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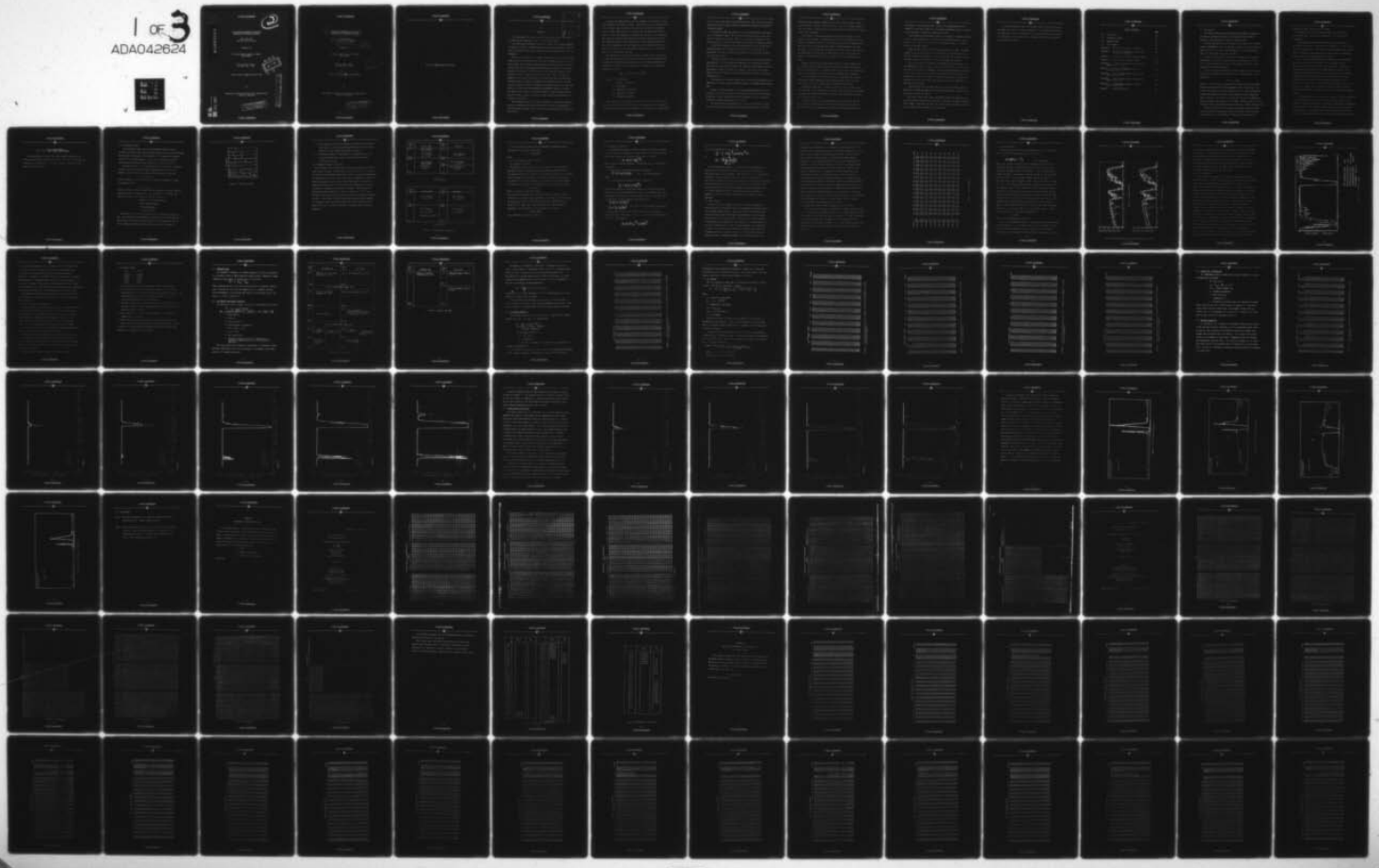

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HIDE REVISED WAVELENGTH RESOLUTION EMISSION AND TRANSMISSION MODEL

Data Item A007
Interim Technical Report

Prepared for

U.S. Army Aviation Material Command
AMCPM-AESWPS

Box 209, Main Station
St. Louis, Mo. 63166

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(9) Data Item A007
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(11) 28 Mar 74

(12) 224 p.

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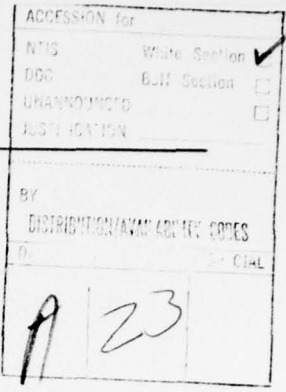

This report describes the high resolution atmospheric transmission and exhaust gas emission models to be incorporated into the HIDE (Helicopter infrared detection estimate) computer model.

Foreword

The requirements for the atmospheric transmission model to be used in the HIDE computer program are that it be fast and accurate.

The HIDE computer program is intended to predict the infrared signature of suppressed aircraft. Suppressed as used here, implies masking of all hot metal, diluting the exhaust plume gasses and reducing body contrast with the background.

Thus it is not sufficient to simply concentrate on the 2-5 micron window regions for the normally predominent tail pipe continuum radiation or the 4 micron region for the selective plume radiation as seen over short to intermediate paths (less than 3 miles). Attention must be applied to the entire spectrum of interest, 1 to 16 microns, and over long paths (such as 40 air masses for a line of sight tangent to the horizon). This is because the signatures of self emitting sources are influenced by the relatively short intervening paths and generally dominate some spectral interval. The body contrast signature, however, is comprised from remote sources (i.e. sun, sky, albedo, etc.) which are transversing long atmospheric paths to illuminate the target and this signal is contrasted against a remote background (i.e. horizon, terrain, clouds, etc.) whose radiance has also been operated on by long path constituents.

The transmission model is the basic ingredient to predicting atmospheric emission, transmission and solar scattering all of which are important to determining body contrast. Hence it must be accurate over both the long and short paths.

Currently the HIDE program is used to determine the 3-D profile of aircraft signatures and detection ranges. These exercises incur numerous itterations in target aspect and range. Thus machine time becomes an important factor in cost. Eventually, it is expected that the HIDE program will be used in a closed loop simulation to evaluate miss distance. This would mean near real time operation where machine time becomes a major factor. Since the transmission model is used repeatedly in a given signature prediction (i.e. solar transmission and scattering, clear and cloudy sky emission as a function of zenith, line of sight path attenuation, etc.), it is essential that it be a fast machine algorithm.

The requirements for speed and accuracy in making computer predictions on suppressed signatures were studied in depth in the Fleet Signature Study conducted for the Naval Research Laboratory contract NOnr 4991(00)(X) over the period of 1965 to 1969. The outcome of this study was a transmission algorithm of the form

$$\tau_{s_\lambda} = EXP\left\{-\alpha(Q_s)^{\beta}\right\}$$

where: τ = Transmission

s = Species of absorber

λ = Wavelength

α = Absorption coefficient

Q = Quantity of absorber

β = Absorption exponent

This function is fast, machine wise, because ther is only one power operation (B) compared to the multiple roots, squares, exponential and trigometric operations encountered in most band models. It also provides an exceptionally

good fit over a wide range of absorber quantities. This has also been demonstrated by Green and Griggs ("Infrared Transmission Through the Atmosphere" IRIS proceedings).

The coefficient, α, and exponent, B, are obtained by least mean square fits to transmission data. Thus the function may be fitted to either measured or computed data or both. Hence it is versatile in adapting to the best data source at any given wavelength over any defined averaging interval.

In the Fleet Signature work, the function was fitted to the extensive band model predictions of Wyatt, Plass and Stull for CO_2 and H_2O and to measurements of Yates and Taylor for H_2O beyond 10 microns where the Wyatt etal. H_2O data stopped.

The resulting predictions, although relatively coarse spectrally, being approximately 50 cm^{-1}, provided good agreements with transmission measurements by Yates and Taylor and Street over long paths and atmospheric emission measurements by Mooler at large zenith angles. The results of the Fleet Signature Work are reported in "Fleet Signature Model" reported in IRIS proceeding May 1969.

The transmission model was carried over in total and incorporated in the HIDE model. This was of great economical benefit to the HIDE program development.

However, it became apparent in the ensuing HIDE development that the resolution 50 cm^{-1} was too coarse to reproduce the selective plume structure accurately. Thus to remedy this, the work reported on in this volume was initiated to improve the resolution to 5 cm^{-1}.

The exercise was strickly mechanical in that the transmission function and curve fit routine were previously developed and validated in the Fleet

Signature Study and merely reapplied to the finer resolution data of Wyatt, Plass and Stull. However, this does not mean it was not an arduous task. In fact, the tedium of resurrecting, key punching and proofing 50,000 data values proved to be horrendous.

The results of this improved resolution model are reported in latter sections of this volume. In general, the curve fits to the Wyatt etal. data exhibit an accuracy of less than one percent in most cases. Comparisons are made with all of the available measurements by General Dynamics and Yates and Taylor. For the most part, the spectral structure fits are very good and the magnitudes are on the order of 20% accuracy. This is well within the degree of uncertainty with which the composition of the measured path is known.

However, there are some obvious deficiencies in selected regions such as the slope of the 4.3 micron CO_2 band head and the 5 micron H_2O region. Since the functional fit to the data is good in these cases, the discrepancies have to be attributed to the data base or the measured path attributes.

If the functional fit had been bad, then the algorithm would be questionable as a viable transmission model representation. But if the data base is bad, then it is a simple matter to upgrade the data base.

Upgrading the data base is simple in principle, but is in fact, an arduous task when 5 cm^{-1} resolution is involved. Thus it would not be attempted on a grand scale without the greatest confidence that the new data base was in fact better than the old.

Since the evolution of the implementation of this algorithm from the Fleet Signature Study through the current HIDE development, much work has been done by others in developing and discrediting transmission models and

measurements. The most publicized of these is the Cambridge Model and a movement is under way to make this the standard transmission model to be used in all radiometric calculations, whatever the form.

This movement is motivated by a desire to standardize transmission models to have a common denominator to compare system performance against. Also, because of the official endorsement of the Cambridge model, it is assumed that it is the most accurate.

These are noble reasons but not necessarily germane to HIDE. The HIDE program is not concerned with relative performance of different systems as much as the absolute performance of specific systems. The transmision model used must be real world accurate and not just academically accurate.

It is no big deal to incorporate the Cambridge or any other model into the HIDE program either in total or via the curve fit function. But it does take time and cost money to implement, and the question unanswered is whether or not it will result in more accurate predictions and if so, will the increased accuracy justify the impact on machine requirements for storage and running time as well as the time delay before exercising the HIDE model to meet current Army needs.

These decisions cannot be made without an in depth validation and comparison of the Cambridge model with the existing HIDE model. This by itself takes time and money to perform.

Thus until a valid case is made and funds provided, the HIDE model will use the previously developed and proven Fleet Signature transmission algorithm with the Wyatt etal. data base which will be periodically upgraded at selected intervals where better agreement can be achieved.

The work described here shows the degree to which this model fits many measurement data sets. It would be desirable to see comparisons this extensive made with other model candidates. If the Cambridge model is as good as its endorsements, then it would be in the Army's best interest to perform such comparisons with it.

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1.0 Introduction

This report describes the high resolution atmospheric transmission and exhaust gas emission models to be incorporated into the HIDE (Helicopter Infrared Detection Estimate) computer model.

The HIDE computer model was developed for the Army Aviation System Command, AMCPM-AEWSPS under the technical direction of Steve Smith and is described in a final report titled "Evaluation of IR Countermeasures, Phase II - HIDE Model", dated Feb. 28, 1973.

The work reported here in represents an addendum to the original model where in the spectral resolution has been increased from 50 to 5 cm^{-1}. This was necessary to obtain a more accurate prediction of the exhaust plume spectral signature.

Section 2 describes the empirical equation used to curve fit transmission data and analyzes the goodness of fit to measured data. This equation is

$$\tau = \text{EXP}\ (-AQ^B)$$

where Q is the quantity of absorber and the coefficient A and exponent B are empirically derived for each wavelength from 1 to 16 microns. The form of the transmission equation allows one to fit either measured data or band model predicted data over a wide range of absorber quantities Thus it provides a fast machine algorithm with an accuracy commensurate with the accuracy with which Q can be defined. The data used for the fits here were from the extensive band model predictions of Wyatt, Plass and Stull.

Section 3 describes the hot gas emission models now used in HIDE. In this instance the band models defined by the data source were used. The 4.3 micron CO_2 is attributed to Jackson and the entire H_2O and

remaining CO_2 bands are attributed to Ludwig.

The appendices contain the original input data, the derived coefficients used in the model and comparisons of predictions with measurements.

The exhaust gas prediction-measurement comparisons have been restricted here merely to illustrate the structural fit in order to keep this report unclassified. More detail on the plume spectral fits will be found in a separate unclassified report, titled "Error and Sensitivity Analysis" (u/c), data item 0008 of this contract.

Due to time and funding limitations, the water vapor coefficients beyond 10 microns were not included. This is because the Wyatt, Plass and Stull H_2O data did not go beyong 10 microns. However, the coefficients may be derived from the measurements of Yates and Taylor using the same empirical fit technique. This was done on the original HIDE model and those coefficients are currently used with this high resolution version beyond 10 microns except possessing a 50 cm^{-1} resolution. However, all of the available Yates and Taylor data is included in this report as is the reduction technique, hence the high resolution coefficients for water vapor beyong 10 microns may be readily derived.

An additional point to note is that an extensive computer optimization process was applied to the Yates and Taylor data (some 9 paths) in an attempt to relate attenuation due to scattering to wavelength, visual range and mixing ratio. The result was that an optimum fit could be obtained for each path but no universal optimum relation could be obtained for all paths that was any better than the original HIDE scattering function.

$$T_{scat} = EXP \frac{2.152 \times PATH\ LENGTH}{VISUAL\ RANGE \times WAVE\ LENGTH}$$

The significance of this is that visual range in itself is not a sufficient descriptor of the particle size or distribution in the path and consequently is responsible for the major prediction errors over long paths at long wave lengths.

2.0 Transmission Model

The transmission model used in the increased resolution task is basically the same as that used in earlier versions of "Hide" only additional data has been incorporated. The resolution of the new model is between 5 and 10 cm^{-1} for the major gasses CO_2 & H_2O which compares with earlier versions whose transmissions were reported at 105 cm^{-1} to 30 cm^{-1}.

This data is used in a particular function described in the following sections to form a transmission over a given path for each gas. The product of these functions is defined as the atmospheric transmission

$$T = t_1 x t_2 \cdots t_m$$

which in essence is the fractional part of radiation transmitted through the quantities of gas

$$q_1, q_2 \cdots q_m$$

found in the path. These gas quantities are dependent upon range, relative humidity, altitude and temperature. The algorithms for obtaining them will not be given in this report as they may be found in

Evaluation of IR Countermeasures

Interim Technical Report

(Model Methodology)

June 26, 1972

The gasses used to form the atmosphere for IR purposes are: CO_2, H_2O, O_3, N_2O. That these are indeed the major contributions can be seen from fig. (1) which shows a low resolution solar spectrum and the gasses which form it. The additional gasses shown here have little effect for two reasons

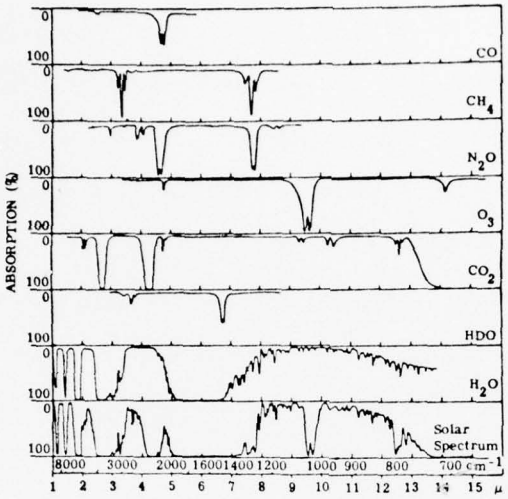

Figure 1. Atmospheric Makeup

1) Path lengths which will be considered by "Hide" are much shorter than tnose for a solar spectrum measurement and hence the actual absorption is much smaller than shown in fig (1).

2) The absorption bands of those gasses not included fall for the most part within other absorption bands and therefore their effect cannot be seen.

2.1 Transmission Equations and Data

The transmission data for water vapor and carbon dioxide was obtained from a report by Wyatt, Plass and Stull under contract No. AF 04 (695)-96 for the Air Force Cambridge Research Laboratories in Bedford, Massachusetts. The reproduction work done on this report was of extremely poor quality as shown in Appendix A, and required a considerable amount of man hours to extract the required data. As can be seen the transmission is listed as a function of wavenumber and quantity of absorber. The resolution as depicted here was averaged over 5 cm^{-1} but recorded at 2.5 cm^{-1} and therefore, the original data was reduced according to an algorithm shown in fig (2). A third order collocation polynomial was used where indicated to interpolate beyond the given accuracy, as in the range 3400 cm^{-1} to 3800 cm^{-1} for H_2O. A complete listing of the reduced data is shown in Appendix B.

Wave No.	W.P.S. Data	Wave No.	Hide Data
1000	Data Averaged Over 5 cm^{-1} Data Reported at 2.5 CM^{-1}	1000.	Data Extracted at 5 CM^{-1}
3400		3400	
3400	Data Averaged Over 20 CM^{-1} Reported at 10 CM^{-1}	3400	Data Interpolated to 5 CM^{-1}
		3800	Data Extracted at 10 CM^{-1}
9990		9990	

H_2O DATA USAGE

Wave No.	W.P.S. Data	Wave No.	Hide Data
507	Data Reported at 25 CM^{-1}	507	Data Extracted at 5 CM^{-1}
3800		3800	
3800	Data Averaged Over 2.5 CM^{-1} & Reported at 10 CM^{-1}	3800	Data Extracted at 10 CM^{-1}
8600		8600	

CO_2 DATA USAGE

Figure 2. Data Extraction Algorithm

In the next section a method will be developed to reduce this data even further to an equation of the form

$$T = EXP\ (-AQ^B)$$

where:

A, B are constants found in Appendix B

Q = quantity of absorber

This equation is the "Hide" version of transmission for water vapor and carbon dioxide as originally described by Wyatt, Plass and Stull. It is considered superior for mathematical programming purposes as it is fairly easy to evaluate for any quantity of absorber and requires storing only two numbers A & B for each wavelength. The accuracy of this approximation is discussed in section 2.4. The transmission for O_3 and N_2O is given by

$$T = EXP\ (-Aq^{.5})$$

where q = quantity of absorber in path.

This is the same equation used in previous versions of "HIDE". The "A" coefficients are reproduced for completeness in Appendix A. These numbers are interpolated down to 5 CM^{-1} for the range 900 - 3800 CM^{-1} and to 10 CM^{-1} for the range 3800 - 9000 CM^{-1} using a 3rd order collocation polynomial. The transmission due to scattering is of the form

$$T = EXP\ (-A\ \lambda^{-B})$$

and is described more fully in Section 2.5.

2.2 H_2O and CO_2 Curve Fits

To interpolate the data in Appendix B between quantities of absorber a curve fit had to be obtained to a proper function. The function which was used and found to be quite satisfactory was of the form:

$$T = EXP(-Aq^{-B})$$

where A & B are constants dependent on wavelength and q is the quantity of absorber.

To obtain A & B the criteria used was to minimize :

$$S = \Sigma\, LN(T_i/M_i) \qquad 2.2.1$$ for each wavenumber ,

where:

M_i = the measured transmission of W.P.S. Appendix B

$$T_i = EXP(-A q_i^{-B})$$

This has the tendency to attach equal weights to both small and large numbers as we are actually minimizing a ratio of two numbers rather than the absolute difference as in a least squares routine. Other functions of this ratio of course could have been used such as:

$$S = \Sigma (1 - T_i/M_i)^2$$

or $S = 1 - \Sigma (T_i/M_i)^2$ etc. each one of which would have produced a slightly different curve fit. More investigation into this area probably should be undertaken, as it is 2.2.1 is fairly easily solved for A & B. Upon expansion :

$$S = \Sigma (A\, q_i^{-B} + LN(M_i))^2$$

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setting the derivative to zero we have:

$$\frac{\partial S}{\partial A} = \sum \left(A q_i^{-B} + LN(M_i)\right) q_i^{-B} = 0$$

or

$$A = \frac{-\sum q_i^{-B} LN(M_i)}{\sum q_i^{-2B}} \qquad 2.2.2$$

The derivative with respect to B could now be taken, however, this leaves us with a transcendentel equation, and it was decided that a more direct approach was advisable. Thus B was varied in a direct search technique, A was then evaluated from 2.2.2 until a minimum value of S was found. A program was written incorporating this technique and exercised on the entire spectrum of W.P.S. data. In addition this routine sorted the data according to fig. (2) and produced a listing and mag tape file in a "HIDE" compatable format. The resultant listing is shown in Appendix B. with the A's and B's shown under their respective column headings.

2.3 Error Measure

The error measure discussed in section 2.2 being non linear has a certain tendency to minimize the ratios of transmission to measured values in a slightly abnormal fashion. That is as the ratio tends toward zero the error blows up much more rapidly than when the ratio becomes larger due to the nature of the natural log. This produces a slight tendency to overestimate the transmission. This effect is so minimal however, as the ratios oscillate about 1, that it takes extremely close observation to notice. On the more positive side this calculation was found to be extremely sensitive to keypunch errors, i.e. large deviation from the exponential curve. Keypunching although just tedious for most jobs

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presented major difficulties in creating this transmission model. The zerox copies from which the data was cut were almost illegible in certain bands; caused in part by the magnification required to make the print large enough to read and partly to blurs in the originals shown in Appendix A. It was decided because of this that the normal validation usually done by the keypunch girl should not even be performed as many interpretations could be made of the same data point. Several other methods, therefore, had to be employed to remove keypunch and other interpretation errors. One device used was to check the values of transmission with increasing absorber quantity, for this function must be monotonically decreasing. This alone uncovered a tremendous amount of errors, however, it was found that an equally sensitive criteria was to observe values of the error function S. Wherever this was found to be large inevitably a keypunch mistake was also uncovered. In some cases this amounted to an error in the third significant digit. Thus, although, it was unexpected the choice of this log function curve fit proved to be very helpful in debugging the W.P.S. data.

2.4 Comparison of Wyatt Plass and Stull with A & B Curve Fits

Fig. (3) shows the results of an exercise to compare some actual data to its respective A, B exponential curve fit. An attempt was made to list a wide range of error values so that a goodness of fit could be determined for any of the curve fits in Appendix B. In this figure the error entered under each actual or measured value is the absolute relative error whereas the error in the last column is the log function described in section 2.2.

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QUANTITY		.001	.002	.005	.010	.020	.050	.100	.200	.500	1.00	2.00	5.00	10.0	20.0	50.0	ERROR
2230.	ACTUAL	1.000	.999	.998	.996	.992	.981	.964	.935	.872	.797	.688	.480	.299	.136	.020	.000
	ERROR	.001	.001	.003	.004	.005	.006	.005	.002	.001	.002	.001	.006	.000	.008	.003	
	CALC	.999	.998	.995	.992	.987	.975	.959	.933	.873	.799	.689	.483	.299	.135	.020	
2459.	ACTUAL	1.000	1.000	1.000	1.000	.999	.999	.997	.995	.988	.978	.960	.906	.611	.674	.352	.000
	ERROR	.000	.000	.000	.000	.001	.000	.001	.001	.003	.004	.003	.001	.011	.011	.022	
	CALC	1.000	1.000	1.000	1.000	1.000	1.000	.998	.996	.991	.982	.963	.907	.820	.687	.353	
2655.	ACTUAL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.999	.997	.993	.984	.944	.865	.718	.354	.000
	ERROR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.002	.004	.002	.000	
	CALC	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.999	.997	.992	.981	.942	.868	.717	.354	
1480.	ACTUAL	.935	.886	.791	.691	.556	.331	.162	.047	.002	.000	.000	.000	.000	.000	.000	.010
	ERROR	.009	.023	.040	.041	.034	.006	.030	.053	.029	.000	.000	.000	.000	.000	.000	
	CALC	.943	.908	.822	.720	.575	.333	.157	.045	.002	.000	.000	.000	.000	.000	.000	
1626.	ACTUAL	.863	.802	.685	.564	.415	.210	.091	.024	.001	.000	.000	.000	.000	.000	.000	.010
	ERROR	.027	.031	.039	.032	.031	.021	.020	.061	.028	.000	.000	.000	.000	.000	.000	
	CALC	.836	.827	.708	.582	.428	.214	.069	.023	.001	.000	.000	.000	.000	.000	.000	
2365.	ACTUAL	1.000	1.000	.999	.998	.997	.992	.984	.972	.941	.910	.864	.755	.615	.461	.188	.010
	ERROR	.000	.000	.000	.000	.000	.001	.005	.009	.020	.022	.021	.020	.032	.077	.024	
	CALC	1.000	1.000	.999	.998	.997	.993	.989	.980	.959	.930	.884	.770	.635	.453	.192	
3035.	ACTUAL	.866	.780	.648	.540	.403	.177	.077	.040	.000	.000	.000	.000	.000	.000	.000	.110
	ERROR	.058	.044	.068	.070	.083	.121	.257	.142	.000	.000	.000	.000	.000	.000	.000	
	CALC	.816	.745	.620	.502	.370	.198	.067	.034	.004	.000	.000	.000	.000	.000	.000	
3675.	ACTUAL	.895	.714	.543	.424	.275	.102	.027	.001	.000	.000	.000	.000	.000	.000	.000	.150
	ERROR	.023	.121	.151	.148	.102	.046	.223	.845	.000	.000	.000	.000	.000	.000	.000	
	CALC	.872	.801	.648	.487	.303	.097	.021	.002	.000	.000	.000	.000	.000	.000	.000	
3595.	ACTUAL	.741	.697	.552	.401	.287	.109	.038	.003	.000	.000	.000	.000	.000	.000	.000	.400
	ERROR	.144	.103	.040	.153	.047	.051	.288	.068	.000	.000	.000	.000	.000	.000	.000	
	CALC	.848	.769	.616	.462	.263	.103	.027	.003	.000	.000	.000	.000	.000	.000	.000	
3640.	ACTUAL	.825	.752	.650	.514	.375	.101	.034	.014	.000	.000	.000	.000	.000	.000	.000	.450
	ERROR	.025	.037	.107	.132	.196	.312	.276	.169	.000	.000	.000	.000	.000	.000	.000	
	CALC	.805	.724	.580	.446	.302	.133	.050	.012	.001	.000	.000	.000	.000	.000	.000	

Figure 3. Curve Fit Errors

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2.5 Scatter Function

The scattering function for real atmospheres as given in the Handbook of military infrared technology is of the form:

$$T = EXP(-\alpha \lambda^{-\gamma}) \qquad \lambda = \text{wavelength}$$

where α and γ are functions of concentration and size of the scattering particles. These particles could be haze, smog, clouds or water vapor normally found in the atmosphere. The exact dependence is unknown although it is generally recognized that $\gamma = 4$ for very small particles, $\gamma = 2$ for a particle diameter equal to λ, $\gamma = 1$ for a particle diameter equal to $3/2\,\lambda$, and $\gamma = 0$ when the diameter is equal to $2\,\lambda$. Since these particle diameters generally are distributed in the infrared region it is not possible to state a scattering function applicable to a wide variety of conditions. It was found that for the Yates and Taylor data used to validate this atmospheric model that γ varied from about .4 to 1.6 with an average value of about 1.0. This is somewhat lower than the sometimes quoted value of 1.3 but the large spread in ambient weather conditions in the Yates and Taylor data could explain this. The value of γ used in the current version of "HIDE" is this average of 1. The value of α used was:

$$= 3.21/VISR$$

where VISR = visual range in kilometers.

Fig. 4 is a representative plot of a more complete validation exercise found in Appendix D. It is included here as a quick reference to point out the difference between the optimum scattering function derived in Appendix J and the general scattering functions described above. The

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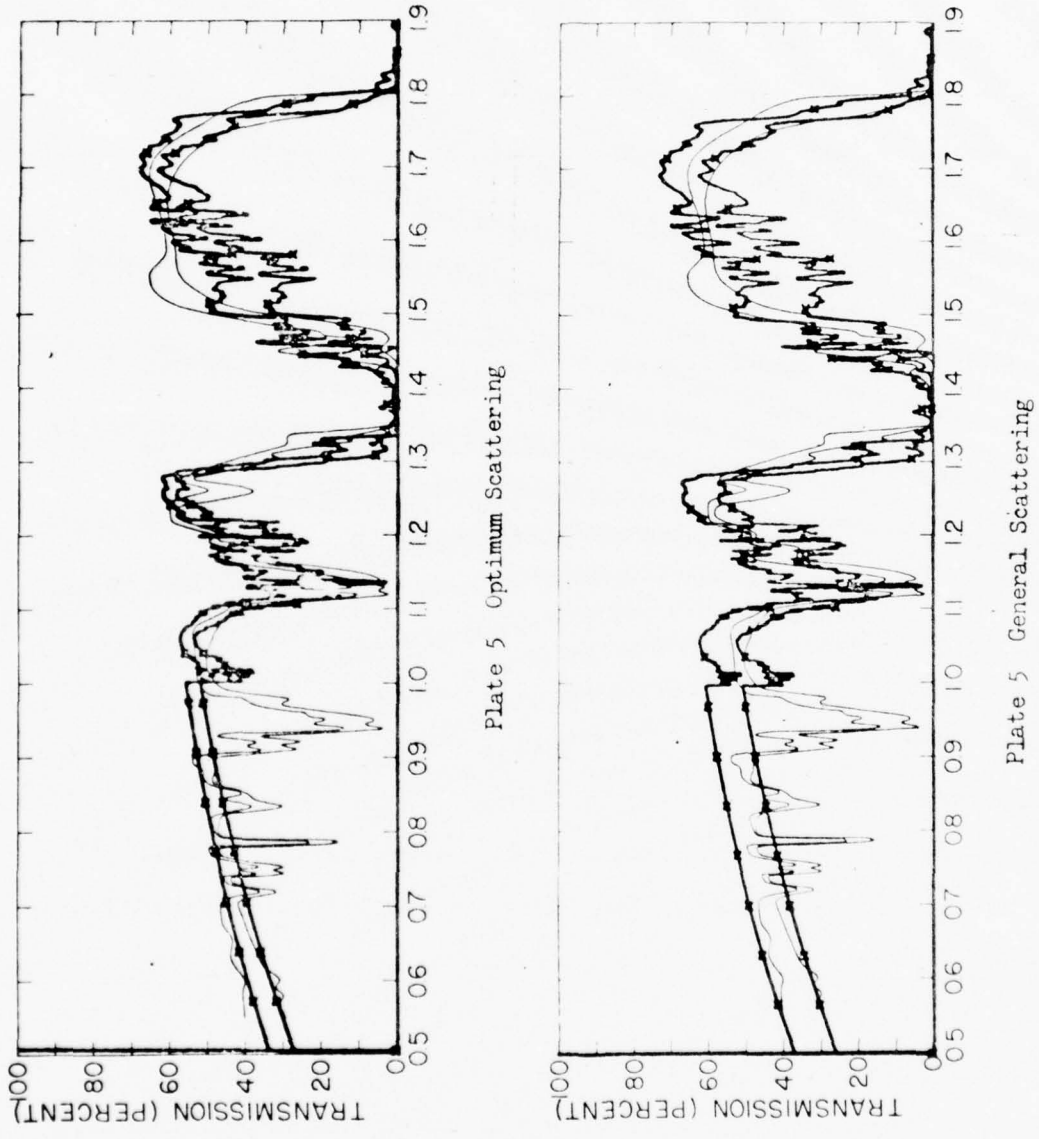

Fig. 4 Optimum and General Scattering for Yates & Taylor

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"Hide" model is plotted over top of the validation data (Yates and Taylor) in both cases. It can be seen that there is a definite difference in the two scattering functions and hence that there is an inherent error in the "Hide" transmission model which cannot be corrected at this time as scattering particle distributions are in general never given or unknown. It is felt, however, that the use of $\gamma = 1$ which may be considered as a typical atmosphere will yield minimal errors.

2.6 G.D. Comparisons

In this section the results of an atmospheric model validation study will be presented. The data that was used was recorded from real atmosphere observations by General Dynamics and presented in a report for the Army. It consisted of short ranges from 280 ft. to 6000 ft. under varying meterological conditions of relative humidity and temperature. The Hide model was used in conjunction with a special plotter program to generate curves of the same spectrum with identical atmospheric parameters. These graphs were run off with small "x's" every .3 inches and were overlayed on top of G.D. A representative plot of this exercise is shown in figure 5 while the complete set of data is shown in Appendix C. A value judgement as to the goodness of fit is very difficult to make here as we have little knowledge about the mean and standard deviation (repeatibility) of the G.D. data. Furthermore the scale factor used in such a presentation plans an important role in how good looking the comparisons are and in fact these figures were blown up from the original G.D. report. In spite of these difficulties one observation can be made from this study in favor of the "Hide" model. It can be said quite positively that the model responds properly to varying concentrations of H20 and carbon dioxide.

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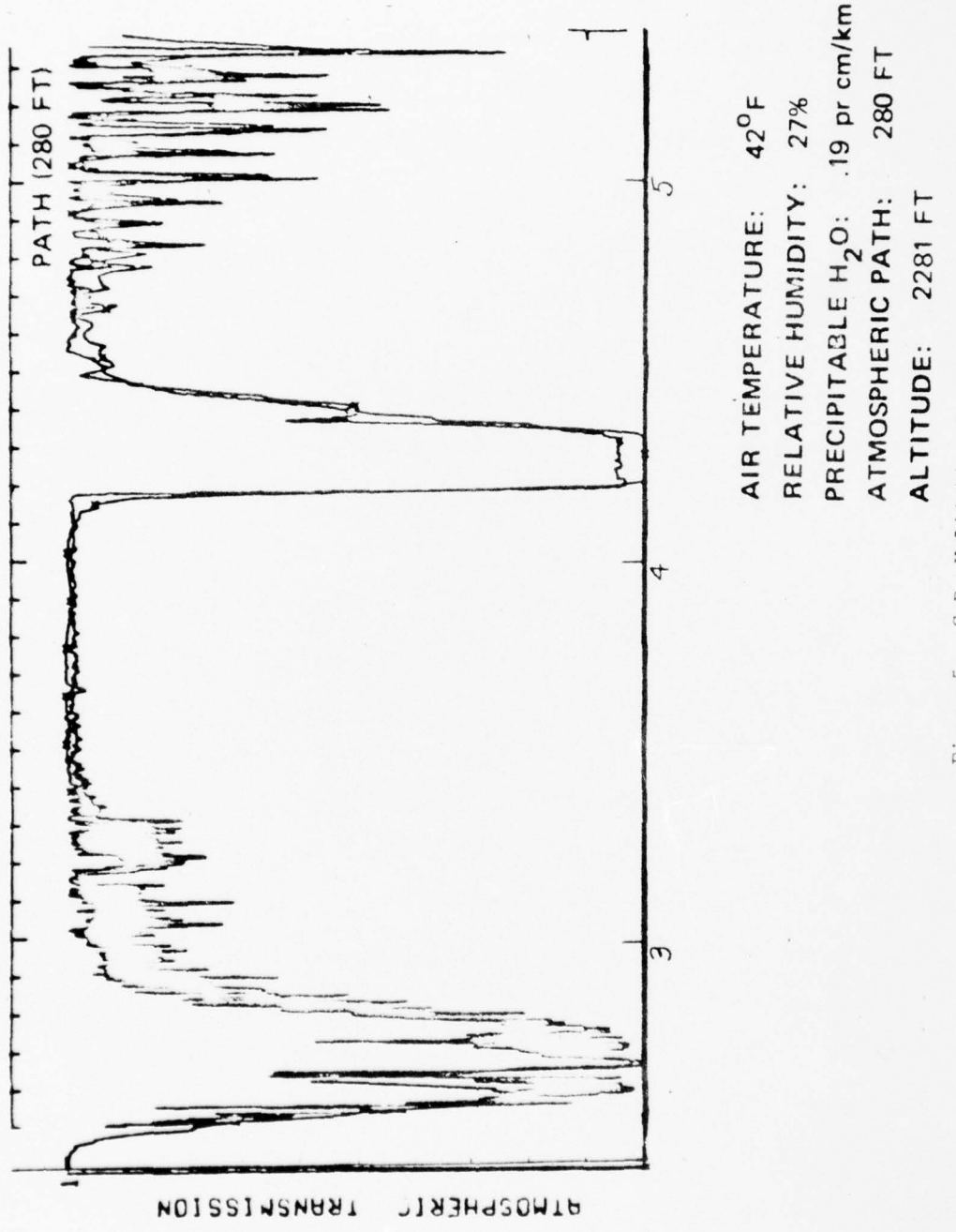

Figure 5. G.D. Validation Sample

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Since the secondary spike at 4.1 μ as well as the entire region from 4.3 - 4.5 μ is caused entirely by CO2 the functional dependence with concentration of this gas can be seen by scanning the figures of Appendix C. It appears to be nearly perfect for these ranges. The water vapor dependence is slightly harder to see due to the poor quality of the reproduction, however, the absorption in the dense region from 3-3.5 μ is due entirely to H_{20}. Although the two curves are almost indistinguishable here, the correct trend can be seen particularly at the longer ranges.

Thus although definite conclusions cannot be drawn from the limited data available some confidence can be obtained in the "Hide" atmosphere from this study.

2.7 Yates and Taylor Data Comparisons

Yates and Taylor at the Naval Research Laboratory in Washington undertook to study and compile data relating to atmospheric transmission in real atmospheres. The data was taken under a wide variety of weather conditions and for extremely long path lengths of from 3.4 to 10.1 statute miles. The results of the study are a series of plates or curves of relatively high resolution extending from .5 μ to 15 μ.

For validation purposes the Hide atmospheric model was compared with the Yates and Taylor data and presented in Appendix D.

In Appendix D two sets of curves are presented to show the effects of the optimum best fit scattering functions described in section 2.5 v.s. the general scattering function. The optimum function is decidely better for all plates except plate 11 where because of the short range scattering is neglegible.

In looking at these plates several things should be noted.

1) The major windows

.94 μ	-	1.13 u
1.13 μ	-	1.38 μ
1.38 μ	-	1.90 μ
1.9 μ	-	2.7 μ
2.7 μ	-	4.30 μ
4.3 μ	-	6.0 μ
6.0 μ	-	15.0 μ

are well defined and show good agreement between the two models.

2) As can be seen from fig. (1) water vapor accounts for most of the strong absorptions in the Yates and Taylor measurements above 10 μ. The Hide model contains no H20 in this region and thus the bad fits in the high wavelength regions are expected.

3) Although the major gasses have been included in the Hide model there are others present. Some of these along with their major absorption bands are shown in fig. (1).

4) The resolution of N_{20} and O_3 shown in Appendix C is relatively low compared with H20 and C02.

5) There could be large fluctuations in gas concentrations along the paths since the distances considered by Yates and Taylor are so long.

In light of the above remarks the agreement between Hide and Yates and Taylor data is considered to be quite good.

3.0 EMISSION MODEL

For purposes of computing the emission spectrum, the plume is considered to be composed chiefly of water vapor and carbon dioxide. Knowing the transmissions of these gases, the emission may be computed as:

$$E = 1 - T_{CO_2} * T_{H_2O}$$

These transmissions have been computed as functions of temperature dependent data by Jackson and Ludwig and are summarized in the following sections. For a determination of the accuracy and origin of this emission model Figures 1, 2 should be referred to.

3.1 H_2O Ludwig Transmission Equations

The transmission model of Ludwig is described mathematically as follows:

$$\tau = \text{EXP}\left(-KU/\sqrt{1 + KU/4A}\right)$$

$$A = (.5/d)\, P_t \sqrt{T_o/T}\, \left[C\left(\sqrt{T_o/T} + .1\right) + .18(1-C)\right]$$

C = Mole fraction

T = Temp °K

T_o = Ambient Temp °K

P_t = Total pressure (atmospheres).

d = EXP (-.0016T + 1.21)

U = P_t CL 273/T

L = Path length (CM)

K = Absorption coefficient which is temperature and wavelength dependent and can be found tabulated in Appendix E.

Hide uses a second order collocation polynominal to interpolate between 300°K and 1000°K and a third order polynominal to interpolate between wavenumbers to the desired wavelength.

<table>
<tr><td>WAVE NO.</td><td colspan="2">ORIGINAL DATA</td><td>WAVE NO.</td><td colspan="2">HIDE MODEL</td></tr>
<tr><td>500

880</td><td colspan="2">Data due to C. B. Ludwig recorded at 5 cm^{-1}</td><td>500

880</td><td colspan="2">Data extracted at 5 cm^{-1}.</td></tr>
<tr><td></td><td colspan="2">NO DATA TRANSMISSION EQUAL UNITY</td><td></td><td colspan="2"></td></tr>
<tr><td>2050

2400</td><td colspan="2">Data due to Jackson recorded at 5 cm^{-1}</td><td>2050

2400</td><td colspan="2">Data extracted at 5 cm^{-1}.</td></tr>
<tr><td>2400

2500</td><td colspan="2">NO DATA AVAILABLE</td><td>2400

2500</td><td colspan="2">Data extrapolated from Jackson 2050 - 2400 data by J. Goodell at 5 cm^{-1}.</td></tr>
<tr><td></td><td colspan="2">NO DATA TRANSMISSION EQUAL UNITY</td><td></td><td colspan="2"></td></tr>
<tr><td>3000

3560</td><td>"K" data due to Ludwig at 10 cm^{-1}.</td><td rowspan="2">"A" data due to Ludwig at 10 cm^{-1}</td><td>3000

3560</td><td>"K" data interpolated</td><td rowspan="2">"A" data interpolated down to 5 cm^{-1}.</td></tr>
<tr><td></td><td>"K" data due to Ludwig at 5 cm^{-1}.</td><td></td><td>Data extracted at 5 cm^{-1}.</td></tr>
<tr><td>3770</td><td></td><td></td><td>3770</td><td></td><td></td></tr>
</table>

Figure 1: CO_2 DATA USAGE

WAVE NO.	ORIGINAL DATA	WAVE NO.	HIDE MODEL
50	Data due to Ludwig recorded at 25. cm^{-1}.	50	Data interpolated down to 5 cm^{-1}.
		3800	
			Data interpolated down to 10 cm^{-1}.
9300		9300	

Figure 2: H_2O Hot Gas Usage

An example of the results of this double interpolation is given in Figure 3 which shows the transmission data of H_2O for the temperature range 300°K to 1500°K. This table agrees with Ludwigs data at 300°, 600°, and 1000°K as it must and varies smoothly between these points. The error between this interpolation and the true function "f" at the temperature "T" as given in elementary numerical analysis is:

$$E(T) = \frac{f^{(3)}(\xi)}{3!} (T-300)\ (T-600)\ (T-1000)$$

Where $f^{(3)}(\xi)$ is the third derivative of the true transmission at some temperature (ξ) between 300°K and 1000°K.

It is interesting and important to note that this function blows up beyond 1000°K and should not be used as an extrapolation routine here. However, the expected temperatures are below 1000° and will cause no problems.

3.2 CO_2 Ludwig Equations

For the range 3000-3770 cm^{-1} (500-800 cm^{-1}), the Carbon Dioxide transmission model is due to Ludwig. The equations are:

$$\tau = \text{EXP}\ (-KU/\sqrt{1 + KU/4A}\ )$$

$$U = PP_{CO_2} \times P \times PL \times 273/T$$

P = Pressure atmospheres

$PPCO_2$ = Partial pressure CO_2

PL = Path length

T = temperature °K

A,K are given in tabular form in Appendix F as a function of temperature and wavenumber.

To interpolate between wavenumbers, a third order collocation polynominal is used, whereas temperature interpolations between 300°K and 1200°K are

H2O TRANSMISSION DATA

	300.	400.	500.	600.	700.	800.	900.	1000.	1100.	1200.	1300.
2110.	.15a-02	.431-02	.730-02	.105-01	.14?-01	.178-01	.21a-01	.26?-01	.3?6-01	.?52-01	.?9?-01
2115.	.14?-02	.399-02	.676-02	.978-02	.1??-01	.166-01	.20?-01	.2??-01	.?86-01	.?31-01	.?81-01
2120.	.13?-02	.370-02	.62?-02	.910-02	.1?9-01	.154-01	.19?-01	.?27-01	.267-01	.?10-01	.?61-01
2125.	.127-02	.346-02	.587-02	.850-02	.11?-01	.144-01	.177-01	.212-01	.249-01	.?a9-01	.?42-01
2130.	.11?-02	.330-02	.561-02	.809-02	.10?-01	.136-01	.166-01	.19?-01	.?32-01	.268-01	.?6?-01
2135.	.110-02	.31?-02	.53?-02	.775-02	.103-01	.129-01	.157-01	.186-01	.21?-01	.2?8-01	.?5?-01
2140.	.10?-02	.306-02	.520-02	.743-02	.?97-02	.122-01	.147-01	.174-01	.201-01	.230-01	.?91-01
2145.	.?47-03	.294-02	.500-02	.713-02	.?91-02	.116-01	.139-01	.163-01	.187-01	.212-01	.?01-01
2150.	.?a?-03	.282-02	.479-02	.680-02	.?65-02	.109-01	.13?-01	.153-01	.17?-01	.196-01	.?6?-01
2155.	.?18-03	.?59-02	.458-02	.62?-02	.?31-02	.101-01	.12?-01	.1?1-01	.163-01	.1?a-01	.?51-01
2160.	.?61-03	.232-02	.395-02	.565-02	.?42-02	.925-02	.111-01	.131-01	.152-01	.173-01	.?a?-01
2165.	.?09-03	.207-02	.352-02	.507-02	.671-02	.a46-02	.103-01	.122-01	.142-01	.164-01	.?3?-01
2170.	.662-03	.162-02	.310-02	.451-02	.604-02	.770-02	.9?1-02	.114-01	.134-01	.156-01	.??a-01
2175.	.620-03	.159-02	.272-02	.400-02	.5?a-02	.?04-02	.a7a-02	.107-01	.12a-01	.150-01	.?3?-01
2180.	.584-03	.146-02	.250-02	.372-02	.511-02	.667-02	.8?6-02	.101-01	.124-01	.146-01	.??4-01
2185.	.553-03	.135-02	.233-02	.349-02	.48?-02	.637-02	.a?a-02	.?a?-01	.121-01	.1?a-01	.??3-01
2190.	.52?-03	.125-02	.218-02	.330-02	.463-02	.613-02	.?a5-02	.a7?-02	.119-01	.1?a-01	.??3-01
2195.	.501-03	.117-02	.205-02	.314-02	.44?-02	.592-02	.?61-02	.a5?-02	.116-01	.140-01	.??a-01
2200.	.a?a-03	.110-02	.193-02	.298-02	.42?-02	.572-02	.?41-02	.a31-02	.114-01	.139-01	.??a-01
2205.	.462-03	.?9a-03	.174-02	.?72-02	.3a?-02	.536-02	.?01-02	.a?a-02	.110-01	.133-01	.?17-01
2210.	.44a-03	.?a4-03	.156-02	.246-02	.360-02	.49a-02	.65a-02	.a44-02	.1a5-01	.12a-01	.?13-01
2215.	.4?2-03	.?a3-03	.138-02	.221-02	.329-02	.a6a-02	.61a-02	.?a6-02	.100-01	.123-01	.?a4-01
2220.	.41a-03	.691-03	.121-02	.197-02	.29a-02	.423-02	.573-02	.?47-02	.a45-02	.117-01	.19a-01
2225.	.a?5-03	.609-03	.106-02	.175-02	.?6a-02	.3a7-02	.5?a-02	.696-02	.a67-02	.110-01	.19a-01
2230.	.3a9-03	.566-03	.971-03	.161-02	.247-02	.356-02	.4a8-02	.6a3-02	.a?a-02	.102-01	.17a-01
2235.	.372-03	.532-03	.902-03	.148-02	.227-02	.327-02	.44a-02	.5?a-02	.753-02	.a37-02	.163-01
2240.	.35a-03	.506-03	.a47-03	.138-02	.21a-02	.3a1-02	.411-02	.54a-02	.6a8-02	.a5?-02	.147-01
2245.	.338-03	.a83-03	.?a9-03	.12a-02	.19a-02	.277-02	.377-02	.4a4-02	.63a-02	.?7a-02	.13?-01
2250.	.321-03	.461-03	.?54-03	.12a-02	.18a-02	.255-02	.3a6-02	.465-02	.a?3-02	.?1a-02	.121-01
2255.	.3a1-03	.414-03	.677-03	.109-02	.166-02	.237-02	.324-02	.426-02	.542-02	.674-02	.11?-01
2260.	.281-03	.365-03	.601-03	.a67-03	.152-02	.221-02	.305-02	.4a4-02	.51a-02	.64a-02	.111-01
2265.	.263-03	.316-03	.527-03	.a69-03	.141-02	.208-02	.290-02	.3a8-02	.5a1-02	.62a-02	.111-01
2270.	.245-03	.272-03	.457-03	.a00-03	.13a-02	.196-02	.277-02	.375-02	.a6a-02	.616-02	.11?-01
2275.	.229-03	.231-03	.395-03	.721-03	.121-02	.186-02	.267-02	.3?4-02	.a77-02	.607-02	.1a?-01
2280.	.22a-03	.207-03	.357-03	.671-03	.115-02	.17a-02	.259-02	.356-02	.a6a-02	.59a-02	.1a4-01
2285.	.212-03	.1a5-03	.327-03	.63a-03	.11a-02	.173-02	.25?-02	.34a-02	.a6a-02	.59a-02	.1a7-01
2290.	.2a6-03	.17a-03	.3a4-03	.597-03	.1a5-02	.167-02	.245-02	.34a-02	.a5a-02	.a77-02	.1a4-01
2295.	.2a0-03	.163-03	.286-03	.569-03	.1a1-02	.161-02	.23a-02	.33a-02	.a5a-02	.a63-02	.1a9-01
2300.	.195-03	.156-03	.273-03	.5a4-03	.a7a-03	.155-02	.229-02	.31a-02	.a?3-02	.a4a-02	.19a-02
2305.	.18a-03	.152-03	.25a-03	.5a8-03	.a9a-03	.1a4-02	.211-02	.2a1-02	.3a0-02	.a?a-02	.a1a-02
2310.	.18a-03	.149-03	.246-03	.a73-03	.a2a-03	.131-02	.192-02	.267-02	.35a-02	.a54-02	.a31-02

Figure 3. Table Obtained by Application of Double Interpolation Formulas to Ludwigs Data in Appendix E.

accomplished using a second order polynomial. Figure 4 and 5 show some data derived by this interpolation process. The numbers agree at the tabulated as they must and vary smoothly between data points.

3.3 CO_2 Jackson

The CO_2 transmission model used for the range 2050-2400 cm^{-1} is due to Jackson. This model is described as follows:

$$\tau = \text{EXP}\left[\frac{-2\alpha P_t R_k^2}{R_A}\left(\sqrt{1 + (R_a/R_k)^2 L_e/\alpha} - 1\right)\right]$$

Where:

P_t = pressure in atmospheres

$\alpha = .15\ P_t \sqrt{300/T}$

T = temperature (atmospheres)

$L_e = 2.PP_{CO2}\ P_L$

PP_{CO2} = Partial pressure

P_L = Path length

RK and RA are given in tabular form in Appendix G as a function of temperature and wave number. A third order interpolation routine is used here to interpolate between temperatures. An example of this interpolation is shown in Figures 6, 7.

To obtain data for the range 2400 cm^{-1} to 2500 cm^{-1} an extrapolation procedure due to J. Goodell was used. It consists basically of extrapolating out to 2500 cm^{-1} using a linear function based on end points of the Jackson data. The equations used are:

$$LN(\nu) = LN(Y)_{2380} + \frac{(\nu - 2380)\ (LN(Y)_{2400} - LN(Y)_{2380})}{2400-2380}$$

$LN(Y)_{2380} = R_k$ or R_a at 2380 cm^{-1}

$LN(Y)_{2400} = R_k$ or R_a at 2400 cm^{-1}

CO2 3000-3770 (A) DATA

	300.	400.	500.	600.	700.	800.	900.	1000.	1100.	1200.	1300.DEG K
3420.	.633-07	.325-01	.308-01	.917-02	.754-01	.180+00	.319+00	.492+00	.699+00	.941+00	.187+01
3425.	.127-06	.331-01	.307-01	.711-02	.804-01	.189+00	.333+00	.513+00	.728+00	.979+00	.194+01
3430.	.317-06	.332-01	.300-01	.973-02	.859-01	.199+00	.348+00	.533+00	.755+00	.101+01	.201+01
3435.	.596-06	.329-01	.285-01	.132-01	.921-01	.208+00	.362+00	.553+00	.781+00	.105+01	.207+01
3440.	.138-05	.319-01	.260-01	.177-01	.963-01	.219+00	.376+00	.571+00	.804+00	.107+01	.211+01
3445.	.256-05	.303-01	.224-01	.236-01	.108+00	.230+00	.390+00	.589+00	.826+00	.110+01	.215+01
3450.	.570-05	.279-01	.176-01	.311-01	.118+00	.243+00	.407+00	.609+00	.849+00	.113+01	.219+01
3455.	.105-04	.250-01	.115-01	.405-01	.131+00	.260+00	.428+00	.634+00	.879+00	.116+01	.224+01
3460.	.222-04	.210-01	.359-02	.522-01	.146+00	.279+00	.450+00	.660+00	.906+00	.119+01	.228+01
3465.	.406-04	.151-01	.707-02	.666-01	.164+00	.298+00	.469+00	.678+00	.925+00	.121+01	.228+01
3470.	.821-04	.802-02	.199-01	.838-01	.184+00	.320+00	.491+00	.699+00	.943+00	.122+01	.228+01
3475.	.147-03	.610-03	.340-01	.104+00	.204+00	.350+00	.526+00	.738+00	.984+00	.127+01	.233+01
3480.	.284-03	.879-02	.510-01	.127+00	.237+00	.380+00	.557+00	.768+00	.101+01	.129+01	.233+01
3485.	.500-03	.232-01	.734-01	.153+00	.260+00	.395+00	.558+00	.749+00	.966+00	.121+01	.212+01
3490.	.919-03	.377-01	.973-01	.180+00	.285+00	.414+00	.565+00	.739+00	.936+00	.116+01	.195+01
3495.	.265-02	.441-01	.114+00	.207+00	.324+00	.463+00	.628+00	.812+00	.102+01	.125+01	.209+01
3500.	.274-02	.553-01	.132+00	.234+00	.359+00	.509+00	.684+00	.882+00	.111+01	.135+01	.224+01
3505.	.425-01	.900-01	.161+00	.254+00	.371+00	.511+00	.674+00	.860+00	.107+01	.130+01	.214+01
3510.	.751-01	.123+00	.191+00	.280+00	.389+00	.518+00	.668+00	.839+00	.103+01	.124+01	.200+01
3515.	.499-01	.125+00	.210+00	.323+00	.447+00	.587+00	.742+00	.914+00	.110+01	.131+01	.202+01
3520.	.186-01	.125+00	.243+00	.371+00	.511+00	.661+00	.822+00	.995+00	.116+01	.137+01	.202+01
3525.	.238-01	.148+00	.277+00	.411+00	.551+00	.696+00	.846+00	.100+01	.116+01	.133+01	.186+01
3530.	.469-01	.177+00	.312+00	.448+00	.584+00	.719+00	.854+00	.989+00	.114+01	.126+01	.166+01
3535.	.579-01	.205+00	.348+00	.485+00	.618+00	.745+00	.867+00	.984+00	.110+01	.120+01	.150+01
3540.	.783-01	.234+00	.380+00	.519+00	.649+00	.770+00	.883+00	.988+00	.108+01	.117+01	.138+01
3545.	.103+00	.260+00	.409+00	.549+00	.681+00	.804+00	.919+00	.102+01	.114+01	.121+01	.143+01
3550.	.127+00	.281+00	.427+00	.566+00	.698+00	.822+00	.939+00	.105+01	.115+01	.125+01	.146+01
3555.	.141+00	.283+00	.419+00	.548+00	.670+00	.785+00	.893+00	.995+00	.109+01	.116+01	.140+01
3560.	.159+00	.288+00	.411+00	.529+00	.641+00	.746+00	.846+00	.941+00	.103+01	.111+01	.133+01
3565.	.207+00	.327+00	.444+00	.557+00	.667+00	.772+00	.874+00	.972+00	.107+01	.116+01	.141+01
3570.	.245+00	.357+00	.467+00	.576+00	.684+00	.790+00	.896+00	.100+01	.110+01	.120+01	.150+01
3575.	.215+00	.314+00	.413+00	.514+00	.615+00	.718+00	.821+00	.923+00	.103+01	.114+01	.146+01
3580.	.201+00	.284+00	.371+00	.461+00	.556+00	.654+00	.756+00	.862+00	.976+00	.109+01	.145+01
3585.	.303+00	.366+00	.438+00	.519+00	.609+00	.706+00	.815+00	.932+00	.106+01	.119+01	.165+01
3590.	.414+00	.456+00	.516+00	.583+00	.668+00	.767+00	.880+00	.101+01	.115+01	.130+01	.186+01
3595.	.452+00	.474+00	.513+00	.571+00	.646+00	.740+00	.851+00	.980+00	.113+01	.129+01	.190+01
3600.	.442+00	.446+00	.471+00	.518+00	.586+00	.675+00	.785+00	.916+00	.107+01	.124+01	.189+01
3605.	.347+00	.345+00	.367+00	.412+00	.481+00	.574+00	.691+00	.831+00	.995+00	.116+01	.189+01
3610.	.259+00	.250+00	.268+00	.313+00	.385+00	.485+00	.612+00	.760+00	.947+00	.116+01	.194+01
3615.	.283+00	.251+00	.254+00	.291+00	.362+00	.468+00	.608+00	.782+00	.990+00	.123+01	.217+01
3620.	.337+00	.282+00	.270+00	.298+00	.368+00	.479+00	.631+00	.825+00	.106+01	.134+01	.241+01
3625.	.378+00	.310+00	.286+00	.309+00	.376+00	.488+00	.648+00	.849+00	.110+01	.139+01	.256+01
3630.	.388+00	.321+00	.300+00	.326+00	.398+00	.516+00	.681+00	.892+00	.115+01	.145+01	.266+01

FIGURE 4. TABLE OBTAINED BY APPLICATION OF DOUBLE INTERPOLATION FORMULAS TO LUDWIGS "A" DATA IN APPENDIX F.

CO2 3000-3770 (κ) DATA

	300.	400.	500.	600.	700.	800.	900.	1000.	1100.	1200.	1500.DEG K
3420.	.116-09	.133-02	.133-02	.123-04	.269-02	.671-02	.121-01	.188-01	.266-01	.362-01	.723-01
3425.	.000	.152-02	.151-02	.218-04	.306-02	.766-02	.138-01	.214-01	.306-01	.412-01	.824-01
3430.	.000	.172-02	.170-02	.409-04	.351-02	.872-02	.157-01	.243-01	.347-01	.468-01	.936-01
3435.	.000	.192-02	.190-02	.708-04	.398-02	.984-02	.176-01	.274-01	.391-01	.527-01	.105+00
3440.	.233-09	.213-02	.209-02	.127-03	.452-02	.111-01	.198-01	.308-01	.439-01	.591-01	.118+00
3445.	.466-09	.236-02	.229-02	.213-03	.515-02	.125-01	.223-01	.346-01	.492-01	.664-01	.132+00
3450.	.466-09	.259-02	.247-02	.363-03	.590-02	.142-01	.251-01	.388-01	.552-01	.742-01	.148+00
3455.	.140-08	.281-02	.261-02	.591-03	.684-02	.160-01	.282-01	.434-01	.617-01	.829-01	.165+00
3460.	.698-09	.298-02	.267-02	.956-03	.788-02	.181-01	.316-01	.485-01	.688-01	.921-01	.184+00
3465.	.163-08	.309-02	.259-02	.149-02	.910-02	.204-01	.352-01	.537-01	.757-01	.101+00	.200+00
3470.	.130-07	.310-02	.233-02	.230-02	.108-01	.231-01	.394-01	.594-01	.834-01	.111+00	.218+00
3475.	.330-04	.305-02	.190-02	.343-02	.129-01	.266-01	.445-01	.665-01	.927-01	.123+00	.239+00
3480.	.146-06	.277-02	.110-02	.502-02	.156-01	.306-01	.501-01	.740-01	.104+00	.135+00	.260+00
3485.	.297-03	.200-02	.280-03	.714-02	.186-01	.346-01	.552-01	.804-01	.110+00	.145+00	.275+00
3490.	.530-03	.100-02	.213-02	.994-02	.224-01	.395-01	.614-01	.878-01	.119+00	.155+00	.290+00
3495.	.300-03	.148-03	.442-02	.135-01	.275-01	.464-01	.701-01	.987-01	.132+00	.170+00	.314+00
3500.	.120-04	.112-02	.712-02	.180-01	.337-01	.544-01	.799-01	.110+00	.146+00	.186+00	.335+00
3505.	.915-05	.365-02	.111+01	.236-01	.408-01	.628-01	.889-01	.120+00	.156+00	.196+00	.344+00
3510.	.834-04	.623-02	.165+01	.310-01	.497-01	.725-01	.995-01	.131+00	.166+00	.205+00	.349+00
3515.	.178-03	.102+01	.237+01	.408+01	.615+01	.857+01	.114+00	.145+00	.180+00	.216+00	.355+00
3520.	.475-03	.152-01	.327+01	.529+01	.758+01	.101+00	.130+00	.161+00	.195+00	.231+00	.357+00
3525.	.158-02	.202+01	.436+01	.675+01	.930+01	.120+00	.148+00	.177+00	.208+00	.240+00	.344+00
3530.	.216-02	.295-01	.568+01	.841+01	.111+00	.139+00	.166+00	.194+00	.221+00	.246+00	.331+00
3535.	.274+01	.523+01	.773+01	.103+00	.128+00	.154+00	.179+00	.205+00	.231+00	.257+00	.337+00
3540.	.489+01	.737+01	.983+01	.123+00	.147+00	.171+00	.195+00	.219+00	.242+00	.266+00	.334+00
3545.	.365+01	.767+01	.113+00	.147+00	.176+00	.203+00	.226+00	.245+00	.261+00	.273+00	.290+00
3550.	.213+01	.772+01	.128+00	.168+00	.204+00	.232+00	.253+00	.268+00	.278+00	.278+00	.237+00
3555.	.188+01	.831+01	.135+00	.185+00	.222+00	.250+00	.269+00	.278+00	.279+00	.271+00	.196+00
3560.	.446+01	.102+00	.151+00	.191+00	.223+00	.246+00	.261+00	.267+00	.265+00	.254+00	.171+00
3565.	.636+01	.124+00	.175+00	.216+00	.248+00	.270+00	.282+00	.285+00	.278+00	.261+00	.153+00
3570.	.861+01	.154+00	.210+00	.254+00	.286+00	.306+00	.314+00	.311+00	.295+00	.268+00	.115+00
3575.	.111+00	.177+00	.230+00	.272+00	.301+00	.318+00	.322+00	.315+00	.295+00	.263+00	.936-01
3580.	.147+00	.195+00	.234+00	.265+00	.286+00	.299+00	.302+00	.296+00	.280+00	.258+00	.133+00
3585.	.283+00	.316+00	.341+00	.358+00	.366+00	.365+00	.356+00	.339+00	.313+00	.278+00	.124+00
3590.	.440+00	.440+00	.436+00	.428+00	.416+00	.400+00	.381+00	.357+00	.330+00	.299+00	.181+00
3595.	.576+00	.535+00	.494+00	.456+00	.421+00	.389+00	.360+00	.334+00	.311+00	.290+00	.247+00
3600.	.634+00	.554+00	.485+00	.425+00	.376+00	.337+00	.306+00	.284+00	.268+00	.262+00	.347+00
3605.	.539+00	.457+00	.387+00	.329+00	.284+00	.251+00	.230+00	.221+00	.225+00	.241+00	.383+00
3610.	.253+00	.220+00	.193+00	.174+00	.161+00	.156+00	.157+00	.164+00	.179+00	.200+00	.309+00
3615.	.182+00	.148+00	.123+00	.106+00	.988-01	.100+00	.111+00	.130+00	.159+00	.196+00	.361+00
3620.	.601+00	.452+00	.329+00	.232+00	.161+00	.115+00	.955-01	.104+00	.133+00	.191+00	.519+00
3625.	.811+00	.628+00	.474+00	.349+00	.254+00	.188+00	.151+00	.143+00	.165+00	.216+00	.545+00
3630.	.726+00	.605+00	.501+00	.413+00	.343+00	.289+00	.252+00	.232+00	.228+00	.241+00	.383+00

FIGURE 5. TABLE OBTAINED BY APPLICATION OF DOUBLE INTERPOLATION FORMULAS TO LUDWIGS "K" DATA IN APPENDIX F.

UNCLASSIFIED

CO2 2050-2500 (A) DATA

	300.	400.	500.	600.	700.	800.	900.	1000.	1100.	1200.	1500.DEG K
2050.	.260-02	.156-02	.879-03	.480-03	.301-03	.276-03	.340-03	.427-03	.473-03	.410-03	.108-02
2055.	.480-02	.279-02	.140-02	.700-03	.363-03	.323-03	.450-03	.612-03	.674-03	.520-03	.262-02
2060.	.801-02	.459-02	.234-02	.103-02	.449-03	.370-03	.572-03	.836-03	.928-03	.637-03	.477-02
2065.	.140-01	.786-02	.383-02	.151-02	.493-03	.375-03	.753-03	.122-02	.136-02	.823-03	.919-02
2070.	.187-01	.104-01	.500-02	.189-02	.548-03	.420-03	.957-03	.161-02	.183-02	.106-02	.126-01
2075.	.202-01	.113-01	.542-02	.208-02	.654-03	.542-03	.115-02	.188-02	.214-02	.134-02	.134-01
2080.	.165-01	.934-02	.466-02	.199-02	.855-03	.783-03	.130-02	.193-02	.221-02	.166-02	.970-02
2085.	.108-01	.636-02	.345-02	.179-02	.109-02	.107-02	.144-02	.192-02	.221-02	.204-02	.412-02
2090.	.631-02	.402-02	.250-02	.163-02	.127-02	.130-02	.157-02	.196-02	.232-02	.254-02	.950-03
2095.	.321-02	.236-02	.181-02	.152-02	.144-02	.154-02	.177-02	.209-02	.245-02	.281-02	.349-02
2100.	.181-02	.152-02	.142-02	.147-02	.162-02	.185-02	.210-02	.234-02	.254-02	.285-02	.207-02
2105.	.133-02	.115-02	.120-02	.141-02	.172-02	.206-02	.235-02	.253-02	.254-02	.230-02	.590-03
2110.	.955-03	.834-03	.964-03	.126-02	.184-02	.202-02	.232-02	.245-02	.234-02	.189-02	.227-02
2115.	.695-03	.634-03	.784-03	.107-02	.143-02	.179-02	.208-02	.224-02	.219-02	.166-02	.146-02
2120.	.585-03	.580-03	.693-03	.882-03	.113-02	.141-02	.170-02	.199-02	.225-02	.246-02	.260-02
2125.	.513-03	.601-03	.663-03	.736-03	.858-03	.107-02	.140-02	.189-02	.255-02	.352-02	.811-02
2130.	.488-03	.655-03	.694-03	.696-03	.751-03	.948-03	.138-02	.214-02	.331-02	.496-02	.139-01
2135.	.480-03	.737-03	.765-03	.711-03	.722-03	.946-03	.153-02	.262-02	.436-02	.691-02	.208-01
2140.	.478-03	.854-03	.863-03	.730-03	.680-03	.939-03	.173-02	.328-02	.581-02	.955-02	.303-01
2145.	.482-03	.103-02	.100-02	.752-03	.603-03	.891-03	.195-02	.412-02	.774-02	.131-01	.432-01
2150.	.491-03	.129-02	.124-02	.781-03	.484-03	.771-03	.220-02	.525-02	.104-01	.182-01	.622-01
2155.	.505-03	.168-02	.154-02	.816-03	.244-03	.551-03	.247-02	.673-02	.141-01	.252-01	.887-01
2160.	.522-03	.219-02	.195-02	.856-03	.623-04	.233-03	.278-02	.862-02	.188-01	.343-01	.123+00
2165.	.547-03	.284-02	.249-02	.916-03	.436-03	.138-03	.325-02	.112-01	.250-01	.463-01	.169+00
2170.	.581-03	.364-02	.314-02	.101-02	.837-03	.472-03	.403-02	.146-01	.331-01	.616-01	.228+00
2175.	.628-03	.456-02	.391-02	.118-02	.111-02	.446-03	.508-02	.198-01	.444-01	.820-01	.298+00
2180.	.695-03	.554-02	.473-02	.146-02	.108-02	.311-03	.882-02	.276-01	.600-01	.109+00	.386+00
2185.	.783-03	.648-02	.555-02	.191-02	.510-03	.221-02	.140-01	.388-01	.805-01	.143+00	.495+00
2190.	.901-03	.752-02	.648-02	.260-02	.660-03	.546-02	.218-01	.545-01	.106+00	.188+00	.631+00
2195.	.106-02	.871-02	.773-02	.391-02	.365-02	.110-01	.334-01	.762-01	.145+00	.246+00	.798+00
2200.	.128-02	.991-02	.934-02	.627-02	.753-02	.199-01	.500-01	.105+00	.191+00	.315+00	.984+00
2205.	.169-02	.116-01	.118-01	.102-01	.145-01	.325-01	.720-01	.141+00	.246+00	.397+00	.120+01
2210.	.245-02	.142-01	.159-01	.165-01	.248-01	.497-01	.100+00	.185+00	.312+00	.492+00	.143+01
2215.	.428-02	.177-01	.223-01	.274-01	.426-01	.773-01	.141+00	.243+00	.393+00	.601+00	.166+01
2220.	.795-02	.226-01	.320-01	.454-01	.720-01	.121+00	.202+00	.324+00	.496+00	.728+00	.187+01
2225.	.160-01	.352-01	.519-01	.754-01	.115+00	.180+00	.279+00	.422+00	.616+00	.876+00	.212+01
2230.	.310-01	.611-01	.881-01	.122+00	.173+00	.251+00	.367+00	.530+00	.751+00	.104+01	.241+01
2235.	.571-01	.102+00	.140+00	.185+00	.247+00	.340+00	.473+00	.660+00	.911+00	.124+01	.280+01
2240.	.984-01	.156+00	.208+00	.266+00	.343+00	.452+00	.605+00	.816+00	.110+01	.146+01	.318+01
2245.	.156+00	.225+00	.290+00	.365+00	.461+00	.592+00	.770+00	.101+01	.132+01	.171+01	.352+01
2250.	.232+00	.308+00	.389+00	.486+00	.609+00	.769+00	.975+00	.124+01	.157+01	.198+01	.378+01

FIGURE 6. TABLE OBTAINED BY APPLICATION OF QUADRATIC INTERPOLATION FORMULA TO JACKSON "A" DATA IN APPENDIX G.

CO2 2050-2500 (K) DATA

	300.	400.	500.	600.	700.	800.	900.	1000.	1100.	1200.	1300.DEG K
2050.	.460-01	.529-01	.585-01	.660-01	.788-01	.100+00	.133+00	.181+00	.247+00	.335+00	.760+00
2055.	.490-01	.572-01	.629-01	.700-01	.822-01	.103+00	.137+00	.187+00	.256+00	.352+00	.817+00
2060.	.525-01	.605-01	.668-01	.750-01	.889-01	.112+00	.149+00	.203+00	.277+00	.376+00	.857+00
2065.	.568-01	.644-01	.709-01	.800-01	.953-01	.120+00	.159+00	.215+00	.291+00	.392+00	.877+00
2070.	.600-01	.675-01	.744-01	.842-01	.101+00	.127+00	.166+00	.226+00	.306+00	.410+00	.909+00
2075.	.631-01	.709-01	.779-01	.881-01	.105+00	.133+00	.176+00	.237+00	.321+00	.431+00	.957+00
2080.	.667-01	.751-01	.823-01	.925-01	.110+00	.139+00	.184+00	.249+00	.338+00	.456+00	.104+01
2085.	.706-01	.783-01	.873-01	.101+00	.123+00	.157+00	.206+00	.274+00	.365+00	.481+00	.102+01
2090.	.742-01	.804-01	.950-01	.119+00	.153+00	.199+00	.256+00	.328+00	.410+00	.509+00	.904+00
2095.	.771-01	.813-01	.104+00	.142+00	.193+00	.254+00	.323+00	.396+00	.476+00	.567+00	.741+00
2100.	.789-01	.827-01	.114+00	.167+00	.236+00	.314+00	.395+00	.474+00	.544+00	.600+00	.619+00
2105.	.801-01	.838-01	.124+00	.187+00	.270+00	.363+00	.458+00	.546+00	.620+00	.671+00	.604+00
2110.	.813-01	.878-01	.130+00	.201+00	.292+00	.394+00	.500+00	.606+00	.691+00	.760+00	.763+00
2115.	.825-01	.928-01	.137+00	.210+00	.304+00	.412+00	.529+00	.647+00	.760+00	.862+00	.103+01
2120.	.840-01	.984-01	.145+00	.219+00	.316+00	.430+00	.558+00	.694+00	.834+00	.973+00	.134+01
2125.	.854-01	.104+00	.156+00	.227+00	.326+00	.447+00	.586+00	.741+00	.910+00	.109+01	.167+01
2130.	.868-01	.112+00	.161+00	.235+00	.334+00	.460+00	.612+00	.792+00	.100+01	.124+01	.214+01
2135.	.882-01	.122+00	.171+00	.243+00	.341+00	.471+00	.638+00	.847+00	.110+01	.141+01	.270+01
2140.	.897-01	.131+00	.181+00	.250+00	.347+00	.483+00	.666+00	.907+00	.121+01	.160+01	.331+01
2145.	.912-01	.140+00	.191+00	.258+00	.355+00	.498+00	.699+00	.974+00	.134+01	.180+01	.395+01
2150.	.928-01	.148+00	.199+00	.266+00	.366+00	.516+00	.740+00	.105+01	.147+01	.201+01	.457+01
2155.	.944-01	.155+00	.208+00	.277+00	.383+00	.549+00	.796+00	.115+01	.166+01	.225+01	.524+01
2160.	.960-01	.161+00	.219+00	.295+00	.413+00	.599+00	.877+00	.127+01	.181+01	.251+01	.586+01
2165.	.974-01	.169+00	.234+00	.321+00	.456+00	.667+00	.981+00	.142+01	.203+01	.281+01	.654+01
2170.	.987-01	.177+00	.253+00	.355+00	.512+00	.754+00	.111+01	.161+01	.228+01	.315+01	.726+01
2175.	.100+00	.185+00	.271+00	.390+00	.572+00	.849+00	.125+01	.181+01	.255+01	.351+01	.800+01
2180.	.102+00	.190+00	.285+00	.422+00	.632+00	.947+00	.140+01	.202+01	.285+01	.391+01	.883+01
2185.	.106+00	.198+00	.302+00	.454+00	.689+00	.104+01	.155+01	.225+01	.317+01	.435+01	.981+01
2190.	.112+00	.206+00	.319+00	.490+00	.756+00	.115+01	.172+01	.249+01	.351+01	.481+01	.108+02
2195.	.120+00	.217+00	.341+00	.531+00	.828+00	.127+01	.190+01	.275+01	.387+01	.530+01	.118+02
2200.	.129+00	.230+00	.367+00	.581+00	.913+00	.141+01	.210+01	.304+01	.426+01	.581+01	.128+02
2205.	.140+00	.244+00	.399+00	.637+00	.101+01	.155+01	.231+01	.333+01	.467+01	.635+01	.139+02
2210.	.152+00	.265+00	.431+00	.697+00	.111+01	.171+01	.254+01	.365+01	.509+01	.690+01	.150+02
2215.	.167+00	.288+00	.471+00	.764+00	.121+01	.187+01	.277+01	.397+01	.552+01	.746+01	.161+02
2220.	.187+00	.315+00	.517+00	.840+00	.133+01	.204+01	.302+01	.431+01	.596+01	.802+01	.171+02
2225.	.217+00	.352+00	.577+00	.940+00	.149+01	.226+01	.331+01	.468+01	.646+01	.857+01	.180+02
2230.	.265+00	.412+00	.670+00	.108+01	.169+01	.253+01	.365+01	.509+01	.690+01	.912+01	.188+02
2235.	.334+00	.500+00	.797+00	.126+01	.193+01	.284+01	.403+01	.554+01	.740+01	.966+01	.192+02
2240.	.431+00	.620+00	.960+00	.148+01	.221+01	.318+01	.443+01	.596+01	.788+01	.101+02	.193+02
2245.	.551+00	.789+00	.116+01	.175+01	.253+01	.355+01	.484+01	.642+01	.834+01	.106+02	.198+02
2250.	.693+00	.983+00	.142+01	.204+01	.288+01	.393+01	.525+01	.687+01	.881+01	.111+02	.204+02

FIGURE 7. TABLE OBTAINED BY APPLICATION OF QUADRATIC INTERPOLATION FORMULA TO JACKSON "K" DATA IN APPENDIX B.

UNCLASSIFIED

3.4 Ludwig CO_2 500-800 cm^{-1}

The transmission model of Ludwig for the range 500-800 cm^{-1} is given mathematically as follows:

$$\tau = EXP\ (-U*K)$$

$$U = (PP_{co2})\ (P_t)\ (L)\ 273/T$$

$PPCO_2$ = Partial pressure CO_2

P_t = pressure atmospheres

L = Path length (cm)

T = temperature ^oK

K = absorption coefficient which is temperature and wavelength dependent and can be found tabulated in appendix H. Hide uses a second order collocation polynominal to interpolate between 300°K and 1200°K, hence, the interpolated numbers agree at the tabulated values and vary smoothly between them as shown in Figure 8.

3.5 Spectra Comparisons

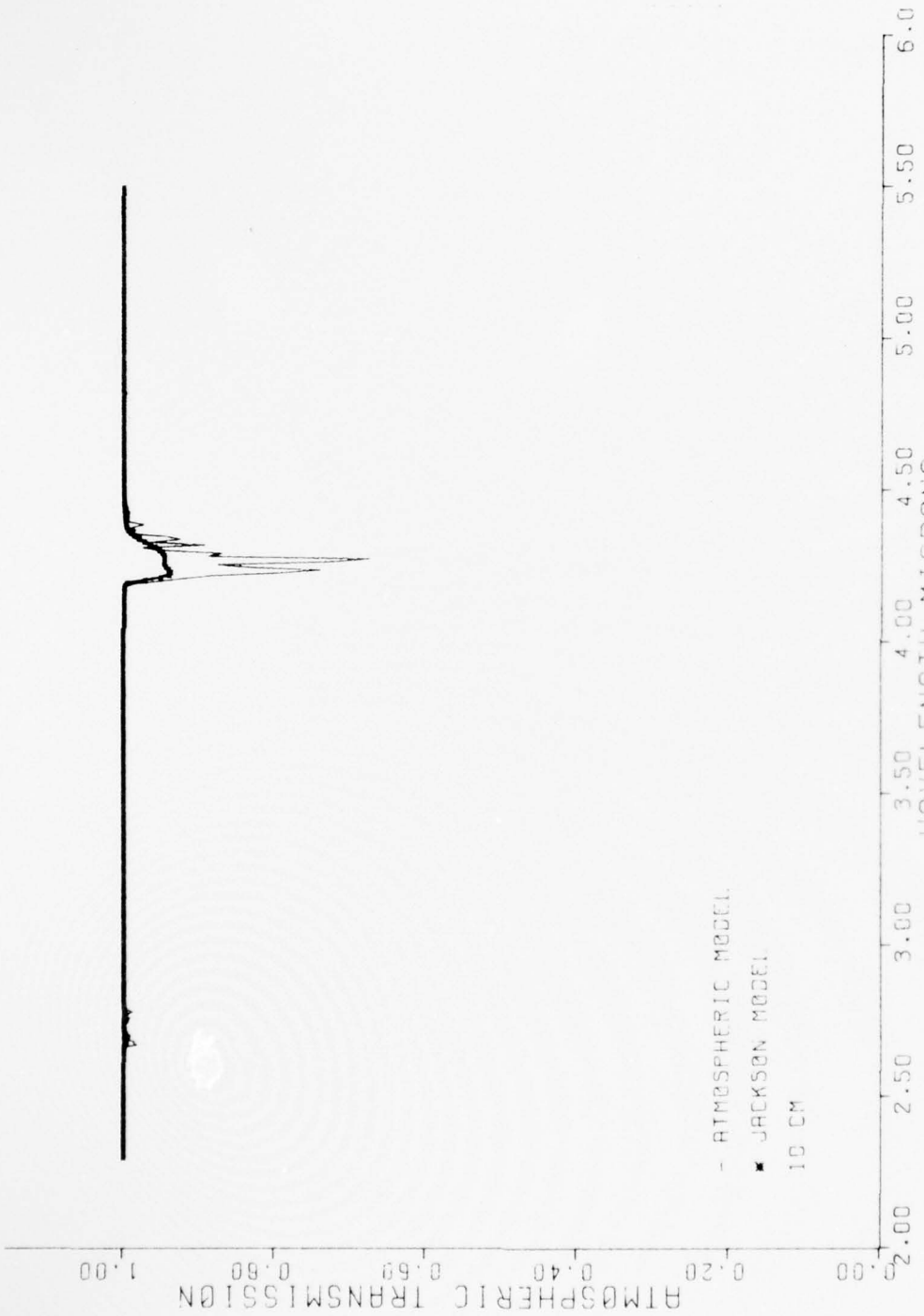
The validation of the emission model was quite difficult as no experimental data was immediately available as in the transmission model, and it is expected that confidence in this program will only be obtained after several valid signatures have been computed. In the plume region 4-5μ, however, it is possible to make a direct comparison between the emission and transmission models at 300°K. This region is important for the models must match up here or bad estimates will be obtained for the plume prediction. Figures 9-13 represent the results of this study which are considered to be quite good.

CC2 500-880 C***-1 (A) DATA

	300.	400.	500.	600.	700.	800.	900.	1000.	1100.	1200.	1500.DEG K
500.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
505.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
510.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
515.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
520.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
525.	.582-10	.326-03	-.326-03	.146-09	.652-03	.163-02	.293-02	.456-02	.652-02	.880-02	.176-01
530.	.873-10	.407-03	-.407-03	.146-09	.815-03	.204-02	.367-02	.570-02	.815-02	.110-01	.220-01
535.	.116-09	.106-02	-.106-02	.233-09	.211-02	.528-02	.950-02	.148-01	.211-01	.285-01	.570-01
540.	.000	.122-02	-.122-02	.233-09	.244-02	.611-02	.110-01	.171-01	.244-01	.330-01	.660-01
545.	.233-09	.167-02	-.167-02	.233-09	.333-02	.833-02	.150-01	.233-01	.333-01	.450-01	.900-01
550.	.233-09	.181-02	-.181-02	.698-09	.363-02	.907-02	.163-01	.254-01	.363-01	.490-01	.980-01
555.	.233-09	.181-02	-.181-02	.698-09	.363-02	.907-02	.163-01	.254-01	.363-01	.490-01	.980-01
560.	.233-09	.178-02	-.178-02	.466-09	.356-02	.889-02	.160-01	.249-01	.356-01	.480-01	.960-01
565.	.698-09	.304-02	-.304-02	.698-09	.607-02	.152-01	.273-01	.425-01	.607-01	.820-01	.164+00
570.	.000	.778-03	.328-02	.750-02	.134+01	.211-01	.305-01	.416-01	.544-01	.690-01	.123+00
575.	.233-09	.807-02	.124+01	.205-01	.289+01	.380-01	.478-01	.585-01	.699-01	.820-01	.123+00
580.	.466-09	.114+01	.233-01	.355-01	.481-01	.611-01	.745-01	.883-01	.102+00	.117+00	.163+00
585.	.157+01	.261-01	.382-01	.520-01	.675-01	.846-01	.103+00	.124+00	.146+00	.170+00	.252+00
590.	.150-01	.380-01	.623-01	.880-01	.115+00	.143+00	.173+00	.204+00	.236+00	.270+00	.379+00
595.	.510-01	.732-01	.995-01	.130+00	.165+00	.203+00	.246+00	.293+00	.345+00	.400+00	.561+00
600.	.120+00	.134+00	.149+00	.165+00	.181+00	.199+00	.217+00	.235+00	.255+00	.275+00	.340+00
605.	.880-01	.121+00	.155+00	.190+00	.227+00	.265+00	.304+00	.345+00	.387+00	.430+00	.568+00
610.	.110+00	.194+00	.274+00	.350+00	.421+00	.488+00	.550+00	.608+00	.661+00	.710+00	.830+00
615.	.180+00	.281+00	.378+00	.470+00	.557+00	.639+00	.717+00	.789+00	.857+00	.920+00	.108+01
620.	.970-01	.153+00	.209+00	.265+00	.322+00	.379+00	.436+00	.494+00	.552+00	.610+00	.787+00
625.	.175+00	.246+00	.314+00	.380+00	.443+00	.504+00	.562+00	.617+00	.670+00	.720+00	.855+00
630.	.370+00	.470+00	.560+00	.640+00	.711+00	.772+00	.823+00	.865+00	.897+00	.920+00	.930+00
635.	.590+00	.683+00	.767+00	.840+00	.903+00	.957+00	.100+01	.103+01	.106+01	.107+01	.105+01
640.	.940+00	.972+00	.100+01	.103+01	.106+01	.108+01	.110+01	.112+01	.114+01	.115+01	.118+01
645.	.196+01	.189+01	.183+01	.177+01	.171+01	.166+01	.160+01	.155+01	.151+01	.146+01	.134+01
650.	.345+01	.322+01	.301+01	.282+01	.264+01	.248+01	.233+01	.220+01	.208+01	.198+01	.177+01
655.	.282+01	.270+01	.259+01	.248+01	.238+01	.229+01	.221+01	.213+01	.206+01	.200+01	.186+01
660.	.254+01	.248+01	.241+01	.234+01	.227+01	.219+01	.211+01	.202+01	.193+01	.184+01	.154+01
665.	.142+02	.121+02	.106+02	.860+01	.720+01	.603+01	.510+01	.440+01	.393+01	.370+01	.440+01
670.	.450+01	.499+01	.539+01	.570+01	.593+01	.607+01	.613+01	.611+01	.600+01	.580+01	.470+01
675.	.360+01	.339+01	.322+01	.310+01	.302+01	.299+01	.300+01	.306+01	.316+01	.330+01	.400+01
680.	.310+01	.292+01	.275+01	.260+01	.246+01	.234+01	.223+01	.214+01	.206+01	.200+01	.190+01
685.	.240+01	.245+01	.248+01	.250+01	.250+01	.249+01	.247+01	.243+01	.237+01	.230+01	.200+01
690.	.182+01	.189+01	.195+01	.200+01	.205+01	.209+01	.212+01	.215+01	.217+01	.218+01	.218+01
695.	.104+01	.115+01	.126+01	.135+01	.143+01	.151+01	.158+01	.163+01	.166+01	.172+01	.176+01
700.	.550+00	.806+00	.102+01	.120+01	.134+01	.144+01	.149+01	.151+01	.149+01	.143+01	.101+01

FIGURE 8. TABLE OBTAINED BY APPLICATION OF DOUBLE INTERPOLATION FORMULAS TO LUDWIG DATA IN APPENDIX H

UNCLASSIFIED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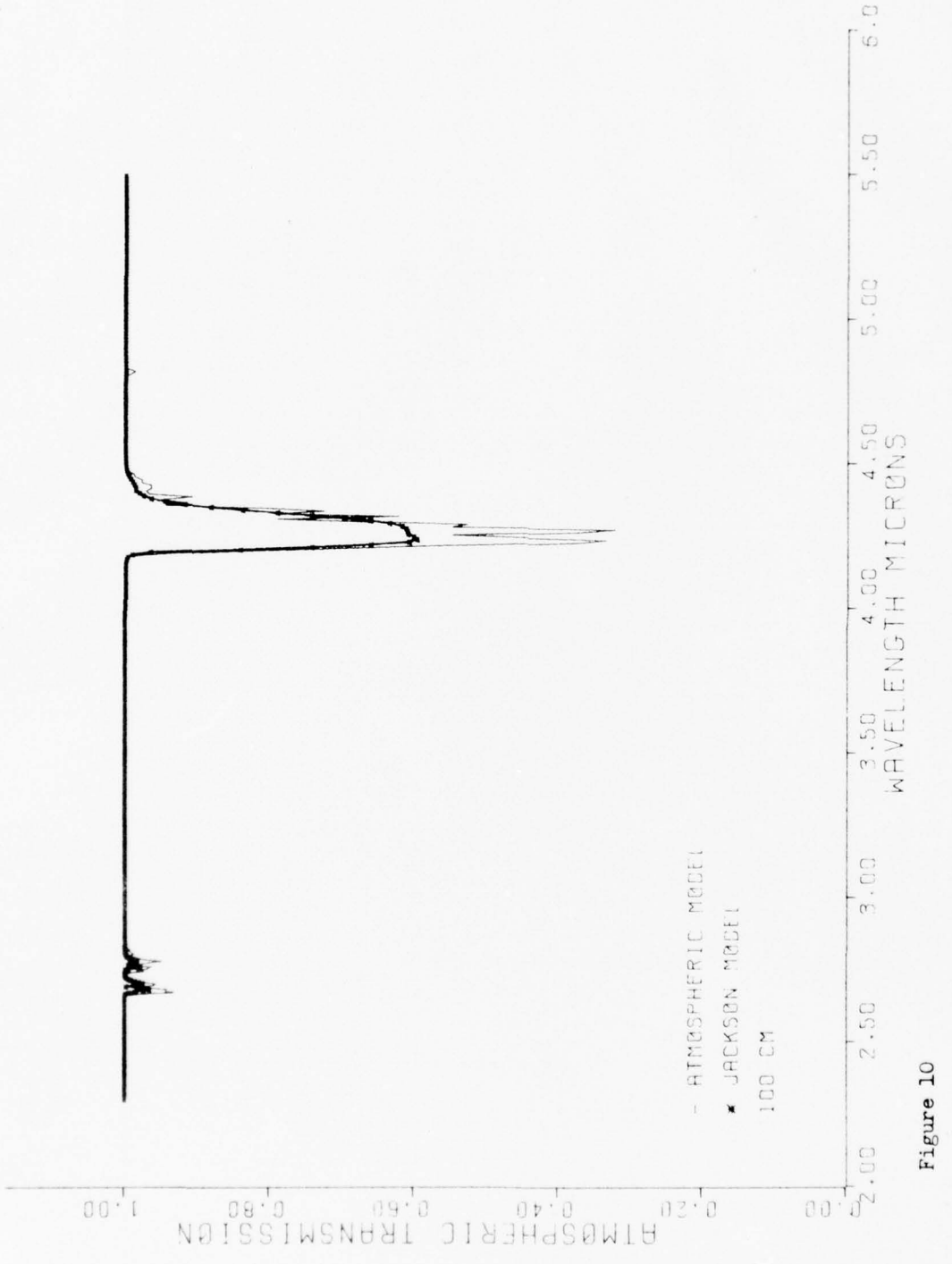
0.80
1.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* JACKSON MODEL
10 CM

Figure 9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0.60
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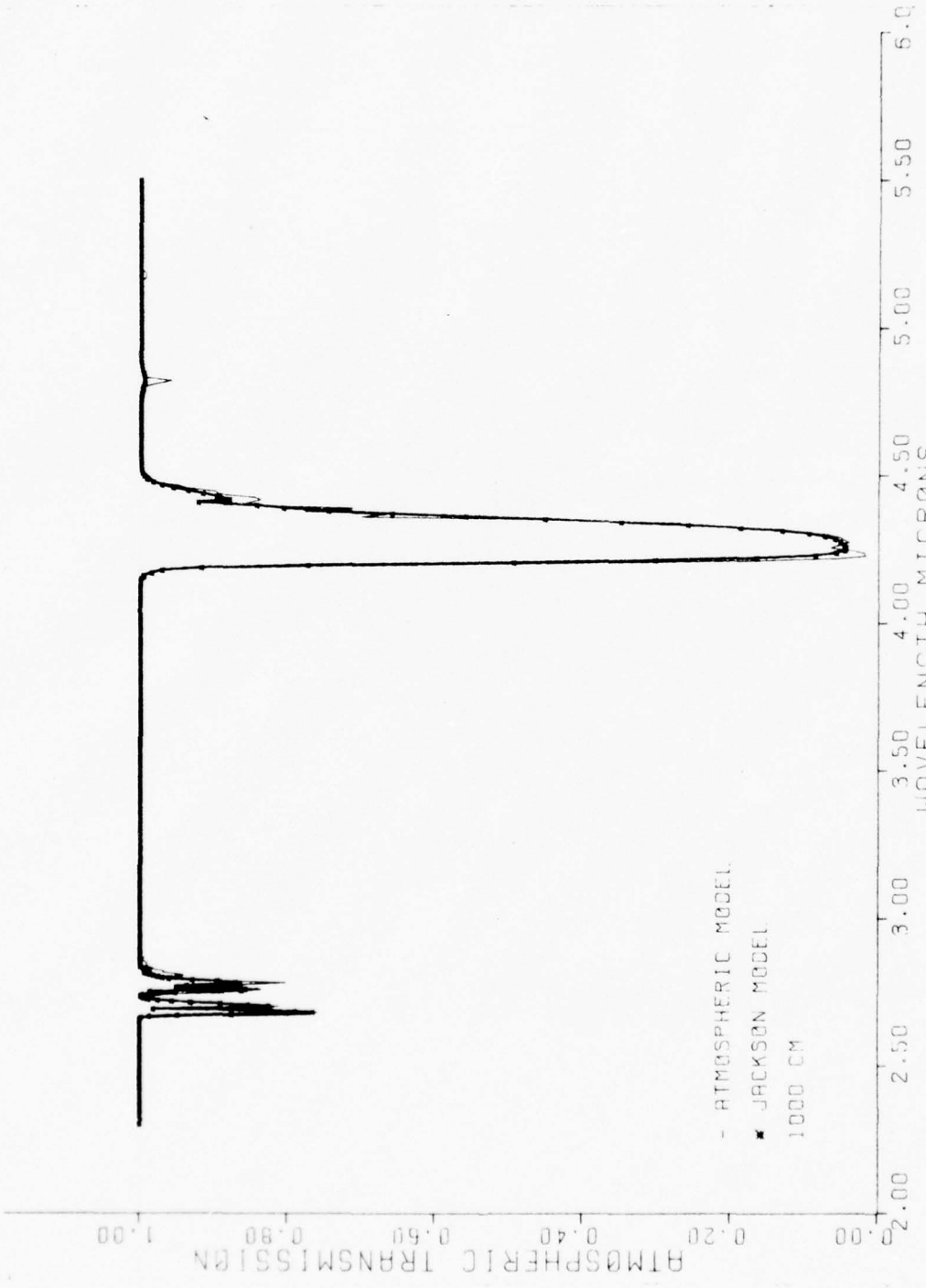
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* JACKSON MODEL
100 CM

Figure 10


ATMOSPHERIC TRANSMISSION
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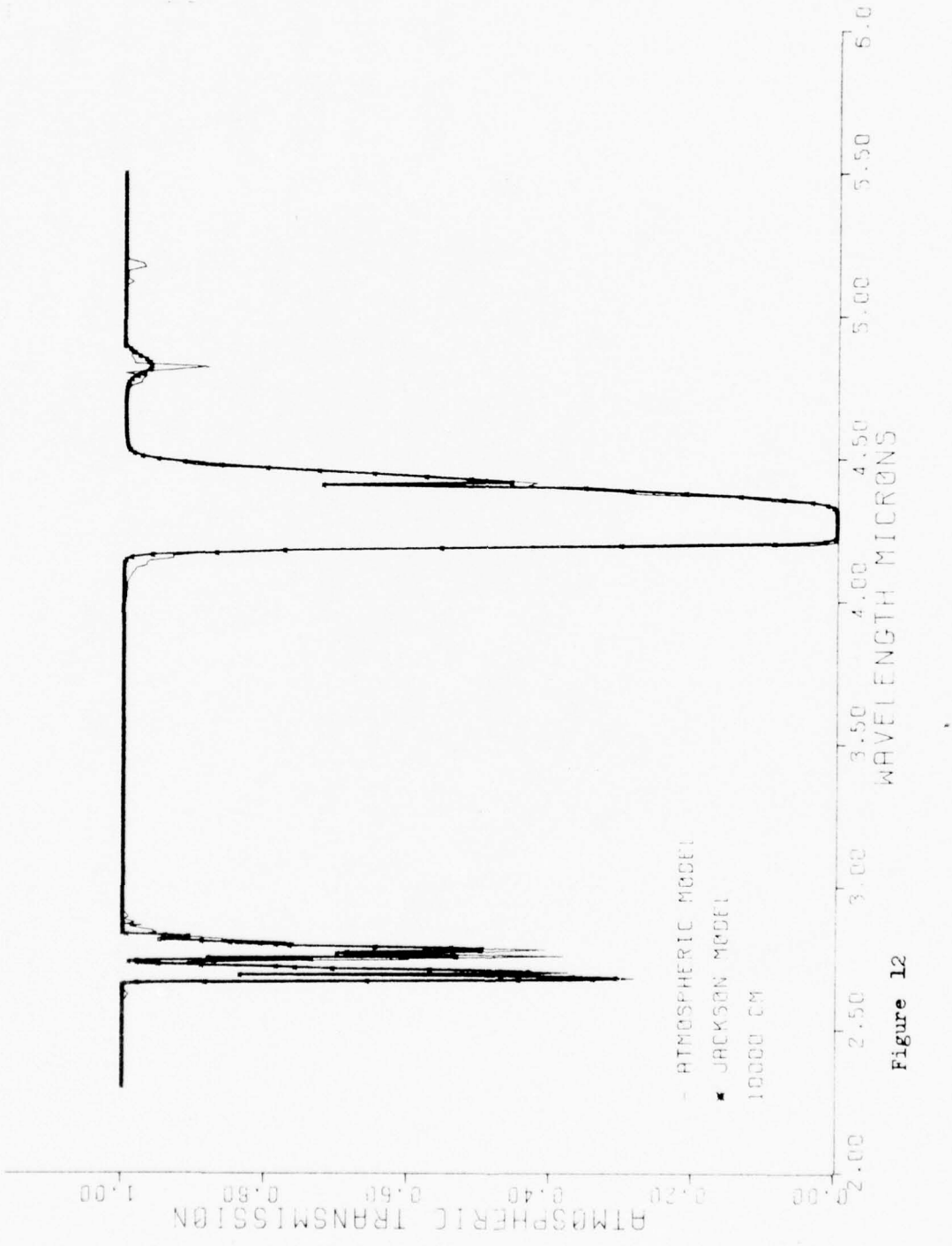
0.80
1.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* JACKSON MODEL
1000 CM

Figure 11


ATMOSPHERIC TRANSMISSION
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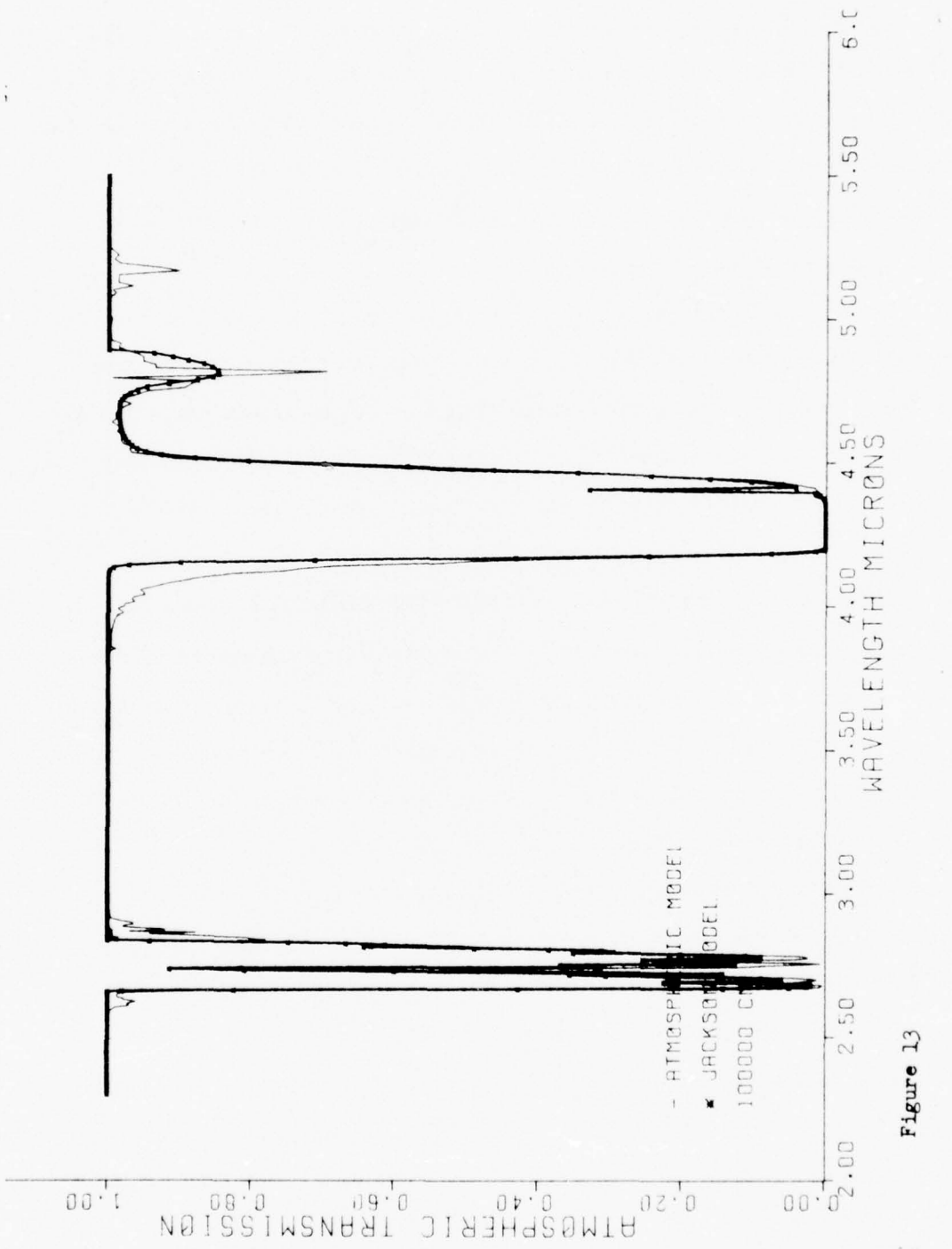
0.80
1.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* JACKSON MODEL
10000 CM

Figure 12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2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* JACKSON MODEL
100000 CM

Figure 13

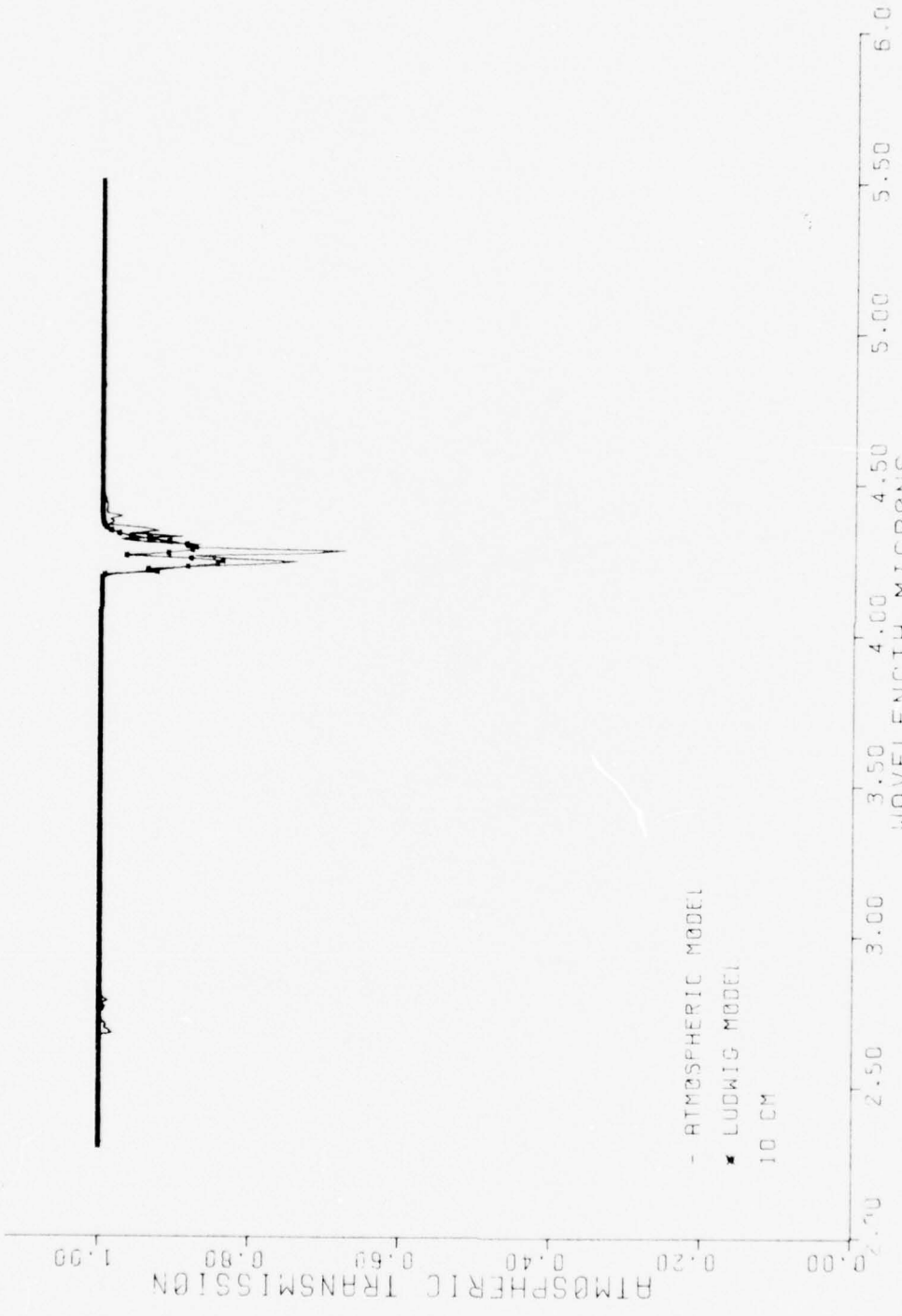
Another CO_2 emission model has been proposed for this region by Ludwig as shown in Appendix I. This model was also run off against the "HIDE" transmission and is shown in Figures 14-17. Neither model shows an exact matchup and the final choice for the "HIDE" model was decided on the basis of the better signature generated which was due to Jackson.

3.6 Plume Radiation Validation

The Infrared Evaluation of a UH1H Helicopter, by General Dynamics, Ref.1, presented the results of some flight tests to measure the radiation from helicopters under varying meteorological and operating conditions. The end product of these tests appears as a series of graphs of Radiant intensity vs. wavelength for various aspect angles. To gain some confidence in the "HIDE" increased resolution models several of the G.D. plots were selected to form a signature and compared directly with the HIDE predictions. Excellent correlation was finally achieved after many iterations and the best of these predictions will be presented in this section. The actual methodology or engineering used to obtain such good validation will be explained in detail in another report on sensitivity and error analysis, Ref. 2, as it illuminates many important facets of the "HIDE" program.

For security reasons, no description of the test conditions, the helicoptor, or even the scales of the graphs will be included in this report. This data may be obtained from the G.D . report referenced earlier, Sec. 2.

Figures 18-21 show the results of this study, four spectral plots of Radiant Intensity vs. wavelength for approximately co-altitude look angles of 134°, 196°, 270°, 312°degrees. These angles are measured clockwise looking down on the helicopter with zero degrees being head on. The HIDE output was traced in heavy black ink to make it distant from the G.D. original.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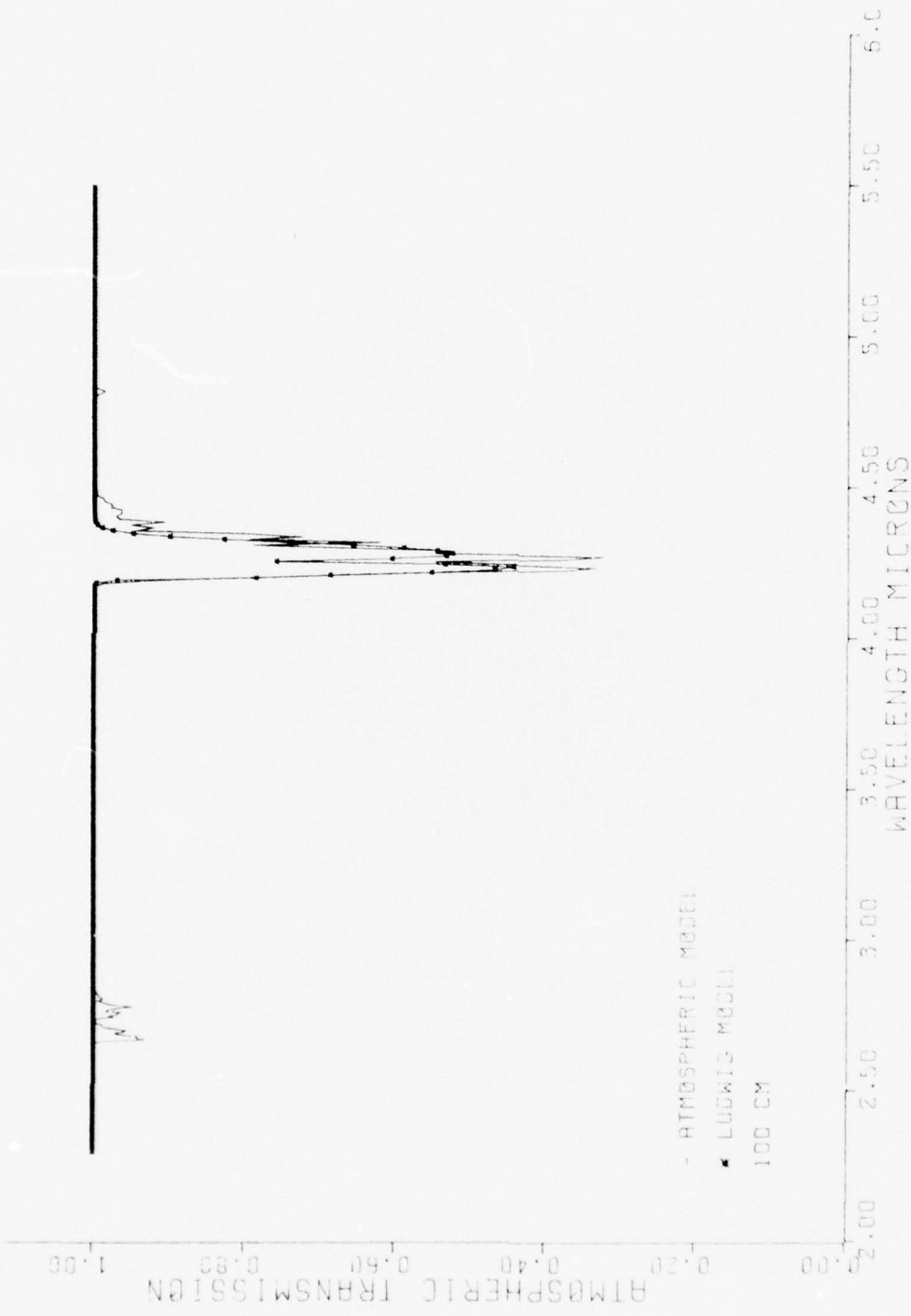
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* LUDWIG MODEL
10 CM

Figure 14


ATMOSPHERIC TRANSMISSION
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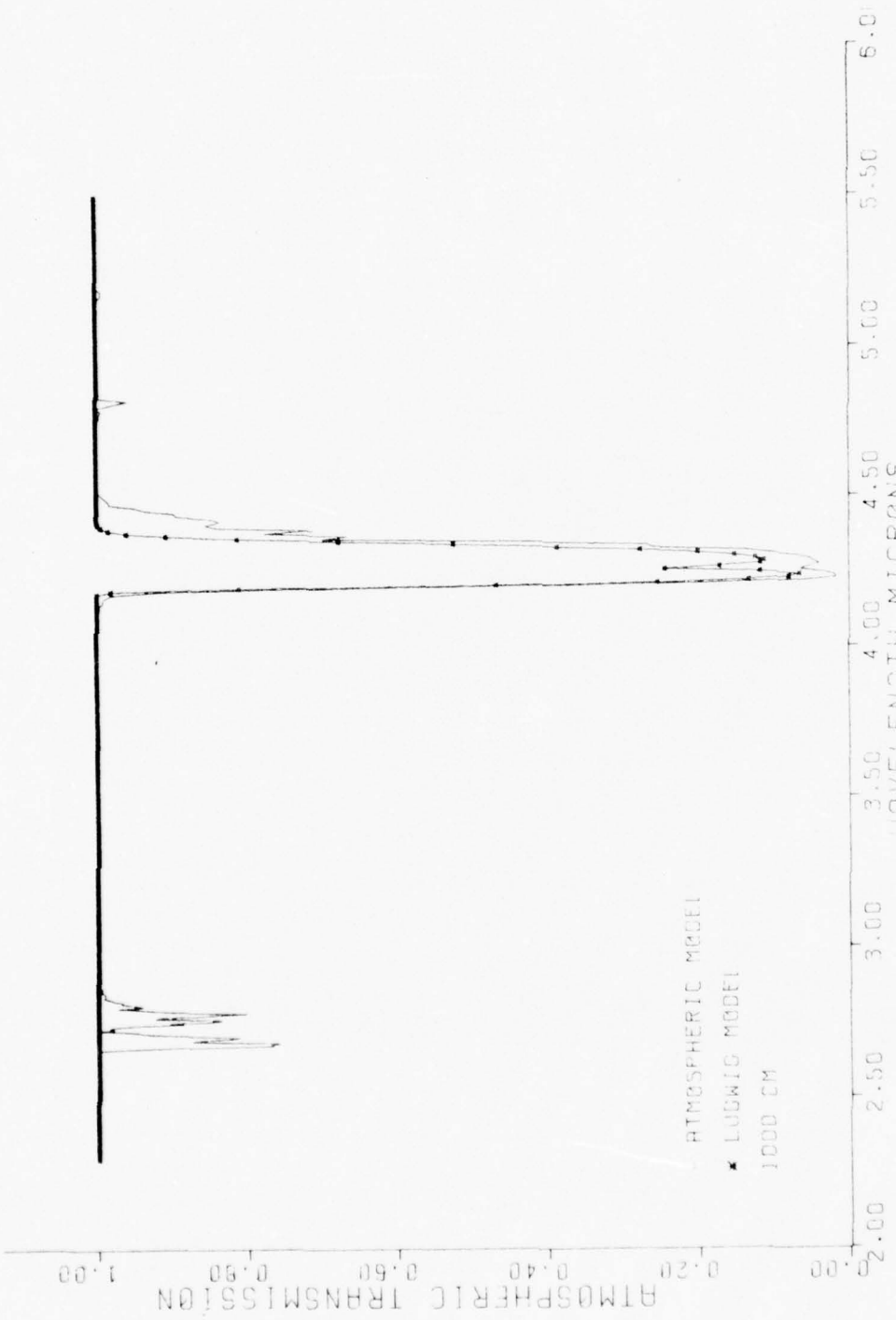
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
5.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* LUDWIG MODEL
100 CM

Figure 15


ATMOSPHERIC TRANSMISSION
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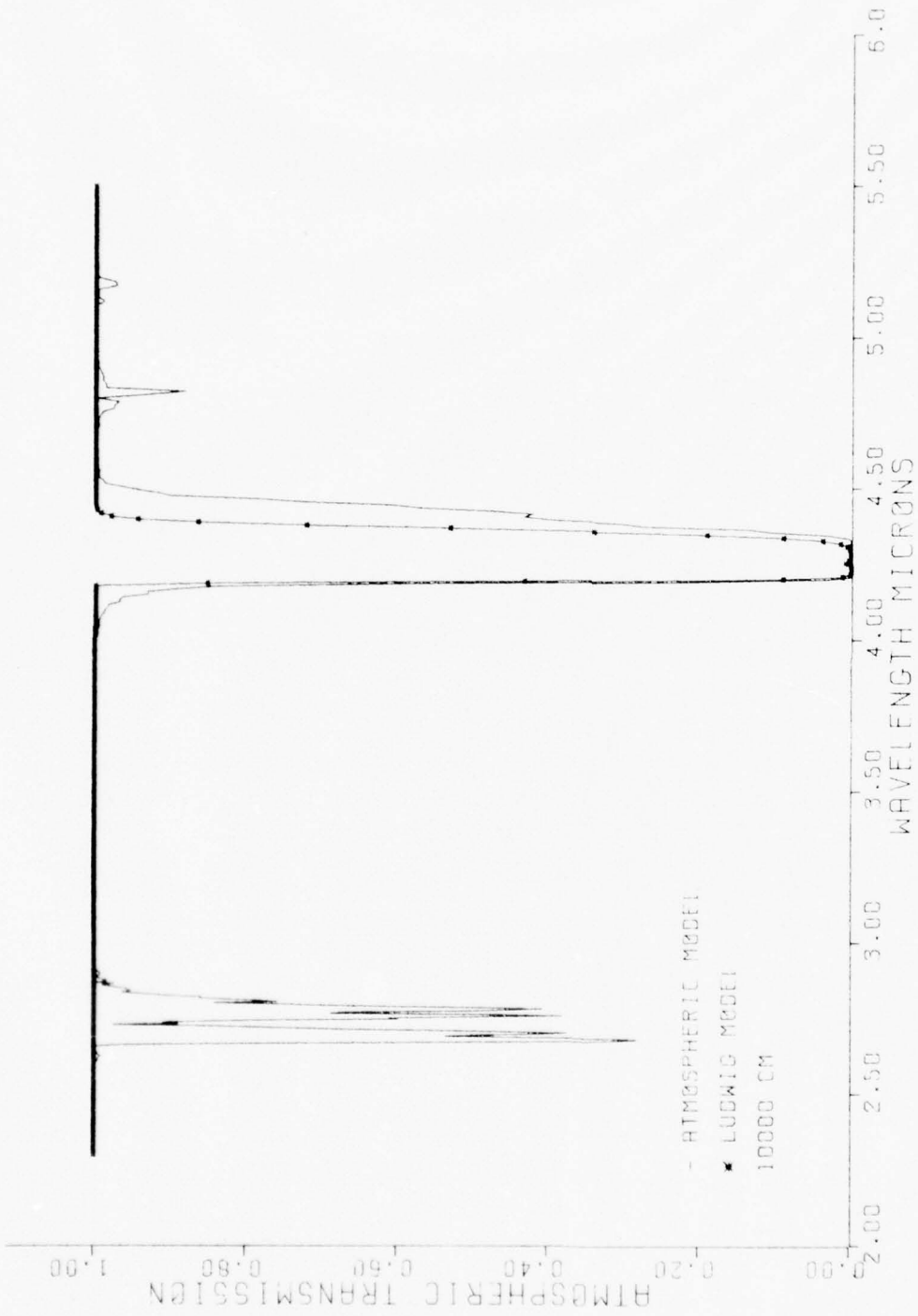
0.60
0.80
1.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.00
WAVELENGTH MICRONS
ATMOSPHERIC MODEL
LUDWIG MODEL
1000 CM

Figure 16


ATMOSPHERIC TRANSMISSION
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0.40
0.60
0.80
1.00
2.00
2.50
3.00
3.50
4.00
4.50
5.00
5.50
6.0
WAVELENGTH MICRONS
- ATMOSPHERIC MODEL
* LUDWIG MODEL
10000 CM

Figure 17

Although the wavelength band over which the "HIDE"oprogram was exercised is,small it represents IR contributions from all the major sources, i.e. tailpipe, boomheating, and plume radiation. In the region about 4.07 μ the transmission of water vapor and carbon dioxide is approximately unity, and thus the IR emission from the hot plume gasses must be zero (emmisivity = 1. - transmission). Hence from 4.05 μ to 4.13 μ the energy is due purely to the blackbody sources, and when viewed from all aspects a perfect match between measurement and prediction confirms the validity of the mathematical model. The double spikes at 4.2 and 4.4 μ represent the IR emmission from the hot carbon dioxide in the plume. Two things are of interest here in comparing the measurements and predictions. First of all the structure of the curves (excluding the magnitudes) is important in validating the emission and transmission models. They are widely varying in the region and must complement themselves exactly in order to obtain the proper shape of the radiance. Secondly the energy under these curves represent a good test for the plume velocity and temperature distribution models. Thus it can be seen that firuges 18-21 are somewhat favorable to the "HIDE" program. For a more complete validation study the report on Error and Sensitivity analysis of the Hide Program March 1974 should be referred to.

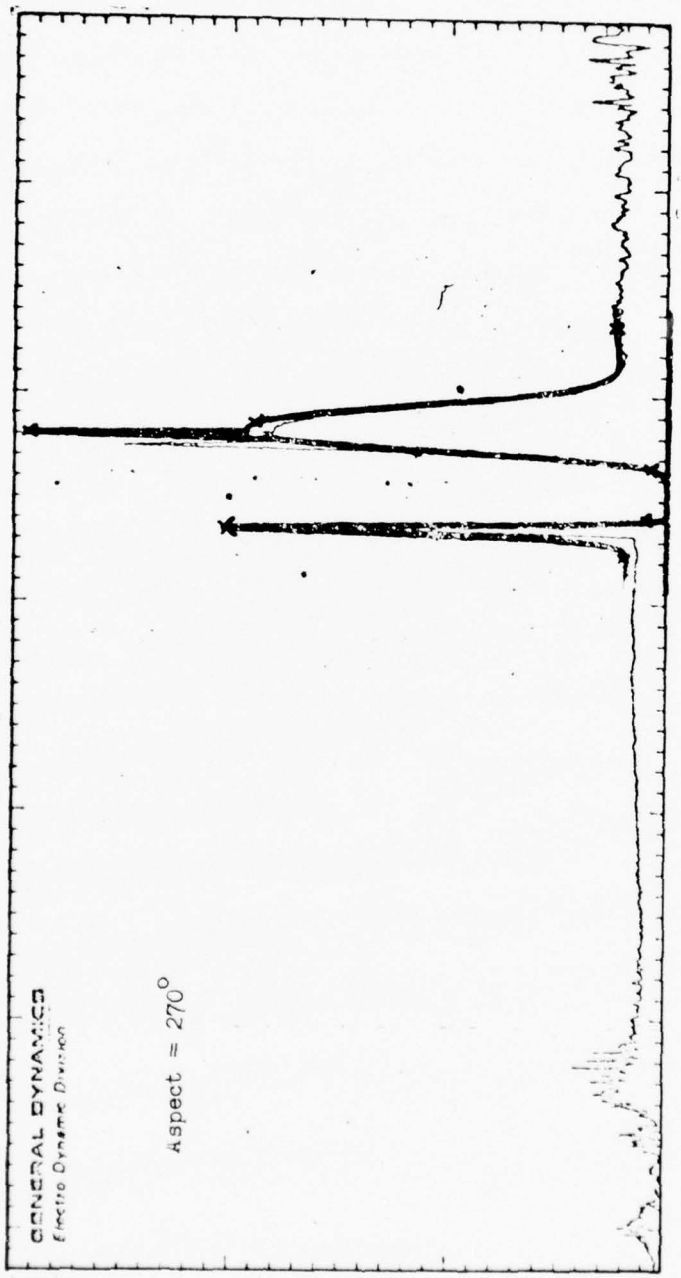


Figure 18 "HIDE" Signature Prediction

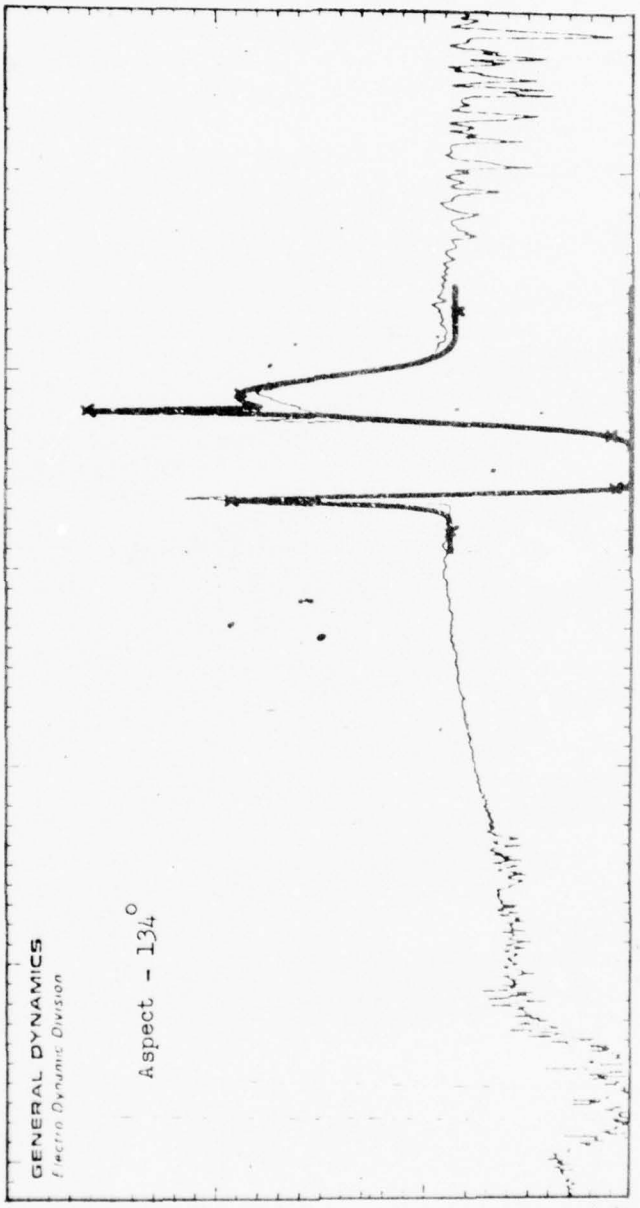


Figure 19 "HIDE" Signature Prediction

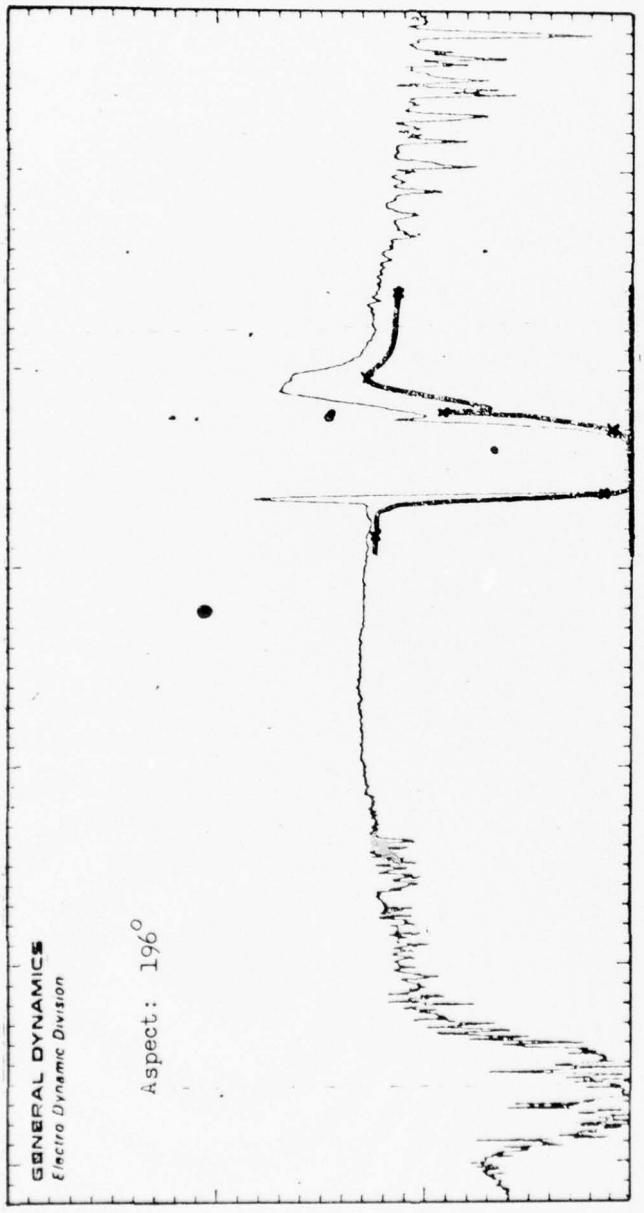


Figure 20 "HIDE" Signature Prediction

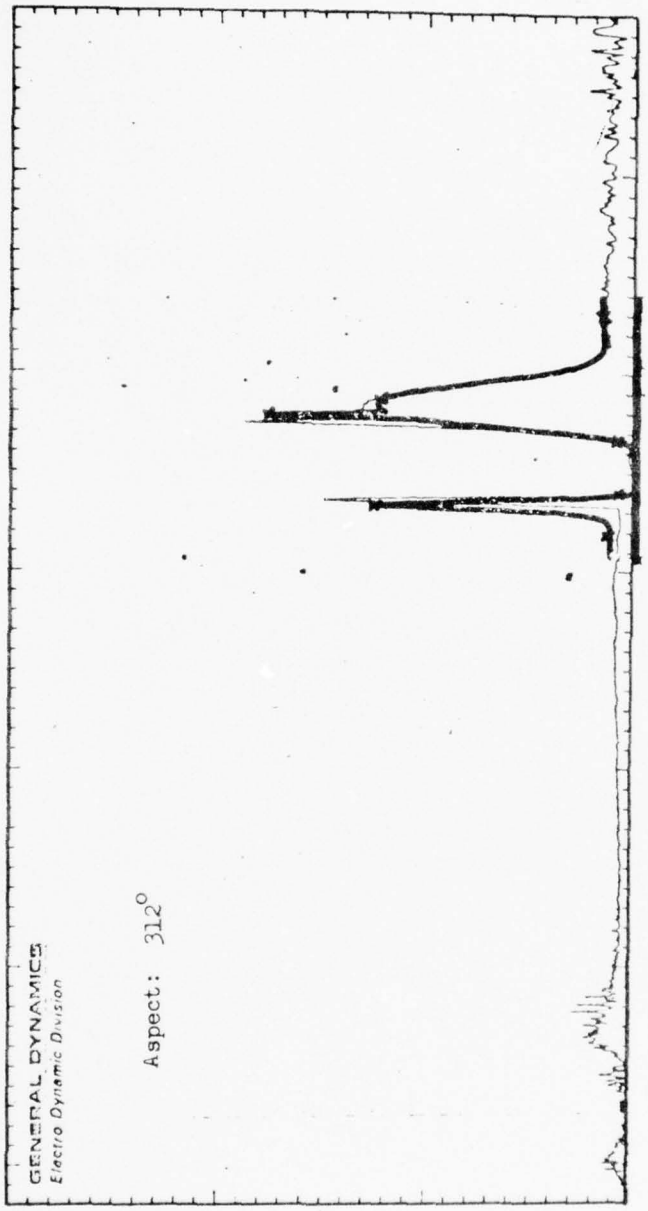


Figure 21 "HIDE" Signature Prediction

4.0 BIBLIOGRAPHY

REF 1 - The Infrared Evaluation of a UH1H Helicopter With & Without Suppression Vol II Ganett Corporation 1972.

REF 2. Error & Sensitivity Analysis of the "HIDE" - Helicopter Infrared Simulation. Data Item A008, Addendum to: Evaluation of IR Countermeasures, Phase II HIDE Model, Final Technical Report Feb. 28, 1973, Westinghouse Electric Co.

APPENDIX A

ATMOSPHERIC TRANSMISSION SOURCES

The Infrared Absorption of water vapor, carbon dioxide, ozone and nitrous oxide as compiled for the high resolution transmission model is given in this Appendix. For water vapor and carbon dioxide the actual values of transmission are presented along with the title page of the report from which they were extracted, whereas for O_3 and N_{20} the coefficients A of the transmission equation:

$$T_i = e^{-A_i q}$$

q = quantity of absorber

T = transmission at wavelength i.

are listed.

SSD-TDR-62-127 - Volume III

INFRARED TRANSMISSION STUDIES

FINAL REPORT, VOLUME III

THE INFRARED ABSORPTION OF CARBON DIOXIDE

V. R. Stull
P. J. Wyatt
G. N. Plass

Contract No. AF 04(695)-96
Project No. 4479-730F
Task No. 447904

as an extension to

Contract No. AF 19(604)-7479

31 January 1963

Prepared for

SPACE SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
Los Angeles, California

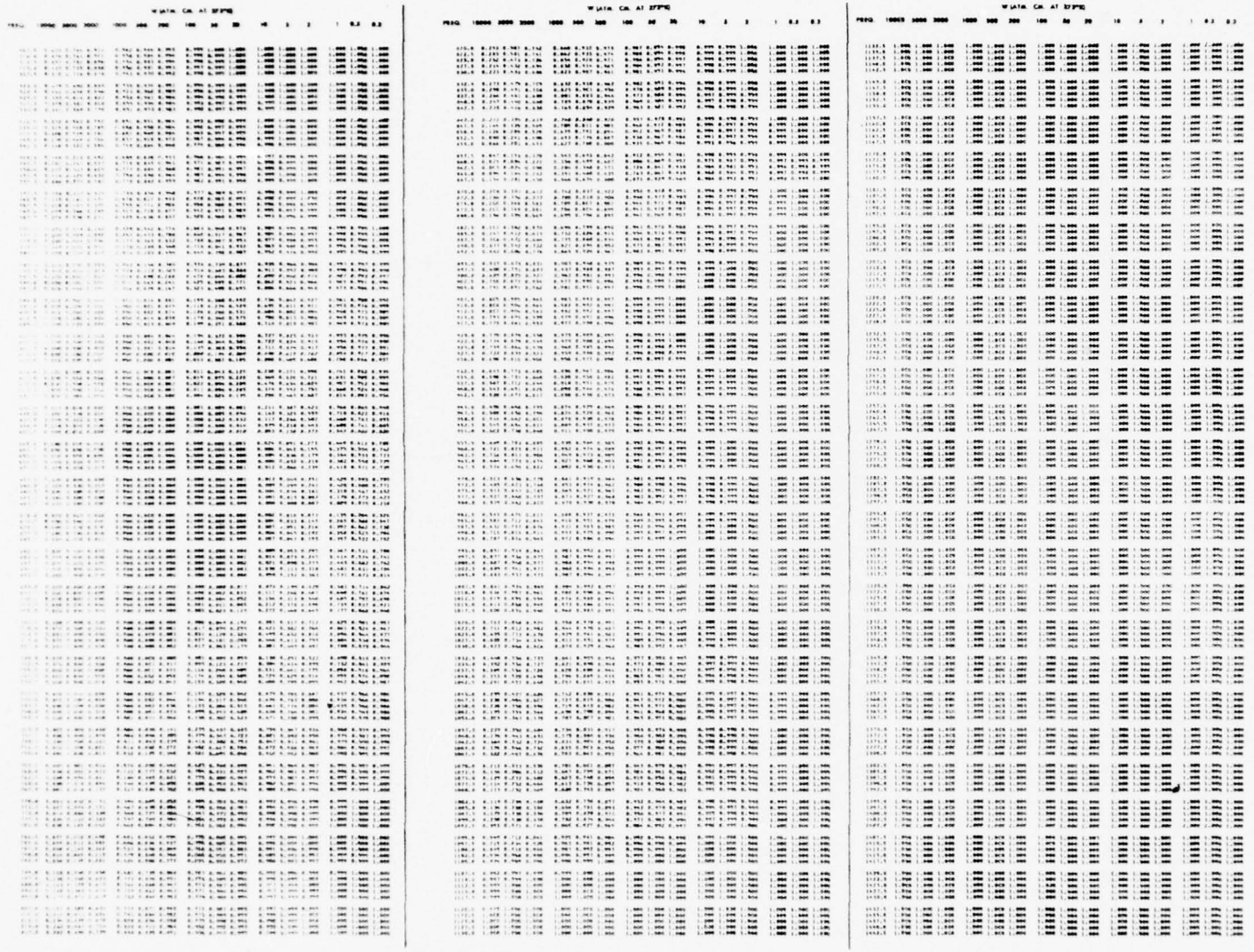
as an extension to work sponsored by

GEOPHYSICS RESEARCH DIRECTORATE
AIR FORCE CAMBRIDGE RESEARCH LABORATORIES
Office of Aerospace Research
United States Air Force
Bedford, Massachusetts

AERONUTRONIC DIVISION
FORD MOTOR COMPANY
Newport Beach, California

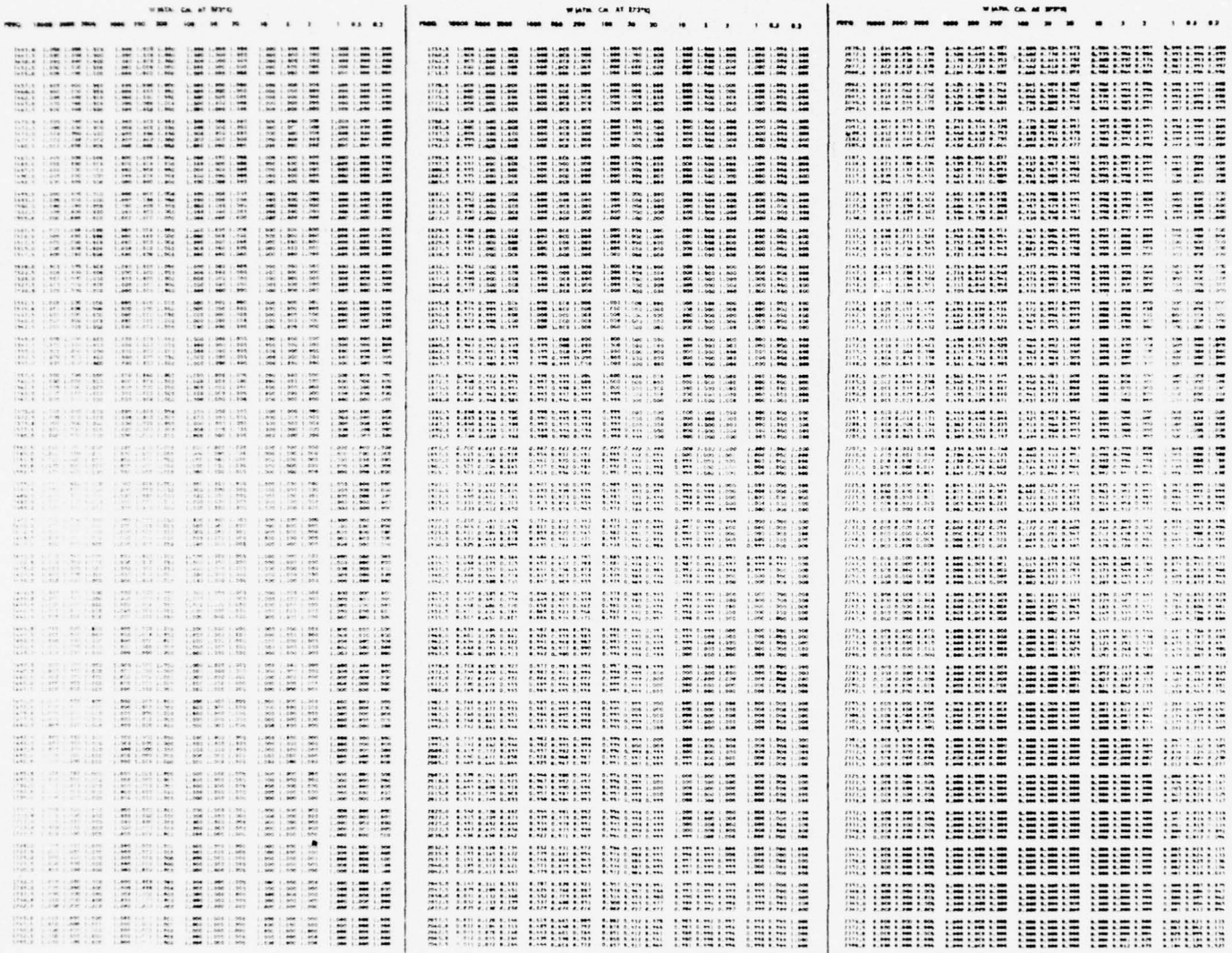
CARBON DIOXIDE AT 1.00 ATMOSPHERE PRESSURE

T = 300°K



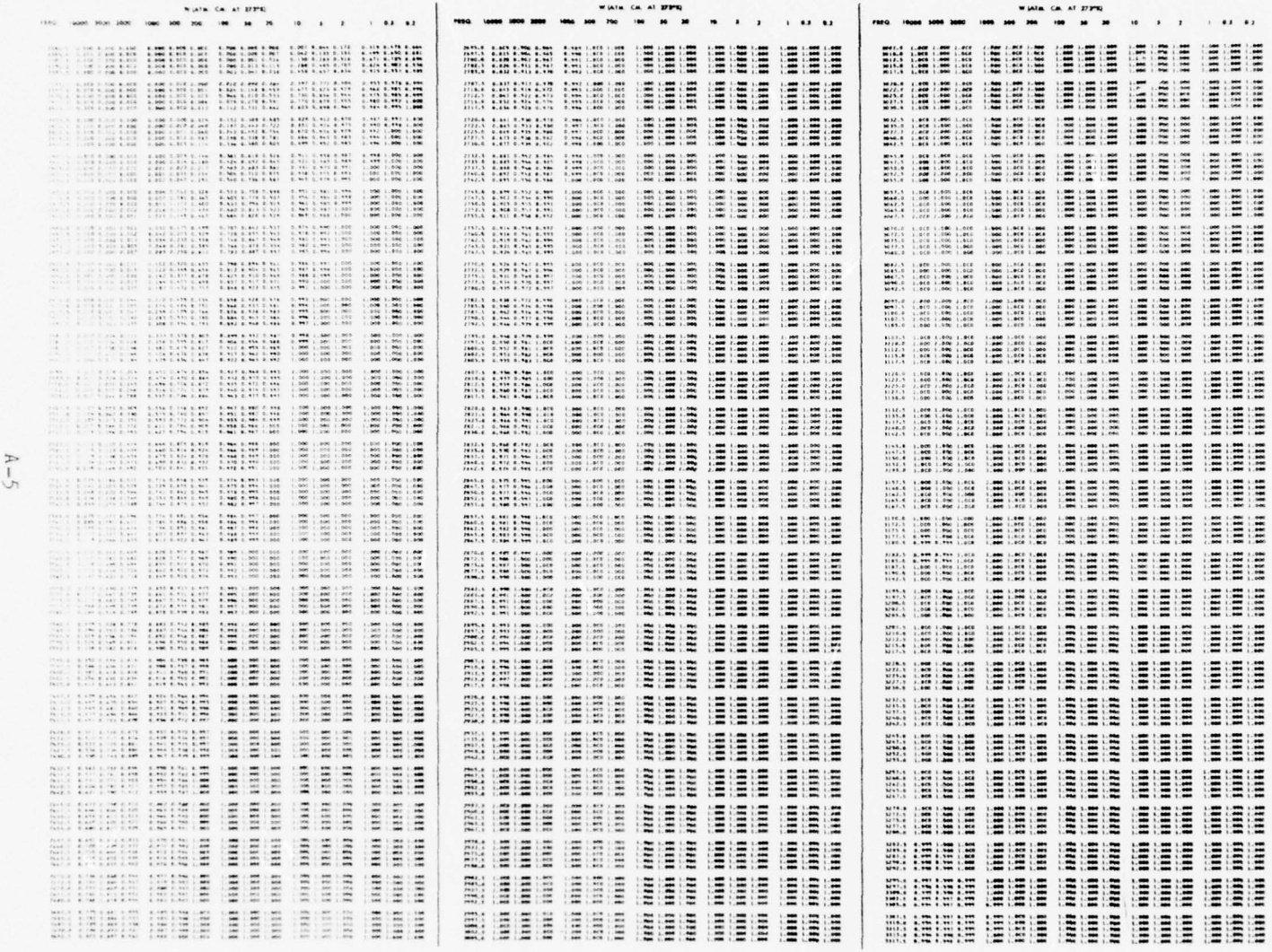
CARBON DIOXIDE AT 1.00 ATMOSPHERE PRESSURE

T = 300°K



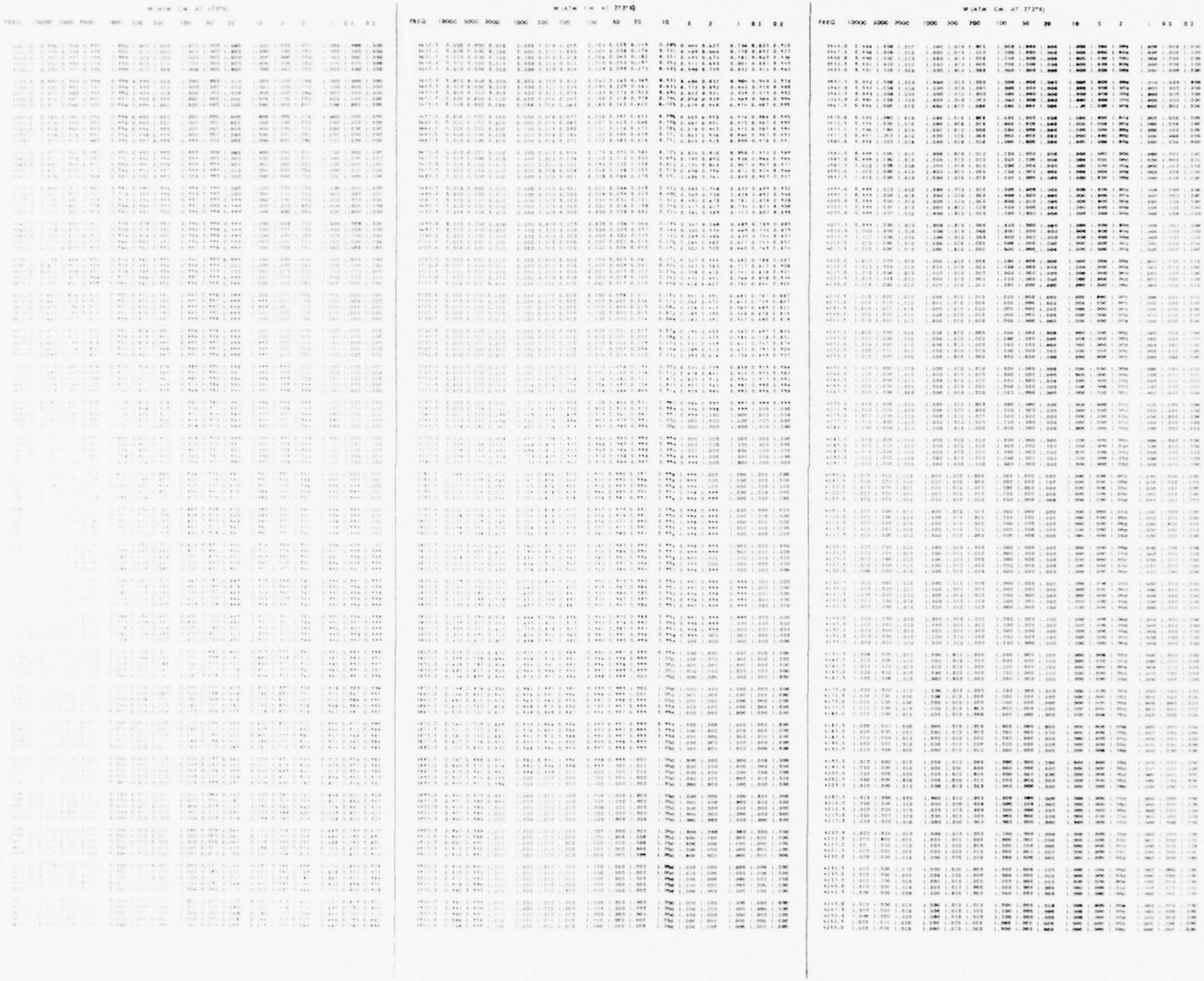
CARBON DIOXIDE AT 1.00 ATMOSPHERE PRESSURE

T = 300°K



CARBON DIOXIDE AT 100 ATMOSPHERE PRESSURE

T = 300°K



CARBON DIOXIDE AT 1.00 ATMOSPHERE PRESSURE

T=300° K

AVERAGED OVER 20 Cm^{-1}

CARBON DIOXIDE AT 1.00 ATMOSPHERE PRESSURE

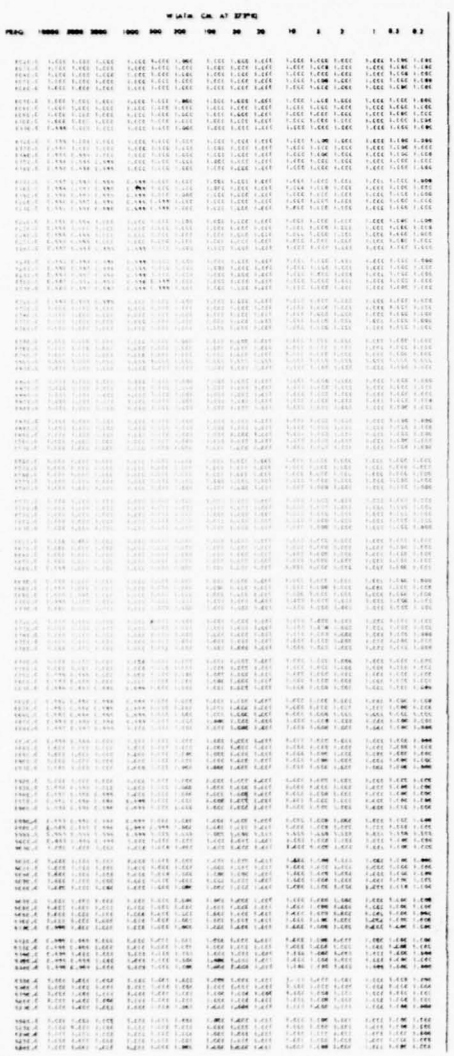
T=300° K

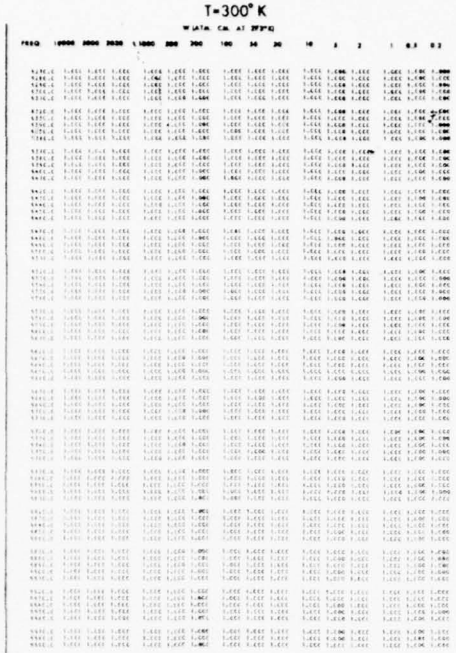
AVERAGED OVER 20 Cm^{-1}

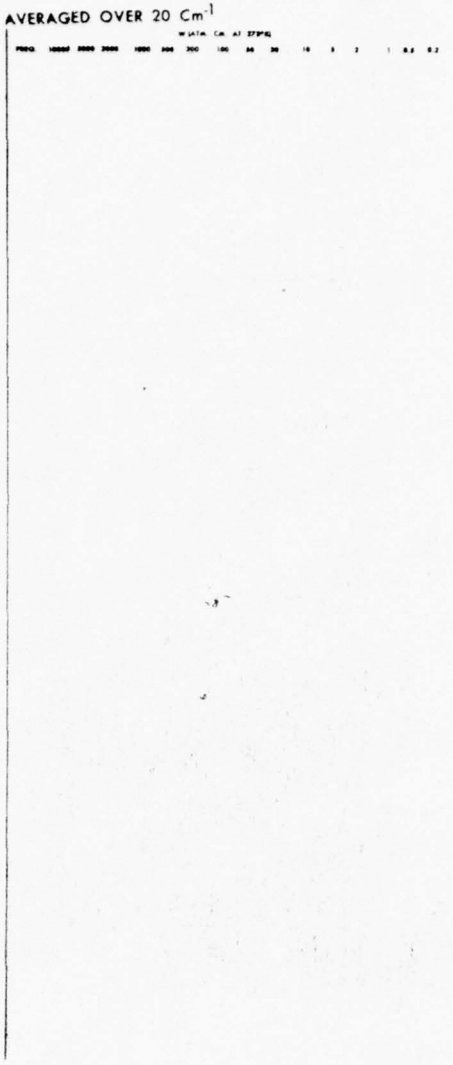
CARBON DIOXIDE AT 1.00 ATMOSPHERE PRESSURE

T=300° K

AVERAGED OVER 20 Cm^{-1}







SSD-TDR-62-127 - Volume II

INFRARED TRANSMISSION STUDIES

FINAL REPORT, VOLUME II

THE INFRARED ABSORPTION OF WATER VAPOR

P. J. Wyatt
V. R. Stull
G. N. Plass

Contract No. AF 04(695)-96
Project No. 4479-730F

as an extension to

Contract No. AF 19(604)-7479
Project No. 4479
Task No. 447904

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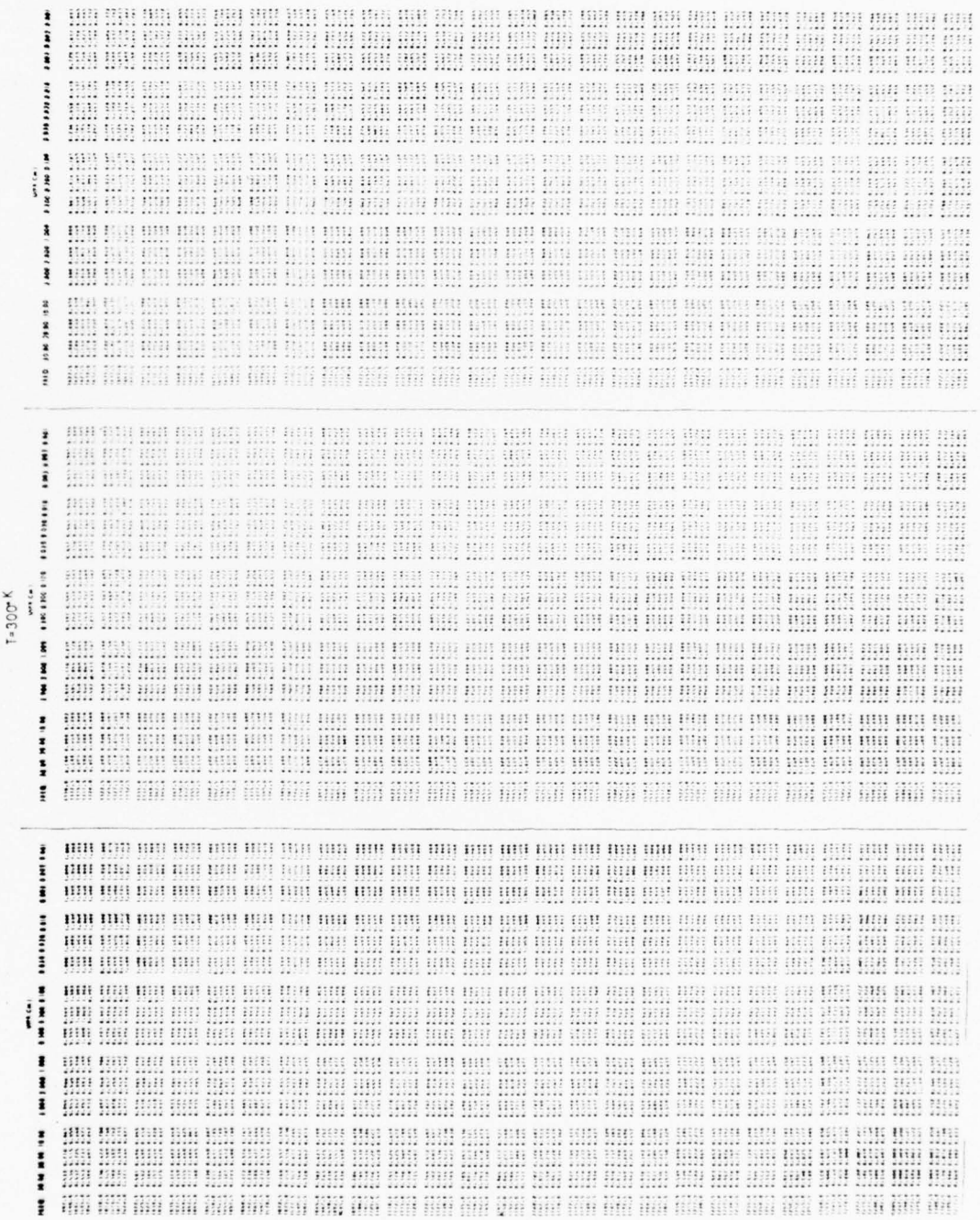
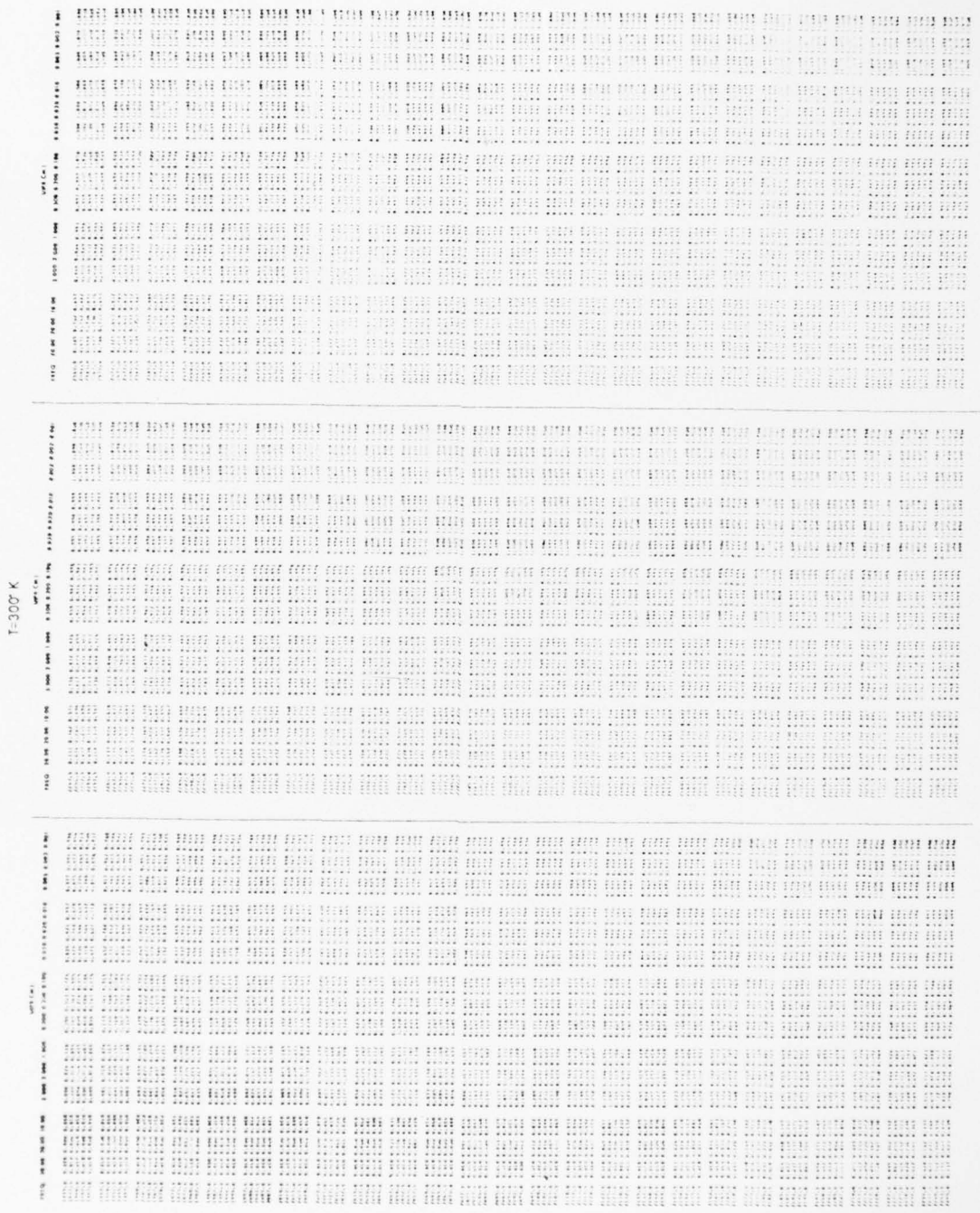
Newport Beach, California

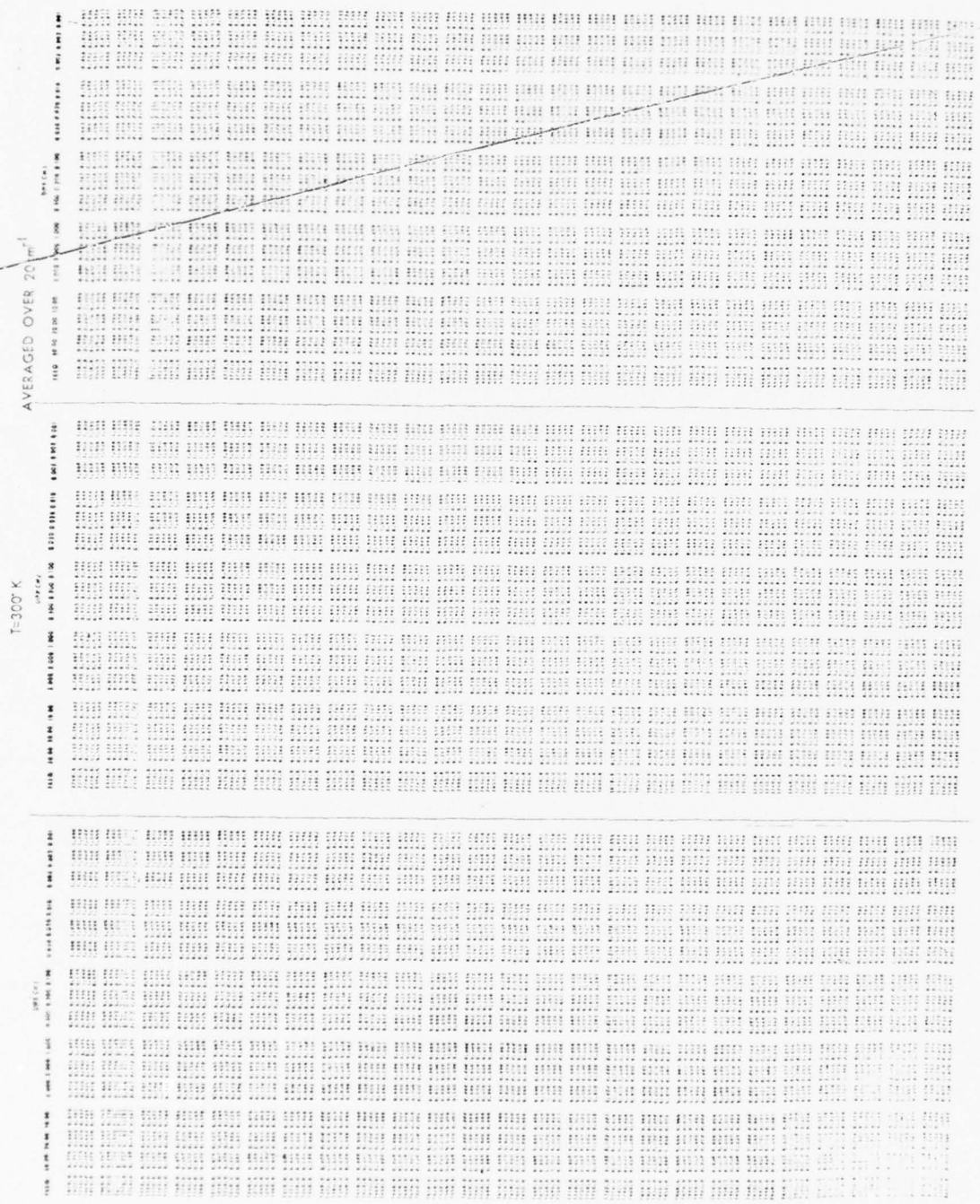


H20 AT 1.00 Atmosphere

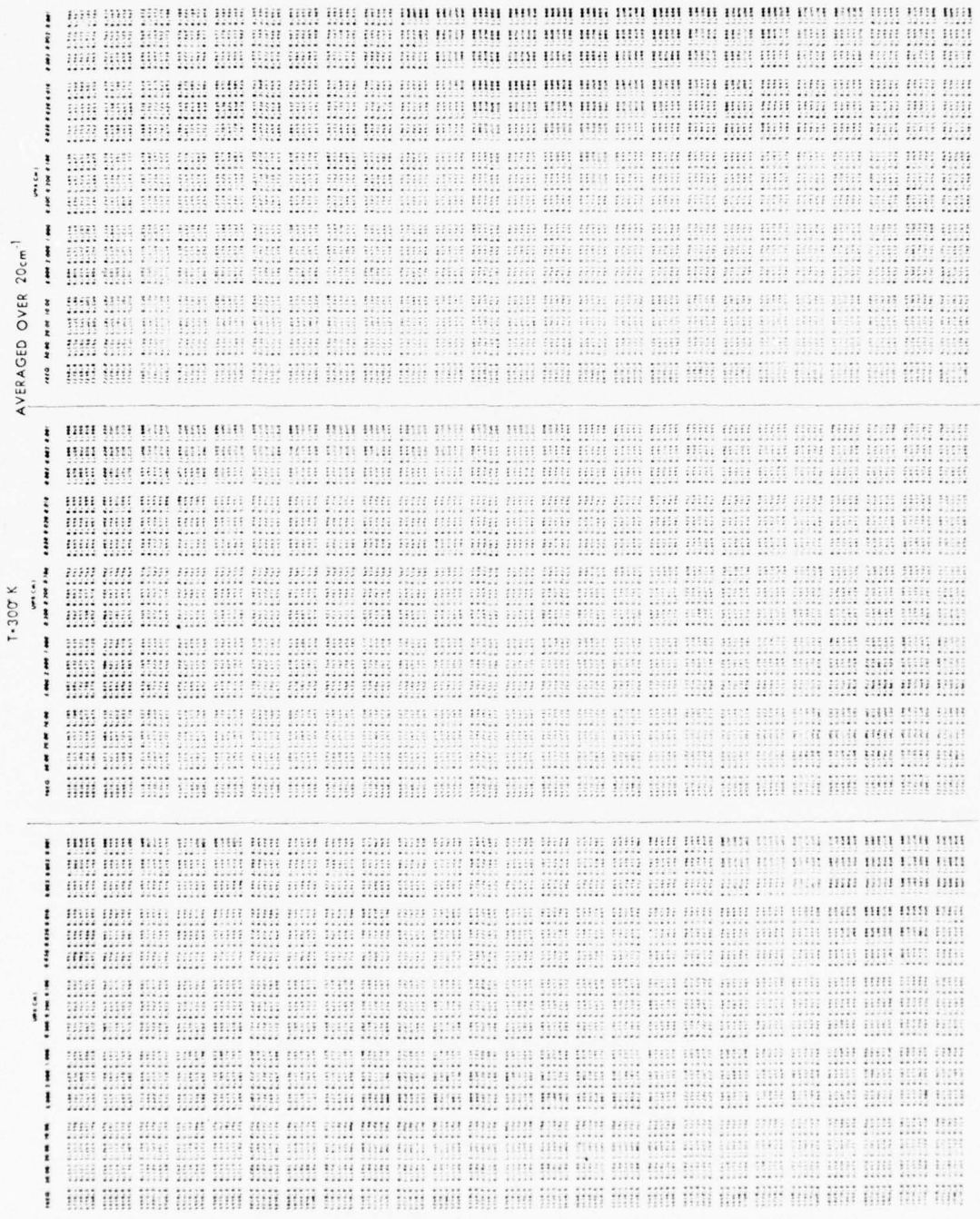


H20 AT 1.00 Atmosphere

H20 AT 1.00 Atmosphere



H20 AT 1.00 Atmosphere



H20 AT 1.00 Atmosphere

A-15

H20 at 1.00 Atmosphere

The following two pages list, for completeness sake, the atmospheric absorption coefficients of O_3 and N_{20}.

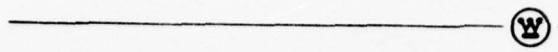
These numbers were obtained by curve fitting in the least mean squares sense the data found in: The Handbook of Military Infrared Technology; T.L. Altshuler, "Infrared Transmission and Background Radiation by Clear Atmosphere," General Electric Document, 61SD199 (1961).

	$^{a}N_2O$	$^{a}O_3$		$^{a}N_2O$	$^{a}O_3$
1.92	0	0	4.08	0.022199	0
1.96	0	0	4.16	0.012799	0
2	0	0	4.25	0.003499	0
2.04	0	0	4.35	0.011099	0
2.09	0	0	4.44	0.083499	0
2.13	0	0	4.55	0.430999	0.0332
2.17	0	0	4.65	0.019199	0.149
2.22	0	0	4.75	0.174999	0.178
2.27	0	0	4.88	0	0.0825
2.32	0	0	5	0	0.0282
2.38	0	0	5.06	0	0
2.44	0	0	5.12	0	0
2.5	0	0	5.19	0	0
2.57	0	0	5.26	0	0
2.64	0	0	5.33	0	0
2.7	0	0	5.4	0	0
2.78	0	0	5.48	0	0
2.86	0	0	5.56	0	0
2.9	0	0	5.68	0	0
2.94	0	0	5.71	0	0
2.98	0	0	5.79	0	0
3.03	0	0	5.88	0	0
3.08	0	0	5.97	0	0
3.12	0	0	6.06	0	0
3.18	0	0	6.15	0	0
3.22	0	0	6.25	0	0
3.28	0	0	6.35	0	0
3.33	0	0	6.45	0	0
3.39	0	0	6.56	0	0
3.45	0	0	6.67	0	0
3.51	0	0	6.78	0	0
3.57	0	0	6.9	0	0
3.64	0	0	7.02	0	0
3.7	0	0	7.14	0	0
3.78	0	0	7.27	0	0
3.85	0.052099	0	7.4	0	0
3.92	0.072699	0	7.55	0	0
4	0.020199	0	7.7	0.018999	0
			7.85	0.227999	0
			8	0.074699	0

N_{20} & O_3 Transmission Coefficients

	$^{a}N_2O$	$^{a}O_3$
8.16	0.000799	0
8.33	0.001499	0
8.56	0.034599	0
8.7	0.092199	0.0404
8.9	0.094299	0.055
9.1	0.000799	0.104
9.3	0	0.178
9.5	0	0.952
9.7	0	0.915
10	0	0.332
10.3	0	0.0459
10.5	0	0
10.8	0	0
11.1	0	0
11.5	0	0.00041
11.8	0	0.0308
12.2	0	0.00551
12.5	0	0.00771
12.9	0	0.0259
13.3	0	0.0441
13.8	0	0.0405
14.3	0	0.0296
14.8	0	0.0277
15.4	0	0.0145
16	0	0.00639
16.7	0	0.00041
17.4	0	0
18.2	0	0
19.1	0	0
20	0	0

N_{20} & O_3 Transmission Coefficients



APPENDIX B

H_{20} and CO2 Transmission Data as Used in

the "Hide" Program

This Appendix presents the water vapor and carbon dioxide data as extracted from Wyatt Plass and Stull, for use in the "Hide" program. The data is listed in tabular form as a function of wavenumber (CM^{-1}) and quantity of absorber. The numbers under columns A and B are the coefficients of the curve fit:

$$T = \exp\left(-Aq^{-B}\right)$$

as explained in Section 2.2.

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
625.	.000	.000	.000	.000	.000	.002	.022	.094	.289	.474	.654	.829	.907	.952	.980	.1448+00	.7100+00	.010
630.	.000	.000	.000	.000	.000	.000	.004	.026	.135	.286	.489	.607	.814	.897	.954	.2798+00	.6500+00	.037
635.	.000	.000	.000	.000	.000	.000	.000	.005	.054	.163	.325	.559	.710	.822	.914	.3863+00	.6700+00	.009
640.	.000	.000	.000	.000	.000	.000	.000	.000	.016	.079	.210	.443	.608	.741	.865	.4939+00	.7100+00	.000
645.	.000	.000	.000	.000	.000	.000	.000	.000	.003	.024	.091	.273	.469	.612	.780	.8092+00	.6600+00	.010
650.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.036	.179	.354	.533	.723	.1029+01	.7300+00	.000
655.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.012	.064	.239	.410	.571	.739	.9317+00	.6700+00	.010
660.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.009	.054	.241	.428	.600	.771	.8638+00	.7400+00	.008
665.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.015	.082	.170	.273	.423	.1732+01	.5900+00	.176
670.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.014	.073	.135	.204	.326	.2021+01	.4800+00	.120
675.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.007	.051	.216	.392	.562	.738	.9235+00	.7300+00	.001
680.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.007	.047	.195	.357	.522	.702	.1013+01	.6900+00	.001
685.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.014	.073	.265	.414	.574	.741	.8490+00	.7000+00	.006
690.	.000	.000	.000	.000	.000	.000	.000	.000	.003	.030	.113	.310	.487	.631	.784	.7100+00	.7000+00	.005
695.	.000	.000	.000	.000	.000	.000	.000	.000	.017	.076	.149	.420	.581	.714	.842	.6024+00	.6400+00	.063
700.	.000	.000	.000	.000	.000	.000	.000	.004	.052	.156	.313	.540	.685	.787	.894	.3862+00	.6800+00	.001
705.	.000	.000	.000	.000	.000	.000	.003	.023	.129	.272	.440	.649	.777	.868	.940	.2924+00	.6500+00	.010
710.	.000	.000	.000	.000	.000	.001	.017	.079	.299	.421	.582	.764	.861	.924	.967	.1438+00	.7300+00	.028
715.	.000	.000	.000	.000	.000	.003	.027	.101	.200	.446	.613	.793	.884	.938	.974	.1942+00	.6400+00	.120
720.	.000	.000	.000	.000	.000	.000	.001	.009	.059	.150	.291	.522	.600	.818	.919	.5027+00	.5700+00	.049
725.	.000	.000	.000	.000	.001	.033	.116	.240	.489	.531	.641	.775	.850	.918	.964	.8810-01	.7000+00	.134
730.	.000	.000	.000	.000	.002	.043	.153	.320	.548	.624	.795	.895	.942	.969	.987	.6634-01	.7300+00	.016
735.	.000	.000	.000	.000	.002	.046	.154	.317	.540	.676	.783	.866	.934	.960	.994	.6231-01	.7400+00	.013
740.	.000	.000	.000	.000	.001	.023	.099	.243	.480	.638	.764	.881	.934	.965	.986	.9544-01	.6900+00	.012
745.	.000	.000	.000	.004	.030	.141	.279	.437	.635	.755	.847	.926	.960	.979	.992	.6620-01	.6400+00	.004
750.	.000	.000	.001	.011	.043	.239	.416	.582	.753	.847	.911	.961	.979	.980	.996	.5005-01	.6500+00	.158
755.	.000	.000	.003	.032	.129	.345	.531	.691	.840	.910	.952	.960	.980	.995	.999	.1942-01	.7500+00	.002
760.	.000	.002	.033	.122	.277	.532	.704	.831	.923	.962	.981	.992	.996	.998	.999	.1755-01	.6900+00	.031
765.	.000	.000	.094	.244	.439	.600	.826	.910	.963	.982	.991	.996	.998	.999	1.000	.7359-02	.7600+00	.017
770.	.003	.033	.102	.394	.605	.818	.909	.955	.963	.972	.984	.990	.999	1.000	1.000	.7014-02	.7300+00	.327
775.	.014	.044	.320	.540	.727	.884	.967	.973	.986	.995	.999	.999	1.000	1.000	1.000	.3720-02	.7700+00	.375
780.	.020	.165	.327	.548	.804	.921	.963	.982	.994	.997	.998	.999	1.000	1.000	1.000	.1054-02	.8900+00	.135
785.	.059	.212	.502	.696	.836	.937	.970	.985	.990	.998	.999	1.000	1.000	1.000	1.000	.7822-03	.8900+00	.002
790.	.014	.045	.215	.379	.500	.766	.868	.920	.971	.985	.993	.997	.999	1.000	1.000	.1326-01	.6300+00	.125
795.	.100	.240	.490	.601	.735	.868	.927	.961	.985	.992	.994	.998	.999	1.000	1.000	.3656-02	.7000+00	.005
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805.	.179	.374	.619	.762	.864	.963	.970	.986	.994	.997	.998	.999	1.000	1.000	1.000	.9912-03	.8100+00	.002

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
810.	.212	.413	.656	.791	.886	.952	.975	.989	.995	.998	.999	1.000	1.000	1.000	1.000	.8152-03	.8200+00	.001
815.	.260	.467	.706	.828	.911	.964	.982	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.5383-03	.8500+00	.001
820.	.293	.507	.742	.860	.932	.973	.987	.994	.996	.998	.999	1.000	1.000	1.000	1.000	.3397-03	.8900+00	.001
825.	.252	.473	.726	.854	.928	.971	.984	.994	.997	.999	.999	1.000	1.000	1.000	1.000	.2895-03	.9200+00	.001
830.	.223	.433	.684	.823	.907	.941	.981	.991	.996	.999	.999	1.000	1.000	1.000	1.000	.4991-03	.8700+00	.001
835.	.290	.491	.708	.825	.901	.956	.978	.989	.995	.999	.999	1.000	1.000	1.000	1.000	.7141-03	.8100+00	.000
840.	.247	.440	.660	.725	.870	.939	.969	.984	.993	.997	.998	.999	1.000	1.000	1.000	.1672-02	.7300+00	.006
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865.	.094	.164	.262	.351	.440	.635	.763	.861	.939	.968	.984	.993	.997	.998	.999	.5093-01	.4200+00	.105
870.	.208	.387	.612	.742	.837	.922	.958	.978	.991	.996	.998	.999	1.000	1.000	1.000	.1891-02	.7300+00	.001
875.	.200	.349	.583	.709	.867	.902	.946	.971	.988	.994	.997	.999	.999	1.000	1.000	.2593-02	.7000+00	.007
880.	.196	.359	.569	.695	.794	.895	.941	.969	.987	.993	.997	.999	.999	1.000	1.000	.3413-02	.6700+00	.001
885.	.247	.412	.613	.732	.826	.915	.954	.976	.990	.995	.997	.999	1.000	1.000	1.000	.2935-02	.6700+00	.001
890.	.377	.542	.722	.821	.894	.952	.975	.987	.995	.997	.999	.999	1.000	1.000	1.000	.1554-02	.7000+00	.001
895.	.515	.675	.831	.903	.945	.979	.985	.994	.998	.999	.999	1.000	1.000	1.000	1.000	.4214-03	.8000+00	.000
900.	.689	.825	.927	.962	.981	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.4492-04	.9800+00	.000
905.	.791	.897	.962	.981	.991	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8514-05	.1110+01	.000
910.	.808	.906	.964	.982	.992	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8482-05	.1100+01	.000
915.	.793	.895	.959	.979	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1334-04	.1060+01	.000
920.	.770	.879	.950	.975	.989	.995	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2175-04	.1020+01	.000
925.	.759	.864	.939	.968	.985	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5267-04	.9300+00	.000
930.	.690	.810	.908	.950	.975	.990	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1485-03	.8500+00	.000
935.	.698	.737	.860	.920	.958	.982	.991	.995	.999	.999	1.000	1.000	1.000	1.000	1.000	.1286-02	.6200+00	.005
940.	.543	.691	.828	.898	.944	.976	.988	.994	.997	.999	.999	1.000	1.000	1.000	1.000	.5613-03	.7600+00	.000
945.	.494	.648	.795	.874	.929	.969	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.8541-03	.7300+00	.000
950.	.516	.662	.801	.878	.930	.970	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.9625-03	.7100+00	.000
955.	.602	.730	.848	.911	.950	.979	.989	.994	.998	.999	.999	1.000	1.000	1.000	1.000	.6150-03	.7300+00	.000
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965.	.664	.773	.874	.927	.960	.983	.991	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	.4983-03	.7300+00	.000
970.	.503	.638	.778	.861	.919	.964	.981	.990	.996	.998	.999	1.000	1.000	1.000	1.000	.1455-02	.6700+00	.001
975.	.513	.647	.785	.865	.921	.965	.982	.991	.996	.999	.999	1.000	1.000	1.000	1.000	.1411-02	.6700+00	.001
980.	.529	.662	.800	.878	.930	.970	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.1121-02	.6900+00	.001
985.	.583	.712	.843	.910	.951	.979	.989	.995	.999	.999	.999	1.000	1.000	1.000	1.000	.5986-03	.7400+00	.001
990.	.787	.876	.945	.972	.986	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.6050-04	.9000+00	.000

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FRE**	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
99**	.851	.919	.967	.983	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2136-04	.9700+00	.000
100**	.887	.940	.977	.988	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1319-04	.9900+00	.000
100**	.883	.937	.975	.987	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1646-04	.9700+00	.000
101**	.836	.907	.961	.980	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3436-04	.9300+00	.000
101**	.813	.888	.949	.973	.986	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7578-04	.8600+00	.000
102**	.765	.848	.924	.958	.978	.991	.995	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2072-03	.7800+00	.000
102**	.655	.772	.878	.929	.961	.983	.991	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	.3897-03	.7600+00	.000
103**	.523	.666	.806	.878	.929	.968	.983	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.9448-03	.7100+00	.000
103**	.392	.554	.727	.821	.890	.948	.973	.986	.994	.997	.999	.999	1.000	1.000	1.000	.1638-02	.6900+00	.001
104**	.353	.520	.698	.796	.869	.935	.965	.981	.992	.996	.999	.999	1.000	1.000	1.000	.2177-02	.6700+00	.001
104**	.299	.427	.624	.762	.830	.912	.951	.974	.989	.995	.997	.999	.999	1.000	1.000	.4086-02	.6200+00	.006
105**	.226	.390	.596	.719	.813	.882	.945	.971	.988	.994	.997	.999	.999	1.000	1.000	.5410-02	.6600+00	.001
105**	.205	.367	.578	.707	.807	.891	.945	.971	.988	.994	.997	.999	.999	1.000	1.000	.3321-02	.6700+00	.001
106**	.276	.443	.651	.775	.864	.936	.966	.982	.993	.996	.998	.999	1.000	1.000	1.000	.1880-02	.7100+00	.002
106**	.376	.386	.732	.833	.903	.956	.977	.988	.995	.999	1.000	1.000	1.000	1.000	1.000	.2508-02	.6600+00	.094
107**	.213	.373	.576	.781	.801	.897	.943	.970	.987	.994	.997	.999	.999	1.000	1.000	.2710-02	.6900+00	.008
107**	.129	.272	.482	.623	.740	.859	.919	.954	.982	.991	.995	.998	.999	1.000	1.000	.5149-02	.6500+00	.002
108**	.113	.252	.469	.620	.743	.865	.924	.960	.983	.991	.996	.998	.999	1.000	1.000	.4569-02	.6700+00	.002
108**	.134	.208	.502	.656	.781	.893	.942	.979	.985	.994	.997	.999	.999	1.000	1.000	.4851-02	.6600+00	.077
109**	.256	.430	.650	.702	.876	.944	.971	.985	.994	.997	.999	.999	1.000	1.000	1.000	.2168-02	.7000+00	.010
109**	.547	.712	.861	.925	.961	.984	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2008-03	.8700+00	.000
110**	.545	.818	.966	.983	.992	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3360-05	.1280+01	.001
110**	.974	.989	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7809-06	.1130+01	.000
111**	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3312-09	.1740+01	.000
111**	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
112**	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
112**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
113**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
113**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
114**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
114**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
115**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
115**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
116**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
116**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
117**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
117**	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
1180.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1185.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1190.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1195.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1200.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1205.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1210.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1215.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1220.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1225.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1230.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1235.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1240.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1245.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1250.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1255.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1260.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1265.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1270.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1275.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1280.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1285.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1290.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1295.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1300.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1305.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1310.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1315.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1320.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1325.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1330.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1335.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1340.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1345.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1350.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1355.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
1360.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000

UNCLASSIFIED

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
1365.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1366.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1367.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1368.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1369.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1370.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1371.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1372.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1373.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1374.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1375.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1376.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1377.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1378.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1379.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1380.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1381.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1382.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1383.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1384.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1385.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1386.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1387.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1388.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1389.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1390.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1391.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1392.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1393.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1394.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1395.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1396.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1397.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1398.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1399.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1400.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1401.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1402.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1403.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1404.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1405.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1406.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1407.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1408.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1409.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1410.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1411.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1412.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1413.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1414.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1415.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1416.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1417.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1418.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1419.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1420.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1421.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1422.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1423.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1424.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1425.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1426.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1427.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1428.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1429.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1430.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1431.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1432.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1433.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1434.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
1550.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1555.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1560.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1565.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1570.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1575.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1580.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1585.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1590.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1595.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1600.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1605.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1610.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1615.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1620.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1625.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1630.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1635.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1640.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1645.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1650.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1655.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1660.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1665.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1670.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1675.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1680.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1685.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1690.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1695.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1700.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1705.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1710.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1715.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1720.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1725.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1730.	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
1733.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1741.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1749.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1757.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1765.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1773.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1781.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1789.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1797.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1805.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1813.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1821.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
1829.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
1837.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2823-10	.2000+01 .000
1845.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6601-10	.2000+01 .000
1853.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6601-10	.2000+01 .000
1861.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6601-10	.2000+01 .000
1869.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9444-10	.2000+01 .000
1877.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1881-10	.2000+01 .000
1885.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1134-09	.2000+01 .000
1893.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1707-09	.2000+01 .000
1901.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6819-09	.2000+01 .000
1909.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6315-09	.2000+01 .000
1917.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2424-09	.2000+01 .000
1925.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2505-09	.2000+01 .000
1933.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1012-07	.1510+01 .000
1941.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3736-09	.2000+01 .000
1949.	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2841-08	.1800+01 .000
1957.	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1047-07	.1650+01 .000
1965.	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9277-07	.1470+01 .000
1973.	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1354-05	.1240+01 .000
1981.	.985	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1779-05	.1230+01 .000
1989.	.976	.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7762-05	.1080+01 .000
1997.	.963	.986	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1356-03	.8300+00 .001
2005.	.943	.972	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1137-03	.9200+00 .000
2013.	.915	.950	.987	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1830-04	.1140+01 .013
2021.	.877	.918	.969	.995	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5015-03	.7900+00 .000
2029.	.831	.872	.935	.982	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1021-02	.7600+00 .002

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
1920.	.210	.363	.776	.871	.943	.971	.983	.994	.997	.998	.999	1.000	1.000	1.000	1.000	.3076-03	.9300+00	.047
1925.	.411	.586	.710	.850	.920	.963	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.1291-02	.7100+00	.005
1930.	.378	.409	.544	.695	.789	.884	.938	.967	.986	.993	.997	.999	.999	1.000	1.000	.1418-01	.4700+00	.049
1935.	.090	.175	.335	.453	.684	.788	.886	.936	.974	.987	.993	.997	.999	.999	1.000	.1557-01	.5500+00	.050
1940.	.368	.544	.738	.834	.867	.939	.974	.989	.994	.998	.999	1.000	1.000	1.000	1.000	.1317-02	.7200+00	.001
1945.	.423	.585	.756	.844	.908	.958	.972	.989	.993	.998	.999	1.000	1.000	1.000	1.000	.1250-02	.7100+00	.000
1950.	.448	.606	.770	.858	.915	.968	.980	.990	.996	.998	.999	1.000	1.000	1.000	1.000	.1066-02	.7200+00	.001
1955.	.567	.651	.663	.826	.914	.921	.989	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.6625-02	.4900+00	.028
1960.	.601	.735	.881	.926	.938	.985	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.3237-03	.8000+00	.001
1965.	.668	.743	.803	.956	.971	.980	.985	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1169-02	.6400+00	.010
1970.	.763	.830	.927	.971	.983	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1772-03	.8000+00	.001
1975.	.761	.871	.951	.984	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1584-04	.1060+01	.000
1980.	.769	.873	.955	.989	.993	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1394-04	.1070+01	.000
1985.	.767	.877	.953	.987	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1167-04	.1090+01	.000
1990.	.748	.865	.947	.983	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1535-04	.1070+01	.000
1995.	.737	.859	.944	.962	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2784-04	.1010+01	.000
2000.	.619	.722	.839	.957	.982	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.3786-03	.7800+00	.006
2005.	.469	.644	.844	.925	.967	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1760-03	.9100+00	.002
2010.	.664	.815	.925	.967	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2598-04	.1050+01	.000
2015.	.613	.779	.908	.957	.987	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4094-04	.1020+01	.000
2020.	.542	.728	.882	.944	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.6165-04	.1000+01	.000
2025.	.491	.692	.864	.935	.978	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.7158-04	.1000+01	.000
2030.	.436	.650	.842	.922	.941	.969	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1201-03	.9600+00	.001
2035.	.193	.365	.622	.779	.887	.934	.976	.988	.995	.999	.999	1.000	1.000	1.000	1.000	.1152-02	.7900+00	.005
2040.	.159	.372	.621	.771	.879	.949	.974	.987	.995	.997	.999	.999	1.000	1.000	1.000	.6650-03	.8600+00	.001
2045.	.147	.311	.553	.707	.820	.921	.957	.978	.991	.995	.998	.999	1.000	1.000	1.000	.1931-02	.7500+00	.002
2050.	.031	.132	.368	.552	.709	.849	.914	.953	.980	.990	.995	.999	.999	1.000	1.000	.2884-02	.7700+00	.001
2055.	.035	.138	.358	.529	.676	.816	.888	.937	.973	.986	.993	.997	.999	.999	1.000	.4012-02	.7300+00	.002
2060.	.022	.104	.363	.489	.640	.792	.870	.924	.966	.983	.991	.996	.999	.999	1.000	.3475-02	.7600+00	.020
2065.	.012	.075	.244	.439	.598	.763	.850	.912	.961	.980	.990	.996	.998	.999	1.000	.5294-02	.7300+00	.008
2070.	.014	.084	.298	.486	.547	.607	.684	.934	.972	.986	.993	.997	.998	.999	1.000	.5547-02	.7200+00	.156
2075.	.005	.030	.104	.170	.238	.353	.412	.616	.792	.883	.937	.974	.987	.993	.997	.7420-01	.4600+00	.276
2080.	.000	.037	.137	.204	.408	.558	.663	.706	.878	.939	.964	.989	.993	.996	.998	.3628-01	.5300+00	.056
2085.	.000	.002	.246	.427	.593	.766	.832	.914	.961	.980	.990	.996	.999	.999	1.000	.3452-04	.1420+01	.287
2090.	.000	.049	.177	.324	.486	.686	.794	.820	.860	.975	.987	.993	.999	.999	.999	.1539-01	.6200+00	.009
2095.	.000	.025	.208	.233	.406	.634	.774	.868	.941	.969	.986	.994	.997	.998	.999	.1195-01	.6700+00	.226
2100.	.011	.012	.263	.448	.618	.793	.878	.931	.978	.985	.992	.993	.998	.999	1.000	.1154-01	.6600+00	2.151

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
2105.	.011	.069	.261	.453	.636	.814	.889	.943	.977	.988	.994	.998	.999	.999	1.000	.4118-02	.7600+00 .002
2110.	.023	.108	.334	.535	.717	.879	.937	.967	.987	.993	.997	.998	.999	.999	1.000	.2870-02	.7800+00 .007
2115.	.030	.134	.416	.622	.761	.909	.941	.988	.992	.996	.998	.999	1.000	1.000	1.000	.1404-02	.8500+00 .006
2120.	.053	.197	.492	.692	.830	.933	.978	.983	.995	.999	.999	1.000	1.000	1.000	1.000	.8129-03	.8900+00 .003
2125.	.037	.130	.400	.606	.784	.898	.937	.939	.981	.996	.998	.999	1.000	1.000	1.000	.2113-02	.8000+00 .023
2130.	.014	.127	.341	.534	.703	.867	.938	.978	.984	.994	.997	.999	1.000	1.000	1.000	.1056-02	.9000+00 .063
2135.	.090	.223	.588	.768	.878	.954	.987	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	.7447-03	.8800+00 .042
2140.	.063	.236	.545	.734	.858	.945	.972	.993	.998	.999	1.000	1.000	1.000	1.000	1.000	.4390-03	.9500+00 .001
2145.	.048	.206	.531	.784	.844	.939	.977	.984	.998	.999	.999	1.000	1.000	1.000	1.000	.3348-03	.9900+00 .007
2150.	.041	.194	.508	.715	.847	.941	.974	.986	.998	.999	1.000	1.000	1.000	1.000	1.000	.4215-03	.9700+00 .001
2155.	.032	.274	.482	.705	.844	.938	.974	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.9295-04	.1140+01 .112
2160.	.025	.157	.476	.675	.819	.936	.972	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.4042-03	.9900+00 .001
2165.	.017	.100	.444	.669	.822	.930	.969	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6546-03	.9500+00 .046
2170.	.013	.113	.470	.650	.815	.925	.966	.993	.998	1.000	1.000	1.000	1.000	1.000	1.000	.3303-03	.1030+01 .009
2175.	.008	.088	.300	.619	.793	.915	.962	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1374-02	.9400+00 .060
2180.	.004	.065	.336	.541	.748	.885	.957	.985	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7637-03	.9500+00 .038
2185.	.002	.046	.290	.540	.839	.894	.960	.981	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5514-03	.1000+01 .006
2190.	.001	.029	.244	.695	.700	.880	.941	.975	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5176-03	.1020+01 .016
2195.	.000	.017	.145	.443	.668	.881	.931	.978	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5780-03	.1020+01 .110
2200.	.000	.000	.146	.382	.621	.835	.918	.966	.997	.999	1.000	1.000	1.000	1.000	1.000	.1374-02	.9400+00 .060
2205.	.000	.003	.095	.365	.551	.887	.889	.994	.997	.998	.999	.999	1.000	1.000	1.000	.8925-03	.1010+01 .001
2210.	.000	.001	.044	.204	.444	.725	.880	.933	.983	.997	.998	.999	1.000	1.000	1.000	.9022-03	.1030+01 .032
2215.	.000	.000	.014	.103	.302	.608	.734	.892	.964	.988	.994	.998	.999	1.000	1.000	.2988-02	.9100+00 .025
2220.	.000	.000	.004	.045	.112	.476	.668	.825	.864	.975	.987	.993	.997	.999	1.000	.3927-02	.9200+00 .004
2225.	.000	.000	.001	.012	.080	.303	.520	.710	.874	.942	.972	.987	.999	.999	.999	.1365-01	.7900+00 .179
2230.	.000	.000	.000	.002	.027	.149	.328	.529	.785	.886	.932	.977	.998	.999	.999	.2352-01	.7500+00 .113
2235.	.000	.000	.000	.000	.003	.056	.172	.551	.606	.764	.886	.932	.977	.985	.999	.3514-01	.7500+00 .025
2240.	.000	.000	.000	.000	.001	.020	.069	.228	.475	.854	.994	.996	.998	.999	.999	.4047-01	.8000+00 .142
2245.	.000	.000	.000	.000	.000	.007	.028	.108	.310	.493	.668	.821	.864	.975	.987	.1090+00	.6700+00 .382
2250.	.000	.000	.000	.000	.000	.000	.008	.032	.203	.373	.544	.740	.841	.910	.960	.1424+00	.7000+00 .008
2255.	.000	.000	.000	.000	.000	.000	.002	.022	.133	.287	.446	.672	.783	.850	.930	.2270+00	.6700+00 .150
2260.	.000	.000	.000	.000	.000	.000	.001	.012	.095	.229	.401	.613	.741	.833	.919	.2475+00	.7000+00 .002
2265.	.000	.000	.000	.000	.000	.000	.000	.004	.036	.167	.335	.588	.776	.807	.910	.3457+00	.6500+00 .137
2270.	.000	.000	.000	.000	.000	.000	.000	.002	.042	.149	.314	.541	.750	.800	.900	.3929+00	.6800+00 .152
2275.	.000	.000	.000	.000	.000	.000	.000	.001	.023	.132	.291	.523	.675	.787	.891	.4003+00	.7300+00 .065
2280.	.000	.000	.000	.000	.000	.000	.000	.000	.019	.091	.241	.581	.776	.807	.910	.6319+00	.5400+00 1.173
2285.	.000	.000	.000	.000	.000	.000	.000	.000	.009	.052	.163	.402	.600	.763	.839	.5656+00	.7100+00 .015

UNCLASSIFIED

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
2290.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.011	.042	.238	.626	.812	.991	.8945+00	.6900+00	.632
2295.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.074	.123	.383	.671	.794	.8886+00	.8000+00	.740
2300.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.176	.344	.500	.1712+01	.6000+00	.006
2305.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.014	.070	.210	.444	.2625+01	.6100+00	.134
2310.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.041	.144	.385	.3234+01	.7700+00	.004
2315.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.020	.064	.234	.4026+01	.6200+00	.031
2320.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.041	.183	.6831+01	.9800+00	.161
2325.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.024	.143	.6869+01	.8300+00	.039
2330.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.019	.117	.6227+01	.6600+00	.001
2335.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.014	.115	.6918+01	.7100+00	.004
2340.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.018	.071	.5532+01	.4600+00	.000
2345.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.018	.119	.5109+01	.4800+00	.201
2350.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.007	.018	.134	.5815+01	.6600+00	.000
2355.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.025	.134	.5815+01	.6600+00	.014
2360.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.010	.086	.6954+01	.6300+00	.019
2365.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.006	.047	.7539+01	.5600+00	.000
2370.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.045	.8586+01	.6300+00	.000
2375.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.028	.8211+01	.6800+00	.000
2380.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.021	.6211+01	.6500+00	.000
2385.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.6211+01	.6500+00	.006
2390.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.028	.3660+01	.6600+00	.008
2395.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1684+01	.6100+00	.008
2400.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.6896+00	.6600+00	.014
2405.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.2055+00	.7800+00	.001
2410.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.5811-01	.9500+00	.001
2415.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.3802-01	.9500+00	.006
2420.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.2290-01	.9900+00	.000
2425.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.2503-01	.9200+00	.057
2430.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1169-01	.1010+01	.001
2435.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1066-01	.9800+00	.001
2440.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1128-01	.9300+00	.025
2445.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.5792-02	.1010+01	.001
2450.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.5322-02	.9900+00	.001
2455.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.4129-02	.1000+01	.001
2460.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.3724-02	.9900+00	.001
2465.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.2908-02	.1000+01	.000
2470.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.2301-02	.1010+01	.000
2475.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1727-02	.1030+01	.001
2480.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1561-02	.1000+01	.000
2485.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.1931-02	.9600+00	.217

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
2480.	.000	.003	.095	.308	.556	.793	.892	.948	.986	.997	1.000	1.000	1.000	1.000	1.000	.1265-02	.990+00 .001
2485.	.000	.006	.128	.358	.599	.817	.906	.956	.988	.999	1.000	1.000	1.000	1.000	1.000	.1024-02	.100+01 .000
2490.	.000	.011	.164	.406	.638	.838	.917	.962	.990	1.000	1.000	1.000	1.000	1.000	1.000	.1501-02	.940+00 .054
2495.	.000	.019	.204	.452	.674	.856	.927	.968	.993	1.000	1.000	1.000	1.000	1.000	1.000	.7929-03	.100+01 .000
2500.	.001	.030	.245	.494	.704	.872	.935	.972	.996	1.000	1.000	1.000	1.000	1.000	1.000	.7586-03	.990+00 .001
2505.	.001	.044	.288	.537	.734	.886	.943	.977	.997	1.000	1.000	1.000	1.000	1.000	1.000	.3001-03	.100+01 .022
2510.	.004	.062	.330	.575	.760	.897	.951	.982	.998	1.000	1.000	1.000	1.000	1.000	1.000	.5530-03	.100+01 .001
2515.	.007	.084	.372	.611	.784	.909	.958	.986	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8561-03	.940+00 .128
2520.	.012	.110	.414	.644	.805	.919	.964	.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4420-03	.100+01 .000
2525.	.019	.138	.454	.675	.824	.928	.968	.989	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3962-03	.100+01 .000
2530.	.029	.169	.492	.703	.841	.935	.972	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2672-03	.103+01 .006
2535.	.041	.203	.529	.729	.855	.941	.975	.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3192-03	.100+01 .000
2540.	.054	.238	.564	.753	.869	.949	.980	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2428-03	.102+01 .000
2545.	.075	.273	.596	.774	.881	.956	.984	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2591-03	.100+01 .000
2550.	.095	.310	.626	.796	.892	.961	.987	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2148-03	.101+01 .000
2555.	.119	.346	.655	.812	.902	.965	.989	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1943-03	.101+01 .000
2560.	.145	.381	.682	.828	.911	.969	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1763-03	.101+01 .000
2565.	.173	.416	.706	.842	.920	.972	.992	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1602-03	.101+01 .000
2570.	.202	.450	.729	.855	.927	.975	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1460-03	.101+01 .000
2575.	.234	.487	.749	.867	.934	.979	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1103-03	.103+01 .000
2580.	.264	.514	.764	.878	.939	.983	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1217-03	.101+01 .000
2585.	.294	.543	.786	.887	.944	.984	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1117-03	.101+01 .000
2590.	.324	.569	.801	.896	.950	.988	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1020-03	.101+01 .000
2595.	.352	.594	.815	.904	.955	.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7246-03	.800+00 .110
2600.	.381	.618	.828	.911	.960	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8043-04	.102+01 .000
2605.	.412	.643	.841	.919	.963	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7388-04	.102+01 .000
2610.	.447	.670	.854	.927	.967	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6707-04	.102+01 .000
2615.	.479	.694	.866	.933	.971	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5112-04	.104+01 .001
2620.	.501	.710	.873	.937	.972	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5753-04	.102+01 .000
2625.	.523	.725	.881	.941	.975	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4930-04	.103+01 .000
2630.	.550	.743	.889	.947	.979	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4548-04	.103+01 .000
2635.	.557	.761	.898	.952	.982	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9346-07	.176+01 .004
2640.	.606	.781	.907	.957	.985	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4568-04	.101+01 .000
2645.	.633	.700	.915	.962	.989	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1778-03	.860+00 .012
2650.	.658	.813	.923	.966	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2652-04	.105+01 .000
2655.	.680	.827	.929	.969	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1549-04	.110+01 .001
2660.	.700	.839	.935	.971	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2061-04	.106+01 .000

UNCLASSIFIED

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
2660.	.714	.850	.939	.974	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1618-04	.1080+01	.000
2670.	.736	.860	.944	.977	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1617-04	.1070+01	.000
2675.	.753	.869	.950	.980	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1367-04	.1080+01	.000
2680.	.768	.878	.954	.981	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1161-04	.1090+01	.000
2685.	.782	.886	.957	.985	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9872-05	.1100+01	.000
2690.	.796	.893	.961	.987	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9165-05	.1100+01	.000
2695.	.809	.900	.964	.989	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7776-05	.1110+01	.000
2700.	.820	.907	.967	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1817-04	.1010+01	.000
2705.	.832	.913	.970	.992	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6150-05	.1120+01	.000
2710.	.843	.919	.972	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5216-05	.1130+01	.000
2715.	.852	.924	.974	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4463-05	.1140+01	.000
2720.	.861	.930	.978	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3162-05	.1170+01	.000
2725.	.869	.935	.980	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2467-05	.1190+01	.000
2730.	.877	.939	.982	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2105-05	.1200+01	.000
2735.	.885	.944	.985	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1486-05	.1230+01	.000
2740.	.892	.948	.987	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1156-05	.1250+01	.000
2745.	.899	.952	.989	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3923-06	.1370+01	.000
2750.	.905	.955	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6380-06	.1300+01	.000
2755.	.911	.958	.992	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5436-06	.1310+01	.000
2760.	.916	.961	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4254-06	.1330+01	.000
2765.	.921	.965	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8107-09	.2000+01	.000
2770.	.926	.967	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2346-06	.1380+01	.000
2775.	.931	.969	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1819-06	.1400+01	.000
2780.	.935	.972	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1181-06	.1440+01	.000
2785.	.940	.974	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9928-07	.1450+01	.000
2790.	.944	.977	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6376-07	.1490+01	.000
2795.	.948	.979	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4091-07	.1530+01	.000
2800.	.952	.981	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2379-07	.1580+01	.000
2805.	.955	.983	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6718-09	.2000+01	.000
2810.	.957	.985	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6395-08	.1710+01	.000
2815.	.960	.987	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2839-08	.1790+01	.000
2820.	.963	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3779-09	.2000+01	.000
2825.	.966	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3463-09	.2000+01	.000
2830.	.968	.992	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3245-09	.2000+01	.000
2835.	.970	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3027-09	.2000+01	.000
2840.	.972	.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2810-09	.2000+01	.000
2845.	.975	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2497-09	.2000+01	.000

UNCLASSIFIED

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	A ERROR
2851.	.977	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2281-09	.2000+01 .000
2861.	.980	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1969-09	.2000+01 .000
2871.	.981	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1850-09	.2000+01 .000
2881.	.983	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1658-09	.2000+01 .000
2891.	.985	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1444-09	.2000+01 .000
2901.	.987	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1230-09	.2000+01 .000
2911.	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9444-10	.2000+01 .000
2921.	.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8495-10	.2000+01 .000
2931.	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8495-10	.2000+01 .000
2941.	.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6601-10	.2000+01 .000
2951.	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5655-10	.2000+01 .000
2961.	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4710-10	.2000+01 .000
2971.	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3766-10	.2000+01 .000
2981.	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2823-10	.2000+01 .000
2991.	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1881-10	.2000+01 .000
3001.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1881-10	.2000+01 .000
3011.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1881-10	.2000+01 .000
3021.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
3031.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3041.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3051.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3061.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3071.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3081.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3091.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3101.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3111.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3121.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
3131.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000

UNCLASSIFIED

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
303E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
304E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
305E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
306E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
307E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
308E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
309E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
310E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
311E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
312E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
313E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
314E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
315E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
316E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
317E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
318E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
319E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
320E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
321E+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000

UNCLASSIFIED

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
322.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
323.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
324.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
325.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
326.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
327.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
328.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
329.	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.9401-11	.2000+01 .000
330.	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.8153-08	.1350+01 .000
331.	.997	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.6136-07	.1170+01 .000
332.	.995	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.4563-07	.1260+01 .000
333.	.994	.997	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.5013-06	.1020+01 .000
334.	.994	.997	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.5013-06	.1020+01 .000
335.	.994	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.8654-08	.1460+01 .000
336.	.996	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.2329-06	.1060+01 .000
337.	.993	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.1755-08	.1650+01 .000
338.	.990	.995	.998	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.999	.6989-06	.1040+01 .000
339.	.964	.982	.991	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3353-05	.1010+01 .000
340.	.974	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2403-05	.1010+01 .000
341.	.980	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1843-05	.1010+01 .000
342.	.968	.983	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6197-05	.9300+00 .000
343.	.947	.977	.988	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4060-05	.1030+01 .000
344.	.921	.958	.981	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3494-06	.1340+01 .000
345.	.877	.894	.973	.988	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9007-04	.8000+00 .001
346.	.890	.912	.963	.981	.990	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1791-03	.7100+00 .000
347.	.794	.882	.968	.973	.986	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2330-04	.1000+01 .000
348.	.733	.845	.928	.961	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8561-04	.8900+00 .000
349.	.700	.825	.920	.958	.979	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8192-04	.9100+00 .000
350.	.711	.830	.925	.960	.980	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.7856-04	.9100+00 .000
351.	.780	.884	.950	.974	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2719-04	.9900+00 .000
352.	.804	.898	.907	.978	.989	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1629-03	.7800+00 .002

UNCLASSIFIED

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
3405.	.722	.847	.929	.963	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5641-04	.9400+00 .000
3411.	.663	.800	.907	.951	.975	.990	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1035-03	.9000+00 .000
3415.	.637	.789	.900	.952	.975	.990	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8600-04	.9300+00 .000
3420.	.675	.814	.917	.937	.978	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9829-04	.9000+00 .000
3425.	.654	.798	.908	.951	.975	.990	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8878-04	.9200+00 .000
3430.	.569	.737	.867	.925	.960	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2549-03	.8500+00 .000
3435.	.485	.645	.790	.877	.930	.969	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.7280-03	.7500+00 .000
3440.	.374	.546	.723	.820	.891	.949	.973	.986	.994	.997	.999	1.000	1.000	1.000	1.000	.1927-02	.7100+00 .000
3445.	.285	.461	.635	.709	.829	.893	.939	.961	.980	.992	.996	.998	.999	1.000	1.000	.2873-02	.6600+00 .010
3450.	.213	.309	.608	.729	.824	.911	.951	.974	.988	.995	.997	.999	.999	1.000	1.000	.3375-02	.6700+00 .036
3455.	.185	.330	.510	.707	.811	.905	.948	.973	.989	.994	.997	.999	1.000	1.000	1.000	.3929-02	.6600+00 .012
3460.	.000	.307	.549	.702	.817	.914	.954	.976	.990	.995	.998	.999	1.000	1.000	1.000	.1665-02	.7700+00 .001
3465.	.130	.310	.507	.776	.878	.932	.965	.982	.993	.996	.998	.999	1.000	1.000	1.000	.1293-02	.8000+00 .022
3470.	.061	.179	.414	.601	.752	.863	.938	.968	.981	.997	.997	.999	.999	1.000	1.000	.3091-02	.7400+00 .005
3475.	.028	.103	.293	.487	.553	.826	.903	.950	.974	.990	.995	.998	.999	.999	1.000	.7491-02	.6700+00 .028
3480.	.012	.060	.219	.396	.578	.877	.879	.936	.972	.986	.993	.997	.999	.999	1.000	.7785-02	.6900+00 .043
3485.	.001	.047	.191	.357	.579	.769	.858	.924	.968	.984	.992	.997	.998	.999	1.000	.1172-02	.9400+00 .365
3490.	.004	.012	.149	.330	.513	.728	.843	.913	.965	.982	.991	.996	.998	.999	1.000	.1342-01	.6600+00 .733
3495.	.002	.073	.142	.307	.492	.701	.816	.895	.954	.976	.984	.995	.997	.998	.999	.3732-02	.6000+00 .902
3501.	.001	.014	.112	.282	.471	.678	.792	.874	.941	.969	.984	.993	.997	.998	.999	.9136-02	.7200+00 .012
3505.	.000	.005	.062	.186	.339	.585	.720	.821	.911	.951	.975	.990	.993	.997	.999	.1255-01	.7100+00 .003
3510.	.000	.001	.023	.100	.248	.484	.642	.764	.878	.931	.964	.985	.992	.996	.998	.1947-01	.6900+00 .013
3515.	.000	.000	.016	.076	.214	.455	.617	.745	.866	.924	.959	.983	.991	.996	.998	.1881-01	.7100+00 .004
3520.	.000	.000	.011	.066	.146	.437	.607	.743	.869	.927	.961	.984	.992	.996	.998	.2211-01	.7000+00 .064
3525.	.000	.000	.015	.074	.217	.476	.658	.789	.901	.947	.973	.989	.994	.997	.999	.1527-01	.7400+00 .013
3531.	.000	.000	.010	.058	.117	.426	.613	.764	.890	.942	.970	.993	.994	.997	.999	.2645-01	.6800+00 .172
3535.	.000	.000	.001	.014	.068	.231	.414	.599	.791	.883	.938	.974	.987	.993	.997	.3648-01	.6900+00 .015
3541.	.000	.000	.000	.005	.035	.161	.327	.517	.738	.851	.920	.967	.983	.991	.997	.4546-01	.6900+00 .022
3545.	.000	.000	.000	.002	.016	.103	.244	.434	.679	.814	.899	.958	.978	.989	.994	.7058-01	.6500+00 .071
3550.	.000	.000	.000	.000	.008	.071	.191	.366	.618	.770	.872	.945	.972	.986	.994	.6681-01	.6900+00 .024
3555.	.000	.000	.000	.000	.004	.046	.145	.306	.555	.718	.837	.924	.963	.981	.992	.8639-01	.6700+00 .030
3561.	.000	.000	.000	.000	.001	.021	.086	.217	.454	.629	.775	.895	.944	.972	.988	.1150+00	.6600+00 .032
3565.	.000	.000	.000	.000	.000	.018	.069	.180	.411	.586	.737	.874	.932	.965	.986	.1300+00	.6500+00 .031
3571.	.000	.000	.000	.000	.000	.004	.093	.157	.363	.534	.691	.845	.915	.956	.982	.6516-01	.8300+00 .552
3575.	.000	.000	.000	.000	.000	.006	.045	.146	.359	.534	.689	.840	.910	.952	.980	.1188+00	.7100+00 .004
3581.	.000	.000	.000	.000	.000	.003	.024	.099	.297	.476	.634	.790	.871	.926	.967	.1596+00	.6800+00 .011
3585.	.000	.000	.000	.000	.000	.000	.007	.044	.187	.352	.523	.709	.819	.886	.947	.2172+00	.6800+00 .001

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
3590.	.000	.000	.000	.000	.000	.000	.001	.012	.092	.222	.388	.600	.729	.827	.915	.3314+00	.6600+00	.004
3595.	.000	.000	.000	.000	.000	.000	.000	.008	.064	.177	.336	.353	.689	.795	.895	.4428+00	.6100+00	.159
3600.	.000	.000	.000	.000	.000	.000	.000	.006	.064	.179	.340	.555	.688	.792	.891	.3583+00	.6800+00	.001
3605.	.000	.000	.000	.000	.000	.000	.001	.013	.100	.237	.406	.610	.731	.824	.910	.3020+00	.6800+00	.001
3610.	.000	.000	.000	.000	.000	.002	.020	.082	.254	.423	.583	.749	.838	.902	.954	.1881+00	.6600+00	.001
3615.	.000	.000	.000	.000	.000	.002	.022	.091	.268	.432	.584	.744	.832	.898	.952	.1687+00	.6800+00	.007
3620.	.000	.000	.000	.000	.000	.000	.001	.017	.068	.231	.331	.611	.727	.819	.907	.3569+00	.6400+00	.190
3625.	.000	.000	.000	.000	.000	.000	.000	.001	.008	.182	.531	.534	.602	.767	.873	.4141+00	.7300+00	2.169
3630.	.000	.000	.000	.000	.000	.000	.001	.014	.095	.219	.372	.565	.687	.787	.886	.3287+00	.6600+00	.016
3635.	.000	.000	.000	.000	.000	.000	.004	.038	.174	.331	.489	.666	.770	.852	.927	.2177+00	.7000+00	.020
3640.	.000	.000	.000	.000	.000	.001	.010	.053	.197	.357	.511	.693	.801	.881	.965	.2476+00	.6300+00	.021
3645.	.000	.000	.000	.000	.000	.012	.060	.165	.369	.657	.886	.887	.904	.948	.998	.1098+00	.7000+00	.097
3650.	.000	.000	.000	.000	.001	.035	.123	.276	.523	.694	.827	.921	.959	.979	.992	.6505-01	.7500+00	.022
3655.	.000	.000	.000	.000	.000	.041	.183	.363	.624	.779	.879	.949	.974	.987	.995	.3513-01	.8500+00	.007
3660.	.000	.000	.000	.000	.009	.087	.227	.413	.660	.798	.887	.951	.975	.987	.995	.5057-01	.7300+00	.009
3665.	.000	.000	.000	.000	.000	.014	.222	.404	.638	.771	.863	.936	.966	.983	.993	.5885-02	.1240+01	.186
3670.	.000	.000	.000	.000	.003	.034	.173	.351	.586	.725	.824	.910	.950	.973	.989	.7150-01	.7100+00	.136
3675.	.000	.000	.000	.000	.001	.021	.093	.232	.458	.612	.734	.848	.907	.947	.977	.1081+00	.6700+00	.014
3680.	.000	.000	.000	.000	.000	.001	.018	.086	.278	.451	.606	.761	.845	.907	.957	.1361+00	.7400+00	.020
3685.	.000	.000	.000	.000	.000	.000	.008	.054	.223	.400	.568	.738	.828	.892	.948	.1751+00	.7200+00	.001
3690.	.000	.000	.000	.000	.000	.000	.001	.016	.108	.249	.417	.617	.734	.823	.908	.2733+00	.7000+00	.015
3695.	.000	.000	.000	.000	.000	.000	.000	.006	.066	.185	.347	.560	.689	.709	.885	.3570+00	.6800+00	.016
3700.	.000	.000	.000	.000	.000	.000	.000	.002	.035	.123	.269	.486	.630	.744	.857	.4513+00	.6700+00	.001
3705.	.000	.000	.000	.000	.000	.000	.000	.004	.050	.151	.302	.520	.660	.769	.874	.4165+00	.6600+00	.001
3710.	.000	.000	.000	.000	.000	.000	.000	.009	.081	.205	.367	.583	.717	.817	.908	.3295+00	.6800+00	.001
3715.	.000	.000	.000	.000	.000	.000	.002	.019	.120	.262	.431	.641	.766	.858	.934	.2852+00	.6700+00	.004
3720.	.000	.000	.000	.000	.000	.000	.000	.008	.071	.185	.341	.551	.683	.787	.887	.3790+00	.6500+00	.000
3725.	.000	.000	.000	.000	.000	.000	.000	.000	.019	.084	.200	.415	.563	.689	.821	.5628+00	.6500+00	.002
3730.	.000	.000	.000	.000	.000	.000	.000	.000	.014	.069	.183	.391	.547	.680	.818	.5895+00	.6600+00	.001
3735.	.000	.000	.000	.000	.000	.000	.000	.001	.022	.088	.211	.425	.584	.718	.851	.5436+00	.6500+00	.001
3740.	.000	.000	.000	.000	.000	.000	.001	.007	.056	.149	.289	.513	.672	.797	.904	.5105+00	.5700+00	.117
3745.	.000	.000	.000	.000	.000	.001	.013	.056	.194	.353	.531	.739	.850	.919	.966	.2319+00	.6400+00	.028
3750.	.000	.000	.000	.000	.005	.048	.136	.280	.511	.675	.805	.912	.954	.977	.991	.1063+00	.6300+00	.029
3755.	.000	.000	.003	.036	.129	.332	.516	.686	.844	.916	.959	.984	.992	.996	.998	.1929-01	.7500+00	.023
3760.	.000	.008	.101	.274	.488	.730	.852	.924	.970	.989	.996	.998	.999	1.000	1.000	.4121-02	.8300+00	.004
3765.	.003	.052	.296	.541	.736	.886	.947	.975	.993	1.000	1.000	1.000	1.000	1.000	1.000	.6993-03	.9800+00	.001
3770.	.014	.111	.408	.637	.798	.917	.963	.983	.998	.999	1.000	1.000	1.000	1.000	1.000	.5635-03	.9700+00	.001

UNCLASSIFIED

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CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	A ERROR
377).	.038	.182	.492	.696	.837	.933	.969	.986	.998	.999	1.000	1.000	1.000	1.000	1.000	.5186-03	.9500+00 .001
378).	.071	.250	.553	.733	.851	.942	.973	.989	.997	.999	1.000	1.000	1.000	1.000	1.000	.5036-03	.9300+00 .000
379).	.103	.299	.585	.747	.856	.942	.972	.990	.998	.999	1.000	1.000	1.000	1.000	1.000	.5701-03	.9000+00 .000
379).	.115	.306	.575	.729	.848	.929	.964	.985	.997	.999	1.000	1.000	1.000	1.000	1.000	.7848-03	.8600+00 .002
379).	.122	.303	.557	.706	.818	.915	.957	.979	.991	.996	.998	.999	1.000	1.000	1.000	.1325-02	.8000+00 .001
380).	.137	.319	.565	.707	.818	.911	.956	.977	.990	.995	.998	.999	1.000	1.000	1.000	.1506-02	.7800+00 .001
381).	.221	.401	.636	.768	.858	.935	.967	.983	.993	.996	.998	.999	1.000	1.000	1.000	.4596-02	.6300+00 .106
382).	.205	.361	.599	.731	.830	.915	.958	.977	.986	.997	.998	.999	.999	1.000	1.000	.2320-02	.7100+00 .003
383).	.170	.333	.558	.698	.808	.907	.949	.973	.989	.994	.997	.999	.999	1.000	1.000	.2815-02	.7000+00 .001
384).	.349	.615	.708	.816	.892	.956	.973	.986	.994	.997	.999	1.000	1.000	1.000	1.000	.7698-03	.7800+00 .017
385).	.664	.752	.864	.941	.973	.989	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5105-03	.7300+00 .002
386).	.666	.802	.918	.959	.982	.992	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.6469-04	.9500+00 .000
387).	.626	.723	.916	.953	.976	.996	.997	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.1774-03	.8600+00 .005
388).	.726	.835	.931	.967	.983	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.6762-04	.9200+00 .000
389).	.689	.946	.982	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3638-08	.2000+01 .001
390).	.953	.982	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2323-07	.1580+01 .000
391).	.965	.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4724-08	.1720+01 .000
392).	.972	.992	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5428-09	.1930+01 .000
393).	.980	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2016-09	.2000+01 .000
394).	.980	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1945-09	.2000+01 .000
395).	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9484-10	.2000+01 .000
396).	.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6601-10	.2000+01 .000
397).	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1881-10	.2000+01 .000
398).	.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3766-10	.2000+01 .000
399).	.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5655-10	.2000+01 .000
400).	.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5655-10	.2000+01 .000
401).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
402).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
403).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
404).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
405).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
406).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
407).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
408).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
409).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
410).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
411).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
412).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
413).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
414).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
415).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
416).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
417).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
418).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
419).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
420).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
421).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
422).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
423).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
424).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
425).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
426).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
427).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
428).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
429).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
430).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
431).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
432).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
433).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
434).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
435).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
436).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
437).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
438).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
439).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
440).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
441).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
442).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
443).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
444).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
445).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
446).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
447).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
448).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000

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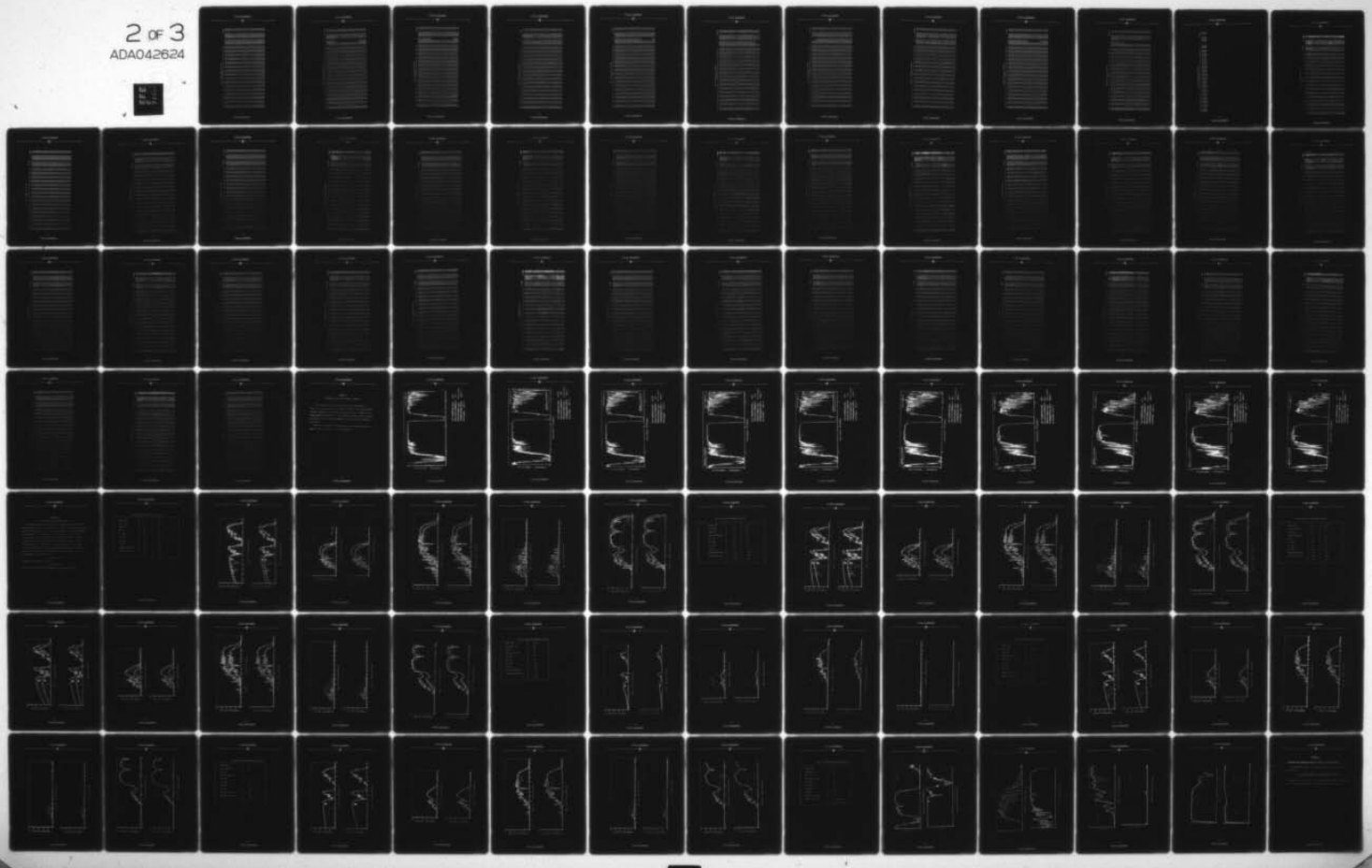
CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
4490.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4500.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4510.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4520.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4530.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4540.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4550.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
456).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4570.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4580.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
4590.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
4600.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
4610.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
4620.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
4630.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
4640.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
4650.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8739-06	.8400+00 .000
4660.	.989	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1068-09	.2000+01 .000
4670.	.974	.988	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2655-06	.1250+01 .000
4680.	.956	.979	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3101-05	.1040+01 .000
4690.	.936	.967	.986	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7959-05	.9800+00 .000
4700.	.921	.959	.983	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9886-05	.9800+00 .000
4710.	.869	.921	.969	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3920-04	.8900+00 .000
4720.	.770	.861	.934	.985	.987	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.6073-04	.9100+00 .000
4730.	.678	.752	.895	.942	.969	.987	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.4068-03	.7500+00 .003
4740.	.665	.765	.893	.941	.964	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.3172-03	.7800+00 .001
4750.	.662	.748	.878	.931	.964	.986	.993	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	.5142-03	.7300+00 .002
4760.	.472	.648	.875	.899	.946	.978	.989	.994	.998	.999	.999	1.000	1.000	1.000	1.000	.1739-03	.9100+00 .003
4770.	.238	.520	.734	.847	.917	.965	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.1295-03	.1010+01 .005
4780.	.632	.664	.685	.776	.873	.942	.971	.985	.994	.997	.999	.999	1.000	1.000	1.000	.1188-01	.4100+00 .028
4790.	.169	.329	.654	.706	.822	.918	.957	.978	.991	.996	.998	.999	1.000	1.000	1.000	.1402-02	.7700+00 .015
4800.	.148	.364	.539	.696	.817	.916	.956	.977	.981	.995	.998	.999	1.000	1.000	1.000	.1713-02	.7600+00 .017
4810.	.199	.232	.449	.614	.751	.875	.931	.964	.985	.992	.996	.998	.999	1.000	1.000	.1222-01	.5400+00 .113
4820.	.038	.112	.286	.448	.666	.775	.863	.921	.965	.987	.991	.996	.998	.999	1.000	.9949-02	.6300+00 .024
4830.	.007	.040	.166	.319	.485	.674	.784	.835	.936	.964	.981	.992	.996	.998	.999	.1371-01	.6400+00 .004
4840.	.005	.032	.151	.366	.461	.642	.755	.839	.918	.953	.976	.990	.995	.998	.999	.1221-01	.6600+00 .038
4850.	.012	.067	.218	.368	.520	.688	.766	.861	.936	.961	.986	.992	.996	.998	.999	.1099-01	.6500+00 .015

UNCLASSIFIED

AD-A042 624 WESTINGHOUSE DEFENSE AND ELECTRONIC SYSTEMS CENTER B--ETC F/G 20/6
HIDE REVISED WAVELENGTH RESOLUTION EMISSION AND TRANSMISSION MO--ETC(U)
MAR 74 DAAJ01-72-C-0447
UNCLASSIFIED NL

2 OF 3
ADA042624



CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
4860.	.075	.081	.190	.346	.491	.664	.767	.847	.922	.957	.977	.990	.995	.997	.999	.5043-01	.4400+00	.368
4870.	.002	.021	.115	.257	.418	.669	.726	.819	.907	.949	.973	.989	.994	.997	.999	.1418-01	.6600+00	.010
4880.	.028	.086	.238	.492	.647	.716	.812	.882	.943	.969	.984	.993	.997	.998	.999	.1098-01	.6300+00	.063
4890.	.097	.215	.423	.692	.730	.856	.915	.952	.975	.989	.994	.998	.999	1.000	1.000	.4508-02	.6800+00	.026
4900.	.192	.357	.689	.739	.848	.952	.965	.982	.993	.996	.998	.999	1.000	1.000	1.000	.1055-02	.8000+00	.015
4910.	.207	.367	.634	.780	.877	.947	.973	.986	.994	.997	.999	.999	1.000	1.000	1.000	.1332-02	.7700+00	.007
4920.	.123	.292	.548	.716	.836	.927	.963	.981	.992	.996	.998	.999	1.000	1.000	1.000	.1455-02	.7900+00	.002
4930.	.084	.176	.298	.573	.719	.854	.916	.954	.981	.990	.995	.998	.999	1.000	1.000	.1015-01	.6000+00	.101
4940.	.018	.065	.212	.362	.521	.706	.816	.885	.945	.970	.985	.994	.997	.998	.999	.1477-01	.6100+00	.015
4950.	.002	.012	.076	.183	.331	.544	.683	.791	.889	.936	.966	.986	.993	.996	.998	.3316-01	.5700+00	.071
4960.	.000	.001	.026	.101	.236	.454	.606	.727	.845	.907	.948	.978	.989	.994	.998	.2102-01	.6800+00	.004
4970.	.000	.002	.056	.108	.244	.464	.617	.735	.855	.914	.952	.980	.996	.998	.998	.2022-01	.6700+00	.229
4980.	.000	.002	.027	.095	.220	.434	.591	.720	.844	.908	.949	.978	.989	.994	.998	.3186-01	.6200+00	.016
4990.	.000	.003	.019	.076	.191	.397	.551	.683	.816	.888	.937	.973	.986	.993	.997	.5542-01	.5500+00	.215
5000.	.007	.020	.090	.184	.216	.516	.643	.752	.826	.916	.953	.986	.990	.995	.996	.6741-01	.4700+00	.257
5010.	.145	.245	.392	.514	.632	.764	.848	.897	.948	.971	.985	.994	.997	.998	.999	.2147-01	.4900+00	.013
5020.	.424	.582	.747	.830	.898	.949	.971	.984	.993	.997	.998	.999	1.000	1.000	1.000	.1641-02	.6800+00	.000
5030.	.616	.772	.895	.949	.975	.990	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9260-04	.9300+00	.000
5040.	.574	.737	.876	.929	.962	.984	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.1679-03	.8800+00	.000
5050.	.468	.577	.757	.849	.910	.958	.978	.988	.998	.998	.999	1.000	1.000	1.000	1.000	.1804-02	.6600+00	.005
5060.	.231	.405	.619	.742	.832	.911	.949	.972	.988	.994	.997	.999	.999	1.000	1.000	.2326-02	.7000+00	.000
5070.	.111	.250	.455	.603	.719	.832	.893	.936	.971	.985	.992	.997	.998	.999	1.000	.6031-02	.6400+00	.001
5080.	.023	.112	.299	.480	.604	.751	.833	.896	.951	.974	.986	.994	.997	.998	.999	.5895-02	.7000+00	.019
5090.	.028	.161	.283	.440	.595	.748	.833	.894	.951	.974	.987	.994	.997	.998	.999	.7169-02	.6700+00	.153
5100.	.027	.092	.258	.412	.565	.730	.822	.891	.949	.973	.986	.994	.997	.998	.999	.1203-01	.6200+00	.004
5110.	.023	.057	.176	.320	.477	.661	.772	.857	.921	.963	.981	.992	.996	.998	.999	.2705-01	.5400+00	.083
5120.	.021	.065	.206	.355	.513	.691	.797	.874	.945	.962	.984	.993	.996	.998	.999	.1881-01	.5800+00	.028
5130.	.097	.204	.398	.558	.706	.836	.903	.945	.976	.988	.994	.997	.999	.999	1.000	.7857-02	.6200+00	.011
5140.	.242	.358	.608	.748	.820	.932	.968	.982	.993	.996	.998	.999	1.000	1.000	1.000	.3357-02	.6600+00	.017
5150.	.586	.685	.865	.883	.963	.972	.985	.992	.997	.999	.999	1.000	1.000	1.000	1.000	.7275-03	.7200+00	.004
5160.	.819	.894	.952	.975	.987	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6070-04	.8800+00	.000
5170.	.964	.982	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3659-05	.1000+01	.000
5180.	.996	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1069-04	.6500+00	.000
5190.	.982	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1802-06	.1250+01	.000
5200.	.975	.989	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5784-06	.1160+01	.000
5210.	.881	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1216-08	.2000+01	.000
5220.	.977	.988	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1625-05	.1040+01	.000

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
523.	.976	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2278-04	.7600+00	.000
524.	.975	.985	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2849-05	.9900+00	.000
525.	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4563-07	.1260+01	.000
526.	.994	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5890-10	.2000+01	.000
527.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01	.000
528.	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6136-07	.1170+01	.000
529.	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8739-06	.8400+00	.000
530.	.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4710-10	.2000+01	.000
531.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
532.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
533.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
534.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
535.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
536.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
537.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
538.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
539.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
540.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
541.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
542.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
543.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
544.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
545.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
546.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
547.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
548.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
549.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
550.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
551.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
552.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
553.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
554.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
555.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01	.000
556.	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6136-07	.1170+01	.000
557.	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2329-06	.1060+01	.000
558.	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2329-06	.1060+01	.000
559.	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5013-06	.1020+01	.000

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
560.	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2167-05	.8600+00 .000
561.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01 .000
562.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
563.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
564.	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4001-10	.2000+01 .000
565.	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1039-05	.8700+00 .000
566.	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4304-06	.1020+01 .000
567.	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1600-06	.1160+01 .000
568.	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5013-06	.1020+01 .000
569.	.996	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6244-05	.7000+00 .000
570.	.981	.995	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1307-07	.1540+01 .000
571.	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2329-06	.1060+01 .000
572.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
573.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
574.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
575.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
576.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
577.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
578.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
579.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
580.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
581.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
582.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
583.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
584.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
585.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
586.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
587.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
588.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
589.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
590.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
591.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
592.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
593.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
594.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01 .000
595.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01 .000
596.	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01 .000
																.8739-06	.8400+00 .000

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	A ERROR
597(	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1039-05	.8700+00	.000
598(	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2329-06	.1060+01	.000
599(	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1533-06	.1150+01	.000
600(	.985	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1371-06	.1260+01	.000
601(	.987	.994	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2455-05	.9300+00	.000
602(	.989	.995	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3585-05	.8700+00	.000
603(	.984	.992	.997	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1611-05	.1000+01	.000
604(	.962	.986	.992	.996	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7935-06	.1170+01	.000
605(	.924	.959	.962	.991	.996	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9429-04	.7300+00	.000
606(	.893	.929	.973	.986	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5087-04	.8400+00	.000
607(	.908	.946	.977	.988	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2946-04	.8800+00	.000
608(	.902	.948	.976	.988	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1963-04	.9300+00	.000
609(	.876	.939	.965	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2728-04	.9200+00	.000
610(	.893	.941	.974	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2596-04	.9100+00	.000
611(	.935	.964	.967	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8072-04	.7300+00	.000
612(	.967	.983	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4039-05	.9800+00	.000
613(	.969	.984	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3458-05	.9900+00	.000
614(	.966	.982	.991	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7234-05	.9200+00	.000
615(	.976	.985	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9877-05	.8500+00	.000
616(	.961	.986	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6181-06	.1200+01	.000
617(	.915	.937	.982	.991	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3407-04	.8600+00	.000
618(	.852	.918	.965	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3060-04	.9300+00	.000
619(	.777	.865	.936	.966	.982	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1107-03	.8400+00	.000
620(	.652	.767	.874	.926	.959	.983	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.5178-03	.7300+00	.000
621(	.635	.677	.812	.886	.935	.972	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.2350-02	.5800+00	.007
622(	.575	.704	.836	.897	.941	.974	.987	.993	.997	.998	.999	1.000	1.000	1.000	1.000	.7384-03	.7200+00	.000
623(	.565	.708	.830	.896	.941	.974	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	.6890-03	.7300+00	.000
624(	.548	.675	.805	.879	.930	.965	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.1271-02	.6700+00	.001
625(	.594	.714	.834	.899	.942	.975	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	.9162-03	.6900+00	.001
626(	.771	.852	.924	.957	.977	.990	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2395-03	.7600+00	.000
627(	.924	.958	.982	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1816-04	.9100+00	.000
628(	.978	.985	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7671-05	.8700+00	.000
629(	.975	.987	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2789-05	.9900+00	.000
630(	.924	.956	.980	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2640-04	.8700+00	.000
631(	.822	.886	.942	.967	.983	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1807-03	.7600+00	.000
632(	.681	.781	.876	.926	.958	.982	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.6169-03	.7000+00	.000
633(	.552	.682	.811	.882	.932	.970	.984	.992	.997	.999	.999	1.000	1.000	1.000	1.000	.1143-02	.6800+00	.001

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
6340.	.552	.667	.819	.888	.936	.972	.985	.993	.997	.998	.999	1.000	1.000	1.000	1.000	.1056-02	.6900+00	.002
6350.	.546	.681	.814	.885	.934	.971	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.9679-03	.7000+00	.000
6360.	.463	.609	.764	.851	.913	.961	.980	.986	.998	.998	.999	1.000	1.000	1.000	1.000	.1355-02	.6900+00	.001
6370.	.401	.647	.795	.874	.928	.968	.984	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.2255-03	.9000+00	.003
6380.	.746	.835	.915	.952	.974	.989	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2697-03	.7600+00	.000
6390.	.951	.973	.989	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1055-04	.9200+00	.000
6400.	.987	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1277-09	.2000+01	.000
6410.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01	.000
6420.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01	.000
6430.	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1039-05	.8700+00	.000
6440.	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5013-06	.1020+01	.000
6450.	.988	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5314-06	.1090+01	.000
6460.	.973	.986	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4746-05	.9400+00	.000
6470.	.936	.964	.985	.992	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1394-04	.9200+00	.000
6480.	.891	.936	.971	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4225-04	.8600+00	.000
6490.	.876	.926	.966	.982	.997	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4440-04	.8700+00	.000
6500.	.878	.928	.965	.983	.991	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5716-04	.8400+00	.000
6510.	.846	.864	.956	.977	.988	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2191-03	.7300+00	.002
6520.	.626	.697	.953	.975	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9535-04	.9300+00	.016
6530.	.914	.952	.979	.989	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2268-04	.9000+00	.000
6540.	.975	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3341-05	.9700+00	.000
6550.	.979	.989	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1950-05	.1010+01	.000
6560.	.987	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4330-06	.1120+01	.000
6570.	.997	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8706-07	.1140+01	.000
6580.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
6590.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6600.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6610.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6620.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6630.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6640.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6650.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6660.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6670.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
6680.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
6690.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01	.000
6700.	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1039-05	.8700+00	.000

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
671).	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5013-06	.1020+01	.000
672).	.989	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1470-05	.9700+00	.000
673).	.961	.998	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3795-09	.2000+01	.000
674).	.972	.983	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6647-05	.9100+00	.000
675).	.945	.970	.988	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9026-05	.9500+00	.000
676).	.922	.957	.982	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1702-04	.9200+00	.000
677).	.921	.962	.984	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5671-05	.1040+01	.000
678).	.893	.896	.986	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7296-04	.8100+00	.002
679).	.867	.937	.973	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8160-05	.1060+01	.000
680).	.923	.967	.981	.990	.995	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7835-05	.1000+01	.000
681).	.990	.993	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2903-05	.8900+00	.000
682).	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1600-06	.1160+01	.000
683).	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3649-05	.7000+00	.000
684).	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4563-07	.1260+01	.000
685).	.985	.995	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2137-06	.1210+01	.000
686).	.970	.988	.995	.995	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9044-06	.1130+01	.000
687).	.945	.974	.985	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7383-05	.9700+00	.000
688).	.902	.948	.975	.989	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1964-04	.9300+00	.000
689).	.824	.903	.958	.979	.989	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3370-04	.9400+00	.000
690).	.707	.822	.917	.956	.978	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1156-03	.8700+00	.000
691).	.585	.721	.862	.920	.960	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.3426-03	.8000+00	.000
692).	.450	.646	.806	.887	.938	.972	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	.3478-03	.8400+00	.000
693).	.405	.572	.751	.844	.868	.954	.976	.985	.996	.998	.999	1.000	1.000	1.000	1.000	.1432-02	.7000+00	.002
694).	.371	.438	.641	.762	.850	.925	.959	.978	.991	.995	.998	.999	1.000	1.000	1.000	.5554-02	.5700+00	.023
695).	.385	.447	.555	.655	.797	.892	.938	.967	.984	.993	.996	.998	.999	1.000	1.000	.1489-01	.4600+00	.038
696).	.246	.386	.595	.737	.868	.893	.935	.967	.988	.993	.996	.996	.999	1.000	1.000	.3277-02	.6600+00	.007
697).	.259	.412	.596	.712	.862	.892	.937	.968	.985	.992	.996	.999	.999	1.000	1.000	.4106-02	.6300+00	.005
698).	.283	.395	.486	.694	.769	.834	.902	.948	.977	.982	.994	.996	.999	.999	1.000	.1301-01	.5000+00	.029
699).	.436	.498	.605	.695	.776	.876	.923	.957	.982	.991	.995	.998	.999	.999	1.000	.1548-01	.4400+00	.019
700).	.535	.668	.813	.935	.956	.978	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	.4864-03	.7800+00	.004
701).	.875	.988	.990	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1287-08	.2000+01	.000
702).	.982	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6557-06	.1110+01	.000
703).	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1325-05	.9600+00	.000
704).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
705).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
706).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
707).	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
708.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
709.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
710.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
711.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
712.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
713.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
714.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
715.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
716.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
717.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
718.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
719.	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1039-05	.8700+00 .000
720.	.997	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8571-05	.6500+00 .000
721.	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1159-05	.9600+00 .000
722.	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1600-06	.1160+01 .000
723.	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2353-05	.8700+00 .000
724.	.984	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1459-07	.1510+01 .000
725.	.977	.988	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2566-05	.9900+00 .000
726.	.945	.971	.988	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8192-05	.9600+00 .000
727.	.924	.958	.982	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1816-04	.9100+00 .000
728.	.936	.965	.983	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1996-04	.8800+00 .000
729.	.933	.960	.965	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1110-03	.7000+00 .000
730.	.913	.952	.986	.990	.995	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9190-05	.1000+01 .000
731.	.923	.959	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1271-04	.9500+00 .000
732.	.948	.973	.989	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7045-05	.9700+00 .000
733.	.968	.982	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7506-05	.9100+00 .000
734.	.967	.983	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5375-08	.2000+01 .015
735.	.966	.975	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1911-04	.8200+00 .000
736.	.988	.989	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8472-04	.5500+00 .000
737.	.977	.988	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7123-06	.1130+01 .000
738.	.960	.979	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4498-05	.9900+00 .000
739.	.911	.929	.986	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3967-04	.8500+00 .001
740.	.873	.936	.971	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1624-04	.9800+00 .000
741.	.868	.928	.969	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2467-04	.9400+00 .000
742.	.757	.880	.945	.972	.985	.994	.997	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2093-04	.1030+01 .000
743.	.643	.787	.879	.931	.963	.989	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2523-03	.8100+00 .000
744.	.820	.862	.873	.879	.930	.969	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.5787-02	.3900+00 .004

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	A ERROR
745(.	.573	.658	.797	.873	.926	.967	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.1925-02	.6200+00	.003
746(.	.553	.688	.818	.888	.936	.972	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.9457-03	.7000+00	.000
747(.	.574	.652	.794	.870	.924	.966	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.2116-02	.6100+00	.004
748(.	.597	.639	.784	.864	.921	.963	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.3208-02	.5600+00	.009
749(.	.835	.857	.867	.921	.956	.981	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.3478-02	.8400+00	.004
750(.	.825	.893	.951	.974	.986	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8487-04	.8400+00	.000
751(.	.946	.972	.986	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1155-04	.9200+00	.000
752(.	.980	.996	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1146-08	.1810+01	.000
753(.	.966	.982	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5016-05	.9600+00	.000
754(.	.893	.941	.974	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2596-04	.9100+00	.000
755(.	.736	.833	.936	.953	.975	.989	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1234-03	.8500+00	.000
756(.	.515	.657	.802	.878	.929	.968	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.9687-03	.7100+00	.000
757(.	.336	.499	.686	.792	.870	.937	.966	.982	.993	.996	.998	.999	1.000	1.000	1.000	.2092-02	.6800+00	.001
758(.	.265	.431	.636	.746	.835	.876	.954	.974	.993	.996	.998	.999	1.000	1.000	1.000	.3041-02	.6600+00	.002
759(.	.273	.441	.642	.759	.847	.924	.956	.978	.993	.995	.998	.999	.999	1.000	1.000	.2482-02	.6800+00	.001
760(.	.234	.467	.606	.733	.828	.913	.957	.975	.990	.995	.997	.999	.999	1.000	1.000	.2084-02	.7100+00	.001
761(.	.225	.362	.563	.768	.867	.901	.945	.977	.988	.994	.997	.999	.999	1.000	1.000	.2916-02	.6800+00	.016
762(.	.415	.555	.715	.808	.878	.946	.967	.983	.993	.996	.998	.999	1.000	1.000	1.000	.2687-02	.6300+00	.002
763(.	.724	.816	.892	.934	.962	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.5658-03	.6900+00	.000
764(.	.933	.963	.984	.992	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1331-04	.9300+00	.000
765(.	.983	.991	.997	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1891-05	.9900+00	.000
766(.	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2088-05	.9500+00	.000
767(.	.983	.996	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9780-09	.1810+01	.000
768(.	.956	.977	.996	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1047-05	.1160+01	.000
769(.	.886	.937	.968	.982	.991	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4798-04	.8500+00	.000
770(.	.760	.855	.923	.955	.978	.990	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1896-03	.7900+00	.000
771(.	.657	.759	.859	.913	.950	.976	.985	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	.4897-03	.6700+00	.000
772(.	.573	.695	.816	.883	.932	.970	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.1180-02	.6700+00	.001
773(.	.575	.802	.827	.893	.938	.973	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	.3962-03	.7800+00	.011
774(.	.503	.642	.786	.885	.921	.965	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.1103-02	.7000+00	.001
775(.	.443	.592	.763	.843	.909	.959	.979	.989	.996	.998	.999	1.000	1.000	1.000	1.000	.1307-02	.7000+00	.001
776(.	.677	.786	.838	.902	.948	.976	.986	.994	.997	.999	.999	1.000	1.000	1.000	1.000	.1416-02	.6100+00	.002
777(.	.751	.854	.932	.984	.987	.992	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5027-04	.9400+00	.000
778(.	.885	.937	.973	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2334-04	.9300+00	.000
779(.	.963	.986	.992	.996	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1114-05	.1130+01	.000
780(.	.994	.997	.999	1.000	1.000	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1533-06	.1150+01	.000
781(.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	B	ERROR
782C.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
783C.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
784C.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
785C.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
786C.	.997	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
787C.	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8706-07	.1140+01	.000
788C.	.994	.996	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5013-06	.1020+01	.000
789C.	.965	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2943-04	.5800+00	.000
790C.	.940	.987	.988	.993	.994	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6821-05	.9300+00	.000
791C.	.825	.867	.888	.993	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1157-07	.1680+01	.000
792C.	.535	.564	.925	.992	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2284-04	.9900+00	.003
793C.	.812	.951	.975	.996	.999	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2098-03	.8800+00	.061
794C.	.929	.967	.982	.991	.995	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6863-08	.1870+01	.000
795C.	.871	.984	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1147-04	.9500+00	.000
796C.	.993	.994	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1338-08	.2000+01	.000
797C.	.997	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1949-04	.6500+00	.000
798C.	.992	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4882-05	.7000+00	.000
799C.	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4467-05	.8200+00	.000
800C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01	.000
801C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
802C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
803C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
804C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
805C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
806C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
807C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
808C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
809C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
810C.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
811C.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01	.000
812C.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
813C.	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
814C.	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01	.000
815C.	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00	.000
816C.	.998	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2487-08	.1550+01	.000
817C.	.998	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3649-05	.7000+00	.000
818C.	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1323-04	.5610+00	.000
																.2167-05	.8600+00	.000

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	A	R ERROR
819(	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5013-06	.1020+01 .000
821(	.992	.996	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1997-05	.9000+00 .000
822(	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8153-08	.1350+01 .000
823(	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9401-11	.2000+01 .000
824(	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2163-06	.9300+00 .000
825(	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3312-09	.1740+01 .000
826(	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9075-06	.9700+00 .000
827(	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1159-05	.9600+00 .000
828(	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6989-06	.1040+01 .000
829(	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1325-05	.9600+00 .000
830(	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2405-05	.9500+00 .000
831(	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2088-05	.9500+00 .000
832(	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6136-07	.1170+01 .000
833(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
834(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
835(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
836(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
837(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
838(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
839(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
840(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
841(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
842(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
843(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
844(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
845(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
846(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
847(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
848(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
849(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
850(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
851(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
852(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
853(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
854(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
855(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000
856(	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.0000	.1000-01 .000

UNCLASSIFIED

CARBON DIOXIDE AT 1.00 ATMOSPHERE
T=300 K

FREQ.	10000	5000.	2000.	1000.	500.0	200.0	100.0	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200		A	R ERROR
857	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		.0000	.1000-01 .000
858	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		.0000	.1000-01 .000
859	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		.0000	.1000-01 .000
860	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		.0000	.1000-01 .000
861	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		.0000	.1000-01 .000

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	30.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	R	ERROR
1000.	.453	.715	.859	.943	.984	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1291-01	.1070+01	.001
1005.	.443	.731	.871	.951	.990	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1106-01	.1100+01	.001
1010.	.436	.622	.788	.897	.968	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.8663-01	.9500+00	.001
1015.	.308	.592	.767	.878	.958	.981	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.3113-01	.9900+00	.001
1020.	.371	.684	.821	.919	.978	.992	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1696-01	.1040+01	.000
1025.	.402	.649	.850	.938	.988	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1924-01	.9900+00	.000
1030.	.351	.654	.820	.920	.980	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1868-01	.1030+01	.001
1035.	.379	.682	.840	.933	.984	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1483-01	.1070+01	.001
1040.	.355	.660	.825	.924	.981	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1711-01	.1050+01	.001
1045.	.380	.685	.841	.935	.985	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1476-01	.1070+01	.001
1050.	.311	.611	.785	.900	.970	.989	.995	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.2441-01	.9900+00	.001
1055.	.367	.612	.787	.901	.971	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2371-01	.1000+01	.001
1060.	.272	.576	.761	.885	.965	.986	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.2828-01	.9800+00	.001
1065.	.200	.477	.666	.807	.915	.955	.976	.990	.995	.997	.999	.999	1.000	1.000	1.000	.5572-01	.8600+00	.000
1070.	.290	.542	.724	.851	.942	.971	.985	.994	.997	.998	.999	1.000	1.000	1.000	1.000	.3949-01	.9100+00	.001
1075.	.259	.556	.758	.867	.955	.980	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.3173-01	.9600+00	.001
1080.	.340	.662	.827	.928	.986	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1522-01	.1090+01	.001
1085.	.302	.623	.799	.912	.978	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1975-01	.1050+01	.001
1090.	.239	.541	.725	.856	.945	.976	.988	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.3627-01	.9400+00	.001
1095.	.236	.540	.724	.855	.944	.975	.988	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.3655-01	.9400+00	.000
1100.	.164	.438	.630	.779	.899	.950	.974	.989	.995	.997	.999	.999	1.000	1.000	1.000	.6260-01	.8600+00	.000
1105.	.156	.429	.621	.771	.889	.940	.968	.986	.993	.996	.999	.999	1.000	1.000	1.000	.6674-01	.8560+00	.000
1110.	.151	.424	.619	.770	.890	.942	.969	.987	.993	.996	.999	.999	1.000	1.000	1.000	.6539-01	.8660+00	.000
1115.	.196	.509	.709	.847	.942	.976	.989	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	.3533-01	.9800+00	.000
1120.	.135	.401	.599	.756	.886	.941	.970	.987	.993	.997	.999	.999	1.000	1.000	1.000	.6936-01	.8600+00	.000
1125.	.182	.483	.681	.824	.928	.967	.984	.993	.997	.998	.999	1.000	1.000	1.000	1.000	.4318-01	.9400+00	.000
1130.	.194	.521	.730	.870	.961	.988	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2922-01	.1030+01	.001
1135.	.105	.343	.536	.698	.841	.909	.950	.978	.988	.994	.998	.999	.999	1.000	1.000	.9839-01	.8000+00	.000
1140.	.116	.384	.595	.759	.890	.944	.970	.987	.993	.997	.999	.999	1.000	1.000	1.000	.6630-01	.8900+00	.000
1145.	.119	.398	.617	.783	.911	.958	.980	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.5610-01	.9300+00	.001
1150.	.085	.271	.468	.646	.818	.898	.946	.976	.988	.994	.998	.999	.999	1.000	1.000	.1194+00	.8000+00	.001
1155.	.113	.386	.600	.771	.906	.958	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.5979-01	.9200+00	.001
1160.	.102	.376	.603	.783	.920	.968	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	.5569-01	.9500+00	.002
1165.	.050	.236	.433	.623	.812	.900	.949	.978	.989	.994	.998	.999	.999	1.000	1.000	.1264+00	.8100+00	.002
1170.	.033	.184	.362	.547	.746	.846	.908	.953	.974	.986	.994	.997	.998	.999	1.000	.1745+00	.7600+00	.000
1175.	.024	.146	.303	.479	.685	.796	.870	.930	.959	.978	.990	.995	.998	.999	1.000	.2316+00	.7100+00	.001
1180.	.056	.287	.518	.719	.890	.952	.980	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.7596-01	.9300+00	.003

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	W(PR.CM.) A	R	ERROR
1185.	.065	.157	.329	.514	.718	.820	.845	.938	.964	.980	.992	.996	.998	.999	1.000	.1963+00	.7500+00	.000
1190.	.032	.098	.192	.383	.787	.872	.924	.962	.978	.988	.995	.997	.999	.999	1.000	.1445+00	.8100+00	.001
1195.	.042	.241	.457	.652	.837	.912	.952	.978	.988	.994	.998	.999	.999	1.000	1.000	.1053+00	.8700+00	.001
1200.	.027	.183	.375	.565	.762	.857	.917	.961	.979	.989	.996	.998	.999	1.000	1.000	.1517+00	.8100+00	.001
1205.	.034	.235	.445	.648	.840	.923	.963	.985	.992	.996	.998	.999	1.000	1.000	1.000	.1002+00	.9000+00	.001
1210.	.009	.098	.225	.395	.614	.743	.835	.912	.949	.972	.988	.994	.997	.999	.999	.2798+00	.7200+00	.013
1215.	.006	.077	.213	.389	.615	.747	.845	.921	.956	.976	.990	.995	.997	.999	.999	.2823+00	.7400+00	.002
1220.	.004	.065	.195	.374	.610	.748	.850	.929	.962	.980	.992	.996	.998	.999	1.000	.2824+00	.7600+00	.002
1225.	.003	.047	.146	.297	.525	.672	.791	.895	.942	.969	.987	.994	.997	.999	.999	.3904+00	.6900+00	.003
1230.	.016	.149	.328	.513	.715	.818	.891	.946	.970	.984	.994	.997	.998	.999	1.000	.1731+00	.8100+00	.007
1235.	.011	.120	.298	.502	.731	.845	.919	.965	.982	.991	.996	.998	.999	1.000	1.000	.1823+00	.8200+00	.001
1240.	.002	.047	.158	.325	.564	.714	.824	.911	.948	.971	.988	.994	.997	.999	.999	.3202+00	.7500+00	.005
1245.	.003	.053	.164	.324	.555	.699	.805	.892	.934	.962	.983	.991	.995	.998	.999	.3460+00	.7200+00	.005
1250.	.003	.063	.199	.391	.647	.787	.881	.949	.973	.986	.994	.997	.999	.999	.999	.2538+00	.8000+00	.002
1255.	.000	.025	.117	.249	.556	.723	.840	.929	.963	.981	.992	.996	.998	.999	1.000	.3371+00	.8000+00	.002
1260.	.000	.007	.050	.162	.388	.560	.701	.827	.888	.930	.966	.982	.990	.996	.998	.5732+00	.7200+00	.001
1265.	.000	.001	.015	.070	.229	.388	.551	.731	.830	.898	.953	.975	.987	.995	.997	.8954+00	.6800+00	.016
1270.	.000	.000	.004	.026	.124	.263	.423	.622	.743	.837	.920	.957	.977	.991	.995	.1331+01	.6200+00	.008
1275.	.000	.019	.103	.267	.518	.679	.795	.888	.928	.955	.979	.988	.994	.997	.999	.3713+00	.7900+00	.002
1280.	.000	.012	.068	.188	.416	.594	.740	.869	.926	.960	.983	.992	.996	.998	.999	.5269+00	.7100+00	.004
1285.	.000	.000	.000	.050	.202	.470	.539	.724	.824	.896	.953	.975	.987	.995	.997	.9880+00	.6900+00	.001
1290.	.000	.002	.021	.087	.263	.427	.579	.742	.833	.901	.955	.976	.988	.995	.998	.8329+00	.6700+00	.003
1295.	.000	.002	.021	.093	.288	.471	.637	.805	.886	.937	.973	.986	.993	.997	.999	.7653+00	.7000+00	.006
1300.	.000	.012	.061	.236	.444	.671	.798	.903	.946	.972	.988	.994	.997	.999	.999	.3906+00	.8100+00	.000
1305.	.000	.006	.057	.199	.444	.668	.769	.885	.932	.960	.982	.990	.995	.998	.999	.4504+00	.8100+00	.003
1310.	.000	.000	.002	.019	.110	.239	.397	.599	.721	.817	.907	.948	.973	.989	.994	.1421+01	.6400+00	.002
1315.	.000	.000	.000	.000	.008	.045	.137	.328	.486	.633	.791	.875	.931	.970	.985	.3099+01	.6400+00	.004
1320.	.000	.000	.000	.002	.033	.107	.231	.433	.582	.710	.857	.902	.945	.976	.984	.2243+01	.6300+00	.009
1325.	.000	.000	.000	.001	.012	.058	.148	.269	.791	.876	.941	.970	.985	.994	.997	.1391+01	.7000+00	.033
1330.	.000	.000	.000	.000	.009	.058	.105	.706	.833	.909	.961	.980	.990	.996	.998	.1327+01	.7900+00	.006
1335.	.000	.000	.000	.000	.002	.036	.117	.247	.444	.582	.697	.809	.875	.925	.966	.2171+01	.6500+00	.020
1340.	.000	.000	.000	.000	.000	.001	.011	.048	.164	.294	.437	.620	.743	.841	.926	.4575+01	.5800+00	.015
1345.	.000	.000	.000	.000	.004	.061	.182	.347	.563	.692	.788	.876	.922	.954	.979	.1726+01	.7200+00	.009
1350.	.000	.000	.000	.000	.003	.057	.142	.362	.594	.726	.822	.904	.944	.969	.987	.1707+01	.7600+00	.002
1355.	.000	.000	.000	.000	.001	.020	.069	.229	.474	.641	.767	.876	.928	.960	.985	.3373+01	.6700+00	.040
1360.	.000	.000	.000	.000	.000	.001	.014	.063	.208	.356	.505	.676	.778	.856	.928	.4371+01	.6500+00	.025
1365.	.000	.000	.000	.000	.000	.001	.015	.062	.191	.322	.461	.629	.737	.826	.911	.4406+01	.6200+00	.092

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	R	ERROR
1370.	.000	.000	.000	.000	.002	.021	.095	.287	.456	.609	.762	.843	.901	.950	.972	.3849+01	.6900+00	.002
1375.	.000	.000	.000	.000	.000	.003	.024	.124	.256	.411	.608	.723	.816	.903	.945	.5796+01	.6300+00	.001
1380.	.000	.000	.000	.000	.002	.024	.090	.252	.405	.559	.731	.827	.897	.952	.975	.3866+01	.6700+00	.038
1385.	.000	.000	.000	.000	.001	.029	.112	.302	.464	.609	.754	.832	.888	.940	.964	.5585+01	.6900+00	.011
1390.	.000	.000	.000	.000	.001	.000	.004	.057	.165	.316	.522	.655	.741	.861	.914	.8782+01	.6800+00	.015
1395.	.000	.000	.000	.000	.000	.001	.023	.087	.202	.395	.542	.672	.809	.863	.902	.8187+01	.6300+00	.005
1400.	.000	.000	.000	.000	.000	.000	.005	.053	.148	.285	.481	.614	.723	.837	.902	.1073+02	.6400+00	.000
1405.	.000	.000	.000	.000	.000	.004	.033	.167	.334	.511	.700	.800	.867	.929	.959	.5525+01	.7000+00	.003
1410.	.000	.000	.000	.000	.000	.005	.044	.217	.413	.604	.794	.884	.939	.974	.987	.5316+01	.7800+00	.028
1415.	.000	.000	.000	.000	.000	.001	.011	.080	.182	.308	.481	.602	.708	.823	.887	.6873+01	.6000+00	.035
1420.	.000	.000	.000	.000	.000	.000	.001	.022	.078	.178	.351	.488	.616	.760	.843	.1036+02	.6000+00	.007
1425.	.000	.000	.000	.000	.000	.000	.005	.066	.186	.349	.560	.690	.791	.887	.935	.8557+01	.7000+00	.001
1430.	.000	.000	.000	.000	.000	.000	.008	.087	.227	.406	.625	.751	.840	.916	.951	.7989+01	.7300+00	.043
1435.	.000	.000	.000	.000	.000	.000	.005	.045	.112	.204	.350	.472	.594	.738	.826	.7477+01	.5200+00	.089
1440.	.000	.000	.000	.000	.000	.002	.036	.194	.359	.503	.643	.725	.794	.869	.913	.5732+01	.7400+00	.002
1445.	.000	.000	.000	.000	.000	.003	.035	.199	.389	.572	.757	.840	.898	.943	.965	.5806+01	.7900+00	.010
1450.	.000	.000	.000	.000	.000	.001	.030	.120	.276	.509	.659	.772	.873	.922	.958	.1144+02	.7300+00	.002
1455.	.000	.000	.000	.000	.000	.000	.011	.049	.116	.235	.344	.461	.615	.722	.803	.9703+01	.4900+00	.038
1460.	.000	.000	.000	.000	.000	.000	.006	.040	.121	.276	.402	.524	.671	.769	.837	.1325+02	.6000+00	.048
1465.	.000	.000	.000	.000	.000	.000	.003	.052	.170	.342	.566	.696	.792	.875	.917	.9619+01	.7300+00	.004
1470.	.000	.000	.000	.000	.000	.000	.003	.043	.129	.250	.427	.554	.666	.785	.849	.8832+01	.6200+00	.043
1475.	.000	.000	.000	.000	.000	.000	.000	.028	.091	.240	.380	.519	.682	.780	.855	.1326+02	.5700+00	.000
1480.	.000	.000	.000	.000	.000	.000	.002	.047	.162	.331	.556	.691	.791	.886	.935	.1080+02	.7500+00	.010
1485.	.000	.000	.000	.000	.000	.000	.002	.035	.120	.254	.455	.595	.713	.831	.895	.9800+01	.6600+00	.009
1490.	.000	.000	.000	.000	.000	.000	.000	.003	.026	.100	.276	.435	.585	.745	.837	.1678+02	.6600+00	.003
1495.	.000	.000	.000	.000	.000	.000	.000	.002	.018	.077	.239	.396	.545	.706	.798	.1710+02	.6300+00	.002
1500.	.000	.000	.000	.000	.000	.000	.000	.003	.026	.105	.295	.458	.606	.758	.843	.1704+02	.6700+00	.002
1505.	.000	.000	.000	.000	.000	.000	.000	.002	.022	.080	.205	.320	.443	.600	.705	.1566+02	.5900+00	.137
1510.	.000	.000	.000	.000	.000	.000	.000	.000	.003	.024	.116	.243	.400	.605	.731	.2416+02	.6200+00	.003
1515.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.008	.047	.186	.341	.506	.701	.2210+02	.6600+00	.001
1520.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.015	.081	.183	.318	.515	.2315+02	.5700+00	.003
1525.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.019	.101	.218	.364	.583	.2582+02	.6200+00	.009
1530.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.016	.073	.231	.386	.542	.721	.2041+02	.6800+00	.034
1535.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005	.036	.157	.293	.450	.637	.2298+02	.6400+00	.006
1540.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005	.043	.119	.234	.420	.2827+02	.5600+00	.001
1545.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.036	.124	.302	.442	.709	.1573+02	.6600+00	.052
1550.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.016	.088	.241	.487	.645	.764	.868	.918	.1403+02	.7600+00	.001

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
1555.	.000	.000	.000	.000	.000	.000	.000	.001	.017	.077	.228	.364	.498	.654	.752	.1994+02	.6700+00	.112
1560.	.000	.000	.000	.000	.000	.000	.000	.000	.003	.020	.088	.180	.298	.472	.603	.1952+02	.5300+00	.011
1565.	.000	.000	.000	.000	.000	.000	.000	.001	.013	.084	.260	.421	.559	.725	.814	.2178+02	.7200+00	.048
1570.	.000	.000	.000	.000	.000	.000	.000	.014	.068	.178	.373	.518	.642	.771	.846	.1166+02	.6300+00	.007
1575.	.000	.000	.000	.000	.000	.000	.000	.014	.065	.173	.373	.524	.650	.775	.841	.1172+02	.6300+00	.002
1580.	.000	.000	.000	.000	.000	.001	.017	.120	.267	.433	.625	.735	.812	.885	.919	.6859+01	.7200+00	.027
1585.	.000	.000	.000	.000	.011	.026	.140	.419	.631	.792	.911	.956	.979	.993	.996	.3673+01	.9100+00	.002
1590.	.000	.000	.000	.000	.001	.015	.066	.284	.456	.610	.767	.855	.916	.962	.980	.4164+01	.7300+00	.007
1595.	.000	.000	.000	.000	.000	.005	.040	.184	.344	.509	.698	.808	.884	.946	.971	.5280+01	.7000+00	.003
1600.	.000	.000	.000	.000	.000	.004	.064	.256	.444	.614	.785	.872	.929	.969	.984	.4708+01	.7700+00	.001
1605.	.000	.000	.000	.000	.000	.005	.046	.210	.392	.569	.752	.847	.913	.961	.980	.5283+01	.7600+00	.003
1610.	.000	.000	.000	.000	.000	.000	.003	.042	.137	.293	.526	.675	.789	.888	.934	.9250+01	.6700+00	.005
1615.	.000	.000	.000	.000	.000	.000	.000	.002	.019	.073	.220	.363	.506	.669	.766	.1645+02	.6100+00	.012
1620.	.000	.000	.000	.000	.000	.000	.001	.024	.091	.210	.415	.564	.685	.802	.863	.1080+02	.6500+00	.010
1625.	.000	.000	.000	.000	.000	.000	.000	.009	.055	.164	.376	.537	.670	.798	.865	.1401+02	.6800+00	.003
1630.	.000	.000	.000	.000	.000	.000	.001	.036	.142	.318	.560	.704	.804	.889	.932	.1183+02	.7800+00	.005
1635.	.000	.000	.000	.000	.000	.000	.001	.025	.088	.180	.320	.436	.550	.686	.772	.1028+02	.6000+00	.202
1640.	.000	.000	.000	.000	.000	.000	.000	.004	.034	.124	.318	.474	.619	.778	.813	.1639+02	.6800+00	.011
1645.	.000	.000	.000	.000	.000	.000	.000	.003	.027	.102	.270	.415	.550	.698	.783	.1642+02	.6500+00	.027
1650.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.009	.066	.160	.288	.470	.600	.2570+02	.5700+00	.006
1655.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.009	.052	.118	.214	.377	.512	.2215+02	.5100+00	.022
1660.	.000	.000	.000	.000	.000	.000	.000	.001	.022	.104	.303	.483	.630	.777	.855	.2441+02	.7900+00	.053
1665.	.000	.000	.000	.000	.000	.000	.000	.001	.012	.063	.212	.359	.504	.671	.771	.1928+02	.6400+00	.010
1670.	.000	.000	.000	.000	.000	.000	.000	.002	.016	.062	.176	.292	.421	.594	.713	.1490+02	.5500+00	.023
1675.	.000	.000	.000	.000	.000	.000	.000	.002	.018	.075	.229	.379	.527	.691	.786	.1680+02	.6200+00	.002
1680.	.000	.000	.000	.000	.000	.000	.000	.004	.034	.110	.259	.387	.512	.659	.751	.1443+02	.6100+00	.083
1685.	.000	.000	.000	.000	.000	.000	.000	.002	.013	.065	.173	.280	.401	.562	.672	.1480+02	.5500+00	.084
1690.	.000	.000	.000	.000	.000	.000	.000	.002	.026	.113	.326	.503	.655	.804	.842	.2073+02	.7500+00	.008
1695.	.000	.000	.000	.000	.000	.000	.000	.000	.005	.033	.150	.296	.455	.644	.756	.2316+02	.6400+00	.000
1700.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.039	.101	.190	.372	.518	.2766+02	.5400+00	.009
1705.	.000	.000	.000	.000	.000	.000	.000	.000	.006	.040	.151	.284	.394	.557	.670	.1957+02	.5900+00	.044
1710.	.000	.000	.000	.000	.000	.000	.000	.005	.038	.135	.348	.518	.661	.802	.875	.1636+02	.7000+00	.000
1715.	.000	.000	.000	.000	.000	.000	.000	.001	.015	.064	.212	.350	.489	.654	.759	.1944+02	.6500+00	.055
1720.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.000	.007	.057	.096	.209	.317	.437	.595	.705	.1086+02	.5000+00	.047
1725.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.007	.094	.266	.480	.712	.874	.895	.948	.970	.8853+01	.8300+00	.005
1730.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.012	.118	.263	.464	.660	.765	.838	.901	.932	.7443+01	.7600+00	.012
1735.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.013	.042	.129	.264	.466	.602	.711	.815	.870	.9017+01	.6400+00	.009

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
1740.	.000	.000	.000	.000	.000	.000	.003	.041	.122	.247	.441	.579	.695	.810	.871	.8870+01	.6200+00	.012
1745.	.000	.000	.000	.000	.000	.000	.000	.001	.012	.056	.188	.325	.470	.647	.759	.1866+02	.6200+00	.013
1750.	.000	.000	.000	.000	.000	.000	.000	.001	.013	.055	.175	.305	.447	.630	.753	.1788+02	.6000+00	.045
1755.	.000	.000	.000	.000	.000	.000	.007	.070	.177	.318	.511	.639	.742	.847	.906	.7673+01	.6400+00	.015
1760.	.000	.000	.000	.000	.000	.000	.007	.075	.199	.360	.564	.686	.777	.861	.905	.7895+01	.5800+00	.010
1765.	.000	.000	.000	.000	.000	.000	.001	.029	.106	.239	.452	.601	.722	.836	.895	.1107+02	.6900+00	.022
1770.	.000	.000	.000	.000	.000	.000	.000	.000	.006	.036	.140	.285	.436	.674	.739	.2135+02	.6200+00	.005
1775.	.000	.000	.000	.000	.000	.000	.000	.000	.004	.025	.085	.231	.373	.514	.675	.771	.1405+02	.5800+00	.001
1780.	.000	.000	.000	.000	.000	.000	.000	.005	.035	.115	.297	.457	.606	.768	.899	.1508+02	.6500+00	.007
1785.	.000	.000	.000	.000	.000	.000	.002	.044	.143	.290	.497	.631	.739	.846	.905	.1010+02	.7100+00	.031
1790.	.000	.000	.000	.000	.000	.000	.001	.029	.102	.222	.425	.564	.691	.808	.871	.1087+02	.6700+00	.050
1795.	.000	.000	.000	.000	.000	.000	.000	.000	.006	.038	.156	.296	.451	.647	.757	.2178+02	.6300+00	.002
1800.	.000	.000	.000	.000	.000	.000	.000	.005	.030	.101	.263	.412	.557	.724	.823	.1392+02	.6000+00	.001
1805.	.000	.000	.000	.000	.000	.000	.005	.056	.157	.303	.506	.642	.752	.857	.913	.8297+01	.6500+00	.003
1810.	.000	.000	.000	.000	.000	.000	.005	.053	.148	.287	.492	.635	.755	.866	.920	.8176+01	.6300+00	.002
1815.	.000	.000	.000	.000	.000	.002	.017	.103	.226	.378	.579	.711	.816	.907	.947	.6220+01	.6200+00	.005
1820.	.000	.000	.000	.000	.000	.000	.052	.245	.444	.628	.747	.880	.934	.972	.986	.5143+01	.8000+00	.005
1825.	.000	.000	.000	.000	.000	.002	.017	.089	.188	.315	.492	.617	.724	.833	.891	.6164+01	.5780+00	.016
1830.	.000	.000	.000	.000	.000	.000	.000	.008	.048	.141	.324	.472	.604	.746	.829	.1319+02	.6500+00	.010
1835.	.000	.000	.000	.000	.000	.000	.003	.044	.145	.305	.512	.675	.781	.880	.926	.9302+01	.6800+00	.002
1840.	.000	.000	.000	.000	.000	.000	.004	.047	.143	.286	.496	.656	.768	.852	.902	.8680+01	.6500+00	.001
1845.	.000	.000	.000	.000	.000	.000	.000	.010	.041	.113	.279	.433	.591	.737	.870	.1167+02	.5700+00	.020
1850.	.000	.000	.000	.000	.000	.008	.047	.167	.306	.462	.654	.767	.857	.925	.959	.4801+01	.6200+00	.009
1855.	.000	.000	.000	.000	.002	.031	.143	.404	.602	.754	.882	.935	.966	.986	.993	.3473+01	.8400+00	.000
1860.	.000	.000	.000	.000	.000	.001	.014	.074	.261	.450	.628	.804	.889	.946	.973	.4233+01	.7100+00	.010
1865.	.000	.000	.000	.000	.000	.001	.014	.098	.222	.365	.542	.654	.745	.840	.894	.6837+01	.6500+00	.043
1870.	.000	.000	.000	.000	.000	.002	.020	.090	.168	.257	.394	.509	.621	.750	.828	.5996+01	.5200+00	.216
1875.	.000	.000	.000	.000	.001	.011	.069	.268	.465	.644	.814	.894	.944	.976	.988	.4296+01	.7100+00	.085
1880.	.000	.000	.000	.000	.006	.049	.171	.415	.594	.737	.864	.923	.958	.987	.991	.3006+01	.7700+00	.001
1885.	.000	.000	.000	.000	.002	.021	.090	.267	.429	.578	.733	.819	.880	.932	.958	.3890+01	.6700+00	.005
1890.	.000	.000	.000	.000	.002	.016	.064	.199	.340	.489	.658	.756	.828	.895	.930	.4135+01	.5900+00	.001
1895.	.000	.000	.000	.000	.002	.019	.083	.256	.419	.575	.736	.829	.886	.939	.965	.3942+01	.6600+00	.001
1900.	.000	.000	.000	.000	.010	.063	.183	.404	.567	.701	.827	.889	.930	.965	.980	.2802+01	.7100+00	.004
1905.	.000	.000	.000	.000	.010	.068	.205	.440	.610	.735	.849	.906	.944	.974	.987	.2713+01	.7600+00	.004
1910.	.000	.000	.000	.000	.001	.013	.064	.222	.381	.554	.698	.790	.860	.921	.959	.4362+01	.6600+00	.003
1915.	.000	.000	.000	.000	.001	.012	.064	.215	.366	.514	.678	.770	.838	.902	.935	.4402+01	.6500+00	.011
1920.	.000	.000	.000	.000	.000	.000	.002	.027	.095	.215	.410	.550	.670	.744	.862	.9425+01	.6000+00	.006

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
1925.	.000	.000	.000	.000	.006	.039	.116	.271	.410	.549	.702	.789	.855	.919	.952	.3338+01	.6000+00	.023
1930.	.000	.000	.000	.001	.032	.156	.372	.650	.796	.884	.948	.972	.986	.994	.997	.1861+01	.8200+00	.041
1935.	.000	.000	.000	.000	.024	.116	.294	.561	.734	.839	.921	.937	.977	.991	.996	.2134+01	.8100+00	.002
1940.	.000	.000	.000	.000	.004	.035	.099	.216	.319	.434	.586	.689	.775	.864	.913	.3394+01	.4900+00	.024
1945.	.000	.000	.000	.000	.002	.000	.016	.141	.276	.421	.609	.711	.810	.896	.937	.6665+01	.7100+00	.055
1950.	.000	.000	.000	.003	.059	.191	.379	.618	.792	.849	.924	.957	.977	.991	.995	.1654+01	.7800+00	.002
1955.	.000	.000	.000	.003	.055	.175	.347	.573	.709	.810	.896	.938	.965	.985	.992	.1760+01	.7400+00	.004
1960.	.000	.000	.000	.003	.059	.191	.379	.618	.752	.845	.924	.957	.977	.991	.995	.1655+01	.7800+00	.000
1965.	.000	.000	.000	.001	.016	.159	.136	.276	.402	.529	.678	.764	.840	.912	.949	.2914+01	.5300+00	.026
1970.	.000	.000	.000	.000	.076	.211	.374	.558	.668	.752	.838	.885	.921	.956	.973	.1621+01	.6400+00	.018
1975.	.000	.000	.002	.027	.189	.400	.607	.799	.885	.937	.974	.987	.993	.997	.999	.9454+00	.8200+00	.010
1980.	.000	.000	.003	.047	.265	.496	.694	.855	.921	.954	.983	.991	.996	.998	.999	.6980+00	.9200+00	.000
1985.	.000	.000	.000	.000	.045	.226	.410	.636	.759	.844	.911	.943	.964	.983	.990	.1630+01	.8900+00	.039
1990.	.000	.000	.000	.000	.001	.012	.048	.153	.271	.405	.576	.640	.783	.871	.922	.4590+01	.5700+00	.069
1995.	.000	.000	.000	.000	.034	.045	.124	.274	.410	.540	.693	.789	.862	.926	.956	.3154+01	.5700+00	.011
2000.	.000	.000	.002	.024	.147	.312	.491	.692	.796	.868	.930	.959	.978	.991	.995	.1156+01	.7300+00	.001
2005.	.000	.000	.004	.054	.284	.471	.641	.794	.807	.918	.961	.979	.989	.996	.998	.7081+00	.8900+00	.020
2010.	.000	.000	.005	.005	.063	.185	.352	.575	.713	.820	.914	.954	.976	.990	.995	.1691+01	.7100+00	.001
2015.	.000	.000	.000	.002	.030	.093	.195	.372	.509	.629	.756	.829	.885	.936	.963	.2419+01	.5800+00	.024
2020.	.000	.000	.000	.003	.039	.118	.236	.414	.541	.656	.781	.853	.907	.951	.973	.2193+01	.6000+00	.023
2025.	.000	.000	.001	.017	.120	.272	.445	.645	.760	.847	.925	.959	.979	.991	.996	.1280+01	.7300+00	.012
2030.	.000	.001	.026	.128	.373	.563	.712	.841	.906	.943	.975	.987	.994	.997	.999	.5068+00	.8700+00	.029
2035.	.000	.000	.007	.056	.241	.437	.623	.807	.842	.941	.977	.988	.994	.998	.999	.8258+00	.7700+00	.003
2040.	.000	.000	.001	.010	.064	.151	.270	.451	.582	.649	.812	.877	.925	.965	.982	.1892+01	.5600+00	.016
2045.	.000	.000	.003	.028	.134	.261	.348	.567	.677	.769	.864	.915	.950	.977	.988	.1342+01	.6300+00	.047
2050.	.000	.006	.067	.216	.504	.693	.820	.914	.951	.974	.989	.994	.997	.999	.999	.3779+00	.8700+00	.000
2055.	.000	.005	.059	.212	.504	.702	.835	.930	.965	.981	.993	.997	.998	.999	1.000	.3680+00	.8900+00	.001
2060.	.000	.003	.004	.033	.159	.288	.431	.598	.700	.784	.869	.915	.947	.974	.986	.1251+01	.6400+00	.032
2065.	.000	.000	.000	.004	.037	.100	.195	.356	.488	.611	.750	.832	.893	.947	.971	.2334+01	.5300+00	.014
2070.	.000	.000	.009	.056	.240	.433	.605	.768	.868	.902	.949	.970	.984	.993	.996	.8583+00	.7500+00	.001
2075.	.000	.005	.049	.141	.361	.533	.674	.807	.876	.925	.965	.982	.990	.996	.998	.6299+00	.7100+00	.001
2080.	.000	.007	.069	.194	.442	.615	.745	.861	.918	.954	.981	.990	.995	.998	.999	.4633+00	.7900+00	.005
2085.	.000	.003	.029	.112	.332	.514	.698	.811	.863	.932	.970	.984	.992	.997	.998	.6738+00	.7200+00	.003
2090.	.000	.000	.001	.013	.084	.195	.339	.531	.659	.764	.864	.915	.950	.977	.988	.1609+01	.6300+00	.018
2095.	.000	.002	.024	.100	.269	.654	.602	.748	.829	.887	.937	.960	.977	.989	.996	.7580+00	.7000+00	.015
2100.	.000	.016	.069	.241	.492	.657	.779	.880	.931	.962	.984	.992	.996	.998	.999	.4118+00	.7700+00	.000
2105.	.000	.007	.049	.157	.374	.543	.689	.930	.902	.947	.978	.989	.994	.998	.999	.5910+00	.7100+00	.002

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
2110.	.000	.009	.053	.156	.365	.530	.670	.803	.872	.920	.959	.977	.988	.995	.997	.6317+00	.6700+00	.001
2115.	.000	.016	.068	.166	.347	.491	.620	.752	.828	.885	.937	.963	.980	.991	.996	.7012+00	.5900+00	.004
2120.	.000	.022	.105	.258	.502	.662	.788	.896	.944	.971	.988	.994	.997	.999	.999	.4032+00	.7500+00	.001
2125.	.000	.018	.061	.209	.424	.574	.712	.844	.910	.952	.980	.990	.995	.998	.999	.5385+00	.6700+00	.003
2130.	.001	.051	.202	.427	.694	.821	.899	.951	.973	.986	.994	.997	.998	.999	1.000	.1962+00	.9100+00	.001
2135.	.000	.018	.075	.165	.305	.420	.539	.683	.775	.848	.916	.950	.972	.988	.994	.8021+00	.5300+00	.006
2140.	.000	.004	.028	.097	.257	.406	.555	.718	.811	.879	.938	.964	.981	.992	.996	.8842+00	.6100+00	.004
2145.	.000	.006	.044	.165	.355	.478	.677	.821	.894	.941	.976	.987	.993	.997	.999	.5910+00	.7200+00	.014
2150.	.001	.028	.110	.254	.481	.639	.760	.868	.922	.957	.981	.991	.995	.998	.999	.4294+00	.7100+00	.003
2155.	.000	.012	.061	.170	.373	.537	.684	.830	.902	.947	.977	.988	.996	.998	.999	.6124+00	.6600+00	.004
2160.	.000	.011	.061	.175	.382	.537	.670	.802	.871	.920	.961	.979	.989	.995	.998	.6031+00	.6700+00	.003
2165.	.004	.059	.167	.320	.531	.663	.767	.865	.913	.949	.976	.987	.993	.997	.999	.3688+00	.6900+00	.015
2170.	.011	.120	.298	.500	.718	.822	.889	.942	.967	.982	.993	.996	.998	.999	1.000	.1824+00	.8200+00	.001
2175.	.056	.280	.501	.648	.849	.911	.946	.972	.984	.992	.996	.998	.999	1.000	1.000	.9558-01	.8700+00	.003
2180.	.037	.214	.415	.604	.783	.861	.910	.952	.973	.985	.994	.997	.998	.999	1.000	.1332+00	.8200+00	.001
2185.	.004	.050	.147	.291	.505	.649	.763	.869	.921	.956	.981	.990	.995	.998	.999	.4176+00	.6600+00	.003
2190.	.037	.197	.371	.538	.717	.812	.879	.936	.962	.979	.991	.995	.998	.999	1.000	.1816+00	.7400+00	.005
2195.	.065	.304	.532	.717	.869	.929	.960	.983	.991	.996	.998	.999	1.000	1.000	1.000	.7775-01	.9100+00	.000
2200.	.042	.212	.404	.587	.769	.855	.911	.957	.977	.988	.995	.998	.999	1.000	1.000	.1500+00	.7800+00	.000
2205.	.003	.048	.148	.297	.515	.658	.770	.872	.923	.956	.981	.990	.995	.999	.999	.3900+00	.6900+00	.006
2210.	.001	.025	.098	.228	.451	.615	.749	.870	.925	.959	.983	.991	.995	.998	.999	.4833+00	.6800+00	.004
2215.	.050	.224	.402	.572	.751	.841	.906	.956	.976	.988	.995	.997	.999	.999	1.000	.1653+00	.7400+00	.001
2220.	.118	.407	.638	.807	.930	.969	.985	.994	.997	.999	.999	1.000	1.000	1.000	1.000	.4672-01	.9800+00	.001
2225.	.062	.255	.449	.627	.799	.882	.934	.971	.985	.992	.997	.998	.999	1.000	1.000	.1317+00	.7800+00	.000
2230.	.020	.136	.299	.480	.688	.797	.872	.935	.964	.981	.992	.996	.998	.999	1.000	.2248+00	.7300+00	.000
2235.	.028	.162	.333	.514	.717	.823	.899	.950	.973	.986	.994	.997	.999	.999	1.000	.1981+00	.7400+00	.001
2240.	.102	.348	.556	.722	.866	.927	.960	.983	.991	.996	.998	.999	1.000	1.000	1.000	.8223-01	.8500+00	.000
2245.	.137	.473	.639	.798	.914	.955	.976	.989	.995	.997	.999	.999	1.000	1.000	1.000	.4272-01	.9800+00	.005
2250.	.074	.289	.494	.672	.829	.899	.943	.974	.987	.993	.997	.999	.999	1.000	1.000	.1095+00	.8100+00	.000
2255.	.096	.319	.547	.713	.856	.917	.954	.980	.989	.995	.998	.999	.999	1.000	1.000	.9163-01	.8300+00	.002
2260.	.137	.410	.618	.711	.848	.889	.978	.991	.994	.997	.999	.999	1.000	1.000	1.000	.7676-01	.8300+00	.008
2265.	.216	.517	.741	.815	.960	.983	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.3596-01	.9600+00	.004
2270.	.135	.398	.605	.764	.888	.937	.965	.985	.992	.996	.998	.999	1.000	1.000	1.000	.6935-01	.8600+00	.000
2275.	.145	.420	.621	.783	.904	.948	.972	.988	.994	.997	.999	.999	1.000	1.000	1.000	.6180-01	.8800+00	.000
2280.	.146	.327	.590	.792	.883	.914	.960	.987	.991	.997	.999	.999	1.000	1.000	1.000	.9302-01	.7800+00	.040
2285.	.160	.370	.668	.814	.923	.981	.990	.992	.998	.998	.999	1.000	1.000	1.000	1.000	.7115-01	.8200+00	.043
2290.	.200	.411	.715	.852	.941	.971	.985	.996	.997	.998	.999	1.000	1.000	1.000	1.000	.5476-01	.8700+00	.034

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
2295.	[illegible]	[illegible]	[illegible]	.767	.857	.963	.969	.987	.991	.997	.999	.999	1.000	1.000	1.000	.5890-01	.8800+00	.001
2300.	[illegible]	[illegible]	[illegible]	.812	.917	.958	.977	.990	.995	.997	.999	.999	1.000	1.000	1.000	.5725-01	.8600+00	.007
2305.	[illegible]	.479	[illegible]	.825	.931	.966	.991	.993	.997	.998	.999	1.000	1.000	1.000	1.000	.4642-01	.9200+00	.001
2310.	.257	[illegible]	.776	[illegible]	.977	.989	.995	.999	.999	.999	1.000	1.000	1.000	1.000	1.000	.2243-01	.1050+01	.001
2315.	[illegible]	[illegible]	[illegible]	[illegible]	.944	.972	.980	.994	.997	.998	.999	1.000	1.000	1.000	1.000	.3120-01	.9800+00	.001
2320.	[illegible]	[illegible]	.747	.873	.954	.978	.984	.995	.999	.999	1.000	1.000	1.000	1.000	1.000	.3106-01	.9700+00	.001
2325.	[illegible]	[illegible]	.741	[illegible]	.950	.985	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2460-01	.1040+01	.003
2330.	[illegible]	[illegible]	.731	[illegible]	.948	.974	.987	.994	.997	.997	.997	1.000	1.000	1.000	1.000	.3638-01	.9300+00	.001
2335.	[illegible]	[illegible]	.703	[illegible]	.924	.962	.980	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.4204-01	.9100+00	.000
2340.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.973	.986	.996	.997	.999	.999	1.000	1.000	1.000	1.000	.3534-01	.9500+00	.001
2345.	[illegible]	[illegible]	.796	[illegible]	.914	.964	.973	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.1414-01	.1150+01	.007
2350.	[illegible]	[illegible]	.811	.921	.940	.991	.996	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2659-01	.9300+00	.004
2355.	[illegible]	.613	[illegible]	.902	.970	.986	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.2256-01	.1020+01	.001
2360.	[illegible]	[illegible]	.771	[illegible]	.967	.965	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1923-01	.1120+01	.000
2365.	[illegible]	[illegible]	.615	.755	.884	.910	.941	.972	.984	.992	.997	.998	.999	1.000	1.000	.7206-01	.8000+00	.010
2370.	[illegible]	[illegible]	.751	[illegible]	.925	.957	.980	.995	.997	.998	.999	.999	1.000	1.000	1.000	.3373-01	.9400+00	.002
2375.	[illegible]	[illegible]	.867	[illegible]	.980	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8693-02	.1210+01	.002
2380.	[illegible]	[illegible]	[illegible]	[illegible]	.983	.992	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1476-01	.1100+01	.001
2385.	[illegible]	[illegible]	[illegible]	[illegible]	.988	.996	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1555-01	.1080+01	.001
2390.	[illegible]	[illegible]	.772	[illegible]	.928	.965	.978	.990	.995	.997	.999	.999	1.000	1.000	1.000	.3192-01	.9600+00	.002
2395.	[illegible]	[illegible]	[illegible]	[illegible]	.961	.979	.987	.995	.998	.999	.999	1.000	1.000	1.000	1.000	.1457-01	.1120+01	.003
2400.	[illegible]	[illegible]	[illegible]	[illegible]	.937	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9965-02	.1160+01	.001
2405.	[illegible]	.711	[illegible]	[illegible]	.977	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1496-01	.1060+01	.004
2410.	[illegible]	[illegible]	[illegible]	[illegible]	.950	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2165-01	.9900+00	.007
2415.	[illegible]	[illegible]	[illegible]	[illegible]	.920	.962	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.2156-01	.1000+01	.002
2420.	[illegible]	.723	[illegible]	[illegible]	.995	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8016-02	.1210+01	.003
2425.	[illegible]	.711	[illegible]	[illegible]	.984	.995	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1094-01	.1150+01	.001
2430.	[illegible]	.471	[illegible]	.775	.872	.915	.946	.973	.985	.992	.997	.998	.999	1.000	1.000	.6548-01	.8100+00	.005
2435.	[illegible]	.510	.740	.855	.921	.944	.971	.986	.992	.996	.998	.999	1.000	1.000	1.000	.5002-01	.8300+00	.009
2440.	[illegible]	[illegible]	.84?	[illegible]	.989	.991	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1400-01	.1080+01	.001
2445.	[illegible]	.713	[illegible]	.954	.992	.990	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8635-02	.1180+01	.001
2450.	[illegible]	.676	.811	[illegible]	.960	.978	.988	.995	.997	.999	.999	1.000	1.000	1.000	1.000	.1854-01	.1030+01	.000
2455.	[illegible]	.532	.744	.857	.929	.968	.977	.990	.995	.997	.999	.999	1.000	1.000	1.000	.3651-01	.9000+00	.000
2460.	.461	.713	[illegible]	.951	.991	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8924-02	.1170+01	.001
2465.	.427	.711	[illegible]	.951	.990	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1115-01	.1110+01	.002
2470.	.475	.73?	.867	[illegible]	.982	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6840-02	.1200+01	.000
2475.	.347	.703	[illegible]	.93?	.950	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1033-01	.1150+01	.002

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	0.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	1/(PR.CM.) A	B	ERROR
2480.	.536	.697	.835	.912	.967	.985	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.1712-01	.1020+01	.000
2485.	.536	.741	.867	.962	.992	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8246-02	.1180+01	.001
2490.	.544	.749	.890	.961	.991	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8053-02	.1180+01	.001
2495.	.541	.758	.840	.967	.992	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1066-01	.1110+01	.003
2500.	.538	.706	.861	.945	.965	.934	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1202-01	.1110+01	.001
2505.	.520	.731	.871	.955	.989	.996	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9903-02	.1140+01	.001
2510.	.550	.754	.844	.965	.997	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7334-02	.1200+01	.001
2515.	.545	.750	.891	.964	.982	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1036-01	.1080+01	.001
2520.	.520	.798	.862	.959	.991	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4326-02	.1350+01	.001
2525.	.531	.741	.800	.960	.991	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8355-02	.1180+01	.001
2530.	.540	.781	.880	.993	.997	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5080-02	.1300+01	.002
2535.	.524	.735	.818	.950	.990	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1355-01	.1060+01	.003
2540.	.466	.717	.867	.951	.987	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1393-01	.1030+01	.002
2545.	.541	.715	.890	.991	.991	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.7883-02	.1210+01	.004
2550.	.504	.678	.822	.916	.984	.985	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	.1729-01	.1040+01	.000
2555.	.572	.674	.855	.940	.993	.996	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1399-01	.1090+01	.002
2560.	.565	.702	.857	.944	.984	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1152-01	.1130+01	.002
2565.	.548	.734	.841	.864	.932	.991	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4711-01	.5800+00	.006
2570.	.566	.709	.853	.941	.982	.992	.994	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1147-01	.1130+01	.000
2575.	.567	.808	.864	.913	.966	.984	.997	.997	.999	1.000	1.000	1.000	1.000	1.000	.3318-01	.5600+00	.003
2580.	.567	.644	.852	.940	.982	.992	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1851-01	.1010+01	.006
2585.	.541	.744	.864	.951	.990	.996	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7528-02	.1220+01	.000
2590.	.556	.649	.812	.914	.970	.984	.993	.998	.999	1.000	1.000	1.000	1.000	1.000	.1942-01	.1030+01	.000
2595.	.567	.610	.750	.874	.954	.977	.984	.996	.998	.999	1.000	1.000	1.000	1.000	.1969-01	.9000+00	.011
2600.	.547	.725	.877	.953	.987	.994	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9634-02	.1160+01	.000
2605.	.542	.732	.877	.954	.984	.995	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.8793-02	.1180+01	.000
2610.	.532	.515	.703	.840	.933	.966	.983	.994	.997	.998	.999	1.000	1.000	1.000	.4506-01	.8900+00	.001
2615.	.566	.606	.780	.891	.958	.979	.990	.996	.998	.999	1.000	1.000	1.000	1.000	.2668-01	.9700+00	.000
2620.	.566	.710	.863	.947	.984	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1061-01	.1150+01	.000
2625.	.540	.587	.757	.873	.947	.973	.987	.995	.997	.999	.999	1.000	1.000	1.000	.2435-01	.1040+01	.000
2630.	.564	.474	.683	.806	.916	.955	.987	.991	.996	.998	.999	1.000	1.000	1.000	.5313-01	.8700+00	.001
2635.	.572	.698	.854	.941	.982	.992	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1147-01	.1140+01	.000
2640.	.494	.705	.809	.947	.984	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.2475-01	.8600+00	.005
2645.	.178	.431	.618	.770	.893	.943	.973	.988	.994	.997	.999	.999	1.000	1.000	.7290-01	.8100+00	.001
2650.	.524	.485	.771	.898	.914	.955	.977	.991	.995	.998	.999	1.000	1.000	1.000	.3502-01	.9700+00	.016
2655.	.554	.718	.865	.944	.984	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8120-02	.1240+01	.000
2660.	.524	.485	.671	.808	.916	.955	.977	.991	.995	.998	.999	1.000	1.000	1.000	.5564-01	.8500+00	.001

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

P/(RP,CM.)	A	B	ERROR
.6118-01	.8200+00		.001
.9978-02	.1180+01		.000
.3866-01	.9300+00		.005
.8437-01	.7100+00		.009
.1059-01	.1150+01		.000
.2408-01	.1010+01		.000
.4936-01	.9000+00		.001
.2706-01	.1000+01		.000
.4323-01	.9800+00		.005
.8512-01	.8700+00		.004
.1805+00	.7400+00		.023
.4431+00	.6600+00		.052
.3786+00	.5700+00		.049
.1048-01	.9300+00		.003
.3818-01	.9500+00		.001
.6279-01	.8800+00		.003
.2853-01	.1000+01		.000
.3144-01	.9900+00		.000
.5053-01	.8900+00		.000
.2218-01	.1050+01		.000
.2850-01	.1010+01		.001
.1238+00	.6800+00		.031
.3336-01	.9400+00		.000
.1981-01	.1060+01		.000
.2000+00	.6400+00		.026
.1158+00	.7600+00		.001
.1471+00	.7200+00		.005
.1951+00	.7200+00		.023
.3363-01	.1010+01		.002
.8106-01	.8200+00		.001
.1914+00	.7200+00		.036
.4676-01	.9200+00		.003
.8440-01	.8200+00		.002
.7691-01	.8500+00		.000
.8243-01	.8400+00		.001
.1460+00	.8000+00		.008
.9585-01	.8500+00		.008

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	0.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	A	B	ERROR
2850.	.074	.890	.515	.697	.860	.926	.963	.985	.993	.996	.999	.999	1.000	1.000	1.000	.9804-01	.8400+00	.006
2855.	.119	.358	.565	.723	.861	.921	.958	.983	.991	.996	.998	.999	1.000	1.000	1.000	.8250-01	.8400+00	.006
2860.	.072	.287	.494	.663	.830	.902	.947	.978	.989	.994	.998	.999	.999	1.000	1.000	.1066+00	.8200+00	.006
2865.	.057	.384	.533	.770	.878	.935	.968	.987	.994	.997	.999	.999	1.000	1.000	1.000	.4162-01	.1046+01	.011
2870.	.147	.450	.673	.822	.929	.964	.983	.994	.997	.998	.999	1.000	1.000	1.000	1.000	.4157-01	.9800+00	.008
2875.	.055	.218	.443	.631	.808	.887	.937	.973	.986	.991	.997	.999	.999	1.000	1.000	.1369+00	.7800+00	.010
2880.	.029	.169	.347	.528	.717	.814	.894	.945	.970	.984	.994	.997	.998	.999	1.000	.1952+00	.7400+00	.011
2885.	.074	.306	.514	.685	.834	.899	.942	.974	.986	.991	.997	.999	.999	1.000	1.000	.9908-01	.8300+00	.006
2890.	.044	.239	.451	.648	.825	.900	.946	.978	.989	.996	.998	.999	.999	1.000	1.000	.1123+00	.8500+00	.006
2895.	.029	.150	.372	.564	.797	.847	.991	.991	.991	.999	.999	.999	.999	.999	1.000	.1697+00	.7800+00	.013
2900.	.028	.181	.368	.551	.734	.826	.890	.946	.970	.984	.993	.997	.998	.999	1.000	.1643+00	.7800+00	.013
2905.	.005	.088	.226	.395	.594	.716	.805	.891	.915	.964	.983	.992	.996	.998	.999	.2484+00	.7800+00	.013
2910.	.007	.098	.254	.439	.655	.772	.854	.926	.958	.977	.991	.995	.998	.999	1.000	.2244+00	.6800+00	.013
2915.	.022	.160	.349	.540	.735	.828	.890	.941	.967	.982	.992	.996	.998	.999	1.000	.1732+00	.7900+00	.011
2920.	.009	.100	.289	.455	.662	.773	.851	.918	.951	.973	.988	.996	.997	.999	.999	.2141+00	.7700+00	.013
2925.	.007	.070	.204	.304	.580	.687	.779	.866	.923	.947	.976	.987	.993	.997	.999	.3601+00	.6700+00	.013
2930.	.005	.063	.183	.337	.540	.665	.767	.855	.905	.942	.973	.986	.993	.997	.998	.3549+00	.6900+00	.013
2935.	.014	.143	.345	.559	.769	.867	.926	.969	.984	.992	.997	.998	.999	1.000	1.000	.1476+00	.6800+00	.013
2940.	.011	.114	.289	.487	.707	.808	.877	.912	.957	.974	.988	.994	.997	.998	.999	.2046+00	.7900+00	.006
2945.	.000	.009	.058	.167	.373	.571	.650	.781	.854	.909	.957	.973	.988	.993	.999	.5926+00	.6900+00	.016
2950.	.000	.000	.048	.156	.363	.518	.647	.777	.868	.902	.951	.973	.986	.994	.997	.6451+00	.6700+00	.015
2955.	.005	.060	.172	.327	.514	.662	.754	.850	.897	.911	.965	.980	.989	.996	.998	.3836+00	.8700+00	.013
2960.	.006	.098	.284	.503	.735	.841	.909	.960	.979	.989	.996	.998	.999	1.000	1.000	.1783+00	.8700+00	.006
2965.	.001	.024	.092	.215	.426	.577	.700	.818	.877	.919	.958	.976	.987	.999	.999	.5218+00	.6600+00	.006
2970.	.000	.014	.076	.207	.432	.586	.707	.870	.876	.917	.956	.975	.986	.994	.997	.5073+00	.7100+00	.006
2975.	.000	.001	.011	.061	.210	.357	.500	.660	.753	.827	.901	.941	.968	.986	.993	.1019+01	.6400+00	.017
2980.	.001	.036	.148	.323	.556	.694	.792	.877	.917	.945	.970	.982	.990	.996	.998	.3138+00	.7900+00	.013
2985.	.001	.046	.179	.384	.645	.788	.880	.948	.973	.986	.995	.997	.999	.999	1.000	.2296+00	.8700+00	.003
2990.	.001	.019	.077	.192	.385	.546	.669	.788	.850	.896	.940	.964	.980	.991	.996	.6129+00	.6200+00	.003
2995.	.006	.090	.240	.431	.637	.746	.824	.890	.924	.947	.970	.987	.990	.996	.998	.2403+00	.7800+00	.020
3000.	.014	.167	.410	.646	.898	.925	.964	.987	.994	.997	.999	1.000	1.000	1.000	1.000	.9264-01	.9800+00	.006
3005.	.006	.107	.216	.576	.760	.866	.927	.970	.985	.993	.997	.999	.999	1.000	1.000	.1764+00	.8600+00	.009
3010.	.001	.018	.079	.198	.407	.559	.684	.806	.869	.914	.955	.974	.986	.994	.997	.6130+00	.6200+00	.015
3015.	.000	.021	.091	.216	.415	.558	.676	.742	.857	.905	.950	.972	.985	.994	.997	.5620+00	.6400+00	.019
3020.	.000	.000	.005	.038	.173	.324	.478	.652	.756	.839	.917	.953	.975	.990	.995	.1127+01	.6700+00	.009
3025.	.000	.000	.002	.017	.107	.215	.366	.578	.700	.800	.896	.942	.969	.987	.993	.1492+01	.6200+00	.009
3030.	.000	.000	.000	.007	.067	.163	.301	.497	.631	.745	.859	.918	.955	.981	.990	.1815+01	.6200+00	.013

UNCLASSIFIED

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WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

KM/A	30.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	R	ERROR
3030.	.000	.000	.000	.002	.030	.094	.149	.378	.520	.654	.802	.883	.936	.972	.986	.2388+01	.5900+00	.020
3040.	.000	.000	.000	.002	.207	.474	.667	.796	.857	.903	.949	.971	.984	.994	.997	.4747+00	.7700+00	.054
3045.	.000	.000	.019	.014	.431	.668	.760	.877	.923	.953	.977	.988	.994	.997	.998	.3817+00	.7800+00	.003
3050.	.000	.000	.017	.015	.514	.680	.812	.919	.960	.978	.988	.994	.997	.998	.998	.5719+00	.7200+00	.016
3055.	.000	.000	.010	.016	.485	.680	.760	.857	.903	.934	.962	.976	.987	.994	.997	.4163+00	.8000+00	.011
3060.	.000	.000	.011	.013	.229	.543	.706	.796	.861	.920	.951	.972	.988	.994	.994	.9630+00	.6600+00	.018
3065.	.000	.000	.011	.011	.063	.391	.544	.638	.663	.755	.849	.903	.943	.974	.987	.1289+01	.5600+00	.032
3070.	.000	.000	.011	.008	.047	.252	.364	.552	.712	.794	.856	.915	.946	.969	.986	.8015+00	.6800+00	.065
3075.	.000	.000	.007	.002	.026	.152	.264	.430	.512	.712	.794	.856	.915	.946	.969	.4403+00	.8300+00	.001
3080.	.000	.000	.005	.001	.012	.088	.191	.345	.445	.579	.725	.853	.915	.946	.969	.7516+00	.6600+00	.070
3085.	.000	.000	.004	.000	.006	.050	.128	.244	.344	.505	.697	.779	.877	.937	.969	.7839+00	.7200+00	.106
3090.	.000	.000	.001	.000	.003	.026	.083	.161	.261	.411	.540	.681	.766	.861	.920	.951	.972	.988	.994	.9630+00	.6600+00	.018
3095.	.000	.000	.000	.000	.002	.013	.052	.099	.161	.328	.459	.599	.694	.794	.861	.920	.951	.972	.988	.994	.994	.9630+00	.6600+00	.018
3100.	.000	.000	.000	.000	.000	.006	.032	.060	.099	.185	.365	.517	.663	.755	.849	.903	.943	.974	.987	.1289+01	.5600+00	.032
3105.	.000	.000	.000	.000	.000	.003	.018	.032	.060	.108	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3110.	.000	.000	.000	.000	.000	.001	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3115.	.000	.000	.000	.000	.000	.000	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3120.	.000	.000	.000	.000	.000	.000	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3125.	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3130.	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3135.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3140.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3145.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3150.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3155.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3160.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3165.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3170.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3175.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3180.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3185.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3190.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3195.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065
3200.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.004	.009	.018	.032	.060	.118	.242	.447	.596	.712	.794	.856	.915	.946	.969	.994	.8015+00	.6800+00	.065

UNCLASSIFIED

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WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

P (PR.CM.)	A	B	ERROR
.5600+00	.3443+01	.5600+00	.014
.5600+00	.1981+01	.5600+00	.071
.6900+00	.1579+01	.6900+00	.084
.6700+00	.9264+00	.6700+00	.030
.7700+00	.6933+00	.7700+00	.023
.6600+00	.1515+01	.6600+00	.078
.6900+00	.1266+01	.6900+00	.054
.6700+00	.1308+01	.6700+00	.070
.6000+00	.2364+01	.6000+00	.007
.6300+00	.2515+01	.6300+00	.008
.6700+00	.1478+01	.6700+00	.005
.6600+00	.1764+01	.6600+00	.008
.7800+00	.8225+00	.7800+00	.001
.6000+00	.1869+01	.6000+00	.059
.5800+00	.3425+01	.5800+00	.009
.6900+00	.1260+01	.6900+00	.028
.7700+00	.9805+00	.7600+00	.011
.7600+00	.1069+01	.7600+00	.032
.7700+00	.1046+01	.7700+00	.024
.7400+00	.9979+00	.7400+00	.012
.6000+00	.2362+01	.6000+00	.003
.6500+00	.1726+01	.6500+00	.055
.7000+00	.1714+01	.7000+00	.002
.6300+00	.1984+01	.6300+00	.026
.6700+00	.1868+01	.6700+00	.024
.7600+00	.1555+01	.7600+00	.008
.7000+00	.1872+01	.7000+00	.016
.6400+00	.2206+01	.6400+00	.007
.7600+00	.1458+01	.7600+00	.001
.6900+00	.1680+01	.6900+00	.008
.7100+00	.1576+01	.7100+00	.007
.7100+00	.2191+01	.7100+00	.027
.7000+00	.1608+01	.7000+00	.035

UNCLASSIFIED

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WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

KAYS	10.000	2.000	1.000	0.600	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	I((DP.CM.) A	R	ERROR
340.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
341.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
342.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
343.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
344.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
345.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
346.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
347.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
348.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
349.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
350.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.1816+01	.6500+00	.004
351.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
352.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
353.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
354.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
355.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
356.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
357.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
358.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
359.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
360.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
361.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
362.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
363.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
364.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
365.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
366.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
367.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
368.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
369.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
370.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
371.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
372.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
373.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
374.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
375.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
376.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
377.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
378.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
379.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
380.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
381.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
382.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
383.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
384.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
385.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
386.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
387.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
388.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001
389.	.000	.006	.054	.166	.247	.536	.671	.785	.865	.911	.944	.971	.984	.2037+01	.6200+00	.001

UNCLASSIFIED

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	0.0	20.0	10.0	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	A	B	ERROR
3540.	.000	.000	.000	.028	.000	.000	.000	.007	.041	.117	.270	.404	.638	.695	.702	.1272+02	.5900+00	.047
3555.	.000	.000	.000	.000	.000	.000	-.000	.003	.038	.109	.267	.401	.592	.697	.741	.1688+02	.6700+00	.200 ***
3600.	.000	.000	.000	.000	.000	.000	.000	.000	.045	.120	.280	.411	.542	.696	.788	.1101+02	.5500+00	.081
3615.	.000	.000	.000	.000	.000	.000	.000	.000	.073	.160	.291	.406	.515	.648	.749	.7463+01	.4600+00	.084 ***
3630.	.000	.000	.000	.000	.000	.000	-.000	.000	.100	.200	.300	.400	.500	.600	.700	.5666+01	.4000+00	.015
3645.	.000	.000	.000	.000	.000	.000	.000	-.000	.102	.202	.294	.390	.485	.582	.683	.5332+01	.3800+00	.017 ***
3660.	.000	.000	.000	.000	.000	.000	.000	.000	.100	.200	.300	.400	.500	.600	.700	.5666+01	.4000+00	.015
3675.	.000	.000	.000	.000	.000	.000	.000	.000	.112	.237	.359	.474	.601	.695	.796	.7990+01	.5400+00	.046
3690.	.000	.000	.000	.000	.000	.000	.000	.000	.115	.254	.413	.545	.696	.785	.885	.6862+01	.5300+00	.032
3705.	.000	.000	.000	.000	.000	.000	.000	.000	.077	.177	.403	.540	.688	.780	.866	.7914+01	.5300+00	.114
3720.	.000	.000	.000	.000	.000	.000	.000	.000	.040	.101	.375	.514	.650	.752	.825	.1115+02	.5700+00	.250
3735.	.000	.000	.000	.000	.000	.000	.000	.000	.014	.039	.314	.508	.632	.755	.826	.1234+02	.6100+00	.070
3750.	.000	.000	.000	.000	.000	.000	.000	.000	.011	.040	.128	.367	.508	.632	.755	.1188+02	.6100+00	.028
3765.	.000	.000	.000	.000	.000	.000	.000	.000	.012	.048	.164	.348	.491	.608	.753	.1283+02	.5900+00	.016
3780.	.000	.000	.000	.000	.000	.000	.000	.000	.007	.035	.124	.241	.423	.554	.713	.1663+02	.6200+00	.033
3795.	.000	.000	.000	.000	.000	.000	.000	.000	.002	.021	.079	.225	.367	.512	.678	.1521+02	.6100+00	.002
3810.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.024	.069	.248	.396	.539	.699	.1542+02	.6400+00	.087
3825.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.029	.107	.283	.435	.574	.725	.1548+02	.6400+00	.156
3840.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.027	.102	.275	.424	.563	.714	.2075+02	.7800+00	.156
3855.	.000	.000	.000	.000	.000	.000	.000	.000	.003	.024	.091	.252	.397	.536	.692	.1509+02	.6300+00	.016
3870.	.000	.000	.000	.000	.000	.000	.000	.000	.003	.020	.077	.223	.362	.501	.666	.1519+02	.5900+00	.006
3885.	.000	.000	.000	.000	.000	.000	.000	.000	.002	.016	.065	.197	.331	.472	.645	.1576+02	.5800+00	.003
3900.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.016	.065	.196	.333	.475	.650	.1569+02	.5800+00	.002
3915.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.016	.065	.196	.333	.475	.650	.1569+02	.5800+00	.002
3930.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.012	.055	.181	.319	.467	.653	.1707+02	.5900+00	.001
3945.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.008	.041	.159	.294	.446	.633	.1746+02	.5700+00	.032
3960.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.004	.027	.124	.252	.408	.552	.2189+02	.6000+00	.145
3975.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.014	.087	.201	.352	.461	.2911+02	.6300+00	.066
3990.	.000	.000	.000	.000	.000	.000	.000	-.000	.000	.000	.006	.054	.141	.269	.416	.2857+02	.5800+00	.014 ***
4005.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.027	.084	.183	.365	.3415+02	.5700+00	.006
4020.	.000	.000	.000	.000	.000	.000	.000	.000	.000	-.000	.000	.012	.042	.107	.251	.3153+02	.5000+00	.001 ***
4035.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005	.019	.058	.153	.2968+02	.4800+00	.006
4050.	.000	.000	.000	.000	.000	.000	.000	.000	.000	-.000	-.001	.001	.016	.053	.134	.3118+02	.4800+00	.015 ***
4065.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.015	.049	.101	.2770+02	.4700+00	.182
4080.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.021	.077	.150	.3489+02	.4400+00	.078
4095.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.012	.052	.161	.278	.397	.1699+02	.5700+00	.118
4110.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.026	.095	.257	.408	.1590+02	.6300+00	.023
4125.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.006	.044	.143	.355	.1577+02	.7000+00	.002

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

U(PR.CM.)

FREQ.	0.001	0.002	0.005	0.010	0.020	0.050	0.100	0.200	0.400	1.000	2.000	5.000	10.00	20.00	A	R	ERROR
3770.	.914	.853	.725	.586	.420	.189	.065	.011	.000	.000	.000	.000	.000	.000	.1442+02	.7200+00	.001
3780.	.905	.852	.742	.620	.467	.228	.086	.016	.000	.000	.000	.000	.000	.000	.1332+02	.7300+00	.003
3790.	.903	.852	.748	.632	.471	.240	.101	.021	-.000	.000	.000	.000	.000	.000	.1222+02	.7200+00	.004 ***
3800.	.899	.847	.745	.632	.465	.261	.112	.026	.000	.000	.000	.000	.000	.000	.1118+02	.7000+00	.006
3810.	.896	.844	.742	.630	.467	.269	.121	.030	.000	.000	.000	.000	.000	.000	.1035+02	.6800+00	.007
3820.	.897	.847	.747	.637	.495	.276	.127	.034	.001	.000	.000	.000	.000	.000	.1147+02	.7400+00	.033
3830.	.872	.810	.689	.561	.407	.198	.081	.020	.001	.000	.000	.000	.000	.000	.1071+02	.6300+00	.001
3840.	.902	.719	.672	.432	.280	.108	.032	.003	.000	.000	.000	.000	.000	.000	.1716+02	.6800+00	.054
3850.	.750	.665	.505	.362	.219	.073	.017	.002	.000	.000	.000	.000	.000	.000	.1657+02	.6100+00	.006
3860.	.742	.643	.476	.334	.202	.069	.017	.001	.000	.000	.000	.000	.000	.000	.1929+02	.6500+00	.140
3870.	.737	.633	.459	.413	.175	.048	.009	.001	.000	.000	.000	.000	.000	.000	.1865+02	.6100+00	.087
3880.	.733	.627	.451	.304	.168	.045	.008	.001	.000	.000	.000	.000	.000	.000	.1775+02	.5800+00	.036
3890.	.726	.619	.443	.299	.167	.051	.011	.001	.000	.000	.000	.000	.000	.000	.1788+02	.5900+00	.003
3900.	.744	.639	.464	.316	.177	.051	.011	.001	.000	.000	.000	.000	.000	.000	.1808+02	.6000+00	.003
3910.	.754	.651	.482	.339	.204	.073	.022	.004	.000	.000	.000	.000	.000	.000	.1317+02	.5400+00	.003
3920.	.796	.706	.554	.420	.281	.121	.043	.009	.000	.000	.000	.000	.000	.000	.1176+02	.5700+00	.001
3930.	.846	.772	.639	.509	.361	.171	.069	.017	.001	.000	.000	.000	.000	.000	.1042+02	.5900+00	.003
3940.	.862	.795	.676	.560	.427	.244	.131	.050	.005	.000	.000	.000	.000	.000	.7851+01	.5800+00	.016
3950.	.872	.808	.690	.575	.441	.255	.134	.051	.005	.000	.000	.000	.000	.000	.7909+01	.5900+00	.012
3960.	.877	.816	.704	.595	.469	.294	.177	.078	.012	.001	.000	.000	.000	.000	.6825+01	.5900+00	.045
3970.	.898	.844	.746	.649	.532	.358	.222	.104	.016	.001	.000	.000	.000	.000	.6803+01	.6600+00	.092
3980.	.927	.886	.807	.725	.623	.459	.322	.188	.059	.014	.000	.000	.000	.000	.4434+01	.6200+00	.067
3990.	.947	.913	.846	.774	.681	.523	.383	.240	.085	.021	.000	.000	.000	.000	.3950+01	.6400+00	.031
4000.	.955	.924	.861	.794	.704	.550	.410	.263	.094	.024	.000	.000	.000	.000	.3857+01	.6700+00	.047
4010.	.959	.930	.870	.807	.725	.585	.457	.320	.148	.056	.011	.002	.000	.000	.2949+01	.6000+00	.014
4020.	.982	.967	.920	.884	.821	.701	.561	.458	.236	.108	.032	.006	.001	.000	.2219+01	.6400+00	.003
4030.	.986	.974	.943	.905	.851	.746	.641	.515	.315	.172	.072	.017	.003	.000	.1703+01	.6600+00	.030
4040.	.993	.987	.960	.944	.905	.825	.734	.617	.419	.251	.107	.029	.005	.000	.1402+01	.7100+00	.008
4050.	.994	.990	.975	.955	.925	.857	.778	.674	.469	.323	.162	.048	.009	.001	.1097+01	.7500+00	.026
4060.	.997	.995	.987	.975	.954	.901	.833	.736	.566	.426	.246	.089	.019	.002	.9501+00	.7300+00	.001
4070.	.998	.996	.991	.982	.967	.928	.876	.798	.646	.496	.310	.134	.035	.004	.8219+00	.8000+00	.051
4080.	.999	.998	.996	.992	.985	.963	.920	.848	.736	.596	.407	.223	.069	.011	.6710+00	.8600+00	.011
4090.	.999	.999	.997	.993	.987	.968	.940	.884	.796	.682	.497	.312	.111	.022	.4520+00	.8100+00	.001
4100.	1.000	1.000	.999	.997	.994	.985	.970	.935	.840	.750	.582	.397	.167	.033	.3136+00	.8900+00	.000
4110.	1.000	1.000	.999	.999	.997	.992	.983	.959	.868	.798	.648	.468	.228	.054	.2435+00	.9200+00	.001
4120.	1.000	1.000	1.000	.999	.998	.995	.988	.971	.894	.834	.707	.534	.289	.077	.1999+00	.9500+00	.001
4130.	1.000	1.000	1.000	1.000	.999	.996	.991	.979	.916	.864	.756	.596	.350	.102	.1682+00	.9600+00	.001

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	0.00	10.00	20.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	!!(PR.CM.) A	R	ERROR
4120.	.061	.055	.267	.474	.744	.866	.939	.981	.993	.997	.999	1.000	1.000	1.000	1.000	.1618+00	.9600+00	.003
4130.	.062	.074	.271	.525	.765	.890	.953	.987	.995	.998	1.000	1.000	1.000	1.000	1.000	.1401+00	.9700+00	.005
4140.	.063	.064	.311	.563	.807	.902	.959	.990	.996	.999	1.000	1.000	1.000	1.000	1.000	.1163+00	.1000+01	.001
4150.	.064	.116	.345	.596	.820	.914	.964	.992	.997	1.000	1.000	1.000	1.000	1.000	1.000	.9826-01	.1030+01	.001
4160.	.066	.134	.371	.618	.831	.920	.967	.993	.998	1.000	1.000	1.000	1.000	1.000	1.000	.9460-01	.1020+01	.001
4170.	.069	.156	.401	.642	.851	.927	.971	.994	.998	1.000	1.000	1.000	1.000	1.000	1.000	.8715-01	.1020+01	.001
4180.	.072	.173	.423	.659	.860	.932	.973	.995	.998	1.000	1.000	1.000	1.000	1.000	1.000	.8189-01	.1020+01	.001
4190.	.075	.189	.442	.673	.867	.936	.975	.995	.998	1.000	1.000	1.000	1.000	1.000	1.000	.7776-01	.1020+01	.001
4200.	.079	.208	.464	.689	.875	.941	.977	.995	.998	1.000	1.000	1.000	1.000	1.000	1.000	.7335-01	.1020+01	.002
4210.	.083	.227	.484	.704	.882	.945	.979	.995	.998	1.000	1.000	1.000	1.000	1.000	1.000	.6718-01	.1030+01	.001
4220.	.087	.242	.500	.716	.887	.949	.981	.996	.998	1.000	1.000	1.000	1.000	1.000	1.000	.6431-01	.1030+01	.001
4230.	.092	.259	.517	.729	.892	.953	.982	.996	.998	1.000	1.000	1.000	1.000	1.000	1.000	.6128-01	.1030+01	.001
4240.	.098	.279	.537	.743	.899	.957	.985	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5616-01	.1030+01	.001
4250.	.105	.297	.554	.755	.904	.960	.986	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5517-01	.1030+01	.001
4260.	.111	.313	.569	.765	.908	.962	.987	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5098-01	.1040+01	.001
4270.	.118	.328	.582	.774	.912	.963	.988	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5065-01	.1030+01	.001
4280.	.124	.343	.595	.787	.916	.965	.988	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.3728-01	.1100+01	.015
4290.	.131	.360	.610	.793	.920	.967	.988	.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4357-01	.1050+01	.000
4300.	.138	.378	.625	.802	.924	.969	.990	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4281-01	.1040+01	.001
4310.	.145	.394	.637	.809	.927	.971	.991	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4118-01	.1040+01	.000
4320.	.152	.409	.650	.817	.931	.973	.992	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3809-01	.1050+01	.000
4330.	.159	.423	.661	.824	.934	.974	.992	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3395-01	.1070+01	.004
4340.	.166	.435	.671	.831	.936	.976	.992	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3547-01	.1050+01	.000
4350.	.173	.448	.680	.838	.939	.977	.993	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3423-01	.1050+01	.000
4360.	.181	.455	.685	.841	.941	.977	.993	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3348-01	.1050+01	.000
4370.	.187	.461	.691	.844	.942	.978	.993	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3276-01	.1050+01	.001
4380.	.194	.467	.693	.845	.942	.978	.992	.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3341-01	.1040+01	.000
4390.	.196	.470	.693	.844	.942	.978	.992	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3298-01	.1040+01	.000
4400.	.199	.470	.690	.841	.941	.977	.991	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.3405-01	.1030+01	.000
4410.	.199	.468	.686	.837	.939	.976	.990	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	.3896-01	.1000+01	.000
4420.	.199	.456	.672	.825	.932	.971	.988	.996	.999	1.000	1.000	1.000	1.000	1.000	1.000	.4179-01	.9800+00	.000
4430.	.199	.454	.667	.820	.928	.969	.986	.995	.998	1.000	1.000	1.000	1.000	1.000	1.000	.4515-01	.9600+00	.000
4440.	.199	.449	.661	.811	.920	.963	.983	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	.5266-01	.9300+00	.000
4450.	.199	.427	.636	.789	.904	.953	.977	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.5847-01	.9100+00	.000
4460.	.199	.411	.619	.773	.893	.944	.971	.988	.994	.997	.999	.999	1.000	1.000	1.000	.7186-01	.8700+00	.000
4470.	.199	.382	.585	.741	.864	.926	.959	.982	.991	.995	.998	.999	1.000	1.000	1.000	.8784-01	.8400+00	.001
4480.	.199	.343	.544	.705	.844	.899	.948	.977	.988	.994	.998	.999	1.000	1.000	1.000	.1034+00	.8100+00	.001
4490.	.199	.316	.514	.676	.823	.892	.935	.969	.984	.991	.997	.998	.999	1.000	1.000			

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	[illegible]	[illegible]	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
4490.	[illegible]	.257	[illegible]	.660	.812	.884	.929	.966	.962	.991	.996	.998	.999	1.000	1.000	.1123+00	.8000+00	.001
4500.	[illegible]	.313	.511	.671	.817	.886	.928	.964	.960	.989	.996	.998	.999	1.000	1.000	.1074+00	.8000+00	.001
4510.	[illegible]	.261	.467	.611	.779	.849	.901	.948	.971	.984	.993	.997	.998	.999	1.000	.1442+00	.7500+00	.002
4520.	[illegible]	.290	.375	[illegible]	.715	.808	.873	.932	.960	.978	.991	.995	.998	.999	.999	.1938+00	.7100+00	.002
4530.	[illegible]	.198	.367	.534	.713	.808	.872	.930	.958	.976	.990	.995	.997	.999	.999	.1963+00	.7200+00	.002
4540.	[illegible]	.139	[illegible]	.475	.669	.774	.847	.915	.948	.971	.987	.993	.997	.999	.999	.2327+00	.7200+00	.004
4550.	[illegible]	.155	.310	.437	.676	.778	.849	.915	.947	.969	.986	.993	.996	.998	.999	.2261+00	.7100+00	.004
4560.	[illegible]	.255	.435	.593	.754	.833	.859	.937	.960	.976	.989	.995	.997	.999	.999	.1566+00	.7300+00	.003
4570.	[illegible]	[illegible]	.473	.634	.789	[illegible]	.906	.949	.969	.982	.992	.996	.998	.999	1.000	.1269+00	.7700+00	.004
4580.	[illegible]	.268	.459	.618	.760	.834	.893	.941	.964	.989	.991	.995	.998	.999	1.000	.1519+00	.7300+00	.004
4590.	[illegible]	.335	.521	.608	.800	.871	.915	.953	.971	.983	.992	.996	.998	.999	1.000	.1186+00	.7500+00	.003
4600.	[illegible]	.344	.542	[illegible]	.834	.894	.934	.966	.981	.989	.995	.998	.999	1.000	1.000	.1101+00	.7700+00	.011
4610.	[illegible]	.266	[illegible]	.631	.768	.860	.910	.952	.972	.985	.993	.997	.998	.999	1.000	.1272+00	.7900+00	.003
4620.	[illegible]	.171	.309	.416	.595	.648	.736	.835	.899	.941	.974	.981	.993	.997	.999	.3538+00	.5600+00	.047
4630.	[illegible]	.059	.129	.274	.384	.513	.640	.785	.867	.924	.967	.983	.991	.996	.998	.6022+00	.5200+00	.036
4640.	[illegible]	.126	.246	.375	.544	.658	.757	.860	.914	.951	.978	.989	.994	.998	.999	.3675+00	.5900+00	.017
4650.	[illegible]	.140	.323	.456	.629	.727	.807	.888	.931	.961	.983	.991	.996	.998	.999	.2895+00	.6200+00	.025
4660.	[illegible]	.237	.365	.517	.609	.757	.829	.902	.940	.966	.989	.992	.996	.999	.999	.2309+00	.6100+00	.008
4670.	[illegible]	.458	[illegible]	[illegible]	.904	.949	.974	.990	.995	.998	.999	.999	1.000	1.000	1.000	.5418-01	.8900+00	.000
4680.	[illegible]	[illegible]	.667	.815	.910	.945	.965	.981	.968	.994	.997	.999	.999	1.000	1.000	.4620-01	.9200+00	.001
4690.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.767	.843	.905	.949	.965	.986	.992	.996	.998	.999	.1804+00	.6500+00	.020
4700.	[illegible]	.304	.467	[illegible]	[illegible]	.760	.858	.902	.939	.965	.984	.992	.996	.998	.999	.1897+00	.6300+00	.015
4710.	[illegible]	.375	[illegible]	.713	[illegible]	[illegible]	.941	.972	.985	.992	.997	.998	.999	1.000	1.000	.9556-01	.7800+00	.000
4720.	[illegible]	.341	[illegible]	.670	.806	.872	.918	.958	.976	.987	.995	.997	.999	1.000	1.000	.1189+00	.7400+00	.001
4730.	[illegible]	.375	[illegible]	[illegible]	.831	[illegible]	.928	.942	.970	.988	.995	.998	.999	.999	1.000	.1218+00	.6800+00	.003
4740.	[illegible]	[illegible]	.477	.614	.743	.810	.862	.915	.945	.967	.985	.992	.996	.998	.999	.1656+00	.6700+00	.011
4750.	[illegible]	.158	[illegible]	[illegible]	[illegible]	.661	.701	.850	.902	.941	.973	.986	.993	.997	.999	.3322+00	.5800+00	.014
4760.	[illegible]	.193	[illegible]	[illegible]	[illegible]	.718	.792	.872	.918	.951	.978	.988	.996	.998	.999	.2767+00	.6100+00	.020
4770.	[illegible]	[illegible]	[illegible]	.791	[illegible]	.896	.934	.968	.982	.990	.996	.998	.999	1.000	1.000	.9592-01	.8000+00	.001
4780.	[illegible]	.374	[illegible]	.712	[illegible]	.897	.953	.964	.979	.988	.995	.997	.999	1.000	1.000	.9352-01	.7900+00	.001
4790.	[illegible]	[illegible]	[illegible]	.567	[illegible]	[illegible]	.867	.923	.941	.970	.986	.993	.996	.998	.999	.1987+00	.6600+00	.003
4800.	[illegible]	[illegible]	[illegible]	.559	[illegible]	.810	.872	.926	.957	.971	.986	.993	.996	.998	.999	.1820+00	.7100+00	.004
4810.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.854	.909	.949	.962	.981	.991	.995	.998	.999	1.000	.1436+00	.7500+00	.017
4820.	[illegible]	.157	[illegible]	.419	[illegible]	.661	.773	.865	.917	.950	.977	.988	.994	.998	.999	.3296+00	.5900+00	.017
4830.	[illegible]	.112	[illegible]	.371	.541	.692	.748	.849	.905	.946	.975	.981	.993	.997	.999	.3655+00	.6100+00	.017
4840.	[illegible]	.170	[illegible]	.497	.671	.765	.817	.905	.941	.965	.986	.992	.996	.998	.999	.2314+00	.6900+00	.012
4850.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.866	.916	.952	.969	.981	.991	.995	.998	.999	1.000	.1256+00	.7500+00	.001

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	H(PR.CM.) A	B	ERROR
4860.	.113	.356	.532	.713	.846	.904	.940	.969	.981	.989	.993	.997	.999	1.000	1.000	.9886-01	.7900+00	.001
4870.	.080	.301	.449	.666	.714	.881	.925	.934	.973	.983	.991	.991	.998	.999	1.000	.1624+00	.6700+00	.015
4880.	.064	.302	.449	.668	.818	.884	.928	.962	.971	.986	.994	.997	.998	.999	1.000	.1127+00	.7900+00	.000
4890.	.048	.246	.411	.576	.711	.807	.878	.929	.954	.971	.986	.991	.996	.999	.999	.1515+00	.7700+00	.031
4900.	.048	.191	.349	.511	.710	.807	.887	.927	.949	.968	.983	.997	.998	.998	.999	.2216+00	.6700+00	.001
4910.	.062	.241	.418	.588	.754	.837	.894	.942	.964	.978	.990	.994	.997	.999	1.000	.1661+00	.7200+00	.001
4920.	.054	.210	.371	.535	.711	.806	.873	.930	.956	.974	.988	.994	.997	.999	.999	.2118+00	.6700+00	.000
4930.	.036	.178	.342	.512	.698	.799	.870	.930	.957	.974	.988	.994	.997	.999	.999	.2145+00	.7000+00	.001
4940.	.040	.183	.360	.530	.715	.809	.877	.934	.961	.970	.990	.995	.997	.999	1.000	.2079+00	.7000+00	.001
4950.	.029	.173	.339	.508	.642	.790	.862	.926	.956	.975	.989	.994	.997	.999	1.000	.2197+00	.7000+00	.010
4960.	.040	.148	.376	.552	.732	.823	.838	.931	.961	.982	.993	.996	.998	.999	1.000	.2117+00	.7000+00	.050
4970.	.041	.139	.361	.534	.709	.800	.808	.929	.959	.978	.991	.995	.998	.999	1.000	.2369+00	.6700+00	.063
4980.	.025	.145	.383	.479	.676	.778	.852	.920	.954	.975	.989	.994	.997	.999	1.000	.2384+00	.7000+00	.001
4990.	.019	.133	.244	.477	.679	.785	.858	.923	.955	.975	.990	.995	.998	.999	1.000	.2559+00	.7000+00	.024
5000.	.014	.102	.235	.399	.601	.710	.804	.892	.935	.964	.985	.992	.996	.998	.999	.3100+00	.6700+00	.003
5010.	.006	.054	.158	.303	.512	.650	.754	.867	.914	.950	.978	.988	.994	.998	.999	.4361+00	.6300+00	.003
5020.	.009	.086	.209	.367	.571	.698	.794	.881	.924	.955	.979	.989	.994	.998	.999	.3279+00	.6800+00	.008
5030.	.009	.079	.191	.336	.530	.657	.758	.856	.907	.945	.974	.986	.993	.997	.998	.3829+00	.6400+00	.010
5040.	.002	.039	.124	.260	.472	.619	.737	.847	.903	.943	.974	.986	.993	.997	.998	.4489+00	.6700+00	.015
5050.	.002	.041	.129	.264	.467	.608	.722	.831	.890	.933	.968	.981	.991	.997	.998	.4316+00	.6800+00	.032
5060.	.001	.030	.106	.234	.436	.578	.693	.814	.879	.927	.966	.982	.991	.996	.998	.4778+00	.6800+00	.050
5070.	.000	.016	.061	.211	.411	.685	.709	.828	.890	.934	.964	.984	.991	.996	.998	.5209+00	.6900+00	.006
5080.	.000	.012	.054	.150	.348	.498	.611	.769	.846	.903	.952	.974	.986	.994	.997	.7096+00	.6100+00	.003
5090.	.000	.005	.036	.117	.303	.462	.605	.753	.835	.896	.969	.972	.986	.994	.997	.7534+00	.6500+00	.005
5100.	.000	.003	.029	.107	.285	.439	.583	.733	.817	.879	.937	.964	.981	.992	.996	.7742+00	.6700+00	.021
5110.	.000	.001	.011	.054	.185	.329	.480	.654	.757	.839	.910	.948	.972	.988	.994	.1108+01	.6100+00	.003
5120.	.000	.000	.003	.027	.134	.273	.431	.623	.739	.827	.907	.947	.971	.988	.994	.1291+01	.6500+00	.007
5130.	.000	.000	.002	.019	.097	.211	.355	.553	.682	.783	.878	.926	.957	.981	.990	.1518+01	.6100+00	.014
5140.	.000	.000	.000	.004	.047	.138	.276	.485	.630	.746	.856	.911	.949	.977	.988	.1972+01	.6400+00	.002
5150.	.000	.000	.000	.004	.050	.149	.293	.498	.636	.748	.853	.906	.943	.973	.985	.1931+01	.6500+00	.004
5160.	.000	.000	.000	.001	.025	.090	.202	.390	.534	.661	.790	.860	.910	.955	.975	.2446+01	.6400+00	.035
5170.	.000	.000	.000	.000	.012	.056	.150	.331	.480	.618	.764	.844	.901	.951	.973	.2897+01	.6100+00	.002
5180.	.000	.000	.000	.000	.011	.055	.147	.320	.464	.600	.748	.830	.890	.943	.967	.2952+01	.6000+00	.007
5190.	.000	.000	.000	.000	.012	.058	.156	.339	.487	.619	.756	.831	.888	.939	.965	.2880+01	.6100+00	.004
5200.	.000	.000	.000	.000	.005	.032	.099	.256	.401	.547	.706	.796	.863	.924	.954	.3433+01	.5800+00	.002
5210.	.000	.000	.000	.000	.002	.016	.062	.190	.324	.474	.648	.751	.820	.901	.939	.4157+01	.5800+00	.003
5220.	.000	.000	.000	.000	.003	.023	.087	.244	.392	.535	.692	.782	.850	.914	.947	.3789+01	.6100+00	.004

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
5230.	.000	.000	.000	.000	.002	.020	.079	.227	.369	.511	.673	.767	.840	.908	.943	.4000+01	.6200+00	.024
5240.	.000	.000	.000	.000	.001	.014	.066	.205	.341	.443	.651	.752	.829	.901	.938	.4394+01	.6300+00	.073
5250.	.000	.000	.000	.000	.001	.016	.074	.228	.372	.514	.674	.766	.837	.903	.938	.4281+01	.6700+00	.069
5260.	.000	.000	.000	.000	.001	.011	.054	.188	.332	.482	.650	.747	.821	.891	.929	.4512+01	.6100+00	.004
5270.	.000	.000	.000	.000	.001	.016	.070	.217	.368	.521	.690	.764	.851	.912	.943	.4304+01	.6600+00	.060
5280.	.000	.000	.000	.000	.000	.007	.036	.116	.300	.458	.602	.752	.832	.888	.937	.3270+01	.6100+00	.006
5290.	.000	.000	.000	.001	.001	.035	.124	.261	.458	.588	.695	.804	.864	.907	.946	.2144+01	.7200+00	.100
5300.	.000	.000	.000	.000	.001	.035	.131	.280	.501	.651	.767	.868	.915	.945	.970	.2052+01	.7500+00	.036
5310.	.000	.000	.000	.000	.000	.006	.034	.106	.241	.470	.637	.749	.875	.924	.960	.3373+01	.6100+00	.052
5320.	.000	.000	.000	.000	.000	.000	.007	.025	.122	.244	.380	.544	.646	.720	.816	.5731+01	.6000+00	.046
5330.	.000	.000	.000	.000	.000	.000	.000	.002	.017	.050	.109	.221	.324	.436	.586	.693	.8363+01	.4400+00	.009
5340.	.000	.000	.000	.000	.000	.000	.000	.000	.005	.026	.076	.184	.289	.407	.566	.680	.1150+02	.4900+00	.019
5350.	.000	.000	.000	.000	.000	.000	.001	.008	.045	.105	.199	.363	.495	.620	.759	.841	.6866+01	.4900+00	.015
5360.	.000	.000	.000	.000	.000	.000	.004	.034	.147	.274	.413	.546	.698	.790	.881	.928	.5443+01	.6300+00	.058
5370.	.000	.000	.000	.000	.000	.000	.009	.041	.179	.326	.473	.640	.741	.820	.895	.933	.4738+01	.6100+00	.014
5380.	.000	.000	.000	.000	.000	.001	.011	.057	.200	.345	.487	.650	.749	.826	.897	.934	.4486+01	.6200+00	.009
5390.	.000	.000	.000	.000	.000	.002	.024	.102	.298	.464	.608	.755	.835	.891	.937	.960	.3781+01	.7100+00	.012
5400.	.000	.000	.000	.000	.000	.002	.022	.085	.236	.375	.516	.677	.773	.844	.907	.939	.3942+01	.6400+00	.048
5410.	.000	.000	.000	.000	.000	.007	.035	.105	.258	.397	.535	.691	.781	.847	.907	.939	.3355+01	.5600+00	.001
5420.	.000	.000	.000	.000	.000	.010	.067	.167	.349	.496	.630	.769	.842	.893	.937	.959	.2723+01	.6000+00	.001
5430.	.000	.000	.000	.000	.000	.015	.057	.141	.309	.457	.596	.741	.820	.876	.926	.952	.2857+01	.5600+00	.002
5440.	.000	.000	.000	.000	.000	.005	.030	.093	.251	.403	.552	.710	.796	.854	.916	.946	.3467+01	.5700+00	.008
5450.	.000	.000	.000	.000	.001	.022	.006	.203	.404	.552	.678	.799	.862	.906	.946	.966	.2464+01	.6400+00	.004
5460.	.000	.000	.000	.000	.001	.020	.079	.184	.358	.493	.616	.747	.820	.875	.925	.952	.2612+01	.6000+00	.021
5470.	.000	.000	.000	.000	.003	.019	.062	.169	.289	.427	.598	.705	.790	.873	.919	.944	.4023+01	.5200+00	.010
5480.	.000	.000	.000	.000	.003	.038	.114	.221	.375	.491	.601	.725	.799	.856	.913	.944	.2285+01	.5700+00	.072
5490.	.000	.000	.000	.000	.008	.075	.195	.355	.567	.695	.740	.874	.916	.944	.970	.982	.1641+01	.6700+00	.008
5500.	.000	.000	.000	.000	.007	.068	.174	.313	.507	.636	.739	.837	.889	.926	.960	.977	.1785+01	.6300+00	.013
5510.	.000	.000	.000	.000	.002	.030	.093	.194	.368	.505	.627	.755	.829	.885	.939	.965	.2420+01	.5800+00	.026
5520.	.000	.000	.000	.001	.011	.075	.161	.273	.436	.559	.667	.781	.846	.897	.945	.969	.1837+01	.5700+00	.063
5530.	.000	.000	.000	.001	.015	.104	.233	.376	.556	.670	.761	.851	.901	.938	.970	.984	.1463+01	.6700+00	.049
5540.	.000	.000	.001	.001	.016	.101	.223	.362	.540	.657	.751	.846	.899	.938	.971	.985	.1488+01	.6600+00	.082
5550.	.000	.000	.001	.001	.012	.074	.177	.303	.483	.607	.712	.823	.886	.932	.969	.984	.1720+01	.6000+00	.035
5560.	.000	.002	.001	.003	.023	.102	.304	.436	.600	.704	.789	.876	.924	.957	.981	.990	.1152+01	.5600+00	.018
5570.	.000	.005	.002	.003	.033	.133	.302	.433	.557	.697	.781	.848	.915	.950	.973	.988	.7618+00	.6400+00	.083
5580.	.000	.009	.002	.007	.057	.160	.347	.491	.620	.755	.831	.891	.946	.971	.985	.996	.6630+00	.6500+00	.026
5590.	.000	.013	.002	.006	.055	.155	.321	.457	.586	.726	.811	.879	.941	.968	.983	.993	.7345+00	.5900+00	.017

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
5600.	.061	.016	.081	.198	.393	.538	.606	.795	.868	.921	.964	.981	.990	.996	.998	.6169+00	.6200+00	.006
5610.	.002	.031	.105	.222	.410	.551	.675	.803	.876	.928	.968	.984	.992	.996	.998	.5482+00	.6200+00	.010
5620.	.002	.037	.122	.254	.457	.603	.728	.849	.912	.951	.979	.989	.995	.998	.999	.4670+00	.6600+00	.013
5630.	.002	.039	.124	.254	.458	.608	.736	.860	.920	.957	.982	.991	.995	.998	.999	.4493+00	.6700+00	.022
5640.	.004	.051	.150	.294	.507	.659	.762	.893	.942	.970	.987	.994	.997	.999	.999	.4164+00	.6600+00	.006
5650.	.035	.144	.279	.425	.612	.735	.831	.917	.955	.976	.990	.995	.998	.999	1.000	.3099+00	.6100+00	.005
5660.	.081	.237	.414	.584	.763	.859	.919	.964	.981	.990	.996	.998	.999	1.000	1.000	.1850+00	.6700+00	.009
5670.	.100	.310	.496	.663	.822	.900	.945	.976	.987	.994	.997	.999	.999	1.000	1.000	.1228+00	.7500+00	.001
5680.	.133	.342	.552	.744	.880	.938	.968	.987	.993	.997	.999	.999	1.000	1.000	1.000	.9665-01	.7800+00	.011
5690.	.124	.358	.555	.717	.859	.923	.958	.983	.991	.996	.998	.999	1.000	1.000	1.000	.9511-01	.7900+00	.001
5700.	.106	.322	.508	.667	.816	.890	.937	.972	.985	.993	.997	.998	.999	1.000	1.000	.1195+00	.7500+00	.000
5710.	.115	.331	.515	.671	.817	.889	.936	.971	.985	.992	.997	.998	.999	1.000	1.000	.1199+00	.7400+00	.000
5720.	.130	.359	.546	.700	.840	.906	.947	.977	.988	.994	.997	.999	.999	1.000	1.000	.1045+00	.7600+00	.000
5730.	.140	.364	.544	.696	.835	.902	.945	.976	.988	.994	.997	.999	.999	1.000	1.000	.1091+00	.7400+00	.001
5740.	.175	.413	.590	.724	.855	.914	.952	.979	.989	.994	.998	.999	.999	1.000	1.000	.9635-01	.7800+00	.000
5750.	.214	.459	.625	.754	.869	.922	.957	.981	.990	.995	.998	.999	.999	1.000	1.000	.8519-01	.7900+00	.000
5760.	.257	.512	.678	.800	.902	.945	.971	.988	.994	.997	.999	.999	1.000	1.000	1.000	.6429-01	.7800+00	.000
5770.	.220	.400	.631	.771	.885	.915	.965	.985	.992	.996	.999	.999	1.000	1.000	1.000	.9621-01	.7100+00	.018
5780.	.253	.509	.674	.797	.902	.946	.971	.988	.994	.997	.999	1.000	1.000	1.000	1.000	.6269-01	.7900+00	.001
5790.	.252	.501	.669	.789	.896	.962	.969	.987	.993	.997	.999	.999	1.000	1.000	1.000	.6794-01	.7700+00	.001
5800.	.344	.616	.770	.865	.940	.968	.984	.993	.997	.998	.999	1.000	1.000	1.000	1.000	.3552-01	.8700+00	.000
5810.	.349	.615	.764	.867	.943	.971	.985	.996	.997	.998	.999	1.000	1.000	1.000	1.000	.3650-01	.8600+00	.000
5820.	.358	.622	.776	.874	.948	.974	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	.3427-01	.8700+00	.000
5830.	.406	.644	.808	.897	.959	.980	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.3024-01	.8700+00	.002
5840.	.502	.756	.871	.936	.977	.989	.995	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.1380-01	.1000+01	.000
5850.	.476	.736	.858	.929	.973	.988	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.1607-01	.9800+00	.000
5860.	.454	.713	.846	.922	.970	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1853-01	.9600+00	.000
5870.	.447	.701	.835	.915	.965	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.2126-01	.9300+00	.000
5880.	.406	.666	.810	.900	.960	.981	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2576-01	.9100+00	.000
5890.	.446	.696	.830	.911	.965	.983	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.2304-01	.9100+00	.000
5900.	.534	.768	.879	.941	.978	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1361-01	.9000+00	.000
5910.	.567	.807	.903	.954	.983	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9872-02	.1020+01	.000
5920.	.599	.775	.877	.937	.974	.988	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.1932-01	.8800+00	.001
5930.	.559	.774	.876	.935	.973	.988	.994	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	.1595-01	.9200+00	.000
5940.	.520	.739	.847	.914	.962	.981	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2268-01	.8600+00	.000
5950.	.508	.728	.838	.908	.959	.979	.989	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2537-01	.8400+00	.000
5960.	.468	.690	.806	.884	.945	.971	.985	.994	.997	.998	.999	1.000	1.000	1.000	1.000	.3458-01	.7900+00	.000

UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
5970.	.442	.571	.762	.874	.939	.968	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	.3870-01	.7800+00	.000
5980.	.404	.633	.767	.852	.926	.960	.978	.991	.995	.998	.999	1.000	1.000	1.000	1.000	.4649-01	.7600+00	.000
5990.	.382	.582	.729	.819	.905	.966	.970	.987	.994	.997	.999	.999	1.000	1.000	1.000	.6022-01	.7300+00	.001
6000.	.344	.578	.719	.820	.907	.948	.971	.988	.994	.997	.999	.999	1.000	1.000	1.000	.5921-01	.7400+00	.000
6010.	.336	.565	.705	.807	.895	.937	.964	.984	.992	.996	.998	.999	1.000	1.000	1.000	.6788-01	.7100+00	.000
6020.	.325	.551	.700	.804	.892	.935	.962	.983	.991	.995	.998	.999	1.000	1.000	1.000	.7006-01	.7100+00	.000
6030.	.304	.533	.676	.732	.874	.921	.953	.978	.989	.994	.998	.999	1.000	1.000	1.000	.8003-01	.6900+00	.000
6040.	.312	.516	.677	.780	.871	.918	.950	.977	.988	.994	.997	.999	.999	1.000	1.000	.8543-01	.6700+00	.001
6050.	.306	.533	.675	.779	.872	.920	.952	.974	.988	.994	.997	.999	.999	1.000	1.000	.8265-01	.6800+00	.000
6060.	.373	.606	.739	.829	.906	.941	.966	.984	.992	.995	.998	.999	1.000	1.000	1.000	.5667-01	.7300+00	.000
6070.	.421	.648	.771	.851	.921	.952	.972	.987	.993	.996	.998	.999	1.000	1.000	1.000	.4774-01	.7400+00	.000
6080.	.460	.647	.812	.884	.941	.966	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.4027-01	.7600+00	.003
6090.	.500	.724	.833	.894	.949	.970	.983	.993	.996	.998	.999	1.000	1.000	1.000	1.000	.2800-01	.8200+00	.000
6100.	.402	.613	.724	.804	.885	.926	.955	.979	.989	.996	.998	.999	1.000	1.000	1.000	.7410-01	.6400+00	.001
6110.	.215	.399	.527	.633	.765	.844	.904	.955	.976	.988	.995	.998	.999	1.000	1.000	.1727+00	.5600+00	.003
6120.	.144	.391	.486	.601	.734	.824	.892	.949	.973	.996	.998	.999	.999	1.000	1.000	.1674+00	.6200+00	.027
6130.	.264	.475	.604	.715	.826	.898	.932	.969	.983	.992	.996	.999	.999	1.000	1.000	.1179+00	.6200+00	.001
6140.	.267	.491	.621	.729	.838	.897	.939	.972	.985	.992	.997	.999	.999	1.000	1.000	.1149+00	.6100+00	.001
6150.	.446	.701	.811	.884	.966	.971	.984	.994	.997	.999	.999	1.000	1.000	1.000	1.000	.2785-01	.8600+00	.001
6160.	.539	.736	.833	.896	.948	.967	.991	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.3160-01	.7600+00	.000
6170.	.314	.493	.618	.719	.827	.887	.931	.968	.981	.991	.996	.998	.999	1.000	1.000	.1256+00	.5700+00	.002
6180.	.241	.431	.573	.689	.812	.879	.921	.966	.983	.991	.996	.998	.999	1.000	1.000	.1372+00	.6000+00	.002
6190.	.362	.613	.749	.843	.925	.959	.978	.991	.995	.998	.999	1.000	1.000	1.000	1.000	.4945-01	.7600+00	.000
6200.	.413	.637	.764	.852	.928	.940	.974	.991	.995	.996	.999	.999	1.000	1.000	1.000	.4894-01	.7400+00	.000
6210.	.429	.644	.763	.891	.923	.954	.973	.989	.995	.997	.999	.999	1.000	1.000	1.000	.4369-01	.7600+00	.002
6220.	.375	.600	.729	.819	.903	.942	.968	.986	.991	.996	.999	.999	1.000	1.000	1.000	.6110-01	.7100+00	.000
6230.	.262	.476	.611	.718	.829	.889	.933	.969	.984	.991	.991	.998	.999	1.000	1.000	.1180+00	.6200+00	.001
6240.	.144	.385	.519	.619	.763	.860	.900	.953	.973	.987	.995	.997	.999	1.000	1.000	.1760+00	.5700+00	.004
6250.	.154	.341	.466	.614	.755	.834	.901	.954	.976	.987	.995	.997	.999	1.000	1.000	.1792+00	.6000+00	.002
6260.	.251	.490	.659	.770	.874	.924	.961	.981	.991	.995	.998	.999	1.000	1.000	1.000	.7968-01	.7300+00	.000
6270.	.262	.502	.667	.777	.862	.930	.961	.983	.991	.996	.998	.999	.999	1.000	1.000	.7710-01	.7300+00	.000
6280.	.224	.454	.618	.745	.862	.917	.952	.979	.988	.994	.998	.999	.999	1.000	1.000	.9327-01	.7100+00	.000
6290.	.164	.395	.560	.700	.817	.903	.965	.975	.981	.993	.997	.999	.999	1.000	1.000	.1191+00	.6800+00	.003
6300.	.168	.352	.522	.672	.823	.846	.942	.974	.987	.993	.997	.999	.999	1.000	1.000	.1342+00	.6800+00	.003
6310.	.208	.436	.606	.749	.870	.925	.958	.981	.990	.995	.998	.999	1.000	1.000	1.000	.9092-01	.7300+00	.001
6320.	.167	.364	.576	.670	.815	.888	.956	.971	.985	.992	.997	.998	.999	1.000	1.000	.1259+00	.6800+00	.006
6330.	.075	.209	.349	.591	.693	.806	.865	.948	.973	.986	.994	.997	.998	.999	1.000	.2604+00	.5900+00	.015

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
6340.	.097	.237	.376	.526	.707	.814	.840	.950	.974	.987	.994	.997	.998	.999	1.000	.2537+00	.5700+00	.013
6350.	.135	.326	.493	.650	.811	.890	.919	.973	.986	.993	.997	.998	.998	.999	1.000	.1468+00	.6700+00	.004
6360.	.093	.258	.421	.569	.766	.860	.921	.965	.982	.991	.996	.998	.999	1.000	1.000	.1886+00	.6500+00	.009
6370.	.086	.243	.399	.559	.741	.844	.911	.961	.980	.990	.996	.998	.999	1.000	1.000	.2028+00	.6400+00	.008
6380.	.040	.253	.414	.579	.762	.858	.921	.966	.982	.991	.996	.998	.999	1.000	1.000	.1287+00	.8200+00	.025
6390.	.065	.215	.361	.560	.758	.858	.921	.966	.983	.991	.996	.998	.999	1.000	1.000	.1935+00	.6800+00	.012
6400.	.029	.120	.259	.428	.653	.785	.815	.943	.970	.985	.994	.997	.998	1.000	1.000	.3168+00	.6200+00	.028
6410.	.031	.124	.250	.415	.642	.777	.871	.942	.969	.984	.993	.997	.998	1.000	1.000	.3239+00	.6100+00	.034
6420.	.070	.212	.364	.529	.726	.834	.905	.958	.978	.989	.995	.998	.999	1.000	1.000	.2284+00	.6300+00	.013
6430.	.132	.306	.454	.606	.770	.859	.918	.963	.980	.990	.996	.998	.999	1.000	1.000	.1809+00	.6200+00	.007
6440.	.154	.313	.473	.607	.761	.850	.913	.961	.980	.990	.996	.998	.999	1.000	1.000	.1891+00	.5900+00	.009
6450.	.120	.251	.363	.485	.652	.768	.860	.916	.966	.983	.993	.997	.998	.999	.999	.2944+00	.5100+00	.023
6460.	.026	.112	.227	.374	.586	.729	.839	.927	.962	.980	.992	.996	.998	.999	.999	.3667+00	.5900+00	.026
6470.	.029	.112	.270	.440	.662	.794	.884	.949	.974	.987	.995	.997	.999	.999	1.000	.2963+00	.6400+00	.055
6480.	.049	.169	.327	.488	.699	.820	.899	.957	.978	.989	.996	.998	.999	1.000	1.000	.2501+00	.6400+00	.020
6490.	.065	.213	.370	.538	.734	.841	.911	.962	.980	.990	.996	.998	.999	1.000	1.000	.2089+00	.6600+00	.010
6500.	.063	.210	.364	.540	.737	.843	.912	.961	.980	.990	.996	.998	.999	1.000	1.000	.2111+00	.6600+00	.011
6510.	.065	.217	.383	.555	.748	.850	.916	.964	.981	.990	.996	.998	.999	1.000	1.000	.2002+00	.6700+00	.008
6520.	.075	.239	.404	.571	.755	.853	.918	.964	.982	.990	.996	.998	.999	1.000	1.000	.1893+00	.6700+00	.005
6530.	.091	.244	.425	.583	.755	.849	.914	.962	.980	.990	.996	.998	.999	1.000	1.000	.1910+00	.6500+00	.010
6540.	.071	.216	.365	.521	.704	.812	.889	.950	.974	.986	.996	.997	.999	.999	1.000	.2355+00	.6200+00	.007
6550.	.065	.208	.358	.515	.700	.810	.889	.950	.974	.986	.995	.997	.999	.999	1.000	.2342+00	.6300+00	.007
6560.	.062	.212	.368	.528	.710	.816	.892	.951	.974	.987	.994	.997	.999	.999	1.000	.2196+00	.6500+00	.004
6570.	.056	.196	.346	.503	.686	.795	.876	.942	.970	.984	.993	.997	.998	.999	1.000	.2457+00	.6300+00	.004
6580.	.063	.241	.391	.541	.714	.815	.889	.949	.973	.986	.994	.997	.998	.999	1.000	.2209+00	.6200+00	.004
6590.	.067	.242	.387	.534	.704	.805	.881	.944	.970	.985	.994	.997	.998	.999	1.000	.2342+00	.6000+00	.004
6600.	.075	.221	.377	.531	.706	.807	.882	.944	.970	.984	.993	.997	.998	.999	1.000	.2307+00	.6200+00	.005
6610.	.091	.266	.427	.584	.753	.844	.907	.956	.976	.988	.995	.998	.999	.999	1.000	.1821+00	.6600+00	.002
6620.	.096	.275	.439	.595	.762	.852	.911	.958	.977	.988	.995	.997	.999	.999	1.000	.1776+00	.6600+00	.002
6630.	.110	.240	.462	.614	.776	.861	.916	.960	.978	.988	.995	.997	.999	.999	1.000	.1855+00	.6400+00	.038
6640.	.096	.269	.427	.578	.742	.831	.843	.966	.970	.984	.993	.997	.998	.999	1.000	.1991+00	.6300+00	.004
6650.	.075	.243	.407	.566	.735	.825	.890	.945	.970	.984	.993	.997	.998	.999	1.000	.1959+00	.6600+00	.001
6660.	.081	.261	.431	.590	.753	.840	.902	.952	.974	.986	.994	.997	.998	1.000	1.000	.1757+00	.6800+00	.000
6670.	.064	.220	.383	.542	.714	.809	.878	.938	.965	.981	.992	.996	.998	.999	1.000	.2159+00	.6500+00	.001
6680.	.033	.149	.295	.458	.652	.768	.854	.927	.959	.979	.991	.995	.998	.999	1.000	.2695+00	.6500+00	.002
6690.	.020	.093	.196	.332	.526	.662	.775	.882	.933	.964	.985	.992	.996	.998	.999	.4396+00	.5600+00	.015
6700.	.004	.041	.120	.244	.443	.592	.722	.852	.915	.954	.981	.990	.995	.998	.999	.5289+00	.6000+00	.009

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
6710.	.005	.040	.120	.240	.432	.582	.718	.838	.905	.948	.978	.989	.994	.998	.999	.5116+00	.6200+00	.011
6720.	.007	.050	.134	.263	.457	.600	.719	.840	.904	.946	.976	.988	.994	.998	.999	.5357+00	.5700+00	.012
6730.	.021	.070	.172	.312	.512	.648	.759	.865	.918	.954	.979	.990	.995	.998	.999	.4405+00	.6000+00	.003
6740.	.007	.050	.124	.235	.417	.557	.601	.809	.879	.928	.966	.982	.991	.996	.998	.5792+00	.5500+00	.010
6750.	.006	.052	.136	.255	.439	.574	.692	.813	.879	.926	.965	.982	.990	.996	.998	.5276+00	.5800+00	.006
6760.	.007	.061	.161	.303	.507	.644	.753	.855	.906	.943	.973	.986	.993	.997	.999	.4383+00	.6200+00	.001
6770.	.002	.022	.079	.132	.373	.523	.657	.794	.869	.920	.962	.979	.989	.996	.998	.6752+00	.5700+00	.024
6780.	.001	.022	.072	.166	.345	.493	.630	.775	.855	.911	.957	.977	.988	.995	.997	.6565+00	.6000+00	.038
6790.	.001	.026	.079	.173	.348	.491	.621	.761	.840	.898	.948	.971	.985	.994	.997	.6511+00	.6000+00	.065
6800.	.003	.040	.130	.260	.456	.588	.700	.913	.873	.917	.957	.976	.987	.995	.997	.4521+00	.6500+00	.045
6810.	.004	.052	.145	.270	.448	.577	.692	.812	.877	.924	.963	.980	.990	.996	.998	.4651+00	.6300+00	.040
6820.	.001	.014	.059	.132	.233	.422	.564	.720	.824	.894	.950	.973	.986	.994	.997	.8370+00	.5400+00	.023
6830.	.003	.040	.113	.221	.395	.531	.656	.792	.869	.922	.964	.981	.990	.996	.998	.5714+00	.5900+00	.035
6840.	.006	.070	.200	.336	.551	.677	.776	.871	.920	.953	.979	.989	.994	.998	.999	.3281+00	.7000+00	.025
6850.	.008	.057	.162	.303	.521	.602	.774	.877	.926	.957	.981	.990	.995	.998	.999	.3839+00	.6800+00	.011
6860.	.002	.025	.061	.177	.343	.472	.591	.722	.800	.861	.920	.952	.973	.988	.994	.7188+00	.5500+00	.009
6870.	.000	.001	.007	.034	.126	.238	.371	.546	.665	.764	.864	.918	.954	.980	.989	.1430+01	.5300+00	.029
6880.	.000	.000	.001	.012	.069	.159	.280	.460	.592	.709	.830	.897	.942	.975	.987	.1798+01	.5800+00	.044
6890.	.000	.001	.012	.054	.177	.305	.440	.607	.715	.804	.891	.936	.965	.985	.992	.1135+01	.6000+00	.033
6900.	.000	.001	.013	.060	.199	.343	.493	.669	.769	.849	.923	.957	.977	.991	.995	.1037+01	.6300+00	.017
6910.	.000	.003	.022	.060	.226	.364	.505	.668	.768	.847	.921	.956	.977	.990	.995	.9881+00	.5900+00	.005
6920.	.001	.020	.064	.206	.419	.560	.693	.813	.877	.923	.962	.979	.989	.995	.998	.5670+00	.6400+00	.004
6930.	.001	.023	.068	.201	.361	.511	.627	.754	.830	.890	.944	.969	.984	.993	.997	.5837+00	.6300+00	.040
6940.	.000	.012	.052	.132	.287	.416	.541	.658	.779	.853	.923	.957	.977	.990	.995	.8464+00	.5500+00	.013
6950.	.000	.002	.019	.078	.235	.384	.532	.699	.796	.869	.934	.963	.981	.992	.996	.9401+00	.6300+00	.004
6960.	.000	.002	.027	.094	.270	.430	.562	.745	.833	.895	.947	.970	.984	.993	.997	.8041+00	.6800+00	.014
6970.	.000	.002	.022	.084	.230	.376	.517	.646	.765	.859	.925	.957	.977	.990	.995	.9269+00	.6300+00	.052
6980.	.000	.003	.029	.066	.179	.300	.440	.621	.730	.829	.912	.950	.973	.989	.994	.1147+01	.5400+00	.022
6990.	.000	.009	.046	.116	.247	.371	.500	.600	.709	.851	.925	.958	.978	.991	.995	.9258+00	.5400+00	.026
7000.	.000	.009	.044	.113	.249	.373	.503	.665	.766	.849	.919	.954	.975	.990	.995	.9259+00	.5400+00	.022
7010.	.000	.000	.005	.029	.118	.236	.360	.571	.701	.805	.900	.944	.970	.989	.994	.1424+01	.5700+00	.011
7020.	.000	.000	.006	.031	.124	.246	.392	.585	.711	.813	.905	.947	.972	.988	.994	.1382+01	.5700+00	.013
7030.	.000	.000	.004	.021	.095	.205	.348	.566	.678	.783	.883	.933	.962	.984	.992	.1569+01	.5500+00	.032
7040.	.000	.000	.000	.005	.050	.141	.277	.482	.528	.751	.867	.924	.958	.982	.991	.1953+01	.6200+00	.004
7050.	.000	.000	.001	.012	.079	.183	.321	.520	.600	.779	.889	.938	.967	.986	.993	.1684+01	.6100+00	.015
7060.	.000	.000	.002	.018	.094	.196	.326	.511	.642	.754	.863	.918	.954	.980	.990	.1617+01	.5800+00	.021
7070.	.000	.000	.002	.015	.088	.184	.313	.496	.676	.738	.850	.909	.949	.978	.989	.1675+01	.5700+00	.009

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	[illegible]	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
7080.	.000	.000	.000	.006	.055	.148	.278	.468	.605	.724	.843	.905	.946	.977	.988	.1916+01	.6100+00	.006
7090.	.000	.000	.000	.003	.036	.103	.207	.381	.522	.653	.793	.871	.925	.966	.982	.2301+01	.5700+00	.019
7100.	.000	.000	.001	.010	.060	.139	.247	.420	.556	.681	.813	.884	.932	.970	.984	.1937+01	.5500+00	.027
7110.	.000	.000	.001	.012	.076	.176	.313	.510	.647	.759	.866	.919	.953	.979	.989	.1688+01	.6100+00	.017
7120.	.000	.000	.001	.006	.039	.095	.189	.360	.500	.630	.769	.868	.907	.956	.976	.2313+01	.4800+00	.073
7130.	.000	.000	.000	.000	.007	.035	.104	.263	.410	.555	.719	.815	.887	.947	.972	.3338+01	.5800+00	.007
7140.	.000	.000	.000	.000	.015	.064	.161	.347	.496	.631	.774	.854	.911	.959	.978	.2765+01	.6000+00	.002
7150.	.000	.000	.000	.001	.020	.083	.199	.394	.549	.679	.808	.875	.922	.963	.980	.2510+01	.6300+00	.002
7160.	.000	.000	.000	.001	.019	.080	.192	.385	.534	.667	.802	.874	.924	.964	.981	.2552+01	.6200+00	.004
7170.	.000	.000	.000	.000	.015	.065	.156	.322	.460	.593	.743	.829	.891	.945	.970	.2793+01	.5800+00	.009
7180.	.000	.000	.000	.000	.015	.066	.159	.328	.469	.604	.754	.837	.897	.948	.971	.2781+01	.5800+00	.009
7190.	.000	.000	.000	.000	.015	.065	.166	.351	.502	.641	.788	.867	.922	.964	.981	.2747+01	.6100+00	.003
7200.	.000	.000	.000	.000	.002	.015	.063	.201	.347	.503	.692	.804	.884	.966	.972	.4147+01	.5900+00	.020
7210.	.000	.000	.000	.000	.000	.004	.026	.121	.247	.399	.604	.738	.839	.925	.960	.5550+01	.6100+00	.011
7220.	.000	.000	.000	.000	.000	.002	.013	.076	.173	.305	.505	.648	.771	.885	.937	.6280+01	.5600+00	.028
7230.	.000	.000	.000	.000	.000	.000	.004	.035	.101	.211	.401	.551	.687	.828	.900	.8184+01	.5600+00	.015
7240.	.000	.000	.000	.000	.000	.002	.010	.044	.102	.201	.379	.523	.654	.797	.876	.6289+01	.4600+00	.100
7250.	.000	.000	.000	.001	.015	.049	.112	.235	.343	.456	.607	.710	.795	.880	.926	.3093+01	.4900+00	.053
7260.	.000	.000	.000	.004	.051	.146	.283	.489	.630	.744	.855	.911	.948	.976	.986	.1933+01	.6500+00	.007
7270.	.000	.000	.000	.004	.051	.149	.290	.491	.627	.740	.851	.908	.944	.976	.987	.1930+01	.6500+00	.008
7280.	.000	.000	.000	.014	.047	.205	.343	.524	.651	.753	.854	.908	.965	.975	.987	.1587+01	.6100+00	.016
7290.	.000	.000	.001	.015	.035	.202	.332	.513	.618	.763	.846	.901	.940	.971	.984	.1591+01	.6300+00	.084
7300.	.000	.000	.000	.006	.036	.148	.284	.484	.675	.763	.853	.908	.945	.974	.986	.1887+01	.6200+00	.008
7310.	.000	.000	.000	.002	.036	.116	.242	.437	.578	.698	.817	.879	.923	.961	.978	.2198+01	.6400+00	.021
7320.	.000	.000	.000	.001	.019	.068	.161	.336	.479	.610	.750	.831	.891	.945	.969	.2702+01	.5800+00	.010
7330.	.000	.000	.000	.000	.031	.015	.065	.206	.351	.500	.675	.780	.859	.928	.960	.4351+01	.6500+00	.048
7340.	.000	.000	.000	.000	.001	.011	.049	.172	.310	.461	.661	.763	.850	.925	.958	.4550+01	.6000+00	.007
7350.	.000	.000	.000	.000	.001	.015	.061	.193	.333	.462	.664	.776	.860	.931	.962	.4394+01	.6300+00	.072
7360.	.000	.000	.000	.000	.003	.036	.115	.287	.438	.580	.730	.828	.894	.949	.972	.3242+01	.5900+00	.013
7370.	.000	.000	.000	.000	.004	.048	.136	.313	.482	.601	.792	.837	.899	.951	.973	.3061+01	.6200+00	.005
7380.	.000	.000	.000	.000	.006	.035	.104	.256	.397	.541	.712	.815	.884	.969	.973	.3402+01	.5800+00	.012
7390.	.000	.000	.000	.002	.021	.066	.143	.293	.427	.562	.724	.823	.895	.952	.975	.2728+01	.5100+00	.022
7400.	.000	.000	.000	.003	.034	.118	.241	.433	.575	.698	.825	.893	.938	.973	.986	.2167+01	.6100+00	.006
7410.	.000	.000	.000	.002	.030	.101	.224	.474	.574	.704	.815	.901	.949	.978	.988	.2261+01	.6300+00	.011
7420.	.000	.000	.000	.002	.025	.082	.185	.369	.516	.651	.745	.873	.929	.969	.984	.2485+01	.5700+00	.009
7430.	.000	.000	.001	.012	.075	.170	.295	.479	.611	.725	.841	.905	.947	.977	.988	.1756+01	.5900+00	.032
7440.	.000	.000	.001	.014	.037	.196	.335	.528	.602	.773	.800	.931	.963	.984	.992	.1600+01	.6300+00	.046

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
7450.	.000	.000	.001	.007	.052	.134	.294	.445	.587	.712	.839	.904	.944	.977	.988	.2018+01	.5400+00	.055
7460.	.000	.000	.000	.003	.039	.117	.234	.436	.583	.711	.819	.904	.967	.971	.988	.2165+01	.6100+00	.011
7470.	.000	.000	.000	.003	.034	.108	.228	.429	.579	.709	.858	.901	.944	.976	.988	.2217+01	.6000+00	.009
7480.	.000	.000	.001	.007	.046	.118	.231	.421	.568	.697	.876	.894	.940	.976	.986	.2107+01	.5200+00	.070
7490.	.000	.000	.001	.012	.072	.162	.284	.468	.603	.720	.840	.904	.946	.977	.988	.1794+01	.5800+00	.041
7500.	.000	.002	.014	.057	.179	.289	.421	.489	.697	.707	.878	.924	.959	.982	.991	.1260+01	.5300+00	.059
7510.	.000	.007	.044	.136	.318	.462	.595	.739	.820	.880	.935	.961	.979	.991	.995	.7444+00	.6300+00	.012
7520.	.000	.007	.047	.145	.341	.491	.622	.756	.830	.886	.936	.960	.977	.989	.996	.6814+00	.6600+00	.014
7530.	.000	.003	.022	.109	.296	.451	.509	.730	.809	.868	.924	.953	.972	.987	.993	.7745+00	.6700+00	.017
7540.	.000	.004	.029	.105	.276	.425	.561	.710	.795	.859	.918	.949	.970	.986	.993	.8337+00	.6300+00	.008
7550.	.000	.017	.074	.186	.379	.523	.647	.773	.843	.894	.940	.963	.978	.990	.995	.6319+00	.6200+00	.005
7560.	.000	.016	[illegible]	.170	.356	.500	.626	.757	.810	.884	.932	.956	.973	.987	.993	.6821+00	.6000+00	.004
7570.	.000	.006	.033	.112	.291	.440	.573	.712	.793	.855	.912	.942	.964	.983	.991	.8262+00	.6100+00	.006
7580.	.000	.002	.024	.097	.274	.422	.556	.699	.787	.846	.907	.939	.962	.982	.991	.8017+00	.6800+00	.051
7590.	.000	.002	.026	.104	.285	.436	.572	.715	.796	.857	.915	.946	.968	.985	.992	.7541+00	.7000+00	.063
7600.	.000	.002	.020	.084	.239	.378	.511	.663	.753	.823	.891	.929	.957	.980	.989	.9321+00	.6300+00	.037
7610.	.000	.004	.030	.111	.249	.439	.576	.721	.802	.861	.918	.948	.969	.986	.993	.8310+00	.6300+00	.025
7620.	.000	.012	.068	.149	.351	.489	.612	.742	.815	.871	.923	.951	.971	.987	.993	.7022+00	.6100+00	.022
7630.	.000	.011	.059	.158	.349	.500	.632	.765	.836	.888	.935	.960	.977	.990	.995	.6824+00	.6300+00	.003
7640.	.000	.011	.051	.135	.306	.452	.508	.729	.807	.866	.922	.952	.973	.988	.994	.7901+00	.5800+00	.002
7650.	.001	.016	.061	.165	.348	.493	.623	.754	.827	.881	.934	.961	.978	.991	.995	.7188+00	.5800+00	.010
7660.	.002	.032	.098	.204	.362	.520	.642	.767	.837	.890	.941	.966	.982	.993	.996	.5899+00	.6000+00	.033
7670.	.007	.063	[illegible]	.229	.474	.601	.707	.814	.873	.918	.959	.977	.988	.995	.997	.4703+00	.6000+00	.014
7680.	.015	.104	.222	.306	.539	.653	.745	.838	.891	.931	.967	.982	.990	.996	.998	.3671+00	.6200+00	.025
7690.	.021	.117	.241	.378	.553	.606	.758	.850	.902	.940	.972	.985	.992	.997	.998	.3661+00	.6000+00	.012
7700.	[illegible]	.127	.245	.377	.549	.600	.754	.850	.904	.944	.975	.987	.993	.997	.998	.3826+00	.5700+00	.007
7710.	.057	.229	.346	.490	.659	.749	.825	.901	.941	.967	.986	.993	.996	.998	.999	.2628+00	.6100+00	.003
7720.	[illegible]	.230	.376	.511	.666	.758	.834	.910	.948	.972	.988	.994	.997	.999	1.000	.2590+00	.5800+00	.002
7730.	.123	.312	.466	.603	.746	.827	.868	.944	.969	.984	.993	.997	.998	.999	1.000	.1845+00	.6200+00	.001
7740.	.144	[illegible]	.497	.625	.769	.847	.903	.954	.975	.987	.995	.997	.998	1.000	1.000	.1647+00	.6300+00	.001
7750.	.255	.471	[illegible]	.736	.846	.906	.945	.976	.987	.993	.998	.999	.999	1.000	1.000	.1037+00	.6600+00	.001
7760.	.299	.512	.652	.763	.867	.921	.957	.981	.991	.995	.998	.999	1.000	1.000	1.000	.9173-01	.6600+00	.001
7770.	.432	.640	.707	.846	.919	.954	.975	.990	.995	.997	.999	.999	1.000	1.000	1.000	.5247-01	.7100+00	.000
7780.	[illegible]	.644	.910	.885	.943	.964	.986	.991	.997	.998	.999	1.000	1.000	1.000	1.000	.4289-01	.7300+00	.005
7790.	[illegible]	.673	.767	.864	.931	.962	.980	.992	.996	.998	.999	1.000	1.000	1.000	1.000	.4477-01	.7700+00	.000
7800.	[illegible]	.652	.773	.869	.935	.965	.982	.992	.996	.998	.990	1.000	1.000	1.000	1.000	.4092-01	.7800+00	.000
7810.	[illegible]	[illegible]	.872	.924	.963	.980	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2116-01	.8100+00	.000

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

INDEX	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
7620.	.754	.899	.961	.983	.995	.999	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5619-02	.1000+01	.000
7630.	.767	.905	.965	.982	.997	.999	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.4890-02	.1020+01	.000
7640.	.769	.914	.967	.984	.998	.999	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.4717-02	.1000+01	.000
7650.	.810	.930	.965	.983	.997	.999	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2628-02	.1120+01	.000
7660.	.713	.862	.915	.948	.972	.984	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.1331-01	.8200+00	.000
7670.	.723	.860	.913	.945	.970	.982	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.1522-01	.7800+00	.000
7680.	.761	.890	.935	.961	.980	.988	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.9290-02	.8600+00	.000
7690.	.742	.873	.924	.953	.975	.986	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.1202-01	.8200+00	.000
7700.	.734	.883	.931	.957	.977	.987	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	.1050-01	.8400+00	.000
7710.	.774	.894	.939	.963	.982	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8818-02	.8600+00	.000
7720.	.802	.907	.944	.966	.984	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8212-02	.8400+00	.000
7730.	.856	.941	.967	.981	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3616-02	.9600+00	.000
7740.	.846	.932	.960	.977	.989	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.5119-02	.8900+00	.000
7750.	.856	.943	.967	.981	.991	.995	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.3916-02	.9200+00	.000
7760.	.865	.944	.969	.983	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3255-02	.9700+00	.000
7770.	.858	.944	.969	.983	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3436-02	.9500+00	.000
7780.	.877	.951	.975	.987	.995	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2332-02	.1030+01	.000
7790.	.852	.937	.967	.983	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3465-02	.9800+00	.000
7800.	.858	.945	.971	.985	.994	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3055-02	.9800+00	.000
7810.	.846	.932	.963	.981	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4231-02	.9400+00	.000
7820.	.748	.865	.918	.949	.974	.986	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.1543-01	.7500+00	.000
7830.	.742	.858	.910	.945	.972	.984	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.1719-01	.7300+00	.000
7840.	.762	.845	.903	.942	.971	.985	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.1809-01	.7400+00	.000
7850.	.760	.844	.902	.941	.971	.985	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.1825-01	.7400+00	.000
7860.	.726	.844	.898	.937	.969	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2075-01	.7000+00	.000
7870.	.807	.881	.908	.918	.961	.979	.989	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2749-01	.6900+00	.000
7880.	.801	.797	.865	.915	.958	.977	.988	.995	.997	.999	.999	1.000	1.000	1.000	1.000	.2915-01	.6800+00	.000
7890.	.792	.750	.830	.888	.942	.966	.983	.993	.996	.998	.999	1.000	1.000	1.000	1.000	.4026-01	.6500+00	.000
8100.	.502	.725	.814	.880	.934	.966	.982	.993	.996	.998	.999	1.000	1.000	1.000	1.000	.4230-01	.6700+00	.000
8110.	.804	.760	.841	.893	.941	.970	.984	.993	.996	.998	.999	1.000	1.000	1.000	1.000	.3290-01	.7000+00	.001
8120.	.548	.704	.796	.866	.927	.958	.977	.990	.995	.997	.999	1.000	1.000	1.000	1.000	.5073-01	.6400+00	.000
8130.	.817	.681	.777	.851	.917	.951	.973	.988	.994	.997	.999	.999	1.000	1.000	1.000	.5878-01	.6200+00	.001
8140.	.814	.679	.775	.849	.914	.948	.970	.987	.993	.997	.999	.999	1.000	1.000	1.000	.5937-01	.6200+00	.000
8150.	.556	.708	.795	.862	.924	.956	.974	.989	.994	.997	.999	1.000	1.000	1.000	1.000	.5466-01	.6100+00	.001
8160.	.547	.784	.856	.908	.952	.972	.985	.993	.997	.999	1.000	1.000	1.000	1.000	1.000	.3237-01	.6700+00	.000
8170.	.830	.695	.787	.855	.922	.954	.974	.989	.994	.997	.999	1.000	1.000	1.000	1.000	.5436-01	.6300+00	.000
8180.	.549	.714	.803	.870	.926	.958	.976	.990	.995	.997	.999	1.000	1.000	1.000	1.000	.4921-01	.6400+00	.000

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
8190.	.526	.694	.789	.869	.923	.954	.974	.989	.994	.997	.999	1.000	1.000	1.000	1.000	.5291-01	.6400+00	.000
8200.	.264	.451	.527	.709	.834	.901	.945	.976	.988	.994	.997	.999	.999	1.000	1.000	.1286+00	.6000+00	.004
8210.	.126	.283	.424	.572	.744	.844	.912	.962	.981	.990	.996	.998	.999	1.000	1.000	.2091+00	.5900+00	.013
8220.	.155	.325	.465	.601	.756	.847	.911	.961	.979	.989	.996	.998	.999	1.000	1.000	.1944+00	.5800+00	.007
8230.	.259	.403	.546	.673	.805	.878	.928	.968	.983	.991	.996	.998	.999	1.000	1.000	.1448+00	.6100+00	.002
8240.	.169	.353	.498	.630	.771	.850	.908	.956	.977	.988	.995	.997	.999	.999	1.000	.1711+00	.6000+00	.002
8250.	.278	.454	.577	.684	.797	.863	.913	.957	.976	.988	.995	.997	.999	.999	1.000	.1504+00	.5500+00	.002
8260.	.337	.516	.665	.767	.863	.912	.945	.976	.986	.993	.997	.998	.999	1.000	1.000	.1012+00	.6100+00	.002
8270.	.208	.360	.501	.631	.770	.848	.905	.953	.976	.986	.996	.997	.999	1.000	1.000	.1813+00	.5700+00	.004
8280.	.125	.288	.479	.568	.724	.815	.883	.941	.967	.983	.993	.996	.998	.999	1.000	.1999+00	.6000+00	.008
8290.	.164	.363	.486	.617	.757	.836	.894	.945	.969	.983	.993	.996	.998	.999	1.000	.1874+00	.5800+00	.002
8300.	.195	.392	.537	.661	.767	.855	.904	.949	.971	.984	.993	.997	.998	.999	1.000	.1561+00	.6000+00	.000
8310.	.157	.396	.542	.660	.796	.864	.914	.956	.976	.987	.995	.997	.999	1.000	1.000	.1495+00	.6100+00	.001
8320.	.152	.331	.477	.612	.758	.840	.899	.950	.973	.986	.994	.997	.998	.999	1.000	.1815+00	.6000+00	.002
8330.	.092	.234	.379	.522	.690	.791	.808	.935	.965	.981	.992	.996	.998	.999	1.000	.2495+00	.5800+00	.007
8340.	.213	.379	.510	.633	.769	.849	.908	.957	.977	.988	.995	.998	.998	.999	1.000	.1823+00	.5500+00	.006
8350.	.313	.529	.606	.772	.871	.920	.952	.978	.988	.994	.997	.999	1.000	1.000	1.000	.8799-01	.6600+00	.000
8360.	.195	.364	.484	.591	.711	.786	.847	.909	.943	.967	.985	.992	.996	.999	.999	.2302+00	.5000+00	.002
8370.	.050	.235	.359	.476	.612	.701	.778	.862	.912	.964	.977	.988	.994	.998	.999	.3239+00	.5100+00	.008
8380.	.093	.238	.362	.479	.615	.706	.735	.869	.917	.951	.978	.989	.994	.998	.999	.3201+00	.5100+00	.006
8390.	.069	.234	.362	.489	.637	.732	.810	.889	.932	.961	.983	.991	.996	.998	.999	.2924+00	.5400+00	.003
8400.	.063	.193	.320	.452	.612	.715	.790	.883	.928	.959	.982	.991	.995	.998	.999	.3210+00	.5500+00	.003
8410.	.098	.276	.435	.583	.741	.820	.890	.944	.968	.983	.993	.996	.998	.999	1.000	.1899+00	.6400+00	.001
8420.	.076	.224	.364	.505	.665	.760	.837	.911	.969	.972	.988	.994	.997	.999	.999	.2659+00	.5800+00	.003
8430.	.075	.222	.360	.494	.664	.740	.817	.897	.940	.967	.986	.993	.996	.998	.999	.2772+00	.5700+00	.003
8440.	.137	.320	.462	.580	.707	.762	.847	.913	.948	.971	.987	.993	.997	.999	.999	.2269+00	.5400+00	.002
8450.	.223	.426	.561	.706	.821	.880	.920	.956	.974	.985	.993	.997	.998	.999	1.000	.1217+00	.6500+00	.000
8460.	.174	.394	.542	.668	.791	.857	.904	.947	.969	.983	.992	.996	.998	.999	1.000	.1506+00	.6100+00	.000
8470.	.175	.360	.513	.641	.772	.844	.897	.945	.969	.983	.993	.996	.998	.999	1.000	.1669+00	.6000+00	.001
8480.	.119	.258	.382	.506	.659	.757	.836	.912	.950	.973	.988	.994	.997	.999	.999	.2914+00	.5100+00	.008
8490.	.138	.274	.403	.524	.670	.763	.839	.914	.950	.973	.989	.994	.997	.999	.999	.2721+00	.5100+00	.007
8500.	.152	.380	.517	.637	.762	.834	.838	.940	.965	.981	.992	.996	.998	.999	1.000	.1772+00	.5700+00	.001
8510.	.177	.390	.493	.629	.760	.839	.891	.942	.967	.982	.993	.996	.998	.999	1.000	.1708+00	.5900+00	.006
8520.	.146	.341	.517	.664	.775	.848	.903	.950	.972	.985	.994	.997	.999	.999	1.000	.1693+00	.5800+00	.002
8530.	.241	.466	.601	.717	.828	.887	.930	.966	.982	.991	.996	.998	.999	1.000	1.000	.1155+00	.6400+00	.001
8540.	[illegible]	.361	.600	.677	.767	.849	.947	.956	.976	.988	.995	.998	.999	1.000	1.000	.1821+00	.5700+00	.004

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
8560.	.228	.434	.548	.650	.771	.847	.906	.956	.977	.988	.995	.998	.999	1.000	1.000	.1638+00	.5600+00	.005
8570.	.361	.474	.583	.689	.802	.871	.923	.965	.982	.991	.996	.998	.999	1.000	1.000	.1472+00	.5400+00	.004
8580.	.206	.451	.571	.687	.806	.876	.927	.967	.983	.991	.996	.998	.999	1.000	1.000	.1437+00	.5700+00	.003
8590.	.247	.422	.543	.661	.787	.861	.916	.961	.979	.990	.996	.998	.999	1.000	1.000	.1640+00	.5500+00	.004
8600.	.141	.307	.447	.580	.732	.824	.886	.951	.974	.987	.995	.997	.999	1.000	1.000	.2118+00	.5700+00	.006
8610.	.176	.364	.513	.644	.785	.862	.919	.963	.981	.990	.996	.998	.999	1.000	1.000	.1607+00	.6100+00	.002
8620.	.167	.337	.478	.602	.744	.827	.891	.947	.971	.985	.994	.997	.998	1.000	1.000	.2013+00	.5600+00	.004
8630.	.089	.219	.353	.492	.674	.780	.852	.933	.964	.981	.993	.996	.998	.999	1.000	.2752+00	.5600+00	.014
8640.	.064	.262	.343	.546	.721	.821	.842	.949	.973	.986	.996	.997	.999	.999	1.000	.2358+00	.6000+00	.031
8650.	.080	.225	.372	.525	.702	.803	.876	.937	.964	.981	.992	.996	.998	.999	1.000	.2430+00	.6000+00	.005
8660.	.062	.196	.341	.497	.680	.786	.863	.930	.960	.979	.991	.995	.998	.999	1.000	.2578+00	.6100+00	.005
8670.	.076	.223	.374	.525	.697	.797	.870	.932	.961	.978	.991	.995	.997	.999	1.000	.2383+00	.6100+00	.003
8680.	.041	.155	.276	.416	.599	.717	.809	.893	.935	.963	.984	.992	.996	.998	.999	.3426+00	.5700+00	.005
8690.	.031	.125	.244	.388	.574	.704	.802	.891	.935	.963	.984	.992	.996	.998	.999	.3621+00	.5800+00	.007
8700.	.038	.147	.280	.431	.619	.736	.825	.904	.943	.967	.986	.993	.996	.998	.999	.3146+00	.6000+00	.003
8710.	.027	.124	.251	.407	.603	.723	.814	.896	.936	.963	.984	.991	.996	.998	.999	.3336+00	.6100+00	.002
8720.	.025	.131	.270	.430	.626	.743	.831	.908	.944	.964	.986	.993	.996	.998	.999	.3008+00	.6400+00	.001
8730.	.021	.132	.263	.413	.600	.716	.805	.887	.928	.957	.980	.989	.995	.998	.999	.3011+00	.6500+00	.013
8740.	.064	.203	.342	.485	.691	.755	.830	.849	.914	.960	.981	.990	.995	.998	.999	.2735+00	.5900+00	.006
8750.	.077	.233	.362	.529	.696	.793	.863	.925	.955	.974	.989	.994	.997	.999	.999	.2355+00	.6100+00	.001
8760.	.067	.219	.370	.521	.691	.791	.864	.926	.956	.975	.989	.994	.997	.999	.999	.2385+00	.6200+00	.001
8770.	.041	.164	.301	.467	.661	.776	.859	.927	.958	.977	.990	.995	.997	.999	.999	.2728+00	.6300+00	.004
8780.	.019	.093	.203	.349	.555	.691	.800	.897	.941	.968	.987	.993	.996	.999	.999	.3980+00	.5980+00	.015
8790.	.001	.018	.066	.161	.340	.490	.631	.782	.864	.919	.962	.980	.990	.996	.998	.7128+00	.5800+00	.010
8800.	.000	.005	.022	.065	.168	.280	.410	.586	.704	.802	.898	.943	.970	.988	.993	.1230+01	.4900+00	.032
8810.	.000	.000	.007	.027	.077	.169	.301	.475	.590	.704	.807	.891	.963	.970	.988	.994	.1147+01	.5000+00	.025
8820.	.003	.031	.095	.204	.392	.539	.670	.804	.878	.926	.966	.982	.991	.996	.998	.6269+00	.5700+00	.009
8830.	.036	.141	.261	.414	.604	.727	.825	.912	.951	.974	.984	.995	.997	.999	.999	.3329+00	.5900+00	.009
8840.	.041	.176	.322	.475	.654	.763	.847	.921	.954	.974	.989	.994	.997	.999	1.000	.2402+00	.6600+00	.018
8850.	.055	.174	.361	.492	.663	.764	.841	.911	.944	.967	.985	.992	.996	.998	.999	.2682+00	.6100+00	.013
8860.	.070	.223	.371	.518	.683	.778	.869	.913	.945	.967	.985	.992	.996	.998	.999	.2439+00	.6100+00	.001
8870.	.058	.185	.316	.451	.629	.733	.813	.889	.929	.957	.980	.989	.995	.998	.999	.3176+00	.5600+00	.002
8880.	.016	.092	.204	.347	.544	.672	.774	.868	.916	.950	.977	.988	.994	.997	.999	.3961+00	.6000+00	.002
8890.	.021	.114	.247	.406	.605	.727	.817	.897	.935	.961	.982	.990	.995	.998	.999	.3283+00	.6300+00	.001
8900.	.010	.110	.237	.384	.583	.702	.795	.883	.927	.957	.980	.990	.995	.998	.999	.3460+00	.6200+00	.001
8910.	.014	.108	.229	.374	.563	.686	.788	.877	.924	.956	.980	.990	.995	.998	.999			

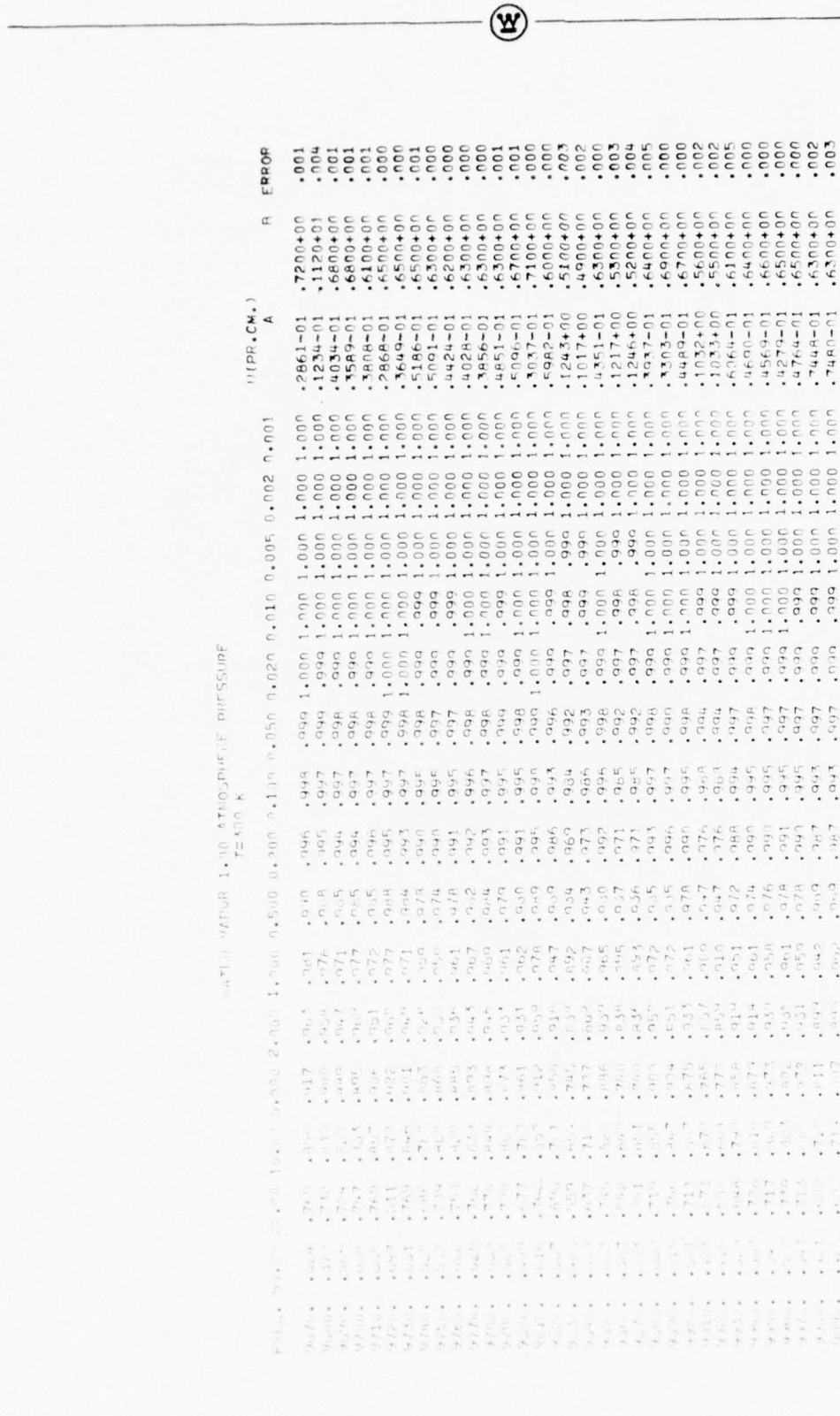
UNCLASSIFIED

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
8930.	[illegible]	.122	.241	.303	.509	.641	.704	.882	.928	.958	.981	.990	.995	.998	.999	.3706+00	.5800+00	.003
8940.	[illegible]	.104	.214	.356	.536	.604	.772	.876	.927	.959	.982	.991	.995	.998	.999	.4111+00	.5700+00	.006
8950.	[illegible]	.082	.142	.31[illegible]	.508	.637	.749	.862	.919	.956	.981	.990	.995	.998	.999	.4530+00	.5700+00	.007
8960.	[illegible]	.130	.2[illegible]	.399	.565	.704	.799	.892	.938	.966	.986	.993	.996	.999	.999	.3471+00	.5900+00	.004
8970.	[illegible]	.117	.232	.371	.559	.666	.791	.892	.919	.968	.986	.993	.997	.999	.999	.3866+00	.5700+00	.008
8980.	.082	.161	.258	.395	.571	.761	.805	.902	.946	.972	.988	.994	.997	.999	.999	.3665+00	.5500+00	.021
8990.	[illegible]	.255	.396	.535	.696	.795	.873	.940	.964	.983	.993	.997	.998	.999	1.000	.2379+00	.5800+00	.005
9000.	.164	.265	.407	.566	.709	.808	.804	.946	.972	.985	.994	.997	.999	.999	1.000	.2261+00	.5900+00	.005
9010.	.101	.249	.387	.527	.697	.862	.860	.945	.971	.985	.994	.997	.999	1.000	1.000	.2484+00	.5700+00	.009
9020.	[illegible]	.294	.42[illegible]	.570	.742	.835	.902	.955	.976	.988	.995	.997	.999	1.000	1.000	.2049+00	.5900+00	.007
9030.	.152	.337	[illegible]	.641	.799	.860	.933	.971	.985	.992	.997	.998	.999	1.000	1.000	.1557+00	.6400+00	.005
9040.	[illegible]	.226	[illegible]	.527	.701	.815	.881	.944	.971	.985	.994	.997	.998	.999	1.000	.2476+00	.5800+00	.009
9050.	.149	.211	.440	.580	.730	.821	.889	.948	.972	.986	.994	.997	.999	1.000	1.000	.2148+00	.5600+00	.006
9060.	.208	.407	[illegible]	.747	.857	.913	.950	.978	.988	.994	.998	.999	.999	1.000	1.000	.9993-01	.6600+00	.001
9070.	[illegible]	.466	.547	.676	.806	.881	.931	.970	.984	.992	.997	.999	.999	1.000	1.000	.1403+00	.6200+00	.003
9080.	.227	.416	.567	.692	.810	.812	.931	.969	.984	.992	.997	.998	.999	1.000	1.000	.1391+00	.6100+00	.002
9090.	.315	.563	.637	.776	.828	.894	.935	.968	.983	.991	.996	.998	.999	1.000	1.000	.1154+00	.5900+00	.001
9100.	.306	.531	.650	.759	.856	.906	.942	.971	.984	.991	.996	.998	.999	1.000	1.000	.1009+00	.6100+00	.000
9110.	.344	.543	.673	.774	.869	.916	.948	.975	.986	.993	.997	.998	.999	1.000	1.000	.9131-01	.6300+00	.000
9120.	.468	.598	.711	.805	.889	.930	.957	.979	.989	.994	.997	.999	.999	1.000	1.000	.7949-01	.6200+00	.000
9130.	.473	.656	.750	.836	.907	.942	.964	.981	.991	.995	.998	.999	1.000	1.000	1.000	.6390-01	.6300+00	.000
9140.	[illegible]	.569	.700	.793	.877	.920	.949	.975	.986	.993	.997	.999	.999	1.000	1.000	.8702-01	.6000+00	.000
9150.	.382	.530	.666	.766	.858	.906	.939	.969	.983	.991	.996	.998	.999	1.000	1.000	.9787-01	.6200+00	.000
9160.	[illegible]	.567	.693	.788	.873	.916	.946	.973	.985	.992	.997	.998	.999	1.000	1.000	.8628-01	.6300+00	.000
9170.	.411	.608	.725	.813	.890	.928	.955	..977	.988	.993	.997	.999	.999	1.000	1.000	.7292-01	.6400+00	.000
9180.	.473	.659	.763	.840	.909	.941	.964	.982	.990	.995	.998	.999	1.000	1.000	1.000	.6132-01	.6400+00	.000
9190.	.510	.687	.766	.857	.919	.948	.969	.985	.992	.996	.998	.999	1.000	1.000	1.000	.5506-01	.6400+00	.000
9200.	[illegible]	.664	.765	.840	.907	.940	.963	.982	.991	.995	.998	.999	.999	1.000	1.000	.6178-01	.6300+00	.000
9210.	.481	.660	.763	.834	.905	.938	.963	.982	.991	.995	.998	.999	.999	1.000	1.000	.6481-01	.6200+00	.000
9220.	[illegible]	.693	.792	.861	.921	.950	.970	.986	.991	.996	.998	.999	1.000	1.000	1.000	.5221-01	.6500+00	.000
9230.	[illegible]	.668	.773	.848	.914	.946	.968	.986	.992	.996	.998	.999	1.000	1.000	1.000	.5569-01	.6600+00	.000
9240.	.551	.710	[illegible]	.894	.924	.952	.971	.987	.993	.996	.999	.999	1.000	1.000	1.000	.5074-01	.6300+00	.000
9250.	.594	[illegible]	[illegible]	[illegible]	.939	.963	.979	.991	.995	.998	.999	1.000	1.000	1.000	1.000	.4098-01	.6500+00	.000
9260.	[illegible]	.745	.826	[illegible]	.933	.950	.976	.989	.994	.997	.999	.999	1.000	1.000	1.000	.4474-01	.6300+00	.000
9270.	.580	.732	.813	.876	.931	.957	.975	.989	.994	.997	.999	1.000	1.000	1.000	1.000	.4777-01	.6200+00	.000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.976	.989	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

FREQ.	50.00	20.00	10.00	5.000	2.000	1.000	0.500	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001	U(PR.CM.) A	B	ERROR
9300.	.695	.810	.871	.915	.954	.974	.986	.994	.997	.998	.999	1.000	1.000	1.000	1.000	.3125-01	.6300+00	.000
9310.	.759	.858	.904	.942	.971	.984	.992	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	.2017-01	.6700+00	.000
9320.	.754	.851	.902	.937	.968	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2241-01	.6500+00	.000
9330.	.774	.862	.908	.940	.969	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2196-01	.6300+00	.000
9340.	.761	.853	.902	.936	.967	.982	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	.2344-01	.6300+00	.000
9350.	.875	.905	.941	.964	.985	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1525-01	.5700+00	.000
9360.	.853	.901	.934	.963	.987	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1299-01	.6800+00	.000
9370.	.898	.944	.967	.931	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.5301-02	.7700+00	.000
9380.	.879	.931	.958	.976	.989	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.8114-02	.7100+00	.000
9390.	.892	.939	.963	.979	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.6920-02	.7200+00	.000
9400.	.887	.934	.961	.978	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7576-02	.7100+00	.000
9410.	.929	.965	.981	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2770-02	.8400+00	.000
9420.	.921	.961	.980	.989	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2868-02	.8600+00	.000
9430.	.956	.982	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9362-03	.9900+00	.000
9440.	.954	.981	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.9434-03	.1000+01	.000
9450.	.951	.979	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1090-02	.9800+00	.000
9460.	.948	.977	.988	.994	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1462-02	.9200+00	.000
9470.	.936	.969	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2481-02	.8400+00	.000
9480.	.912	.967	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1568-02	.1040+01	.000
9490.	.953	.979	.989	.995	.998	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1272-02	.9300+00	.000
9500.	.920	.961	.983	.991	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2391-02	.9100+00	.000
9510.	.936	.972	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1612-02	.9500+00	.000
9520.	.938	.973	.986	.993	.997	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.1620-02	.9400+00	.000
9530.	.936	.961	.980	.990	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3756-02	.7400+00	.000
9540.	.923	.965	.982	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.2200-02	.9200+00	.000
9550.	.869	.945	.970	.984	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4422-02	.8400+00	.000
9560.	.863	.942	.964	.983	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.4853-02	.8300+00	.000
9570.	.904	.952	.974	.986	.994	.997	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.3803-02	.8400+00	.000
9580.	.860	.925	.957	.976	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7196-02	.7800+00	.000
9590.	.860	.925	.957	.976	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	.7196-02	.7800+00	.000
9600.	.810	.895	.936	.963	.984	.991	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1173-01	.7400+00	.000
9610.	.744	.876	.925	.957	.981	.990	.995	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1062-01	.8500+00	.000
9620.	.829	.907	.945	.969	.987	.993	.997	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9657-02	.7600+00	.000
9630.	.831	.908	.945	.969	.985	.993	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9551-02	.7600+00	.000
9640.	.821	.901	.941	.966	.985	.992	.996	.998	.999	1.000	1.000	1.000	1.000	1.000	1.000	.1059-01	.7500+00	.000
9650.	.837	.911	.947	.969	.986	.993	.996	.999	.999	1.000	1.000	1.000	1.000	1.000	1.000	.9533-02	.7500+00	.000



WATER VAPOR 1.00 ATMOSPHERE PRESSURE
T=300 K

P/P0	1.000	0.900	0.800	0.700	0.600	0.500	0.400	0.300	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001
1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.900	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.800	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.700	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.600	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.400	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.300	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.200	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.100	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.050	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.020	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.010	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000
.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	1.000	1.000	1.000	1.000

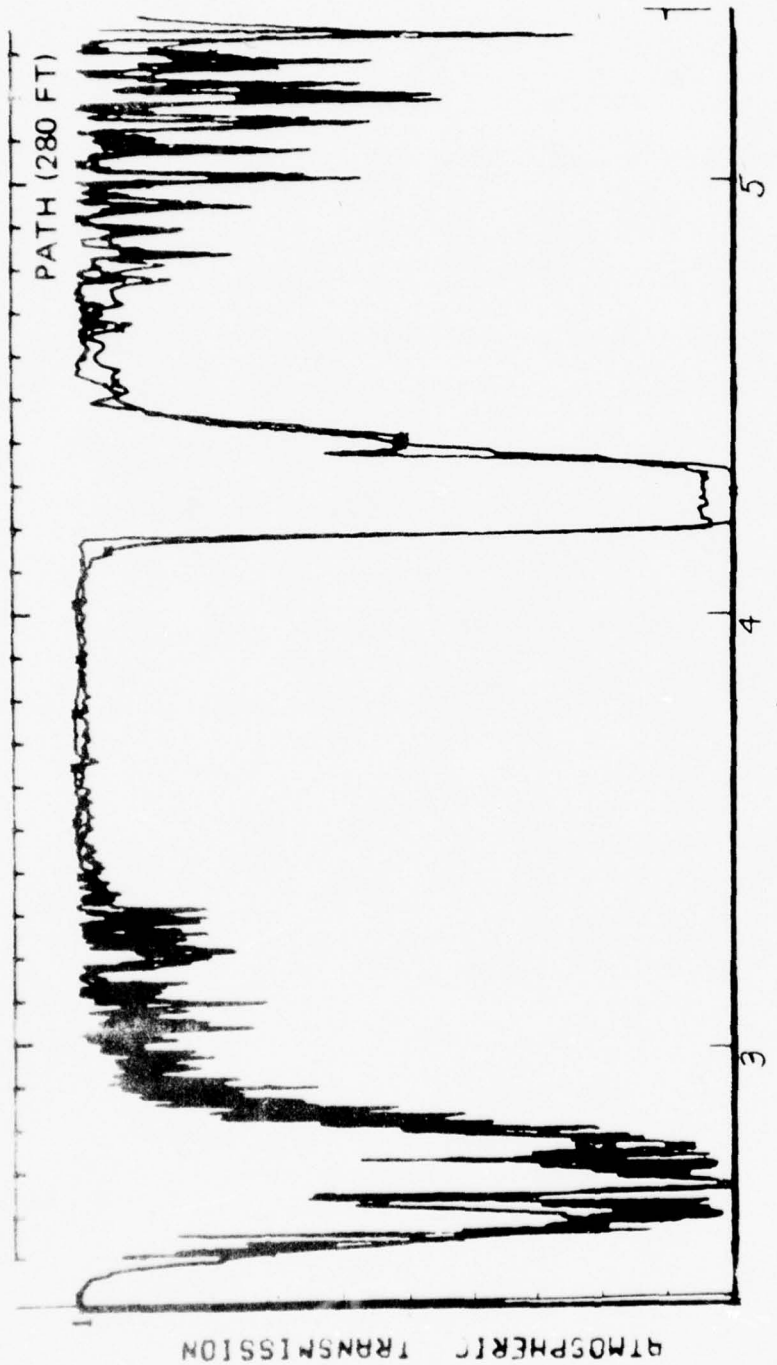
U(PP.CM.) A	R	ERROR
.2861-01	.7200+00	.001
.1234-01	.1120+01	.004
.4034-01	.6800+00	.001
.3589-01	.6800+00	.001
.3808-01	.6100+00	.001
.2868-01	.6500+00	.000
.3649-01	.6500+00	.000
.5186-01	.6500+00	.001
.5091-01	.6300+00	.000
.4424-01	.6200+00	.000
.4028-01	.6300+00	.000
.3856-01	.6300+00	.000
.4851-01	.6300+00	.001
.5096-01	.6700+00	.001
.3037-01	.7100+00	.000
.5982-01	.6000+00	.000
.1243+00	.5100+00	.003
.1017+00	.4900+00	.002
.4351-01	.6300+00	.000
.1217+00	.5300+00	.003
.1246+00	.5200+00	.004
.3037-01	.6400+00	.005
.3303-01	.6900+00	.000
.4489-01	.6700+00	.000
.1032+00	.5600+00	.002
.1033+00	.5500+00	.002
.6064-01	.6100+00	.005
.4690-01	.6400+00	.000
.4569-01	.6600+00	.000
.4279-01	.6500+00	.000
.4764-01	.6500+00	.000
.7448-01	.6300+00	.002
.7480-01	.6300+00	.003

APPENDIX C

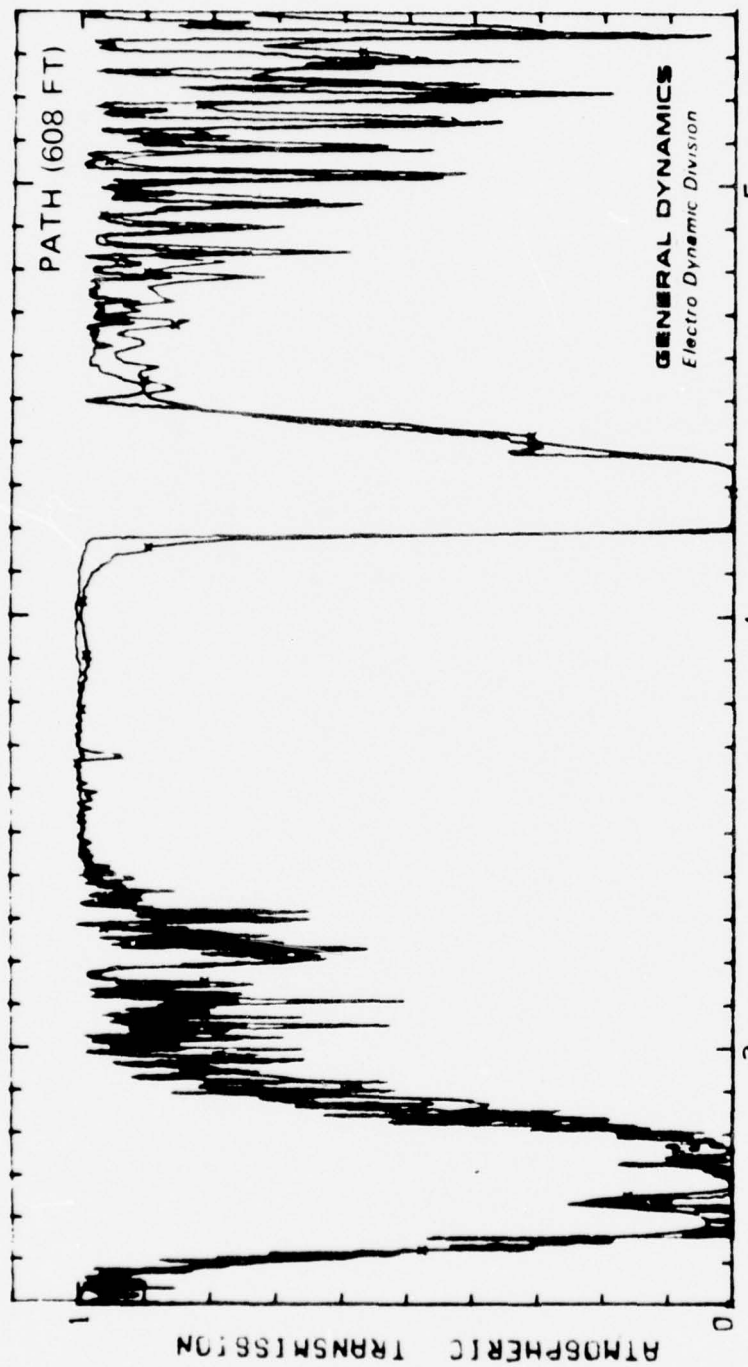
ATMOSPHERIC VALIDATION (GENERAL DYNAMICS)

In this section the results of a validation study described in Section 2-6 are presented. The original transmission curves were obtained by General Dynamics and described in a report for the U.S. Army Aviation System Command (AMCPM-IRCM), St. Louis, Missouri,titled "Infrared Signature Evaluation of a UH-1H Helicopter With and Without Radiation Suppression (June 1972).

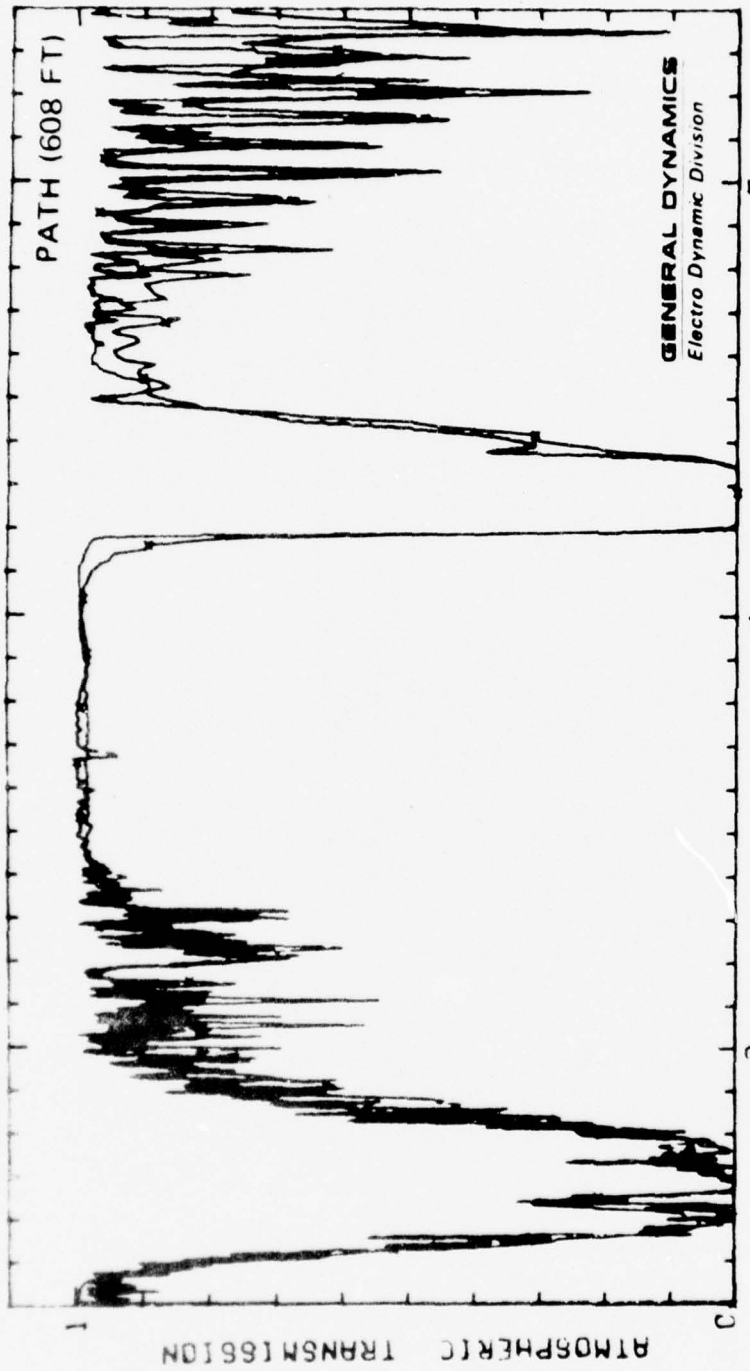
The "Hide" transmission model was plotted over these curves with a small "*" every .3 inches for a direct comparison.



AIR TEMPERATURE: 42°F
RELATIVE HUMIDITY: 27%
PRECIPITABLE H_2O: .19 pr cm/km
ATMOSPHERIC PATH: 280 FT
ALTITUDE: 2281 FT



AIR TEMPERATURE: 53.5°F
RELATIVE HUMIDITY: 29%
PRECIPITABLE H_2O: .31 pr cm/km
ATMOSPHERIC PATH: 608 FT
ALTITUDE: 2281 FT



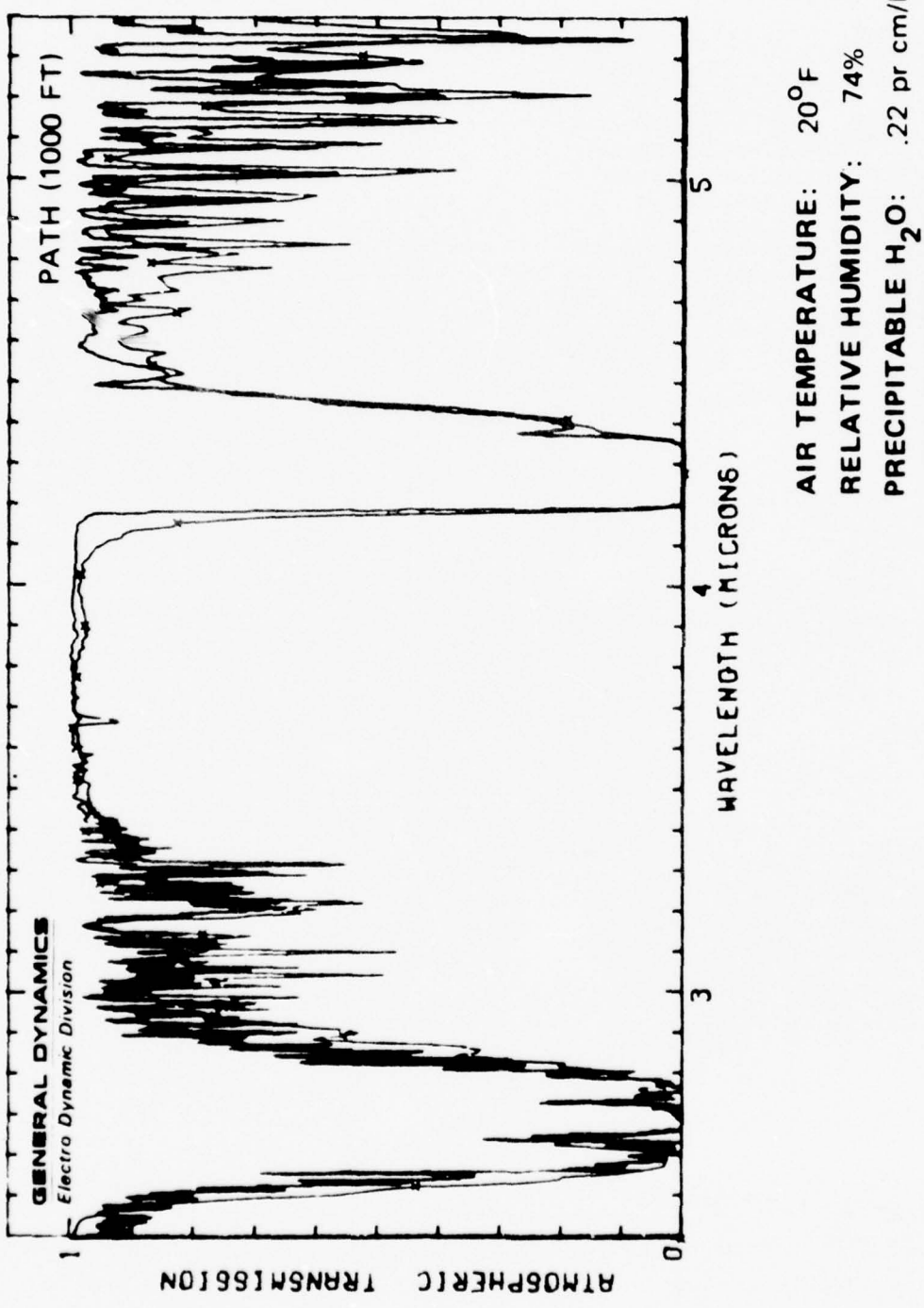
AIR TEMPERATURE: 39.5°F

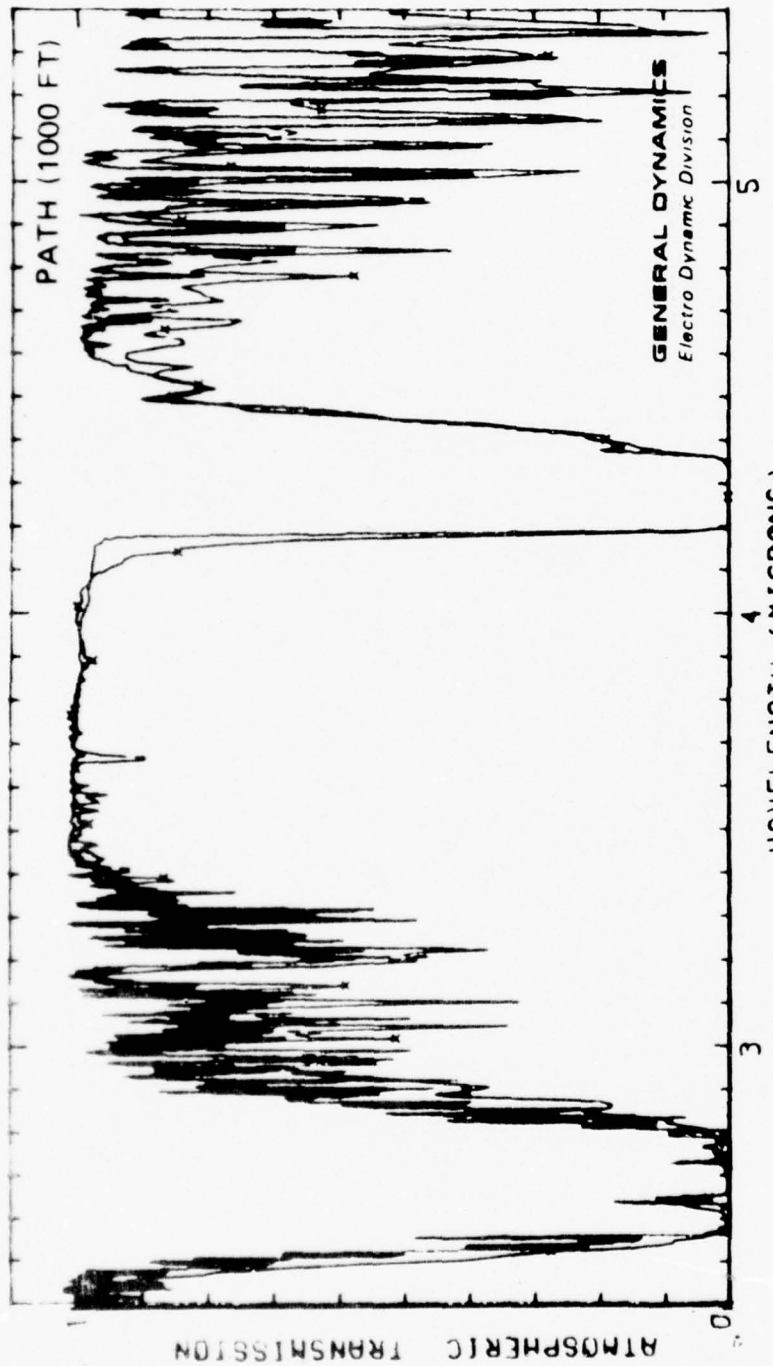
RELATIVE HUMIDITY: 39%

PRECIPITABLE H_2O: .25 pr cm/km

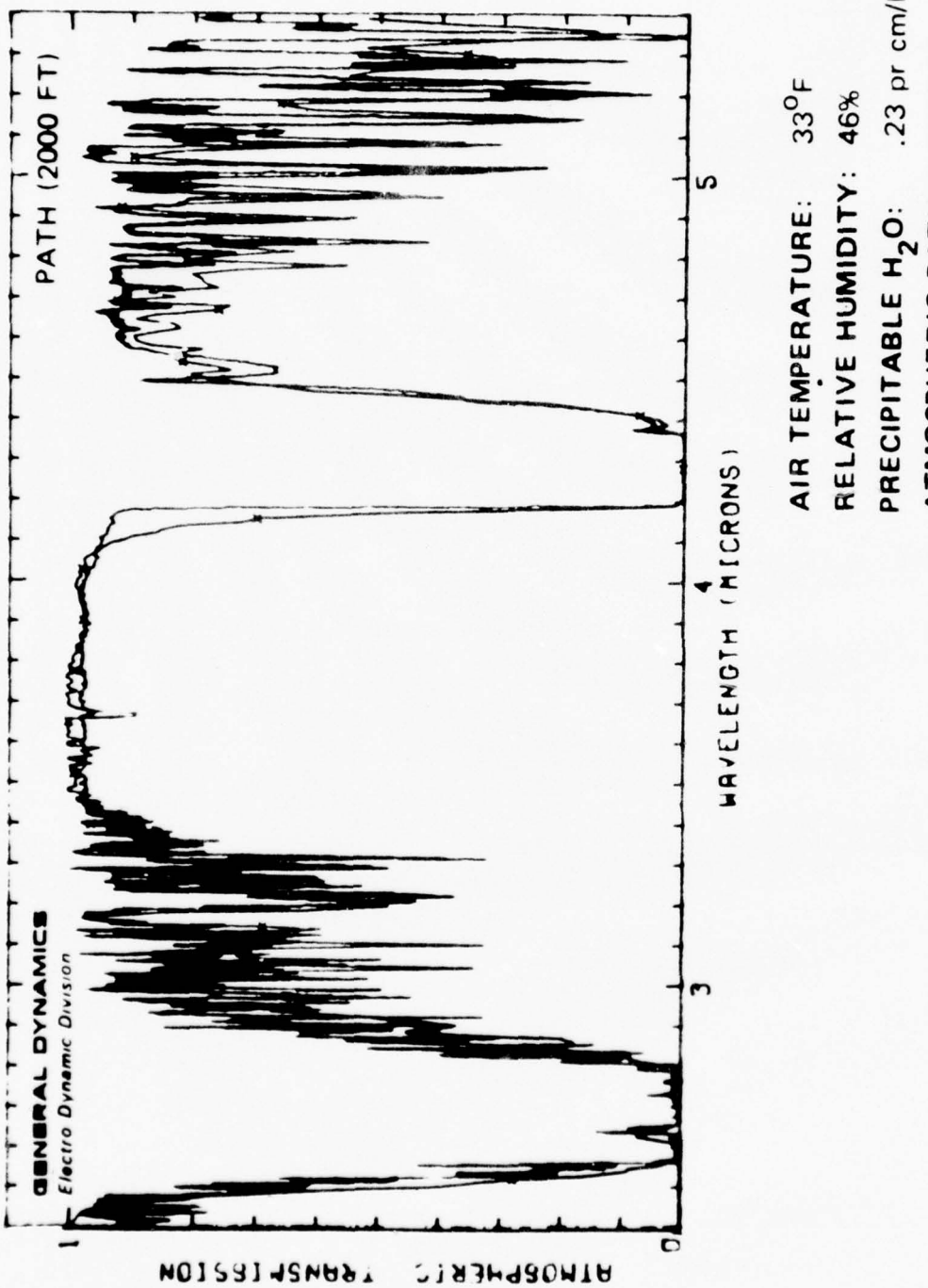
ATMOSPHERIC PATH: 608 FT

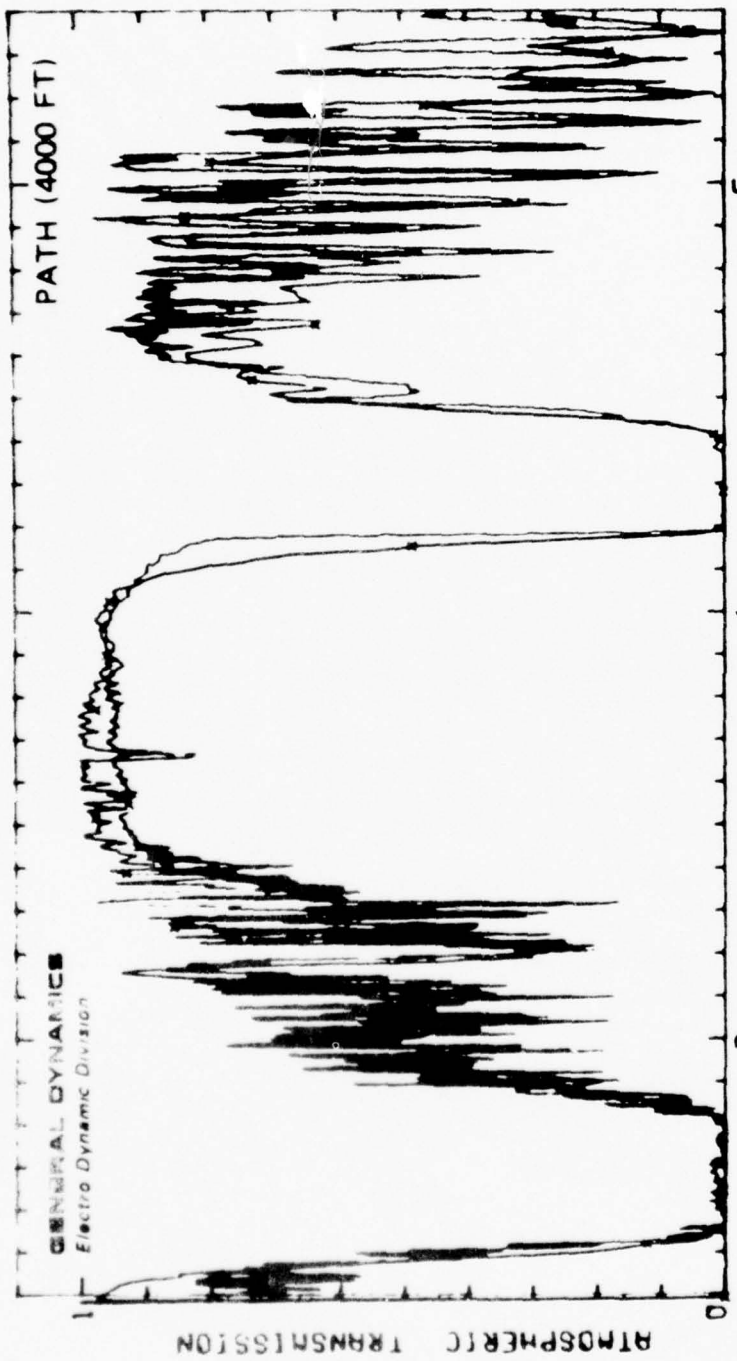
ALTITUDE: 2281 FT


PATH (1000 FT)
GENERAL DYNAMICS
Electro Dynamic Division
ATMOSPHERIC TRANSMISSION
1
0
3
4
5
WAVELENGTH (MICRONS)
AIR TEMPERATURE: 20°F
RELATIVE HUMIDITY: 74%
PRECIPITABLE H_2O: .22 pr cm/km
ATMOSPHERIC PATH: 1000 FT
ALTITUDE: 2281 FT

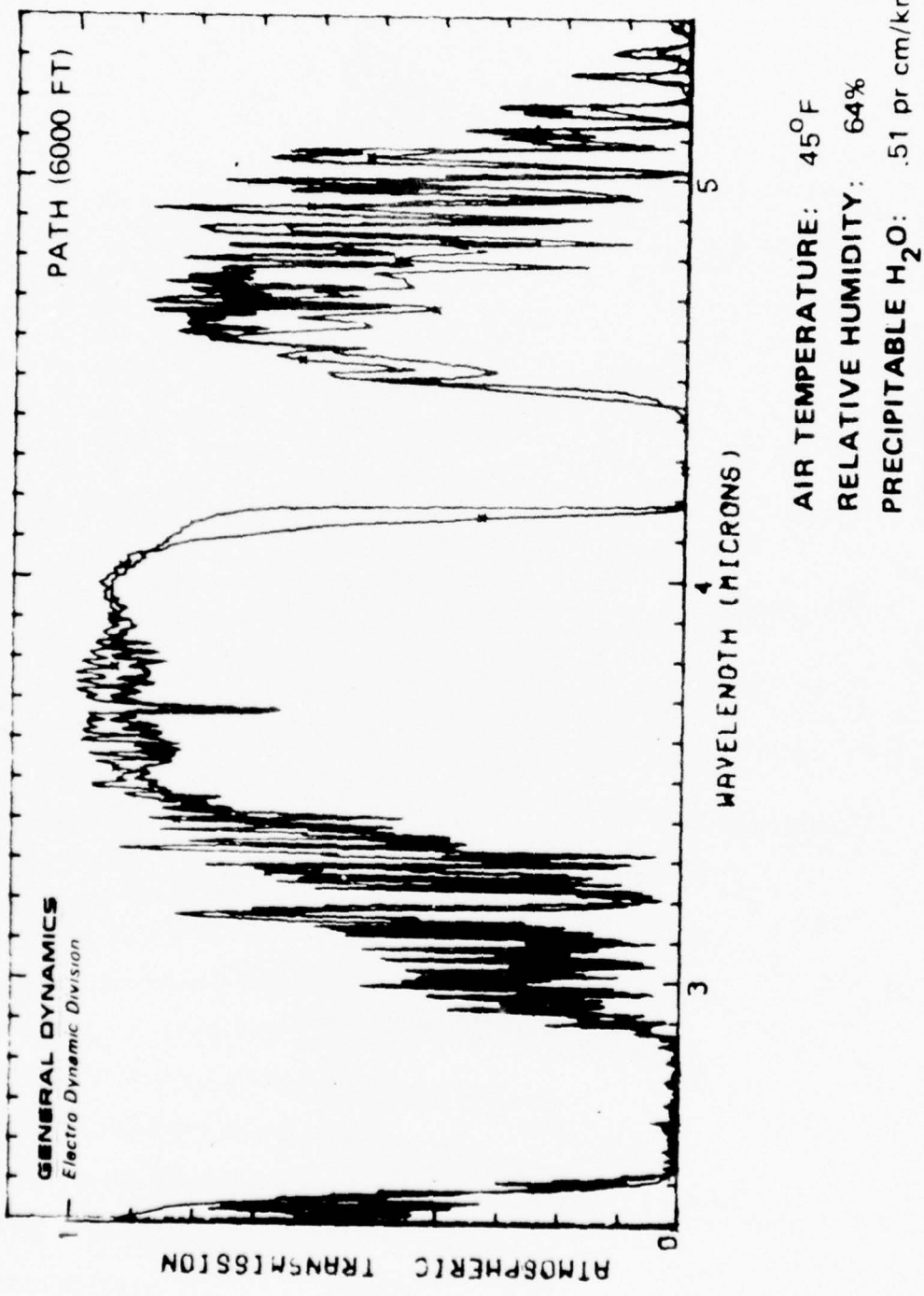


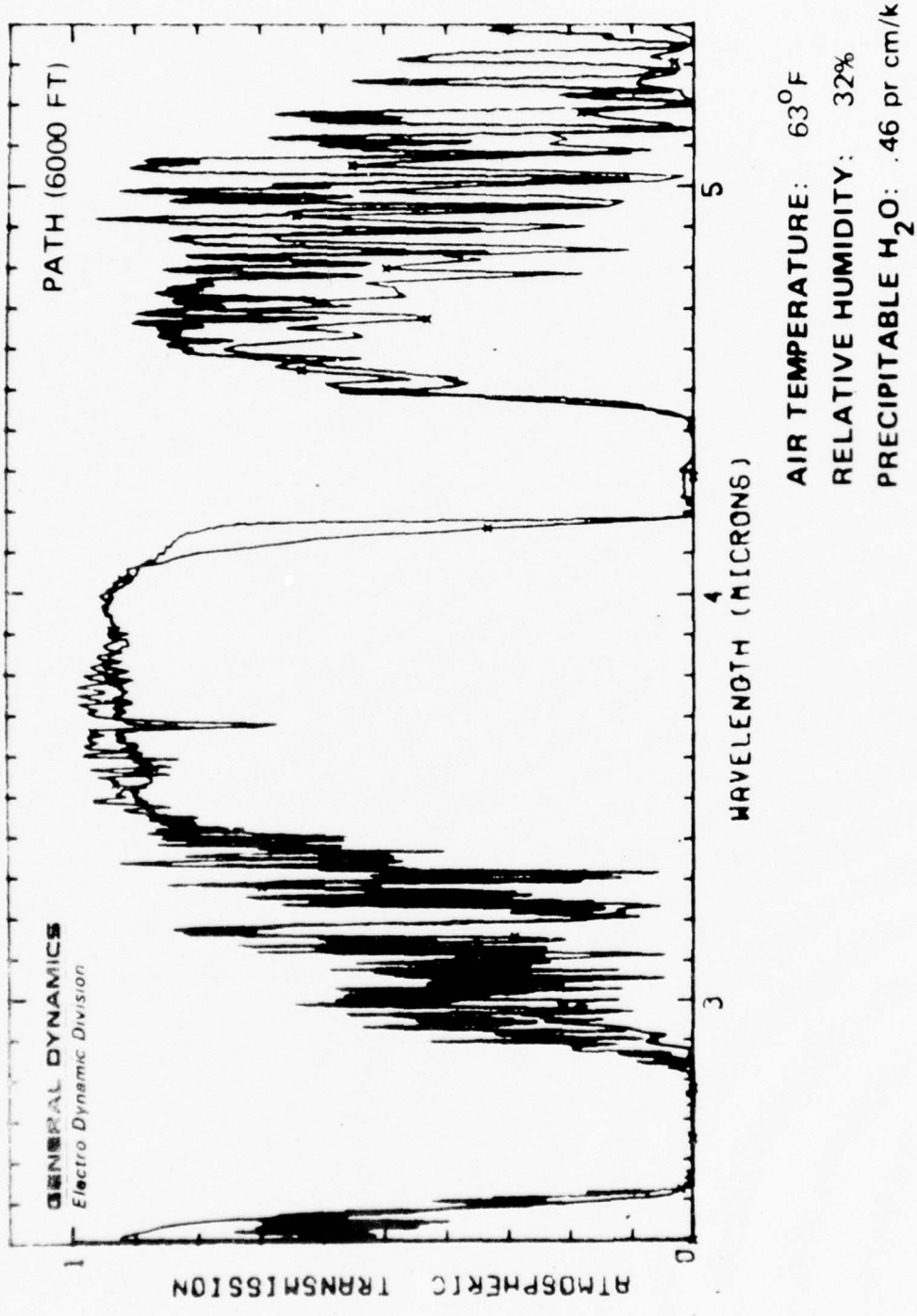
AIR TEMPERATURE: 63°F
RELATIVE HUMIDITY: 32%
PRECIPITABLE H_2O: .46 pr cm/km
ATMOSPHERIC PATH: 1000 FT
ALTITIDE: 2281 FT

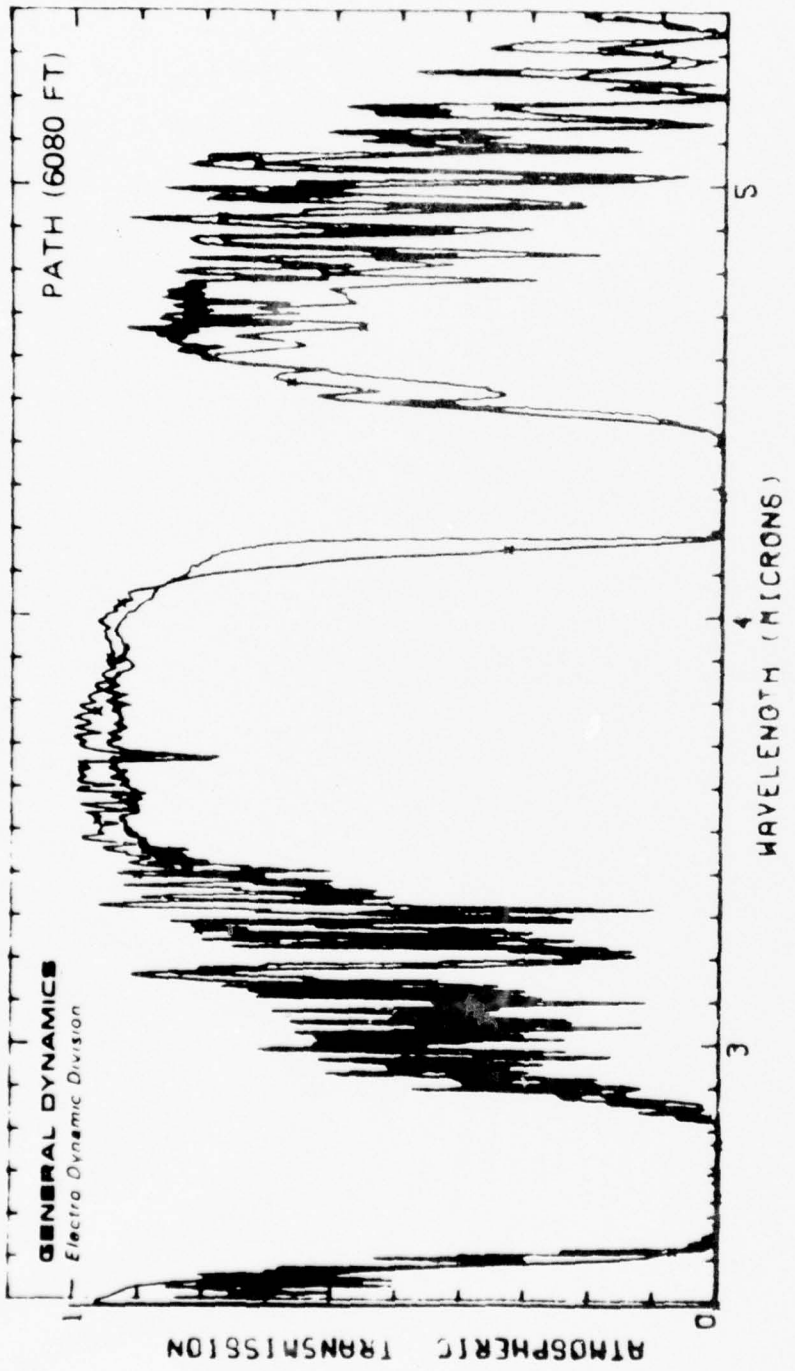

GENERAL DYNAMICS
Electro Dynamic Division
PATH (2000 FT)
ATMOSPHERIC TRANSMISSION
0
1
3
4
5
WAVELENGTH (MICRONS)
AIR TEMPERATURE: 33°F
RELATIVE HUMIDITY: 46%
PRECIPITABLE H_2O: .23 pr cm/km
ATMOSPHERIC PATH: 2000 FT
ALTITUDE: 2281 FT



AIR TEMPERATURE: 44°F
RELATIVE HUMIDITY: 33%
PRECIPITABLE H_2O: .25 pr cm/km
ATMOSPHERIC PATH: 4000 FT
ALTITUDE: 2281 FT


GENERAL DYNAMICS
Electro Dynamic Division
PATH (6000 FT)
ATMOSPHERIC TRANSMISSION
1
0
3
4
5
WAVELENGTH (MICRONS)
AIR TEMPERATURE: 45°F
RELATIVE HUMIDITY: 64%
PRECIPITABLE H_2O: .51 pr cm/km
ATMOSPHERIC PATH: 6000 FT
ALTITUDE: 2281 FT


PATH (6000 FT)
GENERAL DYNAMICS
Electro Dynamic Division
ATMOSPHERIC TRANSMISSION
1
0
3
4
5
WAVELENGTH (MICRONS)
AIR TEMPERATURE: 63°F
RELATIVE HUMIDITY: 32%
PRECIPITABLE H_2O: .46 pr cm/km
ATMOSPHERIC PATH: 6000 FT
ALTITUDE: 2281 FT


PATH (6080 FT)
GENERAL DYNAMICS
Electro Dynamic Division
ATMOSPHERIC TRANSMISSION
1
0
3
4
5
WAVELENGTH (MICRONS)
AIR TEMPERATURE: 41°F
RELATIVE HUMIDITY: 35%
PRECIPITABLE H_2O: .24 pr cm/km
ATMOSPHERIC PATH: 6080 FT
ALTITUDE: 2281 FT

APPENDIX D

YATES AND TAYLOR VALIDATION DATA

The data obtained experimentally by Yates and Taylor working for the Naval Research Laboratory in Washington is presented in this section overlayed with the Hide model prediction for validation purposes. The data was taken under seven different weather conditions and ranges from .5μ to 13 μ. It is plotted in the following figures as a light smooth line. The Hide predictions are plotted as heavy dark lines with "x's" every .3 inches. With the exception of Plate #11, two graphs are presented on each page; one is plotted with the optimum scattering function discussed in Section 2.5 and one with the general scattering function also described in Section 2.5. This general function has the form:

$$T_s = \text{EXP}\ (-C\lambda^{-1})$$

whereas the optimum takes the form

$$T_s = \text{EXP}\ (-A\lambda^{-B})$$

A,B,C are given under the measurement conditions for each plate.

Yates and Taylor Measurements Plate #5

Range (KM)	5.5	16.25
Alt (K ft)	S.L.	S.L.
Temp (^{o}F)	38	53.
RH (%)	66	41.
H_{20} (CM)	2.2	6.78
CO2 (CM)	176.	520.
N_{20} (CM)	1.54	4.55
O_3 (CM)	.169	.498
General Scattering	.503	.681
Optimum Scattering A	.1026	.0402
B	.9020	.9982

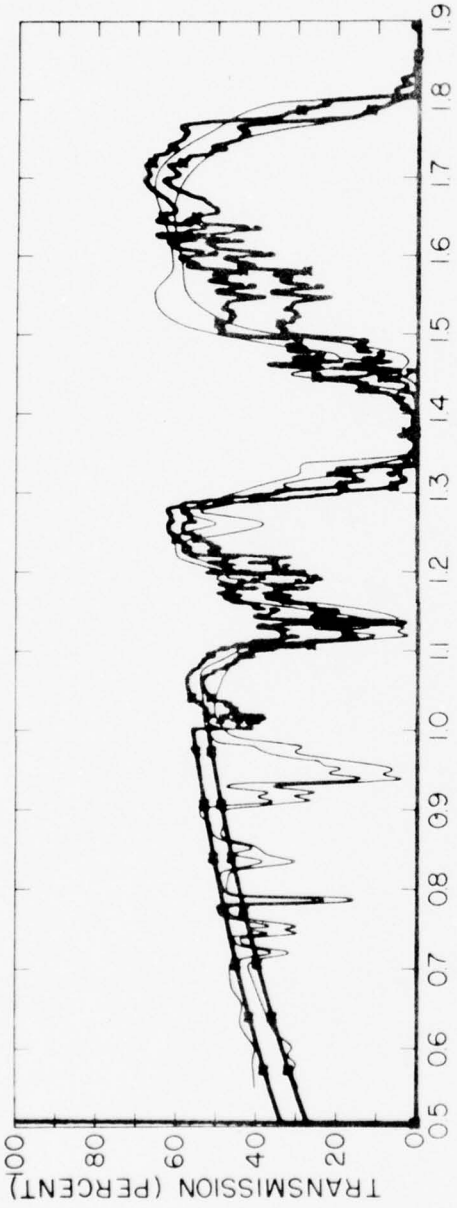


Plate 5 Optimum Scattering

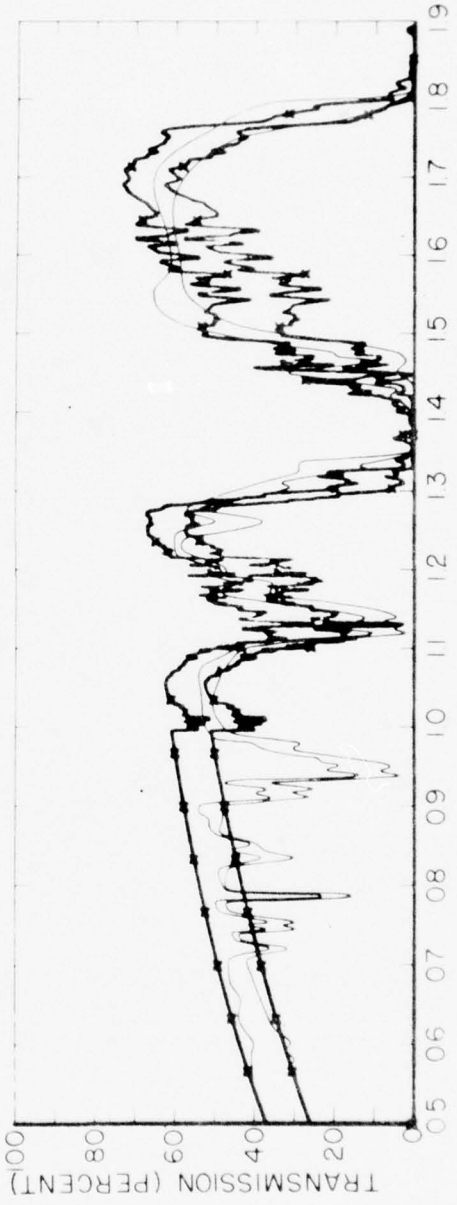


Plate 5 General Scattering

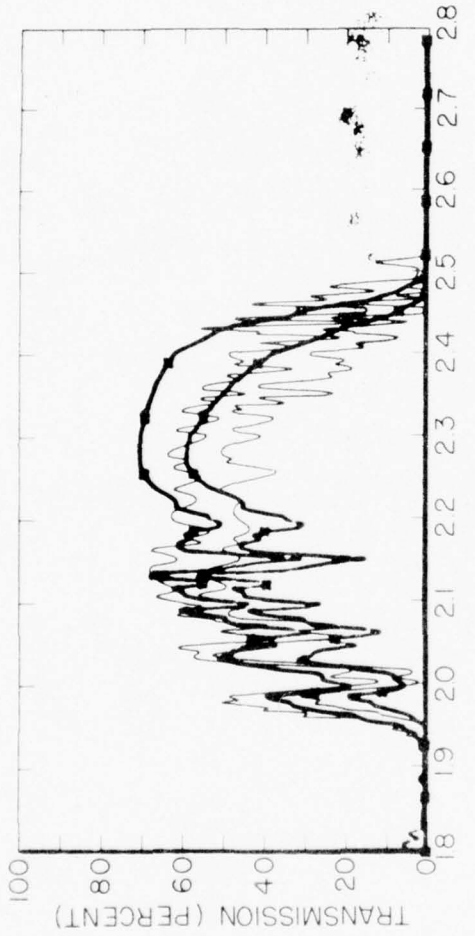


Plate 5-1 Optimum Scattering

Plate 5-1 General Scattering

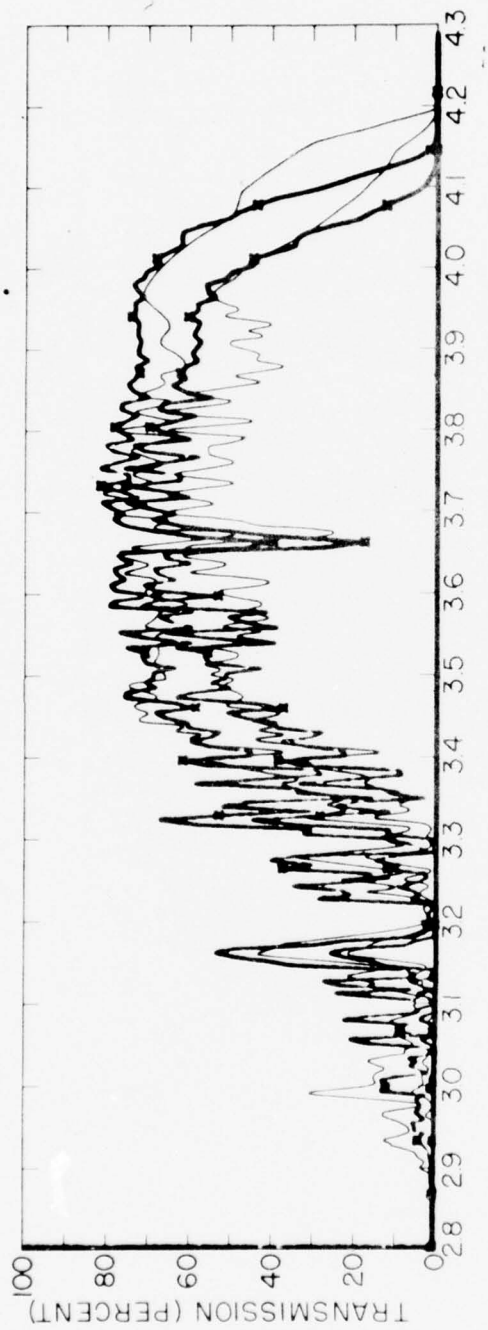


Plate 5-2 Optimum Scattering

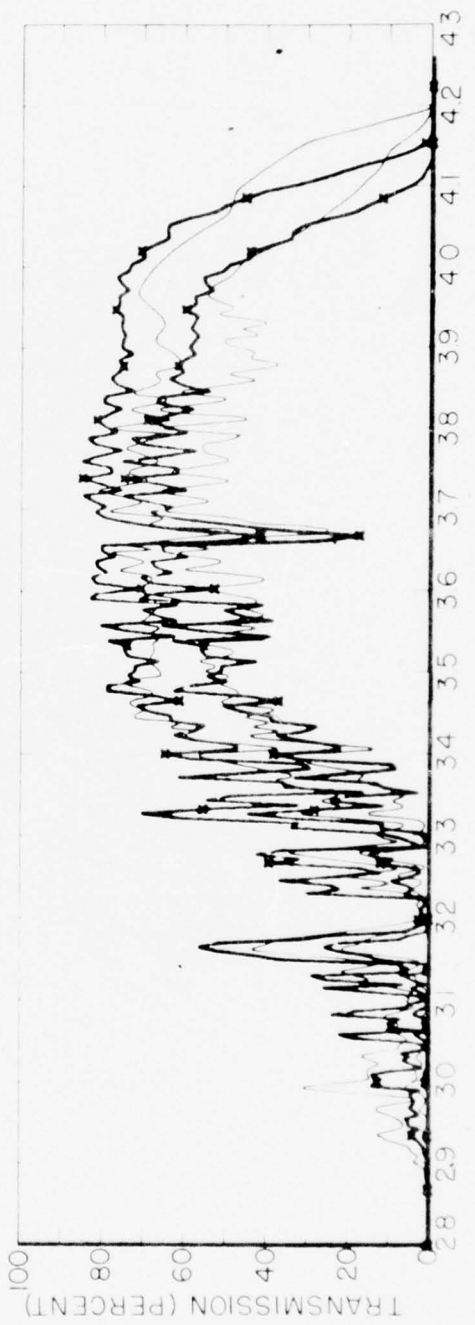


Plate 5-2 General Scattering

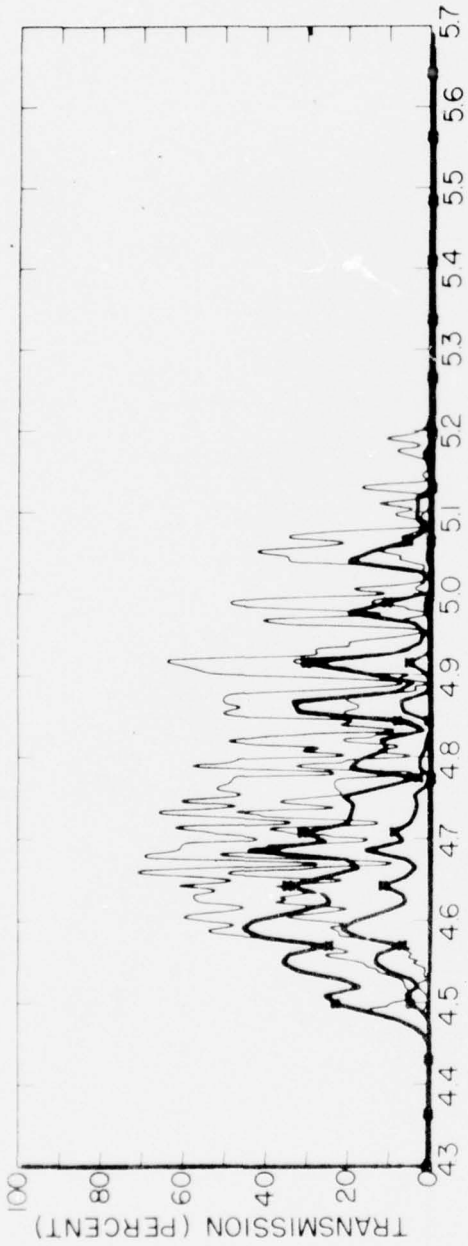


Plate 5-3 Optimum Scattering

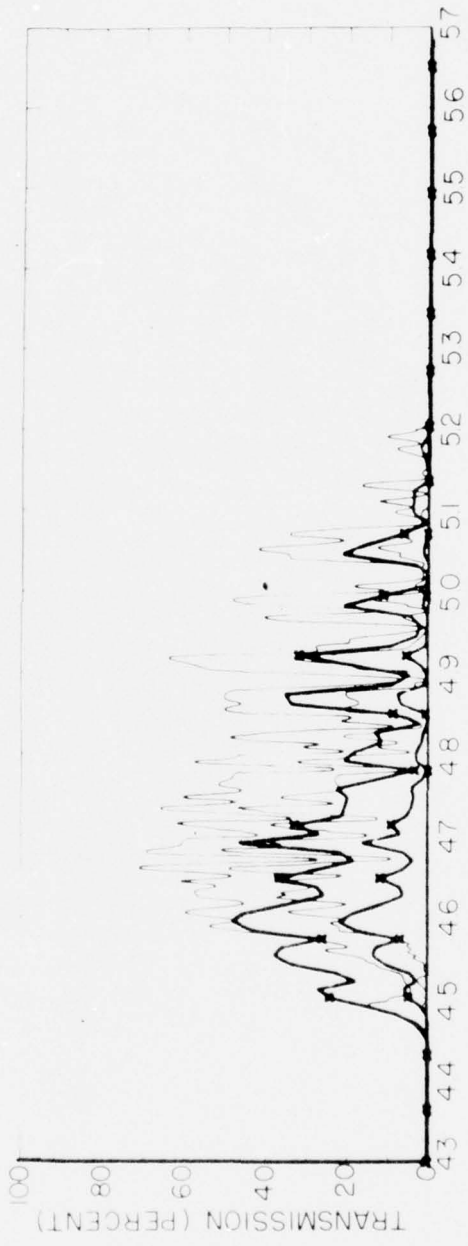


Plate 5-3 General Scattering

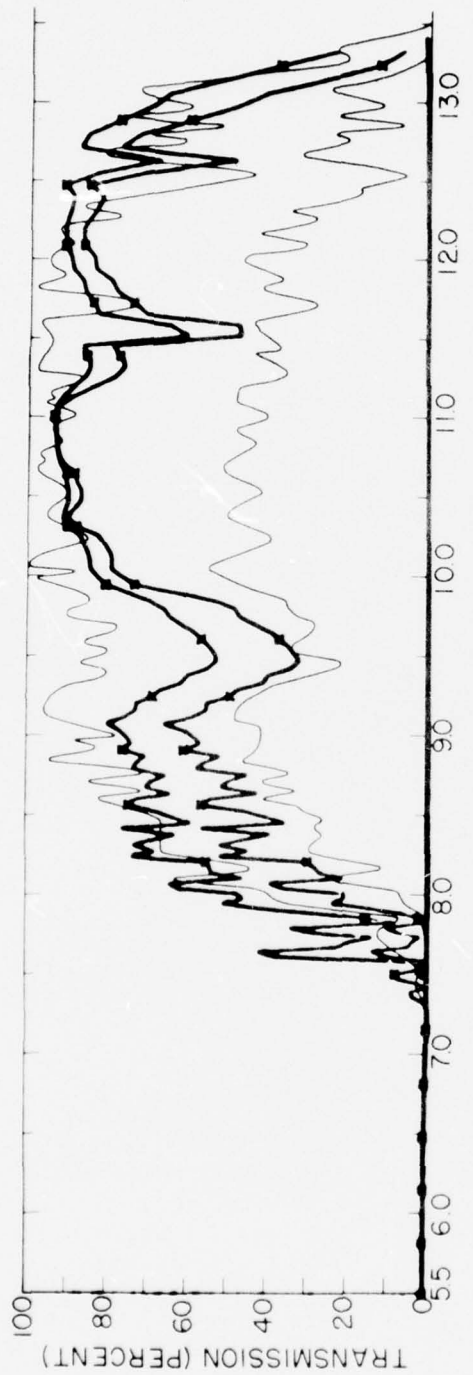


Plate 5-4 Optimum Scattering

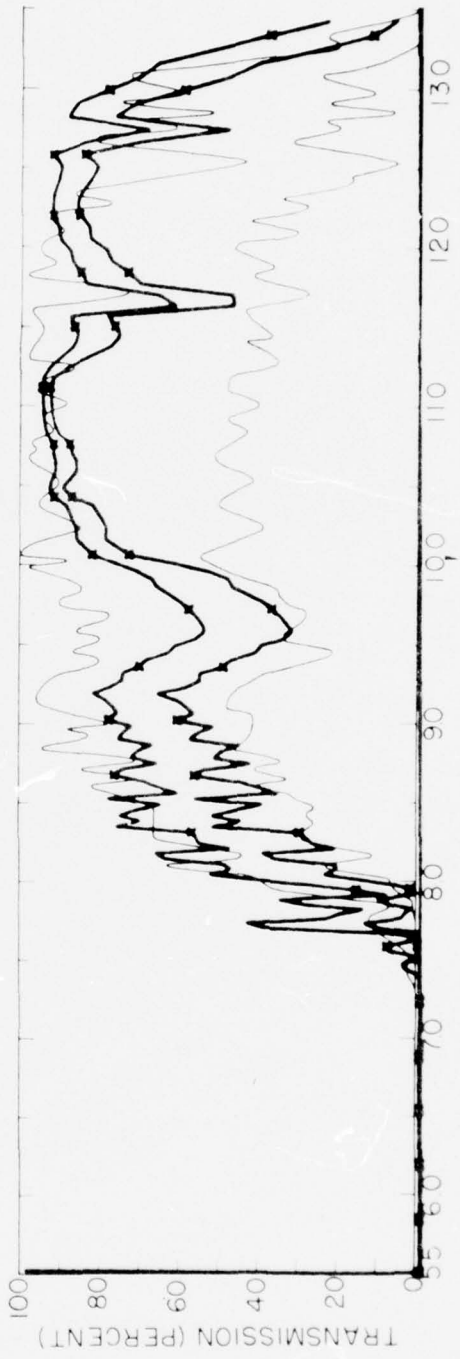


Plate 5-4 General Scattering

Yates & Taylor Measurements Plate #6

Range (KM)	5.5	16.25
Alt (K ft)	S.L.	S.L.
Temp (^{o}F)	64.	68.
Relative Humidity	51	43
H_{20} (Cm)	4.18	15.1
CO2 (Cm)	176.	520.
N_{20} (Cm)	1.54	4.55
O_3 (Cm)	.169	.498
General Scattering	.196	.464
Optimum Scatt A	.0476	.0298
B	.8390	1.078

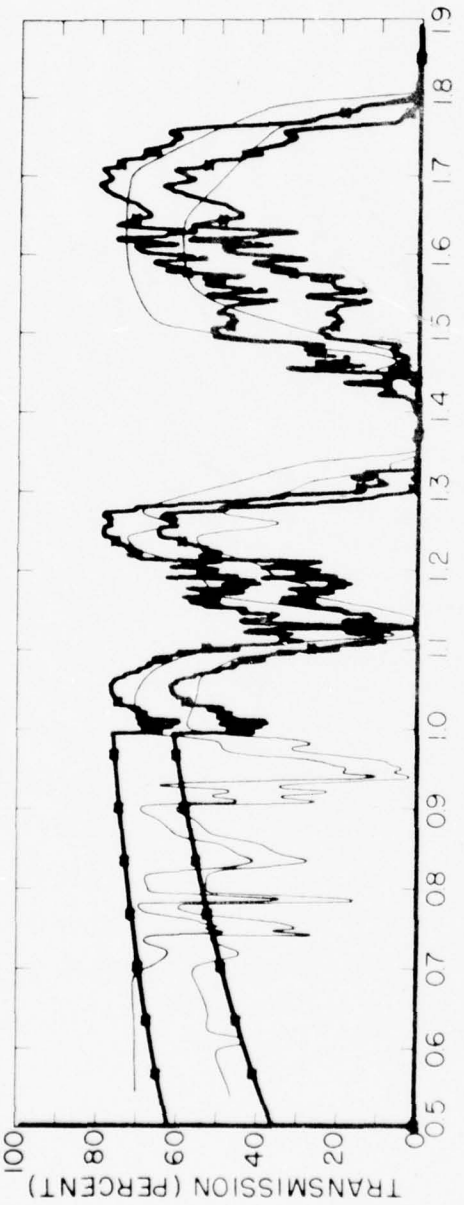


Plate 6 Optimum Scattering

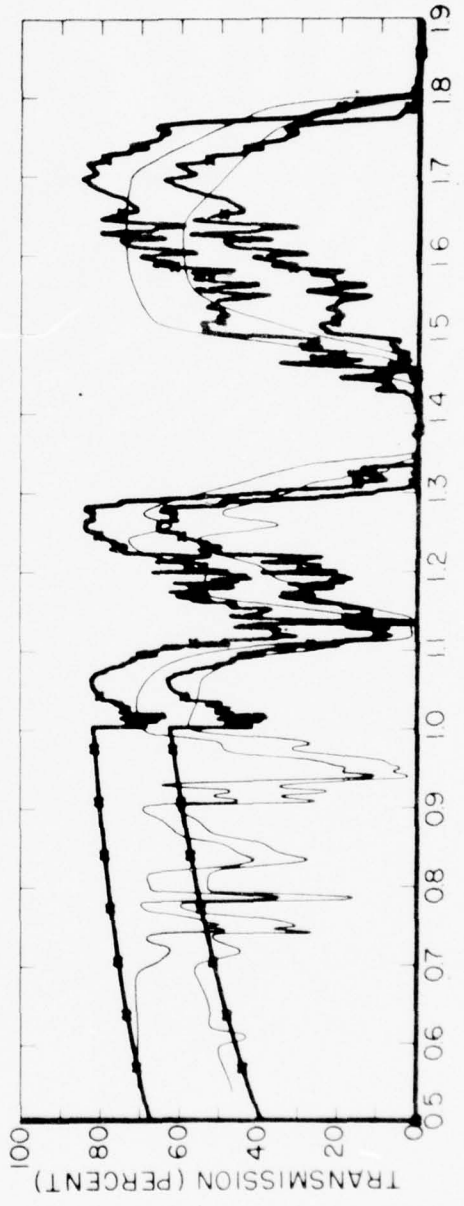


Plate 6 General Scattering

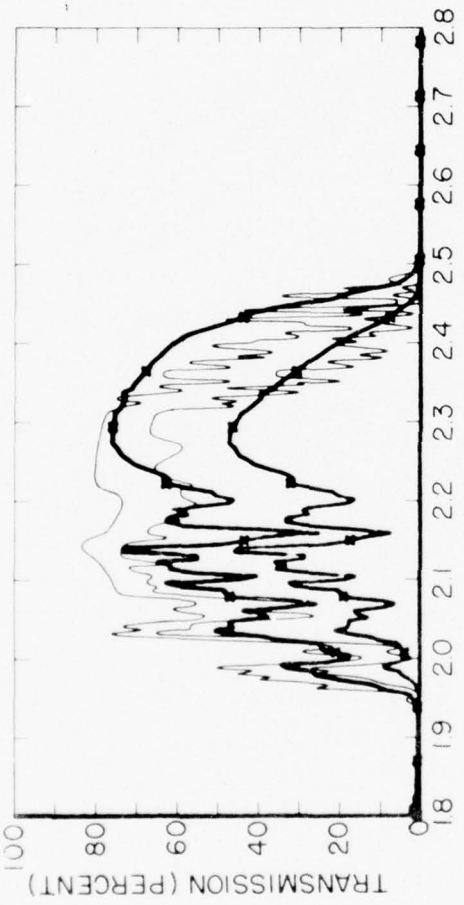


Plate 6-1 Optimum Scattering

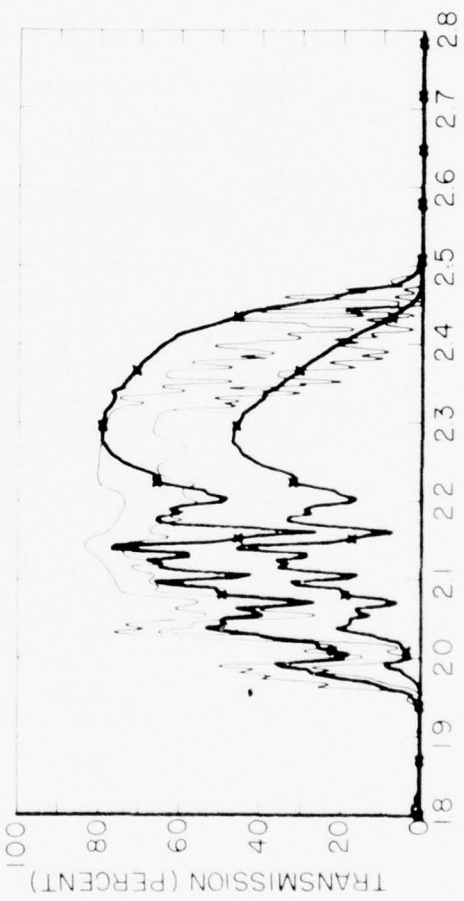


Plate 6-1 General Scattering

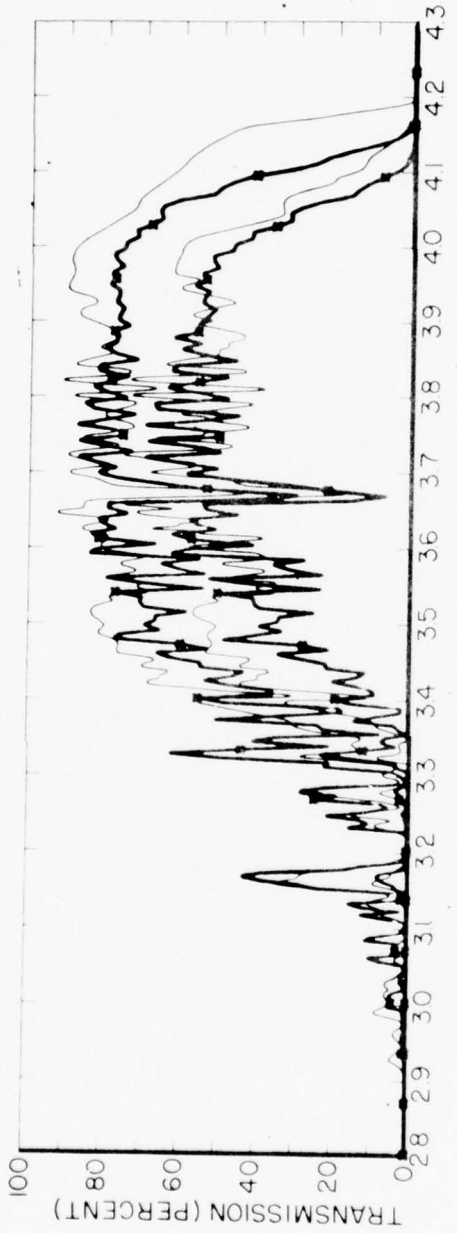


Plate 6-2 Optimum Scattering

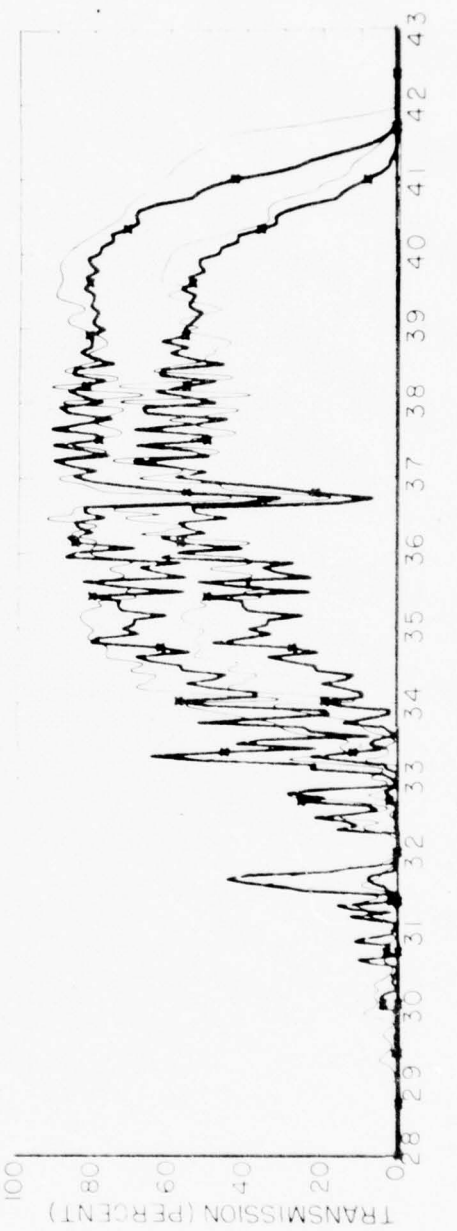


Plate 6-2 General Scattering

UNCLASSIFIED

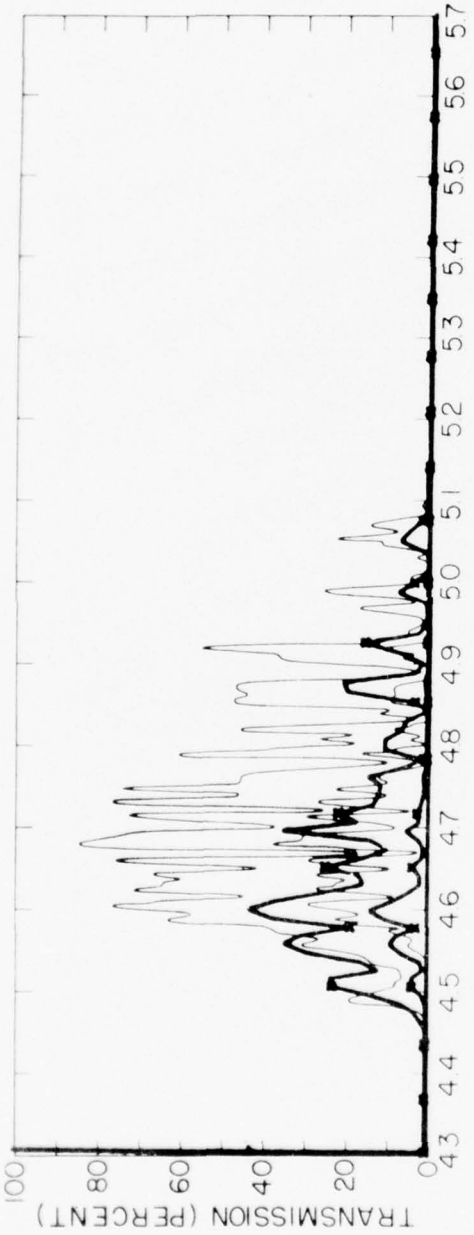


Plate 6-3 Optimum Scattering

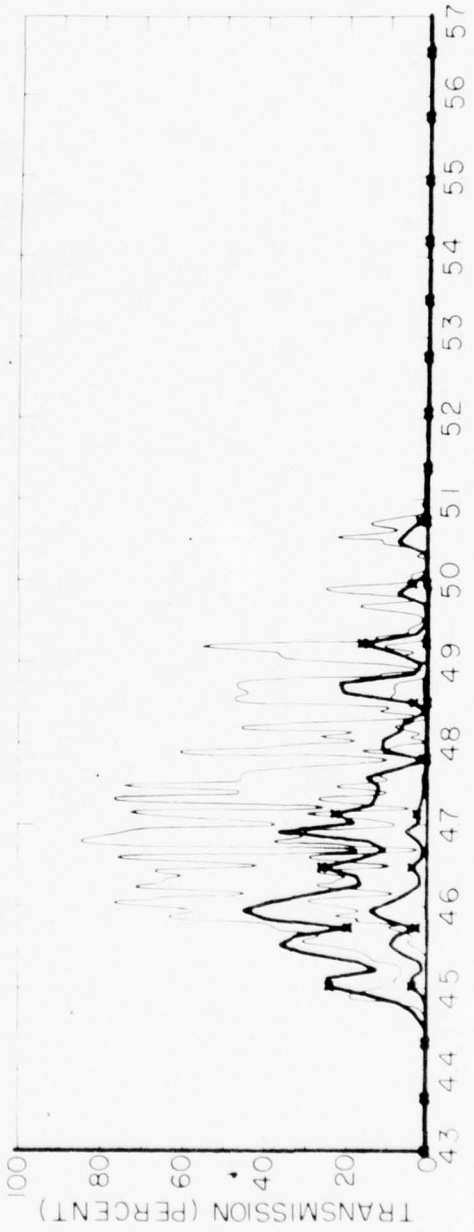


Plate 6-3 General Scattering

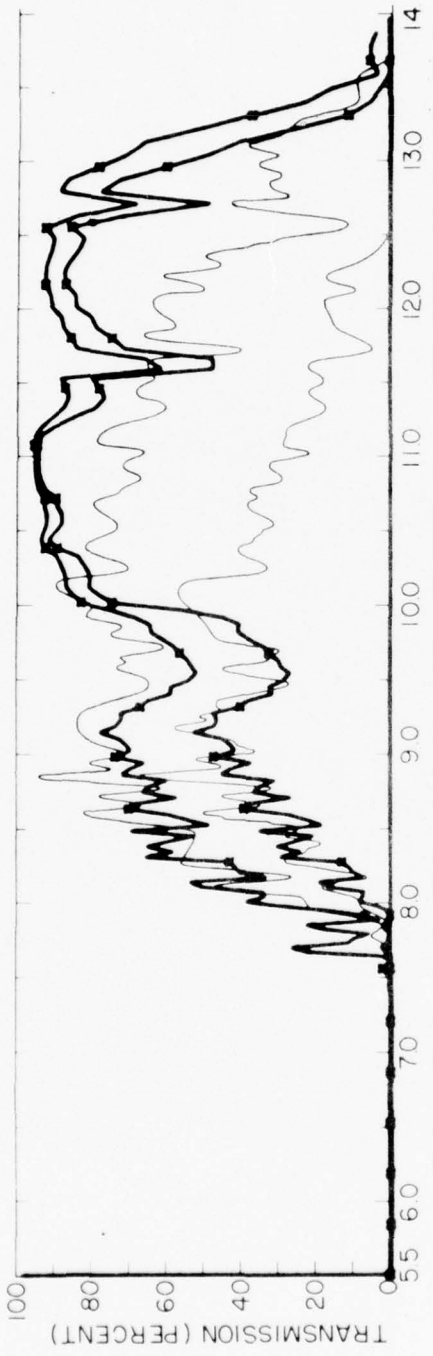


Plate 6-4 Optimum Scattering

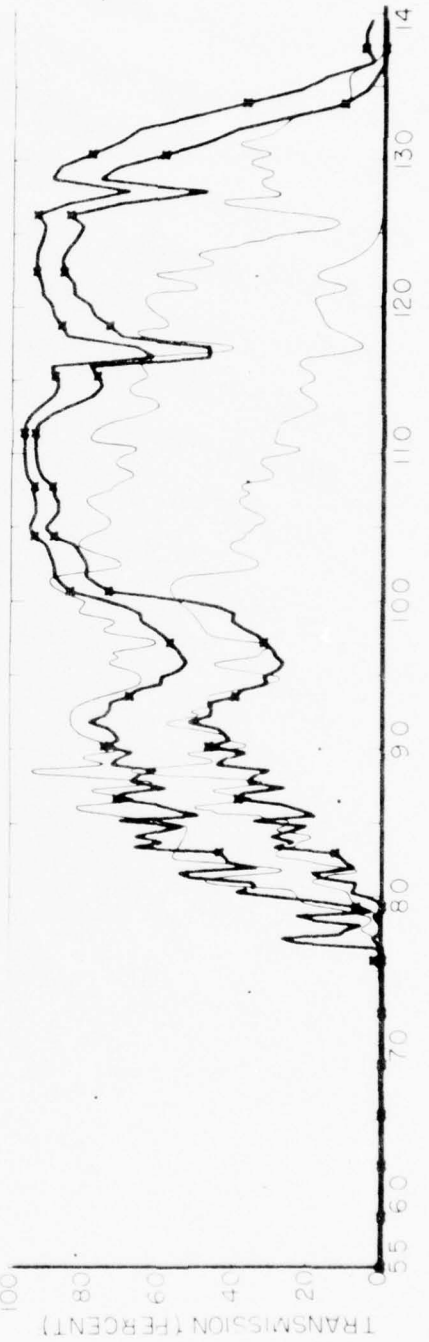


Plate 6-4 General Scattering

Yates and Taylor Measurements Plate #7

Range (KM)		5.5	16.25
Altitude (K ft)		S.L.	S.L.
Temp (^{o}F)		78	74
Relative Humidity		73	82
H20 (CM)		9.4	27.7
C02 (CM)		176	520
N_{20} (CM)		1.54	4.55
O_3 (CM)		.169	.498
General Scattering		.662	1.27
Optimum Scattering	A	.0881	.0600
	B	1.558	1.436

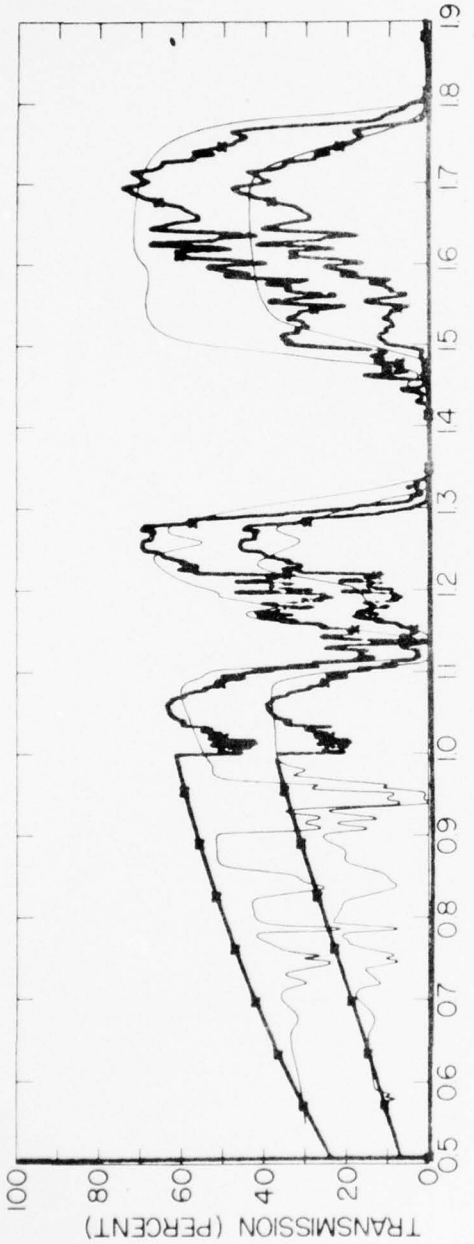


Plate 7 Optimum Scattering

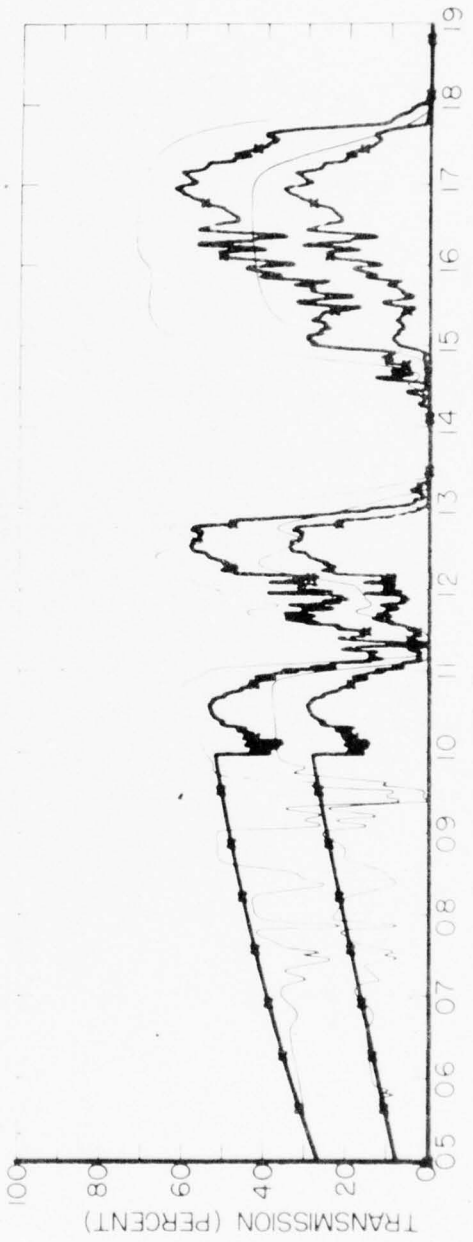


Plate 7 General Scattering

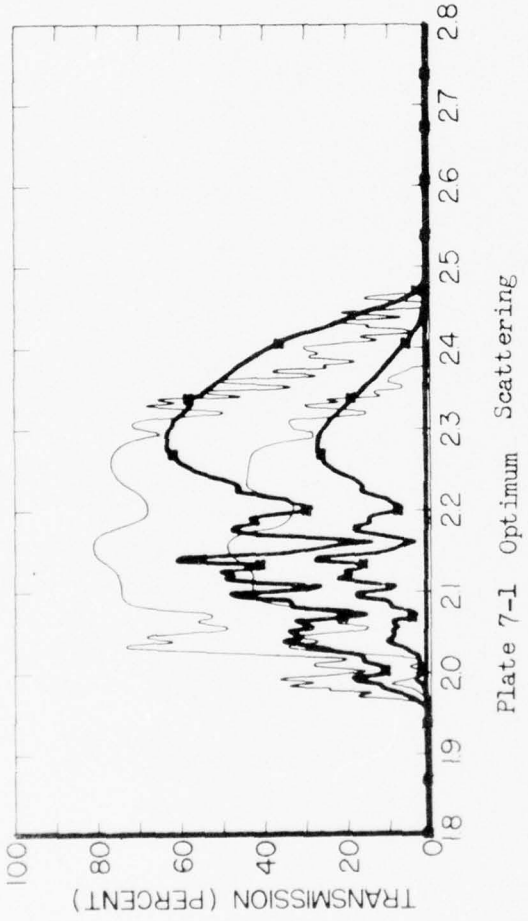


Plate 7-1 Optimum Scattering

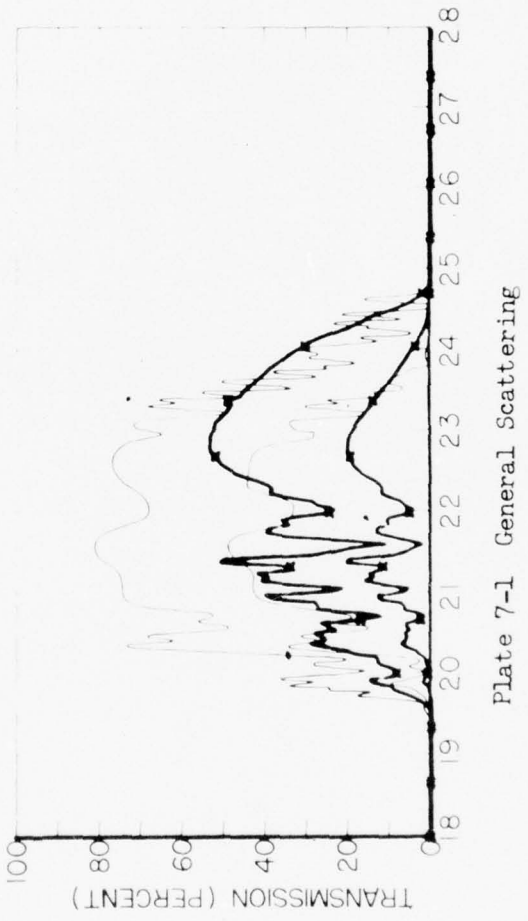


Plate 7-1 General Scattering

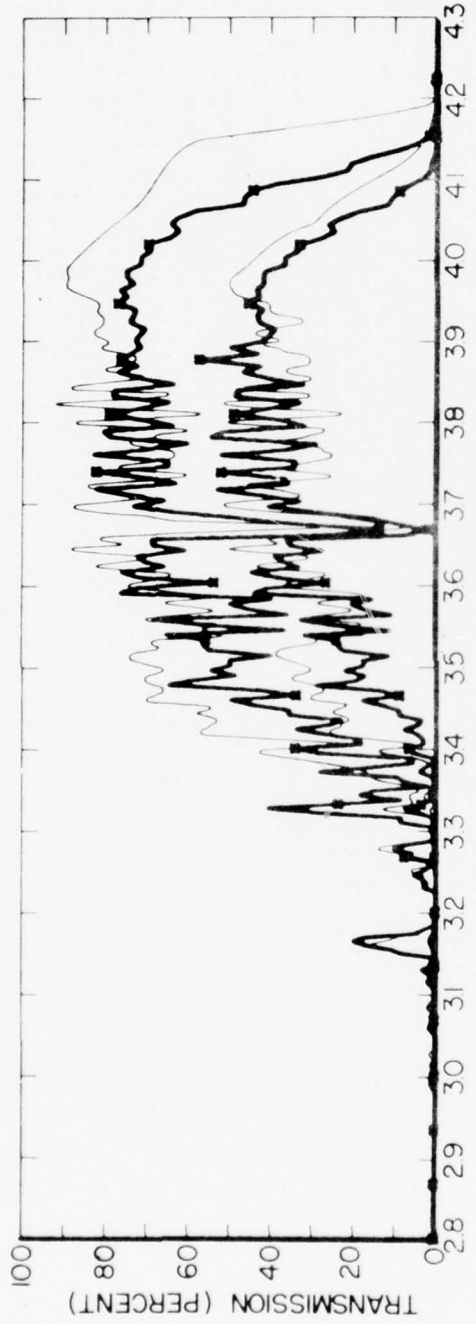


Plate 7-2 Optimum Scattering

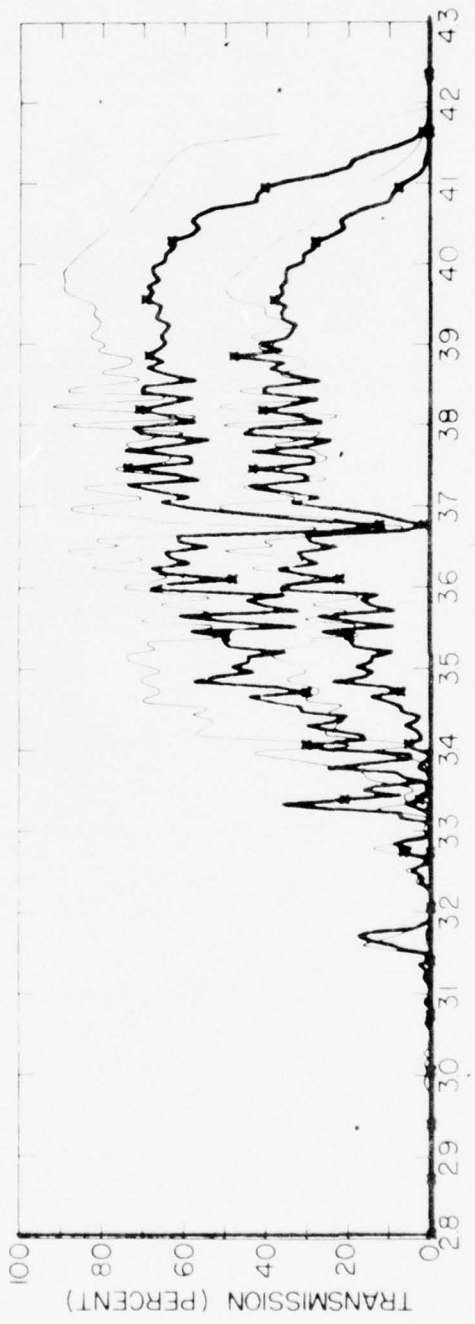


Plate 7-2 General Scattering

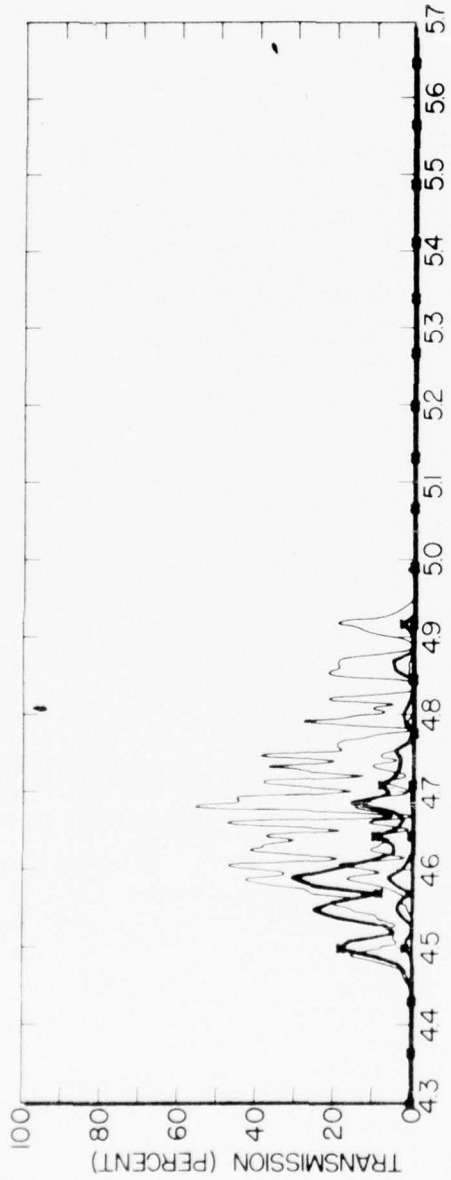


Plate 7-3 Optimum Scattering

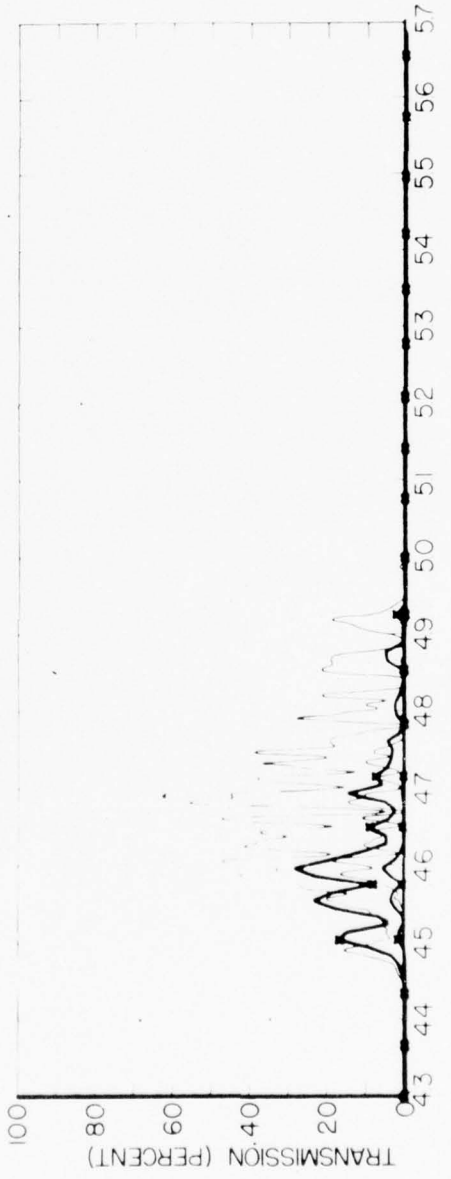


Plate 7-3 General Scattering

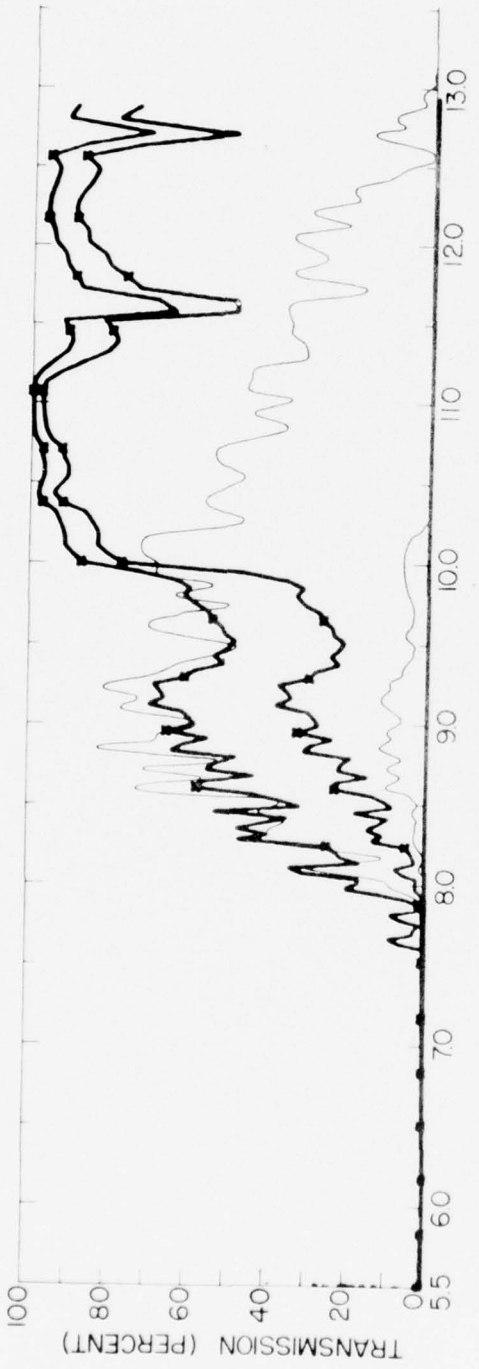


Plate 7-4 Optimum Scattering

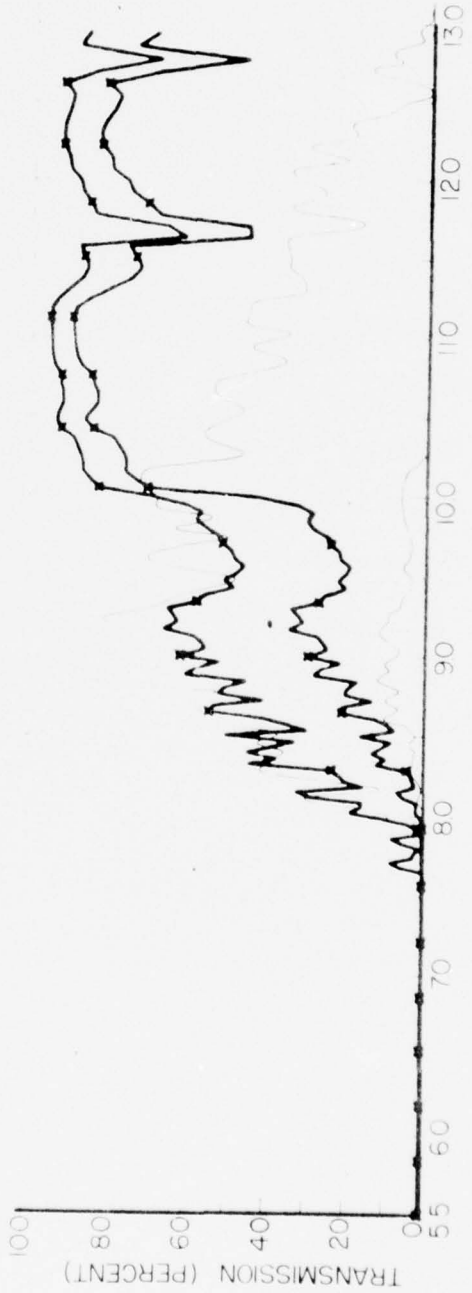


Plate 7-4 General Scattering

Yates & Taylor Measurements Plate #8

Range (KM)	16.25
Altitude (K ft)	S.L.
Temp (^{O}F)	87.
Relative Humidity	59.
H20 (CM)	37.
CO2 (CM)	520
N20 (CM)	4.55
O3 (CM)	.498
General Scattering	2.15
Optimum Scattering A	.096
B	1.610

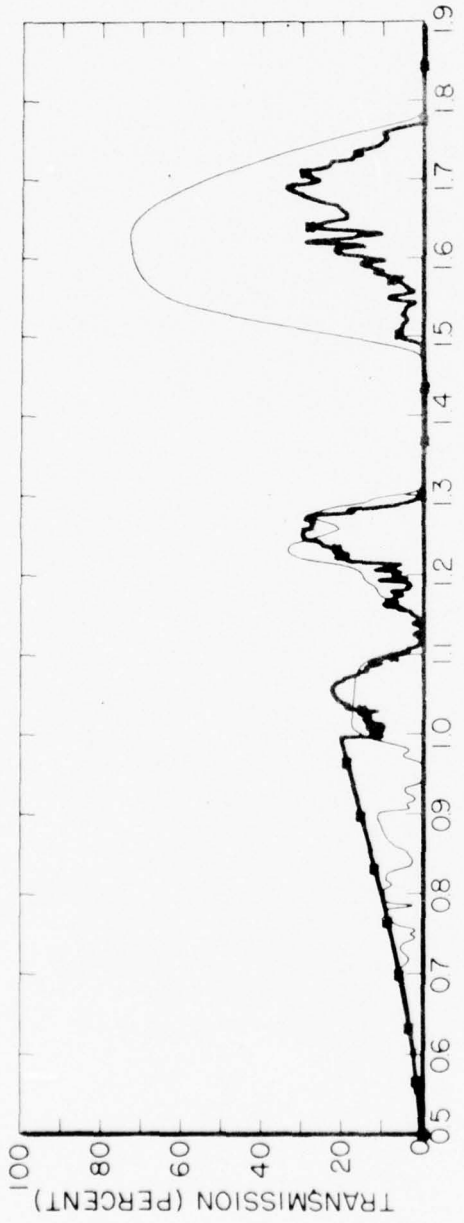


Plate 8 Optimum Scattering

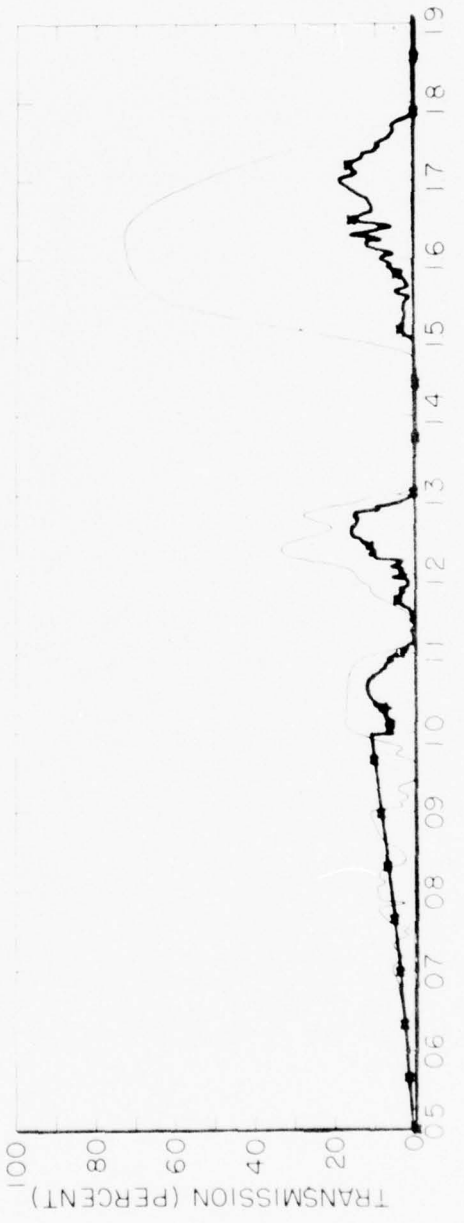


Plate 8 General Scattering

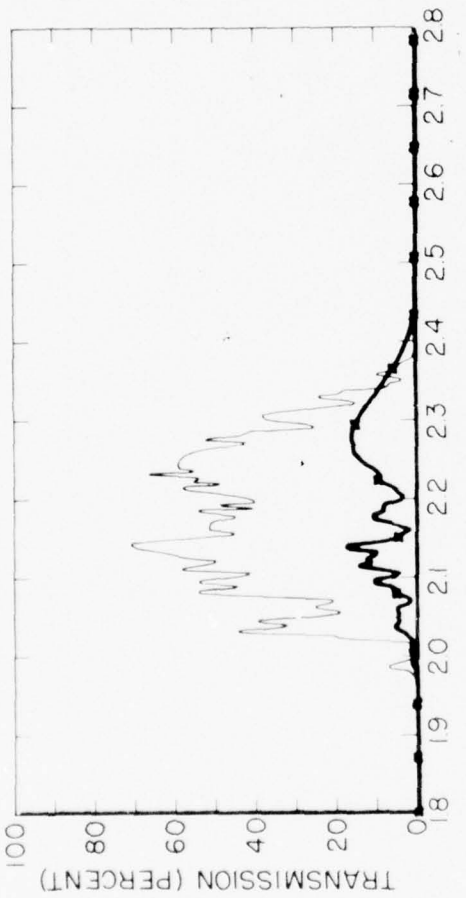


Plate 8-1 Optimum Scattering

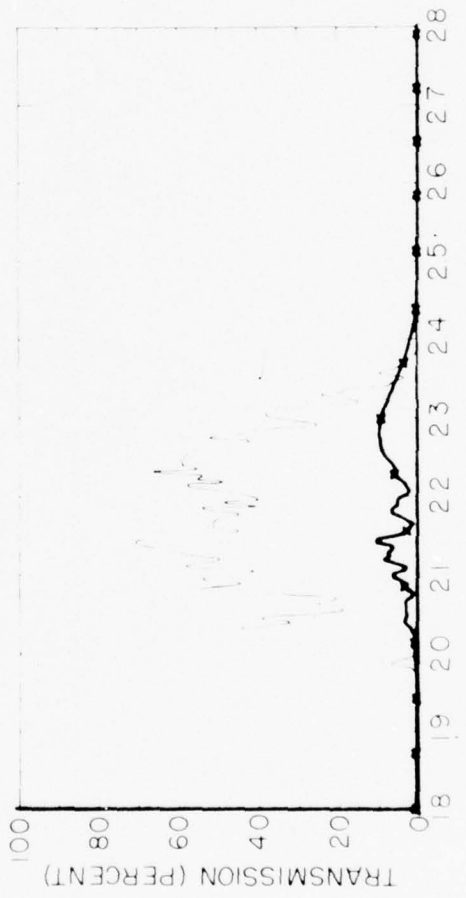


Plate 8-1 General Scattering

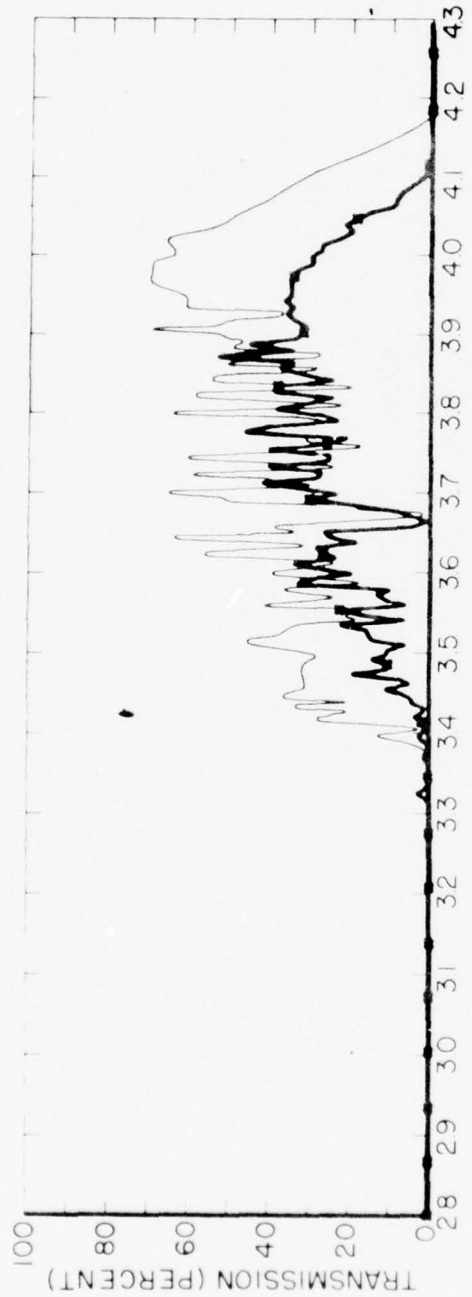


Plate 8-2 Optimum Scattering

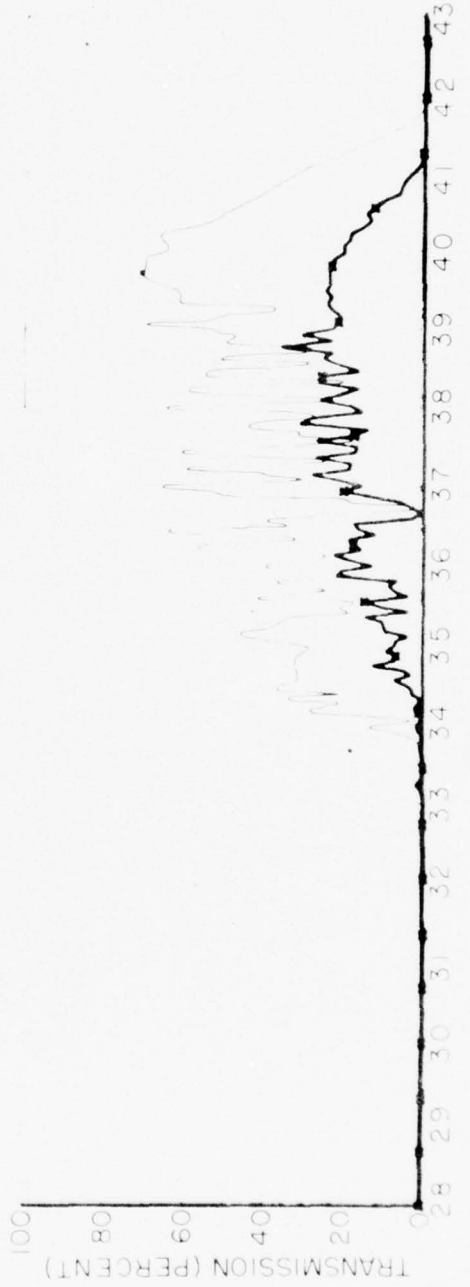


Plate 8-2 General Scattering

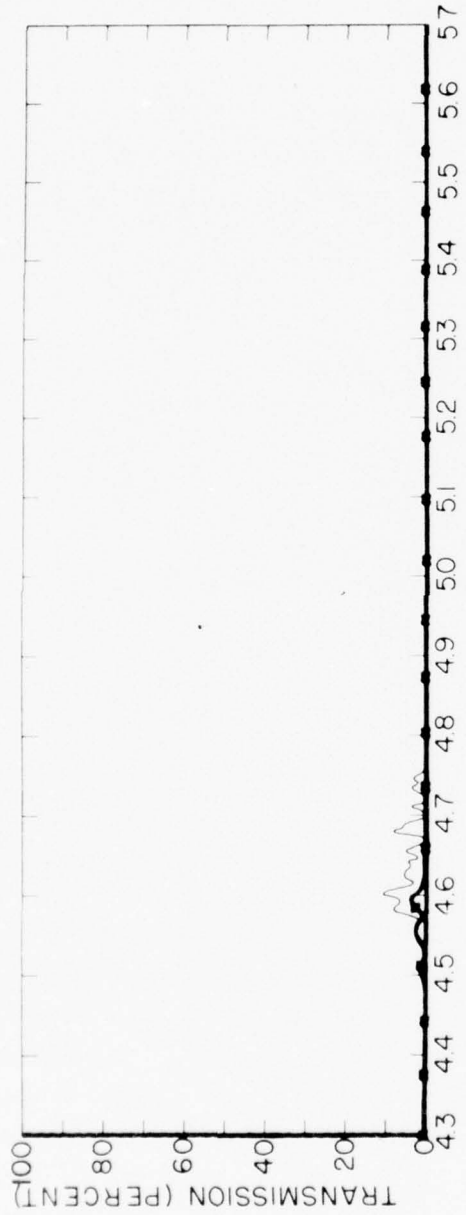


Plate 8-3 Optimum Scattering

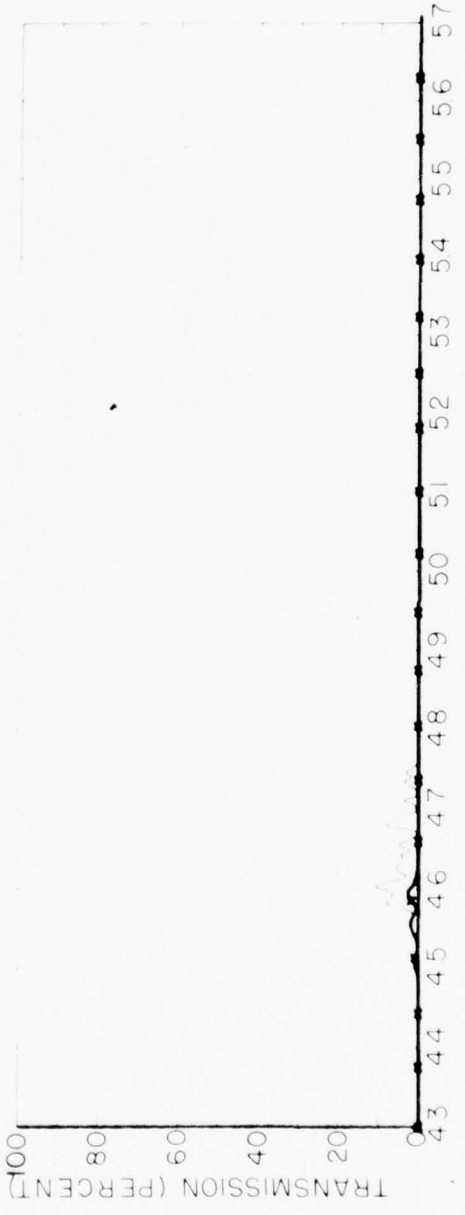


Plate 8-3 General Scattering

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Yates and Taylor Measurements Plate #9

Range (KM)		27.7
Altitude		10 KM
Temp (^{o}F)		43
Relative Humidity		100
H20 (CM)		20
C02 (CM)		413.2
N20 (CM)		3.62
03 (CM)		. 849
General Scattering		.73
Optimum Scattering	A	.03
	B	.9146

UNCLASSIFIED

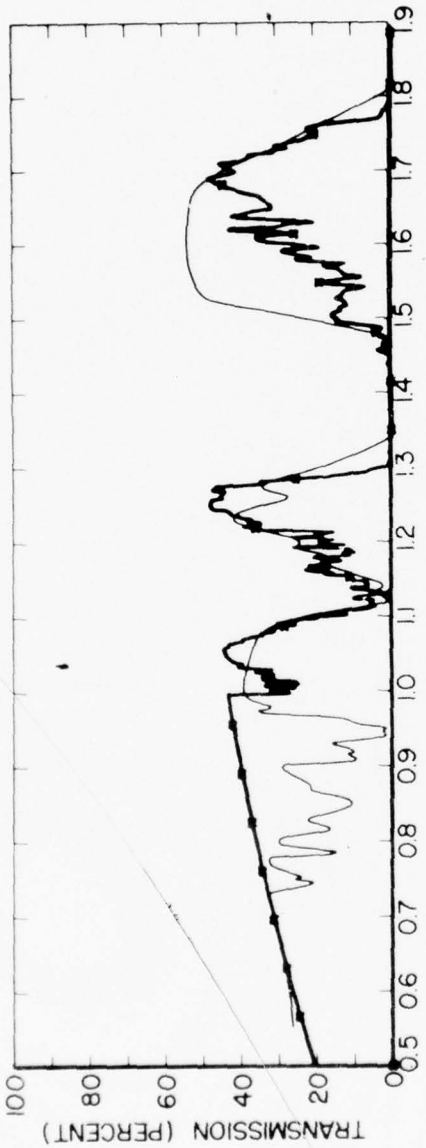

Plate 9 Optimum Scattering

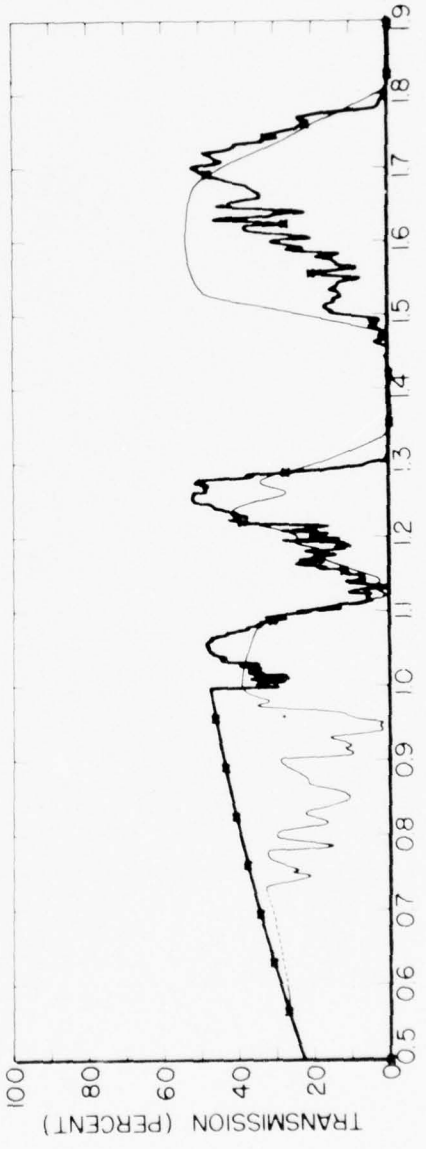

Plate 9 General Scattering

UNCLASSIFIED

UNCLASSIFIED

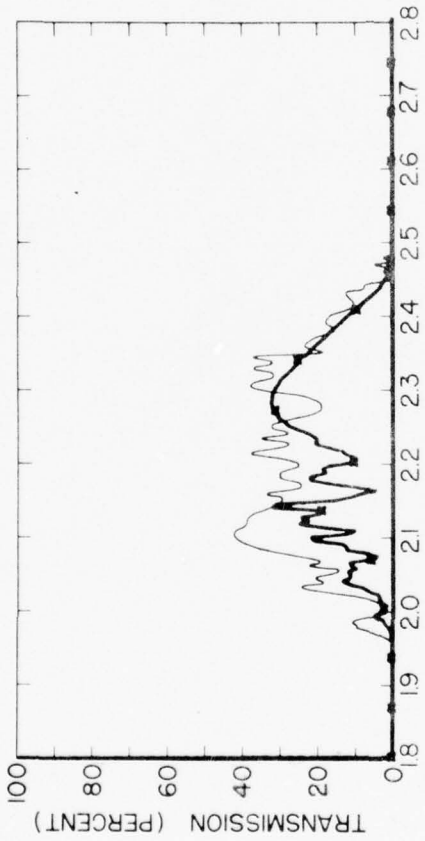

Plate 9-1 Optimum Scattering

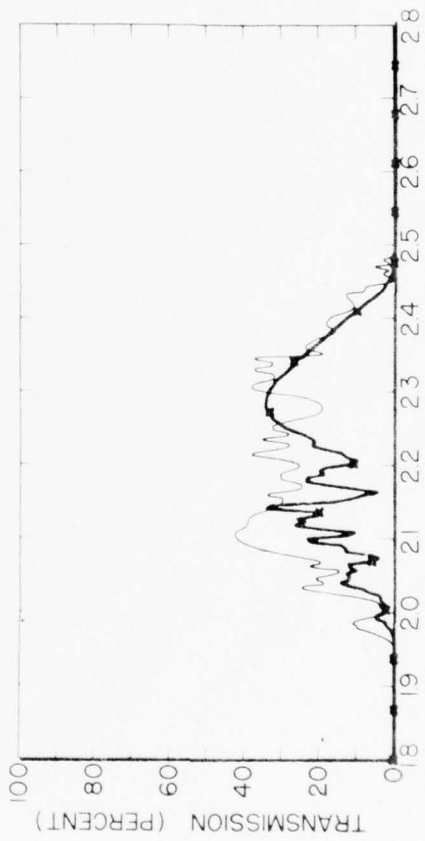

Plate 9-1 General Scattering

UNCLASSIFIED

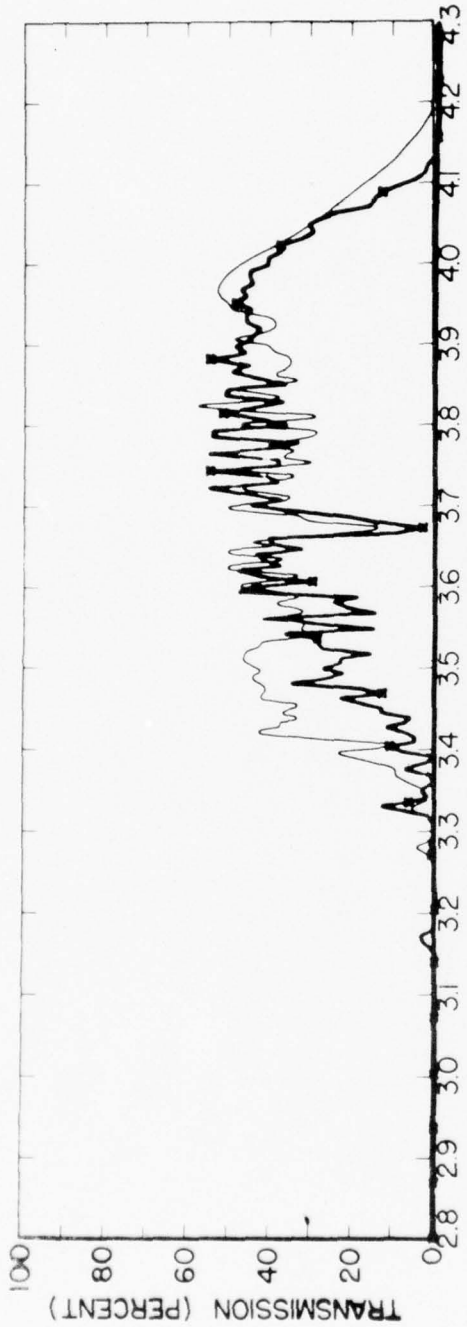

Plate 9-2 Optimum Scattering

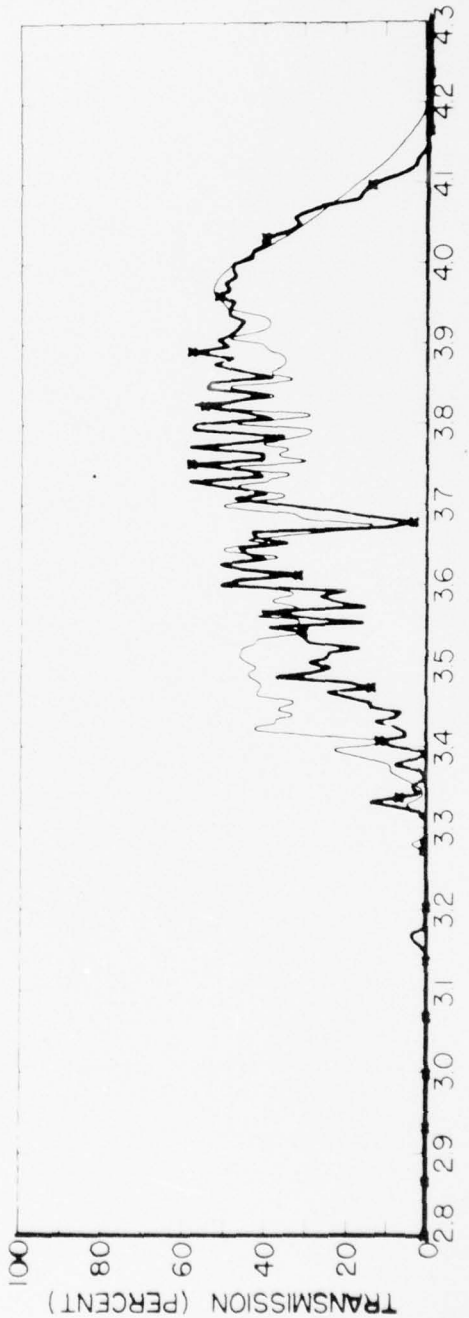

Plate 9-2 General Scattering

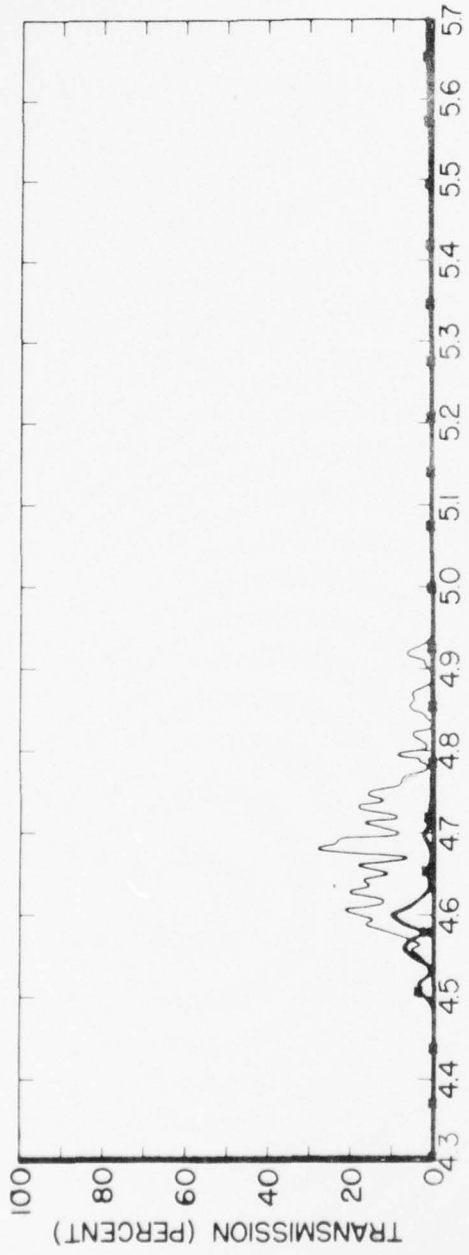

Plate 9-3 Optimum Scattering

Plate 9-3 General Scattering

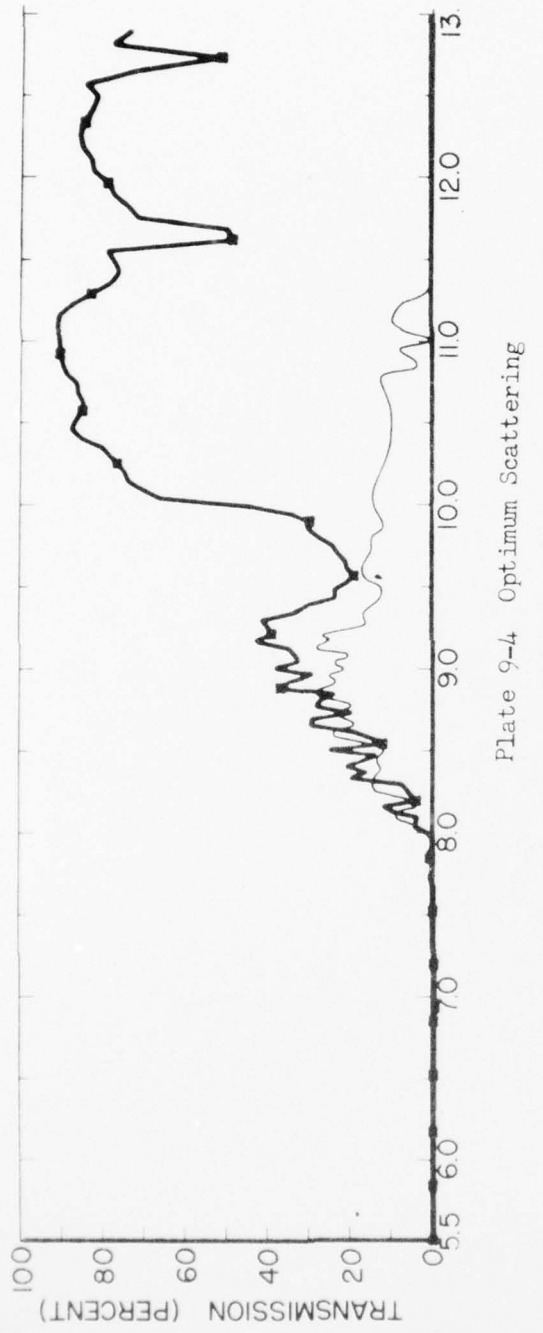

Plate 9-4 Optimum Scattering

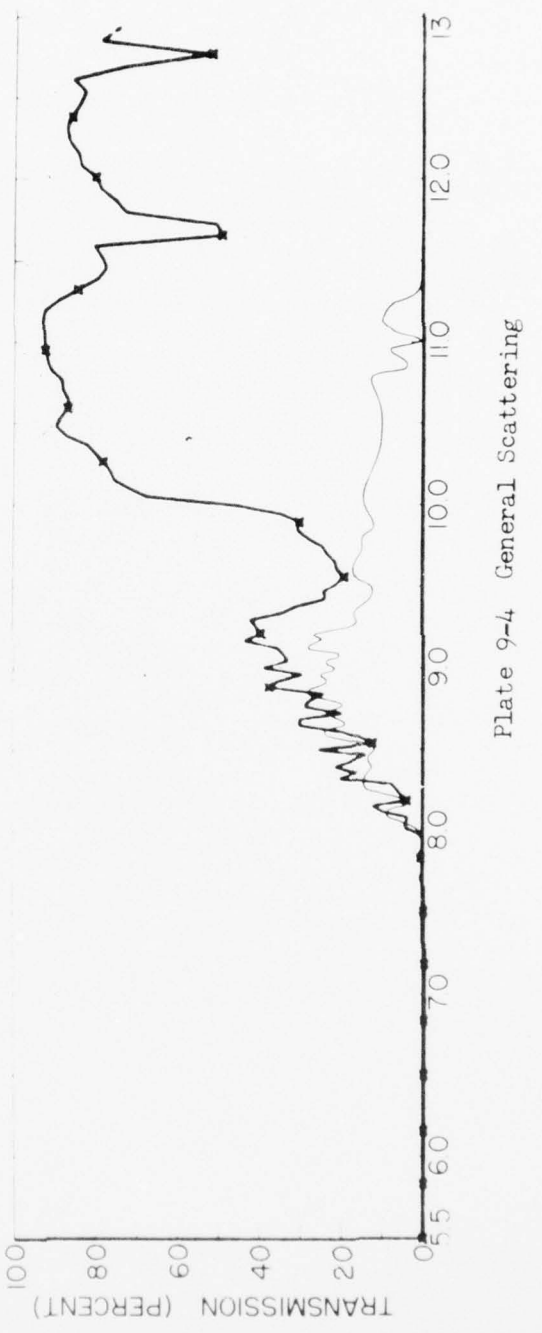

Plate 9-4 General Scattering

Yates and Taylor Measurements Plate #10

Range (KM)		10
Altitude (KM)		27.7
Temp (^{o}F)		
Relative Humidity		
H20 (CM)		10.5
C02 (CM)		413.7
N20 (CM)		3.62
03 (CM)		.849
General Scattering		.49
Optimum Scattering	A	.0258
	B	.4750

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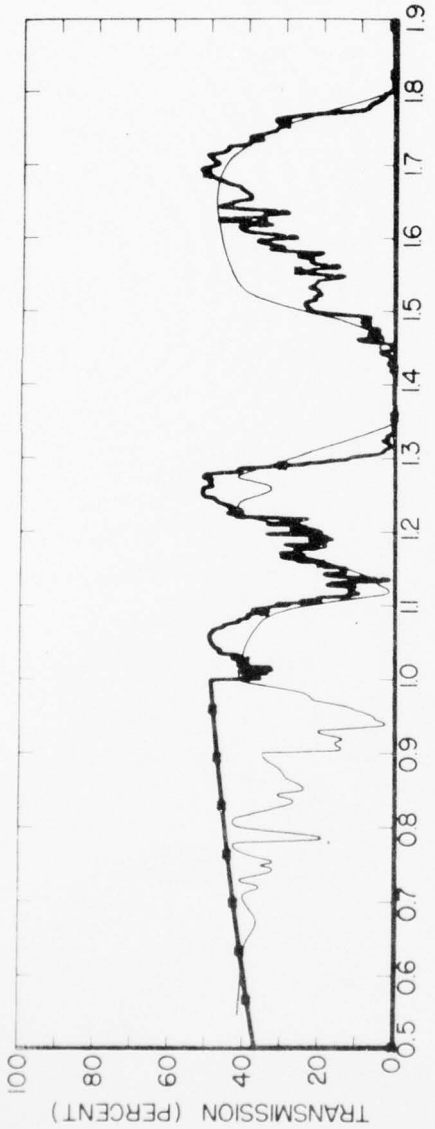

Plate 10 Optimum Scattering

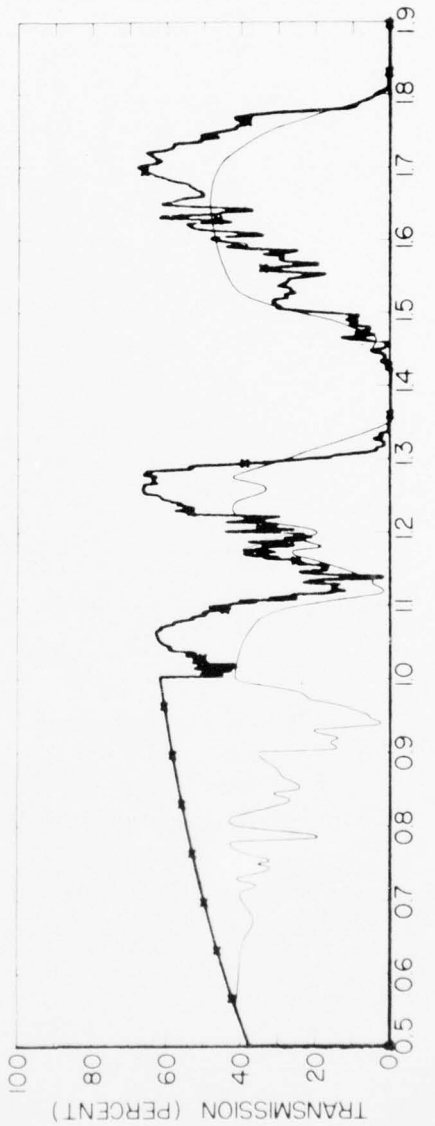

Plate 10 General Scattering

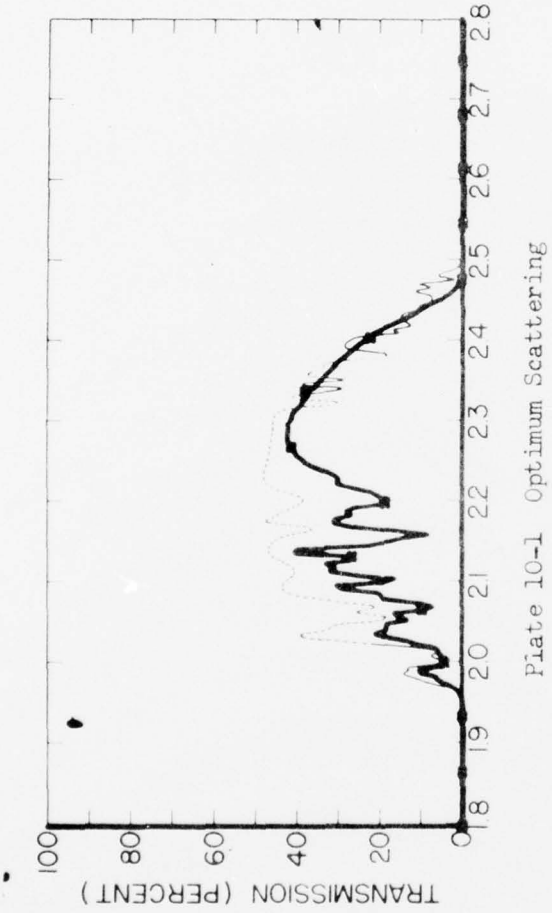

Plate 10-1 Optimum Scattering

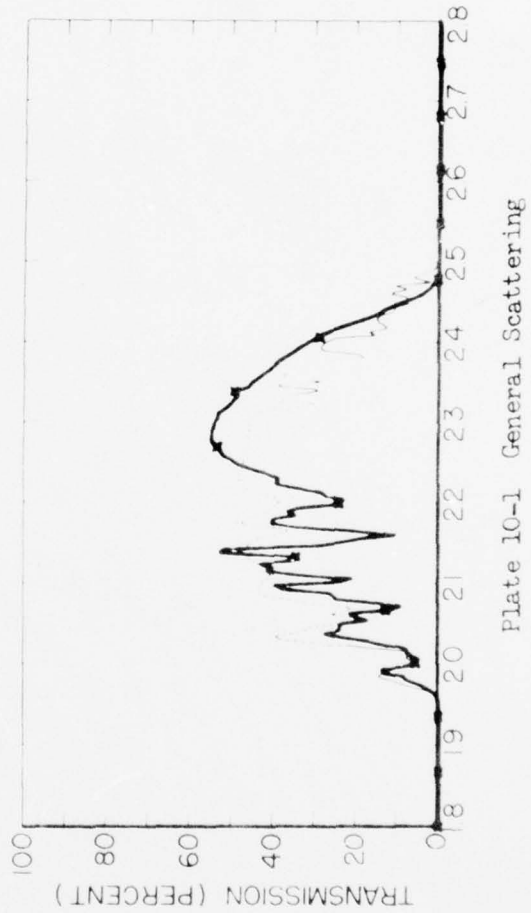

Plate 10-1 General Scattering

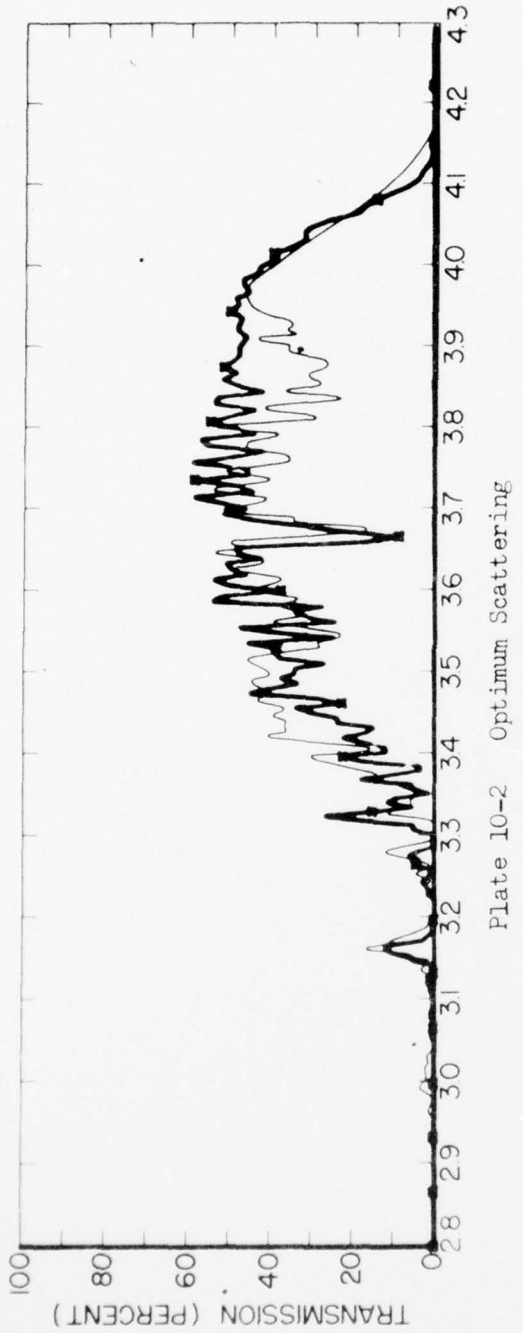

Plate 10-2 Optimum Scattering

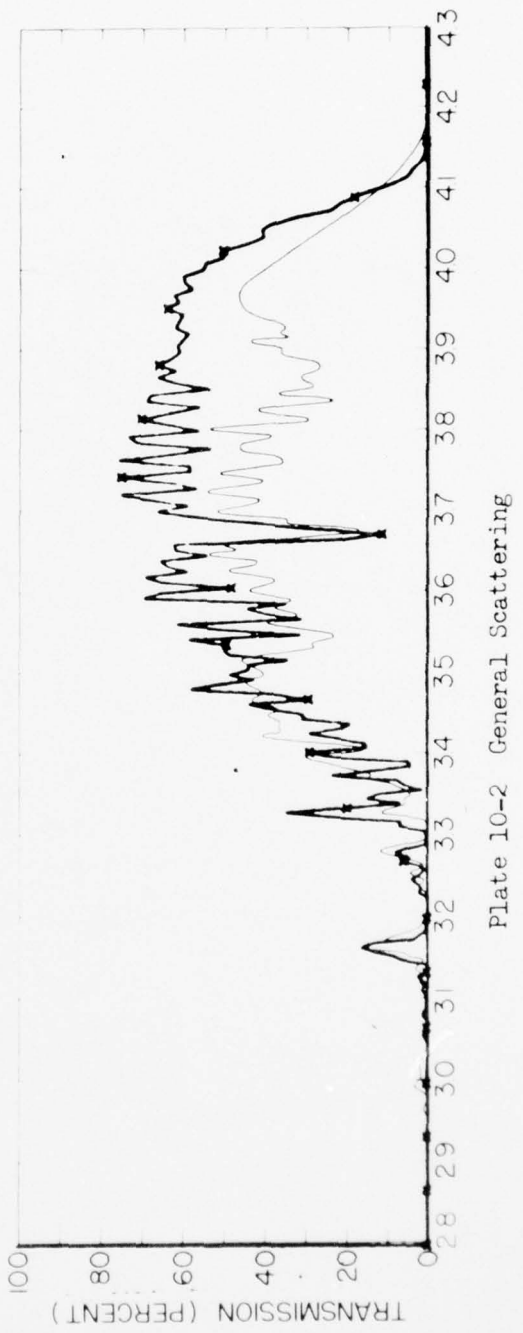

Plate 10-2 General Scattering

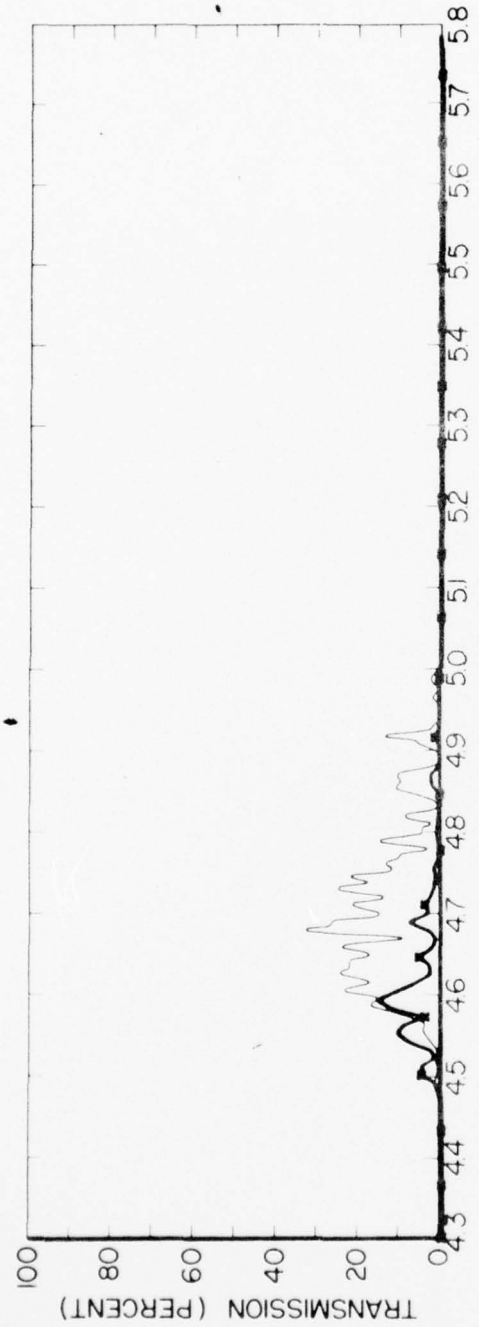

Plate 10-3 Optimum Scattering

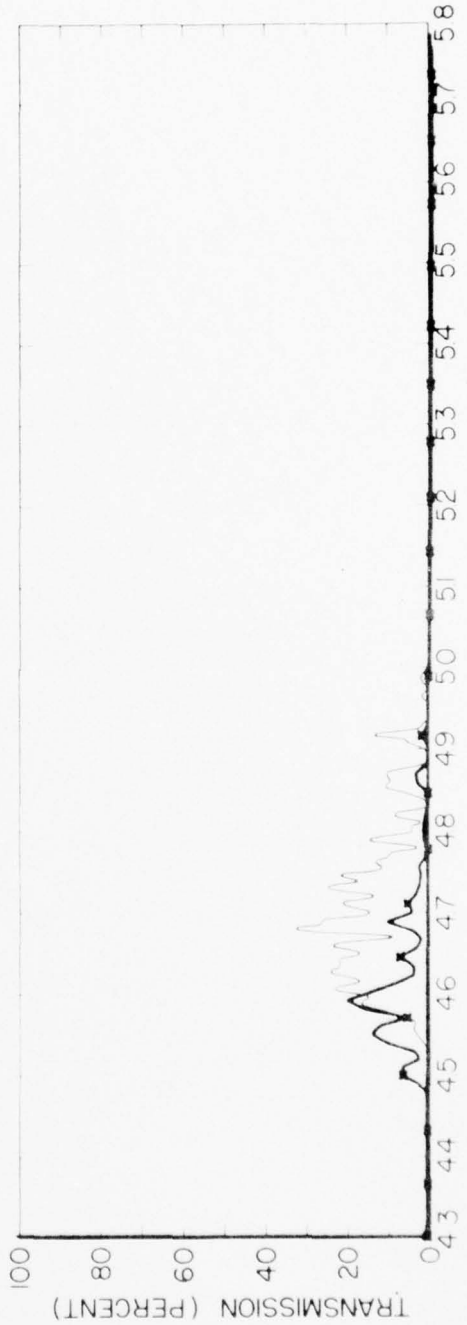

Plate 10-3 General Scattering

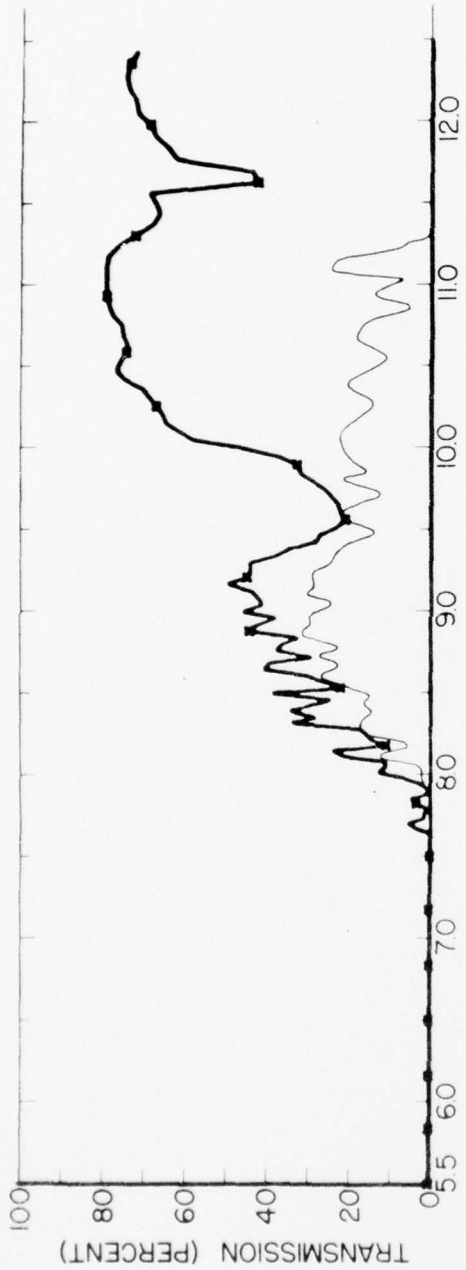

Plate 10-4 Optimum Scattering

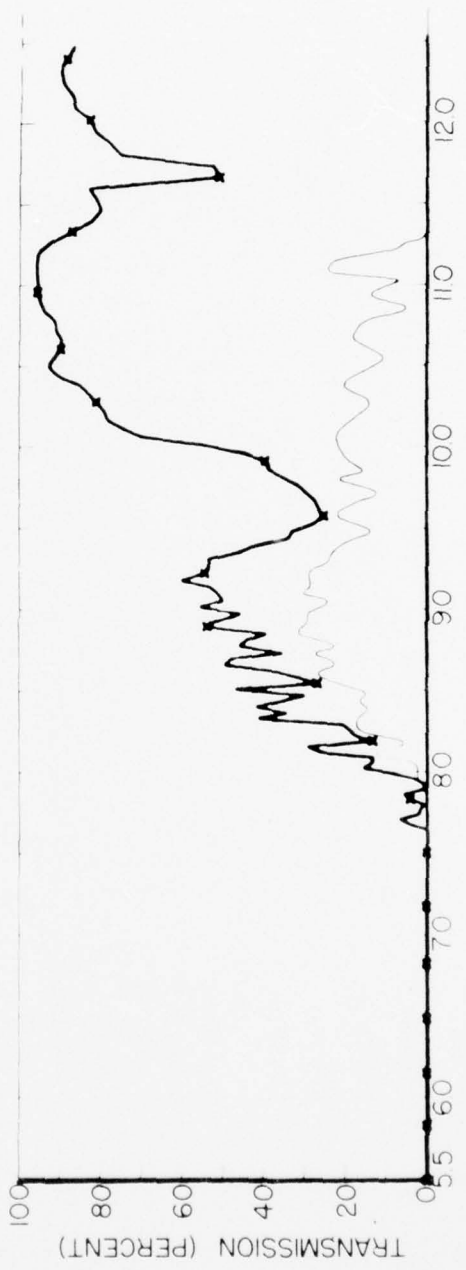

Plate 10-4 General Scattering

Yates and Taylor Measurements Plate #11

Range (KM)		.3
Altitude (K ft)		S.L.
Temp (^{O}F)		-
Relative Humidity		-
H20 (CM)		.57
C02 (CM)		9.
N20 (CM)		.084
03 (CM)		.009
General Scattering		0
Optimum Scattering	A	No Scattering
	B	Range too small

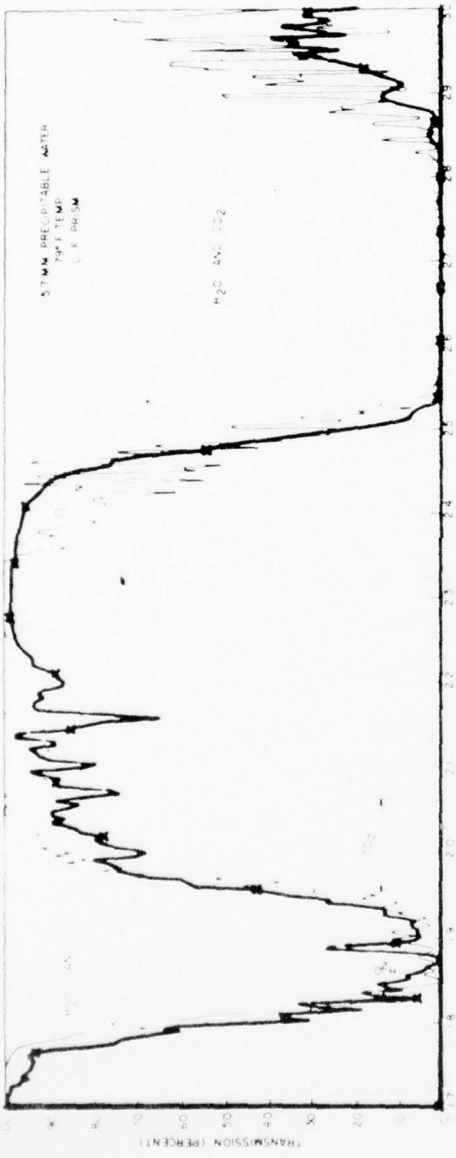

Plate 11-1 Optimum Scattering

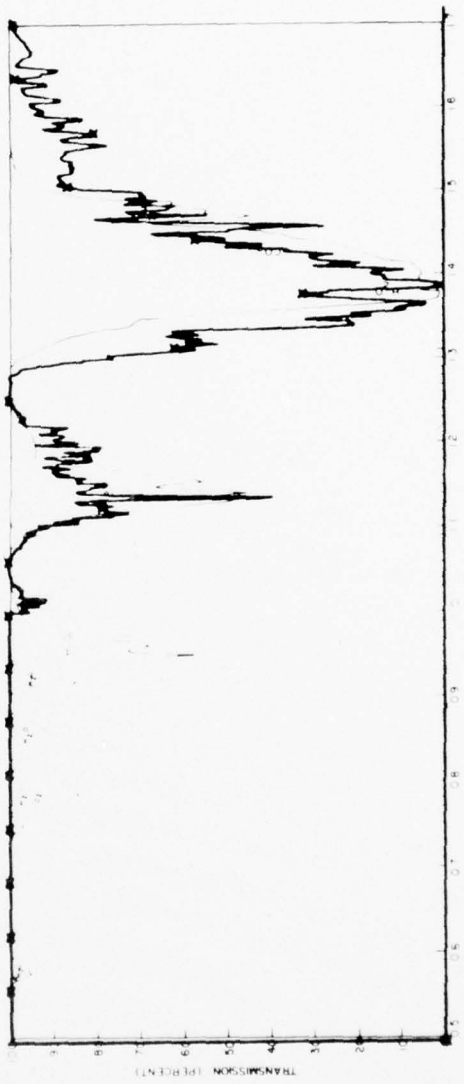

Plate 11-1 General Scattering

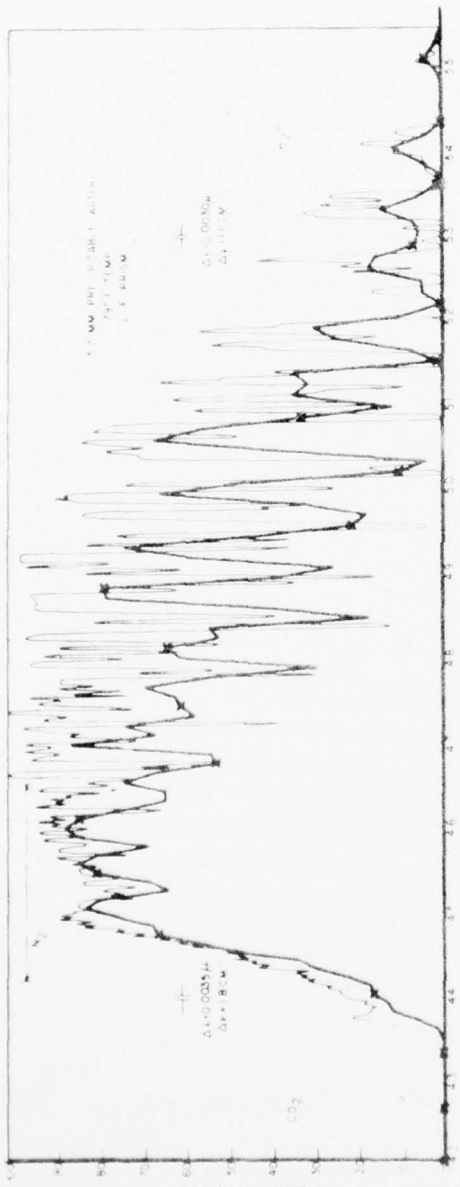

Plate 11-3 Optimum Scattering

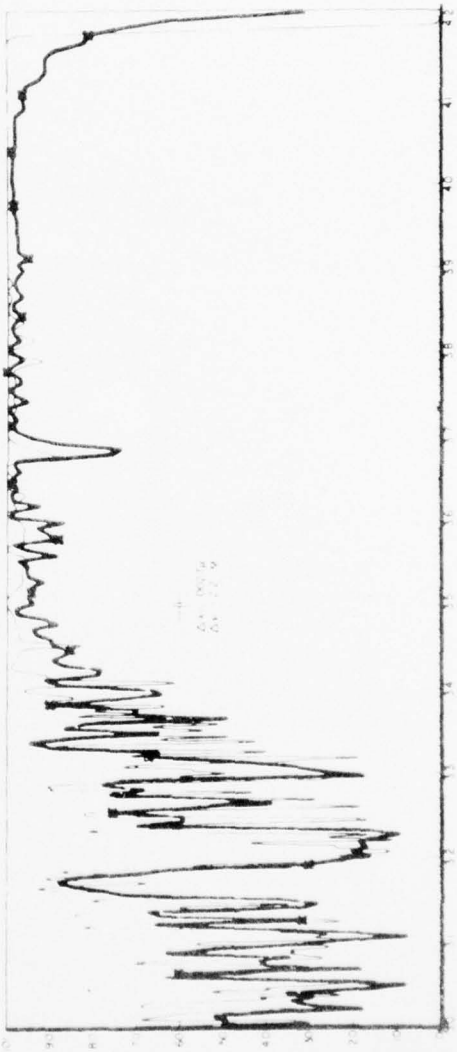

Plate 11-2 General Scattering

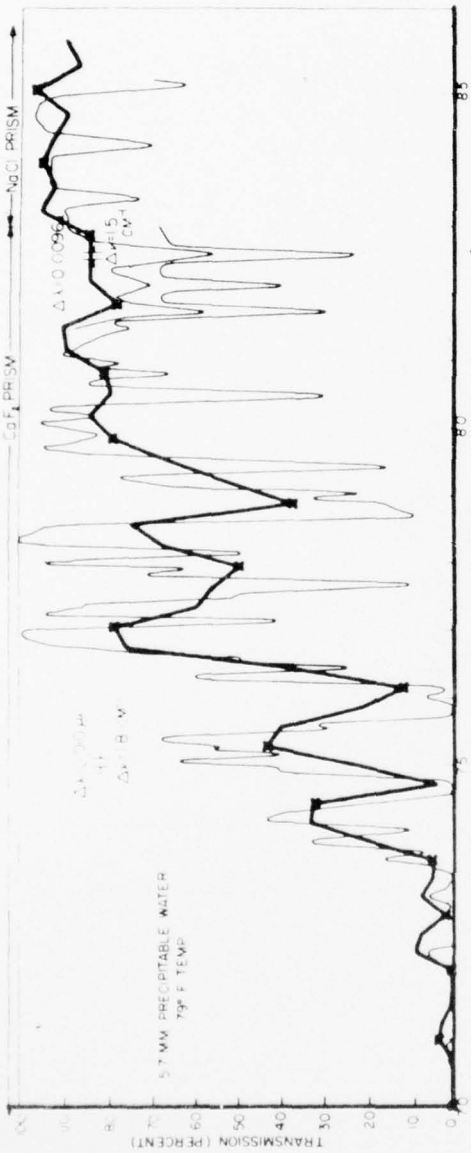

Plate 11-5 Optimum Scattering

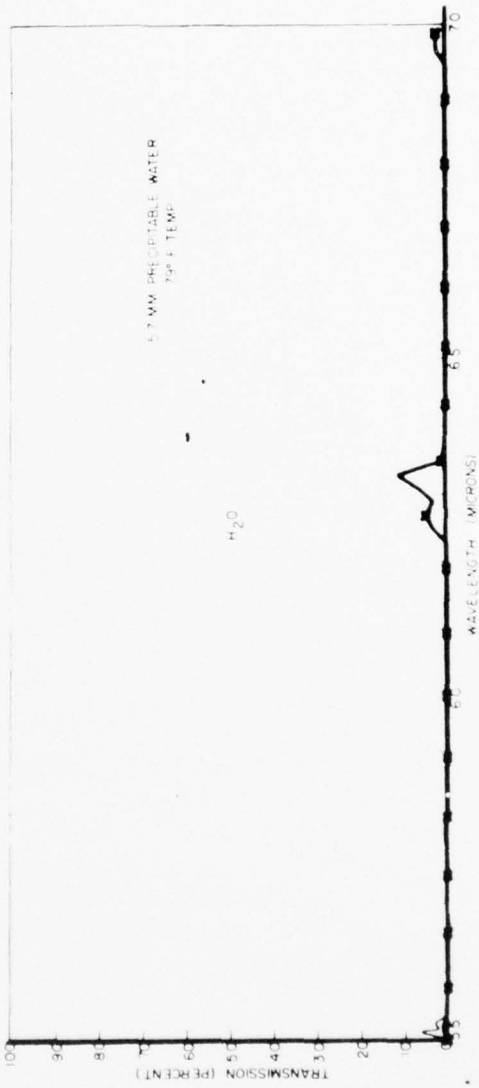

Plate 11-4 General Scattering

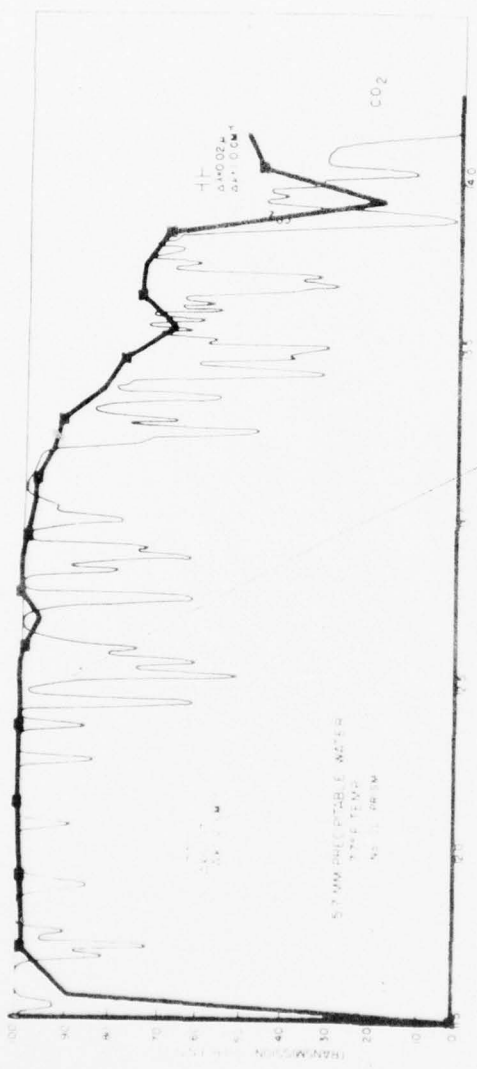

Plate 11-7 Optimum Scattering

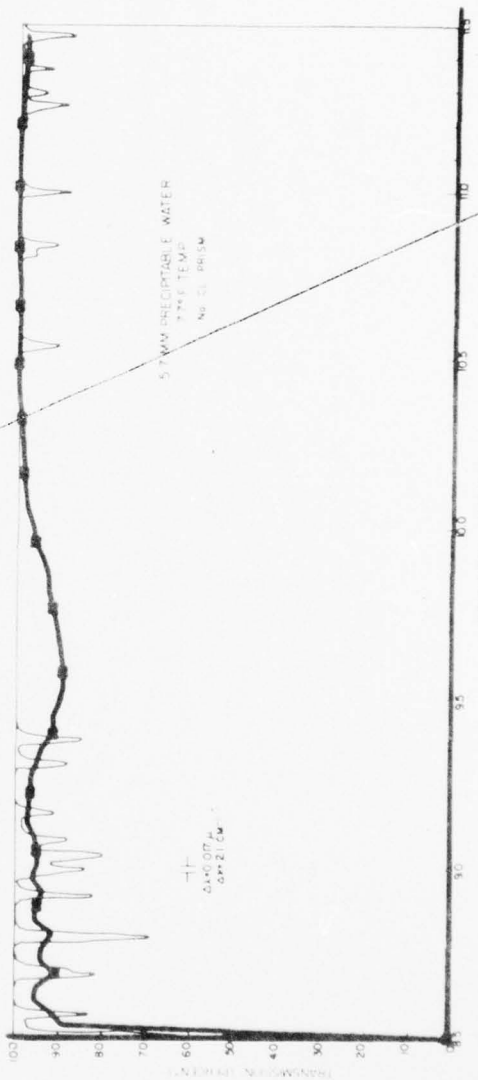

Plate 11-6 General Scattering

APPENDIX E

Hot water vapor Emission Data for the Range 50 cm^{-1} 9300 cm^{-1}.

This appendix presents the Hot water Emission Data as given in this report:

> C. B. Ludwig, Measurements of the Curves of Growth of Hot Water Vapor, Applied Optics, May 1971, Vol. 10. No. 5.

The data is given as a function of temperature and wavenumber in tabular form. The equations utilizing this data are given Section 3.4.

AD-A042 624 WESTINGHOUSE DEFENSE AND ELECTRONIC SYSTEMS CENTER B--ETC F/G 20/6
HIDE REVISED WAVELENGTH RESOLUTION EMISSION AND TRANSMISSION MO--ETC(U)
MAR 74 DAAJ01-72-C-0447

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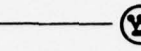


	k (per cm at STP)						
cm^{-1}	300 K	600 K	1000 K	1500 K	2000 K	2500 K	3000 K
50.	0.950E 00	0.103E 00	0.420E-01	0.114E-01	0.450E-02	0.300E-02	0.190E-02
75.	0.20SE 01	0.365E 00	0.113E 00	0.375E-01	0.195E-01	0.134E-01	0.670E-02
100.	0.386E 01	0.990E 00	0.300E 00	0.104E 00	0.577E-01	0.363E-01	0.211E-01
125.	0.650E 01	0.201E 01	0.650E 00	0.214E 00	0.12SE 00	0.S45E-01	0.529E-01
150.	0.825E 01	0.325E 01	0.121E 01	0.415E 00	0.260E 00	0.16SE 00	0.109E 00
175.	0.870E 01	0.452E 01	0.1S0E 01	0.765E 00	0.450E 00	0.29SE 00	0.194E 00
200.	0.810E 01	0.540E 01	0.261E 01	0.126E 01	0.695E 00	0.460E 00	0.309E 00
225.	0.6S2E 01	0.600E 01	0.337E 01	0.179E 01	0.101E 01	0.679E 00	0.454E 00
250.	0.493E 01	0.622E 01	0.407E 01	0.230E 01	0.135E 01	0.935E 00	0.620E 00
275.	0.316E 01	0.592E 01	0.456E 01	0.2S1E 01	0.172E 01	0.122E 01	0.822E 00
300.	0.190E 01	0.52SE 01	0.479E 01	0.32SE 01	0.213E 01	0.149E 01	0.101E 01
325.	0.113E 01	0.450E 01	0.4S4E 01	0.361E 01	0.249E 01	0.179E 01	0.12SE 01
350.	0.585E 00	0.370E 01	0.471E 01	0.3S3E 01	0.2S4E 01	0.20SE 01	0.154E 01
375.	0.29SE 00	0.2S9E 01	0.443E 01	0.394E 01	0.312E 01	0.237E 01	0.1S2E 01
400.	0.13SE 00	0.203E 01	0.400E 01	0.396E 01	0.330E 01	0.260E 01	0.207E 01
425.	0.620E-01	0.14SE 01	0.347E 01	0.3SSE 01	0.341E 01	0.2S0E 01	0.229E 01
450.	0.255E-01	0.950E 00	0.292E 01	0.370E 01	0.345E 01	0.295E 01	0.24SE 01
475.	0.940E-02	0.610E 00	0.236E 01	0.343E 01	0.342E 01	0.304E 01	0.262E 01
500.	0.340E-02	0.3S6E 00	0.1SSE 01	0.310E 01	0.334E 01	0.309E 01	0.273E 01
525.	0.105E-02	0.236E 00	0.145E 01	0.274E 01	0.319E 01	0.307E 01	0.2S0E 01
550.	0.350E-03	0.144E 00	0.110E 01	0.23SE 01	0.300E 01	0.301E 01	0.2S3E 01
575.	0.126E-03	0.S20E-01	0.S1SE 00	0.203E 01	0.276E 01	0.2S9E 01	0.2S2E 01
600.	0.430E-04	0.445E-01	0.59SE 00	0.174E 01	0.24SE 01	0.273E 01	0.277E 01
625.	0.150E-04	0.242E-01	0.427E 00	0.145E 01	0.222E 01	0.260E 01	0.269E 01
650.	0.510E-05	0.127E-01	0.294E 00	0.118E 01	0.195E 01	0.241E 01	0.25SE 01
675.	0.170E-05	0.630E-02	0.200E 00	0.950E 00	0.169E 01	0.221E 01	0.245E 01
700.	0.570E-06	0.300E-02	0.134E 00	0.74SE 00	0.146E 01	0.200E 01	0.229E 01
725.	0.195E-06	0.140E-02	0.902E-01	0.5S0E 00	0.124E 01	0.17SE 01	0.213E 01
750.	0.680E-07	0.620E-03	0.590E-01	0.443E 00	0.103E 01	0.156E 01	0.196E 01
775.	0.3S5E-07	0.275E-03	0.450E-01	0.S30E 00	0.S45E 00	0.136E 01	0.177E 01
800.	0.670E-07	0.115E-03	0.355E-01	0.242E 00	0.693E 00	0.117E 01	0.159E 01
825.	0.113E-06	0.500E-04	0.2S9E-01	0.174E 00	0.560E 00	0.100E 01	0.143E 01
850.	0.195E-06	0.230E-04	0.245E-01	0.123E 00	0.450E 00	0.S55E 00	0.126E 01
875.	0.32SE-06	0.103E-04	0.214E-01	0.100E 00	0.357E 00	0.71SE 00	0.111E 01
900.	0.560E-06	0.460E-05	0.1S9E-01	0.S30E-01	0.27SE 00	0.595E 00	0.975E 00
925.	0.950E-06	0.205E-05	0.174E-01	0.730E-01	0.239E 00	0.492E 00	0.S25E 00
950.	0.160E-05	0.140E-05	0.166E-01	0.665E-01	0.211E 00	0.405E 00	0.705E 00
975.	0.275E-05	0.350E-05	0.165E-01	0.630E-01	0.195E 00	0.352E 00	0.600E 00
1000.	0.470E-05	0.S50E-05	0.167E-01	0.620E-01	0.190E 00	0.312E 00	0.510E 00
1025.	0.S10E-05	0.215E-04	0.175E-01	0.630E-01	0.191E 00	0.2S0E 00	0.425E 00
1050.	0.136E-04	0.570E-04	0.1SSE-01	0.673E-01	0.194E 00	0.2S1E 00	0.35SE 00
1075.	0.225E-04	0.150E-03	0.20SE-01	0.745E-01	0.202E 00	0.2S3E 00	0.32SE 00
1100.	0.400E-04	0.3S0E-03	0.232E-01	0.S65E-01	0.220E 00	0.313E 00	0.307E 00
1125.	0.6S0E-04	0.930E-03	0.26SE-01	0.122E 00	0.260E 00	0.3S0E 00	0.419E 00
1150.	0.120E-03	0.235E-02	0.31SE-01	0.176E 00	0.32SE 00	0.461E 00	0.507E 00
1175.	0.200E-03	0.620E-02	0.42SE-01	0.25IE 00	0.411E 00	0.5IIE 00	0.565E 00
1200.	0.365E-03	0.14SE-01	0.107E 00	0.330E 00	0.47SE 00	0.542E 00	0.614E 00
1225.	0.650E-03	0.330E-01	0.166E 00	0.405E 00	0.4S7E 00	0.571E 00	0.632E 00
1250.	0.130E-02	0.637E-01	0.214E 00	0.456E 00	0.533E 00	0.537E 00	0.617E 00
1275.	0.250E-02	0.12IE 00	0.31IE 00	0.477E 00	0.502E 00	0.502E 00	0.595E 00
1300.	0.500E-02	0.212E 00	0.407E 00	0.547E 00	0.5IIE 00	0.514E 00	0.57SE 00
1325.	0.103E-01	0.2S5E 00	0.4S9E 00	0.592E 00	0.497E 00	0.4S6E 00	0.551E 00
1350.	0.210E-01	0.32SE 00	0.491E 00	0.55SE 00	0.4S9E 00	0.4S7E 00	0.547E 00
1375.	0.4S2E-01	0.345E 00	0.505E 00	0.521E 00	0.477E 00	0.4S1E 00	0.520E 00
1400.	0.114E 00	0.361E 00	0.5SSE 00	0.5S3E 00	0.503E 00	0.502E 00	0.516E 00
1425.	0.239E 00	0.404E 00	0.621E 00	0.621E 00	0.5SSE 00	0.5SSE 00	0.544E 00
1450.	0.397E 00	0.50SE 00	0.749E 00	0.76SE 00	0.7SIE 00	0.567E 00	0.5IIE 00
1475.	0.4IIE 00	0.627E 00	0.S2IE 00	0.S49E 00	0.640E 00	0.594E 00	0.5S0E 00
1500.	0.10SE 01	0.125E 01	0.1I5E 01	0.940E 00	0.S07E 00	0.663E 00	0.525E 00
1525.	0.163E 01	0.155E 01	0.11SE 01	0.670E 00	0.562E 00	0.4SIE 00	0.430E 00
1550.	0.112E 01	0.673E 00	0.537E 00	0.349E 00	0.276E 00	0.263E 00	0.277E 00
1575.	0.45IE 00	0.292E 00	0.232E 00	0.1IIE 00	0.IIIE 00	0.156E 00	0.173E 00

1600.	0.603E-01	0.838E-01	0.863E-01	0.112E 00	0.120E 00	0.125E 00	0.125E 00
1625.	0.501E 00	0.252E 00	0.118E 00	0.112E 00	0.131E 00	0.130E 00	0.130E 00
1650.	0.730E 00	0.430E 00	0.237E 00	0.191E 00	0.171E 00	0.150E 00	0.170E 00
1675.	0.119E 01	0.508E 00	0.294E 00	0.228E 00	0.210E 00	0.201E 00	0.202E 00
1700.	0.100E 01	0.553E 00	0.434E 00	0.310E 00	0.266E 00	0.225E 00	0.175E 00
1725.	0.802E 00	0.65NE 00	0.52NE 00	0.411E 00	0.309E 00	0.216E 00	0.194E 00
1750.	0.580E 00	0.527E 00	0.460E 00	0.37NE 00	0.322E 00	0.284E 00	0.240E 00
1775.	0.330E 00	0.403E 00	0.430E 00	0.356E 00	0.315E 00	0.270E 00	0.226E 00
1800.	0.250E 00	0.363E 00	0.405E 00	0.342E 00	0.303E 00	0.275E 00	0.242E 00
1825.	0.147E 00	0.219E 00	0.315E 00	0.31NE 00	0.291E 00	0.265E 00	0.250E 00
1850.	0.910E-01	0.232E 00	0.298E 00	0.295E 00	0.269E 00	0.253E 00	0.247E 00
1875.	0.580E-01	0.15NE 00	0.214E 00	0.214E 00	0.214E 00	0.245E 00	0.27NE 00
1900.	0.370E-01	0.113E 00	0.184E 00	0.21NE 00	0.214E 00	0.21NE 00	0.222E 00
1925.	0.241E-01	0.11NE 00	0.156E 00	0.15NE 00	0.165E 00	0.200E 00	0.206E 00
1950.	0.162E-01	0.606E-01	0.976E-01	0.141E 00	0.166E 00	0.179E 00	0.18NE 00
1975.	0.112E-01	0.425E-01	0.986E-01	0.135E 00	0.14NE 00	0.156E 00	0.166E 00
2000.	0.780E-02	0.400E-01	0.765E-01	0.112E 00	0.129E 00	0.137E 00	0.147E 00
2025.	0.510E-02	0.372E-01	0.647E-01	0.876E-01	0.116E 00	0.11NE 00	0.125E 00
2050.	0.380E-02	0.252E-01	0.507E-01	0.705E-01	0.88NE-01	0.100E 00	0.111E 00
2075.	0.260E-02	0.179E-01	0.377E-01	0.546E-01	0.724E-01	0.82NE-01	0.96NE-01
2100.	0.180E-02	0.125E-01	0.291E-01	0.443E-01	0.60NE-01	0.68NE-01	0.84NE-01
2125.	0.127E-02	0.850E-02	0.212E-01	0.37NE-01	0.579E-01	0.640E-01	0.725E-01
2150.	0.880E-03	0.650E-02	0.152E-01	0.275E-01	0.449E-01	0.521E-01	0.62NE-01
2175.	0.620E-03	0.400E-02	0.107E-01	0.214E-01	0.374E-01	0.45NE-01	0.55NE-01
2200.	0.450E-03	0.298E-02	0.931E-02	0.189E-01	0.329E-01	0.403E-01	0.47NE-01
2225.	0.405E-03	0.175E-02	0.686E-02	0.152E-01	0.293E-01	0.365E-01	0.39NE-01
2250.	0.321E-03	0.120E-02	0.452E-02	0.101E-01	0.232E-01	0.33TE-01	0.350E-01
2275.	0.229E-03	0.721E-03	0.364E-02	0.930E-02	0.225E-01	0.30NE-01	0.312E-01
2300.	0.195E-03	0.544E-03	0.318E-02	0.730E-02	0.202E-01	0.28TE-01	0.290E-01
2325.	0.154E-03	0.375E-03	0.185E-02	0.603E-02	0.173E-01	0.269E-01	0.27NE-01
2350.	0.101E-03	0.263E-03	0.119E-02	0.48NE-02	0.15NE-01	0.253E-01	0.267E-01
2375.	0.852E-04	0.185E-03	0.909E-03	0.360E-02	0.133E-01	0.241E-01	0.259E-01
2400.	0.763E-04	0.137E-03	0.711E-03	0.316E-02	0.122E-01	0.237E-01	0.252E-01
2425.	0.615E-04	0.126E-03	0.610E-03	0.247E-02	0.101E-01	0.218E-01	0.251E-01
2450.	0.48NE-04	0.113E-03	0.51NE-03	0.201E-02	0.920E-02	0.200E-01	0.249E-01
2475.	0.372E-04	0.106E-03	0.435E-03	0.16NE-02	0.75NE-02	0.18NE-01	0.247E-01
2500.	0.355E-04	0.101E-03	0.376E-03	0.16NE-02	0.669E-02	0.166E-01	0.21NE-01
2525.	0.35NE-04	0.990E-04	0.366E-03	0.167E-02	0.651E-02	0.156E-01	0.249E-01
2550.	0.359E-04	0.102E-03	0.376E-03	0.167E-02	0.641E-02	0.152E-01	0.251E-01
2575.	0.422E-04	0.106E-03	0.373E-03	0.16NE-02	0.656E-02	0.150E-01	0.23NE-01
2600.	0.521E-04	0.111E-03	0.371E-03	0.170E-02	0.673E-02	0.152E-01	0.25NE-01
2625.	0.646E-04	0.121E-03	0.384E-03	0.179E-02	0.79NE-02	0.159E-01	0.263E-01
2650	0.742E-04	0.129E-03	0.479E-03	0.201E-02	0.78NE-02	0.173E-01	0.270E-01
2675.	0.953E-04	0.165E-03	0.544E-03	0.249E-02	0.947E-02	0.204E-01	0.28NE-01
2700.	0.101E-03	0.190E-03	0.761E-03	0.324E-02	0.108E-01	0.231E-01	0.297E-01
2725.	0.147E-03	0.272E-03	0.892E-03	0.441E-02	0.125E-01	0.257E-01	0.318E-01
2750.	0.195E-03	0.326E-03	0.100E-02	0.499E-02	0.147E-01	0.295E-01	0.343E-01
2775.	0.261E-03	0.421E-03	0.145E-02	0.56NE-02	0.161E-01	0.306E-01	0.37NE-01
2800.	0.295E-03	0.513E-03	0.193E-02	0.731E-02	0.185E-01	0.363E-01	0.417E-01
2825.	0.362E-03	0.643E-03	0.237E-02	0.83NE-02	0.205E-01	0.37NE-01	0.479E-01
2850.	0.507E-03	0.85NE-03	0.274E-02	0.88NE-02	0.211E-01	0.431E-01	0.50NE-01
2875.	0.709E-03	0.11NE-02	0.322E-02	0.110E-01	0.262E-01	0.43NE-01	0.559E-01
2900.	0.933E-03	0.160E-02	0.38NE-02	0.126E-01	0.292E-01	0.520E-01	0.602E-01
2925.	0.10NE-02	0.231E-02	0.451E-02	0.140E-01	0.306E-01	0.56NE-01	0.655E-01
2950.	0.192E-02	0.271E-02	0.563E-02	0.150E-01	0.337E-01	0.626E-01	0.73NE-01
2975.	0.263E-02	0.300E-02	0.625E-02	0.179E-01	0.383E-01	0.696E-01	0.80TE-01
3000.	0.295E-02	0.330E-02	0.701E-02	0.203E-01	0.408E-01	0.75NE-01	0.85NE-01
3025.	0.310E-02	0.370E-02	0.84NE-02	0.220E-01	0.519E-01	0.88NE-01	0.970E-01
3050.	0.310E-02	0.400E-02	0.969E-02	0.270E-01	0.602E-01	0.109E 00	0.106E 00
3075.	0.730E-02	0.479E-02	0.111E-01	0.273E-01	0.676E-01	0.106E 00	0.117E 00
3100.	0.900E-02	0.48NE-02	0.137E-01	0.372E-01	0.56NE-01	0.139E 00	0.129E 00
3125.	0.100E-02	0.530E-02	0.162E-01	0.471E-01	0.100E 00	0.142E 00	0.142E 00
3150.	0.610E-03	0.570E-02	0.205E-01	0.63NE-01	0.122E 00	0.16NE 00	0.153E 00
3175.	0.160E-02	0.660E-02	0.247E-01	0.635E-01	0.137E 00	0.177E 00	0.170E 00
3200.	0.330E-02	0.700E-02	0.285E-01	0.770E-01	0.157E 00	0.18NE 00	0.187E 00
3225.	0.410E-02	0.86NE-02	0.376E-01	0.914E-01	0.166E 00	0.206E 00	0.202E 00
3250.	0.410E-02	0.103E-01	0.514E-01	0.117E 00	0.164E 00	0.225E 00	0.220E 00

3275.	0.290E-02	0.129E-01	0.664E-01	0.117E 00	0.220E 00	0.254E 00	0.241E 00
3300.	0.220E-02	0.161E-01	0.533E-01	0.171E 00	0.237E 00	0.263E 00	0.262E 00
3325.	0.229E-02	0.242E-01	0.103E 00	0.201E 00	0.268E 00	0.283E 00	0.280E 00
3350.	0.250E-02	0.287E-01	0.135E 00	0.240E 00	0.295E 00	0.295E 00	0.293E 00
3375.	0.310E-02	0.365E-01	0.169E 00	0.272E 00	0.312E 00	0.301E 00	0.302E 00
3400.	0.420E-02	0.540E-01	0.211E 00	0.309E 00	0.329E 00	0.307E 00	0.308E 00
3425.	0.600E-02	0.770E-01	0.267E 00	0.343E 00	0.332E 00	0.314E 00	0.309E 00
3450.	0.940E-02	0.117E 00	0.338E 00	0.372E 00	0.344E 00	0.303E 00	0.296E 00
3475.	0.165E-01	0.173E 00	0.385E 00	0.385E 00	0.353E 00	0.300E 00	0.272E 00
3500.	0.360E-01	0.275E 00	0.458E 00	0.393E 00	0.315E 00	0.288E 00	0.265E 00
3525.	0.720E-01	0.375E 00	0.500E 00	0.409E 00	0.294E 00	0.271E 00	0.241E 00
3550.	0.133E 00	0.401E 00	0.499E 00	0.399E 00	0.281E 00	0.257E 00	0.222E 00
3575.	0.213E 00	0.380E 00	0.443E 00	0.341E 00	0.251E 00	0.230E 00	0.208E 00
3600.	0.315E 00	0.450E 00	0.316E 00	0.286E 00	0.245E 00	0.219E 00	0.201E 00
3625.	0.442E 00	0.300E 00	0.374E 00	0.279E 00	0.236E 00	0.216E 00	0.210E 00
3650.	0.473E 00	0.405E 00	0.347E 00	0.281E 00	0.235E 00	0.219E 00	0.213E 00
3675.	0.565E 00	0.501E 00	0.423E 00	0.315E 00	0.242E 00	0.218E 00	0.200E 00
3700.	0.690E 00	0.70SE 00	0.673E 00	0.432E 00	0.268E 00	0.189E 00	0.150E 00
3725.	0.617E 00	0.851E 00	0.566E 00	0.320E 00	0.194E 00	0.123E 00	0.113E 00
3750.	0.181E 01	0.529E 00	0.269E 00	0.151E 00	0.124E 00	0.107E 00	0.105E 00
3775.	0.136E 00	0.124E 00	0.120E 00	0.119E 00	0.115E 00	0.115E 00	0.109E 00
3800.	0.455E 00	0.29SE 00	0.167E 00	0.129E 00	0.123E 00	0.112E 00	0.122E 00
3825.	0.760E 00	0.503E 00	0.242E 00	0.154E 00	0.129E 00	0.127E 00	0.136E 00
3850.	0.836E 00	0.584E 00	0.277E 00	0.184E 00	0.161E 00	0.145E 00	0.154E 00
3875.	0.840E 00	0.725E 00	0.422E 00	0.236E 00	0.197E 00	0.167E 00	0.177E 00
3900.	0.505E 00	0.500E 00	0.379E 00	0.276E 00	0.227E 00	0.192E 00	0.197E 00
3925.	0.117E 00	0.400E 00	0.423E 00	0.315E 00	0.243E 00	0.202E 00	0.209E 00
3950.	0.460E-01	0.300E 00	0.35SE 00	0.290E 00	0.230E 00	0.202E 00	0.207E 00
3975.	0.18SE-01	0.205E 00	0.269E 00	0.235E 00	0.195E 00	0.192E 00	0.190E 00
4000.	0.730E-02	0.135E 00	0.186E 00	0.179E 00	0.159E 00	0.168E 00	0.161E 00
4025.	0.357E-02	0.790E-01	0.113E 00	0.124E 00	0.124E 00	0.134E 00	0.132E 00
4050.	0.283E-02	0.415E-01	0.662E-01	0.SS6E-01	0.103E 00	0.106E 00	0.101E 00
4075.	0.226E-02	0.197E-01	0.367E-01	0.594E-01	0.801E-01	0.S79E-01	0.S60E-01
4100.	0.155E-02	0.S60E-02	0.211E-01	0.395E-01	0.563E-01	0.610E-01	0.710E-01
4125.	0.103E-02	0.521E-02	0.119E-01	0.246E-01	0.354E-01	0.4S0E-01	0.59SE-01
4150.	0.821E-03	0.365E-02	0.779E-02	0.166E-01	0.25SE-01	0.370E-01	0.499E-01
4175.	0.772E-03	0.1S8E-02	0.445E-02	0.100E-01	0.179E-01	0.26SE-01	0.41SE-01
4200.	0.429E-03	0.141E-02	0.354E-02	0.S21E-02	0.142E-01	0.212E-01	0.34SE-01
4225.	0.327E-03	0.902E-03	0.209E-02	0.5SSE-02	0.112E-01	0.172E-01	0.2S7E-01
4250.	0.225E-03	0.6S5E-03	0.1S9E-02	0.312E-02	0.101E-01	0.164E-01	0.236E-01
4275.	0.186E-03	0.551E-03	0.156E-02	0.366E-02	0.S12E-02	0.136E-01	0.1S9E-01
4300.	0.173E-03	0.472E-03	0.139E-02	0.300E-02	0.661E-02	0.115E-01	0.150E-01
4325.	0.138E-03	0.395E-03	0.110E-02	0.272E-02	0.5S7E-02	0.104E-01	0.126E-01
4350.	0.900E-04	0.270E-03	0.96SE-03	0.222E-02	0.497E-02	0.921E-02	0.119E-01
4375.	0.752E-04	0.233E-03	0.744E-03	0.20SE-02	0.466E-02	0.S76E-02	0.11SE-01
4400.	0.61SE-04	0.174E-03	0.62SE-03	0.1S5E-02	0.465E-02	0.914E-02	0.123E-01
4425.	0.50SE-04	0.1S1E-03	0.499E-03	0.174E-02	0.477E-02	0.955E-02	0.12SE-01
4450.	0.375E-04	0.125E-03	0.4S3E-03	0.1S2E-02	0.49SE-02	0.971E-02	0.131E-01
4475.	0.30SE-04	0.S02E-04	0.2S1E-03	0.134E-02	0.469E-02	0.101E-01	0.142E-01
4500.	0.257E-04	0.720E-04	0.329E-03	0.15SE-02	0.477E-02	0.112E-01	0.15SE-01
4525.	0.242E-04	0.739E-04	0.30SE-03	0.147E-02	0.527E-02	0.122E-01	0.162E-01
4550.	0.215E-04	0.65SE-04	0.2S2E-03	0.131E-02	0.521E-02	0.134E-01	0.17SE-01
4575.	0.21SE-04	0.660E-04	0.272E-03	0.152E-02	0.575E-02	0.14SE-01	0.1S7E-01
4600.	0.215E-04	0.671E-04	0.26SE-03	0.134E-02	0.607E-02	0.159E-01	0.202E-01
4625.	0.217E-04	0.695E-04	0.2S7E-03	0.161E-02	0.677E-02	0.173E-01	0.225E-01
4650.	0.219E-04	0.722E-04	0.297E-03	0.169E-02	0.7S3E-02	0.197E-01	0.246E-01
4675.	0.226E-04	0.771E-04	0.341E-03	0.236E-02	0.925E-02	0.226E-01	0.270E-01
4700.	0.250E-04	0.S13E-04	0.3S7E-03	0.2S6E-02	0.196E-01	0.250E-01	0.300E-01
4725.	0.2S0E-04	0.S15E-04	0.420E-03	0.357E-02	0.124E-01	0.276E-01	0.33SE-01
4750.	0.351E-04	0.102E-03	0.470E-03	0.467E-02	0.163E-01	0.313E-01	0.370E-01
4775.	0.435E-04	0.2S0E-03	0.105E-02	0.566E-02	0.1S5E-01	0.341E-01	0.39SE-01
4800.	0.522E-04	0.23SE-03	0.129E-02	0.750E-02	0.220E-01	0.37SE-01	0.422E-01
4825.	0.673E-04	0.306E-03	0.1S3E-02	0.9S2E-02	0.27SE-01	0.401E-01	0.440E-01
4850.	0.SS6E-04	0.39SE-03	0.216E-02	0.12SE-01	0.302E-01	0.430E-01	0.45SE-01
4875.	0.113E-03	0.61SE-03	0.246E-02	0.161E-01	0.35SE-01	0.459E-01	0.46SE-01
4900.	0.174E-03	0.S25E-03	0.441E-02	0.200E-01	0.417E-01	0.493E-01	0.473E-01
4925.	0.266E-03	0.163E-02	0.777E-02	0.245E-01	0.4S0E-01	0.507E-01	0.47SE-01

4950.	0.355E-03	0.200E-02	0.978E-02	0.317E-01	0.892E-01	0.527E-01	0.478E-01
4975.	0.358E-03	0.271E-02	0.167E-01	0.401E-01	0.503E-01	0.525E-01	0.473E-01
5000.	0.634E-03	0.301E-02	0.264E-01	0.467E-01	0.520E-01	0.526E-01	0.468E-01
5025.	0.987E-03	0.540E-02	0.321E-01	0.490E-01	0.523E-01	0.510E-01	0.457E-01
5050.	0.137E-02	0.560E-02	0.389E-01	0.528E-01	0.543E-01	0.492E-01	0.479E-01
5075.	0.226E-02	0.130E-01	0.472E-01	0.559E-01	0.500E-01	0.469E-01	0.415E-01
5100.	0.431E-02	0.198E-01	0.526E-01	0.557E-01	0.480E-01	0.452E-01	0.400E-01
5125.	0.628E-02	0.282E-01	0.488E-01	0.495E-01	0.451E-01	0.430E-01	0.396E-01
5150.	0.900E-02	0.390E-01	0.471E-01	0.449E-01	0.430E-01	0.423E-01	0.387E-01
5175.	0.180E-01	0.462E-01	0.412E-01	0.391E-01	0.403E-01	0.413E-01	0.395E-01
5200.	0.348E-01	0.710E-01	0.402E-01	0.366E-01	0.385E-01	0.411E-01	0.405E-01
5225.	0.718E-01	0.590E-01	0.399E-01	0.369E-01	0.376E-01	0.426E-01	0.418E-01
5250.	0.111E-00	0.486E-01	0.340E-01	0.369E-01	0.409E-01	0.434E-01	0.434E-01
5275.	0.329E-01	0.287E-01	0.365E-01	0.423E-01	0.461E-01	0.482E-01	0.450E-01
5300.	0.251E-01	0.270E-01	0.432E-01	0.503E-01	0.529E-01	0.511E-01	0.462E-01
5325.	0.421E-00	0.422E-01	0.589E-01	0.598E-01	0.572E-01	0.541E-01	0.478E-01
5350.	0.139E-00	0.105E-00	0.844E-01	0.687E-01	0.596E-01	0.560E-01	0.489E-01
5375.	0.774E-01	0.710E-01	0.683E-01	0.618E-01	0.556E-01	0.543E-01	0.478E-01
5400.	0.565E-01	0.483E-01	0.579E-01	0.547E-01	0.503E-01	0.496E-01	0.469E-01
5425.	0.983E-01	0.573E-01	0.589E-01	0.510E-01	0.453E-01	0.443E-01	0.425E-01
5450.	0.996E-01	0.682E-01	0.582E-01	0.489E-01	0.434E-01	0.446E-01	0.400E-01
5475.	0.680E-01	0.650E-01	0.548E-01	0.495E-01	0.469E-01	0.475E-01	0.405E-01
5500.	0.325E-01	0.520E-01	0.515E-01	0.483E-01	0.449E-01	0.454E-01	0.415E-01
5525.	0.150E-01	0.350E-01	0.451E-01	0.464E-01	0.452E-01	0.449E-01	0.438E-01
5550.	0.620E-02	0.228E-01	0.369E-01	0.405E-01	0.414E-01	0.417E-01	0.420E-01
5575.	0.270E-02	0.135E-01	0.282E-01	0.329E-01	0.366E-01	0.385E-01	0.400E-01
5600.	0.113E-02	0.101E-01	0.203E-01	0.263E-01	0.303E-01	0.337E-01	0.360E-01
5625.	0.529E-03	0.590E-02	0.148E-01	0.206E-01	0.247E-01	0.296E-01	0.329E-01
5650.	0.367E-03	0.310E-02	0.969E-02	0.154E-01	0.203E-01	0.258E-01	0.295E-01
5675.	0.240E-03	0.130E-02	0.589E-02	0.112E-01	0.161E-01	0.222E-01	0.250E-01
5700.	0.158E-03	0.400E-03	0.417E-02	0.830E-02	0.134E-01	0.190E-01	0.220E-01
5725.	0.103E-03	0.262E-03	0.208E-02	0.594E-02	0.109E-01	0.162E-01	0.190E-01
5750.	0.741E-04	0.181E-03	0.142E-02	0.455E-02	0.907E-02	0.141E-01	0.170E-01
5775.	0.625E-04	0.135E-03	0.816E-03	0.316E-02	0.698E-02	0.121E-01	0.150E-01
5800.	0.499E-04	0.111E-03	0.624E-03	0.230E-02	0.551E-02	0.102E-01	0.130E-01
5825.	0.325E-04	0.677E-04	0.425E-03	0.124E-02	0.385E-02	0.818E-02	0.120E-01
5850.	0.231E-04	0.563E-04	0.278E-03	0.986E-03	0.290E-02	0.672E-02	0.103E-01
5875.	0.165E-04	0.481E-04	0.247E-03	0.914E-03	0.253E-02	0.612E-02	0.940E-02
5900.	0.126E-04	0.432E-04	0.211E-03	0.886E-03	0.220E-02	0.582E-02	0.910E-02
5925.	0.115E-04	0.420E-04	0.235E-03	0.847E-03	0.209E-02	0.571E-02	0.950E-02
5950.	0.110E-04	0.405E-04	0.226E-03	0.812E-03	0.221E-02	0.601E-02	0.925E-02
5975.	0.101E-04	0.400E-04	0.213E-03	0.805E-03	0.230E-02	0.611E-02	0.920E-02
6000.	0.983E-05	0.395E-04	0.186E-03	0.801E-03	0.247E-02	0.631E-02	0.950E-02
6025.	0.979E-05	0.401E-04	0.193E-03	0.805E-03	0.260E-02	0.732E-02	0.970E-02
6050.	0.976E-05	0.410E-04	0.201E-03	0.814E-03	0.285E-02	0.776E-02	0.100E-01
6075.	0.988E-05	0.420E-04	0.210E-03	0.832E-03	0.317E-02	0.842E-02	0.103E-01
6100.	0.991E-05	0.425E-04	0.219E-03	0.877E-03	0.340E-02	0.855E-02	0.105E-01
6125.	0.102E-04	0.453E-04	0.231E-03	0.907E-03	0.361E-02	0.922E-02	0.110E-01
6150.	0.110E-04	0.456E-04	0.241E-03	0.971E-03	0.402E-02	0.996E-02	0.113E-01
6175.	0.127E-04	0.529E-04	0.257E-03	0.131E-02	0.437E-02	0.106E-01	0.119E-01
6200.	0.131E-04	0.612E-04	0.277E-03	0.135E-02	0.465E-02	0.110E-01	0.122E-01
6225.	0.156E-04	0.781E-04	0.302E-03	0.140E-02	0.504E-02	0.116E-01	0.125E-01
6250.	0.178E-04	0.922E-04	0.394E-03	0.157E-02	0.557E-02	0.127E-01	0.135E-01
6275.	0.203E-04	0.115E-03	0.481E-03	0.188E-02	0.601E-02	0.134E-01	0.145E-01
6300.	0.230E-04	0.145E-03	0.617E-03	0.185E-02	0.634E-02	0.139E-01	0.150E-01
6325.	0.280E-04	0.187E-03	0.723E-03	0.202E-02	0.686E-02	0.146E-01	0.157E-01
6350.	0.305E-04	0.209E-03	0.811E-03	0.218E-02	0.779E-02	0.157E-01	0.164E-01
6375.	0.455E-04	0.241E-03	0.936E-03	0.243E-02	0.841E-02	0.166E-01	0.172E-01
6400.	0.661E-04	0.320E-03	0.986E-03	0.255E-02	0.902E-02	0.175E-01	0.180E-01
6425.	0.725E-04	0.397E-03	0.121E-02	0.359E-02	0.100E-01	0.181E-01	0.191E-01
6450.	0.847E-04	0.481E-03	0.141E-02	0.423E-02	0.105E-01	0.192E-01	0.200E-01
6475.	0.103E-03	0.591E-03	0.174E-02	0.488E-02	0.116E-01	0.209E-01	0.211E-01
6500.	0.131E-03	0.703E-03	0.217E-02	0.541E-02	0.124E-01	0.218E-01	0.222E-01
6525.	0.165E-03	0.812E-03	0.267E-02	0.641E-02	0.134E-01	0.231E-01	0.235E-01
6550.	0.207E-03	0.110E-02	0.298E-02	0.749E-02	0.146E-01	0.251E-01	0.244E-01
6575.	0.253E-03	0.130E-02	0.346E-02	0.811E-02	0.159E-01	0.258E-01	0.253E-01
6600.	0.318E-03	0.156E-02	0.414E-02	0.889E-02	0.139E-01	0.237E-01	0.267E-01

6625.	0.437E-03	0.179E-02	0.491E-02	0.107E-01	0.179E-01	0.245E-01	0.276E-01
6650.	0.581E-03	0.190E-02	0.527E-02	0.116E-01	0.179E-01	0.234E-01	0.287E-01
6675.	0.685E-03	0.226E-02	0.575E-02	0.128E-01	0.180E-01	0.263E-01	0.296E-01
6700.	0.900E-03	0.250E-02	0.649E-02	0.136E-01	0.195E-01	0.275E-01	0.305E-01
6725.	0.121E-02	0.280E-02	0.722E-02	0.142E-01	0.202E-01	0.281E-01	0.313E-01
6750.	0.152E-02	0.330E-02	0.813E-02	0.161E-01	0.212E-01	0.288E-01	0.320E-01
6775.	0.185E-02	0.370E-02	0.907E-02	0.168E-01	0.222E-01	0.292E-01	0.329E-01
6800.	0.220E-02	0.430E-02	0.929E-02	0.183E-01	0.233E-01	0.294E-01	0.355E-01
6825.	0.255E-02	0.500E-02	0.111E-01	0.195E-01	0.245E-01	0.289E-01	0.339E-01
6850.	0.290E-02	0.580E-02	0.167E-01	0.215E-01	0.260E-01	0.291E-01	0.348E-01
6875.	0.320E-02	0.670E-02	0.208E-01	0.237E-01	0.274E-01	0.293E-01	0.345E-01
6900.	0.360E-02	0.880E-02	0.220E-01	0.253E-01	0.282E-01	0.300E-01	0.313E-01
6925.	0.400E-02	0.920E-02	0.235E-01	0.273E-01	0.290E-01	0.304E-01	0.341E-01
6950.	0.460E-02	0.108E-01	0.272E-01	0.270E-01	0.298E-01	0.310E-01	0.329E-01
6975.	0.530E-02	0.125E-01	0.303E-01	0.292E-01	0.297E-01	0.312E-01	0.338E-01
7000.	0.620E-02	0.132E-01	0.311E-01	0.303E-01	0.293E-01	0.310E-01	0.323E-01
7025.	0.760E-02	0.182E-01	0.341E-01	0.297E-01	0.290E-01	0.300E-01	0.313E-01
7050.	0.980E-02	0.222E-01	0.368E-01	0.318E-01	0.291E-01	0.291E-01	0.296E-01
7075.	0.132E-01	0.271E-01	0.402E-01	0.291E-01	0.274E-01	0.282E-01	0.283E-01
7100.	0.190E-01	0.335E-01	0.421E-01	0.286E-01	0.262E-01	0.269E-01	0.253E-01
7125.	0.240E-01	0.432E-01	0.431E-01	0.276E-01	0.245E-01	0.257E-01	0.243E-01
7150.	0.288E-01	0.570E-01	0.458E-01	0.270E-01	0.228E-01	0.243E-01	0.228E-01
7175.	0.323E-01	0.740E-01	0.449E-01	0.261E-01	0.214E-01	0.221E-01	0.208E-01
7200.	0.370E-01	0.890E-01	0.435E-01	0.255E-01	0.199E-01	0.196E-01	0.199E-01
7225.	0.216E-01	0.680E-01	0.378E-01	0.239E-01	0.195E-01	0.192E-01	0.190E-01
7250.	0.126E-01	0.473E-01	0.364E-01	0.238E-01	0.197E-01	0.192E-01	0.187E-01
7275.	0.117E-01	0.369E-01	0.353E-01	0.249E-01	0.212E-01	0.204E-01	0.200E-01
7300.	0.140E-01	0.370E-01	0.419E-01	0.272E-01	0.228E-01	0.213E-01	0.224E-01
7325.	0.425E-01	0.415E-01	0.440E-01	0.280E-01	0.218E-01	0.229E-01	0.243E-01
7350.	0.640E-01	0.460E-01	0.427E-01	0.290E-01	0.263E-01	0.278E-01	0.260E-01
7375.	0.385E-01	0.385E-01	0.374E-01	0.259E-01	0.235E-01	0.224E-01	0.260E-01
7400.	0.182E-01	0.179E-01	0.282E-01	0.231E-01	0.211E-01	0.214E-01	0.240E-01
7425.	0.170E-01	0.810E-02	0.191E-01	0.175E-01	0.181E-01	0.194E-01	0.210E-01
7450.	0.161E-01	0.370E-02	0.105E-01	0.127E-01	0.152E-01	0.171E-01	0.180E-01
7475.	0.145E-01	0.170E-02	0.554E-02	0.855E-02	0.113E-01	0.131E-01	0.150E-01
7500.	0.175E-02	0.140E-02	0.385E-02	0.595E-02	0.803E-02	0.945E-02	0.120E-01
7525.	0.772E-03	0.741E-03	0.381E-02	0.573E-02	0.737E-02	0.591E-02	0.830E-02
7550.	0.491E-03	0.609E-03	0.301E-02	0.453E-02	0.380E-02	0.434E-02	0.690E-02
7575.	0.275E-03	0.410E-03	0.193E-02	0.366E-02	0.319E-02	0.332E-02	0.560E-02
7600.	0.185E-03	0.280E-03	0.131E-02	0.232E-02	0.247E-02	0.256E-02	0.420E-02
7625.	0.101E-03	0.160E-03	0.915E-03	0.150E-02	0.186E-02	0.197E-02	0.370E-02
7650.	0.691E-04	0.110E-03	0.565E-03	0.114E-02	0.205E-02	0.192E-02	0.340E-02
7675.	0.476E-04	0.750E-04	0.114E-02	0.121E-02	0.175E-02	0.187E-02	0.320E-02
7700.	0.305E-04	0.290E-04	0.529E-03	0.114E-02	0.160E-02	0.185E-02	0.300E-02
7725.	0.240E-04	0.480E-04	0.293E-03	0.842E-03	0.141E-02	0.184E-02	0.290E-02
7750.	0.176E-04	0.360E-04	0.122E-03	0.437E-03	0.124E-02	0.182E-02	0.290E-02
7775.	0.120E-04	0.240E-04	0.121E-03	0.437E-03	0.115E-02	0.157E-02	0.290E-02
7800.	0.840E-05	0.170E-04	0.365E-03	0.436E-03	0.120E-02	0.162E-02	0.290E-02
7825.	0.560E-05	0.120E-04	0.806E-04	0.367E-03	0.119E-02	0.163E-02	0.307E-02
7850.	0.290E-05	0.960E-05	0.729E-04	0.351E-03	0.110E-02	0.145E-02	0.310E-02
7875.	0.280E-05	0.480E-05	0.557E-04	0.293E-03	0.113E-02	0.163E-02	0.310E-02
7900.	0.240E-05	0.480E-05	0.486E-04	0.298E-03	0.117E-02	0.204E-02	0.320E-02
7925.	0.225E-05	0.520E-05	0.367E-04	0.272E-03	0.116E-02	0.205E-02	0.330E-02
7950.	0.220E-05	0.580E-05	0.371E-04	0.268E-03	0.127E-02	0.211E-02	0.340E-02
7975.	0.223E-05	0.920E-05	0.296E-04	0.273E-03	0.125E-02	0.216E-02	0.355E-02
8000.	0.235E-05	0.103E-04	0.415E-04	0.263E-03	0.121E-02	0.221E-02	0.365E-02
8025.	0.280E-05	0.125E-04	0.623E-04	0.363E-03	0.126E-02	0.231E-02	0.385E-02
8050.	0.310E-05	0.156E-04	0.970E-04	0.392E-03	0.139E-02	0.241E-02	0.405E-02
8075.	0.376E-05	0.180E-04	0.122E-03	0.568E-03	0.167E-02	0.253E-02	0.430E-02
8100.	0.525E-05	0.206E-04	0.165E-03	0.589E-03	0.171E-02	0.257E-02	0.420E-02
8125.	0.516E-05	0.240E-04	0.141E-03	0.347E-03	0.173E-02	0.267E-02	0.440E-02
8150.	0.600E-05	0.270E-04	0.121E-03	0.534E-03	0.172E-02	0.274E-02	0.457E-02
8175.	0.726E-05	0.300E-04	0.204E-03	0.643E-03	0.184E-02	0.284E-02	0.465E-02
8200.	0.520E-05	0.320E-04	0.276E-03	0.819E-03	0.196E-02	0.297E-02	0.479E-02
8225.	0.160E-04	0.380E-04	0.317E-03	0.870E-03	0.214E-02	0.308E-02	0.485E-02
8250.	0.123E-04	0.430E-04	0.240E-03	0.814E-03	0.226E-02	0.317E-02	0.490E-02
8275.	0.145E-04	0.500E-04	0.152E-03	0.470E-02	0.238E-02	0.293E-02	0.483E-02

8800.	0.175E-04	0.560E-04	0.301E-03	0.941E-03	0.243E-02	0.342E-02	0.366E-02
8825.	0.195E-04	0.630E-04	0.280E-03	0.107E-02	0.269E-02	0.353E-02	0.391E-02
8850.	0.230E-04	0.710E-04	0.276E-03	0.109E-02	0.272E-02	0.365E-02	0.402E-02
8875.	0.250E-04	0.830E-04	0.309E-03	0.127E-02	0.293E-02	0.377E-02	0.501E-02
8900.	0.330E-04	0.890E-04	0.430E-03	0.139E-02	0.306E-02	0.385E-02	0.500E-02
8925.	0.360E-04	0.950E-04	0.371E-03	0.135E-02	0.306E-02	0.384E-02	0.499E-02
8950.	0.390E-04	0.980E-04	0.434E-03	0.147E-02	0.316E-02	0.385E-02	0.495E-02
8975.	0.400E-04	0.990E-04	0.397E-03	0.143E-02	0.318E-02	0.384E-02	0.490E-02
9000.	0.400E-04	0.980E-04	0.363E-03	0.141E-02	0.317E-02	0.381E-02	0.485E-02
9025.	0.390E-04	0.940E-04	0.390E-03	0.142E-02	0.311E-02	0.376E-02	0.475E-02
9050.	0.380E-04	0.900E-04	0.380E-03	0.145E-02	0.315E-02	0.375E-02	0.467E-02
9075.	0.330E-04	0.750E-04	0.358E-03	0.138E-02	0.310E-02	0.372E-02	0.455E-02
9100.	0.300E-04	0.680E-04	0.313E-03	0.136E-02	0.309E-02	0.369E-02	0.443E-02
9125.	0.270E-04	0.580E-04	0.385E-03	0.143E-02	0.315E-02	0.369E-02	0.433E-02
9150.	0.240E-04	0.560E-04	0.343E-03	0.136E-02	0.309E-02	0.363E-02	0.420E-02
9175.	0.260E-04	0.470E-04	0.309E-03	0.134E-02	0.306E-02	0.370E-02	0.408E-02
9200.	0.180E-04	0.400E-04	0.281E-03	0.127E-02	0.294E-02	0.341E-02	0.395E-02
9225.	0.170E-04	0.360E-04	0.276E-03	0.124E-02	0.290E-02	0.336E-02	0.386E-02
9250.	0.160E-04	0.310E-04	0.272E-03	0.122E-02	0.285E-02	0.323E-02	0.367E-02
9275.	0.140E-04	0.280E-04	0.241E-03	0.117E-02	0.273E-02	0.309E-02	0.351E-02
9300.	0.120E-04	0.250E-04	0.237E-03	0.115E-02	0.269E-02	0.297E-02	0.338E-02
9325.	0.100E-04	0.220E-04	0.218E-03	0.111E-02	0.259E-02	0.284E-02	0.323E-02
9350.	0.920E-05	0.195E-04	0.206E-03	0.105E-02	0.246E-02	0.269E-02	0.310E-02
9375.	0.810E-05	0.170E-04	0.205E-03	0.100E-02	0.235E-02	0.257E-02	0.295E-02
9400.	0.720E-05	0.160E-04	0.177E-03	0.921E-03	0.226E-02	0.245E-02	0.280E-02
9425.	0.650E-05	0.150E-04	0.172E-03	0.831E-03	0.203E-02	0.232E-02	0.265E-02
9450.	0.590E-05	0.130E-04	0.147E-03	0.735E-03	0.184E-02	0.215E-02	0.243E-02
9475.	0.510E-05	0.110E-04	0.120E-03	0.629E-03	0.177E-02	0.203E-02	0.240E-02
9500.	0.460E-05	0.950E-05	0.960E-04	0.513E-03	0.154E-02	0.180E-02	0.213E-02
9525.	0.420E-05	0.800E-05	0.578E-04	0.314E-03	0.123E-02	0.154E-02	0.218E-02
9550.	0.380E-05	0.720E-05	0.529E-04	0.292E-03	0.114E-02	0.137E-02	0.207E-02
9575.	0.330E-05	0.660E-05	0.485E-04	0.269E-03	0.102E-02	0.122E-02	0.197E-02
9100.	0.290E-05	0.580E-05	0.430E-04	0.239E-03	0.896E-03	0.107E-02	0.187E-02
9125.	0.270E-05	0.520E-05	0.259E-04	0.933E-03	0.784E-03	0.944E-03	0.179E-02
9150.	0.240E-05	0.450E-05	0.316E-04	0.207E-03	0.671E-03	0.815E-03	0.171E-02
9175.	0.220E-05	0.400E-05	0.444E-05	0.602E-04	0.516E-03	0.770E-03	0.163E-02
9200.	0.190E-05	0.360E-05	0.324E-05	0.460E-04	0.439E-03	0.688E-03	0.156E-02
9225.	0.170E-05	0.320E-05	0.180E-05	0.321E-04	0.384E-03	0.652E-03	0.149E-02
9250.	0.140E-05	0.280E-05	0.171E-05	0.314E-04	0.340E-03	0.616E-03	0.143E-02
9275.	0.130E-05	0.250E-05	0.298E-05	0.600E-04	0.343E-03	0.619E-03	0.138E-02
9300.	0.120E-05	0.220E-05	0.296E-05	0.600E-04	0.343E-03	0.619E-03	0.133E-02

APPENDIX F

Carbon Dioxide emission data for the range 3000-3770 cm^{-1}.

This appendix presents the carbon dioxide emission data as given in the report:

> Ludwig, C.R., "Tables of Carbon Dioxide Absorption Coefficients" as obtained in private conversations with Dr. Ludwig when he was at General Dynamics.

The data is given in tabular form as a function of temperature and wavenumber. The equations utilizing these numbers are given in Section 3.2.

ABSORPTION COEFFICIENTS OF CO2

K (PER CM AT STP)

2.7 MICRON COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
3000	3.33	-0.	-0.	-0.	-0.	-0.	-0.	1.166-02
3010	3.32	-0.	-0.	-0.	-0.	-0.	-0.	1.270-02
3020	3.31	-0.	-0.	-0.	-0.	-0.	-0.	1.373-02
3030	3.30	-0.	-0.	-0.	-0.	-0.	-0.	1.567-02
3040	3.29	-0.	-0.	-0.	-0.	-0.	-0.	1.761-02
3050	3.28	-0.	-0.	-0.	-0.	-0.	-0.	2.032-02
3060	3.27	-0.	-0.	-0.	-0.	-0.	-0.	2.303-02
3070	3.26	-0.	-0.	-0.	-0.	-0.	-0.	2.489-02
3080	3.25	-0.	-0.	-0.	-0.	-0.	-0.	2.675-02
3090	3.24	-0.	-0.	-0.	-0.	-0.	3.399-03	3.016-02
3100	3.23	-0.	-0.	-0.	-0.	-0.	6.798-03	3.356-02
3110	3.22	-0.	-0.	2.145-10	-0.	-0.	8.290-03	3.803-02
3120	3.21	-0.	-0.	4.290-10	-0.	-0.	9.782-03	4.250-02
3130	3.19	-0.	-0.	1.516-09	-0.	-0.	1.131-02	4.590-02
3140	3.18	-0.	-0.	2.602-09	-0.	-0.	1.324-02	4.929-02
3150	3.17	-0.	-0.	8.828-09	-0.	-0.	1.565-02	5.510-02
3160	3.16	-0.	-0.	1.505-08	1.361-05	5.917-04	1.806-02	6.091-02
3170	3.15	-0.	-0.	4.883-08	2.723-05	1.183-03	2.132-02	6.984-02
3180	3.14	-0.	-0.	8.260-08	4.842-05	1.661-03	2.459-02	7.878-02
3190	3.13	-0.	-0.	2.548-07	8.452-05	2.267-03	2.755-02	8.107-02
3200	3.13	-0.	-0.	4.271-07	1.446-04	3.003-03	3.052-02	8.336-02
3210	3.12	-0.	3.505-20	1.246-06	2.419-04	3.853-03	3.505-02	9.171-02
3220	3.11	-0.	7.010-20	2.064-06	3.953-04	4.785-03	3.958-02	1.001-01
3230	3.10	-0.	1.554-18	4.412-06	6.295-04	6.050-03	4.569-02	1.124-01
3240	3.09	-0.	3.038-18	9.237-06	9.745-04	7.677-03	5.179-02	1.248-01
3250	3.08	-0.	6.243-17	1.891-05	1.463-03	9.785-03	5.728-02	1.276-01

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
K (PER CM AT STP)
2.7 MICRON COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
3260	3.07	-0.	1.218-16	3.780-05	2.125-03	1.225-02	6.296-02	1.304-01
3270	3.06	-0.	2.302-15	7.361-05	2.951-03	1.519-02	7.520-02	1.414-01
3280	3.05	-0.	4.483-15	1.394-04	4.030-03	1.841-02	7.927-02	1.524-01
3290	3.04	1.100-32	7.724-14	2.558-04	5.252-03	2.185-02	8.582-02	1.667-01
3300	3.03	2.200-32	1.500-13	4.542-04	6.917-03	2.639-02	9.340-02	1.811-01
3310	3.02	8.768-31	2.331-12	7.774-04	9.072-03	3.111-02	1.071-01	1.860-01
3320	3.01	3.397-29	4.512-12	1.279-03	1.193-02	3.726-02	1.179-01	1.906-01
3330	3.00	1.243-27	2.368-11	2.017-03	1.532-02	4.405-02	1.334-01	2.041-01
3340	2.99	4.340-26	1.204-10	3.041-03	1.942-02	5.182-02	1.425-01	2.174-01
3350	2.99	1.442-24	5.914-10	4.578-03	2.412-02	5.985-02	1.495-01	2.468-01
3360	2.98	4.549-23	2.802-09	6.029-03	2.986-02	7.100-02	1.785-01	2.761-01
3370	2.97	1.358-21	1.276-08	8.331-03	3.668-02	8.066-02	1.763-01	2.380-01
3380	2.96	3.819-20	5.572-08	1.155-02	4.486-02	9.186-02	1.851-01	2.397-01
3390	2.95	1.009-18	2.324-07	1.536-02	5.462-02	1.064-01	2.063-01	2.705-01
3400	2.94	2.493-17	9.225-07	2.104-02	6.493-02	1.185-01	2.116-01	2.637-01
3410	2.93	5.730-16	3.470-06	2.806-02	7.862-02	1.354-01	2.256-01	2.718-01
3420	2.92	1.219-14	1.230-05	3.617-02	9.178-02	1.511-01	2.471-01	3.126-01
3430	2.92	2.385-13	4.091-05	4.683-02	1.090-01	1.681-01	2.516-01	2.996-01
3440	2.91	4.262-12	1.267-04	5.915-02	1.254-01	1.812-01	2.463-01	2.801-01
3450	2.90	6.900-11	3.632-04	7.424-02	1.433-01	2.052-01	3.020-01	3.865-01
3460	2.89	1.003-09	9.563-04	9.206-02	1.640-01	2.143-01	2.694-01	3.053-01
3470	2.88	1.295-08	2.299-03	1.112-01	1.816-01	2.242-01	2.582-01	3.027-01
3480	2.87	1.467-07	5.017-03	1.351-01	2.038-01	2.442-01	2.948-01	3.389-01
3490	2.87	5.300-04	9.936-03	1.545-01	2.169-01	2.469-01	2.819-01	3.314-01
3500	2.86	1.198-05	1.799-02	1.857-01	2.422-01	2.664-01	2.988-01	3.501-01
3510	2.85	8.339-05	3.103-02	2.054-01	2.477-01	2.693-01	3.137-01	3.913-01
3520	2.84	4.747-04	5.290-02	2.310-01	2.652-01	2.772-01	3.192-01	3.399-01
3530	2.83	2.162-03	8.412-02	2.483-01	2.685-0.	2.693-01	3.006-01	3.694-01
3540	2.82	4.889-02	1.228-01	2.626-01	2.692-01	3.033-01	4.030-01	3.155-01

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)

K (PER CM AT STP)

2.7 MICRON COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
3550	2.82	2.125-02	1.684-01	2.763-01	2.818-01	2.837-01	3.358-01	4.173-01
3560	2.81	4.482-02	1.912-01	2.544-01	2.566-01	2.643-01	3.353-01	4.292-01
3565	2.81	6.359-02	2.163-01	2.611-01	2.622-01	2.740-01	3.508-01	4.436-01
3570	2.80	8.610-02	2.537-01	2.679-01	2.677-01	2.836-01	3.662-01	4.580-01
3575	2.80	1.106-01	2.716-01	2.631-01	2.632-01	2.809-01	3.684-01	4.608-01
3580	2.79	1.465-01	2.648-01	2.353-01	2.587-01	2.782-01	3.705-01	4.636-01
3585	2.79	2.626-01	3.378-01	2.784-01	2.774-01	3.004-01	3.965-01	4.822-01
3590	2.79	4.404-01	4.261-01	2.986-01	2.961-01	3.226-01	4.225-01	5.008-01
3595	2.78	5.782-01	4.560-01	2.903-01	2.956-01	3.264-01	4.277-01	5.029-01
3600	2.78	6.342-01	4.255-01	2.821-01	2.952-01	3.301-01	4.330-01	5.050-01
3605	2.77	5.391-01	3.292-01	2.413-01	2.798-01	3.345-01	4.521-01	5.216-01
3610	2.77	2.525-01	1.740-01	2.004-01	2.643-01	3.390-01	4.712-01	5.383-01
3615	2.77	1.824-01	1.063-01	1.959-01	2.641-01	3.383-01	4.662-01	5.337-01
3620	2.76	6.008-01	2.321-01	1.911-01	2.638-01	3.377-01	4.613-01	5.290-01
3625	2.76	8.115-01	3.494-01	2.163-01	2.797-01	3.706-01	4.948-01	5.549-01
3630	2.75	7.264-01	4.134-01	2.415-01	2.957-01	4.035-01	5.283-01	5.807-01
3635	2.75	4.525-01	3.977-01	2.752-01	3.366-01	4.180-01	5.218-01	5.683-01
3640	2.75	1.890-01	3.130-01	3.089-01	3.776-01	4.325-01	5.154-01	5.558-01
3645	2.74	4.820-02	2.013-01	3.248-01	4.019-01	4.536-01	5.254-01	5.600-01
3650	2.74	7.095-03	1.127-01	3.407-01	4.261-01	4.746-01	5.354-01	5.642-01
3655	2.74	3.107-03	7.624-02	1.877-01	4.323-01	4.803-01	5.375-01	5.646-01
3660	2.73	7.331-03	8.834-02	3.471-02	4.385-01	4.859-01	5.397-01	5.651-01
3665	2.73	1.776-02	1.290-01	2.197-01	4.495-01	4.841-01	5.302-01	5.555-01
3670	2.72	4.043-02	1.891-01	4.046-01	4.605-01	4.822-01	5.207-01	5.459-01
3675	2.72	8.591-02	2.671-01	4.344-01	4.921-01	5.005-01	5.277-01	5.468-01
3680	2.72	1.691-01	3.634-01	5.042-01	5.239-01	5.187-01	5.346-01	5.477-01
3685	2.71	3.051-01	4.691-01	5.254-01	5.303-01	5.214-01	5.388-01	5.485-01
3690	2.71	4.982-01	5.696-01	5.465-01	5.368-01	5.241-01	5.429-01	5.493-01
3695	2.71	7.218-01	6.423-01	5.145-01	5.045-01	5.032-01	5.340-01	5.376-01

UNCLASSIFIED

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
K (PER CM AT STP)
2.7 MICRON COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
3700	2.70	8.999-01	6.584-01	4.736-01	4.722-01	4.822-01	5.252-01	5.259-01
3705	2.70	9.102-01	5.888-01	4.041-01	4.234-01	4.554-01	5.101-01	5.038-01
3710	2.70	6.358-01	4.169-01	3.296-01	3.746-01	4.286-01	4.950-01	4.817-01
3715	2.69	6.328-02	1.545-01	3.313-01	3.832-01	4.337-01	4.800-01	4.497-01
3720	2.69	6.949-01	3.365-01	3.330-01	3.918-01	4.388-01	4.649-01	4.177-01
3725	2.68	1.159+00	5.998-01	4.776-01	4.953-01	4.942-01	4.603-01	3.845-01
3730	2.68	1.256+00	8.751-01	6.222-01	5.988-01	5.496-01	4.557-01	3.513-01
3735	2.68	9.516-01	9.645-01	5.958-01	6.468-01	5.735-01	4.486-01	3.315-01
3740	2.67	5.092-01	9.013-01	7.695-01	6.947-01	5.973-01	4.407-01	3.118-01
3745	2.67	1.869-01	6.716-01	6.933-01	6.351-01	5.457-01	3.929-01	2.709-01
3750	2.67	4.535-02	3.965-01	6.171-01	5.755-01	4.942-01	3.450-01	2.300-01
3755	2.66	7.247-03	1.762-01	4.440-01	4.339-01	3.840-01	2.709-01	1.793-01
3760	2.66	7.296-04	5.455-02	2.708-01	2.923-01	2.738-01	1.967-01	1.285-01
3765	2.66	2.915-05	1.048-02	1.505-01	1.667-01	1.594-01	1.168-01	7.680-02
3770	2.65	1.079-07	6.896-04	3.010-02	4.100-02	4.508-02	3.681-02	2.507-02

UNCLASSIFIED

ABSORPTION COEFFICIENTS OF CO2

SQRT(4 X ALPHA X S/DXD) AT STP

2.7 MICROM COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K
3000	3.33	.0000E 00	.0000E 00	.0000E 00
3210	3.11	.0000E 00	.0000E 00	.0000E 00
3020	3.31	.0000E 00	.0000E 00	.0000E 00
3030	3.30	.0000E 00	.0000E 00	.0000E 00
3040	3.28	.0000E 00	.0000E 00	.0000E 00
3050	3.27	.0000E 00	.0000E 00	.0000E 00
3060	3.26	.0000E 00	.0000E 00	.0000E 00
3070	3.25	.0000E 00	.0000E 00	.0000E 00
3080	3.24	.0000E 00	.0000E 00	.0000E 00
3090	3.23	.0000E 00	.0000E 00	.0000E 00
3100	3.22	.0000E 00	.0000E 00	.0000E 00
3110	3.21	.0000E 00	.0000E 00	.0000E 00
3120	3.20	.0000E 00	.0000E 00	.7891E-04
3130	3.19	.0000E 00	.0000E 00	.0000E 00
3140	3.18	.0000E 00	.0000E 00	.1704E-03
3150	3.17	.0000E 00	.0000E 00	.0000E 00
3160	3.16	.0000E 00	.0000E 00	.4161E-03
3170	3.15	.0000E 00	.0000E 00	.0000E 00
3180	3.14	.0000E 00	.0000E 00	.9944E-03
3190	3.13	.0000E 00	.0000E 00	.0000E 00
3200	3.12	.0000E 00	.0000E 00	.2316E-02
3210	3.11	.0000E 00	.0000E 00	.0000E 00
3220	3.10	.0000E 00	.3049E-04	.5251E-02
3230	3.09	.0000E 00	.0000E 00	.7813E-02
3240	3.08	.0000E 00	.2014E-03	.1152E-01
3250	3.07	.0000E 00	.0000E 00	.1684E-01

UNCLASSIFIED

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
SQRT(4 X ALPHA X S/DXD) AT STP
2.7 MICROM COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K
3260	3.06	.0000E 00	.1284E-07	.2436E-01
3270	3.05	.0000E 00	.0000E 00	.3486E-01
3280	3.04	.0000E 00	.7872E-07	.4929E-01
3290	3.03	.0000E 00	.0000E 00	.6876E-01
3300	3.03	.8047E-16	.4619E-06	.9451E-01
3310	3.02	.5090E-15	.0000E 00	.1277E 00
3320	3.01	.3433E-14	.2582E-05	.1695E 00
3330	3.00	.2087E-13	.5983E-05	.2199E 00
3340	2.99	.1241E-12	.1366E-04	.2782E 00
3350	2.98	.7205E-12	.3073E-04	.3402E 00
3360	2.97	.4077E-11	.6797E-04	.3958E 00
3370	2.96	.2247E-09	.1476E-03	.4635E 00
3380	2.95	.1203E-09	.3147E-03	.5587E 00
3390	2.94	.6255E-09	.5677E-03	.6713E 00
3400	2.94	.3146E-08	.1340E-02	.7621E 00
3410	2.93	.1529E-07	.2669E-02	.8577E 00
3420	2.92	.7163E-07	.5173E-02	.9407E 00
3430	2.91	.3222E-06	.9734E-02	.1014E 01
3440	2.90	.1387E-05	.1771E-01	.1075E 01
3450	2.89	.5704E-05	.3107E-01	.1127E 01
3460	2.89	.2225E-04	.5224E-01	.1194E 01
3470	2.88	.8209E-04	.8376E-01	.1223E 01
3480	2.87	.2842E-03	.1269E 00	.1290E 01
3490	2.86	.9185E-03	.1799E 00	.1156E 01
3500	2.85	.2744E-02	.2336E 00	.1353E 01
3510	2.84	.7506E-01	.2795E 00	.1241E 01
3520	2.84	.1656E-01	.3713E 00	.1372E 01
3530	2.83	.4085E-01	.4481E 00	.1259E 01
3540	2.82	.7832E-01	.5187E 00	.1174E 01
3550	2.81	.1269E 00	.5664E 00	.1245E 01

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
SQRT(4 X ALPHA X S/DXD) AT STP
2.7 MICROM COMBINATION BAND

1/CM	MICRON	300 K	600 K	1200 K
3560	2.80	.1592E 00	.5289E 00	.1112E 01
3570	2.80	.2451E 00	.5760E 00	.1204E 01
3580	2.79	.2006E 00	.4613E 00	.1085E 01
3590	2.78	.4137E 00	.5829E 00	.1305E 01
3600	2.77	.4418E 00	.5179E 00	.1242E 01
3610	2.77	.2590E 00	.3129E 00	.1155E 01
3620	2.76	.3368E 00	.2979E 00	.1337E 01
3630	2.75	.3879E 00	.3261E 00	.1453E 01
3640	2.74	.2176E 00	.3666E 00	.1707E 01
3650	2.73	.5555E 00	.3489E 00	.1893E 01
3660	2.73	.3783E 00	.3498E 00	.1994E 01
3670	2.72	.9134E 00	.4542E 00	.2065E 01
3680	2.71	.1962E 00	.6502E 00	.2222E 01
3090	3.23	.3579E 00	.8247E 00	.2293E 01
3700	2.70	.5211E 00	.8619E 00	.2274E 01
3710	2.69	.5040E 00	.7022E 00	.2098E 01
3720	2.68	.4783E 00	.7191E 00	.1982E 01
3730	2.68	.7315E 00	.1131E 01	.2253E 01
3740	2.67	.5687E 00	.1171E 01	.2065E 01
3750	2.66	.2065E 00	.7947E 00	.1275E 01
3760	2.65	.2379E-01	.2849E 00	.1266E 01
3770	2.65	.1658E-03	.2403E-01	.1586E 00

APPENDIX G

Carbon Dioxide Emission data for the range 2050-2500 cm^{-1}.

This appendix presents the Carbon Dioxide emission data as given in the report:

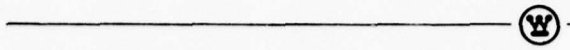
> Jackson, H., Tracey, "A Model for the Spectral Emission of Carbon Dioxide in the 4.3μ Band". Report No. RE-TR-69-9 April 1968. U.S. Army Missile Command, Redstone Arsenal, Alabama.

The data is given in tabular form as a function of temperature and wavenumber. The equations utilizing these numbers are given in Section 3.3

The Spectral Band Parameter S/d as a Function of Temperature

AC02

WAVE NUMBER (1/CM)	TEMPERATURE (DEGREES KELVIN) 300.	600.	900.	1200.	1500.	1800.	2100.
2050.	2.60E-03	4.80E-04	3.40E-04	4.10E-04	8.20E-04	5.70E-03	2.60E-02
2055.	4.80E-03	7.00E-04	4.50E-04	5.20E-04	1.08E-03	7.20E-03	3.00E-02
2060.	8.01E-03	1.03E-03	5.72E-04	6.37E-04	1.37E-03	9.08E-03	3.56E-02
2065.	1.40E-02	1.51E-03	7.53E-04	8.23E-04	1.77E-03	1.14E-02	4.12E-02
2070.	1.87E-02	1.89E-03	9.57E-04	1.06E-03	2.28E-03	1.42E-02	4.76E-02
2075.	2.02E-02	2.08E-03	1.15E-03	1.34E-03	2.95E-03	1.75E-02	5.47E-02
2080.	1.65E-02	1.99E-03	1.30E-03	1.66E-03	3.81E-03	2.13E-02	6.28E-02
2085.	1.08E-02	1.79E-03	1.44E-03	2.04E-03	4.96E-03	2.58E-02	7.21E-02
2090.	6.31E-03	1.63E-03	1.57E-03	2.54E-03	6.41E-03	3.08E-02	8.30E-02
2095.	3.21E-03	1.52E-03	1.77E-03	2.81E-03	8.23E-03	3.65E-02	9.51E-02
2100.	1.81E-03	1.47E-03	2.10E-03	2.65E-03	1.06E-02	4.28E-02	1.08E-01
2105.	1.33E-03	1.41E-03	2.35E-03	2.30E-03	1.36E-02	5.01E-02	1.24E-01
2110.	9.55E-04	1.26E-03	2.32E-03	1.89E-03	1.73E-02	5.86E-02	1.41E-01
2115.	6.95E-04	1.07E-03	2.08E-03	1.86E-03	2.21E-02	6.86E-02	1.60E-01
2120.	5.65E-04	8.82E-04	1.70E-03	2.46E-03	2.80E-02	8.05E-02	1.81E-01
2125.	5.13E-04	7.36E-04	1.40E-03	3.52E-03	3.51E-02	9.61E-02	2.05E-01
2130.	4.88E-04	6.96E-04	1.38E-03	4.98E-03	4.38E-02	1.15E-01	2.31E-01
2135.	4.80E-04	7.11E-04	1.53E-03	6.91E-03	5.46E-02	1.37E-01	2.61E-01
2140.	4.78E-04	7.30E-04	1.73E-03	9.55E-03	6.73E-02	1.63E-01	2.95E-01
2145.	4.82E-04	7.52E-04	1.95E-03	1.31E-02	8.27E-02	1.92E-01	3.32E-01
2150.	4.91E-04	7.81E-04	2.20E-03	1.82E-02	1.01E-01	2.25E-01	3.73E-01
2155.	5.05E-04	8.16E-04	2.47E-03	2.52E-02	1.24E-01	2.62E-01	4.18E-01
2160.	5.22E-04	8.56E-04	2.78E-03	3.43E-02	1.53E-01	3.06E-01	4.68E-01
2165.	5.47E-04	9.16E-04	3.25E-03	4.63E-02	1.88E-01	3.55E-01	5.22E-01
2170.	5.81E-04	1.01E-03	4.03E-03	6.16E-02	2.28E-01	4.07E-01	5.80E-01
2175.	6.28E-04	1.18E-03	5.68E-03	8.20E-02	2.76E-01	4.67E-01	6.42E-01
2180.	6.95E-04	1.46E-03	8.82E-03	1.09E-01	3.32E-01	5.36E-01	7.10E-01
2185.	7.83E-04	1.91E-03	1.40E-02	1.43E-01	3.95E-01	6.13E-01	7.82E-01
2190.	9.01E-04	2.60E-03	2.18E-02	1.88E-01	4.70E-01	7.00E-01	8.57E-01
2195.	1.06E-03	3.91E-03	3.34E-02	2.46E-01	5.58E-01	7.93E-01	9.32E-01
2200.	1.28E-03	6.27E-03	5.00E-02	3.15E-01	6.56E-01	8.93E-01	1.00E-00
2205.	1.69E-03	1.02E-02	7.20E-02	3.97E-01	7.67E-01	1.00E-00	1.08E-00
2210.	2.45E-03	1.65E-02	1.00E-01	4.92E-01	8.88E-01	1.11E-00	1.17E-00
2215.	4.28E-03	2.74E-02	1.41E-01	6.01E-01	1.01E-00	1.23E-00	1.26E-00
2220.	7.95E-03	4.54E-02	2.02E-01	7.28E-01	1.16E-00	1.35E-00	1.36E-00



AC02

WAVE NUMBER (1/CM)	TEMPERATURE (DEGREES KELVIN) 300.	600.	900.	1200.	1500.	1800.	2100.
2225.	1.60E-02	7.54E-02	2.79E-01	8.76E-01	1.31E-00	1.48E-00	1.45E-00
2230.	3.10E-02	1.22E-01	3.67E-01	1.04E-00	1.48E-00	1.61E-00	1.55E-00
2235.	5.71E-02	1.85E-01	4.73E-01	1.24E-00	1.65E-00	1.74E-00	1.64E-00
2240.	9.84E-02	2.66E-01	6.05E-01	1.46E-00	1.84E-00	1.86E-00	1.72E-00
2245.	1.56E-01	3.65E-01	7.70E-01	1.71E-00	2.03E-00	1.99E-00	1.80E-00
2250.	2.32E-01	4.86E-01	9.75E-01	1.98E-00	2.22E-00	2.11E-00	1.87E-00
2255.	3.15E-01	6.30E-01	1.22E-00	2.28E-00	2.42E-00	2.22E-00	1.93E-00
2260.	3.93E-01	7.98E-01	1.53E-00	2.60E-00	2.61E-00	2.32E-00	1.98E-00
2265.	4.63E-01	1.00E-00	1.90E-00	2.93E-00	2.79E-00	2.41E-00	2.03E-00
2270.	5.21E-01	1.26E-00	2.36E-00	3.27E-00	2.96E-00	2.49E-00	2.06E-00
2275.	6.17E-01	1.63E-00	2.89E-00	3.61E-00	3.12E-00	2.55E-00	2.08E-00
2280.	7.99E-01	2.20E-00	3.52E-00	3.94E-00	3.26E-00	2.61E-00	2.10E-00
2285.	1.17E-00	3.05E-00	4.25E-00	4.25E-00	3.38E-00	2.65E-00	2.11E-00
2290.	1.84E-00	4.32E-00	5.10E-00	4.53E-00	3.48E-00	2.69E-00	2.12E-00
2295.	2.89E-00	5.83E-00	5.96E-00	4.76E-00	3.55E-00	2.70E-00	2.12E-00
2300.	4.40E-00	7.42E-00	6.77E-00	4.95E-00	3.60E-00	2.71E-00	2.11E-00
2305.	6.36E-00	9.18E-00	7.44E-00	5.07E-00	3.62E-00	2.70E-00	2.10E-00
2310.	8.72E-00	1.12E+01	7.90E-00	5.14E-00	3.63E-00	2.69E-00	2.07E-00
2315.	1.11E+01	1.31E+01	8.16E-00	5.16E-00	3.62E-00	2.67E-00	2.05E-00
2320.	1.34E+01	1.46E+01	8.25E-00	5.14E-00	3.60E-00	2.65E-00	2.01E-00
2325.	1.53E+01	1.51E+01	8.18E-00	5.12E-00	3.59E-00	2.64E-00	1.99E-00
2330.	1.67E+01	1.42E+01	7.97E-00	5.08E-00	3.57E-00	2.61E-00	1.95E-00
2335.	1.75E+01	1.27E+01	7.70E-00	5.08E-00	3.56E-00	2.57E-00	1.90E-00
2340.	1.76E+01	1.11E+01	7.45E-00	5.10E-00	3.55E-00	2.53E-00	1.85E-00
2345.	1.74E+01	1.03E+01	7.43E-00	5.15E-00	3.52E-00	2.46E-00	1.76E-00
2350.	1.73E+01	1.11E+01	7.87E-00	5.27E-00	3.50E-00	2.40E-00	1.69E-00
2355.	1.81E+01	1.32E+01	8.85E-00	5.35E-00	3.43E-00	2.29E-00	1.59E-00
2360.	1.95E+01	1.56E+01	1.00E+01	5.33E-00	3.28E-00	2.12E-00	1.43E-00
2365.	2.09E+01	1.71E+01	1.01E+01	5.11E-00	3.05E-00	1.94E-00	1.29E-00
2370.	2.11E+01	1.80E+01	9.50E-00	4.90E-00	2.69E-00	1.67E-00	1.09E-00
2375.	1.82E+01	1.60E+01	7.83E-00	3.91E-00	2.28E-00	1.41E-00	8.50E-01
2380.	1.01E+01	7.20E-00	6.00E-00	3.07E-00	1.77E-00	1.05E-00	6.50E-01
2385.	1.19E-00	2.54E-00	3.45E-00	2.19E-00	1.35E-00	8.02E-01	4.50E-01
2390.	2.97E-01	9.97E-01	1.70E-00	1.20E-00	7.80E-01	4.80E-01	3.00E-01
2395.	9.75E-02	2.61E-01	3.62E-01	4.95E-01	3.81E-01	3.21E-01	1.75E-01
2400.	5.01E-02	7.50E-02	1.00E-01	1.50E-01	1.50E-01	1.30E-01	1.00E-01

The Spectral Band Parameter $S_{\frac{1}{2}}/d$ as a Function of Temperature

C02K

WAVE NUMBER (1/CM)	TEMPERATURE (DEGREES KELVIN) 300.	600.	900.	1200.	1500.	1800.	2100.
2050.	4.60E-02	6.60E-02	1.33E-01	3.35E-01	7.90E-01	2.90E-00	8.90E-00
2055.	4.90E-02	7.00E-02	1.37E-01	3.52E-01	8.85E-01	3.20E-00	9.39E-00
2060.	5.25E-02	7.50E-02	1.49E-01	3.76E-01	1.00E-00	3.60E-00	1.00E+01
2065.	5.68E-02	8.00E-02	1.59E-01	3.92E-01	1.13E-00	4.00E-00	1.07E+01
2070.	6.00E-02	8.42E-02	1.68E-01	4.10E-01	1.28E-00	4.40E-00	1.13E+01
2075.	6.31E-02	8.81E-02	1.76E-01	4.31E-01	1.45E-00	4.81E-00	1.19E+01
2080.	6.67E-02	9.25E-02	1.84E-01	4.56E-01	1.63E-00	5.23E-00	1.25E+01
2085.	7.06E-02	1.01E-01	2.06E-01	4.81E-01	1.84E-00	5.66E-00	1.31E+01
2090.	7.42E-02	1.19E-01	2.56E-01	5.02E-01	2.06E-00	6.10E-00	1.37E+01
2095.	7.71E-02	1.42E-01	3.23E-01	5.47E-01	2.30E-00	6.55E-00	1.42E+01
2100.	7.89E-02	1.67E-01	3.95E-01	6.00E-01	2.54E-00	7.00E-00	1.47E+01
2105.	8.01E-02	1.87E-01	4.58E-01	6.71E-01	2.78E-00	7.45E-00	1.52E+01
2110.	8.13E-02	2.01E-01	5.00E-01	7.60E-01	3.04E-00	7.90E-00	1.57E+01
2115.	8.25E-02	2.10E-01	5.29E-01	8.62E-01	3.30E-00	8.33E-00	1.62E+01
2120.	8.40E-02	2.19E-01	5.58E-01	9.73E-01	3.59E-00	8.76E-00	1.66E+01
2125.	8.54E-02	2.27E-01	5.86E-01	1.09E-00	3.89E-00	9.18E-00	1.70E+01
2130.	8.68E-02	2.35E-01	6.12E-01	1.24E-00	4.19E-00	9.60E-00	1.75E+01
2135.	9.82E-02	2.43E-01	6.38E-01	1.41E-00	4.50E-00	1.00E+01	1.78E+01
2140.	9.97E-02	2.50E-01	6.66E-01	1.60E-00	4.85E-00	1.04E+01	1.82E+01
2145.	9.12E-02	2.58E-01	6.99E-01	1.80E-00	5.22E-00	1.08E+01	1.86E+01
2150.	9.28E-02	2.66E-01	7.40E-01	2.01E-00	5.63E-00	1.12E+01	1.90E+01
2155.	9.44E-02	2.77E-01	7.96E-01	2.25E-00	6.06E-00	1.16E+01	1.94E+01
2160.	9.60E-02	2.95E-01	8.77E-01	2.51E-00	6.48E-00	1.20E+01	1.98E+01
2165.	9.74E-02	3.21E-01	9.81E-01	2.81E-00	6.91E-00	1.25E+01	2.01E+01
2170.	9.87E-02	3.55E-01	1.11E-00	3.15E-00	7.35E-00	1.30E+01	2.03E+01
2175.	1.00E-01	3.90E-01	1.25E-00	3.51E-00	7.80E-00	1.34E+01	2.04E+01
2180.	1.02E-01	4.22E-01	1.40E-00	3.91E-00	8.26E-00	1.39E+01	2.05E+01
2185.	1.06E-01	4.54E-01	1.55E-00	4.35E-00	8.75E-00	1.43E+01	2.05E+01
2190.	1.12E-01	4.90E-01	1.72E-00	4.81E-00	9.27E-00	1.47E+01	2.06E+01
2195.	1.20E-01	5.31E-01	1.90E-00	5.30E-00	9.86E-00	1.51E+01	2.08E+01
2200.	1.29E-01	5.81E-01	2.10E-00	5.81E-00	1.05E+01	1.56E+01	2.10E+01
2205.	1.40E-01	6.37E-01	2.31E-00	6.35E-00	1.12E+01	1.60E+01	2.13E+01
2210.	1.52E-01	6.97E-01	2.54E-00	6.90E-00	1.19E+01	1.64E+01	2.17E+01
2215.	1.67E-01	7.64E-01	2.77E-00	7.46E-00	1.26E+01	1.68E+01	2.21E+01
2220.	1.87E-01	8.40E-01	3.02E-00	8.02E-00	1.33E+01	1.72E+01	2.25E+01

C02K

WAVE NUMBER (1/CM)	TEMPERATURE (DEGREES KELVIN) 300.	600.	900.	1200.	1500.	1800.	2100.
2225.	2.17E-01	9.40E-01	3.31E-00	8.57E-00	1.40E+01	1.77E+01	2.30E+01
2230.	2.65E-01	1.08E-00	3.65E-00	9.12E-00	1.45E+01	1.81E+01	2.35E+01
2235.	3.34E-01	1.26E-00	4.03E-00	9.66E-00	1.50E+01	1.86E+01	2.39E+01
2240.	4.31E-01	1.48E-00	4.43E-00	1.01E+01	1.55E+01	1.89E+01	2.41E+01
2245.	5.51E-01	1.75E-00	4.84E-00	1.06E+01	1.58E+01	1.90E+01	2.38E+01
2250.	6.93E-01	2.04E-00	5.25E-00	1.11E+01	1.59E+01	1.89E+01	2.33E+01
2255.	8.50E-01	2.34E-00	5.63E-00	1.15E+01	1.60E+01	1.87E+01	2.26E+01
2260.	1.01E-00	2.65E-00	5.99E-00	1.18E+01	1.59E+01	1.85E+01	2.17E+01
2265.	1.19E-00	2.93E-00	6.29E-00	1.21E+01	1.58E+01	1.82E+01	2.07E+01
2270.	.38E-00	3.20E-00	6.55E-00	1.24E+01	1.57E+01	1.78E+01	1.96E+01
2275.	1.58E-00	3.46E-00	6.79E-00	1.26E+01	1.54E+01	1.72E+01	1.83E+01
2280.	1.81E-00	3.75E-00	7.06E-00	1.27E+01	1.52E+01	1.67E+01	1.74E+01
2285.	2.12E-00	4.05E-00	7.39E-00	1.28E+01	1.50E+01	1.62E+01	1.65E+01
2290.	2.57E-00	4.37E-00	7.80E-00	1.28E+01	1.48E+01	1.58E+01	1.59E+01
2295.	3.18E-00	4.78E-00	8.30E-00	1.28E+01	1.45E+01	1.53E+01	1.53E+01
2300.	4.01E-00	5.38E-00	8.90E-00	1.27E+01	1.42E+01	1.47E+01	1.45E+01
2305.	5.04E-00	6.22E-00	9.55E-00	1.25E+01	1.37E+01	1.42E+01	1.38E+01
2310.	6.26E-00	7.39E-00	1.02E+01	1.23E+01	1.32E+01	1.34E+01	1.30E+01
2315.	7.67E-00	8.71E-00	1.07E+01	1.20E+01	1.27E+01	1.28E+01	1.24E+01
2320.	9.31E-00	1.00E+01	1.12E+01	1.16E+01	1.22E+01	1.21E+01	1.15E+01
2325.	1.09E+01	1.10E+01	1.14E+01	1.13E+01	1.16E+01	1.14E+01	1.08E+01
2330.	1.22E+01	1.14E+01	1.12E+01	1.08E+01	1.10E+01	1.07E+01	1.00E+01
2335.	1.34E+01	1.13E+01	1.08E+01	1.03E+01	1.03E+01	9.86E-00	9.13E-00
2340.	1.44E+01	1.10E+01	1.04E+01	9.85E-00	9.70E-00	9.22E-00	8.52E-00
2345.	1.53E+01	1.06E+01	9.90E-00	9.16E-00	8.88E-00	8.36E-00	7.81E-00
2350.	1.59E+01	1.06E+01	9.50E-00	8.51E-00	8.15E-00	7.61E-00	7.22E-00
2355.	1.52E+01	9.45E-00	8.65E-00	7.77E-00	7.36E-00	6.85E-00	6.50E-00
2360.	1.30E+01	8.01E+00	7.60E-00	6.87E-00	6.33E-00	5.77E-00	5.45E-00
2365.	1.03E+01	7.27E-00	7.61E-00	6.15E-00	5.56E-00	5.05E-00	4.66E-00
2370.	6.97E-00	6.43E-00	5.90E-00	5.50E-00	4.58E-00	4.12E-00	3.67E-00
2375.	4.45E-00	4.95E-00	5.01E-00	4.10E-00	3.76E-00	3.36E-00	2.97E-00
2380.	2.65E-00	3.50E-00	4.10E-00	2.80E-00	2.30E-00	1.90E-00	1.60E-00
2385.	1.51E-00	2.28E-00	3.00E-00	2.05E-00	1.70E-00	1.27E-00	1.15E-00
2390.	9.98E-01	1.40E+00	1.90E-00	1.40E-00	1.20E-00	1.00E-00	9.00E-01
2395.	6.25E-01	7.59E-01	1.20E-00	1.09E-00	9.00E-01	8.65E-01	8.40E-01
2400.	4.03E-01	5.51E-01	6.63E-01	8.00E-01	8.00E-01	8.10E-01	8.00E-01

APPENDIX H

Carbon Dioxide Emission Data for the range 500-800 cm^{-1}.

This appendix presents the Carbon Dioxide Emission data as contained in the report:

> Ludwig, C.R., "Tables of Carbon Dioxide Absorption Coefficients", obtained from private communications with Dr. Ludwig when he was at G.D.

The equations utilizing this data are presented in Section 3.2.

ABSORPTION COEFFICIENTS OF CO2

K (PER CM AT STP)

15 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K
500	20.00	.0000E 00	.0000E 00	.0000E 00	.1050E-01	.3000E-01	.8800E-01
505	19.80	.0000E 00	.0000E 00	.0000E 00	.1800E-01	.4900E-01	.8000E-01
510	19.60	.0000E 00	.0000E 00	.0000E 00	.3000E-01	.5400E-01	.7400E-01
515	19.41	.0000E 00	.0000E 00	.0000E 00	.3000E-01	.5600E-01	.8900E-01
520	19.23	.0000E 00	.0000E 00	.0000E 00	.3300E-01	.6900E-01	.9900E-01
525	19.04	.0000E 00	.0000E 00	.8800E-02	.3800E-01	.7200E-01	.9700E-01
530	18.86	.0000E 00	.0000E 00	.1100E-01	.5300E-01	.9500E-01	.1240E 00
535	18.69	.0000E 00	.0000E 00	.2850E-01	.6300E-01	.9900E-01	.1400E 00
540	18.51	.0000E 00	.0000E 00	.3300E-01	.6800E-01	.1030E 00	.1340E 00
545	18.34	.0000E 00	.0000E 00	.4500E-01	.9200E-01	.1380E 00	.1760E 00
550	18.18	.0000E 00	.0000E 00	.4900E-01	.9700E-01	.1480E 00	.1910E 00
555	18.01	.0000E 00	.0000E 00	.4900E-01	.1200E 00	.1880E 00	.2470E 00
560	17.85	.0000E 00	.0000E 00	.4800E-01	.1260E 00	.2010E 00	.2410E 00
565	17.69	.0000E 00	.0000E 00	.8200E-01	.1980E 00	.2760E 00	.2650E 00
570	17.54	.0000E 00	.7500E-02	.6900E-01	.1400E 00	.2250E 00	.3400E 00
575	17.39	.0000E 00	.2050E-01	.8200E-01	.1450E 00	.2360E 00	.5300E 00
580	17.24	.0000E 00	.3550E-01	.1170E 00	.1930E 00	.2950E 00	.5500E 00
585	17.09	.1570E-01	.5200E-01	.1700E 00	.2350E 00	.3050E 00	.4100E 00
590	16.94	.1500E-01	.8800E-01	.2700E 00	.3300E 00	.4400E 00	.5200E 00
595	16.80	.5100E-01	.1300E 00	.4000E 00	.5300E 00	.5600E 00	.5400E 00
600	16.66	.1200E 00	.1650E 00	.2750E 00	.3200E 00	.4200E 00	.5600E 00
605	16.52	.8800E-01	.1900E 00	.4300E 00	.5400E 00	.6200E 00	.6800E 00
610	16.39	.1100E 00	.3500E 00	.7100E 00	.7600E 00	.7600E 00	.6900E 00
615	16.26	.1800E 00	.4700E 00	.9200E 00	.9700E 00	.9100E 00	.6700E 00
620	16.12	.9700E-01	.2650E 00	.6100E 00	.7200E 00	.7800E 00	.7300E 00
625	16.00	.1750E 00	.3800E 00	.7200E 00	.7900E 00	.8300E 00	.8400E 00

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
K (PER CM AT STP)
15 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K
630	15.87	.3700E 00	.6400E 00	.9200E 00	.9600E 00	.9800E 00	.9400E 00
635	15.74	.5900E 00	.8400E 00	.1070E 01	.1100E 01	.1110E 01	.1060E 01
640	15.62	.9400E 00	.1030E 01	.1150E 01	.1150E 01	.1150E 01	.1180E 01
645	15.50	.1960E 01	.1770E 01	.1460E 01	.1360E 01	.1320E 01	.1390E 01
650	15.38	.3450E 01	.2820E 01	.1980E 01	.1720E 01	.1560E 01	.1480E 01
655	15.26	.2820E 01	.2480E 01	.2000E 01	.1900E 01	.1860E 01	.2050E 01
660	15.15	.2540E 01	.2340E 01	.1840E 01	.1760E 01	.1740E 01	.2030E 01
665	15.03	.1420E 02	.8600E 01	.3700E 01	.2600E 01	.1960E 01	.1420E 01
670	14.92	.4500E 01	.5700E 01	.5800E 01	.5200E 01	.3500E 01	.4200E 01
675	14.81	.3600E 01	.3100E 01	.3300E 01	.2900E 01	.2050E 01	.2000E 01
680	14.70	.3100E 01	.2600E 01	.2000E 01	.1960E 01	.1800E 01	.2100E 01
685	14.59	.2400E 01	.2500E 01	.2300E 01	.2200E 01	.1700E 01	.1940E 01
690	14.49	.1820E 01	.2000E 01	.2180E 01	.2050E 01	.1840E 01	.1300E 01
695	14.38	.1040E 01	.1350E 01	.1720E 01	.1720E 01	.1650E 01	.1300E 01
700	14.28	.5500E 00	.1200E 01	.1430E 01	.1470E 01	.1480E 01	.1250E 01
705	14.18	.1360E 01	.1280E 01	.1280E 01	.1350E 01	.1380E 01	.1340E 01
710	14.08	.2100E 00	.7800E 00	.1270E 01	.1330E 01	.1370E 01	.1320E 01
715	13.98	.1900E 00	.7800E 00	.1400E 01	.1460E 01	.1470E 01	.1420E 01
720	13.88	.9000E 00	.1060E 01	.1400E 01	.1500E 01	.1550E 01	.1340E 01
725	13.79	.7200E-01	.3000E 00	.8000E 00	.1000E 01	.1150E 01	.1260E 01
730	13.69	.6400E-01	.2100E 00	.5600E 00	.7200E 00	.8600E 00	.1020E 01
735	13.60	.6800E-01	.2100E 00	.5300E 00	.6700E 00	.7900E 00	.1010E 01
740	13.51	.6900E-01	.2100E 00	.5400E 00	.6900E 00	.8200E 00	.9100E 00
745	13.42	.3300E-01	.1400E 00	.3900E 00	.5300E 00	.1650E 04	.7700E 00
750	13.33	.2300E-01	.7800E-01	.2700E 00	.4100E 00	.5600E 00	.8900E 00
755	13.24	.3000E-01	.8600E-01	.2800E 00	.4000E 00	.5200E 00	.7100E 00
760	13.15	.1750E-01	.6200E-01	.2250E 00	.3350E 00	.4500E 00	.6600E 00
765	13.07	.1050E-01	.4500E-01	.1800E 00	.2800E 00	.3800E 00	.6000E 00
770	12.98	.4500E-02	.3000E-01	.1480E 00	.2400E 00	.3450E 00	.5700E 00

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ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
K (PER CM AT STP)
15 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K
775	12.90	.0000E 00	.1400E-01	.1240E 00	.2050E 00	.2850E 00	.4300E 00
780	12.82	.0000E 00	.1150E-01	.1100E 00	.1850E 00	.2600E 00	.3750E 00
785	12.73	.0000E 00	.1350E-01	.8400E-01	.1400E 00	.2050E 00	.3350E 00
790	12.65	.0000E 00	.4300E-02	.6500E-01	.1200E 00	.1850E 00	.3250E 00
795	12.57	.0000E 00	.0000E 00	.5400E-01	.1150E 00	.1800E 00	.3150E 00
800	12.50	.0000E 00	.0000E 00	.4400E-01	.9500E-01	.1500E 00	.2700E 00
805	12.42	.0000E 00	.0000E 00	.3600E-01	.7900E-01	.1250E 00	.2050E 00
810	12.34	.0000E 00	.0000E 00	.2500E-01	.6500E-01	.1100E 00	.1780E 00
815	12.26	.0000E 00	.0000E 00	.1800E-01	.6200E-01	.1030E 00	.1530E 00
820	12.19	.0000E 00	.0000E 00	.3200E-01	.5800E-01	.8600E-01	.1470E 00
825	12.12	.0000E 00	.0000E 00	.8000E-02	.5100E-01	.8700E-01	.1340E 00
830	12.04	.0000E 00	.0000E 00	.6000E-02	.4800E-01	.8300E-01	.1330E 00
835	11.97	.0000E 00	.0000E 00	.0000E 00	.4300E-01	.7800E-01	.1180E 00
840	11.90	.0000E 00	.0000E 00	.0000E 00	.4200E-01	.7000E-01	.1080E 00
845	11.83	.0000E 00	.0000E 00	.0000E 00	.3600E-01	.6400E-01	.9800E-01
850	11.76	.0000E 00	.0000E 00	.0000E 00	.3500E-01	.6100E-01	.8700E-01
855	11.69	.0000E 00	.0000E 00	.0000E 00	.3200E-01	.5800E-01	.8600E-01
860	11.62	.0000E 00	.0000E 00	.0000E 00	.3300E-01	.5600E-01	.7500E-01
865	11.55	.0000E 00	.0000E 00	.0000E 00	.3000E-01	.5300E-01	.7500E-01
870	11.49	.0000E 00	.0000E 00	.0000E 00	.2900E-01	.5300E-01	.8500E-01
875	11.42	.0000E 00	.0000E 00	.0000E 00	.2400E-01	.4700E-01	.9000E-01
880	11.36	.0000E 00	.0000E 00	.0000E 00	.2200E-01	.4500E-01	.8600E-01

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APPENDIX I

Ludwig emmission model for the CO_2 1900-2395 cm^{-1} band.

The Ludwig model is included in this report as at one time it was under consideration for use in "HIDE". It was found, however, to be slightly inferior to Jackson for plume predictor comparisons and thus was not used.

The transmission equation of Ludwig is defined as:

$$= EXP(-KU/\sqrt{1+KU/4A})$$

$U = PP_{CO_2} * P * PL * 273/T$

P = Pressure (atmospheres)

PP_{CO_2} = Partial pressure (carbon dioxide)

PL = path length

T = temperature ^{o}K

A,K from tables in this appendix.

To determine A,K in steps of 5 cm^{-1} as required by "HIDE" for this band a third order collocation polynominal was used. In order to interpolate between temperatures, a second order quadratic was passed through the 300, 600, 1200 ^{o}K points. Thus, the "HIDE" A,K agree exactly with the Ludwig data at the tabulated values and varies smoothly between them.

The data itself comes from a report by Ludwig, C.R., titled "Table of Carbon Dicxide Absorption Coefficients", obtained from private communications with Dr. Ludwig when he was at General Dynamics.

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ABSORPTION COEFFICIENTS OF CO2

K (PER CM AT STP)

4.3 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
1900	5.26	-0.	-0.	-0.	-0.	-0.	-0.	6.923-02
1910	5.24	-0.	-0.	-0.	-0.	-0.	-0.	8.943-02
1920	5.21	-0.	-0.	-0.	-0.	-0.	-0.	1.144-01
1930	5.18	-0.	-0.	-0.	-0.	-0.	-0.	1.447-01
1940	5.15	-0.	-0.	-0.	-0.	-0.	-0.	1.816-01
1950	5.13	-0.	-0.	-0.	-0.	-0.	-0.	2.259-01
1960	5.10	-0.	-0.	-0.	-0.	-0.	-0.	2.815-01
1970	5.08	-0.	-0.	-0.	-0.	-0.	-0.	3.504-01
1980	5.05	-0.	-0.	-0.	-0.	-0.	-0.	4.352-01
1990	5.03	-0.	-0.	-0.	6.525-05-0.		6.443-02	5.372-01
2000	5.00	-0.	-0.	-0.	1.305-04-0.		1.289-01	6.558-01
2010	4.98	-0.	-0.	-0.	3.076-04-0.		1.727-01	8.004-01
2020	4.95	-0.	-0.	-0.	4.848-04-0.		2.284-01	9.665-01
2030	4.93	-0.	-0.	-0.	1.098-03-0.		2.983-01	1.159+00
2040	4.90	-0.	-0.	-0.	1.712-03-0.		3.883-01	1.427+00
2050	4.88	-0.	-0.	-0.	3.710-03-0.		5.030-01	1.662+00
2060	4.85	-0.	-0.	-0.	5.708-03-0.		6.485-01	1.956+00
2070	4.83	-0.	-0.	-0.	1.178-02-0.		8.320-01	2.299+00
2080	4.81	-0.	-0.	-0.	1.785-02-0.		1.059+00	2.802+00
2090	4.78	-0.	-0.	-0.	3.491-02	1.461-01	1.331+00	3.171+00
2100	4.76	-0.	-0.	-0.	5.196-02	2.923-01	1.663+00	3.651+00
2110	4.74	-0.	-0.	-0.	8.608-02	4.157-01	2.058+00	4.180+00
2120	4.72	-0.	-0.	-0.	1.396-01	5.813-01	2.539+00	4.881+00
2130	4.69	-0.	-0.	-0.	2.216-01	8.043-01	3.083+00	5.474+00
2140	4.67	-0.	-0.	3.746-02	3.437-01	1.104+00	3.717+00	6.125+00
2150	4.65	-0.	-0.	7.491-02	5.212-01	1.501+00	4.521+00	7.315+00

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ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
K (PER CM AT STP)
4.3 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
2155	4.64	-0.	-0.	1.012-01	6.468-01	1.758+00	4.898+00	7.494+00
2160	4.63	-0.	-0.	1.357-01	7.724-01	2.016+00	5.276+00	7.673+00
2165	4.62	-0.	-0.	1.807-01	9.488-01	2.340+00	5.722+00	8.006+00
2170	4.61	-0.	-0.	2.388-01	1.125+00	2.664+00	6.169+00	8.339+00
2175	4.60	-0.	-0.	3.134-01	1.372+00	3.066+00	6.652+00	8.670+00
2180	4.59	-0.	-0.	4.081-01	1.618+00	3.467+00	7.136+00	9.000+00
2185	4.58	-0.	-0.	5.274-01	1.954+00	3.960+00	7.724+00	9.742+00
2190	4.57	-0.	-0.	6.765-01	2.289+00	4.453+00	8.313+00	1.048+01
2195	4.56	-0.	3.728-04	8.611-01	2.734+00	5.037+00	8.829+00	1.057+01
2200	4.55	-0.	7.456-04	1.088+00	3.180+00	5.621+00	9.344+00	1.066+01
2205	4.54	-0.	1.444-03	1.364+00	3.753+00	6.284+00	9.870+00	1.088+01
2210	4.52	-0.	2.760-03	1.702+00	4.326+00	6.975+00	1.040+01	1.110+01
2215	4.51	-0.	5.202-03	2.110+00	5.042+00	7.706+00	1.090+01	1.127+01
2220	4.50	-0.	9.661-03	2.606+00	5.758+00	8.493+00	1.140+01	1.145+01
2225	4.49	-0.	1.767-02	3.191+00	6.629+00	9.294+00	1.200+01	1.201+01
2230	4.48	-0.	3.183-02	3.883+00	7.500+00	1.016+01	1.261+01	1.257+01
2235	4.47	-0.	5.641-02	4.690+00	8.494+00	1.098+01	1.298+01	1.252+01
2240	4.46	-0.	9.829-02	5.614+00	9.459+00	1.185+01	1.336+01	1.247+01
2245	4.45	3.878-05	1.683-01	6.679+00	1.059+01	1.276+01	1.366+01	1.241+01
2250	4.44	7.757-05	2.829-01	7.646+00	1.168+01	1.351+01	1.396+01	1.236+01
2255	4.43	2.543-04	4.667-01	9.179+00	1.288+01	1.439+01	1.479+01	1.390+01
2260	4.42	8.058-04	7.550-01	1.058+01	1.398+01	1.521+01	1.562+01	1.544+01
2265	4.42	2.464-03	1.197+00	1.213+01	1.517+01	1.585+01	1.525+01	1.398+01
2270	4.41	7.260-03	1.856+00	1.368+01	1.620+01	1.640+01	1.489+01	1.252+01
2275	4.40	2.056-02	2.816+00	1.533+01	1.726+01	1.697+01	1.483+01	1.216+01
2280	4.39	5.587-02	4.174+00	1.689+01	1.812+01	1.734+01	1.477+01	1.181+01
2285	4.38	1.452-01	6.032+00	1.842+01	1.907+01	1.789+01	1.462+01	1.143+01
2290	4.37	3.602-01	8.490+00	1.985+01	1.960+01	1.793+01	1.447+01	1.105+01
2295	4.36	8.492-01	1.162+01	2.092+01	2.000+01	1.817+01	1.510+01	1.211+01

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ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
K (PER CM AT STP)
4.3 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1500 K	1800 K	2400 K	3000 K
2300	4.35	1.896+00	1.550+01	2.209+01	2.042+01	1.858+01	1.574+01	1.317+01
2305	4.34	3.985+00	1.989+01	2.241+01	2.038+01	1.809+01	1.434+01	1.223+01
2310	4.33	7.844+00	2.482+01	2.329+01	2.092+01	1.849+01	1.474+01	1.129+01
2315	4.32	1.434+01	2.934+01	2.300+01	2.048+01	1.849+01	1.594+01	1.064+01
2320	4.31	2.407+01	3.349+01	2.327+01	2.072+01	1.815+01	1.384+01	9.987+00
2325	4.30	3.660+01	3.552+01	2.263+01	2.034+01	1.775+01	1.328+01	9.291+00
2330	4.29	4.955+01	3.616+01	2.262+01	2.039+01	1.766+01	1.271+01	8.595+00
2335	4.28	5.733+01	3.401+01	2.275+01	2.053+01	1.745+01	1.202+01	8.926+00
2340	4.27	5.428+01	2.931+01	2.238+01	2.116+01	1.785+01	1.308+01	9.257+00
2345	4.26	3.709+01	2.640+01	2.308+01	2.033+01	1.654+01	1.039+01	8.216+00
2350	4.26	1.138+01	2.082+01	2.282+01	2.028+01	1.680+01	1.113+01	7.175+00
2355	4.25	5.283+01	3.627+01	2.523+01	1.989+01	1.706+01	1.177+01	6.247+00
2360	4.24	7.796+01	4.701+01	2.620+01	2.047+01	1.556+01	9.080+00	5.319+00
2365	4.23	7.550+01	5.033+01	2.546+01	1.939+01	1.464+01	8.851+00	4.436+00
2370	4.22	5.149+01	4.548+01	2.319+01	1.699+01	1.223+01	6.507+00	3.553+00
2375	4.21	2.410+01	3.436+01	1.960+01	1.446+01	1.066+01	6.027+00	2.653+00
2380	4.20	7.111+00	2.096+01	1.508+01	1.089+01	8.962+00	3.566+00	1.753+00
2385	4.19	1.123+00	9.634+00	1.063+01	8.434+00	6.427+00	3.568+00	1.263+00
2390	4.18	6.789-02	2.886+00	5.809+00	4.217+00	3.314+00	1.585+00	7.741-01
2395	4.18	6.472-04	3.776-01	2.817+00-0.		2.496+00	1.502+00-0.	

ABSORPTION COEFFICIENTS OF C02

SQRT(4 X ALPHA X S/DXD) AT STP

4.3 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1800 K	2400 K	3000 K
1900	5.26	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.5970E 01
1910	5.23	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.6838E 01
1920	5.20	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.7770E 01
1930	5.18	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.8734E 01
1940	5.15	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.9659E 01
1950	5.12	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1071E 02
1960	5.10	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1199E 02
1970	5.07	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1350E 02
1980	5.05	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1538E 02
1990	5.02	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1754E 02
2000	5.00	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.5683E 01	.1906E 02
2010	4.97	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.6582E 01	.2137E 02
2020	4.95	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.7510E 01	.2270E 02
2030	4.92	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.8402E 01	.2366E 02
2040	4.90	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.9496E 01	.3066E 02
2050	4.87	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1076E 02	.2753E 02
2060	4.85	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1228E 02	.2774E 02
2070	4.83	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1414E 02	.2828E 02
2080	4.80	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1651E 02	.3938E 02
2090	4.78	.0000E 00	.0000E 00	.0000E 00	.0000E 00	.1759E 02	.3272E 02
2100	4.76	.0000E 00	.0000E 00	.0000E 00	.5194E 01	.1907E 02	.3238E 02
2110	4.73	.0000E 00	.0000E 00	.0000E 00	.6106E 01	.2015E 02	.3220E 02
2120	4.71	.0000E 00	.0000E 00	.0000E 00	.7002E 01	.2288E 02	.3745E 02
2130	4.69	.0000E 00	.0000E 00	.0000E 00	.7990E 01	.2317E 02	.3523E 02
2140	4.67	.0000E 00	.0000E 00	.0000E 00	.9202E 01	.2380E 02	.3417E 02
2150	4.65	.0000E 00	.0000E 00	.1338E 01	.1065E 02	.3027E 02	.4727E 02

ABSORPTION COEFFICIENTS OF CO2 (CONT.D)
SQRT(4 X ALPHA X S/DXD) AT STP
4.3 MICRON FUNDAMENTAL BAND

1/CM	MICRON	300 K	600 K	1200 K	1800 K	2400 K	3000 K
2160	4.62	.0000E 00	.0000E 00	.1808E 01	.1229E 02	.2632E 02	.3626E 02
2170	4.60	.0000E 00	.0000E 00	.2396E 01	.1381E 02	.2616E 02	.3404E 02
2180	4.58	.0000E 00	.0000E 00	.3102E 01	.1511E 02	.2607E 02	.3236E 02
2190	4.56	.0000E 00	.0000E 00	.3912E 01	.1707E 02	.3119E 02	.4551E 02
2200	4.54	.0000E 00	.4352E-01	.4765E 01	.1792E 02	.2684E 02	.3513E 02
2210	4.52	.0000E 00	.8462E-01	.5631E 01	.1855E 02	.2760E 02	.3192E 02
2220	4.50	.0000E 00	.1596E 00	.6654E 01	.1902E 02	.2636E 02	.2917E 02
2230	4.48	.0000E 00	.2910E 00	.7799E 01	.2063E 02	.2932E 02	.3377E 01
2240	4.46	.0000E 00	.5111E 00	.9013E 01	.2018E 02	.2641E 02	.2862E 02
2250	4.44	.7172E-02	.8599E 00	.1023E 02	.1973E 02	.2418E 02	.2503E 02
2260	4.42	.2312E-01	.1377E 01	.1125E 02	.2350E 02	.3368E 02	.3977E 01
2270	4.40	.6896E-01	.2084E 01	.1192E 02	.1925E 02	.2225E 02	.2236E 02
2280	4.38	.1882E 00	.2941E 01	.1236E 02	.1792E 02	.1928E 02	.1638E 02
2290	4.36	.4647E 00	.3771E 01	.1250E 02	.1651E 02	.1668E 02	.1521E 02
2300	4.34	.1018E 01	.4570E 01	.1307E 02	.1925E 02	.2214E 02	.2224E 02
2310	4.32	.1937E 01	.5406E 01	.1255E 02	.1604E 02	.1642E 02	.1519E 02
2320	4.31	.3064E 01	.6047E 01	.1175E 02	.1366E 02	.1299E 02	.1141E 02
2330	4.29	.3916E 01	.6282E 01	.1066E 02	.1130E 02	.1005E 02	.8410E 01
2340	4.27	.4019E 01	.6087E 01	.9964E 01	.1104E 02	.1039E 02	.9106E 01
2350	4.25	.2883E 01	.5477E 01	.8262E 01	.8162E 01	.7041E 01	.5804E 01
2360	4.23	.5110E 01	.5912E 01	.6719E 01	.5795E 01	.4580E 01	.3560E 01
2370	4.21	.3784E 01	.4594E 01	.4666E 01	.3679E 01	.2735E 01	.2039E 01
2380	4.20	.1410E 01	.2615E 01	.2528E 01	.1756E 01	.1190E 01	.8297E 00
2390	4.18	.1595E 00	.8748E 00	.1045E 01	.7246E 00	.4829E 00	.3334E 00

APPENDIX J

Scattering Function

This section will attempt to present and explain the results of a study to determine the proper form of the scattering function to be used in Hide.

Most references on the subject give the form of the scattering function to be:

$$T_s = \text{EXP}\ (-AR\ \lambda^{-B})$$

where:

λ is wavelength in microns

A & B are constants dependent on meterological conditions such as visual range and scattering particle size and concentration.

R is range.

Rayleigh scattering occurs when the particle size is much smaller than the radiation wavelength, and B=4. When B=2, the particle size equals the wavelength and is called mie scattering. Finally non selective scattering occurs for large particles when B=0. Since the size distribution for the important scattering particles lie in the infrared, i.e. Haze and fog are distributed around 3-5 μ and cumulus water droplets range from about 1-15 μ, this becomes a formidable problem and can only be solved exactly by knowing the conditions on a given day over the entire path. These conditions are hardly ever known so one must use what he believes to be a typical real atmosphere, derive the scattering function and hope the ensuing errors for a given day are minimal. This then was the approach used in the Hide model, that is an "exact" scattering function was derived for each of several real atmospheres and the average values of the resulting A's and B's were used to define the "typical atmosphere".

The "Hide" real atmosphere was defined by Yates & Taylor in their work for N.R.L. in Washington, D.C. This project concerned itself with making accurate measurements of transmission over varied weather conditions. Data was then taken by Westinghouse off these curves at selected wavelengths falling within each of the eight major windows. This information was then fed into a computer program which upon dividing by the Wyatt Plass and Struel transmission was able to come up with a value of scattering at each wavelength. These scattering values were then used to perform a least squares curve fit to the function:

$$T_s = EXP(-AR\lambda^{-B})$$

The results of this exercise are shown in figure 1. The meterological conditions under which Yates and Taylor recorded their measurements for each plate are given therein as:

RM = range in KM

RV = visual range in KM

Temp = ambient temp (^{o}F)

RH = relative humidity

The data shown under the column headings "WV", "Trans", "SCAT" are the wavelength at which the data was transcribed, the transmission read off the curves, and the calculated value of scattering respectively. A and B are given as the results of a curve fit to the presumed scattering function:

$$T_s = EXP(-AR\lambda^{-B}),$$

and the error shown is the sum of the squares of the difference between the actual and calculated values of scattering. An attempt was then

carried out to determine whether or not A & B were corallated to temperature, relative humidity, absolute humidity, and visual range but no significant results were obtained. More data and a rigorous statistical analysis possibly would show some relationship but time did not allow and it is recommended that this be done in the future.

The average value of B is approximately 1 which determines the wavelength dependence of the scattering function. Since the value of A depends on B it would not be fitting to use an average value of A as typical. Instead since at .55 μ all the transmission is considered to be due to scattering and is related to visual range, a known quantity is a given day, A was adjusted to given an exact fit at this wavelength.

Hence the scattering function used in the Hide model is

$$T_s = \mathrm{EXP}(-A\lambda^{-1})$$

where A = f (visual range).

The Yates and Taylor data is shown in Appendix D with the Hide transmission plotted in a heavy line over it for comparison. The top figure on each page is the optimum scattering function using the individual A & B's of figure 1 whereas the bottom figure is plotted with the Hide transmission. Using this as an error measure the Hide general function works fairly good.

PLATE NO. 5 P=5.5

QUANTITIES	2.20000	176.0000	1.54000	.16900	.50300
T55 = .400	RM =	5.5000	23.462	T=0 =	38.000 RH = 66.000
		SOLT			
	TRANS				
.5500	.4000				
1.0500	.5500	.5334			
1.2500	.6900	.6044			
1.4500	.6790	.6855			
2.2500	.8700	.7221	A = .1026	B = .9020	Error = 044
3.0400	.8900	.8777			
4.0000	.8800	1.0000			
8.3300	1.0300	1.0000			

PLATE NO. P P=16.25

QUANTITIES	6.78000	220.5000	4.55000	.40800	.50100
T55 = .400	RM =	16.500	RM =	51.754	T=0 = 57.000 RH = 41.000
		SOLT			
	TRANS				
.5500	.2400	.2984			
1.0500	.5600	.5000			
1.2500	.6300	.6017			
1.4500	.6700	.6600			
2.2500	.8400	.7182	A = .0420	B = .9982	Error = 0289
3.0400	.8900	.8131			
4.0000	.8300	1.0000			
8.3300	.8500	.8780			

PLATE NO. P P=16.25

QUANTITIES	27.00000	220.5000	4.55000	.49800	2.15200
T55 = .400	RM =	16.500	RM =	16.250	T=0 = 87.000 RH = 59.000
		SOLT			
	TRANS				
.5500	.2400	.2984			
1.0500	.5600	.5000			
1.2500	.6300	.6017			
1.4500	.6700	.6600			
2.2500	.8400	1.0000			
3.0400	.8900	1.0000	A = .096	B = 1.610	Error = .7841
4.0000	.8300	1.0000			
8.3300	.8500	1.0000			

Fig. 1

```
PLATE NO. 6   R=5.0                    1.54000                .16900                .10600
QUANTITIES    4.13000   +76.00000      50.3324   TEMP =    64.000  RH =          51.000
TOS =  .790   RT =      SCAT
          RT      TRANS
        .5500     .7000
       1.0550     .7000
       1.2550     .7200
       1.6500     .7400
       2.2500     .8300     A = .0476     B = .8390     Error = .0524
       3.8400     .9200
       4.6000     .8400
       8.8300     .9300

PLATE NO. 8   R=16.25               4.55000                .49600                .46400
QUANTITIES    15.10000   320.10000   75.723   TEMP =    68.000  RH =          43.000
TOS =  .430   RT =      SCAT
          RT      TRANS
        .5500     .4300
       1.0550     .5600     .5647
       1.2550     .5500     .5745
       1.6500     .5900     .7127
       2.2500     .7300     1.0000
       3.8400     .7200     1.0000
       4.6000     .3700     1.0000     A = .0298     B = 1.078     Error = .1168
       8.8300     .6700     1.0000

PLATE NO. 10  R=27.7                 3.62000                .84900                .49000
QUANTITIES    10.50000   +13.70000   121.537   TEMP =      .000  RH =          .000
TOS =  .410   RT =      SCAT
          RT      TRANS
        .5500     .4100
       1.0550     .4100     .4175
       1.2550     .4100     .4227
       1.6500     .4300     .5517
       2.2500     .4500     .7922
       3.8400     .5400     .7612     A = .0258     B = .4750     Error = .3220
       4.6000     .3200     1.0000
       8.8300     .3300     .5653
```

Fig 1 (cont.)

PLATE NO. 9 R=27.7 10 KM ALTITUDE
QUANTITIES 20.00000 413.70000 3.62000 .84900 .73000
TO5 = .265 RM = 27.700 RV = 81.597 TEMP = 43.000 RH = 100.000

WV	TRANS	SCAT
.5500	.2650	.2650
1.0550	.3900	.4040
1.2500	.3100	.3284
1.6900	.5400	.6860
2.2800	.4300	.9045
3.8400	.5500	.8386
4.6000	.2700	1.0000
8.8300	.2600	.7279

A = .0300 B = 9146 Error = .4069

PLATE NO. 7 R=16.25
QUANTITIES 27.70000 520.00000 4.55000 .49800 1.27000
TO5 = .100 RM = 16.250 RV = 27.608 TEMP = 74.000 RH = 82.000

WV	TRANS	SCAT
.5500	.1000	.1000
1.0550	.3700	.3888
1.2500	.4100	.4438
1.6900	.4300	.5890
2.2300	.4000	1.0000
3.8400	.5100	.8134
4.6000	.2900	1.0000
8.8000	.1200	.4082

A = .0600 B = 1.436 Error = .8494

PLATE NO. 7 R=5.5
QUANTITIES 9.40000 176.00000 1.54000 .16900 .66200
TO5 = .300 RM = 5.500 RV = 17.871 TEMP = 78.000 RH = 73.000

WV	TRANS	SCAT
.5500	.3000	.3000
1.0550	.5300	.5894
1.2500	.6600	.6784
1.6900	.7200	.8174
2.2800	.8000	1.0000
3.8400	.9100	1.0000
4.6000	.5600	1.0000
8.8300	.3200	1.0000

A = .0881 B = 1.558 Error = .034

Fig. 1 (cont)

PLATE NO. 4755 B=5.5 1.54000 .16900 .46800

QUANTITIES 1.37000 175.00000 24.802 TEMP = 34.500 RH = 47.000

T55 = .4200 RV = 5.5500

MV	TRANS	SCAT
.5500	.4200	
1.0550	.5500	.5712
1.2500	.5600	.5824
1.6900	.6500	.6660
2.2300	.8200	.8524
3.3400	.8000	.8694
4.6000	.7600	1.0000
8.8800	.8500	1.0000

A = .0993 B = .9174 Error = .0672

PLATE NO. 4753 P=10.25 4.55000 .49800 .88000

QUANTITIES 5.20000 520.00000 39.498 TEMP = 40.500 RH = 48.000

T55 = .2000 RV = 16.250

MV	TRANS	SCAT
.5500	.2000	
1.0550	.2500	.2522
1.2500	.3300	.3960
1.6900	.4200	.4661
2.2300	.4000	.4804
3.3400	.6000	.7333
4.6000	.4500	1.0000
8.8800	.5000	.7824

A = .0680 B = .7613 Error = .2671

Fig. 1 (cont.)