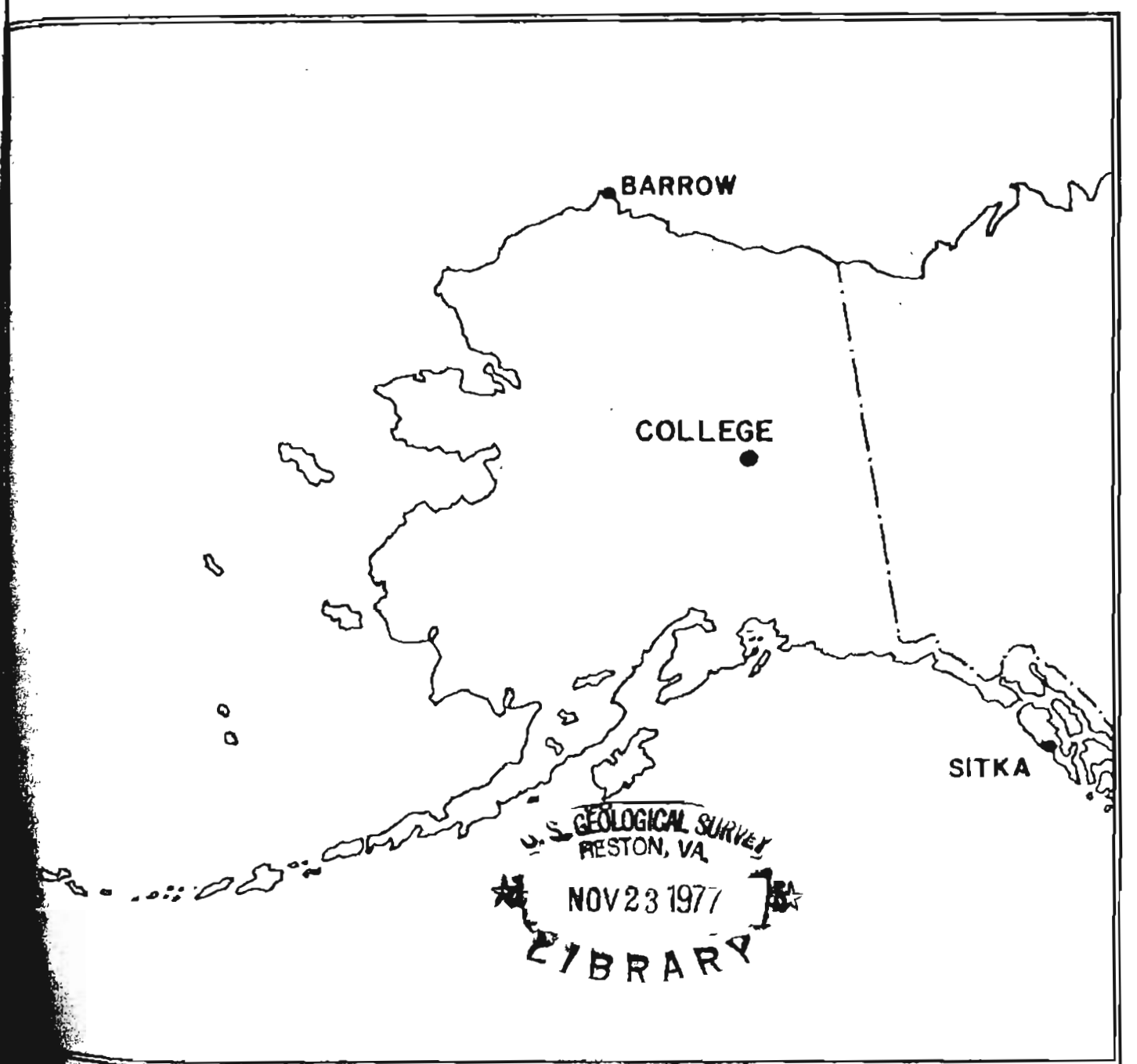
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

OCTOBER 1977 OPEN FILE REPORT 77-300J



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THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY WITH THE ASSISTANCE OF OBSERVATORY STAFF MEMBERS J. E. PAPP, M. J. MOORMAN, AND S. P. TILTON, AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF ELECTROMAGNETISM 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. 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
Yukon Drive on West Ridge
Fairbanks, Alaska 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A-NOAA
Environmental Data Service
Boulder, Colorado 80302

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 10 γ 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≤30	1
30<	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 & 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, ALASKA

MONTH AND YEAR: OCTOBER 1977

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	1	0	0	0	1	0	0	0	02	01
2	1	0	2	6	1	0	0	0	10	12
3	0	0	4	5	4	2	1	1	17	14
4	2	1	3	4	4	0	0	1	15	10
5	1	1	2	4	3	1	0	0	12	07
6	2	0	3	3	3	1	2	0	14	08
7	0	0	0	4	1	0	0	0	05	04
8	0	1	0	2	3	1	2	0	09	04
9	0	0	0	0	0	0	0	0	00	00
10	0	0	0	1	0	0	0	0	01	00
11	1	0	0	1	1	1	2	3	09	04
12	3	4	7	7	6	3	1	1	32	53
13	1	4	3	4	6	1	0	1	20	20
14	0	0	0	2	2	2	2	3	11	05
15	3	1	5	6	3	2	3	2	25	24
16	2	2	0	2	3	2	1	1	13	06
17	1	2	2	1	3	5	2	2	18	12
18	2	3	6	5	4	4	5	4	33	35
19	6	5	5	6	6	4	2	0	34	46
20	0	1	2	5	5	3	1	1	18	16
21	2	0	2	2	2	2	2	2	14	06
22	3	4	7	6	5	4	3	2	34	45
23	2	2	2	2	0	0	1	1	10	04
24	1	1	1	4	4	1	1	0	13	09
25	1	0	0	0	0	0	1	0	02	01
26	0	1	1	2	2	0	0	1	07	03
27	3	1	3	7	7	7	6	5	39	73
28	4	5	4	4	6	4	2	2	31	31
29	2	1	0	3	6	2	1	1	16	15
30	1	0	3	3	3	4	3	1	18	12
31	1	1	3	4	1	0	1	1	12	07

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	h	m	END d	h	m

K SCALE USED:	D	H	Z	
LOWER LIMIT FOR K = 9.....	683.8	321.7		(mm)
CURRENT SCALE VALUE.....	3.76	7.82		(γ/mm)
LOWER LIMIT FOR K = 9	2570	2520		(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 818

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973-761-867

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: OCTOBER

YEAR: 1977

DATE	TIME U.T.	NATURE OF PHENOMENON [1]	REMARKS
01	12XX	Pi 2	
02	14XX	Pg	
13	0321	Si	
22	01XX	Pc 1	
23	20XX	Pc 1	
26	2329	SSC*	
31	21XX	Pc 4	

IDENTIFIED BY: JBT

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

OCTOBER 1977

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	11	19XX	. .	. .	. .	. .	12	3,4	7	258	1620	630	12	18
		18	02XX	. .	. .	. .	. .	18	3	6	192	1480	490		
								19	1,4,5	6				19	19
		26	2329	S.C.*	+13	+23	+10	27	4,5,6	7	307	1900	730	28	21

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: OCTOBER 1977

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 10-1-77	2400 U.T., 10-31-77	1.0/mm	3.8 γ/mm	27° 47.2 E
H	0000 U.T., 10-1-77	2400 U.T., 10-15-77	7.8 γ/mm		12770 γ
	0000 U.T., 10-16-77	2400 U.T., 10-31-77	"		12764 γ
Z	0000 U.T., 10-1-77	2400 U.T., 10-31-77	7.7 γ/mm		55130 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 10-1-77	2400 U.T., 10-31-77	7.9/mm	29.8 γ/mm	24° 18.8 E
H	0000 U.T., 10-1-77	2400 U.T., 10-15-77	44.1 γ/mm		11514 γ
	0000 U.T., 10-16-77	2400 U.T., 10-31-77	"		11526 γ
Z	0000 U.T., 10-1-77	2400 U.T., 10-31-77	48.9 γ/mm		54012 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D	0000 U.T., 10-1-77	2400 U.T., 10-31-77	0.3/mm	1.0 γ/mm
H	0000 U.T., 10-1-77	2400 U.T., 10-31-77	1.0 γ/mm	
Z	0000 U.T., 10-1-77	2400 U.T., 10-31-77	2.4 γ/mm	

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
28° 17.9 E	13045 γ	55369 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: OCT 1, 7, 8, 9, 10, 11, 16, 23, 25, 26

Form C&GS-6846
10-67

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 (150W 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 COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
GEOMAGNETISM DIVISION

OBSY.	YEAR	MONTH	ELEMENT
CO	77	OCT	D

E	U <	Test O	DY	01	02	03	04	05	06	07	08	09	10	11	12	DY	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	296	290	279	289	288	296	299	298	300	307	312	318	01	353	379	369	340	333	350	356	351	341	324	309	290	7667
			02	277	278	276	269	262	259	268	249	300	291	335	343	02	336	332	341	357	360	364	361	354	336	316	306	299	7469
			03	297	293	287	281	283	280	281	276	451*	516	279	306	03	367	453	376	374	386	381	342	343	327	312	300	299	8090
			04	287	271	276	263	281	270	261	351	287	299	308	322	04	433	361	330	332	337	342	347	348	321	301	279	267	7475
			05	261	269	281	284	288	279	274	388	313	282	291	332	05	331	338	339	323	336	359	348	309	317	311	288	281	7442
			06	280	270	275	270	281	281	332	441	270	293	304	331	06	341	343	341	332	351	349	360	361	352	333	303	287	7681
			07	283	289	288	288	290	290	289	291	289	292	252	322	07	320	320	320	327	333	347	370	367	352	337	317	293	7466
			08	282	281	288	287	288	307	298	304	297	306	307	300	08	329	361	337	350	382	387	399	371	319	293	281	277	7618
			09	281	296	299	298	300	301	301	299	300	301	297	307	09	323	326	307	340	370	377	378	362	341	314	292	294	7604
			10	298	301	300	303	301	299	301	294	289	298	300	298	10	313	331	330	335	350	361	369	350	315	279	271	277	7463
			11	278	290	277	289	281	288	290	284	387	310	303	327	11	318	326	317	311	341	381	385	361	318	320	101	162	7250
			12	248	232	217	210	196	257	54*	-113*	244*	109*	248	792*	12	379*	464	498	472	350	342	322	302	288	247	251	270	6879
			13	289	306	303	299	271	298	330	301	271	276	301	352	13	287	411*	344	403	368	363	349	330	317	277	277	287	7710
			14	303	309	307	308	309	309	309	307	306	307	311	302	14	323	336	353	361	357	385	377	391	306	303	292	292	7713
			15	291	188	297	289	291	291	213	188	189*	195	240	301	15	317	342	261	369	367	368	356	332	289	257	221	225	6785
			15	240	281	273	270	313	273	281	290	293	332	301	319	16	336	322	301	317	371	379	377	359	341	313	284	261	7433
			17	261	262	267	234	249	271	288	261	307	307	316	322	17	348	381	456	537	435	362	367	332	303	286	248	218	7618
			18	241	250	241	224	201	264	333	259	299	236*	445	354	18	363	350	399	432	391	281	303	284	278	291	334	281	7422
			19	281	273	140*	268*	247	326	260	357	231	249	287	337	19	426*	562*	434*	291	281	313	337	322	321	296	293	296	7428
			20	299	307	313	313	319	307	301	267	239	198	309	374	20	452	473	347	384	377	326	323	331	316	281	287	262	7705
			21	260	284	296	310	312	313	311	308	342	327	330	336	21	340	322	322	331	353	391	348	331	293	247	242	232	7481
			22	243	261	263	254	308	267	263	421	338*	267	313	356	22	441*	482	318	428	452	363	271	253	247	231	246	236	7522
			23	289	291	306	237	306	318	287	286	355	293	292	310	23	316	317	313	319	329	328	333	321	277	249	271	284	7297
			24	303	301	291	299	302	307	299	293	292	329	338	280	24	313	330	328	341	359	342	337	307	287	280	277	287	7533
			25	274	279	237	294	296	299	300	301	298	303	301	306	25	311	317	321	330	341	347	337	317	293	279	282	291	7314
			26	299	300	299	291	290	296	263	276	311	302	287	301	26	300	321	331	333	341	339	340	341	327	314	306	288	7396
			27	243	212	151	287	312	294	293	289	274	363*	719*	547*	27	616*	760*	1259*	1212*	696*	680*	394*	449*	203*	277	327	298*	11154
			28	441*	307*	338	254	116*	61*	290	269	267	283*	269	328	28	383	513*	544*	379	443	416	339	343	339	326	287	286	7821
			29	283	264	279	300	301	312	281	303	305	327	317	336	29	521*	464	307	378	382	329	356	329	316	289	291	282	7851
			30	281	281	284	293	297	295	294	278	304	503	317	303	30	312	343	352	390	426	316	371	326	307	292	280	271	7526
			31	279	281	295	301	300	289	311	386	279	294	268	303	31	307	318	320	318	322	328	329	324	326	301	292	293	7394

SCALED BY	SPT, HKR
CHECKED BY	SPT, HKR, JBT
SIGNS REVIEWED BY	
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	236217
MONTHLY MEAN	317
DATES WITH GAPS:	

USCOMM-DC 80056-P67

FORM C&GS 4046
(10-57)

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
GEOMAGNETISM DIVISION

Values are in tenths of γ's, and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150W M.T.) is hour 11 of the same universal day.
All base corrections have been applied. Negative values are in red, with minus signs shown.

OBSY.	YEAR	MONTH	ELEMENT
CO	77	OCT	H

C	Day	00	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	333	339	353	344	352	350	355	359	360	361	361	359	01	336	334	356	364	358	354	350	346	341	340	346	340	8391
	02	346	346	356	365	369	370	373	447	420	385	-27*	359	02	380	366	358	351	347	346	348	344	341	346	348	347	8336
	03	349	350	351	356	359	361	371	383	393	234	347	381	03	369	257	446	381	339	346	340	350	350	344	346	341	8384
	04	347	354	346	361	360	369	430	409	372	359	331	164	04	197	339	370	358	351	346	342	339	337	338	337	328	8184
	05	337	338	351	354	360	363	373	371	389	376	338	226	05	343	331	367	268	354	361	351	341	338	334	351	337	8332
	06	343	356	346	359	366	373	399	377	420	399	378	300	06	304	316	364	359	353	353	351	359	349	337	337	341	8539
	07	347	354	361	363	361	363	364	363	369	357	121	343	07	369	367	367	365	361	365	363	357	350	346	341	339	8356
	08	343	349	353	360	359	361	367	364	371	371	376	342	08	353	319	334	371	359	362	351	346	350	349	340	340	8490
	09	347	348	351	354	357	358	361	359	359	358	359	357	09	358	353	340	357	357	356	350	340	333	333	333	338	8416
	10	344	349	352	353	359	361	360	361	359	353	359	371	10	369	364	366	363	361	360	351	347	344	347	352	340	8551
	11	349	351	350	353	361	359	360	366	369	366	381	370	11	381	380	375	360	350	363	361	343	347	300	286	348	8529
	12	360	349	350	551	683	531	321	394	-434*	242	269	-468*	12	-129*	69	183	246	304	357	369	360	364	345	369	374	6286
	13	366	356	357	367	384	497	419	416	390	330	269	177	13	164	-338*	276	369	366	360	351	353	352	349	353	359	7532
	14	357	357	359	356	354	352	353	354	359	357	359	366	14	371	371	358	360	361	339	339	340	359	316	321	331	8449
	15	339	387	371	355	343	350	439	325	288	310	441	399	15	380	359	351	343	359	336	327	291	263	299	333	323	8301
	16	346	377	383	371	384	369	350	353	361	359	326	347	16	303	276	260	340	350	353	349	348	333	337	329	330	8220
	17	333	343	367	399	381	416	423	436	378	366	360	361	17	313	236	190	156	88	334	329	339	324	330	306	331	7839
	18	363	387	414	402	440	531	530	496	393	0*	-33	194	18	306	301	228	271	377	379	266	11	232	328	493	456	7671
	19	517	569	543*	678*	488	387	400	151	343	303	169	50*	19	-56*	-389*	-255*	270	281	272	339	339	338	251	353	359	6806
	20	357	356	356	349	357	369	359	379	373	332	235	215	20	110	-9	219	250	329	351	371	361	345	329	346	357	7403
	21	363	370	363	366	366	361	363	361	353	346	343	350	21	346	330	301	297	249	244	257	301	303	339	351	350	7989
	22	356	393	419	406	436	526	435*	321	-12*	303	332	0*	22	-136*	60	284	213	110	167	258	330	341	350	359	383	6649
	23	341	371	349	377	360	376	363	361	379	386	360	349	23	351	351	350	349	340	339	336	334	336	340	359	348	8525
	24	360	351	339	347	350	363	353	358	359	347	310	151	24	359	360	330	331	336	344	341	349	351	354	361	357	8169
	25	344	353	365	369	369	368	369	371	370	373	367	366	25	365	363	365	360	353	347	343	353	351	356	363	364	8667
	26	358	361	367	372	379	377	402	404	376	383	393	413	26	401	376	372	369	360	351	360	359	360	362	366	369	8998
	27	343	375	438	384	370	379	371	376	410	-159*	-917*	-532*	27	-12*	-46	-549*	-560*	0*	-169*	-249*	-74*	-108*	322	452	529	1374
	28	542	568	385	296	378*	718*	409	397	333	266	298	305	28	144	-204*	45	270	202	174	335	346	354	347	346	345	7599
	29	356	353	362	369	370	363	346	361	369	379	376	353	29	-85*	18*	398	367	337	351	367	357	351	351	356	350	7889
	30	367	368	379	369	374	371	377	390	439	453	411	386	30	375	329	319	276	241	301	316	354	355	346	356	340	8601
	31	353	367	375	383	378	386	380	379	387	373	236	301	31	379	370	366	368	367	361	359	351	352	350	359	360	8640

SCALED BY: SPT, HKR
CHECKED BY: SPT, HKR, JBT
SIGNS REVIEWED BY:
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 Mgh., converted to Normal Mgh.

MONTHLY SUM	244105
MONTHLY MEAN	328
DATES WITH GAPS:	

USCOMM-DC 56560-P77

FORM CGS-4066

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
GEOMAGNETISM DIVISION

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°W M.T.) is hour 11 of the same universal day. Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

OBSY.	YEAR	MONTH	ELEMENT
CO	77	OCT	Z

Day	01	02	03	04	05	06	07	08	09	10	11	12	Day	13	14	15	16	17	18	19	20	21	22	23	24	SUM
01	315	317	317	320	318	318	318	320	322	327	332	320	01	289	263	280	305	307	311	314	304	302	302	304	310	7435
02	308	312	313	316	316	336	350	371	379	340	156	229	02	313	326	323	320	319	316	316	315	314	311	311	313	7517
03	310	309	310	310	313	314	316	323	250	32	183	291	03	336	337	279	321	307	310	290	291	306	309	311	316	6974
04	313	317	329	324	331	319	337	331	336	329	302	226	04	146	199	287	305	312	312	308	305	302	301	303	308	7182
05	310	318	317	319	314	316	329	360	282	326	303	266	05	249	246	277	297	296	308	306	300	301	303	300	306	7249
06	312	315	318	317	316	311	346	311	292	321	322	299	06	268	261	259	277	289	302	299	290	297	298	301	304	7225
07	310	311	309	309	311	312	313	315	317	309	206	236	07	276	293	300	307	310	311	311	306	302	299	300	302	7175
08	303	308	308	307	313	317	310	310	313	320	321	302	08	281	279	238	286	311	311	316	297	283	284	298	306	7122
09	310	313	314	314	314	314	312	313	313	315	316	313	09	309	310	301	306	316	311	313	307	307	307	310	313	7471
10	313	313	313	313	315	315	316	312	313	315	316	312	10	314	313	312	316	317	317	318	310	306	301	306	312	7508
11	312	316	319	327	321	320	320	319	327	323	327	319	11	309	313	307	296	267	289	294	294	291	306	270	315	7399
12	339	347	377	410	331	206	91	129	462*	346	389	507*	12	248	434	387	276	261	290	298	309	309	308	317	327	7698
13	327	325	319	319	321	571	366	349	343	333	316	293	13	343	475*	152	249	259	289	303	297	295	300	310	320	7577
14	323	320	317	313	310	309	310	310	311	313	313	306	14	301	301	316	300	300	297	290	293	292	294	307	356	7405
15	352	375	364	336	328	317	307	195	57	267	283	303	15	315	328	324	299	310	316	307	297	286	307	328	333	7234
16	340	351	333	340	356	342	339	326	337	329	306	306	16	298	244	216	287	294	311	315	316	314	315	320	321	7556
17	333	336	335	233	347	360	370	401	369	336	328	327	17	296	233	172	122	257	229	247	263	290	310	330	340	7264
18	347	359	379	373	379	392	294	260	227	286	162	118	18	202	247	218	159	210	285	251	172	269	396	370	328	6683
19	336	267	156*	236	370	389	339	341	321	306	278	280	19	266	-51	-53	155	236	274	250	273	279	298	313	318	6177
20	319	320	321	321	320	318	312	311	313	290	268	221	20	103	148	199	171	181	261	306	318	319	314	328	341	6623
21	325	340	330	331	326	321	320	321	313	285	294	289	21	258	236	210	211	178	160	161	168	221	270	311	328	6507
22	359	353	350	280	382	359	187	181	68*	290	291	428	22	348*	326	257	276	258	241	201	210	252	296	335	337	6965
23	342	341	340	326	358	356	337	329	297	328	336	321	23	319	320	321	321	326	322	318	313	310	308	315	326	7842
24	336	332	332	331	327	323	329	332	328	320	287	290	24	240	308	295	270	270	274	277	267	301	309	316	321	7345
25	321	320	313	318	317	317	319	322	328	320	318	313	25	313	311	311	310	311	310	290	271	270	275	265	304	7403
26	320	317	316	313	319	326	352	370	346	327	329	321	26	331	325	317	311	311	310	310	307	302	304	306	301	7689
27	291	298	347	360	328	311	320	316	316	510*	708*	517*	27	618*	694*	924*	383*	250*	383*	243*	409*	317	330	324	245	9642
28	241	219	20	15	-36*	14*	272	270	272	345	350	358	28	496	466*	288*	221	296	269	254	306	304	303	316	326	6185
29	326	324	330	335	337	336	341	344	346	327	204	317	29	498	262	250	276	283	301	309	313	318	317	323	321	7748
30	322	327	324	321	321	323	327	336	343	342	350	338	30	329	317	298	306	257	273	259	263	290	306	316	321	7509
31	329	237	242	341	329	332	348	349	284	323	249	199	31	278	317	317	318	320	320	317	318	316	316	323	329	7553

MONTHLY SUM	226962
MONTHLY MEAN	325
DATES WITH GAPS	

SCALED BY: SPT, HKR

CHECKED BY: SPT, HKR, JBT

SIGNS REVIEWED BY:

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.

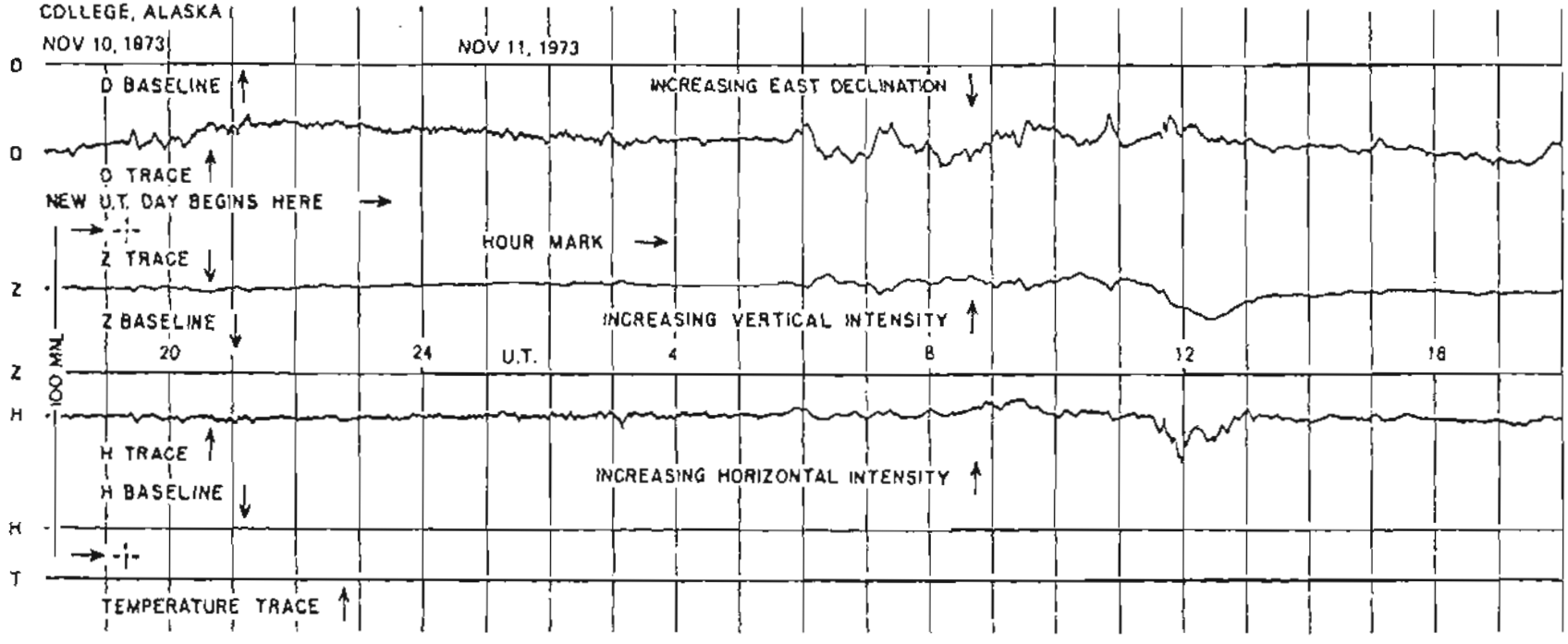
<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

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

USCOMM-DC

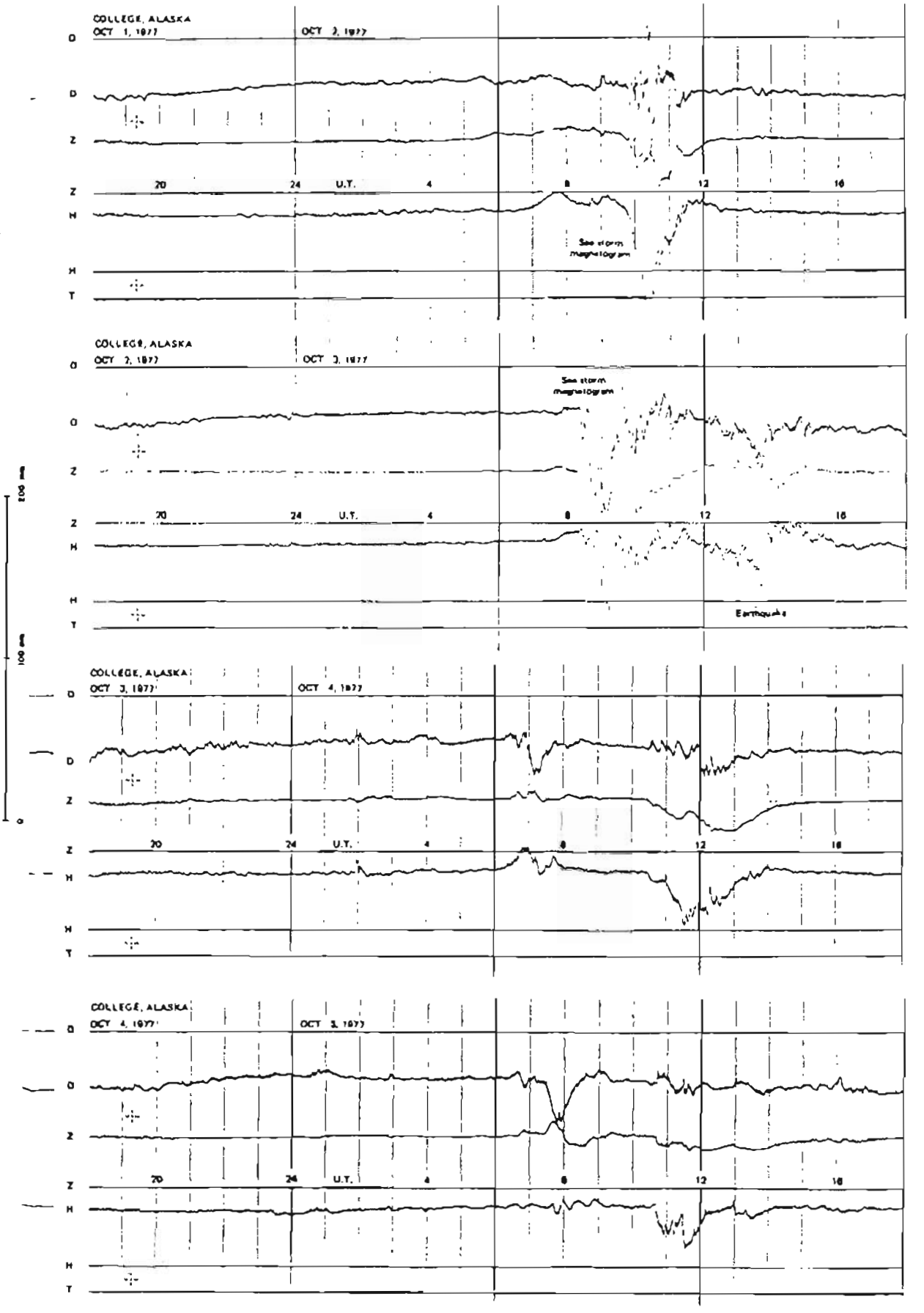
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)

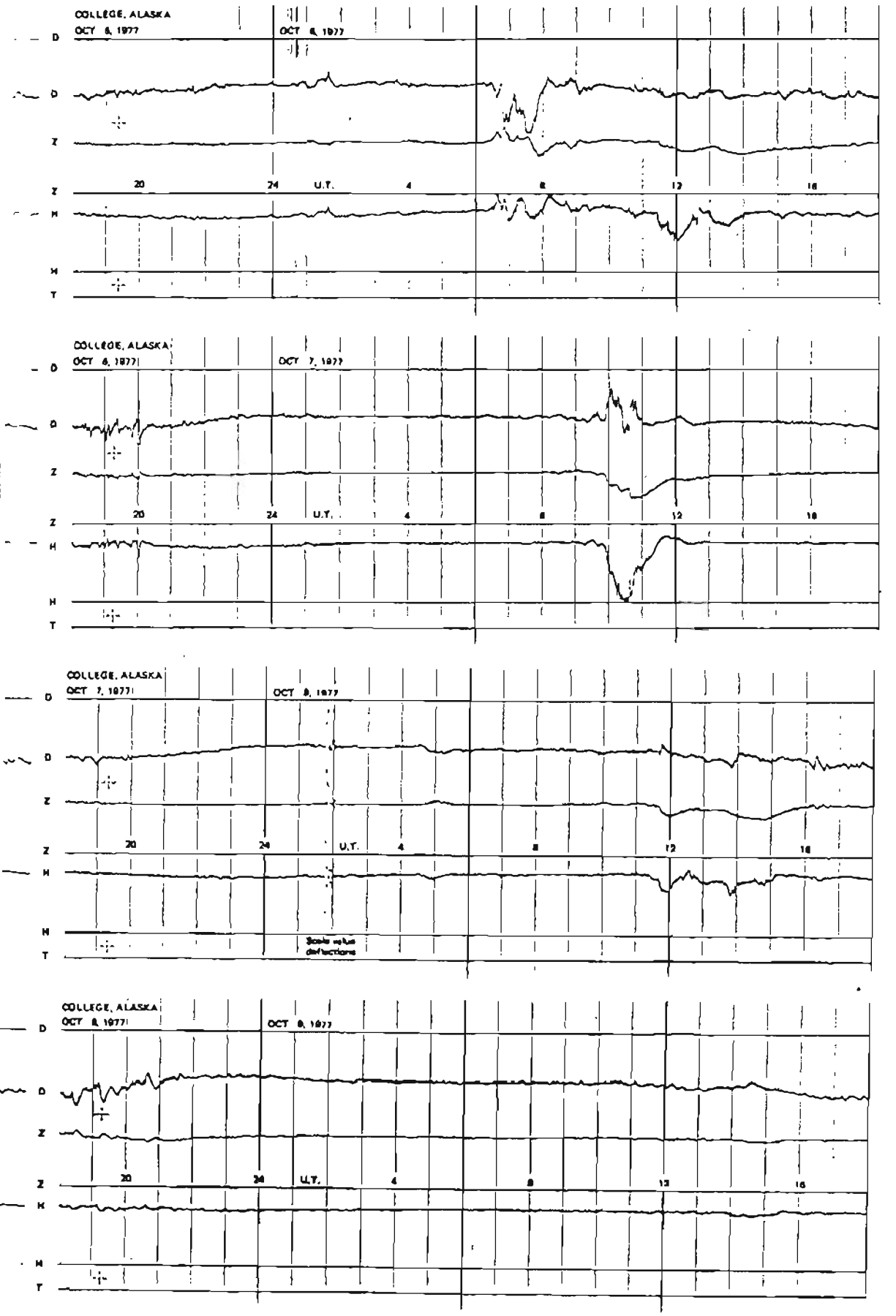


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

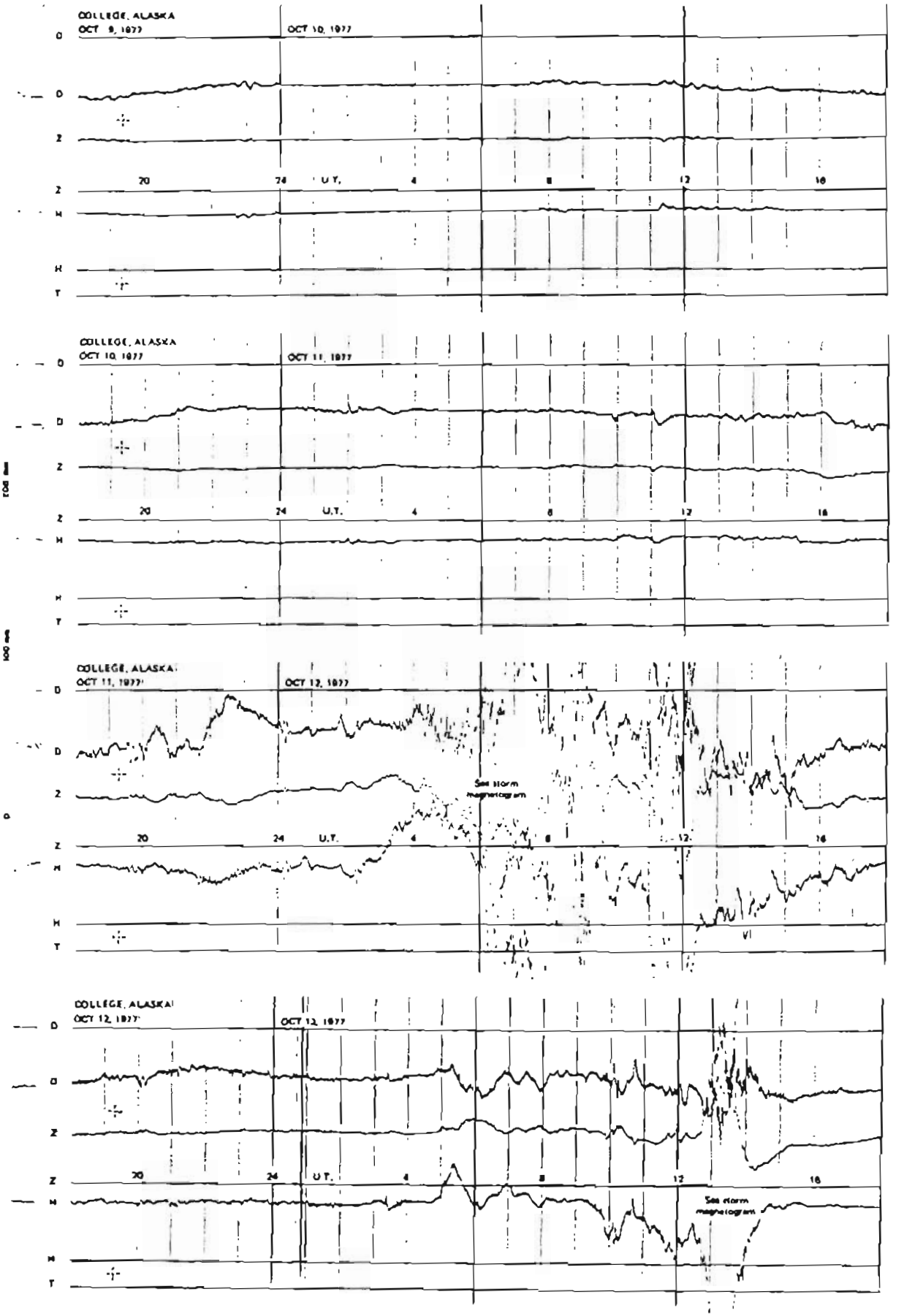
NORMAL MAGNETOGRAMS



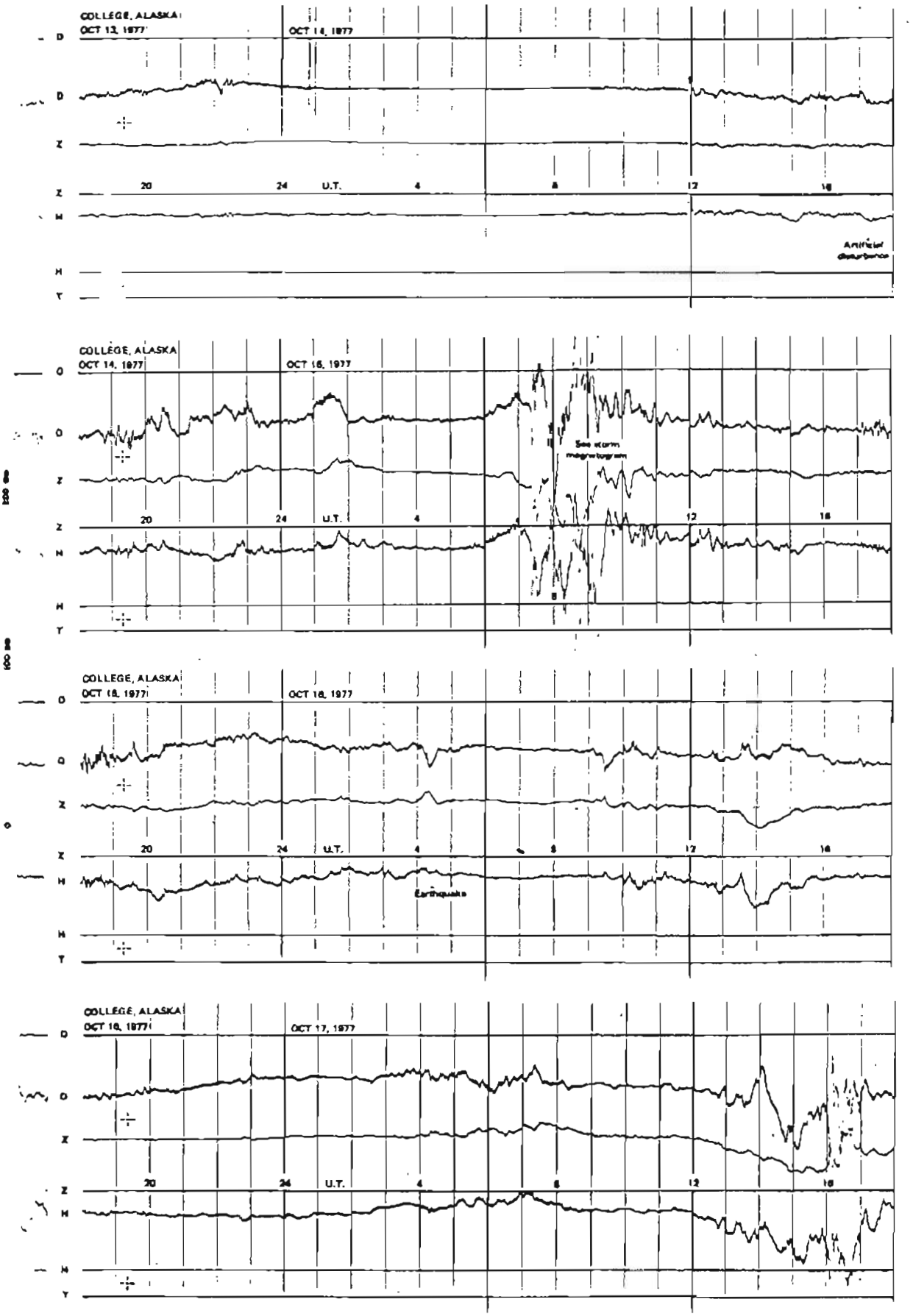
NORMAL MAGNETOGRAMS



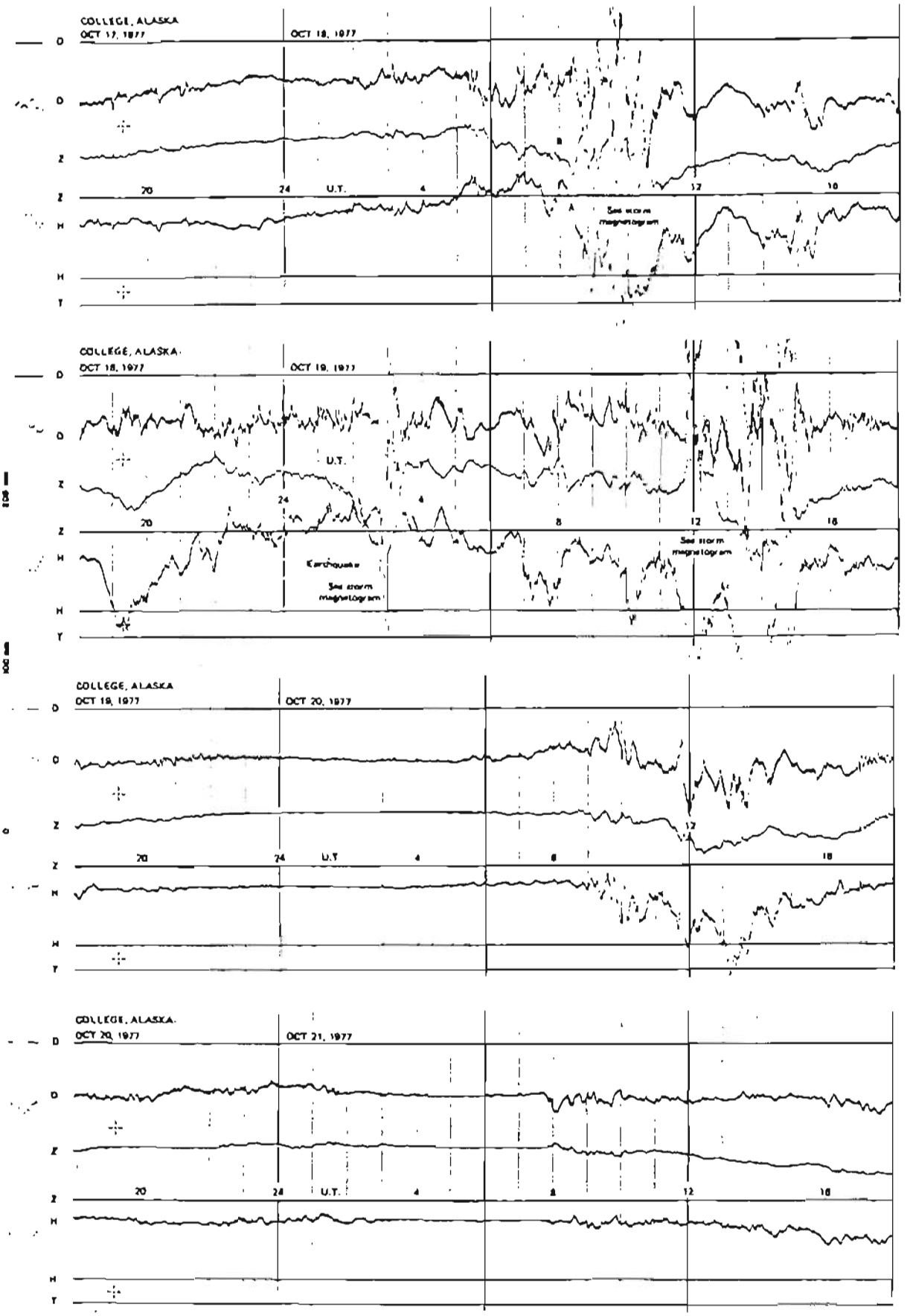
NORMAL MAGNETOGRAMS



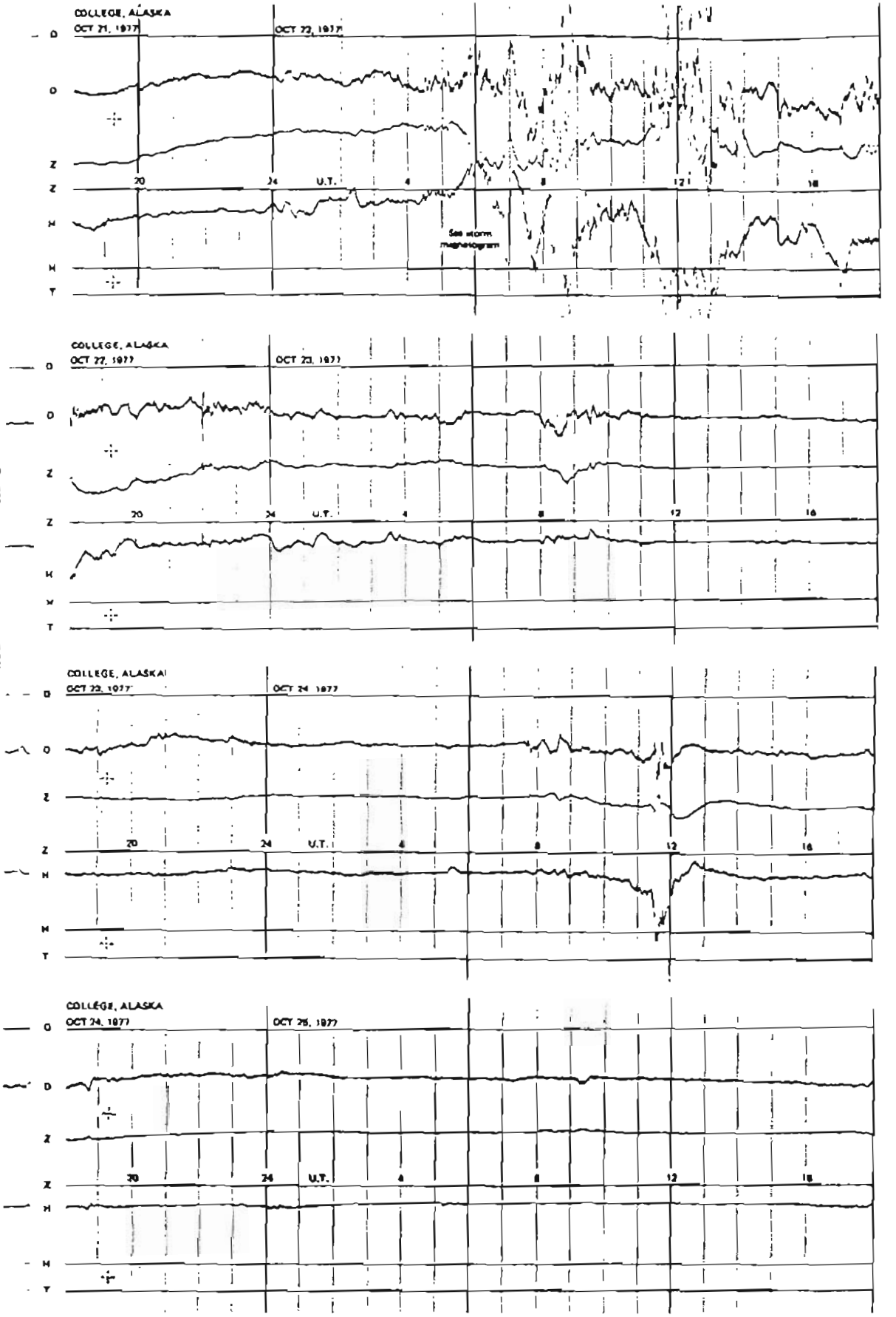
NORMAL MAGNETOGRAMS



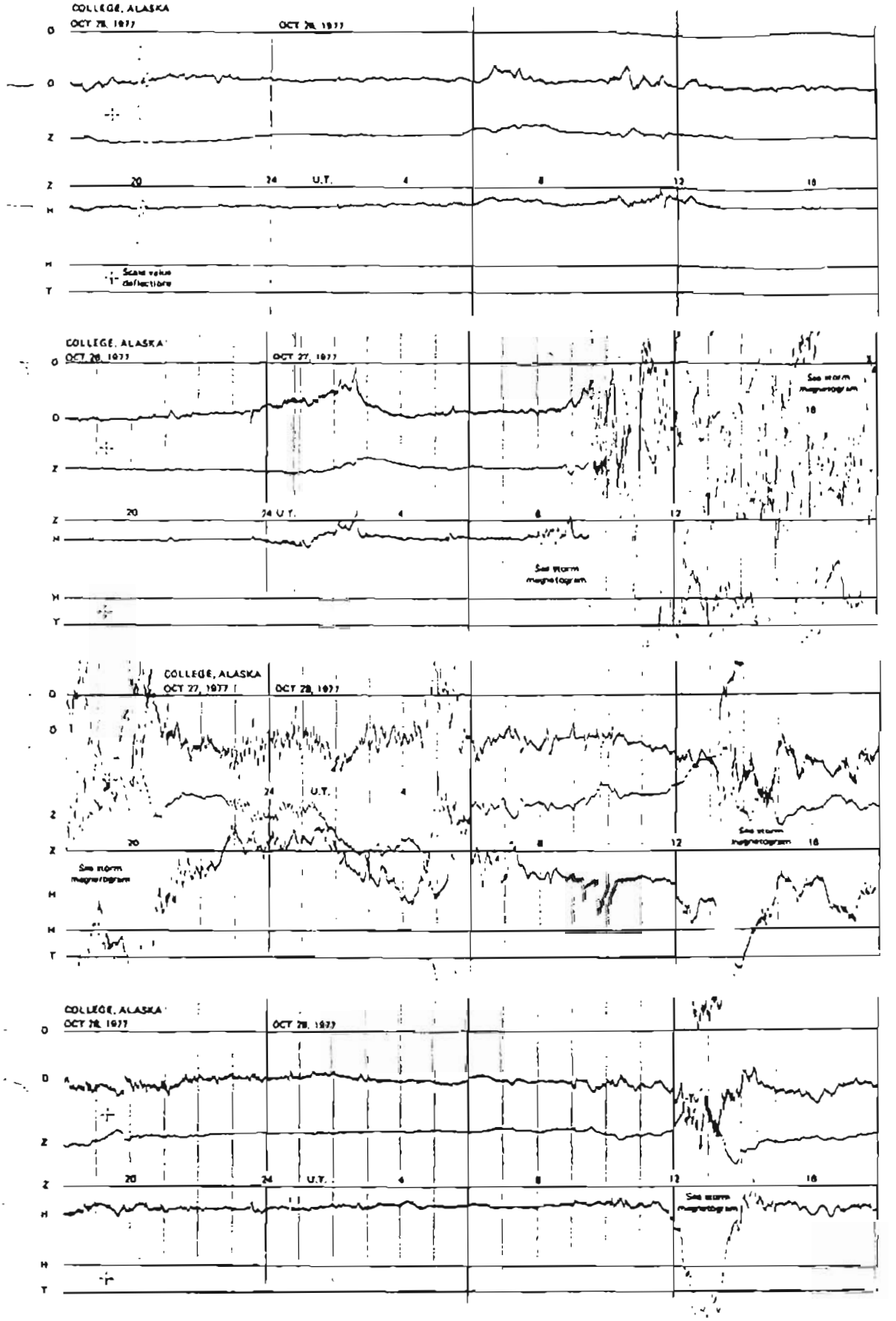
NORMAL MAGNETOGRAMS



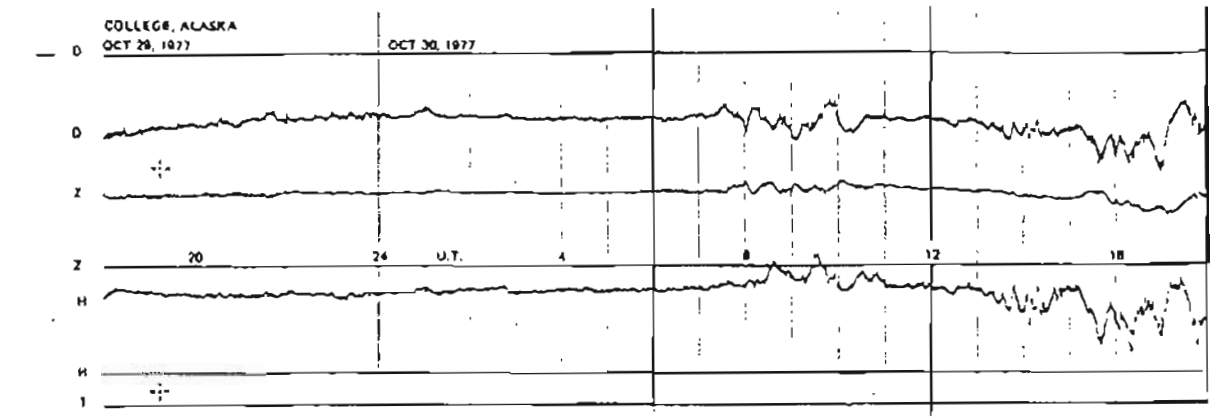
NORMAL MAGNETOGRAMS

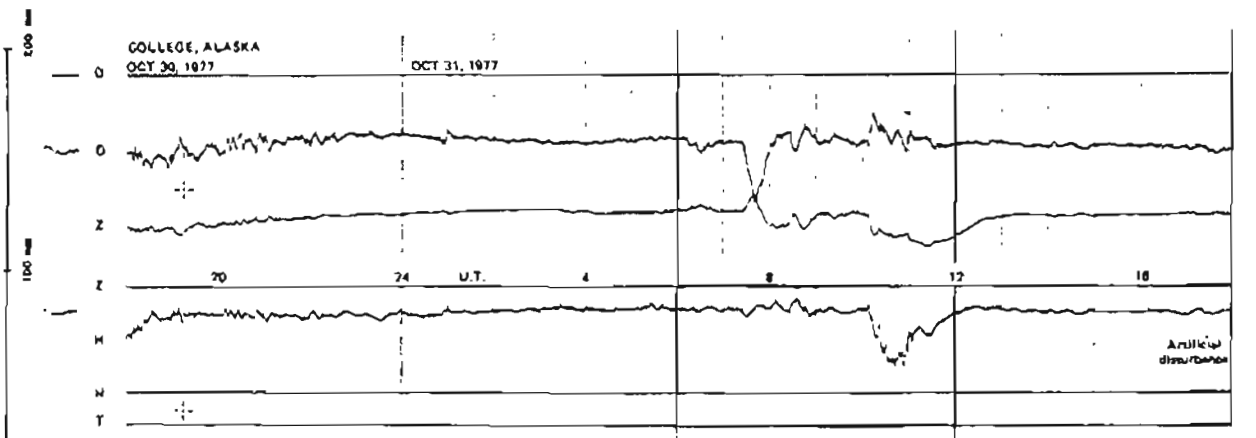


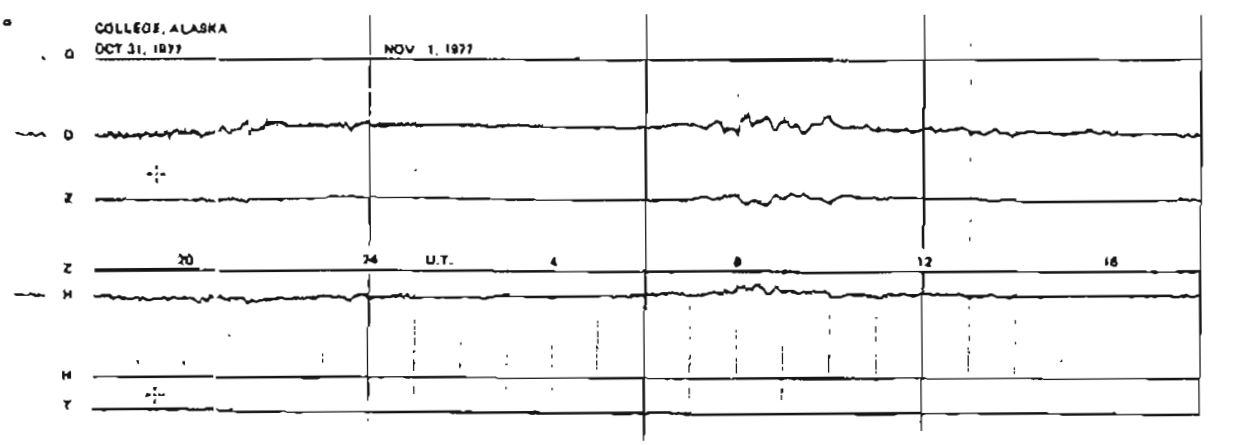
NORMAL MAGNETOGRAMS



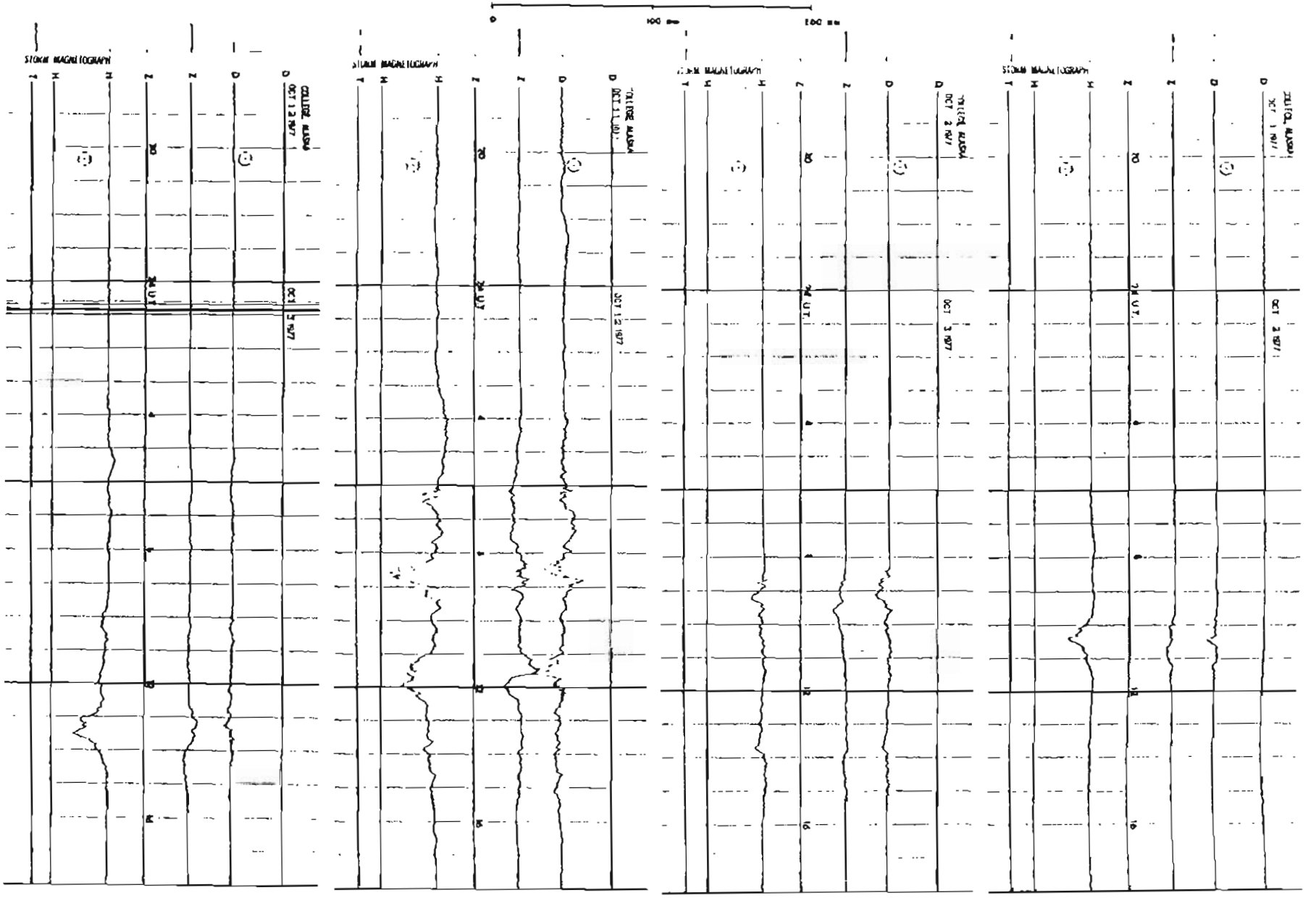
NORMAL MAGNETOGRAMS



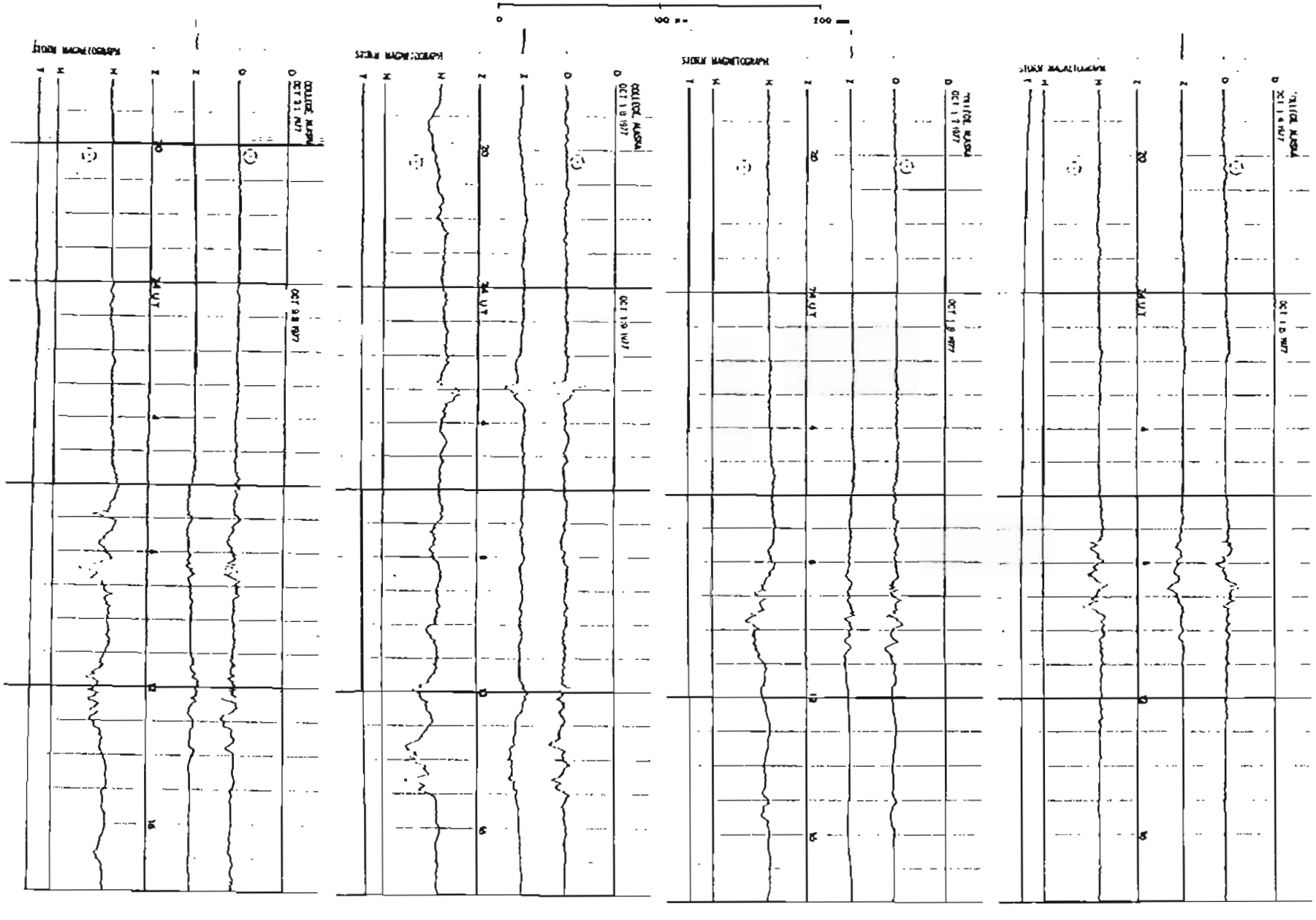




STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS