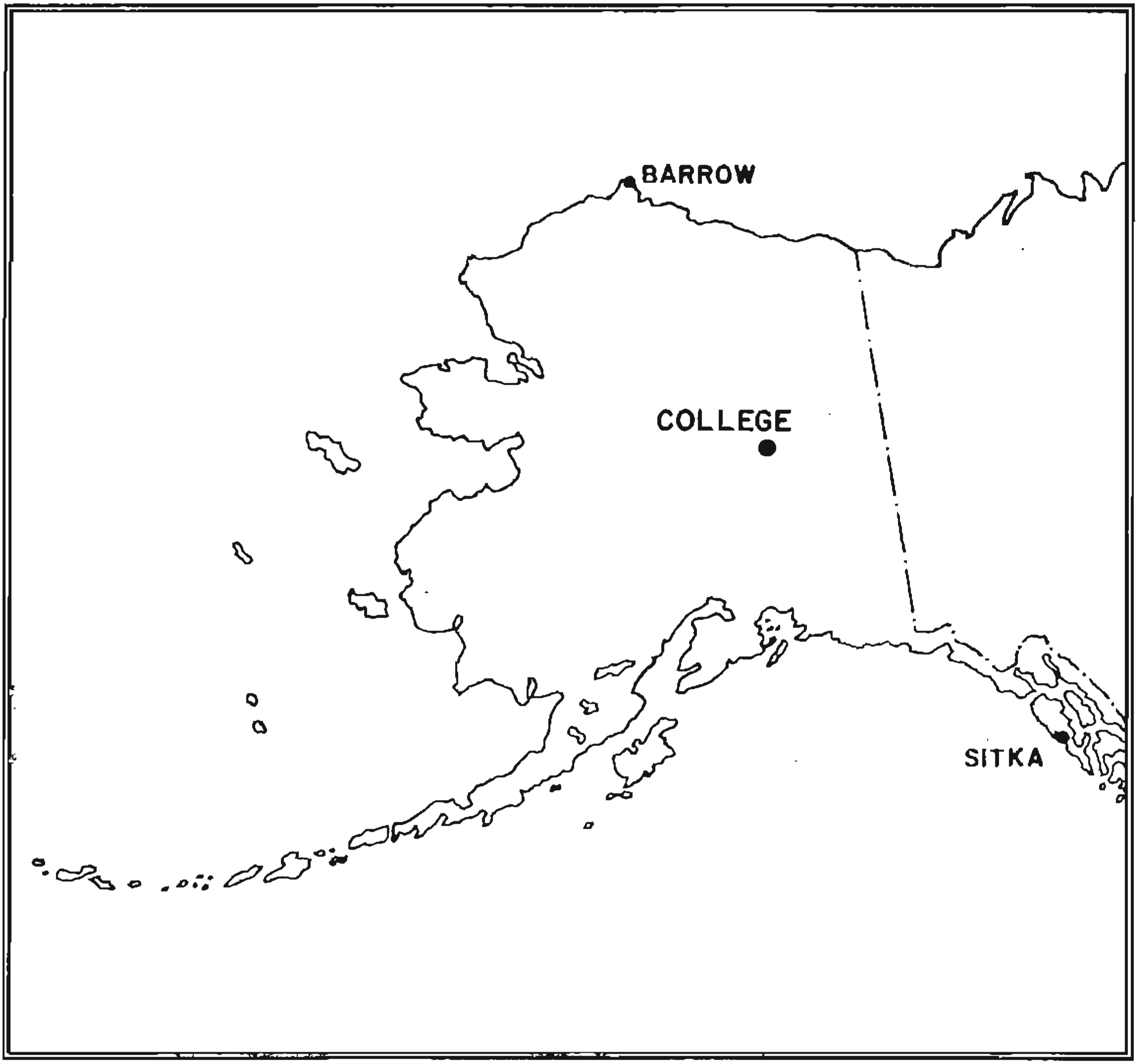
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

APRIL 1983

OPEN FILE REPORT 83-0300D


BARROW
COLLEGE
SITKA

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)

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
500 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 OBSERVATORY

MONTH AND YEAR: APRIL 1983

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	3	5	4	6	5	5	3	2	33	36
2	3	3	3	5	3	4	2	2	25	19
3	2	3	3	5	6	1	1	2	23	22
4	2	3	4	5	3	4	5	2	28	24
5	3	3	3	4	4	3	1	1	22	15
6	3	4	6	5	6	5	4	3	36	43
7	3	4	4	7	6	5	4	4	37	49
8	4	4	4	5	7	4	3	2	33	40
9	2	3	3	5	4	5	3	3	28	24
10	3	3	4	5	4	3	2	3	27	21
11	3	2	3	2	0	1	1	1	13	07
12	3	2	4	5	4	4	2	2	26	21
13	4	5	5	6	7	4	3	3	37	50
14	4	4	6	5	5	5	4	5	38	44
15	5	5	7	6	6	6	5	3	43	67
16	5	5	4	7	6	5	4	4	40	56
17	3	2	5	4	3	5	4	3	29	25
18	3	3	2	4	4	4	2	1	23	16
19	1	3	3	6	5	5	2	1	26	27
20	3	3	4	4	5	4	3	2	28	23
21	4	3	4	3	4	2	2	3	25	18
22	3	4	5	6	2	2	1	0	23	23
23	2	3	5	4	4	2	2	3	25	19
24	3	4	5	7	5	6	6	4	40	58
25	5	4	4	6	5	5	4	5	38	44
26	4	4	4	5	6	6	2	2	33	38
27	4	4	4	4	4	4	1	2	27	22
28	4	3	3	4	5	2	2	1	24	19
29	2	3	5	5	7	6	6	3	37	54
30	3	4	7	5	4	5	3	3	34	42
31										

SUDDEN COMMENCEMENTS

d	h	m

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

BEGIN d	h	m	END d	h	m

K SCALE USED:	D	H	Z	
LOWER LIMIT FOR K = 9.........	683.8	321.7		(mm)
CURRENT SCALE VALUE.........	3.73	7.76		(γ/mm)
LOWER LIMIT FOR K = 9	2550	2500		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY
OBSERVER IN CHARGE

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973-761-887

OUTSTANDING MAGNETIC EFFECTS	OBSERVATORY COLLEGE, ALASKA	
	MONTH APRIL	YEAR 1983

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
06	0005	ssc*	
18	10xx	pi 2	

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.

NOAA FORM 86-500
(11/73)

Data from Individual Observatories:

PRINCIPAL MAGNETIC STORMS

COLLEGE OBSERVATORY, COLLEGE, ALASKA
APRIL 1983

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

Obs. 2 letter IAGA code	Geomag. lat.	Commencement			SC - amplitudes			Max. 3 hr - index K			Ranges			UT End	
		day	hr min (UT)	type	D(')	H(γ)	Z(γ)	day	(3 hr - period)	K	D(')	H(γ)	Z(γ)	day	hr
CO	64°6 N	06	0005	s.c.*	-6	+30	..	07 08	4 5	7 7	209	1740	1040	09	00
		13	00XX	..	..	..	..	13 15 16	5 3 4	7 7 7	234	1470	1090	18	05
		23	20XX	..	..	..	..	24	4	7	214	1450	850	27	17
		29	03XX	..	..	..	..	29 30	5 3	7 7	163	1310	980	May 01	14

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: APRIL 1983

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 4-1-83	2400 U.T., 4-30-83	1'.0/mm	3.7γ/mm	27° 46'.8 E
H	0000 U.T., 4-1-83	1831 U.T., 4-15-83	7.8γ/mm		12759γ
	1832 U.T., 4-15-83	2400 U.T., 4-24-83	"		12756γ
	0000 U.T., 4-25-83	2400 U.T., 4-30-83	"		12762γ
Z	0000 U.T., 4-1-83	1831 U.T., 4-15-83	7.7γ/mm		55150γ
	1832 U.T., 4-15-83	2400 U.T., 4-24-83	"		55129γ
	0000 U.T., 4-25-83	2400 U.T., 4-30-83	"		55140γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 4-1-83	1831 U.T., 4-15-83	7'.9/mm	29.6γ/mm	23° 41'.3 E
	1832 U.T., 4-15-83	2400 U.T., 4-30-83	"	"	24° 21'.1 E
H	0000 U.T., 4-1-83	1831 U.T., 4-15-83	43.9γ/mm		11517γ
	1832 U.T., 4-15-83	2400 U.T., 4-30-83	"		10808γ
Z	0000 U.T., 4-1-83	1831 U.T., 4-15-83	48.4γ/mm		54088γ
	1832 U.T., 4-15-83	2400 U.T., 4-30-83	"		54108γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION
	FROM	TO	SCALE VALUE
D			
H			
Z			

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 52'.4 E	12955γ	55388γ

* COMPUTED FROM ~~TEN~~ FIVE QUIETEST DAYS DURING MONTH. **

DAYS USED: APR. 2, 5, 11, 18, 21, ___, ___, ___, ___, ___

** NOTE: DUE TO VERY DISTURBED MAGNETIC CONDITIONS DURING THE MONTH OF APRIL 1983, ONLY 5 DAYS ARE USED TO COMPUTE THE MONTHLY MEAN ABSOLUTE VALUES.

FORM 76-106

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	83	APR	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 M S	Tra 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	50	32	13	16	94	55	70	-138	-107	-99	84	-11	01	44	195	230	293	218	135	158	90	59	67	101	63	1712
			02	49	33	-2	-31	-2	-29	42	-16	36	58	66	128	02	50	58	153	259	86	58	65	62	71	36	52	41	1323
			03	50	14	-18	-65	72	-58	20	66	38	44	72	74	03	53	113	101	92	88	107	110	93	106	100	24	4	1300
			04	-8	-22	-37	-70	-31	154	-50	-46	14	-6	85	85	04	178	112	235	234	262	404	406	101	-8	40	24	52	2108
			05	2	2	-4	26	16	-20	41	15	20	27	47	102	05	120	148	136	121	63	90	83	90	84	84	82	60	1435
			06	32	6	-20	10	18	59	49	18	-233	-145	74	219	06	124	315	283	208	176	172	109	44	18	22	34	43	1635
			07	33	-5	-8	27	-8	88	69	44	36	-2	-51	346	07	-42	152	151	289	156	137	103	71	66	52	100	53	1857
			08	33	37	34	-15	-27	80	99	63	41	75	122	96	08	371	-257	132	217	173	96	95	114	96	82	74	56	1897
			09	44	25	36	14	17	56	38	41	165	6	120	74	09	166	173	178	198	263	97	86	99	81	78	68	49	2172
			10	50	22	49	60	49	73	162	52	223	51	66	164	10	11	86	118	134	99	108	89	84	36	68	42	55	1951
			11	24	21	30	35	24	52	36	74	136	37	40	59	11	69	69	89	108	122	127	127	115	72	34	34	28	1562
			12	6	1	46	29	60	66	66	63	48	-51	102	101	12	76	86	100	65	173	142	79	94	51	39	28	23	1493
			13	0	10	-40	38	51	109	9	51	-25	-74	43	77	13	69	116	108	115	160	230	205	125	8	81	77	10	1553
			14	-39	-72	-96	-154	-217	-47	-26	37	-98	-129	-82	204	14	219	148	529	394	312	300	68	100	65	-67	-41	-11	1297
			15	258	64	-82	-114	-122	7	-42	-98	-82	-98	100	44	15	27	140	188	426	379	204	266	32	38	32	28	29	1643
			16	50	-18	-36	-37	-74	-15	24	-90	-38	-18	45	-34	16	69	387	108	292	218	230	96	60	80	125	116	58	1598
			17	-10	-16	7	-36	28	13	79	24	135	-15	22	46	17	79	85	96	96	288	236	204	118	74	-14	6	37	1582
			18	13	-24	-1	-40	45	46	4	26	36	31	39	49	18	106	85	106	216	177	122	150	142	54	25	52	24	1483
			19	18	22	15	14	-14	13	43	36	-24	-121	30	79	19	196	213	379	426	331	213	152	104	93	86	55	22	2381
			20	-17	-29	-24	-48	-48	4	42	28	40	-2	44	-2	20	106	93	205	230	244	264	205	62	16	-20	46	32	1471
			21	-13	-35	-52	-46	0	-22	-39	-9	55	34	30	45	21	90	98	93	122	146	134	127	106	108	56	33	-2	1059
			22	-6	4	-72	-79	-119	-121	-209	-273	-177	-98	72	62	22	82	101	118	120	124	133	125	98	77	59	26	-9	44
			23	-19	-38	-38	-25	-100	-42	-7	44	-93	-45	19	82	23	65	78	145	152	166	185	184	174	136	146	13	-76	1106
			24	-36	-64	-106	-124	-157	-77	-52	-26	-85	-21	121	169	24	201	162	120	551	149	495	243	161	182	33	-11	74	1902
			25	58	12	-47	-20	6	-29	52	21	44	32	18	-21	25	35	53	188	352	304	273	-14	36	117	102	28	126	1726
			26	33	14	-3	-70	29	-65	353	-23	26	-82	134	98	26	92	320	224	526	153	150	150	140	130	110	38	34	2511
			27	-13	0	18	-66	-46	100	19	72	-1	42	50	0	27	13	100	159	164	111	156	145	129	89	85	46	22	1394
			28	-1	-30	-61	24	-52	-38	18	16	28	73	35	29	28	-40	40	116	131	132	166	120	81	71	65	27	6	959
			29	0	-28	-21	-65	-112	-50	-37	2	-40	3	12	47	29	151	404	182	262	301	198	213	158	24	35	-56	-20	1563
			30	-24	-46	-23	16	-49	31	-24	-120	-207	-65	-96	24	30	86	146	101	354	176	158	144	115	97	66	59	29	948
			31													31													

SCALED BY	LYT
CHECKED BY	TKC, JEP
SIGNATURE 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 Magn., converted to Normal Magn.

MONTHLY SUM	46654
MONTHLY MEAN	65
DATES WITH GAPS	

FORM 74-186

U.S. DEPARTMENT OF THE 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 (150 M.T.) is hour 11 of the same universal day. Shrinkage corrections have been applied. Negative values are in red, with minus sign shown.

OBSY.	YEAR	MONTH	ELEMENT
CO	83	APR	Z

C	Q or S		Day	01	02	03	04	05	06	07	08	09	10	11	12	Day	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	337	344	356	372	348	356	254	189	166	167	232*	325	01	329	194	279	345	208	295	298	294	290	318	342	341	7029
			02	340	358	338	352	368	360	366	298	348	368	241	214	02	271	304	270	254	255	172	197	248	304	307	313	322	7168
			03	359	351	341	344	392	376	386	363	365	334	328	325	03	227	205	279	290	305	317	321	315	320	322	325	344	7834
			04	346	350	366	376	390	379	379	374	340	318	498	416	04	336	340	322	331	184	143	233	128	180	283	301	318	7631
			05	316	363	373	371	332	353	353	289	256	280	330	356	05	361	302	265	253	282	276	295	294	298	304	308	314	7526
			06	317	314	342	377	385	374	385	314	392	502	423	703*	06	697*	445*	461	410	356	274	238	287	310	326	331	341	9304
			07	337	356	377	364	365	370	380	342	172	224	261	60*	07	59	207	268	380	282	258	232	304	324	325	362	363	6974
			08	330	341	336	334	360	362	305	250	214	261	268	322	08	565*	79*	221	192	216	220	264	276	293	297	301	293	6923
			09	300	304	308	301	308	350	306	252	202	239	273	137	09	189	304	297	264	250	217	257	265	268	295	302	326	6534
			10	336	320	339	329	312	358	328	310	106	150	241	242	10	158	239	245	232	250	277	263	288	278	293	304	328	6546
			11	311	307	312	322	311	318	298	320	280	259	305	270	11	278	286	294	297	294	292	296	298	290	268	294	296	7116
			12	293	300	324	313	310	304	308	303	292	123	217	215	12	266	246	265	262	224	188	240	266	268	260	284	303	6394
			13	314	341	344	366	308	327	333	310	284	314	316	562	13	539*	539*	368	230	275	290	274	252	190	237	256	273	7544
			14	267	322	301	318	292	193*	79*	38	124*	266	346	541	14	565*	397	401*	326*	271	218	242	264	282	266	317	306	6956
			15	255*	271	311	306	186*	309	190	199	165	249	419*	665*	15	536	603*	464*	401*	104*	-75	137	251	316	338	367	393	7360
			16	403	353	322	338	361	391	261	326	356	346	442	406	16	437	402	361	312	226	199	292	296	327	370	411	394	8332
			17	357	365	389	375	408	364	368	326	225	157	279	339	17	344	330	283	286	251	305	242	292	329	339	352	366	7691
			18	366	369	356	366	428	384	364	366	370	356	340	365	18	326	267	276	208	263	334	342	334	317	306	325	328	8130
			19	331	334	337	340	349	396	396	382	320	259	323	356	19	374	423	352*	301*	358*	228	320	334	327	336	337	345	8160
			20	346	373	372	384	411	440	420	371	252	298	335	322	20	366	386	317	315	242	160	246	226	259	290	328	346	7805
			21	366	366	386	350	389	367	276	345	400	359	341	340	21	287	244	259	308	329	324	329	316	320	322	328	328	8003
			22	369	387	389	399	342	215	94*	154	233	414	378	344	22	347	340	346	332	328	321	326	324	321	320	326	334	7683
			23	346	350	376	416	393	471	416	375	320	391	425	422	23	352	314	318	330	346	341	327	309	302	324	338	341	8643
			24	359	355	372	378	366	135	135	171	253	417	435*	323	24	605*	699*	655*	617*	239	189*	244	223	309	356	353	347	8535
			25	346	352	310	344	350	352	326	327	340	308	618	323	25	381	172	186	359*	428*	227*	176	234	295	316	367	393	7652
			26	393	362	358	348	391	338	239	152	293	354	473	457	26	434	287	372*	417*	286	267	307	322	324	333	346	345	8198
			27	346	352	376	337	346	384	354	330	186	320	325	246	27	195	207	229	277	242	269	304	320	313	316	316	314	7210
			28	338	338	360	384	379	421	427	395	361	325	298	289	28	246	214	222	244	300	309	296	297	295	291	282	279	7589
			29	305	331	335	314	333	371	362	336	241	363	406	386	29	548*	586*	706*	770*	819*	637*	497*	448*	200	350	339	330	10313
			30	357	368	351	363	315	283	254	145*	194	315	445	432	30	441	414	315	461	272	262	277	303	304	302	333	321	7647
			31													31													

SCALED BY	LYT
CHECKED BY	TKC, 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 Magnetogram, converted to Normal Magnetogram.

MONTHLY SUM	231160
MONTHLY MEAN	321
DATES WITH GAPS:	

FORM 71-106

U.S. DEPARTMENT OF THE INTERIOR
Geological Survey, Geomagnetic 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 (130 M.T.) is hour 11 of the same universal day. Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

OBSY.	YEAR	MONTH	ELEMENT
CO	83	APR	H

C	Q or S	Tro D	Day \ Hr	01	02	03	04	05	06	07	08	09	10	11	12	Day \ Hr	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	244	264	293	415	397	359	403	326	407	303	-260	147	01	50	-57	-2	-191	51	276	190	156	270	266	250	259	4876
			02	276	274	298	296	303	361	387	466	390	309	197	70	02	222	182	148	-19	-8	160	220	234	255	242	241	250	5754
			03	318	313	268	338	318	352	313	326	310	330	283	162	03	180	223	244	240	250	254	263	251	236	198	183	215	6028
			04	233	252	276	339	414	374	504	493	413	363	68	-24	04	16	-6	-19	-35	-87	-112	-86	95	251	264	270	260	4536
			05	297	352	339	279	266	364	376	372	331	344	253	123	05	125	40	165	217	234	268	250	277	267	257	233	230	6249
			06	230	234	315	274	340	450	323	387	-130	-130	40	-108	06	-436	-299	-95	124	93	104	210	290	276	257	244	247	3240
			07	273	324	310	266	459	492	369	294	209	171	-111	-813	07	-72	230	212	-99	57	185	138	255	245	227	231	218	4090
			08	270	405	299	326	363	416	367	336	240	271	112	62	08	-366	-314	260	156	34	189	245	264	250	248	243	250	4946
			09	256	267	240	264	274	297	273	340	354	289	173	-26	09	0	30	24	-114	-157	202	258	236	232	235	236	279	4464
			10	265	297	275	282	270	338	252	293	256	218	156	-122	10	41	170	170	139	214	259	234	232	220	230	228	266	5187
			11	240	255	274	280	276	259	248	299	288	281	272	240	11	266	264	263	256	252	253	246	239	225	226	232	222	6158
			12	252	277	226	258	243	275	253	254	276	104	246	176	12	52	247	267	210	86	178	250	261	262	249	236	247	5365
			13	256	314	359	282	442	394	321	332	240	342	292	-196	13	-586	-27	-106	260	299	237	216	150	166	226	233	248	4694
			14	335	442	465	436	661	602	465	246	131	30	115	-106	14	-202	-253	-406	-122	-72	-21	206	153	111	224	215	333	4052
			15	545	470	414	442	567	398	200	-202	-72	215	64	-213	15	22	-55	-399	-610	-445	-9	54	286	270	266	268	276	2752
			16	414	362	555	419	529	394	308	338	365	130	-284	-357	16	-425	-250	2	-145	-108	145	235	186	255	216	315	279	3698
			17	258	328	317	317	337	359	381	415	245	126	210	246	17	237	164	95	147	-210	-22	48	211	148	226	242	256	5103
			18	257	244	270	327	329	261	266	268	262	266	249	193	18	10	179	24	-33	169	222	230	186	194	223	230	223	5093
			19	216	219	240	254	291	357	356	276	345	102	59	151	19	14	-81	-122	-125	-63	229	287	269	246	228	219	199	4166
			20	232	334	354	329	409	365	267	312	252	314	221	152	20	103	-75	-72	49	68	126	143	114	198	202	221	253	4671
			21	272	345	474	512	416	490	544	450	351	310	262	226	21	59	86	212	246	232	236	225	210	207	198	204	241	7010
			22	369	430	391	490	564	595	568	497	396	13	220	234	22	223	222	214	236	241	245	254	251	239	226	214	218	7570
			23	232	219	246	299	354	408	490	440	311	80	208	85	23	-2	190	254	286	260	271	257	242	234	214	209	224	6031
			24	278	303	263	370	426	446	508	426	239	-241	-648	-304	24	-179	51	76	-439	19	-326	-134	91	199	223	279	367	2313
			25	442	442	516	475	395	432	353	273	270	257	-321	-168	25	-207	33	1	-135	-184	-207	74	135	166	168	208	369	3867
			26	299	319	231	326	302	436	466	443	436	241	196	104	26	102	-479	-603	-371	69	301	275	261	236	214	197	220	4121
			27	322	436	295	288	394	270	252	260	165	267	239	56	27	23	166	132	46	167	243	252	229	219	205	205	210	5341
			28	251	284	365	377	322	370	346	248	269	275	231	182	28	-79	101	102	246	260	225	216	215	222	211	208	217	5666
			29	235	218	247	291	354	442	485	442	232	3	105	156	29	-174	-626	-309	-264	-378	-655	-343	-264	56	196	217	280	946
			30	309	316	308	238	316	440	442	64	115	244	50	98	30	21	79	87	-191	128	175	218	217	228	220	287	272	4683
			31													31													

SCALED BY	LYT
CHECKED BY	TAC, JEP
HONE REVIEWED BY	JEP
PUNCHED BY	

Preliminary base-line and scale values:

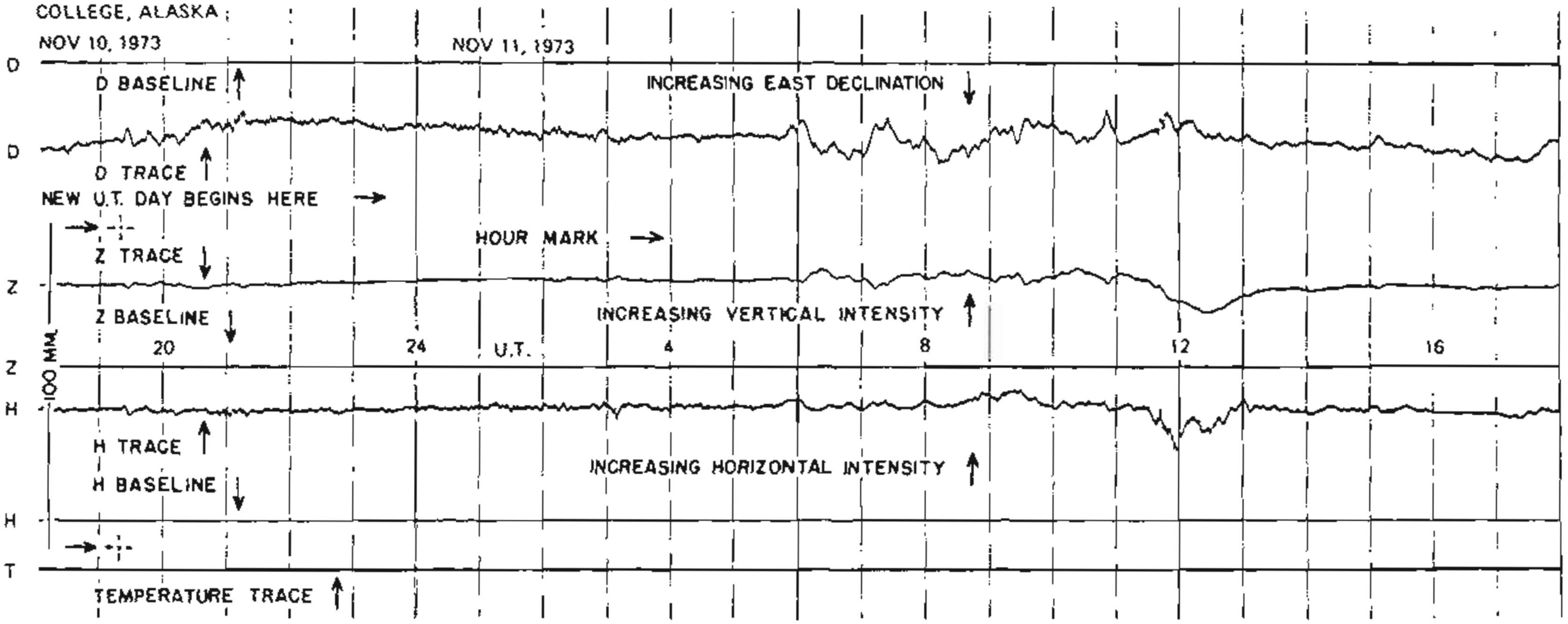
Interval Beginning	Base-line Value	Scale Value

( ) 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	143090
MONTHLY MEAN	199
DATES WITH GAPS:	

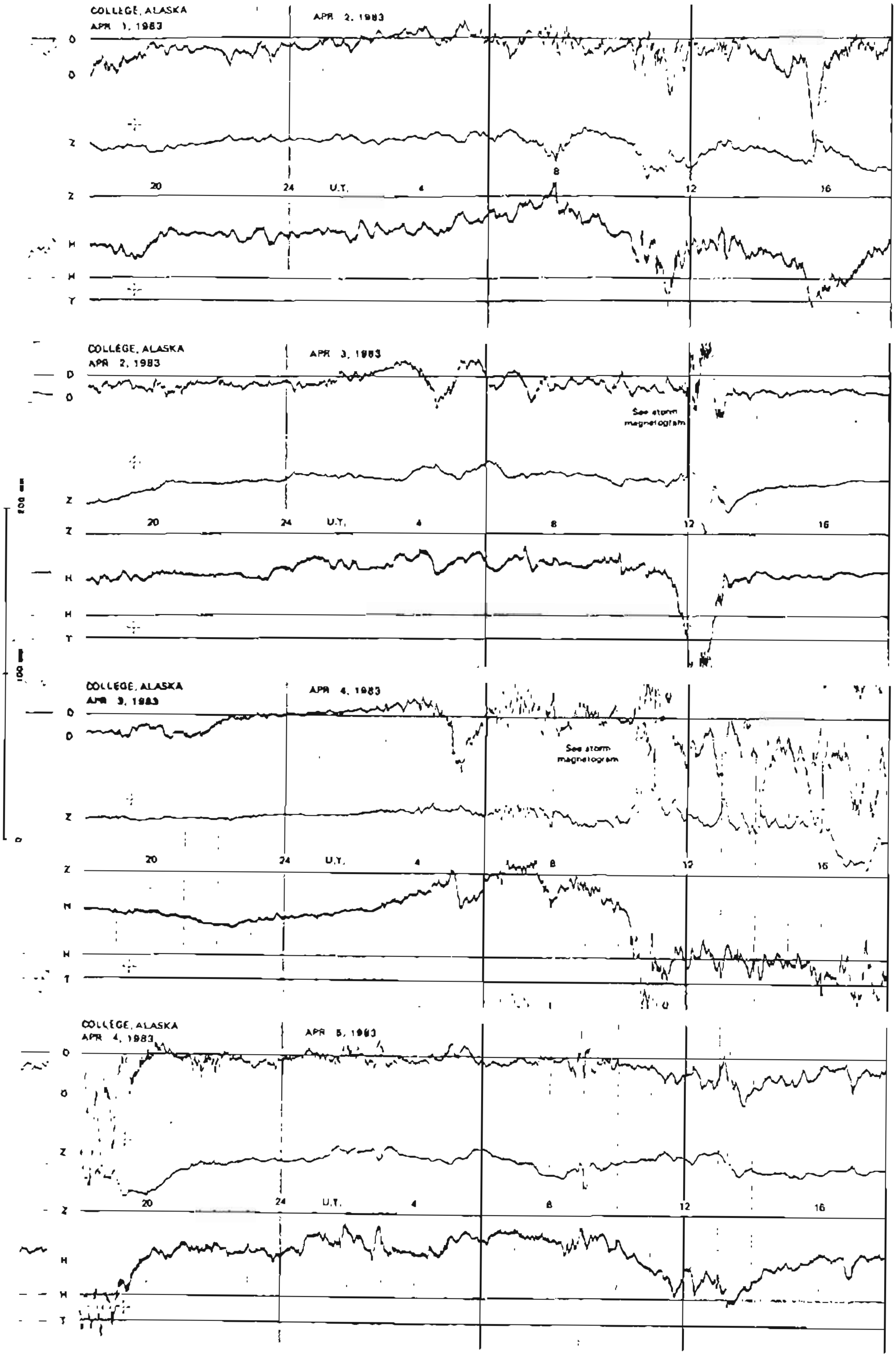
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)

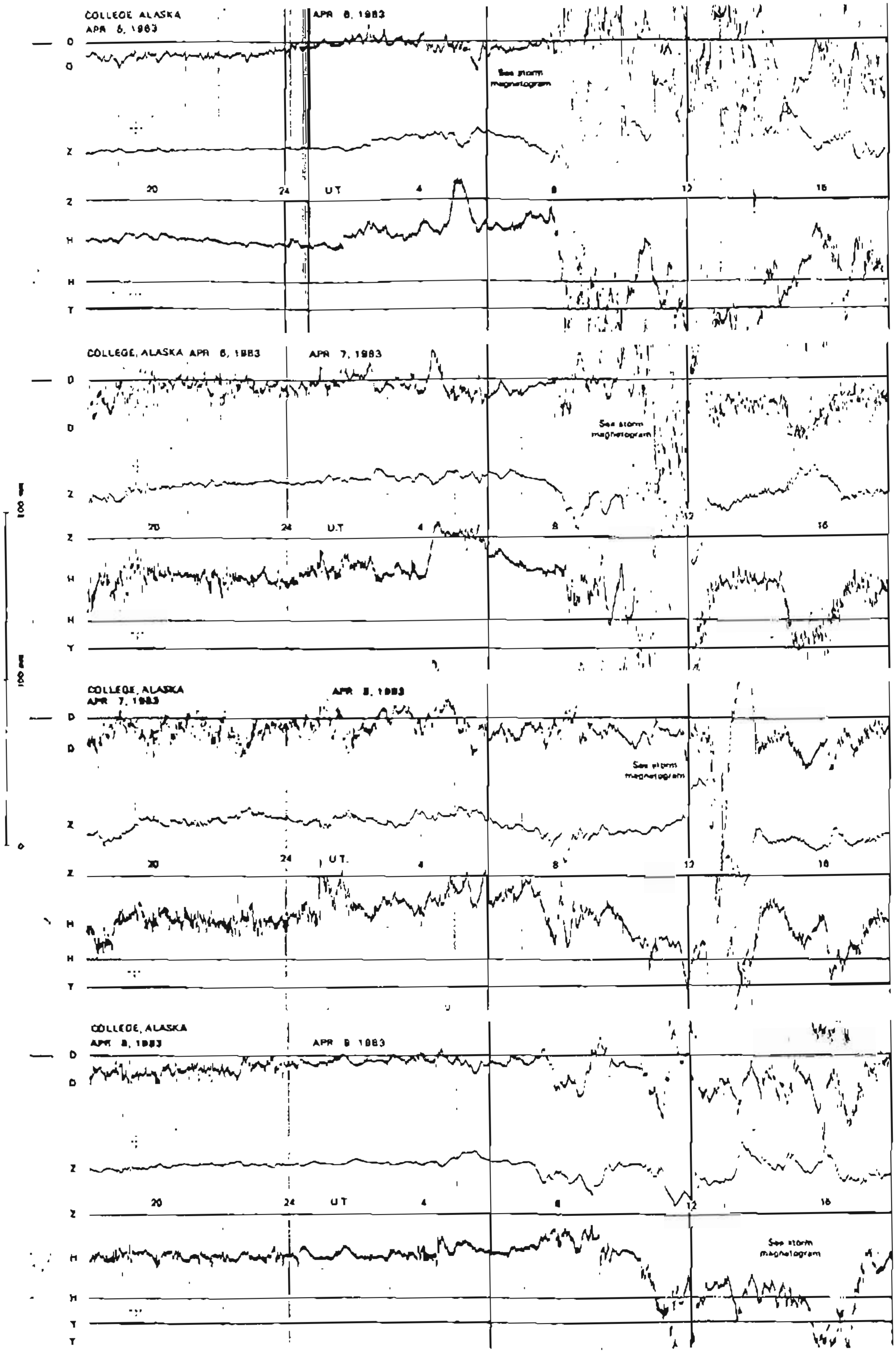


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

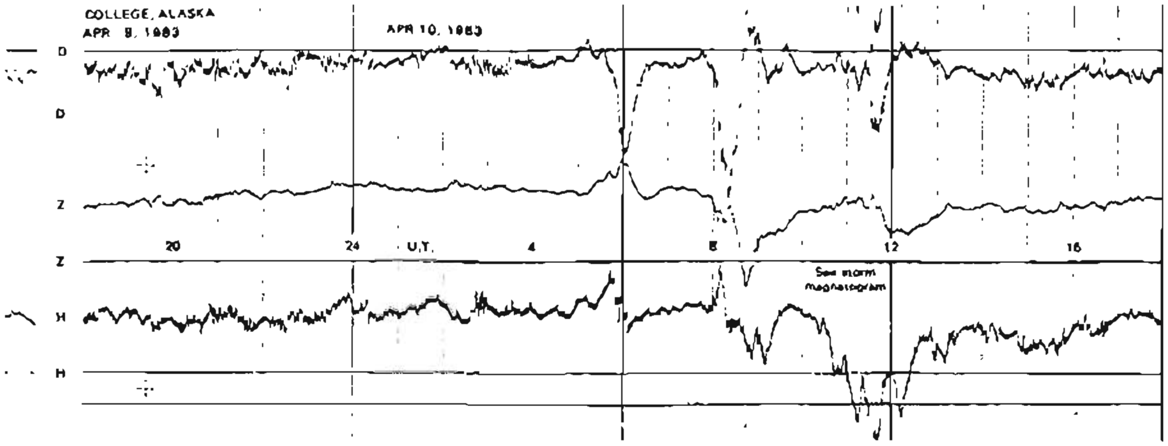
NORMAL MAGNETOGRAMS

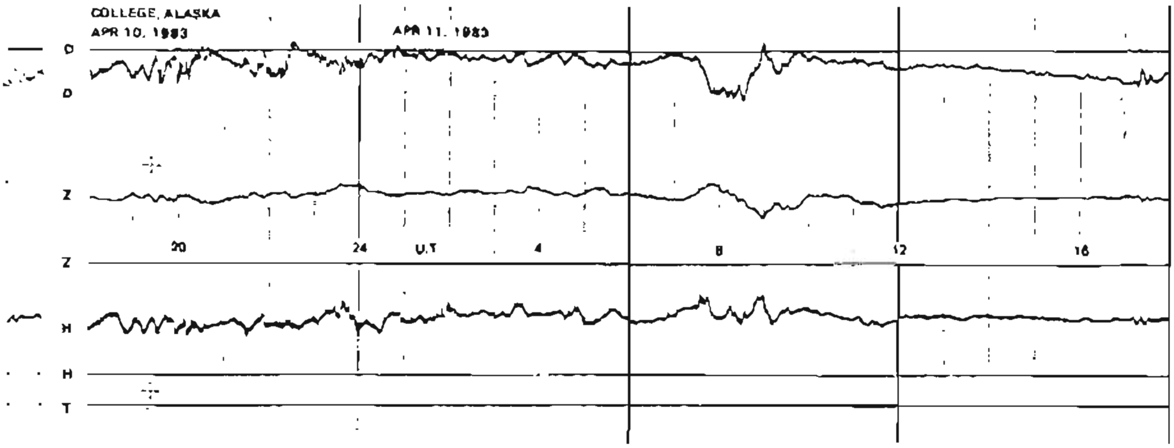


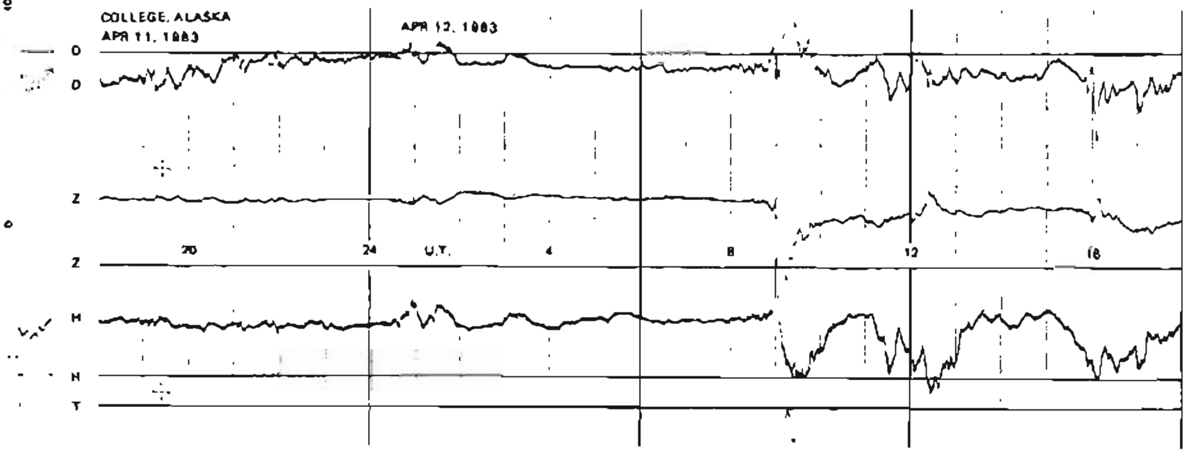
NORMAL MAGNETOGRAMS

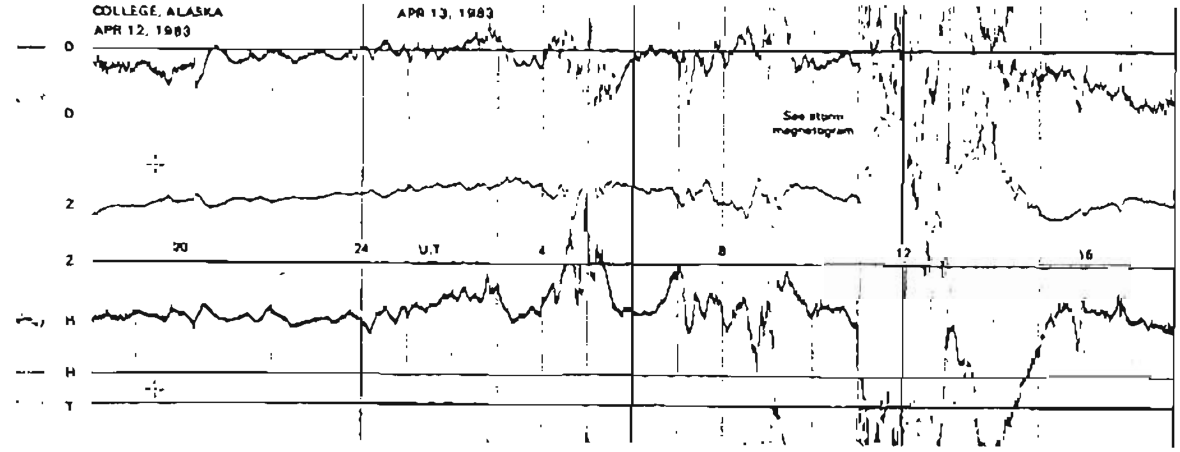


NORMAL MAGNETOGRAMS









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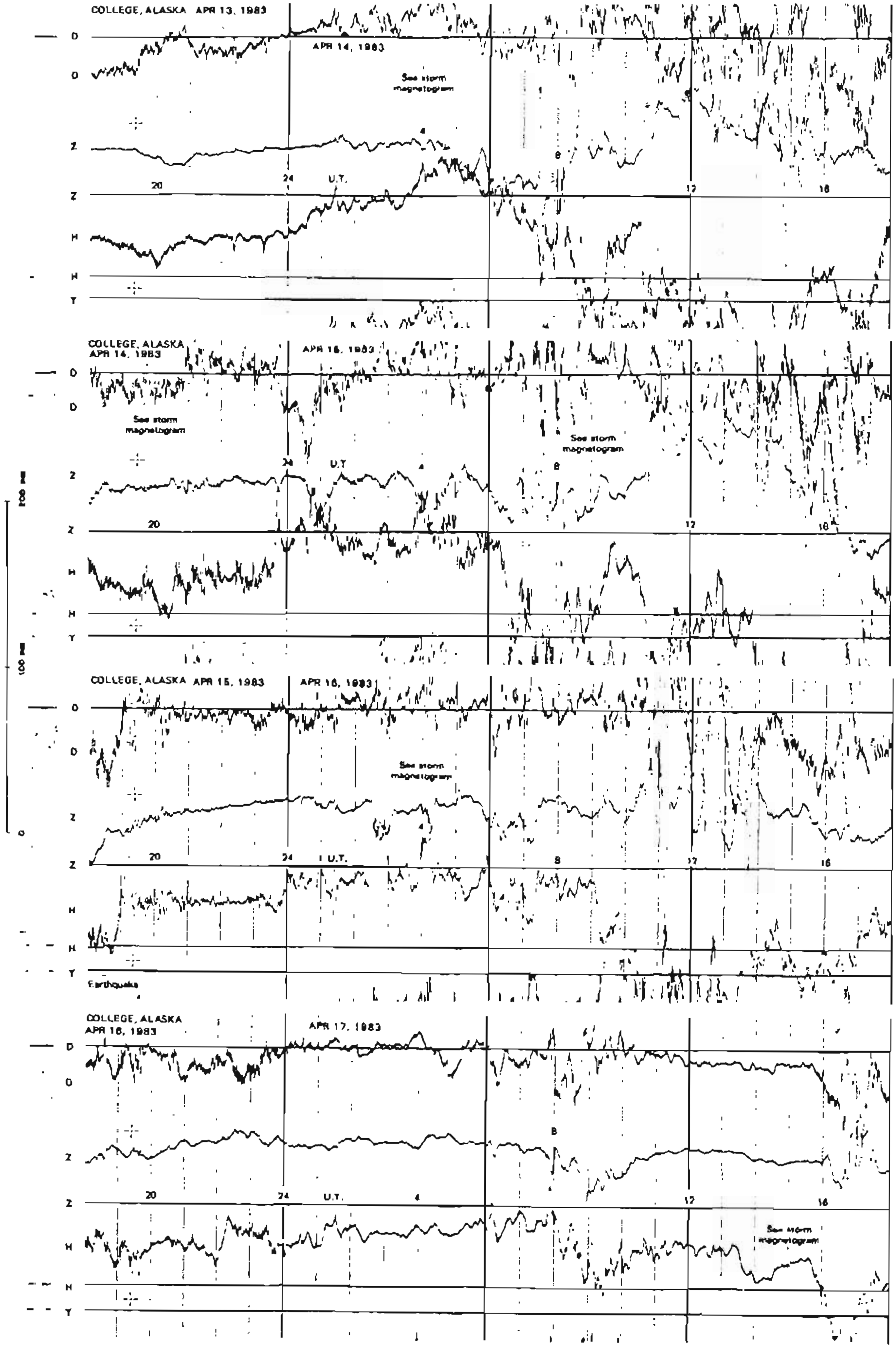

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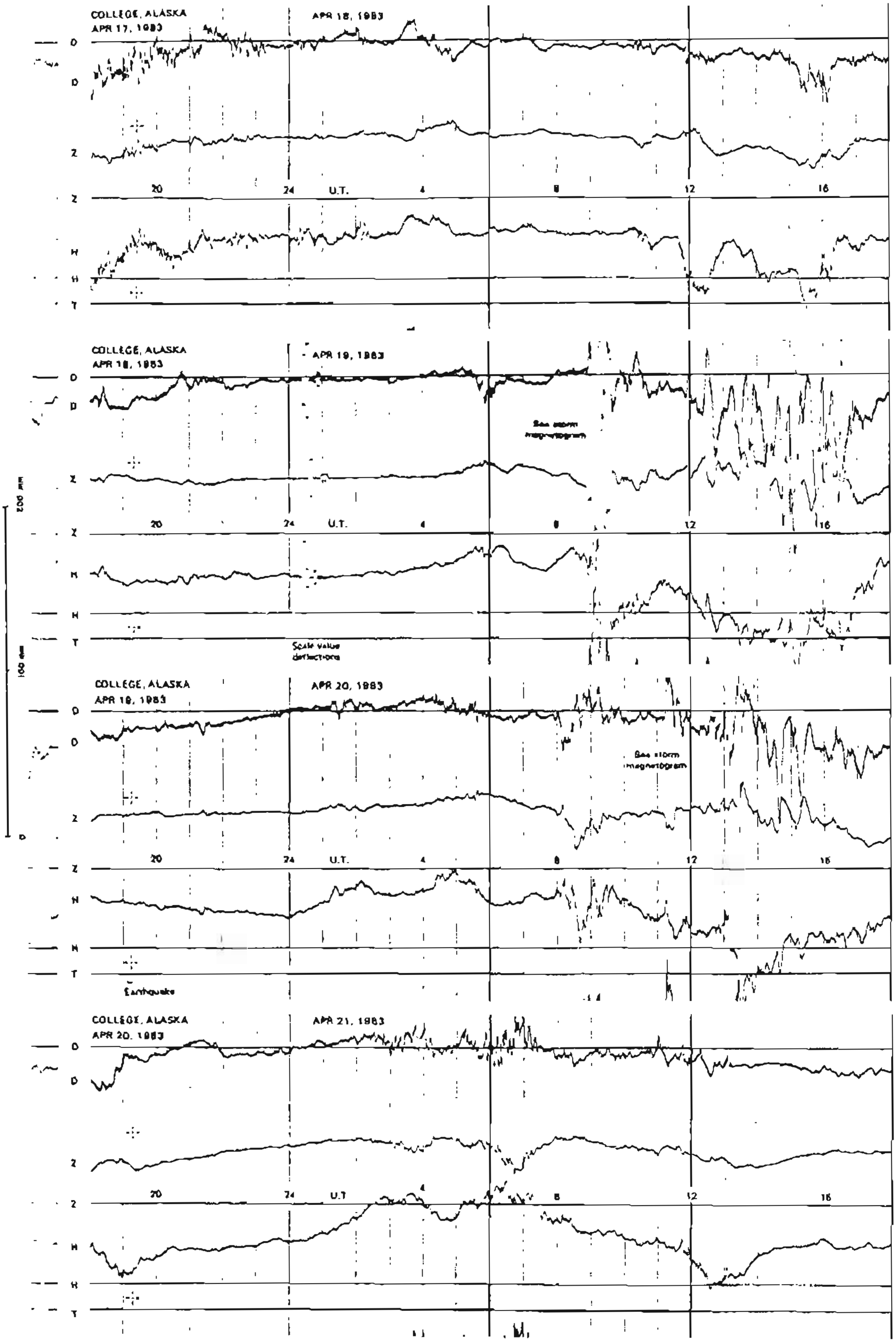

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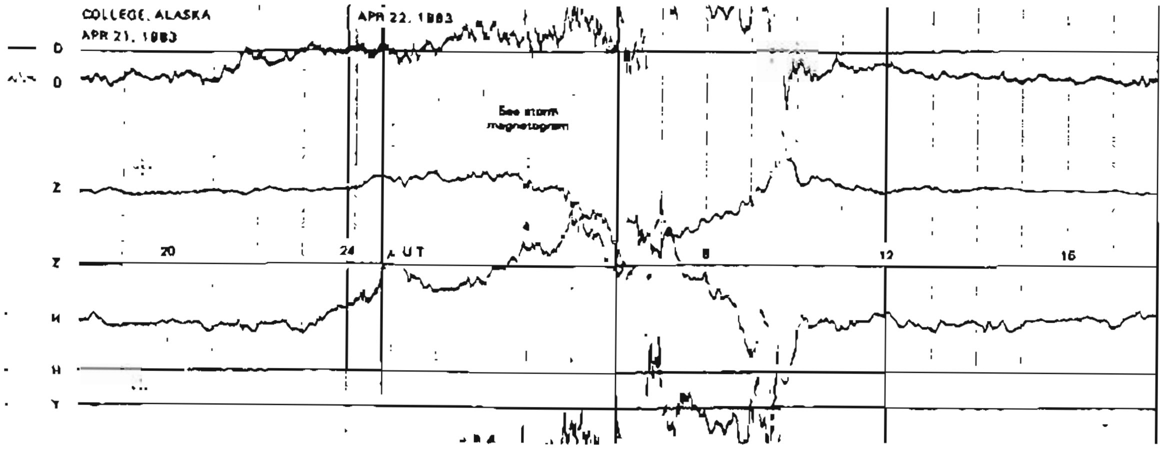

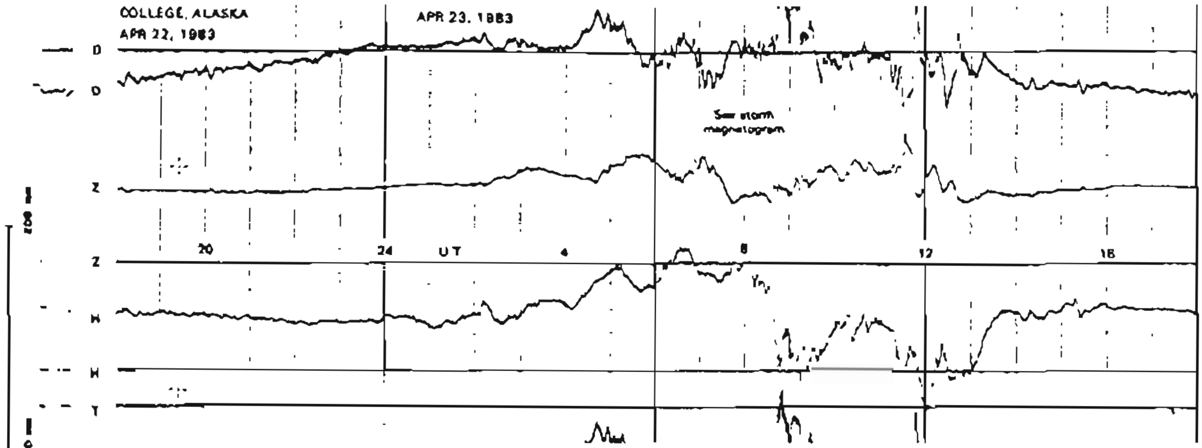

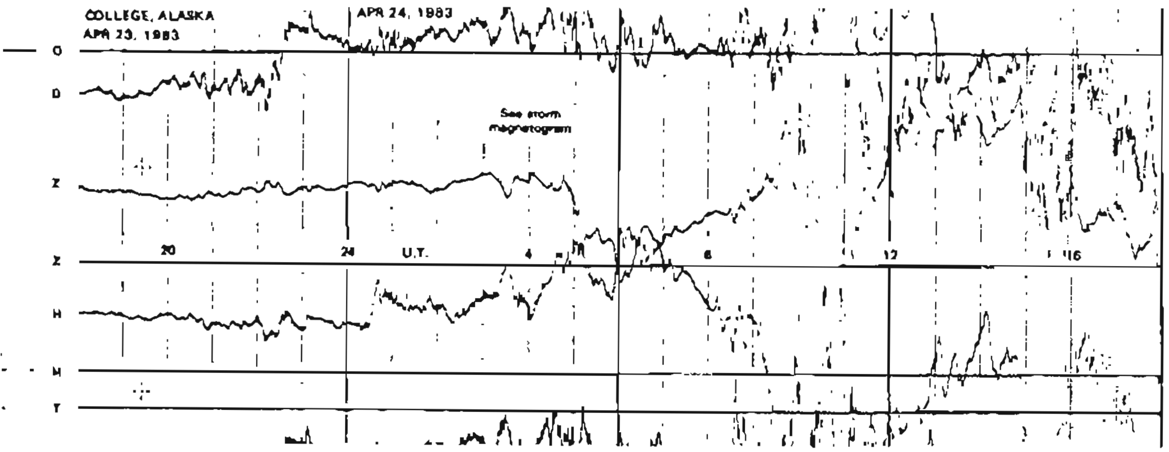

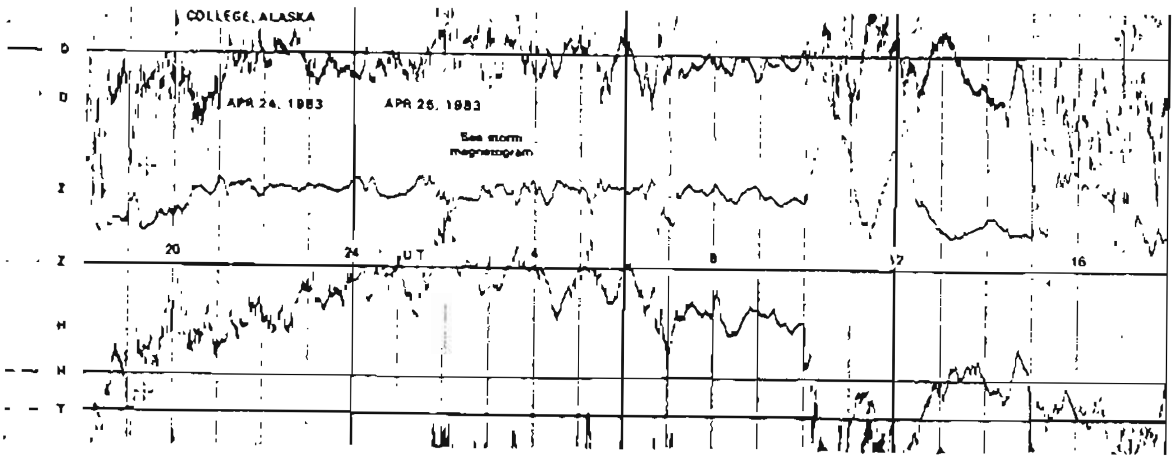

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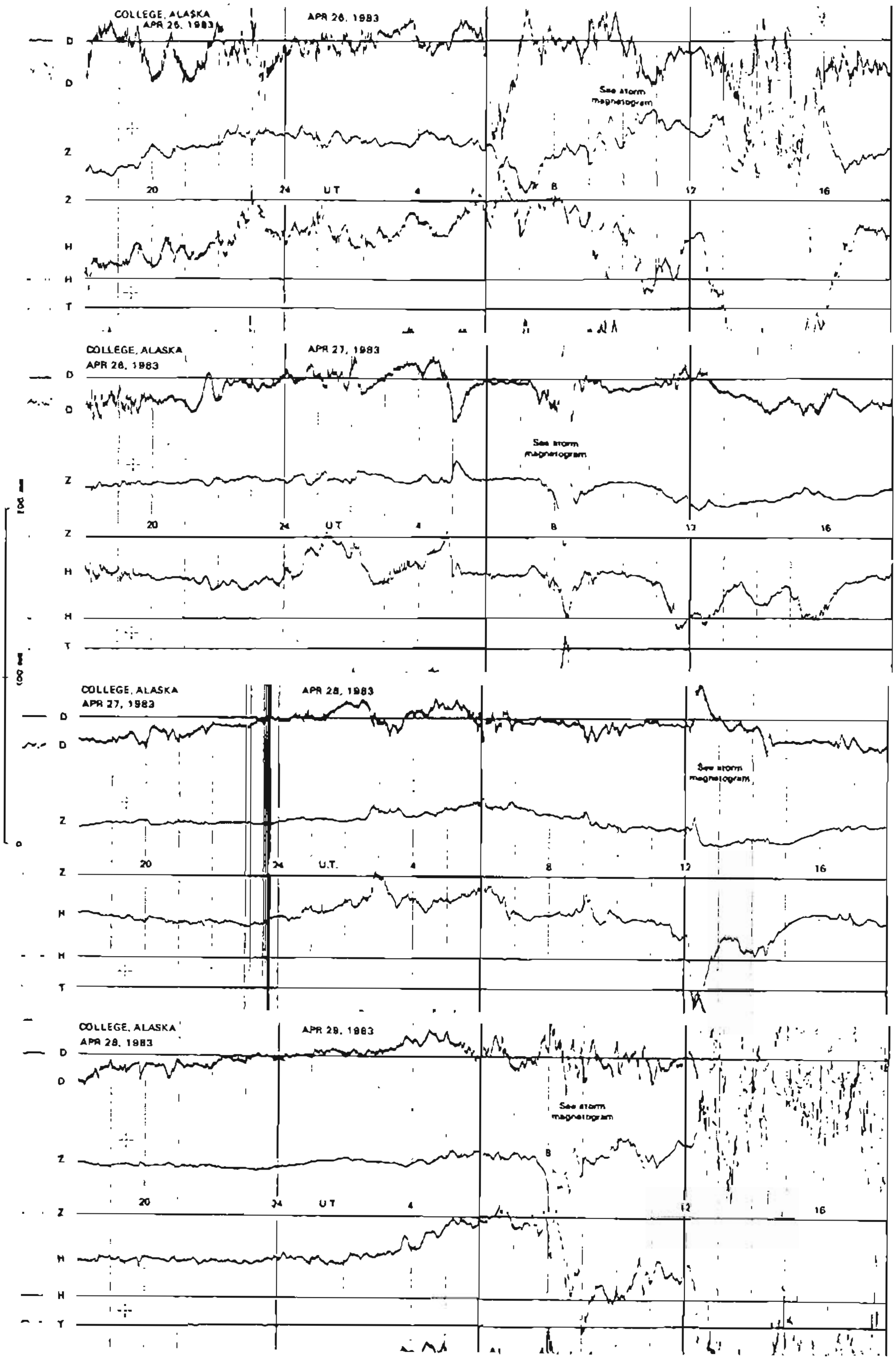
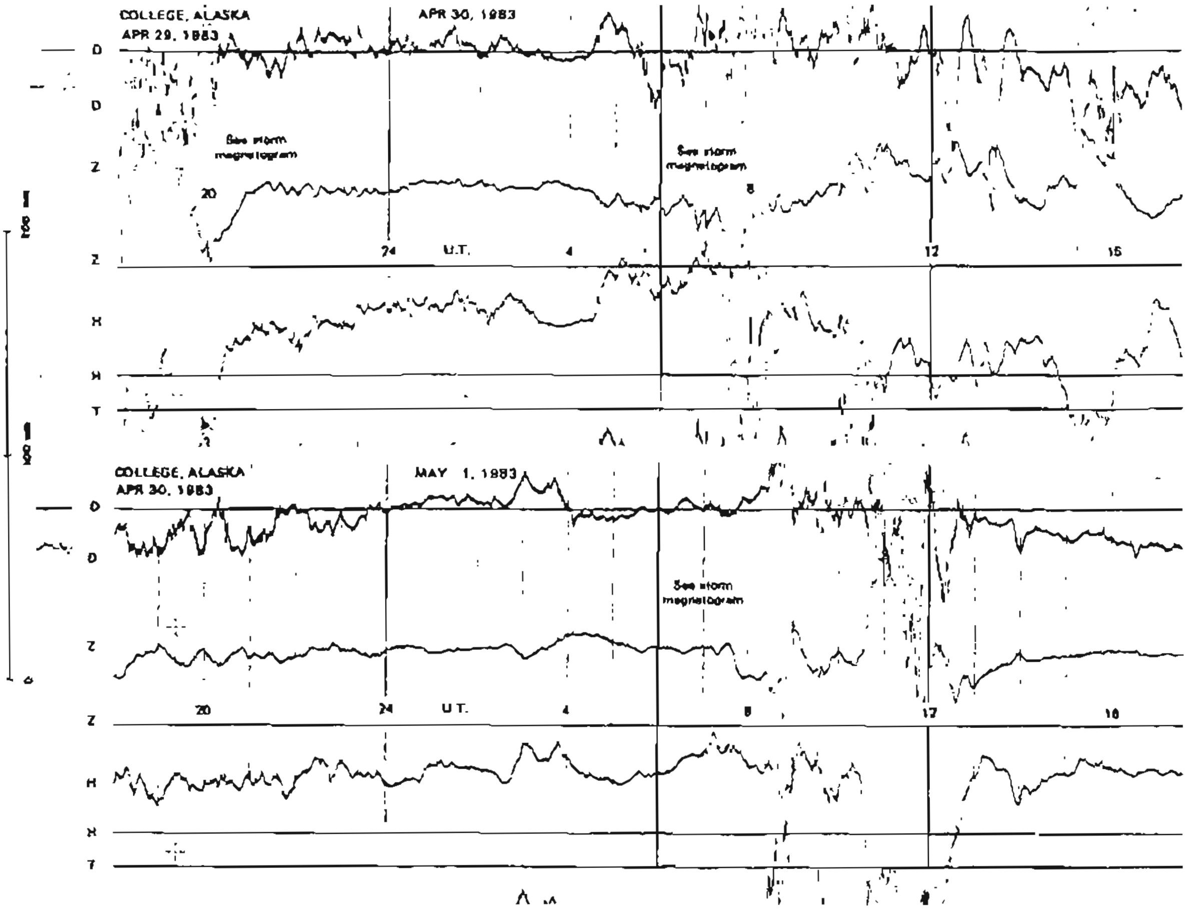
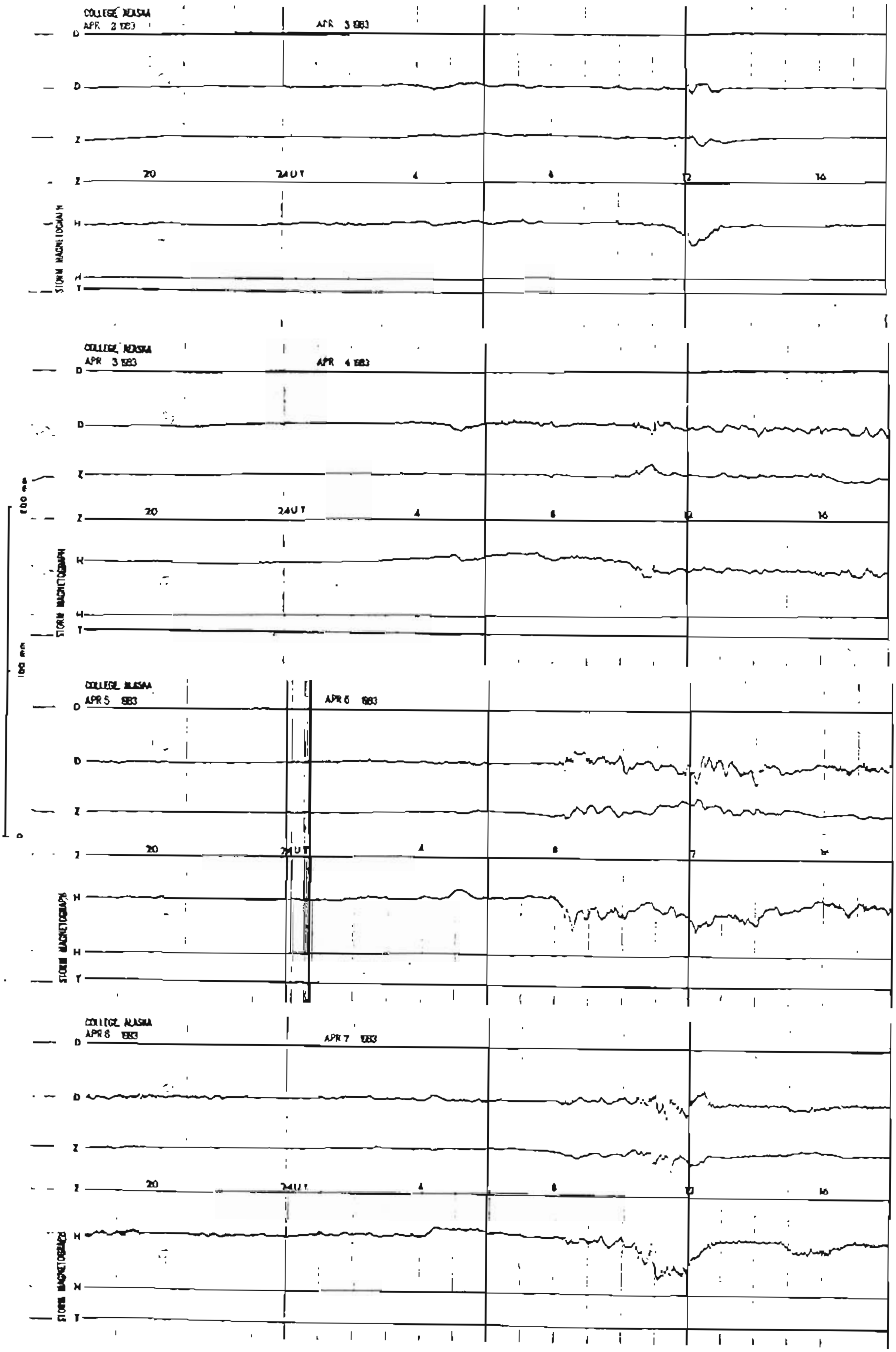


NORMAL MAGNETOGRAMS



STORM MAGNETOGRAMS



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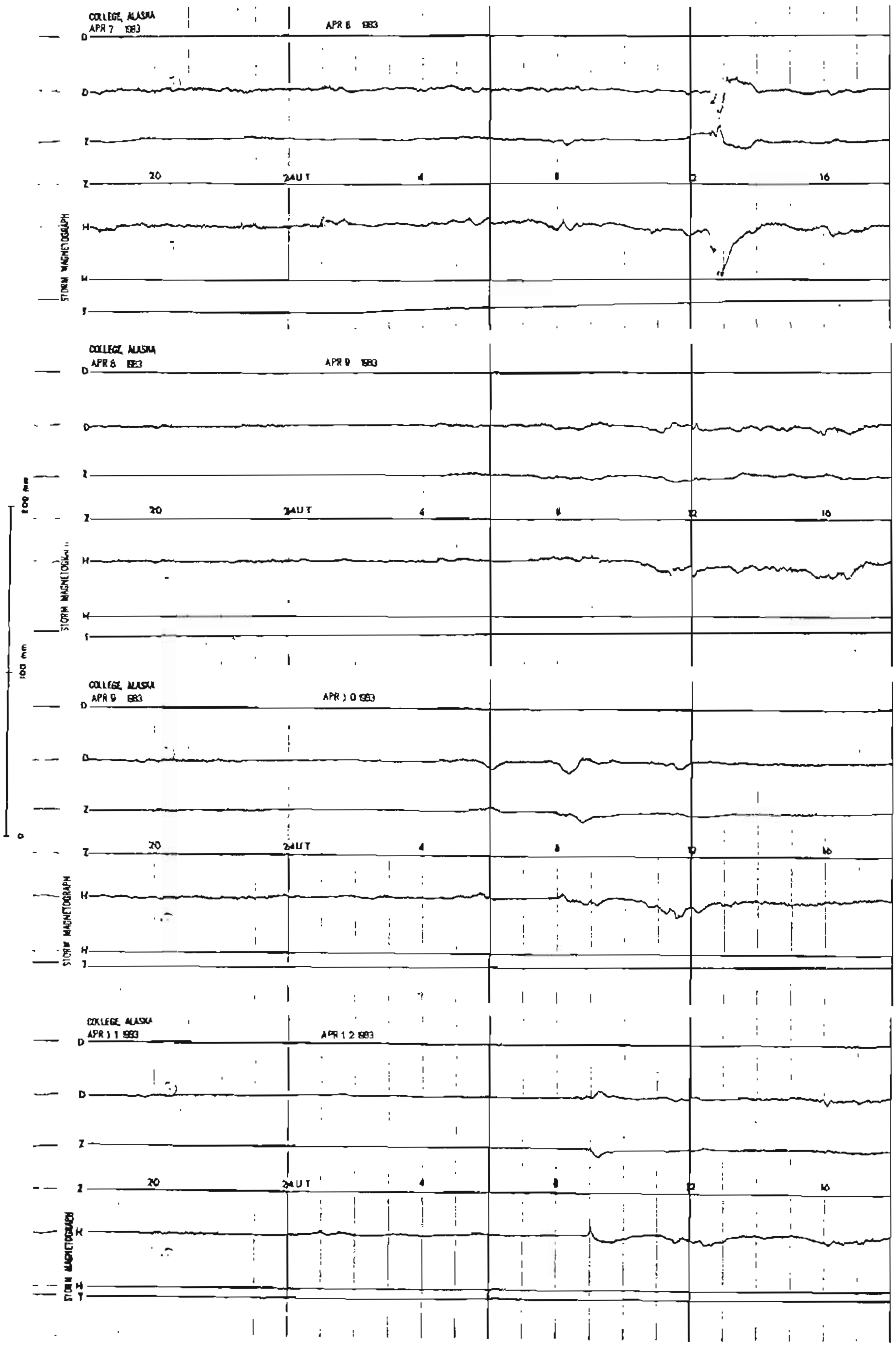
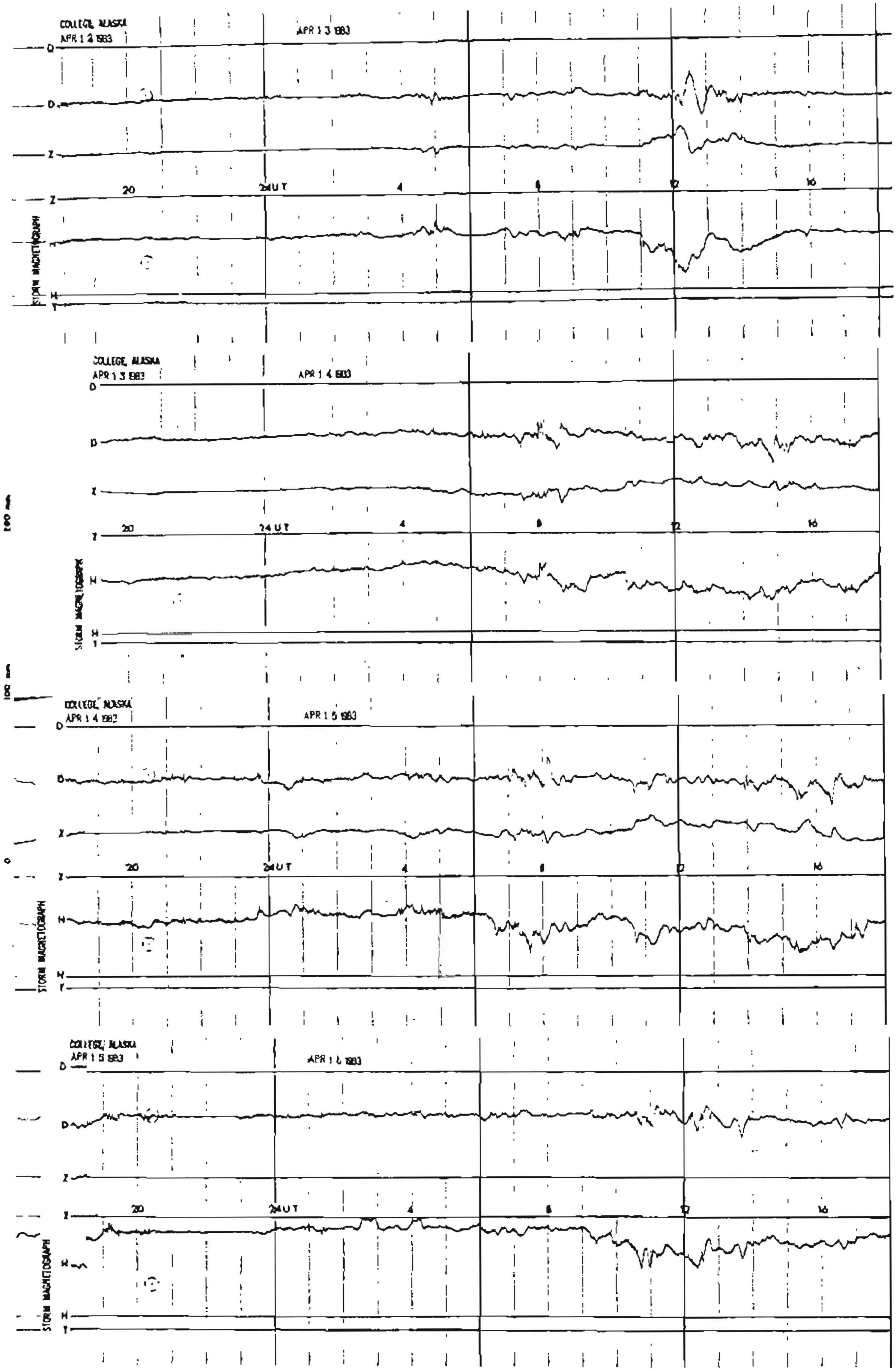
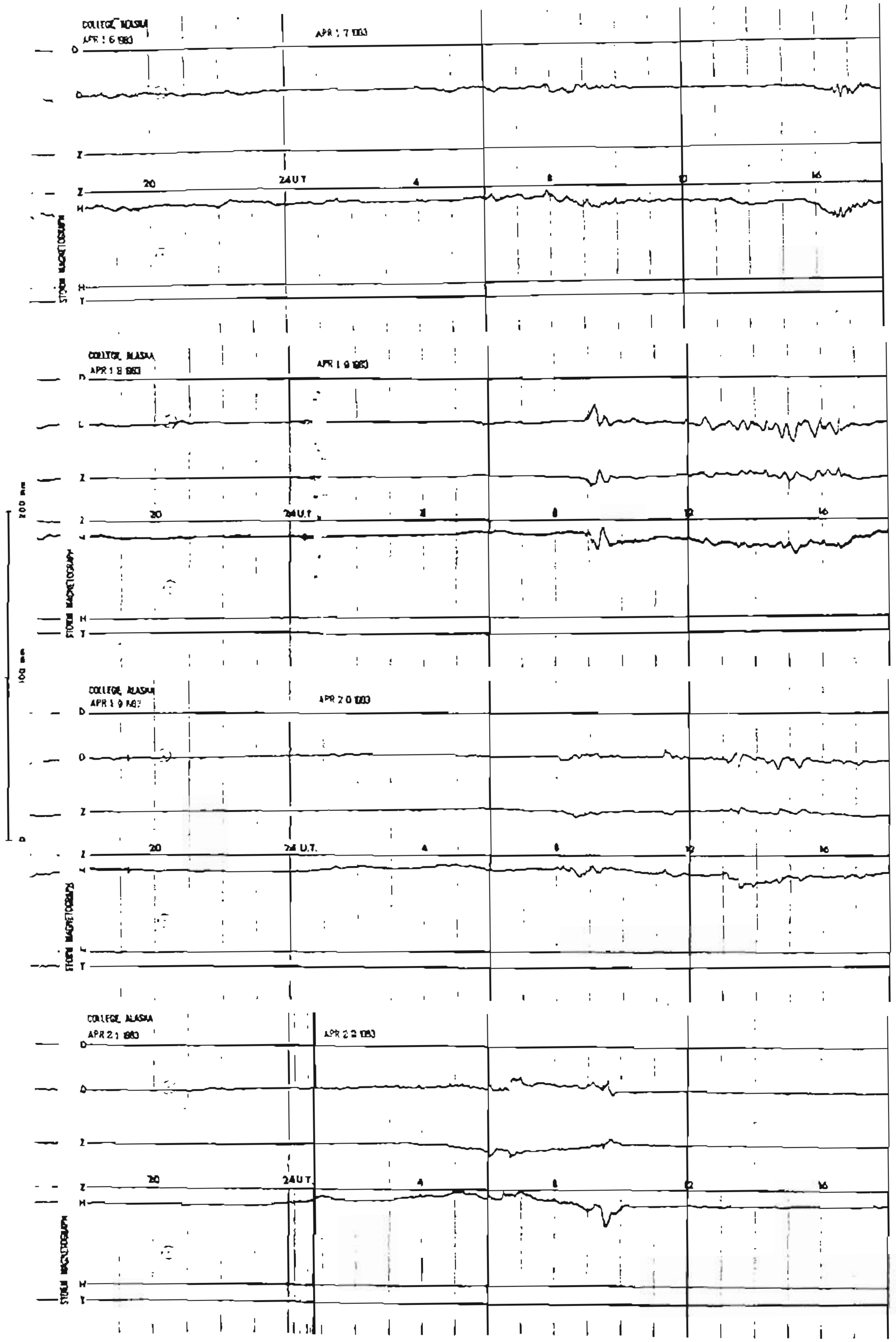


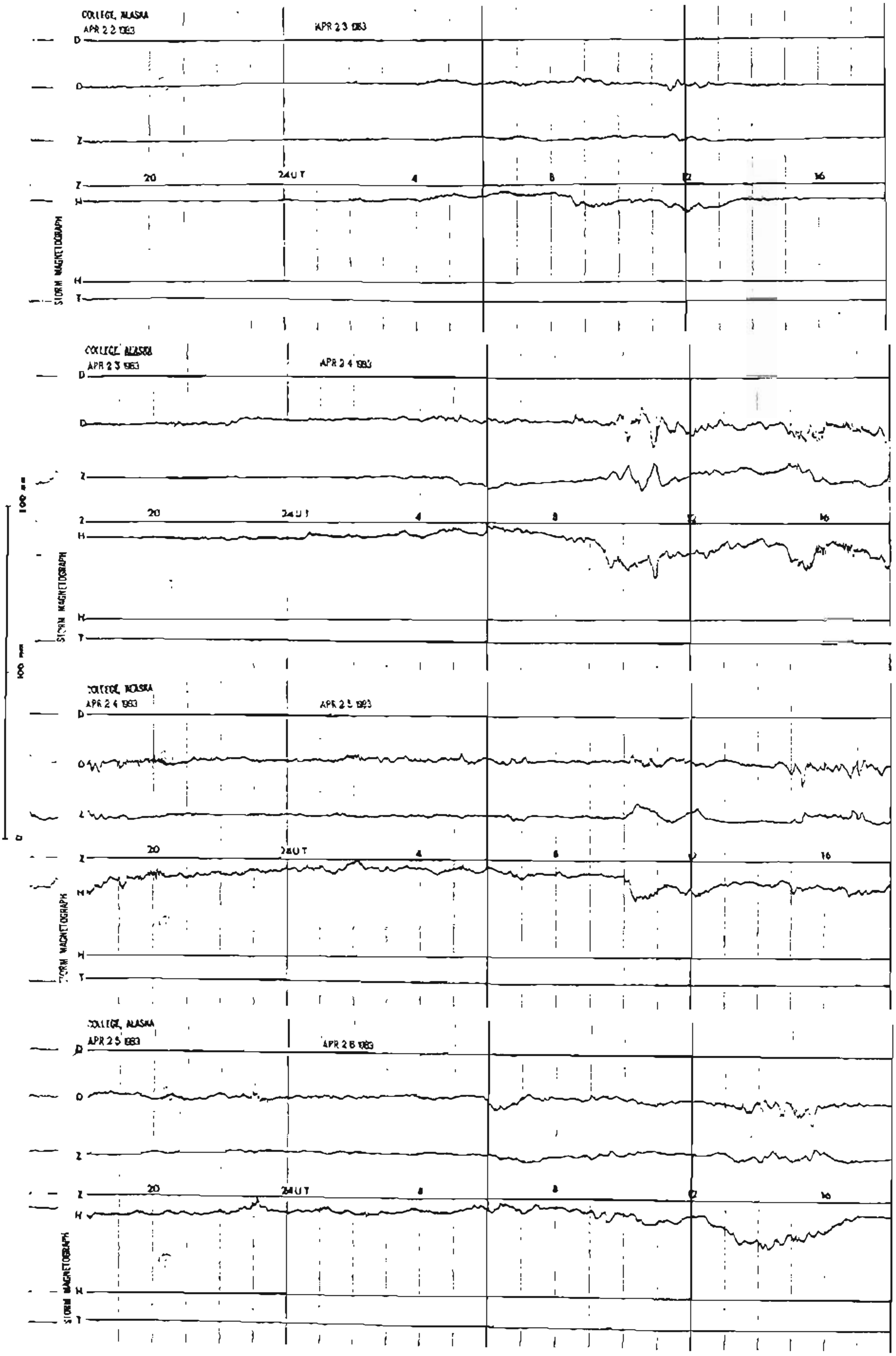
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



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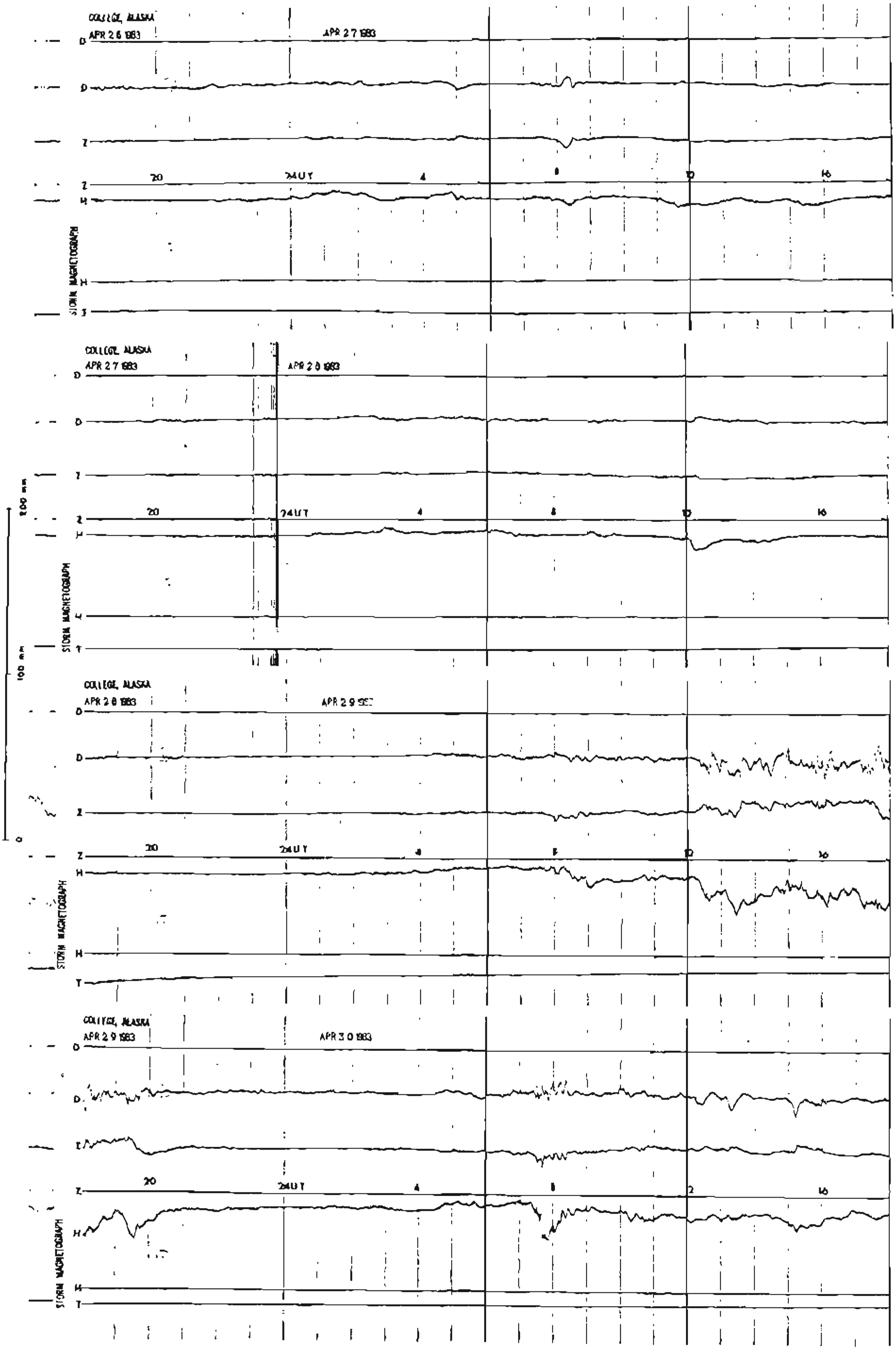

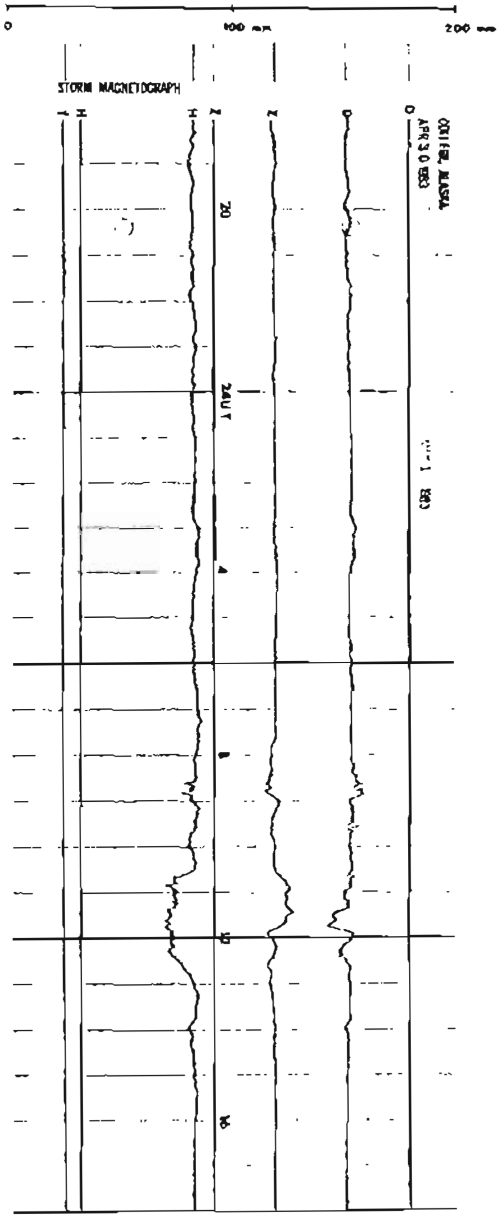STORM MAGNETOGRAMS