

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA

COLLEGE OBSERVATORY

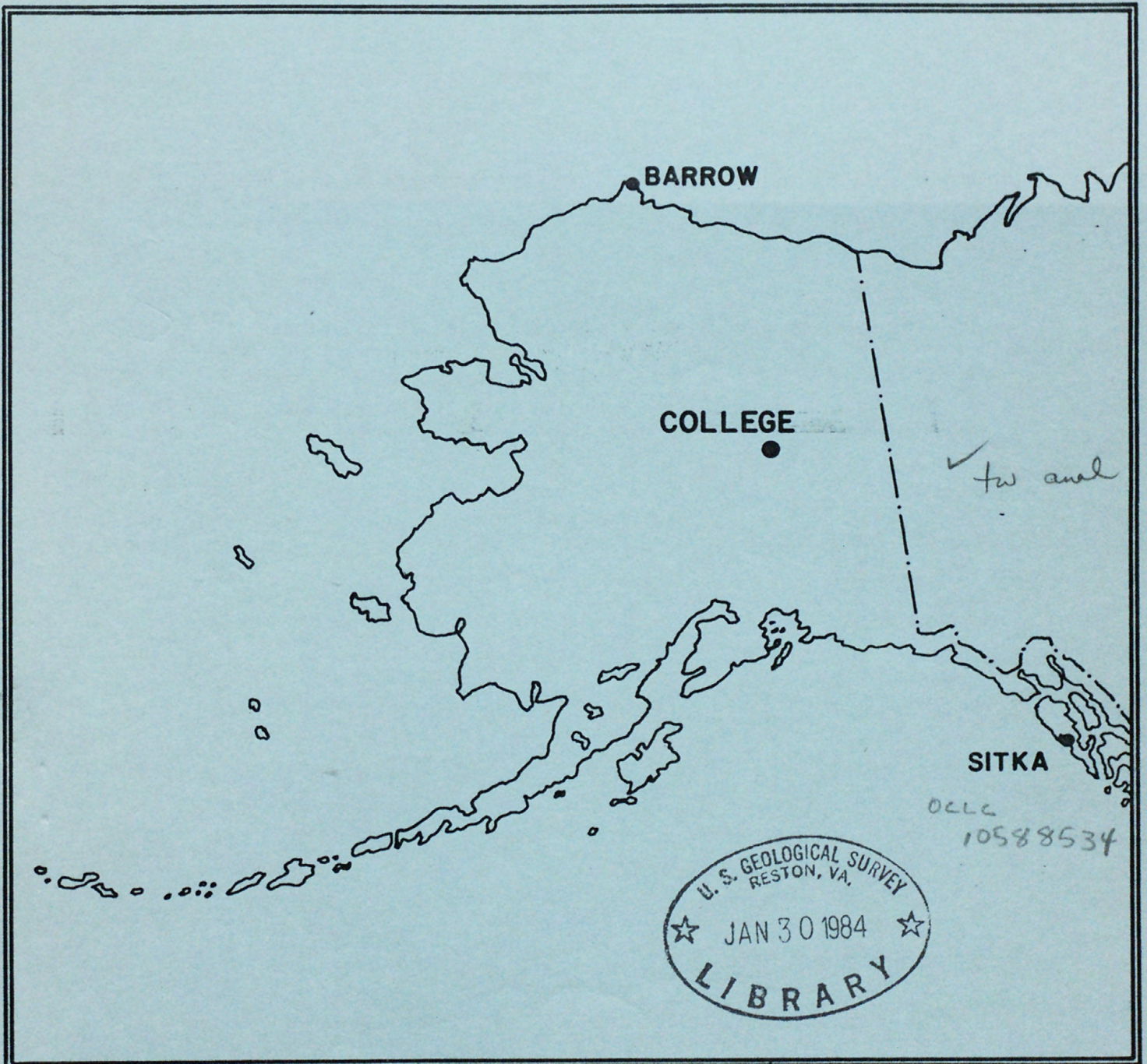
FAIRBANKS, ALASKA



(200)
R290
no. 83-300L

DECEMBER 1983

OPEN FILE REPORT 83-0300L



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: J.E. PAPP, E.A. SAUTER, L.Y. TORRENCE, P.A. FRANKLIN AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA, THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

Explanation of Data and Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

Open-file report
Geological Survey
(U.S.G.)

344935

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

EXPLANATION OF DATA AND REPORTS

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, 325 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..... $+64.6^{\circ}$
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, 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 10γ 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 (10γ)

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.

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 "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:

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

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.

MAGNETIC ACTIVITY
(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR
DECEMBER 1983

DATE	K-INDICES									AK	TIME SCALE ON MAGNETOGRAMS
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM		
1	3	3	2	5	3	2	3	3	24	17	SUDDEN COMMENCEMENTS d h m
2	2	3	3	3	4	4	3	2	24	16	
3	0	0	0	0	3	0	1	1	05	03	
4	0	1	0	0	2	3	0	0	06	03	
5	0	2	6	5	5	4	2	3	27	29	
6	2	5	6	7	6	5	4	4	39	57	
7	3	3	5	5	6	6	5	3	36	44	
8	2	3	3	4	5	1	1	2	21	16	
9	1	0	0	0	0	0	1	0	02	01	
10	0	2	6	5	6	7	4	2	32	49	
11	1	3	4	4	8	6	4	5	35	58	
12	3	3	2	5	6	6	4	4	33	37	
13	3	3	2	5	6	6	5	5	35	43	
14	4	4	6	6	5	5	5	4	39	48	
15	3	3	4	5	5	3	2	3	28	24	
16	3	2	0	2	2	0	0	0	09	05	
17	1	1	0	1	3	2	2	1	11	05	
18	1	0	0	0	2	5	4	2	14	12	
19	2	2	2	2	2	2	1	1	14	06	
20	2	2	0	0	0	0	0	1	05	02	
21	0	0	0	0	0	0	1	0	01	00	
22	1	2	3	6	4	4	2	1	23	21	
23	1	2	4	4	5	4	1	0	21	18	
24	1	0	0	1	7	5	3	2	19	27	
25	3	2	3	6	5	4	2	1	26	25	
26	0	2	2	3	2	3	3	3	18	10	
27	4	2	1	2	3	3	3	3	21	13	
28	3	2	3	5	5	2	1	2	23	19	
29	2	1	4	4	4	3	0	0	18	13	
30	1	3	4	7	7	6	6	2	36	62	
31	3	3	4	6	5	6	4	4	35	40	

POSSIBLE SOLAR-FLARE
EFFECTS BASED ON
INSPECTION OF GRAMS
ALONE (WITHOUT
REFERENCE TO DATA
FROM OTHER SOURCES)

BEGIN

END

d h m

d h m

K SCALE USED:

LOWER LIMIT FOR K = 9.....

D
675.7

H

322.2

Z

(mm)

CURRENT SCALE VALUE.....

3.73

7.76

(γ /mm)

LOWER LIMIT FOR K = 9.....

2520

2500

(to nearest 10 γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY
COLLEGE, ALASKA

MONTH DECEMBER	YEAR 1983
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DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
09	19xx	pc5	
10	0313	ssc*	
17	14xx	pi 2	
28	19xx	pc3, pc4 & pc5	
30	0346	ssc*	

IDENTIFIED BY: JEP

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

WDC-A FOR SOLAR-TERRSTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80302 U.S.A.

Data from Individual Observatories:

COLLEGE OBSERVATORY, COLLEGE, ALASKA
DECEMBER 1983

Obs. 2 letter IAGA code	Geomag. lat.	Commencement			SC - amplitudes			Max. 3 hr - index K			Ranges			UT End	
		day	hr min (UT)	type	D(')	H(γ)	Z(γ)	day	(3 hr - period)	K	D(')	H(γ)	Z(γ)	day	hr
CO	64.6 N	05	06xx	..	..	..	..	06	4	7	166	1550	880	08	15
		10	0313	s.c.*	+3	+32	+6	11	5	8	271	2550	1060	15	19
		30	0346	s.c.*	+8	+155	+30	30	4,5	7	290	1920	960	02	17

NORMAL MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 12-1-83	2400 U.T., 12-31-83	1.0/mm	3.78/mm	27° 16.8 E
H	0000 U.T., 12-1-83	2400 U.T., 12-9-83	7.88/mm		126668
	0000 U.T., 12-10-83	2400 U.T., 12-31-83	"		126598
Z	0000 U.T., 12-1-83	2400 U.T., 12-31-83	7.58/mm		551818

STORM MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 12-1-83	2400 U.T., 12-31-83	7.9/mm	29.68/mm	24° 22.8 E
H	0000 U.T., 12-1-83	2400 U.T., 12-9-83	43.98/mm		108008
	0000 U.T., 12-10-83	2400 U.T., 12-31-83	"		107768
Z	0000 U.T., 12-1-83	2400 U.T., 12-18-83	48.08/mm		540558
	0000 U.T., 12-19-83	2400 U.T., 12-31-83	"		540698

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

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
27° 49.5 E	129348	553658

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: DEC 3, 4, 9, 16, 17, 18, 19, 20, 21, 26

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80275

OBSY. YEAR MONTH ELE-
MENT
CO 83 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 (150 N.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	O of S	Tr O	HR (Day)	01	02	03	04	05	06	07	08	09	10	11	12	HR (Day)	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	311	290	266	270	301	324	367	325	339	350	338	307	01	389	326	332	330	356	327	356	361	335	317	314	306	7837
			02	303	330	324	303	305	337	336	347	298	324	328	336	02	356	404	435	328	354	335	347	342	329	328	320	318	8067
			03	316	320	314	318	319	316	326	326	328	332	340	342	03	362	352	389	354	344	342	348	347	340	328	327	331	8061
			04	327	324	319	317	323	316	326	325	331	331	328	327	04	336	339	347	350	333	360	382	377	350	328	315	315	8026
			05	317	318	314	293	305	323	368	220	370	399	288	296	05	392	429	434	484	436	427	338	374	368	288	235	262	8278
			06	288	278	312	328	314	274	345	389	319	273*	368*	416*	06	443	789*	559*	220	337	380	278	175	190	218	276	288	8057
			07	313	315	314	429	305	334	344	330	567*	374	265*	241*	07	516	491*	551*	431*	273*	387	408	396	282	292	290	274	8662
			08	294	338	326	336	438	356	326	350	488	332	317	330	08	272	215	385	334	369	354	353	354	313	249	286	308	8023
			09	296	313	318	327	329	339	341	337	333	333	330	330	09	331	329	330	330	339	340	348	434	346	339	334	327	8053
			10	323	327	329	332	329	332	334	344	59*	289	328	393	10	598*	758*	686*	932*	606*	519*	356	312	278	303	304	304	9675
			11	308	298	283	296	319	310	322	398	498	210	310	309	11	416*	575*	431*	162*	437	420	389	388	334	186	114	214	7922
			12	247	280	281	244	249	279	301	296	298	290	332	532	12	311	326	439*	527*	540	459	380	344	341	397	234	250	8177
			13	289	318	273	276	266	298	301	321	304	328*	384*	222	13	320*	392*	316	379	388	352	360	295	249	276	289	281	7467
			14	276	277	304	320	287	320	305*	360	340	264	282	233*	14	308	320	527*	512	360	367	346	218	306	296	329	273	7730
			15	250	275	296	282	305	388	346	300	330	255	206	272	15	369	389	355	365	360	321	358	352	327	326	274	222	7523
			16	270	292	297	321	333	344	343	332	326	327	319	282	16	332	321	332	340	347	345	348	344	338	324	322	320	7799
			17	316	327	315	323	320	326	327	327	330	335	340	331	17	349	344	269	342	359	366	300	341	335	323	315	312	7872
			18	304	321	327	331	334	333	332	330	330	324	323	327	18	325	334	358	398	434	405	484	391	305	300	291	280	8221
			19	308	330	301	284	292	283	290	287	281	326	269	302	19	339	342	344	385	386	400	376	359	348	324	316	270	7742
			20	277	294	315	303	326	333	331	330	331	331	327	330	20	332	330	334	338	339	344	345	346	341	318	316	311	7822
			21	308	313	317	315	325	330	327	329	330	329	325	331	21	335	343	342	359	346	336	340	353	343	327	300	278	7881
			22	278	281	289	306	302	321	326	320	341	376	456	359	22	386	380	544	372	358	364	353	358	329	336	308	283	8346
			23	286	305	312	311	308	326	366	352	269	319	330	331	23	337	386	386	364	410	391	359	354	318	259	263	278	7920
			24	306	315	320	327	328	330	329	331	328	328	322	331	24	378	353*	988*	614*	408	348	350	339	302	305	284	260	8824
			25	278	251	272	295	320	326	326	326	350	358	382	439*	25	456	407	454	366	324	354	375	272	314	327	316	308	8196
			26	300	313	317	297	314	332	324	328	328	370	313	337	26	359	355	344	344	342	368	274	299	270	321	302	284	7735
			27	295	305	282	289	296	303	294	321	322	316	299	324	27	327	354	341	370	389	372	356	255	212	290	277	281	7470
			28	277	262	273	284	314	332	329	307	367	298	288	359	28	360	421	322	295	306	330	337	344	349	342	330	324	7750
			29	303	310	322	338	318	316	433	336	309	343	310	328	29	354	408	324	291	323	339	352	354	353	345	333	323	8065
			30	306	290	295	298	279	301	275	449*	299	308	434*	569*	30	910*	577*	330*	561*	799*	529*	283*	80	247	318	315	308	9360
			31	292	298	292	340	382	249	308	268	233	295	226	416	31	372	347	409	512	537*	314	377	384	286	219	206	262	7824

SCALED BY LYT,JEP
CHECKED BY EAS,LYT,JEP
SIGNS RE-VIEWED 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 Mgb., converted to Normal Mgb.
 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 250,385
MONTHLY MEAN 337
DATES WITH GAPS:

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
Denver, CO 80235

OBSY. YEAR MONTH ELEM-
CO 83 DEC 2
MENT

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150 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 or S	Teo	Q	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		
				01	283	286	297	313	298	302	320	319	315	290	205	157	01	201	241	260	253	240	246	254	256	250	266	270	274	6396
				02	267	272	269	273	289	303	296	295	267	262	268	256	02	222	178	170	178	173	244	254	252	246	256	255	257	6002
				03	263	265	263	263	263	266	267	266	265	263	263	260	03	248	165	161	223	246	254	260	260	254	254	256	260	6008
				04	259	253	255	260	260	262	268	269	260	256	254	253	04	258	246	225	178	140	134	242	243	235	238	245	249	5737
				05	254	251	255	276	289	314	249*	84	226	244	226	228	05	194	250	181	134	97	98	148	200	208	224	246	260	5136
				06	276	280	298	297	288*	288*	327*	266	239	359*	-39*	128	06	288*	544*	519*	35	172	217	191	161	228	254	244	286	6146
				07	299	284	290	346	295	270	263	260	199*	13*	-25*	255	07	264	461*	391*	333*	128*	83	58	144	170	234	240	272	5577
				08	286	309	290	276	312	279	282	272	246	237	244	202	08	175	40	148	213	246	244	247	247	237	217	233	243	5725
				09	250	253	259	253	257	259	255	251	250	249	250	249	09	247	253	254	254	256	257	257	253	248	252	253	257	6076
				10	256	257	256	253	253	256	265	278	45*	160	219	315	10	633*	589*	551*	320*	180*	-12*	112	167	216	248	250	259	6326
				11	272	268	274	292	285	292	300	257	134	169	219	343	11	455*	385	672*	32*	143	185	218	232	196	198	202	216	6239
				12	251	288	296	290	301	327	344	300	288	273	264	114	12	190	318	391*	141*	200	139	201	232	247	244	235	262	6136
				13	300	303	296	297	304	321	338	333	290	261	185*	342	13	480*	384*	308*	231	282	261	234	170	237	242	298	310	7007
				14	287	295	302	291	308	318	320*	346	299	258	265	238	14	306	236	359*	185	107	173	175	222	241	285	330	302	6448
				15	304	320	314	300	299	328	288	319	236	162	186	186	15	221	218	181	182	212	242	251	249	248	250	249	263	6008
				16	281	299	298	294	282	270	260	263	258	260	240	214	16	232	254	263	257	253	254	253	247	246	252	263	264	6257
				17	269	274	271	266	260	256	256	256	254	254	260	254	17	234	202	158	219	247	225	220	231	238	243	250	259	5856
				18	259	257	257	255	256	255	254	254	254	254	256	254	18	254	254	251	180	62	38	122	142	175	218	235	241	5237
				19	258	270	257	258	264	281	282	293	306	298	280	290	19	276	237	231	230	227	243	230	230	224	224	236	234	6159
				20	245	260	266	272	257	247	243	247	248	245	246	247	20	247	247	244	244	243	245	247	247	247	247	250	248	5979
				21	247	252	257	256	256	254	250	249	253	253	254	254	21	247	247	246	239	235	227	221	230	232	234	234	236	5863
				22	241	243	250	252	258	261	270	270	253	140	-53	72	22	206	172	139	203	190	141	133	186	219	231	236	242	4755
				23	260	262	276	269	281	309	298	329	214	198	197	229	23	220	112	160	100	167	200	220	220	230	231	229	243	5454
				24	250	250	250	249	249	250	245	249	246	241	236	226	24	238	309*	92*	111*	76	135	115	140	193	232	250	249	5081
				25	261	268	270	275	291	281	278	268	236	250	224	143*	25	97	167	-9	40	181	239	223	198	200	229	238	242	5090
				26	250	258	260	266	288	269	261	277	269	241	223	251	26	250	219	200	207	222	209	168	130	179	285	280	271	5733
				27	310	285	269	287	287	280	285	289	285	267	252	265	27	260	225	192	191	206	230	180	221	141	151	181	245	5784
				28	264	262	266	271	271	270	260	271	267	265	220	191	28	278	220	70	156	248	259	248	254	256	256	262	266	5851
				29	272	277	283	271	271	274	311	246	297	283	267	278	29	232	200	214	183	223	246	244	248	247	243	242	244	6096
				30	248	251	260	272	287	287	305	219*	187*	208	321*	308*	30	461*	699*	257*	263*	187*	327*	82	-26	59	197	213	241	6113
				31	268	267	272	307	300	320	329	337	257	180*	163	70	31	147	134	132	173	321*	49	122	144	190	211	251	298	5242

SCALED BY LYT, JEP
CHECKED BY JEP, LYT, EAS
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 Mgp., converted to Normal Mgp.
[] 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 181517
MONTHLY MEAN 244
DATES WITH GAPS:

FORM 76-106

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225OBSY. YEAR MONTH FILE-
CO 83 DEC H
MENTValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight, Hour 01 of local day (150 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 or S	Ten Q	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	
			362	340	372	394	420	410	393	390	369	349	313	180	01	300	360	342	341	307	330	338	346	325	315	348	337	8281
			339	343	350	356	360	399	367	371	355	344	346	330	02	281	178	94	220	334	356	354	347	344	345	339	335	7787
			342	353	357	367	355	354	354	351	351	350	350	343	03	326	259	311	349	352	350	350	350	342	340	340	340	8246
			340	348	350	353	352	350	347	355	354	353	360	349	04	349	343	322	245	200	353	369	364	360	360	353	352	8171
			352	359	352	333	356	384	441*	224	335	244	114	-14	05	278	120	12	106	202	338	372	356	345	349	306	345	6609
			366	359	336	376	559*	611*	586	512	233	-159*	-396*	-430*	06	-6*	-509*	255*	161	427	357	253	248	276	333	333	377	4954
			404	392	389	407	388	362	356	357	305*	305*	362*	242	07	-102*	-97*	-68*	-345*	17*	219	51	304	359	322	333	310	5572
			364	392	389	392	394	372	354	350	369	348	315	216	08	-51	79	324	379	363	361	360	358	328	315	330	350	7761
			359	362	365	369	369	365	360	355	351	349	350	350	09	351	352	352	353	353	354	357	358	356	350	344	346	8530
			351	355	359	374	376	366	365	382	122*	216	283	149	10	-160*	-280*	-290*	-363*	-245*	-8*	229	380	393	380	359	354	4447
			365	371	368	345	363	410	431	426	315	282	271	250	11	203	-122	-879*	117*	410	386	378	316	226	168	206	350	5956
			364	377	417	430	462	494	458	420	420	352	270	187	12	294	273	353*	-58*	269	352	362	355	357	318	263	314	7397
			395	385	435	435	442	474	446	459	432	405	334	290	13	198	-88	162	301	372	388	297	240	335	365	381	283	8166
			413	378	380	395	460	501	688*	419	342	379	254	-131*	14	105	234	-42	-155*	127	290	376	275	301	340	375	348	7102
			385	404	389	385	408	434	436	422	372	152	24	250	15	288	67	283	332	324	360	332	370	360	344	301	301	7723
			316	366	379	389	370	373	359	354	351	350	351	330	16	329	351	348	341	345	349	348	349	341	341	342	341	8413
			340	351	360	351	359	350	358	354	352	356	350	352	17	321	256	262	342	361	342	349	360	360	367	351	352	8246
			351	361	360	362	360	360	361	361	361	362	362	360	18	360	361	340	166	148	195	234	319	350	352	381	362	7889
			373	359	386	382	342	422	404	449	440	408	398	380	19	351	314	345	322	352	358	351	354	365	352	332	334	8963
			342	368	370	385	380	372	362	356	352	350	351	351	20	351	351	351	351	356	353	352	351	349	340	340	350	8534
			351	360	359	351	352	360	361	359	356	353	351	359	21	349	349	350	350	340	340	360	360	351	350	350	357	8478
			363	379	380	380	383	361	351	379	346	36*	-146*	226	22	188	192	117	146	260	322	361	373	361	350	341	357	6806
			360	360	362	352	354	400	399	427	314	229	350	330	23	175	168	2	219	370	381	370	356	340	341	341	350	7650
			351	361	362	361	363	361	362	369	361	361	362	359	24	240	-361*	-463*	38	305	174	278	361	320	350	349	369	6293
			370	333	370	358	388	380	372	390	362	359	280	-61*	25	221	-44*	-134*	270	370	392	351	332	358	357	350	341	7125
			349	352	359	351	352	376	377	390	445	425	375	342	26	299	300	321	321	339	313	264	254	248	407	336	356	8301
			440	390	394	360	371	384	418	389	389	373	363	351	27	358	288	322	328	346	328	330	371	260	288	360	375	8576
			362	356	416	400	390	374	371	419	380	164	240	274	28	151	-63	137	381	389	370	363	354	354	358	348	351	7639
			355	345	371	374	380	363	366	413	478	434	353	251	29	183	166	189	304	367	372	362	364	361	357	349	348	8205
			350	344	368	392	384	384	432	566*	662*	300*	-209*	-390*	30	-616*	-384*	6*	108*	-147*	-197*	-317*	95	322	395	371	366	3585
			376	372	386	405	414	420	462	526	589	594*	368	116	31	-17*	191	252	118	-390*	234	326	261	271	275	346	316	7211

SCALED BY LYT, JEP
 CHECKED BY JEP, LYT, EAS
 SIGNS REVIEWED BY
 PUNCHED BY

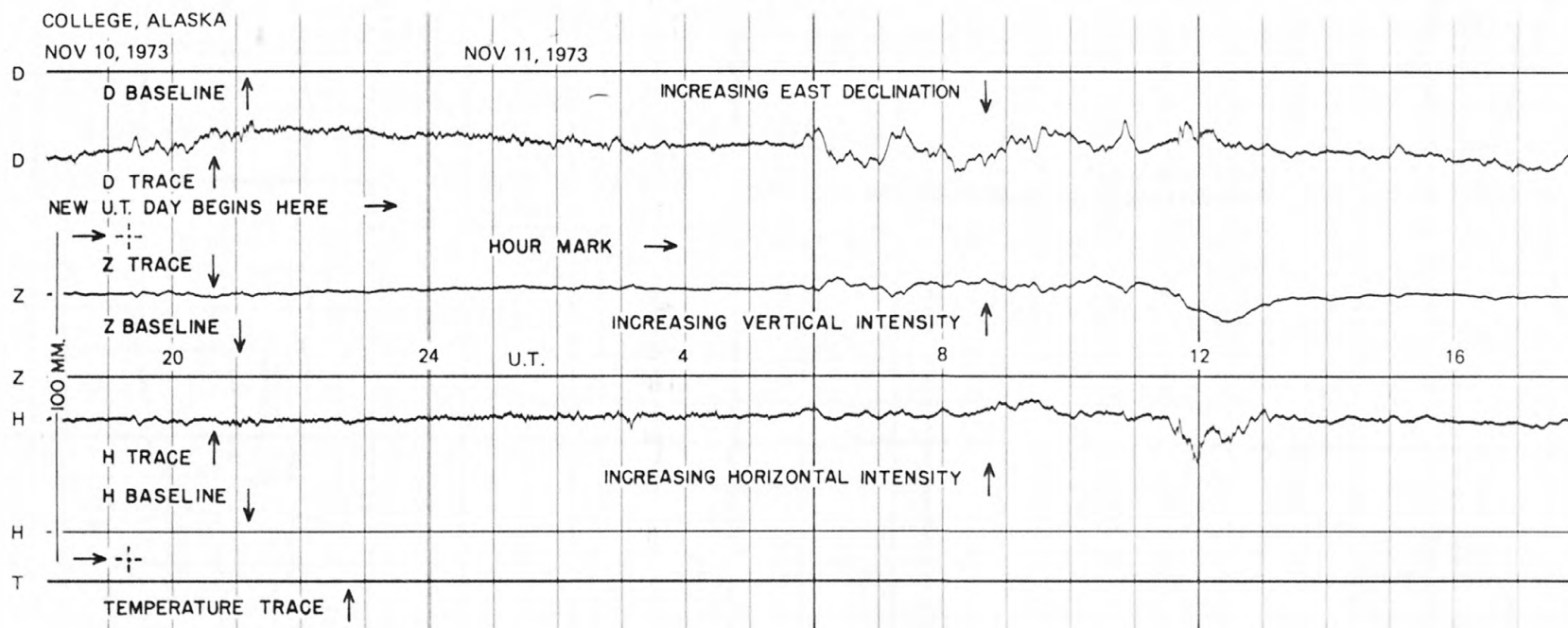
Preliminary base-line and scale values:
 Interval Beginning Base-line Value Scale Value

- () Interpolated
 Significant portion of hour interpolated.
 No record; or no values available because of faulty record.
 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.

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

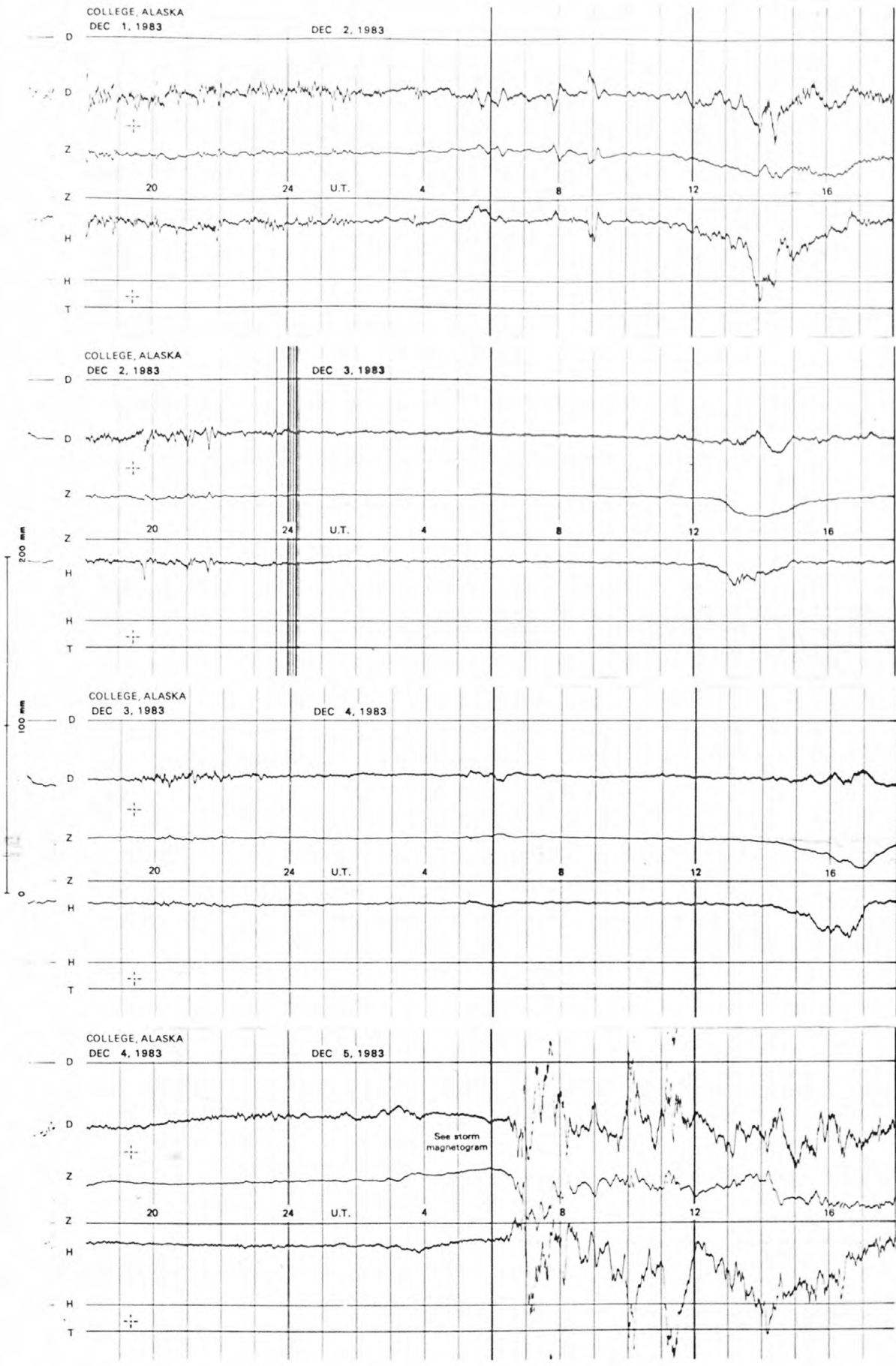
MONTHLY SUM 228616
 MONTHLY MEAN 307
 DATES WITH GAPS

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

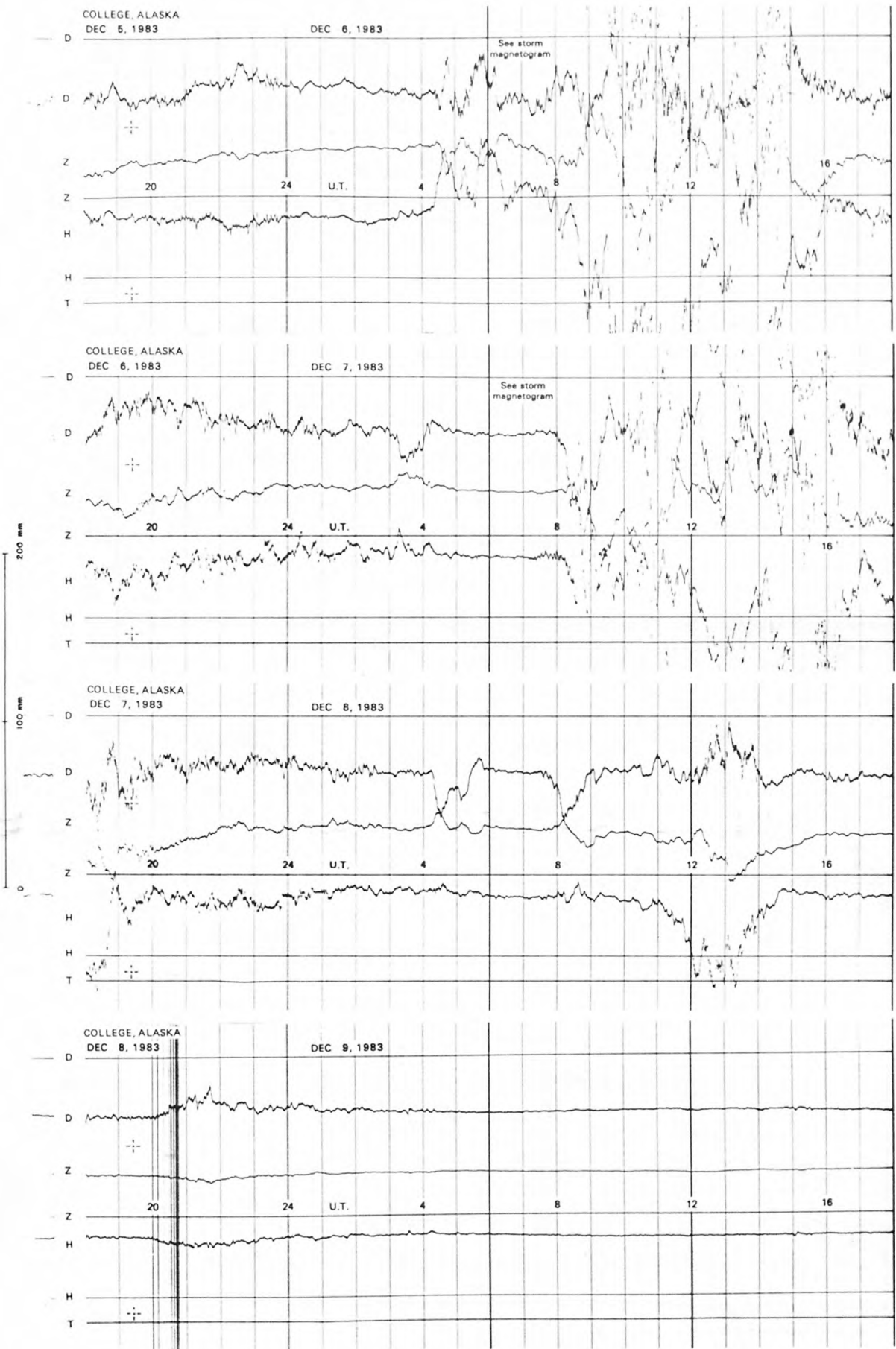


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

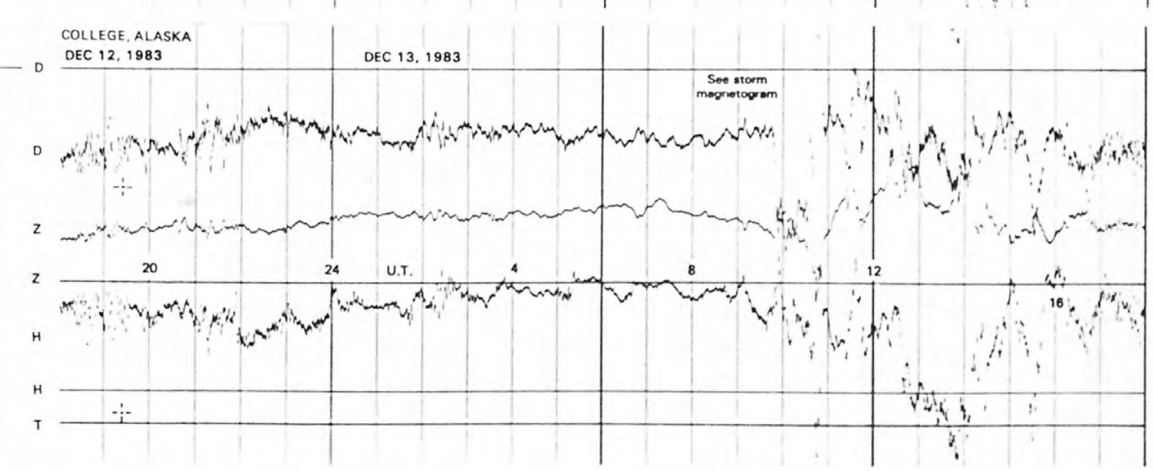
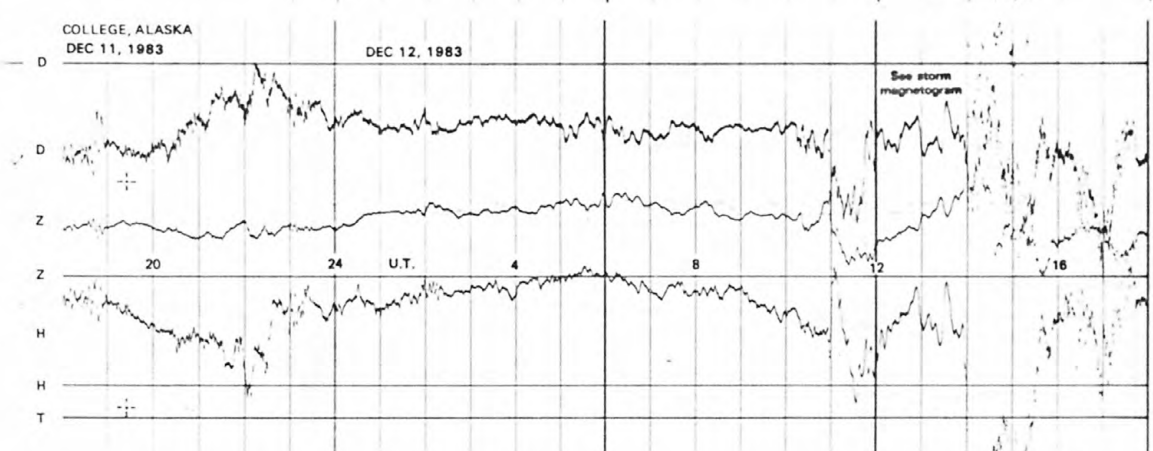
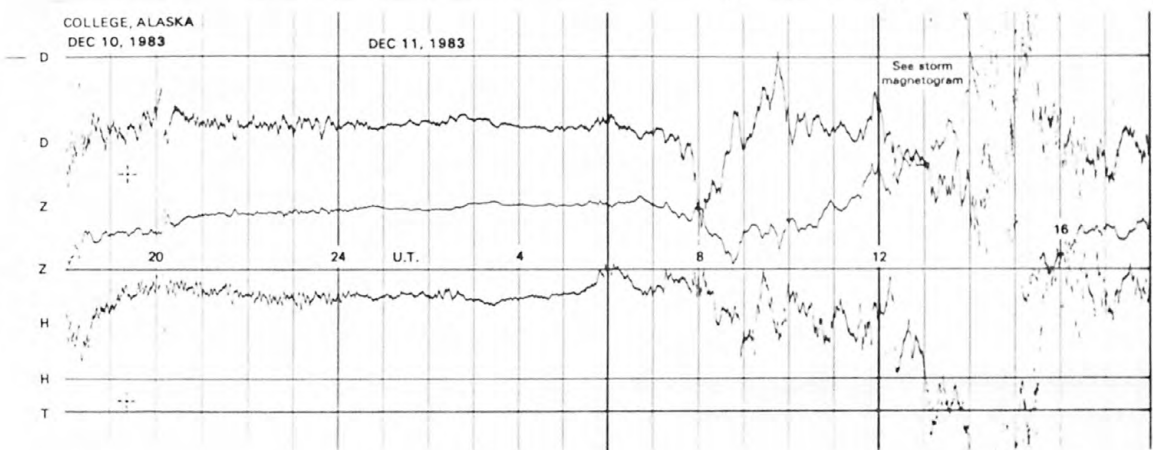
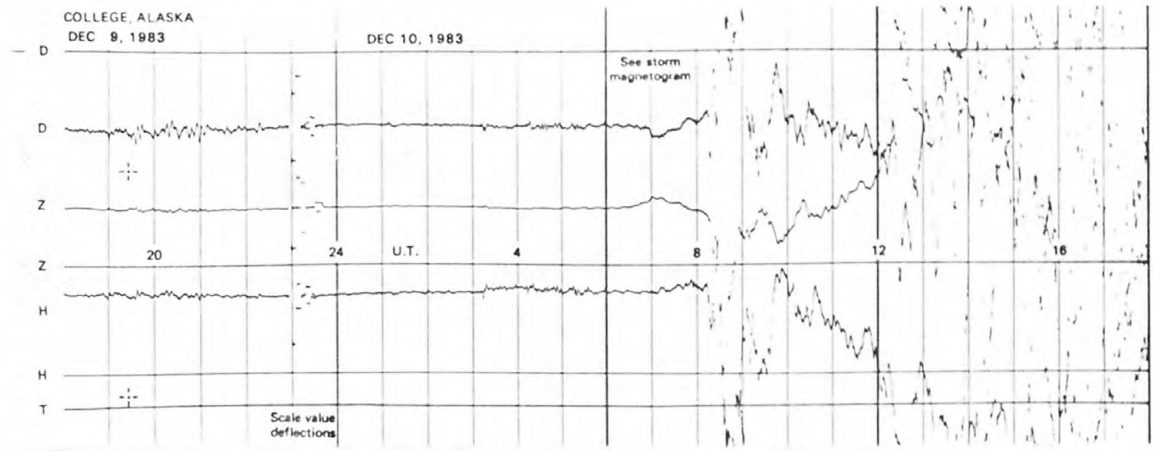
NORMAL MAGNETOGRAMS



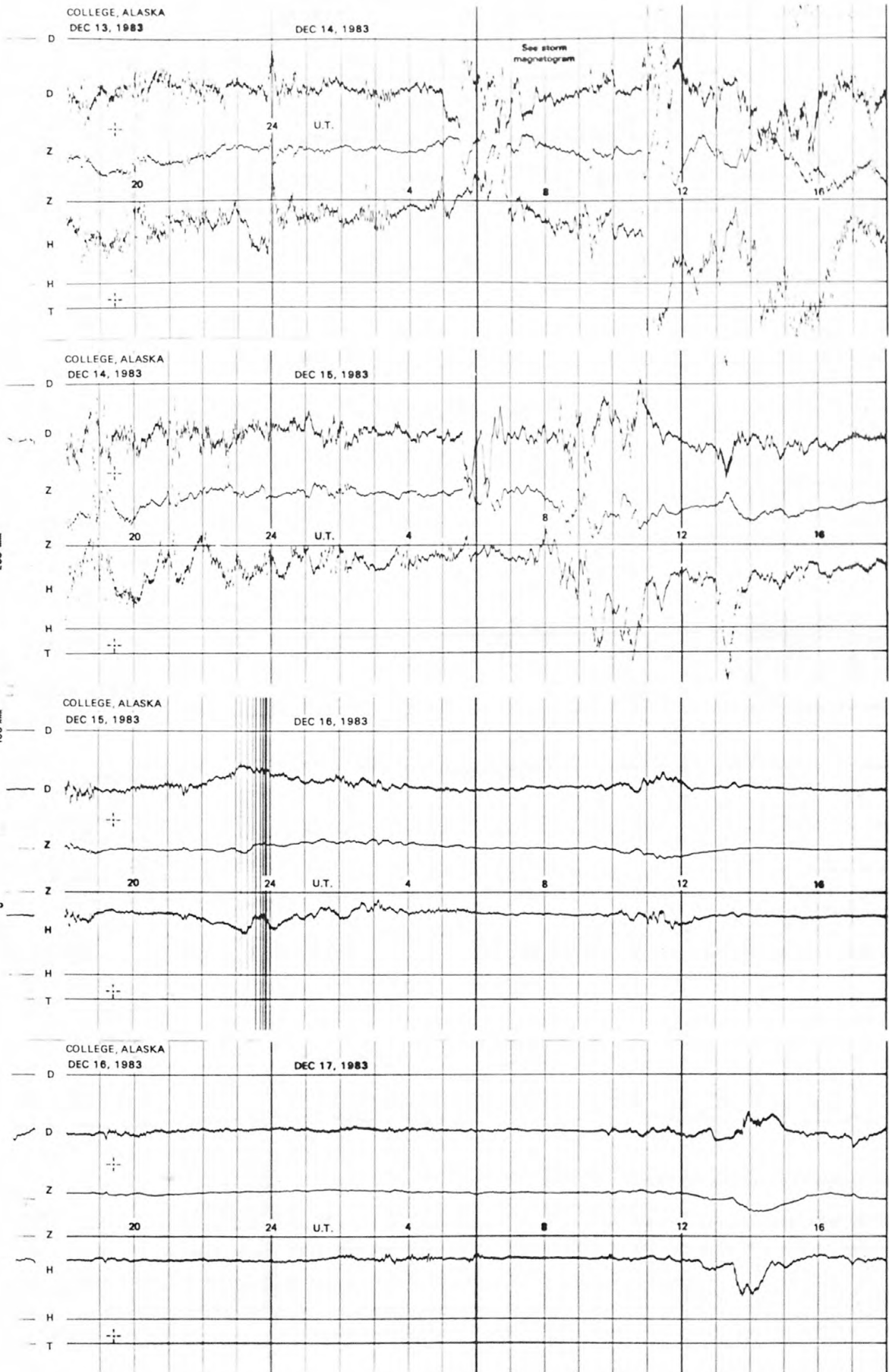
NORMAL MAGNETOGRAMS



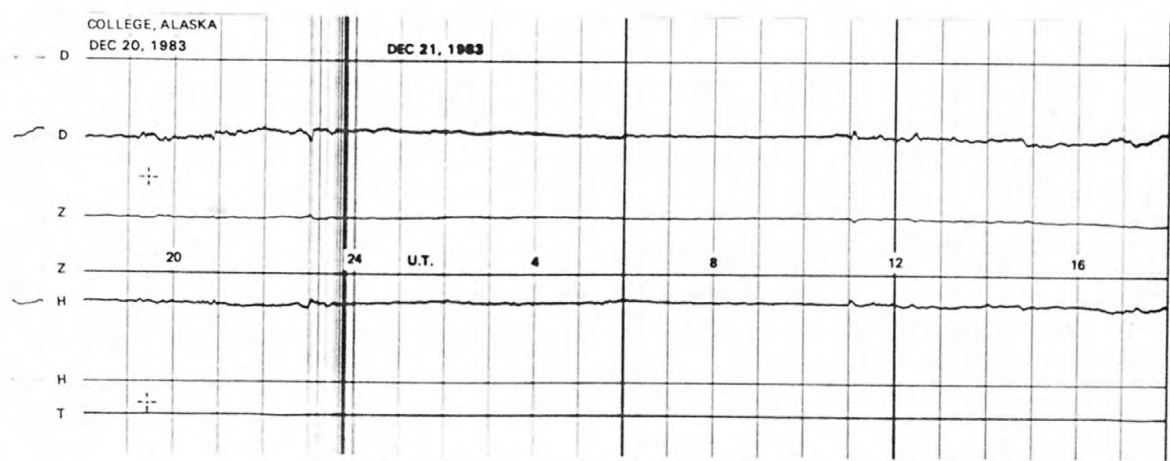
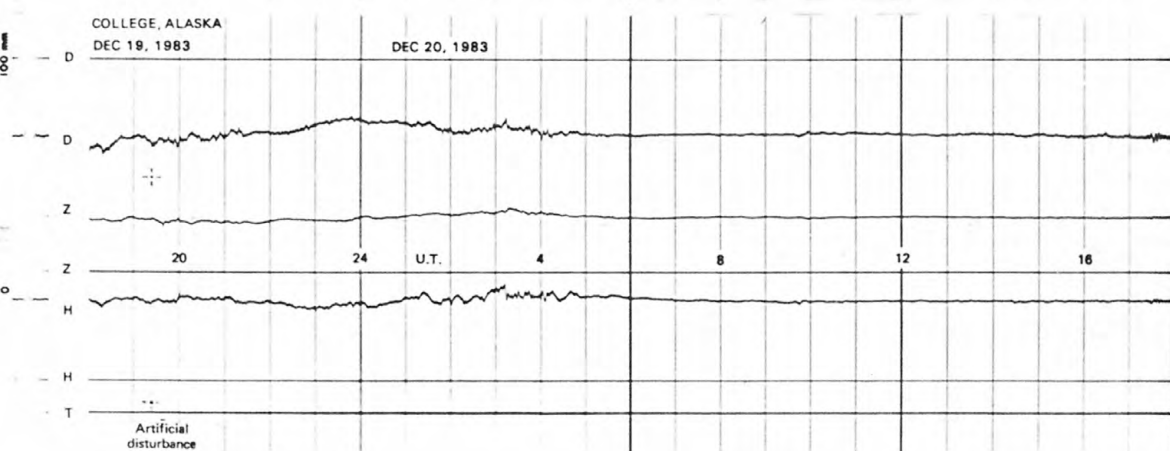
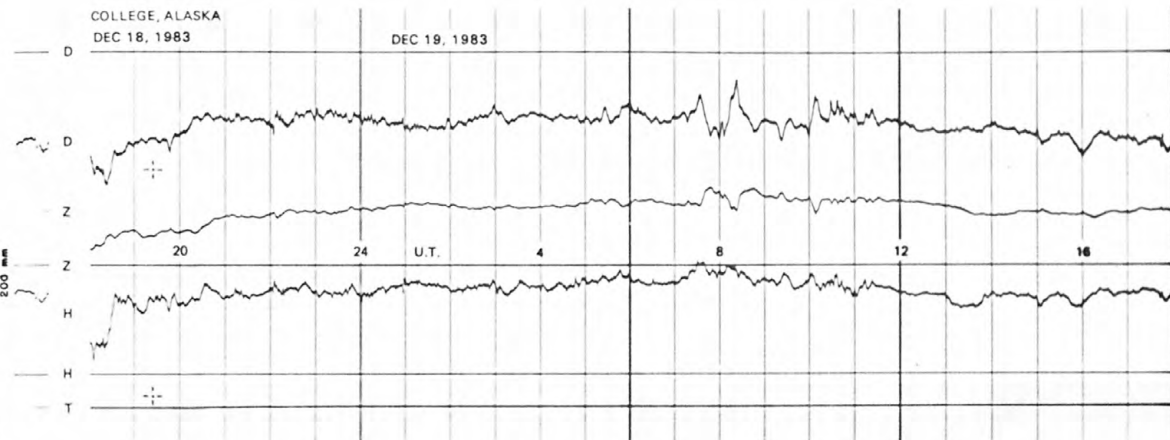
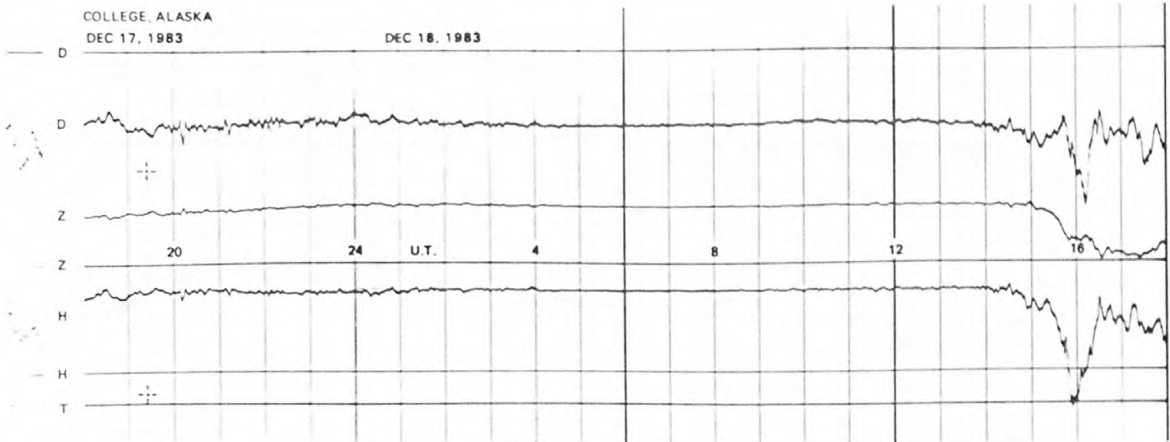
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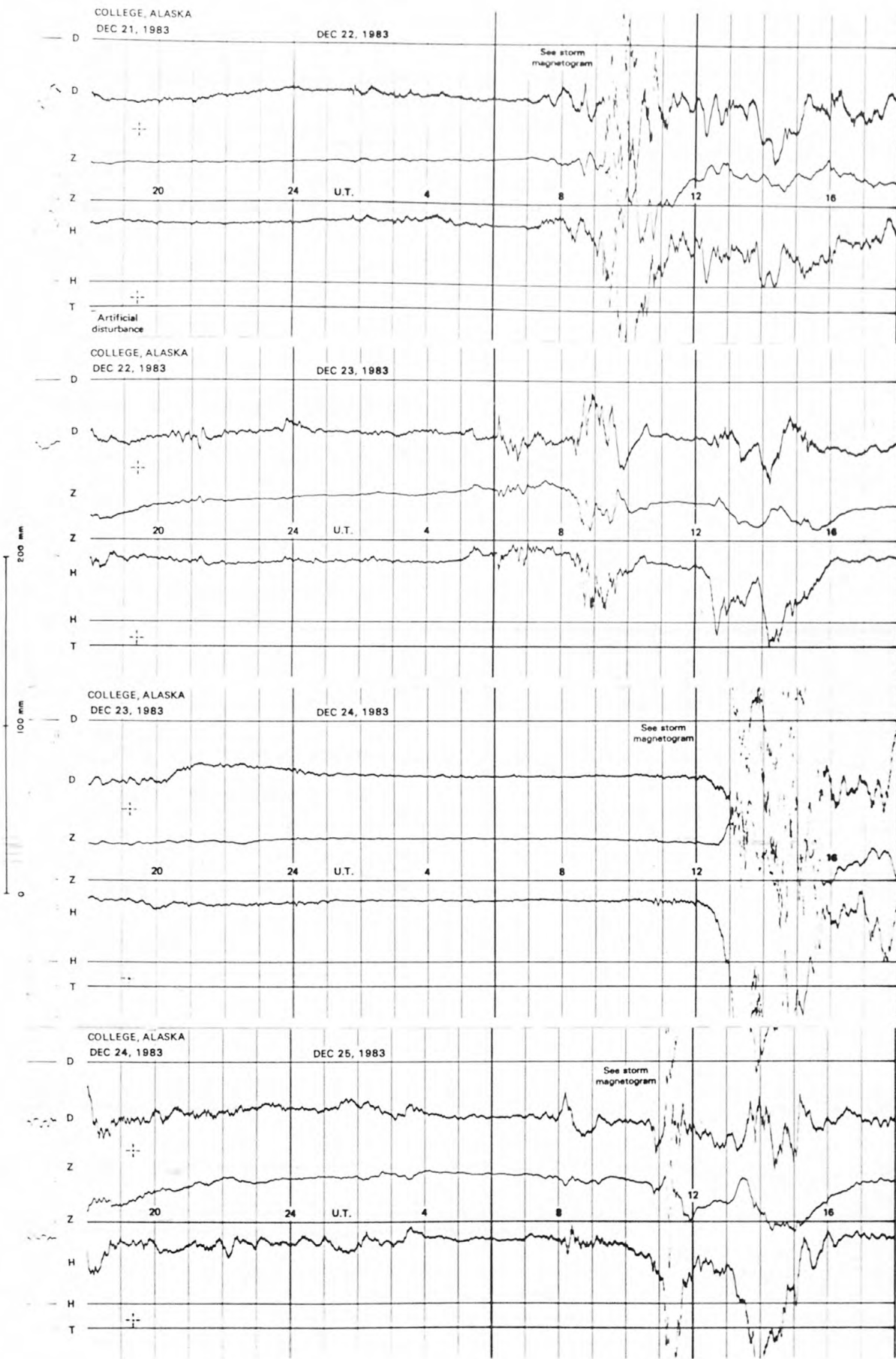
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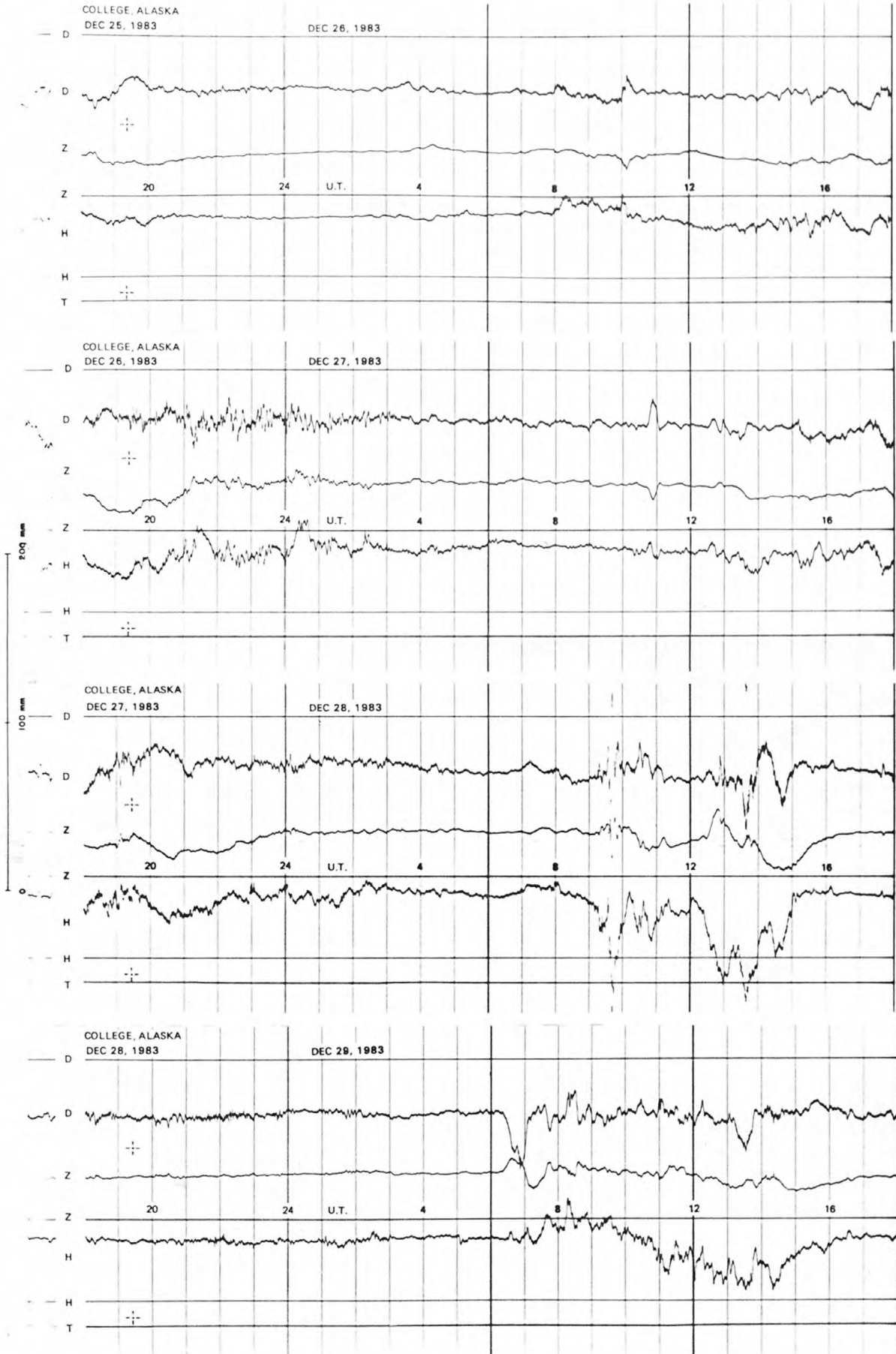
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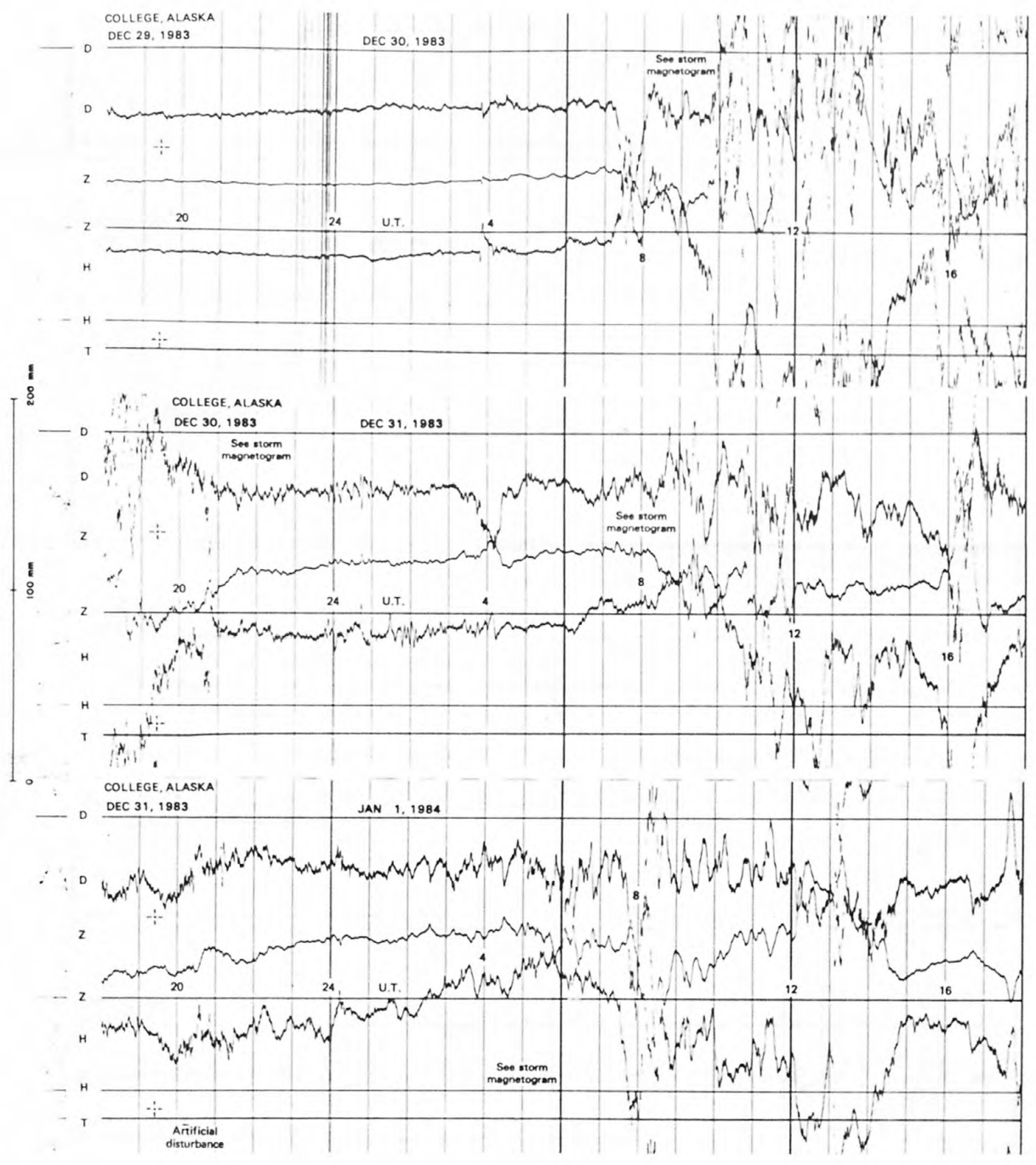
NORMAL MAGNETOGRAMS



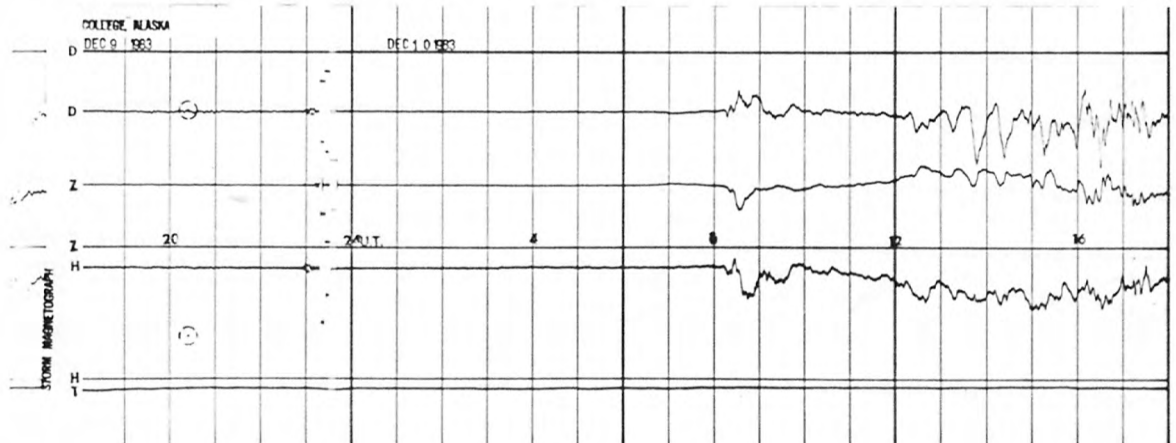
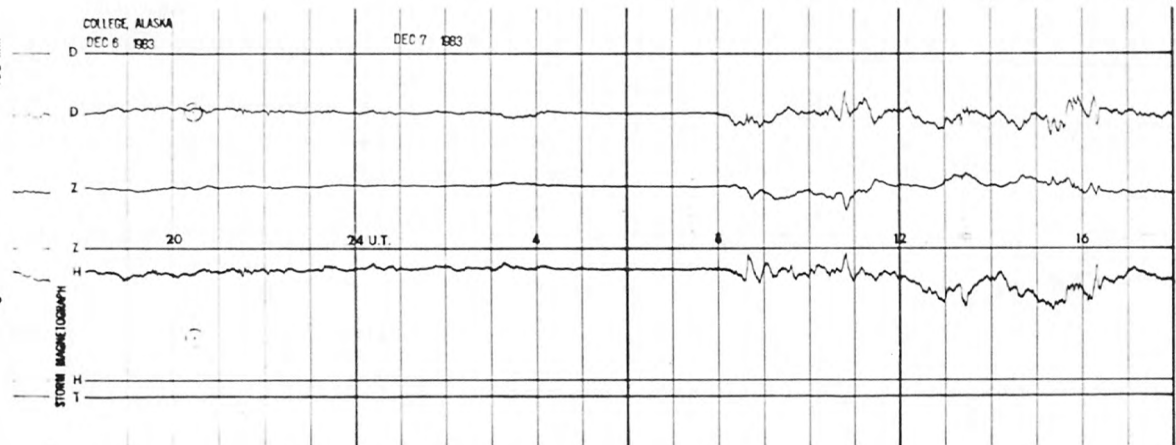
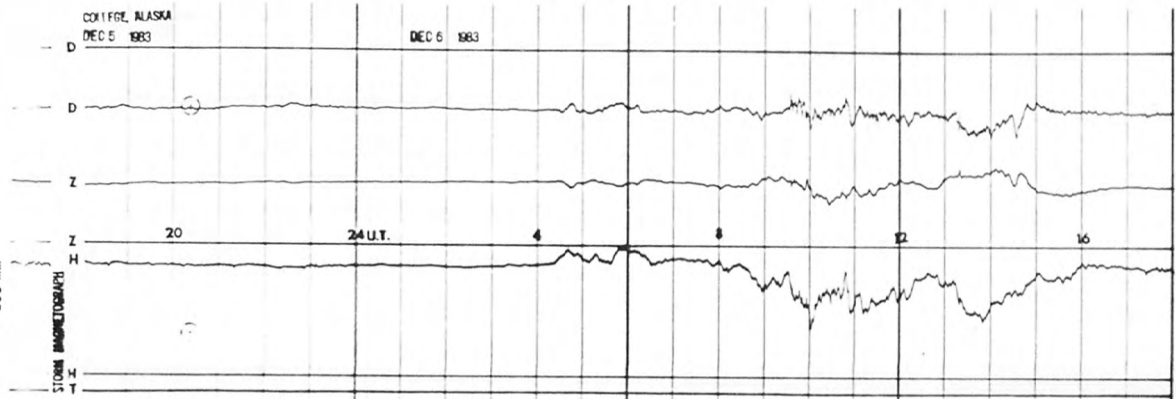
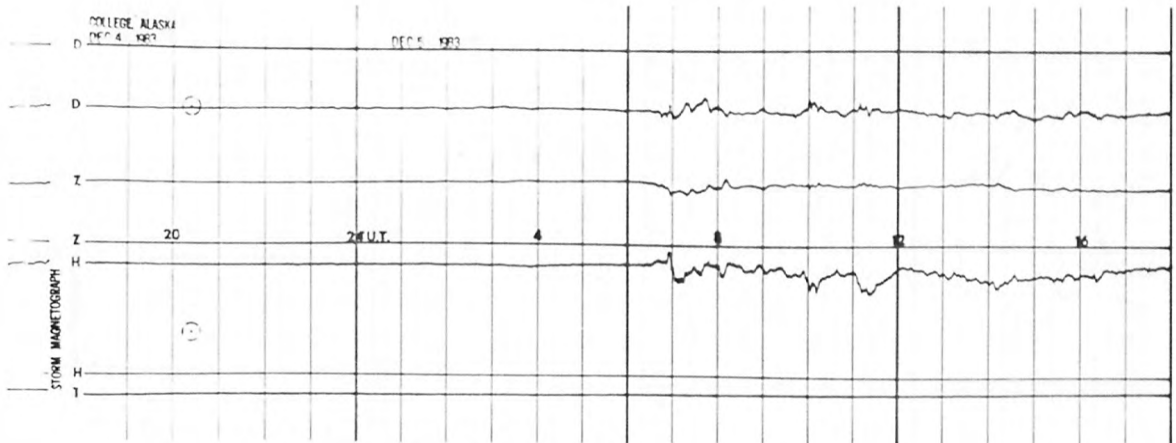
NORMAL MAGNETOGRAMS



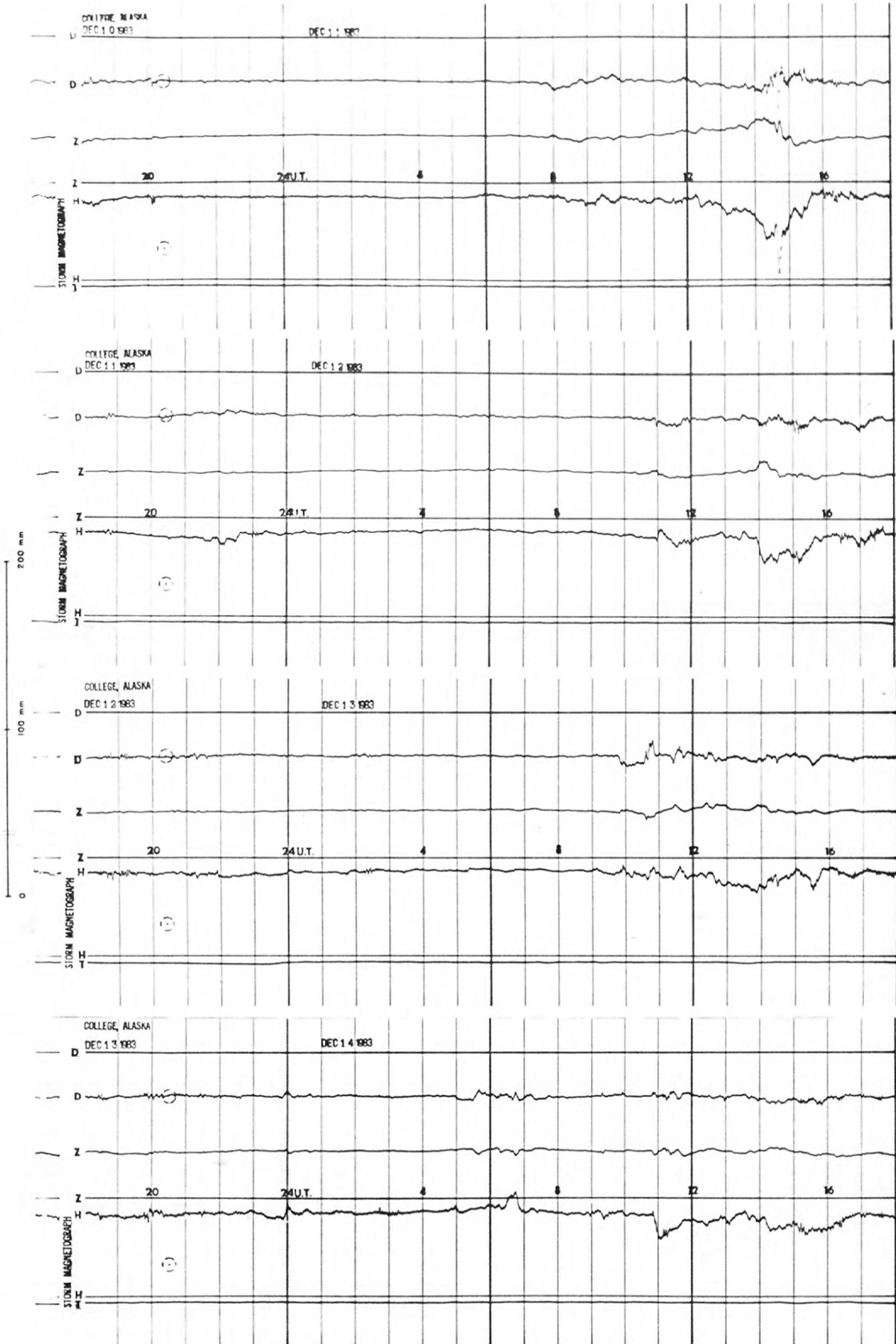
NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS

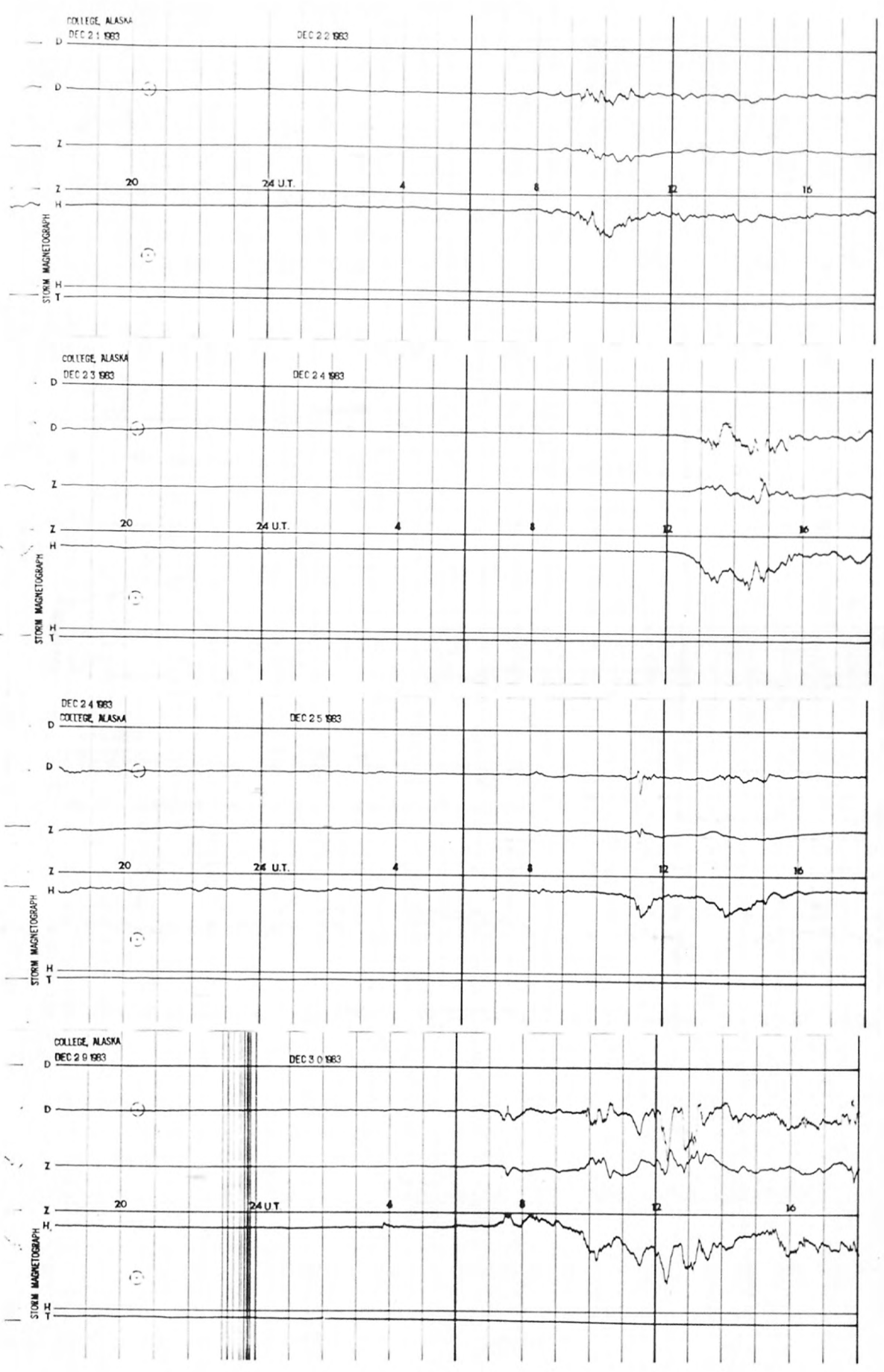


STORM MAGNETOGRAMS

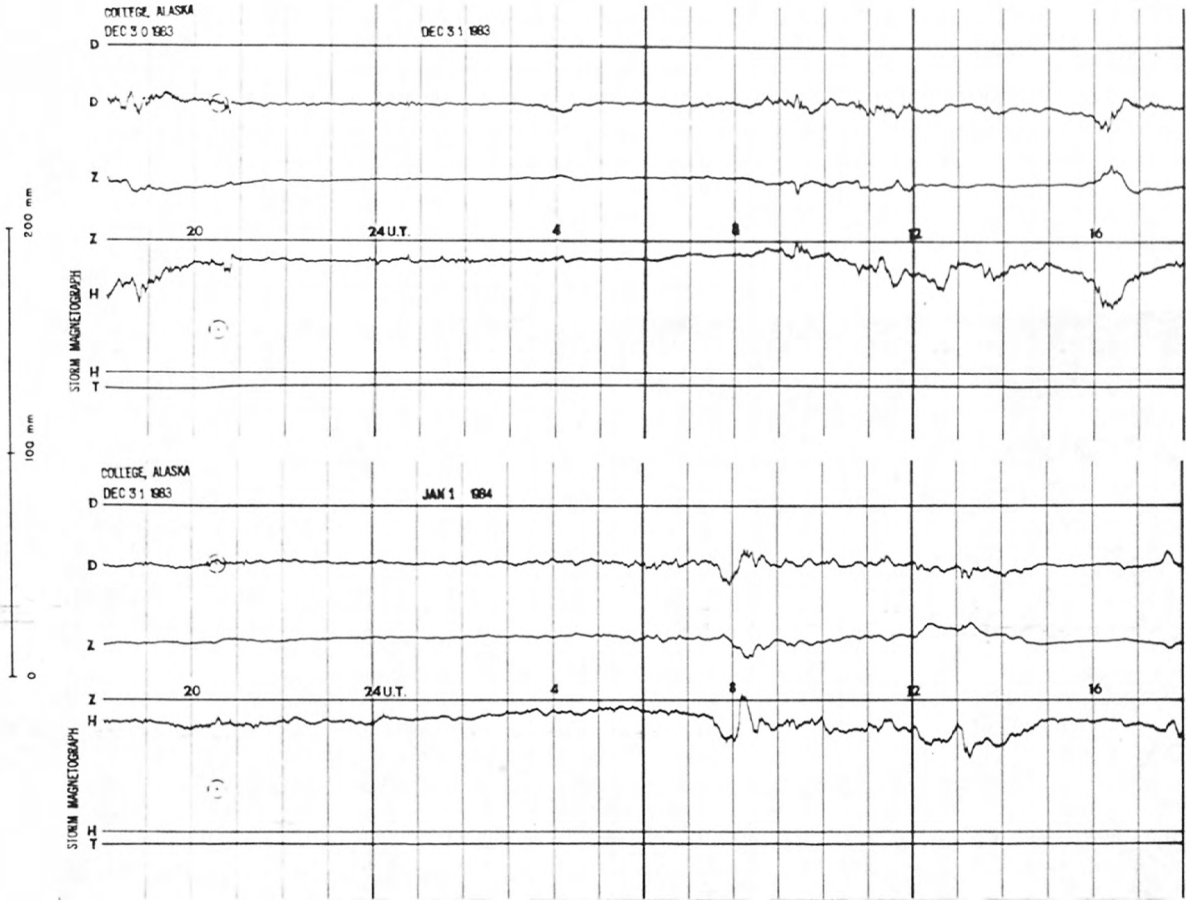


STORM MAGNETOGRAMS

200 mm
100 mm
0



STORM MAGNETOGRAMS



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