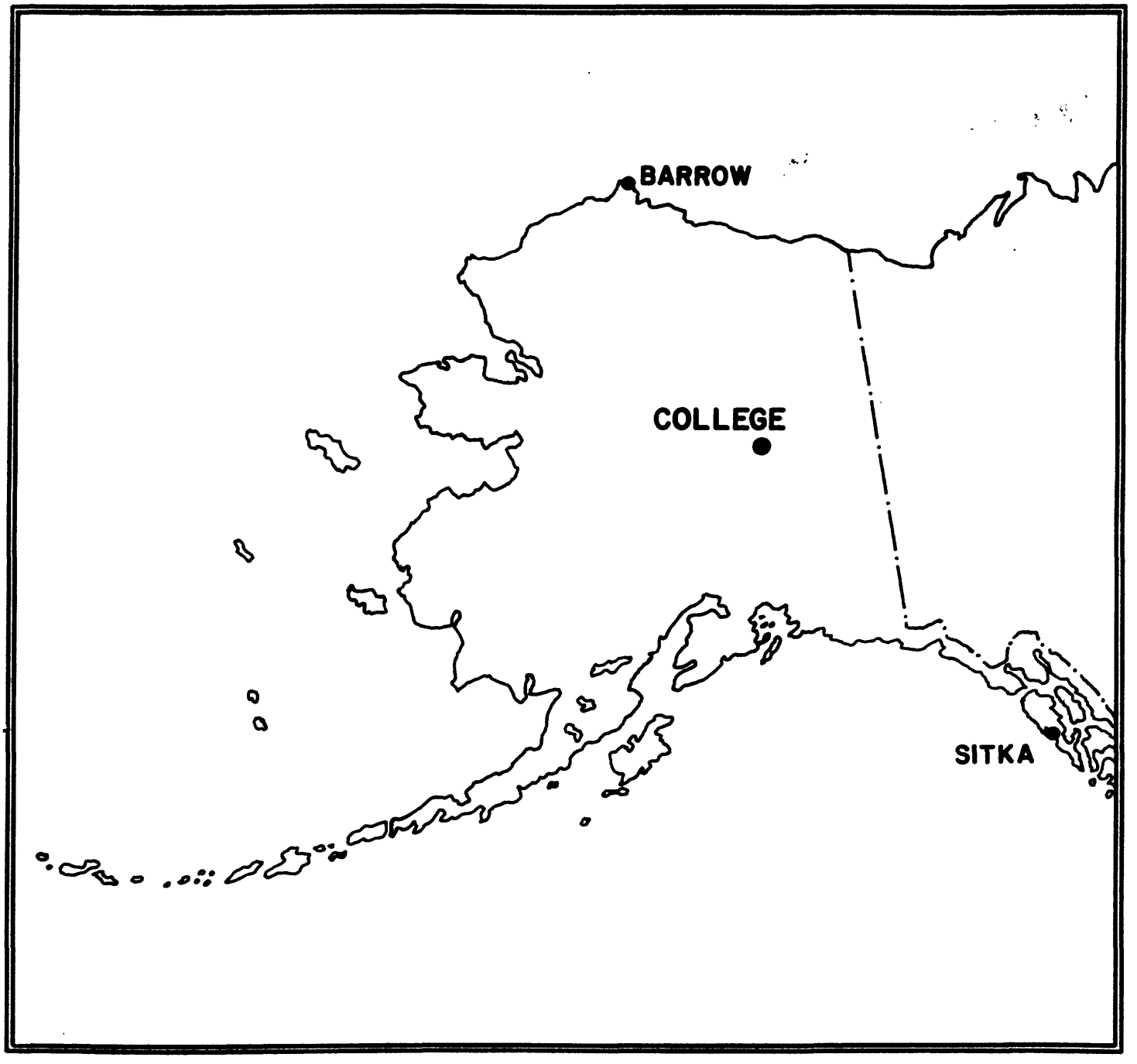
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

AUGUST 1990

OPEN FILE REPORT 90-0300H



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: AUGUST, 1990

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	A_K
1	1	1	4	3	6	6	4	5	30	35
2	4	3	3	2	2	1	2	2	19	11
3	3	1	1	5	5	3	2	3	23	19
4	3	3	2	0	2	2	1	1	14	7
5	2	1	0	1	3	4	2	1	14	8
6	3	2	2	3	1	2	2	2	17	9
7	2	1	1	2	3	2	1	2	14	7
8	3	3	1	1	0	1	0	1	10	5
9	2	2	1	1	1	2	1	0	10	4
10	0	2	1	2	2	1	2	2	12	5
11	2	2	4	2	4	1	1	1	17	11
12	3	4	1	4	2	1	1	1	17	11
13	3	4	4	5	5	5	2	1	29	28
14	2	3	7	5	5	3	3	2	30	37
15	4	2	2	6	6	5	5	3	33	39
16	3	4	5	6	5	5	3	3	34	37
17	4	4	3	2	5	5	4	3	30	27
18	4	4	3	3	3	3	2	2	24	16
19	3	4	4	4	4	3	2	2	26	19
20	3	5	5	6	5	5	3	2	34	39
21	2	2	5	4	5	6	5	5	34	39
22	4	6	6	7	5	5	3	3	39	57
23	3	6	5	7	6	6	6	4	43	69
24	4	5	5	5	5	3	2	1	30	31
25	1	1	1	0	3	2	3	2	13	7
26	1	3	6	6	6	6	6	3	37	54
27	5	4	3	1	3	3	2	2	23	17
28	2	2	0	0	1	1	2	2	10	4
29	2	2	4	4	2	1	3	2	20	15
30	2	3	5	6	5	5	3	3	32	35
31	3	4	3	4	3	2	2	2	23	15

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

d	h	m
1	07	42
26	05	43

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.....	3.68	7.77		(γ/mm)
LOWER LIMIT FOR K = 9	2490	2500		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED John B. Townshend, Chief
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**

AUGUST 1990

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	15	09 XX	..				15	4, 5	6	142	1110	660	16	20
								16	4	6					
		21	06 XX	..				22	4	7	290	1830	1400	22	19
		23	05 XX	..				23	4	7	252	1990	1560	24	16
		26	05 43	SC	-9	+180		26	3, 4, 5, 6, 7	6	216	1260	800	27	09

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: AUGUST 1990

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0001 U.T., 8-1-90	2400 U.T., 8-31-90	1.0'/mm	3.7 γ/mm	26° 34.7' E
H	(SAME)	(SAME)	7.8 γ/mm		12647 γ
Z	(SAME)	(SAME)	7.7 γ/mm		55206 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0001 U.T., 8-1-90	2400 U.T., 8-31-90	7.9'/mm	29.4 γ/mm	
H	(SAME)	(SAME)	43.5 γ/mm		
Z	(SAME)	(SAME)	48.7 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° 51.7' E	12764 γ	55330 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: AUG 8, 9, 10, 25, 28

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
College, Alaska	AUGUST	1990

Jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

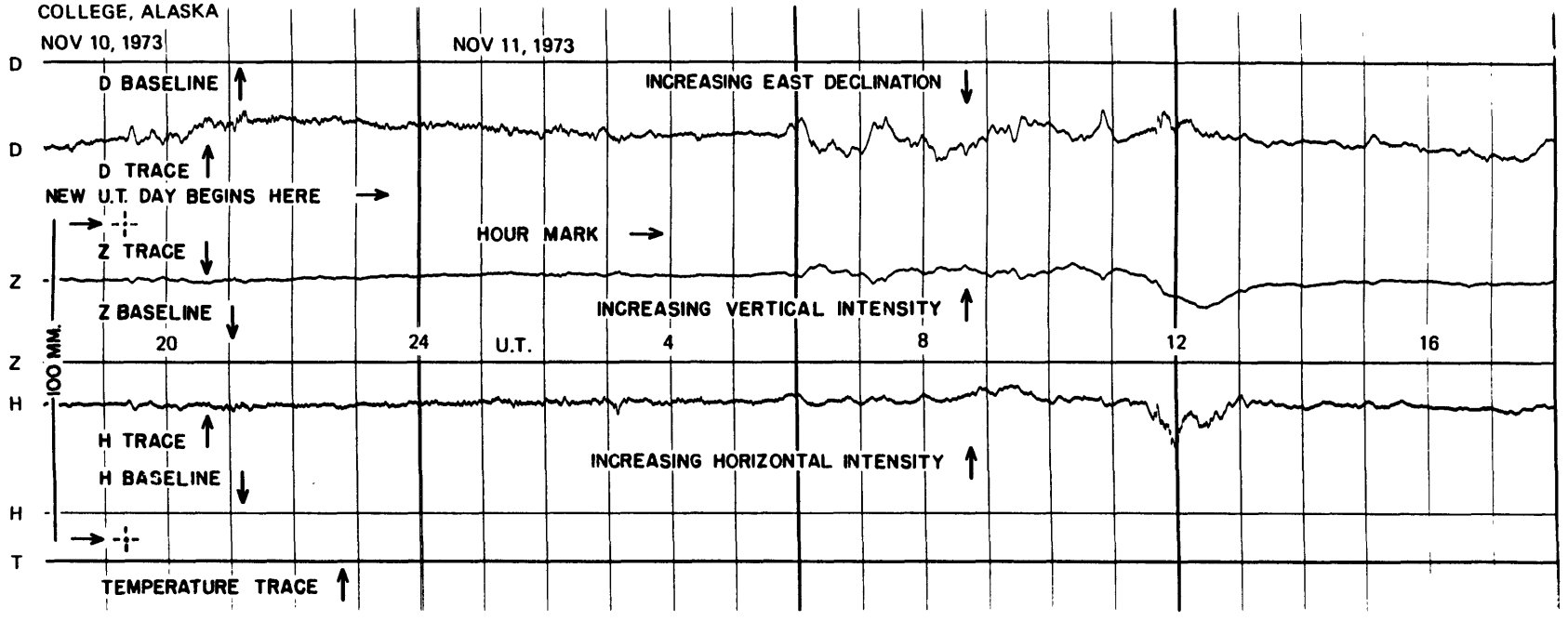
(UNIVERSAL TIME)

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		8	9	10	25	28	8	9	10	25	28	8	9	10	25	28	DAY
A_k		5	4	5	7	4	5	4	5	7	4	5	4	5	7	4	A_k
HOUR	01	72	74	79	130	100	165	170	130	150	140	170	175	159	209	180	01 HOUR
	02	87	77	80	135	110	166	196	150	158	136	161	195	158	213	183	02
	03	80	69	91	124	119	245	230	168	156	151	176	210	160	204	180	03
	04	111	92	113	119	131	300	171	182	172	135	234	214	158	196	185	04
	05	174	140	128	130	128	190	121	204	164	137	230	186	155	200	177	05
	06	139	142	159	189	134	189	149	180	161	132	185	154	169	216	177	06
	07	153	139	148	161	131	194	162	182	170	146	201	149	156	168	174	07
	08	130	148	141	150	138	190	162	172	150	148	175	155	152	183	175	08
	09	198	144	149	147	147	180	170	180	157	150	180	149	153	180	176	09
	10	154	160	150	149	155	165	167	177	154	153	140	152	154	182	177	10
	11	139	153	149	152	161	160	182	190	156	151	145	145	144	176	176	11
	12	147	162	160	154	162	166	201	199	160	149	150	149	127	173	176	12
	13	151	160	192	123	175	168	195	180	143	160	151	152	141	69	178	13
	14	149	171	196	157	202	167	183	199	42	156	149	150	131	114	185	14
	15	183	193	220	163	227	157	157	201	54	161	146	140	163	95	188	15
	16	236	240	260	214	252	170	140	193	90	150	139	123	163	105	182	16
	17	270	292	290	231	273	160	111	178	130	133	151	103	159	139	180	17
	18	313	317	325	302	301	135	102	132	130	130	154	87	148	164	175	18
	19	301	350	325	307	289	123	90	113	150	121	151	65	113	168	170	19
	20	270	298	291	310	258	106	108	132	130	119	151	63	107	185	162	20
	21	219	228	246	193	216	84	107	112	110	107	145	99	110	170	161	21
	22	172	166	150	46	182	88	109	110	91	110	146	129	104	176	165	22
	23	132	111	141	81	149	100	116	115	102	120	146	140	129	200	175	23
	24	95	90	83	94	145	141	120	140	117	127	160	150	140	201	182	24
DAILY SUM		4075	4116	4265	3944	4285	3909	3624	3919	3197	3322	3936	3434	3453	4206	4239	DAILY SUM
DAILY MEAN		170	172	178	164	179	163	151	163	133	138	164	143	144	175	177	DAILY MEAN
MEAN				172					150					161			MEAN

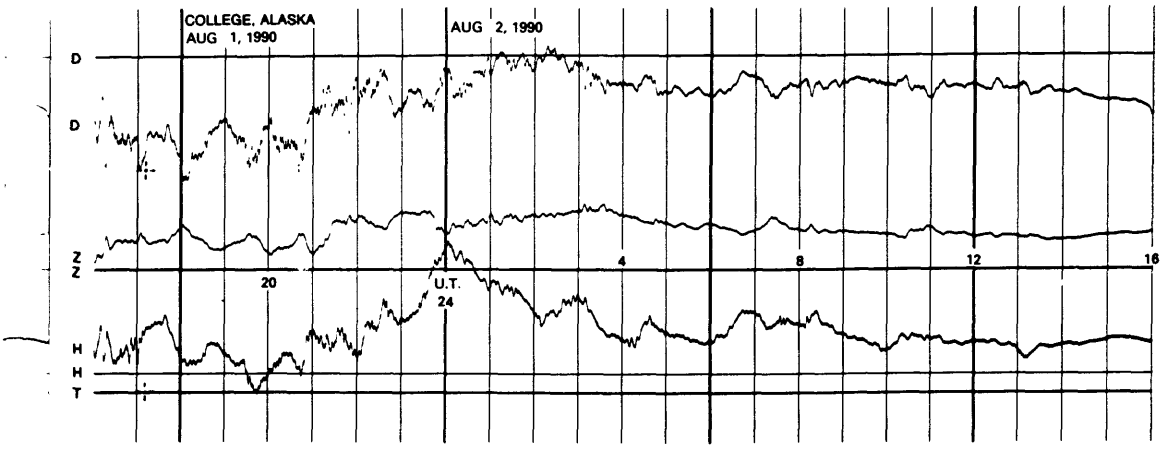
Scaled KVO | Checked

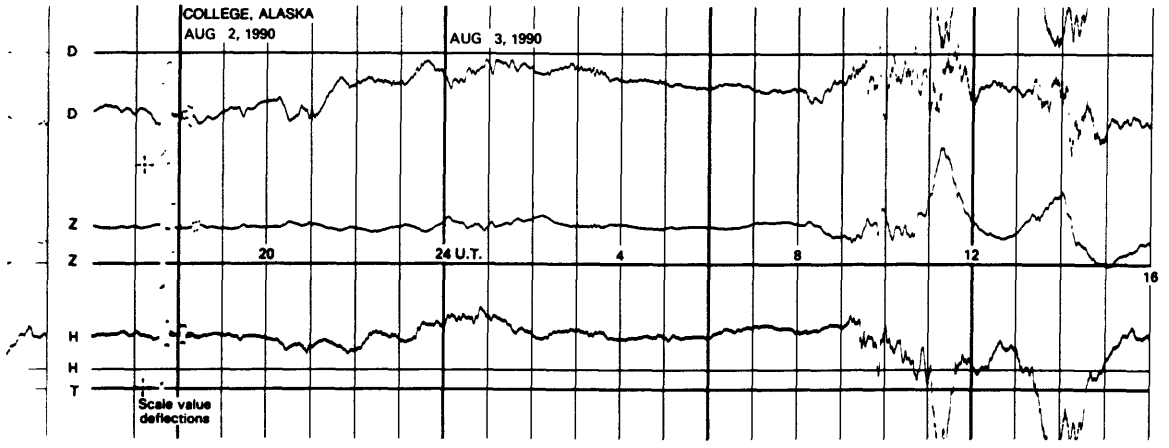
FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

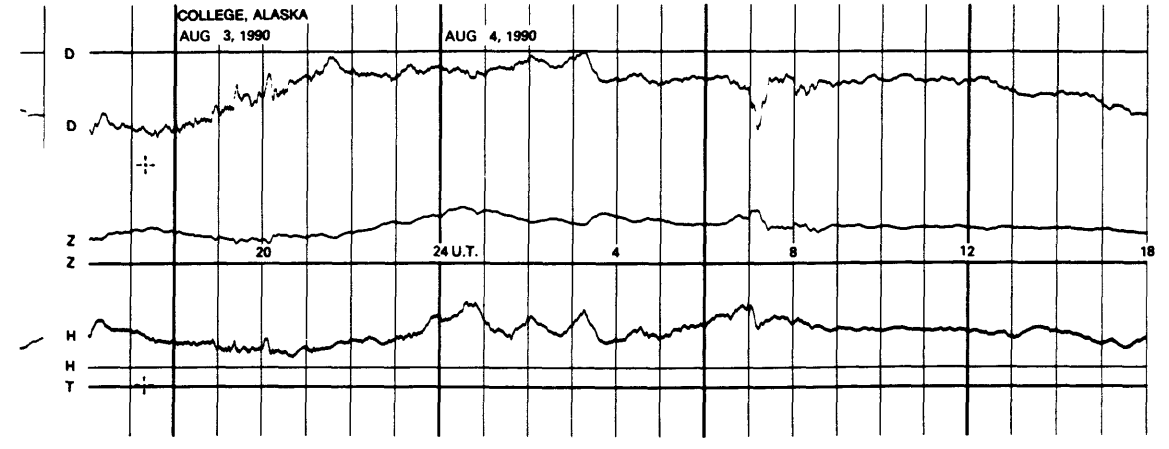


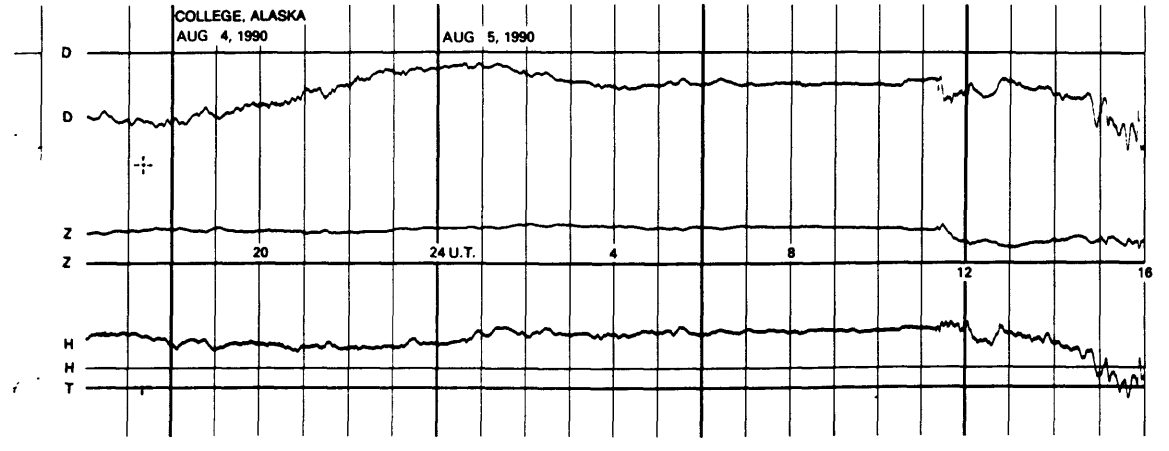
SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS









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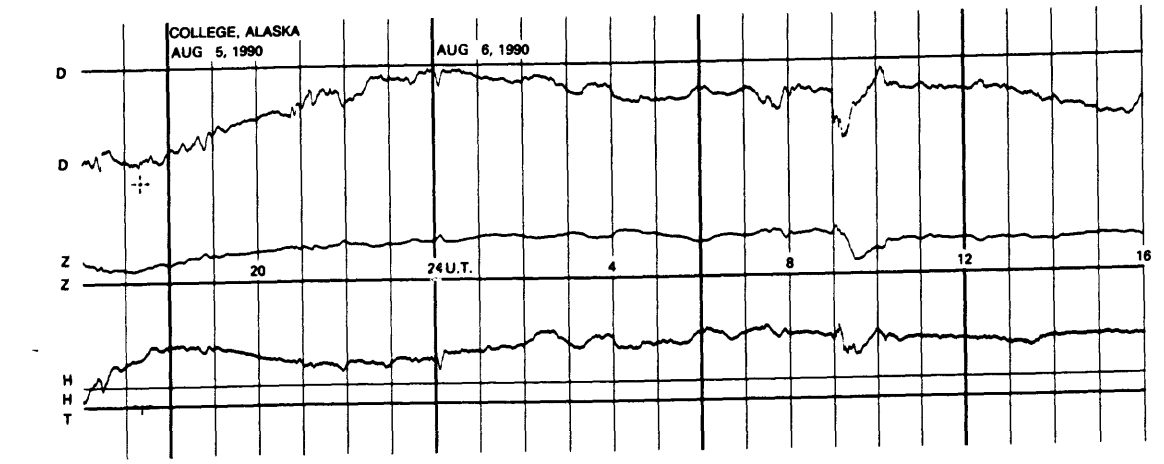

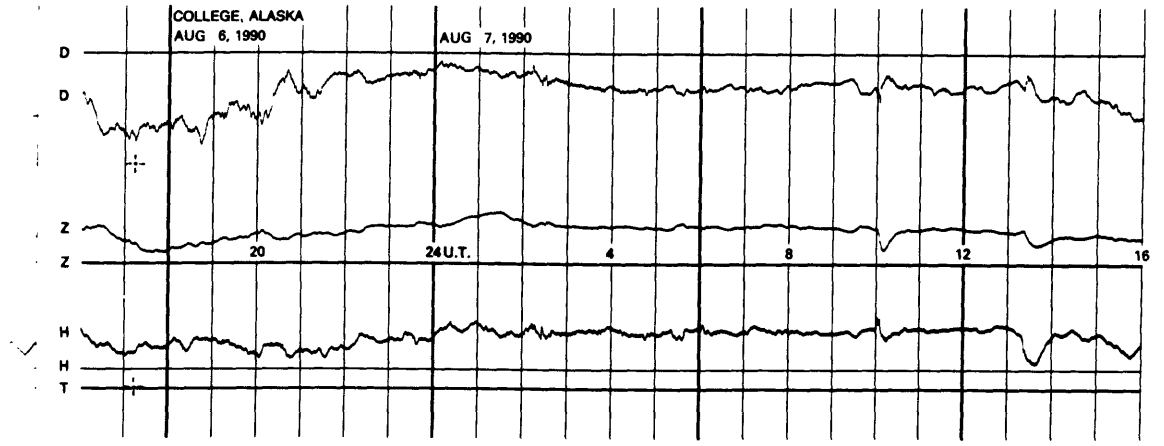

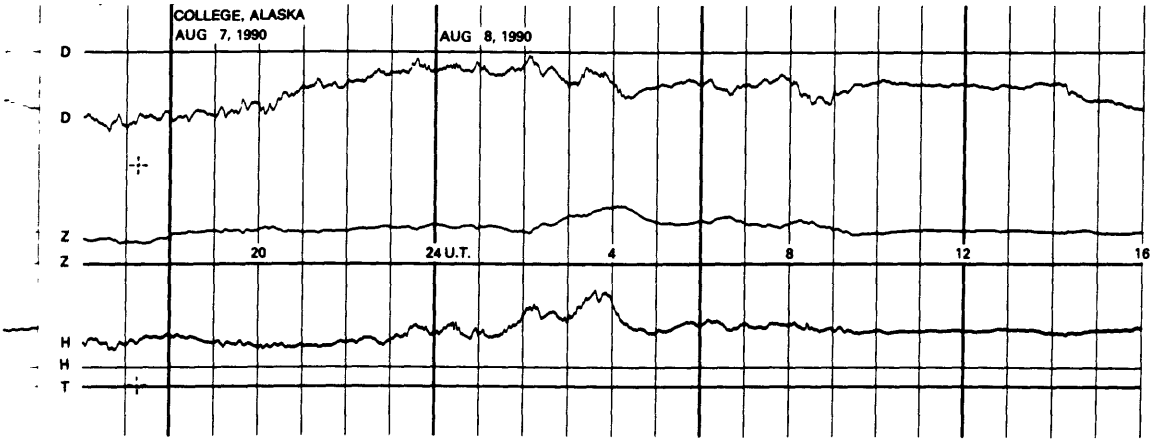

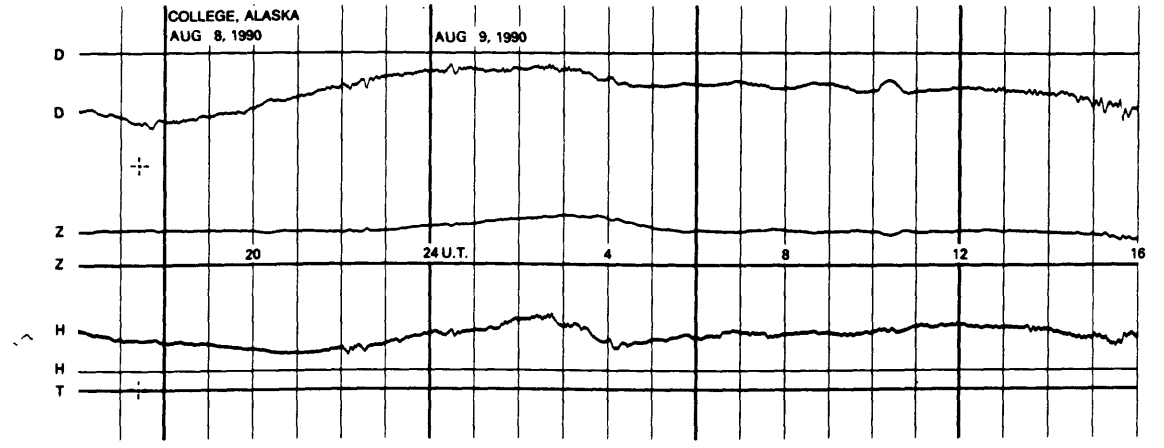

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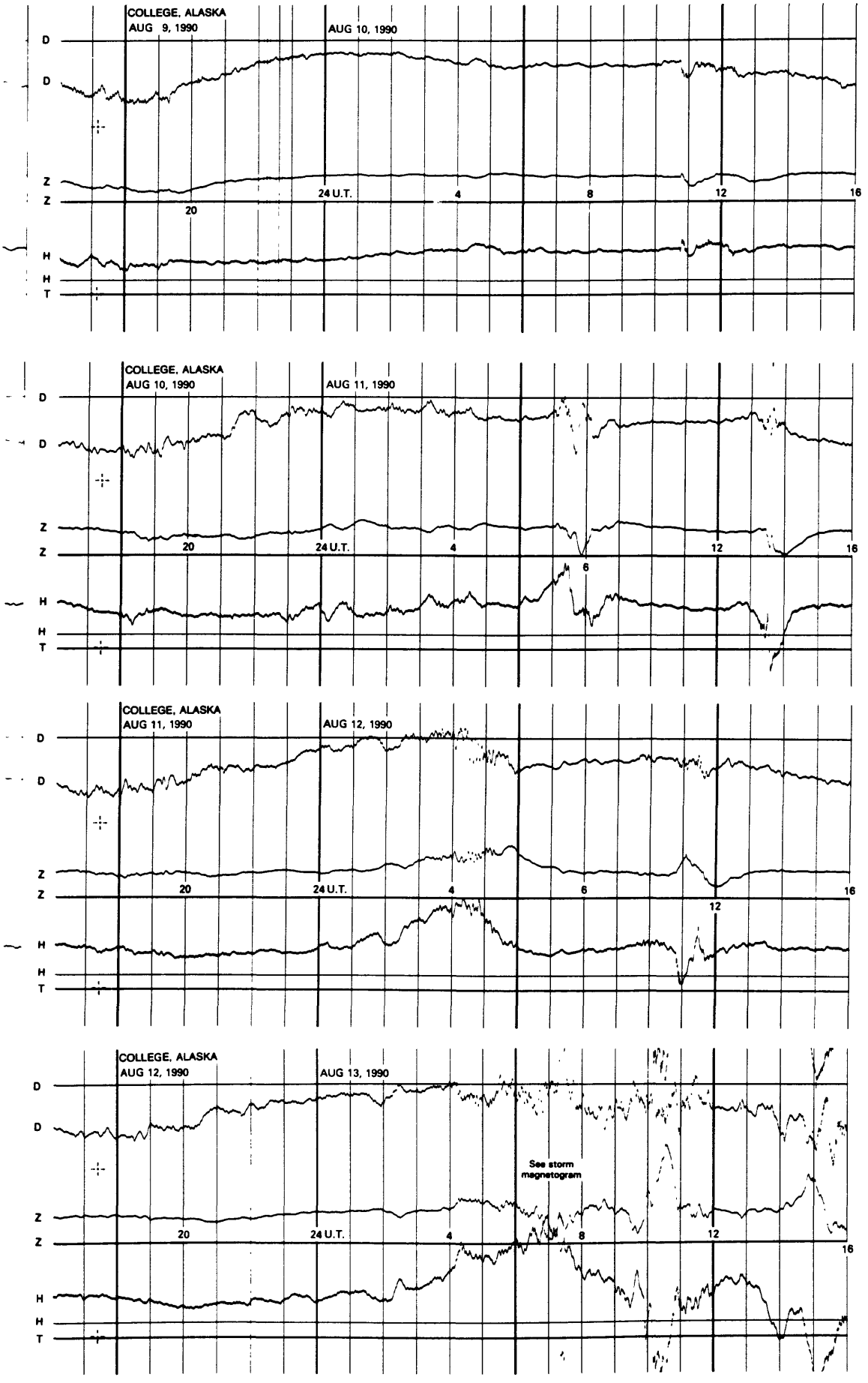

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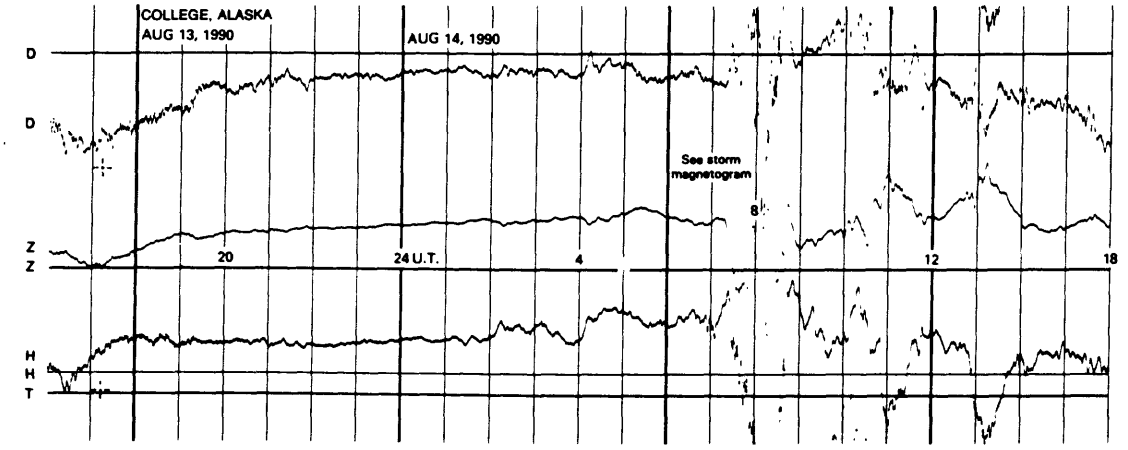

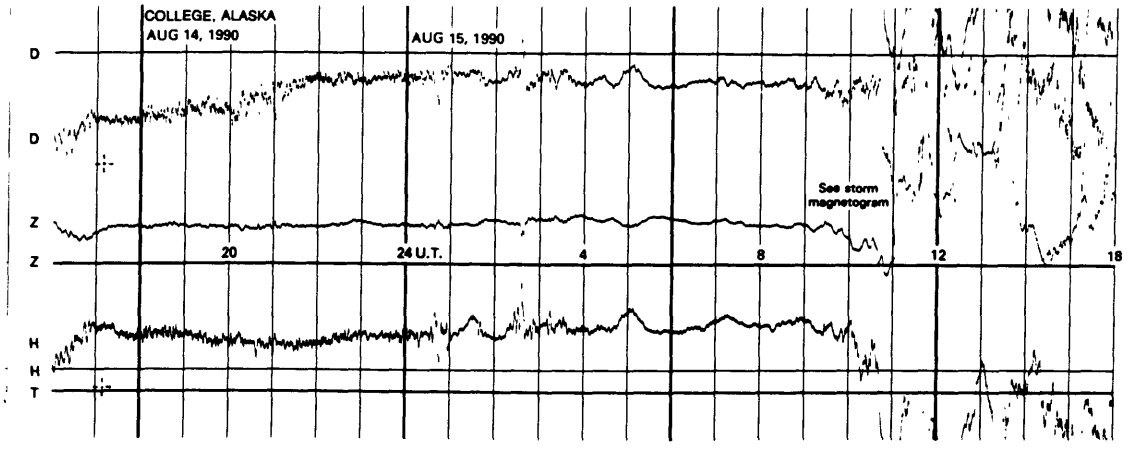

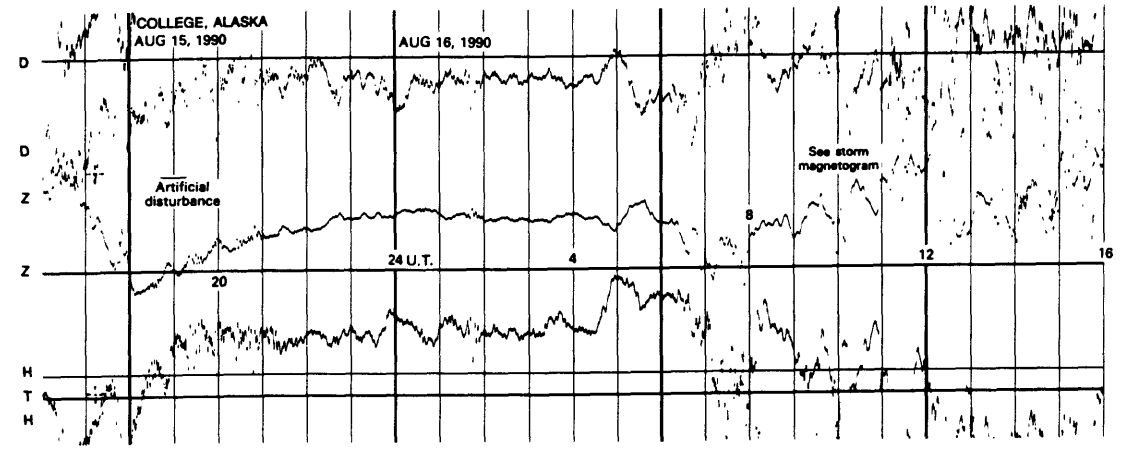

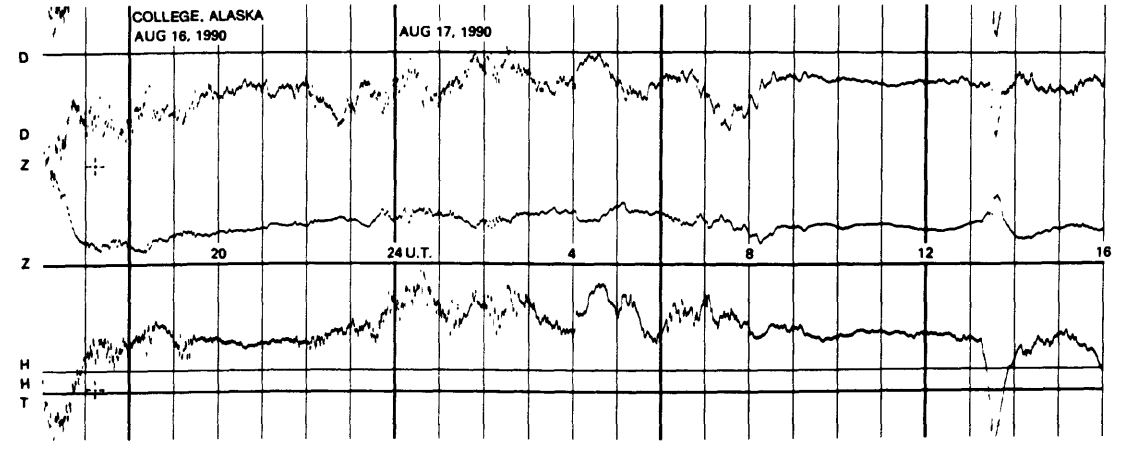

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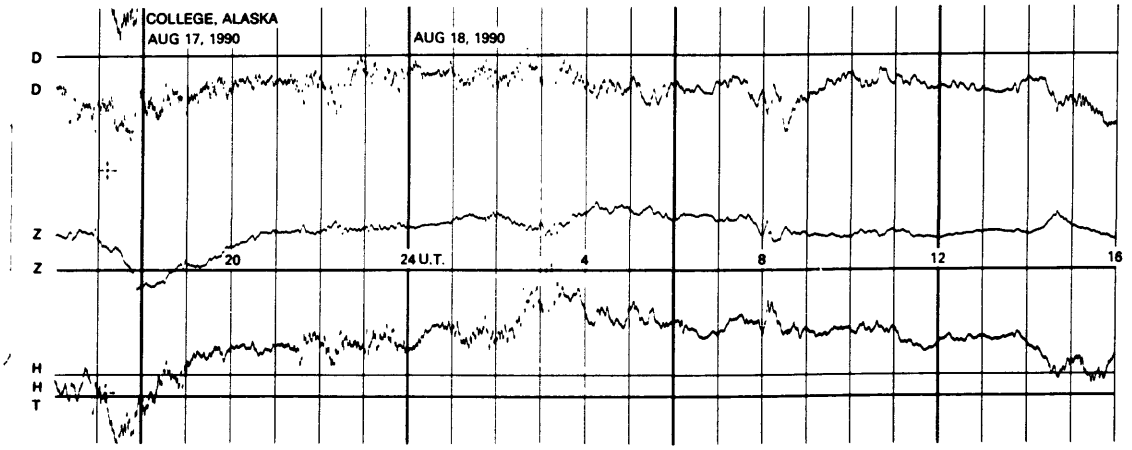

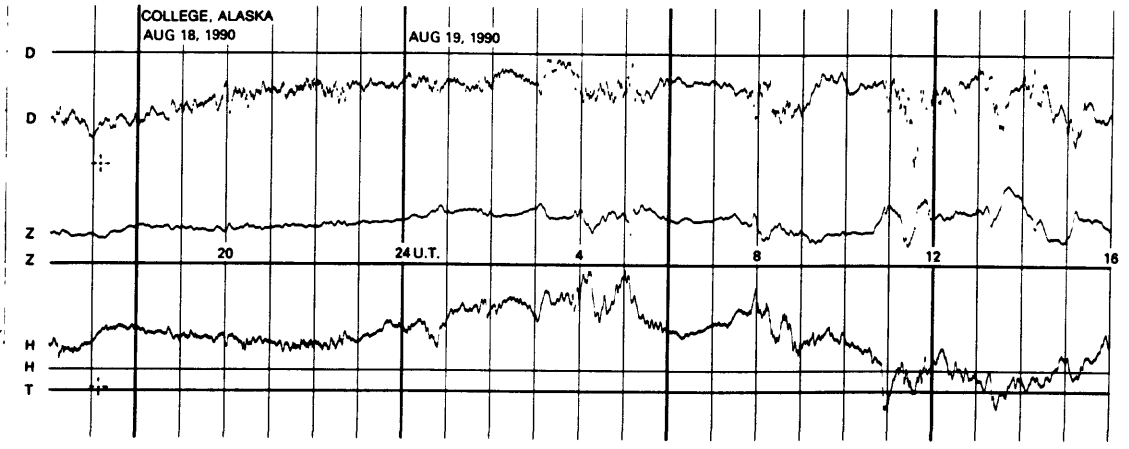

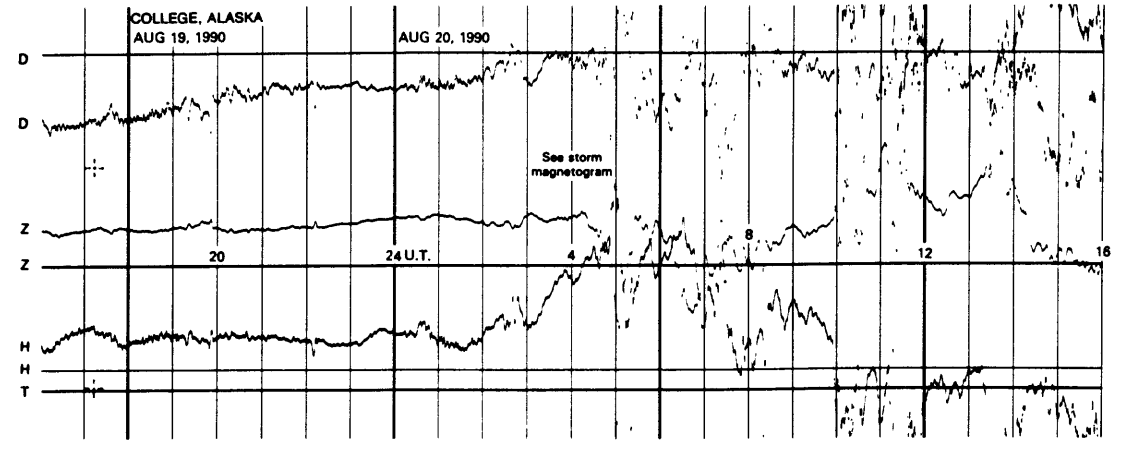

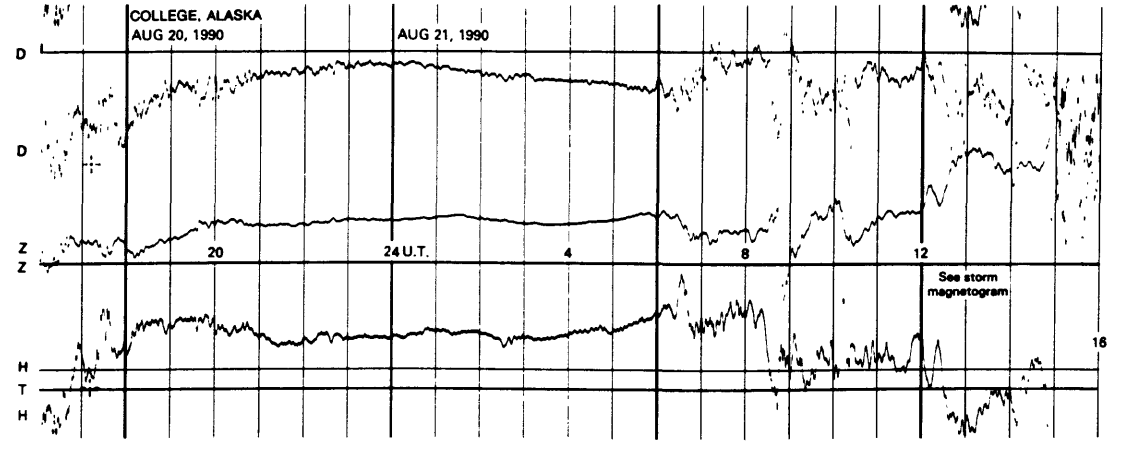

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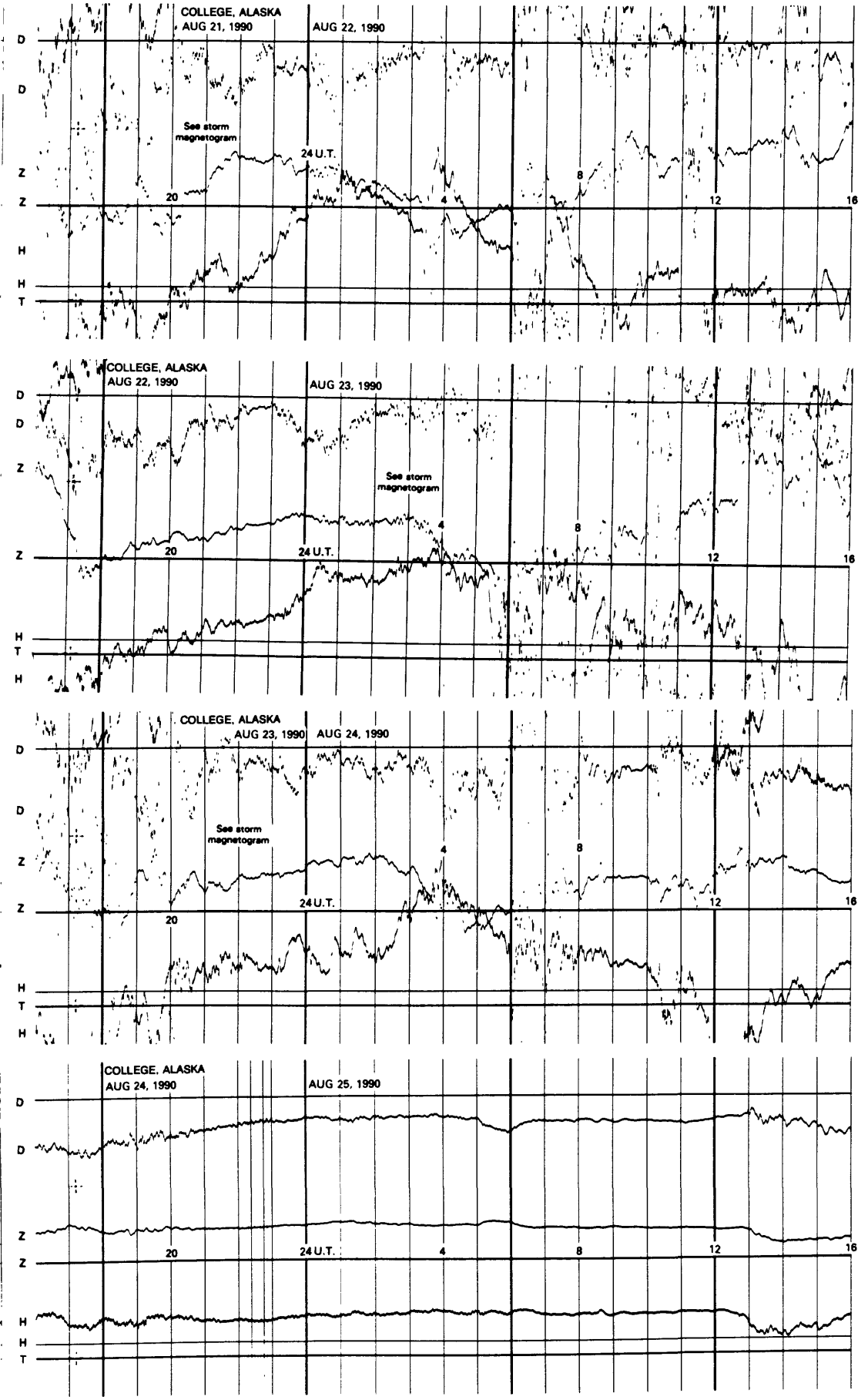
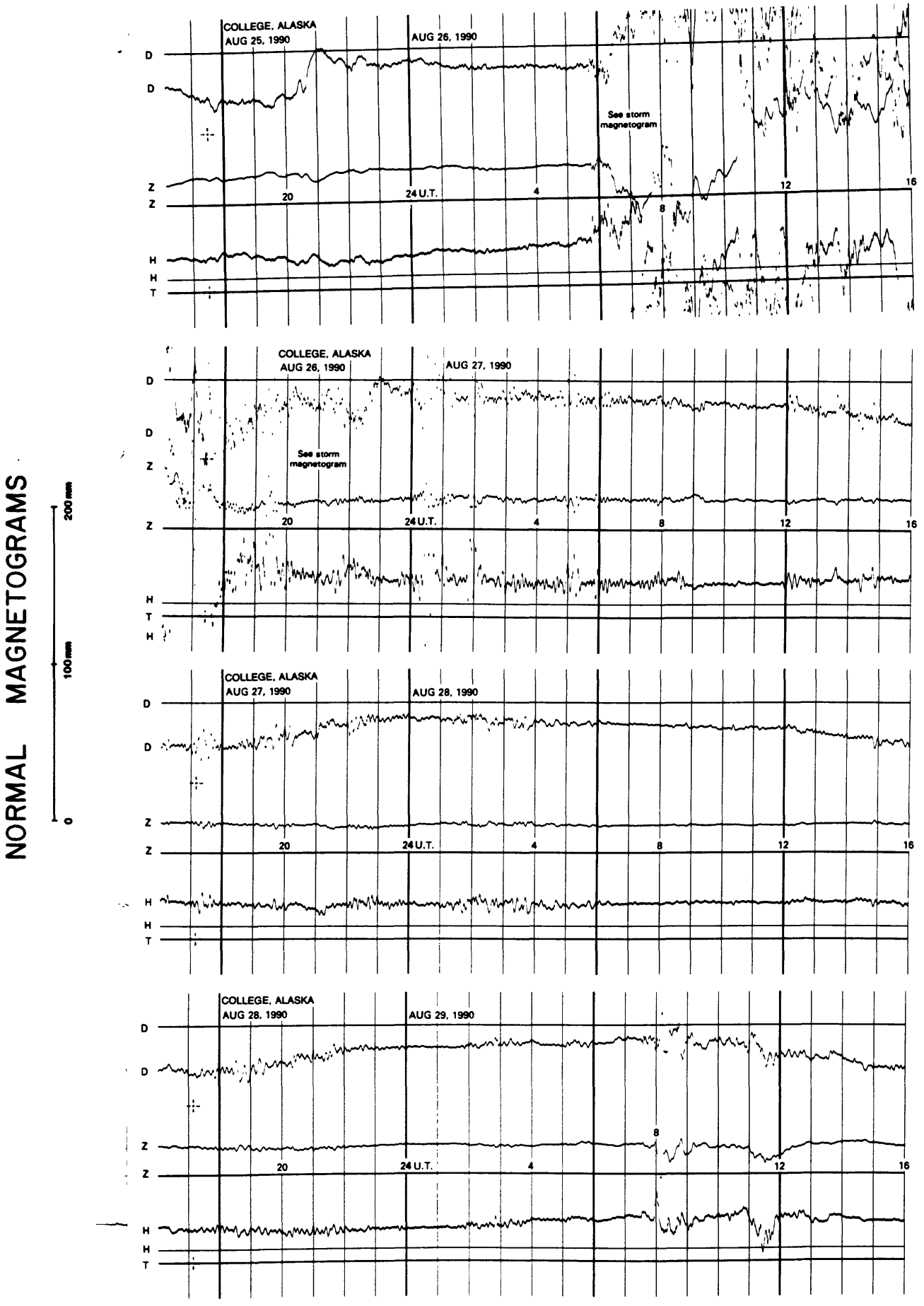


200 mm
100 mm
0

NORMAL MAGNETOGRAMS



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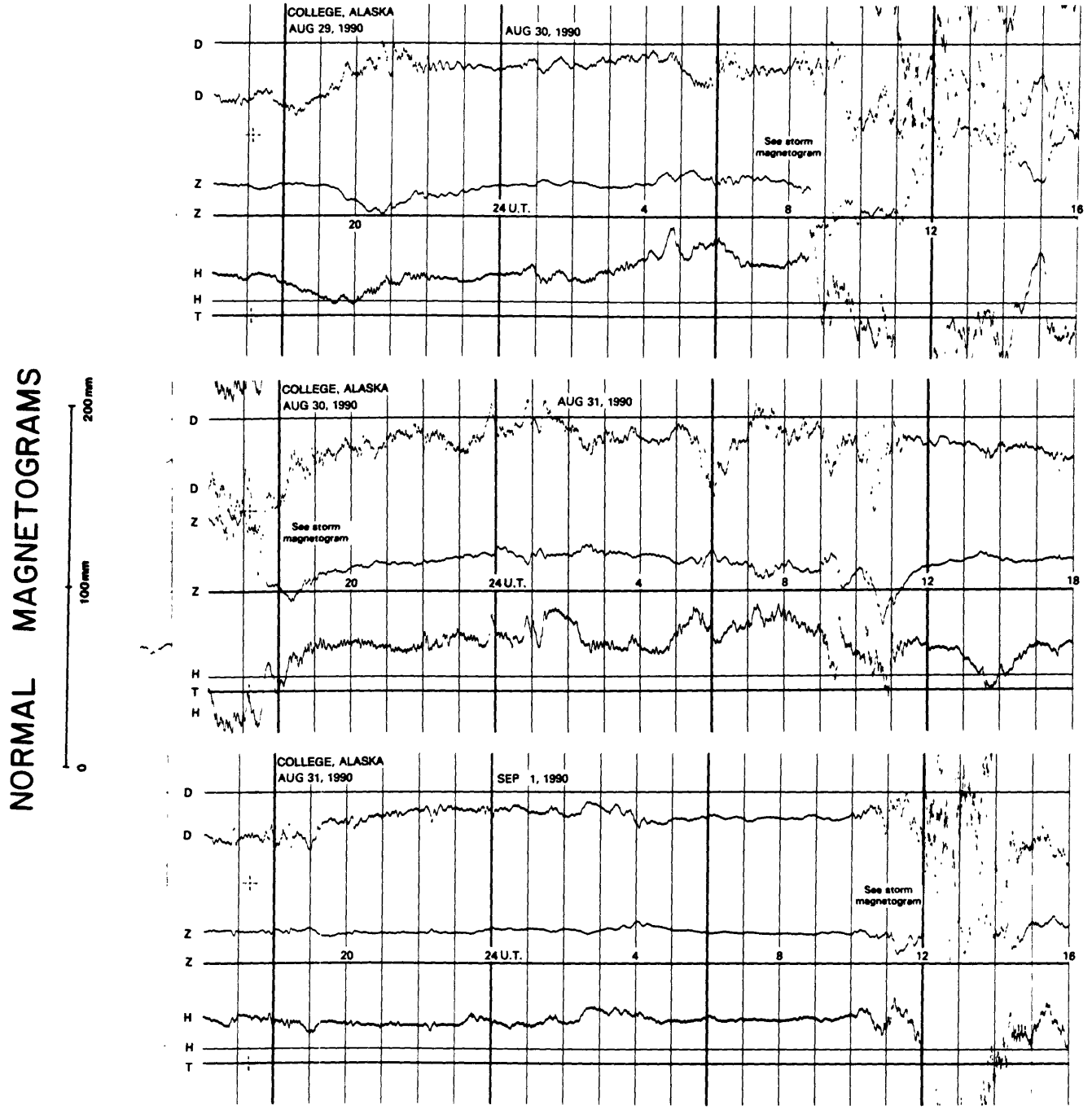
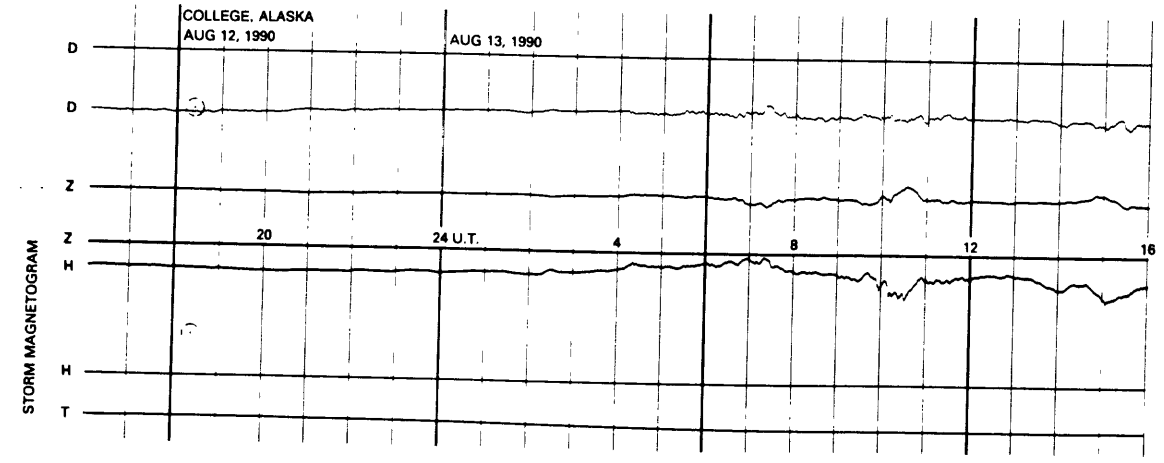
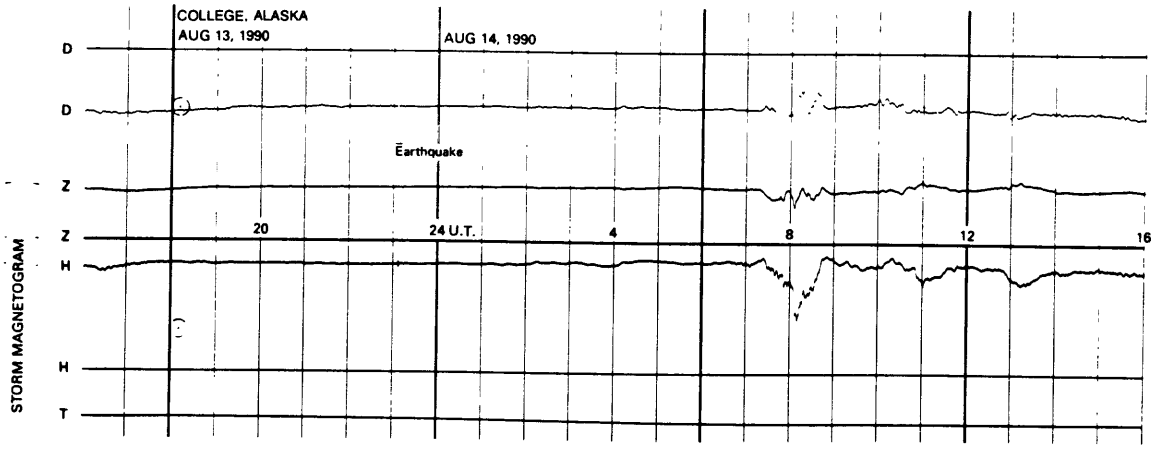
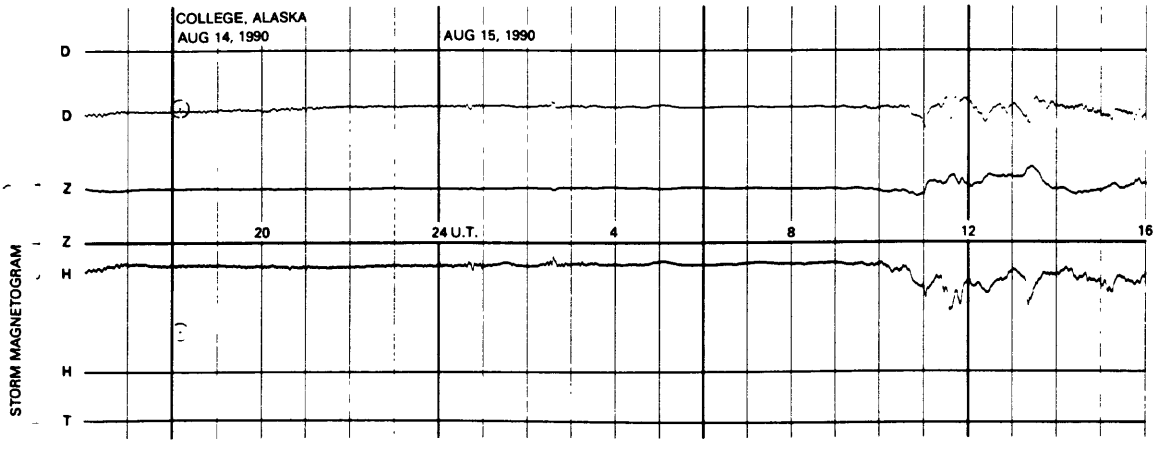
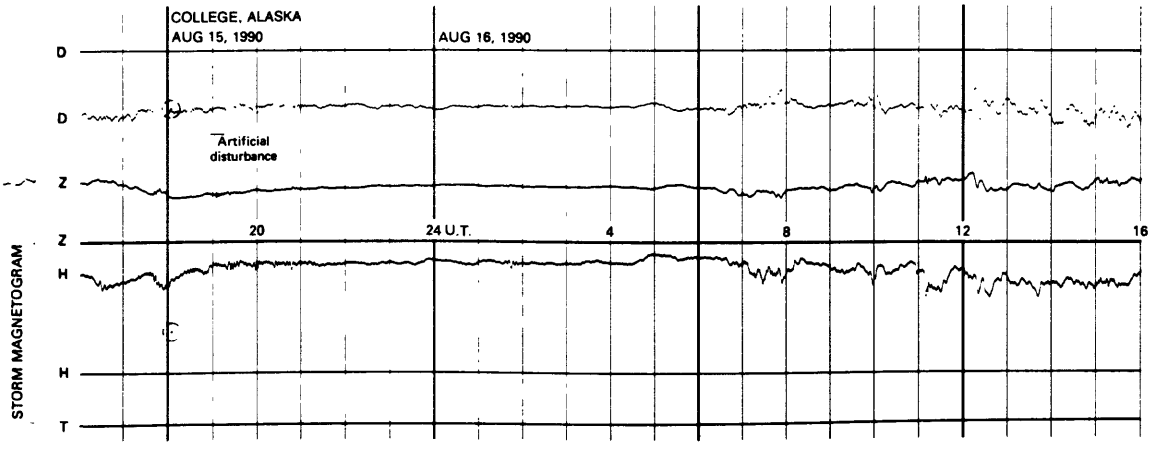


STORM MAGNETOGRAMS

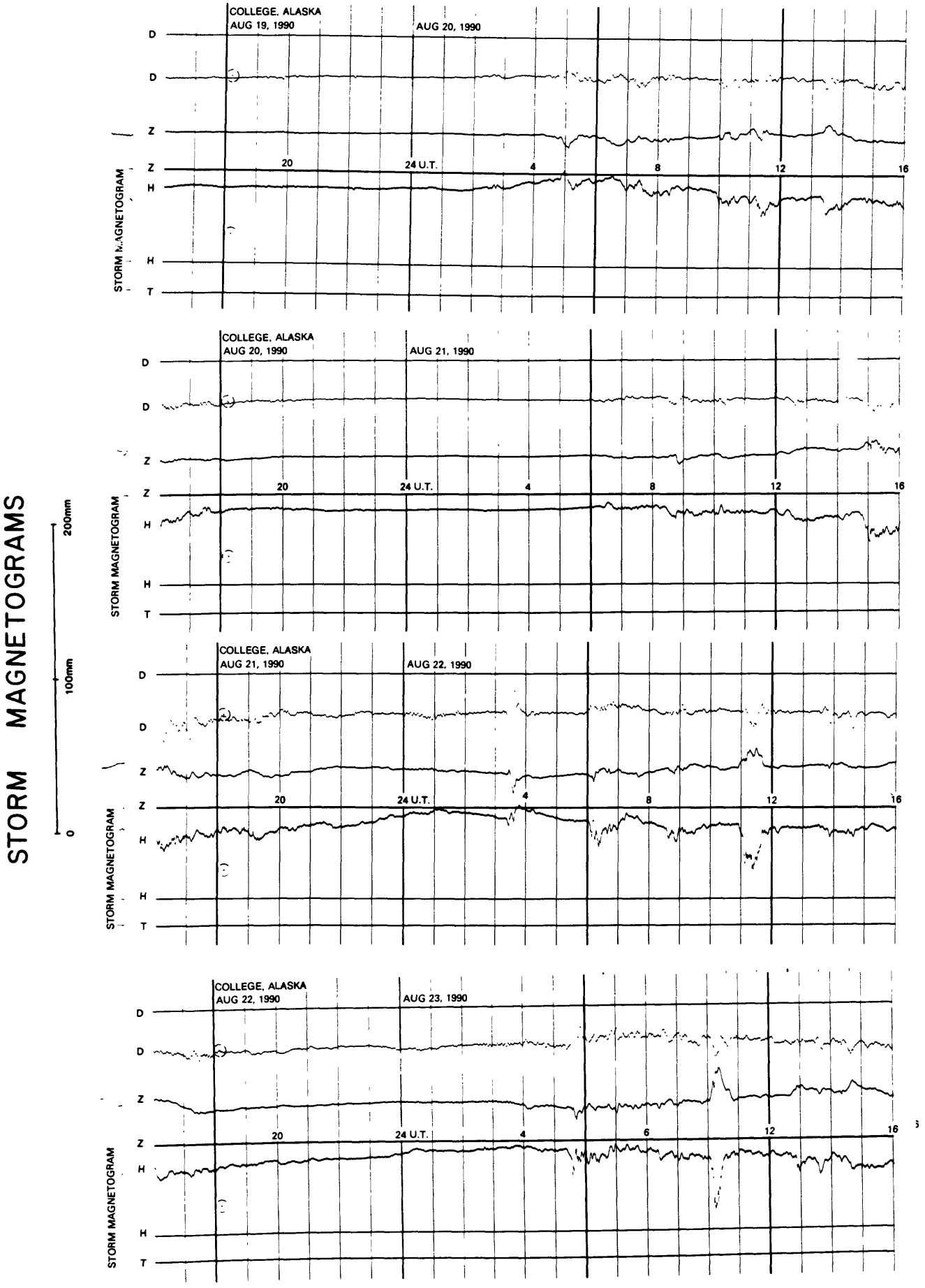




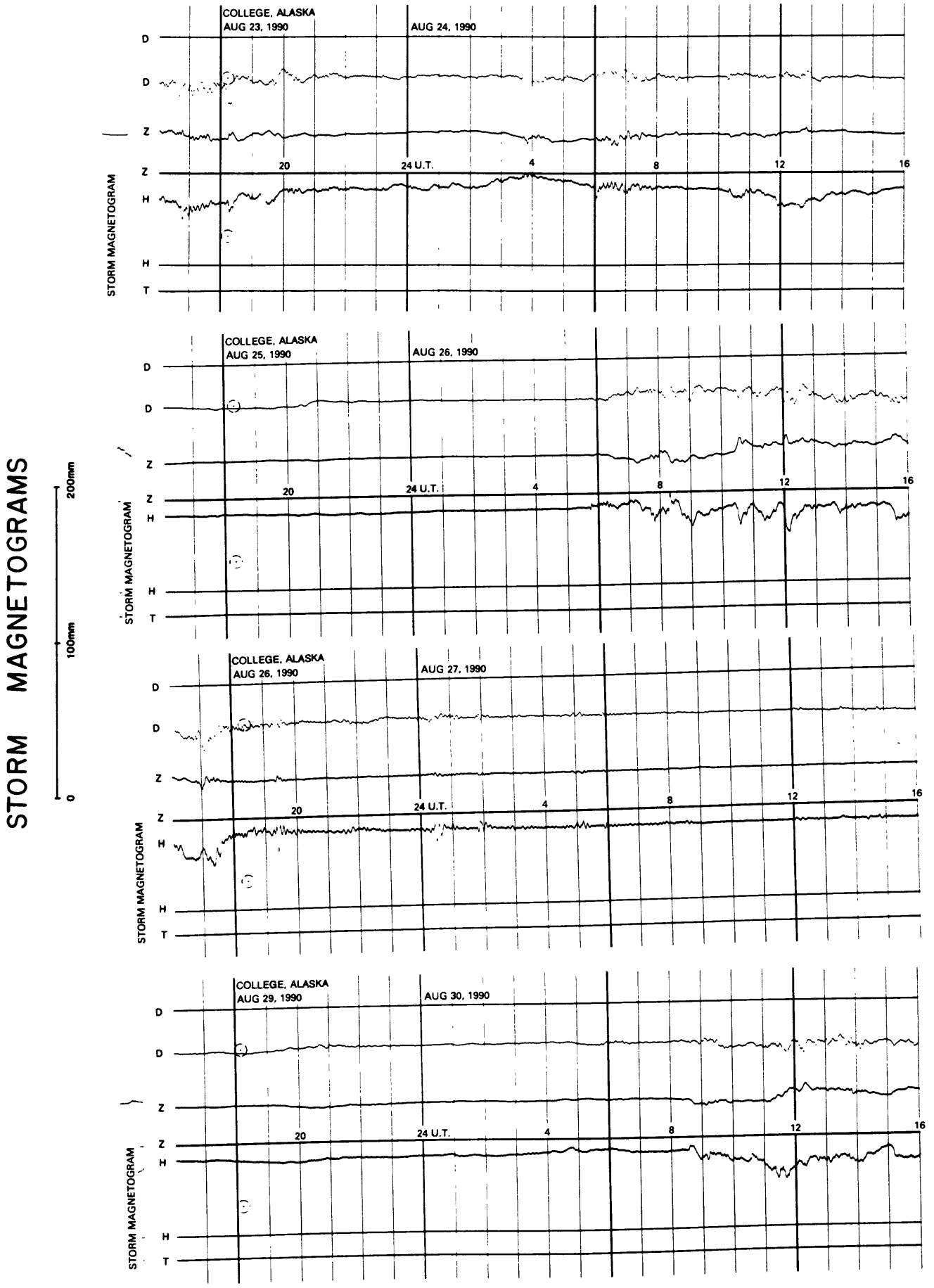




STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS