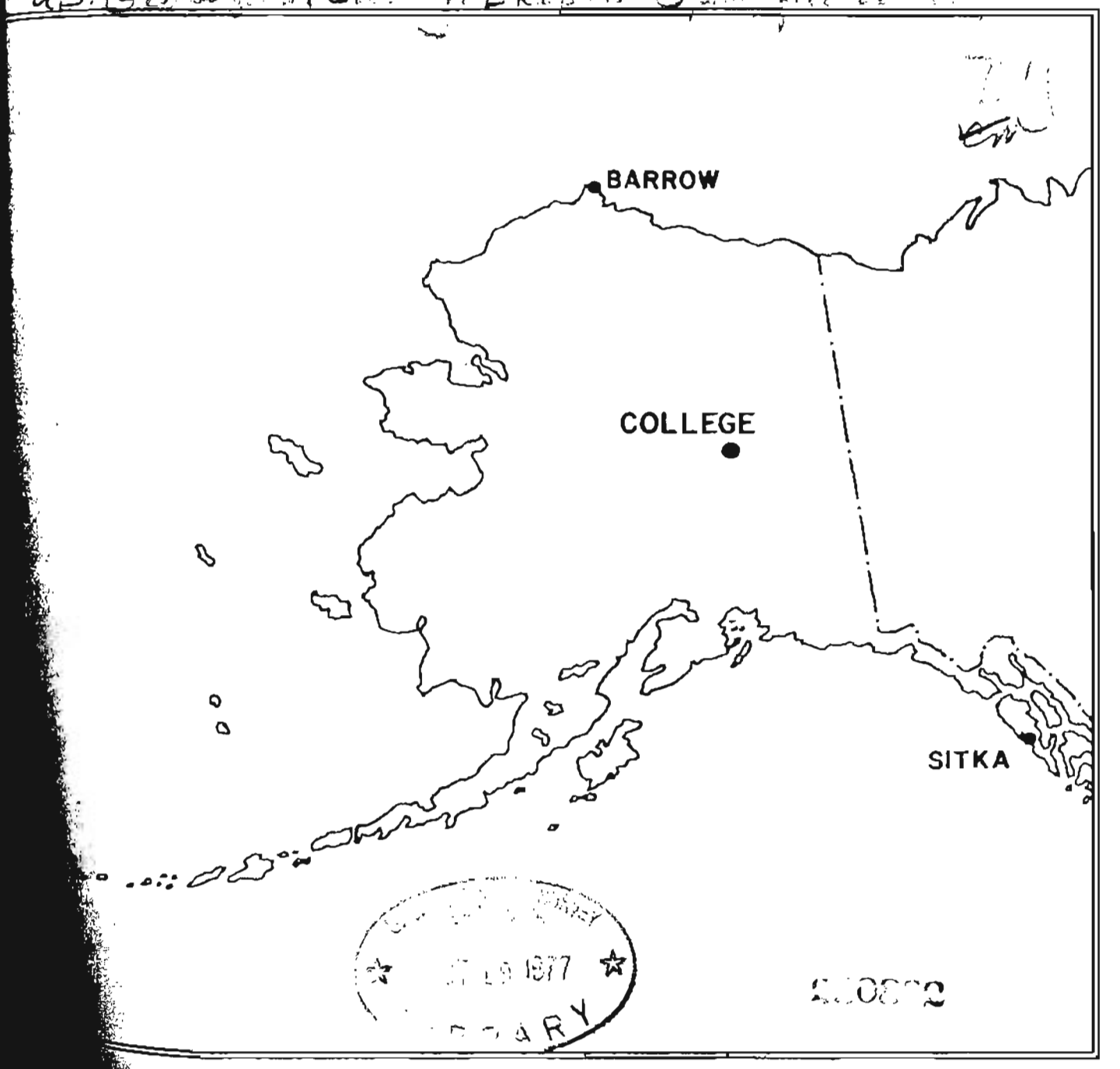
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JULY 1977 OPEN FILE REPORT 77-300G



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Normal Magnetograms

Storm Magnetograms(When Normal is too disturbed to read)

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 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 the end of 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: JULY 1977

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	2	3	5	4	4	3	3	2	26	20
2	3	2	2	2	2	3	2	2	18	09
3	1	1	3	2	4	3	1	1	16	10
4	2	2	3	4	1	1	1	2	16	09
5	2	2	1	2	5	4	1	1	18	13
6	1	1	2	2	4	3	3	3	19	12
7	4	4	4	2	4	2	1	1	22	16
8	3	4	3	3	3	4	2	2	24	16
9	4	3	3	3	2	3	2	3	23	15
10	4	4	2	4	4	3	3	2	26	19
11	2	3	5	3	4	2	1	1	21	16
12	1	1	1	1	0	1	1	1	07	03
13	2	4	3	1	3	3	1	2	19	12
14	3	4	5	6	4	2	2	1	27	27
15	3	3	2	5	4	3	2	3	25	19
16	2	3	5	7	5	5	3	3	33	42
17	3	3	4	5	3	3	2	2	25	19
18	2	1	3	4	5	2	1	1	19	14
19	2	3	5	4	6	5	3	2	30	31
20	3	4	7	6	6	4	3	2	35	49
21	4	3	2	3	1	2	1	1	17	10
22	3	3	5	6	1	2	1	1	22	22
23	3	2	2	1	0	0	1	0	09	04
24	2	1	2	4	1	2	1	2	15	08
25	1	2	1	1	1	1	1	1	09	04
26	1	1	1	2	1	0	1	0	07	03
27	0	0	1	0	0	0	0	0	01	00
28	1	0	0	0	0	1	0	1	03	01
29	5	5	7	5	7	4	3	2	38	59
30	4	4	6	5	3	2	2	1	27	27
31	2	3	2	5	3	2	2	1	20	14

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 815

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OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: JULY

YEAR: 1977

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
06	10XX	pi2	
10	01XX	pc5	
13	22XX	pc1	
25	14XX	pi2	
26	09XX	pi2	
27	13XX	pi2	
29	0027	ssc*	

VERIFIED 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.

GM 86-500

Data from Individual Observatories:

PRINCIPAL MAGNETIC STORMS

COLLEGE OBSERVATORY, COLLEGE, ALASKA

JULY 1977

WDC-A FOR SOLAR-TERRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80303 U.S.A.

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	16	06XX	..	..	..	..	16	4	7	154	1250	900	17	13
		19	05XX	..	..	..	..	20	3	7	178	1450	1120	21	09
		29	0027	s.c.*	+41	+161	-23	29	3, 5	7	200	1680	920	30	13

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 7-1-77	2400 U.T., 7-31-77	1.0'/mm	3.8 γ/mm	27° 46.4' E
H	0000 U.T., 7-1-77	2400 U.T., 7-9-77	7.8 γ/mm		12765 γ
	0000 U.T., 7-10-77	2400 U.T., 7-31-77	"		12773 γ
Z	0000 U.T., 7-1-77	2400 U.T., 7-31-77	7.7 γ/mm		55123 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 7-1-77	2400 U.T., 7-31-77	7.9'/mm	29.8 γ/mm	24° 20.6' E
H	0000 U.T., 7-1-77	2400 U.T., 7-9-77	44.1 γ/mm		11509 γ
	0000 U.T., 7-10-77	2400 U.T., 7-31-77	"		11522 γ
Z	0000 U.T., 7-1-77	2400 U.T., 7-31-77	48.9 γ/mm		53991 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D	0000 U.T., 7-1-77	2400 U.T., 7-31-77	0.3'/mm	1.0 γ/mm
H	0000 U.T., 7-1-77	2400 U.T., 7-31-77	1.0 γ/mm	
Z	0000 U.T., 7-1-77	2400 U.T., 7-31-77	2.4 γ/mm	

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
28° 18.3' E	13053 γ	55363 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: JUL 2, 3, 4, 12, 23, 24, 25, 26, 27, 28

FORM CGS-1-86
10-77

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

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

Values are to remain as scaled, and are necessary for correct time periods of one hour beginning at midnight. Hour 01 of the day (LSTM or U.T.) is hour 11 of the previous universal day.
Minimum requirements are hourly scalings. Separate values are to be red, with minus signs (-) shown.

OBSY.	YEAR	MONTH	ELEMENT
CO	77	JUL	D

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	Daily Mean
01	169	191	233	227	209	228	230	155	48	152	83	245	01	258	346	365	370	444	451	443	377	308	282	281	244	6339
02	235	243	269	271	283	312	333	281	279	253	272	284	02	321	318	321	388	411	431	429	381	378	311	316	281	7611
03	261	256	269	282	297	320	297	308	303	290	292	282	03	308	356	409	442	410	421	431	387	349	332	273	277	7852
04	253	245	248	254	249	241	272	227	271	301	322	313	04	282	298	321	352	377	410	413	408	381	313	320	288	7363
05	224	229	241	268	294	307	332	321	287	333	292	311	05	322	312	415	366	370	394	441	399	339	288	272	251	7658
06	237	234	250	267	271	286	287	301	300	319	321	311	06	329	369	456	445	409	416	411	331	381	353	297	318	7839
07	221	171	178	192	209	211	262	397	263	307	303	322	07	312	351	377	390	411	387	402	388	369	341	312	293	7390
08	259	209	198	224	163	274	317	303	312	282	309	304	08	353	350	367	383	367	397	412	413	372	307	252	239	7366
09	190	164	216	209	207	276	271	291	303	406	322	293	09	286	308	341	377	353	408	466	458	400	321	277	272	7415
10	261	244	223	236	253	270	287	322	296	281	257	285	10	288	347	347	328	403	383	371	373	339	281	282	272	7329
11	251	233	238	239	301	290	257	336	353	277	281	237	11	326	371	306	357	420	451	455	430	388	310	276	270	7705
12	251	250	271	285	253	300	300	311	310	310	319	315	12	319	320	322	350	388	399	402	399	381	338	300	270	7713
13	240	229	238	224	207	281	285	280	279	267	291	299	13	310	318	370	399	449	444	434	423	391	307	279	223	7459
14	213	191	161	133	276	239	246	233	414	292	259	487*	14	276	294	331	329	392	409	433	409	367	303	288	280	7294
15	270	230	257	279	302	313	297	306	301	267	268	396	15	311	309	319	381	406	446	431	376	382	311	259	239	7656
16	234	251	241	244	283	273	213	313	131	352*	296*	318	16	238	352*	296*	534*	418	459	419	401	349	284	293	293	7485
17	238	227	232	232	277	278	322	311	303	284	288	308	17	307	336	349	347	399	377	354	374	367	322	281	267	7403
18	268	246	258	277	312	322	322	308	296	303	319	391	18	242	358	403	401	437	431	411	378	342	310	278	268	7681
19	256	262	263	262	292	279	346	336	283	162	228	241	19	281	328	301	419	361	439	453	408	356	291	273	267	7459
20	242	241	224	229	320	368	281	292	366*	175*	287	306	20	683*	389*	293	382	419	458	418	391	322	288	331	277	7992
21	251	227	278	271	273	287	338	347	300	309	293	300	21	297	318	338	361	377	401	415	411	387	323	302	282	7666
22	267	248	267	257	302	415	259	315	236	267*	359*	278	22	326	319	346	376	388	404	416	388	339	312	289	273	7666
23	258	236	233	281	306	284	293	310	349	293	291	289	23	298	328	358	377	392	397	402	397	378	337	307	274	7668
24	261	271	271	281	289	287	297	300	327	371	324	307	24	322	330	377	392	418	421	435	369	307	299	281	257	7794
25	253	273	298	308	294	313	314	297	286	302	288	292	25	297	317	341	360	401	422	413	384	361	304	271	251	7640
26	258	276	287	287	296	311	312	307	304	303	298	320	26	328	333	357	390	411	428	427	397	362	312	287	285	7876
27	294	301	292	301	306	311	320	303	301	291	301	311	27	328	341	359	363	387	411	409	401	367	341	301	259	7699
28	254	278	284	284	297	301	301	300	306	309	304	309	28	319	347	369	399	414	434	419	397	369	332	299	277	7902
29	301	186	77	81	89	60	-102*	41*	367*	200	289	271	29	430*	118	306	349	360	426	437	369	342	324	285	265	5891
30	260	303	263	257	260	224	115	152	96	228	295	316	30	269	299	331	370	400	458	444	335	353	314	283	253	6963
31	279	280	299	281	348	282	268	291	284	284	330	297	31	330	340	360	370	408	443	429	397	360	306	279	232	7777

SCALED BY	SPT, JEP, MJM
CHECKED BY	JEP, MJM
ENGR REVIEWED BY	JEP
PUNCHED BY	

Preliminary baseline and scale values:

Interval Beginning	Baseline Value	Scale Value

( ) Interpolated

[ ] Significant portion of hour interpolated.

[ ] No record, or no values available because of faulty record.

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

[ ] Scaling uncertain because of magnetic storm.

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

MONTHLY SUM	232985
MONTHLY MEAN	313
DATES DITH GAPS:	

U.S. COMM. DOC. 10-77-P.1

Form C&GS-[illegible]
(6-69)

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

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

STATION	YEAR	MONTH	ELEMENT
CO	77	NOV	S

Values are in tenths of gam, and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1500 U.T.) is hour 11 of the 3rd universal day.
Baseline corrections have been applied. Negative values are in red, with minus signs shown.

C	Q	Tab C	Hr.	01	02	03	04	05	06	07	08	09	10	11	12	Hr.	13	14	15	16	17	18	19	20	21	22	23	24	Sum
			01	380	388	390	424	458	477	594	373*	452	444	333	442	01	424	340	335	420	360	340	320	369	387	386	374	396	9586
			02	353	375	381	383	399	396	418	474	441	401	403	377	02	324	376	370	335	290	279	924	316	349	354	383	351	8852
			03	370	363	366	369	363	364	410	409	377	386	416	384	03	328	216	96	269	363	371	365	350	367	353	356	364	8355
			04	363	381	371	400	413	449	514	582	474	390	306	316	04	376	361	364	389	393	379	401	389	374	359	369	349	9462
			05	382	380	347	344	361	384	373	369	400	400	397	369	05	304	204	-20	186	360	380	376	375	380	364	351	349	8113
			06	359	347	360	363	371	376	390	396	416	438	429	426	06	379	319	283	386	384	346	349	400	370	361	387	361	8990
			07	332	429	402	420	470	530	431	429	470	400	367	343	07	367	179	299	349	360	360	363	370	365	352	356	359	9102
			08	382	417	450	519	536	520	440	377	372	364	374	264	08	240	370	261	187	196	325	369	354	361	357	343	342	8880
			09	349	420	506	431	419	359	369	366	381	353	384	379	09	350	393	336	290	269	341	371	346	339	337	344	354	8786
			10	410	406	426	536	439	411	360	401	383	370	350	215	10	249	259	256	259	236	209	239	297	326	341	340	336	8054
			11	341	360	350	453	451	419	405	475	457	440	408	351	11	274	86	280	364	361	360	357	347	324	320	320	342	8635
			12	358	350	360	375	361	363	365	368	370	373	380	367	12	360	363	367	352	366	261	360	350	337	333	330	325	8597
			13	336	356	340	411	480	519	400	369	363	376	360	380	13	358	350	310	300	370	376	358	330	314	310	323	319	8708
			14	320	344	429	521	479	380	397	439	365	246	429	-100*	14	311	398	381	393	401	384	406	389	366	353	340	348	8757
			15	256	387	416	489	407	389	396	439	423	334	114	39	15	101	219	353	240	341	363	376	350	330	324	351	357	7804
			16	356	377	386	383	359	429	508	449	329	-182*	-317*	99	16	97	-114	88	-57	76	236	301	307	252	330	373	371	5596
			17	339	379	358	396	401	464	516	504	376	390	98	259	17	313	346	307	378	317	241	326	319	310	322	329	375	8433
			18	331	356	367	376	378	369	371	407	404	407	281	219	18	-87	54	235	347	371	399	379	359	339	326	339	340	7667
			19	349	400	344	347	370	419	519	538	438	319	416	446	19	307	-12*	-182*	173	429	361	350	361	326	351	354	349	8092
			20	394	409	416	410	516	450	509	419	-269*	59*	404	22	20	-208*	-253*	219	362	304	259	359	362	298	349	363	331	6594
			21	371	438	483	373	371	379	430	419	420	367	356	343	21	355	357	341	340	359	364	356	340	329	331	324	334	8880
			22	333	361	360	369	401	433	470	410	416	264*	-200*	201	22	371	349	369	353	376	390	359	354	346	324	324	323	8056
			23	348	379	384	380	376	404	410	401	369	369	360	364	23	356	356	356	360	373	360	343	327	321	320	326	323	8661
			24	327	345	353	350	360	371	361	379	396	276	336	376	24	369	369	360	371	391	362	321	336	330	340	329	333	8441
			25	354	350	359	360	383	369	364	369	383	377	364	364	25	362	361	350	324	343	353	343	333	324	324	324	333	8470
			26	350	360	356	359	360	350	356	364	369	381	360	361	26	365	369	371	369	366	367	359	340	340	336	343	357	8668
			27	363	363	364	364	369	364	365	370	370	372	371	372	27	373	371	379	373	363	354	353	340	329	321	326	337	8676
			28	350	362	363	376	370	363	361	366	369	369	369	370	28	365	364	364	369	356	349	350	339	326	326	330	357	8583
			29	381	383	520	720	760	438*	433*	446	4*	137	365	307	29	-731*	225	361	291	404	398	371	357	347	339	344	350	7947
			30	421	473	525	639	524	616	530	445	178	-14	158	132	30	298	370	328	331	337	334	315	342	321	316	316	327	8622
			31	340	381	371	398	444	436	398	369	370	367	320	100	31	218	287	230	335	361	355	350	340	323	310	313	320	8036

SCALED BY	SFT, JEP, MJM
CHECKED BY	JEP, MJM
SIGNIFICANT REVIEWED BY	JEP
PUBLISHED BY	

Preliminary baseline and scale values:

Interval Beginning	Baseline Value	Scale Value

( ) Interpolated
[ ] Significant portion of hour interpolated.
[ ] Not enough or no values available because of lack of facility record.
( ) Scaling uncertain because of magnetic storm.
( ) Record all above for part or all of hour; actual value or gamma, estimated or missing, part.
* Derived from Storm Magnetogram, converted to Natural Magnetogram.

MONTHLY SUM 260146
MONTHLY MEAN 350

FORM C&GS-4004
Rev. 4

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

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

OBSV.	YEAR	MONTH	SHEET
50	77	JUL	2

Values are in units of nanotesla and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day 0500 U.T. is hour 23 of the 29/30 universal day.

Day	00	01	02	03	04	05	06	07	08	09	10	11	Day	12	13	14	15	16	17	18	19	20	21	22	23	Mean
01	282	330	323	328	342	374	337	163*	298	347	369	370	01	369	352	300	303	311	300	246	241	276	288	306	317	7472
02	341	342	360	357	351	342	362	348	343	336	243	319	02	269	290	319	309	286	242	269	273	290	301	331	328	7051
03	327	324	320	324	321	329	317	346	331	300	327	309	03	299	253	230	201	251	292	294	286	292	302	307	311	7193
04	316	328	332	348	355	367	376	357	367	352	313	237	04	289	301	302	321	329	320	312	309	301	289	301	319	7741
05	329	320	300	296	301	307	323	317	313	322	300	237	05	234	207	288	120	206	280	313	288	283	276	289	295	6804
06	299	307	316	310	307	311	306	313	313	324	311	272	06	266	294	286	281	305	260	256	311	267	257	260	284	6816
07	279	302	388	374	360	346	363	283	313	357	329	283	07	300	231	200	256	259	300	310	293	299	294	294	311	7324
08	332	326	326	359	368	408	371	343	332	301	306	183	08	230	243	281	240	150	188	256	296	290	297	296	315	7082
09	332	338	369	251	376	276	340	330	326	269	274	296	09	286	311	307	244	167	188	274	277	276	287	299	326	7219
10	361	391	359	384	371	399	359	347	304	299	290	238	10	243	231	240	249	220	177	203	243	270	296	311	331	7116
11	341	334	332	349	380	390	369	268	350	354	350	319	11	328	238	184	266	301	300	310	320	313	310	307	321	7634
12	325	319	333	336	329	328	324	332	326	322	310	306	12	293	300	310	314	313	318	312	310	300	296	300	310	7570
13	320	325	329	320	280	415	410	355	339	340	324	322	13	320	295	297	220	250	290	303	299	293	279	286	290	7604
14	303	306	310	359	441	356	350	350	197	11	300	397*	14	137	291	323	324	321	317	317	314	317	308	311	321	7261
15	346	354	306	399	408	379	366	380	347	300	278	203	15	373	253	280	251	257	290	311	299	314	309	319	321	7723
16	326	336	351	376	383	366	306	286	300	518*	359*	166	16	386	715*	479*	479*	258	168	208	223	265	268	337	366	8268
17	333	339	341	341	364	361	348	341	319	296	241	224	17	252	273	313	327	309	223	247	281	267	301	303	321	7285
18	309	322	333	338	376	335	330	372	337	333	297	293	18	115	194	157	253	297	303	317	313	310	313	319	316	7195
19	310	331	363	340	329	326	327	228	290	286	281	346	19	350	455	396	277	249	320	293	287	294	292	322	352	7637
20	391	388	351	347	406	283	354	290	145*	104	272	267	20	552*	647*	303	275	310	293	252	287	289	299	323	344	7823
21	356	350	377	371	342	359	366	357	344	288	299	287	21	303	323	326	323	323	326	318	319	313	301	306	311	7888
22	317	319	327	320	352	348	342	226	292	265	203*	130	22	254	280	300	301	307	320	309	283	283	296	306	313	6998
23	319	321	331	360	349	348	369	377	304	301	301	293	23	304	309	315	316	317	320	318	310	307	309	311	311	7720
24	314	319	332	321	318	311	315	319	341	193	161	258	24	271	306	303	296	300	310	287	260	247	269	294	307	6952
25	321	339	323	323	323	347	335	318	320	316	318	320	25	318	316	306	288	296	306	310	309	310	306	310	313	7701
26	318	316	320	318	320	322	319	317	316	306	290	282	26	283	301	308	316	316	315	311	303	299	300	303	306	7405
27	311	314	314	319	325	328	329	318	315	310	318	331	27	315	311	308	310	309	308	303	304	296	300	304	305	7492
28	310	317	324	324	336	334	326	320	321	323	320	317	28	307	300	301	301	300	287	281	281	280	277	280	286	7353
29	293	271	299	200	63	10*	-8*	177	438*	340	358	423	29	583*	287	360	261	314	359	343	320	313	312	306	307	6929
30	311	366	418	381	347	344	243	290	327	342	375	267	30	295	347	347	352	357	343	291	290	290	301	318	320	7852
31	337	351	370	360	399	396	397	402	370	352	301	224	31	225	305	273	295	347	348	330	327	320	312	322	340	8023

SCALED BY	SPT, JEP, MJM
CHECKED BY	JEP, MJM
HIGHS REVIEWED BY	JEP
PUNCHED BY	

Preliminary baseline and scale values:

Interval Beginning	Baseline 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.

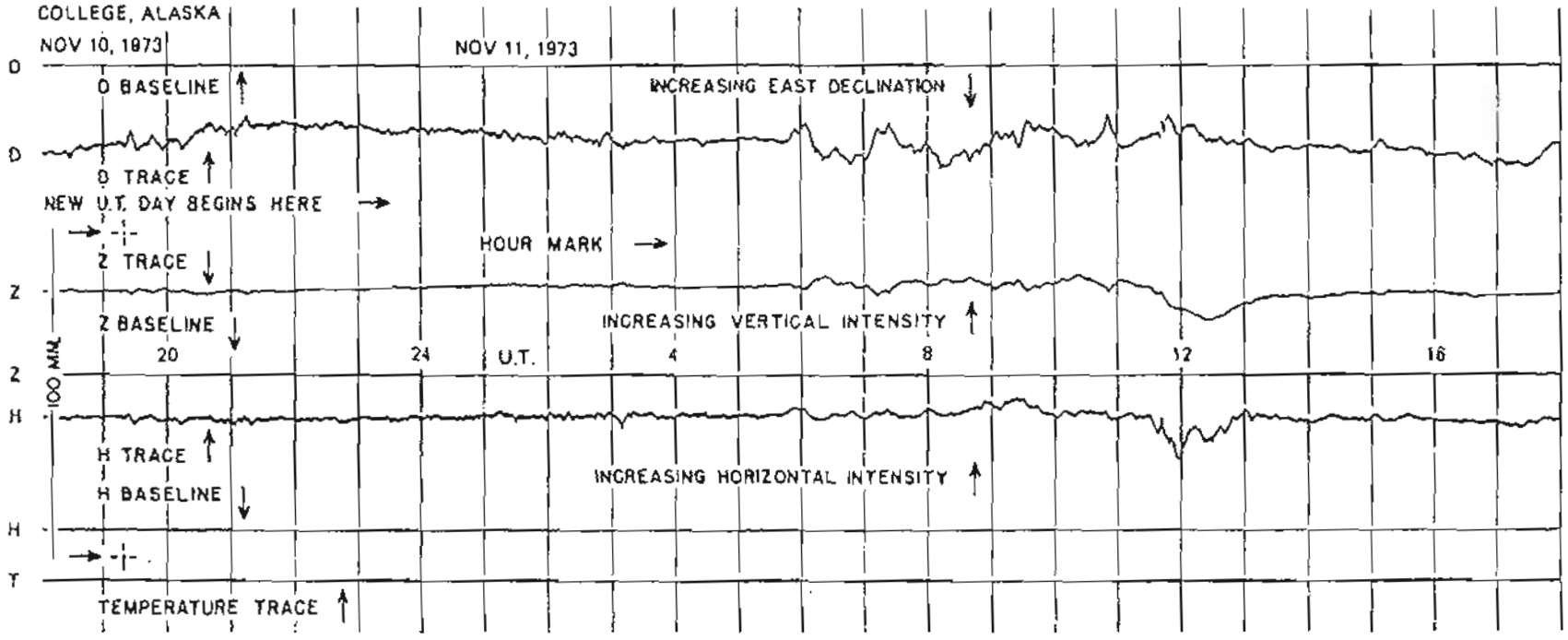
[ ] Scaling uncertain because of magnetic storm.

<> Revised off shore for part or all of hour; it value is given, it was estimated for missing part.

MONTHLY SUM	230791
MONTHLY MEAN	310
DATES WITH DATA	

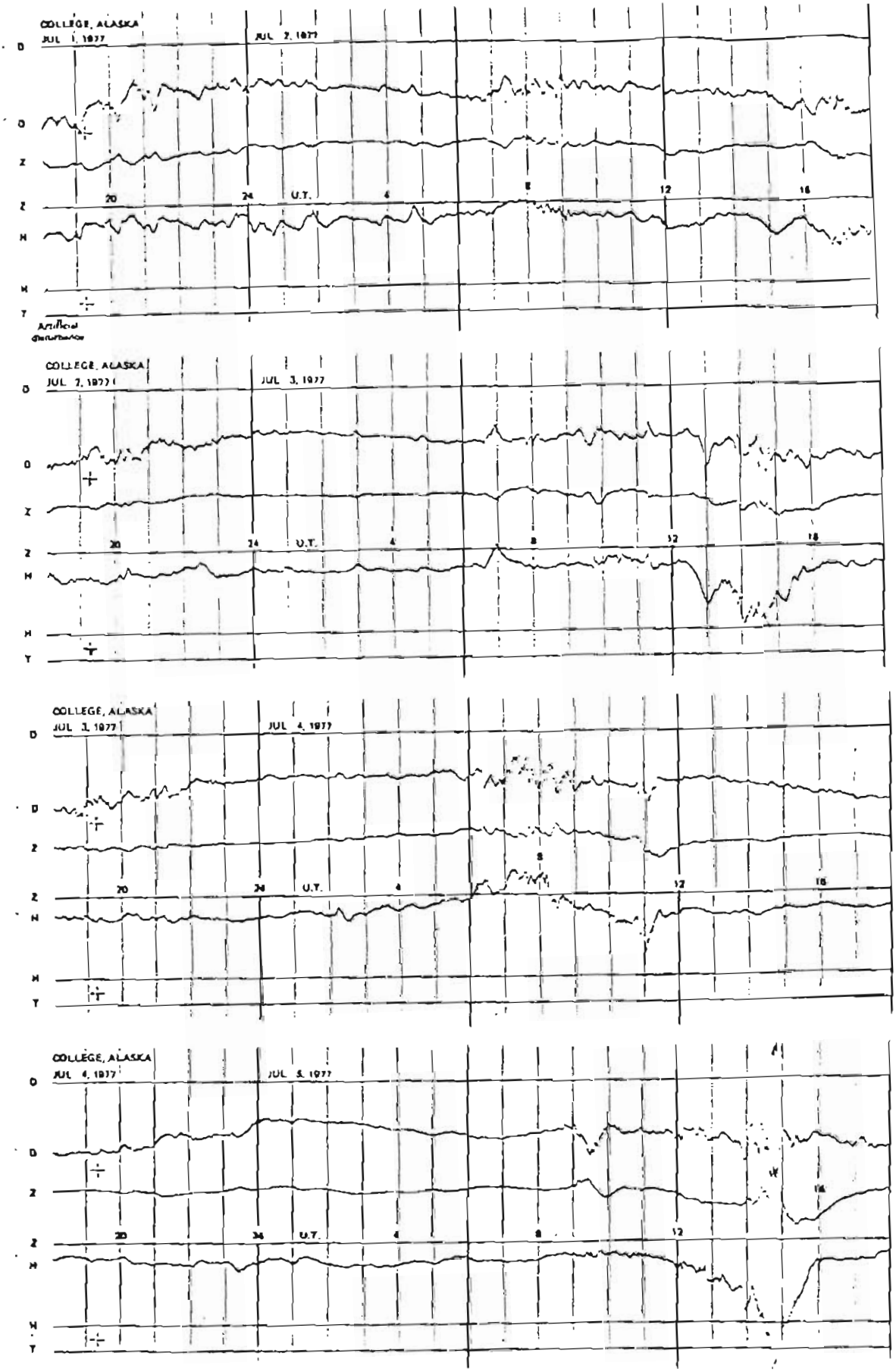
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)

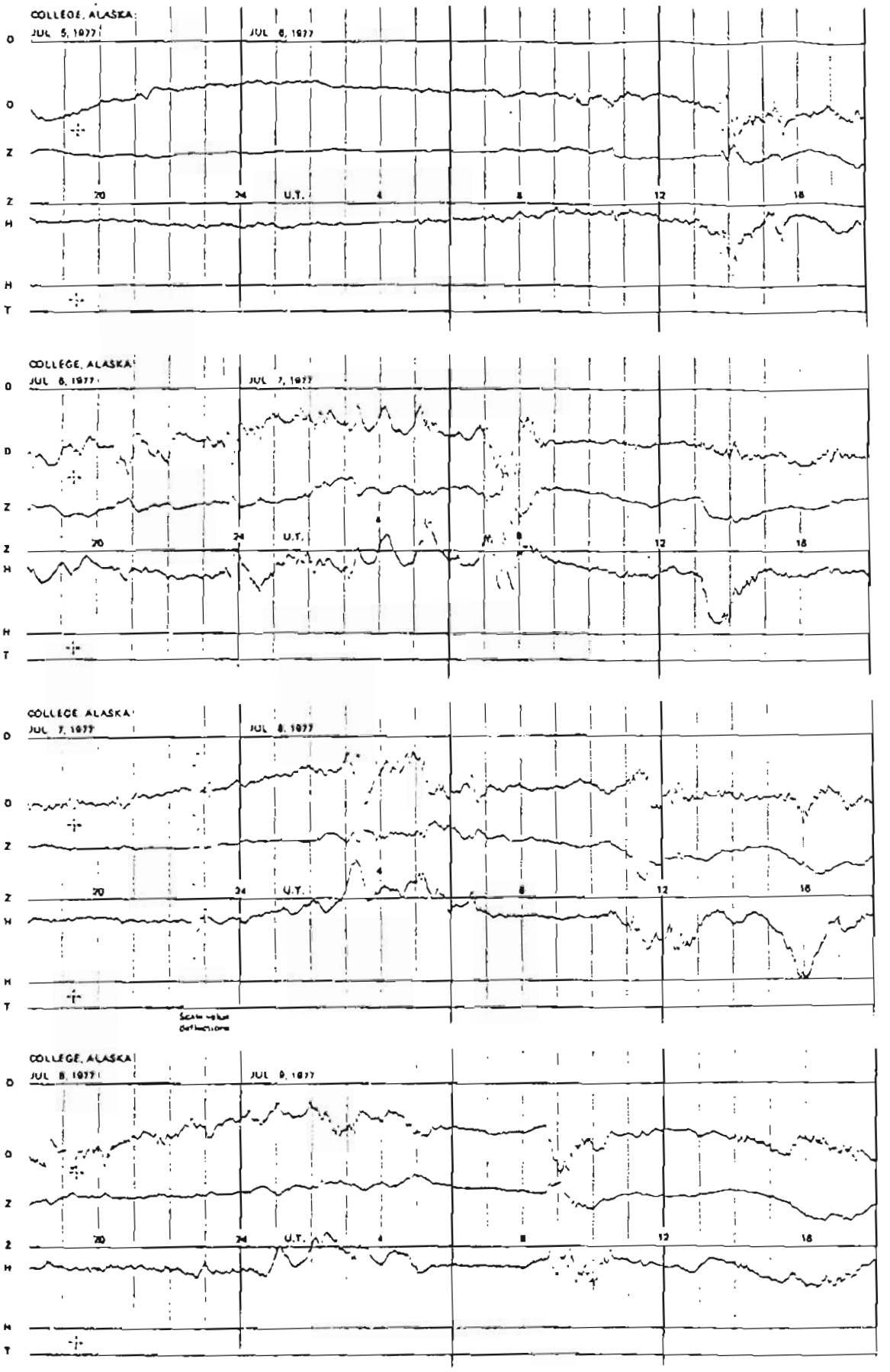


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

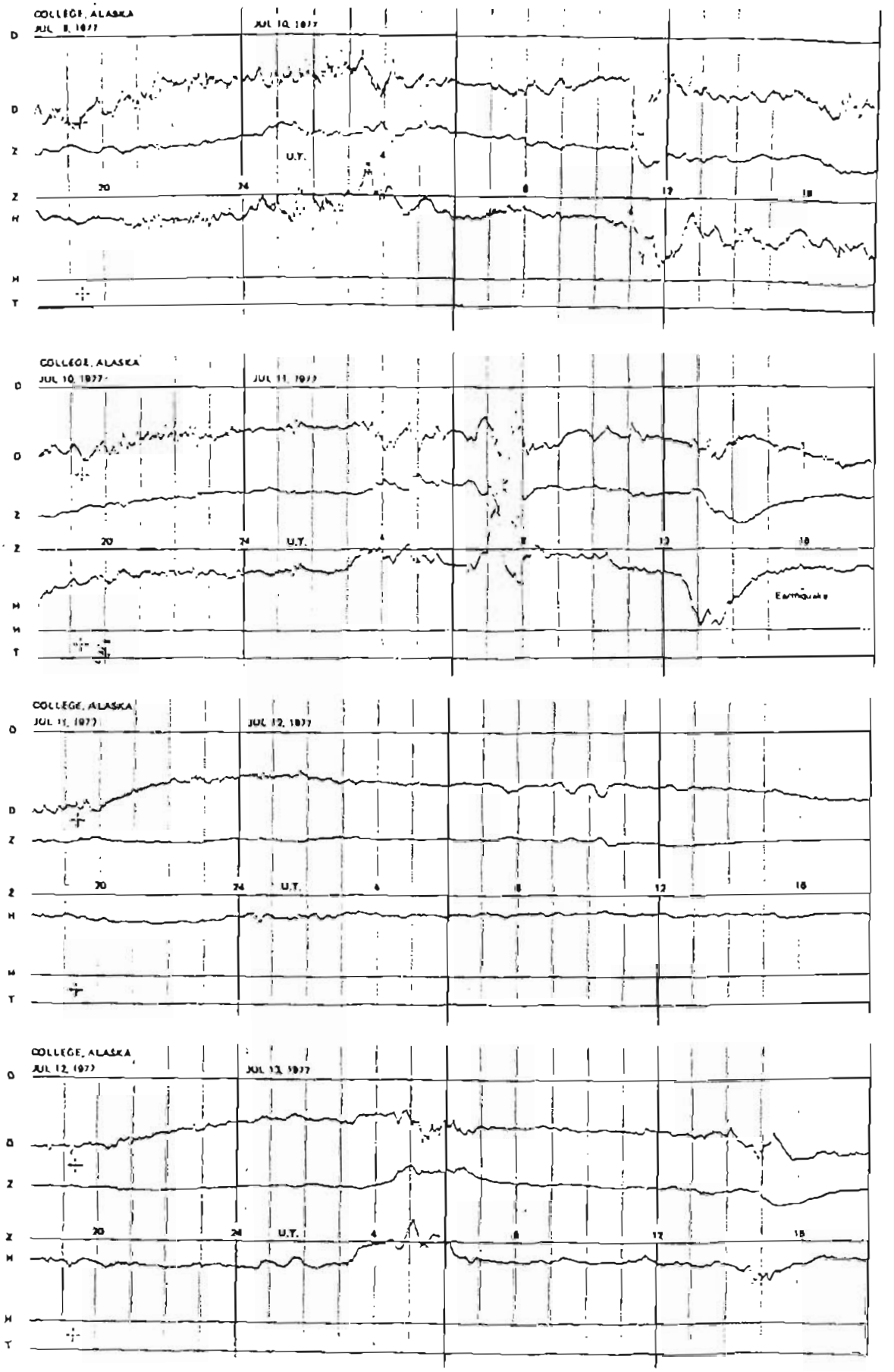
NORMAL MAGNETOGRAMS



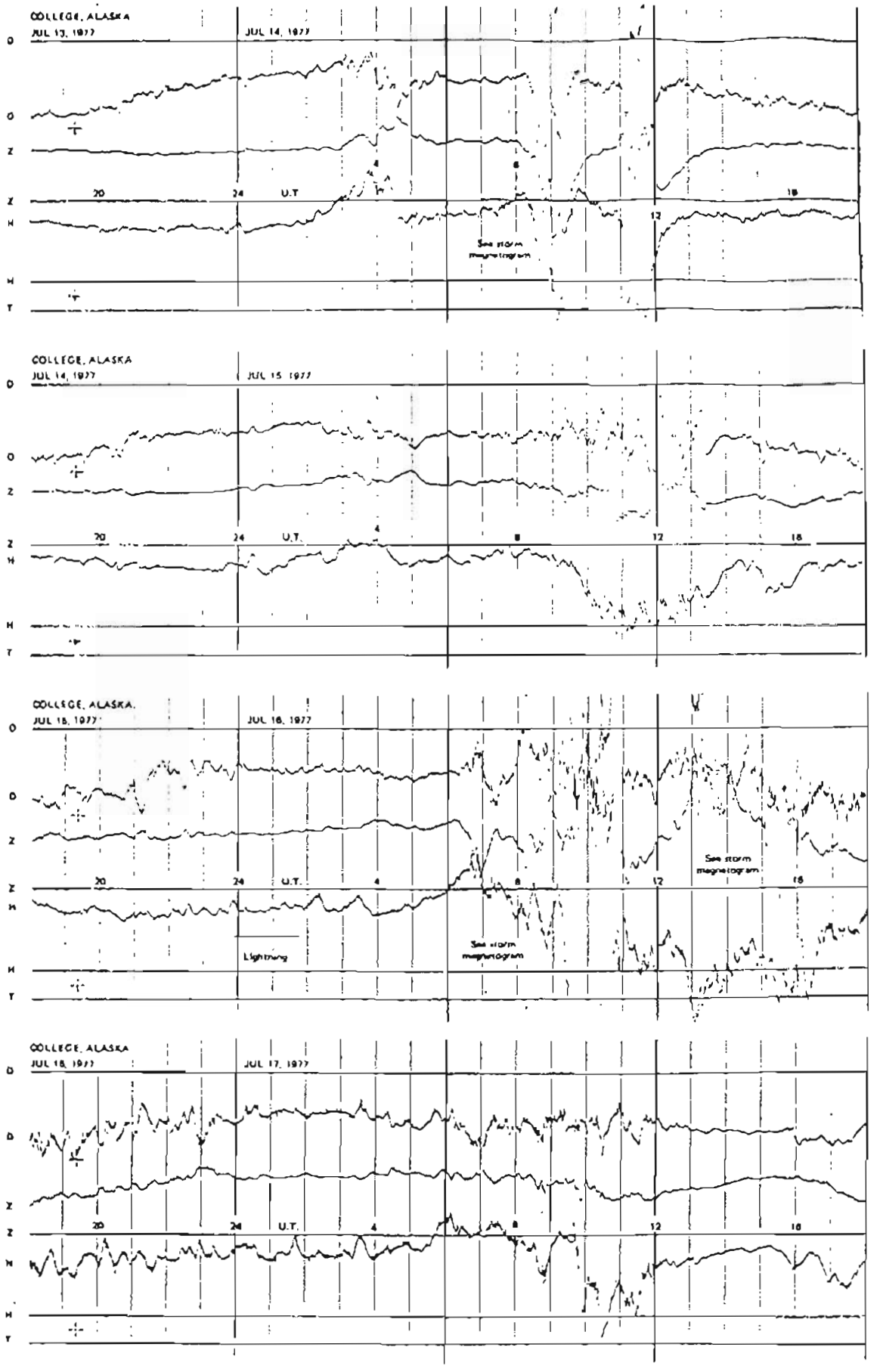
NORMAL MAGNETOGRAMS



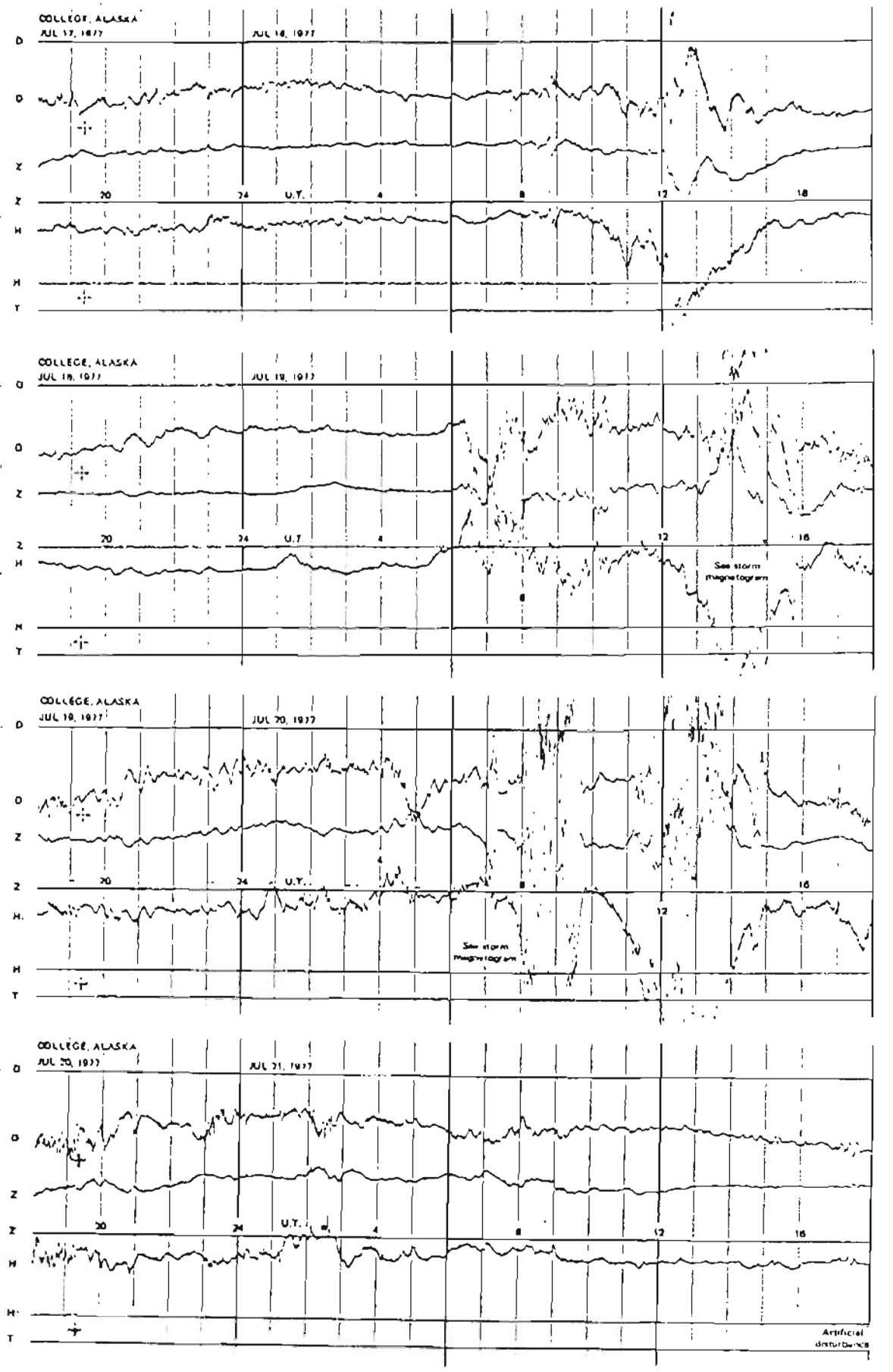
NORMAL MAGNETOGRAMS



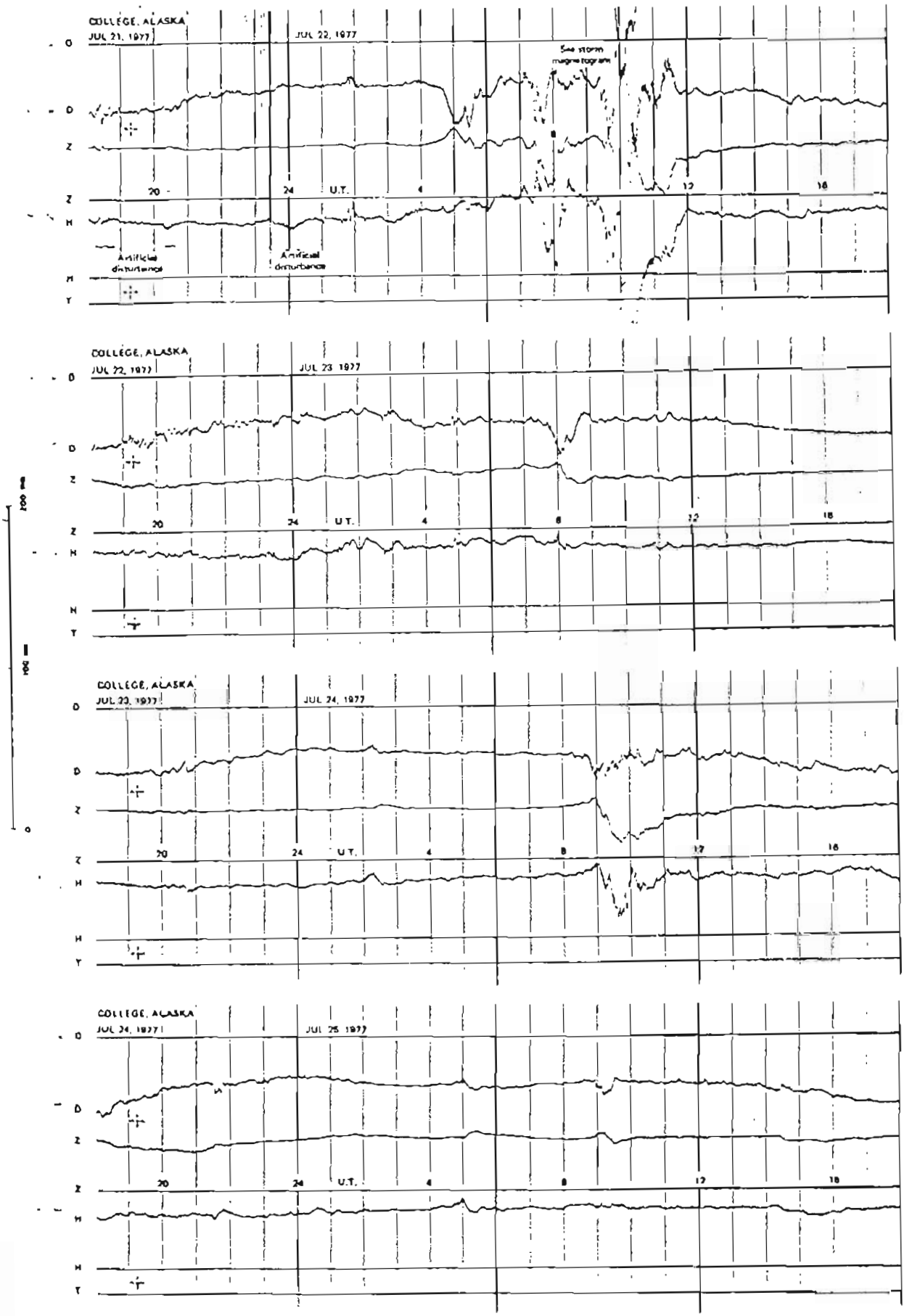
NORMAL MAGNETOGRAMS



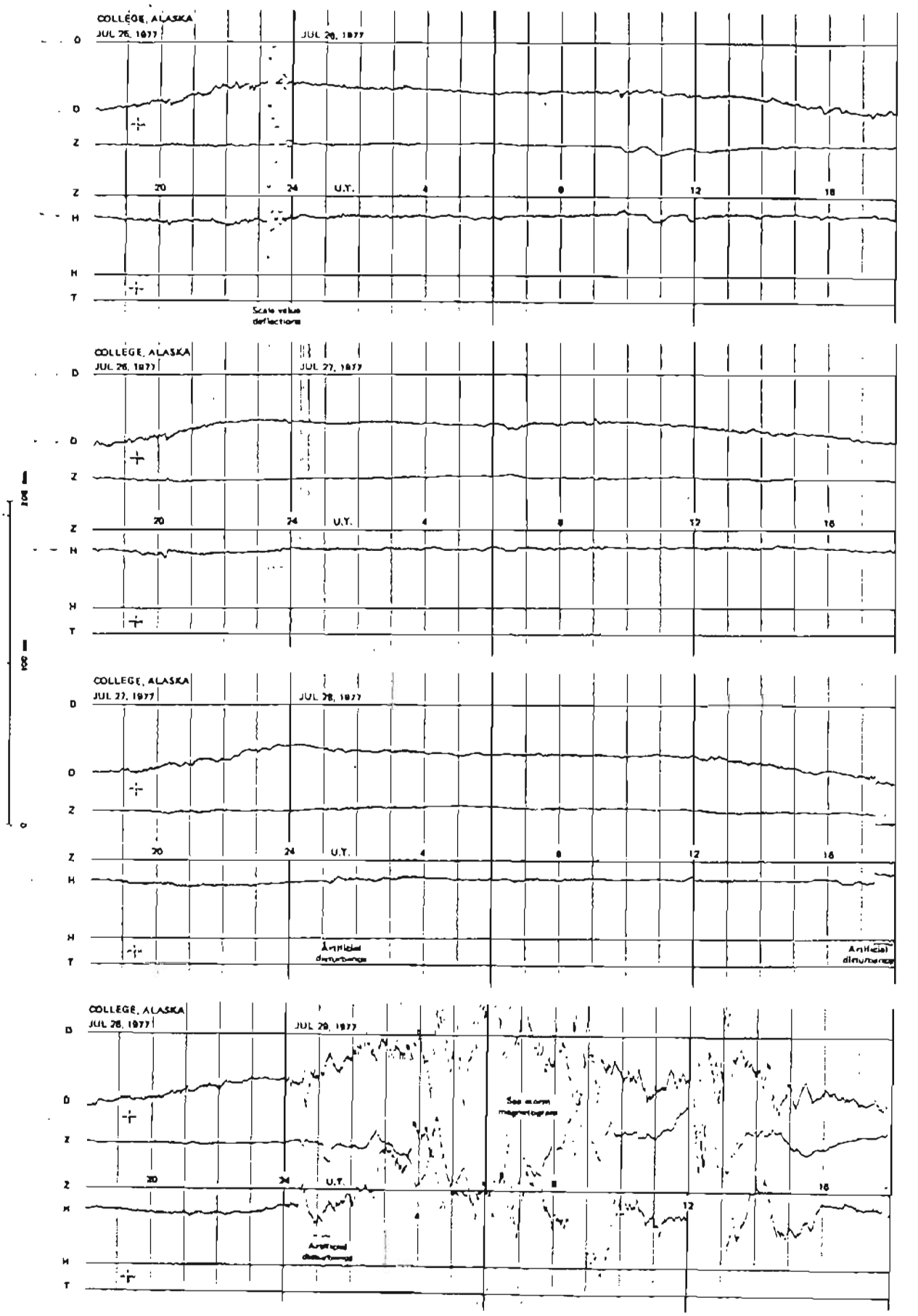
NORMAL MAGNETOGRAMS



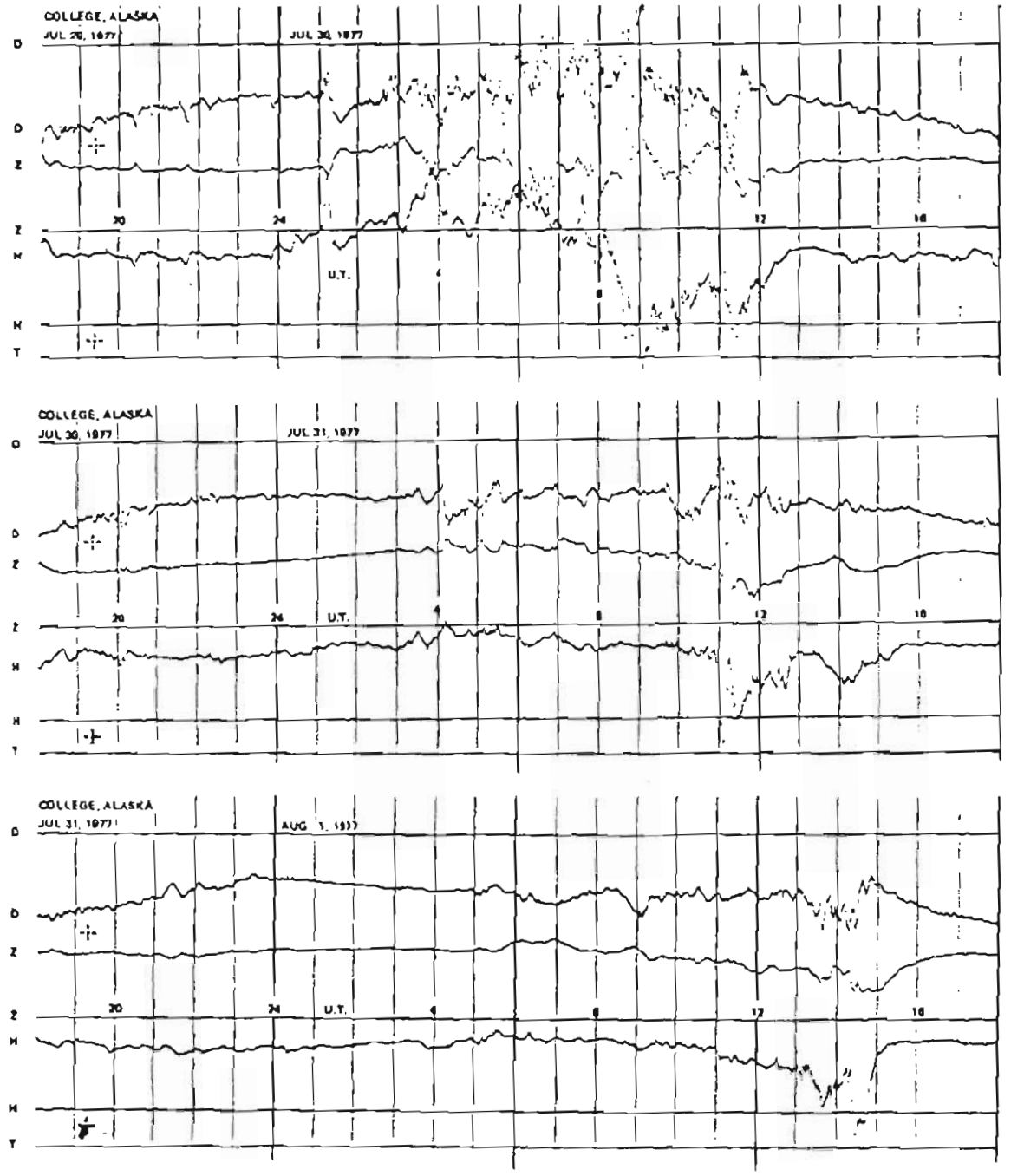
NORMAL MAGNETOGRAMS



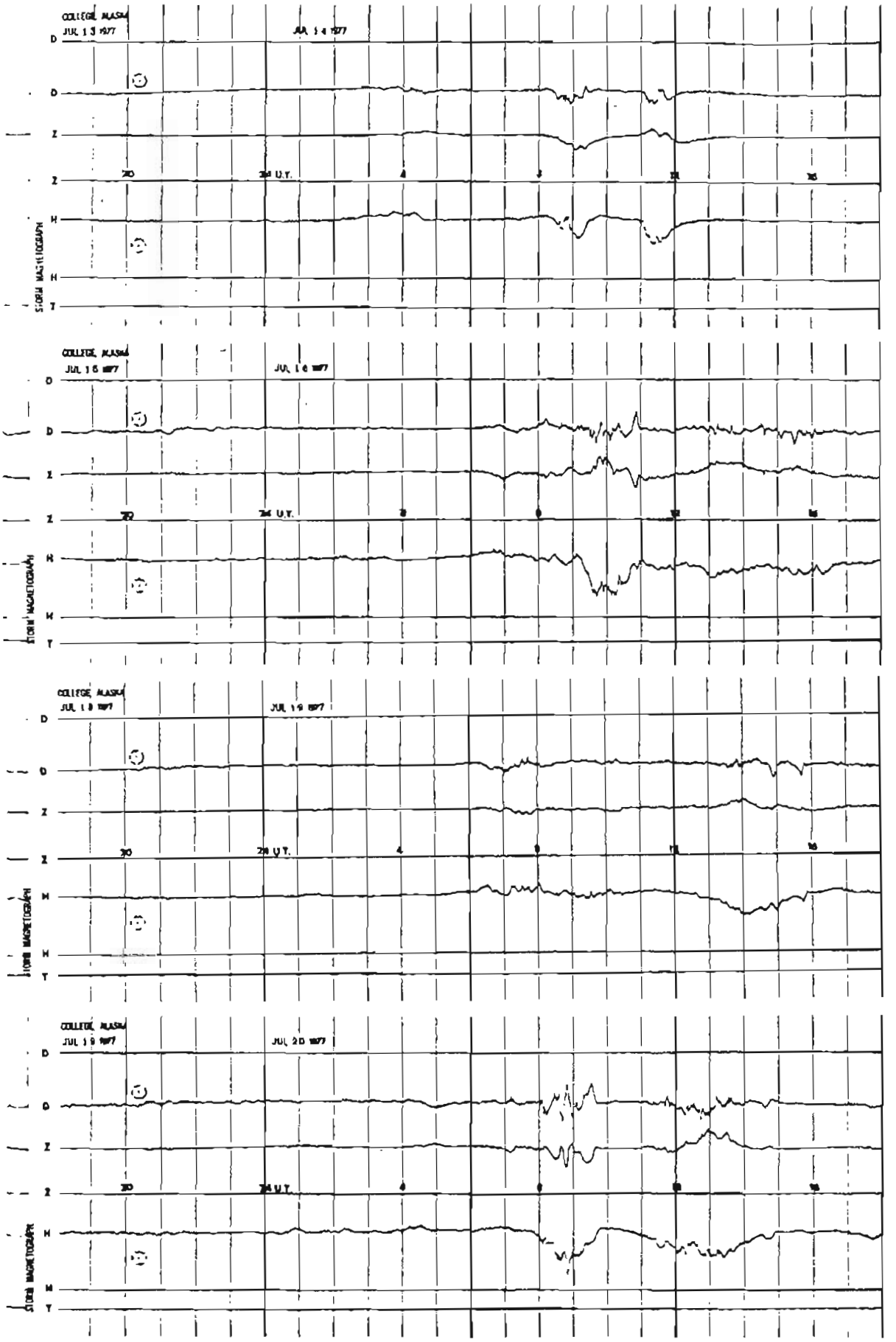
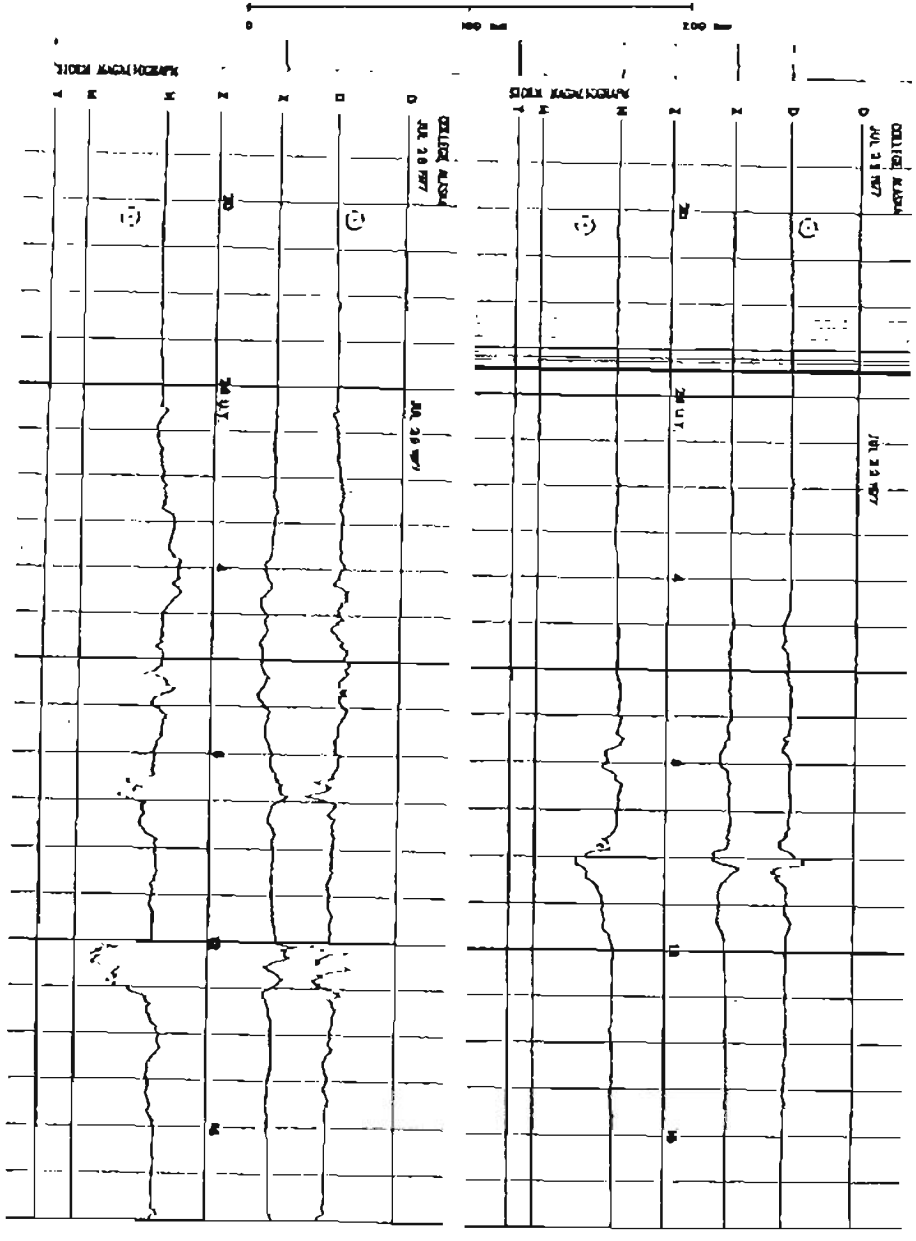
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS