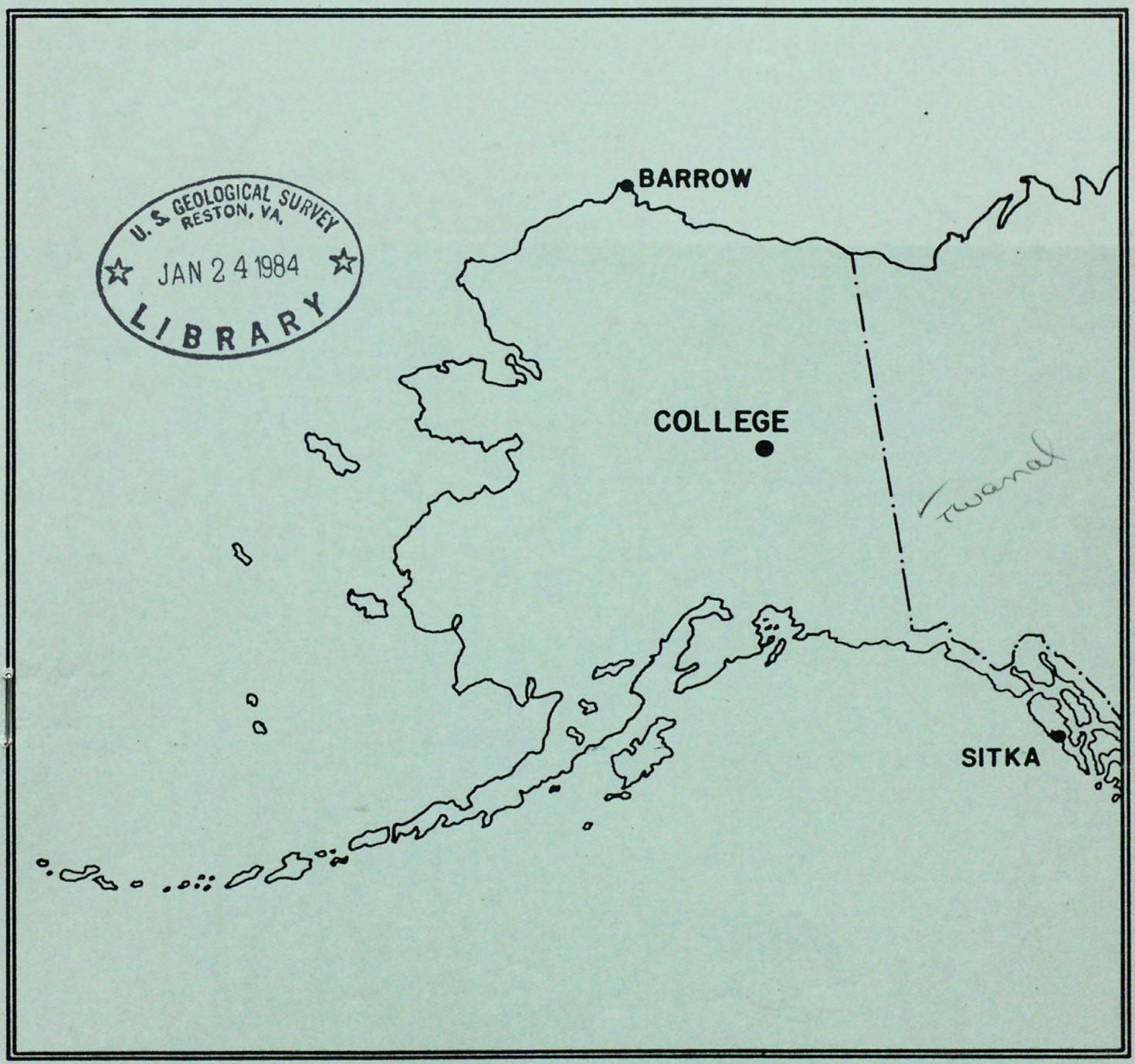
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

OCTOBER 1983

OPEN FILE REPORT 83-0300J



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, 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
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.....+256.9°
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, 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:

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

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 OBSERVATORY

MONTH AND YEAR: OCTOBER 1983

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	1	1	0	2	2	4	2	2	14	08
2	4	5	7	5	5	5	1	2	34	46
3	4	3	5	6	5	5	2	2	32	35
4	2	2	5	7	7	7	4	2	36	65
5	4	1	3	4	2	2	2	1	19	12
6	2	2	3	4	4	5	4	2	26	21
7	3	2	3	4	3	3	2	2	22	14
8	2	2	2	3	4	6	2	2	23	20
9	2	1	1	0	2	1	0	1	08	03
10	0	1	1	3	3	2	2	1	13	07
11	1	2	4	2	1	2	0	0	12	07
12	0	0	0	2	2	0	1	2	07	03
13	2	4	5	6	6	4	3	3	33	37
14	3	3	3	6	5	5	5	4	34	37
15	3	3	4	5	5	5	3	2	30	28
16	2	3	2	4	5	5	1	1	23	20
17	1	2	6	7	6	6	4	4	36	56
18	3	4	7	6	6	6	5	4	41	62
19	2	2	4	3	2	2	1	0	16	09
20	1	1	1	4	0	1	1	1	10	06
21	1	0	2	5	3	4	3	2	20	15
22	4	4	5	5	6	2	2	2	30	31
23	2	2	2	6	7	5	4	4	32	43
24	3	3	2	6	5	4	4	5	30	29
25	1	2	1	2	3	2	1	1	13	06
26	0	0	0	2	0	0	0	0	02	01
27	0	0	1	0	0	0	0	0	01	00
28	0	0	0	0	0	1	2	3	06	03
29	3	4	7	6	6	3	5	3	37	53
30	2	3	6	5	5	5	5	1	32	37
31	1	1	3	5	5	2	1	1	19	16

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.....	683.8	321.7		(mm)
CURRENT SCALE VALUE.....	3.73	7.76		(γ/mm)
LOWER LIMIT FOR K = 9	2550	2500		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY
OBSERVER IN CHARGE

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

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: OCTOBER

YEAR: 1983

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
09	12XX	pi2	
12	10XX	pi2	With several small bays.
24	16XX	pc3, pc4, & pc5	Continuous for approximately 15 hours.
28	2205	si*	

IDENTIFIED BY: JEP

VERIFIED BY: JBT

1. NATURE OF PHENOMENON: ssc, ssc*, si, si*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

(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

OCTOBER 1983

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	12	21XX	..	..	..	..	13	4, 5	6	157	1020	700	15	22
								14	4	6					
		17	03XX	..	..	..	..	17	4	7	314	1660	1020	19	01
								18	3	7					
		28	15XX	..	..	..	..	29	3	7	179	1320	770	30	22

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: OCTOBER 1983

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 10-1-83	2400 U.T., 10-31-83	1.0'/mm	3.7 γ/mm	27° 17.2' E
H	0000 U.T., 10-1-83	2400 U.T., 10-15-83	7.8 γ/mm		12678 γ
	0000 U.T., 10-16-83	2400 U.T., 10-31-83	"		12669 γ
Z	0000 U.T., 10-1-83	2400 U.T., 10-15-83	7.5 γ/mm		55170 γ
	0000 U.T., 10-16-83	2400 U.T., 10-31-83	"		55178 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 10-1-83	2400 U.T., 10-31-83	7.9'/mm	29.6 γ/mm	24° 22.1' E
H	0000 U.T., 10-1-83	2400 U.T., 10-15-83	43.9 γ/mm		10817 γ
	0000 U.T., 10-16-83	2400 U.T., 10-31-83	"		10808 γ
Z	0000 U.T., 10-1-83	2400 U.T., 10-15-83	48.0 γ/mm		54057 γ
	0000 U.T., 10-16-83	2400 U.T., 10-31-83	"		54043 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 51.0' E	12936 γ	55365 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: OCT 1, 9, 10, 11, 12, 20, 25, 26, 27, 28

FORM 76-106

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight, Hour 01 of local day (150 M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225

OBSY.	YEAR	MONTH	ELEMENT
CO	83	OCT	D

C	Q or S	Ten Q	Hr. Da.	01	02	03	04	05	06	07	08	09	10	11	12	Hr. Da.	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	299	304	293	300	306	316	309	311	308	319	337	370	01	378	409	413	427	478	328	326	364	265	308	324	274	8066
			02	256	286	279	279	309*	238	156	313	119*	316	292	386	02	400	465	492	510	380	402	397	342	271	185	196	281	7550
			03	292	334	322	286	282	298	428	322	138	309*	539*	414	03	424	373	526	504	455	443	380	308	299	271	264	302	8513
			04	283	306	298	313	306	320	359	155	168	238*	56*	231	04	339	401	580*	866*	778*	520	435	346	303	314	311	315	8541
			05	310	318	318	337	324	316	324	308	323	326	300	319	05	334	368	374	380	396	400	406	385	354	342	316	302	8180
			06	301	314	304	286	310	300	317	308	255	281	245*	323	06	338	390	391	500	550	496	418	338	346	328	324	294	8257
			07	306	314	308	304	308	272	319	308	324	318	318	351	07	364	362	382	412	402	411	392	363	343	322	299	311	8113
			08	302	290	298	304	298	309	339	308	298	315	300	344	08	373	422	430	446	574	350	414	332	361	300	290	281	8278
			09	298	296	318	300	320	310	321	338	333	335	342	349	09	351	375	353	386	377	388	391	375	346	349	316	311	8178
			10	320	321	323	327	324	315	313	305	312	317	319	335	10	332	364	369	371	389	418	385	347	309	271	296	309	7986
			11	319	324	300	314	308	280	371	394	331	322	323	358	11	360	365	365	342	376	396	395	372	350	330	317	315	8227
			12	324	326	306	314	325	328	328	332	333	334	322	339	12	348	367	375	391	425	430	418	395	324	320	300	292	8296
			13	270	232	210	249	289	276	304	329	416	241	325	357*	13	318	531*	627*	539*	464	513	347	272	290	152	191	278	8020
			14	297	298	320	308	308	289	338	298	304	240	362	603*	14	516*	642*	564*	602	670	405	378	277	289	220	304	219	9046
			15	222	226	278	296	272	476	360	259	264	500*	492*	357*	15	469*	500*	554	534	379	382	392	316	200	264	276	262	8530
			16	278	288	305	290	302	430	295	319	312	320	366	469	16	403	464	498	560	419	368	369	348	313	286	290	293	8585
			17	302	302	302	290	290	279	322	236	294*	183*	287	825*	17	469*	500*	889*	381*	714*	461*	304	290	149	249	330	281	8929
			18	338	302	237	262	271	277	222	233	198*	-64*	175*	500*	18	492*	183*	961*	627*	564*	335	468	259	260	330	308	304	8042
			19	308	339	334	336	384	348	326	320	380	224	335	347	19	356	360	354	364	376	385	384	360	340	330	321	323	8234
			20	329	331	329	314	315	316	315	319	331	326	265	368	20	357	356	353	366	372	390	406	395	368	320	314	316	8171
			21	325	328	324	316	323	325	320	320	328	313	424	390	21	374	357	375	496	499	408	382	379	366	318	301	312	8603
			22	229	266	242	286	258	401	337	306	320	39*	428*	352	22	204	310	393	354	369	404	376	358	332	324	302	293	7483
			23	295	292	310	303	284	285	307	314	323	320	194	619*	23	706*	476	514	296	382	388	348	331	266	124	164	237	8078
			24	279	307	309	321	321	279	324	328	326	329	402	365*	24	239	373	418	379	378	370	340	332	320	325	307	306	7977
			25	315	317	310	314	327	330	325	330	330	336	340	348	25	351	352	404	336	372	374	388	392	370	352	324	312	8249
			26	318	314	318	320	313	324	324	320	330	336	383	350	26	366	354	344	345	350	370	383	382	372	348	336	326	8226
			27	319	316	312	316	313	310	318	309	330	334	336	337	27	343	345	354	356	357	381	391	394	370	356	340	323	8160
			28	314	306	284	312	321	326	327	328	333	333	337	339	28	343	348	350	358	367	412	440	414	397	406	381	246	8322
			29	135	136	247	249	272	266	337	348	327*	360*	605*	558*	29	386	463*	383*	410	433	412	330	301	347	282	252	239	8078
			30	287	308	299	277	270	334	367	248*	279	372	393	530	30	444*	716*	780*	563	379	340	258	255	303	311	320	318	9001
			31	323	326	320	315	329	336	310	386	354	314	342	335	31	420	401	366	395	358	345	362	353	347	318	286	309	8250

SCALED BY	LYT
CHECKED BY	EAS, JEP
SIGNS REVIEWED BY	EAS
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.
[ ] Scaling uncertain because of magnetic storm.
<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.
* Derived from STORM Mgph., converted to Normal Mgph.

MONTHLY SUM	256 169
MONTHLY MEAN	344
DATES WITH GAPS:	

FORM 76-186

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150 M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225

OBSY.	YEAR	MONTH	ELEMENT
CO	83	OCT	Z

C	Q or S	Tes Q	Hr. / Da.	01	02	03	04	05	06	07	08	09	10	11	12	Hr. / Da.	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	261	270	271	270	270	269	273	282	286	298	268	278	01	259	221	218	206	181	144	172	220	218	244	270	304	5953
			02	306	313	342	278	173*	327	210	153	148*	272	258	166	02	192	243	214	210	208	269	260	252	260	245	268	296	5863
			03	302	308	293	300	312	260	135*	60	200	423*	423*	289	03	264	333	372*	198	103	178	193	207	234	252	276	300	6210
			04	316	286	284	300	312	312	274	172	268	532*	628*	395	04	447	414	577*	749*	187*	86	177	215	256	281	290	289	8047
			05	285	285	280	282	276	279	289	288	258	132	189	299	05	326	286	274	276	282	280	276	268	269	270	266	265	6480
			06	284	286	280	278	282	304	314	226	140	217	312	301	06	311	279	279	210	134	42	198	184	245	254	268	279	5907
			07	277	282	282	323	306	294	305	288	264	290	295	307	07	255	261	253	250	216	234	254	255	263	264	260	262	6540
			08	268	274	283	281	286	290	305	288	284	288	272	284	08	275	288	283	244	156	190	194	201	225	246	259	253	6217
			09	264	290	285	275	272	270	282	286	271	269	272	265	09	246	219	226	224	252	264	259	262	257	259	250	260	6279
			10	262	264	264	263	262	259	262	280	280	247	240	251	10	192	231	252	259	258	248	214	206	198	210	243	258	5903
			11	269	267	266	269	268	274	301	255	252	303	296	271	11	255	252	258	260	267	269	260	258	259	257	258	263	6407
			12	265	267	264	269	268	266	266	267	268	270	230	270	12	250	246	254	255	252	237	220	210	198	212	230	242	5976
			13	246	308	336	328	212*	129*	256	189	237	310	429*	685*	13	493*	404*	397*	475*	189	13	160	235	264	222	257	287	7061
			14	309	300	325	296	306	297	288	276	286	221	324	417*	14	397*	443*	308*	199	175	116	-10	118	260	268	304	310	6533
			15	323	330	337	324	306	351	282	230	194	167*	359*	539*	15	475*	404*	144	49	66	187	237	206	173	227	265	274	6449
			16	282	288	312	309	318	331	316	300	280	281	270	207	16	259	310	185	30	42	165	220	256	256	262	272	277	6028
			17	286	294	288	304	312	318	297	181	195	205	423*	641*	17	621*	577*	699*	429*	385*	20*	26	134	144	231	316	329	7655
			18	330	337	314	277	269*	180*	7*	103*	532*	295*	525*	596*	18	641*	251*	525*	308*	205*	152	162	196	256	294	294	302	7351
			19	313	314	303	316	316	312	313	300	250	84	223	220	19	235	264	265	266	278	266	268	270	269	273	273	276	6467
			20	277	276	273	273	290	305	300	305	298	281	175	169	20	232	257	261	263	269	270	268	260	250	240	257	268	6317
			21	266	272	266	266	266	266	270	278	282	256	204	50	21	231	274	271	195	137	128	194	228	246	244	262	268	5620
			22	274	319	348	315	299	297	292	275	173	186	329*	235	22	65	104	139	213	245	250	257	259	251	256	260	256	5897
			23	261	270	278	274	277	276	326	311	306	218	96	80*	23	253*	171	342	164	139	174	226	239	254	274	242	262	5713
			24	301	306	284	269	267	272	312	294	302	252	189	503*	24	132	185	207	231	222	224	222	254	254	267	265	291	6305
			25	295	292	277	273	266	269	270	277	273	273	268	247	25	251	253	244	186	213	249	252	248	245	247	252	253	6173
			26	258	260	263	263	263	268	266	271	272	276	279	255	26	252	249	247	250	243	248	254	251	249	253	254	253	6197
			27	253	256	255	256	256	257	270	279	281	270	259	255	27	253	253	250	248	247	247	245	243	241	240	240	243	6097
			28	249	255	260	263	263	250	249	249	249	247	250	250	28	249	248	247	246	239	237	232	222	222	230	230	248	5884
			29	296	351	399	381	352	260	180	314	308*	263*	148*	308*	29	263	539*	244*	157	198	230	216	252	283	274	280	292	6788
			30	320	304	299	312	326	310	274	91*	166	174	229	228	30	283*	269*	135*	119	181	140	164	214	264	263	282	289	5636
			31	280	284	283	290	278	265	263	274	224	165	182	276	31	322	196	91	190	221	223	243	259	299	256	258	263	5845

SCALED BY	LYT
CHECKED BY	EAS, JEP
SIGNS REVIEWED BY	EAS
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.

[ ] Scaling uncertain because of magnetic storm.

<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

* Derived from STORM Mgph., converted to Normal Mgph.

MONTHLY SUM	195,798
MONTHLY MEAN	263
DATES WITH GAPS:	

FORM 76–106

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight, Hour 01 of local day (150 M.T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225

OBSY.	YEAR	MONTH	ELE-MENT
CO	83	OCT	H

C	Q or S	Tea Q	Hr. Day	01	02	03	04	05	06	07	08	09	10	11	12	Hr. Day	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	308	320	322	331	340	339	349	349	354	377	378	351	01	335	310	319	293	182	263	317	310	291	302	281	306	7627
			02	332	377	442	583	601	614	538	238	-124*	378	256	192	02	-135	55	232	203	364	332	323	315	300	288	314	313	7331
			03	379	311	333	376	399	439	390	264	274	63*	-237*	87	03	178	182	-164*	-2	244	328	339	339	339	320	329	322	5832
			04	330	339	374	348	340	364	525	422	189	-62*	-344*	204	04	262	260	142*	-554*	-107*	337	330	340	344	347	346	340	5416
			05	339	330	336	329	329	331	329	357	405	376	435	377	05	348	321	327	323	322	316	316	317	322	317	324	342	8168
			06	319	333	336	342	334	364	402	413	412	408	412	373	06	357	324	319	190	14	196	207	282	329	326	317	306	7615
			07	314	336	316	382	376	377	366	372	446	412	357	282	07	295	328	308	238	300	310	321	316	320	318	318	328	8036
			08	326	320	324	362	345	348	367	359	356	416	403	363	08	300	228	204	46	6*	296	280	270	300	308	296	316	7139
			09	327	362	348	352	341	351	350	354	340	336	340	338	09	315	312	339	333	336	334	323	313	315	310	314	324	8007
			10	326	330	333	337	340	342	339	348	360	375	372	340	10	294	350	353	345	327	292	289	290	278	305	319	320	7904
			11	329	331	337	327	337	364	433	339	398	381	357	340	11	334	322	334	307	340	338	330	323	319	320	324	326	8190
			12	328	330	338	337	338	341	342	340	345	344	347	376	12	323	356	340	337	321	321	327	320	325	330	334	341	8081
			13	354	356	394	478	594*	668*	471	191	146	245	108	-5*	13	73*	-204*	4	63	93	199	314	320	222	217	308	338	5947
			14	346	362	390	368	333	384	484	417	392	205	142	-73	14	40*	-192*	77	44	41	-10*	133	355	373	324	344	250	5529
			15	338	406	394	352	443	427	420	462	365	0*	-147*	60	15	-130*	-327*	51	88	340	361	344	221	265	334	324	310	5701
			16	325	364	352	355	365	422	366	348	337	338	306	203	16	208	-96	-45	18	320	324	369	356	334	325	342	334	6860
			17	338	347	339	339	358	389	449	391	67	277	166	-531*	17	-124*	161	-521*	-159*	-327*	98	246	99	244	339	346	441	3772
			18	477	444	406	586	696*	724*	651*	454*	-135*	102*	-260*	-209*	18	-919*	-31*	-254*	-226*	79	230	78	232	353	382	356	358	4799
			19	350	346	358	382	359	347	369	392	366	284	311	284	19	320	331	336	324	314	326	338	320	313	316	322	323	7981
			20	325	331	337	340	326	338	348	348	348	358	226	296	20	351	350	347	342	338	331	327	315	310	313	325	316	7886
			21	323	328	336	340	343	343	345	351	376	450	272	267	21	398	378	342	226	156	255	322	340	332	333	336	342	7834
			22	330	419	526	380	379	466	384	368	248	-160*	-125*	-82*	22	-198*	160	370	366	346	323	349	332	330	329	332	331	6503
			23	339	353	354	391	362	376	384	402	388	352	-46	-233*	23	-454*	113	-41	186	293	279	329	299	172	238	360	359	5555
			24	382	411	355	358	353	414	403	406	372	402	244	-92*	24	-37	348	292	280	265	351	254	318	325	330	322	352	7408
			25	347	361	366	355	346	347	348	345	347	350	340	324	25	341	341	269	299	350	348	336	331	330	332	331	332	8116
			26	339	343	350	351	353	346	352	350	351	360	374	361	26	344	345	348	338	340	342	340	337	331	328	329	332	8284
			27	337	342	350	350	350	353	357	359	364	354	350	350	27	351	351	350	346	342	338	341	339	332	332	332	333	8303
			28	340	339	349	350	352	355	352	353	352	353	353	357	28	358	355	355	355	370	360	359	355	360	337	306	324	8399
			29	438	536	446	475	518	567	368	72*	-278*	-216*	-295*	-70*	29	221	-210*	-41*	348	327	286	173	383	357	286	284	317	5342
			30	397	368	394	420	475	439	418	157*	233	141	-44	-106	30	-137*	-278*	-188*	107	-58*	-56	133	372	364	353	360	349	4613
			31	338	340	338	369	350	347	380	427	385	353	107	204	31	131	-88	261	311	346	335	359	347	344	337	313	330	7264

SCALED BY	LYT
CHECKED BY	EAS, JEP
SIGNS REVIEWED BY	EAS
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.

[ ] Scaling uncertain because of magnetic storm.

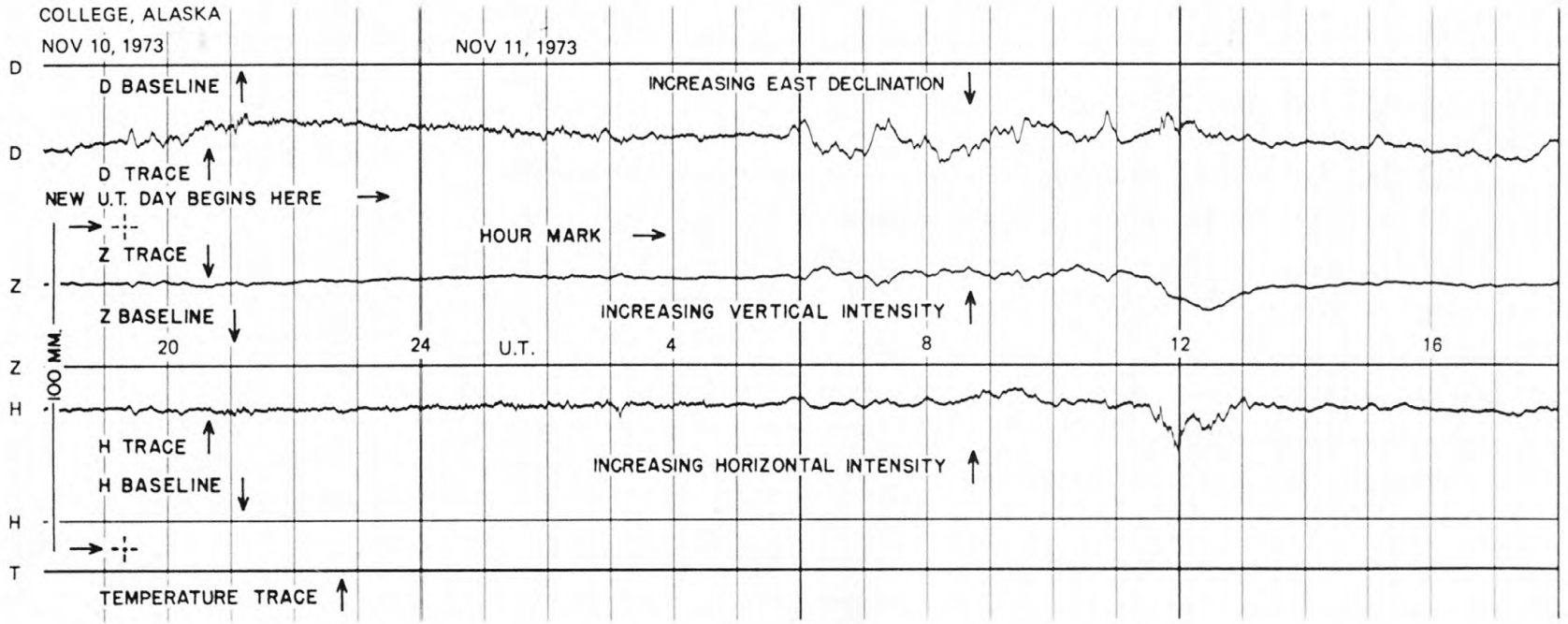
<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

* Derived from STORM Mgph., converted to Normal Mgph.

MONTHLY SUM	215442
MONTHLY MEAN	290
DATES WITH GAPS:	

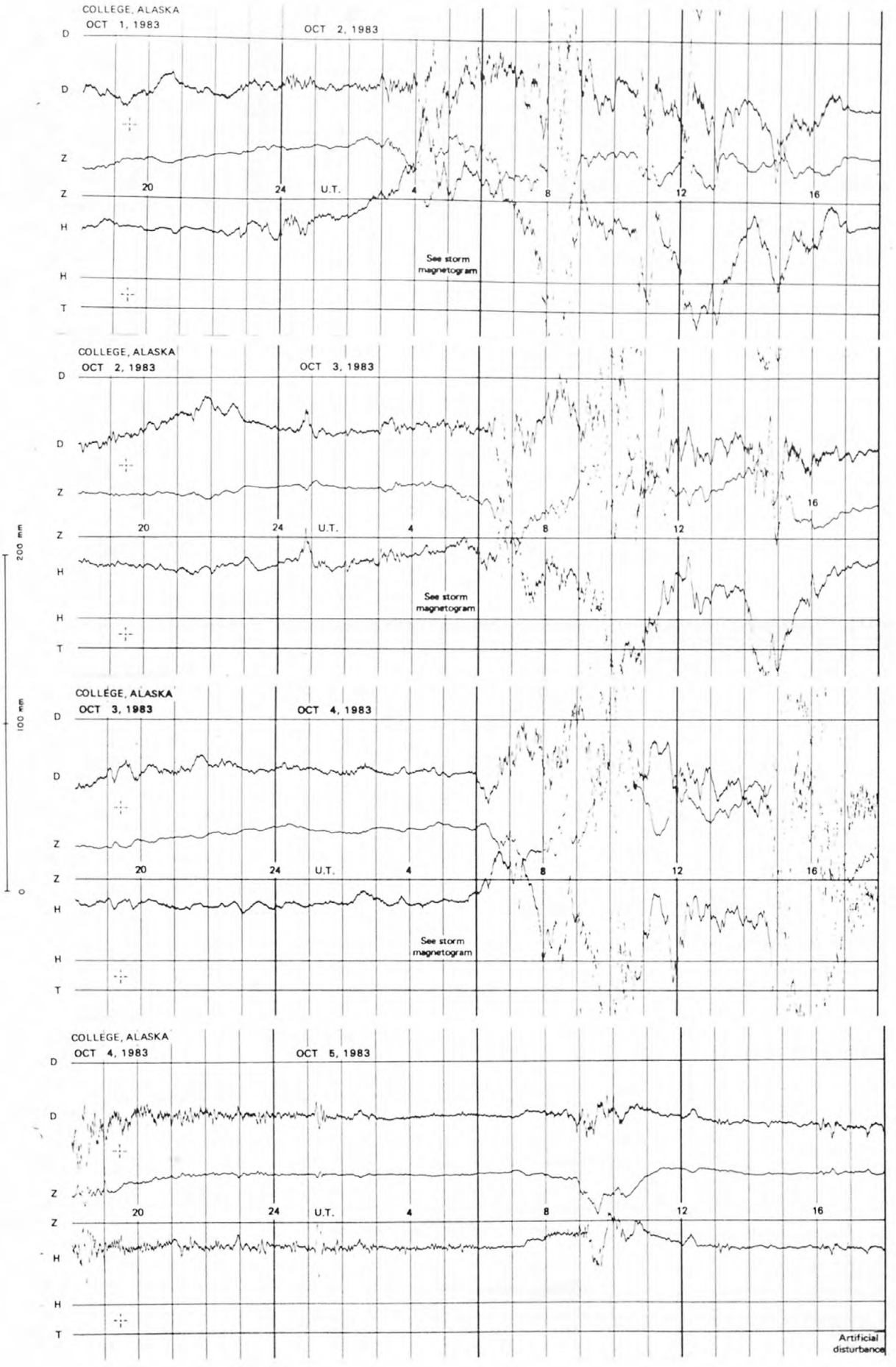
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)

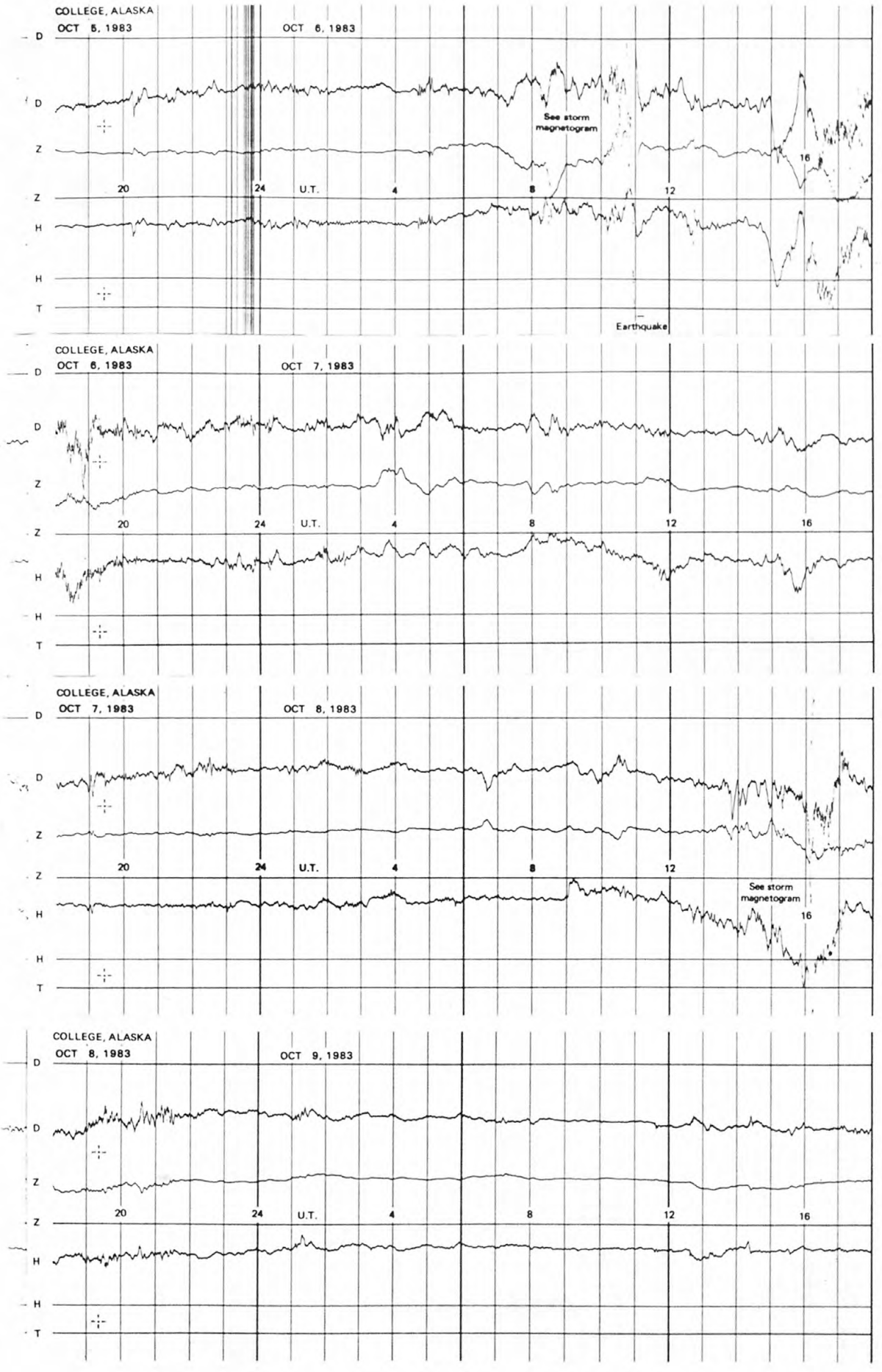


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

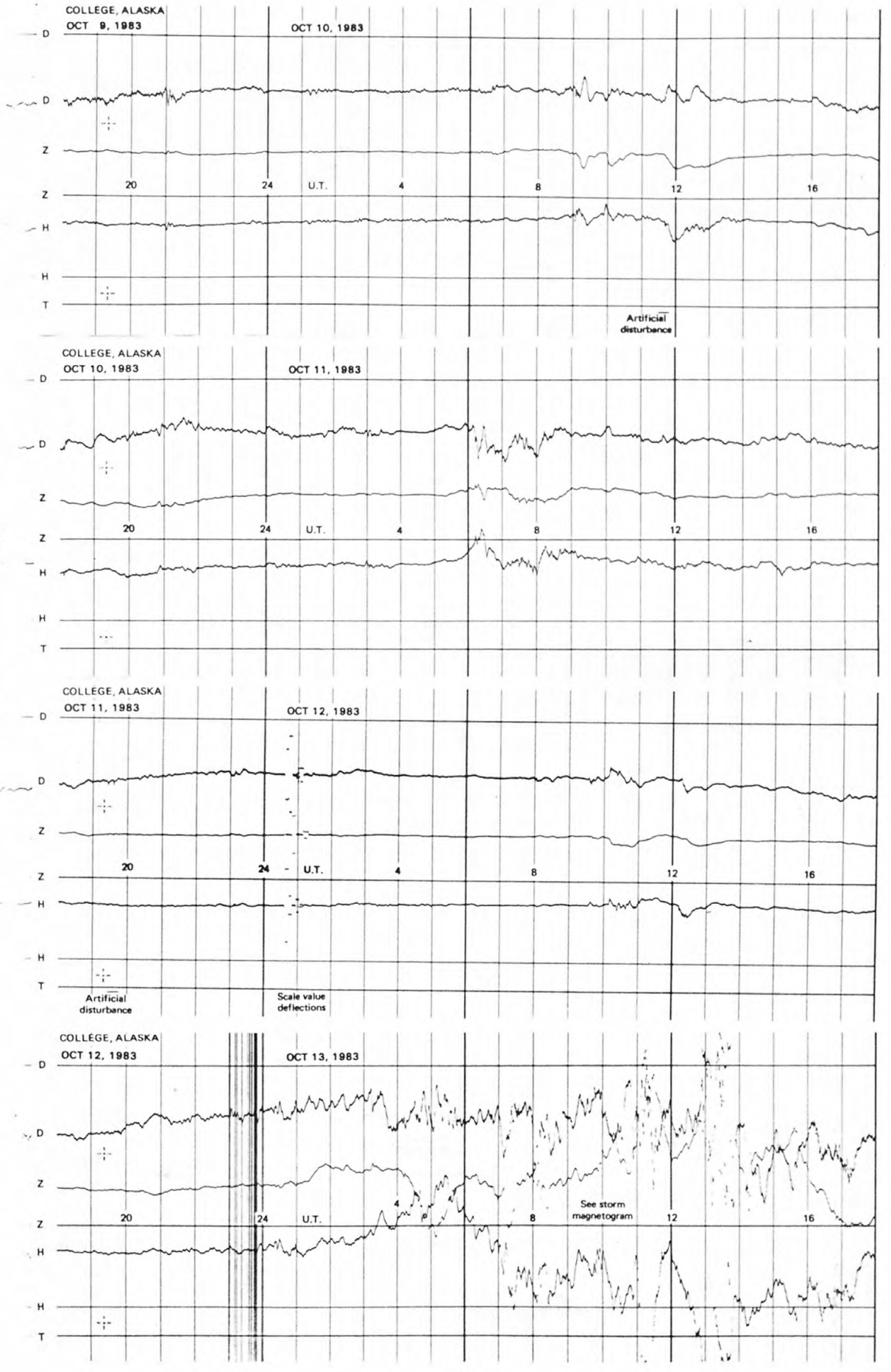
NORMAL MAGNETOGRAMS



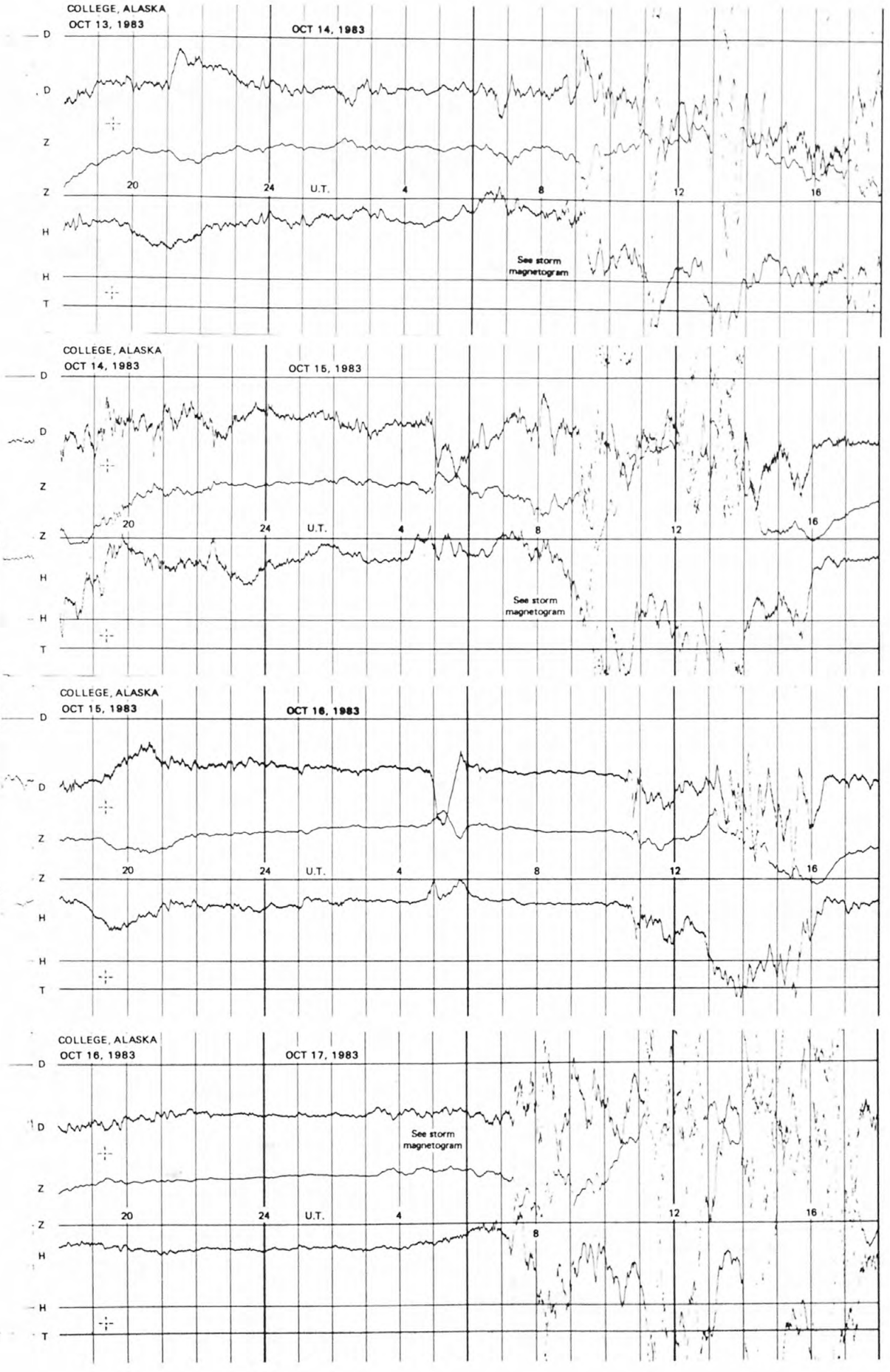
NORMAL MAGNETOGRAMS



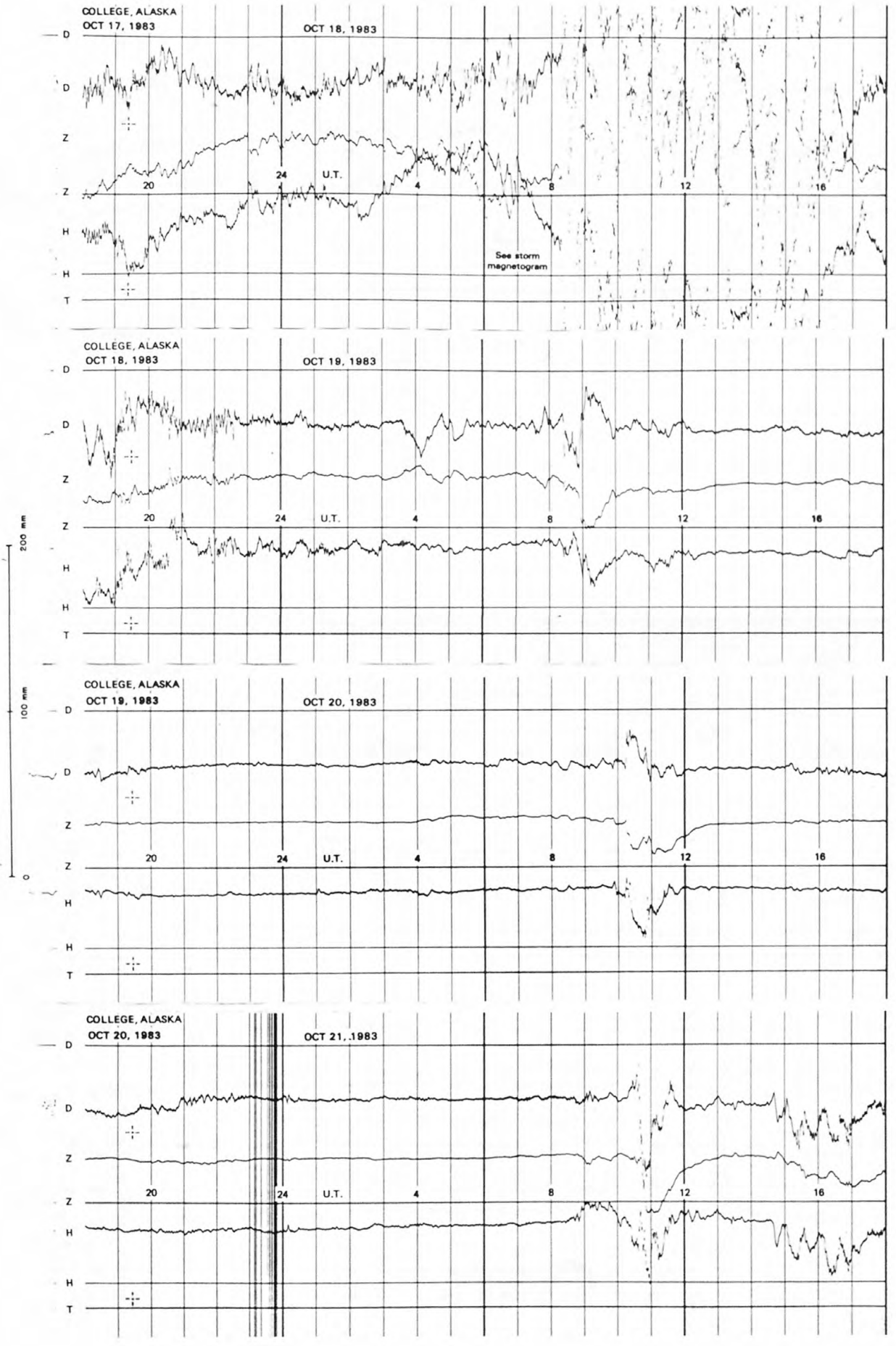
NORMAL MAGNETOGRAMS



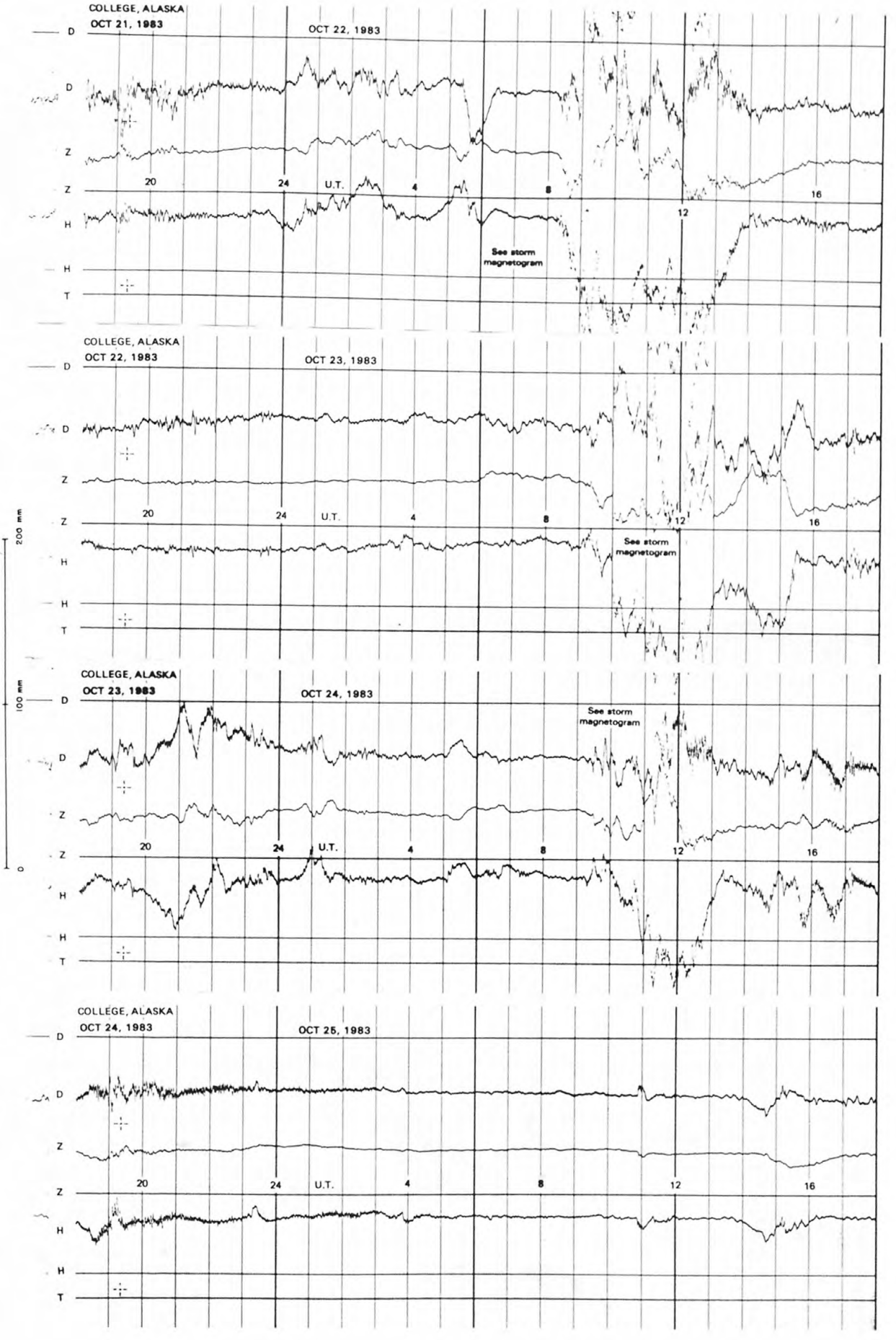
NORMAL MAGNETOGRAMS



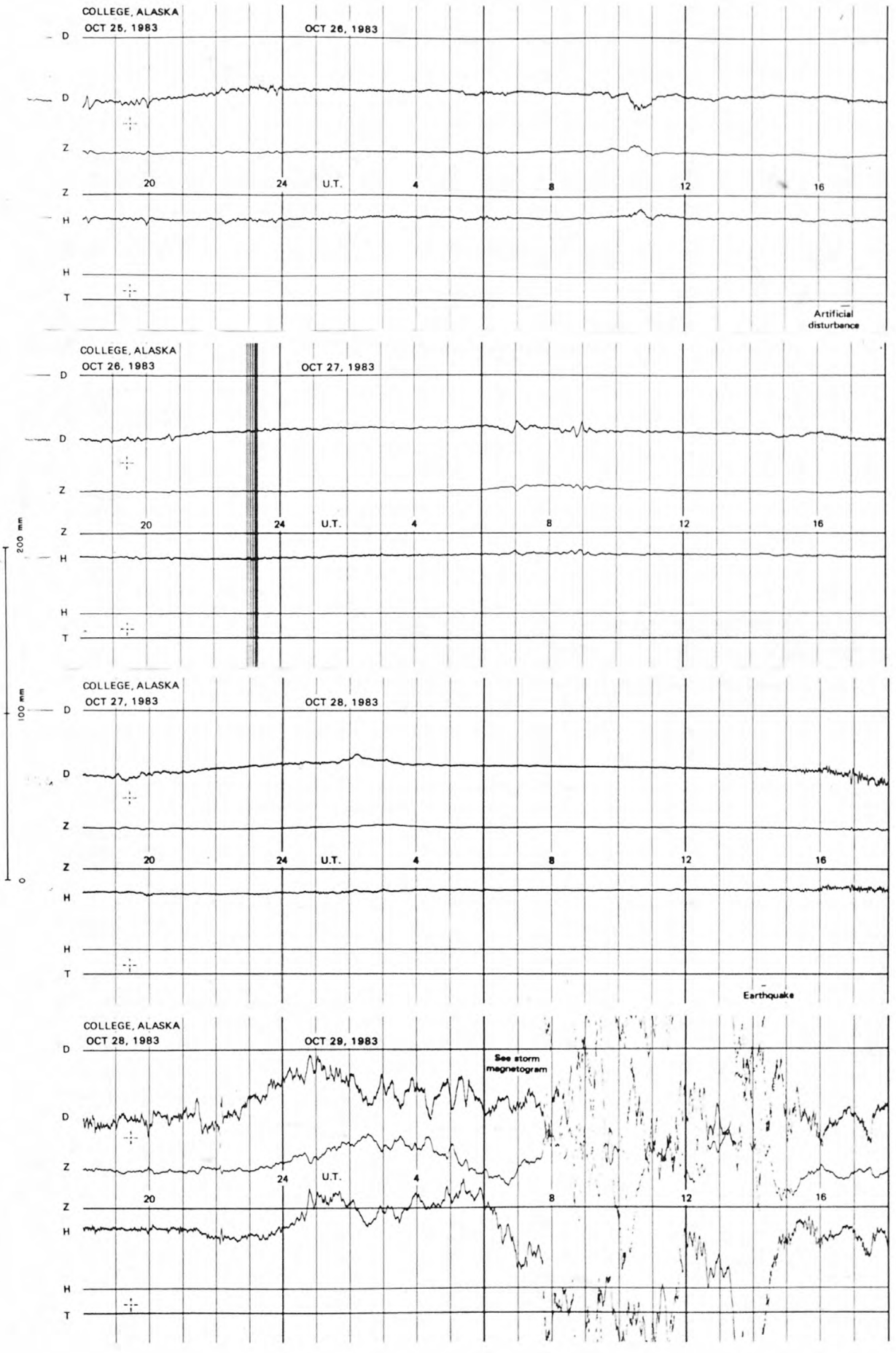
NORMAL MAGNETOGRAMS



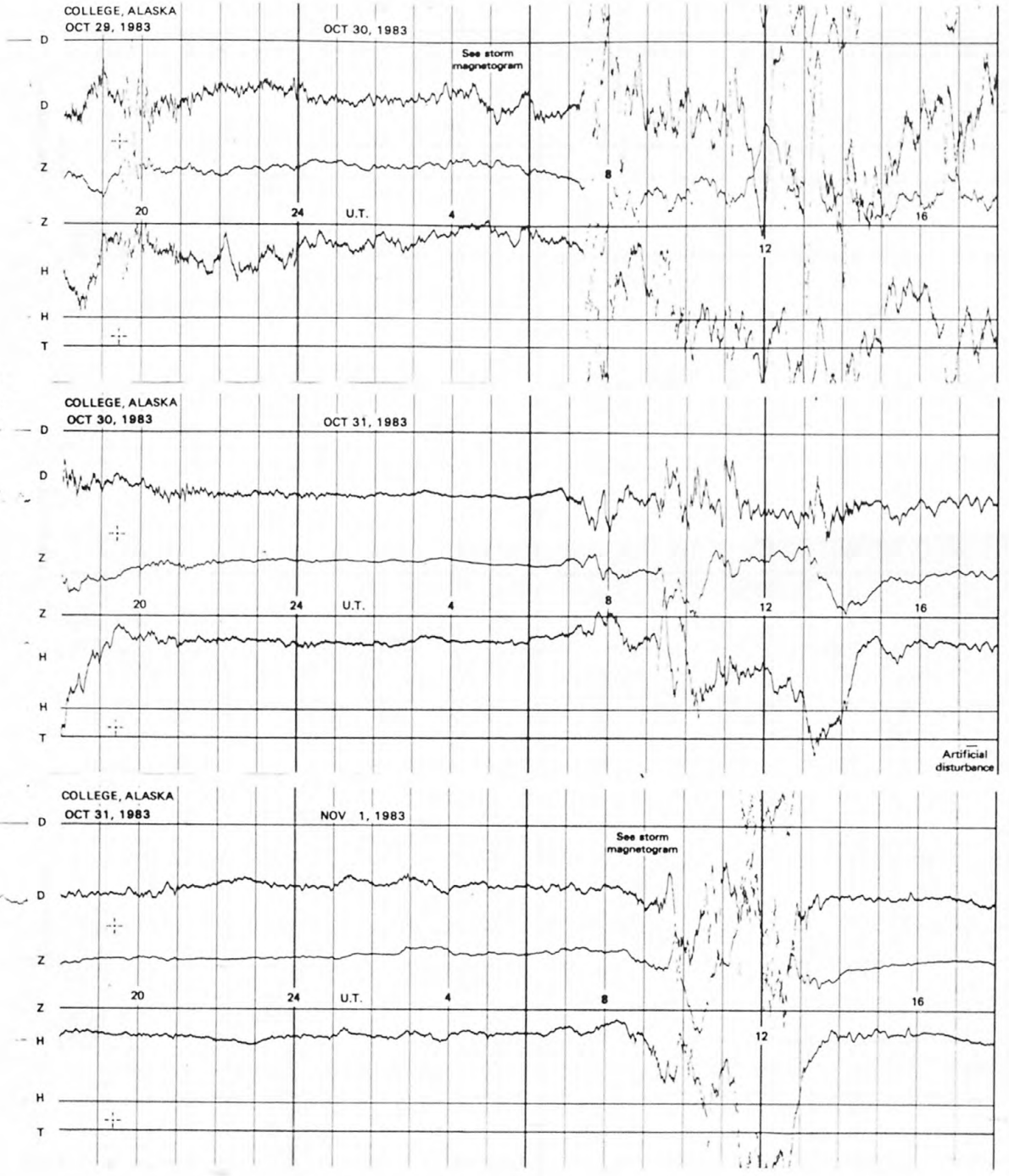
NORMAL MAGNETOGRAMS



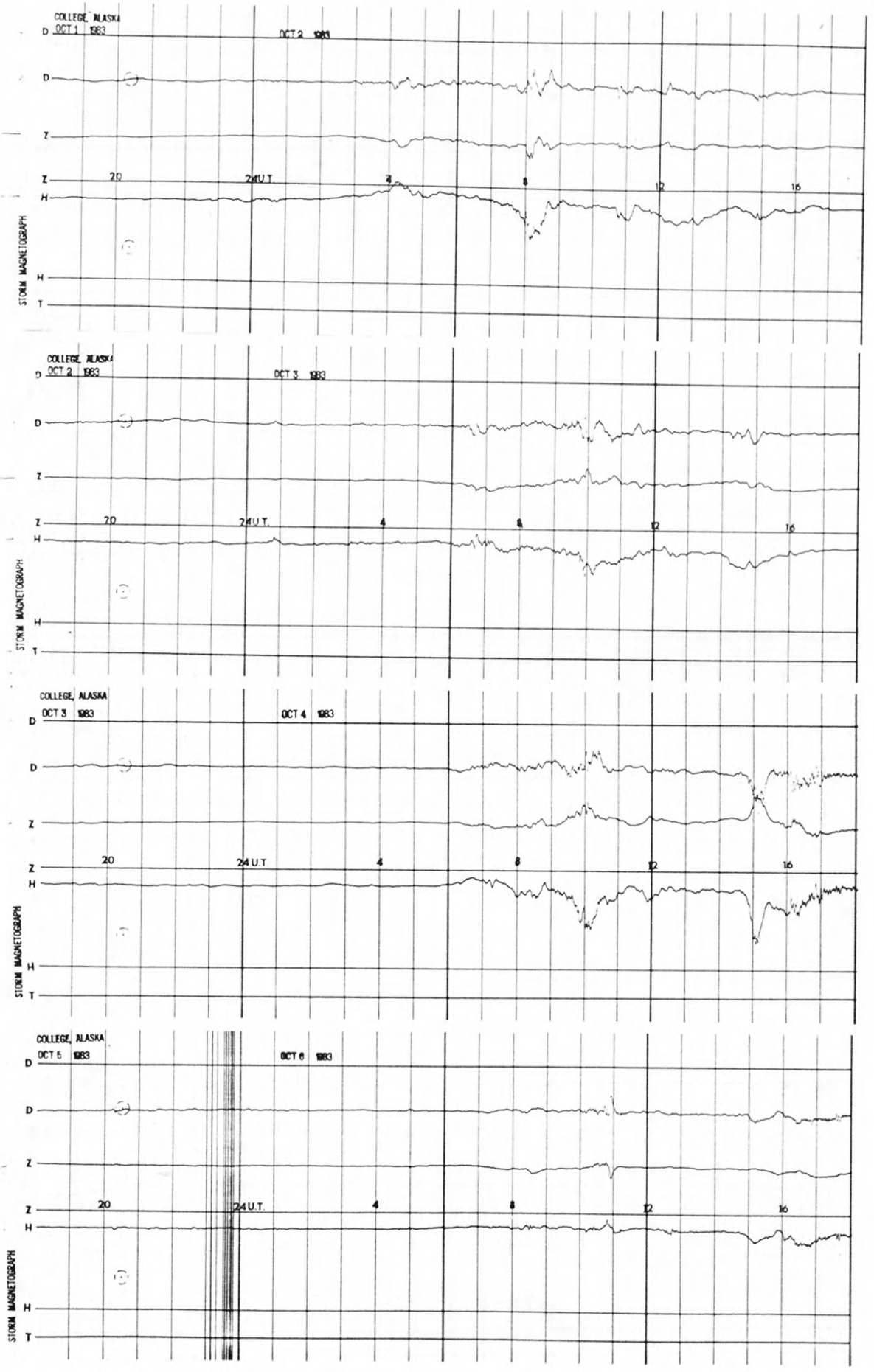
NORMAL MAGNETOGRAMS



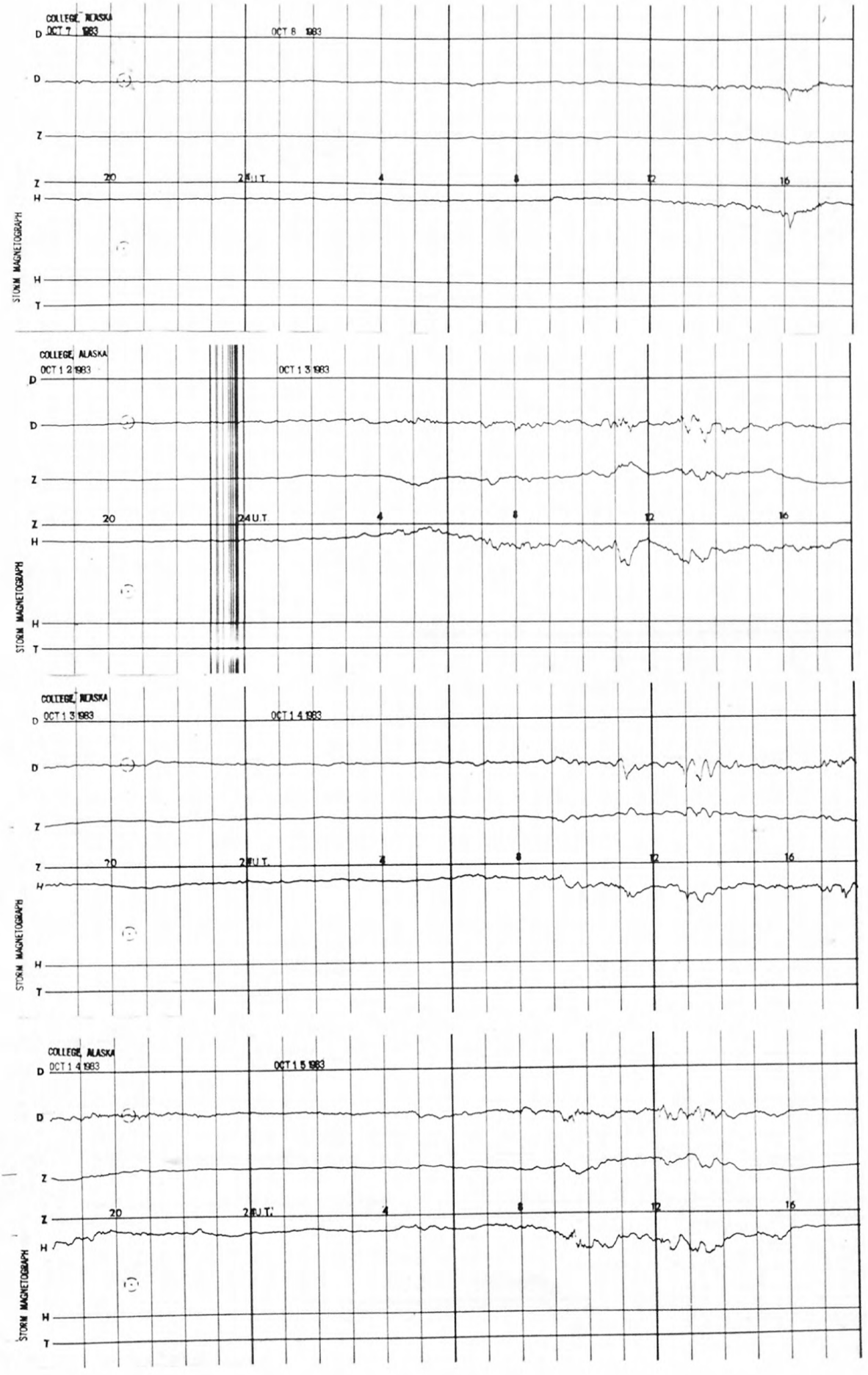
NORMAL MAGNETOGRAMS



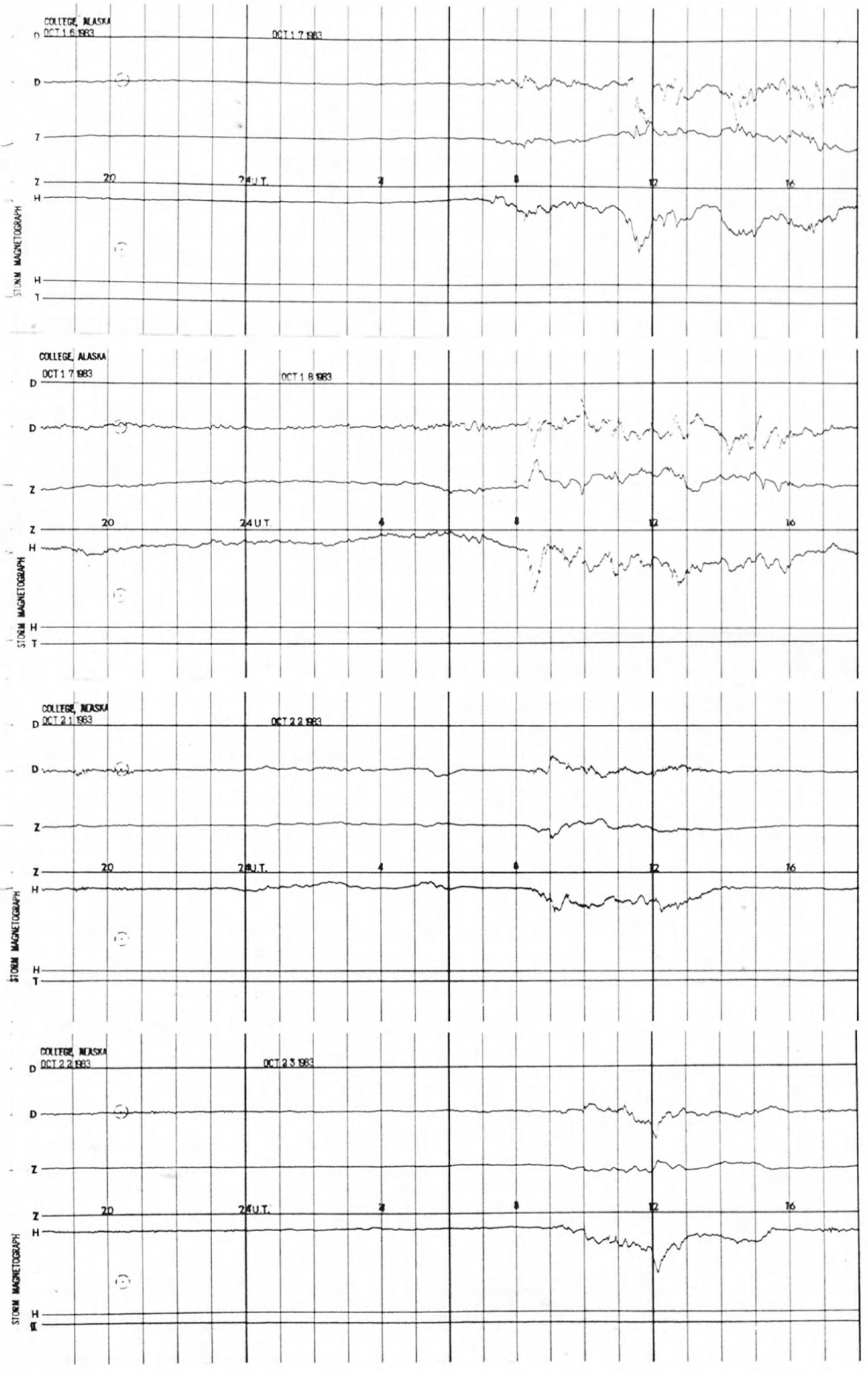
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS