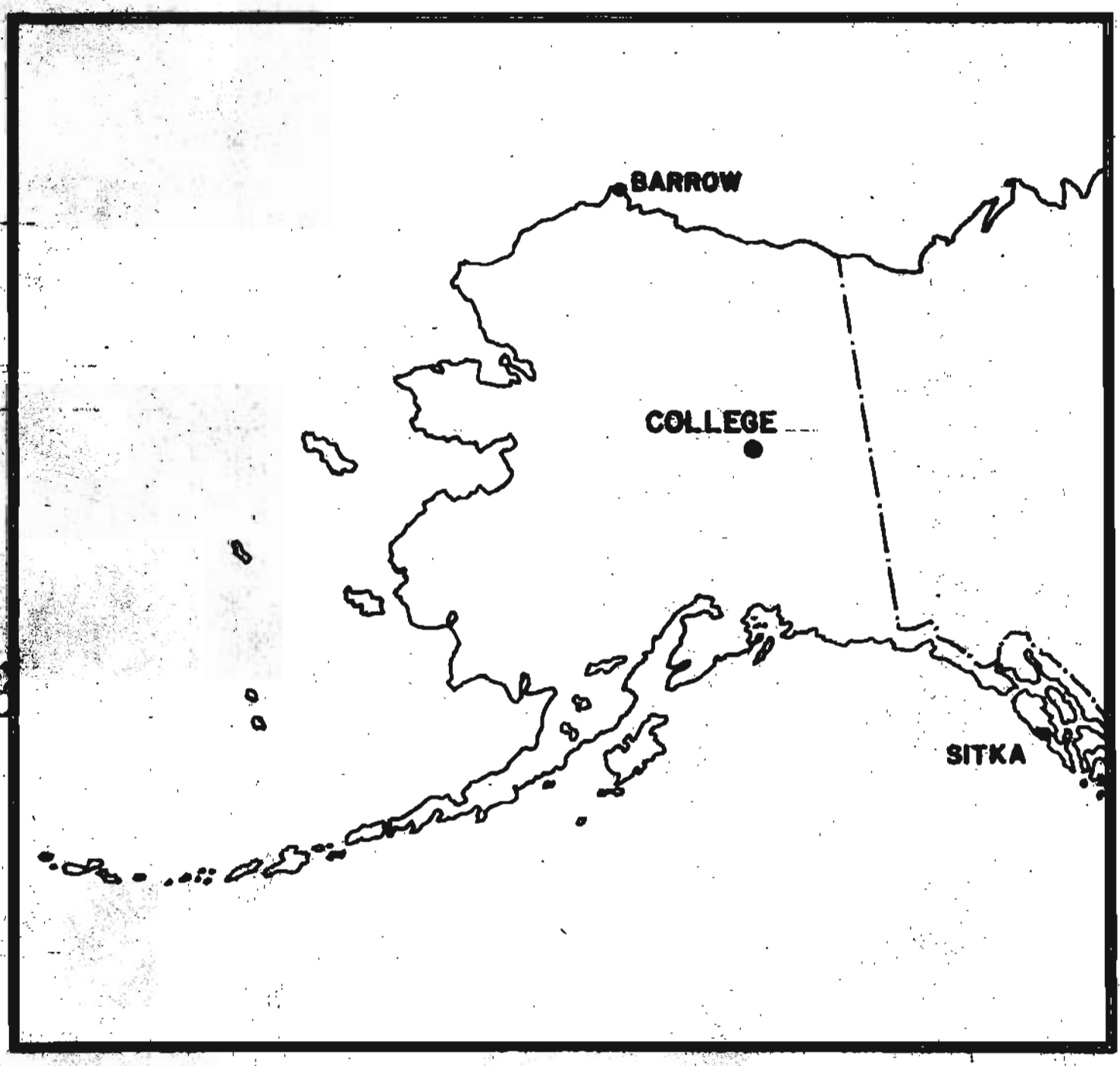
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JULY 1986

OPEN FILE REPORT 86-0300G



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: J.E. PAPP, H.K. REX AND L.Y. TORRENCE AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS 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 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A
NOAA D63, 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 latitude.....64° 51.6'N
Geographic longitude.....147° 50.2'W
Geomagnetic latitude.....+64.6°
Geomagnetic longitude.....+256.5°
Elevation.....200 meters

GEOMAGNETIC DATA

Normal, Storm and Rapid Run magnetograms and appropriate calibration data are processed daily at the observatory and are available for analysis or copying. Also available, are mean hourly scalings, K-Indices, selected magnetic phenomena reports and on a real-time basis are recordings from a 3-component fluxgate magnetometer and F-component proton magnetometer.

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 beginning 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 an 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)

The Magnetic Daily Character Figure, C: To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1, if it is moderately disturbed; C=2, if it is greatly disturbed. The method used to assign characters at the College Observatory is based on AK as follows:

AK Range	C
0 - 11	0
11 - 50	1
50+	2

Routine assignment of C was discontinued at College on January 1, 1976.

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal and Rapid Run records were reviewed at the observatory for selected magnetic phenomena and the events identified were forwarded to the IUGG Commission on Magnetic Variations and Disturbances. This was discontinued on January 1, 1976, but a report on Outstanding Magnetic Effects is prepared monthly for this report.

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 averages 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 sheets 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 he is interested in the detailed morphology of the magnetic field, he should 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 1986

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	3	3	1	1	0	1	1	1	11	06
2	2	2	6	4	5	3	2	2	26	25
3	2	2	3	3	1	1	1	2	15	08
4	2	2	3	3	2	2	2	2	18	09
5	2	1	1	2	2	1	1	1	11	05
6	2	1	0	1	0	1	2	0	07	03
7	0	2	1	0	0	1	1	1	06	02
8	1	1	1	0	2	3	0	1	09	04
9	2	2	1	3	5	1	1	2	17	12
10	2	2	0	1	1	0	1	0	07	03
11	0	2	4	3	1	2	1	1	14	08
12	1	1	0	1	1	1	2	1	08	03
13	2	3	1	2	5	1	1	1	16	11
14	1	1	1	4	1	1	1	1	11	06
15	1	1	0	0	0	1	1	0	04	02
16	2	1	1	2	2	2	1	1	12	05
17	3	3	4	4	1	1	1	2	19	13
18	2	2	0	5	3	2	1	1	16	11
19	1	1	1	0	0	1	2	1	07	02
20	1	1	0	1	1	0	1	1	06	02
21	1	2	1	3	2	1	2	2	14	07
22	2	2	1	5	4	1	0	1	16	12
23	1	1	0	3	3	2	1	0	11	06
24	2	1	1	2	0	1	2	3	12	06
25	3	2	1	2	2	2	3	4	19	11
26	4	4	5	4	6	3	2	2	30	30
27	3	2	5	6	3	2	2	2	25	23
28	3	3	4	4	5	2	2	2	25	19
29	3	2	3	6	6	3	3	2	28	29
30	3	2	4	5	3	3	2	2	24	18
31	2	2	2	6	4	2	2	2	22	19

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

BEGIN d	BEGIN h	BEGIN m	END d	END h	END m

POSSIBLE SOLAR-FLARE EFFECTS BASED ON INSPECTION OF GRAMS ALONE (WITHOUT REFERENCE TO DATA FROM OTHER SOURCES)

K SCALE USED:	D	H	Z	
LOWER LIMIT FOR K = 9.....	675.7	322.2		(mm)
CURRENT SCALE VALUE.....	3.71	7.80		(γ/mm)
LOWER LIMIT FOR K = 9	2510	2510		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY
OBSERVER IN CHARGE

NOAA FORM 76-138 SUPERSEDES C&GS FORM 815

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OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: JULY

YEAR: 1986

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
07	09XX	pi2	
08	14XX	pi2	with small bay
10	13XX	pi2	
12	11XX	pi2	
15	08XX	pi2	
16	15XX	pi2	
20	09XX	pi2	
21	11XX	pi2	with small bay
24	2117	ssc*	

IDENTIFIED BY: JEP

VERIFIED BY: HKR

1. NATURE OF PHENOMENON: ssc, ssc*, si, si*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

NOAA FORM 86-500
(11/73)

PRINCIPAL MAGNETIC STORMS

WDC-A FOR SOLAR-TERRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80303 U.S.A.

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA

JULY 1986

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	24	2117	s.c.*	-40	+95	-46	26	5	6	207	1300	620	30	19
								27	4	6					
								29	4, 5	6					

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: JULY 1986

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T. 7-1-86	2400 U.T. 7-31-86	1.6'/mm	3.7 γ/mm	27° 16.5' E
H	0000 U.T. 7-1-86	2400 U.T. 7-31-86	7.8 γ/mm		12693 γ
Z	0000 U.T. 7-1-86	2400 U.T. 7-31-86	7.7 γ/mm		55171 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T. 7-1-86	2400 U.T. 7-31-86	7.9'/mm	29.5 γ/mm	23° 49.8' E
H	0000 U.T. 7-1-86	2400 U.T. 7-31-86	43.8 γ/mm		10735 γ
Z	0000 U.T. 7-1-86	2400 U.T. 7-31-86	48.7 γ/mm		54117 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 30.3' E	12882 γ	55324 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: JUL 6, 7, 15, 19, 20

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
COLLEGE, ALASKA	JULY	1986

Jap-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

(UNIVERSAL TIME)

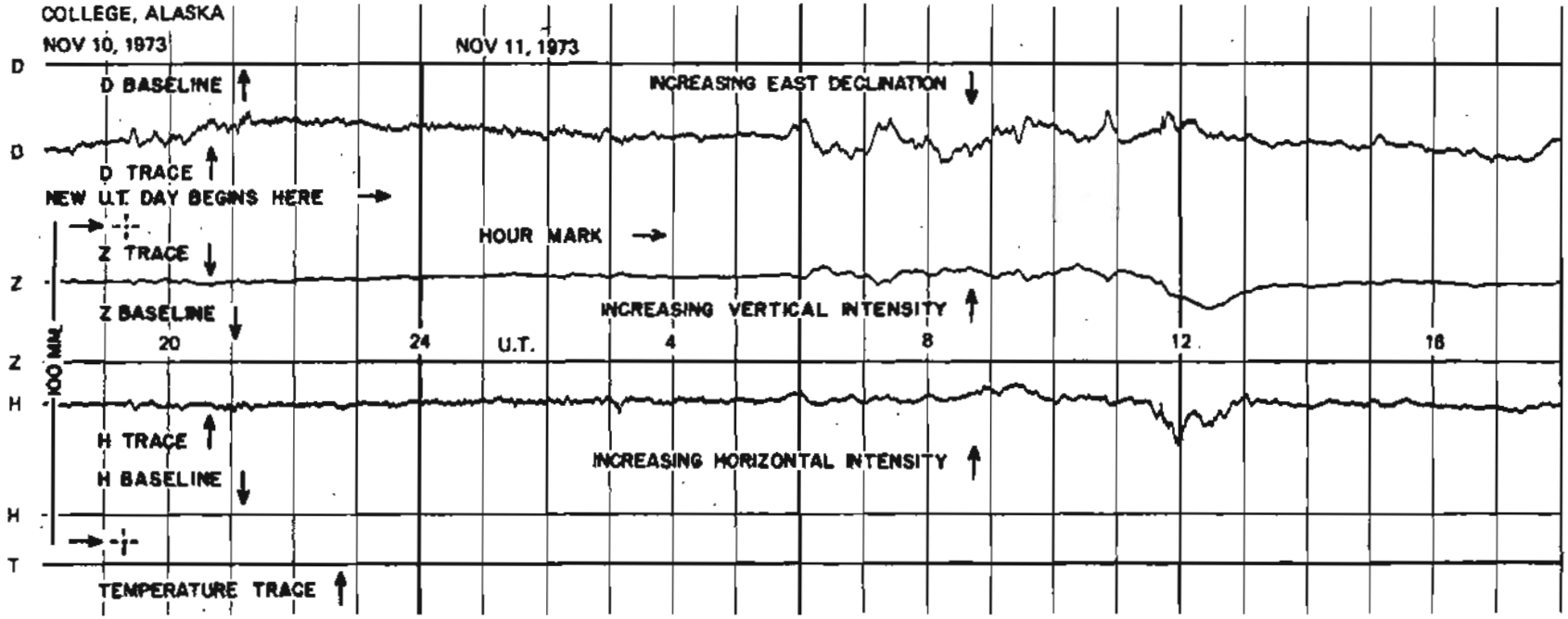
Values are in Tenths of nn and are Averages for Successive Periods of One Hour beginning at Midnight. Skirmage Corrections have been applied. Negative Values in Red with Minus.

COMPONENT		D					H					Z					COMPONENT
DAY		06	07	15	19	20	06	07	15	19	20	06	07	15	19	20	DAY
A_K		03	02	02	02	02	03	02	02	02	02	03	02	02	02	02	A_K
HOUR	01	67	80	67	92	78	221	229	229	234	228	217	205	190	200	187	01 HOUR
	02	49	90	60	80	80	245	231	230	237	238	224	208	198	198	190	02
	03	48	96	62	91	94	236	234	231	221	245	221	208	199	201	203	03
	04	65	118	88	91	104	285	235	238	242	244	245	213	200	193	199	04
	05	118	115	98	103	111	279	239	245	237	239	250	219	204	201	194	05
	06	110	181	108	115	112	257	249	248	246	249	286	219	203	209	187	06
	07	112	119	108	117	120	240	250	249	253	242	226	222	199	209	190	07
	08	105	124	110	119	122	247	250	249	255	241	216	226	198	208	190	08
	09	102	111	108	119	117	241	253	257	252	251	215	220	190	208	188	09
	10	97	122	110	110	110	250	253	263	258	260	220	231	197	207	196	10
	11	136	119	109	116	107	261	253	271	258	251	226	219	199	199	200	11
	12	116	130	130	127	112	259	259	274	259	244	210	219	197	196	188	12
	13	119	147	142	142	131	262	265	277	259	243	211	207	193	199	174	13
	14	149	165	166	153	153	265	251	274	248	246	217	208	191	192	179	14
	15	185	182	183	179	172	259	249	277	255	264	219	200	196	192	181	15
	16	220	206	211	185	196	258	241	268	248	267	211	204	196	179	194	16
	17	256	230	247	217	208	251	235	264	235	253	205	200	199	200	187	17
	18	265	249	260	218	246	246	231	249	225	261	202	182	191	192	194	18
	19	231	209	248	202	232	225	229	247	217	239	200	182	184	186	184	19
	20	198	214	218	214	226	213	219	238	221	230	200	188	184	183	172	20
	21	183	190	179	185	199	208	204	229	214	216	195	191	179	189	168	21
	22	114	190	136	161	150	211	202	216	219	209	196	191	171	189	160	22
	23	78	109	114	127	130	218	219	223	220	219	196	186	180	189	169	23
	24	72	72	82	99	85	220	230	228	227	229	199	190	180	188	178	24
DAILY SUM		3456	3480	3308	3368	3416	5889	5710	5948	5735	5813	5157	4982	4617	4789	4487	DAILY SUM
DAILY MEAN		131	144	139	140	142	245	238	248	239	242	215	206	192	199	186	DAILY MEAN
MEAN				139					242					199			MEAN

Scaled JBP | Checked ABK

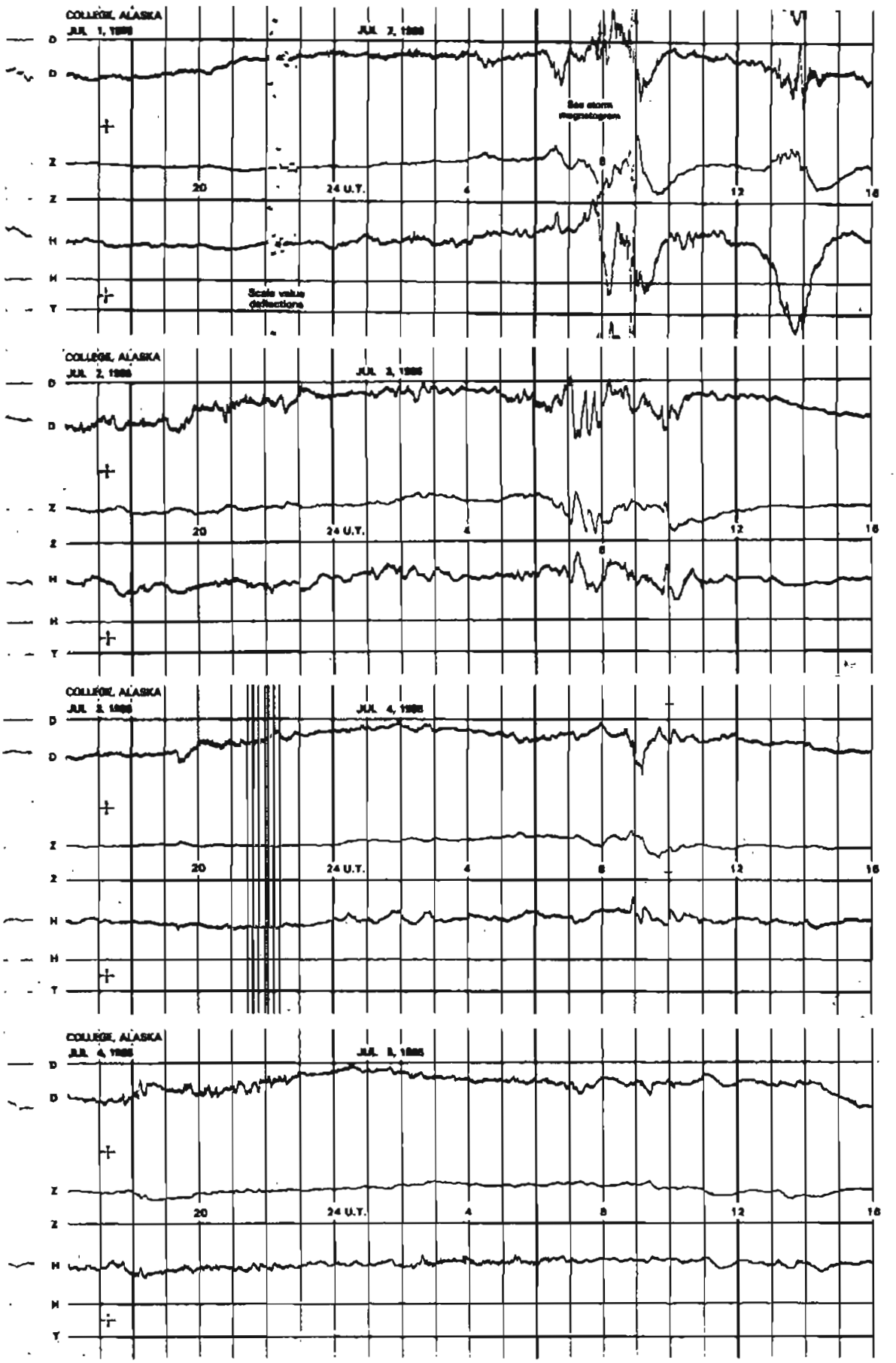
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)

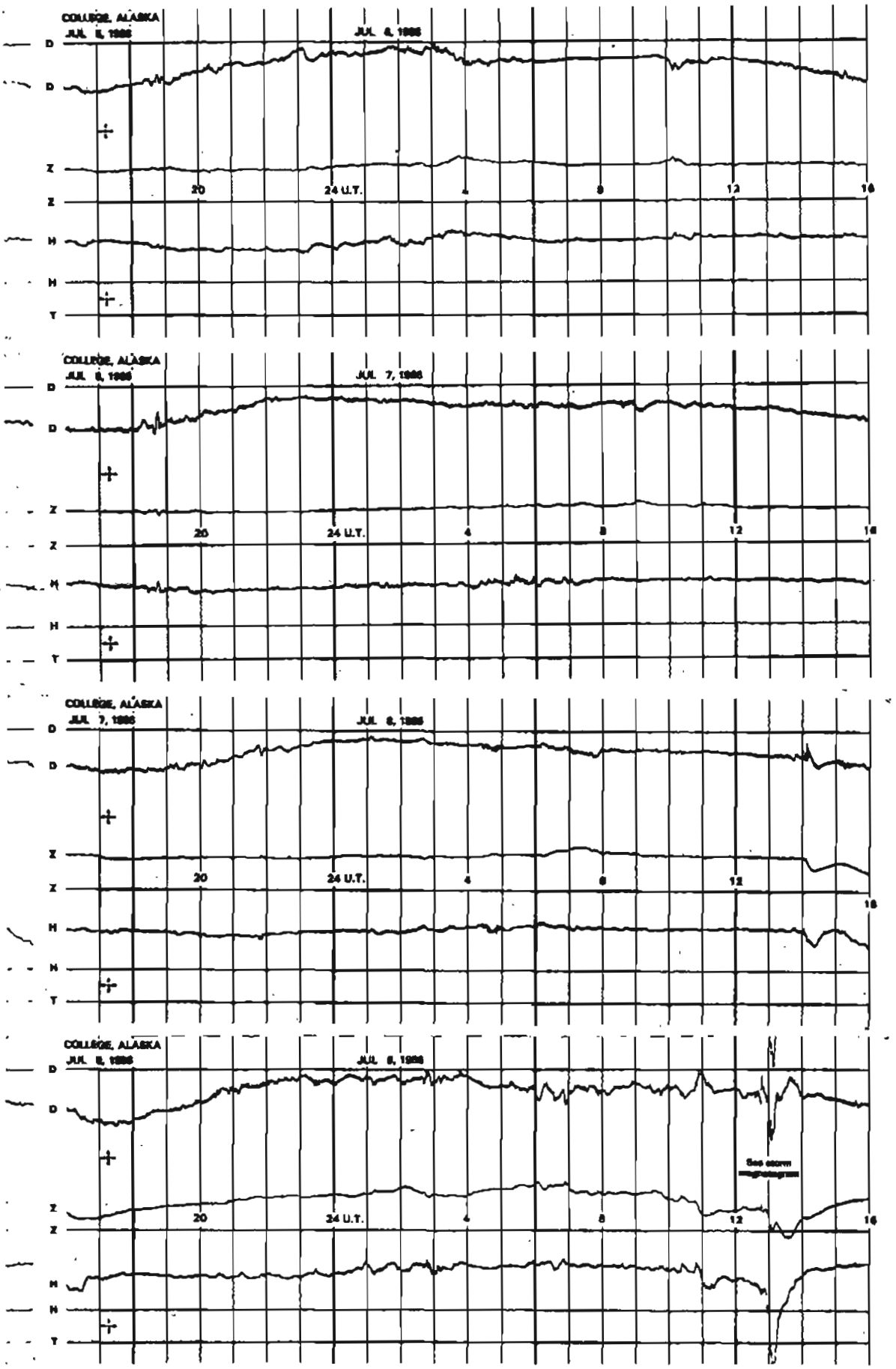


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS



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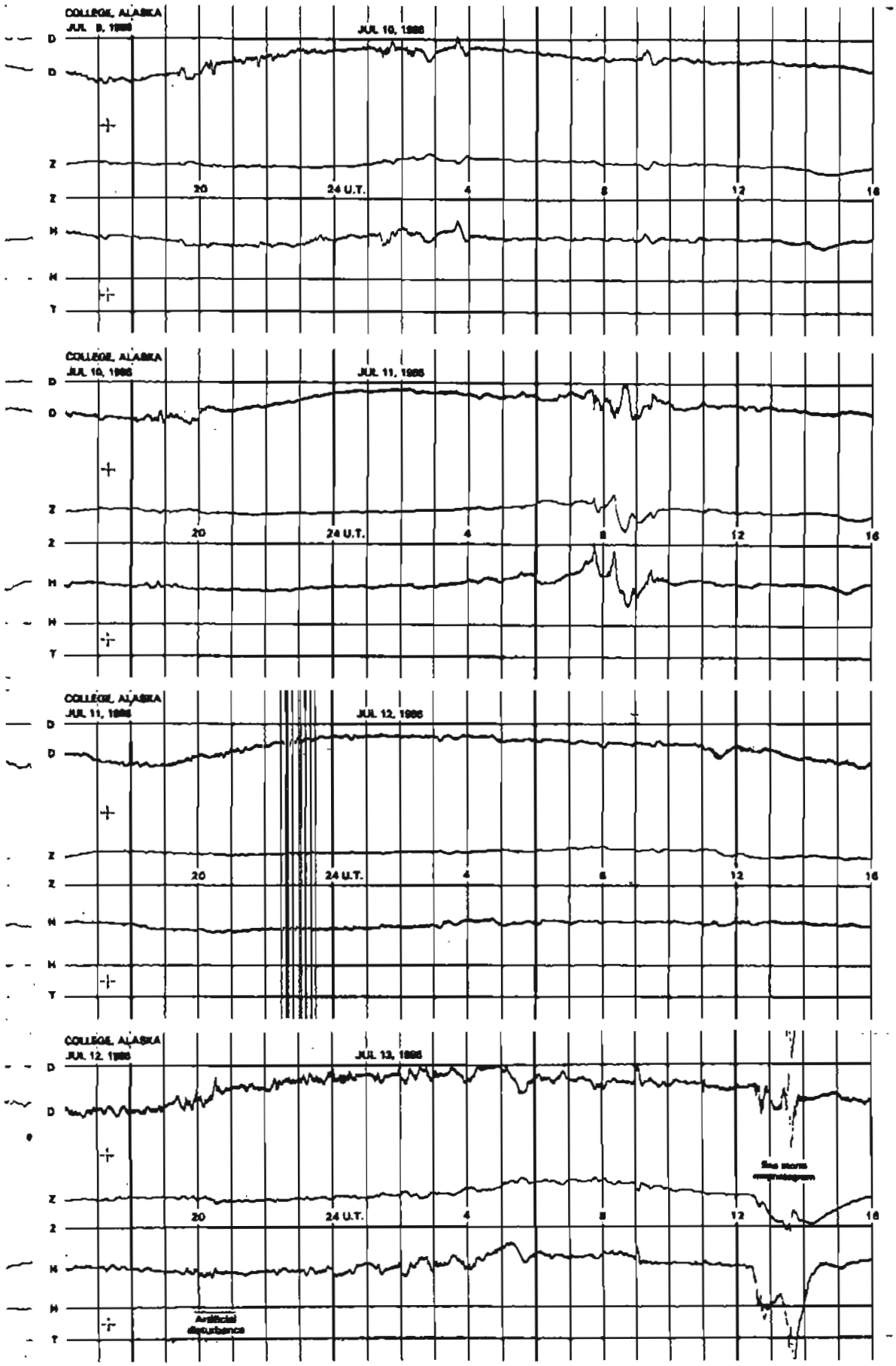

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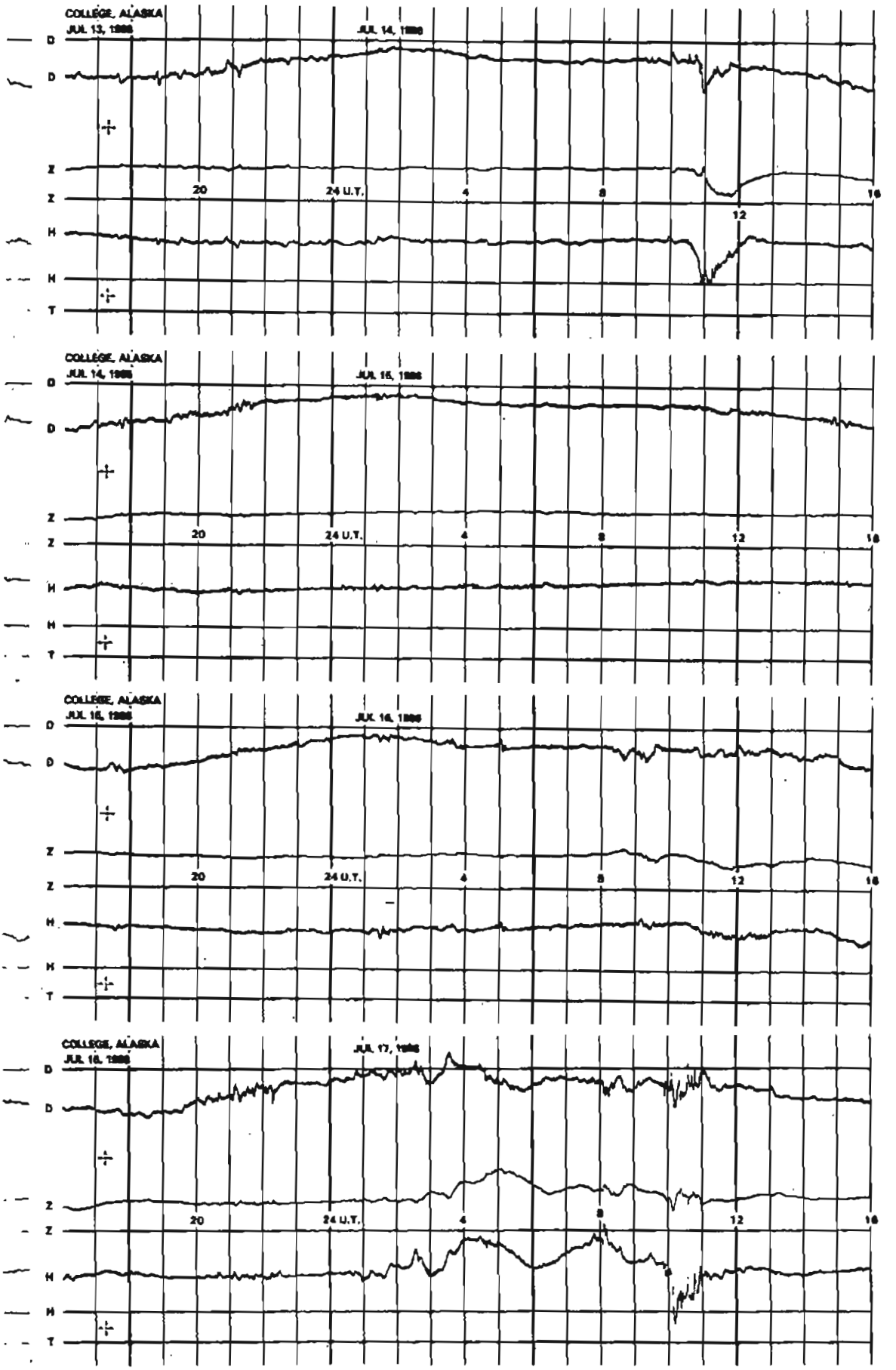

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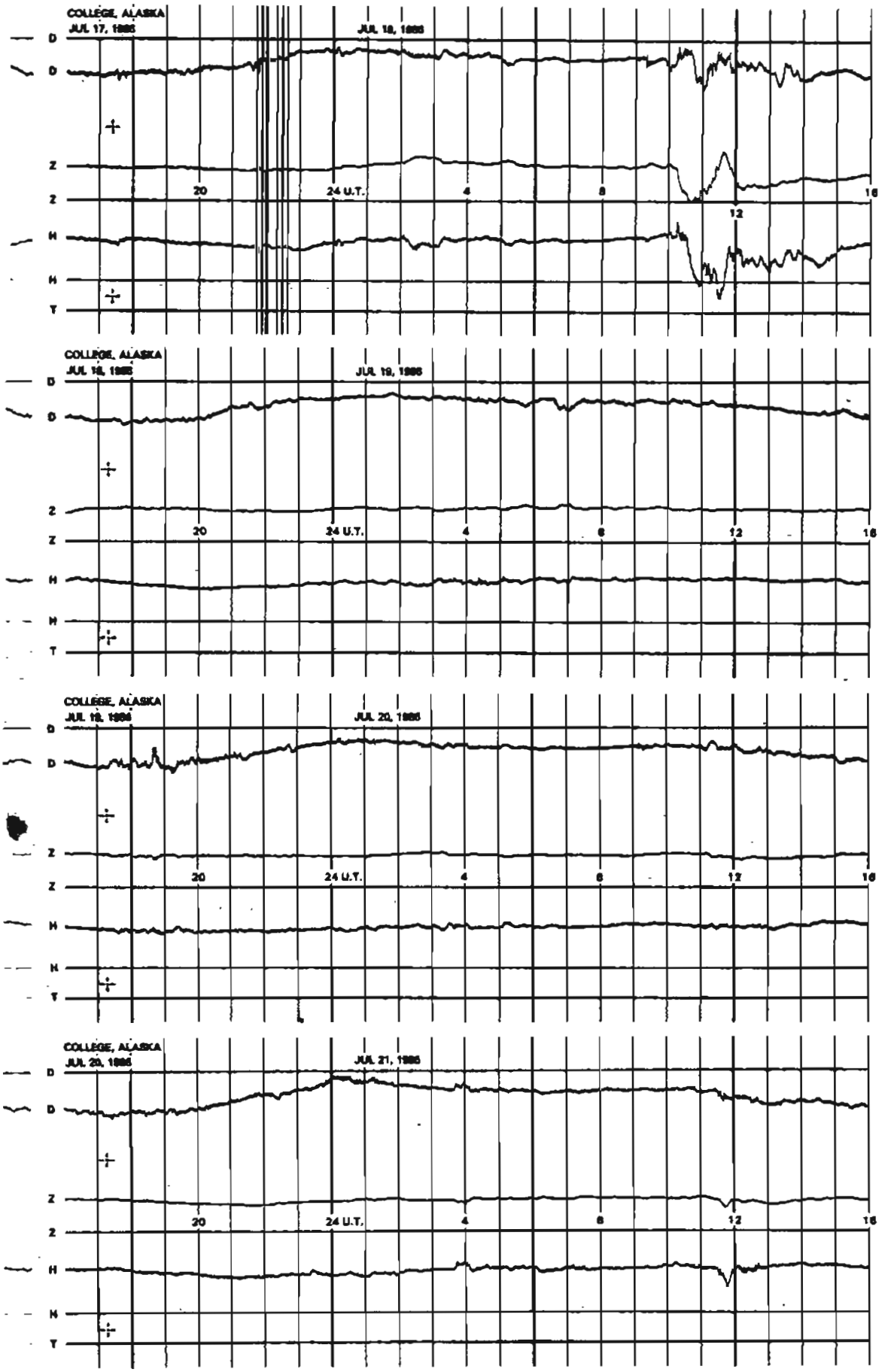

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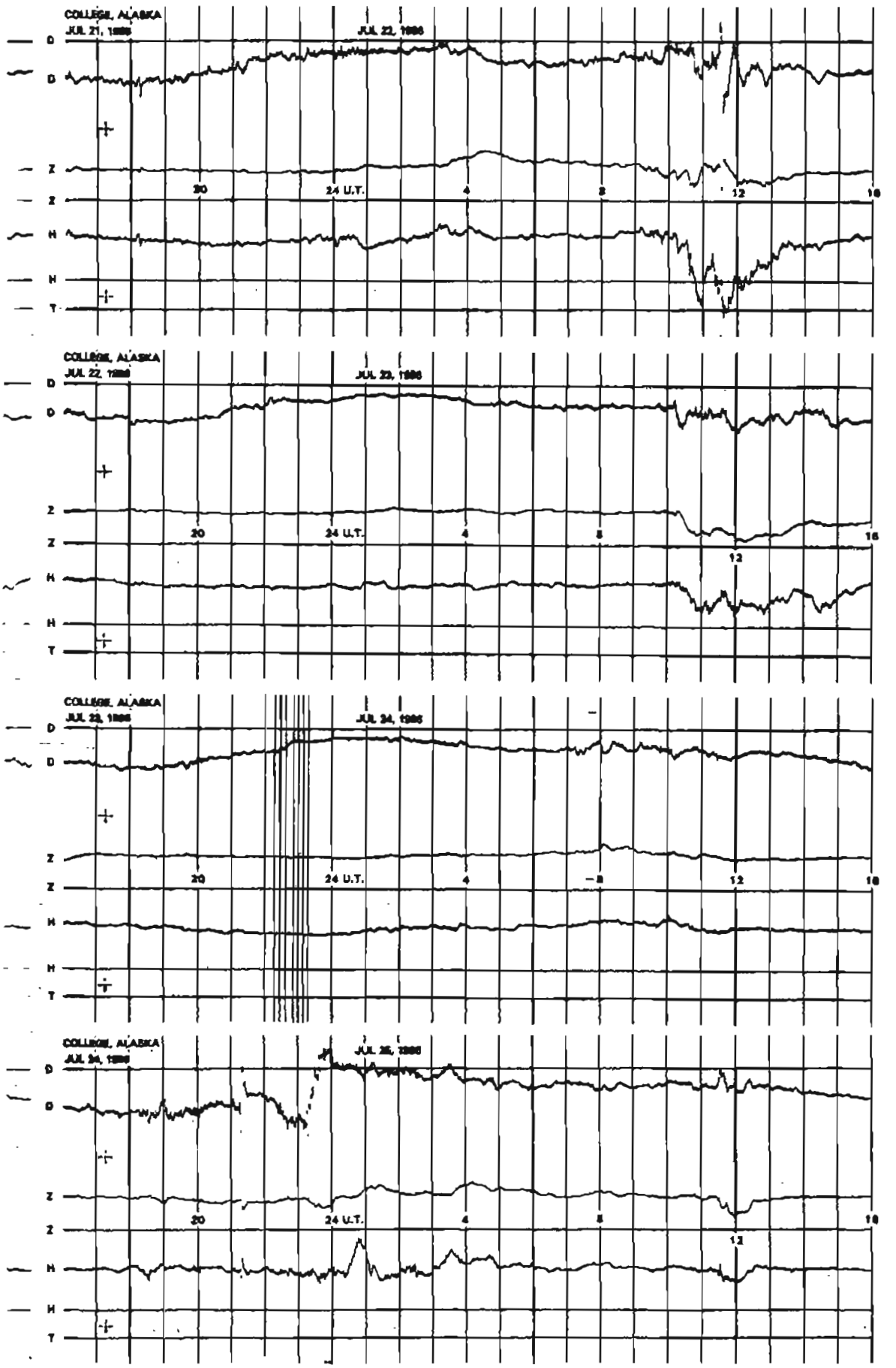
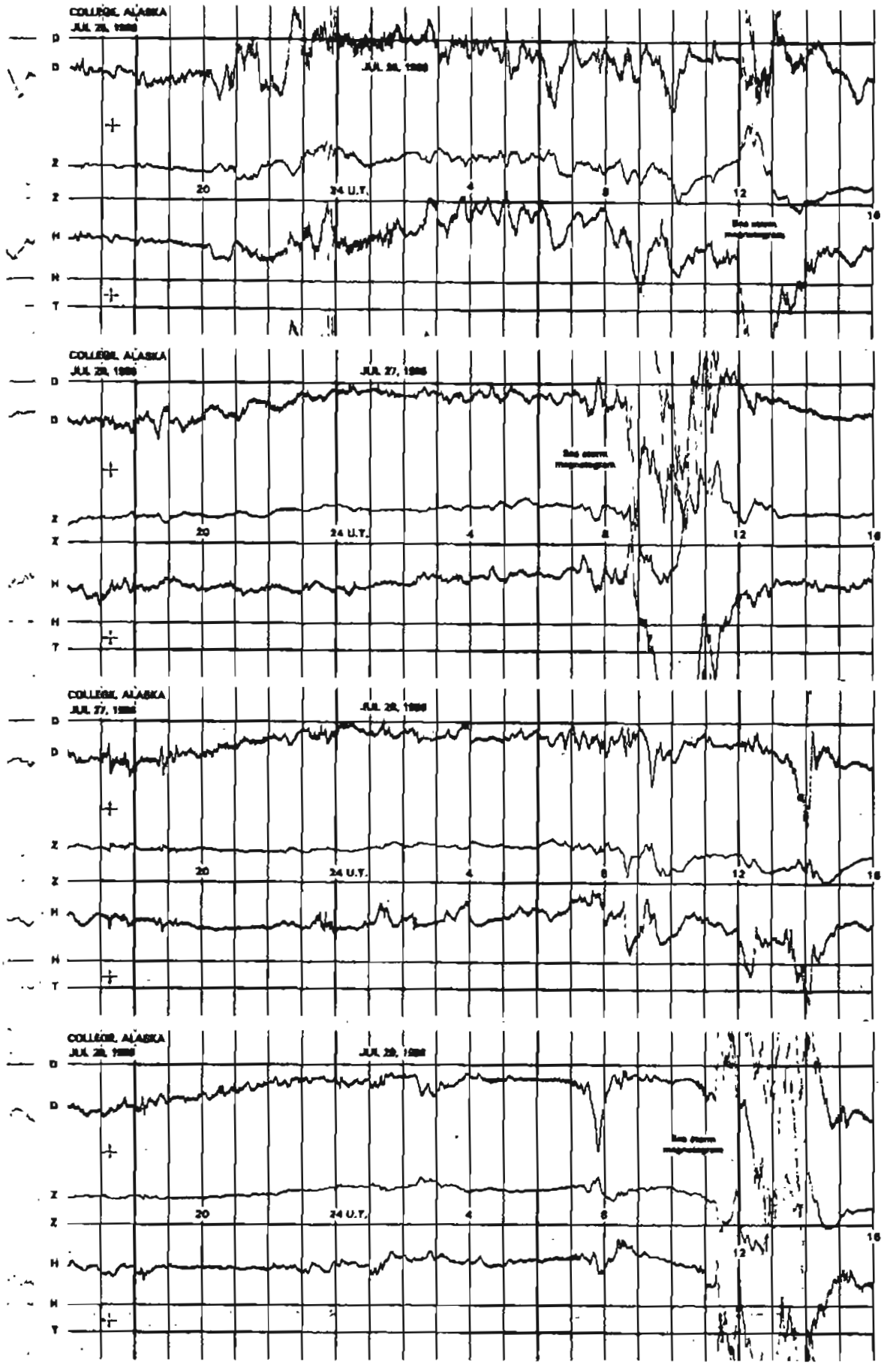


800 nm

100 nm

0

NORMAL MAGNETOGRAMS



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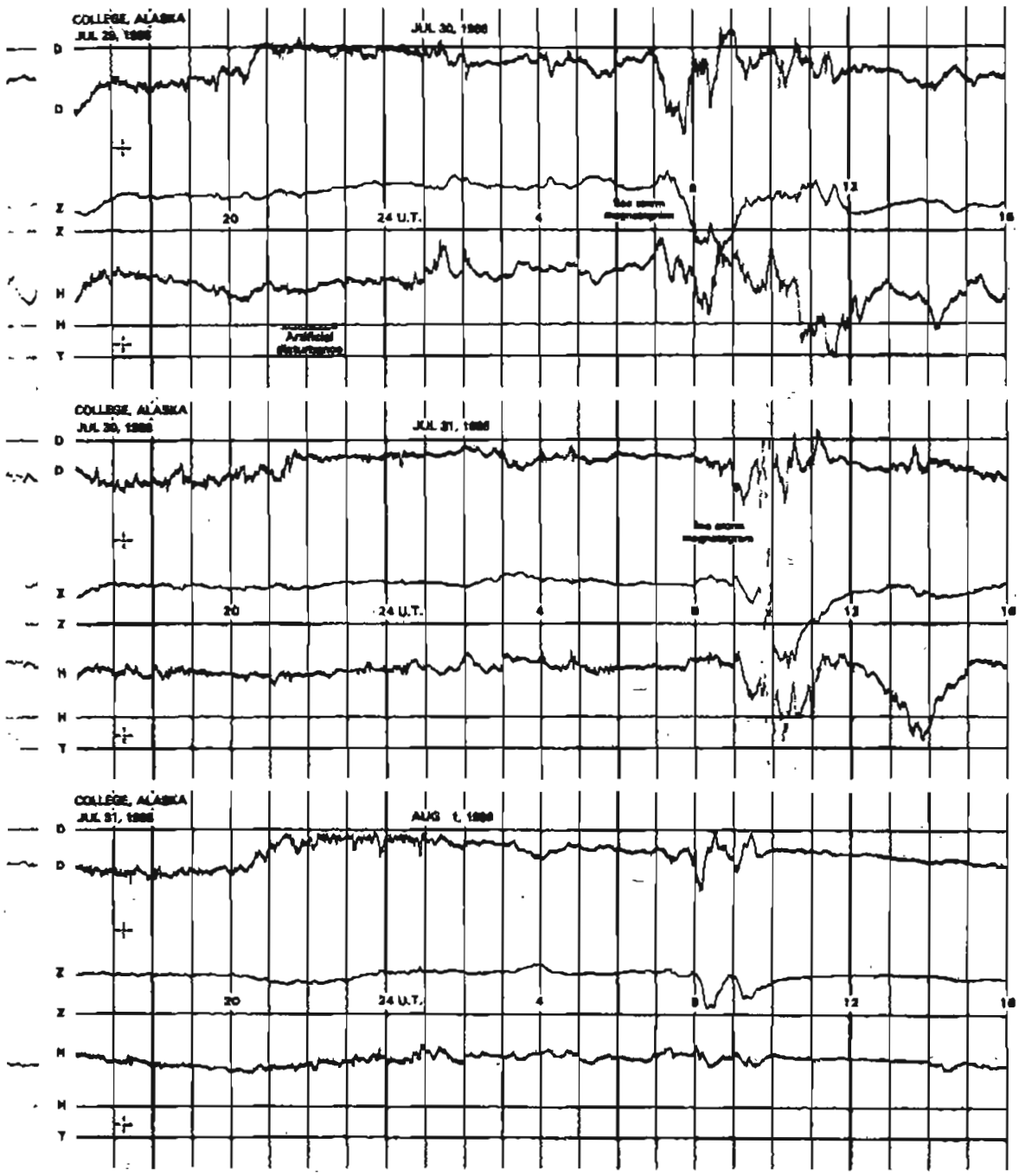
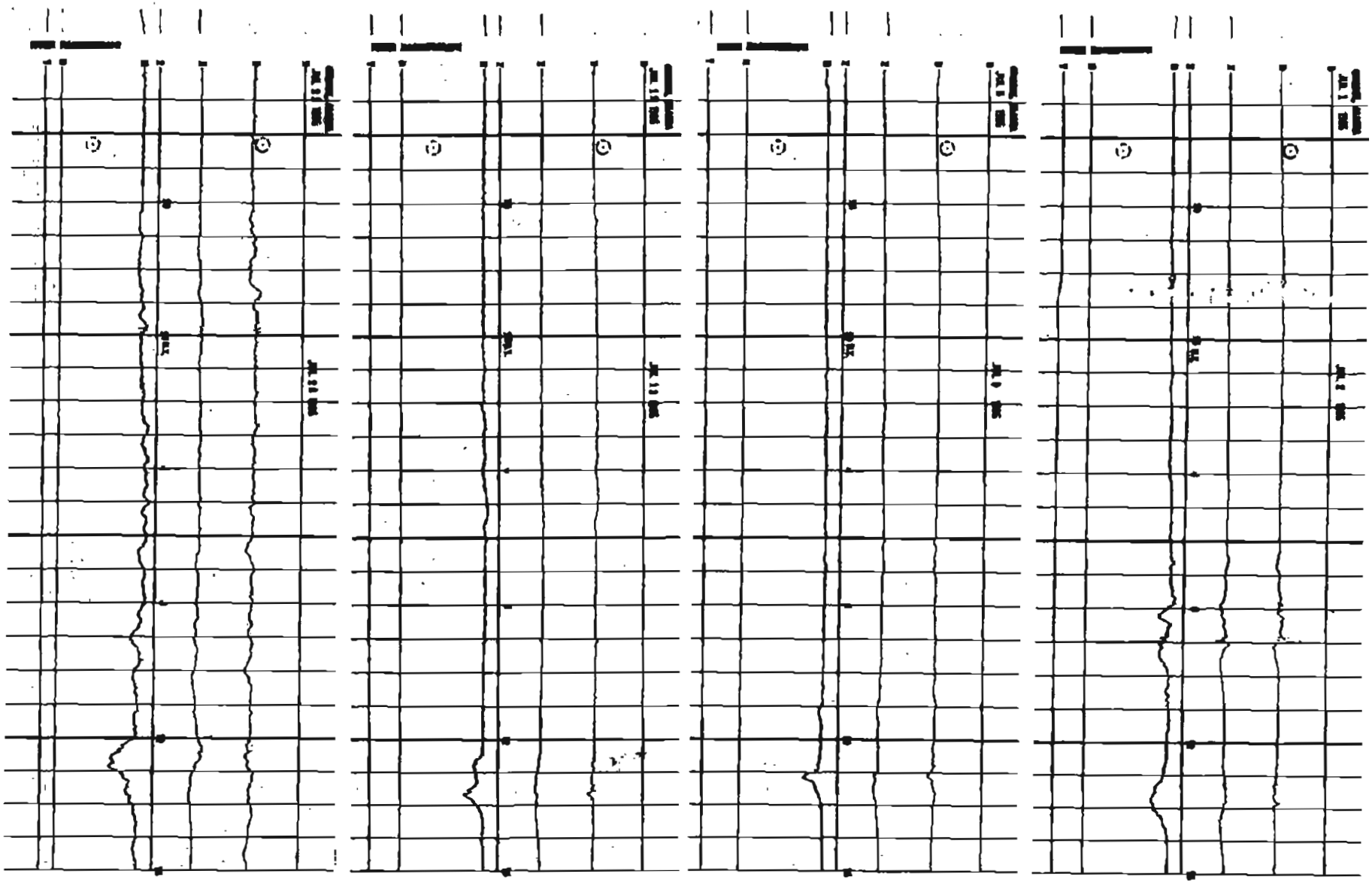


STORM MAGNETOGRAMS



STORM MAGNETOGRAMS