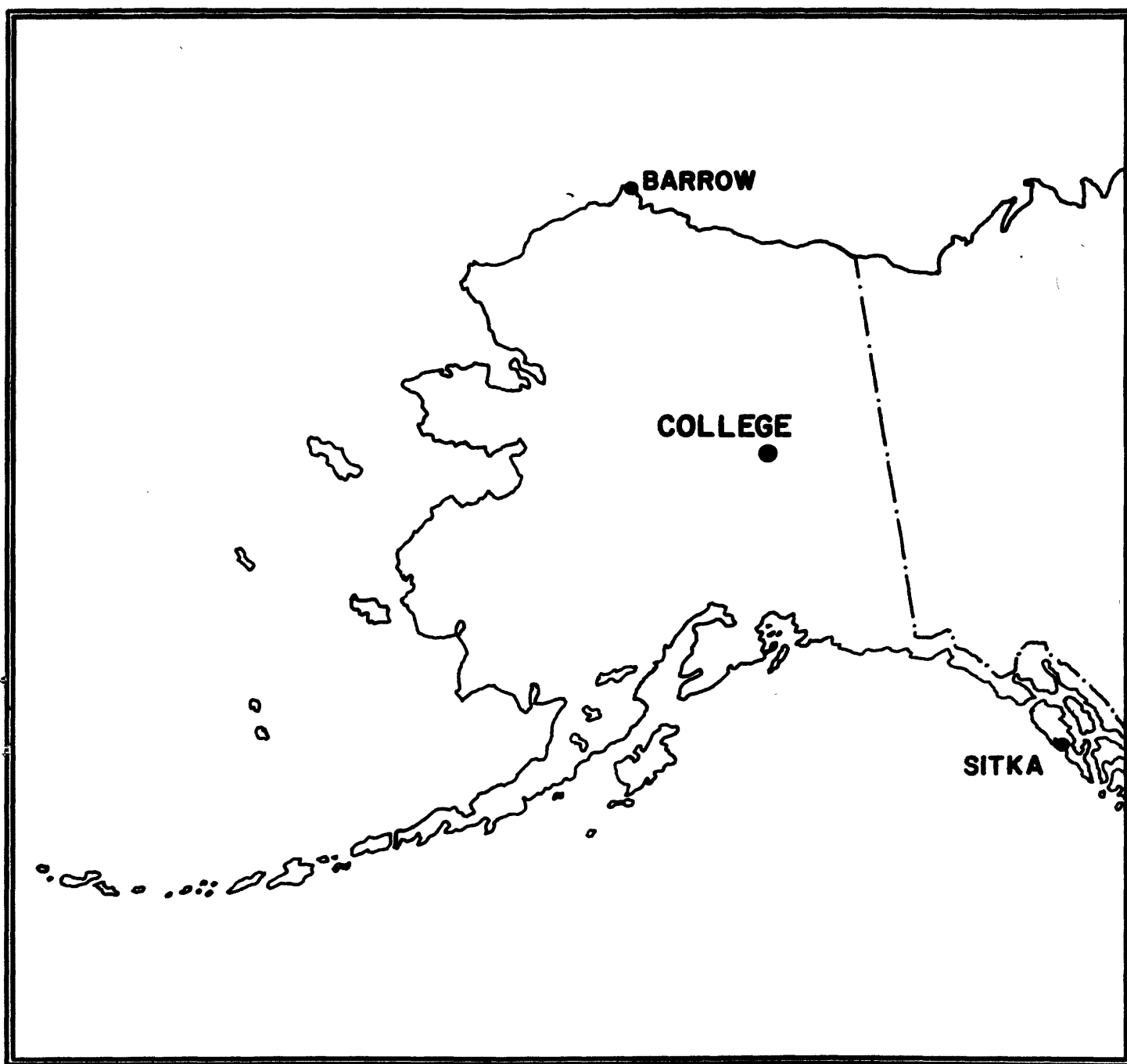


UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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 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:

<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 3	6 3	7 7	283	1690	1150	4 00
		8	14 29	SC		+130		8	5,6	9	555	3880	1910	9 21
		20	01 09	SC	-5	-71	-10	20 21	6 2,4	7 7	282	1700	1130	21 14
		26	16 57	SC	+47	-83		26	6	8	431	2110	1190	27 04
		27	08 48	SC	+53	-390		27	4,6	7	175	1250	860	27 23
		29	09 26	SC	+14	-275		29	5,6,7	7	307	1310	940	29 22

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

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*

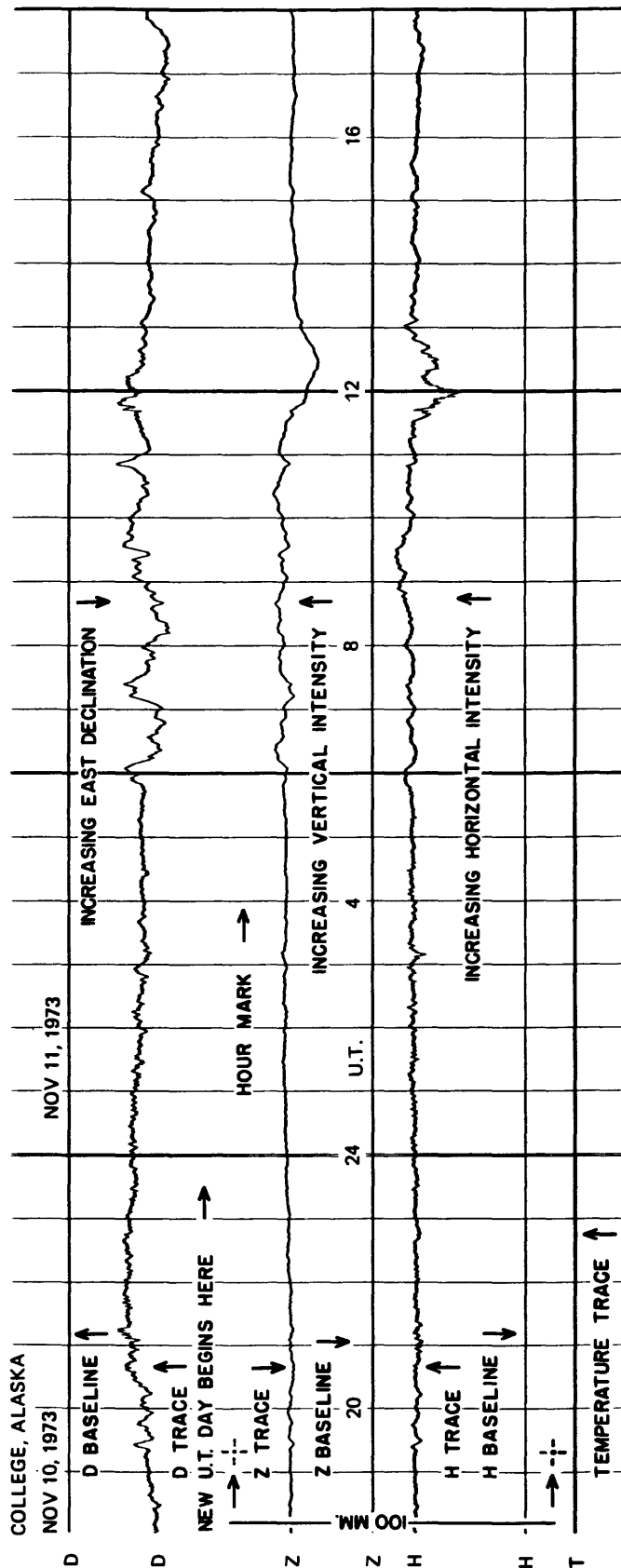
D	H	Z
26° 34.2' E	12726 γ	55338 γ

*COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: FEB 15, 16, 28, , .

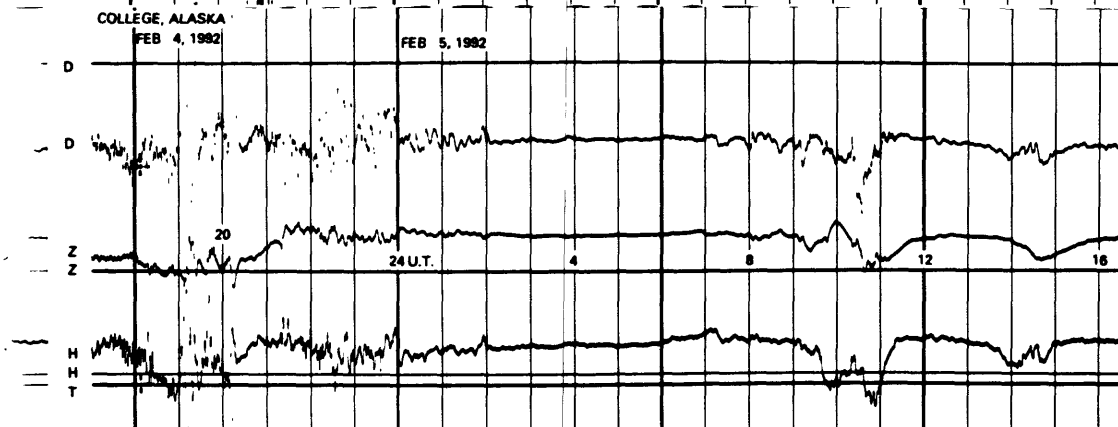
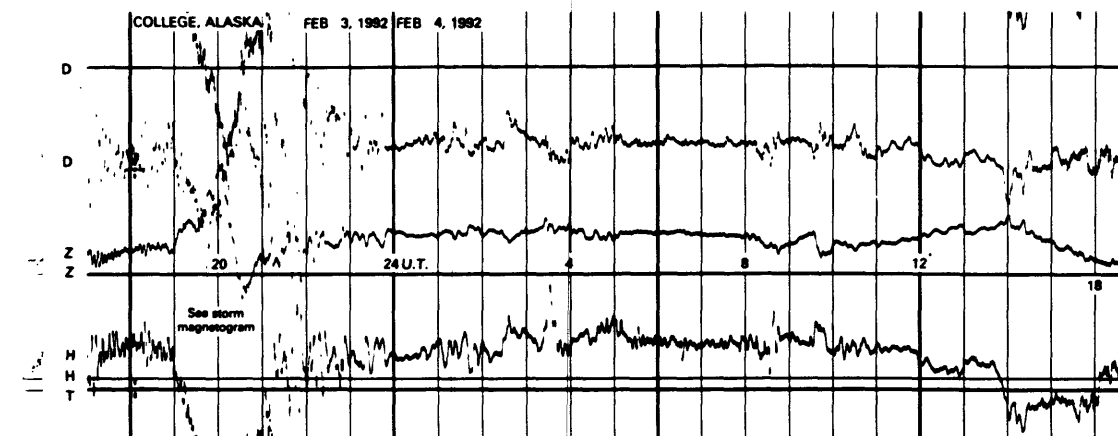
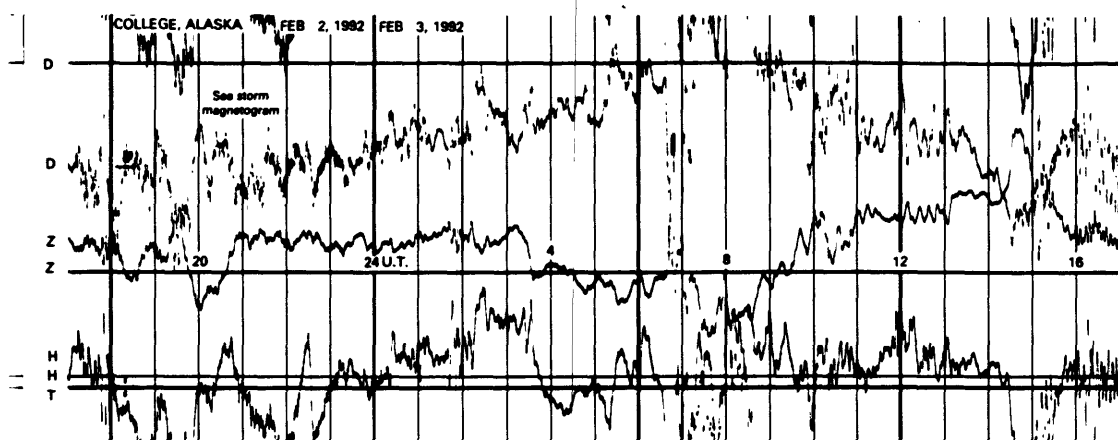
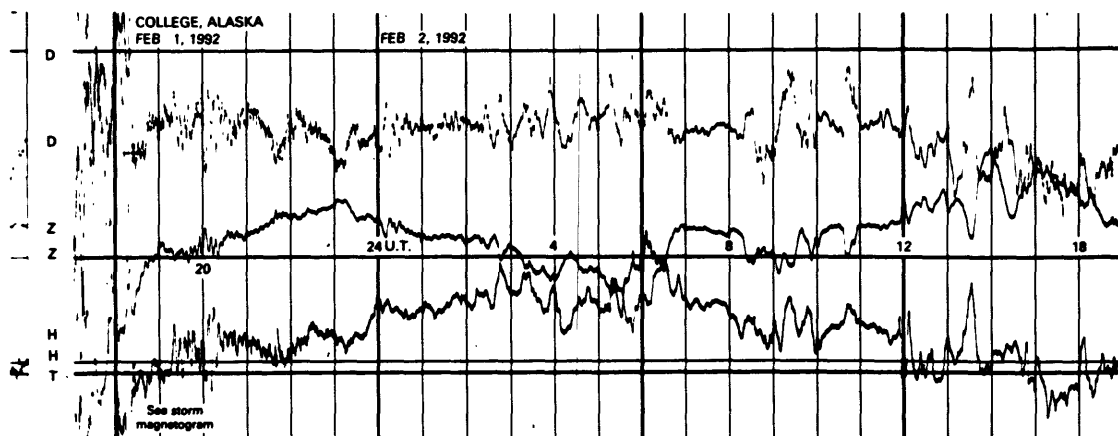
U.S. Dept. of Interior Geological Survey			Observatory College, Alaska		Month February		Year 1992		Jep-CO - 1/86				
MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS (UNIVERSAL TIME)													
Values are in Tenths of mm and are Averages for Successive Periods of One Hour beginning at Midnight. Shrinkage Corrections have been applied. Negative Values in Red with Minus.													
COMPONENT			D			H			Z			COMPONENT	
DAY			28			28			28			DAY	
A _k			7			7			7			A _k	
HOUR			01			01			01			HOUR	
01			360			130			160			01	
02			351			139			158			02	
03			343			148			154			03	
04			342			150			155			04	
05			342			156			155			05	
06			334			160			155			06	
07			338			159			155			07	
08			349			161			158			08	
09			388			170			155			09	
10			340			167			140			10	
11			342			161			151			11	
12			351			153			147			12	
13			356			80			96			13	
14			378			138			99			14	
15			355			160			135			15	
16			365			168			141			16	
17			368			171			142			17	
18			388			169			150			18	
19			390			161			150			19	
20			407			150			154			20	
21			390			141			154			21	
22			379			135			157			22	
23			363			129			160			23	
24			359			125			157			24	
DAILY SUM			8678			3581			3538			DAILY SUM	
DAILY MEAN			362			149			147			DAILY MEAN	
MEAN			361			140			156			MEAN	
Scaled										TKP		Checked RNO	

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

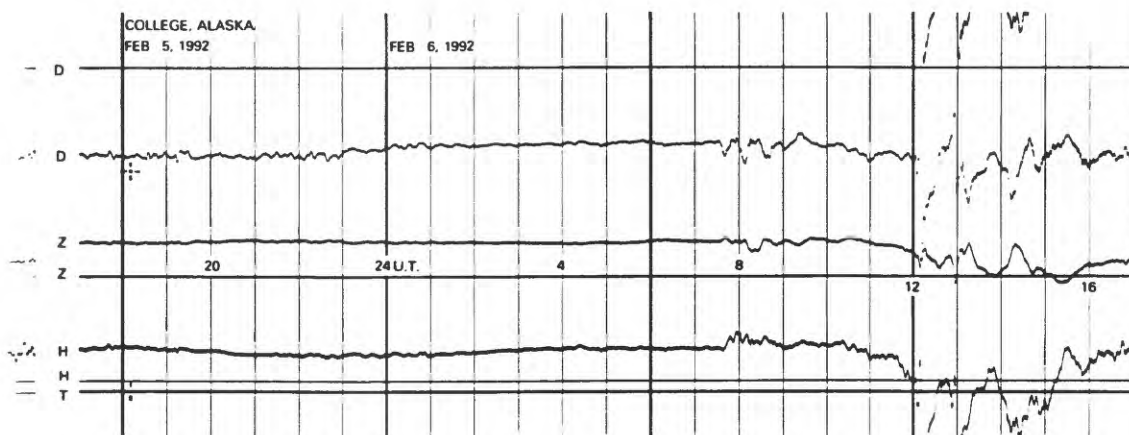


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS

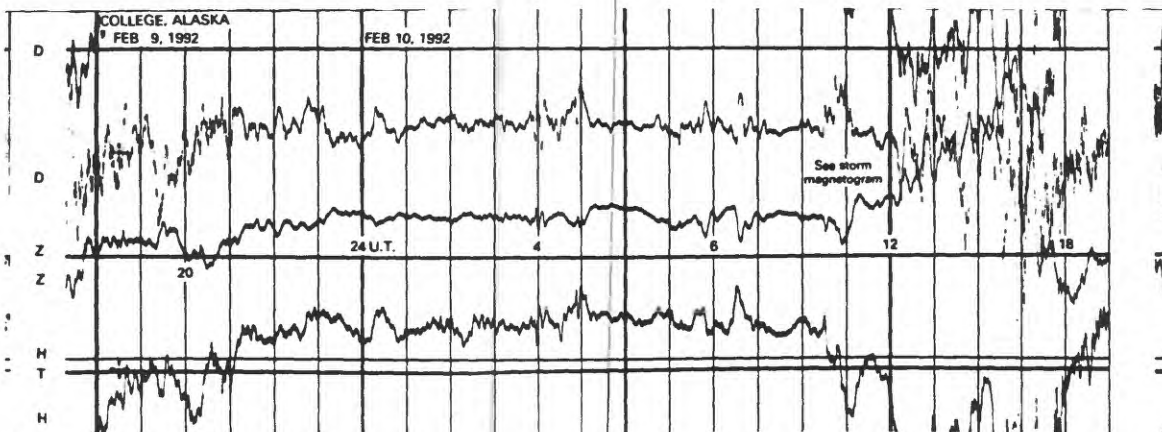
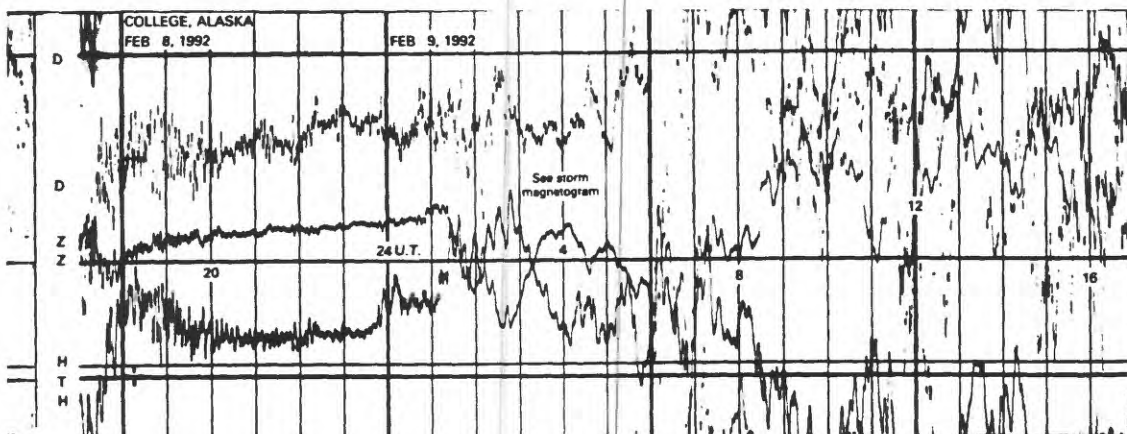
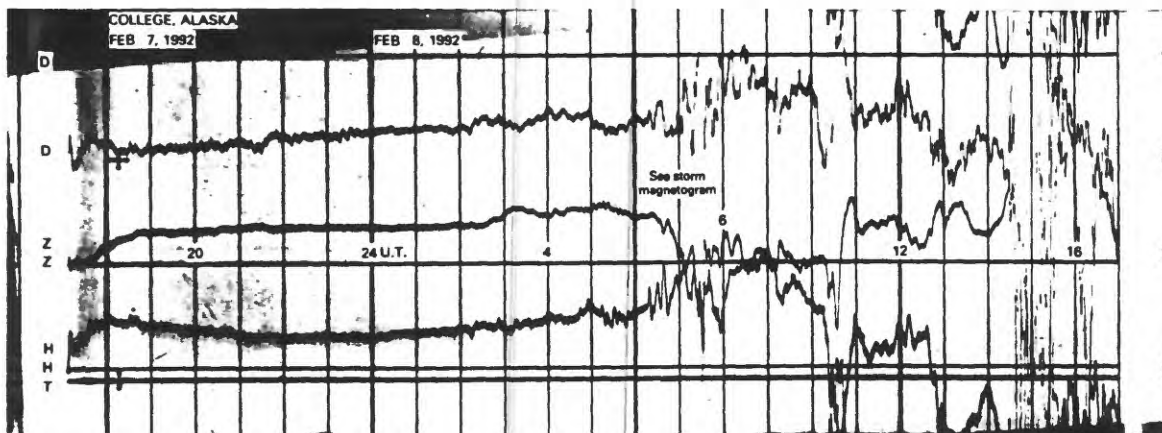
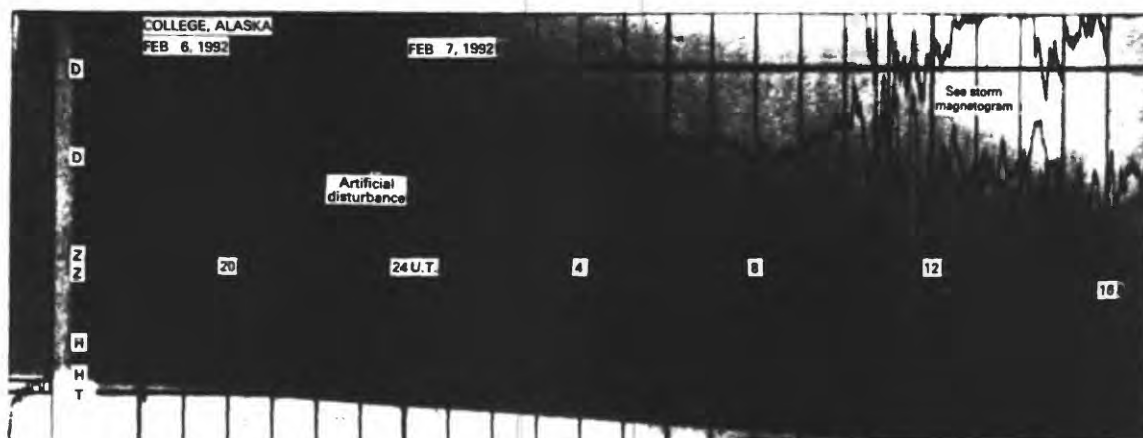


NORMAL MAGNETOGRAMS

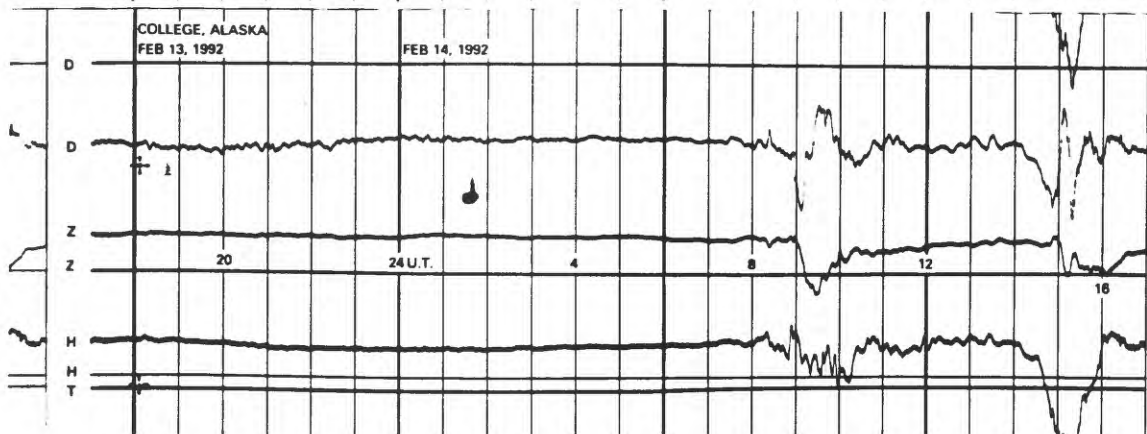
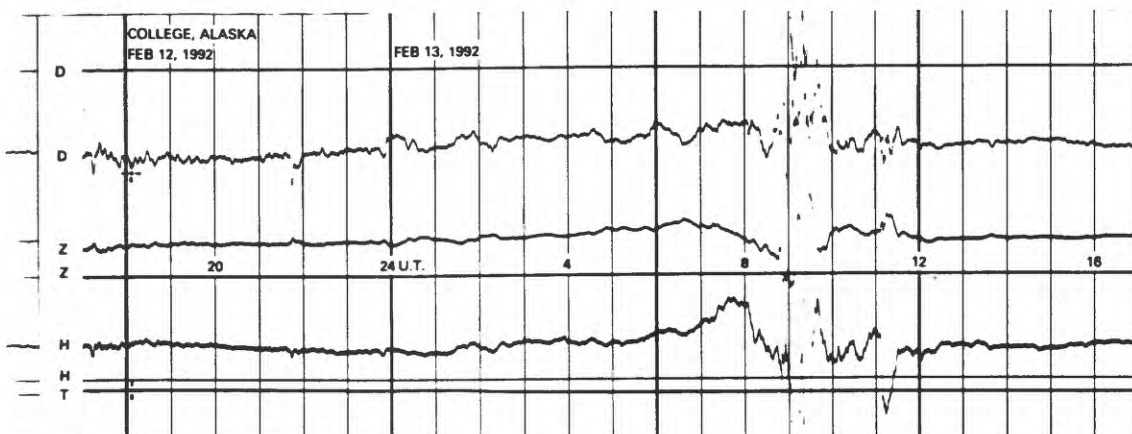
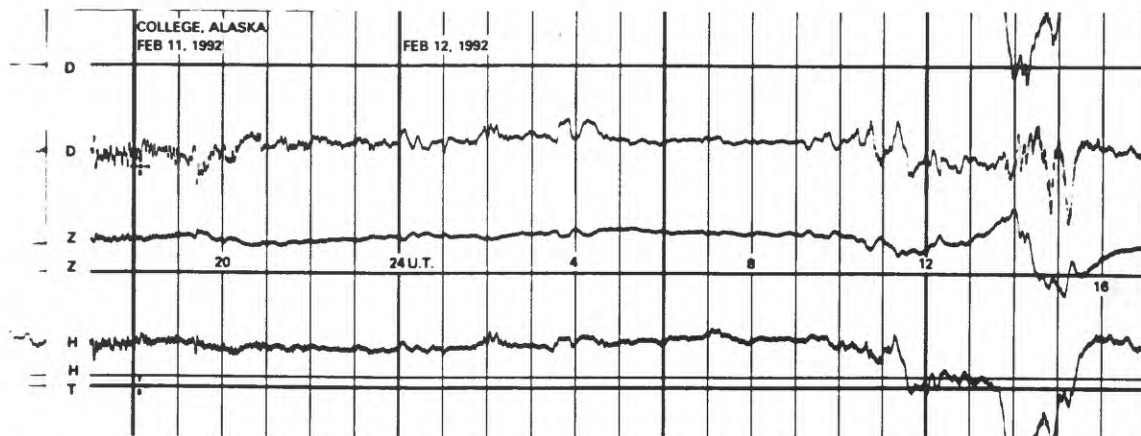
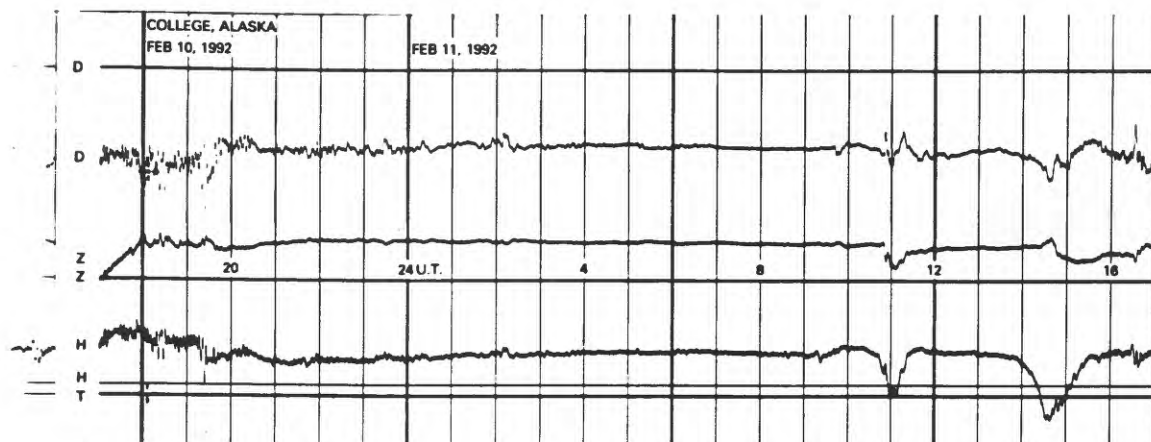


NORMAL MAGNETOGRAMS

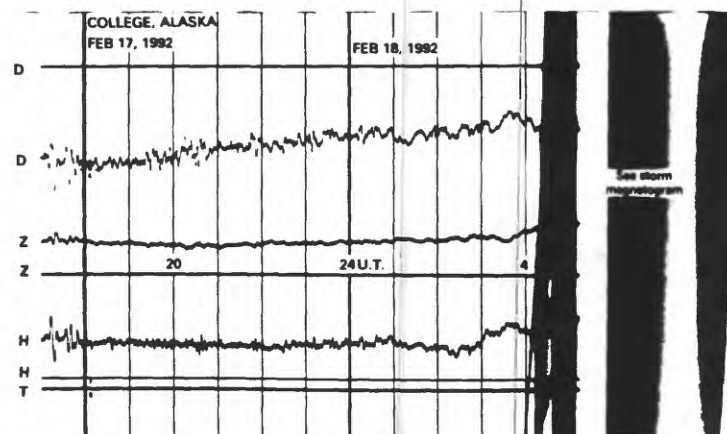
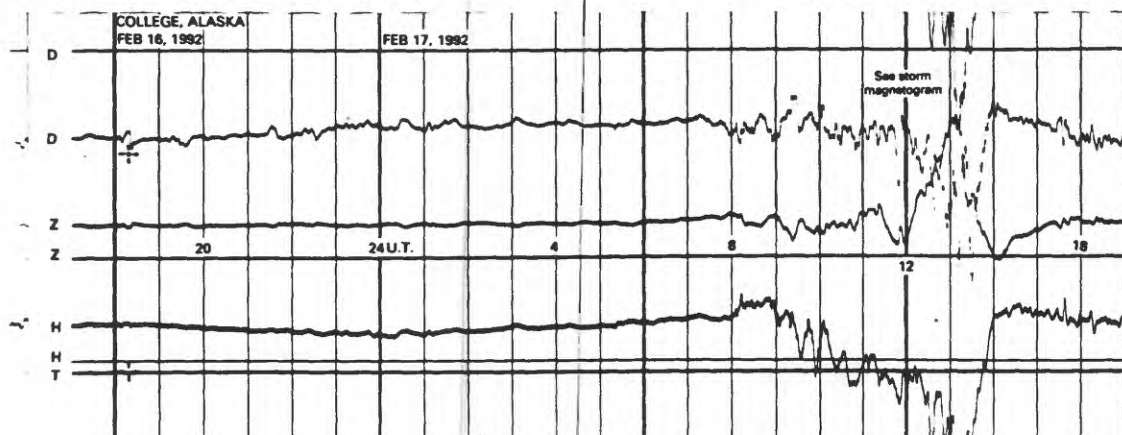
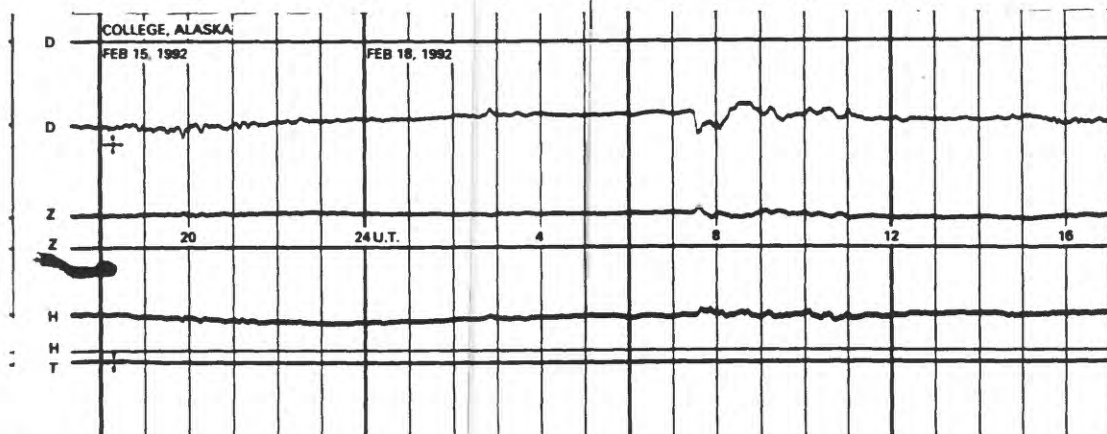
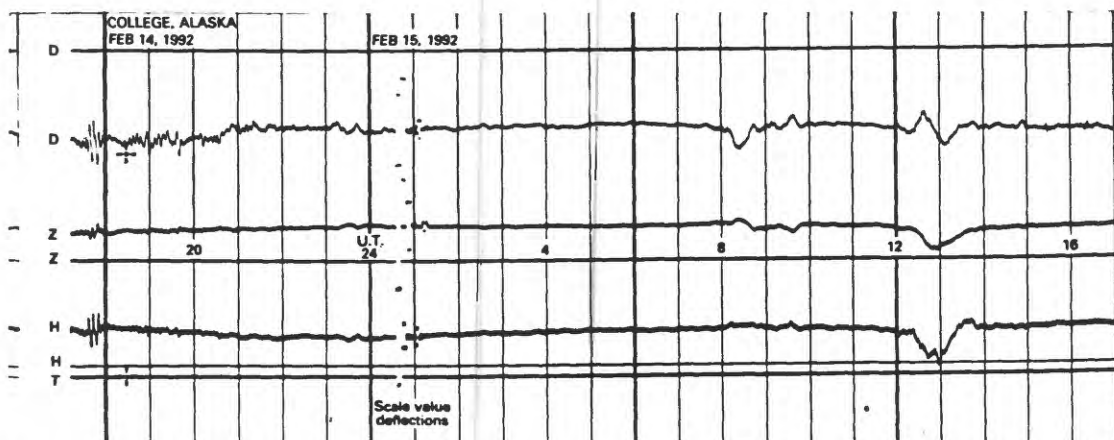
200 mm
100 mm
0



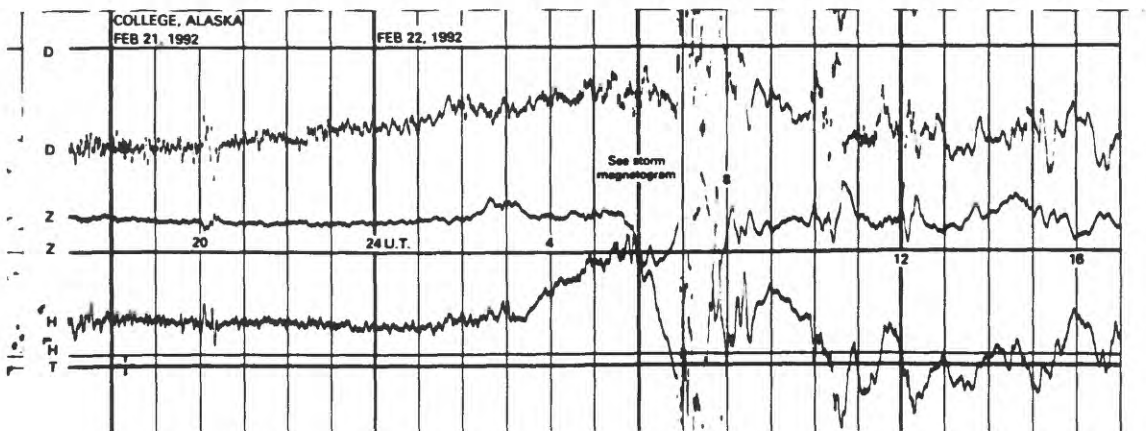
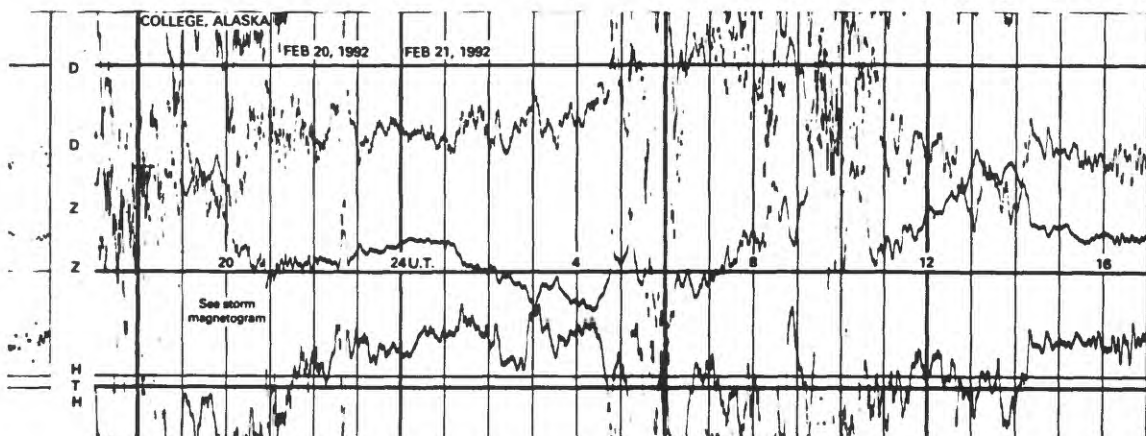
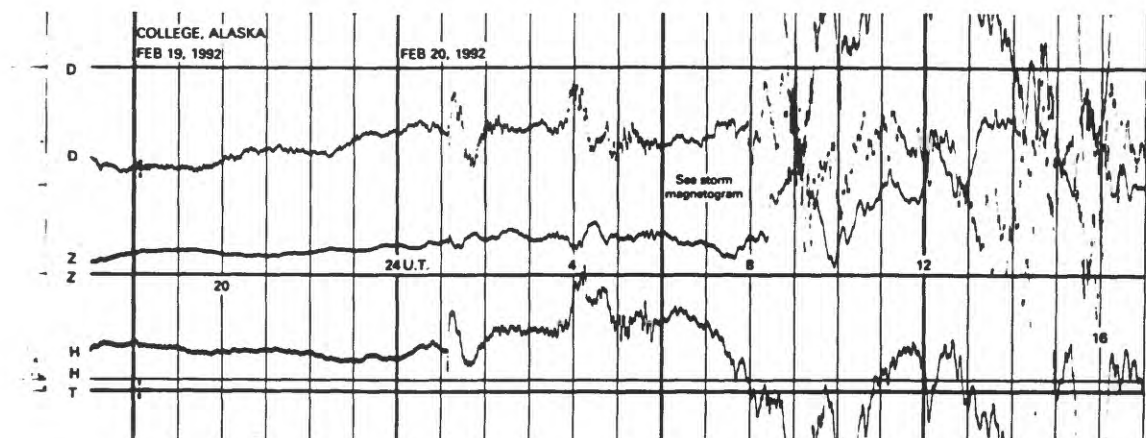
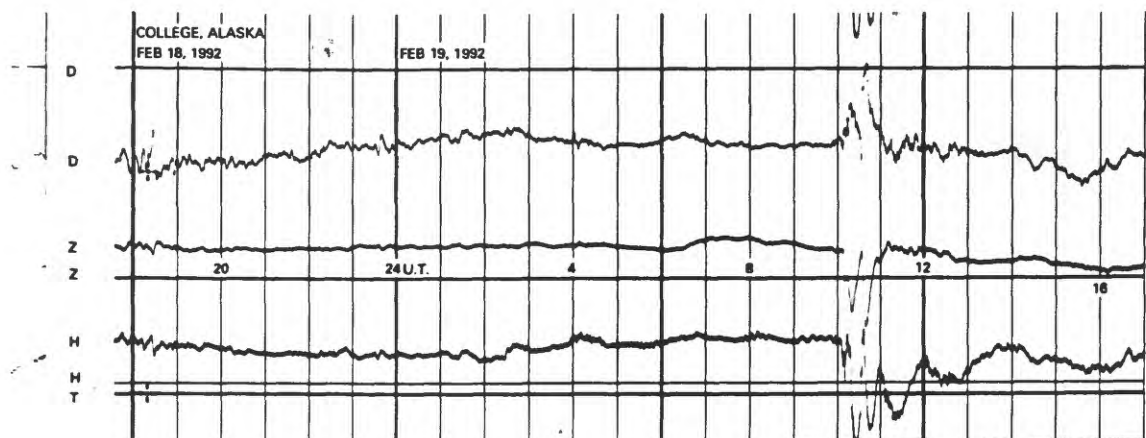
NORMAL MAGNETOGRAMS



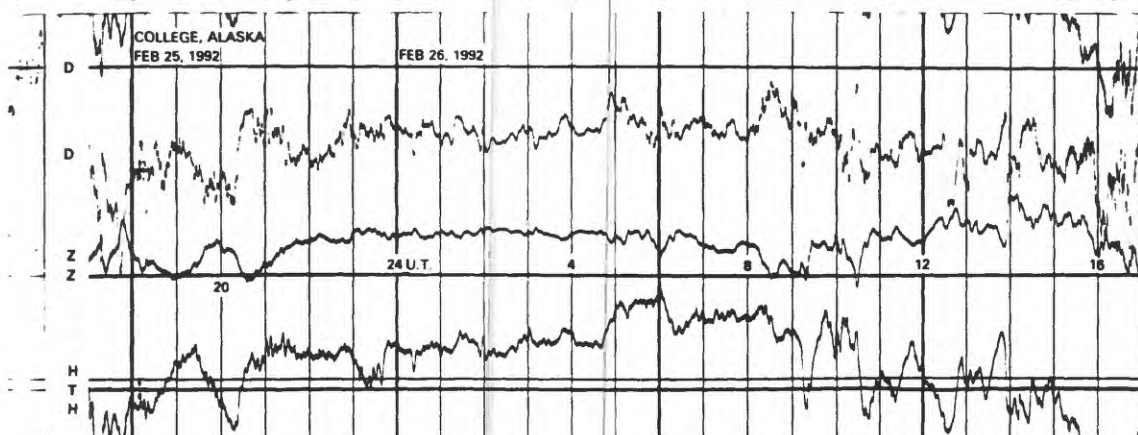
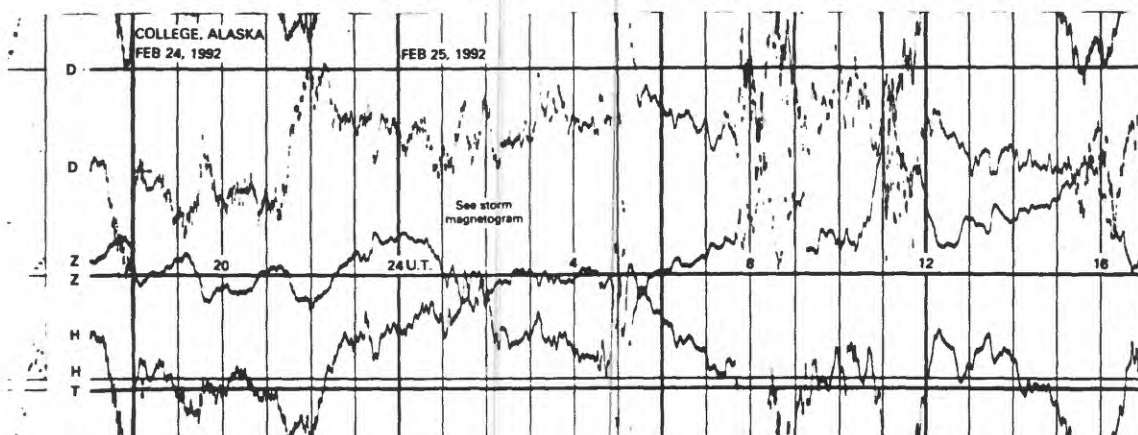
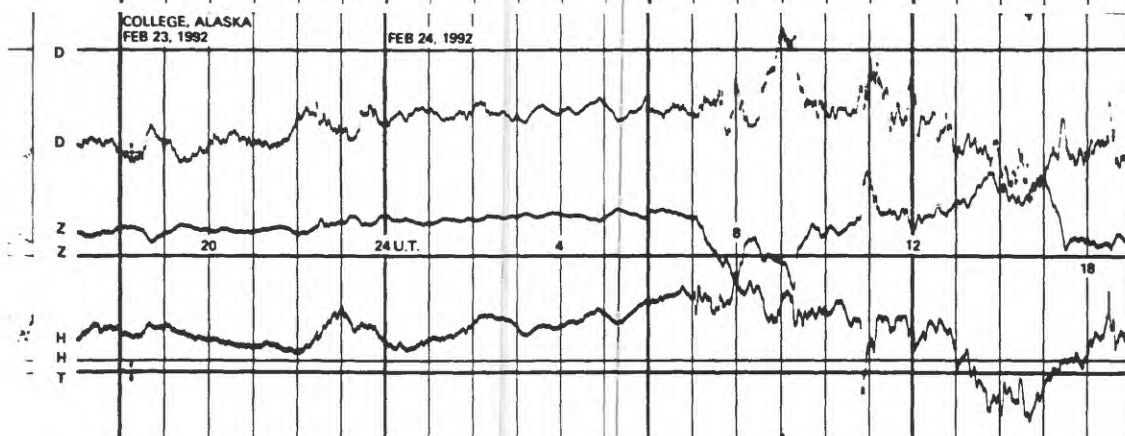
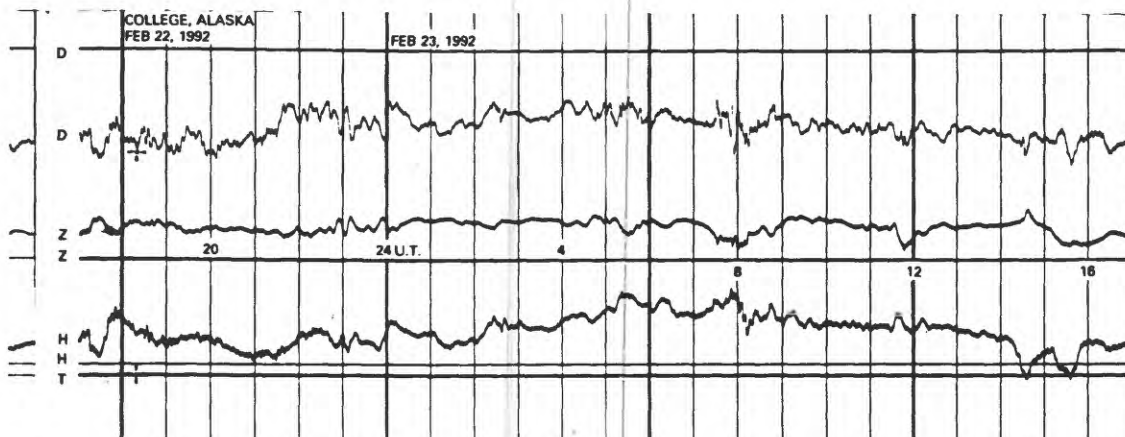
NORMAL MAGNETOGRAMS



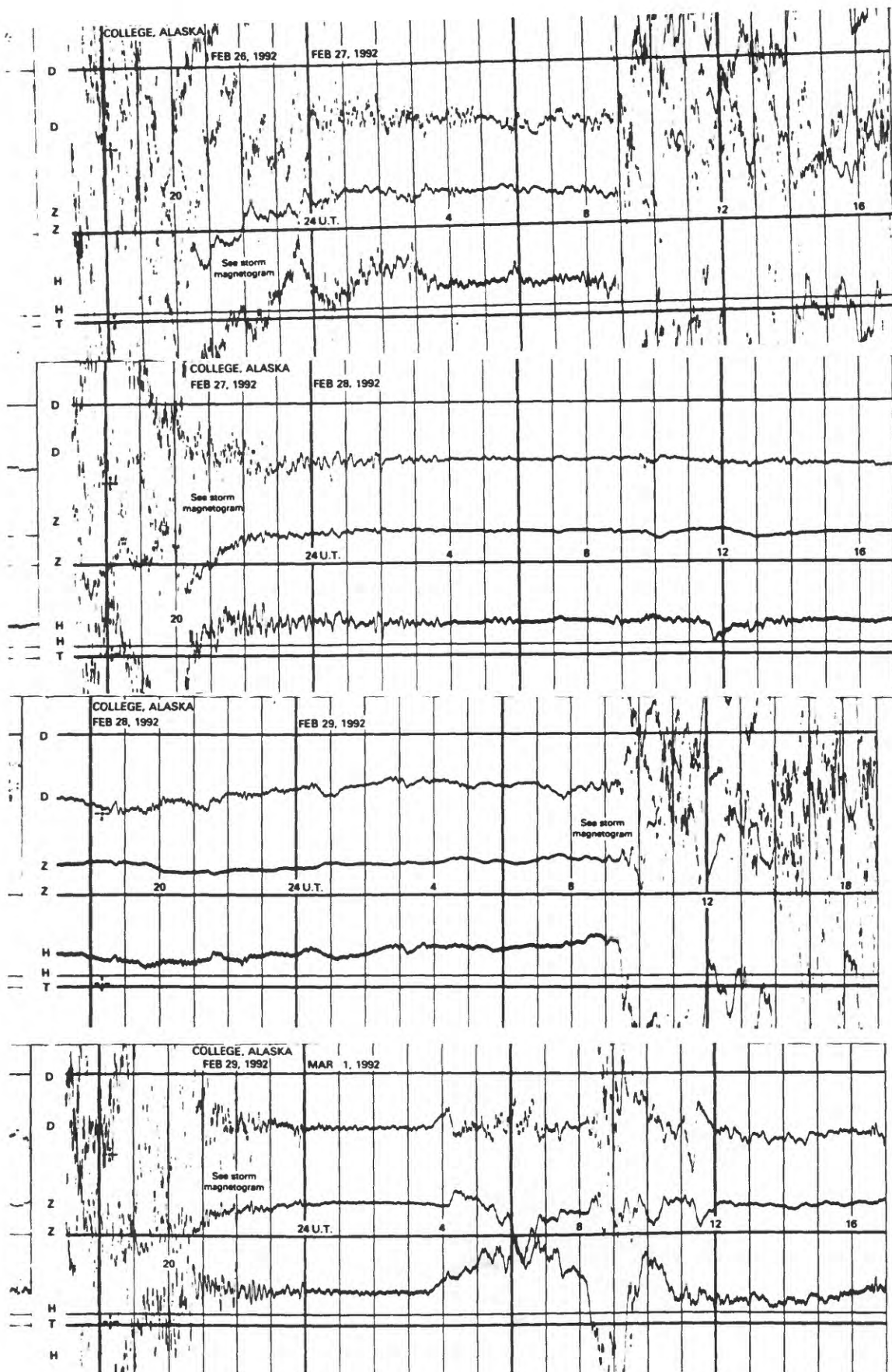
NORMAL MAGNETOGRAMS



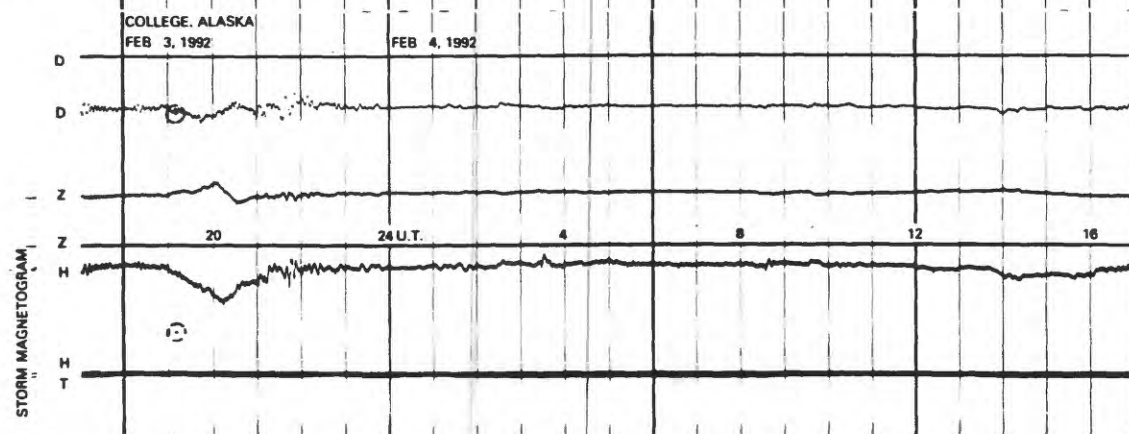
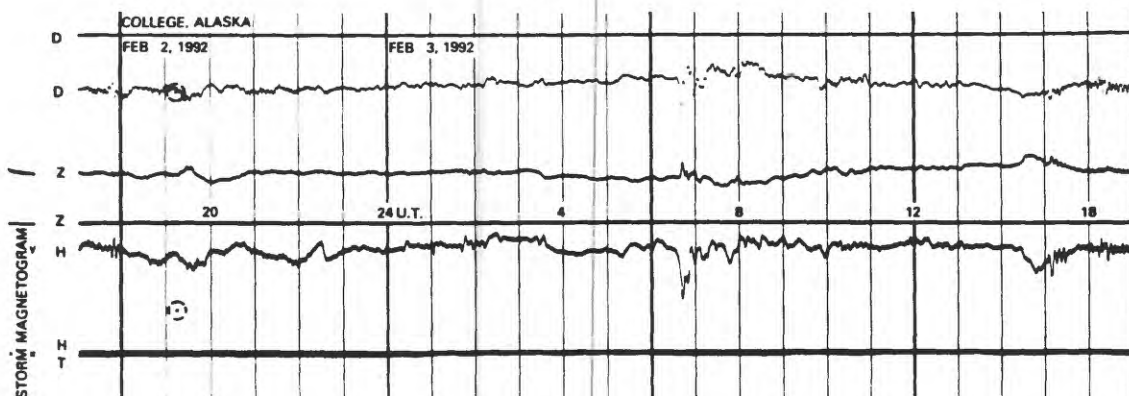
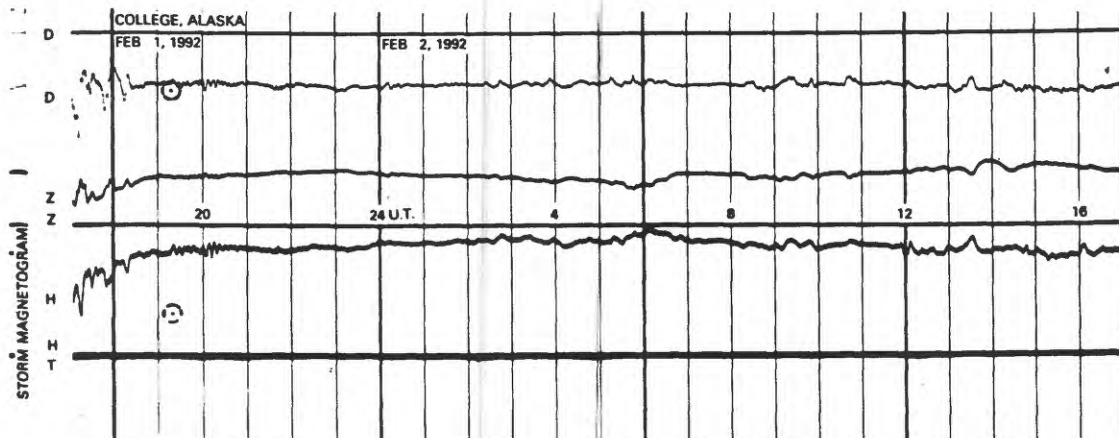
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

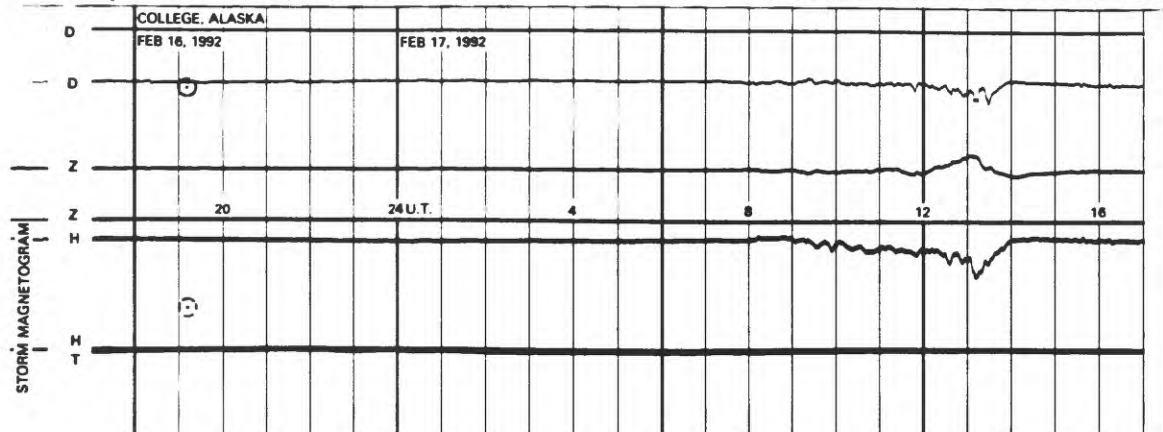
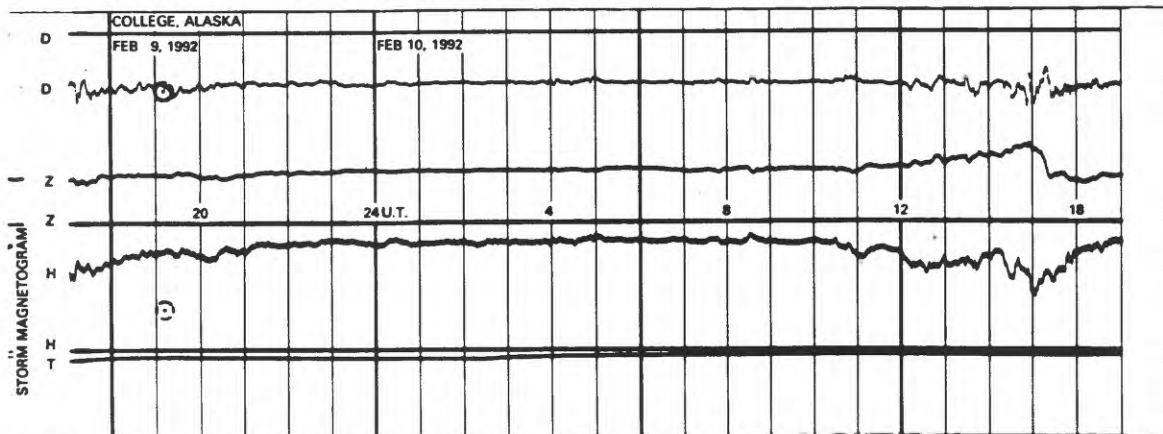
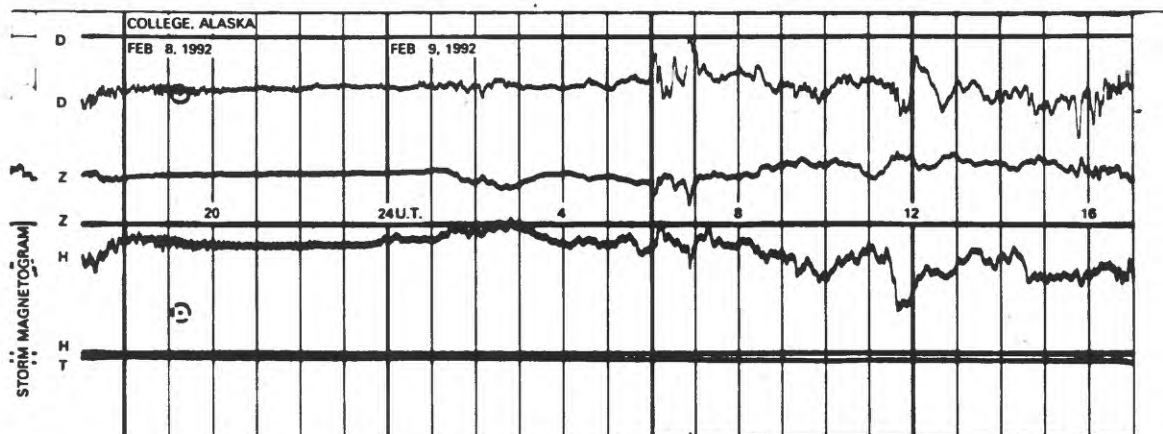
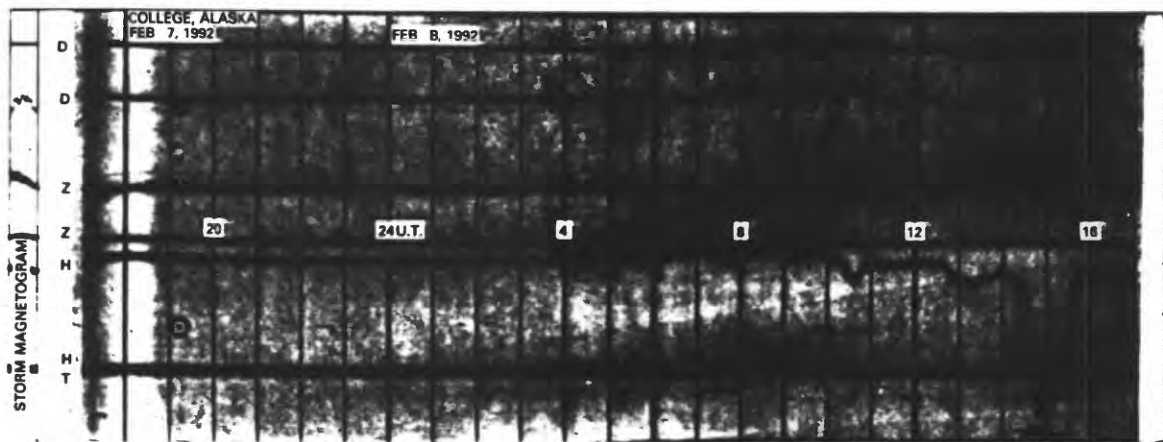


STORM MAGNETOGRAMS

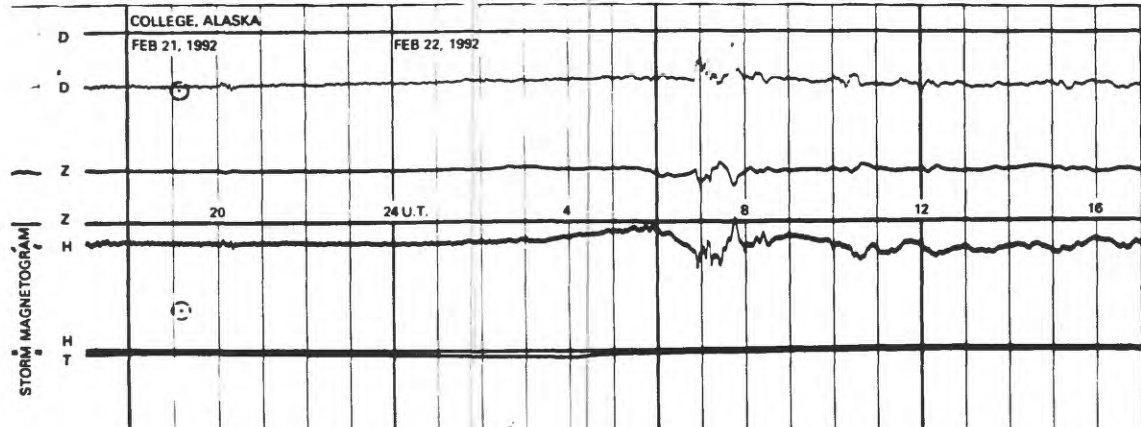
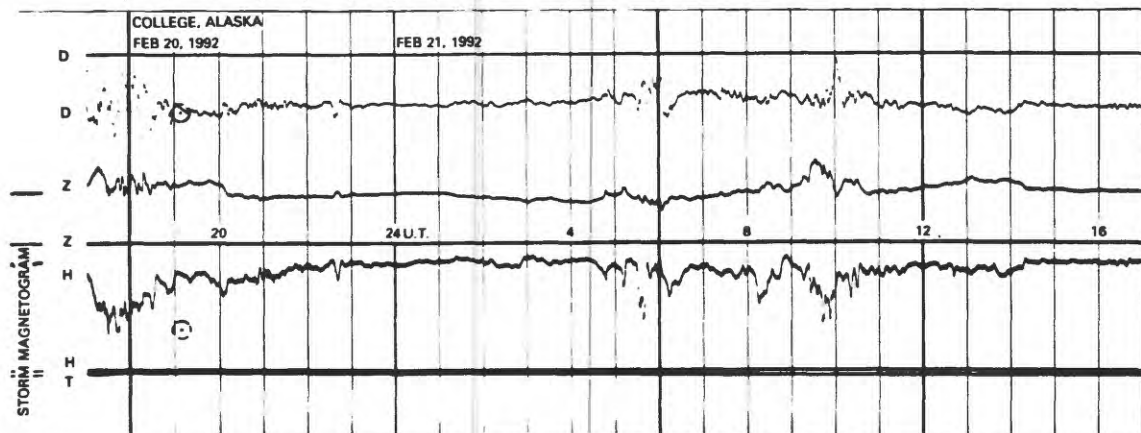
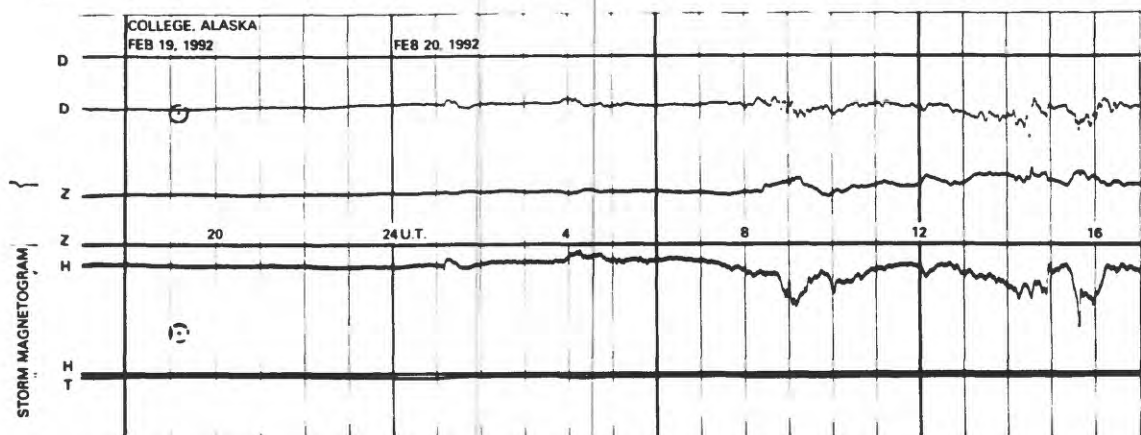
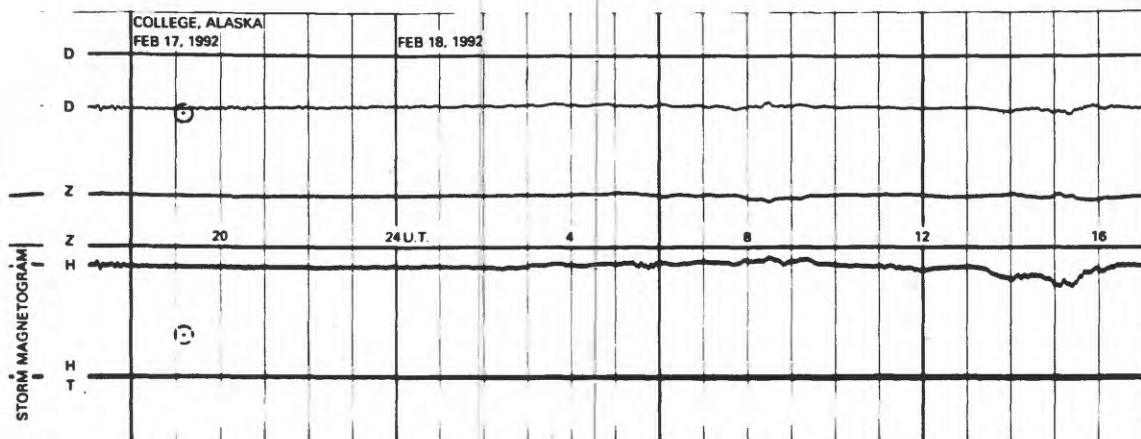


STORM MAGNETOGRAMS

200mm
100mm
0

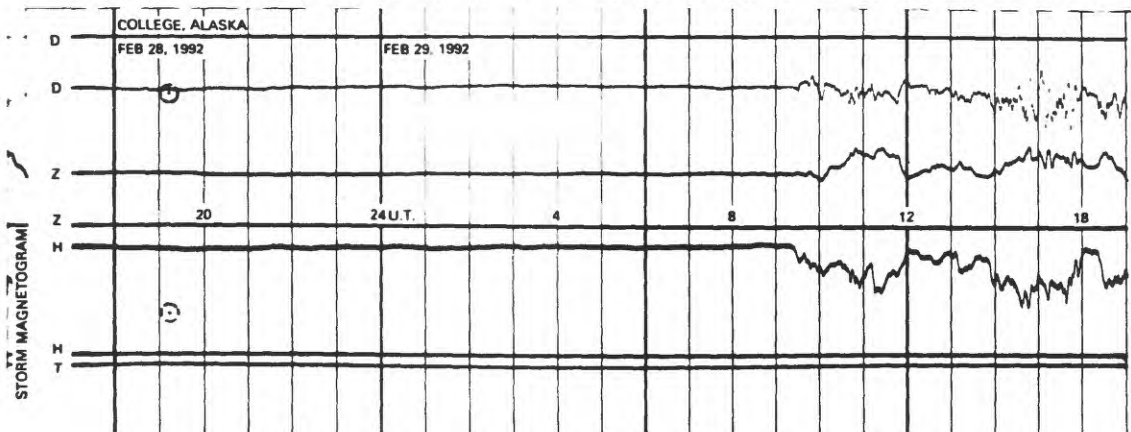
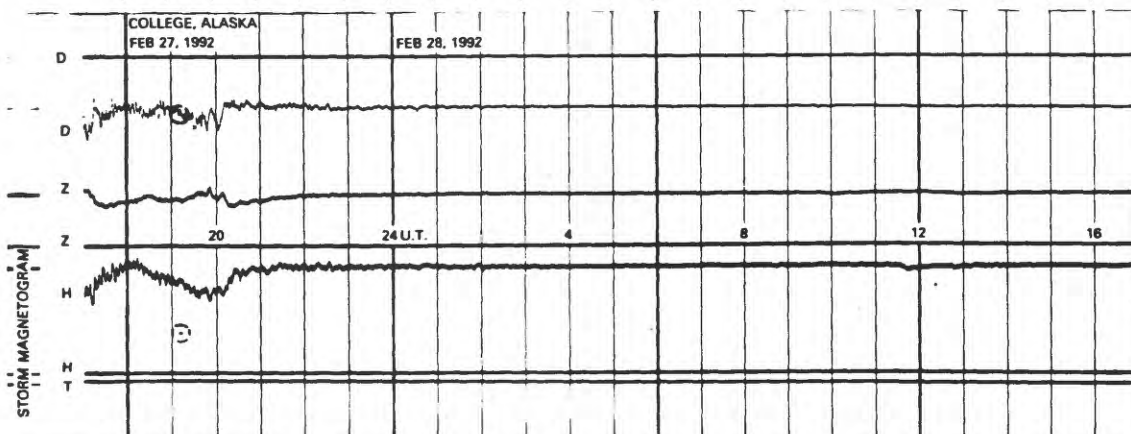
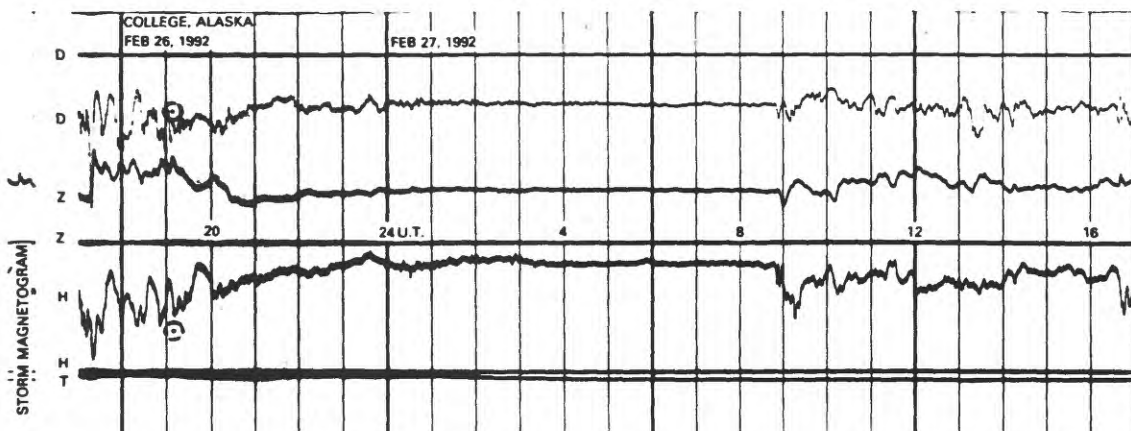
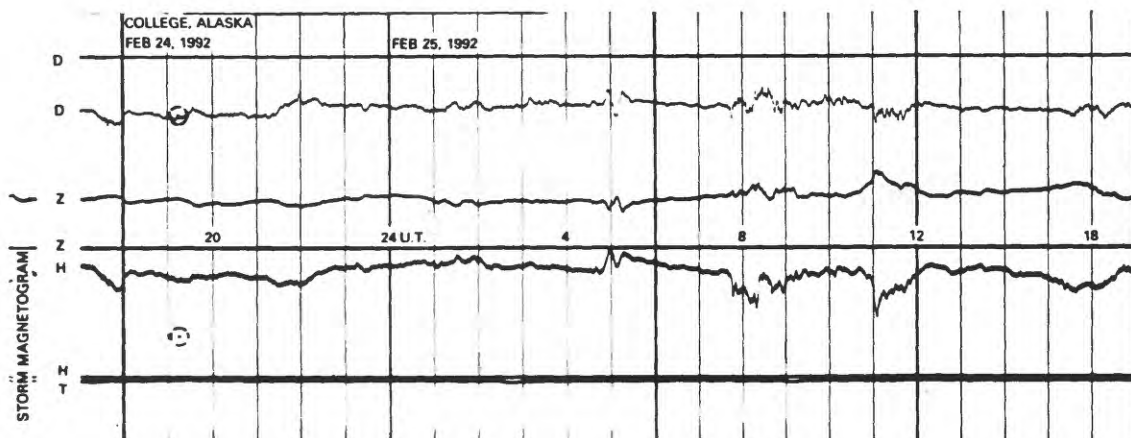


STORM MAGNETOGRAMS



STORM MAGNETOGRAMS

200mm
100mm
0



STORM MAGNETOGRAMS

