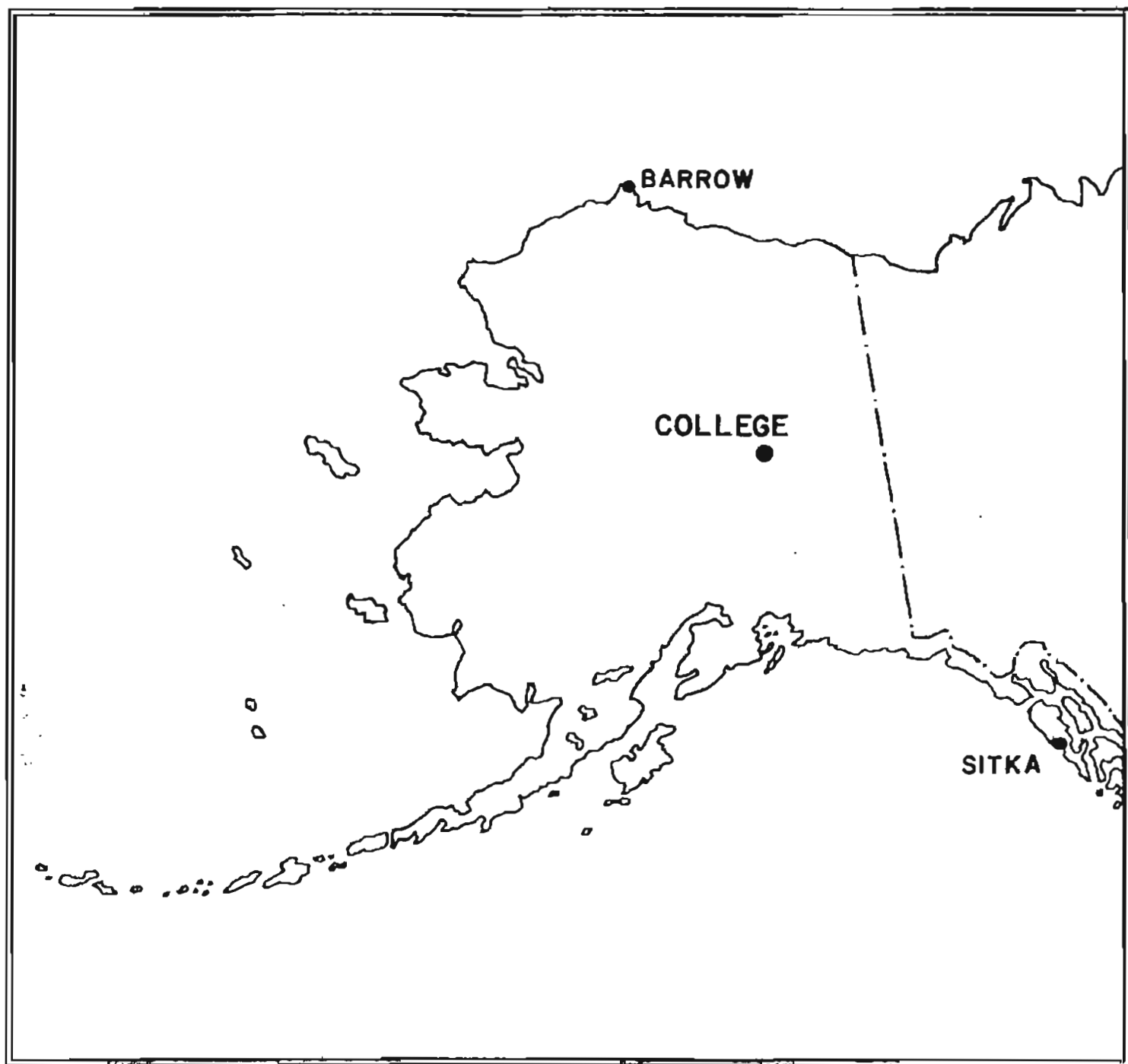


UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

MARCH 1984

OPEN FILE REPORT 84-0300C



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: J.E. PAPP, E.A. SAUTER, L.Y. TORRENCE, P.A. FRANKLIN AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY,

Explanation of Data and Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

EXPLANATION OF DATA AND REPORTS

INTRODUCTION

The preliminary geomagnetic data included here is made available to scientific personnel and organizations as part of a cooperative effort and on a data exchange basis because of the early need by some users. To avoid delay, all of the data is copied from original forms processed at the observatory; therefore it should be regarded as preliminary. Inquiries about this report or about the College Observatory should be addressed to:

Chief, College Observatory
U.S. Geological Survey
800 Yukon Drive
Fairbanks, Alaska 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A
NOAA D63, 325 Broadway
Boulder, Colorado 80303

OBSERVATORY LOCATION

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

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

The position of the observatory site is:

Geographic latitude..... $64^{\circ}51.6'N$
Geographic longitude..... $147^{\circ}50.2'W$
Geomagnetic latitude..... 64.6°
Geomagnetic longitude..... 256.6°
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 10y 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 (10y)

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:

$D = d \cdot S_D$; $H = h \cdot S_H$; $Z = z \cdot S_Z$
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	
MAGNETIC ACTIVITY (Greenwich civil time, counted from midnight to midnight)										COLLEGE, ALASKA	
										MONTH AND YEAR MARCH 1984	
DATE	K-INDICES								SUM	AK	TIME SCALE ON MAGNETOGRAMS
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24			20 mm/hr
1	0	0	2	5	6	4	5	5	27	32	SUDDEN COMMENCEMENTS d h m
2	4	5	6	6	6	5	5	3	40	53	
3	5	6	5	5	4	5	4	3	37	43	
4	2	4	3	3	2	3	1	0	18	11	
5	0	1	1	1	1	0	1	0	05	02	
6	2	4	5	4	5	5	6	4	35	39	
7	4	4	5	4	5	5	3	3	33	32	
8	3	2	4	5	5	6	5	3	33	36	
9	3	3	3	2	2	2	2	2	19	10	
10	2	1	3	4	5	5	4	3	27	24	
11	3	1	1	5	3	3	2	2	20	14	POSSIBLE SOLAR-FLARE EFFECTS BASED ON INSPECTION OF GRAMS ALONE (WITHOUT REFERENCE TO DATA FROM OTHER SOURCES)
12	2	2	2	3	3	3	3	2	20	11	
13	2	2	3	4	6	4	2	1	24	22	
14	1	1	3	3	1	1	1	0	11	06	
15	0	0	1	2	2	2	2	3	12	06	
16	0	2	4	3	6	6	2	1	24	27	
17	1	3	5	7	6	5	3	2	32	45	
18	1	1	3	6	4	4	2	2	23	21	
19	2	3	4	6	3	2	1	2	23	20	
20	2	1	1	4	2	0	0	0	10	06	
21	0	1	0	2	4	3	2	2	14	08	BEGIN END d h m d h m
22	2	3	6	3	0	2	3	2	21	18	
23	3	3	5	6	5	4	2	1	29	30	
24	2	2	2	3	5	4	1	2	21	15	
25	2	4	5	6	6	6	5	3	37	48	
26	2	2	1	4	2	3	3	3	20	12	
27	3	4	3	5	5	4	3	3	30	26	
28	3	4	5	6	6	7	6	5	42	65	
29	5	5	6	6	5	5	4	4	40	51	
30	4	4	6	5	5	4	4	3	35	37	
31	3	4	3	6	6	4	3	5	34	38	

K SCALE USED:	D	H	Z	
LOWER LIMIT FOR K = 9.....	675.7	322.2		(mm)
CURRENT SCALE VALUE.....	3.72	7.76		(γ/mm)
LOWER LIMIT FOR K = 9.....	2510	2500		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY

COLLEGE, ALASKA

MONTH

MARCH

YEAR

1984

DATE

TIME
U.T.

NATURE OF
PHENOMENON¹

REMARKS

NO OUTSTANDING MAGNETIC EFFECTS SELECTED
THIS MONTH.

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

Data from Individual Observatories:

MARCH 19 84

WDC-A FOR SOLAR-TERRRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80503 U.S.A.

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	01	08xx	..	..	..	..	01 02	5 3,4,5	6 6	149	1250	770	04 10
		06	05xx	..	..	..	..	08	6	6	145	990	700	09 08
		17	03xx	..	..	..	..	17	4	7	147	1150	740	18 01
		25	04xx	..	..	..	..	25	4,5,6	6	188	1230	790	26 01
		26	15xx	..	..	..	..	04	6	8	393	2070	1270	06 13

MARCH

1984

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 3-1-84	2400 U.T., 3-31-84	1.6/mm	3.78/mm	27° 16.9 E
H	0000 U.T., 3-1-84	2400 U.T., 3-31-84	7.88/mm		126698
Z	0000 U.T., 3-1-84	2400 U.T., 3-31-84	7.68/mm		551828

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 3-1-84	2300 U.T., 3-13-84	7.9/mm	29.68/mm	24° 23.4 E
	2301 U.T., 3-13-84	2100 U.T., 3-15-84	"	"	No BLV
	2101 U.T., 3-15-84	2400 U.T., 3-31-84	"	"	23° 42.6 E
H	0000 U.T., 3-1-84	2400 U.T., 3-31-84	43.98/mm		107878
Z	0000 U.T., 3-1-84	2400 U.T., 3-31-84	48.08/mm		541028

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 48.5 E	129198	553668

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: MAR 4, 5, 9, 11, 12, 14, 15, 20, 21, 26

MAGNETOGRAM HOURLY SCALINGS

Values are in units of cm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day 150 U.T. is hour 11 of the 5000 universal day.

Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

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 U.T.) is hour 11 of the 90000 universal day.																										
Shrinkage coefficients have been applied. Negative values are in red, with minus signs shown.																										
C	Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM
01	250	244	237	237	237	237	237	237	237	237	235	229	223	314	568	384	321	416	180	165	204	244	230	226	140	6323
02	209	229	277	312	257	264	248	145	148	229	310	78	01	358	580	384	194	253	255	236	140	170	218	251	264	5751
03	259	258	313	300	268	117	252	275	205	91	219	173	02	248	328	173	120	208	267	169	168	213	214	252	274	5364
04	284	286	305	292	294	292	309	316	251	280	296	270	03	240	227	240	239	216	230	254	251	253	250	253	257	6385
05	257	255	256	254	253	254	253	263	283	269	260	260	04	254	247	221	242	256	254	245	240	234	235	237	243	6019
06	246	242	247	252	256	258	30	232	24	209	230	250	05	279	317	293	50	123	162	126	127	233	230	267	227	4442
07	260	275	275	267	245	167	302	193	167	178	230	187	06	281	203	286	247	110	179	223	204	223	270	284	303	5559
08	290	290	299	312	302	331	343	222	225	189	358	262	07	184	306	262	185	-112	-90	-46	24	142	238	278	303	4857
09	301	298	285	287	309	288	302	295	275	264	253	235	08	234	246	215	224	240	265	265	256	252	242	230	246	6207
10	275	284	268	280	284	296	303	322	298	256	185	256	09	269	286	183	202	68	121	87	98	165	240	260	292	5607
11	306	292	290	288	283	300	321	305	274	266	110	105	10	158	220	193	216	216	197	130	126	145	180	232	263	5323
12	254	266	274	288	283	304	276	285	270	271	267	284	11	165	170	162	173	196	204	132	124	163	184	206	220	5425
13	248	269	299	276	304	276	285	270	271	267	284	306	12	371	473	321	100	176	240	252	249	249	257	258	259	6579
14	263	266	271	272	266	263	273	276	227	131	184	231	13	234	243	258	260	260	254	243	223	236	249	257	260	5906
15	262	256	256	254	255	259	280	264	261	247	233	233	14	237	237	207	196	234	249	250	247	248	256	242	259	5972
16	254	250	247	247	275	274	268	143	270	295	279	228	15	184	475	671	262	182	212	196	217	238	257	252	253	6446
17	250	250	252	256	304	334	262	191	60	47	242	270	16	250	314	217	212	184	208	172	212	230	234	244	254	5469
18	257	263	264	262	264	262	273	272	215	179	486	237	17	216	210	253	202	165	200	210	236	246	223	255	242	5937
19	267	277	276	280	302	330	258	166	277	180	91	66	18	191	231	224	224	226	258	256	250	247	244	246	249	5642
20	254	246	247	244	244	244	247	254	262	254	234	239	19	170	203	228	245	247	255	252	243	239	240	243	247	5765
21	247	253	250	251	247	247	256	256	256	255	257	214	21	165	205	211	132	242	212	212	219	231	240	238	246	5560
22	259	283	322	314	342	258	184	146	237	254	242	266	22	266	259	256	242	312	206	213	252	216	242	274	287	6066
23	292	264	286	308	261	246	266	240	164	400	546	577	23	444	400	375	168	221	256	257	259	238	254	252	255	7251
24	255	261	276	283	273	251	266	266	275	277	235	226	24	302	119	68	186	198	232	235	238	238	238	251	252	5641
25	259	269	308	325	274	314	300	276	171	89	247	326	25	476	495	546	305	184	134	176	190	251	255	286	281	6747
26	288	291	274	276	283	264	260	265	262	241	162	211	26	248	246	250	251	245	237	224	204	242	212	236	254	5826
27	274	293	272	268	270	289	316	269	212	182	-42	136	27	302	-4	-83	11	122	96	175	178	204	235	281	272	4562
28	270	270	312	305	348	353	298	288	127	90	311	248	28	206	489	636	230	77	311	89	209	273	177	254	284	6455
29	272	291	252	298	268	126	25	37	311	279	260	277	29	214	412	362	142	170	252	242	244	301	220	297	343	5965
30	282	306	315	287	330	241	19	50	321	254	345	171	30	362	252	252	276	278	267	222	221	249	276	295	290	6061
31	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
32	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
33	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
34	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
35	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
36	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
37	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
38	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
39	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
40	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
41	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
42	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
43	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
44	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
45	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
46	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
47	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
48	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
49	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
50	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
51	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
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53	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
54	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
55	291	279	315	284	295	312	306	292	314	236	303	20	31	514	291	331	292	270	278	277	263	274	266	274	242	6819
56	291	279	315	284	295	312	306	292	3																	

FORM 74-108

MAGNETOGRAM HOURLY SCALINGS

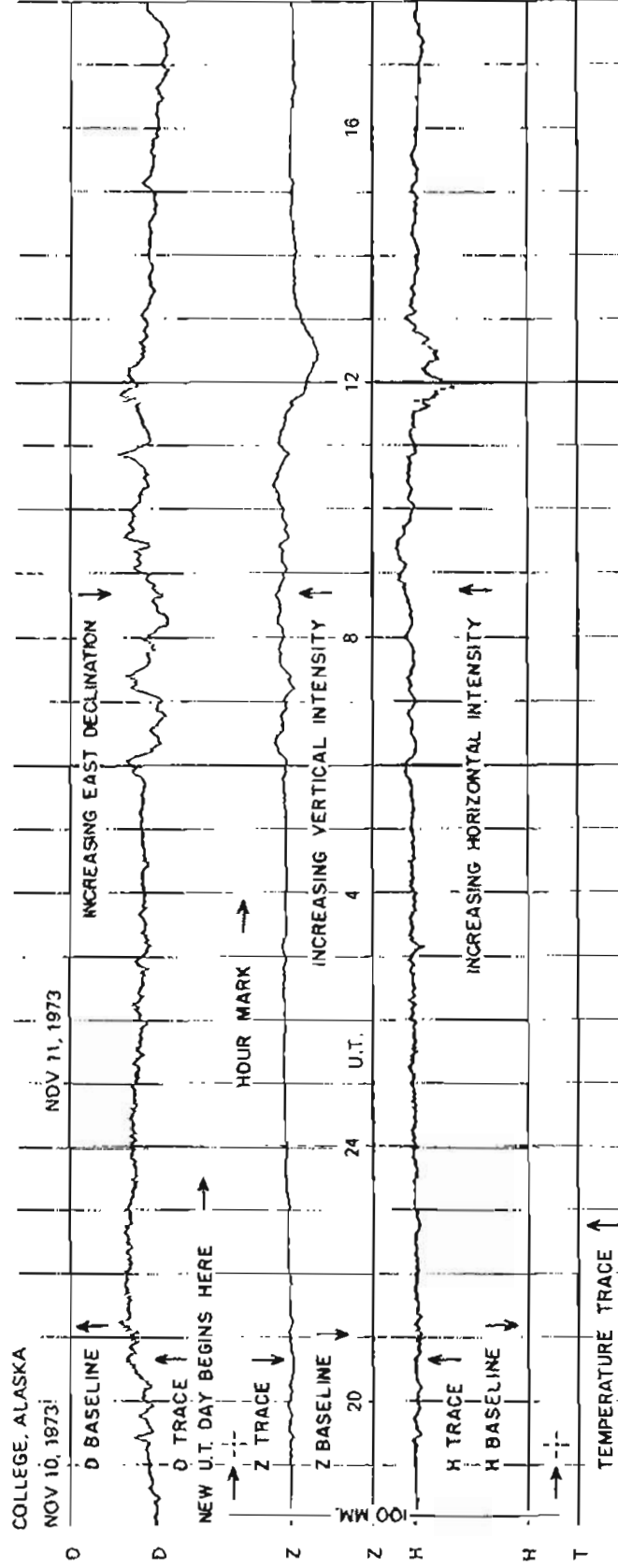
Values are in tenths of mm, and are averages for successive periods of one hour beginning at midnight. (UNIVERSAL TIME)
 Shading corrections have been applied. Negative values are in red, with minus signs shown.

U.S. DEPARTMENT OF AGRICULTURE
 BUREAU OF WEATHER
 WASHINGTON, D.C. 20540

Station: Wichita, Kansas Locality: Wichita
 Date: 1958 Universal day: 11 of the month: 11 Year: 84 Month: 11

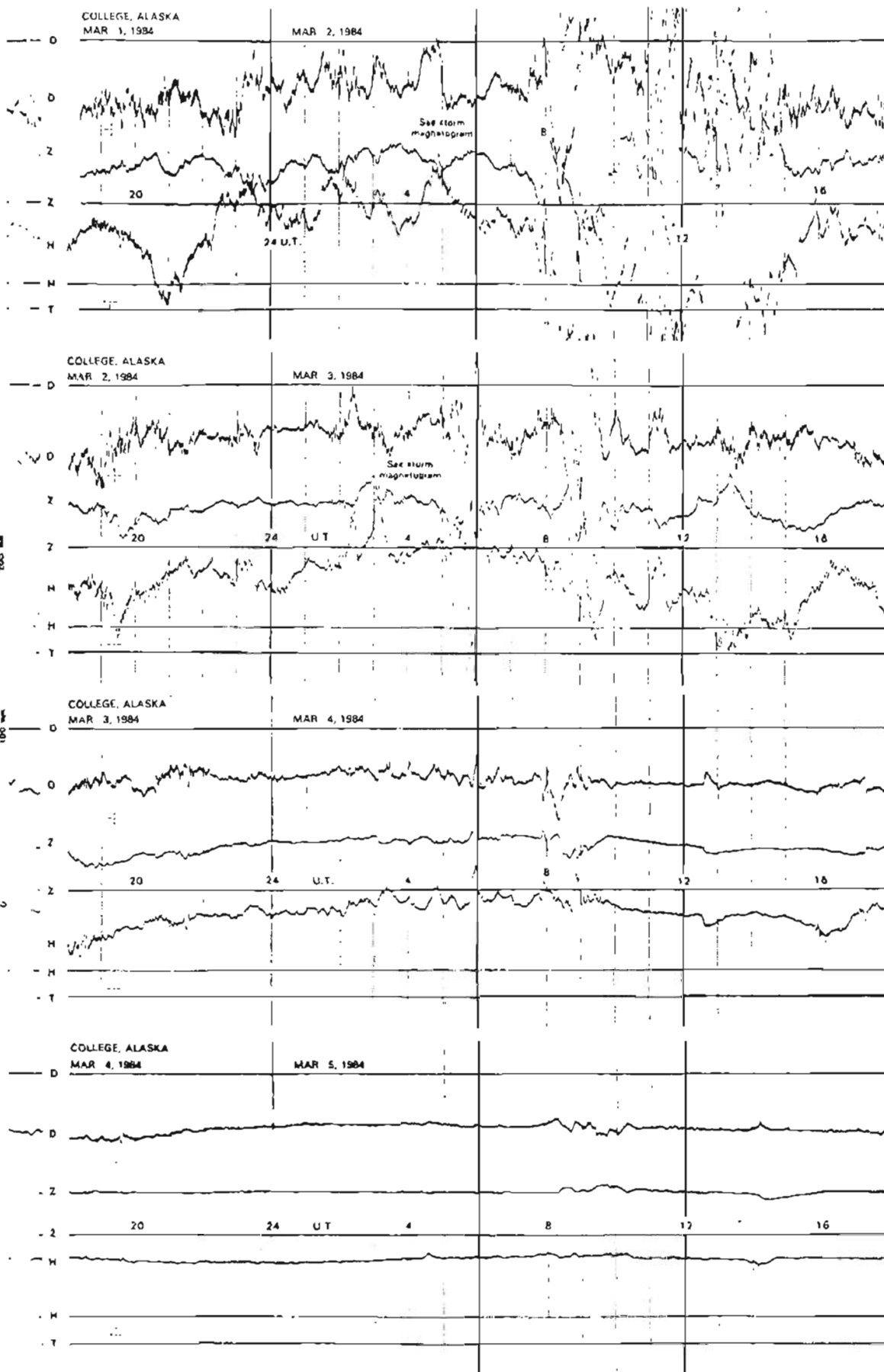
C	10 th	11 th	12 th	13 th	14 th	15 th	16 th	17 th	18 th	19 th	20 th	21 st	22 nd	23 rd	24 th	25 th	26 th	27 th	28 th	29 th	30 th	31 st	32 nd	33 rd	34 th	35 th	36 th	37 th	38 th	39 th	40 th	41 st	42 nd	43 rd	44 th	45 th	46 th	47 th	48 th	49 th	50 th	51 st	52 nd	53 rd	54 th	55 th	56 th	57 th	58 th	59 th	60 th	61 st	62 nd	63 rd	64 th	65 th	66 th	67 th	68 th	69 th	70 th	71 st	72 nd	73 rd	74 th	75 th	76 th	77 th	78 th	79 th	80 th	81 st	82 nd	83 rd	84 th	85 th	86 th	87 th	88 th	89 th	90 th	91 st	92 nd	93 rd	94 th	95 th	96 th	97 th	98 th	99 th	100 th																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

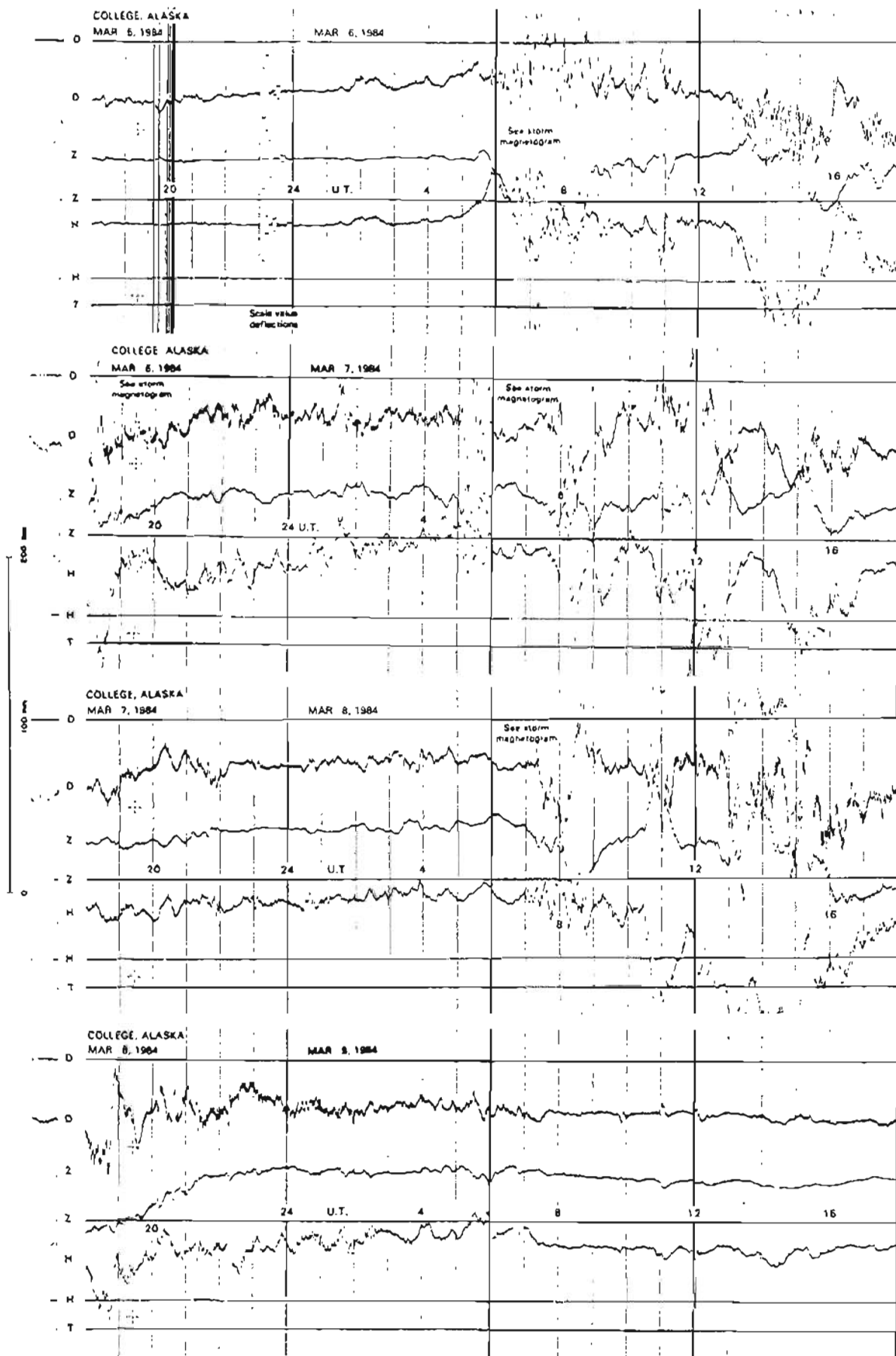


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

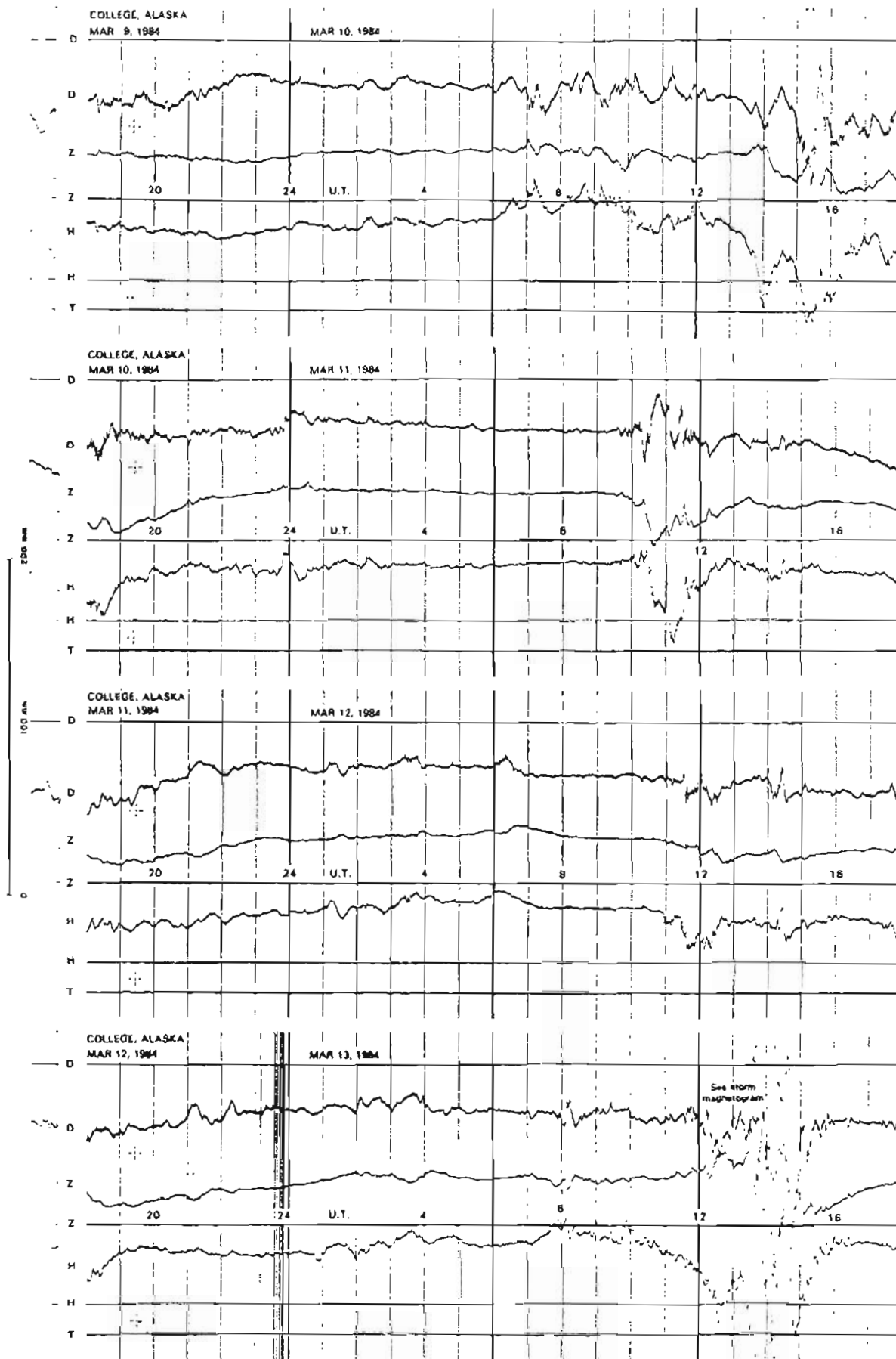
NORMAL MAGNETOGRAMS



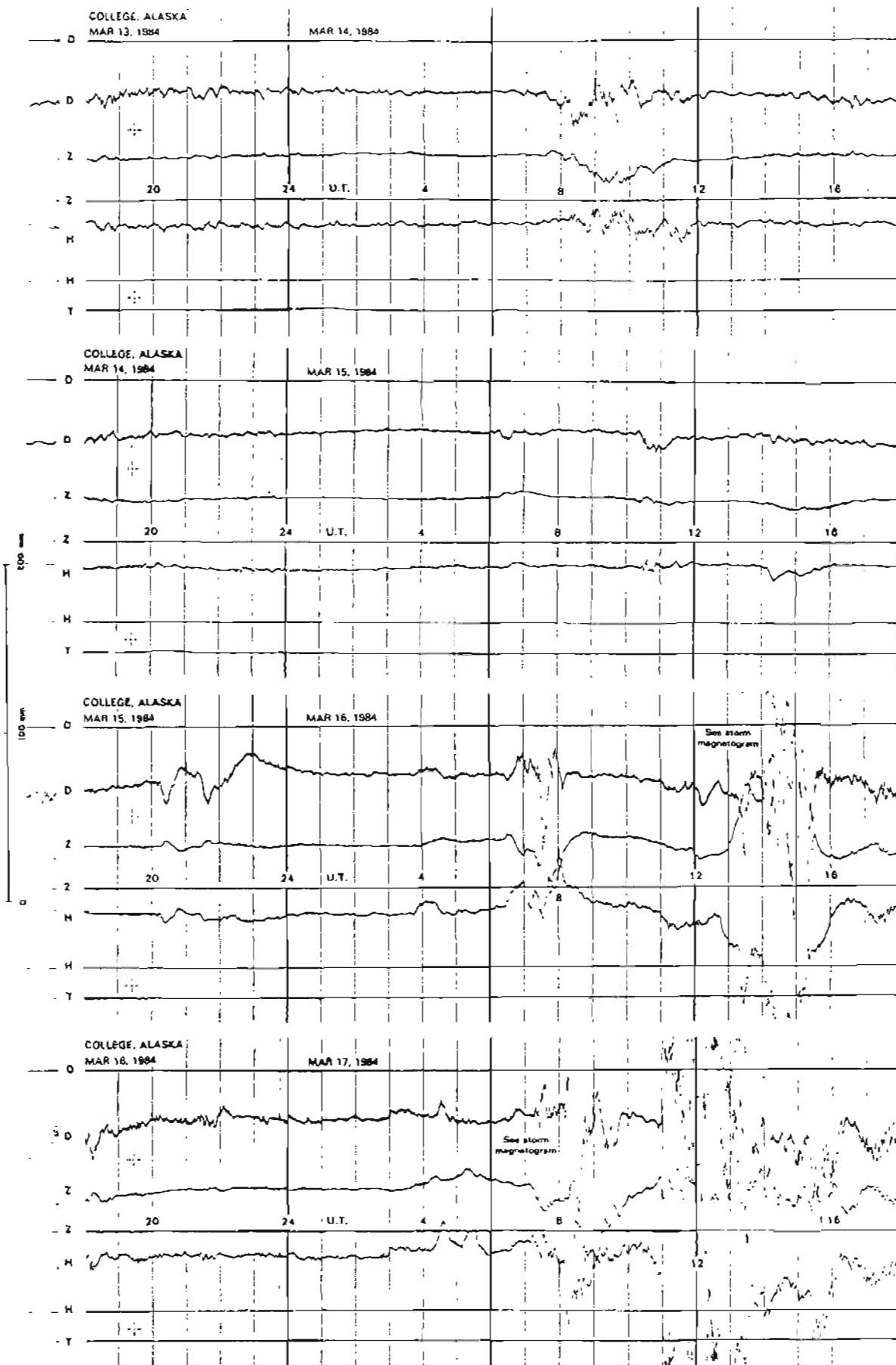
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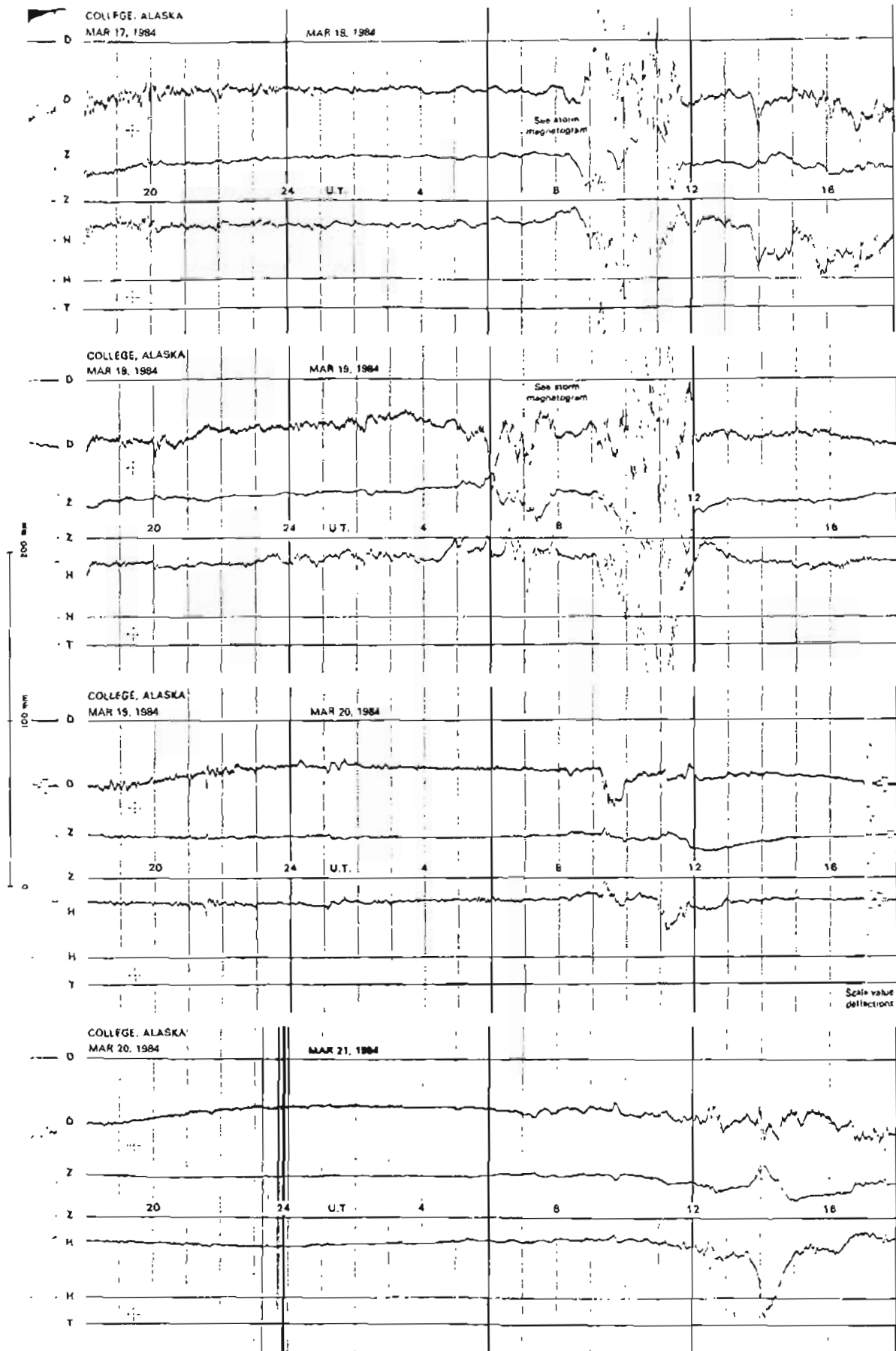
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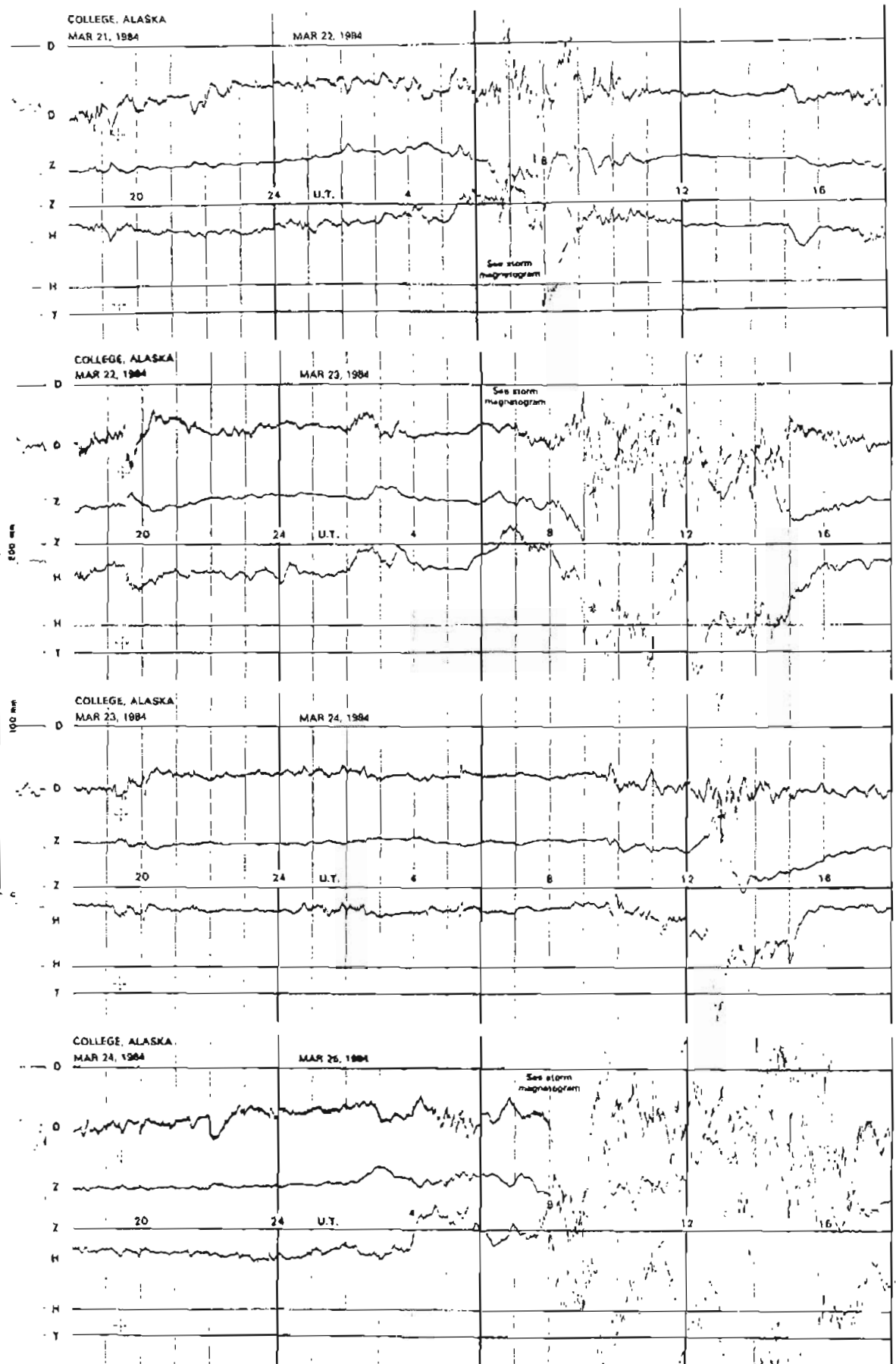
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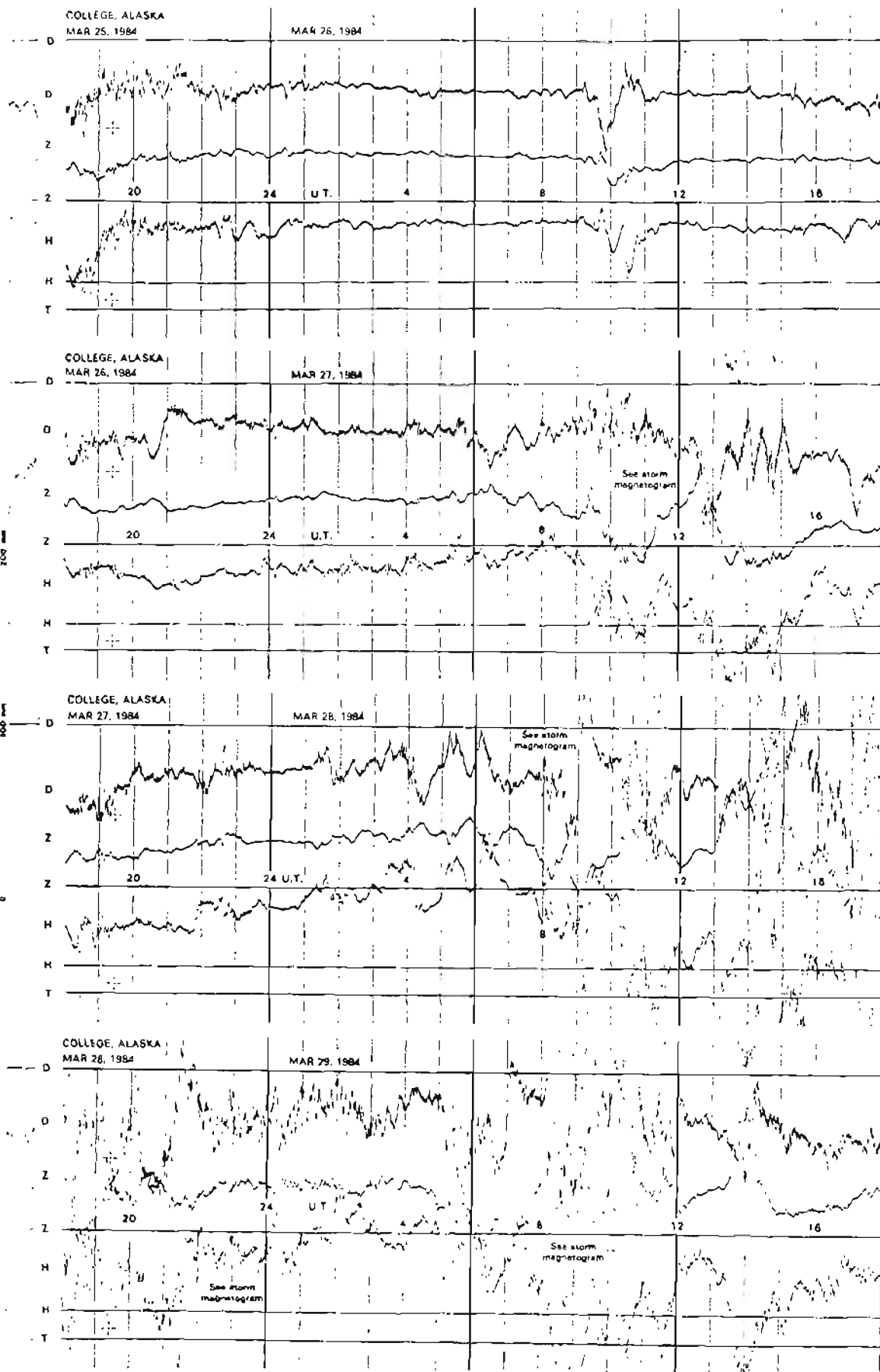
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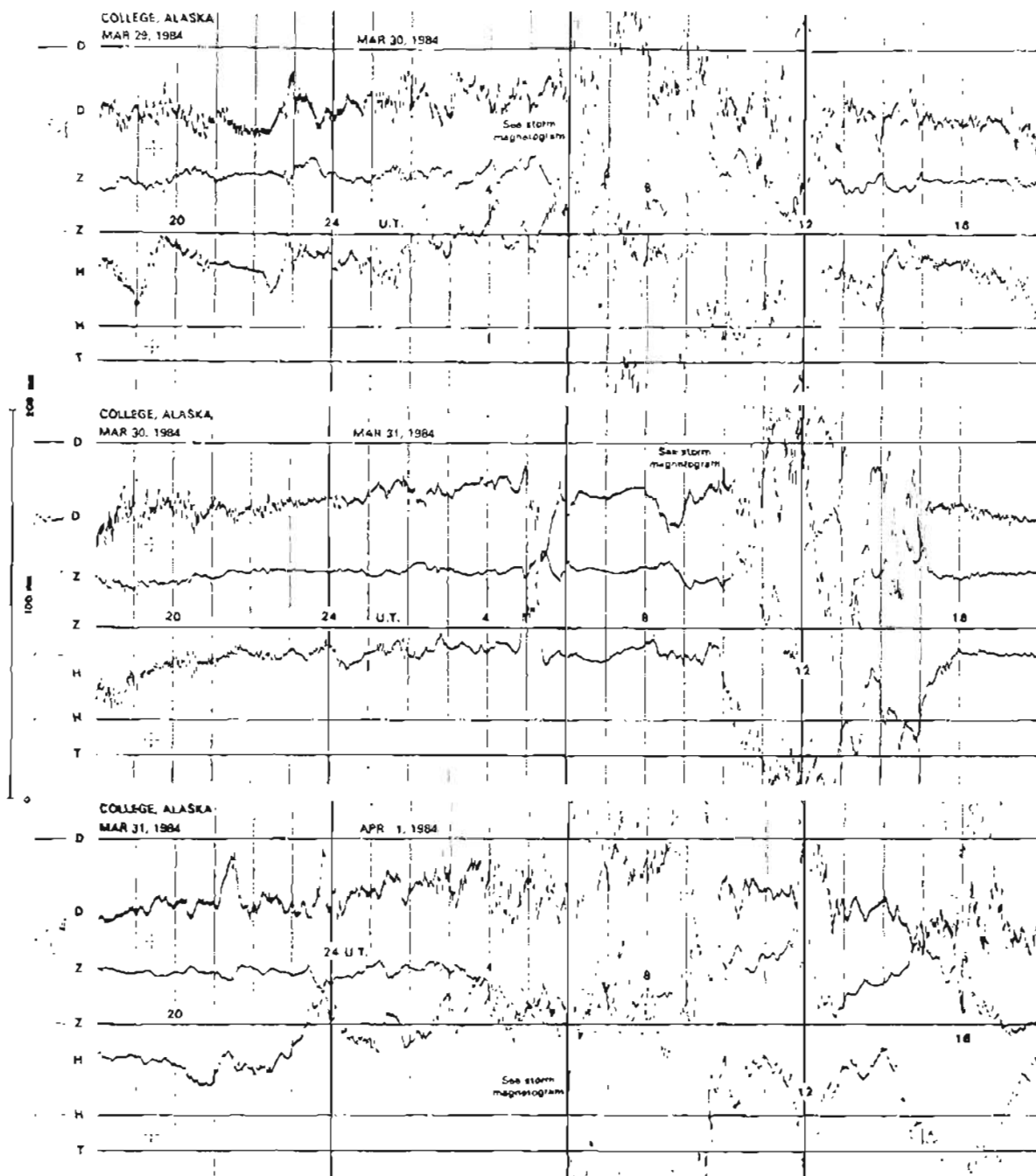
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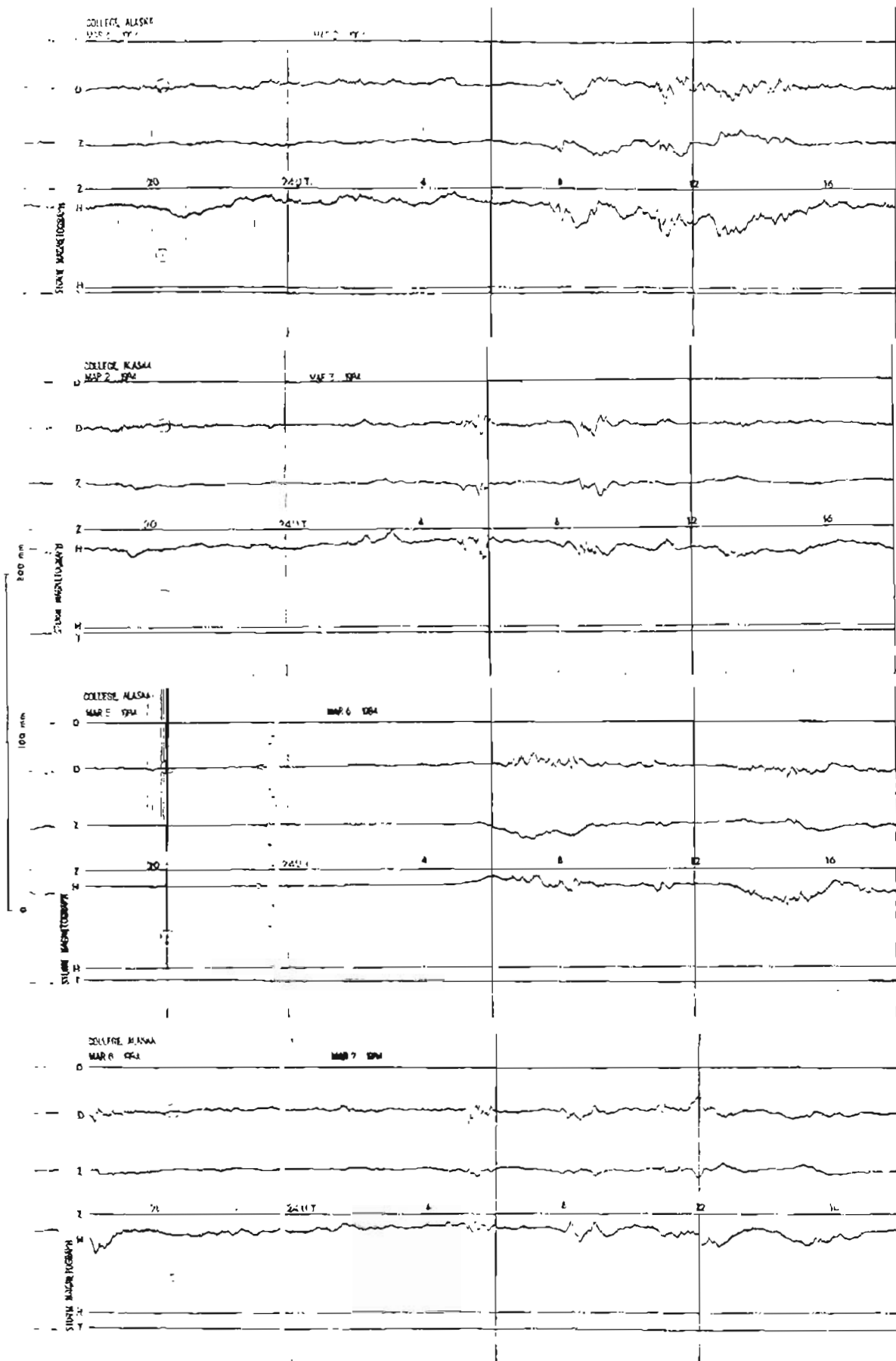
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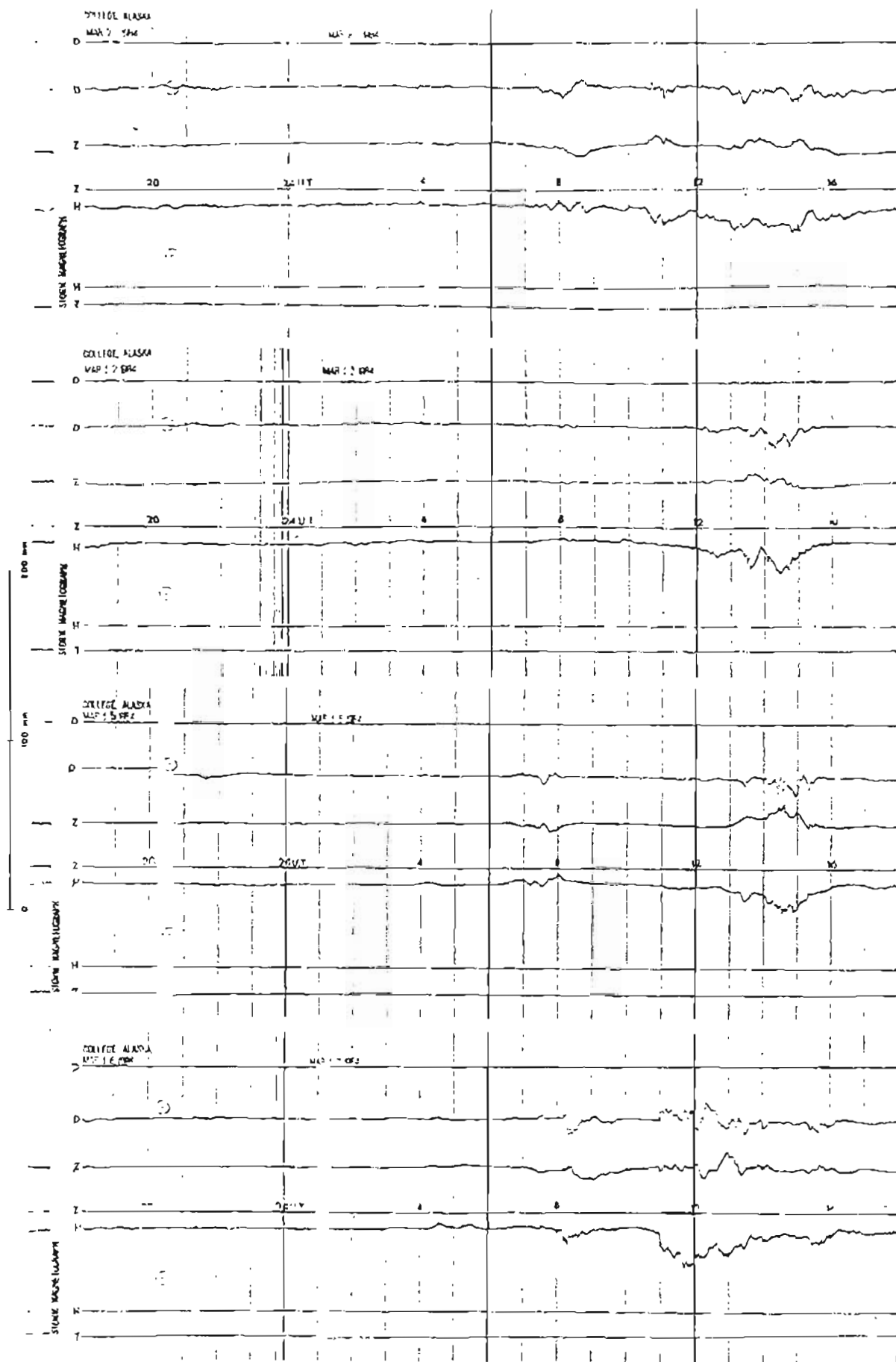
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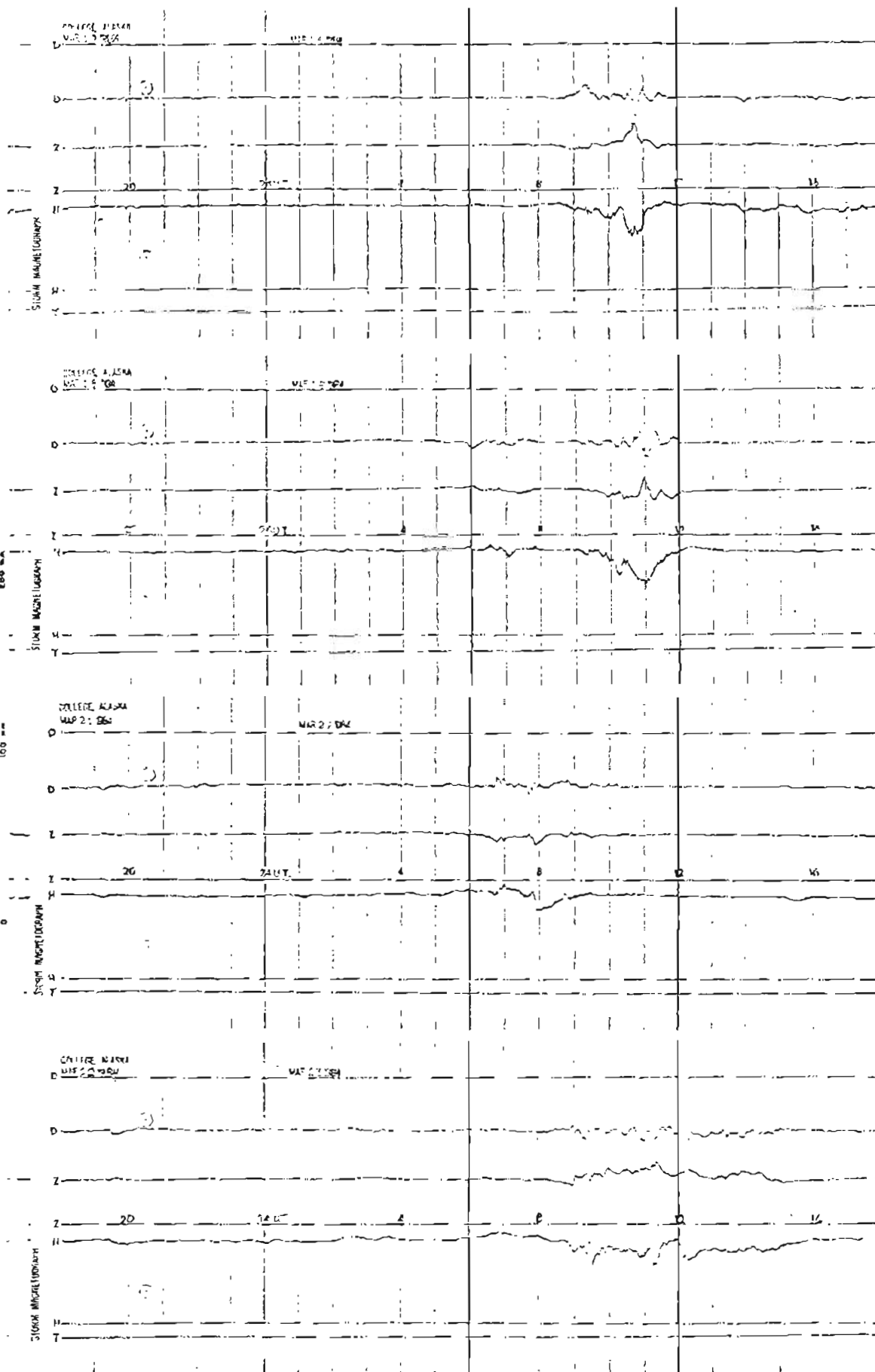
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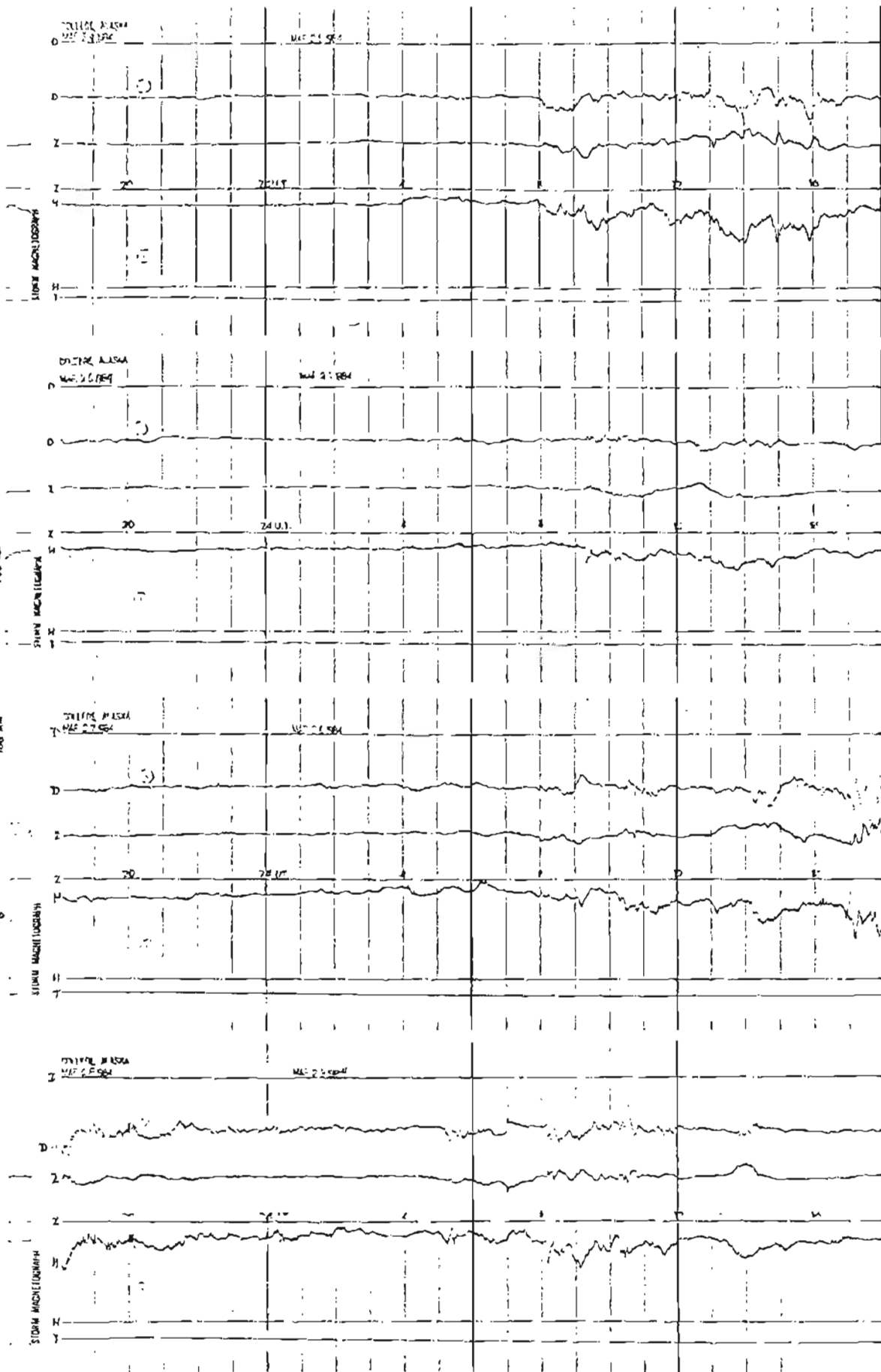
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS

