

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

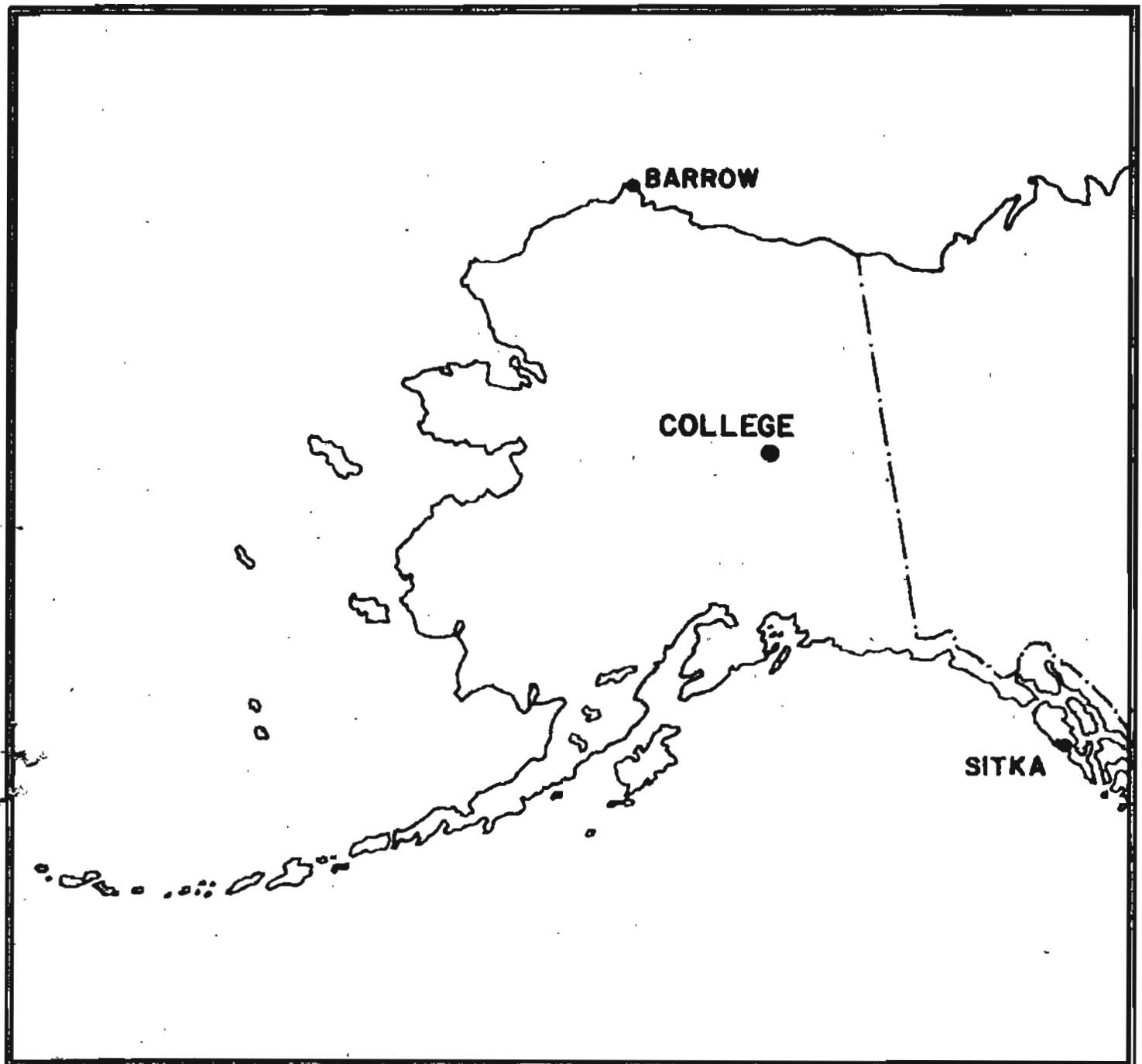
PRELIMINARY GEOMAGNETIC DATA

COLLEGE OBSERVATORY

FAIRBANKS, ALASKA

JUNE 1985

OPEN FILE REPORT 85-0300F



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, 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..... $64^{\circ}51.6'N$
Geographic longitude..... $147^{\circ}50.2'W$
Geomagnetic latitude..... 64.6°
Geomagnetic longitude..... $+256.9^{\circ}$
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 J-component fluxgate magnetometer and F-component proton magnetometer.

Magnetic Activity

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

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

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

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

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:

$$D = B_D + d \cdot S_D; \quad H = B_H + h \cdot S_H; \quad Z = B_Z + z \cdot S_Z$$

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

YEAR

JUNE

1985

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
03	10xx	pi 2	
09	1714	ssc*	
13	13xx	pi 2	
20	16xx	pg	
IDENTIFIED BY: JEP		VERIFIED BY: EAS	

1. NATURE OF PHENOMENON: ssc, ssc*, si, si*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA
1985

WDC-4 FOR SOLAR-TERRRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80502 U.S.A.

Date from Individual Observatories:

JUNE

Obs. 2 letter IAGA code	Geomag. lat.	Commencement		SC - amplitudes			Max. 3 hr - index K			Ranges			UT End day hr	
		day	hr min (UT)	type	D(°)	H(Y)	Z(Y)	day	(3 hr - period)	K	D(°)	H(Y)		Z(Y)
CO	64°6 N	06	12xx	06	6	6	6	150	1330	650	08 18
		09	1714	s.c.*	-6	-17	-5	10	3	7	159	1310	960	11 13

NORMAL MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 6-1-85	2400 U.T., 6-30-85	1.0/mm	37.8/mm	27° 16.8 E
H	0000 U.T., 6-1-85	2400 U.T., 6-30-85	7.8 x/mm		12681 x
Z	0000 U.T., 6-1-85	2400 U.T., 6-30-85	7.6 x/mm		55173 x

STORM MAGNETOGRAPH					
COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 6-1-85	2400 U.T., 6-30-85	7.9/mm	29.5 x/mm	23° 46.4 E
H	0000 U.T., 6-1-85	2400 U.T., 6-30-85	43.8 x/mm		10719 x
Z	0000 U.T., 6-1-85	2400 U.T., 6-30-85	48.2 x/mm		54126 x

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

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
27° 38.4 E	12904 x	55340 x

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DATE USED: JUN 2, 3, 4, 5, 13, 14, 16, 18, 19, 24

FORM CAG-404a

MAGNETOGRAM HOURLY SCALINGS

Values are in tenths of amp. and are averaged for successive periods of one hour beginning at midnight. Head of local day (1200M A.T.) is hour 00. Head of universal time (UT) is hour 00. Scale factors are indicated in the margin. Negative values are in red, with minus signs shown.

C	G	M	N	MAGNETIC SCALING FACTORS																								YEAR	MONTH	DAY	SUM
				01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
01	111	114	88	20	-3	154	122	158	148	72	96	239	01	270	290	358	300	387	369	279	232	237	190	149	151	4601					
02	152	154	166	188	208	204	203	226	200	191	196	186	02	199	299	338	339	343	319	299	214	176	134	137	5411						
03	147	163	177	209	226	223	215	228	202	193	187	228	03	229	245	245	291	320	321	338	315	252	201	162	5509						
04	123	150	144	189	203	207	195	228	190	197	195	199	04	213	243	279	315	321	310	267	230	207	188	166	5299						
05	123	116	112	122	157	169	176	173	222	184	182	202	05	215	233	253	289	320	349	350	322	213	182	149	5060						
06	137	140	132	159	141	110	170	178	195	187	181	158	06	207	224	234	262	302	320	320	301	284	154	105	5595						
07	86	95	176	62	30	189	152	116	189	148	180	174	07	187	188	252	444	347	330	304	219	204	148	144	4664						
08	126	108	66	76	76	138	169	38	14	158	148	190	08	230	258	268	302	342	340	321	276	245	208	197	161	4985					
09	163	157	159	165	186	188	220	119	193	184	183	197	09	207	231	273	302	319	330	385	363	232	235	34	58	5196					
10	90	176	55	-33	22	-81	82	38	-33	-9	284	110	10	227	270	195	308	287	341	351	325	282	203	190	149	5829					
11	134	138	90	147	154	162	217	154	184	172	133	178	11	202	239	252	279	300	298	310	285	260	218	174	149	5011					
12	145	175	154	140	178	189	197	164	163	178	164	212	12	205	223	252	279	300	298	310	285	260	218	174	149	5011					
13	130	139	152	170	159	219	217	207	197	197	197	203	13	211	227	254	292	335	322	345	305	263	218	174	149	5011					
14	124	144	164	186	194	213	193	204	190	188	194	201	14	219	235	256	279	301	307	309	295	277	230	175	159	5228					
15	125	100	84	80	150	104	113	198	202	198	194	204	15	211	236	278	322	352	353	354	317	280	233	179	159	5228					
16	138	124	130	133	158	181	200	202	209	193	204	213	16	218	227	242	261	283	306	307	290	267	237	182	150	5056					
17	133	126	147	177	190	199	200	193	187	188	199	196	17	207	216	285	318	335	346	320	281	268	227	162	162	5306					
18	119	120	127	152	172	180	197	197	197	192	202	190	18	198	220	258	290	301	312	314	294	270	230	185	162	5070					
19	138	129	131	158	179	199	207	200	189	199	208	217	19	221	227	244	277	310	316	316	294	245	200	187	172	5163					
20	149	137	135	134	168	174	183	187	183	169	138	211	20	233	278	340	397	340	320	311	291	255	260	170	150	5313					
21	132	143	161	132	194	201	207	209	200	208	200	212	21	210	237	218	272	312	320	318	300	275	234	200	181	5276					
22	162	160	147	124	136	151	243	193	144	177	276	231	22	208	231	249	259	298	304	298	282	250	215	190	179	5101					
23	169	144	129	119	100	132	192	183	177	190	183	164	23	194	205	233	283	307	322	322	296	252	213	185	172	4880					
24	160	147	166	190	208	209	203	200	193	187	203	206	24	207	213	232	280	310	307	298	272	246	216	185	183	5231					
25	150	152	114	149	159	185	221	178	141	164	208	266	25	227	238	277	304	296	315	302	338	192	164	154	180	5172					
26	126	150	138	120	113	213	174	153	174	198	282	178	26	245	225	247	284	307	339	339	201	180	228	159	164	4989					
27	148	174	178	150	172	174	153	174	158	282	178	211	27	219	272	265	270	294	347	347	296	211	268	171	153	160	5082				
28	135	98	102	40	108	146	196	158	142	159	184	254	28	256	327	252	319	365	345	330	297	256	222	154	131	4976					
29	133	166	162	159	163	228	200	244	228	342	181	175	29	155	190	268	302	334	348	315	291	240	193	168	160	5206					
30	157	160	168	180	193	197	201	204	206	191	174	164	30	183	238	283	321	328	322	329	325	317	244	28	113	5216					
31													31																		

() Interpolated
 () Significant portion of
 day not interpolated.
 () No account for no value
 available because of
 faulty record.
 * Derived from STORM - Alpha, converted to Normal - Alpha.

Scaling increases in
 magnetic items.
 <> Keyed off sheet for part
 in all of hour; if value is
 given, curve was estimated
 for missing part.

Scale Value
 Scale Value
 Scale Value

RECALC BY: LYT
 CHECKED BY: JAF, JEP
 BUREAU VERIFIED BY: JEP
 PUNCHED BY: JEP

MONTHLY SUM: 152,207
 MONTHLY MEAN: 2.11
 DATES WITH DATA:

7900r CAGS-444

MAGNETOGRAM HOURLY SCALINGS

Values are in scale of 100, and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1200 M.T.) is hour 08 of the 0800 universal day.

Scale Value: Preliminary base-line and scale values: Scale Value

Base-line Value: 1.0

Region: 1.0

Scale Value: 1.0

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U.S. DEPARTMENT OF INTERIOR
Geological Survey
Boulder, Colorado

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YEAR 85

MONTH JUN

DAY 24

SCALE 260

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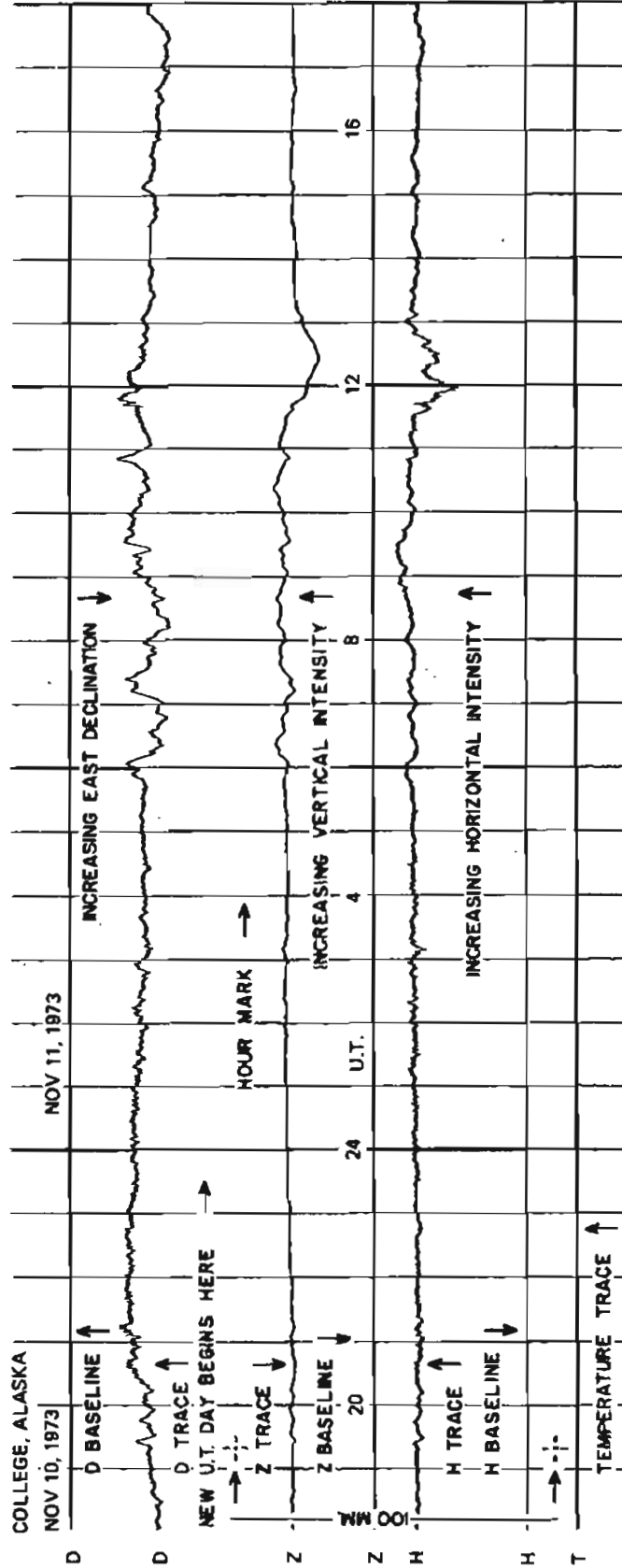
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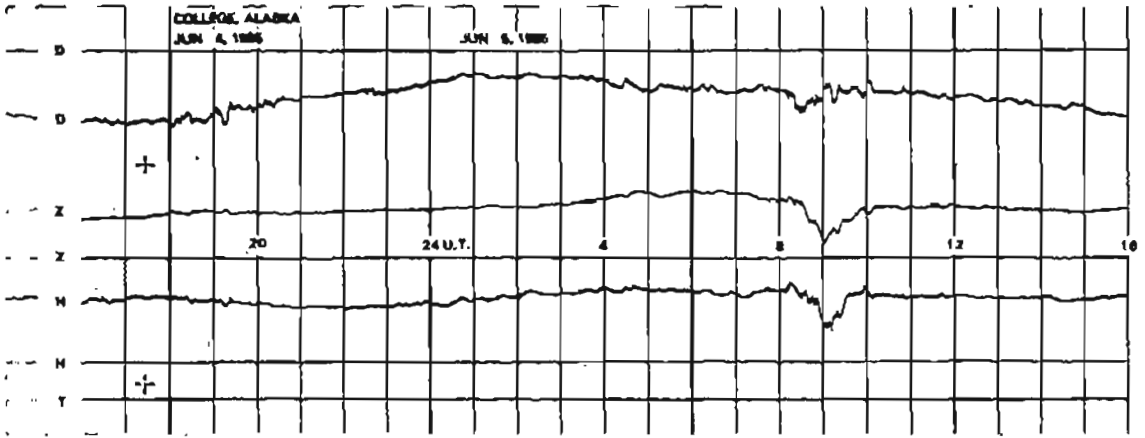
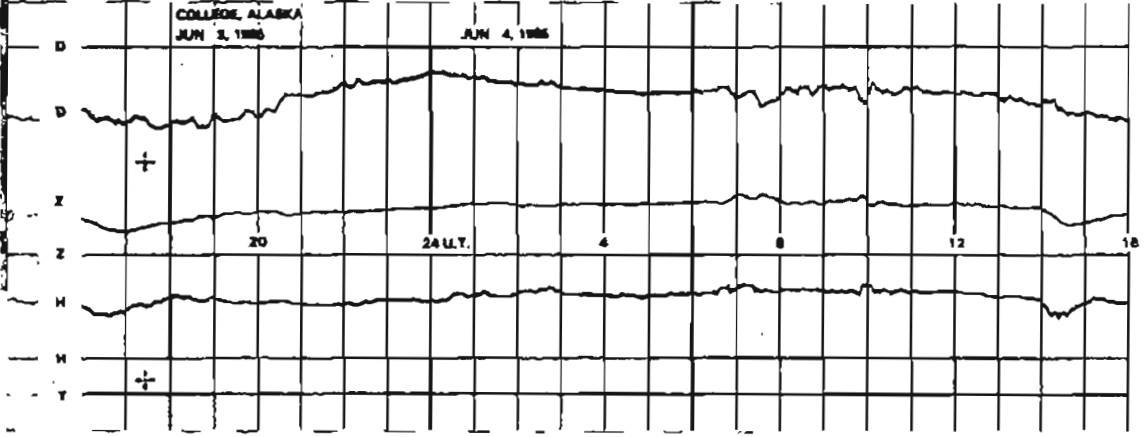
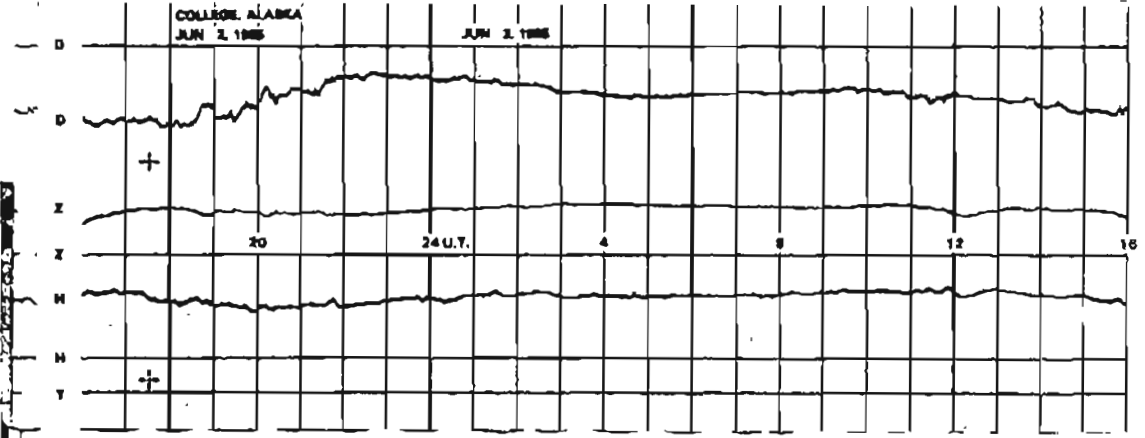
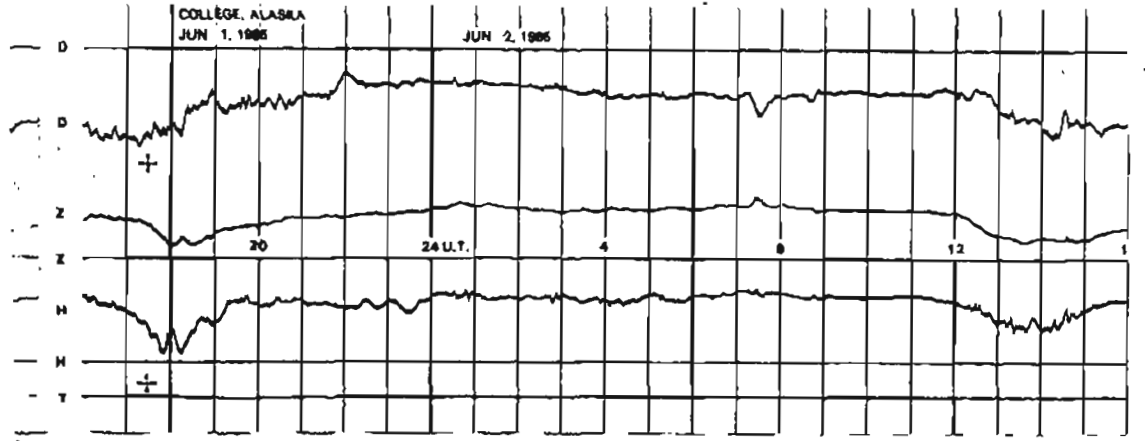
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FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

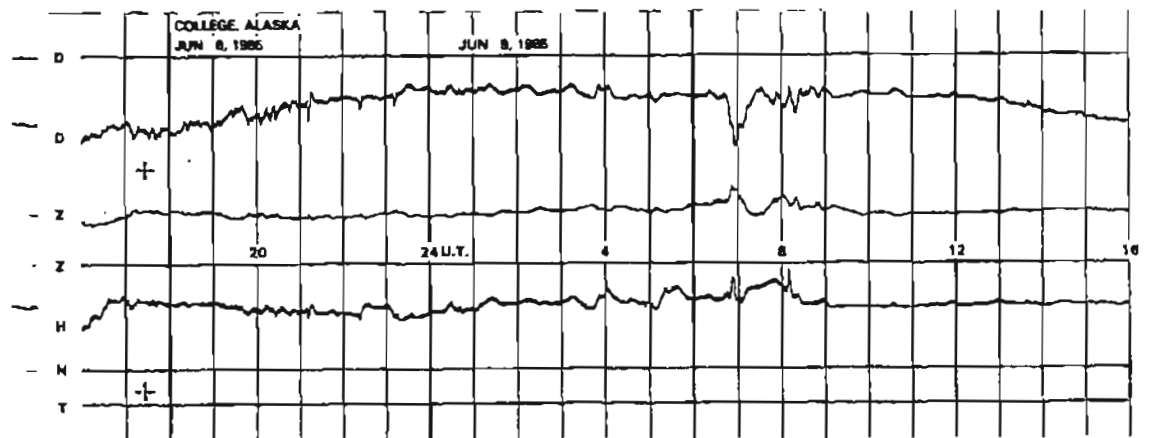
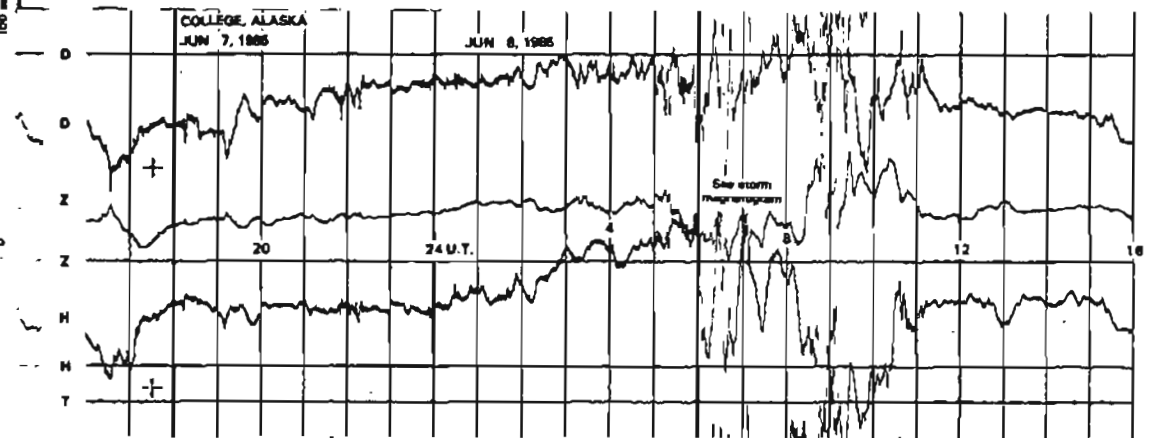
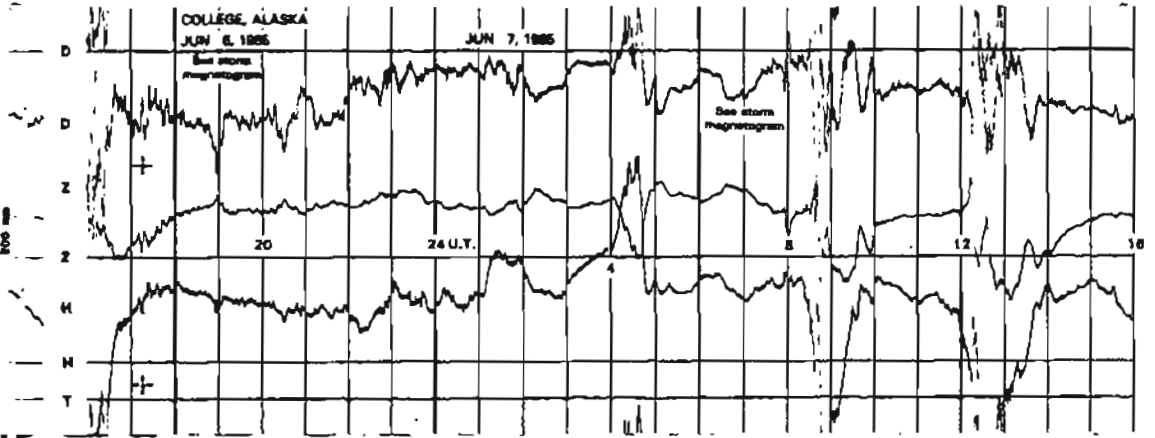
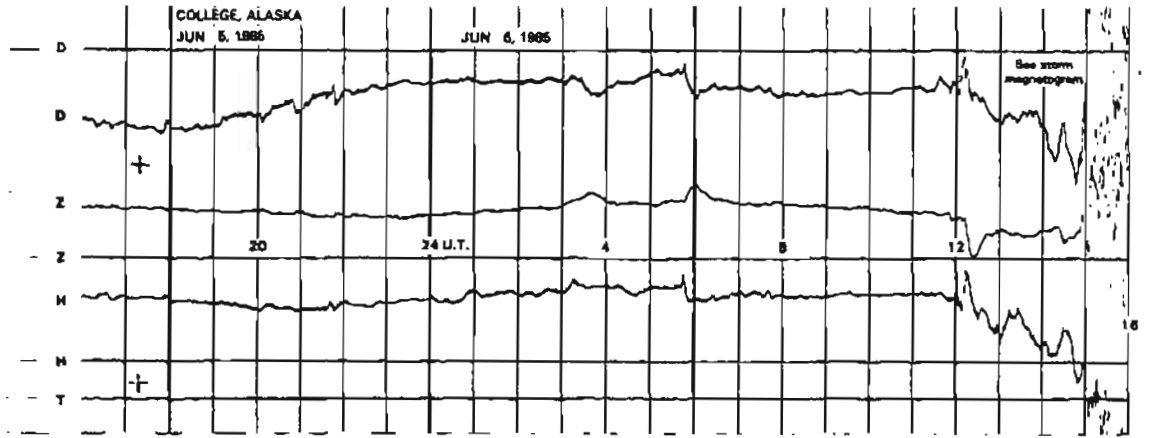


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

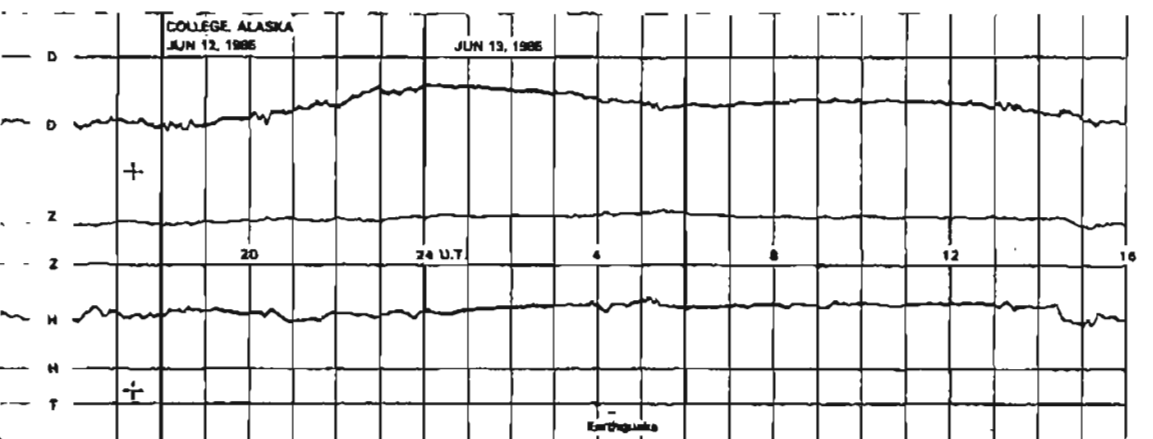
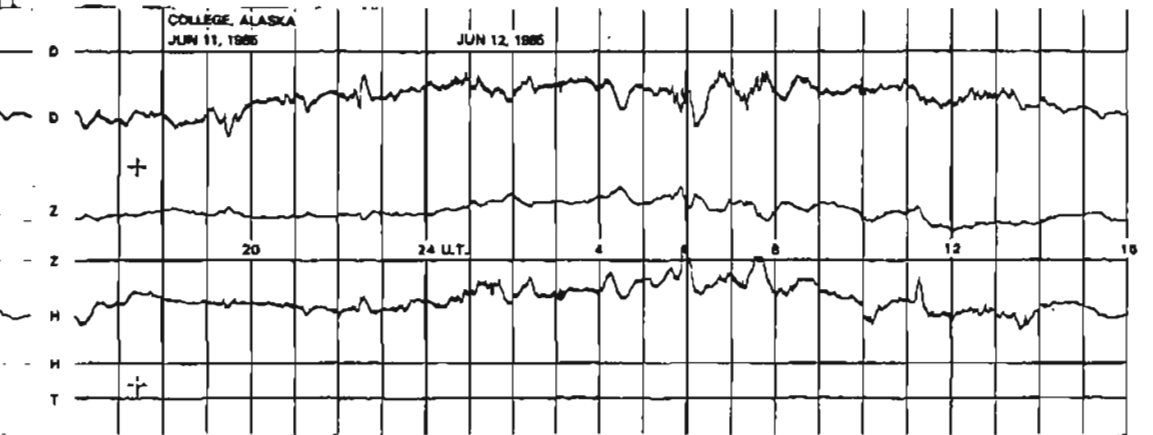
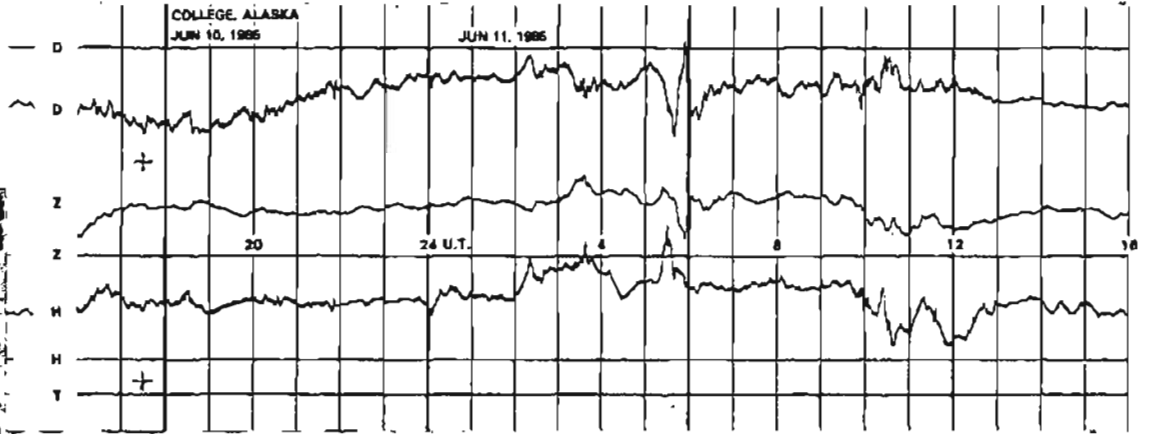
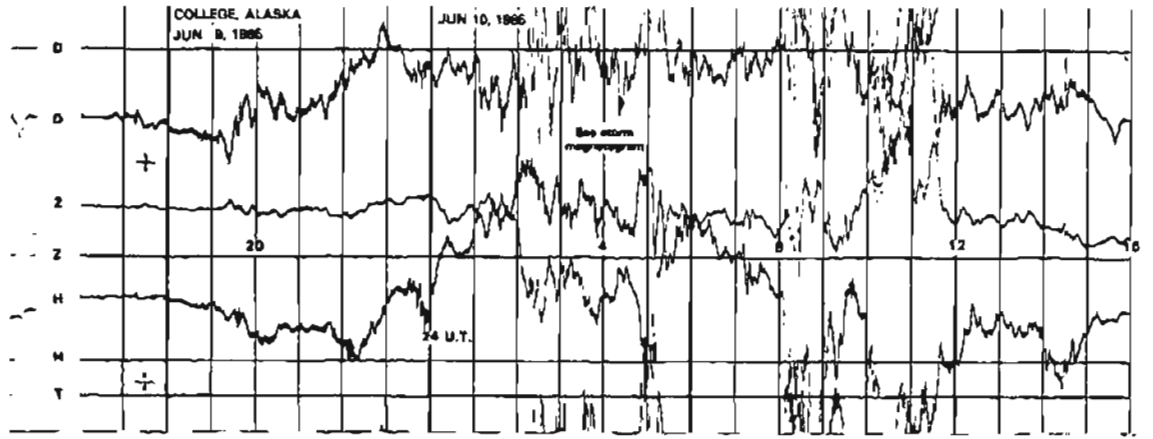
NORMAL MAGNETOGRAMS



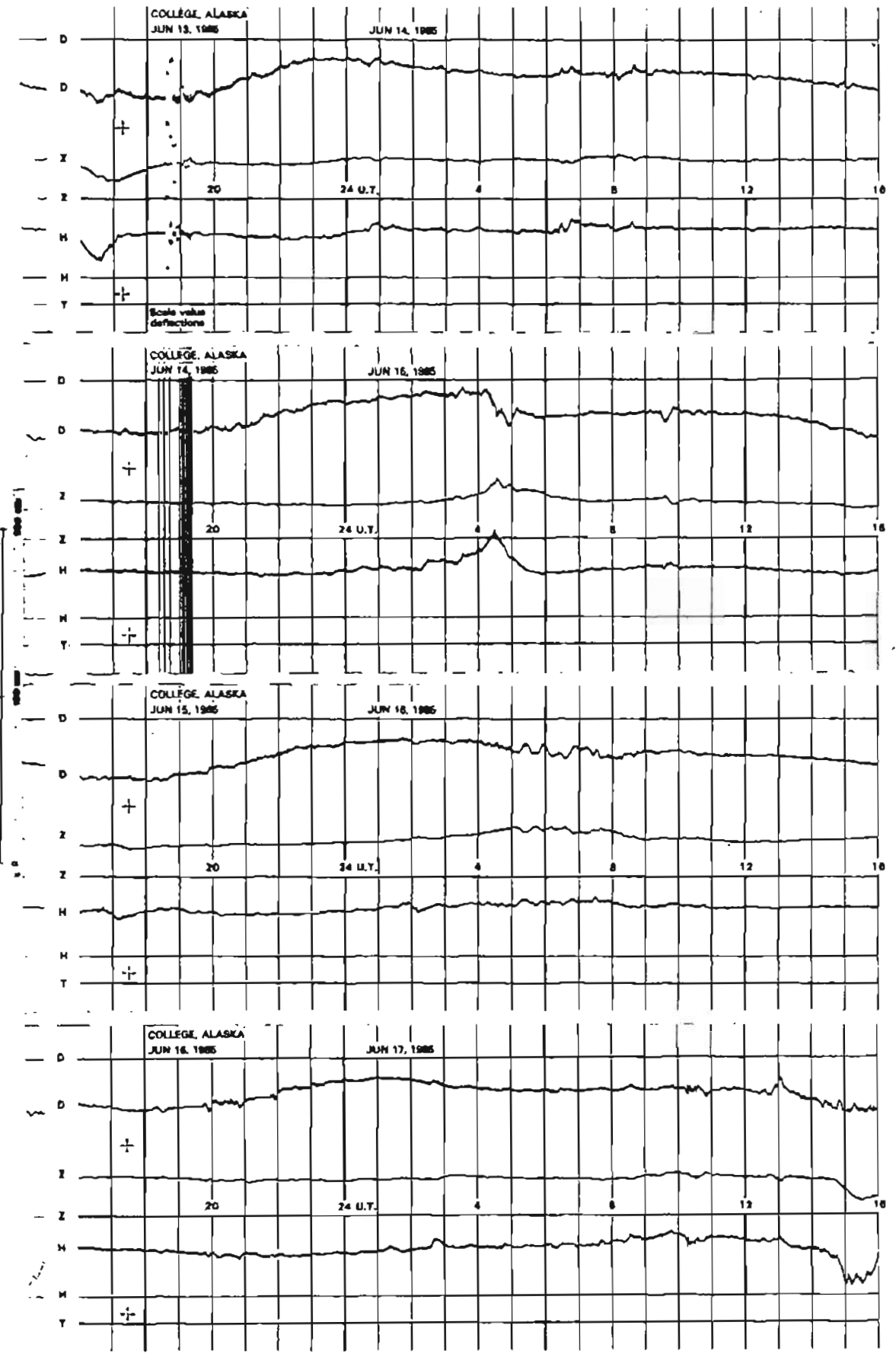
NORMAL MAGNETOGRAMS



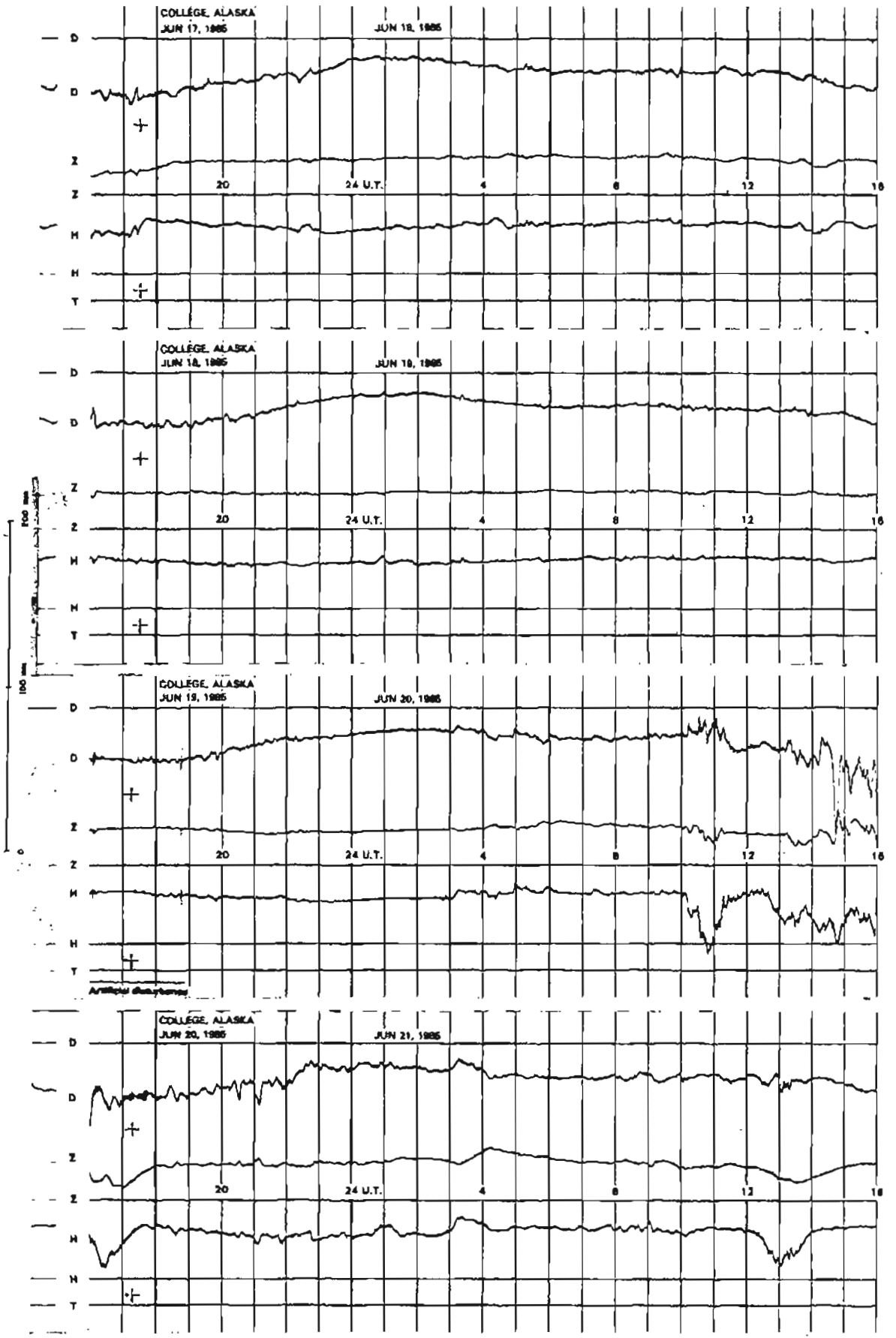
NORMAL MAGNETOGRAMS



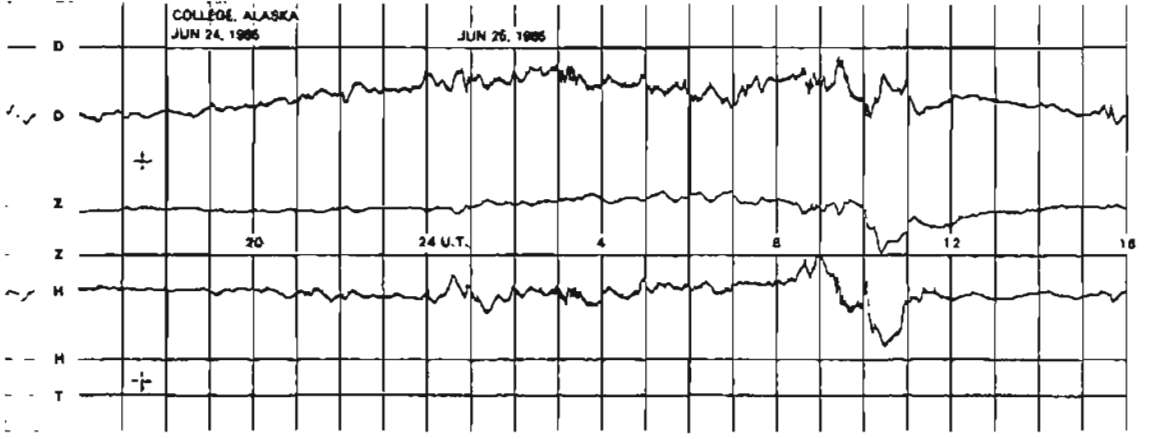
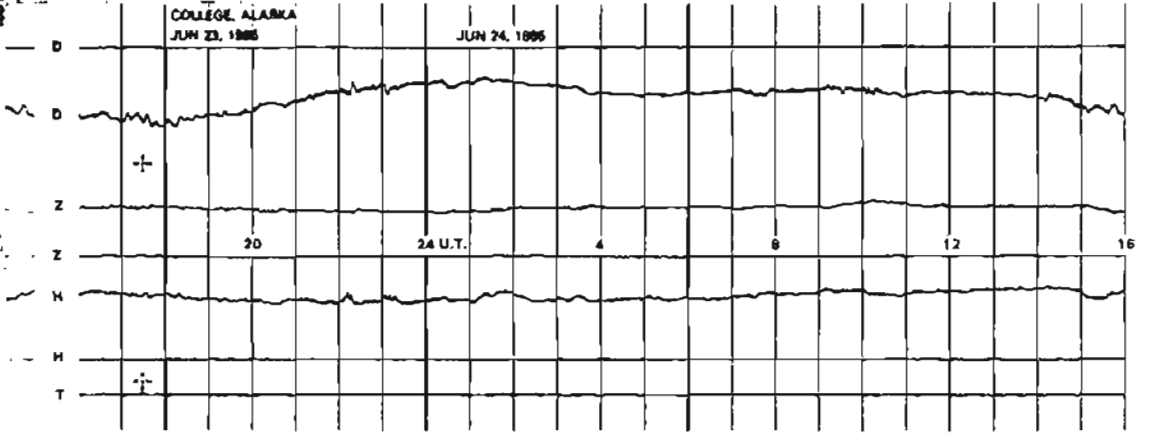
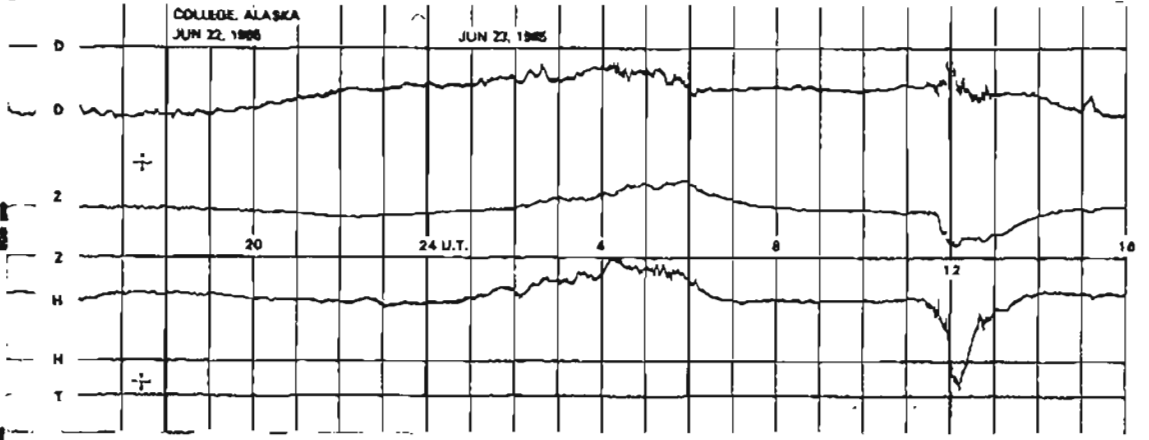
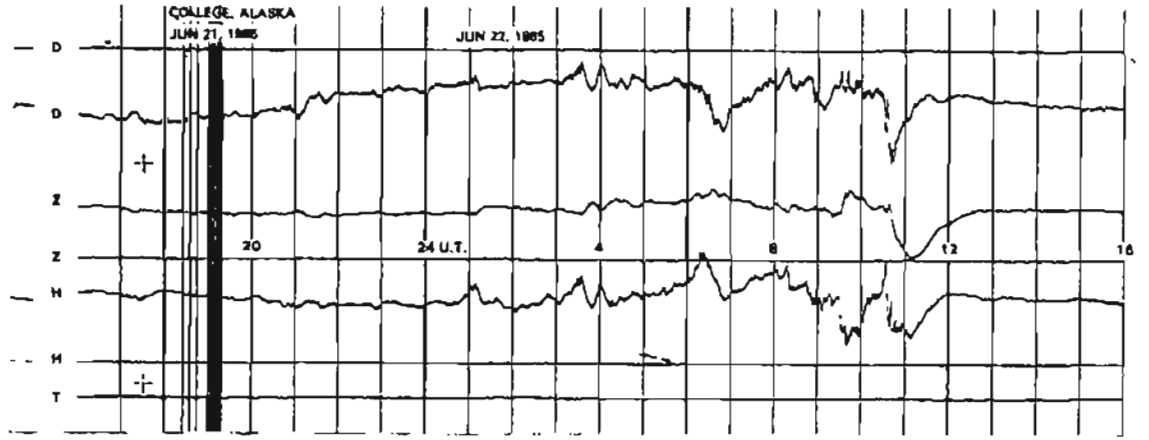
NORMAL MAGNETOGRAMS



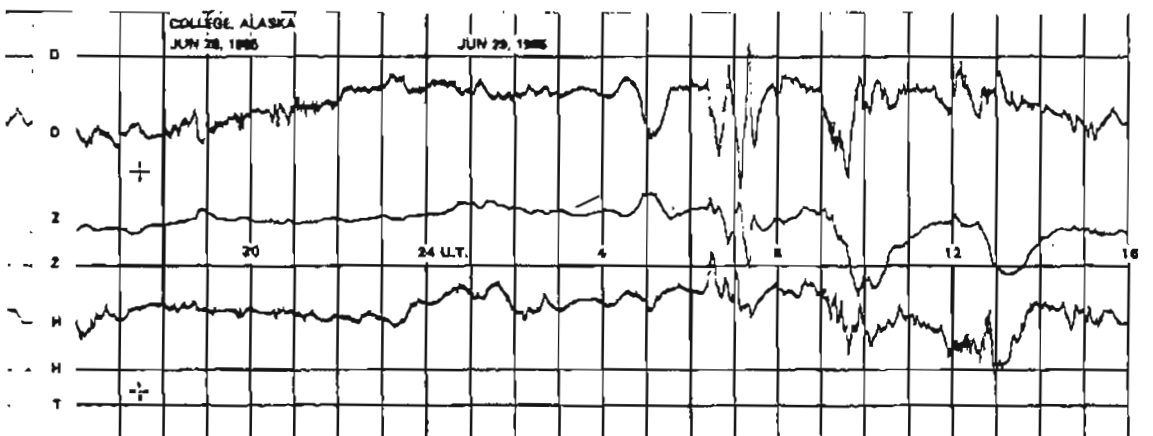
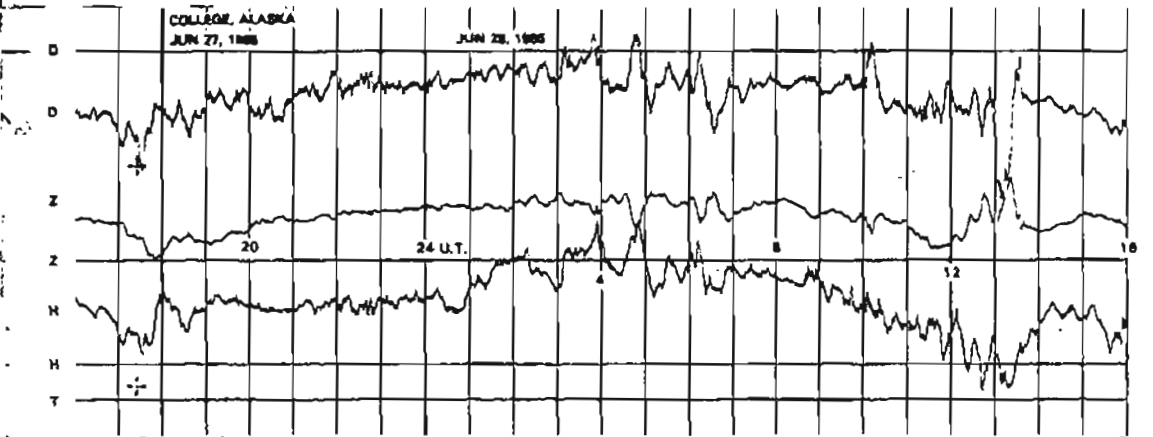
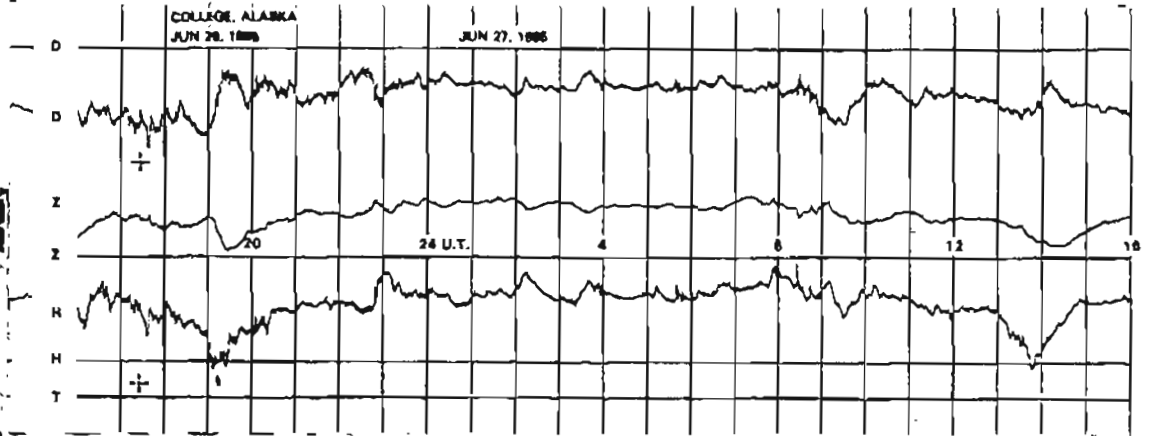
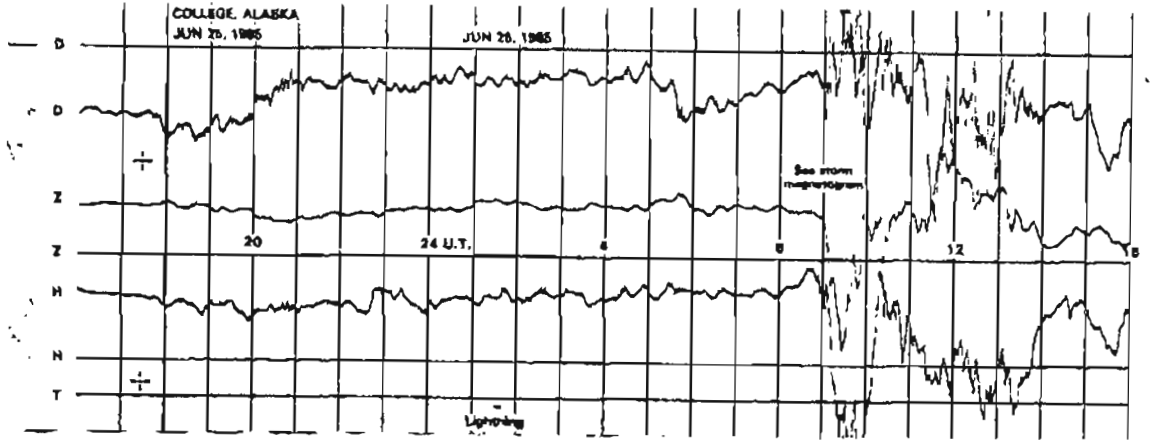
NORMAL MAGNETOGRAMS



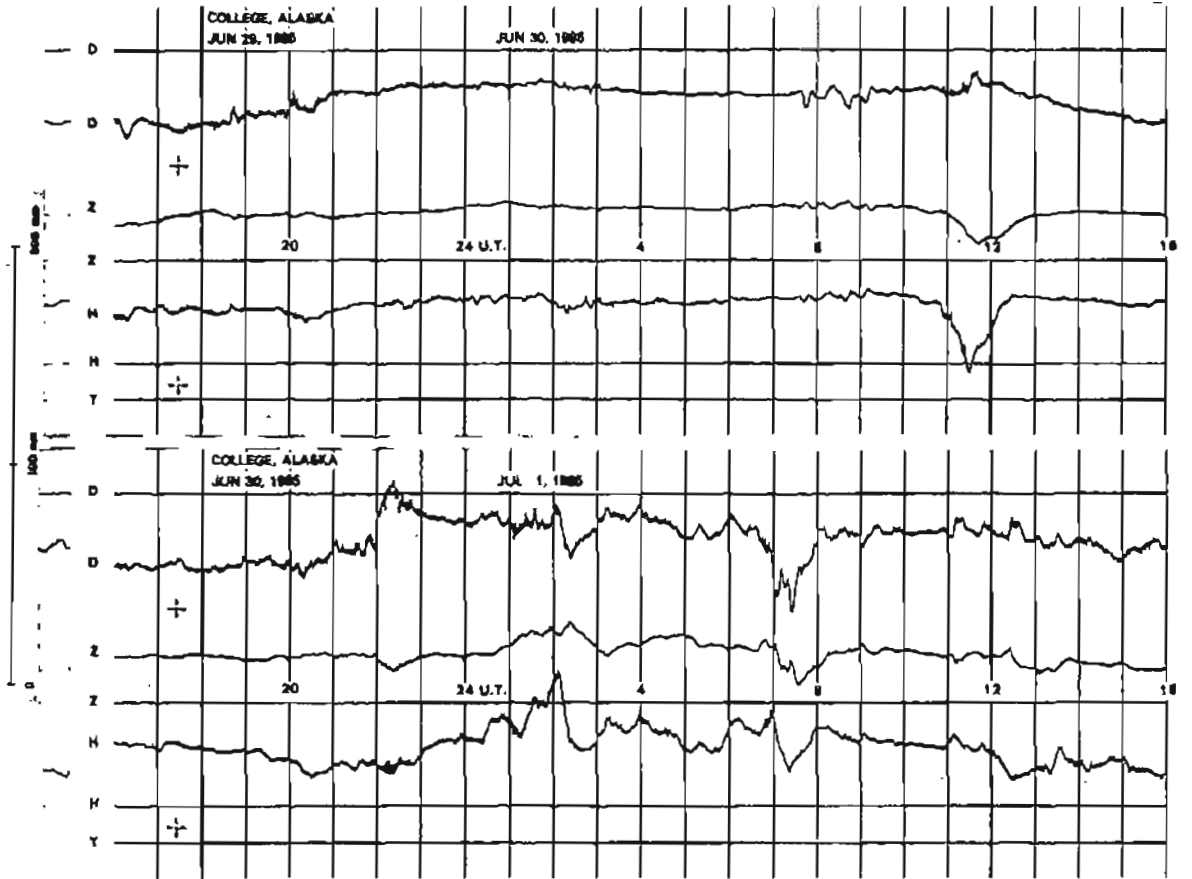
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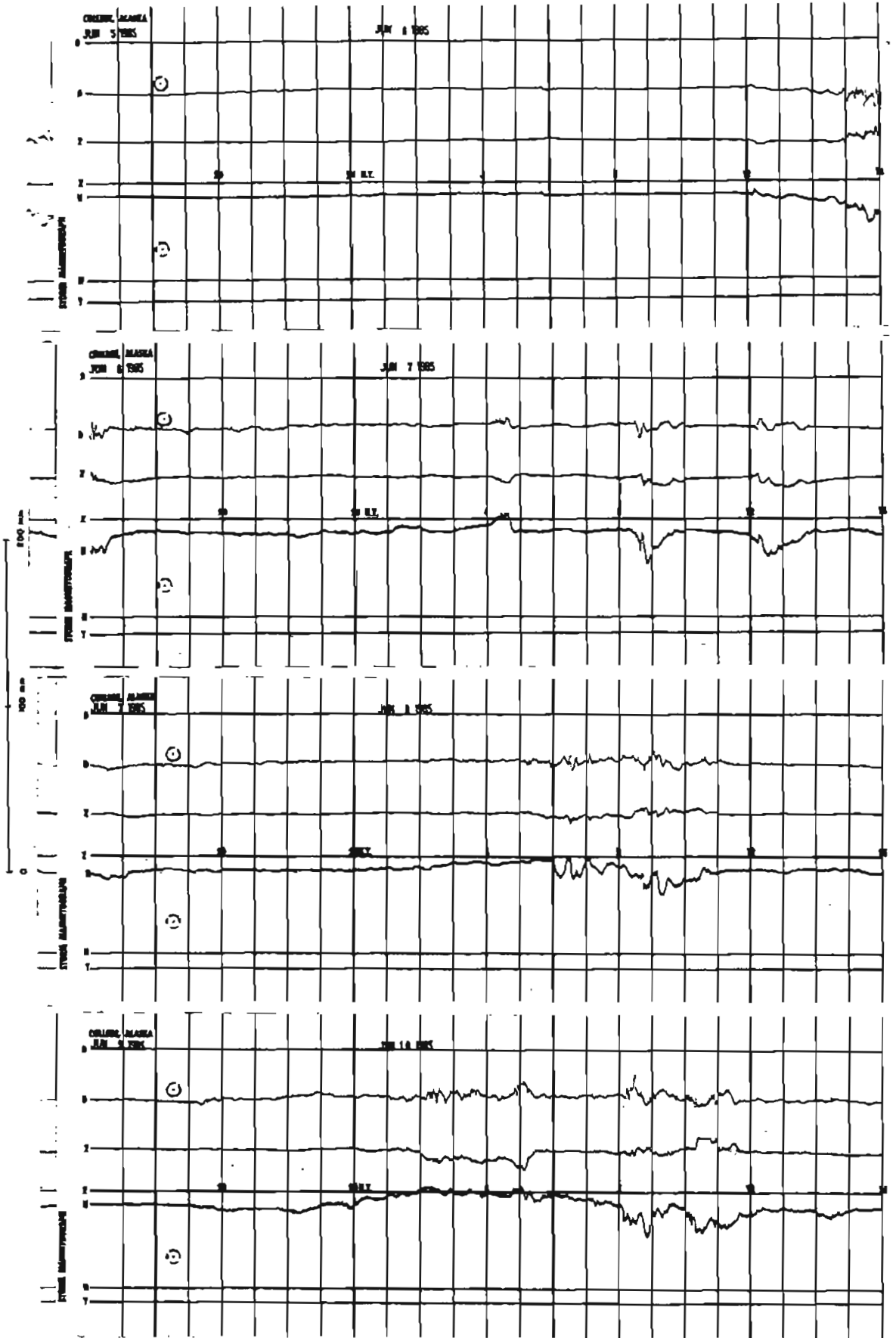
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS

