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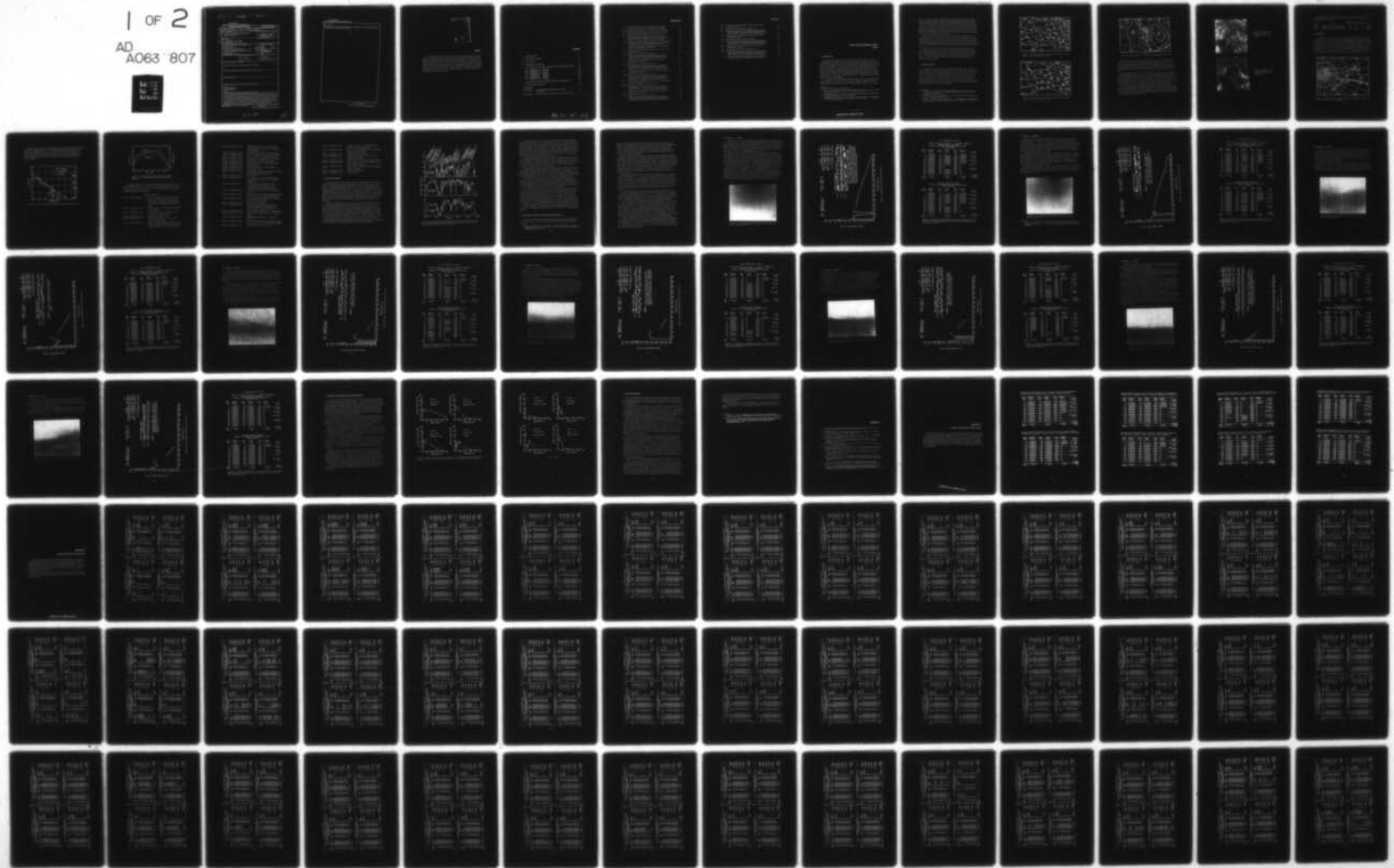
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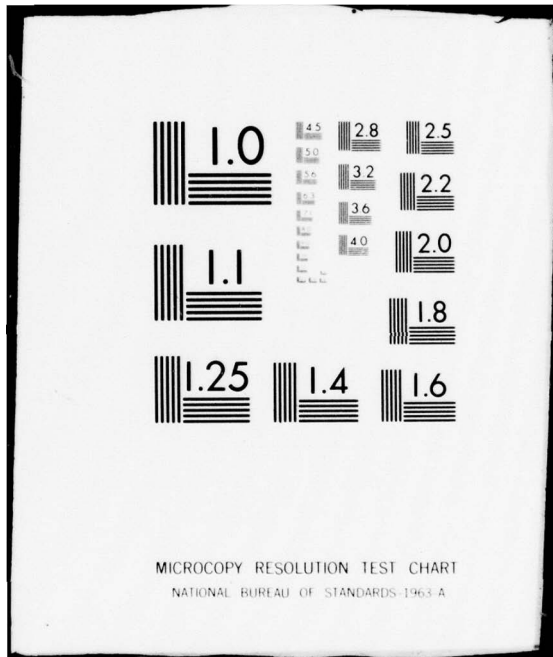
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photographs of clouds and with plots of resulting particle concentrations and calculations of liquid water content.

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## Preface

We greatly appreciate the assistance that the AFGL technicians and engineers, MSgt Tom Moraski, MSgt Steve Crist, and Anthony Matthews provided the Mission Director (DMB) in acquiring the data discussed in this report. Our thanks are also extended to Michael Francis and Daniel Leach of Digital Programming Services, Inc. for their aid in computer processing the aircraft sampling data; to Anthony Matthews and Barbara Main for assistance in processing auxiliary information; to Pat Sheehy for typing the manuscript; and to Dr. Arnold A. Barnes, Jr. and Dr. Robert M. Cunningham for reviewing the paper.

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## Cirrus Particle Distribution Study Part 2

### 1. INTRODUCTION

The AFGL instrumented MC-130E was flown 26 February 1978 on a cirrus sampling flight in the Albuquerque, New Mexico local area to obtain particle data for the Air Force Weapons Laboratory's Advanced Radiation Technology program. The purpose of this flight and of the similar 29 October 1977 flight was to acquire additional information on the typical type and concentration of ice particles in cirrus clouds. For further background information concerning cirrus data in general and the type of data available from this particular aircraft's instrumentation the reader is encouraged to review Part 1 of this study by Varley.<sup>1</sup> Ensuing parts will provide data from other sampling flights.

In a previous paper Knollenberg<sup>2</sup> reported cirrus clouds to be composed largely of bullet particles and columns. Heymsfield<sup>3</sup> found plates, columns, and some bullet rosettes in weak uniform cirrus, but mostly bullet rosettes in heavy uniform

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(Received for publication 10 October 1978)

1. Varley, D. J. (1978) Cirrus Particle Distribution Study, Part I, AFSG, No. 394, AFGL-TR-78-0192.
2. Knollenberg, R. G. (1973) Cirrus-contrail cloud spectra studies with the Sabreliner, Atmos. Tech. (by NCAR), No. 4; 52-55
3. Heymsfield, A. (1974) Ice crystal growth in deep cirrus systems. In Preprints of Conf. on Cloud Physics, Amer. Meteor. Soc. pp 311-316.

cirrus. In cirrus uncinus Heymsfield<sup>4</sup> detected bullet rosettes, single bullets, banded columns, and plates. Heymsfield and Knollenberg<sup>5</sup> collected ice crystals in different cirrus generating cells and found concentrations of crystals larger than  $15 \mu\text{m}$  to be  $1 \times 10^4$  to  $2.5 \times 10^4 \text{ m}^{-3}$ , and the water content to be from 0.106 to  $0.26 \text{ g m}^{-3}$  in cirrostratus, and 0.15 to  $0.39 \text{ g m}^{-3}$  in cirrus uncinus. They pointed out that these values were relatively large in comparison to other cirrus data, but that the cirrus generating cell, which they concentrated on, was somewhat different in that it was a mass of growing ice crystals.

Some 14 case studies of cirrus clouds were described by Hobbs et al<sup>6</sup> who acquired airborne data with a B-23 aircraft. They found low number concentrations of ice particles are usually associated with low ice mass concentrations and high number concentrations with high mass concentrations. They also reported that total ice mass concentration in cirrus clouds generally increases with increasing temperature.

An effort was made in our 26 February flight to collect particle data near the bases and within and near the tops of cirrus and cirrostratus clouds associated with an approaching upper level trough. No thunderstorms were in the sampling area. All PMS particle spectrometers were operative and obtained useful data. However, the formvar particle replicating device and dewpoint equipment were defective and were not used.

## 2. SYNOPTIC SITUATION

The upper level flow across the United States was nearly zonal on 26 February with a weak upper level trough along the West Coast, a minor ridge just east of the Rocky Mountains, and a strong west-northwesterly flow from there to the East Coast. No jet stream was in the Albuquerque area, however. Figures 1 and 2 depict the general flow at 500 and 300 mb. As shown in Figure 3a there was a strong high pressure cell (1032 mb) at the surface in the Central Plains area, a diffuse low pressure area in the western states, and a weak stationary front through the Western Plains along the lee of the Rockies.

4. Heymsfield, A. (1975) Cirrus uncinus generating cells and the evolution of cirriform cloud. Part I: Aircraft observations of the growth of ice phase. J. Atmos. Sci. 32:799-808.
5. Heymsfield, A., and Knollenberg, R.G. (1972) Properties of cirrus generating cells, J. Atmos. Sci. 29:1358-1366.
6. Hobbs, P.V., Radke, L.F., and Atkinson, D.G. (1975) Airborne Measurements and Observations in Cirrus Clouds, AFCRL-TR-75-0249.



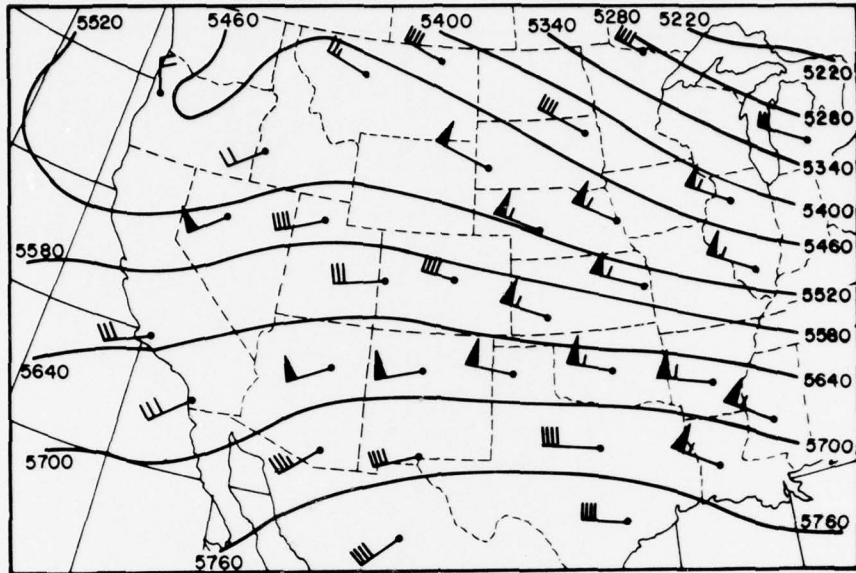


Figure 1. The 500-mb Synoptic Chart 27 February 1978 at 0000Z.  
Heights indicated in geopotential meters

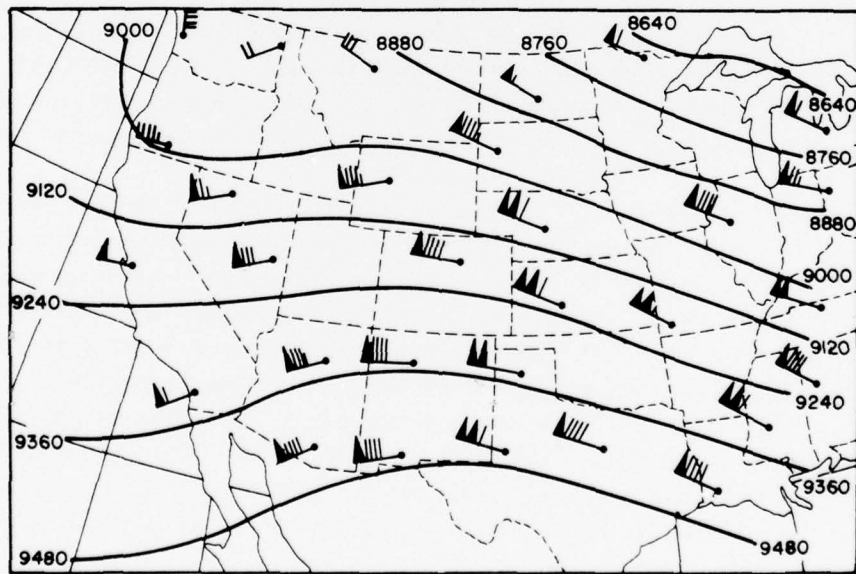


Figure 2. The 300-mb Synoptic Chart 27 February 1978 at 0000Z.  
Heights indicated in geopotential meters

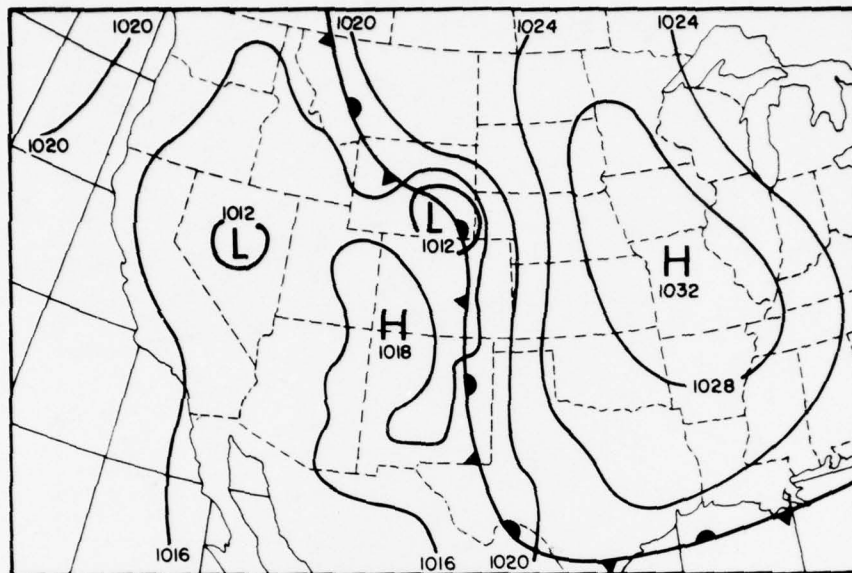


Figure 3a. Surface Synoptic Weather Chart 26 February 1978 at 1800Z

Figures 3b and 3c are visible and infrared pictures from the western GOES satellite. They show that the area east of the Rocky Mountains in Colorado and New Mexico had considerably less clouds than on the western side of that range. The lighter shading south and southwest of Utah, Colorado, and New Mexico in the infrared picture reflects the higher, colder clouds that were being advected to the east.

The cirrostratus and cirrus clouds sampled on 26 February were over south central New Mexico. They consisted of a rather deep cirrostratus layer with bases between 16,000 and 18,000 ft (4.9 - 5.5 km) and a cirrus layer based at approximately 27,000 ft (8.1 km). The cirrostratus was nearly overcast over much of the area, but varied from very thin to dense with striations. Above 29,000 ft the atmosphere was nearly cloud-free except for a few contrails of temporary nature.

Surface estimates of the cloud bases over most of Arizona, New Mexico, and Western Texas ranged from 10,000 to 25,000 ft (3.0 - 7.6 km) with little geographic trend. No weather radar echoes were reported over this large area and there were no reports of precipitation. Surface temperatures over most of New Mexico ranged from the upper 40's to lower 60's (°F).

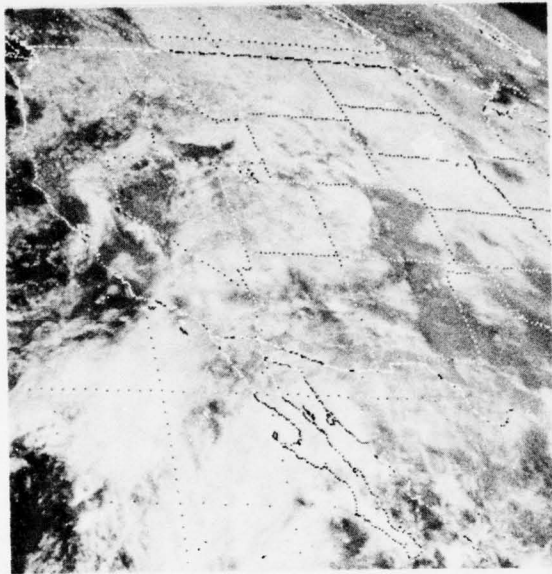


Figure 3b. Western GOES  
Visible Picture 1815Z,  
26 February 1978. 2-mile  
resolution

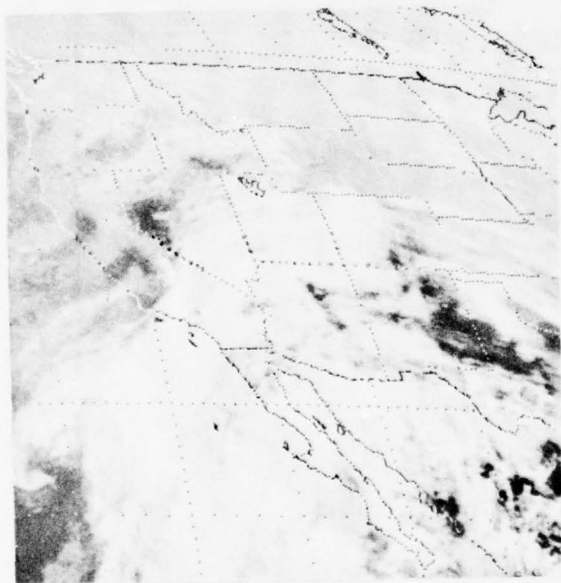


Figure 3c. Western GOES  
IR Picture at 1845Z,  
26 February 1978. 2-mile  
resolution

During the time that sampling was being conducted, Albuquerque reported the following weather conditions.

Time	Clouds	Visibility (mi)	Temp (°F)	DP (°F)	Winds
1800Z	14,000 ft Sctd, Est 25,000 ft Brkn	60	57	19	190/10
1900Z	14,000 ft Sctd, Est 25,000 ft Brkn	60	59	19	210/90

### 3. THE FLIGHT

The sampling aircraft departed Kirtland AFB near Albuquerque at 1810 GMT (1110L) and flew generally in the area near Albuquerque that is indicated in Figure 4. The cirrostratus and cirrus clouds that were flown through, extended from 18,000 to 29,000 ft (5.5 - 8.8 km) during ascent and from 29,000 to 16,000 ft (8.8 - 4.9 km) on descent. An effort was made to record particle spectra throughout the clouds, but particularly in the thinnest portions near their bases and tops. The density of the clouds varied from dense in some areas to very thin and from uniform milky cirrostratus in the cloud interior to striated, wispy cirrus on top.

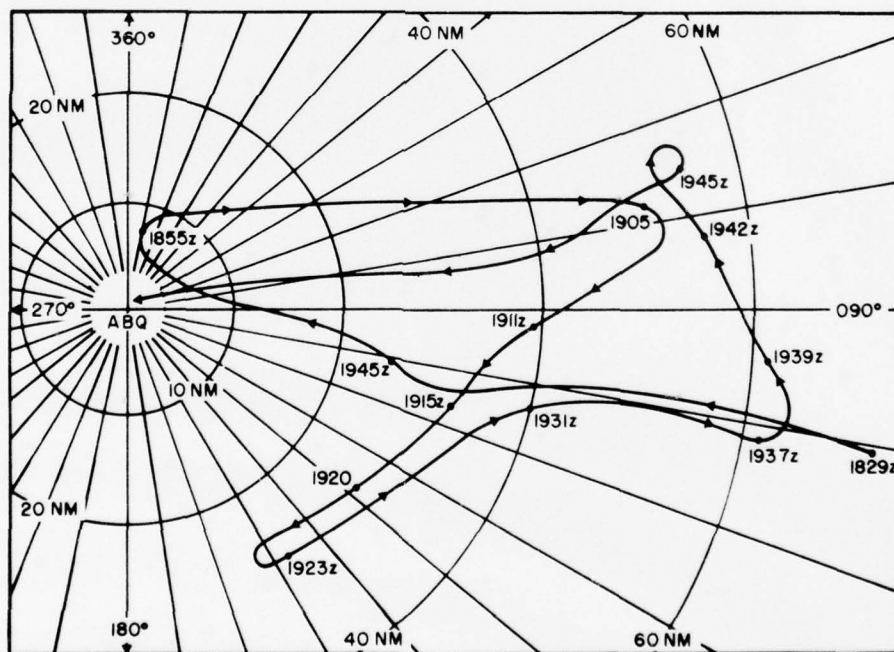


Figure 4. Track and Times of Sampling Aircraft on 26 February 1978 Based on Distance and Direction From Albuquerque

Figure 5a shows a portion of the Albuquerque temperature sounding a few hours before the sampling took place. The small temperature-dewpoint spread from approximately 6 through 9 km (19,700 - 29,500 ft) MSL reflects the presence of cirriform clouds that were later flown through. The plots of aircraft altitude and outside air temperature are shown on Figure 5b for the portion of the flight at cirrus altitudes.

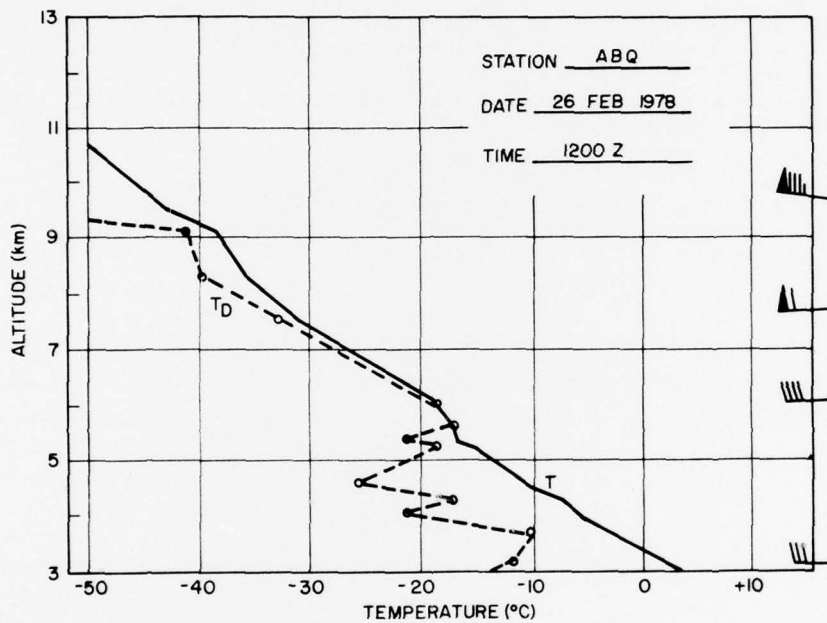


Figure 5a. Portion of Albuquerque 1200Z Sounding on 26 February 1978



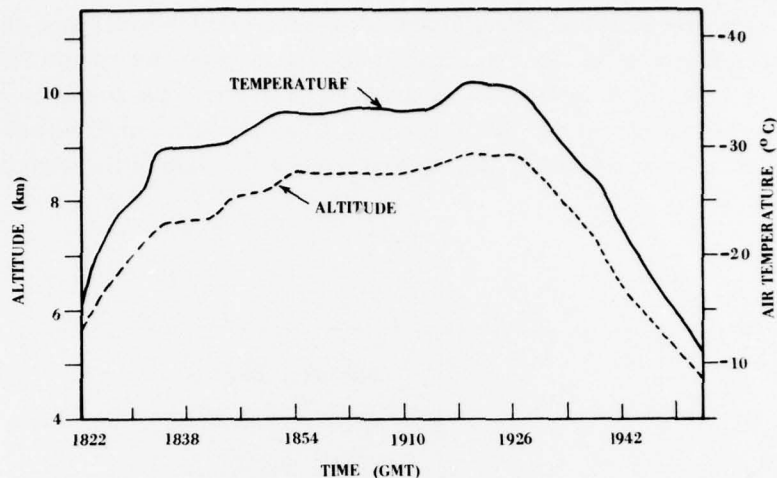


Figure 5b. Variation of Aircraft Altitude and Outside Air Temperature as a Function of Time During the Sampling Mission

The following notes are from the mission director's log or from a review of the nose camera movie film. All times are universal (GMT). Altitudes are from an altimeter set at 29.92 in. of mercury. (More accurate altitudes are given on the printout listings in the appendixes.)

#### Mission Directors Log

1819:35 - 15,000 ft (4.6 km).	Sun moderately to strongly visible through all areas of cloud. One tenth coverage of altostratus (As) and altocumulus (Ac) with bases at 15,000 ft, tops 15,800 ft. No clouds below these.
1822:35 - 18,000 ft (5.5 km).	Base of Cs layer. 2-D probe indicates presence of ice crystals.
1826:11 - 20,800 ft (6.3 km).	In Cs since 18,000 ft. Sun strongly visible. Very faint 22° halo visible above.
1827:24 - 21,500 ft (6.6 km).	Ground faintly visible below.
1828:04 - 21,800 ft (6.7 km).	Halo no longer visible. Still in Cs, with no breaks since initial entry.
1830:59 - 23,100 ft (7.0 km).	Ground still faintly visible. No breaks yet in Cs. Within about 2000 ft of tops. Blue sky visible through Cs above. More Cs below than above.

1833:50 - 24,200 ft (7.4 km).	Striations in Cs above us. Crystal habit is bullet rosette and irregular ice. Some plates also identifiable.
1834:50 - 24,700 ft (7.5 km).	Near top of Cs layer. Cs is very thin here.
1836:27 - 25,000 ft (7.6 km).	Ground no longer visible. Cs is very uniform.
1840:59 - 25,000 ft (7.6 km).	Into area of thin Cs. Just below tops of Cs.
1843:30 - 25,800 ft (7.9 km).	In tops of Cs. Ci bases above us about 1000 ft.
1845:00 - 26,400 ft (8.0 km).	Between Cs layer below and Ci above.
1850:30 - 27,200 ft (8.3 km).	Cs below and Ci above seem to merge ahead.
1851:07 - 27,500 ft (8.4 km).	Entering Ci bases.
1853:50 - 28,000 ft (8.5 km).	In very thin tenuous Ci. Bullet rosettes.
1858:30 - 28,000 ft (8.5 km).	Moderately dense Cs.
1901:00 - 28,000 ft (8.5 km).	In Cs with bullet rosettes. Sun brightly visible. Approximately 1000 ft below tops.
1904:00 - 28,000 ft (8.5 km).	Near tops of Ci.
1908:07 - 28,000 ft (8.5 km).	Very thin Ci here. Can see ground clearly through milky thin Cs below. Tops estimated at 29,000 ft.
1911:28 - 28,100 ft (8.5 km).	In thin Ci with clearly defined 22° halo. Visibility estimated at more than 5 miles. Ground clearly visible through Ci below.
1915:00 - 28,400 ft (8.6 km).	Very near top of Ci. Blue sky visible through Ci above.
1916:05 - 29,000 ft (8.8 km).	On top of most of Ci. Only some distant contrails above. Tops of Ci undulate around 29,000 ft.
1917:39 - 29,000 ft (8.8 km).	Passed through dense Ci then came out rapidly to less dense and then clear.
1919:57 - 29,000 ft (8.8 km).	Still in and out of Ci tops.
1927:00 - 29,000 ft (8.8 km).	Begin gradual descent through Ci and Cs. Skimming through tops of moderately dense cloud. Occasional hints of blue above.
1929:20 - 28,300 ft (8.6 km).	In very uniform, milky thin Ci. Just below tops.
1930:42 - 27,900 ft (8.5 km).	Unable to see through to ground. Sun brightly visible.
1931:24 - 27,500 ft (8.4 km).	Ground faintly visible below. Still in thin uniform Ci.
1933:17 - 26,500 ft (8.1 km).	At level of a break between Ci above and Cs below. A 22° halo in Ci above. Sun still brightly visible.
1936:00 - 25,800 ft (7.9 km).	Entering Cs layer on way down.

1939:48 - 23,500 ft (7.2 km).	In uniform, thin Cs. Visibility estimated at 15 miles. Descending to Cs base.
1941:12 - 22,300 ft (6.8 km).	In Cs. Clouds thin and tenuous. Sun moderately visible through clouds above.
1942:12 - 21,500 ft (6.6 km).	Back into more dense cloud.
1944:54 - 20,200 ft (6.2 km).	Emerged from dense cloud. Now very thin. Ground clearly visible.
1947:25 - 19,000 ft (5.8 km).	Dense cloud. Can no longer see blue sky above.
1948:49 - 18,300 ft (5.6 km).	Ground visible again. Cloud structure uniform. Sun moderately visible.
1950:20 - 17,700 ft (5.4 km).	Near Cs bases. Light intensity, large aggregate particles and plates.
1952:30 - 16,600 ft (5.1 km).	Below bases in clear air.
1953:07 - 16,100 ft (4.9 km).	Below all clouds.

#### 4. DISCUSSION OF RESULTS

Figure 6 is a record of the variation of liquid-water-content (LWC) during the flight as determined by the PMS (Particle Measuring Systems, Inc.) scattering, 1-D cloud and 1-D precipitation spectrometer probes. When recording bullet rosette particles or combination of bullets, as was done in most of this flight, these probes measure particles in ranges extending from approximately 2 to 30  $\mu$  m, 26 to 311  $\mu$  m, and 400 to 4676  $\mu$  m, respectively. These are central values of the lower and upper channels of each probe so the range is actually slightly greater. For example, the 400  $\mu$  m channel records particles from approximately 250 to 550  $\mu$  m in size. The plots of values in Figure 6 are based on data averaged over consecutive 15-sec intervals.

The notes at the top of Figure 6 are based on transcribed comments from the aircraft mission director's log and from a review of the 16-mm movie film from the camera in the nose of the aircraft. In general, there was good correlation between the reported frequency and density of clouds flown through and the variation of liquid water content (LWC) as determined by the precipitation probe. That is, when the mission director indicated the aircraft was in a dense cloud or in no cloud the precipitation probe LWC usually showed high or low values, respectively. This is, of course, comparable to saying there was a high number or low number of precipitation probe-sized particles present. There was less evidence of a correlation between visibility and the smaller particles recorded by the cloud probe.



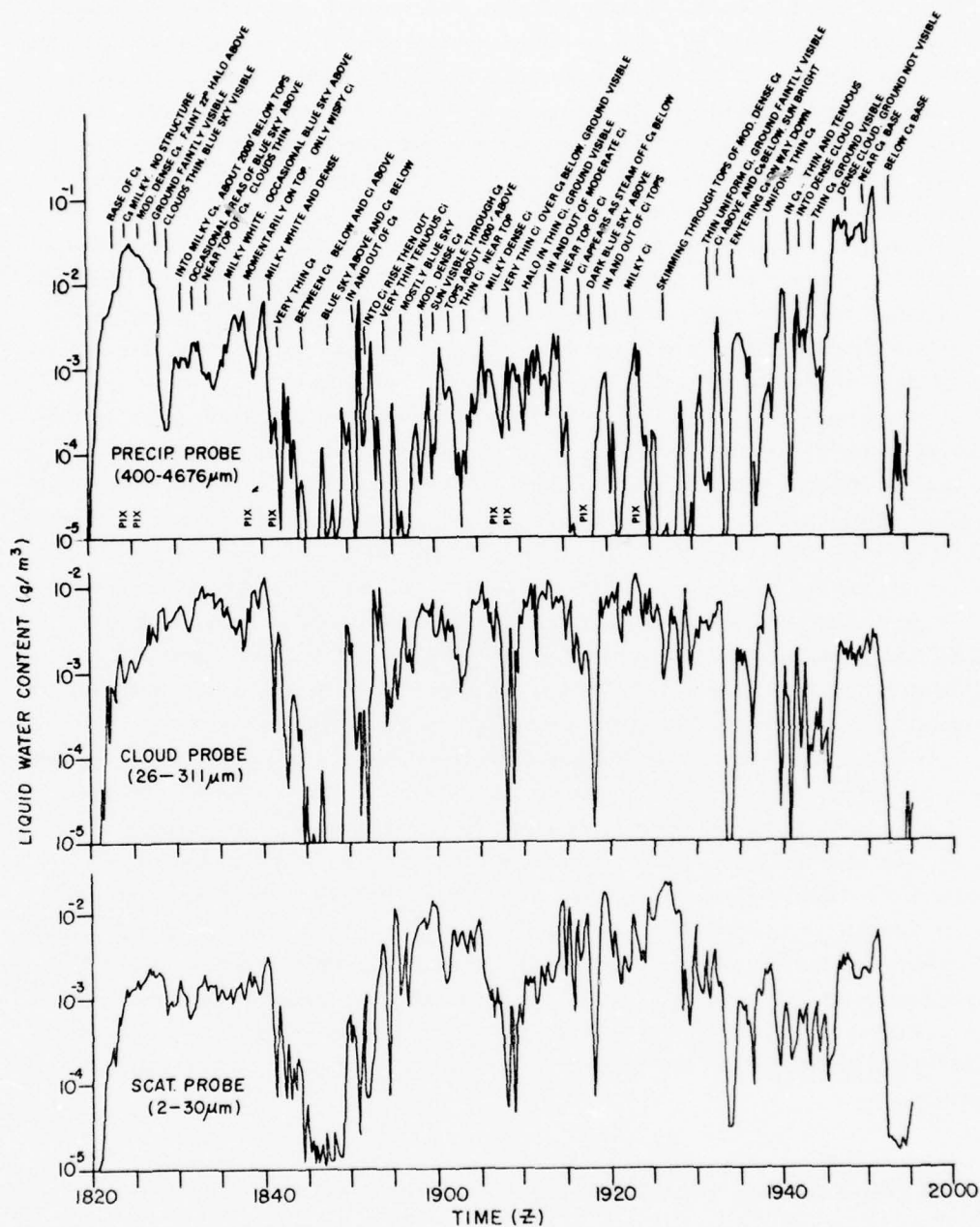


Figure 6. Variation of Liquid Water Content With Time as Determined by Three PMS Spectrometer Probes. Sampling altitude: 16,000 ft (4.8 km) to 29,000 ft (8.8 km) MSL. 26 February 1978, Albuquerque

The correlation, however, between visibility observations and precipitation probe LWC was not exact. It could possibly be improved by making more detailed visual observations and by using smaller time intervals than 15 sec to construct the curves of Figure 6. Such smaller intervals might, however, result in sampling volumes being too small and the outcome, therefore, not being significant. Similar plots of data based on 60-sec averages showed considerably poorer correlation—apparently due to the dilution of high LWC values with low ones, or vice versa, as clouds were entered and exited in rapid succession.

In determining particle habit or shape, primary dependence was placed on the PMS 2-D printouts of particle forms since the formvar replicator was not operated during this flight. Similar to the findings in our first cirrus report,<sup>1</sup> there were very few symmetrically-shaped, text book examples of pristine columns, plates, dendrites, or other classical ice crystal shapes.

In reviewing the 2-D shadowgraph forms, the type seen most frequently from the beginning of the flight until 1823Z (5.7 km altitude) was "small snow". This type consists of agglomerates of smaller individual crystals, which together do not exceed approximately 1/2 mm in size. The particles encountered in the descending portion of the flight after 1946Z (5.8 km) were also of a small snow nature.

The particle form seen most frequently in sampling at the higher altitudes, between 5.7 and 8.8 km (1823-1946Z), was the bullet rosette. Although single columns and plates were not rare the preponderance of discernable shapes appeared to be of the rosette form. As indicated in the literature review of our first cirrus report,<sup>1</sup> the bullet rosette shape is common at cirrus altitudes.

For use at such cold altitudes there are few instruments available to count and size ice crystals smaller than those recorded by the PMS cloud probe ( $\sim 26 \mu\text{m}$ ). The PMS axial scattering probe used in the AFGL aircraft for this purpose was originally intended for use with liquid particles. As pointed out by Ryan et al,<sup>7</sup> since the scattering properties of ice crystals are not known, only apparent size distributions can be reported by this probe in cirrus clouds. Despite this problem it is believed the ice particle populations between 2 and approximately  $30 \mu\text{m}$  that are observed by the scattering probe are reasonable estimates of their real values.

Particle distributions determined by all three probes during the 26 February 1978 flight are presented in Appendix B in terms of averages for consecutive 30-sec periods.

## 5. EXAMPLES OF 15-SECOND AVERAGE PARTICLE DISTRIBUTIONS

After a review of the mission director's notes, the nose camera film and the variation of LWC in Figure 6, eight segments during the flight were selected to

7. Ryan, R. T., Blau, J. H., Jr., vonThuna, P. C., and Cohen, M. L. (1972) Cloud microstructure as determined by an optical cloud particle spectrometer. J. Appl. Meteor. 11:151-156.

study further. These eight times, which are marked "PIX" on Figure 6, were chosen as representative occasions when cirriform clouds of various densities were present. Primary emphasis was on the relatively thin cirrus clouds in which Air Force Weapons Laboratory personnel had previously expressed interest; however, two occasions were also included for comparison when more dense cirro-stratus clouds were being sampled.

Selected frames from the 16-mm movie nose camera are included as Figures 7a through 14a to provide visual documentation of the eight cirrus situations examined. Each of these pictures was taken simultaneously with or a few seconds before particle data were recorded by the various spectrometer probes. The figures on the pictures represent the time in hours, minutes, and seconds that were automatically projected on the film from the aircraft time code generator. The second digit of the hour was not properly projected and this position is vacant in each photo. There was no problem, however, in determining the correct hour since elapsed flight time was less than three hours.

Spectrometer particle data concurrent with each photograph time are shown in Figures 7b through 14b. The "b" figures show plots of particle number density as a function of particle size derived from data averaged over 15-sec intervals near the time the "a" figures were photographed. In the upper right hand corner the total median volume diameter (DIA) and total liquid water content (LWC) of particles recorded by each of the three probes are recorded. The diameter values are those that unfrozen particles having a mass at the median value of each probe's LWC would have.

Because of the deletion of the overlapping amount plus slightly more the C + P (cloud probe plus precipitation probe) LWC and DIA values are sometimes slightly less than the amounts indicated for either the cloud or precipitation probe individually. The two values below "Totals" on the "b" figures and on the printouts in Appendix A and B will similarly be occasionally less than their contributing components.

A few 2-D particle form examples for time approximating the 1-D data acquisition times are shown on the "b" figures. In most cases these were recorded over periods not exceeding 1 - 2 seconds. Dimensions of nearly all 2-D forms may be approximated from knowledge that the height of the vertical bars in these illustrations is  $800 \mu\text{m}$ . A single exception is shown in Figure 7b where the line of 2-D forms recorded at 1951:25Z is from the PMS 2-D precipitation probe. The dimension of the vertical lines in this row is  $6400 \mu\text{m}$ . The 2-D precipitation probe records only the larger sized particles and is seldom activated during cirrus flights.

Figures 7c through 14c are the PMS 1-D data printouts of particle concentration as a function of size for times corresponding to the information shown in Figures 7a and 7b through 14a and 14b. Each of these "c" figures provides data averaged over 15-sec intervals for two consecutive 15-sec periods. The "b" figures were prepared from data for one of these periods.

### 5.1 Example No. 1: 1823:51Z

Figures 7a, b, and c represent a situation where the aircraft was near the base of a cirrostratus (Cs) layer that varied from 6000 to 8000 ft thick. The ground was still visible below, but visibility was rapidly reduced in moving upward toward the horizon. The location of the sun was discernable above through the milky white cloud. The Figure 7a picture and that shown in Figure 8a were taken in one of the higher peaks of the LWC of the precipitation probe (see Figure 6).

Although the median volume diameter of the precipitation probe droplets (and of the total C + P value) was greater at that time than at any other shown in Figures 8 through 14 it is noteworthy that the LWC of the cloud probe was least. Apparently these particles fell from higher altitudes and grew larger by collecting or aggregating the smaller cloud-sized particles. Heymsfield<sup>3</sup> also found aggregation to occur in a cirrus cloud at  $-20^{\circ}\text{C}$  and warmer. The temperature at 1824Z was  $-20^{\circ}\text{C}$ .

The 2-D forms shown on Figure 7b were recorded approximately 1-1/2 hr after the picture and 1-D data were recorded. This substitution of later 2-D data was necessary since the 2-D equipment was not operating when the aircraft ascended through the cloud base at 1824Z. In choosing 2-D forms that were representative of the other Figure 7 data an effort was made to match 1-D spectra data on descent with those recorded on ascent at 1824Z. It is believed the 2-D particle forms in Figure 7b closely approximate those that would have been seen at that time.

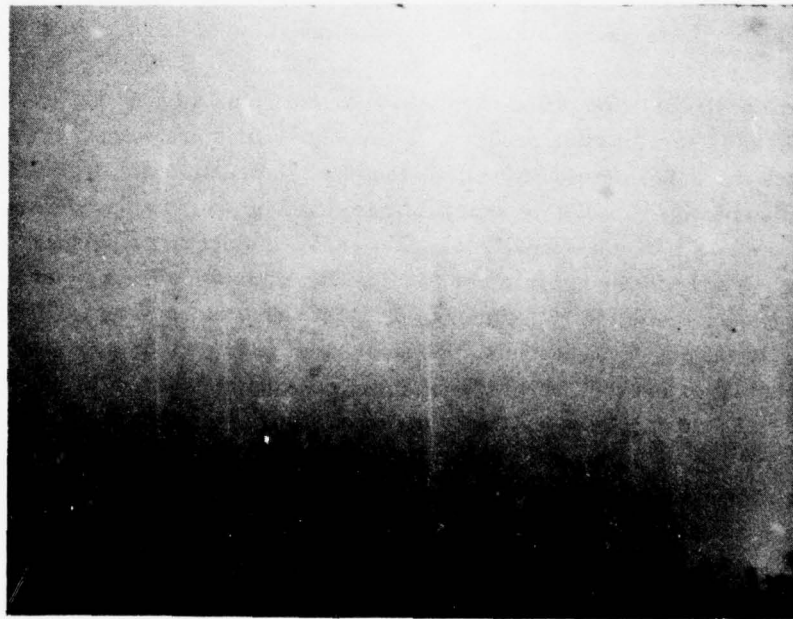


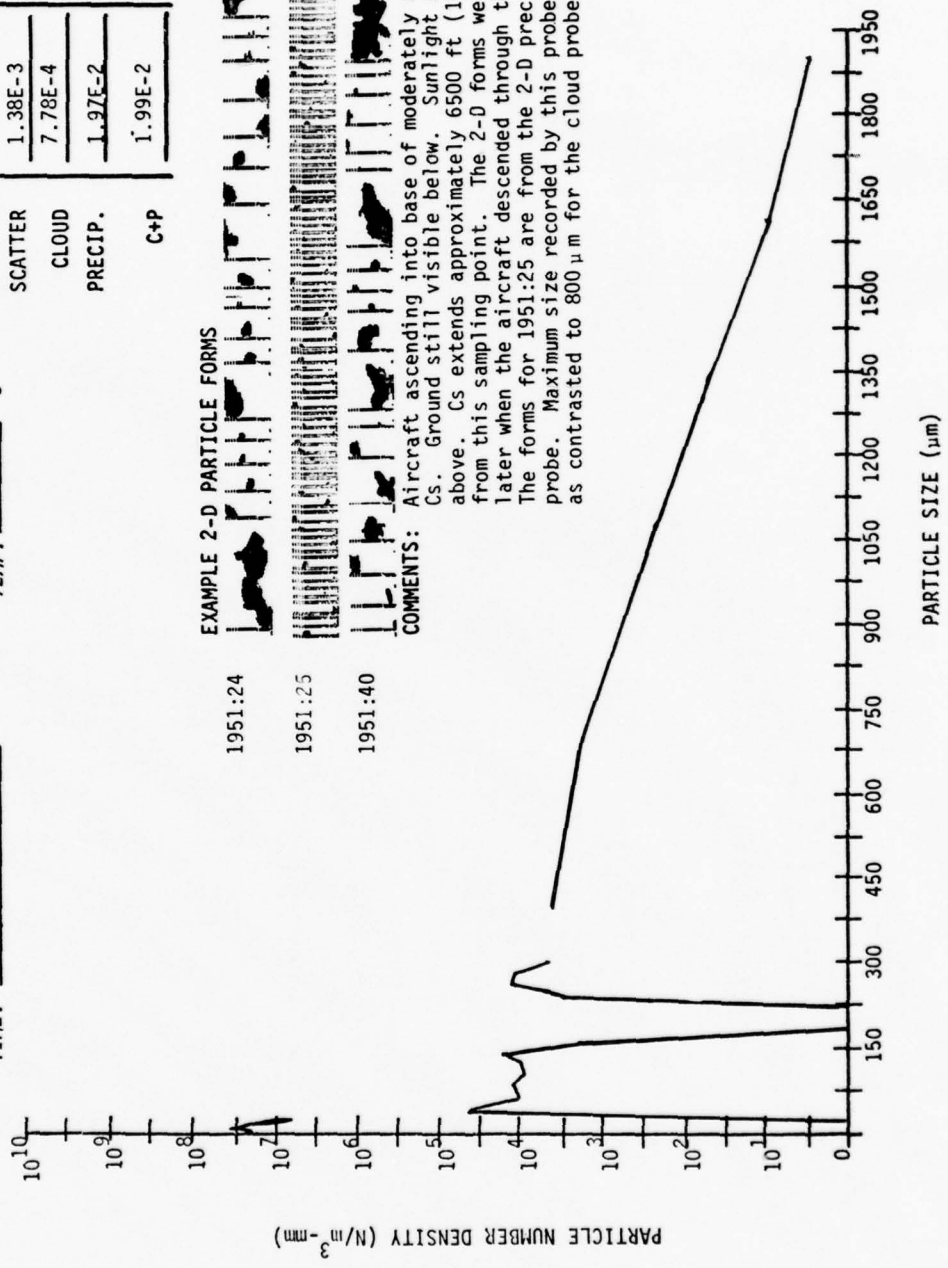
Figure 7a. Selected 16-mm Frame 1823:51Z, Base of Cs 5.9 km MSL, Temperature  $-19.8^{\circ}\text{C}$



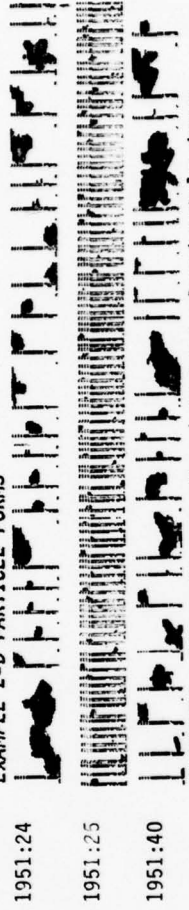
DATE: 26 Feb 78  
 TIME: 1824:10 - 1824:24

ALTITUDE 5.9 km  
 TEMP. -19.8 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	1.38E-3	22
CLOUD	7.78E-4	121
PRECIP.	1.97E-2	343
C+P	1.99E-2	342



EXAMPLE 2-D PARTICLE FORMS



1951:24  
 1951:25  
 1951:40

COMMENTS: Aircraft ascending into base of moderately dense Cs. Ground still visible below. Sunlight strong above. Cs extends approximately 6500 ft (1980M) upward from this sampling point. The 2-D forms were recorded later when the aircraft descended through the Cs base. The forms for 1951:25 are from the 2-D precipitation probe. Maximum size recorded by this probe is 6400 μm as contrasted to 800 μm for the cloud probe.

Figure 7b. Spectrometer Particle Data for Figure 7a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
 INTERVAL START \*18:24:10\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.45E+06	25	0.	400	4.02E+03	476.0
4	7.44E+06	47	4.23E+04	706	1.78E+03	ALT (KM)
6	1.20E+07	67	1.02E+04	1011	3.24E+02	5.934
8	1.78E+07	87	1.21E+04	1316	6.17E+01	
10	2.29E+07	108	8.21E+03	1522	1.01E+01	TEMP (C)
12	3.31E+07	128	9.04E+03	1927	5.11E+00	-19.8
14	2.11E+07	148	1.67E+04	2233	1.65E+00	
16	2.51E+07	169	1.93E+03	2538	0.	DEWP (C)
18	1.82E+07	189	0.	2943	0.	
20	1.26E+07	209	0.	3149	0.	
22	2.05E+07	230	0.	3454	0.	TAS (M/S)
24	9.14E+06	250	2.80E+03	3760	0.	105.7
25	8.58E+06	271	1.26E+04	4065	0.	
28	5.12E+06	291	1.08E+04	4370	0.	
30	9.16E+06	311	4.17E+03	4676	0.	
LWC	1.39E-03		7.78E-04		1.97E-02	TOTALS
MED D	22		121		343	1.99E-02
						342

INTERVAL START \*18:24:25\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.04E+06	25	0.	400	4.43E+03	471.7
4	8.05E+06	47	1.30E+05	706	1.95E+03	ALT (KM)
6	9.21E+06	67	1.01E+04	1011	3.74E+02	5.933
8	1.44E+07	87	1.21E+04	1316	7.18E+01	
10	2.36E+07	108	8.19E+03	1522	1.31E+01	TEMP (C)
12	2.70E+07	128	1.52E+04	1927	3.08E+00	-20.4
14	2.36E+07	148	1.20E+04	2233	1.63E+00	
16	2.53E+07	169	3.95E+03	2538	1.75E+00	DEWP (C)
18	2.01E+07	189	0.	2943	0.	
20	1.49E+07	209	0.	3149	0.	
22	1.27E+07	230	5.10E+03	3454	0.	TAS (M/S)
24	8.62E+06	250	2.83E+03	3760	0.	104.3
25	6.91E+06	271	3.20E+03	4065	0.	
28	4.03E+06	291	3.65E+03	4370	0.	
30	5.13E+06	311	2.13E+04	4676	0.	
LWC	1.14E-03		1.02E-03		2.21E-02	TOTALS
MED D	21		133		347	2.24E-02
						345

Figure 7c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 7b and the Photo in Figure 7a

## 5.2 Example No. 2: 1825:30Z

Figures 8a, b, and c depict another moderately dense cirrostratus situation where the aircraft had moved about 0.3 km higher into the cloud than at the time recorded in Figures 7a, b, and c. Uniform milky Cs extended about 5000 ft (1.5 km) above the observer and a thin halo was around the sun which was dimly visible. The LWC measured by the precipitation probe was greater for this example than for the other seven times discussed here, while the median volume diameter was approximately the same as the Figure 7b occasion.

Although some channels of the cloud probe recorded no particles in the relatively dense cirrostratus, it is to be noted in both Figures 7b and 8b that there is a gradual but discontinuous increase in number density as particle size decreases. At the higher altitudes examined in most of the figures from Figures 9b through 14b this fairly smooth increase in concentration with diminishing size was interrupted by a second maximum in the cloud probe data.

The particle spectrum shown in Figure 8b is similar to that examined by Glass and Varley<sup>8</sup> during another study of cirrus conditions at the time a halo was present. Their case, however, indicated slightly fewer particles in the 50 to 100  $\mu$ m range than those shown in Figure 8b.

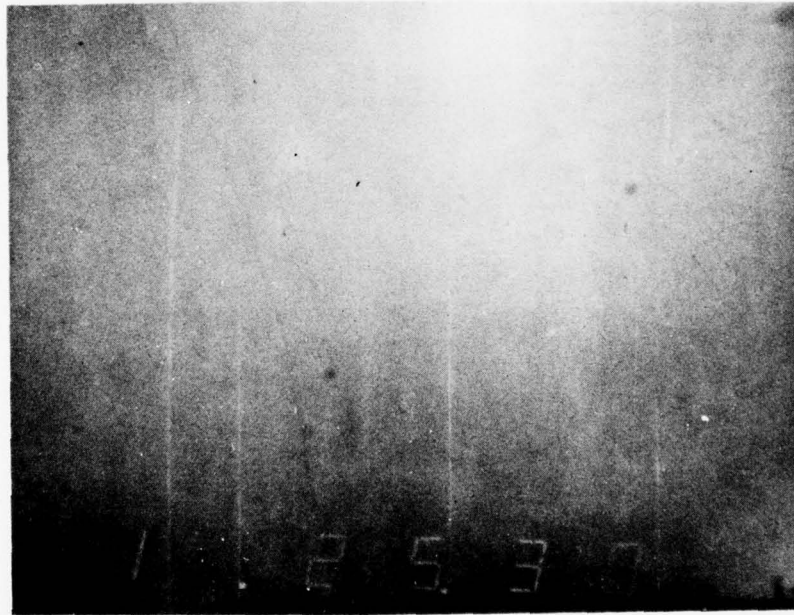


Figure 8a. Selected 16-mm Frame 1825:30Z, In Cs 6.2 km MSL, Temperature  $-22.3^{\circ}\text{C}$

8. Glass, M., and Varley, D. J. (1978) Observations of cirrus particle characteristics occurring with halos. In Preprints of Conference on Cloud Physics and Atmospheric Electricity, Amer. Meteor. Soc. pp 126-128. Also, AFGL-TR-78-0196.

DATE: 26 Feb 78  
 TIME: 1825:40 - 1825:54

ALTITUDE 6.2 km  
 TEMP. -22.3 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	1.39E-3	21
CLOUD	1.32E-3	119
PRECIP.	2.54E-2	341
C+P	2.59E-2	337

EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In moderately dense Cs. High LWC values here  
 and in similar part of cloud upon descent.  
 A halo is seen around the sun although the  
 milky, uniform cloud extends upward approximately  
 5000 ft (1520m) from the sampling point.

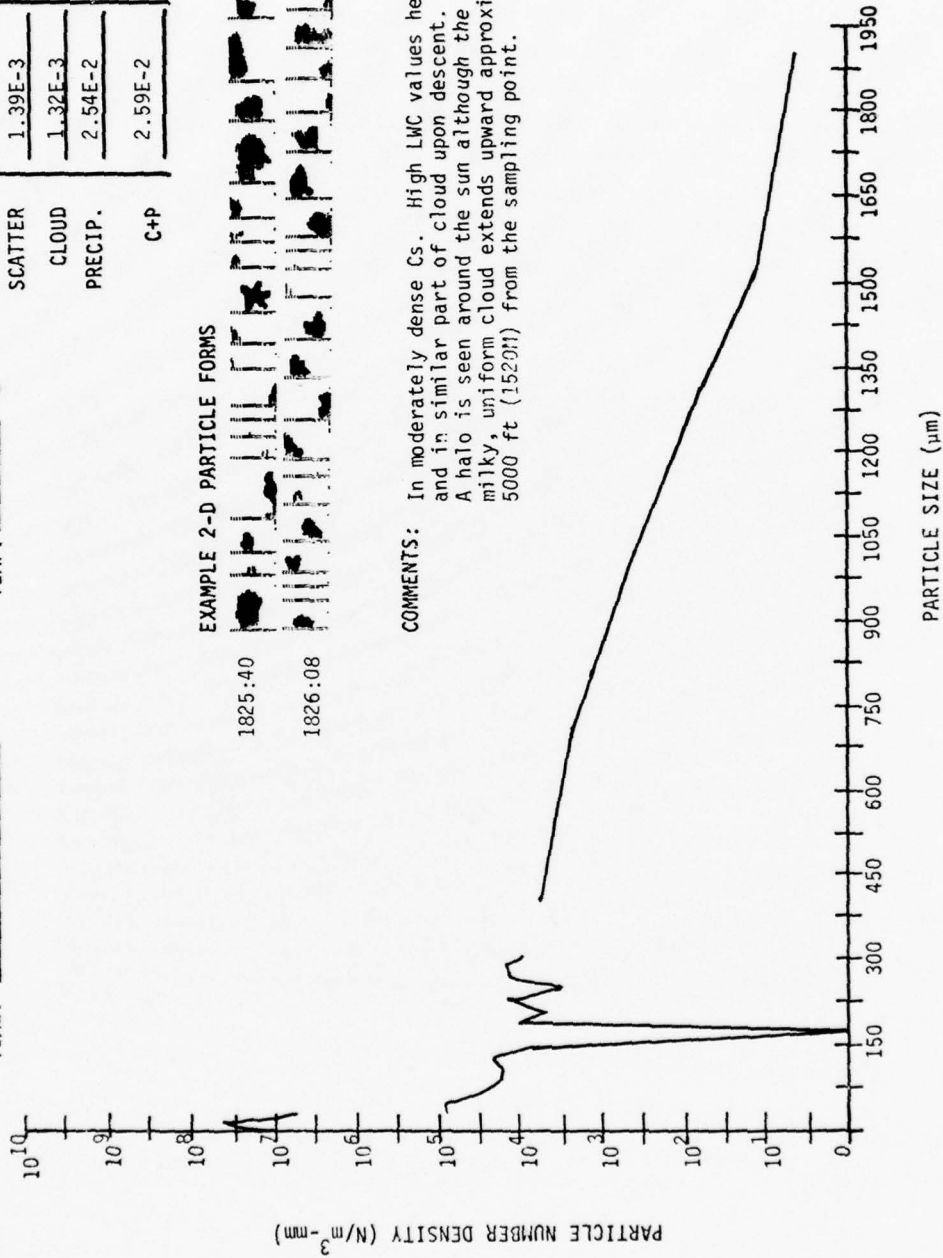


Figure 8b. Spectrometer Particle Data for Figure 8a



AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
 INTERVAL START \*13:25:40\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.30E+05	26	8.19E+04	400	5.60E+03	453.9
4	9.22E+05	47	8.65E+04	706	2.25E+03	ALT (KM)
6	2.07E+07	67	3.03E+04	1011	4.28E+02	5.273
8	2.76E+07	87	1.81E+04	1316	5.08E+01	TEMP (C)
10	3.68E+07	108	1.65E+04	1522	1.31E+01	-22.3
12	4.20E+07	128	2.13E+04	1927	5.18E+00	
14	3.85E+07	148	7.18E+03	2233	4.92E+00	DEWP (C)
16	2.87E+07	169	0.	2538	0.	
18	2.88E+07	189	1.07E+04	2843	0.	
20	1.72E+07	209	4.65E+03	3149	0.	TAS (M/S)
22	1.03E+07	230	1.54E+04	3454	0.	104.3
24	7.48E+05	250	2.83E+03	3760	0.	
26	1.04E+07	271	1.28E+04	4065	0.	
28	6.91E+06	291	1.46E+04	4370	0.	
30	4.60E+06	311	8.51E+03	4676	0.	
LWC	1.39E-03		1.32E-03		2.54E-02	TOTALS
MFD 0	21		119		341	2.59E-02
						337

INTERVAL START \*13:25:55\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.85E+05	26	0.	400	5.52E+03	451.2
4	1.26E+07	47	8.59E+04	706	2.15E+03	ALT (KM)
6	1.20E+07	67	3.01E+04	1011	3.65E+02	5.321
8	2.35E+07	87	1.21E+04	1316	5.33E+01	TEMP (C)
10	3.44E+07	108	2.04E+04	1522	7.27E+00	-22.7
12	3.95E+07	128	9.09E+03	1927	5.13E+00	
14	3.26E+07	148	7.14E+03	2233	1.62E+00	DEWP (C)
16	3.54E+07	169	1.18E+04	2538	0.	
18	2.17E+07	189	2.45E+03	2843	0.	
20	1.83E+07	209	0.	3149	0.	TAS (M/S)
22	1.43E+07	230	5.04E+03	3454	0.	105.6
24	1.25E+07	250	1.14E+04	3760	0.	
26	8.55E+05	271	1.27E+04	4065	0.	
28	5.71E+05	291	1.45E+04	4370	0.	
30	1.03E+07	311	1.68E+04	4676	0.	
LWC	1.58E-03		1.51E-03		2.32E-02	TOTALS
MFD 0	22		123		332	2.35E-02
						330

Figure 8c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 8b and the Photo in Figure 8a

### 5.3 Example No. 3: 1838:14Z

The Figure 9a, b, and c series was seen or recorded about 13 min later and 1.4 km higher than that of the preceding series. Blue sky was evident above, although the aircraft was still approximately 1000 ft (300 m) below the top of the Cs. In the direction of the horizon the cloud appeared to be fairly heavy. Each of the probes recorded the same magnitude of liquid water content though the cloud probe had a slightly greater contribution.

From the time represented by Figure 8a to that of Figure 9a the size and mass recorded by the precipitation probe had decreased significantly, while those of the cloud probe had increased. The LWC of the scatter probe also increased slightly, although visible cloud density decreased. Particle size had substantially diminished as the aircraft climbed higher toward the top of the cirrostratus layer.

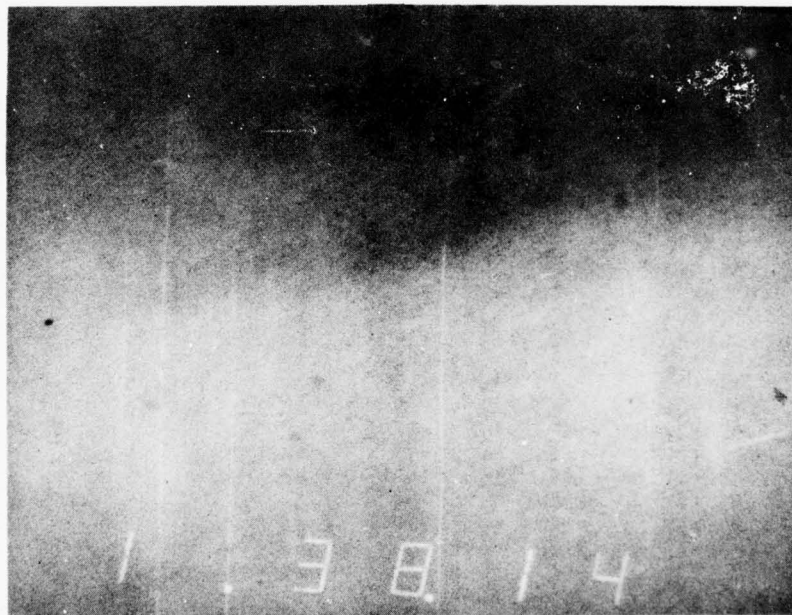
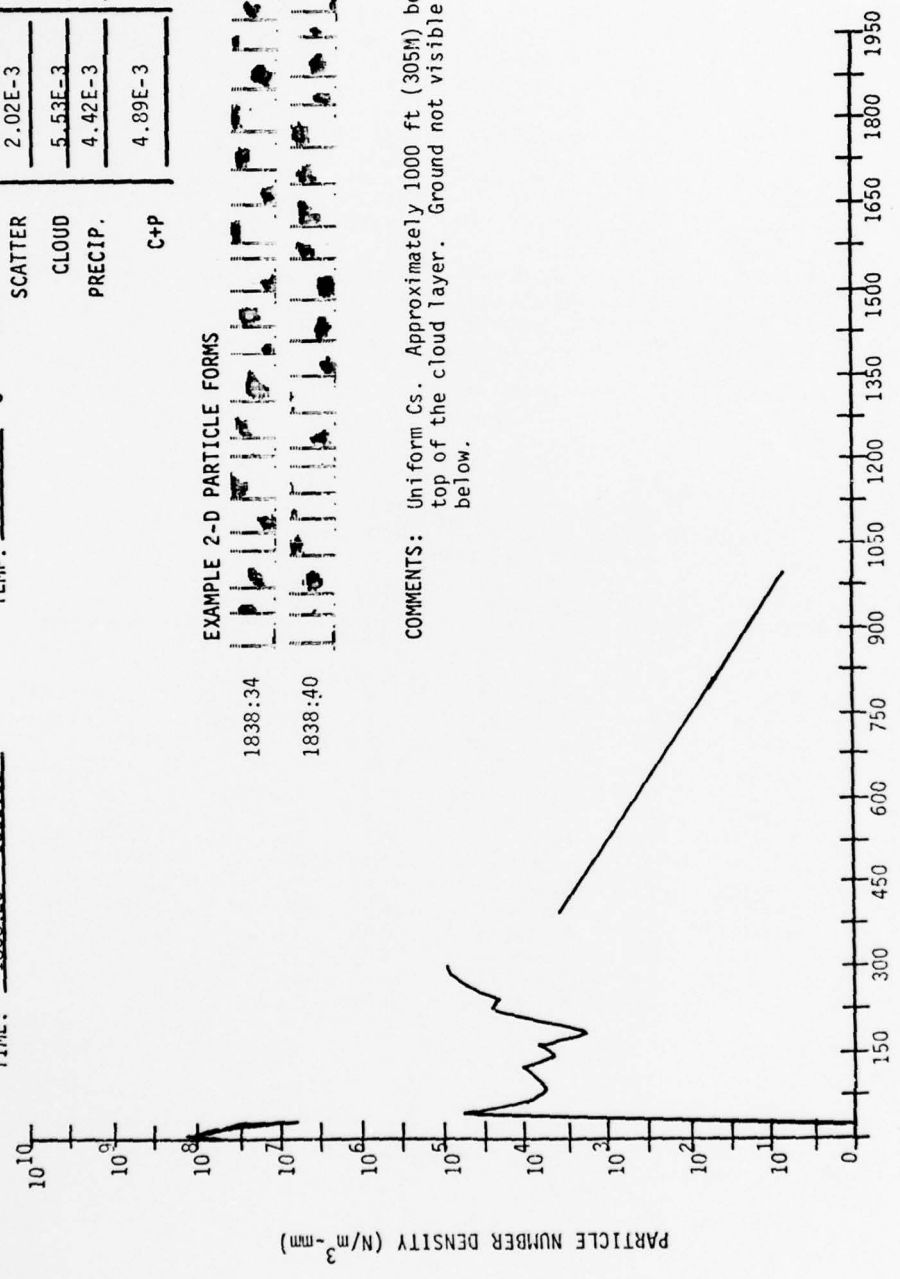


Figure 9a. Selected 16-mm Frame 1838:14Z, Near Cs tops 7.6 km MSL, Temperature  $-29.9^{\circ}\text{C}$

DATE: 26 Feb 78  
 TIME: 1838:25 - 1838:39

ALTITUDE 7.6 km  
 TEMP. -29.9 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	2.02E-3	21
CLOUD	5.53E-3	129
PRECIP.	4.42E-3	192
C+P	4.89E-3	183



EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Uniform Cs. Approximately 1000 ft (305M) below top of the cloud layer. Ground not visible below.

PARTICLE SIZE (μm)

Figure 9b. Spectrometer Particle Data for Figure 9a

AFWL CTRRUS STUDY BY AFGL

FLIGHT E79-03 ON 26 FEB 78 15 SECOND AVERAGING

INTERVAL START \*10:38:10\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.60E+05	26	0.	400	3.48E+03	376.3
4	5.09E+07	47	5.73E+04	706	2.46E+02	ALT (KM)
6	8.85E+07	67	8.96E+03	1111	4.65E+00	7.611
8	7.94E+07	87	2.67E+04	1316	0.	TEMP (C)
10	4.94E+07	108	2.18E+04	1522	0.	-29.3
12	3.67E+07	128	5.38E+03	1927	0.	DEWP (C)
14	2.75E+07	148	2.12E+03	2233	0.	
16	2.70E+07	169	1.74E+03	2538	0.	
18	2.85E+07	189	5.67E+03	2843	0.	
20	1.69E+07	209	2.05E+03	3149	0.	TAS (M/S)
22	1.12E+07	230	1.59E+04	3454	0.	118.5
24	1.12E+07	250	1.01E+04	3760	0.	
26	9.16E+05	271	1.98E+04	4065	0.	
28	1.22E+07	291	1.62E+04	4370	0.	
30	9.16E+05	311	4.15E+04	4676	0.	
LWC	1.69E-03		2.35E-03		4.23E-03	TOTALS
MED D	23		130		202	4.51E-03
						134

INTERVAL START \*11:38:25\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.01E+07	26	0.	400	4.07E+03	376.4
4	1.26E+08	47	5.75E+04	706	1.69E+02	ALT (KM)
6	1.23E+08	67	9.00E+03	1111	6.98E+00	7.611
8	1.03E+08	87	5.35E+03	1316	0.	TEMP (C)
10	7.14E+07	108	7.29E+03	1522	0.	-29.3
12	6.43E+07	128	1.08E+04	1927	0.	DEWP (C)
14	4.75E+07	148	4.24E+03	2233	0.	
16	4.03E+07	169	7.00E+03	2538	0.	
18	3.88E+07	189	1.89E+03	2843	0.	TAS (M/S)
20	2.04E+07	209	5.19E+03	3149	0.	118.4
22	1.22E+07	230	2.49E+04	3454	0.	
24	1.28E+07	250	2.02E+04	3760	0.	
26	1.65E+07	271	4.25E+04	4065	0.	
28	1.07E+07	291	7.45E+04	4370	0.	
30	5.10E+05	311	8.69E+04	4676	0.	
LWC	2.02E-03		5.53E-03		4.42E-03	TOTALS
MED D	21		129		192	4.39E-03
						183

Figure 9c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Lower One Corresponds to the Plotted Values on Figure 9b and the Photo in Figure 9a

#### 5.4 Example No. 4: 1842:07Z

Figures 10a, b, and c represent a time when the aircraft was in the upper portion of very thin cirrostratus. The horizon was faintly visible. Snow capped mountains about five miles distant may be seen in the lower foreground of Figure 10a. Although this figure indicates thin cirriform clouds straight ahead near the horizon the base of the cirrus layer was estimated to be more than a thousand feet above the aircraft.

The particle population recorded by each of the probes at this time was quite low. In fact, the liquid water content determined by the scattering probe was smaller at this time than at any of the other specific times studied here; the overall LWC of the "cloud plus precipitation" probes was also smallest. Even though several of the individual cloud probe channels recorded no particles this probe recorded the highest LWC measurement of the three—although it was still relatively low when compared to other cirrus situations.

The greatest contribution to the mass determined by the cloud probe was apparently made by particles in the 200 to 250  $\mu\text{m}$  range according to Figure 10b. The concentration or density falls off for sizes both smaller and larger than this.

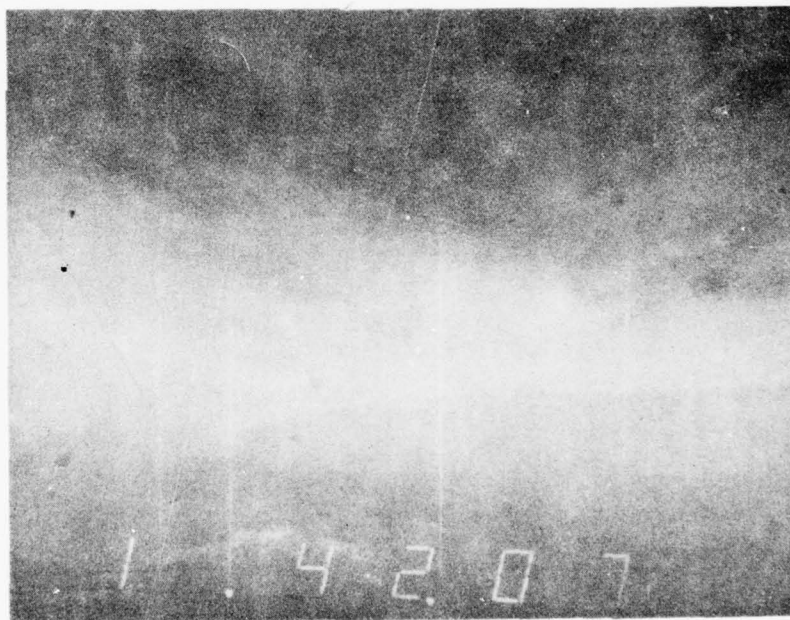


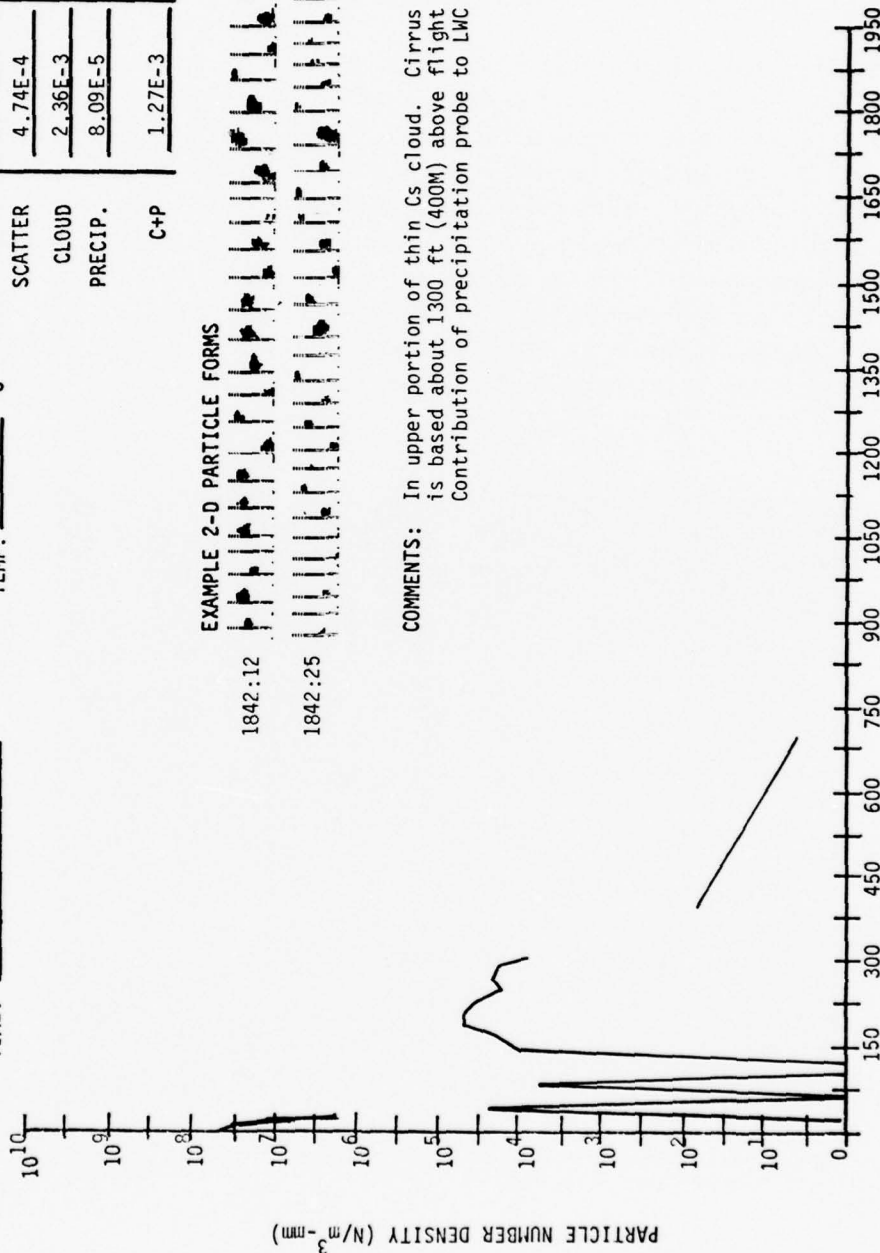
Figure 10a. Selected 16-mm Frame 1842:07Z, Very Thin Cs 8.5 km MSL, Temperature  $-30.3^{\circ}\text{C}$



DATE: 26 Feb 78  
 TIME: 1842:10 - 1842:24

ALTITUDE 7.6 km  
 TEMP. -30.3 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	4.74E-4	21
CLOUD	2.36E-3	105
PRECIP.	8.09E-5	192
C+P	1.27E-3	92



EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In upper portion of thin Cs cloud. Cirrus layer is based about 1300 ft (400M) above flight level. Contribution of precipitation probe to LWC is small

PARTICLE SIZE (μm)

Figure 10b. Spectrometer Particle Data for Figure 10a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
 INTERVAL START \*18:42:10\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.32E+03	25	0.	400	7.47E+01	376.7
4	4.19E+07	47	1.98E+04	706	3.44E+00	ALT (KM)
6	3.18E+07	67	0.	1011	0.	7.634
8	2.33E+07	87	5.54E+03	1316	0.	
10	2.07E+07	109	0.	1522	0.	TEMP (C)
12	1.64E+07	129	0.	1927	0.	-30.3
14	1.22E+07	148	6.80E+03	2233	0.	
16	1.01E+07	169	1.64E+04	2538	0.	DEWP (C)
18	5.30E+05	189	4.72E+04	2843	0.	
20	5.30E+05	209	4.71E+04	3149	0.	
22	4.76E+05	230	3.30E+04	3454	0.	TAS (M/S)
24	1.59E+05	250	1.57E+04	3760	0.	114.0
26	2.65E+05	271	2.06E+04	4065	0.	
28	3.17E+05	291	1.68E+04	4370	0.	
30	1.59E+05	311	7.85E+03	4676	0.	
LWC	4.74E-04		2.36E-03		8.09E-05	TOTALS
MED D	21		105		192	1.27E-03
						32

INTERVAL START \*19:42:25\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	8.32E+03	25	0.	400	7.65E+00	375.1
4	1.26E+07	47	0.	706	1.15E+00	ALT (KM)
6	7.35E+05	67	9.30E+03	1011	0.	7.633
8	4.22E+05	87	5.50E+03	1316	0.	
10	5.79E+05	109	3.75E+03	1522	0.	TEMP (C)
12	3.16E+05	129	8.34E+03	1927	0.	-30.3
14	5.28E+05	148	0.	2233	0.	
16	2.10E+05	169	1.81E+03	2538	0.	DEWP (C)
18	3.16E+05	189	7.80E+03	2843	0.	
20	0.	209	2.13E+03	3149	0.	
22	1.05E+05	230	9.37E+03	3454	0.	TAS (M/S)
24	5.29E+05	250	0.	3760	0.	115.1
26	5.26E+05	271	0.	4065	0.	
28	1.05E+05	291	0.	4370	0.	
30	5.27E+05	311	0.	4676	0.	
LWC	1.21E-04		2.27E-04		1.20E-05	TOTALS
MED D	22		90		230	2.39E-04
						33

Figure 10c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 10b and the Photo in Figure 10a

5.5 Example No. 5: 1907:39Z

Figure 11a shows a situation where the aircraft was in very thin cirrus at 28,000 ft (8.5 km) with cirrostratus below. Less than a minute after this photo was taken the mission director reported he could see the ground clearly through the milky, thin Cs. The tops of the thin cirrus were believed to be about 1000 ft (300 m) above flight level.

The large variation of particles in both size and shape is shown in the 2-D forms on Figure 11b. As noted there, the majority of recognizable particles appears to be composed of the bullet rosette form and vary from approximately 200 to 500  $\mu\text{m}$  in their largest dimension. The mean "diameter" values shown on Figure 11b and the other "b" figures are smaller than the 2-D particle dimensions since they represent spherical "melted" droplets having the same mass as the larger frozen crystals.

As in most of the other particular cirrus cases described in this section the largest contribution to total liquid water content was made by the particles in the 26 to 311  $\mu\text{m}$  range that are observed by the cloud probe.

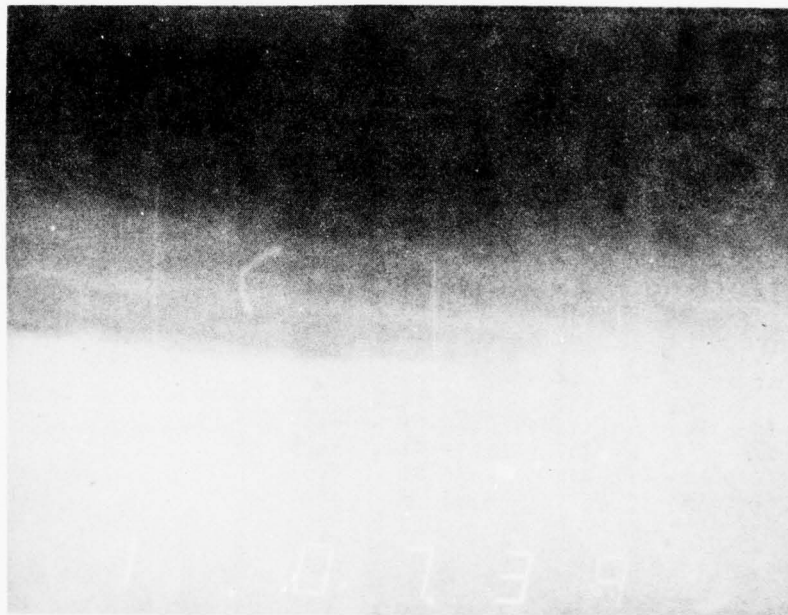


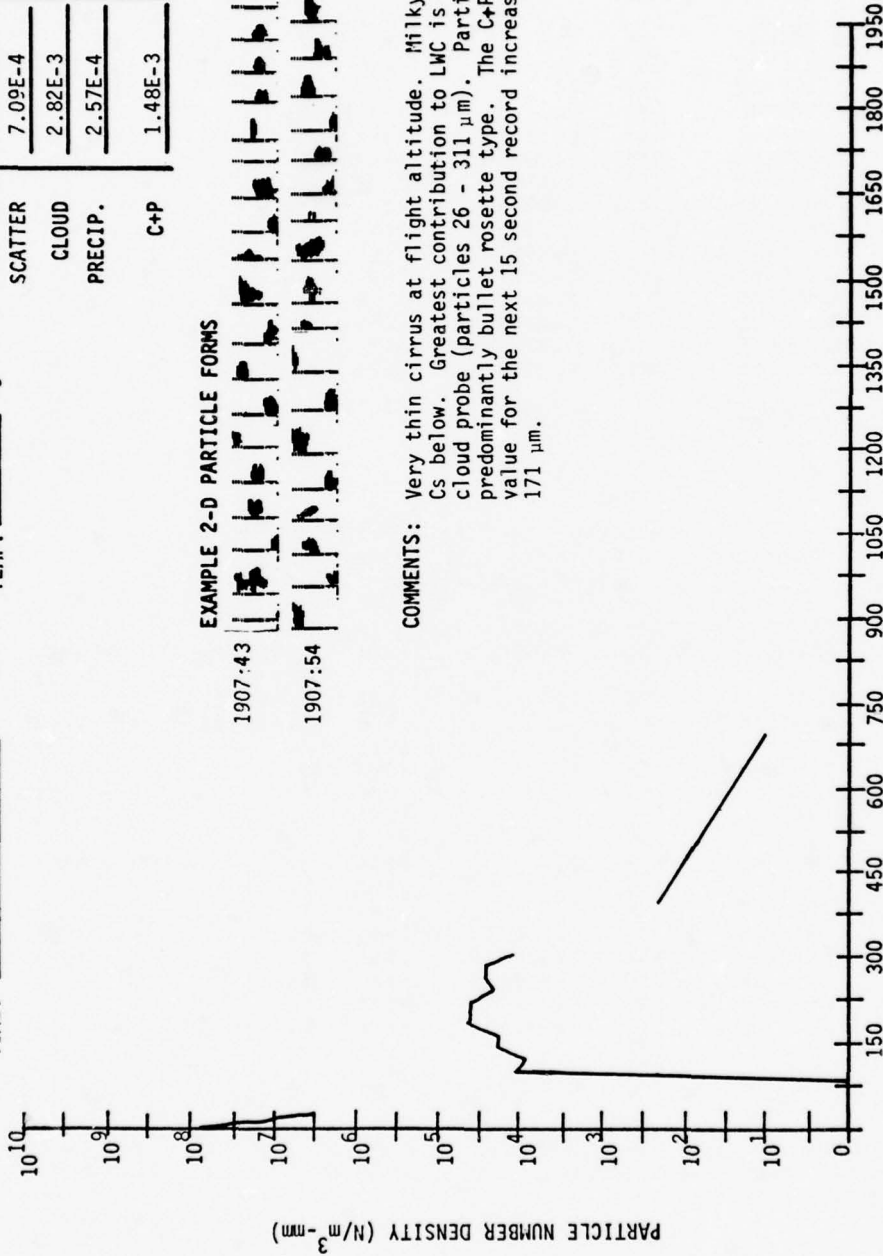
Figure 11a. Selected 16-mm Frame 1907:39, Thin Ci 8.5 km MSL, Temperature  $-33.5^{\circ}\text{C}$



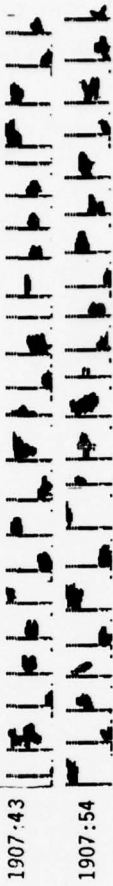
DATE: 26 Feb 78  
 TIME: 1907:40 - 1907:54

ALTITUDE 8.5 km  
 TEMP. -33.5 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	7.09E-4	22
CLOUD	2.82E-3	111
PRECIP.	2.57E-4	192
C+P	1.48E-3	93



EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Very thin cirrus at flight altitude. Milky, thin Cs below. Greatest contribution to LWC is from cloud probe (particles 26 - 311 μm). Particles are predominantly bullet rosette type. The C+P diameter value for the next 15 second record increased to 171 μm.

PARTICLE SIZE (μm)

Figure 11b. Spectrometer Particle Data for Figure 11a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
 INTERVAL START \*19:07:40\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.73E+03	25	0.	400	2.37E+02	331.2
4	5.50E+07	47	0.	706	1.09E+01	ALT (KM)
6	3.94E+07	67	0.	1011	0.	8.492
8	2.57E+07	87	0.	1316	0.	
10	2.49E+07	108	1.08E+04	1522	0.	TEMP (C)
12	2.42E+07	128	8.02E+03	1927	0.	-33.5
14	1.01E+07	148	1.89E+04	2233	0.	
16	1.06E+07	169	1.73E+04	2538	0.	DEWP (C)
18	1.11E+07	189	4.30E+04	2943	0.	
20	6.06E+06	209	4.08E+04	3149	0.	TAS (M/S)
22	5.55E+05	230	3.60E+04	3454	0.	119.3
24	5.56E+05	250	2.00E+04	3760	0.	
26	5.05E+05	271	2.52E+04	4065	0.	
28	3.03E+05	291	2.57E+04	4370	0.	
30	3.54E+05	311	1.12E+04	4676	0.	
LWC	7.09E-04		2.82E-03		2.57E-04	TOTALS
MFD D	22		111		192	1.48E-03
						93

INTERVAL START \*19:07:55\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.33E+03	25	0.	400	1.91E+02	331.0
4	2.39E+07	47	0.	706	3.26E+00	ALT (KM)
6	9.48E+05	67	0.	1011	0.	8.496
8	4.99E+05	87	0.	1316	0.	
10	2.00E+05	108	0.	1522	0.	TEMP (C)
12	9.93E+05	128	0.	1927	0.	-33.4
14	4.99E+05	148	0.	2233	0.	
16	2.99E+06	169	0.	2538	0.	DEWP (C)
18	2.99E+05	189	0.	2943	0.	
20	3.43E+05	209	0.	3149	0.	TAS (M/S)
22	4.97E+05	230	2.22E+03	3454	0.	120.9
24	0.	250	2.47E+03	3760	0.	
26	9.97E+05	271	5.55E+03	4065	0.	
28	4.99E+05	291	0.	4370	0.	
30	0.	311	3.68E+03	4676	0.	
LWC	1.27E-04		2.58E-04		1.81E-04	TOTALS
MFD D	19		120		181	2.05E-04
						171

Figure 11c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 11b and the Photo in Figure 11a

5.6 Example No. 6: 1908:46Z

The photo shown in Figure 12a was taken 1 min after that of Figure 11a. Although some wispy, thin cirrus extends before the aircraft there is blue sky above. The tops of the cirrus layer were estimated to be about 1000 ft (300 m) above the aircraft's 28,000 ft (8.5 km) flight level. The cirrostratus below was reported to be thinner than it appears in the photo, and the ground was visible through it.

Considering the relative clearness of the sky before the aircraft the  $1.67 \times 10^{-3} \text{ g m}^{-3}$  C + P LWC value seems large; however, it is still two orders of magnitude less than Heymsfield and Knollenberg<sup>5</sup> found in cirrus uncinus that was presumably more dense. The C + P LWC decreased by an order of magnitude in the 15-sec sample recorded after that shown on Figure 12b.

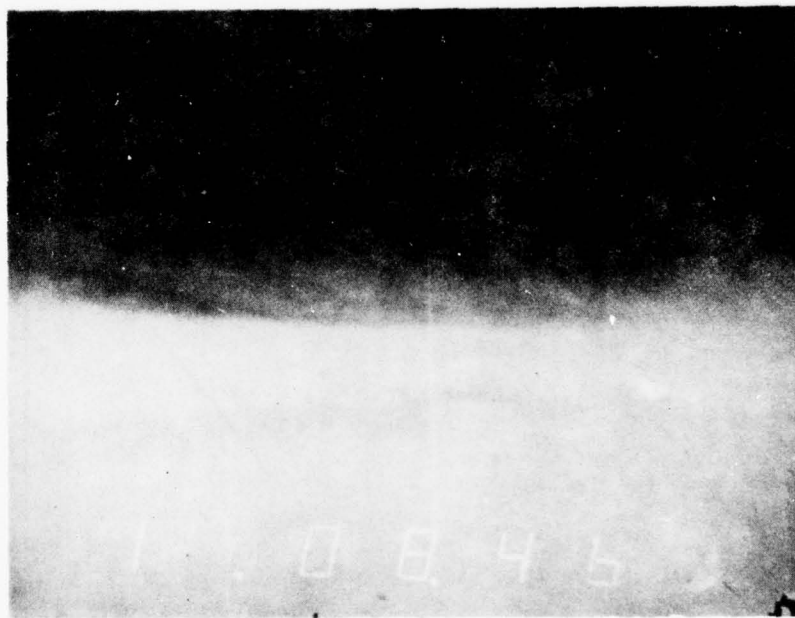
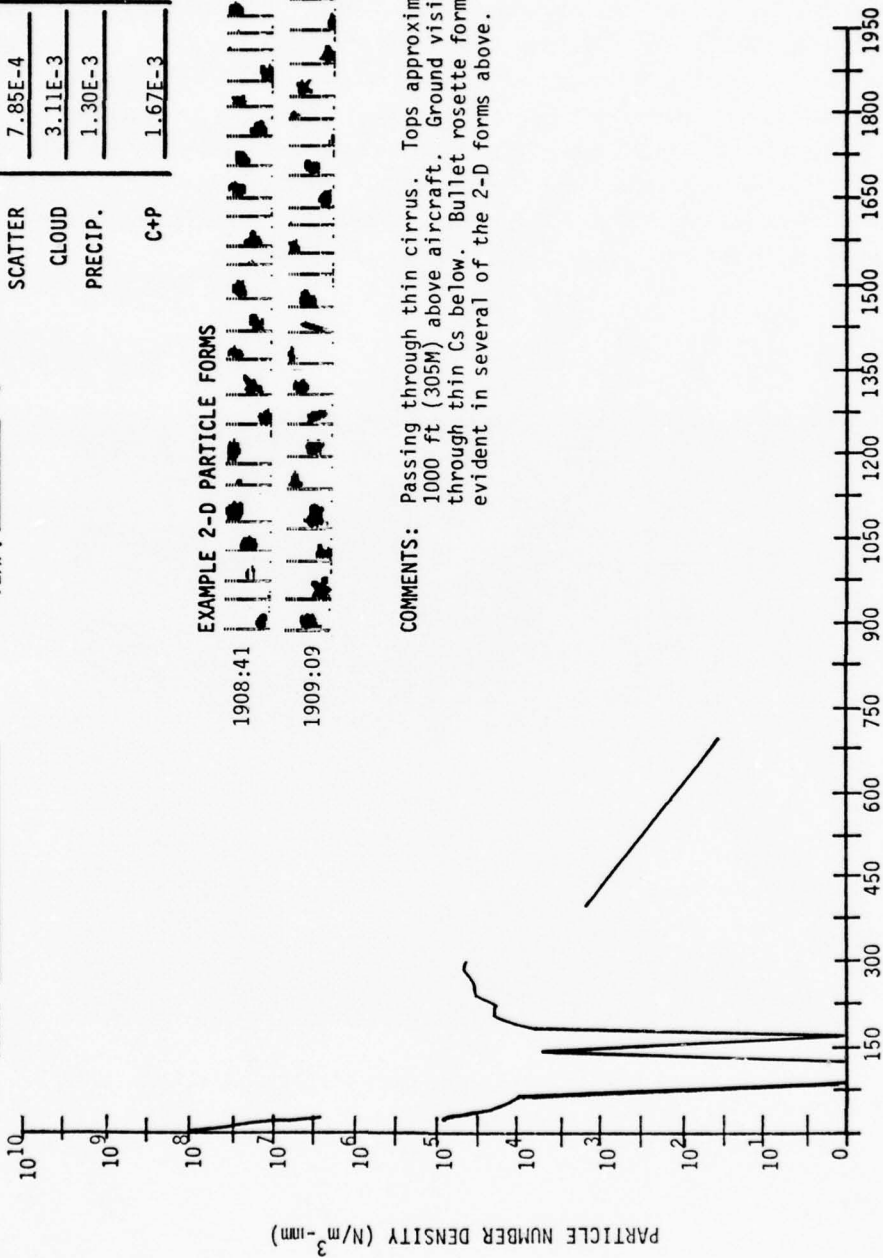


Figure 12a. Selected 16-mm Frame 1908:46, Thin Ci 8.5 km MSL, Temperature  $-33.5^{\circ}\text{C}$

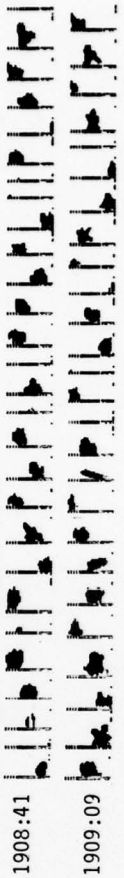
DATE: 26 Feb 78  
 TIME: 1908:40 - 1908:54

ALTITUDE 8.5 km  
 TEMP. -33.5 °C

	LMC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	7.85E-4	19
CLOUD	3.11E-3	126
PRECIP.	1.30E-3	184
C+P	1.67E-3	162



EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Passing through thin cirrus. Tops approximately 1000 ft (305M) above aircraft. Ground visible through thin Cs below. Bullet rosette forms are evident in several of the 2-D forms above.

PARTICLE SIZE (μm)

Figure 12b. Spectrometer Particle Data for Figure 12a

AFWL CIRRUS STUDY BY AF3L

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
 INTERVAL START \*19:08:40\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.58E+03	26	7.01E+04	400	1.32E+03	330.5
4	8.01E+07	47	1.85E+04	706	3.21E+01	ALT (KM)
6	5.11E+07	67	8.65E+03	1011	0.	8.517
8	3.54E+07	87	0.	1316	0.	
10	3.74E+07	108	0.	1522	0.	TEMP (C)
12	1.82E+07	128	0.	1927	0.	-33.5
14	1.62E+07	148	4.09E+03	2233	0.	
16	2.65E+07	169	0.	2538	0.	DEWP (C)
18	1.19E+07	189	5.47E+03	2943	0.	
20	9.33E+05	209	1.59E+04	3149	0.	TAS (M/S)
22	5.89E+05	230	1.53E+04	3454	0.	122.7
24	4.91E+05	250	2.67E+04	3760	0.	
26	4.42E+05	271	3.01E+04	4065	0.	
28	3.44E+05	291	3.75E+04	4370	0.	
30	1.96E+05	311	3.64E+04	4676	0.	
LWC	7.85E-04		3.11E-03		1.30E-03	TOTALS
MED D	13		126		184	1.67E-03
						162

INTERVAL START \*19:09:55\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.41E+03	26	0.	400	1.23E+02	330.5
4	2.73E+07	47	0.	706	1.16E+01	ALT (KM)
6	3.89E+05	67	0.	1011	0.	8.507
8	3.89E+05	87	0.	1316	0.	
10	2.43E+05	108	0.	1522	0.	TEMP (C)
12	4.85E+05	128	0.	1927	0.	-33.5
14	2.43E+06	148	0.	2233	0.	
16	4.89E+05	169	0.	2538	0.	DEWP (C)
18	9.77E+05	189	0.	2943	0.	
20	4.85E+05	209	0.	3149	0.	TAS (M/S)
22	0.	230	0.	3454	0.	123.7
24	0.	250	0.	3760	0.	
26	0.	271	2.71E+03	4065	0.	
28	0.	291	0.	4370	0.	
30	0.	311	0.	4676	0.	
LWC	4.76E-05		4.83E-05		1.61E-04	TOTALS
MED D	7		118		210	1.61E-04
						210

Figure 12c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 12b and the Photo in Figure 12a



### 5.7 Example No. 7: 1916:56Z

The photo in Figure 13a shows an example of very thin cirrus at aircraft altitude with a cirrostratus undercast. This picture was taken at 29,000 ft MSL (8.8 km), the highest altitude attained during this flight.

The  $6.63 \times 10^{-3} \text{ g m}^{-3}$  LWC value determined by the scattering probe at this time is greater than comparable scattering probe values for the other specific seven cases considered here. It is also larger than LWC contributions determined at this particular time by the cloud and precipitation probes.

The precipitation probe recorded only a small number of particles and those were in its smallest channel,  $400 \mu\text{m}$ . Since there was only one point that could be plotted a precipitation probe distribution of density-size is not graphed on Figure 13b—although a mean diameter and LWC are given. The  $400 \mu\text{m}$  bullet rosette crystals measured by the precipitation probe were computed to have mean diameters of  $175 \mu\text{m}$  when converted to equivalent volume droplets. This is the smallest size determined by this probe for any of the eight cases considered here.

The maximum in the cloud probe distribution near  $200\text{--}250 \mu\text{m}$  that was seen in several other cirrus cases is not apparent in Figure 13b. There is instead a gradual, discontinuous decrease of concentration with increased size as was seen in the denser clouds represented by Figures 7 and 8. The cloud probe LWC is also one of the lowest examined in this series aside from those of the cirrostratus cases given in Figures 7b and 8b.

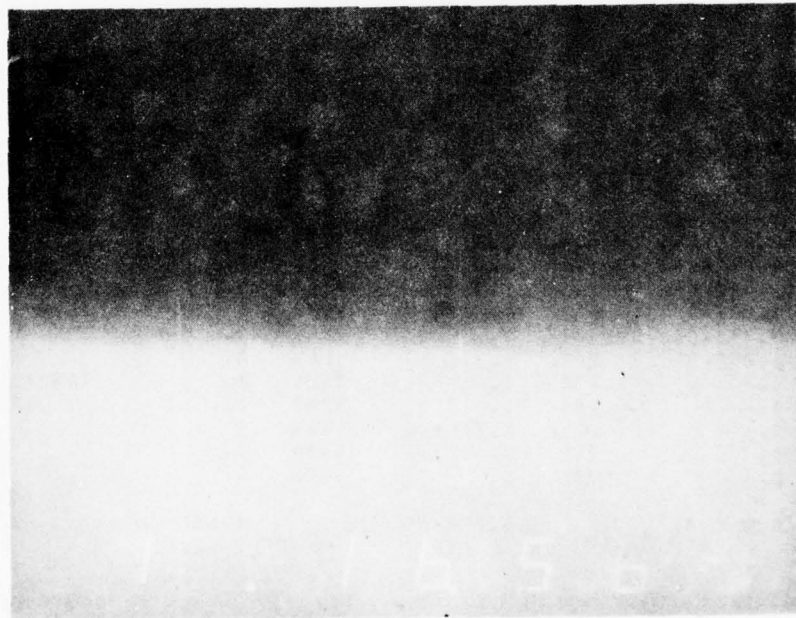
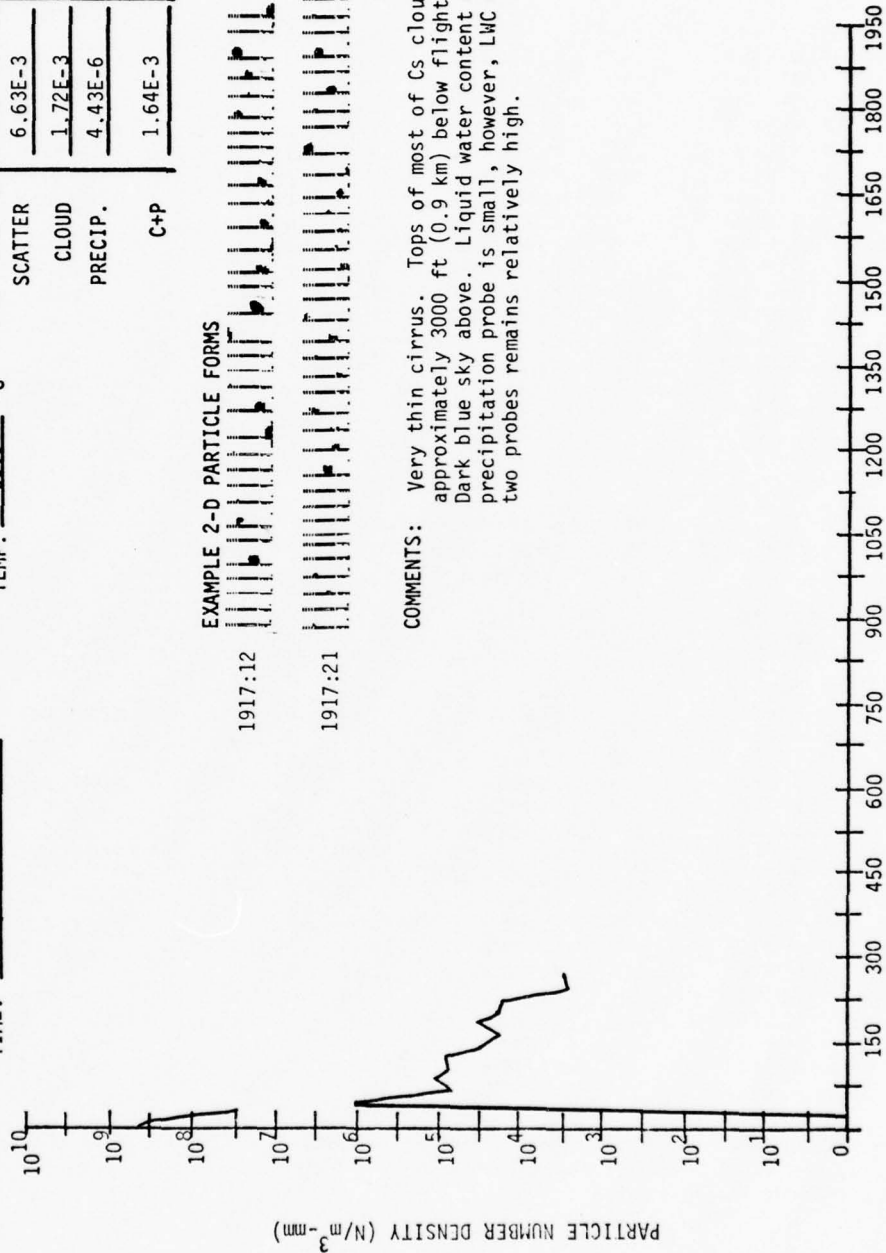


Figure 13a. Selected 16-mm Frame 1916:56, Thin Ci 8.8 km MSL, Temperature  $-35.5^{\circ}\text{C}$

DATE: 26 Feb 78  
 TIME: 1917:10 - 1917:24

ALTITUDE	8.8	km
TEMP.	-35.5	°C
	LWC	DIA
	(G/M <sup>3</sup> )	(μm)
SCATTER	6.63E-3	20
CLOUD	1.72E-3	66
PRECIP.	4.43E-6	175
C+P	1.64E-3	64



EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Very thin cirrus. Tops of most of Cs clouds are approximately 3000 ft (0.9 km) below flight altitude. Dark blue sky above. Liquid water content of precipitation probe is small, however, LWC of other two probes remains relatively high.

PARTICLE SIZE (μm)

Figure 13b. Spectrometer Particle Data for Figure 13a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
 INTERVAL START \*19:17:10\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.33E+03	26	0.	400	5.13E+00	316.4
4	3.68E+03	47	9.65E+05	706	0.	ALT (KM)
6	3.33E+03	67	6.10E+04	1011	0.	8.802
8	3.08E+03	87	1.04E+05	1316	0.	
10	2.41E+03	108	6.70E+04	1522	0.	TEMP (C)
12	1.91E+03	128	7.57E+04	1927	0.	-35.5
14	1.17E+03	148	2.67E+04	2233	0.	
16	1.81E+03	169	1.53E+04	2538	0.	DEWP (C)
18	1.40E+03	189	3.30E+04	2843	0.	
20	6.22E+07	209	1.60E+04	3149	0.	
22	4.40E+07	230	1.54E+04	3454	0.	TAS (M/S)
24	4.94E+07	250	2.44E+03	3760	0.	122.7
26	3.16E+07	271	2.75E+03	4065	0.	
28	3.61E+07	291	0.	4370	0.	
30	2.32E+07	311	0.	4676	0.	
LWC	6.63E-03		1.72E-03		4.43E-06	TOTALS
MED D	20		56		175	1.64E-03
						64

INTERVAL START \*19:17:25\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.24E+03	26	0.	400	8.18E+00	316.2
4	5.61E+03	47	1.13E+06	706	0.	ALT (KM)
6	6.60E+03	67	1.74E+05	1011	0.	8.815
8	5.79E+03	87	1.34E+05	1316	0.	
10	4.52E+03	108	3.52E+04	1522	0.	TEMP (C)
12	3.67E+03	128	5.73E+04	1927	0.	-35.4
14	2.19E+03	148	4.10E+04	2233	0.	
16	3.11E+03	169	1.01E+04	2538	0.	DEWP (C)
18	2.27E+03	189	1.64E+04	2843	0.	
20	1.03E+03	209	1.19E+04	3149	0.	
22	7.30E+07	230	4.39E+03	3454	0.	TAS (M/S)
24	5.82E+07	250	1.22E+04	3760	0.	122.5
26	4.63E+07	271	2.73E+03	4065	0.	
28	3.70E+07	291	0.	4370	0.	
30	2.17E+07	311	0.	4676	0.	
LWC	9.87E-03		1.70E-03		7.08E-06	TOTALS
MED D	18		61		175	1.49E-03
						53

Figure 13c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 13b and the Photo in Figure 13a

5.8 Example No. 8: 1924:04Z

Figure 14a shows a case of thin cirrus before the airplane at 29,000 ft MSL and a broad layer of cirrostratus beneath. The nose-camera movie film indicated the aircraft was passing in and out of thin cirrus tops frequently at this time so that LWC and particle size values changed rapidly.

The liquid water content determined by the cloud probe (in Figures 14b and 14c) is the greatest of any of the eight cases discussed here; however, the range of the eight values was relatively small, varying between  $0.78 \times 10^{-3} \text{ g m}^{-3}$  in Figure 7b and  $7.35 \times 10^{-3}$  in Figure 14b.

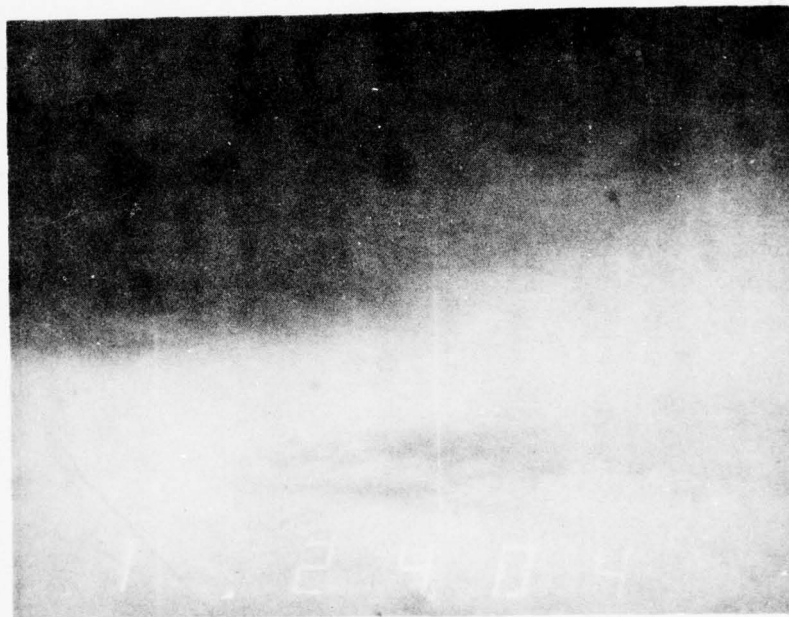
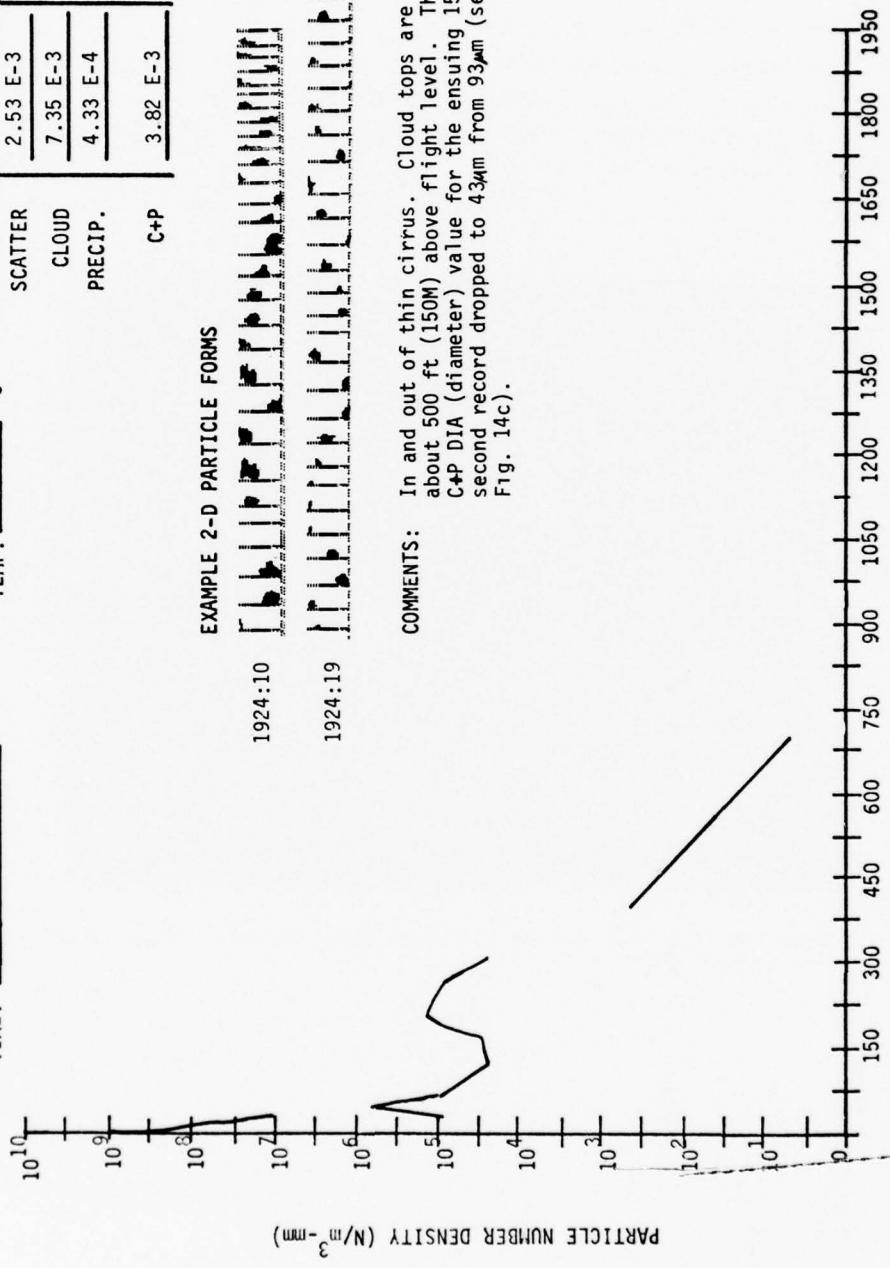


Figure 14a. Selected 16-mm Frame 1924:04, Thin Ci 8.8 km MSL, Temperature  $-36.1^{\circ}\text{C}$

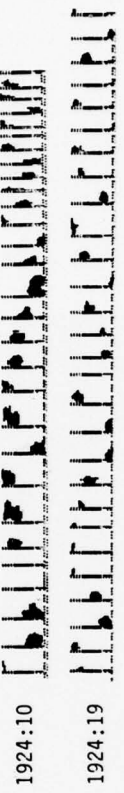
DATE: 26 Feb 78  
 TIME: 1924:10 - 1924:24

ALTITUDE 8.8 km  
 TEMP. -36.1 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	2.53 E-3	21
CLOUD	7.35 E-3	107
PRECIP.	4.33 E-4	178
C+P	3.82 E-3	93



EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In and out of thin cirrus. Cloud tops are about 500 ft (150M) above flight level. The C+P DIA (diameter) value for the ensuing 15 second record dropped to 43μm from 93μm (see Fig. 14c).

PARTICLE SIZE (μm)

Figure 14b. Spectrometer Particle Data for Figure 14a



AFWL CIRRUS STUDY BY AFG

FLIGHT E79-03 ON 26 FEB 78 15 SECOND AVERAGING

INTERVAL START \*19:24:10\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.08E+03	26	6.95E+04	400	4.78E+02	315.6
4	1.95E+03	47	6.01E+05	706	4.23E+00	ALT (KM)
6	1.41E+03	67	9.55E+04	1011	0.	8.820
8	1.11E+03	87	5.09E+04	1316	0.	TEMP (C)
10	8.31E+07	108	3.46E+04	1522	0.	-36.1
12	7.29E+07	128	2.06E+04	1927	0.	DEWP (C)
14	3.99E+07	148	2.43E+04	2233	0.	
16	6.99E+07	169	2.50E+04	2538	0.	
18	4.18E+07	189	7.02E+04	2943	0.	
20	2.19E+07	209	1.22E+05	3149	0.	
22	1.84E+07	230	1.08E+05	3454	0.	TAS (M/S)
24	1.46E+07	250	8.88E+04	3760	0.	124.1
26	1.36E+07	271	7.30E+04	4065	0.	
28	1.94E+07	291	3.71E+04	4370	0.	
30	8.26E+05	311	2.16E+04	4676	0.	
LWC	2.53E-03		7.35E-03		4.33E-04	TOTALS
MED D	21		107		178	3.82E-03
						93

INTERVAL START \*19:24:25\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.81E+07	26	1.39E+05	400	1.17E+02	315.3
4	4.28E+03	47	3.87E+06	706	3.18E+00	ALT (KM)
6	5.98E+03	67	5.93E+05	1011	0.	8.825
8	5.25E+03	87	3.23E+05	1316	0.	TEMP (C)
10	4.08E+03	108	1.22E+05	1522	0.	-36.0
12	3.53E+03	128	6.19E+04	1927	0.	DEWP (C)
14	1.95E+03	148	3.46E+04	2233	0.	
16	3.04E+03	169	1.17E+04	2538	0.	
18	2.51E+03	189	2.71E+04	2943	0.	
20	1.34E+03	209	1.97E+04	3149	0.	
22	1.07E+03	230	8.68E+03	3454	0.	TAS (M/S)
24	8.15E+07	250	1.21E+04	3760	0.	123.7
26	1.01E+03	271	2.44E+04	4065	0.	
28	8.64E+07	291	6.21E+03	4370	0.	
30	6.15E+07	311	3.63E+03	4676	0.	
LWC	1.40E-02		4.38E-03		1.16E-04	TOTALS
MED D	22		49		185	3.65E-03
						43

Figure 14c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 14b and the Photo in Figure 14a

## 6. EXAMPLES OF LONGER PERIOD PARTICLE DISTRIBUTIONS

The cloud particle data in Figures 7b and 7c through 14b and 14c are averages for 15-sec intervals during the *sampling flight*. In Figure 15 some examples are given of particle distributions averaged over longer periods, from 1 to 5-1/2 minutes. The time intervals selected were based on the length of time a given type of cloud was being sampled. That is, periods were sought when sampling was continuous through the same general kind of cloud conditions, for example, thin cirrus near the tops. The periods chosen were primarily based on review of the nose-camera color film and of the mission director's flight log.

It was desired to have data averages over even longer intervals than those in Figure 15, however, cirriform cloud conditions were quite variable on the day that sampling was performed. For this reason the sampling aircraft was almost continuously moving from one type of cloud to another, and was not in homogeneous cloud or non-cloud conditions for more than a few minutes at a time.

Several of the Figure 15 plots were made over time periods that encompass some of the shorter period examples shown in Figures 7 through 14. In these cases longer period particle distributions may be compared with those computed for 15-sec periods. For the examples in Figure 15 more detailed data listings of particle concentration as a function of particle size are given in Appendix A.

The specific type of cloud condition that the Figure 15 plots represent are given on each diagram. In general, the greatest particle concentrations were found in the various types of cirrostratus shown in Figures 15a, b, c, and d. The e diagram represents a time when the aircraft was flying in a nearly cloud-free "blue sky", however, even here small numbers of cloud- and precipitation-sized particles were recorded.

Figures 15f, g, and h represent thin or very thin cirrus situations as well as could be determined by the eye. The spectrometers indicated different particle distributions in each case. The f diagram differs from h in that it has a small maximum at about  $200 \mu m$ . Additionally, the h figure indicates precipitation-sized particles as large as  $700 \mu m$  which are not reflected in f. The Figure 15g differs from both f and h in having a significant peak in the distribution near  $300 \mu m$  and a general decrease in concentration from that point as particles decrease in size.

The maximum in the concentration curves near 250 to  $300 \mu m$ , that was mentioned in the previous section, is also apparent to some extent in most of the Figure 15 plots.

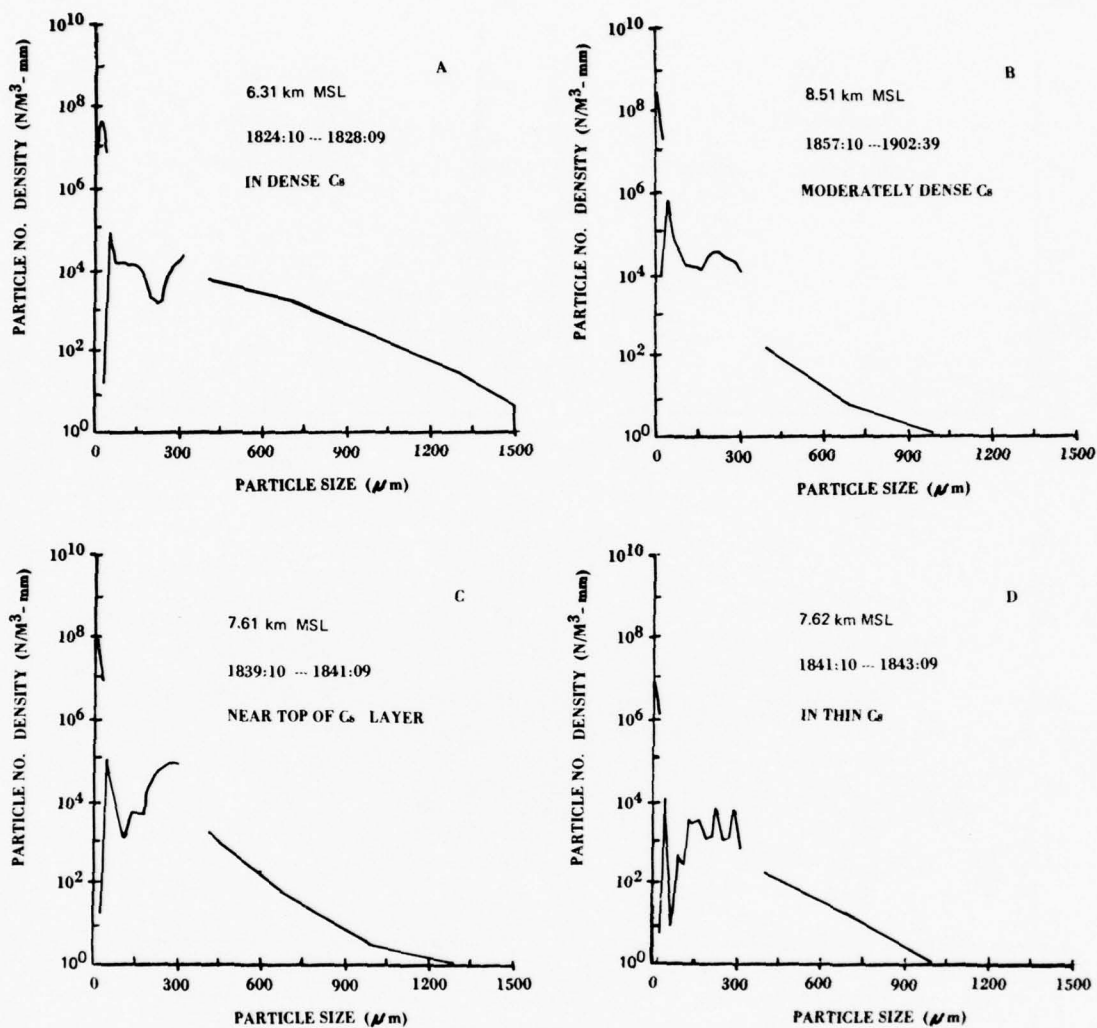


Figure 15. Particle Concentration as Function of Size for Different Cirriform Cloud Types Sampled on 26 February 1978. Data are averaged over the varying time intervals indicated

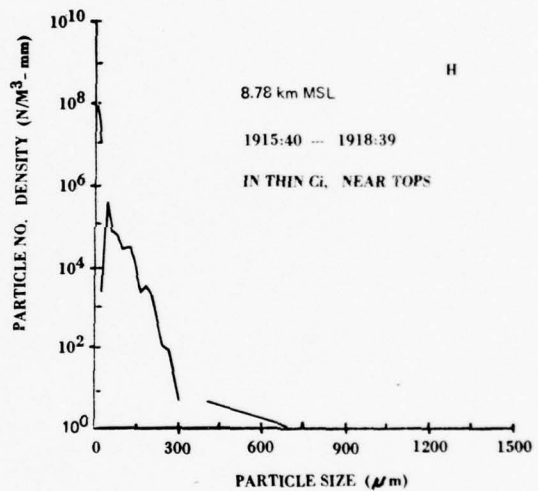
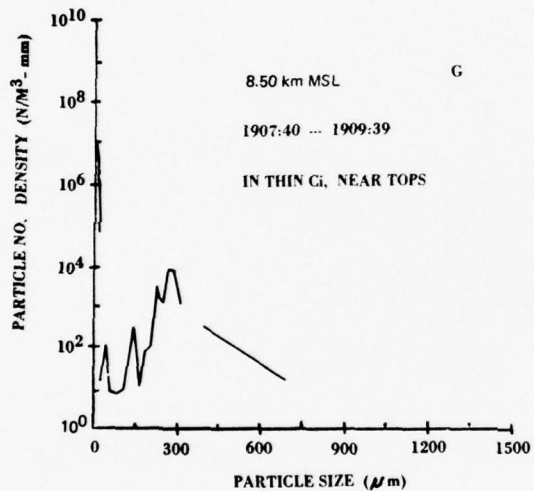
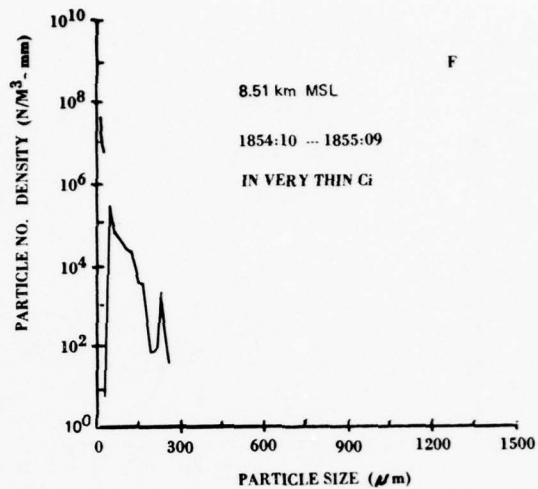
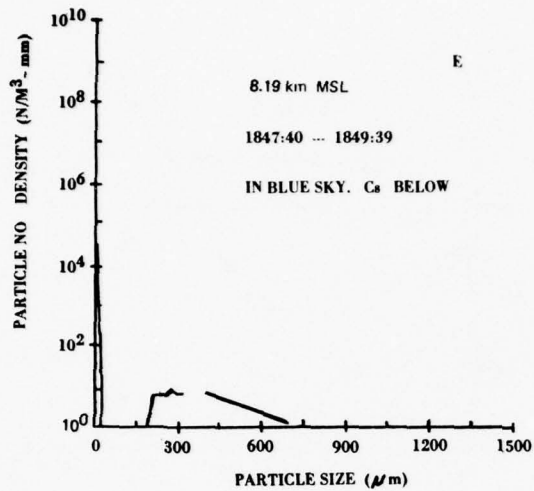


Figure 15. (Cont)

## 7. CONCLUDING COMMENTS

The MC-130E flight of 26 February 1978 in the Albuquerque, New Mexico area was successful in that a variety of cirrus types was available for sampling and the aircraft instrumentation, aside from the particle replicator and dew point equipment, was all operative.

Although our primary emphasis was on sampling relatively thin cirriform clouds, an extensive, more dense cirrostratus cloud layer was also sampled as the aircraft ascended to the cirrus above it. The data in this report, which were recorded during the approximately one and one-half hour flight at cirrus altitudes, will permit various comparisons of particle concentrations to be made between, for example, cirrostratus bases and tops or thicker uniform cirrostratus and fibrous cirrus.

There was a large variation in liquid water content during the flight as the aircraft passed in and out of cirriform clouds. For a short time before the aircraft ascended into the visible Cs cloud some particles as large as  $1700 \mu\text{m}$  were recorded. This was similar to the situation of rain falling to the ground from a cloud above while the surface visibility remains relatively good. The lower levels of the cirrostratus cloud had few particles in the 25 to  $300 \mu\text{m}$  range that are recorded by the PMS cloud probe. There was, however, a greater population of larger particles up to  $2000 \mu\text{m}$  in the cirrostratus.

In the cirrus clouds up to 29,000 ft (8.8 km) the highest concentration of particles was almost always in the smaller sizes measured by the scattering probe (2 -  $30 \mu\text{m}$ ). This is in agreement with the results of Heymsfield<sup>3</sup> who studied 13 cirrus cases. With respect to mass or liquid water content, however, the scattering probe and cloud probe (26 -  $311 \mu\text{m}$ ) measurements often resulted in approximately equal amounts with the cloud probe becoming dominant with denser clouds. The precipitation probe occasionally recorded a few particles as large as  $1500 \mu\text{m}$ , but liquid water computations from its measurements were usually half those of the cloud probe or less. Since the cirriform particle spectra frequently extended from  $2 \mu\text{m}$  or less to sizes in excess of 2 mm the use of all three spectrometer probes was justified on this mission.

Liquid water content measurements ranged from approximately  $1 \times 10^{-5}$  to  $1 \times 10^{-4} \text{ g m}^{-3}$  in some of the thinner cirrus clouds, to 2 to  $4 \times 10^{-2} \text{ g m}^{-3}$  in the base of cirrostratus and in the more dense cirrus. Past measurements in cirrus by Heymsfield and Knollenberg<sup>5</sup> and by Hobbs et al<sup>6</sup> have derived slightly higher values of LWC (or ice water content). Heymsfield and Knollenberg, however, studied primarily cirrus generating cells, and most of the measurements by Hobbs et al were made below 23,000 ft (7.0 km). According to a later study by Heymsfield<sup>3</sup>, larger ice water content values are frequently encountered in the lowest portions of



cirrus clouds. This does not totally explain the difference in water content values in cirrus, but those reported here were determined in a manner that has previously permitted close correlations with radar derived reflectivity values (for example, Berthel<sup>9</sup> and Plank<sup>10</sup>).

Computer printouts of particle distributions as a function of size are provided in the two appendixes for the time sampling was being made at cirriform cloud altitudes.

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  10. Plank, V.G. (1977) Hydrometeor Data and Analytical-Theoretical Investigations Pertaining to the SAMS Rain Erosion Program of the 1972-73 Season at Wallops Island, Virginia, SAMS Report No. 5. ERP No. 603. AFGL-TR-77-0149.

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## Appendix A

### Average Particle Distributions for Varying Time Periods

Particle concentration data are given in the following pages for some of the types of cirriform clouds that were sampled on 26 February 1978 in the Albuquerque area. The varying time periods over which the data are averaged were selected to be as long as possible while sampling a relatively homogeneous cloud type, for example, dense cirrostratus or thin cirrus. Each data listing (two per page) corresponds to one of the plots of data shown in Figure 15 in the text. The specific one is indicated near each listing.

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Average particle distribution (No. / m<sup>3</sup> --mm) for the 240-sec period beginning at 1824:10Z. Data correspond to Figure 15A in text. In dense cirrostratus.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.99E+06	26	1.01E+04	400	6.22E+03	451.8
4	1.28E+07	47	9.39E+04	706	1.86E+03	ALT (KM)
6	1.67E+07	67	1.86E+04	1011	2.94E+02	6.315
8	2.80E+07	87	1.78E+04	1316	4.90E+01	
10	4.40E+07	108	1.56E+04	1622	7.86E+00	TEMP (C)
12	4.66E+07	128	1.55E+04	1927	3.62E+00	-22.3
14	3.74E+07	148	1.27E+04	2233	1.42E+00	
16	3.53E+07	169	6.74E+03	2538	1.09E-01	FROSTPOINT
18	2.78E+07	189	6.13E+03	2843	1.17E-01	
20	1.74E+07	209	4.82E+03	3149	0.	
22	1.59E+07	230	5.17E+03	3454	0.	TAS (M/S)
24	1.19E+07	250	8.66E+03	3760	0.	107.0
26	1.02E+07	271	1.52E+04	4065	0.	
28	9.03E+06	291	2.07E+04	4370	0.	
30	7.23E+06	311	2.52E+04	4676	0.	
						TOTALS
LWC	1.67E-03		1.91E-03		2.09E-02	2.12E-02
MED D	22		126		319	316

Average particle distribution (No. / m<sup>3</sup> --mm) for the 330-sec period beginning at 1857:10Z. Data correspond to Figure 15B in text. In moderately dense cirrostratus

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.18E+08	23	6.06E+04	350	3.16E+02	330.3
4	3.88E+08	43	8.07E+05	647	1.28E+01	ALT (KM)
6	5.78E+08	62	7.76E+04	944	3.66E-01	8.910
8	4.88E+08	82	5.11E+04	1241	0.	
10	3.56E+08	102	2.26E+04	1538	0.	TEMP (C)
12	2.77E+08	122	2.67E+04	1935	0.	-30.8
14	1.64E+08	142	2.75E+04	2132	0.	
16	2.01E+08	161	2.46E+04	2429	0.	FROSTPOINT
18	1.42E+08	181	4.58E+04	2726	0.	
20	6.67E+07	201	4.93E+04	3023	0.	
22	5.83E+07	221	4.19E+04	3320	0.	TAS (M/S)
24	3.63E+07	241	2.99E+04	3617	0.	123.5
26	3.52E+07	260	2.79E+04	3914	0.	
28	2.93E+07	280	2.21E+04	4211	0.	
30	1.88E+07	300	1.38E+04	4508	0.	
						TOTALS
LWC	8.99E-03		3.77E-03		3.39E-04	2.38E-03
MED D	19		72		212	69

Average particle distribution (No. /m<sup>3</sup>--mm) for the 120-sec period beginning at 1839:10Z. Data correspond to Figure 15C in text. Near top of cirrostratus layer.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.83E+07	26	1.86E+04	400	2.25E+03	376.6
4	1.25E+08	47	1.24E+05	706	1.01E+02	ALT (KM)
6	1.12E+08	67	2.05E+04	1011	4.16E+00	7.607
8	8.73E+07	87	8.18E+03	1316	1.56E-01	
10	7.25E+07	108	1.06E+04	1622	0.	TEMP (C)
12	5.49E+07	128	6.51E+03	1927	0.	-29.7
14	3.65E+07	148	5.38E+03	2233	0.	
16	3.98E+07	169	4.98E+03	2538	0.	FROSTPOINT
18	2.92E+07	189	1.63E+04	2843	0.	
20	1.90E+07	209	3.37E+04	3149	0.	
22	1.37E+07	230	6.09E+04	3454	0.	TAS (M/S)
24	1.29E+07	250	7.50E+04	3750	0.	116.6
26	1.22E+07	271	9.76E+04	4055	0.	
28	1.03E+07	291	9.82E+04	4370	0.	
30	8.75E+06	311	8.74E+04	4676	0.	
						TOTALS
LWC	1.92E-03		8.55E-03		2.48E-03	3.70E-03
MED D	22		124		194	152

Average particle distribution (No. /m<sup>3</sup>--mm) for the 330-sec period beginning at 1841:10Z. Data correspond to Figure 15D in text. In thin cirrostratus.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.13E+08	26	0.	400	2.70E+02	375.9
4	2.70E+07	47	1.24E+04	706	2.88E+01	ALT (KM)
6	2.07E+07	67	1.16E+03	1011	1.52E-01	7.620
8	1.62E+07	87	3.47E+03	1316	1.59E-01	
10	1.31E+07	108	1.42E+03	1622	0.	TEMP (C)
12	1.10E+07	128	4.18E+03	1927	0.	-30.2
14	6.75E+06	148	4.70E+03	2233	0.	
16	6.89E+06	169	5.69E+03	2538	0.	FROSTPOINT
18	6.69E+06	189	1.45E+04	2843	0.	
20	3.51E+06	209	1.78E+04	3149	0.	
22	3.31E+06	230	1.60E+04	3454	0.	TAS (M/S)
24	2.26E+06	250	1.08E+04	3750	0.	114.3
26	2.73E+06	271	1.07E+04	4055	0.	
28	2.25E+06	291	8.43E+03	4370	0.	
30	1.59E+06	311	4.93E+03	4676	0.	
						TOTALS
LWC	3.82E-04		1.15E-03		3.77E-04	8.66E-04
MED D	21		110		216	102



Average particle distribution (No. /m<sup>3</sup>--mm) for the 120-sec period beginning at 1847:40Z. Data correspond to Figure 15E in text. In blue sky with cirrostratus below.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						346.8
2	1.49E+09	26	0.	400	9.03E+00	
4	1.28E+06	47	0.	706	2.80E-01	ALT (KM)
5	4.48E+05	67	0.	1011	0.	8.194
8	5.10E+05	87	0.	1316	0.	
10	5.73E+05	108	0.	1522	0.	TEMP (C)
12	5.06E+05	128	0.	1927	0.	-32.2
14	2.54E+05	148	0.	2233	0.	
16	1.27E+05	169	0.	2538	0.	FROSTPOINT
18	6.81E+04	189	0.	2843	0.	
20	0.	209	0.	3149	0.	
22	0.	230	2.81E+02	3454	0.	TAS (M/S)
24	1.91E+05	250	3.12E+02	3760	0.	117.8
26	0.	271	7.01E+02	4065	0.	
28	0.	291	4.01E+02	4370	0.	
30	0.	311	0.	4676	0.	
						TOTALS
LWC	1.89E-05		2.89E-05		9.14E-06	1.22E-05
MED D	2		119		186	160

Average particle distribution (No. /m<sup>3</sup>--mm) for the 60-sec period beginning at 1854:10Z. Data correspond to Figure 15F in text. In very thin cirrus.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						330.1
2	7.54E+08	26	0.	400	1.03E+00	
4	1.53E+08	47	4.04E+05	706	0.	ALT (KM)
6	2.12E+08	67	6.54E+04	1011	0.	8.515
8	1.92E+08	87	4.54E+04	1316	0.	
10	1.49E+08	108	2.92E+04	1622	0.	TEMP (C)
12	1.12E+08	128	2.29E+04	1927	0.	-33.8
14	7.55E+07	148	7.73E+03	2233	0.	
16	9.68E+07	169	5.52E+03	2538	0.	FROSTPOINT
18	5.87E+07	189	2.75E+03	2843	0.	
20	2.74E+07	209	3.51E+03	3149	0.	
22	1.74E+07	230	3.30E+03	3454	0.	TAS (M/S)
24	1.23E+07	250	6.13E+02	3760	0.	122.1
26	1.06E+07	271	0.	4065	0.	
28	9.63E+06	291	0.	4370	0.	
30	6.51E+06	311	0.	4676	0.	
						TOTALS
LWC	2.70E-03		5.54E-04		8.89E-07	5.46E-04
MED D	10		54		175	94

Average particle distribution (No. /m<sup>3</sup>--mm) for the 120-sec period beginning at 1907:40Z. Data correspond to Figure 15G in text. In thin cirrus, near tops.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						330.6
2	2.09E+09	26	1.78E+04	400	4.95E+02	
4	4.32E+07	47	9.12E+03	706	2.17E+01	ALT (KM)
5	2.41E+07	67	1.08E+03	1011	0.	8.504
8	1.75E+07	87	6.47E+02	1316	0.	
10	1.46E+07	108	1.35E+03	1622	0.	TEMP (C)
12	9.46E+06	128	1.66E+03	1927	0.	-33.5
14	6.60E+06	148	4.18E+03	2233	0.	
16	8.20E+06	169	8.04E+03	2538	0.	FROSTPOINT
18	5.74E+06	189	7.47E+03	2843	0.	
20	3.77E+06	209	8.63E+03	3149	0.	
22	3.14E+06	230	1.03E+04	3454	0.	TAS (M/S)
24	2.10E+06	250	1.04E+04	3760	0.	122.5
26	2.34E+06	271	1.30E+04	4065	0.	
28	1.85E+06	291	1.17E+04	4370	0.	
30	1.54E+06	311	1.04E+04	4676	0.	
						TOTALS
LWC	3.83E-04		1.20E-03		5.31E-04	8.11E-04
MED D	21		120		191	147

Average particle distribution (No. /m<sup>3</sup>--mm) for the 180-sec period beginning at 1915:40Z. Data correspond to Figure 15H in text. In thin cirrus, near tops.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						317.5
2	1.24E+09	26	7.66E+04	400	3.52E+01	
4	2.17E+08	47	6.17E+05	706	5.44E-01	ALT (KM)
6	2.00E+08	67	8.42E+04	1011	0.	8.779
8	1.78E+08	87	8.14E+04	1316	0.	
10	1.37E+08	108	4.15E+04	1622	0.	TEMP (C)
12	1.11E+08	128	4.14E+04	1927	0.	-35.4
14	6.91E+07	148	2.32E+04	2233	0.	
16	9.70E+07	169	1.28E+04	2538	0.	FROSTPOINT
18	7.57E+07	189	2.13E+04	2843	0.	
20	3.77E+07	209	1.51E+04	3149	0.	
22	2.63E+07	230	1.29E+04	3454	0.	TAS (M/S)
24	2.39E+07	250	9.04E+03	3760	0.	122.4
26	2.04E+07	271	8.33E+03	4065	0.	
28	1.91E+07	291	4.23E+03	4370	0.	
30	1.20E+07	311	1.85E+03	4676	0.	
						TOTALS
LWC	3.72E-03		1.62E-03		3.30E-05	1.24E-03
MED D	20		81		181	67

## Appendix B

### Average Particle Distributions for 30-Second Periods

The following pages provide cloud particle concentration data as a function of particle size for the time on 26 February 1978 when the sampling aircraft was between approximately 16,000 ft (4.9 km) and 29,000 ft (8.8 km) MSL. Varying amounts of cirrostratus were sampled up to about 26,000 ft (7.9 km). Above that the aircraft was primarily in and out of cirrus clouds. There was no extensive cloudiness above 29,000 ft MSL.

The printouts consist of data averages for consecutive 30-sec periods during the flight. For description of the printout format see the first AFGL study in this series by Varley.<sup>1</sup>

AFML CIRRUS STUDY BY AFGL

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING

INTERVAL START 01:10:00  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: SMALL SNOW

INTERVAL START 01:20:00  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	2.49E+06	26	0.	0.	549.2	2	1.55E+06	26	0.	0.	526.3
4	0.	49	0.	5.40E-01	ALT (KM)	4	1.39E+06	49	0.	7.01E+01	ALT (KM)
6	0.	72	0.	4.929	4.929	6	1.11E+06	72	0.	1.95E+01	ALT (KM)
8	0.	95	0.	0.	0.	8	0.31E+05	95	0.	1.77E+09	TEMP (C)
10	0.	118	0.	0.	TEMP (C)	10	2.77E+05	118	1.74E+03	0.	TEMP (C)
12	2.82E+05	141	0.	0.	-12.1	12	5.55E+05	141	0.	21.2	0.
14	0.	164	0.	0.	0.	14	0.	164	0.	24.68	0.
16	0.	187	0.	0.	0.	16	2.74E+05	187	8.36E+02	0.	FFCSTPOINT
18	0.	210	0.	0.	0.	18	5.57E+05	210	0.	31.54	0.
20	0.	233	0.	0.	0.	20	0.	233	0.	35.03	0.
22	0.	256	0.	0.	TAS (M/S)	22	2.75E+05	256	0.	38.44	0.
24	0.	279	0.	0.	109.0	24	2.80E+05	279	0.	41.93	0.
26	0.	302	0.	0.	0.	26	0.	302	0.	45.34	0.
28	0.	325	0.	0.	0.	28	2.75E+05	325	0.	48.83	0.
30	0.	348	0.	0.	0.	30	0.	348	0.	52.24	0.
LWC	5.12E-07	0.	0.	2.73E-06	TOTALS	LWC	2.01E-05	2.10E-05	2.41E-04	7.64E-04	TOTALS
MED	14	0	0	303	303	MED	23	104	324	319	

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	4.53E+06	26	0.	1.14E+01	533.4	2	3.40E+06	26	0.	0.	517.6
4	0.	49	0.	1.05E+01	ALT (KM)	4	7.25E+06	49	9.22E+03	7.54E+02	ALT (KM)
6	0.	72	0.	2.28E+00	5.092	6	5.14E+06	72	0.	5.18E+01	ALT (KM)
8	0.	95	0.	6.05E-01	0.	8	5.02E+06	95	0.	1.43E+09	TEMP (C)
10	0.	118	0.	0.	0.	10	4.18E+06	118	0.	1.77E+03	TEMP (C)
12	0.	141	0.	0.	-13.2	12	2.75E+06	141	1.34E+03	0.	TEMP (C)
14	0.	164	0.	0.	0.	14	3.05E+06	164	1.02E+03	24.68	0.
16	0.	187	0.	0.	0.	16	2.79E+06	187	0.	28.13	0.
18	2.8E+05	210	0.	0.	0.	18	2.50E+06	210	9.17E+02	31.54	0.
20	0.	233	0.	0.	0.	20	5.48E+05	233	0.	35.03	0.
22	0.	256	0.	0.	0.	22	8.35E+05	256	0.	38.44	0.
24	0.	279	0.	0.	0.	24	1.67E+06	279	0.	41.93	0.
26	0.	302	0.	0.	106.6	26	8.25E+05	302	0.	45.34	0.
28	0.	325	0.	0.	0.	28	8.36E+05	325	0.	48.83	0.
30	0.	348	0.	0.	0.	30	5.58E+05	348	0.	52.24	0.
LWC	1.77E-06	0.	0.	1.45E-04	TOTALS	LWC	1.79E-04	4.61E-05	2.41E-04	2.46E-03	TOTALS
MED	17	0	0	314	314	MED	23	94	312	316	

AFGL CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 18122100					INTERVAL START 18123100				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: SMALL SNOW					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (HR)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (HR)
2	1.10E+06	26	0.	510.4	2	1.08E+06	25	0.	492.0
4	3.59E+05	59	0.		4	4.23E+06	47	4.82E+04	
6	3.86E+05	77	4.31E+03	5.421	6	5.21E+06	67	0.	5.690
8	7.57E+05	143	8.20E+01		8	1.10E+07	97	2.96E+03	
10	4.14E+06	114	1.74E+03	TEMP (C)	10	1.55E+07	104	2.02E+03	TEMP (C)
12	5.52E+06	151	0.	-19.7	12	1.10E+07	128	3.00E+03	-18.1
14	4.96E+06	164	0.	FROSTPOINT	14	9.29E+06	144	3.52E+03	
16	4.56E+06	197	1.88E+03		16	6.20E+06	159	2.88E+03	
18	3.31E+06	210	9.06E+02		18	9.28E+06	159	2.09E+03	
20	2.20E+06	233	0.		20	0.19E+06	209	2.27E+03	
22	2.48E+06	256	0.	TAS (M/S)	22	5.35E+06	239	7.51E+03	TAS (M/S)
24	1.10E+06	279	0.	109.5	24	3.78E+06	250	5.51E+03	107.1
26	5.50E+05	302	2.71E+03		26	3.66E+06	271	4.71E+03	
28	1.85E+06	325	3.10E+03		28	2.54E+06	291	0.92E+03	
30	1.10E+06	344	1.81E+03		30	1.13E+06	311	5.27E+03	
TOTALS					TOTALS				
LWC	2.17E-04		4.75E-04	3.91E-03	LWC	4.93E-04		7.07E-04	7.22E-03
MEQ	0		154	291	MEQ	0		123	349

AFGL CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 18122100					INTERVAL START 18123100				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: SMALL SNOW					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (HR)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (HR)
2	8.19E+05	26	0.	502.2	2	2.22E+06	25	0.	405.2
4	2.46E+06	47	0.		4	5.26E+06	47	4.15E+04	
6	3.26E+06	67	4.24E+03	5.540	6	6.37E+06	57	1.47E+04	5.794
8	4.77E+06	97	0.		8	1.29E+07	87	2.96E+03	
10	7.18E+06	104	3.70E+03	TEMP (C)	10	1.51E+07	104	5.94E+03	TEMP (C)
12	4.82E+06	124	0.	-16.7	12	1.00E+07	128	1.88E+03	-16.9
14	4.65E+06	143	0.	FROSTPOINT	14	1.14E+07	144	1.16E+03	
16	3.56E+06	164	0.		16	1.33E+07	159	0.	
18	6.07E+06	193	0.		18	0.32E+06	189	2.06E+03	
20	5.88E+05	219	0.		20	0.59E+06	209	3.35E+03	
22	1.36E+06	230	1.08E+03	TAS (M/S)	22	6.10E+06	239	3.69E+03	TAS (M/S)
24	1.82E+06	250	2.78E+03	110.1	24	6.37E+06	250	5.75E+03	109.0
26	2.74E+06	271	0.		26	4.43E+06	271	1.54E+04	
28	5.58E+05	291	0.39E+03		28	1.56E+06	291	1.56E+04	
30	8.16E+05	311	5.62E+03		30	4.19E+06	311	1.44E+04	
TOTALS					TOTALS				
LWC	2.19E-04		6.76E-04	4.94E-03	LWC	6.80E-04		1.23E-03	1.10E-02
MEQ	0		159	317	MEQ	0		126	343



AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 10425100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1 BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	3.74E+06	76	0.	4.23E+03	473.6	2	3.98E+06	76	0.	5.50E+03	459.5	
4	7.75E+06	47	8.60E+04	1.86E+03	ALT (KM)	4	1.28E+07	47	6.42E+04	706	2.35E+03	ALT (KM)
6	1.06E+07	57	1.01E+04	3.49E+02	5.967	6	1.59E+07	67	1.01E+04	1011	4.78E+02	6.189
8	1.61E+07	37	1.21E+04	6.57E+01		8	2.27E+07	37	2.40E+04	1316	9.50E+01	
10	2.32E+07	108	8.20E+03	1.16E+01	TEMP (C)	10	4.30E+07	108	8.12E+03	1622	1.73E+01	TEMP (C)
12	3.01E+07	128	1.21E+04	4.60E+07	-20.1	12	6.57E+07	128	1.36E+04	1927	1.22E+01	-21.9
14	2.24E+07	168	1.63E+04	1.64E+00		14	3.62E+07	148	7.11E+03	2233	4.85E+00	
16	2.52E+07	169	7.94E+03	6.77E-01	FROSTPOINT	16	2.98E+07	169	3.49E+03	2538	0.	FROSTPOINT
18	1.52E+07	199	0.	28.83		18	2.71E+07	189	2.09E+03	2843	0.	
20	1.38E+07	203	0.	31.99		20	1.37E+07	209	3.40E+03	3149	0.	
22	1.66E+07	230	2.55E+03	34.54	TAS (M/S)	22	1.48E+07	230	3.79E+03	3454	0.	TAS (M/S)
24	8.80E+6	250	2.82E+03	37.60	105.3	24	1.14E+07	240	5.40E+03	3760	0.	106.0
26	7.46E+06	271	7.89E+03	40.65		26	7.58E+06	271	3.15E+03	4065	0.	
28	4.59E+06	291	7.23E+03	43.70		28	8.27E+06	291	5.43E+03	4370	0.	
30	7.18E+06	311	1.27E+04	46.76		30	6.64E+06	311	2.72E+04	4676	0.	
LWC MED 0	1.26E-03	27	8.96E-04	126		LWC MED 0	1.51E-03	27	1.14E-03	132		
TOTALS				344		TOTALS				355		
				2.11E-02						2.84E-02		

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 10425100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1 BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	5.57E+06	26	0.	5.05E+03	466.8	2	2.57E+06	26	4.09E+04	400	5.56E+03	
4	9.69E+06	47	9.62E+04	2.18E+03	ALT (KM)	4	1.69E+07	47	6.42E+04	706	2.20E+03	ALT (KM)
6	1.31E+07	57	1.01E+04	4.61E+02	6.078	6	1.63E+07	67	3.02E+04	1011	3.96E+02	6.300
8	2.29E+07	37	1.50E+04	9.51E+01		8	2.55E+07	37	1.51E+04	1316	6.20E+01	
10	3.27E+07	108	1.42E+04	1.95E+01	TEMP (C)	10	3.56E+07	108	1.84E+04	1622	1.02E+01	TEMP (C)
12	3.98E+07	128	1.06E+04	3.08E+03	-21.0	12	4.07E+07	128	1.57E+04	1927	6.45E+00	-22.5
14	3.22E+07	148	1.30E+04	22.33		14	3.55E+07	148	7.16E+03	2233	3.27E+07	
16	3.28E+07	169	3.90E+03	29.38	FROSTPOINT	16	3.81E+07	169	5.08E+03	2538	0.	FROSTPOINT
18	2.34E+07	199	9.49E+03	28.43		18	2.52E+07	189	2.39E+03	2843	0.	
20	1.34E+07	209	2.30E+03	31.49		20	1.79E+07	209	9.50E+03	3149	0.	
22	1.54E+07	230	1.40E+03	34.54	TAS (M/S)	22	1.23E+07	230	1.02E+04	3454	0.	TAS (M/S)
24	1.20E+07	250	1.40E+03	37.60	106.1	24	1.00E+07	250	3.15E+03	3760	0.	105.3
26	5.51E+06	271	9.50E+03	40.65		26	9.45E+06	271	1.27E+04	4065	0.	
28	5.41E+06	291	1.26E+04	43.70		28	6.31E+06	291	1.46E+04	4370	0.	
30	4.84E+06	311	2.53E+04	46.76		30	7.46E+06	311	1.27E+04	4676	0.	
LWC MED 0	1.33E-03	21	1.43E-03	131		LWC MED 0	1.44E-03	21	1.41E-03	121		
TOTALS				392		TOTALS				396		
				2.57E-02						2.43E-02		

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *1012Z+00*					INTERVAL START *1012Z+00*						
FARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					FARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPEP *ULL-ROSE					TYPEP *ULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	6.19E+05	26	0.	6.64E+03	488.7	2	6.71E+06	26	0.	7.97E+03	433.2
4	1.25E+07	47	9.40E+04	2.12E+03	ALT (KMH)	4	1.40E+07	47	1.15E+05	1.55E+03	ALT (KMH)
6	1.53E+07	67	2.94E+04	2.37E+02	6.361	6	2.35E+07	67	1.48E+04	1.12E+02	6.549
8	2.81E+07	97	1.17E+04	4.74E+01		8	3.75E+07	97	2.39E+04	7.39E+04	
10	4.14E+07	108	2.18E+04	2.83E+00	TEMP (C)	10	6.28E+07	108	2.80E+04	1622	0.
12	4.17E+07	129	1.76E+04	1.92E+00	-22.8	12	5.59E+07	129	1.92E+04	1927	0.
14	3.52E+07	148	9.24E+03	2.23E-01		14	4.56E+07	148	1.51E+04	2233	0.
16	3.28E+07	169	7.63E+03	2.53E 0.	FRCSPOINT	16	3.29E+07	169	1.29E+04	2538	0.
18	2.56E+07	199	6.18E+03	2.84E 0.		18	3.44E+07	189	5.18E+03	2843	0.
20	1.75E+07	209	2.25E+03	3.14E 0.		20	2.18E+07	209	1.18E+03	3149	0.
22	2.11E+07	230	3.71E+03	3.45E 0.	TAS (M/S)	22	1.51E+07	230	7.46E+02	3454	0.
24	1.31E+07	250	1.58E+04	3.76E 0.	106.6	24	1.45E+07	250	1.66E+04	3760	0.
26	9.44E+06	271	1.24E+04	4.06E 0.		26	1.40E+07	271	2.79E+04	4065	0.
28	1.08E+07	291	2.29E+04	4.37E 0.		28	1.26E+07	291	2.48E+04	4370	0.
30	6.96E+06	311	2.26E+04	4.67E 0.		30	8.45E+06	311	3.73E+04	4676	0.
TOTALS						TOTALS					
LWC	1.71E-03	22	1.89E-03	2.19E-02	2.22E-02	LWC	2.05E-03	22	2.84E-03	1.50E-02	1.66E-02
MED D			126	311	309	MED D			125	262	257

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *1012Z+00*					INTERVAL START *1012Z+00*						
FARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					FARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPEP *ULL-ROSE					TYPEP *ULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	5.86E+05	26	3.97E+04	8.09E+03	482.3	2	4.73E+06	26	0.	6.70E+03	433.6
4	1.22E+07	47	8.59E+04	1.89E+03	ALT (KMH)	4	1.22E+07	47	1.25E+05	7.72E+02	ALT (KMH)
6	2.15E+07	67	3.93E+04	2.18E+02	6.465	6	1.75E+07	67	4.92E+03	1.011	4.31E+01
8	3.89E+07	97	1.17E+04	1.69E+01		8	3.25E+07	97	2.92E+04	1316	1.33E+04
10	5.79E+07	108	1.80E+04	1.42E+00	TEMP (C)	10	5.45E+07	108	7.95E+03	1622	0.
12	6.51E+07	129	2.76E+04	1.92E-01	-23.1	12	5.24E+07	129	1.18E+04	1927	0.
14	4.56E+07	148	1.98E+04	2.23E 0.	FRCSPOINT	14	4.23E+07	148	1.62E+04	2233	0.
16	4.84E+07	169	9.68E+03	2.53E 0.		16	4.28E+07	169	7.63E+03	2538	0.
18	3.83E+07	199	1.04E+04	2.84E 0.		18	2.89E+07	189	6.18E+03	2843	0.
20	1.93E+07	209	7.91E+03	3.14E 0.		20	2.36E+07	209	6.96E+03	3149	0.
22	1.59E+07	230	7.47E+03	3.45E 0.	TAS (M/S)	22	1.56E+07	230	6.19E+03	3454	0.
24	1.38E+07	250	6.28E+03	3.76E 0.	106.1	24	1.25E+07	250	1.37E+04	3760	0.
26	1.29E+07	271	2.64E+04	4.06E 0.		26	1.34E+07	271	2.16E+04	4065	0.
28	1.58E+07	291	4.26E+04	4.37E 0.		28	1.26E+07	291	3.58E+04	4370	0.
30	8.11E+06	311	3.32E+04	4.67E 0.		30	7.51E+06	311	3.50E+04	4676	0.
TOTALS						TOTALS					
LWC	2.16E-03	22	2.97E-03	1.96E-02	2.01E-02	LWC	1.88E-03	22	2.74E-03	1.01E-02	1.05E-02
MED D			126	289	281	MED D			127	285	288

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 181220Z  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.17E+06	76	0.	4.00	5.09E+03	432.2
4	1.11E+07	47	6.19E+04	706	4.12E+02	ALT (KM)
6	1.75E+07	67	1.45E+04	1011	1.81E+01	6.631
8	3.48E+07	37	3.14E+04	1316	1.98E+07	
10	5.28E+07	108	5.91E+03	1622	0.	TEMP (C)
12	5.38E+07	128	1.44E+04	1927	0.	-22.6
14	4.89E+07	148	9.01E+03	2233	0.	
16	3.21E+07	168	9.27E+03	2538	0.	FROSTPOINT
18	2.95E+07	188	6.93E+03	2843	0.	
20	1.68E+07	208	1.53E+04	3149	0.	
22	1.40E+07	238	2.53E+04	3454	0.	TAS (M/S)
24	1.59E+07	258	3.47E+04	3760	0.	111.3
26	1.31E+07	271	6.17E+04	4065	0.	
28	1.11E+07	291	5.14E+04	4370	0.	
30	7.35E+06	311	7.64E+04	4676	0.	
LWC						TOTALS
MED 0						7.57E-03
						209
						199

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 181220Z  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.35E+06	76	0.	4.00	2.09E+02	424.4
4	7.43E+06	47	4.61E+04	706	3.47E+00	ALT (KM)
6	8.80E+06	67	1.89E+04	1011	0.	6.763
8	1.71E+07	37	1.59E+04	1316	0.	
10	2.49E+07	108	7.67E+03	1622	0.	TEMP (C)
12	2.45E+07	128	1.82E+04	1927	0.	-23.2
14	1.69E+07	148	4.19E+04	2233	0.	
16	1.41E+07	168	3.39E+04	2538	0.	FROSTPOINT
18	1.43E+07	188	4.65E+04	2843	0.	
20	7.17E+06	208	5.79E+04	3149	0.	
22	5.56E+06	238	6.59E+04	3454	0.	TAS (M/S)
24	5.86E+06	258	3.15E+04	3760	0.	114.0
26	5.58E+06	271	2.07E+04	4065	0.	
28	5.58E+06	291	1.35E+04	4370	0.	
30	6.10E+06	311	1.97E+04	4676	0.	
LWC						TOTALS
MED 0						1.97E-04
						141
						103

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 181220Z  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.09E+06	76	0.	4.00	4.96E+02	429.7
4	7.07E+06	47	1.28E+05	706	1.09E+01	ALT (KM)
6	1.42E+07	67	1.79E+04	1011	6.07E-01	6.672
8	2.17E+07	37	5.50E+03	1316	0.	
10	3.38E+07	108	7.44E+03	1622	0.	TEMP (C)
12	2.49E+07	128	1.24E+04	1927	0.	-22.6
14	1.83E+07	148	1.52E+04	2233	0.	
16	1.62E+07	168	2.24E+04	2538	0.	FROSTPOINT
18	1.65E+07	188	4.26E+04	2843	0.	
20	8.11E+06	208	8.02E+04	3149	0.	
22	6.82E+06	238	7.09E+04	3454	0.	TAS (M/S)
24	7.88E+06	258	4.90E+04	3760	0.	119.7
26	3.65E+06	271	4.82E+04	4065	0.	
28	4.97E+06	291	2.84E+04	4370	0.	
30	3.51E+06	311	1.35E+04	4676	0.	
LWC						TOTALS
MED 0						4.89E-04
						144
						108

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 181220Z  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.42E+05	76	0.	4.00	3.43E+02	410.1
4	5.64E+06	47	4.03E+04	706	1.16E+01	ALT (KM)
6	1.32E+07	67	9.41E+03	1011	0.	6.858
8	2.95E+07	37	1.69E+04	1316	0.	
10	2.74E+07	108	1.72E+04	1622	0.	TEMP (C)
12	2.20E+07	128	3.41E+04	1927	0.	-24.2
14	1.31E+07	148	4.92E+04	2233	0.	
16	2.69E+07	168	3.58E+04	2538	0.	FROSTPOINT
18	1.56E+07	188	5.18E+04	2843	0.	
20	9.67E+06	208	5.21E+04	3149	0.	
22	3.76E+06	238	4.18E+04	3454	0.	TAS (M/S)
24	4.39E+06	258	4.39E+04	3760	0.	112.4
26	6.19E+06	271	3.29E+04	4065	0.	
28	5.64E+06	291	2.55E+04	4370	0.	
30	5.12E+06	311	2.38E+04	4676	0.	
LWC						TOTALS
MED 0						3.51E-04
						109
						91

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 181300Z

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.58E+06	76	0.	400	9.08E+02	614.3
4	1.01E+07	67	1.29E+05	706	5.39E+01	ALT (KM)
6	1.67E+07	67	1.86E+04	1011	3.01E+00	6.933
8	2.19E+07	57	1.35E+04	1316	0.	
10	3.48E+07	108	9.45E+03	1622	0.	TEMP (C)
12	3.54E+07	128	3.36E+04	1927	0.	-24.7
14	2.40E+07	143	4.74E+04	2233	0.	
16	2.83E+07	189	5.09E+04	2538	0.	FROSTPOINT
18	2.49E+07	189	6.37E+04	2843	0.	
20	1.81E+07	209	5.67E+04	3149	0.	
22	1.24E+07	210	6.46E+04	3454	0.	TAS (M/S)
24	1.01E+07	250	3.68E+04	3760	0.	114.1
26	9.51E+06	271	3.67E+04	4065	0.	
28	7.53E+06	291	3.36E+04	4370	0.	
30	9.25E+06	311	4.11E+04	4676	0.	
TOTALS						
LWC	1.40E-03	23	5.28E-03	112	1.08E-03	3.33E-03
MED D						200

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 181310Z

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.86E+06	76	0.	400	1.21E+03	484.5
4	6.09E+06	47	5.99E+04	706	5.14E+01	ALT (KM)
6	1.01E+07	57	9.35E+03	1011	6.08E-01	7.104
8	2.47E+07	87	1.39E+04	1316	0.	
10	2.48E+07	109	5.67E+03	1622	0.	TEMP (C)
12	2.26E+07	129	2.81E+03	1927	0.	-25.9
14	1.54E+07	143	1.11E+03	2233	0.	
16	1.69E+07	169	4.55E+03	2538	0.	FROSTPOINT
18	1.49E+07	189	1.08E+04	2843	0.	
20	9.29E+06	209	2.99E+04	3149	0.	
22	3.59E+06	230	3.07E+04	3454	0.	TAS (M/S)
24	6.39E+06	250	3.54E+04	3760	0.	113.7
26	3.59E+06	271	4.72E+04	4065	0.	
28	6.11E+06	291	4.99E+04	4370	0.	
30	3.72E+06	311	3.35E+04	4676	0.	
TOTALS						
LWC	8.34E-04	22	3.91E-03	122	1.30E-03	1.99E-03
MED D						191

INTERVAL START 181310Z

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.67E+06	76	0.	400	1.02E+03	600.9
4	9.09E+06	47	7.09E+04	706	4.69E+01	ALT (KM)
6	1.20E+07	57	1.88E+04	1011	1.83E+00	7.026
8	2.58E+07	97	8.41E+03	1316	0.	
10	3.59E+07	108	1.34E+04	1622	0.	TEMP (C)
12	3.49E+07	129	1.70E+04	1927	0.	-25.3
14	2.27E+07	149	2.57E+04	2233	0.	
16	2.69E+07	169	4.04E+04	2538	0.	FROSTPOINT
18	2.57E+07	189	6.45E+04	2843	0.	
20	1.10E+07	209	7.89E+04	3149	0.	
22	1.10E+07	230	9.40E+04	3454	0.	TAS (M/S)
24	9.89E+06	250	8.07E+04	3760	0.	112.9
26	3.0E+06	271	5.65E+04	4065	0.	
28	7.23E+06	291	4.79E+04	4370	0.	
30	6.69E+06	311	1.19E+04	4676	0.	
TOTALS						
LWC	1.33E-03	22	5.78E-03	108	1.13E-03	3.67E-03
MED D						194

INTERVAL START 181310Z

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.32E+06	76	0.	400	1.13E+03	399.7
4	5.05E+06	47	0.	706	4.80E+01	ALT (KM)
6	1.67E+07	67	4.68E+03	1011	0.	7.188
8	2.88E+07	87	5.59E+03	1316	0.	
10	3.13E+07	109	9.43E+03	1622	0.	TEMP (C)
12	2.84E+07	129	4.81E+03	1927	0.	-26.4
14	1.41E+07	149	2.21E+03	2233	0.	
16	1.81E+07	169	6.42E+03	2538	0.	FROSTPOINT
18	1.12E+07	189	1.18E+04	2843	0.	
20	6.63E+06	209	1.63E+04	3149	0.	
22	5.07E+06	230	2.61E+04	3454	0.	TAS (M/S)
24	2.99E+06	250	5.88E+04	3760	0.	113.7
26	5.85E+06	271	3.40E+04	4065	0.	
28	3.69E+06	291	3.21E+04	4370	0.	
30	3.18E+06	311	2.95E+04	4676	0.	
TOTALS						
LWC	7.19E-04	27	3.42E-03	120	1.17E-03	1.77E-03
MED D						188



AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START 110321400					INTERVAL START 110321400							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	1.68E+06	26	0.	1.56E+03	394.5	2	3.44E+06	26	0.	1.73E+03	305.2	
4	8.08E+06	47	7.04E+04	5.98E+01	ALT (KM)	4	9.24E+06	47	9.92E+04	4.31E+01	ALT (KM)	
6	1.32E+07	67	9.46E+03	5.88E-01	7.281	6	1.77E+07	67	1.86E+04	1.011	1.21E+00	7.375
8	3.49E+07	97	1.69E+04	0.	TEMP (C)	8	8.33E+07	97	6.71E+03	1316	0.	TEMP (C)
10	3.79E+07	104	1.53E+04	0.	-27.2	10	4.54E+07	104	7.55E+03	1622	0.	TEMP (C)
12	3.09E+07	126	5.68E+03	0.	FRGSTPOINT	12	4.94E+07	126	5.58E+03	1927	0.	FRGSTPOINT
14	1.77E+07	144	6.70E+03	0.	TAS (M/S)	14	3.01E+07	144	5.49E+03	2233	0.	TAS (M/S)
16	2.83E+07	169	4.56E+03	0.	112.0	16	3.26E+07	169	5.96E+03	2538	0.	114.3
18	1.77E+07	199	2.28E+04	0.	TOTALS	18	2.77E+07	199	3.42E+04	2843	0.	TOTALS
20	1.07E+07	209	5.52E+04	0.	LWC 1.64E-03	20	1.18E+07	209	6.48E+04	3149	0.	LWC 1.75E-03
22	9.14E+06	240	5.96E+04	0.	MED 0	22	1.35E+07	240	7.63E+04	3454	0.	MED 0
24	6.72E+06	250	6.10E+04	0.	121	24	1.35E+07	250	1.04E+05	3760	0.	120
26	7.00E+06	271	6.13E+04	0.	119	26	1.37E+07	271	1.04E+05	4065	0.	119
28	5.91E+06	291	6.59E+04	0.	TOTALS	28	1.03E+07	291	9.89E+04	4370	0.	TOTALS
30	5.18E+06	311	5.59E+04	0.	LWC 6.33E-03	30	7.29E+06	311	7.24E+04	4676	0.	LWC 1.72E-03
LWC	1.12E-03		6.33E-03		189	LWC	1.75E-03		9.30E-03	1420		LWC 1.72E-03
MED 0	22		121		119	MED 0	23		120	105		MED 0
AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START 110321400					INTERVAL START 110321400							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	2.36E+06	26	0.	1.75E+03	397.0	2	8.00E+05	26	3.42E+04	9.34E+02	305.5	
4	8.18E+06	47	8.07E+04	6.33E+01	ALT (KM)	4	9.85E+06	47	6.80E+04	1.27E+01	ALT (KM)	
6	1.39E+07	67	9.24E+03	1.20E+00	7.307	6	1.57E+07	67	1.87E+04	1.011	7.443	
8	4.10E+07	97	5.92E+03	0.	TEMP (C)	8	4.24E+07	97	1.18E+04	1316	0.	TEMP (C)
10	4.28E+07	104	3.73E+03	0.	-27.5	10	5.00E+07	104	1.90E+03	1622	0.	TEMP (C)
12	4.72E+07	126	4.16E+03	0.	FRGSTPOINT	12	4.34E+07	126	2.63E+03	1927	0.	FRGSTPOINT
14	3.15E+07	144	6.56E+03	0.	TAS (M/S)	14	3.03E+07	144	9.95E+03	2233	0.	TAS (M/S)
16	3.38E+07	169	9.92E+03	0.	119.0	16	2.05E+07	169	3.02E+04	2538	0.	114.5
18	2.34E+07	199	2.53E+04	0.	TOTALS	18	2.61E+07	199	7.29E+04	2843	0.	TOTALS
20	1.31E+07	209	6.56E+04	0.	LWC 1.03E-03	20	1.44E+07	209	1.04E+05	3149	0.	LWC 1.40E-03
22	1.26E+07	240	7.35E+04	0.	MED 0	22	1.31E+07	240	8.61E+04	3454	0.	MED 0
24	8.13E+06	250	9.72E+04	0.	119	24	1.67E+07	250	1.04E+05	3760	0.	119
26	9.72E+06	271	9.48E+04	0.	117	26	8.25E+06	271	9.90E+04	4065	0.	117
28	7.88E+06	291	6.67E+04	0.	TOTALS	28	8.26E+06	291	5.74E+04	4370	0.	TOTALS
30	7.28E+06	311	6.80E+04	0.	LWC 8.03E-03	30	3.99E+06	311	3.55E+04	4676	0.	LWC 8.69E-04
LWC	1.48E-03		8.03E-03		119	LWC	1.40E-03		8.37E-03	100		LWC 3.45E-03
MED 0	22		119		117	MED 0	21		113	97		MED 0



AFML CIRRUS STUDY BY AFGL

FLIGHT E79-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 1035410

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.41E+06	75	0.	400	7.94E+02	383.0	2	3.41E+06	75	0.	400	8.42E+02	370.3
4	1.40E+07	47	1.09E+05	706	2.69E+01	7.487	4	1.40E+07	47	7.02E+04	786	7.33E+00	ALT (KM)
6	3.42E+07	57	3.27E+04	1011	0.	7.574	6	3.42E+07	57	1.38E+04	1011	5.90E-01	7.574
8	5.09E+07	37	1.11E+04	1316	0.		8	5.09E+07	47	5.48E+03	1316	0.	
10	5.09E+07	174	9.46E+03	1622	0.	TEMP (C)	10	4.83E+08	104	7.43E+03	1622	0.	TEMP (C)
12	4.21E+07	128	7.01E+03	1927	0.	78.9	12	3.63E+07	128	4.15E+03	1927	0.	78.9
14	2.61E+07	168	1.10E+04	2233	0.		14	2.69E+07	168	1.42E+04	2233	0.	
16	3.14E+07	189	2.73E+04	2538	0.	FRCPSTPOINT	16	2.41E+07	169	2.60E+04	2538	0.	FRCPSTPOINT
18	2.08E+07	199	7.95E+04	2843	0.		18	2.32E+07	199	6.11E+04	2843	0.	
20	1.19E+07	219	1.24E+05	3149	0.		20	1.07E+07	219	6.77E+04	3149	0.	
22	1.27E+07	270	1.15E+05	3454	0.	TAS (M/S)	22	1.02E+07	270	9.07E+04	3454	0.	TAS (M/S)
24	9.56E+06	290	1.10E+05	3760	0.	113.9	24	8.95E+06	290	7.22E+04	3760	0.	113.9
26	9.80E+06	271	9.86E+04	4065	0.		26	8.37E+06	271	7.26E+04	4065	0.	
28	7.55E+06	291	5.72E+04	4370	0.		28	6.55E+06	291	6.46E+04	4370	0.	
30	6.36E+06	311	3.53E+04	4676	0.		30	6.29E+06	311	3.67E+04	4676	0.	
LWC MED 0	1.41E-03	22	8.65E-03	112	8.13E-04	3.91E-03	LWC MED 0	1.28E-03	22	7.11E-03	145	7.71E-04	3.14E-03

AFML CIRRUS STUDY BY AFGL

FLIGHT E79-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 1035410

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.88E+06	76	3.75E+04	400	5.91E+02	383.2	2	2.31E+06	75	0.	400	1.13E+03	377.2
4	5.94E+06	47	4.93E+04	706	1.29E+01	7.522	4	1.45E+07	47	1.86E+05	786	3.57E+01	ALT (KM)
6	2.65E+07	57	9.27E+03	1011	5.94E-01	7.522	6	4.20E+07	57	1.81E+04	1011	0.	7.522
8	4.59E+07	37	8.21E+03	1316	0.		8	4.03E+07	37	5.75E+03	1316	0.	
10	4.25E+07	174	7.45E+03	1622	0.	TEMP (C)	10	3.64E+07	174	1.10E+04	1622	0.	TEMP (C)
12	3.90E+07	128	4.12E+03	1927	0.	78.9	12	3.21E+07	128	4.04E+03	1927	0.	78.9
14	2.12E+07	143	1.09E+04	2233	0.		14	2.36E+07	143	2.14E+03	2233	0.	
16	2.12E+07	159	1.44E+04	2538	0.	FRCPSTPOINT	16	2.41E+07	159	7.04E+03	2538	0.	FRCPSTPOINT
18	1.73E+07	199	6.12E+04	2843	0.		18	2.05E+07	199	3.05E+04	2843	0.	
20	1.39E+07	209	8.15E+04	3149	0.		20	1.80E+07	209	4.97E+04	3149	0.	
22	8.14E+06	270	8.16E+04	3454	0.	TAS (M/S)	22	7.43E+06	270	5.58E+04	3454	0.	TAS (M/S)
24	6.28E+06	290	9.62E+04	3760	0.	113.2	24	7.71E+06	290	6.00E+04	3760	0.	113.2
26	6.55E+06	271	5.98E+04	4065	0.		26	5.55E+06	271	5.99E+04	4065	0.	
28	6.07E+06	291	5.18E+04	4370	0.		28	6.47E+06	291	4.88E+04	4370	0.	
30	5.77E+06	311	3.88E+04	4676	0.		30	5.33E+06	311	1.90E+04	4676	0.	
LWC MED 0	1.11E-03	22	6.21E-03	112	5.79E-04	2.73E-03	LWC MED 0	1.05E-03	22	4.71E-03	147	1.14E-03	2.50E-03

AFGL CIRRUS STUDY BY AFGL											
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E7B-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 161336.000					INTERVAL START 161337.000						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER FROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER FROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	3.52E+06	26	0.	1.71E+03	376.8	2	3.01E+06	26	0.	3.46E+03	377.5
4	2.34E+07	47	2.83E+04	5.86E+01	ALT (MM)	4	3.19E+07	47	6.54E+04	1.99E+02	ALT (MM)
6	5.10E+07	67	8.85E+03	1.72E+00	7.602	6	6.25E+07	67	8.82E+03	5.70E+00	7.590
8	5.89E+07	87	0.	0.		8	7.24E+07	87	7.87E+03	1.31E+01	
10	4.50E+07	108	8.98E+03	1622	TEMP (C)	10	6.01E+07	108	3.57E+03	1622	TEMP (C)
12	3.29E+07	129	3.98E+03	1927	-30.0	12	4.18E+07	129	5.29E+03	1927	0.
14	2.44E+07	149	7.32E+03	2233		14	3.44E+07	149	1.04E+03	2233	0.
16	2.21E+07	169	6.03E+03	2538	FRGSTPOINT	16	2.54E+07	169	8.56E+02	2538	0.
18	1.86E+07	189	1.21E+04	2843		18	1.98E+07	189	2.77E+03	2843	0.
20	9.20E+06	209	3.68E+04	3149		20	1.94E+07	209	1.01E+04	3149	0.
22	8.05E+06	230	4.13E+04	3454	TAS (M/S)	22	9.52E+06	230	1.00E+04	3454	0.
24	6.04E+06	250	3.97E+04	3760	120.1	24	1.05E+07	250	2.85E+04	3760	0.
26	7.29E+06	271	5.45E+04	4065		26	1.05E+07	271	3.61E+04	4065	0.
28	8.53E+06	291	5.27E+04	4370		28	8.72E+06	291	3.81E+04	4370	0.
30	4.52E+06	311	5.21E+04	4676		30	5.52E+06	311	3.90E+04	4676	0.
LWC	1.10E-03		5.06E-03	1.74E-03	TOTALS	LWC	1.48E-03		3.24E-03	4.02E-03	TOTALS
MED D	21		123	187	144	MED D	22		126	198	194

AFGL CIRRUS STUDY BY AFGL											
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E7B-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 161336.000					INTERVAL START 161337.000						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER FROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER FROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	5.50E+06	26	0.	2.63E+03	377.2	2	8.40E+06	26	0.	2.70E+03	376.1
4	2.81E+07	47	7.53E+04	1.89E+02	ALT (MM)	4	3.65E+07	47	6.78E+04	1.48E+02	ALT (MM)
6	5.59E+07	67	1.33E+04	2.29E+00	7.595	6	6.12E+07	67	4.89E+03	10.11	7.614
8	6.79E+07	87	1.57E+04	0.		8	5.88E+07	87	0.	1.31E+01	
10	4.74E+07	108	1.79E+03	1622	TEMP (C)	10	4.58E+07	108	9.09E+03	1622	TEMP (C)
12	3.28E+07	129	3.99E+03	1927	-29.9	12	3.65E+07	129	5.29E+03	1927	0.
14	2.51E+07	149	4.17E+03	2233		14	2.32E+07	149	7.42E+03	2233	0.
16	2.71E+07	169	0.	2538	FRGSTPOINT	16	2.65E+07	169	2.62E+03	2538	0.
18	2.83E+07	189	3.71E+03	2843		18	2.27E+07	189	9.43E+02	2843	0.
20	1.00E+07	209	1.21E+04	3149		20	1.19E+07	209	6.42E+03	3149	0.
22	9.27E+06	230	2.00E+04	3454	TAS (M/S)	22	9.54E+06	230	7.92E+03	3454	0.
24	7.52E+06	250	3.22E+04	3760	120.9	24	7.40E+06	250	2.81E+04	3760	0.
26	5.76E+06	271	3.06E+04	4065		26	6.37E+06	271	2.41E+04	4065	0.
28	4.78E+06	291	4.62E+04	4370		28	5.10E+06	291	3.83E+04	4370	0.
30	7.26E+06	311	3.90E+04	4676		30	4.59E+06	311	4.72E+04	4676	0.
LWC	1.25E-03		3.52E-03	2.80E-03	TOTALS	LWC	1.15E-03		2.96E-03	3.09E-03	TOTALS
MED D	21		125	191	170	MED D	21		125	197	199

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START 1101301400					INTERVAL START 1101301400						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.78E+07	26	0.	3.77E+03	376.3	2	9.14E+07	26	0.	1.11E+03	375.1
4	8.52E+07	47	5.74E+04	2.07E+02	ALT (MM)	4	1.06E+08	47	7.71E+04	706	1.45E+01
6	1.06E+08	67	8.98E+03	5.87E+00	7.611	6	8.75E+07	67	1.81E+04	1011	5.85E-01
8	9.17E+07	97	1.60E+04	0.		8	8.63E+07	97	2.69E+03	1316	0.
10	6.04E+07	104	1.45E+04	1622	TEMP (C)	10	5.88E+07	104	9.16E+03	1622	0.
12	5.05E+07	123	5.08E+03	1927	-29.9	12	4.31E+07	123	6.78E+03	1927	0.
14	3.75E+07	149	3.18E+03	2233		14	3.09E+07	149	6.41E+03	2233	0.
16	3.76E+07	159	4.37E+03	2538	FRCSTPOINT	16	3.08E+07	159	6.17E+03	2538	0.
18	3.16E+07	139	3.74E+03	2843		18	2.29E+07	139	2.19E+04	2843	0.
20	1.68E+07	709	4.12E+03	3149		20	1.59E+07	709	4.77E+04	3149	0.
22	1.17E+07	230	2.04E+04	3454	TAS (M/S)	22	9.50E+06	230	7.65E+04	3454	0.
24	1.20E+07	250	1.51E+04	3760	116.9	24	1.00E+07	250	9.00E+04	3760	0.
26	1.30E+07	271	3.12E+04	4065		26	8.22E+06	271	1.18E+05	4065	0.
28	1.15E+07	291	4.53E+04	4370		28	7.56E+06	291	1.18E+04	4370	0.
30	7.13E+06	311	6.42E+04	4676		30	6.68E+06	311	5.51E+04	4676	0.
LMC	1.84E-03		3.94E-03	4.33E-03	TOTALS	LMC	1.47E-03		7.91E-03	1.04E-03	TOTALS
MED D	22		130	197		MED D	21		119	190	
AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START 1101301400					INTERVAL START 1101301400						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	6.63E+07	25	0.	2.21E+03	376.4	2	1.07E+08	25	0.	1.10E+03	376.0
4	1.33E+08	47	7.70E+04	5.94E+01	ALT (MM)	4	1.01E+08	47	1.85E+05	1.23E+01	ALT (MM)
6	9.53E+07	67	1.35E+04	1.17E+00	7.610	6	7.82E+07	67	2.71E+03	1011	0.
8	7.20E+07	97	2.69E+03	1416		8	6.41E+07	97	2.71E+03	1316	0.
10	5.35E+07	104	9.15E+03	1622	TEMP (C)	10	5.76E+07	104	0.	1622	0.
12	4.68E+07	123	6.13E+03	1927	-29.9	12	4.41E+07	123	1.37E+03	1927	0.
14	3.76E+07	144	4.26E+03	2233		14	3.02E+07	144	4.30E+03	2233	0.
16	3.77E+07	149	4.59E+03	2538	FRCSTPOINT	16	3.25E+07	149	3.54E+03	2538	0.
18	2.92E+07	139	1.52E+04	2843		18	2.22E+07	139	2.01E+04	2843	0.
20	1.61E+07	709	2.90E+04	3149		20	1.08E+07	709	6.28E+04	3149	0.
22	1.41E+07	230	3.54E+04	3454	TAS (M/S)	22	8.77E+06	230	6.77E+04	3454	0.
24	1.50E+07	250	5.97E+04	3760	117.9	24	1.06E+07	250	7.69E+04	3760	0.
26	8.46E+06	271	7.84E+04	4065		26	1.08E+07	271	9.18E+04	4065	0.
28	8.20E+06	291	6.07E+04	4370		28	8.77E+06	291	9.84E+04	4370	0.
30	8.20E+06	311	7.21E+04	4676		30	5.68E+06	311	6.31E+04	4676	0.
LMC	1.65E-03		6.33E-03	2.19E-03	TOTALS	LMC	1.47E-03		7.94E-03	1.01E-03	TOTALS
MED D	22		124	189		MED D	22		122	179	

AFML CIRRHUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 1100:11:00					INTERVAL START 1100:11:00						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.01E+07	76	0.	3.17E+03	377.1	2	5.32E+08	26	0.	5.62E+02	377.6
4	1.80E+08	47	1.45E+05	1.11E+02	ALT (RM)	4	3.20E+07	47	1.00E+04	7.36E+01	ALT (RM)
6	1.60E+08	67	1.37E+04	4.15E+00	7.596	6	2.49E+07	67	0.	6.87E-01	7.588
8	1.22E+08	47	1.09E+04	0.		8	2.12E+07	57	5.50E+03	1316	6.45E-01
10	9.40E+07	108	1.40E+04	1622	TEMP (C)	10	1.30E+07	108	1.80E+03	1622	TEMP (C)
12	7.80E+07	128	5.23E+03	1927	-29.6	12	1.37E+07	128	5.60E+03	1927	
14	4.51E+07	148	3.24E+03	2233		14	7.14E+06	148	1.10E+03	2233	
16	5.24E+07	169	5.23E+03	2538	FROSTPOINT	16	8.20E+06	169	1.81E+03	2538	FROSTPOINT
18	3.57E+07	199	1.06E+04	2843		18	8.47E+06	199	2.94E+03	2843	
20	3.01E+07	209	3.15E+04	3149		20	5.12E+06	209	3.20E+03	3149	
22	2.13E+07	240	7.26E+04	3454	TAS (M/S)	22	2.46E+06	240	3.54E+03	3454	TAS (M/S)
24	1.74E+07	250	9.49E+04	3760	116.3	24	1.89E+06	250	9.14E+02	3760	113.0
26	1.57E+07	271	1.33E+05	4065		26	1.85E+06	271	1.10E+04	4065	
28	1.38E+07	291	1.55E+05	4370		28	1.45E+06	291	1.01E+04	4370	
30	1.35E+07	311	1.48E+05	4676	TOTALS	30	7.52E+05	311	3.91E+03	4676	TOTALS
LMC	2.76E-03		1.25E-02	3.32E-03	4.63E-03	LMC	3.67E-04		7.98E-04	8.52E-04	5.92E-04
MED	0.22		126	189	157	MED	0.19		120	227	209

AFML CIRRHUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 1100:11:00					INTERVAL START 1100:11:00						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	8.47E+07	26	7.43E+04	400	3.60E+03	2	3.54E+08	26	0.	1.76E+02	377.6
4	1.82E+08	47	1.47E+05	706	2.66E+02	4	3.50E+07	47	2.61E+04	1.63E+01	ALT (RM)
6	1.21E+08	67	3.22E+04	1011	1.19E+01	6	2.51E+07	67	0.	1011	7.587
8	9.69E+07	87	1.64E+04	1316	6.29E-01	8	2.30E+07	87	2.61E+03	1316	TEMP (C)
10	7.55E+07	108	1.86E+04	1622	0.	10	2.14E+07	108	1.91E+03	1622	TEMP (C)
12	5.67E+07	128	9.87E+03	1927		12	1.66E+07	128	4.24E+03	1927	
14	3.50E+07	148	7.60E+03	2233		14	9.65E+06	148	1.22E+04	2233	
16	4.33E+07	169	3.57E+03	2538	FROSTPOINT	16	1.02E+07	169	1.10E+04	2538	FROSTPOINT
18	3.21E+07	189	1.26E+04	2843		18	1.13E+07	189	2.77E+04	2843	
20	1.95E+07	209	1.27E+04	3149		20	4.61E+06	209	4.32E+04	3149	
22	1.54E+07	230	2.67E+04	3454	TAS (M/S)	22	6.42E+06	230	3.80E+04	3454	TAS (M/S)
24	1.33E+07	250	3.86E+04	3760	115.9	24	5.62E+06	250	2.64E+04	3760	113.0
26	1.02E+07	271	4.93E+04	4065		26	3.15E+06	271	2.08E+04	4065	
28	1.07E+07	291	6.79E+04	4370		28	3.74E+06	291	1.36E+04	4370	
30	9.14E+06	311	8.32E+04	4676	TOTALS	30	3.21E+06	311	1.19E+04	4676	TOTALS
LMC	1.58E-03		5.90E-03	4.56E-03	5.27E-03	LMC	6.89E-04		2.45E-03	2.98E-04	1.31E-03
MED	0.21		128	206	191	MED	0.23		106	209	95



AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 11042100*					INTERVAL START 11042100*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	F (MB)
2	5.82E+08	25	0.	4.12E+01	375.9	2	9.66E+08	26	0.	2.34E+02	368.1
4	2.72E+07	47	9.92E+03	2.30E+00	ALT (KMH)	4	1.12E+07	47	0.	1.94E+01	ALT (KMH)
6	1.56E+07	67	4.65E+03	1011	7.618	6	8.16E+06	67	4.48E+03	1011	7.765
8	1.38E+07	37	5.25E+03	1315	0.	8	3.36E+06	37	0.	1315	0.
10	1.32E+07	108	1.87E+03	1622	TEMP (C)	10	4.59E+06	108	0.	1622	TEMP (C)
12	9.79E+06	123	4.17E+03	1927	-30.3	12	3.31E+06	128	0.	1927	0.
14	6.36E+06	143	4.40E+03	2333	0.	14	1.02E+06	144	2.12E+03	2333	0.
16	6.08E+06	159	9.08E+03	2538	0.	16	2.56E+06	159	0.	2538	0.
18	4.23E+06	189	2.75E+04	2843	0.	18	1.54E+06	189	0.	2843	0.
20	2.53E+06	209	2.46E+04	3149	0.	20	5.09E+05	209	1.03E+03	3149	0.
22	2.51E+06	231	2.12E+04	3454	0.	22	7.64E+05	230	2.27E+03	3454	0.
24	1.06E+06	250	7.85E+03	3760	114.5	24	7.88E+05	250	2.51E+03	3760	0.
26	1.59E+06	271	1.03E+04	4065	0.	26	2.55E+05	271	0.	4065	0.
28	2.11E+06	291	8.15E+03	4370	0.	28	1.02E+06	291	1.63E+03	4370	0.
30	1.86E+06	311	3.92E+03	4676	0.	30	2.54E+05	311	7.55E+03	4676	0.
TOTALS					7.54E-04	TOTALS					2.95E-04
LWC	2.94E-04	21	1.29E-03	4.69E-05	195	LWC	1.06E-04	21	3.22E-04	205	3.48E-04
MED	0	103	0.	0.	0.	MED	0	134	0.	0.	190

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 11042100*					INTERVAL START 11042100*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	F (MB)
2	9.86E+08	25	0.	3.03E+02	372.4	2	9.52E+08	25	0.	1.03E+02	362.8
4	8.78E+06	47	9.66E+03	2.30E+01	ALT (KMH)	4	1.08E+07	47	9.66E+03	1.12E+01	ALT (KMH)
6	7.64E+06	67	0.	1011	7.685	6	7.70E+06	67	0.	1011	7.665
8	6.72E+06	37	0.	1316	0.	8	7.44E+06	37	0.	1316	0.
10	4.51E+06	108	0.	1622	0.	10	5.39E+06	108	0.	1622	0.
12	3.87E+06	129	2.73E+03	1927	0.	12	3.33E+06	128	1.46E+03	1927	0.
14	3.61E+06	149	1.07E+03	2333	0.	14	3.33E+06	149	1.07E+03	2333	0.
16	3.10E+06	169	6.67E+02	2538	0.	16	2.56E+06	169	6.67E+02	2538	0.
18	2.22E+06	189	0.	2843	0.	18	2.56E+06	189	9.54E+02	2843	0.
20	1.54E+06	209	0.	3149	0.	20	1.28E+06	209	2.07E+03	3149	0.
22	1.29E+06	230	1.16E+03	3454	0.	22	1.02E+06	230	2.26E+03	3454	0.
24	5.15E+05	250	0.	3760	116.9	24	1.03E+06	250	6.33E+03	3760	0.
26	5.15E+05	271	0.	4065	0.	26	1.03E+06	271	5.68E+03	4065	0.
28	1.29E+06	291	1.65E+03	4370	0.	28	7.23E+05	291	6.16E+03	4370	0.
30	1.29E+06	311	0.	4676	0.	30	2.56E+05	311	3.76E+03	4676	0.
TOTALS					4.04E-04	TOTALS					7E-05
LWC	1.75E-04	27	6.39E-05	3.71E-04	194	LWC	1.44E-04	20	4.85E-04	129	1.59E-04
MED	0	123	0.	0.	0.	MED	0	129	0.	0.	131



AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL						
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *1145110*					INTERVAL START *1145110*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	9.58E+08	26	0.	400	7.35E+01	358.1	2	1.31E+09	26	0.	0.68E+00
4	8.80E+06	47	0.	706	2.81E+10	7.956	4	1.04E+06	47	0.	1.79E+00
6	4.40E+06	57	0.	1011	0.	0.	6	1.05E+06	57	0.	1011
8	5.69E+05	47	2.7E+03	1316	0.	0.	8	2.2E+09	47	0.	1316
10	5.18E+06	108	0.	1622	0.	TEMP (C)	10	5.24E+05	108	0.	1622
12	3.62E+06	128	0.	1927	0.	-30.1	12	7.65E+05	128	0.	1927
14	1.56E+06	148	1.0E+03	2233	0.	PRECIPPOINT	14	5.22E+05	148	0.	2233
16	2.73E+06	169	0.	2538	0.	0.	16	2.4E+05	169	0.9E+02	2538
18	1.82E+06	189	9.6E+02	2843	0.	0.	18	0.	183	0.	2843
20	2.59E+05	209	0.	3149	0.	0.	20	2.40E+05	209	0.	3149
22	5.18E+05	230	0.	3454	0.	TAS (M/S)	22	0.	230	0.	3454
24	2.40E+05	250	1.2E+03	3760	0.	116.5	24	0.	250	1.2E+03	3760
26	1.04E+06	271	4.3E+03	4065	0.	0.	26	0.	271	0.	4065
28	2.59E+05	291	1.8E+03	4370	0.	0.	28	0.	291	0.	4370
30	2.40E+05	311	1.9E+03	4676	0.	0.	30	2.4E+05	311	0.	4676
TOTALS				TOTALS				TOTALS			
LWC	9.41E-05	1.98E-04	7.69E-05	5.11E-05	174		LWC	2.56E-05	2.29E-05	1.56E-05	2.02E-05
MED D	1R	121	189	174			MED D	12	190	246	206
72											
AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL						AFML CIRRUS STUDY BY AFGL					
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START *1145110*						INTERVAL START *1145110*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	1.17E+09	26	0.	400	3.80E+01	398.0	2	1.32E+09	26	0.	1.62E+00
4	2.42E+06	47	9.8E+03	706	3.40E+10	8.016	4	2.40E+05	47	0.	706
6	1.05E+06	57	0.	1011	0.	0.	6	0.	57	0.	1011
8	2.39E+06	47	0.	1316	0.	0.	8	0.	47	0.	1316
10	1.05E+06	108	0.	1622	0.	TEMP (C)	10	0.	108	0.	1622
12	1.57E+06	128	0.	1927	0.	-30.5	12	2.61E+05	128	0.	1927
14	1.05E+06	148	0.	2233	0.	0.	14	2.4E+05	148	0.	2233
16	5.23E+05	169	0.	2538	0.	PRECIPPOINT	16	0.	169	0.	2538
18	2.42E+05	189	9.7E+02	2843	0.	0.	18	0.	189	9.6E+02	2843
20	0.	209	1.0E+03	3149	0.	0.	20	0.	209	0.	3149
22	2.42E+05	230	0.	3454	0.	TAS (M/S)	22	0.	230	0.	3454
24	0.	250	0.	3760	0.	116.0	24	2.59E+05	250	0.	3760
26	0.	271	0.	4065	0.	0.	26	0.	271	0.	4065
28	0.	291	0.	4370	0.	0.	28	0.	291	0.	4370
30	2.42E+05	311	0.	4676	0.	0.	30	0.	311	0.	4676
TOTALS				TOTALS				TOTALS			
LWC	3.26E-05	1.89E-05	4.89E-05	6.78E-05	169		LWC	1.40E-05	6.20E-06	1.40E-06	7.60E-06
MED D	13	87	208	169			MED D	175	34	175	85

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 18165100

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPET BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.46E+09	25	0.	400	0.	353.5
4	0.	47	0.	706	0.	ALT (KM)
6	0.	67	0.	1011	0.	8.063
8	0.	87	0.	1316	0.	TEMP (C)
10	0.	104	0.	1622	0.	-31.5
12	0.	123	0.	1927	0.	FRGSTPOINT
14	0.	144	0.	2233	0.	TAS (M/S)
16	2.60E+05	159	0.	2538	0.	116.4
18	0.	183	0.	2843	0.	TOTALS
20	0.	209	0.	3149	0.	LWC 1.42E-05
22	2.59E+05	230	0.	3454	0.	MED 0
24	0.	250	0.	3760	0.	0.
26	0.	271	0.	4065	0.	0.
28	0.	291	0.	4370	0.	0.
30	0.	311	0.	4676	0.	0.
TOTALS						
LWC	1.42E-05	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 18165100

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPET BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.46E+09	25	0.	400	0.	353.5
4	0.	47	0.	706	0.	ALT (KM)
6	0.	67	0.	1011	0.	8.063
8	0.	87	0.	1316	0.	TEMP (C)
10	0.	104	0.	1622	0.	-31.5
12	0.	123	0.	1927	0.	FRGSTPOINT
14	0.	144	0.	2233	0.	TAS (M/S)
16	2.60E+05	159	0.	2538	0.	116.4
18	0.	183	0.	2843	0.	TOTALS
20	0.	209	0.	3149	0.	LWC 1.42E-05
22	2.59E+05	230	0.	3454	0.	MED 0
24	0.	250	0.	3760	0.	0.
26	0.	271	0.	4065	0.	0.
28	0.	291	0.	4370	0.	0.
30	0.	311	0.	4676	0.	0.
TOTALS						
LWC	1.42E-05	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 18167100

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPET BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.35E+09	25	0.	400	3.07E+01	350.0
4	1.07E+06	47	0.	706	1.22E+01	ALT (KM)
6	5.11E+05	67	0.	1011	5.83E-01	8.097
8	2.59E+05	87	0.	1316	0.	TEMP (C)
10	0.	103	0.	1622	0.	-31.7
12	2.59E+05	124	0.	1927	0.	FRGSTPOINT
14	0.	145	0.	2233	0.	TAS (M/S)
16	0.	169	0.	2538	0.	116.1
18	0.	189	0.	2843	0.	TOTALS
20	0.	209	0.	3149	0.	LWC 1.93E-05
22	0.	230	0.	3454	0.	MED 0
24	0.	250	0.	3760	0.	0.
26	0.	271	0.	4065	0.	0.
28	0.	291	0.	4370	0.	0.
30	2.55E+05	311	0.	4676	0.	0.
TOTALS						
LWC	1.93E-05	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 18167100

FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPET BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.46E+09	25	0.	400	0.	352.6
4	2.55E+05	47	0.	706	0.	ALT (KM)
6	0.	67	0.	1011	0.	8.063
8	2.60E+05	87	0.	1316	0.	TEMP (C)
10	2.55E+05	103	0.	1622	0.	-31.7
12	0.	124	0.	1927	0.	FRGSTPOINT
14	0.	148	0.	2233	0.	TAS (M/S)
16	2.59E+05	153	0.	2538	0.	117.0
18	5.15E+05	189	0.	2843	0.	TOTALS
20	0.	209	0.	3149	0.	LWC 3.63E-05
22	0.	230	0.	3454	0.	MED 0
24	0.	250	0.	3760	0.	0.
26	0.	271	0.	4065	0.	0.
28	0.	291	0.	4370	0.	0.
30	0.	311	0.	4676	0.	0.
TOTALS						
LWC	1.71E-05	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 11049+10*					INTERVAL START 11049+10*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.47E+09	26	0.	340.2	2	1.34E+09	26	0.	344.0
4	1.03E+06	47	0.		4	3.79E+06	47	0.	
6	7.74E+05	67	0.	ALT (MM)	6	2.78E+06	67	0.	ALT (MM)
8	5.15E+05	97	0.	8.189	8	2.27E+06	97	0.	8.233
10	5.15E+05	108	0.	TEMP (C)	10	1.77E+06	108	0.	TEMP (C)
12	2.58E+05	128	0.	-32.1	12	1.77E+06	128	0.	1927
14	2.58E+05	148	0.	FRCPSTPOINT	14	7.57E+05	148	0.	2233
16	0.	159	0.		16	5.06E+05	159	0.	2538
18	0.	199	0.	2843	18	1.01E+06	199	0.	2843
20	0.	219	0.		20	0.	209	0.	3149
22	0.	270	0.	TAS (M/S)	22	0.	230	0.	3454
24	2.58E+05	250	0.	117.2	24	5.05E+05	250	0.	3750
26	0.	271	0.		26	0.	271	0.	4065
28	0.	291	0.		28	0.	291	0.	4370
30	0.	311	0.		30	2.52E+05	311	0.	4676
TOTALS					TOTALS				
LMC	1.02E-05	0.	2.43E-05	194	LMC	4.73E-05	2.25E-04	1.19E-05	175
MED D	2	0	194	194	MED D	16	120	175	102

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 11049+10*					INTERVAL START 11049+10*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.47E+09	26	0.	340.2	2	1.34E+09	26	0.	344.0
4	1.03E+06	47	0.		4	3.79E+06	47	0.	
6	7.74E+05	67	0.	ALT (MM)	6	2.78E+06	67	0.	ALT (MM)
8	5.15E+05	97	0.	8.189	8	2.27E+06	97	0.	8.233
10	5.15E+05	108	0.	TEMP (C)	10	1.77E+06	108	0.	TEMP (C)
12	2.58E+05	128	0.	-32.1	12	1.77E+06	128	0.	1927
14	2.58E+05	148	0.	FRCPSTPOINT	14	7.57E+05	148	0.	2233
16	0.	159	0.		16	5.06E+05	159	0.	2538
18	0.	199	0.	2843	18	1.01E+06	199	0.	2843
20	0.	219	0.		20	0.	209	0.	3149
22	0.	270	0.	TAS (M/S)	22	0.	230	0.	3454
24	2.58E+05	250	0.	117.2	24	5.05E+05	250	0.	3750
26	0.	271	0.		26	0.	271	0.	4065
28	0.	291	0.		28	0.	291	0.	4370
30	0.	311	0.		30	2.52E+05	311	0.	4676
TOTALS					TOTALS				
LMC	1.02E-05	0.	2.43E-05	194	LMC	4.73E-05	2.25E-04	1.19E-05	175
MED D	2	0	194	194	MED D	16	120	175	102

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 11049+10*					INTERVAL START 11049+10*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.47E+09	26	0.	340.2	2	1.34E+09	26	0.	344.0
4	1.03E+06	47	0.		4	3.79E+06	47	0.	
6	7.74E+05	67	0.	ALT (MM)	6	2.78E+06	67	0.	ALT (MM)
8	5.15E+05	97	0.	8.189	8	2.27E+06	97	0.	8.233
10	5.15E+05	108	0.	TEMP (C)	10	1.77E+06	108	0.	TEMP (C)
12	2.58E+05	128	0.	-32.1	12	1.77E+06	128	0.	1927
14	2.58E+05	148	0.	FRCPSTPOINT	14	7.57E+05	148	0.	2233
16	0.	159	0.		16	5.06E+05	159	0.	2538
18	0.	199	0.	2843	18	1.01E+06	199	0.	2843
20	0.	219	0.		20	0.	209	0.	3149
22	0.	270	0.	TAS (M/S)	22	0.	230	0.	3454
24	2.58E+05	250	0.	117.2	24	5.05E+05	250	0.	3750
26	0.	271	0.		26	0.	271	0.	4065
28	0.	291	0.		28	0.	291	0.	4370
30	0.	311	0.		30	2.52E+05	311	0.	4676
TOTALS					TOTALS				
LMC	1.02E-05	0.	2.43E-05	194	LMC	4.73E-05	2.25E-04	1.19E-05	175
MED D	2	0	194	194	MED D	16	120	175	102

AFML CIRRUS STUDY 9Y AFGL												AFML CIRRUS STUDY 9Y AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING												FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING											
INTERVAL START *18150110*												INTERVAL START *18151110*											
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)											
TYPE: BULL-ROSE												TYPE: BULL-ROSE											
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)			
2	0.40E+00	26	0.	400	1.95E+02	383.4	2	1.25E+09	25	0.	400	5.62E+02	344.4	2	1.25E+09	25	0.	400	5.62E+02	344.4			
4	3.07E+07	47	1.05E+04	706	1.06E+00	ALT (KM)	4	1.18E+07	47	0.00E+03	706	1.56E+02	ALT (KM)	4	1.18E+07	47	0.00E+03	706	1.56E+02	ALT (KM)			
6	1.84E+07	67	0.	1011	0.	8.244	6	6.53E+06	67	4.13E+03	1011	4.66E+00	8.226	6	6.53E+06	67	4.13E+03	1011	4.66E+00	8.226			
8	1.99E+07	37	2.57E+03	1316	0.		8	0.57E+06	07	0.	1316	1.53E+00		8	0.57E+06	07	0.	1316	1.53E+00				
10	1.14E+07	108	3.49E+03	1622	0.	TEMP (C)	10	3.92E+06	108	1.67E+03	1622	0.	TEMP (C)	10	3.92E+06	108	1.67E+03	1622	0.	TEMP (C)			
12	9.58E+05	128	0.	1927	0.	-32.7	12	6.09E+06	128	0.	1927	0.	-32.7	12	6.09E+06	128	0.	1927	0.	-32.7			
14	7.61E+06	148	0.	2233	0.		14	3.15E+06	148	0.	2233	0.		14	3.15E+06	148	0.	2233	0.				
16	7.37E+06	159	0.	2530	0.	FROSTPOINT	16	3.51E+06	159	0.	2530	0.	FROSTPOINT	16	3.51E+06	159	0.	2530	0.	FROSTPOINT			
18	6.38E+06	189	1.82E+03	2843	0.		18	2.04E+06	189	0.	2843	0.		18	2.04E+06	189	0.	2843	0.				
20	2.95E+05	209	8.95E+03	3149	0.		20	1.01E+06	209	0.	3149	0.		20	1.01E+06	209	0.	3149	0.				
22	9.40E+05	230	1.42E+04	3454	0.	TAS (M/S)	22	1.34E+06	230	0.	3454	0.	TAS (M/S)	22	1.34E+06	230	0.	3454	0.	TAS (M/S)			
24	2.48E+05	250	1.59E+04	3760	0.	122.0	24	1.07E+06	250	0.	3760	0.	122.0	24	1.07E+06	250	0.	3760	0.	122.0			
26	2.71E+05	271	1.91E+04	4065	0.		26	1.41E+06	271	1.31E+03	4065	0.		26	1.41E+06	271	1.31E+03	4065	0.				
28	2.70E+05	291	2.03E+04	4370	0.		28	2.34E+05	291	0.	4370	0.		28	2.34E+05	291	0.	4370	0.				
30	2.21E+06	311	2.37E+04	4676	0.		30	7.03E+05	311	5.23E+03	4676	0.		30	7.03E+05	311	5.23E+03	4676	0.				
LWC	3.50E-04		1.88E-03		1.74E-04	TOTALS	LWC	1.74E-04		1.76E-04		1.38E-03	TOTALS	LWC	1.74E-04		1.76E-04		1.38E-03	TOTALS			
MED D	23		126		177	103	MED D	21		135		277	276	MED D	21		135		277	276			

AFML CIRRUS STUDY 9Y AFGL												AFML CIRRUS STUDY 9Y AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING												FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING											
INTERVAL START *18150110*												INTERVAL START *18151110*											
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)											
TYPE: BULL-ROSE												TYPE: BULL-ROSE											
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)			
2	1.26E+03	26	0.	400	3.91E+01	383.0	2	7.74E+08	26	0.	400	1.66E+07	342.0	2	7.74E+08	26	0.	400	1.66E+07	342.0			
4	6.02E+06	47	9.04E+03	706	0.	ALT (KM)	4	5.98E+07	47	3.52E+04	706	3.05E+02	ALT (KM)	4	5.98E+07	47	3.52E+04	706	3.05E+02	ALT (KM)			
6	3.63E+06	67	0.	1011	0.	8.237	6	4.40E+07	67	8.95E+03	1011	7.49E+00	8.256	6	4.40E+07	67	8.95E+03	1011	7.49E+00	8.256			
8	1.98E+06	97	0.	1316	0.		8	3.25E+07	97	0.	1316	0.		8	3.25E+07	97	0.	1316	0.				
10	4.82E+05	108	0.	1622	0.	TEMP (C)	10	2.08E+07	108	5.01E+03	1622	0.	TEMP (C)	10	2.08E+07	108	5.01E+03	1622	0.	TEMP (C)			
12	1.28E+06	128	0.	1927	0.	-32.0	12	1.59E+07	128	1.24E+03	1927	0.	-32.0	12	1.59E+07	128	1.24E+03	1927	0.	-32.0			
14	1.49E+06	148	0.	2233	0.		14	1.50E+07	148	9.75E+02	2233	0.		14	1.50E+07	148	9.75E+02	2233	0.				
16	1.09E+06	159	6.19E+02	2530	0.	FROSTPOINT	16	1.52E+07	159	6.04E+02	2530	0.	FROSTPOINT	16	1.52E+07	159	6.04E+02	2530	0.	FROSTPOINT			
18	1.21E+06	189	0.	2843	0.		18	1.03E+07	189	1.74E+03	2843	0.		18	1.03E+07	189	1.74E+03	2843	0.				
20	0.	209	2.94E+03	3149	0.		20	4.49E+06	209	0.	3149	0.		20	4.49E+06	209	0.	3149	0.				
22	9.40E+05	230	3.23E+03	3454	0.	TAS (M/S)	22	3.58E+06	230	2.08E+03	3454	0.	TAS (M/S)	22	3.58E+06	230	2.08E+03	3454	0.	TAS (M/S)			
24	2.48E+05	250	1.20E+03	3760	0.	122.0	24	6.56E+06	250	2.50E+03	3760	0.	122.0	24	6.56E+06	250	2.50E+03	3760	0.	122.0			
26	2.71E+05	271	1.67E+03	4065	0.		26	3.05E+06	271	2.60E+03	4065	0.		26	3.05E+06	271	2.60E+03	4065	0.				
28	2.70E+05	291	3.07E+03	4370	0.		28	2.28E+06	291	2.97E+03	4370	0.		28	2.28E+06	291	2.97E+03	4370	0.				
30	4.81E+05	311	3.60E+03	4676	0.		30	2.34E+06	311	0.	4676	0.		30	2.34E+06	311	0.	4676	0.				
LWC	8.58E-05		2.98E-04		3.38E-05	TOTALS	LWC	6.34E-04		2.21E-04		3.15E-03	TOTALS	LWC	6.34E-04		2.21E-04		3.15E-03	TOTALS			
MED D	25		125		179	101	MED D	21		114		240	236	MED D	21		114		240	236			



AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START *1019210*					INTERVAL START *1019210*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.25E+09	26	0.	4.00	338.9	2	2.64E+08	75	1.80E+05	4.00	2.64E+02
4	9.64E+06	47	0.	706	8.336	4	1.34E+08	47	6.06E+05	706	2.71E+00
6	6.59E+06	67	0.	1011	8.336	6	9.83E+07	57	1.02E+05	1011	0.
8	4.24E+06	97	0.	1316	8.336	8	8.33E+07	97	8.06E+04	1316	0.
10	3.87E+06	120	0.	1622	8.336	10	6.70E+07	120	1.97E+04	1622	0.
12	4.34E+06	148	0.	1927	8.336	12	6.44E+07	148	5.31E+03	1927	0.
14	1.60E+06	168	0.	2233	8.336	14	3.82E+07	168	3.14E+03	2233	0.
16	2.18E+06	189	0.	2538	8.336	16	4.03E+07	189	6.04E+03	2538	0.
18	4.83E+05	189	1.79E+03	2843	8.336	18	3.67E+07	189	2.51E+04	2843	0.
20	7.23E+05	209	9.81E+02	3149	8.336	20	1.29E+07	209	4.06E+04	3149	0.
22	9.69E+05	230	2.15E+03	3454	8.336	22	1.59E+07	230	5.68E+04	3454	0.
24	4.80E+05	250	0.	3760	8.336	24	1.23E+07	250	5.32E+04	3760	0.
26	4.83E+05	271	2.69E+03	4065	8.336	26	1.66E+07	271	5.72E+04	4065	0.
28	9.66E+05	291	0.	4370	8.336	28	1.10E+07	291	3.34E+04	4370	0.
30	7.23E+05	311	3.59E+03	4676	8.336	30	1.13E+07	311	2.97E+04	4676	0.
TOTALS					103	TOTALS					
LMC	1.19E-04	1.92E-04	1.32	199	3.18E-03	LMC	2.27E-03	4.97E-03	114	2.41E-04	1.92E-03
MED	22	132	199	103	103	MED	22	114	179	94	94

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START *1019210*					INTERVAL START *1019210*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	7.63E+08	26	0.	4.00	338.9	2	1.25E+08	75	3.52E+04	4.00	1.73E+02
4	8.47E+07	47	6.47E+04	706	8.336	4	1.00E+08	47	9.64E+05	706	1.63E+00
6	6.06E+07	57	4.37E+03	1011	8.336	6	1.81E+08	57	1.40E+05	1011	0.
8	4.84E+07	97	0.	1316	8.336	8	1.40E+08	97	9.14E+04	1316	0.
10	3.52E+07	120	3.51E+03	1622	8.336	10	1.15E+08	120	4.08E+04	1622	0.
12	3.29E+07	148	2.05E+03	1927	8.336	12	6.70E+07	148	5.06E+04	1927	0.
14	2.41E+07	168	0.	2233	8.336	14	6.25E+07	168	6.52E+04	2233	0.
16	1.93E+07	189	4.50E+03	2538	8.336	16	8.29E+07	189	5.04E+04	2538	0.
18	1.43E+07	189	6.99E+03	2843	8.336	18	5.45E+07	189	8.49E+04	2843	0.
20	9.61E+06	209	8.99E+03	3149	8.336	20	4.16E+07	209	1.19E+05	3149	0.
22	5.67E+06	230	1.32E+04	3454	8.336	22	2.42E+07	230	1.02E+05	3454	0.
24	4.44E+06	250	3.91E+04	3760	8.336	24	2.49E+07	250	6.99E+04	3760	0.
26	5.68E+06	271	5.08E+04	4065	8.336	26	2.34E+07	271	3.74E+04	4065	0.
28	3.21E+06	291	7.67E+04	4370	8.336	28	2.74E+07	291	3.01E+04	4370	0.
30	3.95E+06	311	4.93E+04	4676	8.336	30	2.24E+07	311	1.66E+04	4676	0.
TOTALS					103	TOTALS					
LMC	8.97E-04	4.79E-03	126	166	1.53E-03	LMC	3.92E-03	6.76E-03	100	1.58E-04	4.18E-03
MED	20	126	166	103	103	MED	20	100	179	94	94



AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 11054100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	ALT (MM)	TEMP (C)	PRCSTPOINT	TAS (M/S)
2	9.17E+08	26	0.	2.06E+00	339.2				
4	4.09E+07	47	2.19E+05	0.		8.513			
6	3.32E+07	67	6.59E+04	1011	0.				
8	2.57E+07	87	4.18E+04	1316	0.				
10	2.48E+07	109	3.54E+04	1622	0.				
12	1.49E+07	128	2.79E+04	1927	0.				
14	1.12E+07	148	1.44E+04	2233	0.				
16	1.64E+07	169	9.39E+03	2538	0.				
18	7.44E+06	189	5.50E+03	2843	0.				
20	5.49E+06	209	7.01E+03	3149	0.				
22	3.72E+06	230	5.51E+03	3454	0.				
24	2.73E+06	250	1.23E+03	3760	0.				
26	2.57E+06	271	0.	4065	0.				
28	3.57E+06	291	0.	4370	0.				
30	3.22E+06	311	0.	4676	0.				
TOTALS									
LMC	5.59E-04		6.26E-04	1.78E-06	6.10E-04				
MEAN	21		65	175	84				

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING

INTERVAL START 11055100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	ALT (MM)	TEMP (C)	PRCSTPOINT	TAS (M/S)
2	8.01E+07	25	1.09E+05	400	1.92E+02				
4	3.79E+08	47	7.94E+05	786	3.28E+08				
6	6.66E+08	67	5.63E+04	1011	0.				
8	6.12E+08	87	3.39E+04	1316	0.				
10	4.70E+08	109	1.58E+04	1622	0.				
12	3.83E+08	128	2.28E+04	1927	0.				
14	2.42E+08	148	1.44E+04	2233	0.				
16	3.19E+08	169	6.77E+03	2538	0.				
18	2.44E+08	189	8.22E+03	2843	0.				
20	1.04E+08	209	4.97E+03	3149	0.				
22	6.20E+07	230	5.46E+03	3454	0.				
24	4.51E+07	250	2.43E+03	3760	0.				
26	3.44E+07	271	4.10E+03	4065	0.				
28	3.15E+07	291	1.56E+03	4370	0.				
30	2.21E+07	311	7.28E+03	4676	0.				
TOTALS									
LMC	9.59E-03		1.10E-03	1.81E-04	1.01				
MEAN	19		72	181	63				

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 11054100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	ALT (MM)	TEMP (C)	PRCSTPOINT	TAS (M/S)
2	5.91E+08	25	0.	0.	339.0				
4	2.89E+09	47	5.93E+05	786	0.				
6	3.52E+08	67	6.53E+04	1011	0.				
8	3.59E+08	87	4.97E+04	1316	0.				
10	2.73E+08	109	2.29E+04	1622	0.				
12	2.89E+08	128	1.68E+04	1927	0.				
14	1.40E+08	144	1.03E+03	2233	0.				
16	1.69E+08	169	1.70E+03	2538	0.				
18	1.10E+08	189	0.	2843	0.				
20	4.33E+07	209	0.	3149	0.				
22	3.11E+07	230	1.10E+03	3454	0.				
24	2.19E+07	250	0.	3760	0.				
26	1.82E+07	271	0.	4065	0.				
28	1.53E+07	291	0.	4370	0.				
30	1.66E+07	311	0.	4676	0.				
TOTALS									
LMC	4.81E-03		4.82E-04	0.	4.82E-04				
MEAN	17		39	0	39				

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING

INTERVAL START 11055100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	ALT (MM)	TEMP (C)	PRCSTPOINT	TAS (M/S)
2	1.15E+09	26	0.	1.99E+01					
4	5.99E+07	47	4.59E+05	786	0.				
6	4.06E+07	67	6.02E+04	1011	0.				
8	3.55E+07	87	3.09E+04	1316	0.				
10	3.25E+07	109	1.74E+04	1622	0.				
12	2.22E+07	128	1.19E+04	1927	0.				
14	1.71E+07	148	9.14E+03	2233	0.				
16	2.20E+07	169	3.36E+03	2538	0.				
18	1.79E+07	189	8.14E+03	2843	0.				
20	1.20E+07	209	4.93E+03	3149	0.				
22	6.24E+06	230	2.17E+03	3454	0.				
24	7.89E+06	250	2.44E+03	3760	0.				
26	6.85E+06	271	0.	4065	0.				
28	8.07E+06	291	1.55E+03	4370	0.				
30	7.34E+06	311	3.64E+03	4676	0.				
TOTALS									
LMC	1.17E-03		6.80E-04	1.72E-05	5.31E-04				
MEAN	23		67	175	53				

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 140577+00					INTERVAL START 140577+00						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	4.54E+08	26	6.94E+04	1.26E+01	328.8	2	3.63E+08	26	0.	4.00	4.52E+00
4	1.88E+08	47	9.83E+05	0.		4	2.21E+08	47	1.0E+06	706	5.20E-01
6	1.81E+08	67	1.66E+05	1011	8.521	6	2.17E+08	57	1.53E+05	1011	0.
8	1.58E+08	37	9.91E+04	1316	0.	8	1.50E+08	37	7.82E+04	1316	0.
10	1.20E+08	108	5.70E+04	1622	0.	10	1.47E+08	108	2.41E+04	1622	0.
12	9.58E+07	128	5.12E+04	1927	0.	12	1.25E+08	128	2.55E+04	1927	0.
14	6.08E+07	143	4.03E+04	2233	0.	14	7.49E+07	143	1.30E+04	2233	0.
16	7.80E+07	169	3.07E+04	2538	0.	16	1.03E+08	169	6.29E+03	2538	0.
18	6.57E+07	199	5.02E+04	2843	0.	18	8.86E+07	199	6.24E+03	2843	0.
20	3.92E+07	209	4.11E+04	3149	0.	20	4.50E+07	209	1.17E+04	3149	0.
22	2.96E+07	230	2.48E+04	3454	0.	22	4.23E+07	230	6.47E+03	3454	0.
24	2.35E+07	250	1.91E+04	3760	0.	24	2.59E+07	250	5.95E+03	3760	0.
26	2.13E+07	271	1.21E+04	4065	0.	26	3.62E+07	271	1.33E+03	4065	0.
28	2.15E+07	291	6.17E+03	4370	0.	28	3.02E+07	291	1.53E+03	4370	0.
30	2.03E+07	311	5.39E+03	4676	0.	30	1.53E+07	311	1.78E+03	4676	0.
LWC	3.87E-03		2.96E-03	1.09E-05	2.20E-03	LWC	4.94E-03		1.31E-03	6.41E-06	1.13E-03
MED	0.22		0.55	0.175	0.75	MED	0.22		0.52	0.199	0.60
TOTALS											
AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 140577+00						INTERVAL START 140577+00					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	6.44E+08	26	3.43E+04	7.43E+00	330.1	2	8.53E+07	26	7.00E+04	400	1.51E+02
4	1.21E+08	47	6.89E+05	0.		4	3.43E+08	47	1.53E+06	706	5.20E+00
6	1.07E+08	67	6.34E+04	1011	8.515	6	3.87E+08	57	1.21E+05	1011	0.
8	9.24E+07	37	7.09E+04	1316	0.	8	3.11E+08	37	9.58E+04	1316	0.
10	6.79E+07	108	2.57E+04	1622	0.	10	2.42E+08	108	6.19E+04	1622	0.
12	5.80E+07	128	2.41E+04	1927	0.	12	2.05E+08	128	2.75E+04	1927	0.
14	3.51E+07	144	1.70E+04	2233	0.	14	1.31E+08	143	1.12E+04	2233	0.
16	4.39E+07	169	1.57E+04	2538	0.	16	1.65E+08	169	1.89E+04	2538	0.
18	4.06E+07	199	1.87E+04	2843	0.	18	1.26E+08	199	2.00E+04	2843	0.
20	2.38E+07	209	2.33E+04	3149	0.	20	6.93E+07	209	3.57E+04	3149	0.
22	1.52E+07	230	1.60E+04	3454	0.	22	6.09E+07	230	2.51E+04	3454	0.
24	1.27E+07	250	9.92E+03	3760	0.	24	3.22E+07	250	1.45E+04	3760	0.
26	1.87E+07	271	4.01E+03	4065	0.	26	4.09E+07	271	1.63E+04	4065	0.
28	1.88E+07	291	1.53E+03	4370	0.	28	3.54E+07	291	1.49E+04	4370	0.
30	1.06E+07	311	0.	4676	0.	30	2.67E+07	311	1.09E+04	4676	0.
LWC	2.41E-03		1.36E-03	6.07E-06	1.18E-03	LWC	7.05E-03		2.95E-03	1.59E-04	2.00E-03
MED	0.22		0.51	0.175	0.75	MED	0.21		0.53	0.199	0.60
TOTALS											

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 181500Z						INTERVAL START 180900Z					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					
TYPE: GULL-ROSE						TYPE: GULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	7.26E+07	25	7.07E+04	400	1.86E+02	2	3.94E+07	25	1.06E+05	400	1.40E+02
4	4.12E+08	47	1.01E+06	706	2.13E+00	4	5.70E+08	47	8.72E+06	706	2.15E+00
6	4.87E+08	67	8.73E+04	1011	0.	6	1.17E+09	67	5.21E+04	1011	0.
8	4.12E+08	47	7.29E+04	1316	0.	8	1.02E+09	47	4.43E+04	1316	0.
10	3.11E+08	108	1.77E+04	1622	0.	10	7.38E+08	108	2.12E+04	1622	0.
12	2.51E+08	128	2.75E+04	1927	0.	12	5.96E+08	128	5.24E+04	1927	0.
14	1.45E+08	148	2.79E+04	2233	0.	14	3.44E+08	148	6.19E+04	2233	0.
16	1.99E+08	168	3.06E+04	2538	0.	16	4.25E+08	168	5.44E+04	2538	0.
18	1.47E+08	188	7.72E+04	2843	0.	18	2.78E+08	188	9.18E+04	2843	0.
20	7.58E+07	208	9.42E+04	3149	0.	20	1.73E+08	208	7.61E+04	3149	0.
22	6.10E+07	228	9.15E+04	3454	0.	22	8.92E+07	228	5.95E+04	3454	0.
24	4.74E+07	248	4.65E+04	3760	0.	24	6.09E+07	248	5.18E+04	3760	0.
26	4.56E+07	271	4.27E+04	4065	0.	26	5.15E+07	271	2.34E+04	4065	0.
28	4.04E+07	291	2.68E+04	4370	0.	28	4.14E+07	291	2.04E+04	4370	0.
30	2.55E+07	311	9.18E+03	4676	0.	30	2.53E+07	311	3.67E+03	4676	0.
TOTALS						TOTALS					
LMC	7.39E-03		5.50E-03		1.71E-04	LMC	1.27E-02		4.74E-03		1.31E-04
MED	21		100		179	MED	14		95		191
TOTALS						TOTALS					
					3.41E-03						3.17E-03

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 181500Z						INTERVAL START 180900Z					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					
TYPE: GULL-ROSE						TYPE: GULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	7.59E+07	26	7.13E+04	400	5.28E+01	2	4.48E+07	25	7.05E+04	400	2.99E+02
4	4.17E+08	47	1.16E+06	706	0.	4	6.14E+08	47	3.70E+06	706	9.66E+00
6	5.14E+08	67	1.10E+05	1011	0.	6	1.73E+09	67	2.60E+04	1011	0.
8	4.07E+08	87	6.81E+04	1316	0.	8	1.43E+09	87	6.14E+04	1316	0.
10	3.14E+08	108	4.63E+04	1622	0.	10	9.45E+08	108	3.69E+04	1622	0.
12	2.31E+08	128	4.86E+04	1927	0.	12	7.11E+08	128	4.94E+04	1927	0.
14	1.55E+08	148	4.62E+04	2233	0.	14	3.09E+08	148	6.35E+04	2233	0.
16	2.02E+08	168	7.26E+04	2538	0.	16	4.34E+08	168	4.56E+04	2538	0.
18	1.54E+08	188	1.23E+05	2843	0.	18	2.54E+08	188	7.94E+04	2843	0.
20	7.59E+07	208	1.00E+05	3149	0.	20	1.61E+08	208	7.37E+04	3149	0.
22	5.59E+07	228	6.21E+04	3454	0.	22	7.42E+07	228	5.04E+04	3454	0.
24	3.87E+07	248	2.90E+04	3760	0.	24	5.22E+07	248	3.65E+04	3760	0.
26	4.52E+07	271	2.50E+04	4065	0.	26	4.28E+07	271	3.84E+04	4065	0.
28	4.34E+07	291	1.83E+04	4370	0.	28	2.86E+07	291	2.86E+04	4370	0.
30	2.05E+07	311	5.54E+03	4676	0.	30	1.85E+07	311	2.01E+04	4676	0.
TOTALS						TOTALS					
LMC	7.60E-03		5.29E-03		4.57E-05	LMC	1.25E-02		5.01E-03		3.04E-04
MED	20		90		179	MED	16		103		107
TOTALS						TOTALS					
					4.00E-03						2.94E-03

AFML CIRRUS STUDY BY AFGL

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START 191011+00  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1-BULL-ROSE

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191011+00  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1-BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.40E+07	26	6.98E+04	400	1.04E+02	329.8
4	6.34E+08	47	2.83E+05	706	2.11E+00	ALT (KM)
6	1.08E+09	67	4.28E+04	1011	0.	8.520
8	3.36E+09	37	2.45E+04	1316	0.	
10	6.66E+08	104	3.12E+04	1622	0.	TEMP (C)
12	5.06E+08	128	4.88E+04	1927	0.	-33.8
14	2.92E+08	143	2.53E+04	2233	0.	FROSTPOINT
16	3.43E+08	169	2.75E+04	2538	0.	
18	2.16E+08	189	5.13E+04	2843	0.	
20	9.22E+07	209	3.63E+04	3149	0.	
22	4.94E+07	230	3.74E+04	3454	0.	TAS (M/S)
24	3.60E+07	250	1.56E+04	3760	0.	124.2
26	2.59E+07	271	1.35E+04	4065	0.	
28	1.97E+07	291	1.54E+04	4370	0.	
30	9.74E+06	311	5.40E+03	4676	0.	
LWC	9.14E-03		2.57E-01		1.00E-04	TOTALS
MED D	16		96		182	1.72E-07
						85

FLIGHT E78-01 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START 191011+00  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1-BULL-ROSE

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191011+00  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1-BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.67E+08	26	3.40E+04	400	8.85E+02	329.8
4	1.90E+08	47	9.38E+03	706	9.96E+01	ALT (KM)
6	1.56E+08	67	5.46E+04	1011	2.72E+00	8.526
8	1.46E+08	37	3.50E+04	1316	0.	
10	1.01E+08	104	1.76E+04	1622	0.	TEMP (C)
12	7.82E+07	128	3.88E+03	1927	0.	-34.6
14	5.23E+07	143	6.98E+03	2233	0.	FROSTPOINT
16	6.67E+07	169	7.41E+03	2538	0.	
18	5.93E+07	189	3.46E+04	2843	0.	
20	3.28E+07	209	6.29E+04	3149	0.	TAS (M/S)
22	2.70E+07	230	6.91E+04	3454	0.	120.3
24	2.63E+07	250	5.90E+04	3760	0.	
26	1.84E+07	271	6.24E+04	4065	0.	
28	1.67E+07	291	3.64E+04	4370	0.	
30	1.12E+07	311	2.65E+04	4676	0.	
LWC	3.09E-03		5.40E-03		1.09E-03	TOTALS
MED D	21		113		203	3.01E-03
						100



AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 19102100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.08E+08	26	1.06E+05	400	3.83E+02	330.1
4	2.69E+08	47	9.25E+05	706	1.18E+01	ALT (KMH)
6	2.46E+08	57	9.99E+04	1011	0.514	8.507
8	2.14E+08	37	2.89E+04	1316	0.	
10	1.60E+08	109	5.28E+03	1622	0.	TEMP (C)
12	1.49E+08	128	5.21E+03	1927	0.	-34.2
14	9.02E+07	149	2.05E+03	2233	0.	
16	1.10E+08	169	8.49E+02	2538	0.	FRAGSTPOINT
18	1.02E+08	139	1.62E+03	2843	0.	
20	4.59E+07	209	6.99E+03	3149	0.	
22	4.24E+07	230	1.110E+04	3454	0.	TAS (M/S)
24	3.53E+07	250	7.50E+03	3760	0.	122.5
26	3.06E+07	271	2.05E+04	4065	0.	
28	2.50E+07	291	2.19E+04	4370	0.	
30	2.00E+07	311	2.01E+04	4676	0.	
TOTALS						
LMC	5.17E-03	2.21E-03	1.87E-04	1.10E-03	1.10E-03	07
MED	0	121	106	0	0	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 19103140

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.00E+08	26	3.53E+04	400	5.58E+01	330.5
4	2.70E+08	47	9.57E+05	706	2.93E-01	ALT (KMH)
6	3.02E+08	67	9.16E+04	1011	0.	8.507
8	2.50E+08	47	6.23E+04	1316	0.	
10	1.86E+08	109	2.65E+04	1622	0.	TEMP (C)
12	1.49E+08	129	1.96E+04	1927	0.	-34.2
14	9.57E+07	149	6.18E+03	2233	0.	
16	1.31E+08	169	2.54E+03	2538	0.	FRAGSTPOINT
18	9.49E+07	189	5.51E+03	2843	0.	
20	9.06E+07	209	9.00E+02	3149	0.	
22	4.28E+07	230	1.110E+03	3454	0.	TAS (M/S)
24	3.62E+07	250	0.	3760	0.	122.5
26	3.22E+07	271	1.38E+03	4065	0.	
28	3.19E+07	291	0.	4370	0.	
30	1.95E+07	311	3.67E+03	4676	0.	
TOTALS						
LMC	5.37E-03	0.77E-04	0.77E-04	2.08E-05	2.08E-05	46
MED	0	21	44	179	179	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 19103140

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.69E+08	26	3.52E+04	400	1.22E+02	330.4
4	2.77E+08	47	9.82E+05	706	1.61E+00	ALT (KMH)
6	3.09E+08	57	9.56E+04	1011	0.	8.509
8	2.70E+08	37	6.73E+04	1316	0.	
10	2.03E+08	109	2.29E+04	1622	0.	TEMP (C)
12	1.70E+08	129	1.50E+04	1927	0.	-34.2
14	1.11E+08	149	3.08E+03	2233	0.	
16	1.37E+08	169	2.54E+03	2538	0.	FRAGSTPOINT
18	1.06E+08	139	9.14E+02	2843	0.	
20	3.69E+07	209	9.97E+02	3149	0.	
22	3.23E+07	230	2.19E+03	3454	0.	TAS (M/S)
24	3.23E+07	250	2.44E+03	3760	0.	122.5
26	2.59E+07	271	4.11E+03	4065	0.	
28	2.67E+07	291	1.56E+03	4370	0.	
30	1.48E+07	311	9.13E+03	4676	0.	
TOTALS						
LMC	5.23E-03	1.10E-03	1.13E-04	1.13E-04	1.13E-04	40
MED	0	20	33	180	180	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 19103140

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.17E+08	26	0.	400	8.36E+01	330.7
4	2.64E+08	47	6.73E+05	706	1.08E+00	ALT (KMH)
6	2.59E+08	57	4.38E+04	1011	0.	8.503
8	2.30E+08	47	3.14E+04	1316	0.	
10	1.66E+08	109	2.31E+04	1622	0.	TEMP (C)
12	1.32E+08	129	2.11E+04	1927	0.	-34.2
14	9.56E+07	149	4.05E+04	2233	0.	
16	1.22E+08	169	1.97E+04	2538	0.	FRAGSTPOINT
18	9.51E+07	139	2.96E+04	2843	0.	
20	4.53E+07	209	2.42E+04	3149	0.	
22	3.79E+07	230	1.99E+04	3454	0.	TAS (M/S)
24	2.99E+07	250	1.47E+04	3760	0.	122.5
26	3.06E+07	271	1.24E+04	4065	0.	
28	2.89E+07	291	7.89E+03	4370	0.	
30	1.82E+07	311	9.21E+03	4676	0.	
TOTALS						
LMC	4.54E-03	2.16E-03	2.16E-03	7.74E-05	7.74E-05	40
MED	0	21	45	180	180	



AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL						
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 191045+00					INTERVAL START 191045+00						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.71E+08	26	3.58E+04	2.45E+02	330.7	2	4.86E+08	26	1.09E+05	5.00E+02	332.1
4	2.30E+08	47	5.57E+05	2.73E+00		4	2.18E+08	47	4.81E+05	6.20E+00	
6	1.51E+08	57	4.43E+04	1011 0.	8.503	6	1.51E+08	57	5.82E+04	1011 0.	8.473
8	1.71E+08	57	2.11E+04	1316 0.		8	1.59E+08	57	3.47E+04	1316 0.	
10	1.38E+08	108	1.44E+04	1622 0.	TEMP (C)	10	1.17E+08	108	3.26E+04	1622 0.	TEMP (C)
12	1.07E+08	128	4.52E+04	1927 0.	-18.0	12	9.06E+07	128	3.69E+04	1927 0.	
14	7.05E+07	143	7.43E+04	2233 0.		14	6.04E+07	144	4.54E+04	2233 0.	
16	9.41E+07	169	9.19E+04	2538 0.	FRCSPOINT	16	8.78E+07	169	5.79E+04	2538 0.	
18	6.82E+07	189	1.27E+05	2843 0.		18	6.12E+07	189	1.16E+05	2843 0.	
20	4.25E+07	209	1.41E+05	3149 0.		20	3.39E+07	209	1.40E+05	3149 0.	
22	3.12E+07	220	7.95E+04	3454 0.	TAS (M/S)	22	3.28E+07	230	1.46E+05	3454 0.	TAS (M/S)
24	2.42E+07	250	7.09E+04	3760 0.	119.9	24	2.18E+07	259	1.03E+05	3760 0.	118.9
26	2.39E+07	271	3.50E+04	4065 0.		26	2.14E+07	271	9.03E+04	4065 0.	
28	2.77E+07	291	2.28E+04	4370 0.		28	2.44E+07	291	7.50E+04	4370 0.	
30	1.65E+07	311	9.34E+03	4676 0.	TOTALS	30	1.80E+07	311	2.63E+04	4676 0.	TOTALS
LWC	4.02E-03		6.44E-03	2.25E-04	4.30E-03	LWC	3.85E-03		9.92E-03	4.76E-04	4.94E-03
MED D	21		96	179	86	MED D	22		108	191	93
INTERVAL START 191045+00											
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)											
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.66E+08	26	1.08E+05	3.45E+02	331.3	2	8.51E+08	26	0.	1.41E+03	332.3
4	4.47E+08	47	6.92E+05	1.10E+01		4	1.21E+08	47	9.44E+04	7.41E+01	
6	4.76E+08	57	4.01E+04	1011 0.	6.490	6	9.27E+07	57	0.	1.17E+00	6.469
8	4.21E+08	57	3.16E+04	1316 0.		8	8.44E+07	57	1.00E+04	1316 0.	
10	3.08E+08	108	4.69E+04	1622 0.	TEMP (C)	10	5.03E+07	108	1.81E+03	1622 0.	TEMP (C)
12	2.74E+08	128	6.07E+04	1927 0.	-33.0	12	4.54E+07	128	2.72E+03	1927 0.	-33.9
14	1.67E+08	143	1.07E+05	2233 0.		14	2.72E+07	144	5.34E+03	2233 0.	
16	2.17E+08	169	7.07E+04	2538 0.	FRCSPOINT	16	3.59E+07	169	1.50E+04	2538 0.	
18	1.65E+08	189	1.15E+05	2843 0.		18	2.72E+07	189	6.09E+04	2843 0.	
20	7.71E+07	209	6.28E+04	3149 0.	TAS (M/S)	20	1.21E+07	209	7.47E+04	3149 0.	TAS (M/S)
22	5.84E+07	230	4.72E+04	3454 0.	119.4	22	1.03E+07	230	7.99E+04	3454 0.	117.7
24	6.20E+07	250	3.37E+04	3760 0.		24	6.54E+06	259	5.34E+04	3760 0.	
26	3.64E+07	271	4.91E+04	4065 0.		26	7.67E+06	271	5.70E+04	4065 0.	
28	3.71E+07	291	3.37E+04	4370 0.		28	1.00E+06	291	4.73E+04	4370 0.	
30	1.50E+07	311	2.43E+04	4676 0.	TOTALS	30	4.36E+05	311	6.05E-03	1.54E-03	3.63E-03
LWC	7.55E-03		6.10E-03	3.50E-04	3.69E-03	LWC	1.44E-03		6.05E-03	1.54E-03	3.63E-03
MED D	19		100	167	89	MED D	20		116	195	102

AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL						
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *1910610*					INTERVAL START *1910710*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.19E+09	26	0.	5.59E+02	332.2	2	1.27E+09	26	7.26E+04	4.00	4.59E+02
4	3.91E+07	47	8.71E+04	3.25E+01	ALT (KM)	4	9.32E+07	47	2.67E+04	706	1.27E+01
6	5.46E+07	57	4.54E+03	5.89E-01	6.472	6	6.83E+07	57	1.35E+04	1011	0.
8	5.28E+07	37	2.71E+03	0.		8	5.20E+07	37	5.36E+03	1316	0.
10	3.30E+07	103	9.18E+03	0.	TEMP (C)	10	3.36E+07	103	0.	1622	0.
12	3.37E+07	128	6.79E+03	1927	-34.1	12	2.79E+07	128	2.68E+03	1927	0.
14	2.27E+07	143	1.18E+04	2233	FRGSTPOINT	14	1.91E+07	143	1.83E+04	2233	0.
16	2.56E+07	169	2.30E+04	2533		16	2.17E+07	169	2.82E+04	2533	0.
18	1.44E+07	199	4.96E+04	2843		18	1.27E+07	199	4.52E+04	2843	0.
20	1.13E+07	209	5.31E+04	3149		20	9.33E+06	209	6.95E+04	3149	0.
22	8.50E+06	230	6.30E+04	3454	TAS (M/S)	22	6.63E+06	230	7.24E+04	3454	0.
24	7.22E+06	250	3.82E+04	3760	117.2	24	6.37E+06	250	5.04E+04	3760	0.
26	6.46E+06	271	5.01E+04	4065		26	5.60E+06	271	4.39E+04	4065	0.
28	7.77E+06	291	2.82E+04	4370		28	5.35E+06	291	3.99E+04	4370	0.
30	2.83E+06	311	1.91E+04	4676		30	4.08E+06	311	2.08E+04	4676	0.
TOTALS						TOTALS					
LWC	1.04E-03	21	4.22E-03	6.45E-04	2.34E-03	LWC	9.59E-04	21	4.78E-03	4.57E-04	2.31E-03
MED	0	22	112	197	98	MED	0	21	112	165	97
AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL						
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *1910610*					INTERVAL START *1910710*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.39E+09	26	0.	7.50E+02	332.0	2	2.06E+09	26	0.	2.14E+02	331.1
4	8.71E+07	47	1.93E+04	3.69E+01	ALT (KM)	4	3.55E+07	47	0.	706	7.10E+00
6	5.06E+07	57	4.52E+03	1.76E+00	8.477	6	2.44E+07	57	0.	1011	0.
8	4.97E+07	37	5.86E+03	0.		8	1.54E+07	37	0.	1316	0.
10	3.15E+07	103	1.83E+03	1622	TEMP (C)	10	1.34E+07	103	5.42E+03	1622	0.
12	2.80E+07	128	0.	1927	-34.1	12	1.28E+07	128	4.01E+03	1927	0.
14	1.34E+07	148	3.70E+02	2233	FRGSTPOINT	14	5.30E+06	148	9.47E+03	2233	0.
16	2.18E+07	169	1.06E+04	2533		16	6.18E+06	169	8.67E+03	2533	0.
18	1.54E+07	189	4.09E+04	2843		18	7.16E+06	189	2.15E+04	2843	0.
20	7.56E+06	209	6.64E+04	3149		20	4.77E+06	209	2.84E+04	3149	0.
22	8.22E+06	230	5.71E+04	3454	TAS (M/S)	22	3.02E+06	230	1.91E+04	3454	0.
24	9.18E+06	250	6.00E+04	3760	117.4	24	8.79E+06	250	1.15E+04	3760	0.
26	4.88E+06	271	4.42E+04	4065		26	3.02E+06	271	1.54E+04	4065	0.
28	6.88E+06	291	2.61E+04	4370		28	1.76E+06	291	1.28E+04	4370	0.
30	4.36E+06	311	2.09E+04	4676		30	1.77E+06	311	7.44E+03	4676	0.
TOTALS						TOTALS					
LWC	9.62E-04	22	4.39E-03	8.48E-04	2.38E-03	LWC	4.18E-04	21	1.54E-03	2.19E-04	8.40E-04
MED	0	22	111	196	100	MED	0	21	113	167	96

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 191010Z

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-NM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.46E+09	76	0.	400	1.95E+02	330.7
4	1.68E+07	47	0.	706	2.09E+01	ALT (KM)
6	3.56E+06	57	0.	1011	0.	8.502
8	9.20E+05	57	2.59E+03	1316	0.	TEMP (C)
10	3.70E+06	104	0.	1622	0.	-33.4
12	1.48E+06	123	1.31E+03	1927	0.	FRGSTPOINT
14	9.86E+05	144	0.	2233	0.	TAS (M/S)
16	1.58E+06	169	0.	2538	0.	121.9
18	0.	139	0.	2843	0.	0.
20	2.48E+05	219	0.	3143	0.	0.
22	1.24E+06	210	1.10E+03	3454	0.	0.
24	0.	250	0.	3760	0.	0.
26	2.46E+05	271	1.37E+03	4065	0.	0.
28	2.49E+05	291	1.57E+03	4370	0.	0.
30	9.82E+05	311	0.	4676	0.	0.
TOTALS						
LWC	9.67E-05	7.66E-05	2.68E-04	216	2.87E-04	207
MED D	21	121	0.	216	207	0.

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 191010Z

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-NM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.53E+09	26	0.	400	8.19E+02	330.0
4	5.08E+07	47	2.78E+04	704	3.26E+01	ALT (KM)
6	3.22E+07	57	0.	1011	0.	8.516
8	2.61E+07	57	0.	1316	0.	TEMP (C)
10	1.62E+07	104	0.	1622	0.	-33.6
12	1.21E+07	124	0.	1927	0.	FRGSTPOINT
14	8.70E+06	143	1.00E+03	2233	0.	TAS (M/S)
16	8.23E+06	169	0.	2538	0.	124.0
18	8.47E+06	149	0.	2843	0.	0.
20	3.24E+06	219	0.	3143	0.	0.
22	4.84E+06	210	1.07E+03	3454	0.	0.
24	2.66E+06	250	1.31E+04	3760	0.	0.
26	3.29E+06	271	2.02E+04	4065	0.	0.
28	2.91E+06	291	1.39E+04	4370	0.	0.
30	2.42E+06	311	1.61E+04	4676	0.	0.
TOTALS						
LWC	5.14E-04	1.32E-03	8.63E-04	198	2.89E-03	107
MED D	22	125	0.	198	107	0.

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING

INTERVAL START 191010Z

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-NM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.00E+09	26	3.51E+04	400	7.24E+02	330.5
4	5.37E+07	47	9.23E+03	706	2.19E+01	ALT (KM)
6	2.75E+07	57	4.73E+03	1011	0.	8.507
8	1.98E+07	57	0.	1316	0.	TEMP (C)
10	1.59E+07	104	0.	1622	0.	-33.9
12	9.23E+06	124	0.	1927	0.	FRGSTPOINT
14	9.33E+06	144	2.05E+03	2233	0.	TAS (M/S)
16	1.35E+07	159	0.	2538	0.	123.4
18	6.39E+06	199	2.73E+03	2843	0.	0.
20	4.51E+06	203	7.95E+03	3149	0.	0.
22	2.95E+06	210	7.64E+03	3454	0.	0.
24	2.68E+06	250	1.24E+04	3760	0.	0.
26	2.21E+06	271	1.64E+04	4065	0.	0.
28	1.87E+06	291	1.87E+04	4370	0.	0.
30	9.82E+05	311	1.82E+04	4676	0.	0.
TOTALS						
LWC	4.14E-04	1.58E-03	7.29E-04	186	9.16E-04	166
MED D	19	125	0.	186	166	0.

AFWL CIRRUS STUDY 9Y AFGL										AFWL CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING				
INTERVAL START *19110110*					INTERVAL START *19110110*					INTERVAL START *19110110*					INTERVAL START *19110110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE1 BULL-ROSE					TYPE1 BULL-ROSE					TYPE1 BULL-ROSE					TYPE1 BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)		
2	1.06E+09	26	3.44E+04	4.00	6.03E+02	329.9	9.72E+08	26	1.74E+05	4.00	9.56E+02	2	9.72E+08	26	1.74E+05	4.00	9.56E+02		
4	1.28E+08	47	7.24E+04	7.06	9.96E+01	8.519	1.43E+09	47	1.28E+05	7.06	2.23E+01	4	1.43E+09	47	1.28E+05	7.06	2.23E+01		
6	8.20E+07	57	4.25E+03	10.11	0.	0.	1.03E+08	57	4.32E+03	10.11	5.53E-01	6	1.03E+08	57	4.32E+03	10.11	5.53E-01		
8	6.63E+07	87	1.27E+04	13.16	0.	0.	6.03E+07	87	7.59E+03	13.16	0.	8	6.03E+07	87	7.59E+03	13.16	0.		
10	4.92E+07	109	1.03E+04	16.22	0.	0.	5.91E+08	109	2.78E+04	16.22	0.	10	5.91E+08	109	2.78E+04	16.22	0.		
12	4.32E+07	128	2.17E+04	19.27	0.	0.	4.22E+07	128	3.22E+04	19.27	0.	12	4.22E+07	128	3.22E+04	19.27	0.		
14	2.68E+07	145	4.01E+04	22.33	0.	0.	2.85E+07	145	3.14E+04	22.33	0.	14	2.85E+07	145	3.14E+04	22.33	0.		
16	2.77E+07	169	4.95E+04	25.38	0.	0.	4.29E+07	169	4.35E+04	25.38	0.	16	4.29E+07	169	4.35E+04	25.38	0.		
18	2.70E+07	189	9.74E+04	28.43	0.	0.	2.44E+07	189	9.03E+04	28.43	0.	18	2.44E+07	189	9.03E+04	28.43	0.		
20	1.37E+07	203	9.26E+04	31.49	0.	0.	1.68E+07	203	8.68E+04	31.49	0.	20	1.68E+07	203	8.68E+04	31.49	0.		
22	1.25E+07	230	7.40E+04	34.54	0.	0.	1.29E+07	230	9.44E+04	34.54	0.	22	1.29E+07	230	9.44E+04	34.54	0.		
24	1.11E+07	250	5.43E+04	37.60	0.	0.	1.03E+07	250	6.78E+04	37.60	0.	24	1.03E+07	250	6.78E+04	37.60	0.		
26	7.48E+06	271	5.95E+04	40.65	0.	0.	8.59E+06	271	7.20E+04	40.65	0.	26	8.59E+06	271	7.20E+04	40.65	0.		
28	9.16E+06	291	3.52E+04	43.70	0.	0.	8.30E+06	291	5.74E+04	43.70	0.	28	8.30E+06	291	5.74E+04	43.70	0.		
30	9.20E+06	311	3.04E+04	46.76	0.	0.	6.13E+06	311	3.98E+04	46.76	0.	30	6.13E+06	311	3.98E+04	46.76	0.		
TOTALS					TOTALS					TOTALS					TOTALS				
LWC	1.56E-03	22	6.32E-03	109	5.69E-04	141	1.11E-03	21	7.51E-03	113	9.54E-04	LWC	1.11E-03	21	7.51E-03	113	9.54E-04		
MED D	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	MED D	0.	0.	0.	0.	0.		

AFWL CIRRUS STUDY 9Y AFGL										AFWL CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING				
INTERVAL START *19110110*					INTERVAL START *19110110*					INTERVAL START *19110110*					INTERVAL START *19110110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE1 BULL-ROSE					TYPE1 BULL-ROSE					TYPE1 BULL-ROSE					TYPE1 BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)		
2	9.25E+08	25	2.07E+05	4.00	6.88E+02	330.1	1.59E+09	25	7.04E+04	4.00	1.09E+03	2	1.59E+09	25	7.04E+04	4.00	1.09E+03		
4	1.55E+08	47	5.45E+04	7.06	1.79E+01	8.515	9.77E+07	47	4.62E+04	7.06	3.47E+01	4	9.77E+07	47	4.62E+04	7.06	3.47E+01		
6	9.45E+07	57	1.28E+04	10.11	0.	0.	6.65E+07	57	1.73E+04	10.11	1.68E+01	6	6.65E+07	57	1.73E+04	10.11	1.68E+01		
8	8.66E+07	87	5.07E+03	13.16	0.	0.	4.92E+07	87	0.	13.16	0.	8	4.92E+07	87	0.	13.16	0.		
10	6.58E+07	109	1.72E+04	16.22	0.	0.	3.50E+07	109	5.26E+03	16.22	0.	10	3.50E+07	109	5.26E+03	16.22	0.		
12	4.82E+07	128	3.72E+04	19.27	0.	0.	3.22E+07	128	2.42E+02	19.27	0.	12	3.22E+07	128	2.42E+02	19.27	0.		
14	2.68E+07	145	5.12E+04	22.33	0.	0.	1.68E+07	145	1.35E+04	22.33	0.	14	1.68E+07	145	1.35E+04	22.33	0.		
16	3.41E+07	169	7.29E+04	25.38	0.	0.	2.28E+07	169	9.30E+02	25.38	0.	16	2.28E+07	169	9.30E+02	25.38	0.		
18	2.85E+07	189	1.18E+05	28.43	0.	0.	1.92E+07	189	3.88E+04	28.43	0.	18	1.92E+07	189	3.88E+04	28.43	0.		
20	1.60E+07	203	1.29E+05	31.49	0.	0.	7.88E+06	203	5.64E+04	31.49	0.	20	7.88E+06	203	5.64E+04	31.49	0.		
22	1.45E+07	230	1.06E+05	34.54	0.	0.	9.10E+06	230	5.04E+04	34.54	0.	22	9.10E+06	230	5.04E+04	34.54	0.		
24	7.51E+06	250	8.01E+04	37.60	0.	0.	6.64E+06	250	4.67E+04	37.60	0.	24	6.64E+06	250	4.67E+04	37.60	0.		
26	6.77E+06	271	7.26E+04	40.65	0.	0.	5.39E+06	271	3.29E+04	40.65	0.	26	5.39E+06	271	3.29E+04	40.65	0.		
28	9.42E+06	291	4.92E+04	43.70	0.	0.	5.41E+06	291	4.38E+04	43.70	0.	28	5.41E+06	291	4.38E+04	43.70	0.		
30	5.80E+06	311	2.67E+04	46.76	0.	0.	5.17E+06	311	2.73E+04	46.76	0.	30	5.17E+06	311	2.73E+04	46.76	0.		
TOTALS					TOTALS					TOTALS					TOTALS				
LWC	1.55E-03	21	6.06E-03	107	6.80E-04	185	1.07E-03	21	4.76E-03	115	1.12E-03	LWC	1.07E-03	21	4.76E-03	115	1.12E-03		
MED D	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	MED D	0.	0.	0.	0.	0.		



AFWL CIRRUS STUDY BY AFGL										AFWL CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING					
INTERVAL START 1911110*					INTERVAL START 1911110*					INTERVAL START 1911110*					INTERVAL START 1911110*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE1 BULL-ROSE										TYPE1 BULL-ROSE										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)			
2	0.48E+08	26	2.13E+05	400	1.44E+03	330.8	2	1.05E+09	25	1.75E+05	400	5.21E+02	2	0.68E+08	26	3.56E+04	400	7.05E+02	330.7	
4	1.66E+08	47	7.46E+04	706	6.25E+01	ALT (KM)	4	1.94E+08	47	6.50E+04	706	4.55E+01	ALT (KM)	4	1.74E+08	47	1.41E+05	706	3.05E+01	ALT (KM)
6	1.13E+08	57	3.93E+04	1011	1.13E+00	6.501	6	9.18E+07	57	1.30E+04	1011	0.	6.547	6	1.16E+08	57	5.29E+04	1011	0.	6.547
8	9.70E+07	47	5.20E+03	1316	0.		8	7.08E+07	37	1.60E+04	1316	0.		8	8.66E+07	37	3.66E+04	1316	0.	
10	6.50E+07	108	8.66E+03	1622	0.	TEMP (C)	10	5.71E+07	124	1.23E+04	1622	0.	TEMP (C)	10	7.30E+07	104	2.67E+04	1622	0.	TEMP (C)
12	5.58E+07	128	3.91E+04	1927	0.	-33.5	12	6.58E+07	124	3.84E+04	1927	0.	-33.5	12	5.80E+07	124	5.80E+04	1927	0.	-33.5
14	3.72E+07	143	5.37E+04	2233	0.	FRCTPOINT	14	2.63E+07	143	8.60E+04	2233	0.	FRCTPOINT	14	2.63E+07	143	8.60E+04	2233	0.	FRCTPOINT
16	4.49E+07	169	5.11E+04	2538	0.		16	3.79E+07	169	5.67E+04	2538	0.		16	3.79E+07	169	5.67E+04	2538	0.	
18	3.47E+07	189	1.53E+05	2843	0.		18	2.46E+07	189	1.15E+05	2843	0.		18	2.46E+07	189	1.15E+05	2843	0.	
20	1.89E+07	209	1.31E+05	3149	0.		20	1.28E+07	209	1.31E+05	3149	0.		20	1.28E+07	209	1.31E+05	3149	0.	
22	1.51E+07	230	1.16E+05	3454	0.	TAS (M/S)	22	1.53E+07	230	9.64E+04	3454	0.	TAS (M/S)	22	1.53E+07	230	9.64E+04	3454	0.	TAS (M/S)
24	1.44E+07	250	6.98E+04	3760	0.	121.7	24	1.11E+07	250	7.18E+04	3760	0.	121.7	24	1.11E+07	250	7.18E+04	3760	0.	121.7
26	1.41E+07	271	5.79E+04	4065	0.		26	1.20E+07	271	6.29E+04	4065	0.		26	1.20E+07	271	6.29E+04	4065	0.	
28	9.43E+06	291	4.88E+04	4370	0.		28	9.36E+06	291	3.76E+04	4370	0.		28	9.36E+06	291	3.76E+04	4370	0.	
30	6.68E+06	311	4.05E+04	4676	0.		30	9.13E+06	311	2.37E+04	4676	0.		30	9.13E+06	311	2.37E+04	4676	0.	
LWC	1.56E-03		8.22E-03	1.53E-03	5.58E-03	TOTALS	LWC	1.74E-03		7.35E-03	4.23E-03	TOTALS	LWC	1.56E-03		8.22E-03	1.53E-03	5.58E-03	TOTALS	
MED D	21		106	192	96		MED D	22		104	191		MED D	21		109	191	94		

AFWL CIRRUS STUDY BY AFGL										AFWL CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING					
INTERVAL START 1911110*					INTERVAL START 1911110*					INTERVAL START 1911110*					INTERVAL START 1911110*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE1 BULL-ROSE										TYPE1 BULL-ROSE										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)			
2	1.07E+09	26	3.56E+04	400	7.05E+02	330.7	2	0.68E+08	26	1.07E+05	400	5.21E+02	2	0.68E+08	26	3.56E+04	400	7.05E+02	330.7	
4	1.52E+08	47	1.12E+05	706	1.19E+01	ALT (KM)	4	1.74E+08	47	1.41E+05	706	3.05E+01	ALT (KM)	4	1.74E+08	47	1.41E+05	706	3.05E+01	ALT (KM)
6	1.05E+08	57	1.32E+04	1011	0.	8.502	6	1.16E+08	57	5.29E+04	1011	0.	8.547	6	1.16E+08	57	5.29E+04	1011	0.	8.547
8	8.66E+07	37	1.63E+04	1316	0.		8	8.66E+07	37	3.66E+04	1316	0.		8	8.66E+07	37	3.66E+04	1316	0.	
10	6.36E+07	104	1.07E+04	1622	0.	TEMP (C)	10	6.36E+07	104	2.67E+04	1622	0.	TEMP (C)	10	6.36E+07	104	2.67E+04	1622	0.	TEMP (C)
12	4.77E+07	124	1.98E+04	1927	0.	-33.5	12	4.77E+07	124	5.80E+04	1927	0.	-33.5	12	4.77E+07	124	5.80E+04	1927	0.	-33.5
14	3.17E+07	143	4.05E+04	2233	0.	FRCTPOINT	14	3.17E+07	143	6.02E+04	2233	0.	FRCTPOINT	14	3.17E+07	143	6.02E+04	2233	0.	FRCTPOINT
16	4.32E+07	169	3.94E+04	2538	0.		16	4.32E+07	169	4.53E+04	2538	0.		16	4.32E+07	169	4.53E+04	2538	0.	
18	3.59E+07	189	1.33E+05	2843	0.		18	3.59E+07	189	7.86E+04	2843	0.		18	3.59E+07	189	7.86E+04	2843	0.	
20	1.50E+07	209	1.27E+05	3149	0.		20	1.50E+07	209	5.97E+04	3149	0.		20	1.50E+07	209	5.97E+04	3149	0.	
22	1.67E+07	230	1.29E+05	3454	0.	TAS (M/S)	22	1.67E+07	230	7.22E+04	3454	0.	TAS (M/S)	22	1.67E+07	230	7.22E+04	3454	0.	TAS (M/S)
24	1.10E+07	250	9.24E+04	3760	0.	121.0	24	1.10E+07	250	6.91E+04	3760	0.	121.0	24	1.10E+07	250	6.91E+04	3760	0.	121.0
26	1.12E+07	271	9.43E+04	4065	0.		26	1.12E+07	271	7.49E+04	4065	0.		26	1.12E+07	271	7.49E+04	4065	0.	
28	1.20E+07	291	5.54E+04	4370	0.		28	1.20E+07	291	4.42E+04	4370	0.		28	1.20E+07	291	4.42E+04	4370	0.	
30	6.99E+06	311	3.33E+04	4676	0.		30	6.99E+06	311	1.85E+04	4676	0.		30	6.99E+06	311	1.85E+04	4676	0.	
LWC	1.52E-03		8.96E-03	6.67E-04	4.51E-03	TOTALS	LWC	1.74E-03		6.61E-03	4.23E-03	TOTALS	LWC	1.52E-03		8.96E-03	6.67E-04	4.51E-03	TOTALS	
MED D	21		109	181	94		MED D	22		109	191		MED D	21		109	191	94		



AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*19114100\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1 BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.64E+08	26	7.20E+04	400	1.54E+03	326.4
4	3.41E+08	47	1.81E+06	706	7.97E+01	ALT (MM)
6	3.82E+08	67	1.55E+05	1011	1.72E+00	6.592
8	3.17E+08	37	9.77E+04	1316	0.	
10	2.56E+08	108	5.88E+04	1622	0.	TEMP (C)
12	1.98E+08	128	8.37E+04	1927	0.	-34.1
14	1.27E+08	149	5.55E+04	2233	0.	
16	1.09E+08	169	4.59E+04	2538	0.	FRGSTPOINT
18	1.37E+08	139	6.71E+04	2843	0.	
20	7.59E+07	209	5.70E+04	3149	0.	
22	5.97E+07	230	5.26E+04	3454	0.	TAS (M/S)
24	3.58E+07	250	5.59E+04	3760	0.	120.0
26	4.21E+07	271	4.76E+04	4065	0.	
28	3.50E+07	291	3.88E+04	4370	0.	
30	2.44E+07	311	4.87E+04	4676	0.	
TOTALS						
LWC	7.19E-03		6.78E-03		1.73E-03	4.84E-03
MED D	21		108		195	94

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*19115100\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1 BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.10E+08	26	2.16E+05	400	1.68E+02	321.9
4	3.58E+08	47	1.39E+06	706	2.74E+00	ALT (MM)
6	3.55E+08	67	2.66E+05	1011	0.	8.685
8	3.10E+08	37	2.98E+05	1316	0.	
10	2.28E+08	108	8.80E+04	1622	0.	TEMP (C)
12	1.86E+08	128	9.88E+04	1927	0.	-34.0
14	1.24E+08	148	6.50E+04	2233	0.	
16	1.09E+08	169	3.37E+04	2538	0.	FRGSTPOINT
18	1.40E+08	189	6.16E+04	2843	0.	
20	7.39E+07	209	5.92E+04	3149	0.	
22	5.39E+07	230	3.36E+04	3454	0.	TAS (M/S)
24	4.82E+07	250	3.80E+04	3760	0.	119.9
26	4.68E+07	271	2.66E+04	4065	0.	
28	4.18E+07	291	2.40E+04	4370	0.	
30	2.82E+07	311	3.74E+03	4676	0.	
TOTALS						
LWC	7.24E-03		4.87E-03		1.58E-04	3.42E-03
MED D	21		87		101	71

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*19114100\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1 BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.15E+08	26	1.80E+05	400	1.09E+03	324.0
4	3.11E+08	47	1.11E+06	706	7.98E+01	ALT (MM)
6	4.56E+08	67	1.11E+05	1011	1.72E+00	8.642
8	3.79E+08	37	1.01E+05	1316	6.07E+01	
10	3.10E+08	108	5.03E+04	1622	0.	TEMP (C)
12	2.38E+08	128	3.79E+04	1927	0.	-34.0
14	1.54E+08	149	4.72E+04	2233	0.	
16	2.26E+08	169	2.16E+04	2538	0.	FRGSTPOINT
18	1.70E+08	189	3.55E+04	2843	0.	
20	8.58E+07	209	5.30E+04	3149	0.	
22	6.11E+07	230	3.62E+04	3454	0.	TAS (M/S)
24	4.50E+07	250	2.74E+04	3760	0.	119.8
26	4.34E+07	271	2.52E+04	4065	0.	
28	4.14E+07	291	3.20E+04	4370	0.	
30	2.42E+07	311	2.61E+04	4676	0.	
TOTALS						
LWC	8.08E-03		4.49E-03		1.35E-03	3.50E-03
MED D	20		105		205	94

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*19115100\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE1 BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.58E+09	26	3.58E+04	400	1.57E+02	320.6
4	1.89E+09	47	1.88E+05	706	2.72E+00	ALT (MM)
6	8.17E+07	67	3.95E+04	1011	0.	8.713
8	6.79E+07	37	3.93E+04	1316	0.	
10	4.70E+07	108	2.66E+04	1622	0.	TEMP (C)
12	3.85E+07	128	1.84E+04	1927	0.	-35.0
14	2.73E+07	149	2.18E+04	2233	0.	
16	3.20E+07	169	1.80E+04	2538	0.	FRGSTPOINT
18	4.68E+07	189	4.16E+04	2843	0.	
20	1.48E+07	209	5.85E+04	3149	0.	
22	1.05E+07	230	4.78E+04	3454	0.	TAS (M/S)
24	8.74E+06	250	3.88E+04	3760	0.	121.2
26	1.13E+07	271	3.75E+04	4065	0.	
28	8.76E+06	291	1.88E+04	4370	0.	
30	9.01E+06	311	1.11E+04	4676	0.	
TOTALS						
LWC	1.41E-03		3.56E-03		1.49E-04	1.81E-03
MED D	22		107		101	91

AFGL CIRRUS STUDY BY AFGL												
AFGL CIRRUS STUDY BY AFGL					AFGL CIRRUS STUDY BY AFGL							
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START 191710Z					INTERVAL START 191710Z							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	6.86E+08	25	2.12E+05	4.00	1.39E+01	318.7	2	2.29E+08	25	0.	4.00	6.65E+00
4	2.47E+08	47	9.78E+05	706	0.	ALT (KM)	4	4.64E+08	47	1.05E+06	706	0.
6	2.16E+08	57	1.43E+05	1011	0.	8.754	6	4.57E+08	57	1.17E+05	1011	0.
8	1.08E+08	87	1.59E+05	1316	0.		8	4.74E+08	87	1.19E+05	1316	0.
10	1.44E+08	108	1.03E+05	1622	0.	TEMP (C)	10	3.46E+08	108	5.11E+04	1622	0.
12	1.27E+08	128	1.06E+05	1927	0.	-35.1	12	2.79E+08	128	6.55E+04	1927	0.
14	7.59E+07	148	6.09E+04	2233	0.	FRCSTPOINT	14	1.68E+08	148	3.59E+04	2233	0.
16	1.12E+08	169	3.23E+04	2538	0.		16	2.40E+08	169	1.27E+04	2538	0.
18	8.72E+07	189	4.41E+04	2843	0.		18	1.84E+08	189	2.47E+04	2843	0.
20	4.51E+07	209	1.40E+04	3145	0.		20	8.50E+07	209	1.40E+04	3145	0.
22	3.59E+07	229	1.21E+04	3454	0.	TAS (M/S)	22	5.85E+07	229	9.88E+03	3454	0.
24	3.25E+07	251	4.90E+03	3760	0.	121.9	24	5.30E+07	251	7.30E+03	3760	0.
26	3.02E+07	271	4.19E+03	4065	0.		26	3.00E+07	271	2.74E+03	4065	0.
28	2.85E+07	291	6.77E+03	4370	0.		28	3.65E+07	291	0.	4370	0.
30	2.13E+07	311	0.	4676	0.		30	2.25E+07	311	0.	4676	0.
LMC	4.87E-03	22	2.51E-03	1.20E-05	175	TOTALS	LMC	8.25E-03	19	1.71E-03	54	5.76E-06
MED	0.	57	0.	0.	65		MED	0.	64	0.	175	0.

AFGL CIRRUS STUDY BY AFGL												
AFGL CIRRUS STUDY BY AFGL					AFGL CIRRUS STUDY BY AFGL							
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START 191710Z					INTERVAL START 191710Z							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	7.36E+08	26	1.06E+05	4.00	0.	317.3	2	1.49E+09	25	7.04E+04	4.00	0.
4	1.50E+08	47	7.87E+05	706	0.	ALT (KM)	4	2.41E+08	47	4.99E+05	706	0.
6	1.41E+08	57	1.17E+05	1011	0.	8.783	6	2.27E+08	57	6.94E+04	1011	0.
8	1.30E+08	87	8.40E+04	1316	0.		8	2.10E+08	87	2.64E+04	1316	0.
10	1.00E+08	108	4.57E+04	1622	0.	TEMP (C)	10	1.42E+08	108	1.05E+04	1622	0.
12	7.82E+07	128	2.88E+04	1927	0.	-35.3	12	1.24E+08	128	1.43E+04	1927	0.
14	5.52E+07	148	1.54E+04	2233	0.	FRCSTPOINT	14	7.51E+07	148	3.07E+03	2233	0.
16	6.56E+07	169	1.10E+04	2538	0.		16	1.09E+08	169	2.45E+03	2538	0.
18	6.06E+07	189	1.10E+04	2843	0.		18	8.03E+07	189	0.	2843	0.
20	7.54E+07	209	2.99E+03	3145	0.	TAS (M/S)	20	4.16E+07	209	9.9E+02	3145	0.
22	7.34E+07	229	3.29E+03	3454	0.	122.4	22	2.56E+07	229	0.	3454	0.
24	1.95E+07	250	0.	3760	0.		24	2.29E+07	250	0.	3760	0.
26	1.75E+07	271	0.	4065	0.		26	1.85E+07	271	0.	4065	0.
28	1.52E+07	291	0.	4370	0.		28	1.45E+07	291	0.	4370	0.
30	1.26E+07	311	0.	4676	0.		30	7.43E+06	311	0.	4676	0.
LMC	3.05E-03	27	3.58E-04	0.	0.	TOTALS	LMC	3.66E-03	19	1.99E-04	0.	3.99E-04
MED	0.	50	0.	0.	90		MED	0.	37	0.	0.	0.

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-0X ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*191810\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.85E+09	26	0.	400	0.	315.0
4	3.11E+07	47	5.87E+04	706	0.	ALT (KM)
6	9.46E+06	67	1.71E+04	1011	0.	8.815
8	8.49E+06	37	1.59E+04	1316	0.	
10	5.82E+06	109	3.46E+03	1622	0.	TEMP (C)
12	5.58E+05	128	1.16E+04	1927	0.	-35.3
14	2.91E+06	148	2.02E+03	2233	0.	
16	5.37E+06	159	0.	2538	0.	FROSTPOINT
18	3.40E+06	139	2.70E+03	2843	0.	
20	7.29E+05	203	0.	3149	0.	
22	1.46E+06	230	0.	3454	0.	TAS (M/S)
24	1.94E+06	253	0.	3760	0.	124.1
26	1.21E+06	271	0.	4065	0.	
28	1.21E+06	291	0.	4370	0.	
30	2.47E+06	311	0.	4676	0.	
TOTALS						
LWC	2.66E-04		1.23E-04		0.	1.23E-04
MED D	73		59		0	59

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*191910\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.13E+07	26	3.44E+05	400	2.77E+02	315.9
4	4.94E+06	47	3.69E+06	706	7.35E+00	ALT (KM)
6	7.42E+08	67	2.89E+05	1011	0.	8.814
8	6.39E+06	37	1.90E+05	1316	0.	
10	5.24E+06	109	5.16E+04	1622	0.	TEMP (C)
12	4.17E+06	129	3.57E+04	1927	0.	-35.9
14	2.76E+08	143	2.71E+04	2233	0.	
16	3.71E+08	169	1.74E+04	2538	0.	FROSTPOINT
18	3.19E+08	189	3.66E+04	2843	0.	
20	1.08E+08	209	3.51E+04	3149	0.	
22	1.44E+08	210	1.82E+04	3454	0.	TAS (M/S)
24	1.10E+08	240	1.91E+04	3760	0.	125.1
26	1.03E+08	271	3.08E+04	4065	0.	
28	9.24E+07	291	1.07E+04	4370	0.	
30	6.78E+07	311	2.15E+04	4676	0.	
TOTALS						
LWC	1.67E-02		4.77E-03		2.75E-04	3.41E-03
MED D	21		60		185	45

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*191910\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.61E+07	26	3.46E+05	400	6.65E+02	315.0
4	4.67E+06	47	3.52E+06	706	3.05E+01	ALT (KM)
6	6.73E+08	67	4.05E+05	1011	0.	8.815
8	5.51E+06	47	2.66E+05	1316	0.	
10	4.33E+08	108	6.91E+04	1622	0.	TEMP (C)
12	3.71E+08	129	6.09E+04	1927	0.	-35.9
14	2.30E+08	149	3.52E+04	2233	0.	
16	3.37E+08	169	2.99E+04	2538	0.	FROSTPOINT
18	2.67E+08	199	3.49E+04	2843	0.	
20	1.41E+08	209	3.51E+04	3149	0.	
22	1.14E+08	230	4.08E+04	3454	0.	TAS (M/S)
24	9.79E+07	250	3.94E+04	3760	0.	124.0
26	9.84E+07	271	3.09E+04	4065	0.	
28	8.92E+07	291	3.53E+04	4370	0.	
30	6.17E+07	311	2.51E+04	4676	0.	
TOTALS						
LWC	1.49E-02		6.24E-03		7.20E-04	4.39E-03
MED D	22		93		192	60

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START \*191810\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.57E+08	26	1.38E+05	400	8.21E+01	315.0
4	4.05E+08	47	2.50E+06	706	0.	ALT (KM)
6	5.32E+08	67	3.28E+05	1011	0.	8.816
8	4.40E+08	47	2.54E+05	1316	0.	
10	3.39E+08	109	7.77E+04	1622	0.	TEMP (C)
12	2.87E+08	128	5.37E+04	1927	0.	-36.0
14	1.79E+08	149	4.53E+04	2233	0.	
16	2.47E+08	169	2.82E+04	2538	0.	FROSTPOINT
18	2.02E+08	189	7.25E+04	2843	0.	
20	1.17E+08	203	4.39E+04	3149	0.	
22	9.51E+07	230	2.58E+04	3454	0.	TAS (M/S)
24	6.89E+07	250	2.74E+04	3760	0.	124.8
26	7.18E+07	271	2.01E+04	4065	0.	
28	6.48E+07	291	1.07E+04	4370	0.	
30	4.26E+07	311	1.79E+03	4676	0.	
TOTALS						
LWC	1.11E-02		4.41E-03		7.11E-05	3.45E-03
MED D	71		76		179	99

APML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING				
INTERVAL START *1920140*					INTERVAL START *192140*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	6.31E+08	26	3.79E+05	400	5.60E+02	2	1.41E+09	26	3.44E+05
4	2.23E+08	57	5.90E+05	706	9.44E+03	4	1.15E+09	47	9.50E+04
6	1.79E+08	67	1.28E+05	1011	8.817	6	7.76E+07	57	3.38E+04
8	1.33E+08	87	1.79E+05	1316	0.	8	5.29E+07	57	6.03E+04
10	1.12E+08	104	7.76E+04	1622	0.	10	4.41E+07	108	9.73E+04
12	8.61E+07	128	6.17E+04	1927	0.	12	3.71E+07	128	1.54E+05
14	4.57E+07	144	7.63E+04	2233	0.	14	2.68E+07	148	9.46E+04
16	7.88E+07	169	4.55E+04	2538	0.	16	2.76E+07	149	6.17E+04
18	6.04E+07	189	9.84E+04	2843	0.	18	2.15E+07	193	7.46E+04
20	3.07E+07	209	1.04E+05	3149	0.	20	1.10E+07	209	8.90E+04
22	2.54E+07	230	8.80E+04	3454	0.	22	1.44E+07	230	1.92E+04
24	2.49E+07	250	9.06E+04	3760	0.	24	6.94E+06	250	5.93E+03
26	2.42E+07	271	5.90E+04	4065	0.	26	1.03E+07	271	2.66E+03
28	1.98E+07	291	3.37E+04	4370	0.	28	7.43E+06	291	1.53E+03
30	1.46E+07	311	3.04E+04	4676	0.	30	6.54E+06	311	0.
LWC 3.46E-03					TOTALS				
MED 0 27					LWC 1.43E-03				
					MED 0 22				
					LWC 8.61E-06				
					MED 0 175				
					TAS (M/S) 126.1				
					ALT (KM) 8.823				
					TEMP (C) -35.9				
					PRECIP (MM) 319.4				

APML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING				
INTERVAL START *1920140*					INTERVAL START *192140*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.63E+08	26	5.84E+05	400	1.27E+02	2	6.52E+08	26	2.39E+05
4	2.66E+08	47	8.68E+05	706	1.08E+00	4	1.58E+08	47	1.78E+05
6	2.49E+08	57	2.33E+05	1011	0.	6	1.42E+08	57	1.47E+05
8	1.99E+08	87	2.49E+05	1316	0.	8	1.07E+08	87	1.08E+05
10	1.61E+08	104	1.61E+05	1622	0.	10	8.76E+07	104	2.33E+05
12	1.15E+08	128	1.62E+05	1927	0.	12	7.25E+07	128	2.64E+05
14	8.17E+07	144	1.19E+05	2233	0.	14	4.20E+07	144	1.79E+05
16	1.01E+08	169	9.63E+04	2538	0.	16	5.90E+07	169	0.94E+04
18	6.77E+07	189	1.63E+05	2843	0.	18	4.39E+07	189	1.06E+05
20	5.23E+07	209	1.09E+05	3149	0.	20	2.80E+07	209	6.66E+04
22	4.29E+07	230	7.93E+04	3454	0.	22	2.56E+07	230	2.92E+04
24	3.37E+07	250	5.00E+04	3760	0.	24	1.39E+07	250	1.86E+04
26	3.78E+07	271	4.16E+04	4065	0.	26	2.08E+07	271	1.19E+04
28	3.25E+07	291	2.91E+04	4370	0.	28	1.77E+07	291	1.51E+03
30	3.03E+07	311	1.43E+04	4676	0.	30	1.48E+07	311	3.54E+03
LWC 5.50E-03					TOTALS				
MED 0 73					LWC 2.86E-03				
					MED 0 22				
					LWC 4.91E-03				
					MED 0 175				
					TAS (M/S) 126.4				
					ALT (KM) 8.822				
					TEMP (C) -35.0				
					PRECIP (MM) 319.5				



AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *19122100*					INTERVAL START *19123100*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE1 BULL-ROSE					TYPE1 BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	7.36E+08	25	3.43E+05	2.99E+01	315.4	2	4.09E+08	25	1.04E+05	4.00	1.62E+03
4	1.70E+08	47	8.12E+04	0.	ALT (KM)	4	2.54E+08	47	9.40E+05	706	1.69E+01
6	1.03E+08	57	7.61E+04	0.	8.823	6	2.25E+08	57	2.05E+05	1011	1.67E+00
8	8.88E+07	47	1.06E+05	0.		8	1.77E+08	47	1.67E+05	1316	0.
10	7.25E+07	104	1.37E+05	0.	TEMP (C)	10	1.36E+08	104	8.32E+04	1622	0.
12	5.35E+07	125	2.03E+05	0.	-36.0	12	1.19E+08	125	2.62E+04	1927	0.
14	3.65E+07	143	1.66E+05	0.	FRCSPOINT	14	6.82E+07	143	1.62E+04	2233	0.
16	4.70E+07	159	8.90E+04	0.		16	9.88E+07	159	6.66E+03	2538	0.
18	1.07E+07	149	1.32E+05	0.		18	5.89E+07	149	3.24E+04	2843	0.
20	1.83E+07	203	9.32E+04	0.	TAS (M/S)	20	3.87E+07	203	7.56E+04	3149	0.
22	1.70E+07	230	3.51E+04	0.	125.7	22	4.08E+07	230	8.64E+04	3454	0.
24	1.65E+07	250	1.78E+04	0.		24	3.21E+07	250	9.36E+04	3760	0.
26	1.42E+07	271	1.60E+04	0.		26	3.23E+07	271	1.01E+05	4065	0.
28	1.25E+07	291	9.45E+03	0.		28	2.82E+07	291	1.47E+05	4370	0.
30	9.12E+06	311	7.12E+03	0.		30	1.75E+07	311	7.59E+04	4676	0.
LMC	2.13E-03		5.13E-03	2.59E-05	TOTALS	LMC	4.30E-03		1.06E-02	1.50E-03	4.41E-03
MED	27		83	175	4.28E-03	MED	22		119	166	96
AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *19122100*					INTERVAL START *19123100*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE1 BULL-ROSE					TYPE1 BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.80E+08	25	3.10E+05	6.55E+02	315.7	2	1.12E+09	25	0.	4.00	1.09E+03
4	3.55E+08	47	1.92E+06	6.30E+00	ALT (KM)	4	1.67E+08	47	6.84E+05	706	2.68E+01
6	3.61E+08	57	2.59E+05	5.51E-01	8.817	6	1.46E+08	57	7.70E+04	1011	1.12E+00
8	3.20E+08	47	1.89E+05	0.		8	1.27E+08	47	4.55E+04	1316	0.
10	2.58E+08	104	9.30E+04	0.	TEMP (C)	10	1.00E+08	104	2.08E+04	1622	0.
12	2.31E+08	125	9.23E+04	0.	-36.1	12	7.75E+07	125	2.68E+04	1927	0.
14	1.29E+08	143	3.41E+04	0.	FRCSPOINT	14	4.53E+07	143	9.10E+03	2233	0.
16	1.93E+08	169	2.40E+04	0.		16	7.17E+07	169	5.85E+03	2538	0.
18	1.43E+08	183	8.16E+04	0.		18	4.81E+07	189	5.41E+03	2843	0.
20	8.72E+07	203	1.23E+05	0.	TAS (M/S)	20	2.79E+07	209	1.24E+04	3149	0.
22	6.86E+07	230	1.50E+05	0.	125.1	22	2.50E+07	230	1.30E+04	3454	0.
24	5.89E+07	250	1.17E+05	0.		24	2.04E+07	250	3.13E+04	3760	0.
26	5.26E+07	271	1.07E+05	0.		26	2.24E+07	271	5.81E+04	4065	0.
28	4.49E+07	291	9.20E+04	0.		28	1.72E+07	291	5.42E+04	4370	0.
30	3.77E+07	311	8.29E+04	0.		30	1.42E+07	311	1.80E+04	4676	0.
LMC	8.42E-03		1.18E-02	6.04E-04	TOTALS	LMC	3.66E-03		4.01E-02	1.08E-03	1.93E-03
MED	27		109	179	5.66E-03	MED	22		120	105	125



AFML CIRRUS STUDY BY AFGL

FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 19124100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	5.79E+08	26	1.04E+05	4.00	315.5
4	3.12E+08	47	2.23E+06	706	
6	3.70E+08	57	3.89E+05	1011	8.823
8	3.08E+08	37	1.87E+05	1316	
10	2.46E+08	128	7.81E+04	1522	TEMP (C)
12	2.13E+08	128	4.13E+04	1927	-56.0
14	1.13E+08	148	2.94E+04	2233	
16	1.87E+08	169	1.84E+04	2938	FRCTPOINT
18	1.47E+08	159	4.87E+04	2943	
20	7.08E+07	209	7.08E+04	3149	
22	6.29E+07	230	5.84E+04	3454	TAS (M/S)
24	4.80E+07	250	5.05E+04	3760	123.9
26	4.73E+07	271	4.87E+04	4065	
28	5.29E+07	291	2.17E+04	4370	
30	3.49E+07	311	1.26E+04	4676	
TOTALS					
LWC	6.25E-03		5.87E-03	2.75E-04	3.74E-03
MED D	22		97	150	77

AFML CIRRUS STUDY BY AFGL

FLIGHT E7B-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 19125110  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	1.47E+08	26	4.18E+05	4.00	315.5
4	4.82E+08	47	2.17E+06	706	
6	5.26E+08	57	2.45E+05	1011	6.822
8	4.71E+08	37	2.17E+05	1316	
10	3.59E+08	128	9.92E+04	1622	TEMP (C)
12	3.03E+08	128	1.03E+05	1927	-35.7
14	1.64E+08	148	7.71E+04	2233	
16	2.75E+08	169	4.18E+04	2938	FRCTPOINT
18	1.58E+08	159	5.50E+04	2943	
20	1.10E+08	209	4.87E+04	3149	
22	9.50E+07	230	3.24E+04	3454	TAS (M/S)
24	6.72E+07	250	1.44E+04	3760	123.9
26	6.76E+07	271	1.48E+04	4065	
28	6.57E+07	291	1.23E+04	4370	
30	4.41E+07	311	1.26E+04	4676	
TOTALS					
LWC	1.17E-02		4.62E-03	8.55E-05	3.63E-03
MED D	21		77	179	66

INTERVAL START 19124110  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	1.54E+08	26	1.74E+05	4.00	315.5
4	3.75E+08	47	2.77E+06	706	
6	4.20E+08	57	4.61E+05	1011	8.823
8	3.99E+08	37	2.72E+05	1316	
10	2.68E+08	128	1.26E+05	1522	TEMP (C)
12	2.88E+08	128	1.02E+05	1927	-55.9
14	1.47E+08	148	8.59E+04	2233	
16	2.95E+08	159	4.86E+04	2938	FRCTPOINT
18	1.51E+08	189	7.51E+04	2643	
20	9.20E+07	209	7.31E+04	3149	
22	8.27E+07	230	5.00E+04	3454	TAS (M/S)
24	5.52E+07	250	4.28E+04	3760	123.9
26	6.09E+07	271	2.72E+04	4065	
28	5.75E+07	291	1.09E+04	4370	
30	4.52E+07	311	5.44E+03	4676	
TOTALS					
LWC	9.64E-03		6.12E-03	7.67E-05	4.72E-03
MED D	22		81	177	67

INTERVAL START 19125110  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)
2	5.90E+07	26	1.39E+05	4.00	315.5
4	5.07E+08	47	2.14E+06	706	
6	8.59E+08	57	2.06E+05	1011	8.819
8	7.94E+08	37	1.61E+05	1316	
10	6.76E+08	128	7.31E+04	1622	TEMP (C)
12	5.30E+08	128	7.02E+04	1927	-35.6
14	3.28E+08	148	4.67E+04	2233	
16	4.86E+08	169	2.76E+04	2938	FRCTPOINT
18	3.54E+08	189	4.97E+04	2843	
20	1.80E+08	209	3.64E+04	3149	
22	1.45E+08	230	1.84E+04	3454	TAS (M/S)
24	1.89E+08	250	2.29E+04	3760	123.9
26	8.53E+07	271	1.08E+04	4065	
28	9.37E+07	291	1.24E+04	4370	
30	5.47E+07	311	5.41E+03	4676	
TOTALS					
LWC	1.75E-02		3.70E-03	8.43E-05	2.85E-03
MED D	21		77	162	66

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E79-03 ON 26 FEB 76 30 SECOND AVERAGING							
INTERVAL START *1912510*						INTERVAL START *1912710*							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPET-BULL-ROSE						TYPET-BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.59E+07	26	1.05E+05	400	2.53E+00	319.9	2	7.31E+07	26	4.24E+05	400	8.73E+00	316.0
4	5.92E+08	47	1.08E+06	706	0.	ALT (MM)	4	4.99E+08	47	1.44E+06	706	0.	ALT (MM)
6	1.57E+09	67	8.61E+04	1011	0.	8.812	6	1.20E+09	67	2.44E+05	1011	0.	8.811
8	1.76E+09	87	3.08E+04	1316	0.	TEMP (C)	8	1.20E+09	67	2.68E+05	1316	0.	TEMP (C)
10	1.34E+09	108	2.44E+04	1622	0.	-35.7	10	9.40E+08	108	1.68E+05	1622	0.	TEMP (C)
12	1.77E+09	128	2.58E+04	1927	0.	FRCSPOINT	12	7.19E+08	128	1.68E+05	1927	0.	FRCSPOINT
14	6.17E+08	148	8.13E+03	2233	0.	TAS (M/S)	14	4.16E+08	148	9.46E+04	2233	0.	TAS (M/S)
16	9.14E+08	169	8.40E+03	2538	0.	123.6	16	6.10E+08	169	5.84E+04	2538	0.	FRCSPOINT
18	6.22E+08	189	4.53E+03	2843	0.	376.0	18	4.26E+08	189	7.69E+04	2843	0.	TAS (M/S)
20	2.87E+08	209	6.93E+03	3149	0.	437.0	20	1.76E+08	209	3.49E+04	3149	0.	FRCSPOINT
22	1.64E+08	230	1.09E+03	3454	0.	467.6	22	1.13E+08	230	3.74E+04	3454	0.	TAS (M/S)
24	9.31E+07	250	0.	3760	0.	0.	24	7.19E+07	250	1.38E+04	3760	0.	FRCSPOINT
26	7.45E+07	271	1.36E+03	4065	0.	0.	26	6.55E+07	271	4.12E+03	4065	0.	TAS (M/S)
28	5.08E+07	291	0.	4370	0.	0.	28	5.29E+07	291	6.28E+03	4370	0.	FRCSPOINT
30	3.56E+07	311	0.	4676	0.	0.	30	3.76E+07	311	5.51E+03	4676	0.	TAS (M/S)
LWC	2.24E-02	8.78E-04	2.19E-06	2.19E-06	2.19E-06	8.56E-04	LWC	1.64E-02	4.42E-03	4.42E-03	7.56E-05	7.56E-05	3.87E-03
MED	17	38	175	175	175	37	MED	10	72	175	175	175	67
TOTALS							TOTALS						

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E79-03 ON 26 FEB 76 30 SECOND AVERAGING							
INTERVAL START *1912510*						INTERVAL START *1912710*							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPET-BULL-ROSE						TYPET-BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.04E+07	26	3.51E+04	400	3.07E+00	316.1	2	1.72E+08	26	3.53E+04	400	5.07E+00	316.4
4	5.92E+08	47	1.50E+06	706	0.	ALT (MM)	4	4.67E+08	47	1.35E+06	706	0.	ALT (MM)
6	1.53E+09	67	1.43E+05	1011	0.	8.808	6	5.14E+08	67	1.69E+05	1011	0.	8.803
8	1.77E+09	87	1.71E+05	1316	0.	TEMP (C)	8	5.08E+08	87	1.18E+05	1316	0.	TEMP (C)
10	1.21E+09	108	6.15E+04	1622	0.	-35.7	10	3.66E+08	108	8.77E+04	1622	0.	TEMP (C)
12	9.71E+08	128	4.95E+04	1927	0.	FRCSPOINT	12	3.22E+08	128	1.27E+05	1927	0.	FRCSPOINT
14	5.68E+08	148	3.08E+04	2233	0.	TAS (M/S)	14	1.76E+08	148	8.91E+04	2233	0.	TAS (M/S)
16	8.90E+08	169	1.37E+04	2538	0.	123.6	16	2.76E+08	169	4.47E+04	2538	0.	FRCSPOINT
18	5.22E+08	189	2.10E+04	2843	0.	376.0	18	2.20E+08	189	5.01E+04	2843	0.	TAS (M/S)
20	2.26E+08	209	6.90E+03	3149	0.	437.0	20	1.60E+08	209	3.77E+04	3149	0.	FRCSPOINT
22	1.41E+08	230	1.10E+04	3454	0.	0.	22	8.29E+07	230	2.07E+04	3454	0.	TAS (M/S)
24	6.79E+07	250	1.22E+03	3760	0.	0.	24	5.39E+07	250	6.05E+03	3760	0.	FRCSPOINT
26	8.32E+07	271	1.36E+03	4065	0.	0.	26	5.23E+07	271	2.75E+03	4065	0.	TAS (M/S)
28	5.77E+07	291	1.50E+03	4370	0.	0.	28	4.57E+07	291	4.64E+03	4370	0.	FRCSPOINT
30	3.45E+07	311	0.	4676	0.	0.	30	2.53E+07	311	1.80E+03	4676	0.	TAS (M/S)
LWC	2.12E-02	1.75E-03	2.66E-06	2.66E-06	2.66E-06	1.68E-03	LWC	9.80E-03	3.11E-03	3.11E-03	4.38E-06	4.38E-06	2.83E-03
MED	17	34	175	175	175	32	MED	20	71	175	175	175	69
TOTALS							TOTALS						

AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL						
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E76-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *19128100*					INTERVAL START *19128100*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTE-PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTE-PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.42E+09	26	6.82E+04	4.68E+01	319.3	2	2.35E+09	26	6.92E+04	1.05E+01	326.2
4	2.24E+08	47	5.92E+05	5.16E-01		4	6.54E+07	47	3.66E+04	0.	ALT (KM)
6	2.46E+08	67	6.28E+04	1011	8.741	6	3.05E+07	67	2.57E+04	1011	0.
8	2.69E+08	37	1.00E+04	1316	0.	8	2.69E+07	37	3.59E+04	1316	0.
10	1.52E+08	109	1.87E+04	1622	0.	10	1.50E+07	109	3.70E+04	1622	0.
12	1.80E+08	123	5.01E+03	1927	0.	12	1.53E+07	123	3.60E+04	1927	0.
14	1.42E+08	148	7.95E+03	2233	0.	14	9.53E+06	148	2.43E+04	2233	0.
16	1.42E+08	159	2.45E+03	2538	0.	16	1.31E+07	159	1.00E+04	2538	0.
18	1.09E+08	169	8.79E+02	2843	0.	18	8.48E+06	169	2.66E+04	2843	0.
20	5.79E+07	209	2.87E+03	3149	0.	20	7.27E+06	209	2.62E+04	3149	0.
22	3.71E+07	230	3.19E+03	3454	0.	22	4.54E+05	230	9.61E+03	3454	0.
24	2.75E+07	250	2.75E+03	3760	0.	24	3.53E+05	250	8.32E+03	3760	0.
26	2.56E+07	271	7.95E+03	4065	0.	26	4.13E+05	271	5.35E+03	4065	0.
28	2.25E+07	291	4.52E+03	4370	0.	28	3.80E+06	291	4.60E+03	4370	0.
30	1.15E+07	311	3.51E+03	4676	0.	30	3.16E+06	311	1.78E+03	4676	0.
LMC	4.09E-03	19	7.56E-04	4.29E-05	5.40E-04	LMC	6.46E-04	1.29E-03	9.08E-06	5.35E-04	0.
MED	0	19	70	179	42	MED	0	99	175	0.	0.
TOTALS											
322.3											
ALT (KM)											
8.676											
TEMP (C)											
-35.6											
FROSTPOINT											
-34.2											
TAS (M/S)											
126.9											

AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL						
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E76-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START *19128100*					INTERVAL START *19128100*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTE-PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTE-PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.19E+09	26	1.02E+05	2.40E+02	322.3	2	4.75E+08	26	7.04E+04	1.58E+01	326.5
4	1.40E+08	47	6.26E+04	1.99E+01		4	2.52E+08	47	9.41E+05	788	0.
6	8.80E+07	67	0.	0.	8.676	6	2.04E+08	67	1.36E+05	1011	0.
8	6.38E+07	87	9.92E+03	1316	0.	8	1.32E+08	87	1.12E+05	1316	0.
10	5.42E+07	109	1.67E+04	1622	0.	10	1.35E+06	109	8.48E+04	1622	0.
12	3.78E+07	129	5.79E+04	1927	0.	12	1.80E+08	129	7.00E+04	1927	0.
14	2.40E+07	148	5.94E+04	2233	0.	14	6.78E+07	148	4.44E+04	2233	0.
16	3.26E+07	159	5.72E+04	2538	0.	16	1.03E+08	159	2.56E+04	2538	0.
18	2.26E+07	189	1.30E+05	2843	0.	18	8.46E+07	189	1.84E+04	2843	0.
20	1.36E+07	209	9.42E+04	3149	0.	20	4.54E+07	209	2.64E+04	3149	0.
22	1.07E+07	230	8.35E+04	3454	0.	22	3.67E+07	230	1.43E+04	3454	0.
24	9.51E+06	250	6.39E+04	3760	0.	24	3.67E+07	250	8.63E+03	3760	0.
26	9.04E+06	271	5.81E+04	4065	0.	26	3.72E+07	271	2.72E+03	4065	0.
28	9.04E+06	291	3.02E+04	4370	0.	28	2.80E+07	291	6.54E+03	4370	0.
30	7.66E+06	311	1.23E+04	4676	0.	30	2.41E+07	311	3.70E+03	4676	0.
LMC	1.51E-03	22	6.26E-03	2.15E-04	3.54E-03	LMC	4.89E-03	2.24E-03	1.38E-05	1.84E-03	0.
MED	0	22	103	177	69	MED	0	71	175	0.	0.
TOTALS											
322.3											
ALT (KM)											
8.676											
TEMP (C)											
-35.0											
FROSTPOINT											
-34.2											
TAS (M/S)											
126.7											

AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START *191310*					INTERVAL START *191310*							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	9.22E+08	26	3.22E+05	5.54E+01	331.7	2	1.04E+09	26	1.78E+05	400	1.02E+02	
4	1.46E+08	47	2.25E+05	5.49E-01		4	1.53E+08	47	5.65E+05	706	8.65E+08	
6	8.50E+07	57	7.06E+04	0.	8.483	6	9.49E+07	57	1.01E+05	1011	5.68E-01	
8	5.68E+07	47	5.50E+04	0.		8	8.78E+07	37	6.53E+04	1316	0.	
10	5.48E+07	108	8.04E+04	0.	TEMP (C)	10	6.97E+07	108	2.49E+04	1622	0.	
12	4.38E+07	128	8.74E+04	0.	-33.2	12	5.35E+07	128	5.53E+04	1927	0.	
14	2.63E+07	148	7.30E+04	0.		14	2.81E+07	148	5.39E+04	2233	0.	
16	4.38E+07	168	3.62E+04	0.	FRGSTPOINT	16	4.59E+07	168	4.79E+04	2538	0.	
18	3.08E+07	188	5.49E+04	0.		18	3.39E+07	188	7.85E+04	2843	0.	
20	1.58E+07	208	4.77E+04	0.		20	2.02E+07	208	5.89E+04	3149	0.	
22	1.70E+07	230	3.57E+04	0.	TAS (M/S)	22	1.64E+07	230	3.55E+04	3454	0.	
24	9.02E+06	250	2.11E+04	0.	120.4	24	1.45E+07	250	1.89E+04	3760	0.	
26	1.05E+07	271	1.68E+04	0.		26	1.47E+07	271	1.11E+04	4065	0.	
28	1.50E+07	291	1.12E+04	0.		28	1.37E+07	291	9.53E+03	4370	0.	
30	7.76E+06	311	5.57E+03	0.		30	9.47E+06	311	9.23E+03	4676	0.	
LWC 1.87E-03					TOTALS	LWC 2.15E-03					TOTALS	
MED 0 22					2.35E-03	179	MED 0 22					2.58E-03
					90						49	
AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START *191310*					INTERVAL START *191310*							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	1.37E+09	26	7.15E+04	4.73E+02	325.4	2	9.43E+08	26	2.51E+05	400	5.76E+01	
4	9.68E+07	47	6.58E+04	3.27E+01		4	1.40E+08	47	2.93E+05	706	5.44E-01	
6	5.65E+07	57	4.42E+03	1.14E+01	8.406	6	1.00E+08	57	9.76E+04	1011	0.	
8	5.48E+07	47	1.06E+04	0.		8	8.44E+07	47	1.11E+05	1316	0.	
10	3.80E+07	108	2.69E+04	0.	TEMP (C)	10	6.46E+07	108	0.98E+04	1622	0.	
12	2.79E+07	128	3.59E+04	0.	-32.9	12	5.13E+07	128	8.22E+03	1927	0.	
14	2.06E+07	148	4.50E+04	0.		14	3.78E+07	148	9.20E+04	2233	0.	
16	2.48E+07	168	3.62E+04	0.	FRGSTPOINT	16	4.25E+07	168	5.34E+04	2538	0.	
18	1.91E+07	188	5.40E+04	0.		18	3.22E+07	188	9.56E+04	2843	0.	
20	1.11E+07	208	6.30E+04	0.		20	1.76E+07	208	7.19E+04	3149	0.	
22	8.79E+06	230	2.80E+04	0.	TAS (M/S)	22	1.61E+07	230	3.68E+04	3454	0.	
24	7.53E+06	250	3.60E+04	0.	120.1	24	1.46E+07	250	2.97E+04	3760	0.	
26	8.54E+06	271	1.54E+04	0.		26	1.56E+07	271	1.25E+04	4065	0.	
28	6.29E+06	291	2.71E+04	0.		28	1.53E+07	291	7.94E+03	4370	0.	
30	5.03E+06	311	1.49E+04	0.		30	1.13E+07	311	3.71E+03	4676	0.	
LWC 1.17E-03					TOTALS	LWC 2.22E-03					TOTALS	
MED 0 22					2.33E-03	203	MED 0 22					2.22E-03
					109						86	



AFWL CIRRUS STUDY BY AFGL

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING

INTERVAL START \*1933340\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

INTERVAL START \*1933210\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	7.35E+08	24	1.08E+05	400	2.26E+02	346.5	2	3.11E+09	26	0.	400	3.62E+02	353.9
4	1.75E+08	47	3.29E+05	706	2.72E+00	8.183	4	3.41E+07	47	0.	706	5.44E+01	ALT (KM)
6	1.20E+08	57	6.63E+04	1011	0.	8.183	6	8.70E+06	67	0.	1011	1.70E+10	8.037
8	8.74E+07	47	1.39E+05	1316	0.		8	0.70E+06	97	2.61E+03	1316	0.	
10	6.96E+07	104	5.72E+04	1622	0.	TEMP (C)	10	5.72E+06	108	7.55E+03	1622	0.	TEMP (C)
12	5.46E+07	124	9.25E+04	1927	0.	-31.7	12	3.73E+06	124	0.	1927	0.	
14	3.66E+07	148	5.15E+04	2233	0.		14	3.23E+06	148	0.	2233	0.	
16	4.89E+07	169	4.55E+04	2538	0.	FROSTPOINT	16	3.40E+06	169	0.	2538	0.	FROSTPOINT
18	3.18E+07	189	8.25E+04	2843	0.		18	1.99E+06	189	9.22E+02	2843	0.	
20	2.13E+07	209	7.20E+04	3149	0.		20	2.74E+06	209	0.	3149	0.	
22	1.53E+07	230	5.01E+04	3454	0.	TAS (M/S)	22	1.24E+06	230	1.11E+03	3454	0.	TAS (M/S)
24	1.05E+07	251	4.45E+04	3760	0.	120.6	24	4.87E+05	250	0.	3760	0.	121.4
26	1.78E+07	271	2.78E+04	4065	0.		26	9.56E+05	271	4.14E+02	4065	0.	
28	1.07E+07	291	3.10E+04	4370	0.		28	7.46E+05	291	0.	4370	0.	
30	1.08E+07	311	1.11E+04	4676	0.		30	2.49E+05	311	0.	4676	0.	
TOTALS													
LMC	2.44E-03	23	5.04E-03	98	2.09E-04	179	LMC	1.71E-04	19	1.03E-04	116	5.92E-04	235
MED	0					3.12E-03	MED	0					259

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	1.02E+09	26	0.	400	2.84E+02	349.7	2	3.50E+09	26	0.	400	1.57E+00	357.1
4	1.77E+08	47	9.56E+04	706	1.04E+02	ALT (KM)	4	3.41E+07	47	0.	706	0.	ALT (KM)
6	8.50E+07	57	2.64E+04	1011	4.55E+00	8.120	6	0.	67	0.	1011	0.	7.976
8	5.68E+07	47	4.23E+03	1316	0.		8	5.06E+05	47	0.	1316	0.	
10	4.94E+07	104	5.74E+03	1622	0.	TEMP (C)	10	0.	104	0.	1622	0.	TEMP (C)
12	3.39E+07	124	8.59E+03	1927	0.	-31.3	12	0.	124	0.	1927	0.	-30.7
14	2.04E+07	148	4.15E+03	2233	0.		14	0.	148	0.	2233	0.	
16	3.29E+07	169	2.56E+03	2538	0.	FROSTPOINT	16	0.	169	0.	2538	0.	FROSTPOINT
18	2.07E+07	189	1.76E+04	2843	0.		18	0.	189	0.	2843	0.	
20	1.87E+07	209	3.02E+04	3149	0.		20	0.	209	0.	3149	0.	
22	8.47E+06	230	3.44E+04	3454	0.	TAS (M/S)	22	0.	230	0.	3454	0.	TAS (M/S)
24	6.73E+06	251	3.70E+04	3760	0.	121.1	24	0.	250	0.	3760	0.	119.6
26	7.03E+06	271	5.96E+04	4065	0.		26	0.	271	0.	4065	0.	
28	8.08E+06	291	5.33E+04	4370	0.		28	0.	291	0.	4370	0.	
30	6.48E+06	311	4.60E+04	4676	0.		30	0.	311	0.	4676	0.	
TOTALS													
LMC	1.59E-03	21	5.16E-03	123	3.29E-03	196	LMC	3.17E-05	0.	0	0	1.36E-06	175
MED	0					4.16E-03	MED	0					175

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191331100  
 INFERVAL START 191351100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191331100  
 INFERVAL START 191351100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.19E+09	76	0.	2.15E+02	360.0	2	2.06E+09	26	0.	1.56E+03	366.2
4	3.89E+07	47	1.89E+04	5.17E+01	ALT (KM)	4	7.14E+07	47	5.69E+04	1.96E+02	ALT (KM)
6	8.83E+06	67	4.44E+03	1.73E+01	7.909	6	3.59E+07	57	1.33E+04	1.21E+01	7.764
8	5.30E+06	47	0.	0.	TEMP (C)	8	3.66E+07	47	2.39E+03	0.	TEMP (C)
10	5.80E+06	104	0.	0.	-29.8	10	3.82E+07	104	5.40E+03	0.	-26.7
12	3.03E+06	128	2.57E+03	0.	0.	12	1.82E+07	128	1.87E+04	0.	0.
14	2.02E+06	148	0.	0.	0.	14	1.56E+07	148	4.20E+03	0.	0.
16	2.52E+06	169	8.66E+02	25.38	0.	16	1.77E+07	169	6.97E+03	25.38	0.
18	1.77E+06	189	6.54E+03	29.43	0.	18	1.49E+07	189	7.48E+03	28.43	0.
20	7.56E+05	209	4.07E+03	31.99	0.	20	8.08E+05	209	6.18E+03	31.99	0.
22	1.01E+06	230	1.01E+04	36.54	0.	22	5.55E+05	230	1.12E+04	34.54	0.
24	2.52E+05	250	1.12E+04	37.60	0.	24	3.88E+06	250	6.28E+03	37.60	0.
26	2.52E+05	271	1.40E+03	40.65	0.	26	5.81E+06	271	7.02E+03	40.65	0.
28	5.05E+05	291	3.20E+03	43.70	0.	28	5.81E+06	291	9.61E+03	43.70	0.
30	5.05E+05	311	1.87E+03	46.76	0.	30	1.51E+06	311	2.24E+04	46.76	0.
LWC	1.36E-04	5.15E-04	4.07E-04	6.17E-04	TOTALS	LWC	7.83E-04	1.39E-03	2.45E-03	2.80E-03	TOTALS
MED D	18	108	254	179		MED D	21	124	229	212	

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191331100  
 INFERVAL START 191351100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191331100  
 INFERVAL START 191351100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.97E+09	76	0.	1.25E+01	366.1	2	2.54E+09	76	0.	1.35E+03	371.5
4	9.26E+07	47	4.74E+04	7.840	ALT (KM)	4	7.52E+07	47	9.46E+03	1.04E+02	ALT (KM)
6	5.56E+07	67	3.11E+04	4.61E+00	7.840	6	3.59E+07	57	4.46E+03	5.20E+00	7.701
8	3.61E+07	47	2.65E+04	1316	0.	8	2.99E+07	37	1.86E+04	0.	0.
10	3.03E+07	104	2.52E+04	1622	0.	10	2.28E+07	104	1.80E+03	1622	0.
12	2.17E+07	128	2.27E+04	1977	0.	12	1.82E+07	128	5.35E+03	1977	0.
14	1.44E+07	148	1.47E+04	2233	0.	14	1.04E+07	148	4.21E+03	2233	0.
16	2.02E+07	169	7.80E+03	2538	0.	16	1.79E+07	169	0.	2538	0.
18	1.52E+07	189	1.59E+04	2843	0.	18	9.11E+06	189	0.	2843	0.
20	7.89E+05	209	1.59E+04	3149	0.	20	5.06E+06	209	3.07E+03	3149	0.
22	4.59E+05	230	1.79E+04	3454	0.	22	3.86E+06	230	6.28E+03	3454	0.
24	5.81E+05	250	4.99E+03	3760	0.	24	3.86E+06	250	6.28E+03	3760	0.
26	5.56E+06	271	1.40E+04	4065	0.	26	3.86E+06	271	1.97E+04	4065	0.
28	5.05E+06	291	9.62E+03	4370	0.	28	3.86E+06	291	1.44E+04	4370	0.
30	5.05E+06	311	1.12E+04	4676	0.	30	2.79E+06	311	2.06E+04	4676	0.
LWC	9.08E-04	1.56E-03	1.87E-03	2.60E-03	TOTALS	LWC	5.93E-04	1.45E-03	1.75E-03	1.80E-03	TOTALS
MED D	27	112	224	179		MED D	21	124	229	201	

AFGL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191310\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.69E+09	25	0.	6.79E+02	374.4	2	1.47E+09	26	1.08E+05	4.00	5.59E+01
4	4.73E+07	47	0.	8.68E+01	7.666	4	8.30E+07	47	9.89E+04	706	5.48E-01
6	1.54E+07	57	4.47E+03	1.011	7.666	6	6.43E+07	57	2.66E+04	1.011	0.
8	1.67E+07	97	2.65E+03	1.316	0.	8	4.81E+07	97	5.81E+04	1.316	0.
10	9.62E+06	108	3.62E+03	1.622	0.	10	3.48E+07	108	7.19E+04	1.622	0.
12	7.65E+06	123	0.	1.927	0.	12	2.95E+07	128	7.99E+04	1.927	0.
14	3.54E+06	143	0.	2.233	0.	14	1.59E+07	143	7.66E+04	2.233	0.
16	3.32E+06	169	0.	2.538	0.	16	2.27E+07	169	3.29E+04	2.538	0.
18	3.04E+06	139	9.32E+02	2.843	0.	18	1.79E+07	189	6.08E+04	2.843	0.
20	2.03E+06	209	1.07E+03	3.149	0.	20	1.03E+07	209	4.13E+04	3.149	0.
22	2.79E+06	230	1.13E+03	3.454	0.	22	9.08E+06	230	1.94E+04	3.454	0.
24	2.02E+06	271	2.81E+03	4.065	0.	24	6.01E+06	271	1.12E+04	3.760	0.
26	1.77E+06	271	6.44E+03	4.370	0.	26	7.82E+06	271	1.54E+04	4.065	0.
28	1.27E+06	311	7.53E+03	4.676	0.	28	7.82E+06	291	1.12E+04	4.370	0.
30	1.27E+06	311	7.53E+03	4.676	0.	30	4.29E+06	311	1.68E+04	4.676	0.
TOTALS											
LMC	2.89E-04	4.99E-04	1.07E-03	1.11E-03	1.11E-03	LMC	1.13E-03	3.00E-03	5.10E-05	2.01E-03	0.1
MED	21	131	230	229	229	MED	29	91	179	103	81

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191310\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.15E+09	25	7.15E+04	3.75E+02	376.2	2	1.07E+09	26	1.10E+05	4.00	4.95E+01
4	6.31E+07	47	1.51E+05	5.19E+01	7.576	4	1.22E+08	47	2.89E+04	706	1.11E+09
6	3.19E+07	57	4.42E+04	3.44E+00	7.576	6	7.57E+07	57	5.86E+04	1.011	0.
8	2.34E+07	97	5.53E+04	1.316	0.	8	6.20E+07	97	5.09E+04	1.316	0.
10	1.61E+07	108	2.51E+04	1.622	0.	10	4.66E+07	108	9.67E+04	1.622	0.
12	1.66E+07	123	1.19E+04	1.927	0.	12	3.55E+07	128	1.54E+05	1.927	0.
14	8.29E+06	143	4.18E+03	2.233	0.	14	2.50E+07	143	1.37E+05	2.233	0.
16	1.31E+07	169	2.55E+03	2.538	0.	16	3.56E+07	169	7.84E+04	2.538	0.
18	1.46E+07	139	2.79E+03	2.843	0.	18	2.61E+07	183	1.25E+05	2.843	0.
20	5.02E+06	209	4.06E+03	3.149	0.	20	1.59E+07	209	7.40E+04	3.149	0.
22	5.78E+06	230	2.23E+03	3.454	0.	22	1.28E+07	230	3.88E+04	3.454	0.
24	5.02E+06	271	1.24E+03	3.760	0.	24	1.20E+07	271	3.99E+04	3.760	0.
26	5.02E+06	271	0.	4.065	0.	26	1.20E+07	271	9.99E+03	4.065	0.
28	4.27E+06	291	0.	4.370	0.	28	1.15E+07	291	3.27E+03	4.370	0.
30	3.77E+06	311	3.72E+03	4.676	0.	30	7.44E+06	311	1.68E+03	4.676	0.
TOTALS											
LMC	7.40E-04	4.93E-04	6.18E-04	9.92E-04	9.92E-04	LMC	1.72E-03	4.14E-03	4.81E-05	3.62E-03	0.1
MED	23	131	236	198	198	MED	29	84	103	103	81

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191310\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.15E+09	25	7.15E+04	3.75E+02	376.2	2	1.07E+09	26	1.10E+05	4.00	4.95E+01
4	6.31E+07	47	1.51E+05	5.19E+01	7.576	4	1.22E+08	47	2.89E+04	706	1.11E+09
6	3.19E+07	57	4.42E+04	3.44E+00	7.576	6	7.57E+07	57	5.86E+04	1.011	0.
8	2.34E+07	97	5.53E+04	1.316	0.	8	6.20E+07	97	5.09E+04	1.316	0.
10	1.61E+07	108	2.51E+04	1.622	0.	10	4.66E+07	108	9.67E+04	1.622	0.
12	1.66E+07	123	1.19E+04	1.927	0.	12	3.55E+07	128	1.54E+05	1.927	0.
14	8.29E+06	143	4.18E+03	2.233	0.	14	2.50E+07	143	1.37E+05	2.233	0.
16	1.31E+07	169	2.55E+03	2.538	0.	16	3.56E+07	169	7.84E+04	2.538	0.
18	1.46E+07	139	2.79E+03	2.843	0.	18	2.61E+07	183	1.25E+05	2.843	0.
20	5.02E+06	209	4.06E+03	3.149	0.	20	1.59E+07	209	7.40E+04	3.149	0.
22	5.78E+06	230	2.23E+03	3.454	0.	22	1.28E+07	230	3.88E+04	3.454	0.
24	5.02E+06	271	1.24E+03	3.760	0.	24	1.20E+07	271	3.99E+04	3.760	0.
26	5.02E+06	271	0.	4.065	0.	26	1.20E+07	271	9.99E+03	4.065	0.
28	4.27E+06	291	0.	4.370	0.	28	1.15E+07	291	3.27E+03	4.370	0.
30	3.77E+06	311	3.72E+03	4.676	0.	30	7.44E+06	311	1.68E+03	4.676	0.
TOTALS											
LMC	7.40E-04	4.93E-04	6.18E-04	9.92E-04	9.92E-04	LMC	1.72E-03	4.14E-03	4.81E-05	3.62E-03	0.1
MED	23	131	236	198	198	MED	29	84	103	103	81

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 191310\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.15E+09	25	7.15E+04	3.75E+02	376.2	2	1.07E+09	26	1.10E+05	4.00	4.95E+01
4	6.31E+07	47	1.51E+05	5.19E+01	7.576	4	1.22E+08	47	2.89E+04	706	1.11E+09
6	3.19E+07	57	4.42E+04	3.44E+00	7.576	6	7.57E+07	57	5.86E+04	1.011	0.
8	2.34E+07	97	5.53E+04	1.316	0.	8	6.20E+07	97	5.09E+04	1.316	0.
10	1.61E+07	108	2.51E+04	1.622	0.	10	4.66E+07	108	9.67E+04	1.622	0.
12	1.66E+07	123	1.19E+04	1.927	0.	12	3.55E+07	128	1.54E+05	1.927	0.
14	8.29E+06	143	4.18E+03	2.233	0.	14	2.50E+07	143	1.37E+05	2.233	0.
16	1.31E+07	169	2.55E+03	2.538	0.	16	3.56E+07	169	7.84E+04	2.538	0.
18	1.46E+07	139	2.79E+03	2.843	0.	18	2.61E+07	183	1.25E+05	2.843	0.
20	5.02E+06	209	4.06E+03	3.149	0.	20	1.59E+07	209	7.40E+04	3.149	0.
22	5.78E+06	230	2.23E+03	3.454	0.	22	1.28E+07	230	3.88E+04	3.454	0.
24	5.02E+06	271	1.24E+03	3.760	0.	24	1.20E+07	271	3.99E+04	3.760	0.
26	5.02E+06	271	0.	4.065	0.	26	1.20E+07	271	9.99E+03	4.065	0.
28	4.27E+06	291	0.	4.370	0.	28	1.15E+07	291	3.27E+03	4.370	0.
30	3.77E+06	311	3.72E+03	4.676	0.	30	7.44E+06	311	1.68E+03	4.676	0.
TOTALS											
LMC	7.40E-04	4.93E-04	6.18E-04	9.92E-04	9.92E-04	LMC	1.72E-03	4.14E-03	4.81E-05	3.62E-03	0.1
MED	23	131	236	198	198	MED	29	84	103	103	81

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START 191338100					INTERVAL START 191338100						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	F (MM)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	F (MM)
2	8.52E+08	76	2.59E+05	3.11E+02	389.9	2	2.37E+09	26	3.74E+04	400	2.62E+02
4	1.20E+08	47	8.75E+04	706	7.362	4	9.23E+07	47	9.00E+03	706	2.79E+01
6	9.65E+07	67	1.38E+04	1011	0.	6	2.77E+07	67	9.26E+03	1011	0.
8	6.45E+07	87	1.09E+04	131E	0.	8	2.49E+07	87	2.79E+03	131E	0.
10	6.4E+07	104	1.67E+04	1622	0.	10	1.91E+07	104	3.74E+03	1622	0.
12	4.70E+07	128	1.92E+04	1927	0.	12	1.42E+07	128	2.70E+03	1927	0.
14	3.62E+07	148	8.21E+03	2233	0.	14	1.05E+07	148	4.37E+03	2233	0.
16	3.22E+07	169	7.13E+03	2538	0.	16	8.90E+06	169	1.39E+04	2538	0.
18	3.22E+07	189	1.56E+05	2843	0.	18	6.53E+06	189	3.11E+04	2843	0.
20	1.74E+07	209	2.01E+05	3149	0.	20	5.78E+05	209	4.89E+04	3149	0.
22	1.82E+07	230	1.20E+05	3454	0.	22	3.40E+06	230	3.96E+04	3454	0.
24	1.12E+07	250	6.80E+04	3760	0.	24	4.97E+06	250	2.99E+04	3760	0.
26	1.20E+07	271	6.65E+04	4065	0.	26	2.36E+06	271	3.06E+04	4065	0.
28	1.25E+07	291	2.37E+04	4370	0.	28	9.19E+06	291	9.97E+03	4370	0.
30	9.11E+06	311	2.70E+04	4676	0.	30	3.67E+06	311	9.73E+03	4676	0.
TOTALS					389.9	TOTALS					409.0
LWC	1.95E-03	8.25E-03	2.95E-04	5.15E-03	91	LWC	6.02E-04	2.52E-03	3.56E-04	1.40E-03	97
MED	27	100	141	91		MED	23	104	213	313	
AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START 191338100					INTERVAL START 191338100						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE					TYPE: BULL-ROSE						
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	F (MM)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	F (MM)
2	9.62E+08	76	7.49E+04	400	5.66E+02	2	2.78E+09	26	0.	400	6.71E+02
4	1.26E+08	47	1.08E+05	706	1.54E+01	4	3.51E+07	47	0.	706	1.79E+02
6	8.29E+07	67	9.24E+03	1011	1.20E+00	6	1.03E+07	67	4.55E+03	1011	2.19E+01
8	7.22E+07	87	1.30E+05	131E	0.	8	7.74E+06	87	2.70E+03	131E	1.06E+04
10	5.43E+07	104	5.62E+03	1622	0.	10	9.23E+06	104	0.	1622	6.54E-01
12	4.20E+07	128	2.78E+04	1927	0.	12	3.09E+06	128	0.	1927	0.
14	3.05E+07	148	4.04E+04	2233	0.	14	4.35E+06	148	3.21E+03	2233	0.
16	3.99E+07	169	6.04E+04	2538	0.	16	3.62E+06	169	0.	2538	0.
18	3.07E+07	189	1.46E+05	2843	0.	18	2.84E+06	189	9.56E+02	2843	6.41E-01
20	2.10E+07	209	1.17E+05	3149	0.	20	1.55E+06	209	0.	3149	0.
22	1.02E+07	230	7.23E+04	3454	0.	22	1.55E+06	230	0.	3454	0.
24	9.72E+06	250	7.26E+04	3760	0.	24	5.19E+05	250	0.	3760	0.
26	1.10E+07	271	4.52E+04	4065	0.	26	1.03E+06	271	0.	4065	0.
28	1.21E+07	291	3.17E+04	4370	0.	28	1.02E+06	291	0.	4370	0.
30	7.61E+06	311	3.89E+04	4676	0.	30	5.15E+05	311	0.	4676	0.
TOTALS					5.79E-04	TOTALS					2.09E-03
LWC	1.79E-03	6.92E-03	5.79E-04	3.92E-03	91	LWC	1.66E-04	2.63E-05	2.09E-03	2.11E-03	313
MED	27	106	107	91		MED	19	71	313	313	



AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*191410\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/H\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.87E+09	26	0.	2.01E+01	417.0
4	7.53E+07	47	2.97E+04	4.99E+02	ALT (KM)
6	4.67E+07	57	0.	9.72E+01	6.867
8	3.52E+07	57	8.29E+03	2.27E+01	
10	2.74E+07	108	3.74E+03	4.67E+00	TEMP (C)
12	2.18E+07	128	4.16E+03	1.41E+00	-24.4
14	1.74E+07	148	2.19E+03	2233	7.41E-01
16	1.48E+07	159	8.96E+02	2538	0.
18	1.36E+07	139	9.72E+02	2843	0.
20	4.33E+06	209	1.07E+03	3149	0.
22	5.77E+06	240	0.	3454	0.
24	4.95E+06	250	6.45E+03	3760	0.
26	4.59E+06	271	5.84E+03	4065	0.
28	4.20E+06	291	6.67E+03	4370	0.
30	2.89E+06	311	1.36E+04	4676	0.
LWC	7.46E-04		7.82E-04	6.67E-03	TOTALS
MED	0		0	332	332
					6.74E-03

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*191410\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/H\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.75E+09	76	0.	9.19E+02	424.9
4	3.75E+07	47	9.99E+03	2.97E+02	ALT (KM)
6	2.05E+07	67	0.	6.30E+01	6.754
8	1.33E+07	97	0.	9.57E+00	
10	1.04E+07	108	0.	4.04E+00	TEMP (C)
12	9.70E+06	128	0.	1.43E+00	-23.4
14	6.64E+06	148	0.	1.51E+00	2233
16	5.50E+06	159	0.	4.73E+00	2538
18	4.26E+06	189	0.	8.12E+01	FROSTPOINT
20	4.26E+06	209	1.07E+03	0.	0.
22	2.46E+06	230	0.	0.	0.
24	2.13E+06	250	0.	0.	0.
26	2.13E+06	271	2.95E+03	0.	0.
28	2.13E+06	291	5.05E+03	0.	0.
30	1.59E+06	311	1.97E+03	0.	0.
LWC	3.65E-04		2.31E-04	4.14E-03	TOTALS
MED	0		0	384	383
					4.16E-03

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*191410\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/H\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.66E+09	26	3.79E+04	3.87E+01	431.6
4	3.69E+07	47	9.99E+03	1.74E+00	ALT (KM)
6	1.04E+07	57	1.41E+04	1011	6.639
8	1.01E+07	57	1.12E+04	1316	0.
10	5.33E+06	108	7.60E+03	1622	0.
12	8.79E+06	128	4.23E+03	1927	0.
14	5.33E+06	148	6.65E+03	2233	0.
16	5.80E+06	159	3.65E+03	2538	0.
18	5.33E+06	159	8.87E+03	2843	0.
20	1.67E+06	209	1.07E+04	3149	0.
22	2.13E+06	230	7.10E+03	3454	0.
24	1.80E+06	240	0.	3760	0.
26	1.83E+06	271	4.44E+03	4065	0.
28	1.60E+06	291	1.69E+03	4370	0.
30	1.33E+06	311	0.	4676	0.
LWC	2.89E-04		4.49E-04	4.17E-05	TOTALS
MED	0		0	191	191
					3.74E-04

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*191410\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/H\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.23E+09	76	0.	1.14E+03	437.3
4	5.71E+07	47	3.05E+04	2.88E+02	ALT (KM)
6	3.08E+07	57	0.	2.22E+01	6.547
8	2.20E+07	47	2.85E+03	1316	2.81E+00
10	1.88E+07	108	1.91E+03	1622	0.
12	1.81E+07	128	8.71E+03	1927	0.
14	9.04E+06	148	3.35E+03	2233	0.
16	1.65E+07	159	8.32E+03	2538	0.
18	1.03E+07	159	1.30E+04	2843	0.
20	6.66E+06	209	2.16E+04	3149	0.
22	4.40E+06	230	3.58E+03	3454	0.
24	4.10E+06	240	1.25E+04	3760	0.
26	4.54E+06	271	1.05E+04	4065	0.
28	3.88E+06	291	6.92E+03	4370	0.
30	3.56E+06	311	4.03E+03	4676	0.
LWC	6.81E-04		1.03E-03	2.69E-03	TOTALS
MED	0		0	278	278
					3.09E-03

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*191410\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/H\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.75E+09	76	0.	9.19E+02	424.9
4	3.75E+07	47	9.99E+03	2.97E+02	ALT (KM)
6	2.05E+07	67	0.	6.30E+01	6.754
8	1.33E+07	97	0.	9.57E+00	
10	1.04E+07	108	0.	4.04E+00	TEMP (C)
12	9.70E+06	128	0.	1.43E+00	-23.4
14	6.64E+06	148	0.	1.51E+00	2233
16	5.50E+06	159	0.	4.73E+00	2538
18	4.26E+06	189	0.	8.12E+01	FROSTPOINT
20	4.26E+06	209	1.07E+03	0.	0.
22	2.46E+06	230	0.	0.	0.
24	2.13E+06	250	0.	0.	0.
26	2.13E+06	271	2.95E+03	0.	0.
28	2.13E+06	291	5.05E+03	0.	0.
30	1.59E+06	311	1.97E+03	0.	0.
LWC	3.65E-04		2.31E-04	4.14E-03	TOTALS
MED	0		0	384	383
					4.16E-03

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*191410\*  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/H\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.66E+09	26	3.79E+04	3.87E+01	431.6
4	3.69E+07	47	9.99E+03	1.74E+00	ALT (KM)
6	1.04E+07	57	1.41E+04	1011	6.639
8	1.01E+07	57	1.12E+04	1316	0.
10	5.33E+06	108	7.60E+03	1622	0.
12	8.79E+06	128	4.23E+03	1927	0.
14	5.33E+06	148	6.65E+03	2233	0.
16	5.80E+06	159	3.65E+03	2538	0.
18	5.33E+06	159	8.87E+03	2843	0.
20	1.67E+06	209	1.07E+04	3149	0.
22	2.13E+06	230	7.10E+03	3454	0.
24	1.80E+06	240	0.	3760	0.
26	1.83E+06	271	4.44E+03	4065	0.
28	1.60E+06	291	1.69E+03	4370	0.
30	1.33E+06	311	0.	4676	0.
LWC	2.89E-04		4.49E-04	4.17E-05	TOTALS
MED	0		0	191	191
					3.74E-04

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CIRRUS PARTICLE DISTRIBUTION STUDY, PART 2.(U)  
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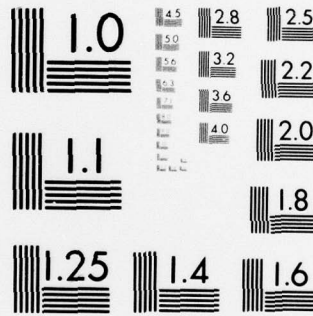
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AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 1943100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBF	SIZE (UM)	PRECIP PROBE	P (MB)
2	2.59E+09	76	0.	4.00	1.34E+03	442.1
4	5.73E+07	47	3.22E+04	706	4.72E+02	ALT (KM)
6	2.48E+07	57	1.01E+04	1011	5.44E+01	6.470
8	2.02E+07	37	9.02E+03	1316	5.14E+00	
10	1.82E+07	108	2.04E+03	1622	7.18E-01	TEMP (C)
12	1.76E+07	128	3.02E+03	1927	0.	-22.9
14	1.05E+07	144	0.	2233	0.	
16	1.11E+07	169	0.	2538	0.	FROSTPOINT
18	9.69E+06	199	2.12E+02	2843	0.	
20	3.70E+06	209	2.31E+03	3149	0.	
22	2.00E+06	230	3.80E+03	3454	0.	TAS (M/S)
24	3.43E+06	250	1.41E+03	3760	0.	105.9
26	3.65E+06	271	4.77E+03	4065	0.	
28	2.84E+06	291	5.66E+03	4370	0.	
30	3.14E+06	311	2.12E+03	4676	0.	
TOTALS						
LWC	5.54E-04		4.04E-04		4.39E-03	4.50E-03
MED	22		120		304	300

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 1943100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBF	SIZE (UM)	PRECIP PROBE	P (MB)
2	3.08E+09	26	0.	4.00	3.99E+02	452.9
4	2.44E+07	47	1.04E+04	706	3.13E+02	ALT (KM)
6	8.33E+06	57	4.90E+03	1011	4.19E+01	6.300
8	6.99E+06	67	0.	1316	4.00E+00	
10	5.83E+06	108	1.98E+03	1622	7.05E-01	TEMP (C)
12	5.44E+06	128	0.	1927	0.	-22.3
14	4.17E+06	148	0.	2233	0.	
16	5.25E+06	169	2.55E+03	2538	0.	FROSTPOINT
18	3.06E+06	199	0.	2843	0.	
20	1.12E+06	209	0.	3149	0.	
22	1.59E+06	230	2.47E+03	3454	0.	TAS (M/S)
24	1.11E+06	250	0.	3760	0.	100.7
26	1.11E+06	271	1.54E+03	4065	0.	
28	8.56E+05	291	1.76E+03	4370	0.	
30	1.11E+06	311	0.	4676	0.	
TOTALS						
LWC	2.15E-04		1.20E-04		2.57E-03	2.62E-03
MED	13		116		327	326

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 1943100  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: BULL-ROSE

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBF	SIZE (UM)	PRECIP PROBE	P (MB)
2	2.24E+09	26	0.	4.00	1.43E+03	457.2
4	4.58E+07	47	3.12E+04	706	1.13E+03	ALT (KM)
6	3.55E+07	57	0.	1011	1.43E+02	6.227
8	2.81E+07	67	0.	1316	9.97E+00	
10	2.10E+07	108	0.	1622	7.01E-01	TEMP (C)
12	1.47E+07	128	4.39E+03	1927	0.	-21.8
14	7.20E+06	148	4.61E+03	2233	0.	
16	1.08E+07	169	1.90E+03	2538	0.	FROSTPOINT
18	9.14E+05	189	3.08E+03	2843	0.	
20	7.68E+05	209	1.12E+03	3149	0.	
22	6.09E+05	230	0.	3454	0.	TAS (M/S)
24	5.38E+05	250	1.37E+03	3760	0.	100.9
26	4.15E+05	271	1.53E+03	4065	0.	
28	4.58E+05	291	3.52E+03	4370	0.	
30	5.82E+05	311	2.04E+03	4676	0.	
TOTALS						
LWC	7.80E-04		2.66E-04		8.86E-03	8.95E-03
MED	24		123		323	322



AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 1944510					INTERVAL START 1944510				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	2.53E+09	26	3.97E+04	461.8	2	3.00E+09	26	0.	474.5
4	2.52E+07	57	0.		4	1.04E+07	47	1.03E+04	474.5
6	1.50E+07	57	0.	6.154	6	9.50E+05	57	0.	5.957
8	1.25E+07	1316	2.00E+00		8	4.13E+06	97	2.06E+03	
10	1.03E+07	1622	0.	TEMP (C)	10	2.75E+05	198	1.97E+03	TEMP (C)
12	4.73E+06	128	0.	-21.4	12	3.37E+05	128	2.91E+03	-20.3
14	4.73E+06	144	2.32E+03		14	1.55E+06	144	0.	
16	5.28E+06	149	3.82E+03	FRCSTPOINT	16	1.30E+06	159	9.47E+02	FRCSTPOINT
18	4.73E+06	189	5.14E+03		18	2.02E+06	199	1.02E+03	
20	3.52E+06	203	1.72E+03	TAS (M/S)	20	2.20E+06	209	2.22E+03	TAS (M/S)
22	3.54E+06	230	2.48E+03	108.6	22	1.65E+05	270	0.	109.9
24	8.35E+05	259	1.37E+03		24	9.31E+05	280	1.35E+03	
26	1.67E+06	271	3.09E+03		26	0.	271	3.04E+03	
28	8.75E+05	291	3.53E+03		28	1.30E+06	291	0.	
30	5.57E+05	311	2.06E+03		30	0.	311	0.	
LWC	2.66E-04		3.31E-04	TOTALS	LWC	1.41E-04		1.74E-04	TOTALS
MED D	19		118	1.83E-03	MED D	19		110	1.56E-03
				315					322
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 1944510					INTERVAL START 1944510				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	2.83E+09	26	0.	466.9	2	2.65E+09	26	0.	477.5
4	1.87E+09	57	0.		4	2.09E+07	49	0.	477.5
6	8.50E+08	57	0.	6.043	6	1.19E+07	72	0.	5.910
8	1.89E+08	57	0.		8	9.37E+06	95	0.	
10	2.49E+07	108	0.	TEMP (C)	10	9.37E+06	118	9.38E+03	TEMP (C)
12	3.70E+06	128	0.	-20.9	12	4.13E+06	141	2.95E+03	-19.9
14	5.51E+06	144	1.16E+03		14	3.86E+06	154	1.01E+03	
16	1.59E+06	159	0.	FRCSTPOINT	16	5.51E+06	187	0.	FRCSTPOINT
18	1.10E+06	199	1.01E+03		18	3.03E+06	210	2.04E+03	
20	1.11E+06	203	3.38E+03		20	2.76E+06	244	2.82E+03	
22	5.54E+05	230	1.21E+03	TAS (M/S)	22	1.65E+06	256	1.23E+03	TAS (M/S)
24	2.78E+05	259	0.	109.8	24	1.69E+06	279	0.	109.6
26	8.30E+05	271	1.54E+03		26	2.48E+06	302	1.36E+03	
28	1.10E+06	291	0.		28	5.51E+05	309	0.	
30	0.	311	2.02E+03		30	2.76E+05	348	0.	
LWC	5.64E-04		1.35E-04	TOTALS	LWC	2.36E-04		1.64E-04	TOTALS
MED D	5		119	6.16E-04	MED D	20		90	6.02E-03
				266					369
				299					381

AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL						AFML CIRRUS STUDY BY AFGL					
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 1945110*						INTERVAL START 1947110*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (MU)	SCATTER FRORE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)	SIZE (MU)	SCATTER FRORE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)
2	1.43E+09	76	0.	3.56E+02	481.3	2	9.10E+08	76	0.	3.98	4.80E+02
4	8.12E+07	43	5.48E+04	6.30E+02		4	1.16E+08	43	4.80E+04	743	9.39E+02
6	6.28E+07	72	8.53E+03	8.03E+02	5.052	6	9.36E+07	72	8.93E+03	1008	1.54E+03
8	5.58E+07	75	1.28E+04	6.38E+02		8	7.39E+07	95	1.60E+04	1433	7.87E+02
10	4.58E+07	118	6.93E+03	2.11E+02	TEMP (C)	10	7.05E+07	118	1.10E+04	1778	1.44E+02
12	4.69E+07	141	7.70E+03	4.70E+01	-19.1	12	5.86E+07	141	9.51E+03	2123	4.26E+01
14	3.27E+07	154	2.02E+03	1.11E+01	FROSTPOINT	14	4.54E+07	154	4.21E+03	2468	1.17E+01
16	3.39E+07	177	0.	2.96E+00		16	5.24E+07	187	2.85E+03	2813	1.53E+01
18	3.16E+07	210	4.49E+03	3.17E+00		18	4.11E+07	210	8.60E+03	3158	0.
20	1.85E+07	233	5.25E+03	0.		20	2.44E+07	233	5.15E+03	3503	0.
22	1.56E+07	256	4.73E+03	9.25E-01	TAS (M/S)	22	2.44E+07	256	3.46E+03	3848	0.
24	1.21E+07	279	0.	1.01E+00	110.2	24	1.97E+07	279	2.95E+03	4193	0.
26	1.12E+07	302	5.40E+03	4.538		26	1.63E+07	302	7.14E+03	4538	0.
28	1.07E+07	325	3.09E+03	1.24E+00		28	1.46E+07	325	3.27E+03	4883	0.
30	1.15E+7	348	0.	1.39E+00	TOTALS	30	1.57E+7	348	3.78E+03	5228	0.
LWC	1.89E-03		1.01E-03	3.45E-02	3.51E-02	LWC	2.73E-03		1.59E-03	4.29E-02	4.36E-02
MED	0		137	464	462	MED	0		149	430	426
AFML CIRRUS STUDY BY AFGL											
AFML CIRRUS STUDY BY AFGL						AFML CIRRUS STUDY BY AFGL					
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 1945110*						INTERVAL START 1947110*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (MU)	SCATTER FRORE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)	SIZE (MU)	SCATTER FRORE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)
2	1.04E+09	26	3.49E+04	5.10E+02	489.7	2	9.73E+08	26	3.75E+04	398	7.53E+02
4	1.11E+08	69	2.74E+04	7.26E+02		4	1.26E+08	69	4.93E+04	743	2.80E+03
6	8.42E+07	72	2.17E+04	9.96E+02	5.786	6	9.65E+07	72	2.32E+04	1088	1.83E+03
8	7.59E+07	75	7.66E+03	9.44E+02		8	8.28E+07	95	8.27E+03	1433	5.68E+02
10	6.33E+07	118	1.05E+04	3.05E+02	TEMP (C)	10	6.94E+07	118	1.69E+04	1778	8.65E+01
12	5.21E+07	141	6.51E+03	7.79E+01	-18.4	12	6.08E+07	141	2.46E+04	2123	2.19E+01
14	3.50E+07	164	8.19E+03	1.53E+01		14	4.27E+07	164	1.42E+04	2468	1.35E+01
16	5.66E+07	187	2.54E+03	1.92E+00	FROSTPOINT	16	5.41E+07	187	3.60E+03	2813	7.60E-01
18	3.69E+07	210	1.14E+04	7.98E-01		18	3.59E+07	210	7.80E+03	3158	0.
20	2.63E+07	233	5.06E+03	1.73E+00		20	2.61E+07	233	4.95E+03	3503	0.
22	1.84E+07	256	5.46E+03	0.	TAS (M/S)	22	2.02E+07	256	5.83E+03	3848	9.99E-01
24	1.75E+07	279	7.23E+03	1.04E+00	188.9	24	1.84E+07	279	2.99E+03	4193	0.
26	1.76E+07	302	4.10E+03	4.538		26	1.40E+07	302	4.59E+03	4538	0.
28	1.36E+07	325	7.80E+03	4.883		28	1.13E+07	325	3.35E+03	4883	0.
30	1.44E+7	348	3.60E+03	1.43E+00	TOTALS	30	1.66E+7	348	1.95E+03	5228	0.
LWC	2.50E-03		2.02E-03	4.72E-02	4.80E-02	LWC	2.56E-03		1.66E-03	4.61E-02	4.71E-02
MED	0		147	468	467	MED	0		140	460	397

AFGL CIRRHUS STUDY 9Y AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING												
INTERVAL START 19494110*												
FARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: SMALL SNOW												
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.21E+09	26	3.72E+04	398	1.99E+03	501.2	2	9.54E+08	76	0.	398	1.34E+03
4	9.88E+07	49	1.95E+06	743	2.95E+03	ALT (KM)	4	1.10E+08	69	2.06E+04	743	2.85E+03
6	8.02E+07	72	9.23E+03	1088	8.01E+02	5.554	6	9.58E+07	72	2.23E+04	1088	1.54E+03
8	6.38E+07	95	8.23E+03	1433	8.97E+01		8	8.95E+07	95	1.60E+04	1433	3.77E+02
10	4.34E+07	119	9.34E+03	1778	1.35E+01	TEMP (C)	10	5.87E+07	119	1.27E+04	1778	9.28E+01
12	4.29E+07	141	1.39E+04	2123	6.37E+00	-16.7	12	4.99E+07	141	1.61E+04	2123	2.53E+01
14	2.59E+07	164	1.09E+04	2468	2.24E+00	FROSTPOINT	14	3.70E+07	164	1.06E+04	2468	1.23E+01
16	3.49E+07	187	6.70E+03	2813	0.		16	3.79E+07	187	8.71E+03	2813	2.31E+00
18	2.79E+07	210	1.45E+04	3158	0.		18	2.56E+07	210	7.54E+03	3158	8.23E-01
20	1.50E+07	233	4.29E+03	3503	0.		20	1.52E+07	233	9.75E+03	3503	0.
22	1.54E+07	256	6.98E+03	3848	0.	TAS (M/S)	22	1.52E+07	256	2.27E+02	3848	0.
24	1.27E+07	279	1.20E+02	4193	0.	101.9	24	1.59E+07	279	6.29E+03	4193	0.
26	1.01E+07	302	2.91E+03	4538	0.		26	1.46E+07	302	0.	4538	0.
28	7.69E+06	325	0.	4883	0.		28	1.12E+07	325	0.	4883	0.
30	9.42E+06	348	1.95E+02	5228	0.		30	1.18E+07	348	1.87E+03	5228	0.
LWC	1.44E-03		1.37E-03		2.83E-02	TOTALS	LWC	2.41E-03		1.37E-03		4.47E-02
MEQ D	22		121		332	328	MEQ D	23		122		368

AFGL CIRRHUS STUDY 9Y AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING												
INTERVAL START 19494110*												
FARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: SMALL SNOW												
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.15E+09	26	0.	398	1.54E+03	505.8	2	9.42E+08	76	0.	398	1.65E+03
4	9.88E+07	49	9.72E+03	743	2.95E+03	ALT (KM)	4	1.15E+08	69	3.70E+04	743	2.65E+03
6	8.05E+07	72	0.	1088	1.11E+03	5.487	6	1.03E+08	72	8.72E+03	1088	1.26E+03
8	7.37E+07	95	1.09E+04	1433	2.59E+02		8	7.08E+07	95	5.34E+03	1433	2.87E+02
10	4.20E+07	118	1.85E+04	1778	3.86E+01	TEMP (C)	10	6.37E+07	118	1.27E+04	1778	6.96E+01
12	4.20E+07	141	1.37E+04	2123	9.69E+00	-16.4	12	6.97E+07	141	1.67E+04	2123	2.10E+01
14	2.01E+07	164	8.61E+03	2468	2.94E+00	FROSTPOINT	14	3.74E+07	164	3.45E+03	2468	7.90E+00
16	3.53E+07	187	2.85E+03	2813	0.		16	3.74E+07	187	8.71E+03	2813	1.43E+00
18	2.22E+07	210	7.67E+03	3158	0.		18	6.77E+07	210	7.53E+03	3158	8.19E-01
20	1.93E+07	233	1.07E+03	3503	0.		20	1.94E+07	233	6.13E+03	3503	3.79E-01
22	1.31E+07	256	3.82E+03	3848	0.	TAS (M/S)	22	1.94E+07	256	9.01E+03	3848	0.
24	1.17E+07	279	6.82E+03	4193	0.	105.4	24	1.80E+07	279	3.72E+03	4193	0.
26	1.02E+07	302	2.85E+03	4538	0.		26	1.14E+07	302	4.22E+03	4538	0.
28	9.15E+06	325	4.90E+03	4883	0.		28	1.14E+07	325	8.02E+03	4883	0.
30	7.00E+06	348	1.90E+03	5228	0.		30	1.14E+07	348	5.68E+03	5228	0.
LWC	1.42E-03		1.45E-03		3.32E-02	TOTALS	LWC	2.03E-03		2.22E-03		3.83E-02
MEQ D	22		140		361	358	MEQ D	22		140		368



AFGL CIRRUS STUDY BY AFGL											
FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START *191500*0*						INTERVAL START *191511*0*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	7.22E+08	26	0.	798	2.40E+03	2	1.16E+09	26	0.	398	1.44E+03
4	1.59E+08	49	5.83E+04	743	3.55E+03	4	9.89E+07	49	2.04E+04	743	1.52E+03
6	1.23E+08	72	1.56E+04	1086	1.70E+03	6	7.25E+07	72	2.87E+04	1086	8.20E+02
8	1.17E+08	95	1.36E+04	1433	4.50E+02	8	5.30E+07	95	8.52E+03	1433	2.89E+02
10	8.81E+07	119	1.66E+04	1778	1.06E+02	10	4.80E+07	119	5.79E+03	1778	9.27E+01
12	5.69E+07	141	2.59E+04	2123	4.80E+01	12	4.44E+07	141	1.18E+03	2123	3.13E+01
14	5.55E+07	164	1.18E+04	2469	2.22E+01	14	3.29E+07	164	6.75E+03	2468	1.55E+01
16	6.04E+07	187	1.19E+04	2813	4.74E+00	16	3.52E+07	187	6.64E+03	2813	5.76E+00
18	4.41E+07	210	8.62E+03	3158	0.	18	3.09E+07	210	5.07E+03	3158	8.87E-01
20	2.87E+07	233	6.27E+03	3503	0.	20	1.99E+07	233	3.28E+03	3503	9.40E-01
22	2.51E+07	256	4.72E+03	3848	0.	22	1.74E+07	256	3.67E+03	3848	0.
24	1.69E+07	279	1.02E+03	4193	0.	24	1.44E+07	279	2.67E+03	4193	1.12E+00
26	2.16E+07	302	2.80E+03	4538	0.	26	1.74E+07	302	3.01E+03	4538	0.
28	1.88E+07	325	3.28E+03	4883	0.	28	1.19E+07	325	3.49E+03	4883	1.37E+00
30	1.66E+07	348	7.65E+03	5228	0.	30	1.04E+07	348	2.01E+03	5228	1.55E+00
LWC	3.00E-03	27	2.26E-03	137	377	LWC	2.06E-03	23	1.18E-03	140	3.09E-02
MED 0						MED 0					
TOTALS					5.66E-02	TOTALS					3.15E-02
P (MB)	520.2	P (MB)	520.2	TAS (M/S)	103.6	P (MB)	520.1	TAS (M/S)	99.8		
ALT (MM)		ALT (MM)		PRCSTPOINT		ALT (MM)		PRCSTPOINT			
TEMP (C)		TEMP (C)				TEMP (C)					

AFGL CIRRUS STUDY BY AFGL											
FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START *191500*0*						INTERVAL START *191511*0*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	3.78E+08	24	0.	398	2.10E+03	2	2.21E+09	26	0.	398	3.06E+02
4	2.38E+08	49	6.99E+04	743	4.15E+03	4	1.53E+07	49	1.81E+04	743	2.87E+02
6	2.03E+08	72	4.20E+04	1086	3.15E+03	6	1.65E+07	72	4.76E+03	1086	1.30E+02
8	1.79E+08	95	1.11E+04	1433	1.77E+03	8	1.19E+07	95	2.83E+03	1433	8.93E+01
10	1.42E+08	119	3.01E+04	1778	4.86E+02	10	7.32E+06	119	1.93E+03	1778	2.40E+01
12	1.17E+08	141	1.53E+04	2123	1.94E+02	12	6.81E+06	141	2.65E+03	2123	7.25E+00
14	9.32E+07	164	1.65E+04	2468	8.24E+01	14	5.19E+06	164	0.	2468	4.62E+00
16	1.02E+08	187	1.46E+04	2813	3.96E+01	16	6.71E+06	187	0.	2813	4.21E+01
18	8.29E+07	210	1.87E+04	3158	1.89E+01	18	3.57E+06	210	0.	3158	8.80E-01
20	5.28E+07	233	1.71E+04	3503	3.71E+00	20	2.75E+06	233	0.	3503	0.
22	4.86E+07	256	4.68E+03	3848	1.93E+00	22	3.36E+06	256	0.	3848	0.
24	4.29E+07	279	6.54E+03	4193	3.29E+00	24	3.26E+06	279	1.33E+03	4193	0.
26	4.32E+07	302	2.92E+03	4538	0.	26	2.74E+06	302	1.50E+03	4538	0.
28	3.23E+07	325	0.	4883	1.39E+00	28	1.84E+06	325	1.71E+03	4883	0.
30	2.49E+07	348	3.98E+03	5228	1.53E+00	30	1.22E+06	348	2.00E+03	5228	0.
LWC	5.58E-03	23	2.44E-03	123	432	LWC	3.53E-04	194	4.03E-04	104	5.52E-03
MED 0						MED 0					
TOTALS					1.15E-01	TOTALS					5.58E-03
P (MB)	1.17E-01	P (MB)	1.17E-01	TAS (M/S)	104.0	P (MB)	1.17E-01	TAS (M/S)	99.8		
ALT (MM)		ALT (MM)		PRCSTPOINT		ALT (MM)		PRCSTPOINT			
TEMP (C)		TEMP (C)				TEMP (C)					



AFHL CIRRUS STUDY BY AFGL

FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 19152100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MH)
2	2.63E+09	26	0.	398	1.62E+01	542.1
4	1.22E+06	49	0.	743	2.68E+01	ALT (KM)
6	6.07E+05	72	0.	1088	1.17E+01	4.972
8	6.09E+05	95	0.	1433	8.40E+00	
10	6.07E+05	118	0.	1778	1.36E+00	TEMP (C)
12	0.	141	0.	2123	1.44E+00	-12.8
14	0.	164	0.	2468	7.69E-01	
16	0.11E+05	187	0.	2813	5.16E-01	FRGSTPOINT
18	6.07E+05	210	0.	3158	0.	
20	0.	233	0.	3503	0.	
22	0.	256	0.	3848	0.	TAS (M/S)
24	6.07E+05	279	0.	4193	0.	95.6
26	6.07E+05	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	348	0.	5228	0.	
LMC	5.06E-05		2.51E-05		6.25E-04	TOTALS
MED	16		97		456	6.50E-04

AFHL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
 INTERVAL START 19153100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MH)
2	2.36E+09	26	0.	398	0.	550.0
4	0.	49	0.	743	1.69E+00	ALT (KM)
6	2.63E+15	72	0.	1088	1.16E+00	4.863
8	0.	95	0.	1433	0.	
10	0.	113	0.	1778	0.	TEMP (C)
12	0.	141	0.	2123	0.	-11.8
14	0.	164	0.	2468	0.	
16	0.	187	0.	2813	0.	FRGSTPOINT
18	0.	210	0.	3158	0.	
20	0.	233	0.	3503	0.	
22	0.	256	0.	3848	0.	TAS (M/S)
24	0.	279	0.	4193	0.	103.9
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	348	0.	5228	0.	
LMC	1.99E-05		0.		2.13E-05	TOTALS
MED	2		0		353	2.13E-05

INTERVAL START 19152100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MH)
2	2.69E+09	26	0.	398	0.	546.0
4	2.59E+05	49	0.	743	0.	ALT (KM)
6	0.	72	0.	1088	6.03E-01	4.918
8	0.	95	0.	1433	6.65E-01	
10	0.	118	0.	1778	0.	TEMP (C)
12	0.	141	0.	2123	0.	-12.4
14	0.	164	0.	2468	0.	
16	0.	187	0.	2813	0.	FRGSTPOINT
18	0.	210	0.	3158	0.	
20	0.	233	0.	3503	0.	TAS (M/S)
22	0.	256	0.	3848	0.	100.8
24	0.	279	0.	4193	0.	
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	348	0.	5228	0.	
LMC	2.26E-05		0.		1.87E-05	TOTALS
MED	2		0		490	1.87E-05

INTERVAL START 19153100  
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MH)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MH)
2	2.07E+09	26	0.	398	2.55E+00	552.7
4	2.65E+05	49	0.	743	4.99E+00	ALT (KM)
6	0.	72	0.	1088	5.78E+00	4.826
8	0.	95	0.	1433	1.19E+00	
10	0.	113	0.	1778	0.	TEMP (C)
12	0.	141	0.	2123	0.	-11.4
14	0.	164	0.	2468	0.	
16	0.	187	0.	2813	0.	FRGSTPOINT
18	0.	210	0.	3158	0.	
20	0.	233	0.	3503	0.	TAS (M/S)
22	0.	256	0.	3848	0.	100.6
24	0.	279	0.	4193	0.	
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	348	0.	5228	0.	
LMC	1.74E-05		0.		1.13E-04	TOTALS
MED	2		0		307	1.13E-04

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 191955+10*						INTERVAL START 191955+10*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.69E+09	26	0.	8.12E+00	576.6	2	1.68E+09	26	0.	3.07E+01	576.5
4	7.51E+05	49	0.	9.71E+00	ALT (KM)	4	2.50E+06	49	0.	2.99E+01	ALT (KM)
6	1.02E+06	72	0.	1.56E+00	4.760	6	2.16E+06	72	3.40E+03	1.40E+01	4.588
8	1.02E+06	99	0.	0.		8	1.71E+06	99	0.	3.22E+00	TEMP (C)
10	5.14E+05	119	0.	0.	TEMP (C)	10	1.08E+06	119	0.	1778	TEMP (C)
12	0.	141	0.	0.	-11.0	12	4.32E+05	141	1.08E+03	2123	-9.2
14	0.	164	0.	0.	FRCPSTPOINT	14	6.46E+05	164	0.	2468	FRCPSTPOINT
16	5.03E+05	197	0.	0.	2813	16	6.46E+05	197	0.	2813	0.
18	0.	210	0.	0.	3158	18	2.17E+05	210	0.	3158	0.
20	0.	233	0.	0.	3503	20	6.06E+05	233	0.	3903	0.
22	0.	256	0.	0.	TAS (M/S)	22	4.32E+05	256	0.	1848	TAS (M/S)
24	2.37E+05	279	0.	0.	4193	24	0.	279	0.	6193	149.7
26	0.	302	0.	0.	4538	26	0.	302	0.	4538	0.
28	0.	325	0.	0.	4883	28	0.	325	0.	4883	0.
30	0.	348	0.	0.	5228	30	0.	348	0.	5228	0.
LWC	2.11E-05	0.	0.	7.71E-05	7.71E-05	LWC	3.79E-05	12	1.33E-05	4.0E-04	4.14E-04
MED D	2	0	0	309	309	MED D	12	42	356	356	352
TOTALS											
TOTALS						TOTALS					
6.98E-05						6.98E-05					
346						346					
1.74E-05						1.74E-05					
51						51					
5.24E-05						5.24E-05					
346						346					
6.98E-05						6.98E-05					
307						307					
1.49E-05						1.49E-05					
366						366					
2.02E-05						2.02E-05					
264						264					

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*1915610\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	1.62E+09	26	0.	398	1.55E+00	581.6
4	2.31E+05	49	0.	743	0.	ALT (MM)
6	0.	72	0.	1088	0.	4.442
8	0.	95	0.	1433	0.	TEMP (C)
10	0.	119	0.	1778	0.	-8.0
12	0.	141	0.	2123	0.	FRCPSTPOINT
14	0.	164	0.	2468	0.	TAS (M/S)
16	0.	187	0.	2813	0.	142.1
18	0.	210	0.	3158	0.	TOTALS
20	0.	233	0.	3503	0.	LWC 2.08E-06
22	0.	256	0.	3848	0.	MED 0 19%
24	0.	279	0.	4193	0.	
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	349	0.	5228	0.	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*1915710\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	1.48E+09	26	0.	398	1.95E+01	643.2
4	2.08E+05	49	0.	743	0.07E+00	ALT (MM)
6	0.	72	0.	1088	8.06E-01	3.696
8	0.	95	0.	1433	0.	TEMP (C)
10	0.	119	0.	1778	0.	-1.0
12	0.	141	0.	2123	4.75E-01	FRCPSTPOINT
14	0.	164	0.	2468	0.	TAS (M/S)
16	0.	187	0.	2813	0.	150.5
18	0.	210	0.	3158	0.	TOTALS
20	0.	233	0.	3503	0.	LWC 9.97E-05
22	0.	256	0.	3848	0.	MED 0 55%
24	0.	279	0.	4193	0.	
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	349	0.	5228	0.	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*1915710\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	1.28E+09	26	0.	398	1.87E+01	675.2
4	0.	49	0.	743	5.39E+00	ALT (MM)
6	0.	72	0.	1088	8.12E-01	3.294
8	0.	95	0.	1433	4.85E-01	TEMP (C)
10	0.	119	0.	1778	0.	-7
12	0.	141	0.	2123	0.	FRCPSTPOINT
14	0.	164	0.	2468	0.	TAS (M/S)
16	0.	187	0.	2813	0.	154.1
18	0.	210	0.	3158	0.	TOTALS
20	0.	233	0.	3503	0.	LWC 5.91E-05
22	0.	256	0.	3848	0.	MED 0 92%
24	0.	279	0.	4193	0.	
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	349	0.	5228	0.	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING  
 INTERVAL START \*1915810\*  
 FARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
 TYPE: SMALL SNOW

SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	P (MB)
2	1.45E+09	26	0.	398	7.94E+00	607.9
4	0.	49	0.	743	1.97E+00	ALT (MM)
6	0.	72	0.	1088	1.66E+00	4.105
8	0.	95	0.	1433	4.76E-01	TEMP (C)
10	0.	119	0.	1778	0.	-5.1
12	0.	141	0.	2123	0.	FRCPSTPOINT
14	0.	164	0.	2468	0.	TAS (M/S)
16	0.	187	0.	2813	0.	147.0
18	0.	210	0.	3158	0.	TOTALS
20	0.	233	0.	3503	0.	LWC 4.69E-05
22	0.	256	0.	3848	0.	MED 0 36%
24	0.	279	0.	4193	0.	
26	0.	302	0.	4538	0.	
28	0.	325	0.	4883	0.	
30	0.	349	0.	5228	0.	