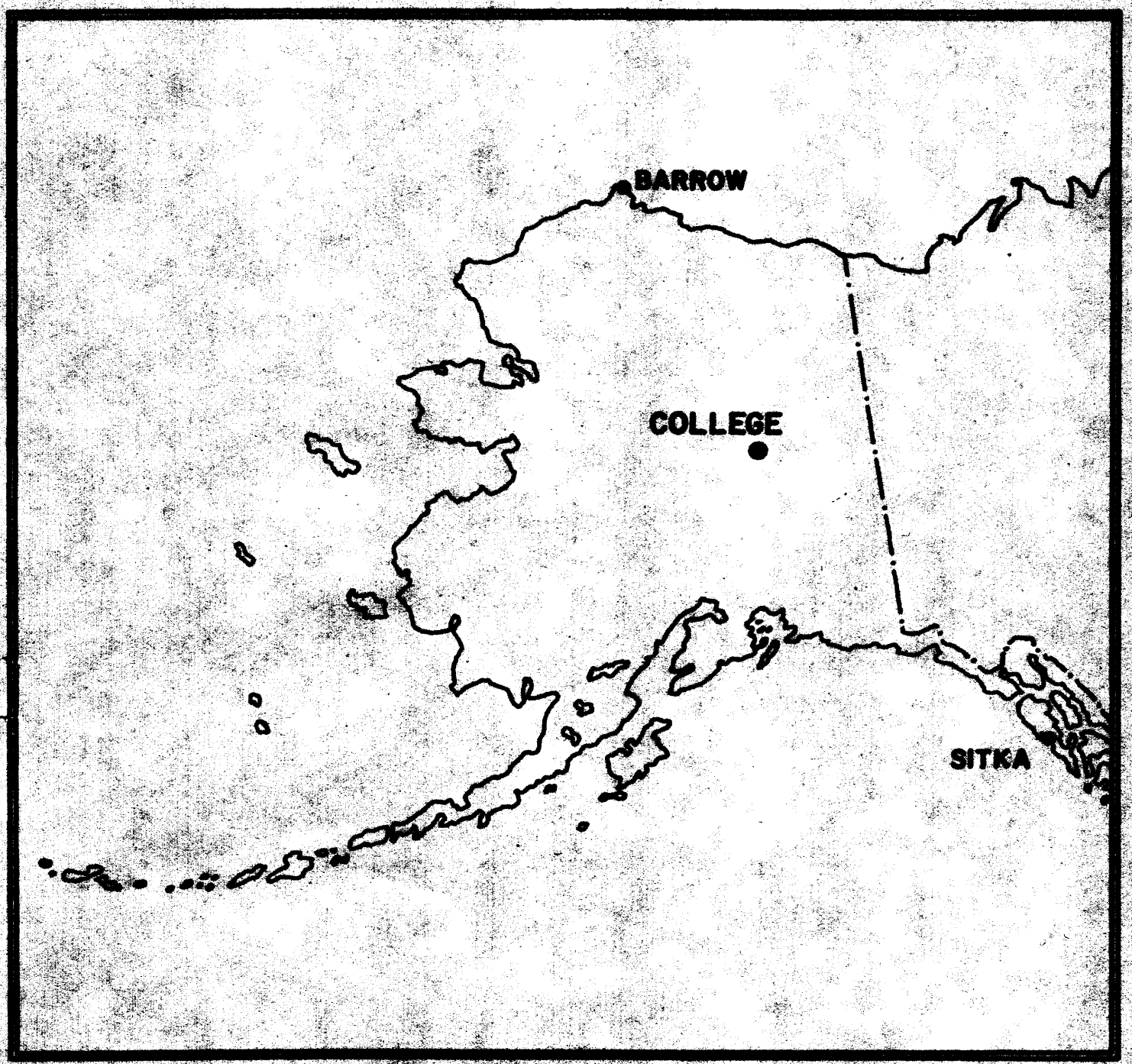
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

NOVEMBER 1988

OPEN FILE REPORT 88-0300K



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: R.V. O'CONNELL 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 GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

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 99775-5160

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

World Data Center A
NOAA D63m 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° 51.6'N
Geographic longitude.....147° 50.2'W
Geomagnetic latitude.....+64.6°
Geomagnetic longitude.....+256.5°
Elevation.....200 meters

GEOMAGNETIC DATA

Normal and storm magnetograms and appropriate calibration data are processed at the observatory and are available for analysis or copying. Also available are mean hourly scalings for the five quietest days for the month and K-Indices.

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 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 a 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)

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 averaged 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 sheet 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 one is interested in the detailed morphology of the magnetic field, 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

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

OBSERVATORY: College Alaska

MONTH AND YEAR: November 1988

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	1	0	2	2	0	3	2	1	11	05
2	3	2	4	6	5	6	6	3	35	44
3	3	4	6	6	7	3	3	2	34	47
4	2	1	2	4	4	3	1	1	18	12
5	2	2	3	5	5	5	2	0	24	23
6	0	4	3	5	4	4	3	2	25	21
7	2	4	2	5	5	5	3	1	27	25
8	2	3	5	5	6	6	4	2	33	39
9	2	1	2	6	5	6	2	1	25	29
10	2	3	4	5	6	3	2	1	26	25
11	0	1	1	2	1	3	3	2	13	07
12	2	2	1	3	4	6	3	2	23	20
13	2	1	1	4	3	4	2	2	19	12
14	1	1	2	6	5	2	2	2	21	20
15	2	2	1	4	4	3	2	2	20	13
16	1	2	6	6	3	5	5	3	31	37
17	3	3	4	5	5	1	2	1	24	21
18	0	0	2	4	4	3	2	2	17	11
19	1	0	0	0	1	0	1	1	4	02
20	0	0	0	0	0	1	0	0	1	00
21	0	0	1	0	0	0	1	0	2	01
22	0	0	3	2	0	0	0	0	5	03
23	0	0	0	0	0	0	0	0	0	00
24	1	0	1	0	0	0	0	0	2	01
25	0	0	1	1	0	1	2	2	7	03
26	3	2	6	6	6	4	2	1	30	37
27	1	1	2	6	4	2	2	1	19	17
28	1	2	2	4	6	1	2	1	19	17
29	1	2	3	3	3	3	1	2	18	10
30	1	1	5	6	5	7	5	2	32	47

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

d	h	m

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

BEGIN d	h	m	END d	h	m

K SCALE USED:	D	H	Z	
LOWER LIMIT FOR K = 9.....	675.7	322.2		(mm)
CURRENT SCALE VALUE.....	3.70	7.79		(γ/mm)
LOWER LIMIT FOR K = 9	2500	2510		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED John B. Townshend, Chief, College Observatory
OBSERVER IN CHARGE

NOAA FORM 76-133 SUPERSEDES C&GS FORM 815

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NOAA FORM 86-500
(11/73)

PRINCIPAL MAGNETIC STORMS

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

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA

November 1988

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	2	07xx	..				3	5	7	201	1300	1110	3	16
		30	06xx	..				30	6	7	227	1235	980	30	21

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: November 1988

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0001 UT, 11/1/88	2359 UT, 11/19/88	1.0'/mm	3.7 γ/mm	26°51.1' E
	0000 UT, 11/20/88	2400 UT, 11/30/88	(SAME)		26°51.2' E
H	1200 U.T., 10/28/88	2359 UT, 11/19/88	7.8 γ/mm		12625 γ
	0000 UT, 11/20/88	2400 UT, 11/30/88	(SAME)		12620 γ
Z	0001 UT, 11/1/88	2359 UT, 11/19/88	7.7 γ/mm		55172 γ
	0000 UT, 11/20/88	2400 UT, 11/30/88	(SAME)		55175 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 11/1/88	2400 UT, 11/30/88	7.9'/mm	29.5 γ/mm	
H	(SAME)	(SAME)	43.6 γ/mm		
Z	(SAME)	(SAME)	49.2 γ/mm		

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27°08.6' E	12816 γ	55315 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: NOV 19, 20, 21, 23, 24

