

UNITED STATES DEPARTMENT OF THE INTERIOR

(200)
R298
NO. 77-300-L

GEOLOGICAL SURVEY

[Reports- Open
file series]

PRELIMINARY GEOMAGNETIC DATA

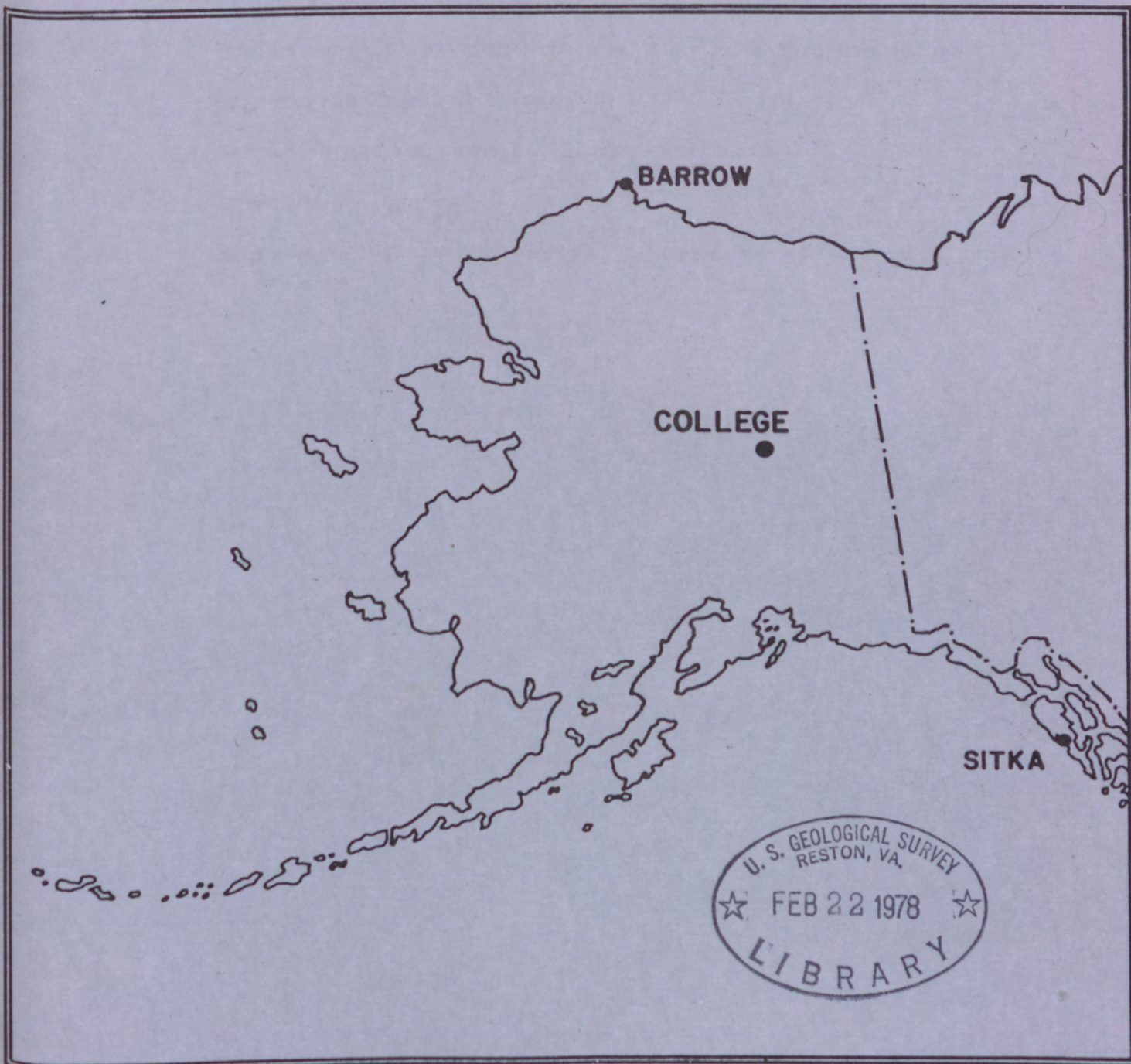
COLLEGE OBSERVATORY

FAIRBANKS, ALASKA

DECEMBER 1977

OPEN FILE REPORT 77-300L

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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, M. J. MOORMAN, 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 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
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 $\approx$ 11	0
11 $\approx$ 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

DECEMBER 1977

DATE	K-INDICES								REMARKS	TIME SCALE ON MAGNETOGRAMS
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24		
								SUM	AK	20 mm/hr
1	1	0	0	1	1	1	2	07	03	SUDDEN COMMENCEMENTS d h m
2	4	5	4	6	6	8	7	43	82	
3	3	2	1	5	3	2	2	19	13	
4	0	1	1	2	3	3	3	16	09	
5	3	6	6	5	2	1	1	25	30	
6	1	0	1	2	0	0	0	04	02	
7	0	0	0	0	0	1	1	02	01	
8	0	0	0	1	0	0	0	01	00	
9	0	0	2	0	0	0	0	02	01	
10	0	0	1	1	1	0	0	04	02	
11	1	4	6	6	7	5	2	34	50	POSSIBLE SOLAR-FLARE EFFECTS BASED ON INSPECTION OF GRAMS ALONE (WITHOUT REFERENCE TO DATA FROM OTHER SOURCES)
12	3	4	4	3	5	2	3	27	21	
13	2	2	2	5	4	3	2	22	16	
14	1	2	2	3	3	2	1	14	07	
15	0	0	2	3	4	0	0	09	09	
16	0	0	2	2	3	3	1	13	07	
17	3	5	1	2	1	0	1	14	10	
18	1	0	0	0	0	0	0	01	00	
19	0	0	1	1	0	0	0	02	01	
20	0	0	0	3	2	0	0	05	03	
21	0	0	0	0	1	2	0	04	02	BEGIN
22	1	0	0	0	1	0	0	02	01	
23	0	0	0	3	3	0	0	06	04	
24	1	0	0	4	2	1	1	09	05	
25	0	0	1	1	1	1	1	06	02	
26	1	1	1	2	2	1	2	13	06	END
27	1	2	0	2	2	1	0	08	03	
28	0	1	0	3	0	0	3	10	06	
29	1	4	0	1	3	0	0	09	06	
30	1	0	0	2	1	0	1	06	02	
31	0	1	0	3	3	1	1	10	05	

SUM

K SCALE USED:

LOWER LIMIT FOR K = 9.....

CURRENT SCALE VALUE.....

LOWER LIMIT FOR K = 9

D

683.8

3.76

2570

H

321.7

7.82

2520

Z

(mm)

(γ/mm)

(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY

COLLEGE, ALASKA

MONTH

YEAR

DECEMBER

1977

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
03	15XX	pc4	
06	1022	bps	
23	10XX	pi2	
28	20XX	pc5	
29	04XX	b	Positive bay on H component.
30	10XX	pi2	
IDENTIFIED BY: JEP			VERIFIED BY: JEP

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

NOAA FORM 86-500
(11/73)

PRINCIPAL MAGNETIC STORMS

WDC-A FOR SOLAR-TERRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80502 U.S.A.

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA
DECEMBER 1977

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(γ)	Z(γ)	day	(3 hr - period)	K	D(')	H(γ)	Z(γ)	
CO	64°6 N	01	22XX	..	..	..	..	02	6	8	373	2150	1090	03 02
		11	03XX	..	..	..	..	11	5	7	296	1810	1180	12 15

NORMAL MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 12-1-77	2400 U.T., 12-31-77	1.0/mm	3.88/mm	27° 46.9 E
H	0000 U.T., 12-1-77	2400 U.T., 12-18-77	7.88/mm		127428
	0000 U.T., 12-19-77	2400 U.T., 12-31-77	"		127508
Z	0000 U.T., 12-1-77	2400 U.T., 12-18-77	7.78/mm		551428
	0000 U.T., 12-19-77	2400 U.T., 12-31-77	"		551368

STORM MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 12-1-77	2400 U.T., 12-31-77	7.9/mm	29.88/mm	24° 22.4 E
H	0000 U.T., 12-1-77	2400 U.T., 12-18-77	44.18/mm		114768
	0000 U.T., 12-19-77	2400 U.T., 12-31-77	"		114938
Z	0000 U.T., 12-1-77	2400 U.T., 12-18-77	48.98/mm		540068
	0000 U.T., 12-19-77	2400 U.T., 12-31-77	"		540398

RAPID RUN MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		
D	0000 U.T., 12-1-77	2400 U.T., 12-31-77	0.3/mm		1.08/mm
H	0000 U.T., 12-1-77	2400 U.T., 12-31-77	1.08/mm		
Z	0000 U.T., 12-1-77	2400 U.T., 12-31-77	2.48/mm		

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
28° 17.0 E	130498	553718
* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.		
DAYS USED: DEC 6, 7, 8, 9, 10, 18, 19, 21, 22, 25		

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
GEOMAGNETISM DIVISION

OBSY. YEAR MONTH ELEMENT
CO 77 DEC D

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150W M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q	U	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM		
				01	284	294	300	303	308	308	312	314	308	309	304	309	01	306	319	329	322	306	341	345	254	260	190	149	173	6947
				02	233	230	253	250	151	257*	214	263	257	299*	37*	240	02	386	243*	157*	491	556	124*	212*	434*	109*	209	254	234	5579
				03	259	278	282	270	300	312	313	309	301	310	248	321	03	315	332	291	311	320	321	328	327	299	263	271	279	7180
				04	294	302	301	299	289	309	290	300	305	327	310	311	04	320	367	337	361	427	340	281	219	273	221	196	241	7120
				05	250	256	279	250	260	349	307*	316	402*	346*	341	284	05	313	327	310	302	329	327	319	310	297	289	285	288	7336
				06	281	280	283	300	301	301	300	307	302	309	293	310	06	312	311	312	320	312	310	314	316	321	315	308	297	7215
				07	293	299	304	301	301	303	309	309	301	298	300	303	07	310	312	318	317	313	319	326	321	298	262	281	261	7299
				08	281	287	301	306	307	310	310	306	303	316	317	322	08	289	299	311	319	321	322	319	310	300	300	296	290	7344
				09	290	296	301	300	291	289	307	291	312	300	297	300	09	301	302	309	310	320	321	321	320	310	306	300	300	7294
				10	300	300	299	300	300	300	297	293	309	300	307	320	10	330	340	313	310	320	327	329	328	325	291	258	267	7363
				11	270	287	262	273	215	135*	374*	231*	72*	334*	445*	349*	11	914*	874*	460	431	538	378	287	327	288	219	182	229	8374
				12	251	230	211	234	204	355	315	334	323	300	293	311	12	454	324	308	315	321	328	311	265	258	276	261	253	7035
				13	253	271	300	308	303	312	306	291	315	302	292	264	13	319	390	268	261	382	304	287	279	246	265	251	271	7040
				14	283	290	297	307	303	351	372	309	308	340	317	305	14	299	292	330	319	303	328	322	318	300	290	260	289	7452
				15	294	299	300	310	307	303	300	301	304	401	311	309	15	272	256	310	320	321	330	321	314	310	301	297	298	7479
				16	297	299	301	300	295	290	300	300	374	365	301	298	16	300	310	311	331	340	365	331	270	246	250	279	289	7342
				17	281	259	236	230	257	247	311	324	320	316	308	296	17	321	318	314	313	317	324	319	321	301	294	288	290	7105
				18	291	294	300	304	307	304	309	309	303	300	301	303	18	302	307	307	309	310	310	310	313	311	309	304	299	7316
				19	298	300	301	303	307	308	308	299	309	320	309	301	19	299	300	300	302	304	313	320	319	318	309	302	292	7341
				20	295	299	300	301	306	309	305	302	299	300	310	393	20	351	360	354	333	348	332	329	302	290	290	281	282	7571
				21	287	300	302	310	310	311	310	308	313	319	326	303	21	300	301	280	334	340	321	327	317	304	271	249	268	7311
				22	270	300	300	297	289	296	301	301	300	300	300	306	22	308	320	291	311	323	326	312	294	293	289	276	276	7179
				23	287	299	298	304	310	313	309	310	307	309	311	342	23	370	306	317	320	324	329	324	313	303	296	290	280	7471
				24	287	297	311	311	311	310	307	298	300	291	276	348	24	356	330	329	331	327	328	321	304	299	294	290	286	7442
				25	290	287	290	294	294	300	310	311	284	311	307	308	25	319	312	330	327	341	353	352	290	254	270	276	279	7289
				26	277	273	263	271	288	281	321	317	310	307	287	282	26	308	347	329	320	316	318	317	269	272	306	298	289	7166
				27	285	280	287	300	290	297	311	312	310	311	302	301	27	312	314	318	299	311	312	333	321	320	317	305	293	7341
				28	292	290	289	287	286	289	304	300	323	321	314	260	28	311	305	312	317	338	369	347	330	316	201	244	267	7212
				29	254	273	276	274	319	313	317	313	310	303	304	321	29	370	356	349	331	321	320	321	316	317	311	304	279	7472
				30	270	281	291	290	301	311	307	307	307	308	311	292	30	321	318	301	315	317	319	322	327	306	291	287	289	7289
				31	299	297	298	300	301	307	306	311	307	317	331	310	31	316	330	310	310	339	333	344	325	307	280	244	256	7378

SCALED BY: SPT, JEP

CHECKED BY: JEP, SPT

SIGNS REVIEWED BY: JEP

PUNCHED BY:

Preliminary base-line and scale values:

Interval Beginning	Base-line Value	Scale Value
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() Interpolated

☐ Significant portion of hour interpolated.

☐ No record; or no values available because of faulty record.

* Derived from Storm Mgh., converted to Normal Mgh.

☐ Scaling uncertain because of magnetic storm.

<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

MONTHLY SUM: 225382

MONTHLY MEAN: 303

DATES WITH GAPS:

FORM C&S-604 10-571		MAGNETOGRAM HOURLY SCALINGS (UNIVERSAL TIME)																				U.S. DEPARTMENT OF COMMERCE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION COAST AND GEODETIC SURVEY GEOMAGNETISM DIVISION		OBSY.	YEAR	MONTH	ELE- MENT
		Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1500 M.T.) is hour 11 of the same universal day. Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.																				CO	77	DEC	H		
C	S	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
		390	390	394	395	390	389	384	387	389	386	384	384	01	379	383	380	373	350	359	350	346	340	300	331	350	8903
		363	376	462	573	563	471	523	468	440	-88*	-365*	112	02	101	-388*	86*	184	-83*	-999*	-677*	-309*	172*	380	381	354	3100
		362	410	416	403	379	374	368	369	370	363	361	360	03	219	299	254	380	382	380	372	372	366	365	377	377	8678
		379	381	386	389	381	386	394	391	389	407	393	383	04	363	329	299	336	281	331	292	332	331	330	379	414	8676
		391	421	431	420	487	499*	715	542	149*	81*	289	368	05	353	341	366	380	380	383	380	377	372	371	370	376	9242
		376	369	391	410	400	395	390	384	380	381	375	383	06	380	381	380	380	381	386	389	385	380	381	379	380	9236
		376	380	384	386	390	390	384	386	387	389	390	389	07	389	386	387	386	385	385	386	363	384	381	377	374	9234
		381	390	396	396	393	393	390	390	392	399	392	396	08	400	393	390	390	392	393	390	391	390	386	386	389	9398
		390	391	396	397	391	388	432	440	408	393	384	389	09	387	389	390	390	388	384	384	381	382	384	386	386	9430
		387	391	397	398	397	390	397	384	394	396	393	388	10	384	389	400	400	399	393	393	392	392	390	390	394	9428
		400	397	380	429	512	643	413*	392	339	78*	-199*	-131*	11	-877*	-391*	253	151	87	353	394	380	369	314	294	407	5387
		432	510	510	507	638*	605*	620	444	385	363	351	316	12	-1	48	316	411	400	384	371	360	349	362	370	363	9414
		378	394	401	415	410	400	403	412	400	296	-66	278	13	362	215	127	201	290	310	356	359	350	376	381	381	7829
		391	392	391	402	400	391	406	400	387	383	310	279	14	303	333	372	351	380	393	390	389	383	386	390	385	8987
		363	391	390	391	400	397	399	389	380	381	326	323	15	263	302	392	369	391	394	390	386	380	380	380	383	8980
		387	390	391	390	387	389	381	386	382	389	386	390	16	391	391	351	244	327	350	391	389	399	390	356	350	8977
		366	411	510	513	650	577	411	390	384	381	381	369	17	379	384	385	384	384	389	390	390	396	390	400	396	10010
		396	397	395	395	396	391	390	391	390	390	390	386	18	386	388	391	391	390	390	390	390	390	385	381	386	9365
		390	392	393	391	391	390	390	389	383	387	392	391	19	390	390	390	391	395	403	401	399	394	390	391	390	9403
		391	393	394	398	398	395	391	391	393	386	308	333	20	376	380	383	380	381	400	392	391	394	392	399	393	9232
		394	400	399	397	396	390	387	386	390	388	389	396	21	390	389	369	340	389	400	399	401	397	380	370	380	9316
		392	398	391	381	380	380	382	382	380	380	379	376	22	356	360	360	381	383	381	380	379	381	390	390	383	9125
		382	393	400	396	392	389	386	386	387	381	379	330	23	351	402	389	390	384	386	380	379	380	380	374	376	9172
		375	380	386	383	381	382	382	381	381	390	307	326	24	390	390	390	385	381	386	384	380	379	380	380	386	9065
		389	390	393	390	389	386	386	386	396	394	390	389	25	386	390	383	380	380	383	382	367	371	389	380	380	9249
		383	383	403	403	427	409	390	386	406	443	406	400	26	384	383	385	387	381	382	373	377	380	380	370	359	9380
		376	386	393	406	396	393	392	383	381	380	376	346	27	384	370	350	370	389	384	380	376	370	367	369	370	9087
		370	378	381	389	391	383	379	381	376	383	351	310	28	387	390	381	389	391	397	393	340	340	373	370	370	8993
		369	370	386	407	498	381	371	370	369	361	363	357	29	264	359	390	390	387	382	380	379	374	371	366	363	9007
		370	363	390	387	387	381	381	381	380	377	380	380	30	376	378	379	379	380	381	376	376	373	374	369	366	9084
		375	381	387	384	390	384	382	380	379	382	383	380	31	361	292	367	397	389	389	385	375	361	359	373	376	9011

SCALED BY	SPT, JEP	Preliminary base-line and scale values: Interval Beginning Base-line Value Scale Value	() Interpolated	[] Scaling uncertain because of magnetic storm.	MONTHLY SUM	273398
CHECKED BY	JEP, SPT		[] Significant portion of hour interpolated.	<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.	MONTHLY MEAN	367
SIGNS RE-VIEWED BY	JEP		[] No record; or no values available because of faulty record.		DATES WITH GAPS:	
PUNCHED BY			* Derived from Storm Mph., converted to Normal Mph.			

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
GEOMAGNETISM DIVISION

OBSY. YEAR MONTH ELEMENT
C0 77 DEC Z

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150W M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

Smallage corrections have been applied. Negative values are in red, with minus signs minus.																														
C	Q	S	Ten	Q	01	02	03	04	05	06	07	08	09	10	11	12	SUM	13	14	15	16	17	18	19	20	21	22	23	24	SUM
					01	311	313	309	307	307	306	306	305	305	306	305	01	292	299	297	297	280	270	264	224	236	249	259	309	6963
					02	339	366	383	59	-188	-221	-2	132	238	348*	248	02	459	482*	155	164	455	228*	647*	577*	-85*	151	266	292	5923
					03	320	340	349	350	341	329	327	326	329	303	212	03	287	292	267	280	310	310	311	312	309	310	317	326	7467
					04	330	329	321	317	317	334	332	330	324	318	307	04	319	317	237	252	180	123	106	116	216	250	304	311	6611
					05	336	340	330	323	320	202	142	236	259*	97	131	05	266	289	284	301	308	307	309	307	310	310	311	310	6578
					06	313	314	321	331	322	317	313	317	316	317	304	06	315	311	310	308	307	306	306	306	307	309	310	310	7509
					07	312	314	311	311	313	316	316	309	307	307	306	07	307	306	306	303	300	299	301	296	288	290	299	302	7325
					08	307	310	309	307	305	305	306	306	313	316	300	08	301	309	308	307	310	300	296	293	291	296	296	297	7264
					09	300	300	300	300	303	314	317	323	351	321	305	09	302	302	304	303	302	303	303	300	299	297	300	301	7354
					10	302	300	300	301	301	304	310	327	317	311	309	10	289	267	279	295	301	301	298	290	289	284	276	290	7137
					11	307	303	310	348	370	168	49	-56	186	322	451	11	647*	482*	354	313	284	170	280	297	280	294	289	346	7448
					12	344	340	364	354	253*	228*	354	354	340	325	320	12	334	332	230	289	299	304	300	280	265	280	298	310	7437
					13	325	345	349	330	329	326	339	320	330	265	289	13	255	256	216	140	182	214	240	259	275	287	290	306	6595
					14	311	313	316	320	321	351	321	303	307	309	286	14	188	262	270	270	271	283	283	290	296	300	300	306	6961
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					16	305	302	306	306	306	309	310	311	321	284	281	16	300	299	280	159	138	120	146	167	198	246	284	297	6269
					17	307	329	337	310	266	436	371	337	320	311	313	17	310	309	304	300	300	299	294	293	290	294	296	300	7534
					18	305	306	307	306	304	304	304	302	302	300	303	18	302	300	294	300	300	300	300	300	300	302	305	303	7254
					19	302	302	304	304	301	300	300	300	309	311	300	19	300	300	300	300	300	300	299	299	300	300	299	300	7230
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					21	300	301	299	299	300	302	304	309	307	300	299	21	288	283	279	222	241	271	286	286	287	284	290	300	6927
					22	313	318	306	310	321	334	314	307	305	301	300	22	286	281	256	274	299	298	299	297	296	296	290	299	7201
					23	304	310	309	309	309	309	306	306	305	306	310	23	216	287	300	300	304	300	300	297	296	296	299	300	7145
					24	307	313	315	311	314	311	307	306	306	307	251	24	259	286	299	300	297	296	297	300	300	303	303	303	7102
					25	306	305	305	306	306	311	316	330	330	329	317	25	287	300	300	293	284	280	280	270	259	260	280	297	7164
					26	301	307	311	322	337	336	327	320	324	332	330	26	316	290	295	299	300	300	294	290	299	310	307	310	7493
					27	317	324	312	313	319	321	320	320	313	308	309	27	289	287	250	260	277	287	296	301	306	305	305	305	7224
					28	305	306	305	304	305	310	319	316	321	309	291	28	279	295	294	290	297	291	266	276	320	321	309	317	7156
					29	317	331	333	351	401	340	320	310	304	300	299	29	273	258	280	296	300	300	298	300	301	300	300	300	7422
					30	303	306	314	311	310	310	307	310	316	313	310	30	300	297	300	304	304	302	304	303	299	300	301	307	7320
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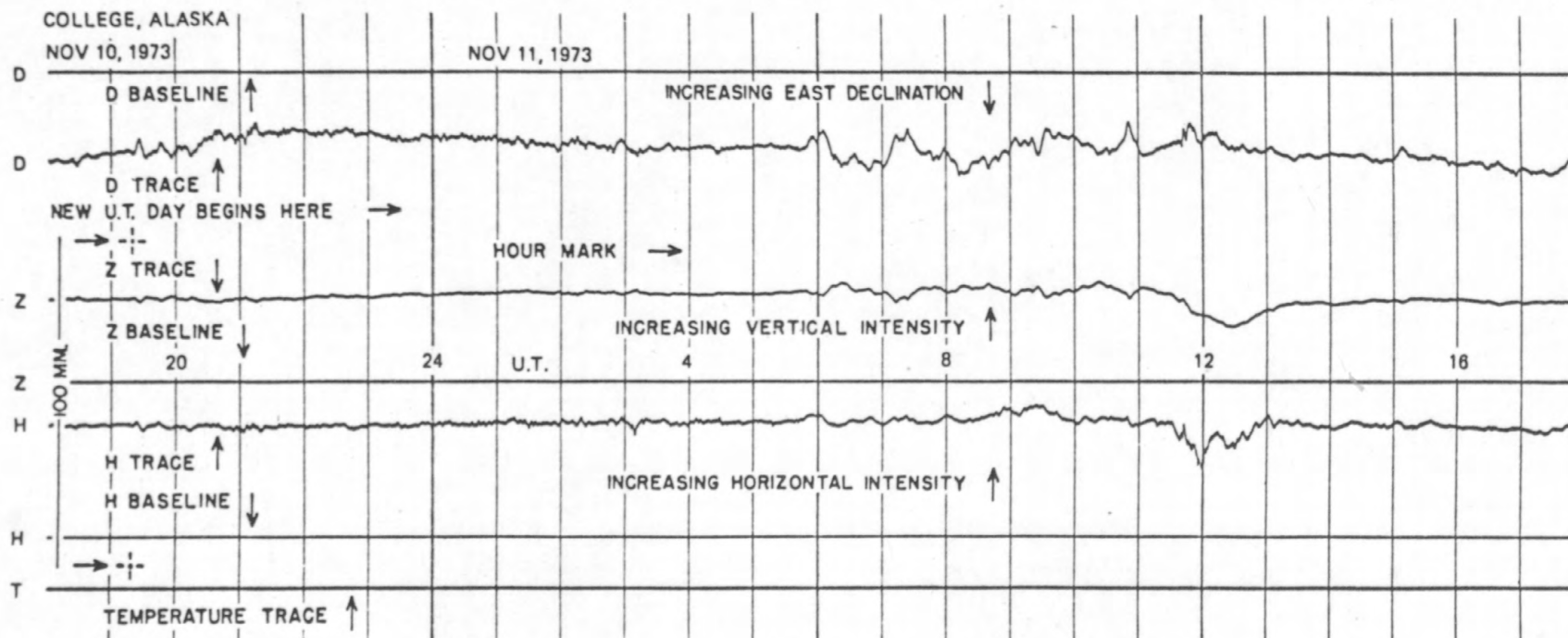
SCALED BY SPT, JEP
CHECKED BY JEP, SPT
SIGNS REVIEWED BY JEP
PUNCHED BY

Preliminary base-line and scale values:
Interval Beginning Base-line Value Scale Value

- () Interpolated
☐ Significant portion of hour interpolated.
☐ No record; or no values available because of faulty record.
* Derived from Storm Mgh., converted to Normal Mgh.
- [] Scaling uncertain because of magnetic storm.
<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

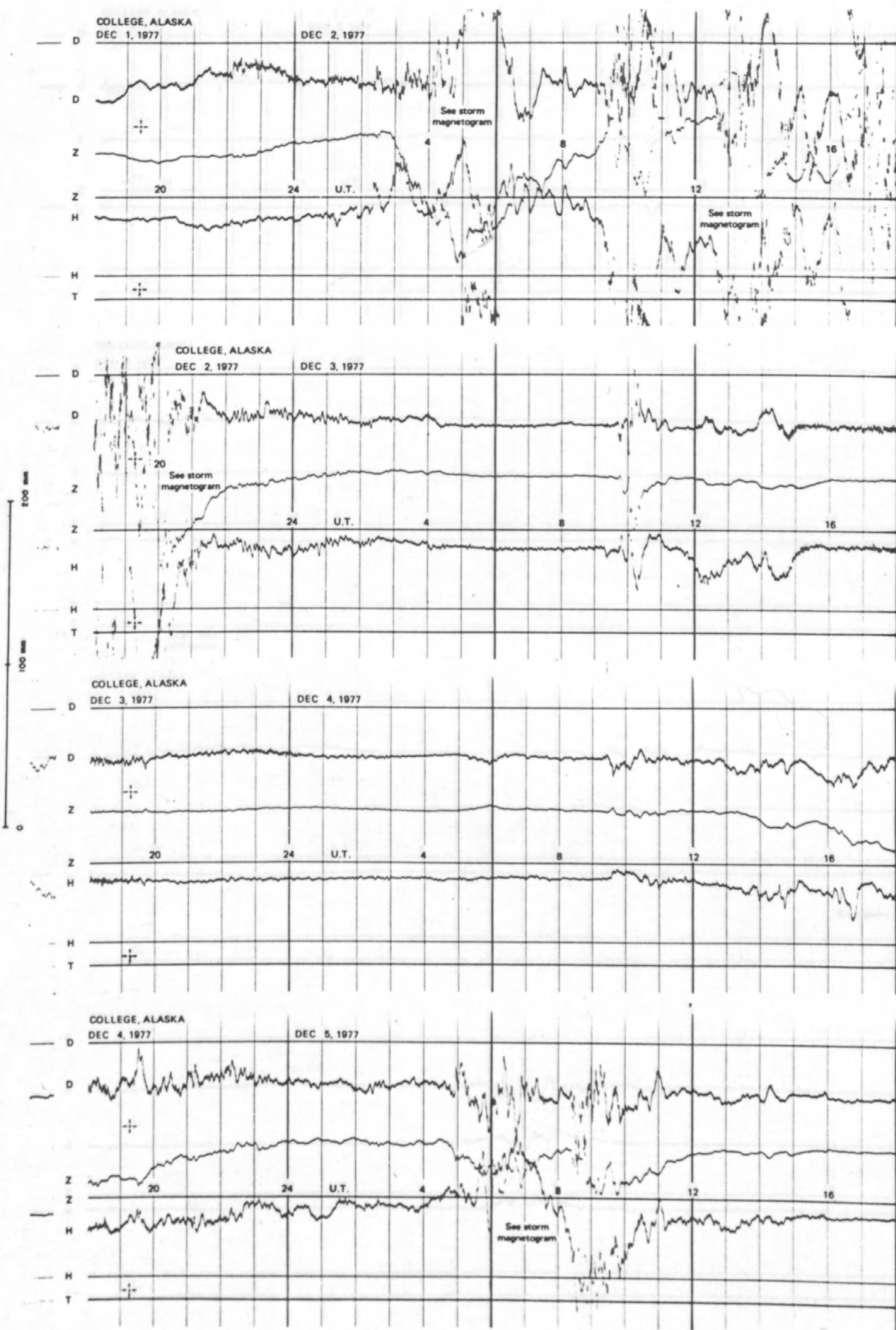
MONTHLY SUM 219683
MONTHLY MEAN 295
DATES WITH GAPS:

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

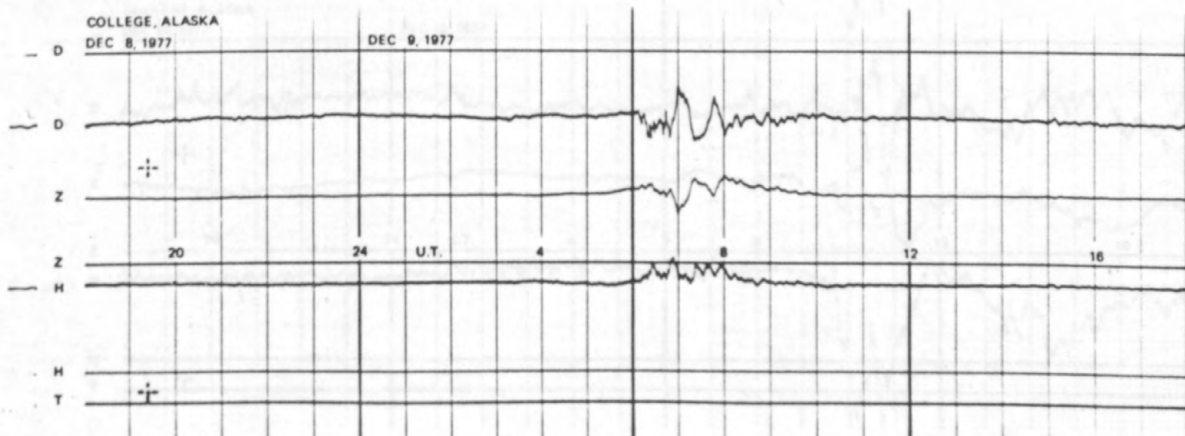
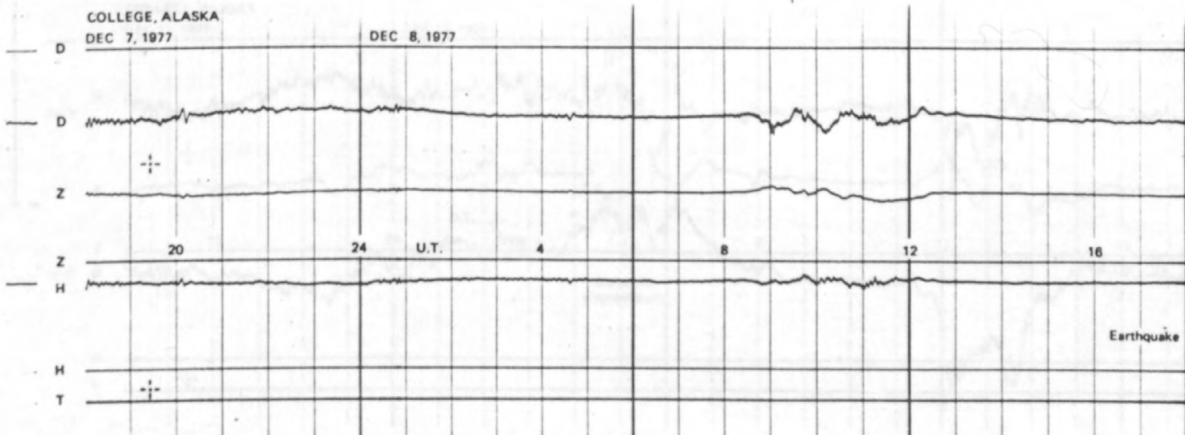
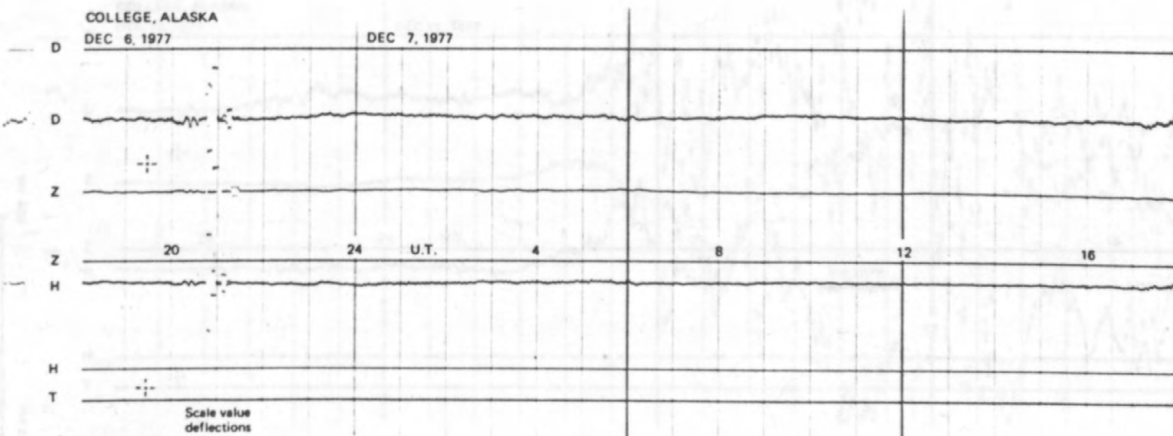
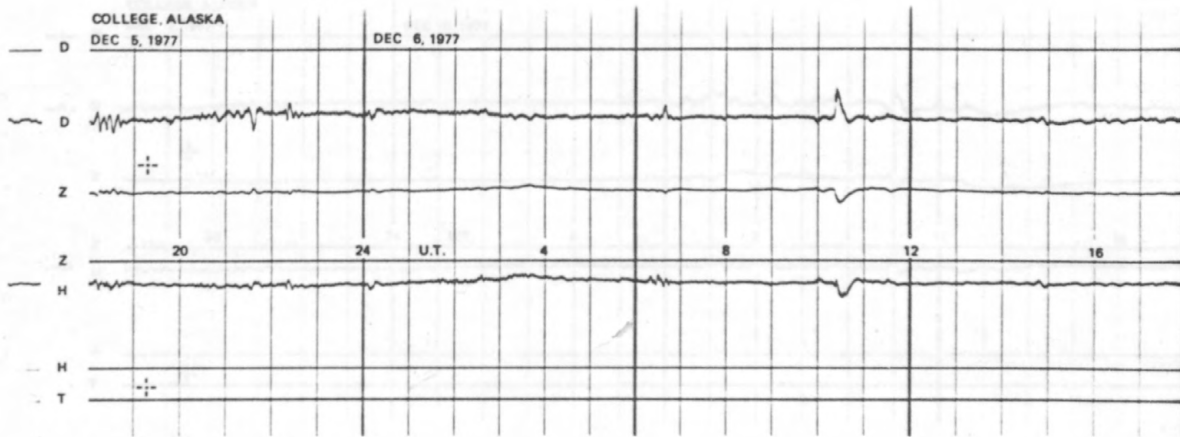


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

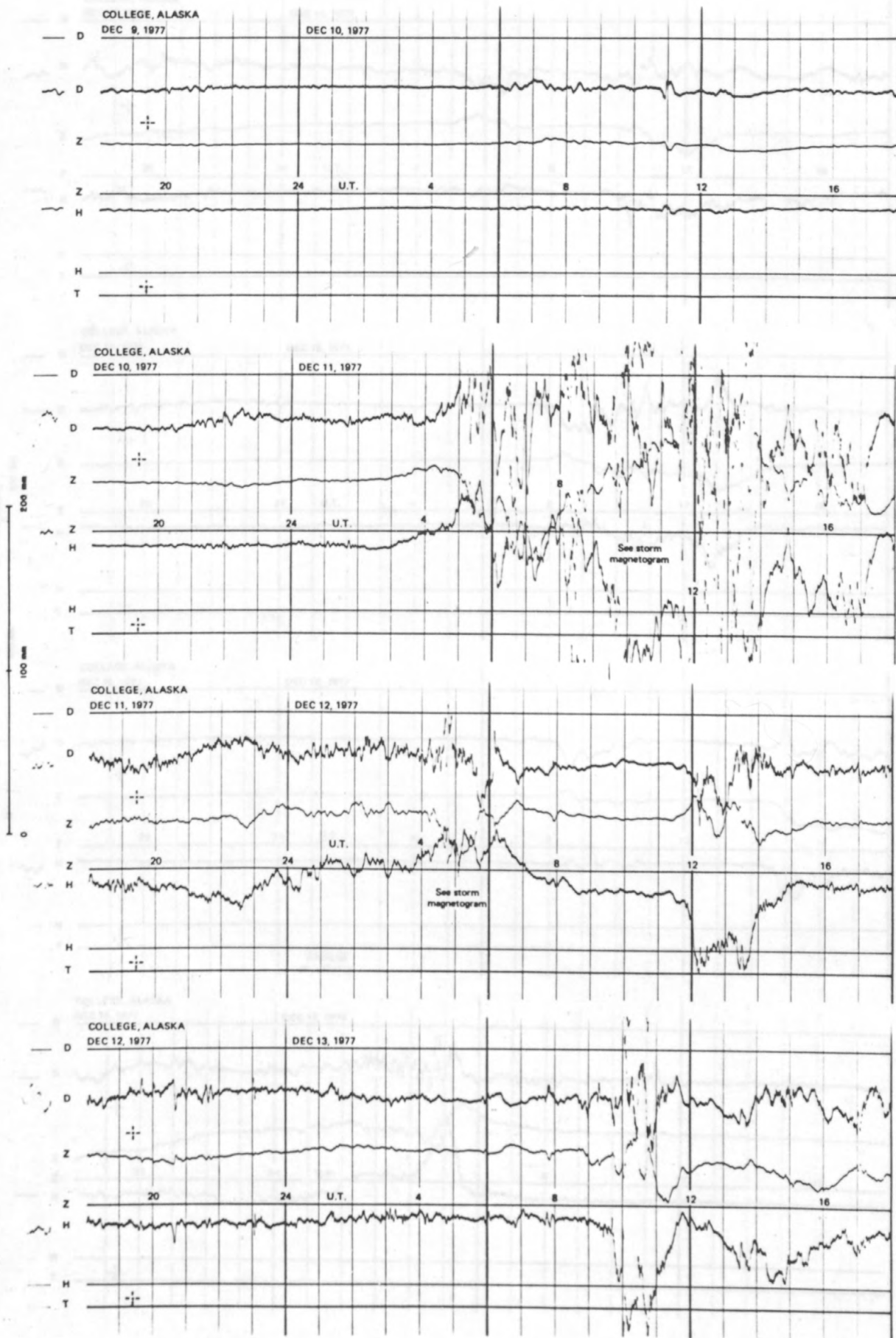
NORMAL MAGNETOGRAMS



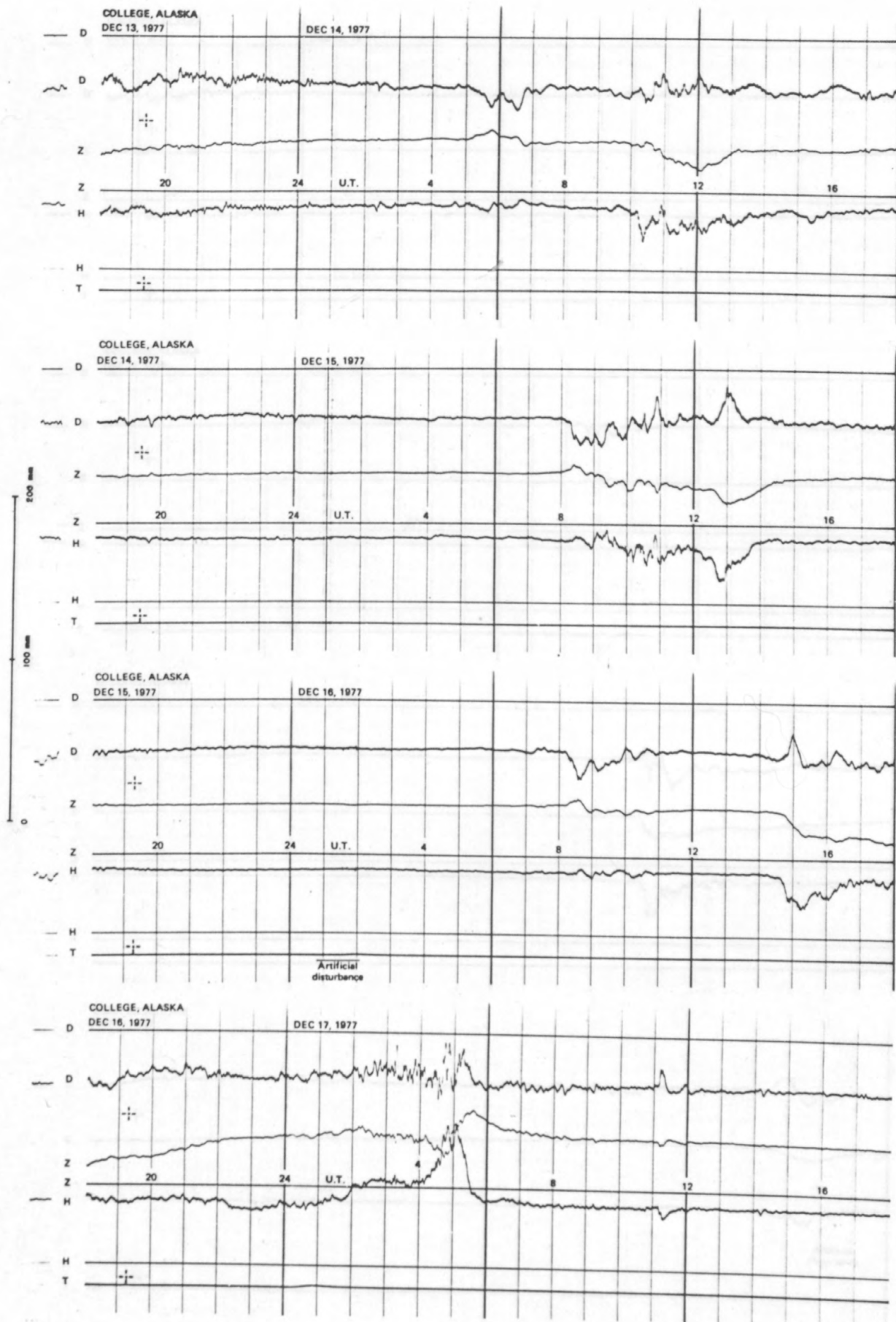
NORMAL MAGNETOGRAMS



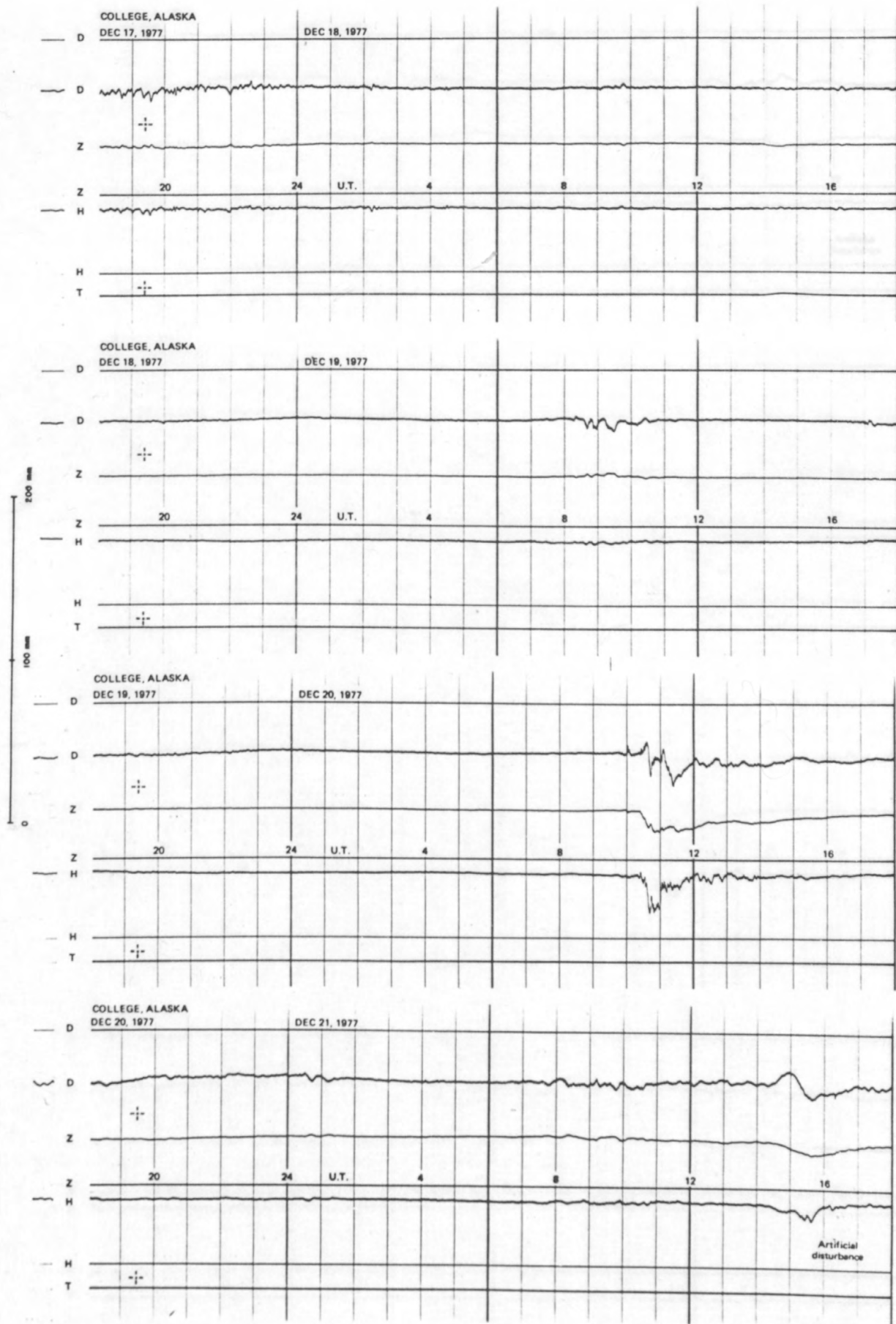
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

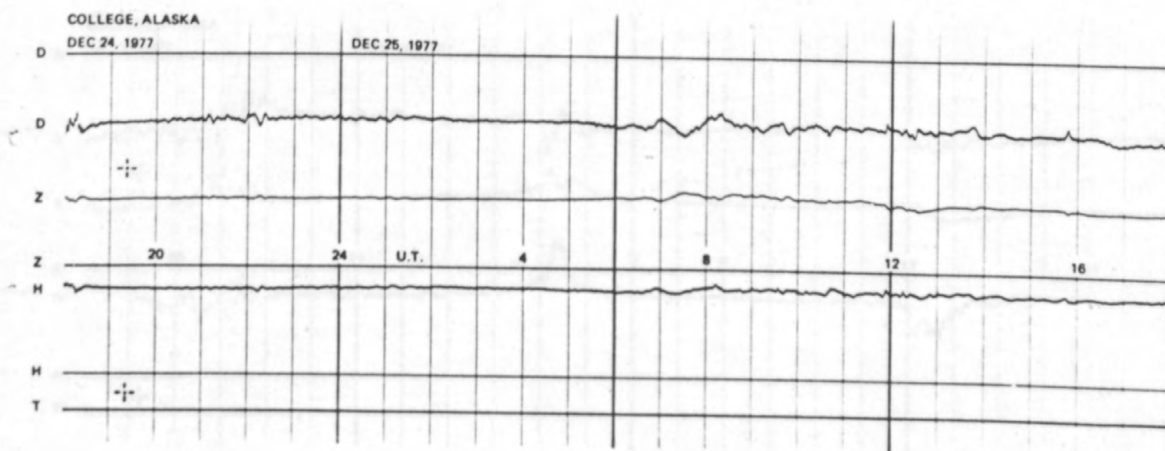
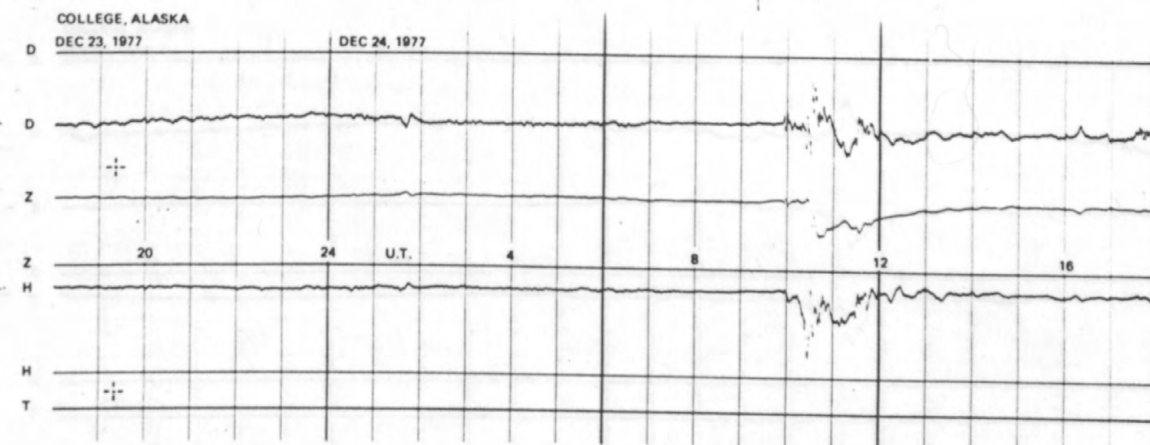
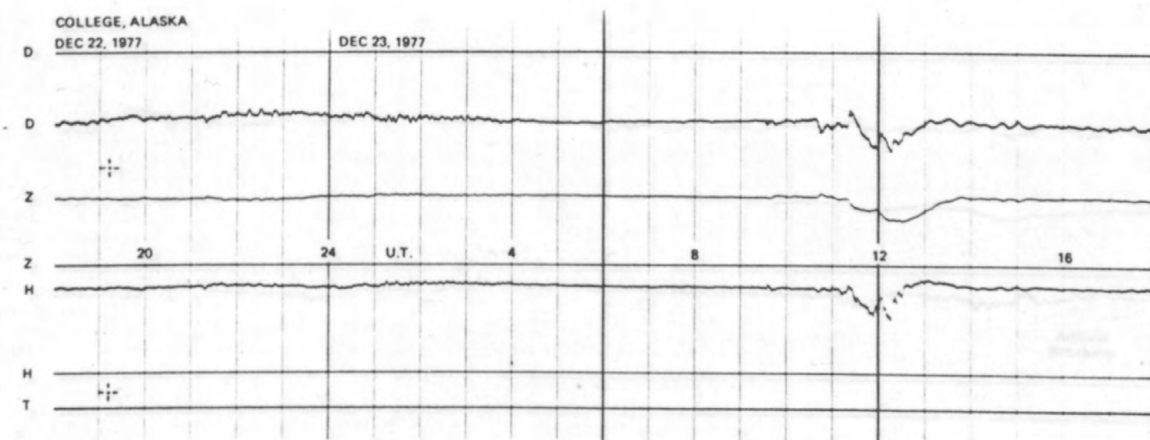
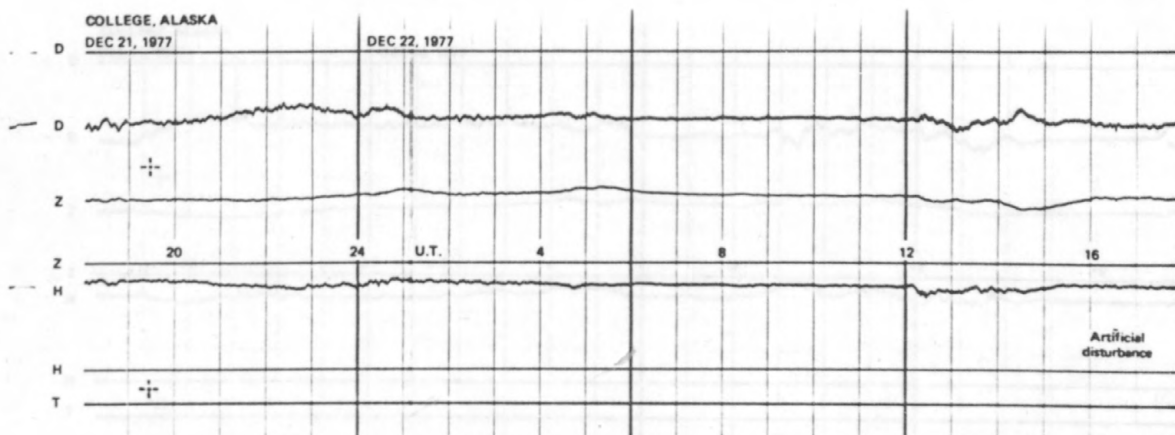


NORMAL MAGNETOGRAMS



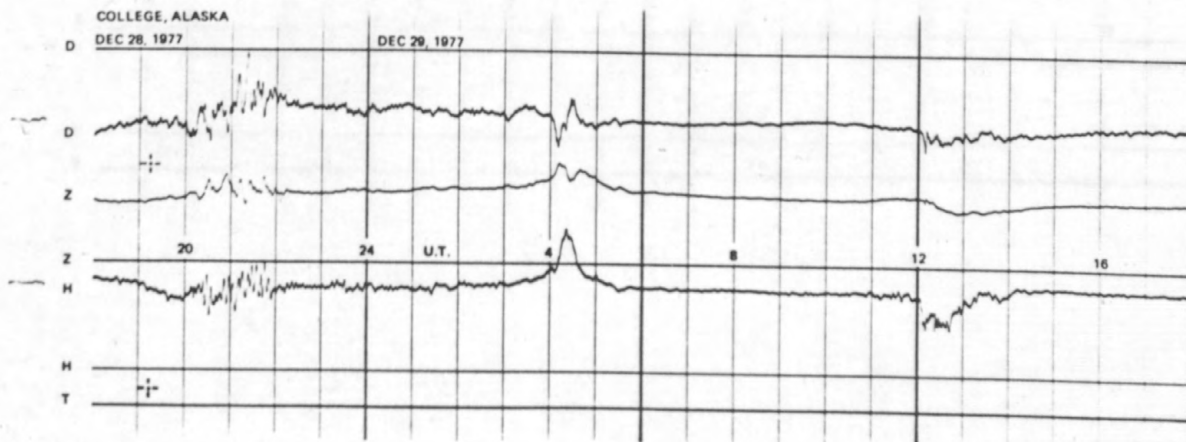
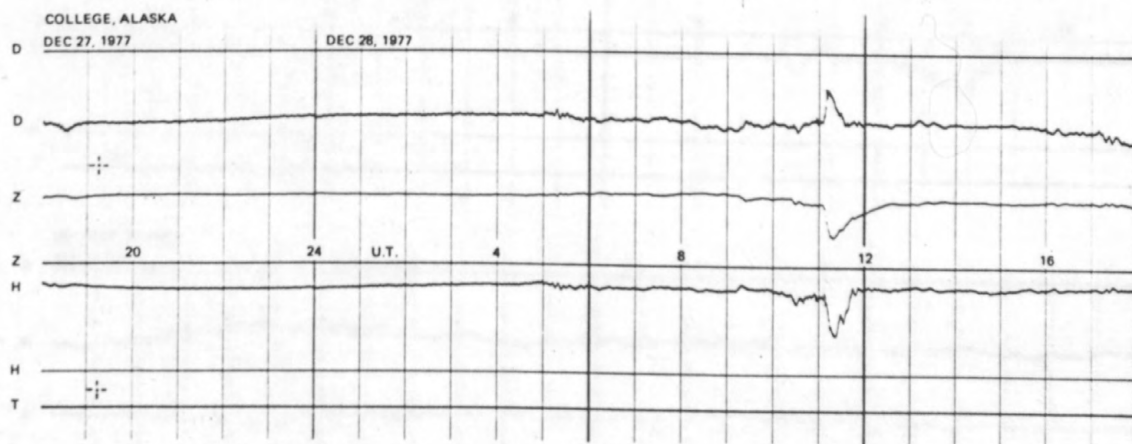
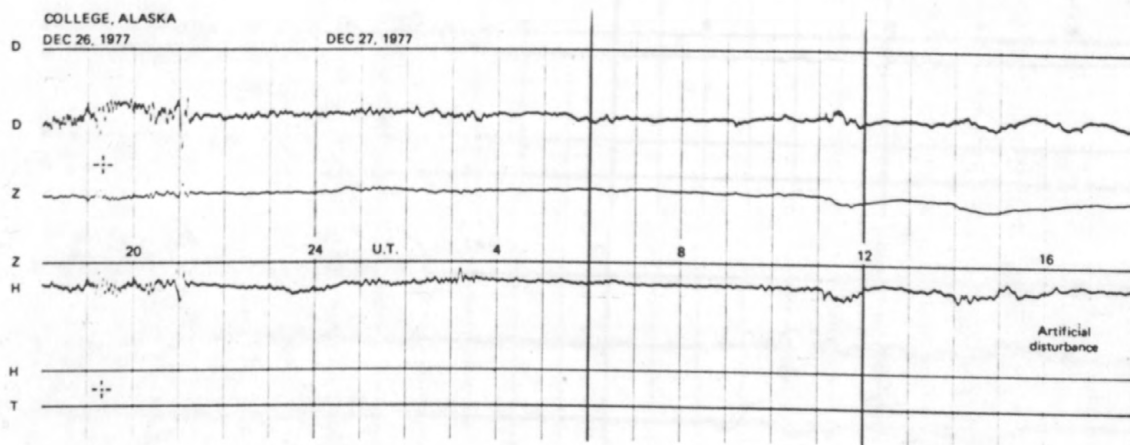
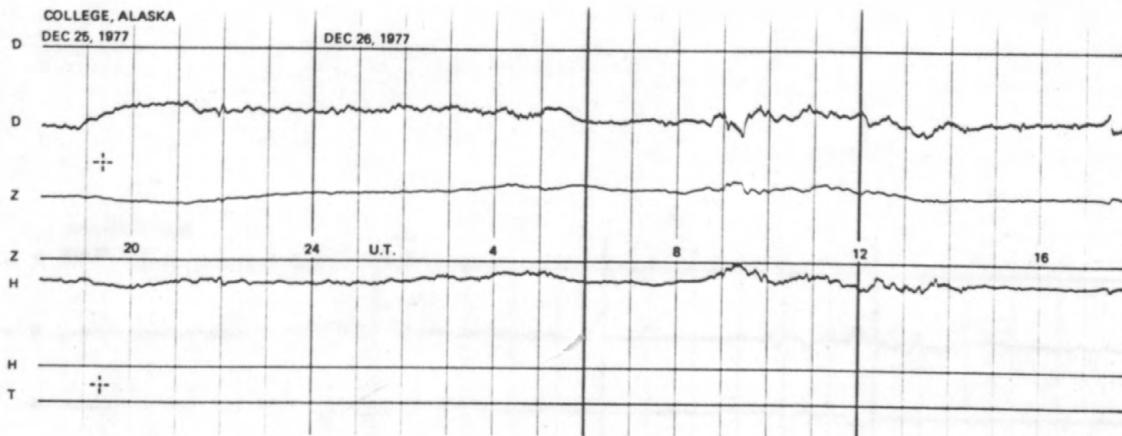
NORMAL MAGNETOGRAMS

200 mm
100 mm
0

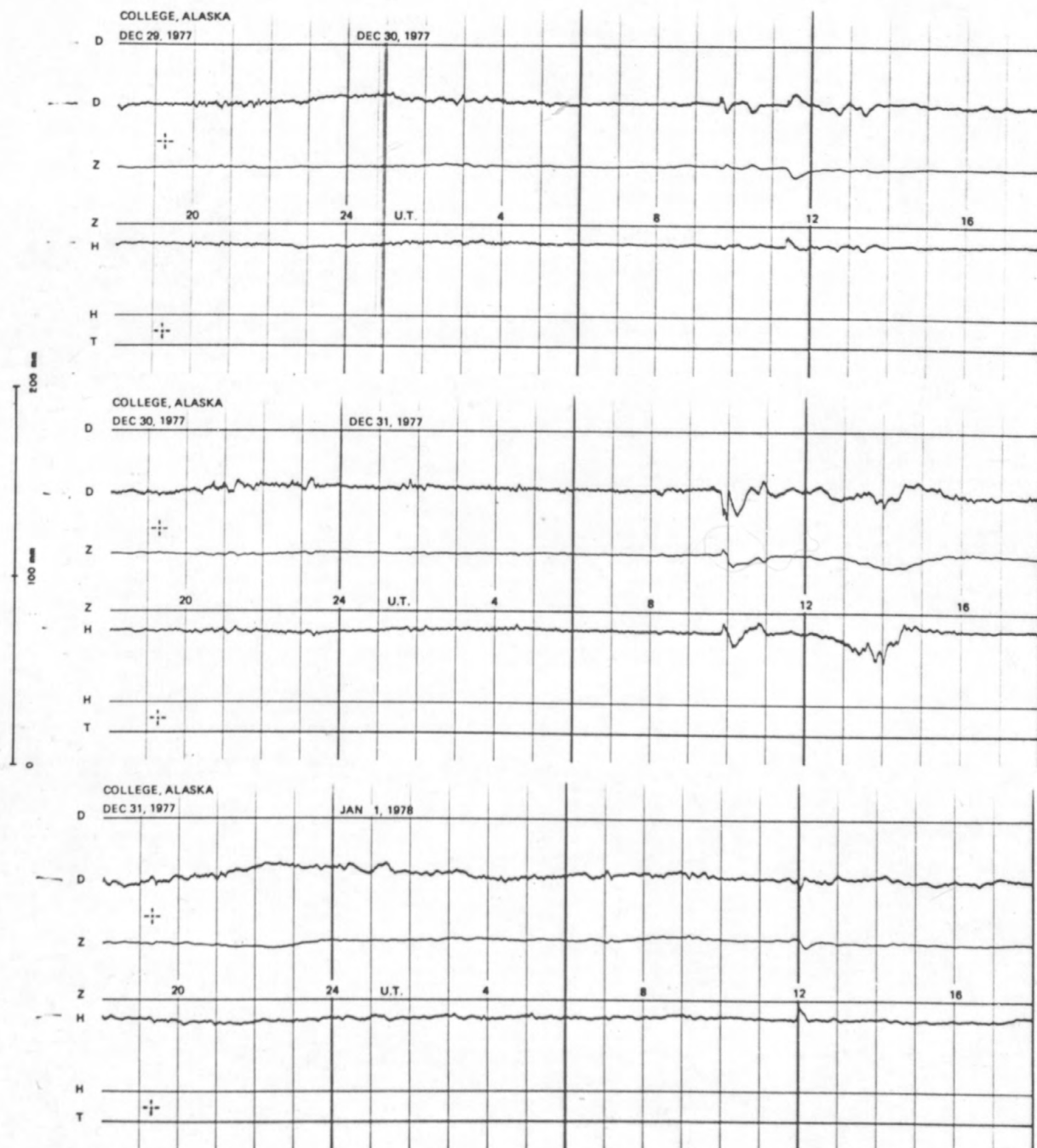


NORMAL MAGNETOGRAMS

200 mm
100 mm
0

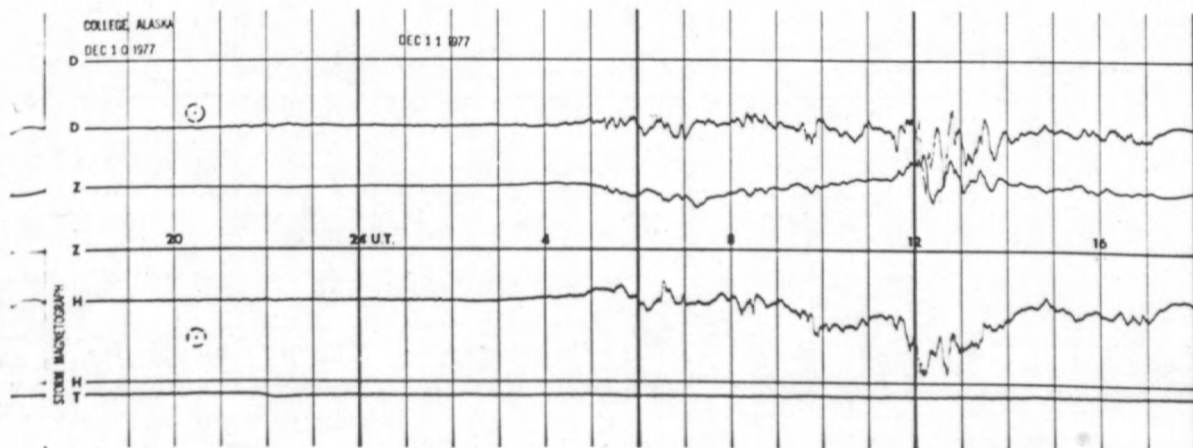
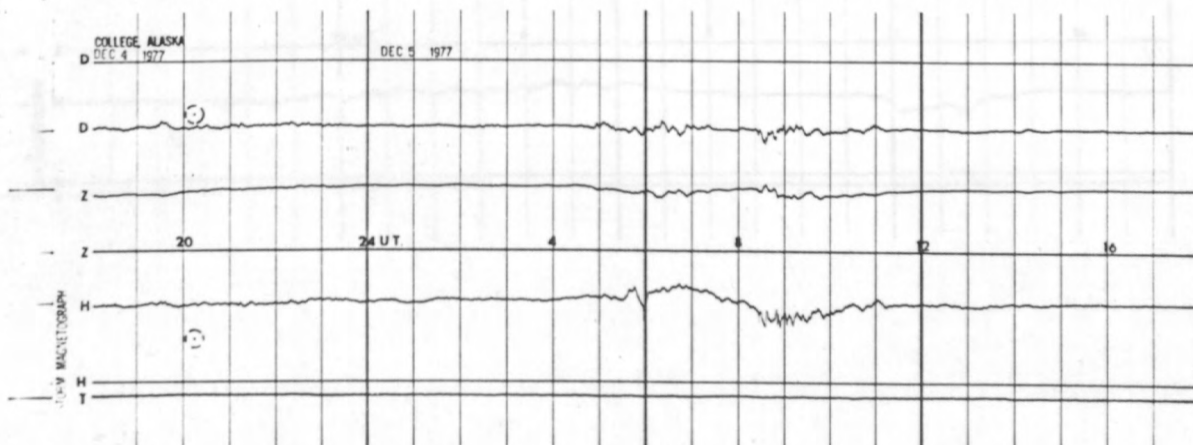
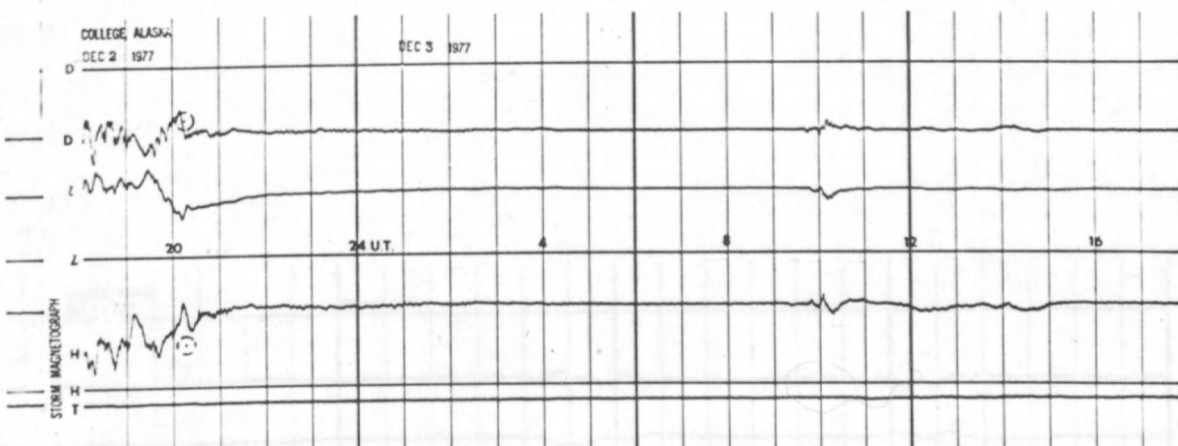
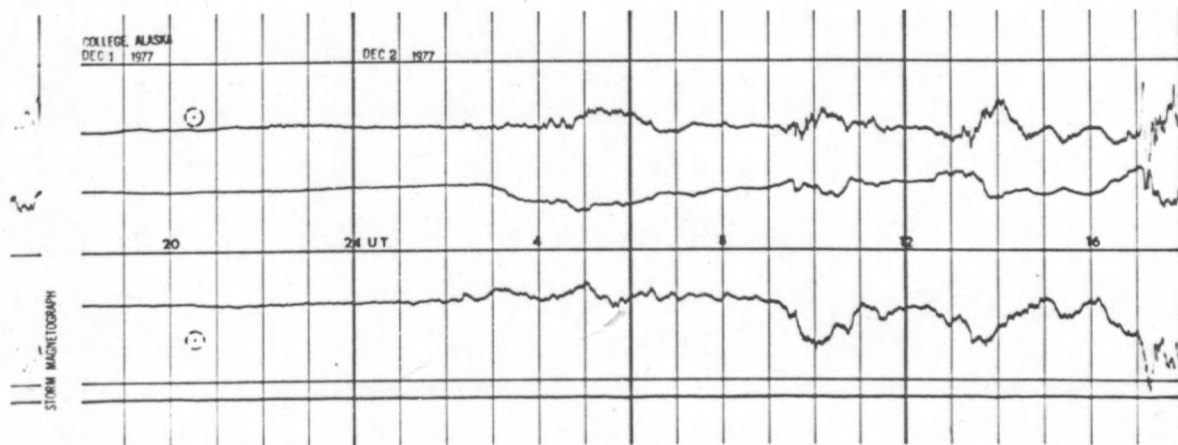


NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS

200 mm
100 mm
0



STORM MAGNETOGRAMS

