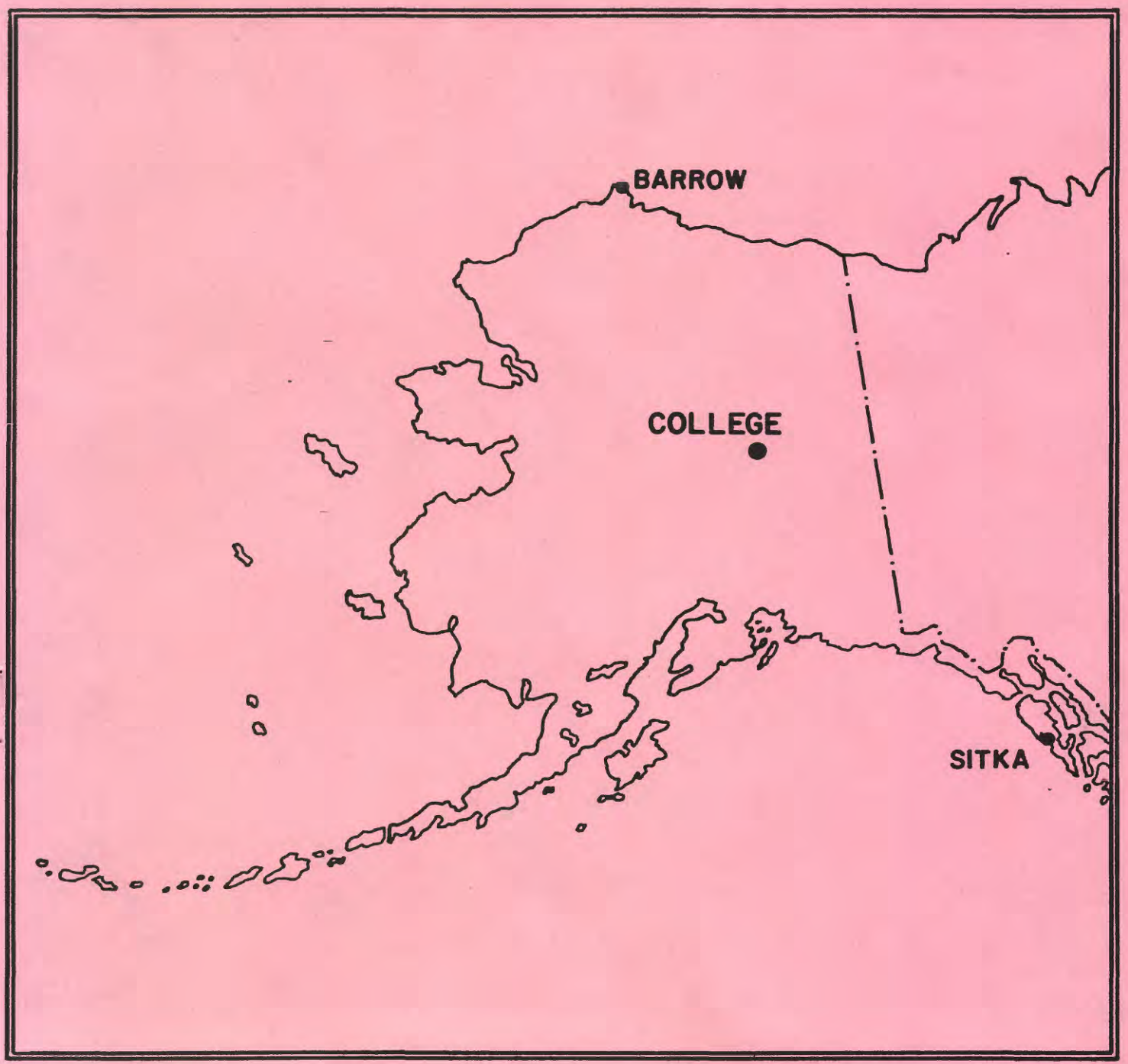
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

AUGUST 1986

OPEN FILE REPORT 86-0300H



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: 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, whic 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 repor 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 tent of mm with the decimal point omitted. The user of the scalings should keep in mind that the tabular values a hourly means and if he is interested in the detailed morphology of the magnetic field, he should refer dire 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 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: August 1986

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	2	2	3	2	2	1	1	2	15	07
2	1	2	3	2	2	0	0	1	11	05
3	2	4	4	7	4	4	3	3	31	36
4	4	4	4	5	5	3	2	2	29	26
5	2	3	2	3	3	1	2	2	18	10
6	2	2	3	0	1	2	1	1	12	06
7	1	0	1	1	1	1	1	2	08	03
8	2	2	3	3	4	4	2	1	21	14
9	1	2	0	1	3	3	3	2	15	08
10	2	1	2	2	2	1	1	1	12	05
11	2	2	2	5	5	4	1	0	21	18
12	1	4	6	5	3	2	1	1	23	23
13	1	3	4	6	7	3	1	2	27	36
14	1	1	0	1	2	2	1	1	09	04
15	1	2	1	5	4	1	1	1	16	12
16	1	1	1	2	0	0	1	1	07	03
17	1	2	0	2	1	1	0	0	07	03
18	1	1	0	0	0	0	0	0	02	01
19	1	0	2	5	4	1	1	0	14	11
20	1	1	2	2	3	4	4	3	20	13
21	3	3	5	6	7	6	2	3	35	50
22	3	5	6	5	7	4	3	3	36	49
23	2	4	6	5	5	5	3	3	33	36
24	3	3	4	3	4	5	5	3	30	26
25	4	4	5	5	3	2	2	2	27	23
26	3	3	4	4	6	3	1	1	25	23
27	3	2	4	5	7	2	1	2	26	32
28	2	2	2	4	6	4	3	2	25	22
29	3	4	5	5	5	5	2	2	31	31
30	3	3	4	5	5	3	3	3	29	25
31	5	5	2	4	3	3	2	2	26	22

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

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973-761-857

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY	
College, Alaska	
MONTH	YEAR
August	1986

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
			OUTSTANDING MAGNETIC EFFECTS ARE DISCONTINUED STARTING AUGUST 1, 1986 AND WILL NOT APPEAR IN THIS REPORT IN THE FUTURE.

IDENTIFIED BY:	VERIFIED BY: JBT

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 80302 U.S.A.

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA

AUGUST 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	20	1351	s.c.*	..	+20	..	21	5	7	198	1490	1230	21	20

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T. 8-1-86	2400 U.T. 8-31-86	1.0'/mm	3.7 γ/mm	27° 16.3' E
H	0000 U.T. 8-1-86	2400 U.T. 8-31-86	7.8 γ/mm		12688 γ
Z	0000 U.T. 8-1-86	2400 U.T. 8-31-86	7.7 γ/mm		55172 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T. 8-1-86	2400 U.T. 8-31-86	7.9'/mm	29.5 γ/mm	23° 44.8' E
H	0000 U.T. 8-1-86	2400 U.T. 8-31-86	43.8 γ/mm		10725 γ
Z	0000 U.T. 8-1-86	2400 U.T. 8-31-86	48.7 γ/mm		54112 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION
	FROM	TO	SCALE VALUE
D			
H			
Z			

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 29.4' E	12871 γ	55318 γ

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: AUG 7, 14, 16, 17, 18,

U.S. Dept. of Interior
Geological Survey

Observatory	Month	Year
COLLEGE ALASKA	AUGUST	1986

jep-CO - 1/86

MAGNETOGRAM HOURLY SCALINGS - FIVE QUIETEST DAYS

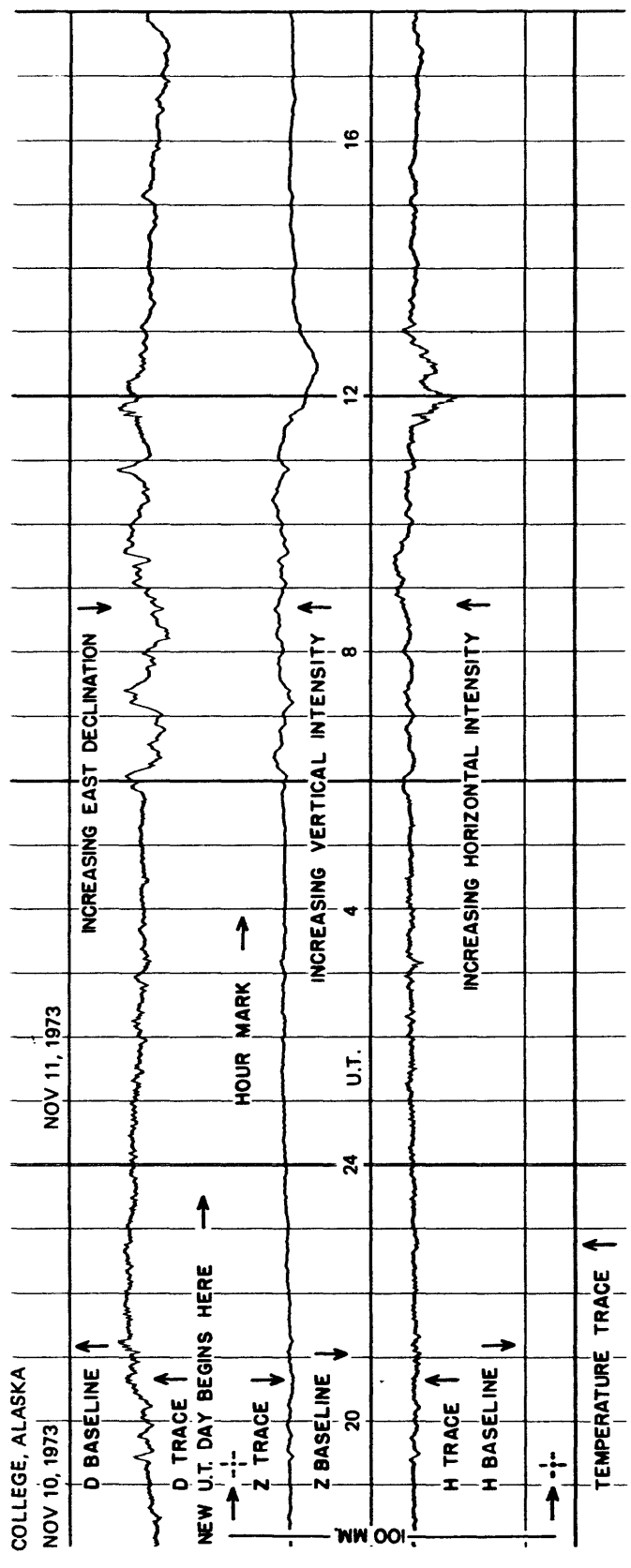
(UNIVERSAL TIME)

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		07	14	16	17	18	07	14	16	17	18	07	14	16	17	18	DAY	
A_k		03	04	03	03	01	03	04	03	03	01	03	04	03	03	01	A_k	
HOUR	01	80	57	73	70	68	220	227	220	234	228	190	201	221	189	193	01	HOUR
	02	80	68	79	71	78	230	241	239	230	232	192	205	221	189	189	02	
	03	90	90	82	77	84	239	242	231	243	238	195	206	214	190	190	03	
	04	100	110	101	78	87	242	240	224	248	240	195	205	210	202	191	04	
	05	104	119	116	79	93	244	240	235	234	247	190	210	199	207	193	05	
	06	107	122	110	115	101	249	239	244	254	249	191	210	198	235	199	06	
	07	100	116	105	100	116	259	246	248	247	243	200	201	199	208	210	07	
	08	103	110	97	106	99	259	241	260	240	247	220	200	208	203	200	08	
	09	94	100	110	99	103	272	247	259	248	247	232	203	224	196	200	09	
	10	112	136	102	108	107	268	251	260	256	247	232	200	210	208	199	10	
	11	106	112	107	129	112	258	270	239	251	249	220	191	181	190	195	11	
	12	120	124	112	147	119	250	259	241	230	257	211	200	144	171	197	12	
	13	133	139	122	168	152	244	224	247	236	248	205	152	183	138	190	13	
	14	162	200	152	155	158	240	223	240	249	249	201	136	190	149	189	14	
	15	188	221	176	177	179	221	250	241	250	241	190	168	198	174	186	15	
	16	232	239	189	197	213	230	249	238	248	239	146	181	199	184	185	16	
	17	250	235	221	218	230	249	240	231	240	242	162	187	196	188	188	17	
	18	244	209	244	215	220	227	208	220	219	237	181	173	191	191	189	18	
	19	230	196	223	207	201	212	210	208	209	225	184	159	190	190	190	19	
	20	184	176	184	191	170	203	211	204	201	210	181	157	190	189	190	20	
	21	148	142	144	148	139	200	211	208	200	201	181	162	179	181	190	21	
	22	109	90	99	108	118	209	194	221	208	199	181	170	178	181	198	22	
	23	94	54	85	77	106	211	204	230	218	199	190	180	179	188	199	23	
	24	65	50	76	72	90	222	215	239	222	207	191	188	183	190	198	24	
DAILY SUM		3235	3015	3109	3112	3143	5652	5581	5627	5615	5621	4661	4445	4685	4531	4648	DAILY SUM	
DAILY MEAN		135	134	130	130	131	236	233	234	234	234	194	185	195	189	194	DAILY MEAN	
MEAN				132					234					191			MEAN	

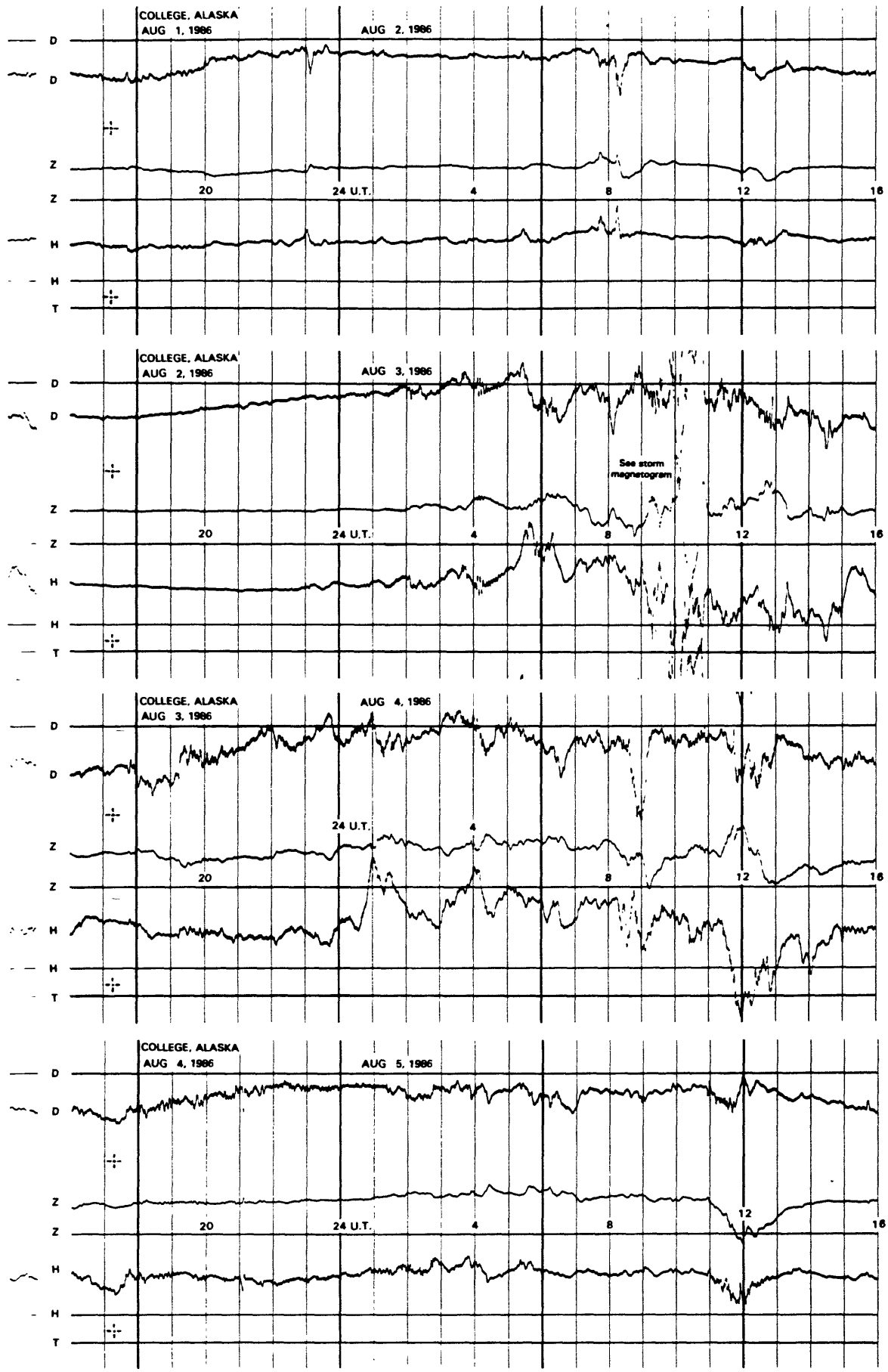
Scaled JEP | Checked HKR

FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

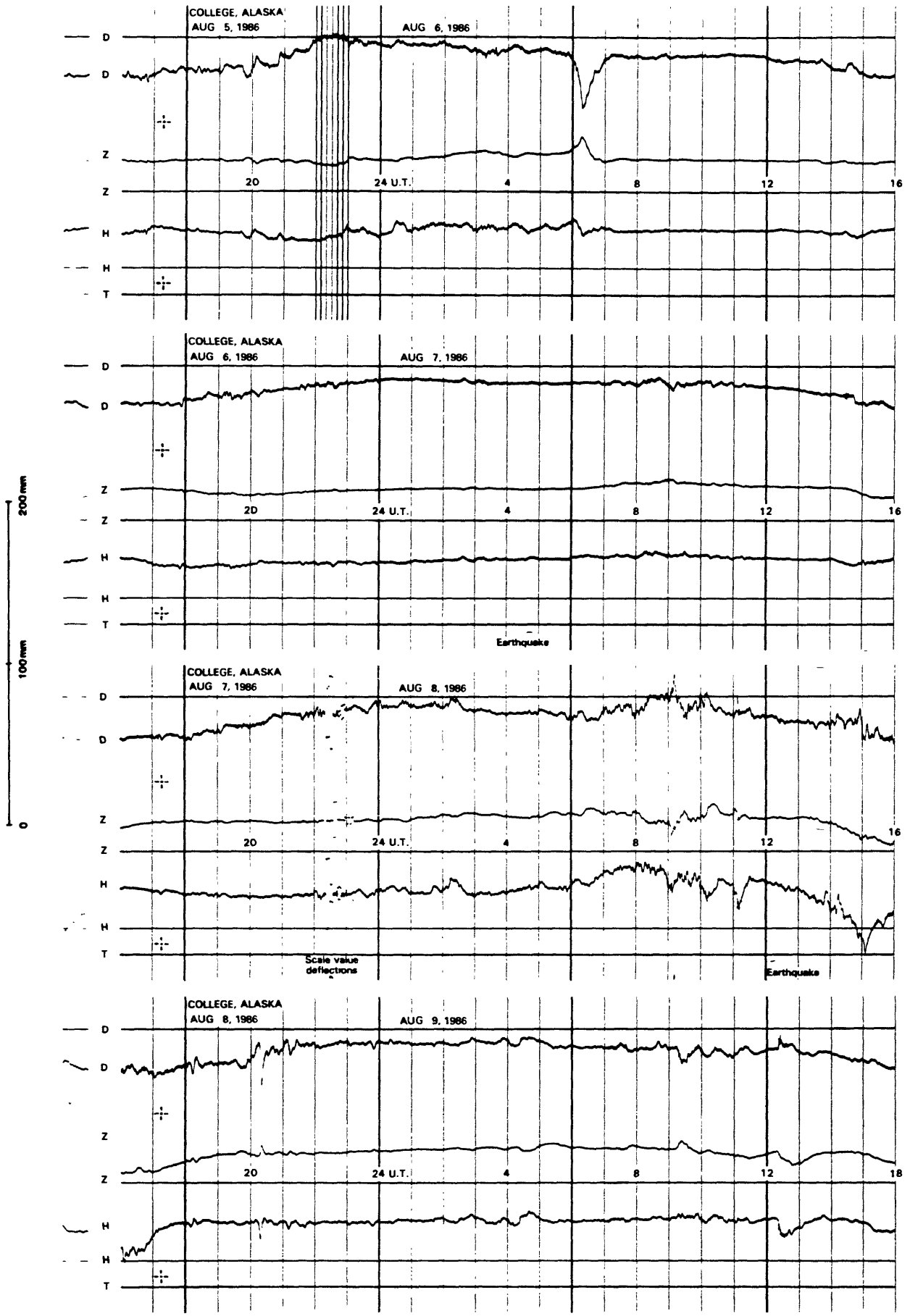


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

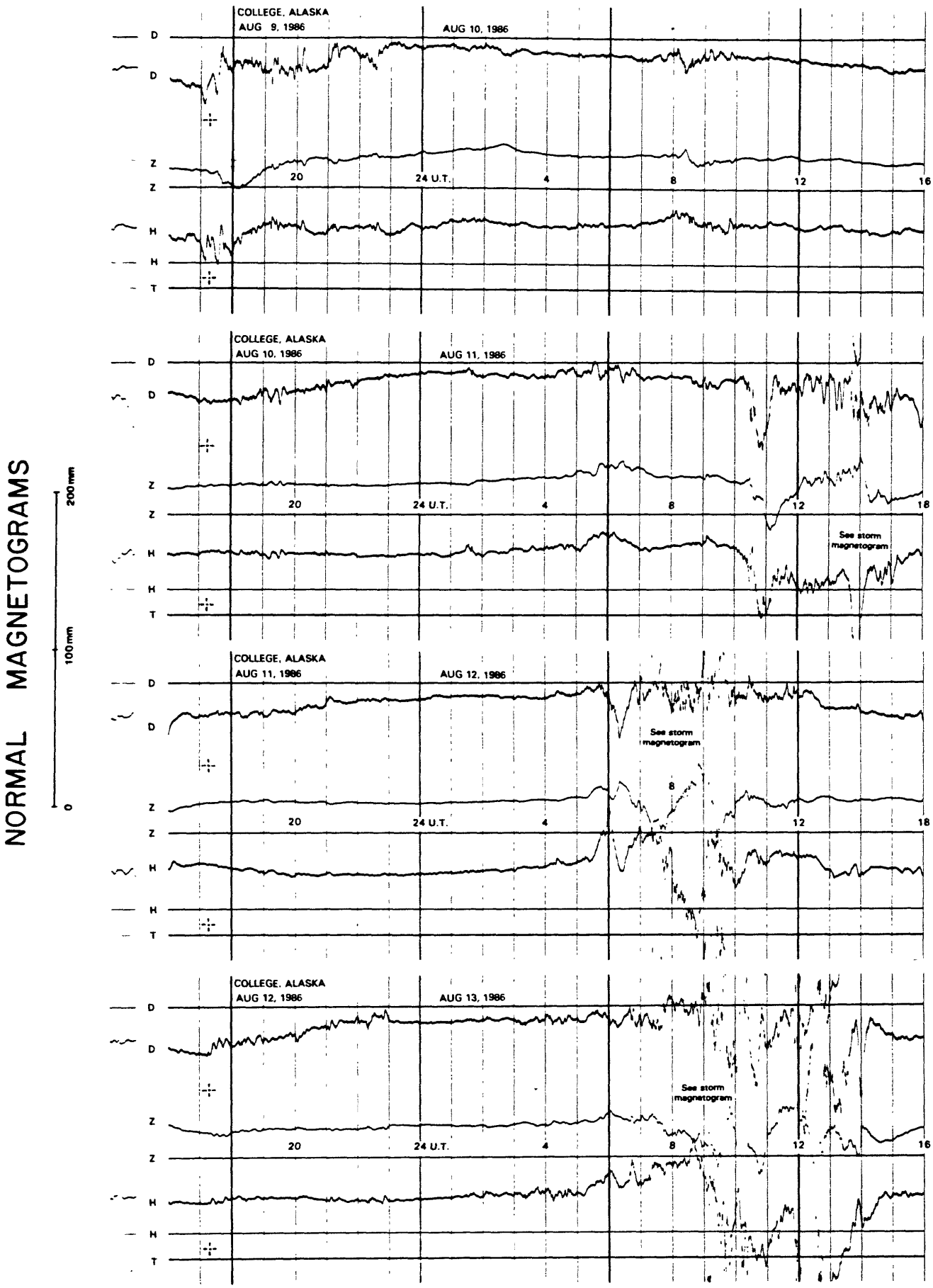
NORMAL MAGNETOGRAMS



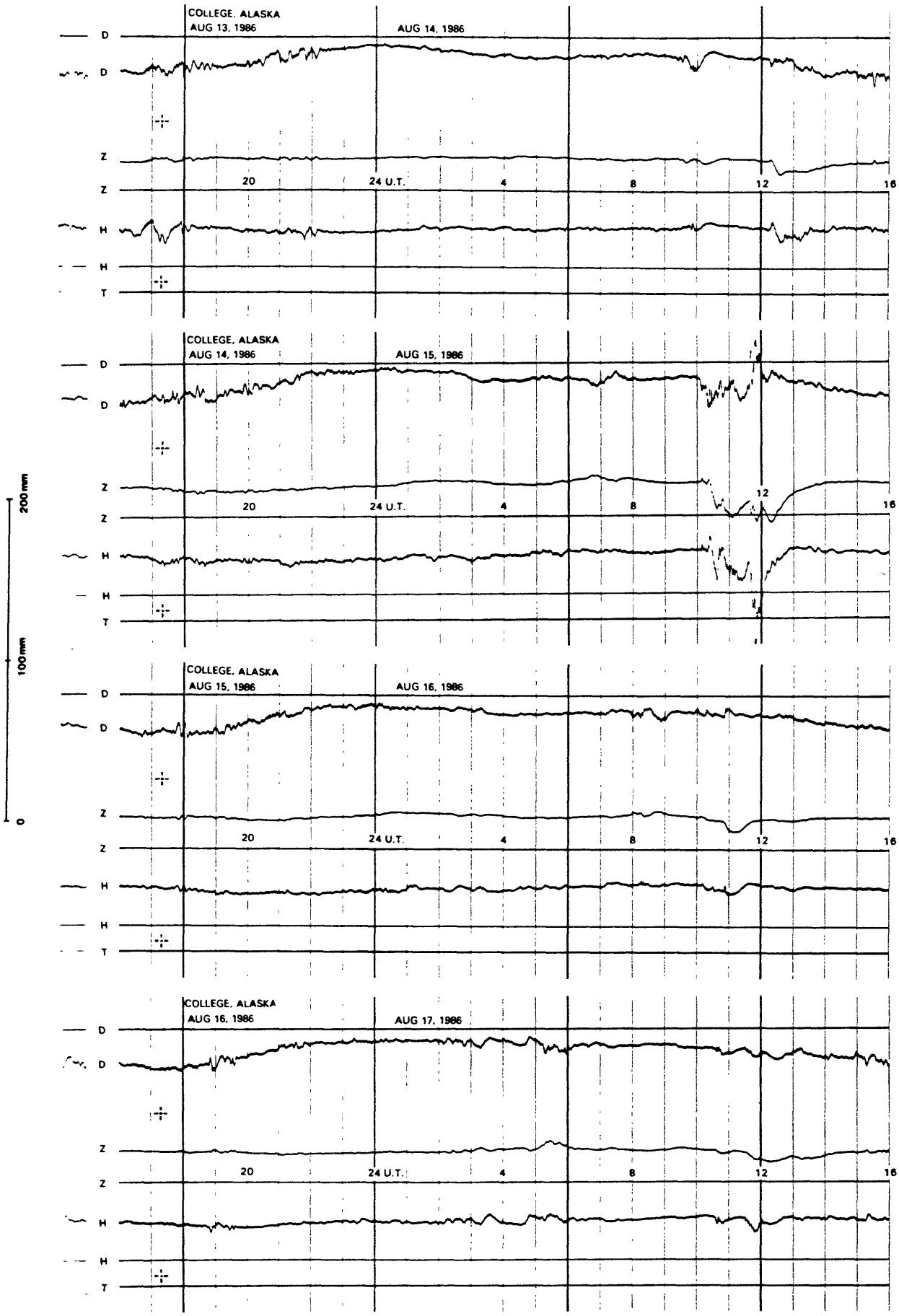
NORMAL MAGNETOGRAMS



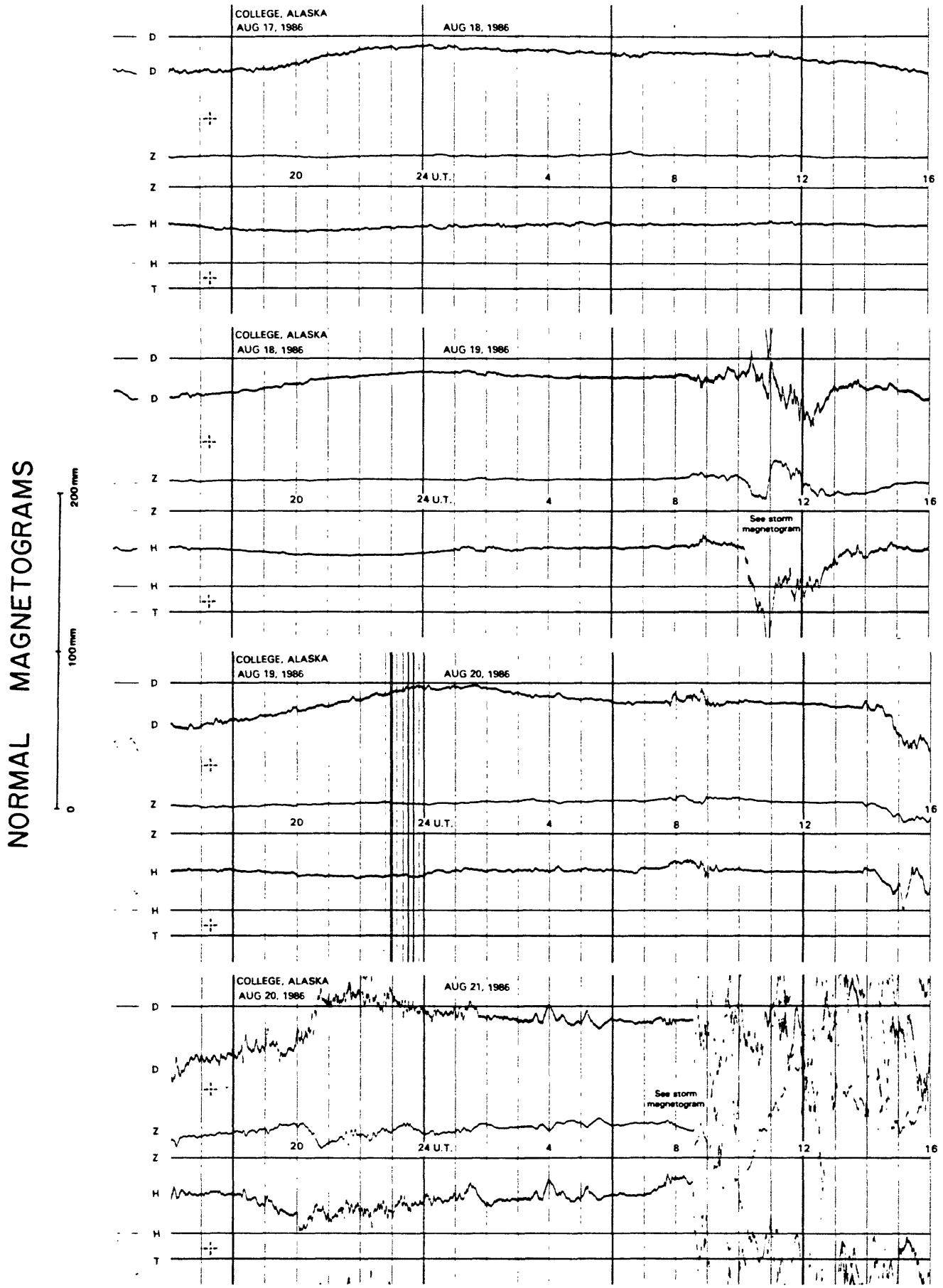
NORMAL MAGNETOGRAMS



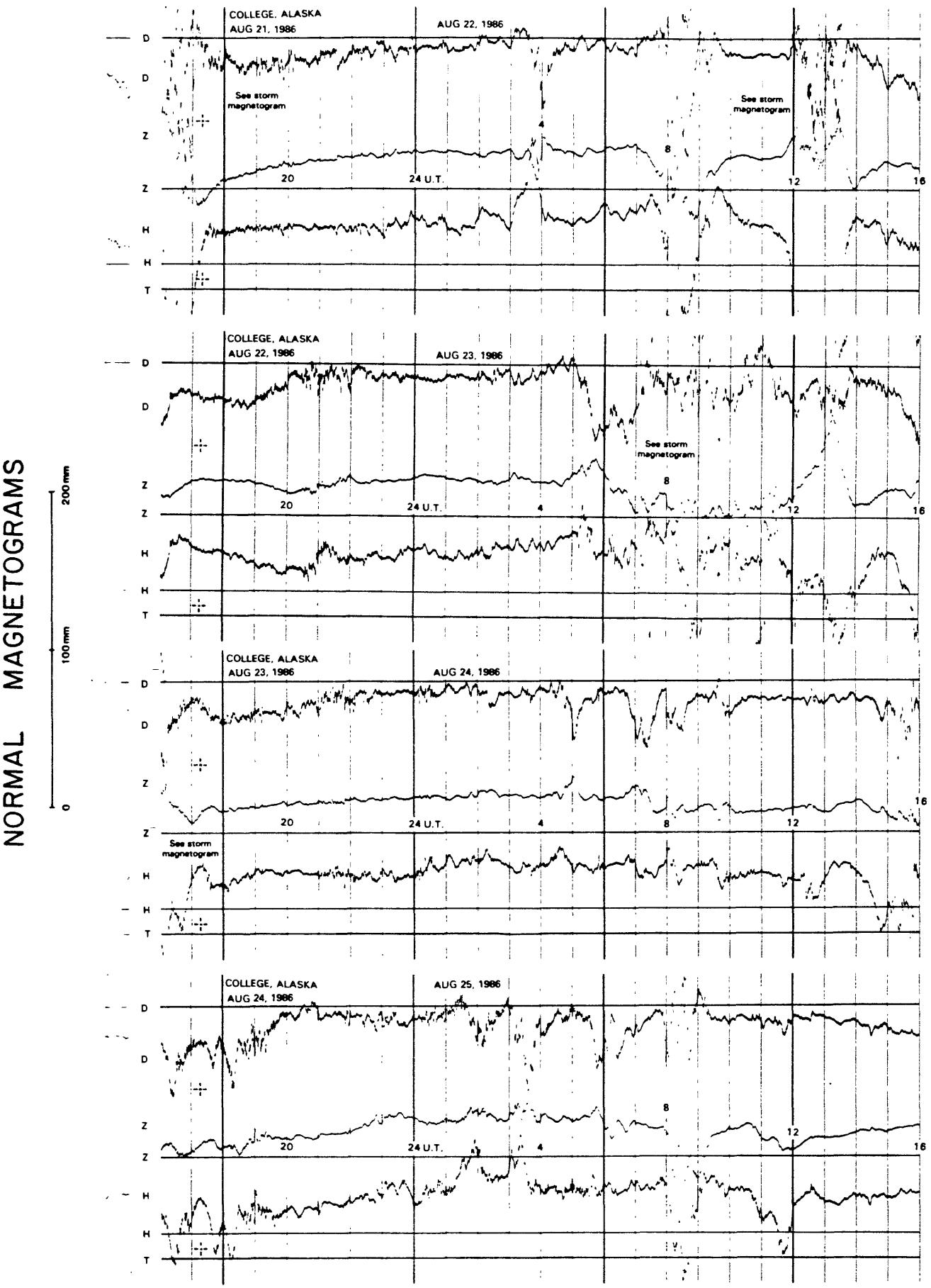
NORMAL MAGNETOGRAMS



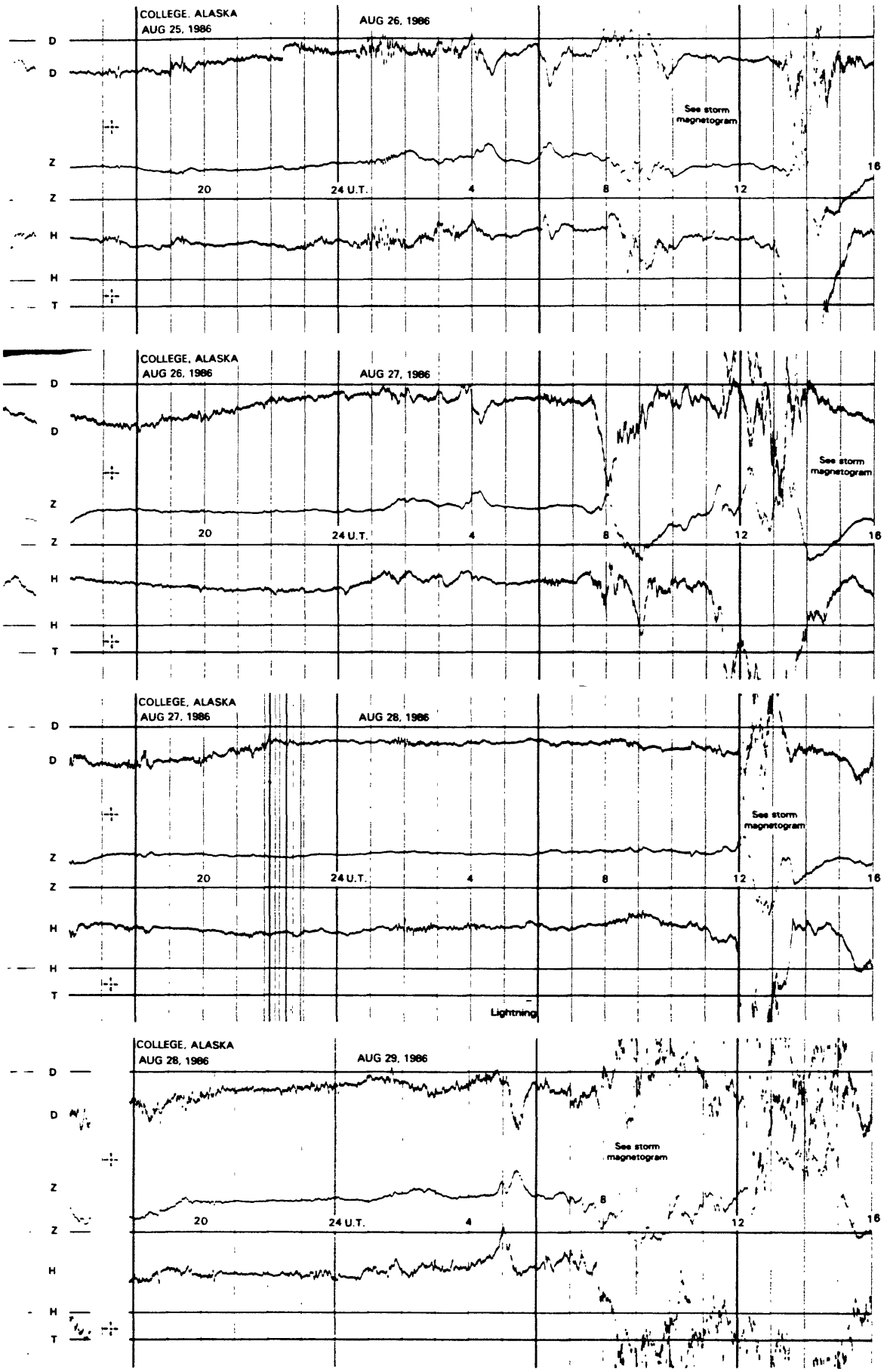
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

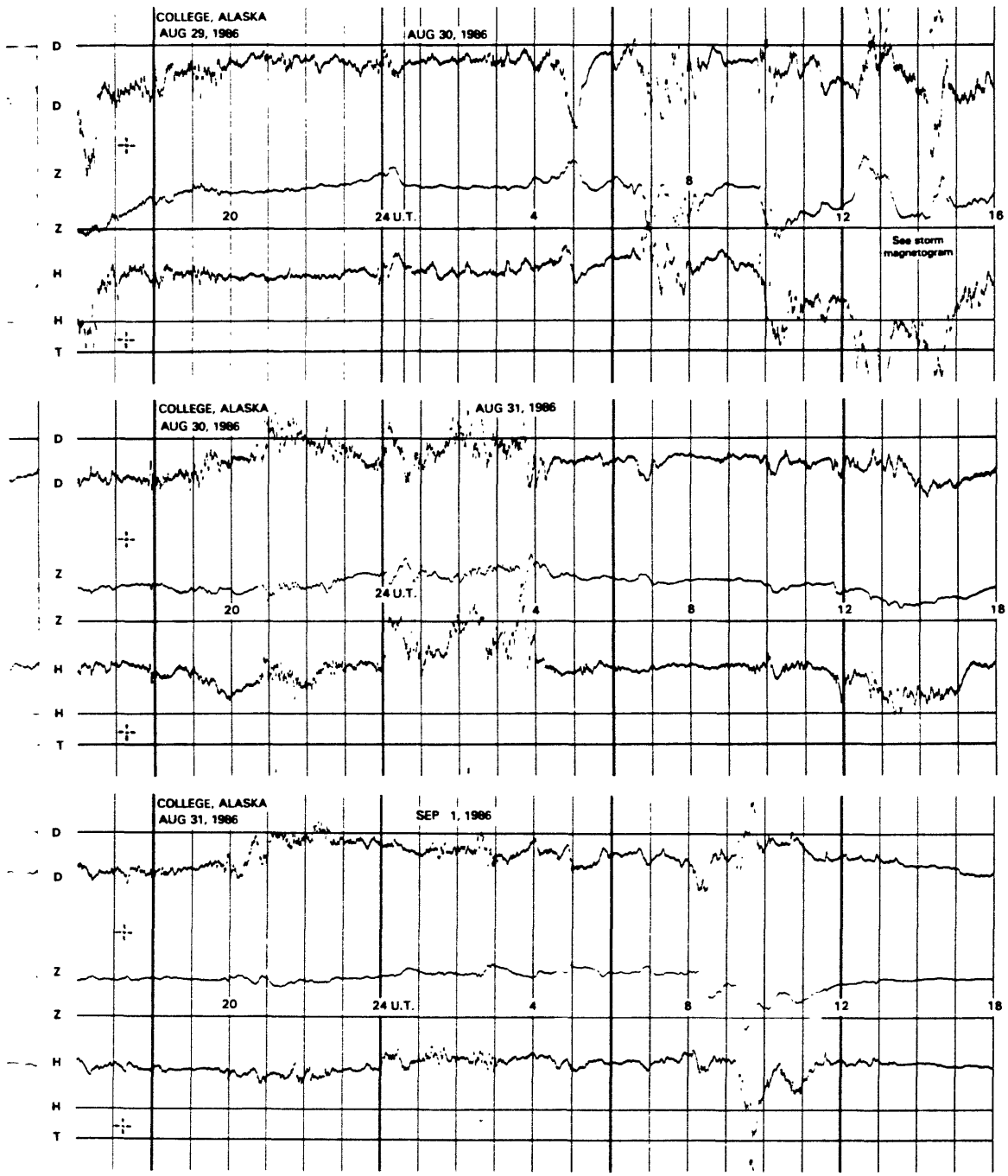


NORMAL MAGNETOGRAMS



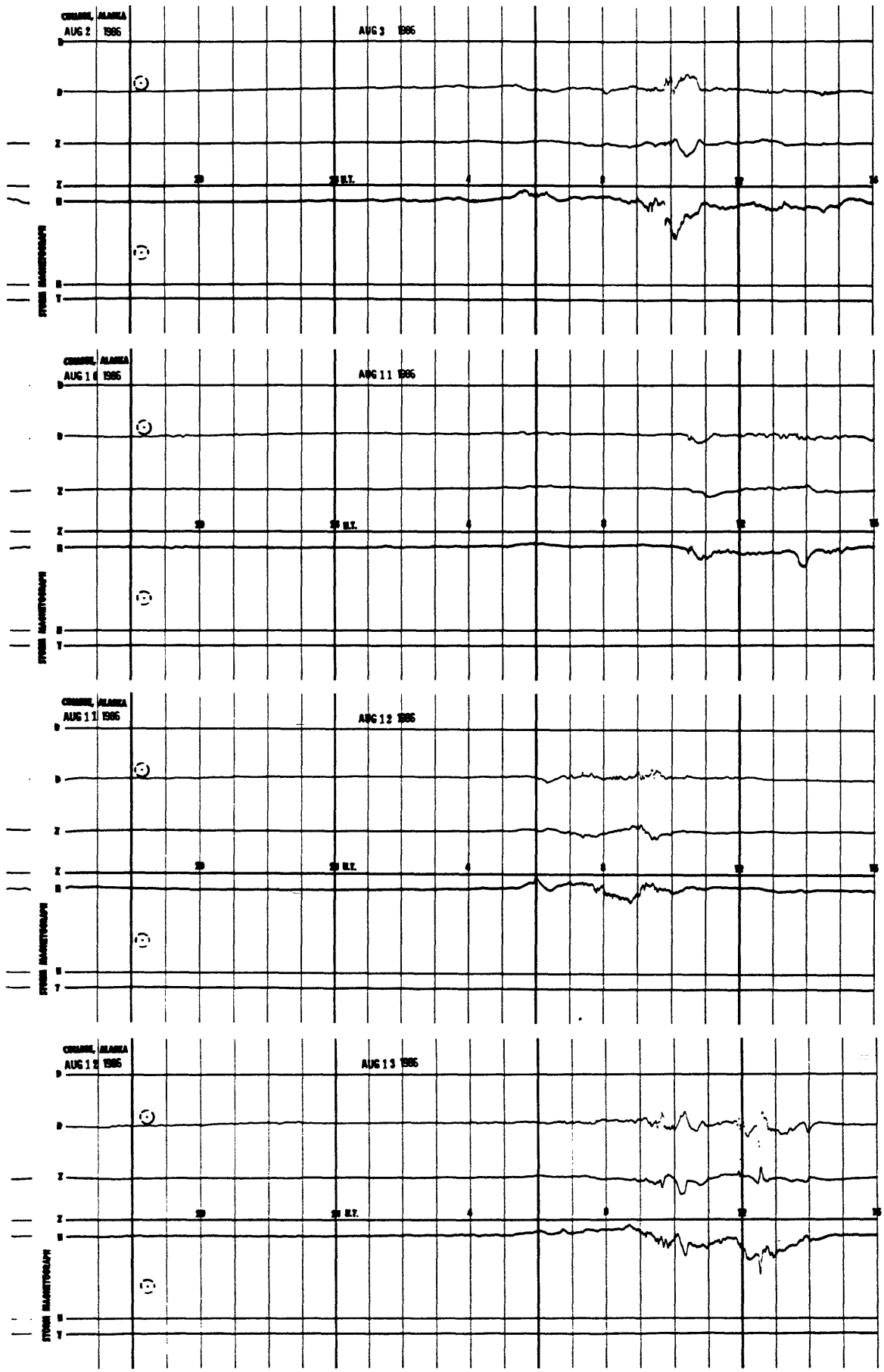
200 mm
100 mm
0

NORMAL MAGNETOGRAMS

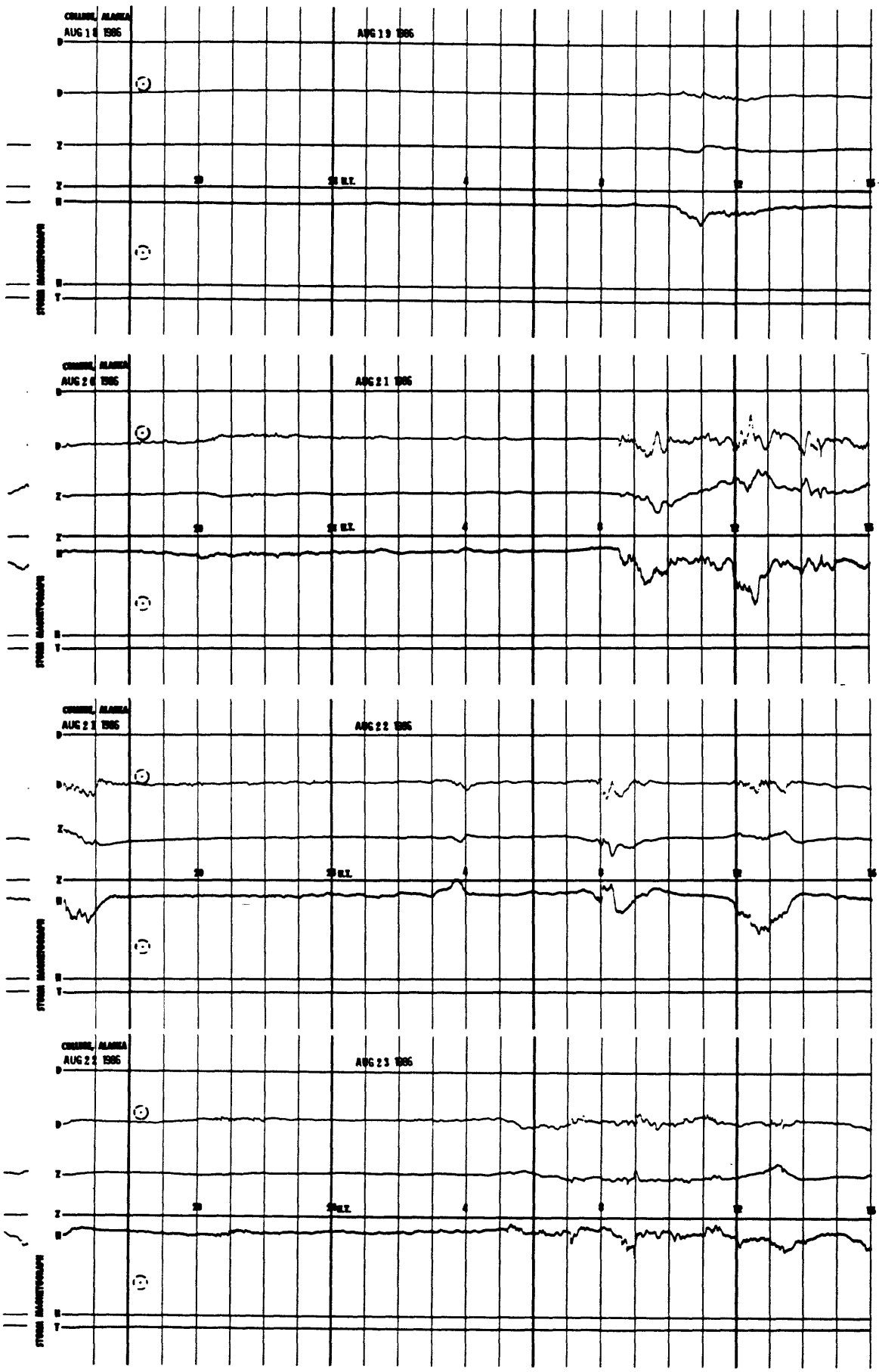


200 mm
100 mm
0

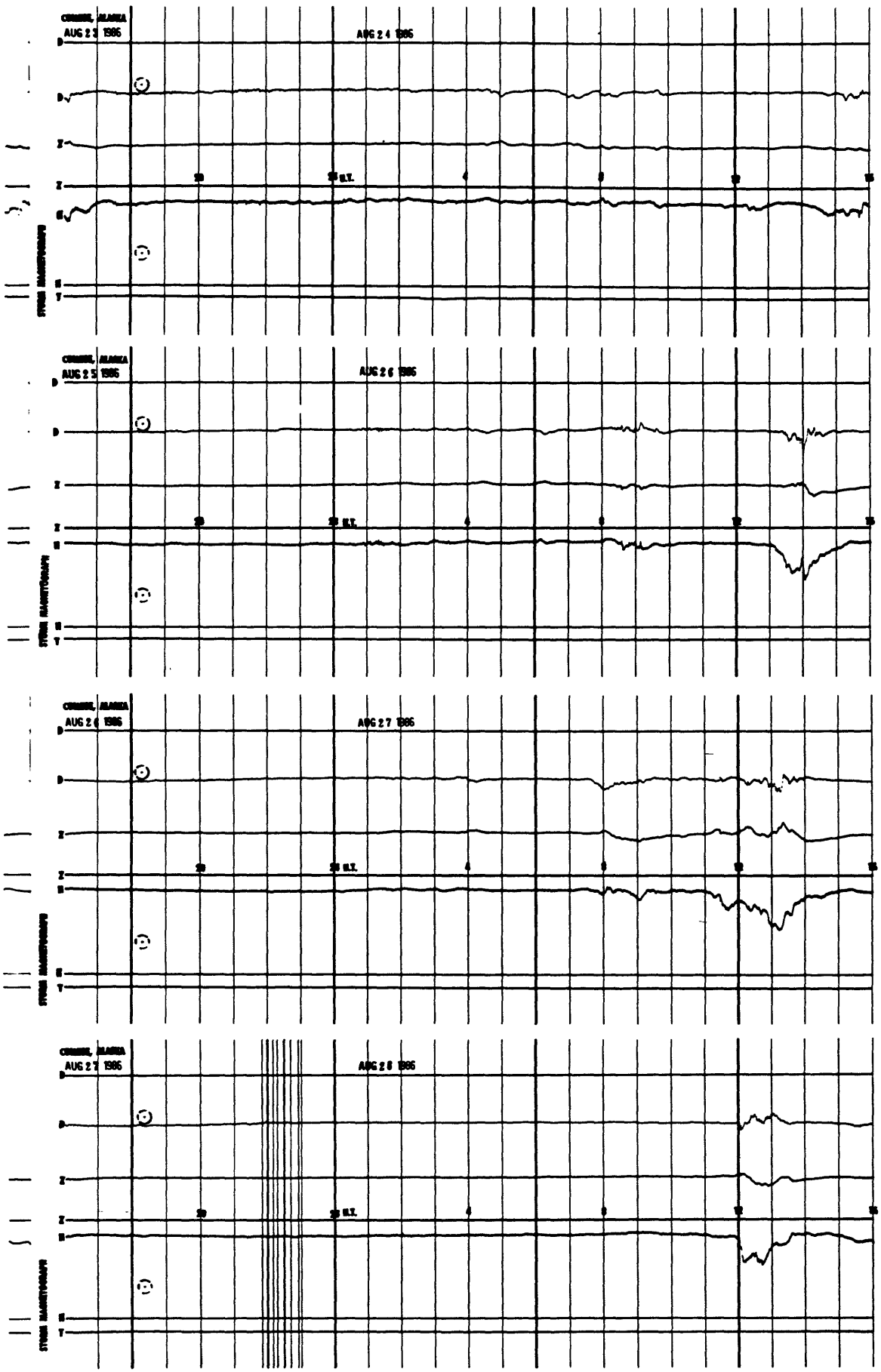
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS