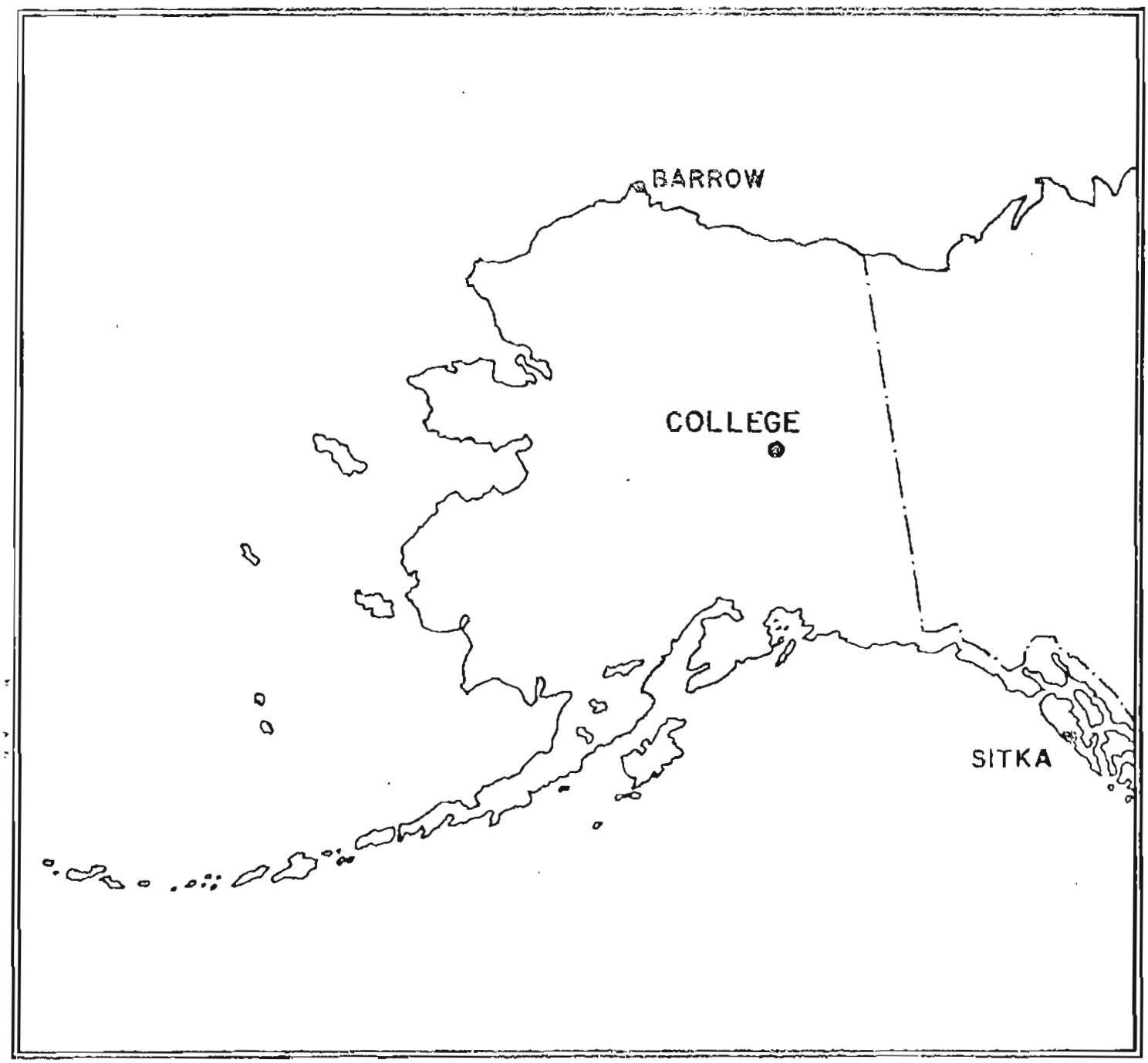
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

APRIL 1981 OPEN FILE REPORT 81-300D



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

College Observatory
800 Yukon Drive
Fairbanks, Alaska 99701

May 18, 1981

TO : Persons Addressing Mail to the College Observatory

SUBJECT: Address Change

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

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

COLLEGE OBSERVATORY
800 YUKON DRIVE
FAIRBANKS, ALASKA 99701

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

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

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

Thank you for your assistance in this matter.

Sincerely yours,

Jack Townshend

Jack Townshend
Chief, College Observatory

ORDER OF CONTENTS

Explanation of Data & Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data & Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal & Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

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

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

INTRODUCTION

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

COLLEGE OBSERVATORY
800 YUKON DRIVE
FAIRBANKS, ALASKA 99701

Requests for copies of the magnetograms except for the current month should be addressed to:
World Data Center A-NOAA
Environmental Data Service
Boulder, Colorado 80302

OBSERVATORY LOCATION

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

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

The position of the observatory site is:
Geographic latitude.....64°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 & 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, ALASKA

MONTH AND YEAR: APRIL 1981

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	WHOLE-DAY CHARACTER 0, 1, OR 2 AK
1	4	3	4	4	4	5	4	2	30	26
2	0	2	3	3	4	2	1	1	16	10
3	3	2	1	1	4	4	3	2	20	13
4	3	2	2	4	4	2	3	2	22	14
5	0	0	0	0	1	0	2	1	04	02
6	1	3	4	3	4	1	2	1	19	13
7	2	1	1	2	4	2	2	2	16	09
8	2	0	2	3	0	3	3	1	14	08
9	3	3	0	0	2	1	1	3	13	07
10	0	1	1	3	2	0	2	1	10	05
11	0	1	2	4	5	5	3	4	24	22
12	5	6	4	5	6	5	5	6	42	57
13	5	7	6	4	4	4	5	4	39	53
14	3	5	5	3	5	5	2	2	30	30
15	0	1	1	3	4	2	2	3	16	10
16	3	2	1	6	5	3	2	2	24	23
17	1	3	7	5	4	6	3	2	31	42
18	2	2	1	0	0	4	2	2	13	07
19	5	5	2	6	5	5	5	2	35	42
20	3	6	5	4	5	6	5	5	39	49
21	4	4	6	6	5	5	5	4	39	48
22	4	4	7	5	5	4	5	3	37	48
23	4	5	6	6	6	3	3	4	37	47
24	2	3	4	6	4	5	5	3	32	33
25	4	3	3	3	5	3	2	2	25	19
26	3	4	6	7	6	6	4	4	40	60
27	5	5	6	6	5	5	3	3	38	48
28	2	1	2	3	3	5	1	3	20	14
29	4	3	2	7	5	4	3	2	30	36
30	2	2	2	2	3	0	2	1	14	07
31										
								SUM		

TIME SCALE ON MAGNETOGRAMS: 20 mm/hr

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.....	3.75	7.81		(γ/mm)
LOWER LIMIT FOR K = 9	2560	2510		(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: APRIL

YEAR: 1981

DATE	TIME U.T.	NATURE OF PHENOMENON [1]	REMARKS
07	1953	si*	
09	14XX	pc5	
15	17XX	pc5	
18	1502	ssc*	

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)

PRINCIPAL MAGNETIC STORMS

WDC-A FOR SOLAR-TERRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80302 U.S.A.

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA

APRIL 1981

Obs. 2 letter IAGA code	Geomag. lat.	Commencement			SC - amplitudes			Max. 3 hr - index K			Ranges			UT End	
		day	hr min (UT)	type	D(')	H(γ)	Z(γ)	day	(3 hr - period)	K	D(')	H(γ)	Z(γ)	day	hr
CO	64.6 N	11	08XX	..	..	..	..	13	2	7	250	1480	960	14	22
		18	1502	s.c.*	-11	+72	-10	22	3	7	206	1380	810	25	15
		26	02XX	..	..	..	..	26	4	7	247	1590	1090	27	22

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: APRIL 1981

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T. 4-1-81	2400 U.T. 4-30-81	1.0/mm	3.78/mm	27° 46.8 E
H	0000 U.T. 4-1-81	2400 U.T. 4-6-81	7.8 γ/mm		12755 γ
	0000 U.T. 4-7-81	2400 U.T. 4-20-81	"		12751 γ
	0000 U.T. 4-21-81	2400 U.T. 4-30-81	"		12756 γ
Z	0000 U.T. 4-1-81	2400 U.T. 4-30-81	7.7 γ/mm		55143 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T. 4-1-81	2400 U.T. 4-30-81	7.8/mm	29.7 γ/mm	23° 48.5 E
H	0000 U.T. 4-1-81	2400 U.T. 4-6-81	44.0 γ/mm		11519 γ
	0000 U.T. 4-7-81	2400 U.T. 4-20-81	"		11505 γ
	0000 U.T. 4-21-81	2400 U.T. 4-30-81	"		11518 γ
Z	0000 U.T. 4-1-81	2400 U.T. 4-30-81	48.6 γ/mm		54029 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
28° 05.1 E	12982 γ	55390 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

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

FORM 76-10d

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	81	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.

Day	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM
01	135	32	95	115	123	77	151	122	171	140*	175	172	183	228	227	266	297	311	271	308	163	185	214	153	4314
02	133	133	134	130	136	147	150	120	125	120	160	171	197	370	279	235	258	303	271	278	229	249	200	139	4687
03	122	110	58	102	126	134	139	136	137	176	166	177	193	212	273	279	285	333	384	236	241	179	197	115	4510
04	108	110	63	123	132	134	134	149	150	171	104	153	180	172	213	169	214	285	278	226	331	134	154	142	4029
05	124	122	128	127	139	156	163	170	168	181	180	176	168	167	196	211	244	289	319	294	268	189	161	137	4477
06	126	106	115	143	139	110	201	157	160	202	181	184	171	189	223	209	275	306	318	304	281	215	202	139	4656
07	134	118	123	128	140	151	180	190	155	154	159	161	190	171	193	245	285	294	304	321	300	228	179	142	4645
08	117	105	108	115	118	141	160	149	150	154	177	197	165	168	169	173	179	248	338	287	273	172	113	124	4100
09	137	99	84	85	127	145	146	164	169	172	171	172	154	177	176	199	230	256	276	294	270	251	204	138	4296
10	142	131	130	130	140	172	145	138	156	168	195	186	185	181	189	217	273	298	313	313	264	214	185	156	4621
11	138	127	126	130	125	141	142	149	110	140	178	244	310	472*	384*	464	366	286	245	231	121	154	168	257	5208
12	185	211	-44*	43*	265	3*	103	-171*	-44*	-10	161	188	231	270	207	323	410	464*	408*	362	241*	-23	123	209*	4115
13	336*	337	-92*	-187*	-790*	-655*	-599*	-370*	-251*	-108*	39	226	189	283	305	320	280	282	332	223	251	134	242	209	936
14	169	128	172	139	86	85	37	146	50	64	104	156	171	315	323	274	244	247	239	250	228	119	119	123	3988
15	131	147	150	151	150	150	157	148	159	159	134	169	208	202	233	268	272	308	296	278	235	196	169	160	4630
16	149	112	149	138	121	132	139	157	155	130	146*	216	295	192	265*	302	315*	295	280	240	207	184	119	118	4556
17	131	138	141	108	121	130	-115*	-251*	-12*	8	135	174	124	174	187	416*	567*	473	292	181	133	101	118	126	3600
18	160	166	154	162	160	167	164	169	161	163	160	155	165	178	204	188	305	324	308	274	263	224	159	91	4624
19	120	68	144	55	138	149	158	124	100	61	202*	551*	98	157	322	534*	551*	598*	280	206	219	90	85	105	5115
20	98	88	104	76	43	-28*	-147*	127	168	146	83*	45	107	145	164	353*	678*	542*	552	368	165	34	176	109	4196
21	106	92	18	21	56	66	19*	-60*	99*	-53*	178*	130*	155	258*	408*	456*	418	247	250	159	262	160	168	215	3828
22	179	177	51	47	103	-20*	19*	-100*	66	94	110	129	160	152	190	264	251	297	351	123	160	156	131	153	3249
23	165	137	76	94	108	108	-187*	-12	81	52*	130*	83*	106*	255	220	310	291	262	219	215	320	190	130	123	3476
24	115	111	116	75	99	114	137	144	131	197	288	222	206	254	154	274	358	375	185	278	200	210	197	160	4600
25	154	200	106	45	134	118	149	236	176	157	134	142	204	204	310	353	370	319	268	264	263	210	217	209	4942
26	151	138	38	85	45	122	194	157	43*	258*	11*	148	102	47	606*	884*	637*	349	323	294	227	255	203	142	5459
27	243	162	141	145	119	-60*	-76*	-171*	4	83*	21	178*	128	130	323	319	372	296	252	174	223	236	117	93	3452
28	97	108	119	111	121	131	149	140	140	139	133	149	220	230	276	333	318	291	242	239	215	229	287	242	4659
29	204	136	96	98	115	114	143	122	141	120	130*	-20*	99*	281	333	314	418	408	320	218	163	171	164	151	4439
30	120	94	106	119	131	139	141	135	117	130	151	176	169	197	190	234	226	218	220	209	165	170	147	140	3844
31																									

SCALED BY: EAS, LLF, JEP
CHECKED BY: JEP, EAS
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 Mag'h., corrected to Normal Mag'h.

MONTHLY SUM: 127251
MONTHLY MEAN: 177
DATES WITH GAPS:

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	81	APR	H

Values are in tenths of gau. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (2506 U. T.) is hour 11 of the same universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	Q of S	Ten Q	Dy	01	02	03	04	05	06	07	08	09	10	11	12	Dy	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	377	526	411	361	409	398	335	413	305	101	202	234	01	277	156	244	157	-216	67	220	100	242	273	282	261	6135
			02	281	277	281	289	307	318	317	358	367	299	331	306	02	156	57	268	312	302	247	250	257	283	272	272	246	6653
			03	273	306	326	323	325	324	319	324	331	327	323	318	03	296	214	60	55	255	269	198	245	248	253	254	265	6431
			04	299	289	380	323	314	310	325	320	378	371	207	192	04	193	80	171	299	333	305	295	302	261	274	266	280	6767
			05	288	290	296	306	305	309	313	316	324	318	313	320	05	328	319	315	319	313	317	286	275	268	270	264	256	7228
			06	272	293	310	301	329	409	468	374	354	330	289	296	06	300	148	225	337	339	325	317	289	270	254	253	251	7333
			07	268	287	306	311	327	326	330	324	325	321	324	315	07	121	234	326	300	342	342	317	305	261	266	245	254	7077
			08	279	297	286	309	321	322	347	376	339	334	278	269	08	338	319	328	316	288	234	135	203	241	237	240	269	6905
			09	283	346	412	395	362	323	296	295	306	306	309	327	09	322	301	336	327	326	305	304	290	259	263	251	237	7481
			10	250	269	285	308	321	337	335	327	341	342	280	247	10	300	301	323	324	328	328	303	290	261	266	253	254	7173
			11	259	273	290	304	320	336	343	356	411	353	252	190	11	29	-181*	-137	-30	292	327	412	378	354	341	320	383	6175
			12	547	819*	856	827	317	386	138	170	170	149	100	-108	12	-45*	75	296	192	194	218	194	118	6	221	324	363	6527
			13	522	428	292	334	-148*	90*	10	-35*	96*	276	268	190	13	58	195	237	181	297	322	247	291	211	219	301	393	5275
			14	412	427	470	355	380	627	428	282	310	262	276	231	14	127	-13	-141*	-73*	99	248	309	303	253	281	256	264	6373
			15	274	271	272	271	272	280	289	285	294	291	321	305	15	222	310	280	292	272	293	282	288	253	266	261	279	6723
			16	282	310	275	285	300	310	328	318	318	225	-125*	-13	16	7	239	227	230	298	298	272	239	252	274	278	273	5700
			17	261	282	278	345	421	425	448	333	-17*	362	168	108	17	228	70	-7	-125*	-168*	64	221	262	269	259	298	290	5075
			18	289	296	298	307	306	306	311	314	319	320	321	320	18	323	330	321	313	252	260	291	281	270	252	250	260	7110
			19	323	417	734	617	560	359	320	324	341	325	40*	-418*	19	-17*	49	-105	-350*	-407*	-226*	29	220	179	223	240	252	4029
			20	292	346	409	630	557	367*	423	451	320	308	190	181	20	131	197	113*	-367*	-362*	-204*	-18	95	-108*	184	325	398	4858
			21	419	347	418	491	491	484	454	62*	-209*	62*	-435*	-134	21	97	-85*	-63	58	-20	144	189	242	248	282	342	441	4325
			22	612	436	488	513	485	466	413	12*	209	326	285	72	22	8	22*	-164*	280	260	168	-119*	-91*	187	253	264	316	5701
			23	341	378	338	401	448	387	497*	360	242	-85*	-101*	3	23	-91*	159	240	193	238	275	300	281	246	263	256	279	5848
			24	293	300	289	365	376	439	410	342	276	48	-254*	-85*	24	30	-42	-5	-18	-153*	-136*	-118	240	348	301	315	330	3891
			25	428	540	331	423	383	320	334	320	281	286	221	198	25	28	-72	116	151	152	200	241	262	248	250	307	320	6268
			26	331	275	404	574	470	545	388	345	-226*	-490*	-17*	77	26	-27	223	-294*	-271*	12*	269	266	81	115	257	294	407	4268
			27	426	639	649	574	600	621*	526	293	398	-12*	-6*	5*	27	9	-38	-158*	-5*	-61	272	302	322	280	258	239	282	6417
			28	308	308	297	332	318	331	323	344	349	308	309	258	28	279	248	204	52	114	235	296	284	263	239	265	339	6603
			29	586	631	443	395	340	319	314	332	323	324	50*	-565*	29	-87	-49	118	65	-111	14	132	162	200	249	270	289	4744
			30	283	287	319	289	282	300	303	310	331	350	359	330	30	310	273	285	330	329	320	284	283	293	284	283	275	7292
			31													31													

SCALED BY: EAS, LLF, JEP
CHECKED BY: JEP, EAS
SIGNS REVIEWED BY: JEP
PUNCHED BY:

Preliminary base-line and scale values:

Interval Beginning	Base-line Value	Scale Value

( ) Interpolated
[ ] Scaling uncertain because of magnetic storm.
[Significant portion of hour interpolated.
< > Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.
[ ] No record; or no values available because of faulty record.
* Derived from STORM Mgph., converted to Normal Mgph.

MONTHLY SUM: 182385
MONTHLY MEAN: 253
DATES WITH GAPS:

FORM 76-108

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

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

OBY.	YEAR	MONTH	ELE-MENT
(O)	81	APR	Z

Values are in tenths of nm, and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1200 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 S	Int Q	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	351	341	377	379	362	390	419	390	295	267	279	360	01	346	351	282	285	310	228	233	275	250	304	335	332	7761
			02	337	341	333	332	333	341	339	345	329	294	347	337	02	300	264	230	289	324	327	290	291	300	323	317	310	7573
			03	318	339	333	376	355	336	327	321	331	332	319	320	03	307	298	304	212	162	224	230	224	281	262	303	318	7232
			04	331	338	349	359	328	338	334	348	351	326	239	251	04	254	240	165	228	312	336	326	313	339	291	322	330	7348
			05	337	343	331	323	319	322	322	323	325	324	314	312	05	311	312	316	329	334	336	334	316	308	303	313	319	7727
			06	325	330	338	335	327	342	394	389	366	303	272	285	06	294	311	231	284	316	329	330	325	318	305	309	311	7679
			07	319	331	336	330	330	332	338	329	324	320	318	307	07	273	203	276	314	318	325	322	320	317	311	309	317	7519
			08	316	338	333	321	311	315	320	341	349	335	308	255	08	297	316	316	319	312	341	306	264	291	287	288	317	7498
			09	352	359	360	353	382	353	333	325	321	321	318	315	09	312	299	337	324	330	339	330	328	317	318	310	309	7945
			10	319	328	333	334	335	336	319	318	328	316	287	278	10	281	279	232	321	333	337	332	330	308	277	300	309	7552
			11	319	321	320	316	311	317	314	321	319	283	312	442	11	434	467*	695*	647	415	376	317	322	308	323	328	371	8848
			12	502	410*	-12	-104	-35	-60	170	317	265	441	645	680	12	706	671	470	564	594	543*	384*	368	346*	276	345	353*	6789
			13	169*	-96*	-65*	118*	-56	-66	164	481	416	316	447	526	13	606	665	612	583	389	350	389	337	398	353	407	408	7841
			14	390	430	380	416	420	322	229	311	216	311	358	359	14	360	355	467	610	351	315	330	341	349	348	359	352	8719
			15	352	358	354	353	350	350	347	341	349	349	332	353	15	328	330	334	341	341	339	342	339	340	330	321	325	8192
			16	349	344	360	348	340	337	346	349	338	337	420	412	16	364	359	335	360	329	338	341	332	330	330	328	348	8374
			17	350	351	352	349	390	399	135	73	499	360	434	398	17	348	419	433	423*	264*	230	239	293	314	340	338	344	8095
			18	350	362	348	349	340	340	340	340	337	335	330	329	18	329	330	333	343	355	298	310	311	319	310	310	309	7957
			19	323	307	205	194	294	414	386	351	347	352	417*	440*	19	330	456	486*	240*	233*	244	135	232	303	292	291	338	7618
			20	355	378	401	332	80	94*	258	351	380	372	356	472	20	458	420	550	543*	428*	118*	163	209	111	177	328	342	7676
			21	345	355	353	371	369	344	336	331	446	427	594*	499	21	478	600*	556*	486*	263	219	290	297	370	366	404	372	9511
			22	277	338	341	358	348	169*	134	410*	401	354	372	457	22	318	319	335	289	301	336	305	207	266	292	334	373	7634
			23	381	389	357	390	351	275	218	215	330	230	415	540	23	478*	312	317	337	326	344	358	363	330	379	349	350	8425
			24	342	360	363	346	372	365	382	398	325	234	360	205	24	188	368	308	347	310	208	154	229	316	354	378	400	7612
			25	398	394	390	380	438	331	398	351	290	301	262	260	25	168	163	240	269	294	319	300	309	321	329	354	372	7711
			26	372	399	377	418	389	452	495	381	26	94	600*	470	26	506	548	751*	251*	100*	240	331	345	354	394	407	367	9067
			27	364	235	259	268	297	182*	256	73	324	182*	456	536*	27	442	439	441	524	391	270	329	327	349	360	348	350	8002
			28	362	368	370	360	370	372	377	367	359	330	349	337	28	340	330	303	290	208	211	275	309	321	333	348	348	7937
			29	342	335	366	404	383	384	376	368	375	347	357	96	29	53	227	216	316	193	70	80	216	260	312	340	353	6771
			30	356	360	359	347	340	339	338	330	334	342	350	339	30	334	333	225	317	330	339	342	329	317	322	329	330	8051
			31													31													

SCALED BY	EMS, LLF, JEP
CHECKED BY	JEP, EAS
SIGNS REVIEWED BY	JEP
PUNCHED BY	

Preliminary base-line and scale values:

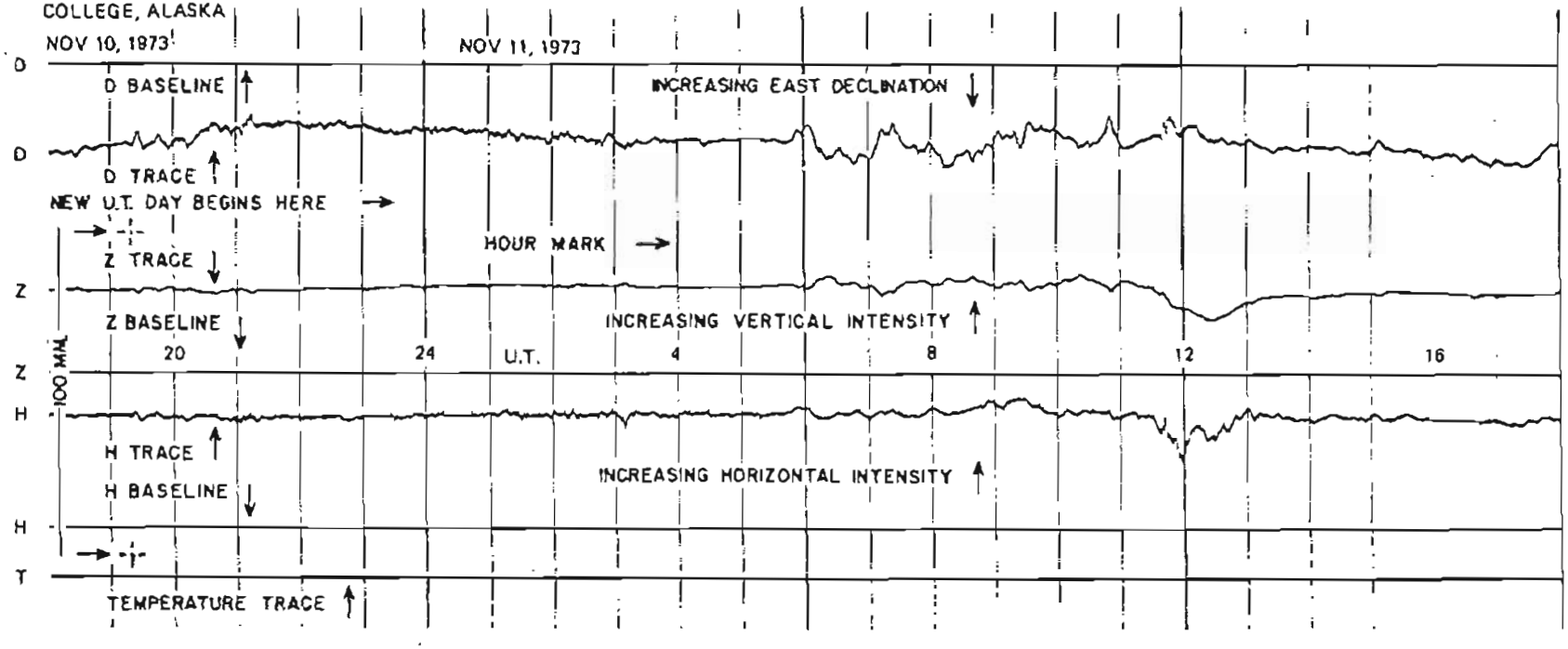
Interval Beginning	Base-line Value	Scale Value

( ) Interpolated
[ ] Significant portion of hour interpolated.
[ ] No record; or no values available because of faulty record
L] 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 Mags., converted to Normal Mags.

MONTHLY SUM	236664
MONTHLY MEAN	331
DATES WITH DATA	

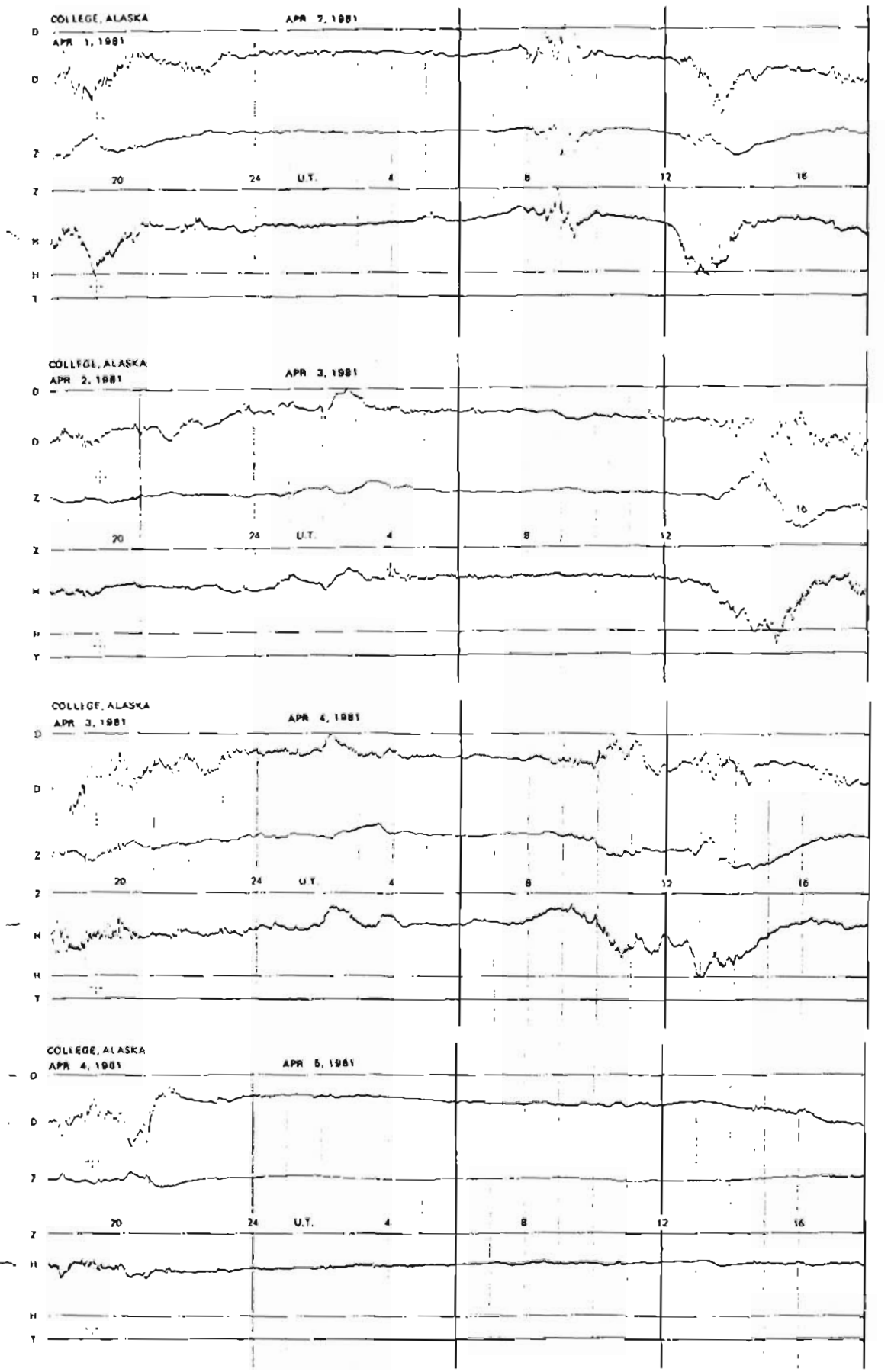
FORMAT FOR NORMAL & STORM MAGNETOGRAMS

(SAMPLE ONLY)

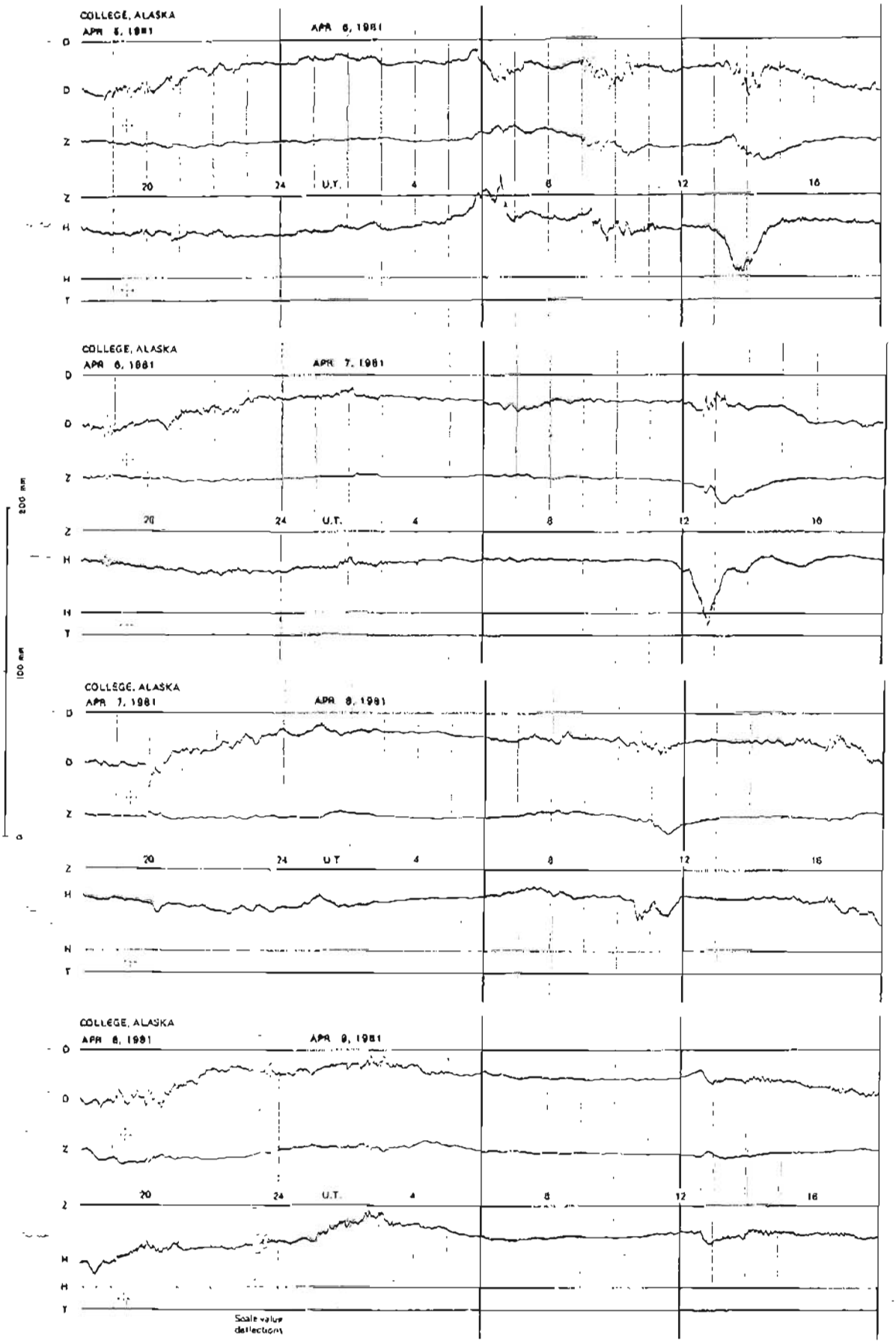


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

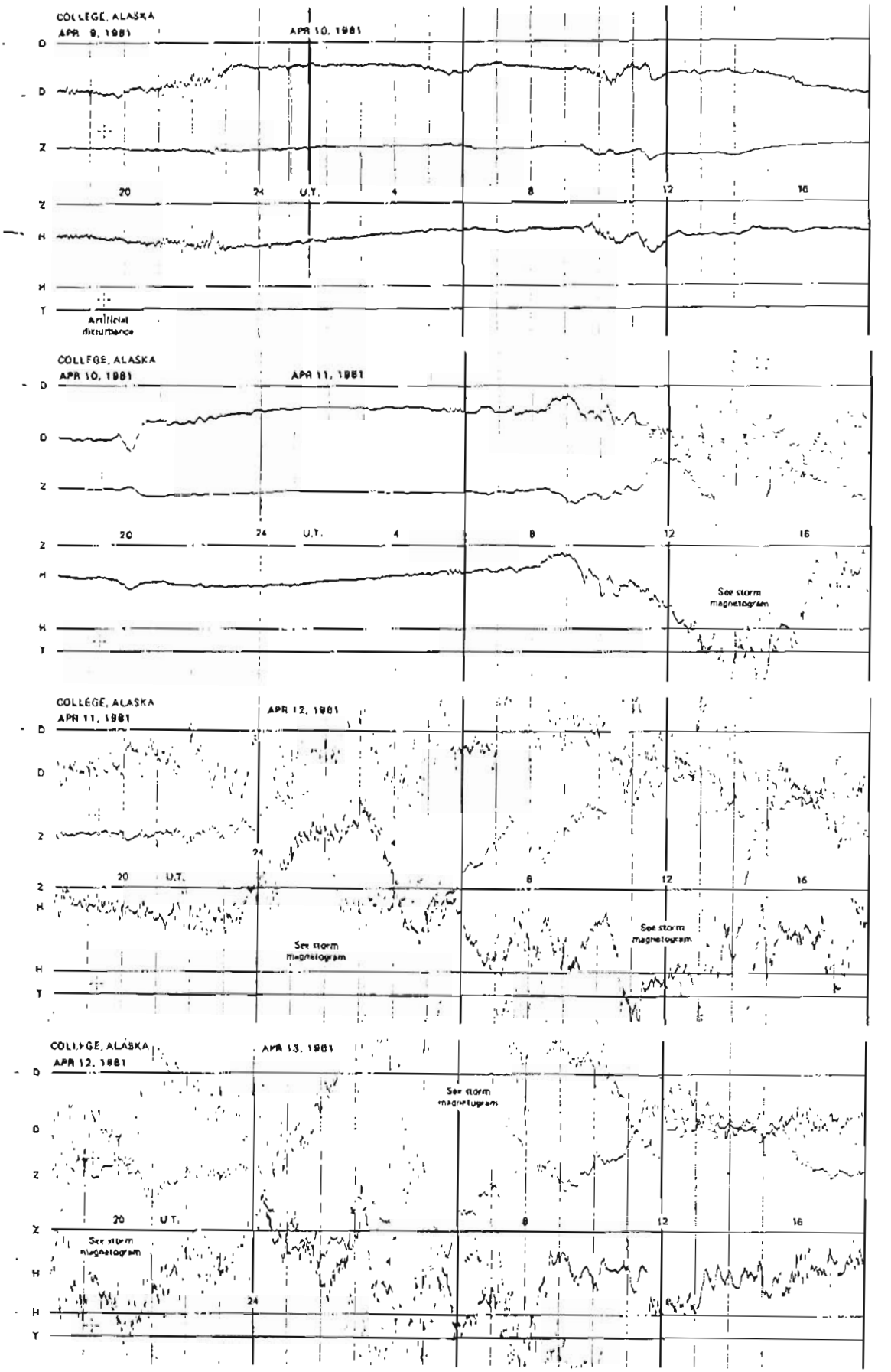
NORMAL MAGNETOGRAMS



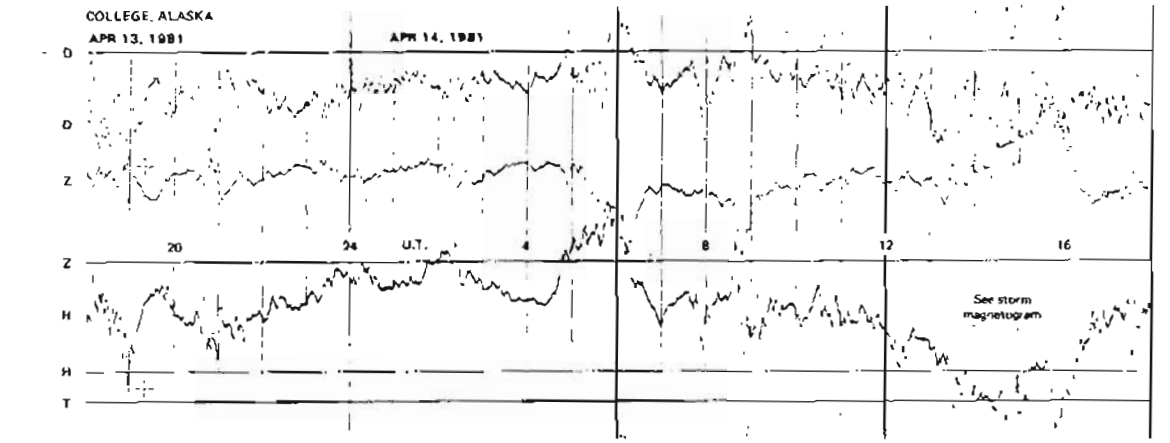
NORMAL MAGNETOGRAMS

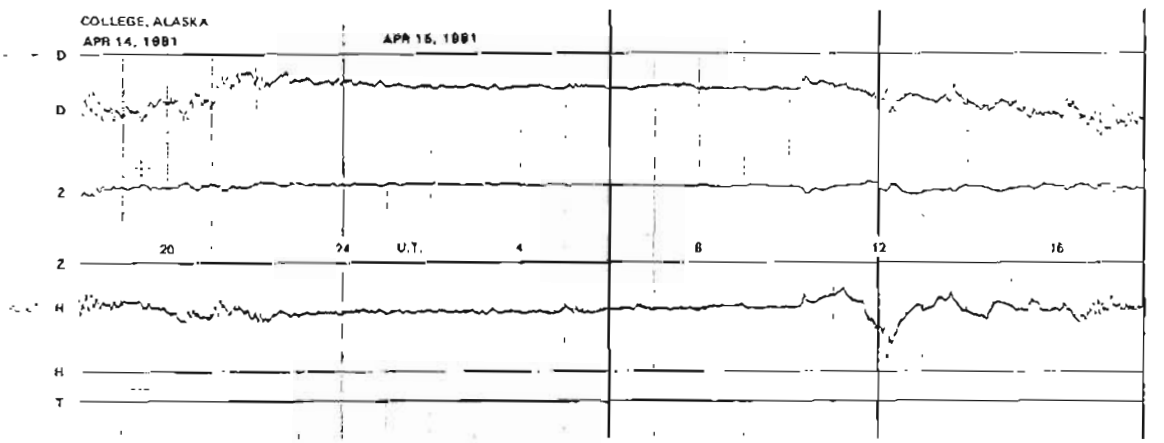


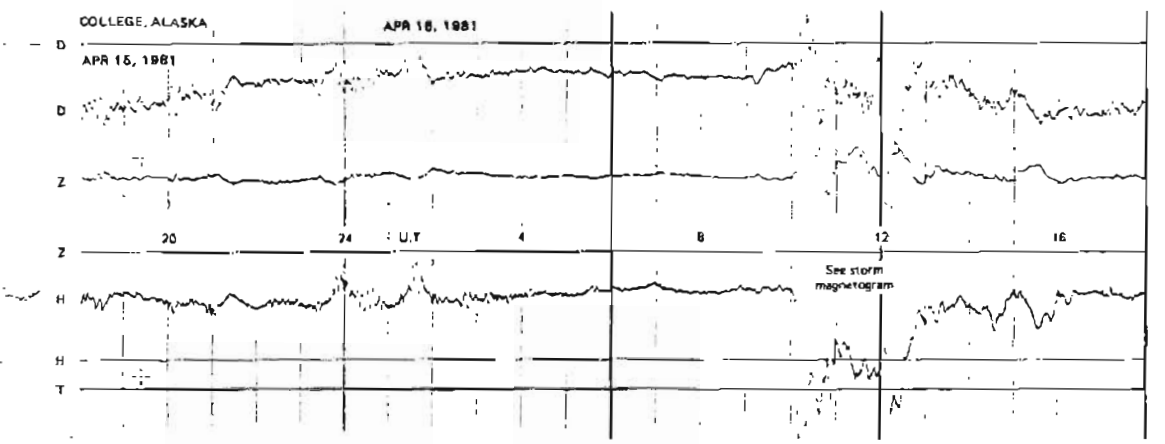
NORMAL MAGNETOGRAMS

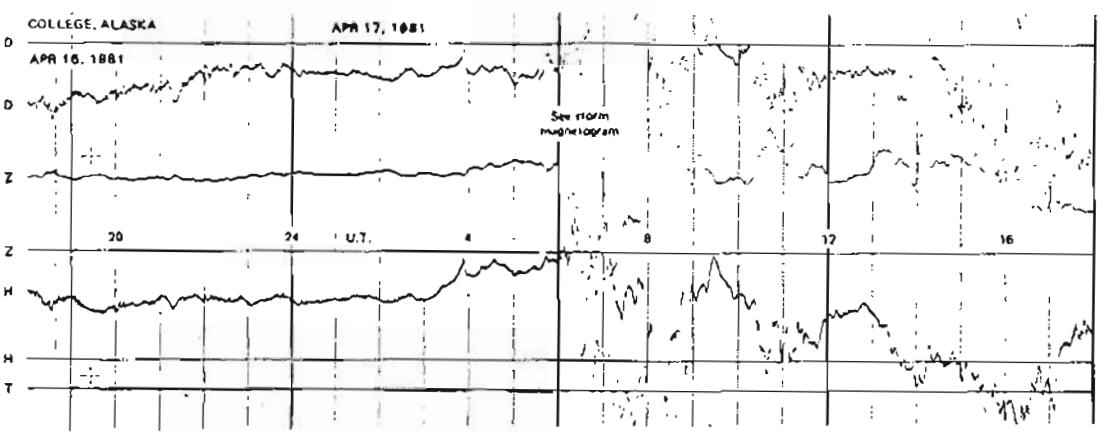


NORMAL MAGNETOGRAMS

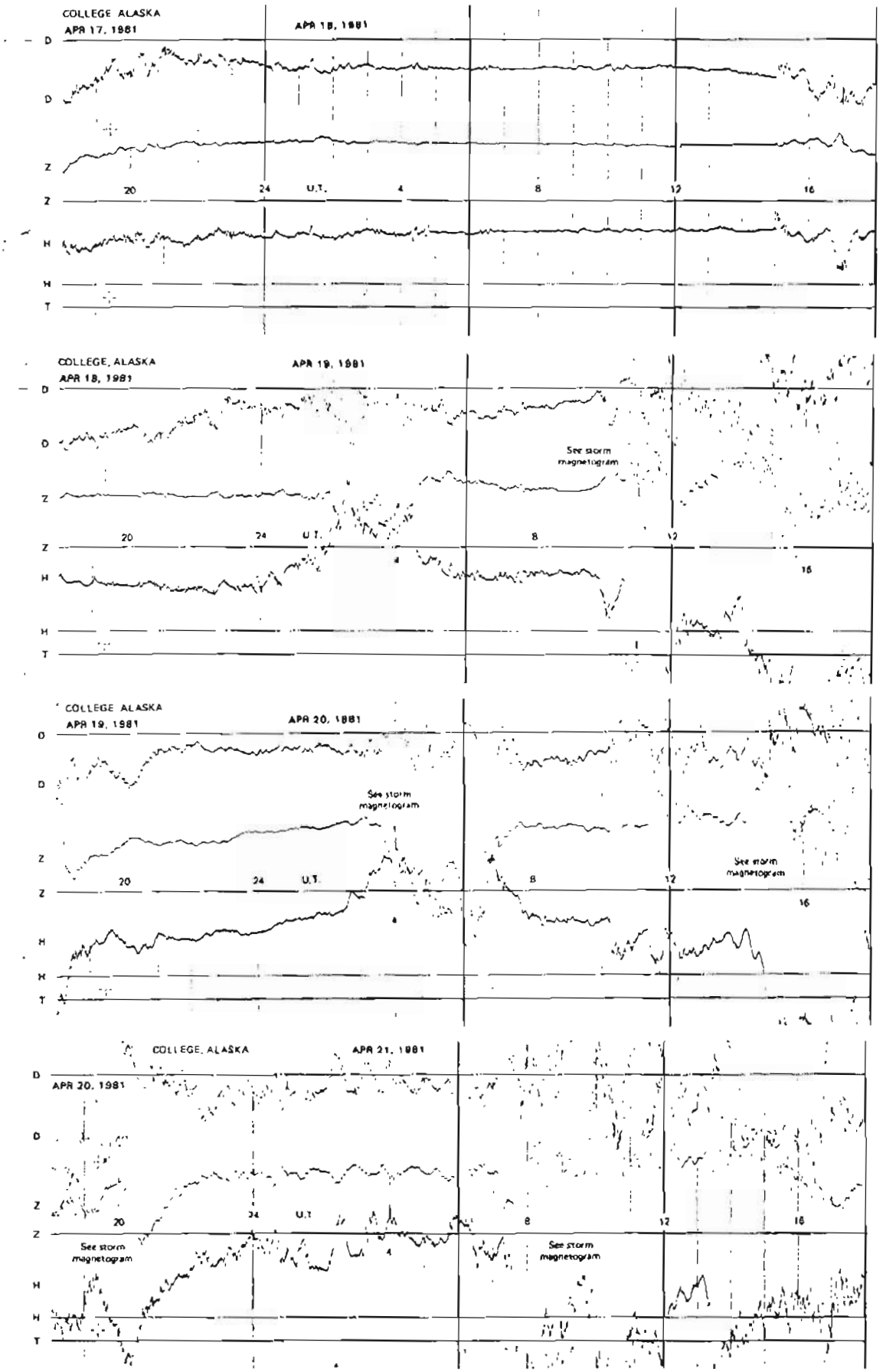




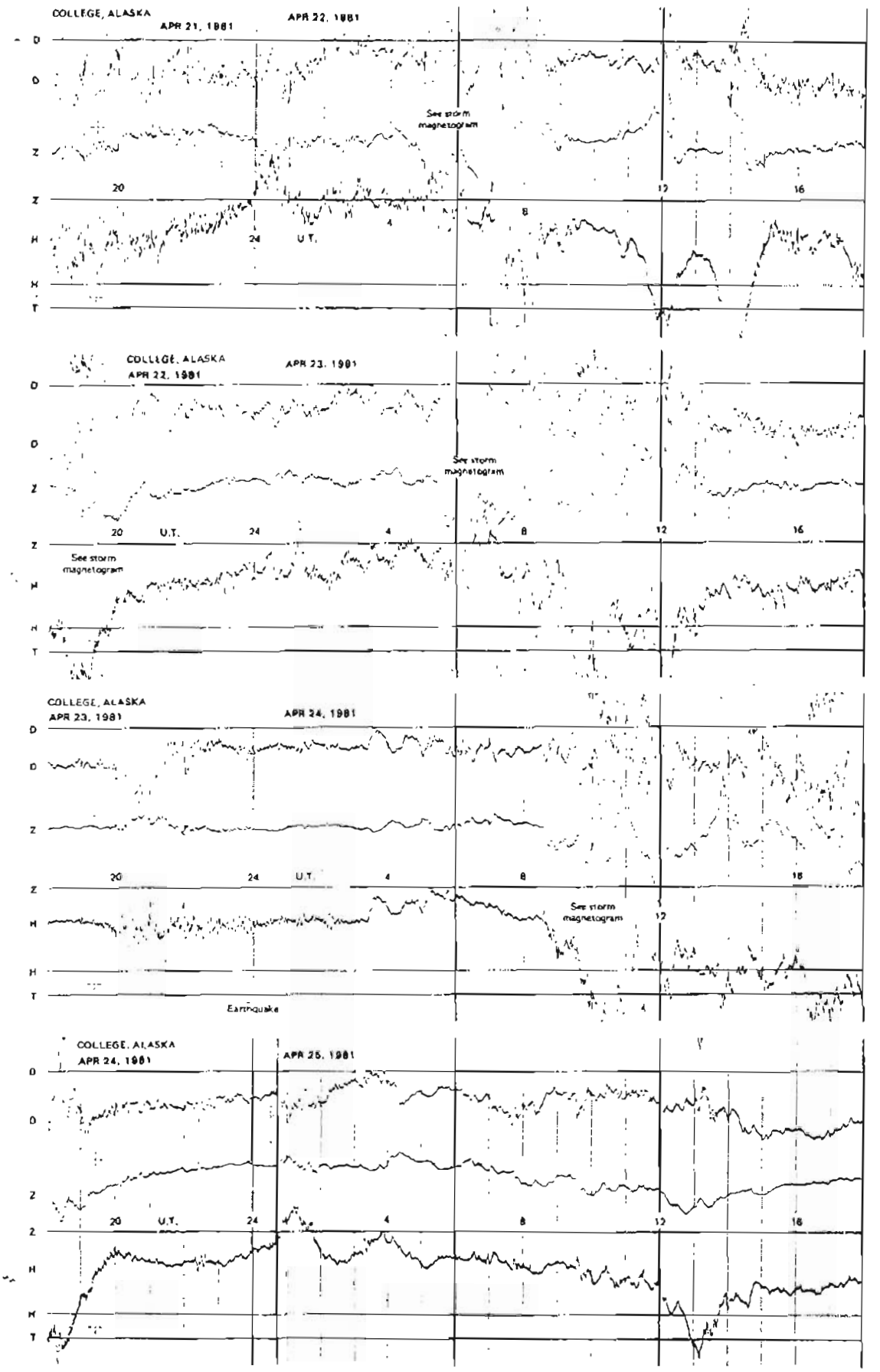




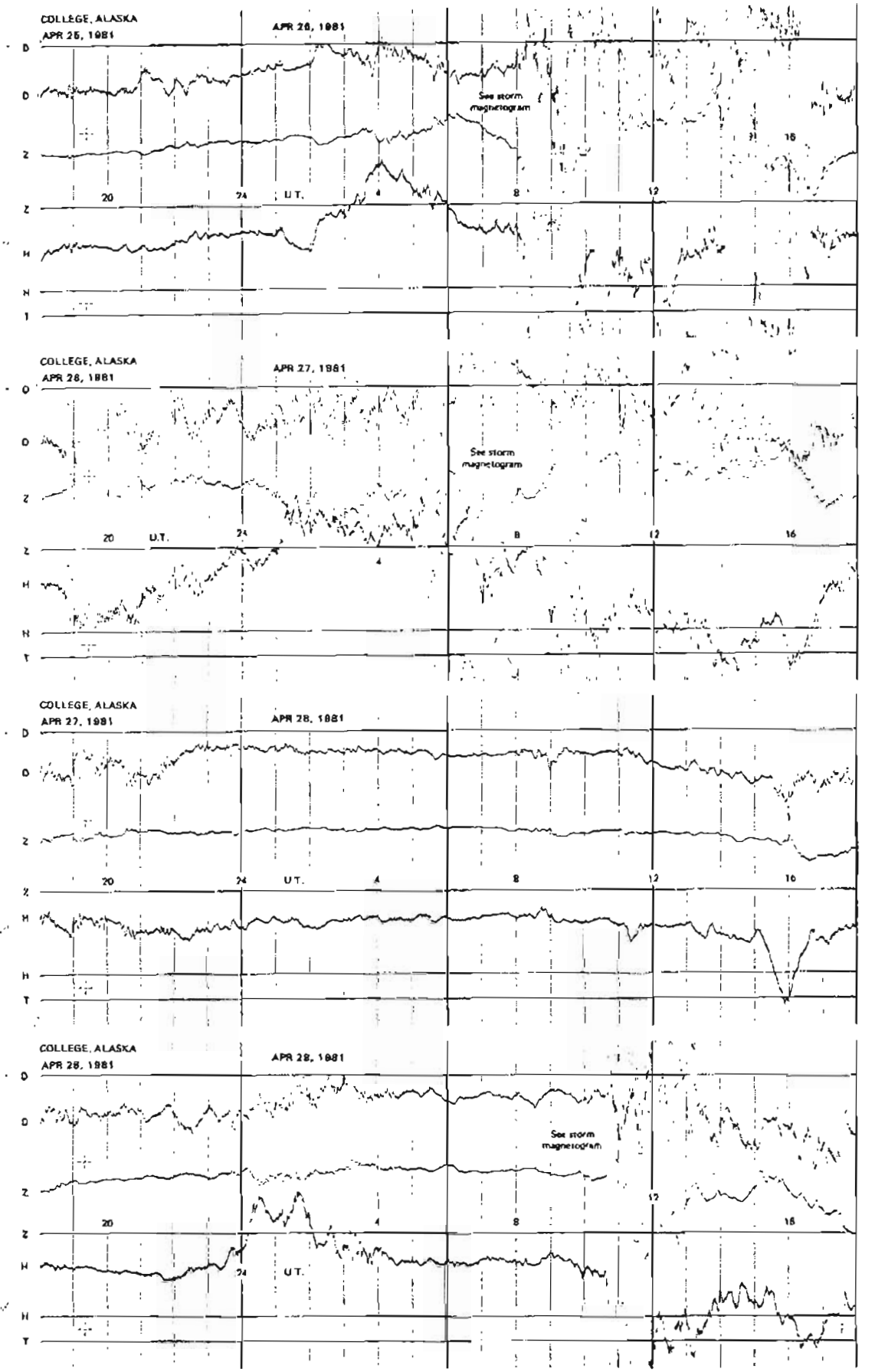
NORMAL MAGNETOGRAMS



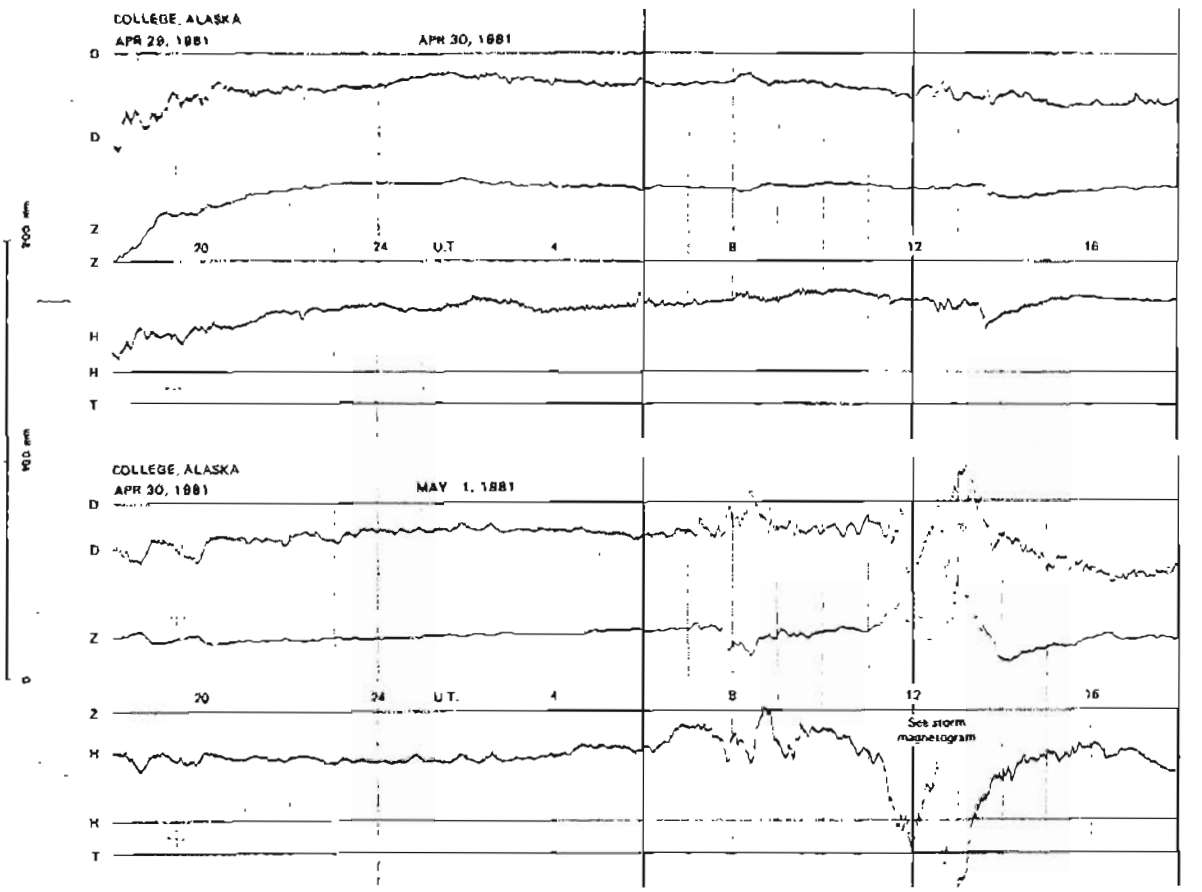
NORMAL MAGNETOGRAMS



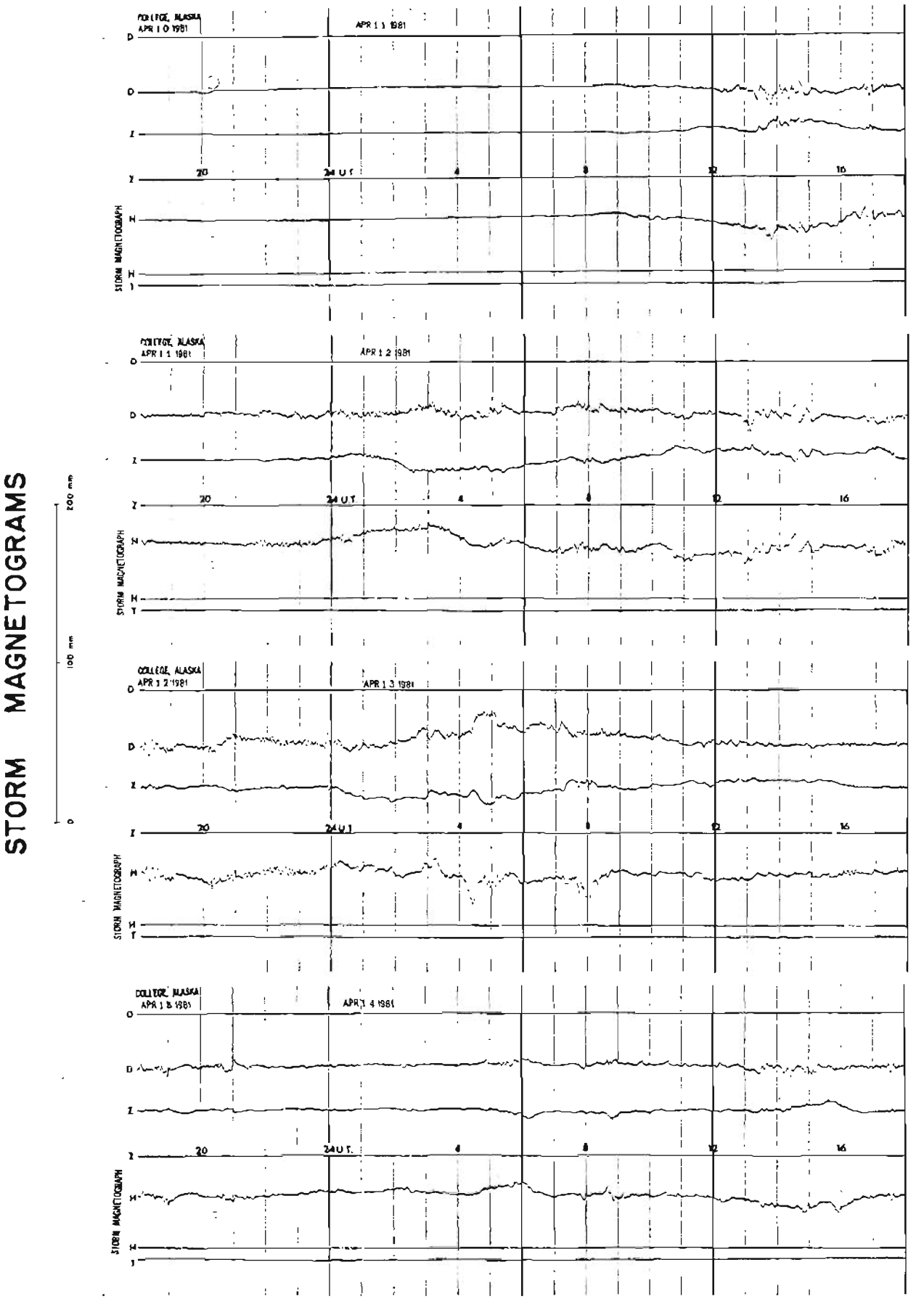
NORMAL MAGNETOGRAMS



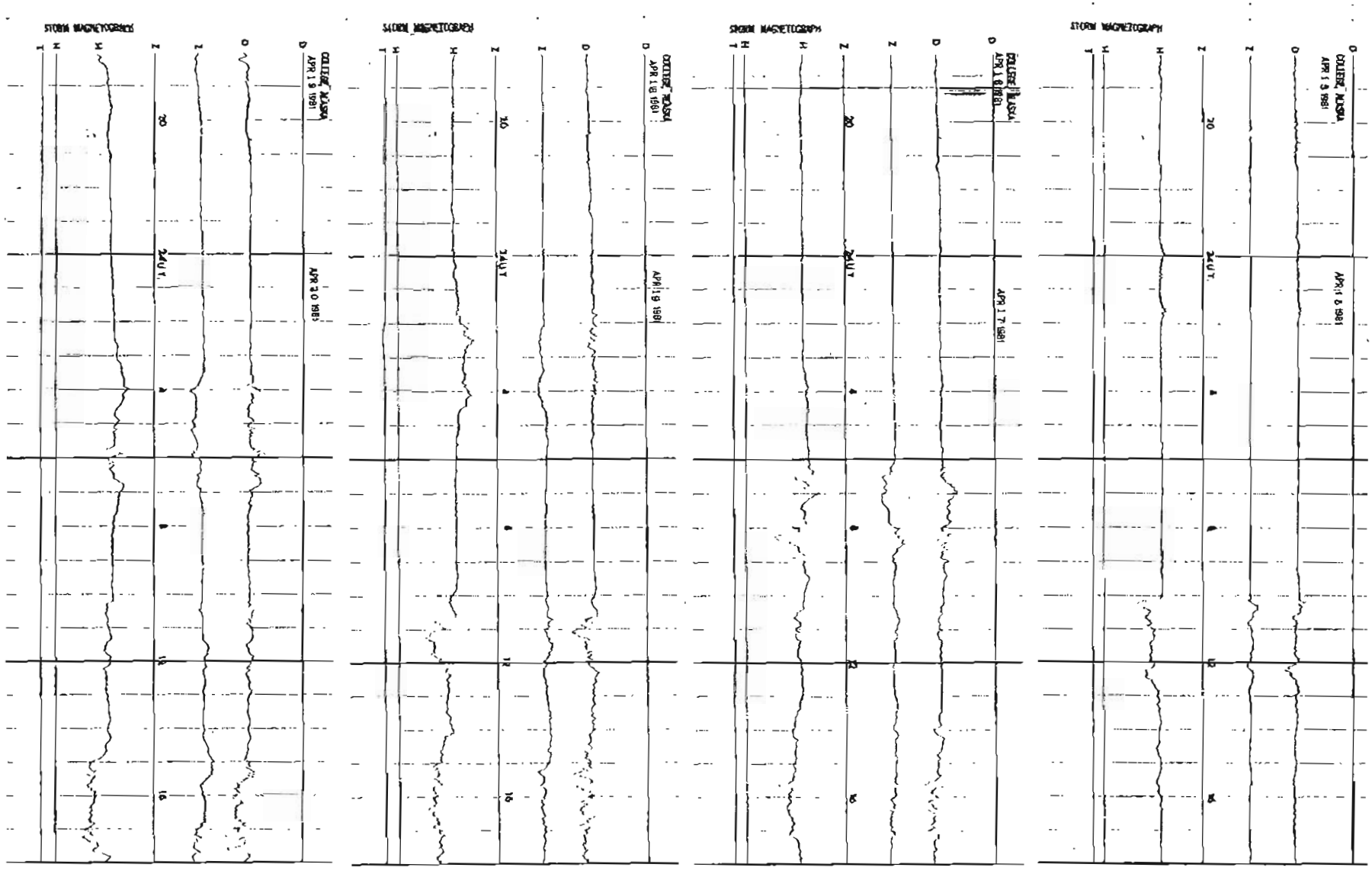
NORMAL MAGNETOGRAMS



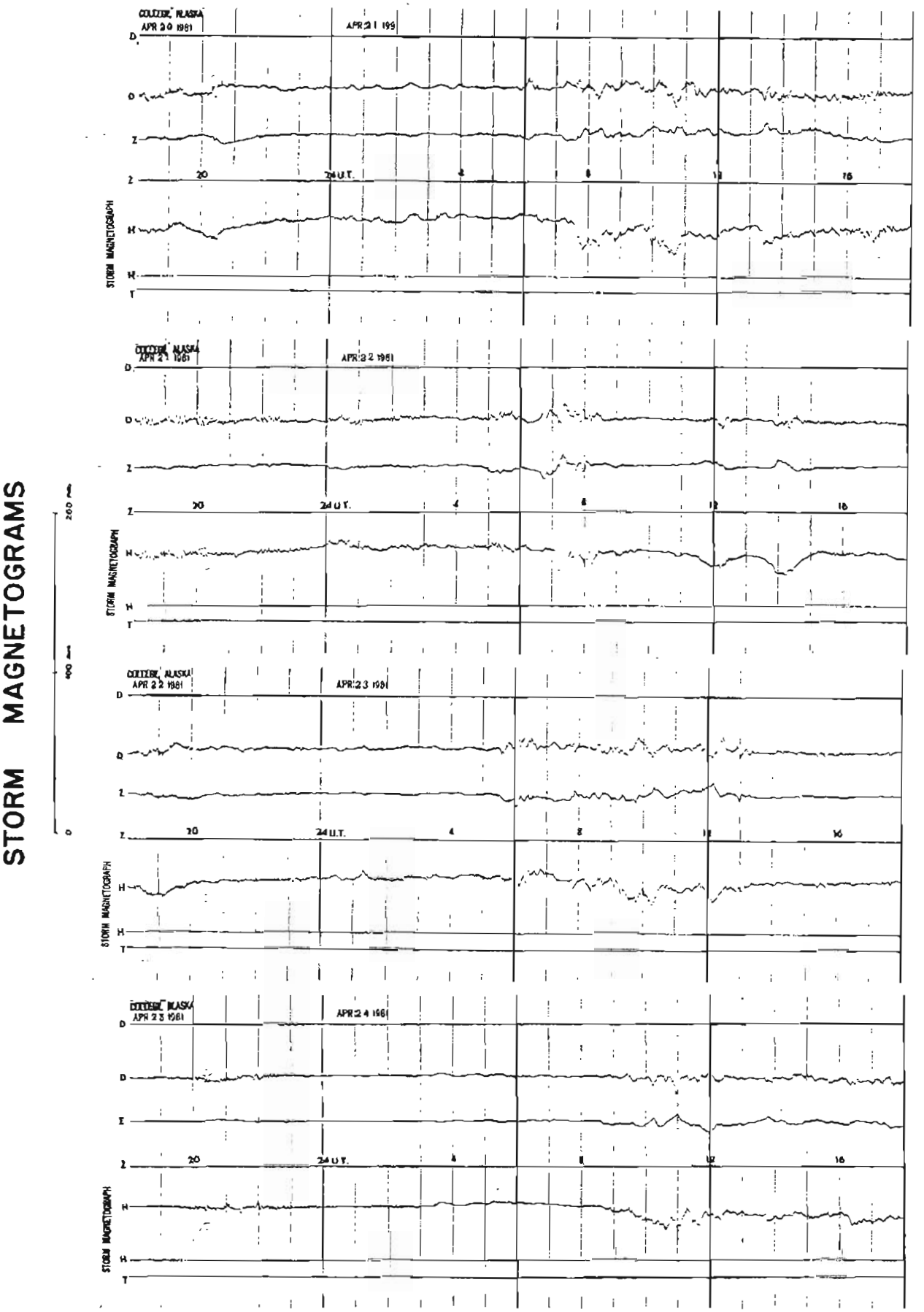
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS