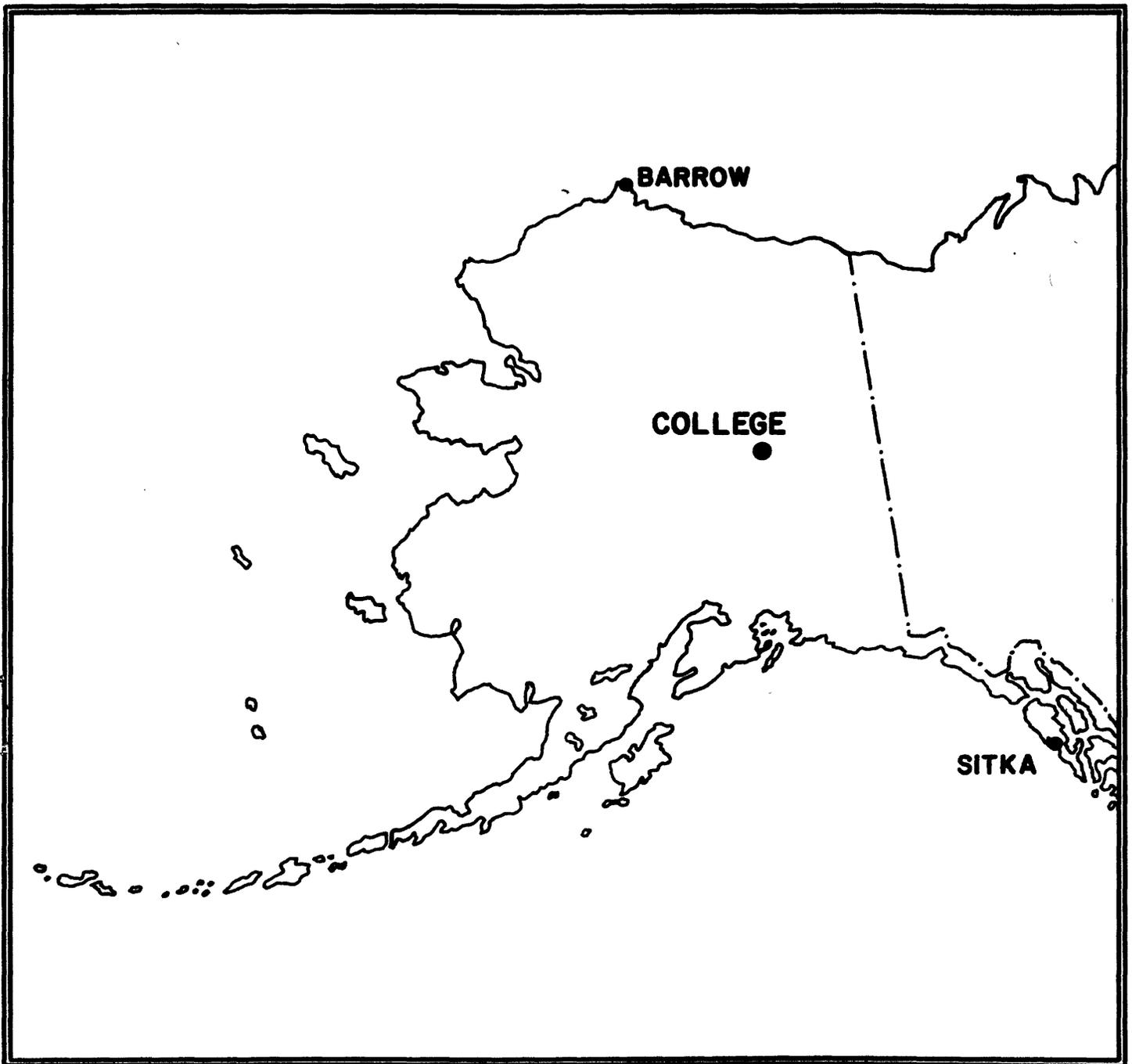


**UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

**PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA**

FEBRUARY 1992

OPEN FILE REPORT 92-0300B



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 CAROL ANN VARNER AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA FAIRBANKS. THE COLLEGE OBSERVATORY IS PART OF THE BRANCH OF GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

Explanation of Data and Reports

Magnetic Activity Report

Principal Magnetic Storms

Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings - Five Quietest Days

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

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. 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 the 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

EXPLANATION OF DATA & REPORTS

Available Data & Reports

Normal and storm magnetograms and appropriate calibration data are processed at the observatory and are available for analysis or copying. Magnetic Activity Report (K-Indices & AK values), Principal Magnetic Storms Report, and Magnetogram Hourly Scalings for the five quietest days of the month are also available.

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 an accuracy not justified.

The schedule for converting gamma range to K, and K to ak is as follows:

<u>Gamma Range</u>	<u>K-Index</u>	<u>ak</u>
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)

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 commencement; 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 magnetogram.

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:

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

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.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA

FEBRUARY 1992

Obs	Geomag lat.	Commencement (UT)			SC -amplitudes			Max. 3 hr -index K			Ranges				UT End day hr
		day	hr min	type	D(')	H nT	Z nT	day	(3 hr - period)	K	D(')	HnT	ZnT		
CO	64.6 N	1	11 XX	..				1	6	7	283	1690	1150	4 00	
		8	14 29	SC		+130		3	3	7	555	3880	1910	9 21	
		20	01 09	SC	-5	-71	-10	20	6	7	282	1700	1130	21 14	
		26	16 57	SC	+47	-83		21	2,4	7	431	2110	1190	27 04	
		27	08 48	SC	+53	-390		26	6	8	175	1250	860	27 23	
		29	09 26	SC	+14	-275		27	4,6	7	307	1310	940	29 22	
								29	5,6,7	7					

NORMAL MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0001 U.T., 2-1-92	2400 U.T., 2-29-92	1.0' /mm	3.7 γ/mm	25° 58.5' E
H	0001 U.T., 2-1-92	2400 U.T., 2-21-92	7.7 γ/mm		12618 γ
	0001 U.T., 2-22-92	2400 U.T., 2-29-92	↓		622 γ
Z	0001 U.T., 2-1-92	2400 U.T., 2-29-92	7.8 γ/mm		55216 γ

STORM MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0001 U.T., 2-1-92	2400 U.T., 2-29-92	7.9' /mm	29.3 γ/mm	
H	(SAME)	(SAME)	43.4 γ/mm		
Z	(SAME)	(SAME)	49.0 γ/mm		

The College Observatory has used several absolute instruments and different observing piers since it began operations in 1948. To avoid artificial secular shifts in the absolute values published when instruments were changed, corrections were applied to provide continuity in the data from the time the Observatory began operating. For many years the instruments used for observing absolute values have had zero correction. Effective with the May 1989 Preliminary Data Report, in accordance with a directive issued by the USGS Branch of Global Seismology and Geomagnetism analysis personnel, these longstanding corrections are discontinued and all data listed (D, H & Z) are for the position at absolute pier 1a and without any corrections applied. The net effect of these changes is as follows:

- Declination (D): No Change
- Horizontal Intensity (H): -5γ; i.e., H absolute and baseline values are 5γ less than previously reported.
- Vertical Intensity (Z): +33γ; i.e., Z absolute and baseline values are 33γ higher than previously reported.

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
26° 34.2' E	12726 γ	55338 γ

*COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.
 DAYS USED: FEB 15, 16, 28, _____.

NORMAL MAGNETOGRAPH

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	FROM	TO	SCALE VALUE		BASELINE
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STORM MAGNETOGRAPH

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MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS
(UNIVERSAL TIME)

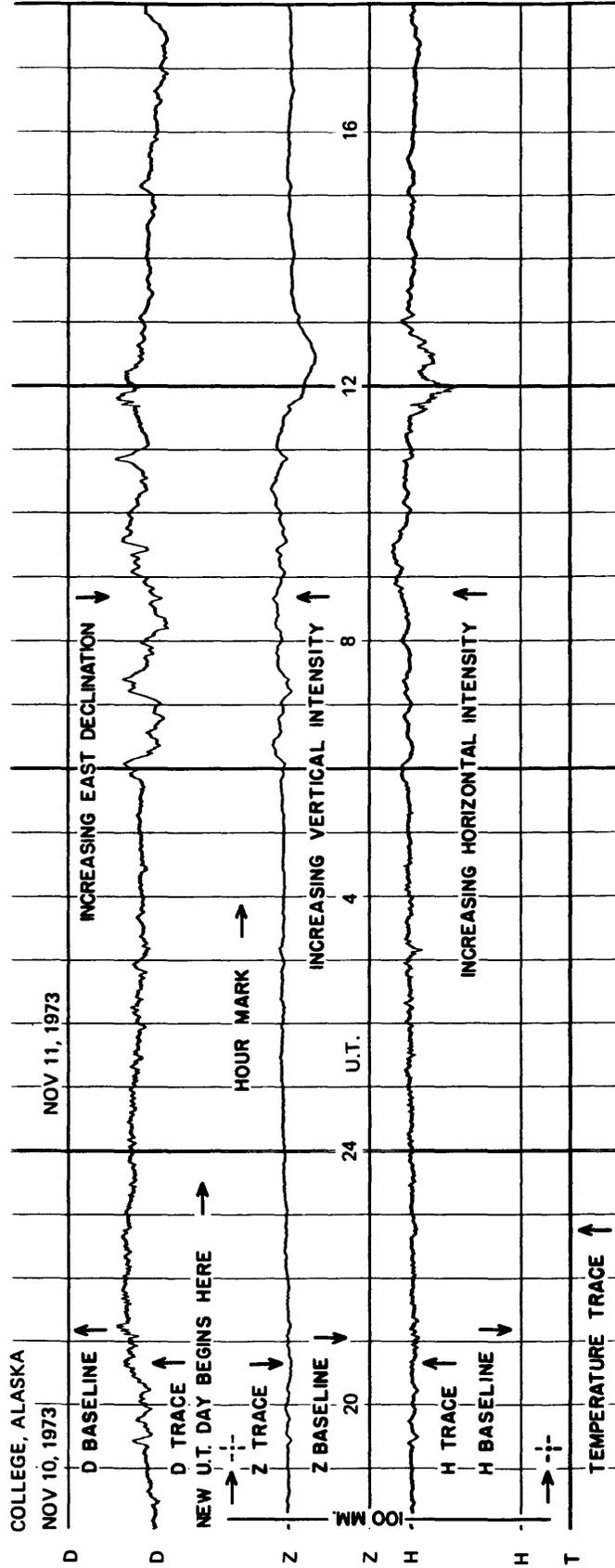
Values are in Tenths of mm and are Averages for Successive Periods of One Hour beginning at Midnight. Shrinkage Corrections have been applied. Negative Values in Red with Minus.

COMPONENT	D			H			Z			COMPONENT
	DAY	15	16	15	16	16	15	16	16	
A _k		3	2	3	2	7		2	7	A _k
HOUR	01	360	360	330	330	342	330	330	342	01
02	351	352	344	339	336	327	336	335	327	02
03	343	332	341	348	348	322	348	353	322	03
04	342	336	340	350	349	320	355	355	320	04
05	342	337	337	356	355	322	355	355	322	05
06	334	337	337	360	356	331	355	355	331	06
07	338	334	343	359	356	328	355	357	328	07
08	349	360	340	361	368	340	358	359	340	08
09	388	331	338	370	361	329	355	347	329	09
10	340	340	344	367	360	331	340	357	331	10
11	342	338	340	361	352	330	351	345	330	11
12	351	357	357	353	350	327	347	339	327	12
13	356	362	369	80	161	86	96	138	166	13
14	378	361	361	138	169	116	99	138	153	14
15	355	360	364	160	164	126	135	135	166	15
16	365	363	366	168	166	129	141	134	174	16
17	368	376	374	171	170	122	142	145	175	17
18	388	392	387	169	167	124	150	150	181	18
19	390	402	437	161	166	98	150	149	190	19
20	407	404	444	150	159	70	154	149	175	20
21	390	392	398	141	149	80	154	149	134	21
22	379	377	400	135	140	101	157	151	135	22
23	363	370	357	129	131	99	160	151	148	23
24	359	335	332	125	127	124	157	150	153	24
DAILY SUM	8678	8602	8702	3581	3690	2784	3538	3571	4139	DAILY SUM
DAILY MEAN	362	358	363	149	154	116	147	149	172	DAILY MEAN
MEAN	361			140			156			MEAN

Scaled **TKP**

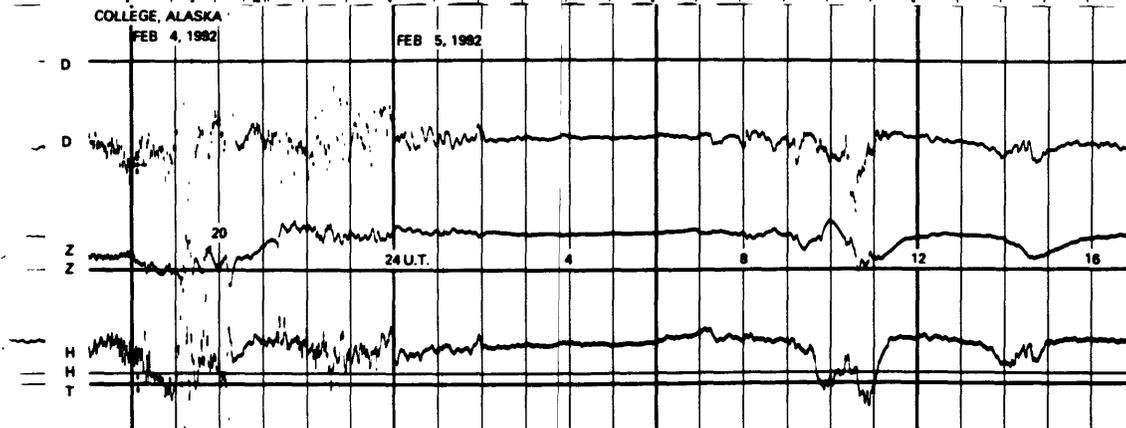
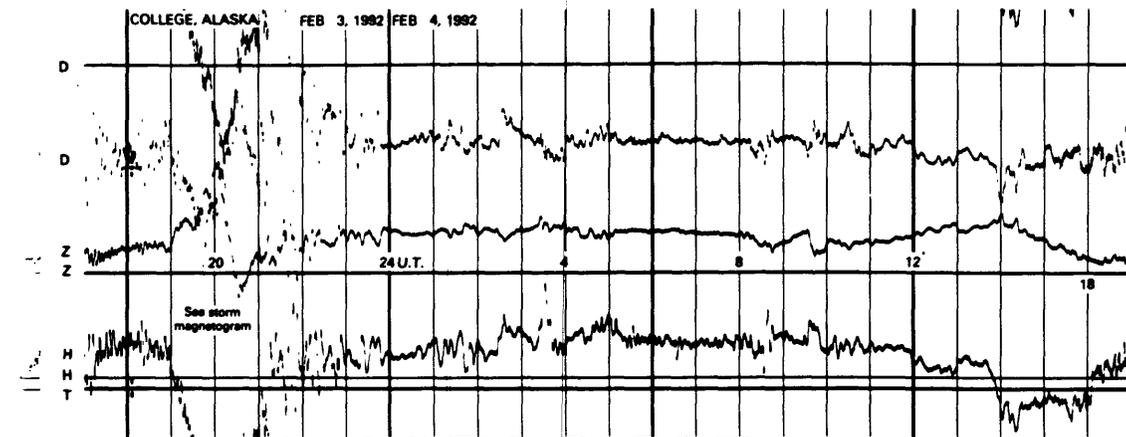
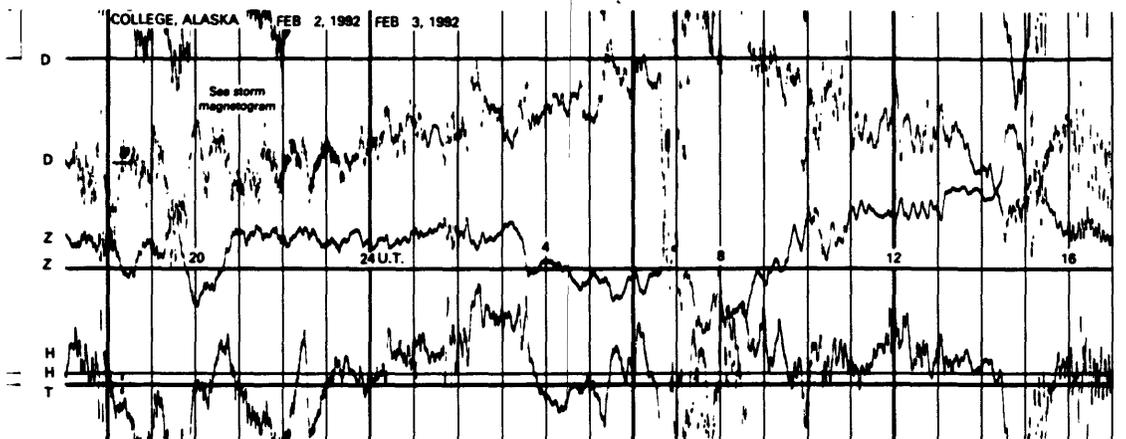
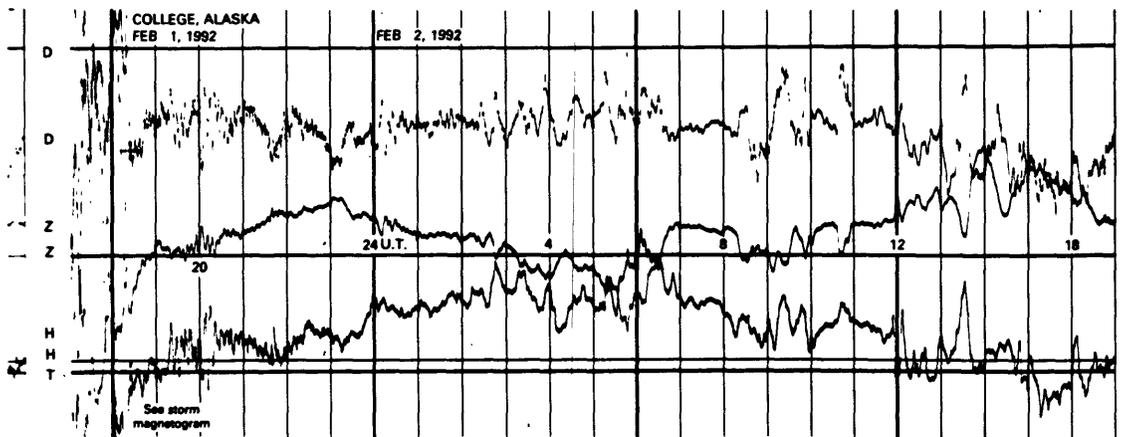
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FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

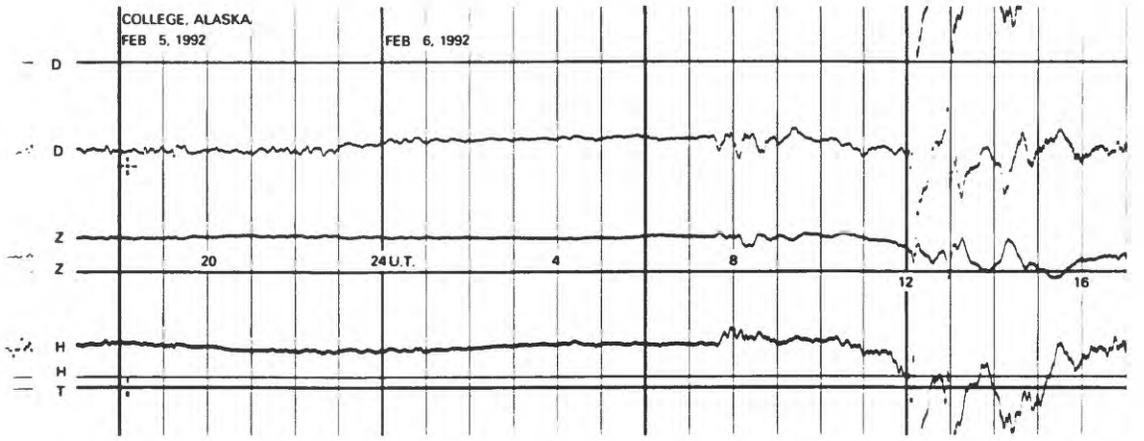


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

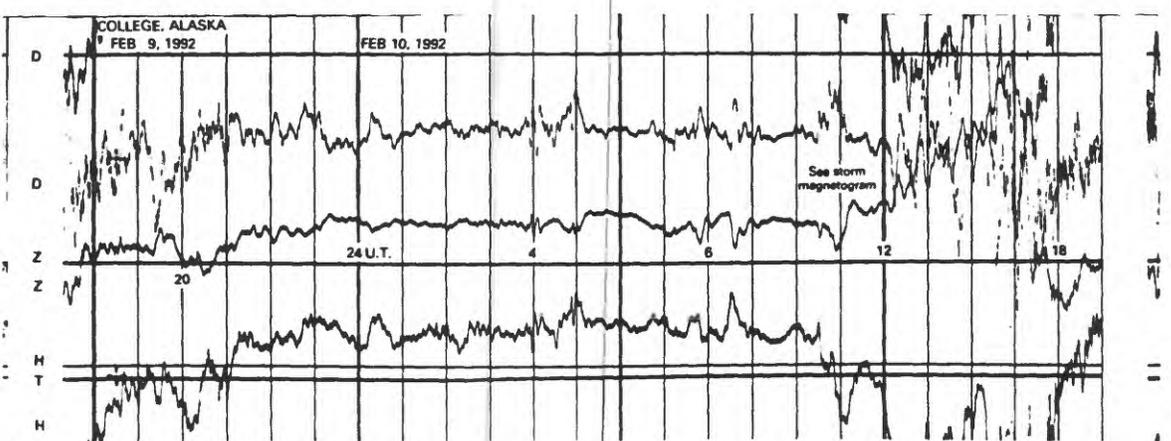
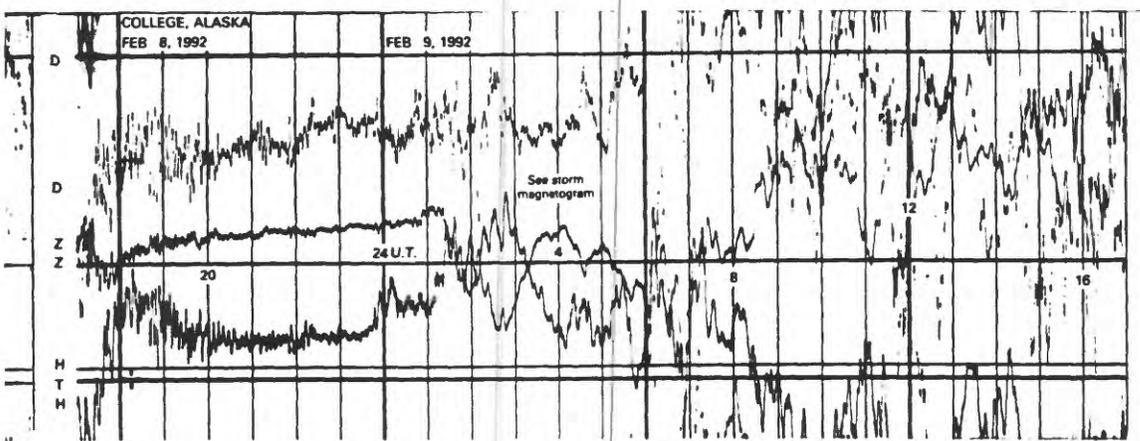
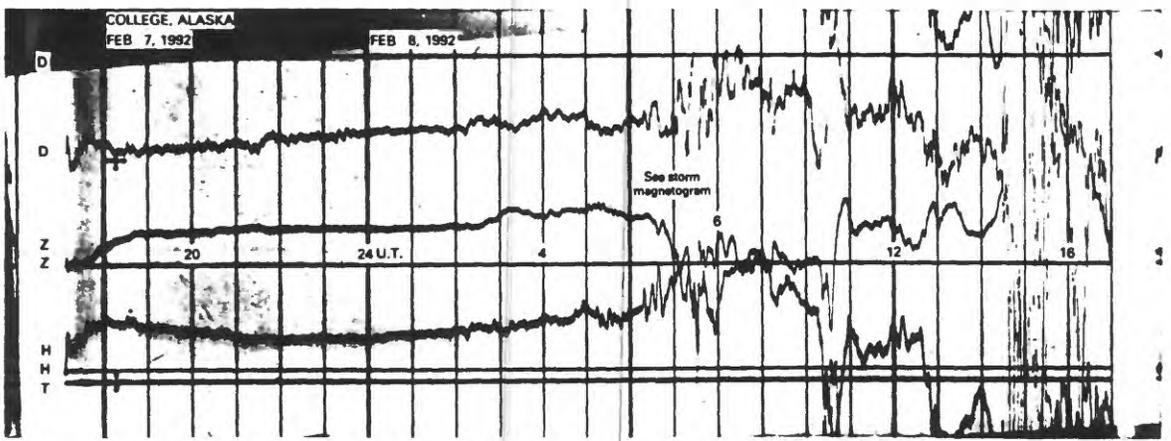
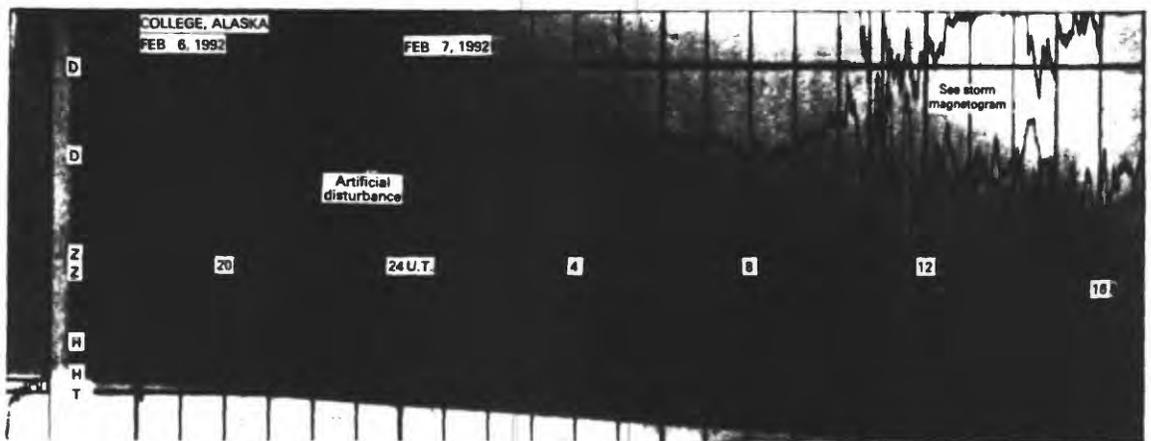
NORMAL MAGNETOGRAMS



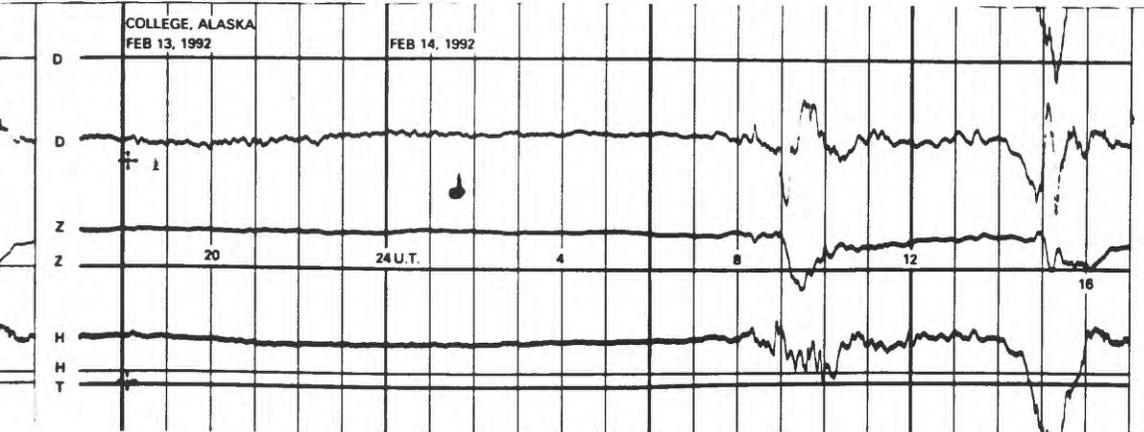
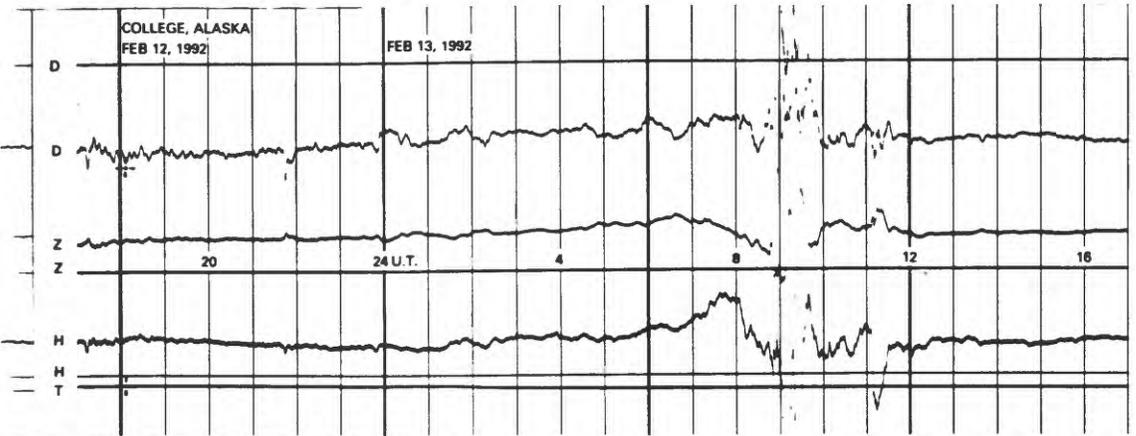
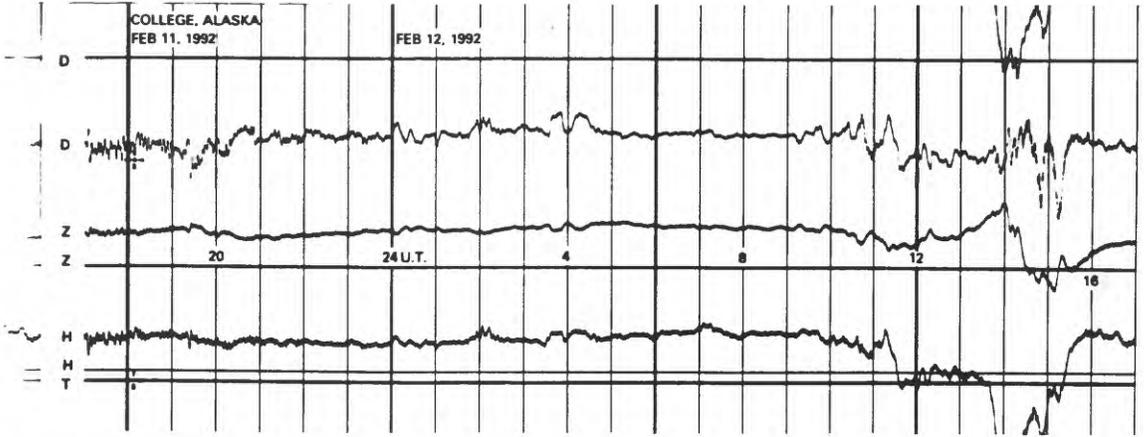
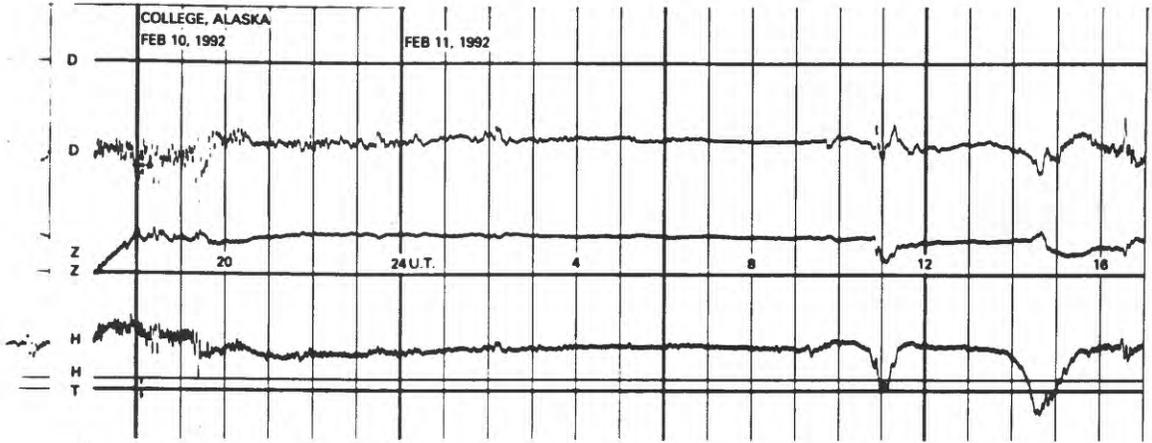
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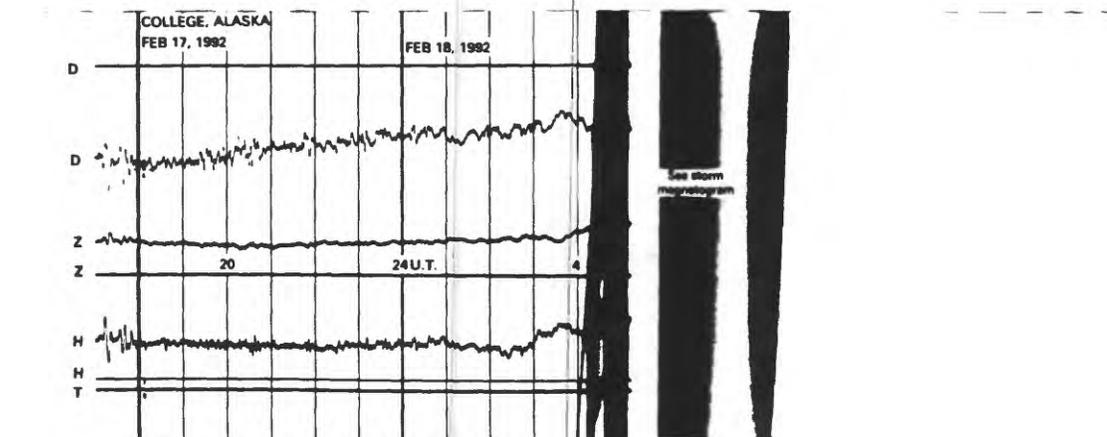
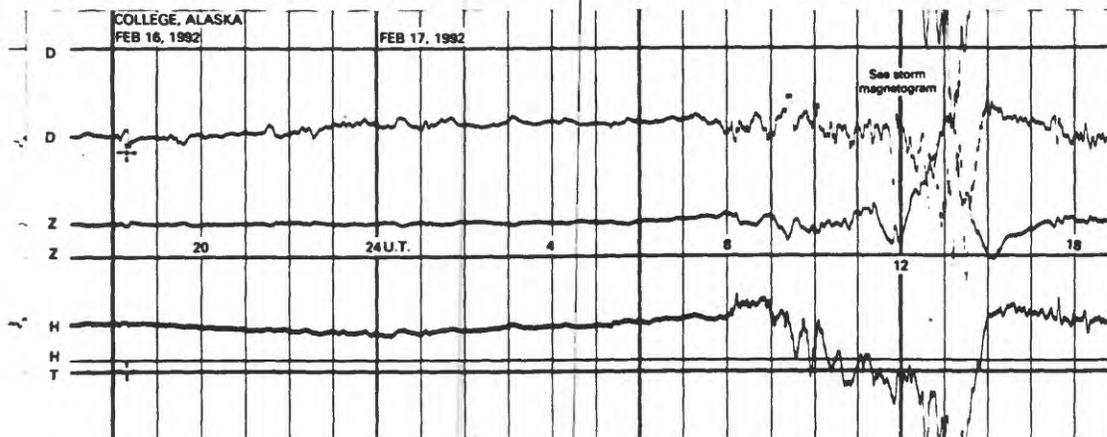
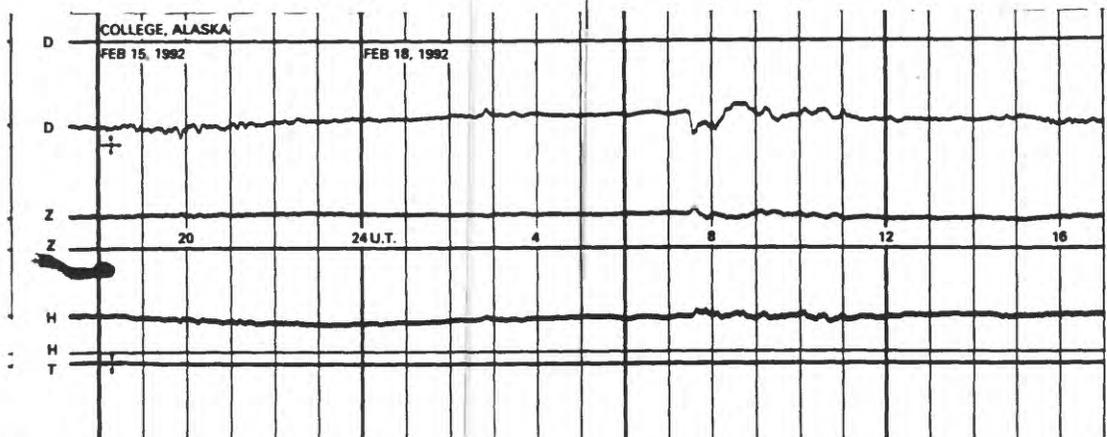
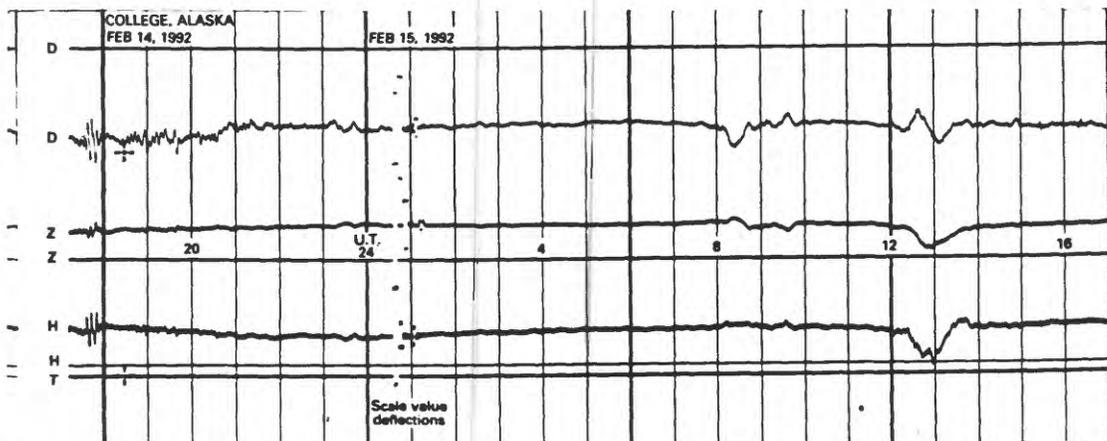
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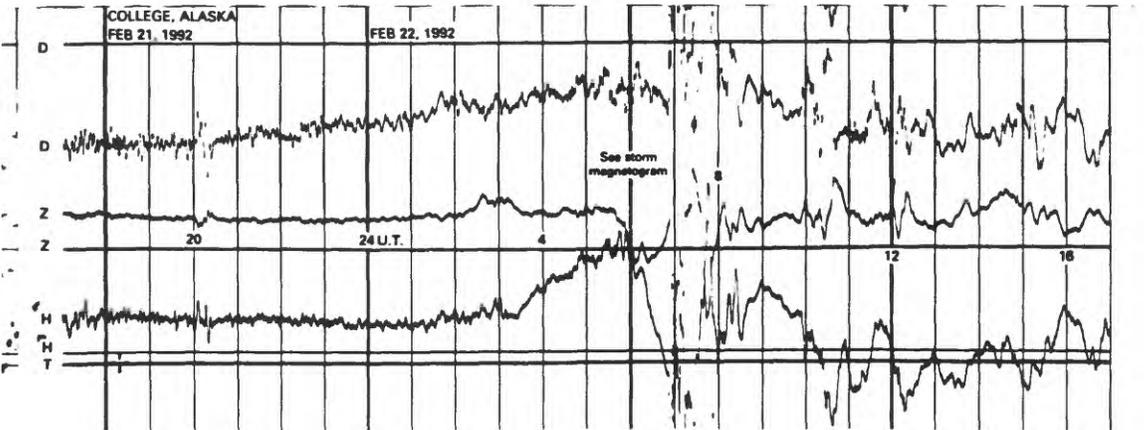
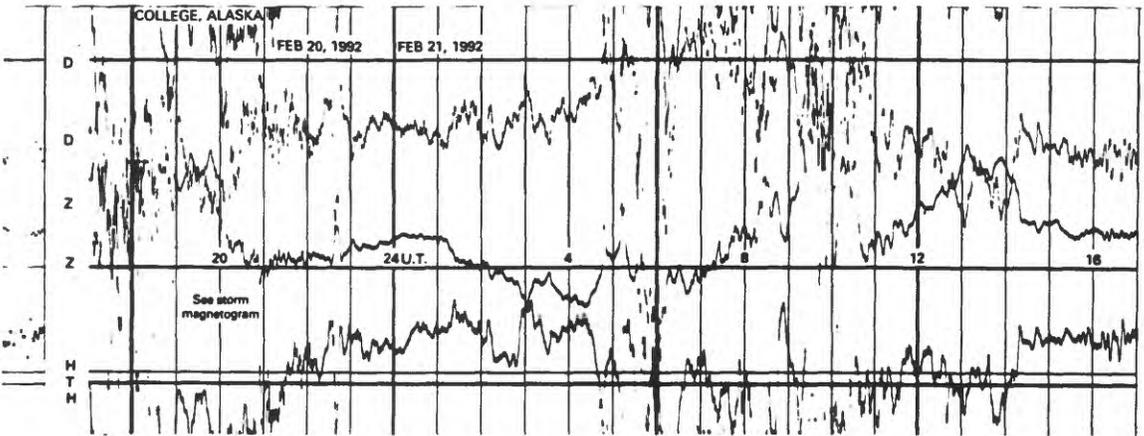
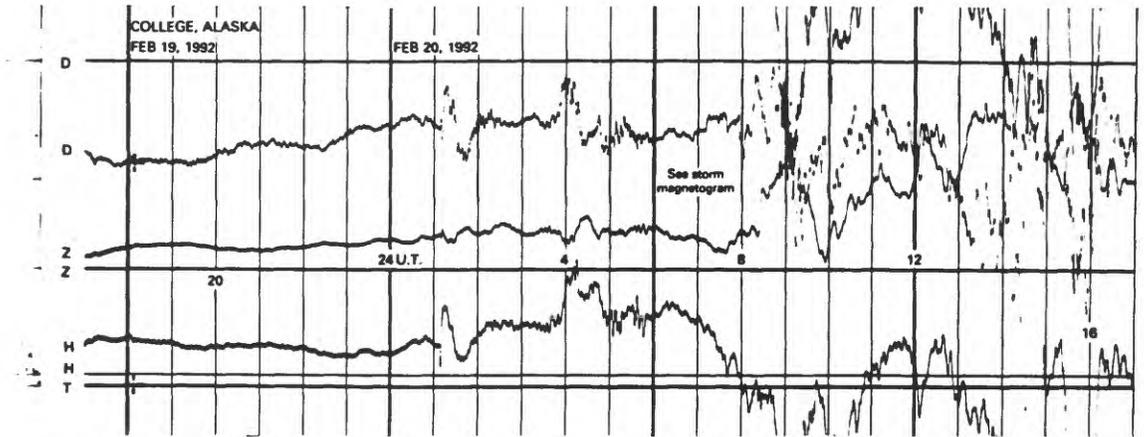
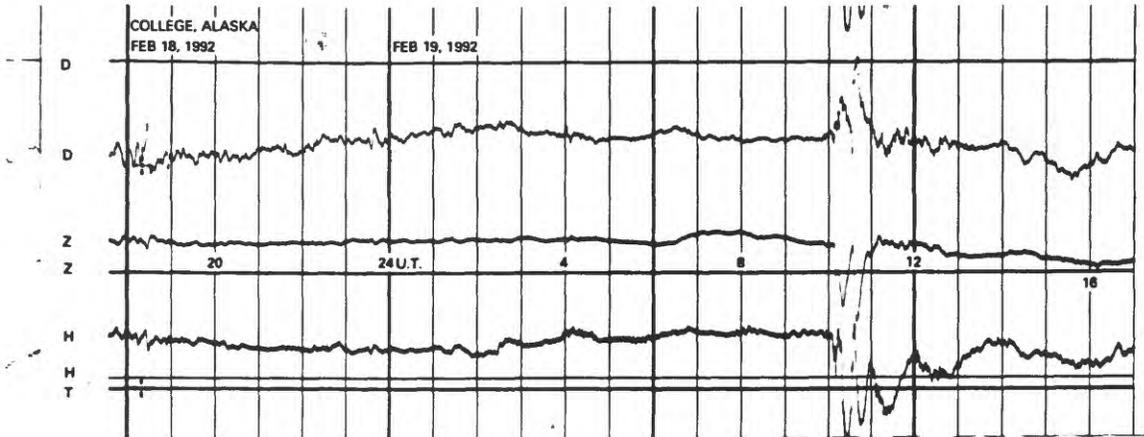
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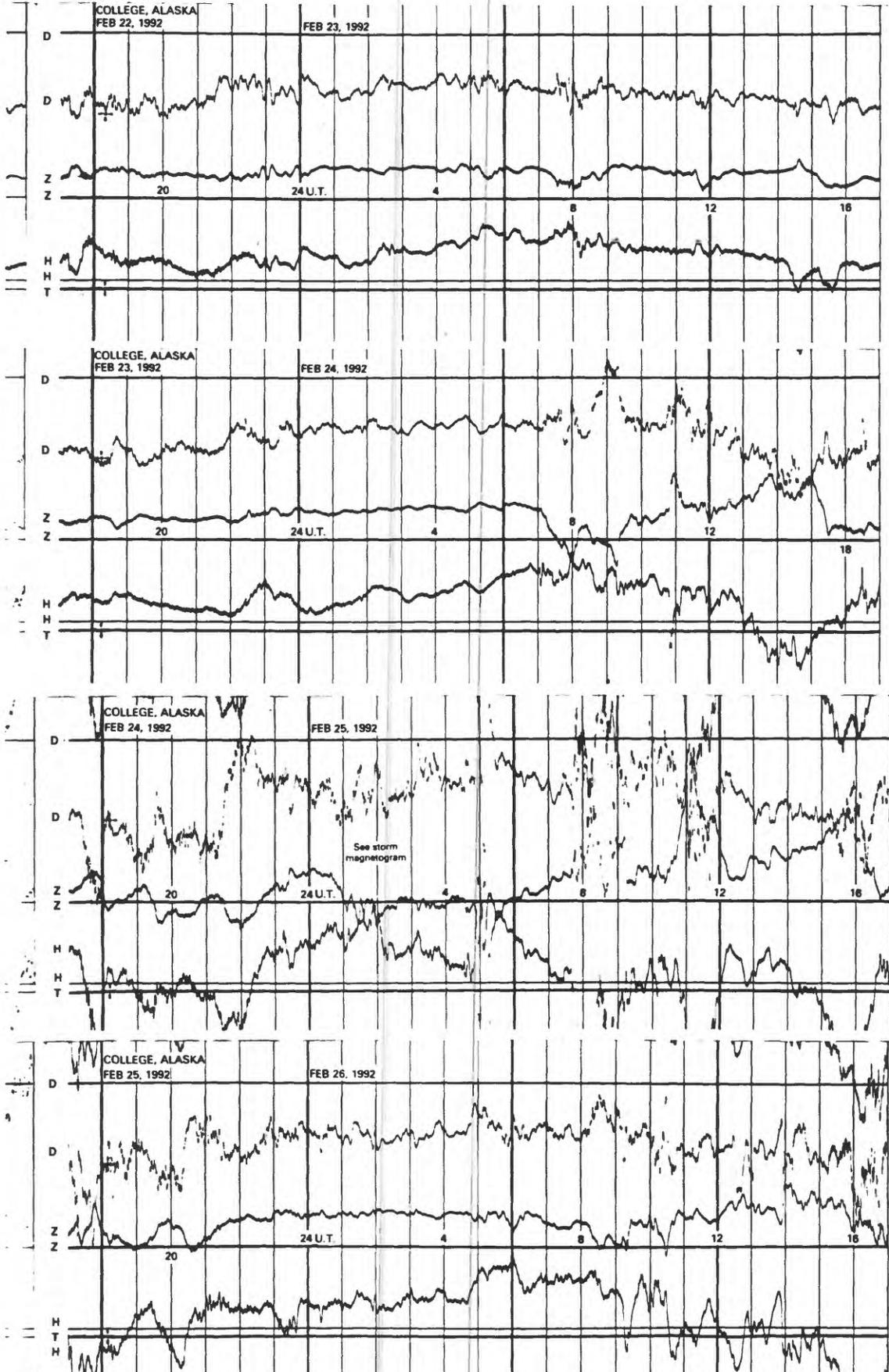
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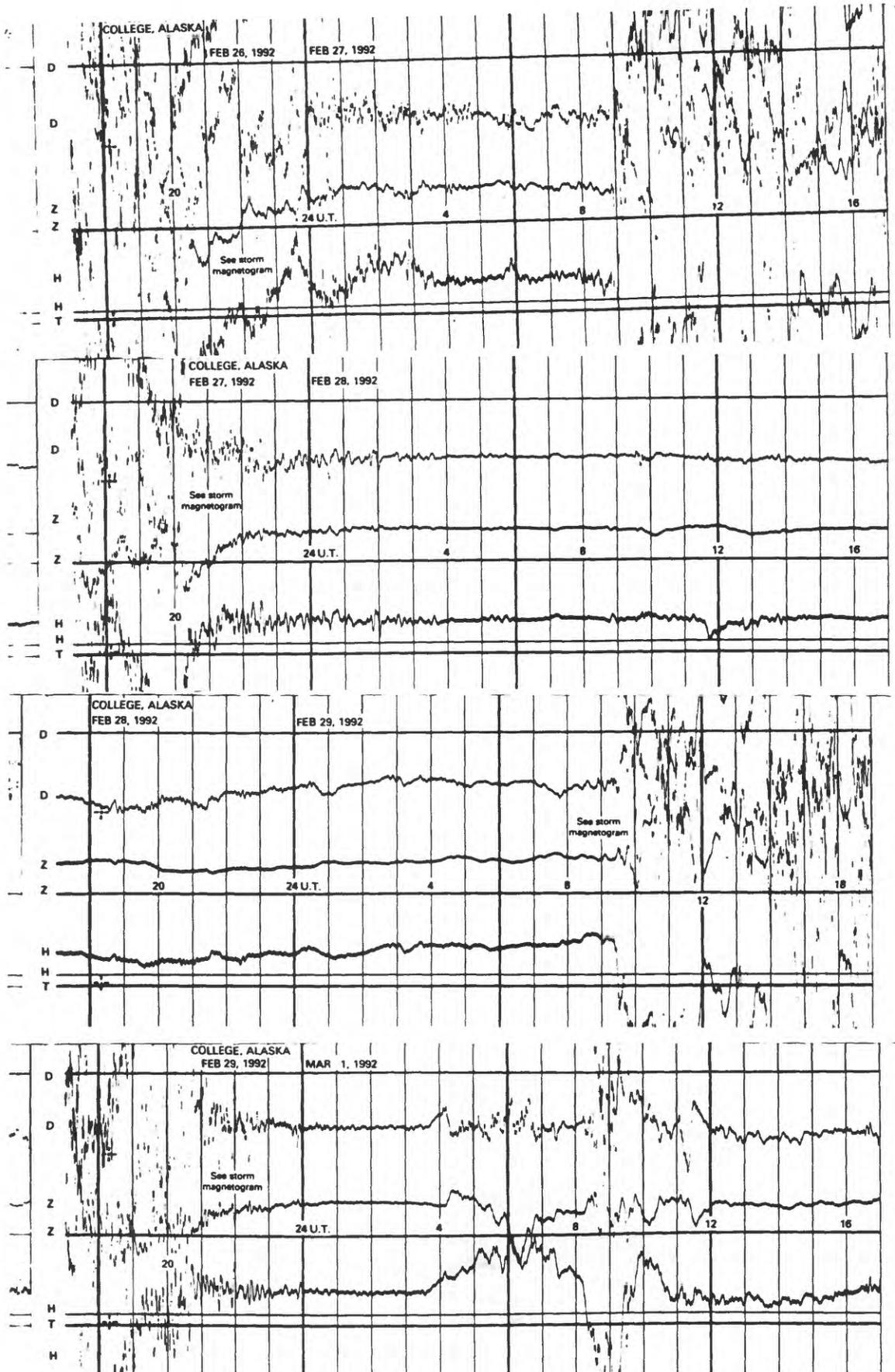
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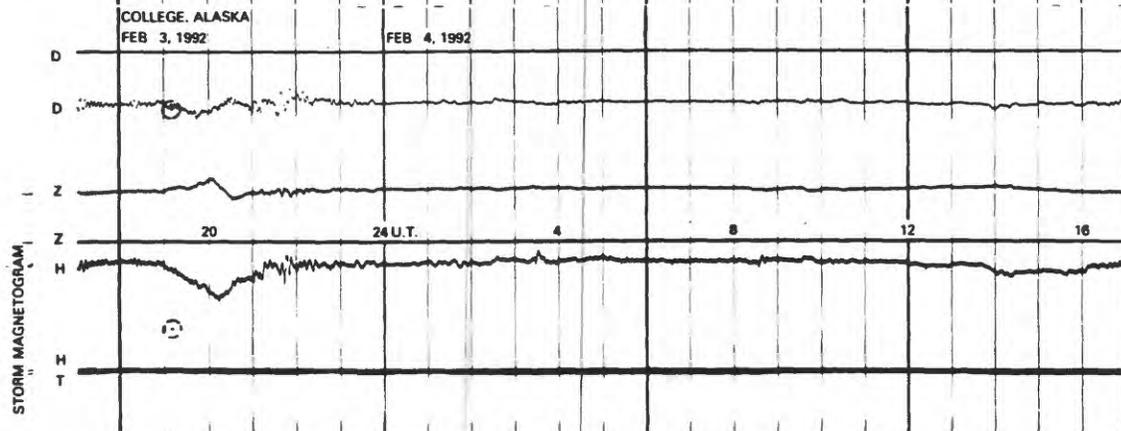
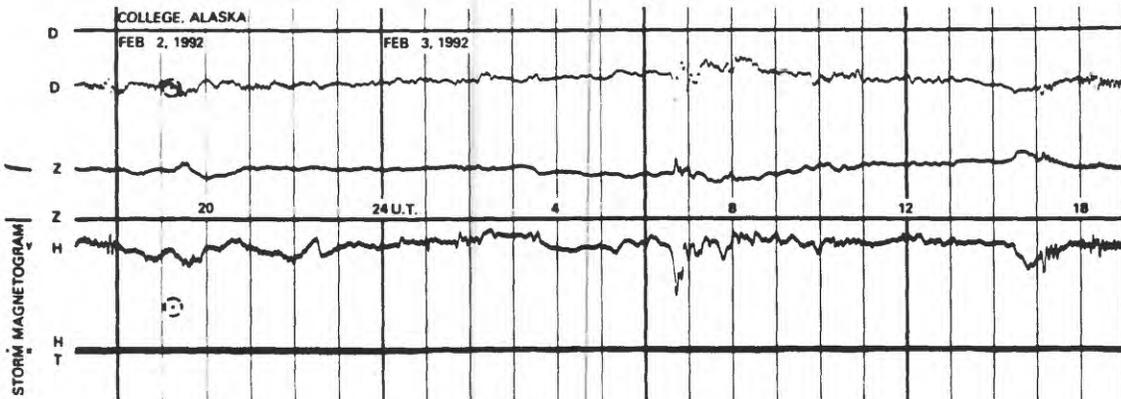
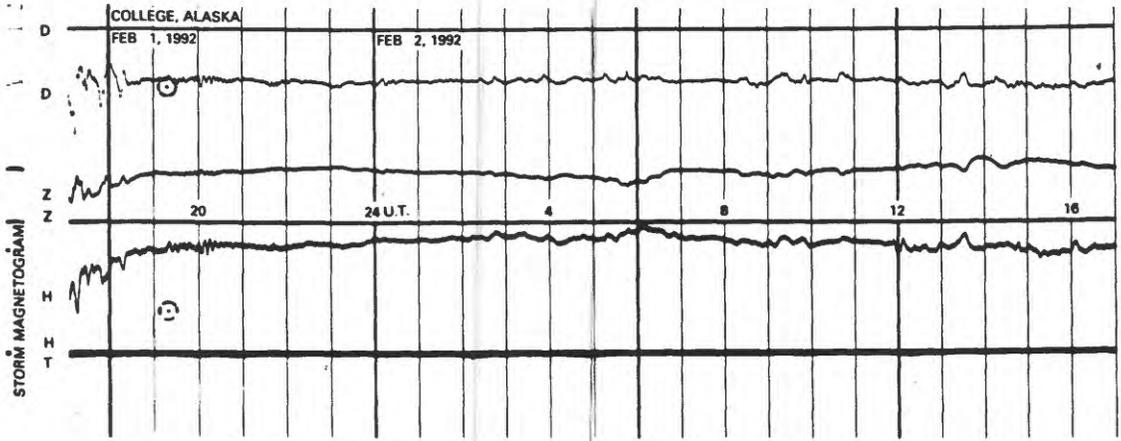
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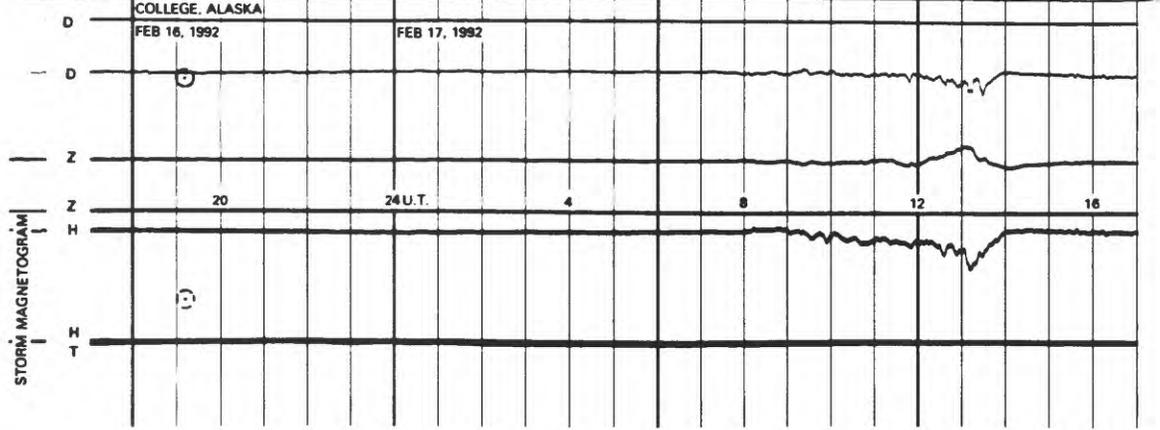
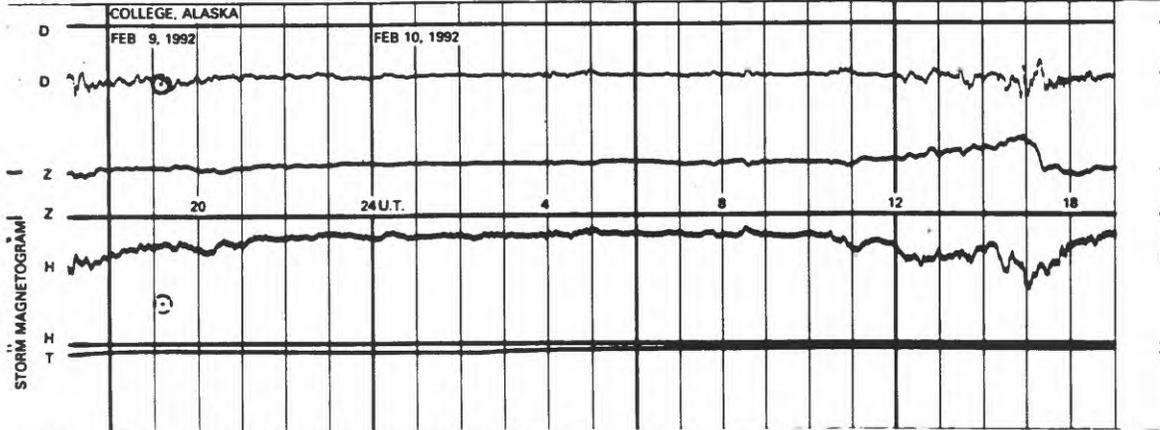
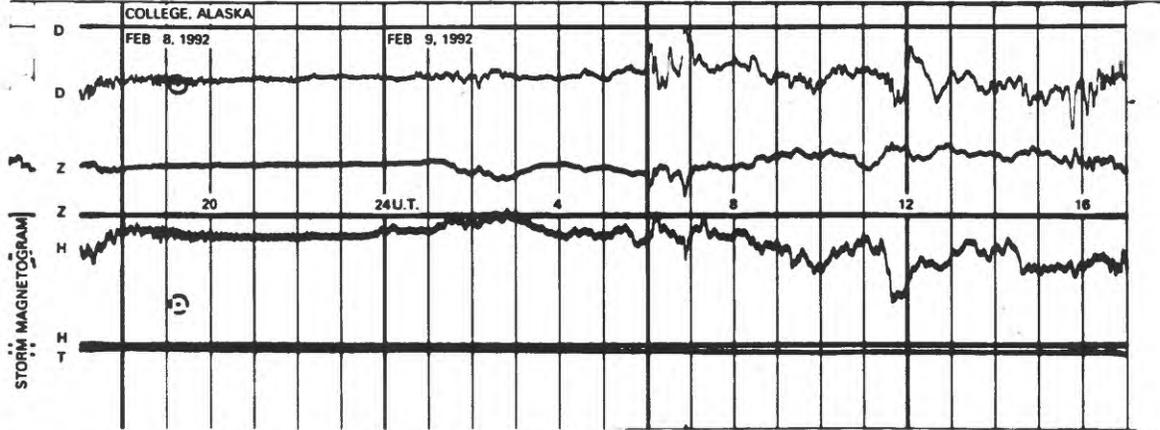
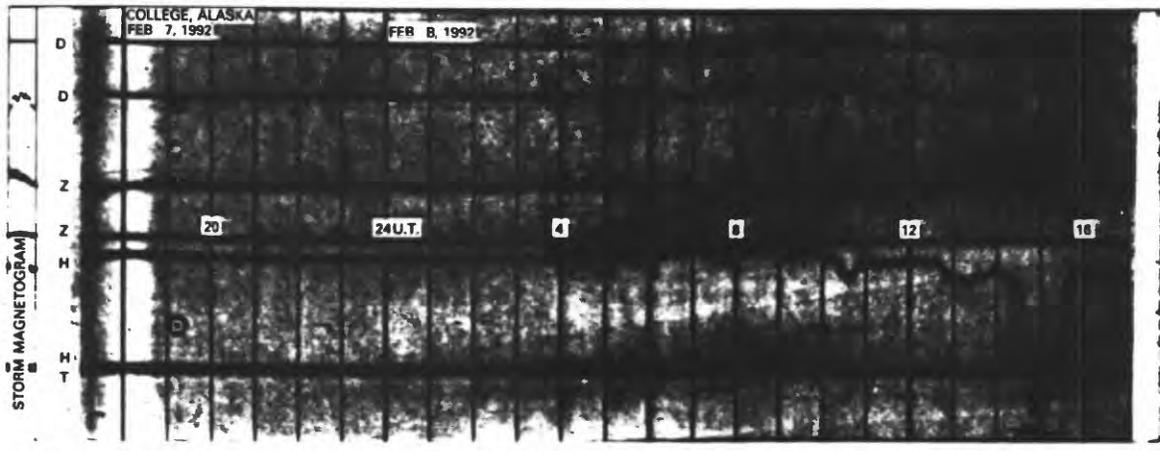
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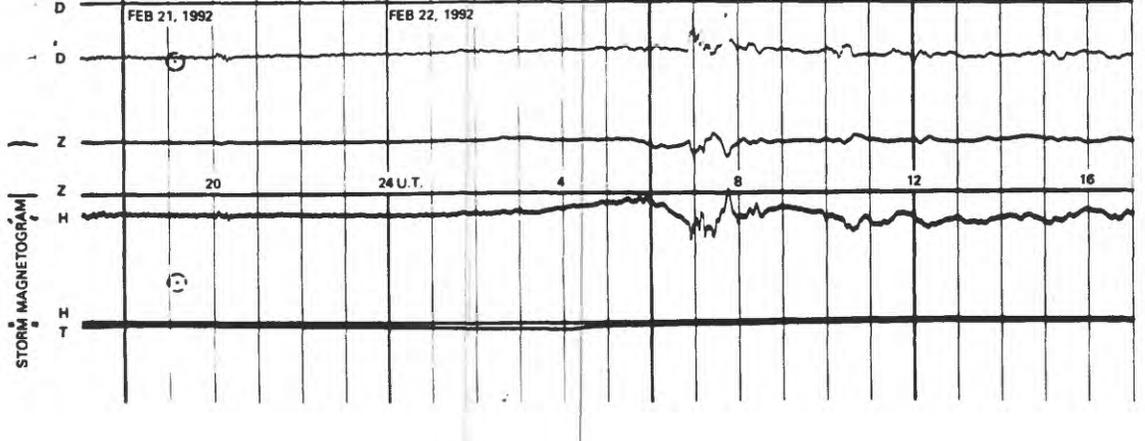
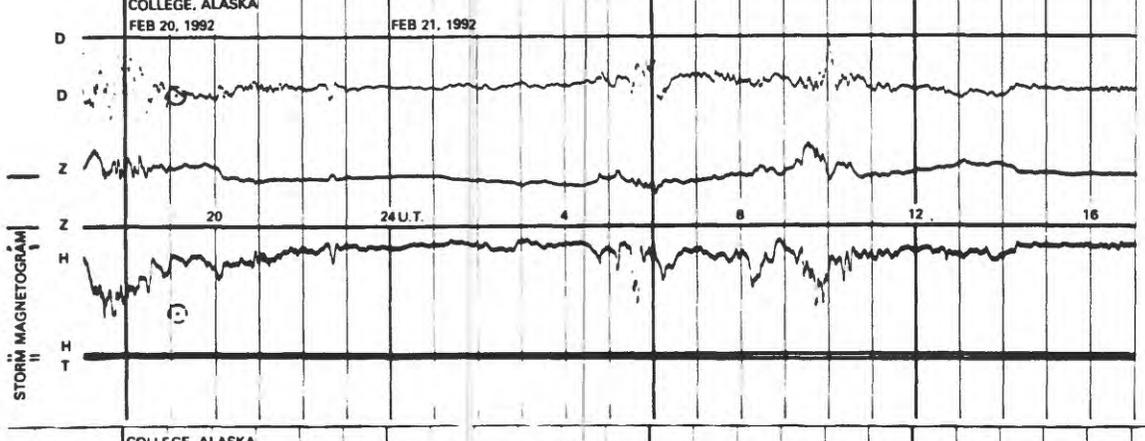
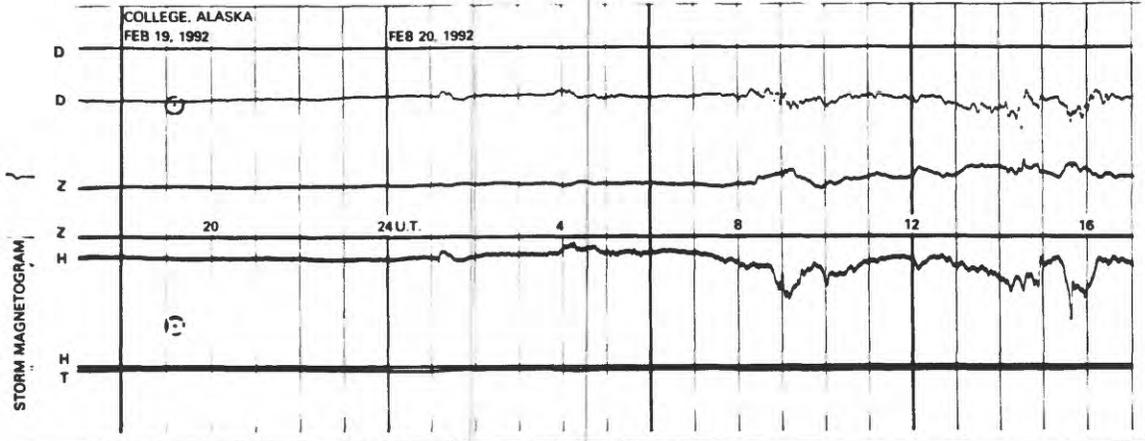
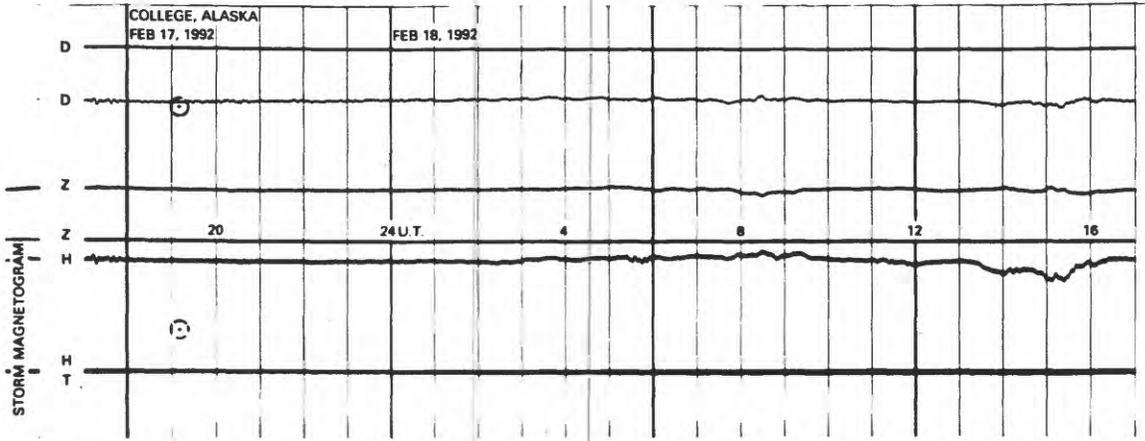
STORM MAGNETOGRAMS



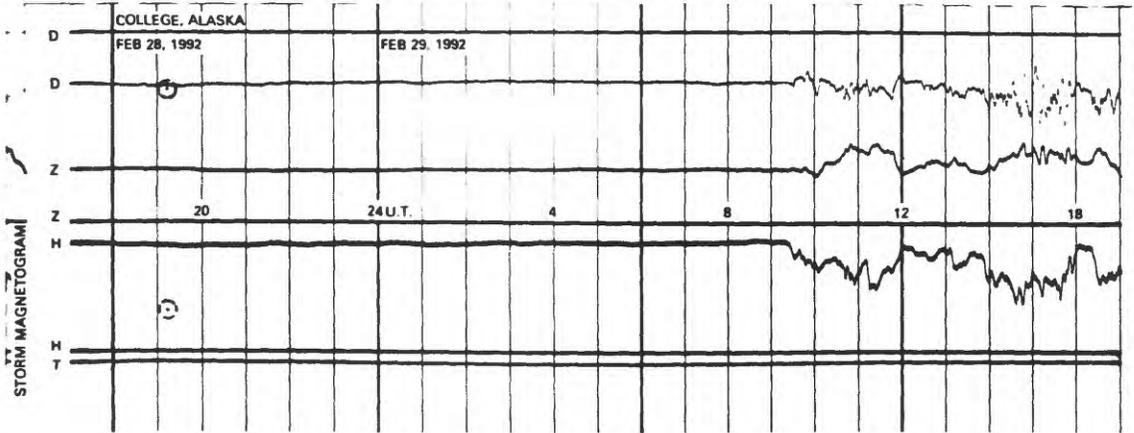
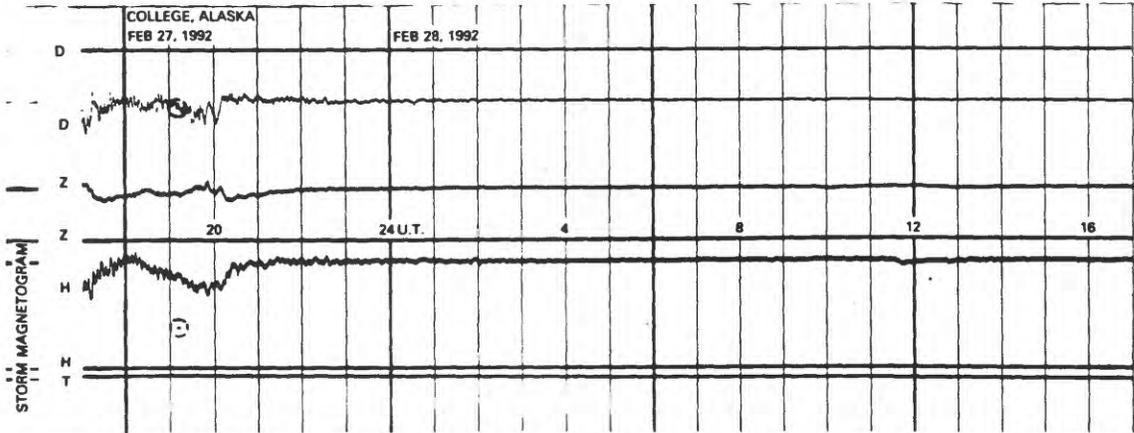
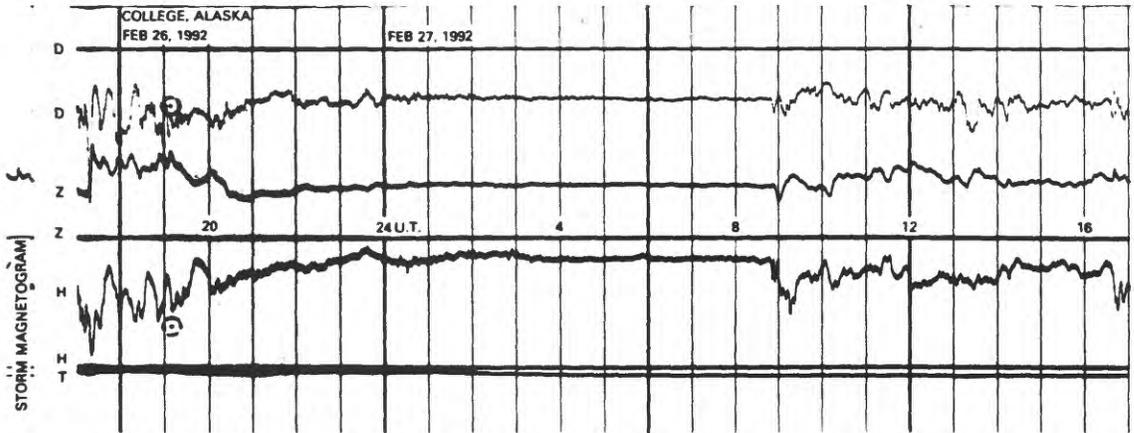
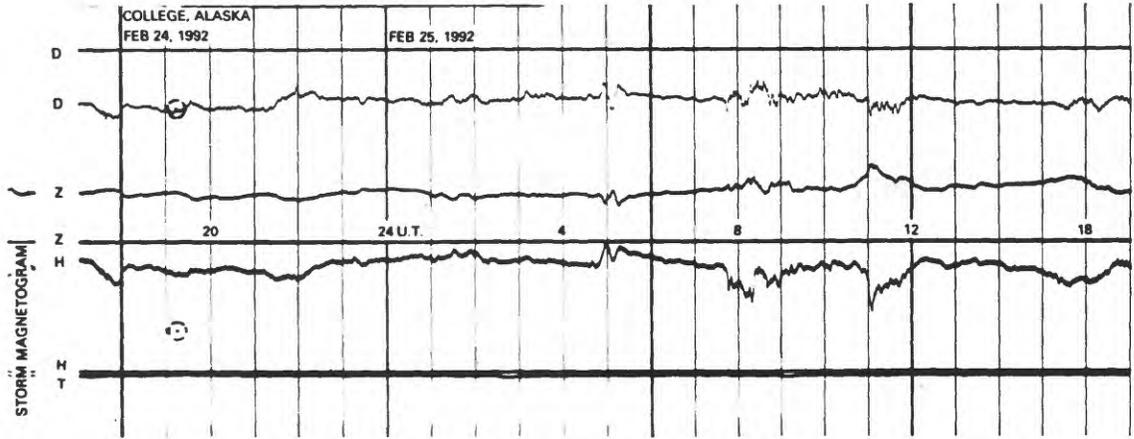
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