LONG RANGE TRANSPORT OF AIR POLLUTANTS

A cooperative OECD technical programme

AIRCRAFT MEASUREMENTS

DATA COLLECTED WITHIN THE LRTAP PROGRAMME

CENTRAL COORDINATING UNIT
Norwegian Institute for Air Research
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LRTAP 17/75

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(FINAL REPORT)

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Preface

This report is a compilation of aircraft measurement data contributed by the participating countries in the OECD Cooperative Technical Programme to Study the Long Range Transport of Air Pollutants (LRTAP), presented in a standardized format. The report has been circulated in draft form to the responsible laboratories, and their comments and data corrections are incorporated.

CONTENTS

1 INTRODUCTION

The aircraft sampling programme of air pollutants within the LRTAP Programme started 1 July 1972. It was expanded during the second measurement phase of the project which started 1 January 1974 and terminated 31 March 1975.

A total of 111 individual flights have been reported to the Central Coordinating Unit (CCU) at the Norwegian Institute for Air Research (NILU). They include air sampling on 92 different days.

The format of reporting data has varied and a standard procedure for presentation is adopted here with a minimum alteration of the original data and remarks.

Preliminary data have earlier been reported by Gotaas (1), and results of analysis from U.K. data have been published by Smith and Jeffrey (2) and Danish data by Heidam (3). This report contains a complete listing of the aircraft sampling within the LRTAP Programme. The results of six similar flights made in 1971 by the Meteorological Office, U.K.

2 OBJECTIVES

The main objectives of the aircraft sampling programme were:

1) To verify and correct sulphur dioxide (SO_2) and particulate sulphate (SO_4) concentration fields predicted by the atmospheric dispersion model. The measurements should represent the average concentration from the surface to the top of the mixed layer.

2) To obtain vertical profiles of pollutant concentrations under representative transport situations and allow estimates of the relative importance of sinks for these compounds.

3) To estimate the conversion rate of sulphur dioxide to sulphuric acid and sulphates by sampling the same air mass at different distance from the main emission sources.

In addition to measuring particulate sulphate and sulphur dioxide, suspended particle concentrations were recorded using either an integrating nephelometer or a particle counter. Meteorological conditions were also concurrently recorded.

Of particular interest as additional information were concentrations of nitrate, ammonium and ammonia, concentration of condensation nuclei and the chemical composition of collected cloud droplet samples.

Procedures for the aircraft sampling and the chemical analyses have been described elsewhere (4,5,6,7).

Coordinated sampling flights over a large region were to coincide with situations of high pollutant concentrations. Through forecasting such situations the participants could be alerted well in advance.

Data from the measurements were to be forwarded by the participants to the CCU within one month from the sampling flights. However, a considerable amount of data going as far back as 1973 was not received before September 1975.

3 PROGRESS OF WORK

The plan for the rather ambitious measurement programme could only be partially implemented. A continuous standby of aircraft equipped with the required instruments could simply not be kept in all the member countries. Considering the practical difficulties, the number of flights was quite high. A total of 48 "episodes" were forecasted and 63 out of 77 proposed flights were executed. Additional flights (mainly by Sweden) brought the total amount to 111.

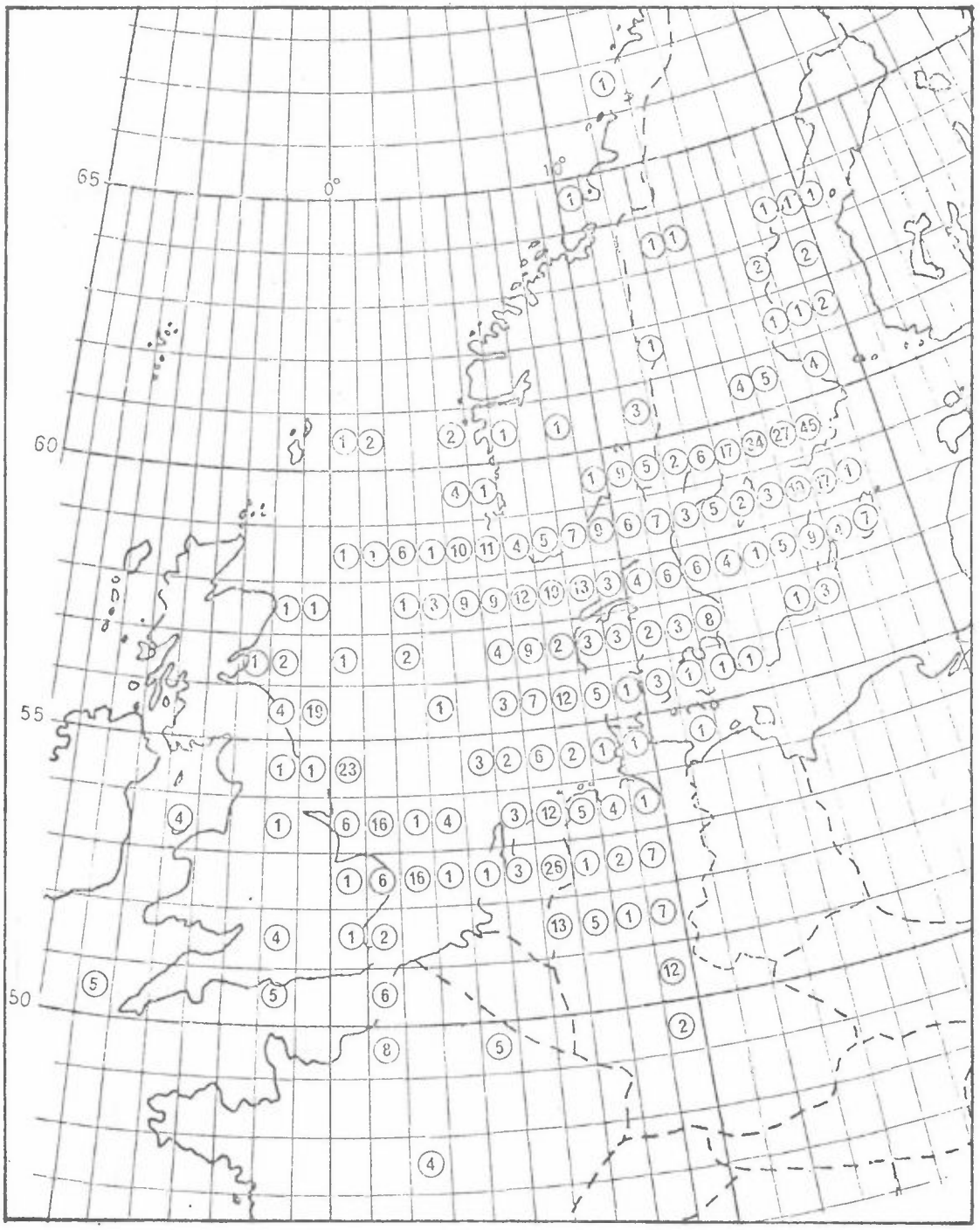

Figure 1. Number and geographical distribution of observations of sulphur compounds (including 26 observations made in 1971 by Meteorological Office, U.K.).

Table 1: Number of flights - country (laboratory)

D = Federal Republic of Germany, DK = Denmark, F = France
N = Norway, S = Sweden, UK-M = United Kingdom (Meteorological Office)
UK-W = United Kingdom (Warren Spring Laboratory).

YEAR	MONTH	DATE	Country (laboratory) D	DK	F	N	S	UK-M	UK-W
1972	11	29							1
	12	08							1
1973	03	01							1
		23						1	
	05	09					1		
		17						1	
		23					1		
	06	13					1		
		20				1			
		28					1		
	07	02				1			
		03				1			
		04					1		
		07				1			
		15				1			
	08	09				1		1	
		16				1			
		17				1			
		27				1			
		29				1			
		30							1
	09	04						1	
		07						1	
		08						1	
	10	08						1	
	11	05					1		
		22						1	1
		28					1		
	12	20				1	1		
1974	01	03				1	1		
		08				1			
	02	21						1	
		28				1			
	03	01				1			
		13				1			
		14					1		
		19					1		
		21					1		
		27				1			
		28				1			
	04	02				1			
	05	03					1		
		07					1		
		09				1			
		10				1			
		13				1			
		16					1		

YEAR	MONTH	DATE	Country (laboratory) D	DK	F	N	S	UK-M	UK-W
1974	05	21						1	
		27				1			
		28			1	1			
	06	05					1		
		11					1		
		18			1				
		19				1			
		20			1				
	07	04	1						
		08	1						
		09	1						
		10	2			1			
		11	1			1			
		12				1			
		23							1
	08	13							1
		20					1		
		21				1			1
		22						1	
		26				1			
		27					2		
		28					1	1	
	09	02					1		
		11	1			1			
		12				1			
		17					1		
		20					1		
		24					1		
	10	07					1		
		09					1		
		31					1		
	11	15				1			
		22					1		
		27					1		
	12	04					1		
		20						1	
1975	02	05			1		1	1	
		06		1					
		12					1		
		20						1	
		21		1		1			
		22	1	1	1	1			
		26				1	1		
		27				1			
	03	21					1		
		SUM	92	8	3	5	37	35	15	8
1971	07	09							1	
	08	25							1	
	10	01							1	
	10	22							1	
									1	
									1	
TOTAL			97 days	9	3	5	37	35	21	8

Table 1 lists the dates of the 111 individual flights on 92 days, conducted within the Programme and also the 6 flights conducted by United Kingdom in 1971. These flights contain a total of 745 individual measurements of sulphur compounds plus som auxillary observations. Figure 1 shows the geographical distribution of the data points.

4 SAMPLING EQUIPMENT AND PROCEDURES

4.1 Sulphur compounds

Filter sampling procedures, specifically designed for measurements of sulphur compounds using light aircraft, were used The air sample is drawn through two filters in series. The first filter collects the aerosol particles, while the second one, impregnated with potassium hydroxide, collects sulphur dioxide. After exposure, the filters were analysed by wet chemical analysis, either by the barium perchlorate thorin method or by isotopic dilution analysis (IDA). X-ray fluorescence spectroscopy was also used, but only as a check. For further details, se the proposed plan for the second measurement phase (5) and references (8) and (9).

The detection limit is about 1 µg SO_2 per filter. This implies a lower detection limit of about 5 µg/m^3 for a sampling time of 10 minutes, and about 1-2 µg/m^3 for a sampling time of 30 minutes. These figures may indicate the accuracies of the measurements and are also fairly representative of the SO_4 samplings.

In addition to the impregnated filter method, sampling of sulphur dioxide was also performed by the West and Gaeke method (10), using wet bubblers. The overall accuracy of this method is about the same as for the filters.

For continuous measurement of sulphur dioxide, an instrument designed by Novak (11) was used on a limited number of NILU flights. Its detection limit is about 5 $\mu g/m^3$ and the response time about 1 minute. Readings were affected by aircraft accelerations, and by changes in the air density. A base-line drift was also noticed. However, through comparing mean values with the corresponding filter values, representative time dependent concentrations during sampling runs could be obtained.

4.2 Particle concentrations

Two different types of optical instruments were used to estimate particle concentrations; integrating nephelometer and Aitken nuclei counter.

The integrating nephelometer measures continuously the aerosol scattering coefficient, b_{sp}, by detecting light scattered from illuminated particles in the air samples (12). The instrument used in Sweden measured scattered light at a wavelength of 450 nm, while the one operated by NILU used 530 nm. Empirical correlations (12) have shown that approximate total mass concentrations may be estimated from the relationship.

$$\text{mass } (\mu g\ m^{-3}) = 4 \times 10^5\ b_{sp}(m^{-1})$$

The light scattering readings are rather sensitive to humidity of the air sample. The Swedish instrument was heated to keep the relative humidity low. The unheated instrument used by NILU may have given somewhat higher readings in moist air. However, this may have been partially compensated by the effect of the longer wavelength used. When the two instrumented aircrafts were flown in formation over Sweden in April 1975, mean values obtained were in good agreement.

On NILU flights, a manually operated particle counter, manufactured by Gardner Association Inc. was used (13). Sample air is drawn into a moistened chamber, the air expanded adiabatically and fog droplets form on the particles. The number of particles is estimated from a photocell read-out and a calibration curve. Although the instrument permits detection of particles down to 10^{-7}cm radius, on these flights the detection limit of 1.3×10^{-5}cm was selected.

A condensation nuclei counter was also used for flights in Denmark.

4.3 Meteorological parameters

The different temperature sensors used are all believed to give an accuracy equal to or better than 0.5^{o}C. That is a value considerably smaller than observed temperature fluctuations during a sampling run. Only a few humidity values are reported.

Wind directions and wind speeds estimated from the aircraft are only reported by the United Kingdom.

Visual observations of cloud and flight conditions are available from most flights.

5 SAMPLING EQUIPMENT USED BY INDIVIDUAL COUNTRIES

Table 2 lists the types of sampling equipment used by each participating country.

An intercalibration of the Norwegian, Swedish and German sampling equipment for sulphur compounds was scheduled to take place in Munich in December 1973. However, bad weather conditions prevented the planned formation flights.

On 11 July 1974, a formation flight of the aircrafts from Norway and the Federal Republic of Germany took place over the Netherlands and northwestern Germany at the 300 and 600 m levels. Concentrations of sulphur compounds were low and close to the detection limits. The 8 German readings showed some scatter and gave a mean value of 9.8 $\mu g\ m^{-3}$ and a standard deviation of 4.0 $\mu g\ m^{-3}$. The corresponding Norwegian readings were more uniform, with a mean value of 6.2 $\mu g\ m^{-3}$ and a standard variation of 1.0 $\mu g\ m^{-3}$.

The Swedish and the Norwegian sampling equipments were compared in flights over Sweden on 22 April 1975. Samples obtained were analysed using the thorin method at the respective laboratories. For the 3 comparable samples of sulphur dioxide the Swedish values of 10.9, 12.0 and 7.1 corresponded to the Norwegian values of 7.8, 12.2 and 11.8 (all in $\mu g\ m^{-3}$). The Norwegian samples, analysed by X-ray fluorescence spectroscopy, gave the values of 10.2, 11.1 and 10.2. (The Swedish values are based on 20 min. sampling time, the first two Norwegian values on 40 min. sampling time and the last one on 20 min.). Although the mean values are in relatively good agreement, the individual scatter was quite large and reflects the uncertainties in measurements. The sampling instruments of Warren Spring Laboratory and of the Met. Office/Harwell laboratory were compared in a series of ground level trials in January 1973. The agreement was very good (14).

6 LISTING OF DATA

In the data listing found at the end of this report, the data are listed according to the date of flight. All concentration values are corrected to the same standard pressure (1013.2 mb = 760 mm Hg). The standard temperatures of the original data varied somewhat. U.K. used 15°C (ICAO standard), while the other countries have used either 0°C (Denmark, Federal Republic of Germany and Sweden) or 20°C (Norway). However, these differences in standard temperatures were found to give variations of only 5% or less in the concentration values.

"Time and position" refer to the mid point of the sampling leg. DUR is the duration of sampling. "Height" refers to height in metres above mean sea level. PART is the number of nuclei per cubic centimeter, and SCAT the scattering coefficient b_{sp}, as measured with an integrating nephelometer.

A rough indication is given of wind direction and general weather conditions along the flight tracks in the sampling area. This information is mainly based on synoptic weather maps. Where flight tracks are not evident from the listing of the mid points of the sampling legs, further information is given in Tables 3 and 4.

General remarks:

DENMARK - The original reports contain graphs from which the listed mean particle concentrations have been extracted. On an additional flight on 8 August 1974, the filter sampler failed and only particle concentrations were measured. These data are not listed, but contained in report from the Danish Atomic Energy Commission, Risø-Roskilde (14).
Aircraft used: Dakota (DC-3).

FEDERAL REPUBLIC
OF GERMANY - Due to some technical difficulties with the filter analyses, all SO_2 values reported are those obtained with the West and Gaeke method. Two simultaneous samples were taken. Only the reported mean values are listed.
Aircraft used: Beechcraft Queen Air.

FRANCE - Filter samplings were performed along prescribed tracks.
Aircraft used: Cessna 206.

NORWAY - Wet bubblers were originally used for sampling of SO_2, but these data are considered uncertain and are not included in the listing.
Aircraft used: Piper Aztec.

SWEDEN - From 14 March 1974 onwards, filters and an auto-analyser were used. Maximum and minimum of nephelometer readings were also reported, but are not included in the listing.
Aircraft used: Beechcraft Travel Air.

UNITED KINGDOM - Most of the flights were carried out along tracks selected to measure flux of sulphur compounds out of England. The Meteorological Office cooperating with the AERE conducted 15 flights (UK-M). Concentration values are corrected for mean filter background (1-3 µg).
Aircraft used: Varsity on all flights except on 20 February 1975 when a Hercules was used.
At the end of the table is listed 6 flights conducted in 1971. Two concurrent samples of SO_2 were made. The mean values are given.

The additional 8 UK flights, were carried out by Warren Spring Laboratory (UK-W), using a Hastings aircraft.

7 PARTICIPATING LABORATORIES

DENMARK
- Aerosol Research Laboratory, Danish Atomic Energy Commission Research Establishment, Risø-Roskilde.
- Danish Meteorological Institute, Copenhagen.

FEDERAL REPUBLIC OF GERMANY
- Institut für Meteorologie und Geophysik der Johann Wolfgang Goethe-Universität, Frankfurt a/Main.

FRANCE
- Etablissement d'Etudes et de Recherches Meteorologiques, Meteorologie Nationale, Observatoire de Magny-les-Hameaux (Yvelines).

NORWAY
- Norwegian Institute for Air Research (NILU), Lillestrøm.

SWEDEN
- Department of Meteorology, University of Stockholm.

UNITED KINGDOM
- Meteorological Office, Bracknell.
- Atomic Energy Research Establisment (AERE), Harwell.
- Warren Spring Laboratory, Hertforshire.

8 REFERENCES

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(2) Smith, F.B. Jeffrey, G.M. — Airborne transport of sulphur dioxide from the U.K. Atm. Env. 9, 643-659 (1975).

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(11) Lahmann, E.
Prescher, K.E.
Automatische Schwefeldioxid Bestimmungen mit einem Polarographisch-Coulometrish arbeitenden Gerät.
Wasser, Luft und Betrieb 15, 366-367 (1971).

(12) Charlson, R.J.
Ahlquist, N.C.
Howarth, H.
On the generality of correlation of atmospheric aerosol mass concentration and light scatter.
Atm.Env. 2, 455-464 (1968).

(13)
Small particle detector Type Cn, Gardner Associates, Inc., Scheneetady, USA 1962.

(14) Atkins, D.H.F.
A ground level comparision of the performance of methods used in aircraft for sampling sulphur dioxide and particulate sulphates.
U.K. Atomic Energy Authority Report AERE-R M614 (1974).

Table 2: Sampling equipment used by aircraft in the LRTAP Programme

COUNTRY	PARAMETER	INSTRUMENT METHOD	ANALYSIS METHOD	PERIOD	REMARKS	Estimated accuracy of values
FEDERAL REPUBLIC OF GERMANY (D)	SO_2 SO_4	Wash bottle Tetrachloro-mercurate solution for SO_2	West and Gaeke	All flights		
DENMARK (DK)	SO_2 SO_4	Filters in series	Isotope dilution analysis	All flights		10% for SO_4 and SO_2
	Number of condensa-tion nuclei	Aitken counter			Diam.less than 0.2µm	
FRANCE (F)	SO_2 SO_4	Filters in series	Barium perchlorate-thorin	All flights		1.5 µg/m^3 for 30 min sampling
NORWAY (N)	SO_2 SO_4	Filters in series	Barium perchlorate-thorin	All flights		2 µg/m^3 for 30 min sampling
	Number of condensation nuclei	Gardner's small parti-cle sampler				
	Scattering coefficient b_{sp}	Integrating nephelometer			Wave-length 530	

Table 2 (continued).

COUNTRY	PARAMETER	INSTRUMENT METHOD	ANALYSING TECHNIQUE	PERIOD	REMARKS	Estimated accuracy of values
SWEDEN (S)	SO_2	Wet absorption peroxide solution	Barium perchlorate-thorin	Before 14 March 1974	Filterdia-meter 180 mm	
	SO_4	Glas fiber filter				
	SO_2 + SO_4	Filter in series	Barium perchlorate-thorin	Since 14 March 1974	Whatmann 40-diam. 47 mm	3 µg/m³ for 10 min sampling
	SO_4	special imp-actor probe for sampling in cloud	——— " ———	On special flights in clouds	For details contact Swedish labo-ratory	
	Scattering coefficient b_{sp}	Integrating nephelometer			Wavelength 450 nm	
UNITED KINGDOM (UK-M)	SO_2 + SO_4	Filters in series	Barium perchlorate-thorin		See refer-ence (9)	
UNITED KINGDOM (UK-W)	SO_2	Tetrachloromercu-rate	West and Gaeke			
	SO_4	Filter	Barium perchlorate-thorin			
	Sodium	——— " ———	Flame photometer			
	Chloride	——— " ———	Potentiometric			
	Ammonium	——— " ———	Indophenol blue			

Table 3. FLIGHT TRACKS - UK-W, DANISH AND SOME NORWEGIAN FLIGHTS.

FLIGHT NO DATE	START			STOP			HEIGHT (m) (REMARKS)
	TIME	POSITION N	E (W)	TIME	POSITION N	E (W)	
501	1011	5200	0155	1038	5315	0155	152
721129	1040	5315	0155	1100	5430	0155	76
	1114	5430	0155	1145	5300	0155	671
	1155	5250	0155	1227	5430	0155	274
	1239	5430	0155	1331	5200	0155	914
502	1115	5540	0750	1145	5700	0530	152
721208	1150	5700	0530	1215	5755	0350	152
	1223	5750	0400	1248	5655	0555	366
	1255	5645	0610	1321	5600	0745	366
	1340	5525	0710	1440	5400	0310	1830
503	0940	5547	0237	1026	5502	0628	1520
730301	1030	5506	0655	1105	5640	0520	610
	1105	5640	0520	1142	5824	0321	610
	1154	5824	0321	1237	5703	0501	152
	1250	5625	0544	1320	5506	0700	610
507	0915	5331	0316	1004	5127	0141	152
730830	1015	5134	0154	1100	5335	0225	1370
	1104	5335	0225	1155	5125	0143	762
	1157	5125	0145	1220	5109	0118	610
512	1120	5503	0656	1202	5654	0508	152
731122	1211	5655	0518	1251	5507	0702	610
	1257	5507	0658	1322	5600	0603	457
	1323	5600	0603	1346	5655	0502	457
	1349	5655	0513	1427	5505	0658	914
	1429	5505	0658	1608	5230	0032	2440
516	1145	5505	0655	1231	5710	0540	1830
740723	1238	5710	0540	1327	5505	0655	610
	1333	5526	0641	1357	5618	0614	152
	1400	5631	0607	1426	5730	0535	152
517	1032	5344	0103	1107	5424	0033	305
740813	1116	5446	0020	1154	5318	0127	914
	1159	5318	0127	1245	5525	W0005	1520
	1251	5525	W0005	1318	5411	0047	152
	1327	5342	0109	1352	5303	0134	1750
518	1003	5112	0136	1051	5325	0259	914
740821	1100	5333	0312	1150	5112	0136	152
	1155	5112	0136	1246	5331	0312	305
	1254	5333	0312	1342	5112	0136	1520

Table 3 (continued).

FLIGHT NO DATE	START			STOP			HEIGHT (m) (REMARKS)
	TIME	POSITION N	E (W)	TIME	POSITION N	E (W)	
401	1015	5150	0620	1025	5210	0620	270
740708	1027	5215	0620	1037	5232	0620	270
	1040	5229	0620	1050	5215	0620	150
	1050	5212	0620	1100	5150	0620	150
	1103	5150	0620	1113	5210	0620	370
	1114	5215	0620	1124	5235	0620	370
	1125	5242	0620	1135	5304	0620	370
	1136	5316	0620	1146	5330	0620	370
	1147	5330	0620	1157	5316	0620	250
	1158	5304	0620	1208	5242	0620	250
402	1434	5150	0620	1444	5207	0620	300
740709	1445	5210	0620	1455	5229	0620	300
	1508	5300	0635	1523	5300	0718	150
	1525	5300	0719	1540	5300	0635	300
	1546	5300	0635	1601	5300	0719	300
	1602	5300	0719	1617	5300	0635	500
	1626	5304	0620	1641	5330	0620	1100
	1642	5319	0620	1657	5329	0620	1100
403	0928	5123	0732	0942	5131	0838	770
740710	0942	5132	0853	0957	5112	0920	VIA 5130N 0920E
	0958	5107	0920	1013	5030	0920	770
	1016	5031	0920	1031	5107	0920	620
	1034	5104	0920	1049	5026	0920	1100
	1050	5026	0920	1005	4945	0920	1100
	1108	4951	0920	1123	5030	0920	770
	1125	5030	0920	1140	4949	0920	620
	1142	4951	0920	1157	5030	0920	920
	1158	5031	0920	1213	5107	0920	920
404	1420	5133	0920	1435	5210	0920	1100
740710	1440	5207	0920	1455	5130	0920	490
	1457	5130	0920	1512	5210	0920	770
	1513	5210	0920	1528	5250	0920	770
	1531	5250	0920	1546	5214	0920	460
	1550	5214	0920	1605	5250	0920	1100
	1608	5300	0911	1624	5300	0821	770
	1625	5300	0814	1641	5300	0719	770
	1641	5300	0719	1656	5300	0628	770
	1657	5251	0620	1712	5216	0620	770
	1725	5140	0620	1738	5124	0657	400

Table 3 (continued).

FLIGHT NO / DATE	START			STOP			HEIGHT (m)
		POSITION			POSITION		
	TIME	N	E (W)	TIME	N	E (W)	(REMARKS)
405	0957	5150	0620	1012	5215	0620	310
740711	1015	5229	0620	1030	5300	0620	310
	1034	5300	0615	1049	5300	0540	370
	1051	5300	0540	1106	5300	0618	400
	1110	5242	0620	1125	5215	0620	380
	1135	5139	0627	1145	5124	0657	310
406	1034	4930	0920	1049	5004	0920	770
740911	1049	5004	0920	1104	5035	0920	770
	1104	5035	0920	1119	5110	0920	770
	1119	5111	0920	1134	5145	0920	770
	1135	5147	0920	1150	5222	0920	770
	1152	5226	0920	1207	5300	0920	430
	1214	5307	0920	1229	5236	0920	710
	1229	5236	0920	1244	5213	0920	710
	1245	5210	0920	1300	5141	0920	1100
	1300	5141	0920	1315	5115	0920	1100
	1315	5115	0920	1330	5041	0920	1100
	1331	5038	0920	1346	5005	0920	1100
	1346	5005	0920	1400	4936	0920	620
301	0825	5535	0900	0855	5514	0717	VIA 5535N 0810E
750206							
	0900	5510	0655	0910	5455	0625	
	0915	5450	0605	0936	5425	0500	
	0938	5425	0500	1008	5340	0325	
	1010	5338	0315	1040	5308	0252	VIA 5305N 0200E
	1041	5308	0252	1110	5355	0405	
	1112	5358	0408	1142	5439	0549	
	1147	5440	0555	1217	5512	0725	
	1220	5515	0435	1250	5515	0922	VIA 5530N 0828E
	1253	5514	0930	1323	5520	1125	VIA 5455N 1035E
302	1336	5705	0843	1406	5608	1005	
750221	1412	5608	1005	1441	5503	1124	
	1446	5503	1124	1502	5431	1159	
303	1056	5503	1410	1116	5508	1314	
750222	1117	5505	1314	1137	5502	1200	VIA 5500N 1223E
	1138	5505	1200	1158	5507	1058	
	1200	5507	1058	1238	5519	0850	
	1240	5519	0850	1300	5505	0751	VIA 5525N 0749E
	1302	5505	0751	1322	5513	0913	
	1337	5529	1020	1354	5542	1134	

Table 3 (continued).

FLIGHT NO / DATE	START TIME	START POSITION N	START POSITION E (W)	STOP TIME	STOP POSITION N	STOP POSITION E (W)	HEIGHT (m) / (REMARKS)
26	0936	5143	0620	0951	5220	0620	300
740710	0953	5220	0620	1008	5143	0620	500
	1010	5143	0620	1028	5220	0620	800
	1028	5222	0620	1043	5257	0620	800
	1045	5257	0620	1100	5222	0620	900
	1102	5222	0620	1117	5257	0620	240
	1119	5300	0628	1134	5300	0730	240
	1136	5300	0730	1151	5300	0648	500
	1154	5300	0650	1209	5300	0810	800
	1211	5300	0810	1224	5306	0910	800
	1226	5306	0910	1241	5303	0810	500
	1244	5303	0810	1259	5307	0930	240
27	CONCURRENT WITH						
740711	GERMAN FLIGHT 405 - FORMATION FLIGHT						
29	1235	5935	1045	1305	5855	0955	600
	1307	5850	0945	1337	5805	0800	600
	1443	5805	0800	1513	5715	0705	450
	1515	5710	0705	1545	5620	0605	450
	1547	5620	0600	1617	5620	0420	450
	1620	5620	0430	1650	5620	0650	900
	1652	5625	0650	1722	5735	0715	600
	1724	5745	0725	1754	5810	0800	600
	1756	5830	0850	1826	5910	1010	150
30	1125	5927	1040	1155	5835	1100	340
740826	1157	5830	1105	1227	5730	1135	300
	1230	5725	1140	1300	5625	1220	300
	1302	5625	1225	1318	5625	1230	VIA 5605N 1230E
	1321	5630	1230	1341	5720	1130	150
	1343	5720	1140	1403	5640	1220	460
	1406	5635	1215	1436	5740	1140	760
	1539	5740	1120	1559	5835	1100	460
	1602	5840	1055	1629	5940	1035	760

Table 4. FLIGHT TRACKS - UK-M AND FRANCE

FLIGHT NO DATE	FLIGHT TRACKS
504 730323	Samples made during slow climb or decent off east UK coast.
505 730517	Test flight near Isle of Wight.
506 730809	Between 5330N 0200E and 5355 0055E.
508 730904	Between 5335N 0110E and 5455N 0000.
509 730907	Between 5555N-0050W and 5435N 0020E.
510 730908	Betwwen 5635N 0735E-5550N 0745E and 5505N 0710E.
511 731008	Same as 509
513 731122	Same as 509.
514 740221	5355N 0055E-5255N 0140E
515 740521	Same as 510
519 740822	Between 5815N 0510E and 5715N 0640E.
520 740828	Between 5535N 0030W and 5415N 0040E.
521 741220	Same as 510
522 750205	Between 5000N 0625W and 5105N 0540W.
523 750220	170km leg oriented NW-SE
601 740528	Between 4740N 0120E and 4740N 0245E.
602 740618	Between 4845N 0345E and 4955N 0315E
603 740620	Same as 602
604 750205	Between 4955N 0405E and 4945N 0450E.
605 750222	Between 4955N 0105E and 5005N 0150E

APPENDIX:

DATA LISTING

CLOUD ABBREVIATIONS USED

Sc	-	Stratocumulus	- cloud at low levels
St	-	Stratus	- cloud at low levels
As	-	Altostratus	- cloud at medium level
Cu	-	Cumulus	- cloud normally through more levels (low + medium)
Cb	-	Cumulonimbus	- shower clouds

NUMBER CODE

1	→	37	Norway	- N
201	→	235	Sweden	- S
301	→	303	Denmark	- DK
401	→	408	Federal Republic of Germany	- D
501	→	501	United Kingdom	- UK
501	→	605	France	- F

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
501	UK-W	721129	1025	27	5233	0155	150	992	43	-				Wind:
			1050	20	5338	0155	75	994	36	-				240^{o}-12 ms^{-1} NH_4 Cl Na
			1130	31	5345	0155	670	925	7	15				250^{o}-17 ms^{-1} 9 11 1
			1211	32	5340	0155	275	970	29	8				250^{o}-17 ms^{-1} 3 36 12
			1305	52	5315	0155	915	902	1	-				250^{o}-16 ms^{-1}
														$\mu g\ m^{-3}$
		STRONG W WINDS - OVERCAST - AHEAD WARM FRONT												
502	UK-W	721208	1130	30	5620	0640	150	985	6	-				Wind:
			1203	25	5728	0440	150	984	2	-				170^{o}-4 ms^{-1} NH_4 Cl Na
			1235	25	5723	0458	365	959	2	2				205^{o}-4 ms^{-1} 2 6 3
			1308	26	5623	0658	365	960	4	1				205^{o}-4 ms^{-1} 3 5 2
			1410	60	5543	0500	1830	804	0	0				235^{o}-12ms^{-1} 0 - -
														$\mu g\ m^{-3}$
		SW FLOW - SCATTERED RAINSHOWERS												
														NH_4 Cl Na
503	UK-W	730301	1003	46	5425	0432	1520	850	-	17				Wind: 21 9 6
			1048	35	5553	0607	610	947	3	-				235^{o}-12 ms^{-1} - - -
			1123	37	5732	0420	610	944	35	-				200^{o}-10 ms^{-1} - - -
			1206	33	5743	0410	150	996	45	67				180^{o}-11 ms^{-1} 56 56 104
			1305	30	5545	0622	610	946	14	41				240^{o}-12 ms^{-1} 3 27 21
														$\mu g\ m^{-3}$
		SW FLOW - OVERCAST - AHEAD WARM FRONT												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
504	UK-M	730323	1010	20	5420	0105W	955	906	3	6	-	-	8	WIND: 240^{o}- 11 ms^{-1}
			1140	15	5645	0145W	170	994	47	11	-	-	8	-
			1150	13	5617	0137W	330	976	9	13	-	-	8	250^{o}- 12 ms^{-1}
			1205	10	5545	0113W	600	932	10	12	-	-	7	240^{o}- 13 ms^{-1}
			1215	12	5522	0048W	965	904	0	4	-	-	7	250^{o}-16 ms^{-1}
			1230	12	5455	0020W	830	920	23	11	-	-	8	250^{o}- 14 ms^{-1}
			1240	12	5430	0010	370	972	94	16	-	-	9	240^{o}- 10 ms^{-1}
			1255	14	5402	0034	160	997	105	17	-	-	12	210^{o}- 10 ms^{-1}
			1310	14	5330	0055	295	981	20	14	-	-	10	200^{o}- 10 ms^{-1}
			1325	13	5308	0116	590	947	40	15	-	-	9	210^{o}- 07 ms^{-1}
			1335	14	5245	0146	885	914	29	8	-	-	8	220^{o}- 06 ms^{-1}
		SW FLOW-FAIR												
201	S	730509	1215	10	5905	1650	3100	692	-	26	-	35	-	Clouds below and above Very hazy
			1225	10	5905	1605	3075	692	41	12	-	38	-	Clouds below and above Very hazy
			1250	10	5915	1530	350	974	16	19	-	112	-	Very hazy.Some Sc at 800 m
			1310	10	5915	1530	750	927	24	17	-	85	-	Very hazy. Some Sc at 800 m
			1320	10	5915	1530	1230	878	-	8	-	20	-	Very hazy. Some Sc at 800 m
			1325	10	5915	1530	1500	845	15	6	-	12	-	Very hazy.Some Sc at 800 m
			1410	8	5915	1720	1270	867	20	18	-	70	-	Clouds above and below
		WEAK FLOW -VERY HAZY-SOME SC CLOUDS												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
505	UK-M	730517	1225	10	5025	0136W	230	981	23	17	-	-	9	Wind: 090°-17 ms^{-1}
			1240	10	5025	0136W	360	966	51	20	-	-	9	110°-17 ms^{-1}
			1250	9	5025	0136W	520	947	27	16	-	-	9	130°-11 ms^{-1}
			1305	12	5025	0136W	675	930	6	12	-	-	9	140°-14 ms^{-1}
			1340	25	5104	0138W	375	964	36	15	-	-	10	110°-14 ms^{-1}
			1405	24	5104	0138W	560	943	33	16	-	-	9	110°-15 ms^{-1}
			1435	20	5006	0131W	735	923	34	15	-	-	7	110°-15 ms^{-1}
			1500	26	5104	0138W	935	901	7	9	-	-	7	120°-16 ms^{-1}
			1525	26	5104	0138W	1280	864	0	5	-	-	6	130°-18 ms^{-1}
		SE FLOW-OVERCAST												
202	S	730523	1205	10	5915	1715	950	907	-	28	-	250	-	Very hazy. Clouds below and above
			1225	10	5920	1640	550	952	37	12	-	130	-	Ci above the aircraft
			1240	10	5920	1600	1000	902	22	9	-	110	-	Just below Cu-base
			1255	10	5920	1525	1460	851	19	3	-	30	-	Above and between Cu
			1315	10	5920	1530	1900	808	19	4	-	35	-	Hazy, Cu below aircraft
			1330	10	5920	1530	2300	770	10	9	-	80	-	Cu below, Ci above the aircraft
			1345	7	5900	1610	1500	847	8	3	-	30	-	Big Cu around, very hazy up to the Cu-base
		WEAK S-LY FLOW - HAZY - CU CLOUDS												
203	S	730613	1320	10	5915	1710	300	972	-	32	-	210	-	Very hazy
			1350	10	5915	1740	2200	796	54	1	-	5	-	Clouds below and above
			1410	10	5920	1550	1750	817	26	18	-	80	-	Partly in clouds
			1425	10	5920	1550	1150	879	14	24	-	155	-	Very hazy.Clouds above
			1445	10	5920	1715	650	934	14	28	-	212	-	Very hazy
		STRONG W-LY FLOW - VERY HAZY AHEAD COLD FRONT - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
1	N	730620	1200	10	5705	0730	1450	860	2	3	-	-	-	
			1215	10	5705	0610	1450	860	3	15	-	-	-	
			1230	10	5705	0500	1450	860	8	17	-	-	-	
			1245	10	5705	0340	1450	860	6	14	-	-	-	
			1300	10	5705	0400	1450	860	5	5	-	-	-	
			1315	10	5705	0450	1450	860	4	2	-	-	-	
			1330	10	5705	0540	1450	860	0	0	-	-	-	
			1345	10	5705	0630	1450	860	0	0	-	-	-	
		SE FLOW - CLEAR - INVERSION BASE AT 1300 M												
204	S	730628	1300	10	5920	1740	350	970	-	36	-	320	-	Very hazy.Cb above the aircraft.
			1320	10	5920	1740	300	977	43	41	-	-	-	Very hazy.Cb above, thunderstorm passing.
		SW FLOW - VERY HAZY - CLOSE TO FRONTAL ZONE												
2	N	730702	1135	10	5950	0420	1450	856	19	-	-	-	-	
			1145	10	5925	0420	1450	856	17	-	-	-	-	
			1200	10	5905	0420	1500	851	18	-	-	-	-	
			1210	10	5840	0440	1500	853	18	-	-	-	-	
			1220	10	5815	0455	1450	856	14	-	-	-	-	
			1235	10	5805	0535	1450	849	25	-	-	-	-	
			1245	10	5750	0620	1500	849	-	-	-	-	-	
			1300	10	5740	0650	1500	849	14	-	-	-	-	
			1310	10	5725	0735	1450	855	10	-	-	-	-	
		SW FLOW - HAZY AHEAD COLD FRONT - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
3	N	730703	1355	10	5900	0440	1350	865	4	-	-	-	-	
			1405	10	5840	0445	1250	878	4	0	-	-	-	
			1415	10	5825	0520	1300	872	4	3	-	-	-	
			1425	10	5810	0550	1250	878	0	2	-	-	-	
			1440	10	5755	0620	1250	878	0	2	-	-	-	
			1450	10	5740	0640	1250	878	0	2	-	-	-	
			1500	10	5730	0725	1250	878	19	20	-	-	-	
			1515	10	5730	0820	1400	862	15	32	-	-	-	
			1525	10	5745	0900	1400	859	11	23	-	-	-	
			1535	10	5800	0930	1400	859	12	53	-	-	-	
		SW FLOW - HAZY - SCATTERED Cb CLOUDS												
205	S	730704	1340	10	5920	1720	300	986	-	14	-	75	-	Very hazy: Cu above the aircraft
			1400	10	5920	1545	900	922	57	29	-	80	-	Dense haze
			1420	10	5920	1545	1500	858	30	24	-	-	-	Dense haze below. Partly into it.
			1450	10	5920	1545	3850	650	29	1	-	5	-	The hazelayer below the aircraft; Ci above
			1545	10	5920	1720	300	986	27	17	-	110	-	Hazy
		WEAK WINDS - HAZY - Cu and Cb CLOUDS												
4	N	730707	0930	10	5800	0720	1400	859	6	14	-	-	-	
			0945	10	5800	0550	1400	859	15	17	-	-	-	
			0955	10	5800	0415	1400	859	11	12	-	-	-	
			1010	11	5800	0245	1400	859	6	8	-	-	-	
			1020	10	5800	0245	1400	859	6	9	-	-	-	
			1030	10	5800	0415	1400	859	8	15	-	-	-	
			1055	10	5800	0720	1400	859	7	18	-	-	-	
			1105	10	5800	0840	1400	859	6	6	-	-	-	
			1120	10	5800	0950	1400	859	6	8	-	-	-	
		VAR FLOW DIRECTIONS - UPPER TROUGH - SHOWERS WITH THUNDER												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
5	N	730715	1150	10	5750	0855	1200	875	4	15	-	-	-	
			1200	10	5745	0800	1200	875	4	11	-	-	-	
			1210	10	5735	0710	1200	878	4	9	-	-	-	
			1230	10	5730	0630	1800	812	4	5	-	-	-	
			1245	10	5730	0630	1500	843	2	11	-	-	-	
			1255	10	5730	0630	1200	875	1	3	-	-	-	
			1305	10	5730	0630	900	908	1	5	-	-	-	
			1320	10	5730	0630	600	942	1	8	-	-	-	
			1405	10	5740	0840	1800	812	1	12	-	-	-	
			1415	10	5740	0840	1500	843	1	12	-	-	-	
			1425	10	5740	0840	1200	875	1	9	-	-	-	
			1445	10	5740	0840	900	908	2	17	-	-	-	
			1455	10	5740	0840	600	942	6	14	-	-	-	
			1730	10	5750	0850	1200	878	8	21	-	-	-	
			1740	10	5825	0925	1200	869	4	23	-	-	-	
			1750	10	5840	1000	1200	875	8	18	-	-	-	
		ESE FLOW - HAZY - CLEAR												
6	N	730809	1650	10	5655	1210	1300	875	0	5	-	-	-	
			1700	10	5625	1220	1300	875	2	6	-	-	-	
			1710	10	5620	1210	1300	875	5	5	-	-	-	
			1725	10	5640	1130	1300	869	5	6	-	-	-	
			1735	10	5655	1050	1300	872	3	6	-	-	-	
			1745	10	5715	1010	1300	875	4	6	-	-	-	
			1800	10	5700	0925	1300	865	2	3	-	-	-	
			1810	10	5750	0840	1300	875	0	5	-	-	-	
		WSW FLOW - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
														Wind:
506	UK-M	730809	1420	20	5200	0100	2840	724	1	0	-	-	5	240° - 18 ms^{-1}
			1510	34	5315	0125	200	1000	13	4	-	-	18	
			1550	39	5315	0125	420	974	12	5	-	-	17	220° - 13 ms^{-1}
			1625	33	5315	0125	665	946	13	5	-	-	15	220° - 14 ms^{-1}
			1715	38	5315	0125	885	921	9	5	-	-	13	230° - 14 ms^{-1}
			1755	34	5315	0125	1115	896	5	3	-	-	12	250° - 15 ms^{-1}
			1845	34	5315	0125	1575	847	0	1	-	-	10	250° - 16 ms^{-1}
		WSW FLOW - CLOUDY												
7	N	730816	1545	30	5850	0420	400	973	0	5	-	-	-	
			1610	30	5850	0210	400	973	1	8	-	-	-	
			1630	30	5850	0210	800	928	3	12	-	-	-	
			1710	30	5850	0420	800	925	3	11	-	-	-	
			1930	30	5835	0615	1250	875	2	9	-	-	-	
			2000	30	5805	0730	1450	856	0	5	-	-	-	
		WEAK S-LY FLOW - HAZY - CLEAR												
8	N	730817	1200	30	5850	1020	600	942	3	8	-	-	-	
			1235	27	5815	0850	600	942	45	33	-	-	-	
			1415	30	5745	0850	600	942	46	41	-	-	-	
			1445	30	5710	1020	800	925	38	30	-	-	-	
			1520	29	5605	1145	800	925	29	23	-	-	-	
			1550	32	5640	1220	800	925	21	20	-	-	-	
		S - FLOW - AHEAD COLD FRONT - HAZY - CLOUDY - INVERSION BASE AT 1800 M												
9	N	730827	1530	30	6020	0410	1300	875	1	5	-	-	-	
			1605	30	6020	0140	1300	875	1	2	-	-	-	
			1635	30	6020	0025	1300	875	11	21	-	-	-	
			1710	30	6020	0120	1300	875	13	27	-	-	-	
			1740	30	6020	0405	1300	875	16	23	-	-	-	
			1815	30	6020	0625	1300	875	2	3	-	-	-	
			2000	40	6020	0850	1600	843	3	12	-	-	-	
		SW FLOW - PARTLY CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
10	N	730829	1435	30	5740	0700	750	932	1	8	-	-	-	
			1505	30	5810	0530	750	929	1	9	-	-	-	
			1540	30	5850	0400	750	929	1	9	-	-	-	
			1610	30	5830	0525	750	932	0	6	-	-	-	
			1640	30	5750	0650	750	932	0	8	-	-	-	
		WEAK WSW FLOW - OVERCAST - DRIZZLE												
														Wind: NH_4 Cl Na
507	UK-W	730830	0940	49	5230	0228	150	997	12	16				320^{o}-10ms^{-1} 10 14 8
			1037	45	5235	0210	1370	861	1	9				300^{o}- 2ms^{-1} 8 2 2
			1130	51	5230	0204	760	927	1	6				360^{o}- 7ms^{-1} 9 5 2
			1210	23	5115	0131	610	946	17	18				360^{o}-10ms^{-1} 2 4 2
		NW FLOW - SCATTERED RAINDROPS												$\mu g\ m^{-3}$
508	UK-M	730904	1610	34	5416	0034E	150	994	27	16	-	-	19	Wind:
			1650	37	5416	0034E	460	958	31	13	-	-	18	190^{o} - 06 ms^{-1}
			1725	32	5416	0034E	780	922	31	13	-	-	15	200^{o} - 07 ms^{-1}
			1810	36	5416	0034E	1080	889	30	13	-	-	13	220^{o} - 09 ms^{-1}
			1845	32	5416	0034E	1370	858	15	5	-	-	12	210^{o} - 11 ms^{-1}
			1930	38	5416	0034E	1700	824	5	4	-	-	10	230^{o} - 13 ms^{-1}
		SW FLOW - FAIR												230^{o} - 15 ms^{-1}
509	UK-M	730907	1620	38	5517	0017W	165	1003	11	9	-	-	18	Wind:
			1700	34	5517	0017W	410	974	2	6	-	-	17	250^{o} - 10 ms^{-1}
			1735	37	5517	0017W	655	946	0	5	-	-	16	270^{o} - 09 ms^{-1}
			1820	33	5517	0017W	905	918	0	3	-	-	15	290^{o} - 07 ms^{-1}
			1855	34	5517	0017W	1140	892	0	3	-	-	13	270^{o} - 05 ms^{-1}
			1935	34	5517	0017W	1395	865	0	2	-	-	12	280^{o} - 05 ms^{-1}
		W FLOW - FAIR												250^{o} - 05 ms^{-1}
510	UK-M	730908	0705	15	5430	0600E	1920	812	1	0	-	-	9	Wind:
			0745	33	5546	0730E	270	990	1	2	-	-	16	300^{o} - 09 ms^{-1}
			0830	33	5546	0730E	745	935	0	3	-	-	15	260^{o} - 05 ms^{-1}
			0900	30	5546	0730E	1440	859	0	6	-	-	10	290^{o} - 07 ms^{-1}
			0945	27	5600	0700E	2500	754	0	1	-	-	7	270^{o} - 06 ms^{-1}
		W FLOW - FAIR												260^{o} - 07 ms^{-1}

NO.	LAB.	DATE	SAMPLING		POSITION.		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
511	UK-M	731008	1410	37	5517	0017W	170	999	13	3	-	-	10	Wind: 250° - 04 ms^{-1}
			1455	36	5517	0017W	490	961	6	3	-	-	8	240° - 08 ms^{-1}
			1525	15	5450	0000	820	924	2	3	-	-	6	260° - 09 ms^{-1}
			1545	16	5530	0035W	840	922	2	2	-	-	5	260° - 12 ms^{-1}
			1620	33	5517	0017W	1185	884	1	2	-	-	4	260° - 13 ms^{-1}
			1655	33	5517	0017W	1520	848	1	1	-	-	2	270° - 15 ms^{-1}
			1730	26	5517	0017W	1980	802	1	1	-	-	-	270° - 12 ms^{-1}
		W FLOW - CLOUDY												
206	S	731105	1320	7	5900	1740	800	911	-	38	-	-	-	8/8 St below and above the aircraft
			1335	10	5845	1720	2000	787	-	3	-	-	2	8/8 St below, 6/8 above
			1350	10	5830	1700	2050	782	13	3	-	-	3	8/8 St " , 3/8 "
			1420	10	5800	1700	700	923	16	6	-	-	11	No clouds hazy; seems to be in the inversion
			1435	10	5750	1745	700	923	10	16	-	-	11	" " " "
			1450	10	5755	1810	600	934	9	16	-	-	11	" " " "
			1510	10	5835	1745	780	914	10	5	-	-	10	Some St below
			1525	10	5900	1740	780	914	10	4	-	-	10	8/8 St below
		STRONG SW FLOW - HAZY - BROKEN ST LAYERS												
512	UK-W	731122	1140	42	5559	0602	150	1002	24	15	-	-	-	Wind: 265°-13ms^{-1} NH4 9 Cl 35 Na 15
			1230	40	5601	0610	610	948	2	0	-	-	-	260°-19ms^{-1} 5 0 0
			1310	25	5533	0630	455	968	0	0	-	-	-	265°-12ms^{-1} 5 0 0
			1335	23	5627	0535	455	963	0	-	-	-	-	265°-13ms^{-1} - - -
			1408	38	5600	0605	915	914	0	0	-	-	-	255°-17ms^{-1} 1 0 0
			1519	39	5347	0348	2440	762	0	-	-	-	-	275°-13ms^{-1}
		STRONG W FLOW - PARTLY CLOUDY												$\mu g\ m^{-3}$
513	UK-M	731122	1550	39	5517	0017W	80	1010	42	11	-	-	9	Wind: 240° - 11 ms^{-1}
			1630	38	5517	0017W	180	998	40	10	-	-	8	250° - 11 ms^{-1}
			1720	42	5517	0017W	330	981	29	4	-	-	9	260° - 15 ms^{-1}
			1810	36	5517	0017W	480	963	25	7	-	-	6	270° - 16 ms^{-1}
			1855	44	5517	0017W	650	944	2	0	-	-	8	280° - 21 ms^{-1}
			1945	31	5517	0017W	1100	894	0	0	-	-	8	280° - 19 ms^{-1}
		W FLOW - PARTLY CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
207	S	731128	1235	10	5920	1710	940	897	-	4	-	5	-6.5	Hazy
			1250	10	5915	1600	940	897	8	2	-	5	-8.0	"
			1305	10	5915	1530	1240	862	4	3	-	5	-9.5	"
			1325	10	5915	1600	500	950	8	3	-	5	-5.0	"
			1340	20	5915	1620	500	950	7	3	-	5	-5.0	"
			1350	5	5915	1705	500	950	9	4	-	5	-5.5	"
			1400	5	5920	1740	260	970	17	33	-	5	-	"
		NW FLOW - CLEAR												
11	N	731220	1120	10	5940	1200	450	956	35	10	-	-	-	
			1155	10	5825	1255	850	908	24	13	-	-	-	
			1205	10	5810	1210	850	908	28	11	-	-	-	
			1315	10	5745	1100	950	898	8	12	-	-	-	
			1325	10	5755	1015	850	908	4	8	-	-	-	
			1325	10	5810	0940	950	901	10	15	-	-	-	
			1350	10	5840	1010	950	898	11	18	-	-	-	
		SW FLOW - HAZY - CLOUDS IN LAYERS BEHIND WARM FRONT												
208	S	731220	1420	10	5905	1720	760	923	22	1	-	5	0	Clear but 6/8 clouds above
			1455	10	5840	1610	1050	889	33	11	-	10	-2	Hazy below " " "
			1515	10	5820	1610	1100	883	10	8	-	10	0	" " " " "
			1530	10	5750	1330	1050	889	1	7	-	15	2	8/8 St.below during first 6 min.
			1835	10	5750	1240	800	918	40	11	-	35	2	Clouds below: Dark
			1850	10	5750	1330	630	938	31	24	-	75	-2	" " "
			1915	10	5820	1530	560	946	22	18	-	45	1	" " "
			1925	10	5840	1610	700	930	9	15	-	35	-1	Below clouds, "
			1945	8	5905	1720	780	921	8	17	-	35	-1	Partly in clouds; Icing
		SW FLOW - HAZY - CLOUDS IN LAYERS BEHIND WARM FRONT												

NO.	LAB.	DATE	SAMPLING		POSITION.		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
209	S	740103	1150	10	5915	1640	300	985	14	15	-	30	-2	Very hazy
			1210	10	5905	1510	700	940	12	3	-	9	2	8/8 St below, clear above
			1240	10	5835	1355	1200	882	13	7	-	12	2	8/8 St " " "
			1520	10	5810	1335	2200	770	-	1	-	-	-1	8/8 St " " " icing
			1545	10	5905	1510	2200	770	-	0	-	-	0	8/8 St " " icing
		S FLOW - VERY HAZY - LOW ST CLOUDS - CLEAR ABOVE												
12	N	740103	1050	10	5920	1000	1250	875	-	4	-	-	-	
			1105	10	5855	0915	1300	869	-	11	-	-	-	
			1120	10	5820	0830	1250	875	-	7	-	-	-	
		S FLOW - OVERCAST - DRIZZLE AND RAIN												
13	N	740108	1330	10	5750	1145	500	959	23	50	-	-	-	
			1345	10	5825	1125	350	977	13	24	-	-	-	
			1400	10	5900	1105	350	977	8	21	-	-	-	
			1410	10	5925	1045	350	977	7	22	-	-	-	
		STRONG SSE FLOW - OVERCAST - LIGHT SNOW - INVERSION BASE AT 1500 M												
514	UK-M	740221	1350	28	5325	0030E	2810	724	2	2	-	-	-1	Wind: 310^{o} - 09 ms^{-1}
			1435	27	5324	0117E	60	1014	31	9	-	-	9	270^{o} - 11 ms^{-1}
			1510	32	5324	0117E	465	966	26	9	-	-	6	270^{o} - 11 ms^{-1}
			1540	27	5324	0117E	760	932	18	8	-	-	4	270^{o} - 09 ms^{-1}
		concurrently with 3 preceding samples:							27	9				
		W FLOW - FAIR												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
14	N	740228	1450	30	5705	1140	550	966	4	4	-	-	-	
			1530	30	5635	0940	550	959	4	4	-	-	-	
			1600	30	5625	0710	550	959	5	4	-	-	-	
			1635	30	5705	0600	550	956	6	5	-	-	-	
			1705	30	5755	0700	500	963	4	6	-	-	-	
		S FLOW - CLEAR - INVERSION BASE AT 1850 M												
15	N	740301	1455	30	5915	0510	750	923	11	12	-	-	-	
			1530	30	5830	0535	650	932	21	16	-	-	-	
			1600	30	5810	0655	650	939	16	18	-	-	-	
			1635	30	5825	0835	750	926	11	9	-	-	-	
			1710	30	5915	1000	750	932	8	8	-	-	-	
		STRONG SSE FLOW - PARTLY CLOUDY												
16	N	740313	1035	30	5905	1110	450	966	12	7	-	-	-	
			1100	20	5820	1140	500	963	21	10	-	-	-	
			1230	30	5730	1100	500	963	16	8	-	-	-	
			1300	30	5730	0900	600	952	15	8	-	-	-	
			1430	30	5825	0900	550	959	15	8	-	-	-	
			1500	25	5900	1000	550	959	13	10	-	-	-	
		ESE FLOW - PARTLY CLOUDY TO CLEAR												
210	S	740314	1120	10	5915	1730	300	973	16	7	-	102	2	Very hazy
			1130	10	5915	1630	300	973	15	7	-	104	-	" "
			1140	10	5920	1540	650	932	10	3	-	80	1	" "
			1200	10	5910	1440	1000	892	10	6	-	80	-1	Hazy
			1215	10	5910	1410	1500	836	1	5	-	4	-5	Above the haze layer
			1225	10	5915	1510	1500	836	1	5	-	8	-5	" " " "
			1245	10	5920	1630	900	904	8	6	-	68	0	Hazy
			1255	10	5920	1730	300	973	12	9	-	100	3	"
		WEAK FLOW - VERY HAZY - CLEAR												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
211	S	740319	0930	15	5800	1630	1700	808	4	10	-	96	-5	8/8 St below;clouds above;Icing
			0950	15	5730	1550	1700	808	3	3	-	10	-5	8/8 St below; 1/8 Ci above
		VAR WINDS - UPPER LOW - SNOW AND RAIN MIXED - LOW ST CLOUDS												
212	S	740321	1250	20	5710	1520	1500	836	-	4	-	10	-1	7/8 St below
			1325	15	5830	1640	1500	836	-	5	-	10	-6	8/8 St below;4/8 As above
		SW FLOW - NEAR CENTER OF LOW - CLOUDS IN LAYERS-SNOW												
17	N	740327	1435	30	5645	0630	400	973	6	0	-	-	-	
			1510	30	5545	0525	400	970	20	4	-	-	-	
			1550	30	5430	0415	400	966	68	20	-	-	-	
			1635	30	5315	0305	450	958	153	40	-	-	-	
			1700	8	5250	0410	500	956	118	20	-	-	-	
		ESE FLOW - VERY HAZY - CLEAR												
18	N	740328	1645	30	5815	1140	350	980	5	2	-	-	-	
			1725	30	5905	1035	550	959	5	8	-	-	-	
		WEAK FLOW - CLEAR - HIGH PRESSURE RIDGE												
19	N	740402	1145	30	5905	0935	850	925	11	15	-	-	-	
			1215	30	5805	0800	850	925	12	16	-	-	-	
			1350	30	5810	0945	850	925	3	16	-	-	-	
			1315	15	5850	1040	850	925	46	17	-	-	-	
			1340	30	5940	1140	600	956	10	13	-	-	-	
			1410	18	6025	1120	600	956	4	14	-	-	-	
		STRONG SE FLOW - PARTLY CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
213	S	740503	0955	15	5920	1715	300	976	4	3	-	22	10	Some haze
			1015	15	5915	1540	930	908	3	3	-	22	4	Hazy
			1035	15	5900	1400	1500	841	4	3	-	16	1	1/8 Cu; one can see the haze layer
			1100	15	5900	1510	950	902	3	4	-	22	6	
			1115	13	5905	1510	950	902	3	4	-	22	4	1/8 Cu
			1135	15	5915	1600	600	942	2	3	-	20	8	1/8 "
		WEAK FLOW - A FEW CU CLOUDS - HAZY												
214	S	740507	0940	15	5920	1710	300	984	3	2	-	-	10	Somewhat hazy
			1000	15	5910	1535	650	944	2	2	-	-	7	" "
			1020	15	5920	1420	1000	904	2	2	-	-	2	" "
			1040	15	5930	1240	1900	808	0	2	-	-	-4	" "
			1535	15	5945	1155	2200	779	0	2	-	-	-4	" "
			1615	15	5910	1440	600	950	1	2	-	-	10	" "
			1630	10	5905	1550	600	950	0	3	-	-	8	" "
			1640	10	5915	1645	600	950	0	3	-	-	5	" "
		ENE FLOW - CLEAR												
20	N	740509	1720	30	5815	0500	450	966	9	10	-	-	-	
			1750	30	5730	0315	450	963	16	11	-	-	-	
			1820	30	5615	0240	700	932	44	20	-	-	-	
			1850	30	5615	0240	850	918	42	21	-	-	-	
			1920	30	5730	0315	850	915	54	24	-	-	-	
			1950	30	5815	0500	1000	901	34	12	-	-	-	
		S FLOW - PARTLY CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
21	N	740510	1020	30	5825	0340	550	942	16	16	-	-	-	
			1050	30	5805	0136	500	945	30	15	-	-	-	
			1125	30	5810	0255	500	949	34	16	-	-	-	
			1155	30	5820	0500	550	945	9	12	-	-	-	
			1225	30	5815	0620	550	949	9	6	-	-	-	
			1255	30	5800	0753	550	949	10	4	-	-	-	
			1330	30	5835	0920	550	949	10	8	-	-	-	
			1350	14	5905	1035	600	942	6	17	-	-	-	
		STRONG SSE FLOW AND OVERCAST IN W - WEAK E WINDS AND CLEAR IN E PARTS												
22	N	740513	1525	30	5810	1000	800	932	-	0	-	-	-	
			1555	30	5710	1000	900	925	-	0	-	-	-	
			1625	30	5635	1110	900	925	-	0	-	-	-	
			1655	30	5640	1230	900	922	-	0	-	-	-	
			1730	30	5745	1340	900	925	-	0	-	-	-	
			1750	10	5745	1220	900	925	-	0	-	-	-	
			1905	30	5815	1130	750	942	-	4	-	-	-	
			1930	17	5910	1100	950	918	-	3	-	-	-	
		SE FLOW - PARTLY CLOUDY												
215	S	740516	1035	10	5915	1735	350	985	10	8	-	30	10	Somewhat hazy,6/8Sc above
			1050	10	5915	1645	350	985	4	5	-	18	10	" " 8/8 " "
			1100	10	5910	1535	650	951	7	4	-	22	8	" " 8/8 " "
			1115	10	5905	1435	950	917	4	3	-	12	5	" " 8/8 " "
			1130	10	5905	1435	1530	852	4	1	-	16	-	" " 8/8 " "
														Partly in the cloud base
			1150	10	5905	1540	1250	883	1	3	-	36	3	Somewhat hazy,7/8Sc above
			1200	10	5910	1615	1250	883	4	3	-	24	4	" " 7/8 " "
			1215	10	5915	1700	350	985	6	4	-	42	11	" " 6/8 " "
		ENE FLOW - OVERCAST												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
515	UK-M	740521	0710	30	5430	0600E	2180	783	0	3	-	-	- 2	Wind: 290° - 12 ms^{-1}
			0805	33	5546	0730E	75	1010	2	4	-	-	9	290° - 09 ms^{-1}
			0845	30	5546	0730E	790	927	0	1	-	-	6	300° - 09 ms^{-1}
			0920	33	5546	0730E	1540	846	0	1	-	-	0	300° - 09 ms^{-1}
		concurrently with 3 preceding samples:							1	2	-	-	-	300° - 11 ms^{-1}
			1000	30			2000	799	0	1	-	-	- 2	
		WNN FLOW-CLOUDY												
23	N	740527	0915	10	5727	0850	180	990	3	1	-	-	11	7/8 St at 180 m, rain
			0940	20	5633	0820	150	995	1	1	-	-	11	in and out of clouds, scattered rainsh.
			1010	30	5510	0800	1500	843	1	1	-	30	6	" " " "
			1045	30	5354	0710	1500	843	1	1	-	-	6	" " " "
			1115	17	5244	0552	2100	782	1	1	14	20	5	Haze, top 2500 m
		STRONG NW FLOW - OVERCAST - RAIN AND REINSHOWERS												
24	N	740528	1240	30	5238	0538	300	977	24	8	500	130	12,8	Haze, 5/8Sc+Cu at 700 m
			1305	15	5322	0647	450	956	9	14	80	150	12,2	" 5/8 " " " 700 "
			1330	30	5427	0733	450	959	14	7	30	130	-	7/8 St at 600 m
			1420	30	5620	0806	2500	724	2	3	3	40	- 1,1	6/8 St top 1100 m
		WNW FLOW - HAZY AND CLOUDY IN W-RAIN IN E PART												
											RH:	Wind:		
601	F	740528	1145	35	4740	0200	305	974	14	15	74	26506	13	4/8Sc at 850m, local fog
			1230	36	4740	0200	810	917	13	10	79	27507	9,5	7/8Sc, top of haze at cloud base
			1315	34	4740	0200	1650	826	2	5	71	30005	4	7/8Cu at 850m, top 1600 m
			1400	22	4740	0200	1950	796	2	3	58	29007	3	6/8Cu at 850m, top 1800 m
		W FLOW - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
216	S	740605	0950	10	5920	1720	330	971	7	0	-	18	13	4/8 Cu above
			1000	10	5920	1635	330	971	2	1	-	20	13	4/8 " "
			1015	10	5910	1540	780	921	3	0	-	16	8	4/8 " "
			1030	10	5905	1435	1250	869	1	1	-	10	5	2/8 "+Ci above
			1045	10	5905	1355	1250	869	-	1	-	6	6	Partly in clouds
			1100	10	5855	1300	1250	869	2	2	-	8	5	3/8 Cu above
			1115	10	5855	1300	1250	869	1	1	-	8	4	3/8 " "
			1125	10	5905	1355	900	908	1	1	-	12	8	3/8 " "
			1145	13	5905	1525	900	908	1	1	-	8	9	
			1200	13	5920	1635	330	971	4	1	-	14	14	
		W FLOW - SCATTERED CU CLOUDS												
217	S	740611	1010	10	5920	1720	330	972	3	8	-	46	12	Hazy; Cu above
			1020	10	5920	1640	330	972	4	6	-	40	13	Hazy; clouds 8/8 above rain 2 min.
			1035	10	5910	1540	630	939	4	6	-	44	8	8/8 above
			1045	10	5905	1440	630	939	2	4	-	36	6	8/8 Partly in clouds
			1115	7	5910	1320	3200	832	0	2	-	10	-11	Icing; Partly in a Cb
			1130	10	5905	1320	900	908	1	3	-	20	4	Cu around
			1145	15	5905	1440	900	908	1	4	-	46	4	Partly in Cu
			1200	10	5910	1620	630	939	2	7	-	52	6	Light rain, below Cb
			1215	7	5855	1640	630	939	1	5	-	44	8	Hazy
			1330	10	5855	1720	630	939	3	4	-	-	9	Small Cu, hazy westward
		SSW FLOW - RAINSHOWERS												
											Wind:			
602	F	740618	1035	43	4920	0100	460	966	19	2	276°-07 ms^{-1}		11,4	4-7/8 Sc+Cu, base 1200 m top 2500 m
			1120	40	4920	0100	915	914	9	2	250°-10 "		7,2	Above clouds
			1215	31	4920	0100	2600	737	17	0	294°-08 "		- 0,5	Below "
			1300	30	4920	0100	3500	657	0	0	288°-13 "		- 5,0	
		W FLOW - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
25	N	740619	0840	9	5800	0810	1900	942	6	1	-	-	3,3	In clouds
			0905	30	5715	0810	3000	791	1	0	-	-	-3,1	" "
			0935	34	5640	0810	3000	697	2	1	4	-	-2,5	5/8 Cu top 1500 m between layers
			1050	23	5445	0800	2500	753	2	1	6	-	2,0	3/8 Cu
			1115	13	5410	0730	1200	875	5	3	20	-	6,7	On top of thick haze
			1135	30	5300	0610	1800	812	2	3	15	-	3,9	In and out of clouds
			1225	10	5215	0500	650	942	9	7	300	-	12,8	Haze, 4/8 Sc
		S FLOW - SCATTERED RAINSHOWERS												
												Wind:		
603	F	740620	1040	41	4020	0100	1370	857	4	3		060^{o}-03 ms^{-1}	7,7	1/8 Cu
			1130	35	4920	0100	915	920	14	6		035^{o}-04 "	11,5	1/8 "
			1210	35	4920	0100	765	945	15	6		030^{o}-04 "	14,4	6/8 Cu at 950 m
			1255	41	4920	0100	460	968	16	7		055^{o}-03 "	16,5	4/8 Cu at 950 m top
		WEAK E FLOW - PARTLY CLOUDY												
401	D	740704	1053		5200	0600	500	975	46	23				
			1111		5242	0600	500	975	17	26				
			1131		5247	0600	1650	936	10	26				
			1147		5211	0600	1650	935	28	22				
			1212		5137	0620	1650	935	29	26				
			1228		5102	0620	1650	935	18	20				
			1246		5110	0620	500	975	19	25				
			1300		5147	0620	500	975	40	17				
		W FLOW - OVERCAST - AHEAD WARM FRONT												
402	D	740708	1020	10	5200	0620	270	985	111	30	-	-	-	
			1030	10	5224	0620	270	985	67	18	-	-	-	
			1045	10	5222	0620	150	995	53	34	-	-	-	
			1055	10	5200	0620	150	995	123	36	-	-	-	
			1110	10	5200	0620	370	970	58	41	-	-	-	
			1120	10	5225	0620	370	970	43	32	-	-	-	
			1130	10	5253	0620	370	970	41	38	-	-	-	
			1140	10	5324	0620	370	970	23	26	-	-	-	
			1150	10	5324	0620	250	986	13	30	-	-	-	
			1205	10	5323	0620	250	986	16	26	-	-	-	
		NW FLOW - PARTLY CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
403	D	740709	1440	10	5158	0620	300	965	12	23	-	-	-	
			1450	10	5220	0620	300	970	3	26	-	-	-	
			1515	15	5300	0657	150	990	2	10	-	-	-	
			1530	15	5300	0657	300	950	0	12	-	-	-	
			1555	15	5300	0657	300	970	0	8	-	-	-	
			1610	15	5300	0657	500	950	3	15	-	-	-	
			1635	15	5317	0620	1100	883	0	12	-	-	-	
			1650	15	5259	0620	1100	883	0	10	-	-	-	
		NW FLOW - PARTLY CLOUDY												
404	D	740710	0935	14	5127	0805	770	925	93	10	-	-	-	
			0950	15	5125	0911	770	925	101	8	-	-	-	
			1005	15	5049	0920	770	925	58	21	-	-	-	
			1025	15	5049	0920	620	943	44	-	-	-	-	
			1040	15	5045	0920	1100	892	42	15	-	-	-	
			1055	15	5006	0920	1100	891	36	22	-	-	-	
			1115	15	5020	0920	770	925	36	16	-	-	-	
			1130	15	5010	0920	620	945	31	23	-	-	-	
			1150	15	5020	0920	920	909	26	17	-	-	-	
			1205	15	5040	0920	920	906	50	16	-	-	-	
		WNW FLOW - CLOUDY - SCATTERED RAINSHOWERS												
405	D	740710	1425	15	5152	0920	1100	890	1	18	-	-	-	
			1445	15	5149	0920	490	955	0	17	-	-	-	
			1505	15	5150	0920	770	923	1	16	-	-	-	
			1520	15	5230	0920	770	924	0	16	-	-	-	
			1540	15	5232	0920	460	957	3	9	-	-	-	
			1555	15	5232	0920	1100	890	0	21	-	-	-	
			1615	16	5300	0846	770	927	2	13	-	-	-	
			1635	16	5300	0740	770	927	12	21	-	-	-	
			1650	15	5300	0654	770	926	13	13	-	-	-	
			1705	15	5234	0620	770	929	6	8	-	-	-	
			1730	13	5132	0639	400	969	127	22	-	-	-	
		STRONG WNW FLOW - CLOUDY - RAINSHOWERS												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
														SO_2 : max-min
26	N	740710	0945	15	5200	0620	300	977	5	1	500	80	17,5	16 2
			1000	15	5200	0620	500	956	6	1	400	85	15,8	23 1
			1020	15	5200	0620	800	918	7	1	-	90	13,4	10 5 4Sc at 900 m
			1035	15	5240	0620	800	918	2	1	-	75	13,3	top 1500 m
			1050	15	5240	0620	500	952	3	1	250	80	15,9	
			1110	15	5240	0620	240	988	3	1	200	90	18,5	
			1125	15	5300	0700	240	977	2	1	200	45	18,8	5/8 Sc + Cu
			1145	15	5300	0710	500	956	1	1	200	40	16,4	
			1200	15	5310	0730	800	925	3	2	200	50	13,7	
			1215	13	5303	0840	800	922	2	2	200	60	14,0	5/8 Cu at 1000 m top 2200 m
			1235	15	5305	0840	500	959	1	1	200	55	16,5	
			1250	15	5305	0850	240	977	2	2	-	55	18,5	
			1528	20	5230	0820	500	956	3	3	70	70	17,5	7/8 Sc+Cu at 1200 m
			1550	17	5155	0730	500	956	23	6	70	150	17,8	Haze
			1605	8	5130	0705	500	952	122	13	100	220	19,0	2/8Sc+7/8Ac, thick haze
		WNW FLOW - CLOUDY												
406	D	740711	1005	15	5203	0620	310	970	8	21	-	-	-	
			1020	15	5245	0620	310	968	12	23	-	-	-	
			1040	15	5300	0558	370	965	17	22	-	-	-	
			1100	15	5300	0559	400	960	7	20	-	-	-	
			1115	15	5229	0620	380	960	8	20	-	-	-	
			1140	10	5132	0642	310	965	7	34	-	-	-	
		STRONG WNW FLOW - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT	PRESSURE	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)	m	mb	SO_2	SO_4				
														SO_2:max-min
27	N	740711	0945	14	5135	0635	300	973	19	3	-	-	-	25 13 5/8Sc+Cu at 600 m
			1000	15	5200	0620	300	973	6	3	400	130	17,2	8 4
			1020	15	5242	0620	340	973	6	2	800	40	16,2	9 5 4/8Sc+Cu at 700 m
			1040	15	5300	0552	340	970	8	2	200	50	14,6	12 4
			1055	15	5300	0610	340	966	6	3	300	50	14,5	10 4 5/8Cu at 600m, top 1800 m
			1115	15	5227	0630	340	963	5	1	300	90	15,9	7 3
			1140	10	5134	0636	340	963	6	1	-	120	17,8	21 3 3/8Cu+, 6/8 Cs
			1410	7	5133	0707	300	966	21	4	-	120	18,7	30 14
			1425	21	5202	0745	300	970	9	5	-	110	17,2	15 5 3/8Sc+Cu at 900 m, 7/8 As
			1450	20	5252	0842	300	966	8	5	-	80	16,3	11 5
			1510	18	5328	0934	300	970	6	3	-	50	14,7	10 4 6/8Sc+Cu at 1000 m
		STRONG WNW FLOW - CLOUDY												
28	N	740712	1235	9	5435	0935	460	952	7	3	-	75	15,5	7/8Cu+Cb,rainshowers
			1350	30	5645	1010	600	935	2	1	-	18	13,7	6/8Cu + 2/8 Cb
			1408		5750	1030	760	-	-	-	-	20	11,5	1/8Cu,top of haze at 600 m
			1415		5750	1030	50	-	-	-	-	60	19,0	
			1420	30	5825	1030	300	935	2	1	-	16	16,3	2/8 Cu + 6/8 As
		STRONG W FLOW - HEAVY RAINSHOWERS S OF 57N - HAZE TO 600 MN OF 57 N												
														Wind:
516	UK-W	740723	1208	46	5607	0617	1830	809	0	1				294^o-13 ms^{-1} Na: 1
			1304	49	5607	0617	610	939	0	4				270^o-11 ms^{-1} " 23
			1345	24	5552	0627	150	992	0	0				280^o- 6 ms^{-1} " 17
			1413	26	5700	0551	150	990	0	8				290^o- 9 ms^{-1} " 28
			1502	55	5553	0356	2440	751	0	-				270^o-11 ms^{-1} " 1
		WNW FLOW - CLOUDY												
														Wind:
517	UK-W	740813	1050	35	5404	0048	305	977	6	1				295^o- 7 ms^{-1} Na: 8
			1135	38	5402	0054	915	910	0	1				270^o- 5 ms^{-1} " 10
			1222	46	5422	0041	1520	843	0	-				280^o- 9 ms^{-1} " 7
			1304	27	5448	0021	150	995	17	3				250^o- 3 ms^{-1} " 11
			1340	25	5322	0121	1750	820	0	-				230^o- 9 ms^{-1} " -
		W FLOW - CLOUDY												$\mu g\ m^{-3}$

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
218	S	740820	1000	10	5920	1720	330	990	1	0	-	5	15,9	1/8Cu clear weather
			1015	10	5920	1650	330	990	3	2	-	10	16,0	1/8 Cu
			1030	10	5915	1535	950	921	1	-	-	10	10,5	1/8 Cu,3/8 Ci
			1040	10	5905	1440	950	921	1	0	-	5	11,2	1/8 Cu,4/8 Ci
			1100	10	5900	1335	1540	855	0	1	-	0	7,4	1/8 Cu,5/8 Ci
			1110	10	5900	1355	1250	888	1	2	-	5	10,2	2/8 Cu,5/8 Ci
			1125	10	5905	1440	1250	888	0	0	-	5	10,0	2/8 Cu,4/8 Ci
			1140	10	5915	1535	650	954	2	1	-	10	13,2	2/8 Cu,2/8 Ci
			1155	10	5915	1635	650	954	3	2	-	10	14,7	2/8 Cu
			1210	10	5915	1710	330	990	1	1	-	10	17,2	2/8 Cu
		WEAK FLOW - HIGH PRESSURE CENTER												
29	N	740821	1250	30	5915	1020	600	952	2	1	42	20	12,7	2/8 Sc at 750 m
			1320	30	5825	0815	600	952	1	1	13	18	12,1	Top of haze 750 m, 2/8 Sc at 600 m
			1455	30	5740	0730	450	970	1	1	10	20	12,2	4/8Sc + Cu at 600m
			1530	30	5645	0635	450	970	1	3	42	30	12,7	3/8 Sc at 500 m
			1600	34	5620	0510	450	970	1	1	30	60	13,3	1/8 Sc, 7/8 As+Cs
														SO_2:max-min
			1635	30	5620	0540	900	918	10	6	-	220	12,6	24 4 3/8Sc at 350m top 500m
			1605	30	5700	0700	600	952	2	1	-	35	11,7	3 1
			1740	30	5755	0750	600	950	1	1	-	21	11,4	5/8Sc at 650m,top 1200m
			1810	30	5850	0930	150	998	2	1	-	30	15,2	7/8Ac+As
		SW FLOW AHEAD OF COLD FRONT OVER ENGLAND - HAZE - CLOUDY												
													Wind:	
518	UK-W	740821	1027	48	5219	0217	915	918	2	5			065^{o}- 4 ms^{-1}	Na: 2
			1125	50	5222	0224	150	1006	10	13			160^{o}- 2 ms^{-1}	" 4
			1220	51	5222	0224	305	987	8	7			070^{o}- 4 ms^{-1}	" 1
			1328	48	5222	0224	1520	852	0	1			255^{o}- 4 ms^{-1}	" 0
		WEAK FLOW - CLEAR												$\mu g\ m^{-3}$

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^oC	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
519	UK-M	740822	0735	30	5730	0430	3380	671	1	0	-	-	-3	Wind: 230^o - 11 ms^{-1}
			0835	26	5745	0554	35	1014	1	8	-	-	14	210^o - 08 ms^{-1}
			0925	27	5745	0554	1110	891	16	11	-	-	7	240^o - 07 ms^{-1}
			0955	25	5745	0554	2020	797	0	3	-	-	1	240^o - 07 ms^{-1}
		concurrently with 3 preceeding samples:							7	8				
			1040	31	5630	0530	2880	715	2	0	-	-	-2	230^o - 11 ms^{-1}
		SW FLOW - CLOUDY - SCATTERED RAINSHOWERS												
														SO_2:max-min
30	N	740826	1140	30	5900	1050	340	959	4	3	34	120	16,6	13 3 6/8 St, top 300 m
			1212	30	5800	1120	300	981	8	6	43	220	18,3	14 3 thick haze, 2/8 Ac
			1245	33	5655	1200	300	973	36	23	40	470	21,1	58 11 thick haze, 2/8 Ac
			1310	20	5615	1230	300	973	5	9	-	330	22,2	34 9 thick haze, 2/8 Ac
			1330	20	5655	1200	150	995	35	23	73	350	22,1	64 16 thick haze, 2/8 Ac
			1350	20	5700	1200	460	966	30	22	95	490	20,6	47 13 thick haze, 2/8 Ac
			1420	20	5705	1155	760	925	40	28	100	450	17,9	72 17 thick haze, 2/8 Ac
			1550	20	5810	1105	460	970	21	19	40	300	20,5	33 9 4Sc at 1000m
			1615	27	5910	1045	760	932	10	11	50	150	16,5	15 3
		SSW FLOW - THICK HAZE S OF 58 N - TOP 1500 M - WARM SECTOR												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
219	S	740827	0940	10	5920	1735	320	983	8	40	-	310	21,1	Very hazy
			0950	10	5915	1710	320	983	3	25	-	270	20,8	" "
			1010	10	5910	1535	870	923	3	13	-	190	16,5	" " 4/8Cu above
			1025	10	5900	1430	1520	853	3	6	-	95	11,9	Hazy; 6/8Cu, partly in clouds
			1040	10	5830	1325	950	914	5	16	-	185	16,1	" 8/8 Cu
			1050	10	5815	1255	700	941	4	10	-	180	19,3	" 6/8 "
			1105	10	5755	1230	700	941	4	11	-	210	18,6	Very hazy, 8/8 Cb
			1115	7	5745	1205	700	941	16	12	-	190	16,5	" "
		SSE FLOW - SCATTERED SHOWERS												
220	S	740827	1855	10	5745	1310	1550	849	11	14	-	150	10,1	Partly in clouds; Passing through cold fron with
			1905	10	5745	1400	1550	849	4	10	-	80	8,7	Partly in clouds,rain
			1930	10	5810	1510	950	914	4	10	-	185	15,5	Below clouds (8/8)
			1945	10	5835	1605	1600	844	2	9	-	90	11,9	4/8 clouds above
			2000	15	5900	1730	1550	849	1	5	-	50	12,1	
		SSE FLOW - PASSING THROUGH COLD FRONT NEAR 14 DEGREES EAST												
														Wind:
520	UK-M	740828	1555	20	5500	0100W	2180	783	0	0	-	-	3	190^{o} - 12 ms^{-1}
			1650	42	5456	0000	50	1014	11	12	-	-	14	150^{o} - 12 ms^{-1}
			1730	27	5456	0000	350	978	35	11	-	-	13	170^{o} - 12 ms^{-1}
			1805	38	5456	0000	800	927	30	11	-	-	9	180^{o} - 10 ms^{-1}
			1845	28	5456	0000	1170	886	46	9	-	-	6	200^{o} - 07 ms^{-1}
			1920	36	5456	0000	1570	844	36	10	-	-	3	190^{o} - 09 ms^{-1}
		concurrently with 5 preceeding samples:							26	12				
		SSE FLOW - PARTLY CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
221	S	740828	1055	10	5900	1730	1920	815	1	7	-	50	9,7	Partly in clouds and rain
			1110	10	5845	1745	1920	815	2	13	-	130	10,8	Clouds both below and above
			1130	10	5755	1810	950	915	2	10	-	140	16,4	Hazy, clouds above
			1140	10	5735	1805	640	949	4	12	-	170	18,0	Very hazy; 8/8 clouds above
			1210	13	5645	1640	640	949	2	4	-	45	16,6	Partly in clouds
			1230	13	5645	1640	640	949	1	5	-	60	16,1	" " " and rain
			1245	11	5715	1725	640	949	4	14	-	225	16,5	" " rain. Hazy
			1255	10	5735	1805	640	949	3	10	-	130	17,9	Hazy
			1310	10	5755	1805	350	981	2	10	-	160	20,4	"
			1330	9	5850	1735	1600	845	2	12	-	135	12,6	"
		SSE FLOW - ALONG COLD FRONT - PARTLY IN RAIN												
222	S	740902	1130	10	5910	1745	340	975	11	20	-	260	18,5	Very hazy, 7/8 clouds above
			1140	12	5855	1730	340	975	6	19	-	280	18,4	" " 7/8 " "
			1155	10	5830	1700	400	968	3	10	-	120	18,6	Hazy; no clouds
			1210	10	5755	1650	940	909	5	8	-	70	14,7	Hazy
			1240	11	5735	1645	650	941	11	10	-	80	16,8	Hazy; Cu above
			1255	12	5820	1655	340	975	5	8	-	80	18,8	Hazy
			1310	13	5855	1730	340	975	2	8	-	75	18,4	Hazy
		S FLOW - SCATTERED SHOWERS												
														SO_2:max-min
31	N	740911	1300	30	5730	0720	370	973	10	5	50	-	14,5	17 6 6/8 Sc at 450m, top 1000 m
			1335	30	5630	0610	520	942	26	5	38	170	11,8	Haze below 600 m
			1405	25	5520	0500	520	959	34	10	-	100	13,7	53 15 Haze below 1100 m
			1510	31	5325	0310	520	959	18	7	38	-	15,6	6/8 As + Cc
			1544	30	5225	0220	460	966	9	6	37	-	16,5	
			1605	7	5150	0135	460	963	12	9	-	-	16,7	Top of haze at 900 m

(continuous)

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
	(continued)		1620	16	5135	0035	2000	785	3	4	-	-	10,7	8/8 As
			1423	-	5410	0430	520	-	-	-	-	130	13,9	5 As + Ac
			1426	-	5414	0425	365	-	-	-	-	130	15,3	Top of lower haze 350m
			1429	-	5418	0420	215	-	-	-	-	230	16,5	
			1430	-	5422	0416	365	-	-	-	-	300	15,5	Top of main haze 1100m
			1433	-	5426	0412	520	-	-	-	-	100	14,6	
			1435	-	5431	0408	670	-	-	-	-	80	13,1	
			1437	-	5436	0404	820	-	-	-	-	60	12,4	
			1439	-	5441	0400	980	-	-	-	-	55	11,6	
			1441	-	5445	0355	1130	-	-	-	-	50	11,1	
			1443	-	5410	0350	1280	-	-	-	-	25	9,4	
	SSW FLOW - CLOUDY ALONG NORW. COAST AND ENGLAND - HAZE OVER SEA													
407	D	740911	1040	15	4947	0920	770	930	8	-	-	-	-	
			1055	15	5020	0920	770	930	6	-	-	-	-	
			1110	15	5053	0920	770	930	9	-	-	-	-	
			1125	15	5128	0920	770	930	8	-	-	-	-	
			1140	15	5205	0920	770	930	11	-	-	-	-	
			1200	15	5243	0920	430	975	9	-	-	-	-	
			1220	15	5251	0920	710	940	9	-	-	-	-	
			1235	15	5225	0920	710	940	7	-	-	-	-	
			1250	15	5156	0920	1100	900	5	-	-	-	-	
			1305	15	5128	0920	1100	900	12	-	-	-	-	
			1320	15	5058	0920	1100	900	6	-	-	-	-	
			1335	15	5022	0920	1100	900	9	-	-	-	-	
			1355	16	4951	0920	620	900	4	-	-	-	-	
	SE FLOW - CLEAR													

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
32	N	740912	1055	30	5210	0030	460	966	3	1	28	-	17,5	In haze and St,4/8As above
			1130	30	5305	0210	460	963	19	3	100	-	16,5	In haze,7/8 As above
			1200	30	5350	0355	460	959	38	10	50	-	17,7	" " 7/8Sc+5/8Ac
			1255	21	5440	0605	460	959	81	12	120	200	17,0	" " 4/8 Ci
			1315	16	5445	0615	300	977	77	12	-	160	18,0	" "
			1335	16	5445	0615	150	998	38	11	70	270	17,5	" "
			1400	30	5515	0730	460	963	22	12	70	130	17,5	" "
			1430	25	5610	0900	430	963	82	30	70	280	16,0	" " 2/8 Ci
			1510	31	5710	1100	490	959	76	26	-	170	16,0	" "
			1800	30	5830	1115	460	970	2	3	-	-	14,0	" " top of haze 2000 m
			1227		5410	0510	1680	-	-	-	-	1	12,5	Top of haze at 1500 m 4/8 Ci
			1230		5410	0510	1250	-	-	-	-	9	14,1	
			1232		5410	0510	940	-	-	-	-	65	15,3	
			1234		5410	0510	640	-	-	-	-	93	17,4	
			1236		5410	0510	300	-	-	-	-	190	19,0	
			1239		5410	0510	150	-	-	-	-	290	18,1	
		WEAK S-LY FLOW - OVERCAST TO 03E - REST OF ROUTE THICK HAZE TO 1500 M												
223	S	740917	1515	15	5835	1705	1840	817	1	8	-	65	11,0	Very hazy
			1530	15	5750	1615	1840	817	2	8	-	90	10,9	" " ground not visible 6/8 above
			1555	15	5730	1550	1840	817	0	7	-	70	10,8	Hazy, 4/8 below
		SW FLOW - PARTLY CLOUDY												
224	S	740920	0925	15	5715	1530	1540	841	0	-	-	-	3,9	Hazy. 4/8 clouds below partly in Sc and Cb with rain
			0955	10	5755	1620	1540	841	0	-	-	15	5,4	8/8 clouds above
			1010	10	5835	1705	1540	841	0	-	-	-	-	Partly in clouds and rain
		W FLOW - ALONG COLD FRONT - RAIN												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
225	S	740924	1125	10	5920	1725	350	962	9	7	-	110	13,8	Very hazy, 8/8 As above
			1135	10	5920	1630	350	962	11	7	-	110	14,1	" " 8/8 " "
			1150	10	5915	1515	950	896	11	5	-	75	9,9	" " 3/8 Cu at 1000 m, 8/8 As
			1200	10	5905	1445	950	896	8	4	-	60	8,8	Hazy, partly in rain
			1215	10	5905	1445	630	931	7	4	-	65	11,1	Hazy, 8/8 As
			1230	15	5910	1540	630	931	8	6	-	95	11,4	Very hazy, partly in rain
			1250	12	5915	1645	630	931	7	6	-	100	11,3	" " " " "
		STRONG S FLOW - AHEAD WARM FRONT - PARTLY IN RAIN												
226	S	741007	1015	16	5845	1705	1800	811	1	0	-	25	-2	8/8St below, clear
			1045	19	5745	1615	1800	811	2	0	-	10	-3	Between layers, partly in clouds
		SE FLOW - ABOVE OVERCAST												
227	S	741009	1450	15	5655	1500	1500	842	0	0	-	320	0	In Ns clouds, rain
			1510	15	5725	1535	1500	842	0	0	-	35	-1	" " " "
			1525	15	5755	1620	1500	842	0	0	-	200	0	" " " "
			1550	15	5835	1655	1500	842	0	2	-	70	0	" " " "
			1610	20	5900	1730	1500	842	0	1	-	80	1	" " " "
		STRONG NE FLOW - RAIN												
228	S	741031	1030	20	5830	1745	1800	806	2	7	-	50	-	In clouds, rain after 10 min.
			1050	13	5750	1810	1800	806	1	3	-	280	-	In clouds and rain, icing
			1110	20	5820	1800	1800	806	1	2	-	180	-	In clouds and rain, icing
		STRONG NE WINDS - RAIN - IN CLOUDS												
33	N	741115	1040	30	6015	1100	1300	847	1	0	-	20	3,9	5/8Sc top 1200m 7/8 As
			1115	20	6015	1100	1500	827	1	0	-	-	1,7	In Sc and Cu clouds
		STRONG SW FLOW - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
229	S	741122	1050	19	5950	1700	1475	849	1	0	-	5	-	On top 8/8Sc clouds
			1115	17	6020	1550	1110	892	0	1	-	10	-	Clear
			1140	17	6015	1605	650	945	1	2	-	15	-	"
			1200	19	6020	1550	450	968	5	3	-	35	-	"
			1220	13	5950	1700	250	992	2	2	-	110	-	8/8 clouds above; snowfall
			1235	15	5930	1730	330	982	3	3	-	70	-	8/8 clouds above; snowfall
		LIGHT WINDS - HIGH PRESSURE RIDGE - LIGHT SNOWFALL AFTER 1200												
230	S	741127	0910	12	5920	1720	340	954	1	2	-	35	6,9	8/8 above
			0920	10	5920	1630	340	954	3	0	-	15	5,2	In clouds
			0935	10	5910	1535	650	918	1	4	-	35	2,4	Clouds both above and below
			0950	11	5805	1435	950	884	1	1	-	20	0,8	Clouds both above and below
			1015	15	5800	1405	1280	846	2	0	-	-	-	Mostly in clouds
			1035	13	5905	1510	650	918	2	0	-	-	1,1	" " "
			1055	13	5910	1610	400	947	1	2	-	35	4,3	Partly in clouds; clouds above and below
			1110	10	5920	1720	340	954	2	2	-	35	4,2	Partly in St clouds, 8/8 above
		STRONG NE FLOW - RAIN - IN CLOUDS												
231	S	741204	1150	13	5905	1735	1070	886	1	2	-	10	5,0	In and out of clouds partly rain
			1205	13	5840	1710	1070	886	-	2	-	30	6,6	6/8 clouds below, 8/8 above
			1225	12	5820	1650	700	928	2	1	-	15	8,9	7/8 clouds below; 7/8 above
			1240	10	5750	1630	650	934	2	2	-	15	8,4	6/8 clouds below; 8/8 above
			1300	20	5730	1625	650	934	3	4	-	15	6,0	Partly in clouds
			1335	6	5845	1715	370	966	3	3	-	35	6,5	Hazy; in clouds for 30sec
		STRONG W FLOW - SW AT LOW LEVELS AHEAD WARM FRONT - BETWEEN CLOUD LAYERS												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
521	UK-M	741220	0710	25	5430	0600E	2070	782	0	0		Cl: 1µg m^{-3}	1	Wind: 270° - 25 ms^{-1}
			0755	33	5546	0730E	1110	876	1	0		1" "	5	290° - 21 ms^{-1}
			0845	45	5546	0730E	130	986	8	13		83" "	8	240° - 23 ms^{-1}
			0930	31	5546	0730E	400	954	0	9		48" "	6	250° - 28 ms^{-1}
		concurrently with 3 preceeding samples:							7	10		58" "	-	
			1015	35	5546	0730E	1730	811	0	0		2" "	2	270° - 23 ms^{-1}
		STRONG W FLOW - AHEAD FRONT - OVERCAST												
232	S	750205	1045	17	5945	1740	1270	886	0	0	-	-	-	Fog in Stockholm and southwards
			1115	16	6015	1600	620	960	1	1	-	20	-	Clear weather northwards
			1130	15	6015	1555	620	960	0	1	-	20	-	
			1150	16	6005	1630	330	994	3	2	-	35	-	
			1215	22	6020	1550	370	989	3	0	-	20	-	
			1225	17	6005	1630	400	986	2	2	-	30	-	
			1240	12	6010	1605	470	978	2	1	-	25	-	
			1300	12	5955	1710	1270	886	2	1	-	10	-	
		NW FLOW - INVERSION AND LOCAL FOG - CLEAR ABOVE												
604	F	750205	1135	13	4950	0430	300	993	22	9	-	-	0,1	
			1205	20	4950	0430	610	957	23	10	-	-	-1,3	
			1225	23	4950	0430	915	922	7	2	-	-	0,4	
			1255	24	4950	0430	1370	872	6	2	-	-	0,4	
			1320	25	4950	0430	1675	840	6	1	-	-	-1,8	
		ESE FLOW - S OF HIGH PRESSURE CENTER - CLEAR												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
322	UK-M	750205	1050	40	5032	0603W	60	1022	51	20		Cl:		Wind:
			1130	33	5032	0603W	130	1013	51	19		13µg m^{-3}	5,0	080° - 17 ms^{-1}
			1205	32	5032	0603W	540	965	39	18		14 " "	5,0	090° - 13 ms^{-1}
			1250	30	5032	0603W	320	991	49	23		12 " "		100° - 10 ms^{-1}
		concurrently with 4 preceeding samples:							51	20		14 " "	1,0	090° - 11 ms^{-1}
			1325	32	5032	0603W	1230	888	7	5		12 " "	3,0	
		E FLOW - PARTLY CLOUDY										2 " "	2,0	100° - 11 ms^{-1}
301	DK	750206	0840	30	5540	0805	650	958	4	-	15	-	10,2	RH:50%, 8/8St at 300m top 540m
			0905	10	5505	0645	650	958	3	-	4	-	10,4	" 48%
			0930	21	5440	0540	200	1010	10	4	5	-	8,1	" 58%,4/8St at 180m top 240m
			0955	30	5400	0400	200	1009	32	11	20	-	9,3	" 55%
			1030	30	5210	0220	200	1006	75	10	35	-	9,3	" 19%,no clouds,haze
			1100	29	5240	0320	160	1011	51	10	28	-	8,1	
			1130	20	5425	0500	160	1014	24	4	20	-	7,7	" 24%, clear
			1200	30	5505	0640	330	995	3	3	18	-	7,0	
			1225	30	5535	0830	650	959	3	0	-	-	9,5	
			1310	30	5500	1040	650	959	2	-	-	-	11,0	" 32%
		ESE FLOW - CLEAR - OVER W PART - HIGH PRESSURE RIDGE - VAR WINDS AND FOG OVER E PARTS												
233	S	750212	1025	15	5910	1735	1250	857	1	1		10	-	8/8 above; 4/8St below very hazy westward
			1045	13	5834	1742	940	893	0	1		10	-	7/8 above;7/8Sc below
			1105	12	5758	1810	400	957	1	1		10	-	Below clouds, 6/8Sc+4/8Ac
			1120	12	5726	1752	400	957	-	1		15	-	6/8 Sc above
			1135	12	5712	1716	350	962	1	4		40	-	5/8 Sc above
			1155	11	5646	1630	350	962	1	7		70	-	Hazy
			1210	10	5720	1620	940	893	1	2		30		Icing after 8 min. 7/8Ac above,8/8St below
			1235	25	5820	1650	1480	841	0	2		-	-	Icing 7/8 Ac above, 8/8 St below
		W FLOW - AHEAD COLD FRONT - CLOUDY BECOMING OVERCAST WITH LATER SNOWFALL												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
												Cl:		Wind:
523	UK-M	750220	1155	17	5700	0430	1045	908	0	1		0 $\mu g\ m^{-3}$	2	230° - 15 ms^{-1}
			1225	25	5825	0430	65	1017	1	11		64 "	5	220° - 15 ms^{-1}
			1310	31	5815	0435	175	1005	1	9		50 "	4	220° - 14 ms^{-1}
			1345	23	5755	0500	240	997	1	11		62 "	3	210° - 14 ms^{-1}
			1415	23	5755	0500	375	981	1	10		51 "	2	220° - 11 ms^{-1}
			1450	29	5755	0500	80	1016	2	10		46 "	5	210° - 13 ms^{-1}
		SW FLOW - CLOUDY												
302	DK	750221	1350	30	5635	0925	450	979	14	2	50	-	4,2	RH: 19%
			1425	29	5535	1045	300	999	38	3	90	-	5,0	" 24% Inversion at 420m
			1455	16	5435	1140	300	999	18	1	80	-	5,7	" 27%
		WSW FLOW - HIGH PRESSURE AREA - HAZE - PARTLY CLOUDY - NO LOW CLOUDS												
34	N	750221	1550	30	5800	0610	500	968	5	1	25	60	-	
			1620	30	5735	0410	420	977	7	2	25	40	3,5	Top of haze at 1200m
			1655	30	5705	0220	420	977	4	2	25	10	5,0	
			1725	30	5640	0040	470	970	5	2	-	20	5,0	
			1805	25W	5505	0115W	950	916	1	1	-	3	4,0	
		STRONG SW FLOW - CLOUDY												
35	N	750222	1215	31	5650	0230W	600	950	41	9	25	210	5,5	
			1240	7	5740	0100W	200	995	49	11	40	500	6,3	6/8St+Sc at 300m top 700 m
			1255	10	5750	0010W	430	970	83	12	40	350	4,3	
			1305	10	5800	0040	700	939	40	15	30	-	4,5	Top of haze 6/8 Sc at 700 m
			1335	30	5825	0225	470	966	33	9	-	200	4,7	
			1405	31	5825	0500	400	977	27	3	-	200	5,0	In clouds
			1440	30	5805	0730	330	988	35	9	-	200	4,2	Partly in clouds
		SW FLOW - CLOUDY												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^2$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. °C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
303	DK	750222	1105	20	5505	1340	270	1001	54	6	200	-	7,1	No clouds
			1125	20	5505	1235	200	1009	61	11	400	-	5,9	" "
			1150	20	5505	1130	380	987	60	8	100	-	4,9	" "
			1210	38	5510	925	450	977	44	8	300	-	5,7	" "
			1250	20	5515	820	360	987	47	10	70	-	4,8	" "
			1310	20	5510	830	480	973	24	4	70	-	5,0	" "
			1345	17	5535	1055	1800	829	8	6	30	-	6,5	" "
		SW FLOW - HIGH PRESSURE AREA - HAZY - NO CLOUDS												
408	D	750222	1407		5142	0622	275	990	62	17				
			1415		5142	0645	275	990	98	15				
			1424		5142	0724	275	990	64	12				
			1432		5142	0724	655	950	137	34				
			1440		5142	0645	655	950	87	-				
			1450		5142	0622	655	950	69	5				
		S FLOW - CLOUDY - INVERSION BELOW 1500 M												
605	F	750222	1100	25	5000	0125	370	981	10	4	-	-	8,4	2/8 Cirrus clouds
			1125	26	5000	0125	250	995	27	8	-	-	7,3	
			1150	27	5000	0125	370	981	14	7	-	-	8,5	
			1215	17	5000	0125	550	960	10	6	-	-	8,0	
			1235	20	5000	0125	920	918	8	5	-	-	4,7	
			1300	25	5000	0125	370	981	11	7	-	-	7,4	
		WEAK S FLOW - FAIR												
36	N	750226	1100	30	6450	1020	200	1006	1	1	-	65	5,0	Below 8/8 clouds at 300 m
			1125	27	6610	1200	200	1001	1	1	-	80	-	" " " " " sleet last 5 min.
		STRONG W FLOW - OVERCAST - SNOWSHOWER AFTER 1125												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	CONC. μgm^{-3}		PART. $\cdot 10^{2}$ cm^{-3}	SCAT. $\cdot 10^{-6}$ m^{-1}	TEMP. ^{o}C	REMARKS
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)			SO_2	SO_4				
234	S	750226	1220	10	5940	1735	1250	891	2	1	-	-	-	
			1235	15	6005	1810	1250	891	1	2	-	-	-	
			1250	10	6035	1835	1000	919	2	1	-	-	-	
			1305	10	6104	1850	1000	919	2	6	-	20	-	
			1320	10	6125	1900	600	965	1	2	-	20	-	
			1335	10	6155	1920	1000	919	3	2	-	20	-	
			1345	10	6217	1935	700	954	4	1	-	20	-	
			1405	10	6247	1950	1250	891	1	3	-	20	-	
			1420	10	6312	2005	800	942	0	4	-	20	-	
			1550	10	6330	1925	500	988	2	6	-	10	-	
			1605	10	6300	1805	800	942	0	2	-	20	-	
			1630	10	6240	1735	800	942	0	1	-	10	-	
			1645	10	6200	1740	600	965	1	4	-	10	-	
			1700	10	6120	1755	600	965	1	2	-	20	-	
			1710	10	6050	1805	600	965	1	5	-	20	-	
			1730	10	6005	1830	1300	885	0	8	-	20	-	
		N FLOW - PARTLY CLOUDY												
37	N	750227	1120	35	6345	1340	860	918	1	1	-	30	0	Below 7/8 of clouds
			1150	30	6300	1400	1020	901	3	1	-	19	-0,3	3/8 Ac very turbulent
			1225	30	6115	1250	980	908	1	1	-	1	0,7	clear " "
		STRONG NW FLOW - CLOUDY IN N - CLEAR IN S PARTS												
235	S	750321	0757	15	5918	1714	350	991	1	32		10		Close to (above) inversion
			0817	15	5908	1555	190	1009	2	35		60		In inversion
			0837	15	5900	1450	630	968	0	13		10		Hazy, clear above
			0858	15	5847	1345	210	1007	30	53		75		Hazy
			0919	15	5900	1440	1080	906	0	5		5		
			0937	12	5915	1600	1100	904	0	1		5		5/8 Ci
			0952	10	5922	1735	350	991	3	56		10		
		WEAK NE WINDS - CLEAR												

NO.	LAB.	DATE	SAMPLING		POSITION		HEIGHT m	PRESSURE mb	SO_2 $\mu g/m^3$	WIND deg/ms^{-1}
			TIME GMT	DUR. min.	LAT. N	LONG. E(W)				
524.		710709	0820	41	5200	0100E	1280	878	53	-
			0943	45	5250	0220E	2030	803	45	-
			1053	45	5250	0220E	150	1006	37	-
			1150	45	5250	0220E	1000	908	46	-
			1246	39	5250	0220E	2620	747	59	-
			1335	34	5200	0100E	1300	878	64	-
525		710825	1155	21	5350	0425W	2000	800	1	-
			1247	29	5350	0425W	150	996	48	-
			1321	22	5350	0425W	910	913	10	-
			1414	42	5350	0425W	2500	757	2	-
526		711001	1041	35	5410	0000	310	987	37	23010
			1146	33	5410	0000	550	960	23	22510
			1234	30	5410	0000	930	916	3	23012
			1316	33	5410	0000	1330	877	3	25011
527		711022	1032	32	5250	0220E	140	1006	18	25521
			1129	39	5250	0220E	390	977	16	26525
			1226	33	5250	0220E	880	918	6	28530
528		711102	1147	34	5350	0055E	160	1010	31	23518
			1305	38	5350	0055E	470	970	19	25023
			1356	36	5350	0055E	300	988	27	24521
			1446	33	5350	0055E	1140	891	0	27021
529		711104	1112	79	5330	0100W	2410	767	3	-
			1226	28	5555	0150W	300	982	4	30017
			1323	36	5410	0000	300	987	22	26018
			1405	28	5300	0130E	300	990	11	26015
			1445	35	5200	0140E	300	993	21	26012