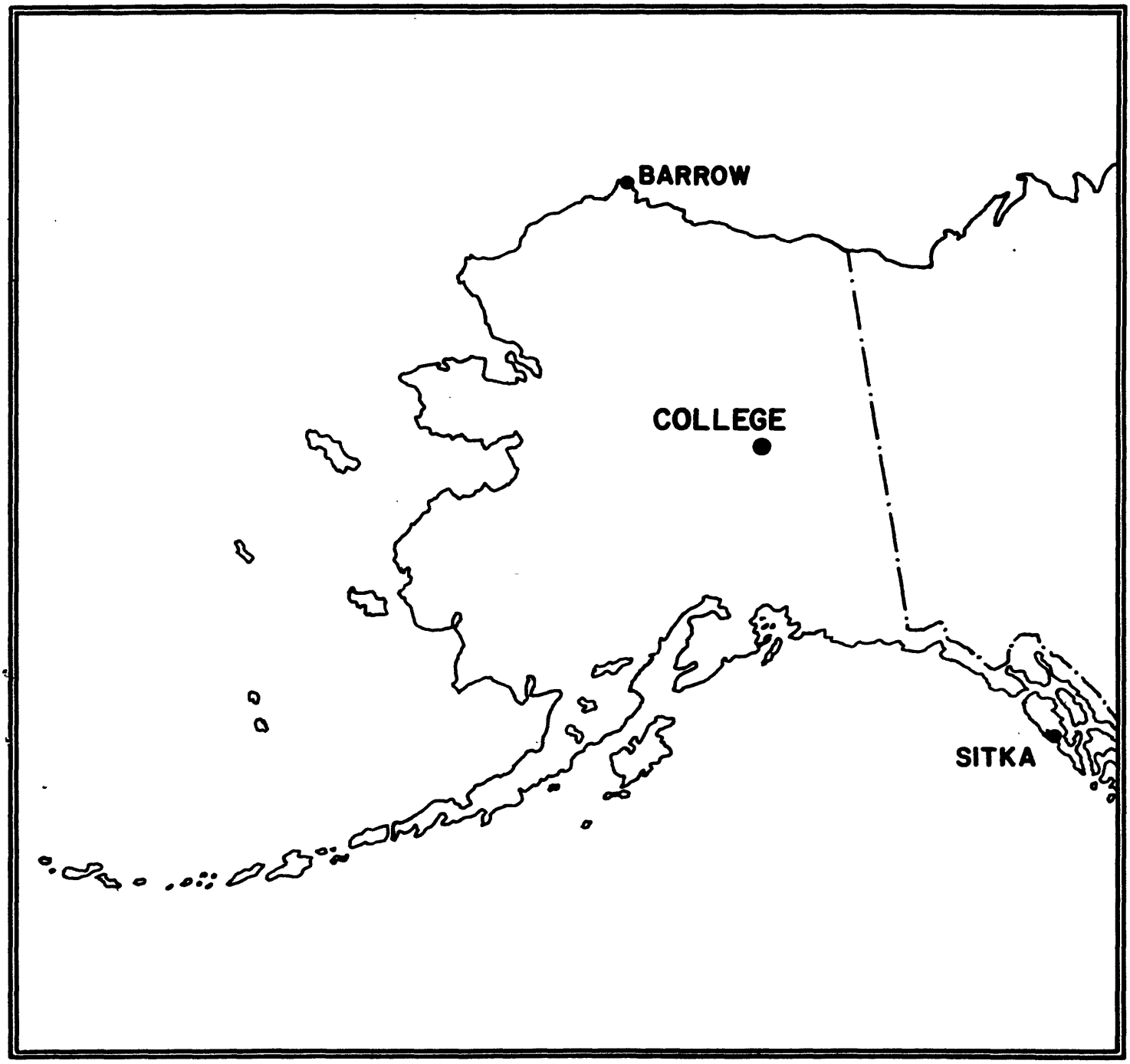
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JUNE 1988

OPEN FILE REPORT 88-0300F



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: 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: June 1988

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	1	1	1	3	1	0	2	1	10	05
2	1	2	0	2	1	0	1	1	08	03
3	0	0	0	0	0	0	0	0	00	00
4	0	0	0	0	0	1	1	0	02	01
5	1	1	0	0	3	2	3	2	12	06
6	4	4	1	0	0	1	1	1	12	08
7	0	2	3	2	1	1	1	1	11	05
8	2	3	2	4	2	1	1	1	16	09
9	0	0	1	0	3	3	2	2	11	06
10	3	4	3	2	0	2	1	1	16	10
11	2	3	3	2	2	3	1	0	16	09
12	1	1	1	1	1	0	0	0	05	02
13	3	2	1	0	1	0	0	1	08	04
14	4	5	4	4	5	3	3	3	31	28
15	2	2	2	1	0	1	2	2	12	05
16	2	3	2	2	3	1	1	1	15	08
17	3	4	4	4	4	2	1	2	24	18
18	3	2	2	2	5	4	3	2	23	17
19	3	3	3	6	4	5	3	2	29	28
20	5	3	5	4	3	2	1	1	24	21
21	1	1	1	4	4	1	1	2	15	10
22	2	3	4	4	5	2	1	1	22	17
23	2	3	2	2	2	1	1	2	15	07
24	3	5	2	1	5	5	3	2	26	24
25	3	4	5	4	4	5	3	3	31	28
26	2	2	3	4	3	3	4	4	25	18
27	3	3	1	2	1	2	3	1	16	08
28	1	3	3	6	3	2	2	2	22	19
29	1	5	5	3	5	4	4	4	31	30
30	5	4	4	2	6	6	6	3	36	46
31										

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.....	3.70	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

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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

June 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	29	04xx	..				30	5, 6, 7	6	261	1490	590	30	20

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 6/1/88	2400 U.T., 6/30/88	1.0'/mm	3.7 γ/mm	27° 01.1' E
H	(Same)	(Same)	7.8 γ/mm		12649 γ
Z	(same)	(Same)	7.7 γ/mm		55159 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 6/1/88	2400 U.T., 6/30/88	7.9'/mm	29.4 γ/mm	
H	(Same)	(Same)	43.5 γ/mm		
Z	(Same)	(Same)	48.7 γ/mm		

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 12.9' E	12838 γ	55309 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: June 2, 3, 4, 12, 13,

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
COLLEGE	JUNE	1988

Jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

(UNIVERSAL TIME)

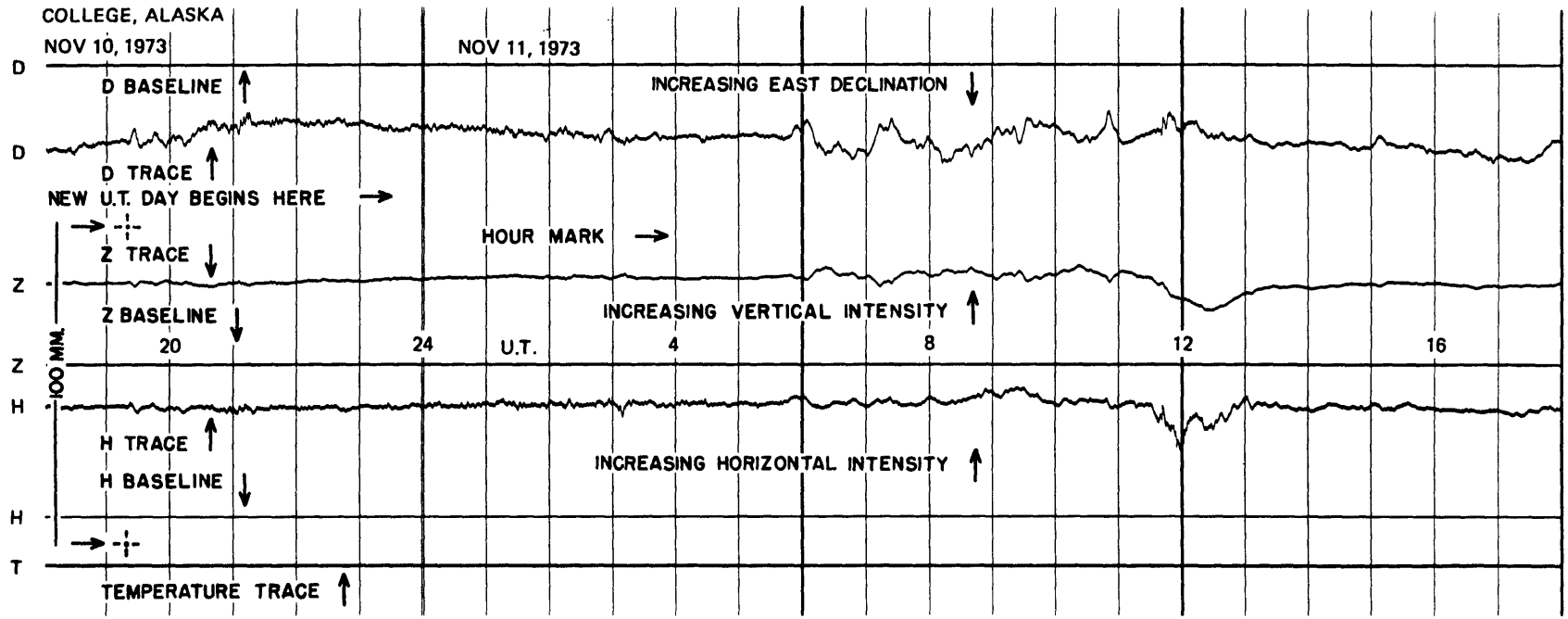
Values are in Tenths of mm and are Averages for Successive Periods of One Hour beginning at Midnight. Shrinkage Corrections have been applied. Negative Values in Red with Minus.

COMPONENT		D					H					Z					COMPONENT
DAY		02	03	04	12	13	02	03	04	12	13	02	03	04	12	13	DAY
A_k		03	00	01	02	04	03	00	01	02	04	03	00	01	02	04	A_k
HOUR	01	54	51	48	47	67	233	229	250	202	230	196	192	181	207	205	01 HOUR
	02	45	50	43	53	60	234	226	261	227	292	199	187	184	201	195	02
	03	55	49	56	70	93	240	241	250	243	226	200	179	187	207	226	03
	04	82	53	65	81	73	260	250	254	239	232	194	179	187	213	212	04
	05	95	79	75	97	89	270	246	256	267	230	196	187	193	218	213	05
	06	101	93	81	119	77	259	251	260	236	233	200	190	193	233	197	06
	07	103	100	97	117	99	253	253	259	230	243	197	195	194	223	204	07
	08	101	110	98	110	103	253	269	263	249	260	195	200	193	215	207	08
	09	97	113	97	99	103	268	270	267	248	265	193	203	194	213	208	09
	10	92	112	95	87	93	280	276	267	248	265	199	203	192	203	203	10
	11	87	111	97	97	86	277	281	270	256	270	206	200	193	203	197	11
	12	104	100	100	87	92	227	280	273	253	269	157	194	193	201	198	12
	13	117	112	122	89	85	256	275	270	261	280	164	197	191	200	203	13
	14	140	127	143	108	113	260	274	263	267	289	172	197	187	207	215	14
	15	163	141	158	135	122	259	270	270	267	273	187	203	187	216	207	15
	16	212	187	193	173	175	260	267	255	268	259	197	213	195	222	209	16
	17	233	217	266	217	209	262	265	239	265	255	196	208	182	219	202	17
	18	228	251	283	225	204	251	257	229	257	263	194	211	173	207	199	18
	19	223	253	245	197	193	238	240	219	239	254	194	202	167	203	196	19
	20	148	221	203	172	187	223	223	227	221	250	183	187	159	197	189	20
	21	136	176	159	128	156	212	207	216	230	240	186	183	160	186	182	21
	22	119	113	107	83	121	207	203	199	225	246	178	178	164	188	180	22
	23	63	87	63	67	89	218	208	199	223	244	173	183	173	193	184	23
	24	55	66	40	72	97	230	223	215	230	260	187	185	176	202	201	24
DAILY SUM		2853	2972	2934	2730	2786	5930	5984	5931	5851	6128	4543	4656	4398	4977	4832	DAILY SUM
DAILY MEAN		119	124	122	114	116	247	249	247	244	255	189	194	183	207	201	DAILY MEAN
MEAN				119					249					195			MEAN

Scaled LYT | Checked RVO

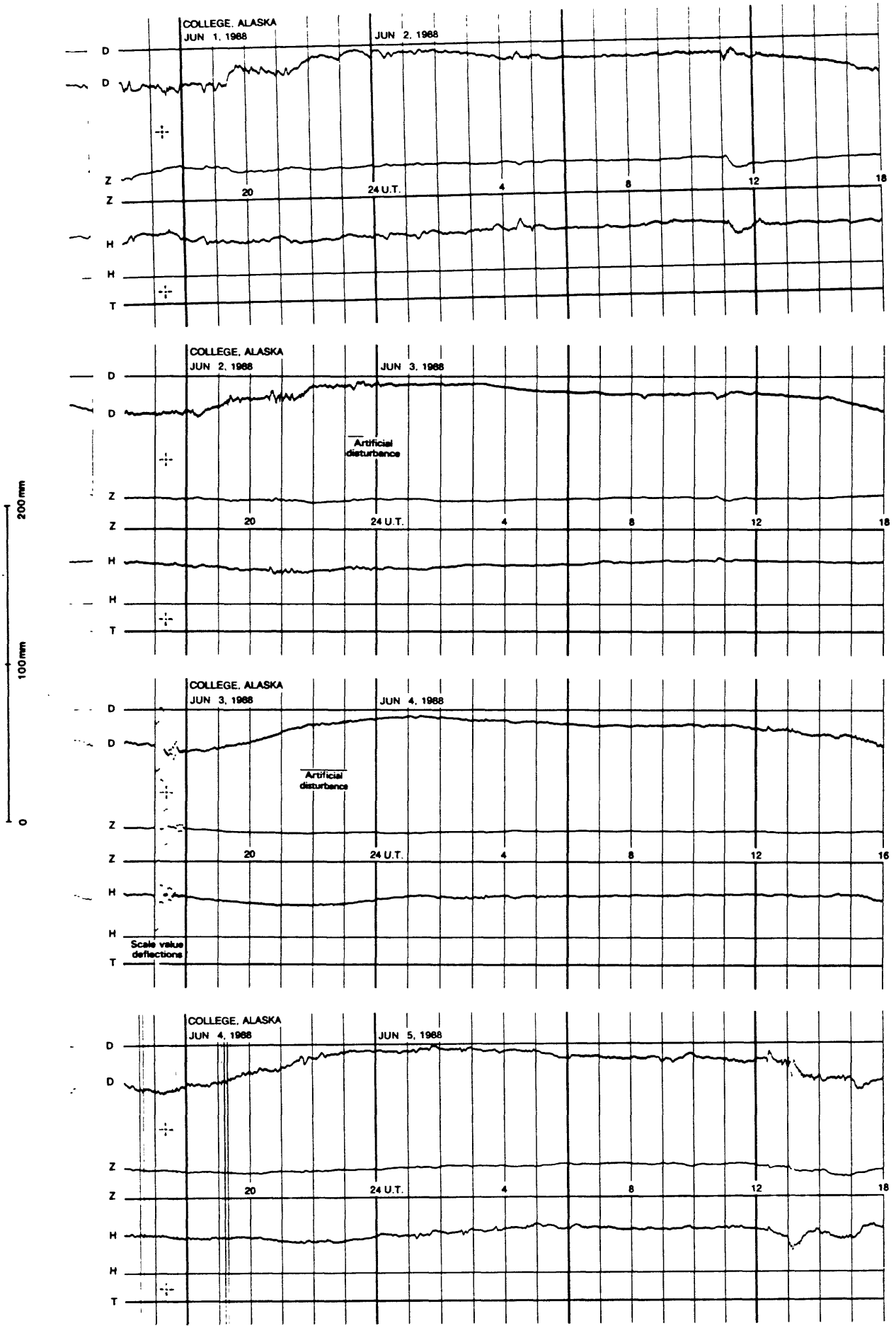
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

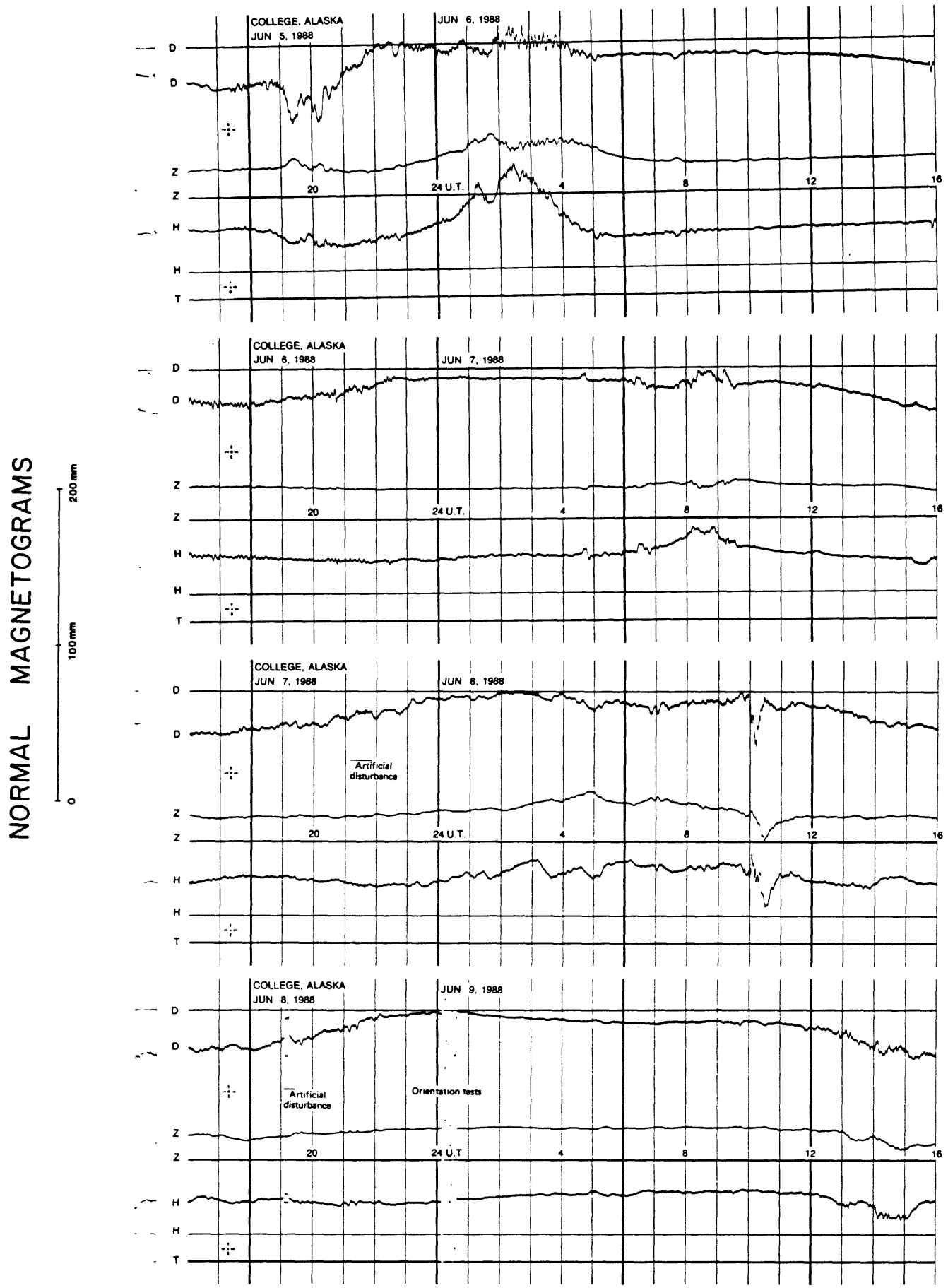
(SAMPLE ONLY)



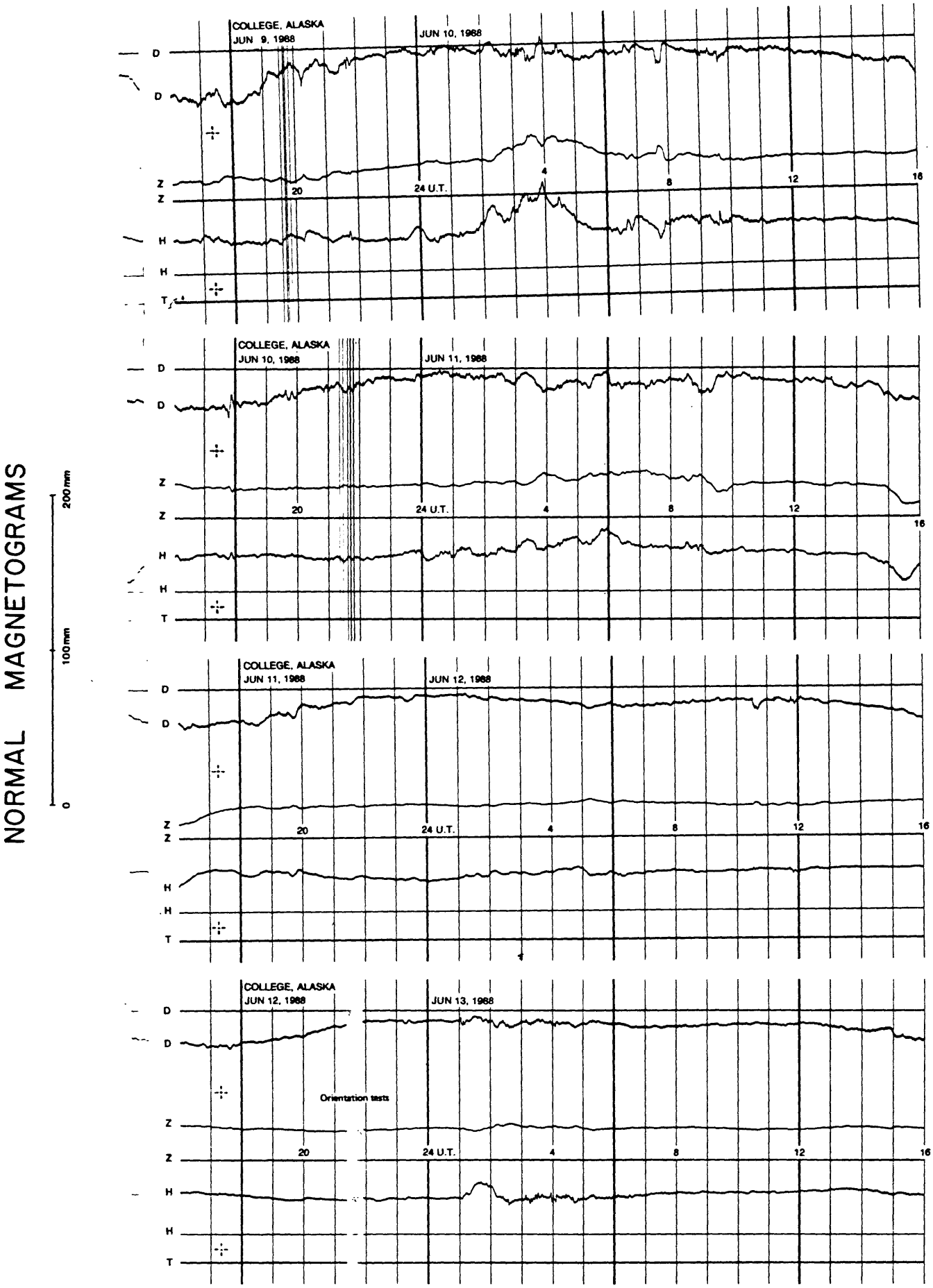
SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS.




NORMAL MAGNETOGRAMS
200 mm
100 mm
0
COLLEGE, ALASKA
JUN 5, 1988
JUN 6, 1988
COLLEGE, ALASKA
JUN 6, 1988
JUN 7, 1988
COLLEGE, ALASKA
JUN 7, 1988
JUN 8, 1988
Artificial disturbance
COLLEGE, ALASKA
JUN 8, 1988
JUN 9, 1988
Artificial disturbance
Orientation tests
D
Z
H
T
20
24 U.T.
4
8
12
16

NORMAL MAGNETOGRAMS



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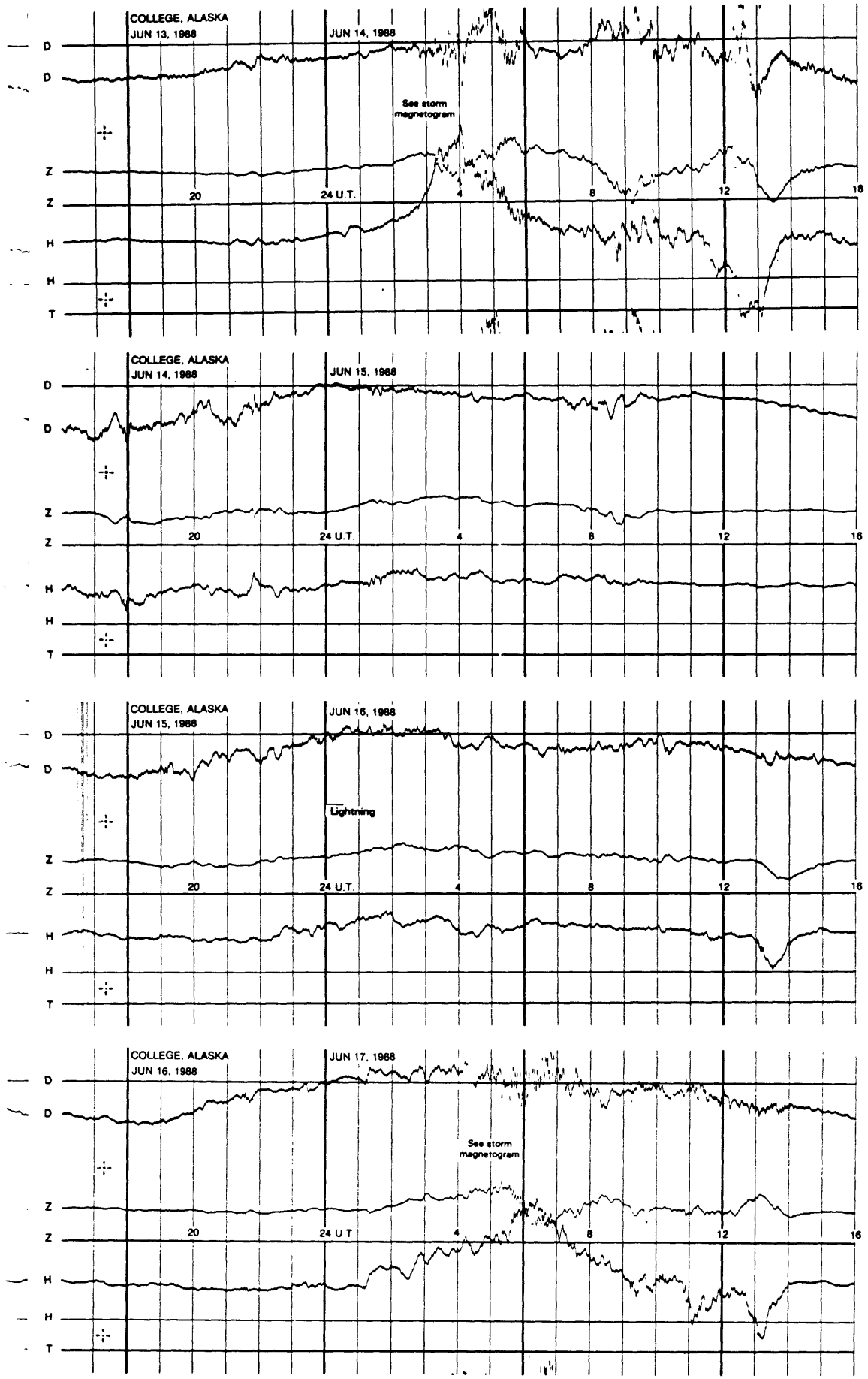

200 mm
100 mm
0

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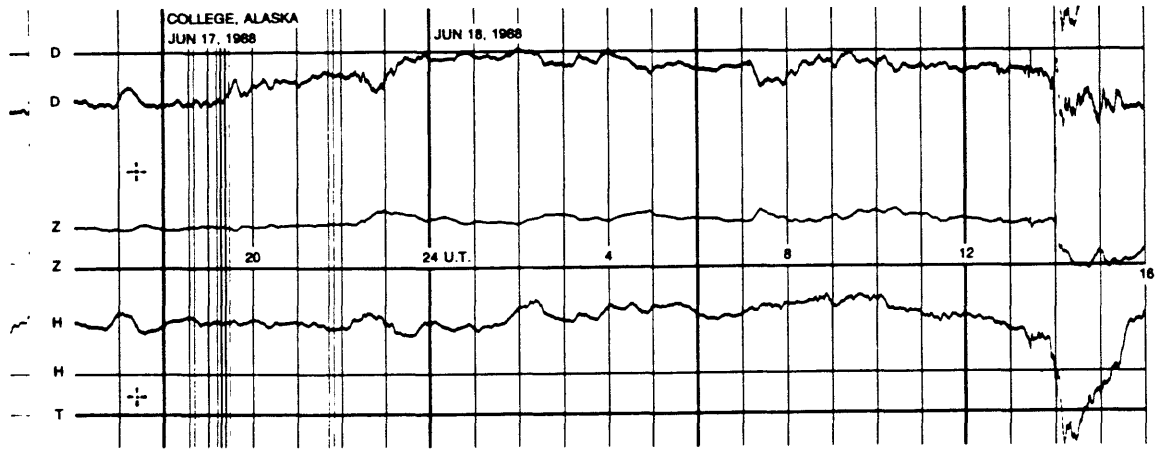

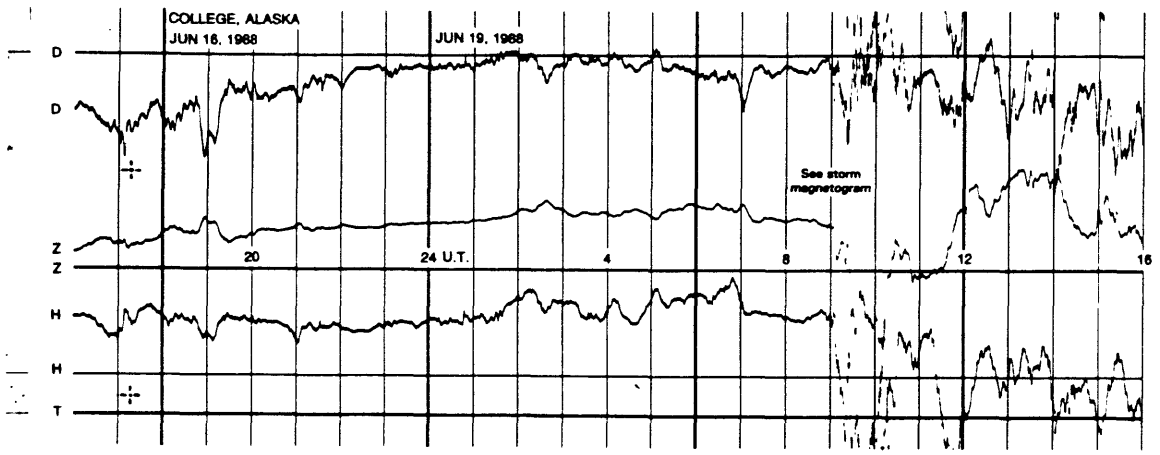

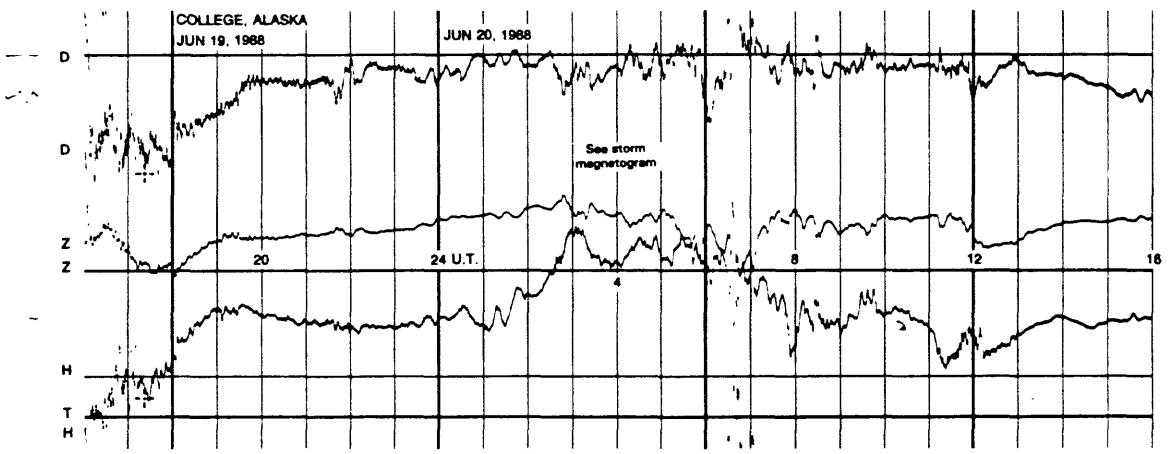

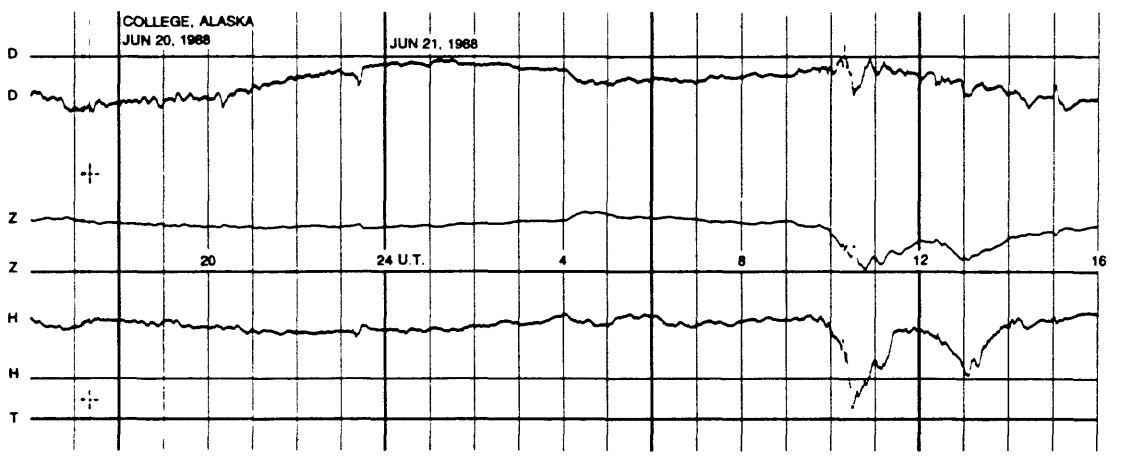

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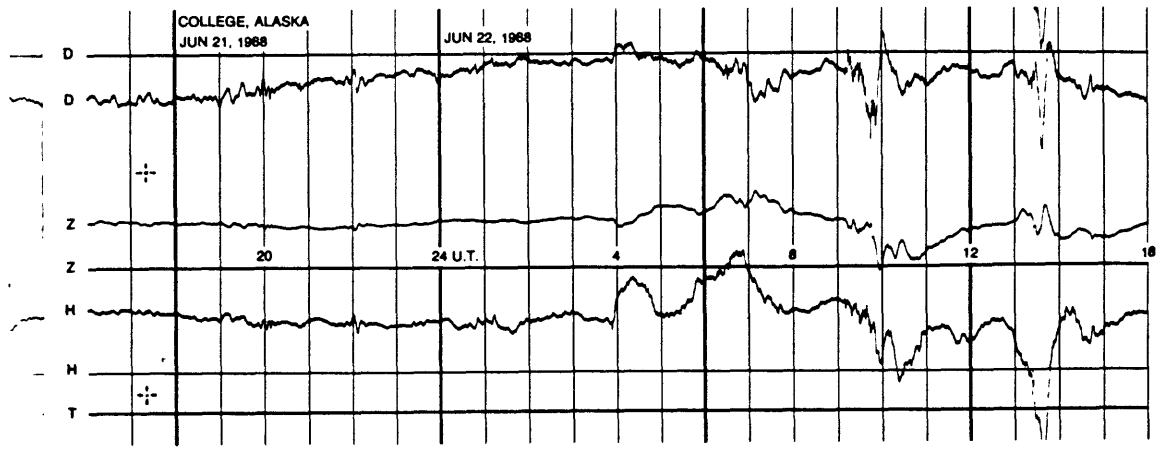

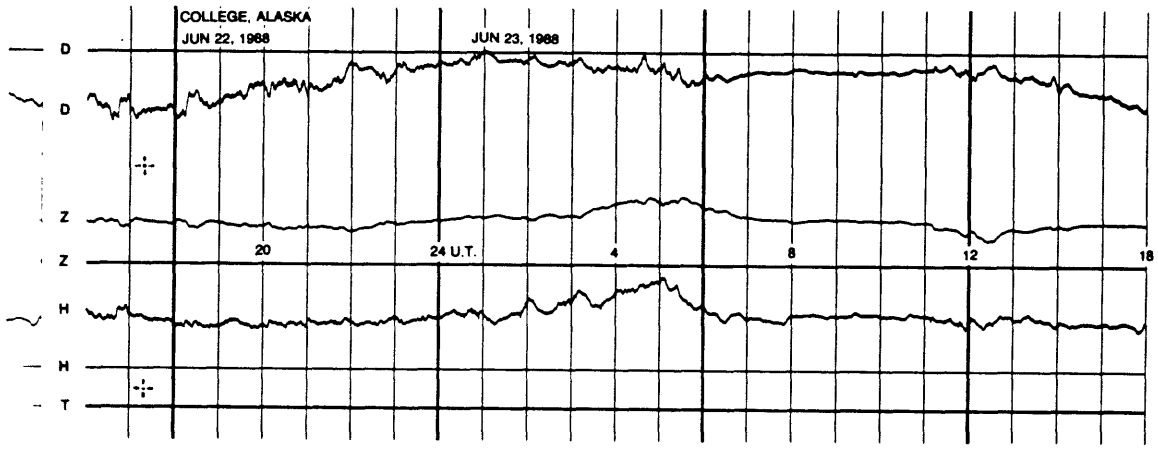

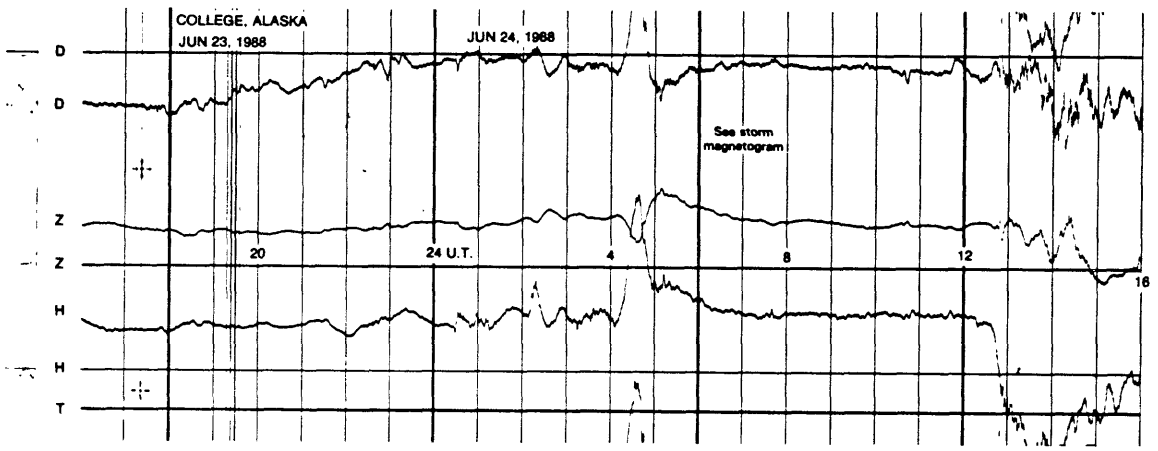

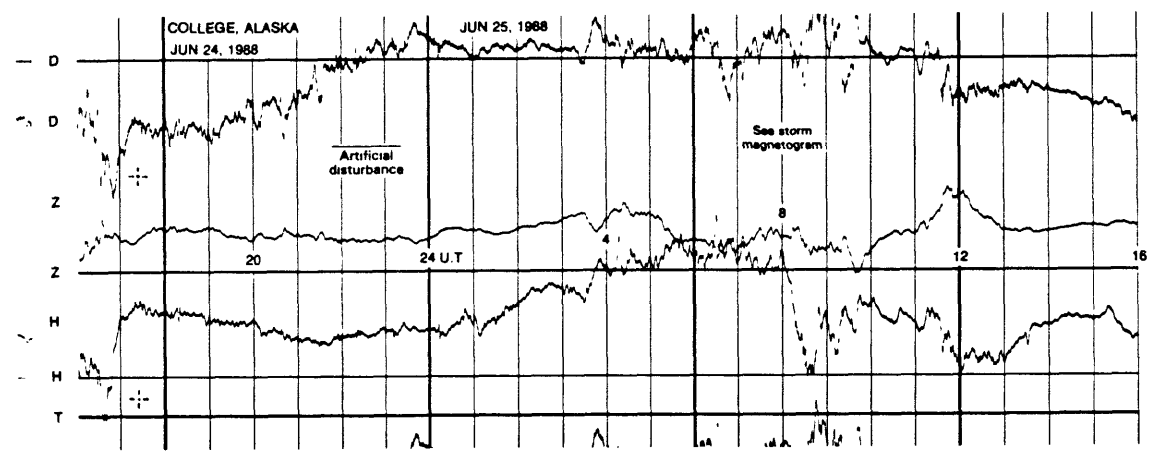

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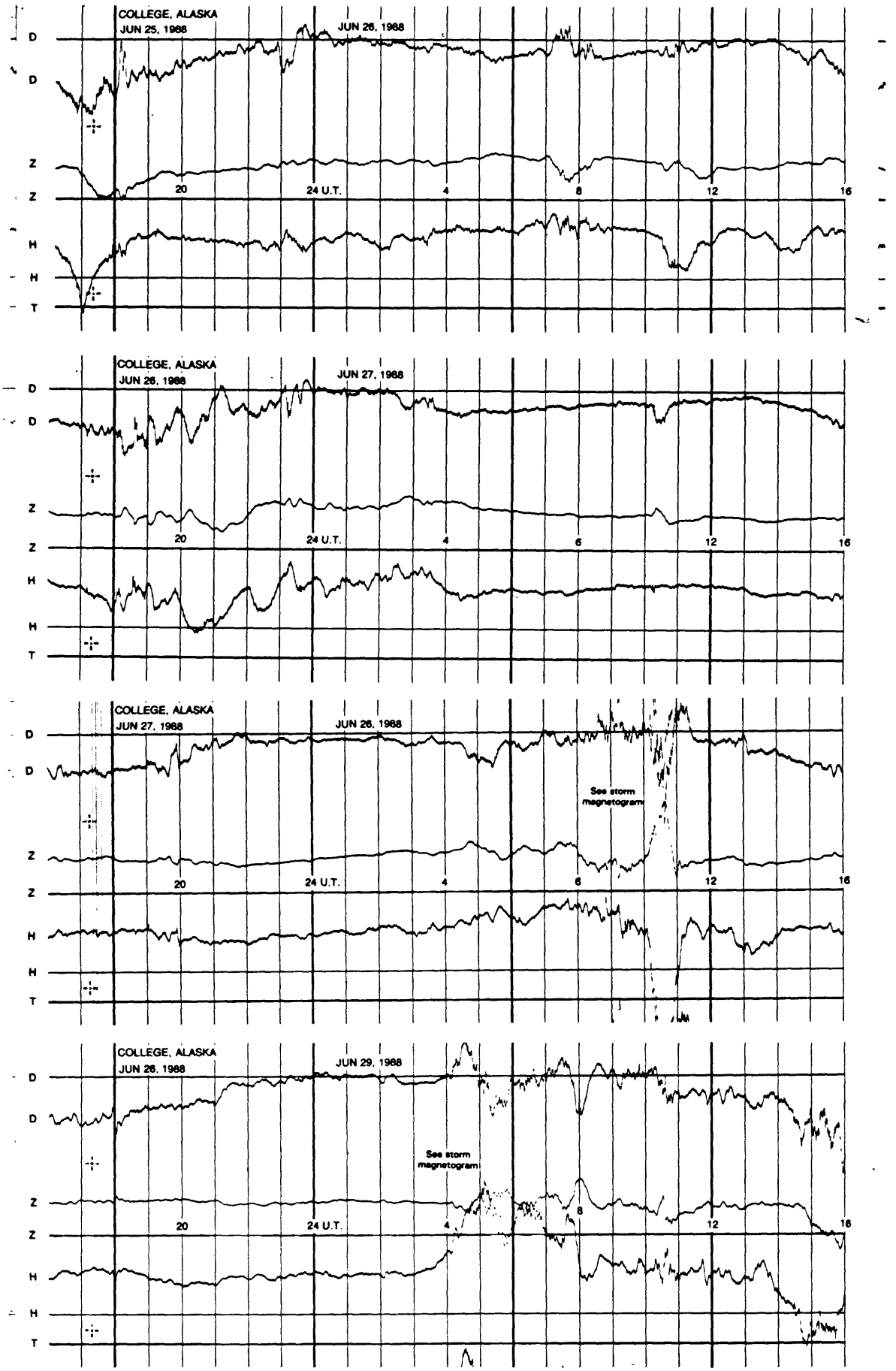
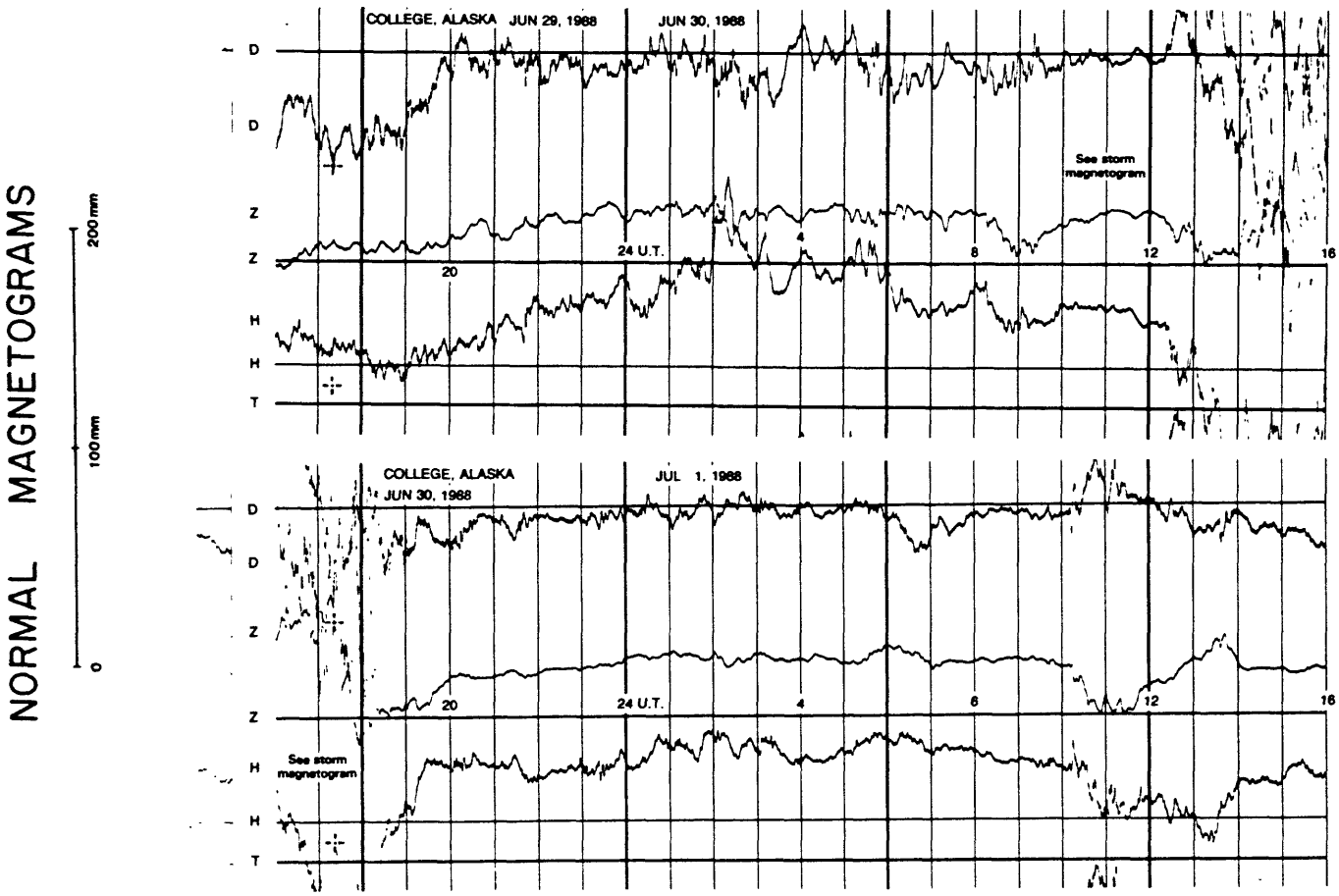
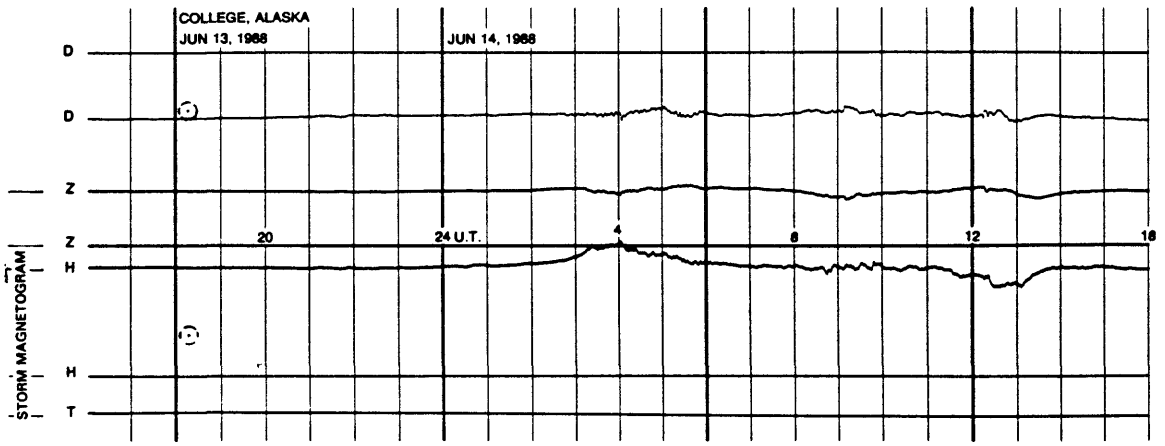
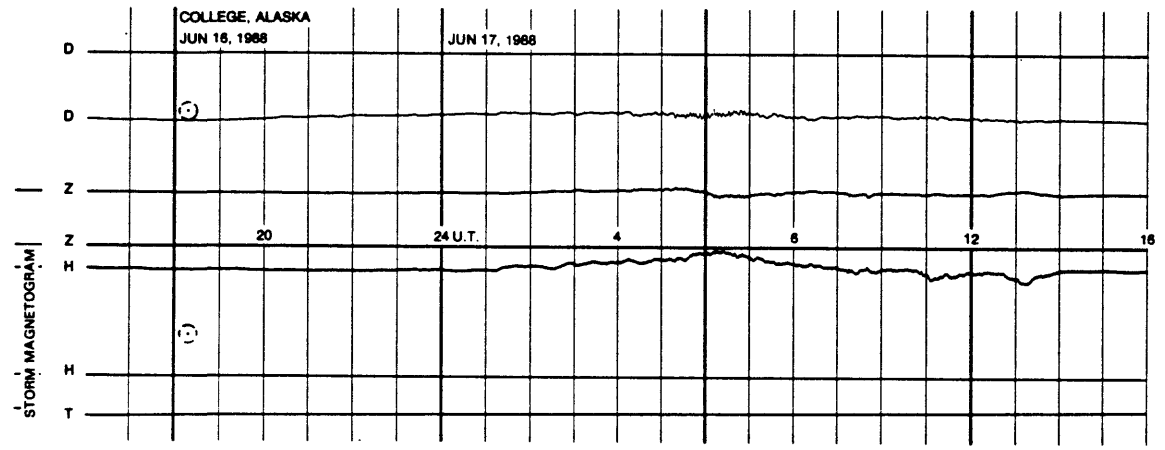


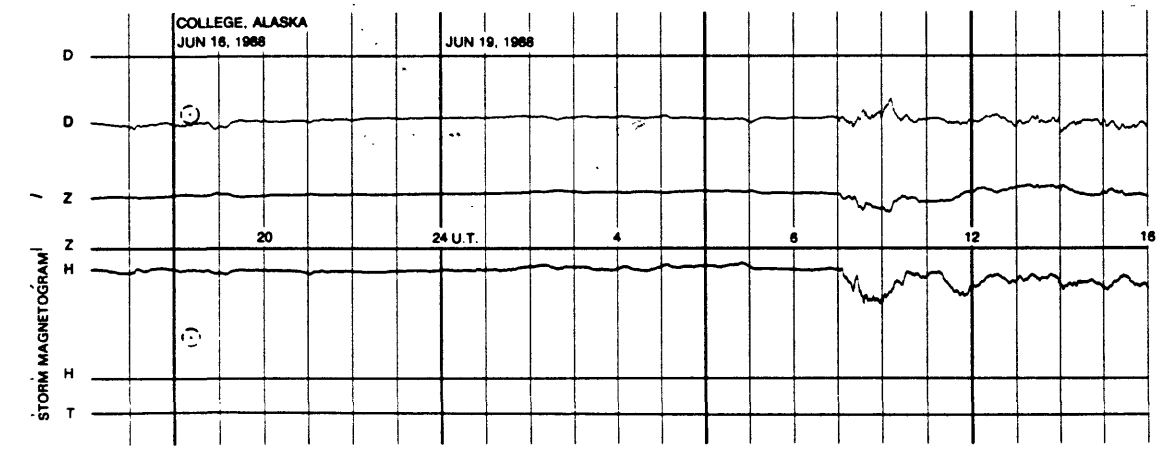
NORMAL MAGNETOGRAMS

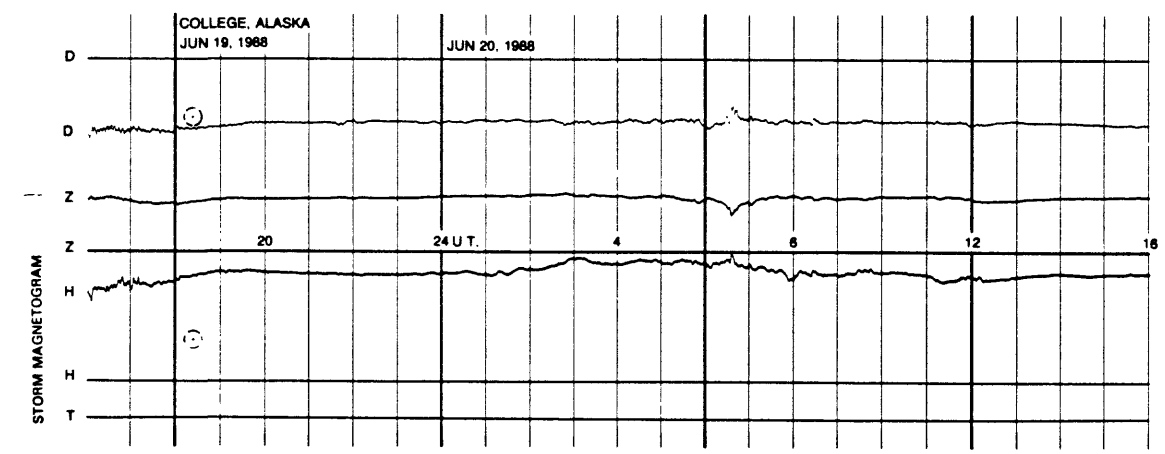


STORM MAGNETOGRAMS

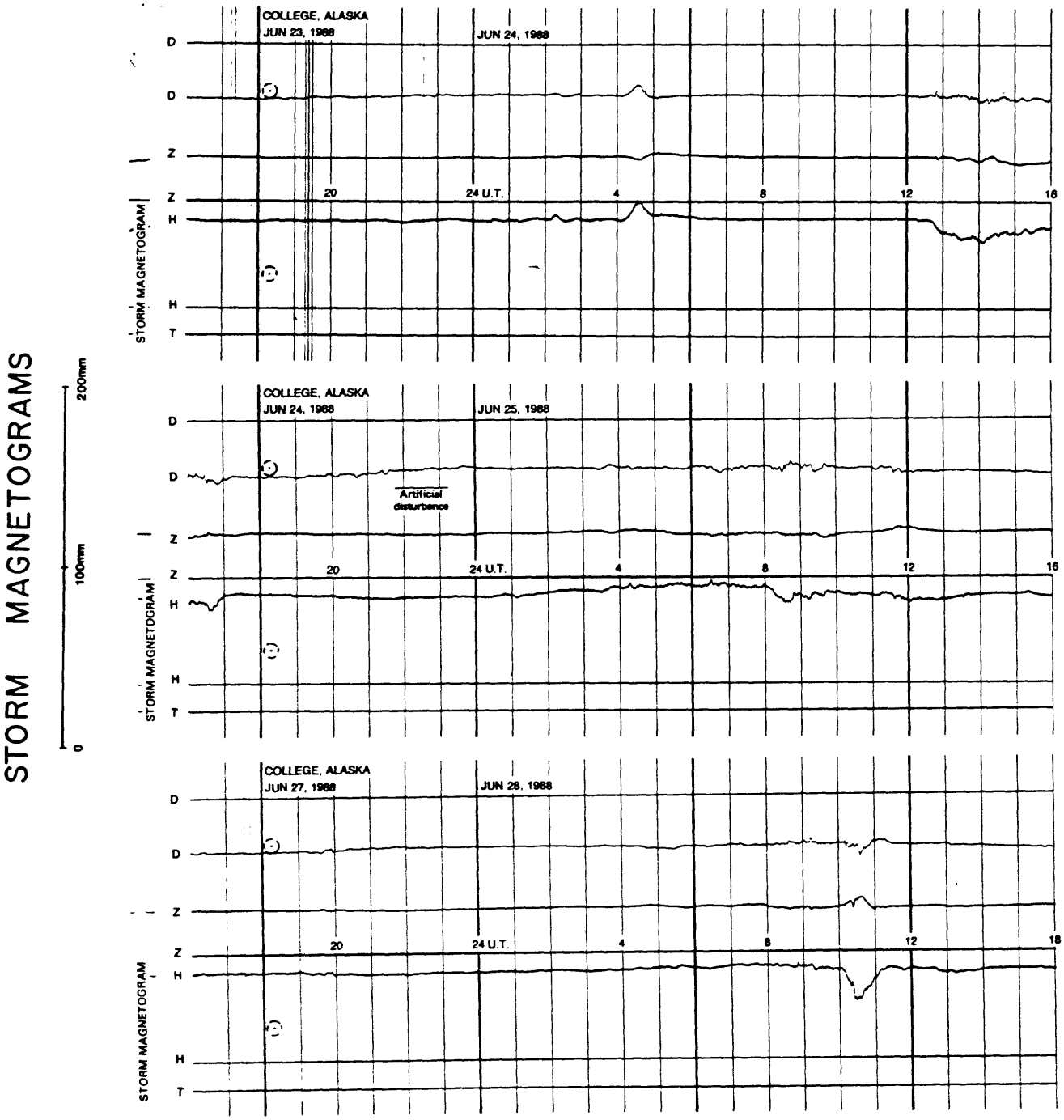








STORM MAGNETOGRAMS



STORM MAGNETOGRAMS