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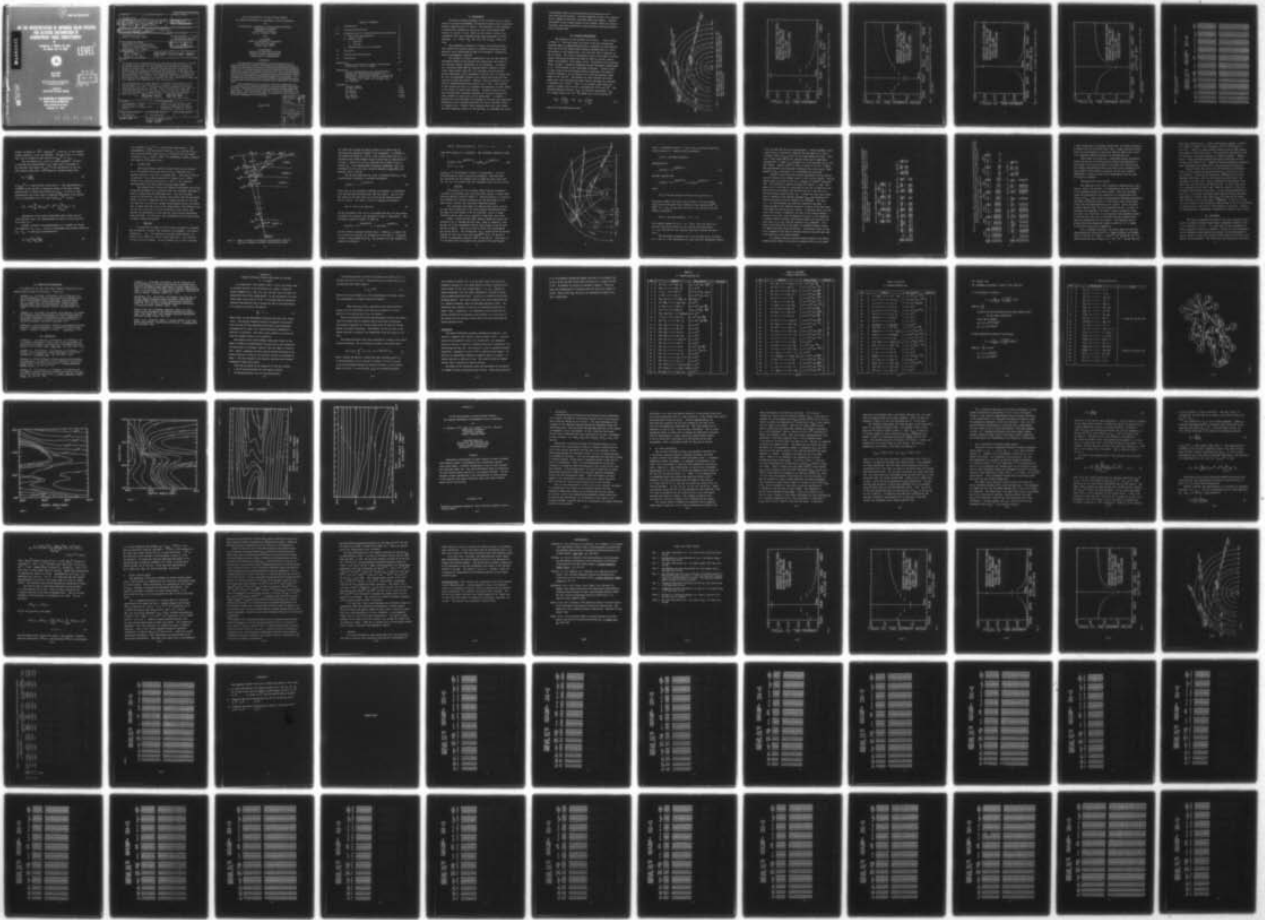
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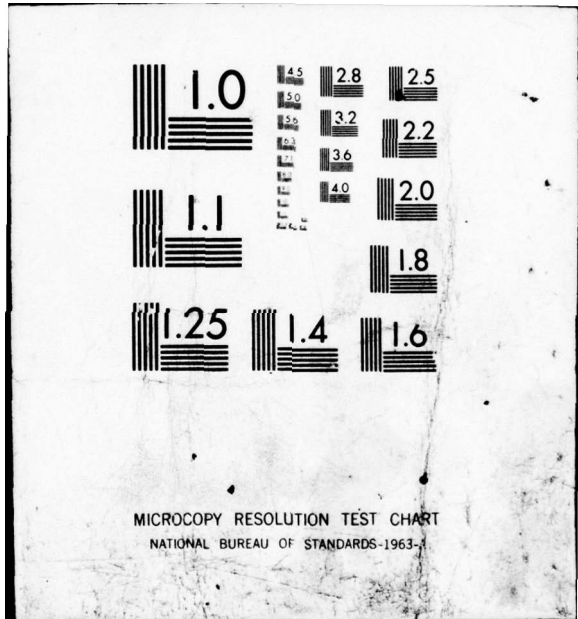
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ON THE INTERPRETATION OF INFRARED SOLAR SPECTRA FOR ALTITUDE DISTRIBUTION OF ATMOSPHERIC TRACE CONSTITUENTS FAA-EE-78-30

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ON THE INTERPRETATION OF INFRARED SOLAR SPECTRA FOR ALTITUDE DISTRIBUTION OF ATMOSPHERIC TRACE CONSTITUENTS

By

D.G. Murcay, A. Goldman, G.R. Cook,
D.K. Rolens, and L.R. Mogil

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On the Interpretation of Infrared Solar Spectra
for Altitude Distribution of Atmospheric Trace Constituents

by

D. G. Murcray, A. Goldman, G. R. Cook and D. K. Rolens
Department of Physics
University of Denver
Denver, Colorado 80208

and

L. R. Megill
Center for Research in Aeronomy
Utah State University
Logan, Utah 84322

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ABSTRACT

The quantitative interpretation of infrared sunset spectra in terms of mixing ratio profiles of atmospheric constituents requires a detailed consideration of the airmass and pressure distribution along the sunset ray. A computer program has been developed for determining the airmass and pressure distribution along this ray. Since infrared absorptions are pressure-dependent, a technique has been developed for treating this pressure dependence in analyzing absorption over such paths. The technique uses an approximation which maintains computational accuracy for such paths while reducing the computer time required for the calculations.

The interpretation of such spectra is further complicated if the concentration of the constituent of interest varies with solar zenith angle (e.g. NO). Calculations were performed using time-varying profiles for NO and NO₂. These calculations show that, if this time variability is not taken into account, the inferred profiles are greatly in error in the case of NO and marginally in error for NO₂.

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I. Introduction

A powerful infrared technique for the detection of trace constituents is to observe atmospheric transmission spectra from an airborne platform using the sun as a source. The sensitivity of the technique is enhanced by obtaining the spectra at solar zenith angles $>90^\circ$ (sunrise or sunset). In fact, within the last decade, several trace constituents have been measured in the lower stratosphere by this technique: i. e., HNO_3 , NO_2 , NO , HCl , HF , CF_2Cl_2 , CFCl_3 and CCl_4 .

The quantitative derivation of mixing ratio altitude profiles from sunset solar spectra requires a detailed consideration of the geometry of the optical path through the atmosphere, including the effect of atmospheric refraction.

The problem is further complicated by the fact that infrared absorptions depend on the pressure and temperature environment of the molecular species responsible for the absorption. In addition, when obtaining profile data by analyzing spectra obtained at solar zenith angles greater than 90° , it is generally assumed that the altitude distribution of the constituent of interest does not change with the time and geographic location of the optical path during the time required to obtain the spectra. However, these assumptions are not valid for photochemically-active species (e. g., NO). The objective of this program has been to investigate the importance of these effects in the analysis of sunset solar spectra. Computer programs have been developed that accurately determine the airmass traversed by solar radiation in each portion of the optical path. In addition, a technique has been developed for including the pressure and temperature dependences of the absorption that does not use an excessive amount of computer time. Finally, these programs have been used, along with time-dependent profiles for NO and NO_2 , to investigate the errors

in the profiles which are introduced when time dependence is not a part of the spectral analysis. The time-dependent profiles were supplied by Dr. Megill of Utah State University under sub-contract. Detailed discussions of the various aspects of the problem, which are summarized here, have been presented in reports issued during the program, and are listed below.

II. Airmass Distributions

The geometry for the problem of low sunset data is shown in Figure 1. The major point of interest is that the concentration along the path of a photochemically-active constituent is quite different from the sun to the tangent point (minimum altitude) than it is from the platform to the tangent point, since the solar flux is different on the two sides. The airmass distribution along a sunset path is derived using a ray-tracing program described in detail in previous reports [Snider and Goldman, 1975; Snider, 1975]. Calculations were performed using, as input, a standard midlatitude summer atmosphere [McClatchey et al., 1972] and $5\mu\text{m}$ as the wavelength of interest. Typical results of such airmass and accumulated airmass calculations are shown in Figures 2 through 5, for an observer at 30 km and apparent zenith angles of 92° and 94° . Calculations for other altitudes and zenith angles were also performed and these figures and tables are included in Goldman et al. [1977]. Table I is an example which shows the results in tabular form of such a calculation for 30 km and 94° . The tabulated effective pressure, P_{eff} , and effective temperature, T_{eff} , are average values over the 1 km shells used in the program as

$$P_{\text{eff}} = \frac{\int P dm}{\int dm} \quad \text{and} \quad T_{\text{eff}} = \frac{\int T dm}{\int dm} \quad (1)$$

where dm is the differential airmass.

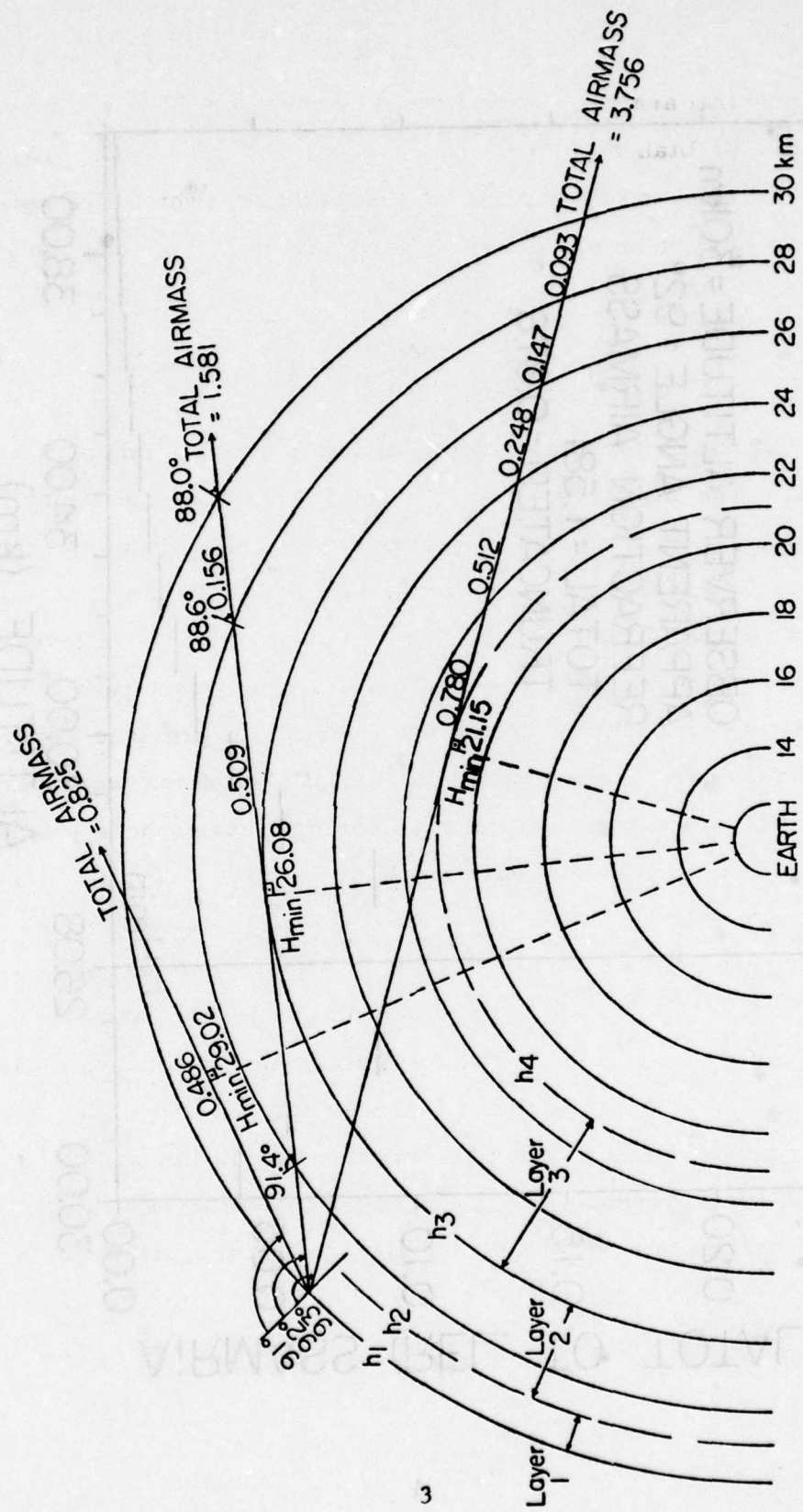


Fig. 1. Ray Geometry and airmass values for 2 km shells along 91°, 92° and 93° paths from 30 km. Only one-half of the symmetrical air-mass distribution is shown. The minimum altitudes define the layers for the inversion.

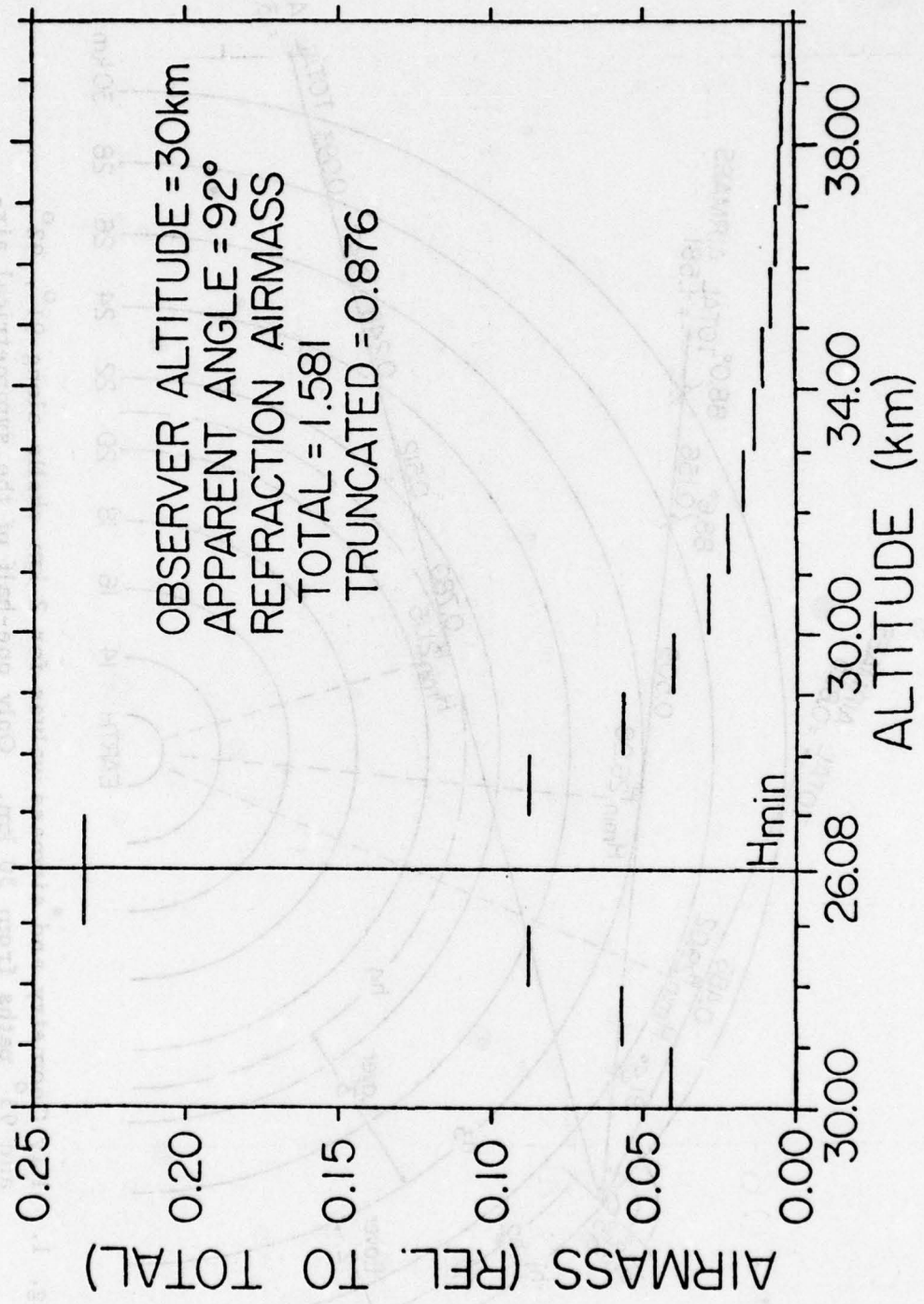


Fig. 2. Airmass distribution for 1 km shells along a 92° path from 30 km.

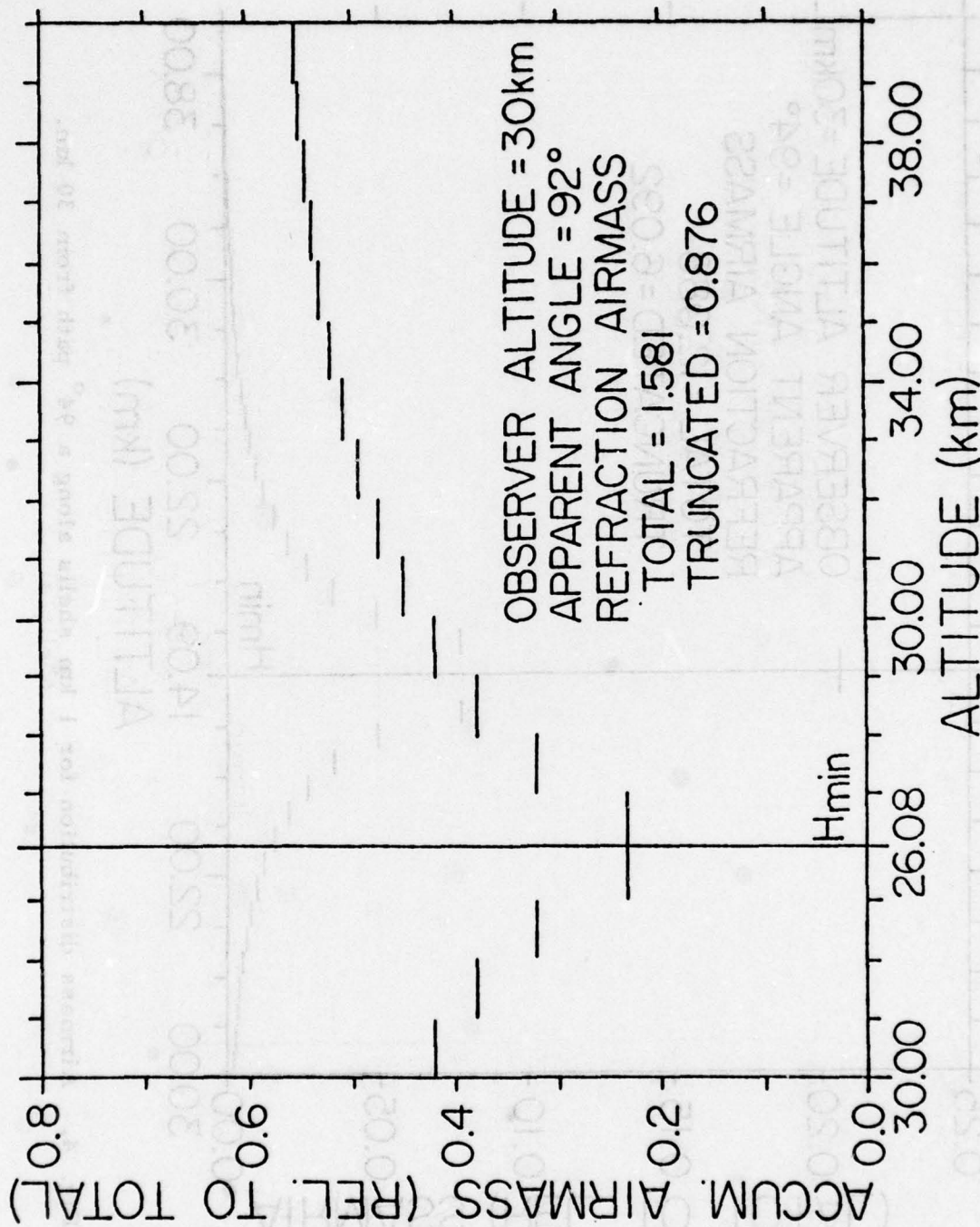


Fig. 3. Accumulated airmass distribution over 1 km shells along a 92° path from 30 km.

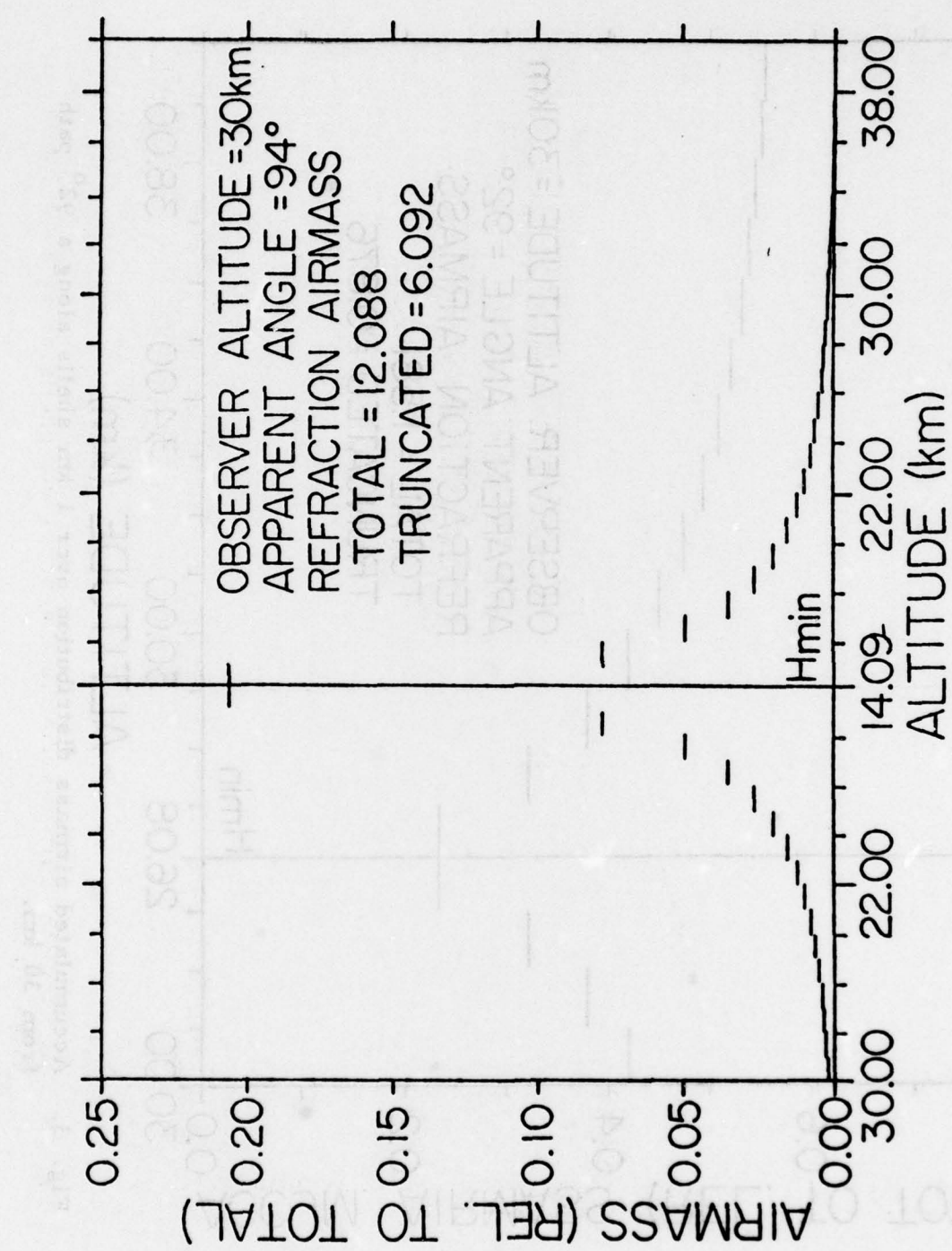


Fig. 4. Airmass distribution for 1 km shells along a 94° path from 30 km.

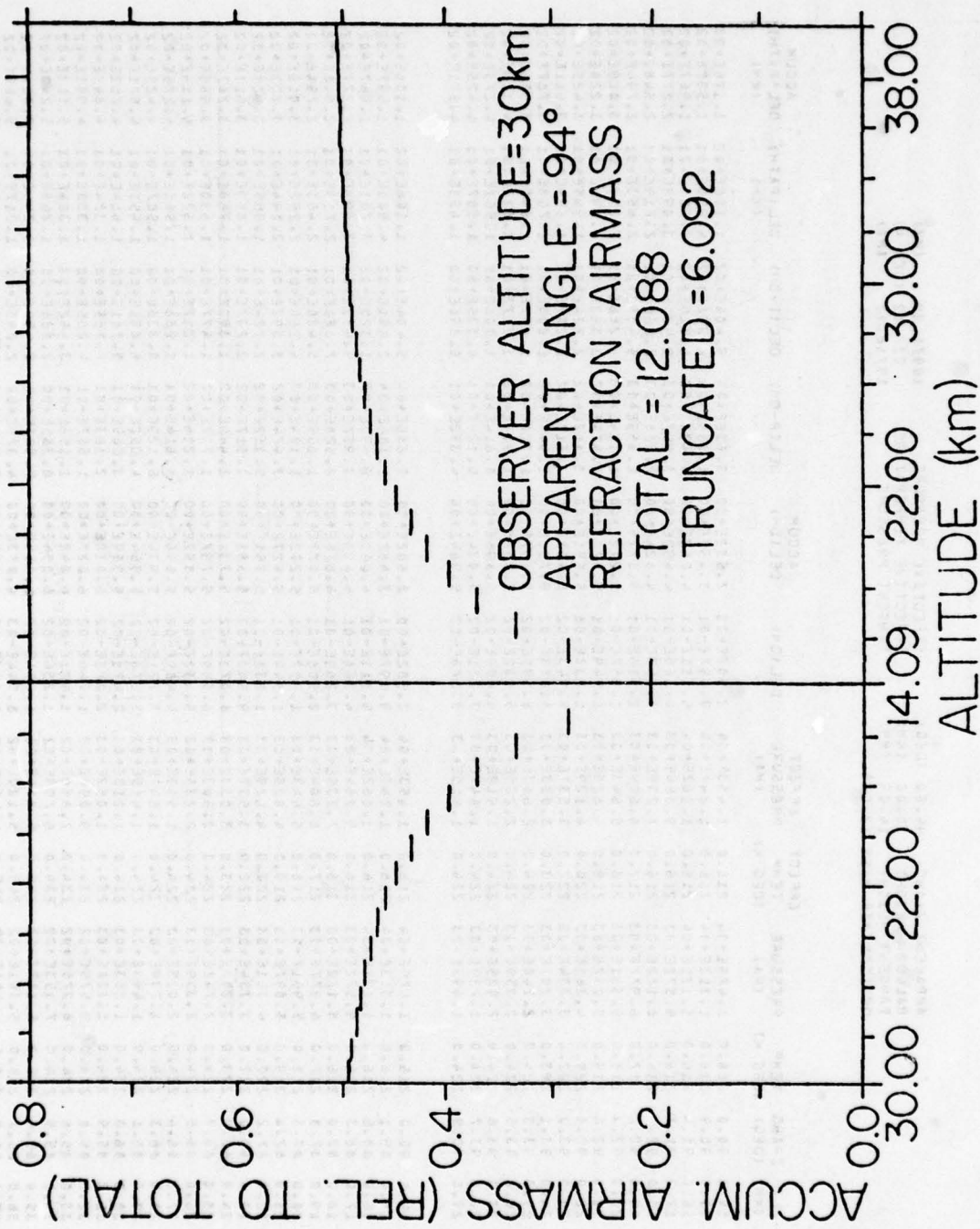


Fig. 5. Accumulated air mass distribution for 1 km shells along a 94° path from 30 km.

Table I. Airmass distributions for an observer altitude of 30 km and an apparent zenith angle of 94°.

ALT (KM)	Z-ANG (DEG K)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (D4)	ACCUM		DEL (P-04)	DEL (T-04)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
							DEL (D4)	DEL (D4)				
14.1	30.0	216.0	1.479E+04	216.0	1.453E+04	2.502E+00	2.502E+00	3.636E+04	5.404E+02	1.106E+02	1.186E+02	
15.0	30.9	216.0	1.313E+04	216.0	1.247E+04	9.497E-01	3.452E+00	1.184E+04	2.051E+02	4.900E+01	1.597E+02	
16.0	31.4	216.0	1.121E+04	216.0	1.062E+04	5.111E-01	4.063E+00	6.493E+03	1.320E+02	3.701E+01	1.957E+02	
17.0	31.7	216.0	9.572E+03	216.0	9.064E+03	4.316E-01	4.499E+00	3.957E+03	9.430E+01	3.099E+01	2.277E+02	
18.0	32.0	216.0	8.172E+03	216.0	7.735E+03	3.269E-01	4.826E+00	2.528E+03	7.010E+01	2.719E+01	2.540E+02	
19.0	32.2	217.0	6.977E+03	217.0	6.604E+03	2.506E-01	5.377E+00	1.855E+03	5.438E+01	2.453E+01	2.794E+02	
20.0	32.4	218.0	5.961E+03	218.0	5.643E+03	1.957E-01	5.272E+00	1.104E+03	4.266E+01	2.252E+01	3.019E+02	
21.0	32.6	219.0	5.097E+03	219.0	4.825E+03	1.549E-01	5.272E+00	7.474E+02	3.352E+01	2.094E+01	3.288E+02	
22.0	32.8	220.0	4.361E+03	220.0	4.129E+03	1.238E-01	5.551E+00	5.112E+02	2.724E+01	1.965E+01	3.425E+02	
23.0	33.0	222.0	3.734E+03	222.0	3.537E+03	9.943E-02	5.651E+00	3.317E+02	2.827E+01	1.859E+01	3.611E+02	
24.0	33.1	223.0	3.202E+03	223.0	3.033E+03	8.073E-02	5.731E+00	2.449E+02	1.800E+01	1.768E+01	3.787E+02	
25.0	33.3	224.0	2.748E+03	224.0	2.603E+03	6.595E-02	5.797E+00	1.717E+02	1.477E+01	1.690E+01	3.956E+02	
26.0	33.5	224.0	2.359E+03	224.0	2.235E+03	5.432E-02	5.852E+00	1.214E+02	1.217E+01	1.622E+01	4.119E+02	
27.0	33.6	224.0	2.025E+03	224.0	1.919E+03	4.469E-02	5.896E+00	8.614E+01	1.006E+01	1.561E+01	4.275E+02	
28.0	33.7	224.0	1.739E+03	224.0	1.647E+03	3.721E-02	5.934E+00	6.129E+01	8.335E+00	1.507E+01	4.425E+02	
29.0	33.9	224.0	1.493E+03	224.0	1.415E+03	3.076E-02	5.964E+00	4.352E+01	6.491E+00	1.451E+01	4.571E+02	
14.1	90.0	216.0	1.479E+04	216.0	1.453E+04	2.502E+00	2.502E+00	3.636E+04	5.404E+02	1.106E+02	1.186E+02	
15.0	89.1	216.0	1.313E+04	216.0	1.247E+04	9.497E-01	3.452E+00	1.184E+04	2.051E+02	4.900E+01	1.597E+02	
16.0	88.6	216.0	1.121E+04	216.0	1.062E+04	5.111E-01	4.063E+00	6.493E+03	1.320E+02	3.701E+01	1.957E+02	
17.0	88.3	216.0	9.572E+03	216.0	9.064E+03	4.316E-01	4.499E+00	3.957E+03	9.430E+01	3.099E+01	2.277E+02	
18.0	88.0	216.0	8.172E+03	216.0	7.735E+03	3.269E-01	4.826E+00	2.528E+03	7.010E+01	2.719E+01	2.540E+02	
19.0	87.8	217.0	6.977E+03	217.0	6.604E+03	2.506E-01	5.377E+00	1.855E+03	5.438E+01	2.453E+01	2.794E+02	
20.0	87.6	218.0	5.961E+03	218.0	5.643E+03	1.957E-01	5.272E+00	1.104E+03	4.266E+01	2.252E+01	3.019E+02	
21.0	87.4	219.0	5.097E+03	219.0	4.825E+03	1.549E-01	5.272E+00	7.474E+02	3.352E+01	2.094E+01	3.288E+02	
22.0	87.2	220.0	4.361E+03	220.0	4.129E+03	1.238E-01	5.551E+00	5.112E+02	2.724E+01	1.965E+01	3.425E+02	
23.0	87.3	222.0	3.734E+03	222.0	3.537E+03	9.943E-02	5.651E+00	3.317E+02	2.827E+01	1.859E+01	3.611E+02	
24.0	86.9	223.0	3.202E+03	223.0	3.033E+03	8.073E-02	5.731E+00	2.449E+02	1.800E+01	1.768E+01	3.787E+02	
25.0	86.7	224.0	2.748E+03	224.0	2.603E+03	6.595E-02	5.797E+00	1.717E+02	1.477E+01	1.690E+01	3.956E+02	
26.0	86.5	224.0	2.359E+03	224.0	2.235E+03	5.432E-02	5.852E+00	1.214E+02	1.217E+01	1.622E+01	4.119E+02	
27.0	86.4	224.0	2.025E+03	224.0	1.919E+03	4.469E-02	5.896E+00	8.614E+01	1.006E+01	1.561E+01	4.275E+02	
28.0	86.3	224.0	1.739E+03	224.0	1.647E+03	3.721E-02	5.934E+00	6.129E+01	8.335E+00	1.507E+01	4.425E+02	
29.0	86.1	224.0	1.493E+03	224.0	1.415E+03	3.076E-02	5.964E+00	4.352E+01	6.491E+00	1.451E+01	4.571E+02	
30.0	86.0	224.0	1.283E+03	224.0	1.218E+03	2.471E-02	5.969E+00	3.009E+01	5.781E+00	1.414E+01	4.712E+02	
31.0	85.9	224.0	1.108E+03	224.0	1.052E+03	2.075E-02	6.010E+00	2.183E+01	4.855E+00	1.374E+01	4.849E+02	
32.0	85.8	224.0	9.579E+02	224.0	9.094E+02	1.746E-02	6.027E+00	1.587E+01	4.085E+00	1.330E+01	4.983E+02	
33.0	85.8	224.0	8.278E+02	224.0	7.858E+02	1.471E-02	6.042E+00	1.156E+01	3.442E+00	1.304E+01	5.113E+02	
34.0	85.6	224.0	7.153E+02	224.0	6.793E+02	1.234E-02	6.054E+00	8.385E+00	2.828E+00	1.266E+01	5.248E+02	
35.0	85.6	224.0	6.187E+02	224.0	5.866E+02	1.004E-02	6.064E+00	5.987E+00	2.459E+00	1.244E+01	5.364E+02	
36.0	85.3	245.0	5.381E+02	245.0	5.120E+02	8.544E-03	6.073E+00	4.375E+00	2.093E+00	1.217E+01	5.486E+02	
37.0	85.2	245.0	4.661E+02	245.0	4.454E+02	7.282E-03	6.080E+00	3.243E+00	1.784E+00	1.193E+01	5.605E+02	
38.0	85.1	245.0	4.072E+02	245.0	3.874E+02	6.212E-03	6.080E+00	2.406E+00	1.522E+00	1.170E+01	5.722E+02	
39.0	85.0	245.0	3.542E+02	245.0	3.371E+02	5.272E-03	6.092E+00	1.777E+00	1.252E+00	1.144E+01	5.837E+02	

The integrands for these experiments are given in the tables as DEL(P-DM) and DEL(T-DM) and the airmass increments are listed as DEL(DM). The values are given for the two sides of the path: from the tangent point to the observer and from the tangent point toward the sun. The angle given is the zenith angle at the intersection of the path and the boundary of the shell. Finally, the geometrical path and airmass are given as ACCUM DEL(PATH) and ACCUM DEL(DM).

III. Interpretation of Infrared Sunset Solar Spectra

A. Weak line approximation

Denote the observed integrated absorption at different apparent zenith angles z_1, z_2, \dots , by A_1, A_2, \dots , for a given observer altitude, h_1 . Without a loss of generality, assume that h_1 is an integer km altitude. For simplicity of the discussion, the weak line approximation is assumed, so that the integrated absorption, A , is given by $A(\text{cm}^{-1}) = S(\text{cm}^{-1}/\text{molecule cm}^{-2}) U (\text{molecule}/\text{cm}^2)$, where S is the integrated line intensity and U is the absorber amount. The airmass distribution tables [Table I here and those in Goldman et al., 1977] give atmospheric amounts U as MU_0 where M is the tabulated airmass, and $U_0 = 1 \text{ airmass} = 2.153 \times 10^{25} \text{ molecule}/\text{cm}^2$. Trace constituent amounts are described by βU where β is the gas volume mixing ratio.

The tables are used for a layer-by-layer derivation of a minor constituent altitude profile in the following way. The atmosphere is divided into even 1 km shells, although Figure 1 shows 2 km shells for graphic simplicity. The 1 km shells listed in the tables can be accumulated over two or more km as required. Starting with the first path and $z_1 > 90^\circ$ (required to observe the weak absorption of the trace constituent), a constant mixing ratio, β_1 , can be derived

for the atmosphere above $H_{\min}^{(1)}$ of the path according to

$$\beta_1 = \frac{A_1}{SU_o M_1} \quad (2)$$

where M_1 is the total airmass along path 1. This β_1 will be considered as the mixing ratio for layer 1, between h_1 and h_2 , as well as for the residual atmosphere above h_1 in the sun direction. It should be noted that H_{\min} can obviously fall between the even km boundaries, so that h_2 will be the same altitude as H_{\min} or the next nearest even km below it. Subsequent inner layer boundaries are defined by the minimum altitudes of the corresponding zenith angles, z_1 , so that a layer can include more than 1 shell with increasing zenith angle. For example, with the observer at 30 km, the layer defined by $z = 92^\circ$ and $z = 93^\circ$ includes five 1 km shells. This is shown as Layer 3 on Figure 1.

A mixing altitude profile is then derived by the successive equations:

$$\beta_n = \frac{A_n - 2SU_o \sum_{k=1}^{n-1} \beta_k M_{k,k+1}^{(n)} - \Delta^{(n)}}{SU_o M_{n,n+1}^{(n)}}, \quad n=2, 3, \dots \quad (3)$$

Here, β_n is the constant mixing ratio for the layer defined by $H_{\min}^{(n)}$ to h_{n-1} , the even km boundary below $H_{\min}^{(n-1)}$. $M_{k,k+1}^{(n)}$ is the portion of the airmass between altitudes h_k and h_{k+1} for path n. The upper index n denotes the different paths for a given observer altitude. The $M_{k,k+1}^{(n)}$ values are those tabulated in the airmass distribution tables every 1 km, accumulated over the proper layers. In Eq. (3) the summation in the numerator represents the correction to A_n due to the absorptions in the outer layers, as each one is crossed twice. A

smaller correction is $\Delta^{(n)} = \beta_1 SU_0 M_r^{(n)}$, where M_r is the residual air mass outside h_1 in the sun direction. The inner layer n is crossed once, but its air mass is twice that from $H_{\min}^{(n)}$ to h_{n-1} .

The corrections to A_n are by no means negligible. However, a commonly used approximation is to neglect these corrections in the numerator and replace $M_{n,n+1}^{(n)}$ in the denominator by M_n , the total air mass along path n , and assign the resulting mixing ratio,

$$\beta_n \approx \frac{A_n}{SU_0 M_n} \quad (4)$$

to $H_{\min}^{(n)}$ or a small altitude range above it. This approximation is motivated by the fact that a significant portion of the total air mass along the path is indeed concentrated near H_{\min} . It can be a good approximation only if the effect of neglected corrections in the numerator are compensated for by the ratio $M_n/M_{n,n+1}^{(n)}$ so that

$$\left(A_n - 2SU_0 \sum_{k=1}^{n-1} \beta_k M_{k,k+1}^{(n)} - \Delta^{(n)} \right) \frac{M_n}{M_{n,n+1}^{(n)}} \approx A_n .$$

Examination of the air mass distribution tables shows that for many practical cases, this approximation can lead to errors from 5% to a factor of 5.

Another commonly used approximation is to consider the absorption difference, $A_n - A_{n-1}$, and the corresponding total air mass difference, $M_n - M_{n-1}$, so that β_n is approximated by

$$\beta_n \approx \frac{A_n - A_{n-1}}{(M_n - M_{n-1})SU_0} \quad (5)$$

and assigned to $H_{\min}^{(n)}$ as in the previous approximation. This approximation can be quite good if both $A_n \gg A_{n-1}$ and $M_n \gg M_{n-1}$, but in many practical cases $A_n \approx A_{n-1}$ and M_n is not very large compared to M_{n-1} , unless $z \geq 94^\circ$. A combination of these conditions can result in a very large error.

B. General Case

The layer-by-layer method described above can be extended to a more general line-by-line layer-by-layer calculation over a spectral interval of non-weak overlapping lines. This can be done by an extension of the method presented by Goldman et al. [1973a; 1973b], to be referred to hereafter as I and II. The extension presented here is for both small and large zenith angles.

The mixing ratio is derived by fitting the theoretical line-by-line integrated absorption to the measured value for successive atmospheric layers, starting from the uppermost layer. For each ray path, except for the first one, the equations used involve only two successive layers, but with an adjustment for the changing direction of the path. For high sun, as occurs for example during balloon ascent, the adjustment is based upon the secant of the zenith angles of the different rays. For low sun, as occurs in sunset observations from balloon float altitude, the adjustment is based upon the actual air mass distribution along each path. In both cases, the contribution from all layers along the path is taken into account.

1. High Sun

The geometry for high sun data is shown in Figure 6, assuming that atmospheric curvature and refraction are negligible. The balloon altitude H_1, \dots, H_N , corresponding to specific measurements, are shown on one radial line, and the zenith angles $\theta_1, \dots, \theta_N$ increase (in this case) with altitude. At each altitude, H_n , a ray n intersects

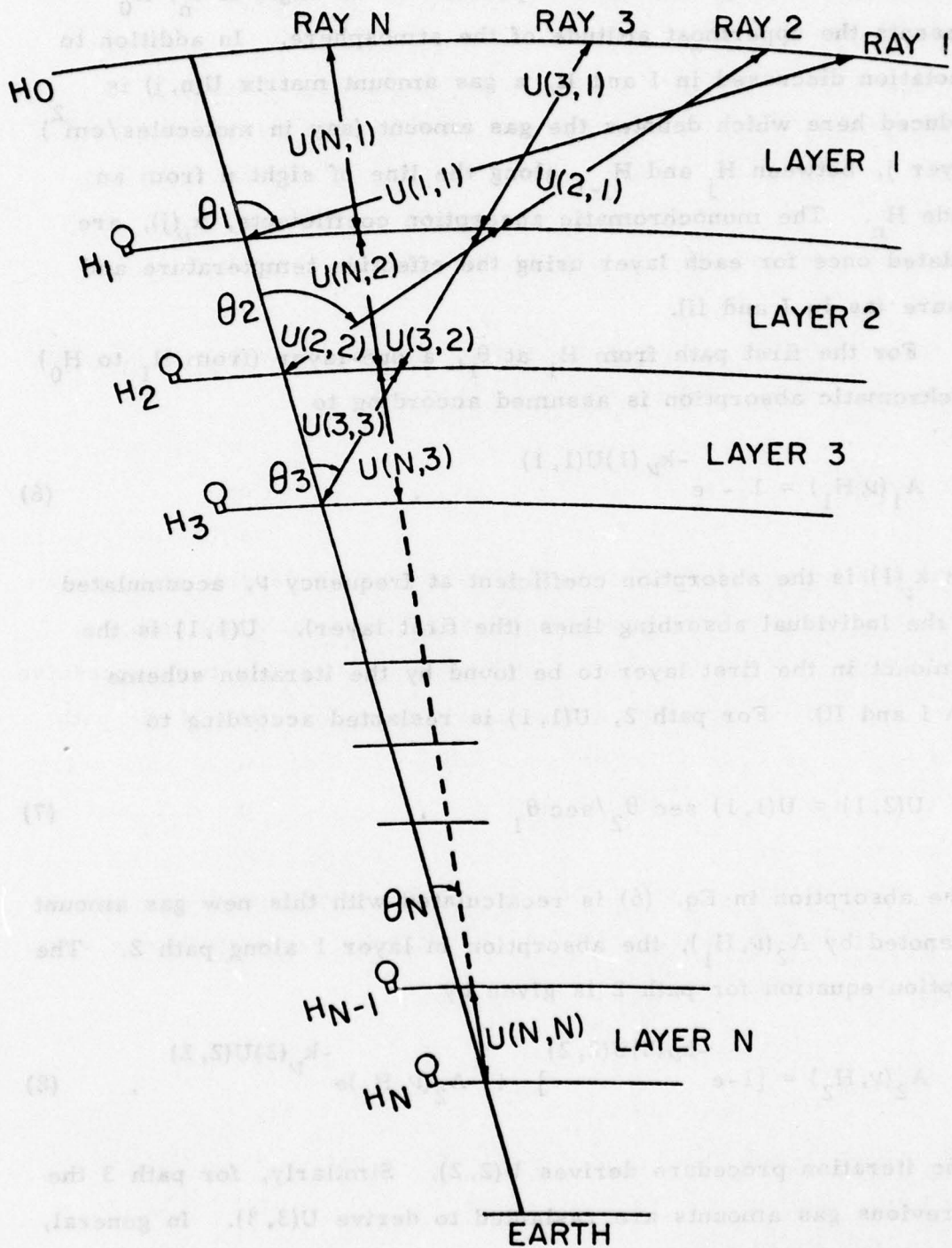


Fig. 6. Solar ray paths for absorption measurements made for high sun at different altitudes during balloon ascent.

the radial line through the balloon position at an angle of θ_n ; H_0 represents the uppermost altitude of the atmosphere. In addition to the notation discussed in I and II, a gas amount matrix $U(n, j)$ is introduced here which denotes the gas amount (say in molecules/cm²) in layer j , between H_j and H_{j-1} along the line of sight n from an altitude H_n . The monochromatic absorption coefficients, $k_\nu(j)$, are calculated once for each layer using the effective temperature and pressure (as in I and II).

For the first path from H_1 at θ_1 , a one-layer (from H_1 to H_0) monochromatic absorption is assumed according to

$$A_1(\nu, H_1) = 1 - e^{-k_\nu(1)U(1,1)}, \quad (6)$$

where $k_\nu(1)$ is the absorption coefficient at frequency ν , accumulated from the individual absorbing lines (the first layer). $U(1,1)$ is the gas amount in the first layer to be found by the iteration scheme (as in I and II). For path 2, $U(1,1)$ is reslanted according to

$$U(2,1) = U(1,1) \sec \theta_2 / \sec \theta_1, \quad (7)$$

and the absorption in Eq. (6) is recalculated with this new gas amount and denoted by $A_2(\nu, H_1)$, the absorption in layer 1 along path 2. The absorption equation for path 2 is given by

$$A_2(\nu, H_2) = [1 - e^{-k_\nu(2)U(2,2)}] + A_2(\nu, H_1)e^{-k_\nu(2)U(2,2)}, \quad (8)$$

and the iteration procedure derives $U(2,2)$. Similarly, for path 3 the two previous gas amounts are reslanted to derive $U(3,3)$. In general, for path n from altitude H_n at θ_n , the previous $(n-1)$ gas amounts are reslanted according to

$$U(n, j) = U(j, j) \sec \theta_n / \sec \theta_j \quad \text{for } j = 1, \dots, n-1 \quad , \quad (9)$$

with which $A_n(\nu, H_{n-1})$ is calculated. The absorption equation for path n is

$$A_n(\nu, H_n) = [1 - e^{-k_\nu(n)U(n, n)}] + A_n(\nu, H_{n-1})e^{-k_\nu(n)U(n, n)} \quad , \quad (10)$$

for $n = 2, \dots, N$.

$A_n(\nu, H_{n-1})$ is the absorption of layer $n-1$ along path n . $U(n, n)$ is the gas amount in layer n derived successively. Note that after the corrections for the different lines of sight have been made with Eq. (9), Eq. (10) involves only two consecutive layers (as in I and II).

2. Low Sun

The geometry for low sun data, where both the atmospheric curvature and refraction have to be taken into account, is shown (with distorted spherical scale) in Figure 7. Here, the balloon is at constant float altitude (H_1) and each successive low sun path defines a new, deeper layer, between two consecutive minimum altitudes.

The formulation used above for high sun data can be used for low sun data provided that 1) the actual airmass distributions along the paths are used instead of the $\sec \theta$ factors, and 2) a single effective pressure value can be assigned to each layer (see below).

Figure 7 shows the first path, which is above the horizon and denoted by ray 0, defining the first layer, layer 0, between H_1 and H_0 (the top of the atmosphere) with the total airmass along the path denoted as $M(0, 0)$. This can be used to derive the corresponding gas amount $U(0, 0)$. The second path, ray 1, passes below the horizon, defining the first inner layer from $H_2 (= H_1^{\min})$ to H_1 (=H observer) with the corresponding airmasses $2M(1, 1)$ and $M(1, 0)$. The factor of 2 is included since in the figure only one-half of the path through

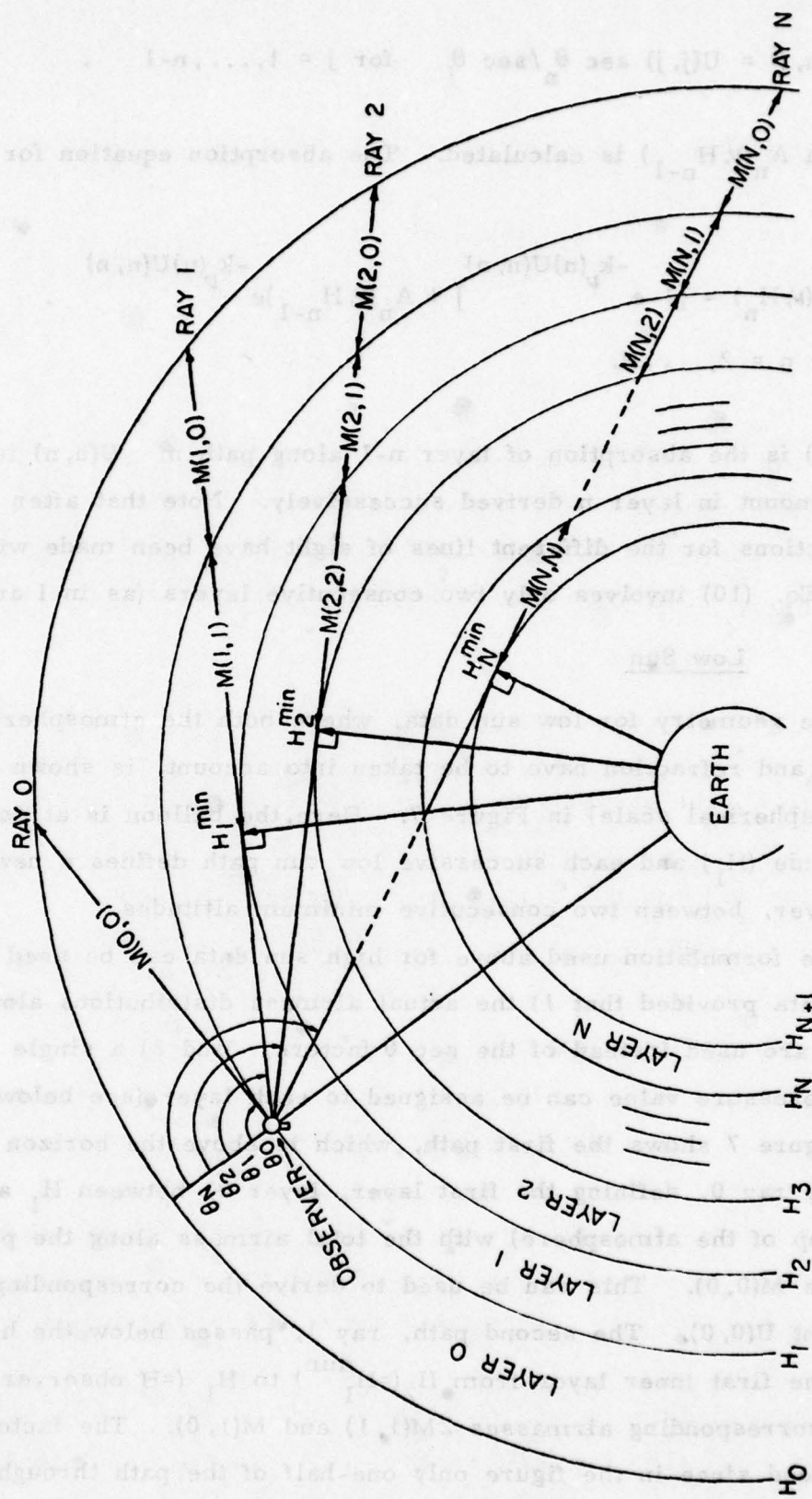


Fig. 7. Solar ray paths for absorption measurements made for low sun while the balloon is at float.

layer 1 is indicated as $M(1, 1)$. $U(1, 0)$, the gas amount between H_0 and H_1 along ray 1, replaces $U(0, 0)$ according to

$$U(1, 0) = U(0, 0)M(1, 0)/M(0, 0)$$

Substituting into

$$A_2(\nu, H_1) = 1 - e^{-k_\nu(0)U(1, 0)} \quad (11)$$

and then $A_2(\nu, H_1)$ into

$$A_2(\nu, H_2) = [1 - e^{-k_\nu(1)U(1, 1)}] + A_2(\nu, H_1)e^{-k_\nu(1)U(1, 1)} \quad (12)$$

yields

$$U(1, 1), \text{ the gas amount in the layer } H_1 - H_2 \text{ along ray 1.}$$

Consecutive paths of $n \geq 2$ each serve to derive a new gas amount $U(n, n)$ for the innermost layer n defined by the boundaries H_n^{\min} to H_{n-1}^{\min} (i. e., H_{n+1} to H_n), after the outer n gas amounts have been adjusted according to

$$U(n, j) = U(j, j)M(n, j)/M(j, j), \quad j=0, \dots, n-1. \quad (13)$$

This equation applies for $n=1, \dots, N$. Here, $U(j, j)$ and $M(j, j)$ are the gas amount and airmass for the previous innermost layers $1, \dots, n-1$ and $M(n, j)$ is the airmass along path n outside the inner layer n .

The absorption coefficients for a low sun path can be calculated as in Eq. (1). The integrations are made along the appropriate sections

M

of the ray path with the ray tracing program. Strictly speaking, when a given layer is traversed by different low sun paths (as in Fig. 7), a different value of P_{eff} occurs for each path through the layer. However, it was found that for the analysis of the type of experiment reported here, a single P_{eff} averaged over all of the paths can be used (see below). Typical cases are shown in Tables II and III. Without this approximation the absorption coefficients for a given layer, which depend on P_{eff} , would have to be recalculated for each path.

Tables II and III show the airmass distribution and the effective pressure values for two typical cases, at 30 km and at 40 km. The airmasses again are given in units of 1 airmass = 2.153×10^{25} molecules/cm². The pressure is given in Pascals (10^2 Pascal = 1 mb). The upper part of each table is constructed for the case in which the first path is below the horizon, thus starting with ray 1 and M(1, 1) as the total airmass along the first ray. It shows the inner layer boundaries as defined by the minimum altitudes H_{min} and airmasses and effective pressures along the different low sun paths. For rays 2, 3, ... N, the airmasses are listed for one-half of the path. A column average of the effective pressures is shown in the lower part of the table for each of the inner layers. A pressure factor for each of the inner layers is defined by the ratio of the average effective pressure to the sum of the atmospheric pressures at the boundaries. A similar effective pressure and pressure factor are defined for the outer layer, H_1 to H_0 , with the pressure at H_0 negligible. Also shown in the lower part of the tables are effective pressure values for typical rays just above the horizon. The pressure factor in this case is defined as the ratio of effective pressure along the total path to the pressure at the balloon altitude.

It is apparent that the pressure factors depend on the balloon altitude and the width of the layers as defined by the low sun paths.

Table II. Airmasses, effective pressures, and effective temperatures for atmospheric layers determined by solar rays observed from an altitude of 30 km with apparent zenith angles of 92.0° , 93.0° and 94.0° . 1 airmass = 2.153×10^{25} molecules/cm².

LOW SUN DATA, MID-LATITUDE SUMMER, OBSERVER ALTITUDE 30.0 km

APP. PATH ANGLE ($^\circ$)	LAYER 1		LAYER 2		LAYER 3	
	30.0-26.1 km	EFF. AIRMASS (PA)	26.1-21.2 km	EFF. AIRMASS (PA)	21.2-14.1 km	EFF. AIRMASS (PA)
92.0	1.58E+0	2.01E+3	1.55E+0	4.19E+3	5.30E+0	1.21E+4
93.0	2.34E-1	1.87E+3	1.55E+0	4.19E+3	5.30E+0	1.21E+4
94.0	1.63E-1	1.86E+3	1.55E+0	4.19E+3	5.30E+0	1.21E+4

APP. PATH ANGLE ($^\circ$)	TOTAL AIRMASS	INNER LAYER BOUNDARIES (km)	INNER LAYERS			OUTER LAYER 30 to 70 KM			HIGH SUN	
			AVG EFF PRESS. (PA)	TANGENT PRESS. (PA)	AVG EFF TEMP. ($^\circ$ K)	EFF. PRESS. (PA)	EFF. TEMP. ($^\circ$ K)	EFF. PRESS. (PA)	EFF. TEMP. ($^\circ$ K)	
88.0										
90.0	26.1	30.0	1.91E+3	2.33E+3	0.820	224	7.52E+2	0.585	241	0.585
91.0	21.2	26.1	4.00E+3	5.23E+3	0.529	221	7.20E+2	0.557	242	0.734
92.0	14.1	21.2	1.21E+4	1.97E+4	0.485	226	7.00E+2	0.542	243	

Table III. Airmasses, effective pressures, and effective temperatures for atmospheric layers determined by solar rays observed from an altitude of 40 km with apparent zenith angles of 91.5° through 94.5° in 0.5° steps. 1 airmass = 2.153×10^{25} molecules/cm².

LOW SUN DATA, MID-LATITUDE SUMMER, OBSERVER ALTITUDE 40.0 km

APP. PATH ANGLE (°)	LAYER 1		LAYER 2		LAYER 3		LAYER 4		LAYER 5		LAYER 6		LAYER 7	
	40.0-37.8 km	EFF. PRESS. (PA)	37.8-36.1 km	EFF. PRESS. (PA)	36.1-33.9 km	EFF. PRESS. (PA)	33.9-31.2 km	EFF. PRESS. (PA)	31.2-28.0 km	EFF. PRESS. (PA)	28.0-24.3 km	EFF. PRESS. (PA)	24.3-20.1 km	EFF. PRESS. (PA)
91.5	2.47E-1	3.84E+2	1.02E-1	4.96E+2	1.60E-1	6.69E+2	2.59E-1	9.75E+2	4.57E-1	1.53E+3	8.52E-1	2.64E+3	1.74E+0	5.01E+3
92.0	4.01E-2	3.79E+2	3.75E-2	4.86E+2	5.92E-2	6.50E+2	9.29E-2	9.34E+2	1.67E-1	1.45E+3	3.15E-1	2.50E+3		
92.5	2.91E-2	3.76E+2	2.71E-2	4.85E+2	4.29E-2	6.46E+2	7.07E-2	9.29E+2	9.29E-2	1.44E+3				
93.0	2.32E-2	3.75E+2	2.17E-2	4.84E+2	3.46E-2	6.45E+2	5.32E-2	9.26E+2	1.23E-1	1.44E+3				
93.5	1.95E-2	3.74E+2	1.82E-2	4.84E+2	2.93E-2	6.45E+2								
94.0	1.68E-2	3.74E+2	1.58E-2	4.84E+2										
94.5	1.48E-2	3.74E+2												

OUTER LAYER 40 to 70 KM

INNER LAYERS

HIGH SUN

APP. PATH ANGLE (°)	TOTAL INNER LAYER		TANGENT		AVG EFF		EFF. PRESS. FACTOR		EFF. TEMP.	
	H _{min}	BOUNDARIES (km)	AVG EFF PRESS. (PA)	FACTOR (PA)	TEMP. (°K)	FACTOR (PA)	TEMP. (°K)	FACTOR (PA)	TEMP. (°K)	
88.0										
90.0	37.8	40.0	3.76E+2	4.06E+2	0.527	245	1.97E+2	0.623	263	
91.5	36.1	37.8	4.86E+2	5.18E+2	0.526	245	1.91E+2	0.604	264	
92.0	33.9	36.1	6.51E+2	7.12E+2	0.529	238	1.87E+2	0.589	264	
92.5	31.2	33.9	9.41E+2	1.06E+3	0.531	234	1.83E+2	0.578	264	
93.0	28.0	31.2	1.47E+3	1.74E+3	0.525	226	1.80E+2	0.570	265	
93.5	24.3	28.0	2.57E+3	3.15E+3	0.526	224	1.78E+2	0.563	265	
94.0	20.1	24.3	5.01E+3	6.49E+3	0.520	219	1.77E+2	0.558	265	
94.5										

A study of this type of calculation showed that, for balloon applications and layers that are not thicker than 6 km, a single effective pressure value can be determined for each layer which is within $\pm 1\%$ to $\pm 5\%$ of the individual effective pressures for the different rays.

These tables are based on a midlatitude summer atmospheric profile, but the use of pressure factors permits the application of such tables to the pressure profile at the time of the measurement. The effective temperatures listed in the tables were calculated in the same manner as the effective pressures, but for most practical applications, a simple average of the temperatures over the layer of interest is sufficient.

C. Photochemically Active Species

The application of the above methods to photochemically active species, such as NO and NO₂, is complicated by the time variability of the constituent during the sunset period. This time variability causes the distribution of the constituent to be asymmetrical with respect to H_{\min} , which results in asymmetrical absorption distributions. The effect is obviously largest for the largest solar zenith angles and for the most photochemically active species. Thus, this effect is quite small for NO₂, but very pronounced for NO. In order to determine the magnitude of the effect on these constituents (which are taken to be illustrative of such species), time-dependent profiles for NO and NO₂ were used to determine how this variation would affect the interpretation of such spectra. The technique used to generate these time-dependent profiles is given by L. R. Megill of Utah State University in Appendix A.

For a simplified discussion, we assume again the weak line approximation and choose the NO Λ -doublet [Goldman and Schmidt, 1975] at 1900.08 cm^{-1} with $S = 1.0 \times 10^{-19} \text{ cm}^{-1}/(\text{molecule cm}^{-2})$ at 300°K and ground state energy of $E'' = 80.3 \text{ cm}^{-1}$, and the NO₂ four

lines group [Goldman et al., 1975], including spin-splitting, at 1604.57 cm^{-1} with $S = 4.6 \times 10^{-19} \text{ cm}^{-1}/(\text{molecule cm}^{-2})$ at 296°K with $E'' = 97.8 \text{ cm}^{-1}$. These are typical spectral features used for high altitude observations of these trace gases. The temperature dependence of the line intensities is included according to standard equations. Figures 8 and 9 show calculated integrated absorption distributions for NO and NO_2 at 93° from 30 km. Within the (small) temperature dependence these distributions are proportional to the gas amount distributions.

Figure 8 shows that most of the NO absorption is distributed widely over the portion of the path between H_{min} and 40 km in the sun direction. If the data are analyzed on the basis of a non-time-dependent distribution using the full analysis presented above, the absorption in a given layer would be attributed to the portions of the path on the sun side and on the platform side. In some cases there is no absorption on the "dark" side, which can result in a 50% error in mixing ratio derived for the layer. If one of the approximations is used (e.g., a one-layer calculation which assumes that the absorption takes place in a narrow layer above H_{min}) the inferred NO mixing ratio could be in error by an order of magnitude. In the case of NO_2 , as seen in Figure 9, the distribution along the path is not so asymmetrical, so that the error in the case of a full analysis is much less. However, as mentioned above, approximate calculations can result in large errors.

IV. Personnel

The major calculations performed in this report represent extensions of programs developed by the Upper Atmospheric Physics Group at the University of Denver. The major effort in the development of these programs has been by A. Goldman. He has also been responsible for the extensions which address the problem of the interpretation of sunset spectra. He has been assisted in this effort by G. R. Cook, D. K. Rolens and R. S. Saunders. The figures have been prepared by C. M. Bauer.

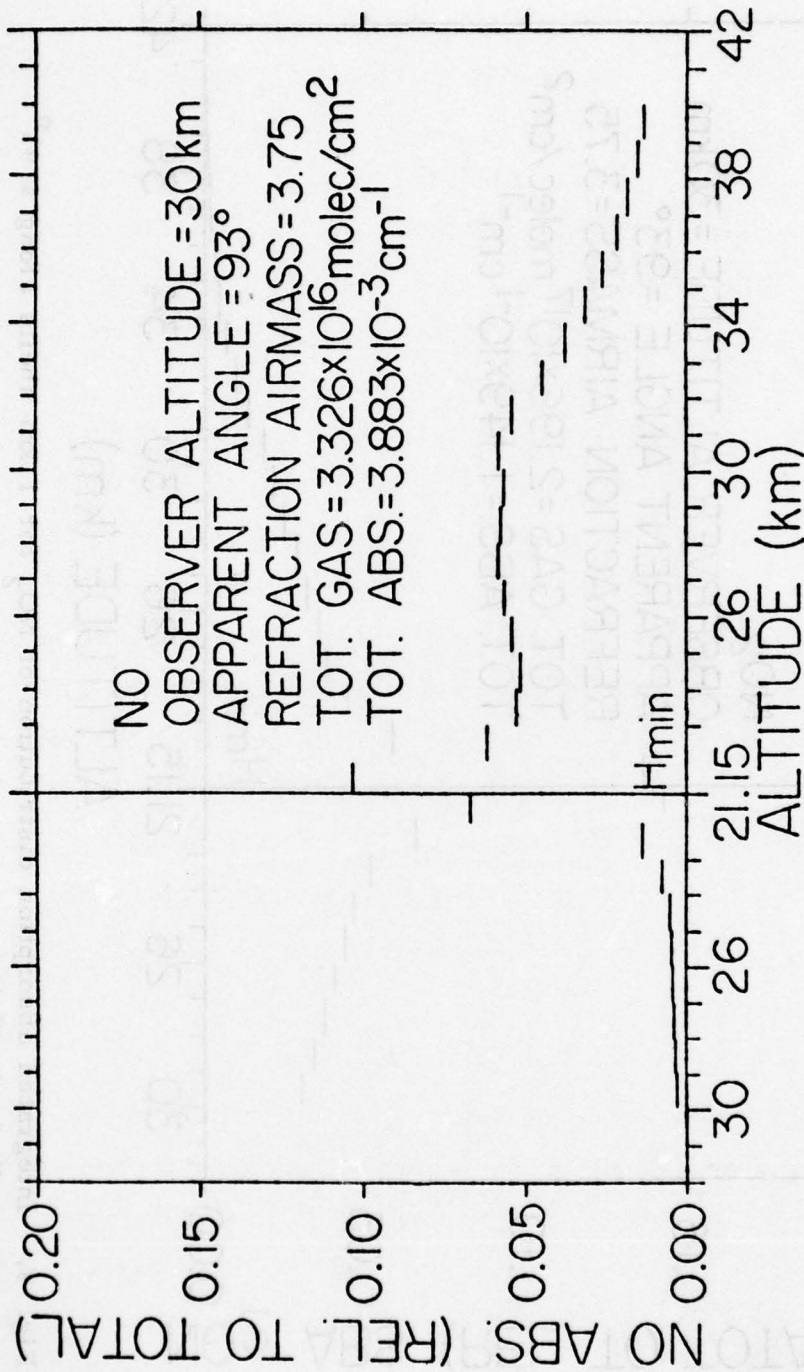


Fig. 8. Integrated absorption distribution of NO for 1 km shells along a 93° path from 30 km.

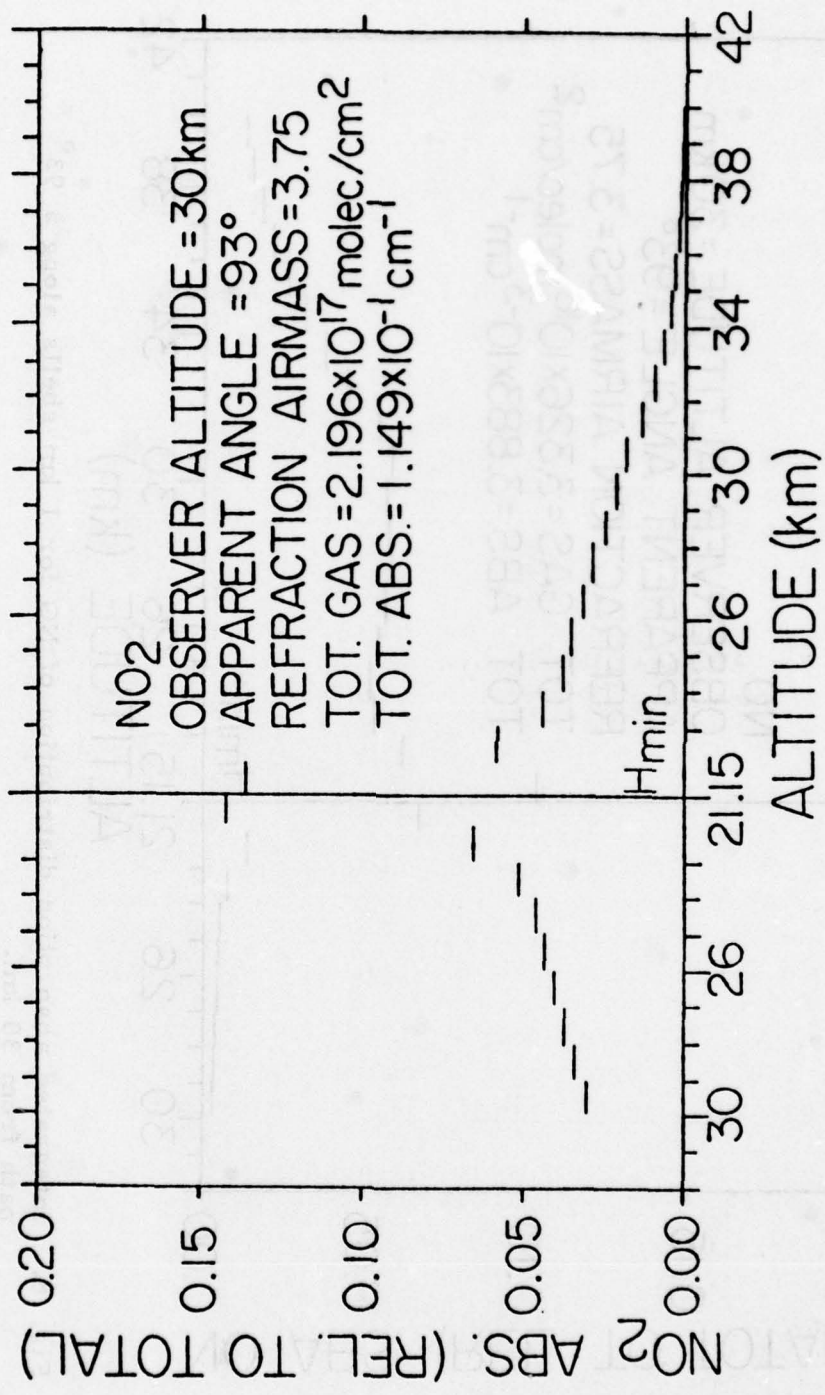


Fig. 9. Integrated absorption distribution of NO₂ for 1 km shells along a 93° path from 30 km.

V. Reports and Publications

As indicated in the text, this report contains summaries of three reports issued as part of this project. These are:

1. Goldman, A., G.R. Cook, D.G. Rolens, and D.G. Murcra y, On the Interpretation of Infrared Sunset Spectra for Altitude Distribution of Atmospheric Trace Constituents, Scientific Report No. 1, Contract No. DOT-FA77WA-3949, Federal Aviation Administration, Dept. of Transportation, by Department of Physics, University of Denver, Denver, Colorado 80208, Nov. 1977.
2. Goldman, A., G. R. Cook, D. G. Rolens, D. G. Murcra y, L. R. Megill and W. Abdou, On the Interpretation of Infrared Sunset Spectra for Altitude Distribution of Atmospheric Trace Constituents, by Department of Physics, University of Denver and Center for Research Aeronomy, Utah State University, 1977.
3. Goldman, A., and R. S. Saunders, Analysis of Atmospheric Infrared Spectra for Altitude Distribution of Atmospheric Trace Constituents, I. Method of Analysis, in press, J. Q. S. R. T., 1978.

VI. References

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Snider, D. E. and A. Goldman, Refractive effects in remote sensing of the atmosphere with infrared transmission spectroscopy. BRL Report No. 1790, Ballistic Research Laboratories, Aberdeen Proving Ground, MD, 1975.

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Appendix A

"Temporal Variations of Minor Constituents at Twilight"

L. R. Megill

A one-dimensional, time dependent model is used in the present work to describe variation in the distribution of a number of important gaseous compounds (e.g., NO_x , ClO_x , HO_x , and CFM_5) from 10 km above the ground level up to 80 km, during sunset. In the calculations, the solar zenith angle varies from 80° to 95° . In the model used the continuity equations describing the rate of change with time of the concentration of a species x is given by the equation

$$\frac{\partial x}{\partial t} = P - L \quad (1)$$

where P and L are the photochemical production and loss terms, respectively. The vertical transport processes are ignored in the present work since the 15° solar depression considered by the calculations corresponds only to about 2 to 3 hours during which integration of equation 1 is performed. This time is short compared to the time constant for transport effects to be significant.

The accuracy of the results depends, among other things, on the number of chemical and photochemical reactions used in the calculations. The data present in literature, however, limit the number of reactions used. Figure 1 represents the basic reaction schemes considered in the present study and a listing of the reactions involved is represented in Table 1. The rate constants of the chemical reactions used are mostly recommended in NASA report number

Other data collected for the completion of this work include:

1. A set of starting profiles for each species involved.
2. The photodissociation rates for the photoreactions.

The starting profiles for most of the species were found in the literature only up to 40 to 60 km. These profiles were extrapolated up to 80 km using the scale height equation

$$N = N_z e^{-h/H} \quad (2)$$

where H is the scale height, N_z is the concentration at altitude z and N_h , the concentration at a height h above the altitude z.

Those starting profiles, especially of the sunset sensitive species, are only approximate since they do not represent the actual profiles at the starting time of the calculations.

Sets of starting profiles which represent greater internal consistency could be obtained from the available ones by successively integrating the continuity equations for 24 hour periods until the essential diurnal effects are properly reproduced. This however, has not been done in the present work and is intended to be accomplished in the next phase of this work.

The photo-dissociation rates were calculated by a computer code written by Harris and Adams. The calculations are based on the equation where

$$j_i(\lambda, \lambda, \psi, z) = \int_{\lambda_1}^{\lambda_2} \sigma_i(\lambda) \phi_{\infty}(\lambda) e^{-\sum_m \sigma_m N_m(\chi, z)} d\lambda \quad (3)$$

where i denotes the species, m denotes the major absorbing species, j_i is the dissociation rate per molecule of species i (in sec^{-1}), λ_1 and λ_2 are the wavelengths bounding the region of interest, χ is the zenith angle of the sun, z is the altitude, $\sigma_i(\sigma_m)$ is the photon absorption

cross section of species $i(m)$, ϕ_{∞} is the solar flux at the top of the atmosphere and $N_m(\chi, z)$ is the column density of species m along the path from altitude z to the sun at zenith angle χ , i.e., $N_m = \int_z^{\infty} N_z \sec \psi dz$. Single scattering is the only effect considered by the code in calculating the photodissociation rates. O_2 and O_3 are considered as the major absorbing species. Their density profiles, were taken respectively from U.S. Standard Atmosphere (1962) and from Adams and Megill (1970). The absorption cross sections of O_2 and O_3 are represented graphically in Figure 2 and 3, respectively. For consistency in the calculations the density profiles and the absorption cross sections of O_2 and O_3 used in the present work are the same as those used by the code calculating the photodissociation rates.

Calculations

The coupled differential equations represented by Equation 1, were solved by a computer code written by Adams and Megill (1970). A modified version of this program is used in the present work. The integration routine of the code is based on a technique which uses an exponential variation during the time step. The accuracy of a step is checked by backward integration. Agreement to 1 part in 10^6 is required by the program. The step size is automatically adjusted as needed to keep this accuracy. An initial step size is taken as 0.1 sec. This could be halved or doubled several times to maintain the required accuracy.

The output of the calculations gives the distribution of the species at a number of points representing space and time. These points constitute

a 6 x 151 gridpoints representing height variation of 2 km (ranging from 10 km to 40 km) and solar zenith angle variation of 0.1 ranging from 80° to 95°. The geometry of the grid is sketched in Figure 6. This grid allows the representation of isodensity plots for any of the species involved. Those for NO, NO₂, ClO and Cl are represented in Figure 4,5,6, and 7, respectively.

TABLE (1)

a - Chemical Reactions Set

No.	Reaction	Rate Constant	Reference
1.	$\text{NO} + \text{O}_3 \longrightarrow \text{NO}_2 + \text{O}_2$	$2.1 \times 10^{-12} \exp - \frac{1450}{T}$	----- NASA, March 1977 -----
2.	$\text{NO}_2 + \text{O} \longrightarrow \text{NO}_2 + \text{O}_2$	9.1×10^{-12}	
3.	$\text{N} + \text{O}_2 \longrightarrow \text{NO} + \text{O}$	$5.5 \times 10^{-12} \exp -3220/T$	
4.	$\text{N} + \text{NO} \longrightarrow \text{N}_2 + \text{O}$	$8.2 \times 10^{-11} \exp -410/T$	
5.	$\text{NO}_2 + \text{OH} + \text{M} \longrightarrow \text{HNO}_3 + \text{M}$	See below (*)	
6.	$\text{OH} + \text{HNO}_3 \longrightarrow \text{H}_2\text{O} + \text{NO}_3$	8×10^{-14}	
7.	$\text{N} + \text{NO}_2 \longrightarrow \text{N}_2\text{O} + \text{O}$	$2.0 \times 10^{-11} \exp \frac{-800}{T}$	
8.	$\text{NO} + \text{O} + \text{M} \longrightarrow \text{NO}_2 + \text{M}$	$1.55 \times 10^{-32} \exp \frac{+584}{T}$	
9.	$\text{NO}_2 + \text{HO}_2 + \text{N}_2 \longrightarrow \text{HO}_2\text{NO}_2 + \text{N}_2$	1.0×10^{-32}	
10.	$\text{N} + \text{O}_3 \longrightarrow \text{NO} + \text{O}_2$	$5 \times 10^{-12} \exp \frac{-650}{T}$	
11.	$\text{NO}_2 + \text{O}_3 \longrightarrow \text{NO}_3 + \text{O}_2$	$1.2 \times 10^{-13} \exp \frac{-2450}{T}$	
12.	$\text{O}^1\text{D} + \text{N}_2\text{O} \longrightarrow \text{N}_2 + \text{O}_2$	5.5×10^{-11}	
13.	$\text{O}^1\text{D} + \text{N}_2\text{O} \longrightarrow \text{NO} + \text{NO}$	5.5×10^{-11}	
14.	$\text{O}^1\text{D} + \text{H}_2\text{O} \longrightarrow \text{OH} + \text{OH}$	2.3×10^{-10}	
15.	$\text{O}^1\text{D} + \text{CH}_4 \longrightarrow \text{OH} + \text{CH}_3$	1.3×10^{-10}	
16.	$\text{O}^1\text{D} + \text{N}_2 + \text{M} \longrightarrow \text{N}_2\text{O} + \text{M}$	3.5×10^{-37}	
17.	$\text{O}^1\text{D} + \text{H}_2 \longrightarrow \text{OH} + \text{H}$	9.9×10^{-11}	
18.	$\text{O}^1\text{D} + \text{N}_2 \longrightarrow \text{O} + \text{N}_2$	$2 \times 10^{-11} \exp \frac{+107}{T}$	
19.	$\text{O}^1\text{D} + \text{O}_2 \longrightarrow \text{O} + \text{O}_2$	$2.9 \times 10^{-11} \exp 67/T$	
20.	$\text{O}^1\text{D} + \text{O}_3 \longrightarrow \text{O}_2 + \text{O}_2$	1.2×10^{-10}	
21.	$\text{O}^1\text{D} + \text{O}_3 \longrightarrow \text{O}_2 + \text{O} + \text{O}$	1.2×10^{-10}	
22.	$\text{O}^1\text{D} + \text{Hcl} \longrightarrow \text{OH} + \text{cl}$	1.4×10^{-10}	
23.	$\text{O}^1\text{D} + \text{CFcl}_3 \longrightarrow \text{CFcl}_2 + \text{clo}$	2.3×10^{-10}	
24.	$\text{O}^1\text{D} + \text{CF}_2\text{cl}_2 \longrightarrow \text{CF}_2\text{cl} + \text{clo}$	2.0×10^{-10}	
25.	$\text{OH} + \text{HO}_2 \longrightarrow \text{H}_2\text{O} + \text{O}_2$	3×10^{-11}	

TABLE (1) continued
a - Chemical Reactions Set

No.	Reaction	Rate Constant	Reference
26.	$\text{HO}_2 + \text{HO}_2 \longrightarrow \text{H}_2\text{O}_2 + \text{O}_2$	$5 \times 10^{-12} \exp \frac{-500}{T}$	NASA, March 1977
27.	$\text{OH} + \text{OH} \longrightarrow \text{H}_2\text{O} + \text{O}$	$1.0 \times 10^{-11} \exp \frac{-550}{T}$	
28.	$\text{HO}_2 + \text{O}_3 \longrightarrow \text{OH} + \text{O}_2 + \text{O}_2$	$1.0 \times 10^{-13} \exp \frac{-1525}{T}$	
29.	$\text{OH} + \text{O}_3 \longrightarrow \text{HO}_2 + \text{O}_2$	$1.5 \times 10^{-12} \exp \frac{-1000}{T}$	
30.	$\text{OH} + \text{O} \longrightarrow \text{H} + \text{O}_2$	$1.0 \times 10^{-10} \exp \frac{-250}{T}$	
31.	$\text{O} + \text{HO}_2 \longrightarrow \text{OH} + \text{O}_2$	$1.0 \times 10^{-10} \exp \frac{-250}{T}$	
32.	$\text{O} + \text{H}_2\text{O}_2 \longrightarrow \text{OH} + \text{HO}_2$	$2.75 \times 10^{-12} \exp \frac{-2125}{T}$	
33.	$\text{H} + \text{O}_2 + \text{M} \longrightarrow \text{HO}_2 + \text{M}$	$2.1 \times 10^{-32} \exp \frac{+290}{T}$	
34.	$\text{NO} + \text{HO}_2 \longrightarrow \text{NO}_2 + \text{OH}$	$1.5 \times 10^{-11} \exp \frac{-1100T}{T}$	
35.	$\text{H} + \text{O}_3 \longrightarrow \text{OH} + \text{O}_2$	$1.2 \times 10^{-10} \exp \frac{-560}{T}$	
36.	$\text{OH} + \text{OH} + \text{M} \longrightarrow \text{H}_2\text{O}_2 + \text{M}$	$1.25 \times 10^{-32} \exp \frac{+900}{T}$	
37.	$\text{OH} + \text{H}_2\text{O}_2 \longrightarrow \text{H}_2\text{O} + \text{HO}_2$	$1.0 \times 10^{-11} \exp \frac{-750}{T}$	
38.	$\text{OH} + \text{CO} \longrightarrow \text{CO}_2 + \text{H}$	1.4×10^{-13}	
39.	$\text{OH} + \text{CH}_4 \longrightarrow \text{H}_2\text{O} + \text{CH}_3$	$2.35 \times 10^{-12} \exp \frac{-1710}{T}$	
40.	$\text{cl} + \text{O}_3 \longrightarrow \text{clo} + \text{O}_2$	$2.7 \times 10^{-11} \exp \frac{-257}{T}$	
41.	$\text{clo} + \text{O} \longrightarrow \text{cl} + \text{O}_2$	$7.7 \times 10^{-11} \exp \frac{-130}{T}$	
42.	$\text{clo} + \text{NO} \longrightarrow \text{cl} + \text{NO}_2$	2.2×10^{-11}	
43.	$\text{OH} + \text{Hcl} \longrightarrow \text{cl} + \text{H}_2\text{O}$	$3 \times 10^{-12} \exp \frac{-425}{T}$	
44.	$\text{cl} + \text{CH}_4 \longrightarrow \text{Hcl} + \text{CH}_3$	$7.3 \times 10^{-12} \exp \frac{-1260}{T}$	
45.	$\text{cl} + \text{HO}_2 \longrightarrow \text{Hcl} + \text{O}_2$	3×10^{-11}	
46.	$\text{clo} + \text{NO}_2 + \text{N}_2 \longrightarrow \text{cloNO}_2 + \text{N}_2$	$5.1 \times 10^{-33} \exp \frac{+1033}{T}$	
47.	$\text{O} + \text{Hcl} \longrightarrow \text{cl} + \text{OH}$	$1.4 \times 10^{-11} \exp \frac{-3370}{T}$	
48.	$\text{cl} + \text{OH} \longrightarrow \text{O} + \text{Hcl}$	$1.0 \times 10^{-11} \exp \frac{-2970}{T}$	
49.	$\text{cl} + \text{H}_2 \longrightarrow \text{Hcl} + \text{H}$	$3.5 \times 10^{-11} \exp \frac{-2290}{T}$	
50.	$\text{cl} + \text{H}_2\text{O}_2 \longrightarrow \text{Hcl} + \text{HO}_2$	$1.7 \times 10^{-12} \exp \frac{-384}{T}$	

TABLE (1) continued

a - Chemical Reactions Set

No.	Reaction	Rate Constant	Reference
51.	$Cl + HNO_3 \longrightarrow HCl + NO_3$	$1 \times 10^{-11} \exp^{-2170/T}$	A
52.	$O_3 + O \longrightarrow O_2 + O_2$	$1.9 \times 10^{-11} \exp^{-2300/T}$	A
53.	$O_2 + O + M \longrightarrow O_3 + M$	$1.07 \times 10^{-34} \exp^{+510/T}$	B
54.	$O + O + M \longrightarrow O_2 + M$	8.0×10^{-33}	A
55.	$H_2 + OH \longrightarrow H + H_2O$	$2.3 \times 10^{-11} \exp^{-2450/T}$	A
56.	$HO_2 + H \longrightarrow H_2 + O_2$	1.0×10^{-11}	A
57.	$CH_3 + O_2 + M \longrightarrow CH_3O_2 + M$	2.6×10^{-31}	A
58.	$Cl + O + M \longrightarrow O + M$	6.0×10^{-11}	A
59.	$HO_2 + NO_2 + M \longrightarrow HO_2 + NO_2 + M$	1.97×10^{-31}	D
60.	$HO_2 + NO \longrightarrow HO + NO_2$	$3 \times 10^{-11} \exp^{-390/T}$	D
61.	$HO_2 + NO_2 + Cl \longrightarrow HCl + O_2 + NO_2$	$1.7 \times 10^{-12} \exp^{-384/T}$	D
62.	$HO_2 + NO_2 + O \longrightarrow OH + O_2 + NO_2$	$2.75 \times 10^{-12} \exp^{+2125/T}$	D
63.	$CO + OH \longrightarrow H + CO_2$	$2.1 \times 10^{-13} \exp^{-75/T}$	A
64.	$CH_3O + HO_2 \longrightarrow CH_3O_2H + O_2$	$3.0 \times 10^{-11} \exp^{-500/T}$	A
65.	$CH_3O + O_2 \longrightarrow CH_2O + HO_2$	$4.2 \times 10^{-13} \exp^{-3300/T}$	A
66.	$N + OH \longrightarrow NO + H$	5.3×10^{-11}	A
67.	$N + HO_2 \longrightarrow NO + OH$	2.0×10^{-10}	A
68.	$HO_2 + NO_2 \longrightarrow H_2O + O_2$	$1.0 \times 10^{-11} \exp^{-750/T}$	D
69.	$NO_2 + NO_3 + M \longrightarrow N_2O_5 + M$	See below (**)	B
70.	$CH_3O_2 + NO \longrightarrow CH_3O + NO_2$	$1.5 \times 10^{-12} \exp^{-500/T}$	A
71.	$CH_2O + OH \longrightarrow H_2O + ClO$	1.4×10^{-11}	A
72.	$CHO + O_2 \longrightarrow HO_2 + CO$	1.7×10^{-13}	A

(A) Crutzen, 1977.

(B) Atmospheric Environment, Volume 9, 1975, page 1045.

* k for reaction 5 is given as

$$k = \frac{k_o}{1 + 7v_o[\mu]} \frac{8 + 7v_o[\mu]}{8 + v_o[\mu]} \text{ cm}^6 \text{ s}^{-1}$$

where $v_o = \frac{k_o}{k_\alpha}$

k_o and k_α are the low pressure and the high pressure limits
for the rates, respectively.

$[\mu]$ is the air density

$$k_o = 6.5 \times 10^{-23} T^{-3} \text{ cm}^6 \text{ s}^{-1}$$

$$k_\alpha = 1.0 \times 10^{-11} \text{ cm}^3 \text{ s}^{-1}$$

**K for reaction 69 is given by the expression

$$k = \frac{k_o}{1 + 5v_o[\mu]} \frac{3 + 5v_o[\mu]}{3 + v_o[\mu]} \text{ cm}^6 \text{ sec}^{-1}$$

where $v_o = \frac{k_o}{k_\alpha}$ as above

$$k_o = 1.9 \times 10^{-30} \text{ cm}^6 \text{ s}^{-1}$$

$$k_\alpha = 3.8 \times 10^{-12} \text{ cm}^3 \text{ s}^{-1}$$

b - The Photoreaction Set

No.	Photoreactions	Notes
1.	$O_2 + hv \longrightarrow O + O$	
2.	$O_3 + hv \longrightarrow O + O_2$	
3.	$O_3 + hv \longrightarrow O_{1D} + O_2$	
4.	$NO_2 + hv \longrightarrow NO + O$	
5.	$NO_3 + hv \longrightarrow NO_2 + O$	
6.	$N_2O_5 + hv \longrightarrow NO_2 + NO_3$	
7.	$H_2O_2 + hv \longrightarrow OH + OH$	
8.	$HNO_3 + hv \longrightarrow OH + NO_2$	
9.	$HO_2 + hv \longrightarrow OH + O$	J values for H_2O_2 are used
10.	$ClONO_2 + hv \longrightarrow NO_2 + ClO$	
11.	$Cl_2 + hv \longrightarrow Cl + Cl$	
12.	$CCl_4 + hv \longrightarrow CCl_2 + Cl + Cl$	
13.	$CFCl_3 + hv \longrightarrow Cl + CFCl_2$	
14.	$CF_2Cl_2 + hv \longrightarrow Cl + CF_2Cl$	
15.	$CHCl_2F + hv \longrightarrow CHClF + Cl$	
16.	$CH_3Cl + hv \longrightarrow CH_3 + Cl$	
17.	$CH_3O_2H + hv \longrightarrow CH_3O + OH$	
18.	$HO_2NO_2 + hv \longrightarrow HO_2 + NO_2$	J values for H_2O_2 are used
19.	$N_2O + hv \longrightarrow N_2 + O^1D$	
20.	$ClO + hv \longrightarrow Cl + O$	
21.	$HOCl + hv \longrightarrow H + Cl$	

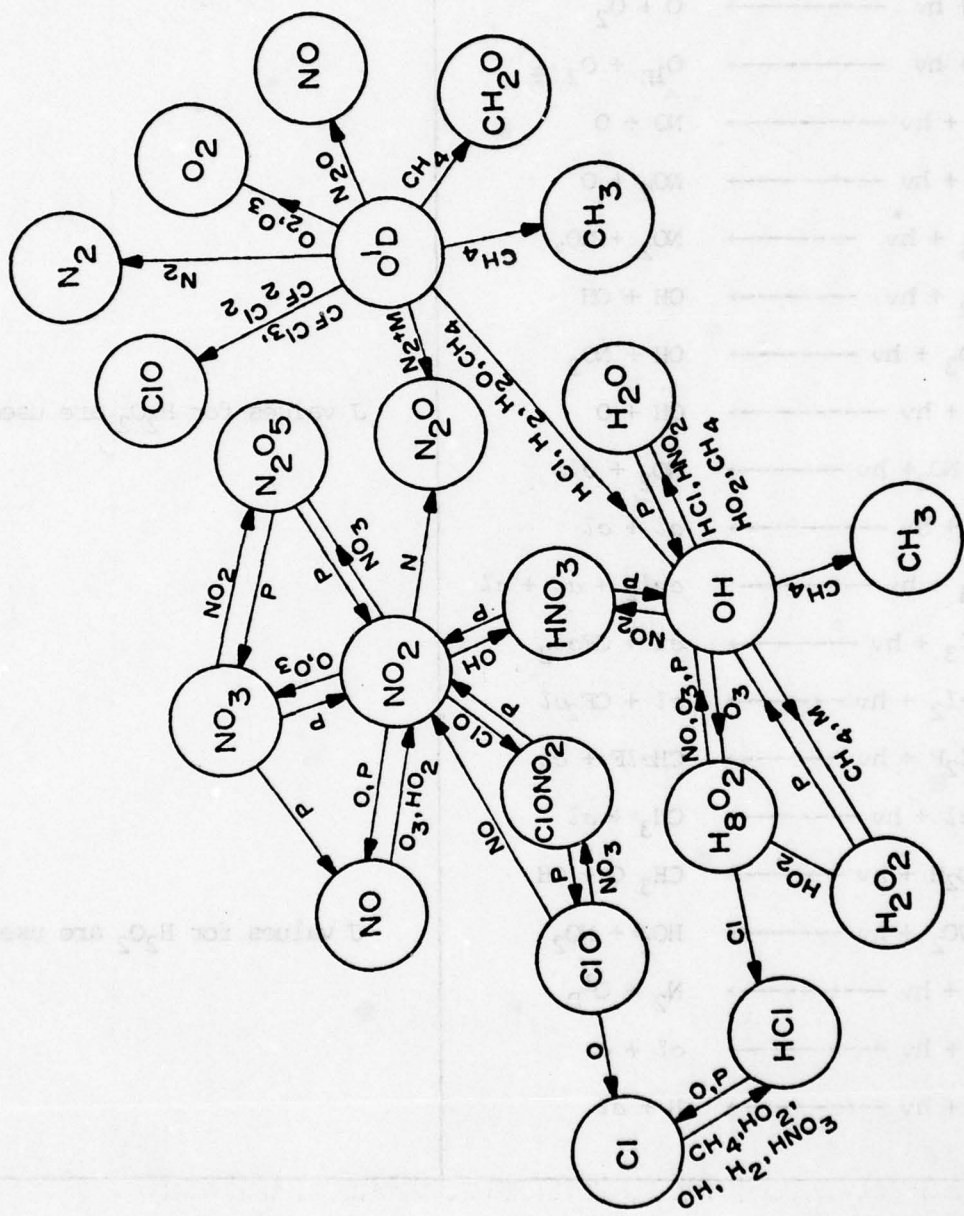


Figure 1

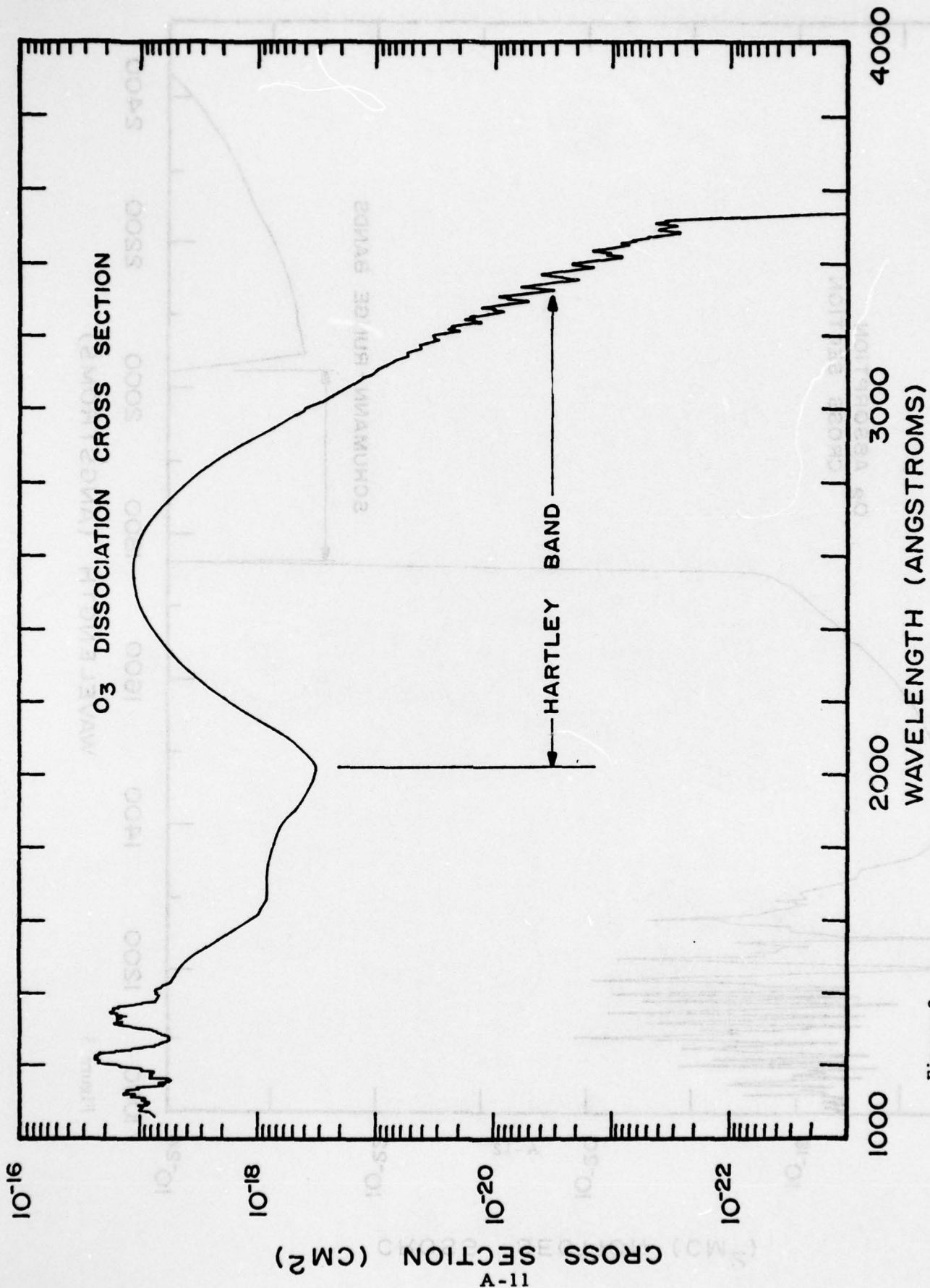


Figure 2

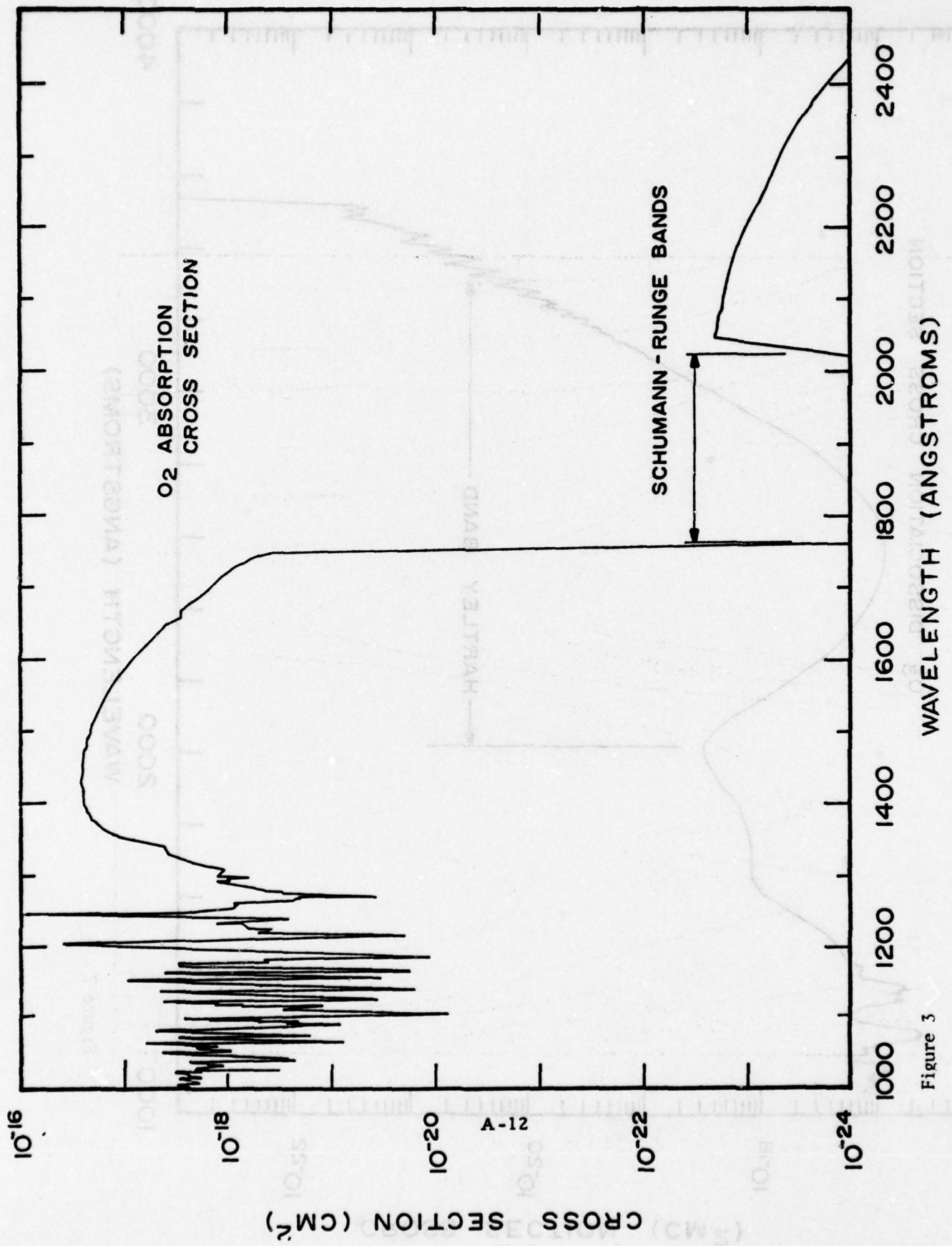
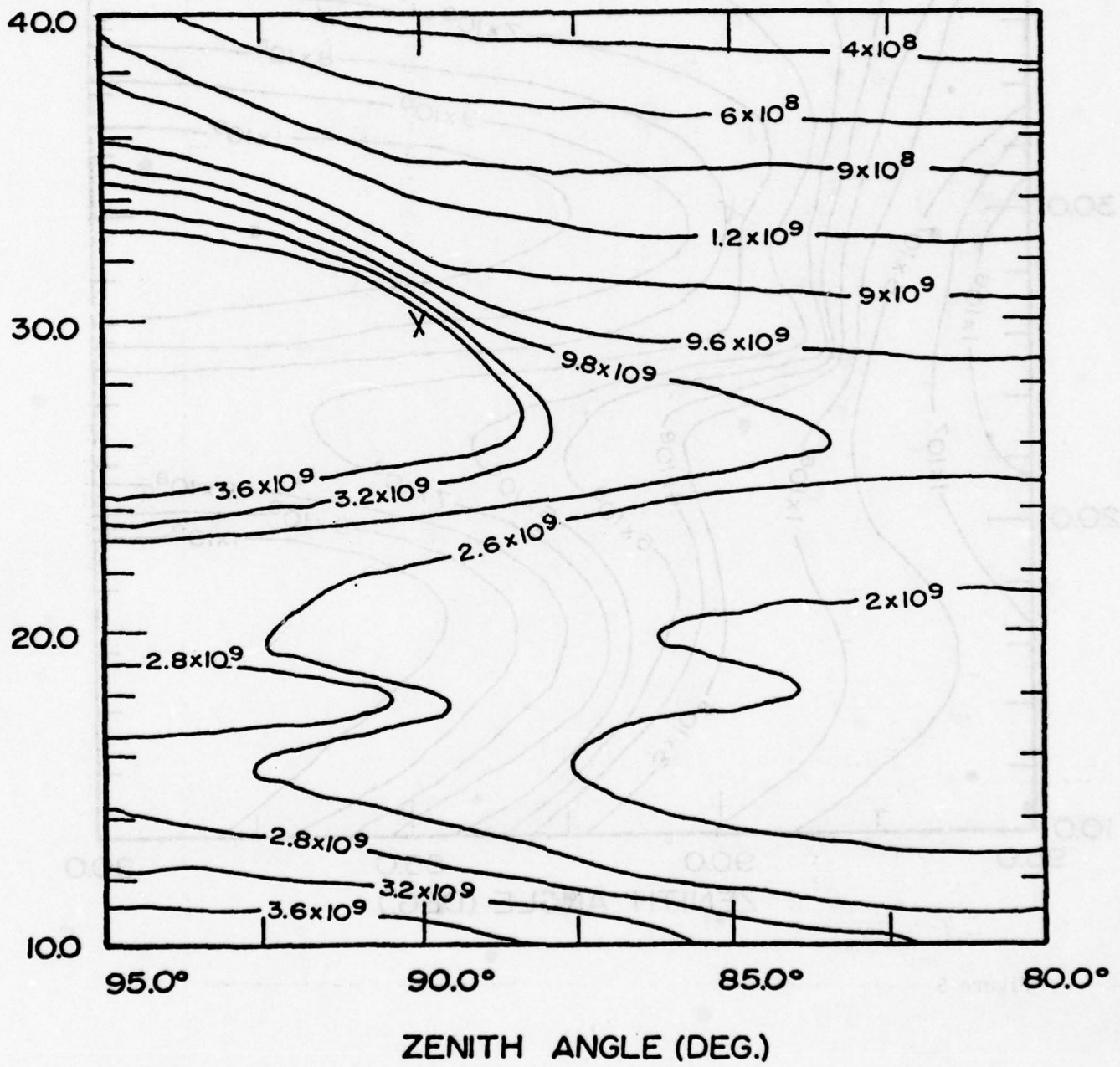


Figure 3



A-13

Figure 4

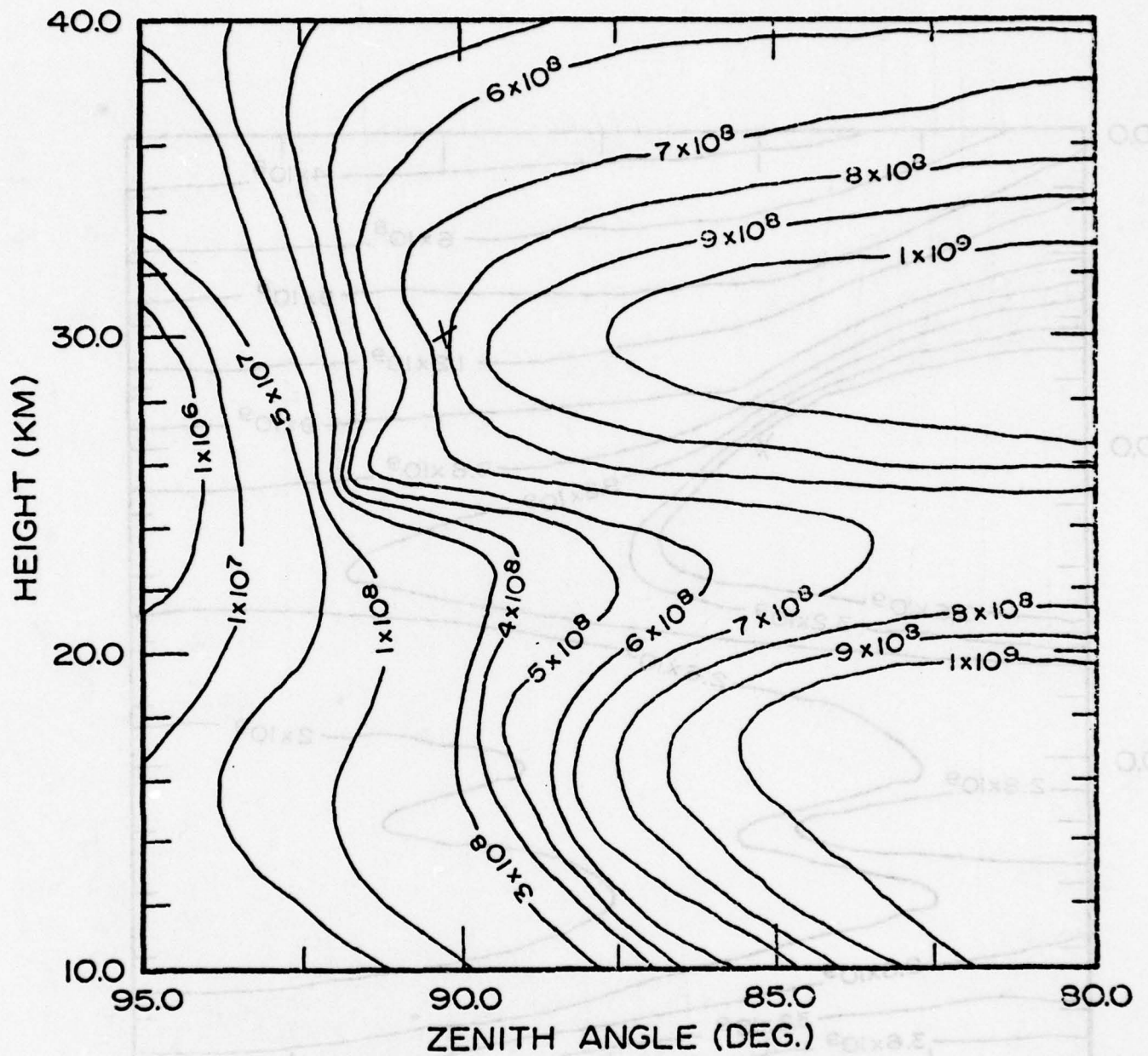
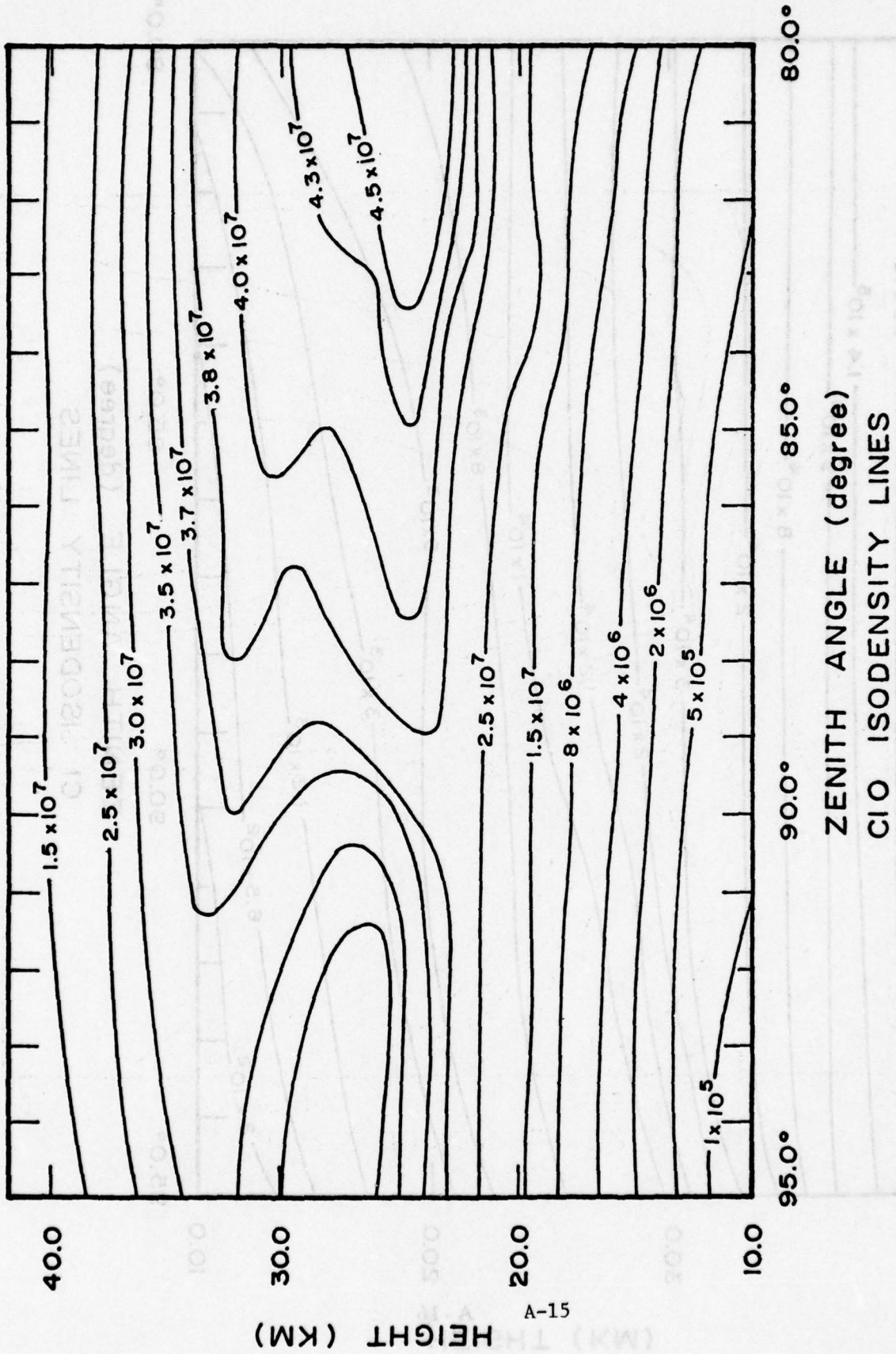


Figure 5



A-15

Figure 6

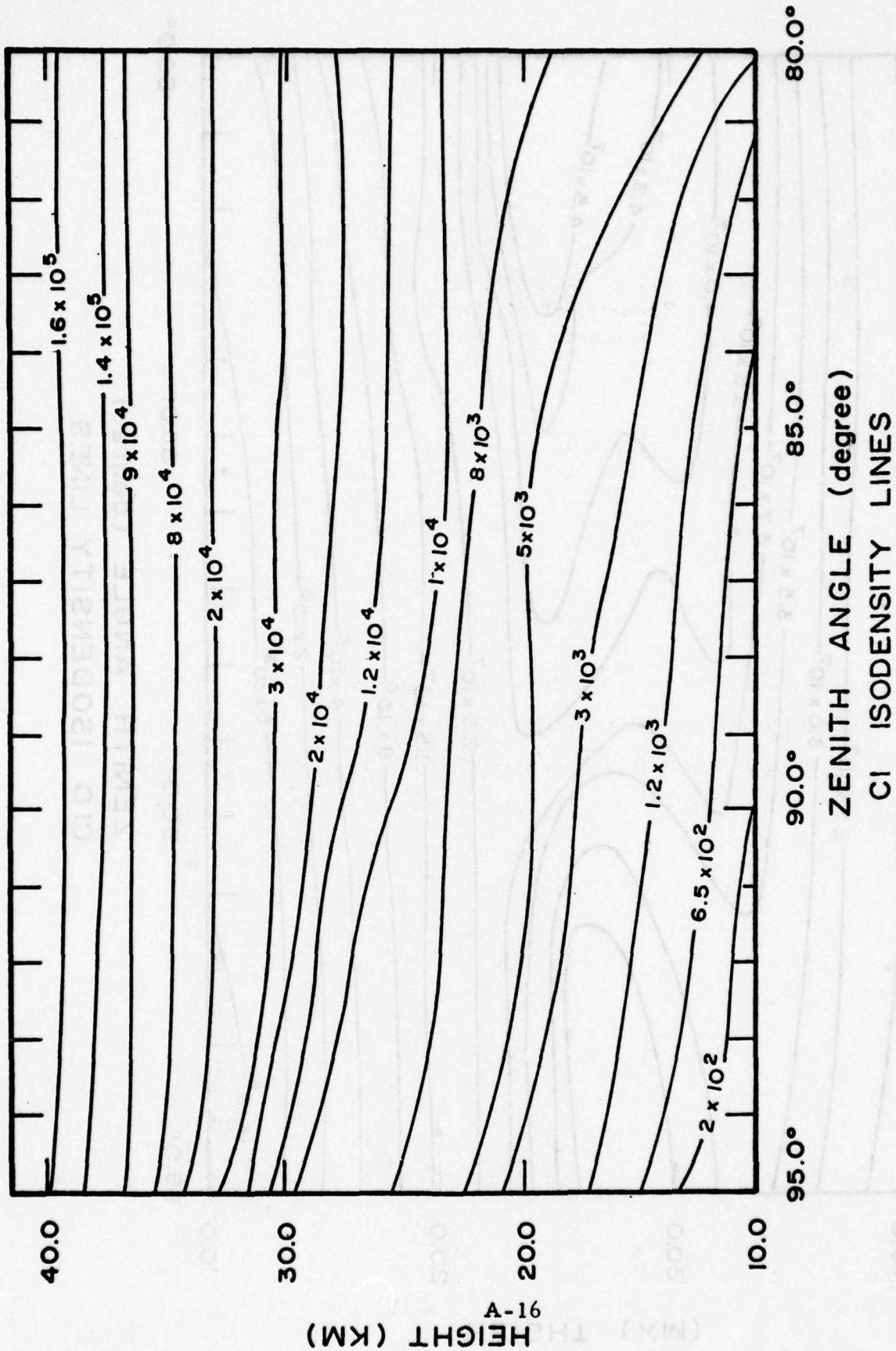


Figure 7

APPENDIX B

On the Interpretation of Infrared Sunset Spectra
for Altitude Distribution of Atmospheric Trace Constituents

by

A. Goldman, G.R. Cook, D.K. Rolens* and D.G. Murcray
Department of Physics
University of Denver
Denver, Colorado 80208

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Abstract

Quantitative interpretation of sunset spectra in terms of mixing ratio altitude profiles of atmospheric trace constituents requires, among other things, a detailed consideration of the air mass distribution along the sunset ray. Air mass distribution tables are generated for such infrared sunset spectra by a ray-tracing technique. The application of these distributions to the interpretation of sunset spectra is discussed for both sunset insensitive gases and sunset sensitive gases such as NO and NO₂.

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*Laboratory of Applied Mechanics, Denver Research Institute, Denver, Colorado 80208

1. Introduction

A powerful infrared technique for the detection of trace constituents is to observe atmospheric transmission spectra from an airborne platform using the setting sun as a source. The main advantage of this technique is the long path achieved through the atmosphere below the observation point, which increases the spectral sensitivity of the method to atmospheric trace constituents. In fact, within the last decade, several trace constituents have been measured in the lower stratosphere by this technique, e.g. HNO_3 , NO_2 , NO , CF_2Cl_2 , CFCl_3 , CCl_4 , HCl , and HF .

Quantitative derivation of mixing ratio altitude profiles of trace constituents from sunset spectra requires a detailed consideration not only of the spectral absorption lines but also of the geometry of the optical path through the atmosphere which, in turn, is largely affected by atmospheric refraction. In a low sun experiment the path goes through a minimum altitude, around which a significant portion of the total air mass is concentrated. Thus, to a first approximation it has been customary to assign the observed absorption to the vicinity of the minimum altitude. In the present paper, we study in detail the air mass distribution along such a path for an isotropic spherical atmosphere divided into thin homogeneous shells. These distributions are then applied to the interpretation of sunset spectra for sunset insensitive gases and also for sunset sensitive gases such as NO and NO_2 .

The air mass distributions for the layers of an isotropic atmosphere are symmetrical with respect to the minimum altitude and have significant widths which depend on the zenith angle and the altitude. In contrast, current time-dependent photochemical models predict that the NO and NO_2 distributions are asymmetrical with respect to the minimum altitude, especially NO as its concentration can change drastically during the sunset period.

The tables of air mass distributions produced in the present study allow an accurate quantitative layer by layer derivation of the mixing ratio profiles, assuming sunset insensitive gases. Common approximations are discussed and compared with the exact method for the case of the weak non-overlapping line approximation. The same method can be extended to a line by line - layer by layer calculation. The air mass distribution tables are then used to examine the difficulties associated with the interpretation of sunset spectra of sunset sensitive gases. It will be shown that a derivation of an NO profile can be quite meaningless, while a meaningful profile for NO₂ can be derived.

2. Air mass distributions

The air mass distribution along a sunset path is derived from a ray-tracing computer program, including refraction, described in detail in Snider and Goldman (1975) and Snider (1975). A standard midlatitude summer atmosphere, as tabulated by McClatchey et al. (1972), and a wavelength of 5 μm have been assumed for the present work. Typical air mass distributions, as well as the accumulated distributions, for an observer at 30 km and apparent zenith angles of 92° and 94° are shown in Figs. 1-4. Table 1 is an example of the corresponding tables and presents the numerical values for 94°. Similarly, air mass distribution tables and figures were made at 0.5° steps from 90.5° on, until the ray strikes the earth's disk, for observer altitudes 15, 20, 25, 30, 35, 40, 45 and 50 km. These are available along with NO and NO₂ absorptions in the Appendix C. The 0.5° step is dictated by the sun's disk (32 min of arc) and typical spectral scan times (~1 minute). The computer programs used can easily be rerun for a different set of altitudes and sun angles.

For a given observer altitude (in kilometers) and an apparent zenith angle (in degrees), the air mass distributions presented in the

tables and figures are divided into two parts. The first part includes the values from the minimum altitude, H_{\min} , to the observer altitude; the second extends from H_{\min} towards the sun, up to 100 km. These two parts are separated by a vertical line at H_{\min} in the figures and by a space in the tables. The total air mass listed on each figure is along the total path which includes the standard atmosphere up to 100 km altitude. One air mass is 2.153×10^{25} molecule/cm² (Snider and Goldman, 1975). The ray-tracing computations have been performed in 250 meter steps for the 0 - 40 km altitude range, 1 km steps for 40-70 km and 5 km steps for 70 - 100 km, as explained by Snider and Goldman (1975). The figures and the tables have been calculated in 1 km atmospheric shells, so starting at H_{\min} the first step can be less than or equal to 1 km until the nearest 1 km shell boundary is reached. Thereafter, the steps are the 1 km shell steps. Figure 5 is an example of ray geometry and air mass distributions along various paths. It is seen in Figs. 1-5 that the air mass distributions are symmetrical around H_{\min} and have significant width. There is always less than 50% of the air mass between H_{\min} and the observer and more than 50% between H_{\min} and the sun. The air mass tables are extended to an arbitrary altitude, H_f , which is 10 km above the altitude of the observer in the sun direction, so that the residual air mass is quite small (but not always negligible). The truncated air mass listed in Figs. 1-4 is the air mass from H_{\min} to H_f , and the residual air mass above H_f can be determined by a comparison with the total air mass listed. The amplitude in the air mass distribution plots (Figs. 1 and 3) are relative to the total air mass. Figures 2 and 4 show accumulated air mass distributions as a running accumulation of the 1 km step values on both sides of H_{\min} which are also relative to the total air mass. It should be

noted that each tabulated value in the tables represents the 1 km shell with the printed altitude as its lower boundary. Thus, the last line tabulated in Table 1 as 39.0 km represents the 39 - 40 km shell.

The tabulated zenith angles are along the path, at the intersection points of the altitude boundary listed. An example of these values along the 92° path are shown on Fig. 5. Thus, H_{\min} is always at 90° and the angles in either direction from H_{\min} complement one another to 180°, one increasing and one decreasing from the 90° value. The tabulated pressure (in Pascals, 10^2 Pascal = 1 mbar) and temperature are average values over the shells. The effective temperature and pressure in the tables are defined by

$$P_{\text{eff}} = \int P dm / \int dm \quad \text{and} \quad T_{\text{eff}} = \int T dm / \int dm ,$$

where dm is the air mass increment, P the pressure and T the temperature, as explained by Snider and Goldman (1975). The integrands for these expressions, after the small step computations have been accumulated over 1 km steps, are given in the tables under the columns $\Delta(P-dm)$ and $\Delta(T-dm)$. The air mass increments are listed under ΔM . The 1 km step values are accumulated along the path from H_{\min} in both directions under the column ACCUM ΔM . These are the values shown in Figs. 2 and 4 as the accumulated air mass distributions. The geometrical path increment is listed under $\Delta(\text{PATH})$ and is accumulated along the path under the ACCUM $\Delta(\text{PATH})$ column. Thus, for 30 km at 93°, the geometrical path from the observer to H_{\min} is 338 km and for 94° is 457 km. It should be noted that with such distances the isotropic atmosphere approximation can be quite poor if the path reaches the troposphere above heavily polluted cities.

For a uniformly mixed gas in an isotropic atmosphere, the gas amount distribution is proportional to the air mass distribution. Further, in the weak-line approximation the gas amount distribution is also proportional to the integrated absorption distribution, within the temperature dependence of the line intensities. Thus, the integrated absorption distributions of such gases have approximately the same shape as the air mass distributions of the type displayed in Figs. 1-4. Significant deviations from these shapes indicate altitude dependent mixing ratios if the shapes remain symmetrical and nonisotropical gas distributions if the shapes are asymmetrical.

3. The interpretation of infrared sunset spectra

Denote the observed integrated absorption at different apparent zenith angles z_1, z_2, \dots , by A_1, A_2, \dots , for a given observer altitude, h_1 . Without a loss of generality, assume that h_1 is an integer km altitude. For simplicity of the discussion, the weak line approximation is assumed, so that the integrated absorption A , is given by $A(\text{cm}^{-1}) = S (\text{cm}^{-1}/\text{molecule cm}^{-2}) U(\text{molecule}/\text{cm}^2)$, where S is the integrated line intensity and U is the absorber amount. The air mass distribution tables give atmospheric amounts U as MU_0 , where M is the tabulated air mass, and $U_0 = 1 \text{ air mass} = 2.153 \times 10^{25} \text{ molecule}/\text{cm}^2$. Trace constituent amounts will be described by βU where β is the gas volume mixing ratio.

The tables can be used for a layer by layer derivation of a minor constituent altitude profile in the following way. The atmosphere is divided into even one km shells, although Fig. 5 shows 2 km shells for simplicity. The tables show 1 km shells which can be accumulated over two or more km as required. Starting with the first path and $z_1 > 90^\circ$ (required to observe the weak absorption of the trace constituent), a constant mixing ratio, β_1 , can be derived for the atmosphere above $H_{\min}^{(1)}$ of the path according to

$$\beta_1 = \frac{A_1}{SU_o M_1} \quad (1)$$

where M_1 is the total air mass along path 1. This β_1 will be considered as the mixing ratio for layer 1, between h_1 and h_2 , as well as for the residual atmosphere above h_1 in the sun direction. It should be noted that H_{\min} can obviously fall between the even km boundaries, so that h_2 will be the same altitude as H_{\min} or the next nearest even km below it. Subsequent inner layer boundaries are defined by the minimum altitudes of the corresponding zenith angles, z_i , so that a layer can include more than 1 shell with increasing zenith angle. For example, with the observer at 30 km, the inner layer defined by $z = 92^\circ$ and $z = 93^\circ$ includes five 1 km shells. This is shown as Layer 3 on Fig. 5.

A mixing ratio altitude profile is then derived by the successive equations:

$$\beta_n = \frac{A_n - 2SU_o \sum_{k=1}^{n-1} \beta_k M_{k,k+1}^{(n)} - \Delta^{(n)}}{SU_o M_{n,n+1}^{(n)}}, \quad n=2, 3, \dots \quad (2)$$

Here, β_n is the constant mixing ratio for the layer defined by $H_{\min}^{(n)}$ to h_{n-1} , the even km boundary below $H_{\min}^{(n-1)}$. $M_{k,k+1}^{(n)}$ is the portion of the air mass between altitudes h_k and h_{k+1} for path n . The upper index n denotes the different paths for a given observer altitude. The $M_{k,k+1}^{(n)}$ values are those tabulated in the air mass distribution tables every 1 km accumulated over the proper layers. In Eq. 2 the summation in the numerator represents the correction to A_n due to the absorptions in the outer layers, each one of which is crossed twice. A smaller correction is $\Delta^{(n)} = \beta_1 SU_o M_r^{(n)}$, where M_r is the residual

air mass outside h_1 in the sun direction. The inner layer n is crossed once, but note that its air mass is twice the air mass from $H_{\min}^{(n)}$ to h_{n-1} .

The corrections to A_n are by no means negligible. However, a commonly used approximation is to neglect these corrections in the numerator and replace $M_{n,n+1}^{(n)}$ in the denominator by M_n , the total airmass along path n , and assign the resulting mixing ratio,

$$\beta_n \approx \frac{A_n}{SU_o M_n} \quad (3)$$

to $H_{\min}^{(n)}$ or a small altitude range above it. This approximation is motivated by the fact that a significant portion of the total air mass along the path is indeed concentrated near $H_{\min}^{(n)}$. It can be a good approximation only if the effect of neglected corrections in the numerator are compensated for by the ratio $M_n / M_{n,n+1}^{(n)}$ so that

$$\left(A_n - 2SU_o \sum_{k=1}^{n-1} \beta_k M_{k,k+1}^{(n)} - \Delta^{(n)} \right) \frac{M_n}{M_{n,n+1}^{(n)}} \approx A_n.$$

Examination of the air mass distribution tables shows that for many practical cases, this approximation can lead to errors from 5% to a factor of 5, as will be demonstrated below.

Another commonly used approximation is to consider the absorption difference, $A_n - A_{n-1}$, and the corresponding total air mass difference, $M_n - M_{n-1}$, so that β_n is approximated by.

$$\beta_n \approx \frac{A_n - A_{n-1}}{(M_n - M_{n-1})SU_o} \quad (4)$$

and assigned to $H_{\min}^{(n)}$ as in the previous approximation. This approximation can be quite good if both $A_n \gg A_{n-1}$ and $M_n \gg M_{n-1}$, but in many practical cases $A_n \approx A_{n-1}$ and M_n is not very large compared to M_{n-1} , unless $z > 94^\circ$. A combination of these conditions can result in a very large error.

Both of these approximations are a one-layer calculation. Strictly speaking, the resulting mixing ratio should then be assigned not to H_{\min} , but rather to a wider layer, the width of which increases as z increases, as is shown by the air mass distributions. If an arbitrary definition of a 90% distribution width is adopted, the width can be quite large, as is seen in Figs. 2 and 4. Thus, for 30 km and 90% of total air mass, the width is ~ 5 km for 92° and ~ 7 km for 94° . The exact Eq. (2) allows a finer altitude resolution, with the overlapping between the air mass distributions at different zenith angles properly accounted for. A typical altitude resolution obtainable by using the entire sun's disk from 30 km altitude is achieved by starting at 90.5° and proceeding in 0.5° steps. The minimum altitudes for $90.5, 91.0, 91.5, 92.0, 92.5, 93.0, 93.5, 94.0$ and 94.5 are (Snider and Goldman, 1975) 29.7, 29.0, 27.8, 26.1, 23.9, 21.1, 17.9, 14.1 and 9.7 km, thus defining 9 layers with widths of 0.7, 1.2, 1.7, 2.2, 2.8, 3.2, 3.8 and 4.4 km.

As an example, for the application of Eqs. (1) and (2) and the approximations (3) and (4), consider an observer at $h_1 = 30$ km, and three integrated absorption measurements at $z_1 = 92^\circ$, $z_2 = 93^\circ$ and $z = 94^\circ$. This can be visualized with the help of Fig. 5, but the 91° path does not pertain to this example and the 94° path is not shown (for simplicity). From our tables we find the minimum altitudes of $H_{\min}^{(1)} = 26.08$ km, $H_{\min}^{(2)} = 21.15$ km and $H_{\min}^{(3)} = 14.09$ km; and total air masses of $M_1 = 1.581$, $M_2 = 3.756$ and $M_3 = 12.088$.

Assuming measured integrated absorptions of $A_1 = 1 \text{ cm}^{-1}$, $A_2 = 5 \text{ cm}^{-1}$ and $A_3 = 2 \text{ cm}^{-1}$, which indicate a trace gas concentrated in a layer in the atmosphere, and assuming $S = 1 \times 10^{-18} \text{ cm/molecule}$, we find by Eq. (1) that $\beta_1 = 2.94 \times 10^{-8} \text{ vol/vol}$.

The approximations (3) and (4) use the same β_1 value. The exact β_2 for the next layer (21 to 26 km) is given by

$$\beta_2 = \frac{A_2 - 2M_{12}^{(2)}\beta_1 SU_0 - M_r^{(2)}\beta_1 SU_0}{SU_0 M_{23}^{(2)}} = 6.89 \times 10^{-8} \text{ vol/vol},$$

where $M_{23}^{(2)} = 3.08$ (between 21.15 and 26 km), $2M_{12} = 0.480$ (between 30 and 26 km) and $M_n^{(2)} = 0.196$. The increased mixing ratio in this second layer shows a gas layered in the atmosphere, since A_3 is relatively small.

Approximation (3) yields $\beta_2 = A_2/SU_0 M_2 = 6.18 \times 10^{-8} \text{ vol/vol}$, which is 10% lower than the exact β_2 . This approximation can improve significantly for smaller A_2 values, i.e., for a gas which is less layered in the atmosphere. Approximation (4) yields

$$\beta_2 = \frac{A_2 - A_1}{(M_2 - M_1)SU_0} = 8.54 \times 10^{-8} \text{ vol/vol},$$

which is 24% higher than the exact β_2 . This approximation will be improved for larger A_2 values. The exact β_3 for the next layer (14 to 21 km) is given by

$$\beta_3 = \frac{A_3 - 2\beta_1 M_{12}^{(3)} SU_o - 2\beta_2 M_{23}^{(3)} SU_o - M_r^{(3)} \beta_1 SU_o}{SU_o M_{34}^{(3)}} = 5.68 \times 10^{-10} \text{ vol/vol ,}$$

where $2M_{12}^{(3)}$ (between 26 and 30 km) = 0.334, $2M_{23}^{(3)}$ (between 21 and 26km) = 1.050, $M_{34}^{(3)}$ (between 14.09 and 21km) = 10.544 and $\Delta_r^{(3)} = 0.160$. Approximation (3) gives $\beta_3 = A_3/SU_o M_3 = 7.68 \times 10^{-9}$, more than 10 times higher than the exact β_3 . Again, this approximation is improved for smaller A_3 values. Approximation (4) for β_3 is not applicable here since $A_3 - A_2 < 0$. It is thus seen that the common approximations can lead to a very large range of errors as stated earlier. The numerical values of this example are summarized in Table 1.

The layer by layer method described above can be extended to a more general line by line - layer by layer calculation over a spectral interval of non-weak overlapping lines. This can be done similarly to the presentation by Goldman et al. (1973). For the first path

$$A^{(1)}(\nu, 1) = \epsilon^{(1)}(\nu, 1) \quad , \quad (5)$$

and for the successive inner paths

$$A^{(n)}(\nu, n) = \epsilon^{(n)}(\nu, n) + 2 \sum_{m=1}^{n-1} \epsilon^{(n)}(\nu, m) \prod_{k=m+1}^n \tau^{(n)}(\nu, k) + \epsilon_r^{(n)} \quad ,$$

$$n = 2, 3, \dots \quad , \quad (6)$$

where the upper index n denotes the path n, with "infinite" resolution spectral transmittivity, $\tau^{(n)}(\nu, k)$, and absorptivity $\epsilon^{(n)}(\nu, k)$ at wavenumber

ν of a layer defined by the altitudes h_k to h_{k-1} . $A^{(n)}(\epsilon, n)$ is the spectral absorption along the total path n . $\epsilon^{(n)}(\nu, n)$ is the emissivity of the inner layer whose mixing ratio β_n is being determined. $\epsilon_r^{(n)}$ is the emissivity of the residual of the atmosphere outside h_1 in the sun direction. By fitting the observed integrated absorptions to the theoretical ones as done by Goldman et al. (1973), a mixing ratio altitude profile can be derived. In the weak line approximation for a single line, Eqs. (5) and (6) yield Eqs. (1) and (2).

4. Sunset sensitive gases

The application of the above methods for sunset sensitive gases such as NO and NO₂ is complicated by the uneven gas distribution during the sunset period. These distributions are asymmetrical with respect to H_{\min} , resulting in asymmetrical absorption distributions. The degree of asymmetry increases for larger zenith angles. It is quite small for NO₂, but very pronounced for NO as will be described below.

For a simplified discussion, we assume again the weak line approximation and choose the NO Λ -doublet (Goldman and Schmidt, 1975) at 1900.08 cm^{-1} with $S = 1.0 \times 10^{-19} \text{ cm}^{-1}/(\text{molecule cm}^{-2})$ at 300°K and ground state energy of $E'' = 80.3 \text{ cm}^{-1}$, and the NO₂ four lines group (Goldman et al., 1975), including spin-splitting, at 1604.57 cm^{-1} with $S = 4.6 \times 10^{-19} \text{ cm}^{-1}/(\text{molecule cm}^{-2})$ at 296°K with $E'' = 97.8 \text{ cm}^{-1}$. These are typical spectral features used for high altitude observations of these trace gases. The temperature dependence of the line intensities is included according to standard equations. Figs. 6 and 7 show calculated integrated absorption distributions for NO and NO₂ at 93° from 30 km. Within the (small) temperature dependence, these distributions are proportional to the gas amount distributions. The latter were taken from a time-dependent

photochemical model tables of NO and NO₂ number densities at various altitudes and zenith angles, generated by R. Megill and W. Abdou. Additional NO and NO₂ figures and tables for various cases are in the Appendix C.

Figure 6 shows that most of the NO absorption is distributed widely over the portion of the path between H_{min} and 40 km in the sun direction. Thus, if the observed absorptions during sunset are used to derive mixing ratio distribution by means of Eqs. (1) and (2), the NO absorptions are then assumed to be symmetrical around H_{min}, which will lead to a large error because there is more than an order of magnitude difference in the NO mixing ratios in either direction. Here it should be noted that a given shell has different mixing ratios for different paths due to the time dependence. As an example of such an inversion of the data, we consider again the case of 30 km at 92°, 93° and 94°. The pre-calculated mixing ratios from the photochemical tables^(*) for the three layers of 30-26 km, 26-21 km and 21-14 km (as defined by the given zenith angles), are $\beta_1^{(I)} = 6.09 \times 10^{-10}$, $\beta_2^{(I)} = 7.95 \times 10^{-11}$ and $\beta_3^{(I)} = 2.22 \times 10^{-12}$ for the H_{min} to observer direction, and $\beta_1^{(II)} = 1.39 \times 10^{-9}$, $\beta_2^{(II)} = 4.54 \times 10^{-10}$ and $\beta_3^{(II)} = 1.90 \times 10^{-10}$ for the H_{min} to sun direction. The corresponding inverted β values, by Eqs. (1) and (2), are $\beta_1 = 1.13 \times 10^{-9}$, $\beta_2 = 2.55 \times 10^{-10}$ and $\beta_3 = 6.68 \times 10^{-11}$. It is apparent that while the averages of $\beta_i^{(I)}$ and $\beta_i^{(II)}$ are within 5% and 50% from the inverted β_i , the variation between $\beta_i^{(I)}$ and $\beta_i^{(II)}$ can exceed an order of magnitude (depending on the photochemical model used). Such possible variations within the shell are not accounted for in our inversion method and the resulting mixing ratios are not always meaningful. Further errors can be introduced if Eq. (3) or (4) are used. In particular,

* For simplicity the integrated absorptions were calculated without the temperature dependence (T) of the line intensity S(T) so that $A_1 = 3.842 \times 10^{-3}$, $A_2 = 3.320 \times 10^{-3}$ and $A_3 = 3.280 \times 10^{-3} \text{ cm}^{-1}$. These A values differ somewhat from the tabulated values in Appendix C which do include the temperature dependence of S. The temperature independent values have been chosen to simplify the example of using Eq. (1)-(2) where, strictly, S should vary with each layer according to temperature.

the precalculated integrated absorptions for NO along the 92°, 93° and 94° paths are 0.00384, 0.00332 and 0.00328 cm⁻¹, which are almost equal if an experimental error is allowed.

The NO₂ distributions are only slightly asymmetrical around H_{min} as demonstrated in Fig. 7, so that the inversion process will be much more accurate. In fact, for the same example as above of 30 km and 92°, 93° and 94°, the precalculated integrated absorption values of 0.0765, 0.101 and 0.124 cm⁻¹ (again calculated without the temperature dependence of the line intensities), we find $\beta_1^{(I)} = 5.82 \times 10^{-9}$, $\beta_2^{(I)} = 2.85 \times 10^{-9}$ and $\beta_3^{(I)} = 1.04 \times 10^{-9}$ for the H_{min} to observer side, and $\beta_1^{(II)} = 5.05 \times 10^{-9}$, $\beta_2^{(II)} = 2.48 \times 10^{-9}$ and $\beta_3^{(II)} = 8.51 \times 10^{-10}$ for the H_{min} to sun side. The inverted values are $\beta_1 = 4.89 \times 10^{-9}$, $\beta_2 = 2.25 \times 10^{-9}$ and $\beta_3 = 7.35 \times 10^{-10}$, which allows a meaningful inversion for NO₂ despite the slight asymmetry. See Table 1 for a summary of these comparisons. It may seem odd here that the β values are smaller than both $\beta^{(I)}$ and $\beta^{(II)}$, but this is due to the fact that $\beta^{(I)}$ and $\beta^{(II)}$ were obtained by averaging the mixing ratios of 1 km shells over each layer. The inversion is limited in altitude resolution and the layers include several 1 km shells.

It is thus seen, that a time-dependent gas distribution model can significantly affect the quantitative interpretation of sunset spectra. Since the sunset long path is needed in many cases to detect the otherwise very weak absorption of a trace constituent, a time-dependent model must be a part of the data interpretation. The layer by layer analysis can be used to test such models, even though the results will not always be unique. High sun or constant low sun observations should then be made to eliminate time-dependence effects.

5. Summary

Air mass distributions along sunset paths have been generated and used to examine some problems concerning the interpretation of

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sunset spectra in terms of mixing ratio altitude profiles of atmospheric trace constituents. It has been shown that the distributions have to be taken into account for both sunset insensitive and sunset sensitive gases.

In the first case, commonly used approximations which neglect these distributions can lead to significant errors in the derivation of mixing ratio altitude profiles. The second case is further complicated by the asymmetry of the gas distribution with respect to the minimum altitude of the path. The tables in Appendix C provide a base for correcting the interpretation of the infrared spectra of such sunset sensitive gases.

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Figure and Table Legends

- Fig. 1. Air mass distribution for 1 km shells along a 92° path from 30 km.
- Fig. 2. Accumulated air mass distribution over 1 km shells along a 92° path from 30 km.
- Fig. 3. Air mass distribution for 1 km shells along a 94° path from 30 km.
- Fig. 4. Accumulated air mass distribution for 1 km shells along a 94° path from 30 km.
- Fig. 5. Ray geometry and air mass values for 2 km shells along 91° , 92° and 93° paths from 30 km. Only one half of the symmetrical air mass distribution is shown. The minimum altitudes define the layers for the inversion.
- Fig. 6. Integrated absorption distribution of NO for 1 km shells along a 93° path from 30 km.
- Fig. 7. Integrated absorption distribution of NO_2 for 1 km shells along a 93° path from 30 km.
- Table 1. Summary of numerical examples for observer altitude of 30 km (see text for details).
- Table 2. Air mass distribution for 1 km shells along a 94° path from 30 km.

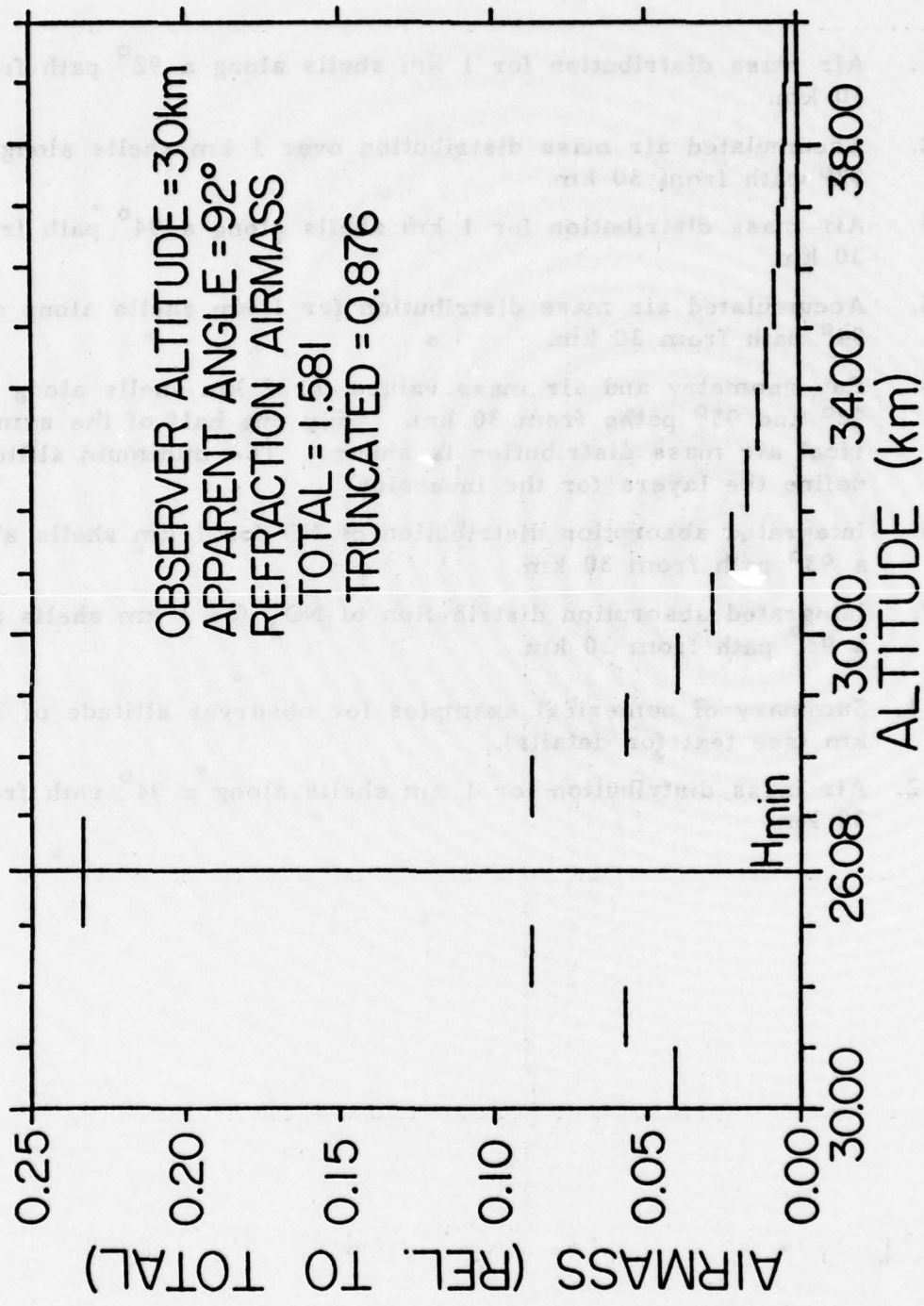


Fig. 1

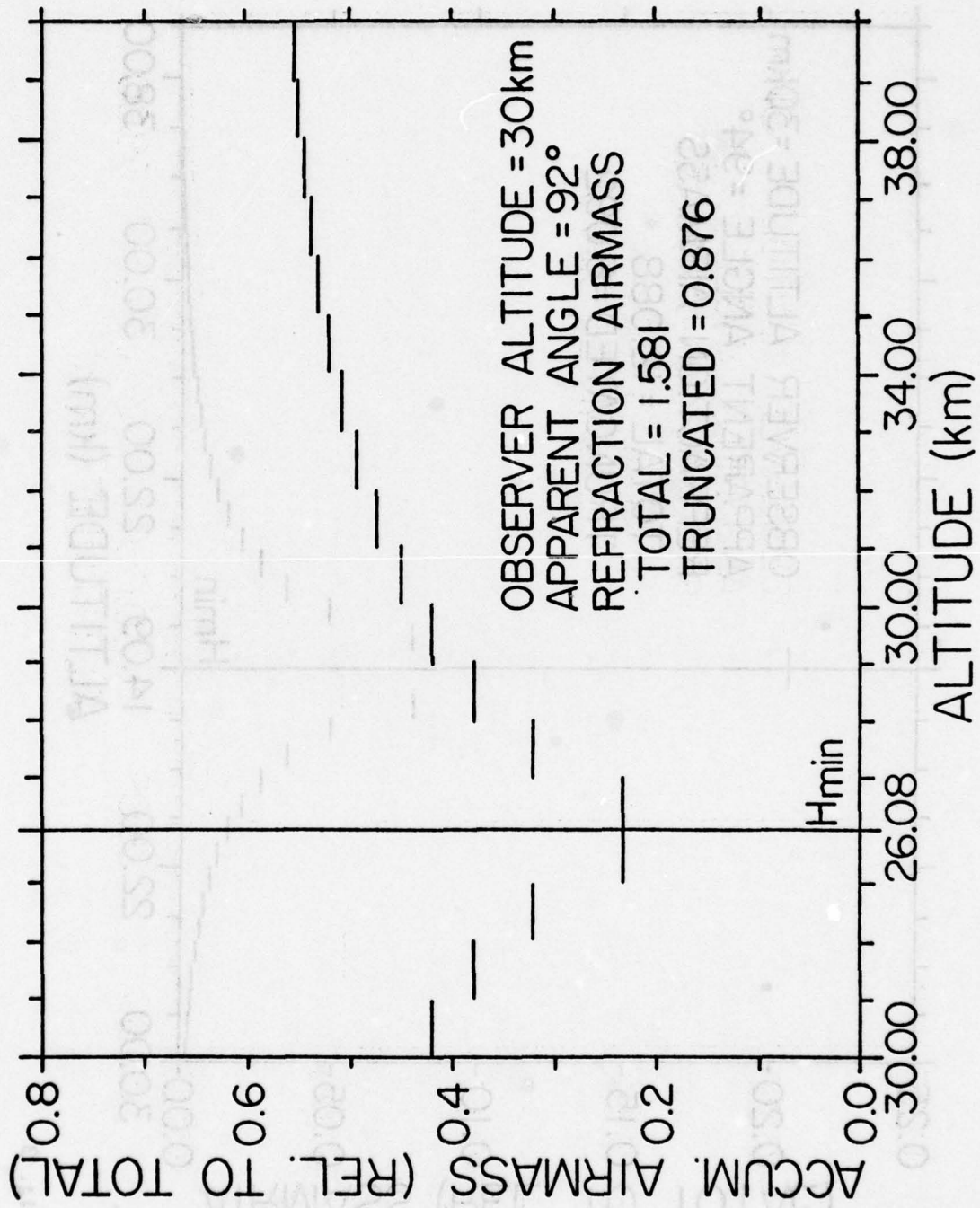


Fig. 2

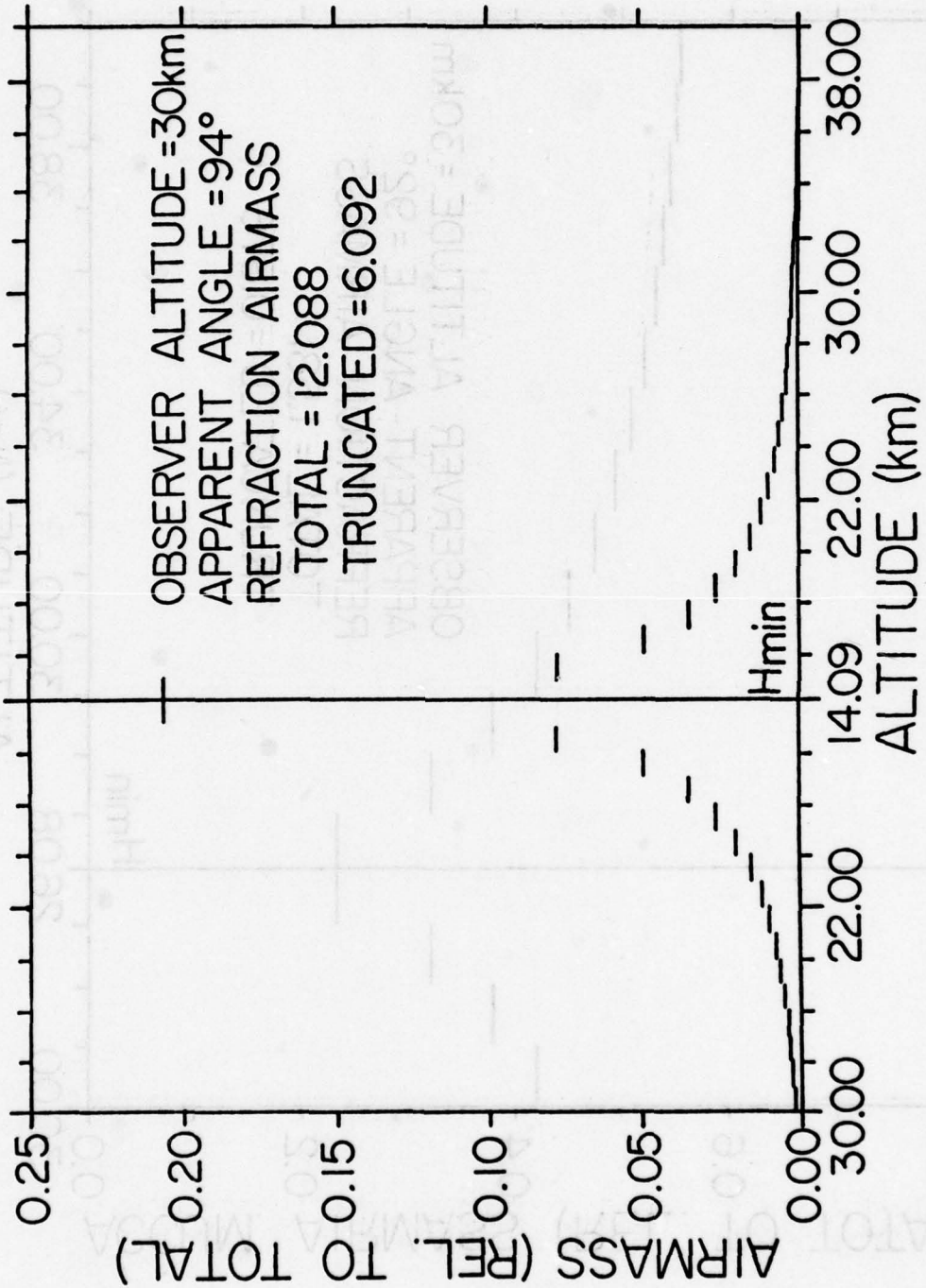


Fig. 3

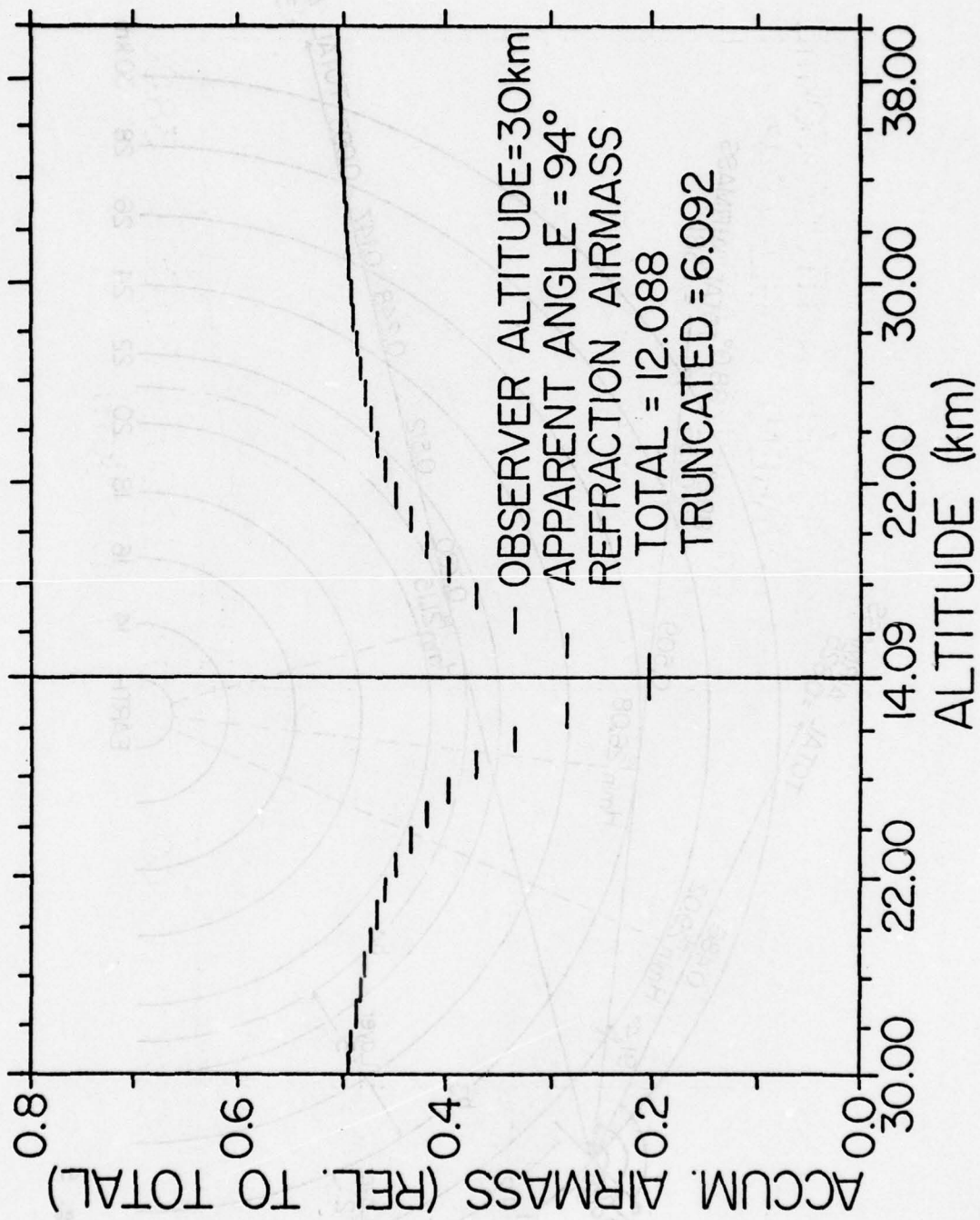


Fig. 4

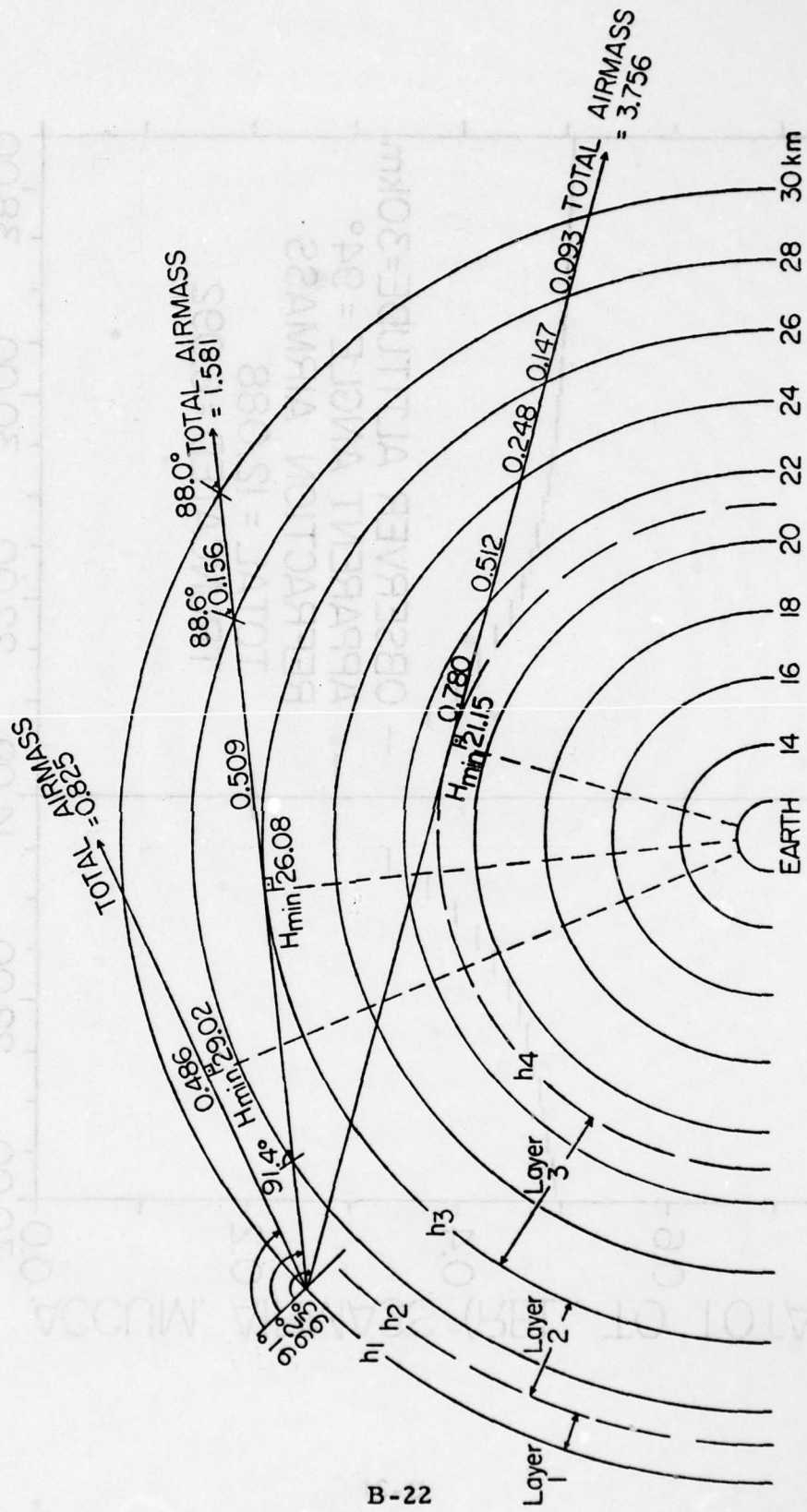


Fig. 5

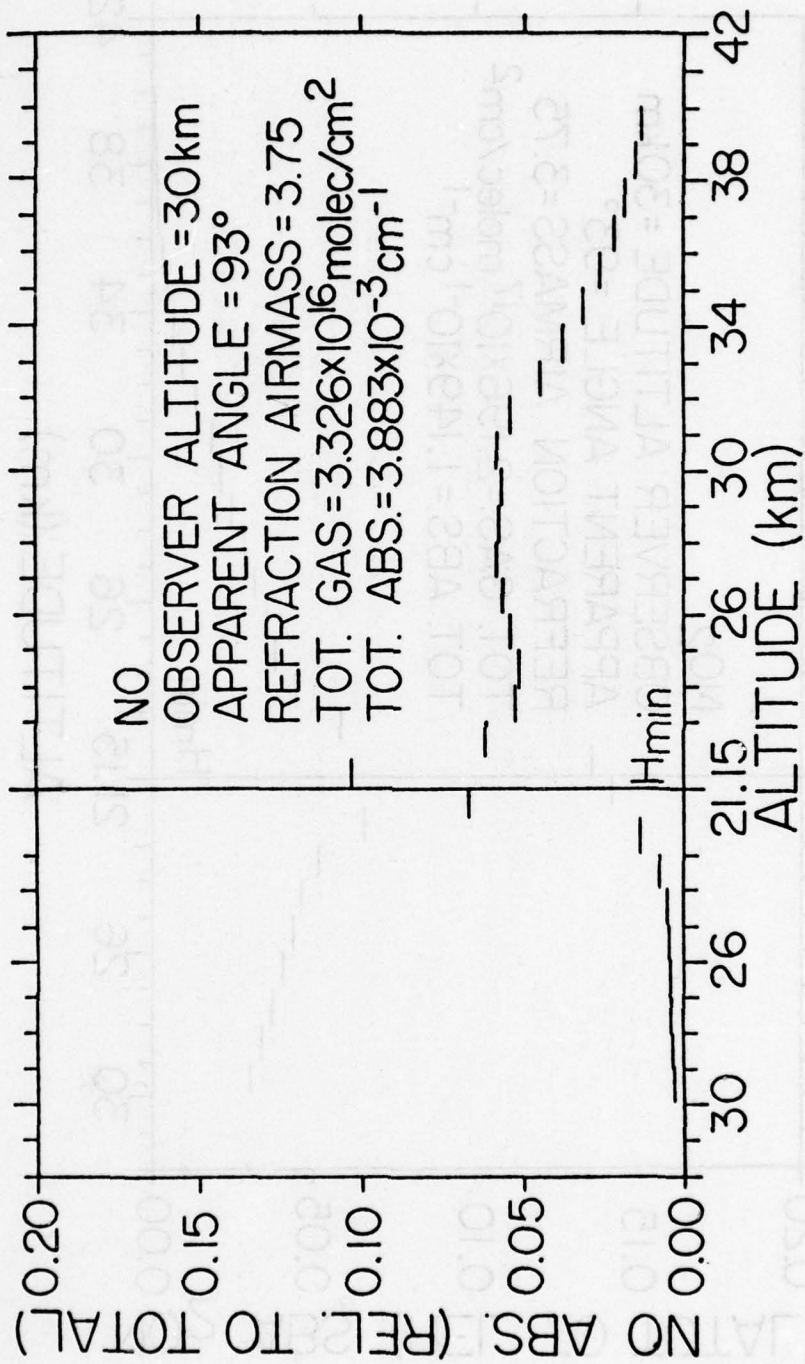


Fig. 6

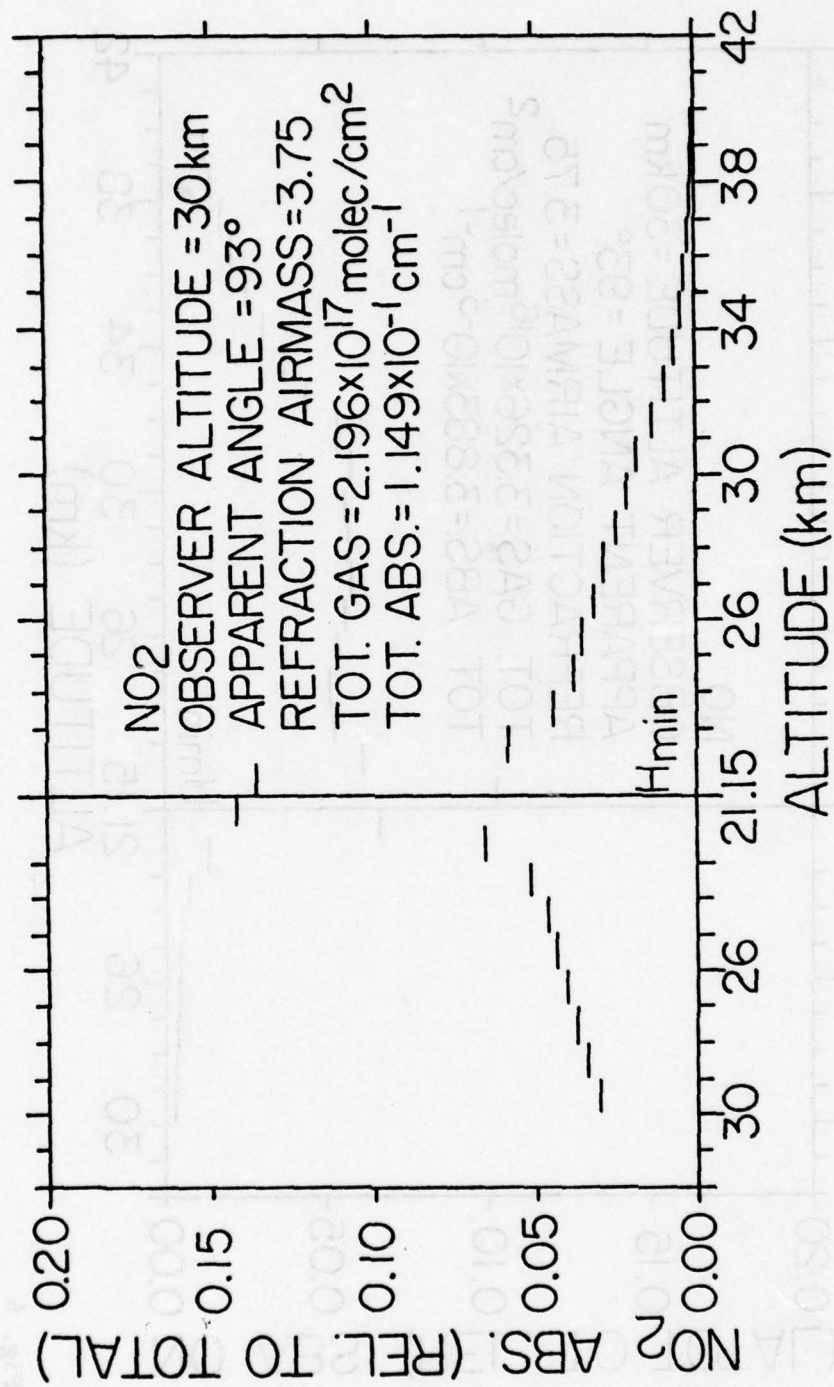


Fig. 7

Table 1. Summary of numerical examples for observer altitude of 30 km (see text for details).

Z (°)	H _{min} (km)	Airmass	Sunset Insensitive Gas			NO Gas			NO ₂ Gas		
			Eq. (1)-(2)	Approx. (3)	Approx. (4)	Precalc. $\beta^I(v/v)$	Precalc. $\beta^{II}(v/v)$	$\beta(v/v)$	Eq. (1)-(2)	Precalc. $\beta^I(v/v)$	Precalc. $\beta^{II}(v/v)$
92	26.03	1.581	2.94×10^{-8}	2.34×10^{-8}	2.98×10^{-8}	6.09×10^{-10}	1.39×10^{-9}	1.13×10^{-9}	5.82×10^{-9}	5.05×10^{-9}	4.89×10^{-9}
93	21.15	3.756	6.89×10^{-8}	6.18×10^{-8}	8.54×10^{-8}	7.95×10^{-11}	4.54×10^{-10}	2.55×10^{-10}	2.85×10^{-9}	2.48×10^{-9}	2.25×10^{-9}
94	14.99	12.088	5.69×10^{-10}	7.68×10^{-9}	N.A.	2.22×10^{-12}	1.90×10^{-10}	6.68×10^{-11}	1.04×10^{-9}	8.51×10^{-10}	7.35×10^{-10}

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Table 2.

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	ΔM	ACCUM ΔM	Δ(P-dm)	Δ(T-dm)	Δ(PATH) (KM)	ACCUM Δ(PATH) (KM)	1974.99 (PA)		
												APPEARANT Z-ANG (DEG)	BALLOON HEIGHT (KM)	EFFECTIVE PRESSURE (PA)
14.1	90.0	216.0	1.479E+04	216.0	1.453E+04	2.502E+00	3.452E+00	3.636E+04	5.404E+02	1.106E+02	1.186E+02	10974.99	217.12	19710.65
15.0	89.9	216.0	1.313E+04	216.0	1.247E+04	9.437E-01	3.452E+00	1.184E+04	2.051E+02	4.300E+01	1.597E+02	217.12		
16.0	89.4	216.0	1.121E+04	216.0	1.062E+04	5.111E-01	4.063E+00	6.493E+03	1.320E+02	3.701E+01	1.967E+02			
17.0	88.3	216.0	9.572E+03	216.0	9.064E+03	3.366E-01	4.499E+00	3.957E+03	9.230E+01	3.099E+01	2.277E+02			
18.0	88.0	216.0	8.172E+03	216.0	7.735E+03	3.269E-01	4.826E+00	2.528E+03	7.060E+01	2.719E+01	2.540E+02			
19.0	87.2	217.0	6.977E+03	217.0	6.604E+03	2.506E-01	5.077E+00	1.655E+03	5.438E+01	2.453E+01	2.794E+02			
20.0	87.4	219.0	5.981E+03	218.0	5.643E+03	1.937E-01	5.272E+00	1.104E+03	4.266E+01	2.252E+01	3.019E+02			
21.0	87.6	220.0	5.097E+03	219.0	4.825E+03	1.549E-01	5.427E+00	7.474E+02	3.352E+01	2.094E+01	3.228E+02			
22.0	87.0	222.0	4.361E+03	220.0	4.129E+03	1.228E-01	5.551E+00	5.112E+02	2.724E+01	1.965E+01	3.425E+02			
23.0	86.3	224.0	3.734E+03	222.0	3.537E+03	9.943E-02	5.651E+00	3.517E+02	2.207E+01	1.859E+01	3.611E+02			
24.0	85.1	223.0	3.202E+03	223.0	3.033E+03	8.073E-02	5.731E+00	2.449E+02	1.808E+01	1.768E+01	3.787E+02			
25.0	83.3	224.0	2.748E+03	224.0	2.603E+03	6.595E-02	5.797E+00	1.717E+02	1.477E+01	1.690E+01	3.956E+02			
26.0	83.5	224.0	2.359E+03	224.0	2.235E+03	5.432E-02	5.852E+00	1.214E+02	1.217E+01	1.622E+01	4.119E+02			
27.0	83.6	224.0	2.025E+03	224.0	1.919E+03	4.489E-02	5.896E+00	8.614E+01	1.006E+01	1.561E+01	4.275E+02			
28.0	83.7	224.0	1.739E+03	224.0	1.647E+03	3.721E-02	5.934E+00	6.129E+01	8.335E+00	1.507E+01	4.425E+02			
29.0	83.9	224.0	1.493E+03	224.0	1.415E+03	3.076E-02	5.986E+00	4.352E+01	6.851E+00	1.451E+01	4.571E+02			
14.1	90.0	216.0	1.479E+04	216.0	1.453E+04	2.502E+00	3.452E+00	3.636E+04	5.404E+02	1.106E+02	1.186E+02			
15.0	89.1	216.0	1.313E+04	216.0	1.247E+04	9.437E-01	3.452E+00	1.184E+04	2.051E+02	4.900E+01	1.597E+02			
16.0	88.6	216.0	1.121E+04	216.0	1.062E+04	6.111E-01	4.063E+00	6.493E+03	1.320E+02	3.701E+01	1.967E+02			
17.0	88.3	216.0	9.572E+03	216.0	9.064E+03	4.306E-01	4.499E+00	3.957E+03	9.430E+01	3.099E+01	2.277E+02			
18.0	88.0	216.0	8.172E+03	216.0	7.735E+03	3.269E-01	4.826E+00	2.528E+03	7.060E+01	2.719E+01	2.540E+02			
19.0	87.8	217.0	6.977E+03	217.0	6.604E+03	2.506E-01	5.077E+00	1.655E+03	5.438E+01	2.453E+01	2.794E+02			
20.0	87.6	218.0	5.981E+03	218.0	5.643E+03	1.937E-01	5.272E+00	1.104E+03	4.266E+01	2.252E+01	3.019E+02			
21.0	87.4	219.0	5.097E+03	219.0	4.825E+03	1.549E-01	5.427E+00	7.474E+02	3.352E+01	2.094E+01	3.228E+02			
22.0	87.2	220.0	4.361E+03	220.0	4.129E+03	1.228E-01	5.551E+00	5.112E+02	2.724E+01	1.965E+01	3.425E+02			
23.0	87.0	222.0	3.734E+03	222.0	3.537E+03	9.943E-02	5.651E+00	3.517E+02	2.207E+01	1.859E+01	3.611E+02			
24.0	86.3	223.0	3.202E+03	223.0	3.033E+03	8.073E-02	5.731E+00	2.449E+02	1.808E+01	1.768E+01	3.787E+02			
25.0	86.7	224.0	2.748E+03	224.0	2.603E+03	6.595E-02	5.797E+00	1.717E+02	1.477E+01	1.690E+01	3.956E+02			
26.0	86.5	224.0	2.359E+03	224.0	2.235E+03	5.432E-02	5.852E+00	1.214E+02	1.217E+01	1.622E+01	4.119E+02			
27.0	86.4	224.0	2.025E+03	224.0	1.919E+03	4.489E-02	5.896E+00	8.614E+01	1.006E+01	1.561E+01	4.275E+02			
28.0	86.3	224.0	1.739E+03	224.0	1.647E+03	3.721E-02	5.934E+00	6.129E+01	8.335E+00	1.507E+01	4.425E+02			
29.0	86.1	224.0	1.493E+03	224.0	1.415E+03	3.076E-02	5.986E+00	4.352E+01	6.851E+00	1.451E+01	4.571E+02			
30.0	86.0	234.0	1.283E+03	234.0	1.218E+03	2.471E-02	5.989E+00	3.089E+01	5.781E+00	1.414E+01	4.712E+02			
31.0	85.9	234.0	1.188E+03	234.0	1.152E+03	2.045E+02	6.030E+00	2.183E+01	4.855E+00	1.374E+01	4.849E+02			
32.0	85.6	234.0	9.579E+02	234.0	9.094E+02	1.746E+02	6.027E+00	1.556E+01	4.005E+00	1.230E+01	4.903E+02			
33.0	85.6	234.0	8.270E+02	234.0	7.858E+02	1.471E+02	6.042E+00	1.157E+01	3.442E+00	1.104E+01	5.113E+02			
34.0	85.5	234.0	7.153E+02	234.0	6.733E+02	1.214E+02	6.044E+00	8.395E+00	2.808E+00	1.266E+01	5.240E+02			
35.0	85.4	245.0	6.187E+02	245.0	5.866E+02	1.044E+02	6.044E+00	5.987E+00	2.459E+00	1.244E+01	5.364E+02			
36.0	85.3	245.0	5.301E+02	245.0	5.128E+02	8.544E+03	6.073E+00	4.544E+00	2.093E+00	1.217E+01	5.486E+02			
37.0	85.2	245.0	4.601E+02	245.0	4.445E+02	7.242E+03	6.080E+00	3.240E+00	1.754E+00	1.193E+01	5.605E+02			
38.0	85.1	245.0	4.072E+02	245.0	3.874E+02	6.212E+03	6.080E+00	2.440E+00	1.522E+00	1.170E+01	5.722E+02			
39.0	85.0	245.0	3.542E+02	245.0	3.371E+02	5.272E+03	6.082E+00	1.777E+00	1.292E+00	1.141E+01	5.837E+02			

APPENDIX C

This appendix includes three sets of tables and figures in this order.

- 1) Air mass distributions for balloon altitudes of 15, 20, 25, 30, 35, 40, 45 and 50 km each for apparent zenith angles of 90.5° , 91.0° , 91.5° , . . . , in steps of 0.5° until the earth's disk is reached.
- 2) Integrated absorption distributions for NO for 30 km and 90.5° , 91.0° , 91.5° , . . . , 94.5° .
- 3) Integrated absorption distributions for NO₂ for 30 km and 90.5° , 91.0° , 91.5° , . . . , 94.5° .

AIRMASS TABLES

APPARENT Z-ANG 90.50 (DEG)
 BALLOON HEIGHT 15.00 (KM)
 TANGENT HEIGHT 14.74 (KM)
 OPTICAL AIR MASS 6.751

EFFECTIVE PRESSURE 10545.33 (PA)
 EFFECTIVE TEMPERATURE 217.35 (DEG K)
 TANGENT PRESSURE 13913.83 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
14.7	98.8	216.0	1.366E+04	216.0	1.366E+04	1.237E+00	1.237E+00	1.690E+04	2.671E+02	5.813E+01	5.813E+01
14.7	98.0	216.0	1.366E+04	216.0	1.366E+04	1.237E+00	1.237E+00	1.690E+04	2.671E+02	5.813E+01	5.813E+01
15.0	89.5	216.0	1.313E+04	216.0	1.253E+04	1.360E+00	2.604E+00	1.714E+04	2.954E+02	7.024E+01	1.204E+02
16.0	88.9	216.0	1.121E+04	216.0	1.064E+04	7.180E-01	3.323E+00	1.745E+03	1.553E+01	4.349E+01	1.719E+02
17.0	88.5	216.0	9.572E+03	216.0	9.068E+03	4.857E-01	3.809E+00	4.495E+03	1.049E+02	3.447E+01	2.063E+02
18.0	88.2	216.0	8.172E+03	216.0	7.737E+03	3.540E-01	4.163E+00	2.730E+03	7.645E+01	2.944E+01	2.358E+02
19.0	87.9	217.0	6.977E+03	217.0	6.605E+03	2.670E-01	4.430E+00	1.764E+03	5.794E+01	2.613E+01	2.619E+02
20.0	87.7	218.0	5.961E+03	218.0	5.643E+03	2.063E-01	4.636E+00	1.164E+03	4.498E+01	2.374E+01	2.856E+02
21.0	87.5	219.0	5.097E+03	219.0	4.825E+03	1.621E-01	4.790E+00	7.820E+02	3.549E+01	2.191E+01	3.075E+02
22.0	87.3	220.0	4.364E+03	220.0	4.129E+03	1.204E-01	4.927E+00	5.310E+02	2.833E+01	2.044E+01	3.200E+02
23.0	87.1	222.0	3.734E+03	222.0	3.537E+03	1.030E-01	5.030E+00	3.643E+02	2.286E+01	1.925E+01	3.472E+02
24.0	87.0	223.0	3.202E+03	223.0	3.034E+03	8.332E-02	5.114E+00	2.527E+02	1.050E+01	1.024E+01	3.655E+02

APPARENT Z-ANG 91.00 (DEG)
 BALLOON HEIGHT 15.00 (KM)
 TANGENT HEIGHT 13.97 (KM)
 OPTICAL AIR MASS 0.938

EFFECTIVE PRESSURE 12253.12 (PA)
 EFFECTIVE TEMPERATURE 216.99 (DEG K)
 TANGENT PRESSURE 16228.10 (PA)

EFFECT PRESSURE 4.445E-01
 DEL (DM) 4.445E-01
 ACCUM DEL (DM) 4.445E-01

DEL (P-DM) 6.038E+03
 DEL (T-DM) 9.601E+01
 DEL (PATH) 1.855E+01
 ACCUM DEL (PATH) 1.855E+01

DEL (P-DM) 3.331E+04
 DEL (T-DM) 4.864E+02
 DEL (PATH) 9.794E+01
 ACCUM DEL (PATH) 1.165E+02

DEL (P-DM) 6.038E+03
 DEL (T-DM) 9.601E+01
 DEL (PATH) 1.855E+01
 ACCUM DEL (PATH) 1.855E+01

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
14.0	90.0	216.0	1.538E+04	216.0	1.538E+04	4.445E-01	4.445E-01	6.038E+03	9.601E+01	1.855E+01	1.855E+01
14.0	90.2	216.0	1.538E+04	216.0	1.479E+04	2.252E+00	2.696E+00	3.331E+04	4.864E+02	9.794E+01	1.165E+02
14.0	90.0	216.0	1.538E+04	216.0	1.538E+04	4.445E-01	4.445E-01	6.038E+03	9.601E+01	1.855E+01	1.855E+01
14.0	89.8	216.0	1.538E+04	216.0	1.479E+04	2.252E+00	2.696E+00	3.331E+04	4.864E+02	9.794E+01	1.165E+02
15.0	89.0	216.0	1.313E+04	216.0	1.247E+04	9.094E-01	3.606E+00	1.134E+04	1.964E+02	4.694E+01	1.634E+02
16.0	88.6	216.0	1.121E+04	216.0	1.062E+04	5.963E-01	4.202E+00	6.335E+03	1.288E+02	3.611E+01	1.995E+02
17.0	88.3	216.0	9.572E+03	216.0	9.063E+03	4.291E-01	4.631E+00	3.089E+03	9.270E+01	3.047E+01	2.308E+02
18.0	88.0	216.0	8.172E+03	216.0	7.734E+03	3.226E-01	4.954E+00	2.495E+03	6.968E+01	2.683E+01	2.568E+02
19.0	87.8	217.0	6.977E+03	217.0	6.604E+03	2.479E-01	5.202E+00	1.637E+03	5.379E+01	2.427E+01	2.811E+02
20.0	87.6	218.0	5.961E+03	218.0	5.643E+03	1.939E-01	5.396E+00	1.094E+03	4.226E+01	2.232E+01	3.034E+02
21.0	87.4	219.0	5.097E+03	219.0	4.825E+03	1.537E-01	5.549E+00	7.416E+02	3.366E+01	2.078E+01	3.242E+02
22.0	87.2	220.0	4.361E+03	220.0	4.129E+03	1.230E-01	5.672E+00	5.077E+02	2.705E+01	1.951E+01	3.437E+02
23.0	87.0	222.0	3.734E+03	222.0	3.537E+03	9.082E-02	5.771E+00	3.496E+02	2.194E+01	1.847E+01	3.622E+02
24.0	86.8	223.0	3.202E+03	223.0	3.033E+03	8.029E-02	5.851E+00	2.435E+02	1.790E+01	1.758E+01	3.798E+02

APPARENT Z-ANG 91.50 (DEG)
 BALLOON HEIGHT 15.00 (KM)
 TANGENT HEIGHT 12.69 (KM)
 OPTICAL AIR MASS 12.195

EFFECTIVE PRESSURE 14944.96 (PA)
 EFFECTIVE TEMPERATURE 218.49 (DEG K)
 TANGENT PRESSURE 20581.77 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
12.7	90.0	222.0	1.874E+04	222.0	1.874E+04	1.831E+00	1.831E+00	3.431E+04	4.066E+02	6.451E+01	6.451E+01
13.0	90.6	216.0	1.802E+04	216.0	1.717E+04	1.791E+00	3.622E+00	3.076E+04	3.868E+02	6.709E+01	1.316E+02
14.0	88.9	216.0	1.538E+04	216.0	1.459E+04	9.744E-01	4.597E+00	1.422E+04	2.105E+02	4.297E+01	1.746E+02
15.0	88.5	216.0	1.313E+04	216.0	1.244E+04	6.627E-01	5.259E+00	8.244E+03	1.431E+02	3.427E+01	2.888E+02
16.0	88.2	216.0	1.121E+04	216.0	1.061E+04	4.843E-01	5.744E+00	5.141E+03	1.046E+02	2.936E+01	2.382E+02
17.0	87.9	216.0	9.572E+03	216.0	9.059E+03	3.674E-01	6.111E+00	3.328E+03	7.935E+01	2.609E+01	2.643E+02
18.0	87.7	216.0	8.172E+03	216.0	7.732E+03	2.849E-01	6.396E+00	2.283E+03	6.154E+01	2.371E+01	2.888E+02
19.0	87.5	217.0	6.977E+03	217.0	6.602E+03	2.235E-01	6.619E+00	1.476E+03	4.851E+01	2.189E+01	3.099E+02
20.0	87.3	218.0	5.961E+03	218.0	5.642E+03	1.775E-01	6.797E+00	1.001E+03	3.869E+01	2.043E+01	3.383E+02
21.0	87.1	219.0	5.097E+03	219.0	4.824E+03	1.422E-01	6.939E+00	6.863E+02	3.115E+01	1.923E+01	3.495E+02
22.0	87.0	220.0	4.361E+03	220.0	4.129E+03	1.148E-01	7.054E+00	4.739E+02	2.525E+01	1.822E+01	3.678E+02
23.0	86.8	222.0	3.734E+03	222.0	3.537E+03	9.290E-02	7.147E+00	3.286E+02	2.062E+01	1.737E+01	3.851E+02
24.0	86.6	223.0	3.202E+03	223.0	3.033E+03	7.590E-02	7.223E+00	2.302E+02	1.693E+01	1.662E+01	4.018E+02

APPARENT Z-ANG 92.00 (DEG) EFFECTIVE PRESSURE 19227.21 (PA)
 BALLOON HEIGHT 15.00 (KM) EFFECTIVE TEMPERATURE 224.35 (DEG K)
 TANGENT HEIGHT 10.00 (KM) TANGENT PRESSURE 20442.04 (PA)
 OPTICAL AIR MASS 17.076

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
10.9	90.0	231.0	2.443E+04	231.0	2.443E+04	1.415E+00	1.415E+00	3.455E+04	3.279E+02	3.991E+01	3.991E+01
11.0	90.3	229.0	2.443E+04	229.0	2.342E+04	2.820E+00	4.234E+00	6.604E+04	6.457E+02	8.211E+01	1.220E+02
12.0	91.0	222.0	2.103E+04	222.0	1.998E+04	1.363E+00	5.617E+00	2.762E+04	3.069E+02	4.576E+01	1.678E+02
13.0	91.4	216.0	1.802E+04	216.0	1.707E+04	9.436E-01	6.561E+00	1.611E+04	2.030E+02	3.556E+01	2.033E+02
14.0	91.7	216.0	1.538E+04	216.0	1.457E+04	6.838E-01	7.244E+00	9.959E+03	1.477E+02	3.021E+01	2.336E+02
10.9	90.0	231.0	2.443E+04	231.0	2.443E+04	1.415E+00	1.415E+00	3.455E+04	3.279E+02	3.991E+01	3.991E+01
11.0	89.7	229.0	2.443E+04	229.0	2.342E+04	2.820E+00	4.234E+00	6.604E+04	6.457E+02	8.211E+01	1.220E+02
12.0	89.0	222.0	2.103E+04	222.0	1.998E+04	1.363E+00	5.617E+00	2.762E+04	3.069E+02	4.576E+01	1.678E+02
13.0	88.6	216.0	1.802E+04	216.0	1.707E+04	9.436E-01	6.561E+00	1.611E+04	2.030E+02	3.556E+01	2.033E+02
14.0	88.3	216.0	1.538E+04	216.0	1.457E+04	6.838E-01	7.244E+00	9.959E+03	1.477E+02	3.021E+01	2.336E+02
15.0	88.0	216.0	1.313E+04	216.0	1.243E+04	5.159E-01	7.768E+00	6.413E+03	1.114E+02	2.671E+01	2.603E+02
16.0	87.8	216.0	1.121E+04	216.0	1.061E+04	3.989E-01	8.159E+00	4.232E+03	8.616E+01	2.419E+01	2.845E+02
17.0	87.6	216.0	9.572E+03	216.0	9.056E+03	3.135E-01	8.473E+00	2.839E+03	6.771E+01	2.227E+01	3.067E+02
18.0	87.4	216.0	8.172E+03	216.0	7.730E+03	2.491E-01	8.722E+00	1.926E+03	5.382E+01	2.074E+01	3.275E+02
19.0	87.2	217.0	6.977E+03	217.0	6.601E+03	1.990E-01	8.921E+00	1.314E+03	4.319E+01	1.949E+01	3.478E+02
20.0	87.0	218.0	5.961E+03	218.0	5.641E+03	1.602E-01	9.081E+00	9.830E+02	3.493E+01	1.845E+01	3.654E+02
21.0	86.8	219.0	5.097E+03	219.0	4.824E+03	1.298E-01	9.211E+00	6.262E+02	2.835E+01	1.755E+01	3.838E+02
22.0	86.7	220.0	4.361E+03	220.0	4.128E+03	1.057E-01	9.317E+00	4.363E+02	2.325E+01	1.677E+01	3.997E+02
23.0	86.5	222.0	3.734E+03	222.0	3.537E+03	8.615E-02	9.403E+00	3.047E+02	1.942E+01	1.611E+01	4.158E+02
24.0	86.4	223.0	3.202E+03	223.0	3.033E+03	7.002E-02	9.474E+00	2.140E+02	1.579E+01	1.551E+01	4.313E+02

APPARENT Z-ANG 92.50 (DEG) EFFECTIVE PRESSURE 26177.18 (PA)
 BALLOON HEIGHT 15.00 (KM) EFFECTIVE TEMPERATURE 235.65 (DEG K)
 TANGENT HEIGHT 8.53 (KM) TANGENT PRESSURE 43874.81 (PA)
 OPTICAL AIR MASS 24.704

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
8.5	90.0	248.0	3.372E+04	248.0	3.372E+04	3.744E+00	3.744E+00	1.263E+05	9.286E+02	8.188E+01	8.188E+01
9.0	90.7	242.0	3.256E+04	242.0	3.114E+04	2.641E+00	6.385E+00	8.223E+04	6.391E+02	6.111E+01	1.430E+02
10.0	88.8	235.0	2.826E+04	235.0	2.690E+04	1.598E+00	7.983E+00	4.299E+04	3.756E+02	4.157E+01	1.846E+02
11.0	91.5	229.0	2.443E+04	229.0	2.320E+04	1.146E+00	9.129E+00	2.658E+04	2.623E+02	3.368E+01	2.182E+02
12.0	91.8	222.0	2.103E+04	222.0	1.993E+04	8.749E-01	1.008E+01	1.744E+04	1.942E+02	2.903E+01	2.473E+02
13.0	92.1	216.0	1.802E+04	216.0	1.709E+04	6.842E-01	1.069E+01	1.167E+04	1.478E+02	2.581E+01	2.731E+02
14.0	92.3	216.0	1.538E+04	216.0	1.456E+04	5.327E-01	1.122E+01	7.753E+03	1.151E+02	2.355E+01	2.966E+02
8.5	90.0	248.0	3.372E+04	248.0	3.372E+04	3.744E+00	3.744E+00	1.263E+05	9.286E+02	8.188E+01	8.188E+01
9.0	89.3	242.0	3.256E+04	242.0	3.114E+04	2.641E+00	6.385E+00	8.223E+04	6.391E+02	6.111E+01	1.430E+02
10.0	88.8	235.0	2.826E+04	235.0	2.690E+04	1.598E+00	7.983E+00	4.299E+04	3.756E+02	4.157E+01	1.846E+02
11.0	88.5	229.0	2.443E+04	229.0	2.320E+04	1.146E+00	9.129E+00	2.658E+04	2.623E+02	3.368E+01	2.182E+02
12.0	88.2	222.0	2.103E+04	222.0	1.993E+04	8.749E-01	1.008E+01	1.744E+04	1.942E+02	2.903E+01	2.473E+02
13.0	87.9	216.0	1.802E+04	216.0	1.709E+04	6.842E-01	1.069E+01	1.167E+04	1.478E+02	2.581E+01	2.731E+02
14.0	87.7	216.0	1.538E+04	216.0	1.456E+04	5.327E-01	1.122E+01	7.753E+03	1.151E+02	2.355E+01	2.966E+02
15.0	87.5	216.0	1.313E+04	216.0	1.242E+04	4.206E-01	1.164E+01	5.226E+03	9.005E+01	2.178E+01	3.184E+02
16.0	87.3	216.0	1.121E+04	216.0	1.061E+04	3.356E-01	1.198E+01	3.559E+03	7.249E+01	2.036E+01	3.388E+02
17.0	87.1	216.0	9.572E+03	216.0	9.053E+03	2.699E-01	1.225E+01	2.443E+03	5.830E+01	1.918E+01	3.580E+02
18.0	87.0	216.0	8.172E+03	216.0	7.729E+03	2.183E-01	1.247E+01	1.687E+03	4.716E+01	1.818E+01	3.761E+02
19.0	86.8	217.0	6.977E+03	217.0	6.600E+03	1.769E-01	1.264E+01	1.167E+03	3.838E+01	1.732E+01	3.935E+02
20.0	86.7	218.0	5.961E+03	218.0	5.640E+03	1.440E-01	1.279E+01	8.123E+02	3.148E+01	1.658E+01	4.100E+02
21.0	86.5	219.0	5.097E+03	219.0	4.823E+03	1.178E-01	1.298E+01	5.681E+02	2.579E+01	1.593E+01	4.268E+02
22.0	86.4	220.0	4.361E+03	220.0	4.128E+03	9.663E-02	1.308E+01	3.989E+02	2.126E+01	1.534E+01	4.413E+02
23.0	86.2	222.0	3.734E+03	222.0	3.536E+03	7.931E-02	1.308E+01	2.805E+02	1.761E+01	1.483E+01	4.561E+02
24.0	86.1	223.0	3.202E+03	223.0	3.033E+03	6.558E-02	1.315E+01	1.989E+02	1.482E+01	1.436E+01	4.785E+02

APPARENT Z-ANG 93.00 (DEG)
 BALLOON HEIGHT 15.00 (KM)
 TANGENT HEIGHT 5.60 (KM)
 OPTICAL AIR MASS 36.811

EFFECTIVE PRESSURE 37979.13 (PA)
 EFFECTIVE TEMPERATURE 250.41 (DEG K)
 TANGENT PRESSURE 73451.50 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
5.6	90.8	267.0	5.037E+04	267.0	5.037E+04	4.804E+00	4.804E+00	2.420E+05	1.263E+03	7.571E+01	7.571E+01
6.8	90.6	261.0	4.877E+04	261.0	4.680E+04	3.805E+00	8.689E+00	1.818E+05	1.014E+03	6.450E+01	1.402E+02
7.0	91.1	255.0	4.277E+04	255.0	4.087E+04	2.307E+00	1.100E+01	9.427E+04	5.082E+02	4.285E+01	1.831E+02
8.0	91.5	248.0	3.739E+04	248.0	3.565E+04	1.661E+00	1.266E+01	5.923E+04	4.121E+02	3.442E+01	2.175E+02
9.0	91.8	242.0	3.256E+04	242.0	3.100E+04	1.273E+00	1.393E+01	3.946E+04	3.081E+02	2.960E+01	2.471E+02
10.0	92.0	235.0	2.826E+04	235.0	2.686E+04	1.010E+00	1.494E+01	2.713E+04	2.374E+02	2.632E+01	2.734E+02
11.0	92.3	229.0	2.443E+04	229.0	2.318E+04	8.142E-01	1.575E+01	1.887E+04	1.864E+02	2.396E+01	2.974E+02
12.0	92.5	222.0	2.103E+04	222.0	1.992E+04	6.659E-01	1.642E+01	1.326E+04	1.478E+02	2.210E+01	3.195E+02
13.0	92.7	216.0	1.802E+04	216.0	1.705E+04	5.447E-01	1.697E+01	9.285E+03	1.177E+02	2.056E+01	3.400E+02
14.0	92.8	216.0	1.530E+04	216.0	1.455E+04	4.300E-01	1.740E+01	6.372E+03	9.460E+01	1.937E+01	3.594E+02
5.6	90.0	267.0	5.037E+04	267.0	5.037E+04	4.804E+00	4.804E+00	2.420E+05	1.263E+03	7.571E+01	7.571E+01
6.0	89.4	261.0	4.877E+04	261.0	4.680E+04	3.805E+00	8.689E+00	1.818E+05	1.014E+03	6.450E+01	1.402E+02
7.0	88.9	255.0	4.277E+04	255.0	4.087E+04	2.307E+00	1.100E+01	9.427E+04	5.082E+02	4.285E+01	1.831E+02
8.0	88.5	248.0	3.739E+04	248.0	3.565E+04	1.661E+00	1.266E+01	5.923E+04	4.121E+02	3.442E+01	2.175E+02
9.0	88.2	242.0	3.256E+04	242.0	3.100E+04	1.273E+00	1.393E+01	3.946E+04	3.081E+02	2.960E+01	2.471E+02
10.0	88.0	235.0	2.826E+04	235.0	2.686E+04	1.010E+00	1.494E+01	2.713E+04	2.374E+02	2.632E+01	2.734E+02
11.0	87.7	229.0	2.443E+04	229.0	2.318E+04	8.142E-01	1.575E+01	1.887E+04	1.864E+02	2.396E+01	2.974E+02
12.0	87.5	222.0	2.103E+04	222.0	1.992E+04	6.659E-01	1.642E+01	1.326E+04	1.478E+02	2.210E+01	3.195E+02
13.0	87.3	216.0	1.802E+04	216.0	1.705E+04	5.447E-01	1.697E+01	9.285E+03	1.177E+02	2.056E+01	3.400E+02
14.0	87.2	216.0	1.530E+04	216.0	1.455E+04	4.300E-01	1.740E+01	6.372E+03	9.460E+01	1.937E+01	3.594E+02
15.0	87.0	216.0	1.313E+04	216.0	1.242E+04	3.543E-01	1.776E+01	4.401E+03	7.653E+01	1.835E+01	3.777E+02
16.0	86.8	216.0	1.121E+04	216.0	1.060E+04	2.881E-01	1.805E+01	3.055E+03	6.223E+01	1.748E+01	3.952E+02
17.0	86.7	216.0	9.572E+03	216.0	9.052E+03	2.353E-01	1.828E+01	2.130E+03	5.082E+01	1.672E+01	4.119E+02
18.0	86.5	216.0	8.172E+03	216.0	7.728E+03	1.927E-01	1.847E+01	1.499E+03	4.163E+01	1.605E+01	4.280E+02
19.0	86.4	217.0	6.977E+03	217.0	6.599E+03	1.570E-01	1.863E+01	1.041E+03	3.424E+01	1.546E+01	4.434E+02
20.0	86.3	218.0	5.961E+03	218.0	5.640E+03	1.298E-01	1.876E+01	7.310E+02	2.826E+01	1.492E+01	4.584E+02
21.0	86.1	219.0	5.097E+03	219.0	4.823E+03	1.069E-01	1.887E+01	5.151E+02	2.339E+01	1.445E+01	4.728E+02
22.0	86.0	220.0	4.361E+03	220.0	4.128E+03	8.821E-02	1.896E+01	3.641E+02	1.941E+01	1.400E+01	4.868E+02
23.0	85.9	222.0	3.734E+03	222.0	3.536E+03	7.282E-02	1.903E+01	2.575E+02	1.617E+01	1.362E+01	5.004E+02
24.0	85.8	223.0	3.202E+03	223.0	3.033E+03	6.092E-02	1.909E+01	1.835E+02	1.350E+01	1.325E+01	5.137E+02

APPARENT Z-ANG 90.50 (DEG) EFFECTIVE PRESSURE 4735.42 (PA)
 BALLOON HEIGHT 20.00 (KM) EFFECTIVE TEMPERATURE 220.40 (DEG K)
 TANGENT HEIGHT 19.75 (KM) TANGENT PRESSURE 6198.40 (PA)
 OPTICAL AIR MASS 3.016

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (KM)	ACCUM DEL (KM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
19.0	90.0	217.0	6.200E+03	217.0	6.200E+03	5.463E-01	5.463E-01	3.387E+03	1.185E+02	5.685E+01	5.685E+01
19.0	90.0	217.0	5.961E+03	217.0	5.961E+03	5.463E-01	5.463E-01	3.257E+03	1.185E+02	5.912E+01	5.912E+01
20.0	89.5	218.0	5.961E+03	218.0	5.690E+03	5.136E-01	1.160E+00	3.491E+03	1.338E+02	7.003E+01	1.292E+02
21.0	88.9	219.0	5.097E+03	219.0	4.838E+03	3.207E-01	1.481E+00	1.552E+03	7.024E+01	4.324E+01	1.724E+02
22.0	88.5	220.0	4.361E+03	220.0	4.135E+03	2.163E-01	1.697E+00	8.943E+02	4.758E+01	3.427E+01	2.067E+02
23.0	88.2	222.0	3.734E+03	222.0	3.541E+03	1.570E-01	1.854E+00	5.558E+02	3.485E+01	2.932E+01	2.360E+02
24.0	87.9	223.0	3.202E+03	223.0	3.036E+03	1.190E-01	1.973E+00	3.613E+02	2.654E+01	2.604E+01	2.628E+02
25.0	87.7	224.0	2.748E+03	224.0	2.609E+03	9.248E-02	2.065E+00	2.409E+02	2.072E+01	2.369E+01	2.857E+02
26.0	87.5	224.0	2.359E+03	224.0	2.236E+03	7.331E-02	2.139E+00	1.639E+02	1.642E+01	2.188E+01	3.076E+02
27.6	87.3	224.0	2.025E+03	224.0	1.919E+03	5.878E-02	2.198E+00	1.128E+02	1.377E+01	2.043E+01	3.280E+02
28.0	87.1	224.0	1.739E+03	224.0	1.648E+03	4.753E-02	2.245E+00	7.832E+01	1.065E+01	1.925E+01	3.473E+02
29.0	86.9	224.0	1.493E+03	224.0	1.415E+03	3.850E-02	2.284E+00	5.448E+01	8.625E+00	1.815E+01	3.654E+02

APPARENT Z-ANG		EFFECTIVE PRESSURE		EFFECTIVE TEMPERATURE		TANGENT PRESSURE					
91.00 (DEG)		5452.66 (PA)		219.41 (DEG K)		7069.96 (PA)					
BALLOON HEIGHT		EFFECTIVE PRESSURE		EFFECTIVE TEMPERATURE		TANGENT PRESSURE					
20.00 (KM)		5452.66 (PA)		219.41 (DEG K)		7069.96 (PA)					
TANGENT HEIGHT		EFFECTIVE PRESSURE		EFFECTIVE TEMPERATURE		TANGENT PRESSURE					
19.00 (KM)		5452.66 (PA)		219.41 (DEG K)		7069.96 (PA)					
OPTICAL AIR MASS		EFFECTIVE PRESSURE		EFFECTIVE TEMPERATURE		TANGENT PRESSURE					
3.965		5452.66 (PA)		219.41 (DEG K)		7069.96 (PA)					
ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
19.0	90.0	217.0	6.708E+03	217.0	6.606E+03	1.183E+00	1.183E+00	7.816E+03	2.568E+02	1.157E+02	1.157E+02
19.0	90.0	217.0	6.708E+03	217.0	6.606E+03	1.183E+00	1.183E+00	7.816E+03	2.568E+02	1.157E+02	1.157E+02
20.0	89.0	218.0	5.961E+03	218.0	5.661E+03	4.094E-01	1.593E+00	2.317E+03	8.924E+01	4.696E+01	1.626E+02
21.0	88.6	219.0	5.097E+03	219.0	4.833E+03	2.669E-01	1.860E+00	1.290E+03	5.844E+01	3.602E+01	1.966E+02
22.0	88.3	220.0	4.361E+03	220.0	4.133E+03	1.915E-01	2.051E+00	7.914E+02	4.212E+01	3.035E+01	2.290E+02
23.0	88.0	222.0	3.734E+03	222.0	3.540E+03	1.433E-01	2.194E+00	5.072E+02	3.181E+01	2.677E+01	2.598E+02
24.0	87.8	223.0	3.202E+03	223.0	3.035E+03	1.106E-01	2.305E+00	3.358E+02	2.467E+01	2.421E+01	2.800E+02
25.0	87.5	224.0	2.748E+03	224.0	2.604E+03	8.702E-02	2.392E+00	2.266E+02	1.949E+01	2.229E+01	3.023E+02
26.0	87.3	224.0	2.359E+03	224.0	2.236E+03	6.958E-02	2.462E+00	1.556E+02	1.599E+01	2.077E+01	3.230E+02
27.0	87.2	224.0	2.025E+03	224.0	1.919E+03	5.615E-02	2.518E+00	1.078E+02	1.258E+01	1.952E+01	3.425E+02
28.0	87.0	224.0	1.739E+03	224.0	1.648E+03	4.564E-02	2.563E+00	7.520E+01	1.022E+01	1.848E+01	3.618E+02
29.0	86.8	224.0	1.493E+03	224.0	1.415E+03	3.712E-02	2.608E+00	5.252E+01	8.315E+00	1.750E+01	3.785E+02

APPARENT Z-ANG 91.50 (DEG)
 BALLOON HEIGHT 20.00 (KM)
 TANGENT HEIGHT 17.75 (KM)
 OPTICAL AIR MASS 5.451

EFFECTIVE PRESSURE 6660.97 (PA)
 EFFECTIVE TEMPERATURE 218.03 (DEG K)
 TANGENT PRESSURE 8824.32 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
17.8	90.0	216.0	8.172E+03	216.0	8.172E+03	7.533E-01	7.533E-01	6.156E+03	1.627E+02	5.920E+01	5.920E+01
18.0	90.5	216.0	8.172E+03	216.0	7.796E+03	8.505E-01	1.604E+00	6.531E+03	1.837E+02	7.019E+01	1.294E+02
19.0	88.9	217.0	6.977E+03	217.0	6.620E+03	4.437E-01	2.047E+00	2.937E+03	9.628E+01	4.332E+01	1.727E+02
20.0	88.5	218.0	5.981E+03	218.0	5.650E+03	2.987E-01	2.346E+00	1.688E+03	6.513E+01	3.434E+01	2.070E+02
21.0	86.2	219.0	5.097E+03	219.0	4.829E+03	2.173E-01	2.563E+00	1.049E+03	4.758E+01	2.935E+01	2.364E+02
22.0	87.9	220.0	4.361E+03	220.0	4.132E+03	1.542E-01	2.728E+00	6.785E+02	3.613E+01	2.605E+01	2.624E+02
23.0	87.7	222.0	3.734E+03	222.0	3.539E+03	1.268E-01	2.854E+00	4.486E+02	2.814E+01	2.369E+01	2.861E+02
24.0	87.5	223.0	3.208E+03	223.0	3.034E+03	9.991E-02	2.954E+00	3.032E+02	2.228E+01	2.187E+01	3.080E+02
25.0	87.3	224.0	2.748E+03	224.0	2.604E+03	7.973E-02	3.034E+00	2.076E+02	1.786E+01	2.043E+01	3.284E+02
26.0	87.1	224.0	2.359E+03	224.0	2.235E+03	6.446E-02	3.099E+00	1.441E+02	1.444E+01	1.924E+01	3.477E+02
27.0	86.9	224.0	2.025E+03	224.0	1.919E+03	5.247E-02	3.151E+00	1.007E+02	1.175E+01	1.824E+01	3.659E+02
28.0	86.8	224.0	1.739E+03	224.0	1.647E+03	4.294E-02	3.194E+00	7.073E+01	9.618E+00	1.739E+01	3.833E+02
29.0	86.6	224.0	1.493E+03	224.0	1.415E+03	3.511E-02	3.229E+00	4.968E+01	7.866E+00	1.656E+01	3.999E+02

APPARENT Z-ANG 92.00 (DEG)
 BALLOON HEIGHT 20.00 (KM)
 TANGENT HEIGHT 15.99 (KM)
 OPTICAL AIR MASS 7.863

EFFECTIVE PRESSURE 8774.63 (PA)
 EFFECTIVE TEMPERATURE 217.26 (DEG K)
 TANGENT TEMPERATURE 12168.76 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
16.0	90.0	216.0	1.121E+04	216.0	1.121E+04	2.377E-01	2.377E-01	2.377E-01	2.665E+03	5.134E+01	1.361E+01	1.361E+01
16.0	90.1	216.0	1.121E+04	216.0	1.080E+04	1.702E+00	1.940E+00	1.940E+00	1.838E+04	3.677E+02	1.015E+02	1.151E+02
17.0	91.0	216.0	9.572E+03	216.0	9.085E+03	6.620E-01	2.602E+00	2.602E+00	6.814E+03	1.430E+02	4.688E+01	1.619E+02
18.0	91.4	216.0	8.172E+03	216.0	7.743E+03	4.334E-01	3.035E+00	3.035E+00	3.356E+03	9.361E+01	3.601E+01	1.980E+02
19.0	91.7	217.0	6.977E+03	217.0	6.688E+03	3.106E-01	3.346E+00	3.346E+00	2.052E+03	6.739E+01	3.038E+01	2.283E+02
16.0	90.0	216.0	1.121E+04	216.0	1.121E+04	2.377E-01	2.377E-01	2.377E-01	2.665E+03	5.134E+01	1.361E+01	1.361E+01
16.0	89.9	216.0	1.121E+04	216.0	1.080E+04	1.702E+00	1.940E+00	1.940E+00	1.838E+04	3.677E+02	1.015E+02	1.151E+02
17.0	89.0	216.0	9.572E+03	216.0	9.085E+03	6.620E-01	2.602E+00	2.602E+00	6.814E+03	1.430E+02	4.688E+01	1.619E+02
18.0	88.6	216.0	8.172E+03	216.0	7.743E+03	4.334E-01	3.035E+00	3.035E+00	3.356E+03	9.361E+01	3.601E+01	1.980E+02
19.0	88.3	217.0	6.977E+03	217.0	6.688E+03	3.106E-01	3.346E+00	3.346E+00	2.052E+03	6.739E+01	3.038E+01	2.283E+02
20.0	88.0	218.0	5.961E+03	218.0	5.645E+03	2.328E-01	3.579E+00	3.579E+00	1.314E+03	5.074E+01	2.678E+01	2.551E+02
21.0	87.8	219.0	5.097E+03	219.0	4.826E+03	1.792E-01	3.758E+00	3.758E+00	8.648E+02	3.924E+01	2.422E+01	2.793E+02
22.0	87.5	220.0	4.361E+03	220.0	4.130E+03	1.404E-01	3.898E+00	3.898E+00	5.797E+02	3.088E+01	2.227E+01	3.016E+02
23.0	87.3	222.0	3.734E+03	222.0	3.538E+03	1.110E-01	4.009E+00	4.009E+00	3.927E+02	2.464E+01	2.075E+01	3.224E+02
24.0	87.2	223.0	3.202E+03	223.0	3.034E+03	8.907E-02	4.098E+00	4.098E+00	2.782E+02	1.986E+01	1.958E+01	3.419E+02
25.0	87.0	224.0	2.748E+03	224.0	2.603E+03	7.206E-02	4.170E+00	4.170E+00	1.876E+02	1.614E+01	1.847E+01	3.683E+02
26.0	86.8	224.0	2.359E+03	224.0	2.235E+03	5.889E-02	4.229E+00	4.229E+00	1.316E+02	1.319E+01	1.758E+01	3.779E+02
27.0	86.7	224.0	2.035E+03	224.0	1.919E+03	4.835E-02	4.278E+00	4.278E+00	9.277E+01	1.083E+01	1.681E+01	3.947E+02
28.0	86.5	224.0	1.739E+03	224.0	1.647E+03	3.985E-02	4.317E+00	4.317E+00	6.964E+01	8.926E+00	1.614E+01	4.188E+02
29.0	86.4	224.0	1.493E+03	224.0	1.415E+03	3.279E-02	4.350E+00	4.350E+00	4.638E+01	7.344E+00	1.546E+01	4.263E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(OM)	ACCUM DEL(OM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
13.7	90.0	216.0	1.600E+04	216.0	1.600E+04	1.626E+00	1.626E+00	2.602E+04	3.512E+02	6.524E+01	6.524E+01
14.0	90.6	216.0	1.530E+04	216.0	1.466E+04	1.529E+00	3.155E+00	2.242E+04	3.302E+02	6.700E+01	1.323E+02
15.0	91.1	216.0	1.313E+04	216.0	1.246E+04	8.300E-01	3.985E+00	1.034E+04	1.793E+02	4.247E+01	1.752E+02
16.0	91.5	216.0	1.121E+04	216.0	1.062E+04	5.643E-01	4.549E+00	5.994E+03	1.219E+02	3.419E+01	2.094E+02
17.0	91.8	216.0	9.572E+03	216.0	9.062E+03	4.125E-01	4.961E+00	3.738E+03	8.911E+01	2.929E+01	2.307E+02
18.0	92.1	216.0	8.172E+03	216.0	7.734E+03	3.128E-01	5.274E+00	2.419E+03	6.756E+01	2.602E+01	2.647E+02
19.0	92.3	217.0	6.977E+03	217.0	6.603E+03	2.417E-01	5.516E+00	1.596E+03	5.245E+01	2.366E+01	2.804E+02
13.7	90.0	216.0	1.600E+04	216.0	1.600E+04	1.626E+00	1.626E+00	2.602E+04	3.512E+02	6.524E+01	6.524E+01
14.0	89.4	216.0	1.530E+04	216.0	1.466E+04	1.529E+00	3.155E+00	2.242E+04	3.302E+02	6.700E+01	1.323E+02
15.0	88.9	216.0	1.313E+04	216.0	1.246E+04	8.300E-01	3.985E+00	1.034E+04	1.793E+02	4.247E+01	1.752E+02
16.0	88.5	216.0	1.121E+04	216.0	1.062E+04	5.643E-01	4.549E+00	5.994E+03	1.219E+02	3.419E+01	2.094E+02
17.0	88.2	216.0	9.572E+03	216.0	9.062E+03	4.125E-01	4.961E+00	3.738E+03	8.911E+01	2.929E+01	2.307E+02
18.0	87.9	216.0	8.172E+03	216.0	7.734E+03	3.128E-01	5.274E+00	2.419E+03	6.756E+01	2.602E+01	2.647E+02
19.0	87.7	217.0	6.977E+03	217.0	6.603E+03	2.417E-01	5.516E+00	1.596E+03	5.245E+01	2.366E+01	2.804E+02
20.0	87.5	218.0	5.961E+03	218.0	5.642E+03	1.898E-01	5.706E+00	1.071E+03	4.139E+01	2.185E+01	3.182E+02
21.0	87.3	219.0	5.097E+03	219.0	4.825E+03	1.509E-01	5.857E+00	7.200E+02	3.304E+01	2.840E+01	3.386E+02
22.0	87.1	220.0	4.361E+03	220.0	4.129E+03	1.210E-01	5.978E+00	4.995E+02	2.661E+01	1.920E+01	3.490E+02
23.0	87.0	222.0	3.734E+03	222.0	3.537E+03	9.739E-02	6.075E+00	3.445E+02	2.162E+01	1.821E+01	3.600E+02
24.0	86.8	223.0	3.202E+03	223.0	3.033E+03	7.923E-02	6.154E+00	2.404E+02	1.767E+01	1.735E+01	3.854E+02
25.0	86.6	224.0	2.748E+03	224.0	2.603E+03	6.463E-02	6.219E+00	1.680E+02	1.452E+01	1.662E+01	4.020E+02
26.0	86.5	224.0	2.359E+03	224.0	2.235E+03	5.347E-02	6.273E+00	1.195E+02	1.190E+01	1.596E+01	4.179E+02
27.0	86.3	224.0	2.025E+03	224.0	1.919E+03	4.425E-02	6.317E+00	8.489E+01	9.911E+00	1.539E+01	4.333E+02
28.0	86.2	224.0	1.739E+03	224.0	1.647E+03	3.671E-02	6.354E+00	6.047E+01	6.223E+00	1.407E+01	4.482E+02
29.0	86.1	224.0	1.493E+03	224.0	1.415E+03	3.030E-02	6.384E+00	4.297E+01	6.805E+00	1.433E+01	4.625E+02

EFFECTIVE PRESSURE 10452.40 (PA)
 EFFECTIVE TEMPERATURE 223.86 (DEG K)
 TANGENT PRESSURE 31025.64 (PA)

APPARENT Z-ANG 93.00 (DEG)
 BALLOON HEIGHT 20.00 (KM)
 TANGENT HEIGHT 10.05 (KM)
 OPTICAL AIR MASS 10.021

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
10.0	90.0	232.6	2.443E+04	232.6	2.443E+04	1.600E+00	1.600E+00	3.909E+04	3.722E+02	4.530E+01	4.530E+01
11.0	90.4	229.0	2.443E+04	229.0	2.340E+04	2.699E+00	4.299E+00	6.315E+04	6.180E+02	7.865E+01	1.240E+02
12.0	91.1	222.0	2.103E+04	222.0	1.997E+04	1.367E+00	5.666E+00	2.732E+04	3.036E+02	4.527E+01	1.692E+02
13.0	91.4	216.0	1.802E+04	216.0	1.707E+04	9.375E-01	6.604E+00	1.600E+04	2.025E+02	3.533E+01	2.046E+02
14.0	91.7	216.0	1.530E+04	216.0	1.457E+04	6.806E-01	7.204E+00	9.913E+03	1.470E+02	3.006E+01	2.346E+02
15.0	92.0	216.0	1.313E+04	216.0	1.243E+04	5.140E-01	7.798E+00	6.390E+03	1.110E+02	2.661E+01	2.612E+02
16.0	92.2	216.0	1.121E+04	216.0	1.061E+04	3.977E-01	8.196E+00	4.219E+03	8.590E+01	2.412E+01	2.853E+02
17.0	92.5	216.0	9.572E+03	216.0	9.056E+03	3.127E-01	8.509E+00	2.832E+03	6.754E+01	2.222E+01	3.076E+02
18.0	92.6	216.0	8.172E+03	216.0	7.730E+03	2.486E-01	8.757E+00	1.922E+03	5.370E+01	2.069E+01	3.283E+02
19.0	92.0	217.0	6.977E+03	217.0	6.601E+03	1.907E-01	8.956E+00	1.311E+03	4.311E+01	1.945E+01	3.477E+02
10.0	90.0	232.6	2.443E+04	232.6	2.443E+04	1.600E+00	1.600E+00	3.909E+04	3.722E+02	4.530E+01	4.530E+01
11.0	89.6	229.0	2.443E+04	229.0	2.340E+04	2.699E+00	4.299E+00	6.315E+04	6.180E+02	7.865E+01	1.240E+02
12.0	88.9	222.0	2.103E+04	222.0	1.997E+04	1.367E+00	5.666E+00	2.732E+04	3.036E+02	4.527E+01	1.692E+02
13.0	88.6	216.0	1.802E+04	216.0	1.707E+04	9.375E-01	6.604E+00	1.600E+04	2.025E+02	3.533E+01	2.046E+02
14.0	88.3	216.0	1.530E+04	216.0	1.457E+04	6.806E-01	7.204E+00	9.913E+03	1.470E+02	3.006E+01	2.346E+02
15.0	88.0	216.0	1.313E+04	216.0	1.243E+04	5.140E-01	7.798E+00	6.390E+03	1.110E+02	2.661E+01	2.612E+02
16.0	87.8	216.0	1.121E+04	216.0	1.061E+04	3.977E-01	8.196E+00	4.219E+03	8.590E+01	2.412E+01	2.853E+02
17.0	87.5	216.0	9.572E+03	216.0	9.056E+03	3.127E-01	8.509E+00	2.832E+03	6.754E+01	2.222E+01	3.076E+02
18.0	87.4	216.0	8.172E+03	216.0	7.730E+03	2.486E-01	8.757E+00	1.922E+03	5.370E+01	2.069E+01	3.283E+02
19.0	87.2	217.0	6.977E+03	217.0	6.601E+03	1.907E-01	8.956E+00	1.311E+03	4.311E+01	1.945E+01	3.477E+02
20.0	87.0	218.0	5.961E+03	218.0	5.641E+03	1.600E-01	9.316E+00	9.023E+02	3.487E+01	1.841E+01	3.661E+02
21.0	86.8	219.0	5.097E+03	219.0	4.824E+03	1.296E-01	9.246E+00	6.252E+02	2.838E+01	1.753E+01	3.837E+02
22.0	86.7	220.0	4.361E+03	220.0	4.120E+03	1.055E-01	9.351E+00	4.356E+02	2.322E+01	1.675E+01	4.004E+02
23.0	86.5	222.0	3.734E+03	222.0	3.537E+03	8.603E-02	9.437E+00	3.043E+02	1.910E+01	1.609E+01	4.165E+02
24.0	86.4	223.0	3.202E+03	223.0	3.033E+03	7.073E-02	9.508E+00	2.145E+02	1.577E+01	1.549E+01	4.320E+02
25.0	86.3	224.0	2.748E+03	224.0	2.603E+03	5.839E-02	9.566E+00	1.520E+02	1.308E+01	1.497E+01	4.469E+02
26.0	86.1	224.0	2.359E+03	224.0	2.235E+03	4.853E-02	9.615E+00	1.084E+02	1.037E+01	1.449E+01	4.614E+02
27.0	86.0	224.0	2.025E+03	224.0	1.919E+03	4.042E-02	9.655E+00	7.754E+01	8.037E+00	1.406E+01	4.755E+02
28.0	85.9	224.0	1.739E+03	224.0	1.647E+03	3.373E-02	9.689E+00	5.555E+01	7.555E+00	1.366E+01	4.891E+02
29.0	85.7	224.0	1.493E+03	224.0	1.415E+03	2.805E-02	9.717E+00	3.968E+01	6.283E+00	1.323E+01	5.024E+02

APPARENT Z-ANG 93.50 (DEG)
 BALLOON HEIGHT 20.00 (KM)
 TANGENT HEIGHT 7.44 (KM)
 OPTICAL AIR MASS 30.194

EFFECTIVE PRESSURE 29407.82 (PA)
 EFFECTIVE TEMPERATURE 239.98 (DEG K)
 TANGENT PRESSURE 58860.34 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
7.4	90.0	255.0	4.000E+04	255.0	3.967E+04	4.641E+00	4.641E+00	1.841E+05	1.183E+03	8.871E+01	8.871E+01
8.0	90.7	248.0	3.739E+04	248.0	3.577E+04	2.814E+00	7.455E+00	1.007E+05	6.979E+02	5.809E+01	1.468E+02
9.0	91.2	242.0	3.256E+04	242.0	3.104E+04	1.755E+00	9.210E+00	5.448E+04	4.248E+02	4.076E+01	1.876E+02
10.0	91.6	235.0	2.826E+04	235.0	2.687E+04	1.276E+00	1.049E+01	3.430E+04	3.000E+02	3.324E+01	2.208E+02
11.0	91.8	229.0	2.443E+04	229.0	2.319E+04	9.790E-01	1.147E+01	2.270E+04	2.242E+02	2.800E+01	2.496E+02
12.0	92.1	222.0	2.103E+04	222.0	1.992E+04	7.753E-01	1.224E+01	1.549E+04	1.721E+02	2.573E+01	2.753E+02
13.0	92.3	216.0	1.802E+04	216.0	1.705E+04	6.201E-01	1.286E+01	1.057E+04	1.339E+02	2.340E+01	2.987E+02
14.0	92.5	216.0	1.538E+04	216.0	1.455E+04	4.903E-01	1.335E+01	7.135E+03	1.059E+02	2.168E+01	3.204E+02
15.0	92.7	216.0	1.313E+04	216.0	1.242E+04	3.915E-01	1.374E+01	4.864E+03	8.457E+01	2.028E+01	3.407E+02
16.0	92.9	216.0	1.121E+04	216.0	1.060E+04	3.151E-01	1.406E+01	3.342E+03	6.806E+01	1.912E+01	3.590E+02
17.0	93.0	216.0	9.572E+03	216.0	9.053E+03	2.552E-01	1.431E+01	2.310E+03	5.511E+01	1.814E+01	3.779E+02
18.0	93.2	216.0	8.172E+03	216.0	7.728E+03	2.076E-01	1.452E+01	1.604E+03	4.483E+01	1.728E+01	3.952E+02
19.0	93.4	217.0	6.977E+03	217.0	6.600E+03	1.689E-01	1.469E+01	1.115E+03	3.665E+01	1.654E+01	4.118E+02
7.4	90.0	255.0	4.000E+04	255.0	3.967E+04	4.641E+00	4.641E+00	1.841E+05	1.183E+03	8.871E+01	8.871E+01
8.0	89.3	248.0	3.739E+04	248.0	3.577E+04	2.814E+00	7.455E+00	1.007E+05	6.979E+02	5.809E+01	1.468E+02
9.0	88.8	242.0	3.256E+04	242.0	3.104E+04	1.755E+00	9.210E+00	5.448E+04	4.248E+02	4.076E+01	1.876E+02
10.0	88.4	235.0	2.826E+04	235.0	2.687E+04	1.276E+00	1.049E+01	3.430E+04	3.000E+02	3.324E+01	2.208E+02
11.0	88.2	229.0	2.443E+04	229.0	2.319E+04	9.790E-01	1.147E+01	2.270E+04	2.242E+02	2.800E+01	2.496E+02
12.0	87.9	222.0	2.103E+04	222.0	1.992E+04	7.753E-01	1.224E+01	1.549E+04	1.721E+02	2.573E+01	2.753E+02
13.0	87.7	216.0	1.802E+04	216.0	1.705E+04	6.201E-01	1.286E+01	1.057E+04	1.339E+02	2.340E+01	2.987E+02
14.0	87.5	216.0	1.538E+04	216.0	1.455E+04	4.903E-01	1.335E+01	7.135E+03	1.059E+02	2.168E+01	3.204E+02
15.0	87.3	216.0	1.313E+04	216.0	1.242E+04	3.915E-01	1.374E+01	4.864E+03	8.457E+01	2.028E+01	3.407E+02
16.0	87.1	216.0	1.121E+04	216.0	1.060E+04	3.151E-01	1.406E+01	3.342E+03	6.806E+01	1.912E+01	3.590E+02
17.0	87.0	216.0	9.572E+03	216.0	9.053E+03	2.552E-01	1.431E+01	2.310E+03	5.511E+01	1.814E+01	3.779E+02
18.0	86.8	216.0	8.172E+03	216.0	7.728E+03	2.076E-01	1.452E+01	1.604E+03	4.483E+01	1.728E+01	3.952E+02
19.0	86.6	217.0	6.977E+03	217.0	6.600E+03	1.689E-01	1.469E+01	1.115E+03	3.665E+01	1.654E+01	4.118E+02
20.0	86.5	218.0	5.961E+03	218.0	5.640E+03	1.381E-01	1.483E+01	7.786E+02	3.010E+01	1.590E+01	4.276E+02
21.0	86.4	219.0	5.097E+03	219.0	4.823E+03	1.133E-01	1.494E+01	5.463E+02	2.480E+01	1.532E+01	4.430E+02
22.0	86.2	220.0	4.361E+03	220.0	4.128E+03	9.319E-02	1.503E+01	3.847E+02	2.050E+01	1.479E+01	4.578E+02
23.0	86.1	222.0	3.734E+03	222.0	3.536E+03	7.667E-02	1.511E+01	2.713E+02	1.702E+01	1.434E+01	4.721E+02
24.0	86.0	223.0	3.202E+03	223.0	3.033E+03	6.353E-02	1.517E+01	1.927E+02	1.447E+01	1.391E+01	4.860E+02
25.0	85.8	224.0	2.740E+03	224.0	2.603E+03	5.200E-02	1.523E+01	1.374E+02	1.183E+01	1.353E+01	4.995E+02
26.0	85.7	224.0	2.359E+03	224.0	2.235E+03	4.415E-02	1.527E+01	9.864E+01	9.889E+00	1.318E+01	5.127E+02
27.0	85.6	224.0	2.029E+03	224.0	1.918E+03	3.699E-02	1.531E+01	7.091E+01	8.280E+00	1.286E+01	5.256E+02
28.0	85.5	224.0	1.739E+03	224.0	1.647E+03	3.099E-02	1.534E+01	5.105E+01	6.943E+00	1.256E+01	5.381E+02
29.0	85.4	224.0	1.493E+03	224.0	1.414E+03	2.589E-02	1.537E+01	3.662E+01	5.799E+00	1.221E+01	5.503E+02

APPARENT Z-ANG 90.50 (DEG) EFFECTIVE PRESSURE 2176.34 (PA)
 BALLOON HEIGHT 25.00 (KM) EFFECTIVE TEMPERATURE 226.60 (DEG K)
 TANGENT HEIGHT 24.75 (KM) TANGENT PRESSURE 2821.04 (PA)
 OPTICAL AIR MASS 1.365

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
24.0	90.0	223.0	2.855E+03	223.0	2.855E+03	2.427E-01	2.427E-01	6.920E+02	5.412E+01	5.637E+01	5.637E+01
24.8	90.0	223.0	2.740E+03	223.0	2.740E+03	2.427E-01	2.427E-01	6.668E+02	5.413E+01	5.857E+01	5.857E+01
25.0	89.5	224.0	2.740E+03	224.0	2.626E+03	2.764E-01	2.764E-01	7.257E+02	6.191E+01	7.023E+01	1.280E+02
26.0	88.9	224.0	2.359E+03	224.0	2.242E+03	1.456E-01	1.456E-01	3.263E+02	3.261E+01	4.332E+01	1.721E+02
27.0	88.5	224.0	2.025E+03	224.0	1.922E+03	9.899E-02	9.899E-02	1.903E+02	2.217E+01	3.436E+01	2.065E+02
28.0	88.2	224.0	1.739E+03	224.0	1.649E+03	7.266E-02	7.266E-02	1.198E+02	1.628E+01	2.939E+01	2.359E+02
29.0	87.9	224.0	1.493E+03	224.0	1.416E+03	5.515E-02	5.515E-02	7.808E+01	1.235E+01	2.599E+01	2.619E+02
30.0	87.7	234.0	1.283E+03	234.0	1.219E+03	4.152E-02	4.152E-02	5.059E+01	9.715E+00	2.374E+01	2.856E+02
31.0	87.5	234.0	1.108E+03	234.0	1.053E+03	3.314E-02	3.314E-02	3.489E+01	7.755E+00	2.193E+01	3.075E+02
32.0	87.3	234.0	9.579E+02	234.0	9.098E+02	2.676E-02	2.676E-02	2.434E+01	6.261E+00	2.049E+01	3.280E+02
33.0	87.1	234.0	8.270E+02	234.0	7.861E+02	2.179E-02	2.179E-02	1.713E+01	5.098E+00	1.931E+01	3.474E+02
34.0	86.9	234.0	7.153E+02	234.0	6.795E+02	1.776E-02	1.776E-02	1.207E+01	4.157E+00	1.822E+01	3.656E+02

APPARENT Z-ANG 91.00 (DEG)
 BALLOON HEIGHT 25.00 (KM)
 TANGENT HEIGHT 24.02 (KM)
 OPTICAL AIR MASS 1.781

EFFECTIVE PRESSURE 2497.68 (PA)
 EFFECTIVE TEMPERATURE 225.68 (DEG K)
 TANGENT PRESSURE 3179.47 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
24.0	90.0	223.0	3.082E+03	223.0	3.035E+03	5.241E-01	5.241E-01	1.591E+03	1.169E+02	1.146E+02	1.146E+02
24.0	90.0	223.0	3.082E+03	223.0	3.035E+03	5.241E-01	5.241E-01	1.591E+03	1.169E+02	1.146E+02	1.146E+02
25.0	89.0	224.0	2.748E+03	224.0	2.613E+03	1.047E-01	7.088E-01	4.825E+02	4.137E+01	4.716E+01	1.617E+02
26.0	88.6	224.0	2.359E+03	224.0	2.239E+03	1.213E-01	8.301E-01	2.716E+02	2.717E+01	3.613E+01	1.979E+02
27.0	88.3	224.0	2.025E+03	224.0	1.921E+03	8.772E-02	9.178E-01	1.685E+02	1.965E+01	3.804E+01	2.283E+02
28.0	88.0	224.0	1.739E+03	224.0	1.649E+03	6.637E-02	9.842E-01	1.094E+02	1.487E+01	2.606E+01	2.552E+02
29.0	87.7	224.0	1.493E+03	224.0	1.416E+03	5.129E-02	1.035E+00	7.261E+01	1.149E+01	2.417E+01	2.794E+02
30.0	87.5	234.0	1.263E+03	234.0	1.219E+03	3.908E-02	1.075E+00	4.762E+01	9.145E+00	2.235E+01	3.017E+02
31.0	87.3	234.0	1.108E+03	234.0	1.053E+03	3.147E-02	1.106E+00	3.313E+01	7.363E+00	2.883E+01	3.225E+02
32.0	87.1	234.0	9.579E+02	234.0	9.097E+02	2.557E-02	1.132E+00	2.326E+01	5.983E+00	1.959E+01	3.421E+02
33.0	87.0	234.0	8.278E+02	234.0	7.861E+02	2.092E-02	1.152E+00	1.645E+01	4.856E+00	1.855E+01	3.687E+02
34.0	86.8	234.0	7.153E+02	234.0	6.795E+02	1.713E-02	1.170E+00	1.164E+01	4.088E+00	1.757E+01	3.782E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
22.8	90.0	220.3	3.734E+03	220.3	3.734E+03	3.127E-01	3.127E-01	1.169E+03	6.807E+01	5.483E+01	5.483E+01
23.0	90.5	222.0	3.734E+03	222.0	3.569E+03	3.893E-01	7.020E-01	1.390E+03	8.643E+01	7.213E+01	1.270E+02
24.0	91.1	223.0	3.202E+03	223.0	3.042E+03	2.000E-01	9.020E-01	6.084E+02	4.459E+01	4.365E+01	1.706E+02
22.8	90.0	220.3	3.734E+03	220.3	3.734E+03	3.127E-01	3.127E-01	1.169E+03	6.807E+01	5.483E+01	5.483E+01
23.0	89.5	222.0	3.734E+03	222.0	3.569E+03	3.893E-01	7.020E-01	1.390E+03	8.643E+01	7.213E+01	1.270E+02
24.0	88.9	223.0	3.202E+03	223.0	3.042E+03	2.000E-01	9.020E-01	6.084E+02	4.459E+01	4.365E+01	1.706E+02
25.0	88.5	224.0	2.748E+03	224.0	2.608E+03	1.349E-01	1.037E+00	3.517E+02	3.021E+01	3.451E+01	2.051E+02
26.0	88.2	224.0	2.359E+03	224.0	2.237E+03	9.884E-02	1.136E+00	2.211E+02	2.214E+01	2.947E+01	2.346E+02
27.0	87.9	224.0	2.025E+03	224.0	1.920E+03	7.531E-02	1.211E+00	1.446E+02	1.687E+01	2.617E+01	2.608E+02
28.0	87.7	224.0	1.739E+03	224.0	1.648E+03	5.876E-02	1.270E+00	9.685E+01	1.316E+01	2.378E+01	2.845E+02
29.0	87.5	224.0	1.493E+03	224.0	1.415E+03	4.634E-02	1.316E+00	6.559E+01	1.038E+01	2.185E+01	3.064E+02
30.0	87.3	234.0	1.283E+03	234.0	1.218E+03	3.583E-02	1.352E+00	4.365E+01	8.384E+00	2.049E+01	3.269E+02
31.0	87.1	234.0	1.108E+03	234.0	1.053E+03	2.916E-02	1.381E+00	3.074E+01	6.824E+00	1.930E+01	3.462E+02
32.0	86.9	234.0	9.579E+02	234.0	9.096E+02	2.390E-02	1.405E+00	2.174E+01	5.592E+00	1.831E+01	3.645E+02
33.0	86.8	234.0	8.278E+02	234.0	7.860E+02	1.969E-02	1.425E+00	1.540E+01	4.607E+00	1.746E+01	3.819E+02
34.0	86.6	234.0	7.153E+02	234.0	6.794E+02	1.621E-02	1.441E+00	1.101E+01	3.793E+00	1.662E+01	3.986E+02

APPARENT Z-ANG 91.50 (DEG)
 BALLOON HEIGHT 25.00 (KM)
 TANGENT HEIGHT 22.78 (KM)
 OPTICAL AIR MASS 2.427

EFFECTIVE PRESSURE 3033.71 (PA)
 EFFECTIVE TEMPERATURE 223.76 (DEG K)
 TANGENT PRESSURE 3891.33 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)	EFFECTIVE PRESSURE			EFFECTIVE TEMPERATURE			
												APPARENT Z-ANG (DEG)	BALLOON HEIGHT (KM)	TANGENT HEIGHT (KM)	OPTICAL AIR MASS	3917.93 (PA)	221.62 (DEG K)	5105.00 (PA)
21.1	90.0	219.0	4.902E+03	219.0	4.023E+03	0.303E-01	0.303E-01	4.005E+03	1.010E+02	1.122E+02	1.122E+02	1.122E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
22.0	91.0	220.0	4.361E+03	220.0	4.144E+03	3.017E-01	1.132E+00	1.250E+03	6.630E+01	4.771E+01	1.599E+02	1.599E+02	221.62	5105.00	3917.93	221.62	5105.00	3917.93
23.0	88.6	222.0	3.734E+03	222.0	3.544E+03	1.940E-01	1.327E+00	6.905E+02	4.326E+01	3.636E+01	1.902E+02	1.902E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
24.0	80.3	223.0	3.202E+03	223.0	3.037E+03	1.390E-01	1.467E+00	4.245E+02	3.117E+01	3.057E+01	2.268E+02	2.268E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
25.0	88.0	224.0	2.748E+03	224.0	2.605E+03	1.051E-01	1.572E+00	2.739E+02	2.355E+01	2.692E+01	2.537E+02	2.537E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
26.0	87.8	224.0	2.359E+03	224.0	2.236E+03	8.157E-02	1.653E+00	1.824E+02	1.827E+01	2.434E+01	2.791E+02	2.791E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
27.0	87.5	224.0	2.025E+03	224.0	1.920E+03	6.441E-02	1.710E+00	1.236E+02	1.443E+01	2.230E+01	3.005E+02	3.005E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
28.0	87.3	224.0	1.739E+03	224.0	1.648E+03	5.149E-02	1.769E+00	8.405E+01	1.153E+01	2.085E+01	3.213E+02	3.213E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
29.0	87.2	224.0	1.493E+03	224.0	1.419E+03	4.134E-02	1.811E+00	5.850E+01	9.260E+00	1.949E+01	3.400E+02	3.400E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
30.0	87.0	234.0	1.203E+03	234.0	1.210E+03	3.239E-02	1.843E+00	3.946E+01	7.500E+00	1.853E+01	3.593E+02	3.593E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
31.0	86.8	234.0	1.100E+03	234.0	1.053E+03	2.665E-02	1.879E+00	2.804E+01	6.236E+00	1.764E+01	3.770E+02	3.770E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
32.0	86.7	234.0	9.579E+02	234.0	9.095E+02	2.203E-02	1.892E+00	2.004E+01	5.155E+00	1.680E+01	3.938E+02	3.938E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
33.0	86.5	234.0	8.270E+02	234.0	7.860E+02	1.820E-02	1.910E+00	1.437E+01	4.277E+00	1.621E+01	4.101E+02	4.101E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00
34.0	86.4	234.0	7.153E+02	234.0	6.794E+02	1.514E-02	1.925E+00	1.020E+01	3.542E+00	1.553E+01	4.256E+02	4.256E+02	3917.93	221.62	5105.00	3917.93	221.62	5105.00

APPARENT Z-ANG 92.50 (DEG) EFFECTIVE PRESSURE 5452.73 (PA)
 BALLOON HEIGHT 25.00 (KM) EFFECTIVE TEMPERATURE 219.16 (DEG K)
 TANGENT HEIGHT 18.81 (KM) TANGENT PRESSURE 7661.45 (PA)
 OPTICAL AIR MASS 5.270

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
18.8	90.0	216.2	6.977E+03	216.2	6.977E+03	5.560E-01	5.560E-01	3.879E+03	1.202E+02	5.124E+01	5.124E+01
19.0	90.4	217.0	6.977E+03	217.0	6.665E+03	7.664E-01	1.322E+00	5.109E+03	1.663E+02	7.432E+01	1.256E+02
20.0	91.1	218.0	5.961E+03	218.0	5.658E+03	3.040E-01	1.707E+00	2.173E+03	8.372E+01	4.407E+01	1.696E+02
21.0	91.5	219.0	5.097E+03	219.0	4.832E+03	2.570E-01	1.963E+00	1.242E+03	5.628E+01	3.469E+01	2.043E+02
22.0	91.8	220.0	4.361E+03	220.0	4.133E+03	1.864E-01	2.150E+00	7.703E+02	4.101E+01	2.955E+01	2.339E+02
23.0	92.1	222.0	3.734E+03	222.0	3.539E+03	1.403E-01	2.290E+00	4.967E+02	3.115E+01	2.621E+01	2.601E+02
24.0	92.3	223.0	3.202E+03	223.0	3.035E+03	1.088E-01	2.399E+00	3.301E+02	2.425E+01	2.380E+01	2.839E+02
18.8	90.0	216.2	6.977E+03	216.2	6.977E+03	5.560E-01	5.560E-01	3.879E+03	1.202E+02	5.124E+01	5.124E+01
19.0	89.6	217.0	6.977E+03	217.0	6.665E+03	7.664E-01	1.322E+00	5.109E+03	1.663E+02	7.432E+01	1.256E+02
20.0	88.9	218.0	5.961E+03	218.0	5.658E+03	3.040E-01	1.707E+00	2.173E+03	8.372E+01	4.407E+01	1.696E+02
21.0	88.5	219.0	5.097E+03	219.0	4.832E+03	2.570E-01	1.963E+00	1.242E+03	5.628E+01	3.469E+01	2.043E+02
22.0	88.2	220.0	4.361E+03	220.0	4.133E+03	1.864E-01	2.150E+00	7.703E+02	4.101E+01	2.955E+01	2.339E+02
23.0	87.9	222.0	3.734E+03	222.0	3.539E+03	1.403E-01	2.290E+00	4.967E+02	3.115E+01	2.621E+01	2.601E+02
24.0	87.7	223.0	3.202E+03	223.0	3.035E+03	1.088E-01	2.399E+00	3.301E+02	2.425E+01	2.380E+01	2.839E+02
25.0	87.5	224.0	2.748E+03	224.0	2.604E+03	8.577E-02	2.485E+00	2.233E+02	1.921E+01	2.197E+01	3.059E+02
26.0	87.3	224.0	2.359E+03	224.0	2.236E+03	6.872E-02	2.553E+00	1.536E+02	1.539E+01	2.051E+01	3.264E+02
27.0	87.1	224.0	2.025E+03	224.0	1.919E+03	5.554E-02	2.609E+00	1.065E+02	1.244E+01	1.931E+01	3.457E+02
28.0	86.9	224.0	1.739E+03	224.0	1.646E+03	4.519E-02	2.654E+00	7.446E+01	1.012E+01	1.830E+01	3.648E+02
29.0	86.8	224.0	1.493E+03	224.0	1.415E+03	3.679E-02	2.691E+00	5.205E+01	8.241E+00	1.735E+01	3.813E+02
30.0	86.6	234.0	1.283E+03	234.0	1.218E+03	2.916E-02	2.720E+00	3.551E+01	6.823E+00	1.668E+01	3.980E+02
31.0	86.5	234.0	1.108E+03	234.0	1.052E+03	2.421E-02	2.744E+00	2.548E+01	5.665E+00	1.603E+01	4.140E+02
32.0	86.3	234.0	9.579E+02	234.0	9.095E+02	2.017E-02	2.764E+00	1.839E+01	4.719E+00	1.545E+01	4.295E+02
33.0	86.2	234.0	8.278E+02	234.0	7.859E+02	1.685E-02	2.781E+00	1.324E+01	3.942E+00	1.494E+01	4.444E+02
34.0	86.1	234.0	7.153E+02	234.0	6.793E+02	1.403E-02	2.795E+00	9.531E+00	3.283E+00	1.433E+01	4.588E+02

APPARENT Z-ANG 93.00 (DEG)
 BALLOON HEIGHT 25.00 (KM)
 TANGENT HEIGHT 16.04 (KM)
 OPTICAL AIR MASS 8.531
 EFFECTIVE PRESSURE 0256.88 (PA)
 EFFECTIVE TEMPERATURE 217.50 (DEG K)
 TANGENT PRESSURE 12713.88 (PA)

EFFECT PRESSURE DEL(DM)
 EFFECT TEMP PRESSURE DEL(DM)
 PRESSURE (PA) DEL(DM)

DEL(IT-DM) DEL(P-DM) DEL(PATH) DEL(PATH)
 DEL(IT-DM) DEL(P-DM) DEL(PATH) DEL(PATH)

ACCUM DEL(DM) ACCUM DEL(DM)
 DEL(DM) DEL(DM)

ACCUM DEL(PATH) ACCUM DEL(PATH)
 DEL(PATH) DEL(PATH)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	DEL(DM)	DEL(DM)	DEL(DM)	DEL(P-DM)	DEL(IT-DM)	DEL(PATH)	DEL(PATH)	ACCUM DEL(DM)	ACCUM DEL(DM)	DEL(PATH)	DEL(PATH)	ACCUM DEL(PATH)	ACCUM DEL(PATH)
16.0	90.0	216.0	1.078E+04	216.0	1.060E+04	1.873E+00	1.873E+00	1.873E+00	1.873E+00	1.986E+04	4.045E+02	1.135E+02	1.135E+02	1.873E+00	1.873E+00	1.986E+04	4.045E+02	1.135E+02	1.135E+02
17.0	91.0	216.0	9.572E+03	216.0	9.087E+03	6.750E-01	6.750E-01	6.750E-01	6.750E-01	6.140E+03	1.460E+02	4.785E+01	4.785E+01	2.546E+00	2.546E+00	6.140E+03	1.460E+02	4.785E+01	4.785E+01
18.0	91.4	216.0	8.172E+03	216.0	7.743E+03	4.385E-01	4.385E-01	4.385E-01	4.385E-01	3.396E+03	9.472E+01	3.644E+01	3.644E+01	2.987E+00	2.987E+00	3.396E+03	9.472E+01	3.644E+01	3.644E+01
19.0	91.7	217.0	6.977E+03	217.0	6.608E+03	3.131E-01	3.131E-01	3.131E-01	3.131E-01	3.300E+00	6.795E+01	3.063E+01	3.063E+01	3.300E+00	3.300E+00	3.300E+00	6.795E+01	3.063E+01	3.063E+01
20.0	92.0	218.0	5.961E+03	218.0	5.645E+03	2.343E-01	2.343E-01	2.343E-01	2.343E-01	2.069E+03	5.107E+01	2.695E+01	2.695E+01	3.534E+00	3.534E+00	2.069E+03	5.107E+01	2.695E+01	2.695E+01
21.0	92.2	219.0	5.097E+03	219.0	4.827E+03	1.801E-01	1.801E-01	1.801E-01	1.801E-01	1.714E+00	3.945E+01	2.434E+01	2.434E+01	3.714E+00	3.714E+00	1.714E+00	3.945E+01	2.434E+01	2.434E+01
22.0	92.4	220.0	4.361E+03	220.0	4.130E+03	1.410E-01	1.410E-01	1.410E-01	1.410E-01	1.693E+02	3.101E+01	2.237E+01	2.237E+01	3.855E+00	3.855E+00	1.693E+02	3.101E+01	2.237E+01	2.237E+01
23.0	92.6	222.0	3.734E+03	222.0	3.538E+03	1.114E-01	1.114E-01	1.114E-01	1.114E-01	3.942E+02	2.474E+01	2.083E+01	2.083E+01	3.967E+00	3.967E+00	3.942E+02	2.474E+01	2.083E+01	2.083E+01
24.0	92.8	223.0	3.202E+03	223.0	3.034E+03	8.936E-02	8.936E-02	8.936E-02	8.936E-02	2.711E+02	1.953E+01	1.956E+01	1.956E+01	4.056E+00	4.056E+00	2.711E+02	1.953E+01	1.956E+01	1.956E+01
16.0	90.0	216.0	1.078E+04	216.0	1.060E+04	1.873E+00	1.873E+00	1.873E+00	1.873E+00	1.986E+04	4.045E+02	1.135E+02	1.135E+02	1.873E+00	1.873E+00	1.986E+04	4.045E+02	1.135E+02	1.135E+02
17.0	89.0	216.0	9.572E+03	216.0	9.087E+03	6.758E-01	6.758E-01	6.758E-01	6.758E-01	6.140E+03	1.460E+02	4.785E+01	4.785E+01	2.546E+00	2.546E+00	6.140E+03	1.460E+02	4.785E+01	4.785E+01
18.0	88.6	216.0	8.172E+03	216.0	7.743E+03	4.385E-01	4.385E-01	4.385E-01	4.385E-01	3.396E+03	9.472E+01	3.644E+01	3.644E+01	2.987E+00	2.987E+00	3.396E+03	9.472E+01	3.644E+01	3.644E+01
19.0	88.3	217.0	6.977E+03	217.0	6.608E+03	3.131E-01	3.131E-01	3.131E-01	3.131E-01	3.300E+00	6.795E+01	3.063E+01	3.063E+01	3.300E+00	3.300E+00	3.300E+00	6.795E+01	3.063E+01	3.063E+01
20.0	88.0	218.0	5.961E+03	218.0	5.645E+03	2.343E-01	2.343E-01	2.343E-01	2.343E-01	2.069E+03	5.107E+01	2.695E+01	2.695E+01	3.534E+00	3.534E+00	2.069E+03	5.107E+01	2.695E+01	2.695E+01
21.0	87.8	219.0	5.097E+03	219.0	4.827E+03	1.801E-01	1.801E-01	1.801E-01	1.801E-01	1.714E+00	3.945E+01	2.434E+01	2.434E+01	3.714E+00	3.714E+00	1.714E+00	3.945E+01	2.434E+01	2.434E+01
22.0	87.6	220.0	4.361E+03	220.0	4.130E+03	1.410E-01	1.410E-01	1.410E-01	1.410E-01	1.693E+02	3.101E+01	2.237E+01	2.237E+01	3.855E+00	3.855E+00	1.693E+02	3.101E+01	2.237E+01	2.237E+01
23.0	87.4	222.0	3.734E+03	222.0	3.538E+03	1.114E-01	1.114E-01	1.114E-01	1.114E-01	3.942E+02	2.474E+01	2.083E+01	2.083E+01	3.967E+00	3.967E+00	3.942E+02	2.474E+01	2.083E+01	2.083E+01
24.0	87.2	223.0	3.202E+03	223.0	3.034E+03	8.936E-02	8.936E-02	8.936E-02	8.936E-02	2.711E+02	1.953E+01	1.956E+01	1.956E+01	4.056E+00	4.056E+00	2.711E+02	1.953E+01	1.956E+01	1.956E+01
25.0	87.0	224.0	2.748E+03	224.0	2.603E+03	7.227E-02	7.227E-02	7.227E-02	7.227E-02	1.882E+02	1.619E+01	1.852E+01	1.852E+01	4.128E+00	4.128E+00	1.882E+02	1.619E+01	1.852E+01	1.852E+01
26.0	86.8	224.0	2.359E+03	224.0	2.235E+03	5.904E-02	5.904E-02	5.904E-02	5.904E-02	1.320E+02	1.323E+01	1.762E+01	1.762E+01	4.187E+00	4.187E+00	1.320E+02	1.323E+01	1.762E+01	1.762E+01
27.0	86.7	224.0	2.025E+03	224.0	1.919E+03	4.846E-02	4.846E-02	4.846E-02	4.846E-02	9.299E+01	1.086E+01	1.685E+01	1.685E+01	4.236E+00	4.236E+00	9.299E+01	1.086E+01	1.685E+01	1.685E+01
28.0	86.5	224.0	1.739E+03	224.0	1.647E+03	3.994E-02	3.994E-02	3.994E-02	3.994E-02	6.579E+01	8.946E+00	1.617E+01	1.617E+01	4.276E+00	4.276E+00	6.579E+01	8.946E+00	1.617E+01	1.617E+01
29.0	86.4	224.0	1.493E+03	224.0	1.415E+03	3.285E-02	3.285E-02	3.285E-02	3.285E-02	4.309E+00	7.359E+00	1.549E+01	1.549E+01	4.309E+00	4.309E+00	4.309E+00	7.359E+00	1.549E+01	1.549E+01
30.0	86.2	234.0	1.283E+03	234.0	1.218E+03	2.627E-02	2.627E-02	2.627E-02	2.627E-02	4.335E+00	6.147E+00	1.503E+01	1.503E+01	4.335E+00	4.335E+00	4.335E+00	6.147E+00	1.503E+01	1.503E+01
31.0	86.1	234.0	1.108E+03	234.0	1.052E+03	2.198E-02	2.198E-02	2.198E-02	2.198E-02	4.357E+00	5.143E+00	1.455E+01	1.455E+01	4.357E+00	4.357E+00	4.357E+00	5.143E+00	1.455E+01	1.455E+01
32.0	86.0	234.0	9.579E+02	234.0	9.094E+02	1.843E-02	1.843E-02	1.843E-02	1.843E-02	4.375E+00	4.312E+00	1.412E+01	1.412E+01	4.375E+00	4.375E+00	4.375E+00	4.312E+00	1.412E+01	1.412E+01
33.0	85.9	234.0	8.278E+02	234.0	7.859E+02	1.548E-02	1.548E-02	1.548E-02	1.548E-02	4.391E+00	3.623E+00	1.373E+01	1.373E+01	4.391E+00	4.391E+00	4.391E+00	3.623E+00	1.373E+01	1.373E+01
34.0	85.7	234.0	7.153E+02	234.0	6.793E+02	1.296E-02	1.296E-02	1.296E-02	1.296E-02	4.404E+00	3.832E+00	1.329E+01	1.329E+01	4.404E+00	4.404E+00	4.404E+00	3.832E+00	1.329E+01	1.329E+01

APPARENT Z-ANG 93.50 (DEG) EFFECTIVE PRESSURE 13817.06 (PA)
 BALLOON HEIGHT 25.00 (KM) EFFECTIVE TEMPERATURE 218.17 (DEG K)
 TANGENT HEIGHT 12.72 (KM) TANGENT PRESSURE 23832.24 (PA)
 OPTICAL AIR MASS 14.758

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-OM)	DEL (T-OM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
12.7	90.0	222.0	1.874E+04	222.0	1.874E+04	1.751E+00	1.751E+00	3.281E+04	3.807E+02	6.168E+01	6.168E+01
13.0	90.5	216.0	1.802E+04	216.0	1.718E+04	1.826E+00	3.577E+00	3.136E+04	3.943E+02	6.037E+01	1.300E+02
14.0	91.1	216.0	1.538E+04	216.0	1.459E+04	9.811E-01	4.558E+00	1.432E+04	2.119E+02	4.326E+01	1.733E+02
15.0	91.5	216.0	1.313E+04	216.0	1.244E+04	6.655E-01	5.223E+00	8.280E+03	1.438E+02	3.442E+01	2.877E+02
16.0	91.8	216.0	1.121E+04	216.0	1.081E+04	4.859E-01	5.789E+00	5.157E+03	1.049E+02	2.945E+01	2.372E+02
17.0	92.0	216.0	9.572E+03	216.0	9.859E+03	3.683E-01	6.877E+00	3.336E+03	7.955E+01	2.616E+01	2.633E+02
18.0	92.3	216.0	8.172E+03	216.0	7.732E+03	2.855E-01	6.363E+00	2.207E+03	6.166E+01	2.376E+01	2.871E+02
19.0	92.5	217.0	6.977E+03	217.0	6.602E+03	2.239E-01	6.507E+00	1.478E+03	4.859E+01	2.192E+01	3.898E+02
20.0	92.7	218.0	5.961E+03	218.0	5.642E+03	1.778E-01	6.765E+00	1.003E+03	3.875E+01	2.046E+01	3.295E+02
21.0	92.9	219.0	5.097E+03	219.0	4.824E+03	1.424E-01	6.907E+00	6.872E+02	3.119E+01	1.926E+01	3.487E+02
22.0	93.0	220.0	4.361E+03	220.0	4.129E+03	1.149E-01	7.022E+00	4.745E+02	2.528E+01	1.824E+01	3.670E+02
23.0	93.2	222.0	3.734E+03	222.0	3.537E+03	9.300E-02	7.115E+00	3.289E+02	2.064E+01	1.739E+01	3.844E+02
24.0	93.4	223.0	3.202E+03	223.0	3.033E+03	7.598E-02	7.191E+00	2.305E+02	1.694E+01	1.664E+01	4.010E+02
12.7	90.0	222.0	1.874E+04	222.0	1.874E+04	1.751E+00	1.751E+00	3.281E+04	3.807E+02	6.168E+01	6.168E+01
13.0	89.5	216.0	1.802E+04	216.0	1.718E+04	1.826E+00	3.577E+00	3.136E+04	3.943E+02	6.037E+01	1.300E+02
14.0	88.9	216.0	1.538E+04	216.0	1.459E+04	9.811E-01	4.558E+00	1.432E+04	2.119E+02	4.326E+01	1.733E+02
15.0	88.5	216.0	1.313E+04	216.0	1.244E+04	6.655E-01	5.223E+00	8.280E+03	1.438E+02	3.442E+01	2.877E+02
16.0	88.2	216.0	1.121E+04	216.0	1.081E+04	4.859E-01	5.789E+00	5.157E+03	1.049E+02	2.945E+01	2.372E+02
17.0	88.0	216.0	9.572E+03	216.0	9.859E+03	3.683E-01	6.877E+00	3.336E+03	7.955E+01	2.616E+01	2.633E+02
18.0	87.7	216.0	8.172E+03	216.0	7.732E+03	2.855E-01	6.363E+00	2.207E+03	6.166E+01	2.376E+01	2.871E+02
19.0	87.5	217.0	6.977E+03	217.0	6.602E+03	2.239E-01	6.507E+00	1.478E+03	4.859E+01	2.192E+01	3.898E+02
20.0	87.3	218.0	5.961E+03	218.0	5.642E+03	1.778E-01	6.765E+00	1.003E+03	3.875E+01	2.046E+01	3.295E+02
21.0	87.1	219.0	5.097E+03	219.0	4.824E+03	1.424E-01	6.907E+00	6.872E+02	3.119E+01	1.926E+01	3.487E+02
22.0	87.0	220.0	4.361E+03	220.0	4.129E+03	1.149E-01	7.022E+00	4.745E+02	2.528E+01	1.824E+01	3.670E+02
23.0	86.8	222.0	3.734E+03	222.0	3.537E+03	9.300E-02	7.115E+00	3.289E+02	2.064E+01	1.739E+01	3.844E+02
24.0	86.6	223.0	3.202E+03	223.0	3.033E+03	7.598E-02	7.191E+00	2.305E+02	1.694E+01	1.664E+01	4.010E+02
25.0	86.5	224.0	2.748E+03	224.0	2.603E+03	6.238E-02	7.253E+00	1.624E+02	1.397E+01	1.599E+01	4.170E+02
26.0	86.4	224.0	2.359E+03	224.0	2.235E+03	5.161E-02	7.305E+00	1.153E+02	1.156E+01	1.541E+01	4.324E+02
27.0	86.2	224.0	2.025E+03	224.0	1.919E+03	4.281E-02	7.348E+00	8.214E+01	9.569E+00	1.489E+01	4.473E+02
28.0	86.1	224.0	1.739E+03	224.0	1.647E+03	3.560E-02	7.383E+00	5.864E+01	7.974E+00	1.442E+01	4.617E+02
29.0	86.0	224.0	1.493E+03	224.0	1.415E+03	2.951E-02	7.413E+00	4.175E+01	6.611E+00	1.392E+01	4.756E+02
30.0	85.8	234.0	1.283E+03	234.0	1.218E+03	2.376E-02	7.437E+00	2.893E+01	5.560E+00	1.360E+01	4.892E+02
31.0	85.7	234.0	1.108E+03	234.0	1.052E+03	2.000E-02	7.456E+00	2.104E+01	4.680E+00	1.324E+01	5.025E+02
32.0	85.6	234.0	9.579E+02	234.0	9.094E+02	1.686E-02	7.473E+00	1.533E+01	3.945E+00	1.292E+01	5.154E+02
33.0	85.5	234.0	8.278E+02	234.0	7.858E+02	1.423E-02	7.488E+00	1.118E+01	3.330E+00	1.262E+01	5.280E+02
34.0	85.4	234.0	7.153E+02	234.0	6.733E+02	1.196E-02	7.500E+00	8.125E+00	2.799E+00	1.227E+01	5.403E+02

APPARENT Z-ANG 94.00 (DEG)
 BALLOON HEIGHT 25.00 (KM)
 TANGENT HEIGHT 0.82 (KM)
 OPTICAL AIR MASS 25.502

EFFECTIVE PRESSURE 23940.36 (PA)
 EFFECTIVE TEMPERATURE 232.66 (DEG K)
 TANGENT PRESSURE 47492.86 (PA)

EFFECTIVE PRESSURE 23940.36 (PA)
 EFFECTIVE TEMPERATURE 232.66 (DEG K)
 TANGENT PRESSURE 47492.86 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
8.8	90.0	246.4	3.256E+04	246.4	3.256E+04	2.230E+00	2.230E+00	7.262E+04	5.494E+02	5.016E+01	5.016E+01
9.8	90.4	242.0	3.256E+04	242.0	3.124E+04	3.301E+00	5.531E+00	1.831E+05	7.988E+02	7.614E+01	1.263E+02
10.0	91.1	235.0	2.826E+04	235.0	2.692E+04	1.733E+00	7.264E+00	4.663E+04	4.071E+02	4.505E+01	1.713E+02
11.0	91.4	229.0	2.443E+04	229.0	2.320E+04	1.205E+00	8.489E+00	2.796E+04	2.768E+02	3.542E+01	2.868E+02
12.0	91.8	222.0	2.103E+04	222.0	1.993E+04	9.079E-01	9.377E+00	1.810E+04	2.016E+02	3.012E+01	2.769E+02
13.0	92.0	216.0	1.802E+04	216.0	1.705E+04	7.044E-01	1.008E+01	1.201E+04	1.521E+02	2.658E+01	2.635E+02
14.0	92.2	216.0	1.538E+04	216.0	1.456E+04	5.457E-01	1.063E+01	7.943E+03	1.179E+02	2.412E+01	2.876E+02
15.0	92.4	216.0	1.313E+04	216.0	1.242E+04	4.293E-01	1.106E+01	5.334E+03	9.273E+01	2.223E+01	3.090E+02
16.0	92.6	216.0	1.121E+04	216.0	1.061E+04	3.416E-01	1.148E+01	3.623E+03	7.379E+01	2.072E+01	3.305E+02
17.0	92.8	216.0	9.572E+03	216.0	9.054E+03	2.742E-01	1.157E+01	2.482E+03	5.922E+01	1.949E+01	3.580E+02
18.0	93.0	216.0	8.172E+03	216.0	7.729E+03	2.214E-01	1.197E+01	1.711E+03	4.783E+01	1.843E+01	3.688E+02
19.0	93.2	217.0	6.977E+03	217.0	6.600E+03	1.791E-01	1.207E+01	1.102E+03	3.808E+01	1.755E+01	3.860E+02
20.0	93.3	218.0	5.961E+03	218.0	5.640E+03	1.457E-01	1.222E+01	8.218E+02	3.176E+01	1.678E+01	4.028E+02
21.0	93.5	219.0	5.097E+03	219.0	4.823E+03	1.190E-01	1.234E+01	5.742E+02	2.607E+01	1.610E+01	4.189E+02
22.0	93.6	220.0	4.361E+03	220.0	4.128E+03	9.760E-02	1.243E+01	4.029E+02	2.147E+01	1.549E+01	4.344E+02
23.0	93.7	222.0	3.734E+03	222.0	3.536E+03	8.004E-02	1.251E+01	2.831E+02	1.777E+01	1.497E+01	4.493E+02
24.0	93.9	223.0	3.202E+03	223.0	3.033E+03	6.614E-02	1.258E+01	2.006E+02	1.475E+01	1.449E+01	4.630E+02
8.8	90.0	246.4	3.256E+04	246.4	3.256E+04	2.230E+00	2.230E+00	7.262E+04	5.494E+02	5.016E+01	5.016E+01
9.0	89.6	242.0	3.256E+04	242.0	3.124E+04	3.301E+00	5.531E+00	1.831E+05	7.988E+02	7.614E+01	1.263E+02
10.0	88.9	235.0	2.826E+04	235.0	2.692E+04	1.733E+00	7.264E+00	4.663E+04	4.071E+02	4.505E+01	1.713E+02
11.0	88.6	229.0	2.443E+04	229.0	2.320E+04	1.205E+00	8.489E+00	2.796E+04	2.768E+02	3.542E+01	2.868E+02
12.0	88.2	222.0	2.103E+04	222.0	1.993E+04	9.079E-01	9.377E+00	1.810E+04	2.016E+02	3.012E+01	2.769E+02
13.0	88.0	216.0	1.802E+04	216.0	1.705E+04	7.044E-01	1.008E+01	1.201E+04	1.521E+02	2.658E+01	2.635E+02
14.0	87.8	216.0	1.538E+04	216.0	1.456E+04	5.457E-01	1.063E+01	7.943E+03	1.179E+02	2.412E+01	2.876E+02
15.0	87.6	216.0	1.313E+04	216.0	1.242E+04	4.293E-01	1.106E+01	5.334E+03	9.273E+01	2.223E+01	3.090E+02
16.0	87.4	216.0	1.121E+04	216.0	1.061E+04	3.416E-01	1.148E+01	3.623E+03	7.379E+01	2.072E+01	3.305E+02
17.0	87.2	216.0	9.572E+03	216.0	9.054E+03	2.742E-01	1.157E+01	2.482E+03	5.922E+01	1.949E+01	3.580E+02
18.0	87.0	216.0	8.172E+03	216.0	7.729E+03	2.214E-01	1.197E+01	1.711E+03	4.783E+01	1.843E+01	3.688E+02
19.0	86.8	217.0	6.977E+03	217.0	6.600E+03	1.791E-01	1.207E+01	1.102E+03	3.808E+01	1.755E+01	3.860E+02
20.0	86.7	218.0	5.961E+03	218.0	5.640E+03	1.457E-01	1.222E+01	8.218E+02	3.176E+01	1.678E+01	4.028E+02
21.0	86.5	219.0	5.097E+03	219.0	4.823E+03	1.190E-01	1.234E+01	5.742E+02	2.607E+01	1.610E+01	4.189E+02
22.0	86.4	220.0	4.361E+03	220.0	4.128E+03	9.760E-02	1.243E+01	4.029E+02	2.147E+01	1.549E+01	4.344E+02
23.0	86.3	222.0	3.734E+03	222.0	3.536E+03	8.004E-02	1.251E+01	2.831E+02	1.777E+01	1.497E+01	4.493E+02
24.0	86.1	223.0	3.202E+03	223.0	3.033E+03	6.614E-02	1.258E+01	2.006E+02	1.475E+01	1.449E+01	4.630E+02
25.0	86.0	224.0	2.748E+03	224.0	2.603E+03	5.484E-02	1.264E+01	1.427E+02	1.228E+01	1.406E+01	4.779E+02
26.0	85.9	224.0	2.359E+03	224.0	2.235E+03	4.576E-02	1.268E+01	1.022E+02	1.025E+01	1.366E+01	4.915E+02
27.0	85.8	224.0	2.025E+03	224.0	1.918E+03	3.824E-02	1.272E+01	7.336E+01	8.566E+00	1.330E+01	5.048E+02
28.0	85.6	224.0	1.739E+03	224.0	1.647E+03	3.201E-02	1.275E+01	5.272E+01	7.170E+00	1.297E+01	5.178E+02
29.0	85.5	224.0	1.493E+03	224.0	1.414E+03	2.669E-02	1.278E+01	3.776E+01	5.919E+00	1.259E+01	5.304E+02
30.0	85.4	234.0	1.283E+03	234.0	1.218E+03	2.160E-02	1.280E+01	2.631E+01	5.035E+00	1.236E+01	5.428E+02
31.0	85.3	234.0	1.108E+03	234.0	1.052E+03	1.827E-02	1.282E+01	1.922E+01	4.275E+00	1.210E+01	5.459E+02
32.0	85.2	234.0	9.579E+02	234.0	9.033E+02	1.547E-02	1.283E+01	1.406E+01	3.619E+00	1.185E+01	5.667E+02
33.0	85.1	234.0	8.278E+02	234.0	7.858E+02	1.311E-02	1.285E+01	1.030E+01	3.067E+00	1.162E+01	5.783E+02
34.0	85.0	234.8	7.153E+02	234.8	6.792E+02	1.106E-02	1.286E+01	7.510E+00	2.587E+00	1.134E+01	5.897E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
29.0	90.0	224.0	1.331E+03	224.0	1.331E+03	1.119E-01	1.119E-01	1.409E+02	2.506E+01	5.595E+01	5.595E+01
30.0	89.5	234.0	1.283E+03	224.2	1.283E+03	1.119E-01	1.119E-01	1.435E+02	2.508E+01	5.812E+01	5.812E+01
31.0	89.0	234.0	1.283E+03	234.0	1.228E+03	1.243E-01	2.362E-01	1.527E+02	2.909E+01	7.055E+01	1.287E+02
32.0	88.5	234.0	1.108E+03	234.0	1.056E+03	6.589E-02	3.021E-01	6.955E+01	1.542E+01	4.350E+01	1.722E+02
33.0	88.2	234.0	9.579E+02	234.0	9.110E+02	4.512E-02	3.472E-01	4.110E+01	1.056E+01	3.451E+01	2.807E+02
34.0	87.9	234.0	8.278E+02	234.0	7.868E+02	3.334E-02	3.805E-01	2.623E+01	7.862E+00	2.953E+01	2.362E+02
35.0	87.7	245.0	7.153E+02	234.0	6.799E+02	2.547E-02	4.060E-01	1.732E+01	5.961E+00	2.611E+01	2.862E+02
36.0	87.5	245.0	6.187E+02	245.0	5.890E+02	1.927E-02	4.253E-01	1.135E+01	4.720E+00	2.386E+01	2.862E+02
37.0	87.3	245.0	5.381E+02	245.0	5.123E+02	1.549E-02	4.408E-01	7.933E+00	3.794E+00	2.205E+01	3.882E+02
38.0	87.1	245.0	4.681E+02	245.0	4.456E+02	1.259E-02	4.534E-01	5.609E+00	3.084E+00	2.061E+01	3.288E+02
39.0	86.9	245.0	4.072E+02	245.0	3.875E+02	1.032E-02	4.637E-01	3.999E+00	2.528E+00	1.942E+01	3.483E+02
			3.542E+02	245.0	3.372E+02	8.466E-03	4.721E-01	2.855E+00	2.074E+00	1.831E+01	3.666E+02

APPARENT Z-ANG 90.50 (DEG)
 BALLOON HEIGHT 30.00 (KM)
 TANGENT HEIGHT 29.75 (KM)
 OPTICAL AIR MASS .629

EFFECTIVE PRESSURE 1016.66 (PA)
 EFFECTIVE TEMPERATURE 233.74 (DEG K)
 TANGENT PRESSURE 1305.48 (PA)

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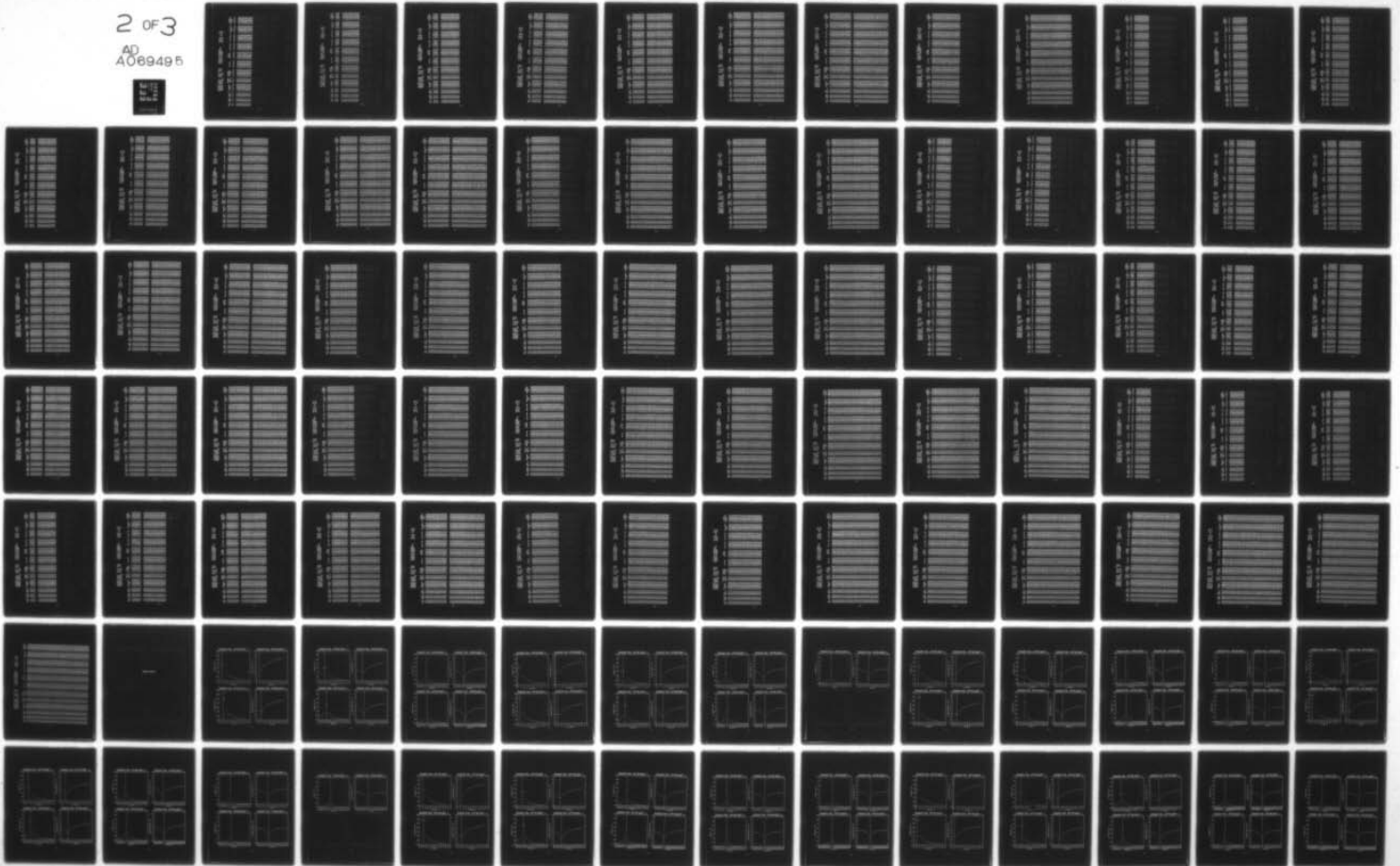
DENVER UNIV COLO DEPT OF PHYSICS
ON THE INTERPRETATION OF INFRARED SOLAR SPECTRA FOR ALTITUDE DI--ETC(U)
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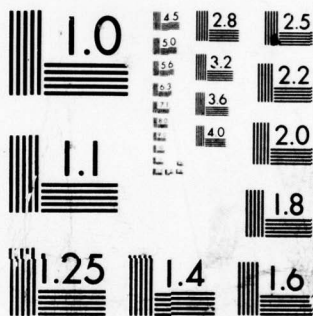
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

APPARENT Z-ANG 91.00 (DEG)
 BALLOON HEIGHT 30.00 (KM)
 TANGENT HEIGHT 29.02 (KM)
 OPTICAL AIR MASS .825

EFFECTIVE PRESSURE 1166.41 (PA)
 EFFECTIVE TEMPERATURE 230.52 (DEG K)
 TANGENT PRESSURE 1464.00 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
29.0	90.0	224.0	1.437E+03	224.0	1.415E+03	2.431E-01	2.431E-01	3.441E+02	5.446E+01	1.145E+02	1.145E+02
29.0	90.0	224.0	1.437E+03	224.0	1.415E+03	2.431E-01	2.431E-01	3.441E+02	5.446E+01	1.145E+02	1.145E+02
30.0	89.0	234.0	1.283E+03	234.0	1.222E+03	8.314E-02	3.263E-01	1.016E+02	1.945E+01	4.740E+01	1.619E+02
31.0	88.6	234.0	1.188E+03	234.0	1.054E+03	5.493E-02	3.012E-01	5.792E+01	1.285E+01	3.630E+01	1.982E+02
32.0	88.3	234.0	9.579E+02	234.0	9.106E+02	4.000E-02	4.212E-01	3.642E+01	9.359E+00	3.061E+01	2.208E+02
33.0	88.0	234.0	8.278E+02	234.0	7.866E+02	3.046E-02	4.516E-01	2.396E+01	7.129E+00	2.699E+01	2.558E+02
34.0	87.7	234.0	7.153E+02	234.0	6.798E+02	2.370E-02	4.753E-01	1.611E+01	5.545E+00	2.429E+01	2.801E+02
35.0	87.5	245.0	6.107E+02	245.0	5.890E+02	1.814E-02	4.935E-01	1.063E+01	4.444E+00	2.247E+01	3.025E+02
36.0	87.3	245.0	5.381E+02	245.0	5.123E+02	1.470E-02	5.082E-01	7.532E+00	3.603E+00	2.094E+01	3.235E+02
37.0	87.1	245.0	4.681E+02	245.0	4.455E+02	1.203E-02	5.202E-01	5.360E+00	2.947E+00	1.970E+01	3.432E+02
38.0	87.0	245.0	4.072E+02	245.0	3.875E+02	9.912E-03	5.301E-01	3.841E+00	2.428E+00	1.866E+01	3.618E+02
39.0	86.8	245.0	3.542E+02	245.0	3.372E+02	8.164E-03	5.383E-01	2.753E+00	2.000E+00	1.766E+01	3.795E+02

APPARENT Z-ANG 91.50 (DEG) EFFECTIVE PRESSURE 1411.95 (PA)
 BALLOON HEIGHT 30.00 (KM) EFFECTIVE TEMPERATURE 228.28 (DEG K)
 TANGENT HEIGHT 27.79 (KM) TANGENT PRESSURE 1775.74 (PA)
 OPTICAL AIR MASS 1.119

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
27.8	90.0	224.0	1.739E+03	224.0	1.739E+03	1.395E-01	1.395E-01	2.425E+02	3.124E+01	5.341E+01	5.341E+01
28.0	90.5	224.0	1.739E+03	224.0	1.653E+03	1.824E-01	3.219E-01	3.033E+02	4.086E+01	7.319E+01	1.266E+02
29.0	91.1	224.0	1.493E+03	224.0	1.419E+03	9.309E-02	4.149E-01	1.321E+02	2.885E+01	4.377E+01	1.704E+02
30.0	88.5	234.0	1.263E+03	234.0	1.220E+03	6.074E-02	4.757E-01	7.410E+01	1.421E+01	3.470E+01	2.851E+02
31.0	88.2	234.0	1.108E+03	234.0	1.054E+03	4.479E-02	5.205E-01	4.719E+01	1.040E+01	2.962E+01	2.347E+02
32.0	87.9	234.0	9.579E+02	234.0	9.102E+02	3.435E-02	5.548E-01	3.127E+01	8.038E+00	2.630E+01	2.618E+02
33.0	87.7	234.0	8.278E+02	234.0	7.864E+02	2.698E-02	5.818E-01	2.122E+01	6.313E+00	2.391E+01	2.849E+02
34.0	87.5	234.0	7.153E+02	234.0	6.797E+02	2.142E-02	6.032E-01	1.456E+01	5.011E+00	2.196E+01	3.868E+02
35.0	87.3	245.0	6.187E+02	245.0	5.889E+02	1.663E-02	6.199E-01	9.795E+00	4.875E+00	2.060E+01	3.274E+02
36.0	87.1	245.0	5.381E+02	245.0	5.122E+02	1.363E-02	6.335E-01	6.981E+00	3.339E+00	1.941E+01	3.469E+02
37.0	86.9	245.0	4.681E+02	245.0	4.455E+02	1.125E-02	6.447E-01	5.010E+00	2.755E+00	1.841E+01	3.653E+02
38.0	86.8	245.0	4.072E+02	245.0	3.875E+02	9.328E-03	6.541E-01	3.615E+00	2.285E+00	1.756E+01	3.828E+02
39.0	86.6	245.0	3.542E+02	245.0	3.372E+02	7.726E-03	6.618E-01	2.605E+00	1.893E+00	1.672E+01	3.996E+02

APPARENT Z-ANG 92.00 (DEG)
 BALLOON HEIGHT 38.00 (KM)
 TANGENT HEIGHT 26.00 (KM)
 OPTICAL AIR MASS 1.561

EFFECTIVE PRESSURE 1810.46 (PA)
 EFFECTIVE TEMPERATURE 226.72 (DEG K)
 TANGENT PRESSURE 2328.61 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
26.1	90.0	224.0	2.271E+03	224.0	2.233E+03	3.703E-01	3.703E-01	8.271E+02	8.295E+01	1.105E+02	1.105E+02
27.0	91.0	224.0	2.025E+03	224.0	1.926E+03	1.395E-01	5.098E-01	2.686E+02	3.124E+01	4.831E+01	1.588E+02
28.0	91.4	224.0	1.739E+03	224.0	1.651E+03	9.069E-02	6.005E-01	1.497E+02	2.831E+01	3.666E+01	1.955E+02
29.0	91.7	224.0	1.493E+03	224.0	1.417E+03	6.504E-02	6.655E-01	9.214E+01	1.457E+01	3.064E+01	2.261E+02
30.0	91.7	224.0	1.283E+03	224.0	1.219E+03	4.735E-02	7.129E-01	5.772E+01	1.108E+01	2.707E+01	2.532E+02
31.0	87.8	234.0	1.108E+03	234.0	1.053E+03	3.697E-02	7.498E-01	3.894E+01	8.652E+00	2.447E+01	2.776E+02
32.0	87.5	234.0	9.579E+02	234.0	9.099E+02	2.938E-02	7.792E-01	2.674E+01	8.376E+00	2.250E+01	3.001E+02
33.0	87.3	234.0	8.270E+02	234.0	7.862E+02	2.365E-02	8.029E-01	1.859E+01	5.534E+00	2.096E+01	3.211E+02
34.0	87.2	234.0	7.153E+02	234.0	6.796E+02	1.911E-02	8.220E-01	1.298E+01	4.471E+00	1.959E+01	3.407E+02
35.0	87.0	245.0	6.187E+02	245.0	5.800E+02	1.504E-02	8.370E-01	8.857E+00	3.685E+00	1.864E+01	3.593E+02
36.0	86.8	245.0	5.381E+02	245.0	5.121E+02	1.246E-02	8.495E-01	6.381E+00	3.052E+00	1.775E+01	3.771E+02
37.0	86.7	245.0	4.681E+02	245.0	4.455E+02	1.037E-02	8.590E-01	4.618E+00	2.540E+00	1.690E+01	3.948E+02
38.0	86.5	245.0	4.072E+02	245.0	3.875E+02	8.661E-03	8.685E-01	3.356E+00	2.122E+00	1.631E+01	4.104E+02
39.0	86.4	245.0	3.542E+02	245.0	3.371E+02	7.216E-03	8.757E-01	2.433E+00	1.760E+00	1.561E+01	4.260E+02

APPARENT Z-ANG 92.50 (DEG) EFFECTIVE PRESSURE 2480.92 (PA)
 BALLOON HEIGHT 30.00 (KM) EFFECTIVE TEMPERATURE 225.06 (DEG K)
 TANGENT HEIGHT 23.86 (KM) TANGENT PRESSURE 3321.98 (PA)
 OPTICAL AIR MASS 2.355

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
23.9	90.0	222.5	3.202E+03	222.5	3.202E+03	2.002E-01	2.002E-01	6.666E+02	4.631E+01	4.300E+01	4.300E+01
24.0	90.4	223.0	3.202E+03	223.0	3.067E+03	3.644E-01	5.726E-01	1.119E+03	6.127E+01	7.893E+01	1.219E+02
25.0	91.1	224.0	2.748E+03	224.0	2.612E+03	1.754E-01	7.480E-01	4.580E+02	3.929E+01	4.481E+01	1.667E+02
26.0	91.5	224.0	2.359E+03	224.0	2.239E+03	1.177E-01	8.657E-01	2.634E+02	2.636E+01	3.506E+01	2.018E+02
27.0	91.8	224.0	2.025E+03	224.0	1.921E+03	8.586E-02	9.515E-01	1.649E+02	1.923E+01	2.982E+01	2.316E+02
28.0	92.1	224.0	1.739E+03	224.0	1.649E+03	6.527E-02	1.017E+00	1.076E+02	1.462E+01	2.641E+01	2.500E+02
29.0	92.3	224.0	1.493E+03	224.0	1.416E+03	5.060E-02	1.067E+00	7.162E+01	1.133E+01	2.385E+01	2.819E+02
23.9	90.0	222.5	3.202E+03	222.5	3.202E+03	2.002E-01	2.002E-01	6.666E+02	4.631E+01	4.300E+01	4.300E+01
24.0	90.6	223.0	3.202E+03	223.0	3.067E+03	3.644E-01	5.726E-01	1.119E+03	6.127E+01	7.893E+01	1.219E+02
25.0	90.9	224.0	2.748E+03	224.0	2.612E+03	1.754E-01	7.480E-01	4.580E+02	3.929E+01	4.481E+01	1.667E+02
26.0	90.5	224.0	2.359E+03	224.0	2.239E+03	1.177E-01	8.657E-01	2.634E+02	2.636E+01	3.506E+01	2.018E+02
27.0	90.2	224.0	2.025E+03	224.0	1.921E+03	8.586E-02	9.515E-01	1.649E+02	1.923E+01	2.982E+01	2.316E+02
28.0	90.9	224.0	1.739E+03	224.0	1.649E+03	6.527E-02	1.017E+00	1.076E+02	1.462E+01	2.641E+01	2.500E+02
29.0	91.7	224.0	1.493E+03	224.0	1.416E+03	5.060E-02	1.067E+00	7.162E+01	1.133E+01	2.385E+01	2.819E+02
30.0	91.5	234.0	1.283E+03	234.0	1.218E+03	3.863E-02	1.106E+00	4.707E+01	9.840E+00	2.209E+01	3.040E+02
31.0	91.3	234.0	1.108E+03	234.0	1.053E+03	3.115E-02	1.137E+00	3.209E+01	7.290E+00	2.062E+01	3.246E+02
32.0	91.1	234.0	9.279E+02	234.0	9.097E+02	2.534E-02	1.162E+00	2.309E+01	5.930E+00	1.941E+01	3.440E+02
33.0	90.9	234.0	8.208E+02	234.0	7.861E+02	2.076E-02	1.183E+00	1.632E+01	4.850E+00	1.840E+01	3.624E+02
34.0	90.8	234.0	7.153E+02	234.0	6.795E+02	1.701E-02	1.200E+00	1.156E+01	3.980E+00	1.744E+01	3.790E+02
35.0	90.6	245.0	6.187E+02	245.0	5.887E+02	1.354E-02	1.214E+00	7.973E+00	3.317E+00	1.678E+01	3.966E+02
36.0	90.5	245.0	5.381E+02	245.0	5.121E+02	1.132E-02	1.225E+00	5.797E+00	2.773E+00	1.612E+01	4.127E+02
37.0	90.3	245.0	4.681E+02	245.0	4.454E+02	9.493E-03	1.235E+00	4.229E+00	2.326E+00	1.555E+01	4.263E+02
38.0	90.2	245.0	4.072E+02	245.0	3.874E+02	7.983E-03	1.243E+00	3.093E+00	1.956E+00	1.503E+01	4.433E+02
39.0	90.1	245.0	3.542E+02	245.0	3.371E+02	6.680E-03	1.249E+00	2.259E+00	1.639E+00	1.447E+01	4.578E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (KM)
21.1	90.0	219.0	4.902E+03	219.0	4.812E+03	7.802E-01	7.802E-01	3.754E+03	1.709E+02	1.057E+02	1.057E+02
22.0	90.9	220.0	4.361E+03	220.0	4.145E+03	3.129E-01	1.093E+00	1.297E+03	6.883E+01	4.946E+01	1.551E+02
23.0	91.4	222.0	3.734E+03	222.0	3.544E+03	1.988E-01	1.292E+00	7.045E+02	4.413E+01	3.709E+01	1.922E+02
24.0	91.7	223.0	3.202E+03	223.0	3.037E+03	1.418E-01	1.434E+00	4.305E+02	3.161E+01	3.100E+01	2.232E+02
25.0	92.0	224.0	2.748E+03	224.0	2.605E+03	1.063E-01	1.540E+00	2.769E+02	2.300E+01	2.721E+01	2.504E+02
26.0	92.2	224.0	2.359E+03	224.0	2.236E+03	8.228E-02	1.622E+00	1.840E+02	1.843E+01	2.455E+01	2.750E+02
27.0	92.4	224.0	2.025E+03	224.0	1.920E+03	6.488E-02	1.687E+00	1.245E+02	1.453E+01	2.255E+01	2.975E+02
28.0	92.6	224.0	1.739E+03	224.0	1.648E+03	5.102E-02	1.739E+00	8.539E+01	1.161E+01	2.098E+01	3.185E+02
29.0	92.8	224.0	1.493E+03	224.0	1.415E+03	4.157E-02	1.780E+00	5.882E+01	9.311E+00	1.960E+01	3.381E+02

APPARENT Z-ANG 93.00 (DEG)
 BALLOON HEIGHT 38.00 (KM)
 TANGENT HEIGHT 21.15 (KM)
 OPTICAL AIR MASS 3.756

EFFECTIVE PRESSURE
 EFFECTIVE TEMPERATURE
 TANGENT PRESSURE

3719.55 (PA)
 221.91 (DEG K)
 5226.05 (PA)

21.1	90.0	219.0	4.902E+03	219.0	4.812E+03	7.802E-01	7.802E-01	3.754E+03	1.709E+02	1.057E+02	1.057E+02
22.0	89.1	220.0	4.361E+03	220.0	4.145E+03	3.129E-01	1.093E+00	1.297E+03	6.883E+01	4.946E+01	1.551E+02
23.0	88.6	222.0	3.734E+03	222.0	3.544E+03	1.988E-01	1.292E+00	7.045E+02	4.413E+01	3.709E+01	1.922E+02
24.0	88.3	223.0	3.202E+03	223.0	3.037E+03	1.418E-01	1.434E+00	4.305E+02	3.161E+01	3.100E+01	2.232E+02
25.0	88.0	224.0	2.748E+03	224.0	2.605E+03	1.063E-01	1.540E+00	2.769E+02	2.300E+01	2.721E+01	2.504E+02
26.0	87.8	224.0	2.359E+03	224.0	2.236E+03	8.228E-02	1.622E+00	1.840E+02	1.843E+01	2.455E+01	2.750E+02
27.0	87.6	224.0	2.025E+03	224.0	1.920E+03	6.488E-02	1.687E+00	1.245E+02	1.453E+01	2.255E+01	2.975E+02
28.0	87.4	224.0	1.739E+03	224.0	1.648E+03	5.102E-02	1.739E+00	8.539E+01	1.161E+01	2.098E+01	3.185E+02
29.0	87.2	224.0	1.493E+03	224.0	1.415E+03	4.157E-02	1.780E+00	5.882E+01	9.311E+00	1.960E+01	3.381E+02
30.0	87.8	234.0	1.283E+03	234.0	1.218E+03	3.255E-02	1.813E+00	3.966E+01	7.610E+00	1.862E+01	3.567E+02
31.0	86.8	234.0	1.108E+03	234.0	1.053E+03	2.617E-02	1.840E+00	2.818E+01	6.264E+00	1.772E+01	3.744E+02
32.0	86.7	234.0	9.579E+02	234.0	9.096E+02	2.212E-02	1.862E+00	2.012E+01	5.176E+00	1.695E+01	3.914E+02
33.0	86.5	234.0	8.278E+02	234.0	7.860E+02	1.835E-02	1.880E+00	1.442E+01	4.293E+00	1.627E+01	4.077E+02
34.0	86.4	234.0	7.153E+02	234.0	6.794E+02	1.519E-02	1.895E+00	1.032E+01	3.554E+00	1.558E+01	4.232E+02
35.0	86.2	245.0	6.187E+02	245.0	5.887E+02	1.220E-02	1.908E+00	7.183E+00	2.989E+00	1.512E+01	4.384E+02
36.0	86.1	245.0	5.381E+02	245.0	5.121E+02	1.028E-02	1.918E+00	5.262E+00	2.518E+00	1.464E+01	4.538E+02
37.0	86.0	245.0	4.681E+02	245.0	4.454E+02	8.675E-03	1.927E+00	3.854E+00	2.125E+00	1.421E+01	4.672E+02
38.0	85.9	245.0	4.072E+02	245.0	3.874E+02	7.337E-03	1.934E+00	2.842E+00	1.798E+00	1.381E+01	4.818E+02
39.0	85.7	245.0	3.542E+02	245.0	3.371E+02	6.178E-03	1.940E+00	2.883E+00	1.514E+00	1.337E+01	4.944E+02

APPARENT Z-ANG 93.50 (DEG)
 BALLOON HEIGHT 30.00 (KM)
 TANGENT HEIGHT 17.90 (KM)
 OPTICAL AIR MASS 6.469

EFFECTIVE PRESSURE 6094.60 (PA)
 EFFECTIVE TEMPERATURE 218.60 (DEG K)
 TANGENT PRESSURE 9315.87 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
17.9	90.0	216.0	8.172E+03	216.0	8.172E+03	4.639E-01	4.639E-01	3.791E+03	1.002E+02	3.646E+01	3.646E+01
18.0	90.3	216.0	8.172E+03	216.0	7.825E+03	1.015E+00	1.479E+00	7.942E+03	2.192E+02	8.345E+01	1.199E+02
19.0	91.0	217.0	6.977E+03	217.0	6.622E+03	4.653E-01	1.944E+00	3.081E+03	1.010E+02	4.542E+01	1.653E+02
20.0	91.4	218.0	5.961E+03	218.0	5.651E+03	3.075E-01	2.252E+00	1.737E+03	6.703E+01	3.533E+01	2.007E+02
21.0	91.8	219.0	5.097E+03	219.0	4.829E+03	2.218E-01	2.473E+00	1.071E+03	4.857E+01	2.996E+01	2.306E+02
22.0	92.0	220.0	4.361E+03	220.0	4.132E+03	1.669E-01	2.640E+00	6.896E+02	3.672E+01	2.647E+01	2.571E+02
23.0	92.3	222.0	3.734E+03	222.0	3.539E+03	1.285E-01	2.769E+00	4.546E+02	2.852E+01	2.480E+01	2.811E+02
24.0	92.5	223.0	3.202E+03	223.0	3.034E+03	1.010E-01	2.870E+00	3.066E+02	2.253E+01	2.211E+01	3.032E+02
25.0	92.7	224.0	2.748E+03	224.0	2.604E+03	8.052E-02	2.950E+00	2.097E+02	1.804E+01	2.063E+01	3.238E+02
26.0	92.9	224.0	2.359E+03	224.0	2.235E+03	6.502E-02	3.015E+00	1.453E+02	1.456E+01	1.941E+01	3.432E+02
27.0	93.0	224.0	2.025E+03	224.0	1.919E+03	5.287E-02	3.060E+00	1.015E+02	1.104E+01	1.830E+01	3.616E+02
28.0	93.2	224.0	1.739E+03	224.0	1.647E+03	4.324E-02	3.111E+00	7.133E+01	9.685E+00	1.751E+01	3.791E+02
29.0	93.4	224.0	1.493E+03	224.0	1.415E+03	3.534E-02	3.147E+00	5.000E+01	7.916E+00	1.666E+01	3.950E+02
17.9	90.0	216.0	8.172E+03	216.0	8.172E+03	4.639E-01	4.639E-01	3.791E+03	1.002E+02	3.646E+01	3.646E+01
18.0	89.7	216.0	8.172E+03	216.0	7.825E+03	1.015E+00	1.479E+00	7.942E+03	2.192E+02	8.345E+01	1.199E+02
19.0	89.0	217.0	6.977E+03	217.0	6.622E+03	4.653E-01	1.944E+00	3.081E+03	1.010E+02	4.542E+01	1.653E+02
20.0	88.6	218.0	5.961E+03	218.0	5.651E+03	3.075E-01	2.252E+00	1.737E+03	6.703E+01	3.533E+01	2.007E+02
21.0	88.2	219.0	5.097E+03	219.0	4.829E+03	2.218E-01	2.473E+00	1.071E+03	4.857E+01	2.996E+01	2.306E+02
22.0	88.0	220.0	4.361E+03	220.0	4.132E+03	1.669E-01	2.640E+00	6.896E+02	3.672E+01	2.647E+01	2.571E+02
23.0	87.7	222.0	3.734E+03	222.0	3.539E+03	1.285E-01	2.769E+00	4.546E+02	2.852E+01	2.480E+01	2.811E+02
24.0	87.5	223.0	3.202E+03	223.0	3.034E+03	1.010E-01	2.870E+00	3.066E+02	2.253E+01	2.211E+01	3.032E+02
25.0	87.3	224.0	2.748E+03	224.0	2.604E+03	8.052E-02	2.950E+00	2.097E+02	1.804E+01	2.063E+01	3.238E+02
26.0	87.1	224.0	2.359E+03	224.0	2.235E+03	6.502E-02	3.015E+00	1.453E+02	1.456E+01	1.941E+01	3.432E+02
27.0	87.0	224.0	2.025E+03	224.0	1.919E+03	5.287E-02	3.060E+00	1.015E+02	1.104E+01	1.830E+01	3.616E+02
28.0	86.8	224.0	1.739E+03	224.0	1.647E+03	4.324E-02	3.111E+00	7.133E+01	9.685E+00	1.751E+01	3.791E+02
29.0	86.6	224.0	1.493E+03	224.0	1.415E+03	3.534E-02	3.147E+00	5.000E+01	7.916E+00	1.666E+01	3.950E+02
30.0	86.5	234.0	1.283E+03	234.0	1.218E+03	2.810E-02	3.175E+00	3.423E+01	6.576E+00	1.600E+01	4.119E+02
31.0	86.4	234.0	1.108E+03	234.0	1.052E+03	2.340E-02	3.198E+00	2.463E+01	5.476E+00	1.549E+01	4.274E+02
32.0	86.2	234.0	9.579E+02	234.0	9.095E+02	1.954E-02	3.218E+00	1.777E+01	4.572E+00	1.497E+01	4.423E+02
33.0	86.1	234.0	8.278E+02	234.0	7.859E+02	1.636E-02	3.234E+00	1.295E+01	3.827E+00	1.450E+01	4.560E+02
34.0	86.0	234.0	7.153E+02	234.0	6.793E+02	1.365E-02	3.248E+00	9.271E+00	3.193E+00	1.400E+01	4.700E+02
35.0	85.8	245.0	6.187E+02	245.0	5.887E+02	1.104E-02	3.259E+00	6.497E+00	2.704E+00	1.368E+01	4.845E+02
36.0	85.7	245.0	5.381E+02	245.0	5.120E+02	9.352E-03	3.268E+00	4.799E+00	2.291E+00	1.332E+01	4.978E+02
37.0	85.6	245.0	4.681E+02	245.0	4.454E+02	7.936E-03	3.276E+00	3.535E+00	1.944E+00	1.300E+01	5.100E+02
38.0	85.5	245.0	4.072E+02	245.0	3.874E+02	6.744E-03	3.283E+00	2.613E+00	1.652E+00	1.270E+01	5.235E+02
39.0	85.4	245.0	3.542E+02	245.0	3.371E+02	5.703E-03	3.289E+00	1.923E+00	1.397E+00	1.234E+01	5.359E+02

APPARENT Z-ANG 94.00 (DEG)
 BALLOON HEIGHT 30.00 (KM)
 TANGENT HEIGHT 14.09 (KM)
 OPTICAL AIR MASS 12.088

EFFECTIVE PRESSURE
 TANGENT PRESSURE

10974.99 (PA)
 217.12 (DEG K)
 19716.65 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
14.1	90.0	216.0	1.479E+04	216.0	1.453E+04	2.502E+00	2.502E+00	2.502E+00	3.636E+04	5.404E+02	1.106E+02	1.106E+02
15.0	90.9	216.0	1.313E+04	216.0	1.247E+04	9.497E-01	9.497E-01	3.452E+00	1.184E+04	2.051E+02	4.900E+01	1.597E+02
16.0	91.4	216.0	1.121E+04	216.0	1.062E+04	6.111E-01	6.111E-01	4.063E+00	6.493E+03	1.320E+02	3.701E+01	1.967E+02
17.0	91.7	216.0	9.572E+03	216.0	9.064E+03	4.366E-01	4.366E-01	4.499E+00	3.957E+03	9.430E+01	3.099E+01	2.277E+02
18.0	92.0	216.0	8.172E+03	216.0	7.735E+03	3.269E-01	3.269E-01	4.826E+00	2.528E+03	7.060E+01	2.719E+01	2.548E+02
19.0	92.2	217.0	6.977E+03	217.0	6.604E+03	2.506E-01	2.506E-01	5.077E+00	1.655E+03	5.430E+01	2.453E+01	2.794E+02
20.0	92.4	218.0	5.961E+03	218.0	5.643E+03	1.957E-01	1.957E-01	5.272E+00	1.104E+03	4.266E+01	2.252E+01	3.019E+02
21.0	92.6	219.0	5.097E+03	219.0	4.829E+03	1.549E-01	1.549E-01	5.427E+00	7.474E+02	3.32E+01	2.094E+01	3.228E+02
22.0	92.8	220.0	4.361E+03	220.0	4.129E+03	1.238E-01	1.238E-01	5.551E+00	5.112E+02	2.74E+01	1.965E+01	3.425E+02
23.0	93.0	222.0	3.734E+03	222.0	3.537E+03	9.943E-02	9.943E-02	5.651E+00	3.517E+02	2.07E+01	1.859E+01	3.611E+02
24.0	93.1	223.0	3.202E+03	223.0	3.033E+03	8.073E-02	8.073E-02	5.731E+00	2.449E+02	1.808E+01	1.768E+01	3.787E+02
25.0	93.3	224.0	2.748E+03	224.0	2.603E+03	6.595E-02	6.595E-02	5.779E+00	1.717E+02	1.477E+01	1.622E+01	3.956E+02
26.0	93.5	224.0	2.359E+03	224.0	2.235E+03	5.432E-02	5.432E-02	5.852E+00	1.214E+02	1.217E+01	1.419E+01	4.119E+02
27.0	93.6	224.0	2.025E+03	224.0	1.919E+03	4.489E-02	4.489E-02	5.896E+00	8.614E+01	1.006E+01	1.561E+01	4.275E+02
28.0	93.7	224.0	1.739E+03	224.0	1.647E+03	3.721E-02	3.721E-02	5.934E+00	6.129E+01	8.35E+00	1.507E+01	4.425E+02
29.0	93.9	224.0	1.493E+03	224.0	1.415E+03	3.076E-02	3.076E-02	5.984E+00	4.352E+01	6.891E+00	1.451E+01	4.571E+02
14.1	90.0	216.0	1.479E+04	216.0	1.453E+04	2.502E+00	2.502E+00	2.502E+00	3.636E+04	5.404E+02	1.106E+02	1.106E+02
15.0	89.1	216.0	1.313E+04	216.0	1.247E+04	9.497E-01	9.497E-01	3.452E+00	1.184E+04	2.051E+02	4.900E+01	1.597E+02
16.0	88.6	216.0	1.121E+04	216.0	1.062E+04	6.111E-01	6.111E-01	4.063E+00	6.493E+03	1.320E+02	3.701E+01	1.967E+02
17.0	88.3	216.0	9.572E+03	216.0	9.064E+03	4.366E-01	4.366E-01	4.499E+00	3.957E+03	9.430E+01	3.099E+01	2.277E+02
18.0	88.0	216.0	8.172E+03	216.0	7.735E+03	3.269E-01	3.269E-01	4.826E+00	2.528E+03	7.060E+01	2.719E+01	2.548E+02
19.0	87.8	217.0	6.977E+03	217.0	6.604E+03	2.506E-01	2.506E-01	5.077E+00	1.655E+03	5.430E+01	2.453E+01	2.794E+02
20.0	87.6	218.0	5.961E+03	218.0	5.643E+03	1.957E-01	1.957E-01	5.272E+00	1.104E+03	4.266E+01	2.252E+01	3.019E+02
21.0	87.4	219.0	5.097E+03	219.0	4.829E+03	1.549E-01	1.549E-01	5.427E+00	7.474E+02	3.32E+01	2.094E+01	3.228E+02
22.0	87.2	220.0	4.361E+03	220.0	4.129E+03	1.238E-01	1.238E-01	5.551E+00	5.112E+02	2.74E+01	1.965E+01	3.425E+02
23.0	87.0	222.0	3.734E+03	222.0	3.537E+03	9.943E-02	9.943E-02	5.651E+00	3.517E+02	2.07E+01	1.859E+01	3.611E+02
24.0	86.9	223.0	3.202E+03	223.0	3.033E+03	8.073E-02	8.073E-02	5.731E+00	2.449E+02	1.808E+01	1.768E+01	3.787E+02
25.0	86.7	224.0	2.748E+03	224.0	2.603E+03	6.595E-02	6.595E-02	5.779E+00	1.717E+02	1.477E+01	1.622E+01	3.956E+02
26.0	86.5	224.0	2.359E+03	224.0	2.235E+03	5.432E-02	5.432E-02	5.852E+00	1.214E+02	1.217E+01	1.419E+01	4.119E+02
27.0	86.4	224.0	2.025E+03	224.0	1.919E+03	4.489E-02	4.489E-02	5.896E+00	8.614E+01	1.006E+01	1.561E+01	4.275E+02
28.0	86.3	224.0	1.739E+03	224.0	1.647E+03	3.721E-02	3.721E-02	5.934E+00	6.129E+01	8.35E+00	1.507E+01	4.425E+02
29.0	86.1	224.0	1.493E+03	224.0	1.415E+03	3.076E-02	3.076E-02	5.984E+00	4.352E+01	6.891E+00	1.451E+01	4.571E+02
30.0	86.0	234.0	1.263E+03	234.0	1.219E+03	2.471E-02	2.471E-02	5.999E+00	3.009E+01	5.791E+00	1.414E+01	4.712E+02
31.0	85.9	234.0	1.108E+03	234.0	1.052E+03	2.075E-02	2.075E-02	6.010E+00	2.183E+01	4.095E+00	1.374E+01	4.849E+02
32.0	85.8	234.0	9.579E+02	234.0	9.094E+02	1.746E-02	1.746E-02	6.027E+00	1.587E+01	4.095E+00	1.304E+01	4.963E+02
33.0	85.6	234.0	8.270E+02	234.0	7.859E+02	1.471E-02	1.471E-02	6.042E+00	1.156E+01	3.442E+00	1.304E+01	5.113E+02
34.0	85.5	234.0	7.153E+02	234.0	6.793E+02	1.234E-02	1.234E-02	6.054E+00	8.385E+00	2.888E+00	1.266E+01	5.240E+02
35.0	85.4	245.0	6.187E+02	245.0	5.886E+02	1.004E-02	1.004E-02	6.064E+00	5.907E+00	2.459E+00	1.244E+01	5.364E+02
36.0	85.3	245.0	5.381E+02	245.0	5.120E+02	8.544E-03	8.544E-03	6.073E+00	4.375E+00	2.093E+00	1.217E+01	5.486E+02
37.0	85.2	245.0	4.681E+02	245.0	4.454E+02	7.282E-03	7.282E-03	6.080E+00	3.245E+00	1.794E+00	1.193E+01	5.605E+02
38.0	85.1	245.0	4.072E+02	245.0	3.874E+02	6.212E-03	6.212E-03	6.086E+00	2.406E+00	1.522E+00	1.170E+01	5.722E+02
39.0	85.0	245.0	3.542E+02	245.0	3.371E+02	5.272E-03	5.272E-03	6.092E+00	1.777E+00	1.292E+00	1.141E+01	5.837E+02

APPARENT Z-ANG 94.50 (DEG)
 BALLOON HEIGHT 30.00 (KM)
 TANGENT HEIGHT 9.70 (KM)
 OPTICAL AIR MASS 22.904

EFFECTIVE PRESSURE 21155.36 (PA)
 EFFECTIVE TEMPERATURE 220.99 (DEG K)
 TANGENT PRESSURE 43556.28 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (OM)	ACCUM DEL (OM)	DEL (P-OM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
9.7	90.0	242.0	2.929E+04	242.0	2.929E+04	2.599E+00	2.599E+00	7.613E+04	6.290E+02	6.304E+01	6.384E+01
10.0	90.5	235.0	2.826E+04	235.0	2.703E+04	2.620E+00	5.227E+00	7.104E+04	6.176E+02	6.003E+01	1.319E+02
11.0	91.1	229.0	2.443E+04	229.0	2.323E+04	1.477E+00	6.705E+00	3.432E+04	3.383E+02	4.338E+01	1.752E+02
12.0	91.5	222.0	2.103E+04	222.0	1.994E+04	1.041E+00	7.746E+00	2.077E+04	2.312E+02	3.453E+01	2.098E+02
13.0	91.8	216.0	1.802E+04	216.0	1.706E+04	7.814E-01	8.527E+00	1.333E+04	1.680E+02	2.947E+01	2.392E+02
14.0	92.0	216.0	1.538E+04	216.0	1.456E+04	5.932E-01	9.321E+00	8.636E+03	1.281E+02	2.622E+01	2.655E+02
15.0	92.3	216.0	1.313E+04	216.0	1.243E+04	4.604E-01	9.581E+00	5.721E+03	9.944E+01	2.304E+01	2.893E+02
16.0	92.5	216.0	1.121E+04	216.0	1.061E+04	3.627E-01	9.944E+00	3.847E+03	7.835E+01	2.200E+01	3.113E+02
17.0	92.7	216.0	9.572E+03	216.0	9.054E+03	2.889E-01	1.023E+01	2.616E+03	6.241E+01	2.053E+01	3.310E+02
18.0	92.8	216.0	8.172E+03	216.0	7.729E+03	2.320E-01	1.046E+01	1.793E+03	5.811E+01	1.931E+01	3.511E+02
19.0	93.0	217.0	6.977E+03	217.0	6.600E+03	1.868E-01	1.065E+01	1.233E+03	4.8054E+01	1.830E+01	3.694E+02
20.0	93.2	218.0	5.961E+03	218.0	5.640E+03	1.514E-01	1.080E+01	8.538E+02	3.300E+01	1.743E+01	3.869E+02
21.0	93.5	219.0	5.097E+03	219.0	4.824E+03	1.233E-01	1.093E+01	5.946E+02	2.780E+01	1.667E+01	4.0335E+02
22.0	93.5	220.0	4.361E+03	220.0	4.128E+03	1.008E-01	1.103E+01	4.161E+02	2.217E+01	1.600E+01	4.195E+02
23.0	93.6	222.0	3.734E+03	222.0	3.577E+03	8.247E-02	1.111E+01	2.916E+02	1.831E+01	1.542E+01	4.350E+02
24.0	93.8	223.0	3.262E+03	223.0	3.033E+03	6.801E-02	1.118E+01	2.063E+02	1.517E+01	1.489E+01	4.499E+02
25.0	93.9	224.0	2.748E+03	224.0	2.603E+03	5.629E-02	1.123E+01	1.465E+02	1.261E+01	1.443E+01	4.643E+02
26.0	94.0	224.0	2.359E+03	224.0	2.235E+03	4.689E-02	1.128E+01	1.048E+02	1.050E+01	1.400E+01	4.783E+02
27.0	94.1	224.0	2.025E+03	224.0	1.918E+03	3.913E-02	1.132E+01	7.508E+01	8.766E+00	1.361E+01	4.919E+02
28.0	94.3	224.0	1.739E+03	224.0	1.647E+03	3.272E-02	1.135E+01	5.389E+01	7.329E+00	1.325E+01	5.051E+02
29.0	94.4	224.0	1.493E+03	224.0	1.414E+03	2.725E-02	1.138E+01	3.855E+01	6.105E+00	1.285E+01	5.180E+02

APPARENT Z-ANG 94.50 (DEG)
 BALLOON HEIGHT 30.00 (KM)
 TANGENT HEIGHT 9.73 (KM)
 OPTICAL AIR MASS 22.904

EFFECTIVE PRESSURE
 EFFECTIVE TEMPERATURE
 TANGENT PRESSURE

21155.38 (PA)
 228.99 (DEG K)
 43556.20 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(OM)	DEL(OM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
9.7	90.0	242.0	242.0	2.929E+04	242.0	2.929E+04	2.599E+00	7.613E+04	6.290E+02	6.384E+01	6.384E+01	6.384E+01
10.0	89.5	235.0	235.0	2.826E+04	235.0	2.703E+04	5.227E+00	7.104E+04	6.176E+02	6.803E+01	6.803E+01	1.319E+02
11.0	88.9	229.0	229.0	2.433E+04	229.0	2.323E+04	6.705E+00	3.432E+04	3.383E+02	4.338E+01	4.338E+01	1.752E+02
12.0	88.5	222.0	222.0	2.103E+04	222.0	1.994E+04	7.746E+00	2.077E+04	2.312E+02	3.453E+01	3.453E+01	2.098E+02
13.0	88.2	216.0	216.0	1.802E+04	216.0	1.706E+04	8.527E+00	1.333E+04	1.608E+02	2.947E+01	2.947E+01	2.392E+02
14.0	88.0	216.0	216.0	1.538E+04	216.0	1.456E+04	9.121E+00	8.636E+03	1.281E+02	2.622E+01	2.622E+01	2.695E+02
15.0	87.7	216.0	216.0	1.313E+04	216.0	1.243E+04	9.581E+00	5.721E+03	9.944E+01	2.384E+01	2.384E+01	2.893E+02
16.0	87.5	216.0	216.0	1.121E+04	216.0	1.061E+04	9.944E+00	3.847E+03	7.835E+01	2.200E+01	2.200E+01	3.113E+02
17.0	87.3	216.0	216.0	9.572E+03	216.0	9.054E+03	1.023E+01	2.616E+03	6.241E+01	2.853E+01	2.853E+01	3.318E+02
18.0	87.2	216.0	216.0	8.172E+03	216.0	7.729E+03	1.046E+01	1.793E+03	5.811E+01	1.931E+01	1.931E+01	3.511E+02
19.0	87.0	217.0	217.0	6.977E+03	217.0	6.600E+03	1.065E+01	1.233E+03	4.054E+01	1.830E+01	1.830E+01	3.694E+02
20.0	86.8	218.0	218.0	5.961E+03	218.0	5.640E+03	1.080E+01	8.538E+02	3.300E+01	1.743E+01	1.743E+01	3.869E+02
21.0	86.7	219.0	219.0	5.097E+03	219.0	4.824E+03	1.093E+01	5.946E+02	2.780E+01	1.667E+01	1.667E+01	4.035E+02
22.0	86.5	220.0	220.0	4.361E+03	220.0	4.128E+03	1.103E+01	4.161E+02	2.217E+01	1.600E+01	1.600E+01	4.195E+02
23.0	86.4	222.0	222.0	3.734E+03	222.0	3.537E+03	1.111E+01	2.916E+02	1.831E+01	1.542E+01	1.542E+01	4.358E+02
24.0	86.2	223.0	223.0	3.202E+03	223.0	3.033E+03	1.118E+01	2.063E+02	1.517E+01	1.489E+01	1.489E+01	4.499E+02
25.0	86.1	224.0	224.0	2.748E+03	224.0	2.603E+03	1.123E+01	1.405E+02	1.261E+01	1.443E+01	1.443E+01	4.643E+02
26.0	86.0	224.0	224.0	2.359E+03	224.0	2.235E+03	1.128E+01	1.048E+02	1.058E+01	1.400E+01	1.400E+01	4.783E+02
27.0	85.9	224.0	224.0	2.025E+03	224.0	1.918E+03	1.132E+01	7.588E+01	8.766E+00	1.361E+01	1.361E+01	4.919E+02
28.0	85.7	224.0	224.0	1.739E+03	224.0	1.647E+03	1.135E+01	5.389E+01	7.329E+00	1.325E+01	1.325E+01	5.051E+02
29.0	85.6	224.0	224.0	1.493E+03	224.0	1.414E+03	1.138E+01	3.855E+01	6.185E+00	1.285E+01	1.285E+01	5.188E+02
30.0	85.5	234.0	234.0	1.283E+03	234.0	1.218E+03	1.140E+01	2.683E+01	5.156E+00	1.261E+01	1.261E+01	5.306E+02
31.0	85.4	234.0	234.0	1.108E+03	234.0	1.052E+03	1.142E+01	1.959E+01	4.356E+00	1.233E+01	1.233E+01	5.429E+02
32.0	85.3	234.0	234.0	9.579E+02	234.0	9.093E+02	1.144E+01	1.432E+01	3.685E+00	1.207E+01	1.207E+01	5.558E+02
33.0	85.2	234.0	234.0	8.278E+02	234.0	7.858E+02	1.145E+01	1.048E+01	3.120E+00	1.182E+01	1.182E+01	5.668E+02
34.0	85.1	234.0	234.0	7.153E+02	234.0	6.793E+02	1.146E+01	7.635E+00	2.630E+00	1.153E+01	1.153E+01	5.784E+02
35.0	85.0	245.0	245.0	6.187E+02	245.0	5.866E+02	1.147E+01	5.401E+00	2.248E+00	1.137E+01	1.137E+01	5.897E+02
36.0	84.9	245.0	245.0	5.381E+02	245.0	5.120E+02	1.148E+01	4.015E+00	1.921E+00	1.117E+01	1.117E+01	6.009E+02
37.0	84.8	245.0	245.0	4.681E+02	245.0	4.453E+02	1.148E+01	2.986E+00	1.643E+00	1.098E+01	1.098E+01	6.119E+02
38.0	84.7	245.0	245.0	4.072E+02	245.0	3.874E+02	1.149E+01	2.233E+00	1.406E+00	1.081E+01	1.081E+01	6.227E+02
39.0	84.6	245.0	245.0	3.542E+02	245.0	3.371E+02	1.149E+01	1.646E+00	1.197E+00	1.057E+01	1.057E+01	6.333E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
34.8	90.0	234.0	6.441E+02	234.0	6.441E+02	5.160E-02	5.160E-02	3.308E+01	1.207E+01	5.599E+01	5.599E+01
34.8	90.0	234.2	6.187E+02	234.2	6.187E+02	5.160E-02	5.160E-02	3.192E+01	1.209E+01	5.808E+01	5.808E+01
35.0	89.5	245.0	6.187E+02	245.0	5.934E+02	5.773E-02	1.093E-01	3.426E+01	1.414E+01	7.097E+01	1.291E+02
36.0	88.9	245.0	5.381E+02	245.0	5.135E+02	3.081E-02	1.401E-01	1.582E+01	7.548E+00	4.377E+01	1.728E+02
37.0	88.5	245.0	4.681E+02	245.0	4.461E+02	2.124E-02	1.614E-01	9.475E+00	5.203E+00	3.473E+01	2.875E+02
38.0	88.2	245.0	4.072E+02	245.0	3.879E+02	1.580E-02	1.772E-01	6.129E+00	3.872E+00	2.972E+01	2.373E+02
39.0	87.9	245.0	3.542E+02	245.0	3.374E+02	1.215E-02	1.893E-01	4.098E+00	2.976E+00	2.626E+01	2.635E+02
40.0	87.7	258.0	3.084E+02	258.0	3.084E+02	9.202E-03	1.985E-01	2.837E+00	2.374E+00	2.289E+01	2.864E+02
41.0	87.5	258.0	2.701E+02	258.0	2.701E+02	7.449E-03	2.060E-01	2.012E+00	1.922E+00	2.115E+01	3.076E+02
42.0	87.3	258.0	2.366E+02	258.0	2.366E+02	6.099E-03	2.121E-01	1.443E+00	1.573E+00	1.977E+01	3.273E+02
43.0	87.1	258.0	2.073E+02	258.0	2.073E+02	5.036E-03	2.171E-01	1.044E+00	1.299E+00	1.864E+01	3.468E+02
44.0	86.9	258.0	1.816E+02	258.0	1.816E+02	4.093E-03	2.212E-01	7.432E-01	1.056E+00	1.729E+01	3.633E+02

EFFECTIVE PRESSURE
EFFECTIVE TEMPERATURE
TANGENT PRESSURE

490.01 (PA)
244.64 (DEG K)
623.68 (PA)

APPARENT Z-ANG 90.50 (DEG)
BALLOON HEIGHT 35.00 (KM)
TANGENT HEIGHT 34.76 (KM)
OPTICAL AIR MASS .296

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
34.0	90.0	234.0	6.097E+02	234.0	6.797E+02	1.121E-01	1.121E-01	7.610E+01	2.623E+01	1.148E+02	1.148E+02
34.0	90.0	234.0	6.897E+02	234.0	6.797E+02	1.121E-01	1.121E-01	7.610E+01	2.623E+01	1.148E+02	1.148E+02
35.0	89.0	245.0	6.187E+02	245.0	5.907E+02	3.862E-02	1.507E-01	2.281E+01	9.463E+00	4.770E+01	1.625E+02
36.0	88.6	245.0	5.381E+02	245.0	5.130E+02	2.569E-02	1.764E-01	1.310E+01	6.294E+00	3.653E+01	1.990E+02
37.0	88.3	245.0	4.681E+02	245.0	4.460E+02	1.883E-02	1.952E-01	8.397E+00	4.613E+00	3.000E+01	2.298E+02
38.0	88.0	245.0	4.072E+02	245.0	3.878E+02	1.444E-02	2.097E-01	5.599E+00	3.538E+00	2.716E+01	2.570E+02
39.0	87.7	245.0	3.542E+02	245.0	3.373E+02	1.130E-02	2.210E-01	3.812E+00	2.768E+00	2.444E+01	2.814E+02
40.0	87.5	250.0	3.084E+02	250.0	3.004E+02	8.663E-03	2.296E-01	2.671E+00	2.235E+00	2.155E+01	3.030E+02
41.0	87.3	258.0	2.701E+02	258.0	2.701E+02	7.074E-03	2.367E-01	1.911E+00	1.825E+00	2.009E+01	3.231E+02
42.0	87.1	258.0	2.366E+02	258.0	2.366E+02	5.829E-03	2.425E-01	1.379E+00	1.504E+00	1.890E+01	3.419E+02
43.0	87.0	258.0	2.073E+02	258.0	2.073E+02	4.837E-03	2.474E-01	1.003E+00	1.248E+00	1.798E+01	3.598E+02
44.0	86.8	258.0	1.816E+02	258.0	1.816E+02	3.947E-03	2.513E-01	7.167E-01	1.018E+00	1.668E+01	3.765E+02

EFFECTIVE PRESSURE 559.46 (PA)
EFFECTIVE TEMPERATURE 241.16 (DEG K)
TANGENT PRESSURE 695.56 (PA)

APPARENT Z-ANG 91.00 (DEG)
BALLOON HEIGHT 35.00 (KM)
TANGENT HEIGHT 34.82 (KM)
OPTICAL AIR MASS .386

APPARENT Z-ANG 91.50 (DEG) EFFECTIVE PRESSURE 671.86 (PA)
 BALLOON HEIGHT 35.00 (KM) EFFECTIVE TEMPERATURE 238.74 (DEG K)
 TANGENT HEIGHT 32.80 (KM) TANGENT PRESSURE 834.30 (PA)
 OPTICAL AIR MASS .519

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
32.0	90.0	234.0	8.278E+02	234.0	8.278E+02	6.288E-02	6.288E-02	5.205E+01	1.471E+01	5.205E+01	5.205E+01
33.0	90.5	234.0	8.278E+02	234.0	7.931E+02	8.416E-02	1.470E-01	6.675E+01	1.969E+01	7.395E+01	1.260E+02
34.0	91.1	234.0	7.153E+02	234.0	6.814E+02	4.308E-02	1.901E-01	2.935E+01	1.008E+01	4.406E+01	1.708E+02
32.0	90.0	234.0	8.278E+02	234.0	8.278E+02	6.288E-02	6.288E-02	5.205E+01	1.471E+01	5.205E+01	5.205E+01
33.0	89.5	234.0	8.278E+02	234.0	7.931E+02	8.416E-02	1.470E-01	6.675E+01	1.969E+01	7.395E+01	1.260E+02
34.0	88.9	234.0	7.153E+02	234.0	6.814E+02	4.308E-02	1.901E-01	2.935E+01	1.008E+01	4.406E+01	1.708E+02
35.0	88.5	245.0	6.107E+02	245.0	5.897E+02	2.822E-02	2.183E-01	1.664E+01	6.914E+00	3.491E+01	2.058E+02
36.0	88.2	245.0	5.381E+02	245.0	5.126E+02	2.095E-02	2.393E-01	1.074E+01	5.132E+00	2.981E+01	2.356E+02
37.0	87.9	245.0	4.681E+02	245.0	4.458E+02	1.617E-02	2.555E-01	7.210E+00	3.963E+00	2.647E+01	2.620E+02
38.0	87.7	245.0	4.072E+02	245.0	3.877E+02	1.279E-02	2.683E-01	4.950E+00	3.133E+00	2.406E+01	2.861E+02
39.0	87.5	245.0	3.542E+02	245.0	3.373E+02	1.021E-02	2.785E-01	3.445E+00	2.502E+00	2.209E+01	3.082E+02
40.0	87.3	258.0	3.084E+02	258.0	3.084E+02	7.944E-03	2.864E-01	2.450E+00	2.050E+00	1.976E+01	3.280E+02
41.0	87.1	258.0	2.701E+02	258.0	2.701E+02	6.557E-03	2.930E-01	1.771E+00	1.692E+00	1.862E+01	3.466E+02
42.0	86.9	258.0	2.366E+02	258.0	2.366E+02	5.449E-03	2.984E-01	1.289E+00	1.406E+00	1.766E+01	3.642E+02
43.0	86.8	258.0	2.073E+02	258.0	2.073E+02	4.552E-03	3.030E-01	9.436E-01	1.175E+00	1.605E+01	3.811E+02
44.0	86.6	258.0	1.816E+02	258.0	1.816E+02	3.736E-03	3.067E-01	6.785E-01	9.630E-01	1.578E+01	3.969E+02

APPARENT Z-ANG 92.00 (DEG)
 BALLOON HEIGHT 35.00 (KM)
 TANGENT HEIGHT 31.09 (KM)
 OPTICAL AIR MASS .724

EFFECTIVE PRESSURE 851.94 (PA)
 EFFECTIVE TEMPERATURE 237.04 (DEG K)
 TANGENT PRESSURE 1077.06 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
31.1	90.0	234.0	1.069E+03	234.0	1.052E+03	1.664E-01	1.664E-01	1.750E+02	3.893E+01	1.101E+02	1.101E+02
32.0	89.0	234.0	9.579E+02	234.0	9.129E+02	6.382E-02	2.302E-01	5.826E+01	1.493E+01	4.872E+01	1.588E+02
33.0	91.4	234.0	8.278E+02	234.0	7.875E+02	4.171E-02	2.719E-01	3.285E+01	9.761E+00	3.691E+01	1.958E+02
34.0	91.7	234.0	7.153E+02	234.0	6.802E+02	3.809E-02	3.020E-01	2.047E+01	7.042E+00	3.803E+01	2.266E+02
35.0	88.0	245.0	6.107E+02	245.0	5.892E+02	2.200E-02	3.240E-01	1.296E+01	5.391E+00	2.724E+01	2.538E+02
36.0	87.8	245.0	5.381E+02	245.0	5.124E+02	1.730E-02	3.413E-01	8.862E+00	4.237E+00	2.462E+01	2.784E+02
37.0	87.5	245.0	4.681E+02	245.0	4.456E+02	1.304E-02	3.551E-01	6.166E+00	3.390E+00	2.265E+01	3.011E+02
38.0	87.3	245.0	4.072E+02	245.0	3.876E+02	1.121E-02	3.663E-01	4.345E+00	2.747E+00	2.110E+01	3.222E+02
39.0	87.2	245.0	3.542E+02	245.0	3.372E+02	9.112E-03	3.754E-01	3.073E+00	2.233E+00	1.971E+01	3.419E+02
40.0	87.0	250.0	3.084E+02	250.0	3.004E+02	7.185E-03	3.826E-01	2.216E+00	1.854E+00	1.787E+01	3.598E+02
41.0	86.8	250.0	2.781E+02	250.0	2.701E+02	5.994E-03	3.886E-01	1.619E+00	1.546E+00	1.702E+01	3.768E+02
42.0	86.7	250.0	2.366E+02	250.0	2.366E+02	5.824E-03	3.936E-01	1.109E+00	1.296E+00	1.629E+01	3.931E+02
43.0	86.5	250.0	2.073E+02	250.0	2.073E+02	4.227E-03	3.975E-01	8.761E-01	1.091E+00	1.564E+01	4.087E+02
44.0	86.4	250.0	1.816E+02	250.0	1.816E+02	3.409E-03	4.014E-01	6.335E-01	9.002E-01	1.474E+01	4.235E+02

APPARENT Z-ANG 92.50 (DEG)
 BALLOON HEIGHT 35.00 (KM)
 TANGENT HEIGHT 20.88 (KM)
 OPTICAL AIR MASS 1.083

1162.42 (PA)
 230.97 (DEG K)
 1509.65 (PA)

EFFECTIVE PRESSURE
 EFFECTIVE TEMPERATURE
 TANGENT PRESSURE

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-OM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
28.9	90.0	224.0	1.493E+03	224.0	1.493E+03	8.918E-02	8.918E-02	1.331E+02	1.998E+01	3.978E+01	3.978E+01
29.0	90.3	224.0	1.493E+03	224.0	1.431E+03	1.739E-01	2.631E-01	2.489E+02	3.896E+01	8.108E+01	1.209E+02
30.0	91.1	234.0	1.283E+03	234.0	1.222E+03	7.935E-02	3.424E-01	9.695E+01	1.857E+01	4.526E+01	1.661E+02
31.0	91.5	234.0	1.108E+03	234.0	1.054E+03	5.346E-02	3.959E-01	5.636E+01	1.251E+01	3.533E+01	2.015E+02
32.0	91.8	234.0	9.579E+02	234.0	9.105E+02	3.923E-02	4.351E-01	3.572E+01	9.180E+00	3.002E+01	2.315E+02
33.0	92.1	234.0	8.278E+02	234.0	7.866E+02	3.081E-02	4.651E-01	2.361E+01	7.023E+00	2.659E+01	2.501E+02
34.0	92.3	234.0	7.153E+02	234.0	6.798E+02	2.341E-02	4.886E-01	1.591E+01	5.478E+00	2.400E+01	2.821E+02
28.9	90.0	224.0	1.493E+03	224.0	1.493E+03	9.918E-02	8.918E-02	1.331E+02	1.998E+01	3.978E+01	3.978E+01
29.0	89.7	224.0	1.493E+03	224.0	1.431E+03	1.739E-01	2.631E-01	2.489E+02	3.896E+01	8.108E+01	1.209E+02
30.0	88.9	234.0	1.283E+03	234.0	1.222E+03	7.935E-02	3.424E-01	9.695E+01	1.857E+01	4.526E+01	1.661E+02
31.0	88.5	234.0	1.108E+03	234.0	1.054E+03	5.346E-02	3.959E-01	5.636E+01	1.251E+01	3.533E+01	2.015E+02
32.0	88.2	234.0	9.579E+02	234.0	9.105E+02	3.923E-02	4.351E-01	3.572E+01	9.180E+00	3.002E+01	2.315E+02
33.0	87.9	234.0	8.278E+02	234.0	7.866E+02	3.081E-02	4.651E-01	2.361E+01	7.023E+00	2.659E+01	2.501E+02
34.0	87.7	234.0	7.153E+02	234.0	6.798E+02	2.341E-02	4.886E-01	1.591E+01	5.478E+00	2.400E+01	2.821E+02
35.0	87.5	245.0	6.187E+02	245.0	5.890E+02	1.795E-02	5.065E-01	1.057E+01	4.398E+00	2.244E+01	3.043E+02
36.0	87.3	245.0	5.381E+02	245.0	5.122E+02	1.457E-02	5.211E-01	7.465E+00	3.570E+00	2.075E+01	3.251E+02
37.0	87.1	245.0	4.681E+02	245.0	4.455E+02	1.193E-02	5.330E-01	5.317E+00	2.924E+00	1.954E+01	3.446E+02
38.0	86.9	245.0	4.072E+02	245.0	3.875E+02	9.842E-03	5.429E-01	3.814E+00	2.411E+00	1.853E+01	3.631E+02
39.0	86.8	245.0	3.542E+02	245.0	3.372E+02	8.112E-03	5.510E-01	2.735E+00	1.987E+00	1.755E+01	3.807E+02
40.0	86.6	258.0	3.084E+02	258.0	3.084E+02	6.468E-03	5.574E-01	1.995E+00	1.669E+00	1.609E+01	3.968E+02
41.0	86.5	258.0	2.701E+02	258.0	2.711E+02	5.446E-03	5.629E-01	1.471E+00	1.405E+00	1.546E+01	4.122E+02
42.0	86.3	258.0	2.366E+02	258.0	2.366E+02	4.600E-03	5.675E-01	1.088E+00	1.187E+00	1.491E+01	4.271E+02
43.0	86.2	258.0	2.073E+02	258.0	2.073E+02	3.896E-03	5.714E-01	8.075E-01	1.005E+00	1.442E+01	4.416E+02
44.0	86.1	258.0	1.816E+02	258.0	1.816E+02	3.234E-03	5.746E-01	5.872E-01	8.344E-01	1.366E+01	4.552E+02

APPARENT Z-ANG 93.50 (DEG) EFFECTIVE PRESSURE 2760.49 (PA)
 BALLOON HEIGHT 35.00 (KM) EFFECTIVE TEMPERATURE 224.72 (DEG K)
 TANGENT HEIGHT 22.99 (KM) TANGENT PRESSURE 3892.83 (PA)
 OPTICAL AIR MASS 2.867

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
23.0	90.0	221.9	3.734E+03	221.9	3.734E+03	7.885E-02	7.885E-02	2.945E+02	1.749E+01	1.393E+01	1.393E+01
23.0	90.1	222.0	3.734E+03	222.0	3.599E+03	5.466E-01	6.255E-01	1.967E+02	1.214E+02	1.004E+02	1.144E+02
24.0	91.0	223.0	3.202E+03	223.0	3.044E+03	2.136E-01	8.391E-01	6.503E+02	4.764E+01	4.662E+01	1.610E+02
25.0	91.4	224.0	2.748E+03	224.0	2.608E+03	1.403E-01	9.794E-01	3.659E+02	3.143E+01	3.509E+01	1.969E+02
26.0	91.8	224.0	2.359E+03	224.0	2.238E+03	1.017E-01	1.081E+00	2.275E+02	2.277E+01	3.031E+01	2.272E+02
27.0	92.0	224.0	2.025E+03	224.0	1.920E+03	7.698E-02	1.159E+00	1.478E+02	1.724E+01	2.675E+01	2.539E+02
28.0	92.3	224.0	1.739E+03	224.0	1.648E+03	5.982E-02	1.248E+00	9.861E+01	1.348E+01	2.421E+01	2.781E+02
29.0	92.5	224.0	1.493E+03	224.0	1.415E+03	4.706E-02	1.265E+00	6.660E+01	1.054E+01	2.218E+01	3.003E+02
30.0	92.7	234.0	1.283E+03	234.0	1.218E+03	3.630E-02	1.381E+00	4.423E+01	8.495E+00	2.077E+01	3.211E+02
31.0	92.9	234.0	1.108E+03	234.0	1.053E+03	2.950E-02	1.331E+00	3.106E+01	6.904E+00	1.953E+01	3.486E+02
32.0	93.0	234.0	9.579E+02	234.0	9.096E+02	2.415E-02	1.355E+00	2.197E+01	5.651E+00	1.850E+01	3.591E+02
33.0	93.2	234.0	8.278E+02	234.0	7.860E+02	1.988E-02	1.375E+00	1.562E+01	4.651E+00	1.762E+01	3.767E+02
34.0	93.4	234.0	7.153E+02	234.0	6.794E+02	1.635E-02	1.391E+00	1.111E+01	3.826E+00	1.677E+01	3.935E+02
23.0	90.0	221.9	3.734E+03	221.9	3.734E+03	7.885E-02	7.885E-02	2.945E+02	1.749E+01	1.393E+01	1.393E+01
23.0	89.9	222.0	3.734E+03	222.0	3.599E+03	5.466E-01	6.255E-01	1.967E+02	1.214E+02	1.004E+02	1.144E+02
24.0	89.0	223.0	3.202E+03	223.0	3.044E+03	2.136E-01	8.391E-01	6.503E+02	4.764E+01	4.662E+01	1.610E+02
25.0	88.6	224.0	2.748E+03	224.0	2.608E+03	1.403E-01	9.794E-01	3.659E+02	3.143E+01	3.509E+01	1.969E+02
26.0	88.2	224.0	2.359E+03	224.0	2.238E+03	1.017E-01	1.081E+00	2.275E+02	2.277E+01	3.031E+01	2.272E+02
27.0	88.0	224.0	2.025E+03	224.0	1.920E+03	7.698E-02	1.159E+00	1.478E+02	1.724E+01	2.675E+01	2.539E+02
28.0	87.7	224.0	1.739E+03	224.0	1.648E+03	5.982E-02	1.248E+00	9.861E+01	1.348E+01	2.421E+01	2.781E+02
29.0	87.5	224.0	1.493E+03	224.0	1.415E+03	4.706E-02	1.265E+00	6.660E+01	1.054E+01	2.218E+01	3.003E+02
30.0	87.3	234.0	1.283E+03	234.0	1.218E+03	3.630E-02	1.381E+00	4.423E+01	8.495E+00	2.077E+01	3.211E+02
31.0	87.1	234.0	1.108E+03	234.0	1.053E+03	2.950E-02	1.331E+00	3.106E+01	6.904E+00	1.953E+01	3.486E+02
32.0	87.0	234.0	9.579E+02	234.0	9.096E+02	2.415E-02	1.355E+00	2.197E+01	5.651E+00	1.850E+01	3.591E+02
33.0	86.8	234.0	8.278E+02	234.0	7.860E+02	1.988E-02	1.375E+00	1.562E+01	4.651E+00	1.762E+01	3.767E+02
34.0	86.6	234.0	7.153E+02	234.0	6.794E+02	1.635E-02	1.391E+00	1.111E+01	3.826E+00	1.677E+01	3.935E+02
35.0	86.5	245.0	6.187E+02	245.0	5.887E+02	1.306E-02	1.484E+00	7.688E+00	3.200E+00	1.618E+01	4.897E+02
36.0	86.4	245.0	5.381E+02	245.0	5.123E+02	1.095E-02	1.435E+00	5.606E+00	2.622E+00	1.560E+01	4.253E+02
37.0	86.2	245.0	4.681E+02	245.0	4.455E+02	9.203E-03	1.424E+00	4.099E+00	2.255E+00	1.507E+01	4.403E+02
38.0	86.1	245.0	4.072E+02	245.0	3.874E+02	7.755E-03	1.432E+00	3.005E+00	1.980E+00	1.460E+01	4.549E+02
39.0	86.0	245.0	3.542E+02	245.0	3.371E+02	6.509E-03	1.448E+00	2.194E+00	1.595E+00	1.409E+01	4.690E+02
40.0	85.8	258.0	3.084E+02	258.0	3.084E+02	5.273E-03	1.444E+00	1.626E+00	1.368E+00	1.312E+01	4.822E+02
41.0	85.7	258.0	2.701E+02	258.0	2.701E+02	4.500E-03	1.448E+00	1.215E+00	1.161E+00	1.278E+01	4.949E+02
42.0	85.6	258.0	2.366E+02	258.0	2.366E+02	3.846E-03	1.452E+00	9.100E-01	9.923E-01	1.247E+01	5.074E+02
43.0	85.5	258.0	2.073E+02	258.0	2.073E+02	3.292E-03	1.456E+00	6.823E-01	8.493E-01	1.218E+01	5.196E+02
44.0	85.4	258.0	1.816E+02	258.0	1.816E+02	2.758E-03	1.458E+00	5.007E-01	7.116E-01	1.165E+01	5.312E+02

APPARENT Z-ANG 94.00 (DEG) EFFECTIVE PRESSURE 4831.54 (PA)
 BALLOON HEIGHT 35.00 (KM) EFFECTIVE TEMPERATURE 220.17 (DEG K)
 TANGENT HEIGHT 19.26 (KM) TANGENT PRESSURE 7444.54 (PA)
 OPTICAL AIR MASS 5.263

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
19.3	98.0	217.0	6.449E+03	217.0	6.405E+03	9.905E-01	9.905E-01	6.344E+03	2.149E+02	9.980E+01	9.980E+01
20.0	98.9	216.0	5.961E+03	216.0	5.666E+03	4.536E-01	1.444E+00	2.570E+03	9.809E+01	5.199E+01	1.510E+02
21.0	91.3	219.0	5.097E+03	219.0	4.834E+03	2.822E-01	1.726E+00	1.364E+03	6.180E+01	3.808E+01	1.899E+02
22.0	91.7	220.0	4.361E+03	220.0	4.134E+03	1.990E-01	1.925E+00	8.228E+02	4.379E+01	3.155E+01	2.214E+02
23.0	91.9	222.0	3.734E+03	222.0	3.540E+03	1.476E-01	2.873E+00	5.225E+02	3.277E+01	2.757E+01	2.490E+02
24.0	92.2	223.0	3.202E+03	223.0	3.035E+03	1.133E-01	2.186E+00	3.440E+02	2.527E+01	2.480E+01	2.738E+02
25.0	92.4	224.0	2.740E+03	224.0	2.584E+03	8.879E-02	2.275E+00	2.312E+02	1.989E+01	2.275E+01	2.965E+02
26.0	92.6	224.0	2.359E+03	224.0	2.236E+03	7.080E-02	2.346E+00	1.583E+02	1.586E+01	2.113E+01	3.177E+02
27.0	92.8	224.0	2.025E+03	224.0	1.919E+03	5.702E-02	2.403E+00	1.094E+02	1.277E+01	1.982E+01	3.375E+02
28.0	93.0	224.0	1.739E+03	224.0	1.648E+03	4.627E-02	2.449E+00	7.623E+01	1.836E+01	1.874E+01	3.562E+02
29.0	93.1	224.0	1.493E+03	224.0	1.415E+03	3.758E-02	2.487E+00	5.317E+01	8.418E+00	1.772E+01	3.739E+02
30.0	93.3	234.0	1.283E+03	234.0	1.218E+03	2.973E-02	2.517E+00	3.621E+01	6.956E+00	1.701E+01	3.989E+02
31.0	93.5	234.0	1.108E+03	234.0	1.052E+03	2.465E-02	2.541E+00	2.594E+01	5.767E+00	1.632E+01	4.873E+02
32.0	93.6	234.0	9.579E+02	234.0	9.095E+02	2.050E-02	2.562E+00	1.865E+01	4.797E+00	1.571E+01	4.238E+02
33.0	93.7	234.0	8.278E+02	234.0	7.859E+02	1.711E-02	2.579E+00	1.344E+01	4.803E+00	1.517E+01	4.381E+02
34.0	93.9	234.0	7.153E+02	234.0	6.793E+02	1.423E-02	2.593E+00	9.660E+00	3.730E+00	1.468E+01	4.527E+02

19.3	98.0	217.0	6.449E+03	217.0	6.405E+03	9.905E-01	9.905E-01	6.344E+03	2.149E+02	9.980E+01	9.980E+01
20.0	89.1	218.0	5.961E+03	218.0	5.666E+03	4.536E-01	1.444E+00	2.570E+03	9.809E+01	5.199E+01	1.510E+02
21.0	88.7	219.0	5.097E+03	219.0	4.834E+03	2.822E-01	1.726E+00	1.364E+03	6.180E+01	3.808E+01	1.899E+02
22.0	88.3	220.0	4.361E+03	220.0	4.134E+03	1.990E-01	1.925E+00	8.228E+02	4.379E+01	3.155E+01	2.214E+02
23.0	88.1	222.0	3.734E+03	222.0	3.540E+03	1.476E-01	2.873E+00	5.225E+02	3.277E+01	2.757E+01	2.490E+02
24.0	87.8	223.0	3.202E+03	223.0	3.035E+03	1.133E-01	2.186E+00	3.440E+02	2.527E+01	2.480E+01	2.738E+02
25.0	87.6	224.0	2.740E+03	224.0	2.584E+03	8.879E-02	2.275E+00	2.312E+02	1.989E+01	2.275E+01	2.965E+02
26.0	87.4	224.0	2.359E+03	224.0	2.236E+03	7.080E-02	2.346E+00	1.583E+02	1.586E+01	2.113E+01	3.177E+02
27.0	87.2	224.0	2.025E+03	224.0	1.919E+03	5.702E-02	2.403E+00	1.094E+02	1.277E+01	1.982E+01	3.375E+02
28.0	87.0	224.0	1.739E+03	224.0	1.648E+03	4.627E-02	2.449E+00	7.623E+01	1.836E+01	1.874E+01	3.562E+02
29.0	86.9	224.0	1.493E+03	224.0	1.415E+03	3.758E-02	2.487E+00	5.317E+01	8.418E+00	1.772E+01	3.739E+02
30.0	86.7	234.0	1.283E+03	234.0	1.218E+03	2.973E-02	2.517E+00	3.621E+01	6.956E+00	1.701E+01	3.989E+02
31.0	86.5	234.0	1.108E+03	234.0	1.052E+03	2.465E-02	2.541E+00	2.594E+01	5.767E+00	1.632E+01	4.873E+02
32.0	86.4	234.0	9.579E+02	234.0	9.095E+02	2.050E-02	2.562E+00	1.865E+01	4.797E+00	1.571E+01	4.238E+02
33.0	86.3	234.0	8.278E+02	234.0	7.859E+02	1.711E-02	2.579E+00	1.344E+01	4.803E+00	1.517E+01	4.381E+02
34.0	86.1	234.0	7.153E+02	234.0	6.793E+02	1.423E-02	2.593E+00	9.660E+00	3.730E+00	1.468E+01	4.527E+02
35.0	86.0	245.0	6.187E+02	245.0	5.887E+02	1.148E-02	2.604E+00	6.759E+00	2.813E+00	1.423E+01	4.670E+02
36.0	85.9	245.0	5.381E+02	245.0	5.120E+02	9.707E-03	2.614E+00	4.978E+00	2.378E+00	1.383E+01	4.808E+02
37.0	85.8	245.0	4.681E+02	245.0	4.544E+02	8.221E-03	2.622E+00	3.662E+00	2.814E+00	1.347E+01	4.943E+02
38.0	85.6	245.0	4.072E+02	245.0	3.874E+02	6.974E-03	2.629E+00	2.702E+00	1.709E+00	1.313E+01	5.074E+02
39.0	85.5	245.0	3.542E+02	245.0	3.371E+02	5.880E-03	2.635E+00	1.905E+00	1.443E+00	1.274E+01	5.201E+02
40.0	85.4	258.0	3.084E+02	258.0	3.084E+02	4.794E-03	2.640E+00	1.478E+00	1.237E+00	1.193E+01	5.321E+02
41.0	85.3	258.0	2.701E+02	258.0	2.701E+02	4.111E-03	2.640E+00	1.110E+00	1.061E+00	1.167E+01	5.437E+02
42.0	85.2	258.0	2.366E+02	258.0	2.366E+02	3.529E-03	2.640E+00	8.350E-01	9.185E-01	1.144E+01	5.552E+02
43.0	85.1	258.0	2.073E+02	258.0	2.073E+02	3.032E-03	2.651E+00	6.285E-01	7.823E-01	1.122E+01	5.664E+02
44.0	85.0	258.0	1.816E+02	258.0	1.816E+02	2.549E-03	2.653E+00	4.629E-01	6.577E-01	1.077E+01	5.772E+02

APPARENT Z-ANG 94.50 (DEG)
 EFFECTIVE PRESSURE 9551.67 (PA)
 BALLOON HEIGHT 35.00 (KM)
 EFFECTIVE TEMPERATURE 217.48 (DEG K)
 TANGENT HEIGHT 14.97 (KM)
 TANGENT PRESSURE 17142.40 (PA)
 OPTICAL AIR MASS 10.563

ALT Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
15.0	90.0	1.313E+04	216.0	1.313E+04	4.072E-01	4.072E-01	5.348E+03	0.795E+01	1.991E+01	1.991E+01	1.991E+01
15.0	90.2	1.313E+04	216.0	1.262E+04	1.892E+00	1.892E+00	2.389E+00	4.008E+02	9.645E+01	9.645E+01	1.164E+02
16.0	91.0	1.121E+04	216.0	1.064E+04	7.730E-01	7.730E-01	3.073E+00	1.670E+02	4.674E+01	4.674E+01	1.631E+02
17.0	91.4	9.572E+03	216.0	9.069E+03	5.073E-01	5.073E-01	4.601E+03	1.096E+02	3.599E+01	3.599E+01	1.991E+02
18.0	91.7	8.172E+03	216.0	7.737E+03	3.651E-01	3.651E-01	2.825E+03	7.887E+01	3.036E+01	3.036E+01	2.295E+02
19.0	92.0	6.977E+03	217.0	6.605E+03	2.736E-01	2.736E-01	1.807E+03	5.936E+01	2.677E+01	2.677E+01	2.562E+02
20.0	92.2	5.961E+03	218.0	5.643E+03	2.105E-01	2.105E-01	1.188E+03	4.588E+01	2.422E+01	2.422E+01	2.804E+02
21.0	92.5	5.097E+03	219.0	4.826E+03	1.648E-01	1.648E-01	7.953E+02	3.609E+01	2.220E+01	2.220E+01	3.027E+02
22.0	92.6	4.361E+03	220.0	4.130E+03	1.307E-01	1.307E-01	5.396E+02	2.875E+01	2.074E+01	2.074E+01	3.235E+02
23.0	92.8	3.734E+03	222.0	3.537E+03	1.043E-01	1.043E-01	3.690E+02	2.316E+01	1.950E+01	1.950E+01	3.429E+02
24.0	93.0	3.202E+03	223.0	3.034E+03	8.428E-02	8.428E-02	2.557E+02	1.879E+01	1.845E+01	1.845E+01	3.614E+02
25.0	93.2	2.748E+03	224.0	2.603E+03	6.857E-02	6.857E-02	1.785E+02	1.536E+01	1.757E+01	1.757E+01	3.790E+02
26.0	93.3	2.359E+03	224.0	2.235E+03	5.629E-02	5.629E-02	1.258E+02	1.261E+01	1.680E+01	1.680E+01	3.958E+02
27.0	93.5	2.025E+03	224.0	1.919E+03	4.639E-02	4.639E-02	8.901E+01	1.099E+01	1.613E+01	1.613E+01	4.119E+02
28.0	93.6	1.739E+03	224.0	1.647E+03	3.836E-02	3.836E-02	6.319E+01	8.593E+00	1.554E+01	1.554E+01	4.274E+02
29.0	93.8	1.493E+03	224.0	1.415E+03	3.165E-02	3.165E-02	4.477E+01	7.089E+00	1.493E+01	1.493E+01	4.424E+02
30.0	93.9	1.283E+03	234.0	1.219E+03	2.537E-02	2.537E-02	3.090E+01	5.937E+00	1.452E+01	1.452E+01	4.569E+02
31.0	94.0	1.108E+03	234.0	1.052E+03	2.127E-02	2.127E-02	2.239E+01	4.978E+00	1.409E+01	1.409E+01	4.710E+02
32.0	94.1	9.579E+02	234.0	9.094E+02	1.787E-02	1.787E-02	1.625E+01	4.182E+00	1.369E+01	1.369E+01	4.847E+02
33.0	94.3	8.278E+02	234.0	7.858E+02	1.504E-02	1.504E-02	1.182E+01	3.519E+00	1.334E+01	1.334E+01	4.988E+02
34.0	94.4	7.153E+02	234.0	6.793E+02	1.261E-02	1.261E-02	8.564E+00	2.950E+00	1.293E+01	1.293E+01	5.109E+02

APPARENT Z-ANG 94.50 (DEG) EFFECTIVE PRESSURE 9551.67 (PA)
 BALLOON HEIGHT 35.00 (KM) EFFECTIVE TEMPERATURE 217.48 (DEG K)
 TANGENT HEIGHT 14.97 (KM) TANGENT PRESSURE 17142.40 (PA)
 OPTICAL AIR MASS 10.563

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
15.0	90.0	216.0	1.313E+04	216.0	1.313E+04	4.072E-01	4.072E-01	5.340E+03	0.795E+01	1.991E+01	1.991E+01
15.0	89.0	216.0	1.313E+04	216.0	1.262E+04	1.892E+00	2.300E+00	2.309E+04	4.000E+02	9.645E+01	1.164E+02
16.0	89.0	216.0	1.121E+04	216.0	1.064E+04	7.730E-01	3.073E+00	0.226E+03	1.670E+02	4.674E+01	1.631E+02
17.0	88.6	216.0	9.572E+03	216.0	9.069E+03	5.073E-01	3.580E+00	4.601E+03	1.096E+02	3.599E+01	1.991E+02
18.0	88.3	216.0	8.172E+03	216.0	7.737E+03	3.651E-01	3.945E+00	2.802E+03	7.887E+01	3.036E+01	2.295E+02
19.0	88.0	217.0	6.977E+03	217.0	6.605E+03	2.736E-01	4.219E+00	1.807E+03	5.936E+01	2.677E+01	2.562E+02
20.0	87.8	218.0	5.961E+03	218.0	5.643E+03	2.105E-01	4.429E+00	1.180E+03	4.588E+01	2.422E+01	2.804E+02
21.0	87.5	219.0	5.097E+03	219.0	4.826E+03	1.640E-01	4.594E+00	7.953E+02	3.609E+01	2.220E+01	3.027E+02
22.0	87.4	220.0	4.361E+03	220.0	4.130E+03	1.307E-01	4.725E+00	5.396E+02	2.875E+01	2.074E+01	3.235E+02
23.0	87.2	222.0	3.734E+03	222.0	3.537E+03	1.043E-01	4.829E+00	3.690E+02	2.316E+01	1.950E+01	3.429E+02
24.0	87.0	223.0	3.202E+03	223.0	3.034E+03	8.428E-02	4.913E+00	2.557E+02	1.879E+01	1.845E+01	3.614E+02
25.0	86.8	224.0	2.748E+03	224.0	2.603E+03	6.857E-02	4.982E+00	1.785E+02	1.536E+01	1.757E+01	3.790E+02
26.0	86.7	224.0	2.359E+03	224.0	2.235E+03	5.629E-02	5.038E+00	1.250E+02	1.261E+01	1.680E+01	3.950E+02
27.0	86.5	224.0	2.025E+03	224.0	1.919E+03	4.639E-02	5.084E+00	8.901E+01	1.039E+01	1.613E+01	4.119E+02
28.0	86.4	224.0	1.739E+03	224.0	1.647E+03	3.836E-02	5.123E+00	6.319E+01	8.593E+00	1.554E+01	4.274E+02
29.0	86.2	224.0	1.493E+03	224.0	1.415E+03	3.165E-02	5.154E+00	4.477E+01	7.889E+00	1.493E+01	4.424E+02
30.0	86.1	234.0	1.203E+03	234.0	1.218E+03	2.537E-02	5.180E+00	3.090E+01	5.937E+00	1.452E+01	4.569E+02
31.0	86.0	234.0	1.108E+03	234.0	1.052E+03	2.127E-02	5.201E+00	2.239E+01	4.978E+00	1.409E+01	4.710E+02
32.0	85.9	234.0	9.579E+02	234.0	9.094E+02	1.787E-02	5.219E+00	1.625E+01	4.102E+00	1.369E+01	4.867E+02
33.0	85.7	234.0	8.278E+02	234.0	7.858E+02	1.504E-02	5.234E+00	1.182E+01	3.519E+00	1.334E+01	4.980E+02
34.0	85.6	234.0	7.153E+02	234.0	6.793E+02	1.261E-02	5.247E+00	8.564E+00	2.950E+00	1.293E+01	5.109E+02
35.0	85.5	245.0	6.187E+02	245.0	5.886E+02	1.024E-02	5.257E+00	6.027E+00	2.509E+00	1.269E+01	5.236E+02
36.0	85.4	245.0	5.381E+02	245.0	5.120E+02	8.710E-03	5.266E+00	4.459E+00	2.134E+00	1.241E+01	5.360E+02
37.0	85.3	245.0	4.681E+02	245.0	4.454E+02	7.417E-03	5.273E+00	3.303E+00	1.817E+00	1.215E+01	5.482E+02
38.0	85.2	245.0	4.072E+02	245.0	3.874E+02	6.322E-03	5.279E+00	2.449E+00	1.549E+00	1.191E+01	5.601E+02
39.0	85.1	245.0	3.542E+02	245.0	3.371E+02	5.362E-03	5.285E+00	1.807E+00	1.314E+00	1.160E+01	5.717E+02
40.0	85.0	258.0	3.084E+02	258.0	3.004E+02	4.384E-03	5.289E+00	1.352E+00	1.131E+00	1.090E+01	5.826E+02
41.0	84.9	258.0	2.701E+02	258.0	2.701E+02	3.773E-03	5.293E+00	1.019E+00	9.734E-01	1.071E+01	5.933E+02
42.0	84.8	258.0	2.366E+02	258.0	2.366E+02	3.250E-03	5.296E+00	7.690E-01	8.385E-01	1.054E+01	6.038E+02
43.0	84.7	258.0	2.073E+02	258.0	2.073E+02	2.801E-03	5.299E+00	5.806E-01	7.227E-01	1.037E+01	6.142E+02
44.0	84.6	258.0	1.816E+02	258.0	1.816E+02	2.362E-03	5.301E+00	4.289E-01	6.094E-01	9.979E+00	6.242E+02

APPARENT Z-ANG 95.00 (DEG)
 BALLOON HEIGHT 35.00 (KM)
 TANGENT HEIGHT 10.06 (KM)
 OPTICAL AIR MASS 22.117

EFFECTIVE PRESSURE 19983.66 (PA)
 EFFECTIVE TEMPERATURE 226.74 (DEG K)
 TANGENT PRESSURE 45519.45 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
10.1	90.0	235.0	2.725E+04	235.0	2.604E+04	4.411E+00	4.411E+00	1.104E+05	1.037E+03	1.149E+02	1.149E+02
11.0	91.0	229.0	2.443E+04	229.0	2.325E+04	1.666E+00	6.077E+00	3.874E+04	3.815E+02	4.887E+01	1.638E+02
12.0	91.4	222.0	2.103E+04	222.0	1.995E+04	1.118E+00	7.196E+00	2.231E+04	2.403E+02	3.707E+01	2.009E+02
13.0	91.7	216.0	1.802E+04	216.0	1.708E+04	8.223E-01	8.018E+00	1.403E+04	1.776E+02	3.101E+01	2.319E+02
14.0	92.0	216.0	1.538E+04	216.0	1.456E+04	6.172E-01	8.635E+00	8.988E+03	1.333E+02	2.728E+01	2.591E+02
15.0	92.2	216.0	1.313E+04	216.0	1.243E+04	4.756E-01	9.111E+00	5.910E+03	1.027E+02	2.462E+01	2.838E+02
16.0	92.4	216.0	1.121E+04	216.0	1.061E+04	3.728E-01	9.494E+00	3.955E+03	8.053E+01	2.261E+01	3.064E+02
17.0	92.6	216.0	9.572E+03	216.0	9.059E+03	2.959E-01	9.779E+00	2.679E+03	6.352E+01	2.103E+01	3.274E+02
18.0	92.8	216.0	8.172E+03	216.0	7.730E+03	2.369E-01	1.002E+01	1.831E+03	5.117E+01	1.972E+01	3.471E+02
19.0	93.0	217.0	6.977E+03	217.0	6.609E+03	1.904E-01	1.021E+01	1.256E+03	4.131E+01	1.864E+01	3.658E+02
20.0	93.1	218.0	5.961E+03	218.0	5.644E+03	1.539E-01	1.036E+01	8.683E+02	3.356E+01	1.772E+01	3.835E+02
21.0	93.3	219.0	5.097E+03	219.0	4.824E+03	1.252E-01	1.049E+01	6.039E+02	2.742E+01	1.693E+01	4.004E+02
22.0	93.4	220.0	4.361E+03	220.0	4.128E+03	1.022E-01	1.059E+01	4.228E+02	2.299E+01	1.623E+01	4.166E+02
23.0	93.6	222.0	3.734E+03	222.0	3.537E+03	8.355E-02	1.067E+01	2.955E+02	1.855E+01	1.562E+01	4.323E+02
24.0	93.7	223.0	3.202E+03	223.0	3.033E+03	6.884E-02	1.074E+01	2.088E+02	1.535E+01	1.508E+01	4.473E+02
25.0	93.8	224.0	2.748E+03	224.0	2.603E+03	5.693E-02	1.080E+01	1.482E+02	1.275E+01	1.459E+01	4.619E+02
26.0	94.0	224.0	2.359E+03	224.0	2.235E+03	4.739E-02	1.084E+01	1.059E+02	1.062E+01	1.415E+01	4.761E+02
27.0	94.1	224.0	2.025E+03	224.0	1.918E+03	3.953E-02	1.088E+01	7.584E+01	8.855E+00	1.375E+01	4.898E+02
28.0	94.2	224.0	1.739E+03	224.0	1.647E+03	3.303E-02	1.092E+01	5.440E+01	7.388E+00	1.330E+01	5.032E+02
29.0	94.3	224.0	1.493E+03	224.0	1.418E+03	2.750E-02	1.094E+01	3.890E+01	6.188E+00	1.297E+01	5.162E+02
30.0	94.5	234.0	1.263E+03	234.0	1.218E+03	2.222E-02	1.097E+01	2.706E+01	5.208E+00	1.272E+01	5.289E+02
31.0	94.6	234.0	1.108E+03	234.0	1.052E+03	1.877E-02	1.099E+01	1.975E+01	4.382E+00	1.243E+01	5.413E+02
32.0	94.7	234.0	9.579E+02	234.0	9.093E+02	1.587E-02	1.100E+01	1.443E+01	3.714E+00	1.216E+01	5.535E+02
33.0	94.8	234.0	8.278E+02	234.0	7.858E+02	1.343E-02	1.102E+01	1.056E+01	3.143E+00	1.191E+01	5.654E+02
34.0	94.9	234.0	7.153E+02	234.0	6.793E+02	1.132E-02	1.103E+01	7.690E+00	2.649E+00	1.161E+01	5.778E+02

19983.66 (PA)
226.74 (DEG K)
45519.45 (PA)

EFFECTIVE PRESSURE (PA)
EFFECTIVE TEMPERATURE (DEG K)
TANGENT PRESSURE (PA)

APPARENT Z-ANG 95.00 (DEG)
BALLOON HEIGHT 35.00 (KM)
TANGENT HEIGHT 10.06 (KM)
OPTICAL AIR MASS 22.117

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
10.1	98.0	235.0	2.725E+04	235.0	2.684E+04	4.411E+00	4.411E+00	1.104E+05	1.037E+03	1.149E+02	1.149E+02
11.0	89.0	229.0	2.443E+04	229.0	2.325E+04	1.666E+00	6.077E+00	3.074E+04	3.015E+02	4.007E+01	1.630E+02
12.0	88.6	222.0	2.103E+04	222.0	1.995E+04	1.118E+00	7.196E+00	2.231E+04	2.403E+02	3.707E+01	2.009E+02
13.0	88.3	216.0	1.802E+04	216.0	1.706E+04	8.223E-01	8.010E+00	1.403E+04	1.776E+02	3.101E+01	2.319E+02
14.0	88.0	216.0	1.538E+04	216.0	1.456E+04	6.172E-01	8.635E+00	8.988E+03	1.333E+02	2.720E+01	2.591E+02
15.0	87.8	216.0	1.313E+04	216.0	1.243E+04	4.756E-01	9.111E+00	5.910E+03	1.027E+02	2.462E+01	2.838E+02
16.0	87.6	216.0	1.121E+04	216.0	1.061E+04	3.720E-01	9.684E+00	3.955E+03	8.053E+01	2.261E+01	3.086E+02
17.0	87.4	216.0	9.572E+03	216.0	9.055E+03	2.959E-01	9.779E+00	2.679E+03	6.392E+01	2.103E+01	3.274E+02
18.0	87.2	216.0	8.172E+03	216.0	7.730E+03	2.369E-01	1.002E+01	1.831E+03	5.117E+01	1.972E+01	3.471E+02
19.0	87.0	217.0	6.977E+03	217.0	6.600E+03	1.904E-01	1.021E+01	1.256E+03	4.131E+01	1.864E+01	3.658E+02
20.0	86.9	218.0	5.961E+03	218.0	5.641E+03	1.539E-01	1.036E+01	8.683E+02	3.256E+01	1.772E+01	3.835E+02
21.0	86.7	219.0	5.097E+03	219.0	4.824E+03	1.252E-01	1.049E+01	6.039E+02	2.742E+01	1.693E+01	4.004E+02
22.0	86.6	220.0	4.361E+03	220.0	4.120E+03	1.022E-01	1.059E+01	4.220E+02	2.249E+01	1.623E+01	4.166E+02
23.0	86.4	222.0	3.734E+03	222.0	3.537E+03	8.355E-02	1.067E+01	2.955E+02	1.855E+01	1.562E+01	4.323E+02
24.0	86.3	223.0	3.202E+03	223.0	3.033E+03	6.864E-02	1.074E+01	2.088E+02	1.535E+01	1.508E+01	4.473E+02
25.0	86.2	224.0	2.740E+03	224.0	2.603E+03	5.693E-02	1.080E+01	1.482E+02	1.275E+01	1.459E+01	4.619E+02
26.0	86.0	224.0	2.359E+03	224.0	2.235E+03	4.739E-02	1.084E+01	1.059E+02	1.062E+01	1.415E+01	4.761E+02
27.0	85.9	224.0	2.025E+03	224.0	1.910E+03	3.953E-02	1.088E+01	7.504E+01	8.855E+00	1.375E+01	4.898E+02
28.0	85.8	224.0	1.739E+03	224.0	1.647E+03	3.303E-02	1.092E+01	5.440E+01	7.398E+00	1.338E+01	5.032E+02
29.0	85.7	224.0	1.493E+03	224.0	1.414E+03	2.750E-02	1.094E+01	3.890E+01	6.160E+00	1.297E+01	5.162E+02
30.0	85.5	234.0	1.283E+03	234.0	1.218E+03	2.222E-02	1.097E+01	2.706E+01	5.200E+00	1.272E+01	5.289E+02
31.0	85.4	234.0	1.108E+03	234.0	1.052E+03	1.877E-02	1.099E+01	1.975E+01	4.392E+00	1.243E+01	5.413E+02
32.0	85.3	234.0	9.579E+02	234.0	9.093E+02	1.587E-02	1.100E+01	1.443E+01	3.714E+00	1.216E+01	5.535E+02
33.0	85.2	234.0	8.278E+02	234.0	7.858E+02	1.343E-02	1.102E+01	1.056E+01	3.143E+00	1.191E+01	5.654E+02
34.0	85.1	234.0	7.153E+02	234.0	6.793E+02	1.132E-02	1.103E+01	7.690E+00	2.649E+00	1.161E+01	5.770E+02
35.0	85.0	245.0	6.187E+02	245.0	5.866E+02	9.239E-03	1.104E+01	5.430E+00	2.264E+00	1.145E+01	5.885E+02
36.0	84.9	245.0	5.381E+02	245.0	5.120E+02	7.893E-03	1.104E+01	4.041E+00	1.934E+00	1.125E+01	5.997E+02
37.0	84.8	245.0	4.681E+02	245.0	4.453E+02	6.748E-03	1.105E+01	3.005E+00	1.653E+00	1.105E+01	6.108E+02
38.0	84.7	245.0	4.072E+02	245.0	3.874E+02	5.774E-03	1.106E+01	2.237E+00	1.415E+00	1.087E+01	6.216E+02
39.0	84.6	245.0	3.542E+02	245.0	3.321E+02	4.914E-03	1.106E+01	1.656E+00	1.204E+00	1.063E+01	6.323E+02
40.0	84.5	258.0	3.084E+02	258.0	3.004E+02	4.030E-03	1.107E+01	1.243E+00	1.000E+00	1.003E+01	6.423E+02
41.0	84.4	258.0	2.701E+02	258.0	2.701E+02	3.479E-03	1.107E+01	9.390E-01	8.976E-01	9.800E+00	6.522E+02
42.0	84.3	258.0	2.366E+02	258.0	2.366E+02	3.005E-03	1.107E+01	7.110E-01	7.753E-01	9.742E+00	6.619E+02
43.0	84.2	258.0	2.073E+02	258.0	2.073E+02	2.597E-03	1.107E+01	5.302E-01	6.780E-01	9.610E+00	6.715E+02
44.0	84.2	258.0	1.816E+02	258.0	1.816E+02	2.195E-03	1.108E+01	3.985E-01	5.663E-01	9.274E+00	6.808E+02

CALVERT NEW MARSH 1998
 LAURENCE WELTON
 NATIONAL CENTER FOR SPACE SCIENCE
 UNIVERSITY OF MARYLAND
 COLLEGE PARK, MARYLAND 20742-8829

APPARENT Z-ANG 90.50 (DEG)
 BALLOON HEIGHT 40.00 (KM)
 TANGENT HEIGHT 39.76 (KM)
 OPTICAL AIR MASS .144

EFFECTIVE PRESSURE 246.51 (PA)
 EFFECTIVE TEMPERATURE 256.28 (DEG K)
 TANGENT PRESSURE 308.18 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
39.8	90.0	245.0	3.190E+02	245.0	3.190E+02	2.460E-02	2.460E-02	7.848E+00	6.027E+00	5.617E+01	5.617E+01
39.8	90.0	245.3	3.084E+02	245.3	3.084E+02	2.460E-02	2.460E-02	7.586E+00	6.035E+00	5.810E+01	5.810E+01
40.0	89.5	258.0	3.084E+02	258.0	3.084E+02	2.757E-02	5.217E-02	8.501E+00	7.113E+00	6.858E+01	1.260E+02
41.0	88.9	258.0	2.701E+02	258.0	2.701E+02	1.402E-02	6.699E-02	4.004E+00	3.824E+00	4.209E+01	1.689E+02
42.0	88.5	258.0	2.366E+02	258.0	2.366E+02	1.029E-02	7.729E-02	2.435E+00	2.655E+00	3.336E+01	2.022E+02
43.0	88.2	258.0	2.073E+02	258.0	2.073E+02	7.714E-03	8.500E-02	1.599E+00	1.990E+00	2.855E+01	2.300E+02
44.0	87.9	258.0	1.816E+02	258.0	1.816E+02	5.875E-03	9.087E-02	1.067E+00	1.516E+00	2.482E+01	2.556E+02
45.0	87.7	270.0	1.595E+02	270.0	1.595E+02	4.584E-03	9.546E-02	7.312E-01	1.238E+00	2.387E+01	2.786E+02
46.0	87.5	270.0	1.406E+02	270.0	1.406E+02	3.733E-03	9.919E-02	5.247E-01	1.008E+00	2.132E+01	3.000E+02
47.0	87.3	270.0	1.239E+02	270.0	1.239E+02	3.075E-03	1.023E-01	3.688E-01	8.802E-01	1.993E+01	3.199E+02
48.0	87.1	270.0	1.091E+02	270.0	1.091E+02	2.554E-03	1.048E-01	2.788E-01	6.897E-01	1.879E+01	3.387E+02
49.0	86.9	270.0	9.616E+01	270.0	9.616E+01	2.113E-03	1.069E-01	2.032E-01	5.706E-01	1.764E+01	3.563E+02

APPARENT Z-ANG 91.00 (DEG) EFFECTIVE PRESSURE 280.06 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 252.49 (DEG K)
 TANGENT HEIGHT 39.02 (KM) TANGENT PRESSURE 341.56 (PA)
 OPTICAL AIR MASS .167

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (KM)	ACCUM DEL (KM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
39.0	90.0	245.0	3.420E+02	245.0	3.373E+02	5.340E-02	5.340E-02	1.601E+01	1.300E+01	1.154E+02	1.154E+02
39.0	90.0	245.0	3.420E+02	245.0	3.373E+02	5.340E-02	5.340E-02	1.601E+01	1.300E+01	1.154E+02	1.154E+02
40.0	89.0	258.0	3.084E+02	258.0	3.084E+02	1.045E-02	7.165E-02	5.689E+00	4.750E+00	4.589E+01	1.613E+02
41.0	88.6	258.0	2.701E+02	258.0	2.701E+02	1.236E-02	8.421E-02	3.339E+00	3.199E+00	3.510E+01	1.964E+02
42.0	88.3	258.0	2.366E+02	258.0	2.366E+02	9.126E-03	9.333E-02	2.159E+00	2.354E+00	2.958E+01	2.259E+02
43.0	88.0	258.0	2.073E+02	258.0	2.073E+02	7.048E-03	1.004E-01	1.461E+00	1.818E+00	2.608E+01	2.520E+02
44.0	87.7	258.0	1.816E+02	258.0	1.816E+02	5.465E-03	1.058E-01	9.923E-01	1.410E+00	2.309E+01	2.751E+02
45.0	87.5	270.0	1.595E+02	270.0	1.595E+02	4.316E-03	1.102E-01	6.884E-01	1.165E+00	2.172E+01	2.968E+02
46.0	87.3	270.0	1.406E+02	270.0	1.406E+02	3.545E-03	1.137E-01	4.983E-01	9.572E-01	2.025E+01	3.171E+02
47.0	87.1	270.0	1.239E+02	270.0	1.239E+02	2.939E-03	1.166E-01	3.640E-01	7.935E-01	1.905E+01	3.361E+02
48.0	87.0	270.0	1.091E+02	270.0	1.091E+02	2.454E-03	1.191E-01	2.678E-01	6.625E-01	1.805E+01	3.542E+02
49.0	86.8	270.0	9.616E+01	270.0	9.616E+01	2.038E-03	1.211E-01	1.960E-01	5.503E-01	1.701E+01	3.712E+02

APPARENT Z-ANG 92.00 (DEG)
 BALLOON HEIGHT 40.00 (KM)
 TANGENT HEIGHT 36.09 (KM)
 OPTICAL AIR MASS .343
 EFFECTIVE PRESSURE 415.50 (PA)
 EFFECTIVE TEMPERATURE 248.18 (DEG K)
 TANGENT PRESSURE 517.60 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
36.1	90.0	245.0	5.197E+02	245.0	5.117E+02	7.759E-02	7.759E-02	3.971E+01	1.901E+01	1.105E+02	1.105E+02
37.0	89.0	245.0	4.681E+02	245.0	4.478E+02	3.007E-02	1.077E-01	1.344E+01	7.368E+00	4.907E+01	1.596E+02
38.0	88.6	245.0	4.072E+02	245.0	3.882E+02	1.978E-02	1.274E-01	7.679E+00	4.847E+00	3.718E+01	1.968E+02
39.0	88.3	245.0	3.542E+02	245.0	3.375E+02	1.436E-02	1.418E-01	4.846E+00	3.517E+00	3.103E+01	2.278E+02
40.0	88.0	258.0	3.084E+02	258.0	3.084E+02	1.051E-02	1.523E-01	3.242E+00	2.712E+00	2.615E+01	2.539E+02
41.0	87.8	258.0	2.701E+02	258.0	2.701E+02	8.322E-03	1.606E-01	2.248E+00	2.147E+00	2.363E+01	2.776E+02
42.0	87.5	258.0	2.366E+02	258.0	2.366E+02	6.786E-03	1.673E-01	1.507E+00	1.730E+00	2.174E+01	2.993E+02
43.0	87.3	258.0	2.073E+02	258.0	2.073E+02	5.472E-03	1.728E-01	1.134E+00	1.412E+00	2.025E+01	3.196E+02
44.0	87.2	258.0	1.816E+02	258.0	1.816E+02	4.407E-03	1.772E-01	8.002E-01	1.137E+00	1.862E+01	3.382E+02
45.0	87.0	270.0	1.595E+02	270.0	1.595E+02	3.579E-03	1.808E-01	5.710E-01	9.664E-01	1.801E+01	3.562E+02
46.0	86.8	270.0	1.406E+02	270.0	1.406E+02	3.004E-03	1.838E-01	4.222E-01	8.118E-01	1.715E+01	3.734E+02
47.0	86.7	270.0	1.239E+02	270.0	1.239E+02	2.533E-03	1.863E-01	3.137E-01	6.839E-01	1.642E+01	3.898E+02
48.0	86.5	270.0	1.091E+02	270.0	1.091E+02	2.144E-03	1.885E-01	2.340E-01	5.789E-01	1.577E+01	4.055E+02
49.0	86.4	270.0	9.616E+01	270.0	9.616E+01	1.802E-03	1.903E-01	1.732E-01	4.864E-01	1.504E+01	4.206E+02

APPARENT Z-ANG 92.50 (DEG) EFFECTIVE PRESSURE 558.07 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 241.67 (DEG K)
 TANGENT HEIGHT 33.89 (KM) TANGENT PRESSURE 711.74 (PA)
 OPTICAL AIR MASS .506

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
33.9	90.0	234.0	7.153E+02	234.0	7.153E+02	3.978E-02	3.978E-02	2.845E+01	9.308E+00	3.869E+01	3.869E+01
34.0	90.3	234.0	7.153E+02	234.0	6.870E+02	8.115E-02	1.209E-01	5.575E+01	1.899E+01	8.231E+01	1.219E+02
35.0	91.1	245.0	6.187E+02	245.0	5.905E+02	3.692E-02	1.578E-01	2.180E+01	9.045E+00	4.560E+01	1.666E+02
36.0	91.5	245.0	5.381E+02	245.0	5.130E+02	2.502E-02	1.829E-01	1.283E+01	6.130E+00	3.558E+01	2.022E+02
37.0	91.8	245.0	4.681E+02	245.0	4.459E+02	1.848E-02	2.013E-01	8.242E+00	4.528E+00	3.023E+01	2.324E+02
38.0	92.1	245.0	4.072E+02	245.0	3.878E+02	1.423E-02	2.156E-01	5.518E+00	3.487E+00	2.677E+01	2.592E+02
39.0	92.3	245.0	3.542E+02	245.0	3.373E+02	1.117E-02	2.267E-01	3.767E+00	2.736E+00	2.415E+01	2.833E+02
33.9	90.0	234.0	7.153E+02	234.0	7.153E+02	3.978E-02	3.978E-02	2.845E+01	9.308E+00	3.869E+01	3.869E+01
34.0	89.7	234.0	7.153E+02	234.0	6.870E+02	8.115E-02	1.209E-01	5.575E+01	1.899E+01	8.231E+01	1.219E+02
35.0	88.9	245.0	6.187E+02	245.0	5.905E+02	3.692E-02	1.578E-01	2.180E+01	9.045E+00	4.560E+01	1.666E+02
36.0	88.5	245.0	5.381E+02	245.0	5.130E+02	2.502E-02	1.829E-01	1.283E+01	6.130E+00	3.558E+01	2.022E+02
37.0	88.2	245.0	4.681E+02	245.0	4.459E+02	1.848E-02	2.013E-01	8.242E+00	4.528E+00	3.023E+01	2.324E+02
38.0	87.9	245.0	4.072E+02	245.0	3.878E+02	1.423E-02	2.156E-01	5.518E+00	3.487E+00	2.677E+01	2.592E+02
39.0	87.7	245.0	3.542E+02	245.0	3.373E+02	1.117E-02	2.267E-01	3.767E+00	2.736E+00	2.415E+01	2.833E+02
40.0	87.5	258.0	3.084E+02	258.0	3.084E+02	8.577E-03	2.353E-01	2.645E+00	2.213E+00	2.134E+01	3.047E+02
41.0	87.3	258.0	2.701E+02	258.0	2.701E+02	7.012E-03	2.423E-01	1.894E+00	1.809E+00	1.991E+01	3.246E+02
42.0	87.1	258.0	2.366E+02	258.0	2.366E+02	5.784E-03	2.481E-01	1.359E+00	1.492E+00	1.875E+01	3.433E+02
43.0	86.9	258.0	2.073E+02	258.0	2.073E+02	4.804E-03	2.529E-01	9.957E-01	1.239E+00	1.778E+01	3.611E+02
44.0	86.8	258.0	1.816E+02	258.0	1.816E+02	3.923E-03	2.568E-01	7.423E-01	1.012E+00	1.657E+01	3.777E+02
45.0	86.6	270.0	1.595E+02	270.0	1.595E+02	3.222E-03	2.601E-01	5.140E-01	8.700E-01	1.621E+01	3.939E+02
46.0	86.5	270.0	1.406E+02	270.0	1.406E+02	2.729E-03	2.628E-01	3.836E-01	7.369E-01	1.559E+01	4.095E+02
47.0	86.3	270.0	1.239E+02	270.0	1.239E+02	2.319E-03	2.651E-01	2.872E-01	6.262E-01	1.503E+01	4.245E+02
48.0	86.2	270.0	1.091E+02	270.0	1.091E+02	1.976E-03	2.671E-01	2.157E-01	5.336E-01	1.454E+01	4.391E+02
49.0	86.1	270.0	9.616E+01	270.0	9.616E+01	1.670E-03	2.688E-01	1.606E-01	4.509E-01	1.394E+01	4.538E+02

APPARENT Z-ANG 93.00 (DEG) EFFECTIVE PRESSURE 809.05 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 237.07 (DEG K)
 TANGENT HEIGHT 31.20 (KM) TANGENT PRESSURE 1063.42 (PA)
 OPTICAL AIR MASS .784

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
31.2	90.0	234.0	1.069E+03	234.0	1.040E+03	1.541E-01	1.541E-01	1.615E+02	3.605E+01	1.023E+02	1.023E+02
32.0	90.9	234.0	9.579E+02	234.0	9.132E+02	6.676E-02	2.208E-01	6.096E+01	1.562E+01	5.094E+01	1.532E+02
33.0	91.4	234.0	8.270E+02	234.0	7.076E+02	4.275E-02	2.636E-01	3.367E+01	1.000E+01	3.782E+01	1.911E+02
34.0	91.7	234.0	7.153E+02	234.0	6.003E+02	3.061E-02	2.942E-01	2.082E+01	7.163E+00	3.136E+01	2.224E+02
35.0	92.0	245.0	6.107E+02	245.0	5.092E+02	2.229E-02	3.165E-01	1.313E+01	5.462E+00	2.760E+01	2.500E+02
36.0	92.2	245.0	5.381E+02	245.0	5.124E+02	1.748E-02	3.340E-01	8.958E+00	4.282E+00	2.408E+01	2.749E+02
37.0	92.4	245.0	4.681E+02	245.0	4.456E+02	1.396E-02	3.479E-01	6.221E+00	3.420E+00	2.285E+01	2.974E+02
38.0	92.6	245.0	4.072E+02	245.0	3.876E+02	1.130E-02	3.592E-01	4.378E+00	2.768E+00	2.126E+01	3.190E+02
39.0	92.8	245.0	3.542E+02	245.0	3.372E+02	9.174E-03	3.604E-01	3.094E+00	2.240E+00	1.905E+01	3.309E+02
31.2	90.0	234.0	1.069E+03	234.0	1.040E+03	1.541E-01	1.541E-01	1.615E+02	3.605E+01	1.023E+02	1.023E+02
32.0	89.1	234.0	9.579E+02	234.0	9.132E+02	6.676E-02	2.208E-01	6.096E+01	1.562E+01	5.094E+01	1.532E+02
33.0	88.6	234.0	8.270E+02	234.0	7.076E+02	4.275E-02	2.636E-01	3.367E+01	1.000E+01	3.782E+01	1.911E+02
34.0	88.3	234.0	7.153E+02	234.0	6.003E+02	3.061E-02	2.942E-01	2.082E+01	7.163E+00	3.136E+01	2.224E+02
35.0	88.0	245.0	6.107E+02	245.0	5.092E+02	2.229E-02	3.165E-01	1.313E+01	5.462E+00	2.760E+01	2.500E+02
36.0	87.8	245.0	5.381E+02	245.0	5.124E+02	1.748E-02	3.340E-01	8.958E+00	4.282E+00	2.408E+01	2.749E+02
37.0	87.6	245.0	4.681E+02	245.0	4.456E+02	1.396E-02	3.479E-01	6.221E+00	3.420E+00	2.285E+01	2.974E+02
38.0	87.4	245.0	4.072E+02	245.0	3.876E+02	1.130E-02	3.592E-01	4.378E+00	2.768E+00	2.126E+01	3.190E+02
39.0	87.2	245.0	3.542E+02	245.0	3.372E+02	9.174E-03	3.604E-01	3.094E+00	2.240E+00	1.905E+01	3.309E+02
40.0	87.0	250.0	3.004E+02	250.0	3.004E+02	7.228E-03	3.756E-01	2.229E+00	1.865E+00	1.790E+01	3.568E+02
41.0	86.8	258.0	2.701E+02	258.0	2.701E+02	6.026E-03	3.816E-01	1.629E+00	1.555E+00	1.711E+01	3.740E+02
42.0	86.7	258.0	2.366E+02	258.0	2.366E+02	5.049E-03	3.867E-01	1.195E+00	1.303E+00	1.637E+01	3.903E+02
43.0	86.5	258.0	2.073E+02	258.0	2.073E+02	4.246E-03	3.909E-01	8.081E-01	1.096E+00	1.571E+01	4.060E+02
44.0	86.4	258.0	1.816E+02	258.0	1.816E+02	3.504E-03	3.944E-01	6.362E-01	9.040E-01	1.480E+01	4.208E+02
45.0	86.2	270.0	1.595E+02	270.0	1.595E+02	2.904E-03	3.973E-01	4.632E-01	7.840E-01	1.461E+01	4.355E+02
46.0	86.1	270.0	1.406E+02	270.0	1.406E+02	2.478E-03	3.998E-01	3.483E-01	6.691E-01	1.415E+01	4.496E+02
47.0	86.0	270.0	1.239E+02	270.0	1.239E+02	2.119E-03	4.019E-01	2.625E-01	5.723E-01	1.374E+01	4.635E+02
48.0	85.9	270.0	1.091E+02	270.0	1.091E+02	1.816E-03	4.038E-01	1.982E-01	4.904E-01	1.336E+01	4.767E+02
49.0	85.7	270.0	9.616E+01	270.0	9.616E+01	1.542E-03	4.053E-01	1.403E-01	4.165E-01	1.280E+01	4.896E+02

APPARENT Z-ANG 93.50 (DEG) EFFECTIVE PRESSURE 1271.13 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 230.11 (DEG K)
 TANGENT HEIGHT 20.01 (KM) TANGENT PRESSURE 1742.45 (PA)
 OPTICAL AIR MASS 1.310

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
28.0	98.0	224.0	1.674E+03	224.0	1.649E+03	2.845E-01	2.845E-01	4.689E+02	6.372E+01	1.150E+02	1.150E+02
29.0	91.0	224.0	1.493E+03	224.0	1.420E+03	1.002E-01	3.846E-01	1.422E+02	2.244E+01	4.707E+01	1.621E+02
30.0	91.4	234.0	1.203E+03	234.0	1.220E+03	6.343E-02	4.401E-01	7.740E+01	1.404E+01	3.623E+01	1.983E+02
31.0	91.7	234.0	1.108E+03	234.0	1.054E+03	4.620E-02	4.943E-01	4.868E+01	1.081E+01	3.055E+01	2.288E+02
32.0	92.0	234.0	9.579E+02	234.0	9.103E+02	3.519E-02	5.295E-01	3.203E+01	8.234E+00	2.694E+01	2.558E+02
33.0	92.3	234.0	8.278E+02	234.0	7.864E+02	2.752E-02	5.578E-01	2.164E+01	6.439E+00	2.438E+01	2.802E+02
34.0	92.5	234.0	7.153E+02	234.0	6.797E+02	2.178E-02	5.787E-01	1.480E+01	5.096E+00	2.233E+01	3.025E+02
35.0	92.7	245.0	6.187E+02	245.0	5.889E+02	1.688E-02	5.956E-01	9.938E+00	4.135E+00	2.090E+01	3.234E+02
36.0	92.9	245.0	5.381E+02	245.0	5.122E+02	1.381E-02	6.894E-01	7.071E+00	3.382E+00	1.966E+01	3.431E+02
37.0	93.0	245.0	4.681E+02	245.0	4.455E+02	1.137E-02	6.208E-01	5.068E+00	2.787E+00	1.863E+01	3.617E+02
38.0	93.2	245.0	4.072E+02	245.0	3.875E+02	9.425E-03	6.302E-01	3.652E+00	2.309E+00	1.774E+01	3.794E+02
39.0	93.4	245.0	3.542E+02	245.0	3.372E+02	7.799E-03	6.300E-01	2.630E+00	1.911E+00	1.687E+01	3.963E+02

28.0	98.0	224.0	1.674E+03	224.0	1.649E+03	2.845E-01	2.845E-01	4.689E+02	6.372E+01	1.150E+02	1.150E+02
29.0	89.0	224.0	1.493E+03	224.0	1.420E+03	1.002E-01	3.846E-01	1.422E+02	2.244E+01	4.707E+01	1.621E+02
30.0	88.6	234.0	1.203E+03	234.0	1.220E+03	6.343E-02	4.401E-01	7.740E+01	1.404E+01	3.623E+01	1.983E+02
31.0	88.3	234.0	1.108E+03	234.0	1.054E+03	4.620E-02	4.943E-01	4.868E+01	1.081E+01	3.055E+01	2.288E+02
32.0	88.0	234.0	9.579E+02	234.0	9.103E+02	3.519E-02	5.295E-01	3.203E+01	8.234E+00	2.694E+01	2.558E+02
33.0	87.7	234.0	8.278E+02	234.0	7.864E+02	2.752E-02	5.578E-01	2.164E+01	6.439E+00	2.438E+01	2.802E+02
34.0	87.5	234.0	7.153E+02	234.0	6.797E+02	2.178E-02	5.787E-01	1.480E+01	5.096E+00	2.233E+01	3.025E+02
35.0	87.3	245.0	6.187E+02	245.0	5.889E+02	1.688E-02	6.094E-01	9.938E+00	4.135E+00	2.090E+01	3.234E+02
36.0	87.1	245.0	5.381E+02	245.0	5.122E+02	1.381E-02	6.208E-01	7.071E+00	3.382E+00	1.966E+01	3.431E+02
37.0	87.0	245.0	4.681E+02	245.0	4.455E+02	1.137E-02	6.208E-01	5.068E+00	2.787E+00	1.863E+01	3.617E+02
38.0	86.8	245.0	4.072E+02	245.0	3.875E+02	9.425E-03	6.302E-01	3.652E+00	2.309E+00	1.774E+01	3.794E+02
39.0	86.6	245.0	3.542E+02	245.0	3.372E+02	7.799E-03	6.300E-01	2.630E+00	1.911E+00	1.687E+01	3.963E+02
40.0	86.5	258.0	3.084E+02	258.0	3.084E+02	6.239E-03	6.443E-01	1.924E+00	1.911E+00	1.687E+01	3.963E+02
41.0	86.4	258.0	2.701E+02	258.0	2.701E+02	5.268E-03	6.495E-01	1.423E+00	1.359E+00	1.496E+01	4.268E+02
42.0	86.2	258.0	2.366E+02	258.0	2.366E+02	4.460E-03	6.540E-01	1.055E+00	1.151E+00	1.446E+01	4.412E+02
43.0	86.1	258.0	2.073E+02	258.0	2.073E+02	3.786E-03	6.609E-01	7.846E-01	9.767E-01	1.401E+01	4.553E+02
44.0	86.0	258.0	1.816E+02	258.0	1.816E+02	3.148E-03	6.609E-01	5.716E-01	8.122E-01	1.330E+01	4.685E+02
45.0	85.8	270.0	1.595E+02	270.0	1.595E+02	2.627E-03	6.636E-01	4.190E-01	7.092E-01	1.322E+01	4.819E+02
46.0	85.7	270.0	1.406E+02	270.0	1.406E+02	2.255E-03	6.658E-01	3.170E-01	6.049E-01	1.280E+01	4.946E+02
47.0	85.6	270.0	1.239E+02	270.0	1.239E+02	1.939E-03	6.678E-01	2.402E-01	5.236E-01	1.257E+01	5.072E+02
48.0	85.5	270.0	1.091E+02	270.0	1.091E+02	1.670E-03	6.694E-01	1.822E-01	4.508E-01	1.228E+01	5.195E+02
49.0	85.4	270.0	9.616E+01	270.0	9.616E+01	1.424E-03	6.708E-01	1.369E-01	3.845E-01	1.189E+01	5.314E+02

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APPARENT Z-ANG 94.00 (DEG) EFFECTIVE PRESSURE 2207.10 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 226.35 (DEG K)
 TANGENT HEIGHT 24.33 (KM) TANGENT PRESSURE 3149.02 (PA)
 OPTICAL AIR MASS 2.358

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-QM)	DEL (T-QM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
24.3	90.0	223.0	2.966E+03	223.0	2.944E+03	4.193E-01	4.193E-01	1.234E+03	9.350E+01	9.444E+01	9.444E+01
25.0	90.8	224.0	2.748E+03	224.0	2.616E+03	2.101E-01	6.294E-01	5.495E+02	4.706E+01	5.359E+01	1.400E+02
26.0	91.3	224.0	2.359E+03	224.0	2.240E+03	1.299E-01	7.593E-01	2.911E+02	2.911E+01	3.070E+01	1.067E+02
27.0	91.6	224.0	2.025E+03	224.0	1.921E+03	9.199E-02	8.513E-01	1.768E+02	2.061E+01	3.194E+01	2.107E+02
28.0	91.9	224.0	1.739E+03	224.0	1.649E+03	6.862E-02	9.201E-01	1.135E+02	1.542E+01	2.785E+01	2.465E+02
29.0	92.2	224.0	1.493E+03	224.0	1.416E+03	5.202E-02	9.729E-01	7.478E+01	1.103E+01	2.489E+01	2.714E+02
30.0	92.4	234.0	1.203E+03	234.0	1.218E+03	4.006E-02	1.013E+00	4.881E+01	9.373E+00	2.291E+01	2.943E+02
31.0	92.6	234.0	1.106E+03	234.0	1.053E+03	3.214E-02	1.045E+00	3.384E+01	7.521E+00	2.127E+01	3.156E+02
32.0	92.8	234.0	9.579E+02	234.0	9.097E+02	2.605E-02	1.071E+00	2.370E+01	6.056E+00	1.995E+01	3.355E+02
33.0	93.0	234.0	8.278E+02	234.0	7.861E+02	2.128E-02	1.092E+00	1.672E+01	4.979E+00	1.886E+01	3.544E+02
34.0	93.1	234.0	7.153E+02	234.0	6.795E+02	1.739E-02	1.110E+00	1.102E+01	4.069E+00	1.783E+01	3.722E+02
35.0	93.3	245.0	6.107E+02	245.0	5.888E+02	1.382E-02	1.124E+00	8.135E+00	3.385E+00	1.712E+01	3.894E+02
36.0	93.5	245.0	5.381E+02	245.0	5.121E+02	1.153E-02	1.135E+00	5.905E+00	2.025E+00	1.643E+01	4.058E+02
37.0	93.6	245.0	4.681E+02	245.0	4.454E+02	9.657E-03	1.145E+00	4.302E+00	2.366E+00	1.582E+01	4.216E+02
38.0	93.7	245.0	4.072E+02	245.0	3.875E+02	8.111E-03	1.153E+00	3.143E+00	1.987E+00	1.527E+01	4.369E+02
39.0	93.9	245.0	3.542E+02	245.0	3.371E+02	6.709E-03	1.160E+00	2.289E+00	1.663E+00	1.469E+01	4.516E+02
24.3	90.0	223.0	2.966E+03	223.0	2.944E+03	4.193E-01	4.193E-01	1.234E+03	9.350E+01	9.444E+01	9.444E+01
25.0	89.2	224.0	2.748E+03	224.0	2.616E+03	2.101E-01	6.294E-01	5.495E+02	4.706E+01	5.359E+01	1.400E+02
26.0	88.7	224.0	2.359E+03	224.0	2.240E+03	1.299E-01	7.593E-01	2.911E+02	2.911E+01	3.070E+01	1.067E+02
27.0	88.4	224.0	2.025E+03	224.0	1.921E+03	9.199E-02	8.513E-01	1.768E+02	2.061E+01	3.194E+01	2.107E+02
28.0	88.1	224.0	1.739E+03	224.0	1.649E+03	6.862E-02	9.201E-01	1.135E+02	1.542E+01	2.785E+01	2.465E+02
29.0	87.8	224.0	1.493E+03	224.0	1.416E+03	5.202E-02	9.729E-01	7.478E+01	1.103E+01	2.489E+01	2.714E+02
30.0	87.6	234.0	1.203E+03	234.0	1.218E+03	4.006E-02	1.013E+00	4.881E+01	9.373E+00	2.291E+01	2.943E+02
31.0	87.4	234.0	1.106E+03	234.0	1.053E+03	3.214E-02	1.045E+00	3.384E+01	7.521E+00	2.127E+01	3.156E+02
32.0	87.2	234.0	9.579E+02	234.0	9.097E+02	2.605E-02	1.071E+00	2.370E+01	6.056E+00	1.995E+01	3.355E+02
33.0	87.0	234.0	8.278E+02	234.0	7.861E+02	2.128E-02	1.092E+00	1.672E+01	4.979E+00	1.886E+01	3.544E+02
34.0	86.9	234.0	7.153E+02	234.0	6.795E+02	1.739E-02	1.110E+00	1.102E+01	4.069E+00	1.783E+01	3.722E+02
35.0	86.7	245.0	6.107E+02	245.0	5.888E+02	1.382E-02	1.124E+00	8.135E+00	3.385E+00	1.712E+01	3.894E+02
36.0	86.5	245.0	5.381E+02	245.0	5.121E+02	1.153E-02	1.135E+00	5.905E+00	2.025E+00	1.643E+01	4.058E+02
37.0	86.4	245.0	4.681E+02	245.0	4.454E+02	9.657E-03	1.145E+00	4.302E+00	2.366E+00	1.582E+01	4.216E+02
38.0	86.3	245.0	4.072E+02	245.0	3.875E+02	8.111E-03	1.153E+00	3.143E+00	1.987E+00	1.527E+01	4.369E+02
39.0	86.1	245.0	3.542E+02	245.0	3.371E+02	6.709E-03	1.160E+00	2.289E+00	1.663E+00	1.469E+01	4.516E+02
40.0	85.8	250.0	3.084E+02	250.0	3.045E+02	5.465E-03	1.165E+00	1.691E+00	1.415E+00	1.365E+01	4.652E+02
41.0	85.9	250.0	2.701E+02	250.0	2.701E+02	4.671E-03	1.170E+00	1.262E+00	1.205E+00	1.326E+01	4.785E+02
42.0	85.8	250.0	2.366E+02	250.0	2.366E+02	3.984E-03	1.174E+00	9.428E-01	1.025E+00	1.292E+01	4.914E+02
43.0	85.6	250.0	2.073E+02	250.0	2.073E+02	3.404E-03	1.177E+00	7.056E-01	8.703E-01	1.268E+01	5.040E+02
44.0	85.5	250.0	1.816E+02	250.0	1.816E+02	2.847E-03	1.188E+00	5.170E-01	7.346E-01	1.203E+01	5.160E+02
45.0	85.4	270.0	1.595E+02	270.0	1.595E+02	2.388E-03	1.183E+00	3.810E-01	6.448E-01	1.202E+01	5.288E+02
46.0	85.3	270.0	1.406E+02	270.0	1.406E+02	2.060E-03	1.185E+00	2.896E-01	5.563E-01	1.177E+01	5.398E+02
47.0	85.2	270.0	1.239E+02	270.0	1.239E+02	1.779E-03	1.186E+00	2.204E-01	4.804E-01	1.153E+01	5.513E+02
48.0	85.1	270.0	1.091E+02	270.0	1.091E+02	1.538E-03	1.188E+00	1.678E-01	4.152E-01	1.131E+01	5.628E+02
49.0	85.0	270.0	9.616E+01	270.0	9.616E+01	1.316E-03	1.189E+00	1.266E-01	3.554E-01	1.099E+01	5.736E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
20.1	90.0	218.0	5.732E+03	218.0	5.630E+03	9.342E-01	9.342E-01	5.260E+03	2.037E+02	1.076E+02	1.076E+02
21.0	90.9	219.0	5.097E+03	219.0	4.843E+03	3.635E-01	1.298E+00	1.761E+03	7.962E+01	4.897E+01	1.566E+02
22.0	91.4	220.0	4.361E+03	220.0	4.137E+03	2.327E-01	1.530E+00	9.626E+02	5.119E+01	3.666E+01	1.935E+02
23.0	91.7	222.0	3.734E+03	222.0	3.541E+03	1.654E-01	1.696E+00	5.856E+02	3.671E+01	3.008E+01	2.243E+02
24.0	92.0	223.0	3.202E+03	223.0	3.036E+03	1.239E-01	1.820E+00	3.762E+02	2.763E+01	2.711E+01	2.514E+02
25.0	92.2	224.0	2.748E+03	224.0	2.605E+03	9.559E-02	1.915E+00	2.499E+02	2.141E+01	2.448E+01	2.759E+02
26.0	92.4	224.0	2.359E+03	224.0	2.236E+03	7.538E-02	1.991E+00	1.685E+02	1.689E+01	2.249E+01	2.984E+02
27.0	92.6	224.0	2.029E+03	224.0	1.919E+03	6.021E-02	2.051E+00	1.156E+02	1.349E+01	2.093E+01	3.193E+02
28.0	92.8	224.0	1.739E+03	224.0	1.648E+03	4.855E-02	2.099E+00	8.009E+01	1.088E+01	1.966E+01	3.398E+02
29.0	93.0	224.0	1.493E+03	224.0	1.415E+03	3.924E-02	2.139E+00	5.953E+01	8.790E+00	1.850E+01	3.575E+02
30.0	93.2	234.0	1.283E+03	234.0	1.218E+03	3.092E-02	2.170E+00	3.765E+01	7.234E+00	1.769E+01	3.752E+02
31.0	93.3	234.0	1.108E+03	234.0	1.053E+03	2.554E-02	2.195E+00	2.689E+01	5.977E+00	1.691E+01	3.921E+02
32.0	93.5	234.0	9.579E+02	234.0	9.095E+02	2.119E-02	2.216E+00	1.927E+01	4.959E+00	1.624E+01	4.003E+02
33.0	93.6	234.0	8.278E+02	234.0	7.859E+02	1.764E-02	2.234E+00	1.388E+01	4.127E+00	1.564E+01	4.240E+02
34.0	93.8	234.0	7.153E+02	234.0	6.794E+02	1.464E-02	2.249E+00	9.949E+00	3.427E+00	1.502E+01	4.390E+02
35.0	93.9	245.0	6.187E+02	245.0	5.887E+02	1.179E-02	2.260E+00	6.942E+00	2.889E+00	1.461E+01	4.536E+02
36.0	94.0	245.0	5.381E+02	245.0	5.121E+02	9.953E-03	2.270E+00	5.097E+00	2.439E+00	1.418E+01	4.678E+02
37.0	94.1	245.0	4.681E+02	245.0	4.454E+02	8.418E-03	2.279E+00	3.749E+00	2.062E+00	1.379E+01	4.816E+02
38.0	94.3	245.0	4.072E+02	245.0	3.874E+02	7.132E-03	2.286E+00	2.763E+00	1.747E+00	1.343E+01	4.950E+02
39.0	94.4	245.0	3.542E+02	245.0	3.371E+02	6.014E-03	2.292E+00	2.027E+00	1.474E+00	1.302E+01	5.000E+02

4219.55 (PA)
221.36 (DEG K)
6493.49 (PA)

EFFECTIVE PRESSURE
EFFECTIVE TEMPERATURE
TANGENT PRESSURE

APPARENT Z-ANG 94.50 (DEG)
BALLOON HEIGHT 40.00 (KM)
TANGENT HEIGHT 20.12 (KM)
OPTICAL AIR MASS 4.619

APPARENT Z-ANG 94.50 (DEG)
 BALLOON HEIGHT 40.00 (KM)
 TANGENT HEIGHT 20.12 (KM)
 OPTICAL AIR MASS 4.619

EFFECTIVE PRESSURE 4219.55 (PA)
 EFFECTIVE TEMPERATURE 221.36 (DEG K)
 TANGENT PRESSURE 6493.49 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
20.1	98.0	218.0	5.732E+03	218.0	5.630E+03	9.342E-01	9.342E-01	5.268E+03	2.037E+02	1.076E+02	1.076E+02
21.0	89.1	219.0	5.097E+03	219.0	4.843E+03	3.636E-01	1.290E+00	1.761E+03	7.962E+01	4.097E+01	1.566E+02
22.0	88.6	220.0	4.361E+03	220.0	4.137E+03	2.327E-01	1.530E+00	9.626E+02	5.119E+01	3.686E+01	1.935E+02
23.0	88.3	222.0	3.734E+03	222.0	3.541E+03	1.654E-01	1.696E+00	5.856E+02	3.671E+01	3.080E+01	2.243E+02
24.0	88.0	223.0	3.202E+03	223.0	3.036E+03	1.239E-01	1.820E+00	3.762E+02	2.763E+01	2.711E+01	2.514E+02
25.0	87.8	224.0	2.748E+03	224.0	2.605E+03	9.558E-02	1.915E+00	2.490E+02	2.141E+01	2.448E+01	2.759E+02
26.0	87.6	224.0	2.359E+03	224.0	2.236E+03	7.538E-02	1.991E+00	1.685E+02	1.609E+01	2.249E+01	2.984E+02
27.0	87.4	224.0	2.025E+03	224.0	1.919E+03	6.021E-02	2.051E+00	1.156E+02	1.349E+01	2.093E+01	3.193E+02
28.0	87.2	224.0	1.739E+03	224.0	1.648E+03	4.855E-02	2.099E+00	8.000E+01	1.088E+01	1.966E+01	3.390E+02
29.0	87.0	224.0	1.493E+03	224.0	1.415E+03	3.924E-02	2.139E+00	5.553E+01	8.790E+00	1.850E+01	3.575E+02
30.0	86.8	234.0	1.283E+03	234.0	1.210E+03	3.092E-02	2.170E+00	3.766E+01	7.234E+00	1.769E+01	3.752E+02
31.0	86.7	234.0	1.108E+03	234.0	1.053E+03	2.554E-02	2.195E+00	2.689E+01	5.977E+00	1.691E+01	3.921E+02
32.0	86.5	234.0	9.579E+02	234.0	9.095E+02	2.119E-02	2.216E+00	1.927E+01	4.959E+00	1.624E+01	4.083E+02
33.0	86.4	234.0	8.278E+02	234.0	7.859E+02	1.764E-02	2.234E+00	1.386E+01	4.127E+00	1.564E+01	4.240E+02
34.0	86.2	234.0	7.153E+02	234.0	6.794E+02	1.464E-02	2.249E+00	9.949E+00	3.427E+00	1.502E+01	4.390E+02
35.0	86.1	245.0	6.107E+02	245.0	5.887E+02	1.179E-02	2.260E+00	6.942E+00	2.809E+00	1.461E+01	4.536E+02
36.0	86.0	245.0	5.381E+02	245.0	5.121E+02	9.953E-03	2.270E+00	5.097E+00	2.439E+00	1.418E+01	4.678E+02
37.0	85.9	245.0	4.681E+02	245.0	4.454E+02	8.418E-03	2.279E+00	3.749E+00	2.062E+00	1.379E+01	4.816E+02
38.0	85.7	245.0	4.072E+02	245.0	3.874E+02	7.132E-03	2.286E+00	2.763E+00	1.747E+00	1.343E+01	4.950E+02
39.0	85.6	245.0	3.542E+02	245.0	3.371E+02	6.014E-03	2.292E+00	2.027E+00	1.474E+00	1.302E+01	5.080E+02
40.0	85.5	258.0	3.084E+02	258.0	3.084E+02	4.892E-03	2.297E+00	1.509E+00	1.262E+00	1.217E+01	5.202E+02
41.0	85.4	258.0	2.701E+02	258.0	2.701E+02	4.191E-03	2.301E+00	1.132E+00	1.081E+00	1.190E+01	5.321E+02
42.0	85.3	258.0	2.366E+02	258.0	2.366E+02	3.595E-03	2.305E+00	8.505E-01	9.274E-01	1.165E+01	5.430E+02
43.0	85.2	258.0	2.073E+02	258.0	2.073E+02	3.086E-03	2.308E+00	6.397E-01	7.962E-01	1.142E+01	5.552E+02
44.0	85.1	258.0	1.816E+02	258.0	1.816E+02	2.593E-03	2.310E+00	4.708E-01	6.690E-01	1.095E+01	5.661E+02
45.0	85.0	270.0	1.595E+02	270.0	1.595E+02	2.184E-03	2.312E+00	3.484E-01	5.896E-01	1.099E+01	5.771E+02
46.0	84.9	270.0	1.406E+02	270.0	1.406E+02	1.891E-03	2.314E+00	2.659E-01	5.105E-01	1.080E+01	5.879E+02
47.0	84.8	270.0	1.239E+02	270.0	1.239E+02	1.638E-03	2.316E+00	2.029E-01	4.424E-01	1.062E+01	5.985E+02
48.0	84.7	270.0	1.091E+02	270.0	1.091E+02	1.421E-03	2.317E+00	1.551E-01	3.836E-01	1.045E+01	6.090E+02
49.0	84.6	270.0	9.616E+01	270.0	9.616E+01	1.220E-03	2.319E+00	1.173E-01	3.293E-01	1.010E+01	6.192E+02

EFFECTIVE PRESSURE 8931.02 (PA)
 EFFECTIVE TEMPERATURE 217.71 (DEG K)
 TANGENT PRESSURE 16451.02 (PA)

APPARENT Z-ANG 95.00 (DEG)
 BALLOON HEIGHT 48.00 (KM)
 TANGENT HEIGHT 15.34 (KM)
 OPTICAL AIR MASS 9.997

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
15.3	98.0	216.0	1.213E+04	216.0	1.204E+04	1.776E+00	1.776E+00	2.138E+04	3.836E+02	9.474E+01	9.474E+01
16.0	98.0	216.0	1.121E+04	216.0	1.066E+04	8.961E-01	2.672E+00	9.549E+03	1.936E+02	5.411E+01	1.488E+02
17.0	91.3	216.0	9.572E+03	216.0	9.073E+03	5.493E-01	3.221E+00	4.904E+03	1.106E+02	3.895E+01	1.878E+02
18.0	91.6	216.0	8.172E+03	216.0	7.739E+03	3.857E-01	3.687E+00	2.905E+03	8.331E+01	3.206E+01	2.199E+02
19.0	91.9	217.0	6.977E+03	217.0	6.686E+03	2.852E-01	3.892E+00	1.884E+03	6.189E+01	2.791E+01	2.478E+02
20.0	92.2	218.0	5.961E+03	218.0	5.644E+03	2.177E-01	4.119E+00	1.229E+03	4.745E+01	2.504E+01	2.729E+02
21.0	92.4	219.0	5.097E+03	219.0	4.826E+03	1.695E-01	4.279E+00	8.182E+02	3.713E+01	2.292E+01	2.957E+02
22.0	92.6	220.0	4.361E+03	220.0	4.130E+03	1.339E-01	4.413E+00	5.530E+02	2.946E+01	2.125E+01	3.178E+02
23.0	92.8	222.0	3.734E+03	222.0	3.538E+03	1.066E-01	4.520E+00	3.770E+02	2.366E+01	1.992E+01	3.369E+02
24.0	92.9	223.0	3.202E+03	223.0	3.034E+03	8.590E-02	4.606E+00	2.686E+02	1.916E+01	1.881E+01	3.557E+02
25.0	93.1	224.0	2.748E+03	224.0	2.603E+03	6.976E-02	4.676E+00	1.816E+02	1.563E+01	1.788E+01	3.736E+02
26.0	93.3	224.0	2.359E+03	224.0	2.235E+03	5.718E-02	4.733E+00	1.278E+02	1.281E+01	1.707E+01	3.907E+02
27.0	93.4	224.0	2.025E+03	224.0	1.919E+03	4.706E-02	4.788E+00	9.030E+01	1.054E+01	1.636E+01	4.078E+02
28.0	93.6	224.0	1.739E+03	224.0	1.647E+03	3.887E-02	4.819E+00	6.404E+01	8.708E+00	1.574E+01	4.228E+02
29.0	93.7	224.0	1.493E+03	224.0	1.415E+03	3.204E-02	4.851E+00	4.533E+01	7.177E+00	1.511E+01	4.379E+02
30.0	93.8	234.0	1.283E+03	234.0	1.218E+03	2.566E-02	4.876E+00	3.125E+01	6.085E+00	1.469E+01	4.526E+02
31.0	94.0	234.0	1.108E+03	234.0	1.052E+03	2.150E-02	4.898E+00	2.263E+01	5.032E+00	1.424E+01	4.668E+02
32.0	94.1	234.0	9.579E+02	234.0	9.094E+02	1.805E-02	4.916E+00	1.642E+01	4.225E+00	1.383E+01	4.806E+02
33.0	94.2	234.0	8.278E+02	234.0	7.859E+02	1.518E-02	4.931E+00	1.193E+01	3.553E+00	1.346E+01	4.941E+02
34.0	94.3	234.0	7.153E+02	234.0	6.793E+02	1.272E-02	4.944E+00	8.643E+00	2.977E+00	1.305E+01	5.071E+02
35.0	94.5	245.0	6.187E+02	245.0	5.806E+02	1.033E-02	4.956E+00	6.080E+00	2.531E+00	1.280E+01	5.199E+02
36.0	94.6	245.0	5.381E+02	245.0	5.120E+02	8.782E-03	4.963E+00	4.496E+00	2.151E+00	1.251E+01	5.325E+02
37.0	94.7	245.0	4.681E+02	245.0	4.454E+02	7.475E-03	4.970E+00	3.329E+00	1.831E+00	1.224E+01	5.447E+02
38.0	94.8	245.0	4.072E+02	245.0	3.874E+02	6.370E-03	4.977E+00	2.468E+00	1.561E+00	1.200E+01	5.567E+02
39.0	94.9	245.0	3.542E+02	245.0	3.371E+02	5.400E-03	4.982E+00	1.820E+00	1.323E+00	1.169E+01	5.684E+02

APPARENT Z-ANG 95.00 (DEG) EFFECTIVE PRESSURE 8931.02 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 217.71 (DEG K)
 TANGENT HEIGHT 15.34 (KM) TANGENT PRESSURE 16451.02 (PA)
 OPTICAL AIR MASS 9.997

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
15.3	88.0	216.0	1.213E+04	216.0	1.204E+04	1.776E+00	1.776E+00	2.130E+04	3.036E+02	9.474E+01	9.474E+01
16.0	88.2	216.0	1.121E+04	216.0	1.066E+04	0.961E-01	2.672E+00	9.549E+03	1.936E+02	5.411E+01	1.488E+02
17.0	88.7	216.0	9.572E+03	216.0	9.073E+03	5.493E-01	3.221E+00	4.904E+03	1.106E+02	3.895E+01	1.870E+02
18.0	88.4	216.0	8.172E+03	216.0	7.739E+03	3.857E-01	3.607E+00	2.985E+03	8.331E+01	3.206E+01	2.199E+02
19.0	88.1	217.0	6.977E+03	217.0	6.606E+03	2.852E-01	3.892E+00	1.884E+03	6.189E+01	2.791E+01	2.470E+02
20.0	87.8	218.0	5.961E+03	218.0	5.644E+03	2.177E-01	4.110E+00	1.229E+03	4.745E+01	2.504E+01	2.728E+02
21.0	87.6	219.0	5.097E+03	219.0	4.826E+03	1.695E-01	4.279E+00	8.182E+02	3.713E+01	2.292E+01	2.957E+02
22.0	87.4	220.0	4.361E+03	220.0	4.130E+03	1.339E-01	4.413E+00	5.530E+02	2.946E+01	2.125E+01	3.170E+02
23.0	87.2	222.0	3.734E+03	222.0	3.538E+03	1.066E-01	4.520E+00	3.770E+02	2.366E+01	1.992E+01	3.369E+02
24.0	87.1	223.0	3.202E+03	223.0	3.034E+03	8.590E-02	4.606E+00	2.606E+02	1.916E+01	1.801E+01	3.557E+02
25.0	86.9	224.0	2.740E+03	224.0	2.603E+03	6.976E-02	4.676E+00	1.816E+02	1.563E+01	1.708E+01	3.736E+02
26.0	86.7	224.0	2.359E+03	224.0	2.235E+03	5.710E-02	4.733E+00	1.278E+02	1.207E+01	1.707E+01	3.907E+02
27.0	86.6	224.0	2.025E+03	224.0	1.919E+03	4.706E-02	4.780E+00	9.030E+01	1.054E+01	1.636E+01	4.078E+02
28.0	86.4	224.0	1.739E+03	224.0	1.647E+03	3.887E-02	4.819E+00	6.404E+01	8.700E+00	1.574E+01	4.220E+02
29.0	86.3	224.0	1.493E+03	224.0	1.415E+03	3.204E-02	4.851E+00	4.533E+01	7.177E+00	1.511E+01	4.379E+02
30.0	86.2	234.0	1.283E+03	234.0	1.218E+03	2.566E-02	4.876E+00	3.125E+01	6.005E+00	1.469E+01	4.526E+02
31.0	86.0	234.0	1.100E+03	234.0	1.052E+03	2.150E-02	4.898E+00	2.263E+01	5.032E+00	1.424E+01	4.660E+02
32.0	85.9	234.0	9.579E+02	234.0	9.094E+02	1.805E-02	4.916E+00	1.642E+01	4.225E+00	1.383E+01	4.806E+02
33.0	85.8	234.0	8.278E+02	234.0	7.859E+02	1.510E-02	4.931E+00	1.193E+01	3.553E+00	1.346E+01	4.941E+02
34.0	85.7	234.0	7.153E+02	234.0	6.793E+02	1.272E-02	4.944E+00	8.643E+00	2.977E+00	1.305E+01	5.071E+02
35.0	85.5	245.0	6.107E+02	245.0	5.866E+02	1.033E-02	4.954E+00	6.080E+00	2.531E+00	1.280E+01	5.199E+02
36.0	85.4	245.0	5.301E+02	245.0	5.120E+02	8.782E-03	4.963E+00	4.496E+00	2.152E+00	1.251E+01	5.325E+02
37.0	85.3	245.0	4.681E+02	245.0	4.454E+02	7.475E-03	4.970E+00	3.529E+00	1.831E+00	1.224E+01	5.447E+02
38.0	85.2	245.0	4.072E+02	245.0	3.874E+02	6.370E-03	4.977E+00	2.460E+00	1.561E+00	1.200E+01	5.567E+02
39.0	85.1	245.0	3.542E+02	245.0	3.371E+02	5.400E-03	4.982E+00	1.820E+00	1.323E+00	1.169E+01	5.684E+02
40.0	85.0	258.0	3.004E+02	258.0	3.004E+02	4.514E-03	4.987E+00	1.361E+00	1.139E+00	1.090E+01	5.794E+02
41.0	84.9	258.0	2.701E+02	258.0	2.701E+02	3.798E-03	4.990E+00	1.026E+00	9.799E-01	1.079E+01	5.902E+02
42.0	84.8	258.0	2.366E+02	258.0	2.366E+02	3.271E-03	4.994E+00	7.739E-01	8.439E-01	1.060E+01	6.008E+02
43.0	84.7	258.0	2.073E+02	258.0	2.073E+02	2.819E-03	4.997E+00	5.842E-01	7.272E-01	1.043E+01	6.112E+02
44.0	84.6	258.0	1.816E+02	258.0	1.816E+02	2.376E-03	4.999E+00	4.314E-01	6.131E-01	1.004E+01	6.212E+02
45.0	84.5	270.0	1.595E+02	270.0	1.595E+02	2.000E-03	5.001E+00	3.203E-01	5.421E-01	1.010E+01	6.313E+02
46.0	84.4	270.0	1.406E+02	270.0	1.406E+02	1.744E-03	5.003E+00	2.451E-01	4.700E-01	9.957E+00	6.413E+02
47.0	84.3	270.0	1.239E+02	270.0	1.239E+02	1.515E-03	5.004E+00	1.876E-01	4.091E-01	9.819E+00	6.511E+02
48.0	84.2	270.0	1.091E+02	270.0	1.091E+02	1.317E-03	5.005E+00	1.437E-01	3.556E-01	9.688E+00	6.608E+02
49.0	84.2	270.0	9.616E+01	270.0	9.616E+01	1.133E-03	5.007E+00	1.090E-01	3.060E-01	9.461E+00	6.703E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
9.9	90.0	237.6	2.026E+04	237.6	2.026E+04	1.402E+00	1.402E+00	3.961E+04	3.330E+02	3.503E+01	3.503E+01
10.0	90.3	235.0	2.026E+04	235.0	2.715E+04	3.315E+00	4.717E+00	9.000E+04	7.790E+02	8.545E+01	1.205E+02
11.0	91.0	229.0	2.443E+04	229.0	2.324E+04	1.579E+00	6.296E+00	3.670E+04	3.616E+02	4.634E+01	1.668E+02
12.0	91.4	222.0	2.103E+04	222.0	1.995E+04	1.084E+00	7.380E+00	2.163E+04	2.407E+02	3.595E+01	2.020E+02
13.0	91.7	216.0	1.802E+04	216.0	1.706E+04	8.045E-01	8.185E+00	1.373E+04	1.736E+02	3.034E+01	2.331E+02
14.0	92.0	216.0	1.538E+04	216.0	1.456E+04	6.069E-01	8.791E+00	8.836E+03	1.311E+02	2.682E+01	2.599E+02
15.0	92.2	216.0	1.313E+04	216.0	1.243E+04	4.691E-01	9.261E+00	5.829E+03	1.013E+02	2.429E+01	2.842E+02
16.0	92.4	216.0	1.121E+04	216.0	1.061E+04	3.685E-01	9.629E+00	3.909E+03	7.960E+01	2.235E+01	3.066E+02
17.0	92.6	216.0	9.572E+03	216.0	9.055E+03	2.930E-01	9.922E+00	2.653E+03	6.328E+01	2.082E+01	3.274E+02
18.0	92.8	216.0	8.172E+03	217.0	7.729E+03	2.348E-01	1.016E+01	1.819E+03	5.072E+01	1.955E+01	3.469E+02
19.0	93.0	217.0	6.977E+03	217.0	6.600E+03	1.889E-01	1.035E+01	1.247E+03	4.090E+01	1.850E+01	3.654E+02
20.0	93.1	218.0	5.961E+03	218.0	5.640E+03	1.529E-01	1.050E+01	8.622E+02	3.332E+01	1.760E+01	3.830E+02
21.0	93.3	219.0	5.097E+03	219.0	4.824E+03	1.244E-01	1.062E+01	6.000E+02	2.724E+01	1.662E+01	3.990E+02
22.0	93.5	220.0	4.361E+03	220.0	4.128E+03	1.016E-01	1.072E+01	4.195E+02	2.236E+01	1.613E+01	4.160E+02
23.0	93.6	222.0	3.734E+03	222.0	3.537E+03	8.310E-02	1.081E+01	2.939E+02	1.845E+01	1.554E+01	4.315E+02
24.0	93.7	223.0	3.202E+03	223.0	3.033E+03	6.849E-02	1.088E+01	2.077E+02	1.527E+01	1.500E+01	4.465E+02
25.0	93.9	224.0	2.748E+03	224.0	2.603E+03	5.666E-02	1.093E+01	1.475E+02	1.269E+01	1.452E+01	4.610E+02
26.0	94.0	224.0	2.359E+03	224.0	2.235E+03	4.718E-02	1.098E+01	1.054E+02	1.057E+01	1.409E+01	4.751E+02
27.0	94.1	224.0	2.025E+03	224.0	1.918E+03	3.936E-02	1.102E+01	7.552E+01	8.810E+00	1.369E+01	4.888E+02
28.0	94.2	224.0	1.739E+03	224.0	1.647E+03	3.290E-02	1.105E+01	5.419E+01	7.369E+00	1.333E+01	5.021E+02
29.0	94.4	224.0	1.493E+03	224.0	1.414E+03	2.740E-02	1.108E+01	3.875E+01	6.137E+00	1.292E+01	5.151E+02
30.0	94.5	234.0	1.283E+03	234.0	1.218E+03	2.214E-02	1.110E+01	2.696E+01	5.182E+00	1.267E+01	5.277E+02
31.0	94.6	234.0	1.108E+03	234.0	1.052E+03	1.870E-02	1.112E+01	1.968E+01	4.377E+00	1.239E+01	5.401E+02
32.0	94.7	234.0	9.579E+02	234.0	9.093E+02	1.582E-02	1.114E+01	1.439E+01	3.702E+00	1.212E+01	5.522E+02
33.0	94.8	234.0	8.270E+02	234.0	7.858E+02	1.339E-02	1.115E+01	1.052E+01	3.134E+00	1.180E+01	5.641E+02
34.0	94.9	234.0	7.153E+02	234.0	6.793E+02	1.129E-02	1.116E+01	7.667E+00	2.641E+00	1.159E+01	5.757E+02
35.0	95.0	245.0	6.187E+02	245.0	5.886E+02	9.213E-03	1.117E+01	5.423E+00	2.257E+00	1.142E+01	5.871E+02
36.0	95.1	245.0	5.381E+02	245.0	5.120E+02	7.871E-03	1.118E+01	4.030E+00	1.928E+00	1.122E+01	5.983E+02
37.0	95.2	245.0	4.681E+02	245.0	4.453E+02	6.731E-03	1.118E+01	2.997E+00	1.649E+00	1.103E+01	6.094E+02
38.0	95.3	245.0	4.072E+02	245.0	3.874E+02	5.759E-03	1.119E+01	2.231E+00	1.411E+00	1.085E+01	6.202E+02
39.0	95.4	245.0	3.542E+02	245.0	3.371E+02	4.902E-03	1.120E+01	1.652E+00	1.201E+00	1.061E+01	6.300E+02

APPARENT Z-ANG 95.50 (DEG)
 BALLOON HEIGHT 40.00 (KM)
 TANGENT HEIGHT 9.91 (KM)
 OPTICAL AIR MASS 22.421

EFFECTIVE PRESSURE 28414.60 (PA)
 EFFECTIVE TEMPERATURE 227.36 (DEG K)
 TANGENT PRESSURE 46192.03 (PA)

APPARENT Z-ANG 95.53 (DEG) EFFECTIVE PRESSURE 20414.68 (PA)
 BALLOON HEIGHT 40.00 (KM) EFFECTIVE TEMPERATURE 227.36 (DEG K)
 TANGENT HEIGHT 9.91 (KM) TANGENT PRESSURE 46192.03 (PA)
 OPTICAL AIR MASS 22.421

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (CM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
9.9	98.0	237.6	2.826E+04	237.6	2.826E+04	1.402E+00	1.402E+00	3.961E+04	3.330E+02	3.503E+01	3.503E+01
10.0	89.7	235.0	2.826E+04	235.0	2.715E+04	3.315E+00	4.717E+00	9.800E+04	7.790E+02	8.545E+01	1.295E+02
11.0	89.8	229.0	2.443E+04	229.0	2.324E+04	1.579E+00	6.296E+00	3.670E+04	3.616E+02	4.634E+01	1.668E+02
12.0	88.6	222.0	2.103E+04	222.0	1.995E+04	1.084E+00	7.380E+00	2.163E+04	2.407E+02	3.595E+01	2.020E+02
13.0	88.3	216.0	1.802E+04	216.0	1.706E+04	8.045E-01	8.185E+00	1.373E+04	1.739E+02	3.034E+01	2.331E+02
14.0	88.0	216.0	1.530E+04	216.0	1.456E+04	6.069E-01	8.791E+00	8.836E+03	1.311E+02	2.682E+01	2.599E+02
15.0	87.8	216.0	1.313E+04	216.0	1.243E+04	4.691E-01	9.261E+00	5.829E+03	1.013E+02	2.429E+01	2.842E+02
16.0	87.6	216.0	1.121E+04	216.0	1.061E+04	3.685E-01	9.629E+00	3.909E+03	7.960E+01	2.235E+01	3.066E+02
17.0	87.4	216.0	9.572E+03	216.0	9.055E+03	2.930E-01	9.922E+00	2.653E+03	6.328E+01	2.082E+01	3.274E+02
18.0	87.2	216.0	8.172E+03	216.0	7.729E+03	2.340E-01	1.016E+01	1.815E+03	5.072E+01	1.955E+01	3.469E+02
19.0	87.0	217.0	6.977E+03	217.0	6.600E+03	1.889E-01	1.035E+01	1.247E+03	4.090E+01	1.850E+01	3.654E+02
20.0	86.9	218.0	5.961E+03	218.0	5.640E+03	1.529E-01	1.050E+01	8.622E+02	3.332E+01	1.760E+01	3.830E+02
21.0	86.7	219.0	5.097E+03	219.0	4.824E+03	1.244E-01	1.062E+01	6.000E+02	2.725E+01	1.682E+01	3.998E+02
22.0	86.5	220.0	4.361E+03	220.0	4.128E+03	1.016E-01	1.072E+01	4.195E+02	2.236E+01	1.613E+01	4.168E+02
23.0	86.4	222.0	3.734E+03	222.0	3.537E+03	8.310E-02	1.081E+01	2.939E+02	1.845E+01	1.554E+01	4.315E+02
24.0	86.3	223.0	3.202E+03	223.0	3.033E+03	6.849E-02	1.088E+01	2.077E+02	1.527E+01	1.500E+01	4.465E+02
25.0	86.1	224.0	2.748E+03	224.0	2.603E+03	5.666E-02	1.093E+01	1.475E+02	1.269E+01	1.452E+01	4.610E+02
26.0	86.0	224.0	2.359E+03	224.0	2.235E+03	4.718E-02	1.098E+01	1.054E+02	1.057E+01	1.409E+01	4.751E+02
27.0	85.9	224.0	2.025E+03	224.0	1.918E+03	3.936E-02	1.102E+01	7.552E+01	8.010E+00	1.369E+01	4.888E+02
28.0	85.8	224.0	1.739E+03	224.0	1.647E+03	3.290E-02	1.105E+01	5.449E+01	7.369E+00	1.333E+01	5.021E+02
29.0	85.6	224.0	1.493E+03	224.0	1.414E+03	2.740E-02	1.108E+01	3.875E+01	6.137E+00	1.292E+01	5.151E+02
30.0	85.5	234.0	1.283E+03	234.0	1.218E+03	2.214E-02	1.110E+01	2.696E+01	5.182E+00	1.267E+01	5.277E+02
31.0	85.4	234.0	1.108E+03	234.0	1.052E+03	1.870E-02	1.112E+01	1.960E+01	4.377E+00	1.239E+01	5.401E+02
32.0	85.3	234.0	9.579E+02	234.0	9.093E+02	1.582E-02	1.114E+01	1.438E+01	3.702E+00	1.212E+01	5.522E+02
33.0	85.2	234.0	8.278E+02	234.0	7.858E+02	1.339E-02	1.115E+01	1.052E+01	3.134E+00	1.188E+01	5.641E+02
34.0	85.1	234.0	7.153E+02	234.0	6.793E+02	1.129E-02	1.116E+01	7.667E+00	2.641E+00	1.158E+01	5.757E+02
35.0	85.0	245.0	6.187E+02	245.0	5.886E+02	9.213E-03	1.117E+01	5.423E+00	2.257E+00	1.142E+01	5.871E+02
36.0	84.9	245.0	5.361E+02	245.0	5.120E+02	7.871E-03	1.118E+01	4.030E+00	1.920E+00	1.122E+01	5.983E+02
37.0	84.8	245.0	4.681E+02	245.0	4.453E+02	6.731E-03	1.118E+01	2.997E+00	1.649E+00	1.103E+01	6.094E+02
38.0	84.7	245.0	4.072E+02	245.0	3.874E+02	5.759E-03	1.119E+01	2.231E+00	1.411E+00	1.085E+01	6.202E+02
39.0	84.6	245.0	3.542E+02	245.0	3.371E+02	4.902E-03	1.120E+01	1.652E+00	1.201E+00	1.061E+01	6.308E+02
40.0	84.5	250.0	3.084E+02	250.0	3.084E+02	4.021E-03	1.120E+01	1.240E+00	1.037E+00	1.000E+01	6.408E+02
41.0	84.4	250.0	2.701E+02	250.0	2.701E+02	3.471E-03	1.120E+01	9.376E-01	8.956E-01	9.857E+00	6.507E+02
42.0	84.3	250.0	2.366E+02	250.0	2.366E+02	2.998E-03	1.121E+01	7.094E-01	7.730E-01	9.720E+00	6.604E+02
43.0	84.2	250.0	2.073E+02	250.0	2.073E+02	2.591E-03	1.121E+01	5.371E-01	6.685E-01	9.590E+00	6.700E+02
44.0	84.1	250.0	1.816E+02	250.0	1.816E+02	2.191E-03	1.121E+01	3.977E-01	5.652E-01	9.254E+00	6.792E+02
45.0	84.1	270.0	1.595E+02	270.0	1.595E+02	1.855E-03	1.121E+01	2.960E-01	5.010E-01	9.337E+00	6.886E+02
46.0	84.0	270.0	1.406E+02	270.0	1.406E+02	1.615E-03	1.121E+01	2.270E-01	4.361E-01	9.224E+00	6.978E+02
47.0	83.9	270.0	1.239E+02	270.0	1.239E+02	1.407E-03	1.122E+01	1.742E-01	3.799E-01	9.117E+00	7.069E+02
48.0	83.8	270.0	1.091E+02	270.0	1.091E+02	1.222E-03	1.122E+01	1.337E-01	3.305E-01	9.014E+00	7.159E+02
49.0	83.7	270.0	9.616E+01	270.0	9.616E+01	1.057E-03	1.122E+01	1.016E-01	2.853E-01	8.820E+00	7.247E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (KM)
44.8	90.0	258.0	1.816E+02	258.0	1.816E+02	1.187E-02	1.187E-02	2.154E+00	3.861E+00	5.013E+01	5.013E+01
44.8	90.0	267.1	1.595E+02	267.1	1.595E+02	1.187E-02	1.187E-02	1.094E+00	3.170E+00	5.909E+01	5.909E+01
45.0	89.5	270.0	1.595E+02	270.0	1.595E+02	1.373E-02	2.560E-02	2.190E+00	3.707E+00	6.909E+01	1.202E+02
46.0	88.9	270.0	1.408E+02	270.0	1.406E+02	7.428E-03	3.303E-02	1.044E+00	2.006E+00	4.242E+01	1.706E+02
47.0	88.5	270.0	1.239E+02	270.0	1.239E+02	5.189E-03	3.822E-02	6.427E-01	1.401E+00	3.363E+01	2.042E+02
48.0	88.2	270.0	1.091E+02	270.0	1.091E+02	3.913E-03	4.213E-02	4.270E-01	1.056E+00	2.878E+01	2.338E+02
49.0	87.9	270.0	9.616E+01	270.0	9.616E+01	3.033E-03	4.516E-02	2.917E-01	8.190E-01	2.532E+01	2.583E+02
50.0	87.7	276.0	8.485E+01	276.0	8.485E+01	2.808E-03	4.757E-02	2.043E-01	6.645E-01	2.328E+01	2.816E+02
51.0	87.5	276.0	7.497E+01	276.0	7.497E+01	1.967E-03	4.954E-02	1.474E-01	5.428E-01	2.152E+01	3.031E+02
52.0	87.3	276.0	6.624E+01	276.0	6.624E+01	1.625E-03	5.116E-02	1.076E-01	4.404E-01	2.012E+01	3.233E+02
53.0	87.1	276.0	5.853E+01	276.0	5.853E+01	1.354E-03	5.252E-02	7.922E-02	3.736E-01	1.898E+01	3.422E+02
54.0	86.9	276.0	5.172E+01	276.0	5.172E+01	1.135E-03	5.365E-02	5.071E-02	3.133E-01	1.801E+01	3.603E+02

APPARENT Z-ANG 90.50 (DEG)
 BALLOON HEIGHT 45.00 (KM)
 TANGENT HEIGHT 44.76 (KM)
 OPTICAL AIR MASS .072
 EFFECTIVE PRESSURE 130.33 (PA)
 EFFECTIVE TEMPERATURE 260.18 (DEG K)
 TANGENT PRESSURE 158.05 (PA)

APPARENT Z-ANG 91.00 (DEG) EFFECTIVE PRESSURE 141.54 (PA)
 BALLOON HEIGHT 45.00 (KM) EFFECTIVE TEMPERATURE 263.85 (DEG K)
 TANGENT HEIGHT 44.02 (KM) TANGENT PRESSURE 173.93 (PA)
 OPTICAL AIR MASS .093

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
44.0	90.0	250.0	1.016E+02	250.0	1.016E+02	2.591E-02	2.591E-02	4.704E+00	6.604E+00	1.095E+02	1.095E+02
44.0	90.0	250.3	1.595E+02	250.3	1.595E+02	2.591E-02	2.591E-02	4.133E+00	6.692E+00	1.247E+02	1.247E+02
45.0	89.0	270.0	1.595E+02	270.0	1.595E+02	9.109E-03	3.510E-02	1.466E+00	2.481E+00	4.624E+01	1.710E+02
46.0	89.6	270.0	1.406E+02	270.0	1.406E+02	6.194E-03	4.129E-02	8.707E-01	1.672E+00	3.537E+01	2.063E+02
47.0	88.3	270.0	1.239E+02	270.0	1.239E+02	4.681E-03	4.509E-02	5.699E-01	1.242E+00	2.982E+01	2.362E+02
48.0	89.0	270.0	1.091E+02	270.0	1.091E+02	3.575E-03	4.947E-02	3.902E-01	9.653E-01	2.630E+01	2.625E+02
49.0	87.7	270.0	9.616E+01	270.0	9.616E+01	2.822E-03	5.229E-02	2.713E-01	7.610E-01	2.355E+01	2.808E+02
50.0	87.5	276.0	8.485E+01	276.0	8.485E+01	2.267E-03	5.456E-02	1.923E-01	6.256E-01	2.192E+01	3.079E+02
51.0	87.3	276.0	7.497E+01	276.0	7.497E+01	1.867E-03	5.643E-02	1.400E-01	5.154E-01	2.044E+01	3.204E+02
52.0	87.1	276.0	6.624E+01	276.0	6.624E+01	1.553E-03	5.790E-02	1.029E-01	4.289E-01	1.923E+01	3.476E+02
53.0	87.0	276.0	5.853E+01	276.0	5.853E+01	1.300E-03	5.928E-02	7.609E-02	3.500E-01	1.823E+01	3.658E+02
54.0	86.8	276.0	5.172E+01	276.0	5.172E+01	1.095E-03	6.037E-02	5.662E-02	3.022E-01	1.737E+01	3.832E+02

APPARENT Z-ANG 91.50 (DEG) EFFECTIVE PRESSURE 172.49 (PA)
 BALLOON HEIGHT 45.00 (KM) EFFECTIVE TEMPERATURE 261.77 (DEG K)
 TANGENT HEIGHT 42.80 (KM) TANGENT PRESSURE 284.89 (PA)
 OPTICAL AIR MASS .123

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
42.8	90.0	258.0	2.073E+02	258.0	2.073E+02	1.439E-02	1.439E-02	2.982E+00	3.712E+00	5.325E+01	5.325E+01
43.0	90.5	258.0	2.073E+02	258.0	2.073E+02	1.949E-02	3.387E-02	4.037E+00	5.025E+00	7.200E+01	1.253E+02
44.0	91.1	258.0	1.816E+02	258.0	1.816E+02	9.942E-03	4.381E-02	1.805E+00	2.565E+00	4.200E+01	1.673E+02
42.8	90.0	258.0	2.073E+02	258.0	2.073E+02	1.439E-02	1.439E-02	2.982E+00	3.712E+00	5.325E+01	5.325E+01
43.0	89.5	258.0	2.073E+02	258.0	2.073E+02	1.949E-02	3.387E-02	4.037E+00	5.025E+00	7.200E+01	1.253E+02
44.0	88.9	258.0	1.816E+02	258.0	1.816E+02	9.942E-03	4.381E-02	1.805E+00	2.565E+00	4.200E+01	1.673E+02
45.0	88.5	270.0	1.595E+02	270.0	1.595E+02	6.716E-03	5.052E-02	1.071E+00	1.813E+00	3.300E+01	2.011E+02
46.0	88.2	270.0	1.406E+02	270.0	1.406E+02	5.052E-03	5.558E-02	7.100E-01	1.364E+00	2.805E+01	2.300E+02
47.0	87.9	270.0	1.239E+02	270.0	1.239E+02	3.952E-03	5.953E-02	4.895E-01	1.067E+00	2.562E+01	2.556E+02
48.0	87.7	270.0	1.091E+02	270.0	1.091E+02	3.166E-03	6.269E-02	3.456E-01	8.550E-01	2.329E+01	2.709E+02
49.0	87.5	270.0	9.616E+01	270.0	9.616E+01	2.550E-03	6.524E-02	2.422E-01	8.866E-01	2.129E+01	3.002E+02
50.0	87.3	276.0	8.485E+01	276.0	8.485E+01	2.079E-03	6.732E-02	1.764E-01	5.737E-01	2.810E+01	3.203E+02
51.0	87.1	276.0	7.497E+01	276.0	7.497E+01	1.731E-03	6.905E-02	1.298E-01	4.778E-01	1.895E+01	3.392E+02
52.0	86.9	276.0	6.624E+01	276.0	6.624E+01	1.451E-03	7.051E-02	9.615E-02	4.006E-01	1.790E+01	3.572E+02
53.0	86.8	276.0	5.853E+01	276.0	5.853E+01	1.224E-03	7.173E-02	7.161E-02	3.377E-01	1.715E+01	3.743E+02
54.0	86.6	276.0	5.172E+01	276.0	5.172E+01	1.036E-03	7.276E-02	5.358E-02	2.859E-01	1.644E+01	3.908E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	APPARENT Z-ANG			EFFECTIVE PRESSURE			DEL (T-DM)			ACCUM		
			HEIGHT (KM)	DEG	(PA)	HEIGHT (KM)	DEG K	TEMP (PA)	DEL (DM)	DEL (DM)	DEL (DM)	DEL (DM)	DEL (DM)	DEL (DM)
41.1	90.0	258.0	92.00	283.12	2.366E+02	3.732E-02	3.732E-02	8.830E+00	9.629E+00	1.210E+02	1.210E+02	1.210E+02	1.210E+02	
42.0	91.0	258.0	45.00	260.41	2.366E+02	1.457E-02	5.109E-02	3.447E+00	3.759E+00	4.723E+01	4.723E+01	1.682E+02	1.682E+02	
43.0	91.4	258.0	257.98		2.073E+02	9.655E-03	6.155E-02	2.001E+00	2.491E+00	3.573E+01	3.573E+01	2.039E+02	2.039E+02	
44.0	91.7	258.0			1.816E+02	6.944E-03	6.849E-02	1.261E+00	1.791E+00	2.934E+01	2.934E+01	2.333E+02	2.333E+02	
45.0	88.0	270.0			1.595E+02	5.237E-03	7.373E-02	8.353E-01	1.414E+00	2.635E+01	2.635E+01	2.596E+02	2.596E+02	
46.0	87.8	270.0			1.406E+02	4.171E-03	7.790E-02	5.862E-01	1.126E+00	2.382E+01	2.382E+01	2.835E+02	2.835E+02	
47.0	87.5	270.0			1.239E+02	3.381E-03	8.120E-02	4.180E-01	9.129E-01	2.191E+01	2.191E+01	3.054E+02	3.054E+02	
48.0	87.3	270.0			1.091E+02	2.776E-03	8.480E-02	3.029E-01	7.494E-01	2.042E+01	2.042E+01	3.258E+02	3.258E+02	
49.0	87.2	270.0			9.616E+01	2.275E-03	8.633E-02	2.188E-01	6.143E-01	1.899E+01	1.899E+01	3.440E+02	3.440E+02	
50.0	87.0	276.0			8.485E+01	1.880E-03	8.821E-02	1.595E-01	5.108E-01	1.818E+01	1.818E+01	3.630E+02	3.630E+02	
51.0	86.8	276.0			7.497E+01	1.582E-03	8.979E-02	1.186E-01	4.367E-01	1.732E+01	1.732E+01	3.803E+02	3.803E+02	
52.0	86.7	276.0			6.624E+01	1.338E-03	9.113E-02	8.864E-02	3.693E-01	1.657E+01	1.657E+01	3.968E+02	3.968E+02	
53.0	86.5	276.0			5.853E+01	1.136E-03	9.226E-02	6.649E-02	3.135E-01	1.593E+01	1.593E+01	4.120E+02	4.120E+02	
54.0	86.4	276.0			5.172E+01	9.677E-04	9.323E-02	5.804E-02	2.671E-01	1.535E+01	1.535E+01	4.281E+02	4.281E+02	

APPARENT Z-ANG 92.50 (DEG) EFFECTIVE PRESSURE 261.56 (PA)
 BALLOON HEIGHT 45.00 (KM) EFFECTIVE TEMPERATURE 253.33 (DEG K)
 TANGENT HEIGHT 38.89 (KM) TANGENT PRESSURE 348.62 (PA)
 OPTICAL AIR MASS .244

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
38.9	90.0	245.0	3.542E+02	245.0	3.542E+02	1.887E-02	1.887E-02	6.605E+00	4.624E+00	3.882E+01	3.882E+01
39.0	90.3	245.0	3.542E+02	245.0	3.408E+02	3.872E-02	5.759E-02	1.319E+01	9.485E+00	8.288E+01	1.217E+02
40.0	91.1	258.0	3.084E+02	258.0	3.044E+02	1.763E-02	7.522E-02	5.437E+00	4.549E+00	4.386E+01	1.656E+02
41.0	91.5	258.0	2.701E+02	258.0	2.701E+02	1.204E-02	8.726E-02	3.252E+00	3.106E+00	3.418E+01	1.997E+02
42.0	91.8	258.0	2.366E+02	258.0	2.366E+02	8.956E-03	9.622E-02	2.119E+00	2.311E+00	2.903E+01	2.288E+02
43.0	92.1	258.0	2.073E+02	258.0	2.073E+02	6.946E-03	1.032E-01	1.440E+00	1.792E+00	2.571E+01	2.545E+02
44.0	92.3	258.0	1.816E+02	258.0	1.816E+02	5.401E-03	1.086E-01	9.805E-01	1.393E+00	2.262E+01	2.773E+02
38.9	90.0	245.0	3.542E+02	245.0	3.542E+02	1.887E-02	1.887E-02	6.605E+00	4.624E+00	3.882E+01	3.882E+01
39.0	89.7	245.0	3.542E+02	245.0	3.408E+02	3.872E-02	5.759E-02	1.319E+01	9.485E+00	8.288E+01	1.217E+02
40.0	88.9	258.0	3.084E+02	258.0	3.044E+02	1.763E-02	7.522E-02	5.437E+00	4.549E+00	4.386E+01	1.656E+02
41.0	88.5	258.0	2.701E+02	258.0	2.701E+02	1.204E-02	8.726E-02	3.252E+00	3.106E+00	3.418E+01	1.997E+02
42.0	88.2	258.0	2.366E+02	258.0	2.366E+02	8.956E-03	9.622E-02	2.119E+00	2.311E+00	2.903E+01	2.288E+02
43.0	87.9	258.0	2.073E+02	258.0	2.073E+02	6.946E-03	1.032E-01	1.440E+00	1.792E+00	2.571E+01	2.545E+02
44.0	87.7	258.0	1.816E+02	258.0	1.816E+02	5.401E-03	1.086E-01	9.805E-01	1.393E+00	2.262E+01	2.773E+02
45.0	87.5	270.0	1.595E+02	270.0	1.595E+02	4.272E-03	1.128E-01	6.815E-01	1.154E+00	2.150E+01	2.988E+02
46.0	87.3	270.0	1.406E+02	270.0	1.406E+02	3.514E-03	1.164E-01	4.940E-01	9.689E-01	2.007E+01	3.189E+02
47.0	87.1	270.0	1.239E+02	270.0	1.239E+02	2.916E-03	1.193E-01	3.612E-01	7.874E-01	1.890E+01	3.378E+02
48.0	86.9	270.0	1.091E+02	270.0	1.091E+02	2.437E-03	1.217E-01	2.659E-01	6.579E-01	1.792E+01	3.557E+02
49.0	86.8	270.0	9.616E+01	270.0	9.616E+01	2.025E-03	1.237E-01	1.948E-01	5.469E-01	1.691E+01	3.726E+02
50.0	86.6	276.0	8.485E+01	276.0	8.485E+01	1.692E-03	1.254E-01	1.436E-01	4.671E-01	1.637E+01	3.890E+02
51.0	86.5	276.0	7.497E+01	276.0	7.497E+01	1.438E-03	1.269E-01	1.078E-01	3.968E-01	1.573E+01	4.047E+02
52.0	86.3	276.0	6.624E+01	276.0	6.624E+01	1.225E-03	1.281E-01	8.116E-02	3.382E-01	1.518E+01	4.199E+02
53.0	86.2	276.0	5.853E+01	276.0	5.853E+01	1.047E-03	1.291E-01	6.128E-02	2.890E-01	1.468E+01	4.346E+02
54.0	86.1	276.0	5.172E+01	276.0	5.172E+01	8.969E-04	1.300E-01	4.639E-02	2.476E-01	1.423E+01	4.488E+02

APPARENT Z-ANG 93.00 (DEG)
 BALLOON HEIGHT 45.00 (KM)
 TANGENT HEIGHT 36.20 (KM)
 OPTICAL AIR MASS .372

EFFECTIVE PRESSURE 396.38 (PA)
 EFFECTIVE TEMPERATURE 249.20 (DEG K)
 TANGENT PRESSURE 518.46 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
36.2	90.0	245.0	5.197E+02	245.0	5.102E+02	7.190E-02	7.190E-02	3.669E+01	1.762E+01	1.027E+02	1.027E+02
37.0	90.9	245.0	4.681E+02	245.0	4.672E+02	3.145E-02	1.034E-01	1.407E+01	7.706E+00	5.131E+01	1.540E+02
38.0	91.4	245.0	4.072E+02	245.0	3.802E+02	2.027E-02	1.236E-01	7.070E+00	4.967E+00	3.009E+01	1.921E+02
39.0	91.7	245.0	3.542E+02	245.0	3.376E+02	1.460E-02	1.382E-01	4.929E+00	3.577E+00	3.156E+01	2.237E+02
40.0	92.0	250.0	3.004E+02	250.0	3.004E+02	1.065E-02	1.489E-01	3.204E+00	2.740E+00	2.649E+01	2.502E+02
41.0	92.2	250.0	2.701E+02	250.0	2.701E+02	8.410E-03	1.573E-01	2.272E+00	2.170E+00	2.300E+01	2.741E+02
42.0	92.4	250.0	2.366E+02	250.0	2.366E+02	6.766E-03	1.641E-01	1.601E+00	1.746E+00	2.193E+01	2.960E+02
43.0	92.6	250.0	2.073E+02	250.0	2.073E+02	5.514E-03	1.696E-01	1.143E+00	1.423E+00	2.041E+01	3.164E+02
44.0	92.8	250.0	1.816E+02	250.0	1.816E+02	4.437E-03	1.740E-01	8.055E-01	1.145E+00	1.074E+01	3.351E+02
36.2	90.0	245.0	5.197E+02	245.0	5.102E+02	7.190E-02	7.190E-02	3.669E+01	1.762E+01	1.027E+02	1.027E+02
37.0	90.1	245.0	4.681E+02	245.0	4.672E+02	3.145E-02	1.034E-01	1.407E+01	7.706E+00	5.131E+01	1.540E+02
38.0	90.6	245.0	4.072E+02	245.0	3.802E+02	2.027E-02	1.236E-01	7.070E+00	4.967E+00	3.009E+01	1.921E+02
39.0	91.3	245.0	3.542E+02	245.0	3.376E+02	1.460E-02	1.382E-01	4.929E+00	3.577E+00	3.156E+01	2.237E+02
40.0	92.0	250.0	3.004E+02	250.0	3.004E+02	1.065E-02	1.489E-01	3.204E+00	2.740E+00	2.649E+01	2.502E+02
41.0	92.8	250.0	2.701E+02	250.0	2.701E+02	8.410E-03	1.573E-01	2.272E+00	2.170E+00	2.300E+01	2.741E+02
42.0	93.6	250.0	2.366E+02	250.0	2.366E+02	6.766E-03	1.641E-01	1.601E+00	1.746E+00	2.193E+01	2.960E+02
43.0	94.4	250.0	2.073E+02	250.0	2.073E+02	5.514E-03	1.696E-01	1.143E+00	1.423E+00	2.041E+01	3.164E+02
44.0	95.7	276.0	5.172E+01	276.0	5.172E+01	8.205E-04	1.929E-01	4.205E-02	2.207E-01	1.315E+01	4.075E+02

607.32 (PA)
240.83 (DEG K)
812.30 (PA)

EFFECTIVE PRESSURE
EFFECTIVE TEMPERATURE
TANGENT PRESSURE

93.50 (DEG)
45.00 (KM)
33.02 (KM)
.614

APPARENT Z-ANG
BALLOON HEIGHT
TANGENT HEIGHT
OPTICAL AIR MASS

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	ACCUM		DEL (T-DM)	DEL (P-DM)	DEL (PATM) (KM)	ACCUM DEL (PATH) (KM)
						DEL (DM)	DEL (DM)				
33.0	90.0	234.0	7.981E+02	234.0	7.864E+02	1.298E-01	1.020E+02	3.036E+01	1.020E+02	1.149E+02	1.149E+02
34.0	91.0	234.0	7.153E+02	234.0	6.818E+02	4.643E-02	1.762E-01	1.086E+01	3.166E+01	4.746E+01	1.623E+02
35.0	91.4	245.0	6.187E+02	245.0	5.898E+02	2.950E-02	2.057E-01	7.227E+00	1.740E+01	3.649E+01	1.988E+02
36.0	91.7	245.0	5.381E+02	245.0	5.127E+02	2.162E-02	2.273E-01	5.297E+00	1.109E+01	3.076E+01	2.296E+02
37.0	92.0	245.0	4.681E+02	245.0	4.458E+02	1.658E-02	2.439E-01	4.061E+00	7.390E+00	2.712E+01	2.567E+02
38.0	92.3	245.0	4.072E+02	245.0	3.877E+02	1.305E-02	2.569E-01	3.197E+00	5.059E+00	2.455E+01	2.812E+02
39.0	92.5	245.0	3.542E+02	245.0	3.373E+02	1.039E-02	2.673E-01	2.545E+00	3.505E+00	2.247E+01	3.037E+02
40.0	92.7	258.0	3.084E+02	258.0	3.084E+02	8.062E-03	2.754E-01	2.486E+00	2.754E+00	2.000E+01	3.238E+02
41.0	92.9	258.0	2.701E+02	258.0	2.701E+02	6.643E-03	2.820E-01	1.714E+00	1.794E+00	1.886E+01	3.426E+02
42.0	93.0	258.0	2.366E+02	258.0	2.366E+02	5.513E-03	2.875E-01	1.422E+00	1.304E+00	1.787E+01	3.685E+02
43.0	93.2	258.0	2.073E+02	258.0	2.073E+02	4.601E-03	2.921E-01	1.107E+00	9.536E-01	1.703E+01	3.775E+02
44.0	93.4	258.0	1.816E+02	258.0	1.816E+02	3.772E-03	2.959E-01	6.848E-01	6.848E-01	1.593E+01	3.935E+02
33.0	90.0	234.0	7.981E+02	234.0	7.864E+02	1.298E-01	1.020E+02	3.036E+01	1.020E+02	1.149E+02	1.149E+02
34.0	89.0	234.0	7.153E+02	234.0	6.818E+02	4.643E-02	1.762E-01	1.086E+01	3.166E+01	4.746E+01	1.623E+02
35.0	88.6	245.0	6.187E+02	245.0	5.898E+02	2.950E-02	2.057E-01	7.227E+00	1.740E+01	3.649E+01	1.988E+02
36.0	88.3	245.0	5.381E+02	245.0	5.127E+02	2.162E-02	2.273E-01	5.297E+00	1.109E+01	3.076E+01	2.296E+02
37.0	88.0	245.0	4.681E+02	245.0	4.458E+02	1.658E-02	2.439E-01	4.061E+00	7.390E+00	2.712E+01	2.567E+02
38.0	87.7	245.0	4.072E+02	245.0	3.877E+02	1.305E-02	2.569E-01	3.197E+00	5.059E+00	2.455E+01	2.812E+02
39.0	87.5	245.0	3.542E+02	245.0	3.373E+02	1.039E-02	2.673E-01	2.545E+00	3.505E+00	2.247E+01	3.037E+02
40.0	87.3	258.0	3.084E+02	258.0	3.084E+02	8.062E-03	2.754E-01	2.486E+00	2.754E+00	2.000E+01	3.238E+02
41.0	87.1	258.0	2.701E+02	258.0	2.701E+02	6.643E-03	2.820E-01	1.714E+00	1.794E+00	1.886E+01	3.426E+02
42.0	87.0	258.0	2.366E+02	258.0	2.366E+02	5.513E-03	2.875E-01	1.422E+00	1.304E+00	1.787E+01	3.685E+02
43.0	86.8	258.0	2.073E+02	258.0	2.073E+02	4.601E-03	2.921E-01	1.107E+00	9.536E-01	1.703E+01	3.775E+02
44.0	86.6	258.0	1.816E+02	258.0	1.816E+02	3.772E-03	2.959E-01	6.848E-01	6.848E-01	1.593E+01	3.935E+02
45.0	86.5	270.0	1.595E+02	270.0	1.595E+02	3.108E-03	2.990E-01	4.950E-01	4.950E-01	1.564E+01	4.091E+02
46.0	86.4	270.0	1.406E+02	270.0	1.406E+02	2.640E-03	3.017E-01	3.711E-01	3.711E-01	1.508E+01	4.242E+02
47.0	86.2	270.0	1.239E+02	270.0	1.239E+02	2.249E-03	3.039E-01	3.072E-01	3.072E-01	1.457E+01	4.388E+02
48.0	86.1	270.0	1.091E+02	270.0	1.091E+02	1.920E-03	3.058E-01	2.095E-01	2.095E-01	1.412E+01	4.529E+02
49.0	86.0	270.0	9.616E+01	270.0	9.616E+01	1.625E-03	3.075E-01	1.563E-01	1.563E-01	1.357E+01	4.664E+02
50.0	85.8	276.0	8.485E+01	276.0	8.485E+01	1.379E-03	3.088E-01	1.170E-01	1.170E-01	1.334E+01	4.790E+02
51.0	85.7	276.0	7.497E+01	276.0	7.497E+01	1.188E-03	3.100E-01	8.985E-02	8.985E-02	1.300E+01	4.928E+02
52.0	85.6	276.0	6.624E+01	276.0	6.624E+01	1.024E-03	3.110E-01	6.786E-02	6.786E-02	1.269E+01	5.055E+02
53.0	85.5	276.0	5.853E+01	276.0	5.853E+01	8.846E-04	3.119E-01	5.178E-02	5.178E-02	1.240E+01	5.179E+02
54.0	85.4	276.0	5.172E+01	276.0	5.172E+01	7.648E-04	3.127E-01	3.955E-02	3.955E-02	1.214E+01	5.308E+02

DATA BY VIS. W/22
 1957-1961
 1962-1964
 1965-1967
 1968-1970
 1971-1973
 1974-1976
 1977-1979
 1980-1982
 1983-1985
 1986-1988
 1989-1991
 1992-1994
 1995-1997
 1998-2000
 2001-2003
 2004-2006
 2007-2009
 2010-2012
 2013-2015
 2016-2018
 2019-2021
 2022-2024

1031.31 (PA)
233.52 (DEG K)
1418.49 (PA)

EFFECTIVE PRESSURE
EFFECTIVE TEMPERATURE
TANGENT PRESSURE

94.00 (DEG)
45.00 (KM)
29.35 (KM)
1.004

APPARENT Z-ANG
BALLOON HEIGHT
TANGENT HEIGHT
OPTICAL AIR MASS

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
29.3	90.0	224.0	1.383E+03	224.0	1.373E+03	1.912E-01	1.912E-01	2.624E+02	4.282E+01	9.276E+01	9.276E+01
30.0	90.0	234.0	1.203E+03	234.0	1.244E+03	9.544E-02	2.066E-01	1.160E+02	2.233E+01	5.435E+01	1.471E+02
31.0	91.3	234.0	1.108E+03	234.0	1.055E+03	5.912E-02	3.437E-01	6.236E+01	1.303E+01	3.905E+01	1.062E+02
32.0	91.6	234.0	9.579E+02	234.0	9.107E+02	4.207E-02	3.078E-01	3.031E+01	9.844E+00	3.219E+01	2.103E+02
33.0	91.9	234.0	8.278E+02	234.0	7.867E+02	3.166E-02	4.194E-01	2.491E+01	7.409E+00	2.804E+01	2.464E+02
34.0	92.2	234.0	7.153E+02	234.0	6.799E+02	2.445E-02	4.439E-01	1.662E+01	5.721E+00	2.506E+01	2.715E+02
35.0	92.4	245.0	6.107E+02	245.0	5.890E+02	1.862E-02	4.625E-01	1.097E+01	4.562E+00	2.306E+01	2.945E+02
36.0	92.6	245.0	5.381E+02	245.0	5.123E+02	1.504E-02	4.775E-01	7.705E+00	3.605E+00	2.142E+01	3.159E+02
37.0	92.8	245.0	4.681E+02	245.0	4.456E+02	1.227E-02	4.098E-01	5.467E+00	3.066E+00	2.009E+01	3.368E+02
38.0	93.0	245.0	4.072E+02	245.0	3.875E+02	1.009E-02	4.999E-01	3.910E+00	2.472E+00	1.899E+01	3.598E+02
39.0	93.1	245.0	3.542E+02	245.0	3.372E+02	8.295E-03	5.082E-01	2.797E+00	2.032E+00	1.795E+01	3.730E+02
40.0	93.3	258.0	3.084E+02	258.0	3.084E+02	6.602E-03	5.148E-01	2.036E+00	1.732E+00	1.642E+01	3.894E+02
41.0	93.5	258.0	2.701E+02	258.0	2.701E+02	5.549E-03	5.204E-01	1.499E+00	1.432E+00	1.576E+01	4.051E+02
42.0	93.6	258.0	2.366E+02	258.0	2.366E+02	4.680E-03	5.238E-01	1.107E+00	1.208E+00	1.517E+01	4.293E+02
43.0	93.7	258.0	2.073E+02	258.0	2.073E+02	3.959E-03	5.290E-01	8.207E-01	1.022E+00	1.465E+01	4.358E+02
44.0	93.9	258.0	1.816E+02	258.0	1.816E+02	3.283E-03	5.323E-01	5.961E-01	8.471E-01	1.307E+01	4.408E+02
29.3	90.0	224.0	1.383E+03	224.0	1.373E+03	1.912E-01	1.912E-01	2.624E+02	4.282E+01	9.276E+01	9.276E+01
30.0	89.2	234.0	1.203E+03	234.0	1.244E+03	9.544E-02	2.066E-01	1.160E+02	2.233E+01	5.435E+01	1.471E+02
31.0	88.7	234.0	1.108E+03	234.0	1.055E+03	5.912E-02	3.437E-01	6.236E+01	1.303E+01	3.905E+01	1.062E+02
32.0	88.4	234.0	9.579E+02	234.0	9.107E+02	4.207E-02	3.078E-01	3.031E+01	9.844E+00	3.219E+01	2.103E+02
33.0	88.1	234.0	8.278E+02	234.0	7.867E+02	3.166E-02	4.194E-01	2.491E+01	7.409E+00	2.804E+01	2.464E+02
34.0	87.8	234.0	7.153E+02	234.0	6.799E+02	2.445E-02	4.439E-01	1.662E+01	5.721E+00	2.506E+01	2.715E+02
35.0	87.6	245.0	6.107E+02	245.0	5.890E+02	1.862E-02	4.625E-01	1.097E+01	4.562E+00	2.306E+01	2.945E+02
36.0	87.4	245.0	5.381E+02	245.0	5.123E+02	1.504E-02	4.775E-01	7.705E+00	3.605E+00	2.142E+01	3.159E+02
37.0	87.2	245.0	4.681E+02	245.0	4.456E+02	1.227E-02	4.098E-01	5.467E+00	3.066E+00	2.009E+01	3.368E+02
38.0	87.0	245.0	4.072E+02	245.0	3.875E+02	1.009E-02	4.999E-01	3.910E+00	2.472E+00	1.899E+01	3.598E+02
39.0	86.9	245.0	3.542E+02	245.0	3.372E+02	8.295E-03	5.082E-01	2.797E+00	2.032E+00	1.795E+01	3.730E+02
40.0	86.7	258.0	3.084E+02	258.0	3.084E+02	6.602E-03	5.148E-01	2.036E+00	1.732E+00	1.642E+01	3.894E+02
41.0	86.5	258.0	2.701E+02	258.0	2.701E+02	5.549E-03	5.204E-01	1.499E+00	1.432E+00	1.576E+01	4.051E+02
42.0	86.4	258.0	2.366E+02	258.0	2.366E+02	4.680E-03	5.238E-01	1.107E+00	1.208E+00	1.517E+01	4.293E+02
43.0	86.3	258.0	2.073E+02	258.0	2.073E+02	3.959E-03	5.290E-01	8.207E-01	1.022E+00	1.465E+01	4.358E+02
44.0	86.1	258.0	1.816E+02	258.0	1.816E+02	3.283E-03	5.323E-01	5.961E-01	8.471E-01	1.307E+01	4.408E+02
45.0	86.0	270.0	1.595E+02	270.0	1.595E+02	2.733E-03	5.350E-01	4.359E-01	7.378E-01	1.375E+01	4.626E+02
46.0	85.9	270.0	1.406E+02	270.0	1.406E+02	2.341E-03	5.374E-01	3.294E-01	6.320E-01	1.337E+01	4.708E+02
47.0	85.8	270.0	1.239E+02	270.0	1.239E+02	2.009E-03	5.394E-01	2.488E-01	5.424E-01	1.302E+01	4.808E+02
48.0	85.6	270.0	1.091E+02	270.0	1.091E+02	1.727E-03	5.411E-01	1.884E-01	4.662E-01	1.270E+01	5.017E+02
49.0	85.5	270.0	9.616E+01	270.0	9.616E+01	1.470E-03	5.426E-01	1.414E-01	3.969E-01	1.227E+01	5.139E+02
50.0	85.4	276.0	8.405E+01	276.0	8.405E+01	1.254E-03	5.439E-01	1.064E-01	3.462E-01	1.213E+01	5.261E+02
51.0	85.3	276.0	7.497E+01	276.0	7.497E+01	1.085E-03	5.449E-01	8.136E-02	2.995E-01	1.188E+01	5.380E+02
52.0	85.2	276.0	6.624E+01	276.0	6.624E+01	9.398E-04	5.458E-01	6.226E-02	2.594E-01	1.164E+01	5.496E+02
53.0	85.1	276.0	5.853E+01	276.0	5.853E+01	8.140E-04	5.467E-01	4.769E-02	2.249E-01	1.142E+01	5.618E+02
54.0	85.0	276.0	5.172E+01	276.0	5.172E+01	7.070E-04	5.474E-01	3.656E-02	1.931E-01	1.122E+01	5.722E+02

APPARENT Z-ANG 94.50 (DEG) EFFECTIVE PRESSURE 1935.25 (PA)
 BALLOON HEIGHT 45.00 (KM) EFFECTIVE TEMPERATURE 227.53 (DEG K)
 TANGENT HEIGHT 25.17 (KM) TANGENT PRESSURE 2764.29 (PA)
 OPTICAL AIR MASS 2.004

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
25.2	98.0	224.0	2.645E+03	224.0	2.595E+03	4.039E-01	4.039E-01	1.040E+03	9.040E+01	1.030E+02	1.030E+02
26.0	98.9	224.0	2.359E+03	224.0	2.244E+03	1.606E-01	5.725E-01	3.703E+02	3.776E+01	5.011E+01	1.539E+02
27.0	91.4	224.0	2.825E+03	224.0	1.923E+03	1.078E-01	6.803E-01	2.072E+02	2.414E+01	3.739E+01	1.913E+02
28.0	91.7	224.0	1.739E+03	224.0	1.649E+03	7.716E-02	7.574E-01	1.273E+02	1.720E+01	3.121E+01	2.225E+02
29.0	92.0	224.0	1.493E+03	224.0	1.416E+03	5.778E-02	8.152E-01	8.102E+01	1.294E+01	2.722E+01	2.497E+02
30.0	92.2	234.0	1.283E+03	234.0	1.219E+03	4.313E-02	8.583E-01	5.256E+01	1.009E+01	2.466E+01	2.743E+02
31.0	92.4	234.0	1.108E+03	234.0	1.053E+03	3.422E-02	8.925E-01	3.604E+01	8.008E+00	2.265E+01	2.970E+02
32.0	92.6	234.0	9.579E+02	234.0	9.098E+02	2.751E-02	9.201E-01	2.503E+01	6.430E+00	2.107E+01	3.181E+02
33.0	92.8	234.0	8.278E+02	234.0	7.861E+02	2.233E-02	9.424E-01	1.755E+01	5.225E+00	1.979E+01	3.379E+02
34.0	93.0	234.0	7.153E+02	234.0	6.795E+02	1.816E-02	9.605E-01	1.234E+01	4.249E+00	1.862E+01	3.569E+02
35.0	93.2	245.0	6.187E+02	245.0	5.888E+02	1.437E-02	9.749E-01	8.461E+00	3.521E+00	1.740E+01	3.743E+02
36.0	93.3	245.0	5.381E+02	245.0	5.121E+02	1.195E-02	9.869E-01	6.121E+00	2.928E+00	1.703E+01	3.913E+02
37.0	93.5	245.0	4.681E+02	245.0	4.455E+02	9.981E-03	9.968E-01	4.446E+00	2.445E+00	1.635E+01	4.077E+02
38.0	93.6	245.0	4.072E+02	245.0	3.875E+02	8.363E-03	1.005E+00	3.241E+00	2.049E+00	1.575E+01	4.234E+02
39.0	93.8	245.0	3.542E+02	245.0	3.371E+02	6.906E-03	1.012E+00	2.355E+00	1.711E+00	1.512E+01	4.385E+02
40.0	93.9	258.0	3.084E+02	258.0	3.084E+02	5.634E-03	1.010E+00	1.737E+00	1.454E+00	1.401E+01	4.525E+02
41.0	94.0	258.0	2.701E+02	258.0	2.701E+02	4.790E-03	1.023E+00	1.294E+00	1.236E+00	1.360E+01	4.661E+02
42.0	94.1	258.0	2.366E+02	258.0	2.366E+02	4.080E-03	1.027E+00	9.653E-01	1.053E+00	1.323E+01	4.794E+02
43.0	94.3	258.0	2.073E+02	258.0	2.073E+02	3.481E-03	1.030E+00	7.215E-01	8.982E-01	1.288E+01	4.922E+02
44.0	94.4	258.0	1.816E+02	258.0	1.816E+02	2.909E-03	1.033E+00	5.201E-01	7.504E-01	1.229E+01	5.045E+02

1935.25 (PA)
227.53 (DEG K)
2764.29 (PA)

EFFECTIVE PRESSURE
EFFECTIVE TEMPERATURE
TANGENT PRESSURE

94.50 (DEG)
45.00 (KM)
25.17 (KM)
2.084

APPARENT Z-ANG
BALLOON HEIGHT
TANGENT HEIGHT
OPTICAL AIR MASS

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DH)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
25.2	90.0	224.0	2.645E+03	224.0	2.595E+03	4.039E-01	4.039E-01	1.840E+03	9.040E+01	1.030E+02	1.030E+02
26.0	89.1	224.0	2.359E+03	224.0	2.244E+03	1.606E-01	5.759E-01	3.783E+02	3.786E+01	5.011E+01	1.539E+02
27.0	88.6	224.0	2.025E+03	224.0	1.923E+03	1.078E-01	6.803E-01	2.072E+02	2.414E+01	3.739E+01	1.913E+02
28.0	88.3	224.0	1.739E+03	224.0	1.649E+03	7.716E-02	7.574E-01	1.273E+02	1.720E+01	3.121E+01	2.225E+02
29.0	88.0	224.0	1.493E+03	224.0	1.416E+03	5.778E-02	8.152E-01	8.162E+01	1.294E+01	2.722E+01	2.497E+02
30.0	87.8	234.0	1.283E+03	234.0	1.219E+03	4.313E-02	8.583E-01	5.256E+01	1.009E+01	2.466E+01	2.743E+02
31.0	87.6	234.0	1.108E+03	234.0	1.053E+03	3.422E-02	8.929E-01	3.604E+01	8.008E+00	2.265E+01	2.970E+02
32.0	87.4	234.0	9.579E+02	234.0	9.098E+02	2.751E-02	9.201E-01	2.503E+01	6.430E+00	2.107E+01	3.181E+02
33.0	87.2	234.0	8.278E+02	234.0	7.861E+02	2.233E-02	9.424E-01	1.755E+01	5.225E+00	1.979E+01	3.379E+02
34.0	87.0	234.0	7.153E+02	234.0	6.795E+02	1.816E-02	9.605E-01	1.234E+01	4.249E+00	1.862E+01	3.565E+02
35.0	86.8	245.0	6.187E+02	245.0	5.888E+02	1.437E-02	9.749E-01	8.461E+00	3.521E+00	1.780E+01	3.743E+02
36.0	86.7	245.0	5.381E+02	245.0	5.121E+02	1.195E-02	9.869E-01	6.121E+00	2.920E+00	1.703E+01	3.913E+02
37.0	86.5	245.0	4.681E+02	245.0	4.455E+02	9.981E-03	9.968E-01	4.446E+00	2.445E+00	1.635E+01	4.077E+02
38.0	86.4	245.0	4.072E+02	245.0	3.875E+02	8.363E-03	1.005E+00	3.241E+00	2.049E+00	1.575E+01	4.234E+02
39.0	86.2	245.0	3.542E+02	245.0	3.371E+02	6.986E-03	1.012E+00	2.355E+00	1.711E+00	1.512E+01	4.385E+02
40.0	86.1	258.0	3.084E+02	258.0	3.044E+02	5.634E-03	1.018E+00	1.737E+00	1.494E+00	1.401E+01	4.525E+02
41.0	86.0	258.0	2.701E+02	258.0	2.701E+02	4.790E-03	1.023E+00	1.294E+00	1.236E+00	1.360E+01	4.661E+02
42.0	85.9	258.0	2.366E+02	258.0	2.366E+02	4.080E-03	1.027E+00	9.653E-01	1.033E+00	1.323E+01	4.794E+02
43.0	85.7	258.0	2.073E+02	258.0	2.073E+02	3.481E-03	1.030E+00	7.215E-01	8.92E-01	1.200E+01	4.922E+02
44.0	85.6	258.0	1.816E+02	258.0	1.816E+02	2.909E-03	1.033E+00	5.281E-01	7.504E-01	1.229E+01	5.045E+02
45.0	85.5	270.0	1.595E+02	270.0	1.595E+02	2.437E-03	1.036E+00	3.888E-01	6.580E-01	1.226E+01	5.160E+02
46.0	85.4	270.0	1.406E+02	270.0	1.406E+02	2.100E-03	1.038E+00	2.952E-01	5.671E-01	1.200E+01	5.280E+02
47.0	85.3	270.0	1.239E+02	270.0	1.239E+02	1.812E-03	1.039E+00	2.245E-01	4.893E-01	1.175E+01	5.405E+02
48.0	85.2	270.0	1.091E+02	270.0	1.091E+02	1.565E-03	1.041E+00	1.708E-01	4.226E-01	1.151E+01	5.521E+02
49.0	85.1	270.0	9.616E+01	270.0	9.616E+01	1.339E-03	1.042E+00	1.287E-01	3.615E-01	1.110E+01	5.632E+02
50.0	85.0	276.0	8.485E+01	276.0	8.485E+01	1.147E-03	1.043E+00	9.731E-02	3.165E-01	1.109E+01	5.743E+02
51.0	84.9	276.0	7.497E+01	276.0	7.497E+01	9.959E-04	1.044E+00	7.467E-02	2.749E-01	1.090E+01	5.852E+02
52.0	84.8	276.0	6.624E+01	276.0	6.624E+01	8.655E-04	1.045E+00	5.734E-02	2.399E-01	1.072E+01	5.959E+02
53.0	84.7	276.0	5.853E+01	276.0	5.853E+01	7.527E-04	1.046E+00	4.406E-02	2.078E-01	1.055E+01	6.065E+02
54.0	84.6	276.0	5.172E+01	276.0	5.172E+01	6.551E-04	1.047E+00	3.388E-02	1.800E-01	1.039E+01	6.169E+02

APPARENT Z-ANG 95.00 (DEG)
 BALLOON HEIGHT 45.00 (KM)
 TANGENT HEIGHT 20.47 (KM)
 OPTICAL AIR MASS 4.383

EFFECTIVE PRESSURE 3996.03 (PA)
 EFFECTIVE TEMPERATURE 221.83 (DEG K)
 TANGENT PRESSURE 6100.63 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
20.5	90.0	210.0	5.512E+03	210.0	5.456E+03	6.955E-01	6.955E-01	3.794E+03	1.516E+02	0.264E+01	0.264E+01
21.0	90.7	219.0	5.097E+03	219.0	4.852E+03	4.209E-01	1.124E+00	2.001E+03	9.394E+01	5.767E+01	1.403E+02
22.0	91.2	220.0	4.361E+03	220.0	4.139E+03	2.520E-01	1.377E+00	1.046E+03	5.562E+01	4.003E+01	1.803E+02
23.0	91.6	222.0	3.734E+03	222.0	3.542E+03	1.749E-01	1.552E+00	6.195E+02	3.883E+01	3.265E+01	2.130E+02
24.0	91.9	223.0	3.202E+03	223.0	3.036E+03	1.293E-01	1.681E+00	3.925E+02	2.893E+01	2.820E+01	2.413E+02
25.0	92.1	224.0	2.740E+03	224.0	2.605E+03	9.809E-02	1.780E+00	2.576E+02	2.215E+01	2.533E+01	2.666E+02
26.0	92.4	224.0	2.359E+03	224.0	2.236E+03	7.756E-02	1.850E+00	1.734E+02	1.737E+01	2.314E+01	2.897E+02
27.0	92.6	224.0	2.025E+03	224.0	1.919E+03	6.171E-02	1.920E+00	1.104E+02	1.362E+01	2.145E+01	3.112E+02
28.0	92.8	224.0	1.739E+03	224.0	1.648E+03	4.961E-02	1.989E+00	8.174E+01	1.111E+01	2.009E+01	3.313E+02
29.0	92.9	224.0	1.493E+03	224.0	1.415E+03	4.000E-02	2.009E+00	5.660E+01	8.960E+00	1.806E+01	3.501E+02
30.0	93.1	234.0	1.263E+03	234.0	1.218E+03	3.145E-02	2.041E+00	3.831E+01	7.368E+00	1.799E+01	3.681E+02
31.0	93.3	234.0	1.108E+03	234.0	1.035E+03	2.595E-02	2.076E+00	2.731E+01	6.072E+00	1.710E+01	3.893E+02
32.0	93.4	234.0	9.579E+02	234.0	9.095E+02	2.150E-02	2.088E+00	1.955E+01	5.030E+00	1.647E+01	4.010E+02
33.0	93.6	234.0	8.270E+02	234.0	7.859E+02	1.787E-02	2.106E+00	1.405E+01	4.102E+00	1.585E+01	4.176E+02
34.0	93.7	234.0	7.153E+02	234.0	6.794E+02	1.463E-02	2.121E+00	1.007E+01	3.469E+00	1.521E+01	4.320E+02
35.0	93.8	245.0	6.187E+02	245.0	5.887E+02	1.193E-02	2.133E+00	7.822E+00	2.922E+00	1.470E+01	4.476E+02
36.0	94.0	245.0	5.381E+02	245.0	5.121E+02	1.006E-02	2.143E+00	5.152E+00	2.465E+00	1.433E+01	4.620E+02
37.0	94.1	245.0	4.681E+02	245.0	4.454E+02	8.504E-03	2.151E+00	3.780E+00	2.003E+00	1.393E+01	4.759E+02
38.0	94.2	245.0	4.072E+02	245.0	3.874E+02	7.200E-03	2.158E+00	2.790E+00	1.764E+00	1.356E+01	4.894E+02
39.0	94.3	245.0	3.542E+02	245.0	3.371E+02	6.069E-03	2.165E+00	2.046E+00	1.607E+00	1.313E+01	5.026E+02
40.0	94.5	250.0	3.004E+02	250.0	3.004E+02	4.935E-03	2.169E+00	1.522E+00	1.273E+00	1.220E+01	5.149E+02
41.0	94.6	250.0	2.701E+02	250.0	2.701E+02	4.226E-03	2.174E+00	1.141E+00	1.090E+00	1.200E+01	5.269E+02
42.0	94.7	250.0	2.366E+02	250.0	2.366E+02	3.623E-03	2.177E+00	8.572E-01	9.347E-01	1.174E+01	5.386E+02
43.0	94.8	250.0	2.073E+02	250.0	2.073E+02	3.109E-03	2.180E+00	6.445E-01	8.922E-01	1.151E+01	5.501E+02
44.0	94.9	250.0	1.816E+02	250.0	1.816E+02	2.612E-03	2.183E+00	4.742E-01	8.730E-01	1.103E+01	5.611E+02

APPARENT Z-ANG 95.00 (DEG)
 BALLOON HEIGHT 45.00 (KM)
 TANGENT HEIGHT 20.47 (KM)
 OPTICAL AIR MASS 4.383
 EFFECTIVE PRESSURE 3996.03 (PA)
 EFFECTIVE TEMPERATURE 221.83 (DEG K)
 TANGENT PRESSURE 6188.63 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM		DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
							DEL (OM)	DEL (OM)				
28.5	90.0	210.0	5.512E+03	210.0	5.456E+03	6.955E-01	6.955E-01	3.794E+03	1.516E+02	8.264E+01	0.264E+01	
21.0	89.3	219.0	5.097E+03	219.0	4.852E+03	4.209E-01	1.124E+00	2.081E+03	9.394E+01	5.767E+01	1.403E+02	
22.0	88.0	220.0	4.361E+03	220.0	4.139E+03	2.528E-01	1.377E+00	1.048E+03	5.562E+01	4.003E+01	1.803E+02	
23.0	80.4	222.0	3.734E+03	222.0	3.542E+03	1.749E-01	1.552E+00	6.195E+02	3.803E+01	3.265E+01	2.130E+02	
24.0	88.1	223.0	3.202E+03	223.0	3.036E+03	1.293E-01	1.681E+00	3.925E+02	2.883E+01	2.828E+01	2.413E+02	
25.0	87.9	224.0	2.740E+03	224.0	2.605E+03	9.089E-02	1.780E+00	2.575E+02	2.215E+02	2.533E+01	2.666E+02	
26.4	87.6	224.0	2.359E+03	224.0	2.236E+03	7.756E-02	1.858E+00	1.739E+02	1.737E+01	2.314E+01	2.897E+02	
27.0	87.4	224.0	2.025E+03	224.0	1.919E+03	6.171E-02	1.920E+00	1.184E+02	1.382E+01	2.145E+01	3.112E+02	
28.0	87.2	224.0	1.739E+03	224.0	1.640E+03	4.961E-02	1.969E+00	8.174E+01	1.111E+01	2.009E+01	3.313E+02	
29.0	87.1	224.0	1.493E+03	224.0	1.415E+03	4.009E-02	2.009E+00	5.660E+01	8.960E+00	1.806E+01	3.501E+02	
30.0	86.9	234.0	1.283E+03	234.0	1.210E+03	3.145E-02	2.041E+00	3.831E+01	7.360E+00	1.799E+01	3.681E+02	
31.0	86.7	234.0	1.108E+03	234.0	1.053E+03	2.595E-02	2.067E+00	2.731E+01	6.072E+00	1.718E+01	3.853E+02	
32.0	86.6	234.0	9.579E+02	234.0	9.095E+02	2.150E-02	2.088E+00	1.995E+01	5.030E+00	1.647E+01	4.010E+02	
33.0	86.4	234.0	8.278E+02	234.0	7.859E+02	1.787E-02	2.106E+00	1.405E+01	4.182E+00	1.585E+01	4.176E+02	
34.0	86.3	234.0	7.153E+02	234.0	6.794E+02	1.483E-02	2.121E+00	1.007E+01	3.469E+00	1.521E+01	4.328E+02	
35.0	86.2	245.0	6.187E+02	245.0	5.887E+02	1.193E-02	2.133E+00	7.022E+00	2.922E+00	1.478E+01	4.476E+02	
36.0	86.0	245.0	5.381E+02	245.0	5.121E+02	1.006E-02	2.143E+00	5.152E+00	2.465E+00	1.433E+01	4.628E+02	
37.0	85.9	245.0	4.681E+02	245.0	4.454E+02	8.504E-03	2.151E+00	3.788E+00	2.063E+00	1.393E+01	4.759E+02	
38.0	85.8	245.0	4.072E+02	245.0	3.874E+02	7.280E-03	2.158E+00	2.790E+00	1.764E+00	1.356E+01	4.894E+02	
39.0	85.7	245.0	3.542E+02	245.0	3.371E+02	6.069E-03	2.165E+00	2.046E+00	1.487E+00	1.313E+01	5.026E+02	
40.0	85.5	258.0	3.084E+02	258.0	3.084E+02	4.935E-03	2.169E+00	1.522E+00	1.273E+00	1.228E+01	5.149E+02	
41.8	85.4	258.0	2.781E+02	258.0	2.701E+02	4.225E-03	2.174E+00	1.141E+00	1.090E+00	1.208E+01	5.269E+02	
42.0	85.3	258.0	2.366E+02	258.0	2.366E+02	3.623E-03	2.177E+00	8.572E-01	9.347E-01	1.174E+01	5.386E+02	
43.0	85.2	258.0	2.073E+02	258.0	2.073E+02	3.109E-03	2.180E+00	6.445E-01	8.022E-01	1.151E+01	5.501E+02	
44.0	85.1	258.0	1.816E+02	258.0	1.816E+02	2.612E-03	2.183E+00	4.742E-01	6.738E-01	1.183E+01	5.611E+02	
45.0	85.0	270.0	1.595E+02	270.0	1.595E+02	2.199E-03	2.185E+00	3.508E-01	5.937E-01	1.107E+01	5.722E+02	
46.0	84.9	270.0	1.406E+02	270.0	1.406E+02	1.903E-03	2.187E+00	2.675E-01	5.139E-01	1.007E+01	5.831E+02	
47.0	84.8	270.0	1.239E+02	270.0	1.239E+02	1.649E-03	2.189E+00	2.042E-01	4.452E-01	1.069E+01	5.938E+02	
48.0	84.7	270.0	1.091E+02	270.0	1.091E+02	1.439E-03	2.190E+00	1.560E-01	3.860E-01	1.052E+01	6.043E+02	
49.0	84.6	270.0	9.616E+01	270.0	9.616E+01	1.227E-03	2.191E+00	1.180E-01	3.313E-01	1.024E+01	6.145E+02	
50.0	84.5	276.0	8.485E+01	276.0	8.485E+01	1.054E-03	2.193E+00	8.947E-02	2.910E-01	1.020E+01	6.247E+02	
51.0	84.4	276.0	7.497E+01	276.0	7.497E+01	9.183E-04	2.193E+00	6.885E-02	2.535E-01	1.005E+01	6.348E+02	
52.0	84.3	276.0	6.624E+01	276.0	6.624E+01	8.003E-04	2.194E+00	5.302E-02	2.209E-01	9.913E+00	6.447E+02	
53.0	84.2	276.0	5.853E+01	276.0	5.853E+01	6.978E-04	2.195E+00	4.084E-02	1.926E-01	9.743E+00	6.545E+02	
54.0	84.2	276.0	5.172E+01	276.0	5.172E+01	6.007E-04	2.196E+00	3.149E-02	1.680E-01	9.658E+00	6.641E+02	

APPARENT Z-ANG 95.50 (DEG) EFFECTIVE PRESSURE 9174.48 (PA)
 BALLOON HEIGHT 45.00 (KM) EFFECTIVE TEMPERATURE 217.72 (DEG K)
 TANGENT HEIGHT 15.19 (KM) TANGENT PRESSURE 17540.99 (PA)
 OPTICAL AIR MASS 10.258

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
15.2	90.0	216.0	1.262E+04	216.0	1.237E+04	1.990E+00	1.990E+00	2.473E+04	4.316E+02	1.030E+02	1.030E+02
16.0	90.9	216.0	1.121E+04	216.0	1.065E+04	8.384E-01	2.837E+00	8.928E+03	1.811E+02	5.066E+01	1.545E+02
17.0	91.3	216.0	9.572E+03	216.0	9.072E+03	5.308E-01	3.367E+00	4.815E+03	1.146E+02	3.765E+01	1.921E+02
18.0	91.7	216.0	8.172E+03	216.0	7.738E+03	3.768E-01	3.744E+00	2.916E+03	6.139E+01	3.133E+01	2.234E+02
19.0	91.9	217.0	6.977E+03	217.0	6.606E+03	2.802E-01	4.025E+00	1.851E+03	6.091E+01	2.742E+01	2.589E+02
20.0	92.2	218.0	5.961E+03	218.0	5.644E+03	2.146E-01	4.239E+00	1.211E+03	4.679E+01	2.469E+01	2.756E+02
21.0	92.4	219.0	5.097E+03	219.0	4.826E+03	1.675E-01	4.407E+00	8.085E+02	3.669E+01	2.265E+01	2.982E+02
22.0	92.6	220.0	4.361E+03	220.0	4.130E+03	1.325E-01	4.539E+00	5.474E+02	2.916E+01	2.103E+01	3.192E+02
23.0	92.8	222.0	3.734E+03	222.0	3.538E+03	1.056E-01	4.645E+00	3.736E+02	2.345E+01	1.974E+01	3.390E+02
24.0	93.0	223.0	3.202E+03	223.0	3.034E+03	8.522E-02	4.730E+00	2.585E+02	1.900E+01	1.866E+01	3.576E+02
25.0	93.1	224.0	2.748E+03	224.0	2.603E+03	6.926E-02	4.799E+00	1.803E+02	1.551E+01	1.775E+01	3.754E+02
26.0	93.3	224.0	2.359E+03	224.0	2.235E+03	5.681E-02	4.856E+00	1.270E+02	1.273E+01	1.696E+01	3.923E+02
27.0	93.4	224.0	2.025E+03	224.0	1.919E+03	4.678E-02	4.903E+00	8.977E+01	1.048E+01	1.627E+01	4.086E+02
28.0	93.6	224.0	1.739E+03	224.0	1.647E+03	3.866E-02	4.942E+00	6.368E+01	8.660E+00	1.566E+01	4.243E+02
29.0	93.7	224.0	1.493E+03	224.0	1.415E+03	3.180E-02	4.973E+00	4.510E+01	7.141E+00	1.503E+01	4.393E+02
30.0	93.9	234.0	1.283E+03	234.0	1.218E+03	2.554E-02	4.999E+00	3.111E+01	5.977E+00	1.462E+01	4.539E+02
31.0	94.0	234.0	1.100E+03	234.0	1.052E+03	2.141E-02	5.020E+00	2.253E+01	5.009E+00	1.410E+01	4.681E+02
32.0	94.1	234.0	9.579E+02	234.0	9.094E+02	1.798E-02	5.038E+00	1.635E+01	4.207E+00	1.378E+01	4.819E+02
33.0	94.2	234.0	8.278E+02	234.0	7.859E+02	1.512E-02	5.053E+00	1.189E+01	3.539E+00	1.341E+01	4.953E+02
34.0	94.4	234.0	7.153E+02	234.0	6.793E+02	1.268E-02	5.066E+00	8.610E+00	2.966E+00	1.300E+01	5.083E+02
35.0	94.5	245.0	6.187E+02	245.0	5.886E+02	1.029E-02	5.076E+00	6.058E+00	2.522E+00	1.275E+01	5.210E+02
36.0	94.6	245.0	5.361E+02	245.0	5.120E+02	8.752E-03	5.085E+00	4.481E+00	2.144E+00	1.247E+01	5.335E+02
37.0	94.7	245.6	4.681E+02	245.0	4.454E+02	7.451E-03	5.093E+00	3.318E+00	1.825E+00	1.220E+01	5.457E+02
38.0	94.8	245.0	4.072E+02	245.0	3.874E+02	6.350E-03	5.099E+00	2.460E+00	1.556E+00	1.196E+01	5.577E+02
39.0	94.9	245.0	3.542E+02	245.0	3.371E+02	5.384E-03	5.104E+00	1.815E+00	1.319E+00	1.165E+01	5.693E+02
40.0	95.0	258.0	3.084E+02	258.0	3.084E+02	4.402E-03	5.109E+00	1.357E+00	1.136E+00	1.095E+01	5.803E+02
41.0	95.1	258.0	2.701E+02	258.0	2.701E+02	3.788E-03	5.113E+00	1.023E+00	9.772E-01	1.076E+01	5.910E+02
42.0	95.2	258.0	2.366E+02	258.0	2.366E+02	3.262E-03	5.116E+00	7.719E-01	8.416E-01	1.057E+01	6.016E+02
43.0	95.3	258.0	2.073E+02	258.0	2.073E+02	2.811E-03	5.119E+00	5.827E-01	7.253E-01	1.040E+01	6.120E+02
44.0	95.4	258.0	1.816E+02	258.0	1.816E+02	2.370E-03	5.121E+00	4.304E-01	6.116E-01	1.001E+01	6.220E+02

APPARENT Z-ANG 95.50 (DEG)
 BALLOON HEIGHT 45.03 (KM)
 TANGENT HEIGHT 15.19 (KM)
 OPTICAL AIR MASS 10.258

EFFECTIVE PRESSURE 9174.48 (PA)
 EFFECTIVE TEMPERATURE 217.72 (DEG K)
 TANGENT PRESSURE 17540.99 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM		DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
							DEL (DM)	DEL (DM)				
15.2	90.0	216.0	1.262E+04	216.0	1.237E+04	1.990E+00	1.990E+00	2.473E+04	4.316E+02	1.030E+02	1.030E+02	
16.0	89.1	216.0	1.121E+04	216.0	1.065E+04	0.304E-01	2.037E+00	0.928E+03	1.011E+02	5.066E+01	1.545E+02	
17.0	88.7	216.0	9.572E+03	216.0	9.072E+03	5.300E-01	3.367E+00	4.015E+03	1.146E+02	3.765E+01	1.921E+02	
18.0	88.3	216.0	8.172E+03	216.0	7.738E+03	3.700E-01	3.744E+00	2.916E+03	8.139E+01	3.133E+01	2.234E+02	
19.0	88.1	217.0	6.977E+03	217.0	6.606E+03	2.802E-01	4.025E+00	3.851E+03	6.801E+01	2.742E+01	2.509E+02	
20.0	87.8	218.0	5.961E+03	218.0	5.644E+03	2.146E-01	4.239E+00	1.211E+03	4.679E+01	2.469E+01	2.756E+02	
21.0	87.6	219.0	5.097E+03	219.0	4.826E+03	1.675E-01	4.407E+00	0.085E+02	3.669E+01	2.265E+01	2.902E+02	
22.0	87.4	220.0	4.361E+03	220.0	4.130E+03	1.325E-01	4.539E+00	5.474E+02	2.916E+01	2.103E+01	3.192E+02	
23.0	87.2	222.0	3.734E+03	222.0	3.536E+03	1.056E-01	4.645E+00	3.736E+02	2.345E+01	1.974E+01	3.390E+02	
24.0	87.0	223.0	3.202E+03	223.0	3.034E+03	8.522E-02	4.730E+00	2.585E+02	1.900E+01	1.866E+01	3.576E+02	
25.0	86.9	224.0	2.748E+03	224.0	2.603E+03	6.926E-02	4.799E+00	1.803E+02	1.551E+01	1.775E+01	3.754E+02	
26.0	86.7	224.0	2.359E+03	224.0	2.235E+03	5.681E-02	4.856E+00	1.270E+02	1.273E+01	1.695E+01	3.923E+02	
27.0	86.6	224.0	2.025E+03	224.0	1.919E+03	4.678E-02	4.903E+00	8.977E+01	1.048E+01	1.627E+01	4.086E+02	
28.0	86.4	224.0	1.739E+03	224.0	1.647E+03	3.866E-02	4.942E+00	6.368E+01	0.660E+00	1.566E+01	4.243E+02	
29.0	86.3	224.0	1.493E+03	224.0	1.415E+03	3.188E-02	4.973E+00	4.510E+01	7.141E+00	1.503E+01	4.393E+02	
30.0	86.1	234.0	1.283E+03	234.0	1.210E+03	2.554E-02	4.999E+00	3.111E+01	5.977E+00	1.462E+01	4.539E+02	
31.0	86.0	234.0	1.108E+03	234.0	1.052E+03	2.141E-02	5.020E+00	2.253E+01	5.009E+00	1.418E+01	4.681E+02	
32.0	85.9	234.0	9.579E+02	234.0	9.094E+02	1.790E-02	5.030E+00	1.635E+01	4.207E+00	1.370E+01	4.819E+02	
33.0	85.8	234.0	8.278E+02	234.0	7.859E+02	1.512E-02	5.053E+00	1.189E+01	3.539E+00	1.341E+01	4.953E+02	
34.0	85.6	234.0	7.153E+02	234.0	6.793E+02	1.268E-02	5.066E+00	8.619E+00	2.966E+00	1.308E+01	5.083E+02	
35.0	85.5	245.0	6.187E+02	245.0	5.886E+02	1.029E-02	5.076E+00	6.058E+00	2.522E+00	1.275E+01	5.210E+02	
36.0	85.4	245.0	5.381E+02	245.0	5.120E+02	8.752E-03	5.085E+00	4.481E+00	2.144E+00	1.247E+01	5.335E+02	
37.0	85.3	245.0	4.601E+02	245.0	4.454E+02	7.451E-03	5.093E+00	3.310E+00	1.825E+00	1.220E+01	5.457E+02	
38.0	85.2	245.0	4.072E+02	245.0	3.874E+02	6.350E-03	5.099E+00	2.468E+00	1.556E+00	1.196E+01	5.577E+02	
39.0	85.1	245.0	3.542E+02	245.0	3.371E+02	5.384E-03	5.104E+00	1.819E+00	1.319E+00	1.165E+01	5.693E+02	
40.0	85.0	258.0	3.084E+02	258.0	3.004E+02	4.402E-03	5.109E+00	1.357E+00	1.136E+00	1.095E+01	5.803E+02	
41.0	84.9	258.0	2.701E+02	258.0	2.701E+02	3.788E-03	5.113E+00	1.023E+00	9.772E-01	1.076E+01	5.910E+02	
42.0	84.8	258.0	2.366E+02	258.0	2.366E+02	3.262E-03	5.116E+00	7.719E-01	8.416E-01	1.057E+01	6.016E+02	
43.0	84.7	258.0	2.073E+02	258.0	2.073E+02	2.811E-03	5.119E+00	5.827E-01	7.253E-01	1.040E+01	6.120E+02	
44.0	84.6	258.0	1.816E+02	258.0	1.816E+02	2.370E-03	5.121E+00	4.394E-01	6.116E-01	1.001E+01	6.220E+02	
45.0	84.5	270.0	1.595E+02	270.0	1.595E+02	2.003E-03	5.123E+00	3.195E-01	5.400E-01	1.000E+01	6.321E+02	
46.0	84.4	270.0	1.406E+02	270.0	1.406E+02	1.740E-03	5.125E+00	2.445E-01	4.697E-01	9.934E+00	6.420E+02	
47.0	84.3	270.0	1.239E+02	270.0	1.239E+02	1.512E-03	5.126E+00	1.872E-01	4.002E-01	9.797E+00	6.510E+02	
48.0	84.2	270.0	1.091E+02	270.0	1.091E+02	1.314E-03	5.128E+00	1.434E-01	3.549E-01	9.667E+00	6.615E+02	
49.0	84.1	270.0	9.616E+01	270.0	9.616E+01	1.131E-03	5.129E+00	1.080E-01	3.054E-01	9.441E+00	6.709E+02	
50.0	84.1	276.0	8.485E+01	276.0	8.485E+01	9.744E-04	5.130E+00	8.260E-02	2.609E-01	9.423E+00	6.804E+02	
51.0	84.0	276.0	7.497E+01	276.0	7.497E+01	8.507E-04	5.131E+00	6.370E-02	2.340E-01	9.311E+00	6.897E+02	
52.0	83.9	276.0	6.624E+01	276.0	6.624E+01	7.430E-04	5.131E+00	4.922E-02	2.051E-01	9.204E+00	6.909E+02	
53.0	83.8	276.0	5.853E+01	276.0	5.853E+01	6.492E-04	5.132E+00	3.800E-02	1.792E-01	9.102E+00	7.000E+02	
54.0	83.7	276.0	5.172E+01	276.0	5.172E+01	5.675E-04	5.133E+00	2.935E-02	1.566E-01	9.004E+00	7.170E+02	

22553.67 (PA)
230.83 (DEG K)
50100.09 (PA)

EFFECTIVE PRESSURE
EFFECTIVE TEMPERATURE
TANGENT PRESSURE

96.00 (DEG)
45.00 (KM)
9.23 (KM)
24.691

APPARENT Z-ANG
BALLOON HEIGHT
TANGENT HEIGHT
OPTICAL AIR MASS

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM		DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
							DEL (DM)	DEL (DM)					
9.2	90.0	242.0	3.143E+04	242.0	3.003E+04	4.415E+00	4.415E+00	1.361E+05	1.060E+03	1.031E+02	1.031E+02	1.031E+02	
10.0	90.9	235.0	2.826E+04	235.0	2.695E+04	2.814E+00	6.420E+00	5.427E+04	4.733E+02	5.230E+01	5.230E+01	1.554E+02	
11.0	91.3	229.0	2.443E+04	229.0	2.321E+04	1.312E+00	7.741E+00	3.047E+04	3.005E+02	3.856E+01	3.856E+01	1.940E+02	
12.0	91.6	222.0	2.103E+04	222.0	1.994E+04	9.630E-01	8.705E+00	1.922E+04	2.140E+02	3.197E+01	3.197E+01	2.259E+02	
13.0	91.9	216.0	1.802E+04	216.0	1.706E+04	7.376E-01	9.442E+00	1.250E+04	1.593E+02	2.702E+01	2.702E+01	2.537E+02	
14.0	92.1	210.0	1.538E+04	210.0	1.456E+04	5.665E-01	1.001E+01	8.247E+03	1.224E+02	2.504E+01	2.504E+01	2.700E+02	
15.0	92.4	216.0	1.313E+04	216.0	1.243E+04	4.431E-01	1.045E+01	5.506E+03	9.571E+01	2.294E+01	2.294E+01	3.017E+02	
16.0	92.6	216.0	1.121E+04	216.0	1.061E+04	3.511E-01	1.000E+01	3.723E+03	7.503E+01	2.130E+01	2.130E+01	3.230E+02	
17.0	92.7	216.0	9.572E+03	216.0	9.054E+03	2.800E-01	1.100E+01	2.943E+03	6.066E+01	1.996E+01	1.996E+01	3.430E+02	
18.0	92.9	216.0	8.172E+03	216.0	7.729E+03	2.262E-01	1.131E+01	1.740E+03	4.806E+01	1.803E+01	1.803E+01	3.610E+02	
19.0	93.1	217.0	6.977E+03	217.0	6.600E+03	1.826E-01	1.149E+01	1.205E+03	3.963E+01	1.709E+01	1.709E+01	3.797E+02	
20.0	93.2	218.0	5.961E+03	218.0	5.640E+03	1.403E-01	1.164E+01	8.364E+02	3.233E+01	1.707E+01	1.707E+01	3.960E+02	
21.0	93.4	219.0	5.057E+03	219.0	4.824E+03	1.240E-01	1.176E+01	5.835E+02	2.649E+01	1.636E+01	1.636E+01	4.131E+02	
22.0	93.5	220.0	4.361E+03	220.0	4.126E+03	9.906E-02	1.106E+01	4.009E+02	2.179E+01	1.572E+01	1.572E+01	4.289E+02	
23.0	93.7	222.0	3.734E+03	222.0	3.536E+03	8.115E-02	1.194E+01	2.870E+02	1.802E+01	1.517E+01	1.517E+01	4.440E+02	
24.0	93.8	223.0	3.202E+03	223.0	3.033E+03	6.700E-02	1.201E+01	2.032E+02	1.494E+01	1.467E+01	1.467E+01	4.587E+02	
25.0	94.0	224.0	2.740E+03	224.0	2.603E+03	5.551E-02	1.206E+01	1.445E+02	1.243E+01	1.423E+01	1.423E+01	4.720E+02	
26.0	94.1	224.0	2.359E+03	224.0	2.235E+03	4.620E-02	1.211E+01	1.034E+02	1.037E+01	1.382E+01	1.382E+01	4.867E+02	
27.0	94.2	224.0	2.025E+03	224.0	1.910E+03	3.865E-02	1.215E+01	7.415E+01	8.650E+00	1.344E+01	1.344E+01	5.002E+02	
28.0	94.3	224.0	1.739E+03	224.0	1.647E+03	3.234E-02	1.210E+01	5.326E+01	7.243E+00	1.310E+01	1.310E+01	5.135E+02	
29.0	94.4	224.0	1.493E+03	224.0	1.414E+03	2.695E-02	1.221E+01	3.812E+01	6.037E+00	1.271E+01	1.271E+01	5.260E+02	
30.0	94.5	234.0	1.283E+03	234.0	1.210E+03	2.180E-02	1.223E+01	2.655E+01	5.102E+00	1.240E+01	1.240E+01	5.305E+02	
31.0	94.7	234.0	1.100E+03	234.0	1.052E+03	1.843E-02	1.225E+01	1.939E+01	4.313E+00	1.220E+01	1.220E+01	5.507E+02	
32.0	94.8	234.0	9.579E+02	234.0	9.093E+02	1.560E-02	1.226E+01	1.410E+01	3.649E+00	1.195E+01	1.195E+01	5.626E+02	
33.0	94.9	234.0	8.278E+02	234.0	7.858E+02	1.321E-02	1.228E+01	1.038E+01	3.091E+00	1.172E+01	1.172E+01	5.744E+02	
34.0	95.0	234.0	7.153E+02	234.0	6.793E+02	1.114E-02	1.229E+01	7.560E+00	2.607E+00	1.143E+01	1.143E+01	5.850E+02	
35.0	95.1	245.0	6.187E+02	245.0	5.886E+02	9.098E-03	1.230E+01	5.355E+00	2.229E+00	1.128E+01	1.128E+01	5.971E+02	
36.0	95.2	245.0	5.301E+02	245.0	5.120E+02	7.777E-03	1.231E+01	3.982E+00	1.905E+00	1.108E+01	1.108E+01	6.081E+02	
37.0	95.3	245.0	4.601E+02	245.0	4.453E+02	6.653E-03	1.231E+01	2.963E+00	1.630E+00	1.090E+01	1.090E+01	6.190E+02	
38.0	95.4	245.0	4.072E+02	245.0	3.874E+02	5.696E-03	1.232E+01	2.206E+00	1.395E+00	1.073E+01	1.073E+01	6.290E+02	
39.0	95.5	245.0	3.542E+02	245.0	3.371E+02	4.849E-03	1.232E+01	1.634E+00	1.100E+00	1.049E+01	1.049E+01	6.403E+02	
40.0	95.6	250.0	3.004E+02	250.0	3.004E+02	3.379E-03	1.233E+01	1.227E+00	1.027E+00	9.890E+00	9.890E+00	6.502E+02	
41.0	95.6	250.0	2.701E+02	250.0	2.701E+02	3.436E-03	1.233E+01	9.202E-01	8.066E-01	9.750E+00	9.750E+00	6.590E+02	
42.0	95.7	250.0	2.366E+02	250.0	2.366E+02	2.969E-03	1.233E+01	7.025E-01	7.660E-01	9.625E+00	9.625E+00	6.695E+02	
43.0	95.8	250.0	2.073E+02	250.0	2.073E+02	2.567E-03	1.234E+01	5.320E-01	6.622E-01	9.499E+00	9.499E+00	6.790E+02	
44.0	95.9	250.0	1.816E+02	250.0	1.816E+02	2.170E-03	1.234E+01	3.941E-01	5.600E-01	9.170E+00	9.170E+00	6.882E+02	

APPARENT Z-ANG 16.00 (DEG)
 BALLOON HEIGHT 45.00 (KM)
 TANGENT HEIGHT 9.23 (KM)
 OPTICAL AIR MASS 24.691

EFFECTIVE PRESSURE 22553.67 (PA)
 EFFECTIVE TEMPERATURE 230.83 (DEG K)
 TANGENT PRESSURE 50188.89 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
9.2	98.8	242.0	3.143E+04	242.0	3.083E+04	4.415E+00	4.415E+00	1.361E+05	1.068E+03	1.031E+02	1.031E+02
10.0	89.1	239.0	2.826E+04	239.0	2.695E+04	2.814E+00	6.420E+00	5.427E+04	4.733E+02	5.230E+01	1.554E+02
11.0	88.7	229.0	2.443E+04	229.0	2.321E+04	1.312E+00	7.741E+00	3.047E+04	3.085E+02	3.856E+01	1.948E+02
12.0	88.4	222.0	2.103E+04	222.0	1.994E+04	9.638E-01	8.705E+00	1.922E+04	2.140E+02	3.197E+01	2.259E+02
13.0	88.1	216.0	1.802E+04	216.0	1.706E+04	7.376E-01	9.442E+00	1.258E+04	1.593E+02	2.782E+01	2.537E+02
14.0	87.9	216.0	1.538E+04	216.0	1.456E+04	5.665E-01	1.001E+01	8.247E+03	1.224E+02	2.504E+01	2.788E+02
15.0	87.6	216.0	1.313E+04	216.0	1.243E+04	4.431E-01	1.045E+01	5.506E+03	9.571E+01	2.294E+01	3.017E+02
16.0	87.4	216.0	1.121E+04	216.0	1.061E+04	3.211E-01	1.080E+01	3.723E+03	7.583E+01	2.130E+01	3.230E+02
17.0	87.3	216.0	9.572E+03	216.0	9.054E+03	2.808E-01	1.108E+01	2.543E+03	6.066E+01	1.996E+01	3.430E+02
18.0	87.1	216.0	8.172E+03	216.0	7.729E+03	2.262E-01	1.131E+01	1.748E+03	4.886E+01	1.883E+01	3.618E+02
19.0	86.9	217.0	6.977E+03	217.0	6.600E+03	1.826E-01	1.149E+01	1.205E+03	3.963E+01	1.789E+01	3.797E+02
20.0	86.8	218.0	5.961E+03	218.0	5.640E+03	1.483E-01	1.164E+01	8.364E+02	3.233E+01	1.707E+01	3.968E+02
21.0	86.6	219.0	5.097E+03	219.0	4.824E+03	1.218E-01	1.176E+01	5.835E+02	2.649E+01	1.636E+01	4.131E+02
22.0	86.5	220.0	4.351E+03	220.0	4.128E+03	9.986E-02	1.186E+01	4.089E+02	2.179E+01	1.572E+01	4.289E+02
23.0	86.3	222.0	3.734E+03	222.0	3.536E+03	8.115E-02	1.194E+01	2.870E+02	1.802E+01	1.517E+01	4.448E+02
24.0	86.2	223.0	3.202E+03	223.0	3.033E+03	6.700E-02	1.201E+01	2.032E+02	1.494E+01	1.467E+01	4.587E+02
25.0	86.0	224.0	2.748E+03	224.0	2.603E+03	5.591E-02	1.206E+01	1.445E+02	1.243E+01	1.423E+01	4.729E+02
26.0	85.9	224.0	2.359E+03	224.0	2.235E+03	4.628E-02	1.211E+01	1.034E+02	1.037E+01	1.382E+01	4.867E+02
27.0	85.8	224.0	2.029E+03	224.0	1.918E+03	3.865E-02	1.215E+01	7.415E+01	8.658E+00	1.344E+01	5.002E+02
28.0	85.7	224.0	1.739E+03	224.0	1.647E+03	3.234E-02	1.218E+01	5.326E+01	6.243E+00	1.310E+01	5.133E+02
29.0	85.6	224.0	1.493E+03	224.0	1.414E+03	2.695E-02	1.221E+01	3.812E+01	4.637E+00	1.271E+01	5.260E+02
30.0	85.5	234.0	1.283E+03	234.0	1.210E+03	2.190E-02	1.223E+01	2.695E+01	3.102E+00	1.248E+01	5.380E+02
31.0	85.3	234.8	1.108E+03	234.0	1.052E+03	1.843E-02	1.225E+01	1.939E+01	2.313E+00	1.220E+01	5.507E+02
32.0	85.2	234.0	9.579E+02	234.0	9.093E+02	1.560E-02	1.226E+01	1.418E+01	1.649E+00	1.195E+01	5.626E+02
33.0	85.1	234.0	8.278E+02	234.0	7.850E+02	1.321E-02	1.228E+01	1.038E+01	1.309E+00	1.172E+01	5.744E+02
34.0	85.0	234.0	7.153E+02	234.0	6.793E+02	1.114E-02	1.229E+01	7.568E+00	1.027E+00	1.143E+01	5.858E+02
35.0	84.9	245.0	6.187E+02	245.0	5.886E+02	9.098E-03	1.230E+01	5.355E+00	8.229E+00	1.128E+01	5.971E+02
36.0	84.8	245.0	5.361E+02	245.0	5.120E+02	7.777E-03	1.231E+01	3.982E+00	6.302E+00	1.108E+01	6.081E+02
37.0	84.7	245.0	4.651E+02	245.0	4.453E+02	6.853E-03	1.231E+01	2.963E+00	4.630E+00	1.090E+01	6.198E+02
38.0	84.6	245.0	4.072E+02	245.0	3.874E+02	5.696E-03	1.232E+01	2.206E+00	3.395E+00	1.073E+01	6.298E+02
39.0	84.5	245.0	3.542E+02	245.0	3.371E+02	4.849E-03	1.232E+01	1.634E+00	2.880E+00	1.049E+01	6.403E+02
40.0	84.4	258.0	3.084E+02	258.0	3.084E+02	3.979E-03	1.233E+01	1.227E+00	2.427E+00	9.998E+00	6.502E+02
41.0	84.4	258.0	2.701E+02	258.0	2.701E+02	3.436E-03	1.233E+01	9.282E-01	2.066E+00	9.758E+00	6.599E+02
42.0	84.3	258.0	2.366E+02	258.0	2.366E+02	2.969E-03	1.233E+01	7.025E-01	1.660E+00	9.625E+00	6.695E+02
43.0	84.2	258.0	2.073E+02	258.0	2.073E+02	2.567E-03	1.234E+01	5.320E-01	1.222E+00	9.499E+00	6.790E+02
44.0	84.1	258.0	1.816E+02	258.0	1.816E+02	2.178E-03	1.234E+01	3.941E-01	8.000E-01	9.170E+00	6.882E+02
45.0	84.0	270.0	1.595E+02	270.0	1.595E+02	1.839E-03	1.234E+01	2.933E-01	6.965E-01	9.254E+00	6.975E+02
46.0	83.9	270.0	1.406E+02	270.0	1.406E+02	1.601E-03	1.234E+01	2.251E-01	6.232E-01	9.144E+00	7.066E+02
47.0	83.8	270.0	1.239E+02	270.0	1.239E+02	1.395E-03	1.234E+01	1.727E-01	5.376E-01	9.040E+00	7.156E+02
48.0	83.8	270.0	1.091E+02	270.0	1.091E+02	1.215E-03	1.234E+01	1.326E-01	4.282E-01	8.940E+00	7.246E+02
49.0	83.7	270.0	9.616E+01	270.0	9.616E+01	1.048E-03	1.235E+01	1.008E-01	3.230E-01	8.749E+00	7.333E+02
50.0	83.6	276.0	8.485E+01	276.0	8.485E+01	9.049E-04	1.235E+01	7.678E-02	2.497E-01	8.675E+00	7.421E+02
51.0	83.5	276.0	7.497E+01	276.0	7.497E+01	7.915E-04	1.235E+01	5.934E-02	2.105E-01	8.663E+00	7.507E+02
52.0	83.4	276.0	6.624E+01	276.0	6.624E+01	6.826E-04	1.235E+01	4.588E-02	1.911E-01	8.579E+00	7.593E+02
53.0	83.4	276.0	5.853E+01	276.0	5.853E+01	6.062E-04	1.235E+01	3.548E-02	1.673E-01	8.498E+00	7.678E+02
54.0	83.3	276.0	5.172E+01	276.0	5.172E+01	5.307E-04	1.235E+01	2.795E-02	1.465E-01	8.421E+00	7.762E+02

APPARENT Z-ANG 90.50 (DEG)
 BALLOON HEIGHT 50.00 (KM)
 TANGENT HEIGHT 49.76 (KM)
 OPTICAL AIR MASS .038
 EFFECTIVE PRESSURE 69.03 (PA)
 EFFECTIVE TEMPERATURE 273.49 (DEG K)
 TANGENT PRESSURE 83.31 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
49.0	90.0	270.0	9.616E+01	270.0	9.616E+01	6.194E-03	6.194E-03	5.957E-01	1.673E+00	5.171E+01	5.171E+01
49.0	90.0	274.5	8.405E+01	274.5	8.405E+01	6.196E-03	6.196E-03	5.257E-01	1.701E+00	5.960E+01	5.960E+01
50.0	89.5	276.0	8.405E+01	276.0	8.405E+01	7.210E-03	1.341E-02	6.110E-01	1.990E+00	6.972E+01	1.293E+02
51.0	88.9	276.0	7.497E+01	276.0	7.497E+01	3.913E-03	1.732E-02	2.934E-01	1.080E+00	4.203E+01	1.721E+02
52.0	88.5	276.0	6.624E+01	276.0	6.624E+01	2.742E-03	2.006E-02	1.816E-01	7.567E-01	3.396E+01	2.061E+02
53.0	88.2	276.0	5.853E+01	276.0	5.853E+01	2.073E-03	2.213E-02	1.214E-01	5.722E-01	2.907E+01	2.352E+02
54.0	87.9	276.0	5.172E+01	276.0	5.172E+01	1.629E-03	2.376E-02	8.426E-02	4.497E-01	2.585E+01	2.610E+02
55.0	87.7	276.0	4.570E+01	276.0	4.570E+01	1.310E-03	2.507E-02	5.988E-02	3.617E-01	2.353E+01	2.846E+02
56.0	87.5	276.0	4.038E+01	276.0	4.038E+01	1.071E-03	2.614E-02	4.322E-02	2.955E-01	2.176E+01	3.063E+02
57.0	87.3	276.0	3.567E+01	276.0	3.567E+01	8.845E-04	2.703E-02	3.155E-02	2.441E-01	2.034E+01	3.267E+02
58.0	87.1	276.0	3.152E+01	276.0	3.152E+01	7.371E-04	2.777E-02	2.323E-02	2.034E-01	1.919E+01	3.450E+02
59.0	86.9	276.0	2.785E+01	276.0	2.785E+01	6.103E-04	2.830E-02	1.722E-02	1.707E-01	1.822E+01	3.641E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
49.0	90.0	270.0	9.616E+01	270.0	9.616E+01	1.332E-02	1.332E-02	1.281E+00	3.597E+00	1.112E+02	1.112E+02
50.0	89.0	276.0	8.405E+01	270.1	8.405E+01	1.332E-02	1.332E-02	1.130E+00	3.599E+00	1.261E+02	1.261E+02
51.0	88.6	276.0	7.497E+01	276.0	8.405E+01	4.826E-03	1.815E-02	4.095E-01	1.332E+00	4.667E+01	1.728E+02
52.0	88.3	276.0	6.624E+01	276.0	7.497E+01	3.263E-03	2.141E-02	2.446E-01	9.805E-01	3.571E+01	2.885E+02
53.0	88.0	276.0	5.853E+01	276.0	6.624E+01	2.431E-03	2.384E-02	1.610E-01	6.709E-01	3.011E+01	2.386E+02
54.0	87.7	276.0	5.172E+01	276.0	5.853E+01	1.894E-03	2.574E-02	1.109E-01	5.228E-01	2.656E+01	2.651E+02
55.0	87.5	276.0	4.570E+01	276.0	5.172E+01	1.516E-03	2.725E-02	7.838E-02	4.183E-01	2.405E+01	2.892E+02
56.0	87.3	276.0	4.038E+01	276.0	4.570E+01	1.234E-03	2.848E-02	5.637E-02	3.405E-01	2.215E+01	3.113E+02
57.0	87.1	276.0	3.567E+01	276.0	4.038E+01	1.016E-03	2.950E-02	4.104E-02	2.806E-01	2.066E+01	3.320E+02
58.0	87.0	276.0	3.152E+01	276.0	3.567E+01	8.453E-04	3.035E-02	3.016E-02	2.333E-01	1.944E+01	3.514E+02
59.0	86.8	276.0	2.785E+01	276.0	3.152E+01	7.079E-04	3.185E-02	2.232E-02	1.954E-01	1.043E+01	3.699E+02
						5.963E-04	3.165E-02	1.661E-02	1.646E-01	1.757E+01	3.874E+02

APPARENT Z-ANG 91.00 (DEG) EFFECTIVE PRESSURE 74.80 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 271.74 (DEG K)
 TANGENT HEIGHT 49.82 (KM) TANGENT PRESSURE 91.44 (PA)
 OPTICAL AIR MASS .049

APPARENT Z-ANG 91.50 (DEG) EFFECTIVE PRESSURE 90.47 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 271.03 (DEG K)
 TANGENT HEIGHT 47.80 (KM) TANGENT PRESSURE 106.95 (PA)
 OPTICAL AIR MASS .063

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(DM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
47.8	90.0	270.0	1.091E+02	270.0	1.091E+02	7.293E-03	7.293E-03	7.959E-01	1.969E+00	5.364E+01	5.364E+01
48.0	90.5	270.0	1.091E+02	270.0	1.091E+02	9.866E-03	1.716E-02	1.077E+00	2.664E+00	7.257E+01	1.262E+02
49.0	91.1	270.0	9.616E+01	270.0	9.616E+01	5.129E-03	2.229E-02	4.932E-01	1.385E+00	4.281E+01	1.690E+02
47.8	90.0	270.0	1.091E+02	270.0	1.091E+02	7.293E-03	7.293E-03	7.959E-01	1.969E+00	5.364E+01	5.364E+01
48.0	89.5	270.0	1.091E+02	270.0	1.091E+02	9.866E-03	1.716E-02	1.077E+00	2.664E+00	7.257E+01	1.262E+02
49.0	88.9	270.0	9.616E+01	270.0	9.616E+01	5.129E-03	2.229E-02	4.932E-01	1.385E+00	4.281E+01	1.690E+02
50.0	88.5	276.0	8.485E+01	276.0	8.485E+01	3.527E-03	2.581E-02	2.993E-01	9.734E-01	3.411E+01	2.831E+02
51.0	88.2	276.0	7.497E+01	276.0	7.497E+01	2.661E-03	2.848E-02	1.995E-01	7.344E-01	2.912E+01	2.323E+02
52.0	87.9	276.0	6.624E+01	276.0	6.624E+01	2.088E-03	3.056E-02	1.383E-01	5.763E-01	2.586E+01	2.581E+02
53.0	87.7	276.0	5.853E+01	276.0	5.853E+01	1.678E-03	3.224E-02	9.820E-02	4.630E-01	2.352E+01	2.816E+02
54.0	87.5	276.0	5.172E+01	276.0	5.172E+01	1.370E-03	3.361E-02	7.084E-02	3.780E-01	2.173E+01	3.034E+02
55.0	87.3	276.0	4.570E+01	276.0	4.570E+01	1.131E-03	3.474E-02	5.169E-02	3.122E-01	2.031E+01	3.237E+02
56.0	87.1	276.0	4.038E+01	276.0	4.038E+01	9.422E-04	3.568E-02	3.804E-02	2.601E-01	1.915E+01	3.428E+02
57.0	86.9	276.0	3.567E+01	276.0	3.567E+01	7.982E-04	3.647E-02	2.819E-02	2.181E-01	1.817E+01	3.618E+02
58.0	86.8	276.0	3.152E+01	276.0	3.152E+01	6.662E-04	3.714E-02	2.100E-02	1.839E-01	1.734E+01	3.783E+02
59.0	86.6	276.0	2.785E+01	276.0	2.785E+01	5.642E-04	3.770E-02	1.571E-02	1.557E-01	1.662E+01	3.958E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
46.1	90.0	270.0	1.239E+02	270.0	1.239E+02	1.872E-02	1.872E-02	2.318E+00	5.054E+00	1.213E+02	1.213E+02
47.0	91.0	270.0	1.239E+02	270.0	1.239E+02	7.341E-03	2.606E-02	9.092E-01	1.982E+00	4.758E+01	1.689E+02
48.0	91.4	270.0	1.091E+02	270.0	1.091E+02	4.896E-03	3.095E-02	5.343E-01	1.322E+00	3.601E+01	2.049E+02
49.0	88.3	270.0	9.616E+01	270.0	9.616E+01	3.584E-03	3.454E-02	3.446E-01	9.676E-01	2.991E+01	2.348E+02
50.0	88.0	276.0	8.485E+01	276.0	8.485E+01	2.750E-03	3.729E-02	2.333E-01	7.590E-01	2.659E+01	2.614E+02
51.0	87.8	276.0	7.497E+01	276.0	7.497E+01	2.197E-03	3.948E-02	1.647E-01	6.063E-01	2.404E+01	2.854E+02
52.0	87.5	276.0	6.624E+01	276.0	6.624E+01	1.786E-03	4.127E-02	1.183E-01	4.930E-01	2.212E+01	3.076E+02
53.0	87.3	276.0	5.853E+01	276.0	5.853E+01	1.471E-03	4.274E-02	8.608E-02	4.059E-01	2.062E+01	3.282E+02
54.0	87.2	276.0	5.172E+01	276.0	5.172E+01	1.222E-03	4.396E-02	6.320E-02	3.373E-01	1.939E+01	3.476E+02
55.0	87.0	276.0	4.570E+01	276.0	4.570E+01	1.023E-03	4.499E-02	4.674E-02	2.823E-01	1.837E+01	3.659E+02
56.0	86.8	276.0	4.038E+01	276.0	4.038E+01	8.612E-04	4.589E-02	3.477E-02	2.377E-01	1.750E+01	3.835E+02
57.0	86.7	276.0	3.567E+01	276.0	3.567E+01	7.284E-04	4.658E-02	2.599E-02	2.011E-01	1.676E+01	4.002E+02
58.0	86.5	276.0	3.152E+01	276.0	3.152E+01	6.186E-04	4.719E-02	1.950E-02	1.707E-01	1.618E+01	4.163E+02
59.0	86.4	276.0	2.785E+01	276.0	2.785E+01	5.270E-04	4.772E-02	1.468E-02	1.455E-01	1.553E+01	4.318E+02

APPARENT Z-ANG 92.00 (DEG)
 BALLOON HEIGHT 50.00 (KM)
 TANGENT HEIGHT 46.09 (KM)
 OPTICAL AIR MASS .086

EFFECTIVE PRESSURE
 EFFECTIVE TEMPERATURE
 TANGENT PRESSURE

105.95 (PA)
 270.61 (DEG K)
 133.32 (PA)

APPARENT Z-ANG 92.50 (DEG) EFFECTIVE PRESSURE 146.28 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 264.83 (DEG K)
 TANGENT HEIGHT 43.89 (KM) TANGENT PRESSURE 177.16 (PA)
 OPTICAL AIR MASS .122

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(OM)	ACCUM DEL(OM)	DEL(P-OM)	DEL(T-OM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
43.9	90.0	258.0	1.816E+02	258.0	1.816E+02	9.347E-03	9.347E-03	1.697E+00	2.412E+00	3.949E+01	3.949E+01
44.0	90.3	258.0	1.816E+02	258.0	1.816E+02	1.869E-02	2.803E-02	3.393E+00	4.021E+00	7.895E+01	1.184E+02
45.0	91.1	270.0	1.595E+02	270.0	1.595E+02	8.776E-03	3.681E-02	1.400E+00	2.370E+00	4.416E+01	1.626E+02
46.0	91.5	270.0	1.406E+02	270.0	1.406E+02	6.830E-03	4.284E-02	8.476E-01	1.628E+00	3.444E+01	1.970E+02
47.0	91.8	270.0	1.239E+02	270.0	1.239E+02	4.514E-03	4.735E-02	5.591E-01	1.219E+00	2.926E+01	2.263E+02
48.0	92.1	270.0	1.091E+02	270.0	1.091E+02	3.523E-03	5.089E-02	3.845E-01	9.511E-01	2.591E+01	2.522E+02
49.0	92.3	270.0	9.616E+01	270.0	9.616E+01	2.788E-03	5.367E-02	2.681E-01	7.527E-01	2.327E+01	2.755E+02
43.9	90.0	258.0	1.816E+02	258.0	1.816E+02	9.347E-03	9.347E-03	1.697E+00	2.412E+00	3.949E+01	3.949E+01
44.0	89.7	258.0	1.816E+02	258.0	1.816E+02	1.869E-02	2.803E-02	3.393E+00	4.021E+00	7.895E+01	1.184E+02
45.0	88.9	270.0	1.595E+02	270.0	1.595E+02	8.776E-03	3.681E-02	1.400E+00	2.370E+00	4.416E+01	1.626E+02
46.0	88.5	270.0	1.406E+02	270.0	1.406E+02	6.830E-03	4.284E-02	8.476E-01	1.628E+00	3.444E+01	1.970E+02
47.0	88.2	270.0	1.239E+02	270.0	1.239E+02	4.514E-03	4.735E-02	5.591E-01	1.219E+00	2.926E+01	2.263E+02
48.0	87.9	270.0	1.091E+02	270.0	1.091E+02	3.523E-03	5.089E-02	3.845E-01	9.511E-01	2.591E+01	2.522E+02
49.0	87.7	270.0	9.616E+01	270.0	9.616E+01	2.788E-03	5.367E-02	2.681E-01	7.527E-01	2.327E+01	2.755E+02
50.0	87.5	276.0	8.485E+01	276.0	8.485E+01	2.244E-03	5.591E-02	1.904E-01	6.193E-01	2.170E+01	2.972E+02
51.0	87.3	276.0	7.497E+01	276.0	7.497E+01	1.851E-03	5.776E-02	1.388E-01	5.109E-01	2.026E+01	3.174E+02
52.0	87.1	276.0	6.624E+01	276.0	6.624E+01	1.541E-03	5.938E-02	1.021E-01	4.282E-01	1.908E+01	3.365E+02
53.0	86.9	276.0	5.853E+01	276.0	5.853E+01	1.291E-03	6.059E-02	7.556E-02	3.543E-01	1.810E+01	3.546E+02
54.0	86.8	276.0	5.172E+01	276.0	5.172E+01	1.088E-03	6.168E-02	5.626E-02	3.033E-01	1.726E+01	3.719E+02
55.0	86.6	276.0	4.570E+01	276.0	4.570E+01	9.209E-04	6.260E-02	4.208E-02	2.542E-01	1.654E+01	3.884E+02
56.0	86.5	276.0	4.038E+01	276.0	4.038E+01	7.824E-04	6.338E-02	3.159E-02	2.168E-01	1.590E+01	4.043E+02
57.0	86.3	276.0	3.567E+01	276.0	3.567E+01	6.670E-04	6.405E-02	2.379E-02	1.841E-01	1.534E+01	4.197E+02
58.0	86.2	276.0	3.152E+01	276.0	3.152E+01	5.701E-04	6.462E-02	1.797E-02	1.573E-01	1.484E+01	4.345E+02
59.0	86.1	276.0	2.785E+01	276.0	2.785E+01	4.885E-04	6.511E-02	1.360E-02	1.348E-01	1.439E+01	4.489E+02

APPARENT Z-ANG 93.00 (DEG)
 BALLOON HEIGHT 50.00 (KM)
 TANGENT HEIGHT 41.20 (KM)
 OPTICAL AIR MASS .103

EFFECTIVE PRESSURE
 EFFECTIVE TEMPERATURE
 TANGENT PRESSURE

195.30 (PA)
 261.41 (DEG K)
 254.45 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM		DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
							DEL (DM)	DEL (DM)			
41.2	90.0	258.0	2.366E+02	258.0	2.366E+02	3.466E-02	3.466E-02	8.201E+00	0.942E+00	1.124E+02	1.124E+02
42.0	90.9	258.0	2.366E+02	258.0	2.366E+02	1.522E-02	4.988E-02	3.602E+00	3.920E+00	4.935E+01	1.617E+02
43.0	91.4	258.0	2.073E+02	258.0	2.073E+02	9.889E-03	5.977E-02	2.050E+00	2.551E+00	3.660E+01	1.903E+02
44.0	91.7	258.0	1.816E+02	258.0	1.816E+02	7.060E-03	6.603E-02	1.202E+00	1.821E+00	2.903E+01	2.201E+02
45.0	92.0	270.0	1.595E+02	270.0	1.595E+02	5.304E-03	7.214E-02	8.460E-01	1.432E+00	2.669E+01	2.548E+02
46.0	92.2	270.0	1.406E+02	270.0	1.406E+02	4.214E-03	7.635E-02	5.923E-01	1.130E+00	2.406E+01	2.709E+02
47.0	92.4	270.0	1.239E+02	270.0	1.239E+02	3.411E-03	7.976E-02	4.224E-01	9.209E-01	2.210E+01	3.010E+02
48.0	92.6	270.0	1.091E+02	270.0	1.091E+02	2.797E-03	8.256E-02	3.052E-01	7.551E-01	2.057E+01	3.216E+02
49.0	92.8	270.0	9.616E+01	270.0	9.616E+01	2.290E-03	8.465E-02	2.202E-01	6.184E-01	1.912E+01	3.407E+02
41.2	90.0	258.0	2.366E+02	258.0	2.366E+02	3.466E-02	3.466E-02	8.201E+00	0.942E+00	1.124E+02	1.124E+02
42.0	89.1	258.0	2.366E+02	258.0	2.366E+02	1.522E-02	4.988E-02	3.602E+00	3.920E+00	4.935E+01	1.617E+02
43.0	88.6	258.0	2.073E+02	258.0	2.073E+02	9.889E-03	5.977E-02	2.050E+00	2.551E+00	3.660E+01	1.903E+02
44.0	88.3	258.0	1.816E+02	258.0	1.816E+02	7.060E-03	6.603E-02	1.202E+00	1.821E+00	2.903E+01	2.201E+02
45.0	88.0	270.0	1.595E+02	270.0	1.595E+02	5.304E-03	7.214E-02	8.460E-01	1.432E+00	2.669E+01	2.548E+02
46.0	87.8	270.0	1.406E+02	270.0	1.406E+02	4.214E-03	7.635E-02	5.923E-01	1.130E+00	2.406E+01	2.709E+02
47.0	87.6	270.0	1.239E+02	270.0	1.239E+02	3.411E-03	7.976E-02	4.224E-01	9.209E-01	2.210E+01	3.010E+02
48.0	87.4	270.0	1.091E+02	270.0	1.091E+02	2.797E-03	8.256E-02	3.052E-01	7.551E-01	2.057E+01	3.216E+02
49.0	87.2	270.0	9.616E+01	270.0	9.616E+01	2.290E-03	8.465E-02	2.202E-01	6.184E-01	1.912E+01	3.407E+02
50.0	87.0	276.0	8.485E+01	276.0	8.485E+01	1.894E-03	8.674E-02	1.684E-01	5.219E-01	1.829E+01	3.590E+02
51.0	86.8	276.0	7.497E+01	276.0	7.497E+01	1.594E-03	8.833E-02	1.193E-01	4.390E-01	1.741E+01	3.764E+02
52.0	86.7	276.0	6.624E+01	276.0	6.624E+01	1.345E-03	8.967E-02	8.907E-02	3.711E-01	1.666E+01	3.930E+02
53.0	86.5	276.0	5.853E+01	276.0	5.853E+01	1.141E-03	9.802E-02	6.679E-02	3.149E-01	1.600E+01	4.090E+02
54.0	86.4	276.0	5.172E+01	276.0	5.172E+01	9.716E-04	9.179E-02	5.025E-02	2.662E-01	1.542E+01	4.244E+02
55.0	86.2	276.0	4.570E+01	276.0	4.570E+01	8.290E-04	9.262E-02	3.792E-02	2.290E-01	1.490E+01	4.393E+02
56.0	86.1	276.0	4.030E+01	276.0	4.030E+01	7.104E-04	9.333E-02	2.860E-02	1.961E-01	1.444E+01	4.530E+02
57.0	86.0	276.0	3.567E+01	276.0	3.567E+01	6.095E-04	9.394E-02	2.174E-02	1.682E-01	1.402E+01	4.678E+02
58.0	85.9	276.0	3.152E+01	276.0	3.152E+01	5.239E-04	9.446E-02	1.652E-02	1.446E-01	1.364E+01	4.814E+02
59.0	85.7	276.0	2.785E+01	276.0	2.785E+01	4.512E-04	9.491E-02	1.257E-02	1.245E-01	1.329E+01	4.947E+02

APPARENT Z-ANG 93.50 (DEG) EFFECTIVE PRESSURE 303.06 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 252.39 (DEG K)
 TANGENT HEIGHT 38.02 (KM) TANGENT PRESSURE 394.08 (PA)
 OPTICAL AIR MASS .296

APPARENT Z-ANG 93.50 (DEG) EFFECTIVE PRESSURE 303.06 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 252.39 (DEG K)
 TANGENT HEIGHT 38.02 (KM) TANGENT PRESSURE 394.08 (PA)
 OPTICAL AIR MASS .296

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
38.0	90.0	245.0	3.932E+02	245.0	3.677E+02	6.150E-02	6.150E-02	2.384E+01	1.507E+01	1.156E+02	1.156E+02
39.0	91.0	245.0	3.542E+02	245.0	3.383E+02	2.213E-02	8.363E-02	7.486E+00	5.422E+00	4.772E+01	1.633E+02
40.0	91.4	258.0	3.084E+02	258.0	3.084E+02	1.408E-02	9.771E-02	4.343E+00	3.634E+00	3.504E+01	1.984E+02
41.0	91.7	258.0	2.701E+02	258.0	2.701E+02	1.040E-02	1.081E-01	2.809E+00	2.603E+00	2.953E+01	2.279E+02
42.0	92.0	258.0	2.366E+02	258.0	2.366E+02	8.031E-03	1.161E-01	1.900E+00	2.072E+00	2.603E+01	2.539E+02
43.0	92.3	258.0	2.073E+02	258.0	2.073E+02	6.368E-03	1.225E-01	1.320E+00	1.643E+00	2.357E+01	2.775E+02
44.0	92.5	258.0	1.816E+02	258.0	1.816E+02	5.023E-03	1.275E-01	9.120E-01	1.296E+00	2.122E+01	2.987E+02
45.0	92.7	270.0	1.595E+02	270.0	1.595E+02	4.016E-03	1.316E-01	6.406E-01	1.084E+00	2.021E+01	3.189E+02
46.0	92.9	270.0	1.406E+02	270.0	1.406E+02	3.329E-03	1.349E-01	4.679E-01	8.988E-01	1.901E+01	3.379E+02
47.0	93.0	270.0	1.239E+02	270.0	1.239E+02	2.779E-03	1.377E-01	3.442E-01	7.504E-01	1.801E+01	3.559E+02
48.0	93.2	270.0	1.091E+02	270.0	1.091E+02	2.333E-03	1.400E-01	2.547E-01	6.300E-01	1.716E+01	3.731E+02
49.0	93.4	270.0	9.616E+01	270.0	9.616E+01	1.947E-03	1.419E-01	1.872E-01	5.257E-01	1.625E+01	3.894E+02
38.0	90.0	245.0	3.932E+02	245.0	3.677E+02	6.150E-02	6.150E-02	2.384E+01	1.507E+01	1.156E+02	1.156E+02
39.0	89.0	245.0	3.542E+02	245.0	3.383E+02	2.213E-02	8.363E-02	7.486E+00	5.422E+00	4.772E+01	1.633E+02
40.0	88.6	258.0	3.084E+02	258.0	3.084E+02	1.408E-02	9.771E-02	4.343E+00	3.634E+00	3.504E+01	1.984E+02
41.0	88.3	258.0	2.701E+02	258.0	2.701E+02	1.040E-02	1.081E-01	2.809E+00	2.603E+00	2.953E+01	2.279E+02
42.0	88.0	258.0	2.366E+02	258.0	2.366E+02	8.031E-03	1.161E-01	1.900E+00	2.072E+00	2.603E+01	2.539E+02
43.0	87.7	258.0	2.073E+02	258.0	2.073E+02	6.368E-03	1.225E-01	1.320E+00	1.643E+00	2.357E+01	2.775E+02
44.0	87.5	258.0	1.816E+02	258.0	1.816E+02	5.023E-03	1.275E-01	9.120E-01	1.296E+00	2.122E+01	2.987E+02
45.0	87.3	270.0	1.595E+02	270.0	1.595E+02	4.016E-03	1.316E-01	6.406E-01	1.084E+00	2.021E+01	3.189E+02
46.0	87.1	270.0	1.406E+02	270.0	1.406E+02	3.329E-03	1.349E-01	4.679E-01	8.988E-01	1.901E+01	3.379E+02
47.0	87.0	270.0	1.239E+02	270.0	1.239E+02	2.779E-03	1.377E-01	3.442E-01	7.504E-01	1.801E+01	3.559E+02
48.0	86.8	270.0	1.091E+02	270.0	1.091E+02	2.333E-03	1.400E-01	2.547E-01	6.300E-01	1.716E+01	3.731E+02
49.0	86.6	270.0	9.616E+01	270.0	9.616E+01	1.947E-03	1.419E-01	1.872E-01	5.257E-01	1.625E+01	3.894E+02
50.0	86.5	276.0	8.485E+01	276.0	8.485E+01	1.632E-03	1.436E-01	1.385E-01	4.505E-01	1.570E+01	4.051E+02
51.0	86.4	276.0	7.497E+01	276.0	7.497E+01	1.390E-03	1.450E-01	1.042E-01	3.838E-01	1.522E+01	4.284E+02
52.0	86.2	276.0	6.624E+01	276.0	6.624E+01	1.188E-03	1.461E-01	7.869E-02	3.278E-01	1.471E+01	4.351E+02
53.0	86.1	276.0	5.853E+01	276.0	5.853E+01	1.017E-03	1.472E-01	5.954E-02	2.808E-01	1.426E+01	4.493E+02
54.0	86.0	276.0	5.172E+01	276.0	5.172E+01	8.730E-04	1.480E-01	4.515E-02	2.409E-01	1.385E+01	4.632E+02
55.0	85.8	276.0	4.570E+01	276.0	4.570E+01	7.505E-04	1.488E-01	3.430E-02	2.072E-01	1.348E+01	4.767E+02
56.0	85.7	276.0	4.038E+01	276.0	4.038E+01	6.464E-04	1.494E-01	2.610E-02	1.784E-01	1.314E+01	4.890E+02
57.0	85.6	276.0	3.567E+01	276.0	3.567E+01	5.576E-04	1.500E-01	1.989E-02	1.539E-01	1.283E+01	5.026E+02
58.0	85.5	276.0	3.152E+01	276.0	3.152E+01	4.816E-04	1.505E-01	1.518E-02	1.329E-01	1.254E+01	5.152E+02
59.0	85.4	276.0	2.785E+01	276.0	2.785E+01	4.165E-04	1.509E-01	1.160E-02	1.150E-01	1.227E+01	5.274E+02

APPARENT Z-ANG 94.00 (DEG)
 BALLOON HEIGHT 50.00 (KM)
 TANGENT HEIGHT 34.35 (KM)
 OPTICAL AIR MASS .510

EFFECTIVE PRESSURE
 EFFECTIVE TEMPERATURE
 TANGENT PRESSURE

497.41 (PA)
 244.54 (DEG K)
 667.77 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DH)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
34.4	98.0	234.0	6.650E+02	234.0	6.601E+02	0.812E-02	0.812E-02	5.817E+01	2.062E+01	9.209E+01	9.209E+01
35.0	98.8	245.0	6.187E+02	245.0	5.914E+02	4.437E-02	1.325E-01	2.624E+01	1.807E+01	5.473E+01	1.476E+02
36.0	91.3	245.0	5.381E+02	245.0	5.32E+02	2.765E-02	1.601E-01	1.419E+01	6.775E+00	3.931E+01	1.869E+02
37.0	91.6	245.0	4.681E+02	245.0	4.60E+02	1.981E-02	1.808E-01	8.836E+00	4.853E+00	3.240E+01	2.193E+02
38.0	91.9	245.0	4.072E+02	245.0	3.878E+02	1.501E-02	1.950E-01	5.821E+00	3.677E+00	2.823E+01	2.476E+02
39.0	92.2	245.0	3.542E+02	245.0	3.374E+02	1.166E-02	2.866E-01	3.933E+00	2.857E+00	2.521E+01	2.720E+02
40.0	92.4	258.0	3.084E+02	258.0	3.004E+02	8.894E-03	2.155E-01	2.743E+00	2.295E+00	2.212E+01	2.949E+02
41.0	92.6	258.0	2.701E+02	258.0	2.701E+02	7.236E-03	2.27E-01	1.954E+00	1.867E+00	2.055E+01	3.154E+02
42.0	92.8	258.0	2.366E+02	258.0	2.366E+02	5.946E-03	2.287E-01	1.407E+00	1.534E+00	1.920E+01	3.347E+02
43.0	93.0	258.0	2.073E+02	258.0	2.073E+02	4.924E-03	2.336E-01	1.021E+00	1.270E+00	1.822E+01	3.529E+02
44.0	93.1	258.0	1.816E+02	258.0	1.816E+02	4.011E-03	2.376E-01	7.203E-01	1.035E+00	1.695E+01	3.699E+02
45.0	93.3	270.0	1.595E+02	270.0	1.595E+02	3.288E-03	2.409E-01	5.245E-01	8.878E-01	1.655E+01	3.864E+02
46.0	93.5	270.0	1.406E+02	270.0	1.406E+02	2.701E-03	2.437E-01	3.980E-01	7.500E-01	1.580E+01	4.024E+02
47.0	93.6	270.0	1.239E+02	270.0	1.239E+02	2.360E-03	2.461E-01	2.922E-01	6.371E-01	1.529E+01	4.176E+02
48.0	93.7	270.0	1.091E+02	270.0	1.091E+02	2.008E-03	2.481E-01	2.192E-01	5.422E-01	1.477E+01	4.324E+02
49.0	93.9	270.0	9.616E+01	270.0	9.616E+01	1.695E-03	2.498E-01	1.630E-01	4.577E-01	1.415E+01	4.465E+02

34.4	98.0	234.0	6.650E+02	234.0	6.601E+02	0.812E-02	0.812E-02	5.817E+01	2.062E+01	9.209E+01	9.209E+01
35.0	89.2	245.0	6.187E+02	245.0	5.914E+02	4.437E-02	1.325E-01	2.624E+01	1.807E+01	5.473E+01	1.476E+02
36.0	88.7	245.0	5.381E+02	245.0	5.132E+02	2.765E-02	1.601E-01	1.419E+01	6.775E+00	3.931E+01	1.869E+02
37.0	88.4	245.0	4.681E+02	245.0	4.460E+02	1.981E-02	1.808E-01	8.836E+00	4.853E+00	3.240E+01	2.193E+02
38.0	88.1	245.0	4.072E+02	245.0	3.878E+02	1.501E-02	1.950E-01	5.821E+00	3.677E+00	2.823E+01	2.476E+02
39.0	87.8	245.0	3.542E+02	245.0	3.374E+02	1.166E-02	2.866E-01	3.933E+00	2.857E+00	2.521E+01	2.720E+02
40.0	87.6	258.0	3.084E+02	258.0	3.004E+02	8.894E-03	2.155E-01	2.743E+00	2.295E+00	2.212E+01	2.949E+02
41.0	87.4	258.0	2.701E+02	258.0	2.701E+02	7.236E-03	2.27E-01	1.954E+00	1.867E+00	2.055E+01	3.154E+02
42.0	87.2	258.0	2.366E+02	258.0	2.366E+02	5.946E-03	2.287E-01	1.407E+00	1.534E+00	1.920E+01	3.347E+02
43.0	87.8	258.0	2.073E+02	258.0	2.073E+02	4.924E-03	2.336E-01	1.021E+00	1.270E+00	1.822E+01	3.529E+02
44.0	86.9	258.0	1.816E+02	258.0	1.816E+02	4.011E-03	2.376E-01	7.203E-01	1.035E+00	1.695E+01	3.699E+02
45.0	86.7	270.0	1.595E+02	270.0	1.595E+02	3.288E-03	2.409E-01	5.245E-01	8.878E-01	1.655E+01	3.864E+02
46.0	86.5	270.0	1.406E+02	270.0	1.406E+02	2.701E-03	2.437E-01	3.980E-01	7.500E-01	1.580E+01	4.024E+02
47.0	86.4	270.0	1.239E+02	270.0	1.239E+02	2.360E-03	2.461E-01	2.922E-01	6.371E-01	1.529E+01	4.176E+02
48.0	86.3	270.0	1.091E+02	270.0	1.091E+02	2.008E-03	2.481E-01	2.192E-01	5.422E-01	1.477E+01	4.324E+02
49.0	86.1	270.0	9.616E+01	270.0	9.616E+01	1.695E-03	2.498E-01	1.630E-01	4.577E-01	1.415E+01	4.465E+02
50.0	85.9	276.0	8.485E+01	276.0	8.485E+01	1.435E-03	2.512E-01	1.218E-01	3.603E-01	1.388E+01	4.684E+02
51.0	85.8	276.0	7.497E+01	276.0	7.497E+01	1.233E-03	2.524E-01	9.243E-02	3.403E-01	1.349E+01	4.739E+02
52.0	85.8	276.0	6.624E+01	276.0	6.624E+01	1.061E-03	2.535E-01	7.029E-02	2.929E-01	1.314E+01	4.878E+02
53.0	85.6	276.0	5.853E+01	276.0	5.853E+01	9.147E-04	2.544E-01	5.354E-02	2.525E-01	1.282E+01	4.999E+02
54.0	85.5	276.0	5.172E+01	276.0	5.172E+01	7.896E-04	2.552E-01	4.884E-02	2.179E-01	1.253E+01	5.124E+02
55.0	85.4	276.0	4.570E+01	276.0	4.570E+01	6.825E-04	2.559E-01	3.119E-02	1.844E-01	1.226E+01	5.246E+02
56.0	85.3	276.0	4.030E+01	276.0	4.030E+01	5.906E-04	2.565E-01	2.304E-02	1.630E-01	1.200E+01	5.367E+02
57.0	85.2	276.0	3.567E+01	276.0	3.567E+01	5.116E-04	2.570E-01	1.825E-02	1.412E-01	1.177E+01	5.484E+02
58.0	85.1	276.0	3.152E+01	276.0	3.152E+01	4.436E-04	2.574E-01	1.398E-02	1.224E-01	1.155E+01	5.600E+02
59.0	85.0	276.0	2.785E+01	276.0	2.785E+01	3.850E-04	2.578E-01	1.072E-02	1.063E-01	1.134E+01	5.713E+02

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL(DM)	ACCUM DEL(OM)	DEL(P-DM)	DEL(T-DM)	DEL(PATH) (KM)	ACCUM DEL(PATH) (KM)
30.2	90.0	234.0	1.237E+03	234.0	1.214E+03	1.794E-01	1.794E-01	2.178E+02	4.199E+01	1.029E+02	1.029E+02
31.0	90.9	234.0	1.108E+03	234.0	1.057E+03	7.680E-02	2.563E-01	8.116E+01	1.797E+01	5.064E+01	1.536E+02
32.0	91.4	234.0	9.579E+02	234.0	9.114E+02	4.928E-02	3.055E-01	4.491E+01	1.153E+01	3.768E+01	1.913E+02
33.0	91.7	234.0	8.278E+02	234.0	7.870E+02	3.549E-02	3.410E-01	2.793E+01	8.306E+00	3.143E+01	2.227E+02
34.0	92.0	234.0	7.153E+02	234.0	6.810E+02	2.674E-02	3.678E-01	1.818E+01	6.257E+00	2.740E+01	2.501E+02
35.0	92.2	245.0	6.187E+02	245.0	5.891E+02	2.004E-02	3.878E-01	1.181E+01	4.911E+00	2.482E+01	2.749E+02
36.0	92.4	245.0	5.381E+02	245.0	5.123E+02	1.601E-02	4.030E-01	8.203E+00	3.923E+00	2.280E+01	2.977E+02
37.0	92.6	245.0	4.681E+02	245.0	4.456E+02	1.296E-02	4.168E-01	5.773E+00	3.174E+00	2.121E+01	3.189E+02
38.0	92.8	245.0	4.072E+02	245.0	3.876E+02	1.059E-02	4.274E-01	4.103E+00	2.594E+00	1.993E+01	3.389E+02
39.0	93.0	245.0	3.542E+02	245.0	3.372E+02	8.661E-03	4.360E-01	2.921E+00	2.122E+00	1.874E+01	3.576E+02
40.0	93.2	258.0	3.084E+02	258.0	3.084E+02	6.865E-03	4.429E-01	2.117E+00	1.771E+00	1.708E+01	3.747E+02
41.0	93.3	258.0	2.711E+02	258.0	2.701E+02	5.751E-03	4.486E-01	1.553E+00	1.484E+00	1.633E+01	3.910E+02
42.0	93.5	258.0	2.366E+02	258.0	2.366E+02	4.837E-03	4.535E-01	1.145E+00	1.248E+00	1.568E+01	4.067E+02
43.0	93.6	258.0	2.073E+02	258.0	2.073E+02	4.002E-03	4.576E-01	8.461E-01	1.053E+00	1.511E+01	4.218E+02
44.0	93.8	258.0	1.816E+02	258.0	1.816E+02	3.378E-03	4.609E-01	6.133E-01	8.715E-01	1.427E+01	4.361E+02
45.0	93.9	270.0	1.595E+02	270.0	1.595E+02	2.806E-03	4.637E-01	4.476E-01	7.577E-01	1.412E+01	4.502E+02
46.0	94.0	270.0	1.406E+02	270.0	1.406E+02	2.400E-03	4.661E-01	3.374E-01	6.480E-01	1.371E+01	4.639E+02
47.0	94.1	270.0	1.239E+02	270.0	1.239E+02	2.057E-03	4.682E-01	2.547E-01	5.553E-01	1.333E+01	4.772E+02
48.0	94.3	270.0	1.091E+02	270.0	1.091E+02	1.766E-03	4.700E-01	1.927E-01	4.767E-01	1.299E+01	4.902E+02
49.0	94.4	270.0	9.616E+01	270.0	9.616E+01	1.502E-03	4.715E-01	1.444E-01	4.054E-01	1.254E+01	5.027E+02

EFFECTIVE PRESSURE 984.11 (PA)
EFFECTIVE TEMPERATURE 238.02 (DEG K)
TANGENT PRESSURE 1246.15 (PA)

APPARENT Z-ANG 94.50 (DEG)
BALLOON HEIGHT 50.00 (KM)
TANGENT HEIGHT 30.19 (KM)
OPTICAL AIR MASS .953

APPARENT Z-ANG 94.50 (DEG) EFFECTIVE PRESSURE 904.11 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 238.02 (DEG K)
 TANGENT HEIGHT 30.19 (KM) TANGENT PRESSURE 1246.15 (PA)
 OPTICAL AIR MASS .953

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
30.2	90.0	234.0	1.237E+03	234.0	1.214E+03	1.794E-01	1.794E-01	2.170E+02	4.199E+01	1.029E+02	1.029E+02
31.0	89.1	234.0	1.109E+03	234.0	1.057E+03	7.600E-02	2.563E-01	8.116E+01	1.797E+01	5.064E+01	1.536E+02
32.0	88.6	234.0	9.579E+02	234.0	9.114E+02	4.328E-02	3.055E-01	4.491E+01	1.153E+01	3.760E+01	1.913E+02
33.0	88.3	234.0	8.278E+02	234.0	7.870E+02	3.549E-02	3.410E-01	2.793E+01	8.306E+00	3.143E+01	2.227E+02
34.0	88.0	234.0	7.153E+02	234.0	6.800E+02	2.674E-02	3.678E-01	1.818E+01	6.257E+00	2.740E+01	2.581E+02
35.0	87.8	245.0	6.187E+02	245.0	5.891E+02	2.004E-02	3.878E-01	1.101E+01	4.911E+00	2.482E+01	2.749E+02
36.0	87.6	245.0	5.381E+02	245.0	5.123E+02	1.601E-02	4.038E-01	8.203E+00	3.923E+00	2.200E+01	2.977E+02
37.0	87.4	245.0	4.681E+02	245.0	4.456E+02	1.296E-02	4.168E-01	5.773E+00	3.174E+00	2.121E+01	3.189E+02
38.0	87.2	245.0	4.072E+02	245.0	3.876E+02	1.059E-02	4.274E-01	4.103E+00	2.594E+00	1.993E+01	3.389E+02
39.0	87.0	245.0	3.562E+02	245.0	3.372E+02	8.661E-03	4.360E-01	2.921E+00	2.122E+00	1.874E+01	3.576E+02
40.0	86.8	258.0	3.084E+02	258.0	3.084E+02	6.865E-03	4.429E-01	2.117E+00	1.771E+00	1.700E+01	3.747E+02
41.0	86.7	258.0	2.701E+02	258.0	2.701E+02	5.751E-03	4.486E-01	1.553E+00	1.484E+00	1.633E+01	3.910E+02
42.0	86.5	258.0	2.366E+02	258.0	2.366E+02	4.837E-03	4.535E-01	1.145E+00	1.248E+00	1.568E+01	4.067E+02
43.0	86.4	258.0	2.073E+02	258.0	2.073E+02	4.082E-03	4.576E-01	8.461E-01	1.053E+00	1.511E+01	4.218E+02
44.0	86.2	258.0	1.816E+02	258.0	1.816E+02	3.378E-03	4.609E-01	6.133E-01	8.771E-01	1.427E+01	4.361E+02
45.0	86.1	270.0	1.595E+02	270.0	1.595E+02	2.806E-03	4.637E-01	4.476E-01	7.577E-01	1.412E+01	4.502E+02
46.0	86.0	270.0	1.406E+02	270.0	1.406E+02	2.400E-03	4.661E-01	3.374E-01	6.480E-01	1.371E+01	4.639E+02
47.0	85.9	270.0	1.239E+02	270.0	1.239E+02	2.057E-03	4.682E-01	2.547E-01	5.553E-01	1.333E+01	4.772E+02
48.0	85.7	270.0	1.091E+02	270.0	1.091E+02	1.766E-03	4.700E-01	1.927E-01	4.767E-01	1.299E+01	4.902E+02
49.0	85.6	270.0	9.616E+01	270.0	9.616E+01	1.502E-03	4.715E-01	1.444E-01	4.054E-01	1.254E+01	5.027E+02
50.0	85.5	276.0	8.485E+01	276.0	8.485E+01	1.280E-03	4.728E-01	1.086E-01	3.532E-01	1.230E+01	5.151E+02
51.0	85.4	276.0	7.497E+01	276.0	7.497E+01	1.106E-03	4.739E-01	8.294E-02	3.053E-01	1.211E+01	5.272E+02
52.0	85.3	276.0	6.624E+01	276.0	6.624E+01	9.573E-04	4.748E-01	6.341E-02	2.642E-01	1.186E+01	5.391E+02
53.0	85.2	276.0	5.853E+01	276.0	5.853E+01	8.293E-04	4.756E-01	4.854E-02	2.289E-01	1.163E+01	5.507E+02
54.0	85.1	276.0	5.172E+01	276.0	5.172E+01	7.190E-04	4.764E-01	3.719E-02	1.985E-01	1.141E+01	5.621E+02
55.0	85.0	276.0	4.570E+01	276.0	4.570E+01	6.240E-04	4.770E-01	2.851E-02	1.722E-01	1.121E+01	5.733E+02
56.0	84.9	276.0	4.038E+01	276.0	4.038E+01	5.420E-04	4.775E-01	2.180E-02	1.496E-01	1.102E+01	5.843E+02
57.0	84.8	276.0	3.567E+01	276.0	3.567E+01	4.711E-04	4.780E-01	1.681E-02	1.300E-01	1.084E+01	5.952E+02
58.0	84.7	276.0	3.152E+01	276.0	3.152E+01	4.098E-04	4.784E-01	1.292E-02	1.131E-01	1.067E+01	6.058E+02
59.0	84.6	276.0	2.785E+01	276.0	2.785E+01	3.567E-04	4.788E-01	9.935E-03	9.045E-02	1.051E+01	6.164E+02

APPARENT Z-ANG 95.00 (DEG) EFFECTIVE PRESSURE 1015.00 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 227.99 (DEG K)
 TANGENT HEIGHT 25.52 (KM) TANGENT PRESSURE 2620.92 (PA)
 OPTICAL AIR MASS 1.985

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
25.5	90.0	224.0	2.451E+03	224.0	2.451E+03	2.964E-01	2.964E-01	7.263E+02	6.639E+01	0.054E+01	0.054E+01
26.0	90.7	224.0	2.359E+03	224.0	2.248E+03	2.002E-01	4.966E-01	4.501E+02	4.484E+01	5.940E+01	1.399E+02
27.0	91.2	224.0	2.025E+03	224.0	1.924E+03	1.172E-01	6.137E-01	2.254E+02	2.625E+01	4.064E+01	1.086E+02
28.0	91.6	224.0	1.739E+03	224.0	1.650E+03	8.162E-02	6.954E-01	1.347E+02	1.828E+01	3.308E+01	2.138E+02
29.0	91.9	224.0	1.493E+03	224.0	1.416E+03	6.028E-02	7.556E-01	8.537E+01	1.359E+01	2.840E+01	2.420E+02
30.0	92.1	234.0	1.283E+03	234.0	1.219E+03	4.462E-02	8.003E-01	5.430E+01	1.044E+01	2.551E+01	2.675E+02
31.0	92.4	234.0	1.108E+03	234.0	1.053E+03	3.521E-02	8.359E-01	3.707E+01	8.239E+00	2.390E+01	2.900E+02
32.0	92.6	234.0	9.579E+02	234.0	9.090E+02	2.819E-02	8.537E-01	2.565E+01	6.598E+00	2.159E+01	3.124E+02
33.0	92.8	234.0	8.278E+02	234.0	7.862E+02	2.281E-02	8.665E-01	1.793E+01	5.375E+00	2.022E+01	3.326E+02
34.0	92.9	234.0	7.153E+02	234.0	6.795E+02	1.851E-02	9.050E-01	1.250E+01	4.331E+00	1.890E+01	3.516E+02
35.0	93.1	245.0	6.187E+02	245.0	5.888E+02	1.462E-02	9.196E-01	8.607E+00	3.581E+00	1.811E+01	3.697E+02
36.0	93.3	245.0	5.381E+02	245.0	5.121E+02	1.214E-02	9.317E-01	6.217E+00	2.974E+00	1.729E+01	3.870E+02
37.0	93.4	245.0	4.681E+02	245.0	4.455E+02	1.012E-02	9.419E-01	4.510E+00	2.481E+00	1.658E+01	4.036E+02
38.0	93.6	245.0	4.072E+02	245.0	3.875E+02	8.474E-03	9.503E-01	3.284E+00	2.076E+00	1.596E+01	4.195E+02
39.0	93.7	245.0	3.542E+02	245.0	3.371E+02	7.072E-03	9.574E-01	2.384E+00	1.733E+00	1.530E+01	4.348E+02
40.0	93.8	256.0	3.084E+02	256.0	3.084E+02	5.699E-03	9.631E-01	1.757E+00	1.470E+00	1.410E+01	4.490E+02
41.0	94.0	258.0	2.701E+02	258.0	2.701E+02	4.441E-03	9.679E-01	1.380E+00	1.249E+00	1.375E+01	4.627E+02
42.0	94.1	258.0	2.366E+02	258.0	2.366E+02	4.121E-03	9.721E-01	9.751E-01	1.063E+00	1.336E+01	4.761E+02
43.0	94.2	258.0	2.073E+02	258.0	2.073E+02	3.515E-03	9.756E-01	7.285E-01	9.060E-01	1.301E+01	4.891E+02
44.0	94.3	258.0	1.816E+02	258.0	1.816E+02	2.935E-03	9.785E-01	5.329E-01	7.572E-01	1.240E+01	5.015E+02
45.0	94.5	270.0	1.595E+02	270.0	1.595E+02	2.450E-03	9.810E-01	3.921E-01	6.637E-01	1.237E+01	5.139E+02
46.0	94.6	270.0	1.406E+02	270.0	1.406E+02	2.110E-03	9.831E-01	2.977E-01	5.718E-01	1.209E+01	5.268E+02
47.0	94.7	270.0	1.239E+02	270.0	1.239E+02	1.826E-03	9.849E-01	2.262E-01	4.932E-01	1.184E+01	5.379E+02
48.0	94.8	270.0	1.091E+02	270.0	1.091E+02	1.577E-03	9.865E-01	1.721E-01	4.250E-01	1.160E+01	5.494E+02
49.0	94.9	270.0	9.616E+01	270.0	9.616E+01	1.340E-03	9.870E-01	1.297E-01	3.641E-01	1.120E+01	5.607E+02

APPARENT Z-ANG 95.00 (DEG)
 BALLOON HEIGHT 50.00 (KM)
 TANGENT HEIGHT 25.52 (KM)
 OPTICAL AIR MASS 1.985

EFFECTIVE PRESSURE 1615.08 (PA)
 EFFECTIVE TEMPERATURE 227.99 (DEG K)
 TANGENT PRESSURE 2628.92 (PA)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
25.5	90.0	224.0	2.451E+03	224.0	2.451E+03	2.964E-01	2.964E-01	7.263E+02	6.639E+01	8.054E+01	8.054E+01
26.0	89.3	224.0	2.359E+03	224.0	2.240E+03	2.002E-01	4.966E-01	4.581E+02	4.404E+01	5.940E+01	1.399E+02
27.0	88.8	224.0	2.025E+03	224.0	1.924E+03	1.172E-01	6.137E-01	2.254E+02	2.625E+01	4.064E+01	1.806E+02
28.0	88.4	224.0	1.739E+03	224.0	1.650E+03	0.162E-02	5.954E-01	1.347E+02	1.020E+01	3.380E+01	2.136E+02
29.0	88.1	224.0	1.493E+03	224.0	1.416E+03	6.028E-02	7.556E-01	8.537E+01	1.350E+01	2.040E+01	2.420E+02
30.0	87.9	234.0	1.203E+03	234.0	1.219E+03	4.462E-02	8.003E-01	5.438E+01	1.044E+01	2.551E+01	2.675E+02
31.0	87.6	234.0	1.108E+03	234.0	1.053E+03	3.521E-02	8.355E-01	3.787E+01	8.239E+00	2.330E+01	2.908E+02
32.0	87.4	234.0	9.579E+02	234.0	9.098E+02	2.819E-02	8.637E-01	2.585E+01	6.596E+00	2.159E+01	3.124E+02
33.0	87.2	234.0	8.278E+02	234.0	7.862E+02	2.281E-02	8.865E-01	1.733E+01	5.337E+00	2.022E+01	3.326E+02
34.0	87.1	234.0	7.153E+02	234.0	6.795E+02	1.851E-02	9.050E-01	1.258E+01	4.331E+00	1.890E+01	3.516E+02
35.0	86.9	245.0	6.107E+02	245.0	5.808E+02	1.462E-02	9.196E-01	8.687E+00	3.581E+00	1.811E+01	3.697E+02
36.0	86.7	245.0	5.301E+02	245.0	5.121E+02	1.214E-02	9.317E-01	6.217E+00	2.974E+00	1.729E+01	3.870E+02
37.0	86.6	245.0	4.601E+02	245.0	4.455E+02	1.012E-02	9.419E-01	4.510E+00	2.481E+00	1.650E+01	4.036E+02
38.0	86.4	245.0	4.072E+02	245.0	3.875E+02	8.474E-03	9.503E-01	3.204E+00	2.076E+00	1.596E+01	4.195E+02
39.0	86.3	245.0	3.542E+02	245.0	3.371E+02	7.072E-03	9.574E-01	2.304E+00	1.733E+00	1.530E+01	4.348E+02
40.0	86.2	250.0	3.084E+02	250.0	3.084E+02	5.699E-03	9.631E-01	1.757E+00	1.470E+00	1.418E+01	4.490E+02
41.0	86.0	250.0	2.701E+02	250.0	2.701E+02	4.841E-03	9.679E-01	1.300E+00	1.249E+00	1.375E+01	4.627E+02
42.0	85.9	250.0	2.366E+02	250.0	2.366E+02	4.121E-03	9.721E-01	9.751E-01	1.063E+00	1.336E+01	4.761E+02
43.0	85.8	250.0	2.073E+02	250.0	2.073E+02	3.515E-03	9.756E-01	7.205E-01	9.068E-01	1.301E+01	4.891E+02
44.0	85.7	250.0	1.816E+02	250.0	1.816E+02	2.935E-03	9.785E-01	5.329E-01	7.572E-01	1.240E+01	5.015E+02
45.0	85.5	270.0	1.595E+02	270.0	1.595E+02	2.458E-03	9.810E-01	3.921E-01	6.637E-01	1.237E+01	5.139E+02
46.0	85.4	270.0	1.406E+02	270.0	1.406E+02	2.110E-03	9.831E-01	2.977E-01	5.710E-01	1.209E+01	5.260E+02
47.0	85.3	270.0	1.239E+02	270.0	1.239E+02	1.826E-03	9.849E-01	2.282E-01	4.932E-01	1.184E+01	5.378E+02
48.0	85.2	270.0	1.091E+02	270.0	1.091E+02	1.577E-03	9.865E-01	1.721E-01	4.258E-01	1.160E+01	5.494E+02
49.0	85.1	270.0	9.616E+01	270.0	9.616E+01	1.348E-03	9.878E-01	1.237E-01	3.641E-01	1.126E+01	5.607E+02
50.0	85.0	276.0	8.405E+01	276.0	8.405E+01	1.155E-03	9.890E-01	9.798E-02	3.187E-01	1.117E+01	5.710E+02
51.0	84.9	276.0	7.497E+01	276.0	7.497E+01	1.003E-03	9.900E-01	7.516E-02	2.767E-01	1.097E+01	5.820E+02
52.0	84.8	276.0	6.624E+01	276.0	6.624E+01	8.710E-04	9.909E-01	5.770E-02	2.404E-01	1.079E+01	5.936E+02
53.0	84.7	276.0	5.853E+01	276.0	5.853E+01	7.574E-04	9.916E-01	4.430E-02	2.090E-01	1.062E+01	6.042E+02
54.0	84.6	276.0	5.172E+01	276.0	5.172E+01	6.590E-04	9.923E-01	3.408E-02	1.819E-01	1.046E+01	6.147E+02
55.0	84.5	276.0	4.570E+01	276.0	4.570E+01	5.737E-04	9.929E-01	2.622E-02	1.583E-01	1.030E+01	6.250E+02
56.0	84.4	276.0	4.038E+01	276.0	4.038E+01	4.998E-04	9.934E-01	2.018E-02	1.379E-01	1.016E+01	6.351E+02
57.0	84.3	276.0	3.567E+01	276.0	3.567E+01	4.356E-04	9.938E-01	1.554E-02	1.202E-01	1.002E+01	6.452E+02
58.0	84.2	276.0	3.152E+01	276.0	3.152E+01	3.799E-04	9.942E-01	1.137E-02	1.049E-01	9.889E+00	6.550E+02
59.0	84.2	276.0	2.789E+01	276.0	2.789E+01	3.315E-04	9.945E-01	9.232E-03	9.149E-02	9.766E+00	6.640E+02

APPARENT Z-ANG 95.50 (DEG) EFFECTIVE PRESSURE 4054.52 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 221.78 (DEG K)
 TANGENT HEIGHT 20.32 (KM) TANGENT PRESSURE 6445.06 (PA)
 OPTICAL AIR MASS 4.496

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
20.3	98.0	210.0	5.512E+03	210.0	5.470E+03	7.990E-01	7.990E-01	4.375E+03	1.744E+02	9.470E+01	9.470E+01
21.0	98.0	219.0	5.097E+03	219.0	4.847E+03	3.973E-01	1.197E+00	1.926E+03	8.781E+01	5.347E+01	1.482E+02
22.0	91.3	220.0	4.361E+03	220.0	4.130E+03	2.430E-01	1.443E+00	1.009E+03	5.363E+01	3.861E+01	1.869E+02
23.0	91.6	222.0	3.734E+03	222.0	3.542E+03	1.707E-01	1.612E+00	6.046E+02	3.790E+01	3.187E+01	2.187E+02
24.0	91.9	223.0	3.202E+03	223.0	3.036E+03	1.270E-01	1.739E+00	3.854E+02	2.831E+01	2.777E+01	2.465E+02
25.0	92.2	224.0	2.748E+03	224.0	2.605E+03	9.746E-02	1.836E+00	2.539E+02	2.183E+01	2.496E+01	2.715E+02
26.0	92.4	224.0	2.359E+03	224.0	2.236E+03	7.663E-02	1.913E+00	1.713E+02	1.716E+01	2.286E+01	2.943E+02
27.0	92.6	224.0	2.025E+03	224.0	1.919E+03	6.107E-02	1.974E+00	1.172E+02	1.360E+01	2.123E+01	3.155E+02
28.0	92.8	224.0	1.739E+03	224.0	1.648E+03	4.916E-02	2.023E+00	8.100E+01	1.101E+01	1.990E+01	3.359E+02
29.0	93.0	224.0	1.493E+03	224.0	1.415E+03	3.968E-02	2.063E+00	5.614E+01	8.880E+00	1.871E+01	3.542E+02
30.0	93.1	234.0	1.283E+03	234.0	1.210E+03	3.123E-02	2.094E+00	3.803E+01	7.307E+00	1.786E+01	3.720E+02
31.0	93.3	234.0	1.108E+03	234.0	1.053E+03	2.578E-02	2.120E+00	2.713E+01	6.032E+00	1.707E+01	3.891E+02
32.0	93.4	234.0	9.579E+02	234.0	9.095E+02	2.137E-02	2.141E+00	1.943E+01	5.000E+00	1.637E+01	4.055E+02
33.0	93.6	234.0	8.270E+02	234.0	7.859E+02	1.777E-02	2.159E+00	1.397E+01	4.159E+00	1.576E+01	4.212E+02
34.0	93.7	234.0	7.153E+02	234.0	6.794E+02	1.475E-02	2.173E+00	1.002E+01	3.451E+00	1.513E+01	4.363E+02
35.0	93.9	245.0	6.187E+02	245.0	5.887E+02	1.167E-02	2.189E+00	6.988E+00	2.900E+00	1.471E+01	4.511E+02
36.0	94.0	245.0	5.381E+02	245.0	5.121E+02	1.002E-02	2.195E+00	5.129E+00	2.454E+00	1.427E+01	4.653E+02
37.0	94.1	245.0	4.681E+02	245.0	4.454E+02	8.468E-03	2.204E+00	3.771E+00	2.075E+00	1.387E+01	4.792E+02
38.0	94.2	245.0	4.072E+02	245.0	3.874E+02	7.171E-03	2.211E+00	2.778E+00	1.757E+00	1.350E+01	4.927E+02
39.0	94.4	245.0	3.542E+02	245.0	3.371E+02	6.046E-03	2.217E+00	2.038E+00	1.481E+00	1.308E+01	5.058E+02
40.0	94.5	250.0	3.084E+02	250.0	3.004E+02	4.917E-03	2.222E+00	1.516E+00	1.223E+00	1.223E+01	5.188E+02
41.0	94.6	250.0	2.701E+02	250.0	2.701E+02	4.211E-03	2.226E+00	1.137E+00	1.086E+00	1.196E+01	5.308E+02
42.0	94.7	250.0	2.366E+02	250.0	2.366E+02	3.611E-03	2.230E+00	8.544E-01	9.316E-01	1.171E+01	5.417E+02
43.0	94.8	250.0	2.073E+02	250.0	2.073E+02	3.100E-03	2.233E+00	6.424E-01	7.997E-01	1.147E+01	5.532E+02
44.0	94.9	250.0	1.816E+02	250.0	1.816E+02	2.604E-03	2.235E+00	4.728E-01	6.710E-01	1.100E+01	5.642E+02
45.0	95.0	270.0	1.595E+02	270.0	1.595E+02	2.193E-03	2.238E+00	3.490E-01	5.920E-01	1.103E+01	5.752E+02
46.0	95.1	270.0	1.406E+02	270.0	1.406E+02	1.898E-03	2.240E+00	2.668E-01	5.125E-01	1.084E+01	5.868E+02
47.0	95.2	270.0	1.239E+02	270.0	1.239E+02	1.645E-03	2.241E+00	2.037E-01	4.440E-01	1.066E+01	5.987E+02
48.0	95.3	270.0	1.091E+02	270.0	1.091E+02	1.426E-03	2.243E+00	1.556E-01	3.850E-01	1.049E+01	6.072E+02
49.0	95.4	270.0	9.616E+01	270.0	9.616E+01	1.224E-03	2.244E+00	1.177E-01	3.304E-01	1.022E+01	6.174E+02

APPARENT Z-ANG 95.50 (DEG) EFFECTIVE PRESSURE 4054.52 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 221.70 (DEG K)
 TANGENT HEIGHT 20.32 (KM) TANGENT PRESSURE 6445.06 (PA)
 OPTICAL AIR MASS 4.496

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-OM)	DEL (T-OM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
20.3	98.0	218.0	5.512E+03	218.0	5.470E+03	7.998E-01	7.990E-01	4.375E+03	1.744E+02	9.670E+01	9.670E+01
21.0	89.2	219.0	5.897E+03	219.0	4.847E+03	3.973E-01	1.197E+00	1.925E+03	6.701E+01	5.347E+01	1.402E+02
22.0	88.7	220.0	4.361E+03	220.0	4.138E+03	2.438E-01	1.441E+00	1.009E+03	5.363E+01	3.061E+01	1.069E+02
23.0	88.4	222.0	3.734E+03	222.0	3.542E+03	1.707E-01	1.612E+00	6.046E+02	3.790E+01	3.187E+01	2.187E+02
24.0	88.1	223.0	3.202E+03	223.0	3.036E+03	1.270E-01	1.739E+00	3.854E+02	2.831E+01	2.777E+01	2.465E+02
25.0	87.8	224.0	2.748E+03	224.0	2.605E+03	9.746E-02	1.836E+00	2.539E+02	2.183E+01	2.496E+01	2.715E+02
26.0	87.6	224.0	2.359E+03	224.0	2.236E+03	7.663E-02	1.913E+00	1.713E+02	1.716E+01	2.286E+01	2.943E+02
27.0	87.4	224.0	2.025E+03	224.0	1.919E+03	6.107E-02	1.974E+00	1.172E+02	1.360E+01	2.123E+01	3.155E+02
28.0	87.0	224.0	1.739E+03	224.0	1.648E+03	4.916E-02	2.023E+00	8.109E+01	1.101E+01	1.990E+01	3.355E+02
29.0	87.0	224.0	1.493E+03	224.0	1.415E+03	3.968E-02	2.063E+00	5.614E+01	8.680E+00	1.871E+01	3.542E+02
30.0	86.9	234.0	1.283E+03	234.0	1.218E+03	3.123E-02	2.094E+00	3.803E+01	7.307E+00	1.786E+01	3.720E+02
31.0	86.7	234.0	1.108E+03	234.0	1.053E+03	2.578E-02	2.120E+00	2.713E+01	6.832E+00	1.707E+01	3.891E+02
32.0	86.6	234.0	9.579E+02	234.0	9.095E+02	2.137E-02	2.141E+00	1.943E+01	5.800E+00	1.637E+01	4.055E+02
33.0	86.4	234.0	8.278E+02	234.0	7.859E+02	1.777E-02	2.159E+00	1.397E+01	4.159E+00	1.576E+01	4.212E+02
34.0	86.3	234.0	7.153E+02	234.0	6.794E+02	1.475E-02	2.173E+00	1.002E+01	3.451E+00	1.513E+01	4.363E+02
35.0	86.1	245.0	6.187E+02	245.0	5.887E+02	1.187E-02	2.185E+00	6.989E+00	2.900E+00	1.471E+01	4.511E+02
36.0	86.0	245.0	5.381E+02	245.0	5.121E+02	1.002E-02	2.195E+00	5.129E+00	2.454E+00	1.427E+01	4.653E+02
37.0	85.9	245.0	4.681E+02	245.0	4.454E+02	8.468E-03	2.204E+00	3.771E+00	2.075E+00	1.387E+01	4.792E+02
38.0	85.8	245.0	4.072E+02	245.0	3.874E+02	7.171E-03	2.211E+00	2.779E+00	1.757E+00	1.350E+01	4.927E+02
39.0	85.6	245.0	3.542E+02	245.0	3.371E+02	6.046E-03	2.217E+00	2.038E+00	1.481E+00	1.308E+01	5.058E+02
40.0	85.5	258.0	3.084E+02	258.0	3.084E+02	4.917E-03	2.222E+00	1.516E+00	1.269E+00	1.223E+01	5.180E+02
41.0	85.4	258.0	2.701E+02	258.0	2.701E+02	4.211E-03	2.226E+00	1.137E+00	1.086E+00	1.196E+01	5.300E+02
42.0	85.3	258.0	2.366E+02	258.0	2.366E+02	3.611E-03	2.230E+00	8.544E-01	9.316E-01	1.171E+01	5.417E+02
43.0	85.2	258.0	2.073E+02	258.0	2.073E+02	3.100E-03	2.233E+00	6.424E-01	7.997E-01	1.147E+01	5.532E+02
44.0	85.1	258.0	1.816E+02	258.0	1.816E+02	2.604E-03	2.235E+00	4.728E-01	6.718E-01	1.100E+01	5.642E+02
45.0	85.0	270.0	1.595E+02	270.0	1.595E+02	2.193E-03	2.238E+00	3.498E-01	5.920E-01	1.103E+01	5.752E+02
46.0	84.9	270.0	1.406E+02	270.0	1.406E+02	1.898E-03	2.240E+00	2.669E-01	5.125E-01	1.084E+01	5.860E+02
47.0	84.8	270.0	1.239E+02	270.0	1.239E+02	1.645E-03	2.241E+00	2.037E-01	4.440E-01	1.066E+01	5.967E+02
48.0	84.7	270.0	1.091E+02	270.0	1.091E+02	1.426E-03	2.243E+00	1.556E-01	3.850E-01	1.049E+01	6.072E+02
49.0	84.6	270.0	9.616E+01	270.0	9.616E+01	1.224E-03	2.244E+00	1.177E-01	3.304E-01	1.022E+01	6.174E+02
50.0	84.5	276.0	8.485E+01	276.0	8.485E+01	1.052E-03	2.245E+00	8.925E-02	2.903E-01	1.017E+01	6.276E+02
51.0	84.4	276.0	7.497E+01	276.0	7.497E+01	9.162E-04	2.246E+00	6.869E-02	2.529E-01	1.003E+01	6.376E+02
52.0	84.3	276.0	6.624E+01	276.0	6.624E+01	7.985E-04	2.247E+00	5.289E-02	2.204E-01	9.891E+00	6.475E+02
53.0	84.2	276.0	5.853E+01	276.0	5.853E+01	6.963E-04	2.247E+00	4.015E-02	1.922E-01	9.761E+00	6.572E+02
54.0	84.1	276.0	5.172E+01	276.0	5.172E+01	6.074E-04	2.248E+00	3.141E-02	1.677E-01	9.638E+00	6.669E+02
55.0	84.1	276.0	4.570E+01	276.0	4.570E+01	5.302E-04	2.248E+00	2.423E-02	1.463E-01	9.528E+00	6.764E+02
56.0	84.0	276.0	4.038E+01	276.0	4.038E+01	4.630E-04	2.249E+00	1.869E-02	1.270E-01	9.409E+00	6.858E+02
57.0	83.9	276.0	3.567E+01	276.0	3.567E+01	4.044E-04	2.249E+00	1.443E-02	1.116E-01	9.302E+00	6.951E+02
58.0	83.8	276.0	3.152E+01	276.0	3.152E+01	3.535E-04	2.250E+00	1.114E-02	9.755E-02	9.201E+00	7.043E+02
59.0	83.7	276.0	2.785E+01	276.0	2.785E+01	3.090E-04	2.250E+00	8.606E-03	8.529E-02	9.104E+00	7.134E+02

APPARENT Z-ANG 96.00 (DEG) EFFECTIVE PRESSURE 10103.73 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 217.54 (DEG K)
 TANGENT HEIGHT 14.52 (KM) TANGENT PRESSURE 20939.82 (PA)
 OPTICAL AIR MASS 11.431

ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DH)	ACCUM		DEL (T-OM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
							DEL (OM)	DEL (P-OM)			
14.5	90.0	216.0	1.366E+04	216.0	1.366E+04	1.743E+00	1.743E+00	2.302E+04	3.765E+02	0.193E+01	0.193E+01
15.0	90.7	216.0	1.313E+04	216.0	1.250E+04	1.160E+00	2.903E+00	1.450E+04	2.505E+02	5.972E+01	1.417E+02
16.0	91.2	216.0	1.121E+04	216.0	1.063E+04	6.740E-01	3.570E+00	7.174E+03	1.450E+02	4.004E+01	1.025E+02
17.0	91.6	216.0	9.572E+03	216.0	9.066E+03	4.667E-01	4.045E+00	4.231E+03	1.000E+02	3.312E+01	2.156E+02
18.0	91.9	216.0	8.172E+03	216.0	7.736E+03	3.437E-01	4.300E+00	2.659E+03	7.424E+01	2.059E+01	2.442E+02
19.0	92.1	217.0	6.977E+03	217.0	6.604E+03	2.609E-01	4.649E+00	1.723E+03	5.661E+01	2.553E+01	2.697E+02
20.0	92.3	218.0	5.961E+03	218.0	5.643E+03	2.024E-01	4.852E+00	1.142E+03	4.412E+01	2.329E+01	2.930E+02
21.0	92.5	219.0	5.097E+03	219.0	4.825E+03	1.594E-01	5.011E+00	7.694E+02	3.492E+01	2.159E+01	3.146E+02
22.0	92.7	220.0	4.361E+03	220.0	4.129E+03	1.270E-01	5.130E+00	5.243E+02	2.793E+01	2.015E+01	3.347E+02
23.0	92.9	222.0	3.734E+03	222.0	3.537E+03	1.017E-01	5.240E+00	3.597E+02	2.257E+01	1.901E+01	3.537E+02
24.0	93.1	223.0	3.202E+03	223.0	3.034E+03	8.230E-02	5.322E+00	2.499E+02	1.837E+01	1.804E+01	3.710E+02
25.0	93.2	224.0	2.748E+03	224.0	2.603E+03	6.717E-02	5.389E+00	1.749E+02	1.505E+01	1.721E+01	3.890E+02
26.0	93.4	224.0	2.359E+03	224.0	2.235E+03	5.524E-02	5.445E+00	1.235E+02	1.237E+01	1.649E+01	4.055E+02
27.0	93.5	224.0	2.025E+03	224.0	1.919E+03	4.560E-02	5.490E+00	8.749E+01	1.021E+01	1.585E+01	4.213E+02
28.0	93.7	224.0	1.739E+03	224.0	1.647E+03	3.775E-02	5.520E+00	6.219E+01	8.456E+00	1.529E+01	4.366E+02
29.0	93.8	224.0	1.493E+03	224.0	1.415E+03	3.118E-02	5.559E+00	4.411E+01	6.985E+00	1.471E+01	4.513E+02
30.0	93.9	234.0	1.283E+03	234.0	1.218E+03	2.502E-02	5.584E+00	3.047E+01	5.844E+00	1.432E+01	4.657E+02
31.0	94.1	234.0	1.100E+03	234.0	1.052E+03	2.100E-02	5.605E+00	2.210E+01	4.913E+00	1.390E+01	4.796E+02
32.0	94.2	234.0	9.579E+02	234.0	9.094E+02	1.765E-02	5.623E+00	1.605E+01	4.131E+00	1.353E+01	4.931E+02
33.0	94.3	234.0	8.270E+02	234.0	7.850E+02	1.466E-02	5.638E+00	1.160E+01	3.470E+00	1.310E+01	5.063E+02
34.0	94.4	234.0	7.153E+02	234.0	6.793E+02	1.247E-02	5.650E+00	8.470E+00	2.918E+00	1.279E+01	5.191E+02
35.0	94.5	245.0	6.187E+02	245.0	5.886E+02	1.013E-02	5.660E+00	5.964E+00	2.482E+00	1.256E+01	5.316E+02
36.0	94.7	245.0	5.301E+02	245.0	5.120E+02	8.623E-03	5.669E+00	4.415E+00	2.113E+00	1.229E+01	5.439E+02
37.0	94.8	245.0	4.681E+02	245.0	4.454E+02	7.346E-03	5.676E+00	3.272E+00	1.800E+00	1.203E+01	5.559E+02
38.0	94.9	245.0	4.072E+02	245.0	3.874E+02	6.264E-03	5.682E+00	2.427E+00	1.535E+00	1.180E+01	5.677E+02
39.0	95.0	245.0	3.542E+02	245.0	3.371E+02	5.315E-03	5.688E+00	1.791E+00	1.302E+00	1.150E+01	5.792E+02
40.0	95.1	250.0	3.084E+02	250.0	3.084E+02	4.347E-03	5.692E+00	1.340E+00	1.121E+00	1.081E+01	5.900E+02
41.0	95.2	250.0	2.701E+02	250.0	2.701E+02	3.742E-03	5.695E+00	1.011E+00	9.655E-01	1.063E+01	6.007E+02
42.0	95.3	258.0	2.366E+02	258.0	2.366E+02	3.224E-03	5.699E+00	7.629E-01	8.319E-01	1.045E+01	6.111E+02
43.0	95.4	258.0	2.073E+02	258.0	2.073E+02	2.780E-03	5.702E+00	5.762E-01	7.173E-01	1.029E+01	6.214E+02
44.0	95.5	258.0	1.816E+02	258.0	1.816E+02	2.345E-03	5.708E+00	4.258E-01	6.050E-01	9.907E+00	6.313E+02
45.0	95.6	270.0	1.595E+02	270.0	1.595E+02	1.982E-03	5.708E+00	3.162E-01	5.352E-01	9.974E+00	6.413E+02
46.0	95.6	270.0	1.406E+02	270.0	1.406E+02	1.722E-03	5.708E+00	2.421E-01	4.550E-01	9.834E+00	6.511E+02
47.0	95.7	270.0	1.239E+02	270.0	1.239E+02	1.497E-03	5.709E+00	1.854E-01	4.042E-01	9.702E+00	6.608E+02
48.0	95.8	270.0	1.091E+02	270.0	1.091E+02	1.302E-03	5.711E+00	1.421E-01	3.515E-01	9.576E+00	6.704E+02
49.0	95.9	270.0	9.616E+01	270.0	9.616E+01	1.121E-03	5.712E+00	1.070E-01	3.026E-01	9.354E+00	6.790E+02

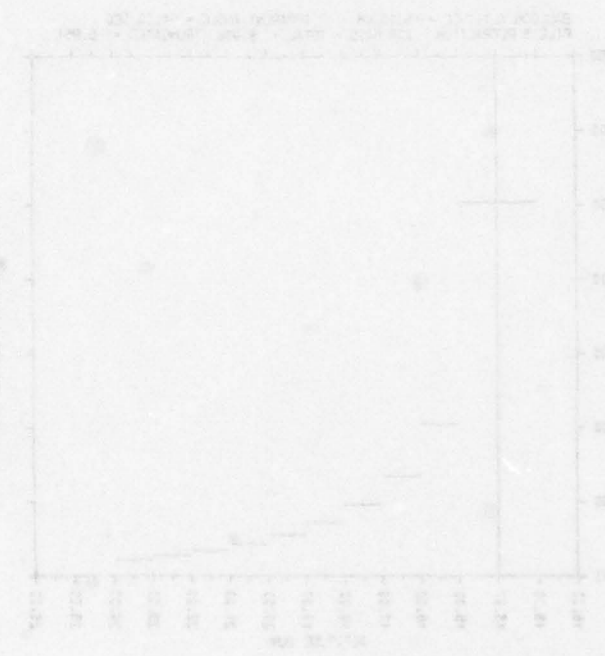
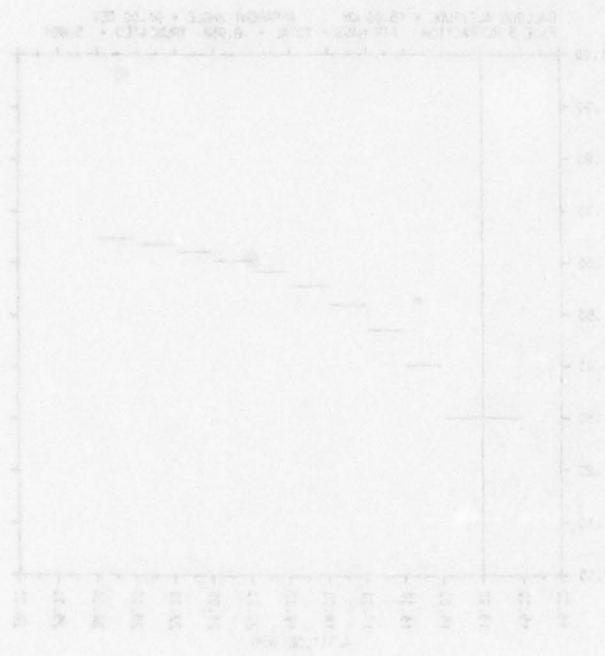
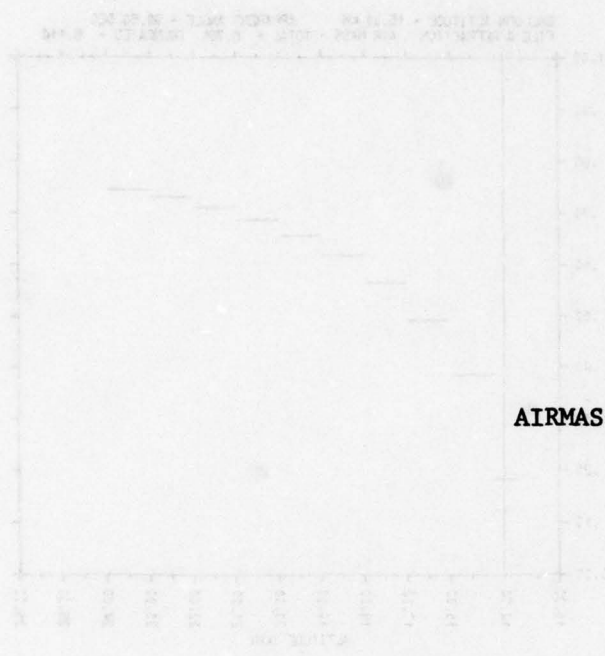
APPARENT Z-ANG 96.00 (DEG) EFFECTIVE PRESSURE 10103.73 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 217.54 (DEG K)
 TANGENT HEIGHT 14.52 (KM) TANGENT PRESSURE 20939.82 (PA)
 OPTICAL AIR MASS 11.431

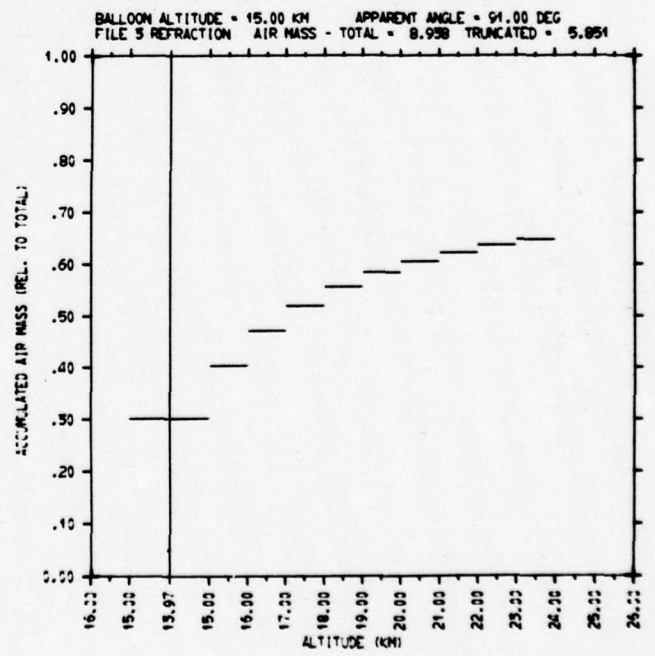
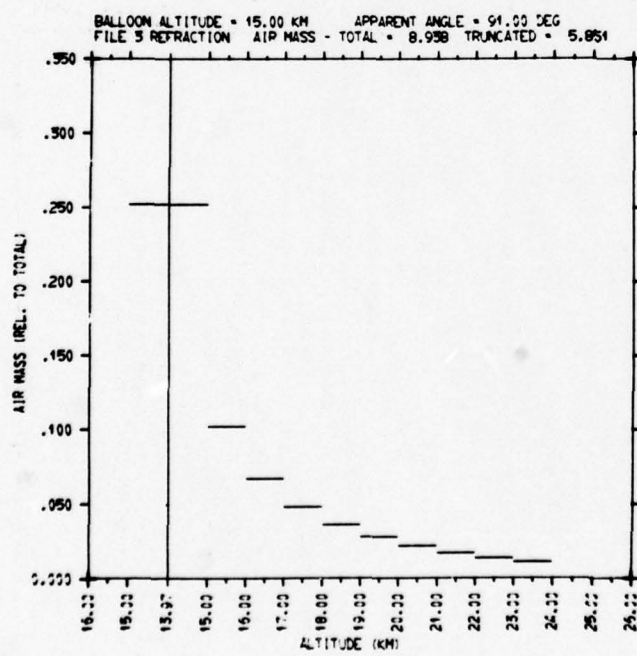
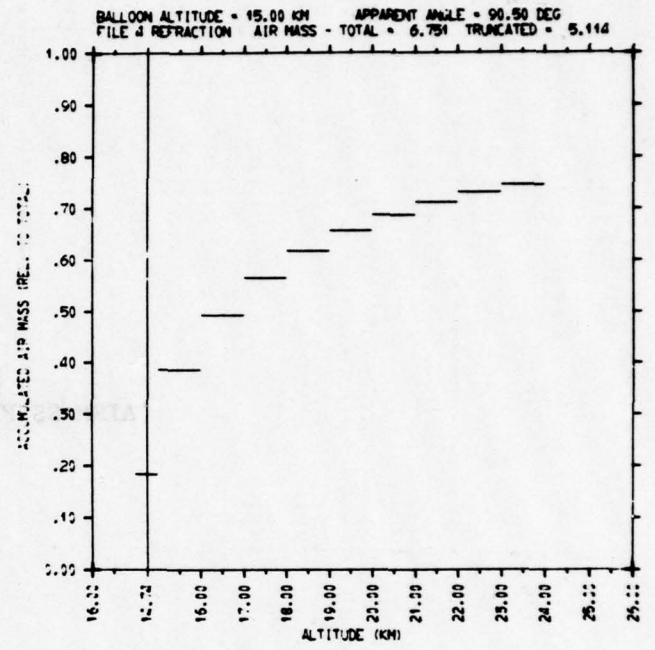
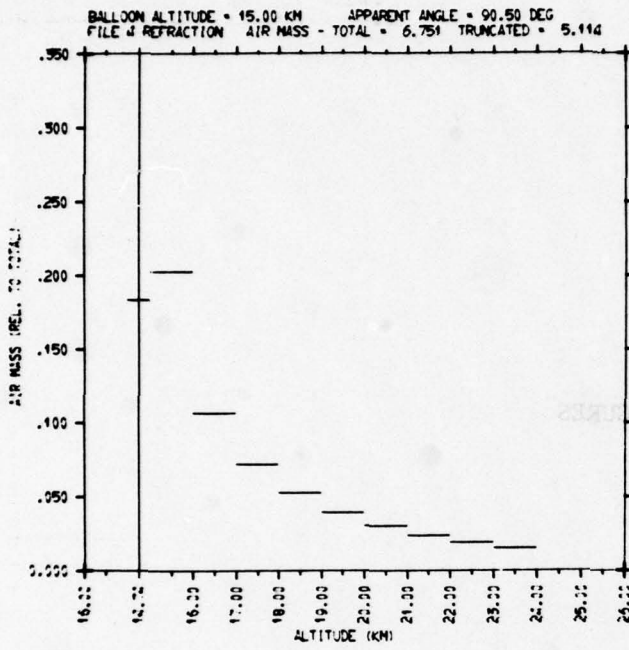
ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL (P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
14.5	96.8	216.8	1.366E+04	216.0	1.366E+04	1.743E+00	1.743E+00	2.302E+04	3.705E+02	8.193E+01	8.193E+01
15.0	99.3	216.8	1.313E+04	216.0	1.250E+04	1.160E+00	2.903E+00	1.459E+04	2.505E+02	5.972E+01	1.417E+02
16.0	88.8	216.0	1.121E+04	216.0	1.063E+04	6.748E-01	3.578E+00	7.174E+03	1.458E+02	4.084E+01	1.829E+02
17.0	88.4	216.0	9.572E+03	216.0	9.066E+03	4.667E-01	4.045E+00	4.231E+03	1.008E+02	3.312E+01	2.156E+02
18.0	86.1	216.0	8.172E+03	216.0	7.738E+03	3.437E-01	4.388E+00	2.659E+03	7.424E+01	2.859E+01	2.442E+02
19.0	87.9	217.0	6.977E+03	217.0	6.604E+03	2.609E-01	4.649E+00	1.723E+03	5.661E+01	2.553E+01	2.697E+02
20.0	87.7	218.0	5.961E+03	218.0	5.643E+03	2.024E-01	4.852E+00	1.142E+03	4.412E+01	2.329E+01	2.930E+02
21.0	87.5	219.0	5.097E+03	219.0	4.823E+03	1.594E-01	5.011E+00	7.694E+02	3.492E+01	2.195E+01	3.146E+02
22.0	87.3	220.0	4.361E+03	220.0	4.129E+03	1.270E-01	5.138E+00	5.243E+02	2.793E+01	2.015E+01	3.347E+02
23.0	87.1	222.0	3.734E+03	222.0	3.537E+03	1.017E-01	5.240E+00	3.597E+02	2.257E+01	1.901E+01	3.537E+02
24.0	86.9	223.0	3.202E+03	223.0	3.034E+03	8.230E-02	5.322E+00	2.499E+02	1.837E+01	1.804E+01	3.710E+02
25.0	86.8	224.0	2.748E+03	224.0	2.603E+03	6.717E-02	5.389E+00	1.749E+02	1.505E+01	1.721E+01	3.890E+02
26.0	86.6	224.0	2.359E+03	224.0	2.235E+03	5.524E-02	5.445E+00	1.235E+02	1.237E+01	1.649E+01	4.055E+02
27.0	86.5	224.0	2.025E+03	224.0	1.919E+03	4.560E-02	5.490E+00	8.749E+01	1.021E+01	1.505E+01	4.213E+02
28.0	86.3	224.0	1.739E+03	224.0	1.647E+03	3.775E-02	5.528E+00	6.219E+01	8.456E+00	1.529E+01	4.366E+02
29.0	86.2	224.0	1.493E+03	224.0	1.415E+03	3.110E-02	5.559E+00	4.411E+01	6.985E+00	1.471E+01	4.513E+02
30.0	86.1	234.0	1.283E+03	234.0	1.218E+03	2.502E-02	5.584E+00	3.047E+01	5.854E+00	1.432E+01	4.657E+02
31.0	85.9	234.0	1.108E+03	234.0	1.052E+03	2.100E-02	5.605E+00	2.210E+01	4.913E+00	1.390E+01	4.796E+02
32.0	85.8	234.0	9.579E+02	234.0	9.095E+02	1.765E-02	5.623E+00	1.605E+01	4.131E+00	1.353E+01	4.931E+02
33.0	85.7	234.0	8.270E+02	234.0	7.859E+02	1.486E-02	5.638E+00	1.169E+01	3.478E+00	1.310E+01	5.063E+02
34.0	85.6	234.0	7.153E+02	234.0	6.793E+02	1.247E-02	5.650E+00	8.470E+00	2.918E+00	1.279E+01	5.191E+02
35.0	85.5	245.0	6.187E+02	245.0	5.886E+02	1.013E-02	5.660E+00	5.964E+00	2.482E+00	1.256E+01	5.316E+02
36.0	85.3	245.0	5.381E+02	245.0	5.129E+02	8.623E-03	5.669E+00	4.415E+00	2.113E+00	1.229E+01	5.439E+02
37.0	85.2	245.0	4.681E+02	245.0	4.454E+02	7.346E-03	5.676E+00	3.272E+00	1.800E+00	1.203E+01	5.559E+02
38.0	85.1	245.0	4.072E+02	245.0	3.874E+02	6.264E-03	5.682E+00	2.427E+00	1.535E+00	1.180E+01	5.677E+02
39.0	85.0	245.0	3.542E+02	245.0	3.371E+02	5.315E-03	5.688E+00	1.791E+00	1.302E+00	1.158E+01	5.792E+02
40.0	84.9	258.0	3.084E+02	258.0	3.084E+02	4.347E-03	5.692E+00	1.340E+00	1.121E+00	1.081E+01	5.900E+02
41.0	84.8	258.0	2.701E+02	258.0	2.701E+02	3.742E-03	5.696E+00	1.011E+00	9.655E-01	1.063E+01	6.007E+02
42.0	84.7	258.0	2.366E+02	258.0	2.366E+02	3.224E-03	5.699E+00	7.623E-01	8.319E-01	1.045E+01	6.111E+02
43.0	84.6	258.0	2.073E+02	258.0	2.073E+02	2.760E-03	5.702E+00	5.762E-01	7.173E-01	1.029E+01	6.214E+02
44.0	84.5	258.0	1.816E+02	258.0	1.816E+02	2.345E-03	5.704E+00	4.259E-01	6.050E-01	9.907E+00	6.313E+02
45.0	84.4	278.0	1.595E+02	278.0	1.595E+02	1.982E-03	5.706E+00	3.162E-01	5.352E-01	9.974E+00	6.413E+02
46.0	84.4	278.0	1.406E+02	278.0	1.406E+02	1.722E-03	5.708E+00	2.421E-01	4.650E-01	9.834E+00	6.511E+02
47.0	84.3	278.0	1.239E+02	278.0	1.239E+02	1.497E-03	5.709E+00	1.854E-01	4.042E-01	9.702E+00	6.608E+02
48.0	84.2	278.0	1.091E+02	278.0	1.091E+02	1.302E-03	5.711E+00	1.421E-01	3.515E-01	9.576E+00	6.704E+02
49.0	84.1	278.0	9.616E+01	278.0	9.616E+01	1.121E-03	5.712E+00	1.079E-01	3.026E-01	9.354E+00	6.798E+02
50.0	84.0	276.0	8.405E+01	276.0	8.405E+01	9.657E-04	5.713E+00	8.194E-02	2.665E-01	9.339E+00	6.891E+02
51.0	83.9	276.0	7.497E+01	276.0	7.497E+01	8.433E-04	5.714E+00	6.323E-02	2.328E-01	9.230E+00	6.983E+02
52.0	83.8	276.0	6.624E+01	276.0	6.624E+01	7.367E-04	5.714E+00	4.888E-02	2.033E-01	9.126E+00	7.074E+02
53.0	83.8	276.0	5.853E+01	276.0	5.853E+01	6.439E-04	5.715E+00	3.769E-02	1.777E-01	9.027E+00	7.165E+02
54.0	83.7	276.0	5.172E+01	276.0	5.172E+01	5.629E-04	5.716E+00	2.911E-02	1.554E-01	8.932E+00	7.254E+02
55.0	83.6	276.0	4.570E+01	276.0	4.570E+01	4.923E-04	5.716E+00	2.250E-02	1.359E-01	8.841E+00	7.342E+02
56.0	83.5	276.0	4.038E+01	276.0	4.038E+01	4.307E-04	5.717E+00	1.739E-02	1.189E-01	8.754E+00	7.430E+02
57.0	83.4	276.0	3.567E+01	276.0	3.567E+01	3.770E-04	5.717E+00	1.345E-02	1.040E-01	8.671E+00	7.517E+02
58.0	83.4	276.0	3.152E+01	276.0	3.152E+01	3.300E-04	5.717E+00	1.049E-02	9.109E-02	8.591E+00	7.603E+02
59.0	83.3	276.0	2.785E+01	276.0	2.785E+01	2.890E-04	5.718E+00	8.049E-03	7.976E-02	8.515E+00	7.688E+02

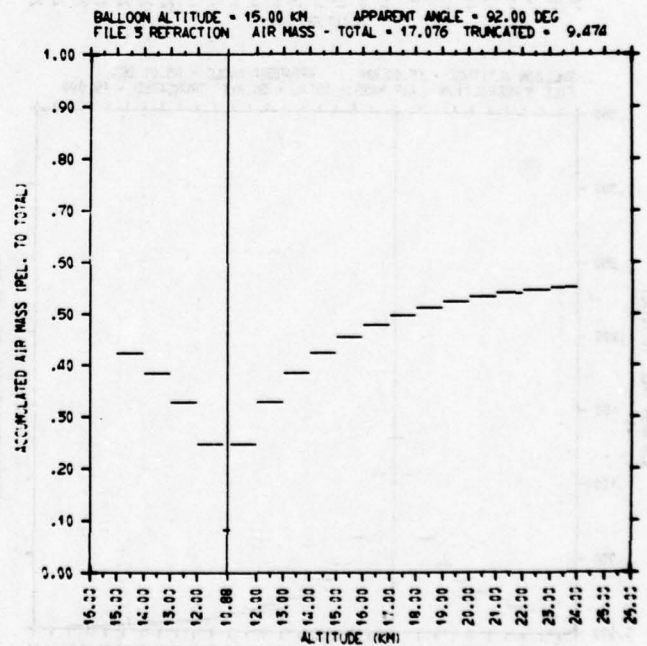
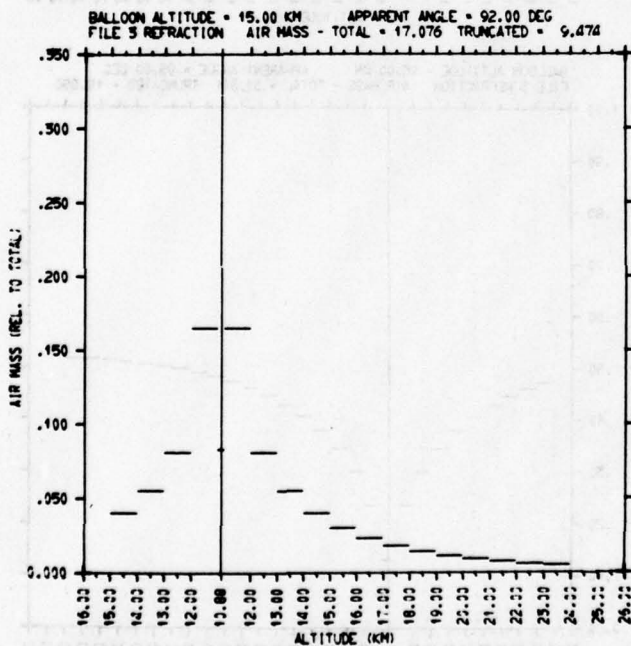
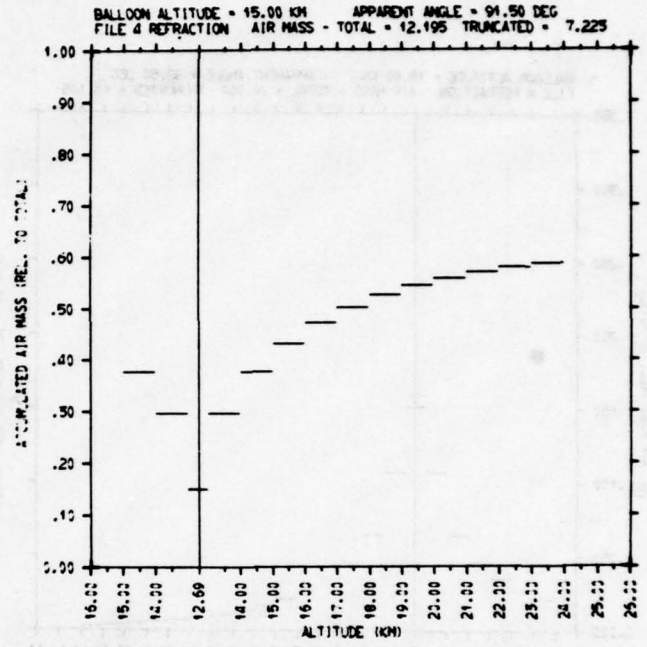
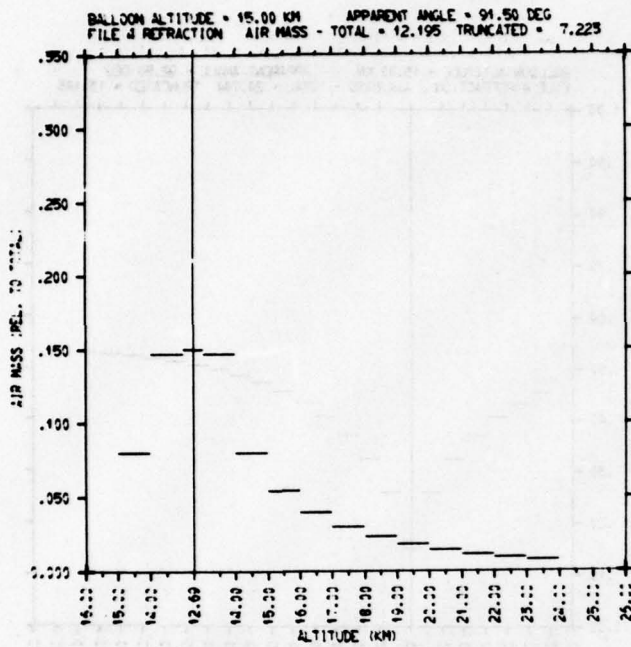
APPARENT Z-ANG 96.50 (DEG) EFFECTIVE PRESSURE 26736.27 (PA)
 BALLOON HEIGHT 50.00 (KM) EFFECTIVE TEMPERATURE 236.10 (DEG K)
 TANGENT HEIGHT 8.00 (KM) TANGENT PRESSURE 78845.28 (PA)
 OPTICAL AIR MASS 29.049

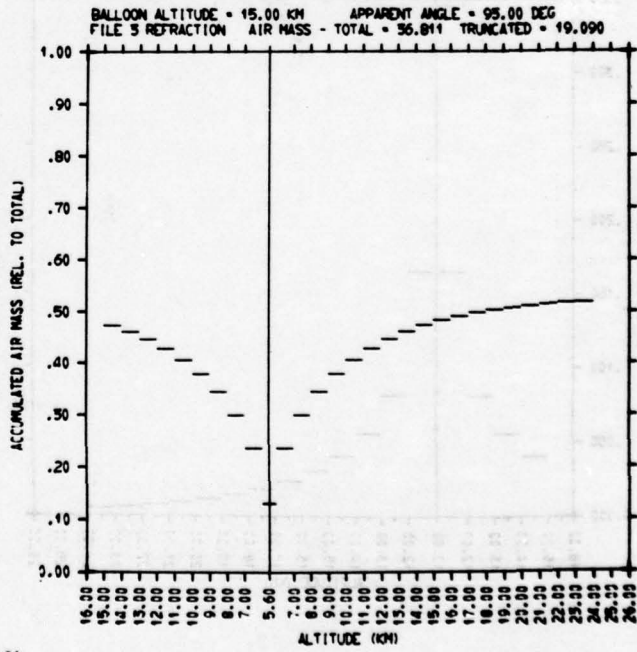
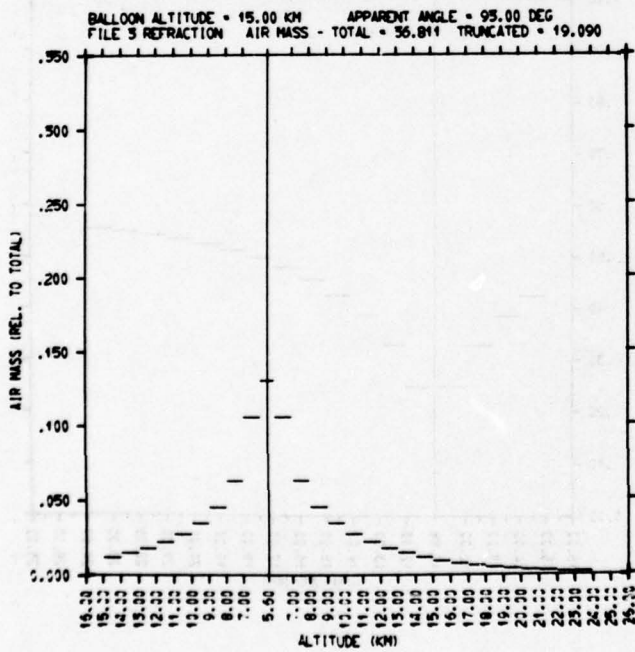
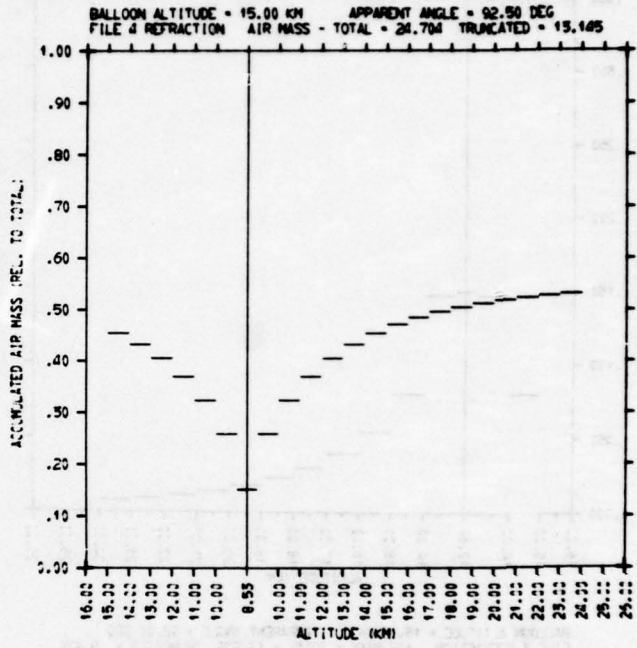
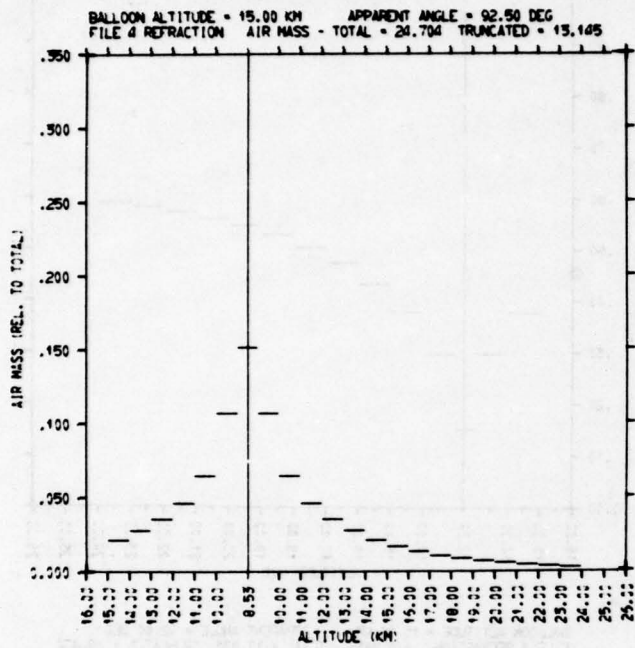
ALT (KM)	Z-ANG (DEG)	TEMP (DEG K)	PRESSURE (PA)	EFFECT TEMP (DEG K)	EFFECT PRESSURE (PA)	DEL (DM)	ACCUM DEL (DM)	DEL(P-DM)	DEL (T-DM)	DEL (PATH) (KM)	ACCUM DEL (PATH) (KM)
8.0	90.0	248.0	3.739E+04	248.0	3.739E+04	3.192E-02	3.192E-02	1.193E+03	7.916E+00	6.295E-01	6.295E-01
8.0	90.0	248.0	3.739E+04	248.0	3.628E+04	5.751E+00	5.783E+00	2.087E+05	1.426E+03	1.170E+02	1.170E+02
9.0	91.0	242.0	3.256E+04	242.0	3.107E+04	2.079E+00	7.862E+00	6.460E+04	5.032E+02	4.823E+01	1.659E+02
10.0	91.4	235.0	2.826E+04	235.0	2.689E+04	1.417E+00	9.279E+00	3.809E+04	3.330E+02	3.688E+01	2.028E+02
11.0	91.7	229.0	2.443E+04	229.0	2.319E+04	1.056E+00	1.034E+01	2.449E+04	2.418E+02	3.106E+01	2.339E+02
12.0	92.0	222.0	2.103E+04	222.0	1.993E+04	8.227E-01	1.116E+01	1.640E+04	1.826E+02	2.730E+01	2.611E+02
13.0	92.2	216.0	1.802E+04	216.0	1.705E+04	6.511E-01	1.181E+01	1.110E+04	1.406E+02	2.457E+01	2.857E+02
14.0	92.4	216.0	1.538E+04	216.0	1.455E+04	5.111E-01	1.232E+01	7.438E+03	1.104E+02	2.259E+01	3.083E+02
15.0	92.6	216.0	1.313E+04	216.0	1.242E+04	4.059E-01	1.273E+01	5.043E+03	8.768E+01	2.102E+01	3.293E+02
16.0	92.8	216.0	1.121E+04	216.0	1.061E+04	3.253E-01	1.305E+01	3.450E+03	7.027E+01	1.974E+01	3.490E+02
17.0	93.0	216.0	9.572E+03	216.0	9.053E+03	2.625E-01	1.331E+01	2.377E+03	5.671E+01	1.866E+01	3.677E+02
18.0	93.1	216.0	8.172E+03	216.0	7.728E+03	2.130E-01	1.353E+01	1.646E+03	4.600E+01	1.773E+01	3.854E+02
19.0	93.3	217.0	6.977E+03	217.0	6.600E+03	1.729E-01	1.370E+01	1.141E+03	3.755E+01	1.694E+01	4.024E+02
20.0	93.4	218.0	5.961E+03	218.0	5.640E+03	1.411E-01	1.384E+01	7.956E+02	3.075E+01	1.624E+01	4.186E+02
21.0	93.6	219.0	5.097E+03	219.0	4.823E+03	1.156E-01	1.396E+01	5.573E+02	2.531E+01	1.563E+01	4.342E+02
22.0	93.7	220.0	4.361E+03	220.0	4.128E+03	9.494E-02	1.405E+01	3.919E+02	2.089E+01	1.507E+01	4.493E+02
23.0	93.8	222.0	3.734E+03	222.0	3.536E+03	7.801E-02	1.413E+01	2.759E+02	1.732E+01	1.459E+01	4.639E+02
24.0	94.0	223.0	3.202E+03	223.0	3.033E+03	6.457E-02	1.419E+01	1.958E+02	1.440E+01	1.414E+01	4.788E+02
25.0	94.1	224.0	2.748E+03	224.0	2.603E+03	5.362E-02	1.425E+01	1.396E+02	1.201E+01	1.374E+01	4.918E+02
26.0	94.2	224.0	2.359E+03	224.0	2.235E+03	4.479E-02	1.429E+01	1.001E+02	1.003E+01	1.337E+01	5.051E+02
27.0	94.3	224.0	2.025E+03	224.0	1.918E+03	3.748E-02	1.433E+01	7.190E+01	8.395E+00	1.303E+01	5.182E+02
28.0	94.5	224.0	1.739E+03	224.0	1.647E+03	3.140E-02	1.436E+01	5.172E+01	7.034E+00	1.272E+01	5.309E+02
29.0	94.6	224.0	1.493E+03	224.0	1.414E+03	2.621E-02	1.439E+01	3.708E+01	5.872E+00	1.236E+01	5.433E+02
30.0	94.7	234.0	1.283E+03	224.0	1.218E+03	2.123E-02	1.441E+01	2.585E+01	4.968E+00	1.215E+01	5.554E+02
31.0	94.8	234.0	1.108E+03	234.0	1.052E+03	1.797E-02	1.443E+01	1.891E+01	4.205E+00	1.190E+01	5.673E+02
32.0	94.9	234.0	9.579E+02	234.0	9.093E+02	1.522E-02	1.444E+01	1.384E+01	3.562E+00	1.167E+01	5.790E+02
33.0	95.0	234.0	8.278E+02	234.0	7.858E+02	1.291E-02	1.445E+01	1.014E+01	3.020E+00	1.145E+01	5.904E+02
34.0	95.1	234.0	7.153E+02	234.0	6.792E+02	1.090E-02	1.447E+01	7.401E+00	2.550E+00	1.118E+01	6.016E+02
35.0	95.2	245.0	6.187E+02	245.0	5.886E+02	8.905E-03	1.447E+01	5.842E+00	2.182E+00	1.104E+01	6.126E+02
36.0	95.3	245.0	5.381E+02	245.0	5.120E+02	7.618E-03	1.448E+01	4.866E+00	1.866E+00	1.085E+01	6.235E+02
37.0	95.4	245.0	4.681E+02	245.0	4.453E+02	6.522E-03	1.449E+01	3.900E+00	1.598E+00	1.068E+01	6.342E+02
38.0	95.5	245.0	4.072E+02	245.0	3.874E+02	5.587E-03	1.449E+01	2.164E+00	1.369E+00	1.052E+01	6.447E+02
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40.0	95.7	258.0	3.084E+02	258.0	3.084E+02	3.908E-03	1.450E+01	1.205E+00	1.008E+00	9.721E+00	6.647E+02
41.0	95.8	258.0	2.701E+02	258.0	2.701E+02	3.377E-03	1.451E+01	9.121E-01	8.712E-01	9.589E+00	6.743E+02
42.0	95.8	258.0	2.366E+02	258.0	2.366E+02	2.919E-03	1.451E+01	6.907E-01	7.532E-01	9.464E+00	6.838E+02
43.0	95.9	258.0	2.073E+02	258.0	2.073E+02	2.525E-03	1.451E+01	5.233E-01	6.514E-01	9.344E+00	6.931E+02
44.0	96.0	258.0	1.816E+02	258.0	1.816E+02	2.136E-03	1.451E+01	3.878E-01	5.511E-01	9.024E+00	7.021E+02
45.0	96.1	270.0	1.595E+02	270.0	1.595E+02	1.811E-03	1.452E+01	2.888E-01	4.889E-01	9.111E+00	7.113E+02
46.0	96.2	270.0	1.436E+02	270.0	1.406E+02	1.577E-03	1.452E+01	2.217E-01	4.258E-01	9.007E+00	7.203E+02
47.0	96.3	270.0	1.239E+02	270.0	1.239E+02	1.374E-03	1.452E+01	1.702E-01	3.711E-01	8.908E+00	7.292E+02
48.0	96.3	270.0	1.091E+02	270.0	1.091E+02	1.198E-03	1.452E+01	1.308E-01	3.235E-01	8.813E+00	7.380E+02
49.0	96.4	270.0	9.616E+01	270.0	9.616E+01	1.034E-03	1.452E+01	9.399E-02	2.791E-01	8.628E+00	7.466E+02

AIRMASS FIGURES

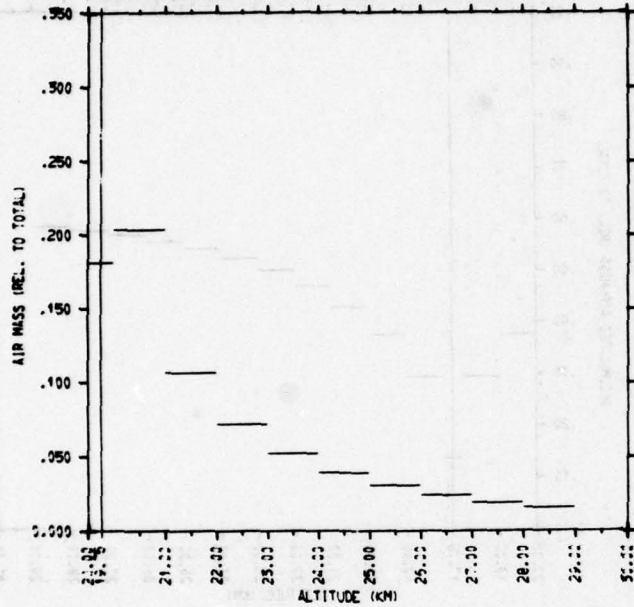




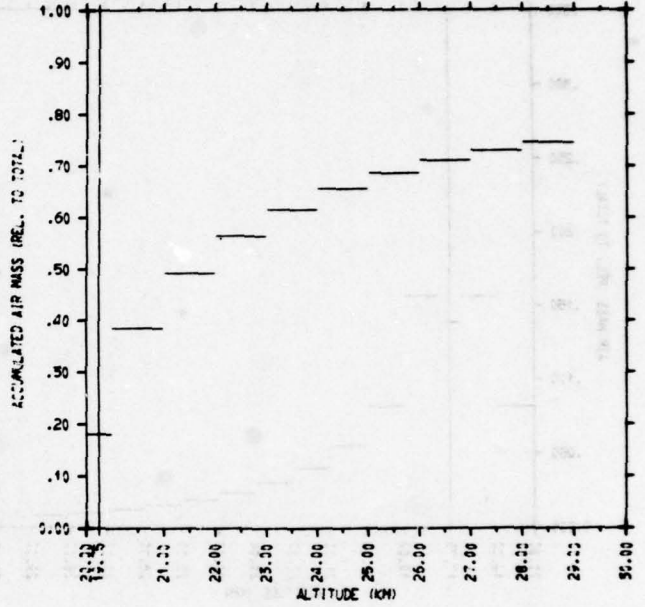




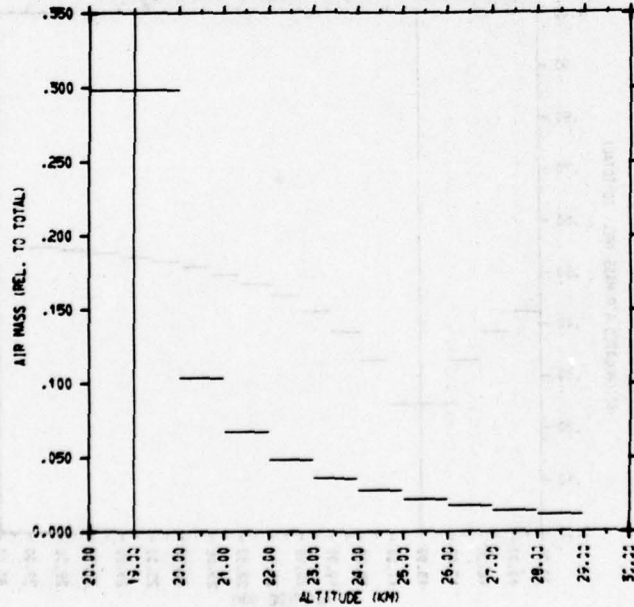
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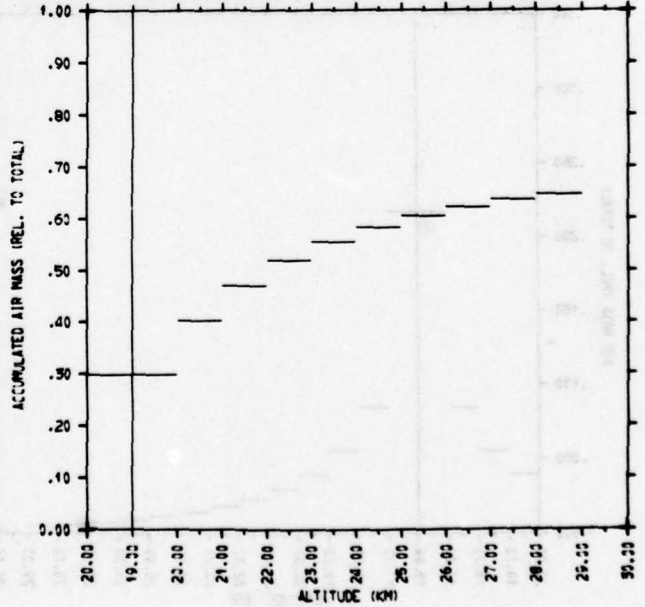
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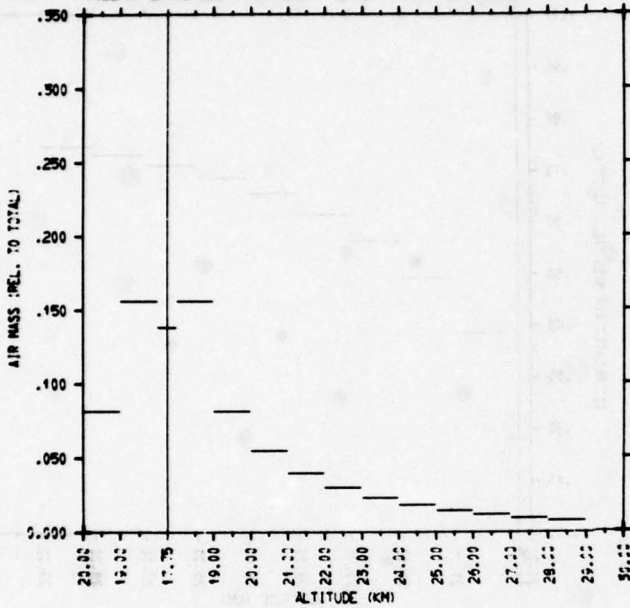
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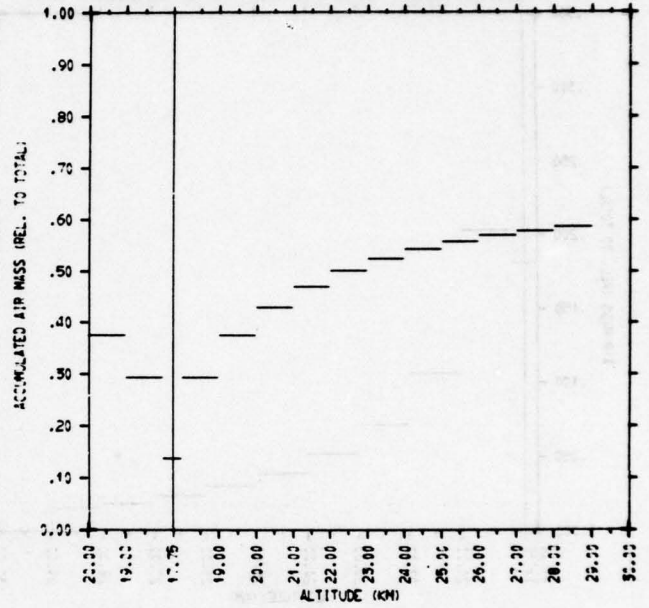
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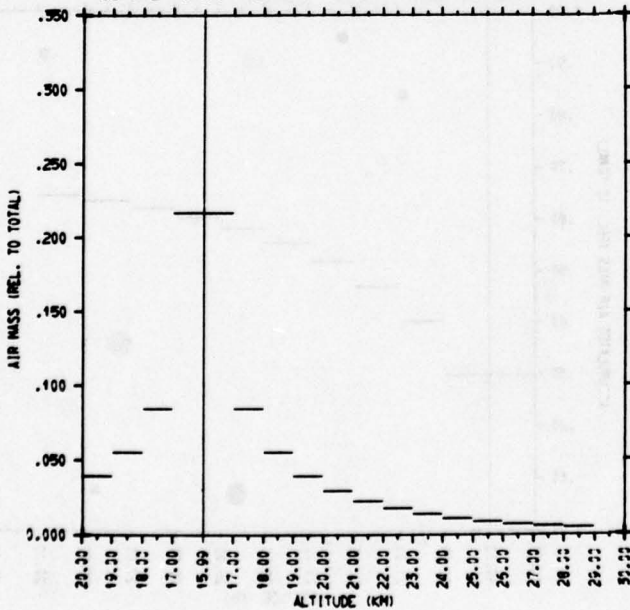
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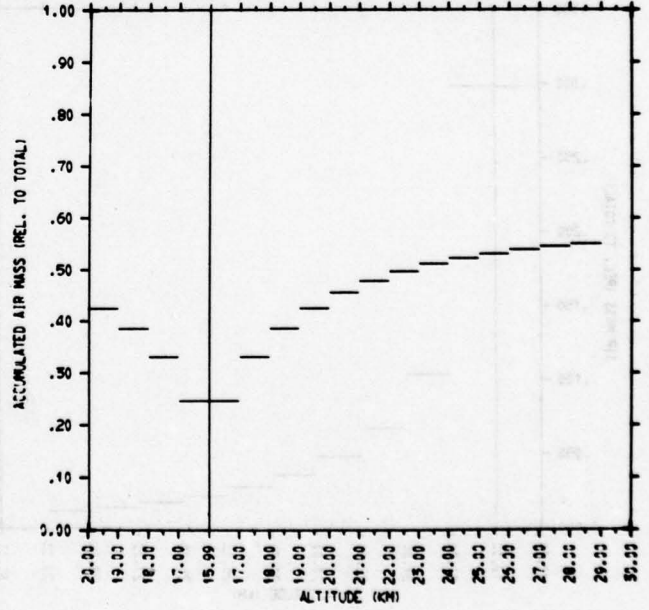
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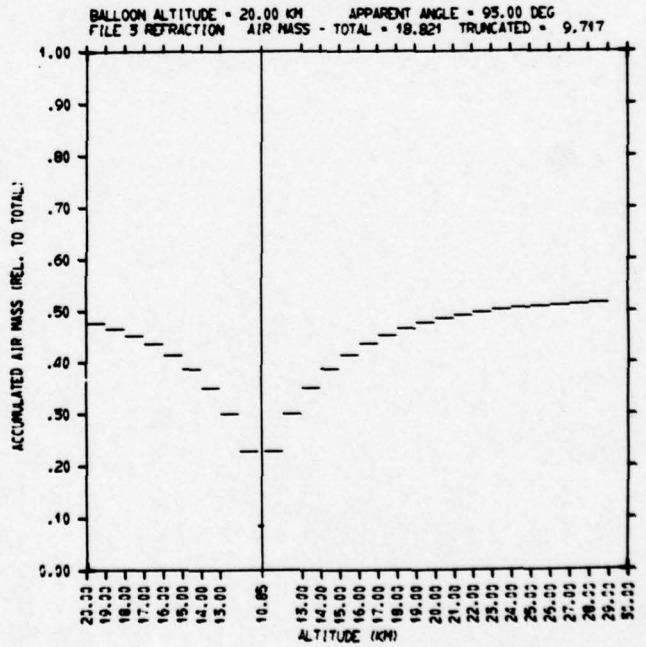
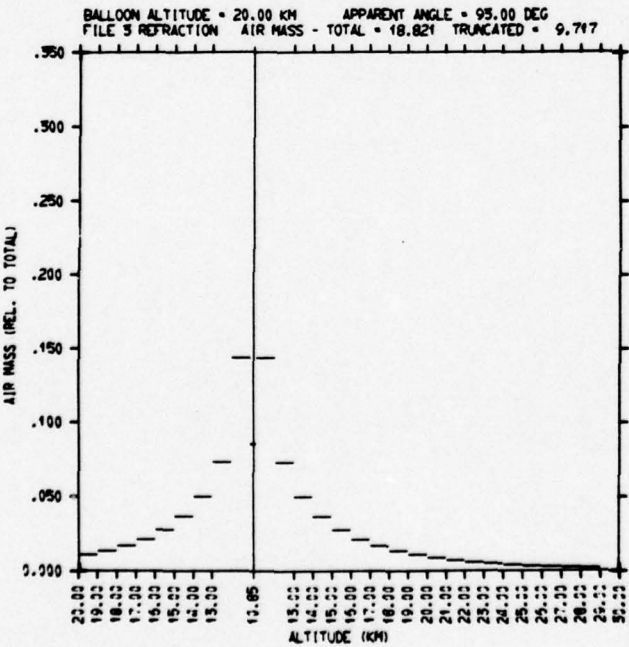
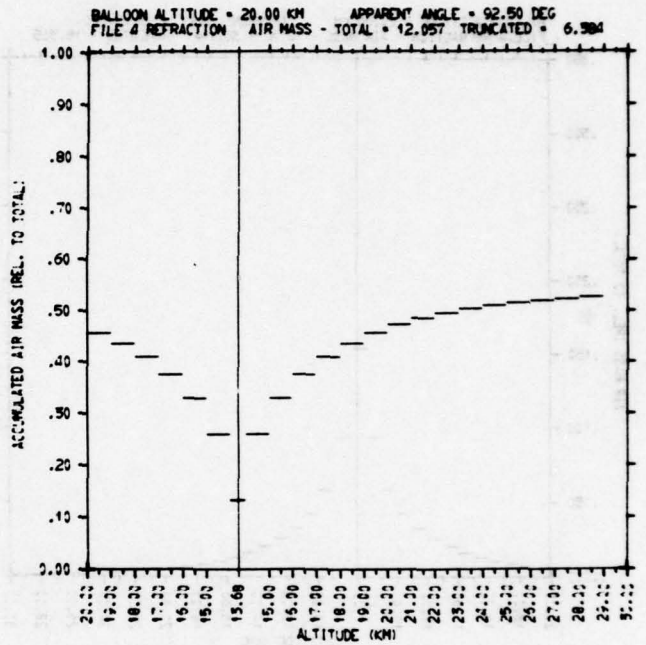
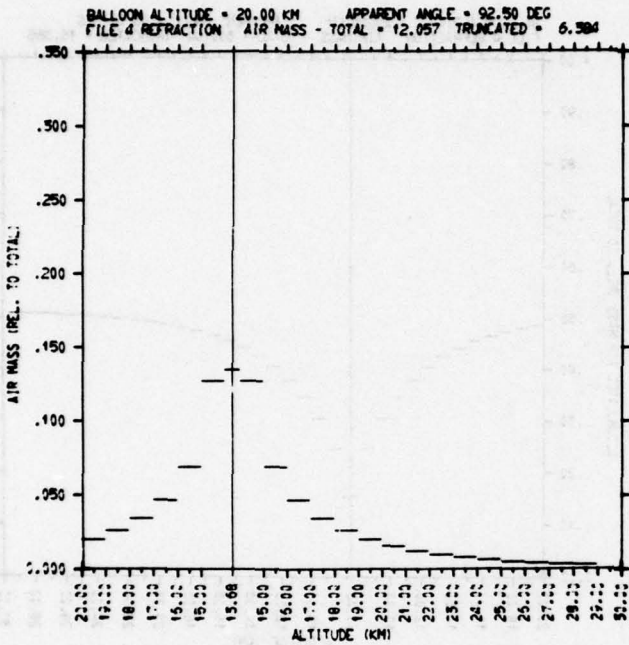


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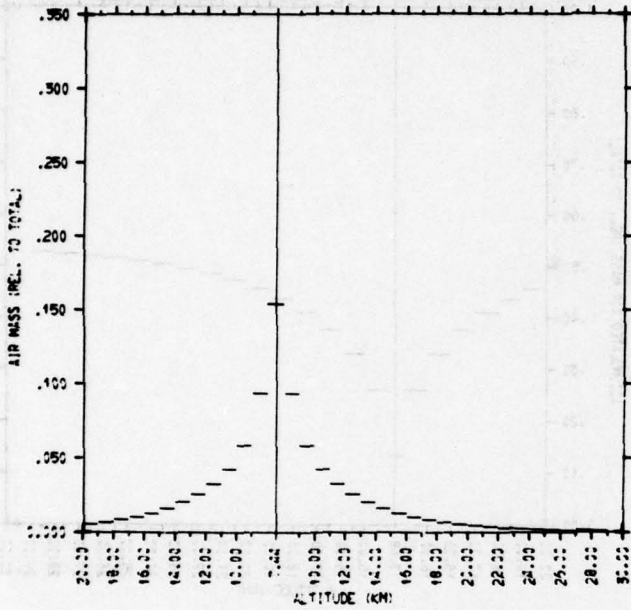


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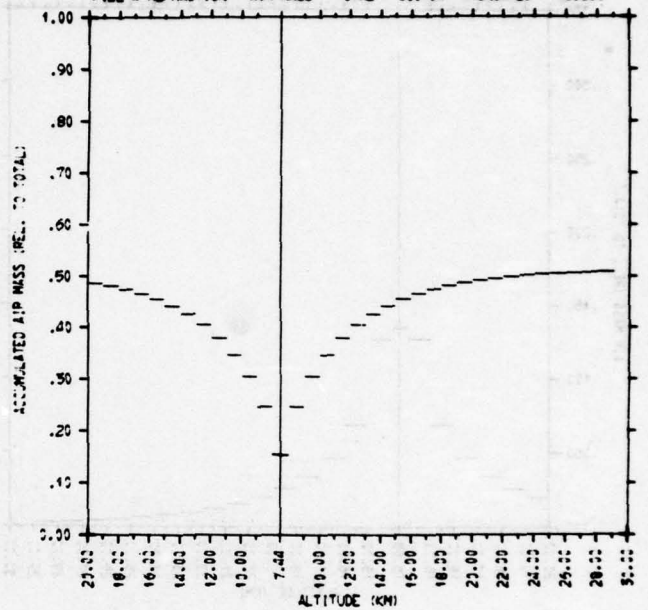




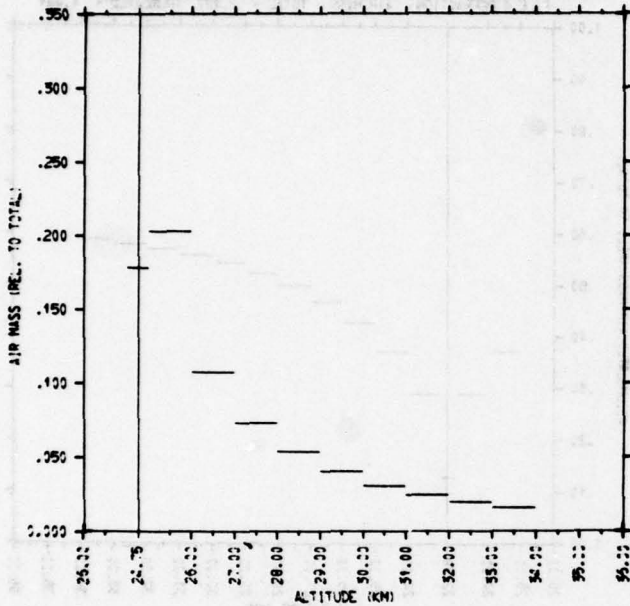
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 FILE 4 REFRACTION AIR MASS - TOTAL = 50.194 TRUNCATED = 15.365



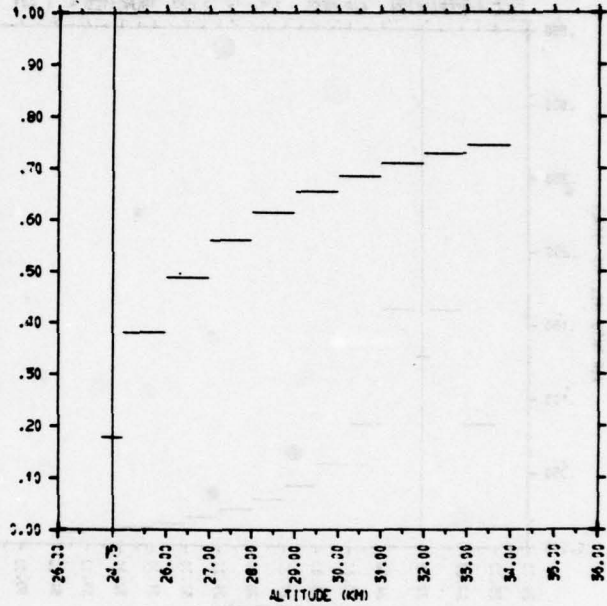
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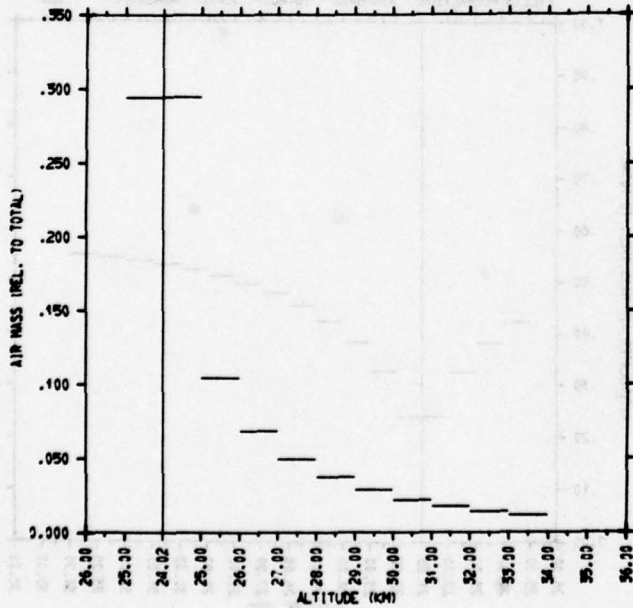
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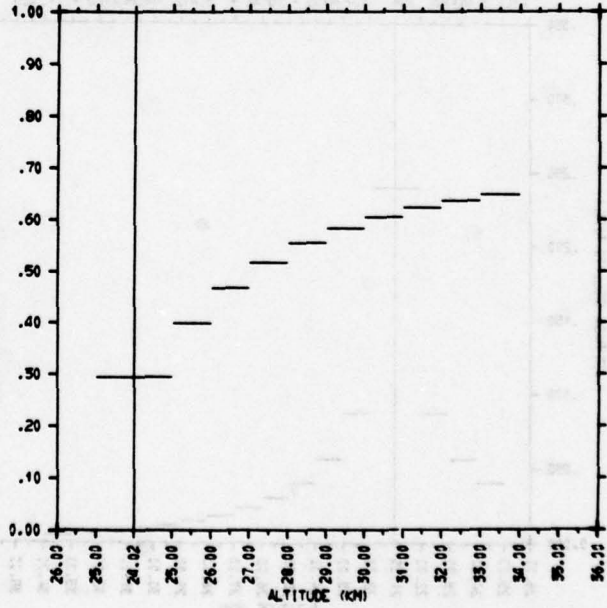
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 FILE 4 REFRACTION AIR MASS - TOTAL = 1.365 TRUNCATED = 1.052

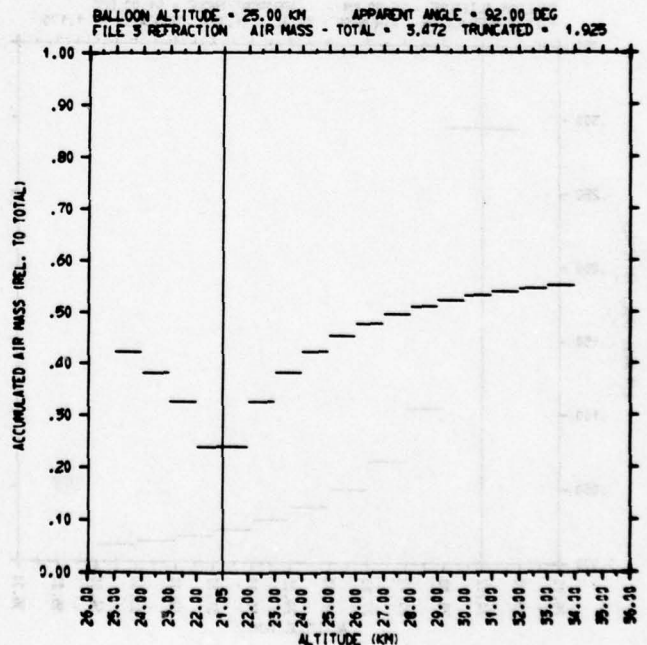
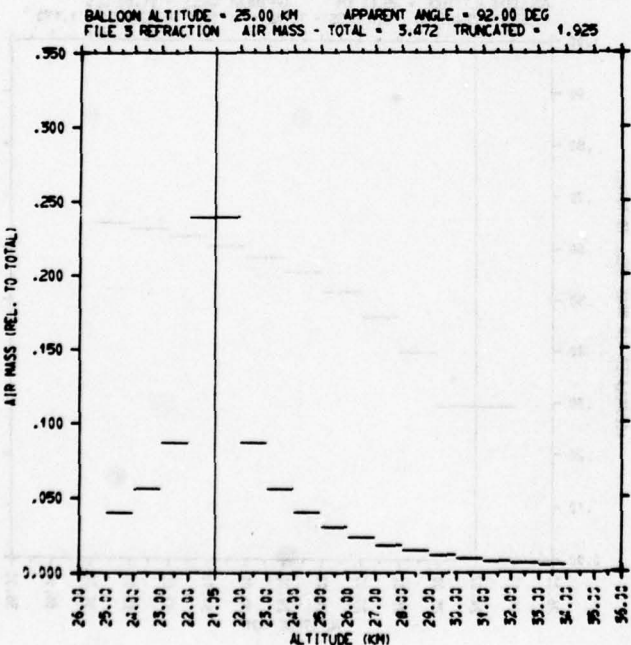
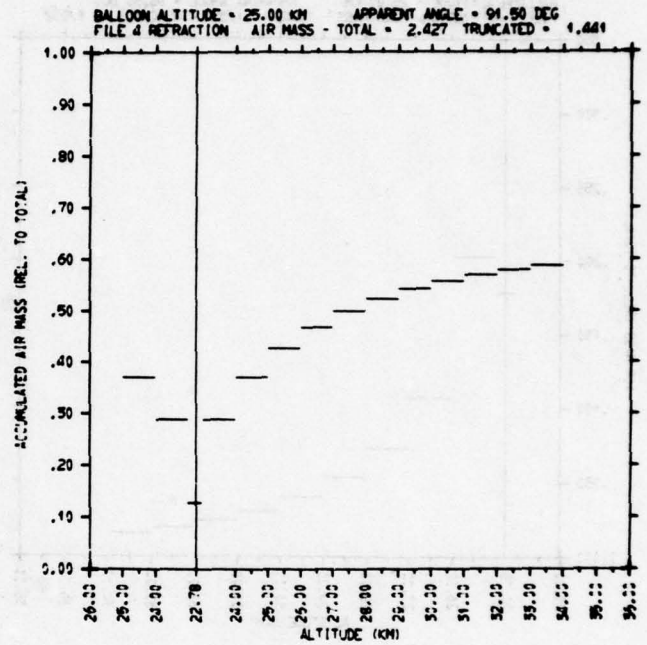
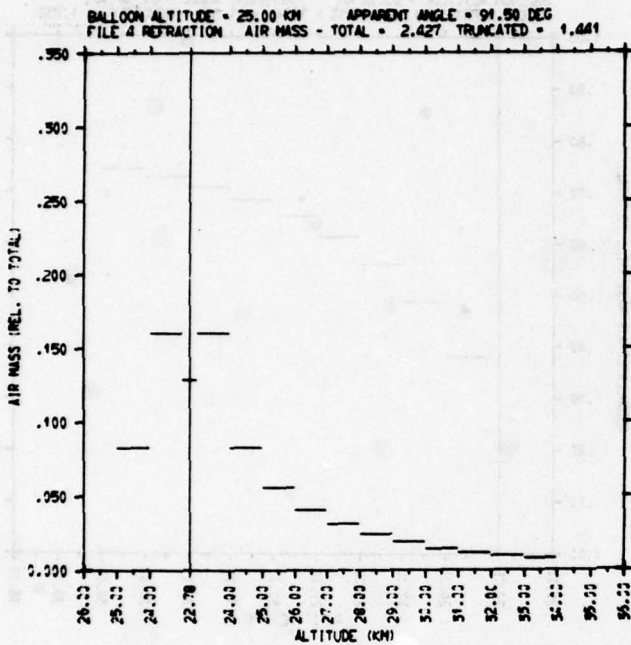


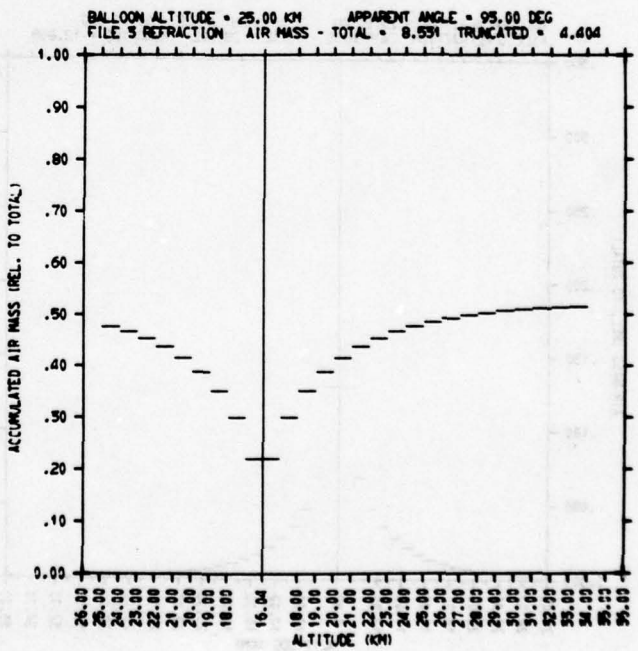
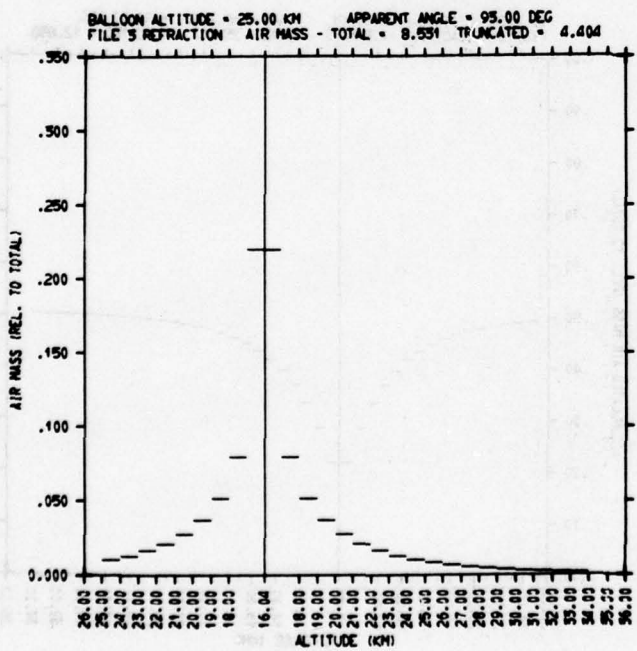
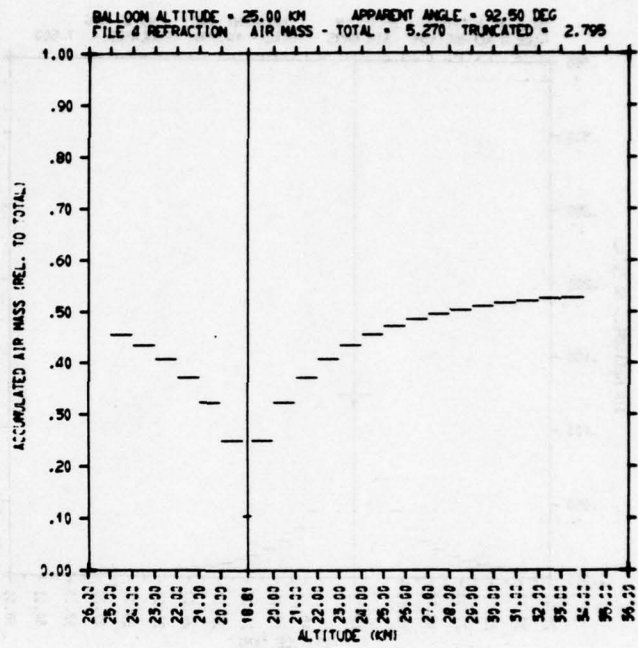
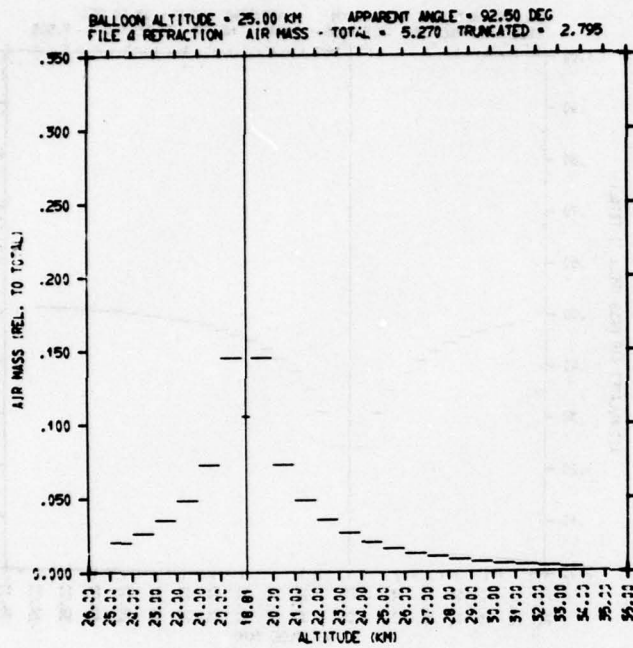
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 FILE 5 REFRACTION AIR MASS - TOTAL = 1.781 TRUNCATED = 1.170

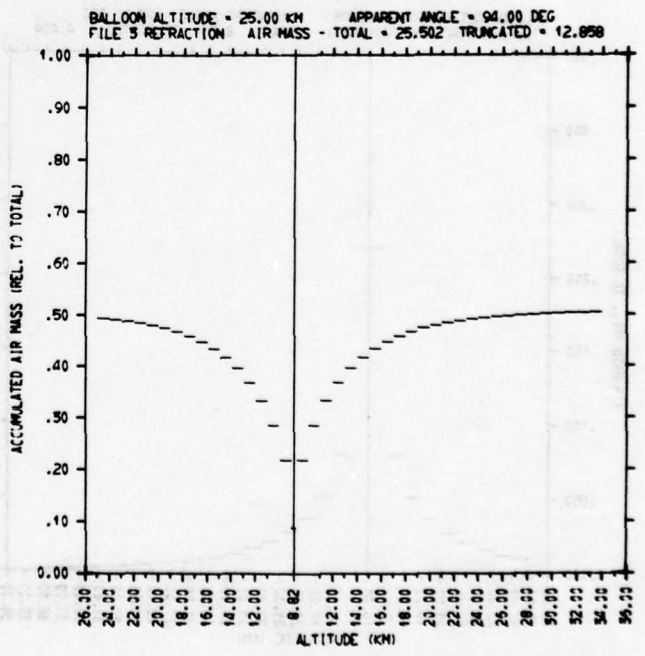
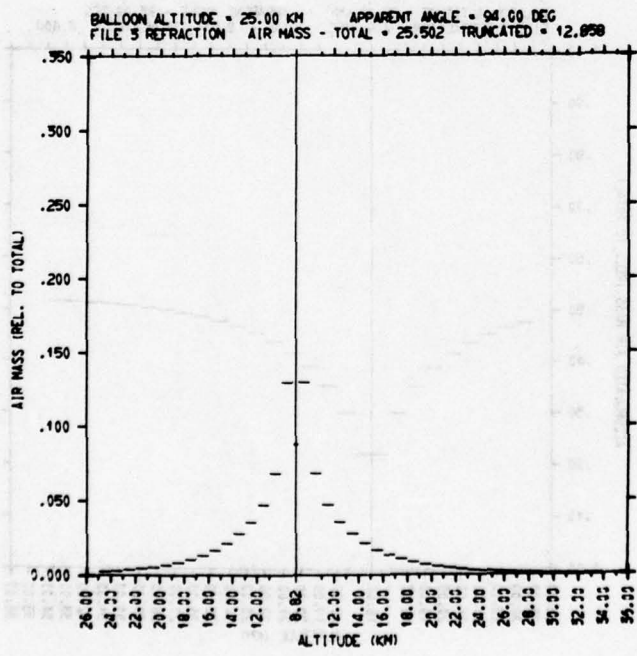
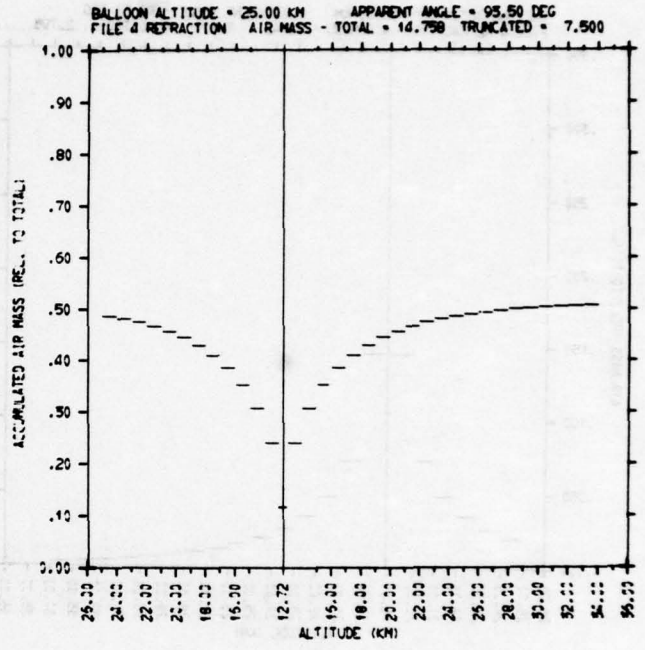
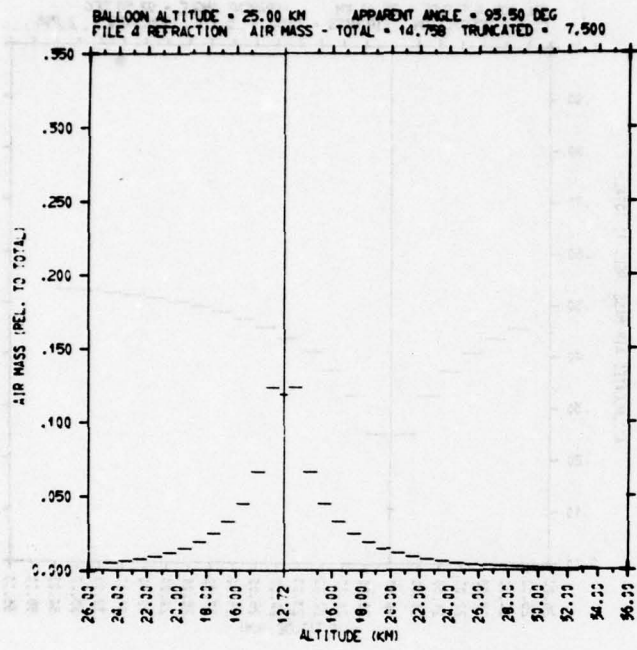


BALLOON ALTITUDE = 25.00 KM APPARENT ANGLE = 91.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = 1.781 TRUNCATED = 1.170

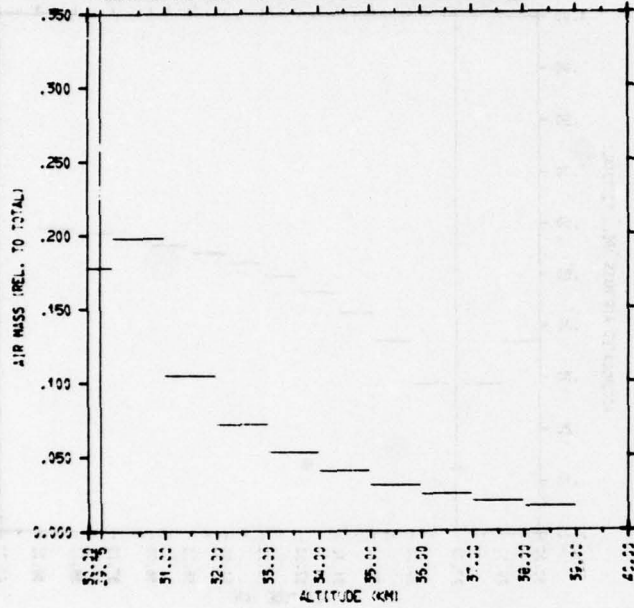




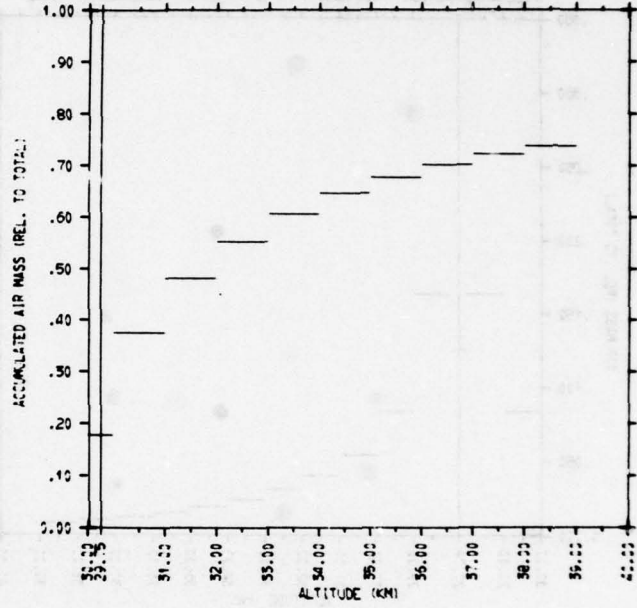




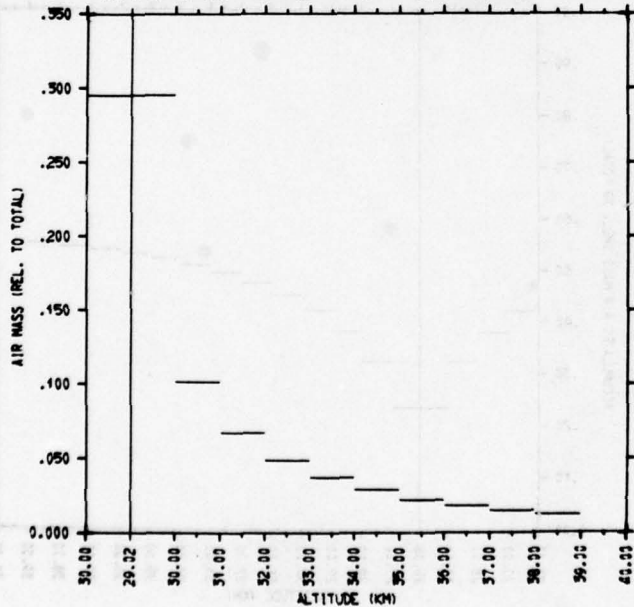
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 FILE 4 REFRACTION AIR MASS - TOTAL = .629 TRUNCATED = .472



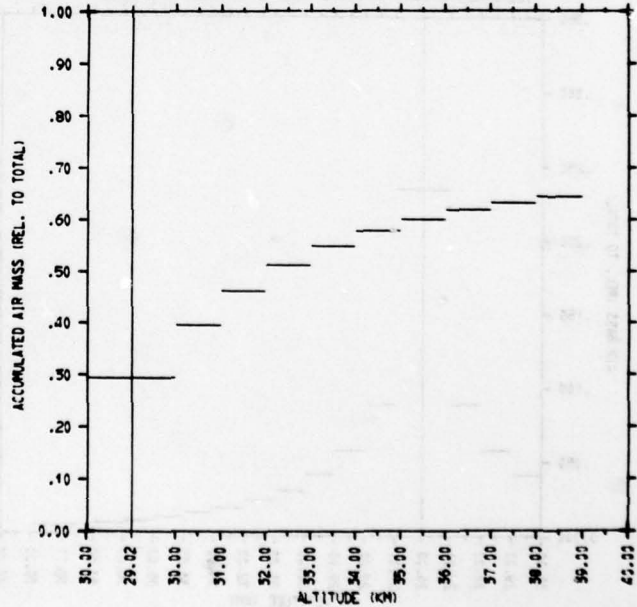
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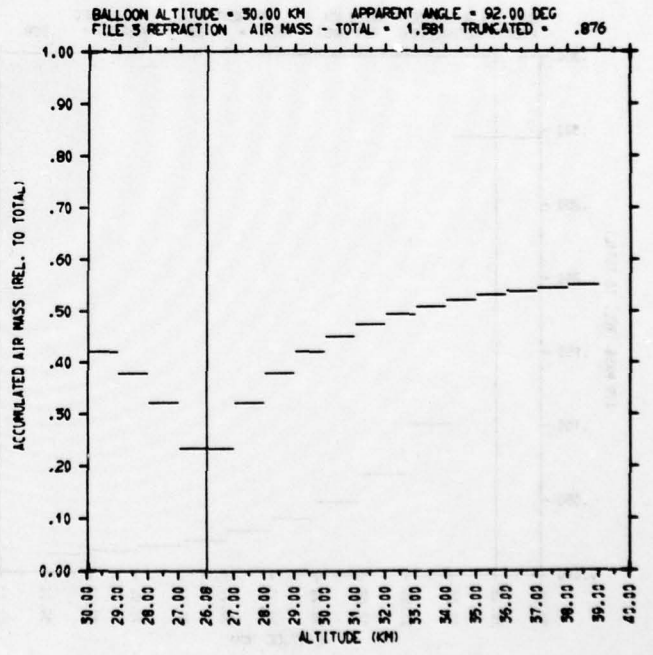
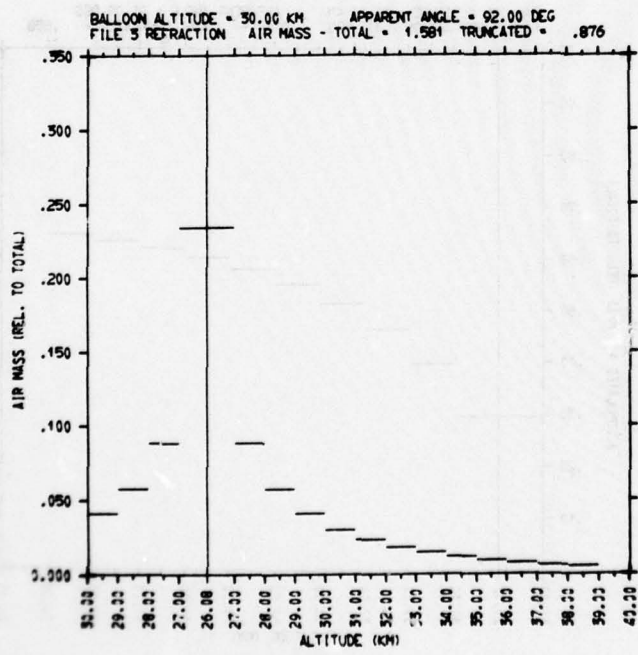
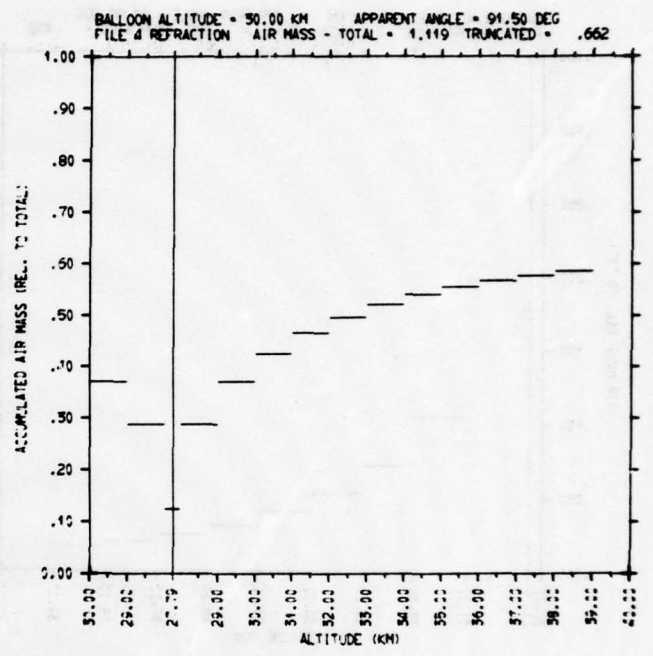
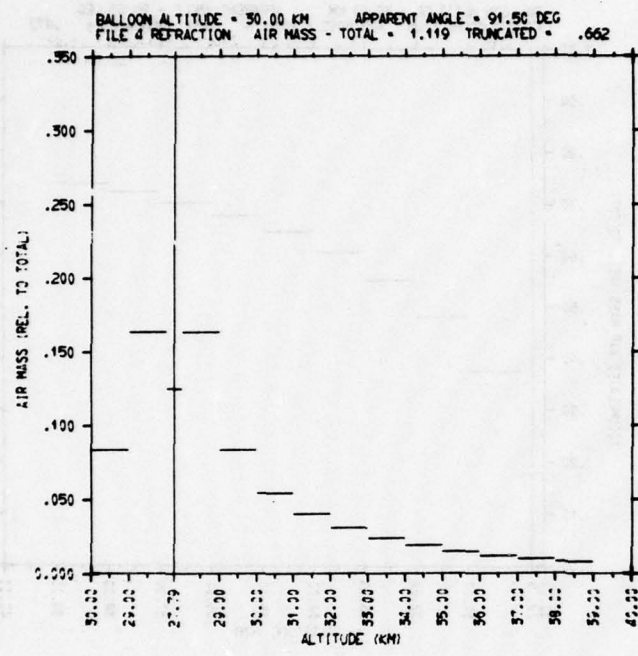


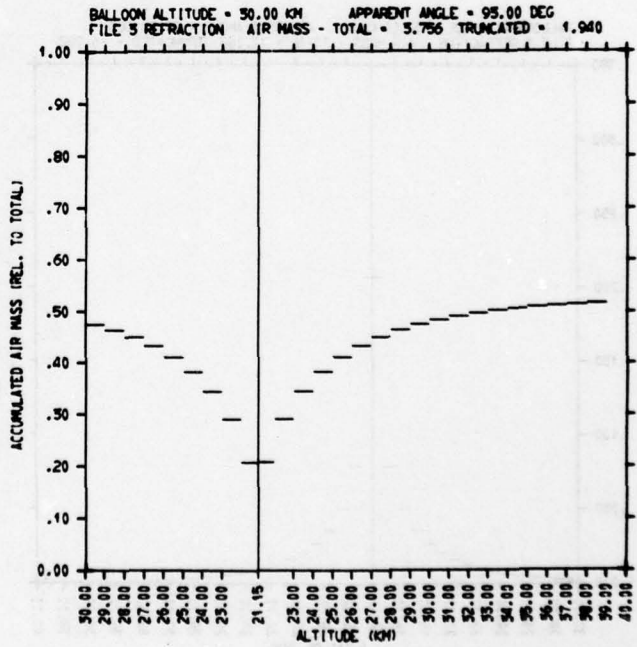
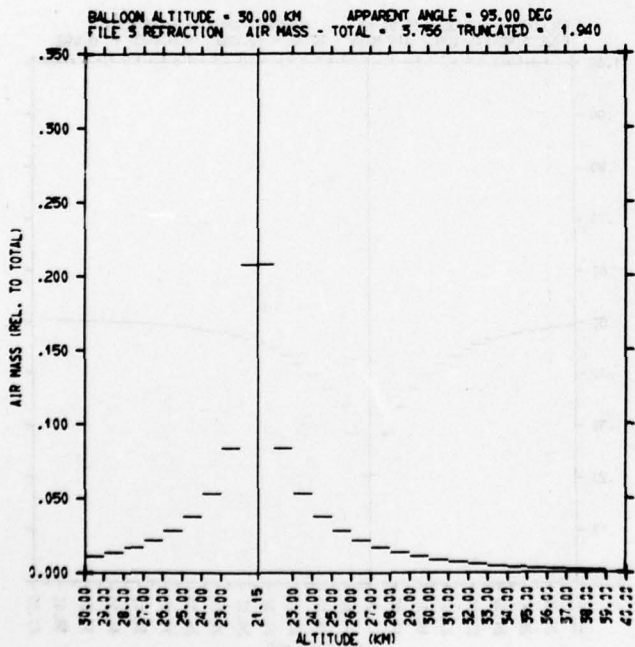
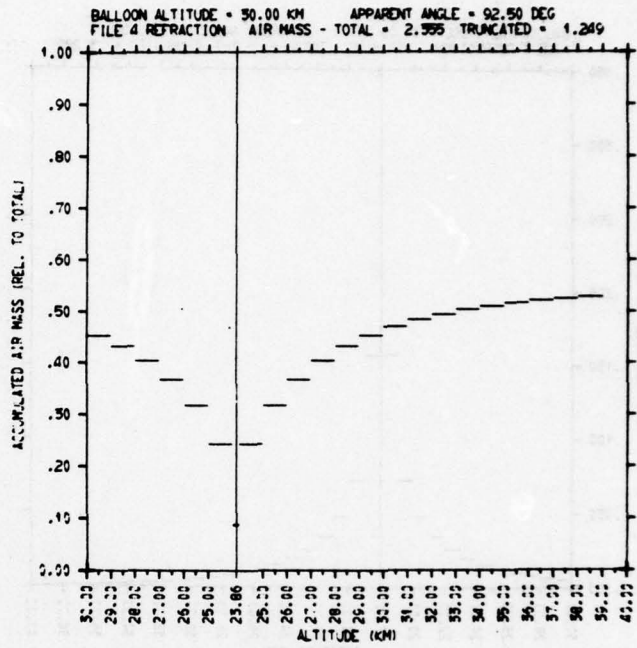
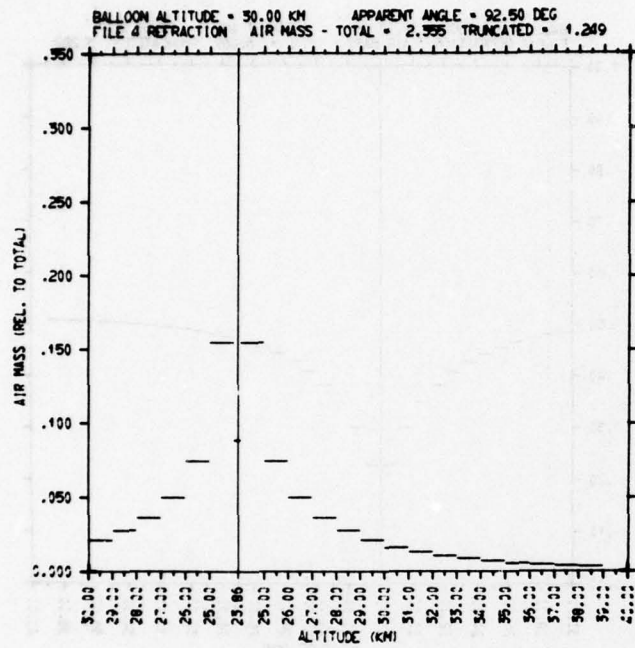
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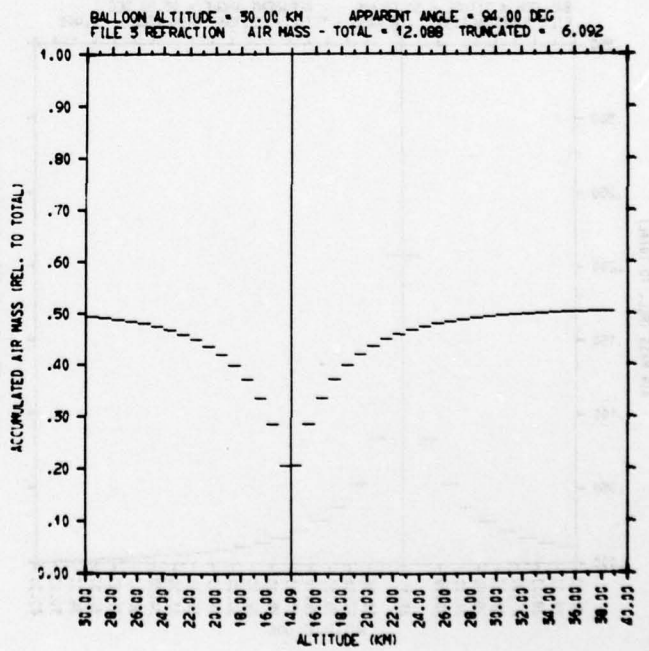
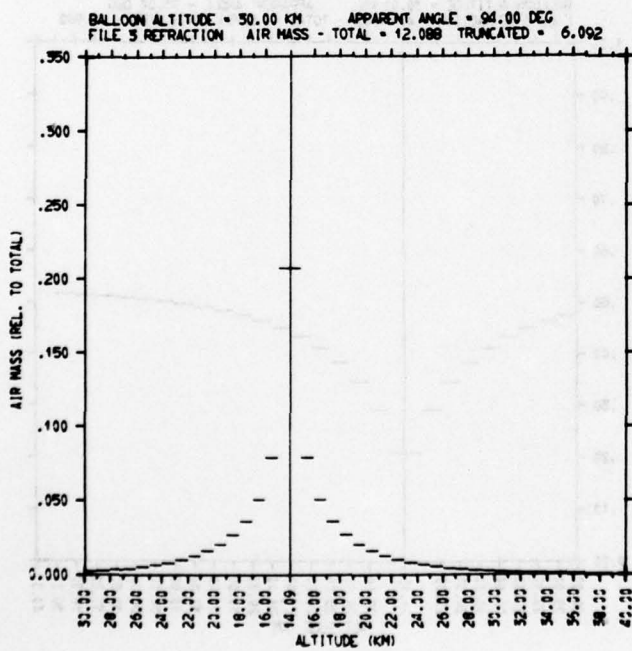
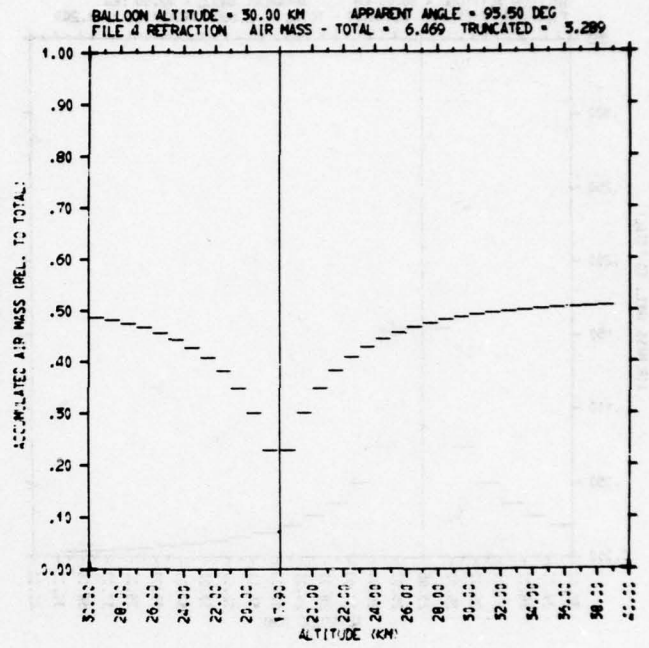
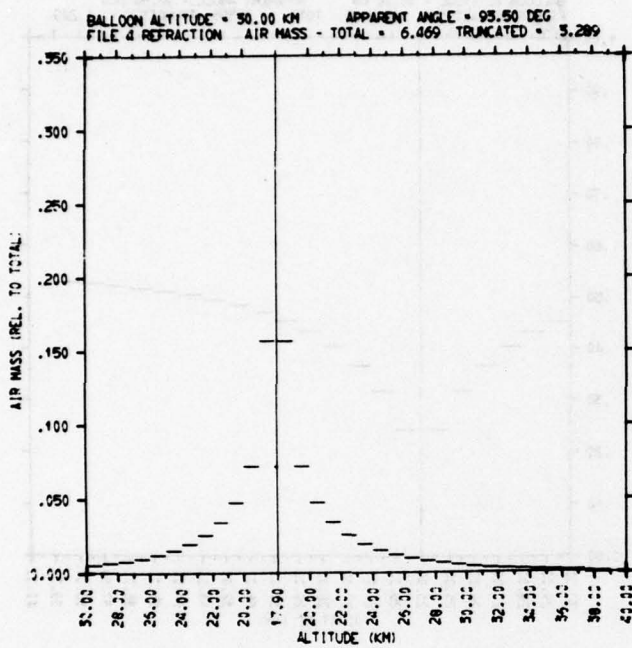


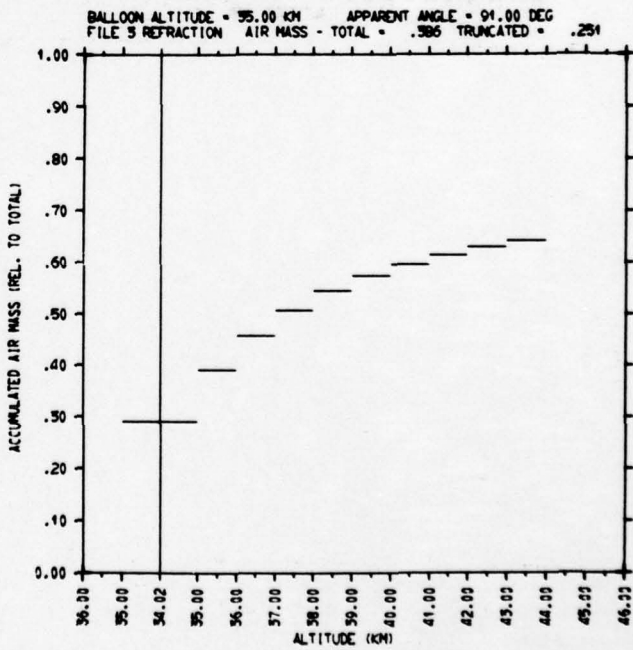
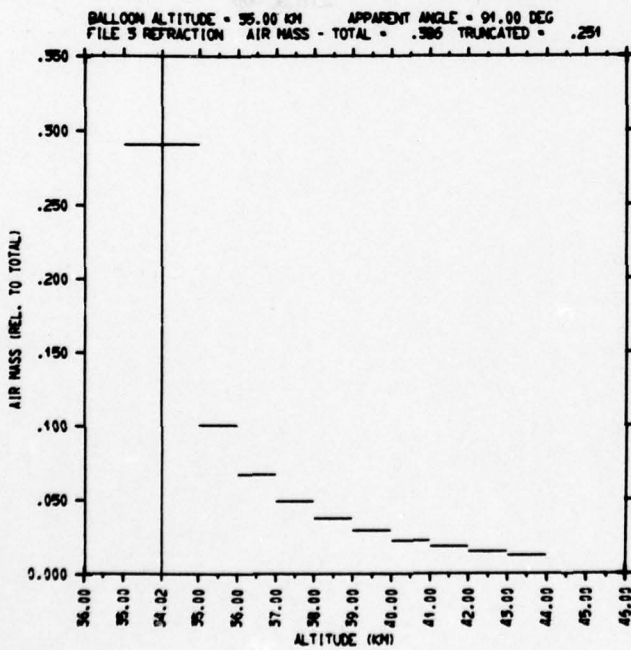
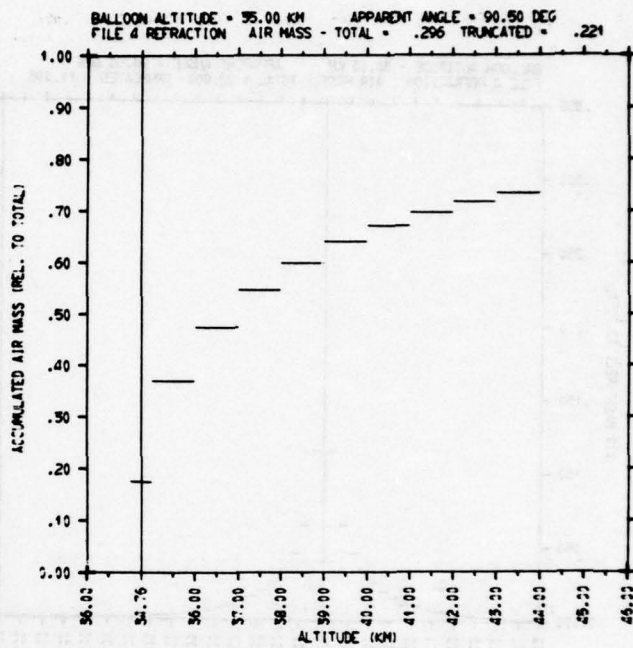
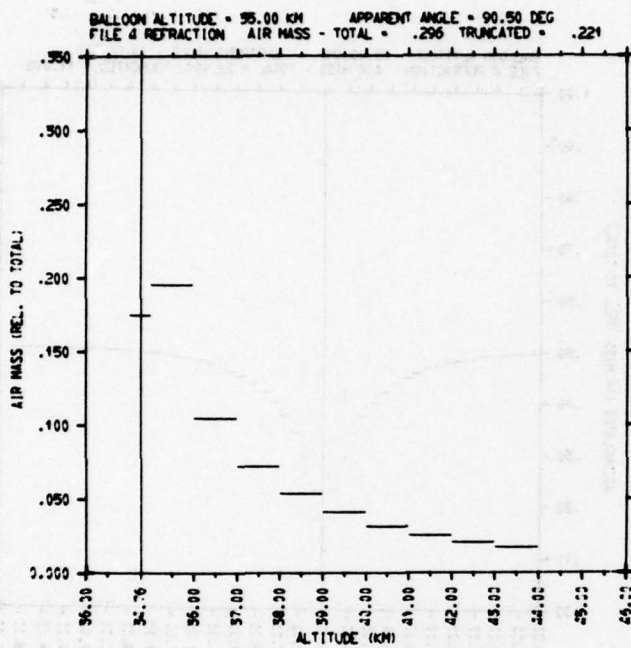
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 FILE 3 REFRACTION AIR MASS - TOTAL = .825 TRUNCATED = .598



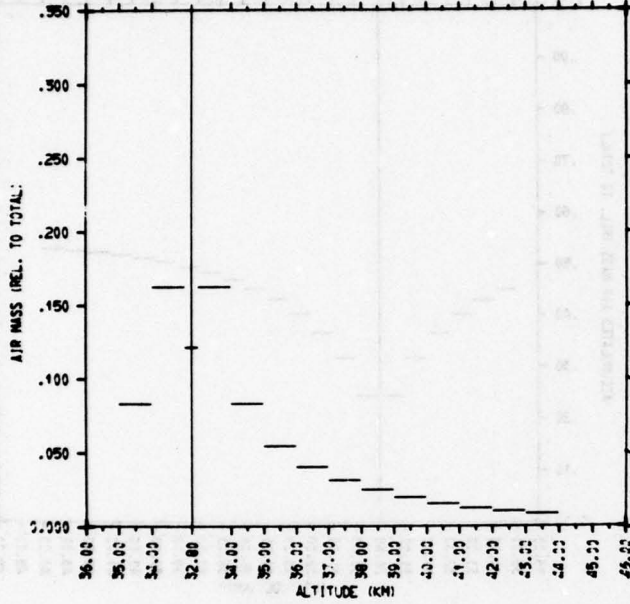




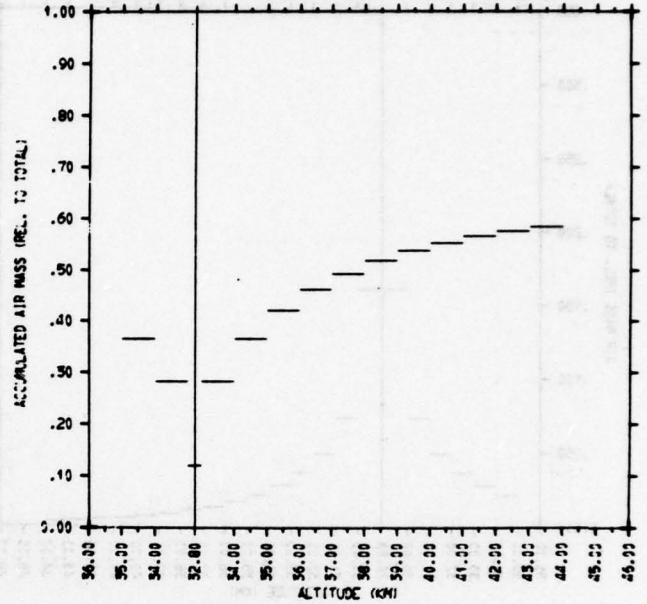




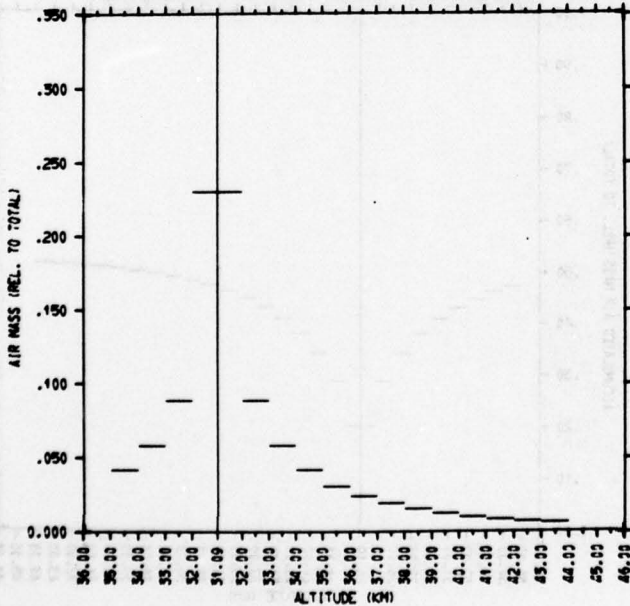
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 FILE 4 REFRACTION AIR MASS - TOTAL = .519 TRUNCATED = .507



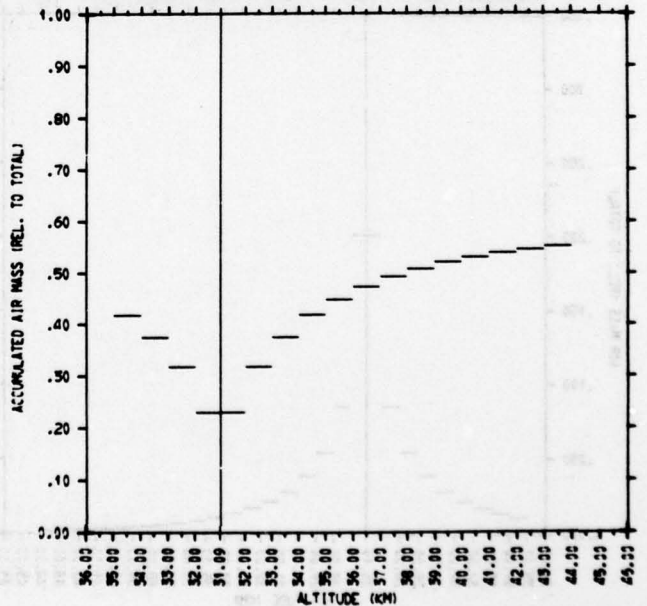
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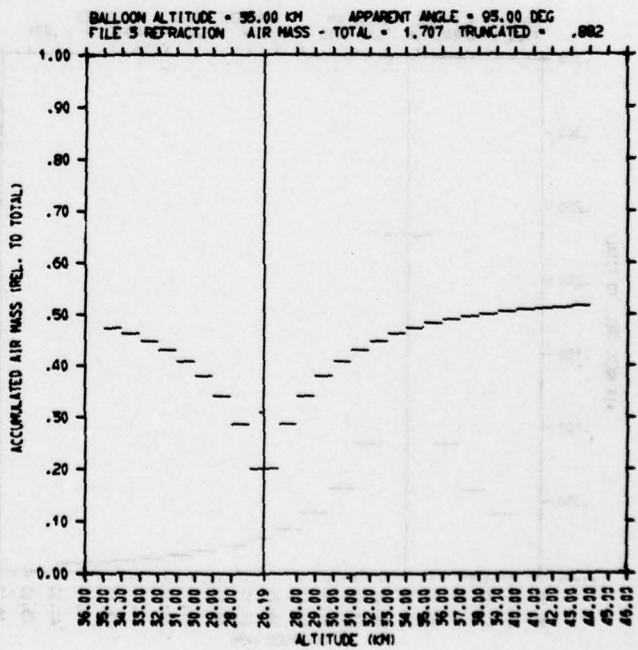
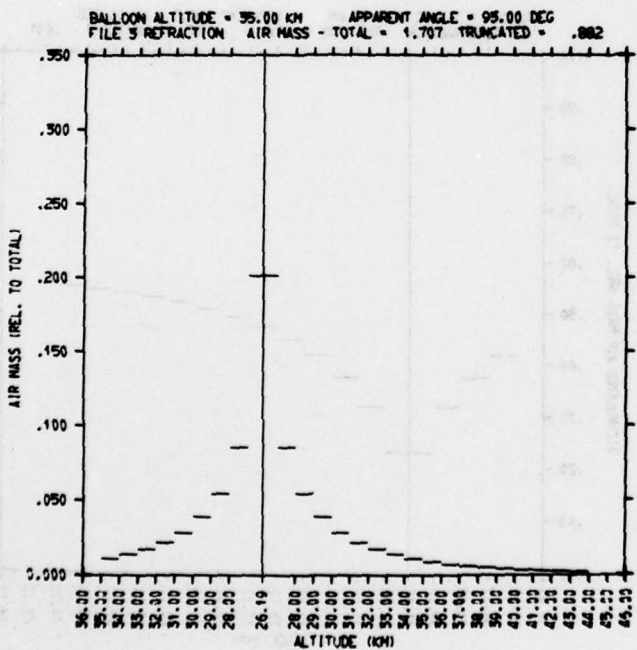
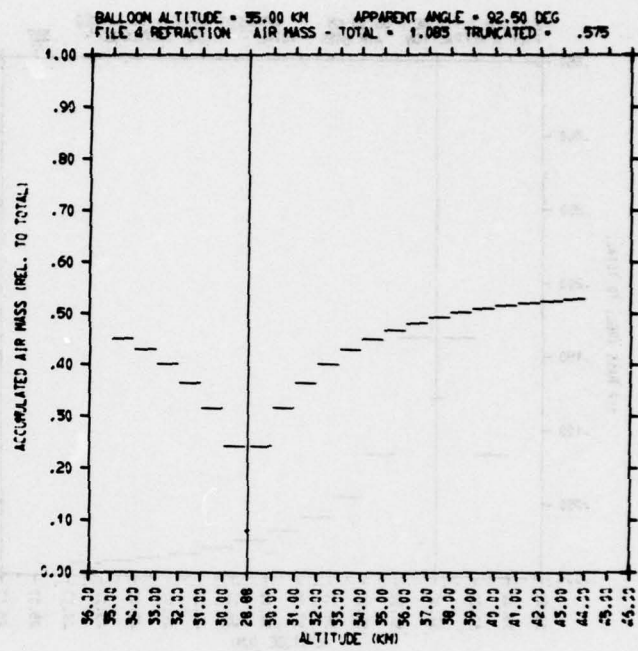
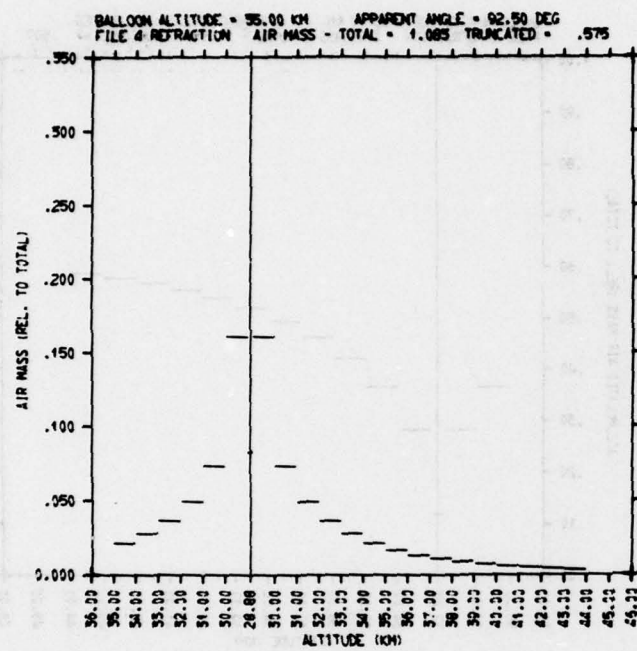


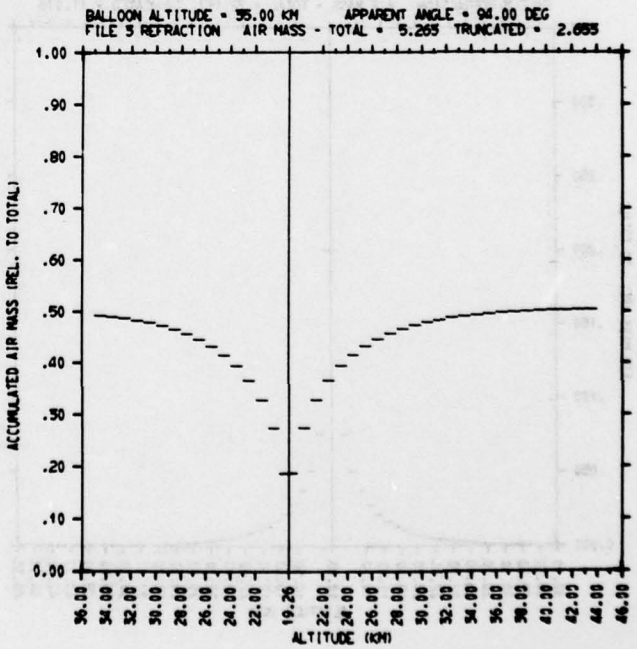
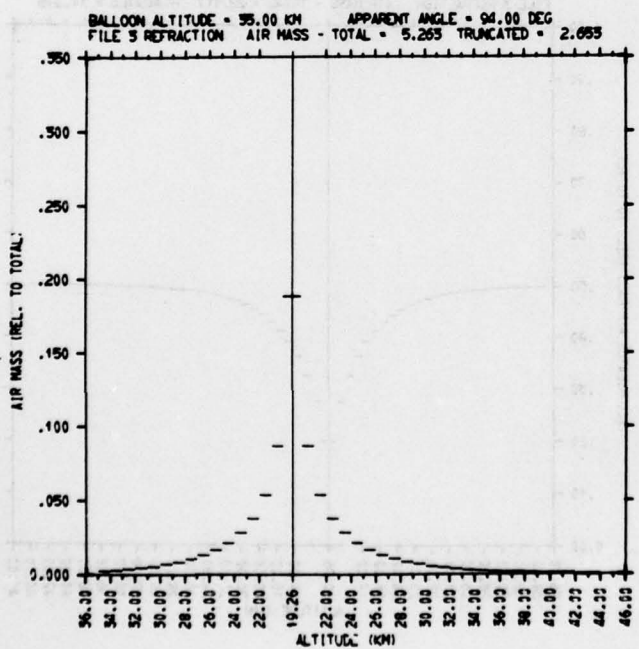
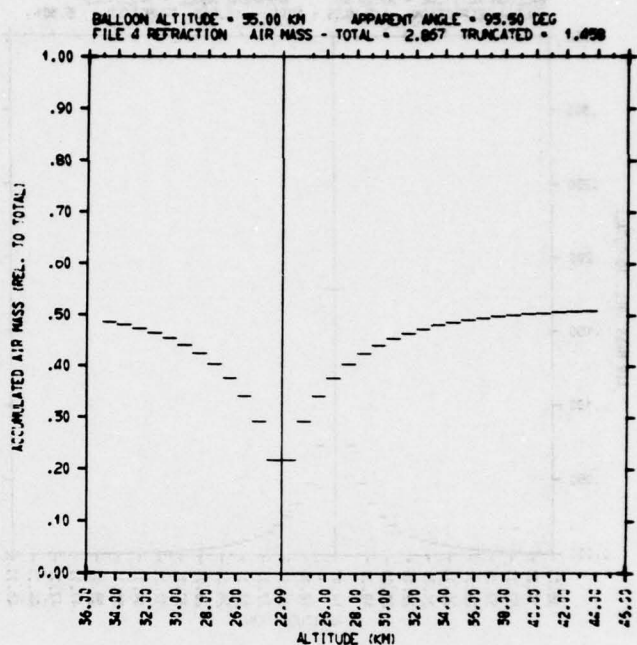
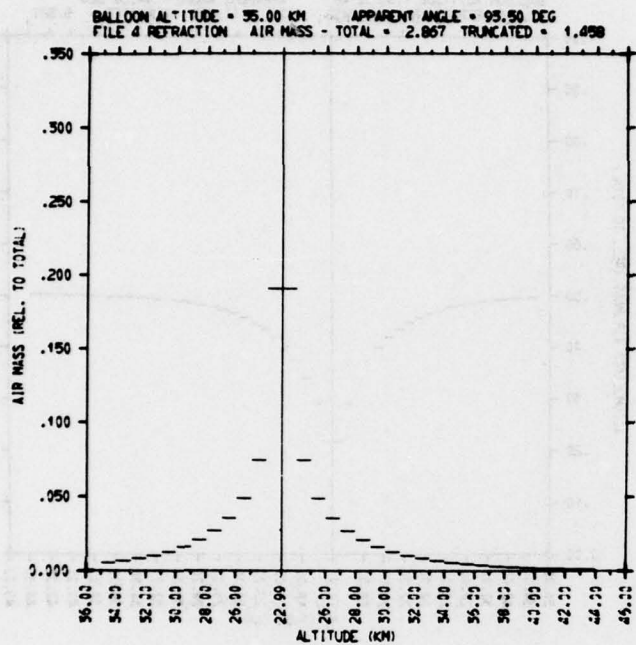
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 FILE 5 REFRACTION AIR MASS - TOTAL = .724 TRUNCATED = .401

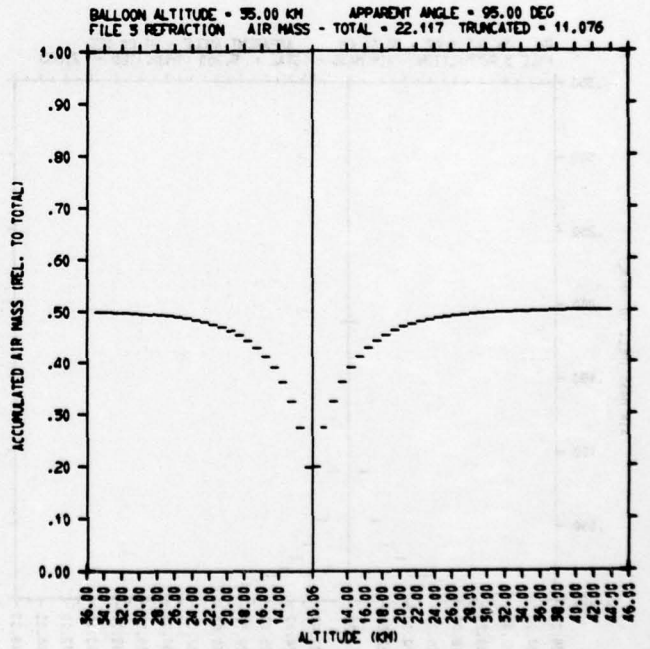
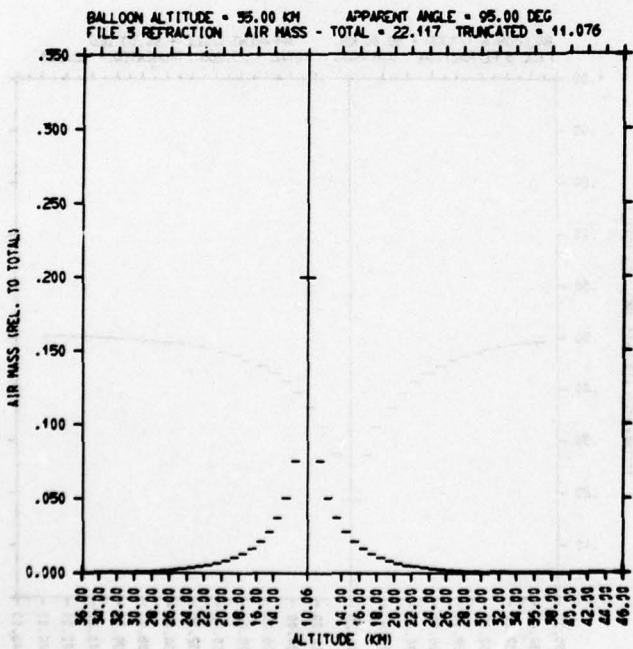
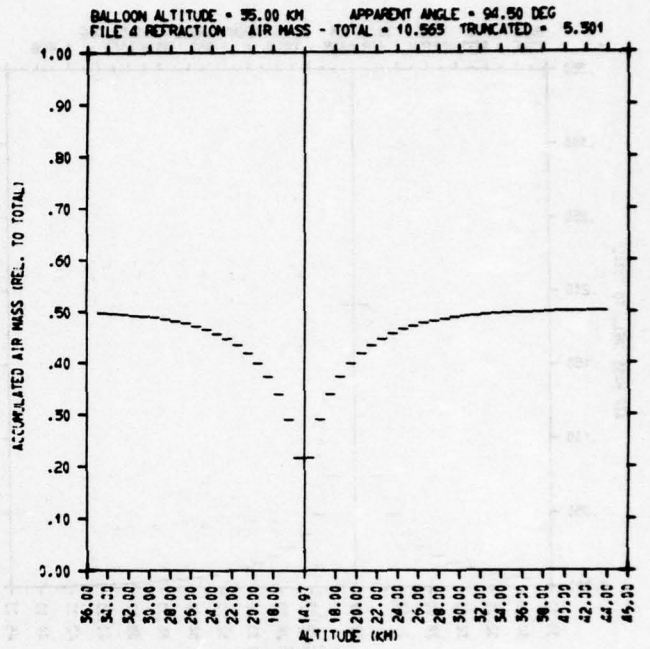
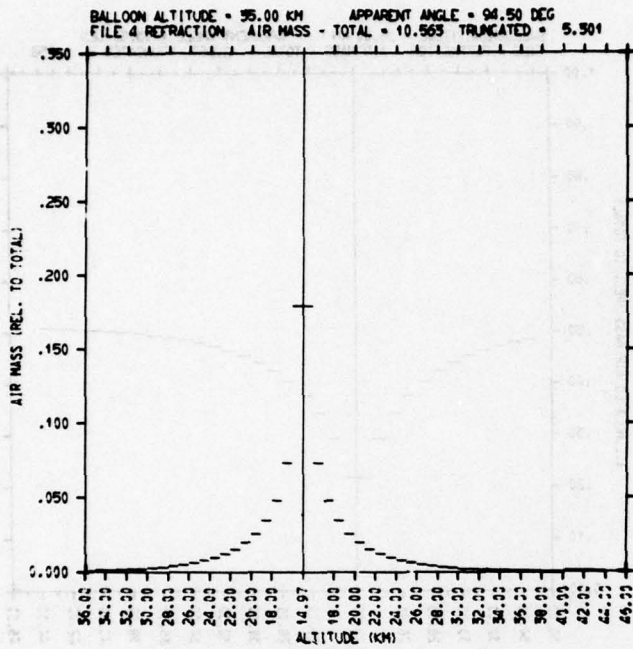


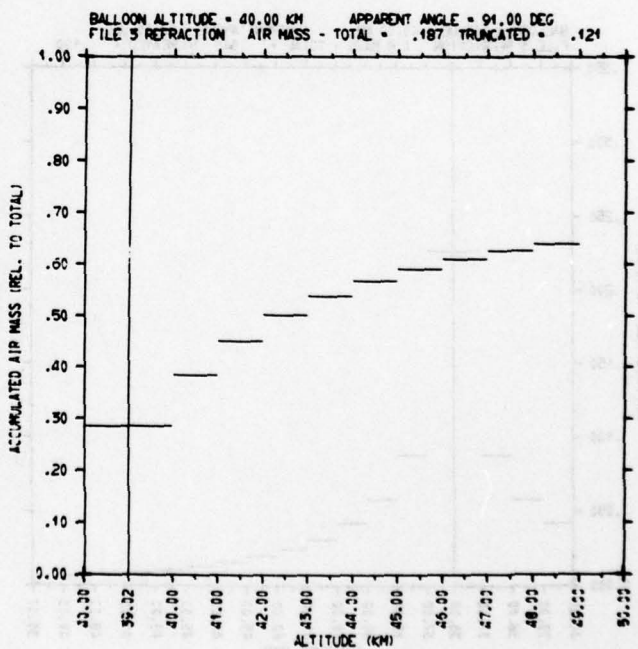
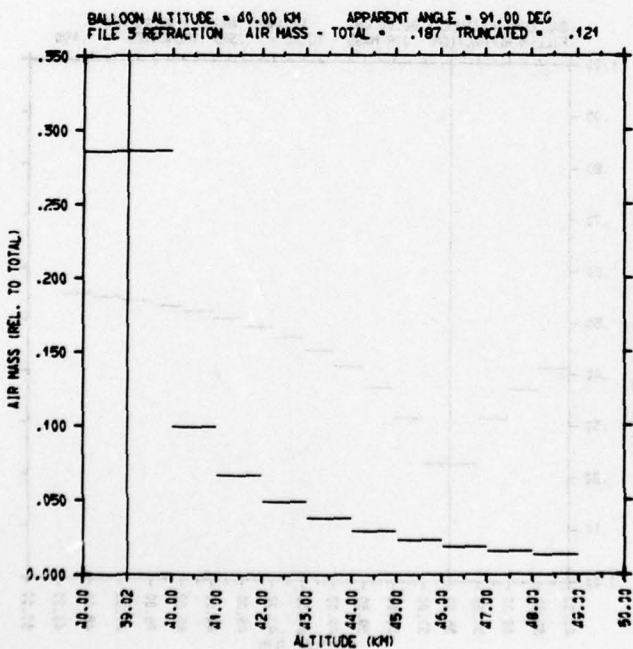
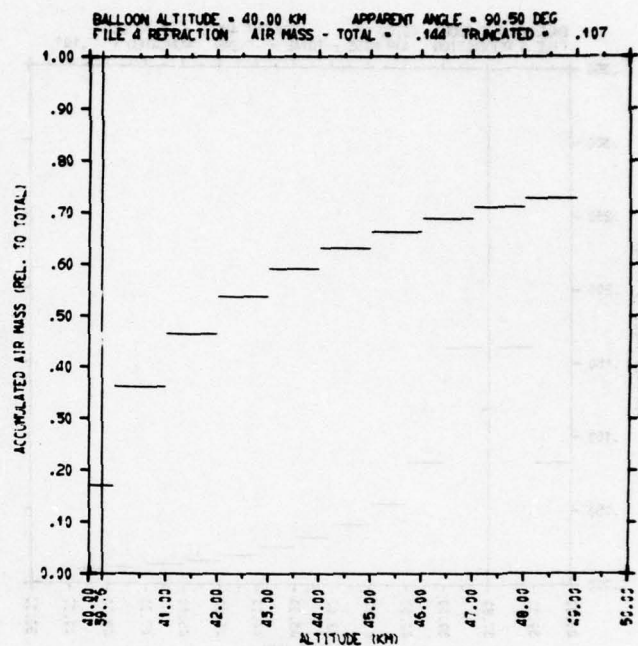
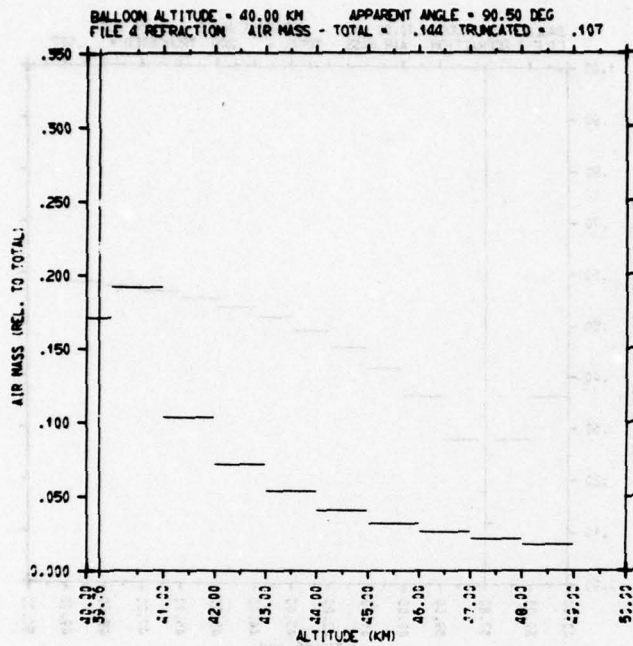
BALLOON ALTITUDE = 95.00 KM APPARENT ANGLE = 92.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .724 TRUNCATED = .401

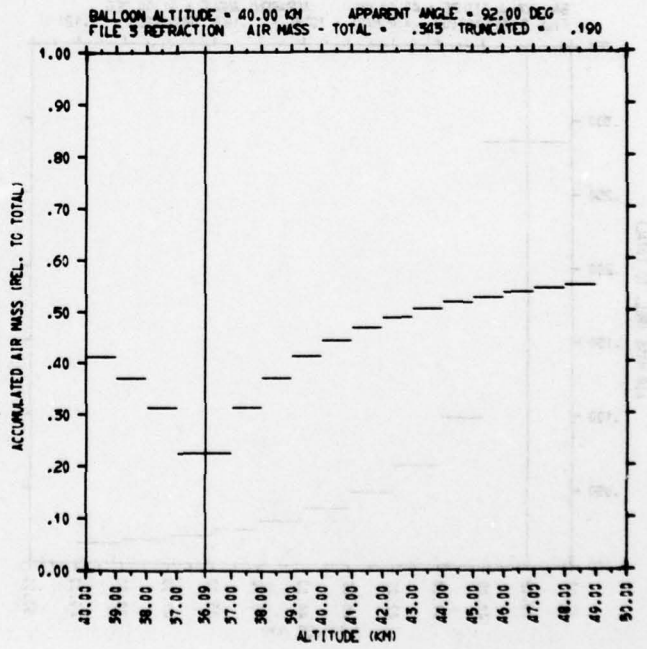
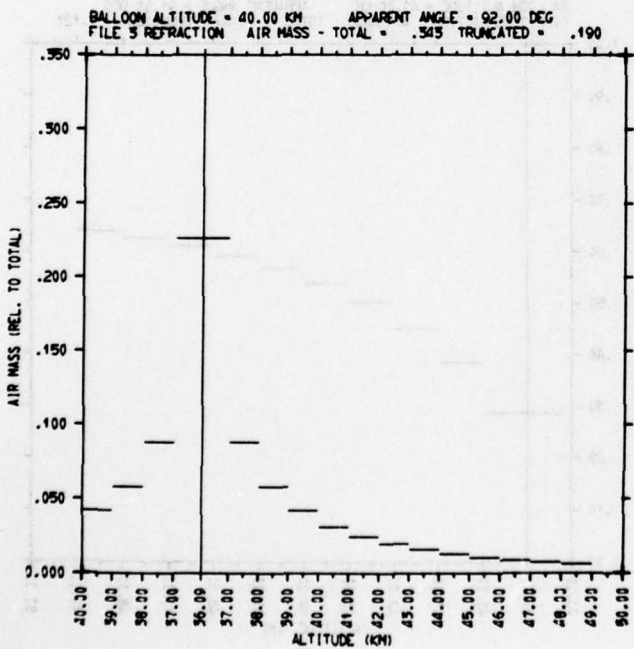
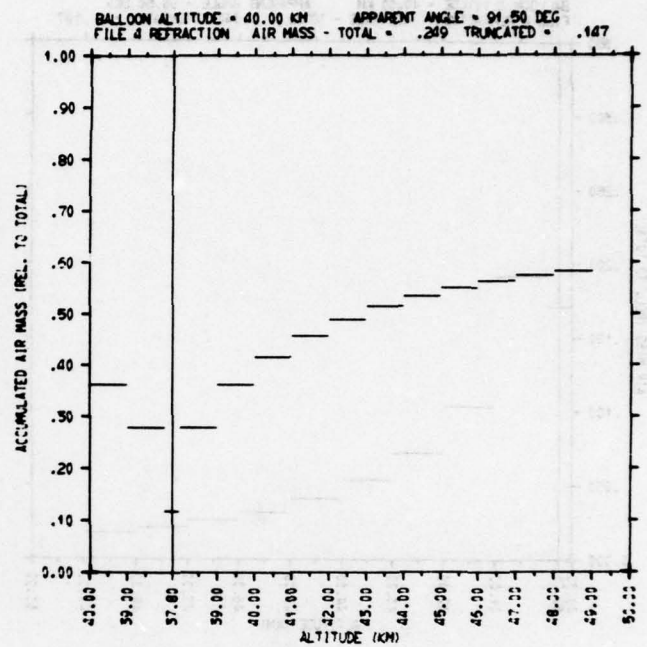
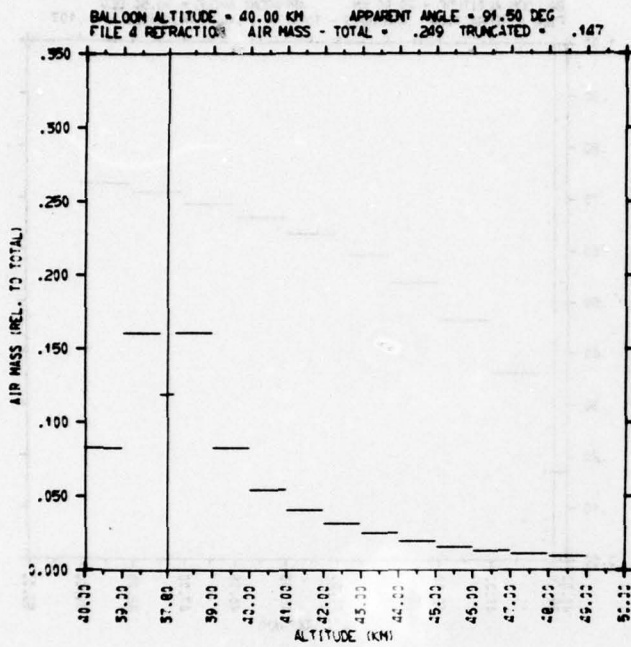




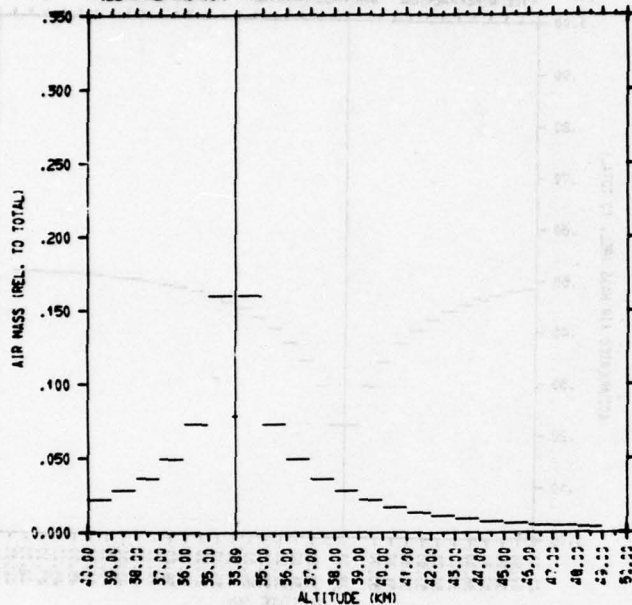




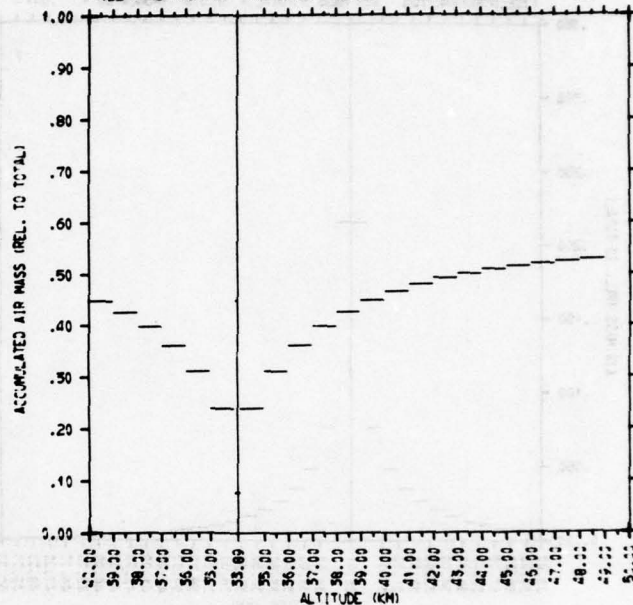




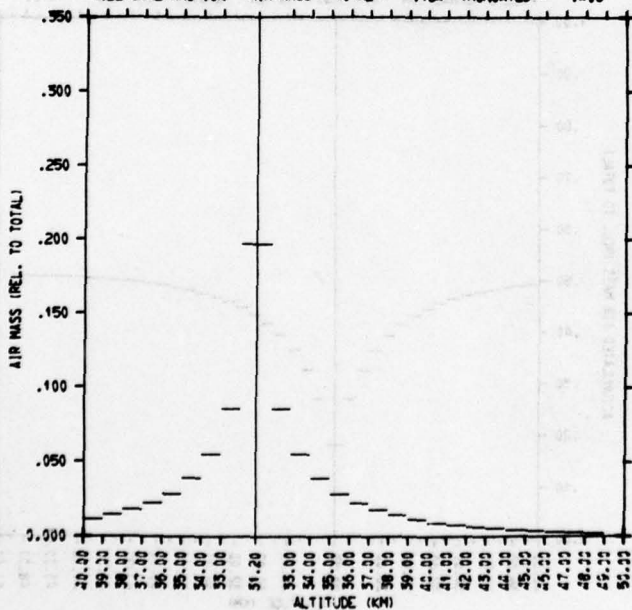
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 FILE 4 REFRACTION AIR MASS - TOTAL = .506 TRUNCATED = .269



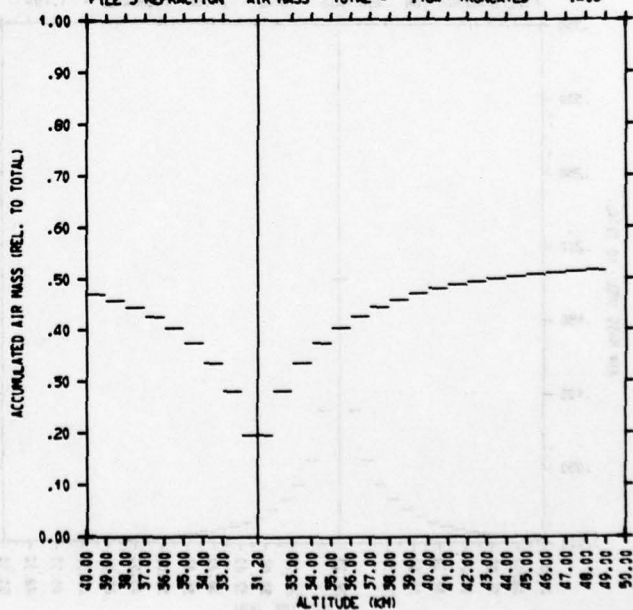
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 FILE 4 REFRACTION AIR MASS - TOTAL = .506 TRUNCATED = .269

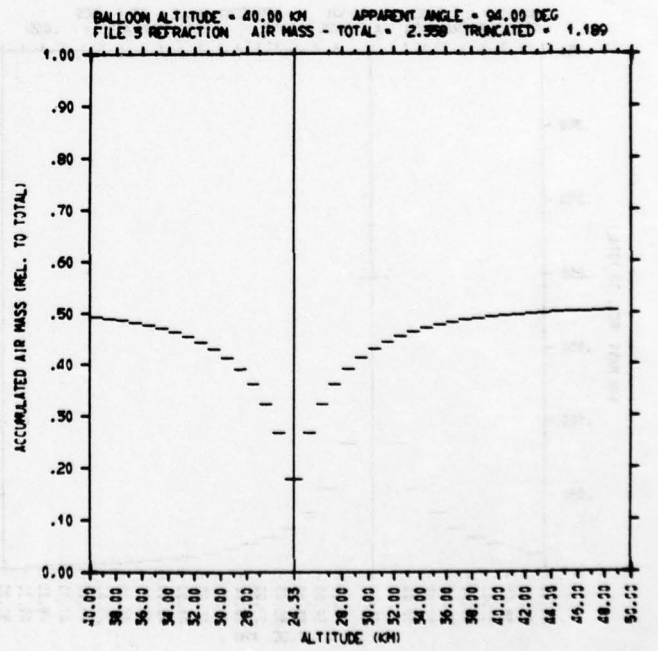
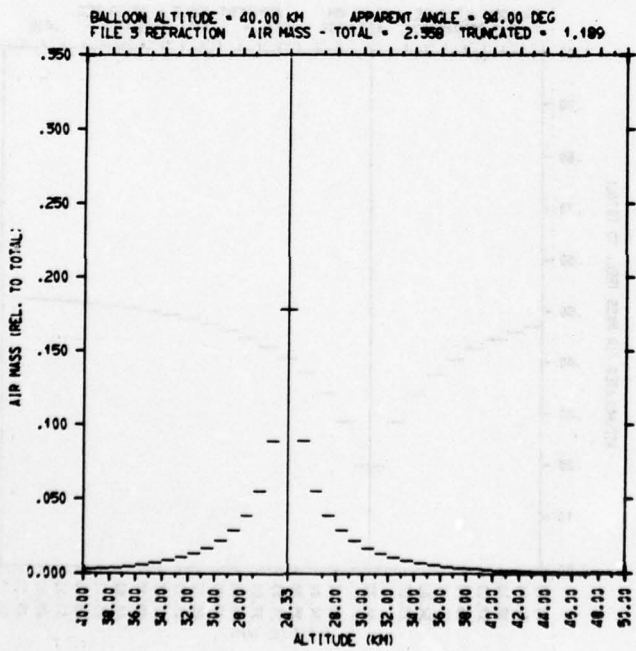
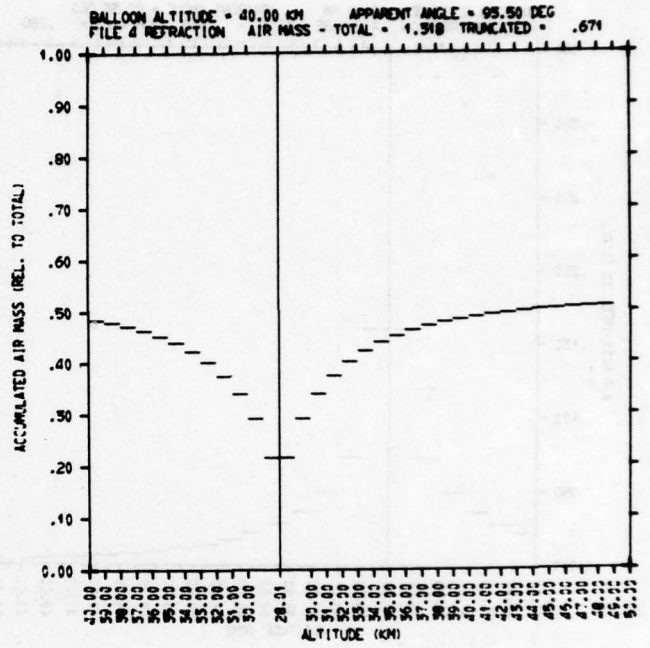
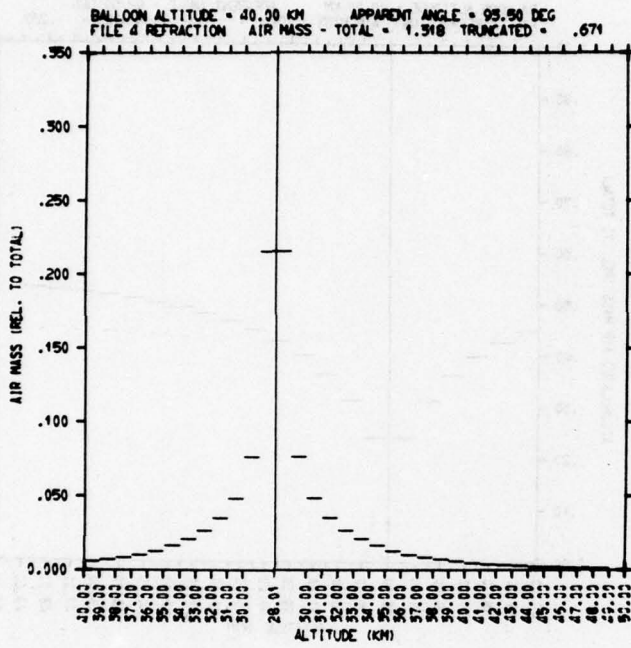


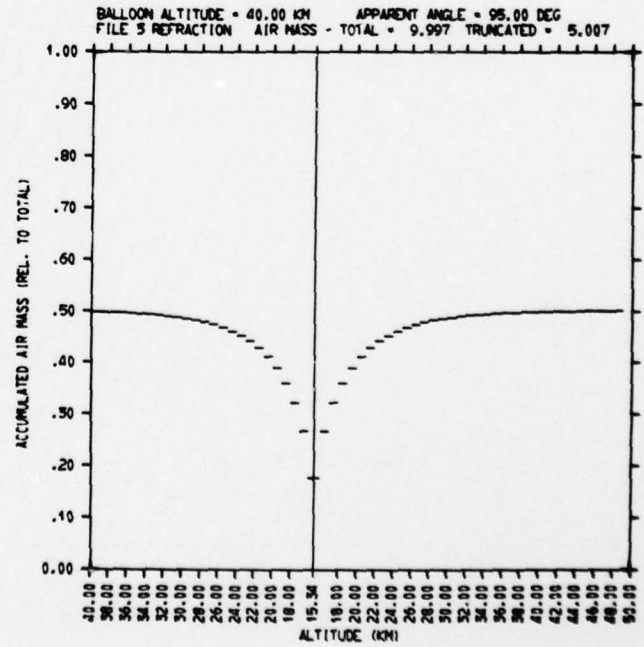
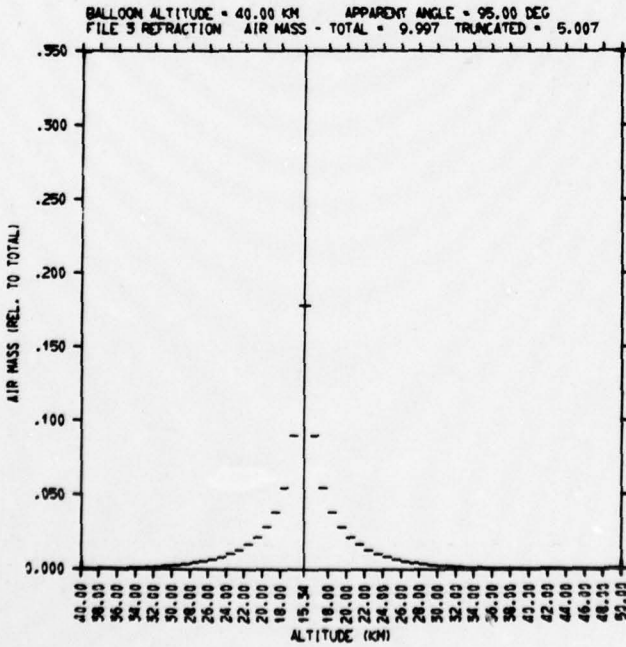
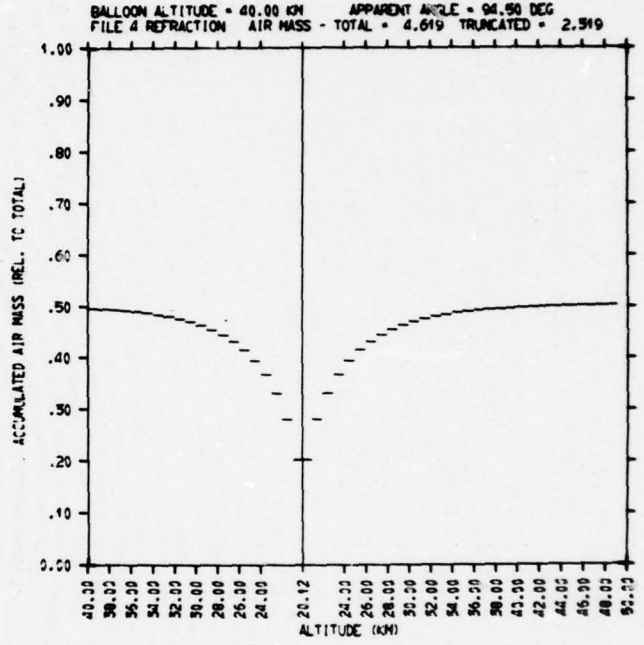
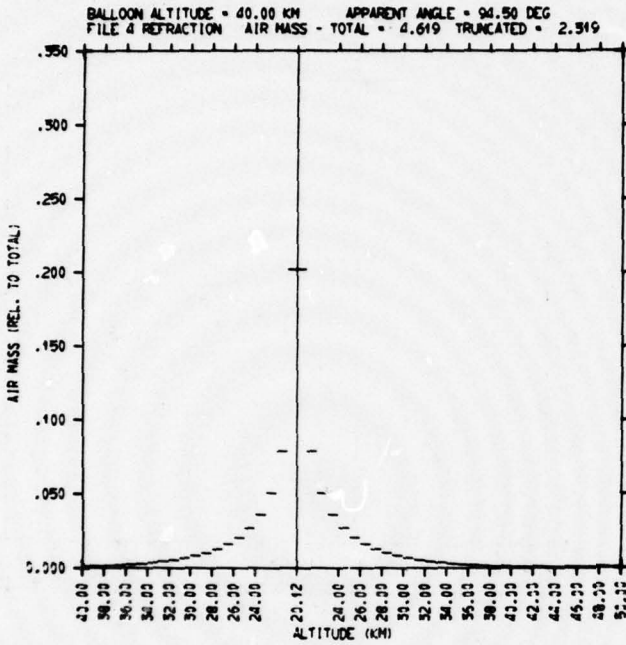
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 FILE 5 REFRACTION AIR MASS - TOTAL = .784 TRUNCATED = .405



BALLOON ALTITUDE = 40.00 KM APPARENT ANGLE = 95.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .784 TRUNCATED = .405







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DENVER UNIV COLO DEPT OF PHYSICS
ON THE INTERPRETATION OF INFRARED SOLAR SPECTRA
AUG 78 D G MURCRAY, A GOLDMAN, G R COOK

F/G 4/1
FOR ALTITUDE DI--ETC(U)
DOT-FA77WA-3949

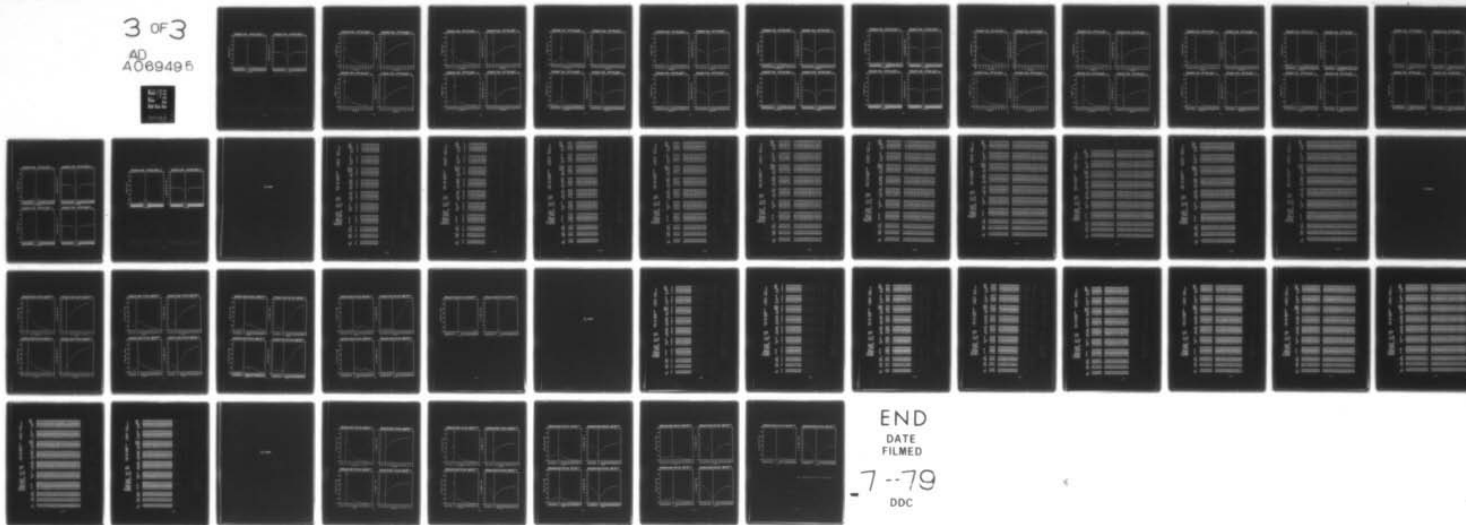
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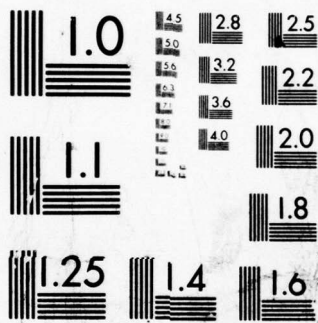
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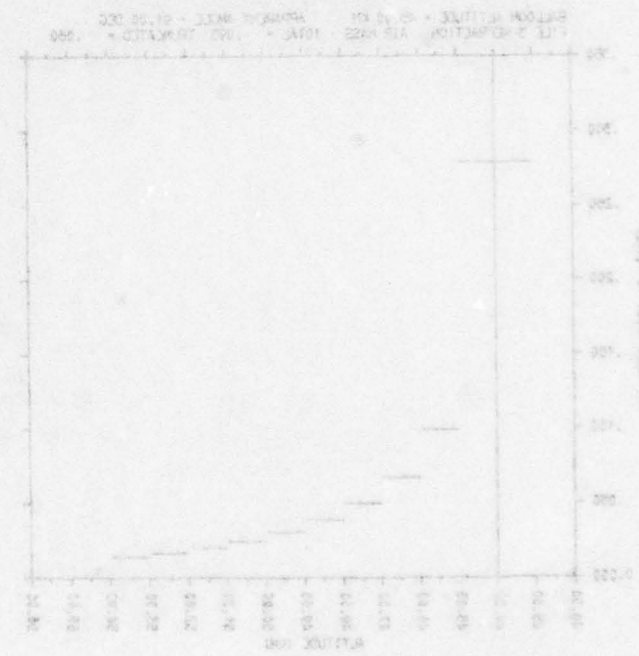
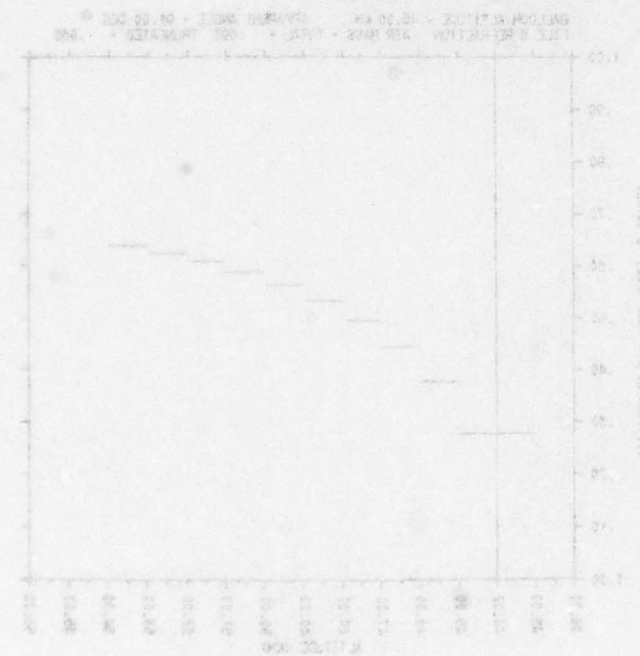
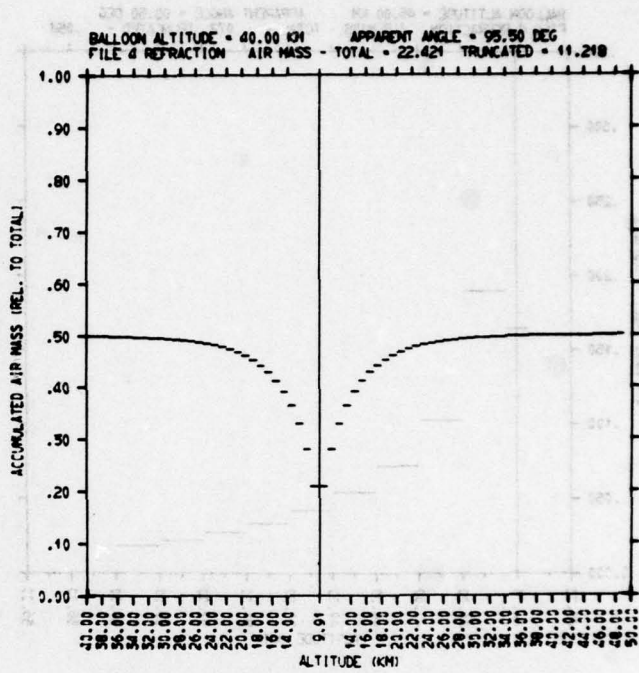
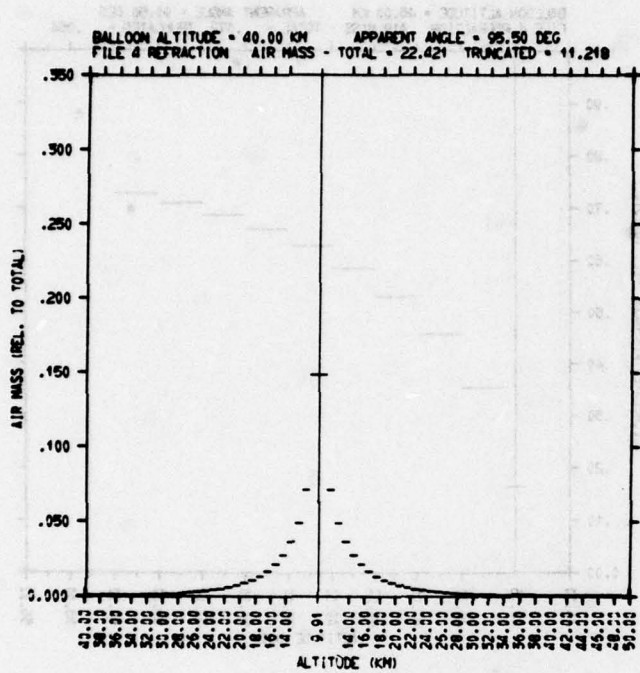
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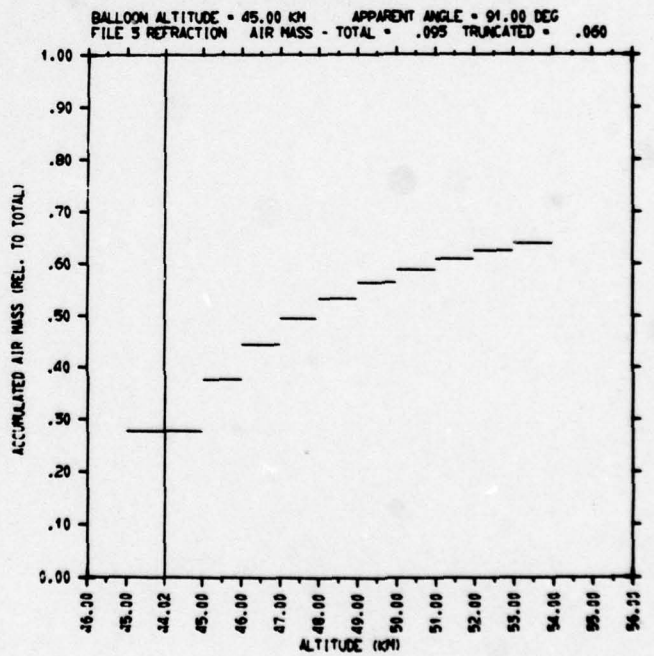
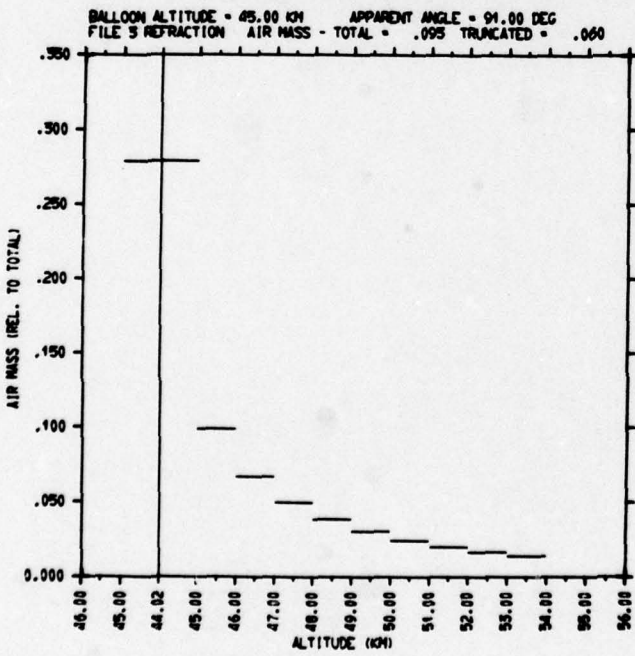
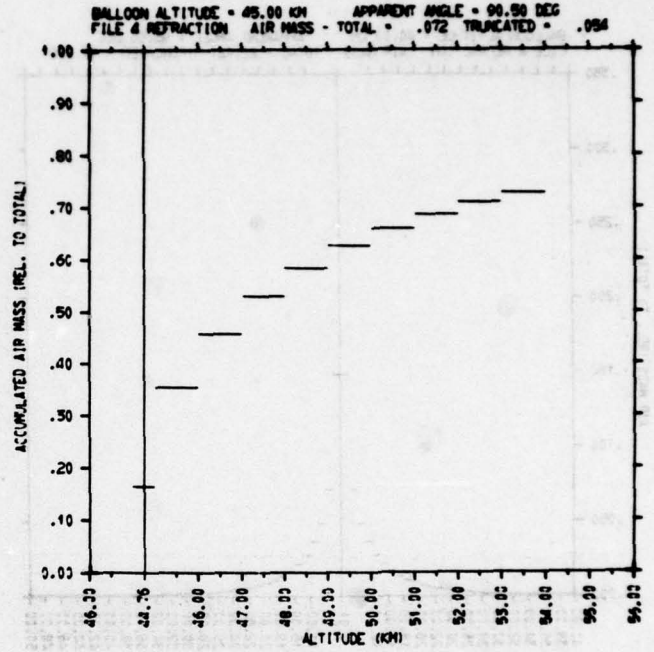
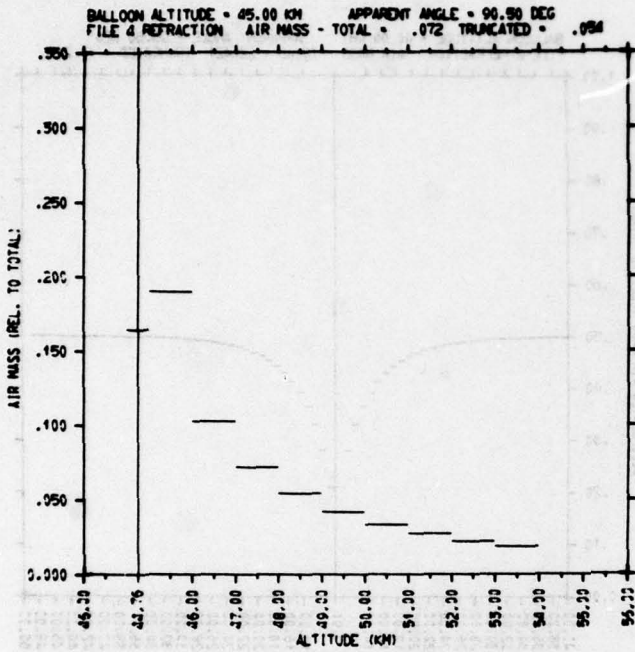
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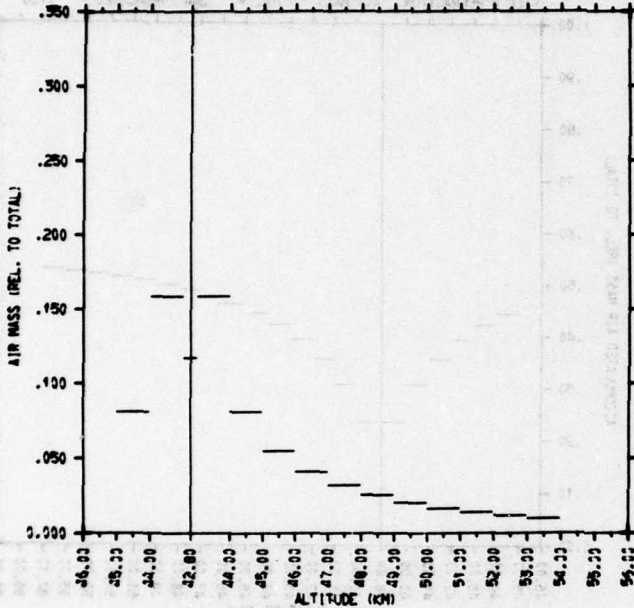


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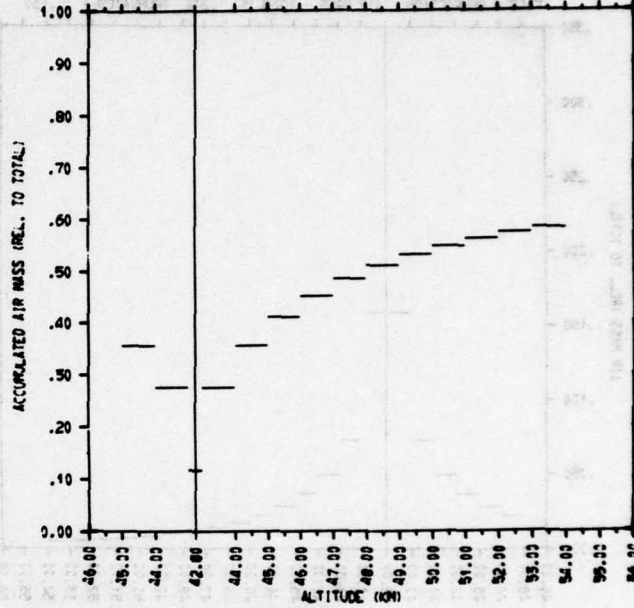




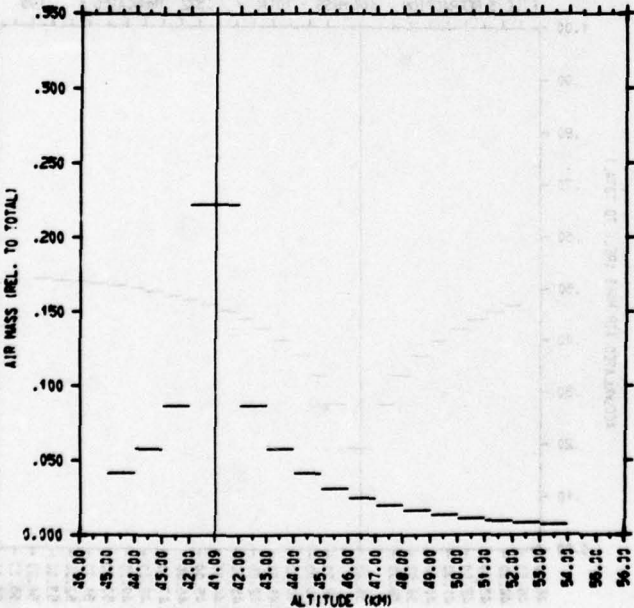
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 FILE 4 REFRACTION AIR MASS - TOTAL = .125 TRUNCATED = .075



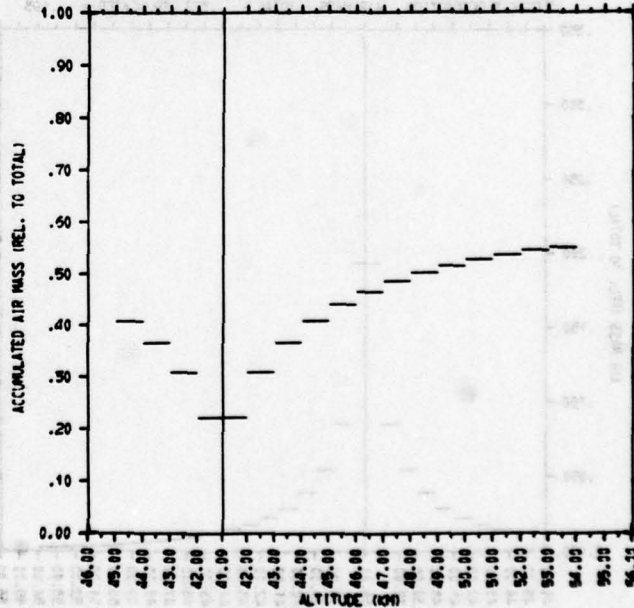
BALLOON ALTITUDE = 45.00 KM APPARENT ANGLE = 91.50 DEG
 FILE 4 REFRACTION AIR MASS - TOTAL = .125 TRUNCATED = .075

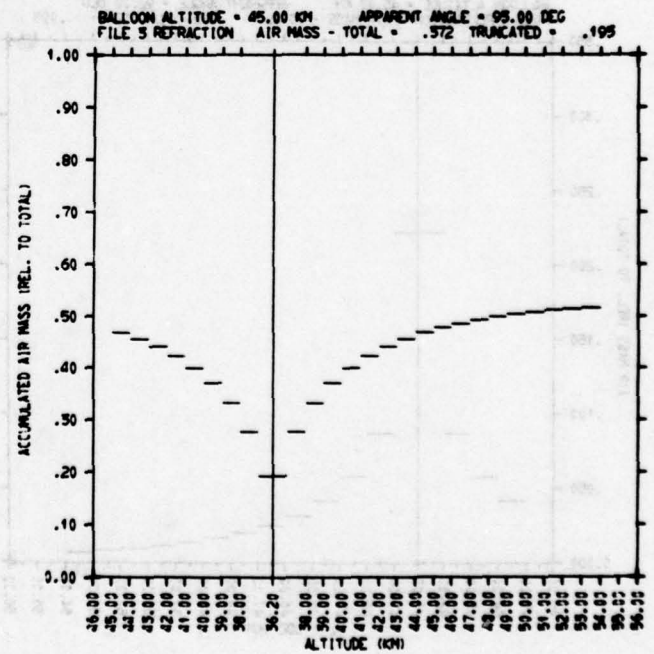
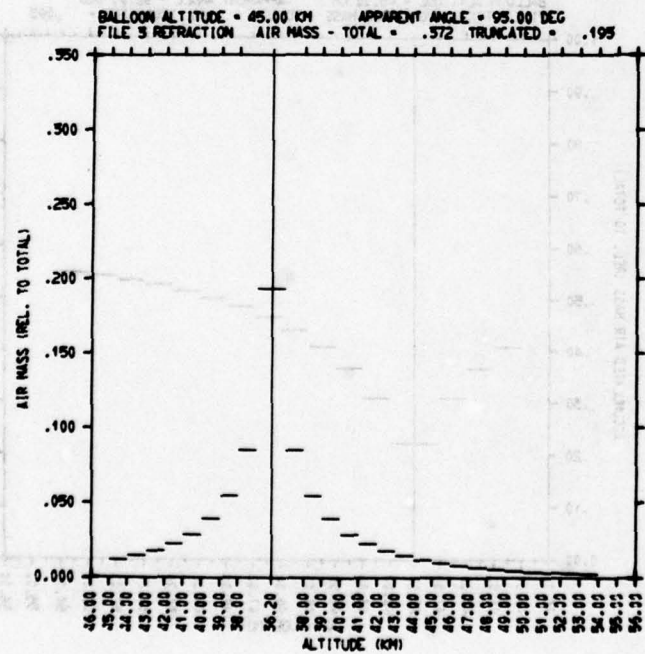
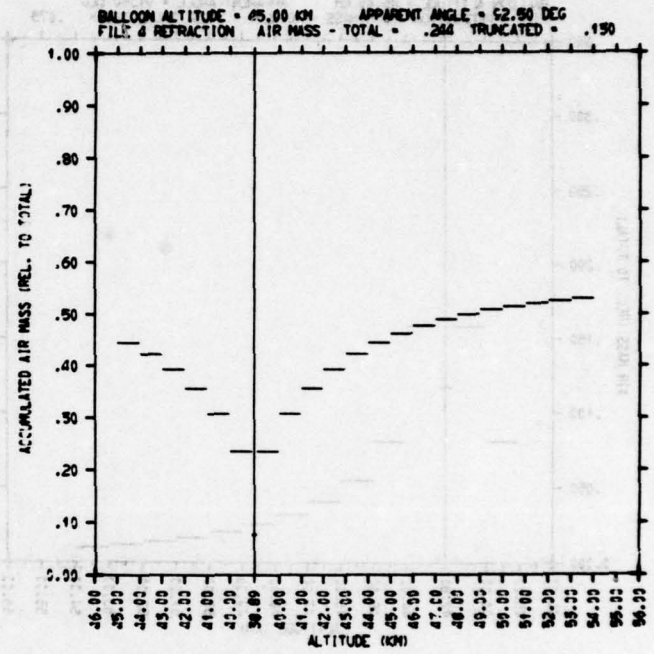
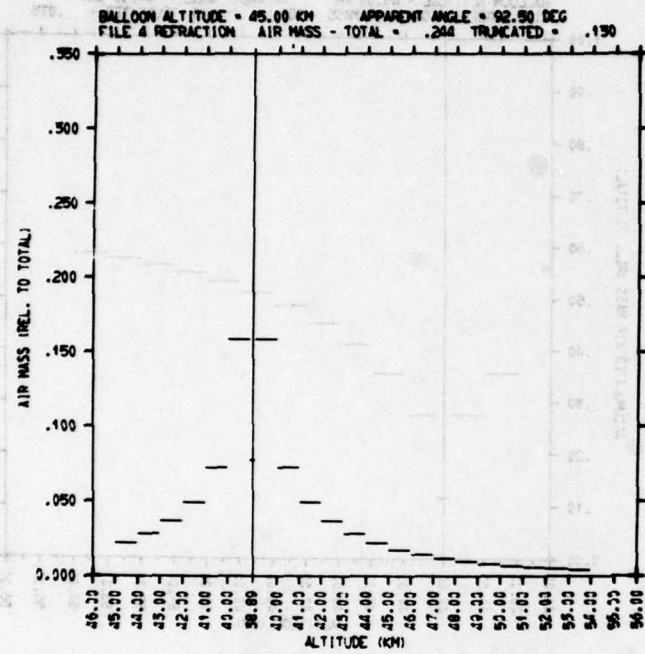


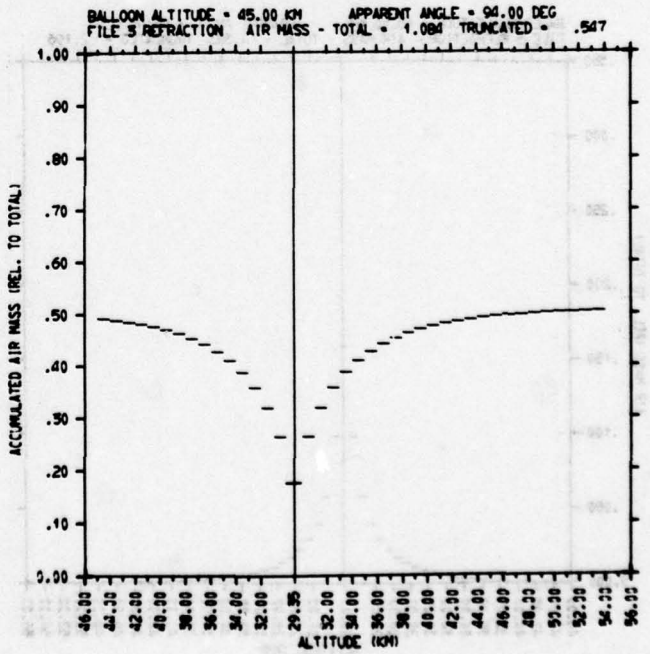
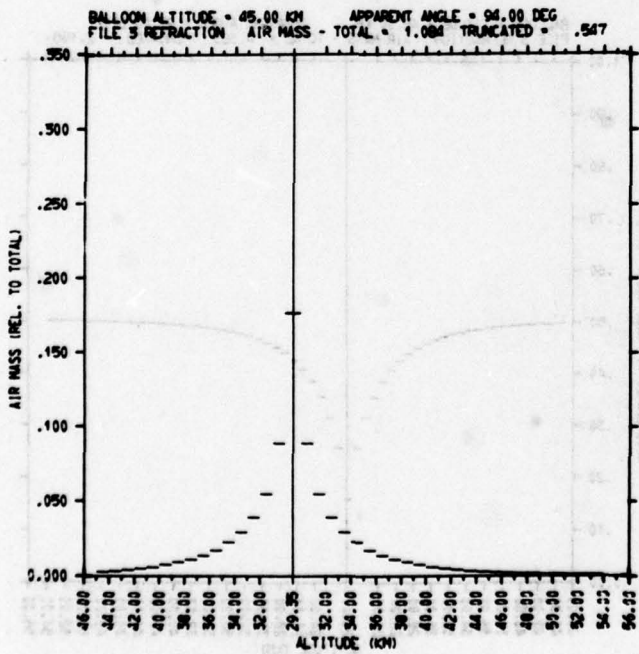
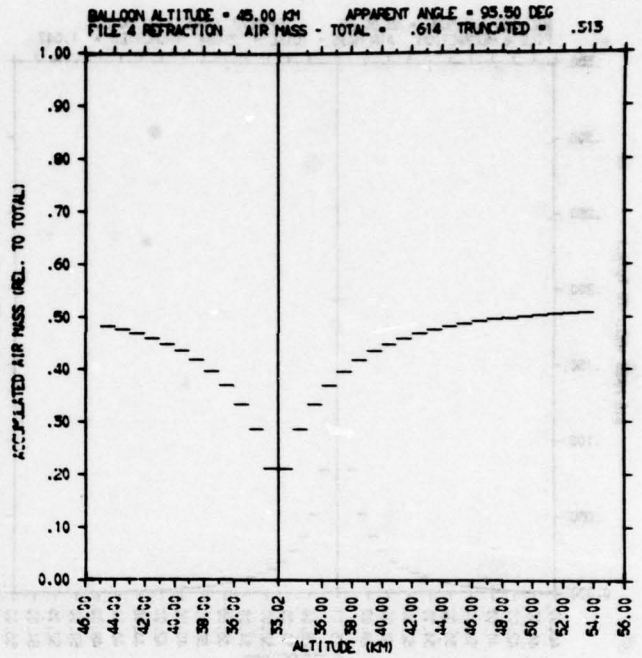
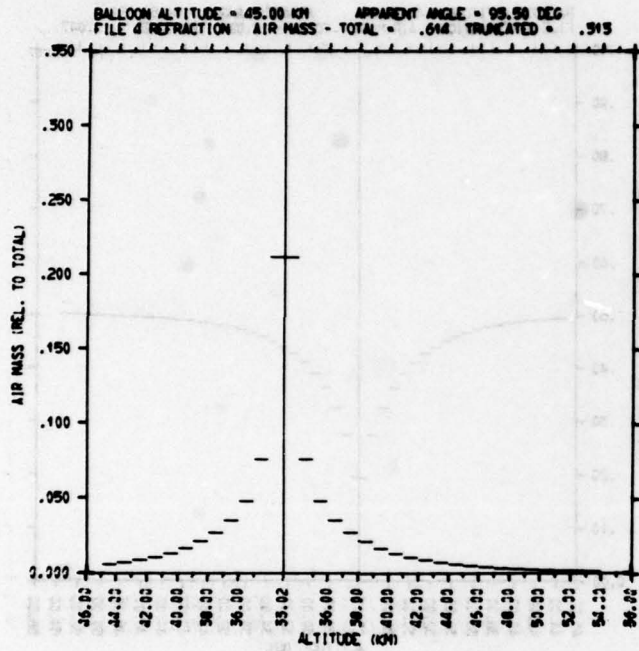
BALLOON ALTITUDE = 45.00 KM APPARENT ANGLE = 92.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .160 TRUNCATED = .095

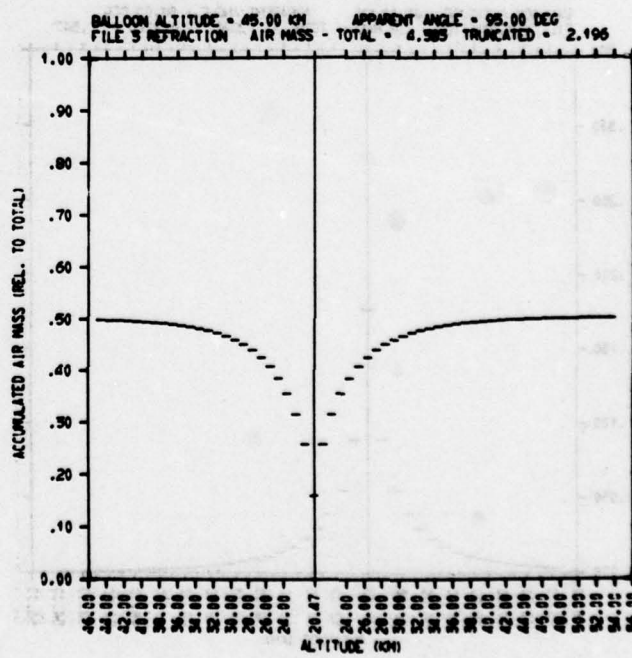
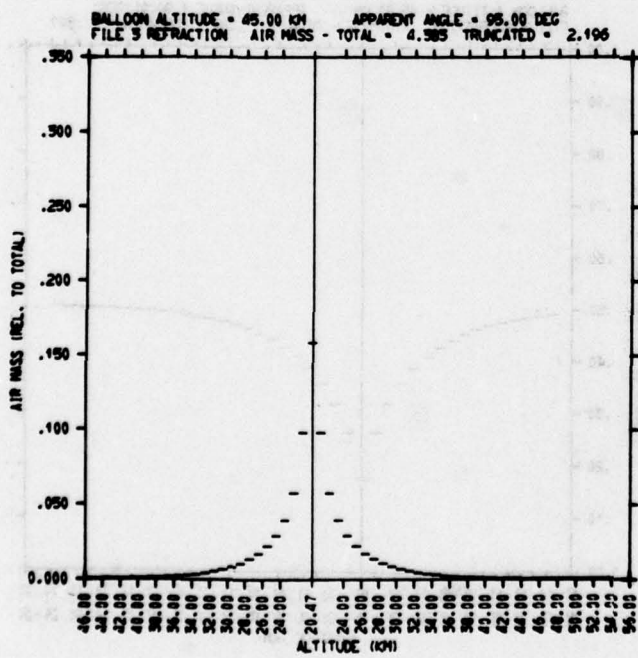
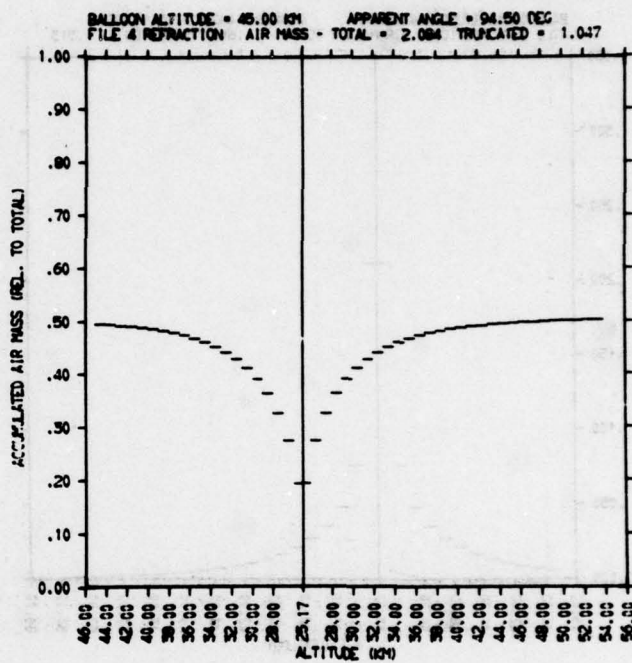
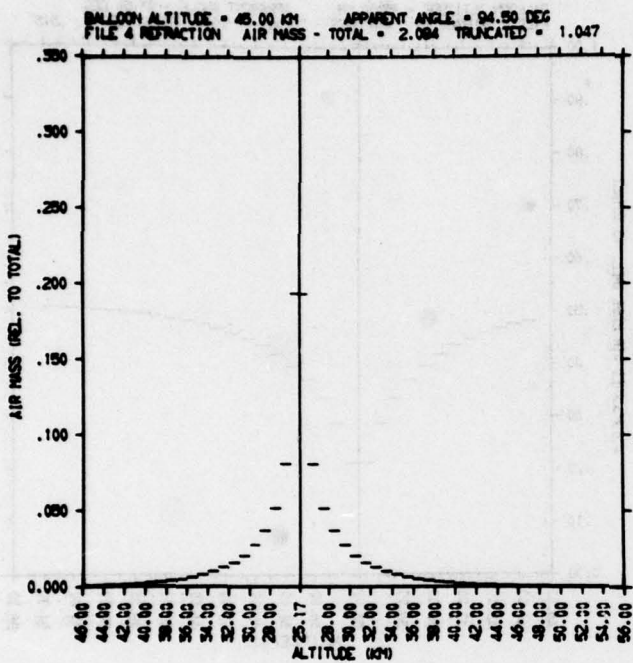


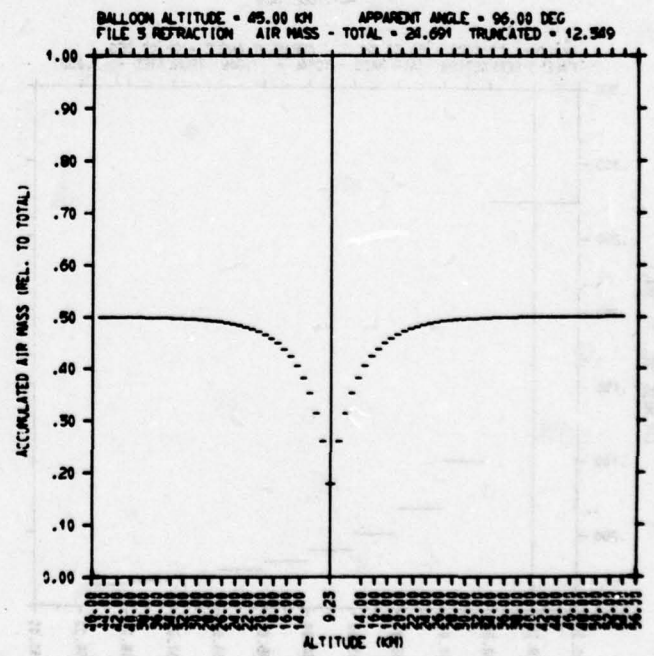
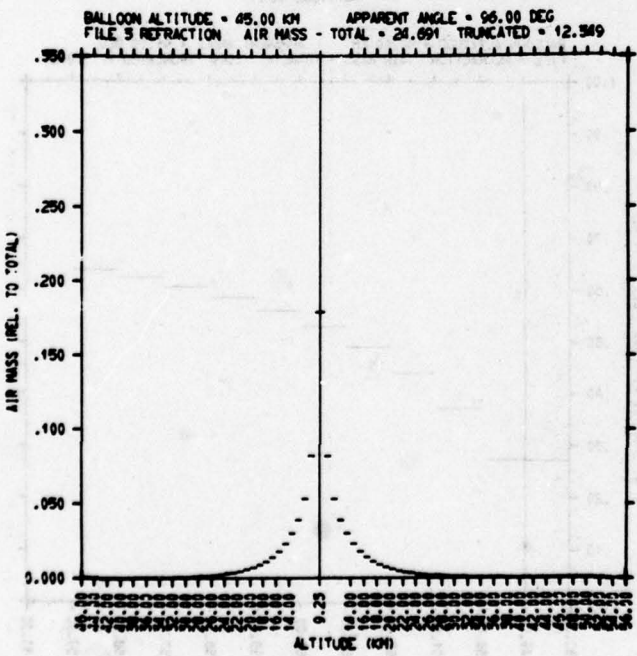
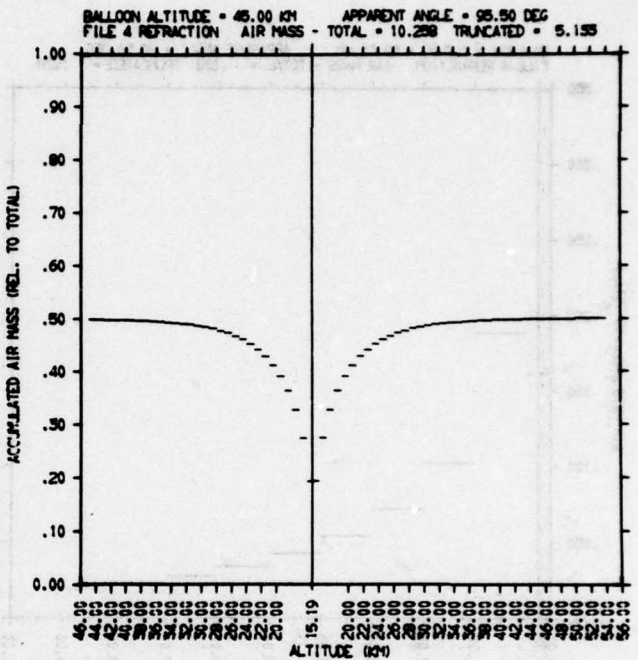
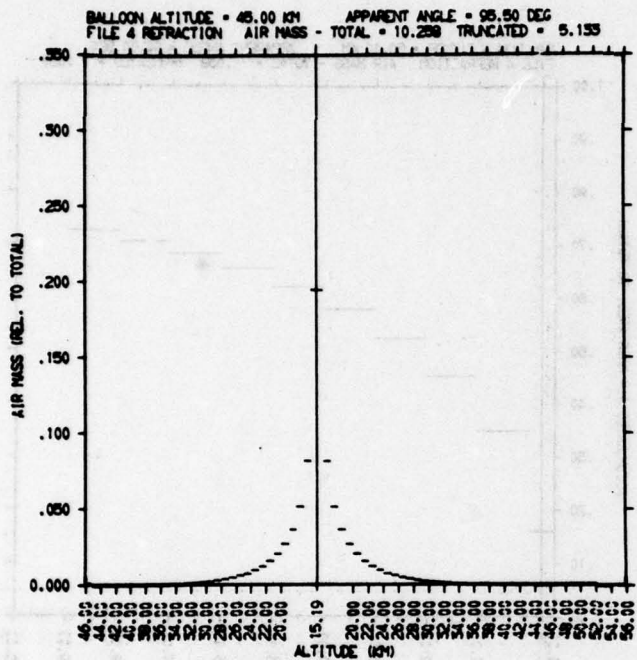
BALLOON ALTITUDE = 45.00 KM APPARENT ANGLE = 92.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .160 TRUNCATED = .095

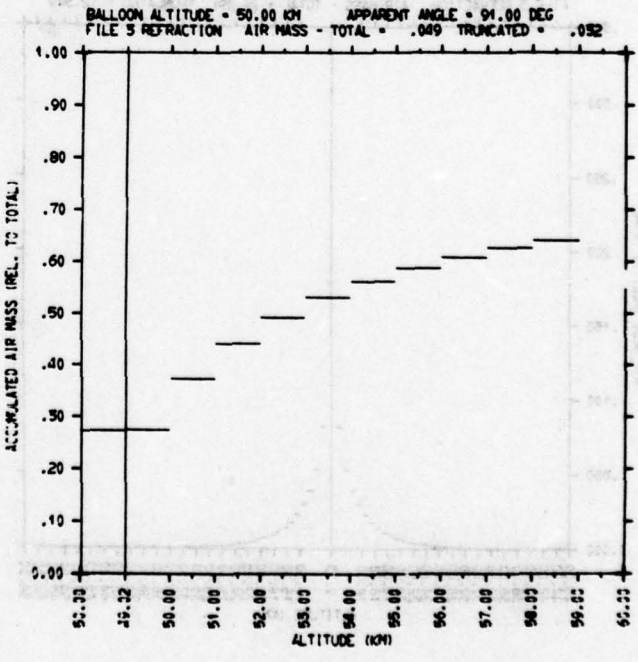
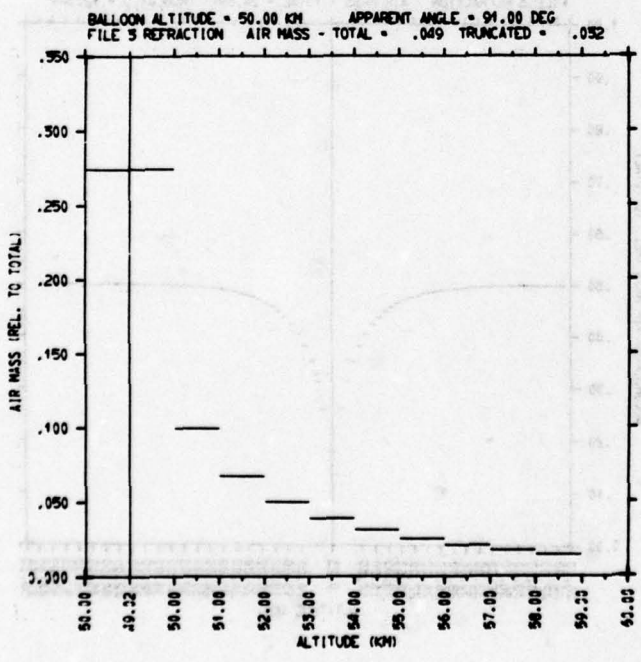
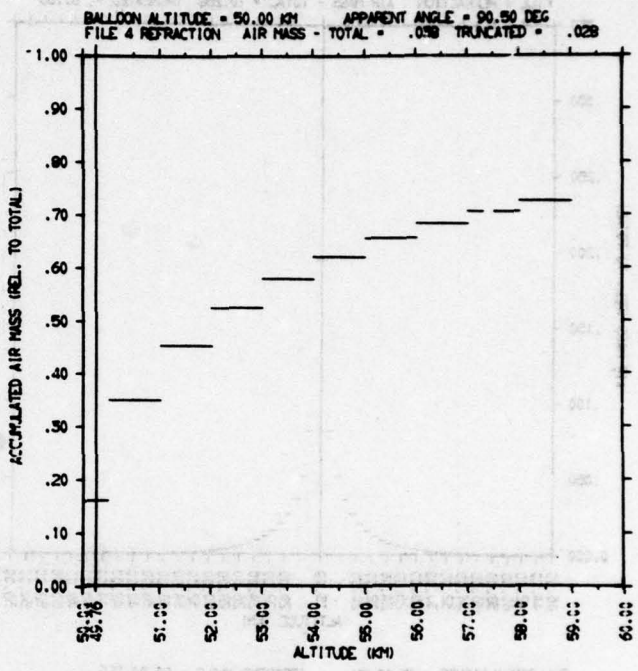
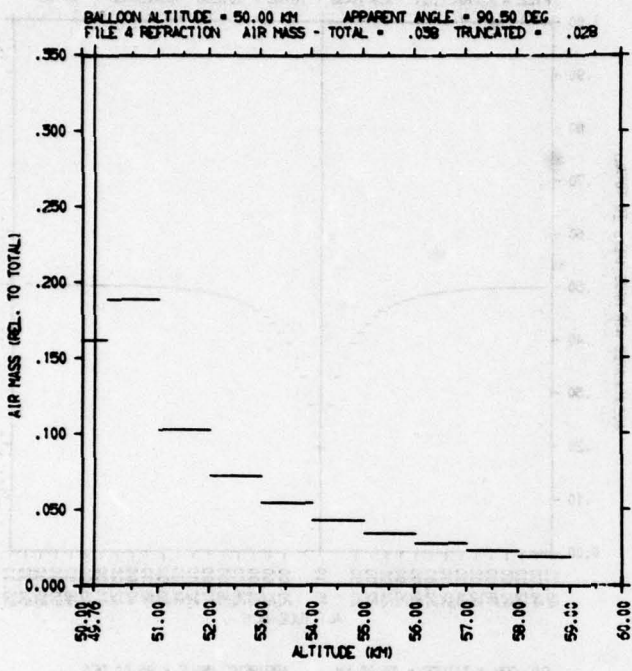




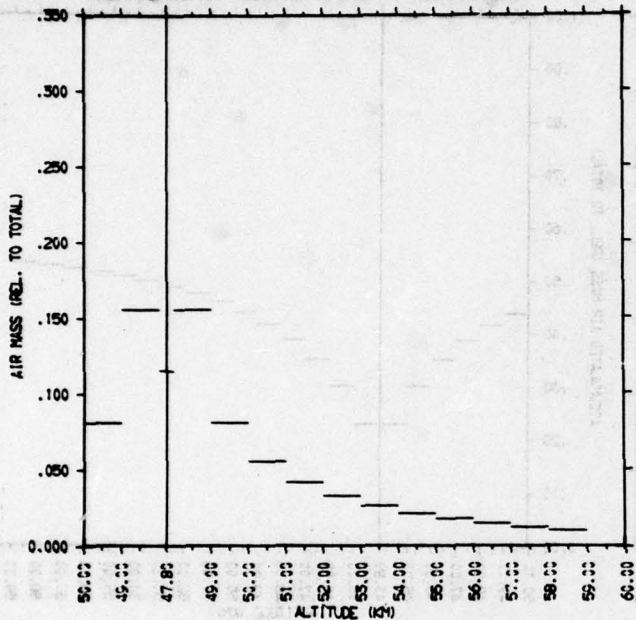




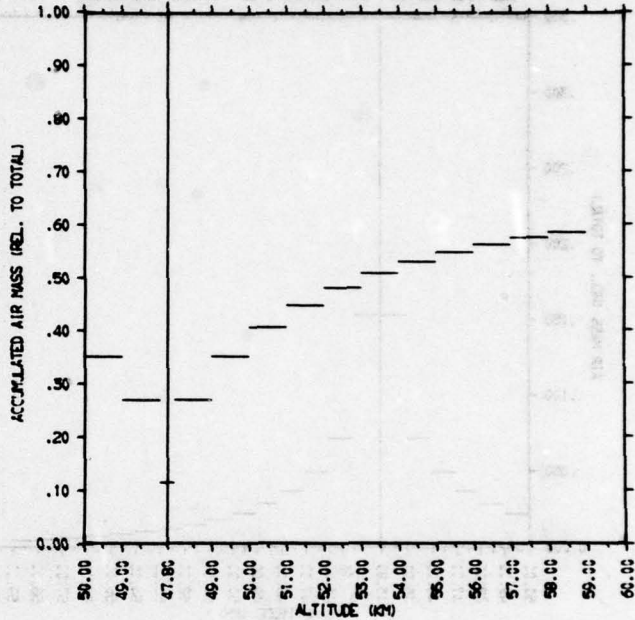




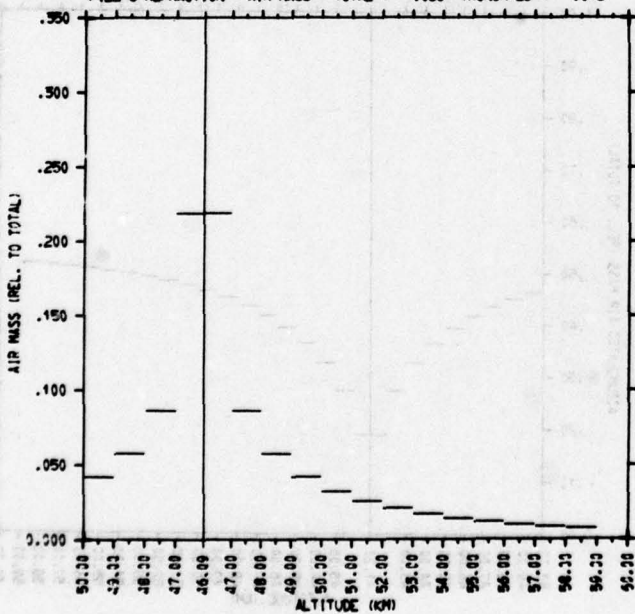
BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 91.50 DEG
 FILE 4 REFRACTION AIR MASS - TOTAL = .065 TRUNCATED = .038



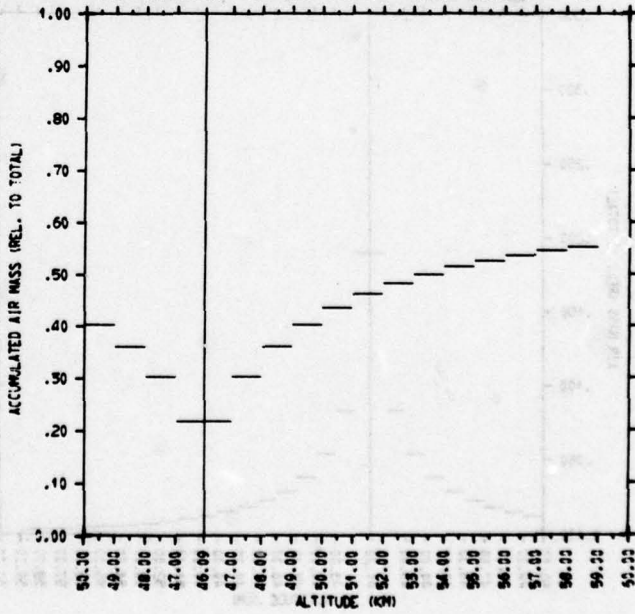
BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 91.50 DEG
 FILE 4 REFRACTION AIR MASS - TOTAL = .065 TRUNCATED = .038

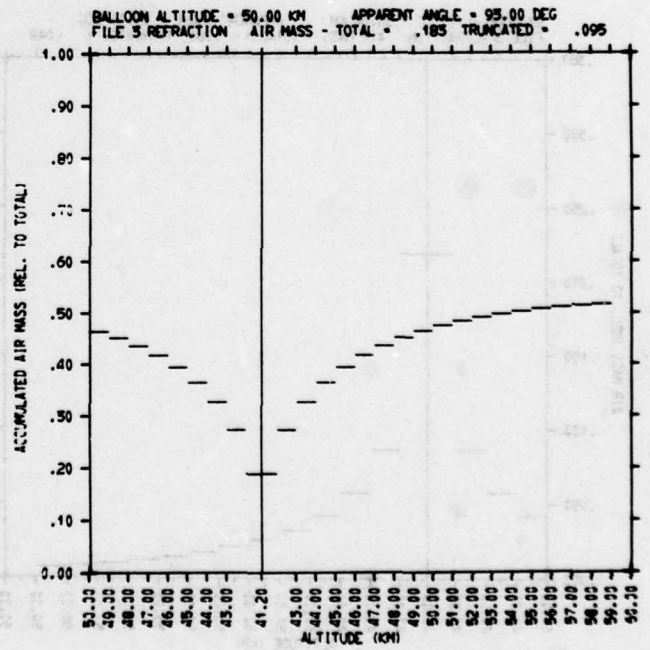
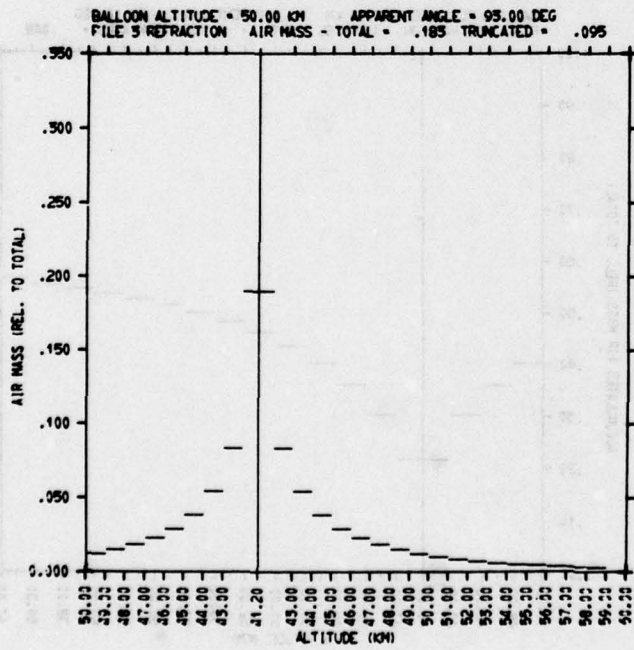
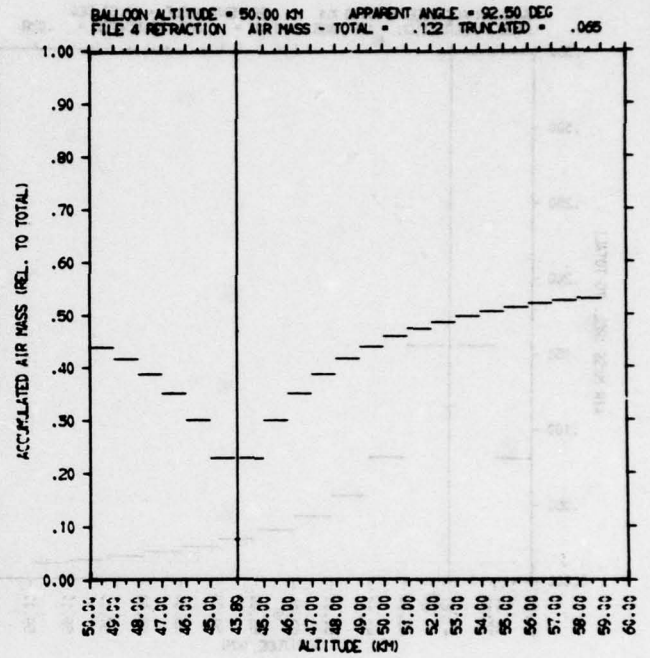
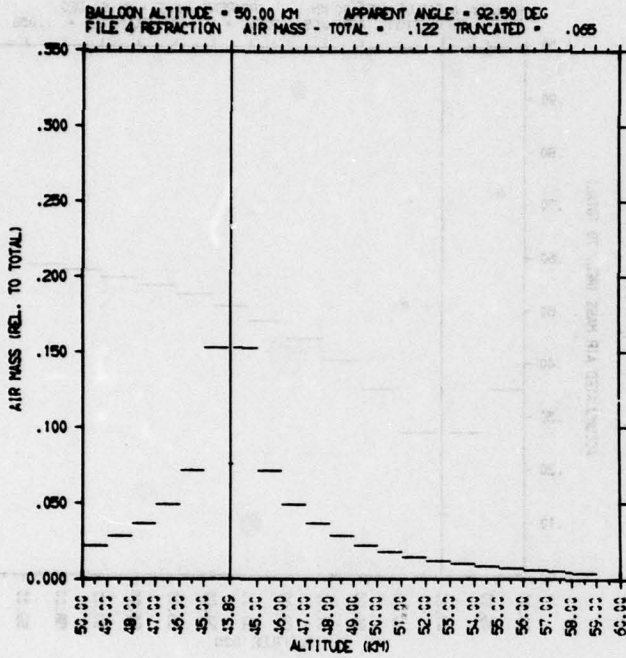


BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 92.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .086 TRUNCATED = .048

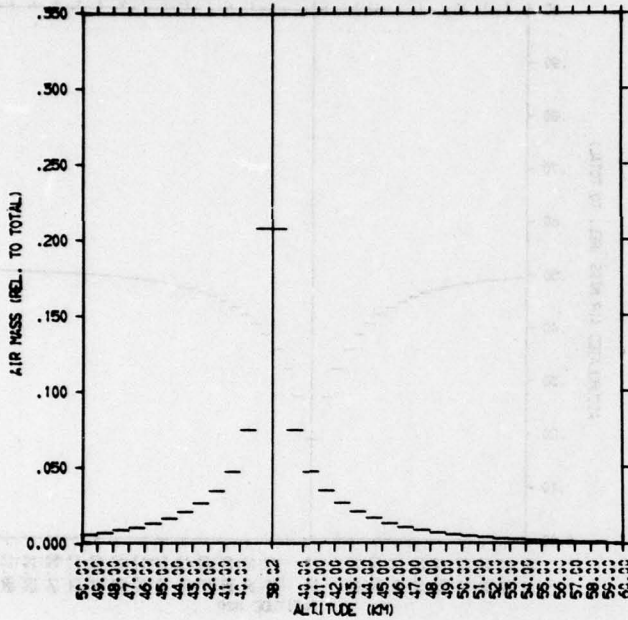


BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 92.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .086 TRUNCATED = .048

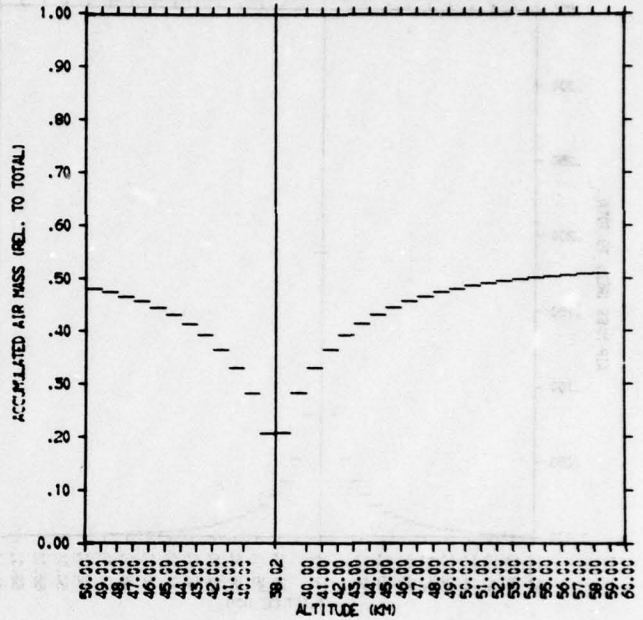




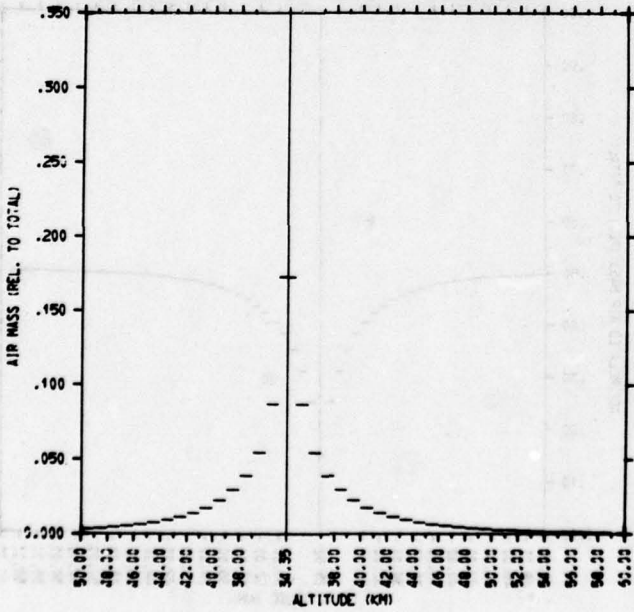
BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 89.50 DEG
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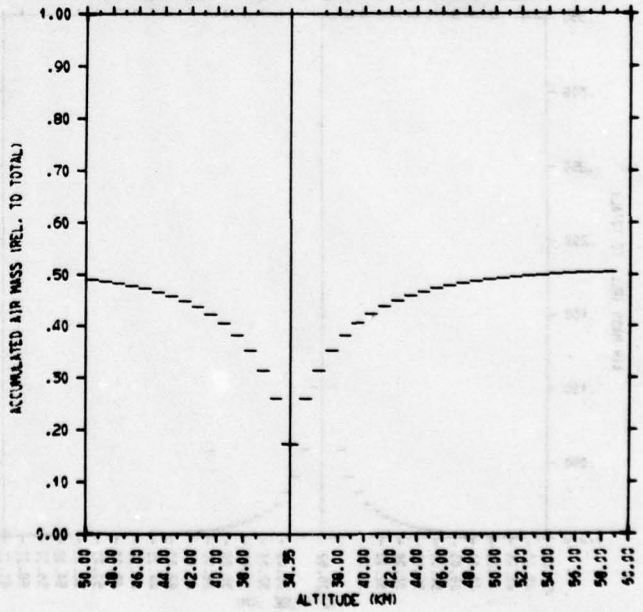
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 FILE 4 REFRACTION AIR MASS - TOTAL = .296 TRUNCATED = .151

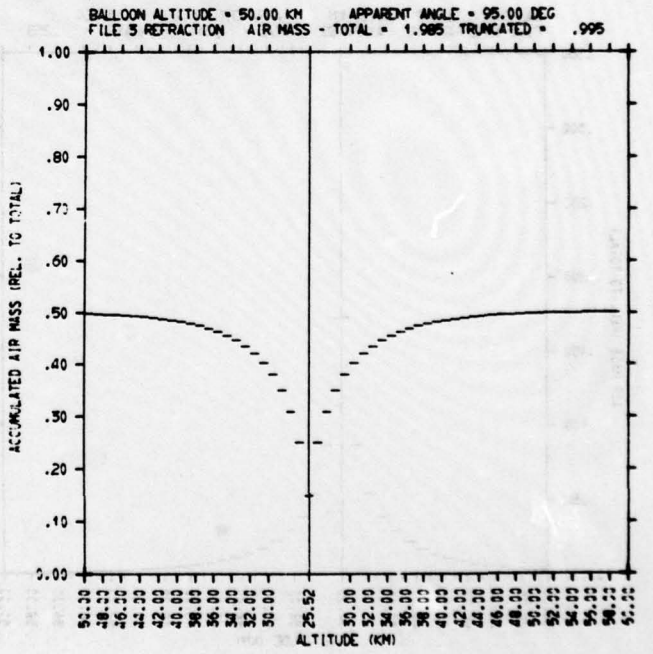
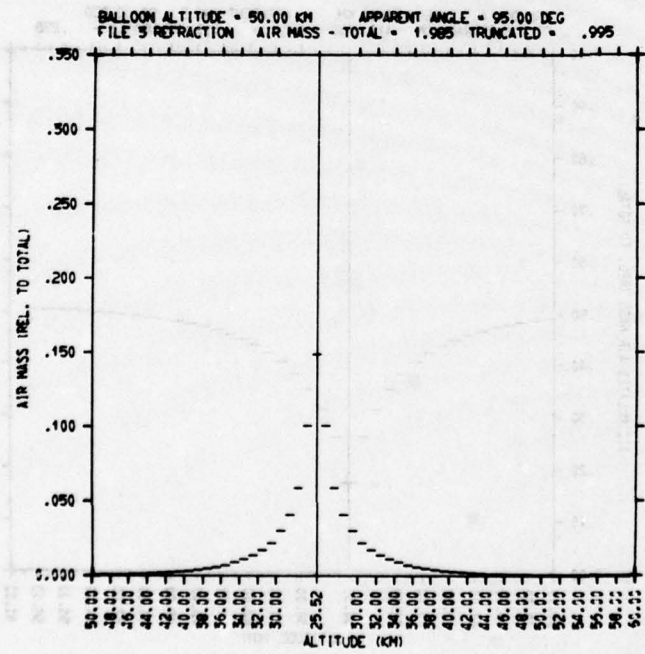
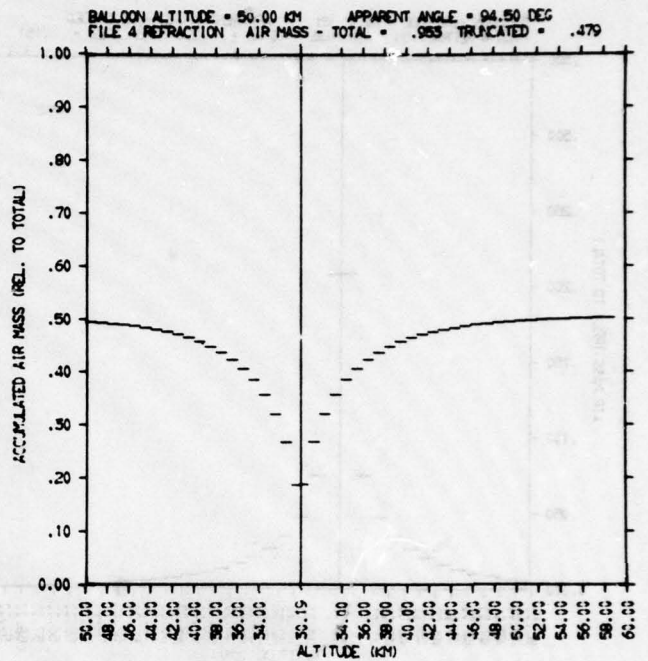
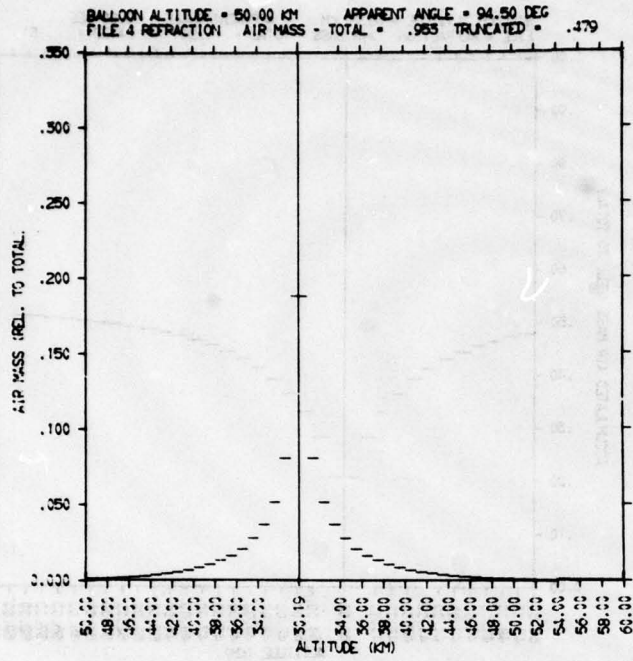


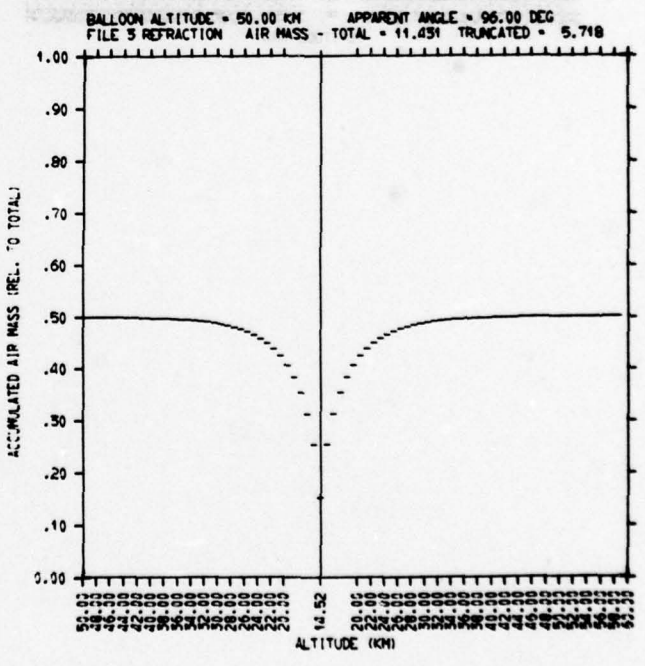
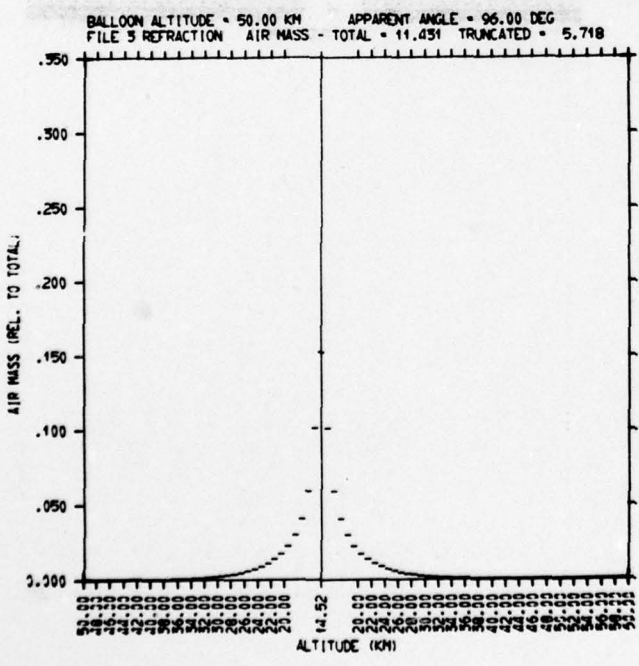
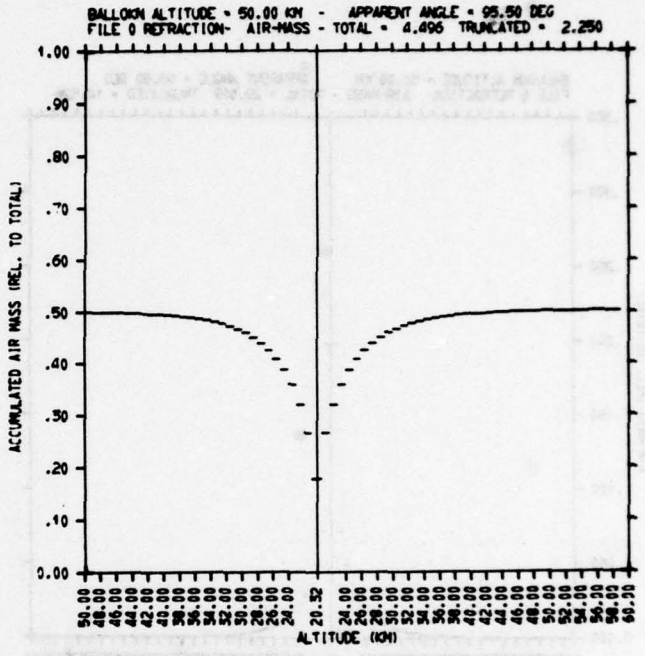
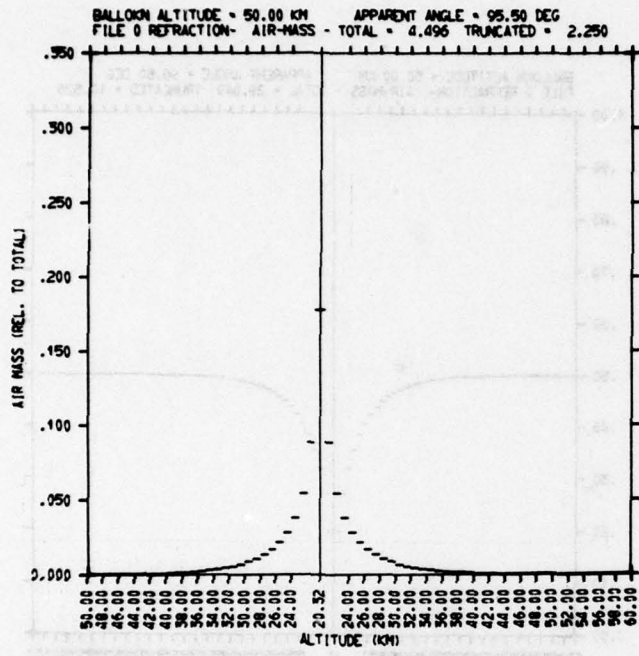
BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 94.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .510 TRUNCATED = .258

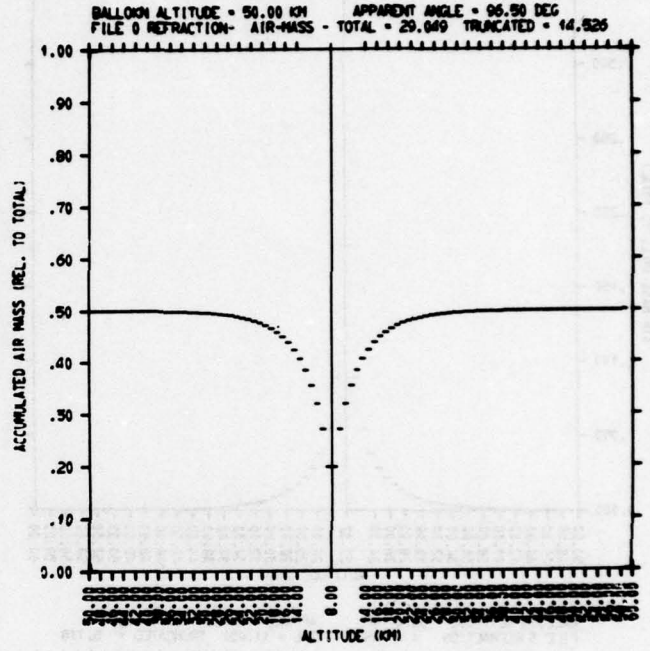
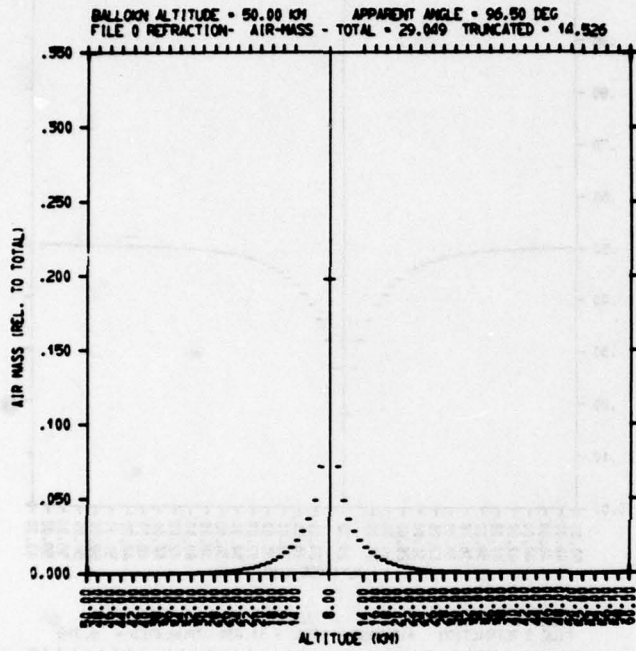


BALLOON ALTITUDE = 50.00 KM APPARENT ANGLE = 94.00 DEG
 FILE 5 REFRACTION AIR MASS - TOTAL = .510 TRUNCATED = .258









NO TABLES

NO
 APPARENT Z-ANG 90.5 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 29.7 (KM)
 OPTICAL AIR MASS .629

TOTAL GAS ABSORPTION 3.483E-03 (CM-1)
 TOTAL GAS AMOUNT 3.023E+16 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
29.7	90.0	224.0	1.119E-01	5.595E+01	6.834E+08	3.824E+15	4.494E-04	3.824E+15	4.494E-04	4.494E-04
29.7	90.0	224.2	1.119E-01	5.812E+01	7.043E+08	4.093E+15	4.809E-04	4.093E+15	4.809E-04	4.809E-04
30.0	89.5	234.0	1.243E-01	7.055E+01	5.111E+08	6.428E+15	7.343E-04	1.052E+16	1.220E-03	1.220E-03
31.0	88.9	234.0	6.589E-02	4.350E+01	9.458E+08	4.114E+15	4.732E-04	1.464E+16	1.693E-03	1.693E-03
32.0	88.5	234.0	4.512E-02	3.451E+01	8.447E+08	2.915E+15	3.353E-04	1.755E+16	2.029E-03	2.029E-03
33.0	88.2	234.0	3.334E-02	2.953E+01	7.530E+08	2.224E+15	2.556E-04	1.977E+16	2.284E-03	2.284E-03
34.0	87.9	234.0	2.547E-02	2.611E+01	6.684E+08	1.745E+15	2.007E-04	2.152E+16	2.485E-03	2.485E-03
35.0	87.7	245.0	1.927E-02	2.386E+01	5.902E+08	1.408E+15	1.582E-04	2.293E+16	2.643E-03	2.643E-03
36.0	87.5	245.0	1.549E-02	2.205E+01	5.154E+08	1.137E+15	1.277E-04	2.406E+16	2.771E-03	2.771E-03
37.0	87.3	245.0	1.259E-02	2.061E+01	4.490E+08	9.254E+14	1.039E-04	2.499E+16	2.875E-03	2.875E-03
38.0	87.1	245.0	1.032E-02	1.942E+01	3.966E+08	7.703E+14	8.652E-05	2.576E+16	2.962E-03	2.962E-03
39.0	86.9	245.0	8.466E-03	1.831E+01	3.505E+08	6.448E+14	7.208E-05	2.640E+16	3.034E-03	3.034E-03

NO
 APPARENT Z-ANG 91.0 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 29.0 (KM)
 OPTICAL AIR MASS .825

TOTAL GAS ABSORPTION 4.056E-03 (CM-1)
 TOTAL GAS AMOUNT 3.502E+16 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
29.0	90.0	224.0	2.431E-01	1.145E+02	6.242E+08	7.147E+15	7.147E+15	7.147E+15	6.401E-04	6.401E-04	6.401E-04
29.0	90.0	224.0	2.431E-01	1.145E+02	7.796E+08	6.927E+15	8.927E+15	8.927E+15	1.049E-03	1.049E-03	1.049E-03
30.0	89.0	234.0	8.314E-02	4.740E+01	9.484E+08	4.496E+15	1.342E+16	1.342E+16	5.171E-04	5.171E-04	1.566E-03
31.0	88.6	234.0	5.493E-02	3.630E+01	9.627E+08	3.495E+15	1.692E+16	1.692E+16	4.019E-04	4.019E-04	1.968E-03
32.0	88.3	234.0	4.000E-02	3.061E+01	8.534E+08	2.612E+15	1.953E+16	1.953E+16	3.005E-04	3.005E-04	2.269E-03
33.0	88.0	234.0	3.046E-02	2.699E+01	7.585E+08	2.047E+15	2.158E+16	2.158E+16	2.355E-04	2.355E-04	2.504E-03
34.0	87.7	234.0	2.370E-02	2.429E+01	6.718E+08	1.632E+15	2.321E+16	2.321E+16	1.877E-04	1.877E-04	2.692E-03
35.0	87.5	245.0	1.814E-02	2.247E+01	5.929E+08	1.332E+15	2.454E+16	2.454E+16	1.496E-04	1.496E-04	2.841E-03
36.0	87.3	245.0	1.470E-02	2.094E+01	5.176E+08	1.084E+15	2.562E+16	2.562E+16	1.217E-04	1.217E-04	2.963E-03
37.0	87.1	245.0	1.203E-02	1.970E+01	4.501E+08	8.867E+14	2.651E+16	2.651E+16	9.959E-05	9.959E-05	3.063E-03
38.0	87.0	245.0	9.912E-03	1.866E+01	3.972E+08	7.412E+14	2.725E+16	2.725E+16	6.325E-05	6.325E-05	3.146E-03
39.0	86.8	245.0	8.164E-03	1.766E+01	3.505E+08	6.191E+14	2.787E+16	2.787E+16	6.953E-05	6.953E-05	3.216E-03

NO

APPARENT Z-ANG 92.0 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 26.1 (KM)
 OPTICAL AIR MASS 1.581
 TOTAL GAS ABSORPTION 7.0469E-03 (CM-1)
 TOTAL GAS AMOUNT 3.842E+16 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (CM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
26.1	90.0	224.0	3.703E-01	1.105E+02	4.152E+08	4.588E+15	4.588E+15	4.588E+15	5.392E-04	5.392E-04
27.0	91.0	224.0	1.395E-01	4.831E+01	3.493E+08	1.687E+15	1.687E+15	6.275E+15	1.983E-04	7.376E-04
28.0	91.4	224.0	9.069E-02	3.666E+01	3.281E+08	1.203E+15	1.203E+15	7.478E+15	1.414E-04	8.790E-04
29.0	91.7	224.0	6.504E-02	3.064E+01	3.134E+08	9.604E+14	9.604E+14	8.439E+15	1.129E-04	9.918E-04
26.1	90.0	224.0	3.703E-01	1.105E+02	5.759E+08	6.363E+15	6.363E+15	6.363E+15	7.479E-04	7.479E-04
27.0	89.0	224.0	1.395E-01	4.831E+01	7.530E+08	3.638E+15	3.638E+15	1.000E+16	4.276E-04	1.175E-03
28.0	88.6	224.0	9.069E-02	3.666E+01	8.342E+08	3.058E+15	3.058E+15	1.306E+16	3.595E-04	1.535E-03
29.0	88.3	224.0	6.504E-02	3.064E+01	9.081E+08	2.783E+15	2.783E+15	1.584E+16	3.270E-04	1.862E-03
30.0	88.0	234.0	4.735E-02	2.707E+01	1.011E+09	2.736E+15	2.736E+15	1.858E+16	3.149E-04	2.177E-03
31.0	87.8	234.0	3.697E-02	2.447E+01	1.004E+09	2.457E+15	2.457E+15	2.104E+16	2.825E-04	2.459E-03
32.0	87.5	234.0	2.938E-02	2.250E+01	8.794E+08	1.979E+15	1.979E+15	2.302E+16	2.276E-04	2.687E-03
33.0	87.3	234.0	2.365E-02	2.096E+01	7.729E+08	1.620E+15	1.620E+15	2.464E+16	1.863E-04	2.873E-03
34.0	87.2	234.0	1.911E-02	1.959E+01	6.799E+08	1.332E+15	1.332E+15	2.597E+16	1.532E-04	3.027E-03
35.0	87.0	245.0	1.504E-02	1.864E+01	5.986E+08	1.116E+15	1.116E+15	2.708E+16	1.253E-04	3.152E-03
36.0	86.8	245.0	1.246E-02	1.775E+01	5.209E+08	9.247E+14	9.247E+14	2.801E+16	1.039E-04	3.256E-03
37.0	86.7	245.0	1.037E-02	1.698E+01	4.524E+08	7.683E+14	7.683E+14	2.878E+16	8.629E-05	3.342E-03
38.0	86.5	245.0	9.661E-03	1.631E+01	3.991E+08	6.509E+14	6.509E+14	2.943E+16	7.311E-05	3.415E-03
39.0	86.4	245.0	7.216E-03	1.561E+01	3.519E+08	5.493E+14	5.493E+14	2.998E+16	6.170E-05	3.477E-03

NO

APPARENT Z-ANG 92.5 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 23.9 (KM)
 OPTICAL AIR MASS 2.355

TOTAL GAS ABSORPTION 4.081E-03 (CM-1)
 TOTAL GAS AMOUNT 3.505E+16 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (CM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
23.9	90.0	222.5	2.082E-01	4.300E+01	2.866E+08	1.232E+15	1.232E+15	1.453E-04	1.453E-04	1.453E-04	1.453E-04
24.0	90.4	223.0	3.644E-01	7.893E+01	2.126E+08	1.678E+15	2.910E+15	1.977E-04	1.977E-04	3.430E-04	3.430E-04
25.0	91.1	224.0	1.754E-01	4.481E+01	1.830E+08	8.200E+14	3.730E+15	9.638E-05	9.638E-05	4.393E-04	4.393E-04
26.0	91.5	224.0	1.177E-01	3.506E+01	1.746E+08	6.123E+14	4.343E+15	7.137E-05	7.137E-05	5.113E-04	5.113E-04
27.0	91.8	224.0	8.586E-02	2.982E+01	1.665E+08	4.965E+14	4.839E+15	5.836E-05	5.836E-05	5.697E-04	5.697E-04
28.0	92.1	224.0	6.527E-02	2.641E+01	1.586E+08	4.190E+14	5.258E+15	4.925E-05	4.925E-05	6.189E-04	6.189E-04
29.0	92.3	224.0	5.060E-02	2.385E+01	1.632E+08	3.692E+14	5.647E+15	4.575E-05	4.575E-05	6.675E-04	6.675E-04
23.9	90.0	222.5	2.082E-01	4.300E+01	2.952E+08	1.269E+15	1.269E+15	1.437E-04	1.437E-04	1.437E-04	1.437E-04
24.0	89.6	223.0	3.644E-01	7.893E+01	4.438E+08	3.503E+15	4.772E+15	4.126E-04	4.126E-04	5.623E-04	5.623E-04
25.0	88.9	224.0	1.754E-01	4.481E+01	5.923E+08	2.654E+15	7.426E+15	3.119E-04	3.119E-04	8.742E-04	8.742E-04
26.0	88.5	224.0	1.177E-01	3.506E+01	7.150E+08	2.507E+15	9.933E+15	2.946E-04	2.946E-04	1.169E-03	1.169E-03
27.0	88.2	224.0	8.586E-02	2.982E+01	8.223E+08	2.452E+15	1.239E+16	2.832E-04	2.832E-04	1.457E-03	1.457E-03
28.0	87.9	224.0	6.527E-02	2.641E+01	8.843E+08	2.336E+15	1.472E+16	2.745E-04	2.745E-04	1.732E-03	1.732E-03
29.0	87.7	224.0	5.060E-02	2.385E+01	9.425E+08	2.248E+15	1.697E+16	2.642E-04	2.642E-04	1.996E-03	1.996E-03
30.0	87.5	234.0	3.863E-02	2.209E+01	1.038E+09	2.294E+15	1.926E+16	2.638E-04	2.638E-04	2.260E-03	2.260E-03
31.0	87.3	234.0	3.115E-02	2.062E+01	1.022E+09	2.108E+15	2.137E+16	2.425E-04	2.425E-04	2.502E-03	2.502E-03
32.0	87.1	234.0	2.534E-02	1.941E+01	8.899E+08	1.727E+15	2.310E+16	1.987E-04	1.987E-04	2.701E-03	2.701E-03
33.0	86.9	234.0	2.076E-02	1.840E+01	7.815E+08	1.438E+15	2.454E+16	1.654E-04	1.654E-04	2.866E-03	2.866E-03
34.0	86.8	234.0	1.701E-02	1.744E+01	6.862E+08	1.197E+15	2.573E+16	1.377E-04	1.377E-04	3.004E-03	3.004E-03
35.0	86.6	245.0	1.354E-02	1.676E+01	6.023E+08	1.011E+15	2.674E+16	1.135E-04	1.135E-04	3.117E-03	3.117E-03
36.0	86.5	245.0	1.132E-02	1.612E+01	5.236E+08	8.441E+14	2.759E+16	9.491E-05	9.491E-05	3.212E-03	3.212E-03
37.0	86.3	245.0	9.493E-03	1.555E+01	4.544E+08	7.067E+14	2.829E+16	7.937E-05	7.937E-05	3.292E-03	3.292E-03
38.0	86.2	245.0	7.983E-03	1.503E+01	4.000E+08	6.013E+14	2.890E+16	6.753E-05	6.753E-05	3.359E-03	3.359E-03
39.0	86.1	245.0	6.688E-03	1.447E+01	3.530E+08	5.109E+14	2.941E+16	5.738E-05	5.738E-05	3.416E-03	3.416E-03

NO

APPARENT Z-ANG 93.0 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 21.1 (KM)
 OPTICAL AIR MASS 3.756

TOTAL GAS ABSORPTION 3.063E-03 (CM-1)
 TOTAL GAS AMOUNT 3.326E+16 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
21.1	90.0	219.0	7.802E-01	1.057E+02	2.070E+08	2.108E+15	2.108E+15	2.599E-04	2.599E-04	2.599E-04	2.599E-04
22.0	90.9	220.0	3.129E-01	4.946E+01	9.375E+07	4.637E+14	2.651E+15	5.497E-05	5.497E-05	3.149E-04	3.149E-04
23.0	91.4	222.0	1.988E-01	3.709E+01	7.124E+07	2.642E+14	2.916E+15	3.119E-05	3.119E-05	3.461E-04	3.461E-04
24.0	91.7	223.0	1.418E-01	3.100E+01	6.170E+07	1.913E+14	3.107E+15	2.253E-05	2.253E-05	3.686E-04	3.686E-04
25.0	92.0	224.0	1.063E-01	2.721E+01	6.178E+07	1.681E+14	3.275E+15	1.976E-05	1.976E-05	3.894E-04	3.894E-04
26.0	92.2	224.0	8.228E-02	2.455E+01	6.452E+07	1.584E+14	3.434E+15	1.862E-05	1.862E-05	4.070E-04	4.070E-04
27.0	92.4	224.0	6.488E-02	2.255E+01	6.627E+07	1.494E+14	3.583E+15	1.756E-05	1.756E-05	4.246E-04	4.246E-04
28.0	92.6	224.0	5.182E-02	2.098E+01	6.383E+07	1.339E+14	3.717E+15	1.574E-05	1.574E-05	4.403E-04	4.403E-04
29.0	92.8	224.0	4.157E-02	1.960E+01	6.105E+07	1.197E+14	3.837E+15	1.406E-05	1.406E-05	4.544E-04	4.544E-04
21.1	90.0	219.0	7.802E-01	1.057E+02	3.199E+08	3.381E+15	3.381E+15	4.017E-04	4.017E-04	4.017E-04	4.017E-04
22.0	89.1	220.0	3.129E-01	4.946E+01	4.132E+08	2.044E+15	5.425E+15	2.423E-04	2.423E-04	6.440E-04	6.440E-04
23.0	88.6	222.0	1.988E-01	3.709E+01	4.739E+08	1.758E+15	7.183E+15	2.075E-04	2.075E-04	6.515E-04	6.515E-04
24.0	88.3	223.0	1.418E-01	3.100E+01	5.537E+08	1.717E+15	8.899E+15	2.022E-04	2.022E-04	1.054E-03	1.054E-03
25.0	88.0	224.0	1.063E-01	2.721E+01	6.644E+08	1.808E+15	1.071E+16	2.125E-04	2.125E-04	1.266E-03	1.266E-03
26.0	87.8	224.0	8.228E-02	2.455E+01	7.680E+08	1.886E+15	1.259E+16	2.216E-04	2.216E-04	1.488E-03	1.488E-03
27.0	87.6	224.0	6.488E-02	2.255E+01	8.626E+08	1.945E+15	1.454E+16	2.286E-04	2.286E-04	1.716E-03	1.716E-03
28.0	87.4	224.0	5.182E-02	2.098E+01	9.149E+08	1.920E+15	1.646E+16	2.256E-04	2.256E-04	1.942E-03	1.942E-03
29.0	87.2	224.0	4.157E-02	1.960E+01	9.691E+08	1.900E+15	1.836E+16	2.233E-04	2.233E-04	2.165E-03	2.165E-03
30.0	87.0	234.0	3.256E-02	1.862E+01	1.062E+09	1.977E+15	2.033E+16	2.274E-04	2.274E-04	2.393E-03	2.393E-03
31.0	86.8	234.0	2.677E-02	1.772E+01	1.039E+09	1.841E+15	2.218E+16	2.118E-04	2.118E-04	2.605E-03	2.605E-03
32.0	86.7	234.0	2.212E-02	1.695E+01	8.999E+08	1.525E+15	2.370E+16	1.754E-04	1.754E-04	2.780E-03	2.780E-03
33.0	86.5	234.0	1.835E-02	1.627E+01	7.801E+08	1.282E+15	2.496E+16	1.475E-04	1.475E-04	2.927E-03	2.927E-03
34.0	86.4	234.0	1.519E-02	1.558E+01	6.910E+08	1.077E+15	2.606E+16	1.238E-04	1.238E-04	3.051E-03	3.051E-03
35.0	86.2	245.0	1.220E-02	1.512E+01	6.062E+08	9.166E+14	2.698E+16	1.029E-04	1.029E-04	3.154E-03	3.154E-03
36.0	86.1	245.0	1.028E-02	1.464E+01	5.261E+08	7.703E+14	2.775E+16	8.652E-05	8.652E-05	3.241E-03	3.241E-03
37.0	86.0	245.0	8.675E-03	1.421E+01	4.556E+08	6.477E+14	2.839E+16	7.275E-05	7.275E-05	3.313E-03	3.313E-03
38.0	85.9	245.0	7.337E-03	1.381E+01	4.013E+08	5.543E+14	2.895E+16	6.225E-05	6.225E-05	3.376E-03	3.376E-03
39.0	85.7	245.0	6.178E-03	1.337E+01	3.534E+08	4.725E+14	2.942E+16	5.307E-05	5.307E-05	3.429E-03	3.429E-03

NO

APPARENT Z-ANG 93.5 (DEG) TOTAL GAS ABSORPTION 3.685E-03 (CM-1)
 BALLOON HEIGHT 30.0 (KM) TOTAL GAS AMOUNT 3.315E+16 (MOLEC/CM2)
 TANGENT HEIGHT 17.9 (KM)
 OPTICAL AIR MASS 6.469

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG UENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
17.9	90.0	216.0	4.639E-01	3.646E+01	1.741E+08	6.347E+14	6.347E+14	7.539E-05	7.539E-05	7.539E-05	7.539E-05
18.0	90.3	216.0	1.015E+00	8.345E+01	8.685E+07	7.248E+14	1.359E+15	6.667E-05	6.667E-05	1.626E-04	1.626E-04
19.0	91.1	217.0	4.653E-01	4.542E+01	4.309E+07	1.957E+14	1.555E+15	2.336E-05	2.336E-05	1.859E-04	1.859E-04
20.0	91.4	218.0	3.075E-01	3.533E+01	2.802E+07	9.899E+13	1.654E+15	1.179E-05	1.179E-05	1.977E-04	1.977E-04
21.0	91.8	219.0	2.218E-01	2.996E+01	1.804E+07	5.405E+13	1.708E+15	6.421E-06	6.421E-06	2.041E-04	2.041E-04
22.0	92.0	220.0	1.669E-01	2.647E+01	1.293E+07	3.423E+13	1.742E+15	4.058E-06	4.058E-06	2.082E-04	2.082E-04
23.0	92.3	222.0	1.285E-01	2.400E+01	9.409E+06	2.257E+13	1.765E+15	2.665E-06	2.665E-06	2.109E-04	2.109E-04
24.0	92.5	223.0	1.010E-01	2.211E+01	8.766E+06	1.938E+13	1.784E+15	2.283E-06	2.283E-06	2.131E-04	2.131E-04
25.0	92.7	224.0	8.052E-02	2.063E+01	8.423E+06	1.738E+13	1.802E+15	2.042E-06	2.042E-06	2.152E-04	2.152E-04
26.0	92.9	224.0	6.502E-02	1.941E+01	9.633E+06	1.670E+13	1.821E+15	2.198E-06	2.198E-06	2.174E-04	2.174E-04
27.0	93.0	224.0	5.287E-02	1.838E+01	1.132E+07	2.081E+13	1.841E+15	2.445E-06	2.445E-06	2.198E-04	2.198E-04
28.0	93.2	224.0	4.324E-02	1.751E+01	1.170E+07	2.049E+13	1.862E+15	2.408E-06	2.408E-06	2.222E-04	2.222E-04
29.0	93.3	224.0	3.534E-02	1.666E+01	1.179E+07	1.964E+13	1.881E+15	2.309E-06	2.309E-06	2.245E-04	2.245E-04
17.9	90.0	216.0	4.639E-01	3.646E+01	1.811E+08	6.603E+14	6.603E+14	7.696E-05	7.696E-05	7.696E-05	7.696E-05
18.0	89.7	216.0	1.015E+00	8.345E+01	3.666E+08	3.060E+15	3.720E+15	3.659E-04	3.659E-04	4.448E-04	4.448E-04
19.0	88.9	217.0	4.653E-01	4.542E+01	4.737E+08	2.152E+15	5.872E+15	2.587E-04	2.587E-04	7.016E-04	7.016E-04
20.0	88.6	218.0	3.075E-01	3.533E+01	5.250E+08	1.855E+15	7.726E+15	2.208E-04	2.208E-04	9.224E-04	9.224E-04
21.0	88.2	219.0	2.218E-01	2.996E+01	5.251E+08	1.585E+15	9.312E+15	1.883E-04	1.883E-04	1.111E-03	1.111E-03
22.0	88.0	220.0	1.669E-01	2.647E+01	5.147E+08	1.362E+15	1.067E+16	1.615E-04	1.615E-04	1.272E-03	1.272E-03
23.0	87.7	222.0	1.285E-01	2.400E+01	5.468E+08	1.312E+15	1.199E+16	1.549E-04	1.549E-04	1.427E-03	1.427E-03
24.0	87.5	223.0	1.010E-01	2.211E+01	6.104E+08	1.350E+15	1.334E+16	1.590E-04	1.590E-04	1.596E-03	1.596E-03
25.0	87.3	224.0	8.052E-02	2.063E+01	7.141E+08	1.473E+15	1.481E+16	1.731E-04	1.731E-04	1.759E-03	1.759E-03
26.0	87.1	224.0	6.502E-02	1.941E+01	8.114E+08	1.575E+15	1.638E+16	1.851E-04	1.851E-04	1.944E-03	1.944E-03
27.0	87.0	224.0	5.287E-02	1.838E+01	8.980E+08	1.651E+15	1.803E+16	1.940E-04	1.940E-04	2.138E-03	2.138E-03
28.0	86.8	224.0	4.324E-02	1.751E+01	9.433E+08	1.652E+15	1.969E+16	1.941E-04	1.941E-04	2.333E-03	2.333E-03
29.0	86.7	224.0	3.534E-02	1.666E+01	9.913E+08	1.652E+15	2.134E+16	1.996E-04	1.996E-04	2.527E-03	2.527E-03
30.0	86.5	234.0	2.810E-02	1.608E+01	1.079E+09	1.735E+15	2.307E+16	1.996E-04	1.996E-04	2.726E-03	2.726E-03
31.0	86.4	234.0	2.340E-02	1.549E+01	1.053E+09	1.631E+15	2.470E+16	1.876E-04	1.876E-04	2.914E-03	2.914E-03
32.0	86.2	234.0	1.954E-02	1.497E+01	9.100E+08	1.362E+15	2.607E+16	1.567E-04	1.567E-04	3.071E-03	3.071E-03
33.0	86.1	234.0	1.636E-02	1.450E+01	7.942E+08	1.152E+15	2.722E+16	1.325E-04	1.325E-04	3.203E-03	3.203E-03
34.0	86.0	234.0	1.365E-02	1.400E+01	6.952E+08	9.733E+14	2.819E+16	1.120E-04	1.120E-04	3.315E-03	3.315E-03
35.0	85.8	245.0	1.104E-02	1.368E+01	6.091E+08	8.333E+14	2.902E+16	9.360E-05	9.360E-05	3.409E-03	3.409E-03
36.0	85.7	245.0	9.352E-03	1.332E+01	5.262E+08	7.036E+14	2.973E+16	7.903E-05	7.903E-05	3.488E-03	3.488E-03
37.0	85.6	245.0	7.936E-03	1.300E+01	4.575E+08	5.947E+14	3.032E+16	6.680E-05	6.680E-05	3.554E-03	3.554E-03
38.0	85.5	245.0	6.744E-03	1.270E+01	4.024E+08	5.111E+14	3.083E+16	5.741E-05	5.741E-05	3.612E-03	3.612E-03
39.0	85.4	245.0	5.703E-03	1.234E+01	3.546E+08	4.376E+14	3.127E+16	4.915E-05	4.915E-05	3.661E-03	3.661E-03

NO		APPARENT Z-ANG		Z-ANG		DEL(DM)		DEL(PATH)		AVG DENS		TOTAL GAS ABSORPTION		GAS ABSORB		ACCUM	
ALT	Z-ANG	TEMP	DEL	DEL	DEL	DEL	DEL	DEL	DEL	DEL	DEL	DEL	TOTAL GAS AMOUNT	GAS AMOUNT	GAS ABSORB	GAS ABSORB	ACCUM
(KM)	(DEG)	(DEG-K)	(DM)	(DM)	(DM)	(DM)	(DM)	(DM)	(DM)	(MOLEC/CM3)	(MOLEC/CM2)	(MOLEC/CM2)	(MOLEC/CM2)	(1/CM)	(1/CM)	(1/CM)	(1/CM)
14.1	90.0	216.0	2.502E+00	1.106E+02	4.330E+07	4.789E+14	4.789E+14	4.789E+14	5.727E-05	5.727E-05	5.727E-05	5.727E-05	5.727E-05	5.727E-05	5.727E-05	5.727E-05	5.727E-05
15.0	90.9	216.0	9.497E-01	4.900E+01	8.654E+06	4.240E+13	4.240E+13	4.240E+13	5.071E-04	5.071E-04	5.071E-04	5.071E-04	5.071E-04	5.071E-04	5.071E-04	5.071E-04	5.071E-04
16.0	91.4	216.0	6.111E-01	3.701E+01	4.606E+06	1.705E+13	1.705E+13	1.705E+13	2.038E-05	2.038E-05	2.038E-05	2.038E-05	2.038E-05	2.038E-05	2.038E-05	2.038E-05	2.038E-05
17.0	91.7	216.0	4.366E-01	3.099E+01	3.115E+06	9.653E+12	9.653E+12	9.653E+12	5.480E-06	5.480E-06	5.480E-06	5.480E-06	5.480E-06	5.480E-06	5.480E-06	5.480E-06	5.480E-06
18.0	92.0	216.0	3.269E-01	2.719E+01	2.161E+06	5.877E+12	5.877E+12	5.877E+12	5.539E-07	5.539E-07	5.539E-07	5.539E-07	5.539E-07	5.539E-07	5.539E-07	5.539E-07	5.539E-07
19.0	92.2	217.0	2.506E-01	2.453E+01	1.639E+06	4.020E+12	4.020E+12	4.020E+12	5.579E-07	5.579E-07	5.579E-07	5.579E-07	5.579E-07	5.579E-07	5.579E-07	5.579E-07	5.579E-07
20.0	92.4	219.0	1.957E-01	2.252E+01	1.224E+06	2.756E+12	2.756E+12	2.756E+12	5.607E-07	5.607E-07	5.607E-07	5.607E-07	5.607E-07	5.607E-07	5.607E-07	5.607E-07	5.607E-07
21.0	92.6	219.0	1.549E-01	2.094E+01	9.267E+05	1.941E+12	1.941E+12	1.941E+12	5.626E-07	5.626E-07	5.626E-07	5.626E-07	5.626E-07	5.626E-07	5.626E-07	5.626E-07	5.626E-07
22.0	92.8	220.0	1.238E-01	1.965E+01	6.182E+05	1.215E+12	1.215E+12	1.215E+12	5.639E-07	5.639E-07	5.639E-07	5.639E-07	5.639E-07	5.639E-07	5.639E-07	5.639E-07	5.639E-07
23.0	93.0	222.0	9.943E-02	1.859E+01	5.014E+05	9.322E+11	9.322E+11	9.322E+11	5.648E-07	5.648E-07	5.648E-07	5.648E-07	5.648E-07	5.648E-07	5.648E-07	5.648E-07	5.648E-07
24.0	93.2	223.0	8.073E-02	1.768E+01	5.131E+05	9.072E+11	9.072E+11	9.072E+11	5.657E-07	5.657E-07	5.657E-07	5.657E-07	5.657E-07	5.657E-07	5.657E-07	5.657E-07	5.657E-07
25.0	93.3	224.0	6.595E-02	1.690E+01	6.362E+05	1.075E+12	1.075E+12	1.075E+12	5.666E-07	5.666E-07	5.666E-07	5.666E-07	5.666E-07	5.666E-07	5.666E-07	5.666E-07	5.666E-07
26.0	93.4	224.0	5.432E-02	1.622E+01	6.593E+05	1.069E+12	1.069E+12	1.069E+12	5.678E-07	5.678E-07	5.678E-07	5.678E-07	5.678E-07	5.678E-07	5.678E-07	5.678E-07	5.678E-07
27.0	93.6	224.0	4.489E-02	1.561E+01	6.677E+05	1.042E+12	1.042E+12	1.042E+12	5.689E-07	5.689E-07	5.689E-07	5.689E-07	5.689E-07	5.689E-07	5.689E-07	5.689E-07	5.689E-07
28.0	93.7	224.0	3.721E-02	1.507E+01	6.180E+05	9.313E+11	9.313E+11	9.313E+11	5.698E-07	5.698E-07	5.698E-07	5.698E-07	5.698E-07	5.698E-07	5.698E-07	5.698E-07	5.698E-07
29.0	93.9	224.0	3.076E-02	1.451E+01	5.787E+05	8.398E+11	8.398E+11	8.398E+11	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07
14.1	90.0	216.0	2.502E+00	1.106E+02	1.469E+08	1.624E+15	1.624E+15	1.624E+15	1.943E-04	1.943E-04	1.943E-04	1.943E-04	1.943E-04	1.943E-04	1.943E-04	1.943E-04	1.943E-04
15.0	89.1	216.0	9.497E-01	4.900E+01	3.169E+08	1.553E+15	1.553E+15	1.553E+15	3.800E-04	3.800E-04	3.800E-04	3.800E-04	3.800E-04	3.800E-04	3.800E-04	3.800E-04	3.800E-04
16.0	88.6	216.0	6.111E-01	3.701E+01	4.702E+08	1.740E+15	1.740E+15	1.740E+15	2.081E-04	2.081E-04	2.081E-04	2.081E-04	2.081E-04	2.081E-04	2.081E-04	2.081E-04	2.081E-04
17.0	88.3	216.0	4.366E-01	3.099E+01	5.936E+08	1.840E+15	1.840E+15	1.840E+15	6.757E-04	6.757E-04	6.757E-04	6.757E-04	6.757E-04	6.757E-04	6.757E-04	6.757E-04	6.757E-04
18.0	88.0	216.0	3.269E-01	2.719E+01	6.578E+08	1.789E+15	1.789E+15	1.789E+15	8.546E+15	8.546E+15	8.546E+15	8.546E+15	8.546E+15	8.546E+15	8.546E+15	8.546E+15	8.546E+15
19.0	87.8	217.0	2.506E-01	2.453E+01	6.476E+08	1.589E+15	1.589E+15	1.589E+15	1.013E+16	1.013E+16	1.013E+16	1.013E+16	1.013E+16	1.013E+16	1.013E+16	1.013E+16	1.013E+16
20.0	87.6	219.0	1.957E-01	2.252E+01	6.461E+08	1.455E+15	1.455E+15	1.455E+15	1.159E+16	1.159E+16	1.159E+16	1.159E+16	1.159E+16	1.159E+16	1.159E+16	1.159E+16	1.159E+16
21.0	87.4	219.0	1.549E-01	2.094E+01	6.129E+08	1.283E+15	1.283E+15	1.283E+15	1.287E+16	1.287E+16	1.287E+16	1.287E+16	1.287E+16	1.287E+16	1.287E+16	1.287E+16	1.287E+16
22.0	87.2	220.0	1.238E-01	1.965E+01	5.753E+08	1.130E+15	1.130E+15	1.130E+15	1.400E+16	1.400E+16	1.400E+16	1.400E+16	1.400E+16	1.400E+16	1.400E+16	1.400E+16	1.400E+16
23.0	87.0	222.0	9.943E-02	1.859E+01	5.946E+08	1.105E+15	1.105E+15	1.105E+15	1.511E+16	1.511E+16	1.511E+16	1.511E+16	1.511E+16	1.511E+16	1.511E+16	1.511E+16	1.511E+16
24.0	86.8	223.0	8.073E-02	1.768E+01	6.509E+08	1.151E+15	1.151E+15	1.151E+15	1.626E+16	1.626E+16	1.626E+16	1.626E+16	1.626E+16	1.626E+16	1.626E+16	1.626E+16	1.626E+16
25.0	86.7	224.0	6.595E-02	1.690E+01	7.474E+08	1.263E+15	1.263E+15	1.263E+15	1.752E+16	1.752E+16	1.752E+16	1.752E+16	1.752E+16	1.752E+16	1.752E+16	1.752E+16	1.752E+16
26.0	86.6	224.0	5.432E-02	1.622E+01	8.420E+08	1.366E+15	1.366E+15	1.366E+15	1.889E+16	1.889E+16	1.889E+16	1.889E+16	1.889E+16	1.889E+16	1.889E+16	1.889E+16	1.889E+16
27.0	86.4	224.0	4.489E-02	1.561E+01	9.261E+08	1.446E+15	1.446E+15	1.446E+15	2.033E+16	2.033E+16	2.033E+16	2.033E+16	2.033E+16	2.033E+16	2.033E+16	2.033E+16	2.033E+16
28.0	86.3	224.0	3.721E-02	1.507E+01	9.261E+08	1.458E+15	1.458E+15	1.458E+15	2.179E+16	2.179E+16	2.179E+16	2.179E+16	2.179E+16	2.179E+16	2.179E+16	2.179E+16	2.179E+16
29.0	86.1	224.0	3.076E-02	1.451E+01	1.012E+09	1.468E+15	1.468E+15	1.468E+15	2.326E+16	2.326E+16	2.326E+16	2.326E+16	2.326E+16	2.326E+16	2.326E+16	2.326E+16	2.326E+16
30.0	86.0	234.0	2.471E-02	1.414E+01	1.095E+09	1.549E+15	1.549E+15	1.549E+15	2.481E+16	2.481E+16	2.481E+16	2.481E+16	2.481E+16	2.481E+16	2.481E+16	2.481E+16	2.481E+16
31.0	85.9	234.0	2.075E-02	1.374E+01	1.065E+09	1.463E+15	1.463E+15	1.463E+15	2.627E+16	2.627E+16	2.627E+16	2.627E+16	2.627E+16	2.627E+16	2.627E+16	2.627E+16	2.627E+16
32.0	85.8	234.0	1.746E-02	1.338E+01	1.015E+09	1.228E+15	1.228E+15	1.228E+15	2.750E+16	2.750E+16	2.750E+16	2.750E+16	2.750E+16	2.750E+16	2.750E+16	2.750E+16	2.750E+16
33.0	85.6	234.0	1.471E-02	1.304E+01	8.015E+08	1.045E+15	1.045E+15	1.045E+15	2.855E+16	2.855E+16	2.855E+16	2.855E+16	2.855E+16	2.855E+16	2.855E+16	2.855E+16	2.855E+16
34.0	85.5	234.0	1.234E-02	1.266E+01	7.002E+08	8.665E+14	8.665E+14	8.665E+14	2.943E+16	2.943E+16	2.943E+16	2.943E+16	2.943E+16	2.943E+16	2.943E+16	2.943E+16	2.943E+16
35.0	85.4	245.0	1.004E-02	1.244E+01	6.122E+08	7.616E+14	7.616E+14	7.616E+14	3.019E+16	3.019E+16	3.019E+16	3.019E+16	3.019E+16	3.019E+16	3.019E+16	3.019E+16	3.019E+16
36.0	85.3	245.0	8.544E-03	1.217E+01	5.302E+08	6.453E+14	6.453E+14	6.453E+14	3.084E+16	3.084E+16	3.084E+16	3.084E+16	3.084E+16	3.084E+16	3.084E+16	3.084E+16	3.084E+16
37.0	85.2	245.0	7.282E-03	1.193E+01	4.568E+08	5.472E+14	5.472E+14	5.472E+14	3.139E+16	3.139E+16	3.139E+16	3.139E+16	3.139E+16	3.139E+16	3.139E+16	3.139E+16	3.139E+16
38.0	85.1	245.0	6.212E-03	1.170E+01	4.036E+08	4.722E+14	4.722E+14	4.722E+14	3.156E+16	3.156E+16	3.156E+16	3.156E+16	3.156E+16	3.156E+16	3.156E+16	3.156E+16	3.156E+16
39.0	85.0	245.0	5.272E-03	1.141E+01	3.553E+08	4.055E+14	4.055E+14	4.055E+14	3.226E+16	3.226E+16	3.226E+16	3.226E+16	3.226E+16	3.226E+16	3.226E+16	3.226E+16	3.226E+16

NO

APPARENT Z-ANG 94.5 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 9.7 (KM)
 OPTICAL AIR MASS 22.904

TOTAL GAS ABSORPTION 3.867E-03 (CM-1)
 TOTAL GAS AMOUNT 3.294E+16 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
9.7	90.0	242.0	2.599E+00	6.384E+01	1.862E+05	1.188E+12	1.188E+12	1.188E+12	1.343E-07	1.343E-07
10.0	90.6	235.0	2.628E+00	6.803E+01	1.333E+06	9.068E+12	1.026E+13	1.026E+13	1.041E-06	1.175E-06
11.0	91.1	229.0	1.477E+00	4.338E+01	8.240E+05	3.575E+12	3.575E+12	3.575E+12	4.156E-07	1.591E-06
12.0	91.5	222.0	1.041E+00	3.453E+01	2.157E+05	7.450E+11	1.458E+13	1.458E+13	8.794E-06	1.679E-06
13.0	91.8	216.0	7.914E-01	2.947E+01	1.625E+05	4.790E+11	1.506E+13	1.506E+13	5.728E-08	1.736E-06
14.0	92.0	216.0	5.932E-01	2.622E+01	8.615E+04	2.311E+11	1.529E+13	1.529E+13	2.764E-08	1.764E-06
15.0	92.3	216.0	4.604E-01	2.384E+01	4.300E+04	1.025E+11	1.539E+13	1.539E+13	1.226E-08	1.776E-06
16.0	92.5	216.0	3.627E-01	2.200E+01	3.085E+04	6.787E+10	1.546E+13	1.546E+13	8.116E-09	1.784E-06
17.0	92.7	216.0	2.899E-01	2.053E+01	3.172E+04	6.513E+10	1.552E+13	1.552E+13	7.766E-09	1.792E-06
18.0	92.8	216.0	2.320E-01	1.931E+01	2.846E+04	5.497E+10	1.558E+13	1.558E+13	6.573E-09	1.798E-06
19.0	93.0	217.0	1.868E-01	1.830E+01	1.973E+04	3.612E+10	1.561E+13	1.561E+13	4.309E-09	1.803E-06
20.0	93.2	219.0	1.514E-01	1.743E+01	1.543E+04	2.689E+10	1.564E+13	1.564E+13	3.202E-09	1.806E-06
21.0	93.3	219.0	1.233E-01	1.667E+01	1.316E+04	2.194E+10	1.566E+13	1.566E+13	2.607E-09	1.808E-06
22.0	93.5	220.0	1.008E-01	1.600E+01	9.137E+03	1.462E+10	1.568E+13	1.568E+13	1.733E-09	1.810E-06
23.0	93.6	222.0	8.247E-02	1.542E+01	7.830E+03	1.207E+10	1.569E+13	1.569E+13	1.425E-09	1.812E-06
24.0	93.8	223.0	6.801E-02	1.489E+01	6.390E+03	9.515E+09	1.570E+13	1.570E+13	1.121E-09	1.813E-06
25.0	93.9	224.0	5.629E-02	1.443E+01	8.232E+03	1.188E+10	1.571E+13	1.571E+13	1.396E-09	1.814E-06
26.0	94.0	224.0	4.689E-02	1.400E+01	7.173E+03	1.004E+10	1.572E+13	1.572E+13	1.180E-09	1.815E-06
27.0	94.2	224.0	3.913E-02	1.361E+01	6.194E+03	8.430E+09	1.573E+13	1.573E+13	9.908E-10	1.816E-06
28.0	94.3	224.0	3.272E-02	1.325E+01	7.622E+03	1.010E+10	1.574E+13	1.574E+13	1.187E-09	1.818E-06
29.0	94.4	224.0	2.725E-02	1.285E+01	8.722E+03	1.121E+10	1.575E+13	1.575E+13	1.317E-09	1.819E-06

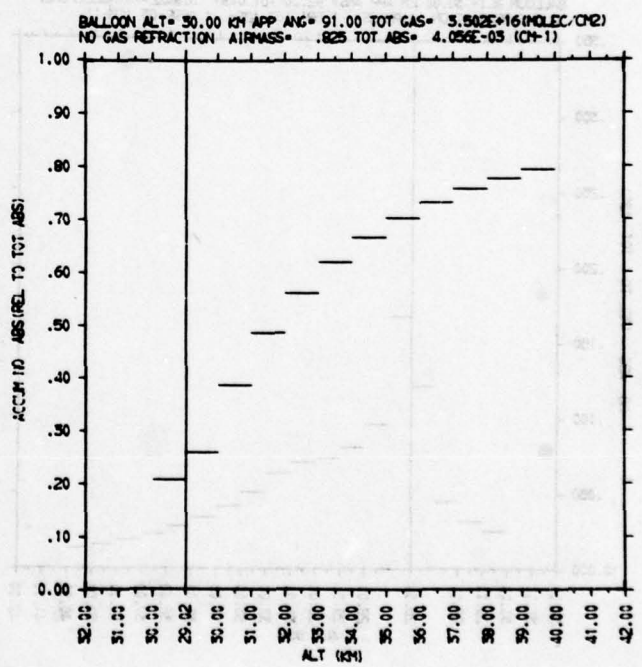
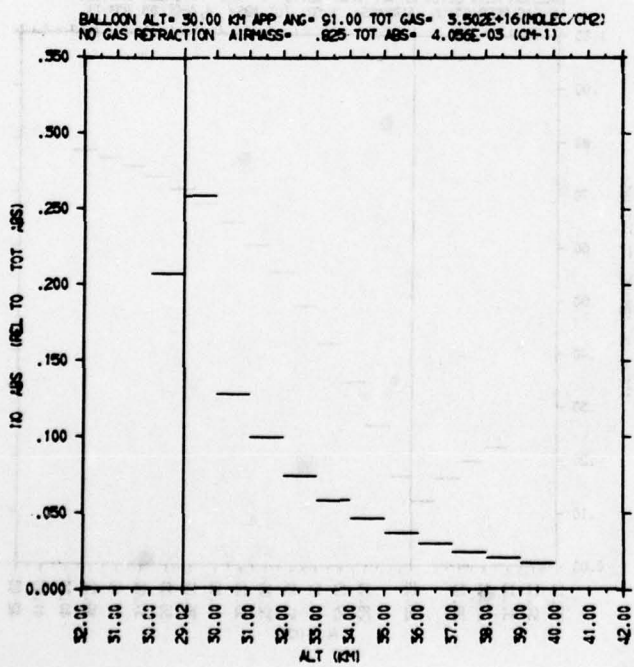
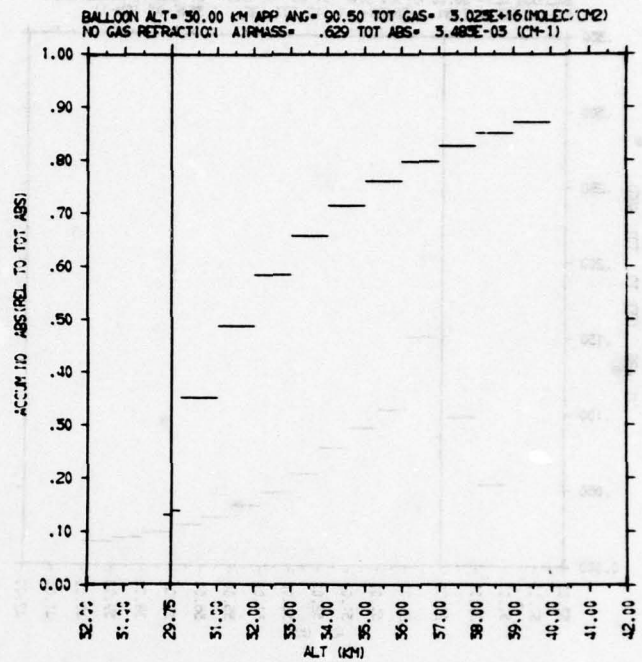
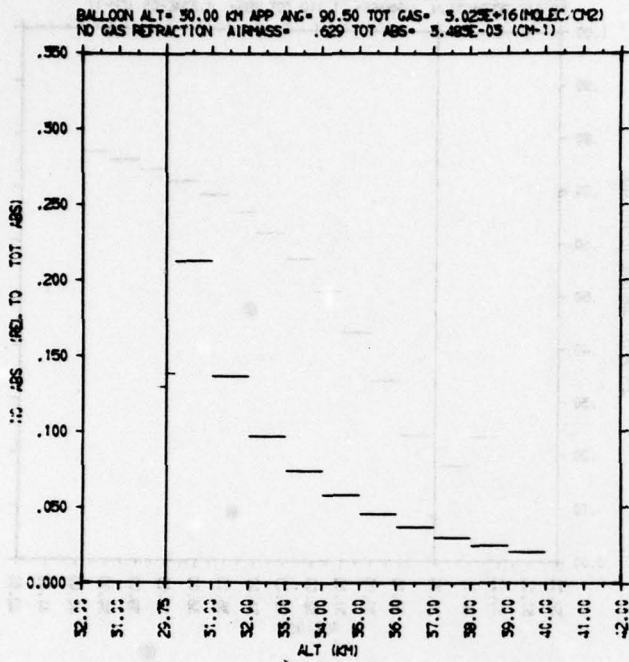
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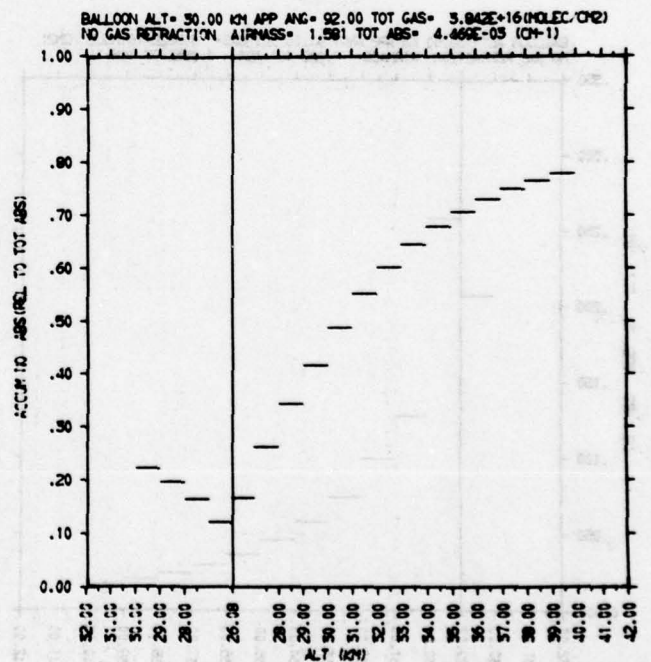
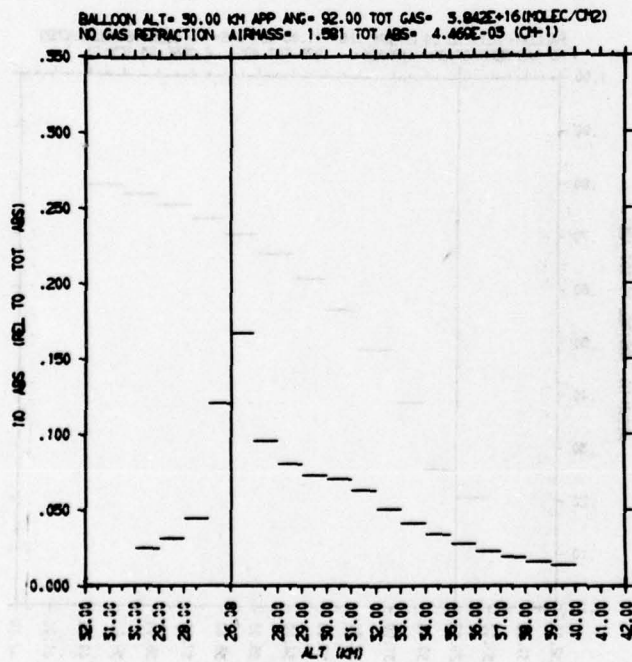
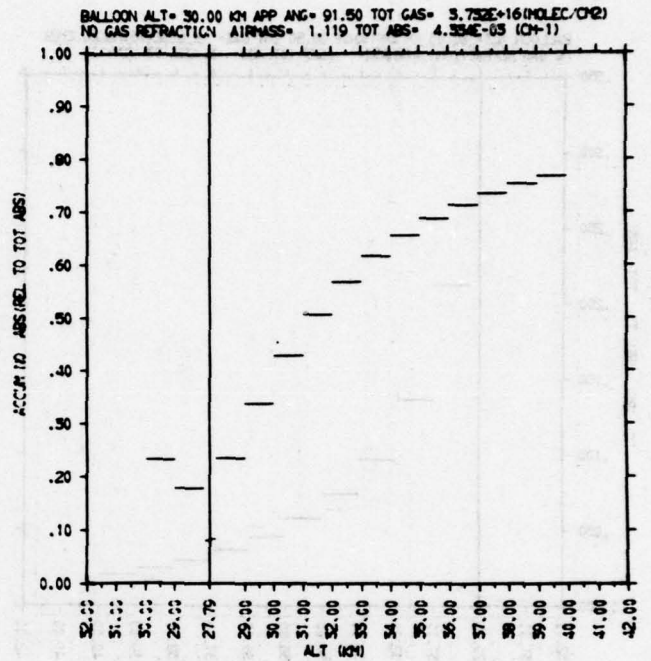
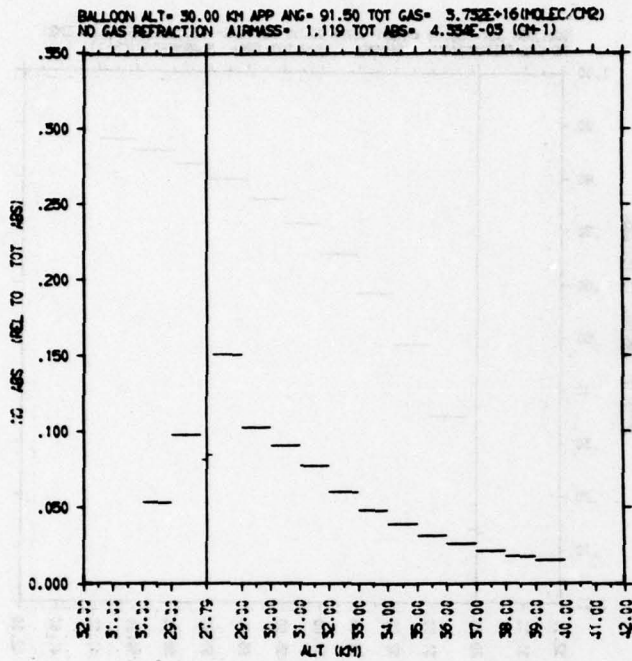
APPARENT Z-ANG 94.5 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 9.7 (KM)
 OPTICAL AIR MASS 22.904

TOTAL GAS ABSORPTION 3.667E-03 (CM-1)
 TOTAL GAS AMOUNT 3.294E+15 (MOLEC/CM2)

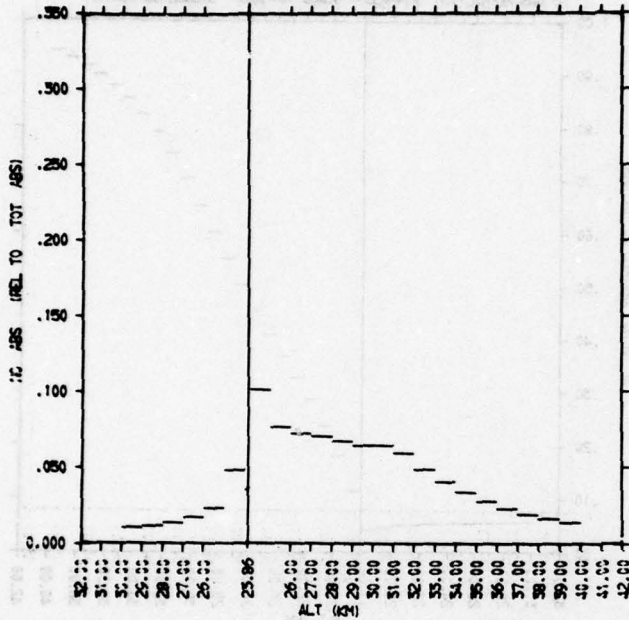
ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSOR (1/CM)	ACCUM GAS ABSOR (1/CM)
9.7	90.0	242.0	2.599E+00	6.384E+01	4.425E+06	2.825E+13	2.825E+13	2.825E+13	3.193E-06	3.193E-06
10.0	89.4	235.0	2.628E+00	6.803E+01	9.365E+07	6.385E+14	6.385E+14	6.667E+14	7.328E-05	7.647E-05
11.0	88.9	229.0	1.477E+00	4.338E+01	2.103E+08	9.123E+14	9.123E+14	1.579E+15	1.061E-04	1.925E-04
12.0	88.5	222.0	1.041E+00	3.453E+01	3.576E+08	1.235E+15	1.235E+15	2.814E+15	1.458E-04	3.283E-04
13.0	88.2	216.0	7.814E-01	2.947E+01	4.868E+08	1.435E+15	1.435E+15	4.248E+15	1.716E-04	4.998E-04
14.0	88.0	216.0	5.932E-01	2.622E+01	5.302E+08	1.390E+15	1.390E+15	5.639E+15	1.663E-04	6.661E-04
15.0	87.7	216.0	4.604E-01	2.384E+01	5.909E+08	1.409E+15	1.409E+15	7.046E+15	1.635E-04	8.346E-04
16.0	87.5	216.0	3.627E-01	2.200E+01	6.972E+08	1.534E+15	1.534E+15	8.581E+15	1.834E-04	1.016E-03
17.0	87.3	216.0	2.889E-01	2.053E+01	7.716E+08	1.585E+15	1.585E+15	1.017E+16	1.835E-04	1.207E-03
18.0	87.2	216.0	2.320E-01	1.931E+01	7.927E+08	1.531E+15	1.531E+15	1.170E+16	1.630E-04	1.391E-03
19.0	87.0	217.0	1.868E-01	1.830E+01	7.514E+08	1.375E+15	1.375E+15	1.307E+16	1.641E-04	1.555E-03
20.0	86.8	218.0	1.514E-01	1.743E+01	7.257E+08	1.265E+15	1.265E+15	1.434E+16	1.506E-04	1.705E-03
21.0	86.7	219.0	1.233E-01	1.667E+01	6.742E+08	1.124E+15	1.124E+15	1.546E+16	1.335E-04	1.839E-03
22.0	86.5	220.0	1.008E-01	1.600E+01	6.199E+08	9.919E+14	9.919E+14	1.645E+16	1.176E-04	1.956E-03
23.0	86.4	222.0	8.247E-02	1.542E+01	6.265E+08	9.691E+14	9.691E+14	1.742E+16	1.144E-04	2.071E-03
24.0	86.2	223.0	6.801E-02	1.489E+01	6.819E+08	1.015E+15	1.015E+15	1.844E+16	1.196E-04	2.190E-03
25.0	86.1	224.0	5.629E-02	1.443E+01	7.775E+08	1.122E+15	1.122E+15	1.956E+16	1.319E-04	2.322E-03
26.0	86.0	224.0	4.689E-02	1.400E+01	8.702E+08	1.218E+15	1.218E+15	2.078E+16	1.432E-04	2.465E-03
27.0	85.8	224.0	3.913E-02	1.361E+01	9.518E+08	1.295E+15	1.295E+15	2.207E+16	1.523E-04	2.618E-03
28.0	85.7	224.0	3.272E-02	1.325E+01	9.873E+08	1.308E+15	1.308E+15	2.338E+16	1.538E-04	2.771E-03
29.0	85.6	224.0	2.725E-02	1.285E+01	1.028E+09	1.321E+15	1.321E+15	2.470E+16	1.552E-04	2.927E-03
30.0	85.5	234.0	2.203E-02	1.261E+01	1.110E+09	1.400E+15	1.400E+15	2.610E+16	1.611E-04	3.086E-03
31.0	85.4	234.0	1.862E-02	1.233E+01	1.078E+09	1.329E+15	1.329E+15	2.743E+16	1.528E-04	3.241E-03
32.0	85.3	234.0	1.575E-02	1.207E+01	9.261E+08	1.118E+15	1.118E+15	2.855E+16	1.266E-04	3.369E-03
33.0	85.2	234.0	1.333E-02	1.162E+01	8.059E+08	9.526E+14	9.526E+14	2.950E+16	1.036E-04	3.472E-03
34.0	85.1	234.0	1.124E-02	1.153E+01	7.036E+08	8.113E+14	8.113E+14	3.031E+16	9.331E-05	3.572E-03
35.0	85.0	245.0	9.176E-03	1.137E+01	6.145E+08	6.987E+14	6.987E+14	3.101E+16	7.848E-05	3.650E-03
36.0	84.9	245.0	7.841E-03	1.117E+01	5.321E+08	5.944E+14	5.944E+14	3.161E+16	6.676E-05	3.717E-03
37.0	84.8	245.0	6.706E-03	1.098E+01	4.604E+08	5.056E+14	5.056E+14	3.211E+16	5.678E-05	3.774E-03
38.0	84.7	245.0	5.739E-03	1.081E+01	4.045E+08	4.373E+14	4.373E+14	3.255E+16	4.912E-05	3.823E-03
39.0	84.6	245.0	4.885E-03	1.057E+01	3.561E+08	3.765E+14	3.765E+14	3.292E+16	4.228E-05	3.865E-03

NO FIGURES

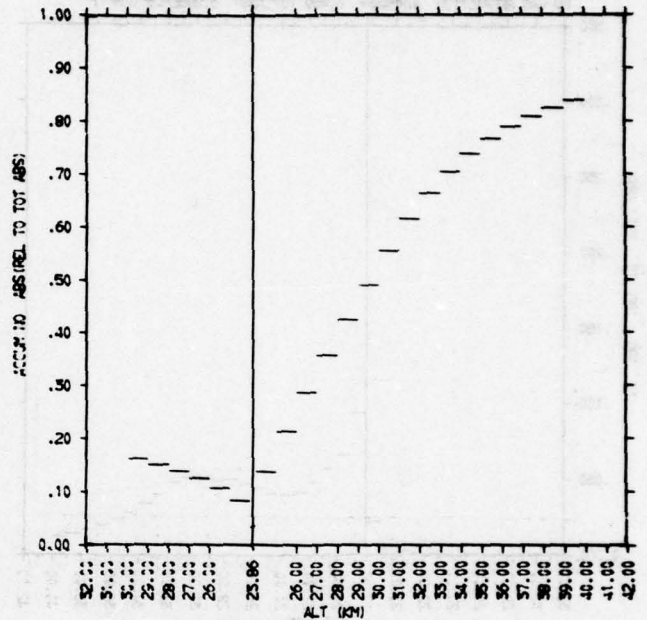




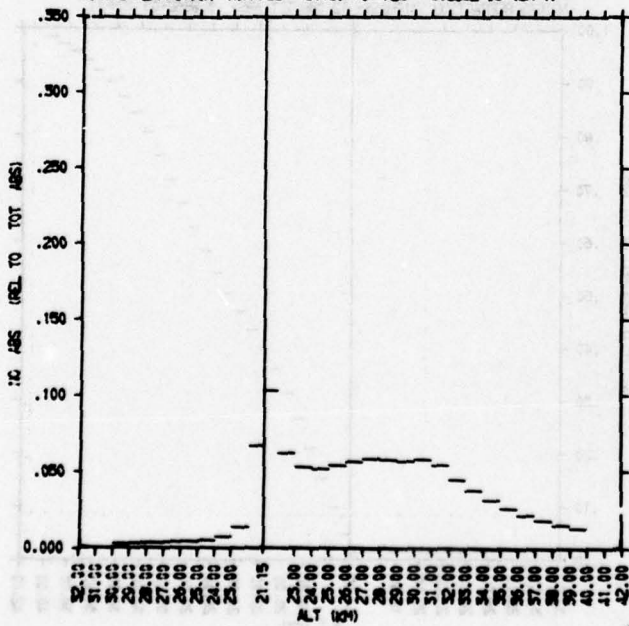
BALLOON ALT= 30.00 KM APP ANG= 92.50 TOT GAS= 5.509E+16(MOLEC./CM²)
 NO GAS REFRACTION AIRMASS= 2.355 TOT ABS= 4.081E-05 (CM⁻¹)



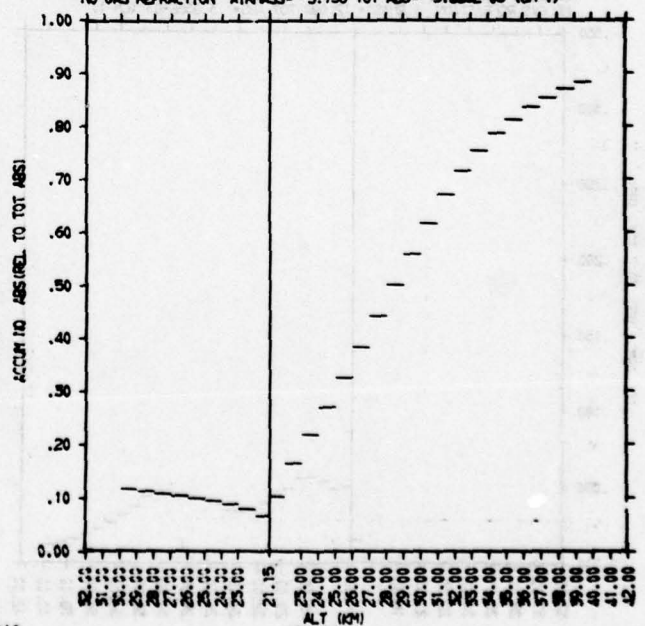
BALLOON ALT= 30.00 KM APP ANG= 92.50 TOT GAS= 5.509E+16(MOLEC./CM²)
 NO GAS REFRACTION AIRMASS= 2.355 TOT ABS= 4.081E-05 (CM⁻¹)



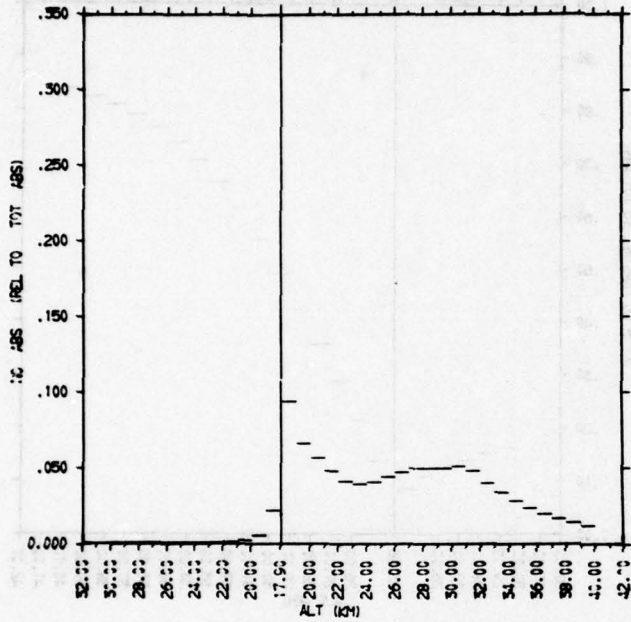
BALLOON ALT= 30.00 KM APP ANG= 95.00 TOT GAS= 5.526E+16(MOLEC./CM²)
 NO GAS REFRACTION AIRMASS= 3.756 TOT ABS= 3.889E-05 (CM⁻¹)



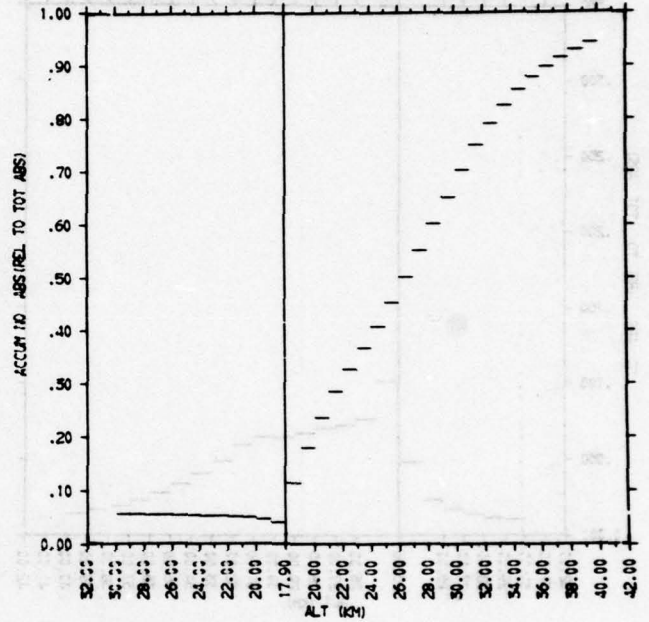
BALLOON ALT= 30.00 KM APP ANG= 95.00 TOT GAS= 5.526E+16(MOLEC./CM²)
 NO GAS REFRACTION AIRMASS= 3.756 TOT ABS= 3.889E-05 (CM⁻¹)



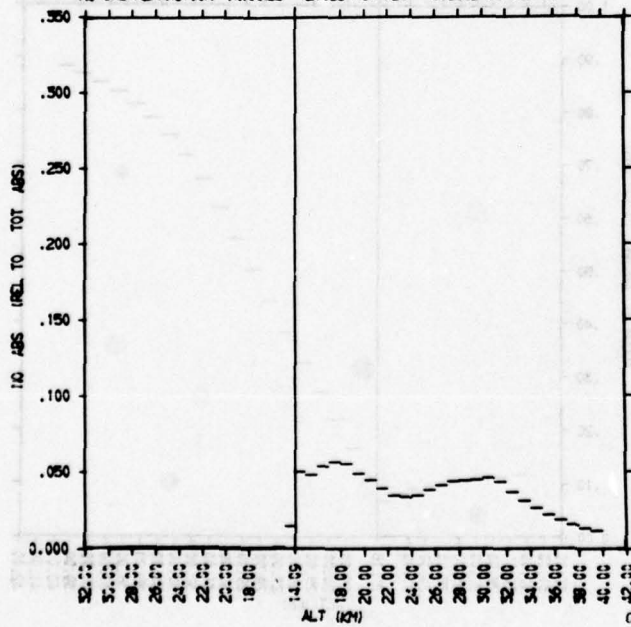
BALLOON ALT= 30.00 KM APP ANG= 95.50 TOT GAS= 3.315E+16(MOLEC/CM²)
 NO GAS REFRACTION AIRMASS= 6.469 TOT ABS= 3.988E-03 (CH-1)



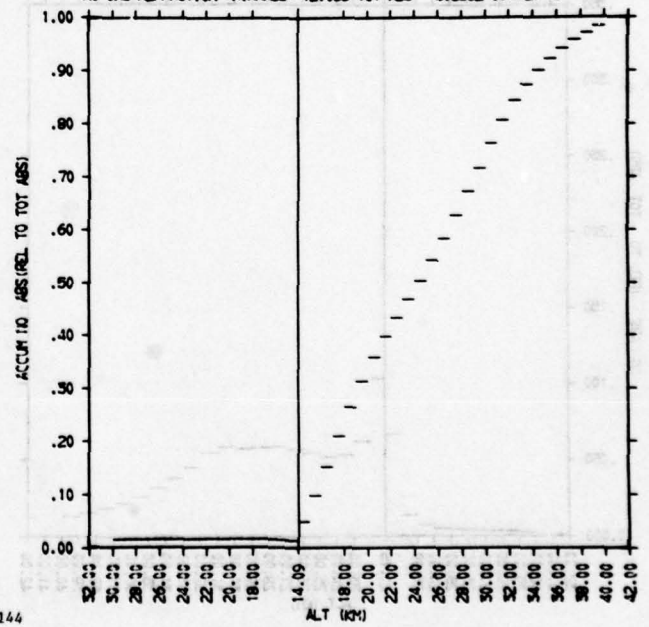
BALLOON ALT= 30.00 KM APP ANG= 95.50 TOT GAS= 3.315E+16(MOLEC/CM²)
 NO GAS REFRACTION AIRMASS= 6.469 TOT ABS= 3.988E-03 (CH-1)

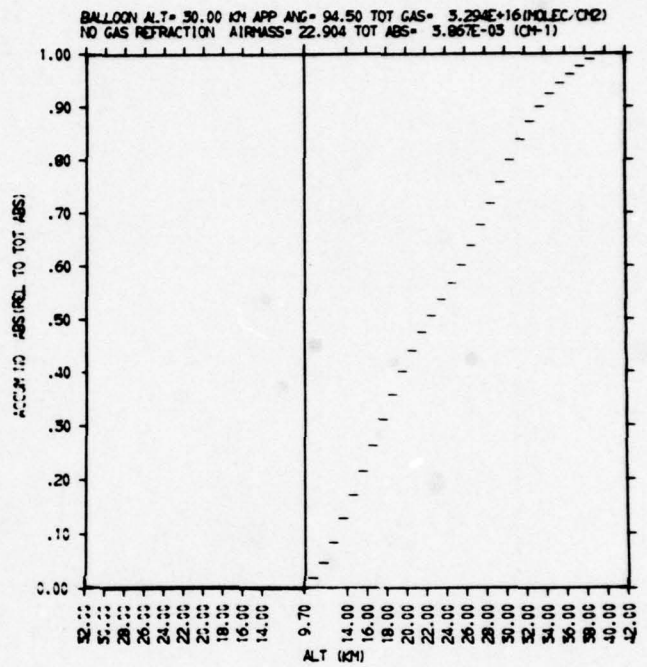
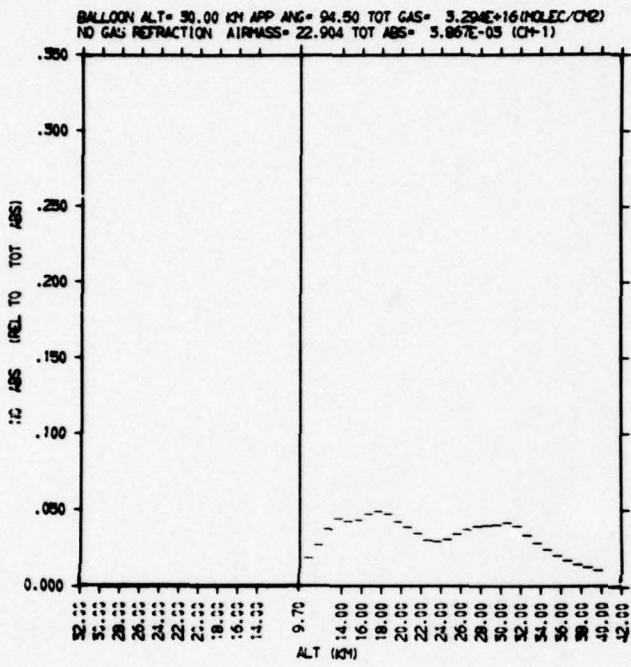


BALLOON ALT= 30.00 KM APP ANG= 94.00 TOT GAS= 3.285E+16(MOLEC/CM²)
 NO GAS REFRACTION AIRMASS= 12.088 TOT ABS= 3.856E-03 (CH-1)



BALLOON ALT= 30.00 KM APP ANG= 94.00 TOT GAS= 3.285E+16(MOLEC/CM²)
 NO GAS REFRACTION AIRMASS= 12.088 TOT ABS= 3.856E-03 (CH-1)





NO₂ TABLES

NO 2

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DM)	DEL (PATH) (KM)	AVG DEMS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)	TOTAL GAS ABSORPTION TOTAL GAS AMOUNT	3.859E-02 (CM-1) 7.475E+16 (MOLEC/CM2)
29.7	90.0	224.0	1.119E-01	5.595E+01	2.840E+09	1.589E+16	1.509E+16	8.293E-03	8.293E-03		
29.7	90.0	224.2	1.119E-01	5.812E+01	2.819E+09	1.630E+16	1.630E+16	8.540E-03	8.540E-03		
30.0	89.5	234.0	1.243E-01	7.055E+01	2.514E+09	1.774E+16	3.412E+16	9.102E-03	1.765E-02		
31.0	88.9	234.0	6.589E-02	4.350E+01	2.007E+09	6.733E+15	4.285E+16	4.402E-03	2.213E-02		
32.0	88.5	234.0	4.512E-02	3.451E+01	1.464E+09	5.054E+15	4.791E+16	2.594E-03	2.473E-02		
33.0	88.2	234.0	3.334E-02	2.953E+01	1.160E+09	3.427E+15	5.133E+16	1.759E-03	2.648E-02		
34.0	87.9	234.0	2.547E-02	2.611E+01	9.150E+08	2.391E+15	5.373E+16	1.227E-03	2.771E-02		
35.0	87.7	245.0	1.927E-02	2.386E+01	7.177E+08	1.713E+15	5.544E+16	8.624E-04	2.857E-02		
36.0	87.5	245.0	1.549E-02	2.205E+01	5.648E+08	1.244E+15	5.660E+16	6.263E-04	2.920E-02		
37.0	87.3	245.0	1.259E-02	2.061E+01	4.526E+08	9.329E+14	5.761E+16	4.698E-04	2.967E-02		
38.0	87.1	245.0	1.032E-02	1.942E+01	3.648E+08	7.005E+14	5.832E+16	3.568E-04	3.003E-02		
38.0	86.9	245.0	8.466E-03	1.831E+01	2.912E+08	5.333E+14	5.886E+16	2.685E-04	3.029E-02		

NO2

APPARENT Z-ANG 91.0 (DEG) TOTAL GAS ABSORPTION 5.866E-02 (CM-1)
 BALLOON HEIGHT 30.0 (KM) TOTAL GAS AMOUNT 9.772E+16 (MOLEC/CM2)
 TANGENT HEIGHT 29.0 (KM)
 OPTICAL AIR MASS .025

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
29.0	90.0	224.0	2.431E-01	1.145E+02	2.076E+09	3.293E+16	3.293E+16	1.719E-02	1.719E-02
29.0	90.0	224.0	2.431E-01	1.145E+02	2.721E+09	3.116E+16	3.116E+16	1.626E-02	1.626E-02
30.0	89.0	234.0	8.314E-02	4.740E+01	2.477E+09	1.174E+16	4.290E+16	6.025E-03	2.229E-02
31.0	88.5	234.0	5.493E-02	3.630E+01	1.991E+09	7.227E+15	5.012E+16	3.709E-03	2.599E-02
32.0	88.3	234.0	4.000E-02	3.061E+01	1.456E+09	4.458E+15	5.458E+16	2.208E-03	2.808E-02
33.0	88.0	234.0	3.046E-02	2.699E+01	1.155E+09	3.119E+15	5.770E+16	1.600E-03	2.980E-02
34.0	87.7	234.0	2.370E-02	2.429E+01	9.129E+08	2.216E+15	5.992E+16	1.137E-03	3.102E-02
35.0	87.5	245.0	1.814E-02	2.247E+01	7.150E+08	1.607E+15	6.152E+16	8.091E-04	3.163E-02
36.0	87.3	245.0	1.470E-02	2.094E+01	5.619E+08	1.177E+15	6.270E+16	5.925E-04	3.242E-02
37.0	87.1	245.0	1.203E-02	1.970E+01	4.515E+08	8.096E+14	6.359E+16	4.479E-04	3.207E-02
38.0	87.0	245.0	9.912E-03	1.866E+01	3.643E+08	6.798E+14	6.427E+16	3.423E-04	3.321E-02
39.0	86.0	245.0	8.164E-03	1.766E+01	2.912E+08	5.143E+14	6.470E+16	2.590E-04	3.347E-02

NO.2
 APPARENT Z-ANG 91.5 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 27.0 (KM)
 OPTICAL AIR MASS 1.119

TOTAL GAS ABSORPTION 6.004E-02 (CM-1)
 TOTAL GAS AMOUNT 1.309E+17 (MOLEC/CM2)

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(OM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
27.0	90.0	224.0	1.395E-01	5.341E+01	3.249E+09	1.735E+16	1.735E+16	1.735E+16	9.050E-03	9.050E-03
28.0	90.5	224.0	1.024E-01	7.319E+01	3.143E+09	2.301E+16	4.036E+16	4.036E+16	1.201E-02	2.107E-02
29.0	91.1	224.0	9.309E-02	4.377E+01	3.050E+09	1.335E+16	5.371E+16	5.371E+16	6.967E-03	2.803E-02
27.0	90.0	224.0	1.395E-01	5.341E+01	3.230E+09	1.725E+16	1.725E+16	1.725E+16	9.003E-03	9.003E-03
28.0	90.5	224.0	1.024E-01	7.319E+01	2.875E+09	2.105E+16	3.830E+16	3.830E+16	1.090E-02	1.999E-02
29.0	90.9	224.0	9.309E-02	4.377E+01	2.635E+09	1.154E+16	4.983E+16	4.983E+16	6.021E-03	2.601E-02
30.0	88.5	234.0	6.074E-02	3.470E+01	2.443E+09	0.477E+15	5.031E+16	5.031E+16	4.350E-03	3.036E-02
31.0	86.2	234.0	4.479E-02	2.962E+01	1.969E+09	5.032E+15	6.414E+16	6.414E+16	2.993E-03	3.335E-02
32.0	87.9	234.0	3.435E-02	2.630E+01	1.443E+09	3.796E+15	6.794E+16	6.794E+16	1.940E-03	3.530E-02
33.0	87.7	234.0	2.690E-02	2.391E+01	1.149E+09	2.747E+15	7.060E+16	7.060E+16	1.410E-03	3.671E-02
34.0	87.5	234.0	2.142E-02	2.196E+01	9.089E+08	1.996E+15	7.268E+16	7.268E+16	1.024E-03	3.773E-02
35.0	87.3	245.0	1.663E-02	2.060E+01	7.126E+08	1.460E+15	7.415E+16	7.415E+16	7.392E-04	3.847E-02
36.0	87.1	245.0	1.363E-02	1.941E+01	5.603E+08	1.000E+15	7.524E+16	7.524E+16	5.477E-04	3.902E-02
37.0	86.9	245.0	1.125E-02	1.841E+01	4.502E+08	8.209E+14	7.607E+16	7.607E+16	4.174E-04	3.944E-02
38.0	86.8	245.0	9.320E-03	1.756E+01	3.634E+08	6.301E+14	7.678E+16	7.678E+16	3.213E-04	3.976E-02
39.0	86.6	245.0	7.726E-03	1.672E+01	2.903E+08	4.054E+14	7.719E+16	7.719E+16	2.444E-04	4.000E-02

NO₂

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
26.1	90.0	224.0	3.703E-01	1.105E+02	3.342E+09	3.693E+16	3.693E+16	1.927E-02	1.927E-02
27.0	91.0	224.0	1.395E-01	4.031E+01	3.431E+09	1.650E+16	5.351E+16	8.652E-03	2.793E-02
28.0	91.4	224.0	9.069E-02	3.666E+01	3.307E+09	1.213E+16	6.563E+16	6.320E-03	3.425E-02
29.0	91.7	224.0	6.504E-02	3.064E+01	3.106E+09	9.763E+15	7.540E+16	5.096E-03	3.935E-02
30.0	92.0	224.0	4.831E-01	1.105E+02	3.102E+09	3.516E+16	3.516E+16	1.035E-02	1.035E-02
31.0	92.3	224.0	3.066E+01	3.666E+01	2.801E+09	1.027E+16	6.005E+16	5.360E-03	3.134E-02
32.0	92.6	224.0	2.707E+01	2.707E+01	2.592E+09	7.942E+15	6.800E+16	4.145E-03	3.549E-02
33.0	92.9	224.0	2.447E+01	2.447E+01	2.414E+09	6.535E+15	7.453E+16	3.354E-03	3.804E-02
34.0	93.2	224.0	2.250E+01	2.250E+01	1.949E+09	4.770E+15	7.930E+16	2.440E-03	4.129E-02
35.0	93.5	224.0	2.096E+01	2.096E+01	1.430E+09	3.217E+15	8.252E+16	1.651E-03	4.294E-02
36.0	93.8	224.0	1.911E-02	1.911E-02	1.141E+09	2.392E+15	8.491E+16	1.227E-03	4.417E-02
37.0	94.1	224.0	1.504E-02	1.504E-02	9.045E+08	1.772E+15	8.660E+16	9.093E-04	4.508E-02
38.0	94.4	224.0	1.246E-02	1.246E-02	7.094E+08	1.322E+15	8.801E+16	6.559E-04	4.574E-02
39.0	94.7	224.0	1.037E-02	1.037E-02	5.505E+08	9.914E+14	8.905E+16	4.992E-04	4.624E-02
40.0	95.0	224.0	8.661E-03	1.690E+01	4.492E+08	7.627E+14	8.976E+16	3.841E-04	4.663E-02
41.0	95.3	224.0	7.216E-03	1.561E+01	3.624E+08	5.911E+14	9.035E+16	2.976E-04	4.692E-02
42.0	95.6	224.0	6.061E-03	1.561E+01	2.890E+08	4.525E+14	9.000E+16	2.270E-04	4.715E-02

NO2

APPARENT Z-ANG 92.5 (DEG) TOTAL GAS ABSORPTION 1.012E-01 (CM-1)
 BALLOON HEIGHT 30.0 (KM) TOTAL GAS AMOUNT 1.941E+17 (MOLEC/CM2)
 TANGENT HEIGHT 23.9 (KM)
 OPTICAL AIR MASS 2.355

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
23.9	90.0	222.5	2.002E-01	4.300E+01	2.060E+09	1.233E+16	1.233E+16	6.452E-03	6.452E-03	6.452E-03
24.0	90.4	223.0	3.644E-01	7.093E+01	3.140E+09	2.478E+16	3.712E+16	1.296E-02	1.941E-02	1.941E-02
25.0	91.1	224.0	1.754E-01	4.481E+01	3.441E+09	1.542E+16	5.253E+16	0.047E-03	2.746E-02	2.746E-02
26.0	91.5	224.0	1.177E-01	3.586E+01	3.588E+09	1.258E+16	6.511E+16	6.565E-03	3.402E-02	3.402E-02
27.0	91.8	224.0	0.586E-02	2.902E+01	3.614E+09	1.078E+16	7.589E+16	5.625E-03	3.965E-02	3.965E-02
28.0	92.1	224.0	6.527E-02	2.641E+01	3.476E+09	9.181E+15	8.507E+16	4.792E-03	4.444E-02	4.444E-02
29.0	92.3	224.0	5.060E-02	2.385E+01	3.336E+09	7.950E+15	9.303E+16	4.153E-03	4.059E-02	4.059E-02
23.9	90.0	222.5	2.002E-01	4.300E+01	2.059E+09	1.229E+16	1.229E+16	6.432E-03	6.432E-03	6.432E-03
24.0	89.6	223.0	3.644E-01	7.093E+01	2.900E+09	2.296E+16	3.525E+16	1.200E-02	1.043E-02	1.043E-02
25.0	88.9	224.0	1.754E-01	4.481E+01	3.031E+09	1.358E+16	4.003E+16	7.090E-03	2.552E-02	2.552E-02
26.0	88.5	224.0	1.177E-01	3.586E+01	3.047E+09	1.060E+16	5.952E+16	5.576E-03	3.110E-02	3.110E-02
27.0	88.2	224.0	0.586E-02	2.902E+01	2.959E+09	0.824E+15	6.034E+16	4.605E-03	3.570E-02	3.570E-02
28.0	87.9	224.0	6.527E-02	2.641E+01	2.751E+09	7.267E+15	7.561E+16	3.793E-03	3.958E-02	3.958E-02
29.0	87.7	224.0	5.060E-02	2.385E+01	2.557E+09	6.100E+15	0.171E+16	3.103E-03	4.260E-02	4.260E-02
30.0	87.5	234.0	3.863E-02	2.209E+01	2.307E+09	5.273E+15	0.690E+16	2.706E-03	4.539E-02	4.539E-02
31.0	87.3	234.0	3.115E-02	2.062E+01	1.931E+09	3.902E+15	9.096E+16	2.043E-03	4.743E-02	4.743E-02
32.0	87.1	234.0	2.534E-02	1.941E+01	1.419E+09	2.755E+15	9.372E+16	1.414E-03	4.804E-02	4.804E-02
33.0	86.9	234.0	2.076E-02	1.840E+01	1.132E+09	2.044E+15	9.500E+16	1.069E-03	4.991E-02	4.991E-02
34.0	86.6	234.0	1.701E-02	1.744E+01	0.981E+08	1.566E+15	9.737E+16	0.038E-04	5.072E-02	5.072E-02
35.0	86.6	245.0	1.354E-02	1.678E+01	7.057E+08	1.104E+15	9.055E+16	5.963E-04	5.131E-02	5.131E-02
36.0	86.5	245.0	1.132E-02	1.612E+01	5.550E+08	0.960E+14	9.945E+16	4.512E-04	5.176E-02	5.176E-02
37.0	86.3	245.0	9.493E-03	1.555E+01	4.472E+08	6.954E+14	1.001E+17	3.502E-04	5.211E-02	5.211E-02
38.0	86.2	245.0	7.983E-03	1.503E+01	3.614E+08	5.433E+14	1.007E+17	2.736E-04	5.239E-02	5.239E-02
39.0	86.1	245.0	6.680E-03	1.447E+01	2.007E+08	4.177E+14	1.011E+17	2.104E-04	5.260E-02	5.260E-02

NO2

APPARENT Z-ANG 93.0 (DEG) TOTAL GAS ABSORPTION 1.149E-01 (CM-1)
 BALLOON HEIGHT 30.0 (KM) TOTAL GAS AMOUNT 2.196E+17 (MOLEC/CM2)
 TANGENT HEIGHT 21.1 (KM)
 OPTICAL AIR MASS 3.756

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
21.1	90.0	219.0	7.002E-01	1.057E+02	2.944E+09	3.112E+16	3.112E+16	1.637E-02	1.637E-02
22.0	90.9	220.0	3.129E-01	4.946E+01	2.930E+09	1.453E+16	4.565E+16	7.636E-03	2.401E-02
23.0	91.4	222.0	1.908E-01	3.709E+01	3.006E+09	1.145E+16	5.710E+16	5.994E-03	3.000E-02
24.0	91.7	223.0	1.418E-01	3.108E+01	3.291E+09	1.020E+16	6.730E+16	5.335E-03	3.534E-02
25.0	92.0	224.0	1.063E-01	2.721E+01	3.563E+09	9.694E+15	7.699E+16	5.059E-03	4.040E-02
26.0	92.2	224.0	8.220E-02	2.455E+01	3.698E+09	9.079E+15	8.607E+16	4.730E-03	4.513E-02
27.0	92.4	224.0	6.408E-02	2.259E+01	3.714E+09	8.376E+15	9.445E+16	4.372E-03	4.951E-02
28.0	92.6	224.0	5.102E-02	2.092E+01	3.571E+09	7.493E+15	1.019E+17	3.911E-03	5.342E-02
29.0	92.8	224.0	4.157E-02	1.960E+01	3.439E+09	6.740E+15	1.087E+17	3.510E-03	5.693E-02
21.1	90.0	219.0	7.002E-01	1.057E+02	2.631E+09	2.992E+16	2.992E+16	1.575E-02	1.575E-02
22.0	89.1	220.0	3.129E-01	4.946E+01	2.610E+09	1.295E+16	4.287E+16	6.804E-03	2.255E-02
23.0	88.6	222.0	1.908E-01	3.709E+01	2.683E+09	9.951E+15	5.283E+16	5.211E-03	2.776E-02
24.0	88.3	223.0	1.418E-01	3.108E+01	2.799E+09	8.677E+15	6.150E+16	4.536E-03	3.230E-02
25.0	88.0	224.0	1.063E-01	2.721E+01	2.960E+09	8.054E+15	6.956E+16	4.204E-03	3.650E-02
26.0	87.6	224.0	8.220E-02	2.455E+01	2.994E+09	7.351E+15	7.691E+16	3.837E-03	4.034E-02
27.0	87.6	224.0	6.408E-02	2.259E+01	2.910E+09	6.500E+15	8.349E+16	3.434E-03	4.377E-02
28.0	87.4	224.0	5.102E-02	2.090E+01	2.720E+09	5.708E+15	8.920E+16	2.979E-03	4.675E-02
29.0	87.2	224.0	4.157E-02	1.960E+01	2.531E+09	4.961E+15	9.416E+16	2.509E-03	4.934E-02
30.0	87.0	234.0	3.256E-02	1.862E+01	2.363E+09	4.401E+15	9.056E+16	2.258E-03	5.160E-02
31.0	86.8	234.0	2.677E-02	1.772E+01	1.914E+09	3.382E+15	1.019E+17	1.741E-03	5.334E-02
32.0	86.7	234.0	2.212E-02	1.695E+01	1.409E+09	2.389E+15	1.043E+17	1.226E-03	5.457E-02
33.0	86.5	234.0	1.835E-02	1.627E+01	1.126E+09	1.831E+15	1.062E+17	9.390E-04	5.550E-02
34.0	86.4	234.0	1.519E-02	1.550E+01	0.935E+08	1.392E+15	1.076E+17	7.144E-04	5.622E-02
35.0	86.2	245.0	1.220E-02	1.512E+01	7.010E+08	1.081E+15	1.086E+17	5.343E-04	5.675E-02
36.0	86.1	245.0	1.020E-02	1.464E+01	5.533E+08	8.101E+14	1.094E+17	4.079E-04	5.716E-02
37.0	86.0	245.0	8.675E-03	1.421E+01	4.450E+08	6.336E+14	1.101E+17	3.190E-04	5.740E-02
38.0	85.9	245.0	7.337E-03	1.381E+01	3.601E+08	4.974E+14	1.106E+17	2.504E-04	5.773E-02
39.0	85.7	245.0	6.170E-03	1.337E+01	2.803E+08	3.855E+14	1.109E+17	1.941E-04	5.793E-02

NO 2

APPARENT Z-ANG 93.5 (DEG) TOTAL GAS ABSORPTION 1.303E-01 (CM-1)
 BALLOON HEIGHT 30.0 (KM) TOTAL GAS AMOUNT 2.482E+17 (MOLEC/GM2)
 TANGENT HEIGHT 17.9 (KM)
 OPTICAL AIR MASS 6.469

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DN)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/GM2)	GAS AMOUNT (MOLEC/GM2)	ACCUM GAS AMOUNT (MOLEC/GM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
17.9	98.0	216.0	4.639E-01	3.646E+01	2.889E+09	1.053E+16	1.053E+16	1.053E+16	5.569E-03	5.569E-03
18.0	98.3	216.0	1.815E+00	8.345E+01	3.871E+09	2.563E+16	3.616E+16	3.616E+16	1.355E-02	1.912E-02
19.0	91.1	217.0	4.653E-01	4.542E+01	2.959E+09	1.344E+16	4.961E+16	4.961E+16	7.097E-03	2.622E-02
20.0	91.4	218.0	3.875E-01	3.533E+01	3.058E+09	1.081E+16	6.041E+16	6.041E+16	5.695E-03	3.192E-02
21.0	91.8	219.0	2.218E-01	2.996E+01	3.181E+09	9.292E+15	6.970E+16	6.970E+16	4.890E-03	3.680E-02
22.0	92.0	220.0	1.669E-01	2.647E+01	3.019E+09	7.991E+15	7.769E+16	7.769E+16	4.198E-03	4.100E-02
23.0	92.3	222.0	1.285E-01	2.480E+01	3.147E+09	7.554E+15	8.525E+16	8.525E+16	3.956E-03	4.496E-02
24.0	92.5	223.0	1.018E-01	2.211E+01	3.343E+09	7.392E+15	9.264E+16	9.264E+16	3.865E-03	4.802E-02
25.0	92.7	224.0	8.852E-02	2.063E+01	3.615E+09	7.459E+15	1.081E+17	1.081E+17	3.893E-03	5.272E-02
26.0	92.9	224.0	6.582E-02	1.941E+01	3.753E+09	7.269E+15	1.074E+17	3.802E-03	5.652E-02	5.652E-02
27.0	93.0	224.0	5.287E-02	1.838E+01	3.778E+09	6.929E+15	1.143E+17	3.616E-03	6.813E-02	6.813E-02
28.0	93.2	224.0	4.324E-02	1.751E+01	3.624E+09	6.346E+15	1.207E+17	3.312E-03	6.345E-02	6.345E-02
29.0	93.3	224.0	3.534E-02	1.666E+01	3.488E+09	5.811E+15	1.265E+17	3.833E-03	6.648E-02	6.648E-02
17.9	98.0	216.0	4.639E-01	3.646E+01	2.882E+09	1.051E+16	1.051E+16	1.051E+16	5.556E-03	5.556E-03
18.0	89.7	216.0	1.815E+00	8.345E+01	2.792E+09	2.330E+16	3.381E+16	3.381E+16	1.232E-02	1.788E-02
19.0	88.9	217.0	4.653E-01	4.542E+01	2.529E+09	1.149E+16	4.529E+16	4.529E+16	6.065E-03	2.394E-02
20.0	88.6	218.0	3.875E-01	3.533E+01	2.561E+09	9.850E+15	5.434E+16	5.434E+16	4.770E-03	2.871E-02
21.0	88.2	219.0	2.218E-01	2.996E+01	2.590E+09	7.761E+15	6.211E+16	6.211E+16	4.084E-03	3.288E-02
22.0	88.4	220.0	1.669E-01	2.647E+01	2.517E+09	6.864E+15	6.877E+16	6.877E+16	3.501E-03	3.630E-02
23.0	87.7	222.0	1.285E-01	2.480E+01	2.610E+09	6.264E+15	7.503E+16	7.503E+16	3.200E-03	3.958E-02
24.0	87.5	223.0	1.018E-01	2.211E+01	2.742E+09	6.063E+15	8.110E+16	8.110E+16	3.169E-03	4.275E-02
25.0	87.3	224.0	8.852E-02	2.063E+01	2.910E+09	6.803E+15	8.740E+16	8.740E+16	3.133E-03	4.588E-02
26.0	87.1	224.0	6.582E-02	1.941E+01	2.951E+09	5.728E+15	9.283E+16	2.989E-03	4.887E-02	4.887E-02
27.0	87.0	224.0	5.287E-02	1.838E+01	2.883E+09	5.299E+15	9.813E+16	2.766E-03	5.163E-02	5.163E-02
28.0	86.8	224.0	4.324E-02	1.751E+01	2.692E+09	4.714E+15	1.028E+17	2.468E-03	5.489E-02	5.489E-02
29.0	86.7	224.0	3.534E-02	1.666E+01	2.508E+09	4.179E+15	1.070E+17	2.101E-03	5.628E-02	5.628E-02
30.0	86.5	234.0	2.818E-02	1.608E+01	2.346E+09	3.773E+15	1.108E+17	1.936E-03	5.821E-02	5.821E-02
31.5	86.4	234.0	2.340E-02	1.549E+01	1.980E+09	2.944E+15	1.137E+17	1.511E-03	5.972E-02	5.972E-02
32.0	86.2	234.0	1.954E-02	1.497E+01	1.399E+09	2.894E+15	1.158E+17	1.075E-03	6.088E-02	6.088E-02
33.0	86.1	234.0	1.636E-02	1.450E+01	1.128E+09	1.623E+15	1.175E+17	8.331E-04	6.163E-02	6.163E-02
34.0	86.0	234.0	1.365E-02	1.408E+01	8.892E+08	1.245E+15	1.187E+17	6.389E-04	6.227E-02	6.227E-02
35.0	85.8	245.0	1.144E-02	1.368E+01	6.988E+08	9.560E+14	1.197E+17	4.814E-04	6.275E-02	6.275E-02
36.0	85.7	245.0	9.352E-03	1.332E+01	5.512E+08	7.343E+14	1.204E+17	3.697E-04	6.312E-02	6.312E-02
37.0	85.6	245.0	7.936E-03	1.300E+01	4.441E+08	5.774E+14	1.210E+17	2.907E-04	6.341E-02	6.341E-02
38.0	85.5	245.0	6.744E-03	1.270E+01	3.590E+08	4.560E+14	1.214E+17	2.296E-04	6.364E-02	6.364E-02
39.0	85.4	245.0	5.703E-03	1.234E+01	2.871E+08	3.543E+14	1.218E+17	1.784E-04	6.382E-02	6.382E-02

NO2

		APPARENT Z-ANG		DEL (DM)		DEL (PATH)		AVG DENS		TOTAL GAS ABSORPTION		GAS ABSORB		ACCUM	
		(DEG)		(KM)		(KM)		(MOLEC/CM3)		(MOLEC/CM2)		(1/CM)		(1/CM)	
ALT	Z-ANG	TEMP	DEL (DM)	DEL (PATH)	AVG DENS	GAS AMOUNT	GAS AMOUNT	GAS AMOUNT	GAS AMOUNT	GAS AMOUNT	GAS ABSORB	GAS ABSORB	ACCUM	ACCUM	
(KM)	(DEG)	(DEG-K)	(DM)	(KM)	(MOLEC/CM3)	(MOLEC/CM2)	(MOLEC/CM2)	(MOLEC/CM2)	(MOLEC/CM2)	(MOLEC/CM2)	(1/CM)	(1/CM)	(1/CM)	(1/CM)	
14.1	90.8	216.0	2.502E+00	1.106E+02	2.707E+09	2.994E+16	2.994E+16	2.994E+16	2.994E+16	2.994E+16	1.583E-02	1.583E-02	1.583E-02	1.583E-02	
15.0	90.9	216.0	9.497E-01	4.900E+01	2.647E+09	1.297E+16	4.291E+16	4.291E+16	4.291E+16	4.291E+16	6.859E-03	6.859E-03	2.269E-02	2.269E-02	
16.0	91.4	216.0	6.111E-01	3.701E+01	2.925E+09	1.803E+16	5.374E+16	5.374E+16	5.374E+16	5.374E+16	5.724E-03	5.724E-03	2.042E-02	2.042E-02	
17.0	91.7	216.0	4.366E-01	3.099E+01	3.103E+09	9.610E+15	6.336E+16	6.336E+16	6.336E+16	6.336E+16	5.086E-03	5.086E-03	3.350E-02	3.350E-02	
18.0	92.0	216.0	3.269E-01	2.719E+01	3.156E+09	8.583E+15	7.194E+16	7.194E+16	7.194E+16	7.194E+16	4.530E-03	4.530E-03	3.804E-02	3.804E-02	
19.0	92.2	217.0	2.506E-01	2.453E+01	3.001E+09	7.363E+15	7.930E+16	7.930E+16	7.930E+16	7.930E+16	3.807E-03	3.807E-03	4.193E-02	4.193E-02	
20.0	92.4	218.0	1.957E-01	2.252E+01	3.085E+09	6.949E+15	8.625E+16	8.625E+16	8.625E+16	8.625E+16	3.662E-03	3.662E-03	4.559E-02	4.559E-02	
21.0	92.6	219.0	1.549E-01	2.094E+01	3.110E+09	6.530E+15	9.270E+16	9.270E+16	9.270E+16	9.270E+16	3.436E-03	3.436E-03	4.903E-02	4.903E-02	
22.0	92.8	220.0	1.230E-01	1.965E+01	3.031E+09	5.956E+15	9.874E+16	9.874E+16	9.874E+16	9.874E+16	3.129E-03	3.129E-03	5.216E-02	5.216E-02	
23.0	93.0	220.0	9.943E-02	1.859E+01	3.156E+09	5.860E+15	1.046E+17	1.046E+17	1.046E+17	1.046E+17	3.073E-03	3.073E-03	5.523E-02	5.523E-02	
24.0	93.2	223.0	8.073E-02	1.768E+01	3.352E+09	5.926E+15	1.105E+17	1.105E+17	1.105E+17	1.105E+17	3.090E-03	3.090E-03	5.833E-02	5.833E-02	
25.0	93.3	224.0	6.595E-02	1.690E+01	3.623E+09	6.123E+15	1.167E+17	1.167E+17	1.167E+17	1.167E+17	3.196E-03	3.196E-03	6.152E-02	6.152E-02	
26.0	93.4	224.0	5.432E-02	1.622E+01	3.761E+09	5.901E+15	1.220E+17	1.220E+17	1.220E+17	1.220E+17	3.104E-03	3.104E-03	6.471E-02	6.471E-02	
27.0	93.6	224.0	4.409E-02	1.561E+01	3.700E+09	5.901E+15	1.207E+17	1.207E+17	1.207E+17	1.207E+17	3.080E-03	3.080E-03	6.779E-02	6.779E-02	
28.0	93.7	224.0	3.721E-02	1.507E+01	3.634E+09	5.477E+15	1.341E+17	1.341E+17	1.341E+17	1.341E+17	2.859E-03	2.859E-03	7.064E-02	7.064E-02	
29.0	93.9	224.0	3.076E-02	1.451E+01	3.499E+09	5.807E+15	1.392E+17	1.392E+17	1.392E+17	1.392E+17	2.650E-03	2.650E-03	7.329E-02	7.329E-02	
14.1	90.0	216.0	2.502E+00	1.106E+02	2.604E+09	2.800E+16	2.800E+16	2.800E+16	2.800E+16	2.800E+16	1.523E-02	1.523E-02	1.523E-02	1.523E-02	
15.0	89.1	216.0	9.497E-01	4.900E+01	2.330E+09	1.146E+16	4.025E+16	4.025E+16	4.025E+16	4.025E+16	6.059E-03	6.059E-03	2.129E-02	2.129E-02	
16.0	88.6	216.0	6.111E-01	3.701E+01	2.459E+09	9.103E+15	4.936E+16	4.936E+16	4.936E+16	4.936E+16	4.813E-03	4.813E-03	2.610E-02	2.610E-02	
17.0	88.3	216.0	4.366E-01	3.099E+01	2.513E+09	7.700E+15	5.714E+16	5.714E+16	5.714E+16	5.714E+16	4.110E-03	4.110E-03	3.022E-02	3.022E-02	
18.0	88.0	216.0	3.269E-01	2.719E+01	2.500E+09	6.799E+15	6.394E+16	6.394E+16	6.394E+16	6.394E+16	3.595E-03	3.595E-03	3.381E-02	3.381E-02	
19.0	87.8	217.0	2.506E-01	2.453E+01	2.355E+09	5.777E+15	6.972E+16	6.972E+16	6.972E+16	6.972E+16	3.850E-03	3.850E-03	3.686E-02	3.686E-02	
20.0	87.6	218.0	1.957E-01	2.252E+01	2.440E+09	5.495E+15	7.521E+16	7.521E+16	7.521E+16	7.521E+16	2.896E-03	2.896E-03	3.976E-02	3.976E-02	
21.0	87.4	219.0	1.549E-01	2.094E+01	2.506E+09	5.249E+15	8.046E+16	8.046E+16	8.046E+16	8.046E+16	2.762E-03	2.762E-03	4.252E-02	4.252E-02	
22.0	87.2	220.0	1.230E-01	1.965E+01	2.457E+09	4.820E+15	8.529E+16	8.529E+16	8.529E+16	8.529E+16	2.536E-03	2.536E-03	4.506E-02	4.506E-02	
23.0	87.0	223.0	9.943E-02	1.859E+01	2.563E+09	4.764E+15	9.006E+16	9.006E+16	9.006E+16	9.006E+16	2.494E-03	2.494E-03	4.755E-02	4.755E-02	
24.0	86.8	223.0	8.073E-02	1.768E+01	2.701E+09	4.776E+15	9.483E+16	9.483E+16	9.483E+16	9.483E+16	2.497E-03	2.497E-03	5.005E-02	5.005E-02	
25.0	86.7	224.0	6.595E-02	1.690E+01	2.876E+09	4.861E+15	9.969E+16	9.969E+16	9.969E+16	9.969E+16	2.537E-03	2.537E-03	5.259E-02	5.259E-02	
26.0	86.6	224.0	5.432E-02	1.622E+01	2.920E+09	4.737E+15	1.044E+17	1.044E+17	1.044E+17	1.044E+17	2.472E-03	2.472E-03	5.506E-02	5.506E-02	
27.0	86.4	224.0	4.409E-02	1.561E+01	2.855E+09	4.457E+15	1.089E+17	1.089E+17	1.089E+17	1.089E+17	2.326E-03	2.326E-03	5.738E-02	5.738E-02	
28.0	86.3	224.0	3.721E-02	1.507E+01	2.660E+09	4.821E+15	1.129E+17	1.129E+17	1.129E+17	1.129E+17	2.890E-03	2.890E-03	5.948E-02	5.948E-02	
29.0	86.1	224.0	3.076E-02	1.451E+01	2.480E+09	3.610E+15	1.165E+17	1.165E+17	1.165E+17	1.165E+17	1.884E-03	1.884E-03	6.137E-02	6.137E-02	
30.0	86.0	234.0	2.471E-02	1.414E+01	2.480E+09	3.295E+15	1.198E+17	1.198E+17	1.198E+17	1.198E+17	1.691E-03	1.691E-03	6.306E-02	6.306E-02	
31.0	85.9	234.0	2.075E-02	1.374E+01	1.809E+09	2.595E+15	1.224E+17	1.224E+17	1.224E+17	1.224E+17	1.332E-03	1.332E-03	6.439E-02	6.439E-02	
32.0	85.8	234.0	1.746E-02	1.338E+01	1.391E+09	1.862E+15	1.243E+17	1.243E+17	1.243E+17	1.243E+17	9.555E-04	9.555E-04	6.534E-02	6.534E-02	
33.0	85.6	234.0	1.471E-02	1.304E+01	1.112E+09	1.451E+15	1.257E+17	1.257E+17	1.257E+17	1.257E+17	7.444E-04	7.444E-04	6.609E-02	6.609E-02	
34.0	85.5	234.0	1.234E-02	1.266E+01	8.843E+08	1.120E+15	1.268E+17	1.268E+17	1.268E+17	1.268E+17	5.745E-04	5.745E-04	6.666E-02	6.666E-02	
35.0	85.4	245.0	1.004E-02	1.244E+01	6.950E+08	0.656E+14	1.277E+17	1.277E+17	1.277E+17	1.277E+17	4.359E-04	4.359E-04	6.710E-02	6.710E-02	
36.0	85.3	245.0	8.544E-03	1.217E+01	5.492E+08	6.684E+14	1.284E+17	1.284E+17	1.284E+17	1.284E+17	3.366E-04	3.366E-04	6.744E-02	6.744E-02	
37.0	85.2	245.0	7.202E-03	1.193E+01	4.420E+08	5.203E+14	1.289E+17	1.289E+17	1.289E+17	1.289E+17	2.660E-04	2.660E-04	6.770E-02	6.770E-02	
38.0	85.1	245.0	6.212E-03	1.170E+01	3.579E+08	4.187E+14	1.293E+17	1.293E+17	1.293E+17	1.293E+17	2.109E-04	2.109E-04	6.791E-02	6.791E-02	
39.0	85.0	245.0	5.272E-03	1.141E+01	2.864E+08	3.260E+14	1.296E+17	1.296E+17	1.296E+17	1.296E+17	1.646E-04	1.646E-04	6.800E-02	6.800E-02	

ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL(DM)	DEL(PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	ACCUM GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
9.7	98.0	242.0	2.599E+00	6.304E+01	5.612E+08	3.502E+15	3.502E+15	1.013E-03	1.013E-03
10.0	99.4	235.8	2.628E+00	6.803E+01	3.591E+09	2.443E+16	2.802E+16	1.252E-02	1.433E-02
11.0	88.9	229.0	1.477E+00	4.338E+01	3.207E+09	1.426E+16	4.227E+16	7.381E-03	2.171E-02
12.0	88.5	222.0	1.041E+00	3.453E+01	2.929E+09	1.811E+16	5.239E+16	5.296E-03	2.701E-02
13.0	80.2	216.0	7.814E-01	2.947E+01	2.577E+09	7.594E+15	5.990E+16	4.016E-03	3.102E-02
14.0	88.0	216.0	5.932E-01	2.622E+01	2.200E+09	5.768E+15	6.575E+16	3.050E-03	3.407E-02
15.0	87.7	216.0	4.504E-01	2.384E+01	2.064E+09	4.922E+15	7.067E+16	2.603E-03	3.667E-02
16.0	87.5	216.0	3.627E-01	2.208E+01	2.232E+09	4.911E+15	7.550E+16	2.597E-03	3.927E-02
17.0	87.3	216.0	2.889E-01	2.053E+01	2.335E+09	4.794E+15	8.030E+16	2.535E-03	4.101E-02
18.0	87.2	216.0	2.320E-01	1.931E+01	2.366E+09	4.569E+15	8.495E+16	2.415E-03	4.422E-02
19.0	87.0	217.0	1.868E-01	1.800E+01	2.251E+09	4.120E+15	8.907E+16	2.175E-03	4.640E-02
20.0	86.8	218.0	1.514E-01	1.743E+01	2.360E+09	4.114E+15	9.310E+16	2.169E-03	4.857E-02
21.0	86.7	219.0	1.233E-01	1.667E+01	2.445E+09	4.076E+15	9.726E+16	2.145E-03	5.071E-02
22.0	86.5	220.0	1.008E-01	1.600E+01	2.412E+09	3.859E+15	1.011E+17	2.027E-03	5.274E-02
23.0	86.4	222.0	8.247E-02	1.542E+01	2.528E+09	3.899E+15	1.050E+17	2.042E-03	5.478E-02
24.0	86.2	223.0	6.801E-02	1.489E+01	2.670E+09	3.976E+15	1.090E+17	2.079E-03	5.686E-02
25.0	86.1	224.0	5.629E-02	1.443E+01	2.846E+09	4.107E+15	1.131E+17	2.145E-03	5.900E-02
26.0	86.0	224.0	4.689E-02	1.400E+01	2.892E+09	4.049E+15	1.171E+17	2.113E-03	6.112E-02
27.0	85.8	224.0	3.913E-02	1.361E+01	2.829E+09	3.851E+15	1.210E+17	2.010E-03	6.313E-02
28.0	85.7	224.0	3.272E-02	1.325E+01	2.648E+09	3.509E+15	1.245E+17	1.832E-03	6.496E-02
29.0	85.6	224.0	2.725E-02	1.285E+01	2.472E+09	3.177E+15	1.277E+17	1.650E-03	6.662E-02
30.0	85.5	234.0	2.203E-02	1.261E+01	2.315E+09	2.919E+15	1.306E+17	1.490E-03	6.811E-02
31.0	85.4	234.0	1.862E-02	1.233E+01	1.876E+09	2.313E+15	1.329E+17	1.107E-03	6.930E-02
32.0	85.3	234.0	1.575E-02	1.207E+01	1.108E+09	1.670E+15	1.346E+17	8.570E-04	7.003E-02
33.0	85.2	234.0	1.333E-02	1.182E+01	1.108E+09	1.310E+15	1.359E+17	6.721E-04	7.003E-02
34.0	85.1	234.0	1.124E-02	1.153E+01	8.009E+08	1.016E+15	1.369E+17	5.212E-04	7.135E-02
35.0	85.0	245.0	9.176E-03	1.137E+01	6.934E+08	7.805E+14	1.377E+17	3.970E-04	7.175E-02
36.0	84.9	245.0	7.841E-03	1.117E+01	5.474E+08	6.145E+14	1.383E+17	3.079E-04	7.206E-02
37.0	84.8	245.0	6.786E-03	1.098E+01	4.412E+08	4.844E+14	1.388E+17	2.439E-04	7.230E-02
38.0	84.7	245.0	5.739E-03	1.081E+01	3.569E+08	3.859E+14	1.392E+17	1.943E-04	7.249E-02
39.0	84.6	245.0	4.885E-03	1.057E+01	2.856E+08	3.019E+14	1.395E+17	1.520E-04	7.265E-02

No. 2
 APPARENT Z-ANG 94.5
 BALLOON HEIGHT 30.0
 TANGENT HEIGHT 9.7
 OPTICAL AIR MASS 22.904

TOTAL GAS ABSORPTION 1.522E-01 (CM-1)
 TOTAL GAS AMOUNT 2.919E+17 (MOLEC/CM2)

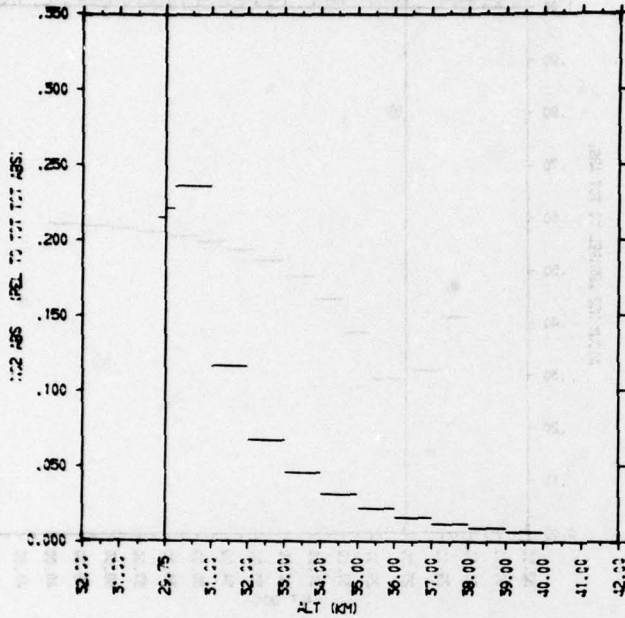
(DEG)
 (KM)
 (KM)

No 2
 APPARENT Z-ANG 94.5 (DEG)
 BALLOON HEIGHT 30.0 (KM)
 TANGENT HEIGHT 9.7 (KM)
 OPTICAL AIR MASS 22.904
 TOTAL GAS ABSORPTION 1.522E-01 (CM-1)
 TOTAL GAS AMOUNT 2.919E+17 (MOLEC/CM2)

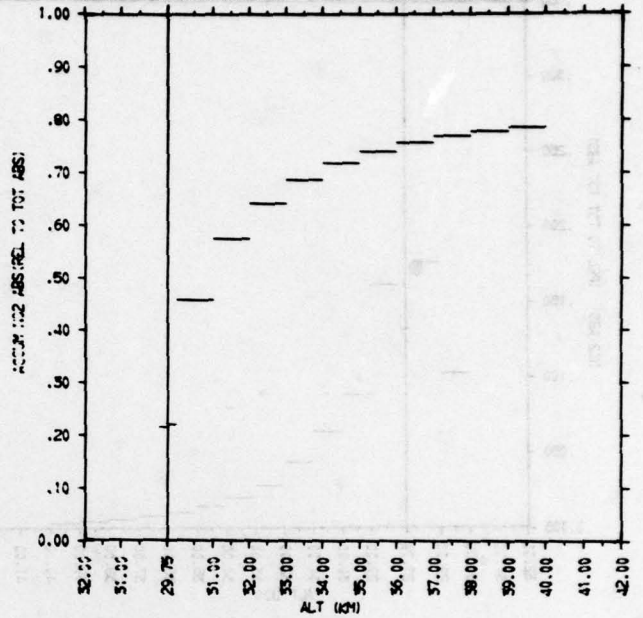
ALT (KM)	Z-ANG (DEG)	TEMP (DEG-K)	DEL (DM)	DEL (PATH) (KM)	AVG DENS (MOLEC/CM3)	GAS AMOUNT (MOLEC/CM2)	GAS AMOUNT (MOLEC/CM2)	GAS ABSORB (1/CM)	ACCUM GAS ABSORB (1/CM)
9.7	98.0	242.0	2.599E+00	6.304E+01	5.655E+08	3.610E+15	3.610E+15	1.027E-03	1.027E-03
10.0	90.6	235.0	2.620E+00	6.803E+01	3.684E+09	2.506E+16	2.067E+16	1.204E-02	1.467E-02
11.0	91.1	229.0	1.477E+00	4.330E+01	3.497E+09	1.517E+16	4.304E+16	7.851E-03	2.252E-02
12.0	91.5	222.0	1.041E+00	3.453E+01	3.286E+09	1.135E+16	5.519E+16	5.942E-03	2.046E-02
13.0	91.8	216.0	7.814E-01	2.947E+01	3.064E+09	9.030E+15	6.422E+16	4.775E-03	3.324E-02
14.0	92.0	216.0	5.932E-01	2.622E+01	2.730E+09	7.159E+15	7.130E+16	3.706E-03	3.702E-02
15.0	92.3	216.0	4.604E-01	2.304E+01	2.655E+09	6.331E+15	7.771E+16	3.348E-03	4.037E-02
16.0	92.5	216.0	3.627E-01	2.200E+01	2.929E+09	6.445E+15	8.416E+16	3.400E-03	4.370E-02
17.0	92.7	216.0	2.809E-01	2.053E+01	3.106E+09	6.370E+15	9.053E+16	3.372E-03	4.715E-02
18.0	92.8	216.0	2.320E-01	1.931E+01	3.150E+09	6.099E+15	9.663E+16	3.225E-03	5.037E-02
19.0	93.0	217.0	1.060E-01	1.830E+01	3.003E+09	5.495E+15	1.021E+17	2.901E-03	5.320E-02
20.0	93.2	218.0	1.514E-01	1.743E+01	3.086E+09	5.380E+15	1.075E+17	2.836E-03	5.611E-02
21.0	93.3	219.0	1.233E-01	1.667E+01	3.119E+09	5.200E+15	1.127E+17	2.736E-03	5.805E-02
22.0	93.5	220.0	1.080E-01	1.600E+01	3.032E+09	4.851E+15	1.176E+17	2.549E-03	6.148E-02
23.0	93.6	222.0	8.247E-02	1.542E+01	3.157E+09	4.860E+15	1.224E+17	2.549E-03	6.395E-02
24.0	93.8	223.0	6.801E-02	1.489E+01	3.352E+09	4.992E+15	1.274E+17	2.610E-03	6.656E-02
25.0	93.9	224.0	5.629E-02	1.443E+01	3.624E+09	5.229E+15	1.326E+17	2.729E-03	6.920E-02
26.0	94.0	224.0	4.689E-02	1.400E+01	3.762E+09	5.267E+15	1.379E+17	2.749E-03	7.203E-02
27.0	94.2	224.0	3.913E-02	1.361E+01	3.761E+09	5.146E+15	1.431E+17	2.606E-03	7.472E-02
28.0	94.3	224.0	3.272E-02	1.325E+01	3.635E+09	4.817E+15	1.479E+17	2.514E-03	7.723E-02
29.0	94.4	224.0	2.725E-02	1.285E+01	3.508E+09	4.497E+15	1.524E+17	2.347E-03	7.950E-02

NO₂ FIGURES

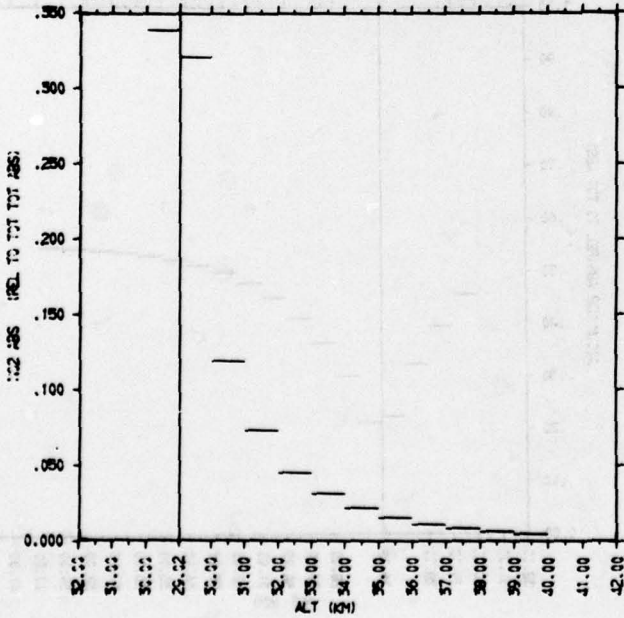
BALLOON ALT= 30.00 KM APP ANG= 90.90 TOT GAS= 7.478E+16(MOLEC./CM²)
 102 GAS REFRACTION AIRMASS= .629 TOT ABS= 3.899E-02 (CM-1)



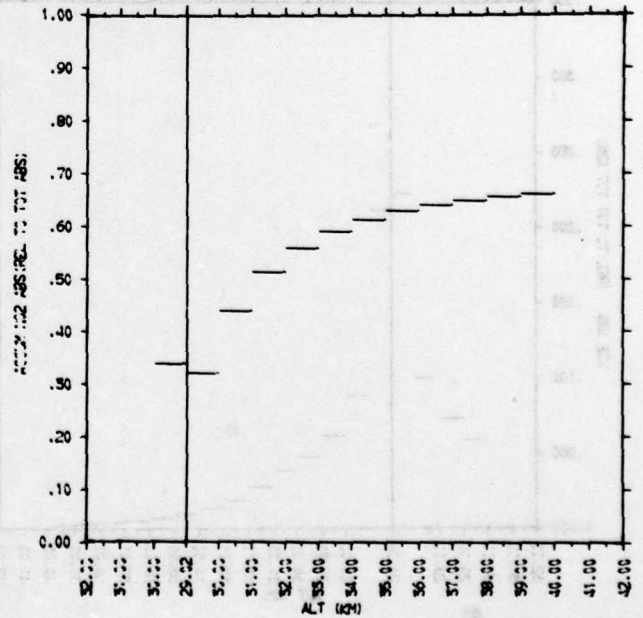
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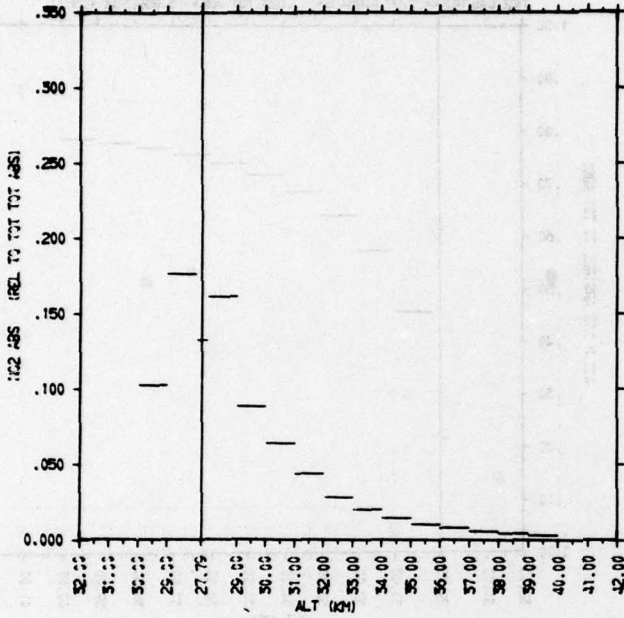
BALLOON ALT= 30.00 KM APP ANG= 91.00 TOT GAS= 9.772E+16(MOLEC./CM²)
 102 GAS REFRACTION AIRMASS= .625 TOT ABS= 5.066E-02 (CM-1)



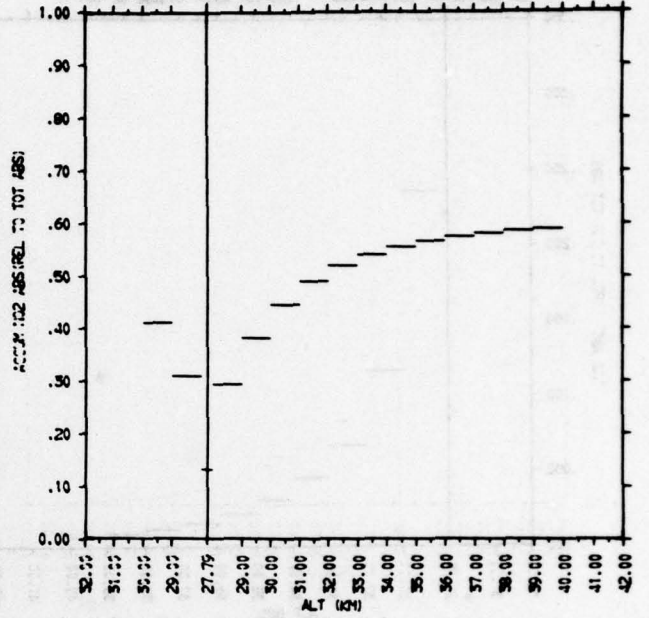
BALLOON ALT= 30.00 KM APP ANG= 91.00 TOT GAS= 9.772E+16(MOLEC./CM²)
 102 GAS REFRACTION AIRMASS= .625 TOT ABS= 5.066E-02 (CM-1)



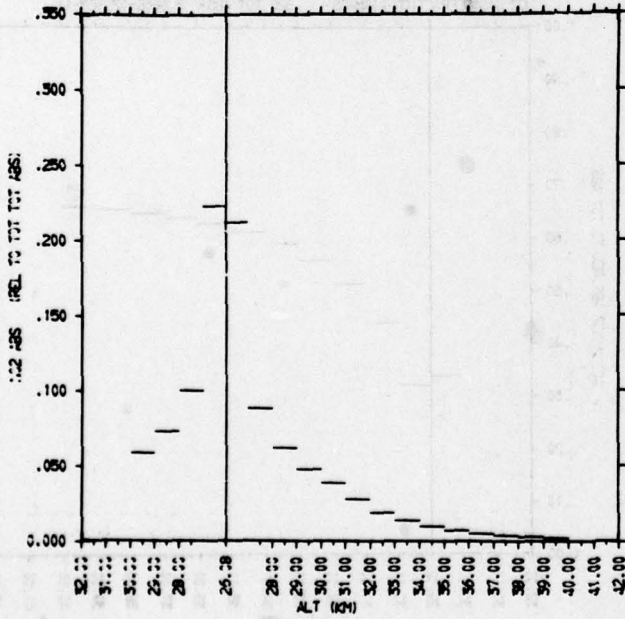
BALLOON ALT= 30.00 KM APP ANG= 91.50 TOT GAS= 1.309E+17(MOLEC.CM²)
 NO2 GAS REFRACTION AIRMASS= 1.119 TOT ABS= 6.804E-02 (CM⁻¹)



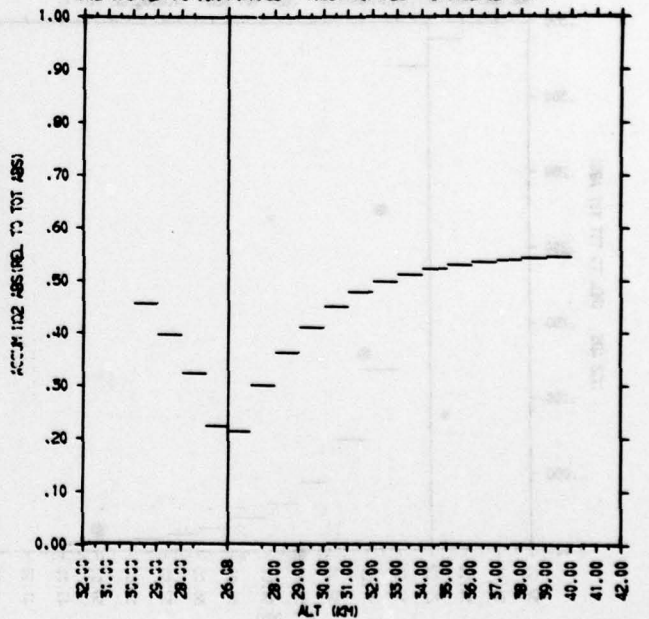
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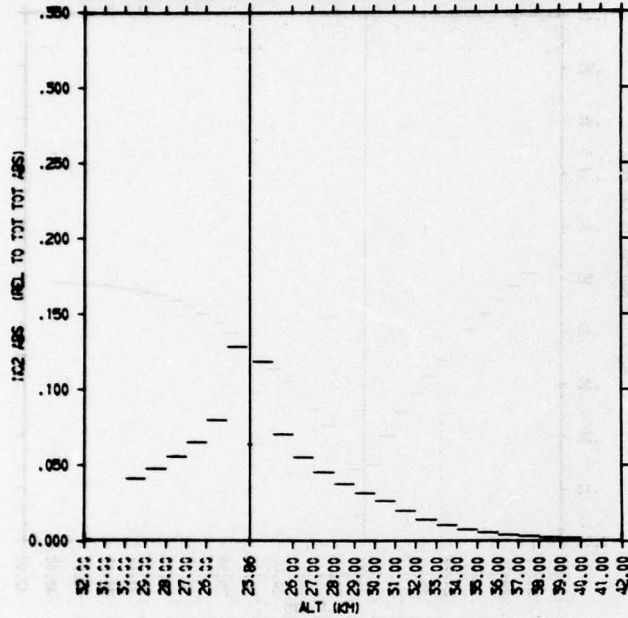
BALLOON ALT= 30.00 KM APP ANG= 92.00 TOT GAS= 1.662E+17(MOLEC.CM²)
 NO2 GAS REFRACTION AIRMASS= 1.981 TOT ABS= 9.650E-02 (CM⁻¹)



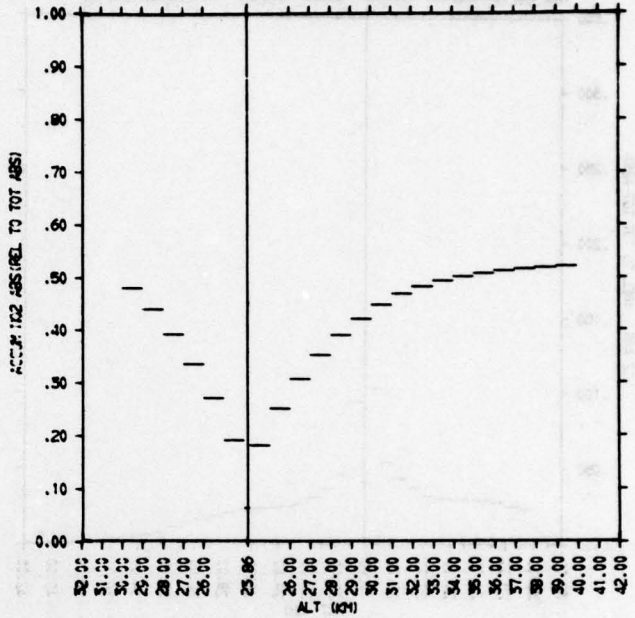
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 NO2 GAS REFRACTION AIRMASS= 1.981 TOT ABS= 9.650E-02 (CM⁻¹)



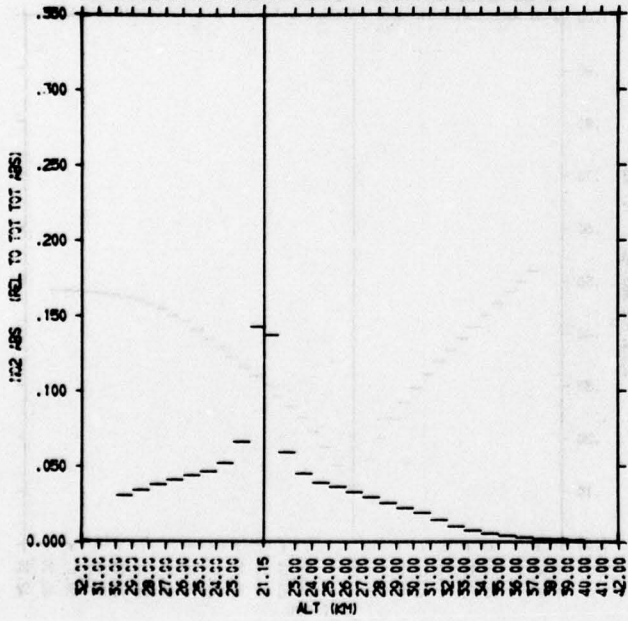
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 NO2 GAS REFRACTION AIRMASS= 2.385 TOT ABS= 1.012E-01 (CM-1)



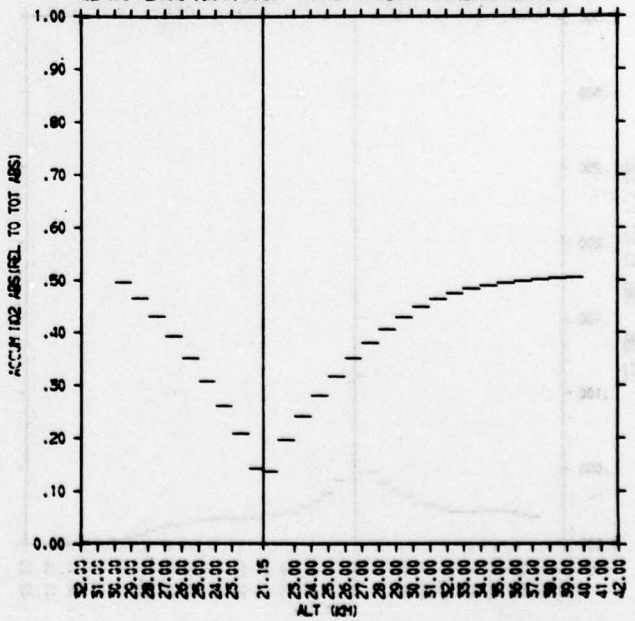
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 NO2 GAS REFRACTION AIRMASS= 2.385 TOT ABS= 1.012E-01 (CM-1)

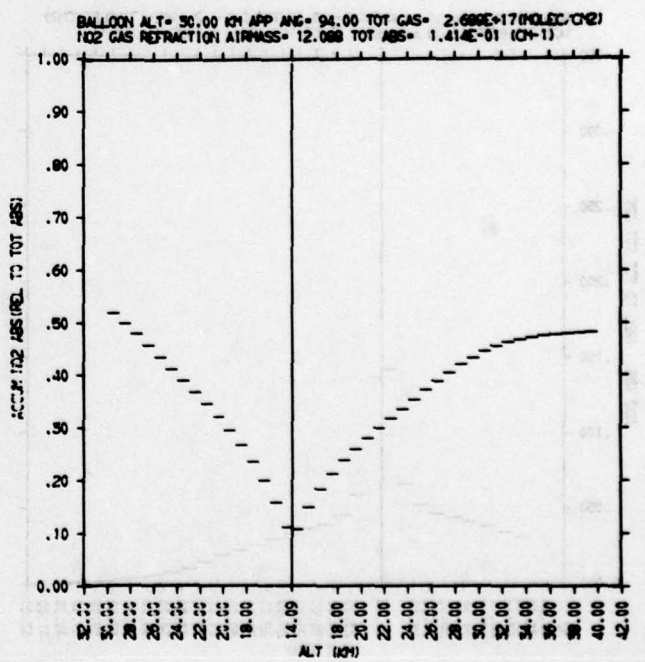
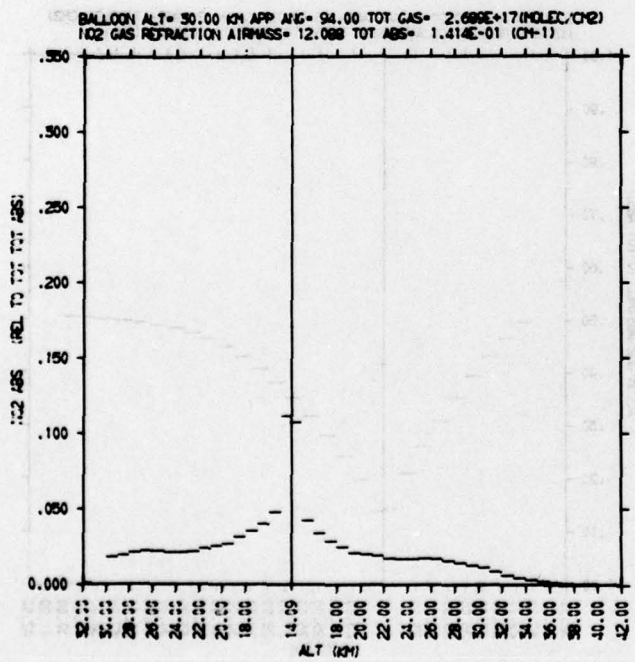
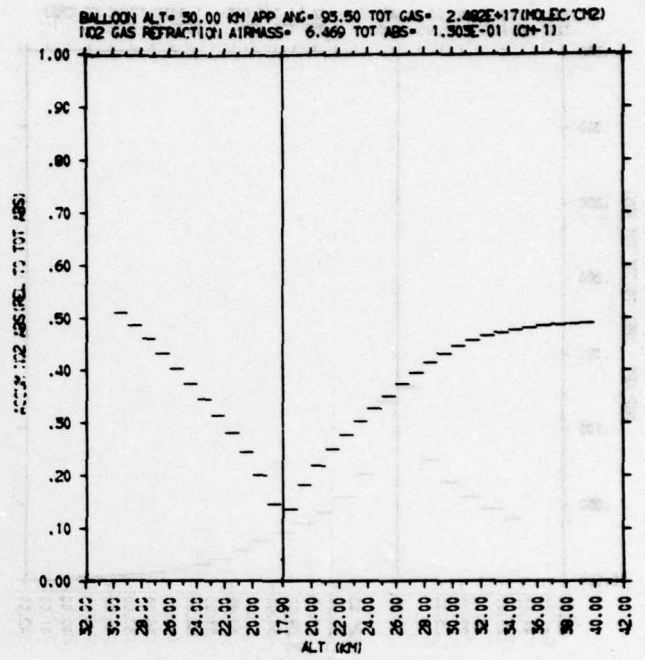
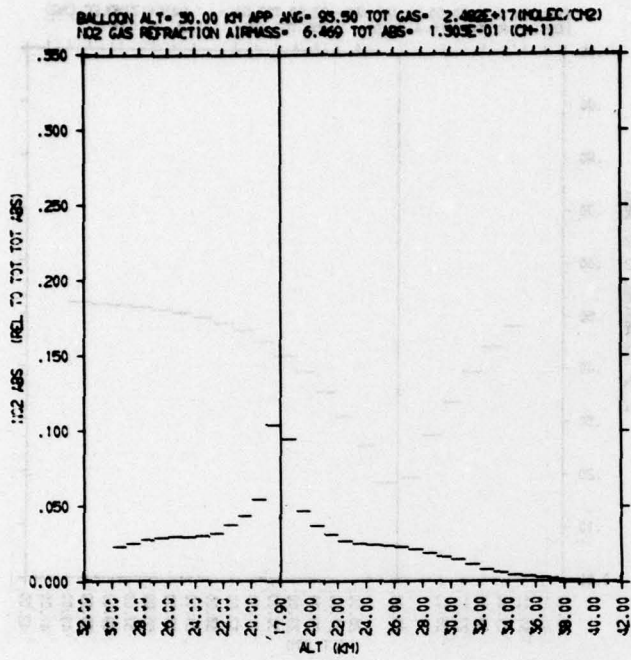


BALLOON ALT= 30.00 KM APP ANG= 95.00 TOT GAS= 2.198E+17(MOLEC./CM²)
 NO2 GAS REFRACTION AIRMASS= 3.786 TOT ABS= 1.149E-01 (CM-1)

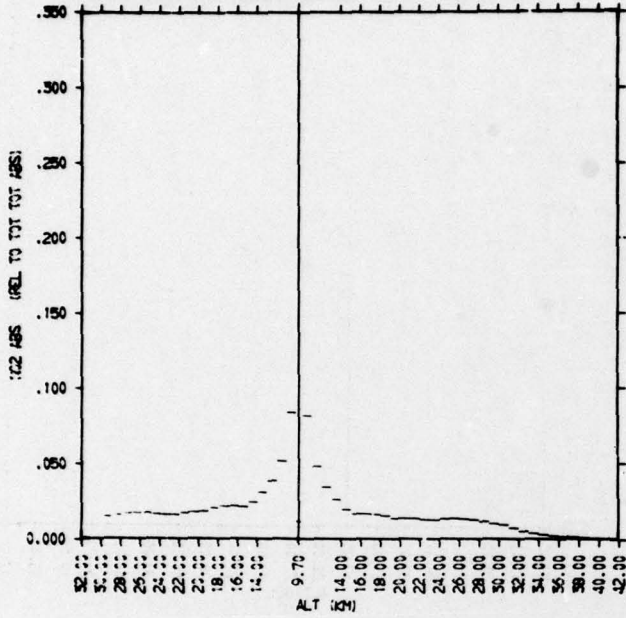


BALLOON ALT= 30.00 KM APP ANG= 95.00 TOT GAS= 2.198E+17(MOLEC./CM²)
 NO2 GAS REFRACTION AIRMASS= 3.786 TOT ABS= 1.149E-01 (CM-1)

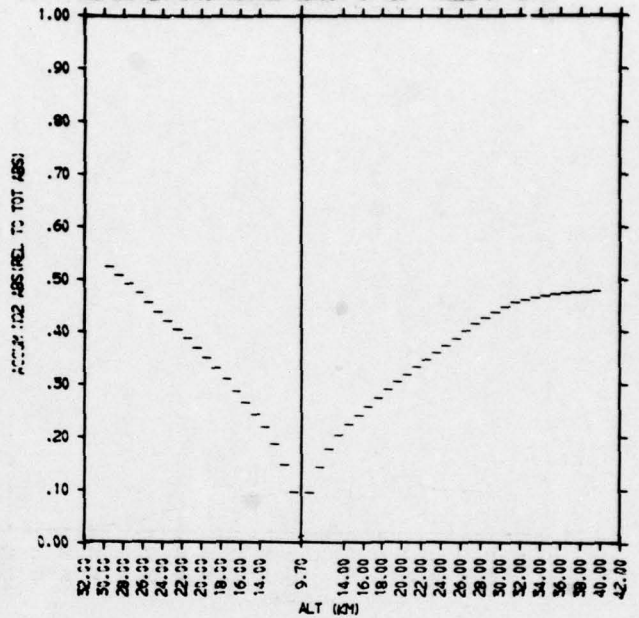




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 NO2 GAS REFRACTION AIRMASS= 22.904 TOT ABS= 1.522E-01 (CM-1)



BALLOON ALT= 30.00 KM APP ANG= 94.50 TOT GAS= 2.919E+17(MOLEC./CM²)
 NO2 GAS REFRACTION AIRMASS= 22.904 TOT ABS= 1.522E-01 (CM-1)



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