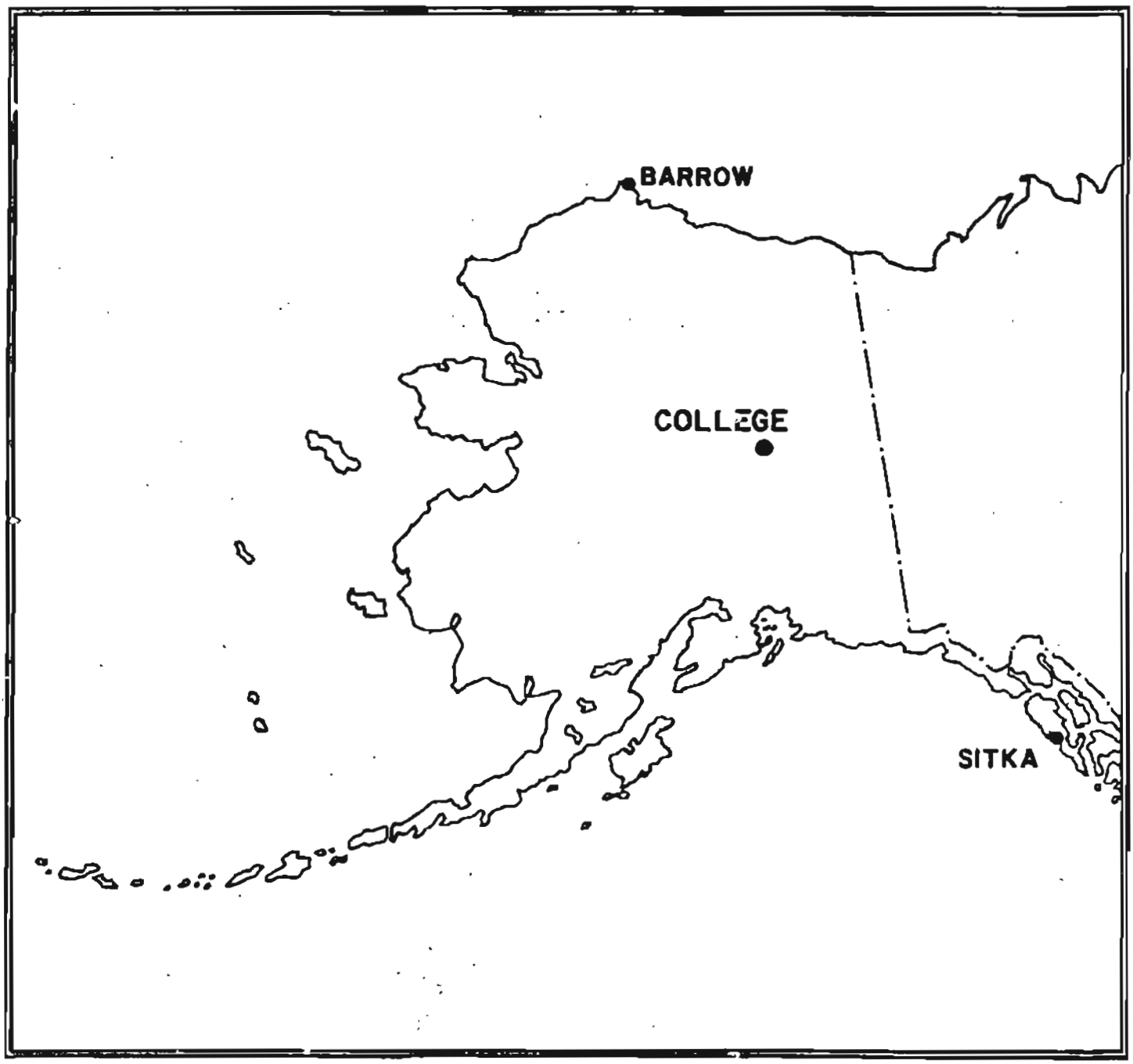
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

FEBRUARY 1988

OPEN FILE REPORT 88-0300B



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 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.

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

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 latituta.....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: February 1988

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	0	0	0	0	0	0	1	0	01	00
2	0	0	0	0	0	0	2	1	03	01
3	0	0	0	2	0	0	0	0	02	01
4	0	0	2	1	2	1	2	1	09	04
5	2	4	7	6	3	5	4	2	33	44
6	2	1	1	5	3	3	1	1	17	12
7	2	1	1	2	0	0	0	0	06	03
8	0	0	0	0	0	1	1	1	03	01
9	0	0	3	4	3	4	2	2	18	12
10	2	2	3	5	6	3	1	1	23	22
11	0	0	3	6	5	3	2	2	21	22
12	2	4	5	4	3	2	3	3	26	20
13	1	3	3	6	5	5	2	1	26	27
14	2	1	1	1	2	0	0	0	07	03
15	0	2	5	7	4	6	2	1	27	39
16	0	1	1	3	6	5	4	2	22	23
17	2	1	0	5	3	5	2	3	21	18
18	3	1	2	7	2	3	2	3	23	26
19	1	1	1	3	3	2	1	1	13	07
20	0	0	0	1	2	1	1	1	06	02
21	3	4	5	5	6	2	2	4	31	32
22	4	5	8	8	8	9	6	4	52	163
23	4	6	6	7	4	5	2	1	35	52
24	2	2	3	5	4	2	2	1	21	15
25	2	3	2	3	4	3	2	2	21	13
26	1	1	3	3	1	4	3	2	18	11
27	1	1	3	3	3	1	0	0	12	07
28	0	1	2	2	4	2	1	0	12	07
29	0	1	1	0	0	1	1	0	04	02
30										
31										

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

d	h	m
21	01	56

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.....	3.68	7.75		(γ/mm)
LOWER LIMIT FOR K = 9	2490	2500		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

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

NOAA FORM 76-139 SUPERSEDES C&GS FORM 576

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973-761-857

NOAA FORM 86-500
(11/73)

PRINCIPAL MAGNETIC STORMS

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA

February 1988

WDC-A FOR SOLAR-TERRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80303 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	5	04xx	..				5	3	7	172	1580	690	5	22
		21	0156	s.c.*	+15	+162	+30	22	6	9	653	3400	2450	23	21

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 2/1/88	2400 U.T., 2/29/88	1.0'/mm	3.7γ/mm	27° 01.2'E
H	(same)	(same)	7.8γ/mm		12623γ
Z	(same)	(same)	7.6γ/mm		55172γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 2/1/88	2400 U.T., 2/29/88	7.9'/mm	29.9γ/mm	
H	(same)	(same)	43.4γ/mm		
Z	(same)	(same)	49.0γ/mm		

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 16.4' E	12835γ	55913γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: FEB 2, 3, 8, 20, 29,

U.S. Dept. of Interior
Geological Survey

Jep-CO - 1/86

Observatory	Month	Year
COLLEGE	FEBRUARY	1988

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

(UNIVERSAL TIME)

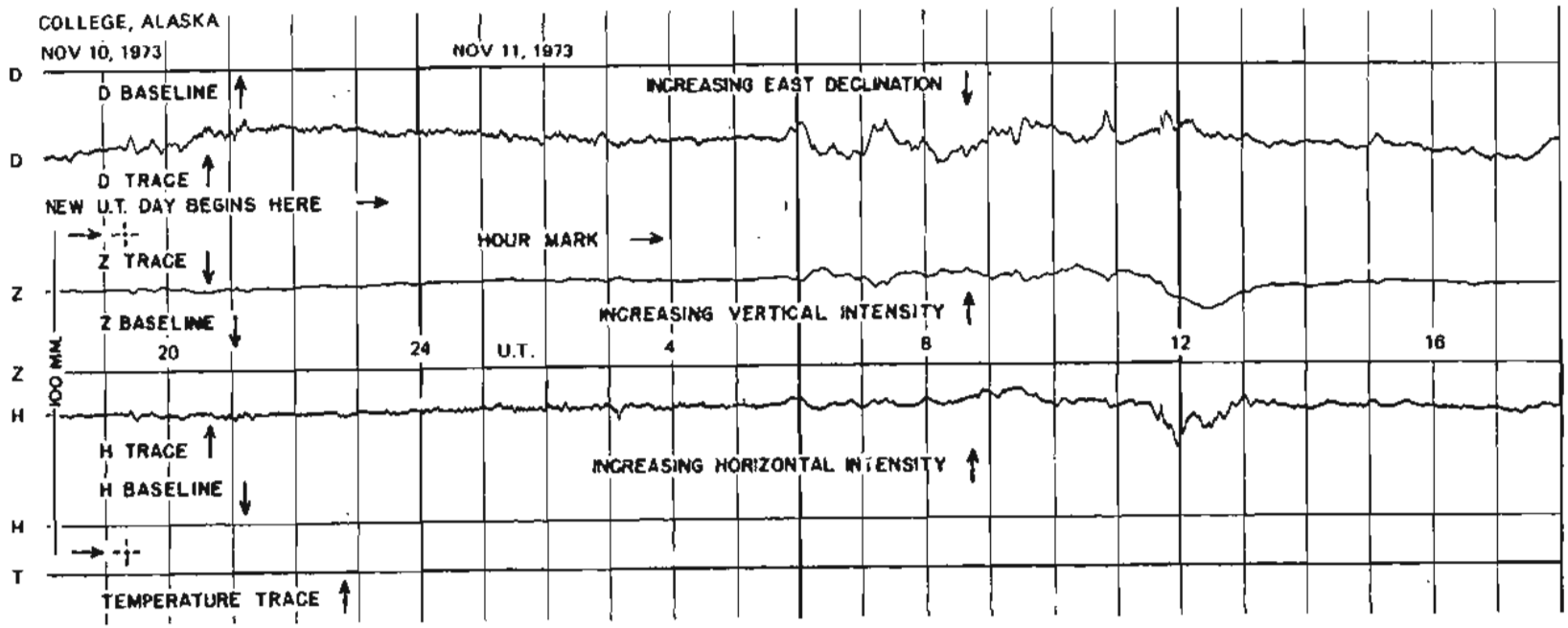
Values are in Tenths of nT and are Averages for Successive Periods of One Hour beginning at Midnight. Shrinkage Corrections have been applied. Negative Values in Red with Minus.

COMPONENT		D					H					Z					COMPONENT
DAY		02	03	08	20	29	02	03	08	20	29	02	03	08	20	29	DAY
4		01	01	01	02	02	01	01	01	02	02	01	01	01	02	02	4
HOUR	01	146	136	127	130	130	276	271	260	259	255	180	190	190	196	198	01 HOUR
	02	145	142	126	130	133	278	270	268	263	259	180	190	189	195	200	02
	03	147	151	130	129	134	281	273	279	269	261	182	192	193	193	203	03
	04	154	153	136	133	136	282	273	280	277	270	183	189	189	189	202	04
	05	153	159	138	137	133	281	275	279	280	272	183	190	197	190	203	05
	06	153	157	150	140	131	280	275	277	279	276	184	190	196	190	207	06
	07	157	153	153	145	131	282	275	274	282	280	185	188	195	193	208	07
	08	151	144	157	147	143	283	280	272	277	280	183	187	193	193	216	08
	09	150	149	153	148	122	281	275	273	273	284	181	197	190	189	215	09
	10	153	176	156	148	131	281	280	270	270	280	179	200	193	190	213	10
	11	153	189	158	147	143	286	289	270	277	279	177	187	193	187	213	11
	12	159	153	176	159	153	283	286	270	275	279	174	177	190	186	201	12
	13	160	148	166	155	158	286	285	273	268	275	167	178	187	173	195	13
	14	144	155	163	176	164	289	286	273	256	270	168	179	186	146	187	14
	15	149	156	158	171	164	290	286	273	270	273	170	178	186	137	186	15
	16	150	155	167	178	157	290	284	267	288	273	170	177	182	176	185	16
	17	173	168	171	158	152	289	283	260	279	271	172	179	171	180	192	17
	18	178	173	163	173	163	289	280	259	293	260	176	179	157	190	195	18
	19	195	182	182	220	193	281	280	258	280	267	176	180	156	186	187	19
	20	155	188	183	195	169	249	277	262	273	263	168	180	147	182	185	20
	21	93	187	183	167	152	256	270	243	257	261	126	181	156	183	189	21
	22	143	177	149	161	148	273	270	263	248	258	150	183	163	189	194	22
	23	160	171	149	147	137	275	270	267	253	259	168	179	173	189	196	23
	24	146	154	142	101	132	273	267	259	241	260	180	178	176	187	199	24
DAILY SUM		3667	3876	3736	3695	3509	6714	6659	6429	6487	6465	4162	4428	4348	4409	4769	DAILY SUM
DAILY MEAN		153	162	156	154	146	280	277	268	270	269	173	184	181	184	199	DAILY MEAN
MEAN			154					273					184				MEAN

Scaled LYT Checked RVO

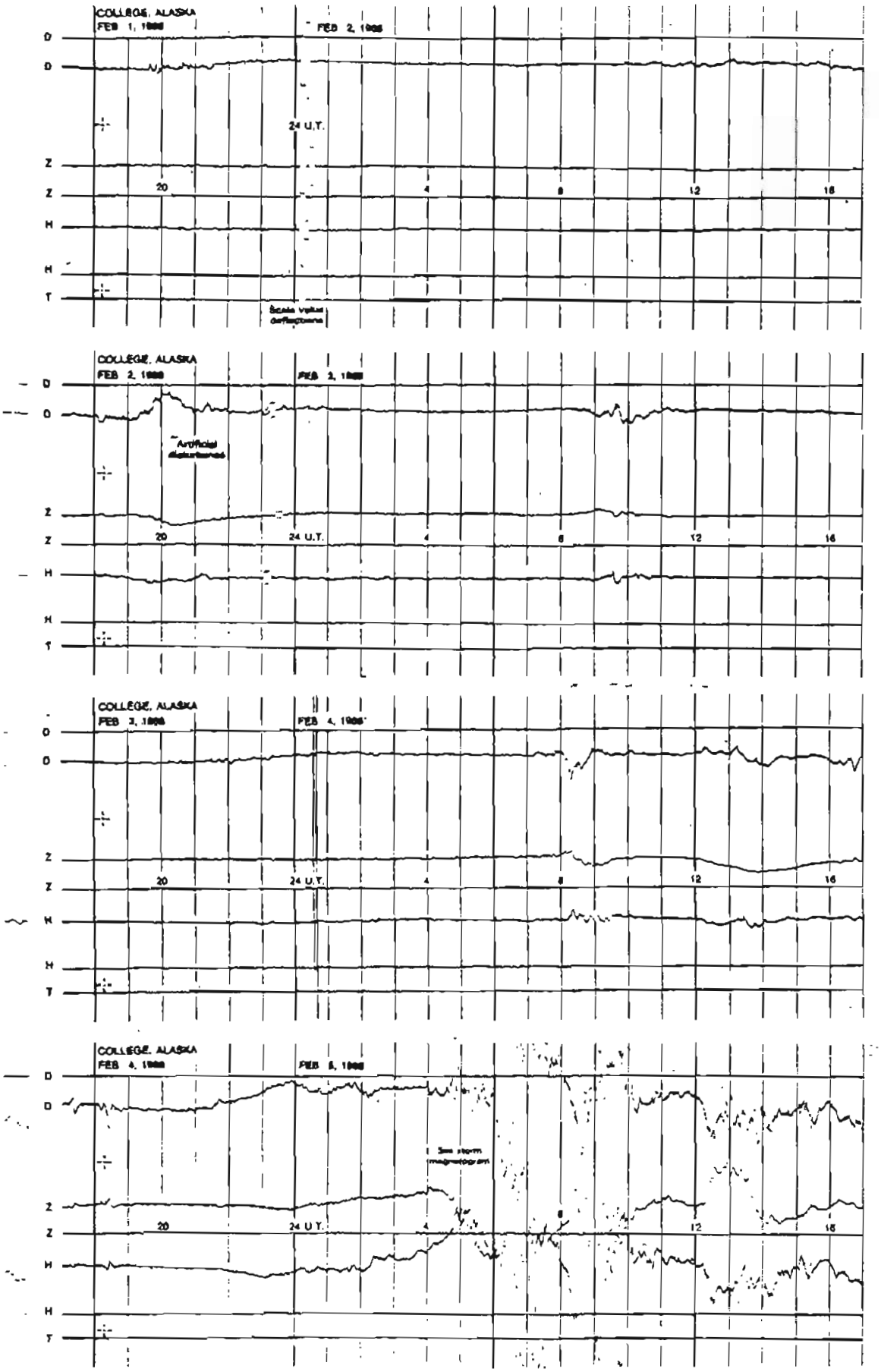
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)



SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS

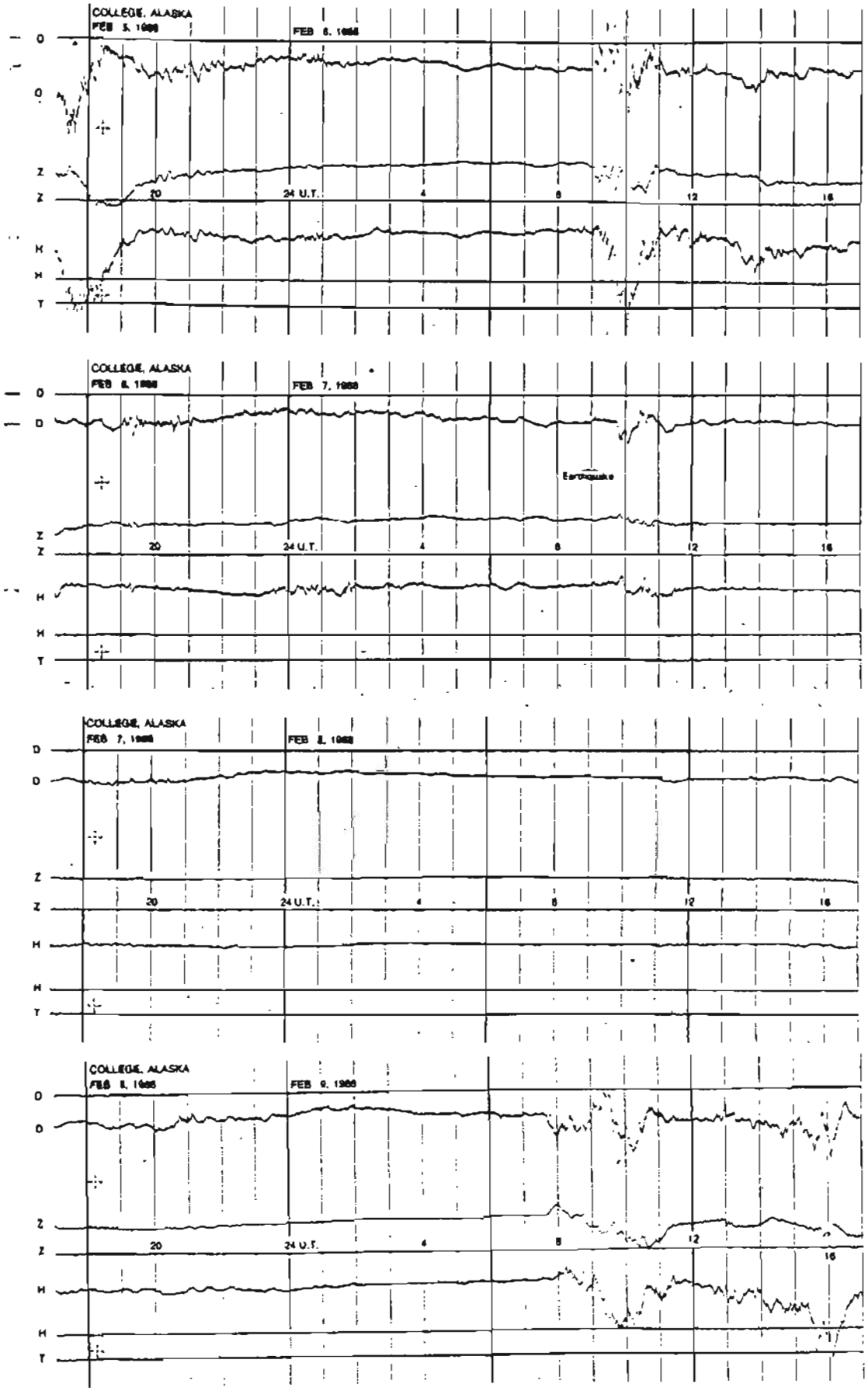


200 mm

100 mm

0

NORMAL MAGNETOGRAMS

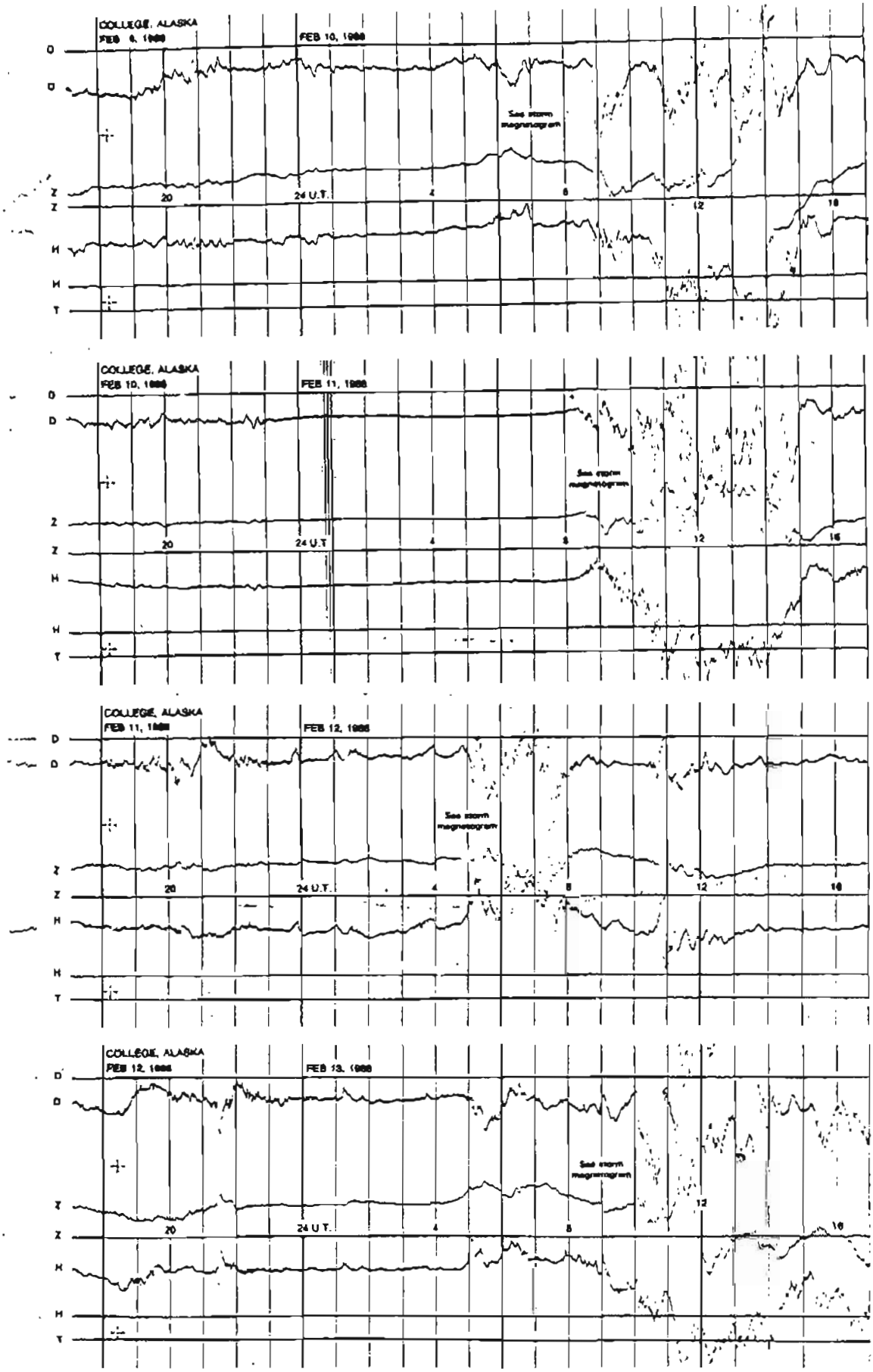


200 mm

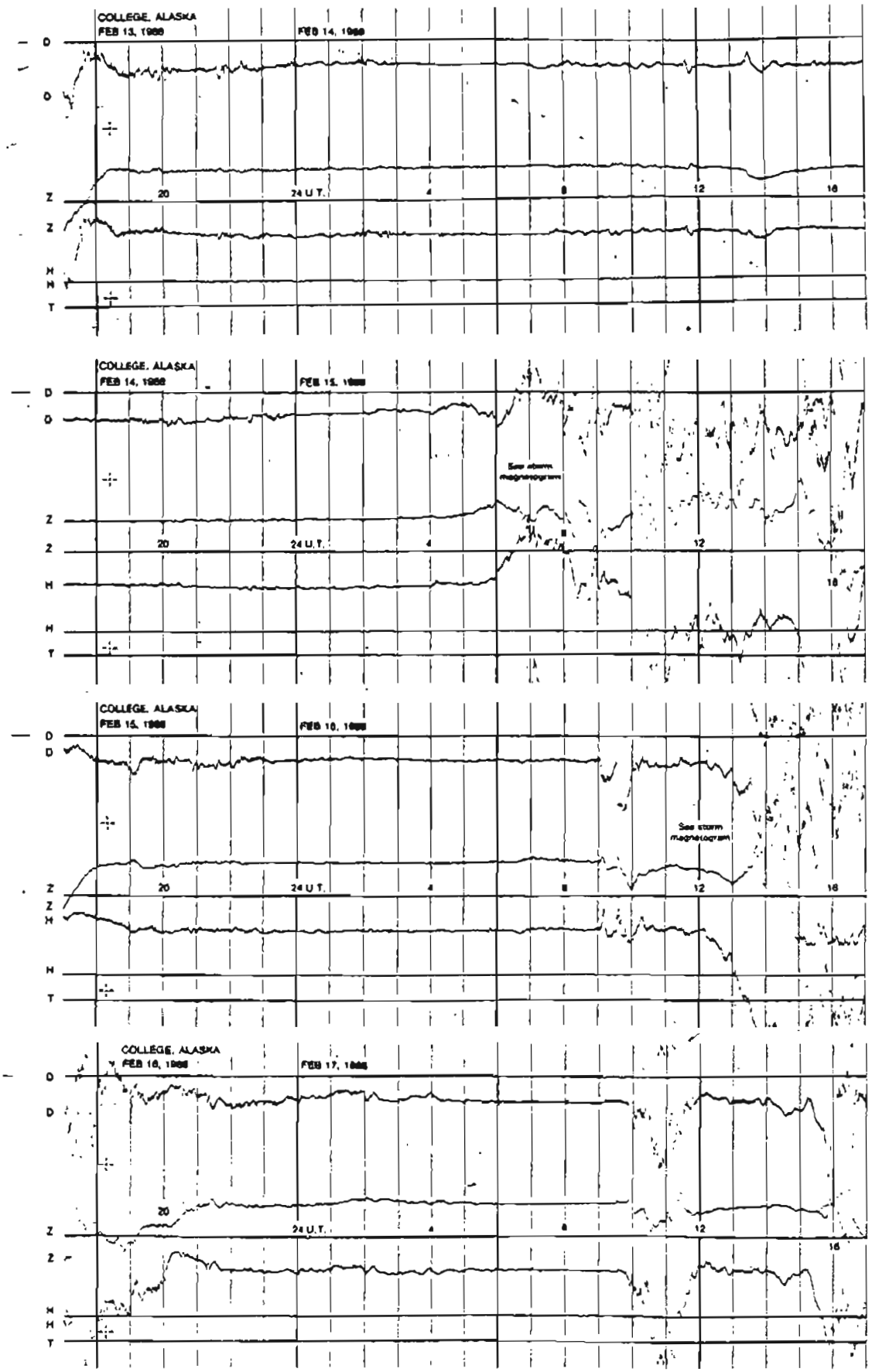
100 mm

0

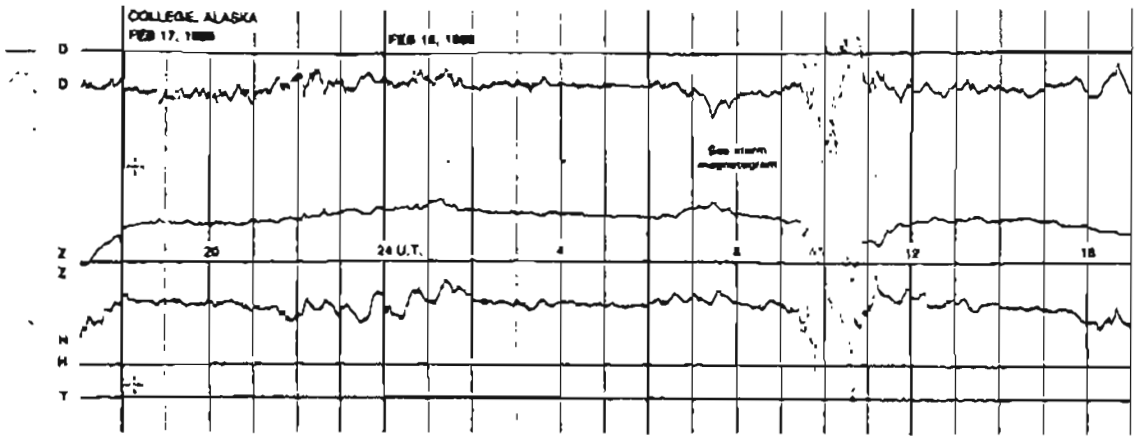
NORMAL MAGNETOGRAMS

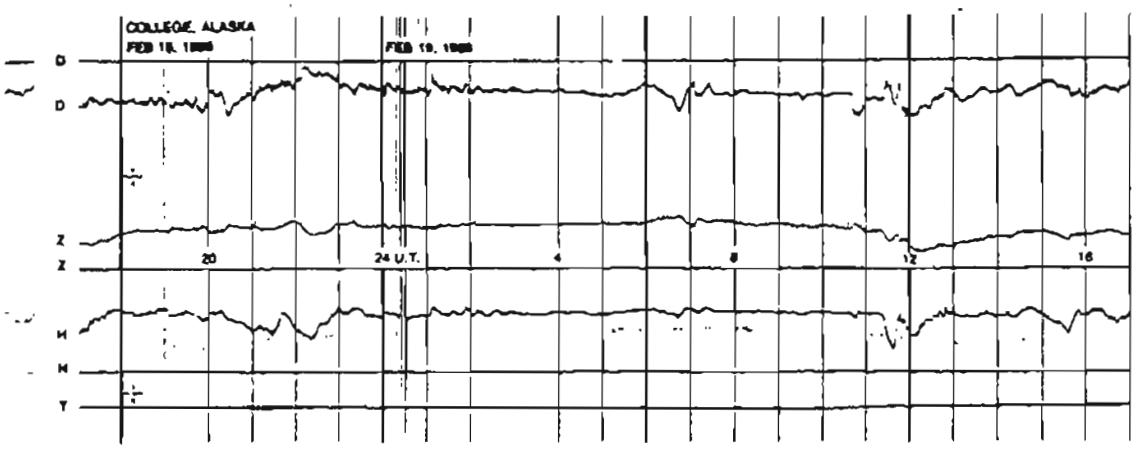


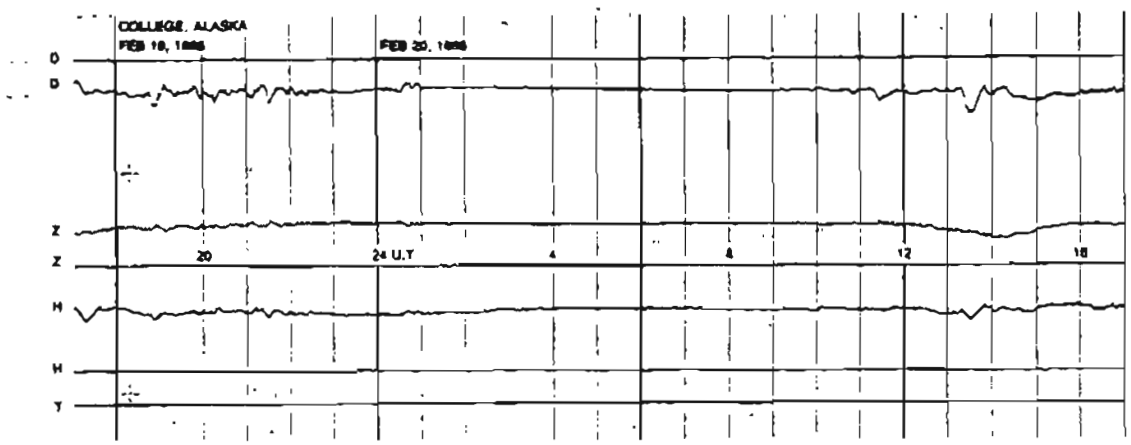
NORMAL MAGNETOGRAMS

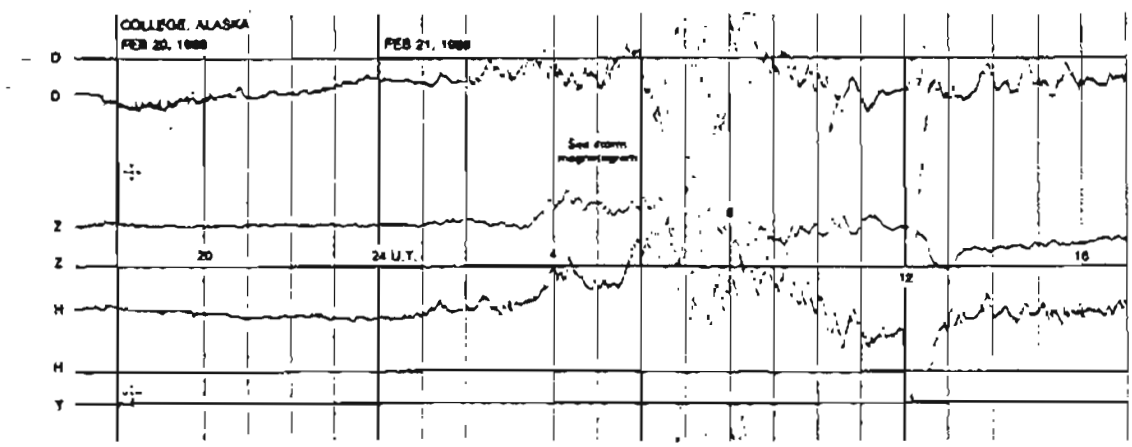


NORMAL MAGNETOGRAMS

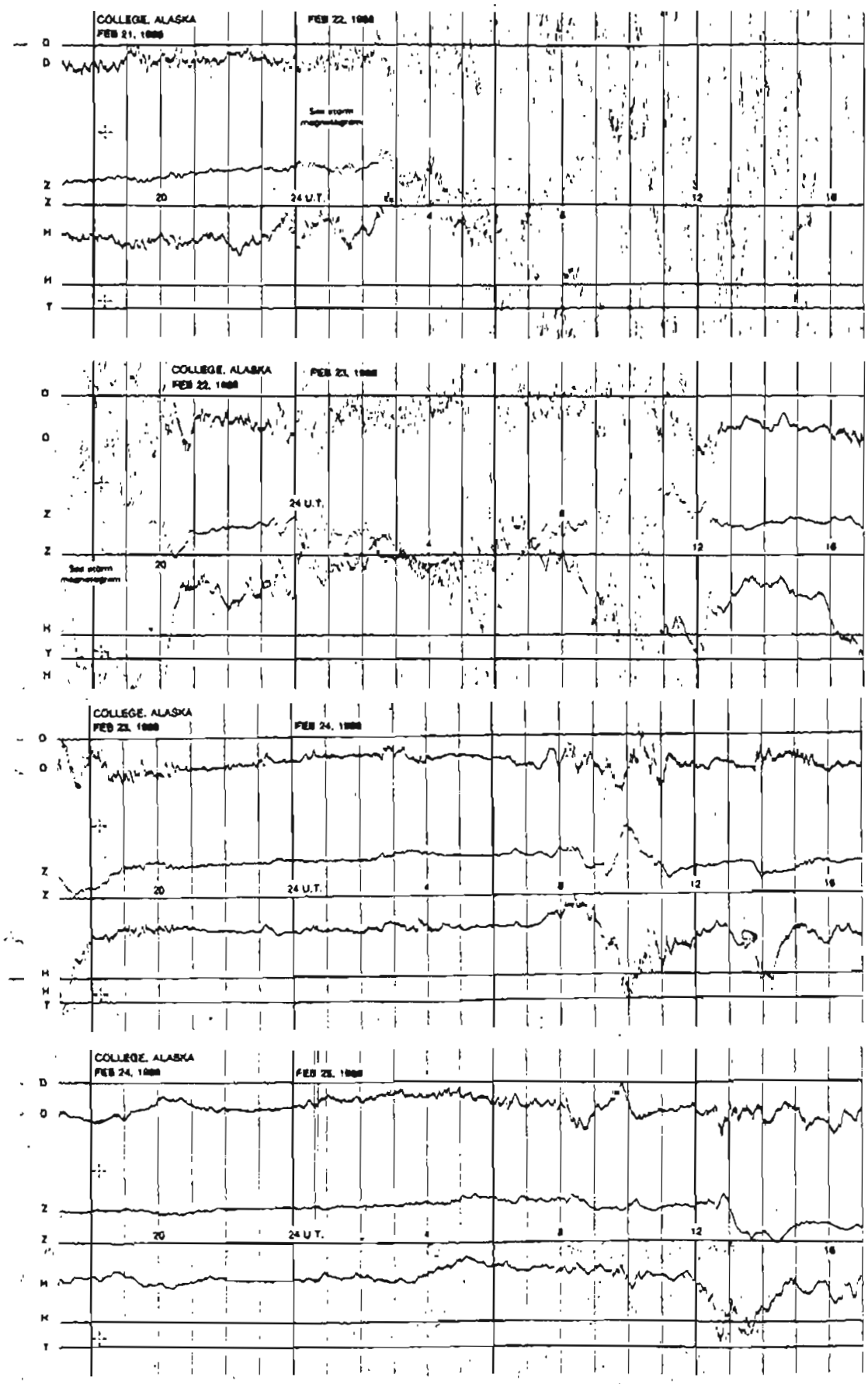




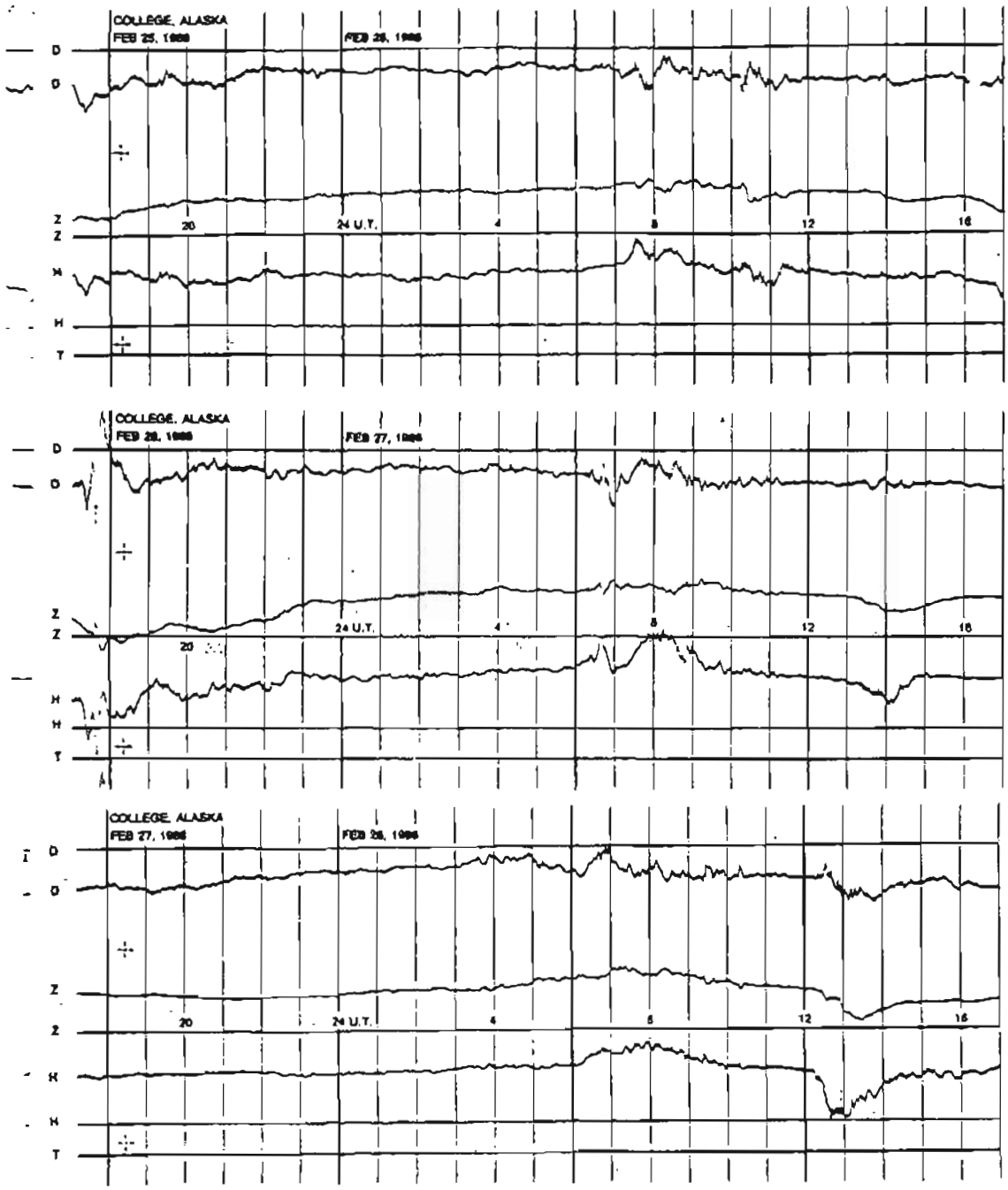




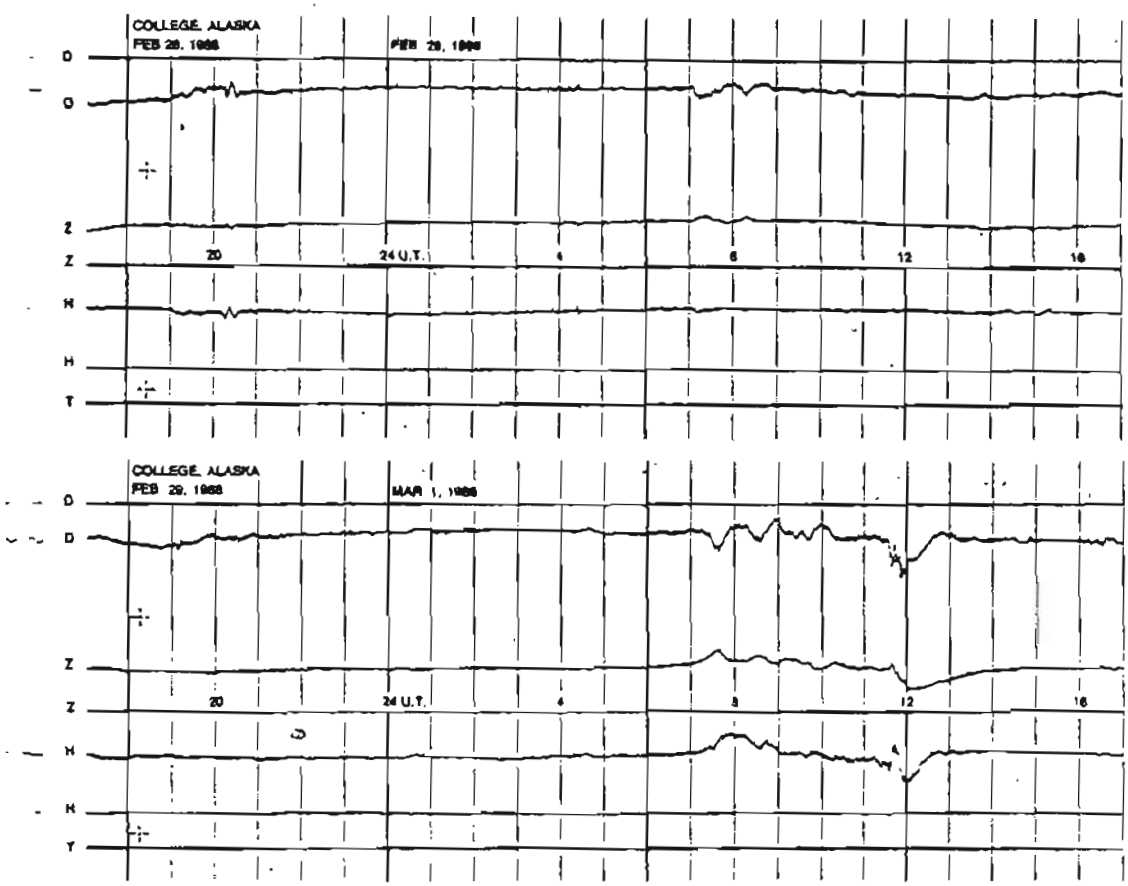
NORMAL MAGNETOGRAMS



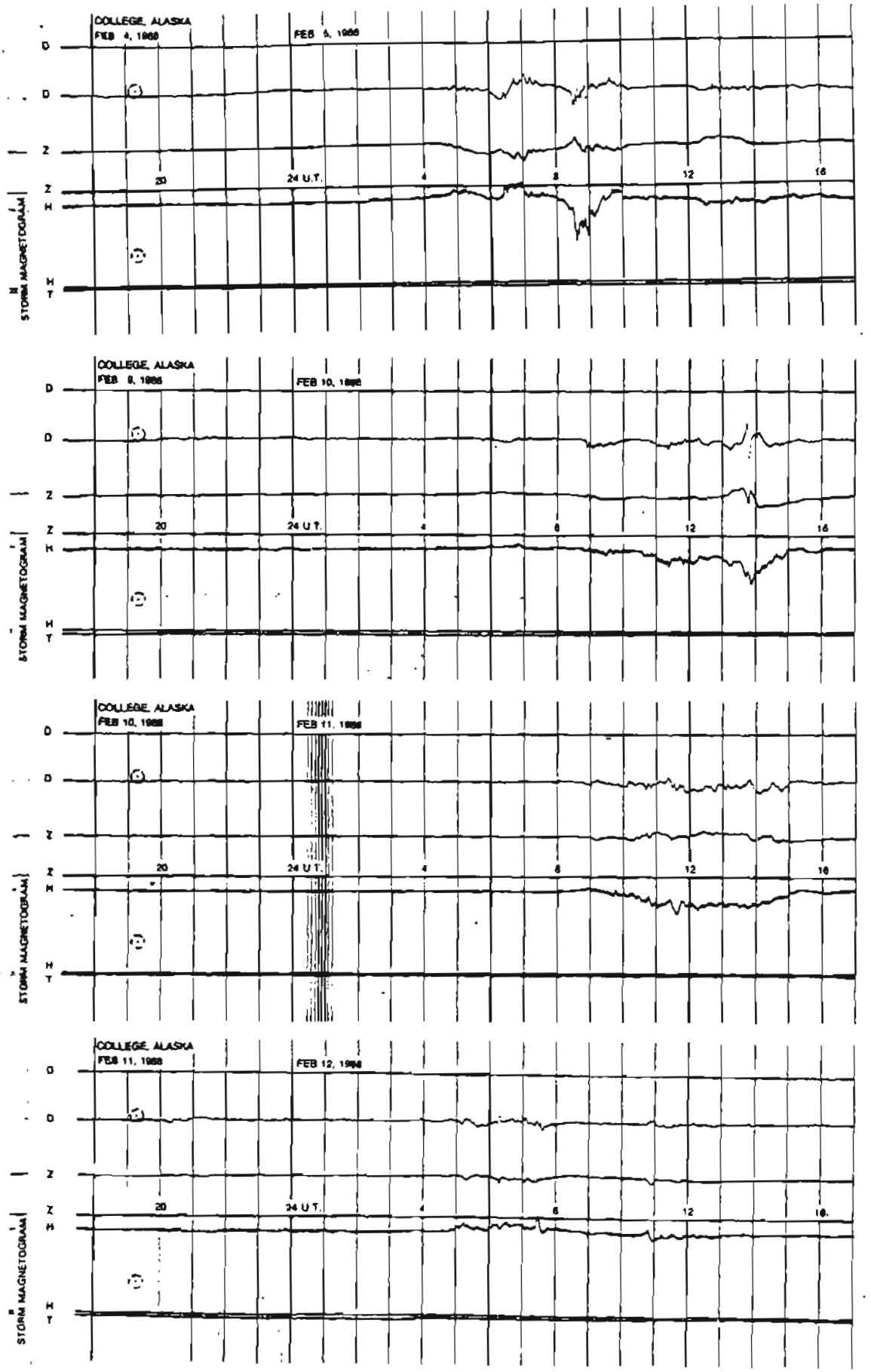
NORMAL MAGNETOGRAMS



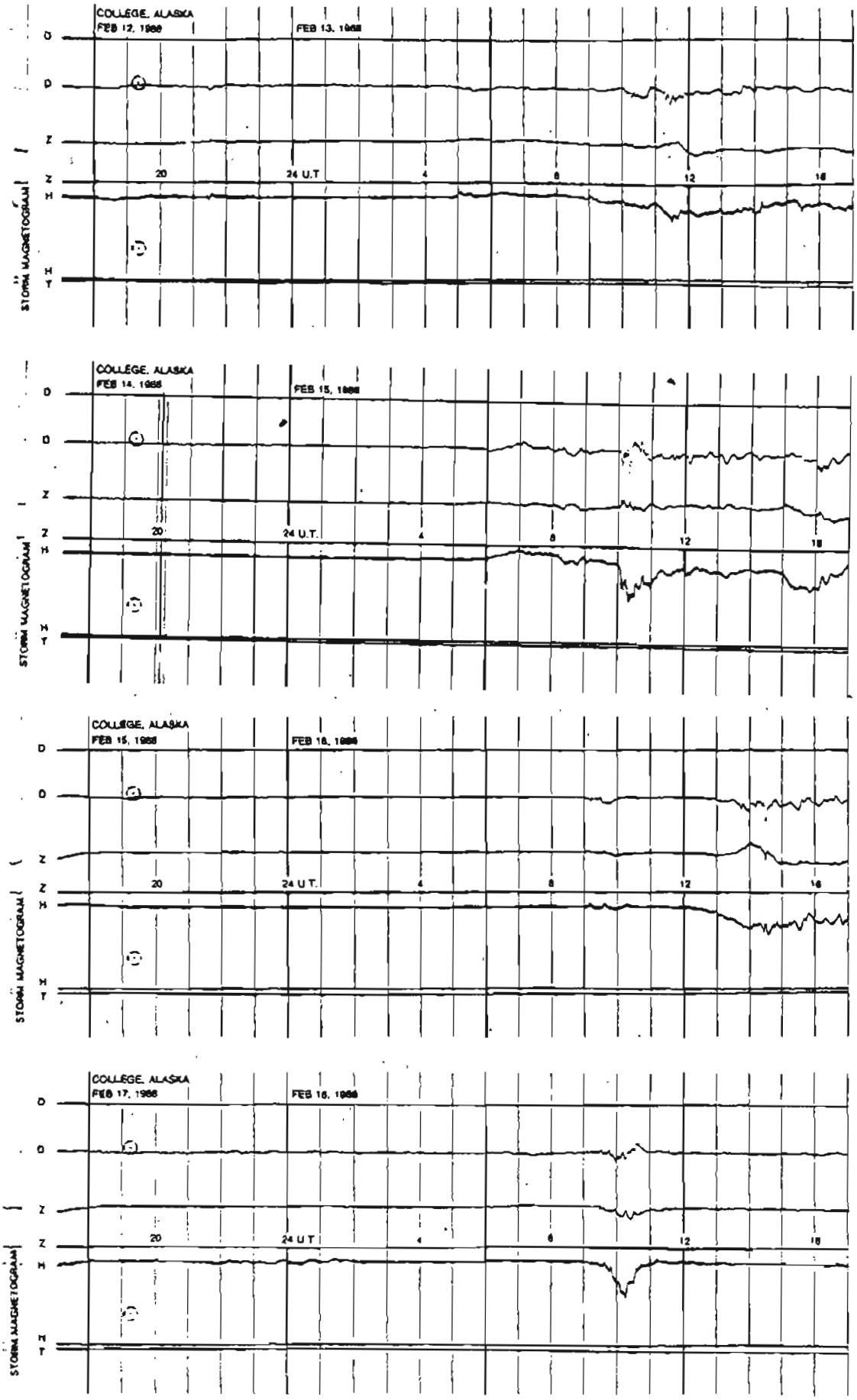
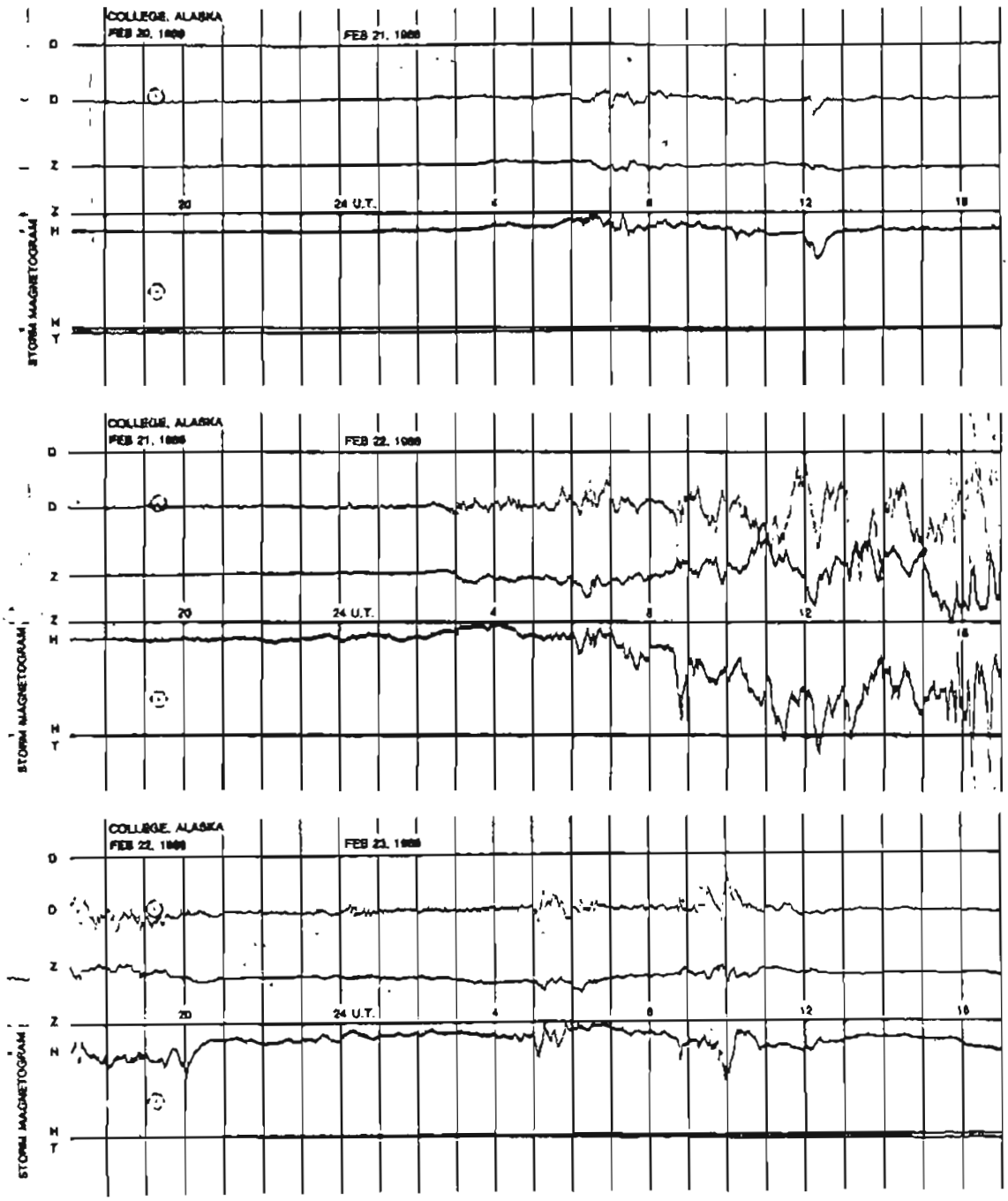
NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS