

**APPENDIX D:**

**KEY TABLE MESA STATION WIND CHARTS**

## Notes Concerning the Following NCAR Table Mesa Strip Chart Copies

The following strip chart copies (reduced to 45% of original size) cover the most interesting periods seen on the charts recovered by RAC from the National Center for Atmospheric Research (Boulder CO) Archives. These selections are from charts for the 25 largest alpha-particle release events noted via the RFP air sampler located near the 903 are from late 1964 through late 1971. Where both were available, wind speed and wind directing charts are aligned by time of day, to demonstrate wind directions during the high wind events responsible for suspension of plutonium-contaminated soils from the 903 area. These winds are generally from the west or northwest during speed extremes. Note that times are generally in GMT (Greenwich Mean Time). While the Table Mesa anemometer was not the location most representative of wind events affecting the 903 area, the Table Mesa data set is the only complete set for the period of interest. Other research, summarized in this report and in the related 903 Area Characterization Report (RAC, December, 1996), demonstrates that wind speeds at the rocky flats Plant were likely to be somewhat less than, but proportional to, the Table Mesa speeds, and that wind directions were likely to correspond to the directions observed at Table Mesa during the extreme high wind events.

The data represented by these strip chart copies were extracted by RAC and used in digital form during the estimation of 903 are wind-driven plutonium-contaminated soil suspension, as described elsewhere in this report.

Following these notes and preceding the strip chart copies are sets of RFP air sampler data for the periods of time surrounding the selected strip chart dates. The air sampler data presented here are not representative of the 27,000+ individual readings from which they were selected. Most of the larger data set shows zero or near-zero air concentrations. The data presented here represent the highest values found in the larger data set.

### Observations for selected NCAR strip chart copies:

**11-14 April 1968.** Winds to 37 mph on the evening of April 10<sup>th</sup>, continuing to mid-AM on the 11<sup>th</sup>. Winds to 55 mph on the evening of the 11<sup>th</sup>, through about 2 AM on the 12<sup>th</sup>. Winds rising and gusty beginning about 10 AM the 12<sup>th</sup>, spikes over 50 mph beginning about 1 PM., rising through the afternoon until the sudden, two-hour event illustrated (with a peak near 100 MPH) beginning at 0245 GMT 14 April (7:45 PM local, 13 April). Followed by an extended, lower speed event beginning in the morning (local) of the 14<sup>th</sup> through late afternoon (with gusts to 60 mph early in that period, and to 50 mph later).

**22-26 November 1968.** Three distinct sets of wind events. The first begins at 0600 GMT on Nov. 22, winds suddenly rise to 25-80 mph for a period through 1400 GMT on the 23<sup>rd</sup>. Very long high winds period. Two peaks, but fairly steady winds throughout. Wind direction from the west for all high winds. Second event begins abruptly at 0330 GMT on three 24<sup>th</sup>, and rises suddenly to nearly 80 mph, running until 1030 on the 24<sup>th</sup>. Peaks as high as 95 mph; high winds were from west. Then the winds drop to low speeds. The next event is short, and begins at 0000 GMT on 26 November, rising gradually to 60 mph. Peak speeds last until about 0300, then the event shuts down. Winds were from the west. It is interesting that both the Nov. 24<sup>th</sup> and the Nov. 25<sup>th</sup> events show significant S8 air sampler activities, even though only 24 hours elapsed between the events. This appears to indicate that suspension does in fact occur over the life of a high wind event) as opposed to a rapid depletion in suspendible soil), since material was still available for wind-driven suspension on the 25<sup>th</sup>, after the fairly long and powerful event on the 24<sup>th</sup>.

**3-6 December 1968.** There were two high-wind periods, the first beginning the evening of 3 December local time, and extending into the evening of 4 December. The 3 December S8 sample shows elevated

activity; 4 December shows only slight elevation. Peak winds during this long storm exceeded 75 mph, with many gusts of this magnitude over the entire period. The second period began at noon on 5 December and lasted 24 hours. One gust during the period approached 100 mph; dozens exceeded 75 mph. The 5 December S8 sample showed highly elevated activity. Wind direction was more variable than on other dates. During the high wind periods, but the dominant direction was clearly from the west during the highest speed events, and centered on a westerly direction during most of the other high speed periods. Strip chart sets for two of the five high-wind days are reproduced here.

**12 December 1968.** No wind direction data available.

**2–8 January 1969.** There were numerous and extended high wind events during this period. Brief gusts over 50 mph late 1 January. Additional gusts, occasionally above 50 mph, beginning at 1 PM local time 2 January, and continuing until about 6 PM. Very long, relatively constant (gusting relatively minor) 25 – 75 mph wind even beginning 0100 GMT on 4 January and continuing through 1 000 GMT. Very constant wind direction, from the west. Copied only a 13-hour sample of this extended event. The major event began at 0100 on 8 January, immediately rising to gusts over 125 mph through –345., then gradually dropping to about 50 mph gusts by 0600 and continuing until 1445 GMT. Wind direction during this latter event was quite variable, but clearly centered from the west, then WNW, during the highest wind speeds.

**29 January–2 February 1969.** Beginning at about 6 PM 29 Jan 69: a major, extended wind event lasted for 24 hours. The period contained two major peaks of wind activity, and several lesser peaks; one gust to 90 mph, several to 85 mph. Gusting was moderate to high; average wind speeds exceeded 50 mph for a period of several hours. Wind direction was from the NW during the highest winds, and relatively stable. A second event of short duration but very high speed occurred from 1400-1440 GMT on 31 January 69, with several gusts exceeding 110 mph. Gusting for this even was severe. The highest-measured S8 air sample is associated with this short event: 654 cpm for the air filter scheduled to be removed from the S8 sampler at 8 AM local on January 31, and associated with the Jan. 30, 24-hour period. After this peak, winds dropped to perhaps 1/3 of this extreme, but continued with 25 – 45 mph gusts through 2400 GMT, 2 February. The period 1600 to 2000 GMT 1 February included several gusts to 80 mph, and several hours of 35-40 mph average wind speed. This period shows a relatively high S8 value, and a quite variable wind direction centering on wind from the NW. The four largest strip chart events for this period are copied to this appendix.

**6–8 April 1969.** A four-day period of relatively constant high winds averaging 30-40 mph with occasional gusts to 90 mph. Some wind direction data are missing, but winds were generally from the NW. Although only one filter sample was taken covering the four-day period from 3-6 April, the wind data clearly indicate that the release for that period, a total of 60 cpm on the air filter, occurred beginning near midnight on April 6. An additional 60 cpm was associated with filter removed on April 7, 1969. Although the high wind event continued for another day, the source material must have been scoured smooth by that time – no significant alpha emitting material was seen on the April 8<sup>th</sup> air filter. Charts for all four day are copied here, to support this conclusion.

**Selected Rocky Flats Plant Air Sampler Data**

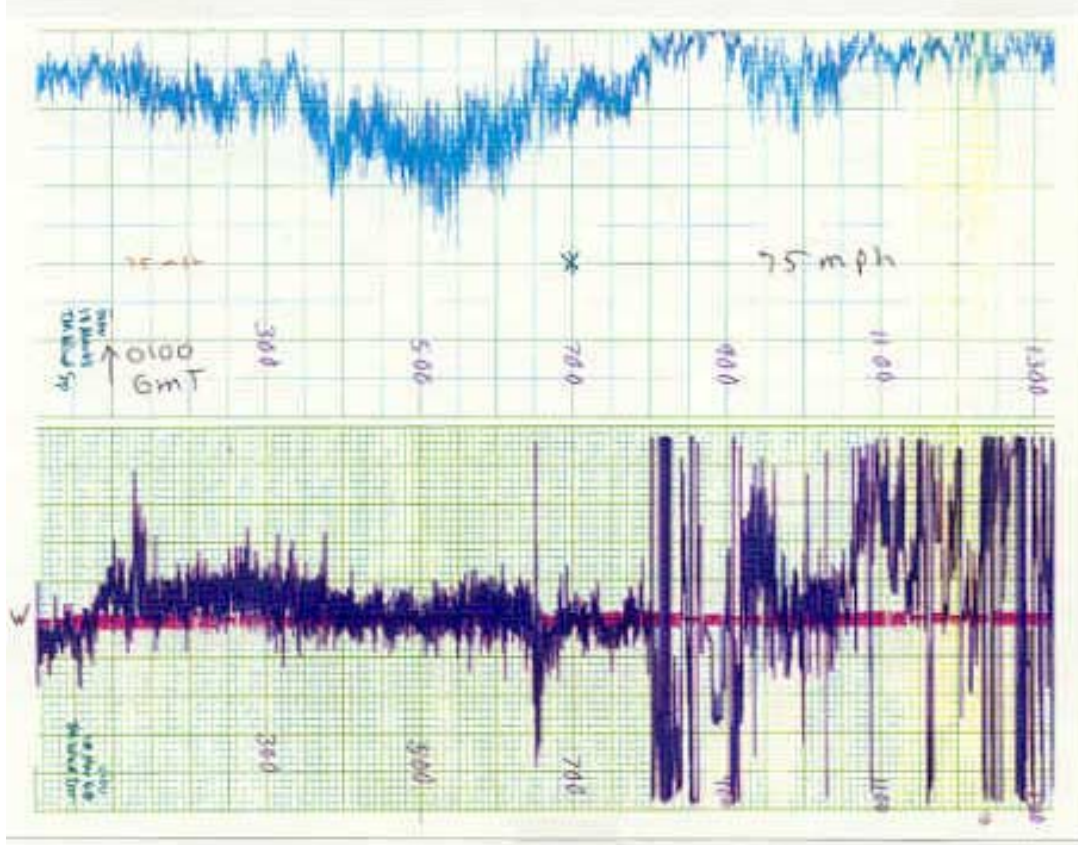
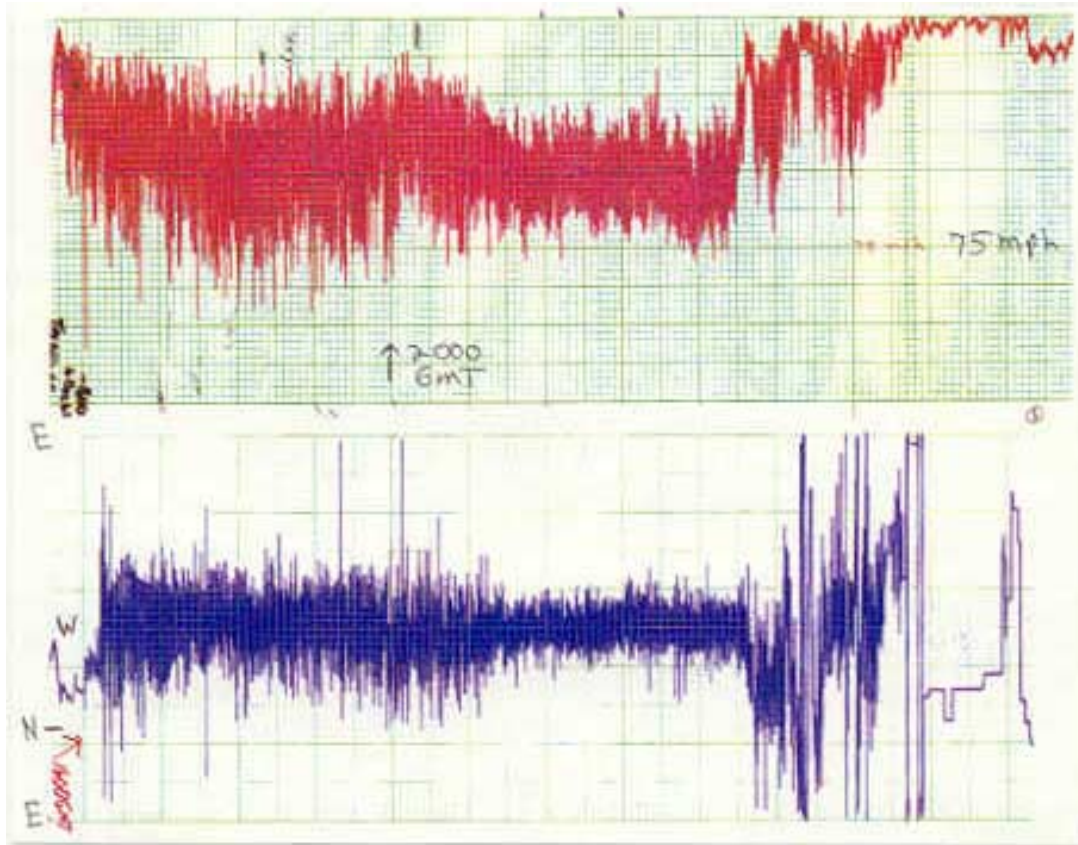
(Data for the 25 Largest Release Incidents Noted at the S8 Sampler)

(Net counts per minute, decayed for radon progeny, from handwritten RFP HP data sheets, extracted by RAC)

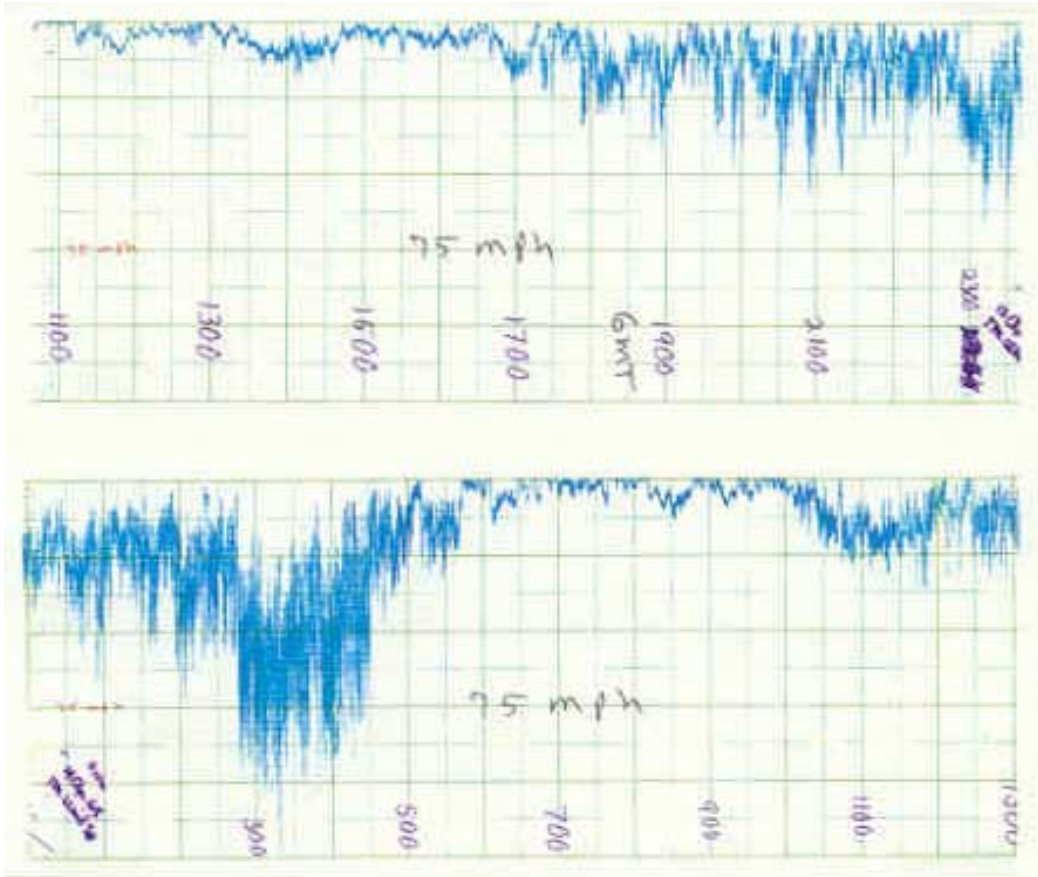
Date	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S50	S51
2-Dec-67	0.3	0.2	0.2	0.3	0.3	0	0.2	0.8				0
3-Dec-67	0.3	0.2	0.2	0.3	0.3	0	0.2	0.8				0
4-Dec-67	0.5	0.9	1	0.6	0	0.5	0.7	0				0
5-Dec-67	0.5	0	0.7	0.1	0	0	0	13.7				0
6-Dec-67	1	0.1	1.1	0.6	0.3	0.3	0.1	67.9				0
7-Dec-67	0.5	0.4	0.7	0.1	0.1	0	0.1	0				0
8-Dec-67	0.3	0.1	0.8	0.2	0	0	1.9	0.5				0.3
9-Dec-67	0.3	0.1	0.8	0.2	0	0	1.9	0.5				0.3
2-Dec-67	0.3	0.2	0.2	0.3	0.3	0	0.2	0.8				0
3-Dec-67	0.3	0.2	0.2	0.3	0.3	0	0.2	0.8				0
4-Dec-67	0.5	0.9	1	0.6	0	0.5	0.7	0				0
5-Dec-67	0.5	0	0.7	0.1	0	0	0	13.7				0
6-Dec-67	1	0.1	1.1	0.6	0.3	0.3	0.1	67.9				0
7-Dec-67	0.5	0.4	0.7	0.1	0.1	0	0.1	0				0
8-Dec-67	0.3	0.1	0.8	0.2	0	0	1.9	0.5				0.3
9-Dec-67	0.3	0.1	0.8	0.2	0	0	1.9	0.5				0.3
15-Mar-68	0.2	0.2	0.2	0	0.2	0.1	0.2	0.3				0.6
16-Mar-68	0.2	0.2	0.2	0	0.2	0.1	0.2	0.3				0.6
17-Mar-68	0.2	0.2	0.2	0	0.2	0.1	0.2	0.3				0.6
18-Mar-68	1	0.6	0.9	0.1	0.8	0.9	0.4	36.3				1
19-Mar-68	0.4	0.7	0.6	0.7	0.7	1.3	0.6	1.9				2.7
20-Mar-68	0.1	2.7	0.7	0.1	1	0.7	1.1	1.2				1.8
21-Mar-68	1	0.7	0.5	0.4	0.8	0.2	0.4	0.8				2.3
10-May-68	0.1	0.6	0.3	0	0.3	0.2	0.1	0.5				0.2
11-May-68	0.1	0.6	0.3	0	0.3	0.2	0.1	0.5				0.2
12-May-68	0.1	0.6	0.3	0	0.3	0.2	0.1	0.5				0.2
13-May-68	0	0.5	0	0.5	0.5	1.3	8.3	86.1				0.1
14-May-68	0	0	0.7	0.1	0	0	0	4.7				0
15-May-68	0.1	0.2	0.5	5	0.3	0.8	3.7	5.8				0.7
16-May-68	0.4	0.2	0.4	0.2	0.3	0	0.5	0.5				0
14-Sep-68	0.1	0.1	0	0.1	0	0.1	0.4	1.1				0.1
15-Sep-68	0.1	0.1	0	0.1	0	0.1	0.4	1.1				0.1
16-Sep-68	0	0.4	0	0.3	0	0.3	3.3	0.2				0
17-Sep-68	0.4	0.8	0.1	0	0.5	0.4	0.2	40.3				0.2
18-Sep-68	0	0.2	0.7	0.1	0.7	0.5	0	0.2				0
19-Sep-68	1.4	0	0.4	0	0.1	0.1	0.3	1.4				0.2
20-Sep-68	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0				0.1

Date	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S50	S51
19-Nov-68	1	0.5	0	0	0.1	0.3	0.1	0.1		0.2	1.1	0.2
20-Nov-68	0.4	0.4	0.9	0.3	0.9	0.2	0.1	0.7		0.1	0.6	0.1
21-Nov-68	0.6	0.4	0.6	0.3	0.5	0.4	0.1	0.5		0.4	0.4	0
22-Nov-68	0.2	0.3	0	0.1	0.3	0.2	0.4	44.8		0	0	0.1
23-Nov-68	0.2	0.3	0	0.1	0.3	0.2	0.4	44.8		0	0	0.1
24-Nov-68	0.2	0.3	0	0.1	0.3	0.2	0.4	44.8		0	0	0.1
25-Nov-68	0	0.4	0.5	0.1	0.5	0.2	0.2	35.1		0.1	0.3	0.3
26-Nov-68	0	0	0.3	0.1	0	0	0.4	0.4		0.1	0.4	0
27-Nov-68	0.1	0	0.1	0	0.2	0.1	0.2	1.3		0	0	0
28-Nov-68	0.1	0	0.1	0	0.2	0.1	0.2	1.3		0	0	0
8-Dec-68	0.2	0	0.1	0.1	0.3	0.4	0.3	4.8		0	0.1	0
9-Dec-68	0.3	0.7	0.2	0.4	0.5	0.2	0.4	2.5		0	0	0.2
10-Dec-68	0.5	0.3	0.1	0.2	0.7	0.5	2.5	1.7		0	0.1	0.3
11-Dec-68	1.1	0.4	0.2	0.1	0.1	0.7	1.4	35.7		0.2	7.8	0.2
12-Dec-68	0.2	0.4	0	0.1	0.6	0	0.5	8.6		0	0.1	0.1
13-Dec-68	0.2	0.2	0.1	0.7	0.3	0.1	0.2	0.7		0.1	0.2	0.2
14-Dec-68	0.2	0.2	0.1	0.7	0.3	0.1	0.2	0.7		0.1	0.2	0.2
29-Dec-68	0.2	0.2	0.4	0.1	0.1	0.1	0.2	1.7		0.1	0.2	0
30-Dec-68	1.1	0.4	0	0	0.1	0.9	8.4	9.2		0	0	0
31-Dec-68	0.2	0.3	0	0	0	0.1	0	22.2		0.1	0.2	0.1
1-Jan-69	0.2	0.3	0	0	0	0.1	0	22.2		0.1	0.2	0.1
2-Jan-69	0.4	0.2	0	0	0.5	0.3	1.6	36.7		0	0	0.2
3-Jan-69	0.1	0.1	0.1	0	0.1	0.1	0.5	38.8		0.2	0	0
4-Jan-69	0.1	0.1	0.1	0	0.1	0.1	0.5	38.8		0.2	0	0
5-Jan-69	0.1	0.1	0.1	0	0.1	0.1	0.5	38.8		0.2	0	0
6-Jan-69	0.1	0.2	0.4	0.2	6.2	0	0.2	215		0.1	1.1	0
7-Jan-69	0.1	0.4	0.5	1.2	0.7	13.4	130.3	422.2		0	1.5	0.6
8-Jan-69	0	0.1	0.3	0	0.3	0.4	0	2.9		0.3	0.5	0.4
9-Jan-69	1.1	0.4	0.5	0.4	0	0.4	10.7	24		0.3	0	0.1
10-Jan-69	0.6	0.1	0.3	0.2	0.1	0.1	0.2	14		0.2	0.3	0.1
11-Jan-69	0.6	0.1	0.3	0.2	0.1	0.1	0.2	14		0.2	0.3	0.1
12-Jan-69	0.6	0.1	0.3	0.2	0.1	0.1	0.2	14		0.2	0.3	0.1
13-Jan-69	0.2	0.4	0.7	0.4	0.2	0.1	0	9.6		0.1	0	0.7
14-Jan-69	0.4	0.9	0.2	0.8	0	0.1	0.2	2.9		0.2	0.7	0.2
15-Jan-69	0	0	0.3	0.7	0.4	0.1	0.3	19.1		0.3	0.4	0.6
16-Jan-69	0.6	0.4	0.3	0.6	0.5	0.4	0	4.7		0	0.1	0
17-Jan-69	0.1	0	0	0	0.2	0.1	0.1	15		0	0.1	0
18-Jan-69	0.1	0	0	0	0.2	0.1	0.1	15		0	0.1	0
19-Jan-69	0.1	0	0	0	0.2	0.1	0.1	15		0	0.1	0
20-Jan-69	0	0.2	0.7	0.8	0	0.3	0	3.1		0.2	0.3	0
21-Jan-69	4.3	0.2	0.1	0	0.4	0.2	0	15.3		0.1	0.3	0.1
22-Jan-69	0.2	0.3	3.4	0.6	0	0	0.1	4.3		0.1	0.1	0.5
23-Jan-69	0.3	0.4	0.4	0	0.5	0.1	0	11		0	0.7	0.3

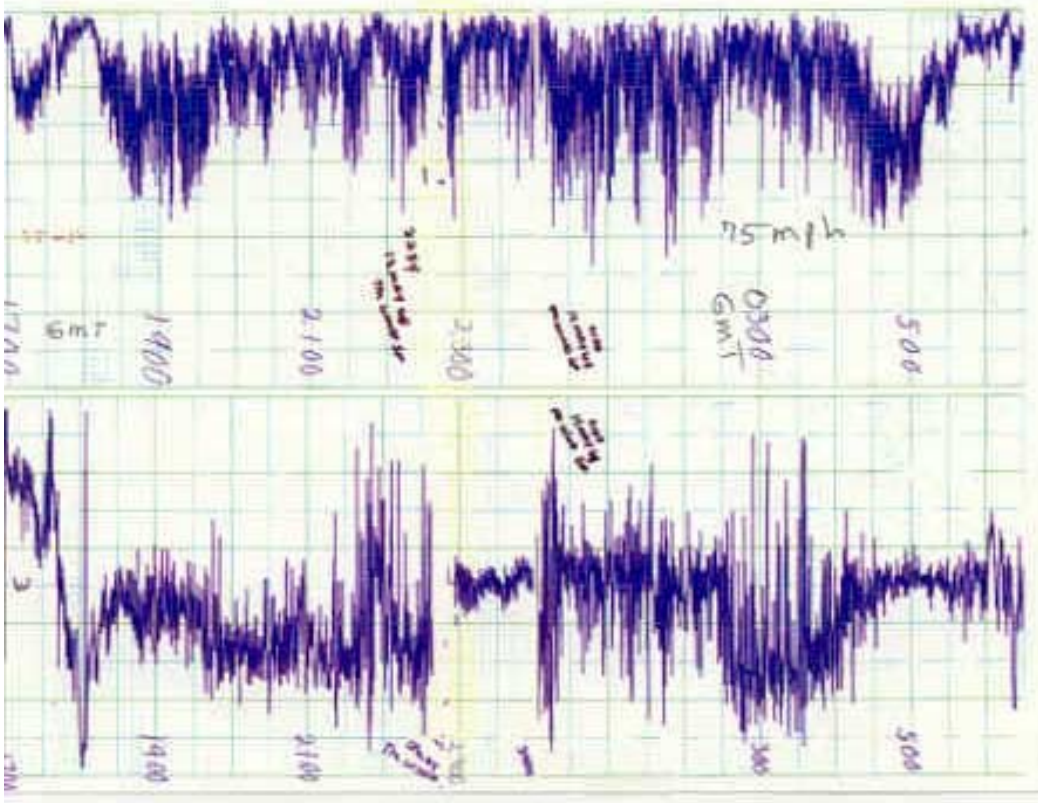
Date	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S50	S51
24-Jan-69	0.1	0.1	0.2	0.2	0.1	0.1	0.4	22.7		0.2	0	0.3
25-Jan-69	0.1	0.1	0.2	0.2	0.1	0.1	0.4	22.7		0.2	0	0.3
26-Jan-69	0.1	0.1	0.2	0.2	0.1	0.1	0.4	22.7		0.2	0	0.3
27-Jan-69	0.4	0.8	0.1	0.2	0.2	0	0.1	3.4		0.2	0	0.1
28-Jan-69	0	0.3	0.3	0.2	0	0.2	0	1.3		0	0.4	0
29-Jan-69	0.3	0.1	0.3	0.4	0	0.2	0.2	55.6		0	0	0.1
30-Jan-69	0.7	0	0.3	0.4	0	0.3	1.4	654.3		0	0.2	0.4
31-Jan-69	0.2	0.2	0.2	0.3	0.1	0	0.6	16.9		0.2	0.1	0.1
1-Feb-69	0.2	0.2	0.2	0.3	0.1	0	0.6	16.9		0.2	0.1	0.1
2-Feb-69	0.2	0.2	0.2	0.3	0.1	0	0.6	16.9		0.2	0.1	0.1
3-Feb-69	0	0	0.4	0.3	0.1	0	0.6	8.4		0	0.3	0
18-Feb-69	0	0.6	0.2	1.5	0	0.5	18.2	0.4		0	0	0.4
19-Feb-69	0.8	0.6	0.5	0	0.1	0.2	0	0.9		0.3	0.3	0
20-Feb-69	0.3	0.2	0.4	0	0.2	0.5	0	2.5		0	0.3	0.2
21-Feb-69	0.2	0	0.2	0	0	0	0	1		0	0	0
22-Feb-69	0.2	0	0.2	0	0	0	0	1		0	0	0
23-Feb-69	0.2	0	0.2	0	0	0	0	1		0	0	0
24-Feb-69	0.3	0.5	0.2	0	0.3	0.1	0.6	32.3		0	0.1	0
25-Feb-69	0.7	0	0.4	0	0.2	0.2	0	1.6		0	0.3	0.3
26-Feb-69	0	0	0.4	0.3	0	0.2	0.2	1.8		0	0	0
27-Feb-69	0.2	0	0.4	0	0	0.5	0.1	0.1		0.1	0	0
16-Mar-69	0.1	0	0	0	0.1	0	0	0.4		0.2	0.3	0
17-Mar-69	0.7	0.2	0	0	0	0.8	0.3	2.1		0	0	0
18-Mar-69	0.7	0.2	0.2	0.1	0.1	0	0.1	23.7		0	0	0.7
19-Mar-69	1.2	0.3	0	0.7	0.4	0.2	0.4	154.6		0	0.5	0
20-Mar-69	0.6	0.6	0.2	0.5	0.1	0.1	0	9.1		0.3	0.1	0
21-Mar-69	0	0	0.1	0	0	0	0.2	3.1		0	0.2	0
22-Mar-69	0	0	0.1	0	0	0	0.2	3.1		0	0.2	0
1-Apr-69	0.2	0.5	0.3	0.2	0.4	0.1	0.4	2.6	0	0	0.2	0.5
2-Apr-69	0.7	0	0.2	0.8	0.5	0.1	0.2	3.5	0	0.2	0.5	0.5
3-Apr-69	0.1	0.1	0.1	0.1	0.1	0.1	0.1	15	0.2	0.2	0.5	0.2
4-Apr-69	0.1	0.1	0.1	0.1	0.1	0.1	0.1	15	0.2	0.2	0.5	0.2
5-Apr-69	0.1	0.1	0.1	0.1	0.1	0.1	0.1	15	0.2	0.2	0.5	0.2
6-Apr-69	0.1	0.1	0.1	0.1	0.1	0.1	0.1	15	0.2	0.2	0.5	0.2
7-Apr-69	0.2	0.1	0	0.2	0.1	0	0.4	67.2	0.3	0.4	0	0.1
8-Apr-69	0.1	0	0.4	0	0	0.2	1.7	1.6	0.5	0	0.4	0
9-Apr-69	0	0	0.2	0.1	0	0	0.2	0.7	0	0.4	0	0
10-Apr-69	0.4	0	0	0.2	0.3	1.1	18.2	1.5	0.6	0.6	0.4	0.3



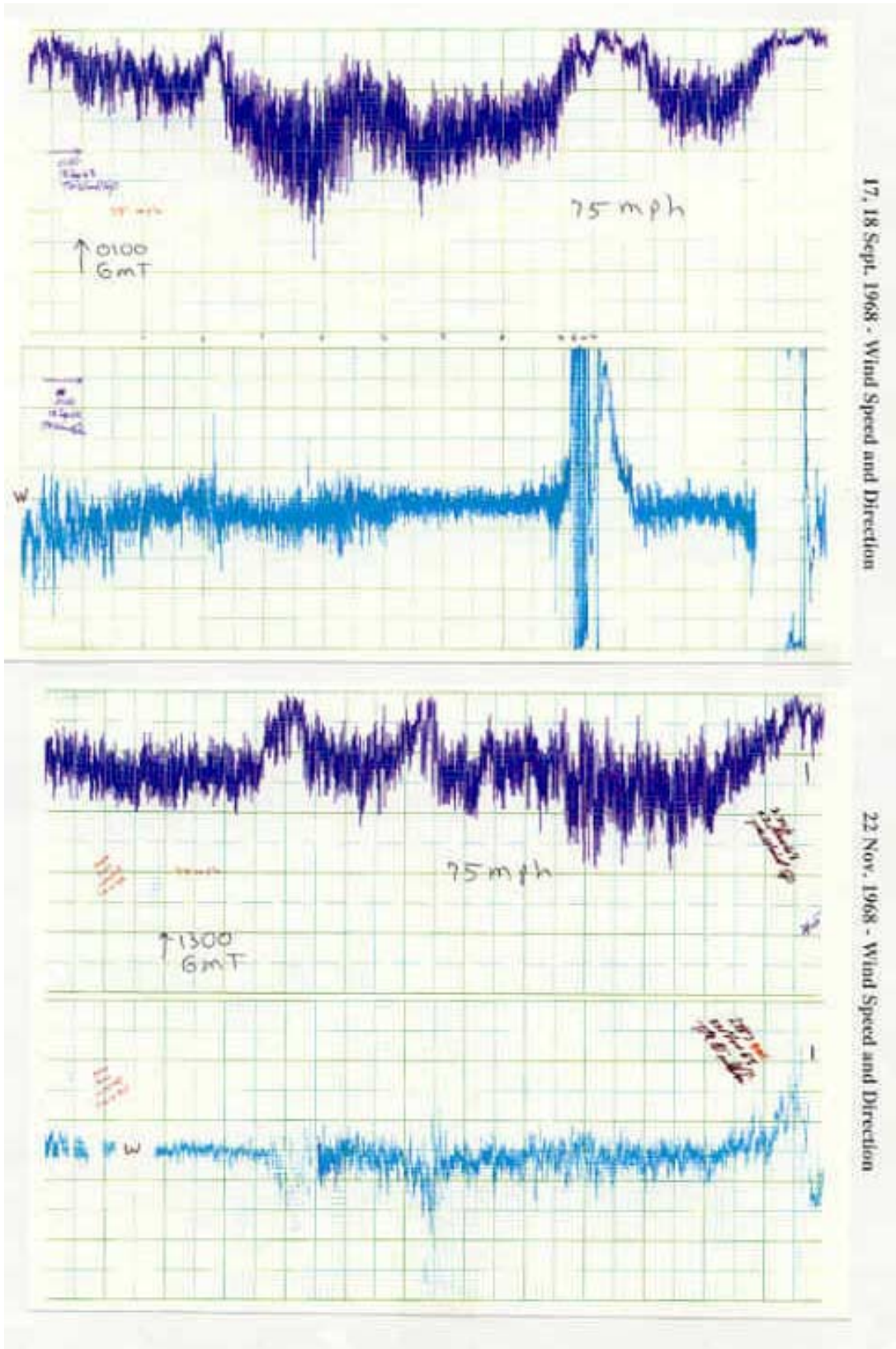
13, 14 April 1968 - Wind Speed

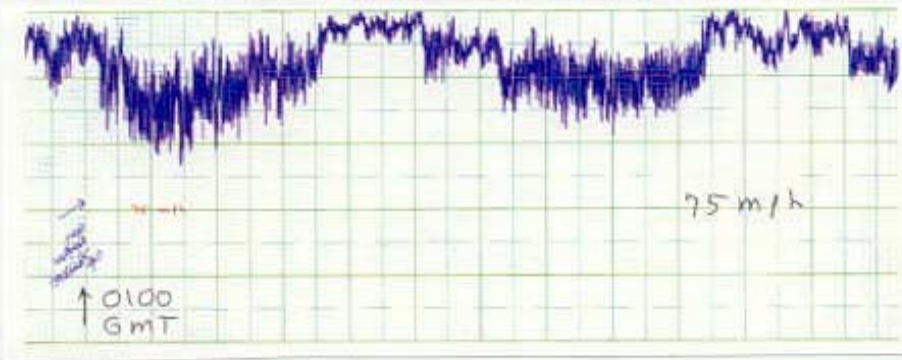


13, 14 May 1968 - Wind Speed and Direction

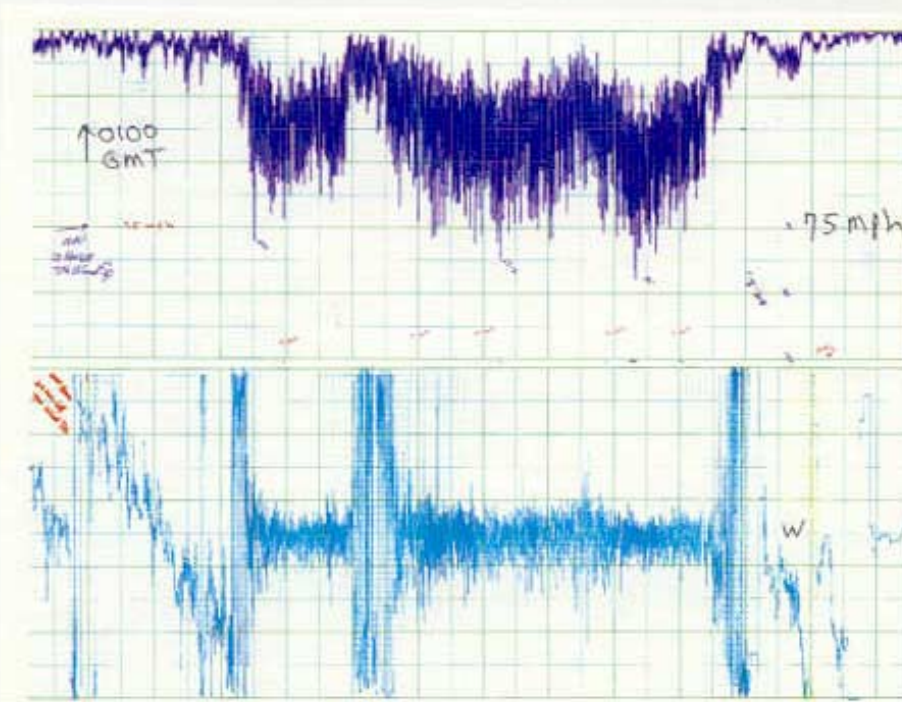




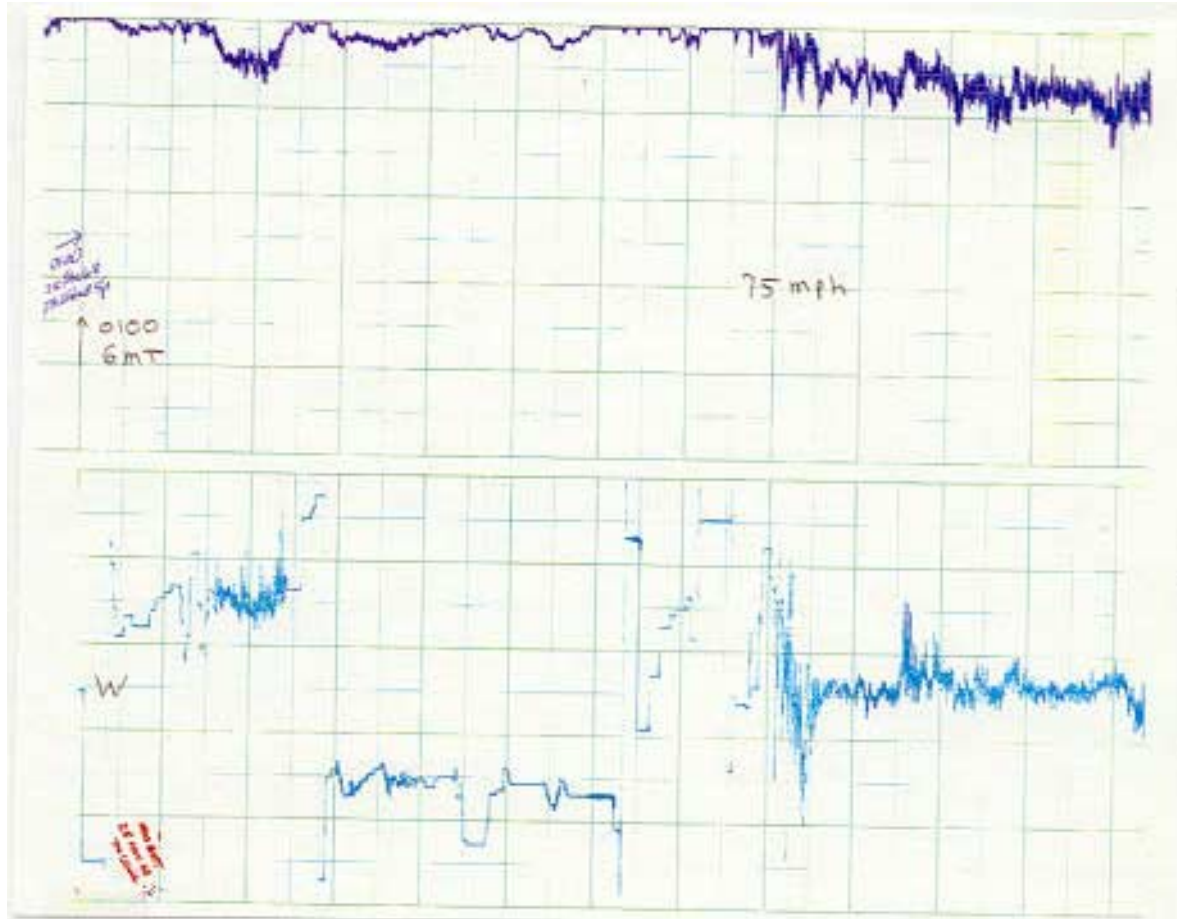




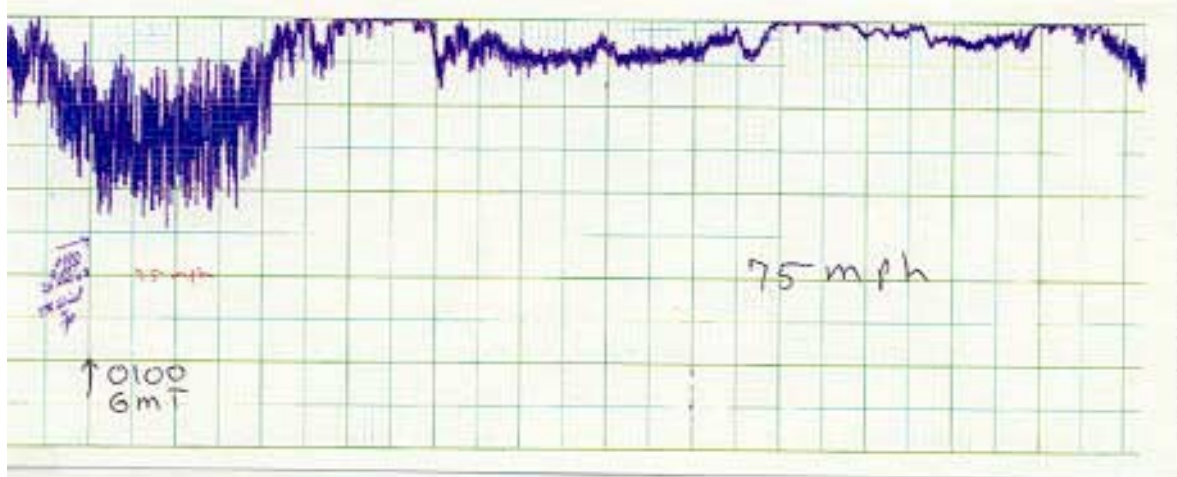
22, 23 Nov, 1968 - Wind Speed



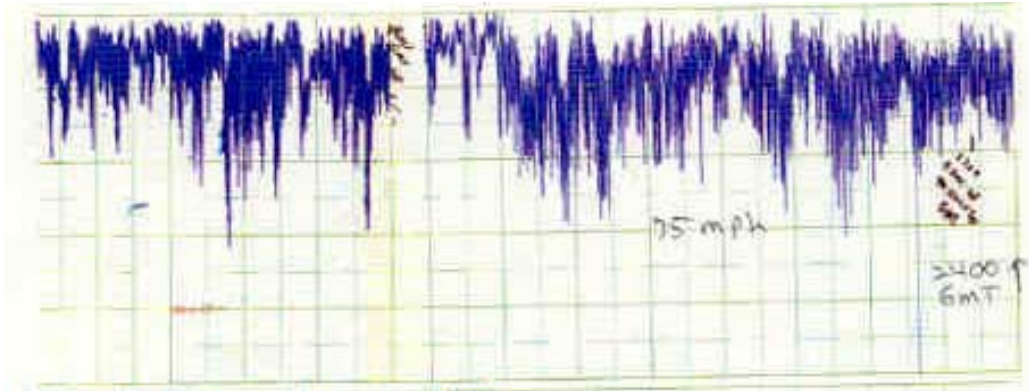
23, 24 Nov, 1968 - Wind Speed and Direction



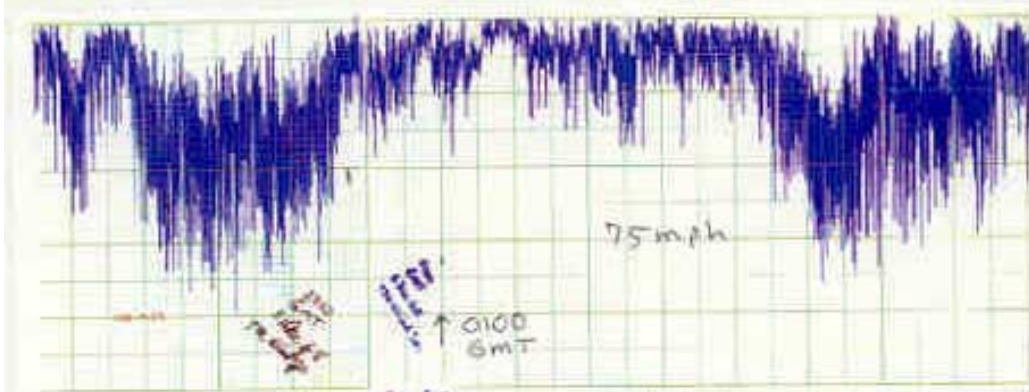
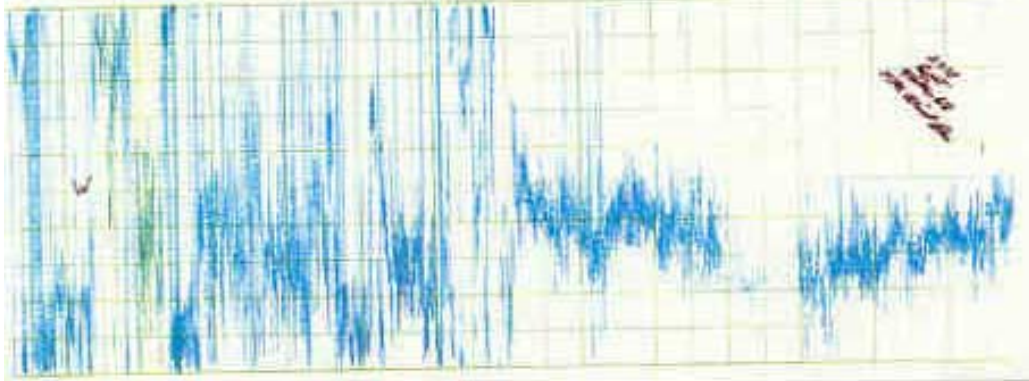
24, 25 Nov. 1968 - Wind Speed and Direction



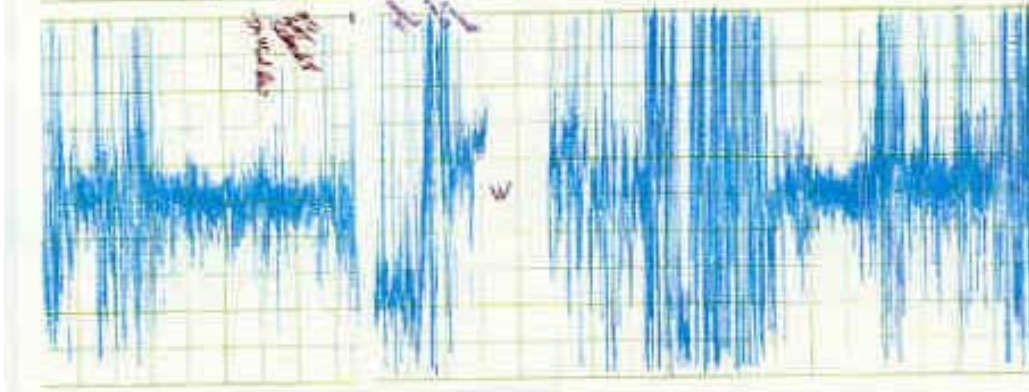
25, 26 Nov. 1968 - Wind Speed

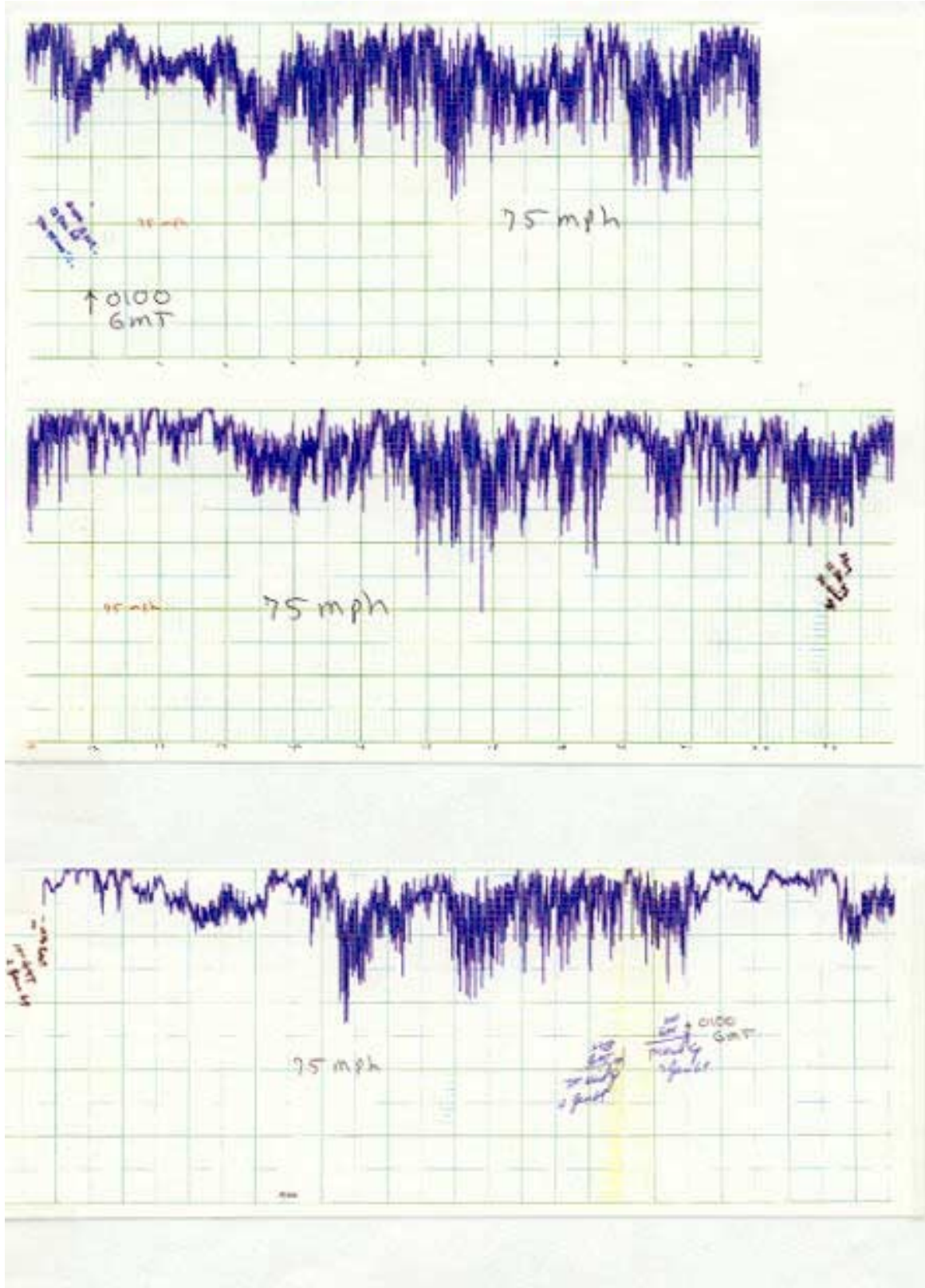


4 Dec. 1968 - Wind Speed and Direction



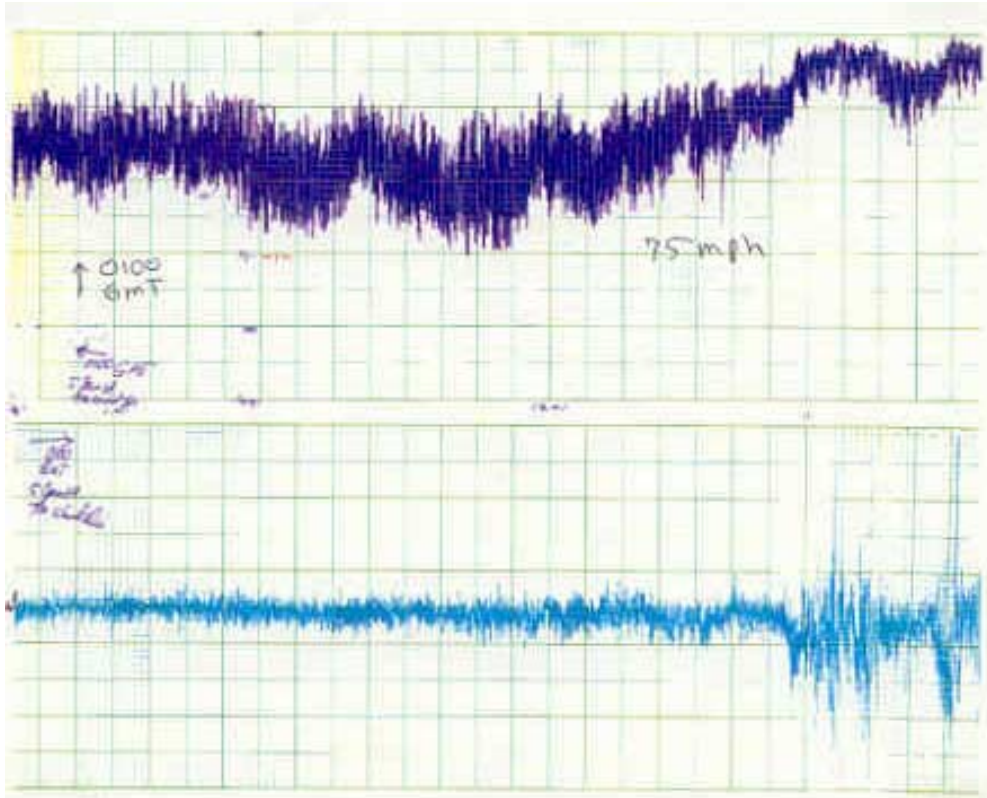
5, 6 Dec. 1968 - Wind Speed and Direction



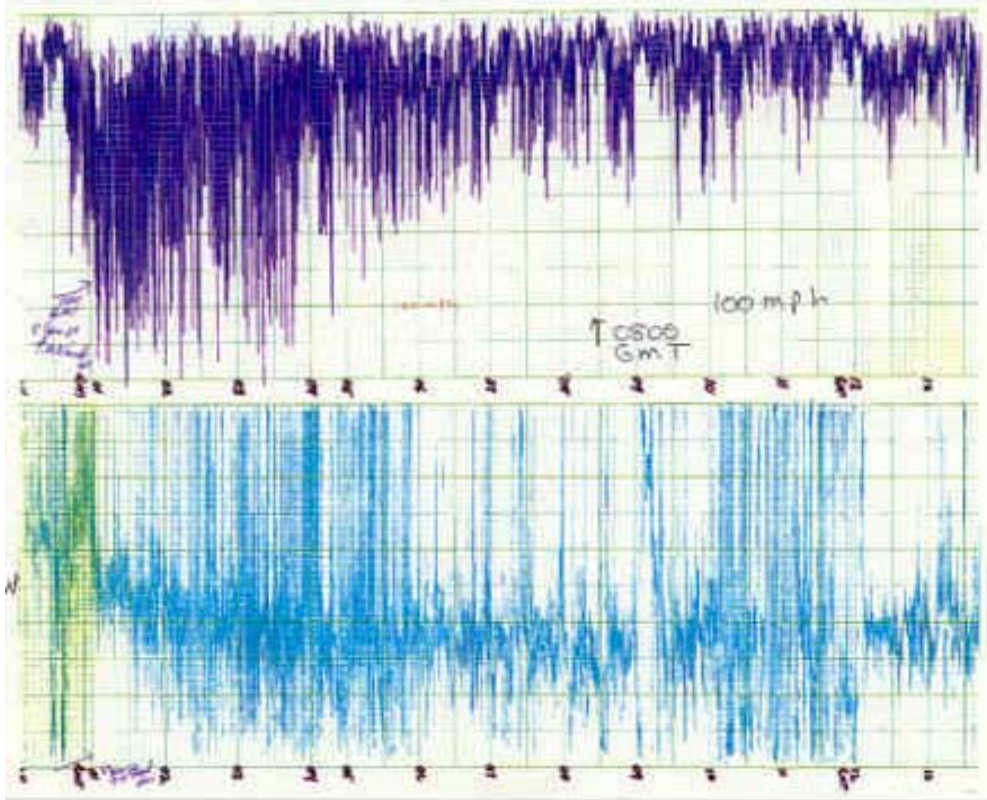


11, 12 Dec. 1968 - Wind Speed

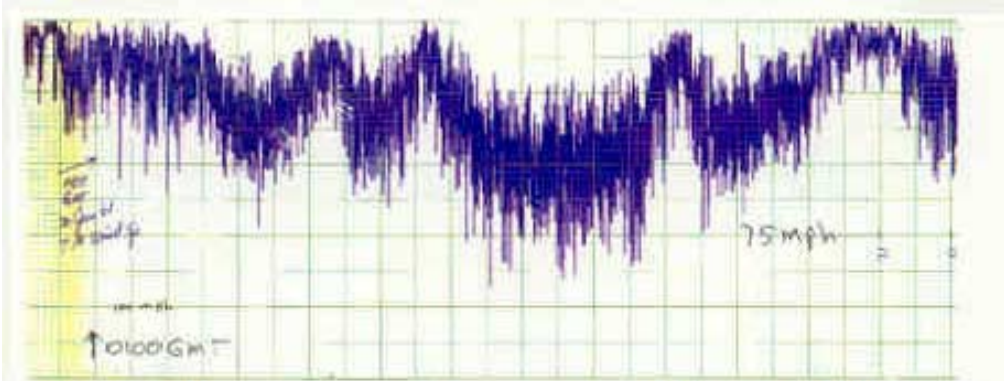
2, 3 Jan. 1969 - Wind Speed



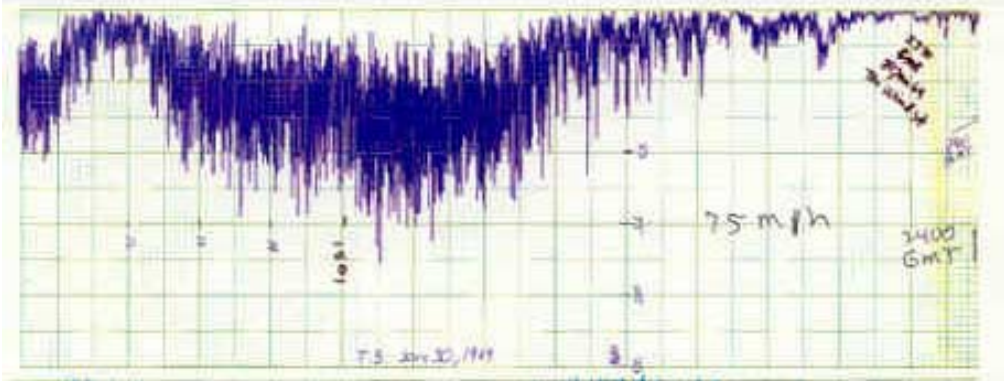
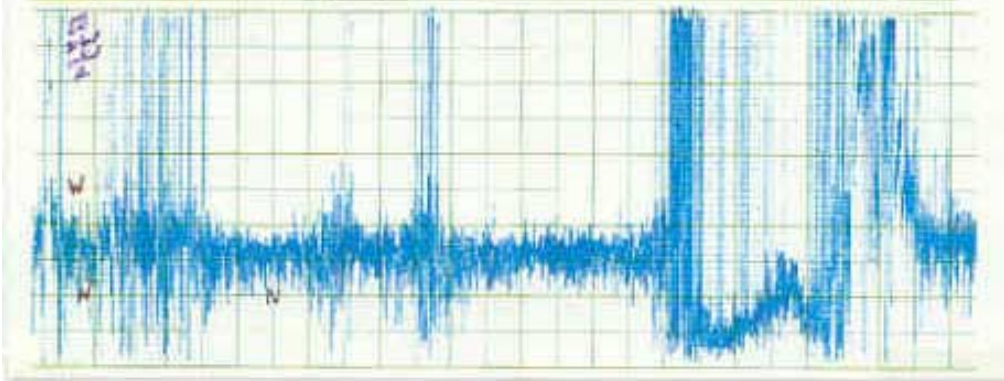
4, 5 Jan. 1969 - Wind Speed and Direction



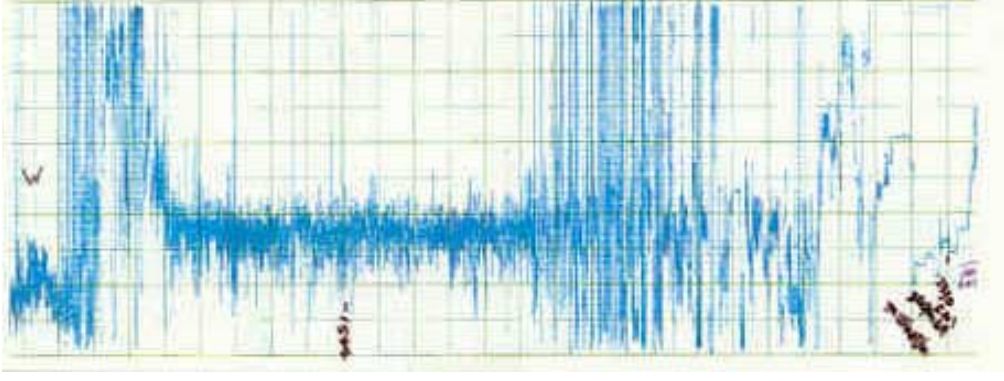
7, 8 Jan. 1969 - Wind Speed and Direction

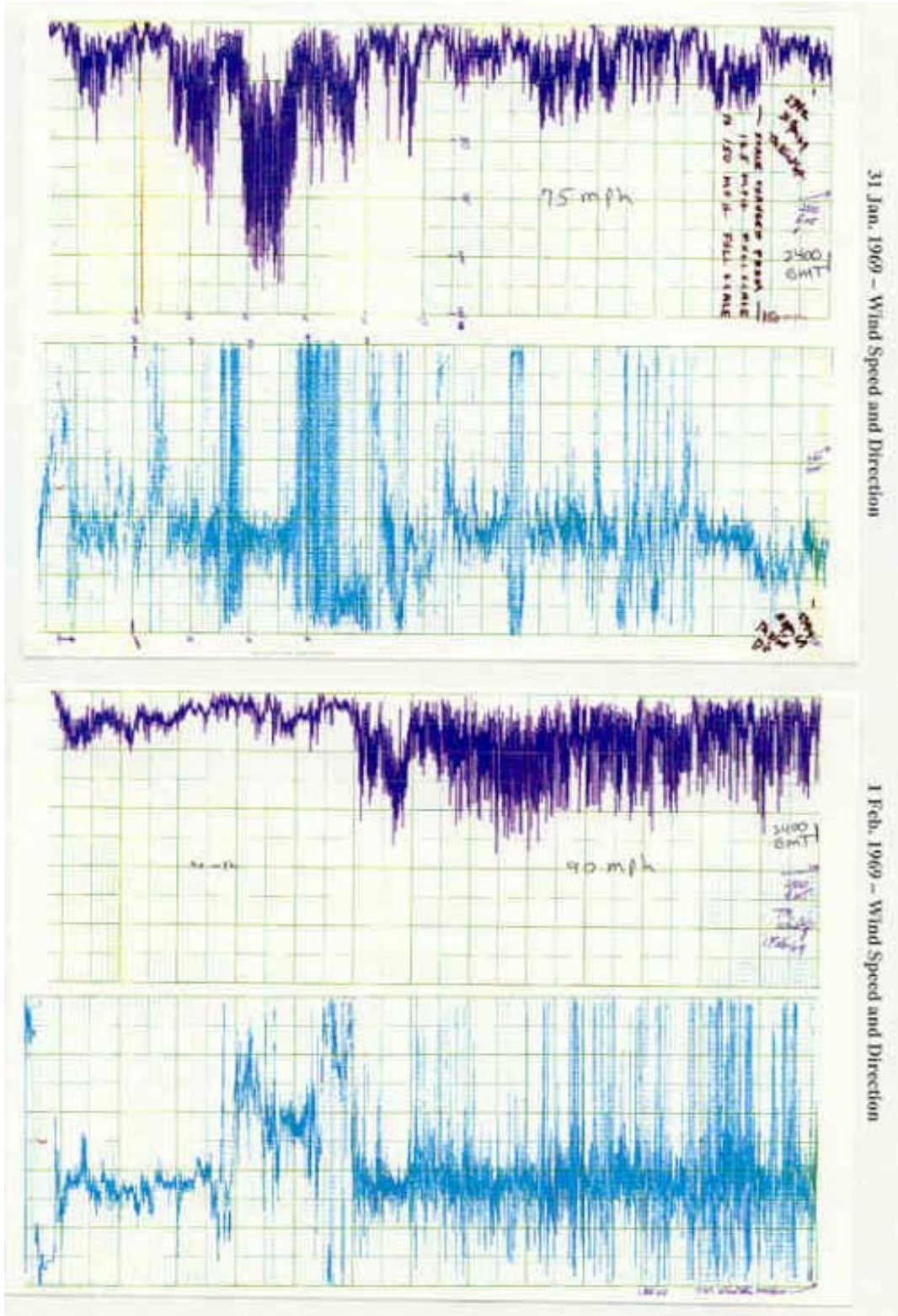


29 Jan 1969 - Wind Speed and Direction



30 Jan 1969 - Wind Speed and Direction

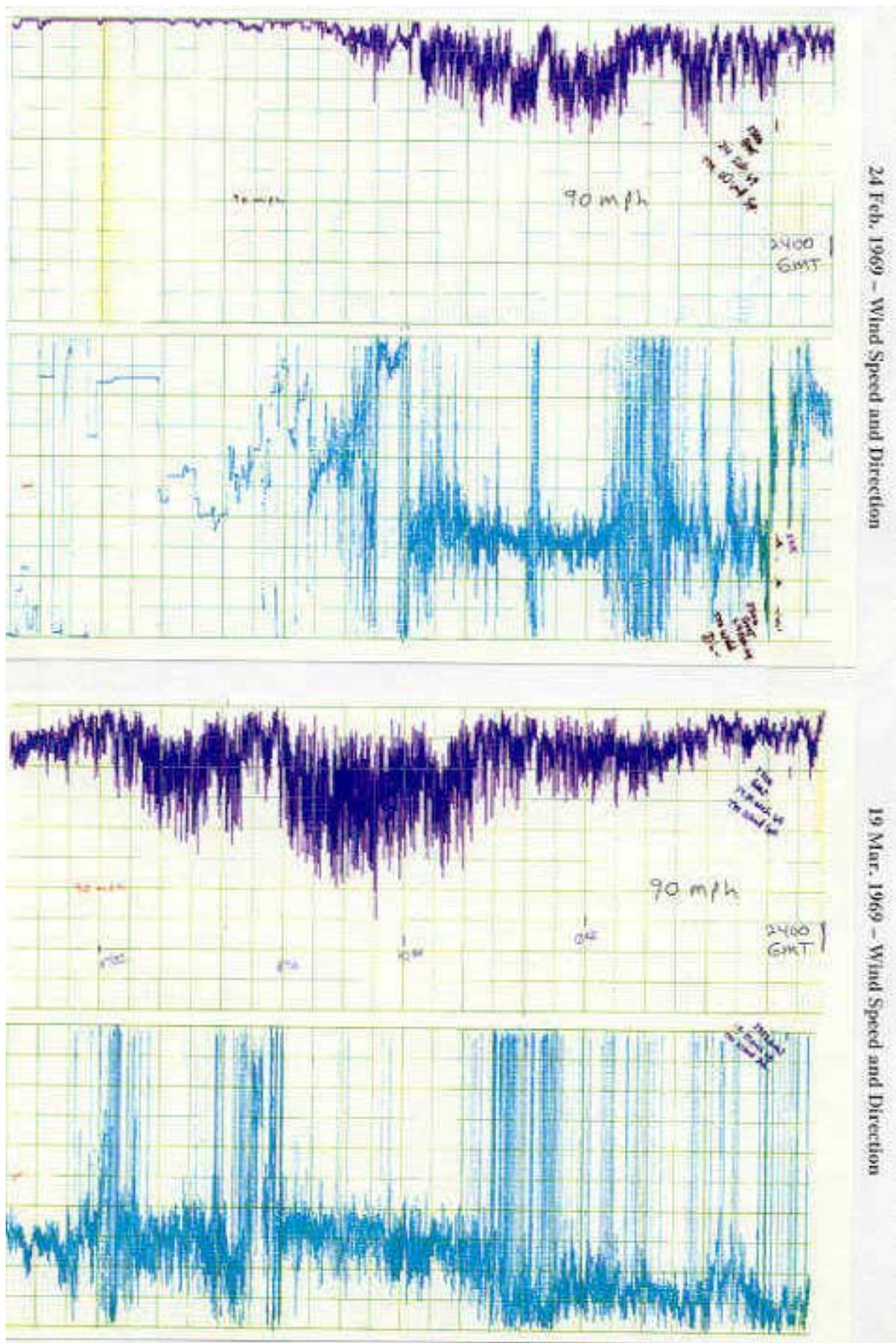


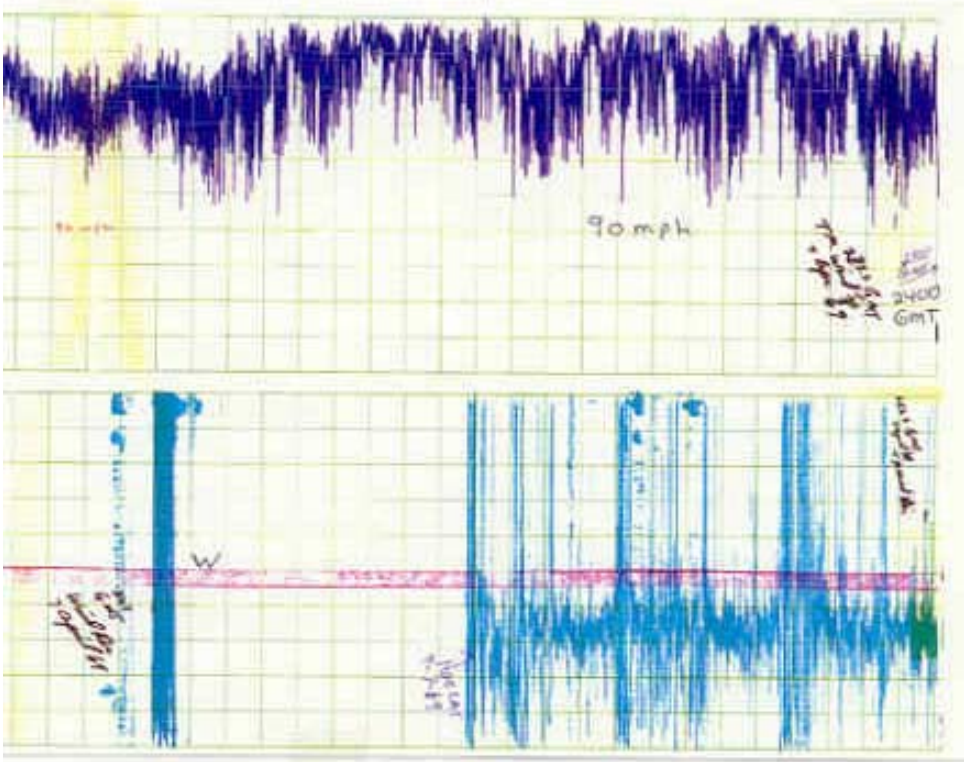
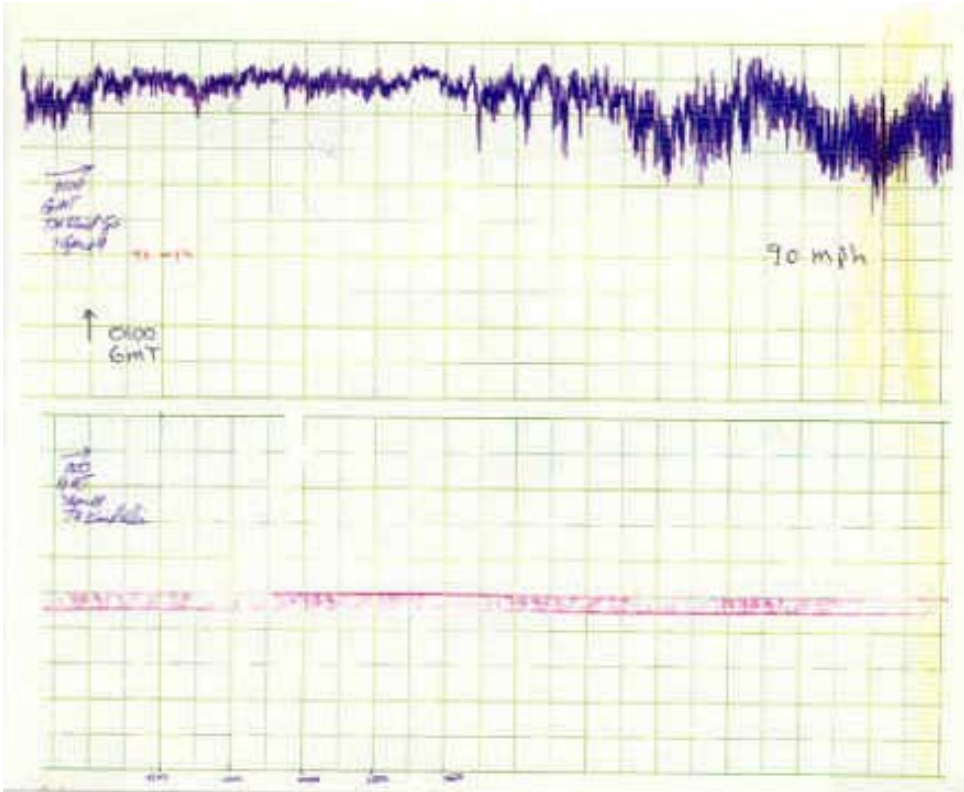


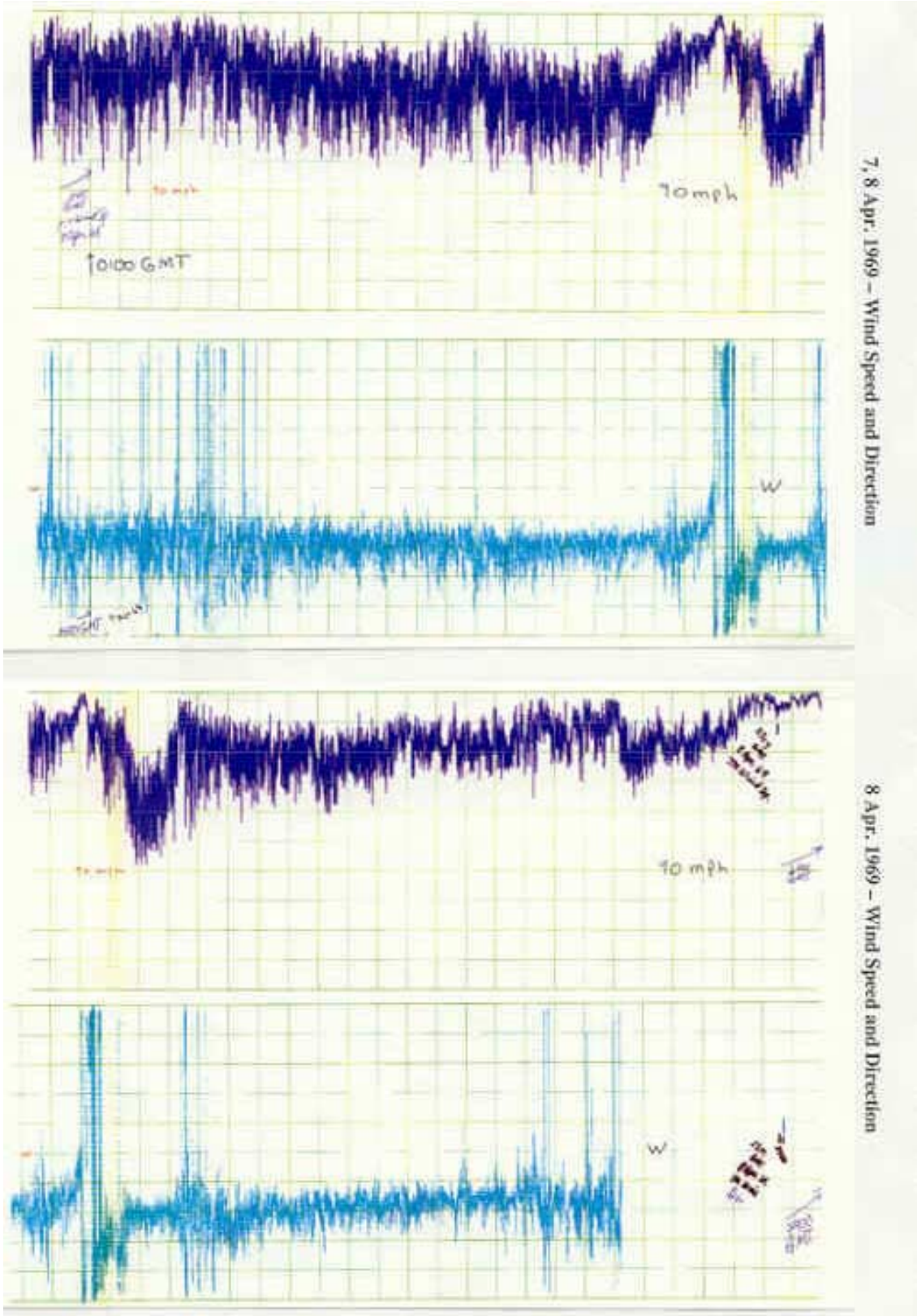
31 Jan. 1969 - Wind Speed and Direction

1 Feb. 1969 - Wind Speed and Direction









7, 8 Apr. 1969 - Wind Speed and Direction

8 Apr. 1969 - Wind Speed and Direction