UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

MAY 1976

OPEN FILE REPORT 76-300E

ALASKAN GEOLOGY BRANCH
TECHNICAL DATA FILE

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Normal Magnetograms

Storm Magnetograms(When Normal is too disturbed to read)

THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSEND, CHIEF OF THE COLLEGE OBSERVATORY WITH THE ASSISTANCE OF OBSERVATORY STAFF MEMBERS J. E. PAPP, M. J. MOORMAN, C. E. DEADMON, AND S. P. TILTON, AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF ELECTROMAGNETISM AND GEOMAGNETISM.

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

INTRODUCTION

The preliminary geomagnetic data included here is made available to scientific personnel and organizations, as part of a cooperative effort and on a data exchange basis because of the early need by some users. To avoid delay, all of the data is copied from original forms processed at the observatory; therefore it should be regarded as preliminary. Inquiries about this report or about the College Observatory should be addressed to:

Chief, College Observatory
U.S. Geological Survey
Yukon Drive on West Ridge
Fairbanks, Alaska 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A-NOAA
Environmental Data Service
Boulder, Colorado 80302

GEOMAGNETIC DATA

Normal, Storm, and Rapid Run magnetograms and appropriate calibration data are processed daily at the observatory and are available for analysis or copying. Also available are mean hourly scalings, K-Indices, selected magnetic phenomena reports, and on a real-time basis are recordings from a 3-component fluxgate magnetometer and F-component proton magnetometer.

Magnetic Activity

The K-Index. The K-Index is a logarithmic measurement of the range of the most disturbed component (D or H) of the geomagnetic field for eight intervals beginning 0000-0300, 0300-0600...2100-2400 UT. It is a measure of the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval.

The Equivalent Daily Amplitude, AK. The K-Index is converted into an equivalent range, ak, which is near the center of the limiting gamma ranges for a given K. The average of the eight values is called equivalent daily amplitude AK. The unit 10 γ has been chosen so as not to give the illusion of an accuracy not justified.

The schedule for converting gamma range to K, and K to ak is as follows:

Gamma Range	K - Index	ak*
0 < 25	0	0
25 < 50	1	3
50 < 100	2	7
100 < 200	3	15
200 < 350	4	27
350 < 600	5	48
600 < 1000	6	80
1000 < 1650	7	140
1650 < 2500	8	240
2500+	9	400 (10 γ)

The Magnetic Daily Character Figure, C. To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1 if it is moderately disturbed; C=2 if it is greatly disturbed. The method used to assign characters at the College Observatory is based on AK as follows:

AK Range	C
0-11	0
11-50	1
50+	2

Routine assignment of C was discontinued at College on January 1, 1976.

OBSERVATORY LOCATION

The College Observatory, operated by the U. S. Geological Survey, is located at the University of Alaska, Fairbanks, Alaska. It is near the Auroral Zone and the northern limit of the world's greatest earthquake belt, the circum-Pacific Seismic belt. Although the observatory's basic operation is in geomagnetism and seismology, it cooperates with other scientists and organizations in areas where the facility and personnel can be of service.

The observatory is one of three operated by the USGS in Alaska. The others are located at Barrow and Sitka.

The position of the observatory site is:

Geographic latitude.....64°51.6'N
Geographic longitude.....147°50.2'W
Geomagnetic latitude.....+64.6°
Geomagnetic longitude.....+256.5°
Elevation.....200 meters

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal & Rapid Run records were reviewed at the observatory for selected magnetic phenomena and the events identified were forwarded to the IUGG Commission on Magnetic Variations and Disturbances. This was discontinued on January 1, 1976, but a report on Outstanding Magnetic Effects is prepared monthly for this report.

Principal Magnetic Storms

Gradual and sudden commencement magnetic disturbances with at least one K-Index of 5 or greater, which are believed to be part of a world-wide disturbance, are classified as principal magnetic storms. The time of the storm beginning and ending; direction and amplitude of sudden commencements; period of maximum activity; and storm range are reported. Monthly reports of these data are forwarded to the World Data Center A in Boulder, Colorado.

Magnetogram Hourly Scalings

Magnetogram hourly scalings are averages for successive periods of one hour for the D, H, and Z elements. The value in the column headed "01" is the average for the hour beginning 0000 and ending 0100. Note that the values on the scaling sheets are in tenths of mm with the decimal point omitted. The user of these scalings should keep in mind that the tabular values are hourly means and if he is interested in the detailed morphology of the magnetic field, he should refer directly to the magnetograms.

Magnetograms

The normal magnetograms in this report are reproduced at about one-third the size of the originals. Preliminary base-line values and scale values adopted for use with the original magnetograms are included. For days when the magnetic field is too disturbed for the Normal magnetogram to be readable, Storm magnetograms are reproduced.

Absolutes, Base-lines, and Scale Values

To determine the absolute value of the magnetic field from the hourly means or from point scalings the following equations should be used:

$D = B_D + d \cdot S_D$; $H = B_H + h \cdot S_H$; $Z = B_Z + z \cdot S_Z$
where D, H, and Z are absolute values;
 B_D , B_H and B_Z are base-line values;
 S_D , S_H and S_Z are scale values;
and d, h, and z are scalings in millimeters.

COLLEGE, ALASKA

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR

MAY 1976

DATE	K-INDICES								AK	TIME SCALE ON MAGNETOGRAMS 20mm/hr	
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24			SUM
1	2	2	3	2	3	2	1	2	17	09	SUDDEN COMMENCEMENTS d h m
2	4	3	2	7	6	4	5	6	37	53	
3	6	6	7	7	6	4	3	3	42	72	
4	3	4	5	4	4	5	4	2	31	28	
5	4	3	2	5	3	1	1	1	20	15	
6	2	2	4	5	3	2	1	2	21	15	
7	3	3	2	4	4	3	1	1	21	14	
8	2	2	3	3	3	2	1	1	17	09	
9	2	1	0	1	1	0	0	0	05	02	
10	1	2	1	1	2	5	1	0	13	09	
11	2	2	3	4	2	2	2	2	19	11	
12	3	2	3	5	3	2	0	1	19	14	
13	1	1	1	1	1	1	1	0	07	03	
14	1	1	1	0	0	0	0	0	03	01	
15	0	0	0	0	3	1	0	2	06	03	
16	2	2	0	3	0	0	0	0	07	04	
17	1	1	1	3	1	0	0	0	07	03	
18	1	1	0	0	0	0	0	0	02	01	
19	0	0	1	0	1	2	2	3	09	04	
20	4	5	5	5	4	5	4	2	34	35	
21	3	2	5	4	5	4	2	1	26	23	
22	2	3	4	1	4	3	2	1	20	13	
23	1	1	6	6	5	4	2	1	26	31	
24	1	2	2	1	1	1	1	1	10	04	
25	2	2	2	4	2	3	2	0	17	10	
26	2	1	0	1	1	1	1	1	08	03	
27	1	2	1	3	2	1	1	1	12	06	
28	2	3	3	6	5	4	2	2	27	26	
29	3	3	3	7	4	4	3	3	30	34	
30	3	3	3	5	3	3	3	2	25	18	
31	3	3	2	4	2	3	2	2	21	13	
SUM											
K SCALE USED:											
LOWER LIMIT FOR K = 9.....				D		H		Z		(mm)	
				683.8		321.7				(Y/mm)	
CURRENT SCALE VALUE.....				3.76		7.82				(to nearest 10Y)	
LOWER LIMIT FOR K = 9.....				2570		2520					
SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.											
/s/ John B. Townshend											
APPROVED John B. Townshend, Chief, College Observatory											
OBSERVER IN CHARGE											

OUTSTANDING MAGNETIC EFFECTS			OBSERVATORY COLLEGE, ALASKA	
			MONTH MAY	YEAR 1976
DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS	
02	02XX	b	H positive	
10	08XX	pi2		
12	17XX	pc4	with pc3's	
13	09XX	pi2		
13	22XX	pc3		
22	05XX	b	H positive	
26	22XX	pc3		
31	22XX	pc4		
6/01	12XX	pi2		
IDENTIFIED BY: JEP/MJM			VERIFIED BY: JBT	

1. NATURE OF PHENOMENON: ssc, ssc*, si, si*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA

Data from Individual Observatories:

MAY 1976

1970

IMF A I

Obs. 2 letter IAGA code	Geomag. lat.	Commencement		SC - amplitudes			Max. 3 hr - index K		Ranges			UT End day hr		
		day	hr min (UT)	type	D(')	H(Y)	Z(Y)	day	(3 hr - period)	K	D(')		H(Y)	Z(Y)
CO	64°6 N	02	08XX	..	..	..	..	02 03	4 3,4	7 7	295	1950	1530	03 22

MAY

1976

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 UT, 5-1-76	2400 UT, 5-31-76	1.0/mm	3.8 γ/mm	28° 07.1 E
H	0000 UT, 5-1-76	2400 UT, 5-31-76	7.8 γ/mm		12758 γ
Z	0000 UT, 5-1-76	2400 UT, 5-31-76	7.6 γ/mm		55125 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 UT, 5-1-76	2400 UT, 5-31-76	7.9/mm	29.8 γ/mm	24° 21.8 E
H	0000 UT, 5-1-76	2400 UT, 5-31-76	44.1 γ/mm		11503 γ
Z	0000 UT, 5-1-76	2400 UT, 5-31-76	48.6 γ/mm		54010 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D	0000 UT, 5-1-76	2400 UT, 5-31-76	0.3/mm	1.0 γ/mm
H	0000 UT, 5-1-76	2400 UT, 5-31-76	1.0 γ/mm	
Z	0000 UT, 5-1-76	2400 UT, 5-31-76	2.4 γ/mm	

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
28° 22.9 E	13053 γ	55361 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: MAY 9, 13, 14, 15, 16, 17, 18, 19, 24, 26

FORM C-55-00a		MAGNETOGRAM HOURLY SCALINGS																								OBSY.		YEAR		MONTH		DAY		SUM	
		U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC DIVISION																								CO		76		MAY		D			
		Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1500u.t.) is hour 11 of the same universal day.																																	
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		Hour 01 of local day (1500u.t.) is hour 1																																	

CO 76 MAY 23

 
75	1	1	2
76	1	1	2
77	1	1	2
78	1	1	2
79	1	1	2
80	1	1	2
81	1	1	2
82	1	1	2
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106	1	1	2
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108	1	1	2
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110	1	1	2
111	1	1	2
112	1	1	2
113</			

6786	300	282	5	282	300	6786
7510	378	374	8	374	378	7510
5152	301	295	6	295	301	5152
6537	340	302	9	302	340	6537
7321	317	308	6	308	317	7321
7162	326	331	9	331	326	7162
7233	312	298	7	298	312	7233
7724	307	302	0	302	307	7724
7655	309	302	3	302	309	7655
7160	300	299	0	299	300	7160
7316	298	288	4	288	298	7316
7255	312	309	5	309	312	7255
7410	306	302	0	302	306	7410
7596	311	308	3	308	311	7596
7559	308	307	2	307	308	7559
7518	304	300	7	300	304	7518
7280	298	294	1	294	298	7280
7233	296	291	6	291	296	7233
7197	309	295	1	295	309	7197
6654	324	313	6	313	324	6654
7117	312	311	8	311	312	7117
7162	308	305	6	305	308	7162
6382	316	316	1	316	316	6382
7702	309	300	2	300	309	7702
7165	306	302	0	302	306	7165
7276	301	294	5	294	301	7276
6967	300	298	8	298	300	6967
6648	325	312	3	312	325	6648
6934	320	281	4	281	320	6934
7233	332	301	9	301	332	7233
7101	322	309	4	309	322	7101

MONTHLY SUM	219558
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MONTHLY MEAN	295
DAYS WITH GAPS.	

1

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USC 6000-02 10370-PA1

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
GEOMAGNETISM DIVISION

CO 76 MAY 23

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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	62	72	SUM
1	1	1	2
2	1	1	2
3	1	1	2
4	1	1	2
5	1	1	2
6	1	1	2
7	1	1	2
8	1	1	2
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6786	300	282	5	282	300	6786
7510	378	374	8	374	378	7510
5152	301	295	6	295	301	5152
6537	340	302	9	302	340	6537
7321	317	308	6	308	317	7321
7162	326	331	9	331	326	7162
7233	312	298	7	298	312	7233
7724	307	302	0	302	307	7724
7655	309	302	3	302	309	7655
7160	300	299	0	299	300	7160
7316	298	288	4	288	298	7316
7255	312	309	5	309	312	7255
7410	306	302	0	302	306	7410
7596	311	308	3	308	311	7596
7559	308	307	2	307	308	7559
7518	304	300	7	300	304	7518
7280	298	294	1	294	298	7280
7233	296	291	6	291	296	7233
7197	309	295	1	295	309	7197
6654	324	313	6	313	324	6654
7117	312	311	8	311	312	7117
7162	308	305	6	305	308	7162
6382	316	316	1	316	316	6382
7702	309	300	2	300	309	7702
7165	306	302	0	302	306	7165
7276	301	294	5	294	301	7276
6967	300	298	8	298	300	6967
6648	325	312	3	312	325	6648
6934	320	281	4	281	320	6934
7233	332	301	9	301	332	7233
7101	322	309	4	309	322	7101

MONTHLY SUM	219558
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MONTHLY MEAN	295
DAYS WITH GAPS.	

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FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

STORM MAGNETOGRAMS

STORM MAGNETOGRAMS