

UNITED STATES DEPARTMENT OF THE INTERIOR

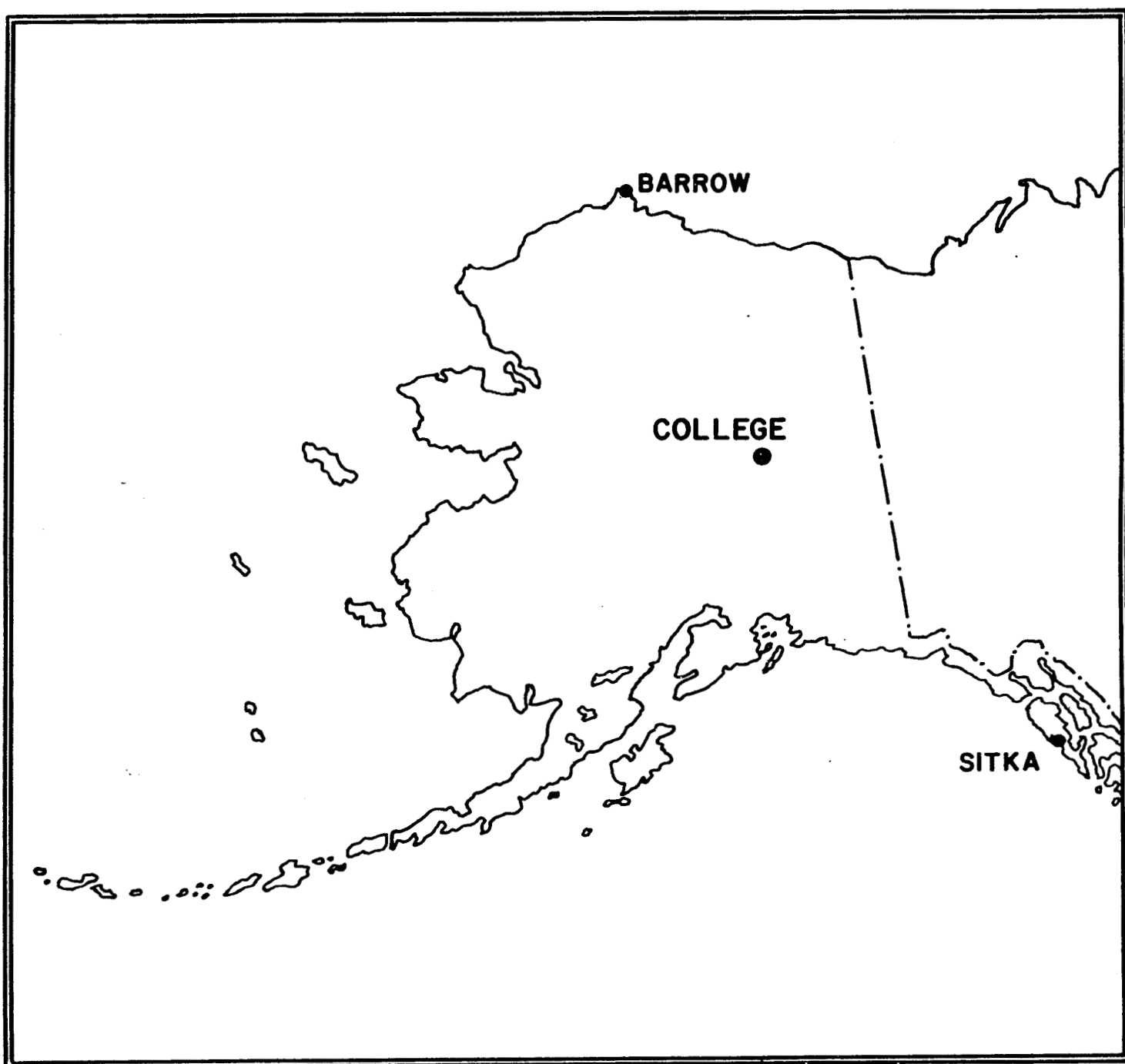
GEOLOGICAL SURVEY

ALASKAN GEOLOGY BRANCH
TECHNICAL DATA FILE

PRELIMINARY GEOMAGNETIC DATA COLLEGE OBSERVATORY FAIRBANKS, ALASKA

DECEMBER 1978

OPEN FILE REPORT 78-300L



ORDER OF CONTENTS

Explanation of Data & Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data & Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal & Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

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, ASST. CHIEF, 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

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..... $+256.5^{\circ}$
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 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.

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.

NOAA FORM 76-133 (9-72) U. S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION										OBSERVATORY <div style="text-align: center; padding: 5px;">COLLEGE, ALASKA</div>						
MAGNETIC ACTIVITY (Greenwich civil time, counted from midnight to midnight)										MONTH AND YEAR <div style="text-align: center; padding: 5px;">DECEMBER 1978</div>						
DATE	K-INDICES								SUM	AK	TIME SCALE ON MAGNETOGRAMS					
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24			20 mm/hr					
1	1	1	3	5	4	2	1	1	18	14	SUDDEN COMMENCEMENTS d h m					
2	0	0	1	1	0	0	0	0	02	01						
3	1	0	0	0	0	1	1	1	04	02						
4	1	1	1	4	3	4	2	2	18	12						
5	3	2	0	2	0	0	1	2	10	05						
6	1	1	0	0	1	1	1	1	06	02						
7	0	0	0	0	0	0	0	0	00	00						
8	0	0	0	2	1	0	1	0	04	02						
9	0	0	0	1	1	0	0	0	02	01						
10	0	0	0	0	0	0	0	0	00	00						
11	0	0	0	0	0	0	0	0	00	00						
12	0	0	0	1	3	1	1	1	07	03						
13	1	1	1	1	0	0	1	1	06	02						
14	2	4	6	4	5	2	2	2	27	26						
15	2	4	5	6	5	5	2	3	32	35						
16	3	2	3	4	2	5	6	3	28	27						
17	2	1	2	2	2	0	1	2	12	05						
18	2	2	6	7	7	6	6	3	39	69						
19	3	3	5	5	6	6	4	3	35	41						
20	3	4	5	7	6	6	3	3	37	53						
21	2	3	4	5	4	2	1	0	21	17						
22	1	3	3	7	5	6	3	1	29	40						
23	1	1	3	2	2	3	1	0	13	07						
24	0	1	2	3	1	0	0	0	07	04						
25	1	1	4	6	7	6	2	0	27	43						
26	1	1	4	3	3	3	1	1	17	11						
27	3	4	3	3	5	2	3	1	24	18						
28	0	1	0	1	2	5	5	2	16	15						
29	2	2	2	3	3	6	5	4	27	26						
30	3	4	3	5	5	5	4	4	33	32						
31	3	3	2	5	5	3	2	2	25	20						
											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..... CURRENT SCALE VALUE..... LOWER LIMIT FOR K = 9										D	H	Z	(mm) (γ/mm) (to nearest 10γ)			
										683.8	321.7					
										3.75	7.80					
										2560	2510					
SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.																
APPROVED <u>JOHN B. TOWNSEND, CHIEF, COLLEGE OBSERVATORY</u>																
OBSERVER IN CHARGE																

OUTSTANDING MAGNETIC EFFECTS			OBSERVATORY COLLEGE, ALASKA	
			MONTH DECEMBER	YEAR 1978
DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS	
03	16XX	pc5		
05	10XX	pi2		
05	18XX	pc5		
14	0127	ssc*		
<div> IDENTIFIED BY: JEP VERIFIED BY: JBT </div>				

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

Data from Individual Observatories:

COLLEGE OBSERVATORY, COLLEGE, ALASKA

DECEMBER

1978

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

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	14	0127	s.c.*	+20	+43	+12	14 15	3 4	6 6	143	1030	870	16	04
		18	06XX	..	..	..	..	18 20	4, 5 4	7 7	266	1630	960	21	14
		25	08XX	.. (Polar disturbance)	..	..	..	25	5	7	284	1550	980	25	21

NORMAL MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 12-1-78	2400 U.T., 12-31-78	1.0/mm	3.88/mm	27° 47.0 E
H	0000 U.T., 12-1-78	2400 U.T., 12-10-78	7.88/mm		127568
	0000 U.T., 12-11-78	2400 U.T., 12-31-78	"		127518
Z	0000 U.T., 12-1-78	2400 U.T., 12-31-78	7.88/mm		551298

STORM MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 12-1-78	2400 U.T., 12-31-78	7.9/mm	29.78/mm	24° 20.5 E
H	0000 U.T., 12-1-78	2400 U.T., 12-31-78	44.18/mm		115028
Z	0000 U.T., 12-1-78	2400 U.T., 12-31-78	48.88/mm		540078

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

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
28° 13'5 E	130358	553798
* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.		
DAYS USED:	DEC 2, 3, 6, 7, 8, 9, 10, 11, 12, 13	

NOAA FORM 76-106

MAGNETOGRAM HOURLY SCALINGS (UNIVERSAL TIME)

U.S. DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hours 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.

C	Q	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	221	241	247	242	248	239	235	222	308	181	176	629	382	319	328	346	344	309	300	306	290	284	271	251	6903	
02	249	247	239	260	262	261	262	261	262	260	261	261	261	261	262	261	279	289	300	307	297	282	274	251	6468	
03	227	237	239	241	261	261	262	269	268	269	268	270	271	271	271	271	281	289	284	321	318	281	228	220	6382	
04	230	231	250	251	236	259	248	271	242	262	267	342	371	371	321	282	353	373	327	329	282	248	212	242	6698	
05	252	219	221	224	234	267	262	267	268	264	284	282	271	271	276	280	282	290	302	284	298	287	208	221	6324	
06	242	249	247	252	248	251	252	239	266	266	261	251	274	274	281	270	299	316	322	329	311	270	248	243	6435	
07	231	248	238	236	242	252	258	260	252	258	260	262	271	271	271	278	281	289	287	293	301	298	277	262	6376	
08	257	257	250	254	260	259	264	261	258	258	257	262	278	300	282	291	308	301	299	292	307	291	261	249	6546	
09	243	250	247	252	257	243	262	262	260	260	262	262	278	287	304	289	280	262	278	269	285	287	279	253	6416	
10	239	230	241	250	252	260	261	263	261	270	263	263	262	270	272	277	274	282	281	292	308	299	282	278	6424	
11	250	250	254	258	259	261	262	262	262	262	267	267	267	270	271	278	280	283	287	291	298	290	279	270	6468	
12	242	249	254	261	264	264	261	260	258	256	298	282	282	300	332	370	330	317	299	308	294	248	264	248	6721	
13	247	231	200	167	208	242	251	257	260	254	249	264	272	272	272	277	279	281	289	293	296	289	282	269	6187	
14	240	239	223	279	259	201	29	74	113	230	197	281	368	368	335	312	321	320	319	327	318	306	281	252	6025	
15	238	258	258	231	267	179	259	291	403	208	197	288	257	257	352	371	372	321	267	308	269	250	262	268	271	6639
16	249	251	249	259	262	251	265	264	308	396	168	251	262	262	259	289	289	340	408	288	290	258	265	250	249	6610
17	239	224	240	259	254	271	261	246	298	265	265	261	261	261	270	277	278	289	299	293	297	282	285	268	251	6423
18	247	258	266	262	258	243	203	203	296	285	352	446	154	154	637	438	628	542	431	423	71	207	200	200	242	7698
19	228	229	241	247	344	356	287	265	276	379	234	211	317	317	368	1066	252	377	237	121	220	221	271	249	261	7247
20	250	249	231	262	299	276	278	326	350	201	264	335	446	446	398	796	502	335	271	301	290	269	127	209	210	7475
21	261	249	249	254	282	289	288	306	209	275	206	259	255	255	287	274	286	279	274	270	281	278	271	254	261	6397
22	259	262	271	262	263	280	279	269	367	349	359	446	479	479	418	354	455	335	302	252	267	262	271	267	254	7582
23	253	262	259	250	260	263	279	286	251	259	271	262	269	269	259	260	271	300	258	289	288	269	279	269	252	6418
24	250	251	253	261	268	267	298	261	252	253	229	277	280	280	276	282	278	259	281	282	292	282	261	258	258	6409
25	249	259	225	229	247	261	259	251	297	193	311	509	429	429	662	667	637	265	287	268	268	252	262	259	258	8704
26	260	266	262	250	239	248	270	253	234	252	271	292	324	324	329	279	318	279	302	302	305	261	269	258	251	6574
27	271	232	231	227	181	203	221	232	239	233	277	300	298	298	347	292	299	310	304	233	224	208	228	259	250	6099
28	248	257	258	257	239	247	258	271	272	271	263	271	267	267	283	281	308	444	448	368	291	312	270	220	232	6636
29	227	218	236	231	249	264	271	269	257	251	261	289	300	300	252	301	311	469	368	438	353	233	187	209	239	6687
30	170	219	199	200	188	239	233	230	274	249	113	238	298	298	381	301	273	269	274	313	317	192	240	269	270	5939
31	256	192	187	229	219	256	293	261	254	277	277	221	261	261	317	272	211	289	331	313	292	291	279	270	261	6309

SCALED BY: JEP

CHECKED BY: JEP, EAS

SIGNS RE-VIEWED BY: JEP

PUNCHED BY:

Scale Value

Rac-line Value

Preliminary base-line and scale values:

Interval Beginning

Interpolated

Significant portion of hour interpolated.

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

Derived from Storm Meph., corrected to Normal Meph.

Sealing 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

MONTHLY MEAN

DATES WITH DATA

206219

277

NOAA FORM 76-106 (12-75) MAGNETOGRAM HOURLY SCALINGS (UNIVERSAL TIME) U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION OBSY. YEAR MONTH TELE- MENT CO 78 DEC H

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 BRIME universal day.

C	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	350	352	361	360	357	370	383	418	400	351	152	-125	262	291	301	316	358	361	371	369	353	352	346	339	7752	
02	349	352	353	362	362	362	359	357	364	360	351	357	358	350	368	368	367	369	368	359	351	349	344	347	8590	
03	352	370	380	381	373	373	375	370	367	366	361	361	363	365	362	366	362	359	370	369	357	341	340	348	8736	
04	359	371	374	377	379	378	391	389	396	379	361	220	272	337	379	339	219	289	376	363	329	349	337	331	8294	
05	343	391	397	409	388	379	377	373	370	359	344	360	361	361	360	359	359	351	350	351	352	329	310	340	8673	
06	344	361	369	371	379	379	376	387	381	371	378	371	364	361	359	362	367	366	360	360	354	359	348	340	8767	
07	351	359	361	371	372	371	370	371	369	366	364	359	356	359	360	361	360	360	359	359	353	353	349	348	8661	
08	349	353	361	359	370	371	368	370	370	371	363	353	369	375	361	362	365	366	360	353	347	349	350	343	8658	
09	349	351	359	361	370	373	371	373	371	366	361	360	349	351	349	354	364	366	361	351	354	351	349	348	8612	
10	350	353	360	363	369	368	370	370	368	370	369	366	366	366	364	364	363	366	362	360	359	353	350	350	8699	
11	352	360	361	367	369	370	370	370	370	369	368	369	370	370	370	371	371	370	365	359	357	358	352	351	8759	
12	361	369	375	380	380	379	376	373	370	369	367	376	333	229	309	371	387	384	380	375	355	361	370	369	8698	
13	359	359	358	423	418	400	392	368	371	379	365	365	362	361	367	361	361	360	359	354	359	351	351	351	8889	
14	364	386	409	424	433	586	463	617	287	176	257	271	39	157	314	319	321	371	351	347	339	340	350	359	8202	
15	364	379	360	534	628	722	581	414	174	391	339	412	59	152	89	71	261	323	354	340	344	353	356	357	7869	
16	379	378	385	383	381	400	387	361	367	353	203	291	389	379	370	367	341	191	122	159	352	391	380	371	7836	
17	379	387	370	369	389	371	371	410	418	385	369	355	360	369	371	373	379	379	371	370	369	367	361	366	9008	
18	367	370	370	366	377	361	451	21	26	201	71	377	569	388	212	219	167	82	171	346	349	361	387	2515		
19	447	430	389	396	409	413	517	465	395	276	353	279	92	450	426	139	181	139	209	366	348	376	367	368	6278	
20	368	372	401	416	491	480	430	430	349	19	257	240	365	31	343	235	282	391	412	387	330	329	319	391	5664	
21	361	366	373	419	439	406	433	361	327	283	148	257	21	242	364	375	358	347	353	357	352	356	359	362	8304	
22	376	370	365	360	489	460	389	357	353	329	349	357	7	96	269	19	300	366	364	370	369	361	370	363	6931	
23	362	361	373	361	374	376	369	400	403	397	382	349	331	313	300	251	331	343	359	371	361	361	357	357	8542	
24	364	367	371	371	369	368	366	375	381	370	327	299	370	373	370	369	359	370	370	372	369	367	368	347	8732	
25	352	359	361	371	381	379	380	382	463	337	376	103	132	159	746	207	393	417	389	382	380	359	357	351	6312	
26	357	350	341	349	361	366	379	379	431	401	353	321	238	256	259	262	373	359	371	370	361	350	357	355	8299	
27	333	380	479	406	526	500	470	431	389	384	351	306	27	229	92	339	350	322	291	300	356	356	353	351	8659	
28	361	360	372	371	381	381	373	376	370	371	370	363	349	349	349	369	310	15	104	25	391	361	345	324	7489	
29	365	386	373	391	376	370	378	369	392	391	361	281	324	405	361	336	105	179	243	253	309	349	340	299	7578	
30	371	370	413	483	599	470	401	399	419	369	154	165	243	106	120	191	381	369	327	134	289	306	361	381	7841	
31	367	371	427	392	431	432	393	391	392	359	244	156	31	253	173	41	301	371	349	351	339	340	349	341	340	7903
SCALED BY																								MONTHLY SUM	245780	
CHECKED BY																								MONTHLY MEAN	330	
SIGNED BY																								DATES WITH GAPS:		
PURCHASER BY																										

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

() Interpolated
() Significant portion of hour interpolated.
() No record or no value available because of faulty record.
() Scaling uncertain because of magnetic storm.
() Record nil after for part or all of hour; if value is given, it is estimated for missing part.

• Derived from Storm Mph., converted to Normal Mph.

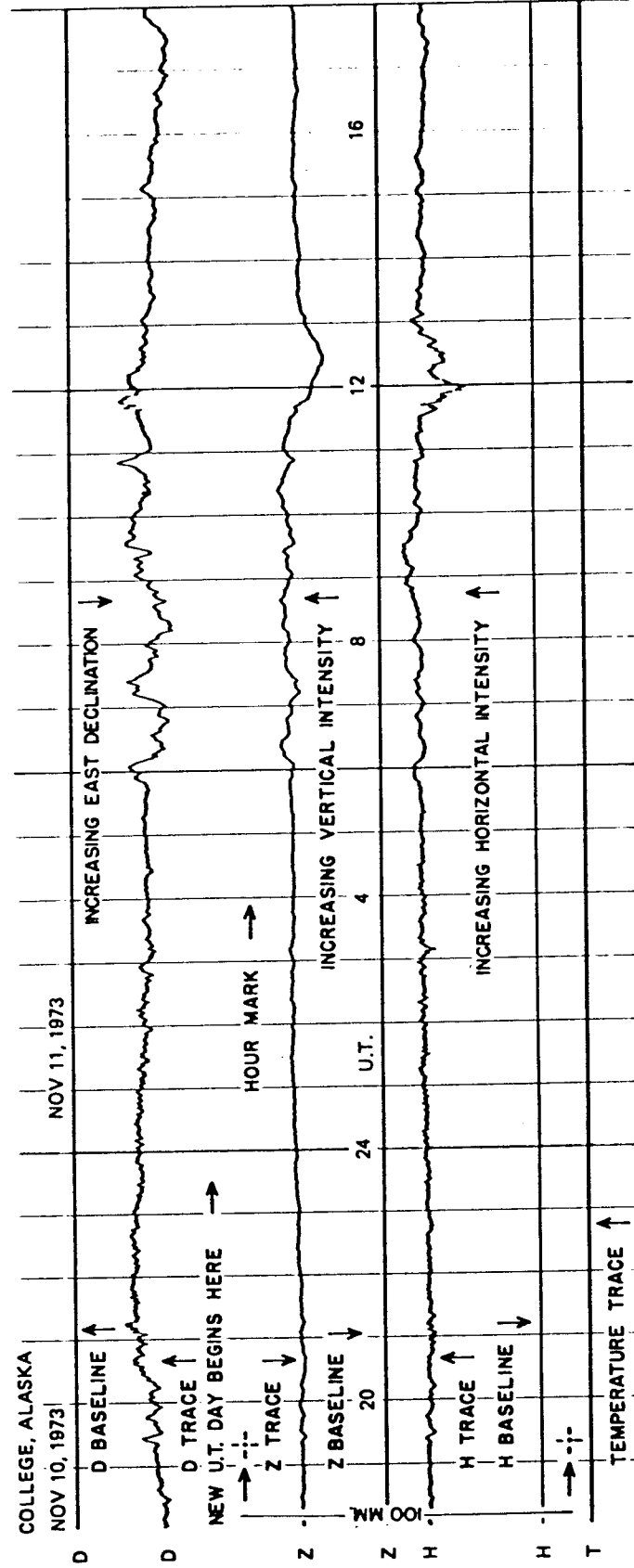
MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATIONOBSY. YEAR MONTH ELE-
CO 78 DEC ZValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight, 1100 01 of local day (1500 M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q	U	T	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	02	03	04	05	06	07	08	09	10	11	12	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
				331	339	339	346	363	359	350	349	241	213	257	246*	187	237	234	230	262	280	302	317	321	329	336	386	7104												
				337	340	341	337	337	336	339	339	319	327	332	324	325	310	318	324	329	330	331	330	329	330	333	331	7928												
				329	331	332	338	342	338	336	332	331	331	331	330	330	329	329	321	322	307	308	313	320	320	316	314	7830												
				320	330	333	330	337	332	338	350	350	340	340	176	284	276	281	307	258	211	281	293	300	326	321	336	7350												
				346	340	340	344	357	343	340	351	340	330	307	300	322	330	329	326	321	320	319	321	317	321	313	319	7916												
				330	331	334	333	333	335	332	348	359	346	343	339	330	329	308	290	310	311	317	310	300	303	310	320	7801												
				329	330	330	331	337	334	333	330	326	327	324	328	328	322	322	324	322	320	324	325	326	327	326	327	7852												
				328	328	324	329	327	328	330	330	330	329	324	304	320	332	330	327	322	327	323	328	324	322	324	330	7820												
				336	337	337	336	333	343	340	333	338	331	338	336	314	303	300	309	320	328	321*	321*	321*	321*	321*	321*	7838												
				321*	321*	321*	328*	328*	328*	328*	328*	328*	328*	328*	321*	321*	321*	321*	315*	315*	315*	315*	310*	315*	315*	315*	315*	7707												
				315*	315*	315*	315*	315*	315*	315*	315*	315*	315*	315*	315*	315*	310*	315*	310*	315*	315*	315*	315*	310*	315*	315*	315*	7566												
				316	314	316	316	316	316	316	315	316	320	317	315	281	201	191	269	294	305	308	300	291	300	307	311	7151												
				311	318	337	380	403	378	370	372	362	342	341	332	328	317	313	317	319	320	321	319	319	320	319	317	8075												
				314	316	305	328	322	189	-195*	-31*	291	356	289	393	568*	331	307	319	289	301	317	316	316	311	313	329	6894												
				320	339	328	237	-104	220	356	272	168	187	301	435*	114	248	383	393	301	279	270	240	273	306	318	337	6521												
				333	347	333	349	370	350	340	350	348	322	97	217	300	326	327	317	298	210	91	-21	167	303	323	324	6721												
				331	343	341	340	341	332	330	328	330	332	330	321	318	320	319	320	319	320	318	319	314	316	316	311	7809												
				311	320	320	320	319	331	333	385*	253*	341	467*	662*	485*	428*	568*	303*	290*	284*	146*	139	234	308	336	353	8236												
				346	324	338	356	401	407	411	395	357	249	180	262	410	329	214*	-1	186	176	134	201	289	230	330	343	6867												
				353	356	377	373	364	380	409	370	294	139*	251	360*	385*	115	203*	232	221	264	317	330	321	319	340	361	7434												
				380	369	361	381	386	381	343	369	352	344	268	334	262	306	323	331	323	316	322	329	339	340	338	341	8138												
				340	340	349	367	439	423	361	348	298	222	320	321*	53	142	193	310*	179	270	289	310	314	338	344	348	7218												
				345	343	351	352	367	356	355	329	361	366	348	330	317	280	289	244	253	279	280	299	306	318	321	325	7714												
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				324	329	337	348	337	331	329	337	339	171	293	348	347	573*	680*	221*	129	267	308	323	338	339	342	340	8030												
				345	352	350	353	351	361	365	352	273	312	333	324	320	289	242	230	279	300	310	309	306	326	329	339	7650												
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				330	339	349	348	350	351	348	339	329	342	329	357	312	319	342	324	271	221*	136	164	211	240	281	328	7260												
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				339	379	339	349	350	377	378	357	357	321	261	197	290	296	261	240	297	316	316	321	320	330	341	348	7680												

SCALED BY	SPT	Preliminary base-line and scale values:	() Interpolated	[] Scaling uncertain because of magnetic storm.	MONTHLY SUM	234665
CHECKED BY	JEP, EAS	Interval Beginning	Base-line Value	Scale Value	MONTHLY MEAN	315
SIGNS RE-VIEWED BY	JEP				DATES WITH GAPS:	
PUNCHED BY						

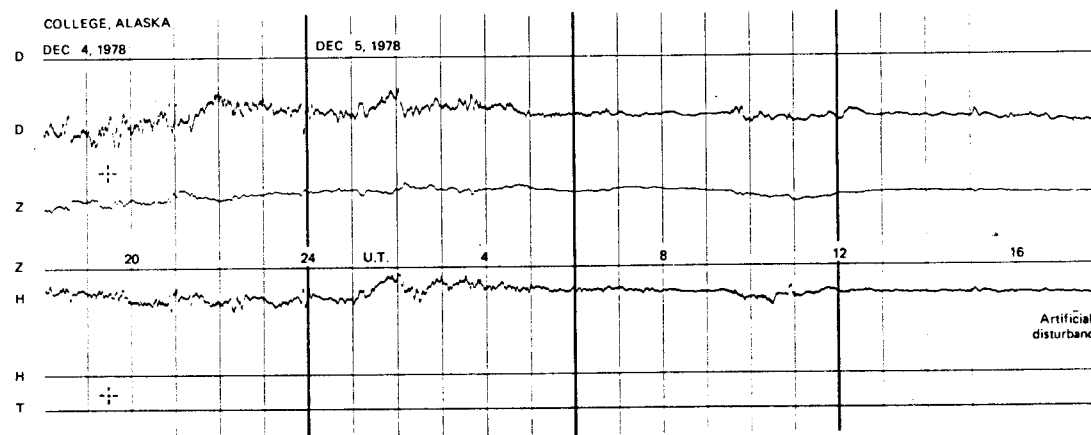
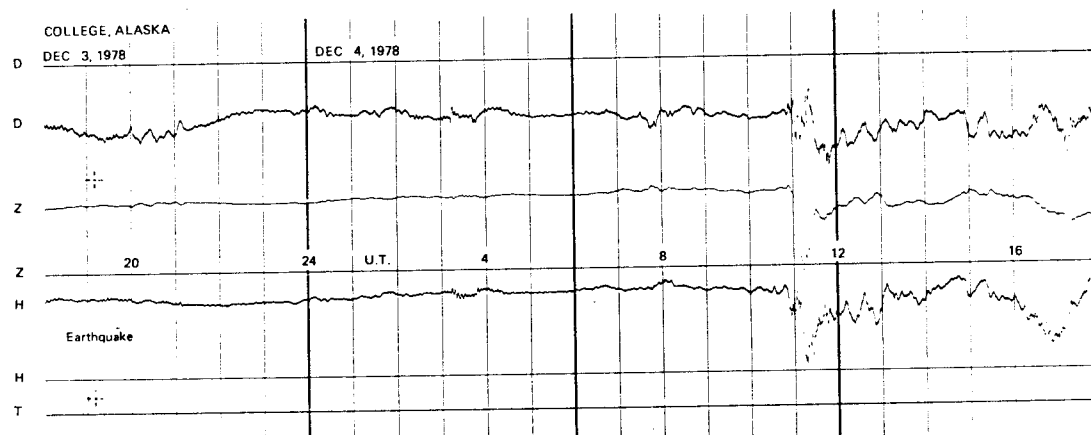
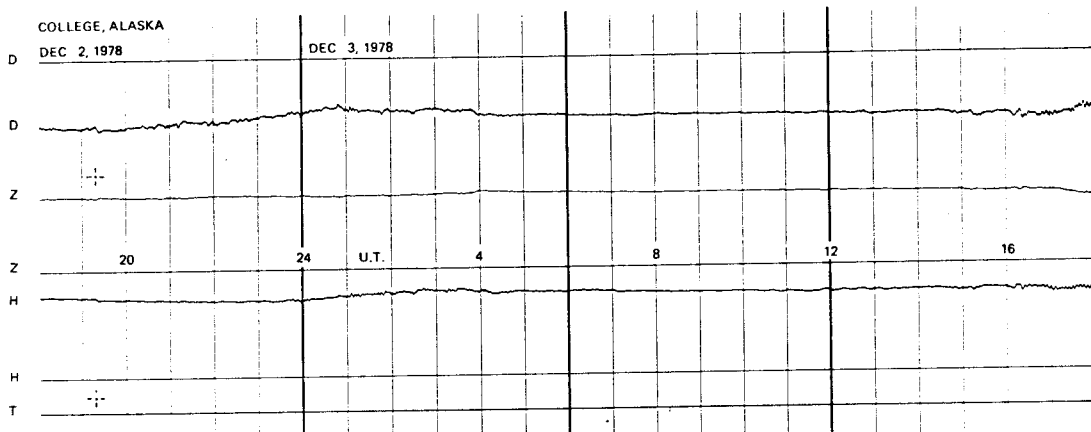
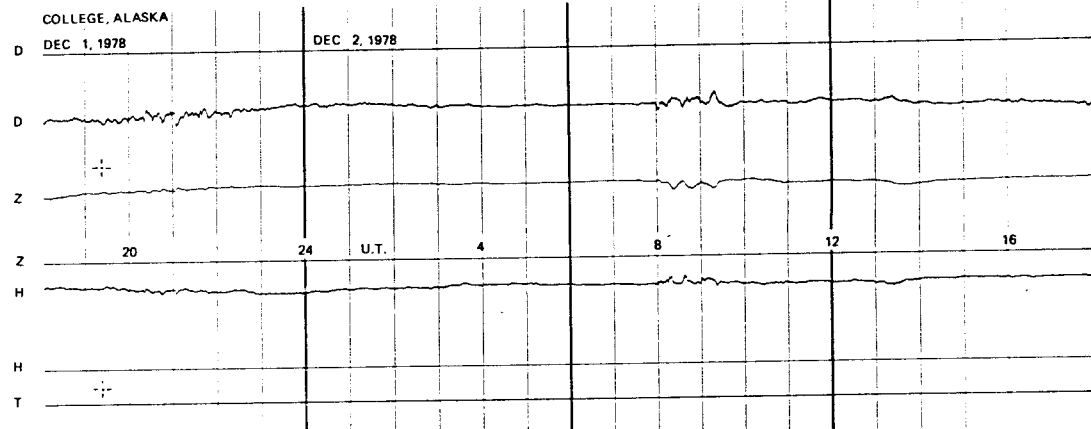
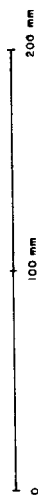
* Derived from Storm Mgh., converted to Normal Mgh.

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

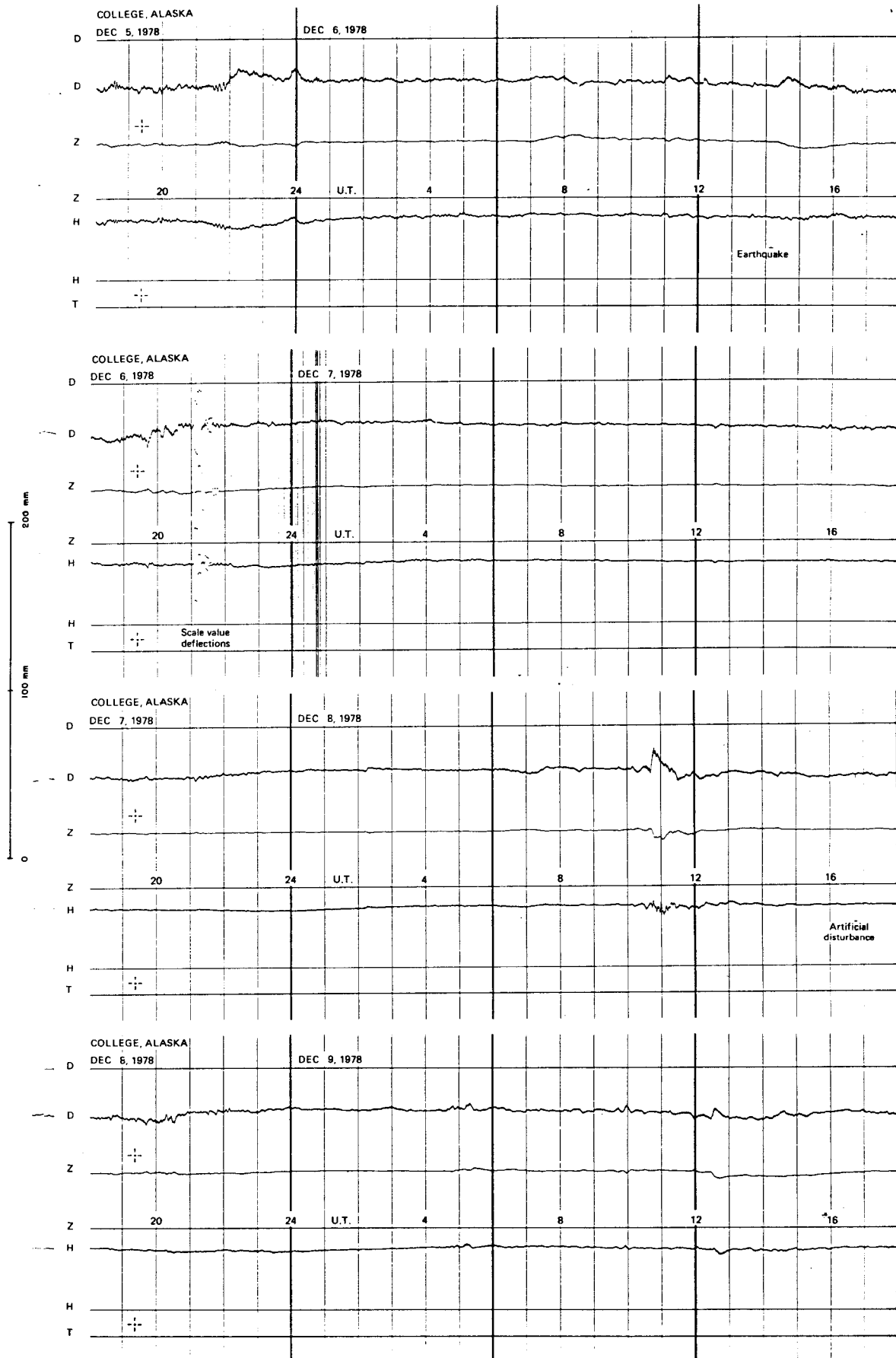


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

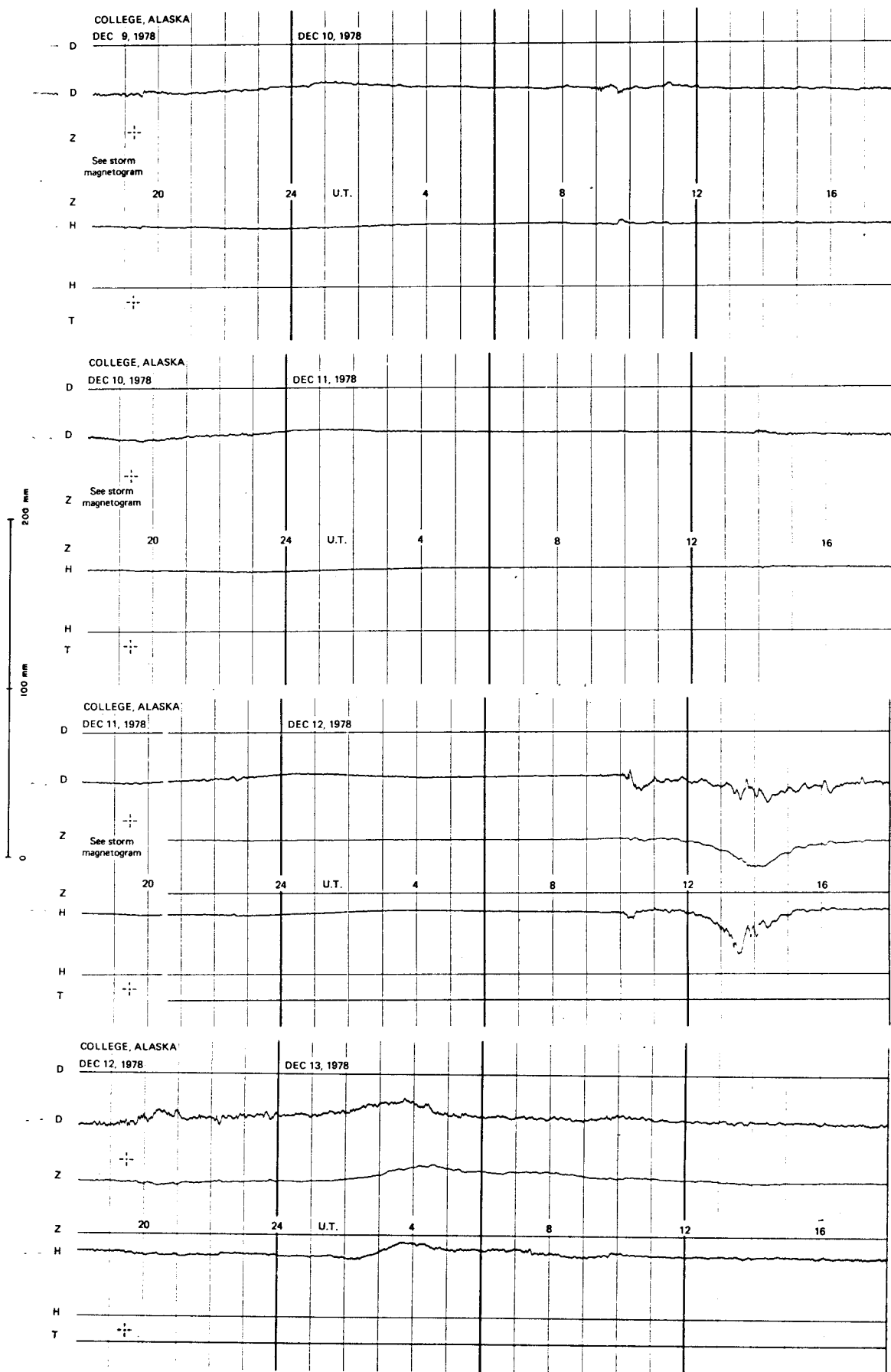
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

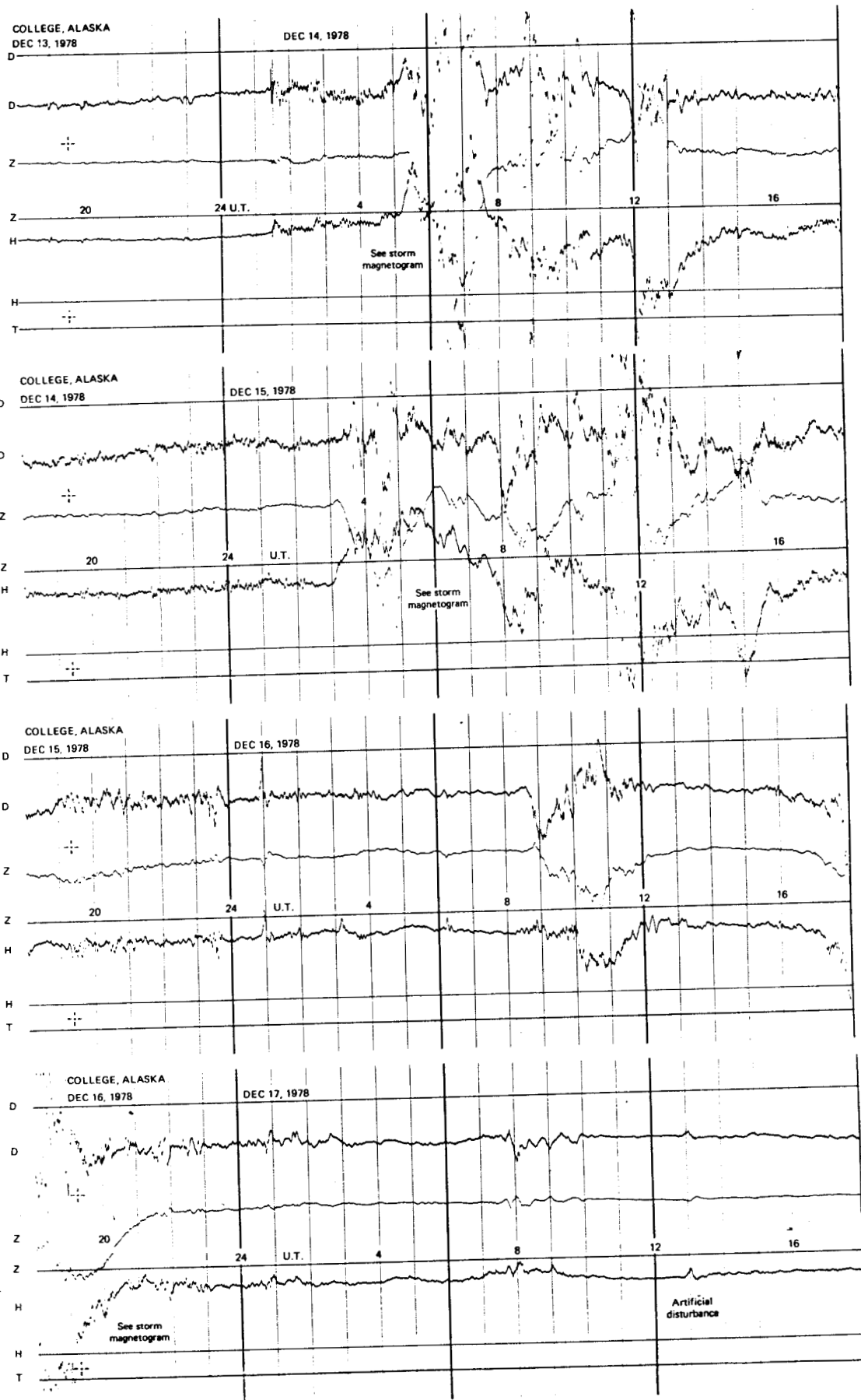


NORMAL MAGNETOGRAMS

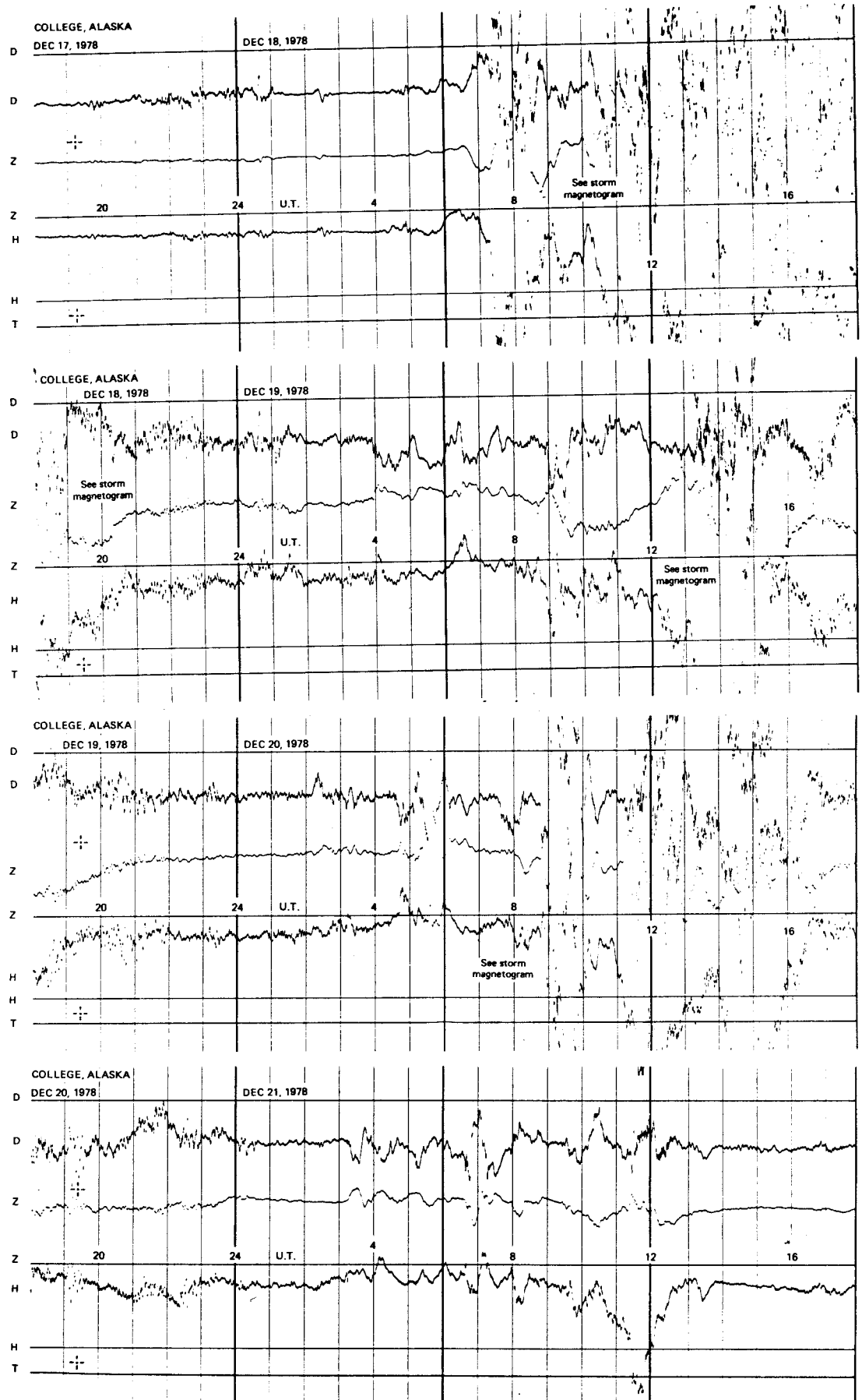
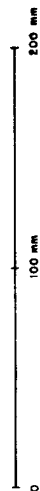


NORMAL MAGNETOGRAMS

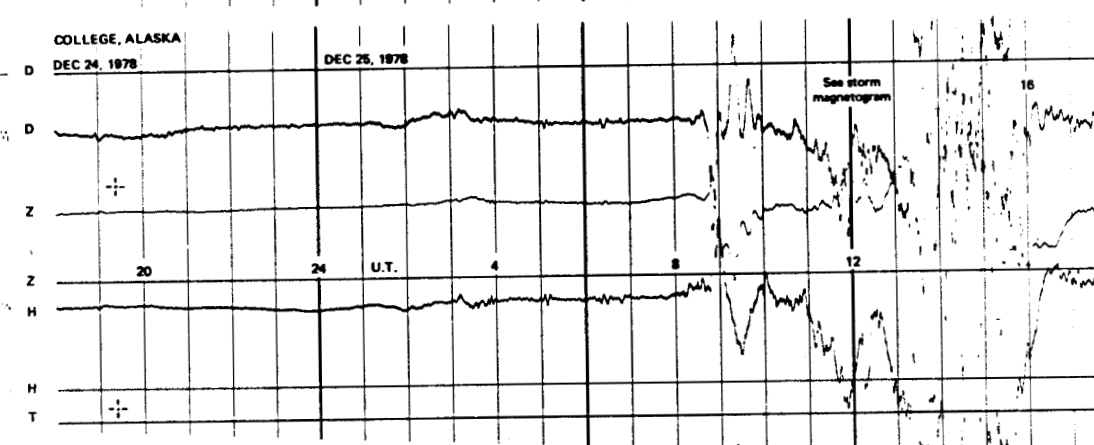
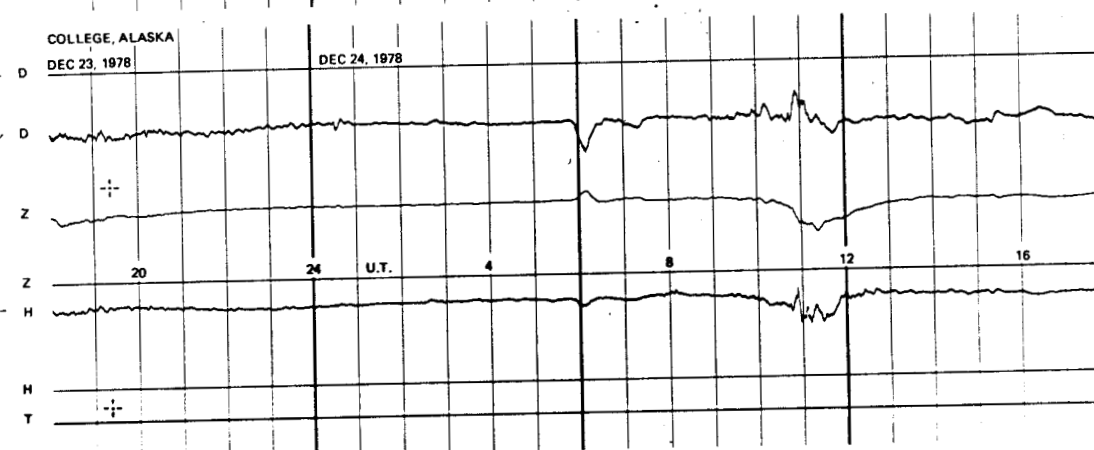
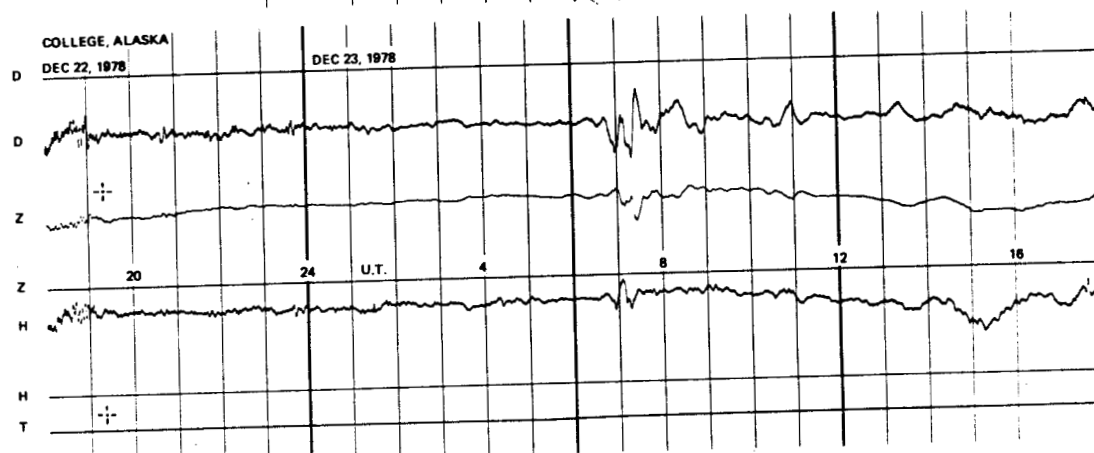
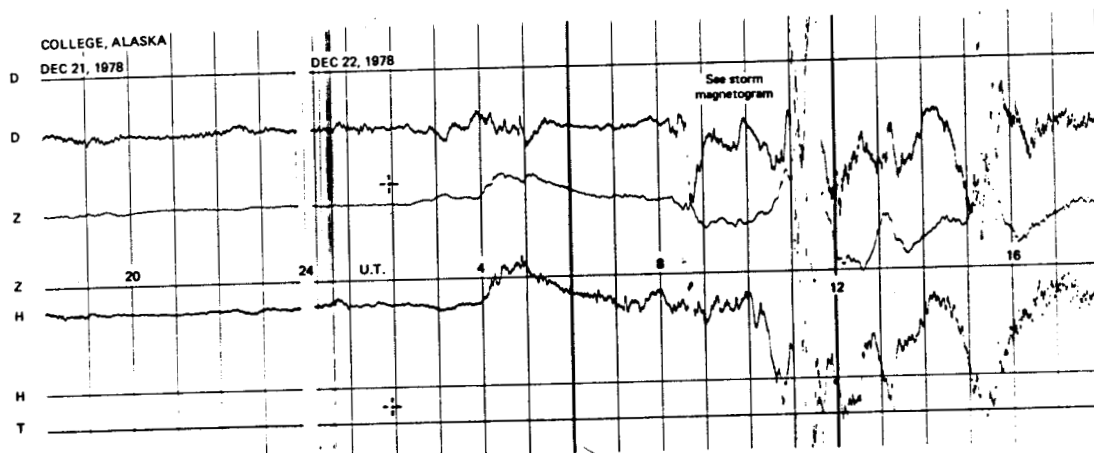
200 mm
100 mm
0



NORMAL MAGNETOGRAMS

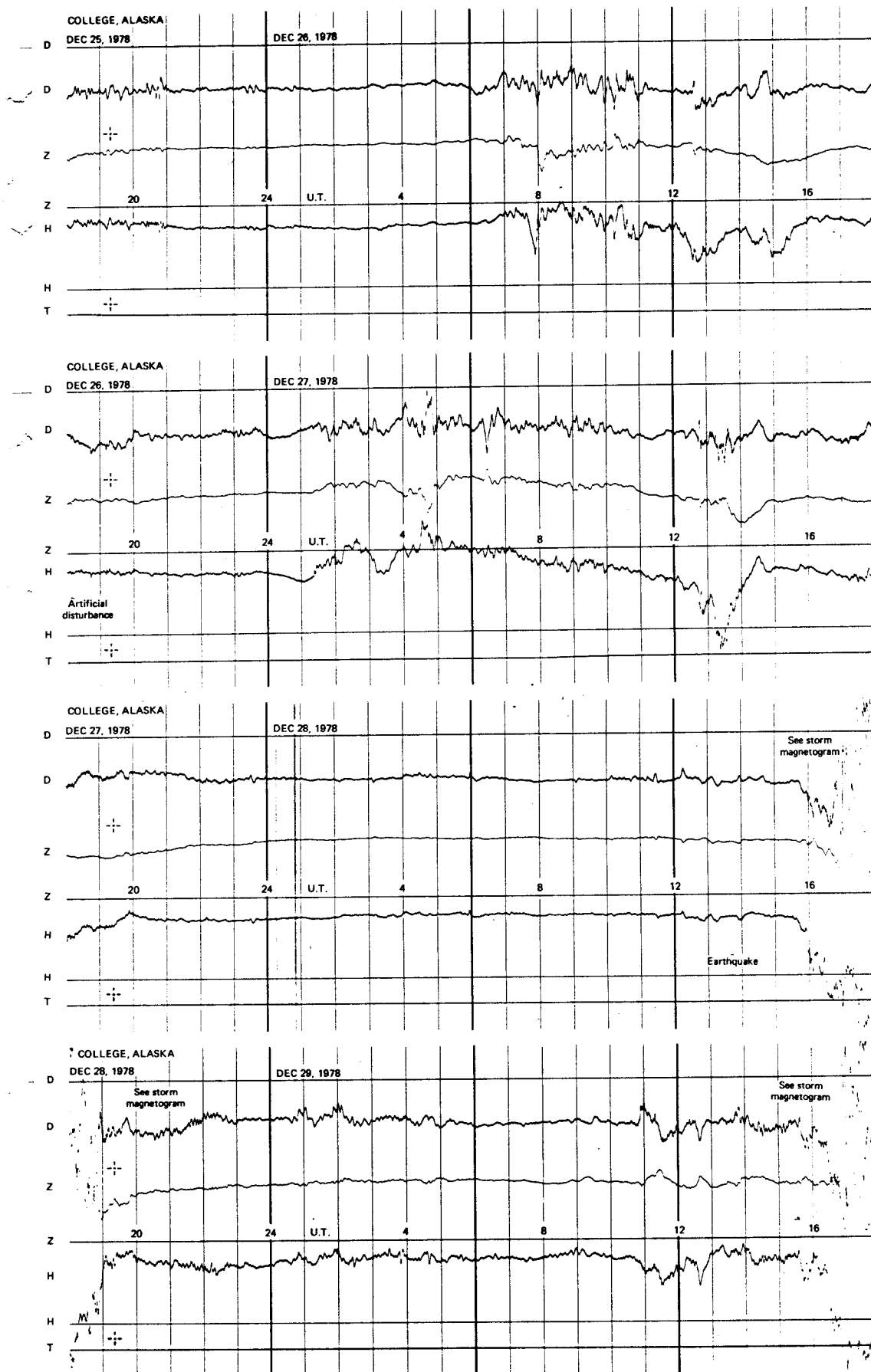


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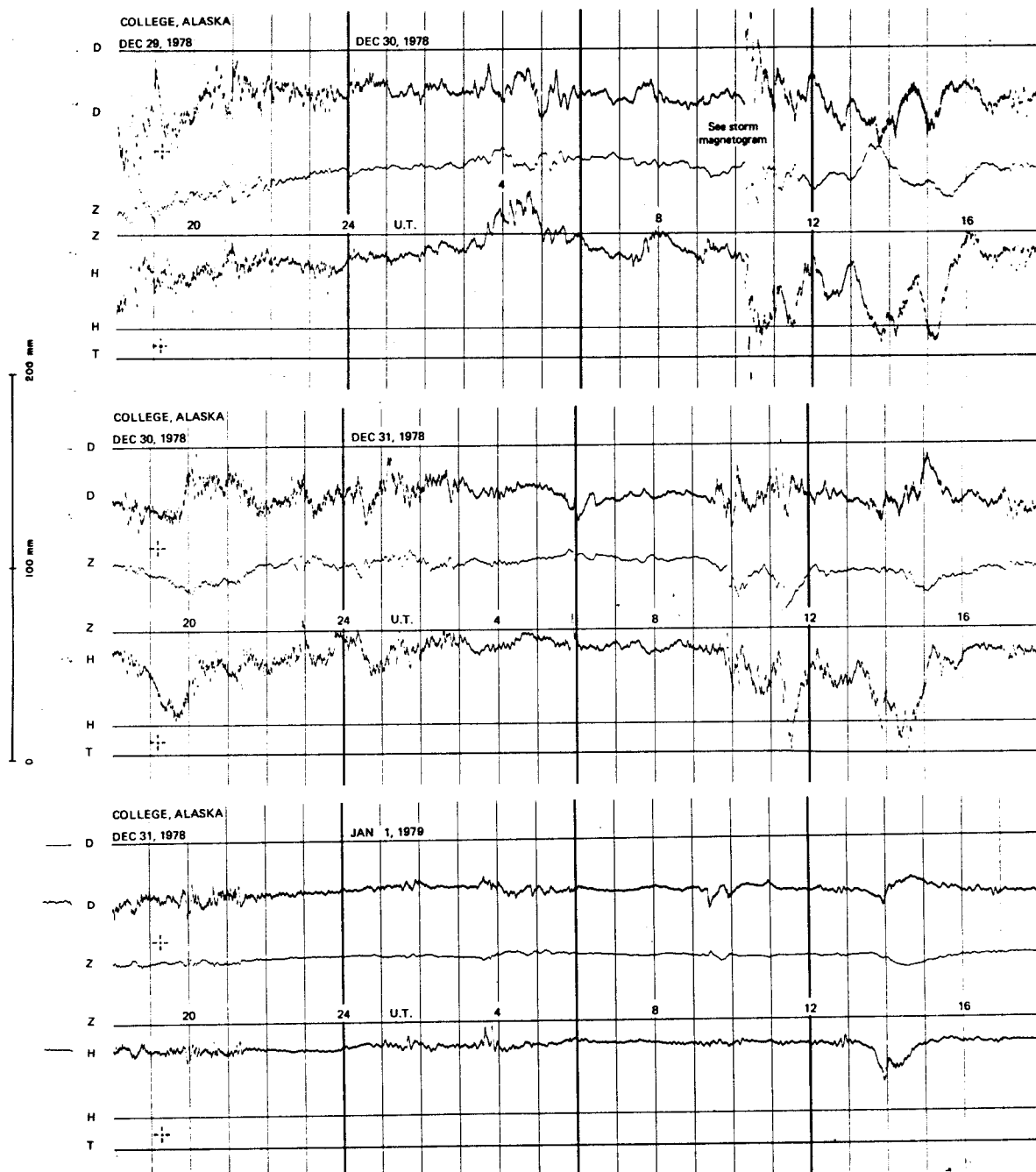


NORMAL MAGNETOGRAMS

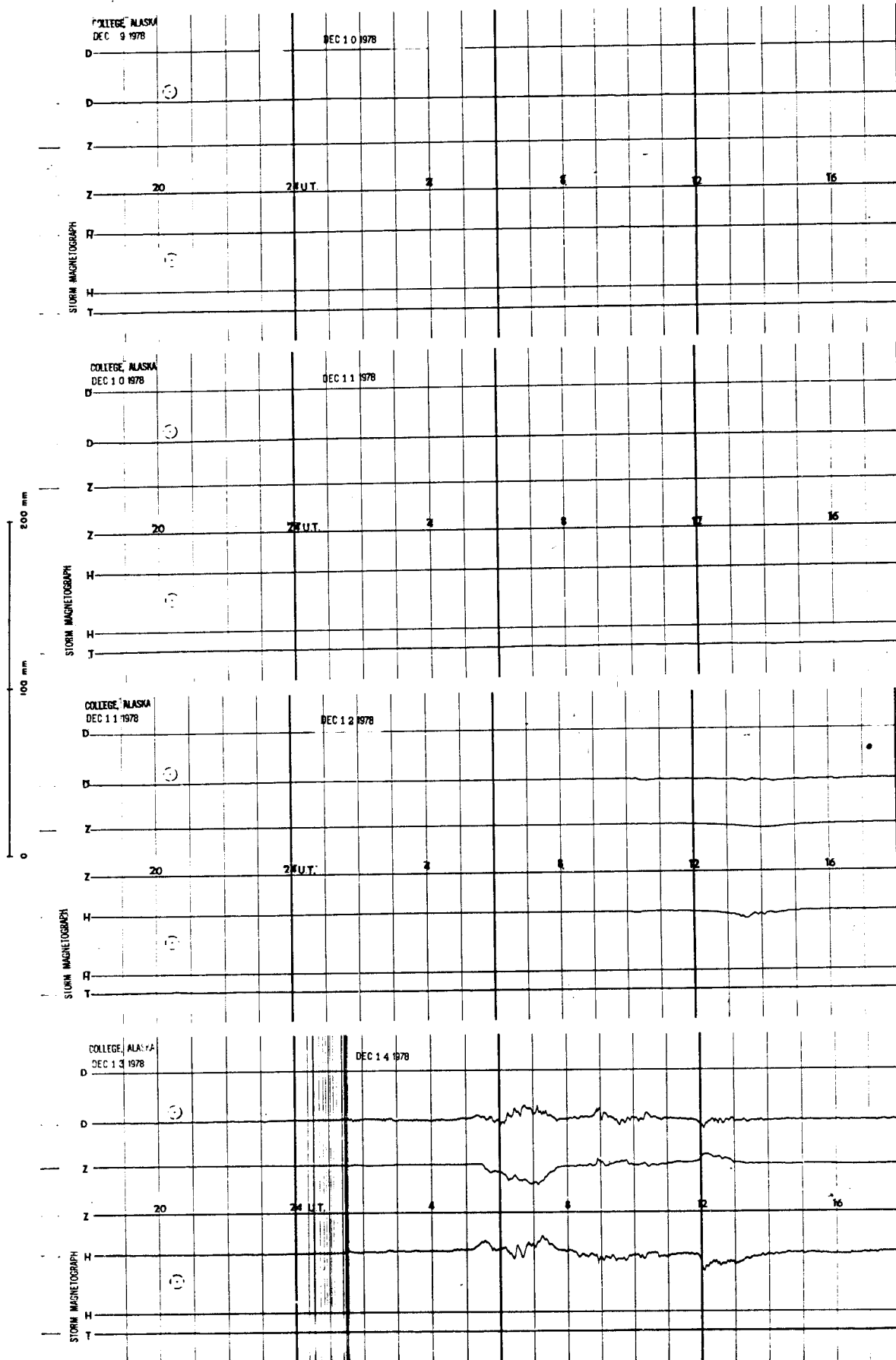
200 mm
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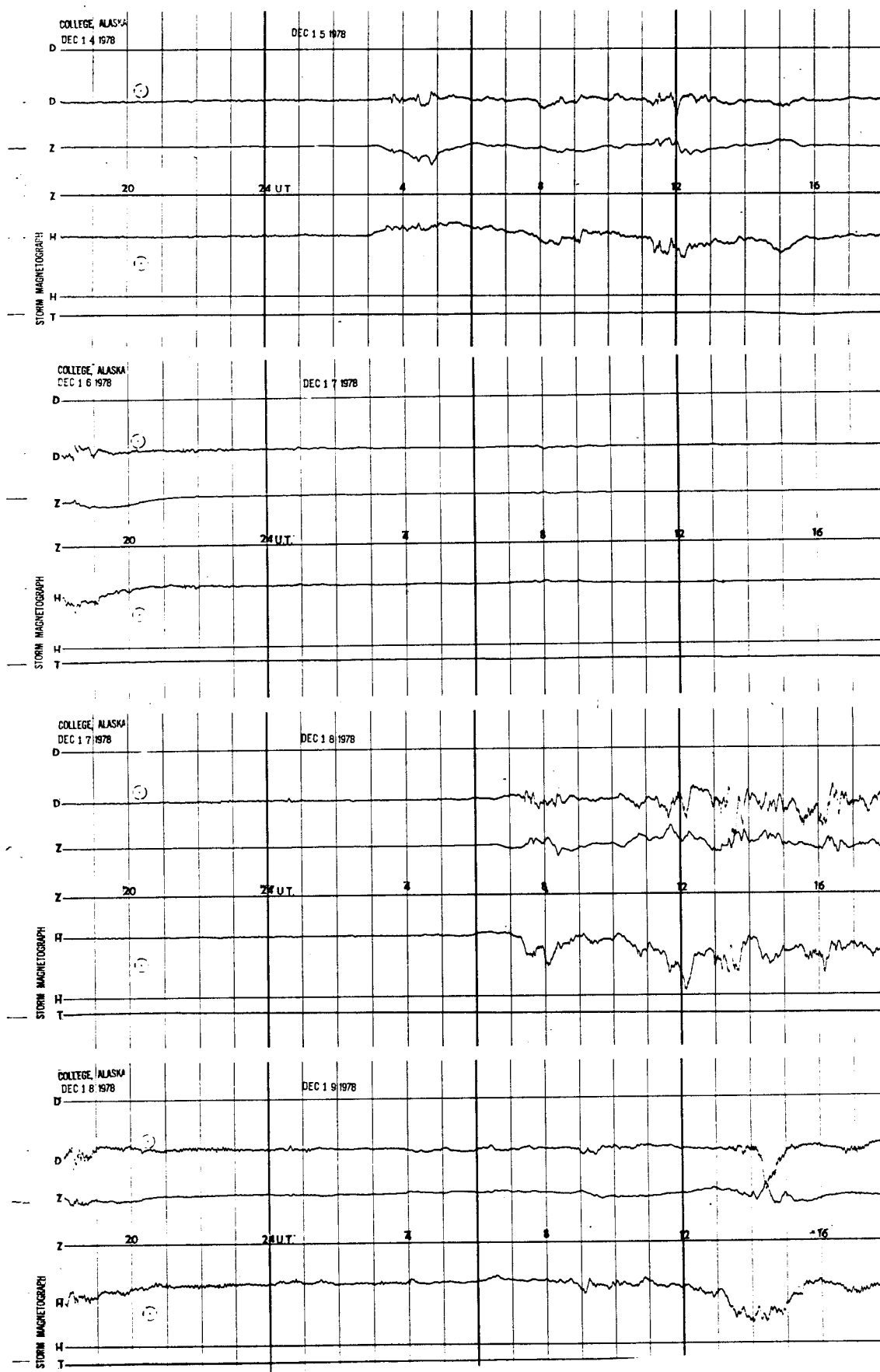


NORMAL MAGNETOGRAMS

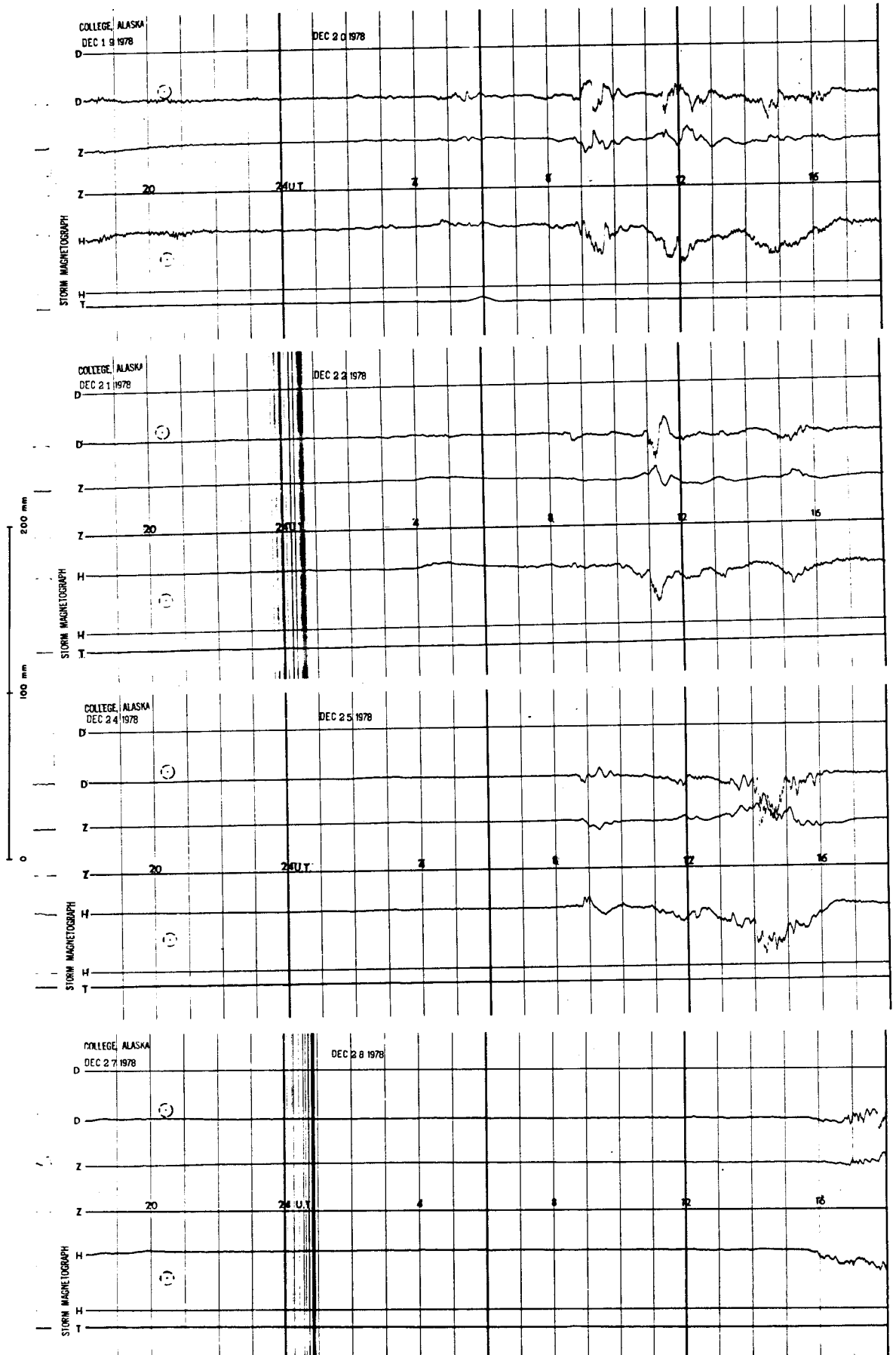


STORM MAGNETOGRAMS





STORM MAGNETOGRAMS



STORM MAGNETOGRAMS

