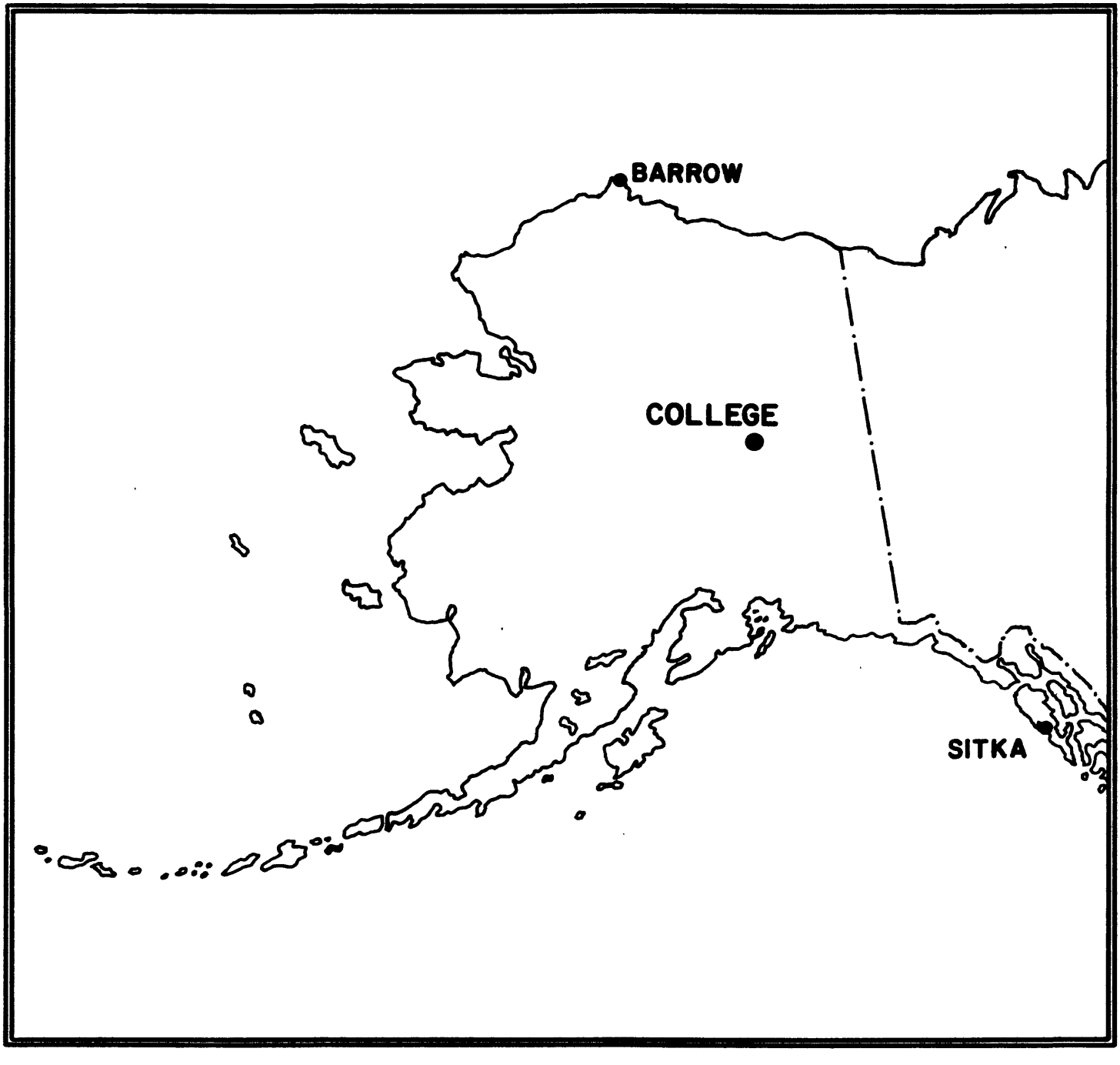
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

APRIL 1992 **OPEN FILE REPORT** 92-0300D



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 CAROL ANN VARNER AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA FAIRBANKS. THE COLLEGE OBSERVATORY IS PART OF THE BRANCH OF GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

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. 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 the 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

EXPLANATION OF DATA & REPORTS

Available Data & Reports

Normal and storm magnetograms and appropriate calibration data are processed at the observatory and are available for analysis or copying. Magnetic Activity Report (K-Indices & AK values), Principal Magnetic Storms Report, and Magnetogram Hourly Scalings for the five quietest days of the month are also available.

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 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)

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 commencement; 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 magnetogram.

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:

$D=B_D+d\ S_D$; $H=B_H+h\ S_H$; $Z=B_Z+z\ S_Z$
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: APRIL 1992

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	Ak
1	2	4	4	5	2	2	1	1	21	16
2	2	2	2	2	0	4	3	1	16	9
3	1	2	4	6	6	7	5	3	34	50
4	2	2	2	5	3	3	3	2	22	15
5	2	2	2	5	4	5	2	3	25	21
6	3	5	6	3	4	4	3	3	31	30
7	3	3	7	6	4	4	3	2	32	41
8	2	3	3	6	5	3	4	1	27	26
9	2	1	1	3	2	3	1	1	14	7
10	1	1	1	1	3	1	1	1	10	5
11	1	1	0	0	0	0	0	0	2	1
12	0	1	0	0	1	1	0	1	4	2
13	2	1	2	3	4	0	1	2	15	9
14	1	1	2	1	0	1	2	2	10	4
15	3	2	1	3	1	1	1	2	14	7
16	1	1	0	0	3	1	1	1	8	4
17	0	0	0	0	0	2	1	1	4	2
18	1	1	3	4	6	4	2	2	23	21
19	4	3	3	4	4	3	3	2	26	19
20	3	4	4	5	4	4	3	2	29	24
21	3	3	2	2	3	3	1	1	18	10
22	3	3	4	5	4	4	3	3	29	24
23	3	1	1	0	2	4	3	3	17	11
24	4	4	2	3	3	5	2	2	25	19
25	4	4	3	3	4	2	1	2	23	16
26	2	2	2	4	2	1	2	2	17	9
27	2	1	1	0	4	4	2	1	15	10
28	2	3	3	4	5	4	1	1	23	18
29	3	3	3	1	1	1	2	1	15	8
30	3	3	3	4	3	1	0	1	18	12
31										

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

d	h	m
3	07	33

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.....	3.67	7.72		(γ/mm)
LOWER LIMIT FOR K = 9	2480	2490		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED John B. Townshend, Chief

OBSERVER IN CHARGE

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PRINCIPAL MAGNETIC STORMS

COLLEGE OBSERVATORY, COLLEGE, ALASKA

APRIL 1992

Obs	Geomag	Commencement (UT)			SC -amplitudes			Max. 3 hr -index K			Ranges			UT End	
	lat.	day	hr min	type	D(′)	H nT	Z nT	day	(3 hr - period)	K	D(′)	HnT	ZnT	day	hr
CO	64.6 N	3	0734	SC	-34	+100	-125	3	6	7	210	1080	810	4	00

College Observatory, College, Alaska -- Preliminary Calibration Data For: APRIL 1992

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0001 U.T., 4-1-92	2400 U.T., 4-30-92	1.0'/mm	3.7 γ/mm	25° 58.8' E
H	(SAME)	(SAME)	7.7 γ/mm		12630 γ
Z	(SAME)	(SAME)	7.8 γ/mm		55210 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0001 U.T., 4-1-92	2400 U.T., 4-30-92	7.9'/mm	29.4 γ/mm	
H	(SAME)	(SAME)	43.4 γ/mm		
Z	(SAME)	(SAME)	49.0 γ/mm		

The College Observatory has used several absolute instruments and different observing piers since it began operations in 1948. To avoid artificial secular shifts in the absolute values published when instruments were changed, corrections were applied to provide continuity in the data from the time the Observatory began operating. For many years the instruments used for observing absolute values have had zero correction. Effective with the May 1989 Preliminary Data Report, in accordance with a directive issued by the USGS Branch of Global Seismology and Geomagnetism analysis personnel, these longstanding corrections are discontinued and all data listed (D, H & Z) are for the position at absolute pier 1a and without any corrections applied. The net effect of these changes is as follows:

Declination (D): No Change
Horizontal Intensity (H): -5γ; i.e., H absolute and baseline values are 5γ less than previously reported.
Vertical Intensity (Z): +33γ; i.e., Z absolute and baseline values are 33γ higher than previously reported.

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
26° 32.3' E	12744 γ	55313 γ

*COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.
DAYS USED: APR 11, 12, 14, 16, 17.

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
College, Alaska	April	1992

jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

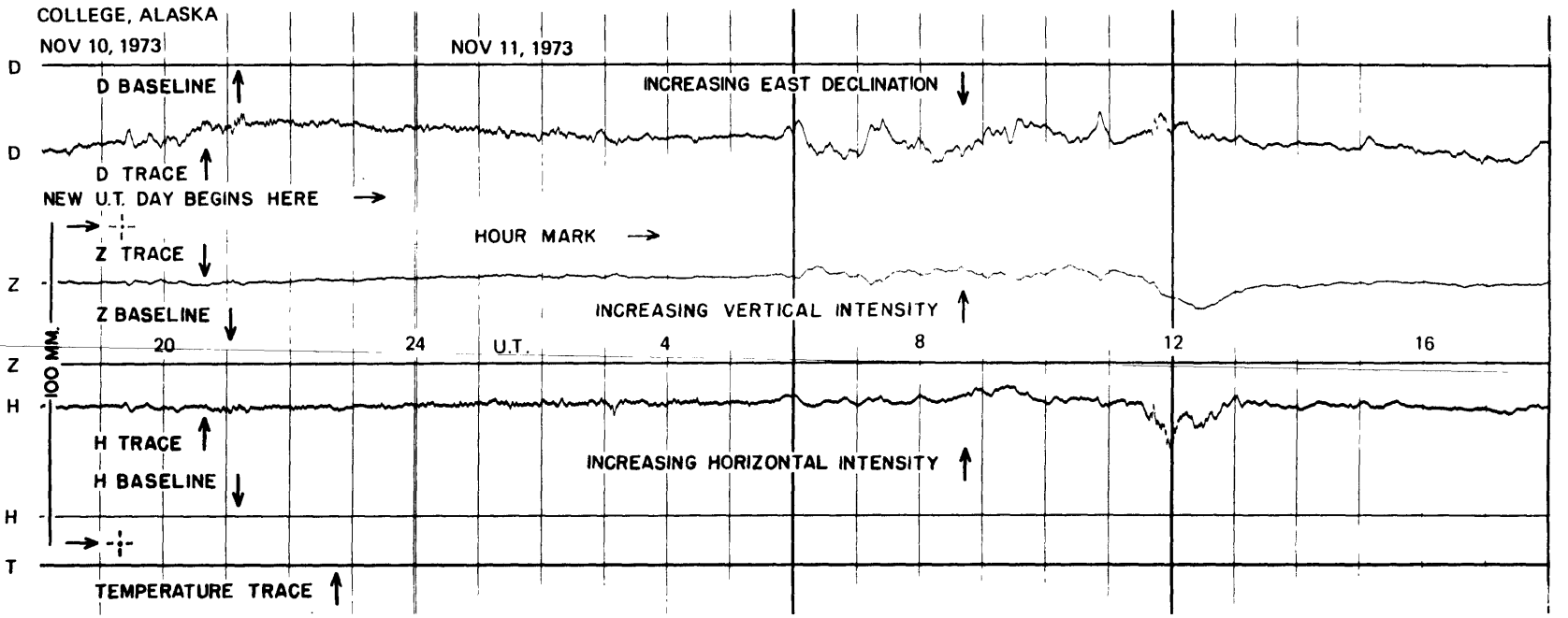
(UNIVERSAL TIME)

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		11	12	14	16	17	11	12	14	16	17	11	12	14	16	17	DAY
A_k		1	2	4	4	2	1	2	4	4	2	1	2	4	4	2	A_k
HOUR	01	306	293	276	305	277	112	108	122	120	112	151	130	138	135	133	01 HOUR
	02	281	272	270	290	281	120	111	130	125	120	146	130	139	135	131	02
	03	290	271	276	286	286	112	121	141	136	130	145	131	144	136	129	03
	04	289	275	293	289	292	130	150	143	149	138	142	131	144	134	130	04
	05	300	296	310	306	301	141	150	160	151	148	147	140	143	137	134	05
	06	306	300	323	317	318	151	159	161	151	150	145	134	145	137	136	06
	07	311	310	320	314	319	153	157	170	158	151	143	134	140	134	133	07
	08	318	316	309	325	322	151	160	175	158	151	143	134	141	135	133	08
	09	320	321	343	328	328	154	170	170	160	158	140	133	141	134	133	09
	10	325	329	330	331	328	157	172	169	163	162	139	132	137	134	132	10
	11	332	334	329	330	330	160	180	168	163	160	140	146	130	130	132	11
	12	340	336	328	329	324	160	180	171	167	160	137	127	115	129	130	12
	13	340	327	314	302	330	161	178	177	181	160	136	119	122	124	132	13
	14	349	337	321	333	340	160	170	172	91	158	138	121	125	69	135	14
	15	345	349	340	376	336	149	161	174	147	159	134	116	133	64	131	15
	16	381	376	350	382	334	152	168	170	176	161	132	119	139	105	132	16
	17	397	408	390	410	393	160	170	157	172	131	137	126	139	131	130	17
	18	401	400	410	420	423	157	178	141	170	149	138	131	143	134	117	18
	19	410	393	401	409	430	150	172	156	160	147	139	134	123	133	130	19
	20	411	362	423	390	400	141	169	159	148	130	136	129	120	130	132	20
	21	402	356	427	371	383	141	151	141	138	118	129	129	133	129	133	21
	22	396	353	357	363	359	134	140	150	126	102	129	130	122	133	133	22
	23	374	340	345	337	332	118	119	130	122	109	130	135	126	133	131	23
	24	330	304	318	305	320	109	109	140	117	112	130	134	127	136	130	24
DAILY SUM		8254	7958	8103	8148	8086	3433	3703	3747	3549	3376	3326	3125	3209	3031	3152	DAILY SUM
DAILY MEAN		344	332	338	340	337	143	154	156	148	141	139	130	134	126	131	DAILY MEAN
MEAN				338					148					132			MEAN

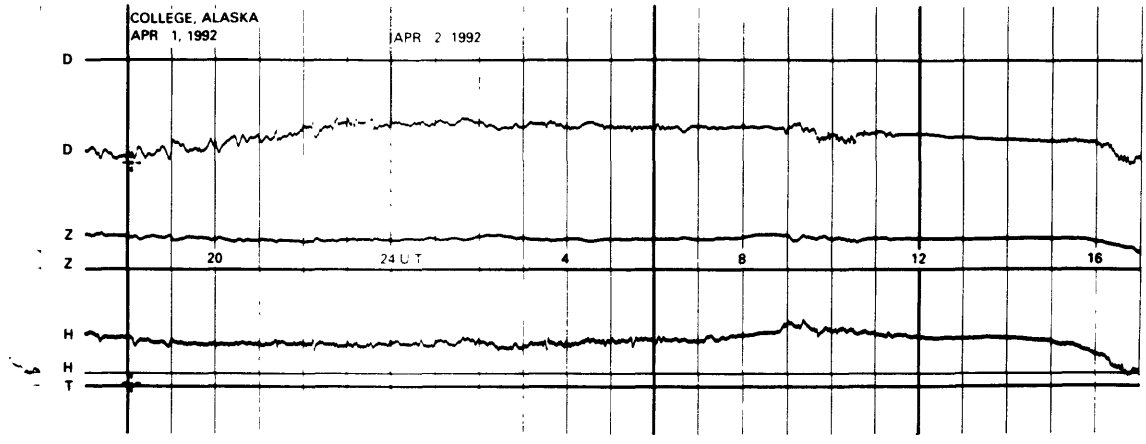
Scaled TWO | Checked TKD

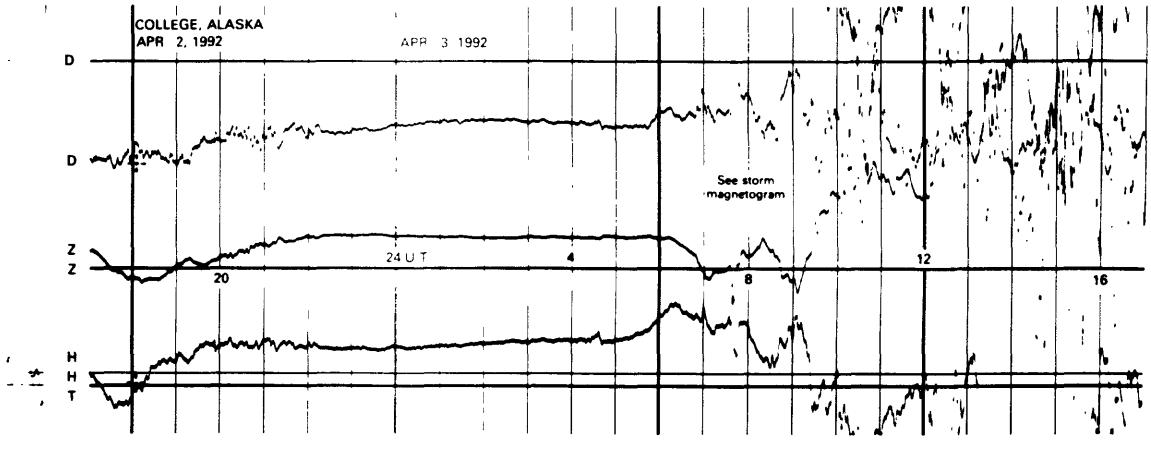
FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

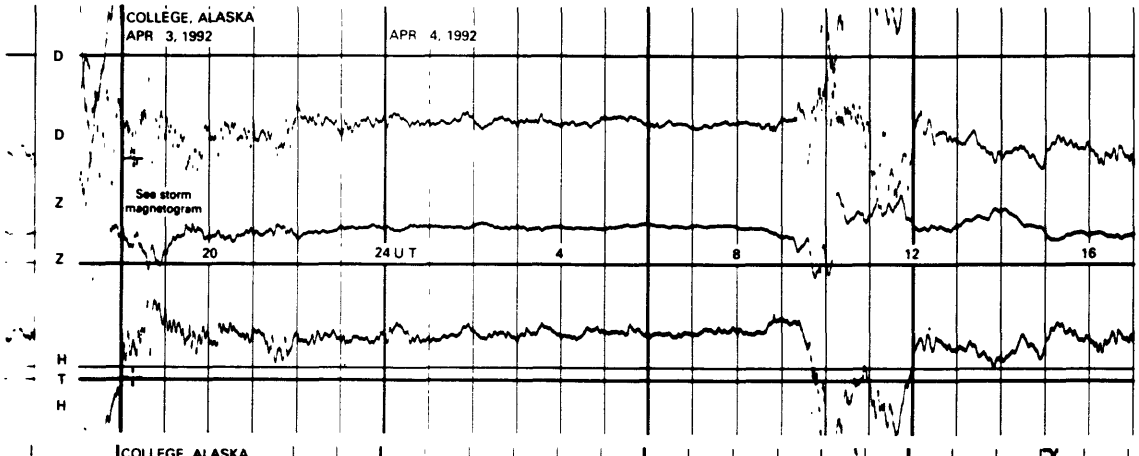


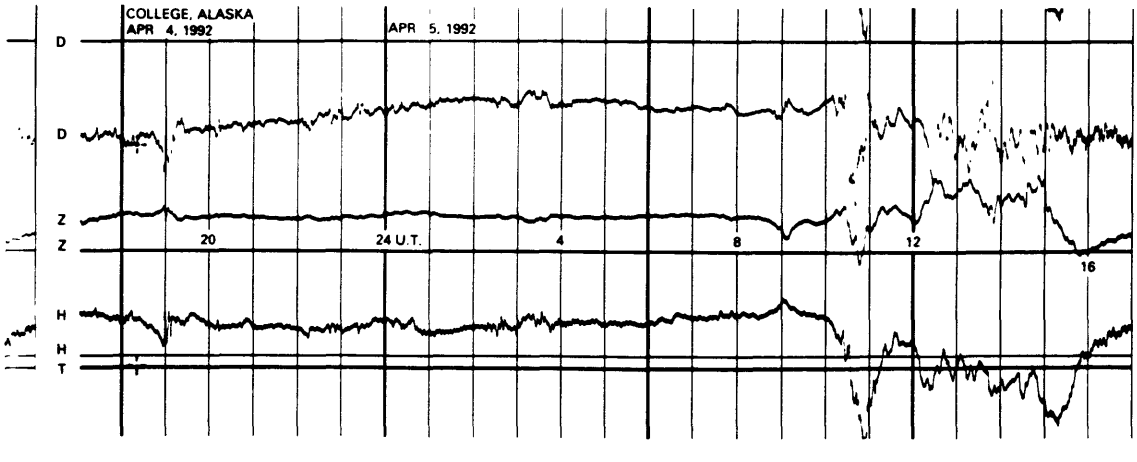
SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS









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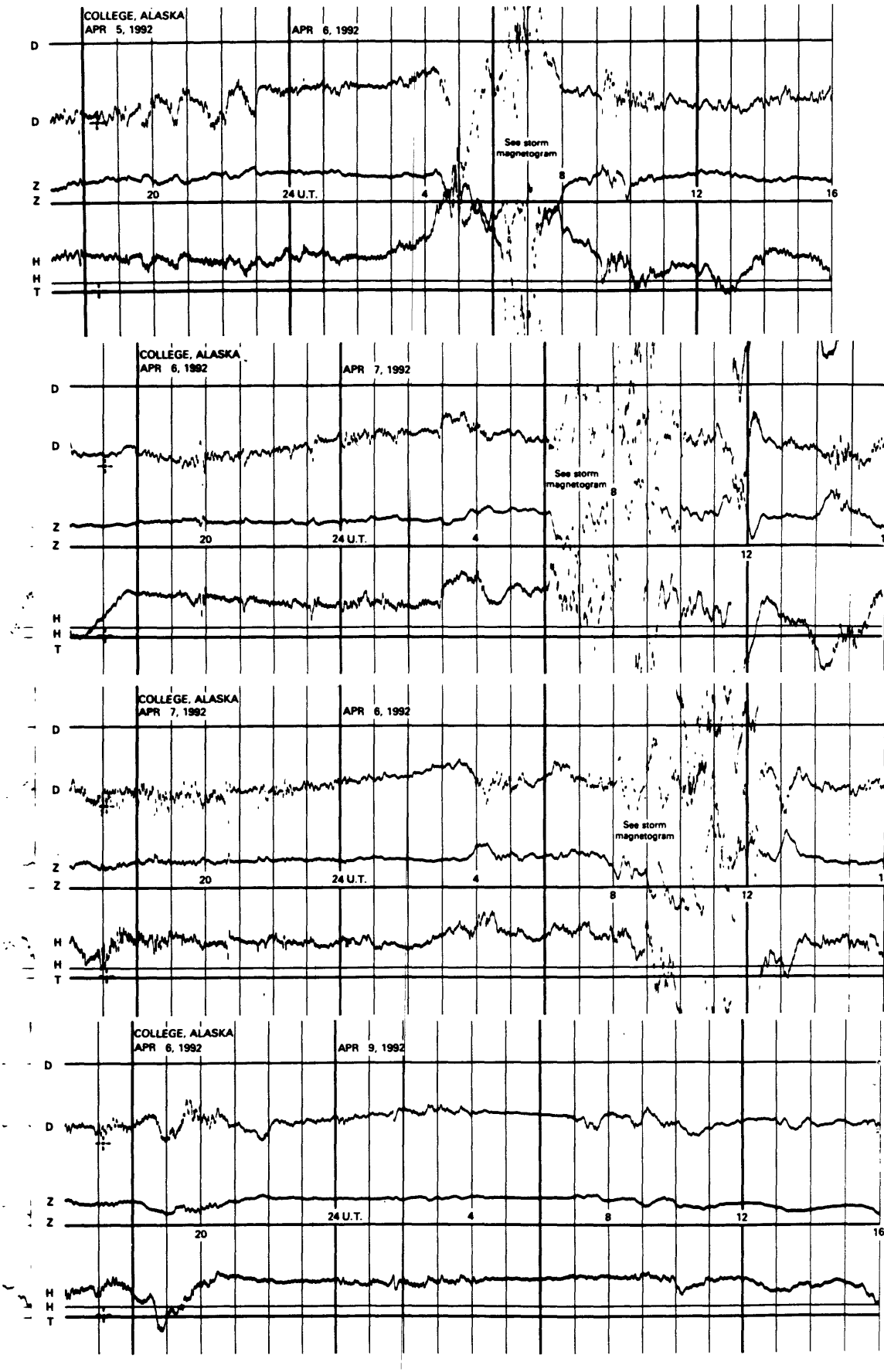

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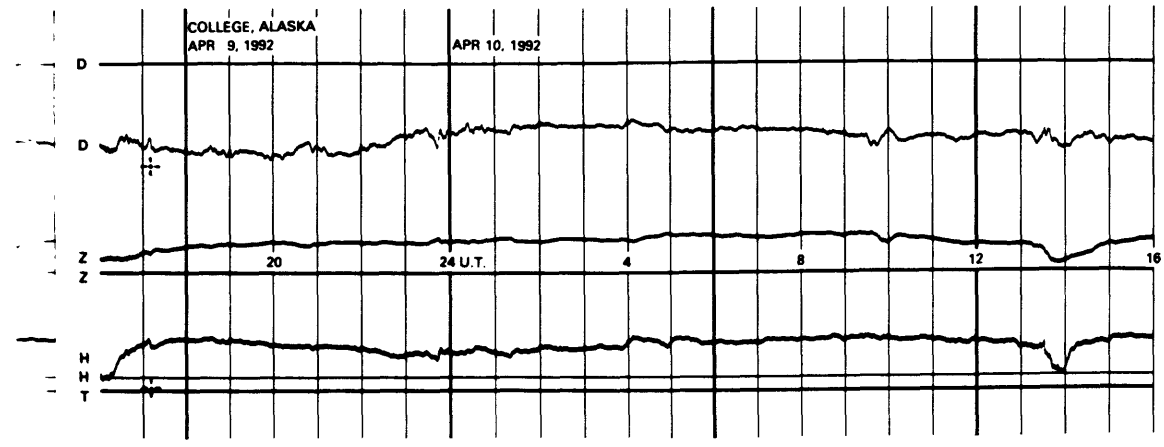

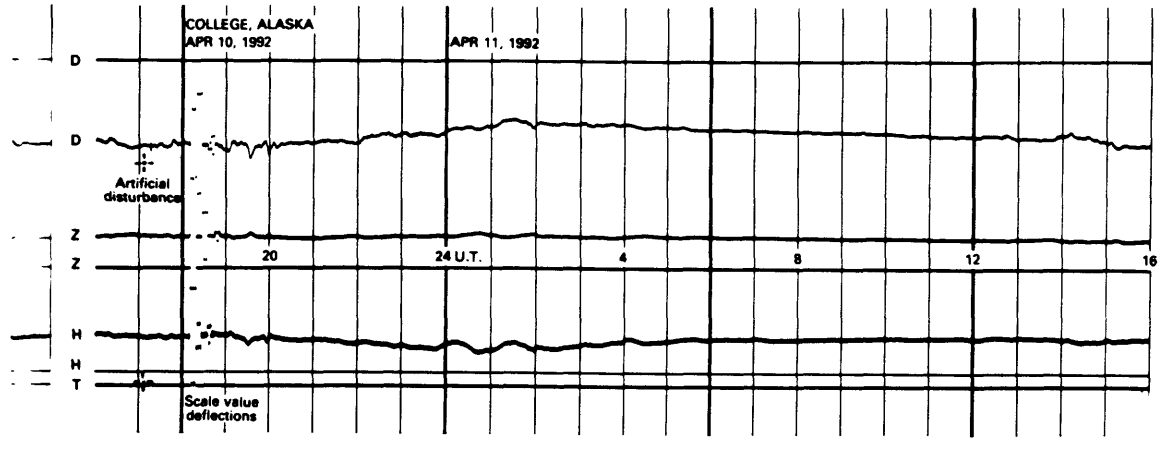

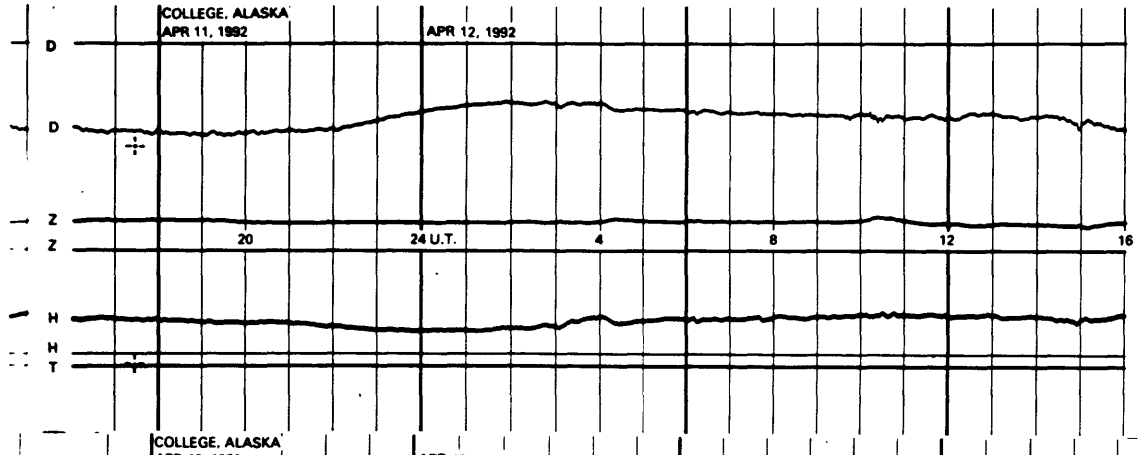

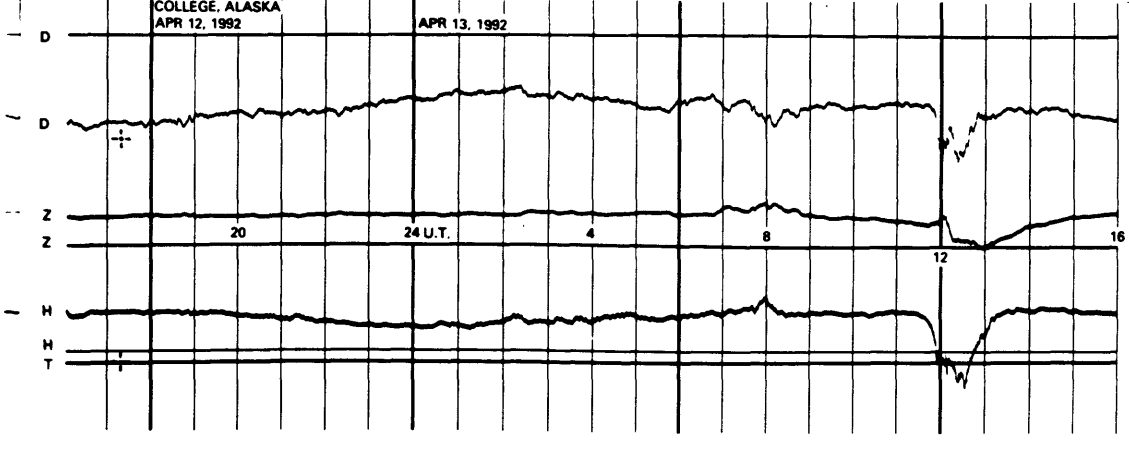

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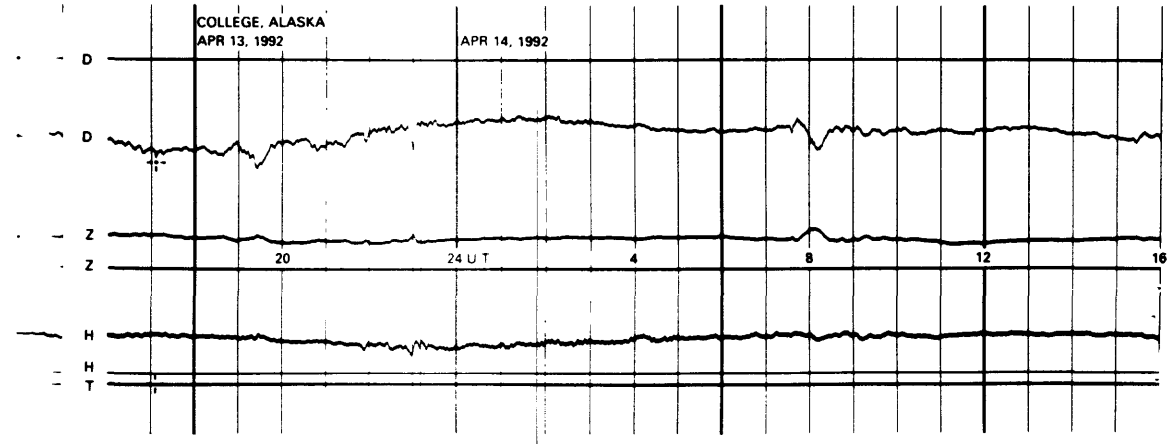

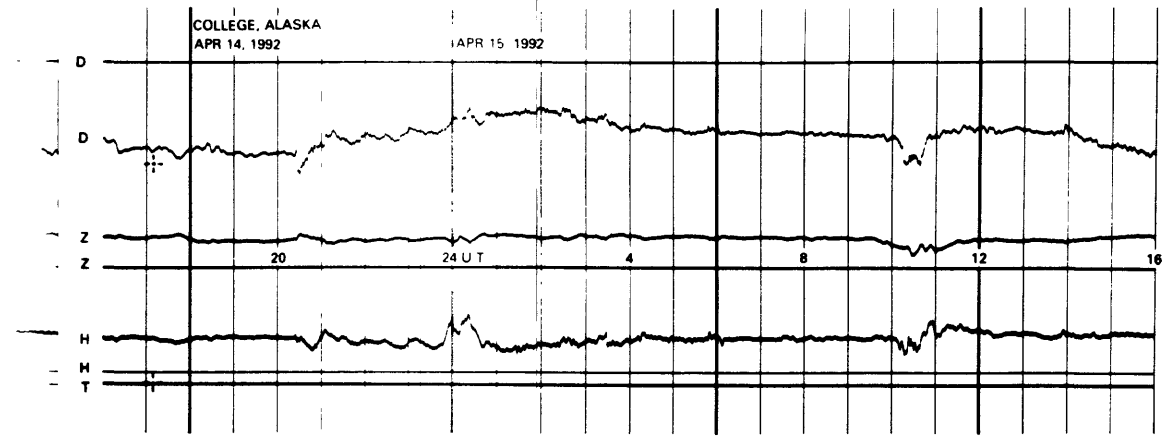

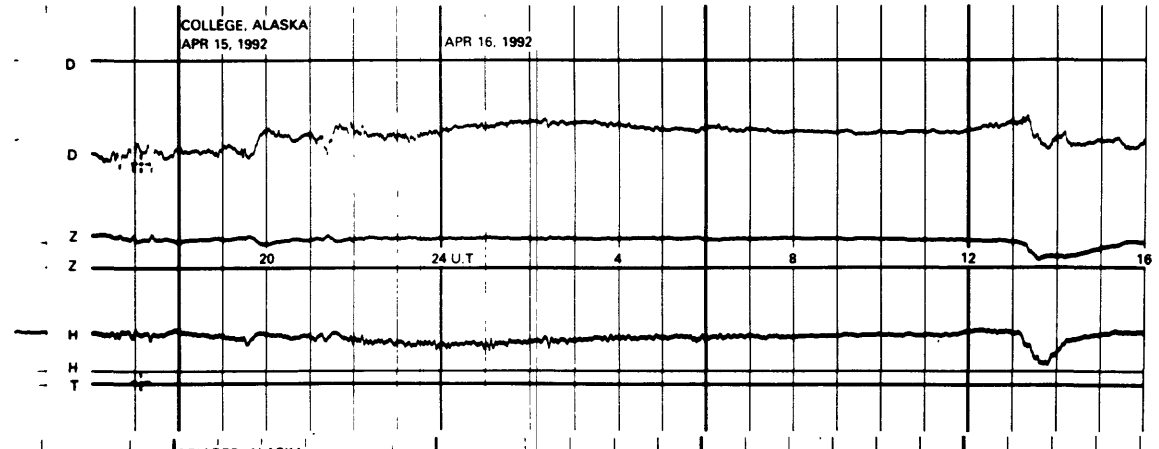

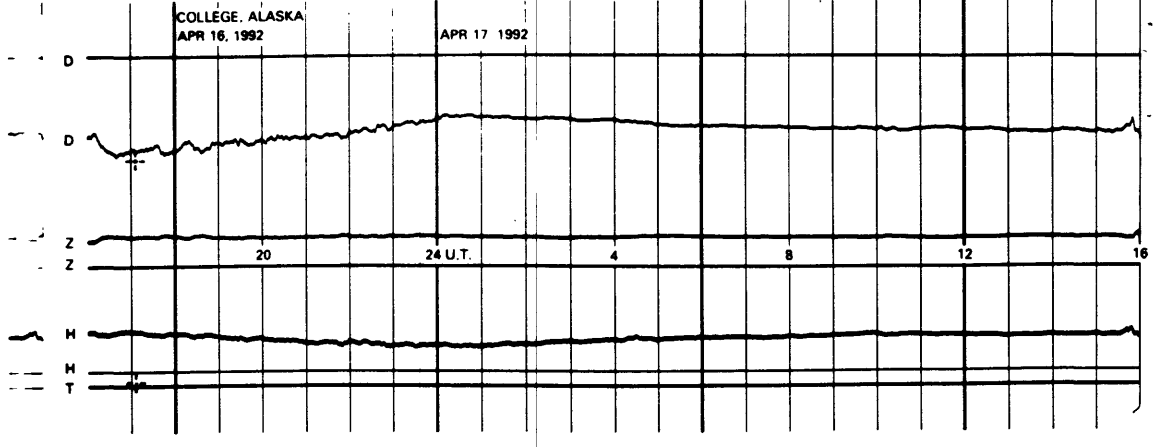

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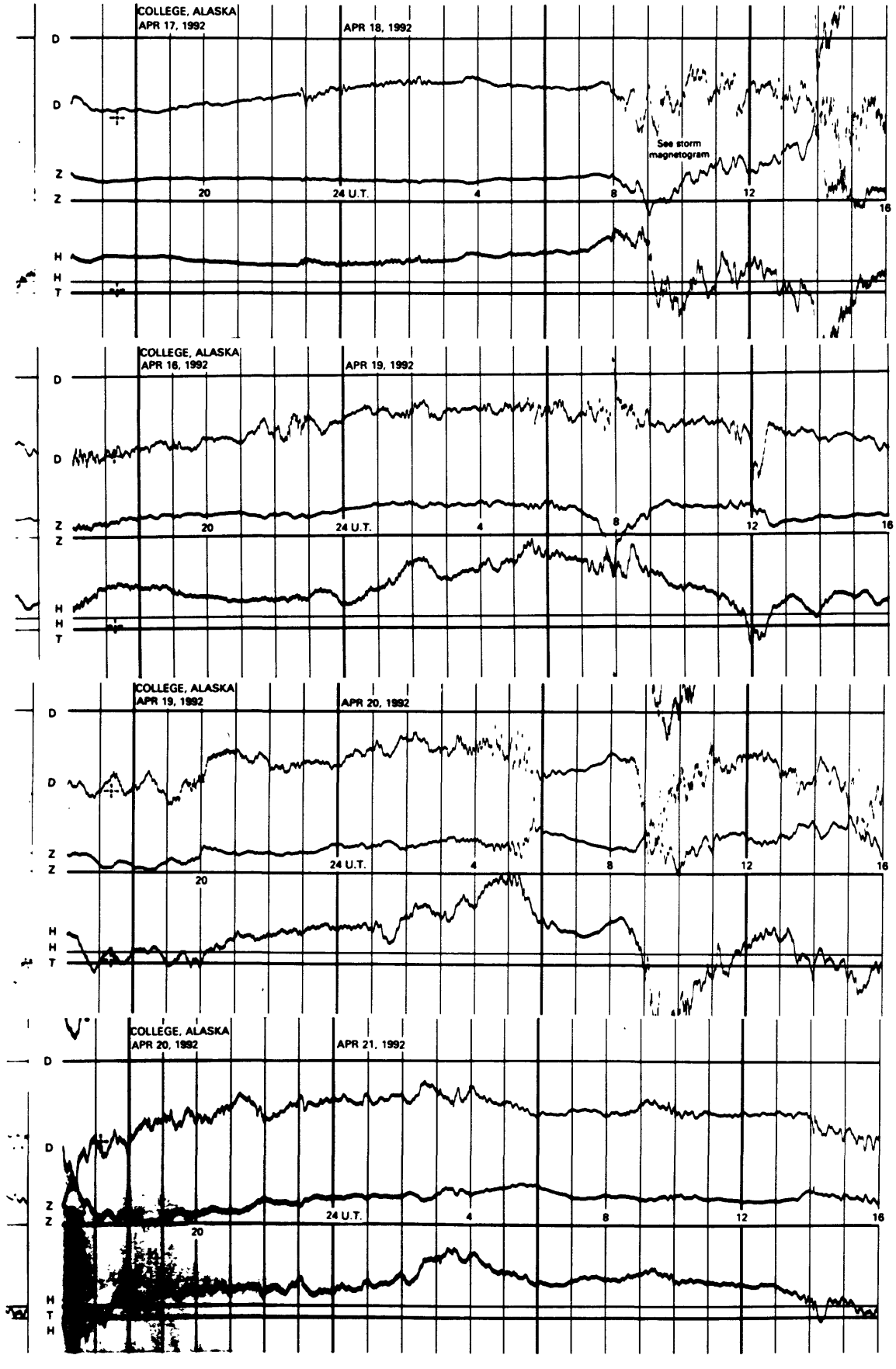
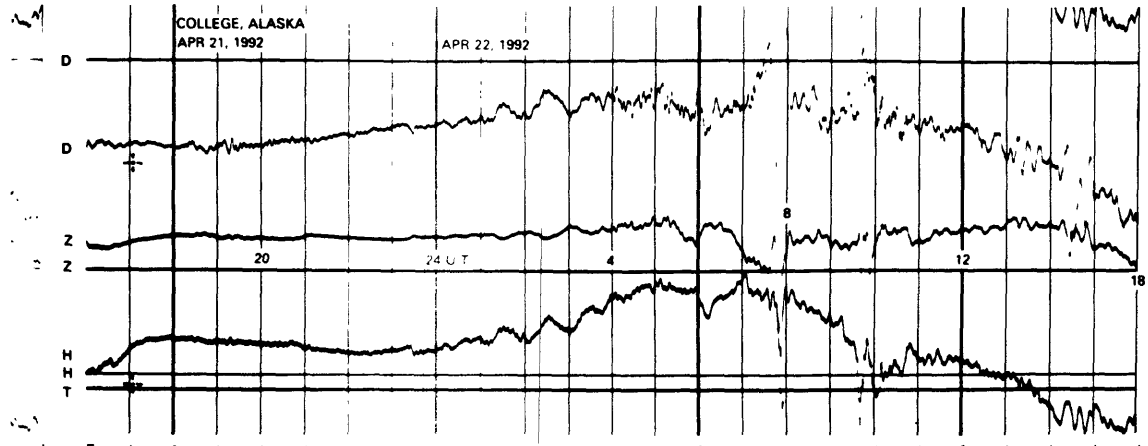
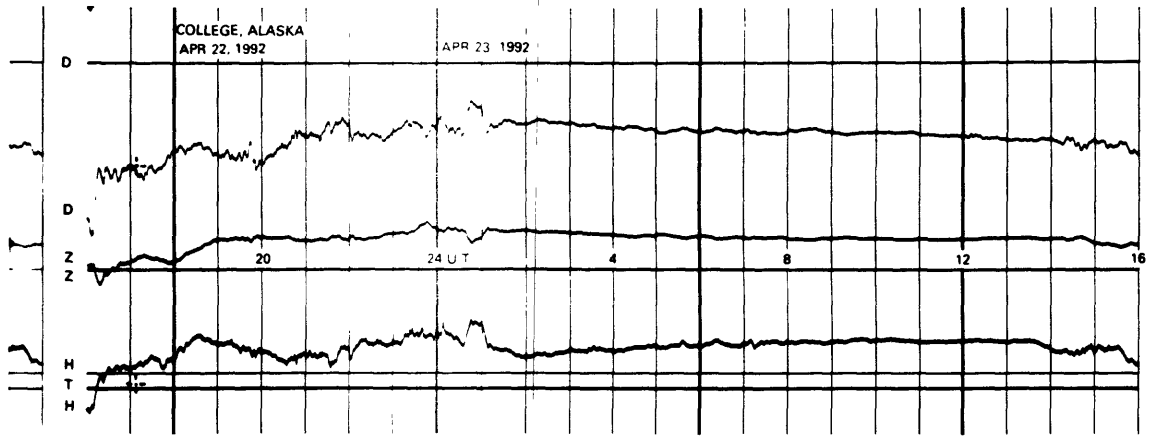
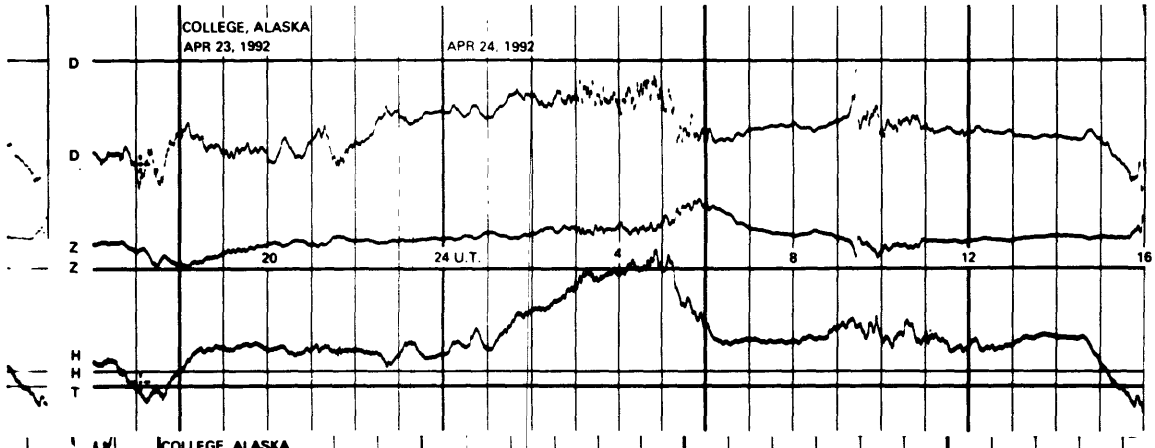


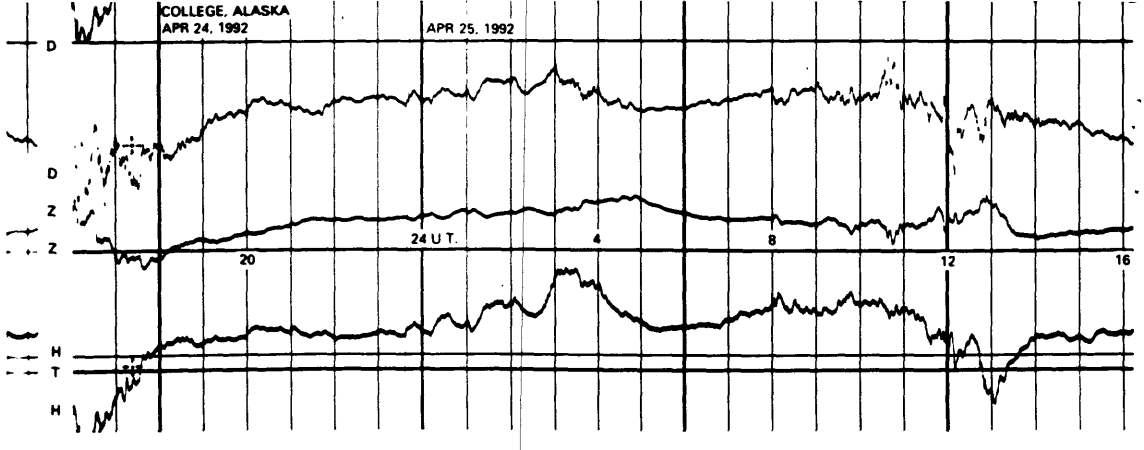
200 mm
100 mm
0

NORMAL MAGNETOGRAMS









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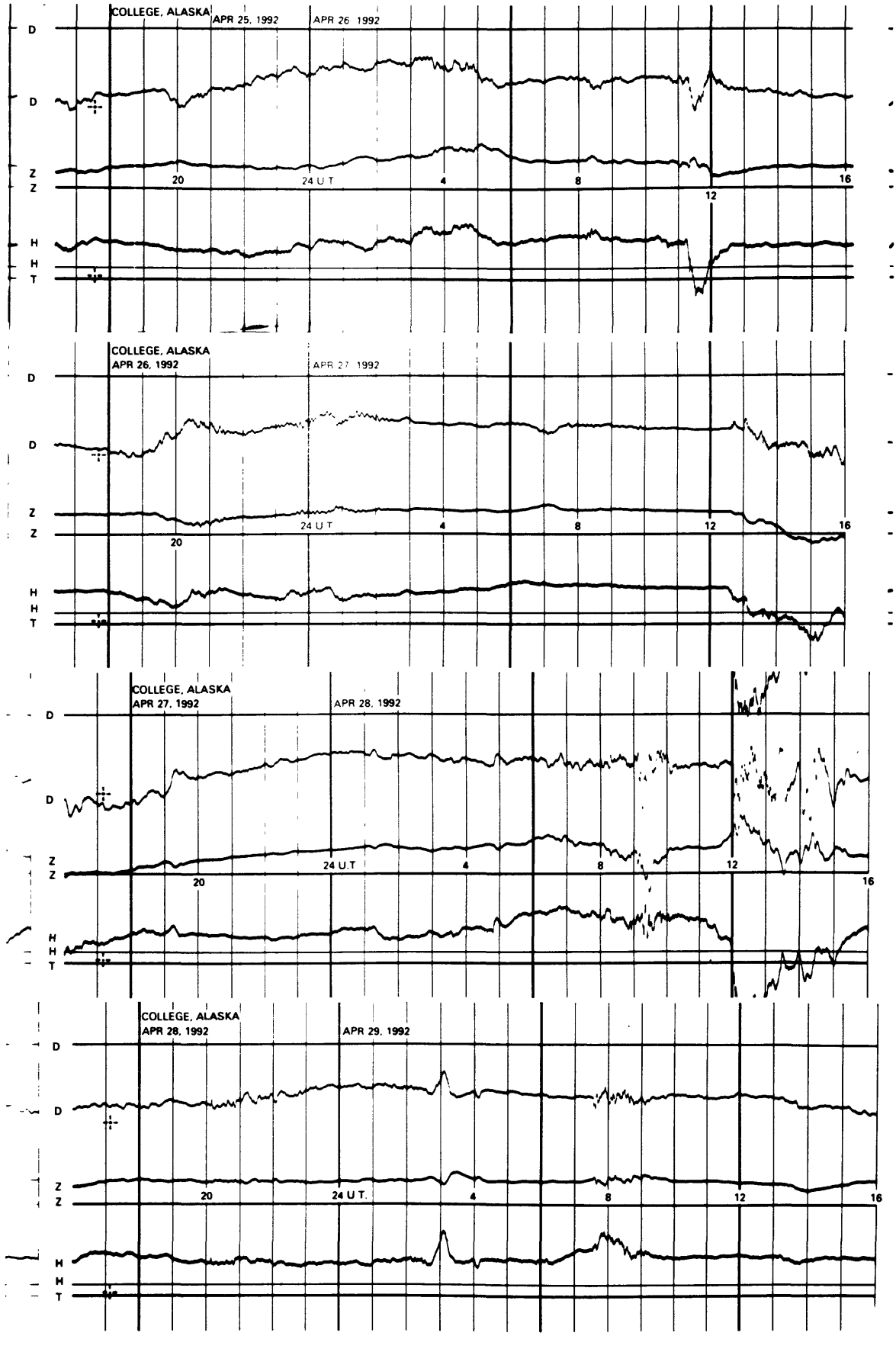

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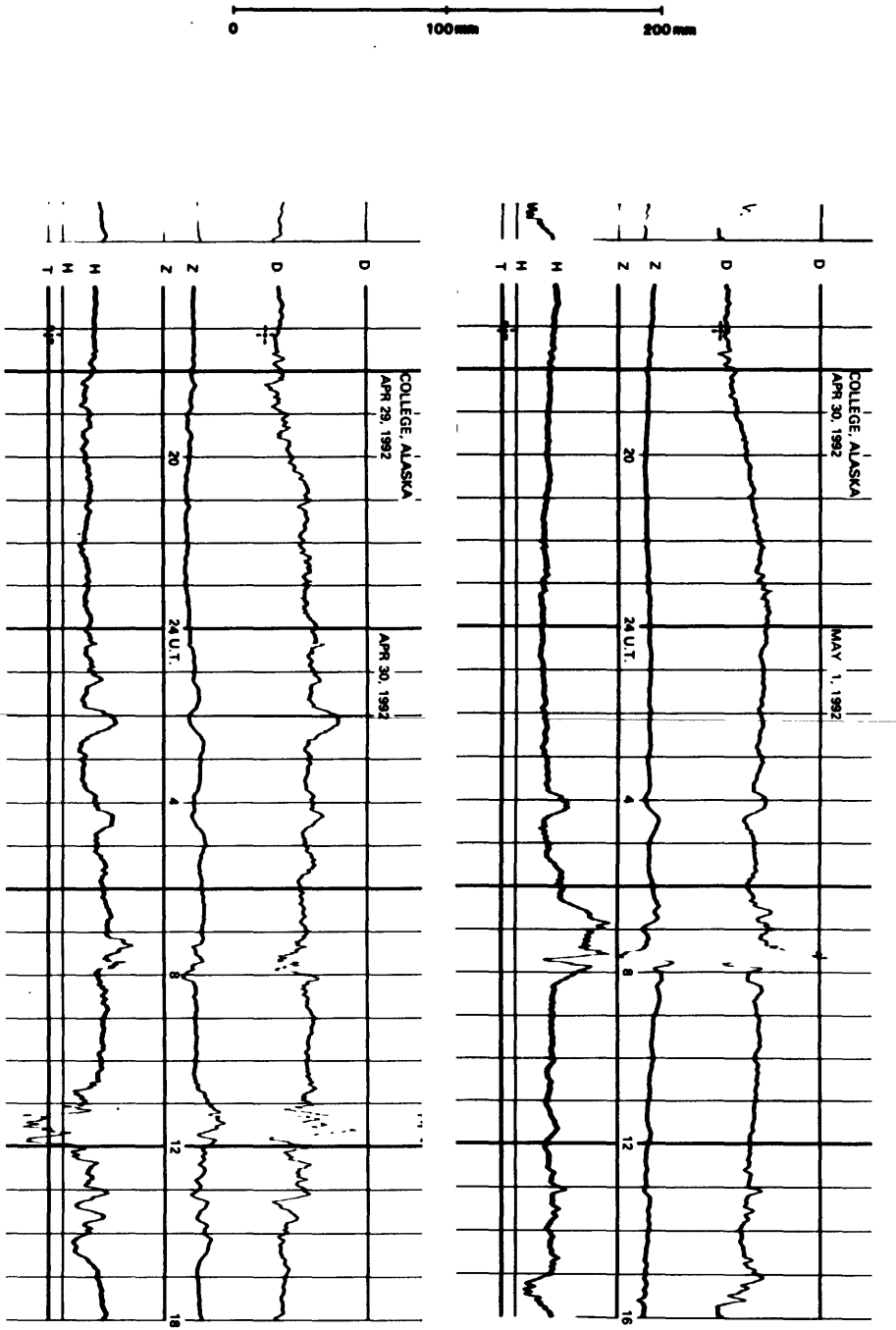
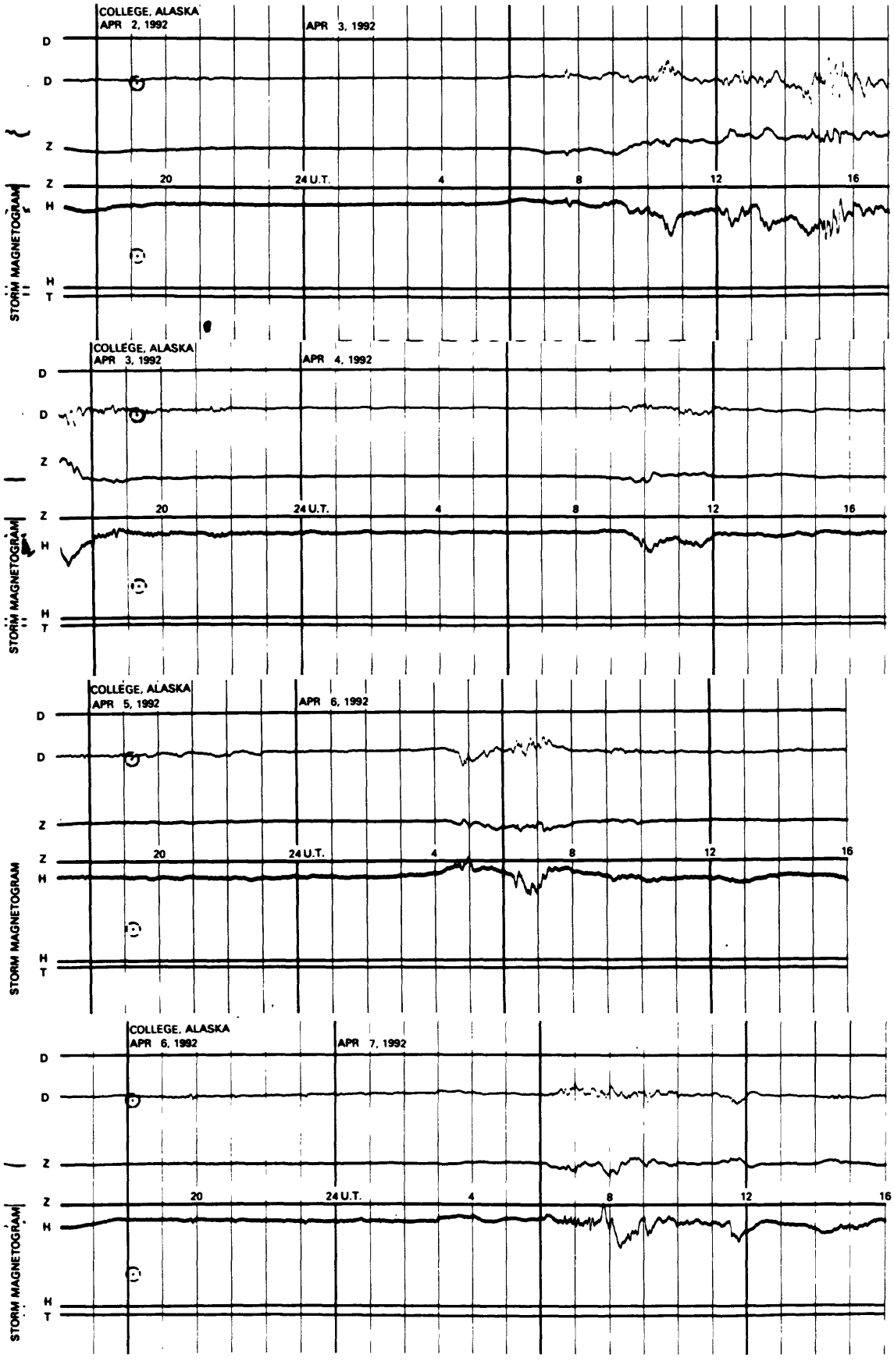


STORM MAGNETOGRAMS



STORM MAGNETOGRAMS