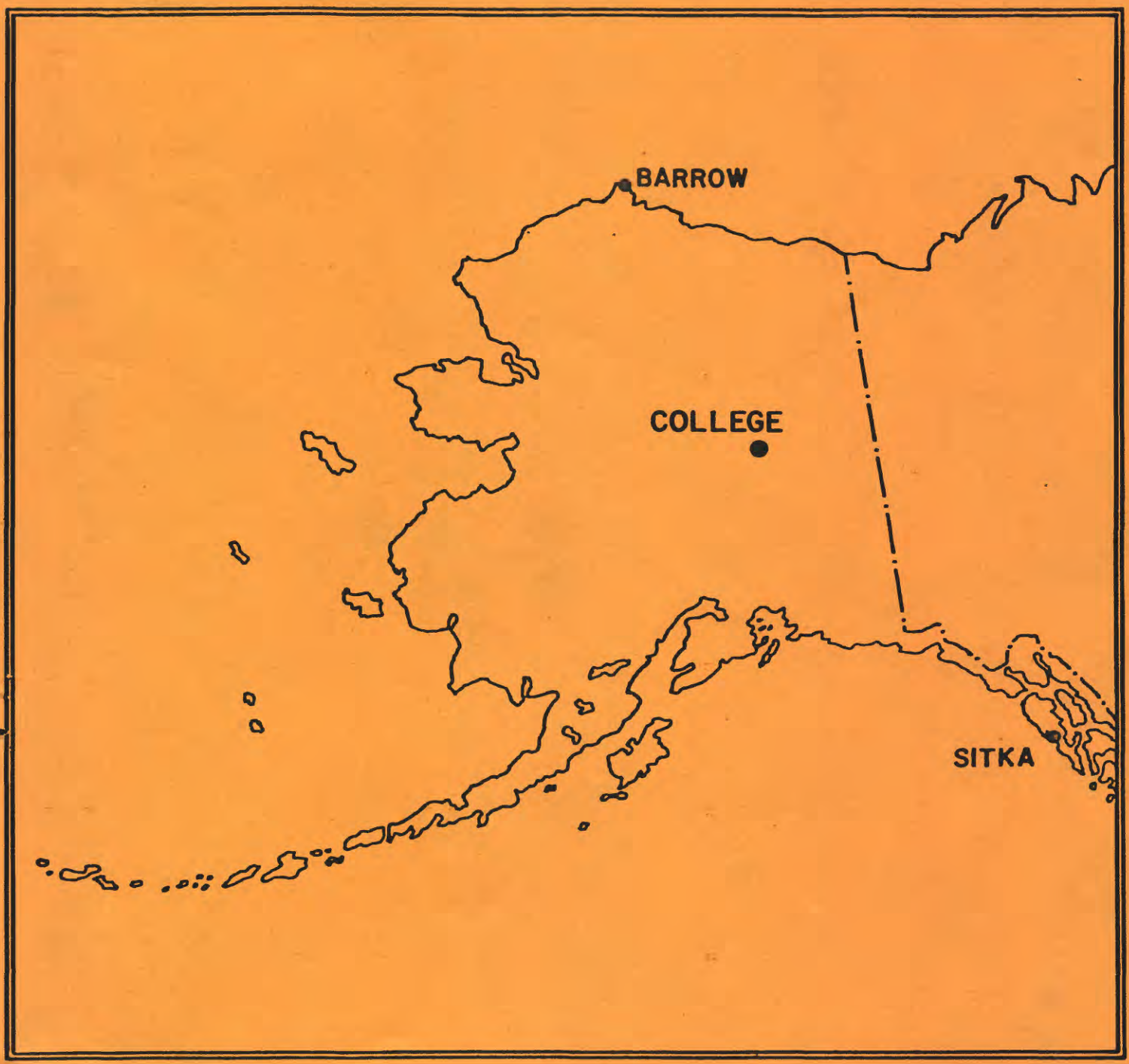
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

NOVEMBER 1984

OPEN FILE REPORT 84-0300K



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.

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° 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, ALASKA

MONTH AND YEAR: NOVEMBER 1984

DATE	K-INDICES 00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM	AK
1	2	2	7	6	5	2	1	2	27	37
2	1	1	1	2	2	4	4	3	18	12
3	2	1	4	3	6	6	3	3	28	30
4	3	2	3	7	4	3	3	2	27	30
5	2	3	5	5	5	3	2	2	27	24
6	0	1	3	6	5	5	3	1	24	27
7	2	2	1	3	4	5	3	3	23	17
8	4	3	6	6	4	5	2	2	32	36
9	1	1	2	2	3	3	2	2	16	08
10	2	2	1	1	7	2	3	3	21	25
11	3	2	1	6	5	3	2	3	25	24
12	2	3	2	3	1	0	0	1	12	06
13	0	0	0	4	2	4	2	2	14	09
14	2	1	3	5	6	2	2	2	23	22
15	2	2	3	7	6	6	6	5	37	57
16	5	8	7	8	8	6	5	4	51	133
17	3	4	5	6	6	6	3	4	37	47
18	4	3	5	6	5	1	3	2	29	30
19	3	4	3	3	3	4	4	3	27	20
20	3	4	4	5	5	4	3	3	31	28
21	3	4	3	6	6	3	4	3	32	34
22	2	3	4	6	4	3	2	1	25	23
23	1	2	1	2	5	2	2	1	16	11
24	1	1	3	4	1	3	2	2	17	10
25	1	1	0	2	0	1	2	2	09	04
26	2	2	1	3	2	1	1	0	12	06
27	0	0	1	5	4	3	2	1	16	13
28	0	0	2	2	2	0	0	0	06	03
29	0	0	4	4	3	1	1	1	14	10
30	2	6	5	5	5	3	5	4	35	40
31										

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	BEGIN h	BEGIN m	END d	END h	END m

K SCALE USED:

	D	H	Z	
LOWER LIMIT FOR K = 9.....	675.7	322.2		(mm)
CURRENT SCALE VALUE.....	3.72	7.83		(γ/mm)
LOWER LIMIT FOR K = 9	2510	2520		(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

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

NOAA FORM 76-133 SUPERSEDES C&GS FORM 815

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973-761-857

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: NOVEMBER

YEAR: 1984

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
06	2018	si	
23	14XX	pg	
23	1941	si	
24	16XX	pc4	
25	21XX	pc5	
27	16XX	pc4	

IDENTIFIED BY: JEP

VERIFIED BY: JBT

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

NOAA FORM 86-500
(11/73)

PRINCIPAL MAGNETIC STORMS

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

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA

NOVEMBER 1984

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	15	07XX	..	..	..	..	16	2, 4, 5	8	441	2510	1790	18	13

COLLEGE OBSERVATORY, COLLEGE, ALASKA -- PRELIMINARY CALIBRATION DATA FOR: NOVEMBER 1984

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 11-1-84	2400 U.T., 11-30-84	1.'0/mm	3.7 γ/mm	27° 16.'8 E
H	0000 U.T., 11-1-84	2400 U.T., 11-30-84	7.8 γ/mm		12670 γ
Z	0000 U.T., 11-1-84	2400 U.T., 11-30-84	7.6 γ/mm		55182 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T., 11-1-84	2400 U.T., 11-30-84	7.'9/mm	29.6 γ/mm	23° 42.'6 E
H	0000 U.T., 11-1-84	2400 U.T., 11-30-84	48.9 γ/mm		10793 γ
Z	0000 U.T., 11-1-84	2400 U.T., 11-30-84	48.3 γ/mm		54066 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 42.'7 E	12910 γ	55353 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: NOV 2, 9, 12, 13, 23, 24, 25, 26, 28, 29

Form C&GS-606

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 signs shown.

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

OBSY.	YEAR	MONTH	ELEMENT
D	84	NOV	D

C	Q or S	Tan 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	199	233	221	240	236	243	156	164*	283*	92*	267*	386*	01	513*	292	273	303	300	307	309	304	287	276	261	269	6414
			02	258	260	248	256	243	253	253	243	263	267	269	287	02	287	283	307	310	337	318	263	283	278	243	247	237	6493
			03	257	247	267	263	260	257	233	221	229	248	280	282	03	326	404*	427	390	317	303	290	300	243	194	214	210	6662
			04	241	221	228	238	263	252	230	270	265	244*	237*	247	04	294	342	317	283	333	346	328	269	254	239	223	219	6383
			05	224	219	227	208	254	228	273	279	200	200	250	305	05	323	299	383	311	298	294	313	252	249	233	240	240	6302
			06	246	253	266	263	258	263	227	282	280	263	229*	184	06	273	300	422	399	320	324	299	287	269	238	223	237	6596
			07	251	258	277	246	237	257	254	243	237	239	242	251	07	273	370	273	515	612	320	293	269	233	200	202	215	6767
			08	200	233	229	203	319	260	277	229	396*	212	130	225	08	240	332	315	308	327	300	293*	253*	244*	229*	237*	261*	6252
			09	255	263	263	260	253	257	231	287	283	267	257	247	09	263	293	327	257	312	353	325	270	243	233	205	233	6437
			10	237	223	263	248	253	302	253	263	270	272	265	269	10	298	475*	200	283	323	327	275	263	262	200	160	162	6346
			11	226	227	237	239	288	250	265	263	266	290	30*	30*	11	463	452*	300	251	311	323	301	283	279	267	93	153	6087
			12	214	257	251	233	232	276	225	253	282	313	252	253	12	274	290	273	285	293	275	292	273	254	245	243	243	6281
			13	244	253	260	260	266	267	264	267	266	253	190	315	13	273	275	291	353	432	357	393	287	243	201	171	190	6571
			14	216	229	224	250	263	269	312	400	263	260	263	373*	14	627*	488	280	288	312	300	230	257	277	240	230	232	7083
			15	247	263	243	200	274	273	262	345	223	245*	531*	278*	15	469*	213	300	341	667*	381*	233	120	129	120	282	312	6951
			16	317	246	300	200	187	31*	-453*	159*	222*	-143*	0*	-47*	16	222*	849*	119*	428*	603*	341*	253	180	201	207	177	220	4819
			17	267	283	306	273	397*	417	323	317*	253*	8*	198*	160	17	255	270*	389*	619*	349*	246	293	233	213	200	221	220	6710
			18	233	246	283	263	300	299	275	309*	64*	200	262	333	18	184	268	287	294	298	303	293	263	223	213	233	240	6166
			19	259	271	347	256	243	228	356	273	248	255	268	280	19	263	302	313	292	319	295	273	162	157	219	223	227	6329
			20	237	247	265	268	257	354	557	273	258	233	187	247	20	277	325*	253	323	300	333	262*	222*	183*	134*	142*	175*	6312
			21	214*	230*	230*	214*	294*	238*	286*	294*	278*	111*	245*	214*	21	214*	341*	254*	325*	373*	341*	245*	238*	193	214	230*	230*	6046
			22	250	268	261	288	309	353	214*	214*	215	-47*	244	332	22	266	336	300	320	330	310	299	250	210	219	220	211	6172
			23	210	247	258	251	256	265	270	250	260	271	261	278	23	270	246	273	254	289	297	276	264	245	237	243	250	6221
			24	259	258	259	255	269	260	277	300	260	237	200	172	24	259	285	309	315	369	361	347	298	225	158	170	189	6311
			25	215	227	236	261	270	278	271	269	261	264	262	265	25	261	279	288	289	282*	299	269	284	245	158	137	208	6098
			26	214	218	260	238	219	272	260	248	251	254	263	269	26	323	298	306	336	290	302	279	256	236	240	236	249	6337
			27	252	259	259	262	269	261	259	267	262	254	268	292	27	270	290	292	320	350	307	224	245	230	236	230	231	6409
			28	241	243	248	252	255	257	252	250	322	272	259	280	28	258	279	280	279	281	284	279	270	261	251	249	249	6351
			29	250	250	257	261	266	261	242	361	147	107*	186	212	29	218	261	307	291	292	290	281	279	230	210	209	230	5898
			30	248	250	207	239	228	184	119	186	220	214	159	291	30	314	231	324	270	280	298	276	284	254	241	188	183	5688
			31													31													

SCALED BY	LYT, JEP, EAS
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 Mgph., converted to Normal Mgph.

MONTHLY SUM	189492
MONTHLY MEAN	263
DATES WITH GAPS:	

FORM C&GS-404e

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 signs shown.

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

OBSY.	YEAR	MONTH	ELEMENT
COL	84	NOV	Z

C	Q or S	Tes Q	Hr. Day	01	02	03	04	05	06	07	08	09	10	11	12	Hr. Day	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	237	251	268	303	280	293	243	151*	-60*	186	363*	472*	01	510*	212	199	241	246	256	248	247	237	240	237	238	6098
			02	237	236	232	236	233	240	237	247	248	240	239	247	02	236	233	233	227	197	183	114	166	217	229	243	234	5384
			03	237	239	249	253	247	240	234	267	216	207	226	223	03	280	371*	217	37	157	209	233	233	203	207	223	239	5447
			04	249	275	275	289	269	263	255	276	270	180	146	180	04	209	263	213	197	187	187	217	201	237	243	245	263	5589
			05	270	269	263	280	279	304	285	279	184	223	266	238	05	187	94	113	180	187	192	201	216	215	219	228	234	5406
			06	237	237	243	243	246	253	253	218	276	240	277	25	06	197	227	184	120	104	148	216	220	221	227	225	237	5074
			07	239	240	243	241	270	291	275	253	259	263	243	226	07	146	143	172	164	177	-50	47	112	166	206	230	276	4832
			08	299	292	275	307	350	316	257	235	179*	42	127	207	08	226	233	245	218	190	206	204*	197*	223*	223*	236*	242*	5429
			09	246	243	240	238	249	255	280	247	234	257	230	177	09	221	240	217	186	181	188	187	229	197	220	224	269	5455
			10	267	283	292	263	277	299	263	266	268	253	249	231	10	237	268*	24	147	219	223	193	190	187	196	237	240	5572
			11	256	248	254	263	295	254	263	254	263	257	98	107	11	117	217*	190	217	233	226	236	233	233	253	248	236	5451
			12	256	272	252	254	288	296	290	299	274	268	227	256	12	243	235	226	230	240	237	239	236	236	237	240	241	6072
			13	241	240	238	241	238	235	236	237	246	266	197	177	13	208	225	209	163	82	145	177	187	190	197	224	243	5042
			14	240	242	247	256	255	278	277	220	207	233	233	254*	14	268*	-123*	170	231	235	203	184	172	188	209	223	238	5140
			15	241	260	270	255	247	253	240	183	204	311*	344*	548*	15	171*	120	202	211	203*	126*	0	141	174	210	280	121*	5321
			16	146*	37*	-148*	-302*	-130*	-162*	-8*	158*	331*	453*	356*	670*	16	580*	932*	433*	458*	632*	261*	175	153	233	264	273	293	6088
			17	298	280	297	288	311*	148	124	132*	249*	67	248*	203	17	297	335	37*	49*	171*	172	188	209	223	274	293	293	5186
			18	300	306	277	297	307	293	268	243	-53*	176	245	297	18	175	233	252	247	242	243	242	221	187	221	247	263	5729
			19	279	283	333	304	300	285	305	313	290	264	249	203	19	213	229	239	207	200	200	174	176	215	243	271	290	6065
			20	288	289	289	289	268	316	263	245	304	176	149	175	20	234	261*	96	84	146	159	216*	171*	209*	216*	241*	248*	5332
			21	279*	286*	311*	338*	331*	311*	311*	279*	209*	209*	146*	440*	21	426*	273*	184*	216*	196*	184*	184*	164*	180	223*	268*	248*	6196
			22	260	263	262	276	268	248	248*	248*	240	-36	87	150	22	214	226	223	223	205	214	213	213	209	223	230	238	5145
			23	248	256	251	242	250	259	253	250	267	240	230	229	23	78	62	170	247	250	244	234	230	226	231	242	244	5423
			24	242	240	240	241	250	244	274	280	255	260	194	188	24	243	243	233	185	124	130	162	173	184	169	199	224	5177
			25	239	250	250	254	251	243	250	245	241	240	219	229	25	230	235	232	230	221*	224	210	210	210	212	221	243	5589
			26	240	245	266	253	265	300	260	250	255	254	254	246	26	191	213	230	220	228	232	226	226	221	229	236	242	5782
			27	245	244	243	242	241	242	250	262	267	245	179	100	27	42	58	140	188	183	130	145	149	167	195	217	231	4605
			28	242	243	253	259	253	242	240	249	271	216	227	201	28	156	185	223	227	227	225	225	225	224	222	222	227	5484
			29	228	227	227	226	225*	226	235	211	37	130	135	229	29	234	266	239	237	230	230	230	221	209	203	210	220	5065
			30	230	241	249	268*	171*	62*	62*	128	190	162	193	261	30	233	230	256	222	223	219	214	226	203	213	221	220	4897
			31													31													

SCALED BY	LYT, JEP, EAS
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 Mgph., converted to Normal Mgph.

MONTHLY SUM	163078
MONTHLY MEAN	226
DATES WITH GAPS	

FORM C&GS-404a

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

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

OBSY.	YEAR	MONTH	ELEMENT
COL	84	NOV	H

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 or S	Ten 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	300	322	328	347	330	343	417	220	-19*	-103*	220	140	01	-155	189	350	323	316	312	302	300	300	301	300	317	6000
			02	315	312	313	307	315	313	329	332	328	332	333	323	02	309	309	300	294	241	187	212	293	316	303	320	318	7254
			03	315	310	313	331	336	329	342	433	400	297	305	299	03	230	-41*	-91	183*	343	290	320	320	223	317	312	312	6728
			04	315	328	350	371	353	327	353	400	359	201*	-86*	206	04	281	147	110	260	196	280	293	300	330	296	297	291	6558
			05	307	327	335	320	357	437	428	430	247	310	112	123	05	-90	91	180	275	291	320	301	318	307	317	312	313	6668
			06	319	318	323	319	324	326	348	440	338	299	-299*	190	06	347	301	103	-50	218	327	318	320	309	320	305	307	6367
			07	312	311	325	331	329	331	353	355	359	350	361	367	07	195	212	303	174	-221*	75	310	287	297	313	273	277	6579
			08	400	321	390	410	381	359	317	351	217*	-222*	332	359	08	200	240	183	194	219	317	312*	335*	312*	312*	312*	301*	7296
			09	313	313	323	330	315	320	355	350	349	317	307	277	09	320	302	183	227	226	274	282	307	300	300	293	333	7216
			10	310	329	365	341	340	341	328	317	320	313	315	296	10	233	-444*	94	338	326	300	281	261	257	260	291	301	6413
			11	303	314	330	349	343	348	316	319	332	333	100	-254*	11	-193*	-83	50	278	340	320	310	309	296	253	237	311	5561
			12	323	318	320	335	375	418	387	340	340	347	351	317	12	304	282	302	300	299	302	302	298	300	300	309	313	7782
			13	317	319	322	325	320	321	313	311	319	349	236	261	13	329	307	278	193	210	316	290	320	303	274	301	319	7153
			14	316	327	352	331	350	353	345	333	347	333	314	153	14	-498*	236*	352	360	330	307	279	281	316	309	320	348	6794
			15	226	340	318	308	343	330	327	379	371	215*	-262*	-273*	15	-43*	370	393	295	-179*	-116*	34*	355	283	250	314	428*	5006
			16	410*	517*	276*	382*	382*	-161*	186*	-66*	-139*	-515*	69*	-733*	16	-234*	-806*	178	141	-369*	-88*	309	232	253	337	330	334	1225
			17	446	353	351	317	365*	404	344*	393*	368	-60*	-324*	95	17	262	-346*	-318*	-123*	123	270	309	310	283	318	306	300	4776
			18	300	353	340	354	357	332	318	358	41*	243	334	-111*	18	230	331	309	301	299	293	285	256	240	300	312	320	6695
			19	327	323	295	345	349	460	461	380	342	300	300	258	19	269	274	233	227	241	227	150	252	261	270	270	273	7087
			20	314	365	319	330	342	407	333	419	381	291	343	167	20	19	-161*	-19	119	281	273	321*	292*	253*	243*	281*	259*	6172
			21	315*	372*	365*	461*	377*	337*	327*	393*	332*	236*	-4*	-133*	21	-369*	-172*	259*	327*	287*	287*	253*	231*	280	281*	327*	327*	5696
			22	321	321	326	325	320	329	344*	327*	350	29*	71	138	22	297	226	286	280	280	288	260	272	310	311	318	310	6639
			23	308	318	306	310	320	319	311	315	317	310	316	294	23	-2	185	302	332	315	302	301	297	301	301	301	310	6989
			24	310	320	318	320	318	318	352	351	321	334	348	289	24	320	309	290	210	201	262	302	299	269	280	299	304	7244
			25	309	310	319	325	323	326	320	309	310	310	333	313	25	310	310	310	306	309*	315	313	300	280	261	274	290	7385
			26	292	293	330	340	340	350	310	312	312	320	310	297	26	265	301	303	300	310	299	290	294	298	301	305	308	7380
			27	311	318	316	318	316	310	306	304	311	306	98	128	27	96	176	294	305	248	180	306	301	302	309	311	310	6480
			28	310	312	304	318	320	320	318	313	303	328	305	279	28	269	320	320	312	311	311	309	308	306	305	303	308	7412
			29	311	319	320	329	330	321	320	303	289	379	313	330	29	379	330	291	309	308	312	314	306	294	300	310	312	7529
			30	311	323	351	466*	803*	607*	405*	380	366	310	315	242	30	103	221	184	251	281	292	302	288	290	232	253	310	7886
			31													31													

SCALED BY	LYT, JEP, EAS
CHECKED BY	JEP, EAS
SIGNS REVISED 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.

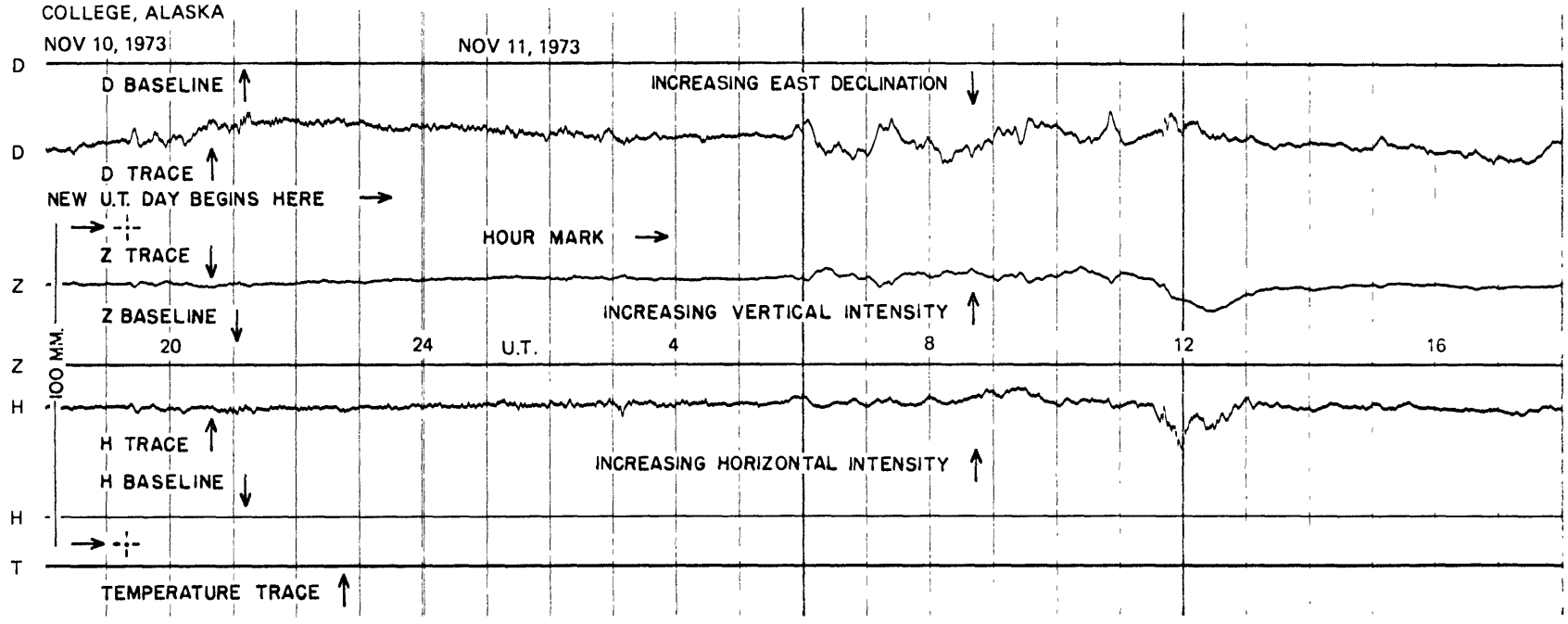
[] Scaling uncertain because of magnetic storm.

<> 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.

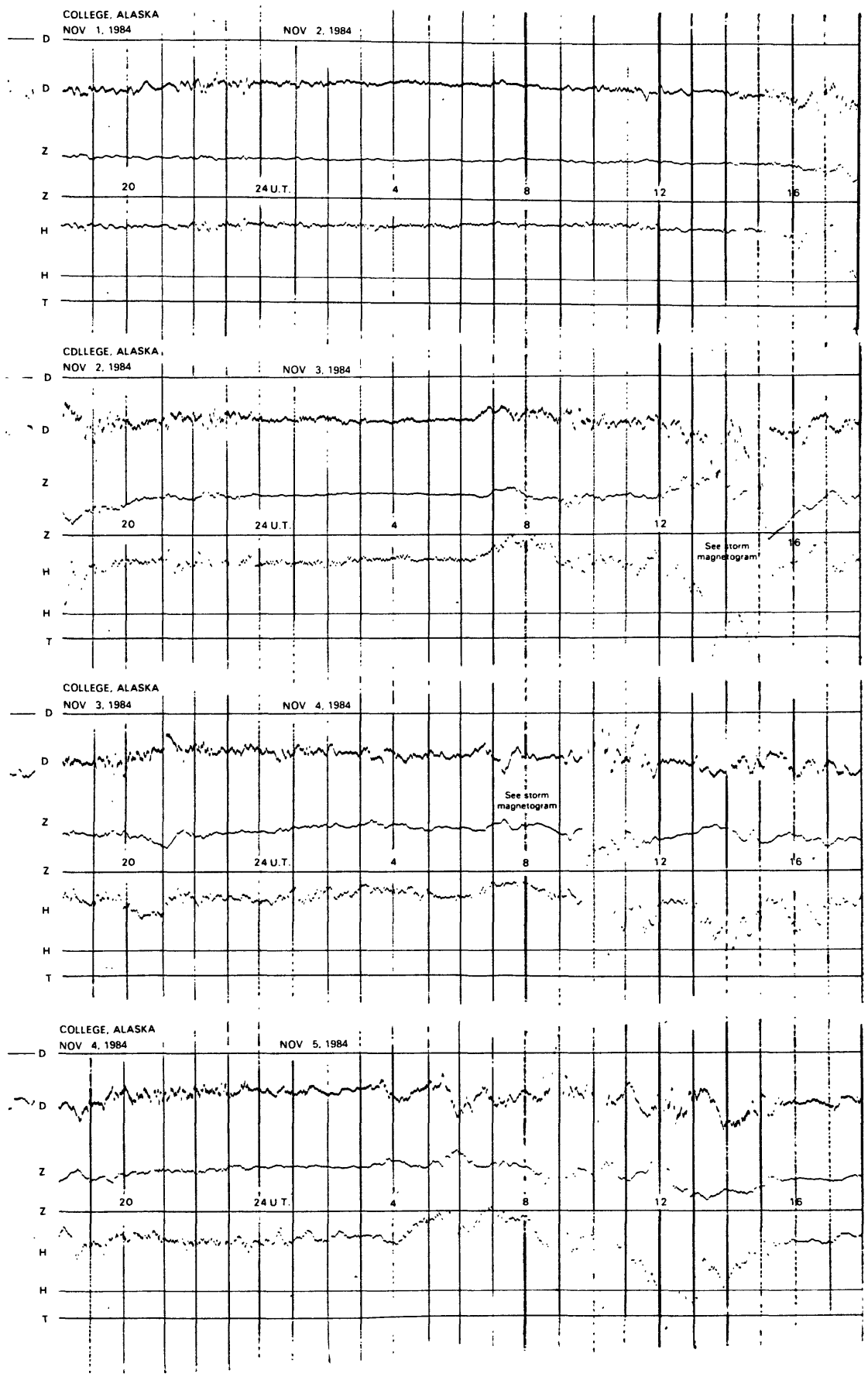
MONTHLY SUM	195970
MONTHLY MEAN	272
DATES WITH GAPS	

FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

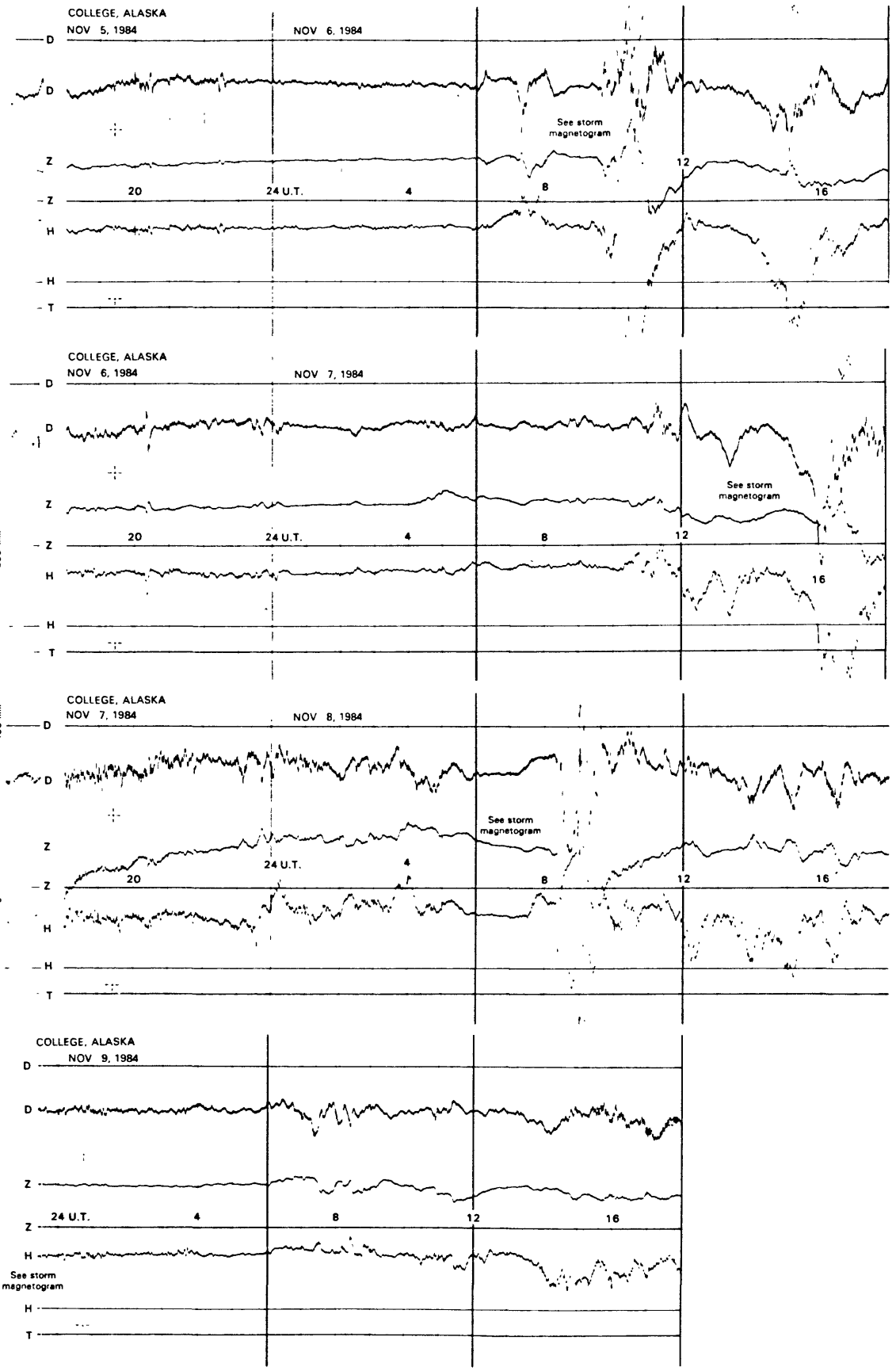


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

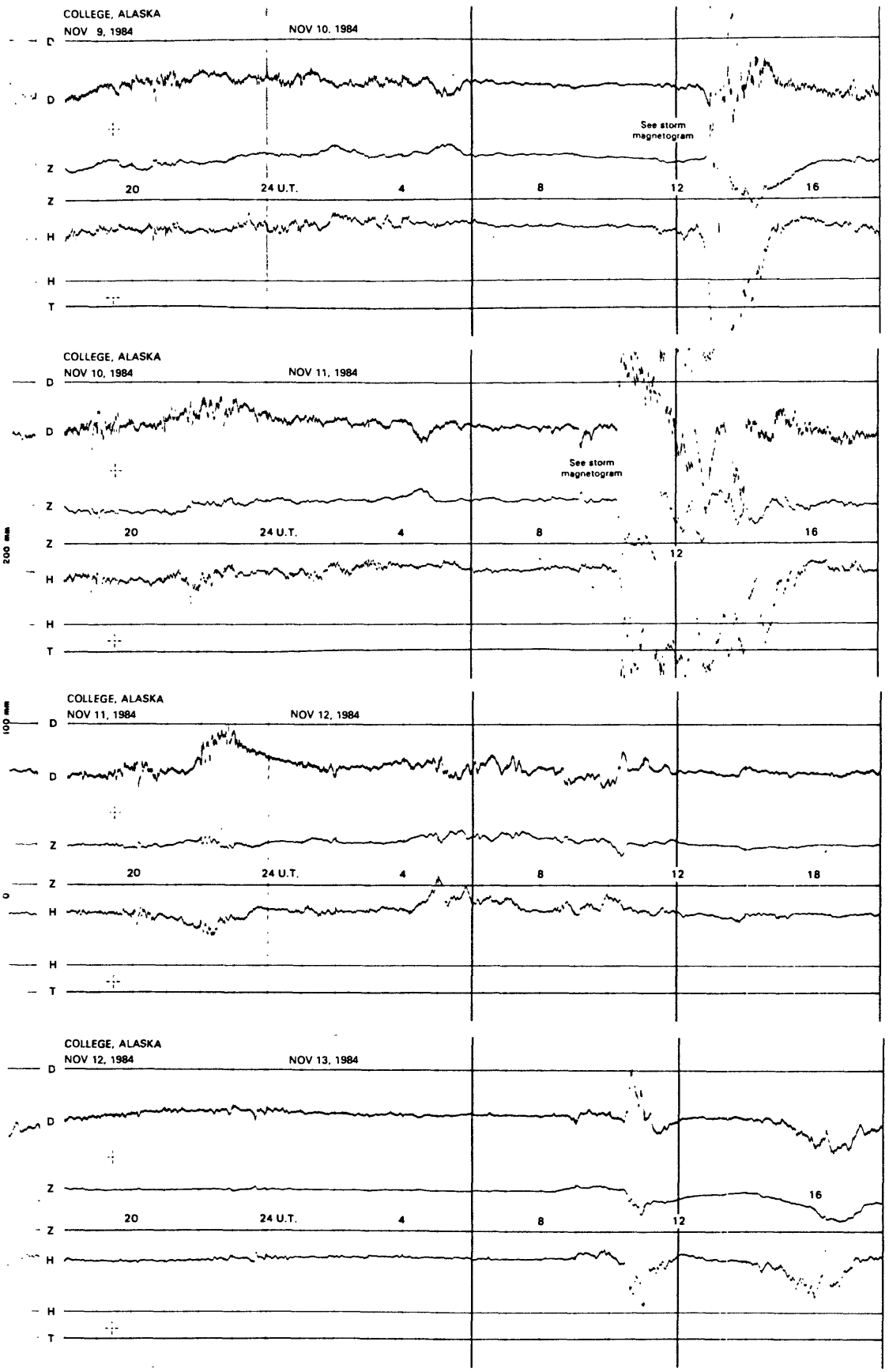
NORMAL MAGNETOGRAMS



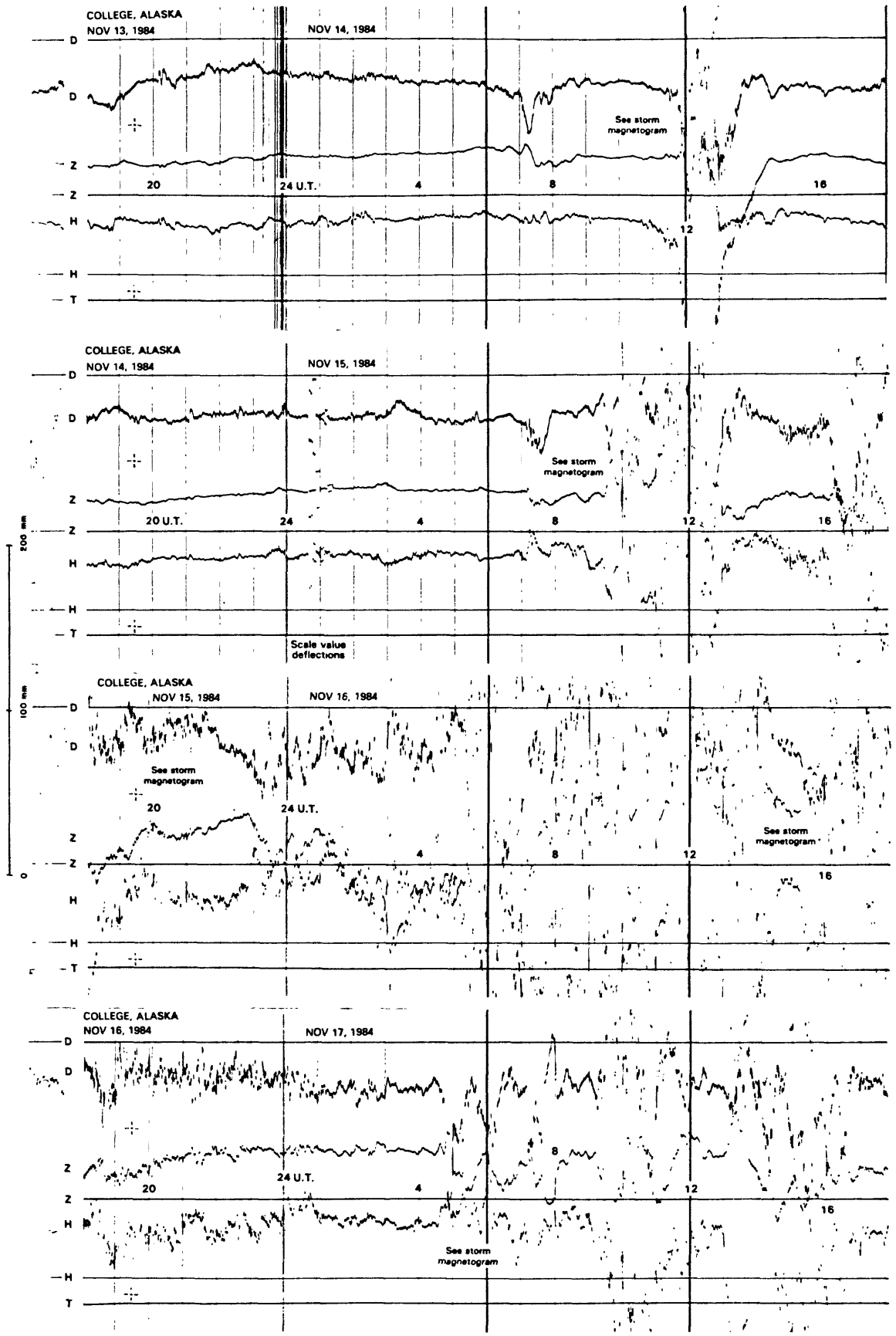
NORMAL MAGNETOGRAMS



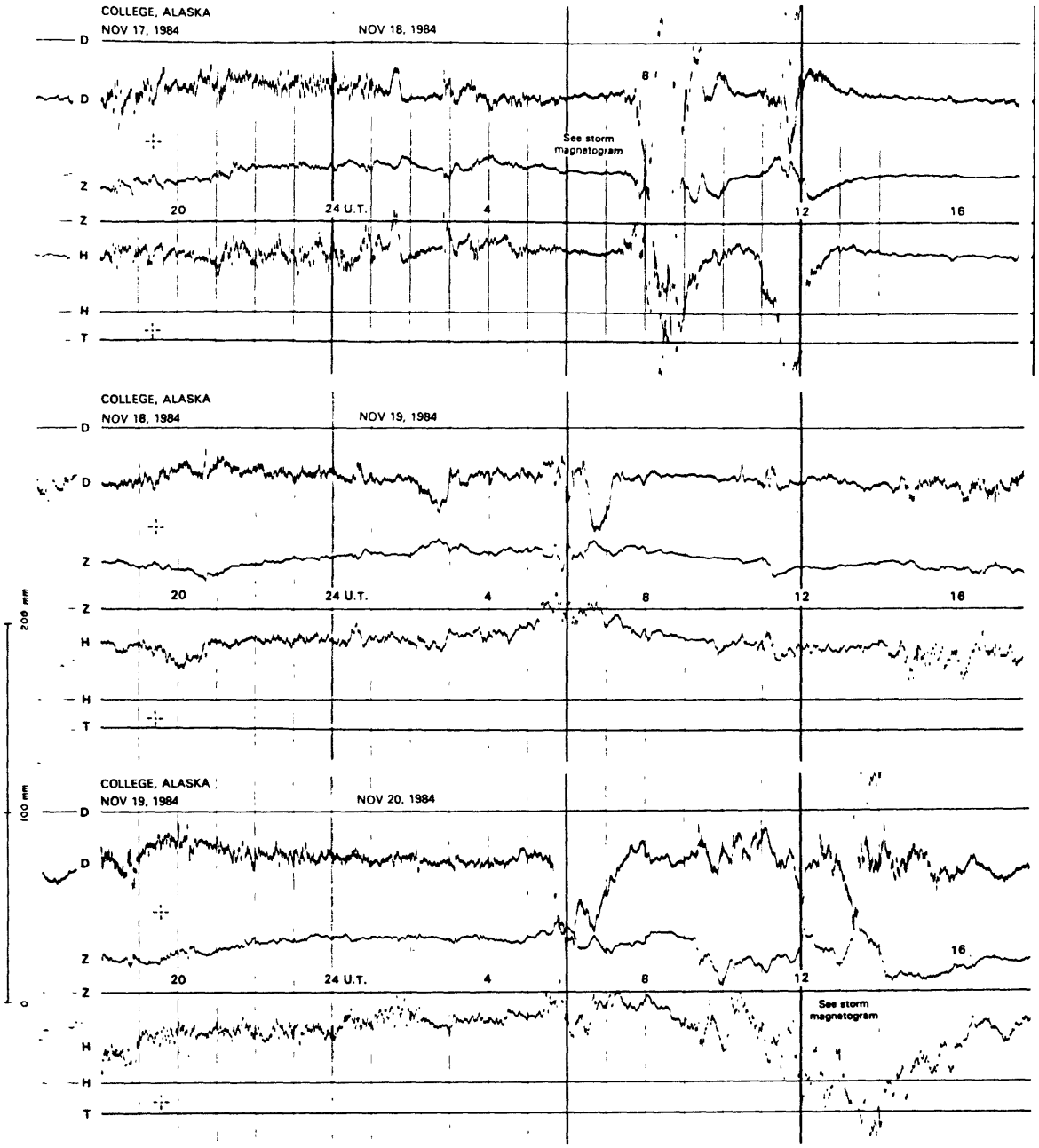
NORMAL MAGNETOGRAMS

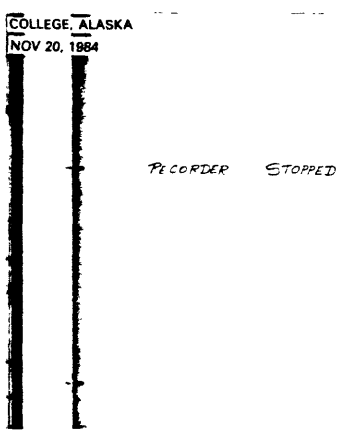


NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

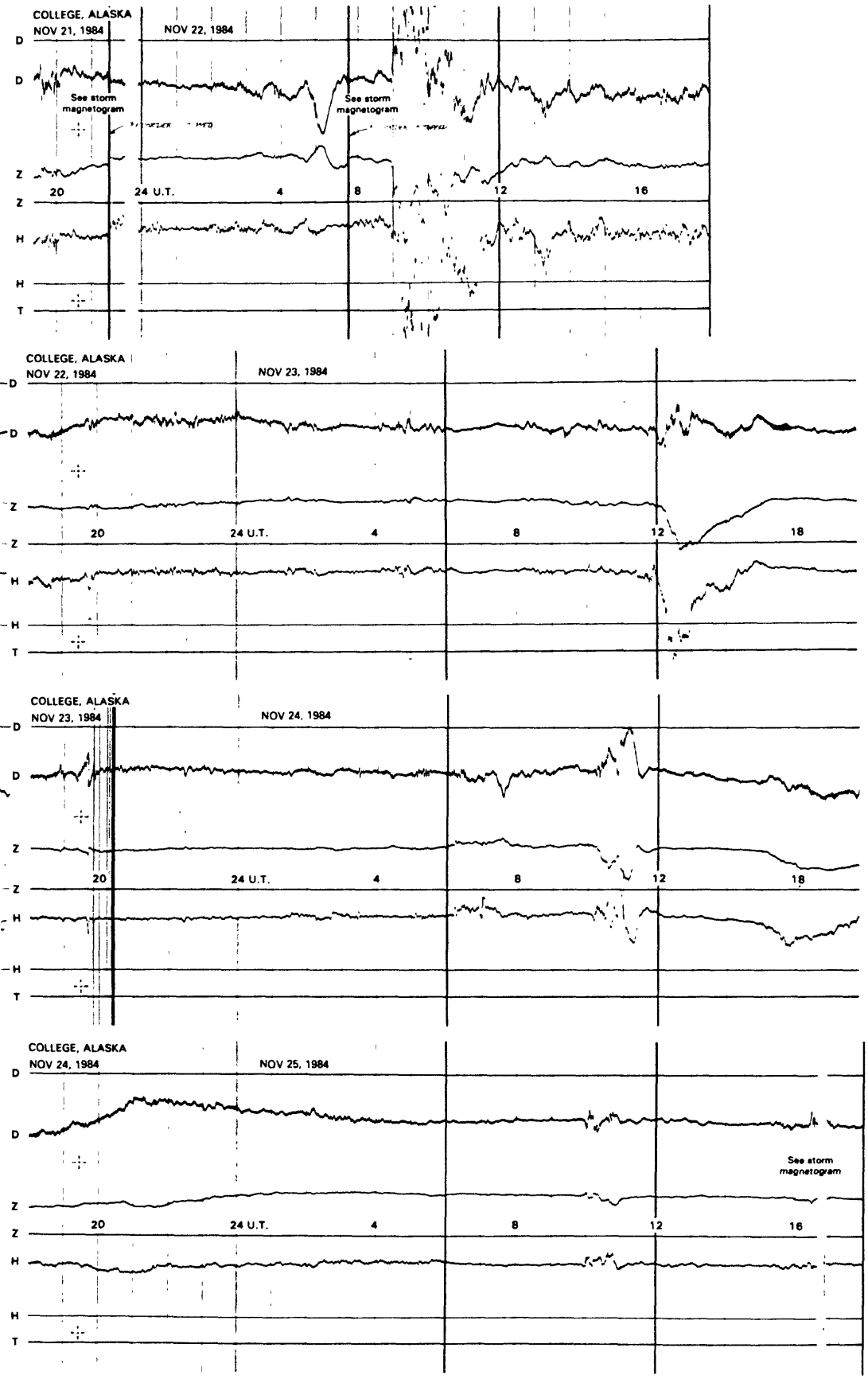




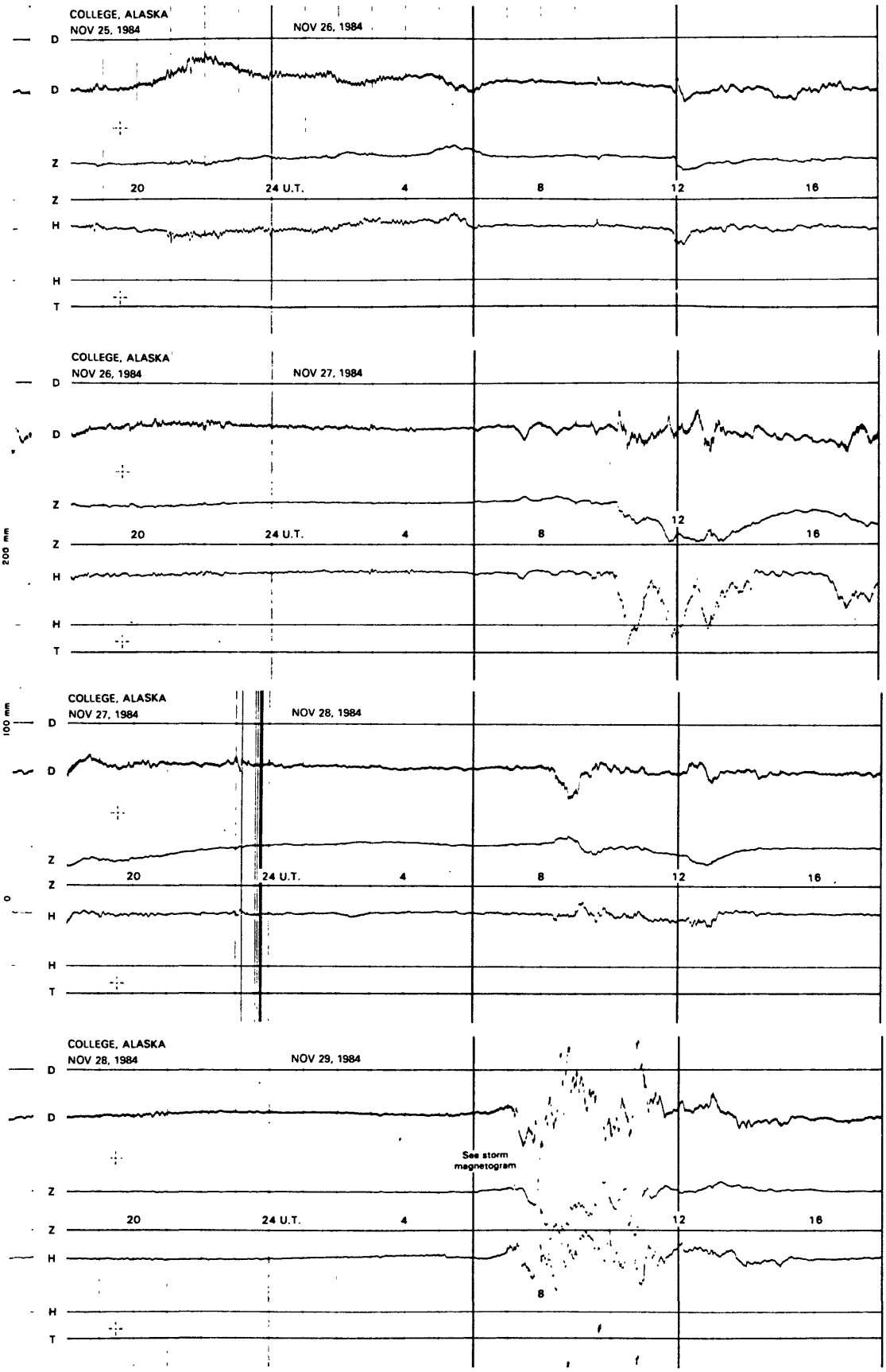
RECORDER STOPPED

See storm magnetogram

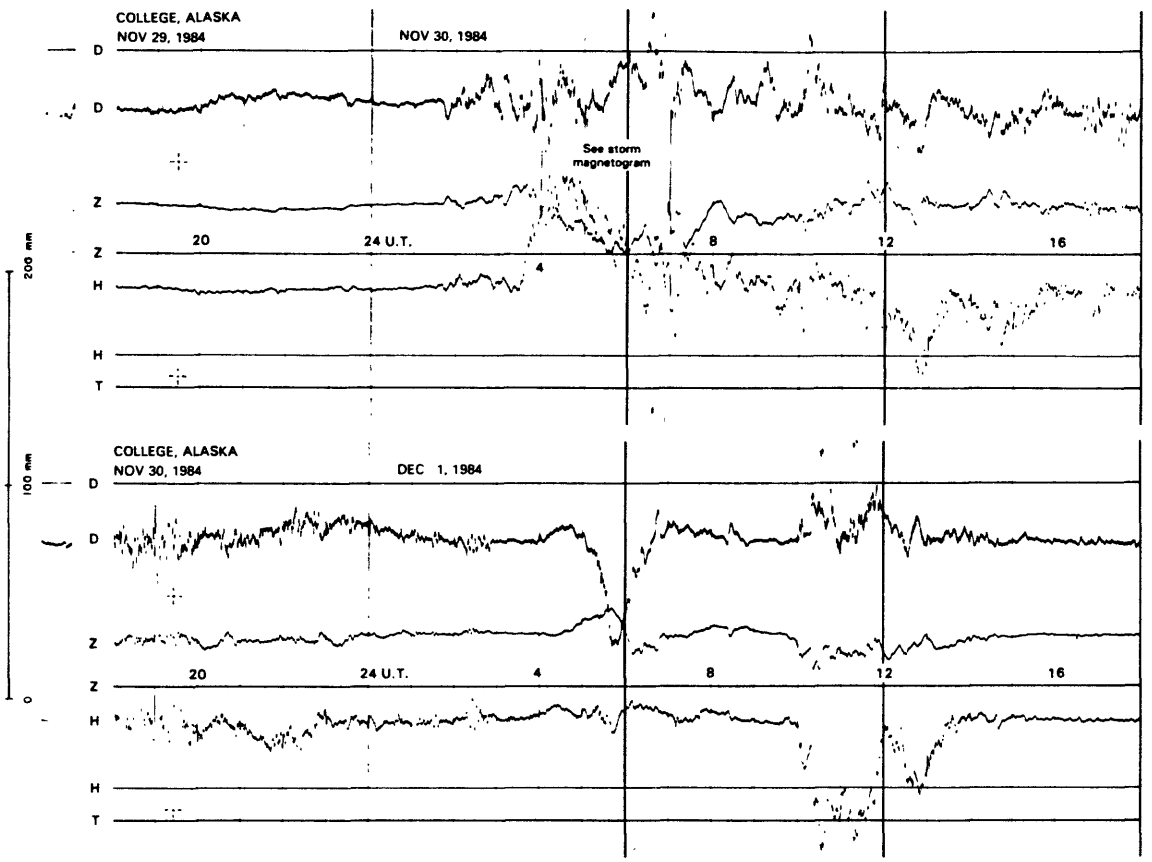
NORMAL MAGNETOGRAMS



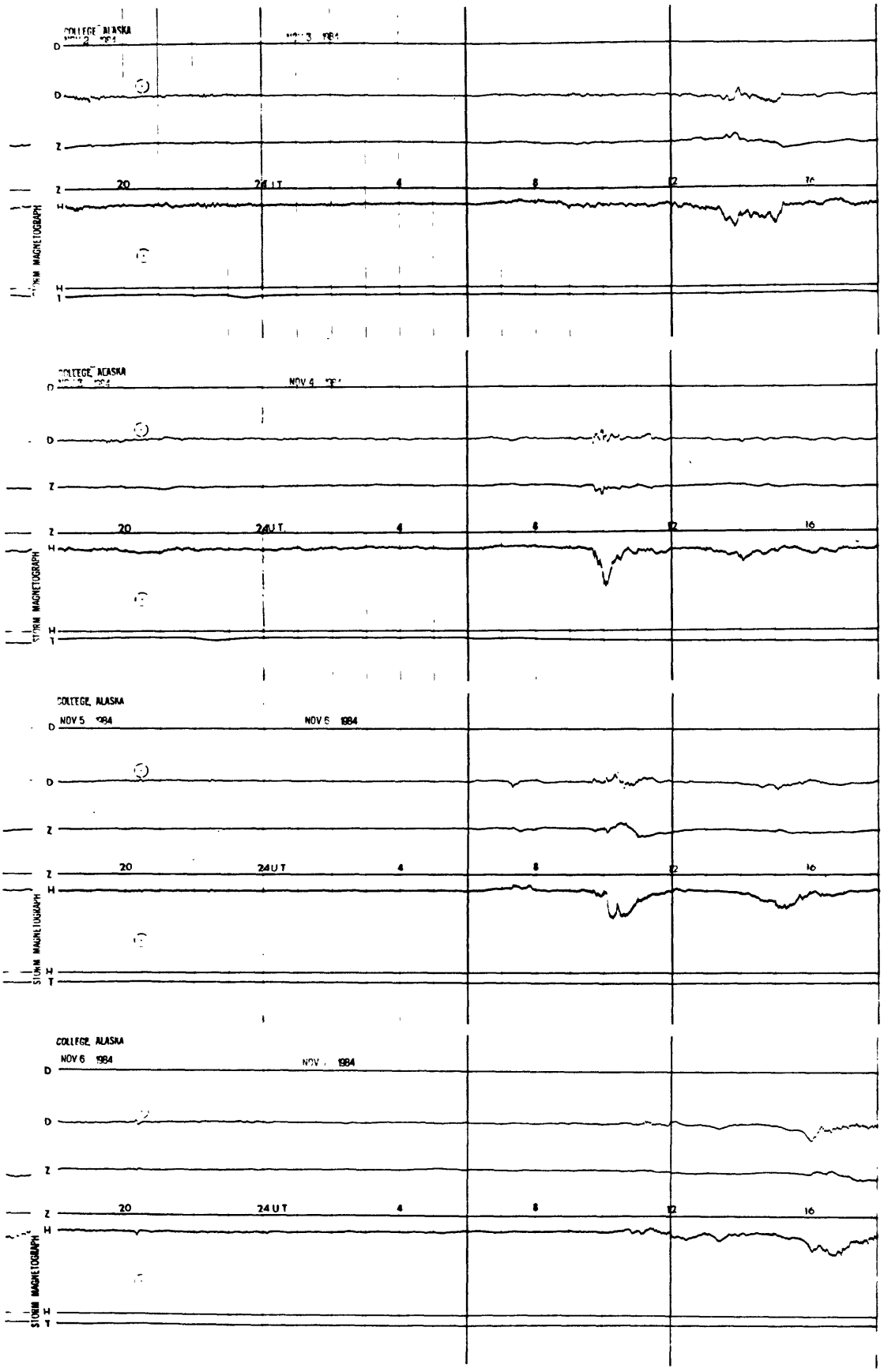
NORMAL MAGNETOGRAMS



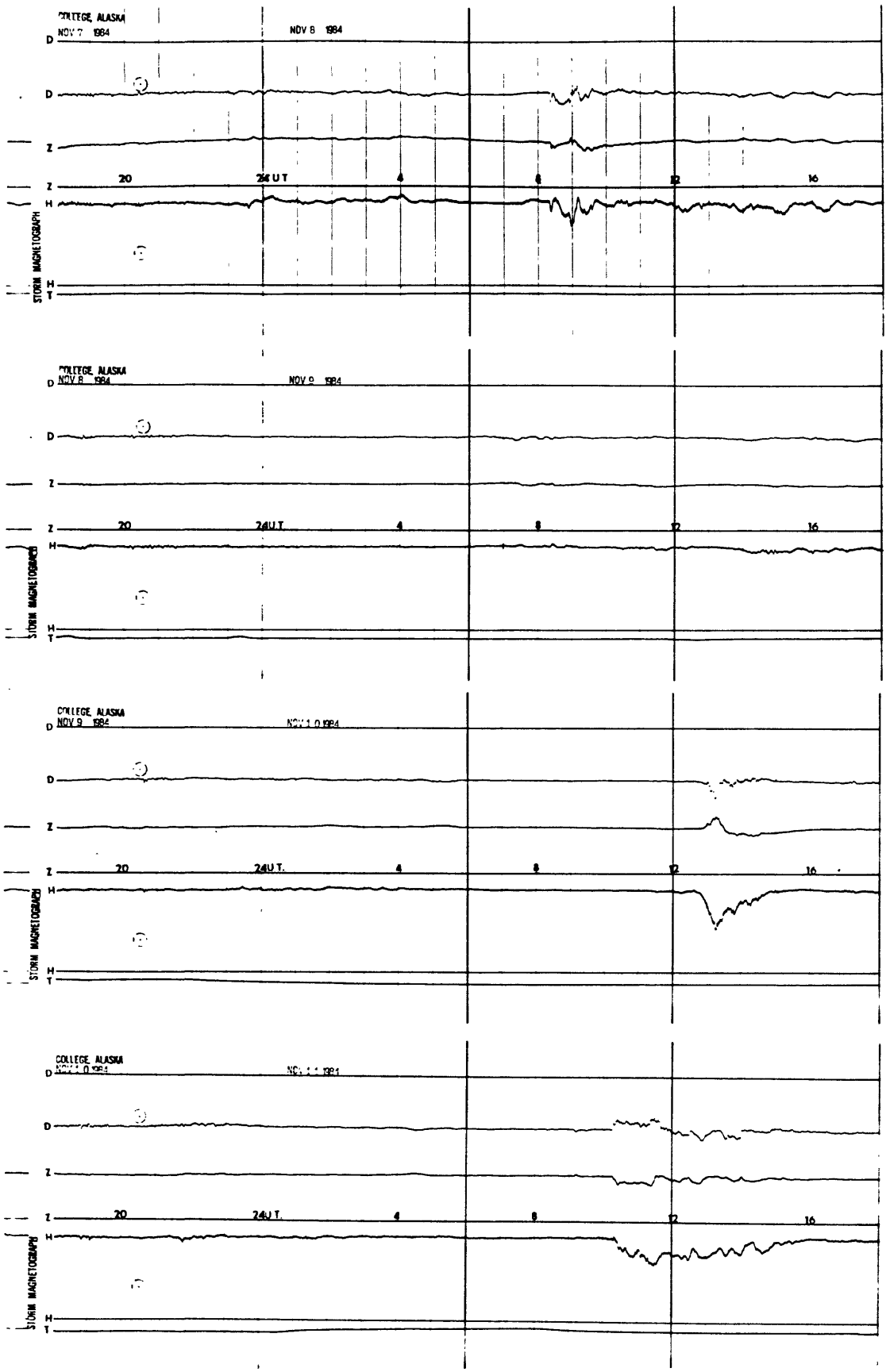
NORMAL MAGNETOGRAMS



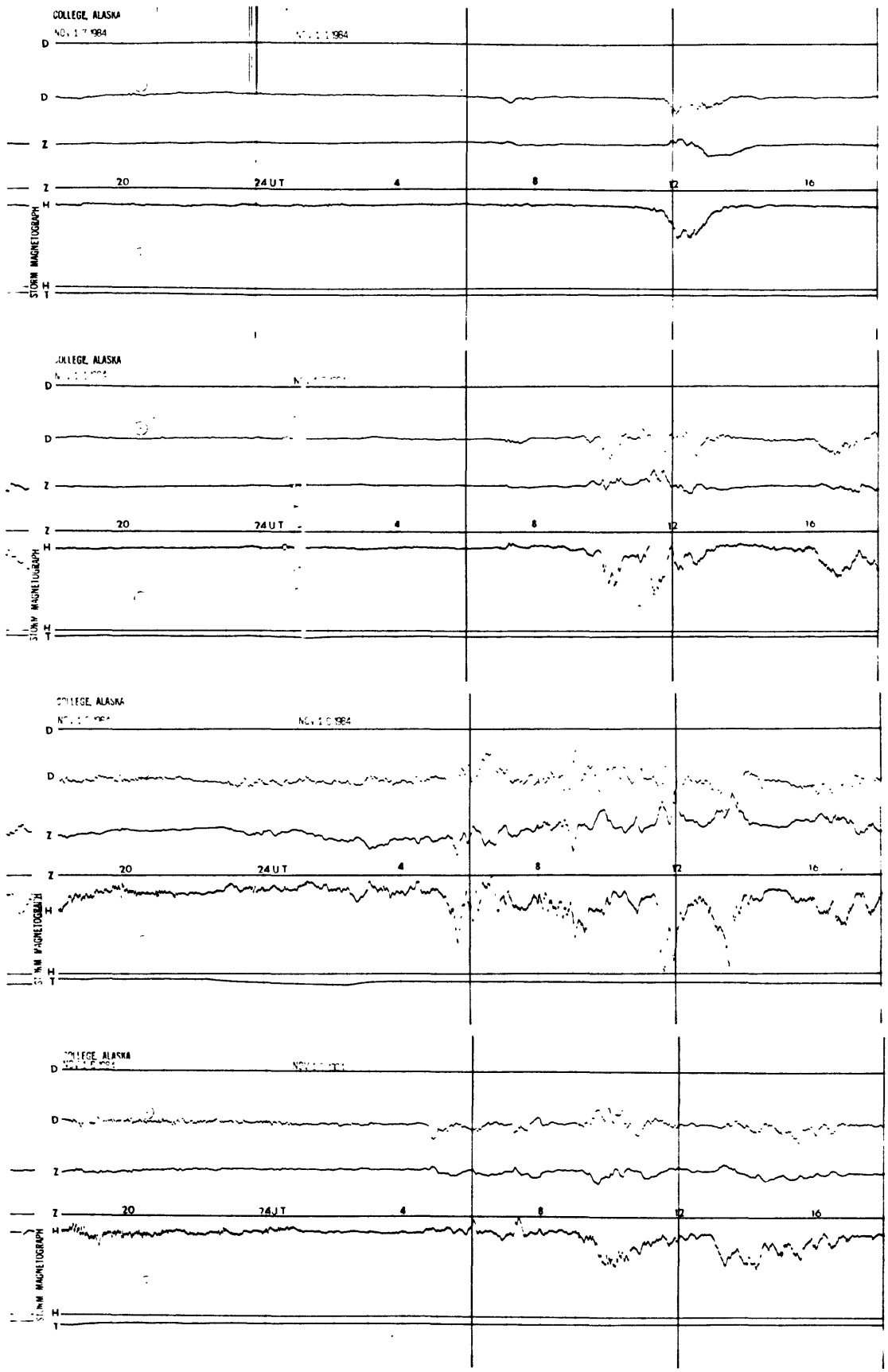
STORM MAGNETOGRAMS



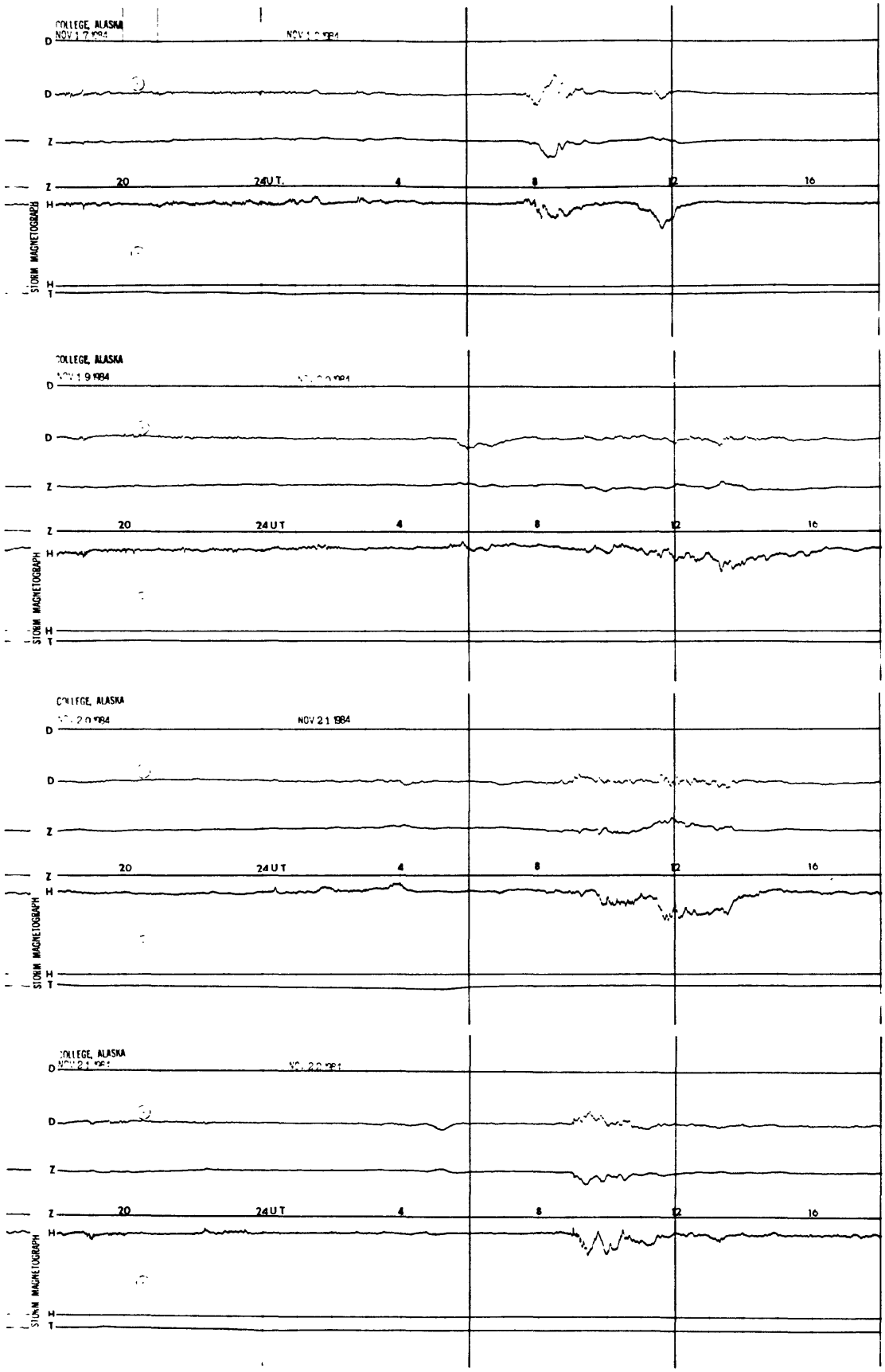
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS