	1.666-06
1.542*03	0.000	5.028-07	0.000	2.290-03	5.896-04	2.151-06
1.544*03	0.000	7.304-07	0.000	3.269-03	5.877-04	3.134-06
1.546*03	0.000	9.560-07	0.000	4.298-03	5.858-04	4.108-06
1.548*03	0.000	.099-06	0.000	4.964-03	5.839-04	4.757-06
1.550*0	0.000	8.675-07	0.000	3.935-03	5.820-04	3.759-06
1.552*03	0.000	6.378-07	0.000	2.902-03	5.801-04	2.769-06
1.554*03	0.000	4.102-07	0.000	1.878-03	5.782-04	1.787-06

1.556+03	0.000	1.846-07	0.000	8.487-04	5.763-04	8.123-07
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	0.000	0.000	5.707-04	0.000
1.564+03	0.000	0.000	0.000	0.000	5.688-04	2.327-09
1.566+03	0.000	0.000	0.000	0.000	5.669-04	5.209-09
1.568+03	0.000	0.000	0.000	0.000	5.650-04	8.069-09
1.570+03	2.167-31	2.288-07	1.029-27	1.086-03	5.632-04	7.779-07
1.572+03	6.871-19	2.207-06	3.277-15	1.052-02	5.613-04	1.001-05
1.574+03	3.689-15	5.566-06	1.767-11	2.667-02	5.594-04	3.043-05
1.576+03	1.386-11	9.759-06	6.672-08	4.697-02	5.575-04	6.390-05
1.578+03	1.305-10	1.443-05	6.311-07	6.978-02	5.556-04	1.117-04
1.580+03	1.566-09	1.905-05	7.605-06	9.259-02	5.534-04	1.723-04
1.582+03	3.306-09	2.096-05	1.613-05	1.023-01	5.512-04	2.250-04
1.584+03	5.034-09	2.096-05	2.468-05	1.028-01	5.490-04	2.655-04
1.586+03	6.723-09	2.011-05	3.311-05	9.907-02	5.468-04	2.883-04
1.588+03	8.203-09	1.919-05	4.059-05	9.498-02	5.446-04	2.897-04
1.590+03	7.883-09	1.811-05	3.919-05	9.004-02	5.428-04	2.771-04
1.592+03	7.650-09	1.779-05	3.821-05	8.884-02	5.411-04	2.674-04
1.594+03	7.412-09	1.805-05	3.719-05	9.060-02	5.393-04	2.553-04
1.596+03	7.181-09	1.839-05	3.620-05	9.273-02	5.375-04	2.475-04
1.598+03	7.035-09	1.822-05	3.564-05	9.230-02	5.357-04	2.484-04
1.600+03	6.607-09	1.867-05	3.363-05	9.504-02	5.340-04	2.411-04

LAYER (1 IS NEAREST GROUND) = 7

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	5.089-13	5.505-06	2.810-09	3.039-02	6.773-04	1.902-04
1.452+03	1.473-13	4.866-06	8.167-10	2.698-02	6.754-04	1.993-04
1.454+03	1.830-15	4.338-06	1.020-11	2.417-02	6.735-04	1.098-04
1.456+03	9.164-23	3.814-06	5.130-19	2.135-02	6.716-04	8.724-05
1.458+03	4.767-23	3.605-06	2.681-19	2.027-02	6.696-04	7.598-05
1.460+03	4.188-24	3.969-06	2.366-20	2.240-02	6.677-04	7.696-05
1.462+03	1.665-28	4.878-06	9.454-25	2.769-02	6.658-04	9.297-05
1.464+03	2.685-28	5.063-06	1.531-24	2.887-02	6.639-04	9.750-05
1.466+03	3.695-28	5.170-06	2.117-24	2.962-02	6.620-04	1.016-04
1.468+03	4.695-28	5.155-06	2.703-24	2.968-02	6.601-04	1.037-04
1.470+03	1.543-20	4.572-06	8.924-17	2.645-02	6.582-04	9.684-05
1.472+03	7.615-20	3.773-06	4.425-16	2.193-02	6.563-04	9.068-05
1.474+03	4.012-19	3.808-06	2.343-15	2.223-02	6.544-04	1.023-04
1.476+03	1.002-18	4.408-06	5.881-15	2.586-02	6.525-04	1.292-04
1.478+03	1.598-18	5.253-06	9.421-15	3.097-02	6.506-04	1.610-04
1.480+03	2.159-18	5.914-06	1.278-14	3.503-02	6.487-04	1.820-04
1.482+03	2.625-18	6.262-06	1.562-14	3.726-02	6.467-04	1.863-04
1.484+03	2.570-18	6.152-06	1.537-14	3.679-02	6.448-04	1.769-04
1.486+03	1.969-18	5.473-06	1.183-14	3.288-02	6.429-04	1.463-04
1.488+03	1.373-18	4.381-06	8.291-15	2.695-02	6.410-04	1.069-04
1.490+03	7.976-19	3.594-06	4.838-15	2.180-02	6.391-04	7.760-05
1.492+03	2.708-19	3.233-06	1.651-15	1.971-02	6.372-04	6.137-05
1.494+03	4.442-22	3.181-06	2.721-18	1.948-02	6.353-04	5.253-05
1.496+03	1.656-37	2.926-06	1.019-33	1.801-02	6.334-04	4.617-05
1.498+03	1.174-37	2.888-06	7.262-34	1.786-02	6.315-04	4.498-05
1.500+03	6.969-38	2.850-06	4.330-34	1.771-02	6.296-04	4.281-05
1.502+03	2.240-38	2.573-06	1.399-34	1.606-02	6.276-04	3.763-05
1.504+03	0.000	1.772-06	1.090-37	1.112-02	6.257-04	2.542-05
1.506+03	0.000	1.293-06	7.862-38	8.153-03	6.238-04	1.855-05
1.508+03	0.000	8.189-07	4.876-38	5.189-03	6.219-04	1.174-05
1.510+03	0.000	3.494-07	1.421-38	2.225-03	6.200-04	4.990-06
1.512+03	0.000	5.253-10	0.000	3.361-06	6.181-04	1.214-08
1.514+03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516+03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518+03	0.000	5.448-10	0.000	3.538-06	6.124-04	1.084-08
1.520+03	3.053-35	3.130-07	1.992-31	2.042-03	6.105-04	5.600-06
1.522+03	2.679-34	1.031-06	1.757-30	6.759-03	6.086-04	1.911-05
1.524+03	5.030-34	1.771-06	3.315-30	1.167-02	6.067-04	3.305-05
1.526+03	7.357-34	2.505-06	4.873-30	1.659-02	6.048-04	4.687-05
1.528+03	9.662-34	3.230-06	6.431-30	2.150-02	6.029-04	6.057-05
1.530+03	1.135-33	3.340-06	7.594-30	2.234-02	6.009-04	6.324-05
1.532+03	8.980-34	2.652-06	6.037-30	1.783-02	5.990-04	5.027-05
1.534+03	6.630-34	1.911-06	4.479-30	1.291-02	5.971-04	3.633-05
1.536+03	4.302-34	1.178-06	2.921-30	7.998-03	5.952-04	2.250-05
1.538+03	1.997-34	4.577-07	1.363-30	3.124-03	5.933-04	8.963-06
1.540+03	7.020-38	6.816-08	4.815-34	4.675-04	5.915-04	1.739-06
1.542+03	0.000	7.174-08	0.000	4.945-04	5.896-04	2.223-06
1.544+03	0.000	1.043-07	0.000	7.229-04	5.877-04	3.238-06
1.546+03	0.000	1.366-07	0.000	9.514-04	5.858-04	4.244-06
1.548+03	0.000	1.579-07	0.000	1.105-03	5.839-04	4.915-06
1.550+03	0.000	1.246-07	0.000	8.765-04	5.820-04	3.884-06
1.552+03	0.000	9.168-08	0.000	6.481-04	5.801-04	2.860-06
1.554+03	0.000	5.907-08	0.000	4.197-04	5.782-04	1.896-06

ORIGINAL PAGE IS
OF POOR QUALITY

1.556+03	0.000	2.678-08	0.000	1.913-04	5.763-04	8.371-02
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	0.000	0.000	5.707-04	0.000
1.564+03	0.000	0.000	0.000	0.000	5.688-04	2.327-09
1.566+03	0.000	0.000	0.000	0.000	5.669-04	5.209-09
1.568+03	0.000	0.000	0.000	0.000	5.650-04	8.049-09
1.570+03	2.957-32	5.414-08	2.189-28	4.007-04	5.632-04	8.316-07
1.572+03	1.061-19	4.871-07	7.891-16	3.624-03	5.613-04	1.050-05
1.574+03	5.845-16	1.186-06	4.371-12	8.869-03	5.594-04	3.162-05
1.576+03	2.288-12	2.035-06	1.720-08	1.530-02	5.575-04	6.594-05
1.578+03	2.237-11	2.970-06	1.691-07	2.244-02	5.556-04	1.147-04
1.580+03	3.582-10	3.876-06	2.721-06	2.944-02	5.539-04	1.761-04
1.582+03	7.568-10	4.174-06	5.778-06	3.187-02	5.512-04	2.291-04
1.584+03	1.152-09	4.098-06	8.841-06	3.145-02	5.490-04	2.696-04
1.586+03	1.539-09	3.877-06	1.187-05	2.991-02	5.468-04	2.921-04
1.588+03	1.889-09	3.650-06	1.465-05	2.831-02	5.446-04	2.934-04
1.590+03	1.790-09	3.398-06	1.396-05	2.649-02	5.428-04	2.805-04
1.592+03	1.730-09	3.348-06	1.356-05	2.624-02	5.411-04	2.707-04
1.594+03	1.669-09	3.435-06	1.315-05	2.706-02	5.393-04	2.587-04
1.596+03	1.610-09	3.530-06	1.275-05	2.796-02	5.375-04	2.510-04
1.598+03	1.565-09	3.525-06	1.246-05	2.806-02	5.357-04	2.519-04
1.600+03	1.490-09	3.657-06	1.192-05	2.927-02	5.340-04	2.448-04

LAYER (1 IS NEAREST GROUND) = 8

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	3.211-14	3.652-07	3.117-10	3.545-03	6.773-04	1.906-04
1.452+03	1.006-14	3.164-07	9.815-11	3.087-03	6.754-04	1.446-04
1.454+03	1.846-16	2.806-07	1.811-12	2.753-03	6.735-04	1.100-04
1.456+03	4.730-24	2.445-07	4.666-20	2.412-03	6.716-04	8.748-05
1.458+03	2.458-24	2.261-07	2.438-20	2.243-03	6.696-04	7.621-05
1.460+03	2.153-25	2.439-07	2.147-21	2.432-03	6.677-04	7.720-05
1.462+03	8.839-30	2.977-07	8.863-26	2.985-03	6.658-04	9.327-05
1.464+03	1.429-29	3.061-07	1.435-25	3.086-03	6.639-04	9.780-05
1.466+03	1.958-29	3.099-07	1.935-25	3.142-03	6.620-04	1.019-04
1.468+03	2.486-29	3.069-07	2.534-25	3.123-03	6.601-04	1.040-04
1.470+03	7.949-22	2.685-07	8.148-18	2.752-03	6.582-04	9.711-05
1.472+03	3.920-21	2.182-07	4.040-17	2.249-03	6.563-04	9.089-05
1.474+03	2.197-20	2.209-07	2.277-16	2.289-03	6.544-04	1.025-04
1.476+03	5.537-20	2.661-07	5.770-16	2.773-03	6.525-04	1.295-04
1.478+03	8.843-20	3.269-07	9.266-16	3.425-03	6.506-04	1.614-04
1.480+03	1.196-19	3.792-07	1.260-15	3.996-03	6.487-04	1.824-04
1.482+03	1.458-19	4.129-07	1.545-15	4.375-03	6.467-04	1.867-04
1.484+03	1.427-19	4.163-07	1.521-15	4.436-03	6.448-04	1.774-04
1.486+03	1.094-19	3.716-07	1.172-15	3.980-03	6.429-04	1.467-04
1.488+03	7.631-20	3.005-07	8.220-16	3.237-03	6.410-04	1.072-04
1.490+03	4.436-20	2.460-07	4.806-16	2.665-03	6.391-04	7.784-05
1.492+03	1.499-20	2.170-07	1.633-16	2.364-03	6.372-04	6.159-05
1.494+03	2.545-23	2.060-07	2.788-19	2.256-03	6.353-04	5.273-05
1.496+03	8.836-39	1.876-07	9.734-35	2.066-03	6.334-04	4.636-05
1.498+03	6.260-39	1.829-07	6.934-35	2.027-03	6.315-04	4.467-05
1.500+03	3.712-39	1.784-07	4.135-35	1.987-03	6.296-04	4.299-05
1.502+03	0.000	1.591-07	1.335-35	1.783-03	6.276-04	3.779-05
1.504+03	0.000	1.090-07	0.000	1.228-03	6.257-04	2.553-05
1.506+03	0.000	7.948-08	0.000	9.006-04	6.238-04	1.862-05
1.508+03	0.000	5.030-08	0.000	5.732-04	6.219-04	1.179-05
1.510+03	0.000	2.145-08	0.000	2.458-04	6.200-04	5.011-06
1.512+03	0.000	3.243-11	0.000	3.737-07	6.181-04	1.218-08
1.514+03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516+03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518+03	0.000	3.116-11	0.000	3.653-07	6.124-04	1.089-08
1.520+03	1.559-36	1.784-08	1.838-32	2.104-04	6.105-04	5.618-06
1.522+03	1.367-35	5.863-08	1.621-31	6.952-04	6.086-04	1.917-05
1.524+03	2.564-35	1.006-07	3.058-31	1.200-03	6.067-04	3.315-05
1.526+03	3.748-35	1.422-07	4.495-31	1.705-03	6.048-04	4.702-05
1.528+03	4.918-35	1.832-07	5.932-31	2.210-03	6.029-04	6.075-05
1.530+03	5.774-35	1.892-07	7.006-31	2.296-03	6.009-04	6.343-05
1.532+03	4.564-35	1.501-07	5.569-31	1.832-03	5.990-04	5.042-05
1.534+03	3.366-35	1.081-07	4.132-31	1.327-03	5.971-04	3.693-05
1.536+03	2.183-35	6.654-08	2.695-31	8.214-04	5.952-04	2.257-05
1.538+03	1.013-35	2.581-08	1.257-31	3.205-04	5.933-04	8.988-06
1.540+03	3.539-39	3.837-09	4.420-35	4.792-05	5.915-04	1.738-06
1.542+03	0.000	4.041-09	0.000	5.076-05	5.896-04	2.227-06
1.544+03	0.000	5.873-09	0.000	7.421-05	5.877-04	3.244-06
1.546+03	0.000	7.684-09	0.000	9.765-05	5.858-04	4.252-06
1.548+03	0.000	8.873-09	0.000	1.134-04	5.839-04	4.924-06
1.550+03	0.000	6.998-09	0.000	8.997-05	5.820-04	3.891-06
1.552+03	0.000	5.144-09	0.000	6.653-05	5.801-04	2.866-06
1.554+03	0.000	3.312-09	0.000	4.308-05	5.782-04	1.849-06

1.556+03	0.000	1.501-09	0.000	1.964-05	5.763-04	8.406-07
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	0.000	0.000	5.707-04	0.000
1.564+03	0.000	0.000	0.000	0.000	5.688-04	2.327-09
1.566+03	0.000	0.000	0.000	0.000	5.669-04	5.209-09
1.568+03	0.000	0.000	0.000	0.000	5.650-04	8.069-09
1.570+03	1.634-33	3.390-09	2.228-29	4.622-05	5.632-04	8.350-07
1.572+03	6.006-21	2.998-08	8.238-17	4.112-04	5.613-04	1.053-05
1.574+03	3.282-17	7.182-08	4.529-13	9.910-04	5.594-04	3.149-05
1.576+03	1.321-13	1.219-07	1.834-09	1.692-03	5.575-04	6.606-05
1.578+03	1.863-12	1.785-07	2.602-08	2.492-03	5.556-04	1.198-04
1.580+03	9.959-11	2.398-07	1.398-06	3.369-03	5.534-04	1.764-04
1.582+03	2.116-10	2.633-07	2.990-06	3.721-03	5.512-04	2.294-04
1.584+03	3.224-10	2.648-07	4.583-06	3.764-03	5.490-04	2.699-04
1.586+03	4.316-10	2.583-07	6.172-06	3.694-03	5.468-04	2.924-04
1.588+03	5.367-10	2.481-07	7.721-06	3.570-03	5.446-04	2.936-04
1.590+03	6.938-10	2.290-07	7.147-06	3.314-03	5.428-04	2.807-04
1.592+03	6.666-10	2.289-07	6.794-06	3.334-03	5.411-04	2.709-04
1.594+03	6.396-10	2.406-07	6.440-06	3.524-03	5.393-04	2.590-04
1.596+03	6.130-10	2.528-07	6.086-06	3.725-03	5.375-04	2.513-04
1.598+03	3.876-10	2.610-07	5.747-06	3.869-03	5.357-04	2.521-04
1.600+03	3.764-10	2.740-07	5.615-06	4.088-03	5.340-04	2.451-04

LAYER(1 IS NEAREST GROUND) = 9

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450*03	2.247-15	2.308-08	5.149-11	5.288-04	6.773-04	1.906-04
1.452*03	9.783-16	1.787-08	2.256-11	4.123-04	6.754-04	1.496-04
1.454*03	4.002-17	1.443-08	9.292-13	3.351-04	6.735-04	1.100-04
1.456*03	2.627-26	1.065-08	6.140-22	2.489-04	6.716-04	8.749-05
1.458*03	1.355-26	7.013-09	3.188-22	1.650-04	6.696-04	7.622-05
1.460*03	1.037-27	4.676-09	2.455-23	1.107-04	6.677-04	7.720-05
1.462*03	7.126-33	4.033-09	1.699-28	9.614-05	6.658-04	9.327-05
1.464*03	1.145-32	3.049-09	2.749-28	7.318-05	6.639-04	9.781-05
1.466*03	1.572-32	2.410-09	3.799-28	5.823-05	6.620-04	1.019-04
1.468*03	1.994-32	1.766-09	4.848-28	4.295-05	6.601-04	1.040-04
1.470*03	6.449-25	1.087-09	1.579-20	2.662-05	6.582-04	9.711-05
1.472*03	3.184-24	4.187-10	7.848-20	1.032-05	6.563-04	9.090-05
1.474*03	4.615-22	1.282-09	1.145-17	3.182-05	6.544-04	1.025-04
1.476*03	1.303-21	5.727-09	3.254-17	1.431-04	6.525-04	1.295-04
1.478*03	2.133-21	1.014-08	5.364-17	2.550-04	6.506-04	1.614-04
1.480*03	2.951-21	1.450-08	7.472-17	3.670-04	6.487-04	1.824-04
1.482*03	3.755-21	1.878-08	9.570-17	4.786-04	6.467-04	1.868-04
1.484*03	3.668-21	2.195-08	9.411-17	5.632-04	6.448-04	1.774-04
1.486*03	2.828-21	1.956-08	7.304-17	5.054-04	6.429-04	1.467-04
1.488*03	1.997-21	1.717-08	5.194-17	4.465-04	6.410-04	1.072-04
1.490*03	1.178-21	1.482-08	3.085-17	3.880-04	6.391-04	7.786-05
1.492*03	3.719-22	1.251-08	9.804-18	3.298-04	6.372-04	6.160-05
1.494*03	7.409-25	9.131-09	1.966-20	2.424-04	6.352-04	5.274-05
1.496*03	0.000	7.096-09	3.418-36	1.883-04	6.334-04	4.636-05
1.498*03	0.000	5.008-09	2.436-36	1.347-04	6.315-04	4.467-05
1.500*03	0.000	2.998-09	1.453-36	8.120-05	6.296-04	4.300-05
1.502*03	0.000	1.009-09	4.712-37	2.751-05	6.276-04	3.779-05
1.504*03	0.000	6.264-11	0.000	1.720-06	6.257-04	2.553-05
1.506*03	0.000	4.598-11	0.000	1.271-06	6.238-04	1.862-05
1.508*03	0.000	2.958-11	0.000	8.234-07	6.219-04	1.179-05
1.510*03	0.000	1.339-11	0.000	3.754-07	6.200-04	5.011-06
1.512*03	0.000	4.199-14	0.000	1.185-09	6.181-04	1.218-08
1.514*03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516*03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518*03	0.000	5.599-15	0.000	1.613-10	6.124-04	1.089-08
1.520*03	0.000	4.399-12	1.881-35	1.276-07	6.105-04	5.618-06
1.522*03	5.786-39	1.787-11	1.690-34	5.219-07	6.086-04	1.917-05
1.524*03	1.085-38	3.194-11	3.193-34	9.394-07	6.067-04	3.315-05
1.526*03	1.585-38	4.581-11	4.695-34	1.357-06	6.048-04	4.702-05
1.528*03	2.078-38	5.948-11	6.198-34	1.774-06	6.029-04	6.075-05
1.530*03	2.440-38	6.951-11	7.328-34	1.937-06	6.009-04	6.343-05
1.532*03	1.927-38	5.179-11	5.826-34	1.566-06	5.990-04	5.042-05
1.534*03	1.420-38	3.773-11	4.324-34	1.149-06	5.971-04	3.693-05
1.536*03	9.200-39	2.385-11	2.821-34	7.314-07	5.952-04	2.257-05
1.538*03	4.270-39	1.096-11	1.319-34	3.230-07	5.933-04	8.988-06
1.540*03	0.000	2.777-12	4.815-38	8.636-08	5.915-04	1.738-06
1.542*03	0.000	3.734-12	0.000	1.169-07	5.896-04	2.227-06
1.544*03	0.000	5.421-12	0.000	1.709-07	5.877-04	3.244-06
1.546*03	0.000	7.084-12	0.000	2.249-07	5.858-04	4.252-06
1.548*03	0.000	8.169-12	0.000	2.612-07	5.839-04	4.924-06
1.550*03	0.000	6.435-12	0.000	2.072-07	5.820-04	3.891-06
1.552*03	0.000	4.725-12	0.000	1.532-07	5.801-04	2.866-06
1.554*03	0.000	3.038-12	0.000	9.922-08	5.782-04	1.849-06

1.556+03	0.000	1.375-12	0.000	4.522-08	5.763-04	8.406-07
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	0.000	0.000	5.707-04	0.000
1.564+03	0.000	0.000	0.000	0.000	5.688-04	2.327-09
1.566+03	0.000	0.000	0.000	0.000	5.669-04	5.209-09
1.568+03	0.000	0.000	0.000	0.000	5.650-04	8.069-09
1.570+03	4.235-37	8.843-13	1.464-32	3.056-08	5.632-04	8.350-07
1.572+03	2.138-29	7.992-12	7.440-28	2.782-07	5.613-04	1.053-05
1.574+03	3.092-20	2.029-11	1.084-15	7.113-07	5.594-04	3.169-05
1.576+03	3.422-16	4.096-11	1.208-11	1.446-06	5.575-04	6.606-05
1.578+03	2.661-13	7.782-10	9.461-09	2.767-05	5.556-04	1.198-04
1.580+03	3.542-11	4.866-09	1.376-06	1.743-04	5.539-04	1.764-04
1.582+03	8.168-11	9.151-09	2.946-06	3.301-04	5.512-04	2.294-04
1.584+03	1.243-10	1.338-08	4.516-06	4.860-04	5.490-04	2.699-04
1.586+03	1.663-10	1.753-08	6.087-06	6.416-04	5.468-04	2.924-04
1.588+03	2.079-10	2.041-08	7.642-06	7.522-04	5.446-04	2.936-04
1.590+03	1.386-10	1.962-08	7.000-06	7.284-04	5.428-04	2.808-04
1.592+03	1.760-10	2.128-08	6.579-06	7.956-04	5.411-04	2.710-04
1.594+03	1.635-10	2.430-08	6.157-06	9.152-04	5.393-04	2.590-04
1.596+03	1.512-10	2.729-08	5.736-06	1.035-03	5.375-04	2.513-04
1.598+03	1.3[illegible]10	3.061-08	5.317-06	1.169-03	5.357-04	2.522-04
1.600+03	1.3[illegible]10	3.232-08	5.228-06	1.294-03	5.340-04	2.451-04

LAYER(1 IS NEAREST GROUND) = 10

UNITS OF RADIANCE ARE WATTS/(CM**2 *STERADIAN*MICROMETER)

UNITS OF WEIGHTING FUNCTIONS ARE D(TRANSMISSION)

FREQ	DOWN INT	UP INT	DOWN WEIGHT FUNCT	UP WEIGHT FUNCT	INT DWN TOTAL	INT UP TOTAL
1.450+03	2.721-15	2.138-[illegible]	5.422-11	4.260-04	6.773-04	1.907-04
1.452+03	1.228-15	1.653-[illegible]	2.462-11	3.314-04	6.754-04	1.447-04
1.454+03	5.749-17	1.31[illegible]	1.160-12	2.695-04	6.735-04	1.101-04
1.456+03	1.595-26	9.681-[illegible]	3.137-22	1.966-04	6.716-04	8.750-05
1.458+03	7.969-27	6.416-09	1.629-22	1.311-04	6.696-04	7.622-05
1.460+03	6.097-28	4.249-09	1.254-23	8.742-05	6.677-04	7.721-05
1.462+03	4.117-33	3.486-09	8.524-29	7.217-05	6.658-04	9.327-05
1.464+03	6.617-33	2.499-09	1.379-28	5.208-05	6.639-04	9.781-05
1.466+03	9.085-33	1.956-09	1.905-28	4.102-05	6.620-04	1.019-04
1.468+03	1.152-32	1.412-09	2.432-28	2.980-05	6.601-04	1.041-04
1.470+03	3.701-25	8.496-10	7.864-21	1.805-05	6.582-04	9.711-05
1.472+03	1.827-24	2.995-10	3.908-20	6.405-06	6.563-04	9.098-05
1.474+03	2.966-22	1.045-09	6.383-18	2.250-05	6.544-04	1.025-04
1.476+03	8.273-22	5.168-09	1.792-17	1.120-04	6.525-04	1.295-04
1.478+03	1.352-21	9.253-09	2.947-17	2.018-04	6.506-04	1.614-04
1.480+03	1.868-21	1.329-08	4.101-17	2.916-04	6.487-04	1.824-04
1.482+03	2.376-21	1.725-08	5.250-17	3.812-04	6.467-04	1.868-04
1.484+03	2.311-21	2.088-08	5.139-17	4.642-04	6.448-04	1.774-04
1.486+03	1.781-21	1.948-08	3.986-17	4.360-04	6.429-04	1.467-04
1.488+03	1.256-21	1.808-08	2.831-17	4.073-04	6.410-04	1.072-04
1.490+03	7.391-22	1.670-08	1.676-17	3.787-04	6.391-04	7.788-05
1.492+03	2.297-22	1.535-08	5.244-18	3.503-04	6.372-04	6.162-05
1.494+03	4.259-25	1.193-08	9.788-21	2.740-04	6.353-04	5.279-05
1.496+03	0.000	9.185-09	1.722-36	2.125-04	6.334-04	4.637-05
1.498+03	0.000	6.491-09	1.225-36	1.511-04	6.315-04	4.468-05
1.500+03	0.000	3.832-09	7.300-37	8.983-05	6.296-04	4.300-05
1.502+03	0.000	1.205-09	2.363-37	2.844-05	6.276-04	3.779-05
1.504+03	0.000	3.560-11	0.000	8.457-07	6.257-04	2.553-05
1.506+03	0.000	2.614-11	0.000	6.251-07	6.238-04	1.862-05
1.508+03	0.000	1.682-11	0.000	4.048-07	6.219-04	1.179-05
1.510+03	0.000	7.617-12	0.000	1.846-07	6.200-04	5.011-06
1.512+03	0.000	2.387-14	0.000	5.823-10	6.181-04	1.218-08
1.514+03	0.000	0.000	0.000	0.000	6.162-04	0.000
1.516+03	0.000	0.000	0.000	0.000	6.143-04	0.000
1.518+03	0.000	3.225-15	0.000	8.025-11	6.124-04	1.089-08
1.520+03	0.000	2.528-12	9.393-36	6.335-08	6.105-04	5.618-06
1.522+03	3.328-39	1.827-11	8.394-35	2.591-07	6.086-04	1.917-05
1.524+03	6.244-39	1.837-11	1.586-34	4.664-07	6.067-04	3.315-05
1.526+03	9.122-39	2.635-11	2.332-34	6.734-07	6.048-04	4.702-05
1.528+03	1.196-38	3.422-11	3.079-34	6.808-07	6.029-04	6.075-05
1.530+03	1.405-38	3.712-11	3.639-34	9.616-07	6.009-04	6.343-05
1.532+03	1.109-38	2.981-11	2.893-34	7.776-07	5.990-04	5.042-05
1.534+03	8.176-39	2.172-11	2.147-34	5.704-07	5.971-04	3.643-05
1.536+03	5.299-39	1.373-11	1.401-34	3.631-07	5.952-04	2.257-05
1.538+03	2.460-39	6.028-12	6.548-35	1.605-07	5.933-04	8.988-06
1.540+03	0.000	1.627-12	2.285-38	4.362-08	5.915-04	1.738-06
1.542+03	0.000	2.202-12	0.000	5.943-08	5.896-04	2.227-06
1.544+03	0.000	3.198-12	0.000	8.688-08	5.877-04	3.244-06
1.546+03	0.000	4.179-12	0.000	1.143-07	5.858-04	4.252-06
1.548+03	0.000	4.821-12	0.000	1.328-07	5.839-04	4.924-06
1.550+03	0.000	3.798-12	0.000	1.053-07	5.820-04	3.891-06
1.552+03	0.000	2.789-12	0.000	7.788-08	5.801-04	2.866-06
1.554+03	0.000	1.794-12	0.000	5.043-08	5.782-04	1.849-06

1.556+03	0.000	8.119-13	0.000	2.298-08	5.763-04	8.406-07
1.558+03	0.000	0.000	0.000	0.000	5.744-04	0.000
1.560+03	0.000	0.000	0.000	0.000	5.725-04	0.000
1.562+03	0.000	0.000	0.000	0.000	5.707-04	0.000
1.564+03	0.000	0.000	0.000	0.000	5.688-04	2.027-09
1.566+03	0.000	0.000	0.000	0.000	5.669-04	5.209-09
1.568+03	0.000	0.000	0.000	0.000	5.650-04	5.069-09
1.570+03	2.425-37	5.057-13	7.203-33	1.502-08	5.632-04	8.350-07
1.572+03	1.225-24	4.575-12	3.664-20	1.368-07	5.613-04	1.053-05
1.574+03	1.777-20	1.162-11	5.352-16	3.501-07	5.594-04	3.169-05
1.576+03	1.965-16	2.349-11	5.960-12	7.123-07	5.575-04	6.404-05
1.578+03	2.591-13	8.265-10	7.913-09	2.434-05	5.556-04	1.148-04
1.580+03	3.662-11	4.773-09	1.126-06	1.468-04	5.534-04	1.764-04
1.582+03	7.769-11	8.849-09	2.406-06	2.740-04	5.512-04	2.294-04
1.584+03	1.182-10	1.287-08	3.686-06	4.013-04	5.490-04	2.699-04
1.586+03	1.581-10	1.683-08	4.965-06	5.284-04	5.468-04	2.924-04
1.588+03	1.971-10	1.936-08	6.232-06	6.121-04	5.446-04	2.937-04
1.590+03	1.818-10	1.909-08	5.788-06	6.079-04	5.428-04	2.808-04
1.592+03	1.766-10	2.231-08	5.663-06	7.156-04	5.411-04	2.710-04
1.594+03	1.715-10	2.776-08	5.538-06	8.963-04	5.393-04	2.590-04
1.596+03	1.664-10	3.313-08	5.412-06	1.077-03	5.375-04	2.513-04
1.598+03	1.615-10	3.887-08	5.289-06	1.273-03	5.357-04	2.522-04
1.600+03	1.596-10	4.184-08	5.263-06	1.380-03	5.340-04	2.451-04

```
EXECUTION TERMINATED BY AN ATTEMPT TO READ THRU AN END OF FILE
I/O CALLED AT SEQUENCE NUMBER 00222 OF MAIN PROGRAM
```

23 JAN 74 02:44:07 IDENT T17 ACCOUNT 002851 CARDS IN 48 CARDS OUT 0 PAGES 89 ELAPSED TIME 0 9 41

ORIGINAL PAGE IS
OF POOR QUALITY

-UNIVAC-1108-PROCESSOR-3-EXEC-II-LEVEL-6.5-HSC-124-NASA-HOUSTON-

APPENDIX C — SAMPLE OF DATA FOR PROGRAM CP

In this appendix, a small sample of the data from the data tape for program CP (ref. 3) is presented. The remainder of the 15 250 lines is stored on a seven-track, 800-bpi, binary computer tape and will be made available to interested persons who supply a blank data tape to the authors.

ν, cm^{-1}	S_0, $cm^{-1}/(atm \cdot cm)$	α_0, cm^{-1}/atm	EPP, cm^{-1}	MOL
.45996+03	.18340-25	.00000	.21706+04	2
.46148+03	.17970-25	.00000	.21479+04	2
.46301+03	.17000-25	.00000	.21284+04	2
.46454+03	.15390-25	.00000	.21120+04	2
.46608+03	.13180-25	.00000	.20987+04	2
.46762+03	.10420-25	.00000	.20886+04	2
.46917+03	.72090-26	.00000	.20815+04	2
.47091+03	.15530-25	.00000	.27183+04	2
.47137+03	.41300-28	.00000	.21833+04	2
.47151+03	.47450-25	.00000	.20933+04	2
.47466+03	.98330-26	.00000	.20815+04	2
.47591+03	.38130-26	.00000	.28845+04	2
.47620+03	.19630-25	.00000	.20886+04	2
.47722+03	.51030-26	.00000	.28151+04	2
.47774+03	.19380-25	.00000	.20987+04	2
.47854+03	.67100-26	.00000	.27488+04	2
.47929+03	.23980-26	.00000	.21120+04	2
.47987+03	.86670-26	.00000	.26856+04	2
.48062+03	.12190-25	.00000	.25979+04	2
.48109+03	.27180-25	.00000	.21284+04	2
.48212+03	.19050-25	.00000	.25424+04	2
.48259+03	.31140-25	.00000	.21479+04	2
.48377+03	.34940-25	.00000	.24900+04	2
.48421+03	.18100-25	.00000	.21706+04	2
.48521+03	.41660-25	.00000	.24407+04	2
.48566+03	.48860-31	.00000	.58453+04	4
.48582+03	.18160-25	.00000	.21963+04	2
.48666+03	.76220-31	.00000	.57724+04	4
.48666+03	.48680-25	.00000	.23946+04	2
.48749+03	.17700-25	.00000	.22252+04	2
.48766+03	.11840-30	.00000	.56803+04	4
.48812+03	.55670-25	.00000	.23515+04	2
.48864+03	.18330-30	.00000	.55890+04	4
.48906+03	.16800-25	.00000	.22572+04	2
.48959+03	.66520-25	.00000	.23116+04	2
.48962+03	.28240-30	.00000	.54986+04	4
.49060+03	.43360-30	.00000	.54089+04	4
.49085+03	.48980-25	.00000	.22923+04	2
.49116+03	.39470-25	.00000	.22749+04	2
.49156+03	.66280-30	.00000	.53201+04	4
.49176+03	.39460-26	.00000	.33246+04	2
.49236+03	.55350-25	.00000	.22572+04	2
.49269+03	.36610-25	.00000	.22412+04	2
.49324+03	.65020-26	.00000	.32164+04	2
.49385+03	.55810-25	.00000	.22252+04	2
.49422+03	.37640-25	.00000	.22107+04	2
.49471+03	.10540-25	.00000	.31114+04	2
.49528+03	.99160-25	.00000	.21963+04	2
.49572+03	.98300-25	.00000	.21833+04	2
.49618+03	.16830-25	.00000	.30094+04	2
.49674+03	.43650-25	.00000	.21706+04	2
.49727+03	.45120-25	.00000	.21590+04	2
.49765+03	.26420-25	.00000	.29105+04	2
.49796+03	.90900-30	.00000	.52749+04	4
.49822+03	.41280-25	.00000	.21479+04	2
.49883+03	.40530-25	.00000	.21379+04	2
.49912+03	.40830-25	.00000	.28187+04	2
.49941+03	.10970-30	.00000	.56900+04	4

MOL	Constituent
1	Water vapor
2	Carbon dioxide
3	Ozone
4	Nitrous oxide
5	Carbon monoxide
6	Methane

ν, cm^{-1}	S_0, $cm^{-1}/(atm.cm)$	α_0, cm^{-1}/atm	EPP, cm^{-1}	MOL
.49971+03	.37280-25	.00000	.21284+04	2
.50036+03	.28230-25	.00000	.21199+04	2
.50059+03	.68390-25	.00000	.27221+04	2
.50070+03	.48010-22	.72000-01	.17747+04	1
.50097+03	.26180-30	.00000	.55079+04	4
.50121+03	.31540-25	.00000	.21120+04	2
.50157+03	.81520-21	.34000-01	.24713+04	1
.50191+03	.22190-25	.00000	.21090+04	2
.50207+03	.97920-25	.00000	.26325+04	2
.50227+03	.16100-19	.56000-01	.10791+04	1
.50253+03	.61430-30	.00000	.53791+04	4
.50272+03	.24220-25	.00000	.20987+04	2
.50346+03	.14970-25	.00000	.20933+04	2
.50355+03	.14060-24	.00000	.25460+04	2
.50391+03	.88110-23	.63000-01	.23375+04	1
.50424+03	.15660-25	.00000	.20886+04	2
.50439+03	.64320-21	.75000-01	.21250+04	1
.50501+03	.20470-24	.00000	.24827+04	2
.50648+03	.28140-24	.00000	.23824+04	2
.50693+03	.78210-20	.73000-01	.55291+03	1
.50791+03	.92100-22	.55000-01	.27564+04	1
.50796+03	.39390-24	.00000	.23853+04	2
.50830+03	.13800-23	.00000	.21833+04	2
.50872+03	.68220-24	.00000	.21963+04	2
.50927+03	.12730-25	.50000-01	.88560+03	1
.50937+03	.77530-24	.00000	.22312+04	2
.50974+03	.14770-24	.00000	.24840+04	2
.51037+03	.97900-25	.00000	.20792+04	2
.51051+03	.13270-20	.61000-01	.16951+04	1
.51090+03	.81440-24	.00000	.21803+04	2
.51127+03	.95710-25	.00000	.20815+04	2
.51181+03	.30020-25	.00000	.28682+04	2
.51185+03	.81400-22	.66000-01	.70421+03	1
.51238+03	.10260-23	.00000	.20925+04	2
.51283+03	.61160-25	.00000	.20886+04	2
.51284+03	.21820-23	.87000-01	.22112+04	1
.51321+03	.67760-26	.00000	.30823+04	2
.51387+03	.13310-23	.00000	.20978+04	2
.51442+03	.43290-21	.37000-01	.27020+04	1
.51448+03	.54720-25	.00000	.20987+04	2
.51513+03	.25250-21	.45000-01	.26128+04	1
.51536+03	.16920-23	.00000	.19462+04	2
.51587+03	.57150-26	.00000	.26875+04	2
.51611+03	.55470-25	.00000	.21120+04	2
.51681+03	.79410-20	.74000-01	.12019+04	1
.51685+03	.21250-23	.00000	.19077+04	2
.51748+03	.67700-26	.00000	.26992+04	2
.51774+03	.59040-25	.00000	.21284+04	2
.51776+03	.47280-20	.58000-01	.92021+03	1
.51835+03	.26180-23	.00000	.18523+04	2
.51844+03	.32730-22	.47000-01	.27481+04	1
.51874+03	.26150-30	.00000	.55890+04	4
.51935+03	.68460-25	.00000	.21479+04	2
.51946+03	.43490-30	.00000	.54089+04	4
.51959+03	.69600-20	.70000-01	.12936+04	1
.51984+03	.31060-23	.00000	.18001+04	2
.52001+03	.61040-25	.00000	.21690+04	2
.52027+03	.25130-22	.55000-01	.22205+03	1

☆ U.S. GOVERNMENT PRINTING OFFICE: 1975—671-201/ 2160