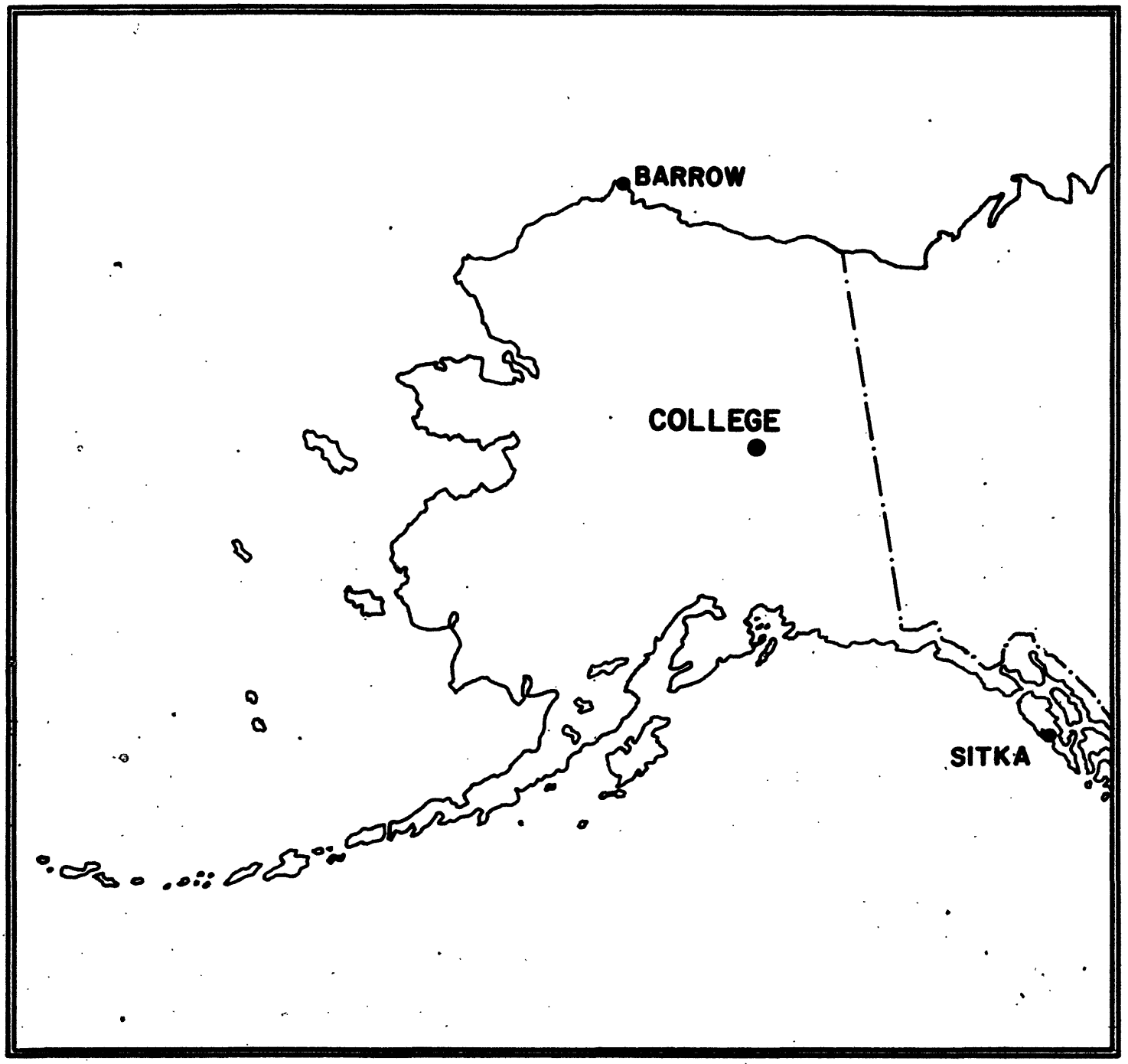
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JULY 1987

OPEN FILE REPORT 87-0300G



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.

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: July 1987

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	0	1	0	0	0	0	0	0	1	00
2	0	1	0	0	0	0	0	0	1	00
3	1	1	1	0	0	0	2	2	7	03
4	2	3	2	0	0	1	2	0	10	05
5	2	2	2	2	1	0	1	1	11	05
6	1	1	0	1	3	0	1	0	7	02
7	1	0	1	0	1	1	1	0	5	02
8	2	2	2	3	4	1	1	1	16	09
9	2	2	3	3	1	1	1	2	15	08
10	2	2	4	5	5	3	2	1	24	20
11	2	1	3	3	3	1	1	1	15	08
12	1	2	4	6	4	1	2	1	21	20
13	1	1	0	0	0	0	1	1	4	02
14	2	2	1	0	0	0	1	1	7	03
15	2	2	2	5	6	5	3	3	28	28
16	3	4	5	5	3	4	4	2	30	27
17	3	4	3	5	5	3	2	2	27	23
18	3	3	3	4	3	2	2	1	21	13
19	2	2	1	4	5	3	2	2	21	15
20	2	3	1	1	3	2	1	2	15	08
21	2	2	2	1	1	1	1	1	11	05
22	2	2	3	2	1	0	1	1	12	06
23	1	1	0	0	3	1	1	1	8	04
24	1	2	0	0	0	2	2	2	9	04
25	3	2	2	5	3	4	1	1	21	16
26	0	0	1	2	0	0	0	0	3	01
27	1	1	1	2	3	1	0	0	9	04
28	1	0	2	5	6	5	3	4	26	29
29	5	6	5	6	5	3	1	1	32	41
30	2	2	2	3	5	2	1	2	19	13
31	3	4	4	4	2	2	1	1	21	15

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

d	h	m
24	16	36
28	08	49

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.....	3.70	7.79		(γ/mm)
LOWER LIMIT FOR K = 9	2500	2510		(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

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

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

July 1987

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	28	0849	s.c*	-6	+58	-21	28	5	6					
								29	2, 4	6	257	1330	1070	29	17

51

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: July 1987

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 UT, 7/1/87	2400 UT, 7/31/87	1.0'/mm	37.8"/mm	27° 01.3' E
H	(same)	(same)	7.8"/mm		12647"
Z	(same)	(same)	7.7"/mm		55163"

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 UT, 7/1/87	2400 UT, 7/31/87	7.9'/mm	29.5"/mm	
H	(same)	(same)	43.7"/mm		
Z	(same)	(same)	48.7"/mm		

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION
	FROM	TO	SCALE VALUE
D			
H			
Z			

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 21.1' E	12857"	55305"

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: July 2, 7, 13, 14, 26,

U.S. Dept. of Interior
Geological Survey

Observatory: COLLEGE, ALASKA | Month: July | Year: 1987

Jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

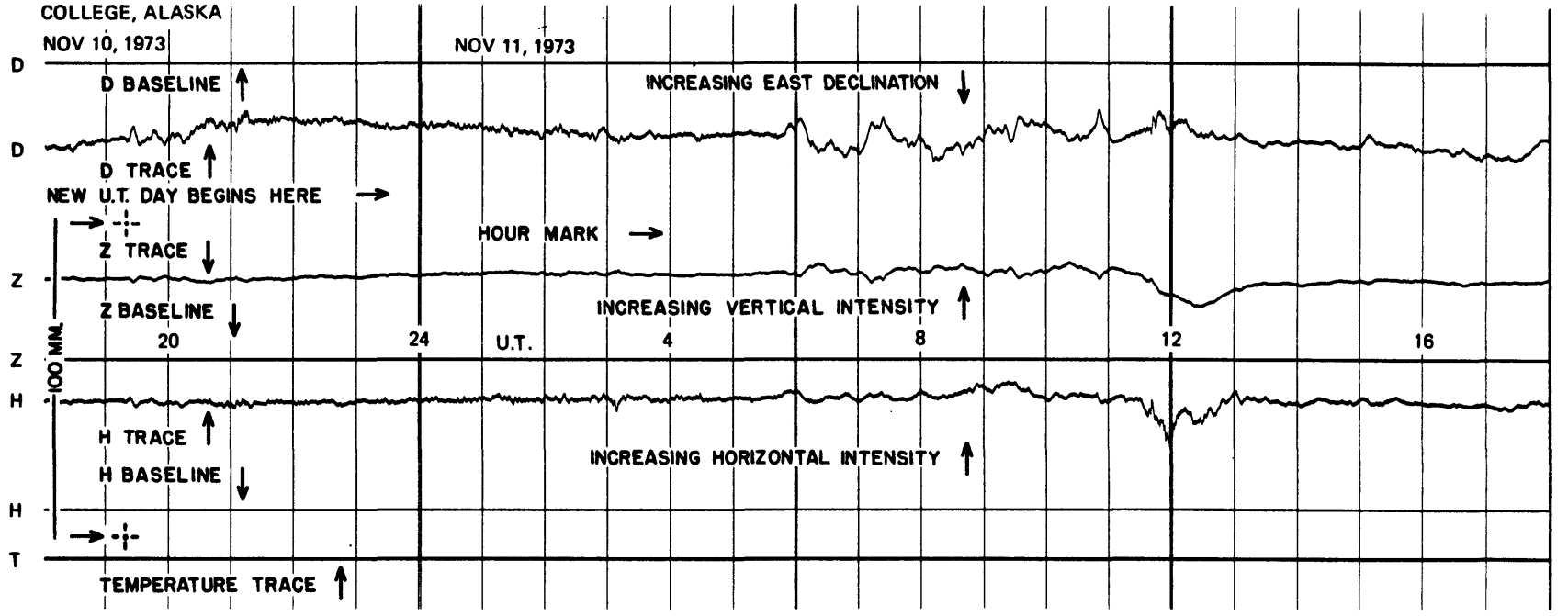
(UNIVERSAL TIME)

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		02	07	13	14	26	02	07	13	14	26	02	07	13	14	26	DAY
A_k		00	02	02	03	01	00	02	02	03	01	00	02	02	03	01	A_k
HOUR	01	123	126	91	113	85	263	268	252	247	263	172	192	170	176	187	01 HOUR
	02	116	133	93	137	87	272	277	269	249	261	179	200	179	189	197	02
	03	126	150	130	143	117	282	277	283	263	250	193	198	198	180	207	03
	04	149	159	159	149	151	291	272	285	293	260	200	196	196	170	194	04
	05	190	170	168	156	180	292	263	287	300	260	228	189	186	176	196	05
	06	199	172	174	147	197	297	259	280	343	272	228	188	190	200	196	06
	07	192	172	180	178	199	287	260	277	310	290	209	189	188	256	204	07
	08	196	176	175	165	195	284	270	277	283	277	200	189	183	211	205	08
	09	191	182	179	167	193	285	280	283	283	289	195	189	184	192	196	09
	10	184	187	177	169	186	286	280	285	283	301	196	199	186	187	199	10
	11	187	186	188	187	200	286	282	280	280	283	196	192	186	188	170	11
	12	208	191	197	190	189	283	286	289	275	293	196	190	186	184	192	12
	13	217	193	207	203	190	282	285	283	280	287	194	183	186	183	193	13
	14	233	227	221	221	205	280	261	290	277	288	193	146	187	180	194	14
	15	249	240	247	243	227	277	267	291	280	289	187	148	193	181	198	15
	16	260	282	279	267	263	279	247	292	279	289	186	149	192	176	200	16
	17	267	324	310	290	295	279	247	288	280	287	184	159	193	170	204	17
	18	277	332	329	274	307	261	253	279	255	283	183	149	190	170	197	18
	19	280	311	323	270	295	249	261	263	254	273	176	153	187	164	198	19
	20	280	272	285	289	264	236	257	253	242	259	174	153	180	170	197	20
	21	240	229	252	253	226	213	250	231	240	242	174	150	179	160	190	21
	22	192	193	191	179	201	230	247	235	240	239	163	156	166	157	192	22
	23	167	168	183	126	169	245	250	234	249	233	167	157	168	156	191	23
	24	110	166	118	103	142	242	256	242	260	236	176	173	167	163	188	24
DAILY SUM		4833	4941	4856	4619	4758	6481	6355	6528	6545	6504	4549	4187	4420	4339	4685	DAILY SUM
DAILY MEAN		201	206	202	192	198	270	265	272	273	271	190	174	184	181	195	DAILY MEAN
MEAN				200					270					185			MEAN

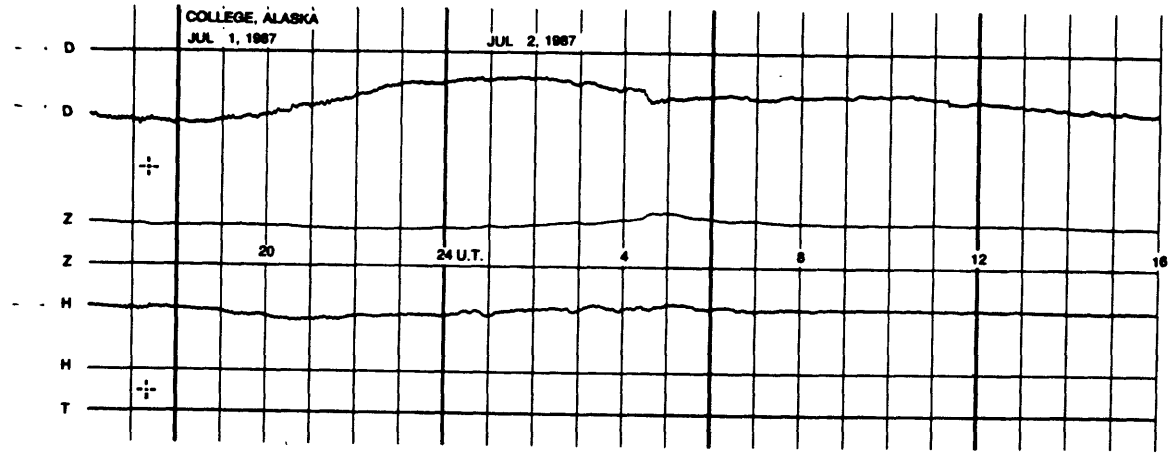
Scaled LYT | Checked RVO

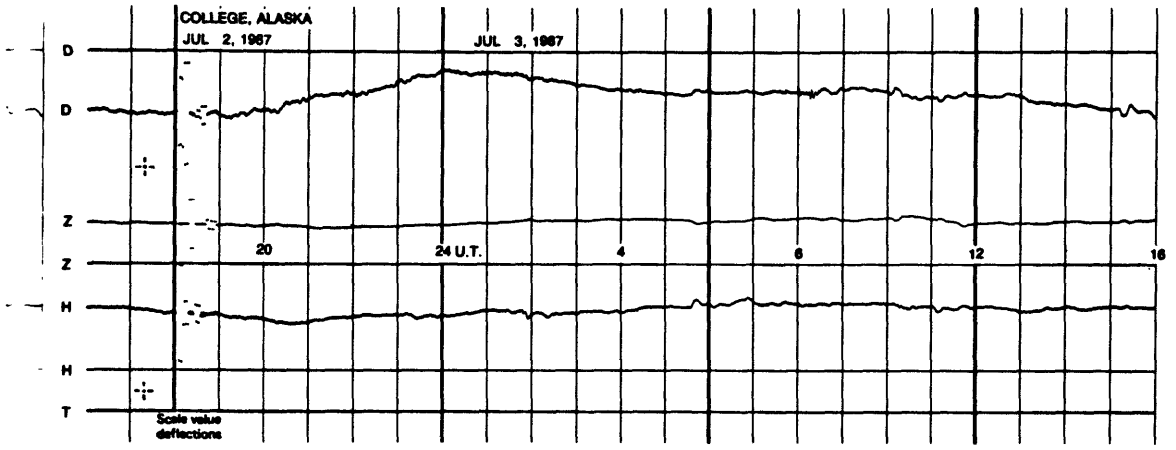
FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

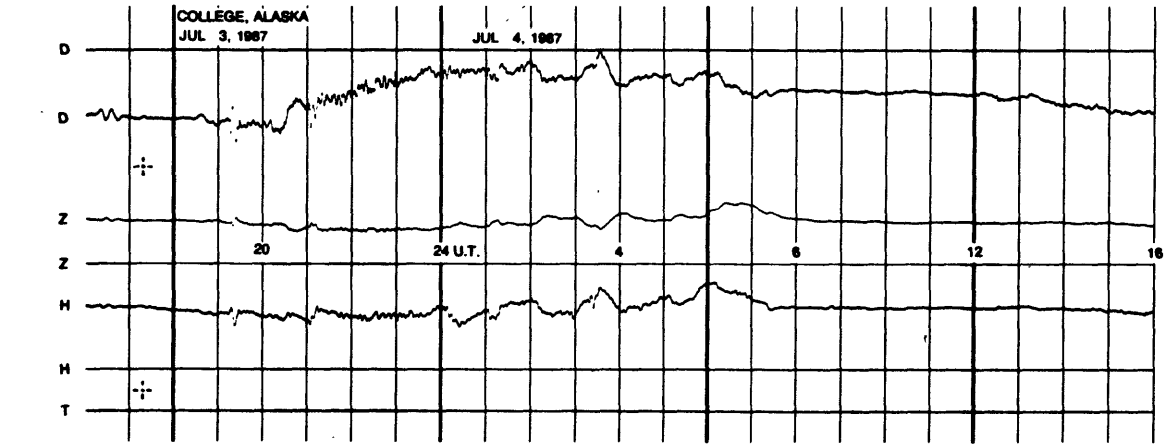


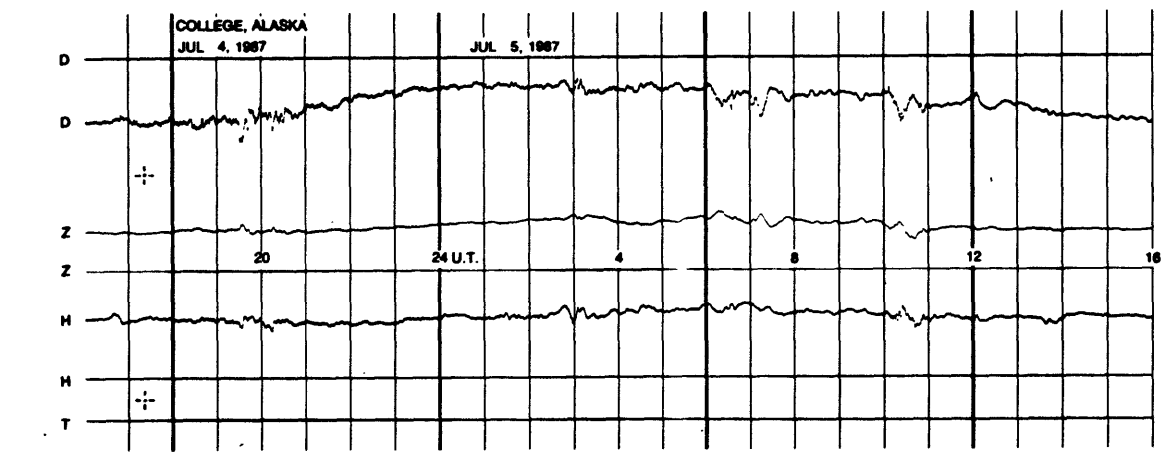
SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS









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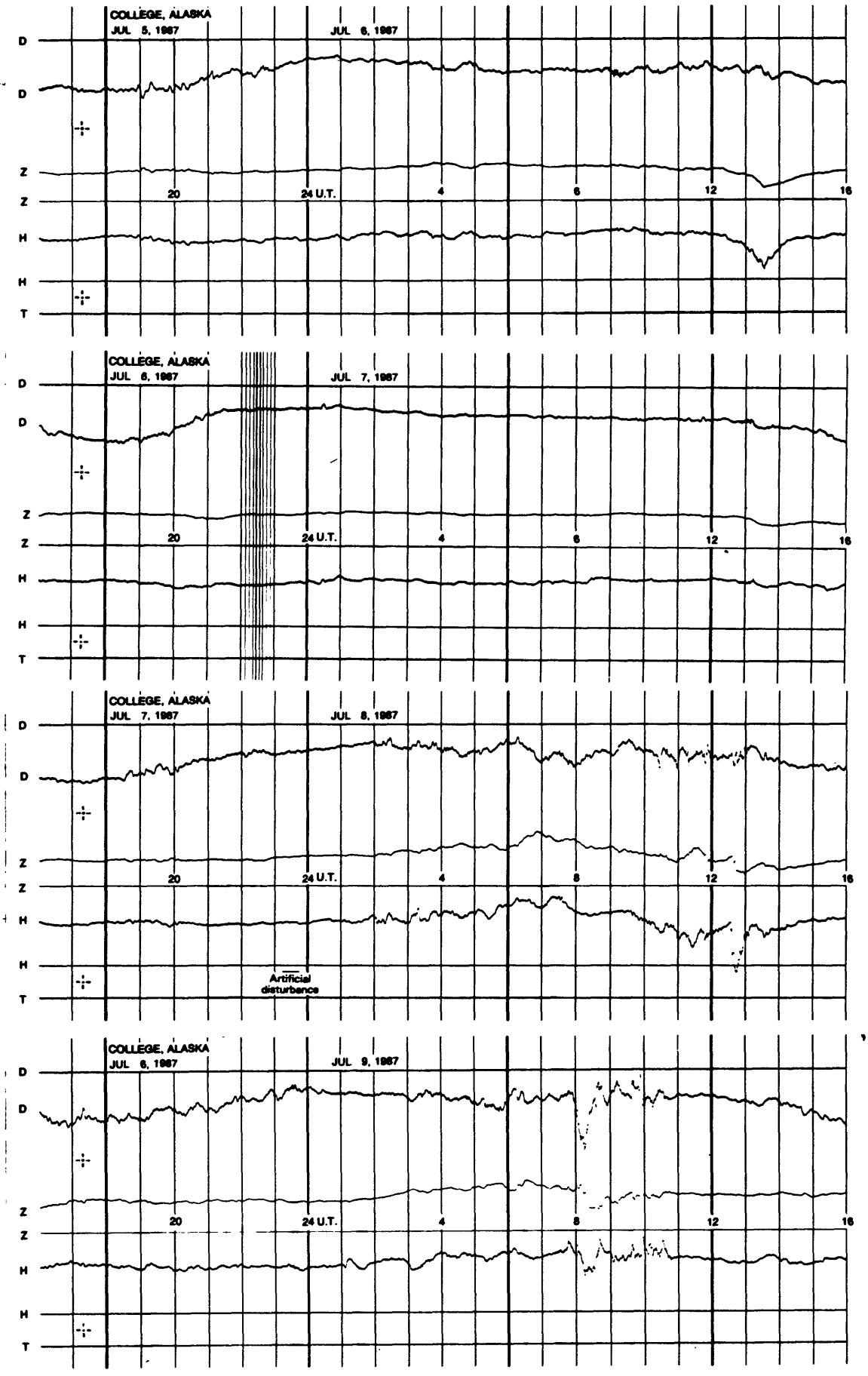

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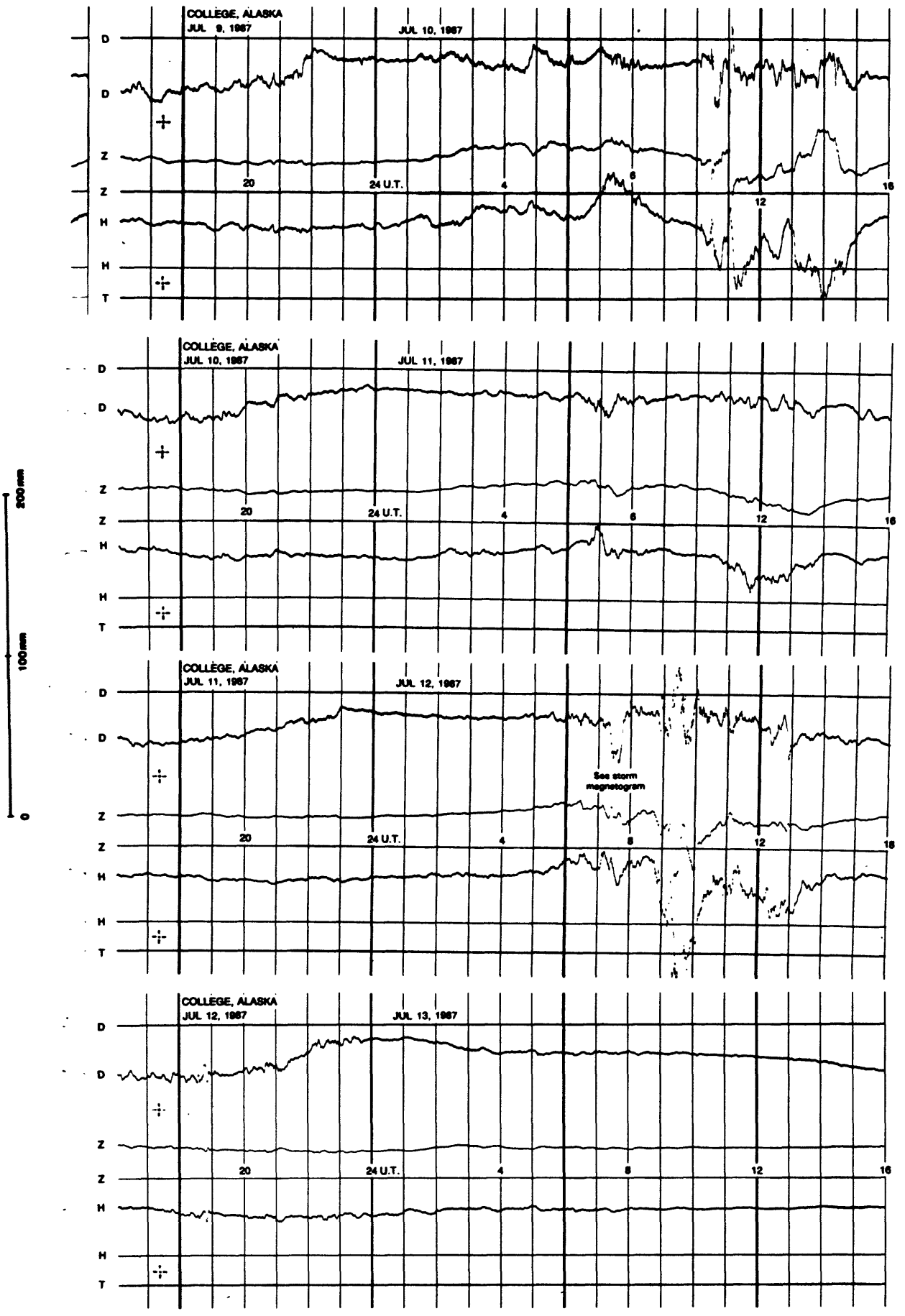

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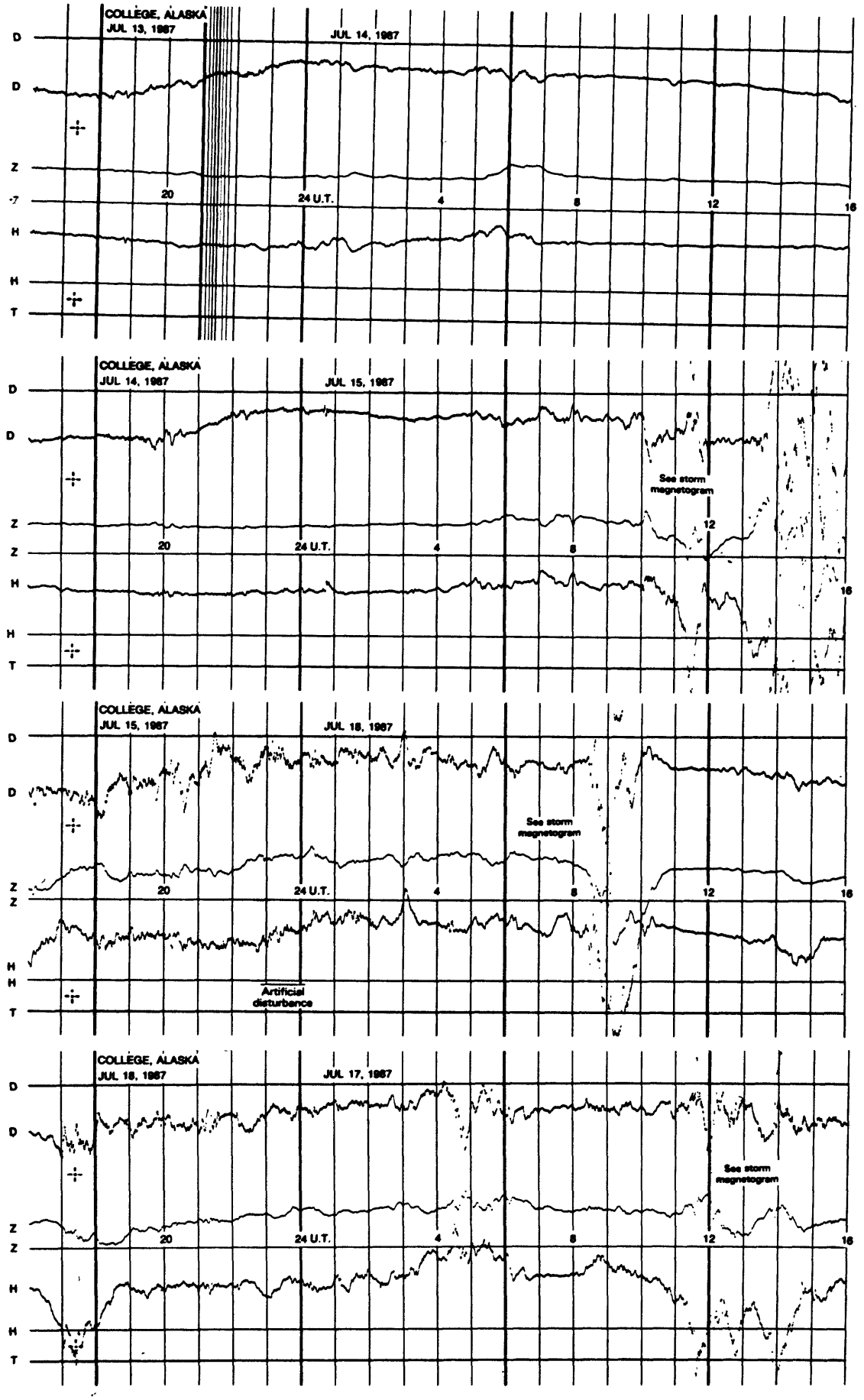

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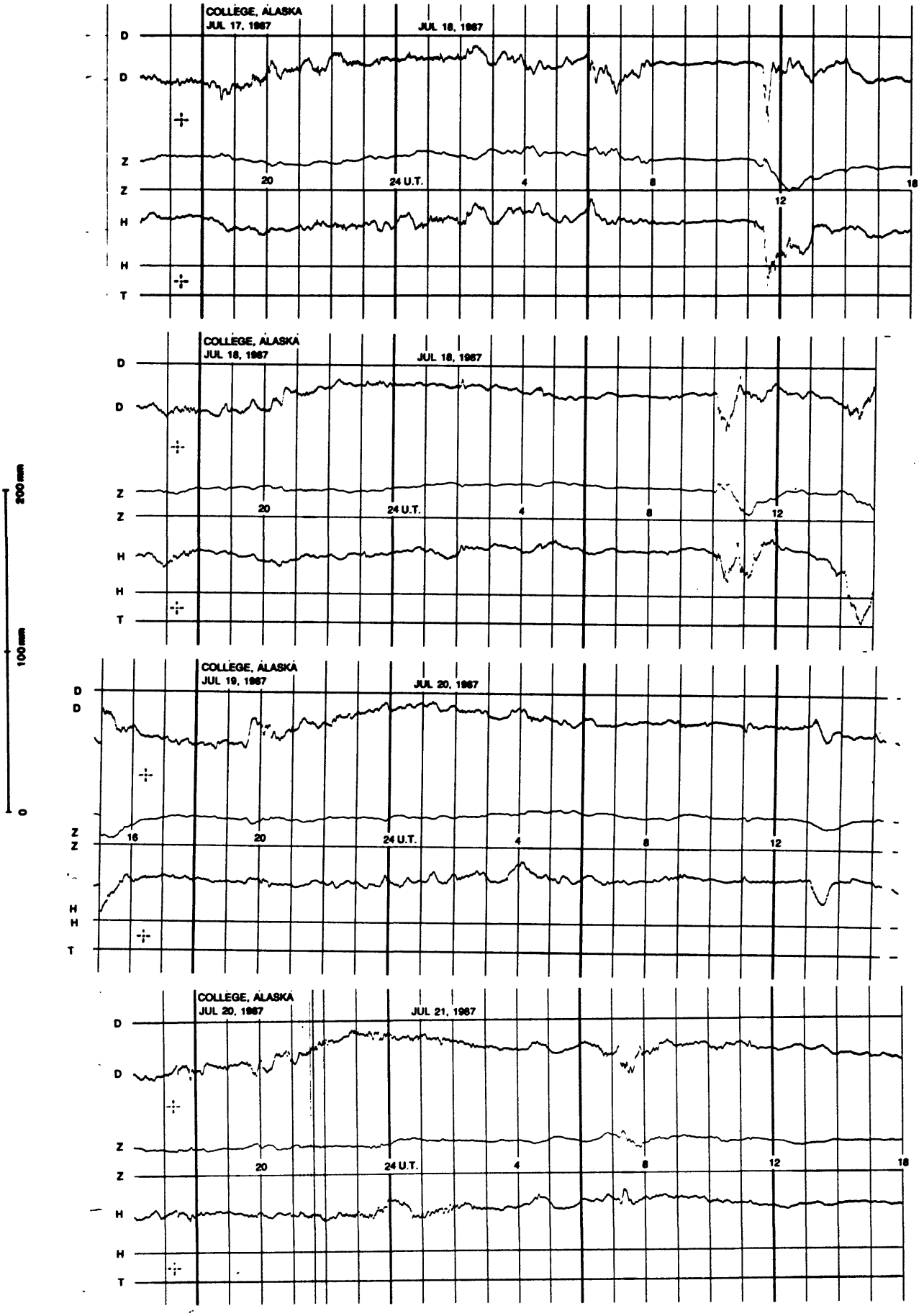

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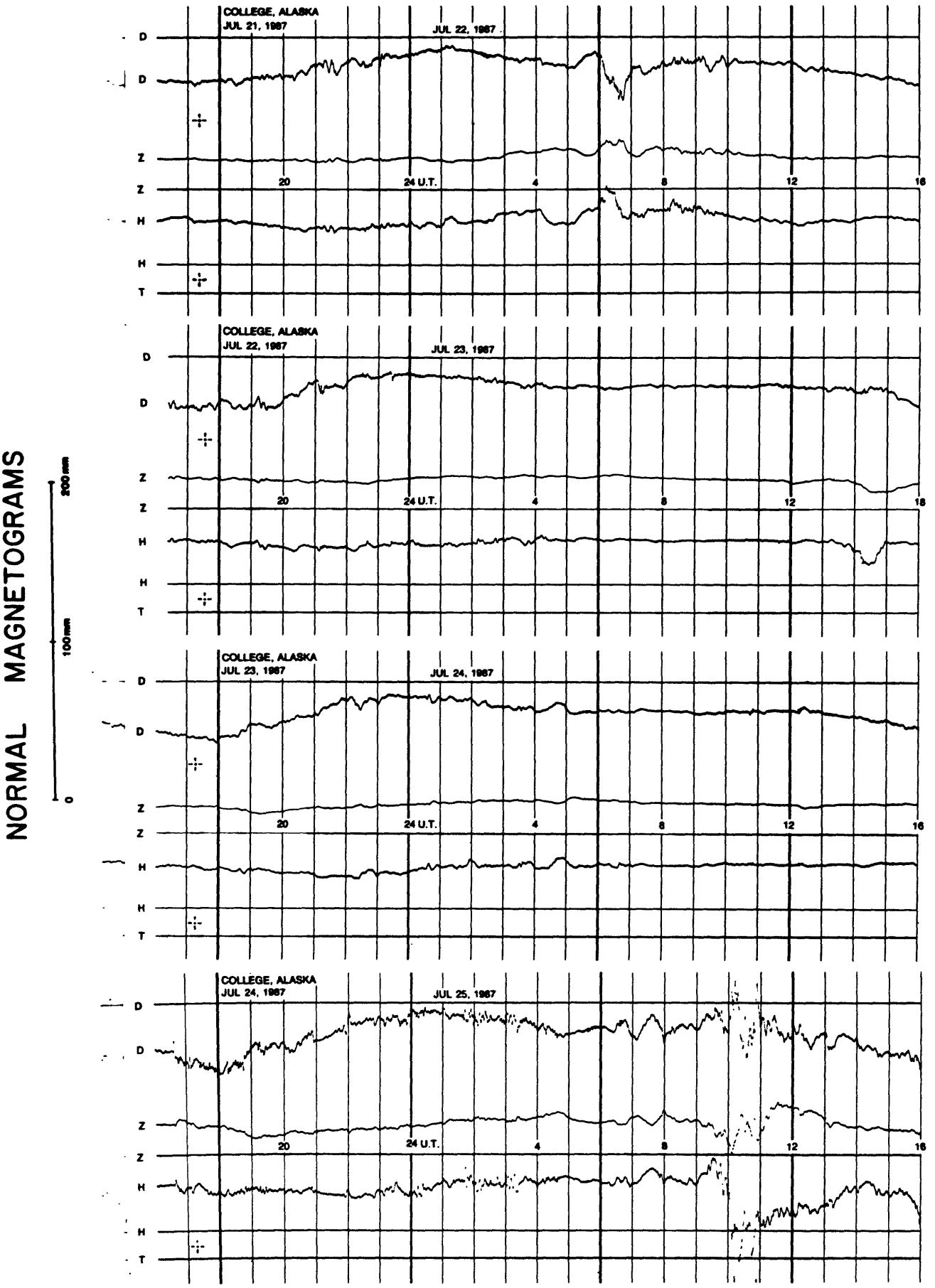

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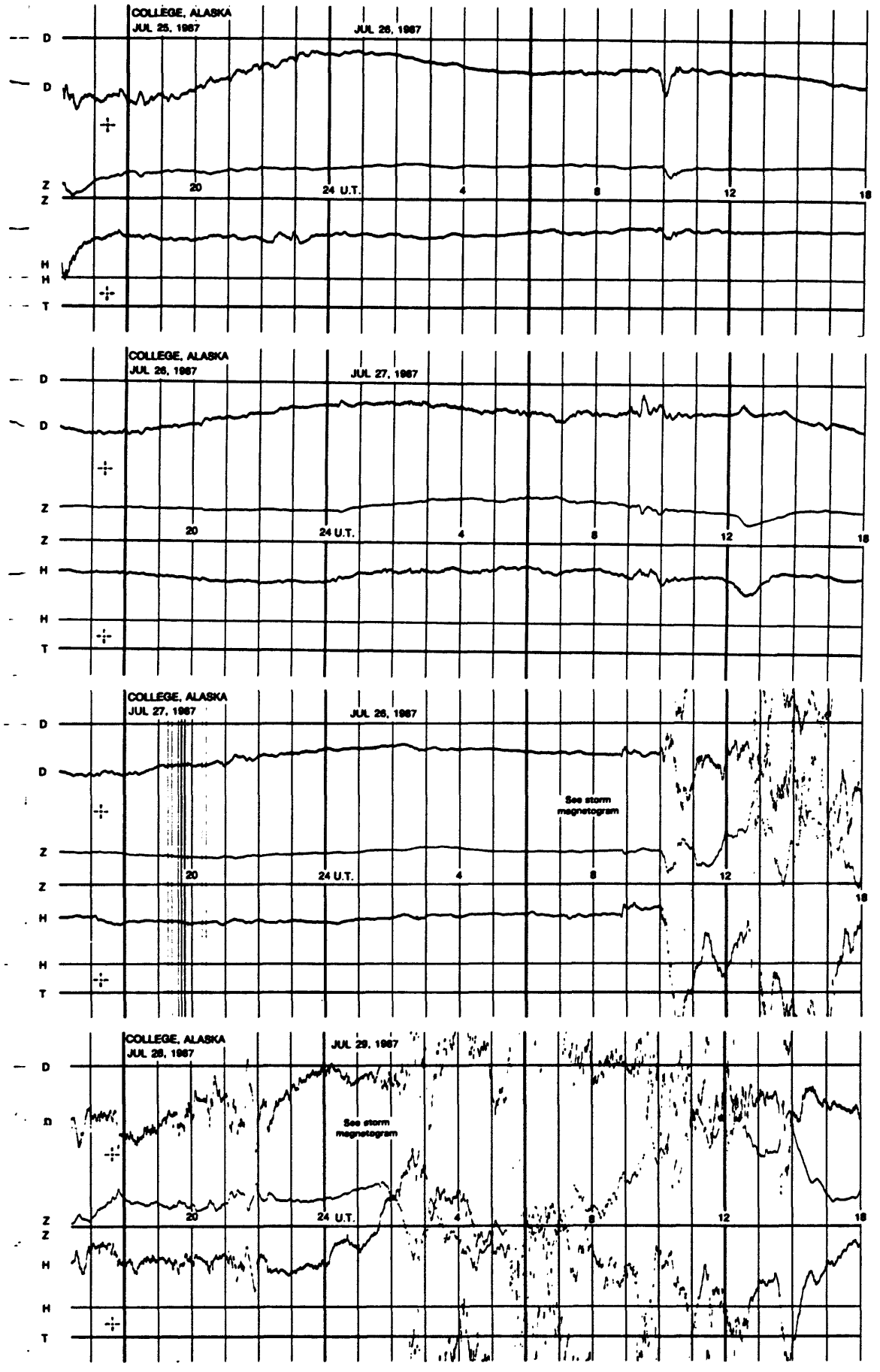
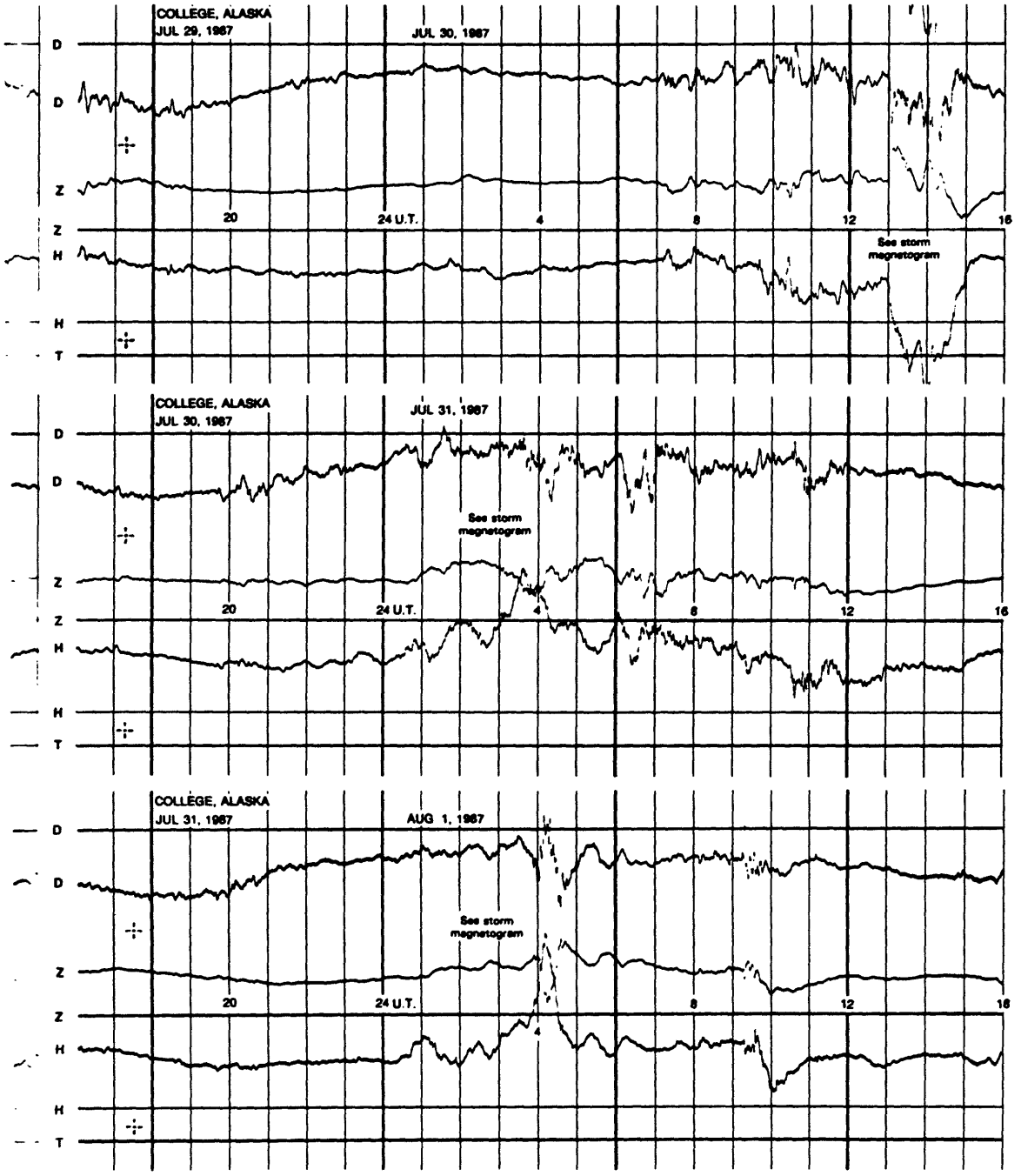
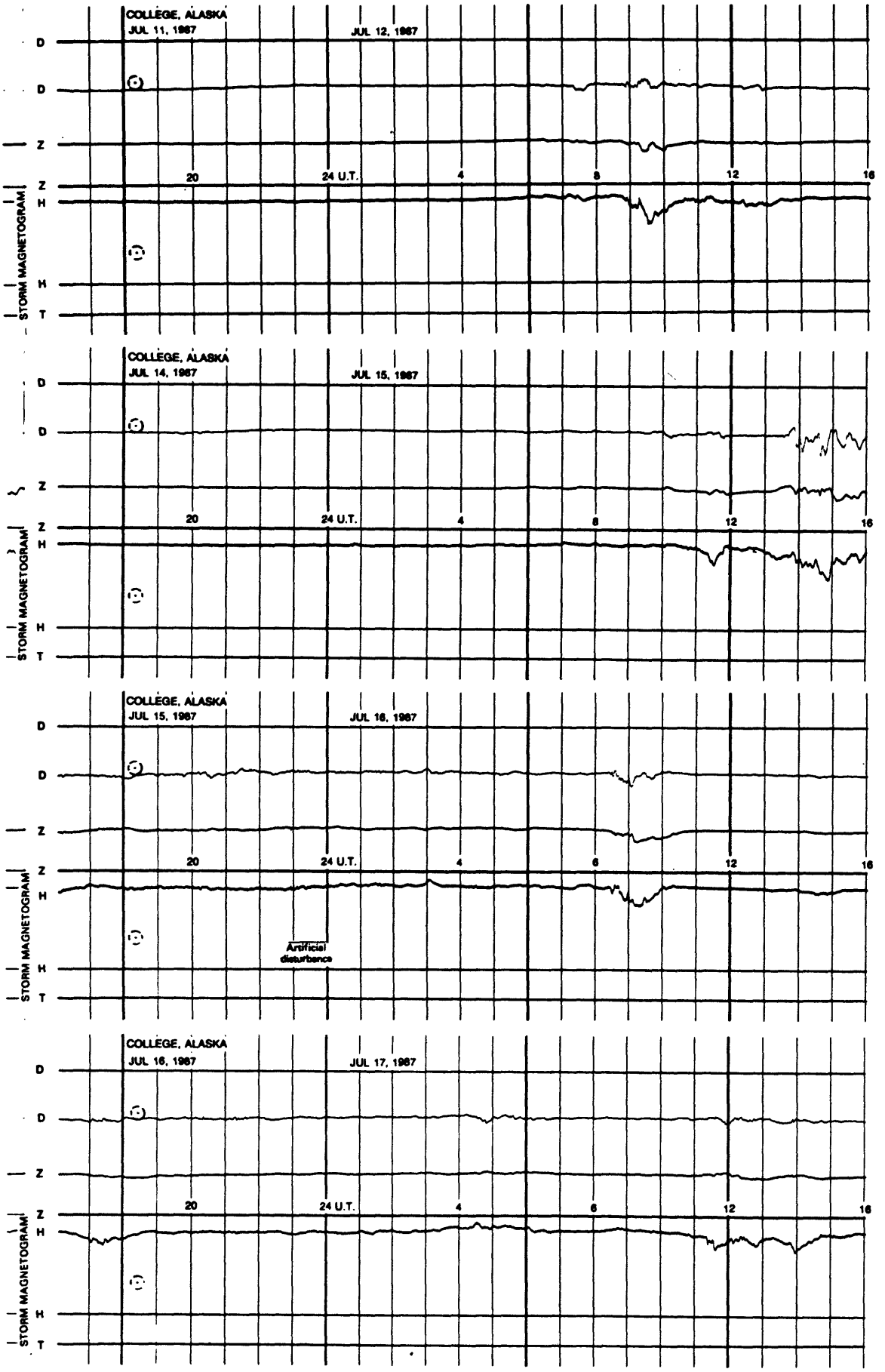


200 mm
100 mm
0

NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



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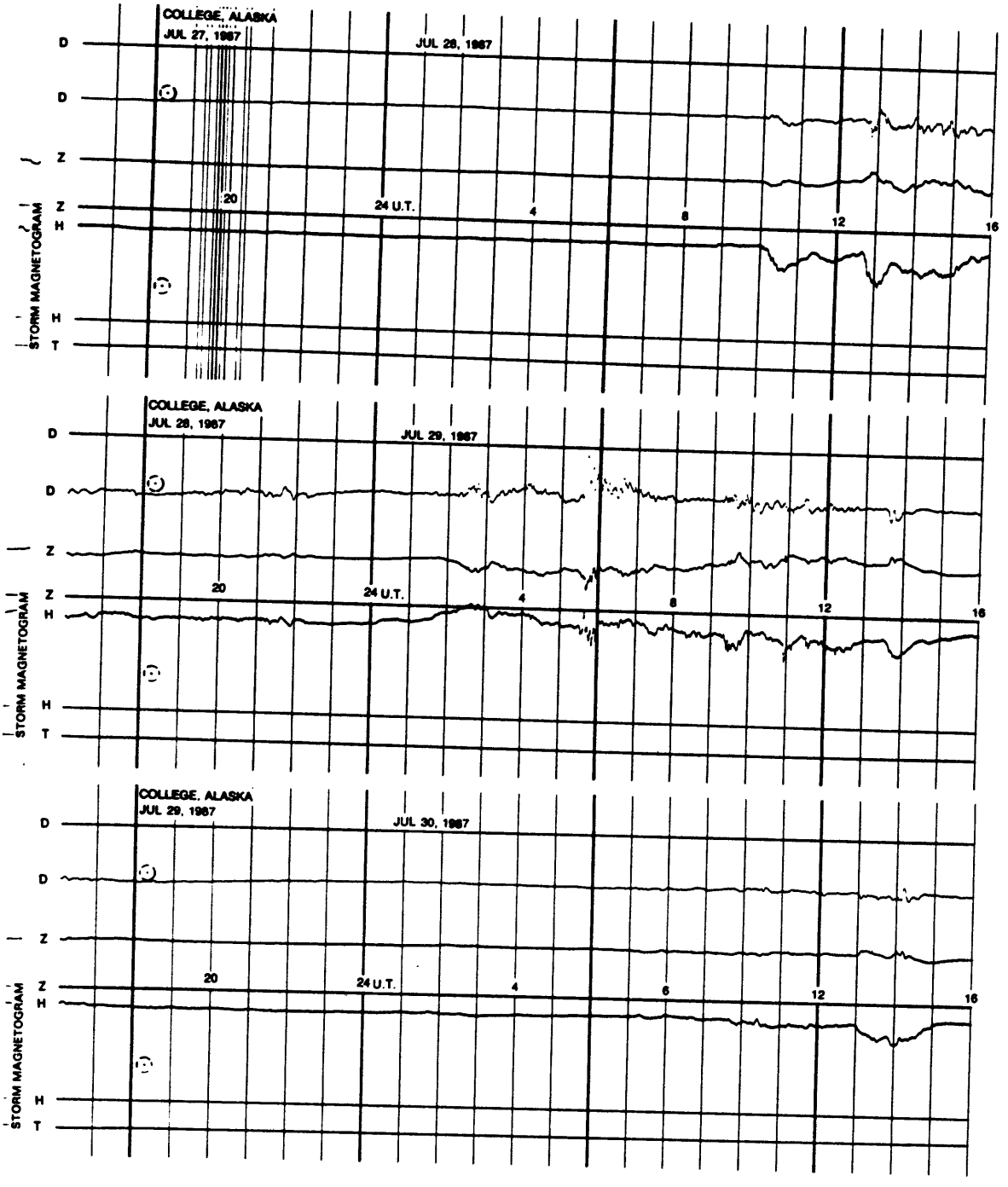

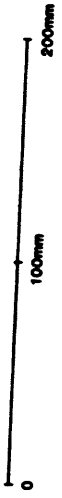

STORM MAGNETOGRAMS