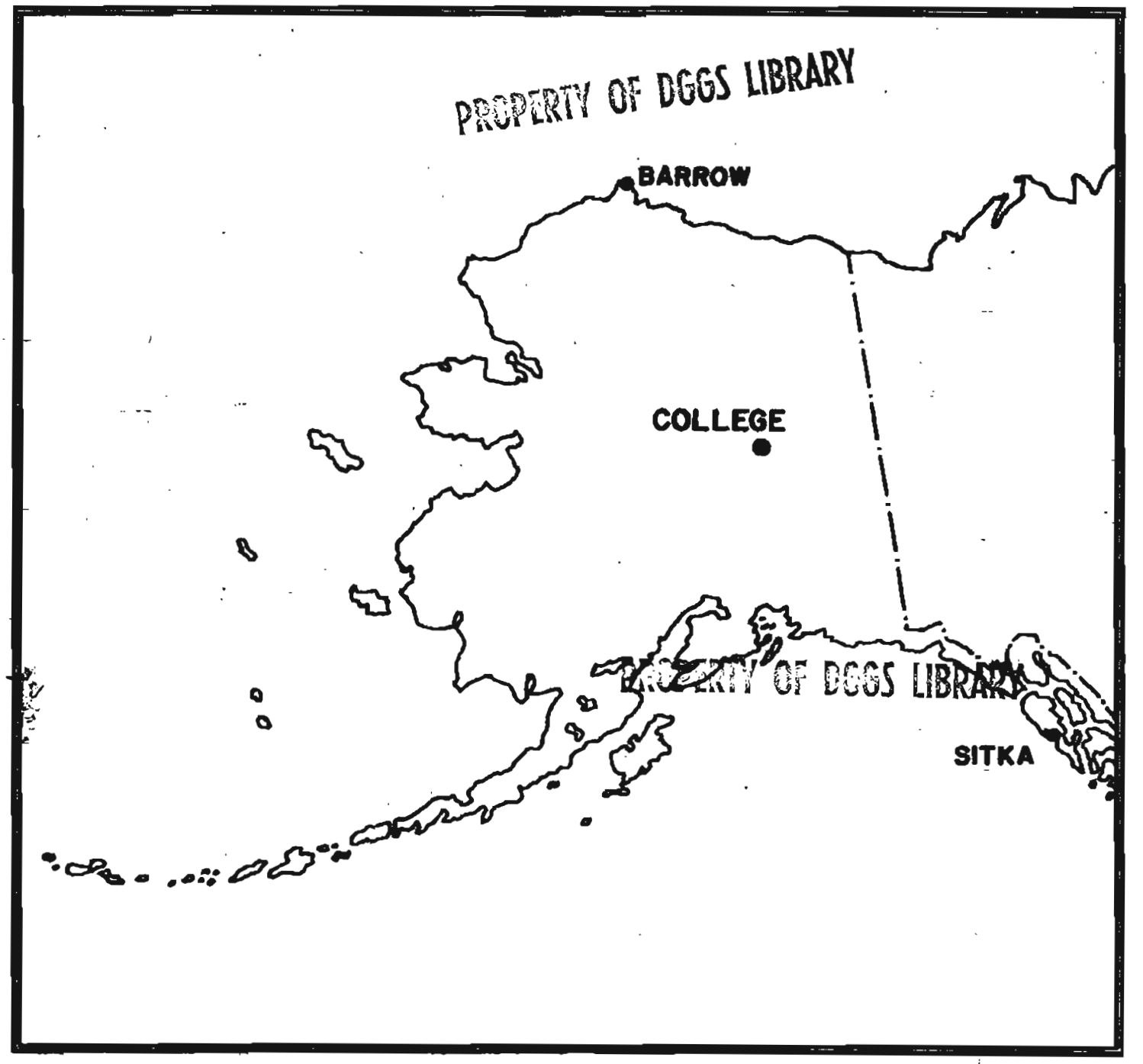
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JUNE 1986

OPEN FILE REPORT 86-0300F



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 equivalant 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 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: June 1986

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	4	3	4	3	3	2	2	2	23	15
2	3	2	2	2	2	1	2	1	15	07
3	2	3	3	3	2	2	1	2	18	10
4	2	3	3	4	4	2	1	0	19	13
5	1	1	2	3	0	1	1	1	10	05
6	2	2	1	4	4	5	2	1	21	16
7	1	3	3	5	5	4	2	2	25	21
8	2	3	4	5	1	0	1	2	18	14
9	2	2	1	0	1	2	2	1	11	05
10	3	2	4	4	4	2	2	1	22	15
11	2	2	2	2	1	1	1	1	12	05
12	1	2	1	3	4	2	1	1	15	09
13	2	2	3	2	1	1	1	1	13	06
14	2	2	1	3	2	1	2	1	14	07
15	1	1	3	3	2	4	1	1	16	10
16	1	1	2	2	3	2	2	1	14	07
17	1	2	1	5	5	2	1	2	19	16
18	2	2	1	5	3	2	1	1	17	12
19	2	0	0	0	0	2	2	2	08	04
20	2	2	1	0	1	1	0	1	08	03
21	2	1	3	5	2	1	1	0	15	11
22	2	3	2	2	2	2	0	1	14	07
23	2	1	1	2	0	0	1	1	08	03
24	1	1	3	3	2	2	2	1	15	08
25	1	1	0	0	1	0	0	0	03	01
26	1	2	1	2	0	0	1	1	08	03
27	2	2	2	4	4	4	3	4	25	18
28	5	5	4	3	2	1	2	2	24	20
29	2	2	1	3	5	4	2	3	22	16
30	3	3	1	2	2	3	2	2	18	10
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	BEGIN h	BEGIN m	END d	END h	END m

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 76-133 SUPERSEDES C&GS FORM 815

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OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: JUNE

YEAR: 1986

DATE	TIME U.T.	NATURE OF PHENOMENON [1]	REMARKS
17	18XX	pc4	
25	12XX	pi2	

IDENTIFIED BY: JEP

VERIFIED BY: JEP

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

JUNE 1986

Obs. (3 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	NO PRINCIPAL MAGNETIC STORMS WERE IDENTIFIED THIS MONTH.												

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T. 6-1-86	2400 U.T. 6-30-86	1.0'/mm	3.7 γ/mm	27° 16.4 E
H	0000 U.T. 6-1-86	2400 U.T. 6-15-86	7.8 γ/mm		12679 γ
	0000 U.T. 6-16-86	2400 U.T. 6-30-86	"		12687 γ
Z	0000 U.T. 6-1-86	2400 U.T. 6-30-86	7.7 γ/mm		55175 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T. 6-1-86	2400 U.T. 6-30-86	7.9'/mm	29.5 γ/mm	23° 44.9 E
H	0000 U.T. 6-1-86	2400 U.T. 6-30-86	49.8 γ/mm		10718 γ
Z	0000 U.T. 6-1-86	2400 U.T. 6-30-86	48.7 γ/mm		55130 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION
	FROM	TO	SCALE VALUE
D			
H			
Z			

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 30.2 E	12880 γ	55326 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: JUN 19, 20, 23, 25, 26,

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
COLLEGE, ALASKA	JUNE	1986

Imp-CD - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

(UNIVERSAL TIME)

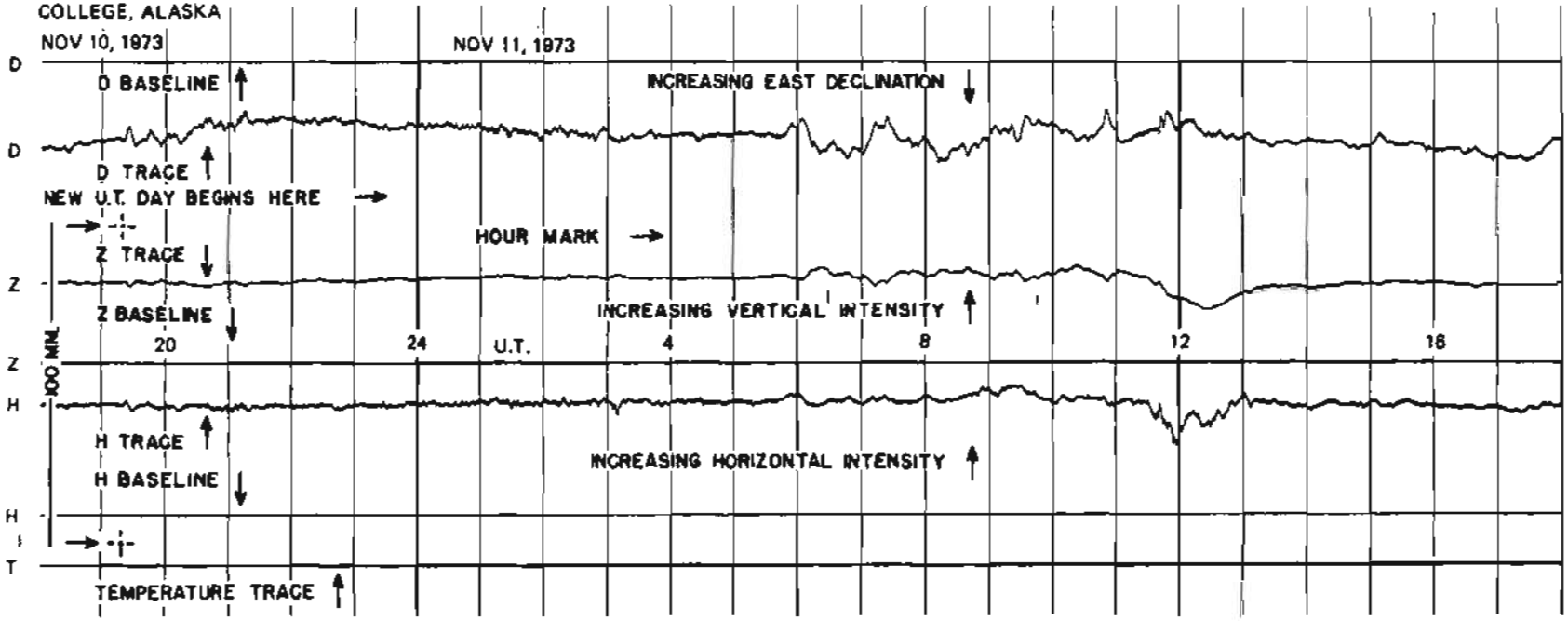
Values are in tenths of gm and are Averages for Successive Periods of One Hour beginning at Midnight. Shrinkage Corrections have been applied. Negative Values in Red with Minus.

COMPONENT		D					H					Z					COMPONENT
DAY		18	20	23	25	26	18	20	23	25	26	18	20	23	25	26	DAY
Ap		04	03	03	01	03	04	03	03	01	03	04	03	03	01	03	Ap
HOUR	01	111	49	63	80	100	251	252	250	240	263	209	192	183	197	191	01 HOUR
	02	102	84	46	68	87	241	246	256	240	253	210	192	197	200	193	02
	03	96	98	66	68	76	247	245	268	260	261	204	203	238	196	191	03
	04	112	92	70	100	93	233	244	269	255	251	208	201	250	192	187	04
	05	110	85	67	114	96	240	264	287	260	259	201	201	230	178	181	05
	06	117	80	67	102	92	240	276	293	256	280	204	221	259	192	188	06
	07	180	158	77	184	109	240	271	285	263	278	206	242	269	201	208	07
	08	185	110	96	181	93	243	268	270	258	287	206	218	249	211	218	08
	09	135	100	110	117	114	251	270	273	263	280	201	210	229	206	218	09
	10	139	105	154	109	108	249	270	274	265	286	203	210	208	198	220	10
	11	139	106	103	118	174	258	272	266	259	253	201	203	190	196	182	11
	12	139	120	120	187	170	260	269	260	263	268	201	200	192	198	160	12
	13	158	146	133	138	130	264	263	269	268	271	208	199	200	196	180	13
	14	168	160	158	148	160	260	268	268	261	269	196	200	201	193	192	14
	15	176	179	178	169	135	260	251	268	247	265	200	200	201	180	200	15
	16	198	210	190	200	237	259	237	267	240	259	201	187	200	171	198	16
	17	219	229	200	237	241	250	250	259	249	264	200	181	200	179	190	17
	18	230	237	236	232	253	240	258	248	249	259	199	198	191	181	189	18
	19	224	240	224	235	235	232	247	237	249	250	191	189	187	186	188	19
	20	215	200	206	210	198	219	249	218	241	259	193	190	182	187	172	20
	21	167	140	155	108	180	206	249	217	230	212	191	186	175	188	170	21
	22	72	125	146	168	149	231	247	218	228	208	178	181	181	190	160	22
	23	64	128	122	141	119	244	241	223	223	219	188	185	187	190	167	23
	24	68	110	101	181	79	251	230	234	240	219	197	190	190	198	170	24
DAILY SUM		3368	3274	3020	3407	3465	5869	6119	6168	5977	6189	4702	4791	4366	4608	4437	DAILY SUM
DAILY MEAN		140	136	130	145	144	245	255	257	249	258	196	200	207	192	185	DAILY MEAN
MEAN		[redacted]	135	[redacted]	262	[redacted]	[redacted]	197	[redacted]								MEAN

Scaled JMP | Checked [redacted]

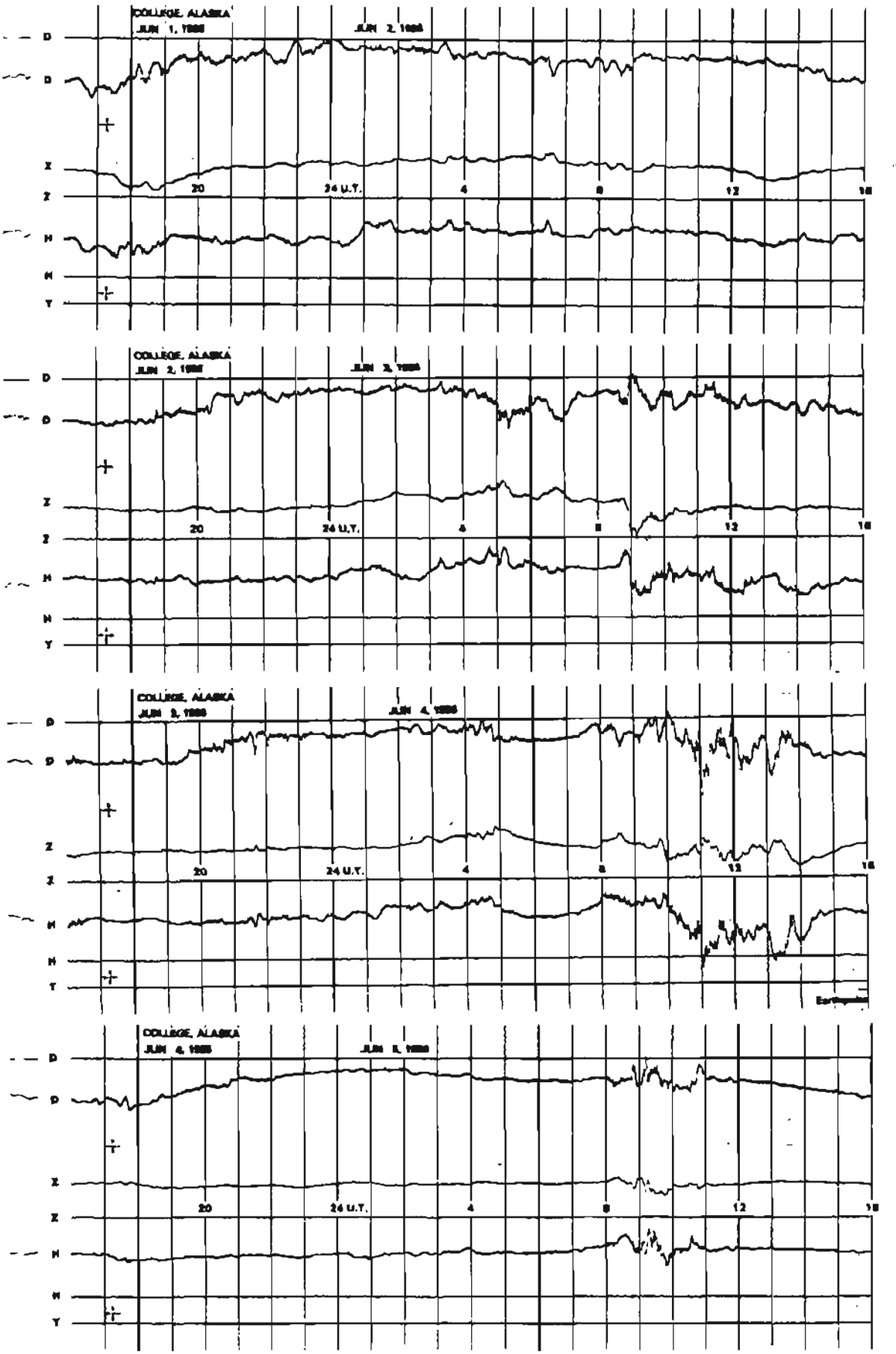
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)



SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS



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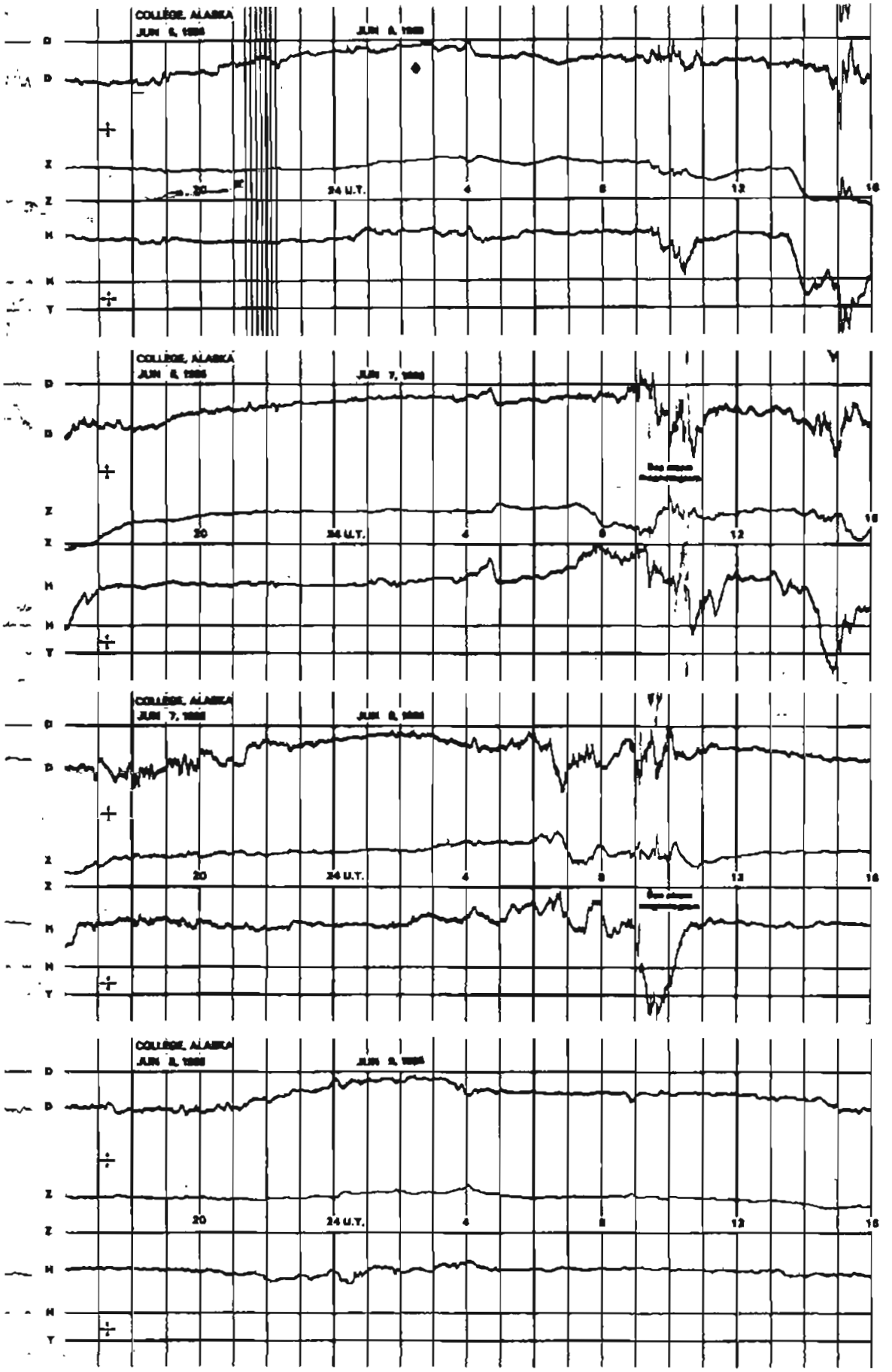

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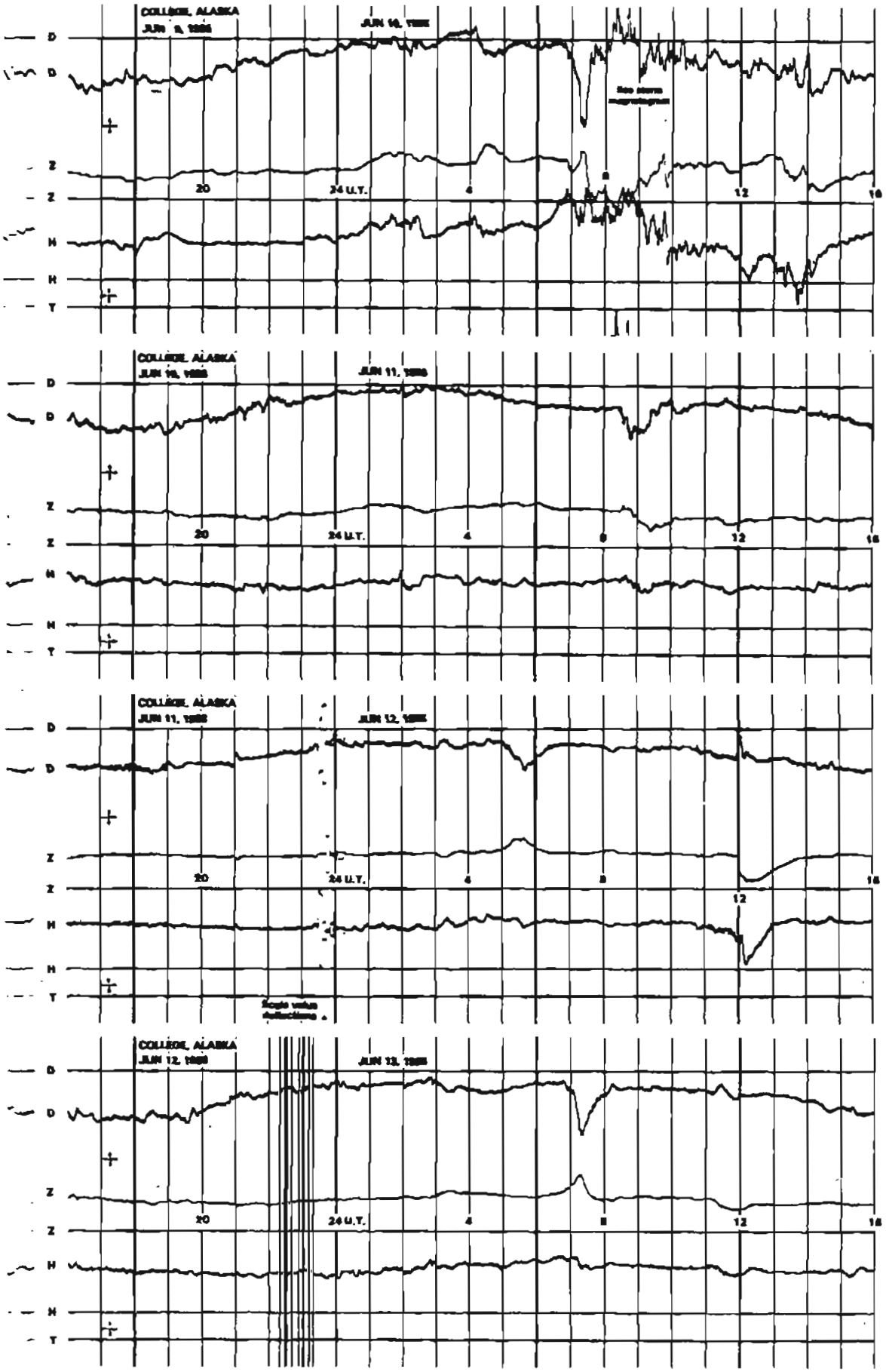

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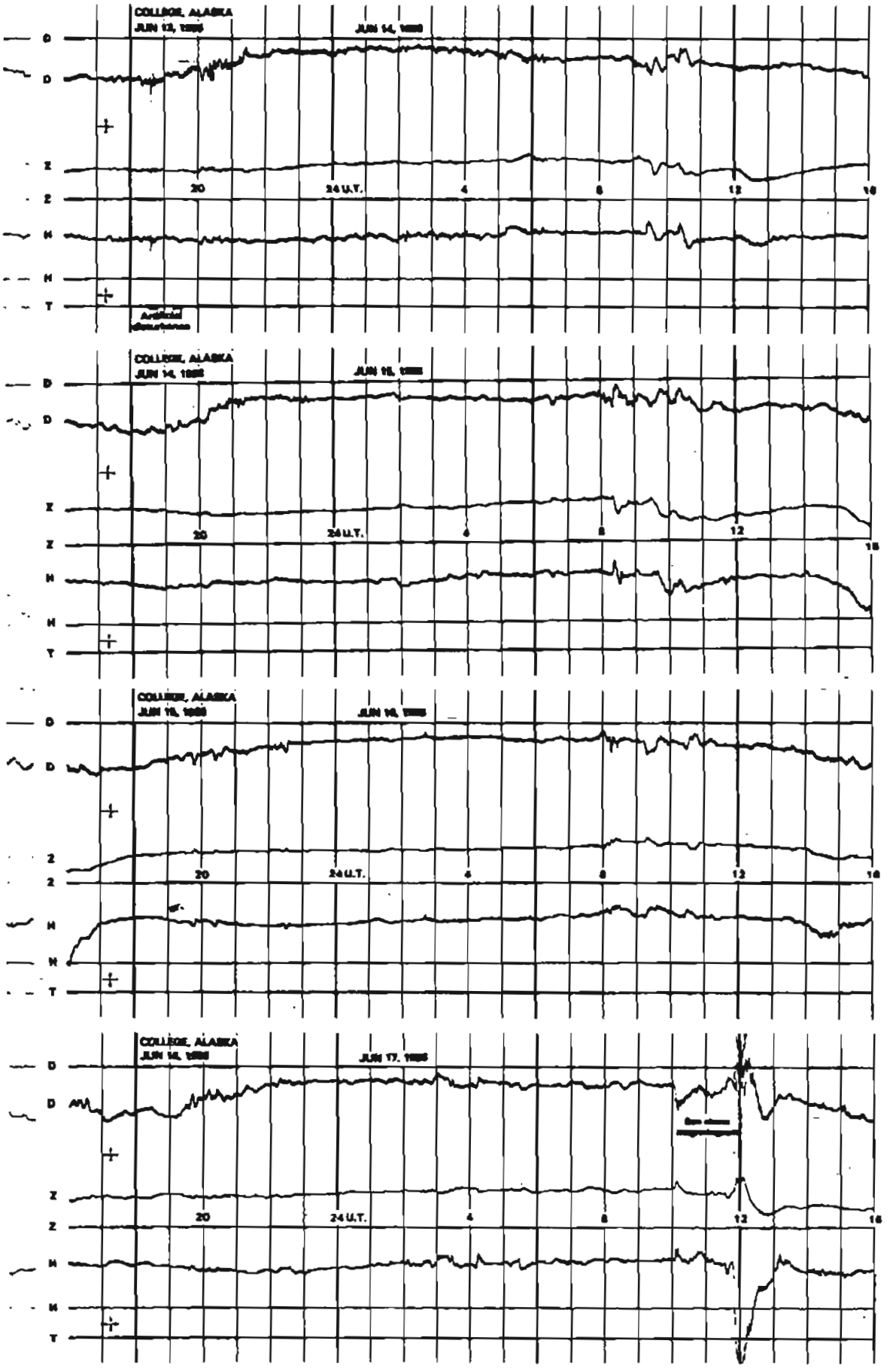

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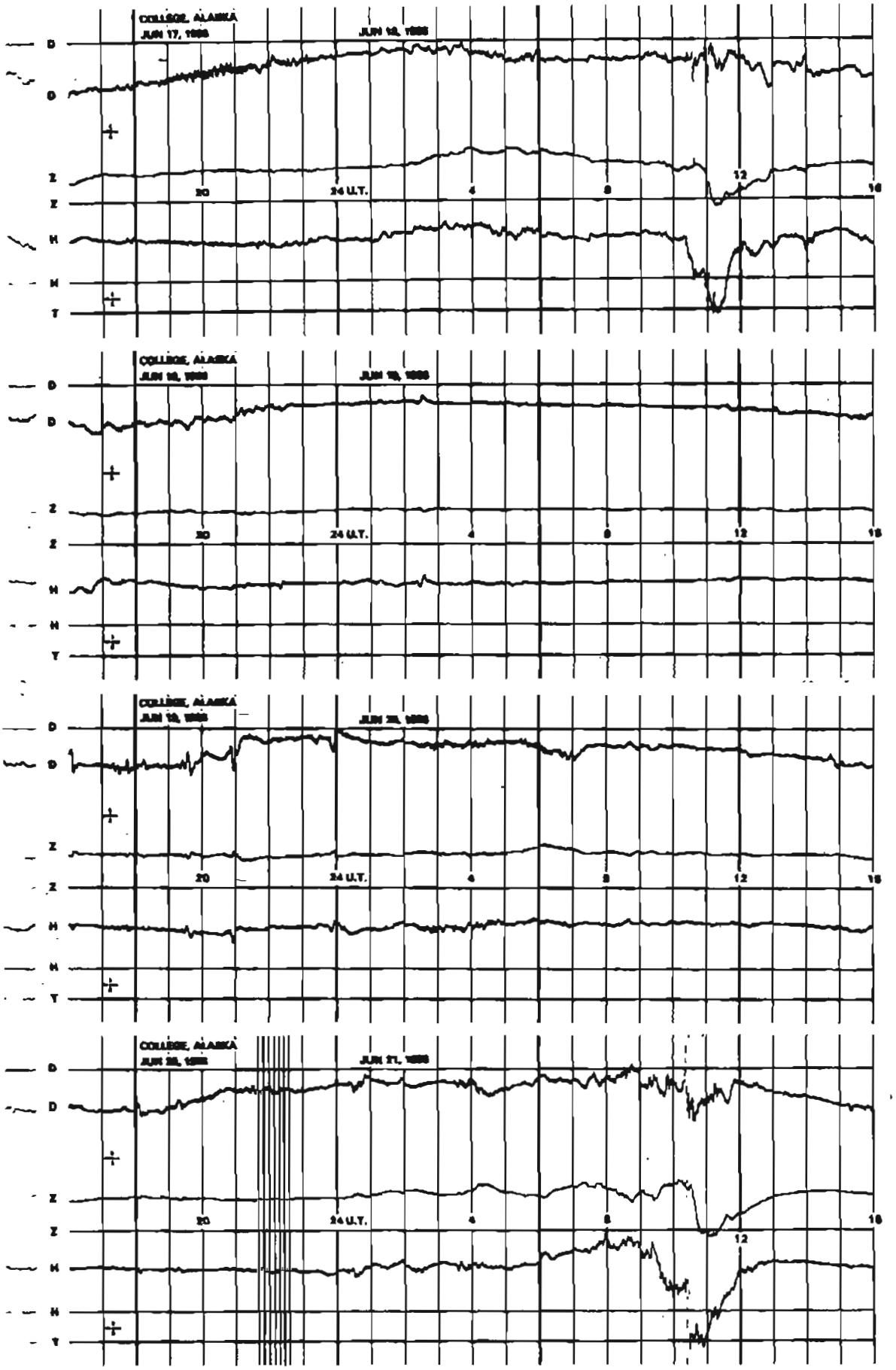

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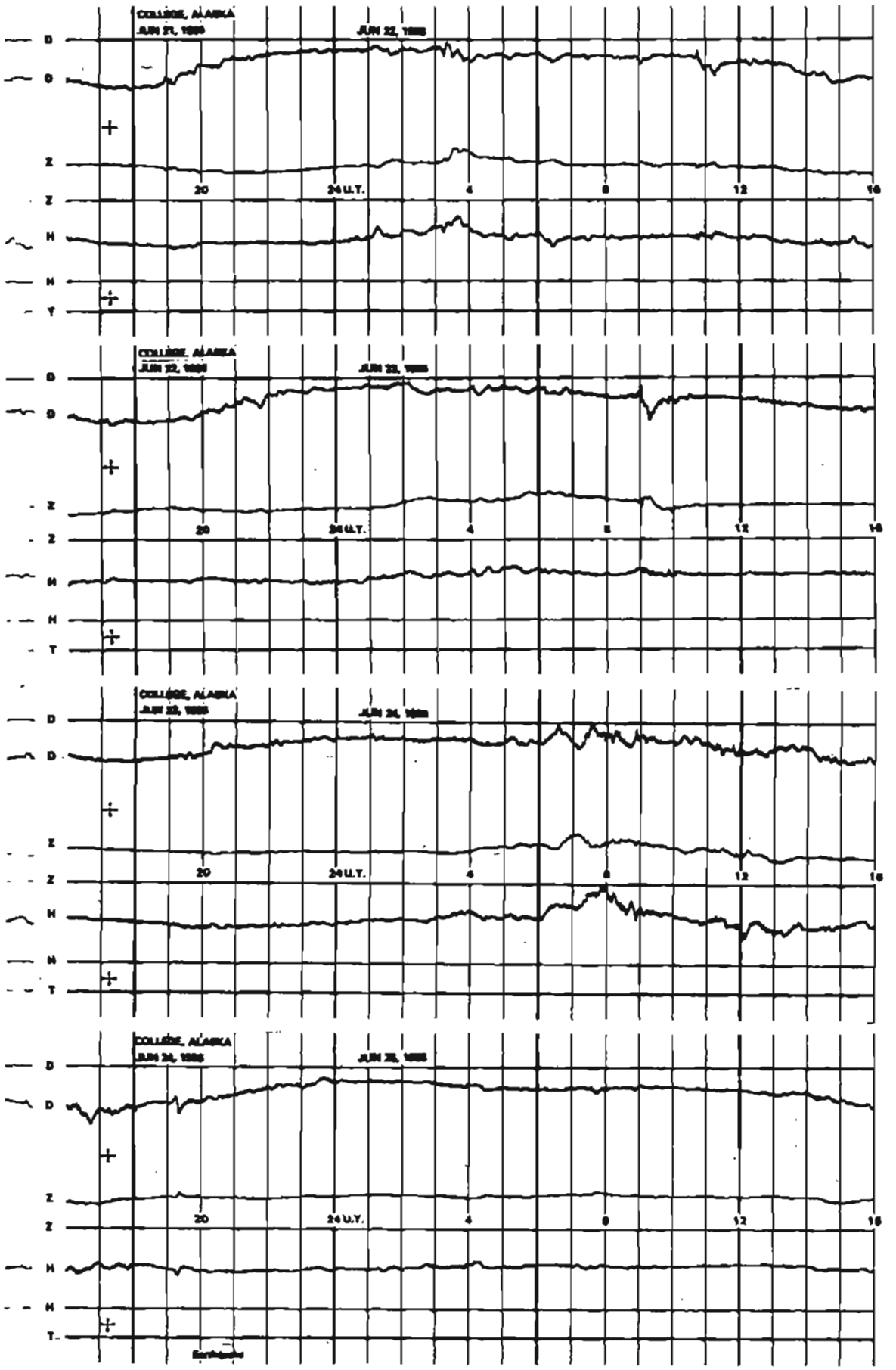

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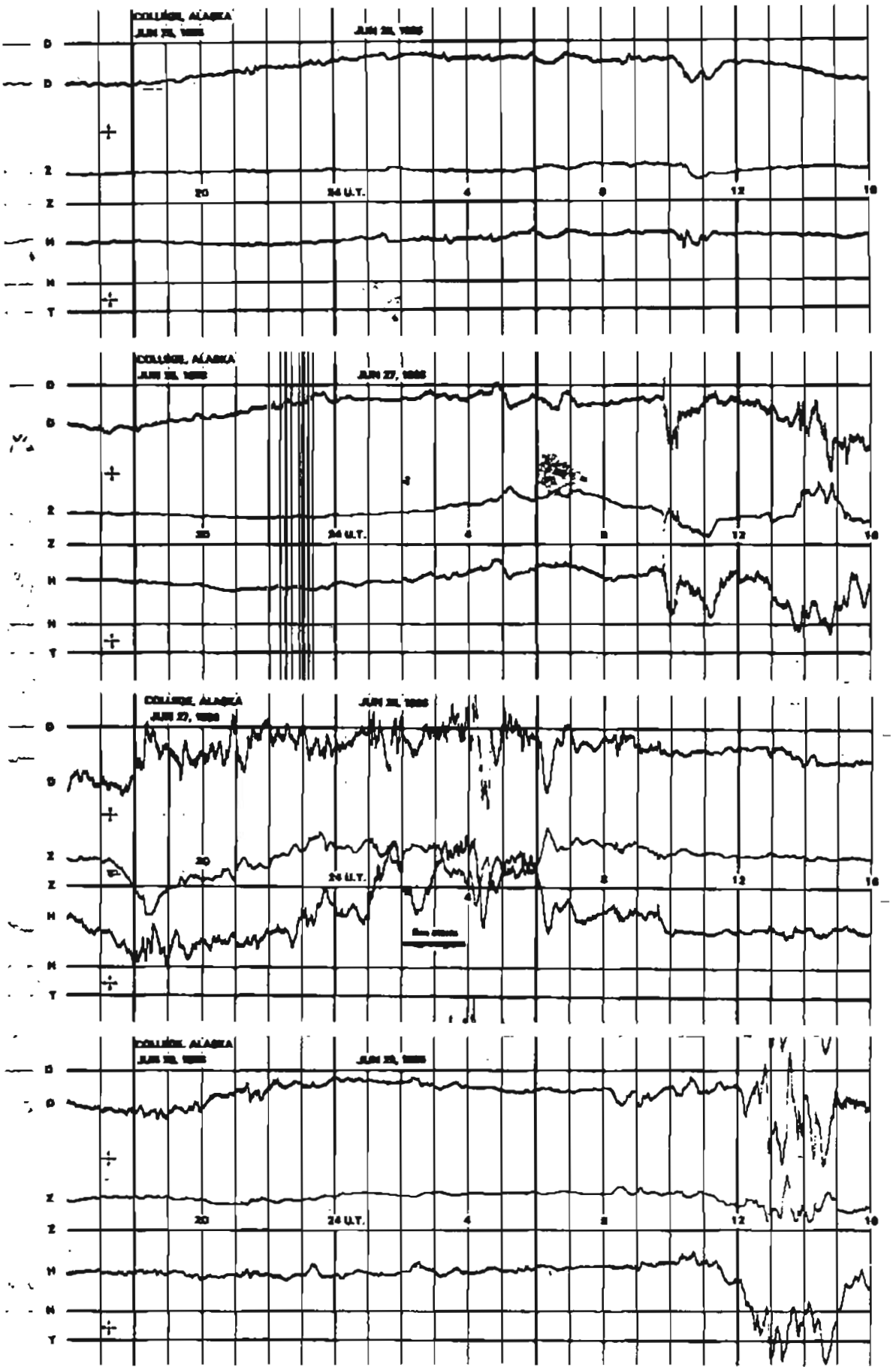

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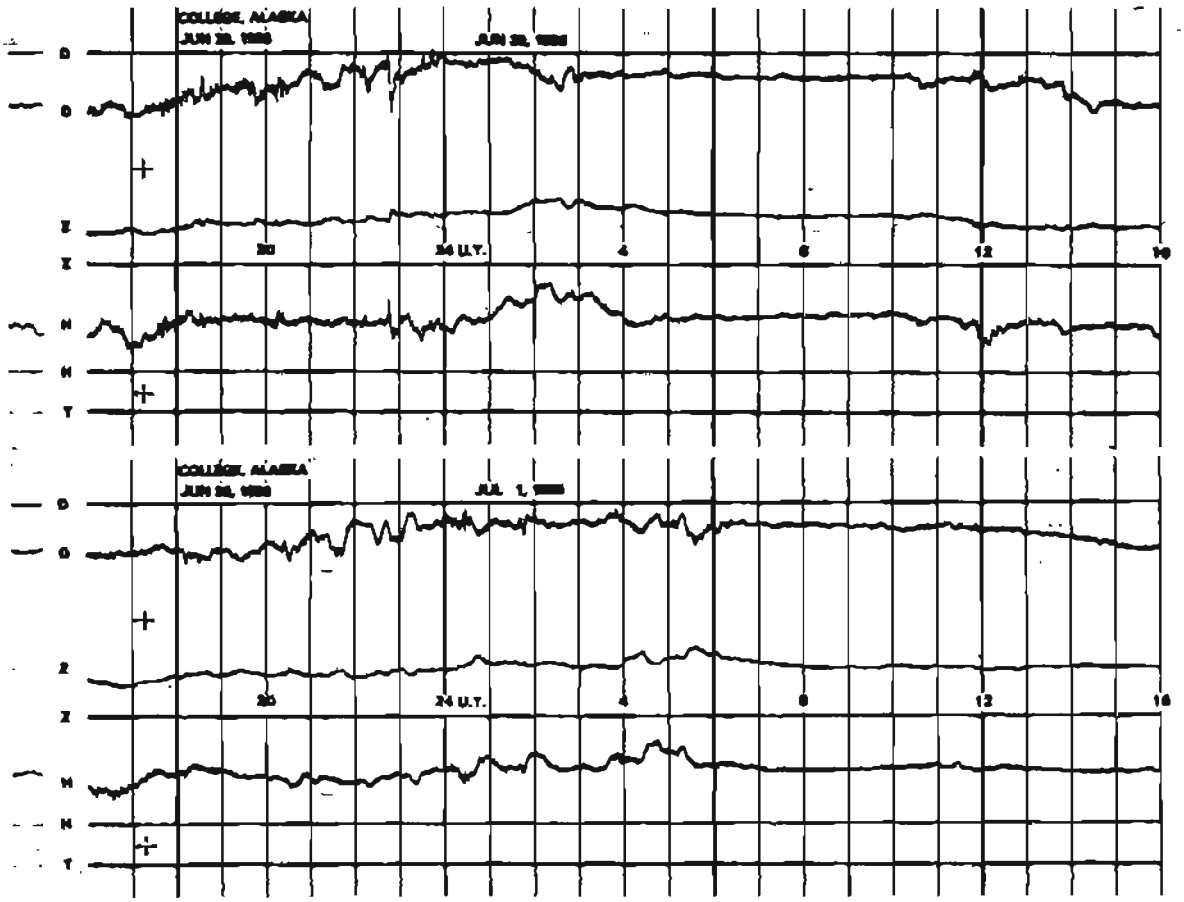
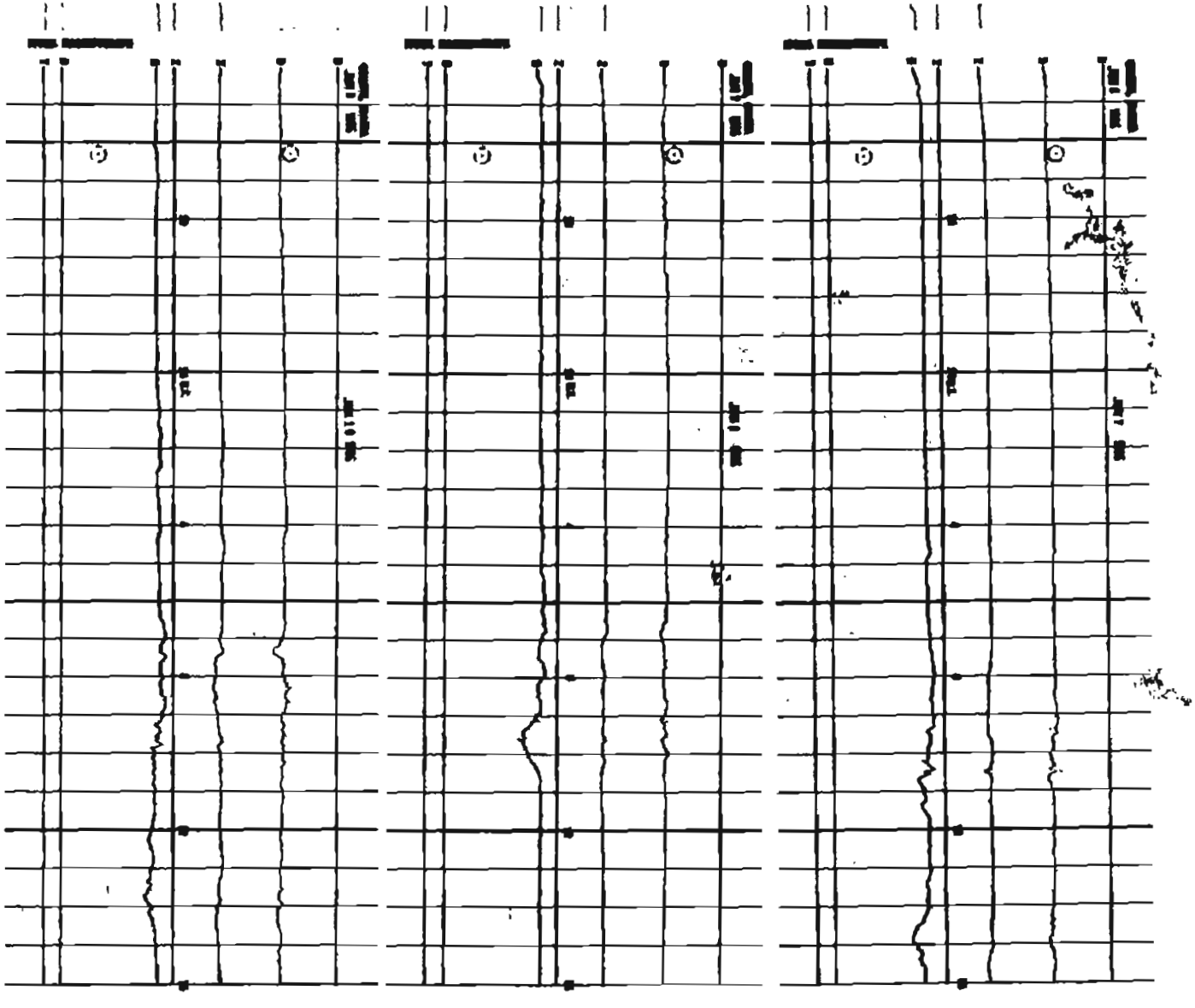


STORM MAGNETOGRAMS



STORM MAGNETOGRAMS