

UNITED STATES DEPARTMENT OF THE INTERIOR

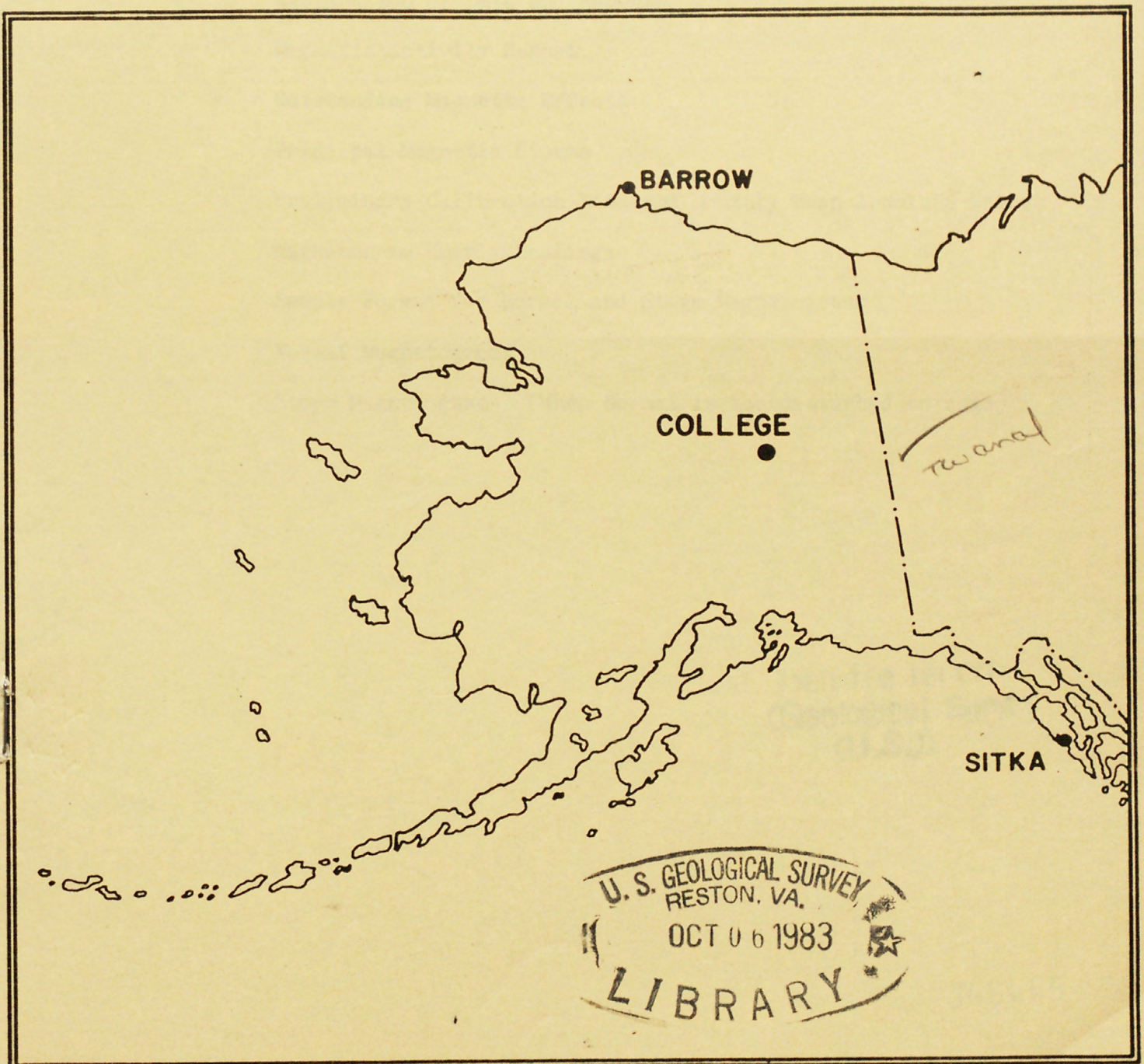
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R290  
no. 83-300-F

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA  
COLLEGE OBSERVATORY  
FAIRBANKS, ALASKA

JUNE 1983

OPEN FILE REPORT 83-0300F









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, T.K. CUNNINGHAM 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)

Open-file report  
(Geological Survey  
(U.S.))

346445



# 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

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.

### OBSERVATORY LOCATION

The College Observatory, operated by the U.S. Geological Survey, is located at the University of Alaska, Fairbanks, Alaska. It is near the Auroral Zone and the northern limit of the world's greatest earthquake belt, the circum-Pacific Seismic belt. Although the observatory's basic operation is in geomagnetism and seismology, it cooperates with other scientists and organizations in areas where the facility and personnel can be of service.

The observatory is one of three operated by the USGS in Alaska. The others are located at Barrow and Sitka.

The position of the observatory site is:  
Geographic latitude.....64°51.6'N  
Geographic longitude.....147°50.2'W  
Geomagnetic latitude.....+64.6°  
Geomagnetic longitude.....+256.9°  
Elevation.....200 meters

## GEOMAGNETIC DATA

#### 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 "OI" 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.



OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY  
COLLEGE, ALASKA

MONTH  
JUNE

YEAR  
1983

DATE	TIME U.T.	NATURE OF PHENOMENON <sup>1</sup>	REMARKS
13	0117	ssc*	
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

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA  
JUNE 19 83

WDC-A FOR SOLAR-TERRSTRIAL 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	64.0 N	09	17xx	..	..	..	..	10	6	7	190	1580	550	10 20
		13	0117	s.c.*	-15	+402	..	13	3	7	196	1720	1400	14 07
		17	11xx	..	..	..	..	18 20	6 5	6 6	171	1100	740	20 16
		22	09xx	..	..	..	..	22 23	5,6,7 3,6	6 6	203	1040	590	23 20

NORMAL MAGNETOGRAPHE					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 6-1-83	2359 U.T., 6-2-83	1.0/mm	3.78/mm	27° 46.8 E
	0000 U.T., 6-3-83	2400 U.T., 6-30-83	"	"	27° 17.1 E
H	0000 U.T., 6-1-83	2359 U.T., 6-2-83	7.88/mm		127608
	0000 U.T., 6-3-83	2400 U.T., 6-15-83	"		126768
	0000 U.T., 6-16-83	2400 U.T., 6-30-83	"		126848
Z	0000 U.T., 6-1-83	2400 U.T., 6-30-83	7.78/mm		551458

STORM MAGNETOGRAPHE					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 6-1-83	2400 U.T., 6-30-83	7.9/mm	29.68/mm	24° 20.8 E
H	0000 U.T., 6-1-83	2400 U.T., 6-15-83	43.98/mm		108048
	0000 U.T., 6-16-83	2400 U.T., 6-30-83	"		108228
Z	0000 U.T., 6-1-83	2400 U.T., 6-30-83	48.48/mm		540778

RAPID RUN MAGNETOGRAPHE					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		
D					
H					
Z					

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
27° 51.9 E	129478	553758

\* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: JUN 2, 3, 4, 6, 7, 24, 25, 27, 28, 30



MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)

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

OBSY. YEAR MONTH ELE-  
CO 83 JUN D

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

C	Q	Tr	U	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	-28	-32	-39	-87	14	26	39	20	60	4	2	34	01	42	16	53	98	127	169	211	142	121	32	-17	-34	973
			02	-46	-34	-8	17	44	45	46	29	38	77	13	14	02	41	46	65	134	200	199	174	136	78	26	-16	-30	1288
			03	268	255	268	306	318	330	331	326	323	379	286	322	03	353	386	408	408	439	434	453	430	393	336	284	281	8317
			04	280	273	286	310	327	344	356	425	341	310	310	323	04	333	354	384	418	452	468	469	440	393	356	308	296	8556
			05	279	279	300	310	335	368	359	353	325	336	391	320	05	316	292	319	425	449	469	470	418	379	336	304	311	8443
			06	256	269	289	308	324	332	347	340	364	316	316	324	06	332	332	356	388	467	515	522	451	388	324	286	313	8459
			07	266	279	303	303	300	349	395	337	318	321	325	346	07	329	350	380	417	473	490	481	434	392	350	309	292	8539
			08	285	291	295	307	322	312	286	375	320	305	285	278	08	278	399	533	498	542	467	441	426	367	270	288	219	8389
			09	198	229	265	300	327	318	313	303	229	213	262	289	09	342	355	421	454	536	594	601	539	435	331	230	249	8333
			10	229	202	211	220	152	241	277	296	223	148	201	306	10	247	418	442	760	752	673	380	360	333	298	275	246	7890
			11	244	249	256	264	175	272	249	250	276	266	274	284	11	322	345	309	404	467	508	506	441	324	315	284	261	7545
			12	246	218	252	212	238	248	295	268	317	332	321	342	12	437	407	454	516	523	517	494	460	392	316	263	231	8299
			13	214	70	-127	-294	-349	-32	-152	-56	-152	23	204	412	13	109	349	311	523	508	595	471	602	407	319	330	288	4573
			14	311	292	300	301	295	314	328	336	332	364	263	297	14	296	275	342	414	480	477	450	455	398	310	294	313	8237
			15	294	300	336	280	246	236	234	253	258	242	365	280	15	324	342	298	458	476	514	549	372	411	344	288	280	7980
			16	264	271	282	312	338	358	362	361	318	271	276	273	16	334	294	390	478	533	460	443	423	401	349	308	269	8368
			17	228	238	264	288	297	333	341	338	318	317	296	276	17	300	416	481	608	536	541	580	475	359	342	311	275	8758
			18	221	204	211	180	151	95	270	165	484	250	178	297	18	389	492	642	516	778	500	487	470	547	344	263	253	8383
			19	259	274	225	284	304	257	234	240	231	182	197	242	19	484	492	516	469	613	468	456	382	412	292	256	282	8051
			20	275	295	231	306	272	306	314	316	318	270	169	264	20	316	400	412	403	450	469	464	441	415	388	366	278	8138
			21	290	251	258	276	270	253	401	264	309	268	295	291	21	330	393	438	455	502	512	496	382	360	329	273	264	8160
			22	250	246	277	286	260	299	344	320	280	394	336	357	22	412	484	444	524	579	778	714	450	395	334	266	226	9255
			23	244	262	236	260	269	285	290	245	412	246	306	304	23	319	359	683	659	579	745	474	370	387	321	258	276	8789
			24	246	250	263	273	316	346	342	308	298	268	274	294	24	331	357	362	420	504	500	484	448	407	358	333	298	8280
			25	278	274	286	295	311	333	340	339	341	338	344	344	25	344	376	409	449	484	488	533	442	437	332	308	256	8681
			26	239	234	251	262	232	322	356	342	348	344	287	281	26	272	320	364	474	524	494	472	452	389	326	335	302	8222
			27	244	266	280	295	322	338	330	364	338	360	336	310	27	312	346	385	439	474	491	465	414	373	376	377	287	8522
			28	257	260	268	291	324	339	340	338	341	321	269	303	28	312	339	412	420	420	466	474	451	382	342	290	252	8211
			29	258	245	276	326	327	328	272	338	284	364	328	266	29	273	355	343	406	479	496	452	444	397	352	305	260	8174
			30	248	264	295	306	326	338	336	342	303	308	312	294	30	330	375	402	438	485	515	500	451	414	317	300	265	8464
			31												31														

SCALED BY: LYT  
 CHECKED BY: TXC, JEP, ERF  
 SIGNS RE-VIEWED BY: JEP  
 PUNCHED BY:

Preliminary base-line and scale values:  
 Interval Beginning Base-line Value Scale Value  
 NOTE: D ORDINATE WAS ADJUSTED 0000 UT, 6-3-83. MONTHLY SUM AND MONTHLY MEAN ARE COMPUTED ACCORDINGLY.

( ) Interpolated  
 Significant portion of hour interpolated.  
 No record; or no values available because of faulty record.  
 \* Derived from STORM Maph., converted to Normal Maph.  
 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:  
 6-1-83-6-2-83 2261  
 6-3-83-6-30-83 47  
 MONTHLY MEAN:  
 6-1-83-6-2-83 23006  
 6-3-83-6-30-83 342

FORM 74-104

MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR  
Geological Survey, Geologic Division  
Denver Federal Center  
DENVER, CO 80225OBSY. YEAR MONTH ELE-  
CO 83 JUN 2  
MENTValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (190M.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	U	Tr	JU	01	02	03	04	05	06	07	08	09	10	11	12	JU	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
					327	333	326	347	395	394	449	373	310	307	338	340	01	330	313	303	249	276	314	324	283	290	278	286	301	7786	
					313	314	320	323	324	322	327	328	317	305	291	307	02	282	227	224	301	312	310	308	298	290	287	289	281	7200	
					315	311	322	340	332	326	319	307	310	251	232	287	03	306	309	305	300	284	287	296	296	293	286	288	295	7197	
					314	318	317	316	307	309	318	350	312	312	304	302	04	301	302	305	305	304	302	296	284	271	275	276	284	7290	
					295	291	299	305	309	316	312	314	303	301	219	271	05	295	294	286	224	266	293	283	265	272	273	284	301	6871	
					299	301	322	299	299	299	306	318	318	293	293	286	06	280	275	224	242	237	230	224	249	260	265	272	303	6694	
					317	321	332	309	303	372	377	340	308	325	304	276	07	281	309	310	309	296	288	262	261	271	273	277	278	7299	
					275	294	289	287	289	293	304	353	312	297	238	114	08	202	273	210	225	214	208	231	258	262	261	284	287	6260	
					304	307	307	304	322	326	347	293	155	131	270	312	09	299	291	310	320	309	274	230	209	197	229	245	266	6557	
					304	302	325	329	341	278	321	306	235	222	318	366	10	418	525	544	689	398	298	218	295	296	301	299	289	8217	
					301	331	334	313	294	369	380	380	340	308	236	264	11	270	260	165	246	288	296	286	270	267	283	290	283	7054	
					291	299	341	328	349	373	374	348	314	305	294	308	12	310	276	295	282	265	294	285	278	272	264	268	259	7272	
					263	212	8	-379	-13	31	-134	190	466	520	526	844	13	435	400	423	484	483	447	318	295	246	258	316	338	6947	
					368	376	376	368	360	398	375	345	320	274	254	304	14	304	311	364	299	265	293	295	282	290	276	278	311	7686	
					325	314	344	390	407	360	321	374	343	348	327	235	15	354	359	266	263	274	253	154	202	258	284	276	281	7312	
					296	336	333	345	358	343	330	332	310	302	271	289	16	265	302	366	244	144	202	297	309	307	300	307	316	7204	
					327	338	344	339	342	377	389	367	328	320	307	290	17	313	260	277	172	198	301	234	202	226	274	290	314	7129	
					314	303	342	348	320	132	324	163	283	236	322	470	18	460	491	327	353	258	207	321	292	302	285	286	307	7446	
					318	325	297	364	340	347	300	294	334	298	320	472	19	435	378	302	186	158	192	286	292	313	292	294	309	7446	
					364	360	323	358	352	367	340	228	174	230	275	309	20	349	365	327	165	258	294	306	295	293	302	298	291	7223	
					313	345	358	355	334	309	271	298	371	342	258	276	21	293	298	257	197	215	263	248	204	259	280	298	320	6962	
					320	315	315	301	308	350	352	322	296	270	127	207	22	289	409	353	118	158	220	189	114	236	267	283	305	6426	
					328	322	318	339	346	332	318	233	125	251	430	403	23	438	395	256	220	107	145	94	185	261	289	309	350	6794	
					364	352	350	378	408	361	344	324	333	328	366	356	24	340	320	305	324	303	305	306	297	291	291	293	298	7937	
					301	307	306	310	307	314	313	314	314	313	311	310	25	308	288	297	308	309	298	309	274	275	244	261	274	7165	
					282	291	299	292	293	384	386	369	343	312	306	307	26	302	330	299	214	202	252	291	295	294	292	306	309	7250	
					298	293	307	306	306	334	358	297	335	319	291	288	27	315	316	314	312	301	284	220	217	242	270	286	287	7096	
					302	306	299	298	303	302	302	304	309	310	295	259	28	265	256	280	218	238	269	263	212	228	262	286	295	6661	
					319	338	339	346	358	366	325	292	292	339	262	270	29	287	322	304	300	271	296	280	290	288	289	295	308	7376	
					316	306	308	311	318	316	305	332	290	299	313	301	30	282	285	288	308	317	294	287	280	272	260	277	283	7148	
																	31														

SCALED BY

LYT

Preliminary base-line and scale values:

Interval  
BeginningBase-line  
ValueScale  
Value

CHECKED BY

TKC, JEP, ERK

SIGNS RE-  
VIEWED BY

JEP

PUNCHED BY

 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, core was estimated  
for missing part.

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

MONTHLY SUM 214905

MONTHLY MEAN 298

DATES WITH GAPS:

MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)

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

OBSY. YEAR MONTH ELE-  
CO 83 JUN H  
MENT

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

C	Day	Time	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	233	230	274	403	542	452	348	392	310	245	249	195	169	225	107	213	263	297	249	264	222	235	240	235	6592
		02	226	221	230	236	243	260	257	321	378	300	223	184	70	51	221	261	268	260	235	230	235	210	217	240	5577
		03	352	336	364	345	356	348	367	365	407	397	348	360	365	360	361	330	314	337	336	337	309	309	312	326	8341
		04	344	329	341	354	361	371	386	392	379	367	357	355	353	361	367	375	371	366	350	338	321	322	332	344	8536
		05	350	343	358	356	360	368	394	370	397	368	213	405	386	375	333	105	400	387	385	377	348	334	329	337	8378
		06	331	367	375	371	376	376	411	450	439	393	383	383	383	383	263	343	314	286	348	336	329	313	328	358	8650
		07	336	384	327	351	415	464	407	373	363	386	320	342	371	369	352	342	323	333	332	333	320	323	312	316	8494
		08	331	340	350	355	362	391	432	411	383	375	320	-74	-91	-104	84	271	184	313	362	328	311	304	294	305	6537
		09	340	346	389	372	392	414	471	488	144	177	412	384	373	366	380	408	361	284	285	247	270	285	290	350	8228
		10	439	498	584	647	707	805	579	556	519	486	136	95	157	469	265	503	-180	85	454	451	386	352	340	368	7227
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		18	326	416	476	514	555	537	595	485	219	374	383	243	-11	-62	10	143	-100	358	408	386	314	302	363	367	7601
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		20	494	494	442	538	464	348	424	357	289	266	255	206	300	-24	245	279	391	379	387	352	325	324	328	345	7718
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		26	307	344	334	363	436	448	454	428	390	410	390	360	319	339	338	162	278	340	365	352	330	325	335	318	8465
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SCALED BY: LYT  
CHECKED BY: TKC, JEP, ERS  
SIGNS REVIEWED BY: JEP  
PUNCHED BY:

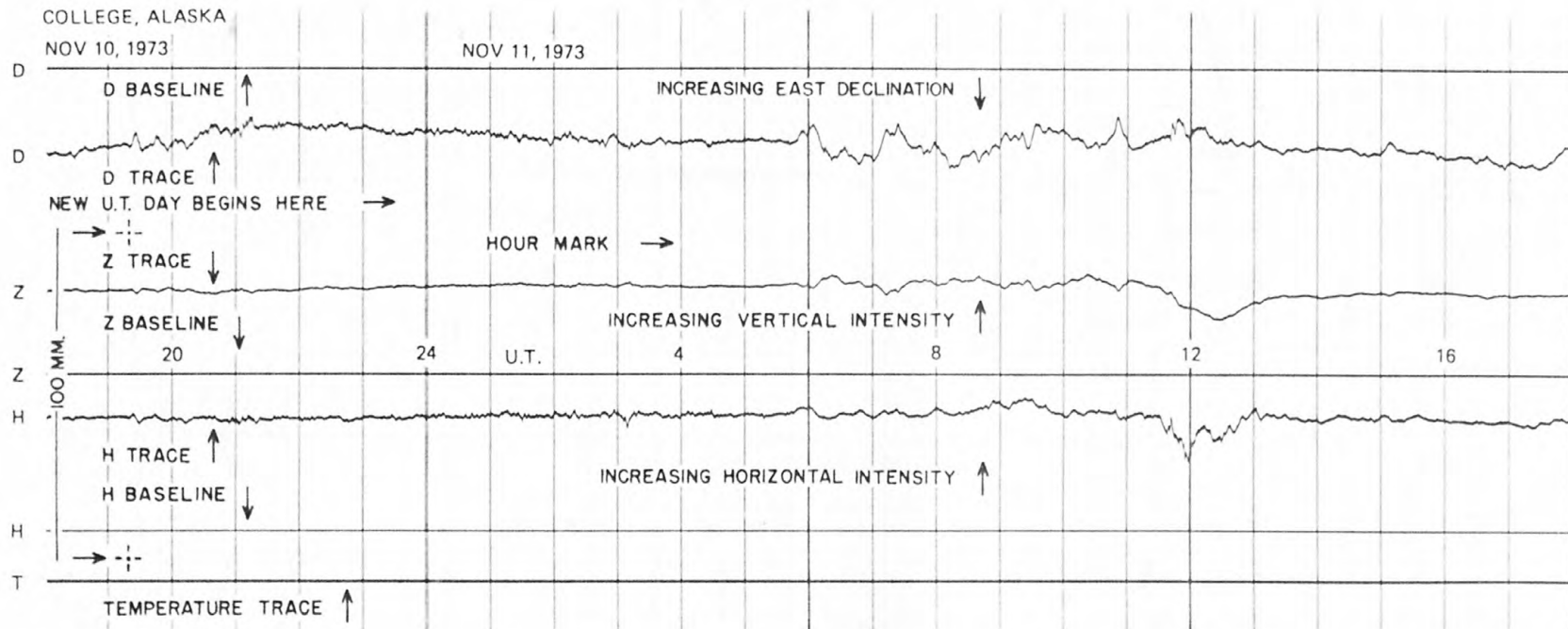
Preliminary base-line and scale values:  
Interval Beginning Base-line Value Scale Value  
NOTE: H ORDINATE WAS ADJUSTED 0000 U.T., 6-3-83. MONTHLY SUM AND MONTHLY MEAN ARE COMPUTED ACCORDINGLY.

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

MONTHLY SUM  
6-4-83-6-2-83 12169  
6-3-83-6-30-83 218714  
MONTHLY MEAN  
6-4-83-6-2-83 254  
6-3-83-6-30-83 325

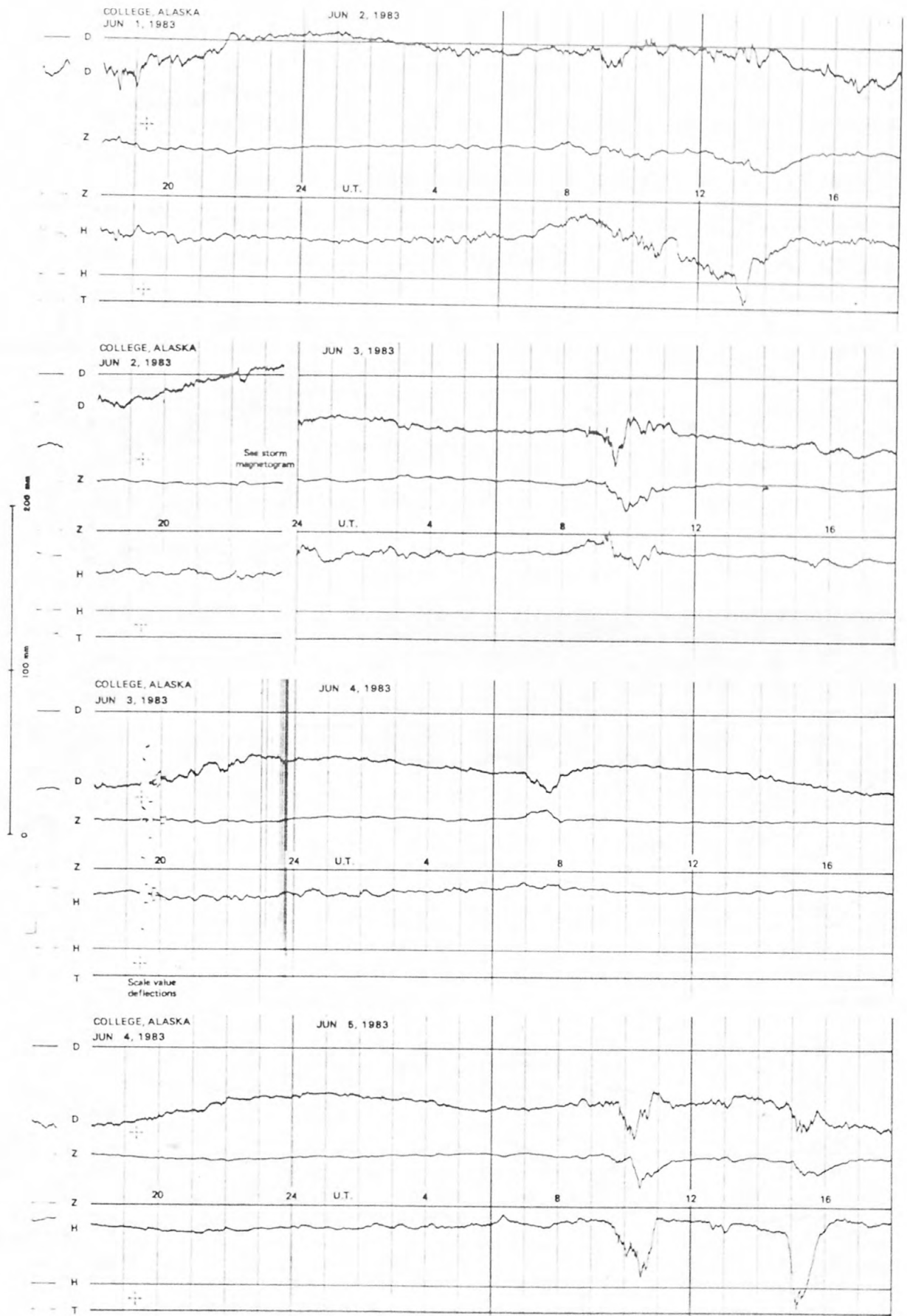


# FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

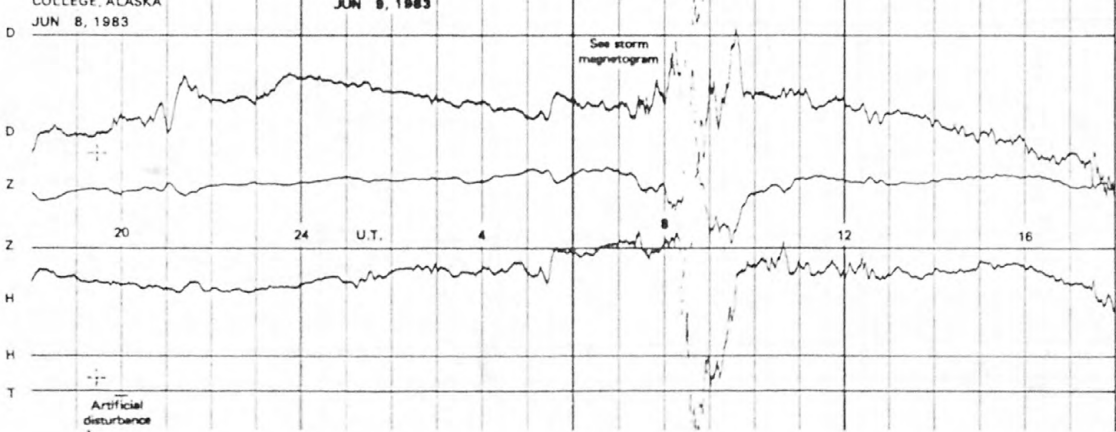
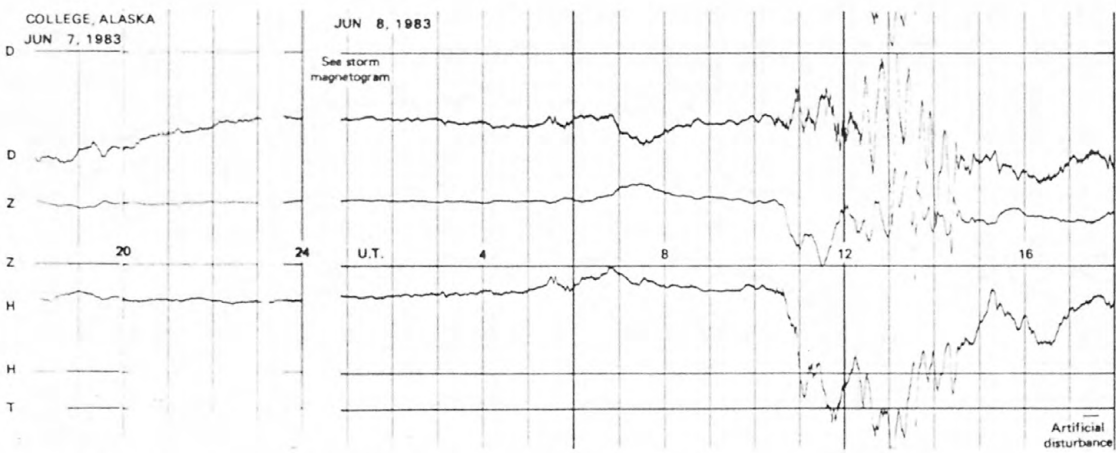
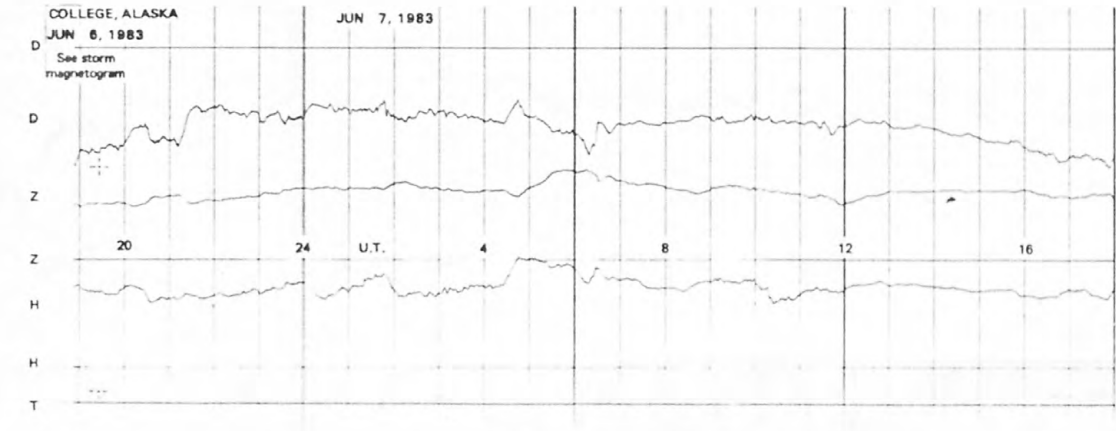
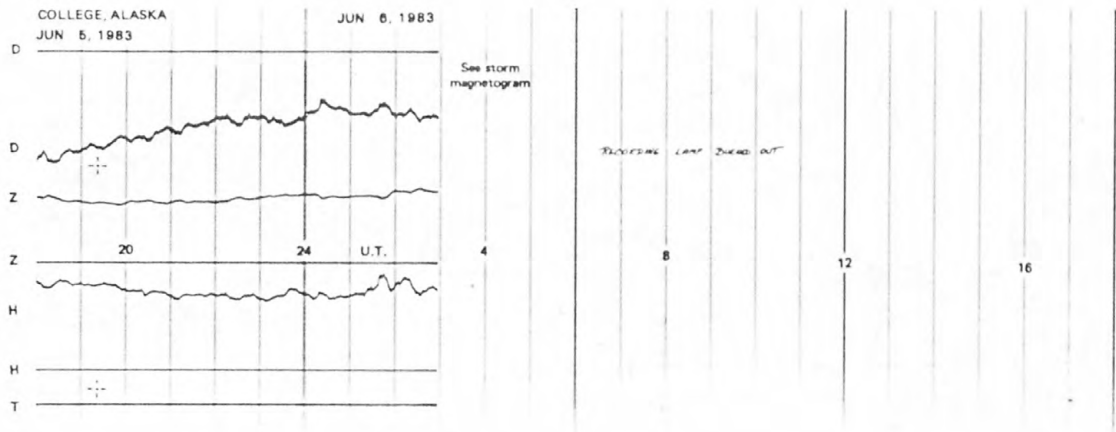


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

NORMAL MAGNETOGRAMS

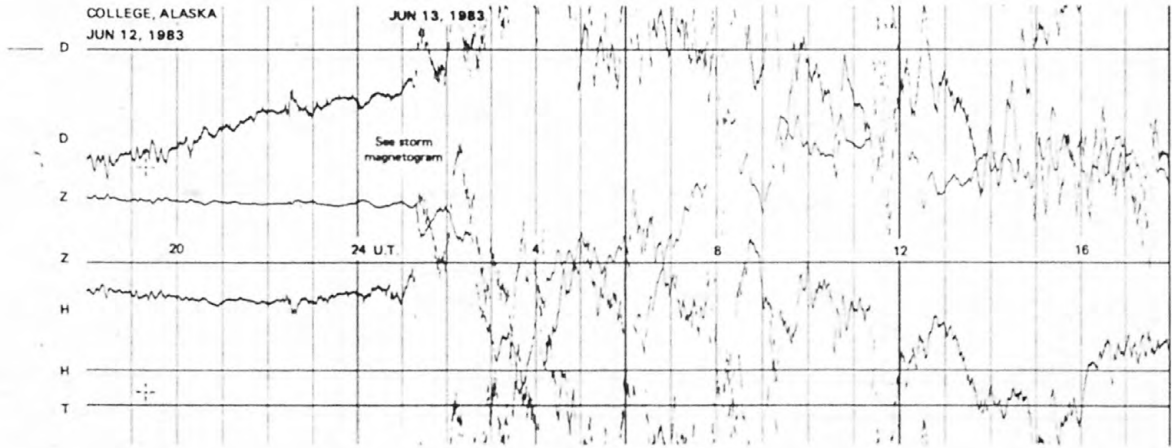
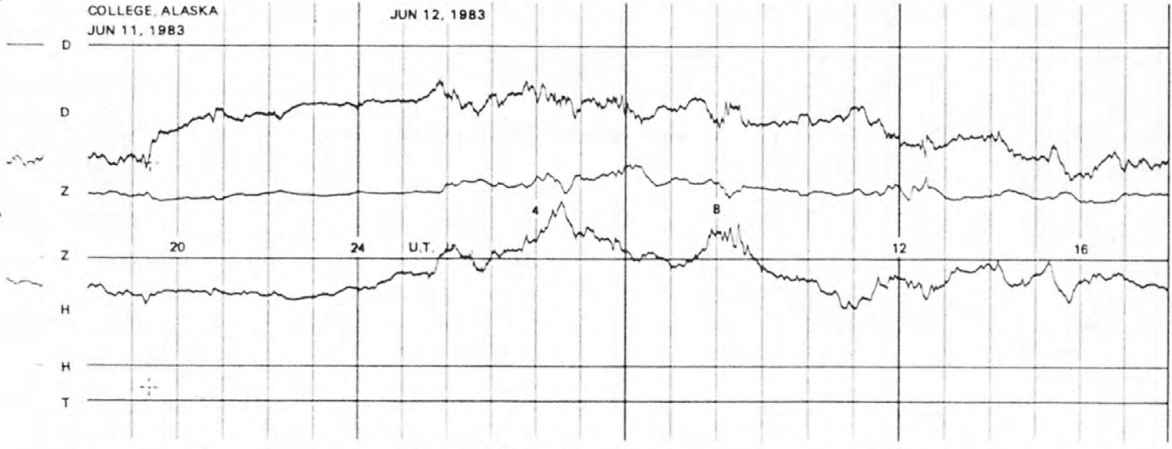
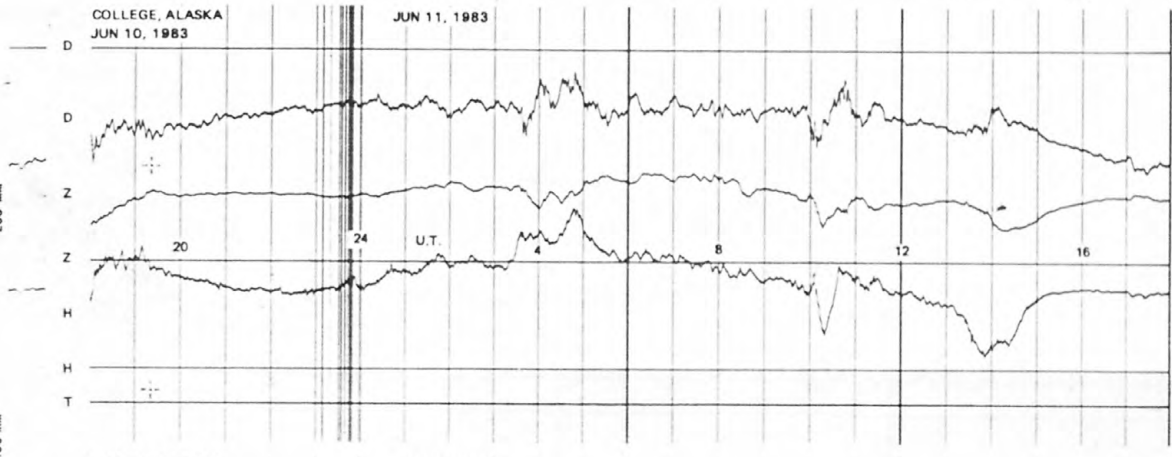
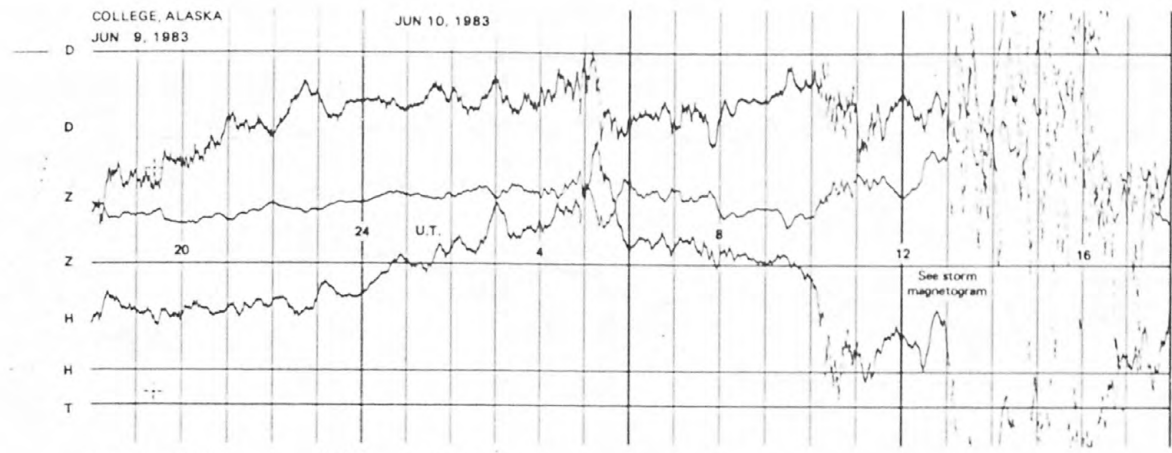


NORMAL MAGNETOGRAMS

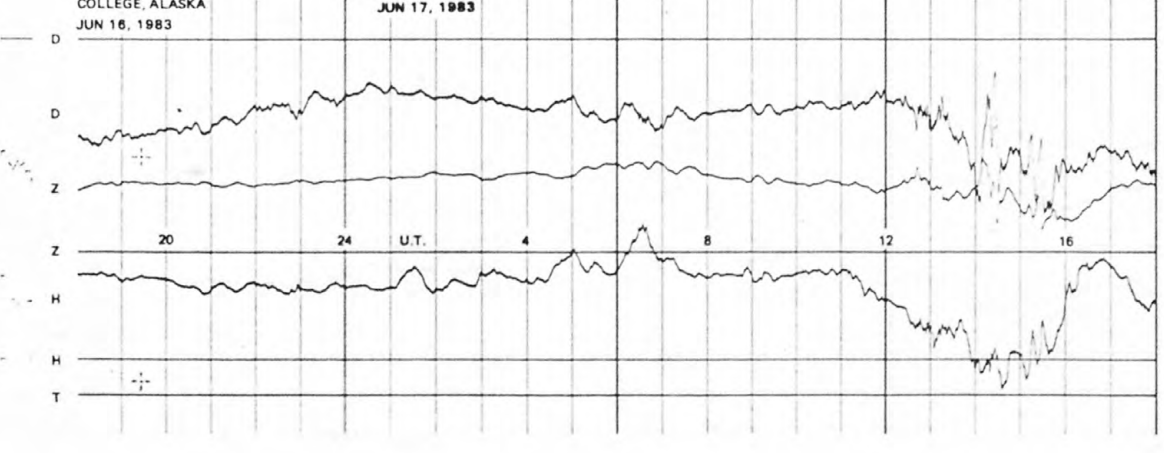
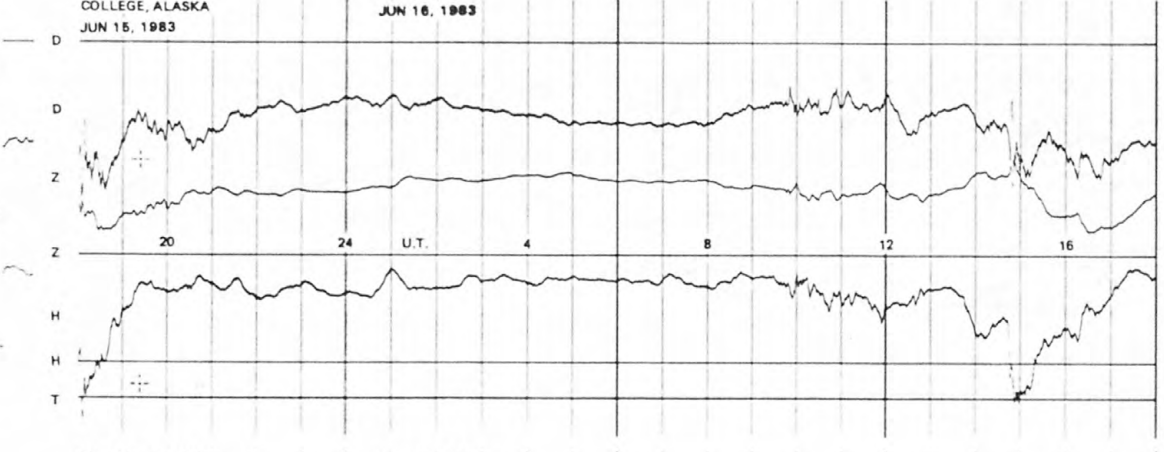
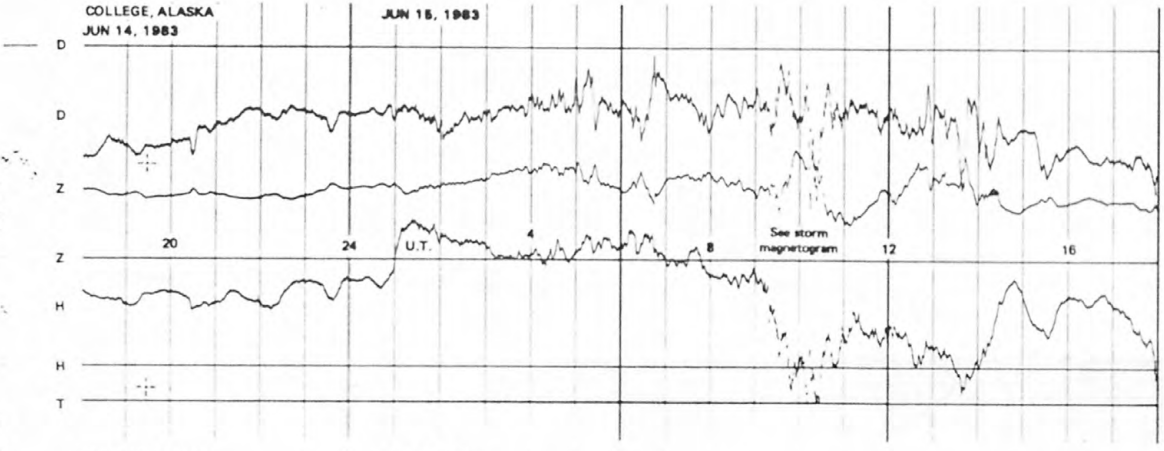
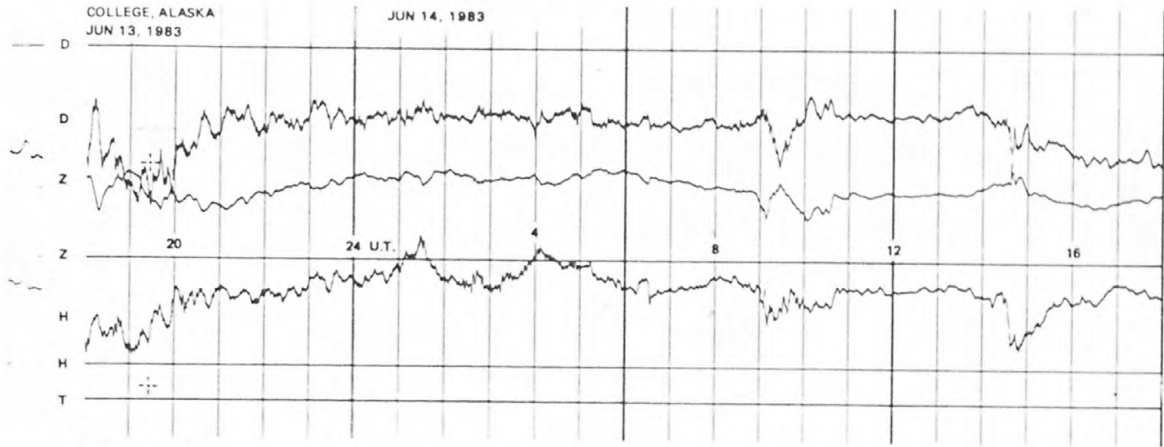




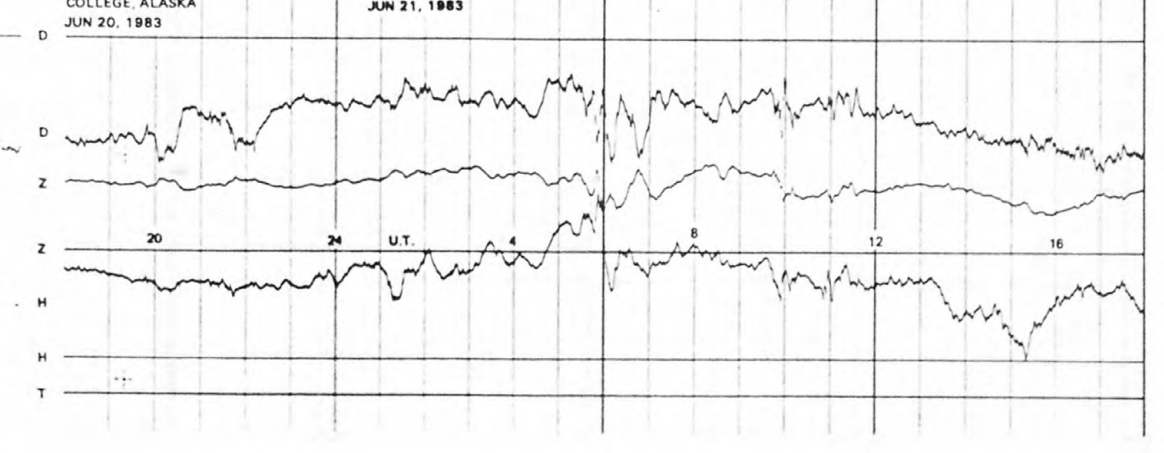
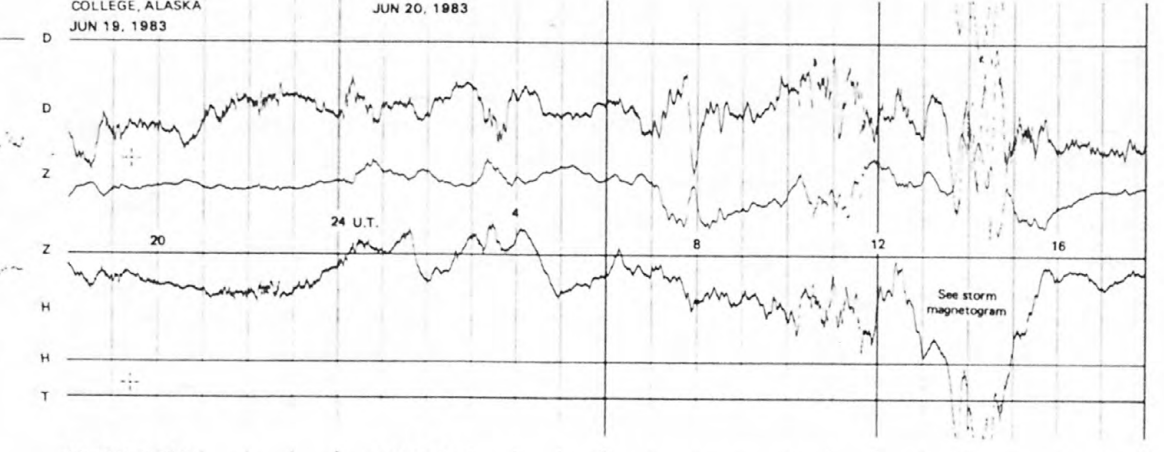
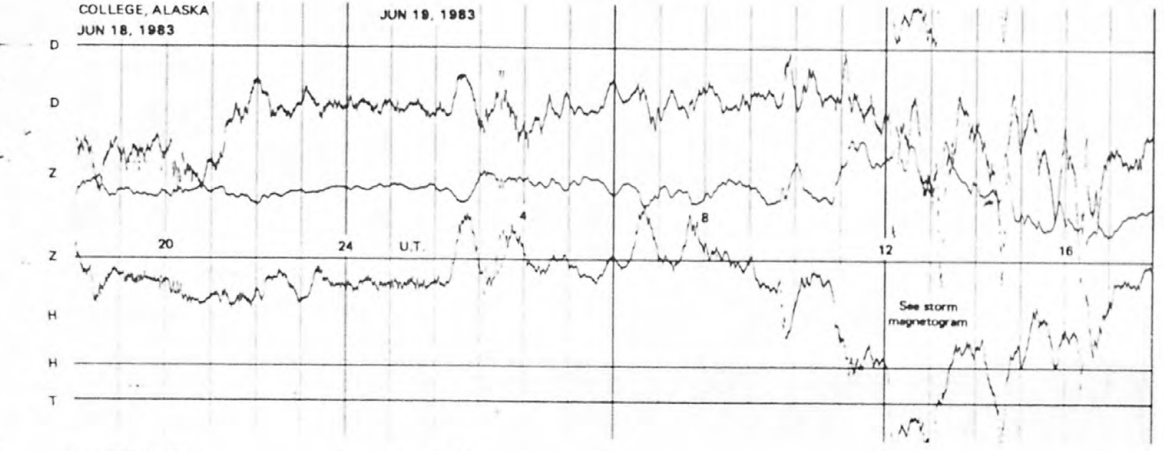
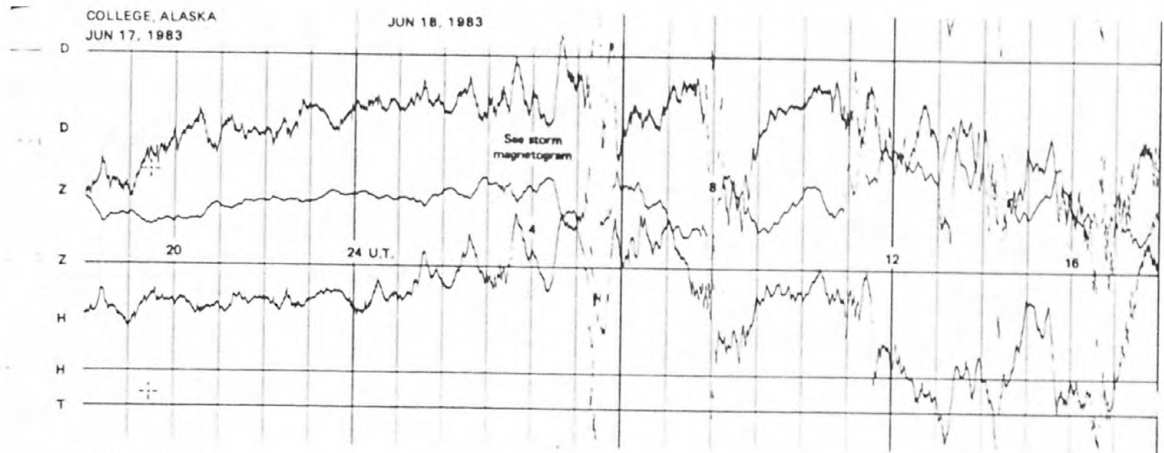
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

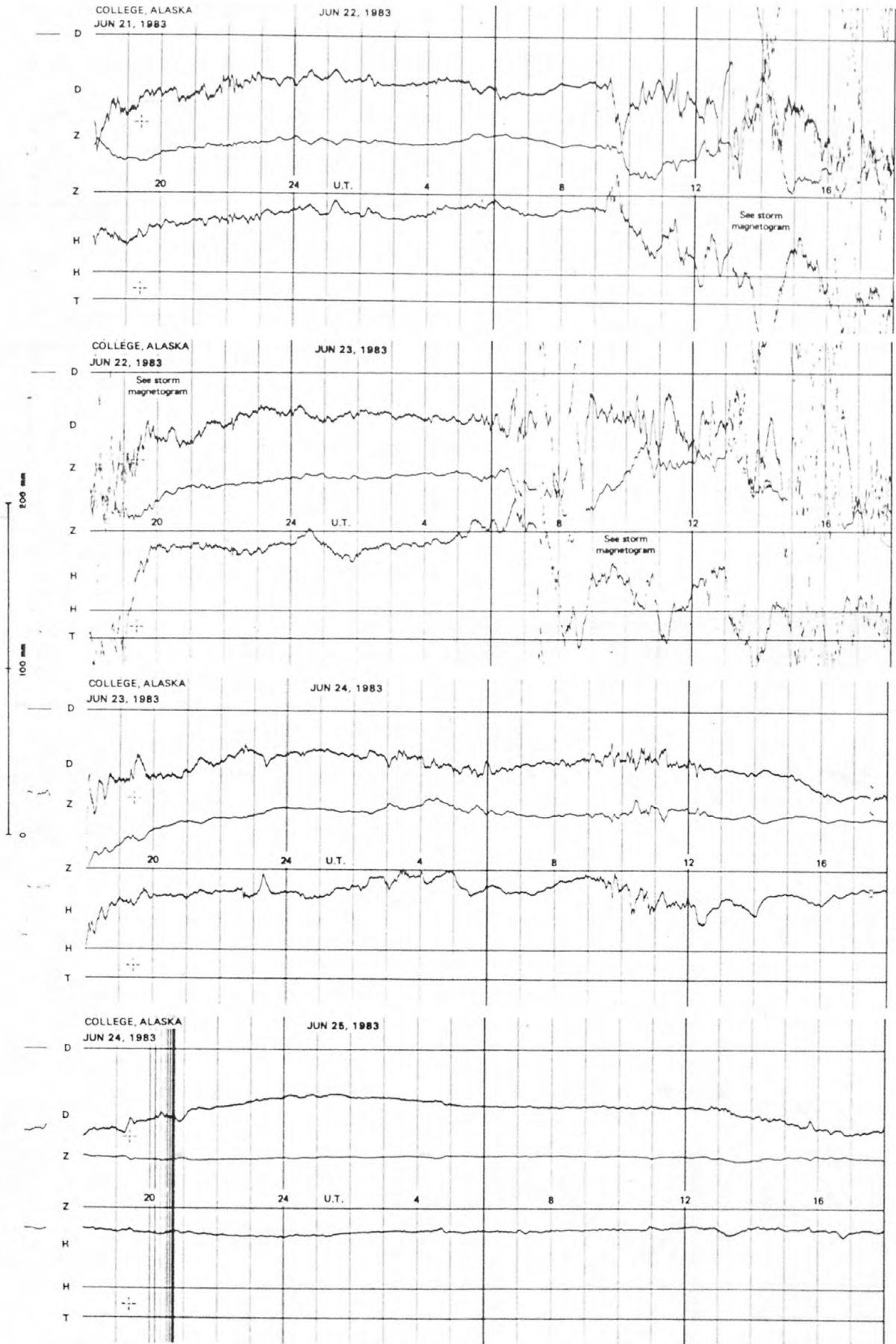


NORMAL MAGNETOGRAMS



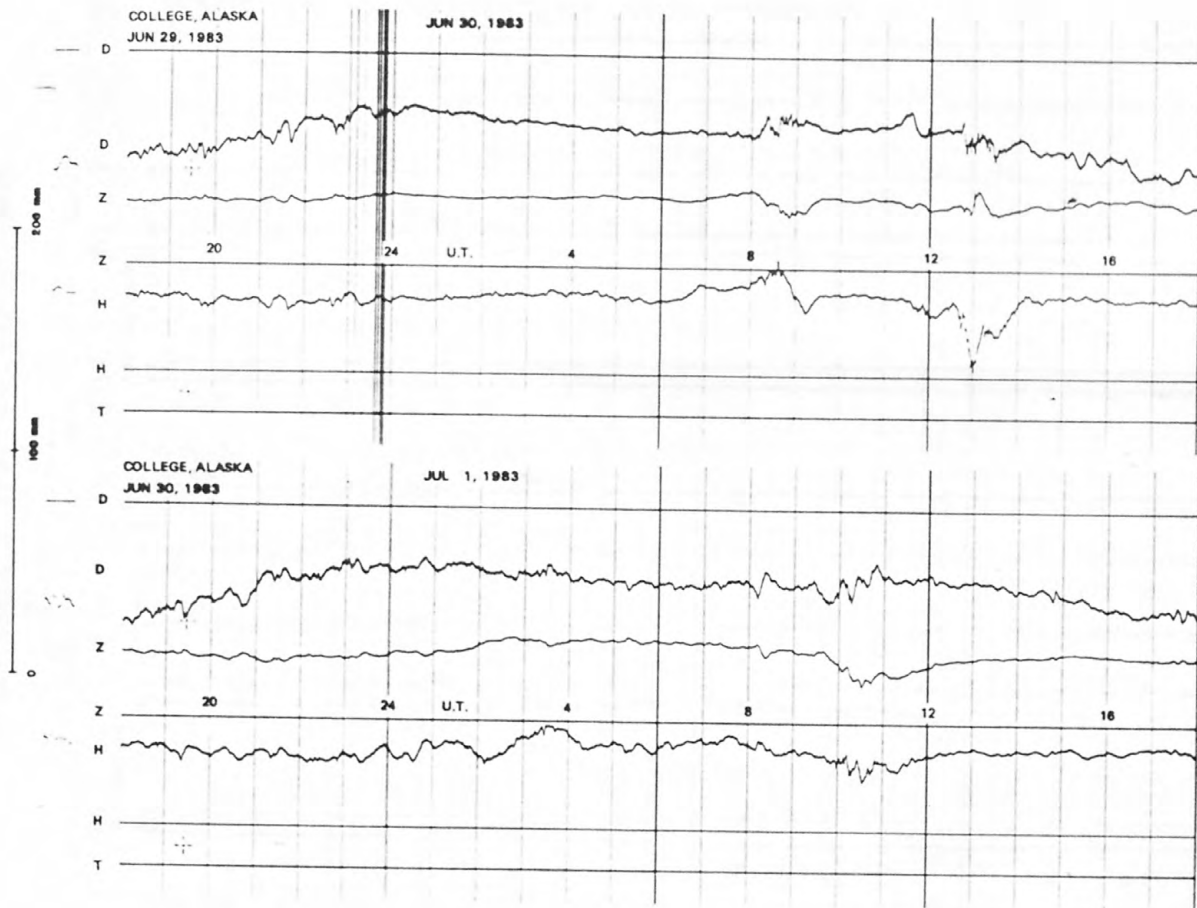


NORMAL MAGNETOGRAMS



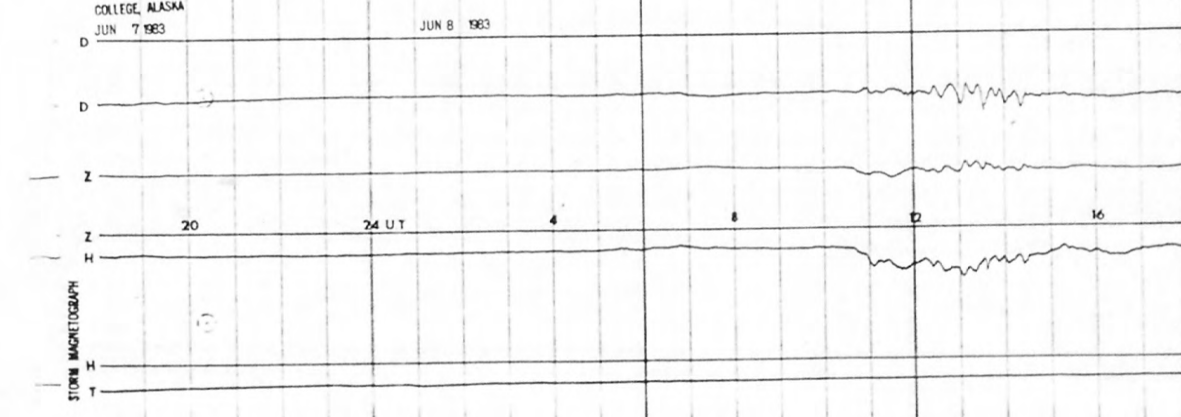
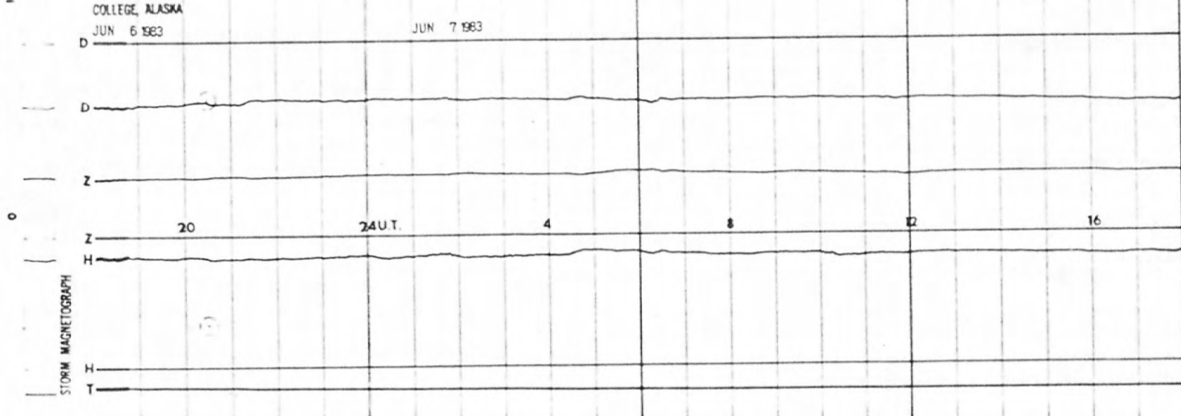
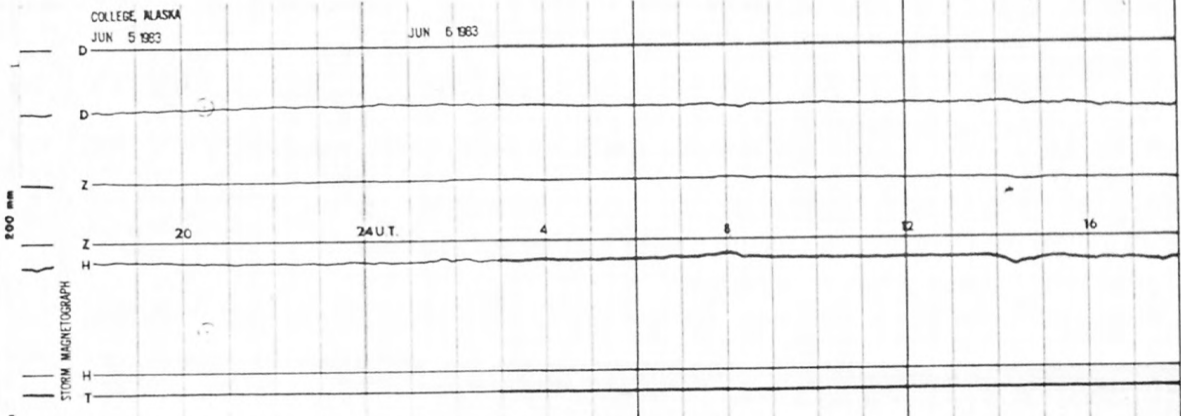
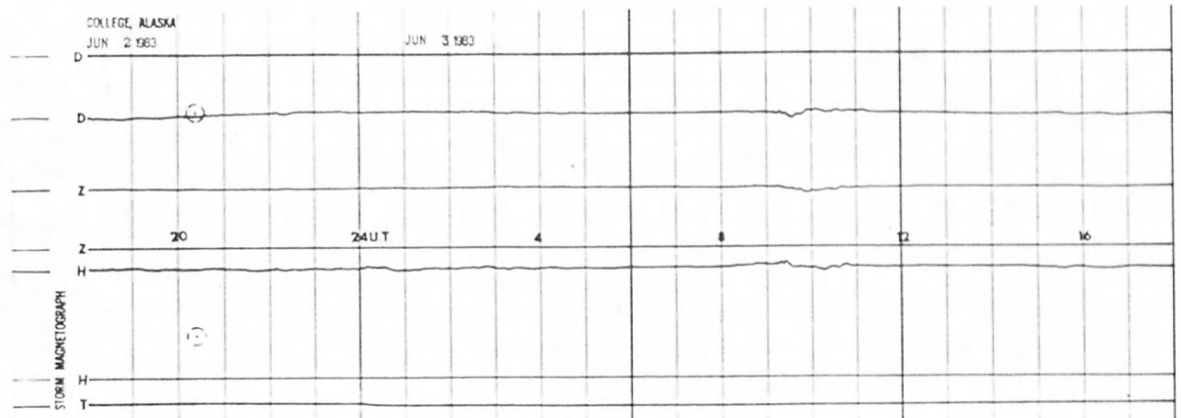


NORMAL MAGNETOGRAMS

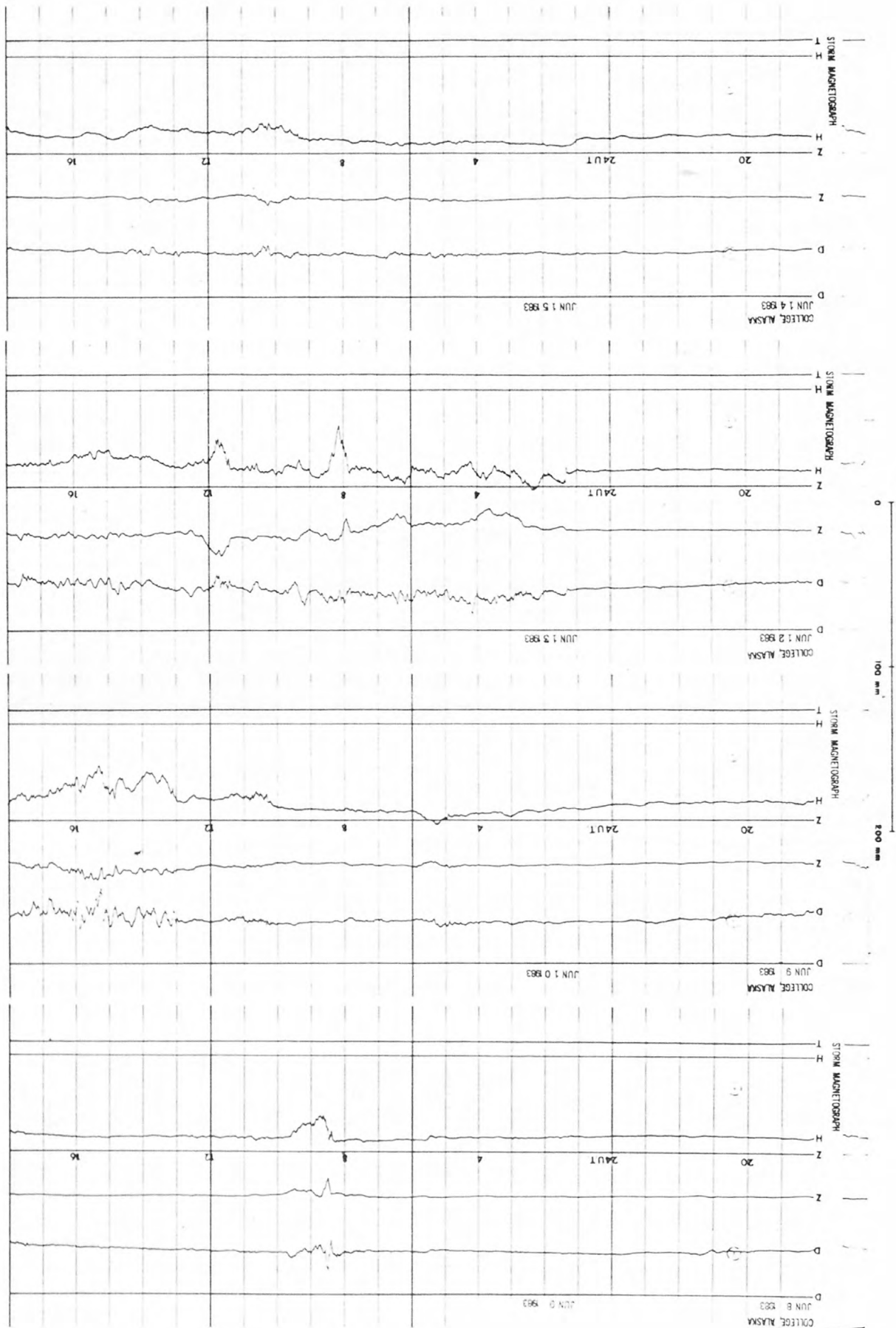




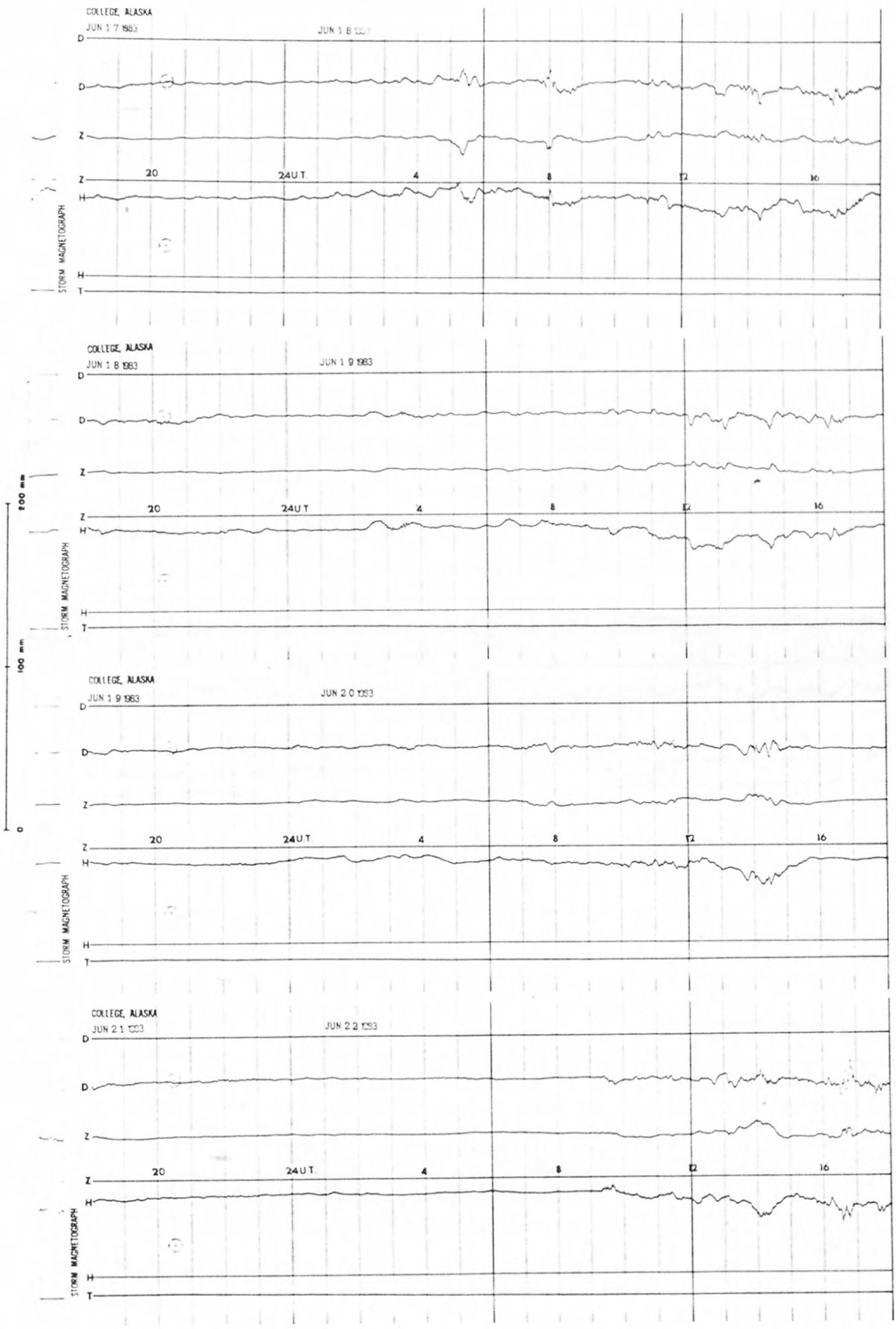
STORM MAGNETOGRAMS



# STORM MAGNETOGRAMS

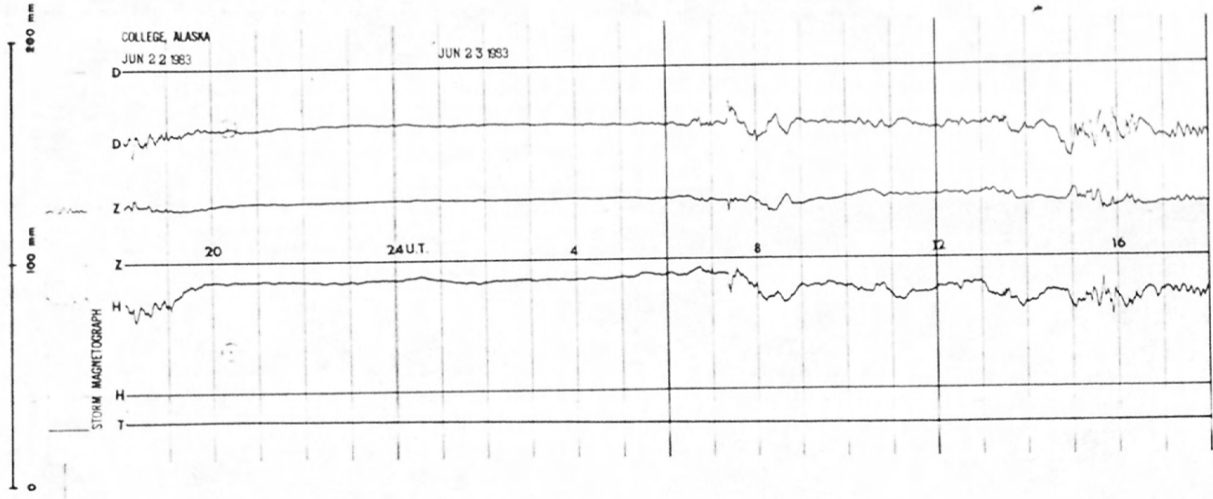


STORM MAGNETOGRAMS





# STORM MAGNETOGRAMS



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