

# UNITED STATES DEPARTMENT OF THE INTERIOR

(200)

R290

no. 81-300D

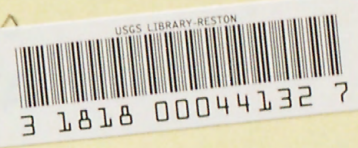
## GEOLOGICAL SURVEY

*cp. 2 in process*

### PRELIMINARY GEOMAGNETIC DATA

### COLLEGE OBSERVATORY

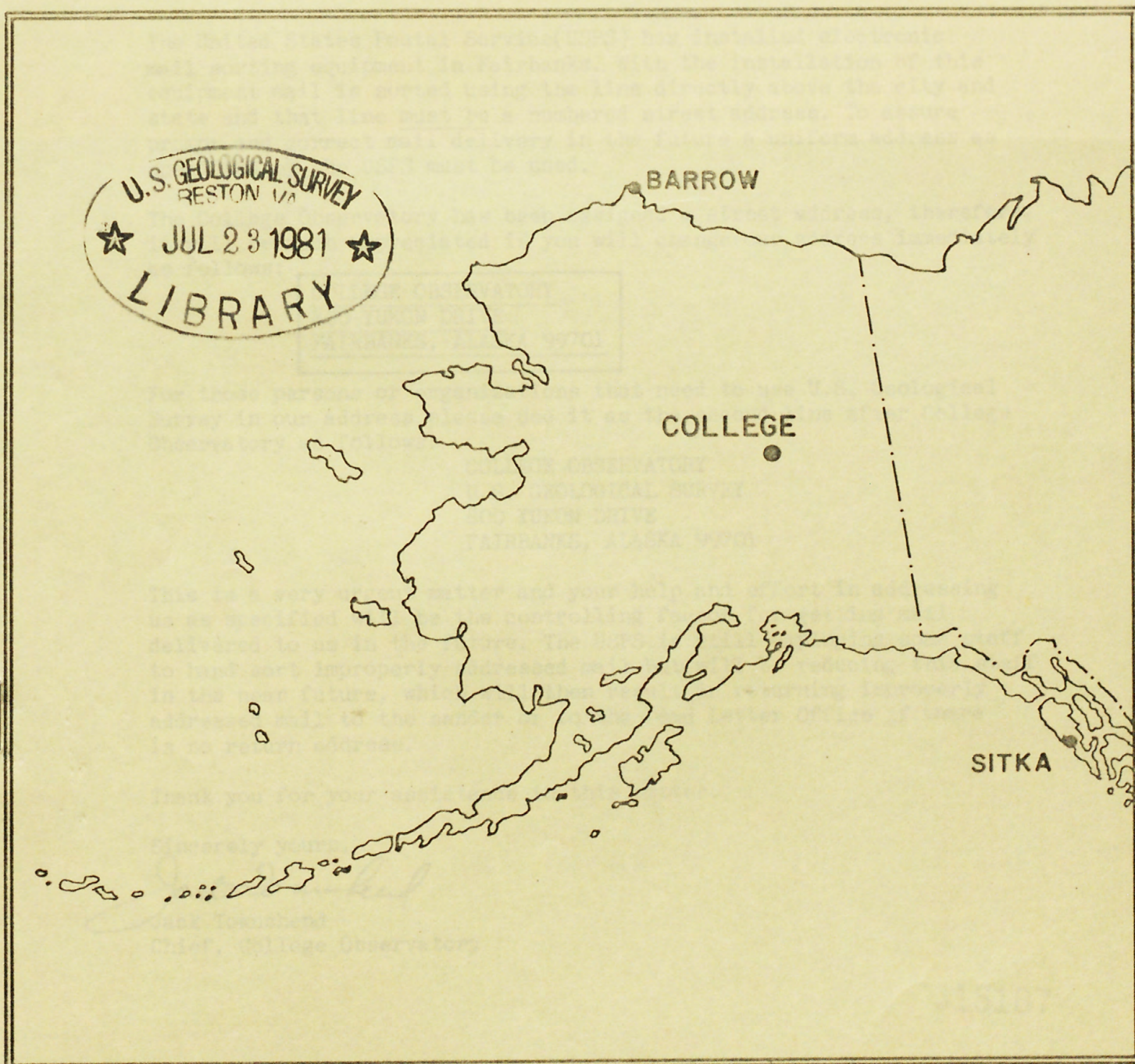
### FAIRBANKS, ALASKA



APRIL 1981

OPEN FILE REPORT

81-300D









UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

May 18, 1981

College Observatory  
800 Yukon Drive  
Fairbanks, Alaska 99701

TO : Persons Addressing Mail to the College Observatory

SUBJECT: Address Change

The United States Postal Service(USPS) has installed electronic mail sorting equipment in Fairbanks. With the installation of this equipment mail is sorted using the line directly above the city and state and that line must be a numbered street address. To assure prompt and correct mail delivery in the future a uniform address as specified by the USPS must be used.

The College Observatory has been assigned a street address, therefore, it will be much appreciated if you will change our address immediately as follows:

COLLEGE OBSERVATORY 800 YUKON DRIVE FAIRBANKS, ALASKA 99701
---

For those persons or organizations that need to use U.S. Geological Survey in our address please use it as the second line after College Observatory as follows:

COLLEGE OBSERVATORY  
U.S. GEOLOGICAL SURVEY  
800 YUKON DRIVE  
FAIRBANKS, ALASKA 99701

This is a very urgent matter and your help and effort in addressing us as specified will be the controlling factor for getting mail delivered to us in the future. The USPS is still employing some staff to hand sort improperly addressed mail but will be reducing this staff in the near future, which will then result in returning improperly addressed mail to the sender or to the Dead Letter Office if there is no return address.

Thank you for your assistance in this matter.

Sincerely yours,

Jack Townshend  
Chief, College Observatory

315107

## ORDER OF CONTENTS

Explanation of Data & Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data & Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal & Storm Magnetograms

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 AND E.A. SAUTER, 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:

COLLEGE OBSERVATORY  
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  
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..... $64^{\circ}51.6'N$   
Geographic longitude..... $147^{\circ}50.2'W$   
Geomagnetic latitude..... $+64.6^{\circ}$   
Geomagnetic longitude..... $+256.5^{\circ}$   
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  $10\gamma$  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 ( $10\gamma$ )

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
$0 \approx 11$	0
$11 \approx 50$	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 & 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										OBSERVATORY																					
<b>MAGNETIC ACTIVITY</b> (Greenwich civil time, counted from midnight to midnight)										COLLEGE, ALASKA MONTH AND YEAR APRIL 1981																					
DATE	K-INDICES								WHOLE-DAY CHARACTER 0, 1, OR 2  AK	TIME SCALE ON MAGNETOGRAMS																					
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24		SUM	20 mm/hr																				
1	4	3	4	4	4	5	4	2	30	26	SUDDEN COMMENCEMENTS d            h            m																				
2	0	2	3	3	4	2	1	1	16	10																					
3	3	2	1	1	4	4	3	2	20	13																					
4	3	2	2	4	4	2	3	2	22	14																					
5	0	0	0	0	1	0	2	1	04	02																					
6	1	3	4	3	4	1	2	1	19	13																					
7	2	1	1	2	4	2	2	2	16	09																					
8	2	0	2	3	0	3	3	1	14	08																					
9	3	3	0	0	2	1	1	3	13	07																					
10	0	1	1	3	2	0	2	1	10	05																					
11	0	1	2	4	5	5	3	4	24	22																					
12	5	6	4	5	6	5	5	6	42	57																					
13	5	7	6	4	4	4	5	4	39	53																					
14	3	5	5	3	5	5	2	2	30	30																					
15	0	1	1	3	4	2	2	3	16	10																					
16	3	2	1	6	5	3	2	2	24	23																					
17	1	3	7	5	4	6	3	2	31	42																					
18	2	2	1	0	0	4	2	2	13	07																					
19	5	5	2	6	5	5	5	2	35	42																					
20	3	6	5	4	5	6	5	5	39	49																					
21	4	4	6	6	5	5	5	4	39	48																					
22	4	4	7	5	5	4	5	3	37	48																					
23	4	5	6	6	6	3	3	4	37	47																					
24	2	3	4	6	4	5	5	3	32	33																					
25	4	3	3	3	5	3	2	2	25	19																					
26	3	4	6	7	6	6	4	4	40	60																					
27	5	5	6	6	5	5	3	3	38	48																					
28	2	1	2	3	3	5	1	3	20	14																					
29	4	3	2	7	5	4	3	2	30	36																					
30	2	2	2	2	3	0	2	1	14	07																					
31																															
SUM																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">K SCALE USED:</td> <td style="width: 15%; text-align: center; padding: 5px;">D</td> <td style="width: 15%; text-align: center; padding: 5px;">H</td> <td style="width: 15%; text-align: center; padding: 5px;">Z</td> <td style="width: 25%; padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;">LOWER LIMIT FOR K = 9.....</td> <td style="text-align: center; padding: 5px;">683.8</td> <td style="text-align: center; padding: 5px;">321.7</td> <td style="text-align: center; padding: 5px;"></td> <td style="padding: 5px;">(mm)</td> </tr> <tr> <td style="padding: 5px;">CURRENT SCALE VALUE.....</td> <td style="text-align: center; padding: 5px;">3.75</td> <td style="text-align: center; padding: 5px;">7.81</td> <td style="text-align: center; padding: 5px;"></td> <td style="padding: 5px;">(γ/mm)</td> </tr> <tr> <td style="padding: 5px;">LOWER LIMIT FOR K = 9.....</td> <td style="text-align: center; padding: 5px;">2560</td> <td style="text-align: center; padding: 5px;">2510</td> <td style="text-align: center; padding: 5px;"></td> <td style="padding: 5px;">(to nearest 10γ)</td> </tr> </table>												K SCALE USED:	D	H	Z		LOWER LIMIT FOR K = 9.....	683.8	321.7		(mm)	CURRENT SCALE VALUE.....	3.75	7.81		(γ/mm)	LOWER LIMIT FOR K = 9.....	2560	2510		(to nearest 10γ)
K SCALE USED:	D	H	Z																												
LOWER LIMIT FOR K = 9.....	683.8	321.7		(mm)																											
CURRENT SCALE VALUE.....	3.75	7.81		(γ/mm)																											
LOWER LIMIT FOR K = 9.....	2560	2510		(to nearest 10γ)																											
SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.																															
APPROVED <u>JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY</u>																															
OBSERVER IN CHARGE																															

OUTSTANDING MAGNETIC EFFECTS			OBSERVATORY COLLEGE, ALASKA	
			MONTH APRIL	YEAR 1981
DATE	TIME U.T.	NATURE OF PHENOMENON <sup>1</sup>	REMARKS	
07	1953	si*		
09	14XX	pc5		
15	17XX	pc5		
18	1502	ssc*		
<div> <div>IDENTIFIED BY:</div> <div>JEP</div> </div> <div> <div>VERIFIED BY:</div> <div>EAS</div> </div>				

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

Data from Individual Observatories:

COLLEGE OBSERVATORY, COLLEGE, ALASKA  
APRIL 1981

WDC-A FOR SOLAR-TERRESTRIAL PHYSICS  
ENVIRONMENTAL DATA SERVICE, NOAA  
BOULDER, COLORADO 80302 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	11	08XX	..	..	..	..	13	2	7	250	1480	960	14	22
		18	1502	s.c.*	-11	+72	-10	22	3	7	206	1380	810	25	15
		26	02XX	..	..	..	..	26	4	7	247	1590	1090	27	22



APRIL

1981

## NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 4-1-81	2400 U.T., 4-30-81	1.0/mm	3.78/mm	27° 46.8 E
H	0000 U.T., 4-1-81	2400 U.T., 4-6-81	7.88/mm		127558
	0000 U.T., 4-7-81	2400 U.T., 4-20-81	"		127518
	0000 U.T., 4-21-81	2400 U.T., 4-30-81	"		127568
Z	0000 U.T., 4-1-81	2400 U.T., 4-30-81	7.78/mm		551438

## STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 4-1-81	2400 U.T., 4-30-81	7.8/mm	29.78/mm	23° 48.5 E
H	0000 U.T., 4-1-81	2400 U.T., 4-6-81	44.08/mm		115198
	0000 U.T., 4-7-81	2400 U.T., 4-20-81	"		115058
	0000 U.T., 4-21-81	2400 U.T., 4-30-81	"		115188
Z	0000 U.T., 4-1-81	2400 U.T., 4-30-81	48.68/mm		540298

## RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

## MONTHLY MEAN ABSOLUTE VALUES\*

D	H	Z
28° 05.1 E	129828	553908

\* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: APR 2, 3, 5, 7, 8, 9, 10, 15, 18, 30

FORM 74-106

MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR  
Geological Survey, Geologic Division  
Denver Federal Center  
DENVER, CO 80225OBSY. YEAR MONTH ELE-  
CO 81 APR DValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1500M.T.) is hour 11 of the same universal day.  
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q of S	Ten Q	11	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
			01	135	32	95	115	123	77	151	122	171	140*	175	172	01	183	228	227	266	297	311	271	308	163	185	214	153	4314
			02	133	133	134	130	136	147	150	120	125	120	160	171	02	197	370	279	235	258	303	271	278	229	249	200	139	4687
			03	122	110	58	102	126	134	139	136	137	176	166	177	03	193	212	273	279	285	333	384	236	241	179	197	115	4510
			04	108	110	63	123	132	134	134	149	150	171	104	153	04	180	172	213	169	214	285	278	226	331	134	154	142	4029
			05	124	122	128	127	139	156	163	170	168	181	180	176	05	168	167	196	211	244	289	319	294	268	189	161	137	4477
			06	126	106	115	143	139	110	201	157	160	202	181	184	06	171	189	223	209	275	306	318	304	281	215	202	139	4656
			07	134	118	123	128	140	151	180	190	155	154	159	161	07	190	171	193	245	285	294	304	321	300	228	179	142	4645
			08	117	105	108	115	118	141	160	149	150	154	177	197	08	165	168	169	173	179	248	338	287	273	172	113	124	4100
			09	137	99	84	85	127	145	146	164	169	172	171	172	09	154	177	176	199	230	256	276	294	270	251	204	138	4296
			10	142	131	130	130	140	172	145	138	156	168	195	186	10	185	181	189	217	273	298	313	313	264	214	185	156	4621
			11	138	127	126	130	125	141	142	149	110	140	178	244	11	310	472*	384*	464	366	286	245	231	121	154	168	257	5208
			12	185	211	-44*	43*	265	3*	103	-171*	-44*	-10	161	188	12	231	270	207	323	410	464*	408*	362	241*	-23	123	209*	4115
			13	336*	337	-92*	-187*	-790*	-655*	-599*	-370*	-251*	-108*	39	226	13	189	283	305	320	280	282	332	223	251	134	242	209	936
			14	169	128	172	139	86	85	37	146	50	64	104	156	14	171	315	323	274	244	247	239	250	228	119	119	123	3988
			15	131	147	150	151	150	150	157	148	159	159	134	169	15	208	202	233	268	272	308	296	278	235	196	169	160	4630
			16	149	112	149	138	121	132	139	157	155	130	146*	216	16	295	192	265	302	315	295	280	240	207	184	119	118	4556
			17	131	138	141	108	121	130	-115*	-251*	-12*	8	135	174	17	124	174	187	416*	567*	473	292	181	133	101	118	126	3600
			18	160	166	154	162	160	167	164	169	161	163	160	155	18	165	178	204	188	305	324	308	274	263	224	159	91	4624
			19	120	68	144	55	138	149	158	124	100	61	202*	551*	19	98	157	322	534*	551*	598*	280	206	219	90	85	105	5115
			20	98	88	104	76	43*	-28*	-147*	127	168	146	83*	45	20	107	145	164	353*	678*	542*	552	368	165	34	176	109	4196
			21	106	92	18	21	56	66	19*	-60*	99*	-53*	178*	130*	21	155	258*	408*	456*	418	247	250	159	262	160	168	215	3828
			22	179	177	57	47	103	-20*	19*	-100*	66	94	110	129	22	160	152	190	264	251	297	351	123	160	156	131	153	3249
			23	165	137	76	94	108	108	-187*	-12	81	52*	130*	83*	23	106*	255	220	310	291	262	219	215	320	190	130	123	3476
			24	115	111	116	75	99	114	137	144	131	197	288	222	24	206	254	154	274	358	375	185	278	200	210	197	160	4600
			25	154	200	106	45	134	118	149	236	176	157	134	142	25	204	204	310	353	370	319	268	264	263	210	217	209	4942
			26	151	138	38	85	45	122	194	157	43*	258*	11*	148	26	102	47	606*	884*	637*	349	323	294	227	255	203	142	5459
			27	243	162	141	145	119	-60*	-76*	-171*	4	83*	21	178*	27	128	130	323	319	372	296	252	174	223	236	117	93	3452
			28	97	108	119	111	121	131	149	140	140	139	133	149	28	220	230	276	333	318	291	242	239	215	229	287	242	4659
			29	204	136	96	98	115	114	143	122	141	120	130*	-20*	29	99*	281	333	314	418	408	320	218	163	171	164	151	4439
			30	120	94	106	119	131	139	141	135	117	130	151	176	30	169	197	190	234	226	218	220	209	165	170	147	140	3844
			31													31													

SCALED BY EAS, LLF, JEP

CHECKED BY JEP, EAS

SIGNS RE-  
VIEWED BY JEP

PUNCHED BY

Preliminary base-line and scale values:

Interval  
BeginningBase-line  
ValueScale  
Value☐ Interpolated☐ Significant portion of  
hour interpolated.☐ No record; or no values  
available because of  
faulty record.

\* Derived from STORM Mghph., converted to Normal Mghph.

☐ 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.

MONTHLY SUM 127251

MONTHLY MEAN 177

DATES WITH GAPS:

CO	81	APR	H
----	----	-----	---

SCALED BY	EAS, LLE, JEP	Preliminary base-line and scale values: Interval                      Base-line                      Scale Beginning                      Value                      Value	<input type="checkbox"/> Interpolated <input type="checkbox"/> Significant portion of hour interpolated. <input type="checkbox"/> No record; or no values available because of faulty record. * Derived from <u>STORM</u> Mghp., converted to Normal Mghp.	<input type="checkbox"/> 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.	MONTHLY SUM	182385
CHECKED BY	JEP, EAS				MONTHLY MEAN	253
SIGNS REVIEWED BY	JEP				DATES WITH GAPS:	
PUNCHED BY						

\* Derived from STORM Mghp., converted to Normal Mghp.

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

gph., converted to Normal Mgph.

DATE WITH GAPS:



MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR  
Geological Survey, Geologic Division  
Denver Federal Center  
DENVER, CO 80225OBSY. YEAR MONTH FILE-  
MENT  
00 81 APR 2Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1500 M.T.) is hour 11 of the same universal day.  
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q or S	Ten Q	Hour	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM		
			01	351	341	377	379	362	390	419	390	295	267	279	380	01	346	351	282	285	310	228	233	275	250	304	335	332	7761	
			02	337	341	333	332	333	341	339	345	329	294	347	337	02	300	264	230	289	324	327	290	291	300	323	317	310	7573	
			03	318	339	333	376	355	336	327	321	331	332	319	320	03	307	298	384	212	162	224	230	224	281	262	303	318	7232	
			04	331	338	349	359	328	338	334	348	351	326	239	251	04	254	240	165	228	312	336	326	313	339	291	322	330	7348	
			05	337	343	331	323	319	322	322	323	325	324	314	312	05	311	312	318	329	334	336	334	316	308	302	313	319	7727	
			06	325	330	338	335	327	342	394	389	366	303	272	285	06	294	311	231	284	326	329	330	325	318	305	309	311	7679	
			07	319	331	336	330	330	332	338	329	324	320	318	307	07	273	203	276	314	318	325	322	320	317	311	309	317	7519	
			08	316	338	333	321	311	315	320	341	349	335	308	255	08	297	316	318	319	312	341	306	264	291	287	288	317	7498	
			09	352	359	360	353	382	353	333	325	321	321	318	315	09	312	299	337	324	330	339	330	328	317	318	310	309	7945	
			10	319	328	333	334	335	338	319	318	328	316	287	278	10	281	279	292	321	333	337	332	330	308	297	300	309	7552	
			11	319	321	320	316	311	317	314	321	319	283	312	442	11	434	467*	695*	647	415	326	317	322	308	323	328	371	8848	
			12	502	410*	-12	-104	-35	-60	170	317	265	441	645	680	12	706	621	470	564	594	543*	384*	368	346*	276	345	353*	6789	
			13	169*	-96*	-65*	118*	-56	-66	164	481	416	316	447	526	13	606	655	612	583	389	350	389	337	398	353	407	408	7841	
			14	390	430	388	418	420	322	229	311	216	311	358	389	14	360	355	467	610	351	315	330	341	349	348	359	352	8719	
			15	352	358	354	353	350	350	347	341	343	349	332	353	15	328	330	334	341	341	339	342	339	340	330	321	325	8192	
			16	349	344	360	348	340	337	346	349	338	337	420	412	16	364	359	335	360	329	338	341	332	330	330	328	348	8374	
			17	350	351	352	349	390	399	135	73	499	360	434	398	17	348	419	433	423*	264*	230	239	293	314	340	338	344	8095	
			18	350	362	348	349	340	340	340	340	337	335	330	329	18	329	330	333	343	355	298	310	311	319	310	310	309	7957	
			19	323	307	205	194	294	414	386	351	347	352	417*	448*	19	330	456	486*	240*	233*	244	135	232	303	292	291	338	7618	
			20	355	378	401	332	80	94*	258	351	380	372	356	472	20	458	420	550	543*	428*	118*	163	209	111	177	328	342	7676	
			21	345	355	353	371	369	344	336	331	446	427	594*	499	21	478	600*	556*	486*	283	219	290	297	370	386	404	372	9511	
			22	277	338	341	358	348	169*	134	410*	401	354	372	457	22	318	319	335	289	301	336	305	207	266	292	334	373	7634	
			23	381	389	357	390	381	275	218	215	330	230	415	540	23	479*	312	317	337	326	344	358	363	390	379	349	350	8425	
			24	342	360	363	346	372	365	382	398	325	234	360	205	24	188	368	308	347	310	208	154	229	316	354	378	400	7612	
			25	398	394	390	380	438	391	398	351	290	301	262	260	25	168	183	240	269	294	319	300	309	321	329	354	372	7711	
			26	372	399	377	418	389	452	495	381	26	94	600*	470	26	506	548	751*	251*	100*	240	331	345	354	394	407	367	9067	
			27	364	235	259	268	297	182*	256	73	324	182*	456	536*	27	442	439	441	524	391	270	329	327	349	360	348	350	8002	
			28	362	368	370	360	370	372	377	367	359	330	349	337	28	340	330	303	290	208	211	215	309	321	333	348	348	7937	
			29	342	335	366	404	383	384	376	368	375	347	357	96	29	53	229	216	316	193	70	80	216	260	312	340	353	6771	
			30	356	360	359	347	340	339	338	330	334	342	350	339	30	334	333	295	317	330	339	342	329	317	322	329	330	8051	
			31													31														

SCALED BY: EAS, LLF, JEP

CHECKED BY: JEP, EAS

SIGNS REVIEWED BY: JEP

PUNCHED BY:

Preliminary base-line and scale values:

Interval	Base-line	Scale
Beginning	Value	Value

( ) Interpolated

[ ] Significant portion of hour interpolated.

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

\* Derived from STUD Mxph., converted to Normal Mxph.

[ ] Scaling uncertain because of magnetic storm.

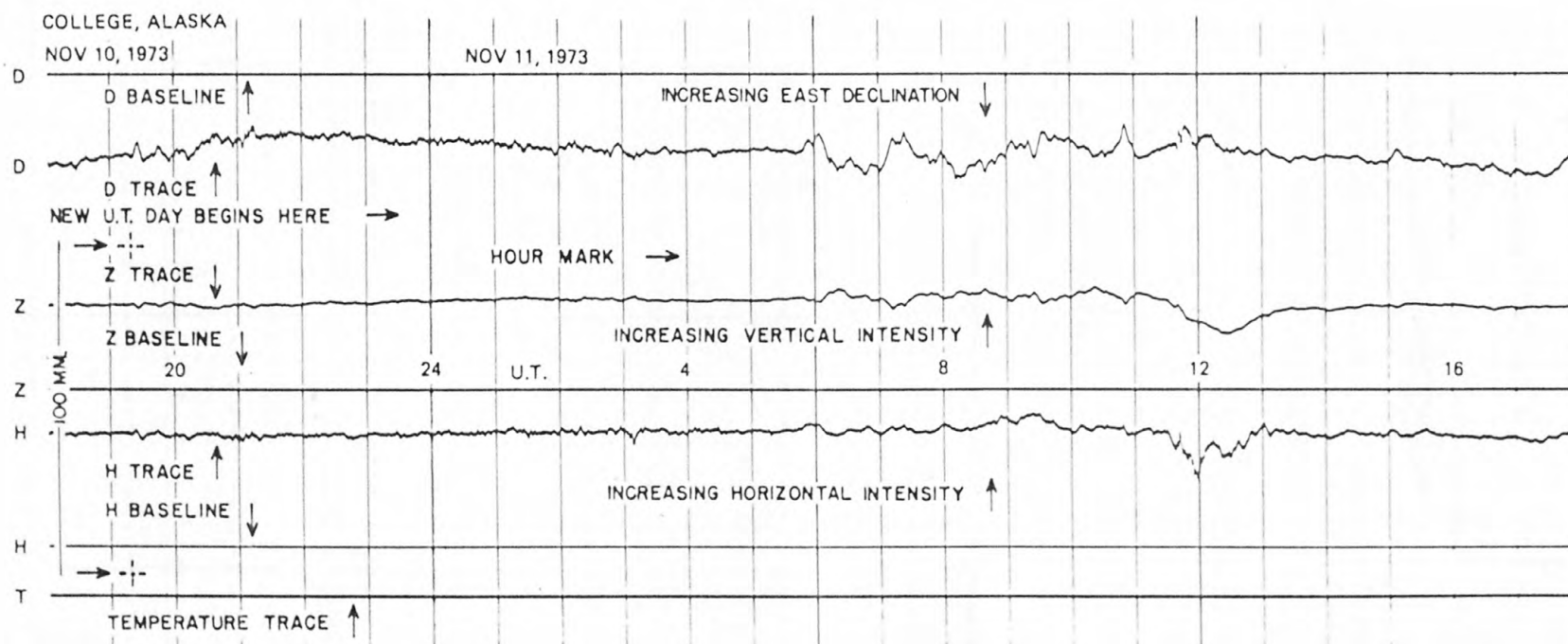
<> Record off sheet for past or all of hour; if value is given, curve was estimated for missing part.

MONTHLY SUM: 238664

MONTHLY MEAN: 331

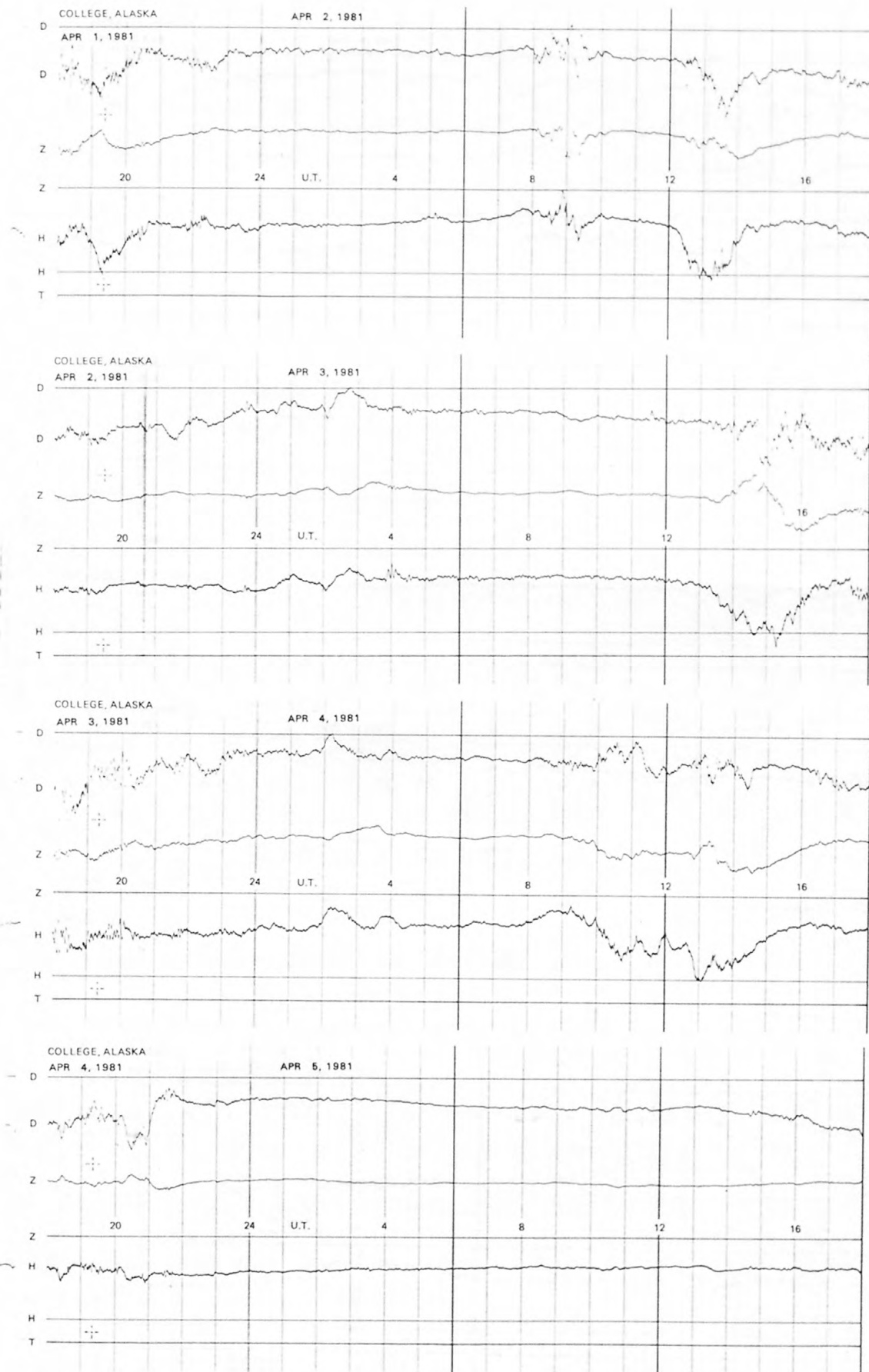
DATES WITH GAPS:

# FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)



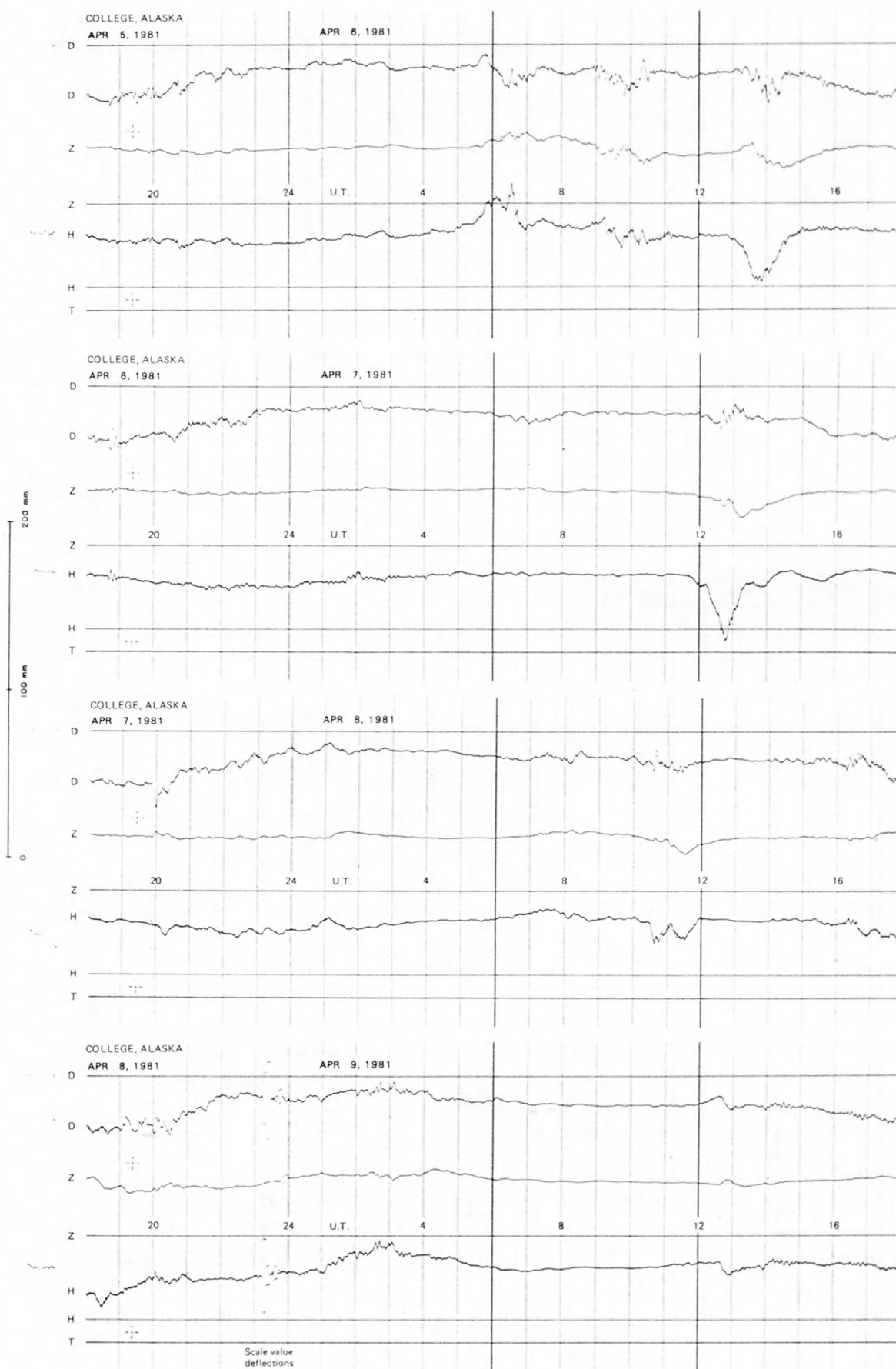
SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

# NORMAL MAGNETOGRAMS

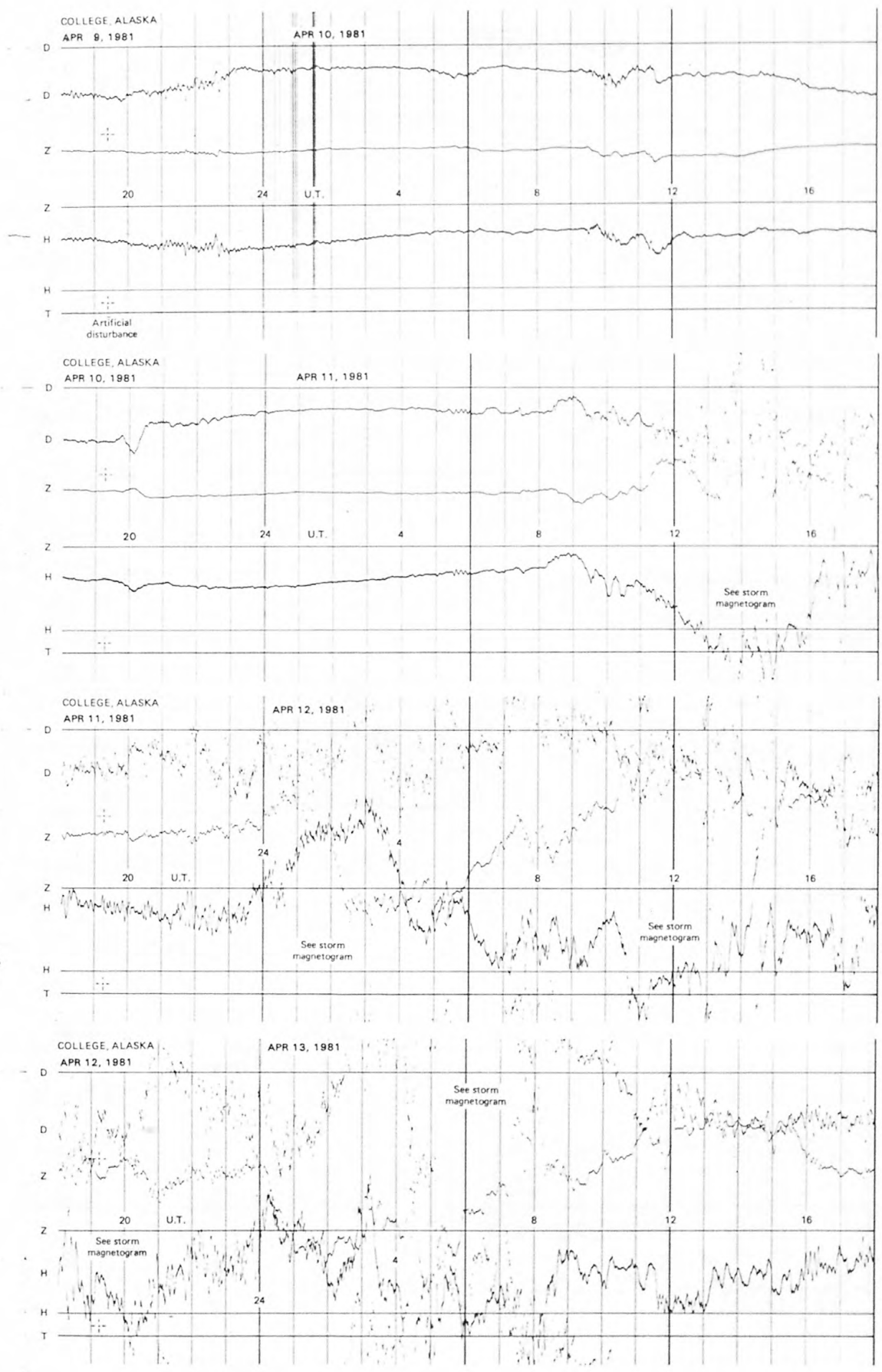




# NORMAL MAGNETOGRAMS

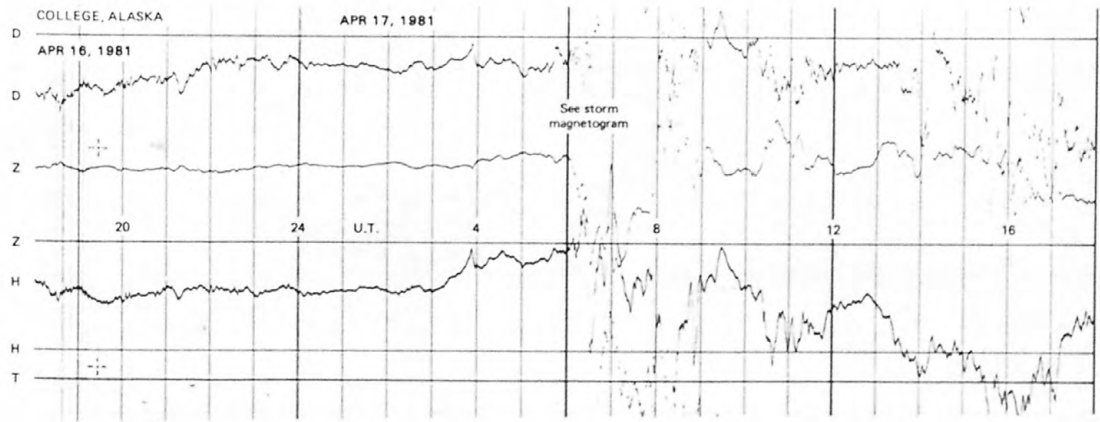
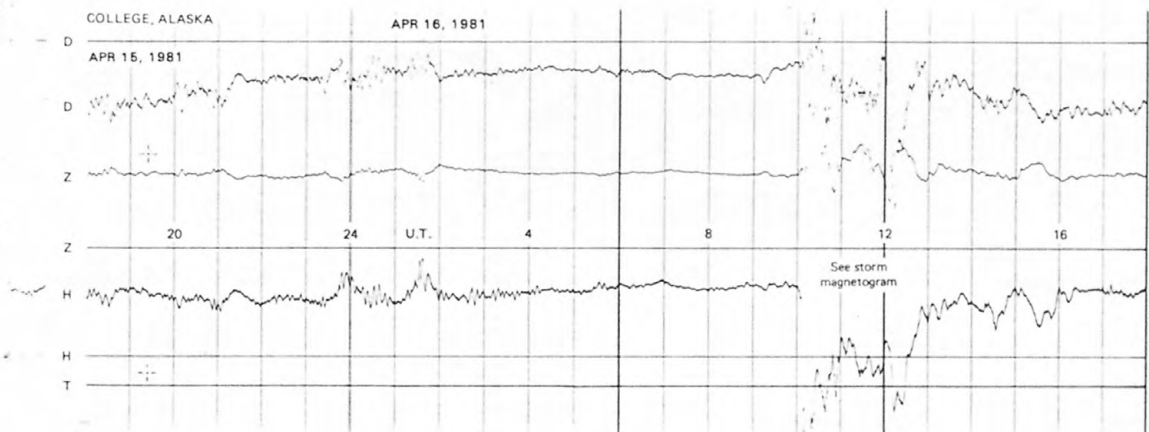
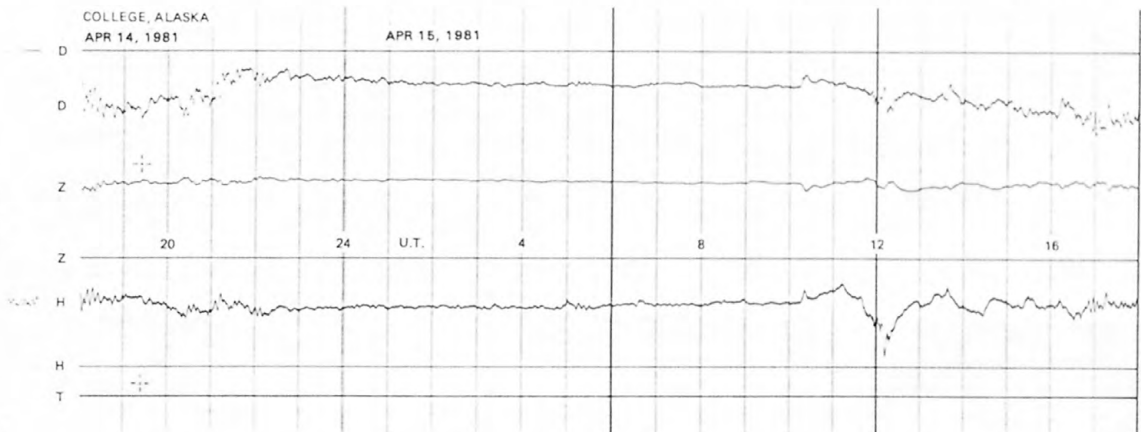
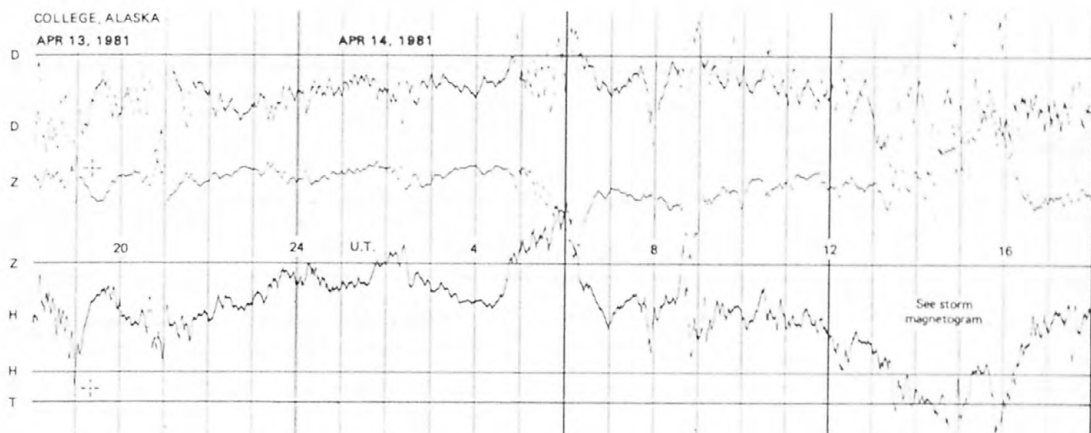


NORMAL MAGNETOGRAMS



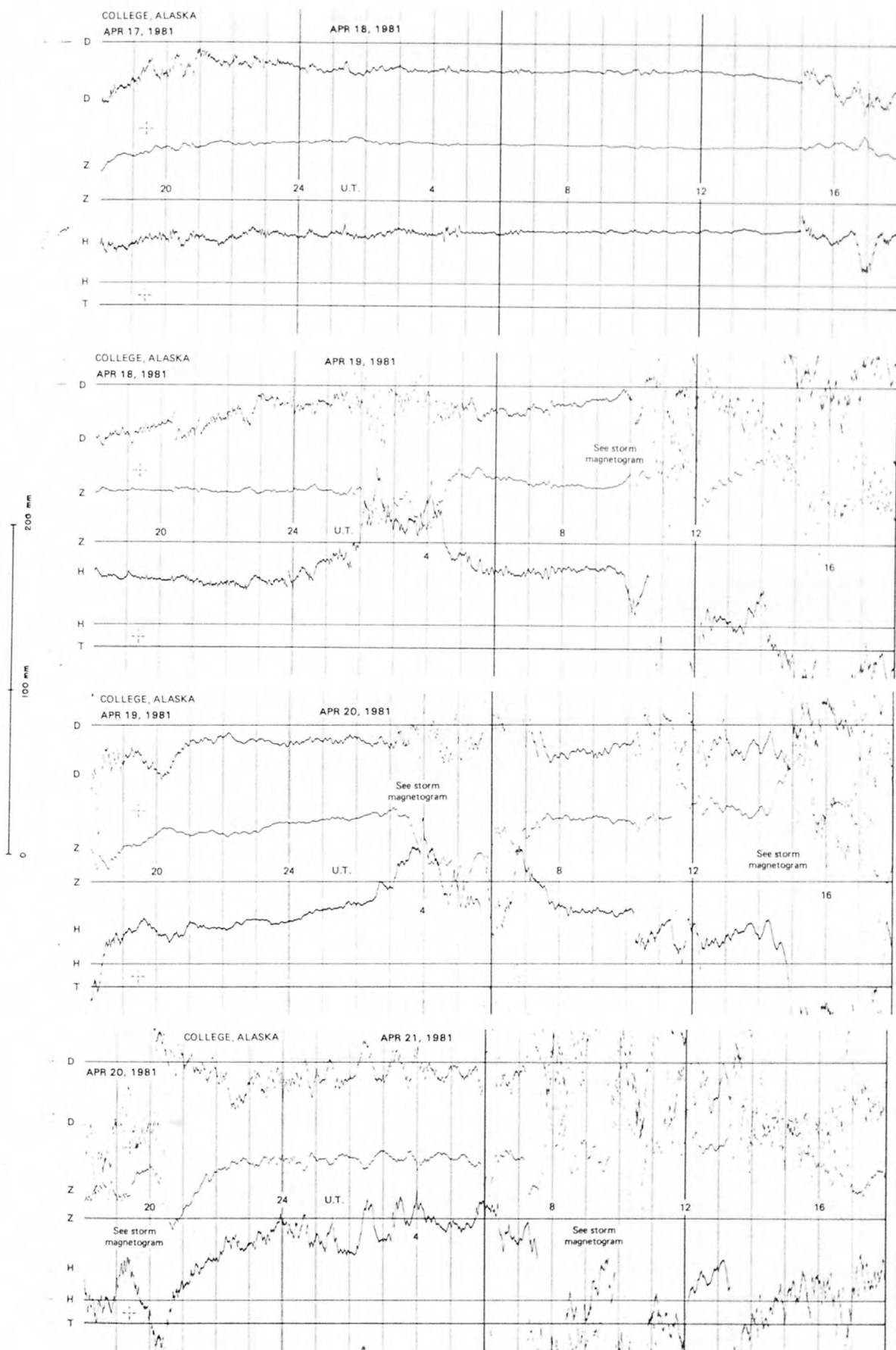
# NORMAL MAGNETOGRAMS

200 mm  
100 mm  
0



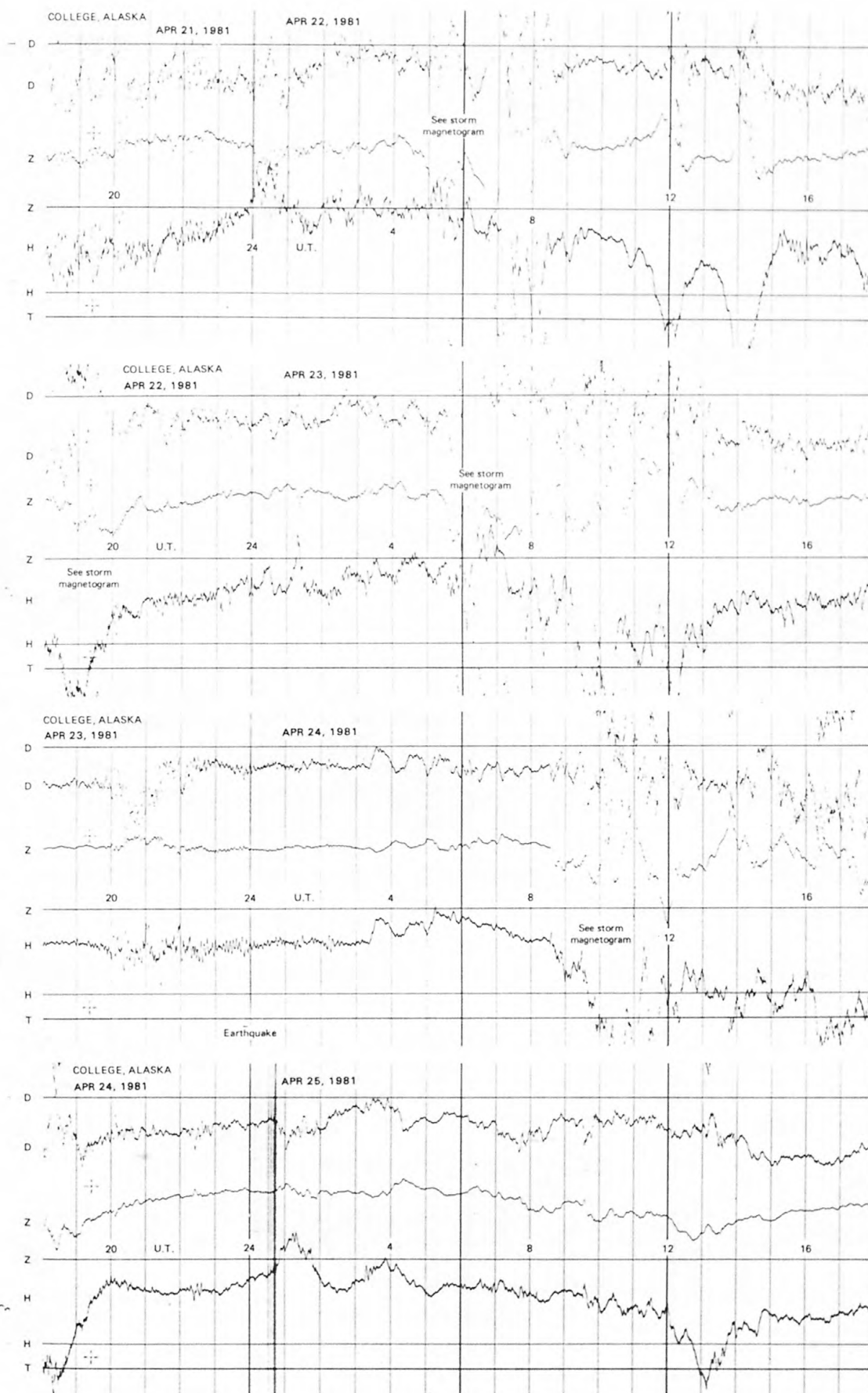


# NORMAL MAGNETOGRAMS

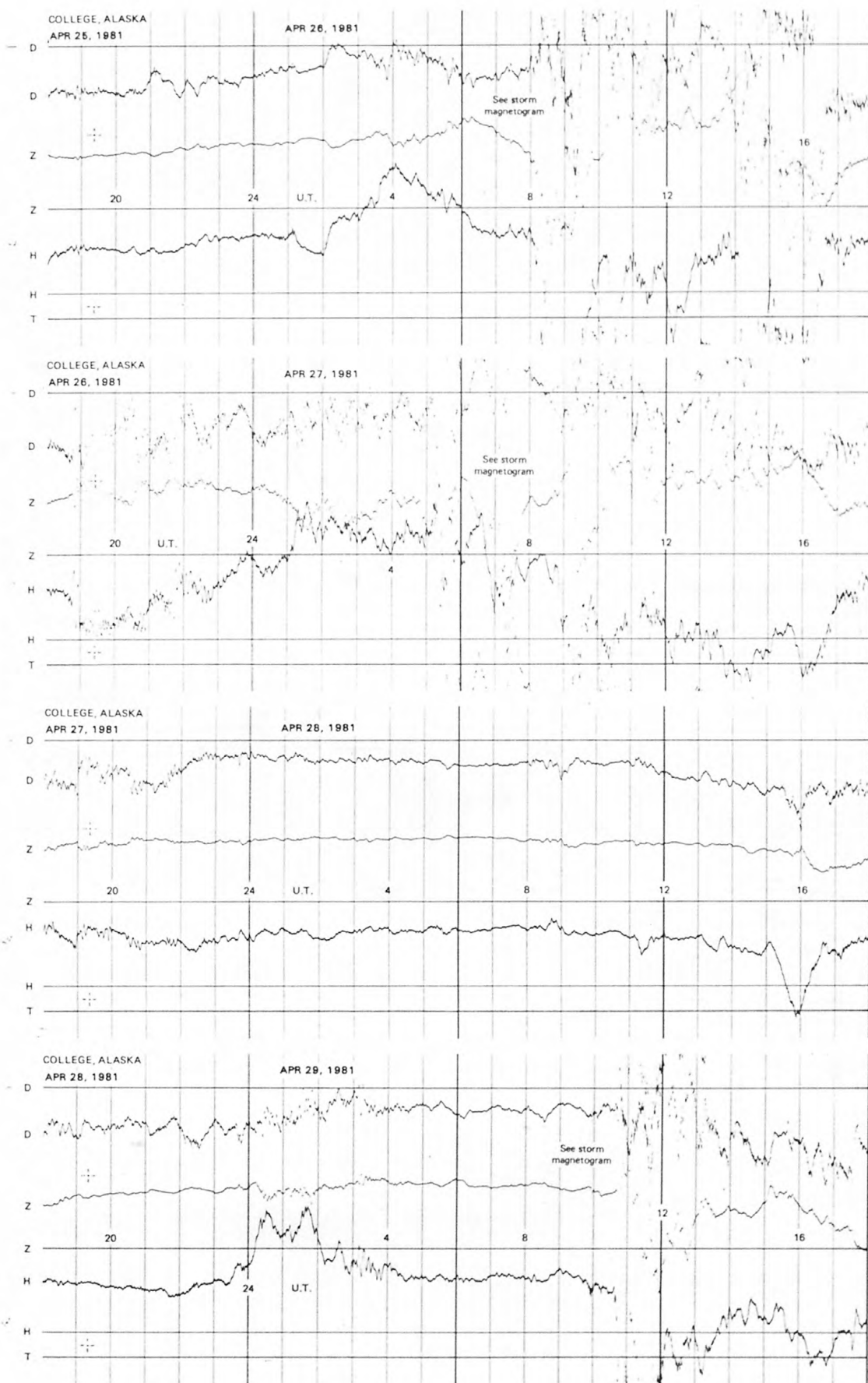


# NORMAL MAGNETOGRAMS

200 mm  
100 mm  
0

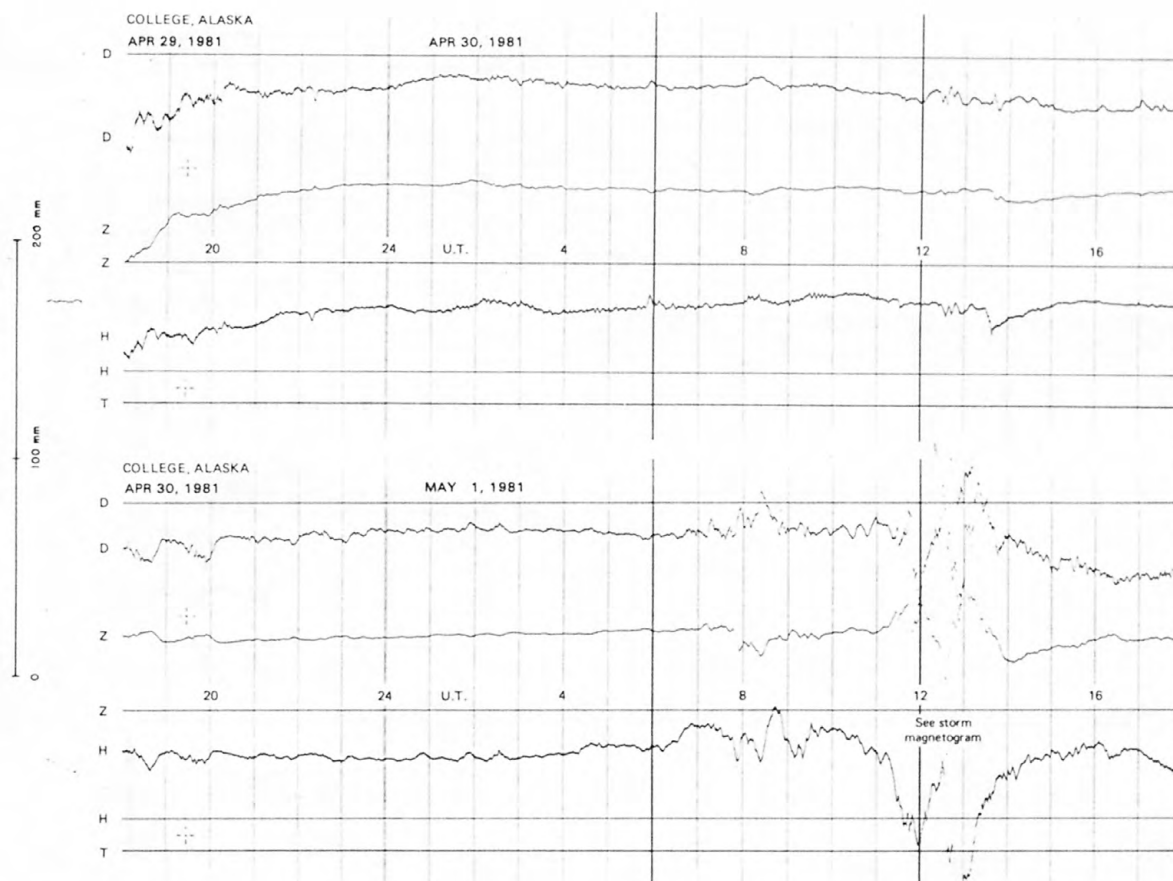


# NORMAL MAGNETOGRAMS



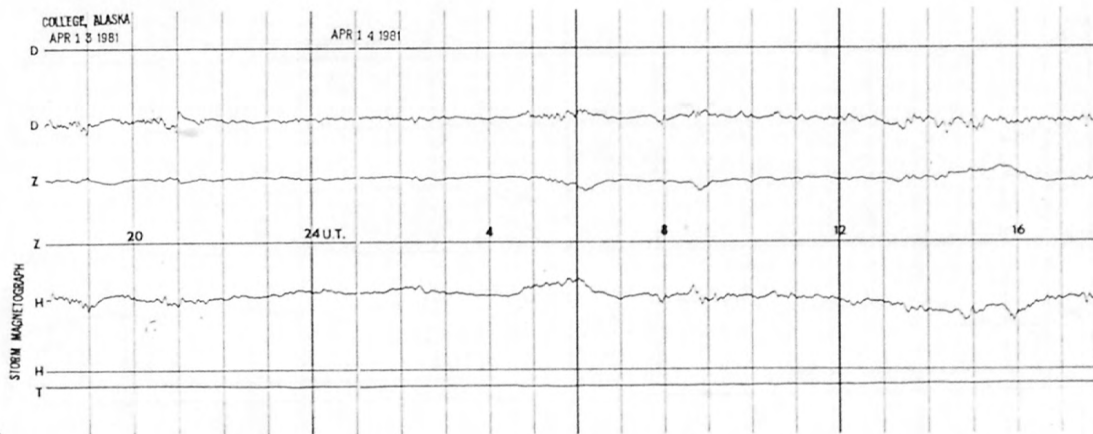
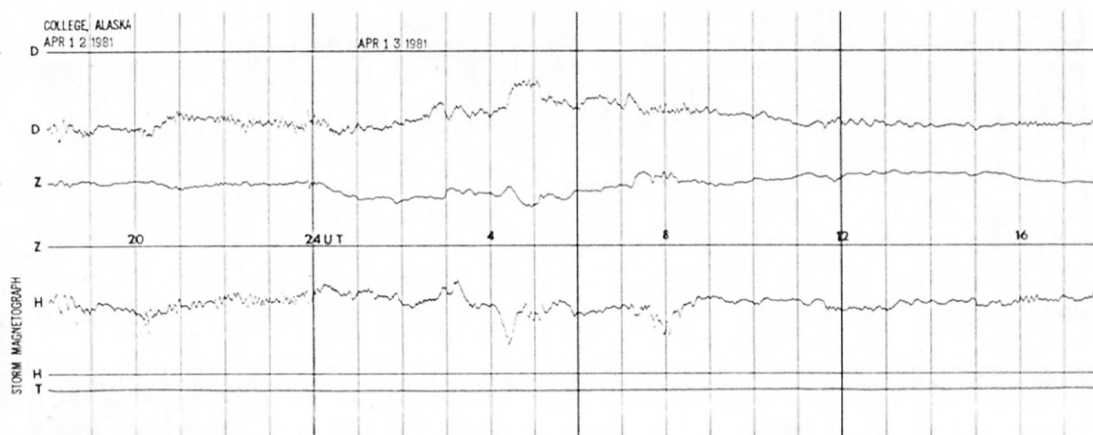
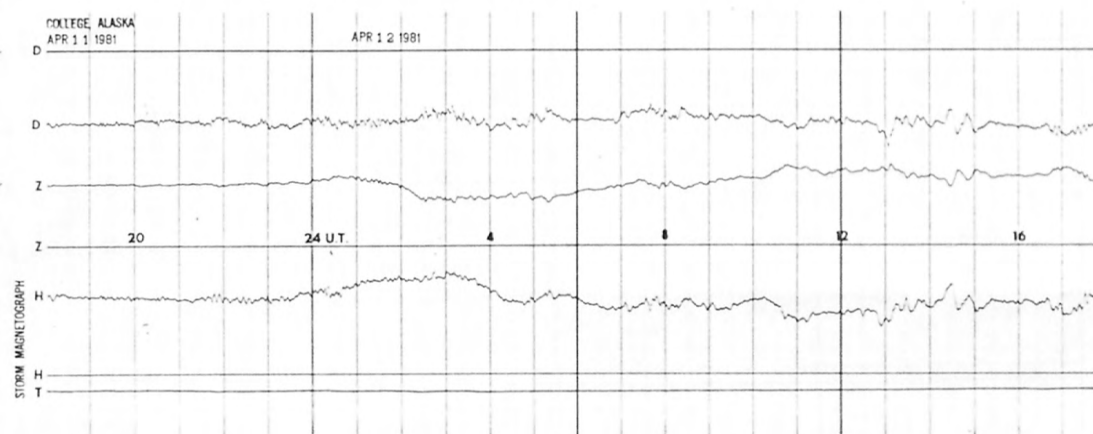
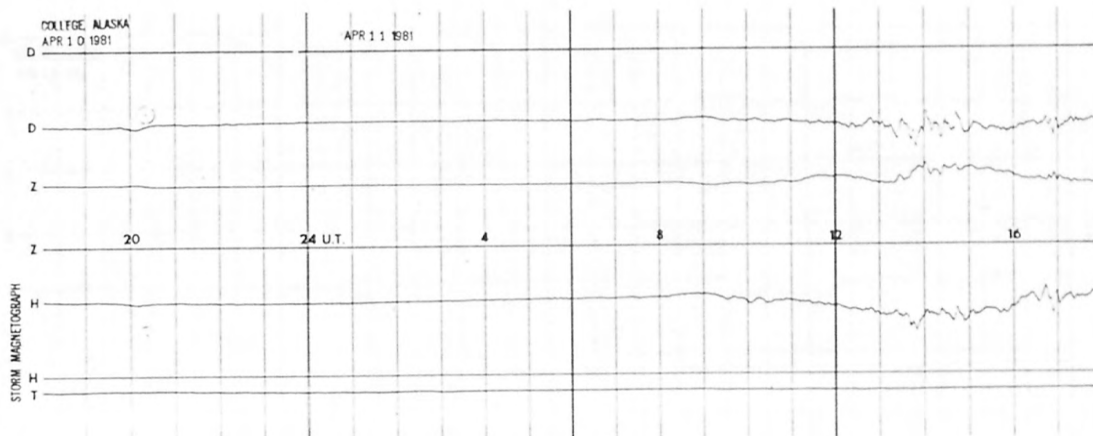


# NORMAL MAGNETOGRAMS



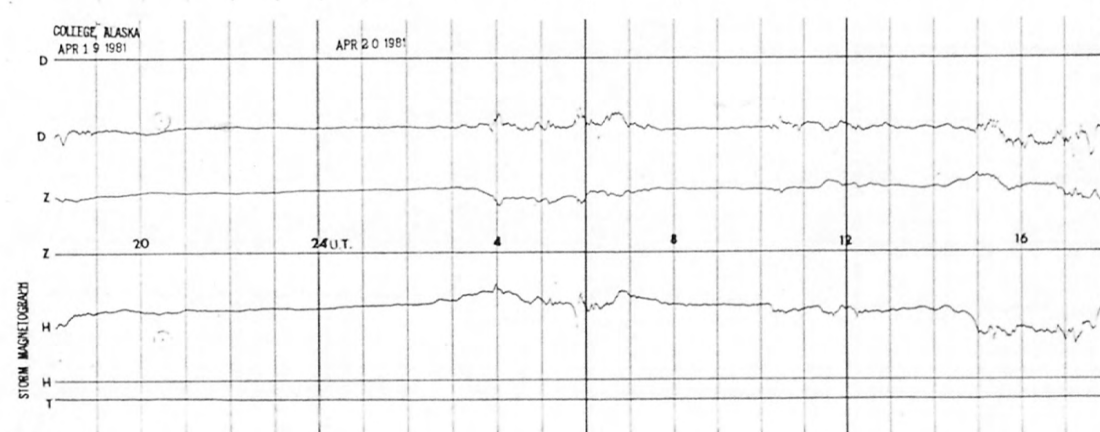
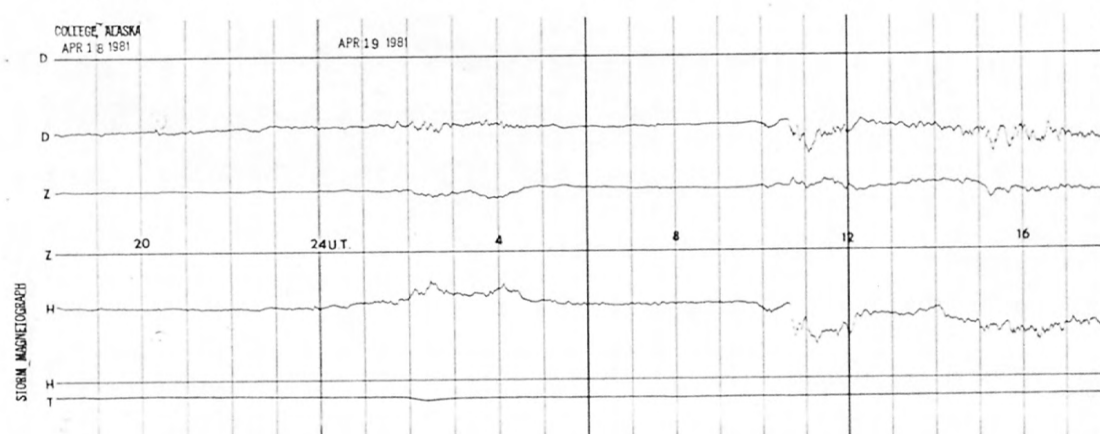
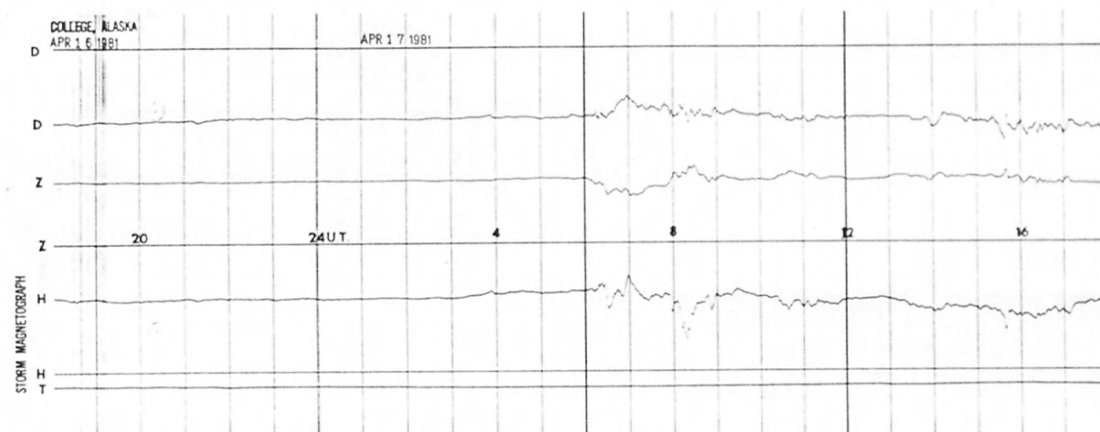
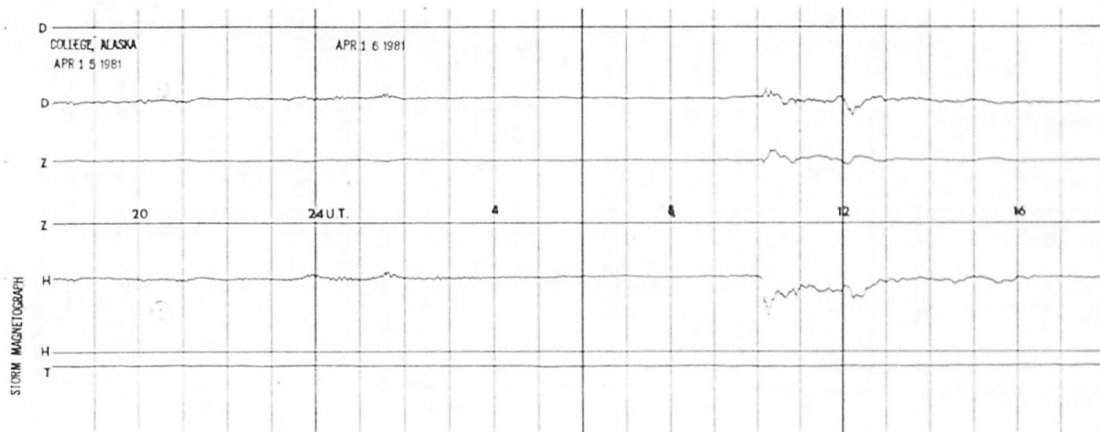
# STORM MAGNETOGRAMS

200 mm  
100 mm  
0



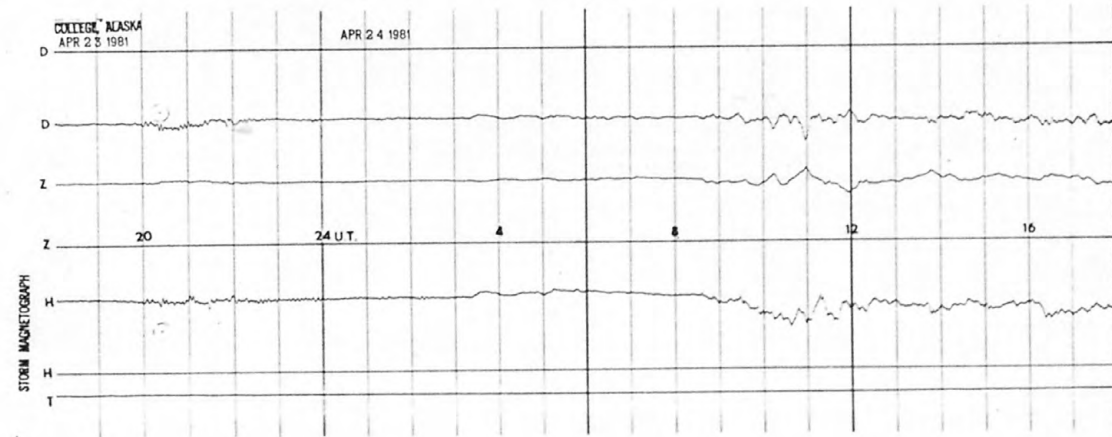
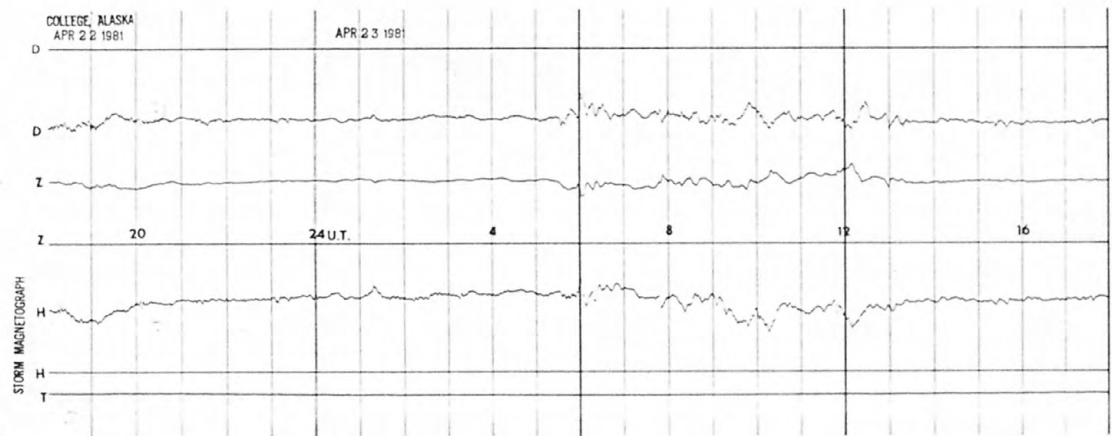
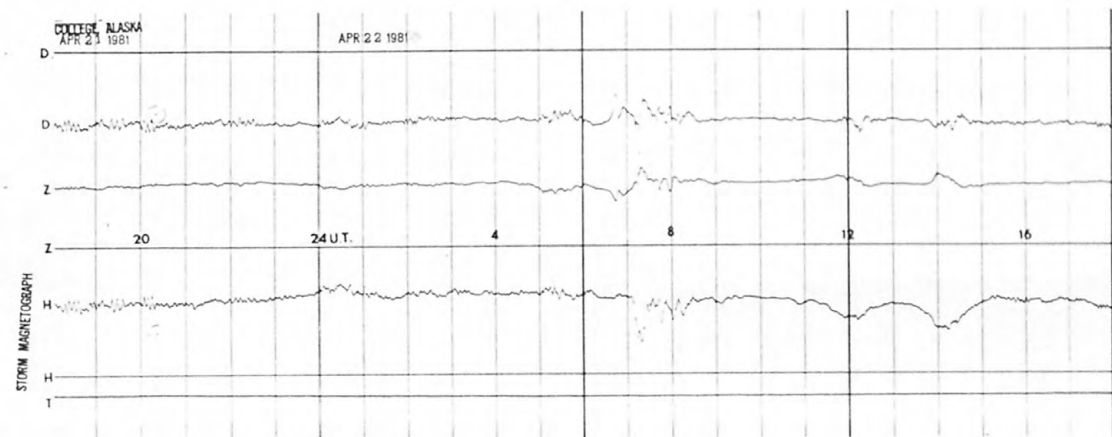
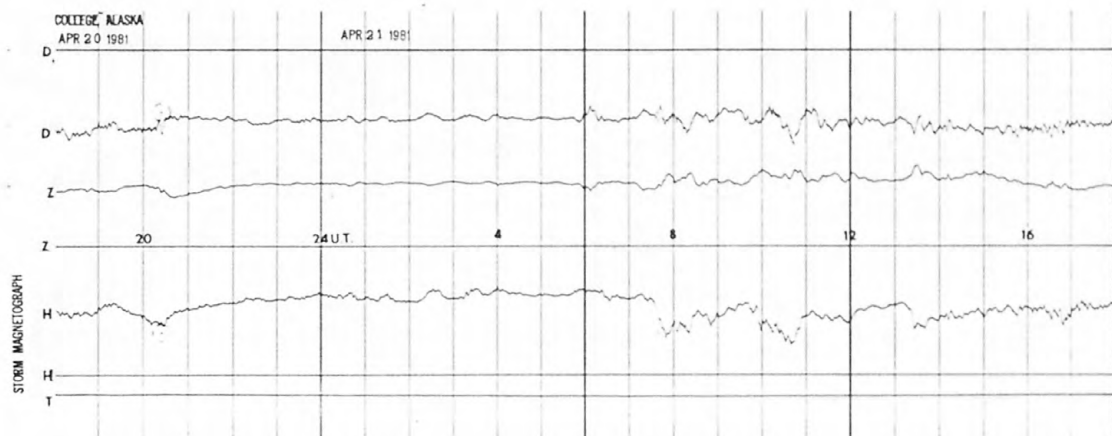
# STORM MAGNETOGRAMS

200 mm  
100 mm  
0



# STORM MAGNETOGRAMS

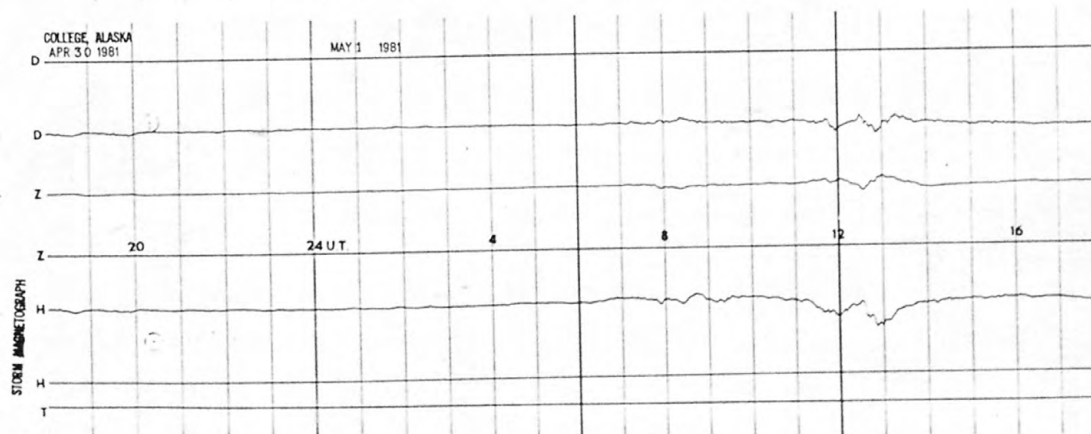
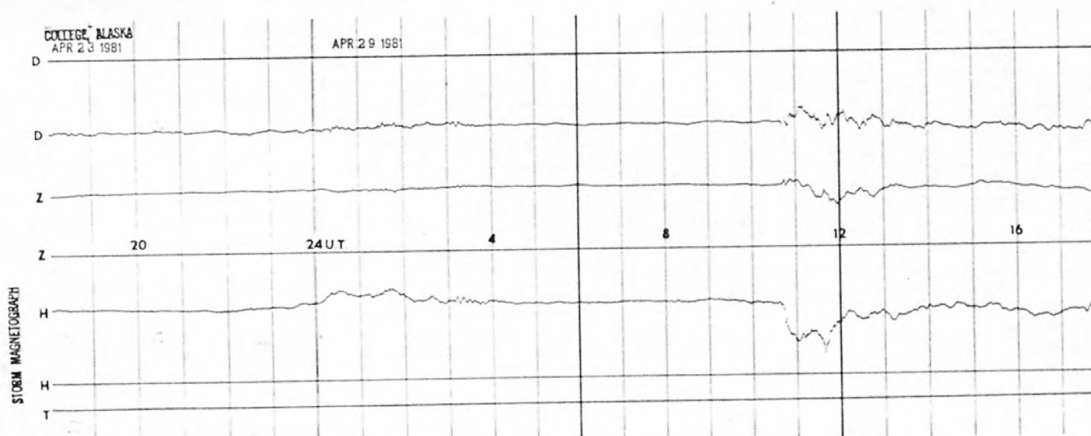
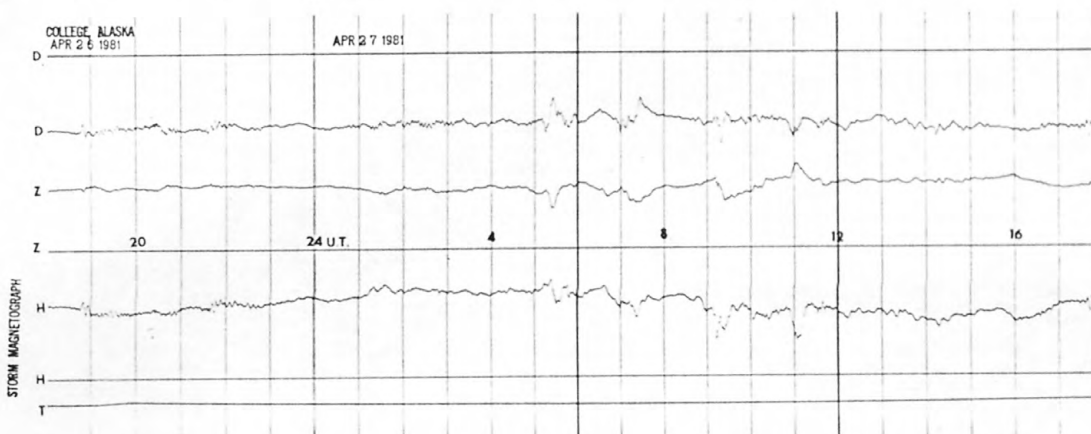
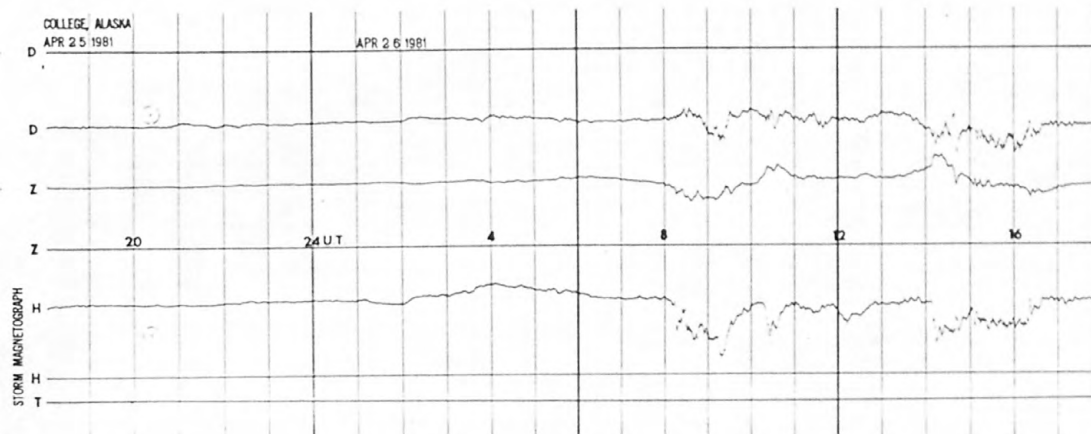
200 mm  
100 mm  
0





# STORM MAGNETOGRAMS

200 mm  
100 mm  
0



USGS LIBRARY-RESTON



3 1818 00044132 7