UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JANUARY 1982

OPEN FILE REPORT 82-0300A

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Normal Magnetograms

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THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF OBSERVATORY STAFF MEMBERS: J.E. PAPP, E.A. SAUTER AND L.Y. TORRENCE 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 OF THE U.S. GEOLOGICAL SURVEY.

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
800 Yukon Drive
Fairbanks, Alaska 99701

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

World Data Center A
NOAA D63, 323 Broadway
Boulder, Colorado 80303

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..... $64^{\circ}51.6'N$
Geographic longitude..... $147^{\circ}50.2'W$
Geomagnetic latitude..... 64.6°
Geomagnetic longitude..... $+256.9^{\circ}$
Elevation.....200 meters

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, ΔK , 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 ΔK is as follows:

Gamma Range	K - Index	ΔK
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.

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal and 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 "OI" 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:

$$D = B_D \cdot d \cdot S_D; H = B_H \cdot h \cdot S_H; Z = B_Z \cdot z \cdot S_Z$$

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

MONTH AND YEAR
JANUARY 1982

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

DATE	K-INDICES									AK	TIME SCALE ON MAGNETOGRAMS
	0000	0000	0000	0000	12-15	13-18	19-21	21-24	SUM		
1	0	0	1	2	4	5	2	0	14	12	SUDDEN COMMENCEMENTS d h m
2	0	0	1	4	4	4	3	2	18	13	
3	2	2	5	4	4	6	4	3	30	30	
4	3	1	1	3	4	5	2	1	20	15	
5	1	2	1	3	0	0	1	0	08	04	
6	0	1	4	4	3	1	3	1	17	12	
7	0	2	4	2	4	4	2	2	20	14	
8	1	2	2	2	1	1	3	1	13	06	
9	1	1	1	2	1	1	0	0	07	03	
10	0	0	0	0	0	1	1	0	02	01	
11	0	0	1	1	2	1	0	0	05	02	POSSIBLE SOLAR-FLARE EFFECTS BASED ON INSPECTION OF GRAMS ALONE (WITHOUT REFERENCE TO DATA FROM OTHER SOURCES)
12	0	1	0	1	0	0	0	0	02	01	
13	0	1	0	1	0	0	0	0	02	01	
14	0	0	0	0	0	0	0	0	00	00	
15	0	2	2	6	5	4	2	2	23	23	
16	0	0	4	4	6	6	3	3	26	31	
17	3	1	2	4	3	4	0	1	18	12	
18	0	1	1	2	2	2	5	3	16	11	
19	2	0	0	1	3	0	0	0	06	03	
20	1	1	0	1	0	0	1	1	05	02	
21	0	1	5	4	3	3	2	2	20	15	BEGIN
22	1	4	6	7	5	6	4	3	36	53	
23	2	3	3	5	6	5	3	3	30	30	END
24	3	3	4	4	6	5	3	3	31	30	
25	3	2	2	3	4	3	1	0	18	11	
26	1	0	0	1	1	1	2	2	08	03	d h m
27	2	2	2	4	5	4	1	2	22	17	
28	2	3	3	6	3	2	1	1	21	18	d h m
29	0	0	0	0	3	3	3	2	11	07	
30	4	3	5	5	5	5	4	1	32	33	d h m
31	2	4	3	6	6	5	5	3	34	40	

K SCALE USED:

LOWER LIMIT FOR K = 9.....

CURRENT SCALE VALUE.....

LOWER LIMIT FOR K = 9.....

D

683.8

3.75

2560

H

321.7

7.81

2510

Z

(mm)

(γ/mm)

(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JACK B. TOWNSEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY
COLLEGE, ALASKA

MONTH
JANUARY

YEAR
1982

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
01	1840	si	
05	20XX	pc3	
10	18XX	pc5	
16	19XX	pc5	
29	1744	ssc*	
<p>IDENTIFIED BY: JEP</p> <p>VERIFIED BY: JBT</p>			

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

1982

JANUARY

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)
C0	64.6 N	21	07XX	..	..	..	..	22	4	7	176	1300	510	24 24
		29	13XX 1744	.. s.c.*	.. +36	.. +136	.. +47	Feb.	4, 5, 7	7	366	2350	1500	Feb. 07 20
								01	3, 4	7				
								02	5	7				
							04			7				

NORMAL MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 1-1-82	2400 U.T., 1-31-82	1.0/mm	3.7x/mm	27° 46.8 E
H	0000 U.T., 1-1-82	2400 U.T., 1-31-82	7.8x/mm		12746x
Z	0000 U.T., 1-1-82	2400 U.T., 1-9-82	7.7x/mm		55157x
	0000 U.T., 1-10-82	2400 U.T., 1-31-82	"		55151x

STORM MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 1-1-82	2400 U.T., 1-31-82	7.9/mm	29.6x/mm	23° 43.0 E
H	0000 U.T., 1-1-82	2400 U.T., 1-31-82	44.0x/mm		11485x
Z	0000 U.T., 1-1-82	2400 U.T., 1-9-82	48.5x/mm		54007x
	0000 U.T., 1-10-82	2400 U.T., 1-31-82	"		54021x

RAPID RUN MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		
D					
H					
Z					

MONTHLY MEAN ABSOLUTE VALUES*					
D	H	Z			
28° 00.8 E	12983x	55382x			

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: JAN 5, 9, 10, 11, 12, 13, 14, 19, 20, 26

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

Values are in tenths of mm, and are arranged for successive periods of one hour beginning at midnight, Hour 01 of local day (1502M, T, 11) at the station. Negative values are indicated with minus sign, none.

Station's magnetic declination here below applied. Negative values are indicated with minus sign, none.

01	136	137	134	134	137	143	151	162	165	143	132	138	01	180	142	132	292	192	162	210	198	186	185	172	142	3913
02	128	132	130	134	132	140	132	141	130	138	192	147	02	179	196	302	321	173	180	136	112	90	111	110	3748	
03	114	114	103	84	72	112	163	150	147	171	176	172	03	161	173	163	190	370	124	202	187	174	81	72	125	
04	70	114	81	108	124	150	158	139	142	158	152	155	04	182	194	200	263	238	273	193	173	171	170	168	153	
05	132	139	134	127	120	118	129	135	132	195	184	149	05	157	153	150	152	156	162	165	175	178	178	172	118	
06	132	132	138	126	112	112	81	105	126	154	140	140	06	223	166	138	145	160	187	184	216	128	164	160	151	
07	133	124	105	110	100	114	72	35	101	138	139	140	07	181	182	160	195	111	199	198	146	139	99	113	79	
08	77	96	80	106	119	126	138	133	188	137	130	135	08	141	137	149	118	154	191	155	151	154	147	135	106	
09	121	124	117	104	114	113	118	126	129	140	137	130	09	143	154	137	154	182	186	154	177	162	145	145	121	
10	98	113	106	121	121	129	129	129	121	129	137	137	10	137	137	145	145	145	154	174	183	174	123	96	87	
11	96	104	113	101	104	123	127	116	124	153	134	138	11	152	184	108	156	125	181	197	170	146	137	126	119	
12	110	110	97	96	116	122	140	136	135	130	136	149	12	163	114	152	156	159	154	155	153	154	158	150	151	
13	136	129	123	121	125	140	147	132	124	115	111	125	13	142	147	150	154	156	163	161	156	154	145	144	135	
14	124	126	130	134	135	136	143	144	143	143	138	139	14	141	145	147	154	159	166	167	174	174	164	153	120	
15	110	120	109	74	126	146	133	130	142	173	167	337	15	256	302	237	180	150	202	202	179	142	123	123	108	
16	115	125	132	130	114	143	127	136	359	67	45	185	16	156	225	421	563	306	260	194	136	34	111	119	100	
17	81	91	84	117	129	130	141	140	168	228	231	186	17	181	198	141	138	186	136	157	186	191	169	156	130	
18	122	113	120	126	140	131	127	142	143	148	160	151	18	180	171	169	150	134	152	140	71	70	114	56	58	
19	70	102	125	125	131	140	143	144	140	149	154	150	19	146	156	130	129	149	154	167	179	191	184	156	136	
20	125	117	119	127	130	136	144	143	136	123	125	138	20	147	145	138	145	146	155	167	176	180	173	154	130	
21	115	108	101	106	115	100	92	48	74	86	108	40	21	163	196	193	183	179	241	134	174	174	151	142	112	
22	91	93	93	50	76	110	114	77	160	48	199	168	22	302	365	405	358	479	386	218	177	106	47	38	74	
23	79	43	60	48	127	152	146	149	141	126	145	267	23	32	281	251	390	160	192	193	146	130	80	45	61	
24	103	142	158	118	112	198	121	96	146	125	81	147	24	233	326	199	508	164	137	166	131	92	25	73	78	
25	94	123	124	141	142	162	165	136	139	126	122	135	25	137	164	142	73	155	172	175	175	186	167	145	133	
26	125	124	126	131	133	156	135	137	134	145	160	169	26	167	146	143	163	173	184	180	172	143	70	91	98	
27	116	133	134	140	119	172	113	133	134	124	144	230	27	246	365	254	273	301	232	216	173	153	116	107	69	
28	96	115	87	119	126	139	128	138	111	23	48	78	28	136	153	163	182	177	157	158	164	159	151	137	126	
29	137	146	137	128	129	134	125	131	126	127	134	139	29	150	156	191	231	232	215	238	125	121	124	108	123	
30	101	47	36	127	94	155	107	128	167	204	59	133	30	182	127	276	238	197	187	181	154	142	128	117	126	
31	125	124	115	137	144	132	101	106	87	102	64	192	31	190	153	461	818	454	454	231	114	100	85	101	116	

 

U.S. Department of Justice Federal Bureau of Investigation Washington, D.C. 20535	CO 82	JAN 82
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U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C. 20250

There are a number of reasons for these periods of

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[illegible]

342	323	220	111	226	288	210
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5

and also -all-

Polymers

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Q21731

of magnetic storm.

Significant positive of

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2017-1909

Interpretation:

157

0283743

1. The first step is to identify the problem.

☐ No record; or no values
have been published.

3.7.

3

2010

187

287

உயிரினம்

Do not know
any record.

1

AM 1030 71A
- 700 54244

... recovered in Normal High

TABLE - continued

 

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS

100 mm
0

NORMAL MAGNETOGRAMS

COLLEGE, ALASKA
JAN 9, 1982

JAN 10, 1982

See above
magnetogram

RECORDED STOPPED

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

NORMAL MAGNETOGRAMS

STORM MAGNETOGRAMS

100 mm
200 mm

STORM MAGNETOGRAMS

STORM MAGNETOGRAMS