

AD-A107 032 NAVAL RESEARCH LAB WASHINGTON DC
AN AEROSOL DATA BASE FORMAT.(U)
SEP 81 G L TRUSTY, K M HAUGHT

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NRL Memorandum Report 4605	2. GOVT ACCESSION NO. ADA107 032	3. RECIPIENT'S CATALOG NUMBER 1
4. TITLE (and Subtitle) AN AEROSOL DATA BASE FORMAT	5. TYPE OF REPORT & PERIOD COVERED Memorandum T 9	
7. AUTHOR(s) Gary L. Trusty and Kenneth M. Haught	6. PERFORMING ORG. REPORT NUMBER	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Research Laboratory Washington, DC 20375	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 62759N 2E52551 55-1182-0-0	
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Ocean Systems Center San Diego, CA 92152	12. REPORT DATE September 24, 1981	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	13. NUMBER OF PAGES 16	
	15. SECURITY CLASS. (for this report) UNCLASSIFIED	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Marine Aerosols Particle Measurements Aerosol Data Base		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) We describe a data base format which allows easy comparisons of results from a large collection of aerosol measurements from several locations.		

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EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

AN AEROSOL DATA BASE FORMAT

INTRODUCTION

From past measurements we have a collection of aerosol-particle size distributions from sites that are coastal, open-sea, and inland. Because different field operations had different data requirements and because we learned as we went along, all the data in the collection were not in the same format. This made comparisons between data from different locations difficult because we had to customize the analysis computer programs for each set of data.

We reached a point where something had to be done to alleviate that situation. This report describes our solution to the problem—an aerosol standard format into which we have put all our data sets. This standard format allows us to use the same computer programs for analysis of all data sets.

We have sent the format description to British, Canadian and Australian representatives of JAG-9 of The Technical Cooperation Program. To facilitate data exchange, they have agreed to use this format as well.

The following information on our standard aerosol file structure is in four parts. First, a description of the parameters involved; second, a sample file; third, a program segment which can process the file; and fourth, an assortment of sample outputs from various programs that access the standard-format files.

FILE DESCRIPTION

The file in Figure 1 can be divided into two subheadings. First is a header section which gives information about what is to be found in the file. The second section contains the data. In the file these two sections are, however, contiguous. Note that each line/record has 80 characters maximum so the file is card compatible.

Manuscript submitted July 10, 1981.

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The first line in the file header in Figure 2 gives the program name which created the file (or another heading if that is not the case) and the date of creation. The date is always stored in the same format so that it can be accessed by program.

The second line in the file header tells what is to be found in the rest of the header and in the data. The number of lines in the header and the data sets are determined by the values of the parameters in this line, i.e., not all files will contain the same amount of information but this line allows the same program to access the different files.

In the parameter description below the four-digit numbers refer to the FORMAT line numbers found in the sample program in Figure 3.

FILE HEADER

9010

SITE	20-Character name of experiment.
NATRH	Number of air temperature-relative humidity pairs. 0 through 2. See 9060.
NWSWD	Number of windspeed-wind direction pairs. 0 through 2. See 9060.
NPROBE	Number of particle counters. 0 through 8. 15 channels per probe. See 9020 and 9070.
NSUMS	Value of 0 or 1 which designates whether the total number, cross section, and volume values for the distribution are included. 0 means they are not included.

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NMIE Number of wavelengths at which calculated aerosol
extinctions are given. See 9040.

SPARES Four-character names of spare channels. See 9060.
Six available.

9020

PROBES Eight-character names of probes, e.g., ASAS-1, CSAS-2.
Up to eight probes. Can indicate different ranges also.

9030

EDGES Locations of the bin edges of the probes. Sixteen
edges assumed. Zeros indicate no further edges.
Values are for radius in micrometers.

9040

MIEW Wavelengths at which aerosol extinctions are calculated.
Values are in micrometers. Maximum of eleven.

MIENR Real part of index of refraction used in extinction
calculation. Correspond to values above.

MIENI Imaginary part of index of refraction as above.

Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution	
Availability	
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TRUSTY AND HAUGHT

DATA

9050

NYEAR	Integer value of (Year-1900).
NDAY	Numerical day of the year.
NTIME	Hour of day (e.g., 1320).
	At the <i>end</i> of period for averaged data.
MINAVG	Length of averaging time for the entry in minutes. Usual values are: 60, 30, 15, 12, 10, 6, 5, 4, 3, 2, and 1.
SECAVG	Length of averaging time for entry in seconds. Will be nonzero only if averaging time is less than <i>one minute</i> .

9060

AT1, DP1	Air temperature and dewpoint at locations 1 and 2
AT2, DP2	in degrees Celsius.
WS1, WS2	Windspeeds in meters/second.
WD1, WD2	Wind direction in compass degrees.
SC1, SC2, SC3	Spare channels for miscellaneous pertinent
SC4, SC5, SC6	data.
PPW1, PPW2	Partial pressure of water vapor in torr. (From DP or AT and RH.)
RH1, RH2	Relative humidity in percent.

9070

DNDR Particle size distribution values from particle counter. Fifteen channels, NPROBE probes.
Particles/cm³/μm.

9080

TNUM Total number density given by the distribution.
Particles per cc.

TAREA Total geometric cross section presented by the distribution. μm²/cm³.

TVOL Total volume density of particles in the distribution.
μm³/cm³.

NOTE: These last three values can have meaning only if the DN/DR values form a single valued distribution. I.E. multirange results which overlap must be handled somehow.

9040

MIEEXT Calculated values of aerosol extinction coefficients in km⁻¹ or the wavelengths given in MIEW. The note above pertains.

PROGRAM SEGMENT

The segment of a Fortran program in Figure 3 reads a file and writes a new file. We include it here to assure proper format structure.

SAMPLE OUTPUTS

Figures 4 through 7 give sample outputs from some of the programs that access the files.

TRUSTY AND HAUGHT

(PROCESSED ON 29-DEC-80)									
PROLPERM A4111H: HEROSOL DATA AVERAGING									
MPL CODE 6552 AT HLM 1 1 2 110 BP									
H005-1 05AS-HV1									
0.142 0.157 0.176 0.202 0.235 0.270 0.310 0.355									
0.405 0.457 0.510 0.570 0.630 0.690 0.745 0.820									
0.900 1.000 1.100 1.200 1.300 1.400 1.500 1.600									
0.750 0.850 0.950 1.050 1.150 1.250 1.350 1.450									
0.450 0.550 0.650 0.750 0.850 0.950 1.050 1.150									
1.300 1.330 1.360 1.390 1.420 1.450 1.480 1.510									
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000									
80 63 1300 30 0									
14.90	3.78	7.30	243.00	0.00	930.00	0.00	6.12	49.28	
-50.00	-50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5.27E-01	2.33E-01	9.27E-00	6.00E-01	5.74E-01	2.01E-00	4.46E-01	4.01E-01	4.01E-01	
0.00E-01	0.00E-01	3.55E-01	0.00E-01	6.63E-01	0.00E-01	3.09E-01	3.09E-01	3.09E-01	
2.25E-03	2.25E-03	9.01E-04	3.34E-04	2.39E-05	1.91E-04	7.16E-05	7.16E-05	7.16E-05	
9.55E-05	7.16E-05	1.19E-04	2.34E-05	7.16E-05	2.39E-05	2.39E-05	2.39E-05	2.39E-05	
1.7	0.6	3.3							
0.0013	0.0013	0.0011	0.0012	0.0010	0.0009	0.0008	0.0007	0.0005	
80 63 1330 30 0									
14.90	3.45	7.91	241.00	0.00	930.30	0.00	5.97	47.09	
-50.00	-50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8.03E-01	1.58E-01	1.16E-01	2.43E-00	1.15E-00	1.00E-00	8.92E-01	8.92E-01	8.92E-01	
3.06E-01	1.58E-01	0.00E-01	3.34E-01	3.35E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
3.90E-03	4.94E-03	1.27E-03	6.31E-04	3.83E-04	3.83E-04	5.25E-04	5.25E-04	4.06E-04	
2.66E-04	3.10E-04	2.39E-04	3.34E-04	3.34E-04	2.63E-04	1.67E-04	1.67E-04	1.67E-04	
2.2	1.6	15.5							
0.0034	0.0034	0.0031	0.0033	0.0032	0.0030	0.0029	0.0028	0.0025	
80 63 1400 30 0									
15.00	3.45	7.56	230.00	0.00	930.30	0.00	5.97	46.79	
-50.00	-50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6.02E-01	1.58E-01	7.72E-00	2.43E-00	1.72E-00	1.00E-00	5.07E-01	4.96E-01	0.00E-01	
0.00E-01	0.00E-01	0.00E-01	3.35E-01	3.35E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
2.79E-03	3.53E-03	6.92E-04	4.30E-04	2.39E-04	1.19E-04	1.19E-04	1.19E-04	1.43E-04	
2.15E-04	9.55E-05	1.43E-04	9.55E-05	9.55E-05	2.39E-05	2.39E-05	2.39E-05	2.39E-05	
1.7	0.8	6.8							
0.0018	0.0017	0.0015	0.0017	0.0016	0.0014	0.0013	0.0011	0.0010	
80 63 1430 30 0									
15.00	3.12	8.63	236.00	0.00	330.20	0.00	5.82	45.63	
-50.00	-50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6.42E-01	1.16E-01	4.63E-00	3.04E-01	0.00E-01	5.07E-01	0.00E-01	0.00E-01	4.01E-01	
0.00E-01	3.79E-01	3.35E-01	0.00E-01	3.35E-01	3.09E-01	3.09E-01	3.09E-01	3.09E-01	
5.63E-03	9.91E-03	4.12E-03	1.17E-03	7.88E-04	7.40E-04	4.06E-04	4.06E-04	5.49E-04	
4.06E-04	3.34E-04	3.10E-04	2.63E-04	2.15E-04	2.15E-04	2.15E-04	2.15E-04	2.15E-04	
1.6	1.0	16.3							
0.0040	0.0036	0.0041	0.0040	0.0038	0.0036	0.0034	0.0034	0.0030	

Fig 1 - File structure

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PROGRAM A41KPH: AEROSOL DATA AVERAGING

(PROCESSED ON 29-DEC-88)

SITE	NATN	NWSWD	NPROBE	NSUNS	NMIE	SPARES(1)	SPARES(2)	SPARES(3)	SPARES(4)	SPARES(5)	SPARES(6)		
NRL CODE 6532 AT NUC	1	1	2	110	(	BP	)						
PROBES (1)	PROBES (2)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
AERAS-1 CSAS-MV1													
0.142	0.157	0.176	0.202	0.235	0.270	0.310	0.355	} EDGES (J, 1) (J+1, 16) | NPROBE					
0.405	0.457	0.510	0.570	0.630	0.690	0.755	0.820						
0.750	1.700	2.650	3.600	4.550	5.500	6.450	7.400						
8.350	9.300	10.250	11.200	12.150	13.100	14.050	15.000	} EDGES (J, 2) (J+1, 16) | NPROBE					
0.4500	0.5500	0.6500	1.0600	1.6100	2.2500	3.0000	5.3000					8.1500	10.6000
1.3400	1.3330	1.3300	1.3260	1.3150	1.2900	1.3550	1.3150					1.2900	1.2100
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050	0.0145	0.0472	0.0510	MIENI (M) (M+1, NMIE)			
MIENR (M) (M+1, NMIE)													
MIENI (M) (M+1, NMIE)													
YEAR	MOJY	MTIME	MMHAG	SECAG									
80	63	1300	30	0									
AT1	DP1	WS1	WD1	SC1	SC2	SC3	PPW1	RH1					
14.90	3.78	7.30	248.00	0.00	930.00	0.00	6.12	48.28					
AT2	DP2	WS2	WD2	SC4	SC5	SC6	PPW2	RH2					
-50.00	-50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
5.22E-01	2.32E-01	9.27E-00	6.00E-01	5.74E-01	2.01E-00	4.46E-01	4.01E-01	} DNDR (J, 1) (J+1, 15) | NPROBE					
0.00E-01	0.00E-01	3.35E-01	0.00E-01	6.64E-01	0.00E-01	3.09E-01							
2.23E-02	2.79E-03	5.01E-04	3.34E-04	2.39E-05	1.91E-04	7.16E-05	7.16E-05						
9.55E-05	7.16E-05	1.19E-04	2.39E-05	7.16E-05	2.39E-05	2.39E-05							
TNUM	TAREA	TVOL											
1.7	0.6	3.3											
0.0013	0.0013	0.0011	0.0012	0.0010	0.0009	0.0008	0.0007	0.0007	0.0005	MIEXT (M) (M+1, NMIE)			

Fig. 2 — Header structure

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Fig. 3 — Program segment

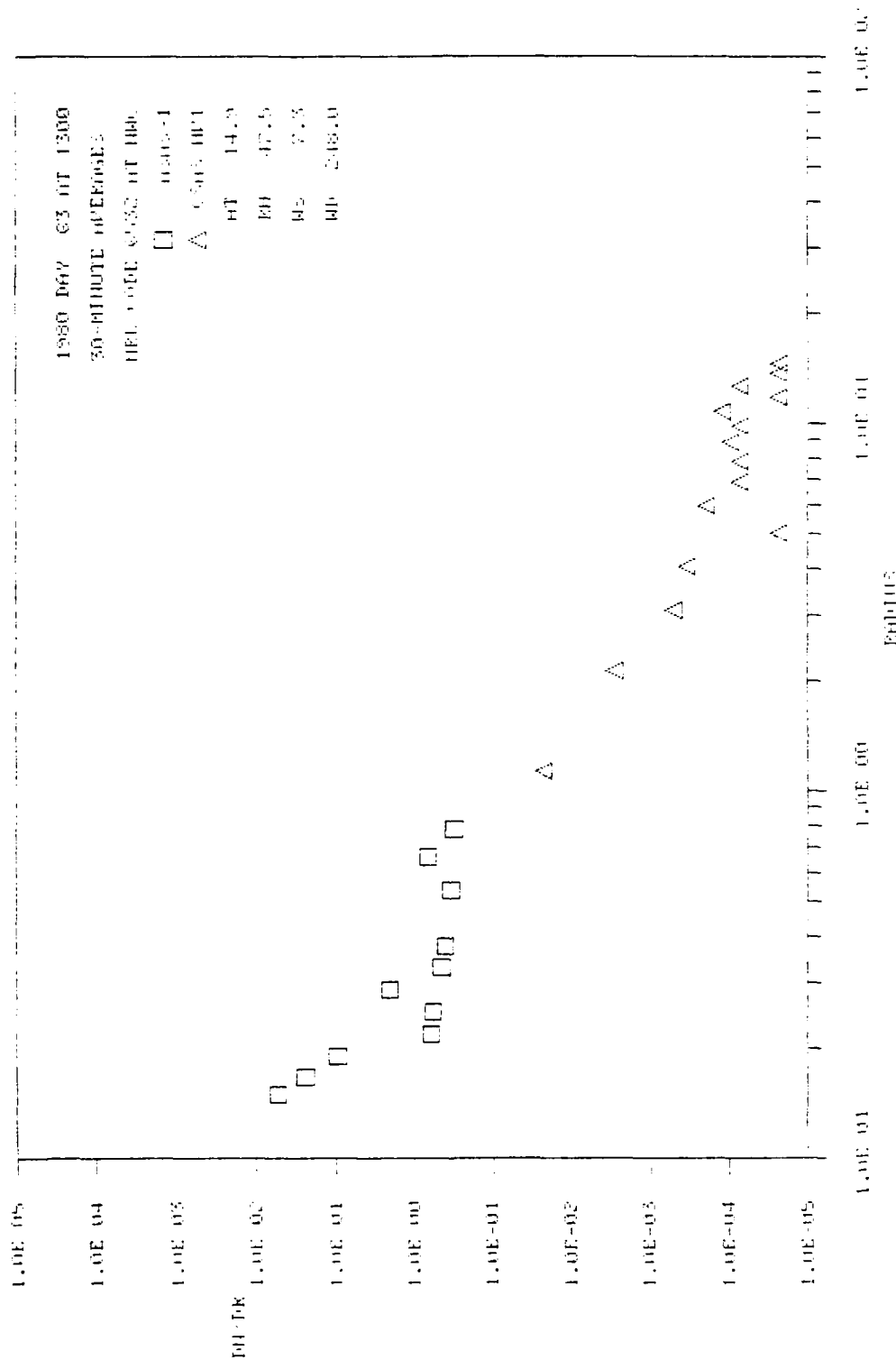


Fig. 4a — Sample A42NRL output. Particle size distribution

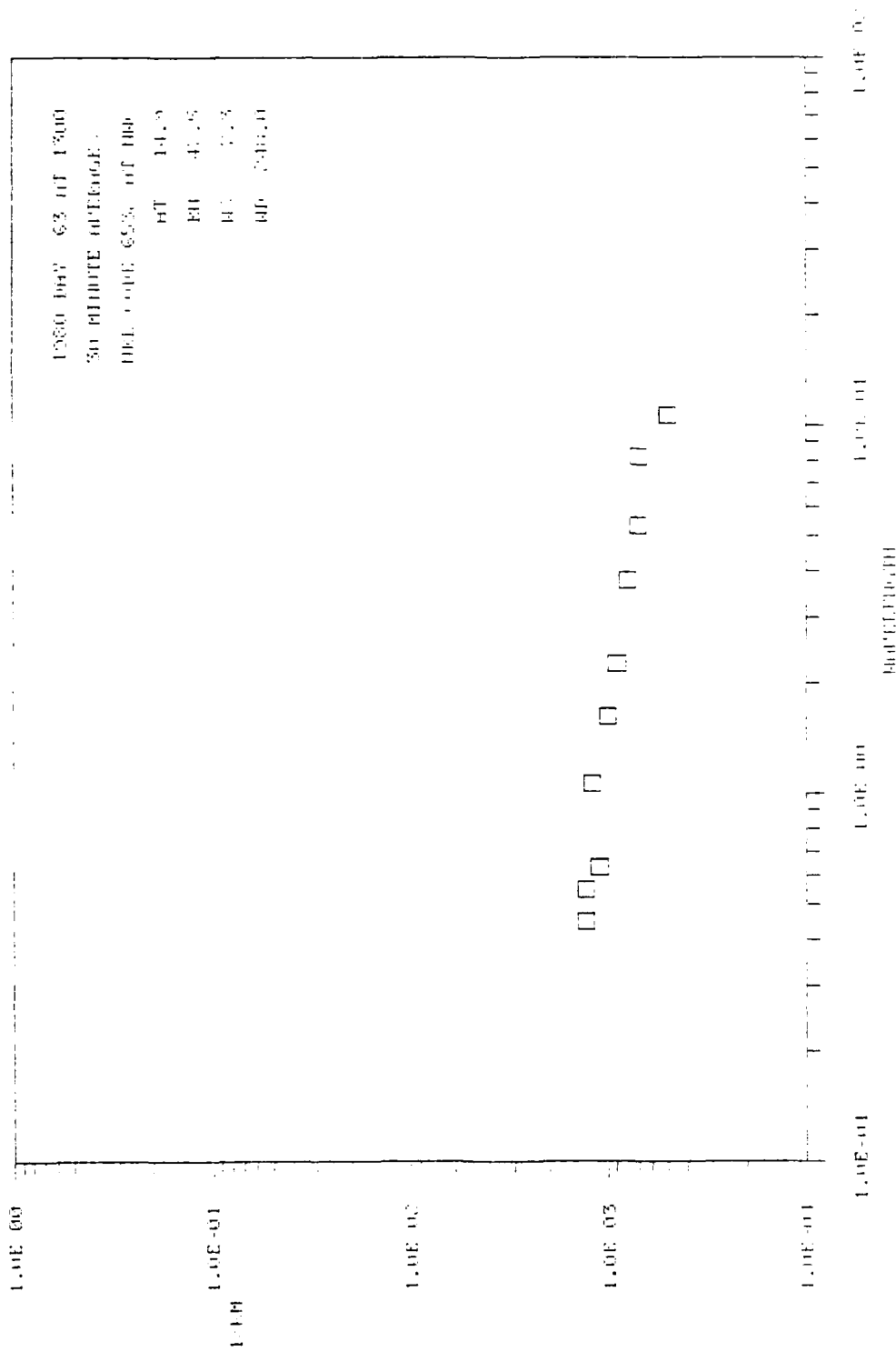


Fig 4b — Sample A42NRL output. Aerosol extinction vs wavelength

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PROGRAM A48NRL: AEROSOL-NET DATA TRANSLATION									
(PROCESSOR ON 24-JUN-81)									
NRL CODE 6532 AT HMC	PH	MS (H ₂ O)	WD	WSP (TUMPS)	HUM (1/CO)	AREA (UM ² /CC)	VOL (UM ³ /CC)	EXTINCTION (1/KM)	10.6
YEAR DAY TIME	HT								
80 63 1300	14.9	47.5	7.3	248	6.0	0.6	3.3	0.0008	0.0005
1400	15.0	46.1	7.6	238	5.9	0.8	6.0	0.0013	0.0010
1600	14.4	48.2	8.2	224	5.9	0.8	5.4	0.0014	0.0009
80 64 1800	15.3	33.5	2.4	129	4.4	0.8	1.6	0.0007	0.0002
1900	13.2	40.9	1.1	90	1.7	0.9	1.1	0.0005	0.0001
2000	12.5	46.0	2.5	140	5.0	1.3	2.3	0.0008	0.0003
2100	11.8	48.4	1.0	116	5.0	1.4	1.5	0.0007	0.0002
2200	10.7	51.7	1.9	106	5.0	2.3	2.9	0.0012	0.0003
80 66 1900	8.9	69.2	2.5	130	5.2	1.3	0.4	0.0002	0.0000
2000	8.1	49.3	3.0	98	4.0	0.5	1.4	0.0005	0.0002
2100	7.8	46.4	5.6	244	3.7	0.5	1.6	0.0005	0.0002
2200	7.1	51.5	5.1	220	3.9	0.6	1.1	0.0004	0.0001
2300	6.6	53.5	5.3	222	3.9	0.7	0.8	0.0005	0.0001
80 67 1900	8.6	63.5	0.9	140	5.3	2.6	6.0	0.0024	0.0008
2000	8.3	61.2	0.9	123	5.0	3.2	7.8	0.0036	0.0011
2100	9.3	59.7	1.1	171	4.9	9.0	15.9	0.0114	0.0020
2200	6.3	73.1	1.5	156	5.2	15.4	26.3	0.037	0.0021
2300	5.6	79.8	0.1	262	5.5	16.6	20.7	0.030	0.0020
80 70 1400	15.4	32.6	1.3	263	4.3	1.0	1.3	0.0006	0.0001
1600	15.2	36.1	2.6	251	4.7	1.9	2.6	0.0012	0.0003
1700	14.0	41.0	3.1	181	4.7	1.9	1.3	0.0010	0.0003
1800	12.1	47.1	1.3	267	5.2	1.7	3.5	0.0015	0.0004
1900	11.3	58.8	0.8	264	5.9	2.1	3.9	0.0016	0.0005
2000	10.9	63.9	1.8	170	6.2	2.0	4.7	0.0033	0.0005
2100	10.7	65.7	1.1	177	6.2	3.7	5.1	0.006	0.0005
2200	10.3	68.3	0.4	197	6.4	3.4	4.2	0.0022	0.0004
2300	10.4	65.7	1.3	124	6.2	3.1	4.1	0.005	0.0004
80 71 0 00.1	6.0	61.0	1.1	86	5.0	2.4	2.7	0.0014	0.0003
80 72 1300	14.7	29.6	1.1	101	3.7	0.1	18.5	0.0037	0.0004
1400	12.6	35.0	0.9	116	3.0	0.9	9.2	0.0116	0.0003
1500	11.9	50.8	1.4	104	3.4	0.8	14.8	0.0067	0.0001
1600	10.7	57.3	0.3	103	4.2	0.3	14.0	0.0064	0.0001
1700	9.4	58.7	0.3	104	4.0	0.8	21.5	0.0069	0.0003
1800	8.9	67.7	0.7	100	4.0	1.3	21.7	0.012	0.0004
80 73 0 0.0	8.0	60.8	1.7	146	1.9	1.0	15.0	0.0017	0.0003

Fig. 5 - Sample of A48NRL output

PROGRAM A49NRL: AEROSOL DISTRIBUTION TABULATION (PROCESSED ON 24-JUN-81)

TRUSTY AND HAUGHT													
NRL CODE	6532 AT NJC	0.15	0.17	0.19	0.22	0.25	0.29	0.33	1.23	2.18	3.12	4.08	
PHILOS													
80	63	1300	5.22E 01	2.32E 01	9.27E 00	6.88E 01	5.74E 01	2.61E 00	4.46E 01	2.23E 02	2.79E 03	5.01E 04	3.34E 04
		1400	6.02E 01	1.58E 01	7.72E 00	2.43E 00	1.72E 00	5.02E 01	4.46E 01	2.79E 02	3.53E 03	6.92E 04	4.30E 04
		1500	2.01E 01	7.40E 00	3.86E 00	6.08E 01	0.00E 01	1.00E 00	0.00E 01	4.12E 02	6.56E 03	1.43E 03	5.13E 04
	64	1800	9.48E 01	4.13E 01	2.34E 01	1.03E 00	1.14E 00	5.01E 01	8.90E 01	5.01E 02	5.28E 03	7.16E 04	1.19E 04
80		1900	1.79E 02	6.43E 01	3.54E 01	7.89E 00	1.72E 00	1.00E 00	4.45E 01	4.87E 02	3.68E 03	4.06E 04	7.16E 05
		2000	2.43E 02	9.59E 01	5.85E 01	8.50E 00	6.30E 00	1.00E 00	4.45E 01	5.61E 02	6.13E 03	9.79E 04	3.10E 04
		2100	2.99E 02	1.13E 02	7.09E 01	1.58E 01	5.72E 00	3.51E 00	4.45E 01	6.37E 02	6.23E 03	8.59E 04	9.59E 05
		2200	3.77E 02	1.11E 02	1.11E 02	3.50E 01	1.37E 01	3.51E 00	2.23E 00	8.58E 02	9.33E 03	1.74E 03	2.36E 04
80	66	1900	2.31E 01	9.51E 00	5.98E 00	7.60E 01	4.30E 01	2.51E 01	0.00E 01	2.31E 02	1.53E 03	1.19E 04	7.16E 05
		2000	3.75E 01	1.24E 01	6.56E 00	1.06E 00	1.58E 00	6.27E 01	2.23E 01	3.73E 02	2.58E 03	5.49E 04	1.91E 04
		2100	3.68E 01	1.03E 01	6.18E 00	1.93E 00	1.47E 00	3.74E 01	2.23E 01	4.75E 02	2.43E 03	2.84E 04	9.53E 05
		2200	3.53E 01	1.34E 01	1.00E 01	2.13E 00	2.29E 00	6.27E 01	5.58E 01	5.89E 02	3.10E 03	1.91E 04	7.16E 05
80		2300	6.69E 01	2.36E 01	1.20E 01	3.19E 00	2.29E 00	1.00E 00	7.81E 01	6.79E 02	3.10E 03	3.10E 04	9.55E 05
	67	1900	2.24E 02	7.84E 01	5.35E 01	1.31E 01	7.31E 00	5.34E 00	3.57E 00	1.70E 01	1.42E 02	2.91E 03	9.55E 04
		2000	2.88E 02	1.71E 02	1.06E 02	2.31E 01	1.42E 01	7.15E 00	3.46E 00	1.88E 01	1.31E 02	2.39E 03	9.79E 04
		2100	8.81E 02	4.08E 02	3.51E 02	9.87E 01	5.64E 01	2.90E 01	1.19E 01	4.47E 01	3.20E 02	7.97E 03	3.74E 03
80		2200	1.36E 03	6.23E 02	5.43E 02	1.56E 02	9.89E 01	5.68E 01	2.40E 01	9.68E 01	4.27E 02	7.69E 03	2.39E 03
		2300	1.31E 03	6.44E 02	5.65E 02	1.81E 02	9.69E 01	5.41E 01	2.79E 01	1.12E 00	5.29E 02	1.02E 02	2.17E 03
	70	1400	1.50E 02	5.41E 01	2.83E 01	6.24E 00	2.53E 00	1.25E 00	1.12E 00	5.56E 02	6.05E 03	8.83E 04	2.15E 01
		1500	2.23E 02	7.00E 01	4.23E 01	7.76E 00	4.45E 00	3.26E 00	1.56E 00	8.80E 02	1.05E 03	1.48E 03	5.13E 01
80		1600	2.48E 02	8.45E 01	4.07E 01	7.45E 00	3.87E 00	2.26E 00	1.17E 00	1.24E 01	1.43E 02	2.30E 03	4.30E 04
		1800	2.74E 02	1.08E 02	4.73E 01	7.30E 00	2.58E 00	1.76E 00	3.35E 01	1.05E 01	1.20E 02	1.89E 03	6.41E 04
		1900	3.47E 02	1.33E 02	6.72E 01	1.00E 01	4.88E 00	2.26E 00	1.49E 00	1.10E 01	1.17E 02	1.65E 03	8.21E 04
		2000	4.57E 02	1.89E 02	9.14E 01	1.60E 01	5.88E 00	2.76E 00	7.81E 01	1.79E 01	1.82E 02	3.13E 03	8.83E 04
80		2100	5.81E 02	2.34E 02	1.24E 02	2.01E 01	1.03E 01	4.77E 00	3.34E 00	2.27E 01	2.12E 02	2.39E 03	6.44E 04
		2200	4.92E 02	2.16E 02	1.18E 02	2.40E 01	1.08E 01	4.89E 00	2.01E 00	2.29E 01	2.15E 02	2.51E 03	5.25E 04
		2300	4.64E 02	2.11E 02	1.10E 02	1.89E 01	1.15E 01	5.65E 00	1.49E 00	2.01E 01	1.82E 02	2.37E 03	5.01E 04
	71	0	4.26E 02	1.64E 01	8.13E 01	1.41E 01	7.31E 00	3.14E 00	1.12E 00	1.62E 01	1.60E 02	1.46E 03	2.86E 04
80	72	1800	3.03E 02	1.19E 02	6.60E 01	1.70E 01	6.88E 00	3.51E 00	2.34E 00	4.81E 01	7.18E 02	1.33E 03	4.63E 03
		1900	4.74E 02	1.61E 02	9.29E 01	2.54E 01	1.09E 01	6.49E 00	3.01E 00	5.03E 01	9.54E 02	1.81E 03	5.29E 03
		2000	1.03E 03	4.51E 02	2.24E 02	3.28E 01	1.56E 01	5.90E 00	3.40E 00	5.13E 01	6.51E 02	1.00E 03	2.54E 03
		2100	1.24E 03	5.24E 02	3.24E 02	5.29E 01	1.03E 01	1.03E 01	5.91E 00	6.24E 01	9.60E 02	1.60E 03	2.54E 03
80		2200	1.39E 03	6.01E 02	3.91E 02	6.19E 01	1.14E 01	1.14E 01	6.00E 01	7.63E 02	1.73E 03	2.54E 03	4.30E 03
		2300	1.14E 03	6.24E 02	1.59E 02	1.03E 01	2.54E 01	1.03E 01	6.69E 00	7.08E 01	1.14E 02	2.18E 03	5.01E 03
	73	0	2.12E 03	9.21E 02	6.82E 02	1.37E 02	5.02E 01	2.46E 01	1.03E 01	6.21E 01	5.65E 02	6.25E 03	1.19E 03

TRUSTY AND HAUGHT

Fig. 6 - Sample of A49NRL output

NRL MEMORANDUM REPORT 4605

PROGRAM H49MPL: AEPOSOL DISTRIBUTION TABULATION (PROCESSED ON 24-JUN-81)

NPL CURE 6532 HT MLC		RADIIUS										
		5.03	5.97	6.93	7.89	8.83	9.78	10.73	11.68	12.63	13.58	14.53
80	63	1400	2.39E-05	1.91E-04	7.16E-05	7.16E-05	9.55E-05	1.19E-04	2.39E-05	7.16E-05	2.39E-05	2.39E-05
	1400	2.39E-04	1.19E-04	1.19E-04	1.19E-04	2.15E-04	9.55E-05	1.43E-04	9.55E-05	9.55E-05	2.39E-05	1.19E-04
	1600	2.15E-04	2.15E-04	1.67E-04	1.67E-04	9.55E-05	1.67E-04	9.55E-05	9.55E-05	4.77E-05	7.16E-05	4.77E-05
	1800	7.16E-05	4.77E-05	7.16E-05	2.39E-05	2.39E-05	2.39E-05	7.16E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01
80	1900	4.77E-05	4.77E-05	4.77E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	2.39E-05	0.00E-01	0.00E-01
	2000	1.91E-04	1.43E-04	7.16E-05	4.77E-05	0.00E-01	0.00E-01	2.39E-05	2.39E-05	0.00E-01	4.77E-05	0.00E-01
	2100	1.43E-04	7.16E-05	7.16E-05	0.00E-01	4.77E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01
	2200	2.39E-04	9.55E-05	9.55E-05	1.19E-04	4.77E-05	4.77E-05	0.00E-01	2.39E-05	2.39E-05	0.00E-01	0.00E-01
80	1900	2.39E-05	2.39E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01
	2000	4.77E-05	4.77E-05	2.39E-05	2.39E-05	2.39E-05	0.00E-01	2.39E-05	2.39E-05	0.00E-01	0.00E-01	2.39E-05
	2100	1.19E-04	7.16E-05	0.00E-01	2.39E-05	0.00E-01	2.39E-05	4.77E-05	0.00E-01	0.00E-01	4.77E-05	0.00E-01
	2200	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	2.39E-05	0.00E-01	0.00E-01	0.00E-01
80	2300	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01
	1900	5.49E-04	3.10E-04	2.39E-04	1.43E-04	1.19E-04	2.86E-04	2.39E-05	2.39E-05	0.00E-01	2.39E-05	0.00E-01
	2000	5.49E-04	4.00E-04	1.91E-04	1.91E-04	7.16E-05	1.67E-04	7.16E-05	9.55E-05	4.77E-05	7.16E-05	4.77E-05
	2100	1.41E-03	1.12E-03	5.49E-04	5.49E-04	2.63E-04	1.19E-04	2.15E-04	9.55E-05	1.19E-04	2.39E-05	0.00E-01
80	2200	9.31E-04	5.49E-04	4.30E-04	4.30E-04	1.19E-04	3.58E-04	7.16E-05	7.16E-05	0.00E-01	7.16E-05	2.39E-05
	2300	1.03E-03	6.92E-04	1.91E-04	2.86E-04	1.19E-04	1.19E-04	0.00E-01	1.19E-04	2.39E-05	0.00E-01	4.77E-05
80	1400	9.55E-05	2.39E-05	2.39E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01	2.39E-05	0.00E-01	0.00E-01	0.00E-01
	1600	3.58E-04	1.67E-04	0.00E-01	0.00E-01	4.77E-05	4.77E-05	0.00E-01	0.00E-01	0.00E-01	2.39E-05	0.00E-01
	1700	4.00E-04	2.63E-04	1.43E-04	1.19E-04	7.16E-05	2.39E-05	4.77E-05	2.39E-05	0.00E-01	2.39E-05	2.39E-05
	1800	2.86E-04	1.91E-04	1.43E-04	7.16E-05	7.16E-05	2.39E-05	2.39E-05	4.77E-05	2.39E-05	0.00E-01	0.00E-01
80	1900	2.63E-04	1.91E-04	1.67E-04	7.16E-05	4.77E-05	7.16E-05	2.39E-05	2.39E-05	7.16E-05	0.00E-01	0.00E-01
	2000	5.73E-04	1.43E-04	9.55E-05	9.55E-05	1.19E-04	7.16E-05	0.00E-01	0.00E-01	0.00E-01	2.39E-05	0.00E-01
	2100	1.91E-04	1.19E-04	1.19E-04	1.43E-04	2.39E-05	4.77E-05	2.39E-05	0.00E-01	4.77E-05	0.00E-01	0.00E-01
	2200	1.91E-04	9.55E-05	7.16E-05	2.39E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	2.39E-05	0.00E-01
80	2300	1.19E-04	1.19E-04	7.16E-05	7.16E-05	2.39E-05	2.39E-05	4.77E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01
	1400	4.77E-05	4.77E-05	4.77E-05	4.77E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01	0.00E-01
	1600	2.39E-05	0.00E-01	0.00E-01	0.00E-01	2.39E-04	1.19E-04	2.15E-04	1.19E-04	9.55E-05	2.39E-05	7.16E-05
	1700	3.00E-03	0.00E-01	0.00E-01	0.00E-01	3.58E-04	3.10E-04	7.16E-05	1.43E-04	1.43E-04	1.19E-04	2.39E-05
80	1800	9.31E-04	2.39E-04	2.39E-04	2.39E-04	2.86E-04	2.86E-04	7.16E-05	4.77E-05	4.77E-05	7.16E-05	0.00E-01
	1900	1.12E-03	2.39E-04	4.30E-04	1.19E-04	3.10E-04	1.19E-04	7.16E-05	0.00E-01	0.00E-01	0.00E-01	0.00E-01
	2000	2.97E-03	1.43E-04	6.92E-04	5.49E-04	4.30E-04	1.67E-04	2.86E-04	9.55E-05	7.16E-05	4.77E-05	0.00E-01
	2100	2.58E-03	1.30E-04	2.39E-04	2.39E-04	1.91E-04	2.15E-04	1.91E-04	7.16E-05	9.55E-05	2.39E-05	2.39E-05
80	2200	6.44E-04	2.39E-04	1.67E-04	2.15E-04	1.43E-04	1.19E-04	7.16E-05	7.16E-05	7.16E-05	4.77E-05	2.39E-05

Fig. 6 (Continued) — Sample of A49NRL output

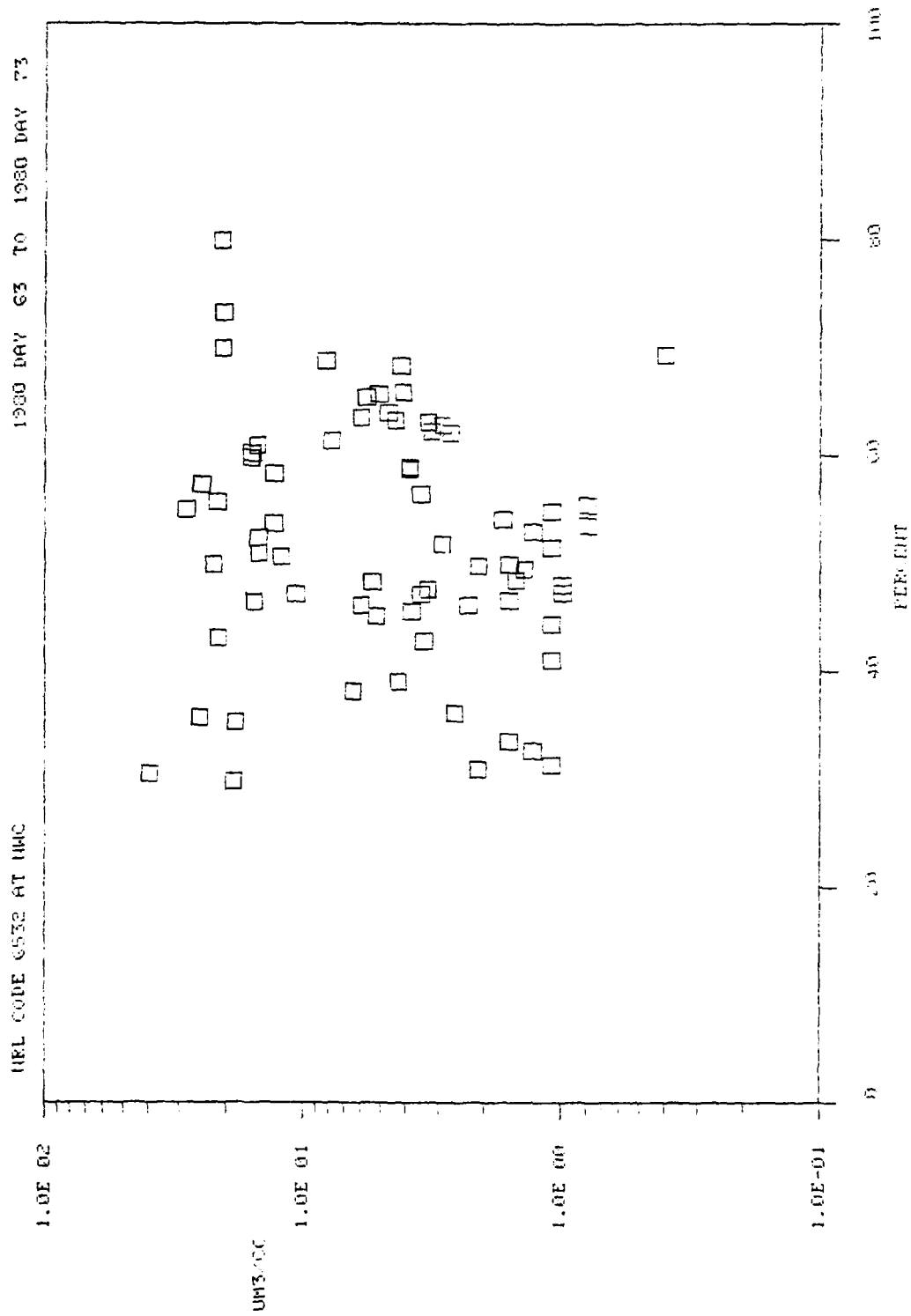


Fig. 7a - Sample of AS2NRL output. Total volume density vs relative humidity

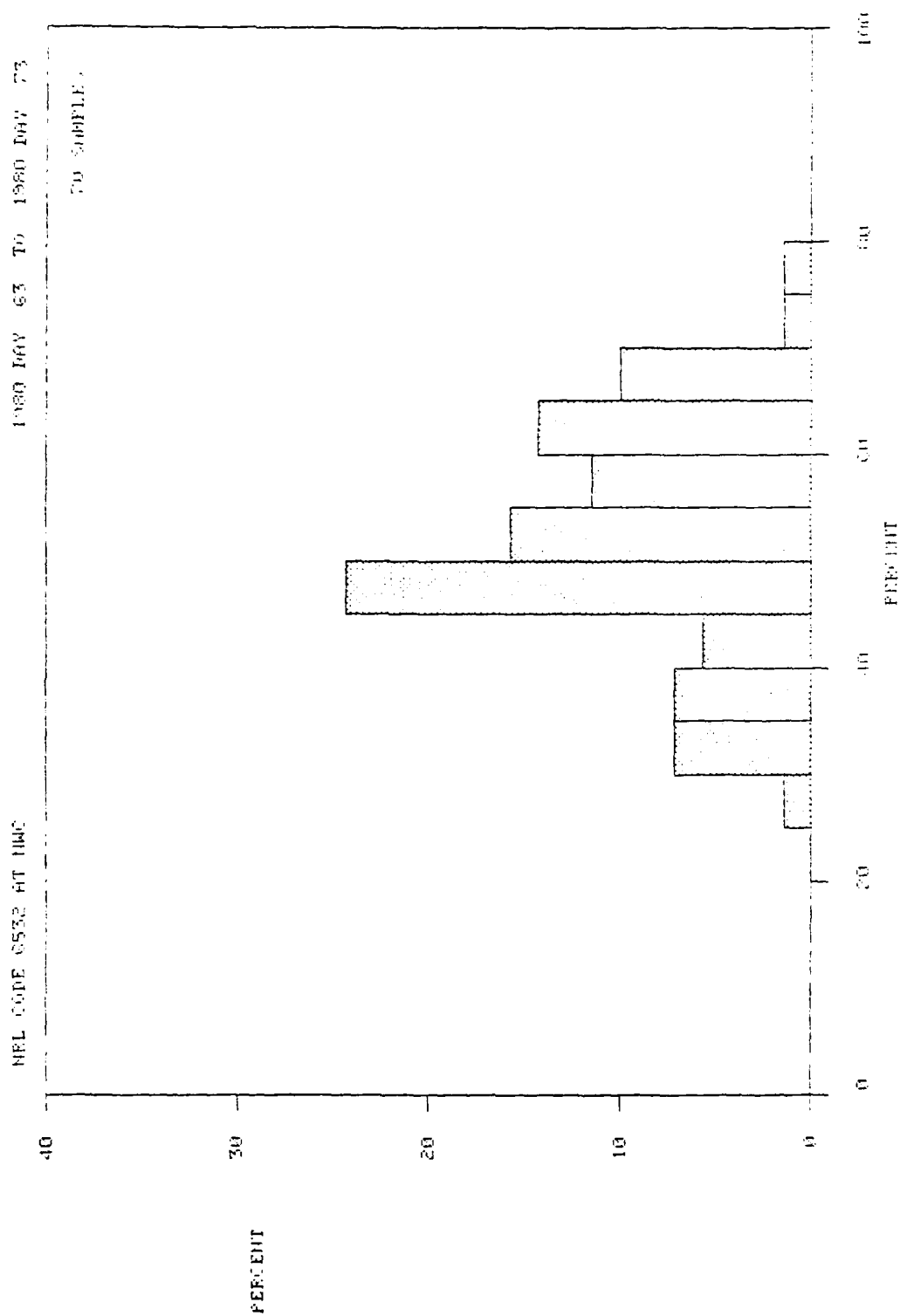


Fig. 7b - Sample A52NRL output. Frequency of occurrence of relative humidity

**DA
FILM**