U.S. Dept. of Interior
Geological Survey

Observatory **COLLEGE, ALASKA** | Month NOVEMBER | Year 1988

Jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

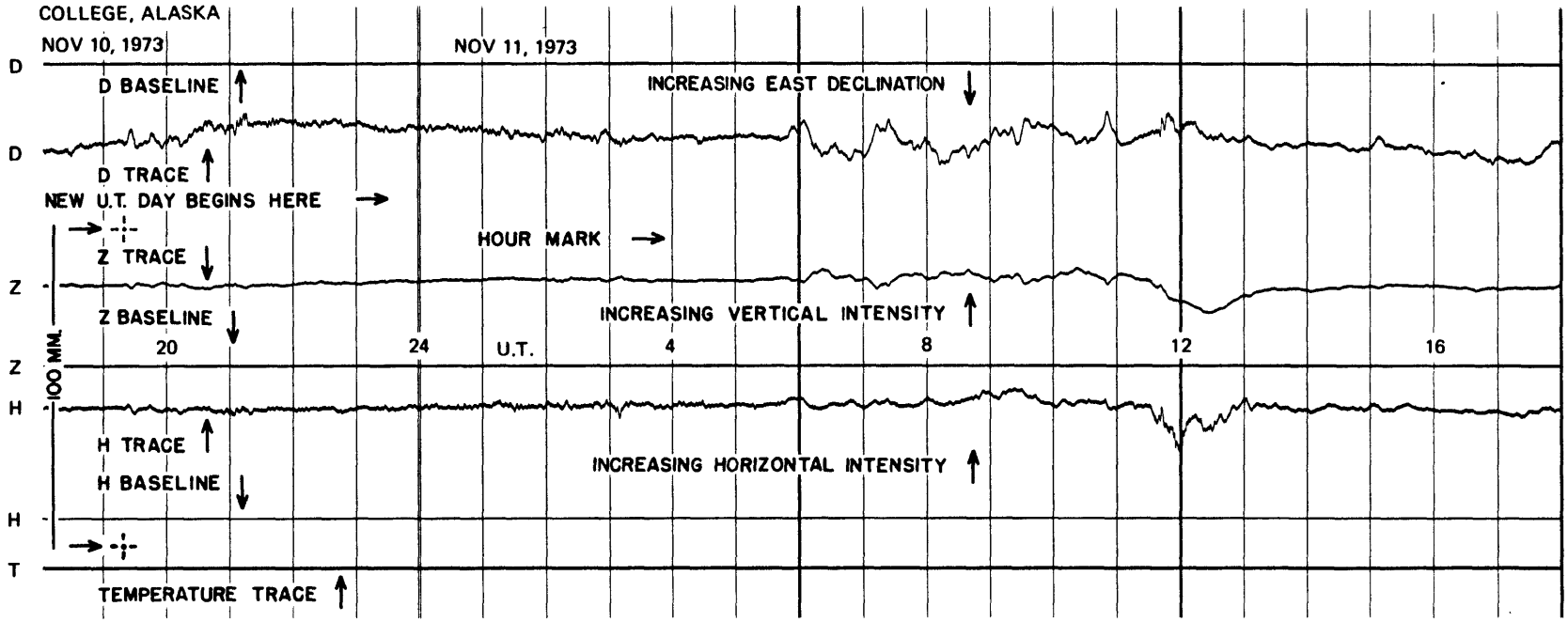
(UNIVERSAL TIME)

Values are in Tenths of mm and are Averages for Successive Periods of One Hour beginning at Midnight. Shrinkage Corrections have been applied. Negative Values in Red with Minus.

COMPONENT		D					H					Z					COMPONENT
DAY		19	20	21	23	24	19	20	21	23	24	19	20	21	23	24	DAY
A_k		02	00	01	00	01	02	00	01	00	01	02	00	01	00	01	A_k
HOUR	01	142	169	162	159	156	241	239	234	240	231	190	190	181	178	176	01 HOUR
	02	163	168	156	159	148	240	240	235	248	240	193	191	185	179	179	02
	03	159	167	154	156	130	249	242	241	259	262	192	191	185	178	182	03
	04	163	167	155	159	150	251	243	256	259	262	190	190	190	179	190	04
	05	164	168	142	157	179	259	246	256	254	255	191	190	199	181	190	05
	06	162	172	140	152	178	260	249	256	254	257	191	190	206	191	182	06
	07	175	174	155	171	174	254	248	280	258	258	192	188	232	200	185	07
	08	171	174	139	166	170	252	249	269	260	259	193	185	234	201	187	08
	09	169	170	170	177	176	258	249	260	253	260	195	186	221	195	188	09
	10	179	172	178	180	172	253	250	251	249	250	197	186	205	190	187	10
	11	179	175	173	170	170	250	250	246	250	255	191	186	190	180	179	11
	12	190	175	174	174	180	249	250	247	248	253	190	185	188	173	180	12
	13	191	179	180	175	182	250	250	249	250	250	182	185	186	172	180	13
	14	178	180	186	178	187	239	251	250	250	250	179	185	185	174	180	14
	15	183	193	190	181	186	245	248	250	252	250	179	185	185	176	179	15
	16	182	180	191	189	191	240	230	250	250	252	181	176	185	176	179	16
	17	188	190	198	191	199	243	253	249	250	251	178	170	185	177	179	17
	18	200	210	209	197	202	248	257	250	245	249	184	180	182	180	176	18
	19	198	212	220	200	203	248	253	249	241	246	189	181	181	180	175	19
	20	199	206	219	201	203	241	250	247	240	248	186	180	180	179	175	20
	21	180	198	199	190	191	241	246	244	236	244	185	181	173	177	172	21
	22	176	189	181	182	179	240	242	238	238	240	189	181	176	176	172	22
	23	173	180	181	169	170	243	239	238	240	240	190	181	178	172	173	23
	24	170	177	180	162	162	249	239	226	241	241	190	181	182	174	173	24
DAILY SUM		4234	4345	4232	4195	4238	5933	5913	5971	5965	6003	4517	4424	4594	4338	4318	DAILY SUM
DAILY MEAN		176	181	176	175	177	247	246	249	249	250	188	184	191	181	180	DAILY MEAN
MEAN			177					248					185				MEAN

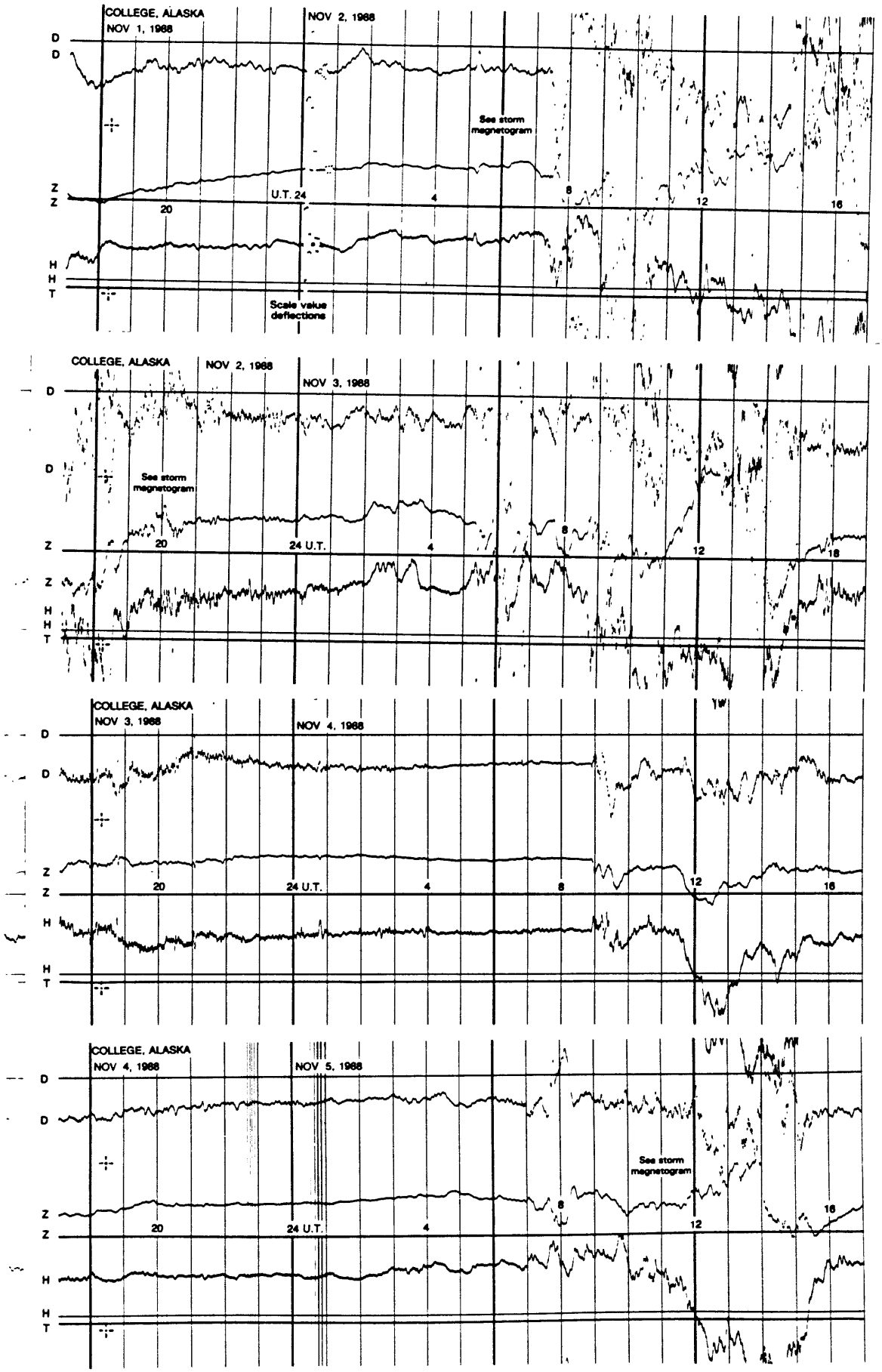
Scaled RVO | Checked

FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)



SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS



200 mm
100 mm
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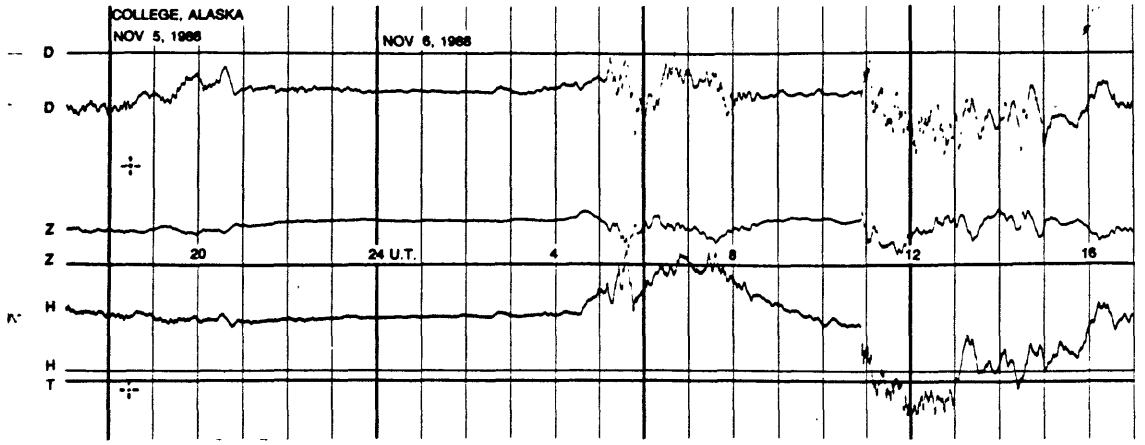
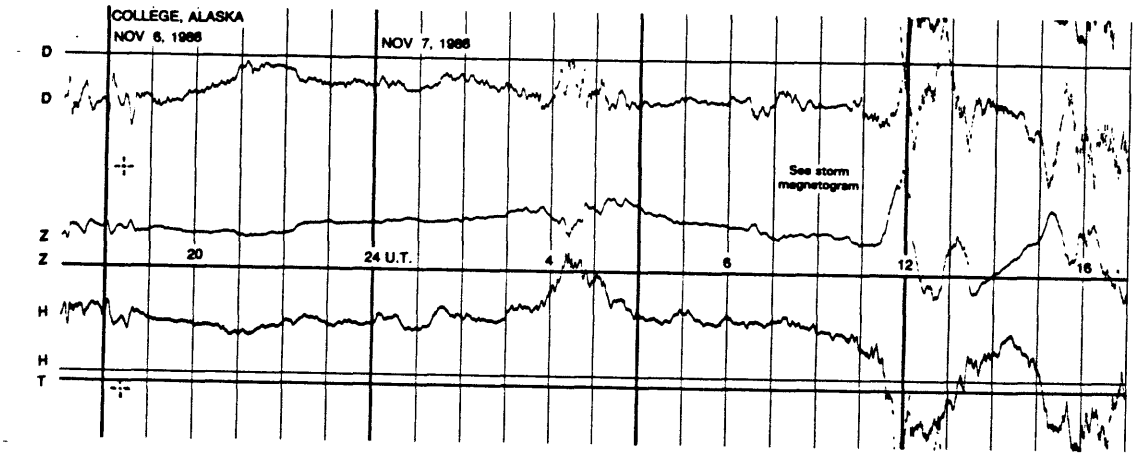
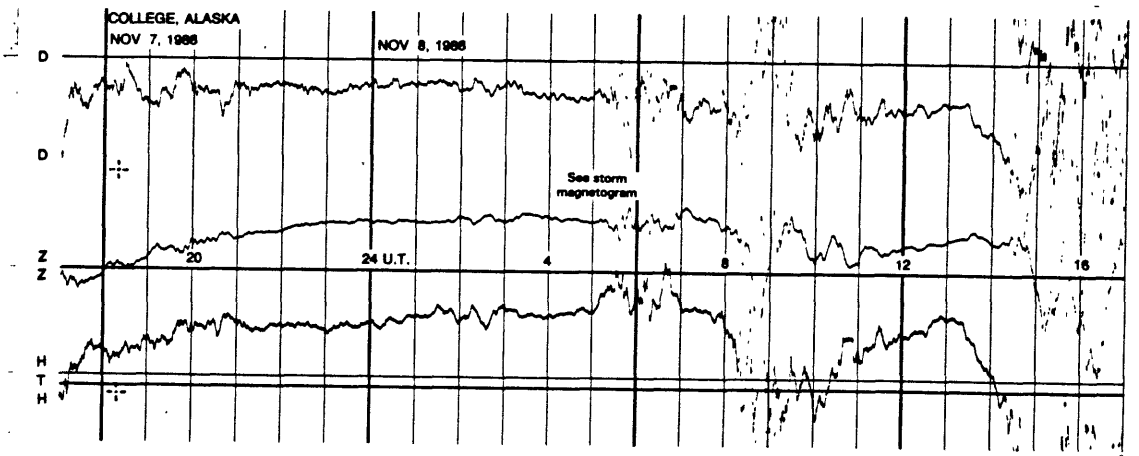
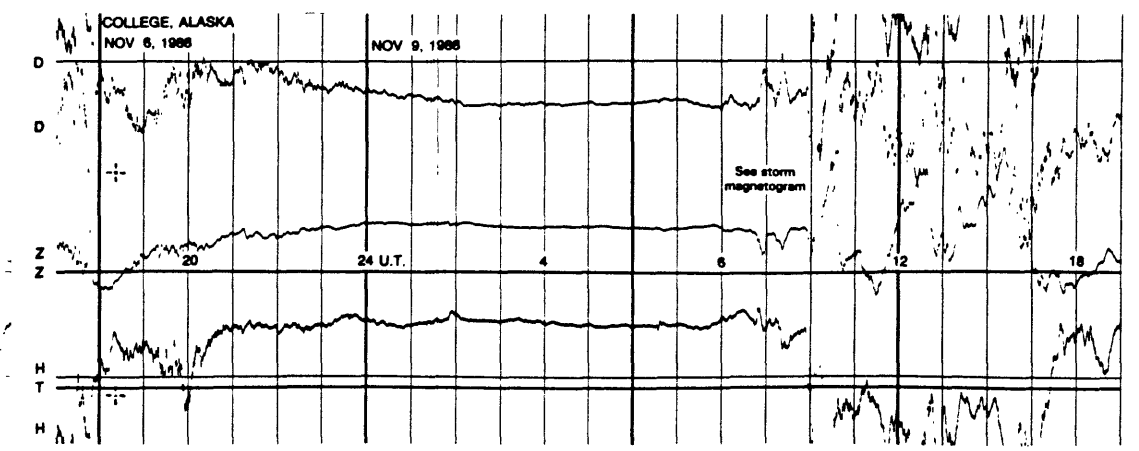
NORMAL MAGNETOGRAMS









200 mm
100 mm
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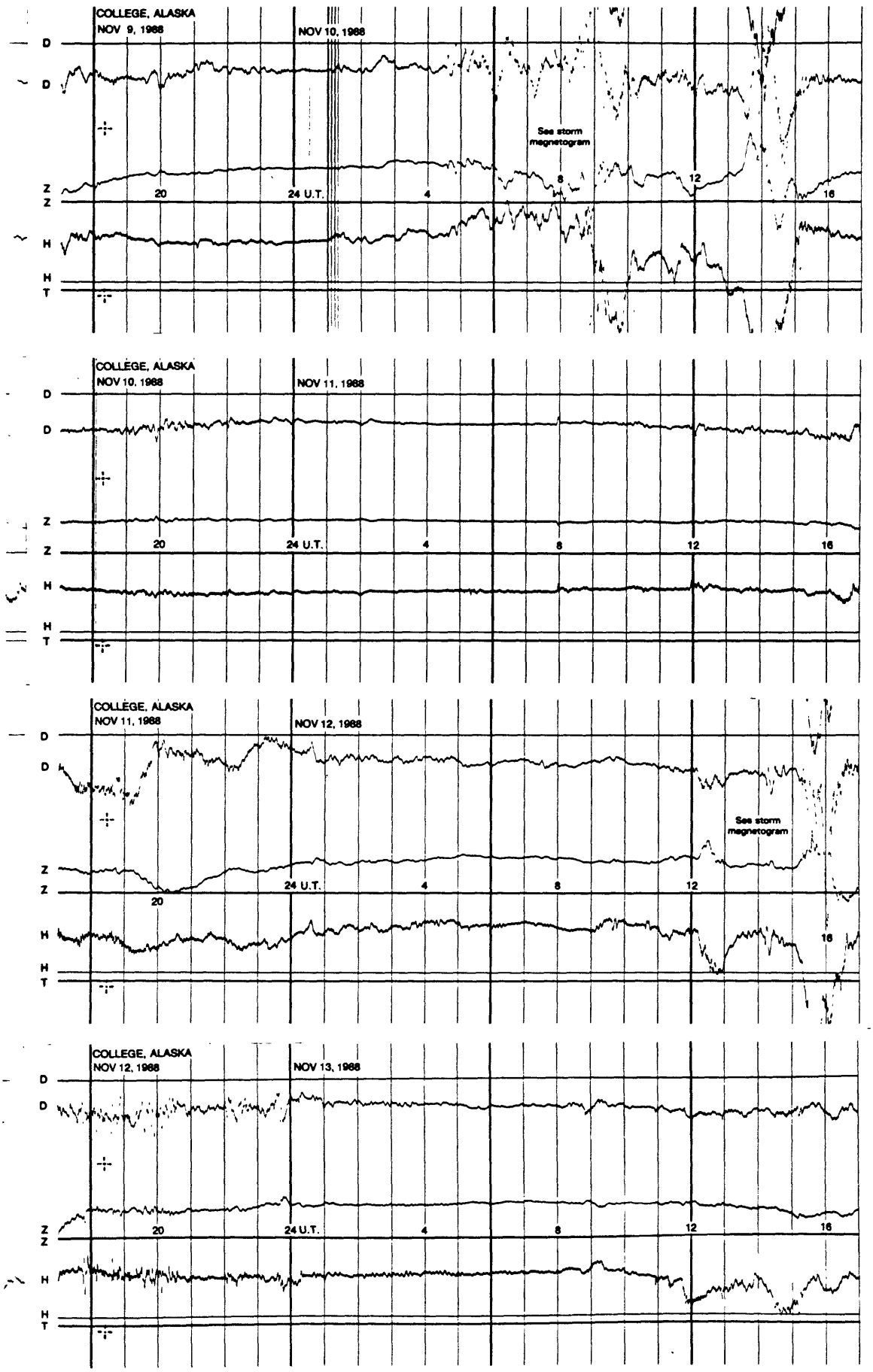

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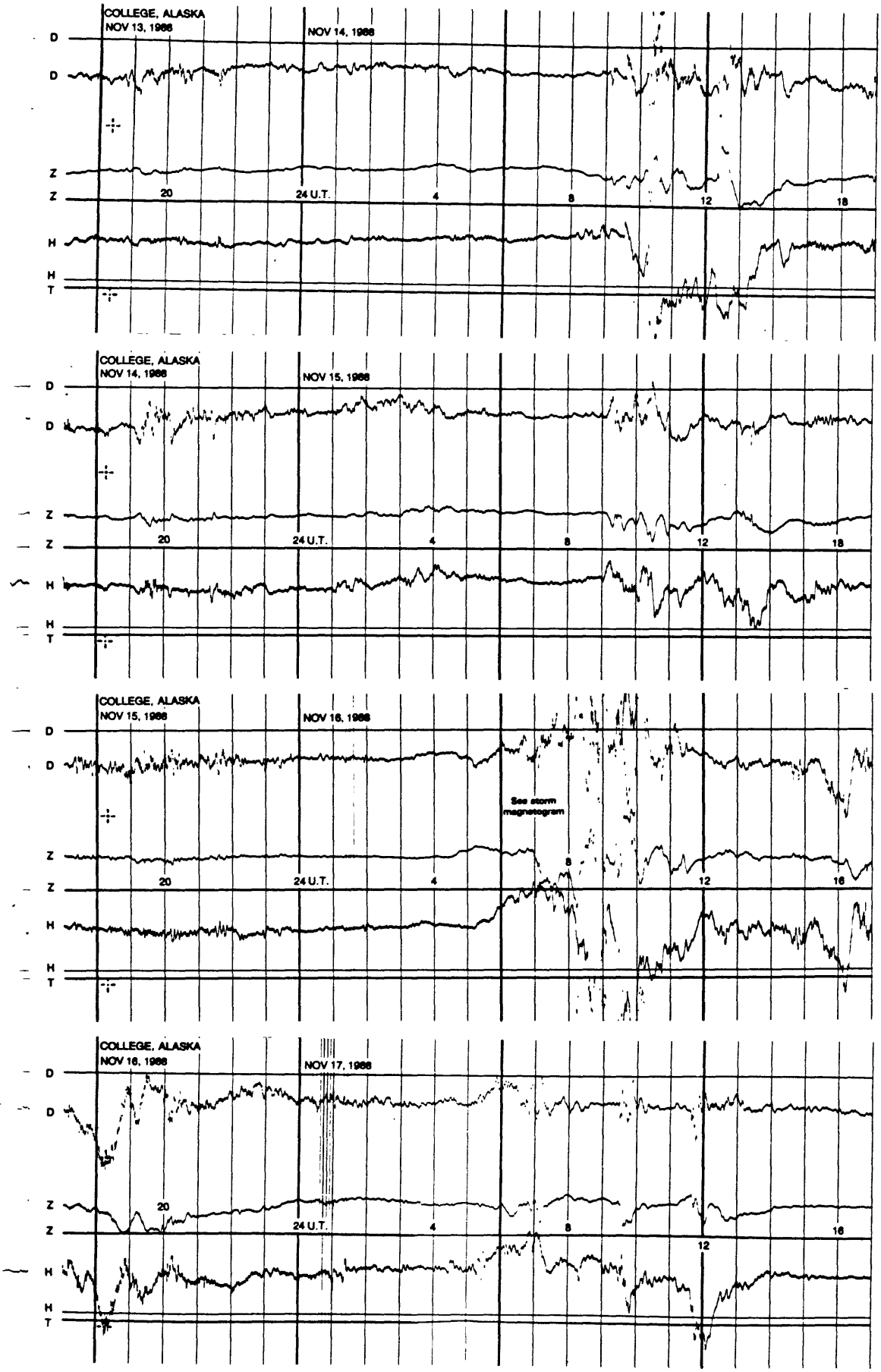

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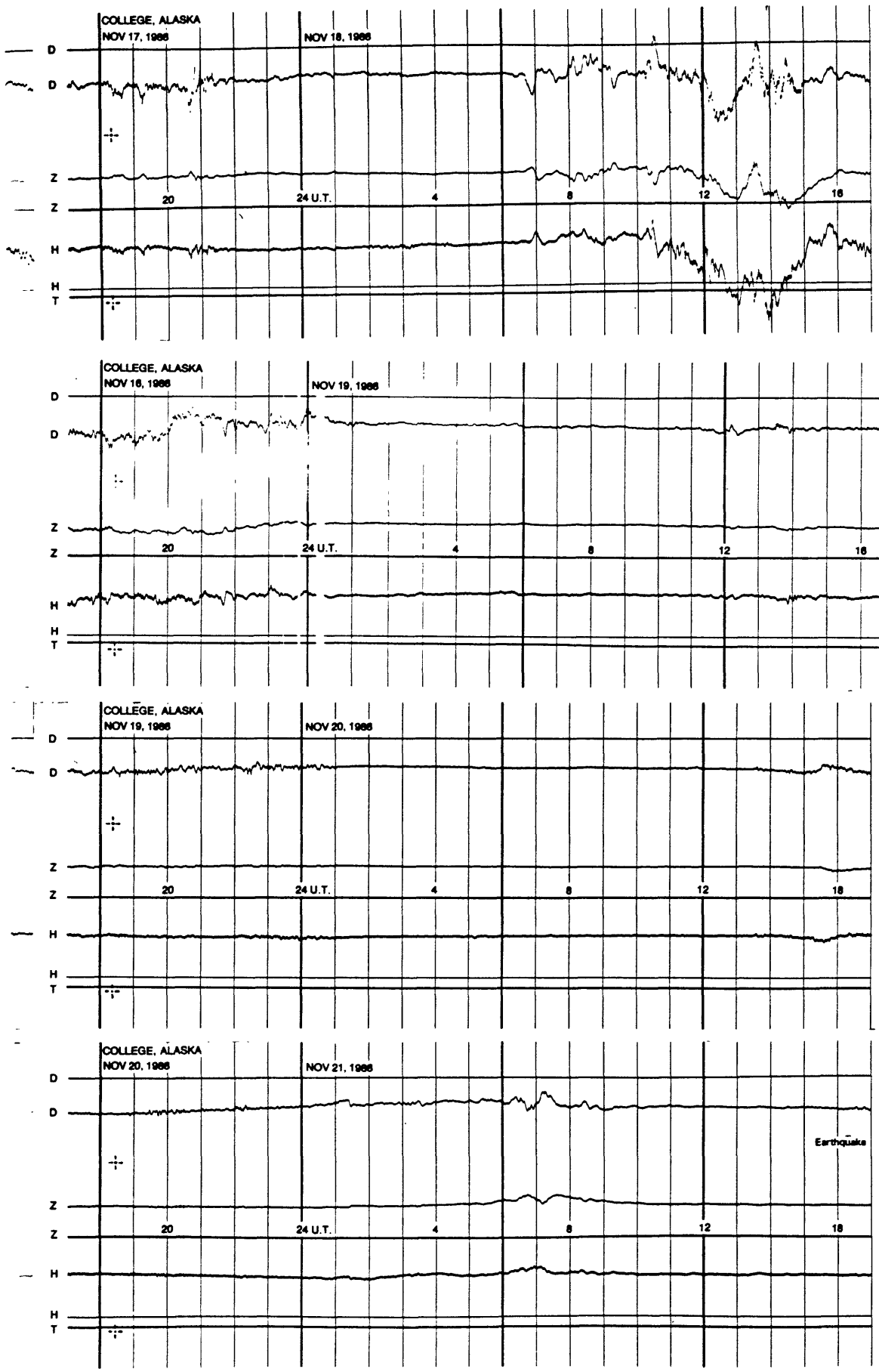

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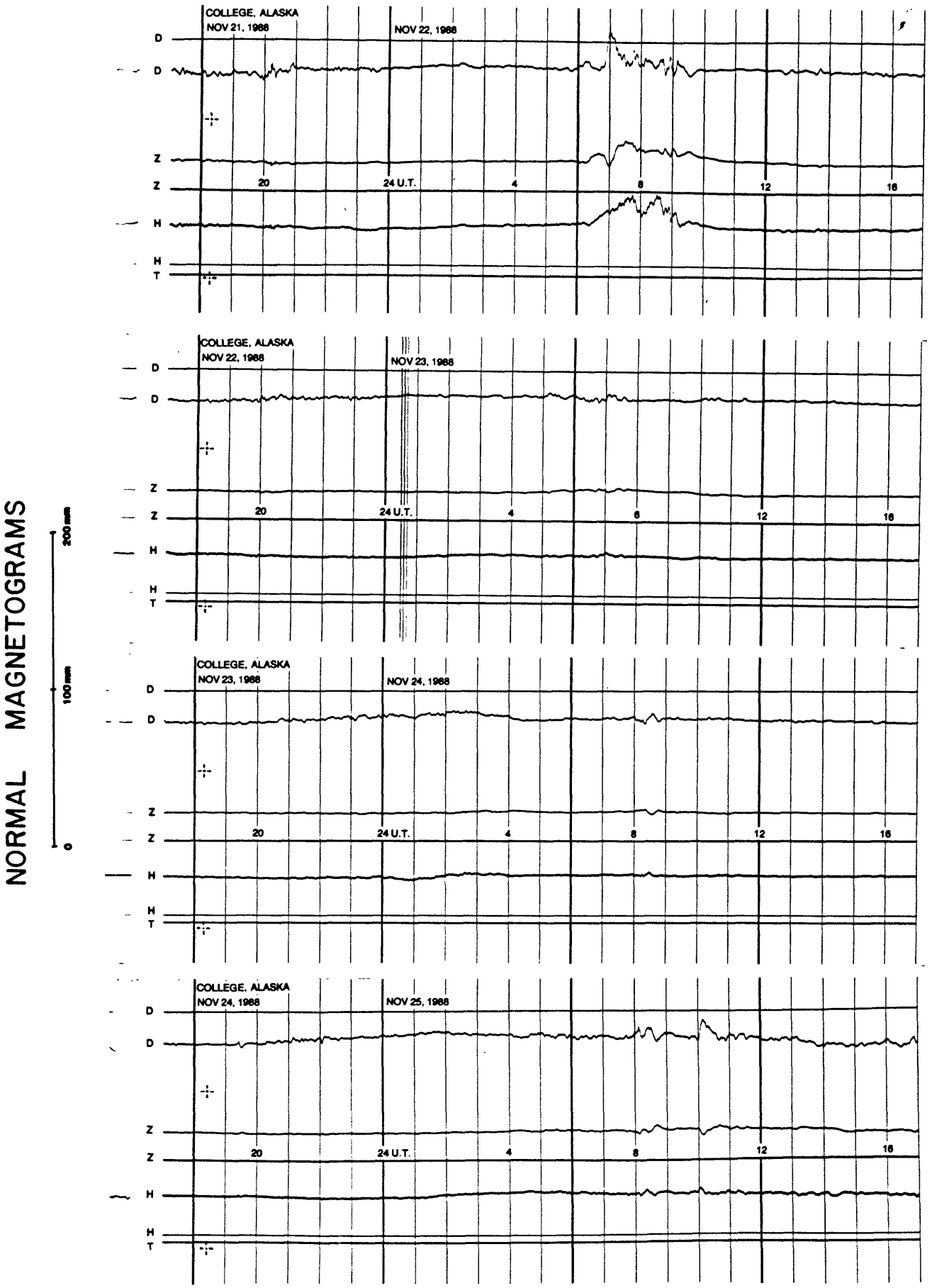

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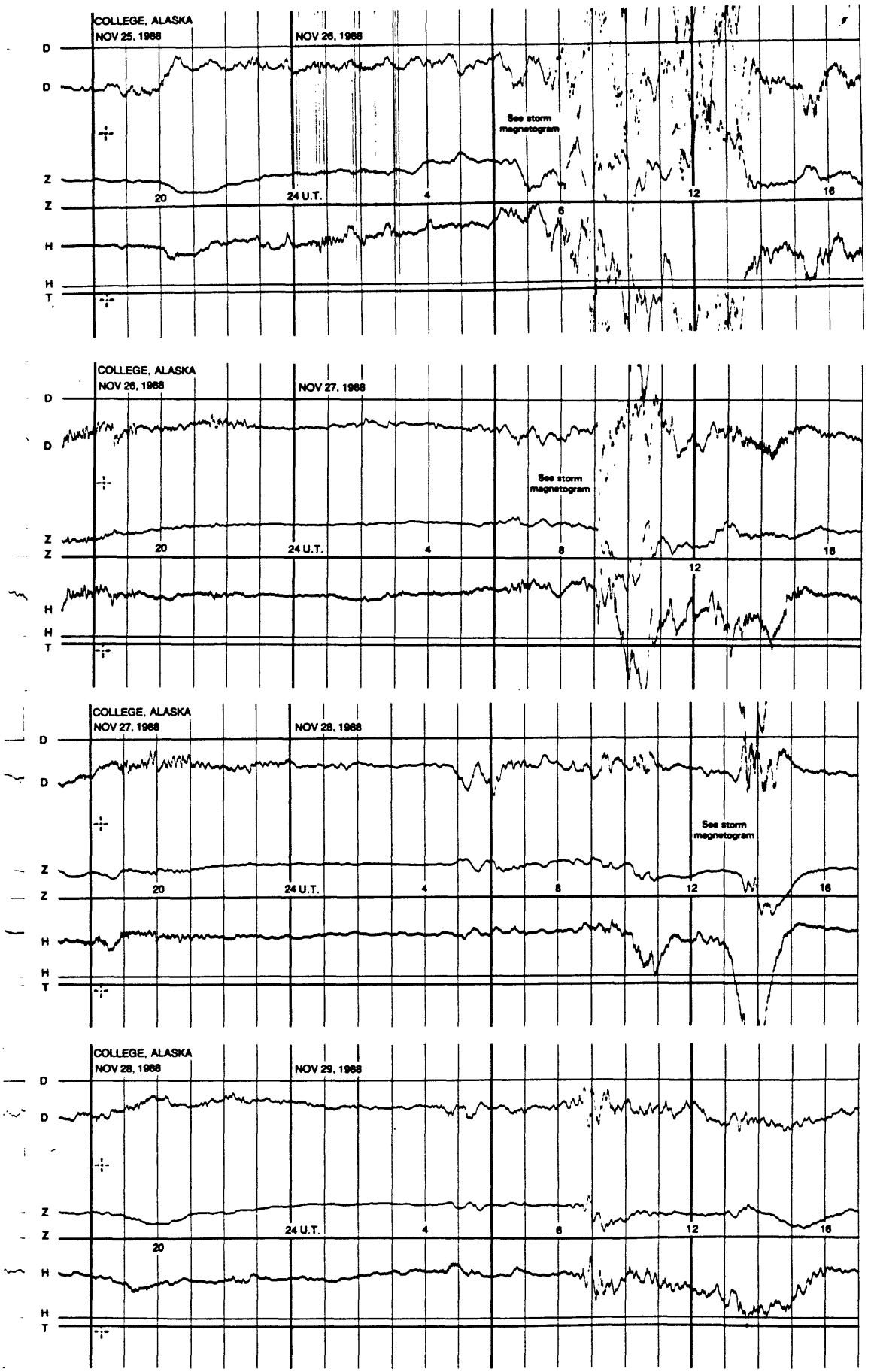
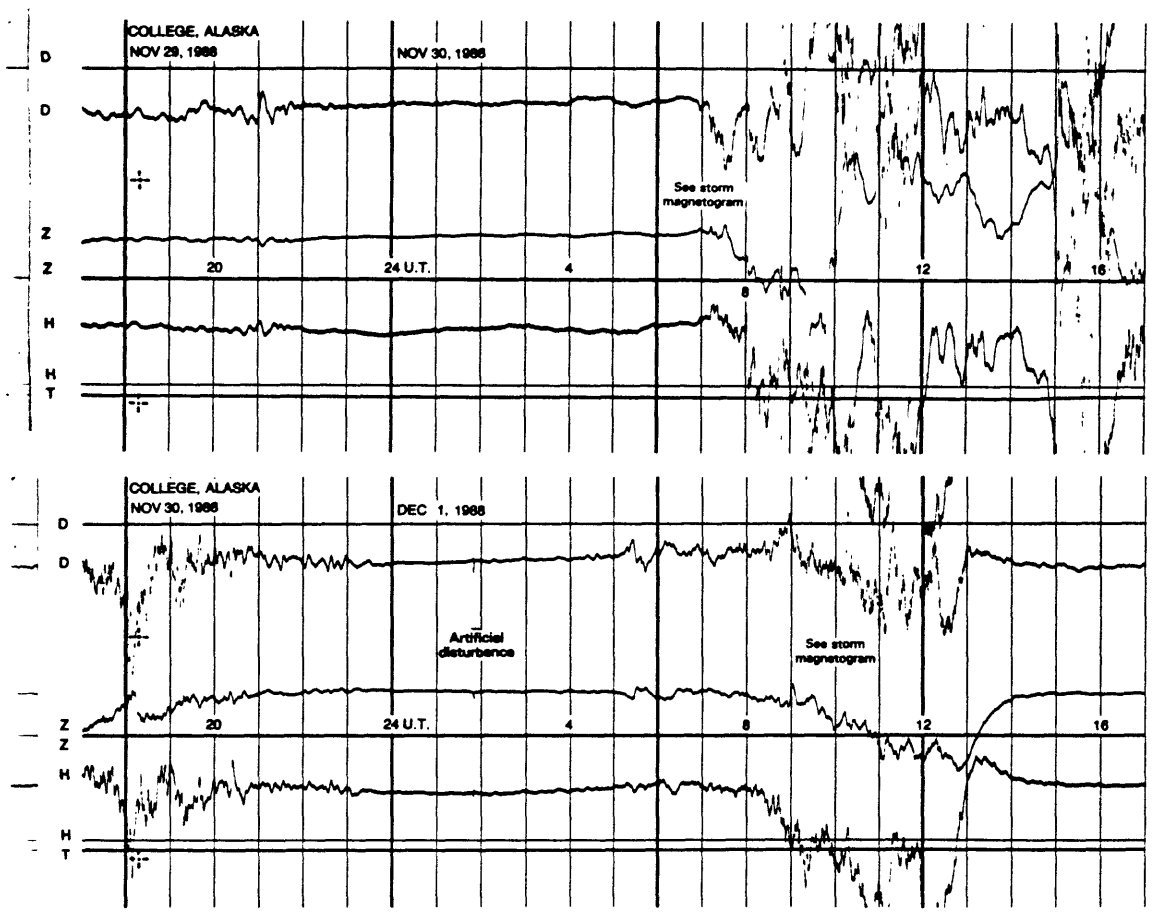


200 mm
100 mm
0

NORMAL MAGNETOGRAMS



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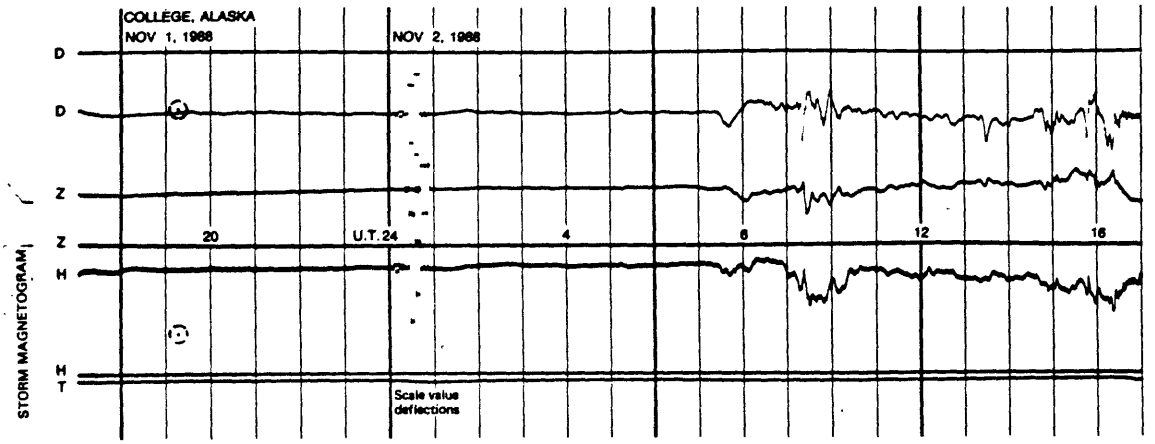

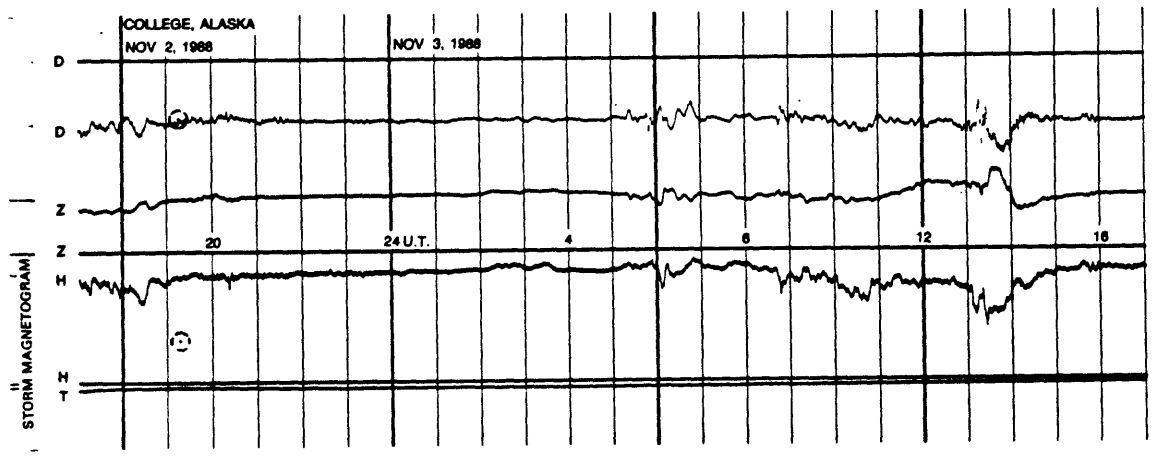

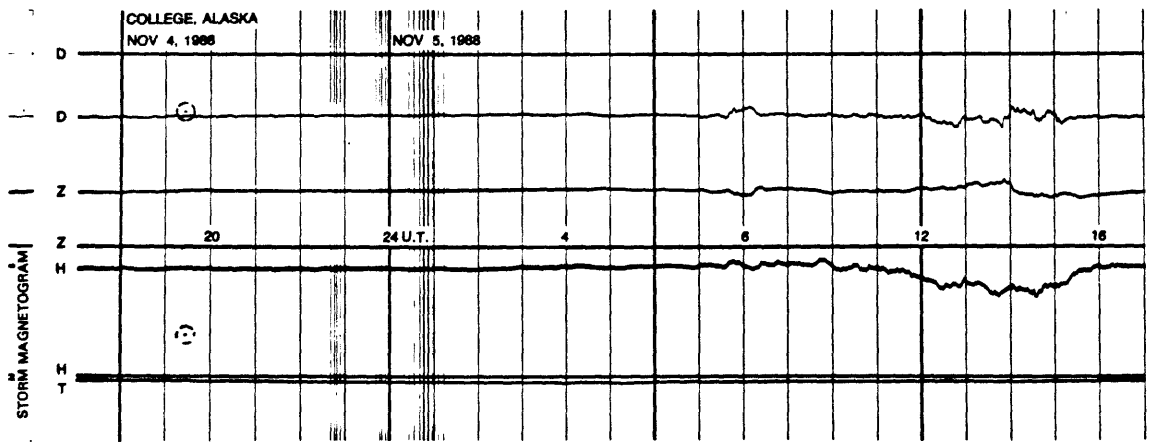

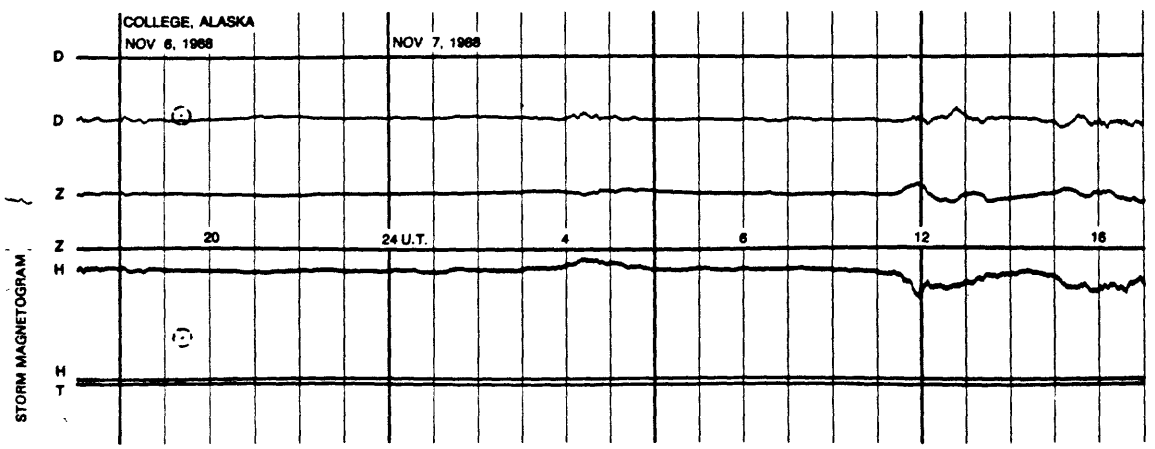

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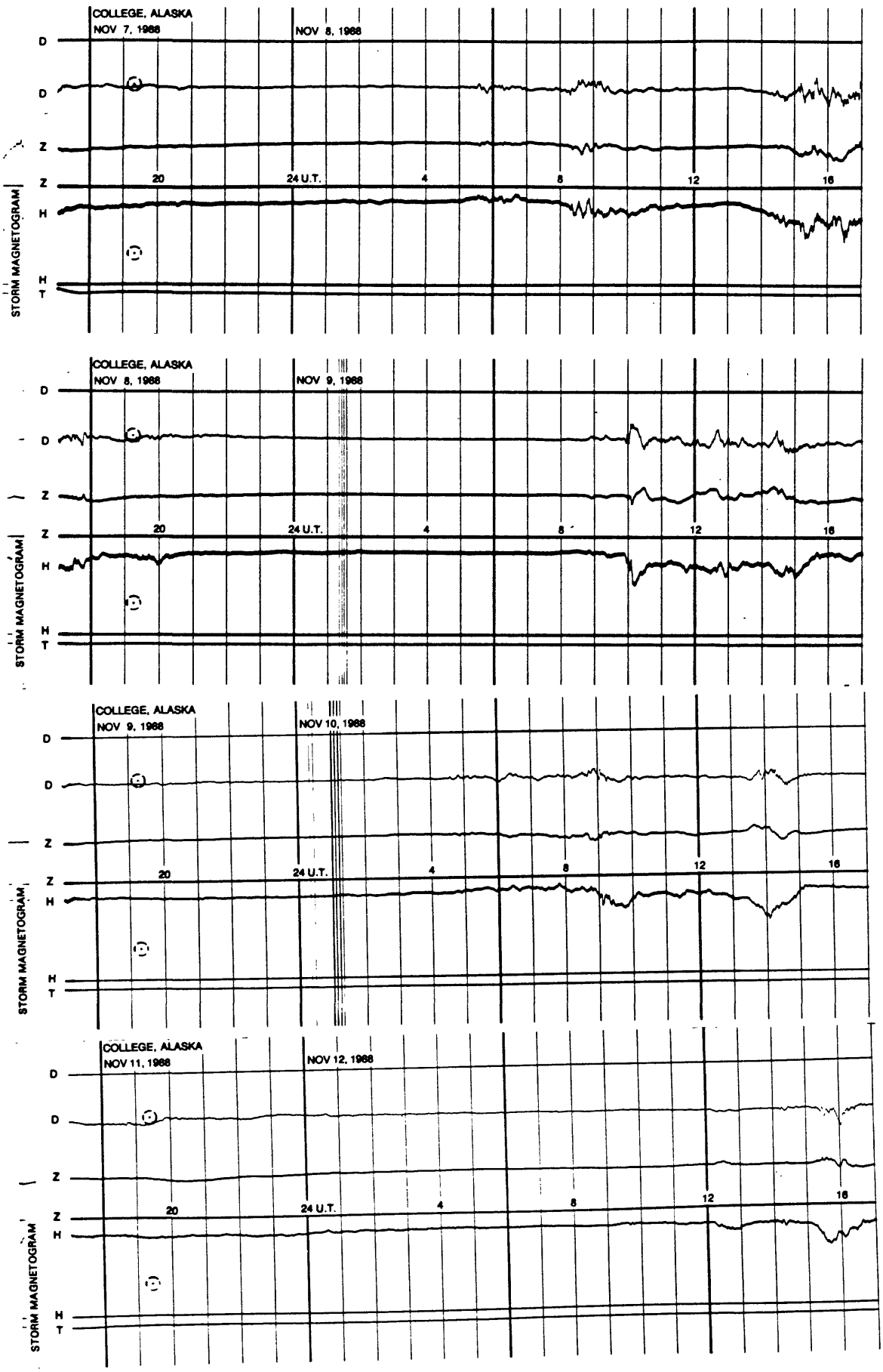

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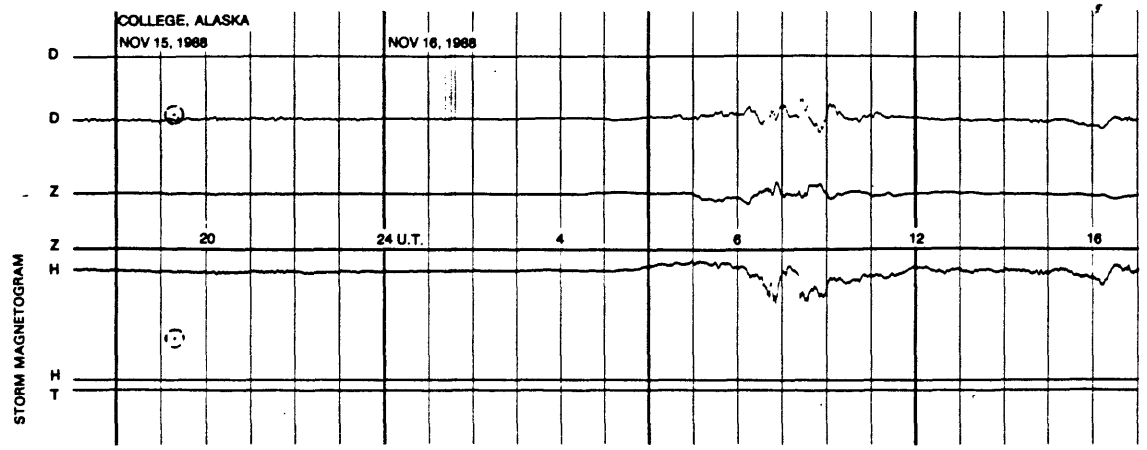

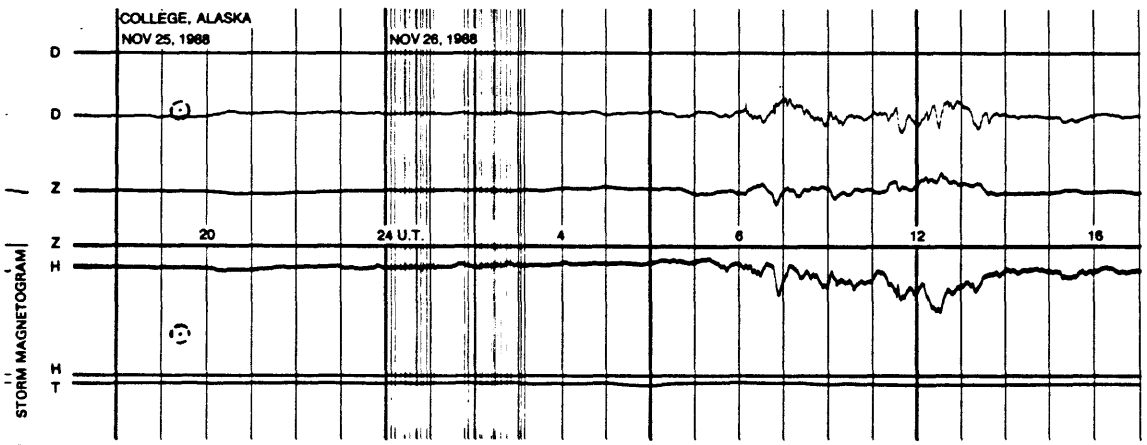

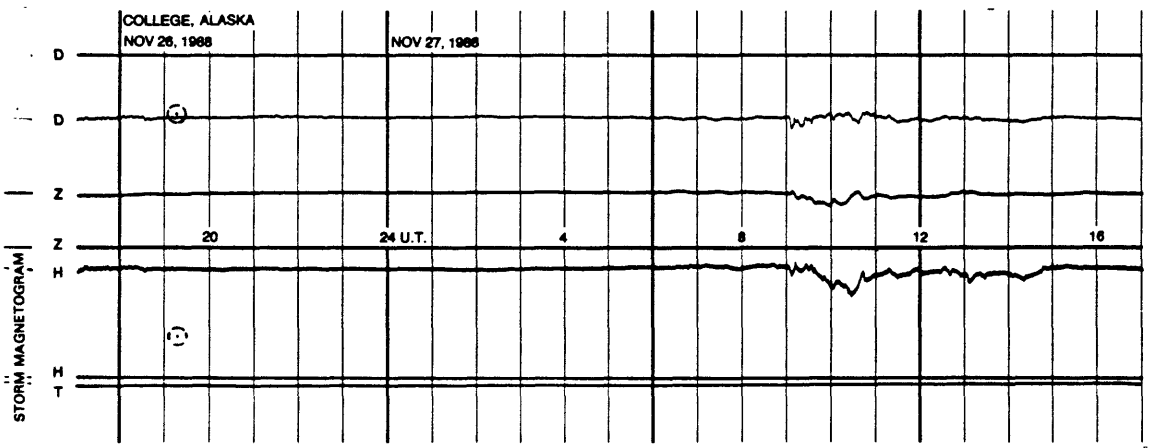

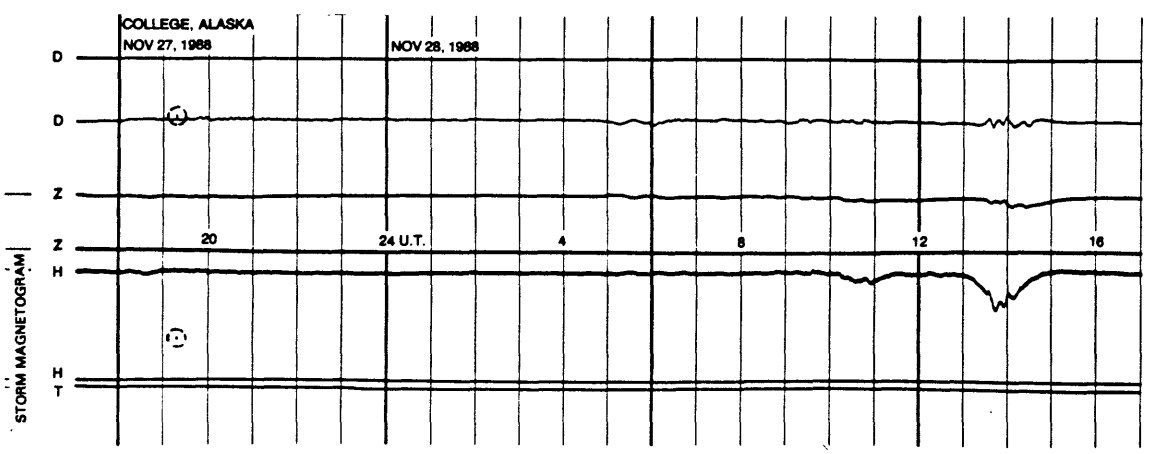

STORM MAGNETOGRAMS