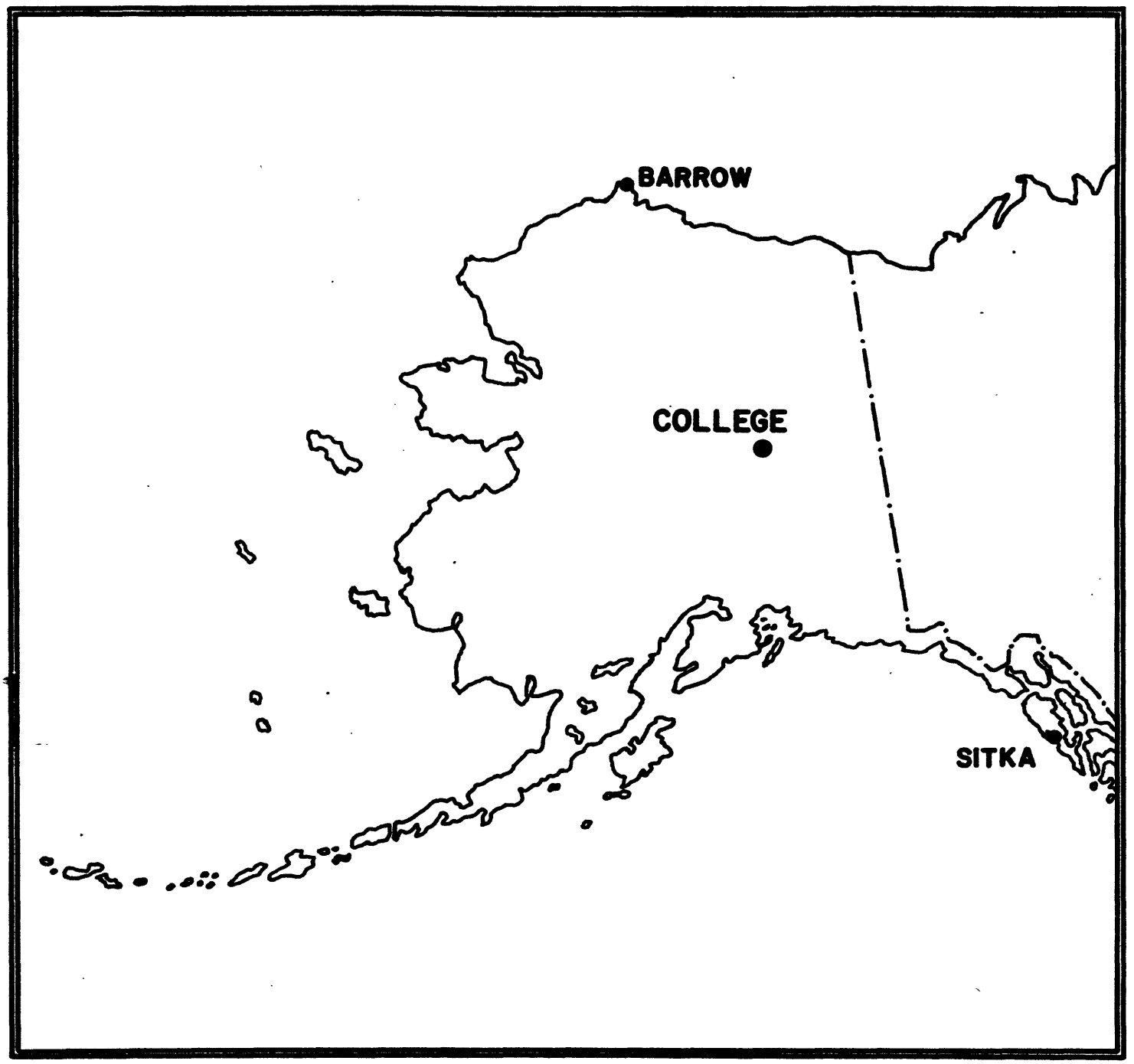
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

FEBRUARY 1989

OPEN FILE REPORT 89-0300B



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. 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 latitute.....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, 1989

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	Ak
1	4	4	3	4	6	3	4	4	32	31
2	3	3	3	2	3	2	5	4	25	19
3	4	4	3	6	6	7	6	4	40	60
4	4	4	3	5	5	5	3	3	32	30
5	3	3	4	5	4	5	4	4	32	29
6	4	3	3	6	5	6	4	2	33	37
7	3	4	4	6	6	6	4	3	36	44
8	3	2	4	5	4	2	1	2	23	18
9	2	4	3	3	5	5	2	2	26	22
10	4	3	3	3	5	1	0	0	19	15
11	0	0	1	4	5	2	4	2	18	15
12	2	1	3	2	3	4	4	2	21	14
13	3	4	4	5	4	5	3	1	29	26
14	1	4	2	5	5	5	1	0	23	23
15	1	2	4	4	2	4	4	3	24	18
16	4	3	3	3	5	1	2	2	23	17
17	2	0	0	1	0	0	1	1	5	02
18	0	1	0	0	5	5	2	0	13	13
19	0	0	2	2	3	5	2	2	16	11
20	3	2	3	5	6	5	4	2	30	31
21	2	2	3	4	3	4	2	1	21	14
22	1	0	5	5	4	2	2	1	20	18
23	1	0	0	3	1	0	1	1	7	03
24	1	2	2	3	4	2	1	0	15	09
25	0	1	3	1	1	0	1	1	8	04
26	0	0	0	0	1	0	0	0	1	00
27	0	0	0	1	2	2	1	1	7	03
28	0	1	2	4	4	4	4	2	21	16
29										
30										
31										

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.....	3.69	7.77		(γ/mm)
LOWER LIMIT FOR K = 9	2490	2500		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED John B. Townshend, Chief
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

FEBRUARY 19 89

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	18XX	. .				3	6	7	243	1320	810	04	18
		7	06XX	. .				7	4,5,6	6	132	1070	480	07	22

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: FEBRUARY 1989

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0001 UT, 2/1/89	2400 UT, 2/28/89	1.0'/mm	3.7 γ/mm	26° 51.0' E
H	0001 UT, 2/1/89	2400 UT, 2/11/89	7.8 γ/mm		12616 γ
	0001 UT, 2/12/89	2400 UT, 2/28/89	(SAME)		12620 γ
Z	0001 UT, 2/1/89	2400 UT, 2/4/89	7.7 γ/mm		55175 γ
	0001 UT, 2/5/89	2400 UT, 2/15/89	(SAME)		55170 γ
	0001 UT, 2/16/89	2400 UT, 2/28/89	(SAME)		55173 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0001 UT, 2/1/89	2400 UT, 2/28/89	7.9'/mm	29.5 γ/mm	
H	(SAME)	(SAME)	43.5 γ/mm		
Z	(SAME)	(SAME)	49.4 γ/mm		

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 06.3' E	12805 γ	55315 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: FEB 17, 23, 25, 26, 27

U.S. Dept. of Interior
Geological Survey

Observatory: COLLEGE, ALASKA | Month: FEBRUARY | Year: 1989

Jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

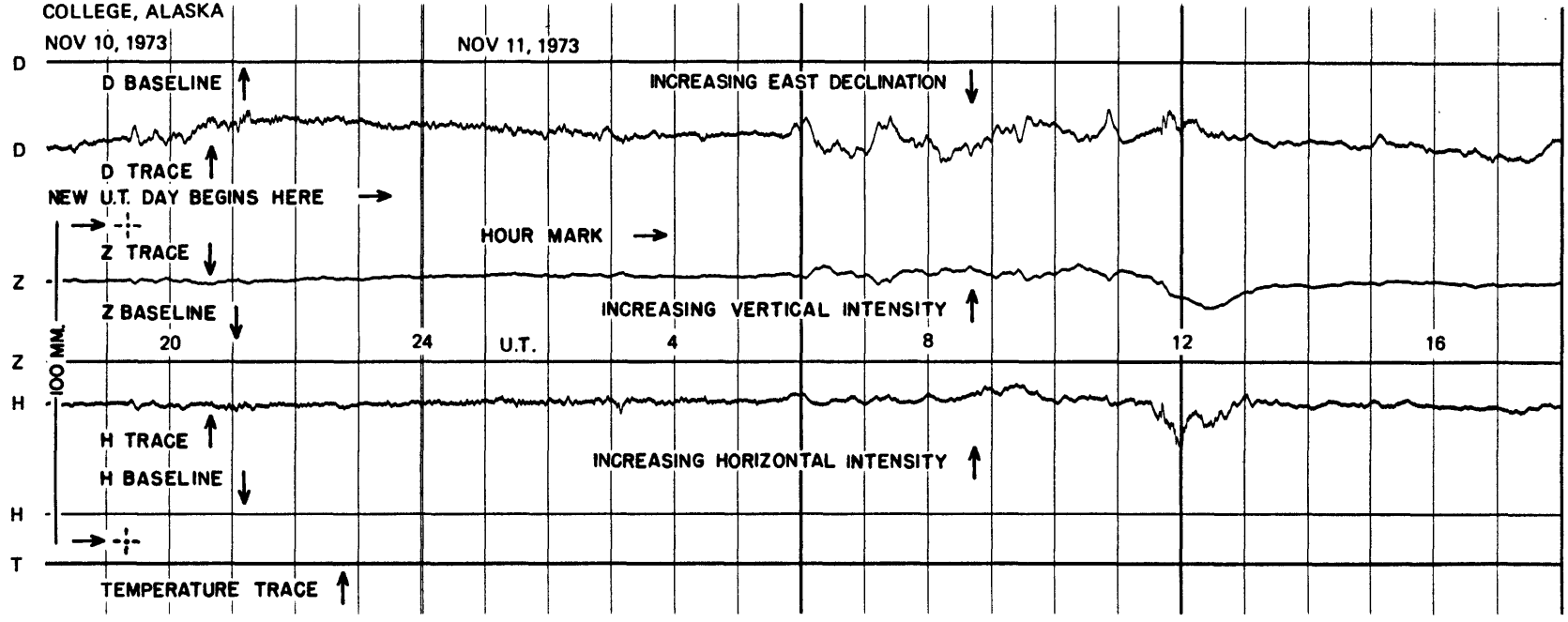
(UNIVERSAL TIME)

Values are in Tenths of nm 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		17	23	25	26	27	17	23	25	26	27	17	23	25	26	27	DAY
A_k		02	03	04	00	03	02	03	04	00	03	02	03	04	00	03	A_k
HOUR	01	170	160	146	129	127	222	223	233	220	230	210	201	199	201	203	01 HOUR
	02	163	141	150	131	121	228	229	231	229	217	206	201	197	200	201	02
	03	161	142	148	127	119	220	224	240	234	220	204	196	189	193	196	03
	04	157	130	138	127	119	219	233	244	240	231	205	189	187	192	198	04
	05	155	129	131	134	123	221	239	251	245	240	203	188	184	189	199	05
	06	149	131	109	137	118	228	240	269	248	250	199	188	181	189	198	06
	07	142	130	129	139	131	229	241	301	250	250	199	190	224	188	199	07
	08	152	125	165	143	141	232	247	346	249	250	197	192	220	190	195	08
	09	150	130	102	145	145	248	250	291	250	251	195	197	240	189	190	09
	10	149	136	126	145	145	248	256	248	249	251	196	204	210	187	192	10
	11	150	160	128	147	150	240	250	259	249	248	190	205	196	186	189	11
	12	175	170	131	152	184	236	191	253	248	240	174	182	197	178	177	12
	13	160	179	168	155	178	248	261	240	249	250	185	184	187	165	170	13
	14	160	172	148	161	170	250	248	249	240	253	185	186	177	162	175	14
	15	161	174	176	176	180	250	242	250	251	210	186	179	171	173	164	15
	16	161	162	179	173	175	250	241	253	258	170	187	175	179	178	110	16
	17	164	162	187	180	160	244	238	256	252	154	190	176	187	186	60	17
	18	179	170	200	199	260	240	220	247	249	201	195	170	190	190	86	18
	19	181	167	198	220	237	236	230	230	233	220	191	164	191	196	139	19
	20	180	164	170	215	181	238	231	220	221	234	189	164	186	193	163	20
	21	170	169	133	191	169	231	240	210	219	230	189	170	186	195	172	21
	22	159	139	120	162	169	232	250	211	219	219	190	168	192	197	173	22
	23	157	133	110	166	160	229	241	219	220	215	200	180	199	210	194	23
	24	156	127	120	141	147	226	239	220	219	220	203	190	206	212	198	24
DAILY SUM		3861	3602	3512	3795	3809	5645	5704	5971	5741	5454	4668	4439	4675	4539	4141	DAILY SUM
DAILY MEAN		161	150	146	158	159	235	238	249	239	227	194	185	195	189	173	DAILY MEAN
MEAN				155					238					187			MEAN

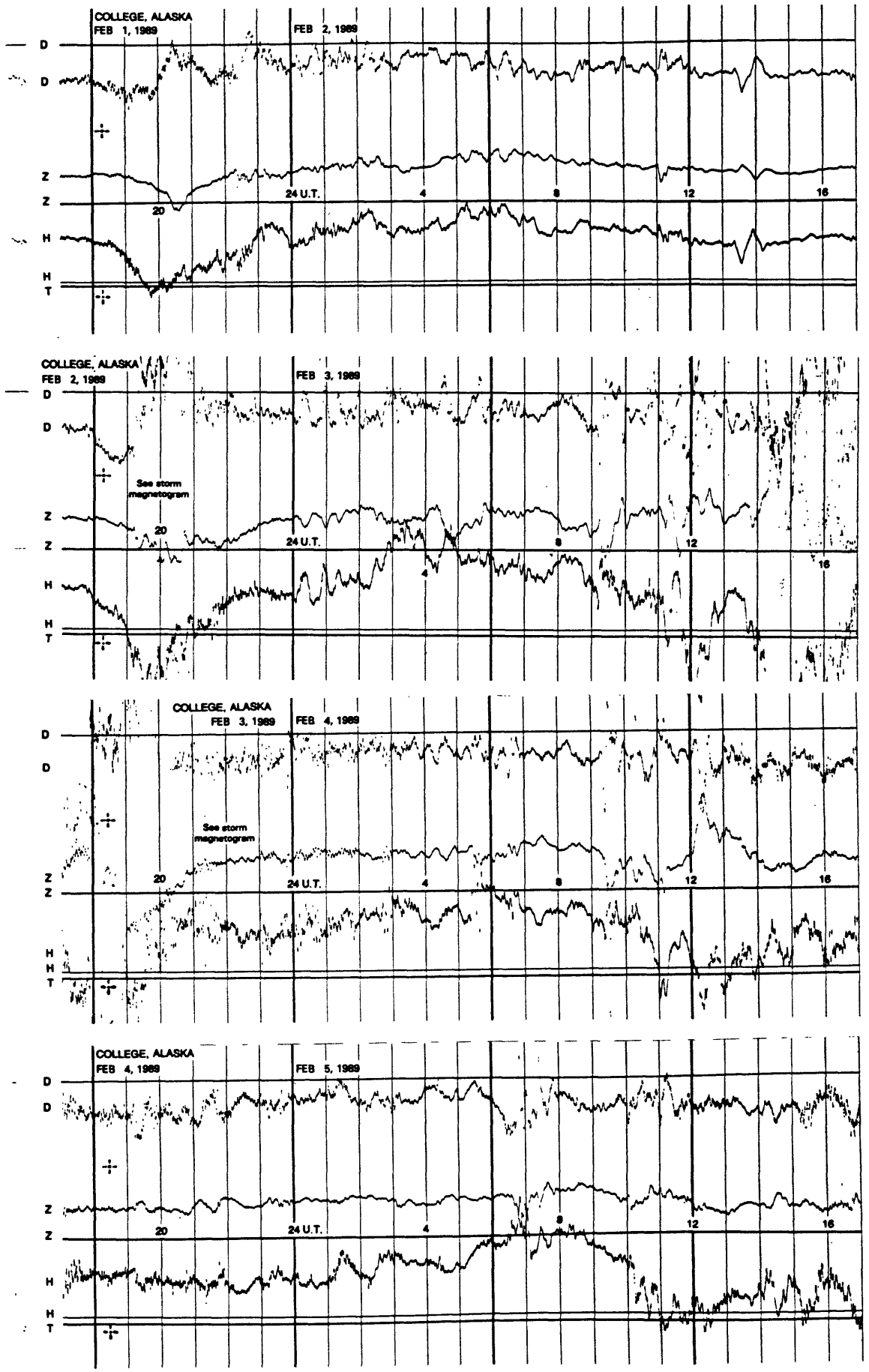
Scaled RVO | Checked CN

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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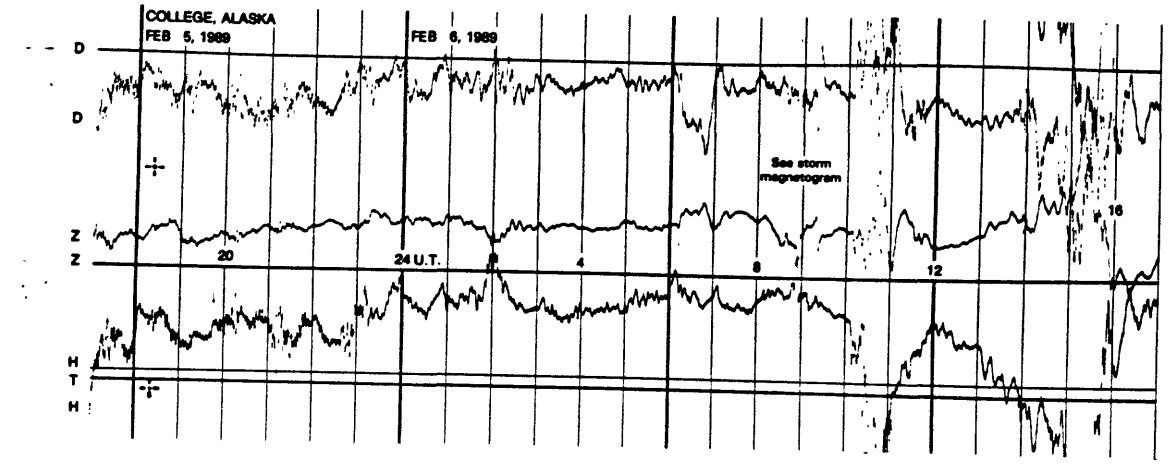

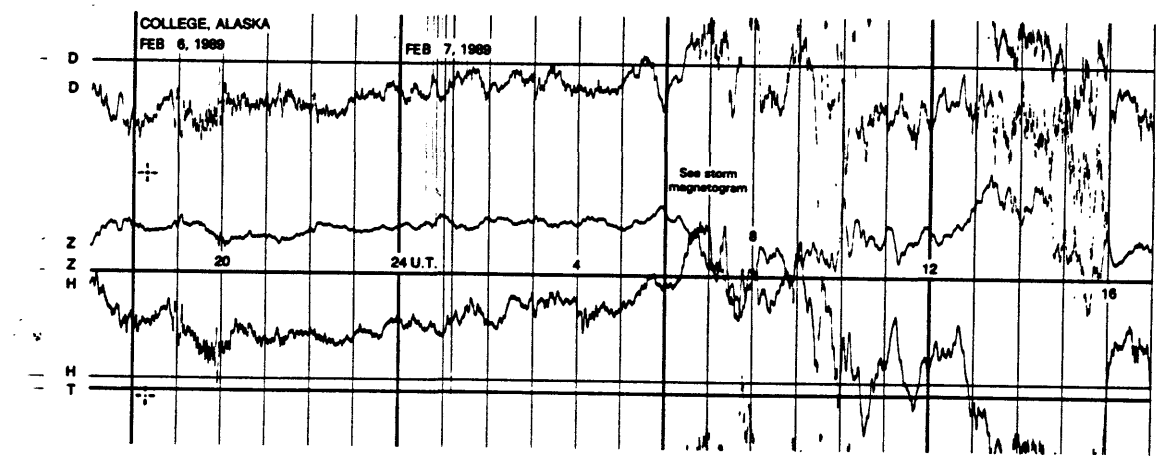

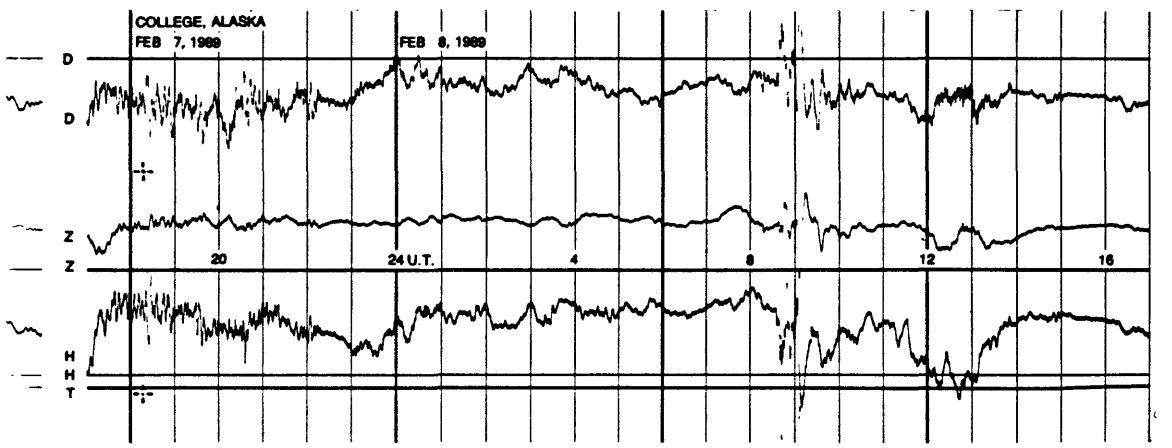

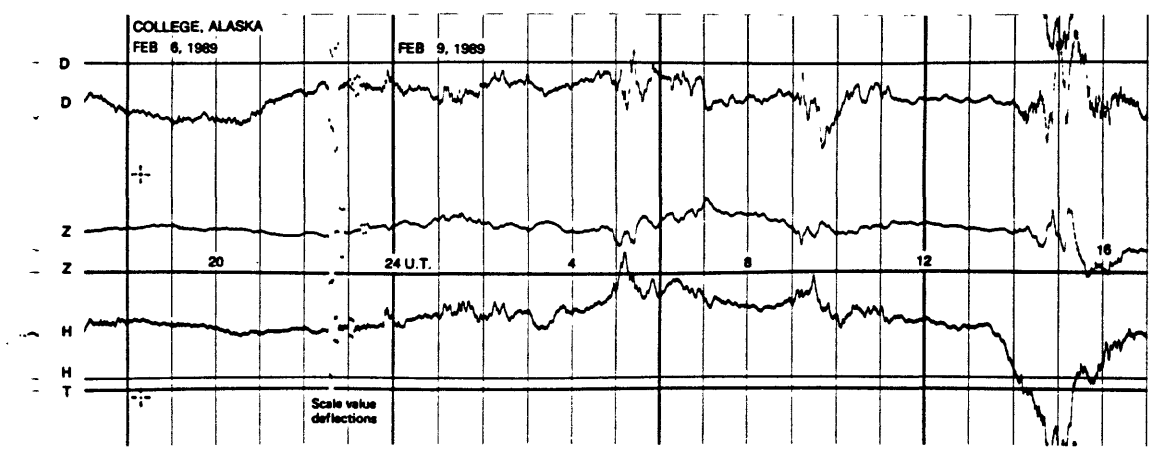

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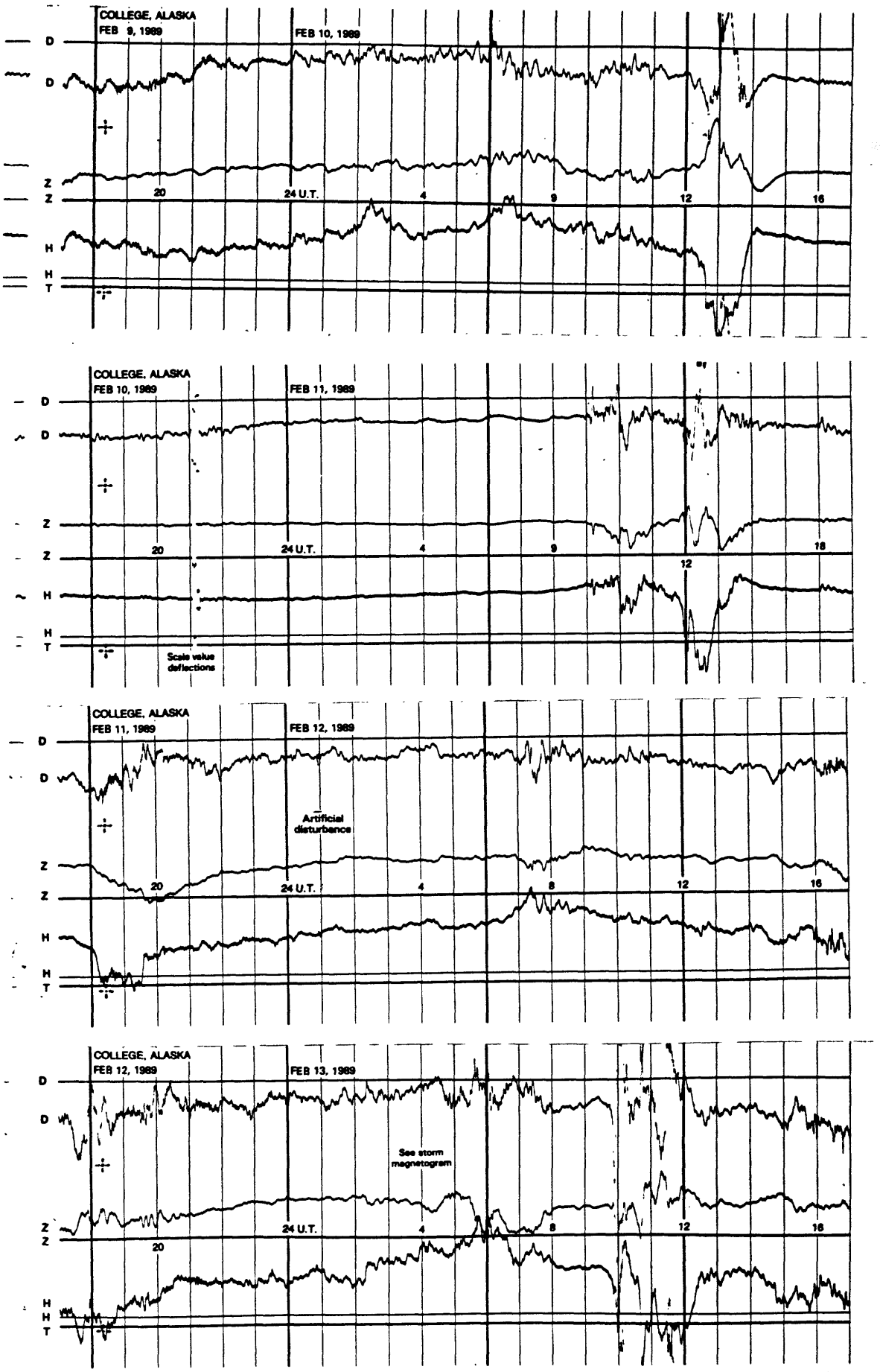
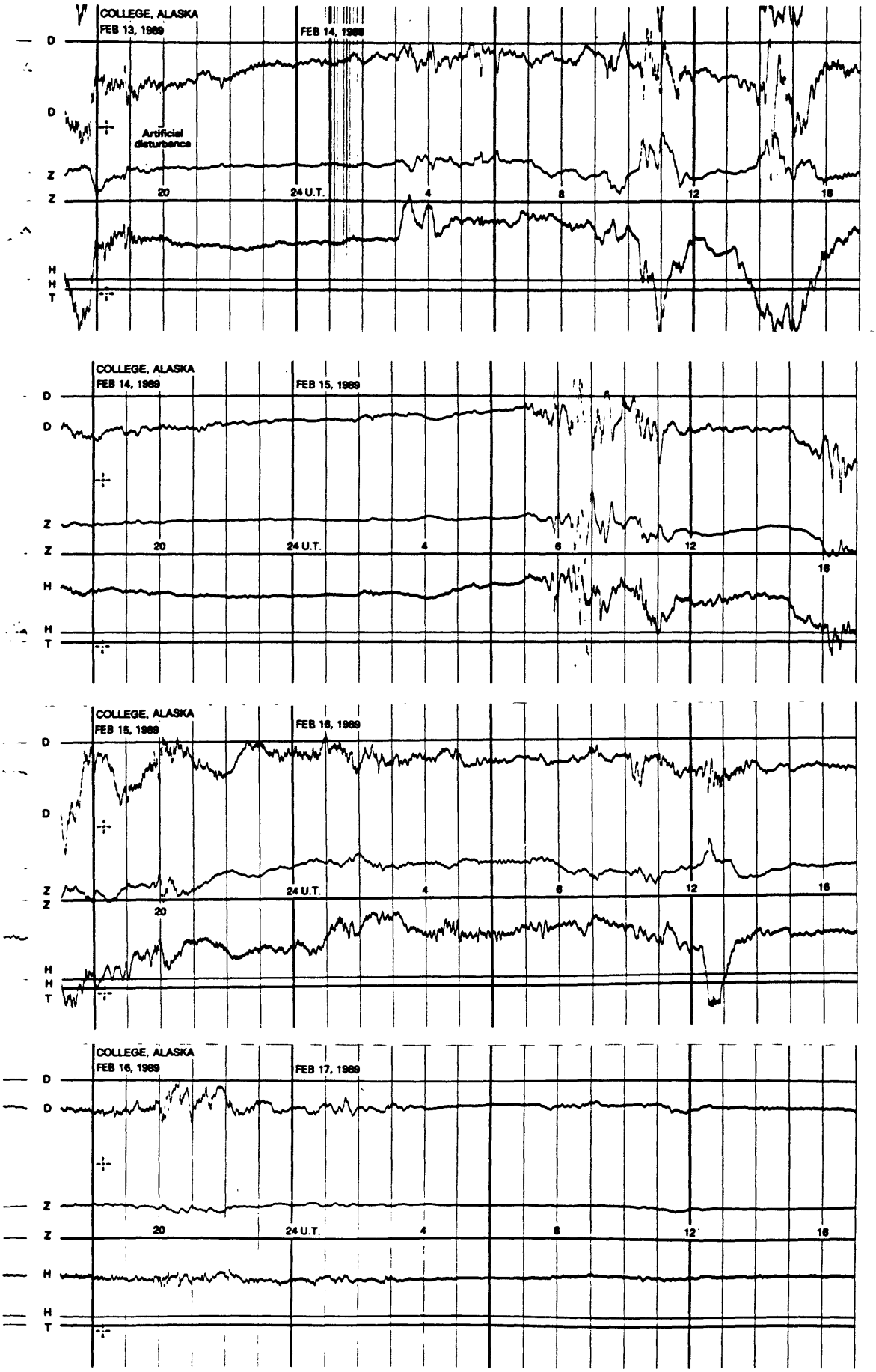


200 mm
100 mm
0

NORMAL MAGNETOGRAMS



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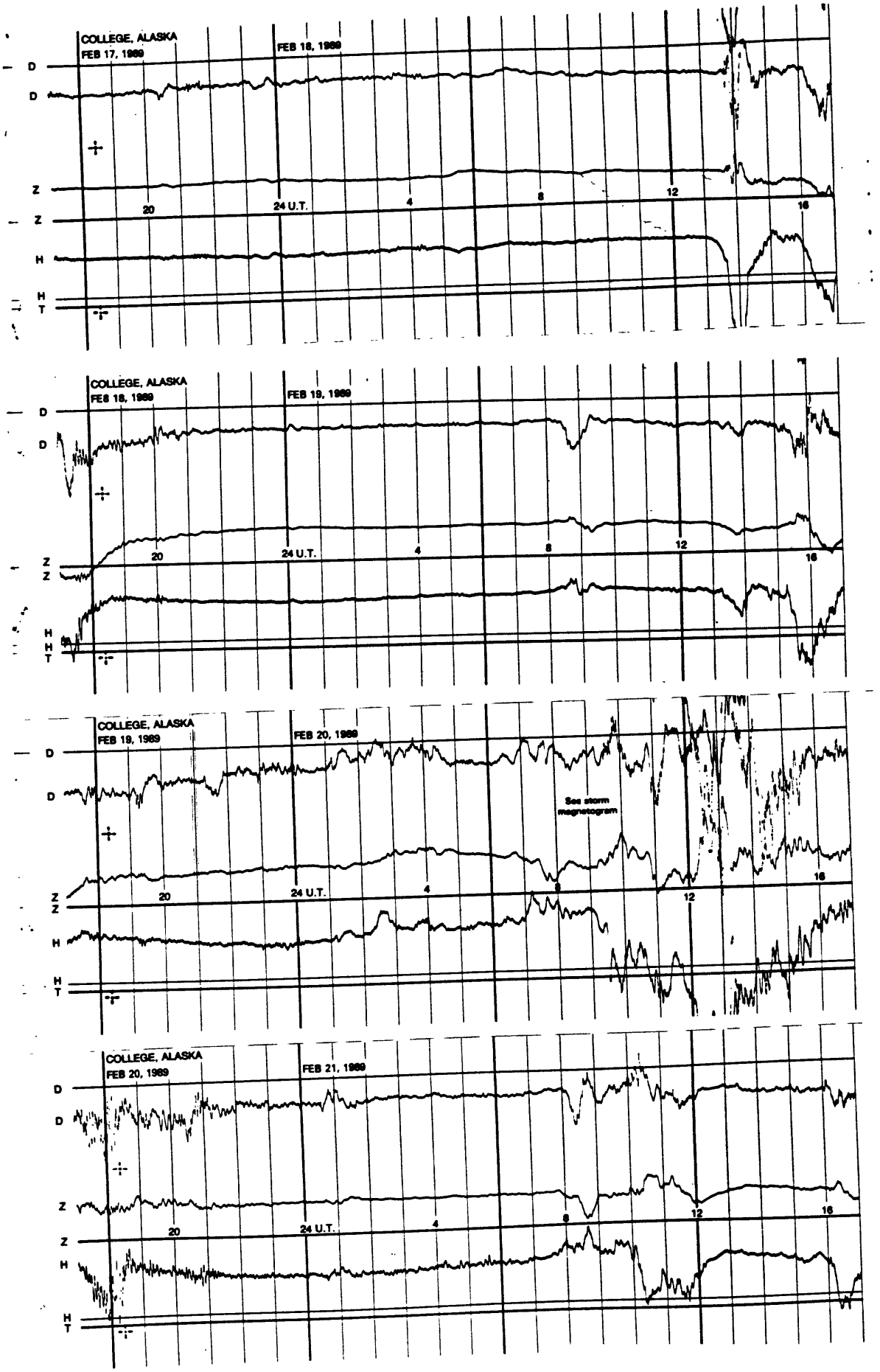

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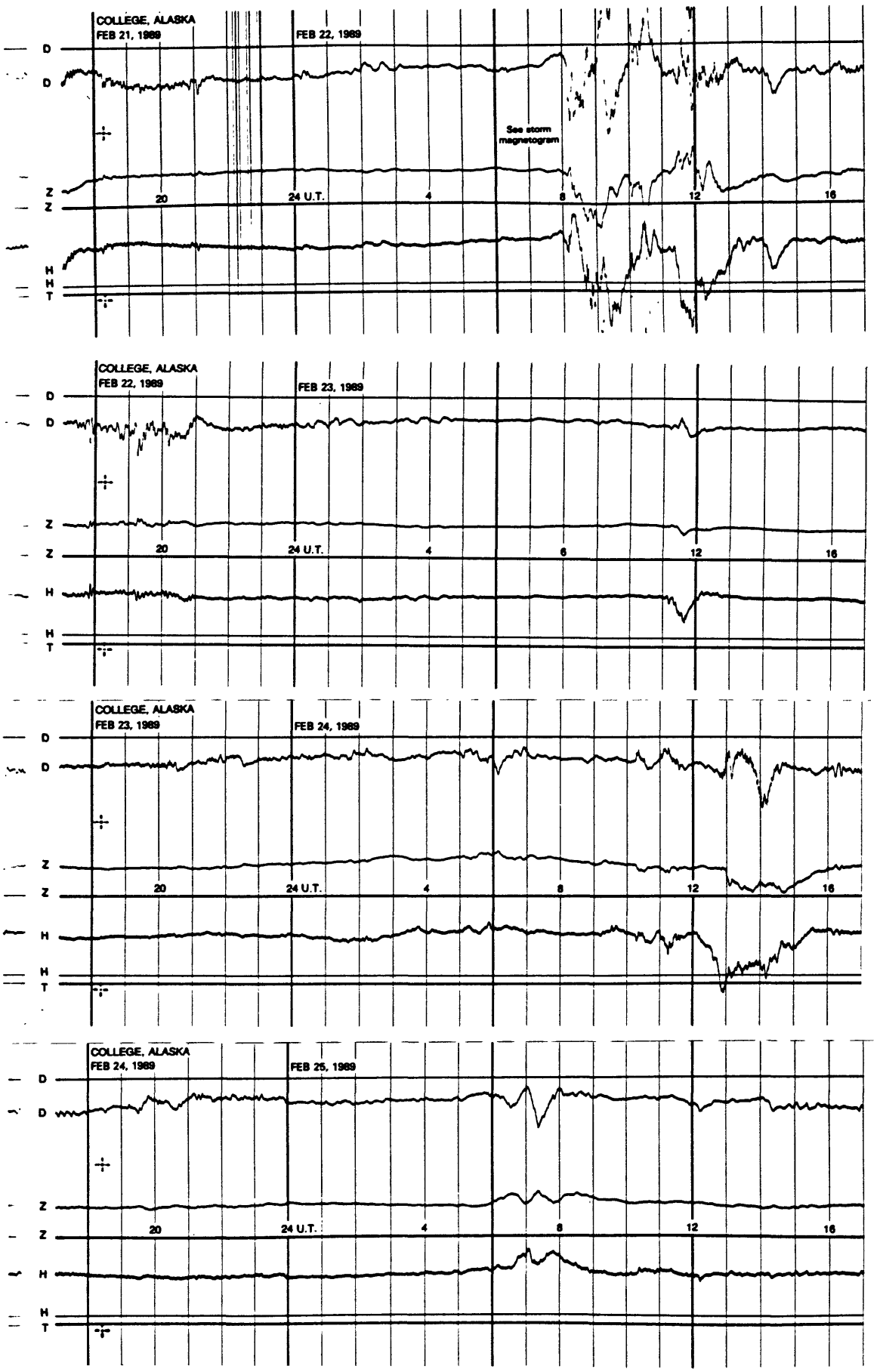

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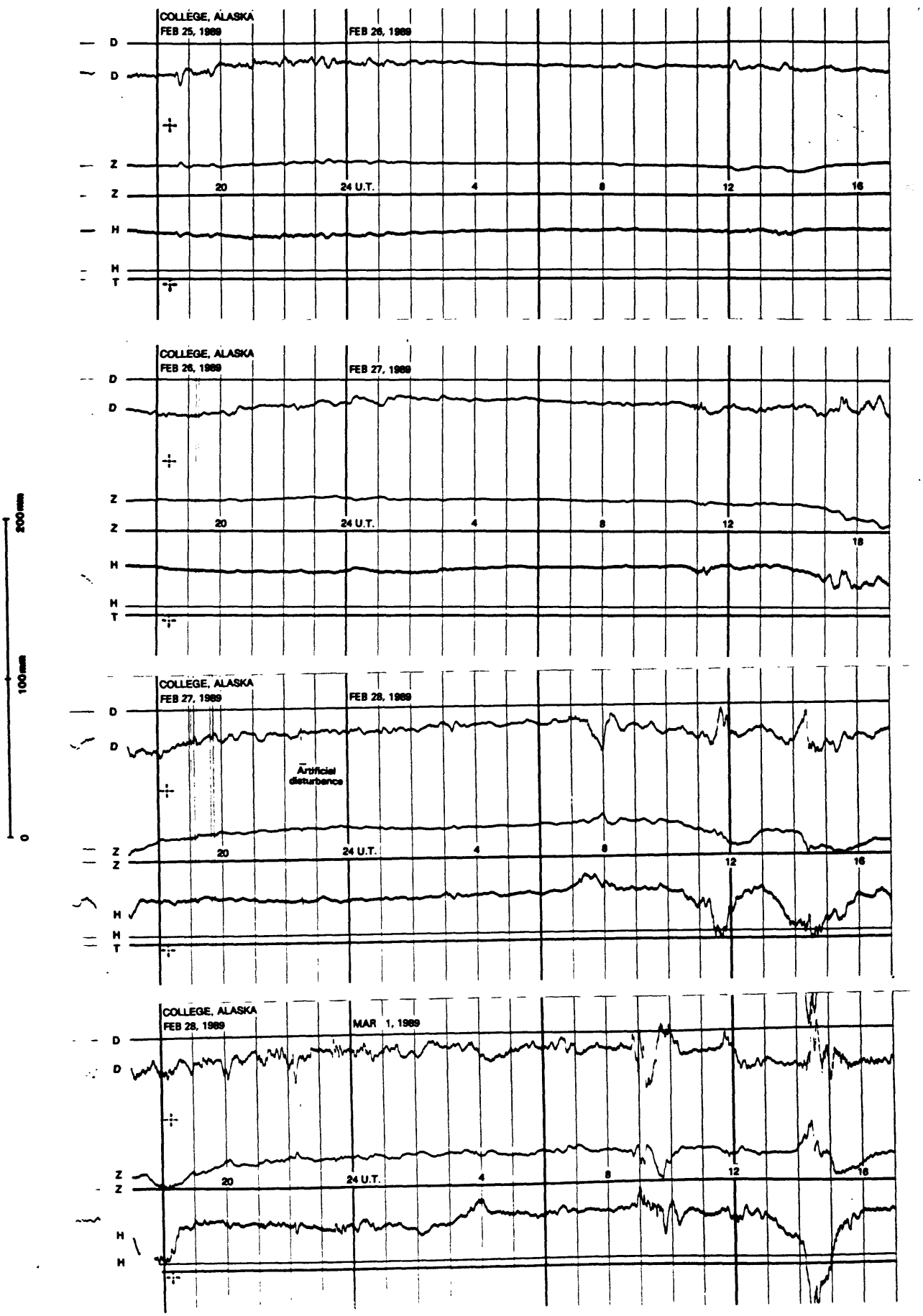
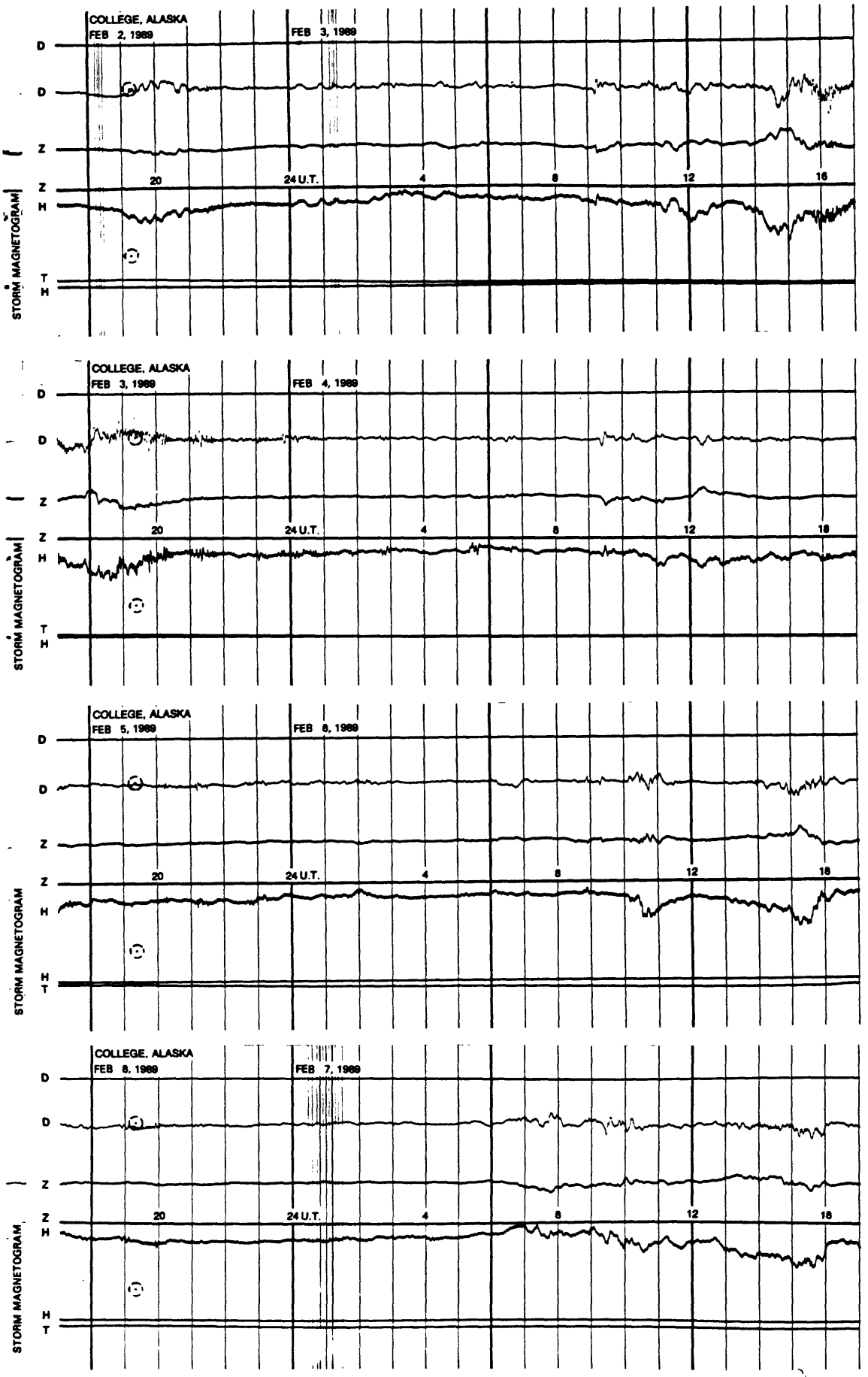


STORM MAGNETOGRAMS



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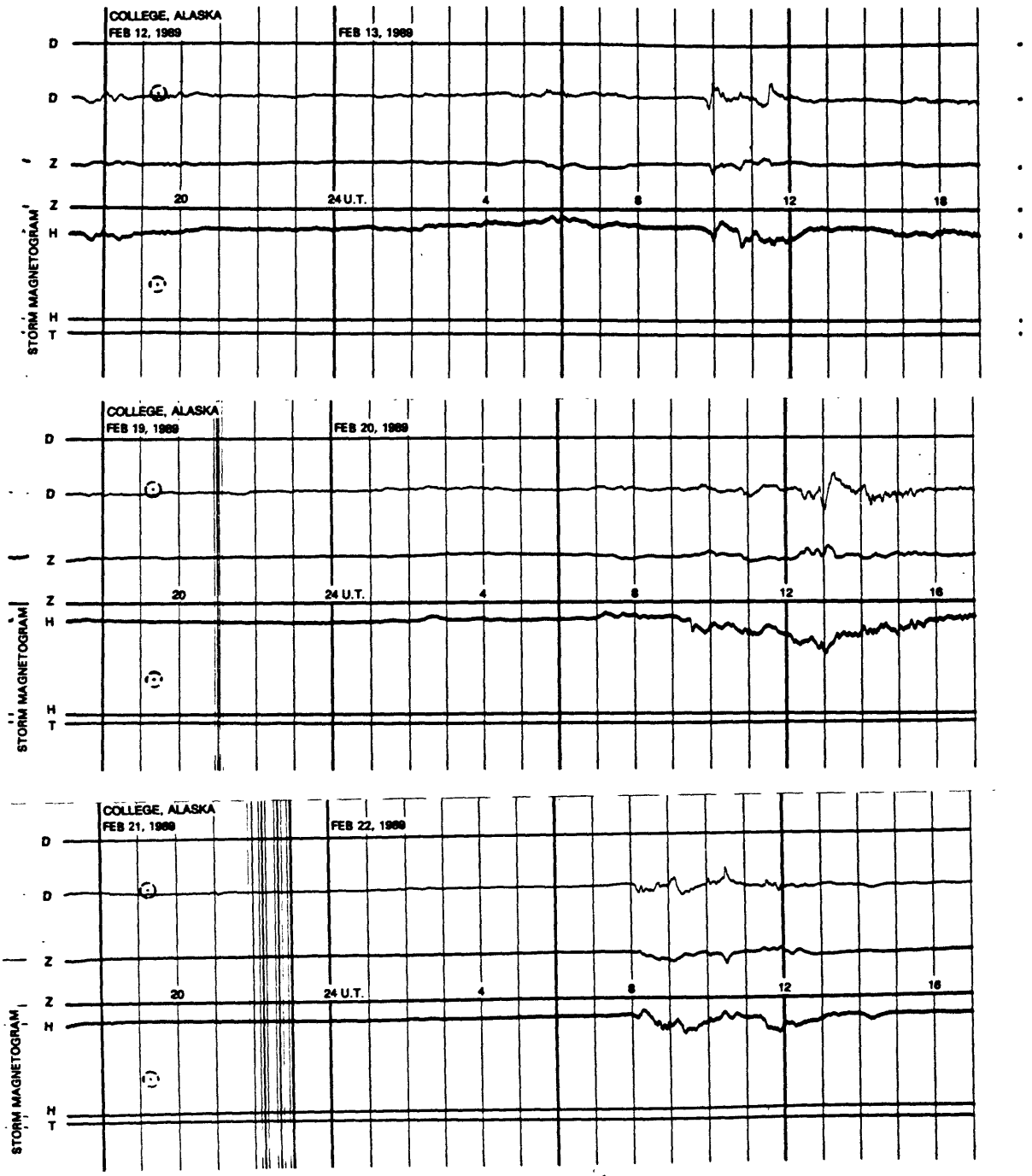

200mm
100mm
0