

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

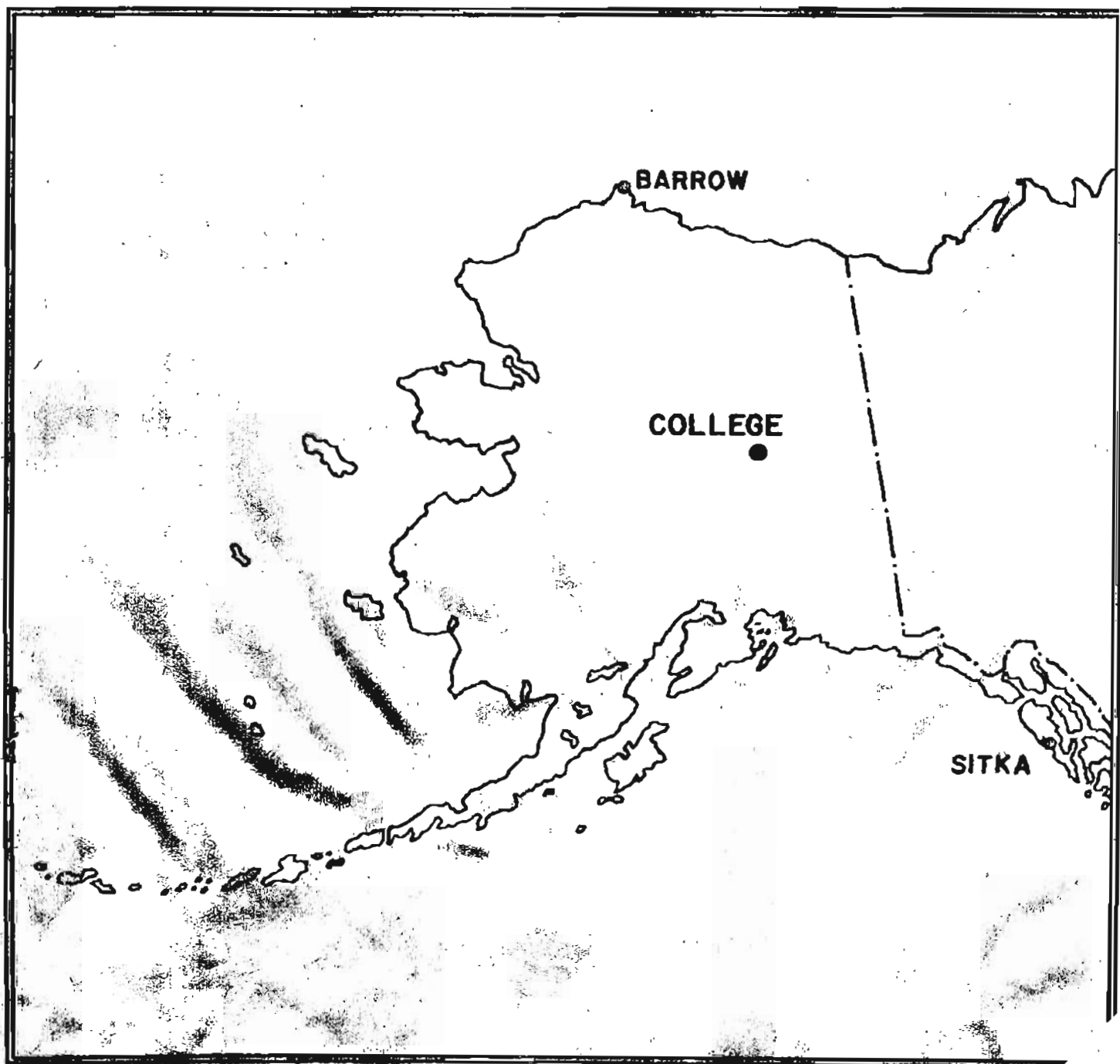
PRELIMINARY GEOMAGNETIC DATA

COLLEGE OBSERVATORY

FAIRBANKS, ALASKA

OCTOBER 1985

OPEN FILE REPORT 85-0300J



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSEND, CHIEF OF THE COLLEGE OBSERVATORY; WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: J.E. PAPP, E.A. SAUTER, L.Y. TORRENCE, P.A. FRANKLIN 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.

Explanation of Data and Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

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
500 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 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 Z-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, 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:

$$D = B_d + d \cdot S_D; \quad H = B_H + h \cdot S_H; \quad Z = B_Z + z \cdot S_Z$$

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.

COLLEGE, ALASKA

MAGNETIC ACTIVITY
(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR

OCTOBER 1985

DATE	K-INDICES									AK	TIME SCALE ON MAGNETOGRAMS
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM		
1	1	1	0	0	1	0	0	0	03	01	SUDDEN COMMENCEMENTS d h m
2	1	0	3	3	0	1	1	1	10	05	
3	0	0	4	6	5	5	1	1	22	26	
4	1	2	3	4	4	4	2	2	22	15	
5	2	6	6	7	6	6	6	5	44	74	
6	5	4	7	6	6	5	3	3	39	57	
7	3	4	4	6	4	5	3	2	31	31	
8	3	3	3	5	5	3	2	2	26	21	
9	1	3	3	0	2	2	1	2	14	07	
10	0	2	3	2	4	0	1	0	12	07	
11	1	2	3	5	3	5	3	3	25	21	
12	3	2	1	3	2	3	1	2	17	09	
13	2	3	4	3	5	5	3	2	27	23	
14	1	2	1	5	2	2	1	0	14	10	
15	1	5	6	4	3	3	1	2	25	25	
16	3	2	4	6	4	3	1	2	25	23	
17	3	2	3	4	4	3	3	2	24	16	
18	3	2	4	6	6	5	2	3	31	35	
19	3	2	4	7	4	2	1	0	23	28	
20	0	1	3	4	3	1	1	0	13	08	
21	0	1	2	3	4	4	3	3	20	14	
22	2	4	5	3	2	3	3	2	24	18	
23	2	2	2	5	5	3	2	2	23	18	
24	2	2	3	2	0	2	2	0	13	06	
25	3	1	3	4	3	2	3	2	21	13	
26	1	0	0	3	2	0	0	1	07	04	
27	0	0	0	0	0	1	0	1	02	01	
28	1	0	0	0	0	0	0	0	01	00	
29	1	3	4	6	4	1	0	0	19	19	
30	0	0	0	1	0	0	1	0	02	01	
31	0	0	0	1	4	2	3	1	11	07	

POSSIBLE SOLAR-FLARE
EFFECTS BASED ON
INSPECTION OF GRAMS
ALONE (WITHOUT
REFERENCE TO DATA
FROM OTHER SOURCES)

BEGIN

END

d h m d h m

K SCALE USED:

LOWER LIMIT FOR K = 9.....

CURRENT SCALE VALUE.....

LOWER LIMIT FOR K = 9.....

D

H

Z

675.7

322.2

3.72

7.80

2510

2510

(mm)

(Y/mm)

(to nearest 10Y)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED John E. Papp, Assistant Chief, College Observatory

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY
COLLEGE, ALASKA

MONTH
OCTOBER

YEAR
1985

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
11	16xx	pg	
24	17xx	pc5	
27	21xx	pc5	
30	12xx	pc5	

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.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA
19 85
OCTOBER

WDC-A FOR SOLAR-TERRRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80501 U.S.A.

Data from Individual Observatories:

Obs. 2 letter ZANA code	Geomag. lat.	Commencement		SC - amplitudes			Max. 3 hr -- index K		Ranges			UT End day hr	
		day	hr min (UT)	type	D(°)	H(Y)	Z(Y)	day	(3 hr - period)	K	D(°)		H(Y)	Z(Y)
00	64.6 N	05	03xx	..	..	..	05	4	7	283	1620	1100	08 17
				..	..	..	06	3	7				
		18	06xx	..	..	..	19	4	7	112	1210	480	19 16

NORMAL MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 10-1-85	2400 U.T., 10-31-85	1.0/mm	3.78/mm	27° 16.8 E
H	0000 U.T., 10-1-85	2400 U.T., 10-15-85	7.88/mm		126898
	0000 U.T., 10-16-85	2400 U.T., 10-31-85	"		126748
Z	0000 U.T., 10-1-85	2400 U.T., 10-15-85	7.68/mm		551688
	0000 U.T., 10-16-85	2400 U.T., 10-31-85	"		551798

STORM MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 10-1-85	2400 U.T., 10-31-85	7.9/mm	29.58/mm	23° 45.0 E
H	0000 U.T., 10-1-85	2400 U.T., 10-15-85	43.98/mm		107248
	0000 U.T., 10-16-85	2400 U.T., 10-31-85	"		107088
Z	0000 U.T., 10-1-85	2400 U.T., 10-31-85	48.28/mm		541108

RAPID RUN MAGNETOGRAPHS					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		
D					
H					
Z					

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
27° 36.7 E	128938	553368

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: OCT 1, 2, 9, 10, 24, 26, 27, 28, 30, 31

MAGNETOGRAM HOURLY SCALINGS

Values are in tenths of mm, and are averages for successive periods of one hour beginning at midnight. Mean of 24 hours (2400 M.T.) is hour 06 of the BASE universal day.

Values are in tenths of mm, and are averages for successive periods of one hour beginning at midnight. Mean of 24 hours (2400 M.T.) is hour 06 of the BASE universal day.

Shrinkage corrections have been applied. Negative values are in red, with minus sign shown.

C S O P	U.S. DEPARTMENT OF INTERIOR Geological Survey, Cambridge Station Wash., D. C. 20505																								YEAR 85	MONTH OCT	SUM
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
01	222	230	219	223	222	219	223	225	233	233	204	01	194	197	187	176	192	206	214	214	216	220	226	223	5124		
02	226	228	236	233	236	246	260	203	264	275	254	02	233	233	226	225	223	213	219	217	213	209	212	217	5574		
03	223	227	228	229	226	248	248	248	248	248	248	03	206	160	160	125	100	183	176	184	200	213	218	232	4884		
04	240	247	250	263	263	263	263	263	263	263	263	04	294	302	349	118	28	131	173	201	182	203	188	206	6356		
05	239	235	229	237	237	237	237	237	237	237	237	05	211	204	253	246	357	98	66	150	159	181	224	772	5054		
06	248	276	250	274	293	293	293	293	293	293	293	06	278	193	208	107	86	193	203	216	205	236	269	284	5064		
07	296	303	273	247	243	244	242	206	203	199	248	07	56	26	19	89	142	10	190	186	201	234	258	298	3915		
08	298	285	264	266	266	266	266	266	266	266	266	08	196	120	78	59	103	72	181	187	203	224	226	233	4676		
09	243	241	240	243	245	270	206	232	243	232	233	09	231	216	188	186	208	212	204	199	213	217	223	230	5389		
10	240	238	237	249	246	244	252	263	260	269	236	10	196	98	180	210	222	226	224	223	222	219	221	229	5460		
11	243	248	253	264	270	270	277	257	153	174	246	11	264	220	219	243	167	136	172	183	204	197	216	224	5233		
12	239	235	260	247	236	236	244	251	241	198	208	12	229	223	207	205	189	186	196	196	197	207	216	224	5363		
13	231	227	231	309	246	256	242	227	168	140	192	13	246	234	189	48	93	132	176	193	200	212	218	225	4900		
14	224	224	223	233	243	260	256	286	236	246	106	14	196	213	204	190	182	209	211	202	204	207	212	214	5058		
15	216	216	215	219	238	191	37	102	172	228	183	15	187	197	214	215	179	179	183	195	200	202	201	202	4289		
16	229	266	257	305	286	259	265	305	267	18	213	16	213	221	198	136	132	179	187	200	201	205	210	226	5229		
17	239	246	251	261	246	257	236	264	284	276	236	17	228	185	189	187	208	137	47	53	117	192	207	221	4950		
18	240	270	272	239	222	251	246	178	232	263	235	18	47	16	134	134	118	117	150	186	187	241	238	229	4522		
19	267	263	242	249	248	267	268	264	69	200	246	19	86	174	199	218	226	223	218	223	214	213	213	214	5126		
20	220	224	223	221	223	226	233	251	227	191	221	20	179	203	216	213	216	212	210	206	207	212	209	209	5132		
21	211	216	217	215	216	212	207	208	249	242	227	21	216	214	154	102	0	162	197	200	176	186	206	213	4653		
22	218	252	251	234	246	227	228	212	50	199	226	22	204	192	196	197	177	187	168	168	153	164	196	216	4805		
23	224	227	233	222	219	261	276	253	243	68	165	23	163	131	175	173	188	203	204	197	188	196	206	224	4838		
24	241	225	225	216	220	243	276	276	260	215	221	24	208	216	213	210	200	192	162	182	196	193	193	197	5796		
25	210	213	214	234	215	241	240	232	256	131	158	25	198	197	164	152	194	170	132	139	162	194	204	209	4765		
26	215	218	216	213	219	233	236	230	228	227	230	26	186	184	204	216	216	219	220	214	212	211	209	212	5143		
27	219	220	219	219	219	217	220	222	223	229	222	27	216	213	213	209	208	207	207	201	196	197	204	210	5121		
28	212	223	219	214	218	224	226	234	234	233	229	28	211	219	209	212	213	213	215	210	204	203	203	206	5781		
29	211	213	228	256	304	354	327	328	249	218	310	29	174	142	201	220	203	204	202	207	208	206	210	213	5696		
30	216	214	215	214	213	213	214	214	216	221	219	30	207	207	203	204	208	207	206	202	203	199	201	213	5050		
31	214	216	212	215	220	226	224	217	214	214	218	31	194	113	150	167	168	139	91	141	175	195	202	206	4479		
SCALE BY	Preliminary base-line and scale values.																								MONTHLY SUM		155.241
CHECKED BY	EAS, JEP																								MONTHLY MEAN		2.09
PLANNED BY	JEP																								DAILY MEAN		0.08
PLANNED BY	STORIA																								MONTHLY MEAN		0.08

(1) Interpretation
 (2) Significant portion of non-interpolated.
 (3) No record for one value of day because of faulty record.
 (4) Derived from STORIA Magph., converted to Normal Magph.
 (5) Scaling correction because of magnetic storm.
 (6) Record off sheet for part or all of hour of value in blue, same was estimated for missing part.

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF THE INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80235

OBSERV. YEAR MONTH ELEMENT
CO 85 OCT H

Values are in units of γ , and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1208 M.T.) is hour 08 of the 308th universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25th
		260	263	270	265	265	266	264	271	259	266	263	260	255	268	261	267	271	263	253	250	251	253	253	255	6272
		252	255	256	268	279	275	299	297	332	333	291	270	267	265	265	270	248	251	260	256	265	260	258	251	6523
		253	259	263	266	270	276	291	352	401	238	155	-133	279	5	13	28	260	272	239	251	271	261	259	273	4749
		263	253	261	297	281	303	422	394	342	254	107	102	107	70	-47	35	204	307	283	271	262	243	231	253	5488
		259	261	270	368	334	121	59	-26	372	88	-212	-57	137	358	296	107	-167	29	115	23	180	148	-269	338	3120
		380	418	276	372	332	317	335	-26	-369	-419	-88	136	240	-324	-167	-69	233	261	264	252	235	252	274	200	2840
		270	286	273	296	306	299	341	305	292	247	-4	-308	-61	32	30	-122	-116	122	270	245	255	268	255	276	4057
		260	252	282	276	277	265	288	292	292	266	80	235	190	105	6	124	189	224	269	259	238	249	259	260	5227
		257	253	261	268	258	274	275	263	271	268	268	270	265	240	214	244	252	249	240	258	259	253	257	260	6172
		260	257	260	241	253	269	279	334	346	297	273	258	188	144	270	266	258	255	253	250	243	230	229	297	6160
		247	252	260	265	268	296	412	419	396	334	327	182	222	218	176	50	191	183	253	242	245	248	251	266	6203
		269	300	272	248	254	264	285	276	300	259	282	290	258	228	258	232	210	267	250	243	239	250	258	269	6261
		276	267	311	331	284	270	276	277	376	364	362	303	280	140	-81	22	188	248	205	250	259	266	271	265	6000
		276	276	279	270	278	290	303	278	273	289	-52	291	275	272	264	238	257	252	250	251	259	260	263	269	6161
		265	269	273	275	306	415	369	88	459	315	193	212	228	253	265	260	198	249	259	268	255	255	233	230	6392
		260	293	310	305	307	288	340	279	274	55	21	142	208	244	174	245	220	263	257	252	259	272	253	261	5784
		257	269	300	297	310	291	302	376	342	300	357	309	260	190	266	267	242	160	152	220	226	259	246	238	6426
		270	258	305	278	280	312	366	488	464	397	329	97	277	161	128	112	58	211	241	254	224	274	246	257	5539
		268	280	290	283	284	293	320	279	293	304	345	41	150	218	237	289	273	268	261	261	260	262	266	269	5599
		267	269	270	265	281	277	279	300	303	335	343	219	218	279	270	261	261	260	266	260	260	255	256	260	6514
		269	271	276	281	283	287	287	288	323	338	291	280	270	199	127	95	165	258	273	256	230	253	276	261	6137
		275	279	301	302	326	375	278	458	167	360	307	290	260	260	270	259	207	259	226	199	194	226	259	264	6701
		271	284	295	285	294	311	328	309	308	237	255	282	19	118	261	229	262	247	256	240	259	260	252	282	6144
		281	273	280	271	281	303	270	396	329	304	291	281	279	278	279	271	260	234	240	253	269	272	275	275	6845
		280	275	275	290	295	283	296	299	350	364	319	284	262	224	247	263	255	207	211	253	258	272	283	277	6622
		276	277	279	280	280	280	287	293	283	280	276	217	273	254	279	277	273	269	267	263	260	271	275	273	6542
		277	277	280	281	279	279	277	279	277	284	289	288	284	283	280	279	277	273	271	270	270	271	268	253	6646
		260	277	287	289	293	291	293	292	298	290	284	283	285	284	282	282	278	278	271	265	270	272	278	286	6768
		288	271	259	279	355	356	406	390	302	139	268	6	80	269	316	287	273	280	275	272	270	271	271	278	5925
		283	286	284	283	281	286	285	289	281	289	303	297	291	287	287	289	281	278	272	263	268	275	278	279	6795
		280	285	288	289	292	287	283	280	281	282	283	278	133	259	279	270	278	214	208	266	284	282	286	293	6460

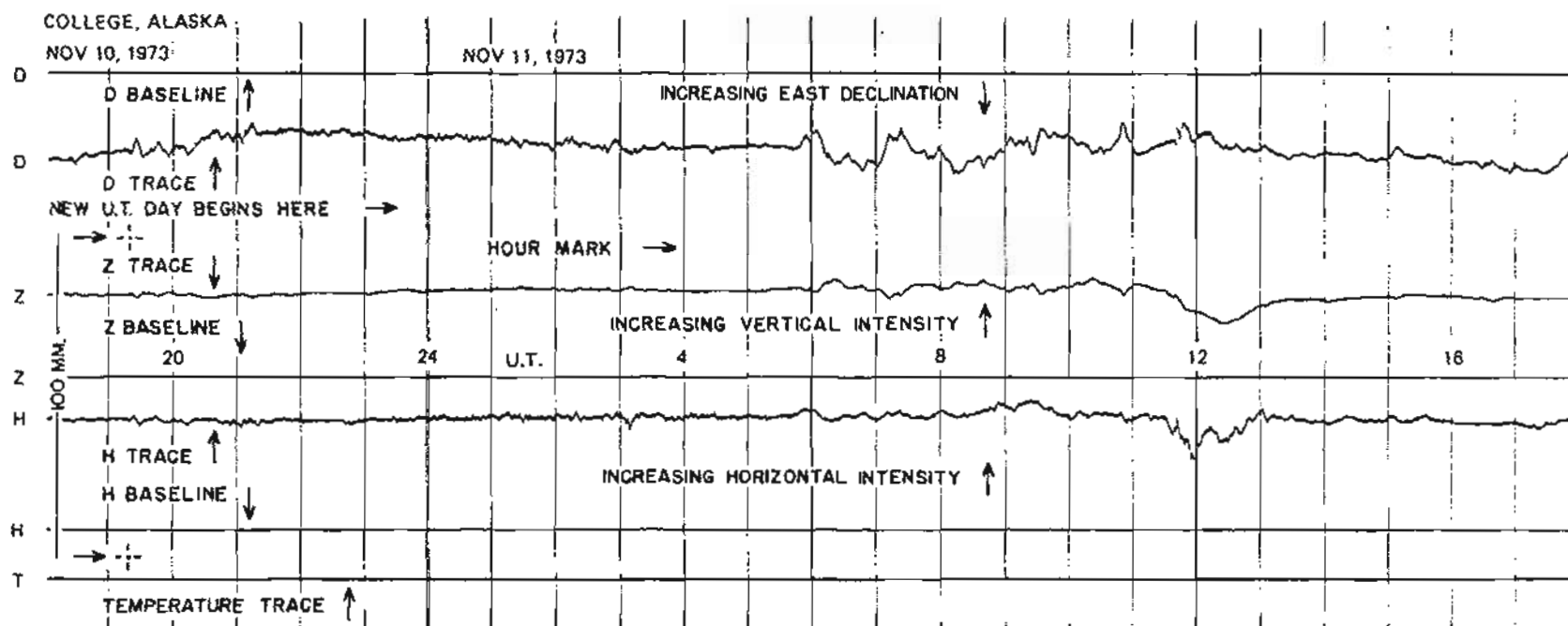
SCALED BY: LYT
CHECKED BY: JEP, EAS
SIGNATURE BY: JEP
PUNCHED BY:

Preliminary base-line and scale values:
Interval Beginning Base-line Value Scale Value

() Interpolated
() Significant portion of hour interpolated.
 No record; or no values available because of faulty record.
* Derived from STORM Mph., converted to Normal Mph.

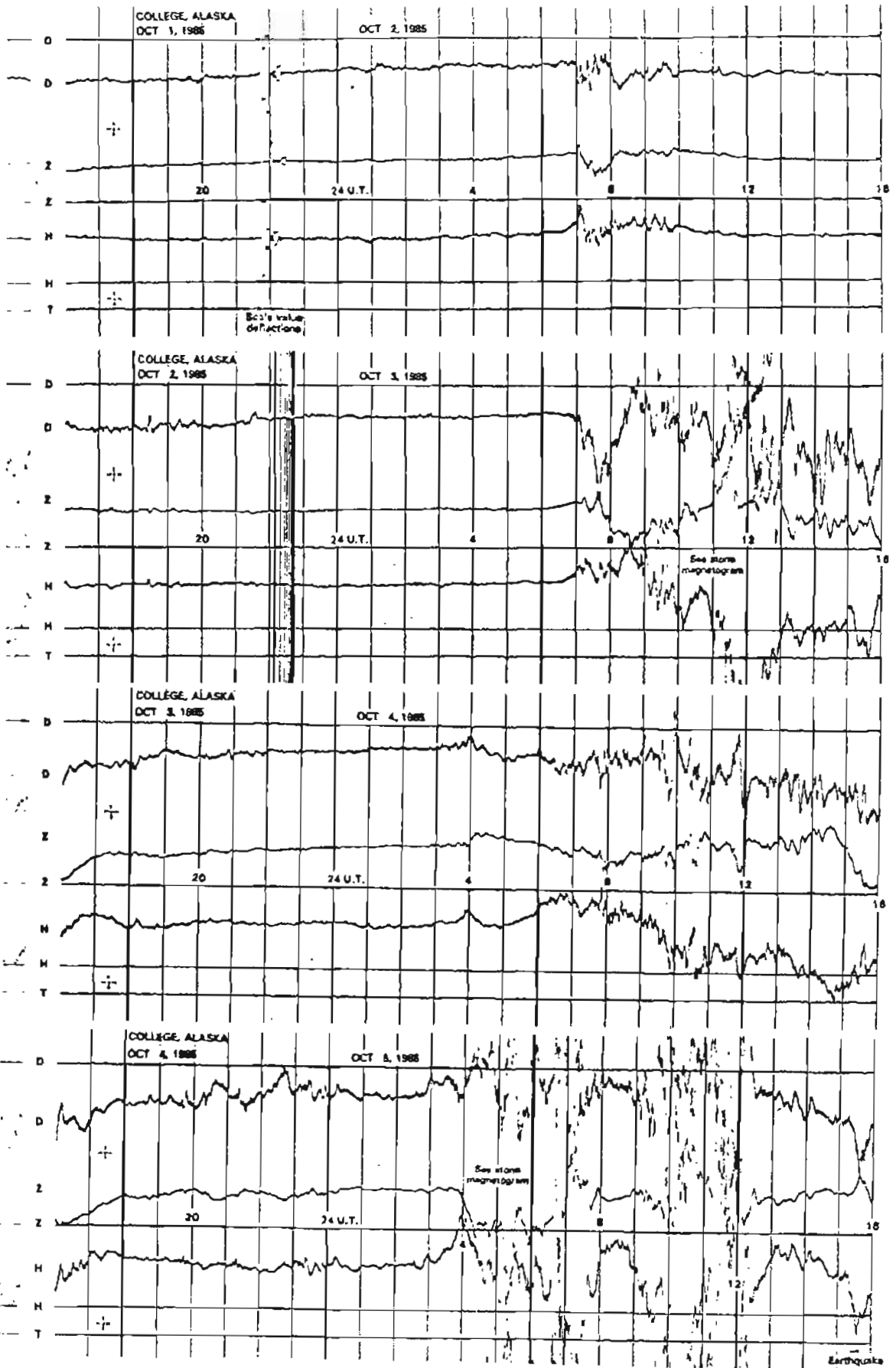
MONTHLY SUM: 183,067
MONTHLY MEAN: 246
DATES WITH GAPS:

FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

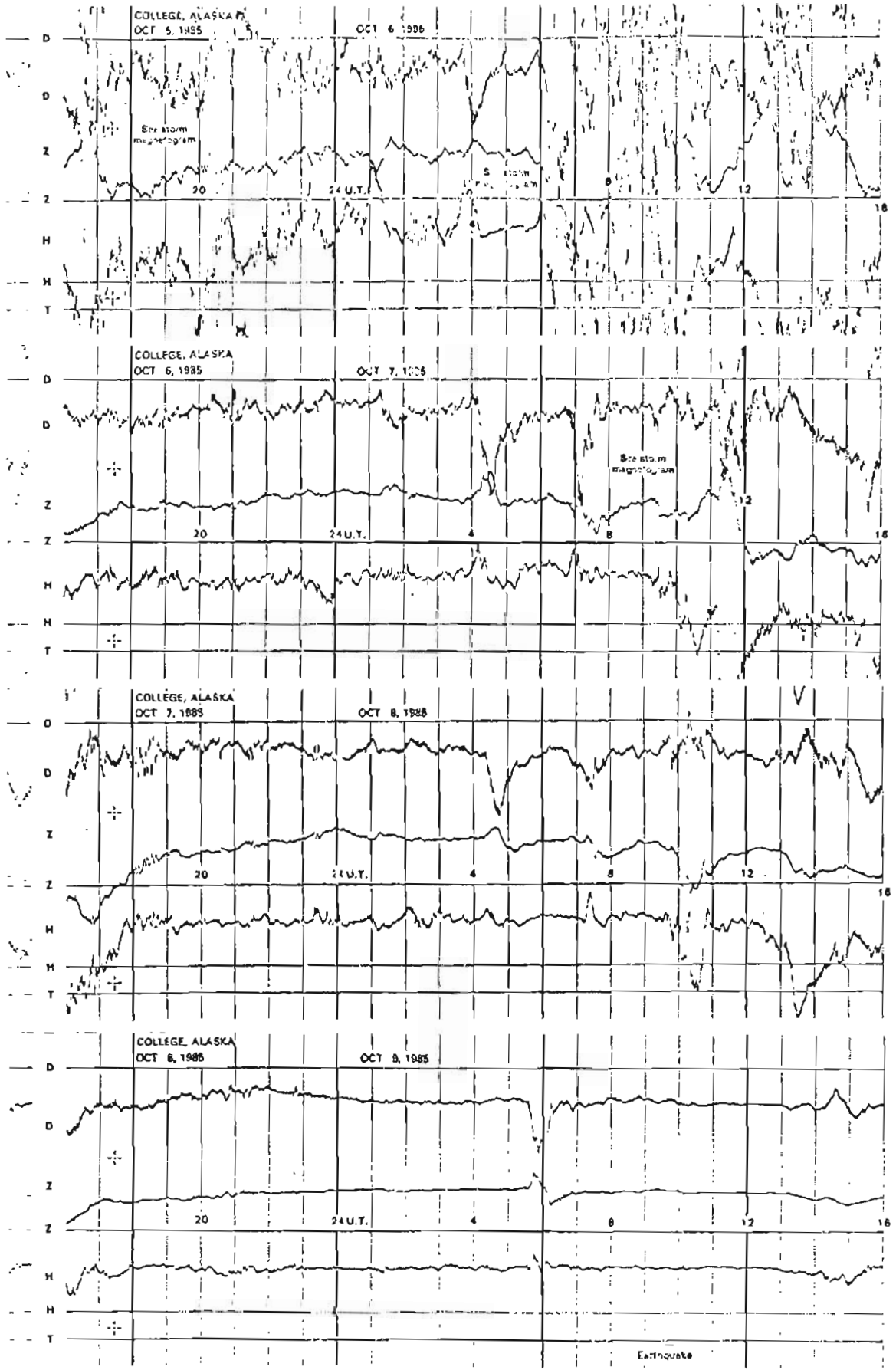


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

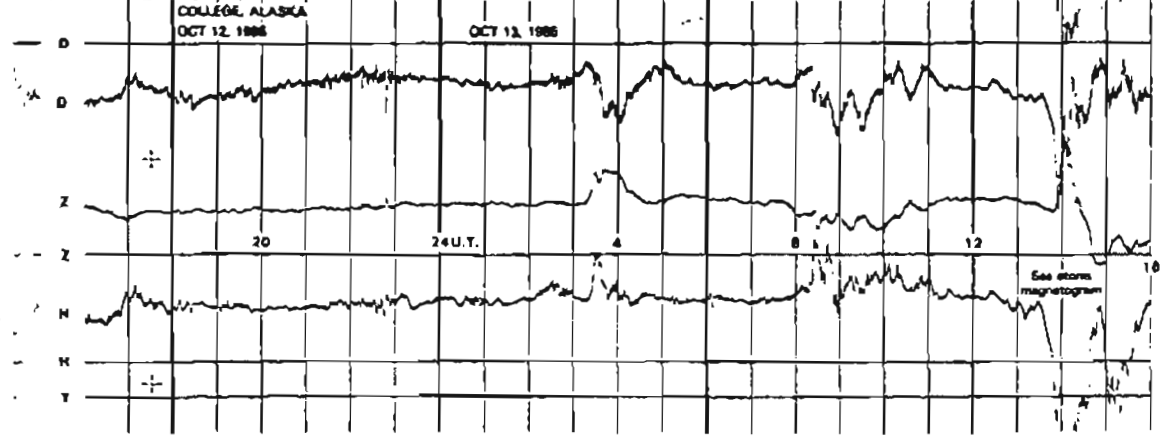
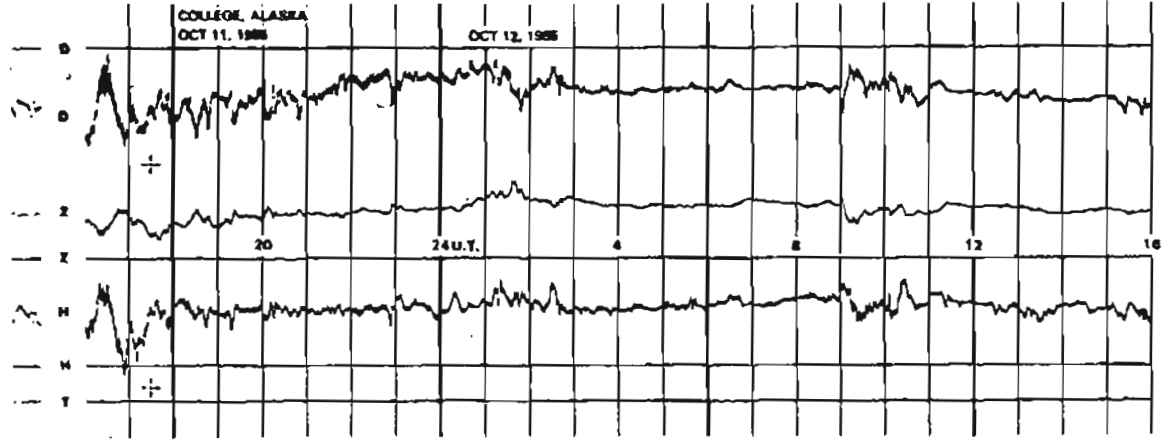
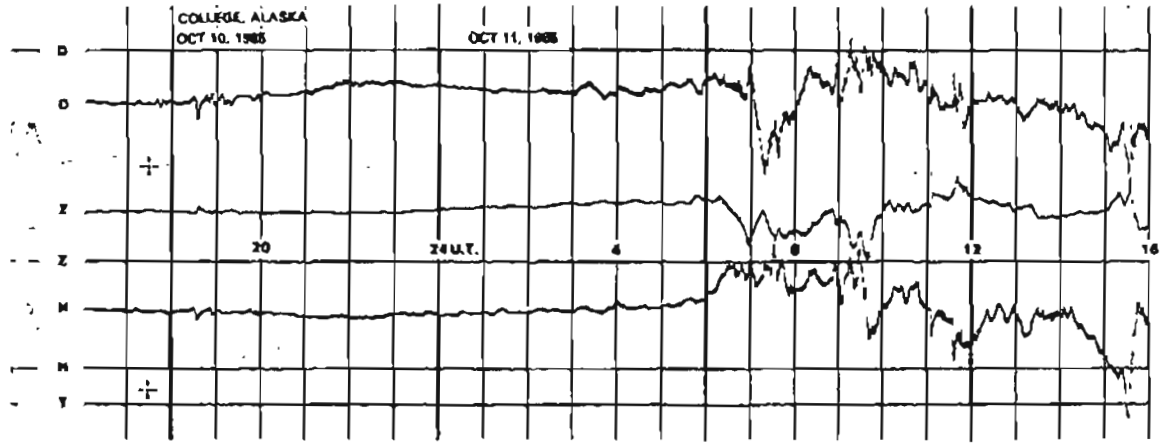
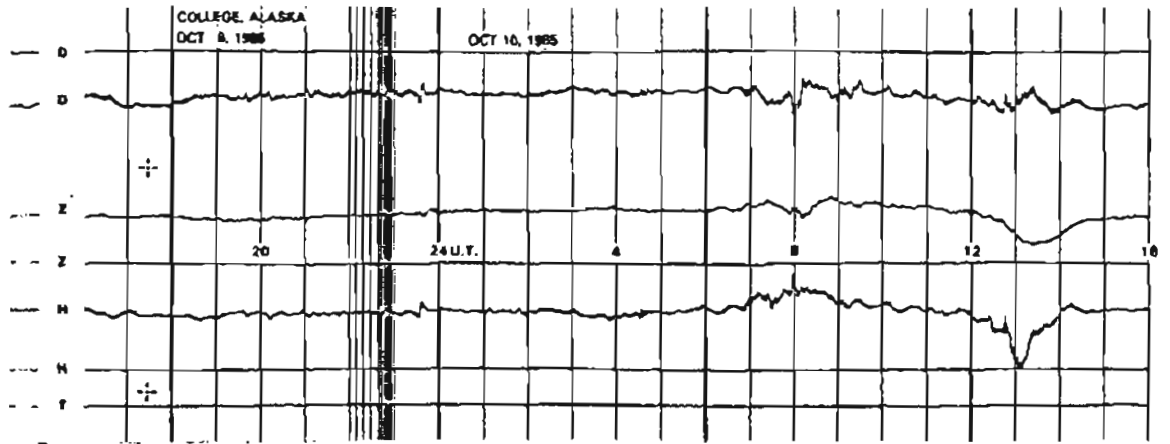
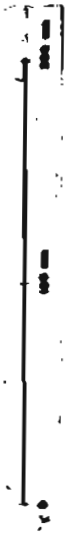
NORMAL MAGNETOGRAMS



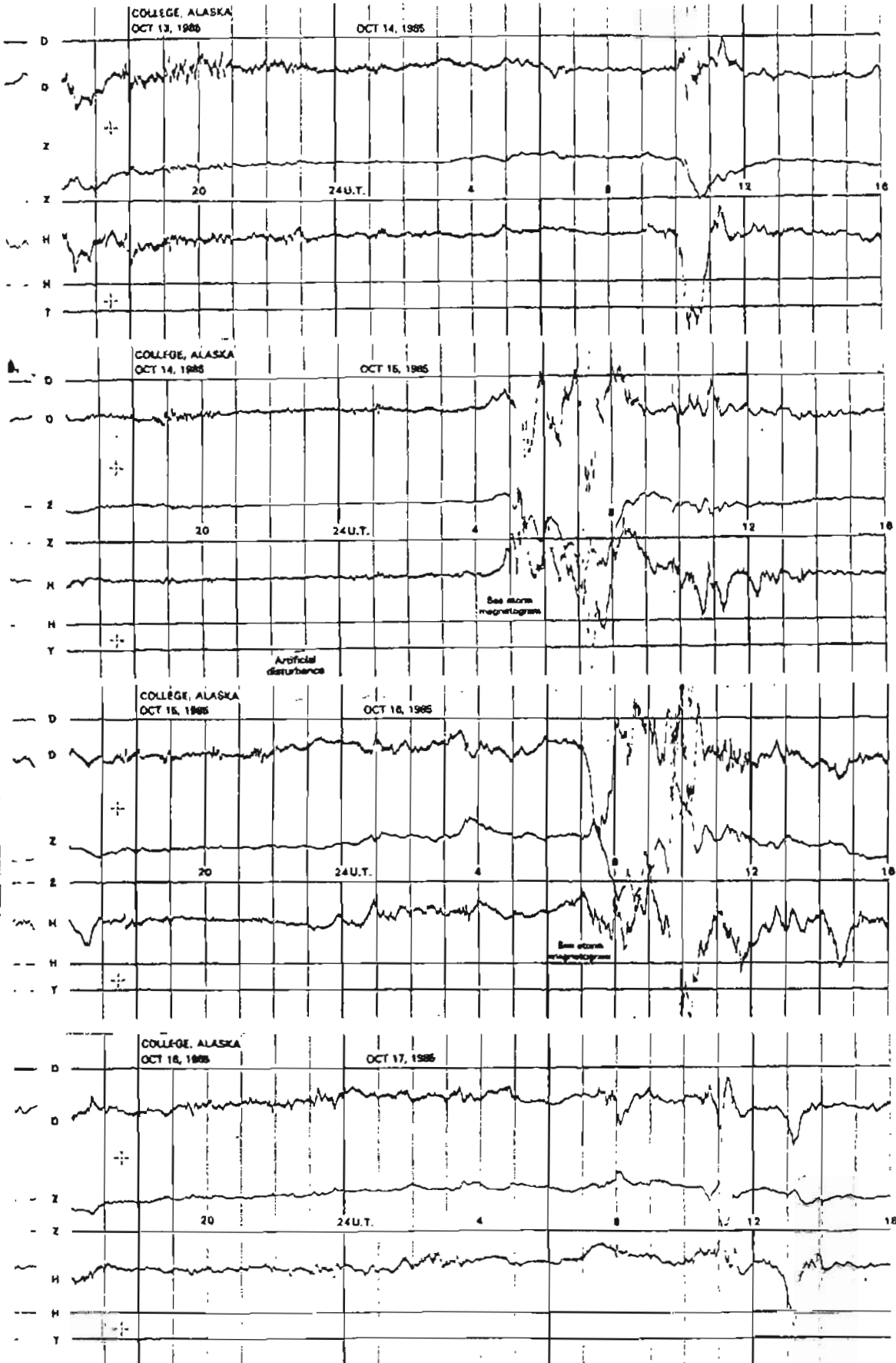
NORMAL MAGNETOGRAMS



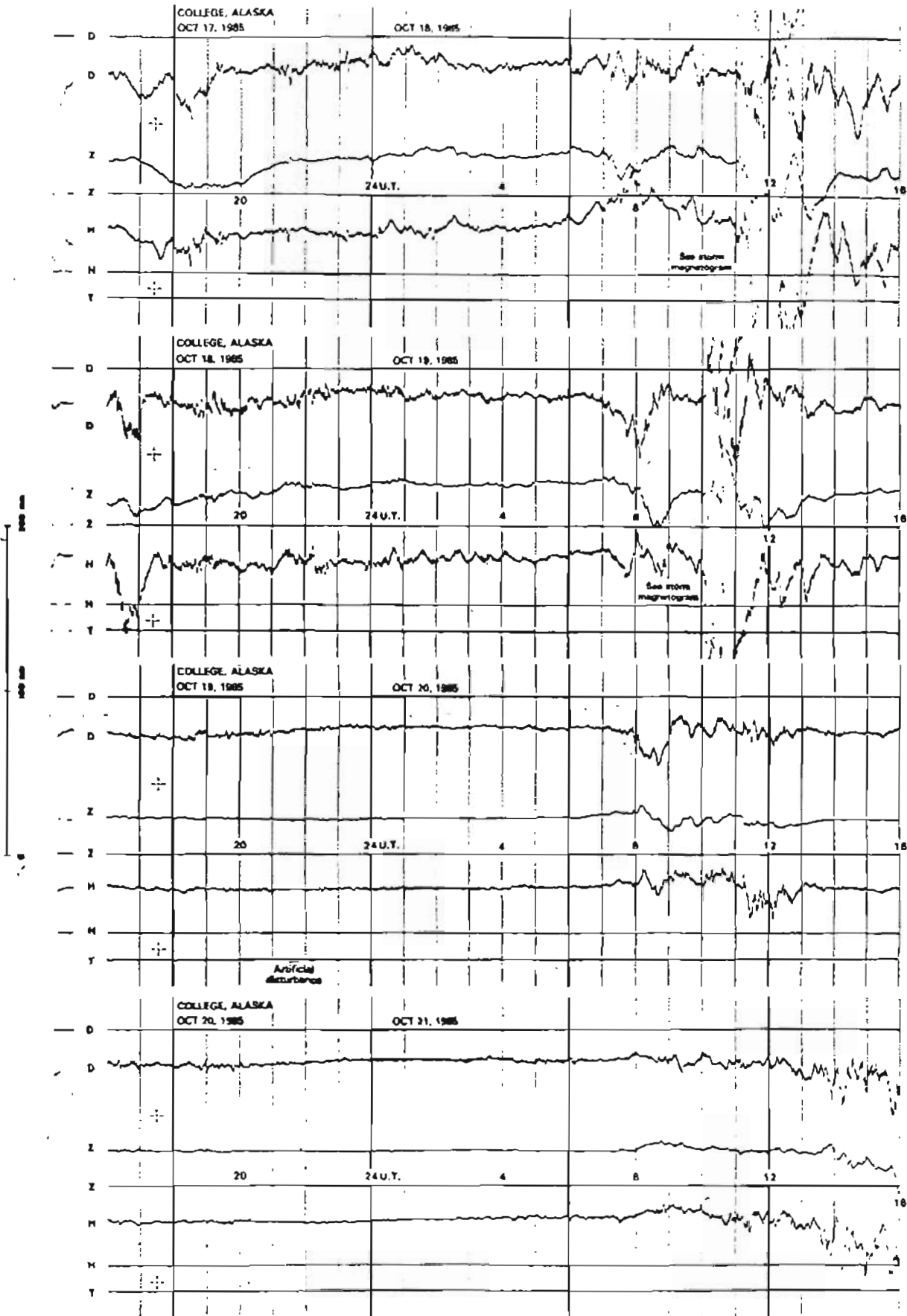
NORMAL MAGNETOGRAMS



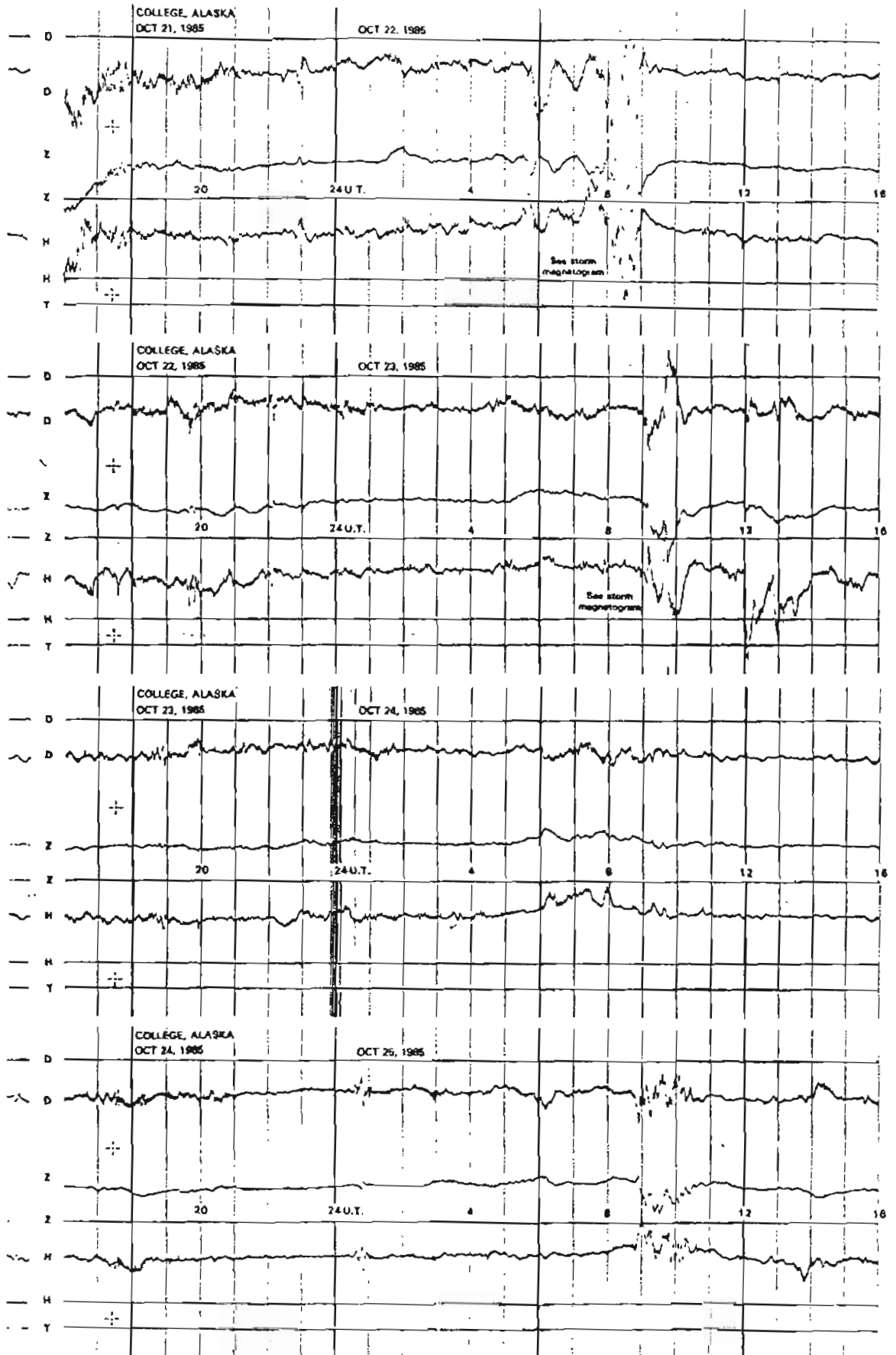
NORMAL MAGNETOGRAMS



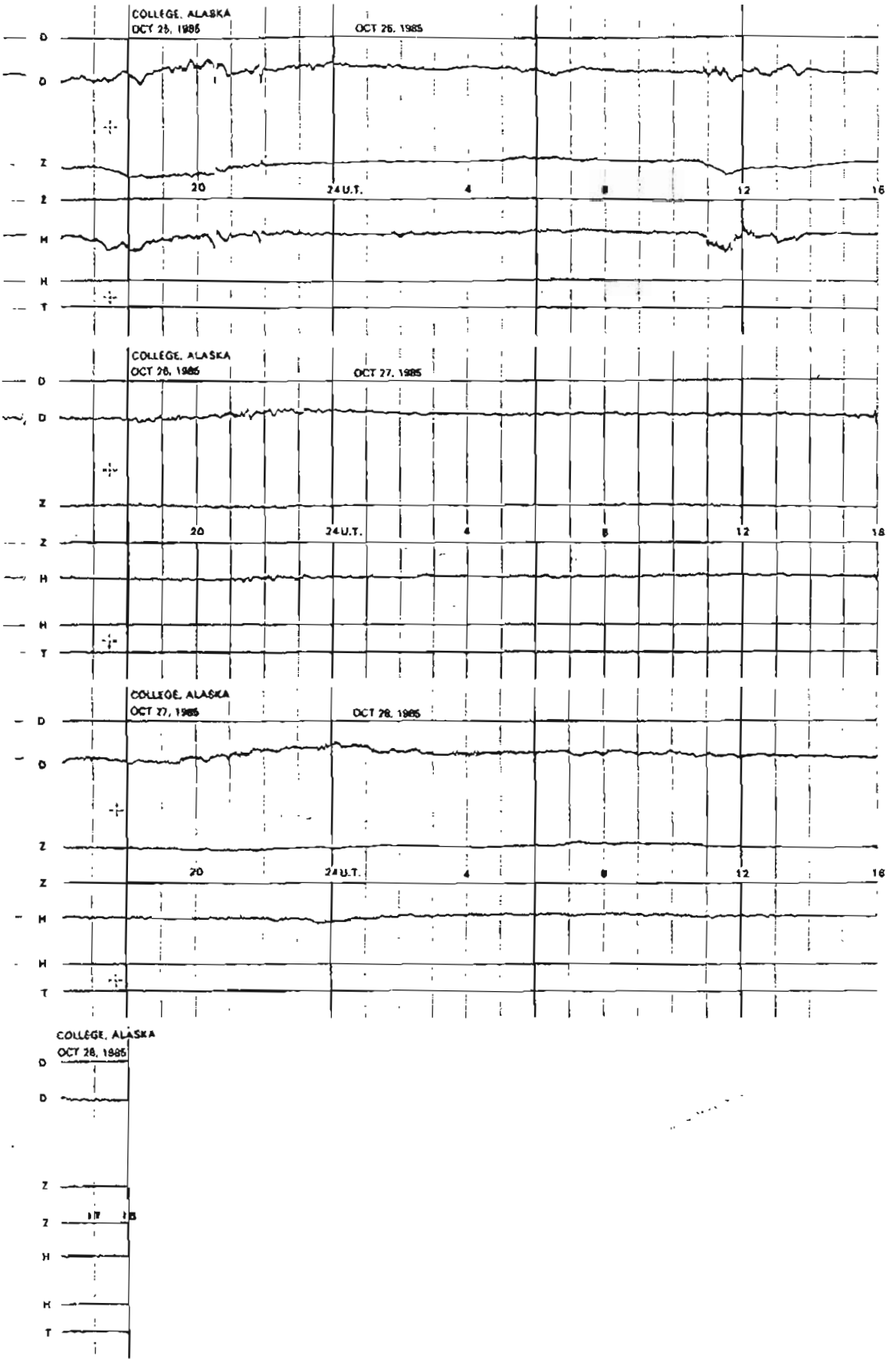
NORMAL MAGNETOGRAMS



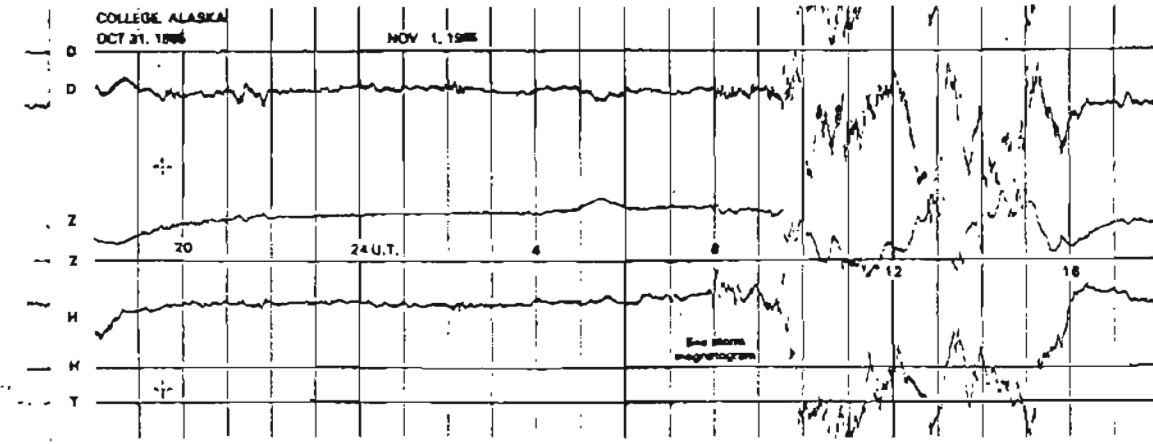
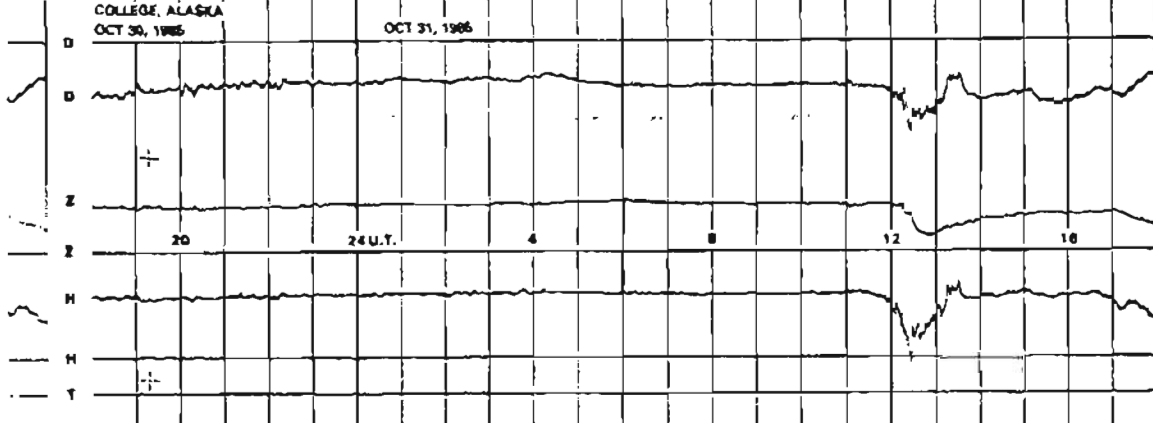
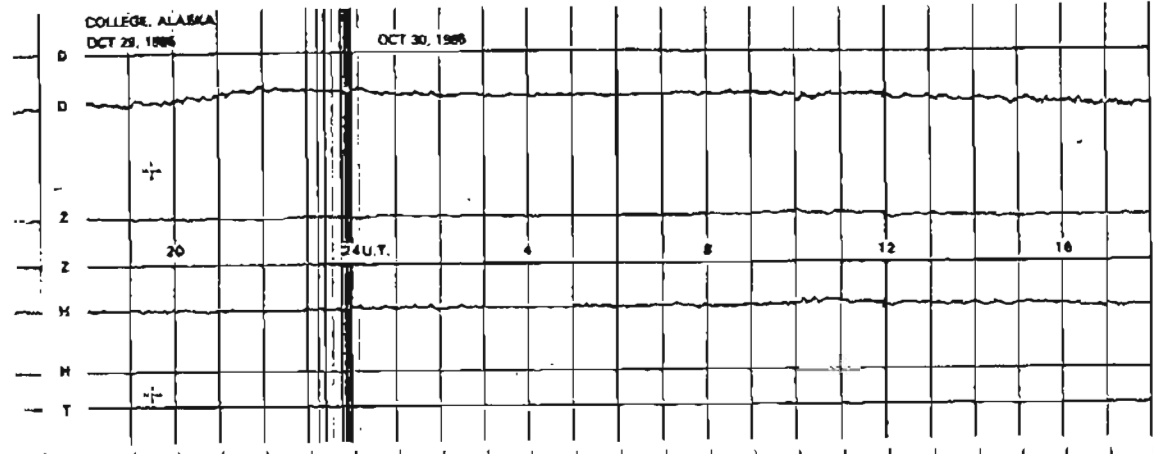
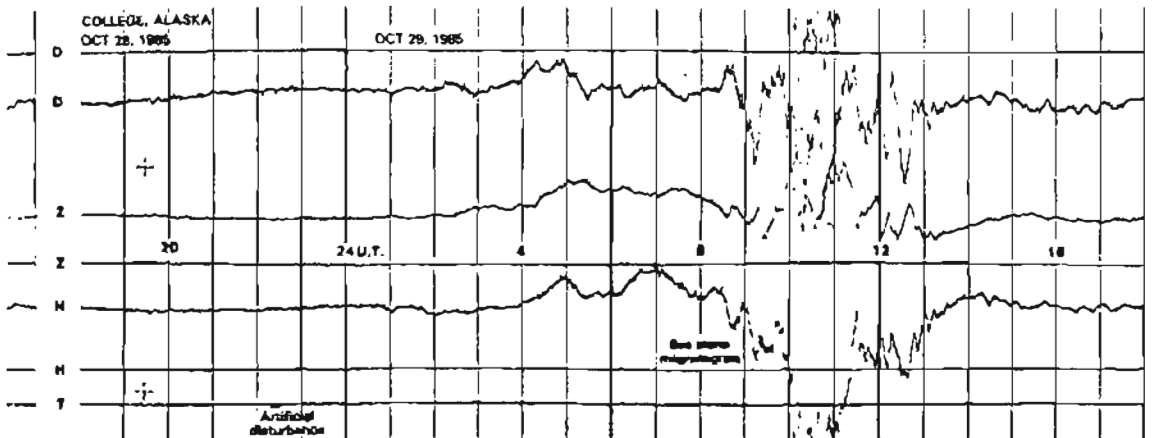
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

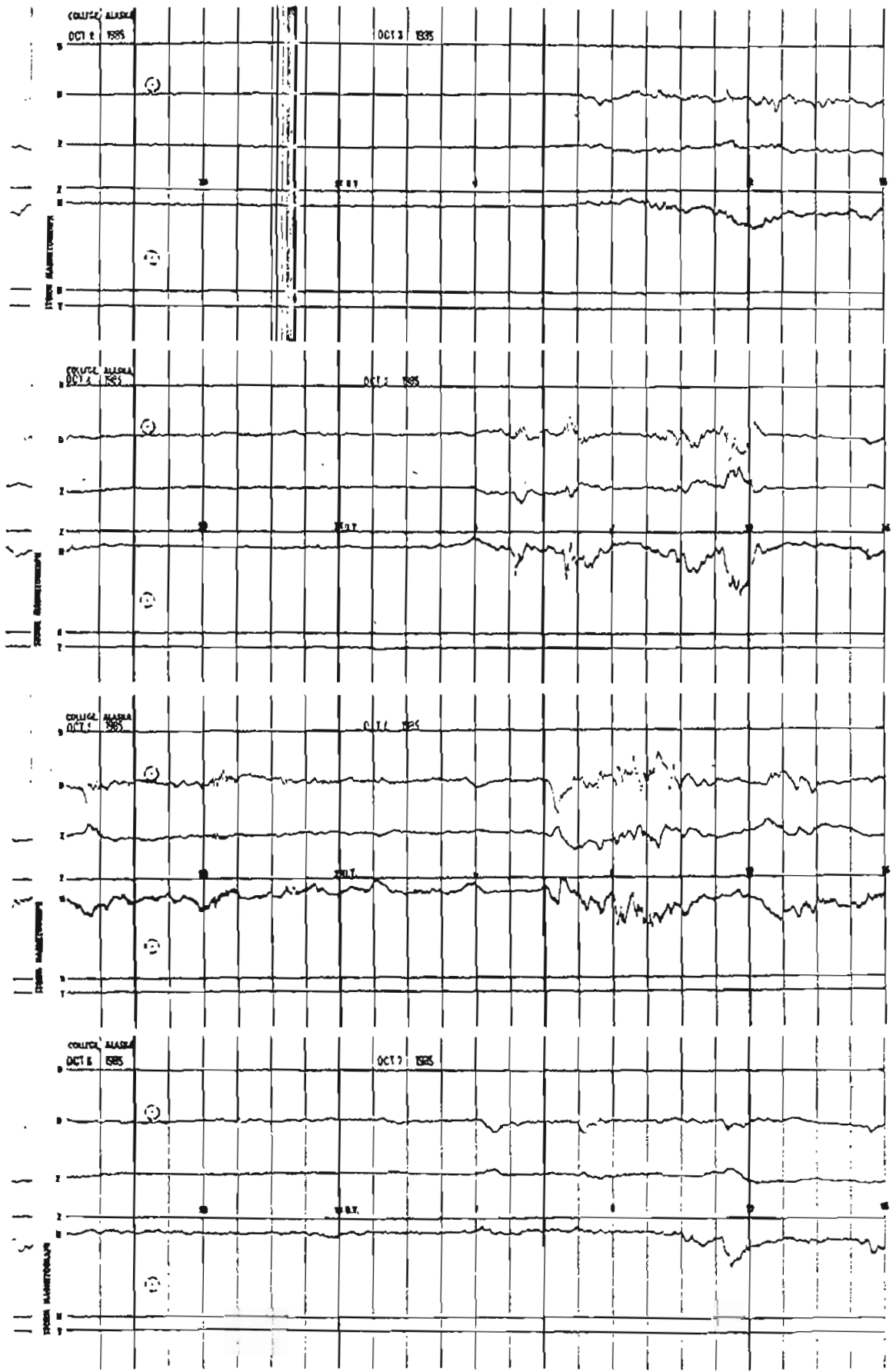


NORMAL MAGNETOGRAMS

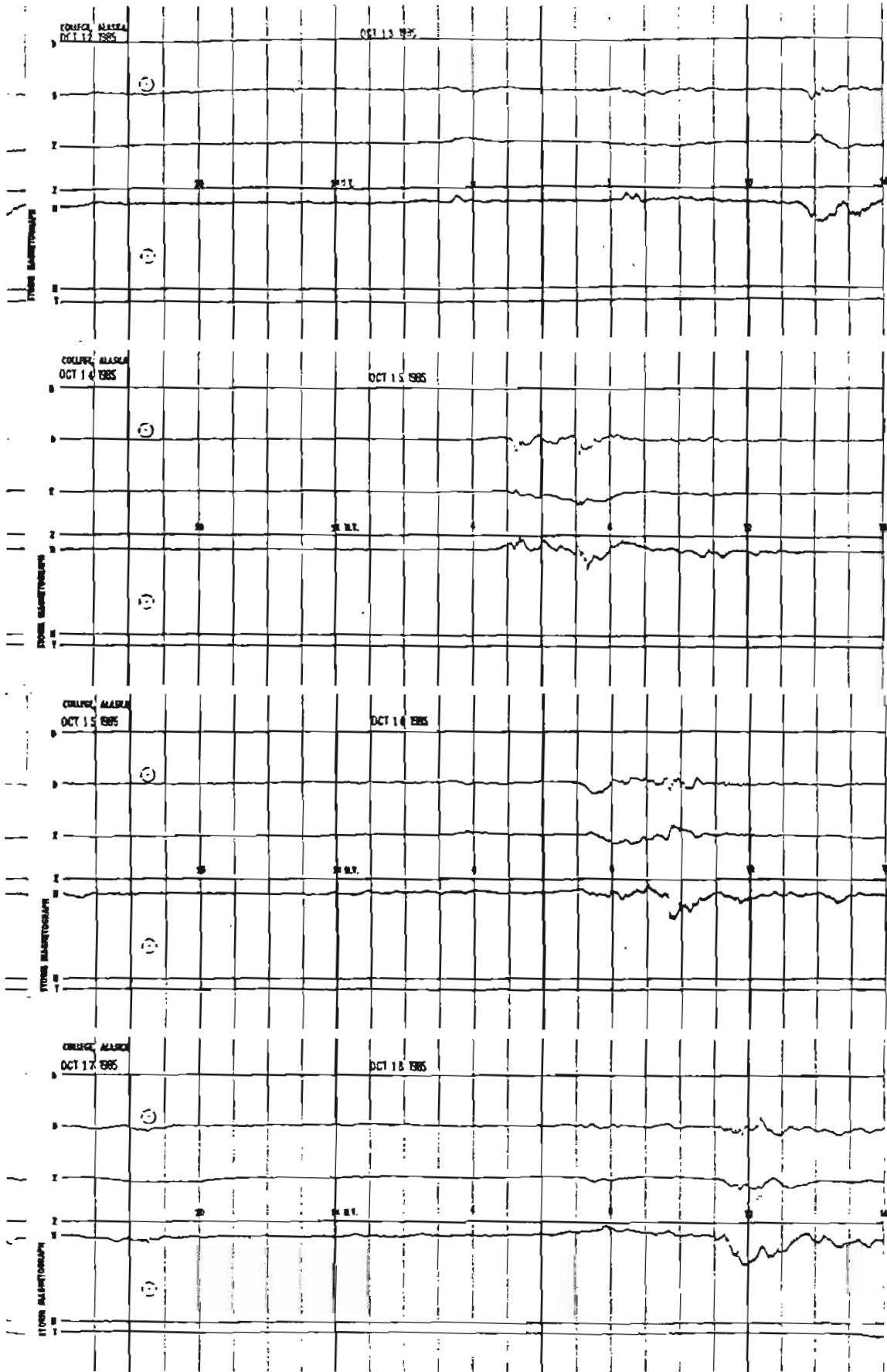


STORM MAGNETOGRAMS

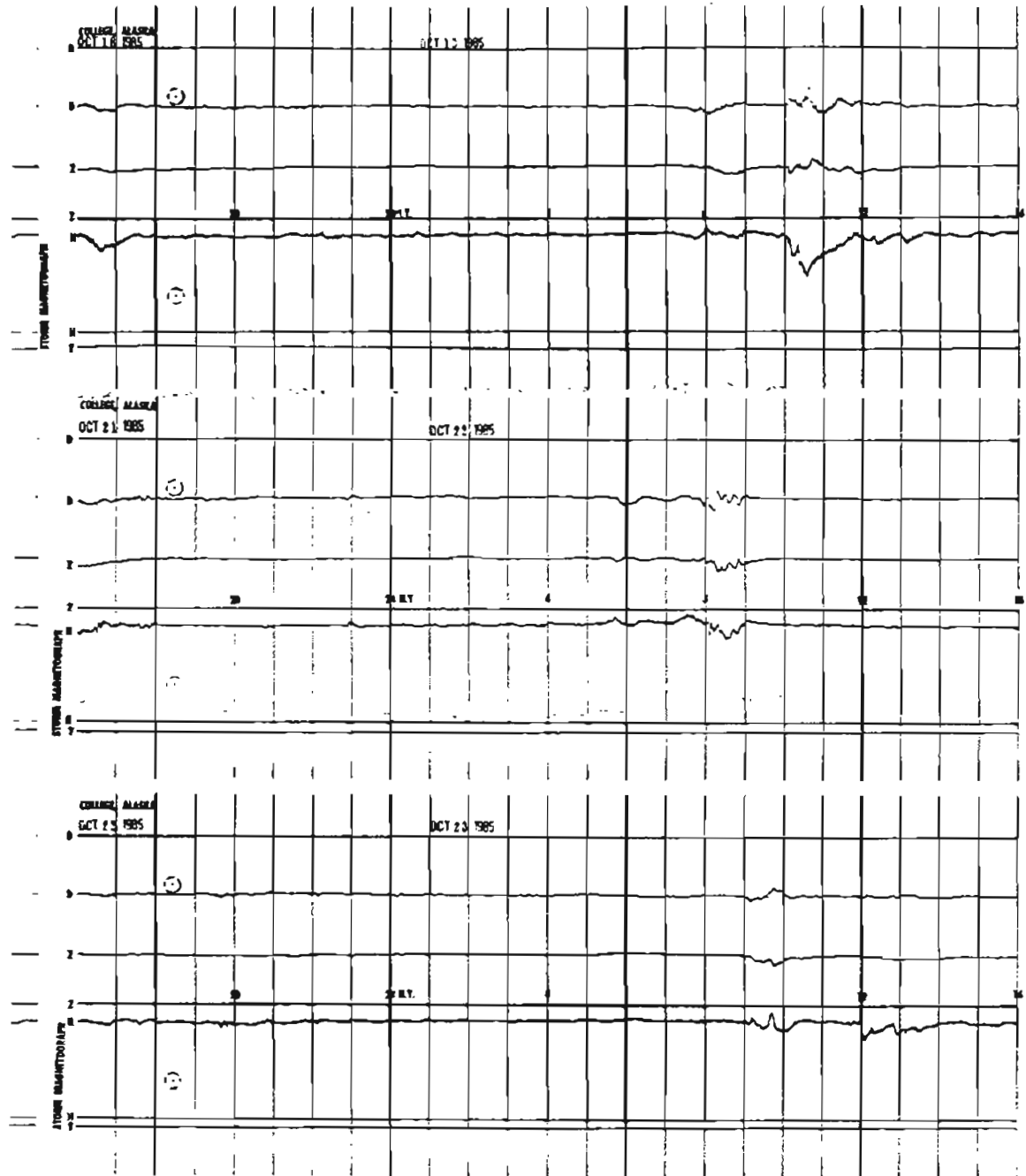
400 mm
100 mm



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS

100 mV
100 m

