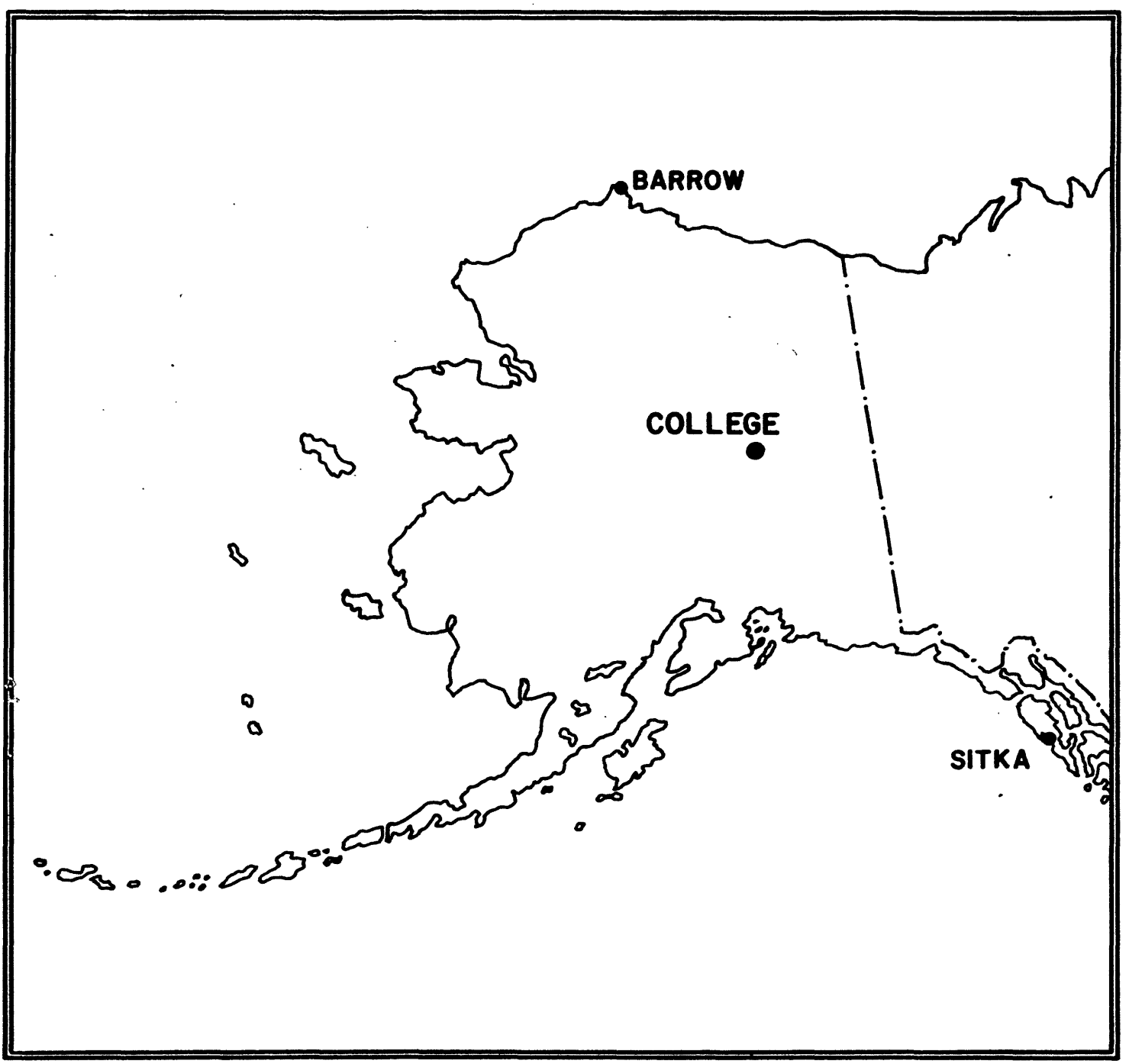
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

MARCH 1985

OPEN FILE REPORT 85-0300C



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.....+256.5°
Elevation.....200 meters

GEOMAGNETIC DATA

Normal, Storm and Rapid Run magnetograms and appropriate calibration data are processed daily at the observatory and are available for analysis or copying. Also available, are mean hourly scalings, K-Indices, selected magnetic phenomena reports and on a real-time basis are recordings from a 3-component fluxgate magnetometer and F-component proton magnetometer.

Magnetic Activity

The K-Index: The K-Index is a logarithmic measurement of the range of the most disturbed component (D or H) of the geomagnetic field for eight intervals beginning 0000-0300, 0300-0600...2100-2400 UT. It is a measure of the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval.

The Equivalent Daily Amplitude, AK: The K-Index is converted into an equivalent range, ak, which is near the center of the limiting gamma ranges for a given K. The average of the eight values is called equivalent daily amplitude AK. The unit 10γ has been chosen so as not to give the illusion of an accuracy not justified.

The schedule for converting gamma range to K, and K to ak is as follows:

Gamma Range	K - Index	ak
0 < 25	0	0
25 < 50	1	3
50 < 100	2	7
100 < 200	3	15
200 < 350	4	27
350 < 600	5	48
600 < 1000	6	80
1000 < 1650	7	140
1650 < 2500	8	240
2500+	9	400 (10γ)

The Magnetic Daily Character Figure, C: To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1, if it is moderately disturbed; C=2, if it is greatly disturbed. The method used to assign characters at the College Observatory is based on AK as follows:

AK Range	C
0≈11	0
11≈50	1
50+	2

Routine assignment of C was discontinued at College on January 1, 1976.

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal and Rapid Run records were reviewed at the observatory for selected magnetic phenomena and the events identified were forwarded to the IUGG Commission on Magnetic Variations and Disturbances. This was discontinued on January 1, 1976, but a report on Outstanding Magnetic Effects is prepared monthly for this report.

Principal Magnetic Storms

Gradual and sudden commencement magnetic disturbances with at least one K-Index of 5 or greater, 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: MARCH 1985

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	2	4	5	4	2	1	0	1	19	15
2	1	2	4	6	5	6	4	4	32	37
3	2	4	4	2	3	2	1	2	20	13
4	2	1	0	3	3	3	1	2	15	08
5	2	2	7	6	4	6	6	3	36	55
6	4	3	6	5	6	4	2	3	33	37
7	3	1	4	6	5	5	5	4	33	37
8	3	4	6	6	5	3	2	2	31	35
9	3	2	1	0	0	0	0	2	08	04
10	1	1	1	1	1	2	2	3	12	06
11	2	1	1	2	5	2	0	0	13	09
12	0	1	0	0	4	3	2	2	12	07
13	0	0	3	4	1	0	0	0	08	06
14	0	0	0	4	5	2	1	1	13	11
15	1	2	6	4	4	1	1	2	21	20
16	1	1	1	2	6	4	1	1	17	16
17	1	0	0	1	0	0	1	2	05	02
18	4	2	1	0	1	0	1	2	11	06
19	2	1	3	5	4	4	2	1	22	17
20	0	0	0	2	3	1	0	0	06	03
21	0	0	0	0	1	1	1	0	03	01
22	1	1	0	1	3	0	0	0	06	03
23	2	2	0	0	0	0	0	1	05	02
24	1	0	0	3	3	0	0	1	08	05
25	1	0	0	0	2	2	1	1	07	03
26	2	1	2	5	4	1	1	0	16	12
27	1	2	3	4	4	2	2	1	19	12
28	3	4	4	2	2	2	2	2	21	13
29	1	0	1	1	1	2	2	1	09	04
30	2	1	0	0	4	1	1	0	09	05
31	2	1	5	5	2	0	1	0	16	15

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

SUDDEN COMMENCEMENTS

d	h	m

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

BEGIN d	BEGIN h	BEGIN m	END d	END h	END m

K SCALE USED:	D	H	Z	
LOWER LIMIT FOR K = 9.....	675.7	322.2		(mm)
CURRENT SCALE VALUE.....	3.72	7.83		(γ/mm)
LOWER LIMIT FOR K = 9	2510	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

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

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: MARCH

YEAR: 1985

DATE	TIME U.T.	NATURE OF PHENOMENON [1]	REMARKS
04	09XX	pi2	With small bays.
09	02XX	pc5	
10	15XX	pc5	
14	10XX	pi2	
18	02XX	pc5	
26	22XX	pg	

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.

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

MARCH 1985

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	02	07XX	..	..	..	..	02	4, 6	6	175	1010	580	03	14
		05	05XX	..	..	..	..	05	3	7	261	1260	890	09	03

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: MARCH 1985

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 3-1-85	2400 U.T., 3-31-85	1.0'/mm	3.7 γ/mm	27° 16.7' E
H	0000 U.T., 3-1-85	2400 U.T., 3-31-85	7.8 γ/mm		12671 γ
Z	0000 U.T., 3-1-85	2400 U.T., 3-18-85	7.6 γ/mm		55175 γ
	0000 U.T., 3-19-85	2400 U.T., 3-31-85	"		55183 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 3-1-85	2400 U.T., 3-31-85	7.9'/mm	29.5 γ/mm	23° 46.6' E
H	0000 U.T., 3-1-85	1408 U.T., 3-9-85	43.8 γ/mm		10778 γ
	1409 U.T., 3-9-85	2400 U.T., 3-31-85	"		10706 γ
Z	0000 U.T., 3-1-85	2400 U.T., 3-18-85	48.2 γ/mm		54097 γ
	0000 U.T., 3-19-85	2400 U.T., 3-31-85	"		54114 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 41.2' E	12904 γ	55343 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: MAR 9, 17, 20, 21, 22, 23, 24, 25, 29, 30

FORM C&GS-404a

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

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

OBSY.	YEAR	MONTH	ELEMENT
CO	85	MAR	D

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (135W M.T.) is hour 09 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q or S	Tes Q	Hr Dy.	01	02	03	04	05	06	07	08	09	10	11	12	Hr. Dy.	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	243	243	227	185	200	219	325*	261	290	190	253	200	01	239	252	251	251	269	275	276	287	278	256	224	219	5913
			02	222	229	221	229	256	235	240	376	253	226	312*	-37*	02	431*	535*	431*	273	526*	399*	150	257	179	182	203	210	6538
			03	227	227	195	204	222	376	271	269	275	245	239	239	03	264	247	242	240	244	278	286	268	257	206	212	200	5923
			04	219	221	241	249	231	269	245	249	231	247	244	261	04	256	255	218	239	274	305	301	296	263	251	172	172	5909
			05	195	178	208	199	235	302	230	257	384*	-54*	166	209	05	269	306	357	347	459	399*	224*	138	215	186	210	258	5877
			06	210	197	246	216	234	271	248	368*	224*	137*	221	250	06	262	328*	242	265	271	264	266	265	240	202	212	204	5843
			07	220	242	234	248	241	233	251	240	303	2*	343*	106*	07	267	296	431*	204	352	296	217	207	190	170	210	196	5703
			08	210	231	232	231	402	224	399*	320	296*	98*	257	238	08	237	258	230	267	261	244	282	273	262	242	250	237	6181
			09	236	229	228	239	242	247	249	251	261	240	249	250	09	253	251	254	247	260	270	281	289	283	279	250	239	6077
			10	219	218	227	230	240	241	243	239	241	242	248	250	10	254	269	279	291	309	279	332	337	347	259	168	219	6181
			11	242	237	228	230	239	239	240	233	230	224	258	238	11	332	359	342	290	267	305	288	289	282	259	248	239	6338
			12	221	217	209	217	220	226	228	240	249	250	260	269	12	279	347	341	278	276	290	287	253	220	146	178	228	5929
			13	230	221	228	228	230	229	235	218	214	314	229	249	13	260	260	257	261	274	286	295	291	288	269	250	233	6049
			14	229	228	230	233	239	242	247	244	240	240	270	271	14	307	320	264	299	310	296	282	255	267	241	227	210	6191
			15	211	218	212	229	221	205	174	114*	100	275	265	250	15	302	264	237	243	274	284	284	278	269	248	220	212	5589
			16	204	210	220	221	228	240	240	257	226	243	250	259	16	256	304	364	230	275	310	286	279	262	230	206	208	6007
			17	199	213	223	228	226	234	238	236	239	242	241	259	17	257	253	257	269	286	305	306	304	275	238	201	179	5907
			18	188	162	189	216	188	232	234	258	230	239	250	246	18	250	259	260	276	283	286	286	292	222	179	154	190	5569
			19	208	218	215	202	226	221	219	221	265	257	254	322	19	310	294	274	293	320	340	320	239	172	195	205	198	5988
			20	195	197	209	217	228	237	235	234	231	240	258	280	20	319	308	288	302	254	299	301	288	275	258	236	221	6110
			21	211	200	200	218	231	232	231	232	236	239	247	249	21	252	260	274	271	299	320	324	311	268	250	213	204	5972
			22	189	190	211	215	226	227	224	220	226	236	258	268	22	262	267	269	274	283	310	320	304	290	276	258	230	6028
			23	194	170	159	176	198	222	228	227	228	233	240	260	23	273	273	270	283	309	310	314	290	265	249	225	203	5799
			24	176	157	151	189	204	211	220	220	227	232	239	246	24	269	260	266	270	287	286	310	316	290	256	209	188	5679
			25	190	194	216	225	230	234	236	238	235	240	247	250	25	250	291	316	320	352	340	348	270	257	224	201	195	6099
			26	172	170	165	190	180	190	218	228	218	268	219	257	26	300	327	280	280	310	326	304	249	226	220	190	172	5759
			27	168	149	133	148	170	197	174	203	205	258	210	230	27	240	312	292	291	400	400	356	341	237	253	218	213	5798
			28	193	169	118	131	177	188	267	163	248	237	243	243	28	240	251	263	271	283	293	272	203	147	180	213	219	5212
			29	220	216	212	227	233	231	232	228	237	237	237	243	29	247	257	253	263	291	298	311	297	242	231	217	213	5873
			30	170	189	197	210	223	223	212	232	234	243	243	243	30	263	313	275	287	308	298	271	287	259	239	217	202	5838
			31	207	201	187	203	228	220	210	179	278	56*	223	240	31	243	267	269	280	294	289	243	231	223	223	221	213	5428

SCALED BY	JEP, LYT, EAS
CHECKED BY	EAS, JEP
SIGNS REVIEWED 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.
[ ] 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	183,307
MONTHLY MEAN	246
DATES WITH GAPS:	

FORM C&GS-404a

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 (135W M.T.) is hour 09 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	85	MAR	Z

C	Q or S	Tens 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	244	250	252	254	251*	213*	124*	254	213*	81	191	210	01	244	230	231	233	234	237	233	232	236	230	232	244	5353
			02	267	258	250	256	269	250	268	293	194	236	280*	55	02	388*	287*	489*	180	211*	191*	53	174	186	241	245	253	5770
			03	255	249	254	276	285	335	283	205	242	200	223	200	03	178	140	192	209	223	229	233	234	217	211	230	235	5538
			04	249	255	257	249	243	269	259	256	253	246	196	179	04	223	219	125	101	185	212	217	221	220	226	222	231	5313
			05	239	250	270	265	279	286	287	251	14	33*	149	255	05	279	263	277	140	211	255*	106	98	180	221	251	296	5155
			06	274	276	282	262	268	287	259	172*	-62*	78*	108	267	06	307	325*	172	126	155	230	229	230	229	224	233	236	5167
			07	250	253	251	247	245	284	293	273	210	92	186*	116*	07	284	232	350*	137	39	10	95	177	213	217	227	243	4924
			08	268	283	283	308	303	249*	191*	166	164	282	148	265	08	142	214	99	145	191	210	213	221	233	239	248	243	5308
			09	249	244	240	241	239	239	238	240	245	238	235	230	09	223	225	228	228	230	235	236	236	235	235	237	238	5664
			10	239	241	240	236	232	231	230	231	231	230	230	230	10	231	229	221	219	220	190	182	201	210	209	205	243	5361
			11	240	236	234	231	233	233	232	235	246	254	267	259	11	242	150	136	149	218	230	229	230	230	230	230	230	5404
			12	231	232	234	239	238	240	243	248	241	243	240	238	12	229	192	130	83	189	215	200	183	184	193	223	226	5114
			13	226	232	237	239	240	250	255	254	260	213	230	260	13	242	240	231	235	241	236	235	232	230	229	229	226	5702
			14	230	230	230	230	229	229	229	229	229	231	240	208	14	145	90	161	143	175	211	212	198	205	210	220	221	4935
			15	231	237	236	239	239	247	228	122*	144	152	179	241	15	254	206	187	229	239	231	224	222	220	211	211	220	5149
			16	229	235	238	238	238	234	234	239	231	233	211	200	16	217	171	157	24	169	210	210	211	215	211	212	221	4988
			17	227	233	239	230	224	221	222	229	229	229	221	209	17	219	219	214	219	220	220	219	215	205	205	200	200	5268
			18	218	220	253	246	260	260	265	265	249	232	222	219	18	193	200	213	220	220	221	227	221	209	202	199	211	5435
			19	225	233	232	239	241	231	235	255	226	189	202	80	19	92	198	200	206	191	200	200	189	167	190	210	218	4948
			20	228	224	229	230	231	229	223	230	234	241	235	218	20	151	61	113	177	190	210	227	223	225	222	223	226	5000
			21	226	230	231	241	237	229	224	225	225	225	226	223	21	221	218	208	196	194	211	220	211	209	213	217	220	5280
			22	221	239	241	238	235	230	230	231	233	240	230	219	22	181	137	199	210	219	221	220	211	211	212	212	212	5232
			23	214	216	230	284	251	243	230	228	228	230	229	218	23	209	202	212	215	219	216	217	210	214	221	229	229	5394
			24	226	230	244	251	243	240	240	239	236	231	230	219	24	169	201	205	216	220	220	210	200	190	191	205	219	5275
			25	217	222	220	219	220	220	219	220	220	220	220	211	25	209	170	130	150	170	182	195	179	200	200	200	210	4823
			26	220	230	240	249	240	251	253	232	242	132	202	229	26	224	186	95	159	190	182	155	140	133	153	170	198	4705
			27	220	226	239	249	259	249	250	283	210	122	225	242	27	198	150	175	210	190	149	127	151	183	221	203	212	4943
			28	223	226	236	276	270	192*	261	270	307	267	239	223	28	218	217	210	213	210	211	197	163	160	188	219	228	5424
			29	233	228	221	218	220	219	219	221	233	227	223	219	29	217	218	213	183	172	200	207	207	203	209	219	227	5156
			30	241	266	248	229	223	221	227	230	225	223	222	217	30	203	111	169	207	209	208	209	212	202	203	209	209	5123
			31	219	221	220	237	237	223	224	223	170	172*	202	231	31	228	233	220	227	220	211	198	193	190	203	210	211	5123

SCALED BY	JEP, LYT, EAS
CHECKED BY	EAS, JEP
SIGNS REVIEWED 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.
[ ] 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	161,974
MONTHLY MEAN	218
DATES WITH GAPS:	

FORM C&GS-404a

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

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 (135W M.T.) is hour 09 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

OBSY.	YEAR	MONTH	ELEMENT
CO	85	MAR	H

C	Q or S	Tens 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	309	295	310	323	484*	496*	395*	444	401*	245	219	290	01	300	309	295	302	297	303	295	290	283	287	288	289	7749
			02	309	303	311	293	292	318	339	360	450	410	-31*	-266*	02	-367*	-75*	-124	-30	-244*	-165*	253	353	261	332	319	316	3917
			03	319	309	330	316	416	419	403	336	328	298	297	296	03	177	281	281	276	287	309	299	290	280	288	299	299	7433
			04	308	303	316	312	309	301	318	311	318	332	299	299	04	311	277	151	260	318	331	326	310	303	291	280	289	7163
			05	305	296	289	314	319	329	419	414	54*	-9*	335	373	05	263	209	159	113	-82*	-264*	-282*	115	281	321	327	343	4951
			06	315	383	335	321	351	342	338	305*	181*	350*	248	176	06	-5	-266*	76	230	256	282	320	310	283	262	294	292	5979
			07	316	319	326	320	320	322	342	339	332	109*	188*	378*	07	29	88	-109*	-40	-72	-82*	32	201	258	289	301	319	4825
			08	301	310	368	471	290	411*	344*	359	249*	-109*	177	18	08	1	-64*	194	275	220	269	299	290	309	298	290	304	5874
			09	309	310	318	310	310	308	301	299	297	301	300	302	09	306	306	307	302	302	303	301	301	299	297	292	289	7270
			10	279	292	299	309	311	311	315	311	310	310	318	319	10	320	321	313	303	299	281	310	309	290	239	254	298	7221
			11	309	290	289	300	299	307	305	310	321	347	346	307	11	207	165	169	305	317	304	309	300	299	289	288	290	6972
			12	292	298	309	306	301	308	310	304	307	302	301	299	12	290	198	142	261	312	299	280	242	242	261	266	301	6731
			13	289	290	290	307	309	314	310	324	380	379	374	317	13	305	303	302	304	301	300	299	294	290	289	288	283	7441
			14	288	294	300	308	305	310	310	310	311	311	319	194	14	23	185	264	266	319	318	292	291	287	280	279	281	6645
			15	284	289	293	311	318	340	455	281*	196	273	272	266	15	142	159	263	325	300	290	290	301	299	291	285	282	6745
			16	282	282	294	303	310	305	306	302	319	319	312	310	16	301	221	-195*	202	317	311	309	295	290	280	298	294	6567
			17	293	288	295	306	310	309	310	306	305	306	313	300	17	318	312	311	309	309	305	300	291	283	270	270	280	7199
			18	306	293	293	319	317	318	319	310	312	307	307	308	18	298	301	313	309	309	301	295	280	265	254	281	291	7206
			19	296	300	310	321	313	313	320	327	340	351	335	91	19	132	196	248	196	330	319	296	231	240	279	279	283	6646
			20	298	301	299	303	303	303	310	311	320	324	331	309	20	210	224	282	272	282	299	310	300	291	289	285	290	7046
			21	296	302	303	291	301	306	312	309	309	310	312	312	21	317	319	302	300	308	306	294	281	280	282	280	280	7212
			22	290	286	303	311	310	310	307	303	303	306	310	305	22	280	262	320	311	319	310	300	289	280	281	282	282	7160
			23	277	300	316	340	300	292	298	300	301	303	308	300	23	300	299	301	297	291	291	287	281	275	273	276	280	7086
			24	289	300	300	300	310	306	309	307	302	305	309	288	24	258	310	301	310	303	302	291	291	288	270	251	253	7053
			25	270	282	291	300	301	304	307	309	310	311	311	320	25	308	273	266	274	309	311	290	291	290	290	283	280	7081
			26	280	303	314	306	317	323	311	320	340	325	369	340	26	247	77	218	289	292	291	280	261	270	277	281	290	6921
			27	300	313	319	310	322	344	400	371	405	296	373	312	27	160	222	302	330	250	259	269	289	302	285	280	298	7311
			28	269	303	360	413	454	571*	491	556	402	321	292	292	28	295	297	281	300	303	289	269	235	255	269	280	281	8078
			29	299	302	307	300	300	302	309	310	310	312	309	312	29	313	309	300	249	293	278	297	287	271	277	280	281	7107
			30	280	292	294	297	298	310	318	311	306	302	311	310	30	173	230	318	321	310	308	303	293	288	281	285	287	7026
			31	290	292	310	303	300	319	314	368	269	208*	367	337	31	330	321	307	308	307	298	279	287	302	300	293	293	7302

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

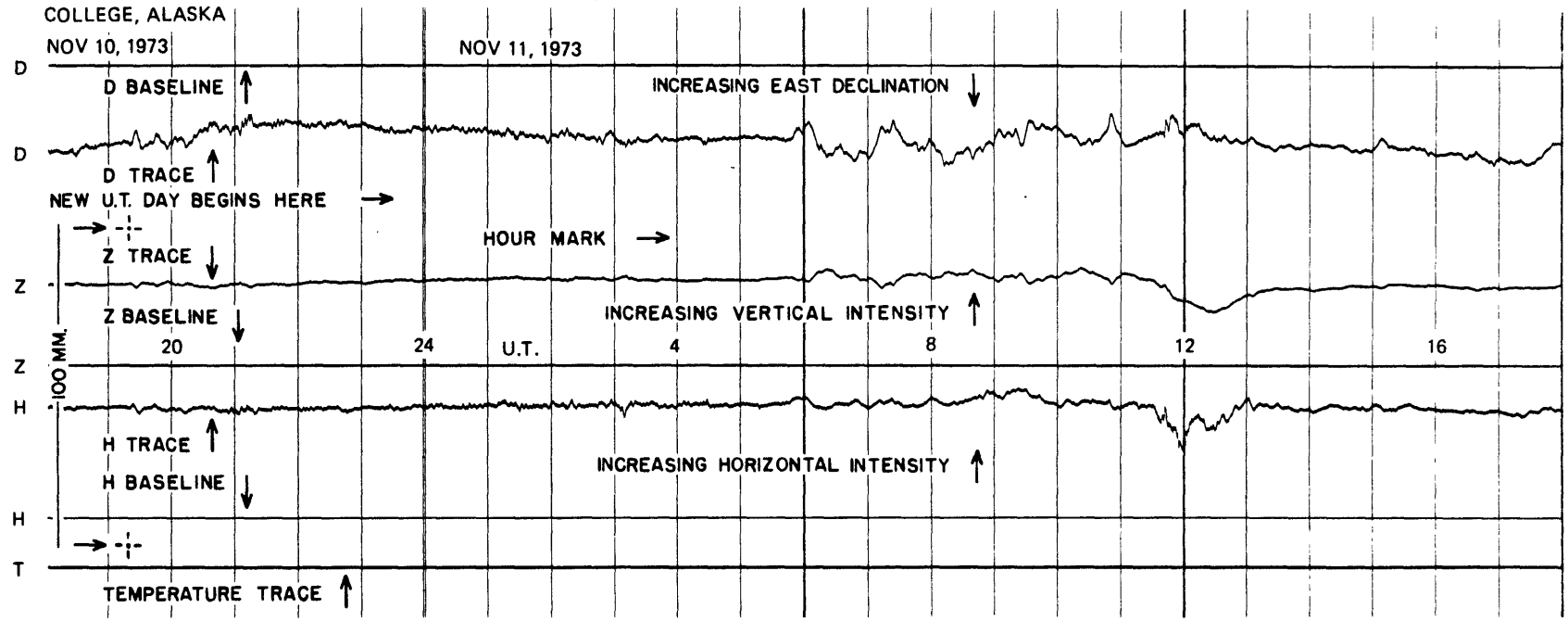
[ ] Scaling uncertain because of magnetic storm.

< > 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.

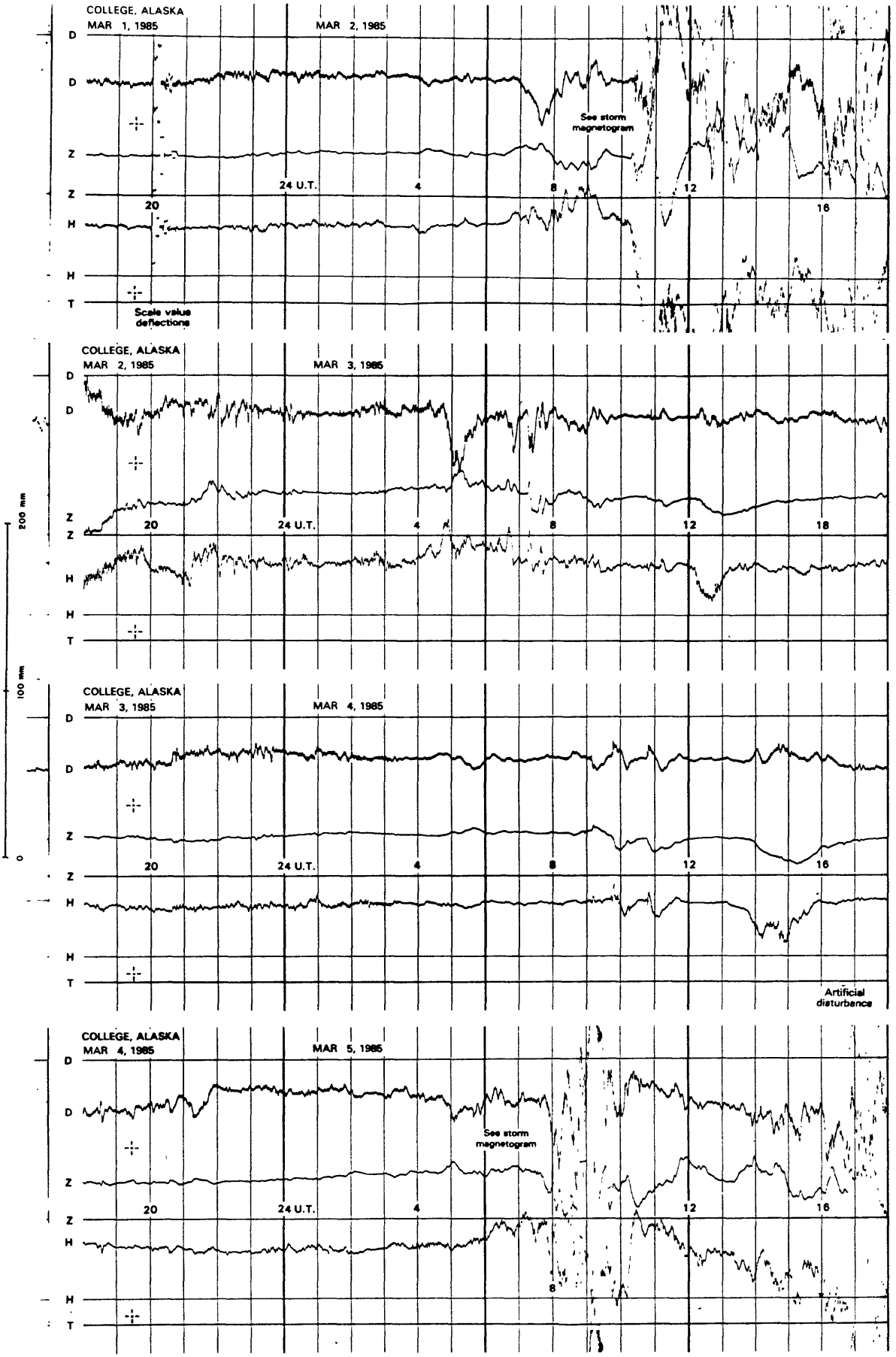
MONTHLY SUM	210,917
MONTHLY MEAN	283
DATES WITH GAPS:	

FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

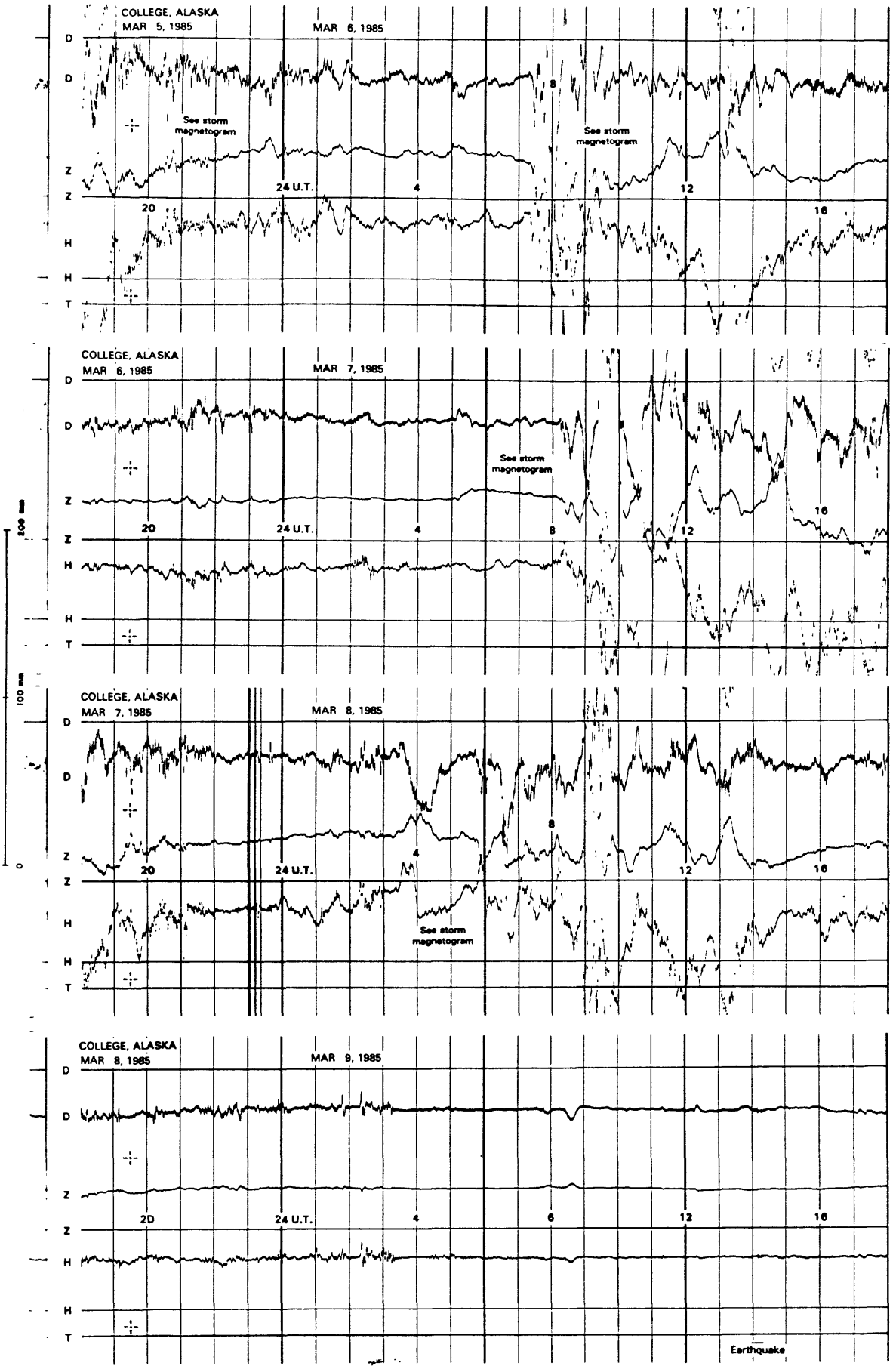


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

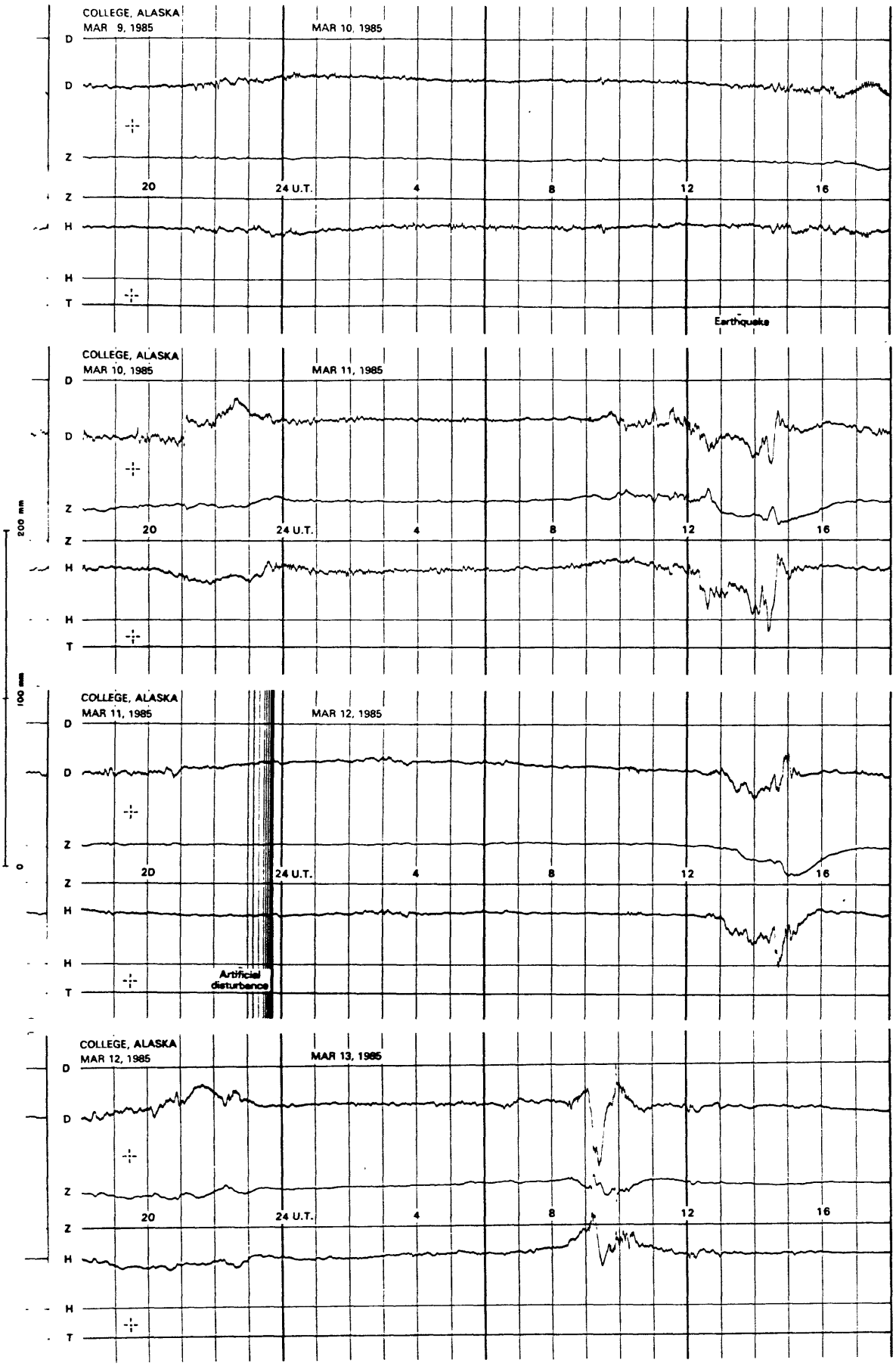
NORMAL MAGNETOGRAMS



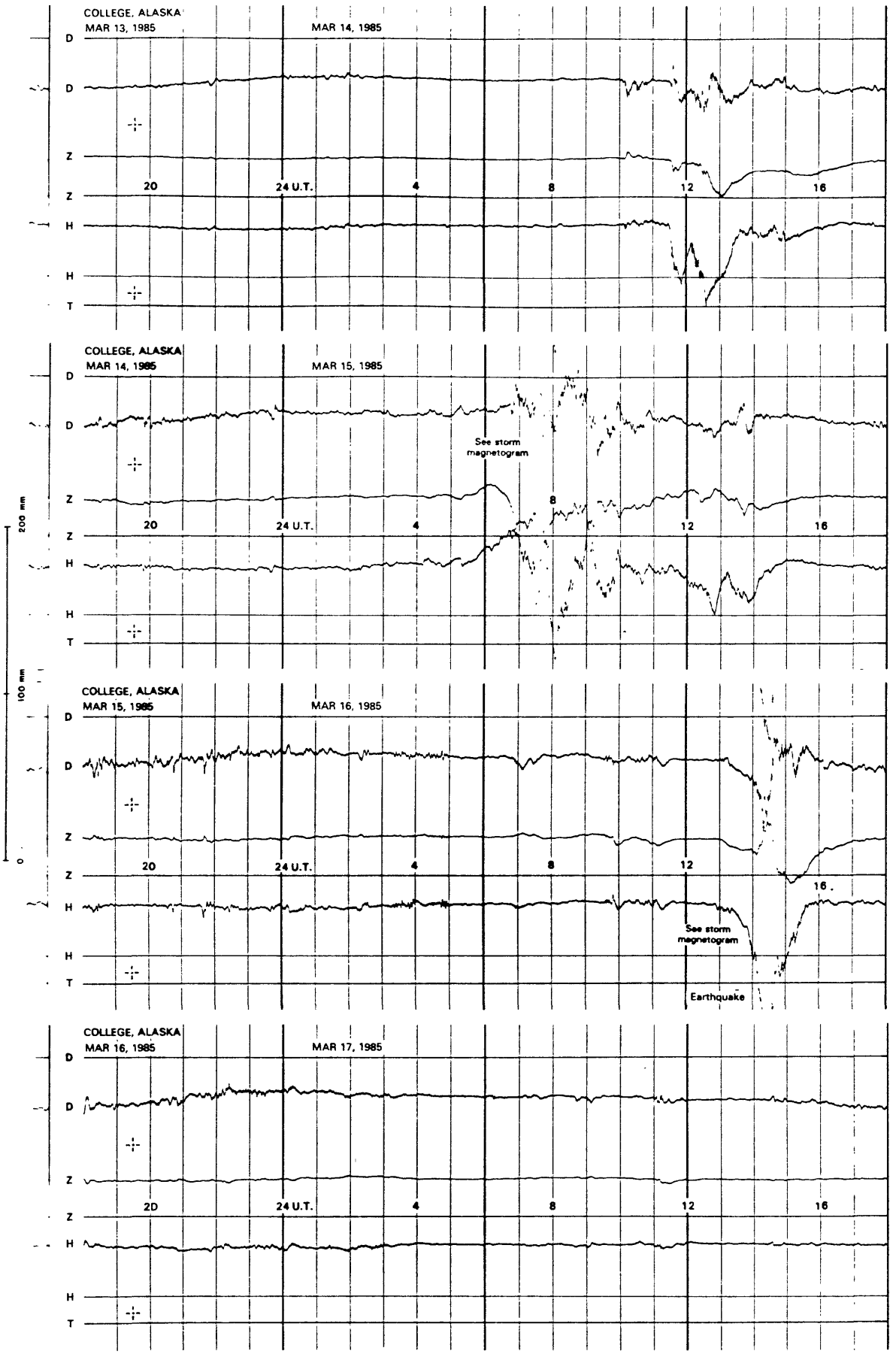
NORMAL MAGNETOGRAMS



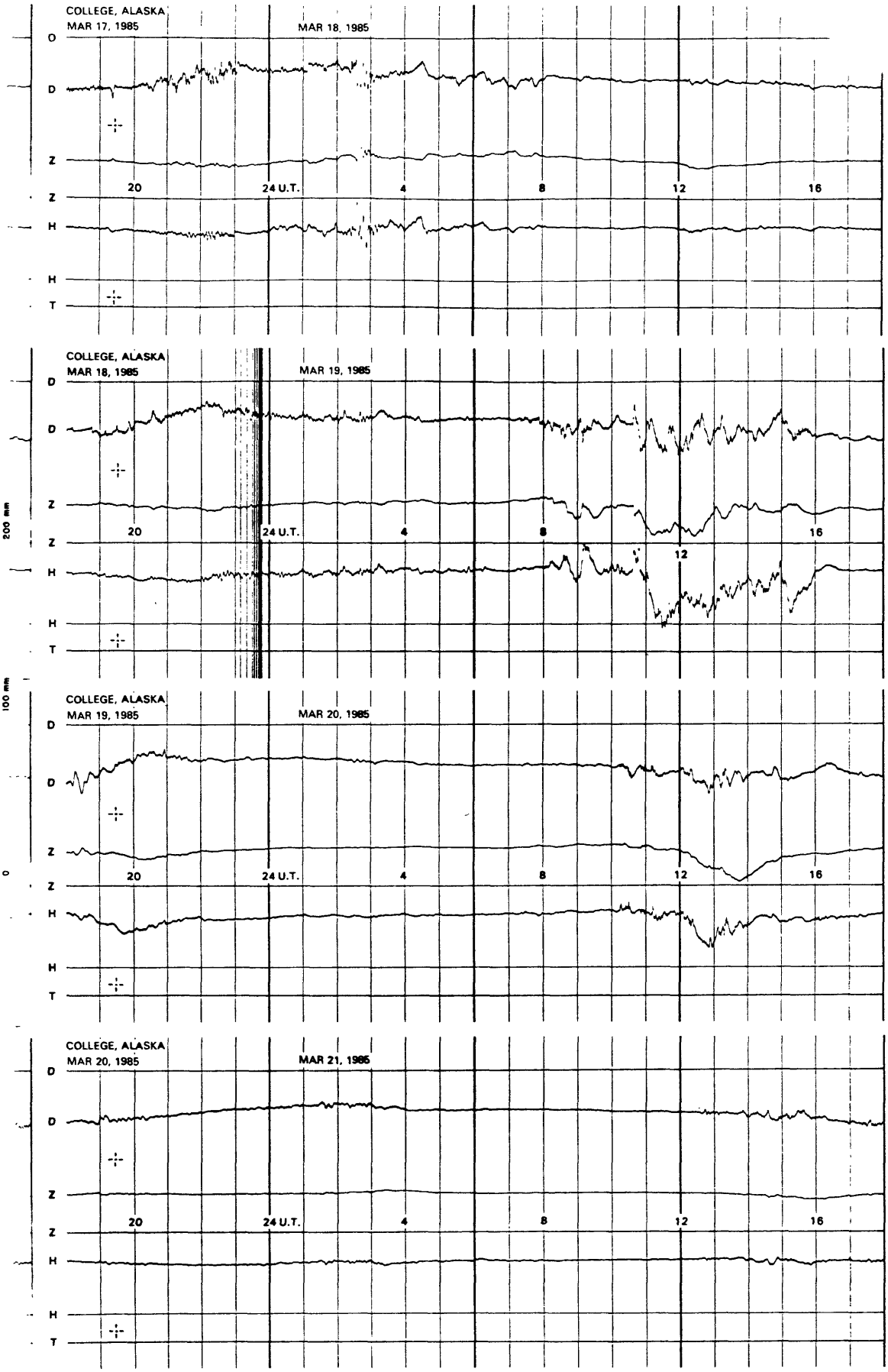
NORMAL MAGNETOGRAMS



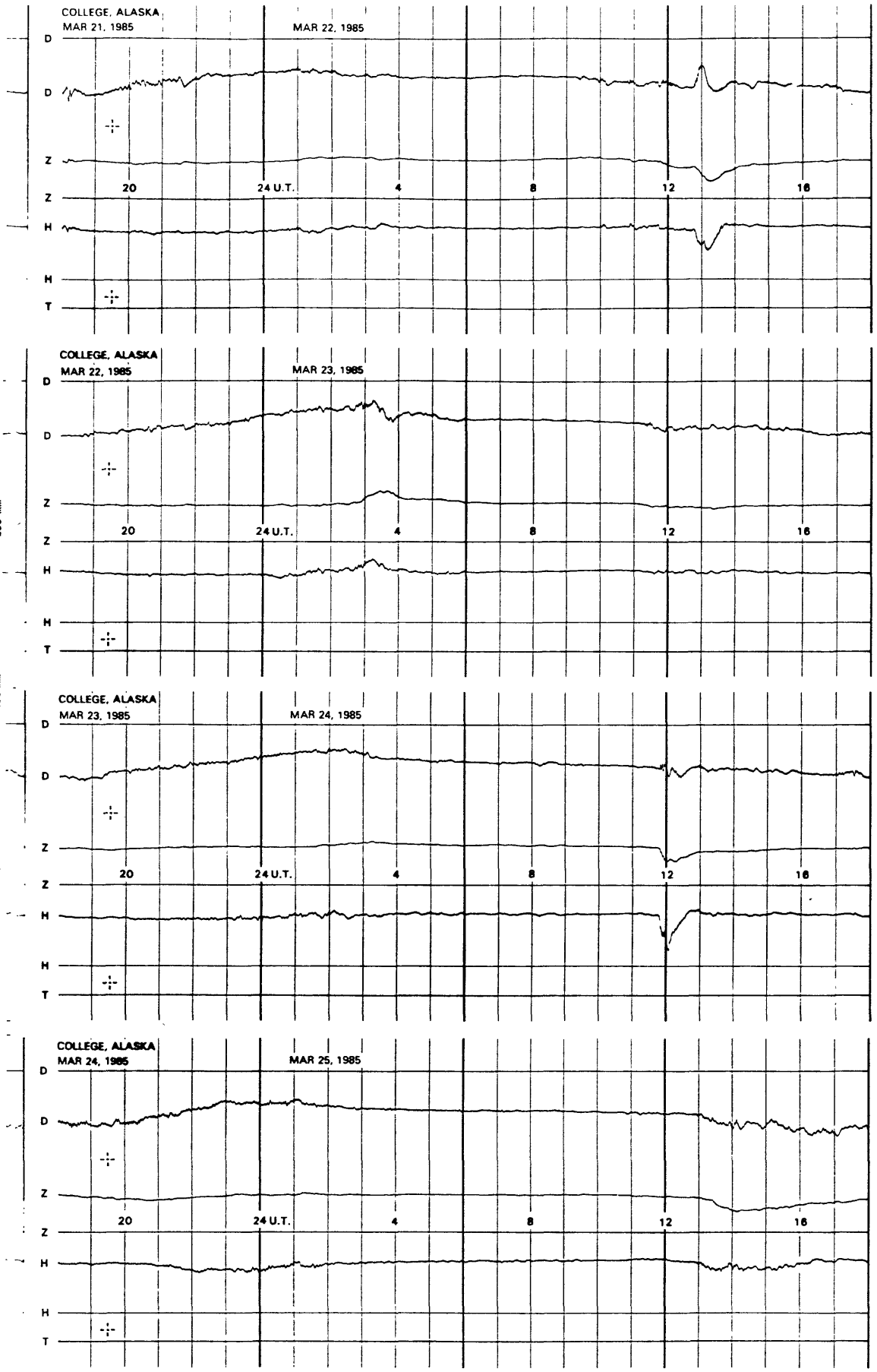
NORMAL MAGNETOGRAMS



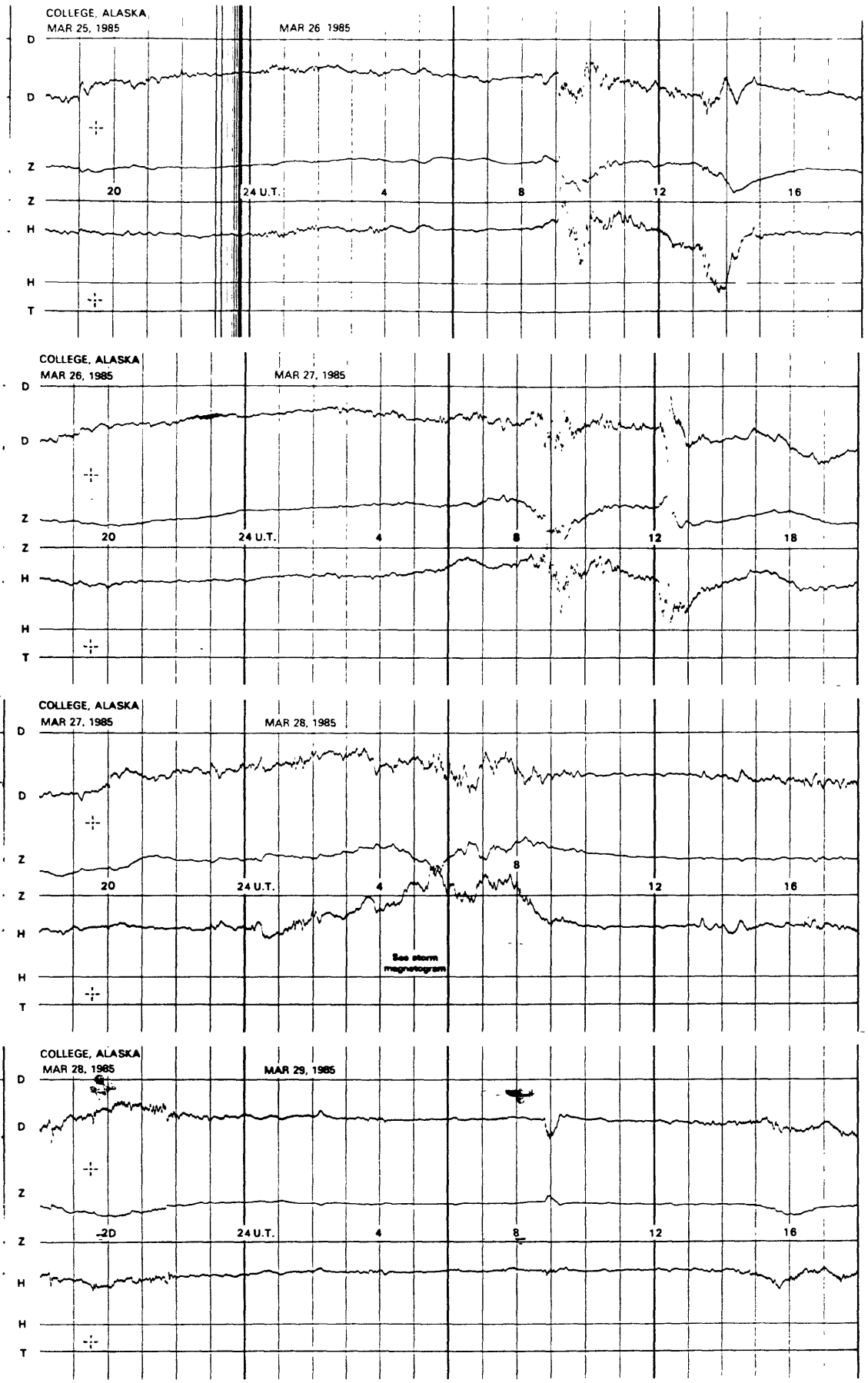
NORMAL MAGNETOGRAMS



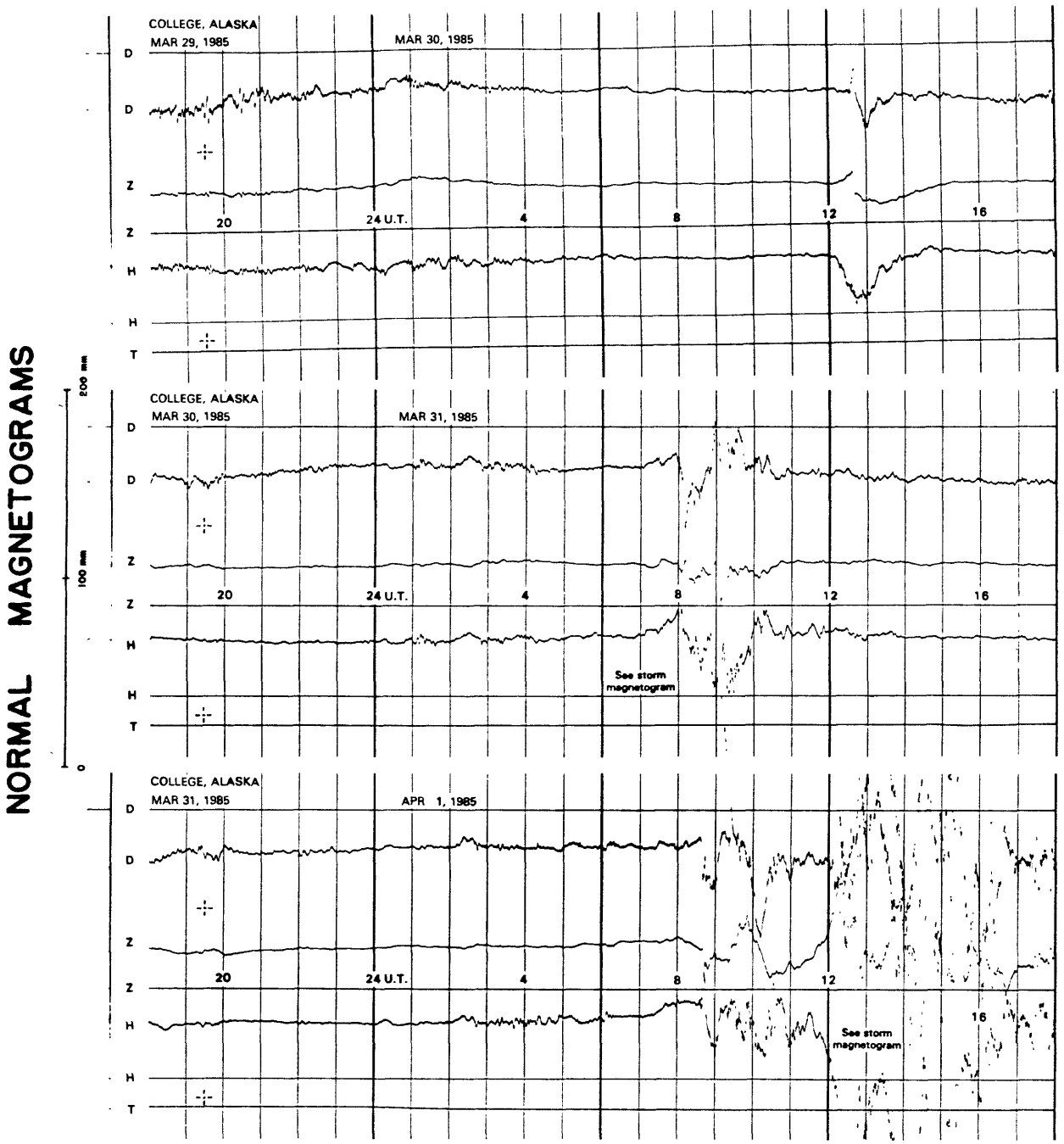
NORMAL MAGNETOGRAMS



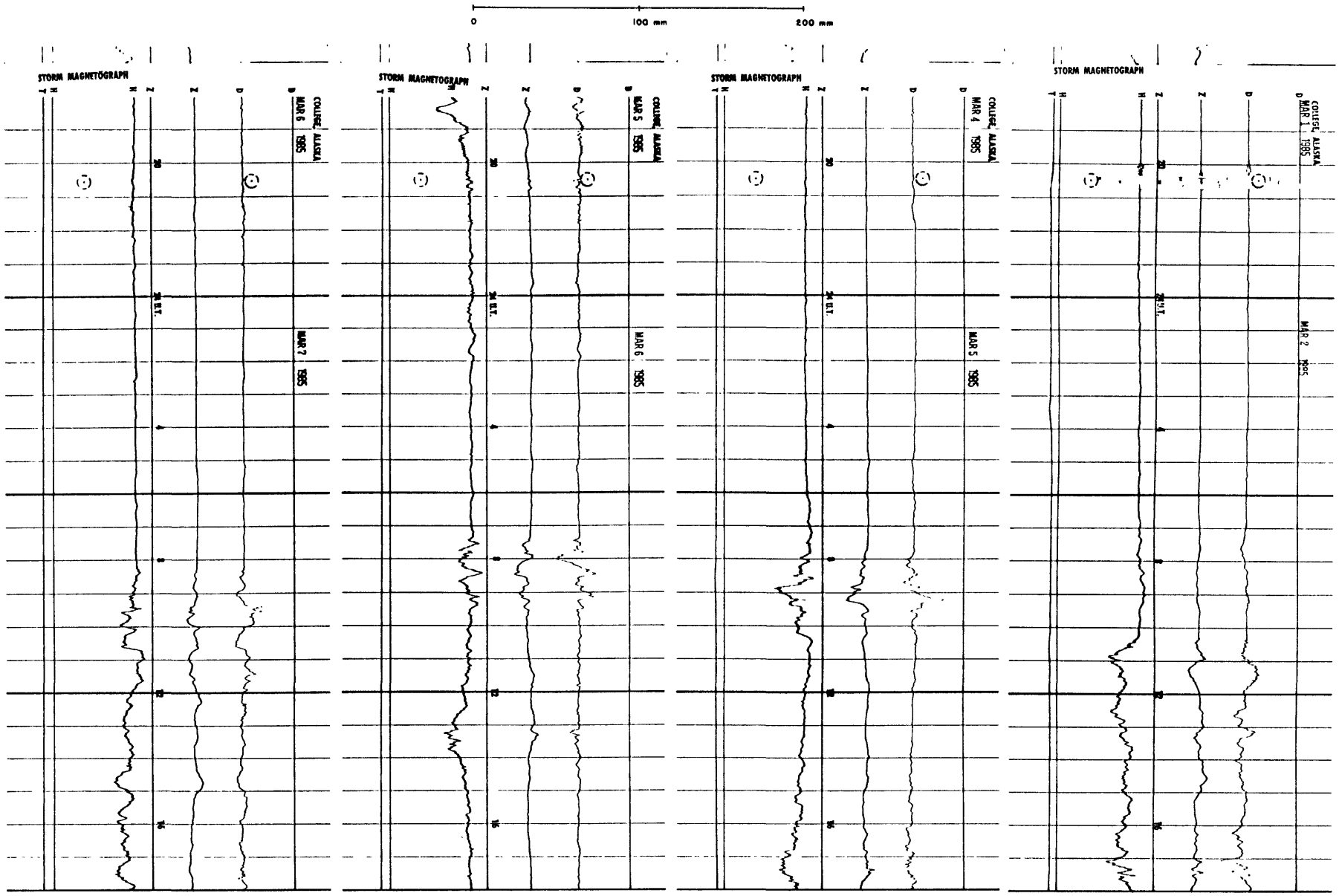
NORMAL MAGNETOGRAMS



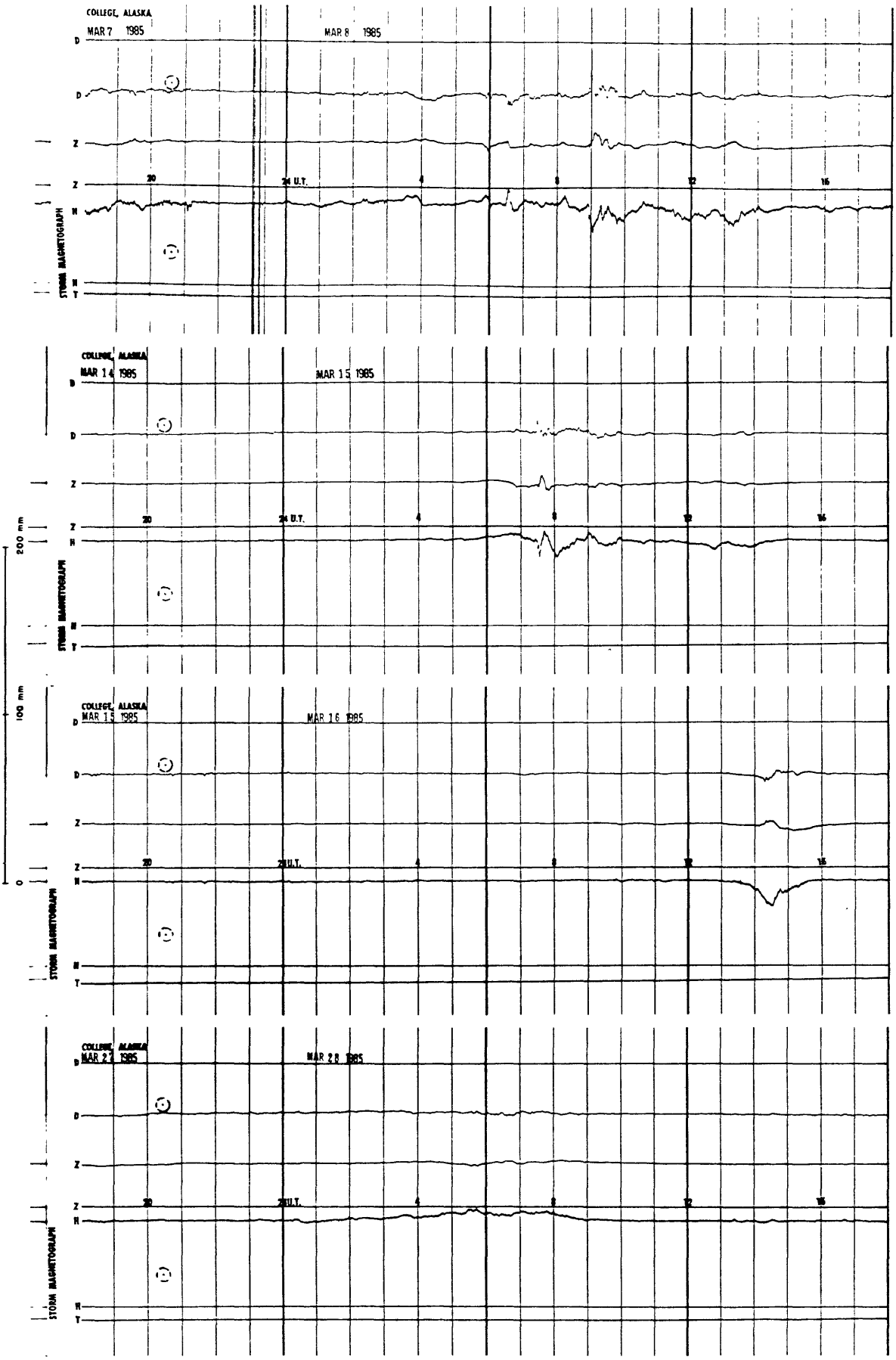
NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS