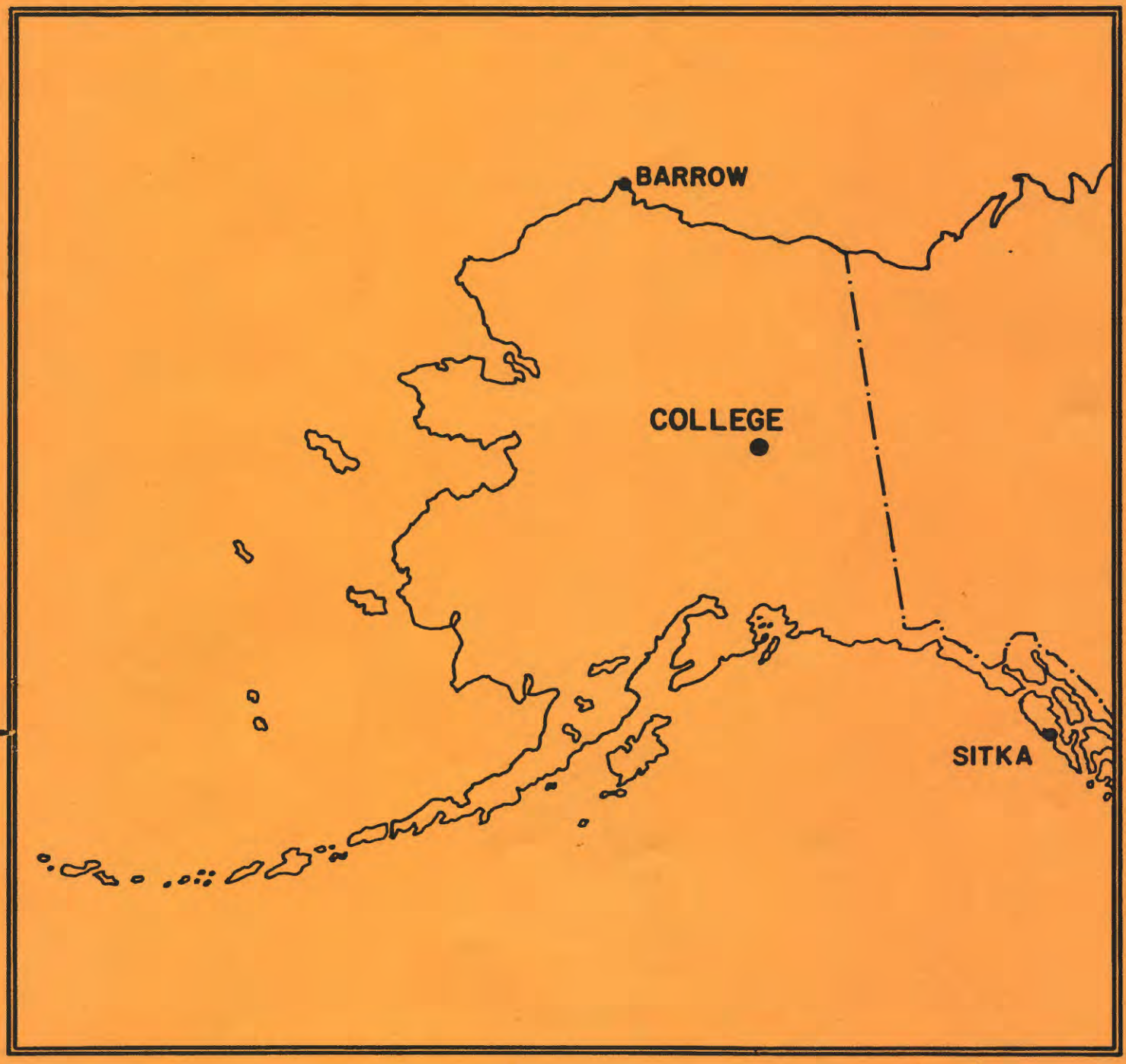
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JANUARY 1988

OPEN FILE REPORT 88-0300A



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 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: January 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	4	4	0	0	0	08	07
2	0	1	2	6	6	6	6	4	31	45
3	3	3	2	3	3	2	1	0	17	10
4	1	2	2	2	3	2	2	3	17	09
5	3	3	3	4	6	2	2	2	25	22
6	3	2	4	5	4	6	7	3	34	45
7	4	3	2	4	3	3	3	3	25	17
8	2	3	1	7	6	5	2	2	28	38
9	1	2	3	4	0	0	1	1	12	07
10	0	0	0	0	1	0	1	1	03	01
11	2	4	5	0	0	0	0	0	11	10
12	0	1	4	6	7	5	3	1	27	40
13	0	0	1	3	4	2	1	3	14	09
14	3	5	2	2	5	7	6	5	35	49
15	5	6	6	5	5	5	3	2	37	47
16	2	1	2	4	6	1	0	1	17	16
17	0	0	1	2	4	4	2	1	14	09
18	0	0	3	3	1	4	4	1	16	11
19	1	1	4	5	4	3	2	0	20	16
20	1	1	4	2	5	3	3	2	21	16
21	2	2	1	3	3	1	1	1	14	07
22	0	0	0	1	4	4	1	0	10	08
23	0	0	0	0	0	0	0	0	00	00
24	0	0	2	1	4	1	1	0	09	05
25	0	0	1	3	3	2	1	0	10	05
26	0	0	2	4	3	1	3	3	16	10
27	1	4	4	6	3	2	1	1	22	21
28	0	1	1	5	2	2	0	0	11	09
29	0	0	0	2	1	1	0	0	04	02
30	0	0	0	0	0	0	0	0	00	00
31	0	0	2	1	3	0	0	0	06	03

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	7.73		(γ/mm)
LOWER LIMIT FOR K = 9	2490	2490		(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

January 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	13	2329	s.c.*	+23	-80	+40	14	6	7	234	1550	810	15 21

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 1/1/88	2400 U.T. 1/31/88	1.0'/mm	3.7γ/mm	27° 01.2' E
H	(same)	(same)	7.7 γ/mm		12622 γ
Z	(same)	(same)	7.6 γ/mm		55178 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 1/1/88	2400 U.T., 1/31/88	7.8'/mm	29.3γ/mm	
H	(same)	(same)	43.4 γ/mm		
Z	(same)	(same)	49.1 γ/mm		

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 16.8' E	12837 γ	55315 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: JAN 10, 23, 29, 30, 31,

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
COLLEGE	JANUARY	1988

Jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

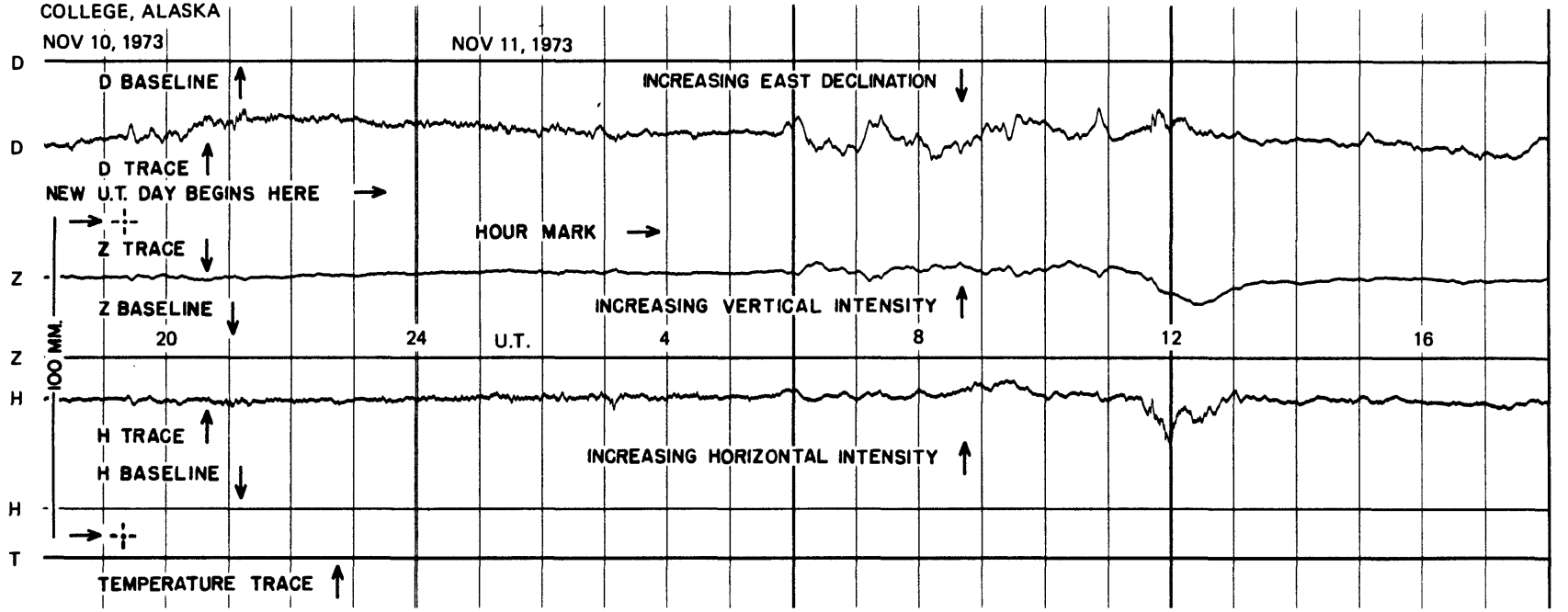
(UNIVERSAL TIME)

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		10	23	29	30	31	10	23	29	30	31	10	23	29	30	31	DAY	
A_k		01	00	02	00	03	01	00	02	00	03	01	00	02	00	03	A_k	
HOUR	01	142	125	151	135	127	273	278	275	280	273	195	186	179	179	169	01	HOUR
	02	152	141	152	137	125	279	275	273	287	281	197	187	180	180	174	02	
	03	157	147	155	140	123	282	277	277	287	290	200	187	180	180	180	03	
	04	153	156	147	150	133	281	280	277	289	289	199	184	180	182	187	04	
	05	160	162	147	153	137	280	280	278	288	288	198	184	184	183	188	05	
	06	163	169	150	156	150	277	276	277	286	285	197	184	182	184	193	06	
	07	172	163	153	163	154	277	273	283	283	289	193	183	183	180	195	07	
	08	167	157	156	158	167	278	272	287	282	291	193	179	182	179	199	08	
	09	163	160	160	160	199	273	269	283	283	308	193	185	189	181	196	09	
	10	158	163	157	160	153	275	269	288	281	293	193	179	196	184	216	10	
	11	157	153	194	157	163	276	272	303	283	290	193	176	185	183	200	11	
	12	165	151	172	155	163	274	272	276	283	285	196	177	184	179	193	12	
	13	165	153	182	156	167	263	272	273	284	227	188	178	167	178	167	13	
	14	184	163	177	155	133	273	272	269	285	211	188	169	154	177	82	14	
	15	199	163	193	157	170	272	272	273	285	296	184	167	156	179	146	15	
	16	205	176	176	161	168	269	282	275	280	293	192	173	156	177	186	16	
	17	207	177	137	162	183	273	283	259	283	284	185	180	148	177	192	17	
	18	199	181	167	167	192	279	277	282	280	281	176	182	153	177	186	18	
	19	185	179	169	170	193	278	268	292	279	281	177	182	170	176	180	19	
	20	176	177	178	189	191	280	263	289	279	275	173	181	170	176	183	20	
	21	157	160	177	177	165	266	260	290	273	273	169	180	170	170	179	21	
	22	116	145	153	150	155	254	267	283	275	281	164	177	170	166	178	22	
	23	98	135	141	128	143	269	272	282	273	286	M	177	169	162	180	23	
	24	106	127	123	133	132	283	277	281	271	283	M	179	170	168	180	24	
DAILY SUM		3906	3778	3867	3729	3736	6584	6558	6725	6759	6733	4143	4316	4157	4257	4329	DAILY SUM	
DAILY MEAN		163	157	161	155	156	274	273	280	282	281	188	180	173	177	180	DAILY MEAN	
MEAN				158					278					180			MEAN	

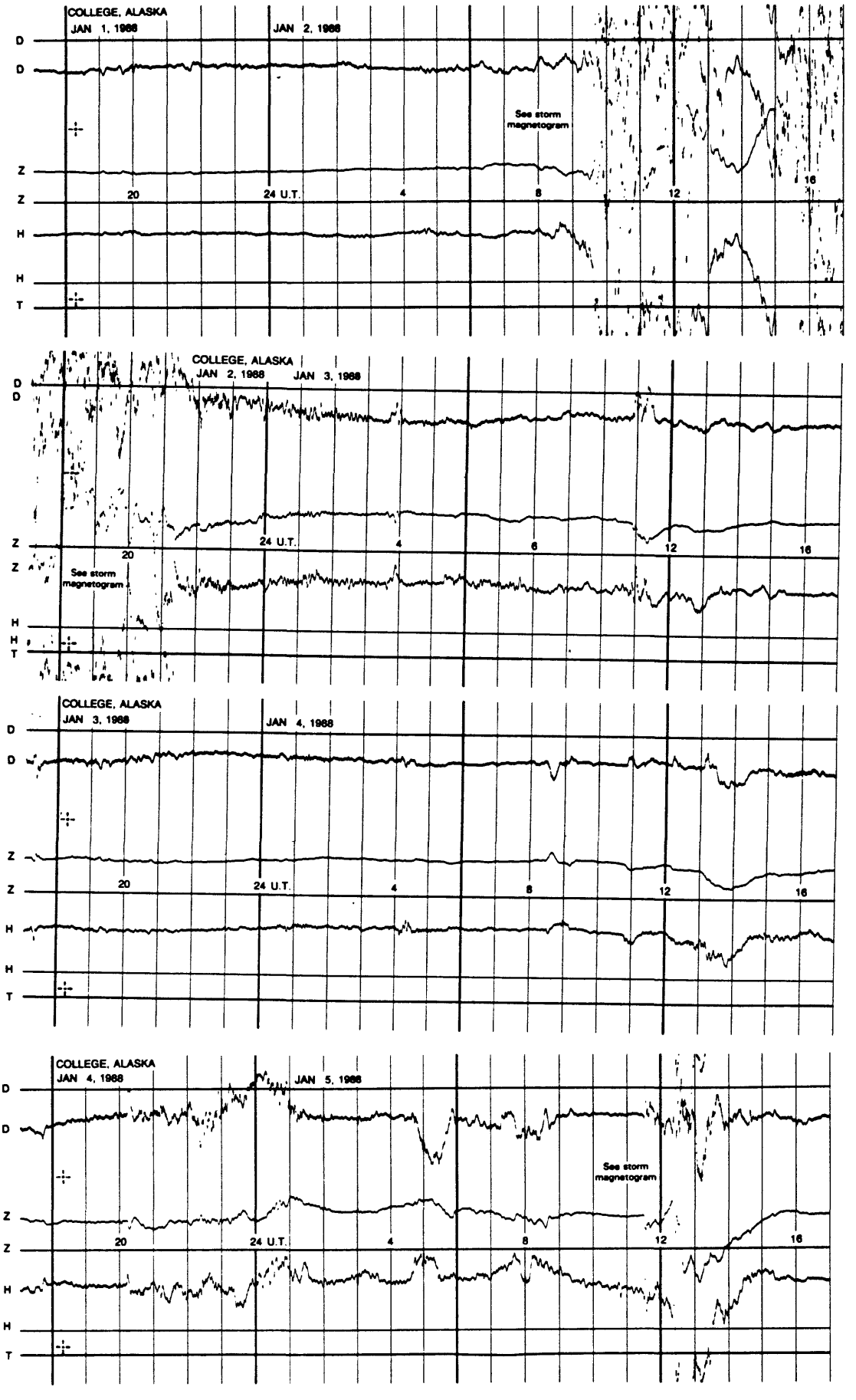
Scaled	Checked
LYT	RVO

FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)



SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS



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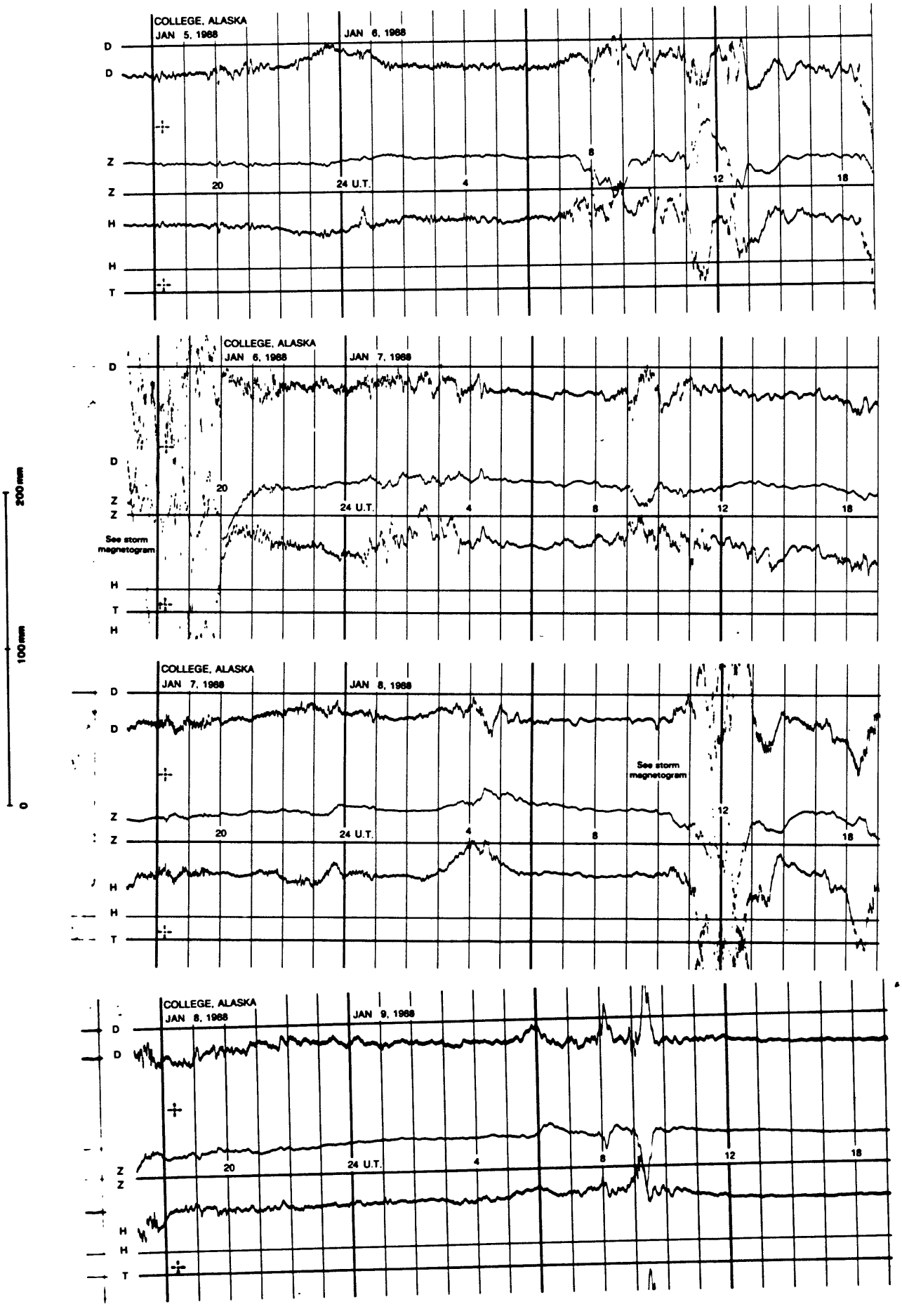
NORMAL MAGNETOGRAMS



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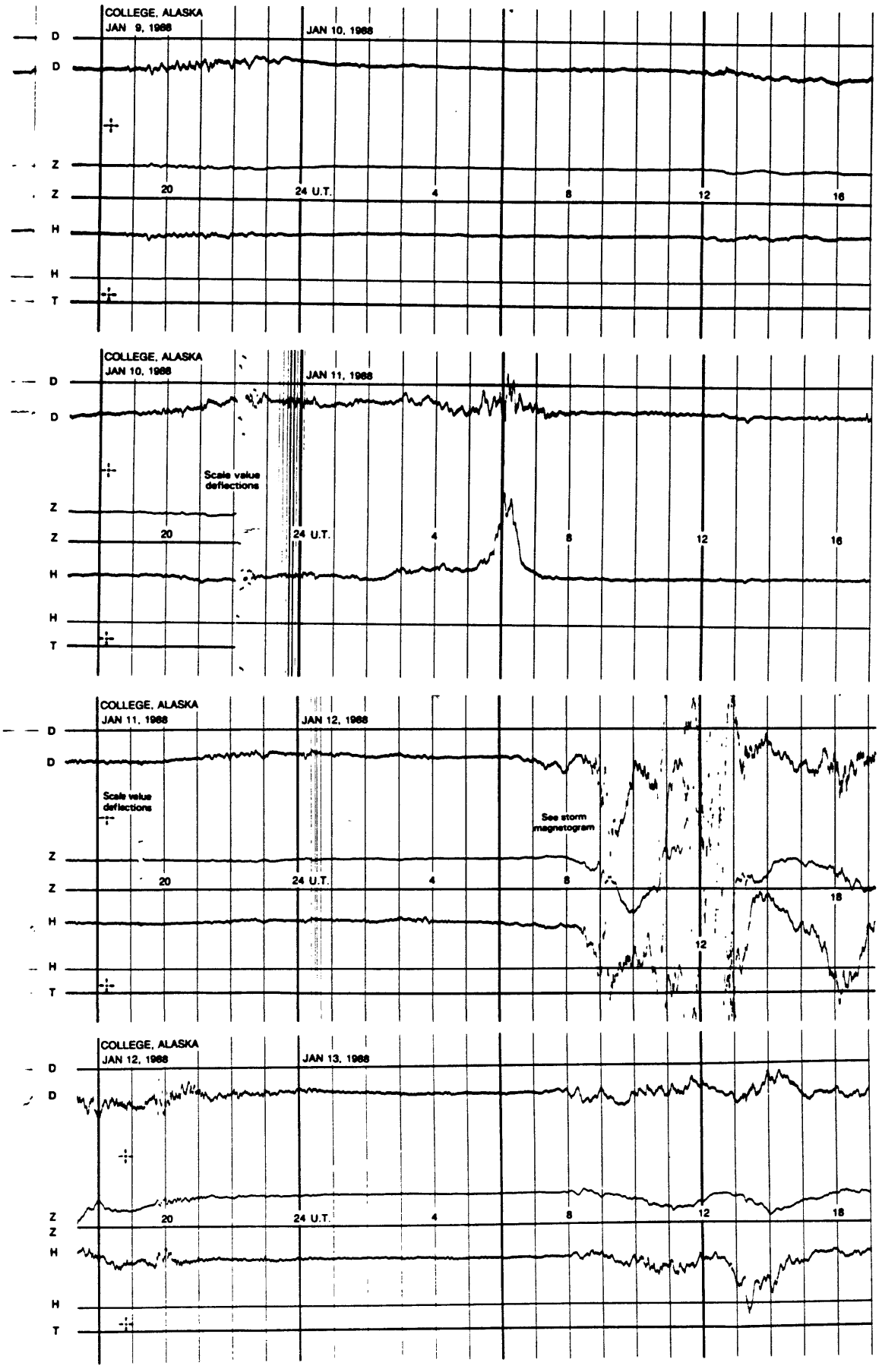

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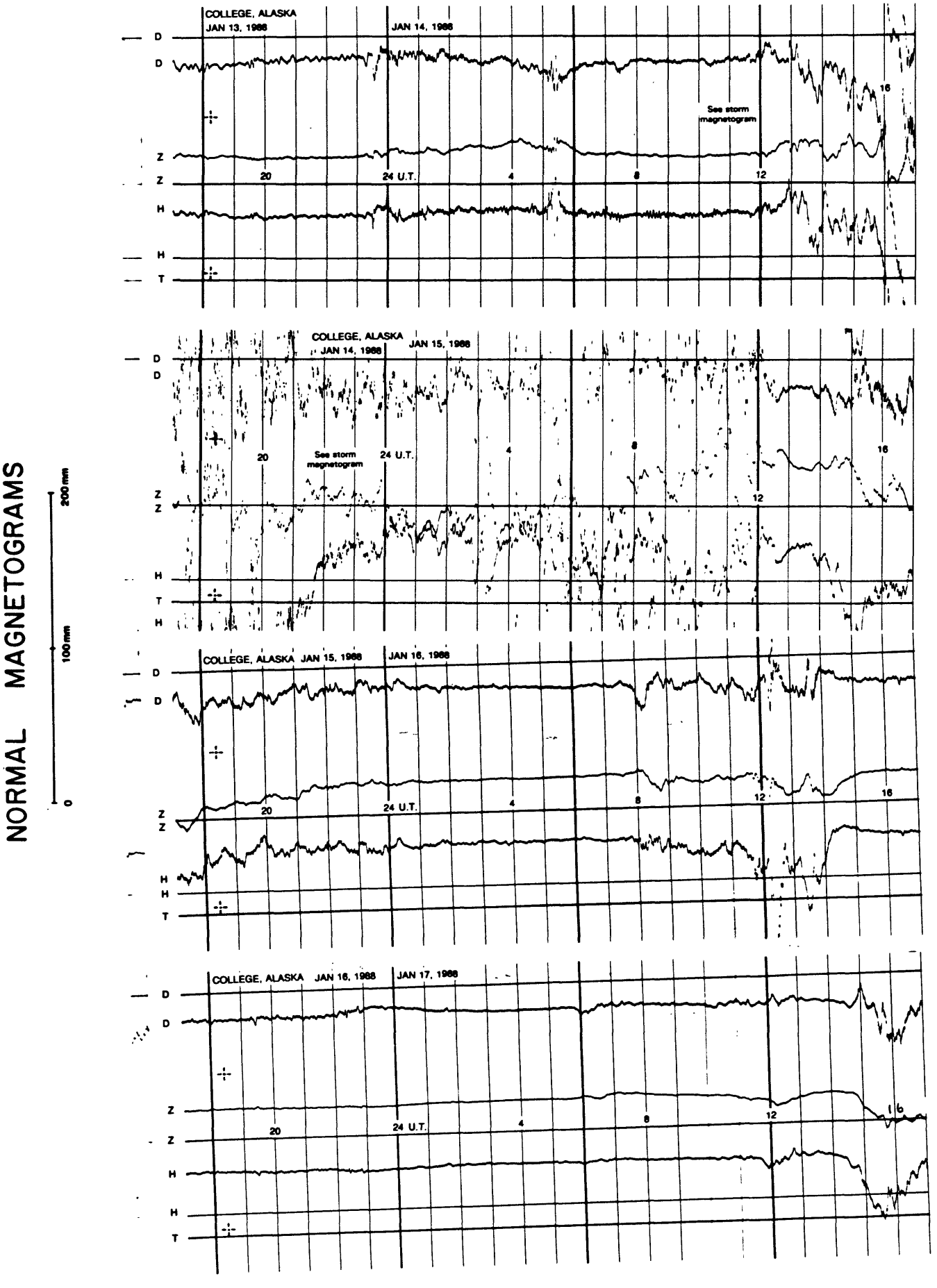

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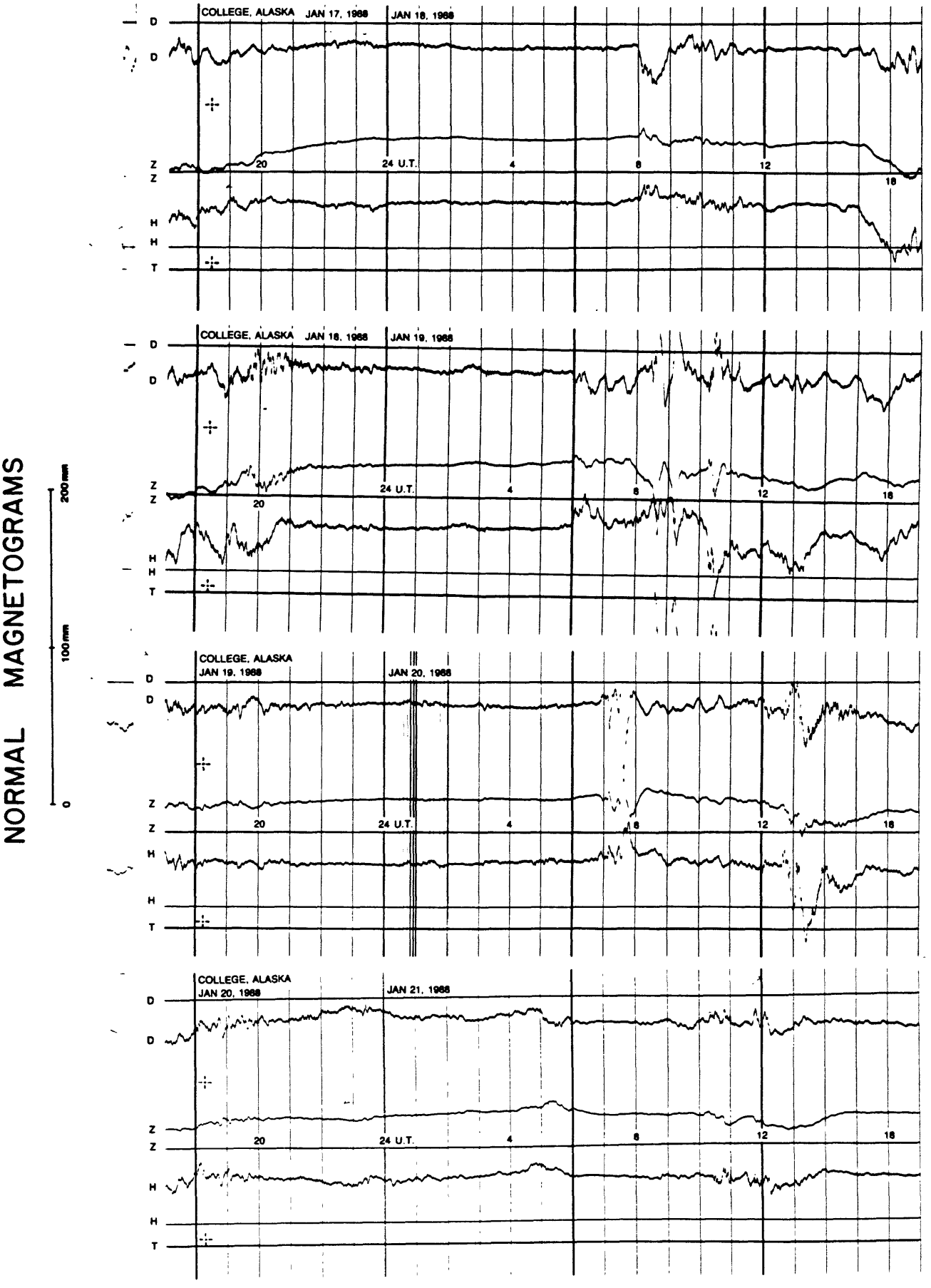

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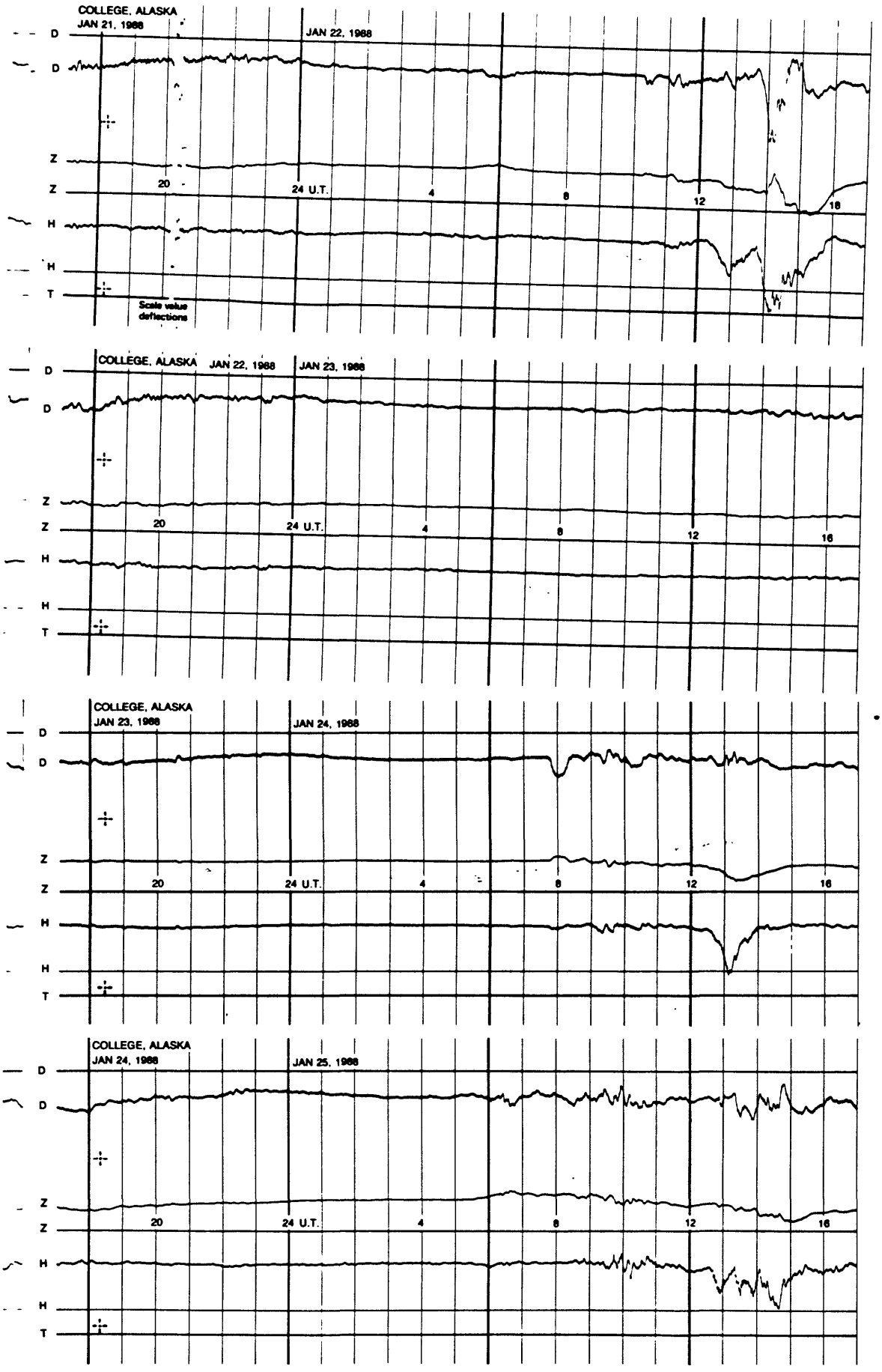

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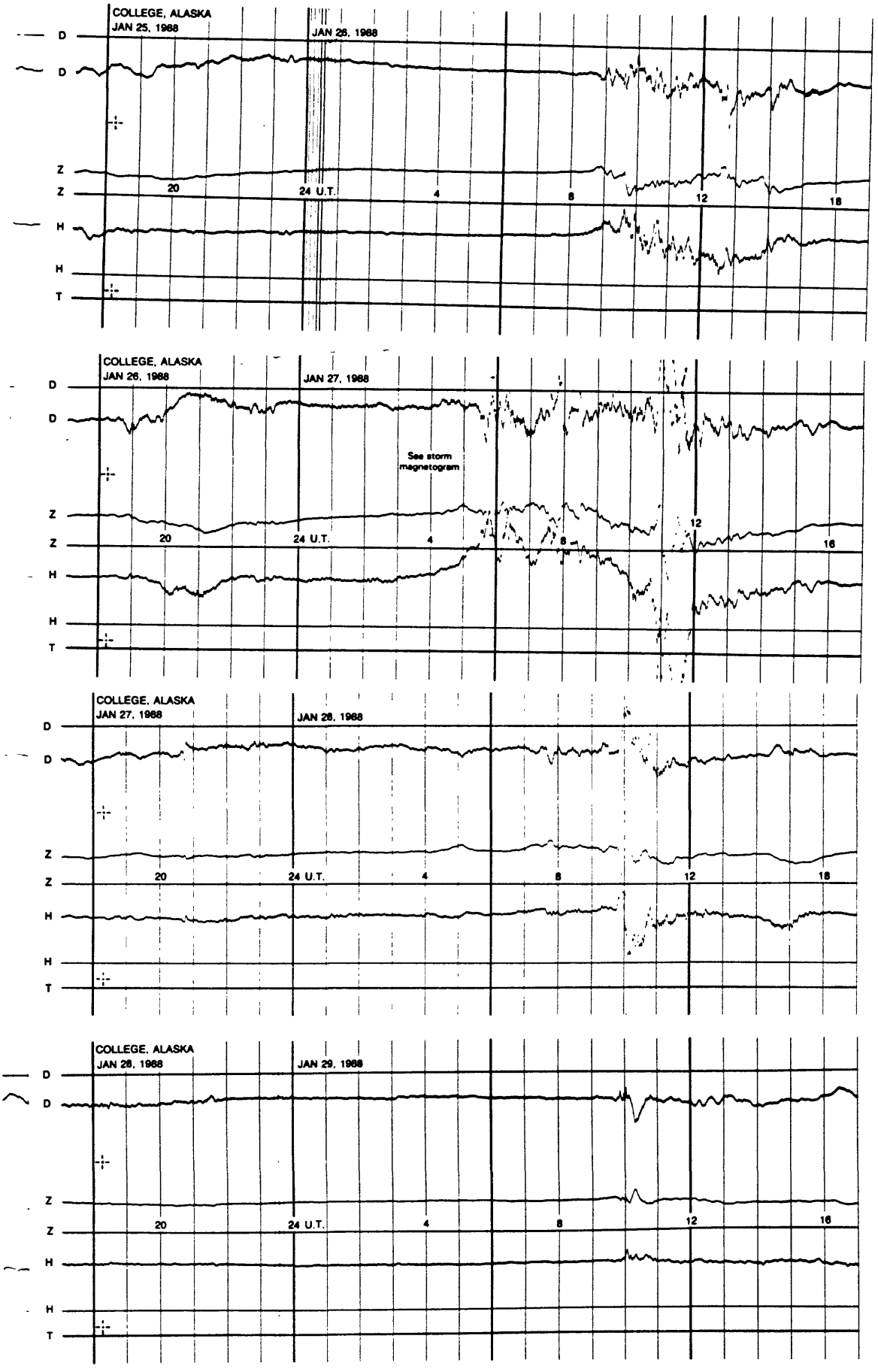

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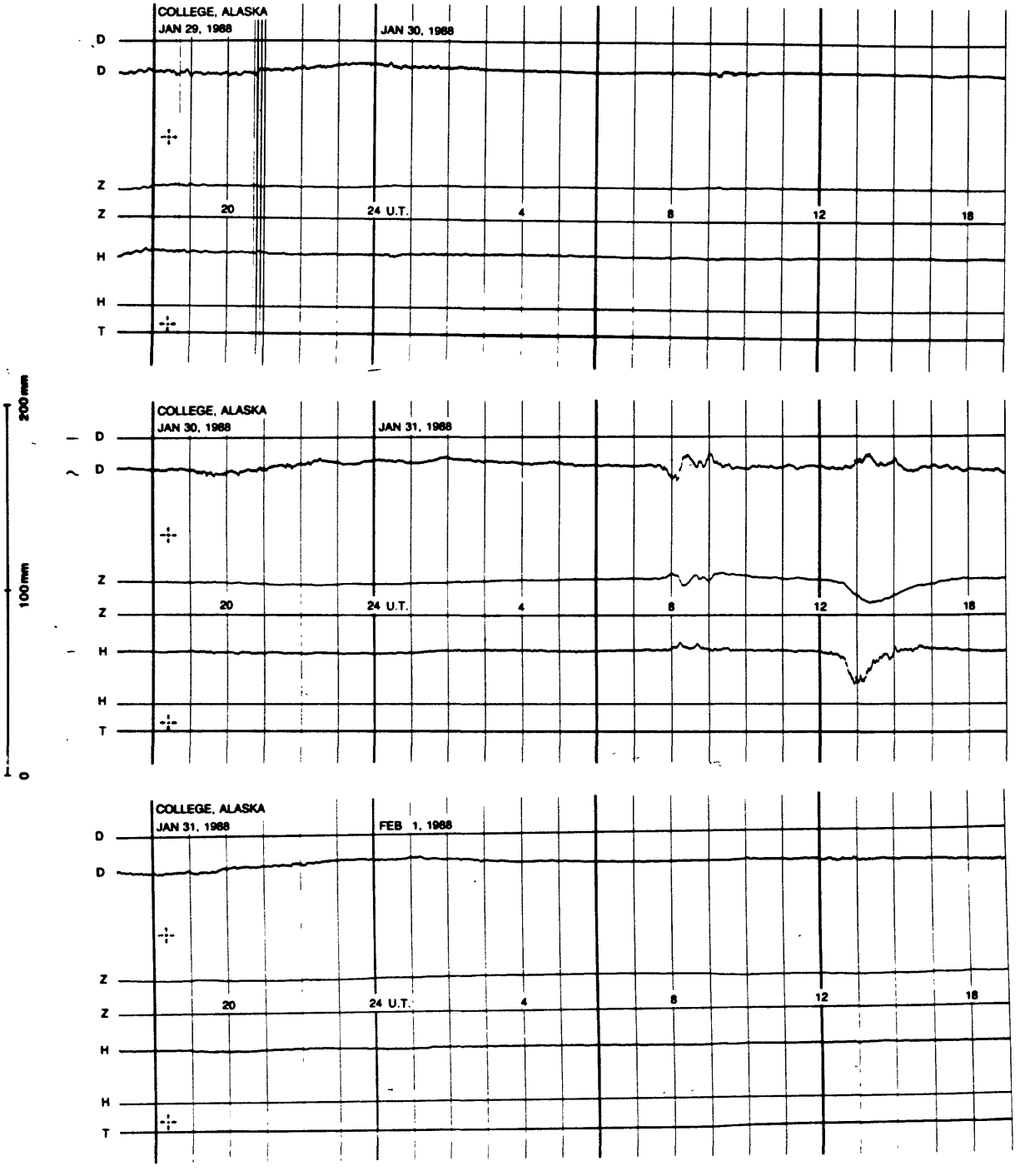
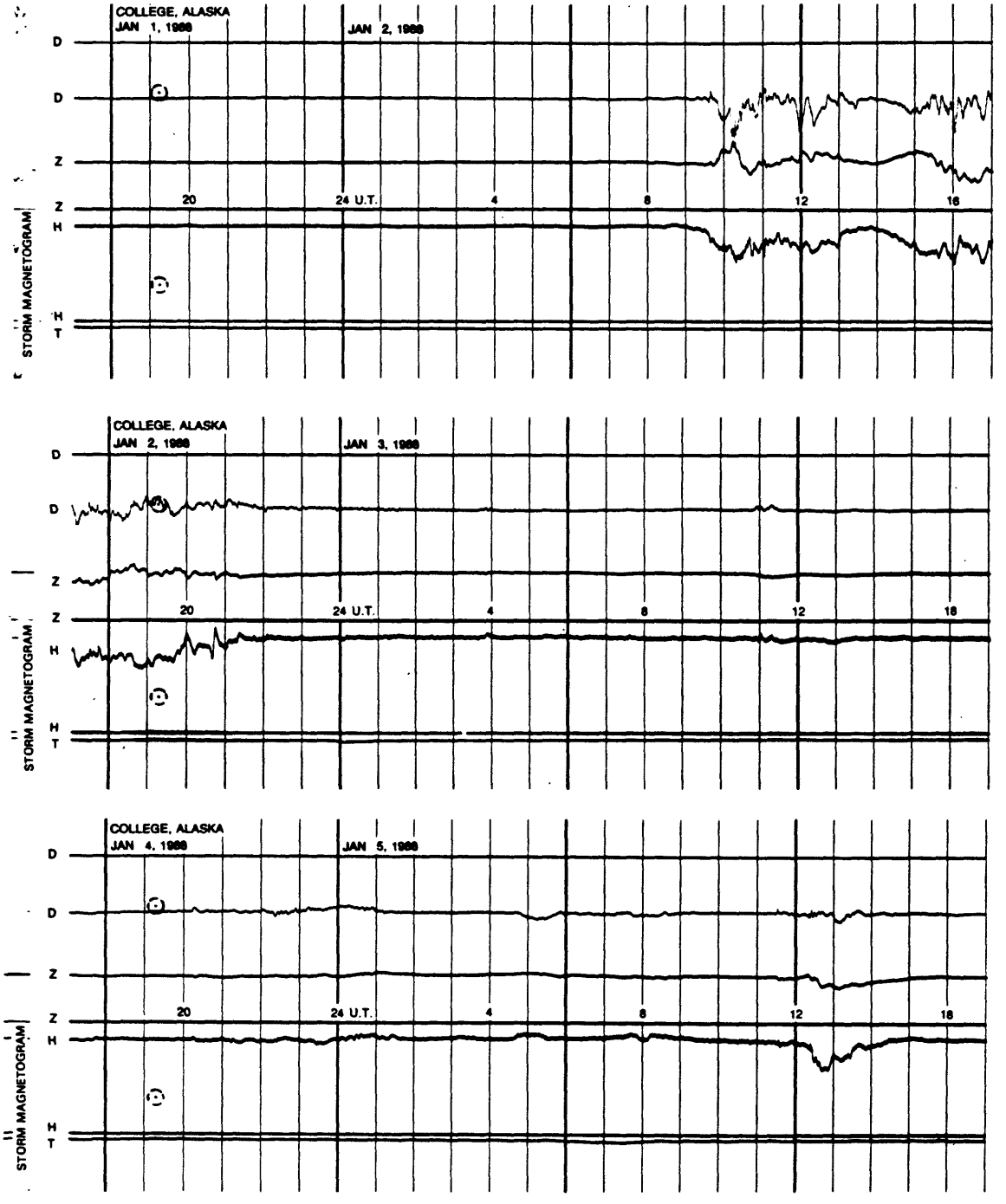
NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



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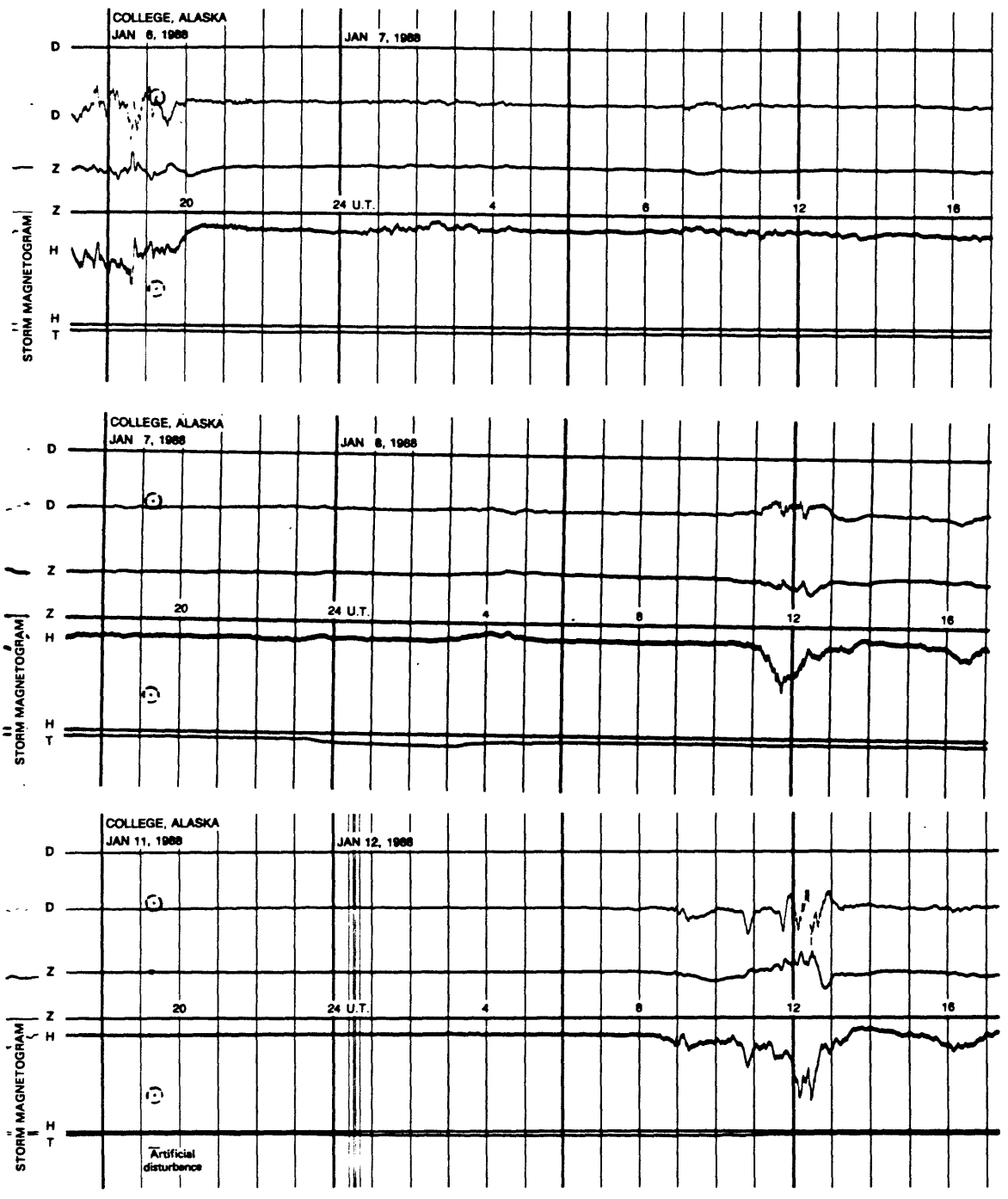

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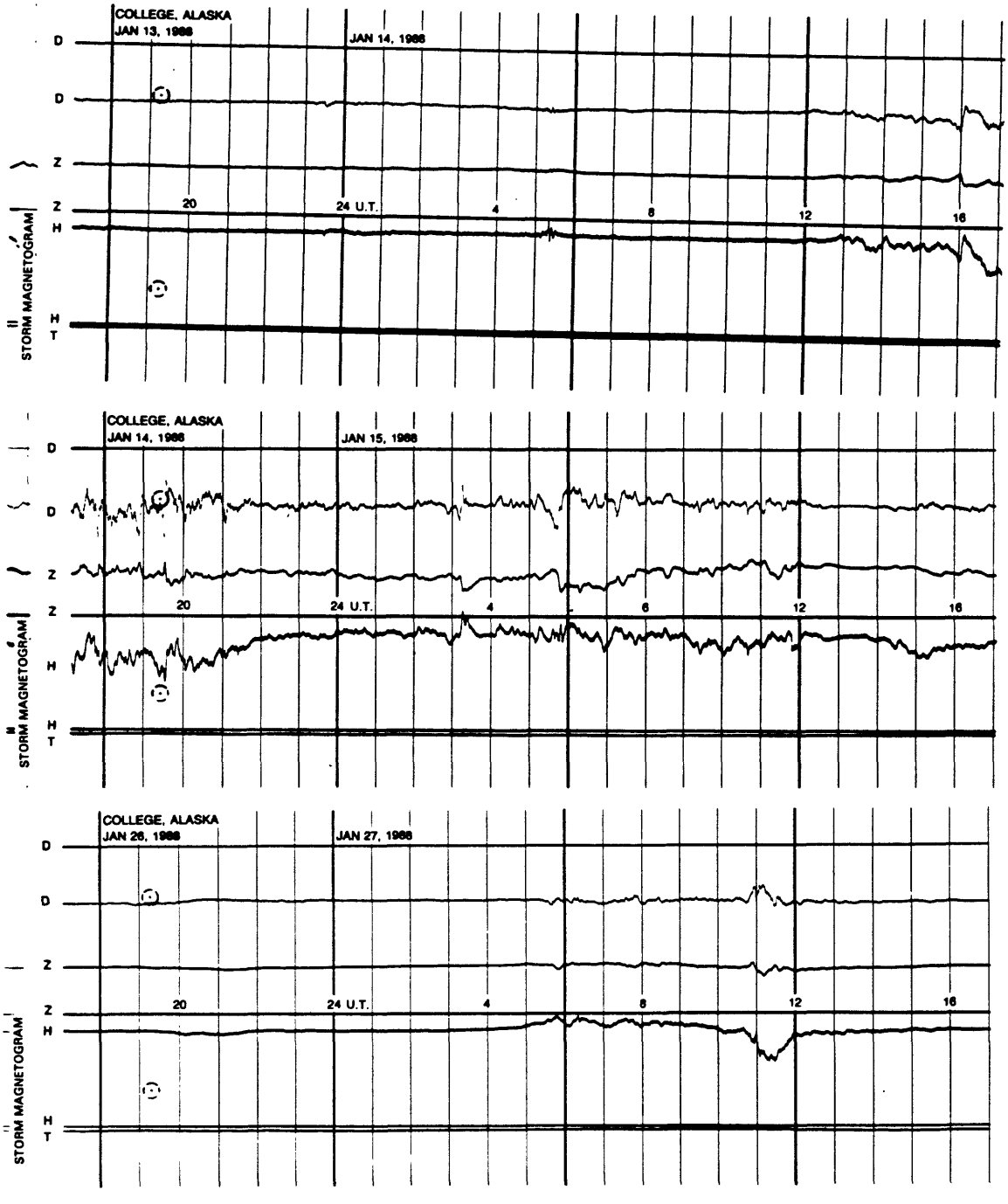

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