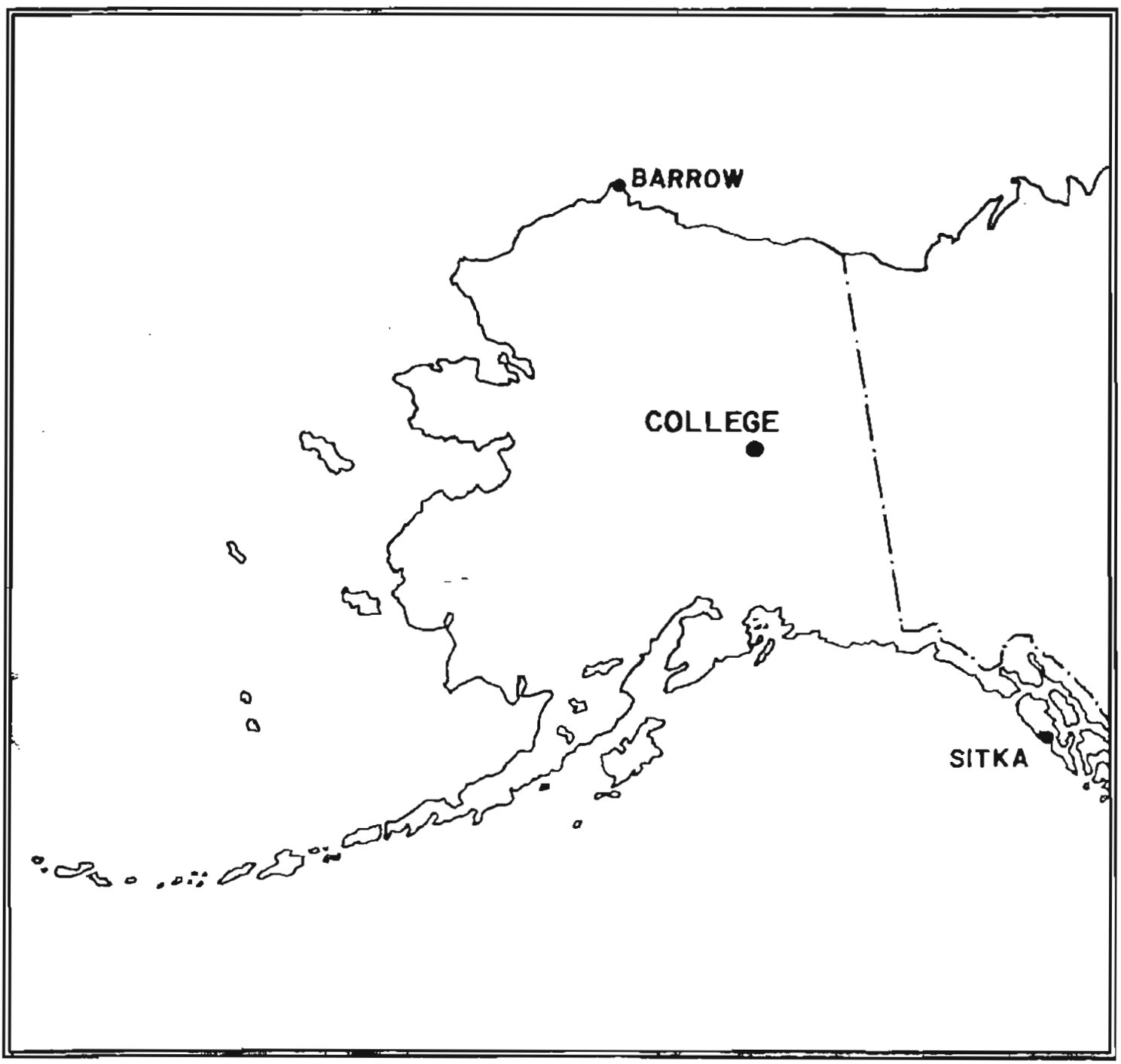
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

JUNE 1984 OPEN FILE REPORT 84-0300F



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

Explanation of Data and Reports

Magnetic Activity Report

Outstanding Magnetic Effects

Principal Magnetic Storms

Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

EXPLANATION OF DATA AND REPORTS

INTRODUCTION

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

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

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

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

OBSERVATORY LOCATION

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

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

The position of the observatory site is:

Geographic latitude.....64° 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: JUNE 1984

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	2	2	2	1	3	2	2	1	15	07
2	2	4	3	4	4	3	2	2	24	17
3	2	1	3	4	7	6	4	3	30	39
4	4	5	4	5	5	3	4	3	33	32
5	4	4	4	5	5	2	2	3	29	26
6	3	3	3	4	5	2	2	2	24	18
7	3	3	5	5	4	1	2	2	25	21
8	1	1	0	0	2	2	3	3	12	06
9	2	3	5	4	4	3	3	3	27	21
10	3	3	2	4	4	4	3	3	26	19
11	3	3	3	3	4	3	2	2	23	15
12	3	3	2	2	4	0	1	1	16	10
13	0	2	3	1	1	1	2	1	11	05
14	1	1	1	1	0	1	2	1	08	03
15	2	3	3	4	4	6	4	4	30	28
16	5	5	6	6	5	3	2	3	35	43
17	2	2	6	5	2	2	1	1	21	20
18	3	2	2	5	6	5	4	3	30	31
19	3	4	5	6	5	5	3	4	35	39
20	4	4	3	6	2	2	1	1	23	21
21	1	0	1	0	0	1	1	1	05	02
22	3	2	2	1	3	2	0	1	14	07
23	2	2	3	1	0	1	3	4	16	10
24	4	5	1	5	3	3	2	2	25	21
25	3	3	3	3	3	2	2	2	21	12
26	3	3	3	4	1	2	2	2	20	12
27	4	4	3	5	4	0	1	1	22	19
28	4	4	5	4	3	5	6	3	34	36
29	3	2	1	4	2	3	2	2	19	11
30	3	4	3	4	5	5	2	2	28	24
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			END		
d	h	m	d	h	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

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

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY: COLLEGE, ALASKA

MONTH: JUNE

YEAR: 1984

DATE	TIME U.T.	NATURE OF PHENOMENON[1]	REMARKS
08	09XX	pc4	
17	01XX	pc5	
23	07XX	b	

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
JUNE 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	03	06XX	..	..	..	..	03	5	7	141	1320	460	05	14
		15	08XX	..	..	..	..	15 16	6 3, 4	6 6	156	1470	710	16	20
		18	01XX	..	..	..	..	18 19 20	5 4 4	6 6 6	190	1180	600	20	11

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

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T. 6-1-84	2400 U.T. 6-30-84	1.0'/mm	3.7 γ/mm	27° 16.9' E
H	0000 U.T. 6-1-84	2400 U.T. 6-17-84	7.8 γ/mm		12680 γ
	0000 U.T. 6-18-84	2400 U.T. 6-30-84	"		12689 γ
Z	0000 U.T. 6-1-84	2400 U.T. 6-10-84	7.6 γ/mm		55174 γ
	0000 U.T. 6-11-84	2400 U.T. 6-30-84	"		55168 γ

STORM MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE		CALIBRATION BASELINE
D	0000 U.T. 6-1-84	2400 U.T. 6-30-84	7.9'/mm	29.6 γ/mm	23° 41.2' E
H	0000 U.T. 6-1-84	2400 U.T. 6-17-84	43.9 γ/mm		10808 γ
	0000 U.T. 6-18-84	2400 U.T. 6-30-84	"		10815 γ
Z	0000 U.T. 6-1-84	2400 U.T. 6-30-84	48.3 γ/mm		54069 γ

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD FROM	PERIOD TO	CALIBRATION SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 45.2' E	12929 γ	55366 γ

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: JUN 1, 8, 12, 13, 14, 21, 22, 23, 25, 29

U.S. DEPARTMENT OF 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 signs shown.

OBSY.	YEAR	MONTH	ELEMENT
COL	84	JUN	D

L.	Qual.	Temp. 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	223	229	242	241	252	282	294	282	282	287	266	241	01	268	334	388	392	402	418	359	326	280	239	244	244	7015
			02	234	225	224	180	236	276	272	267	250	225	259	278	02	294	330	364	415	457	416	419	384	348	315	266	223	7157
			03	225	222	216	232	231	264	226	289	263	218	211	225	03	336	361*	465*	535*	417	458	464	352	279	275	274	230	7268
			04	230	224	183	242	265	200	252	199	280	268	218*	131	04	308	350	393	428	444	482	374	340	345	308	296	306	7066
			05	243	316	262	260	279	289	239	224	281	187	195	260	05	408*	270	302	347	401	422	381	345	306	271	258	308	7093
			06	202	224	216	262	258	208	341	251	222	266	262	241	06	279	326	435	377	396	418	394	380	304	296	273	235	7066
			07	232	241	205	230	252	276	250	272	204	163*	313	270	07	267	410	364	375	377	385	386	342	310	290	244	260	6925
			08	254	251	251	257	268	280	282	280	271	268	278	251	08	259	282	295	415	392	416	378	401	307	244	232	194	7005
			09	188	200	219	240	276	270	176	230	132	244	275	248	09	317	298	319	377	441	431	405	333	274	310	219	226	6648
			10	219	247	241	246	322	317	301	273	241	286	191	214	10	264	233	234	416	428	418	387	341	308	256	238	194	6815
			11	208	216	252	254	293	286	291	278	237	249	238	250	11	343	326	341	394	418	420	376	348	308	264	259	237	7068
			12	244	236	301	289	239	258	259	265	259	254	248	264	12	299	240	288	344	373	384	378	340	304	265	257	261	6849
			13	259	250	260	264	260	262	244	289	268	264	266	254	13	253	296	321	366	390	406	384	331	302	276	259	238	6964
			14	225	243	247	252	263	279	281	272	274	300	268	245	14	253	272	264	334	350	387	398	398	364	314	296	265	7063
			15	210	212	212	197	197	232	223	226	198	282	178	273	15	326	354	395	230	510	528	589	436	354	332	317	238	7199
			16	136	223	216*	106	-46*	65*	-38*	17*	280*	231*	-62*	264*	16	342*	209	330	357	406	374	404	377	363	325	305	252	5436
			17	189	172	189	202	216	228	242	210	366	318	239	260	17	284	293	340	340	341	370	399	405	345	308	262	224	6742
			18	212	197	192	178	185	182	182	199	169	200	398*	222	18	291*	605*	653*	684*	573*	494*	375	318	316	277	250	244	7538
			19	225	206	222	224	154	289	215	199	151	120*	311*	226	19	243	298	391*	362	439	396	398	337	303	302	322	252	6608
			20	187	322	212	85	153	212	224	206	262	281	124	223	20	238	268	312	306	341	354	314	322	291	285	266	234	6226
			21	242	232	230	242	257	276	281	292	284	264	287	297	21	303	307	318	332	353	378	395	387	386	265	262	270	7160
			22	212	186	147	174	182	190	276	274	283	282	286	265	22	261	356	347	335	366	358	353	332	286	252	216	192	6411
			23	186	186	201	221	222	247	244	196	290	276	283	281	23	290	302	320	355	382	371	366	392	516	472	280	275	7156
			24	274	259	187	96	128*	230	290	279	242	221	160	244	24	245	267	309	318	395	388	348	325	309	272	250	239	6275
			25	176	149	132	166	131	235	279	247	216	274	244	261	25	271	354	324	346	386	388	456	375	374	294	246	215	6534
			26	201	169	180	236	232	267	245	212	236	233	267	264	26	292	308	326	351	370	383	417	372	319	230	200	164	6474
			27	150	105	133	152	118	177	227	242	226	214	136	177	27	330	324	299	330	360	380	370	355	316	277	254	232	5884
			28	202	166	148	118	121	120	-24*	176	138	176	115	149	28	244	309*	348*	404	603*	500*	506	442	382	243	169	196	5951
			29	163	146	162	175	241	279	278	275	270	237	278	228	29	273	272	301	338	436	444	425	390	370	238	196	184	6589
			30	190	191	161	186	202	260	240	292	261	210	350	311	30	282	378	372	336	339	392	343	340	318	271	218	198	6661
			31													31													

SCALED BY: LYT
CHECKED BY: JTP 10/85
SUPERVISOR: JSC

Preliminary baseline and scale values:

(Interval) Beginning	Baseline Value	Scale Value

( ) Interpolated
[ ] Significant portion of hour interpolated.
☐ No record; or no values available because of faulty record.
* Derived from STORM Magn., converted to Normal Magn.

{ } 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.

MONTHLY SUM: 202,866
MONTHLY MEAN: 282
DATES WITH GAPS:

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

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)

Values are in tenths of gam, 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.

OBSV.	YEAR	MONTH	ELEMENT
COL	84	JUN	Z

C	Q or S	Tag Q	Day	01	02	03	04	05	06	07	08	09	10	11	12	Hr.	13	14	15	16	17	18	19	20	21	22	23	24	SUM
			01	254	247	237	237	256	285	275	257	269	248	249	234	01	256	229	208	198	246	244	241	242	244	244	248	252	5900
			02	262	264	302	280	358	334	358	343	315	278	274	304	02	279	276	219	200	196	213	245	236	226	237	246	245	6510
			03	247	248	237	236	242	255	256	220	219	232	264	285	03	324	317*	405*	380*	131	197	198	220	228	232	251	244	6068
			04	253	266	264	278*	272*	322	321	271	151	272	374*	374	04	399	255	182	222	244	178	176	224	244	242	272	313	6369
			05	336	351	333	342	321	266	316	268	244	262	322	422	05	362*	135	177	251	278	253	242	237	242	240	248	282	6730
			06	272	277	290	341	293	300	342	291	269	239	179	252	06	406	280	195	221	267	272	252	244	230	244	254	258	6468
			07	267	295	282	300	311	354	331	354	232	66	229	243	07	280	222	136	224	265	260	247	232	240	253	252	247	6126
			08	254	263	263	260	259	260	262	260	260	267	267	263	08	257	249	243	260	252	261	236	253	221	232	242	249	6093
			09	264	266	285	314	316	306	285	106*	235	300	291	264	09	236	174	208	266	254	209	216	222	218	254	246	243	5980
			10	241	276	302	309	340	317	292	298	286	232	170	194	10	218	194	108	140	215	248	250	253	248	254	258	258	5901
			11	277	286	328	316	327	332	318	284	280	268	219	256	11	194	176	214	220	203	219	235	254	245	236	254	261	6202
			12	260	274	344	360	325	353	336	310	280	220	234	245	12	134	185	238	266	272	263	261	258	247	237	238	249	6393
			13	263	267	257	263	274	299	314	350	296	281	273	264	13	256	260	254	269	262	251	230	201	219	224	233	250	6290
			14	257	262	268	266	268	276	275	274	277	290	276	267	14	258	257	260	268	269	269	267	254	233	228	238	250	6307
			15	248	258	272	274	300	319	280	286	276	248	199	250	15	219	206	173	147	42	146	199	134	137	186	214	229	5234
			16	252	123*	66*	105*	-114*	187*	8*	60*	200*	309*	372*	456*	16	444*	262	270	222	190	233	231	236	236	237	272	278	5110
			17	265	341	235	255	260	265	279	260	155*	98*	189	255	17	240	220	198	204	208	243	258	258	234	235	246	245	5554
			18	264	267	273	262	265	262	256	265	229	225	98*	66	18	354*	411*	53*	219*	219*	270*	146	189	216	235	250	279	5563
			19	277	292	296	261	255	312	256	272	125	251	315*	195	19	211	208	302*	234	66	104	218	231	243	264	308	294	5807
			20	235*	257*	200*	207*	225*	250	312	316	248	207	145	230	20	252	231	204	231	276	247	246	267	257	257	267	264	5911
			21	266	267	272	270	265	268	268	267	264	263	263	262	21	263	263	261	263	250	237	224	209	224	205	227	250	6072
			22	254	286	341	349	334	345	359	318	311	293	274	256	22	255	234	142	172	207	217	236	232	217	227	240	250	6359
			23	286	298	286	300	307	315	298	297	327	300	269	251	23	263	260	263	257	262	263	257	253	266	273	290	302	6698
			24	287	105*	136*	168*	136*	301	313	287	254	259	202	189	24	253	223	217	219	230	211	223	231	242	244	254	274	5458
			25	274	267	270	295	298	341	316	272	239	243	256	256	25	222	184	126	200	222	241	246	226	234	231	232	244	5935
			26	252	267	314	316	287	282	277	273	264	228	216	243	26	262	260	258	260	260	261	242	214	200	189	227	239	6091
			27	259	312	297	285	344	333	320	353	290	206	186	328	27	242	218	223	269	282	279	266	260	242	240	248	256	6539
			28	252	264	307	322	325	230*	148*	270	160	179	187	200	28	300	391*	359*	216	321*	192*	-20	100	206	209	239	294	5652
			29	306	305	357	317	324	319	313	297	280	283	277	189	29	217	249	259	233	263	239	223	236	237	207	239	243	6412
			30	273	281	290	311	338	352	295	320	276	266	250	147	30	170	228	257	122	162	207	200	237	254	247	243	237	5963
			31													31													

SCALED BY: LYT

CHECKED BY: JEF PAT

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.

* Derived from STORM Magn., converted to Normal Magn.

[ ] Scaling correction because of magnetic storm.

< > Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

MONTHLY SUM	181,695
MONTHLY MEAN	252

DATES WITH GAPS:

FORM No. 136

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

Values are in tenths of gam. 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, Colorado

C	Q or S	Tra 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	283	278	300	316	344	316	310	345	335	336	345	341	01	342	287	242	327	336	321	309	312	304	306	296	314	7545
			02	339	331	310	427	425	535	445	356	357	364	280	232	02	271	234	156	248	297	360	371	347	331	315	305	303	[illegible]
			03	310	324	320	328	330	331	438	526	465	498	436	347	03	355	-98*	-553*	-126*	244	219	273	359	354	315	309	309	6667
			04	311	332	436	674*	618*	420	355	406	386	261	34	242	04	20	80	226	280	273	243	323	366	324	326	325	378	7642
			05	427	500	518	596	551	471	440	458	326	346	220	-50	05	-37*	200	335	338	327	326	333	337	318	315	290	343	[illegible]
			06	261	296	362	375	360	423	403	403	375	325	269	214	06	-84	7	168	370	361	358	337	322	328	312	300	282	7127
			07	333	262	314	319	371	426	436	446	282	84	212	308	07	199	38	244	345	350	334	326	332	334	318	303	294	7210
			08	294	296	301	302	312	320	322	329	328	332	346	348	08	352	350	359	368	370	382	366	327	339	314	332	309	7598
			09	294	313	328	368	326	351	493	419*	311	272	283	339	09	80	170	300	330	246	254	264	305	296	329	330	324	7529
			10	320	351	352	428	429	432	372	375	358	212	88	222	10	232	97	119	196	324	317	356	317	290	[illegible]	[illegible]	[illegible]	[illegible]
			11	320	345	400	414	373	387	380	343	377	346	288	312	11	218	210	282	262	256	318	334	313	304	343	355	292	[illegible]
			12	291	368	381	426	408	404	374	347	347	314	324	299	12	144	276	325	334	318	309	291	280	279	[illegible]	302	301	[illegible]
			13	306	304	305	319	361	370	422	344	323	321	311	320	13	302	311	313	330	321	293	250	287	295	[illegible]	[illegible]	[illegible]	[illegible]
			14	289	307	318	322	341	330	325	331	350	360	342	344	14	341	346	336	349	345	349	314	301	295	[illegible]	299	[illegible]	7317
			15	291	328	357	341	394	386	368	384	431	440	297	299	15	300	148	122	-137*	122	318	290	245	237	252	333	327	6903
			16	528	839*	821*	626*	771*	682*	436*	26*	244*	65*	-418*	-115*	16	-62	-20	39	269	292	315	285	300	282	[illegible]	[illegible]	[illegible]	[illegible]
			17	289	298	290	312	312	336	340	373	323*	345*	362	333	17	298	287	231	306	278	296	299	284	284	[illegible]	[illegible]	[illegible]	[illegible]
			18	314	305	314	322	346	340	356	372	396	316	239*	99	18	133*	-322*	-209*	-282*	-143*	-143*	236	308	301	[illegible]	316	[illegible]	[illegible]
			19	376	398	364	341	409	465	492	404	140	337	-103*	260	19	274	144	-82	-94	102	232	255	302	255	317	387	392	6357
			20	626*	614*	642*	570*	485*	434	351	425	405	-59*	180	294	20	253	228	225	298	278	215	302	308	297	296	300	296	[illegible]
			21	297	302	297	297	300	303	303	300	304	303	304	308	21	307	305	304	295	263	280	273	281	268	250	278	292	7081
			22	300	379	488	455	433	457	390	385	356	333	300	297	22	297	230	152	250	260	275	271	270	252	255	269	270	7614
			23	299	320	326	340	365	335	353	413	400	319	310	307	23	320	317	320	320	320	320	313	300	257	196	312	439	7821
			24	509	637*	586*	659*	687*	410	253	260	270	309	253	242	24	332	233	237	240	217	258	286	302	274	265	291	290	8250
			25	275	341	398	375	450	423	317	322	379	375	328	307	25	223	172	149	299	277	323	275	297	264	255	255	262	7334
			26	272	362	373	320	351	309	350	413	370	322	240	305	26	333	310	314	323	320	291	242	233	229	272	267	290	7411
			27	313	418	592	535	491	503	437	363	403	357	321	122	27	82	166	337	341	340	318	299	271	267	263	270	258	8097
			28	321	358	515	600	629	741*	718*	550	432	207	297	200	28	107	80	83	54	-207*	-303*	23*	303	283	232	271	289	6703
			29	319	363	299	359	310	317	316	317	330	360	197	253	29	225	240	237	288	311	304	305	288	237	232	271	260	6538
			30	286	349	348	374	403	498	396	354	324	328	142	214	30	157	30	-88	62	287	270	287	328	299	284	276	286	6886
			31													31													

SCALED BY	LYT
CHECKED BY	JEP, PRF
LINES 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.

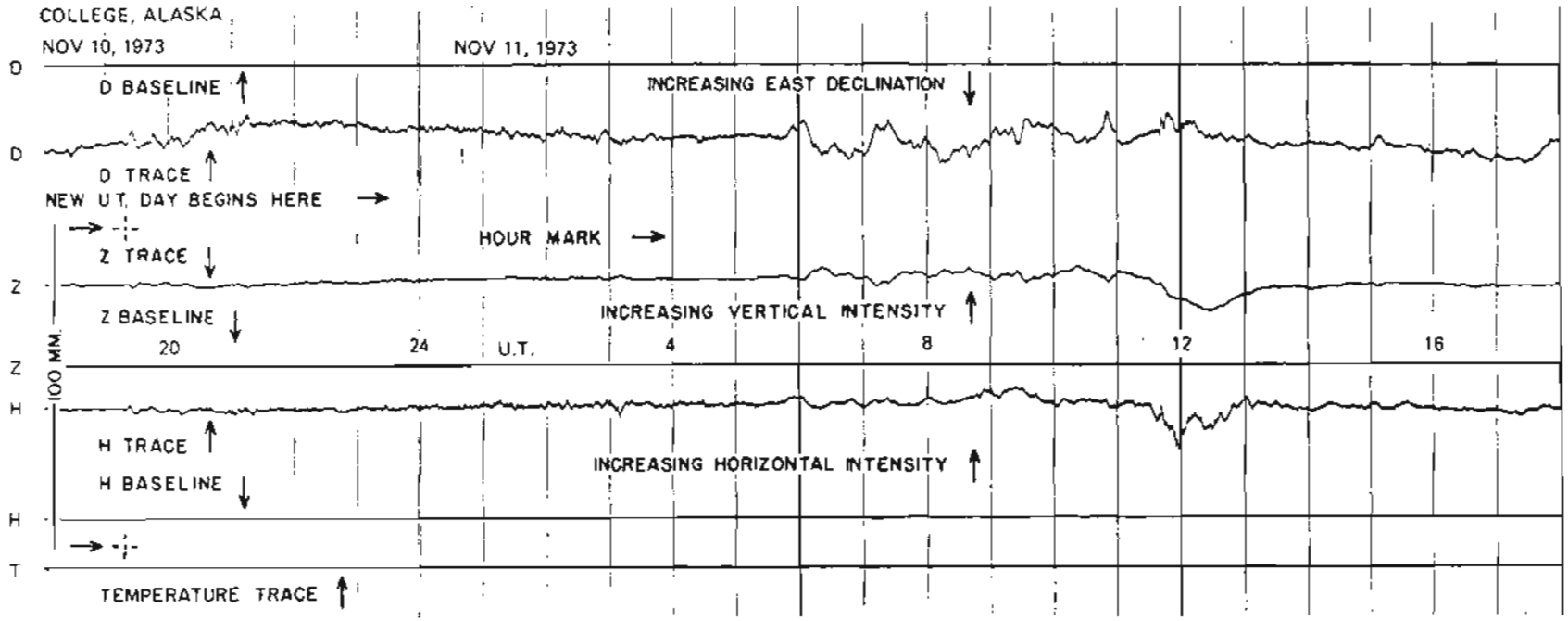
<> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.

* Derived from STARK Magn., converted to Normal Magn.

MONTHLY SUM	220028
MONTHLY MEAN	306

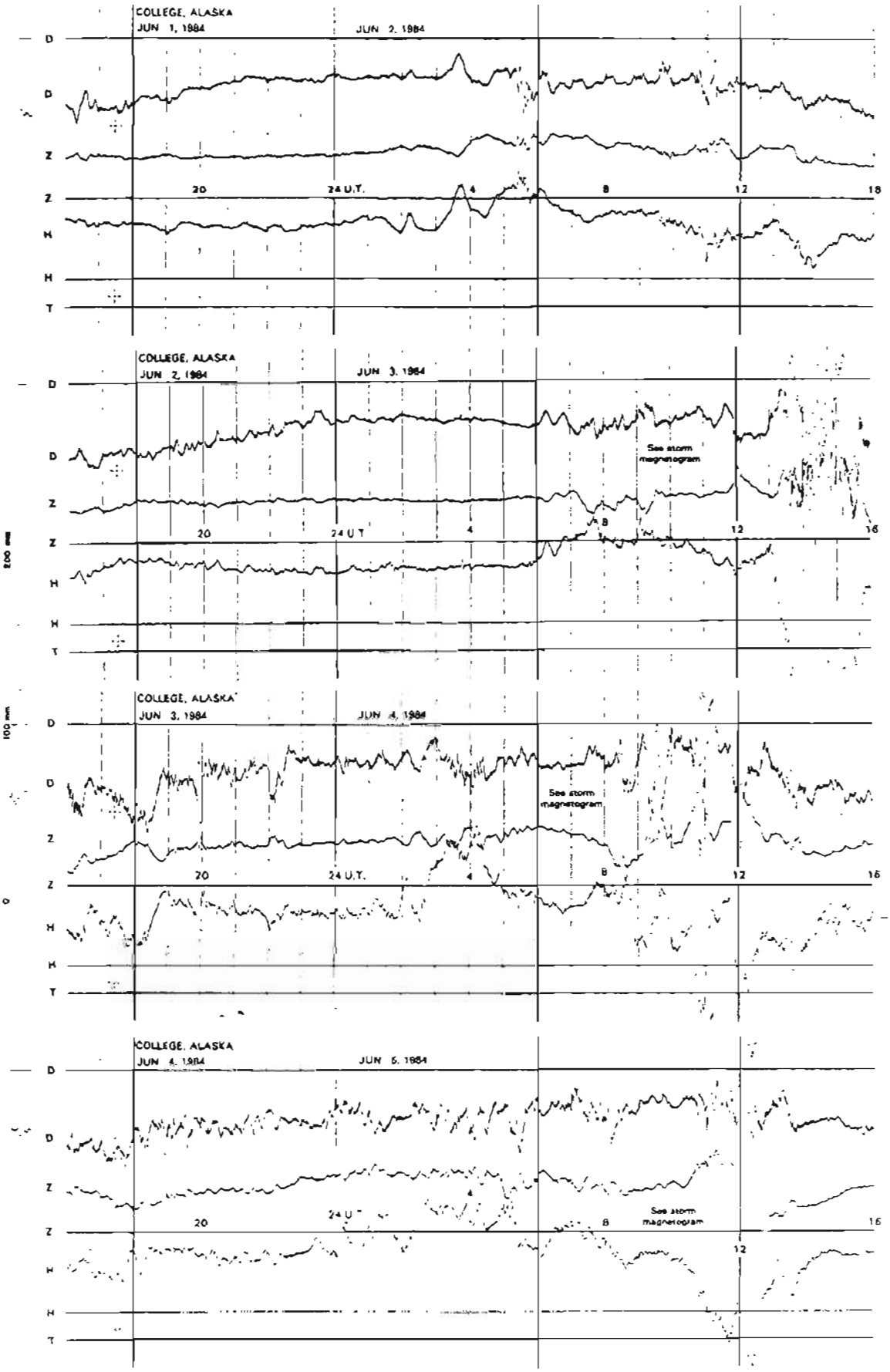
DATES WITH GAPS:

FORMAT FOR NORMAL & STORM MAGNETOGRAMS
(SAMPLE ONLY)

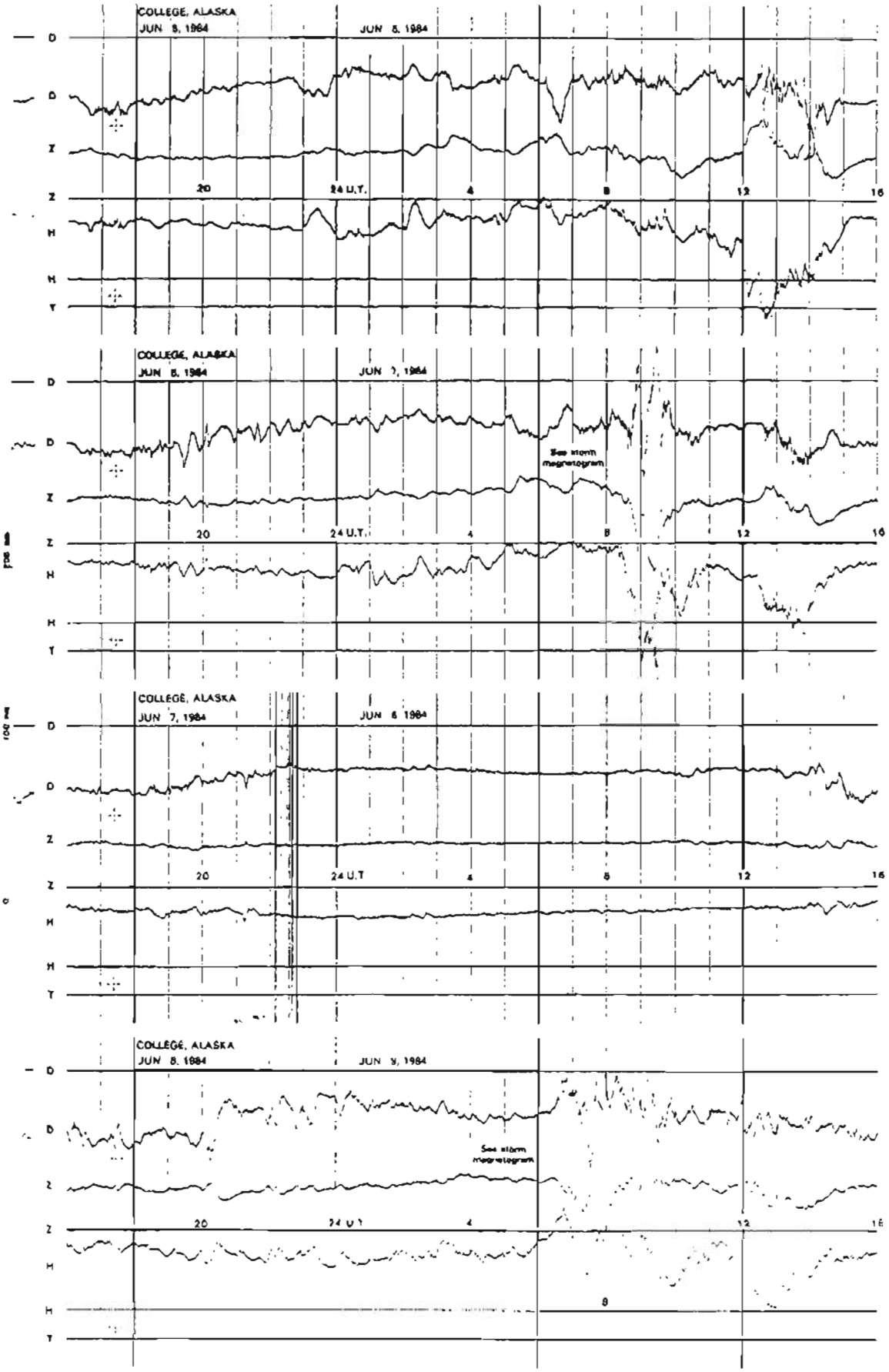


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

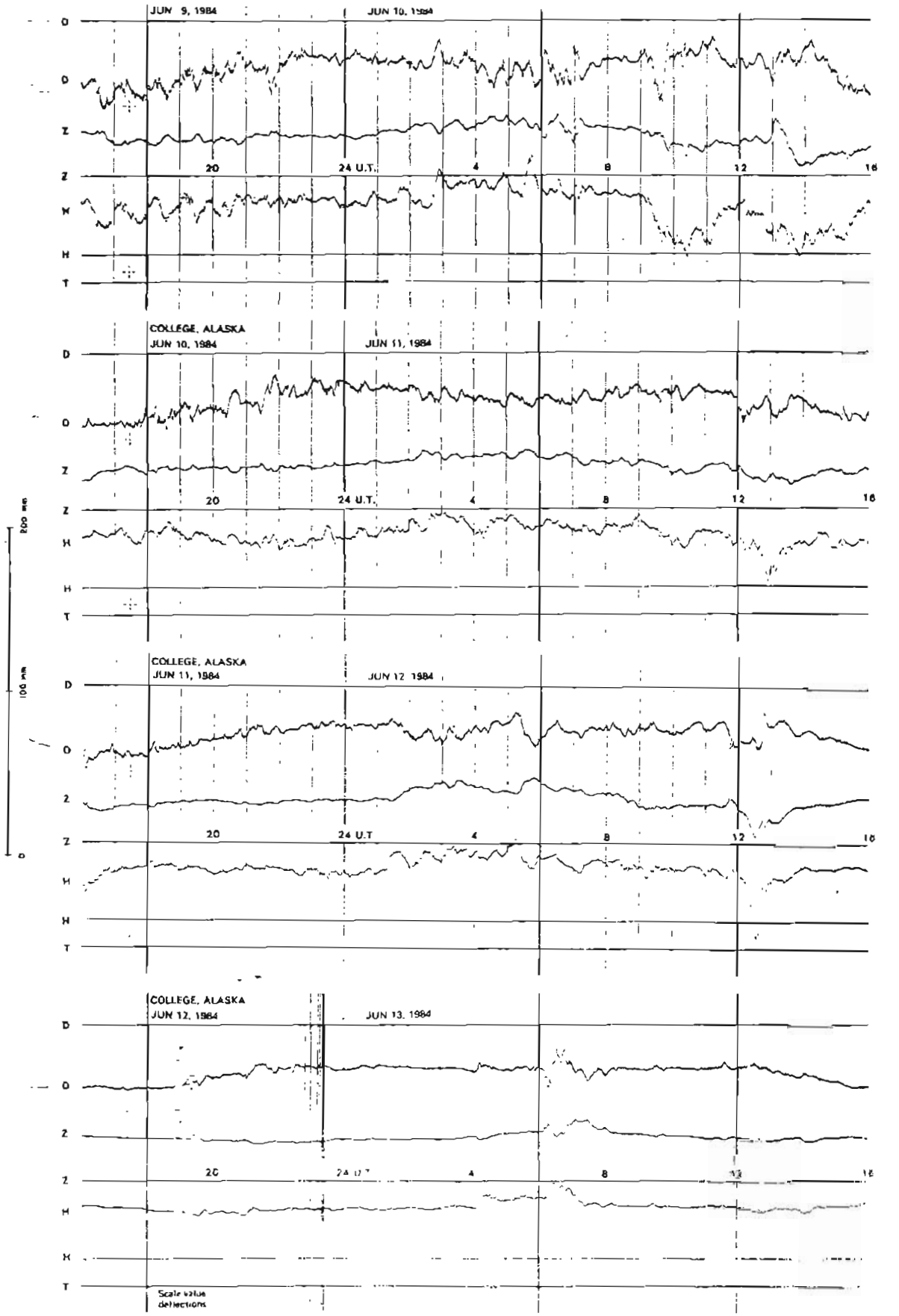
NORMAL MAGNETOGRAMS



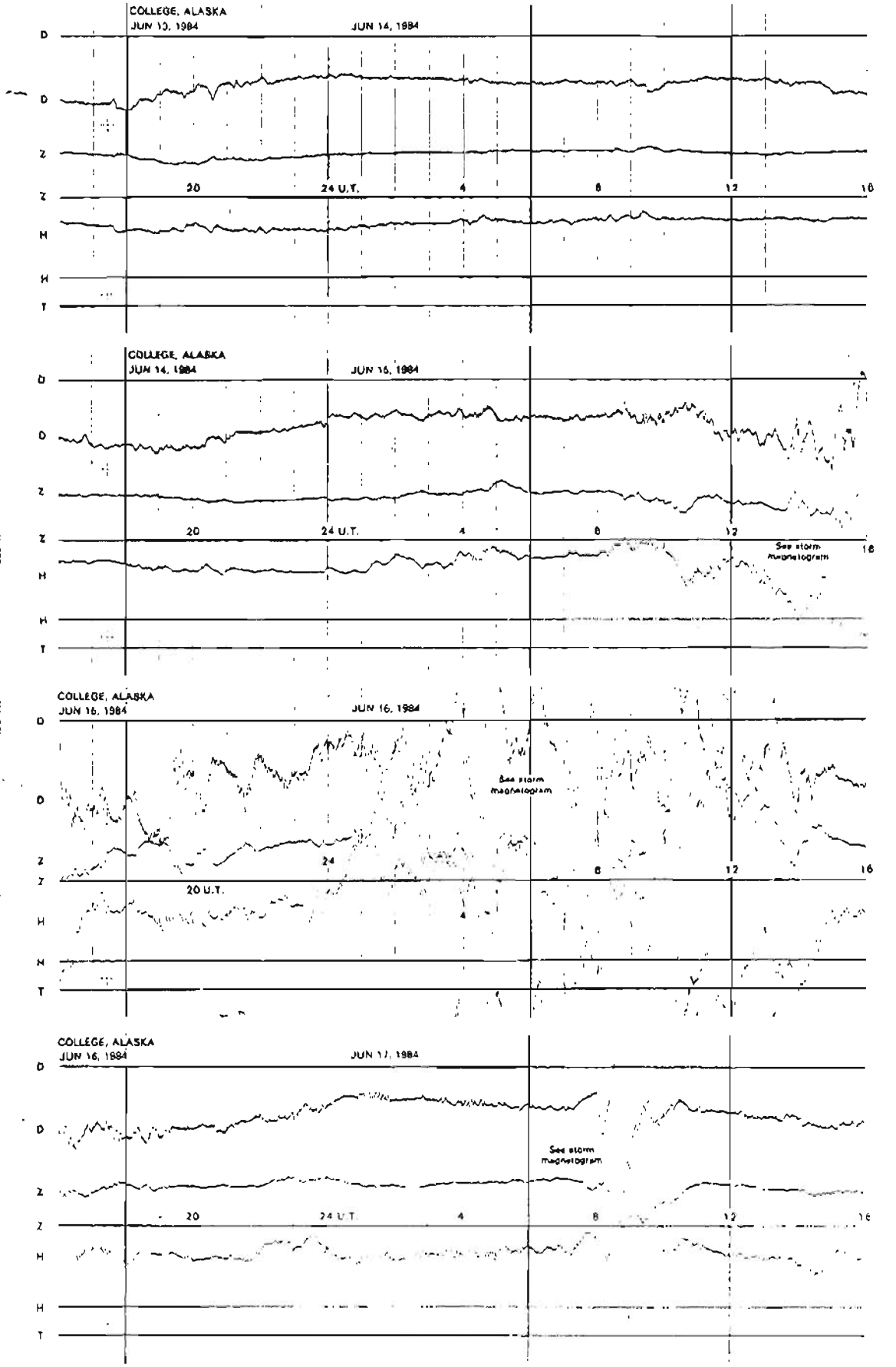
NORMAL MAGNETOGRAMS



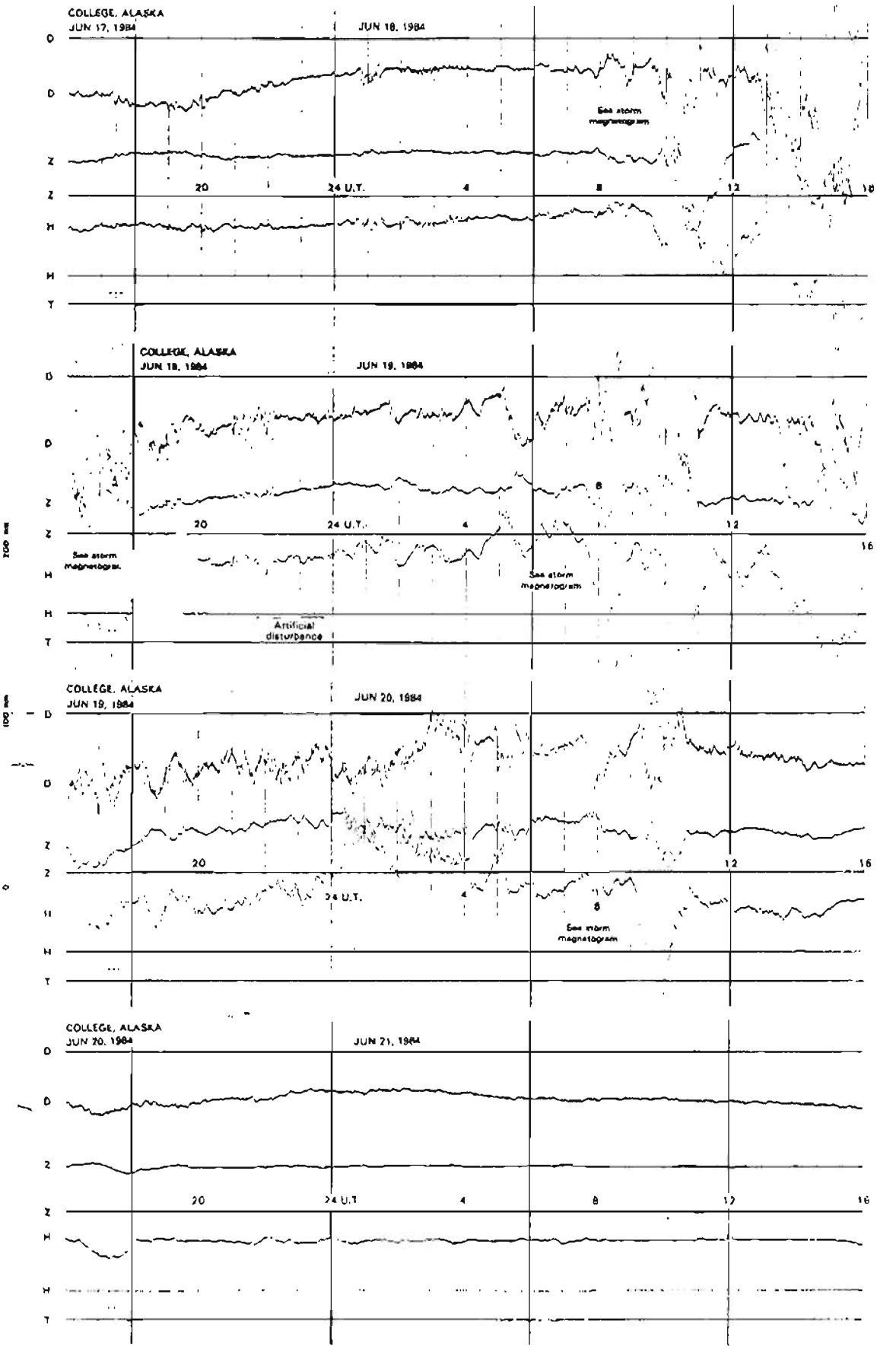
NORMAL MAGNETOGRAMS



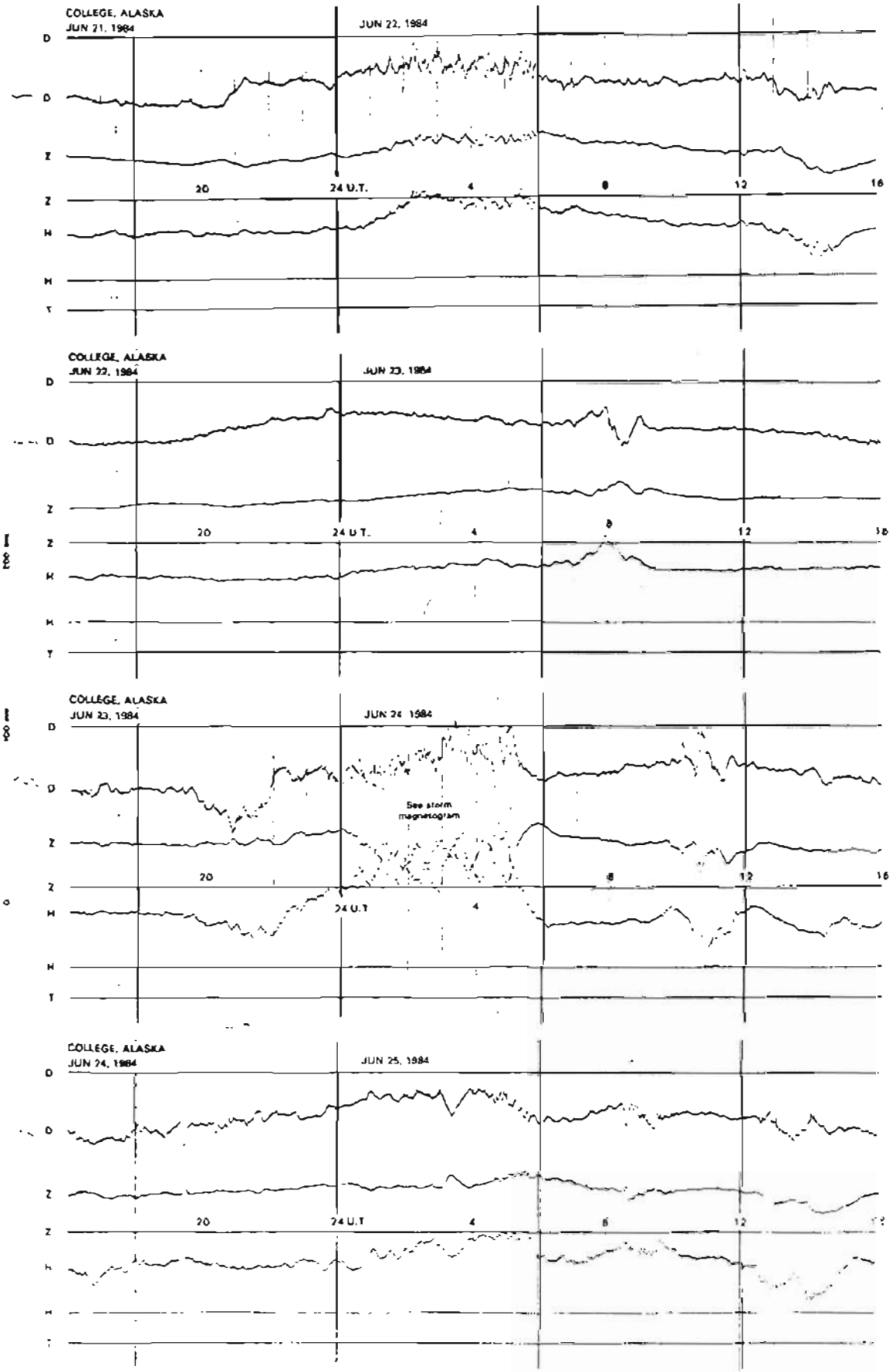
NORMAL MAGNETOGRAMS



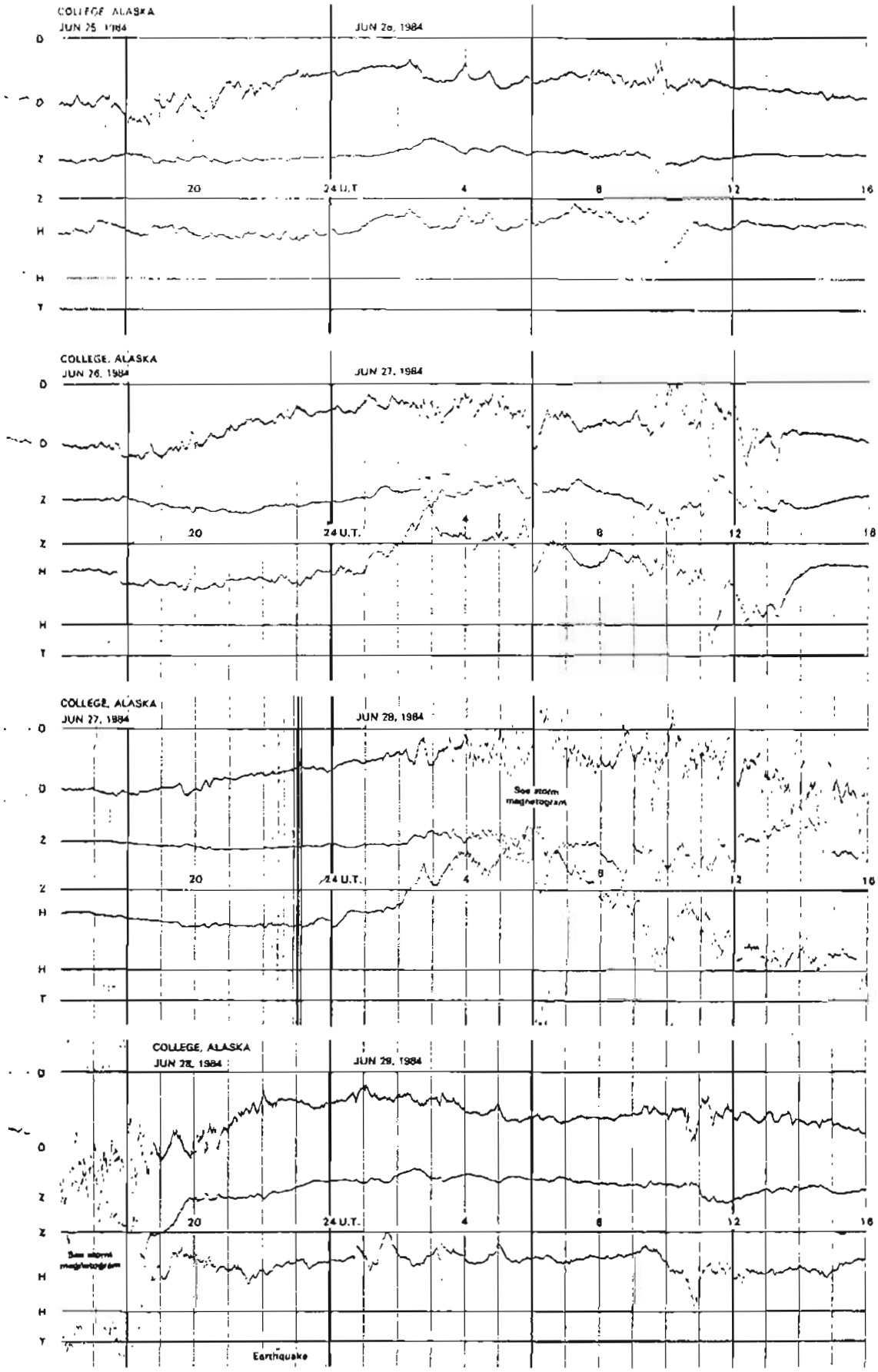
NORMAL MAGNETOGRAMS



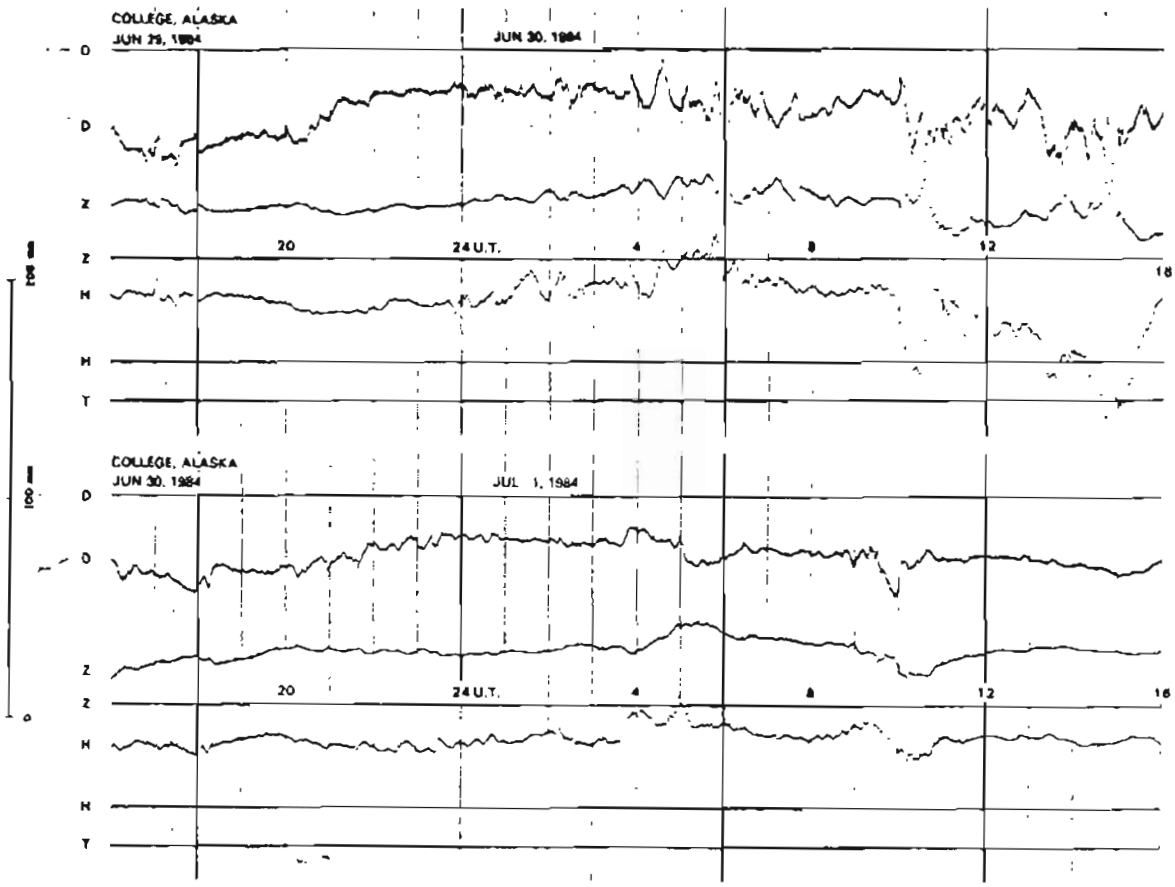
NORMAL MAGNETOGRAMS



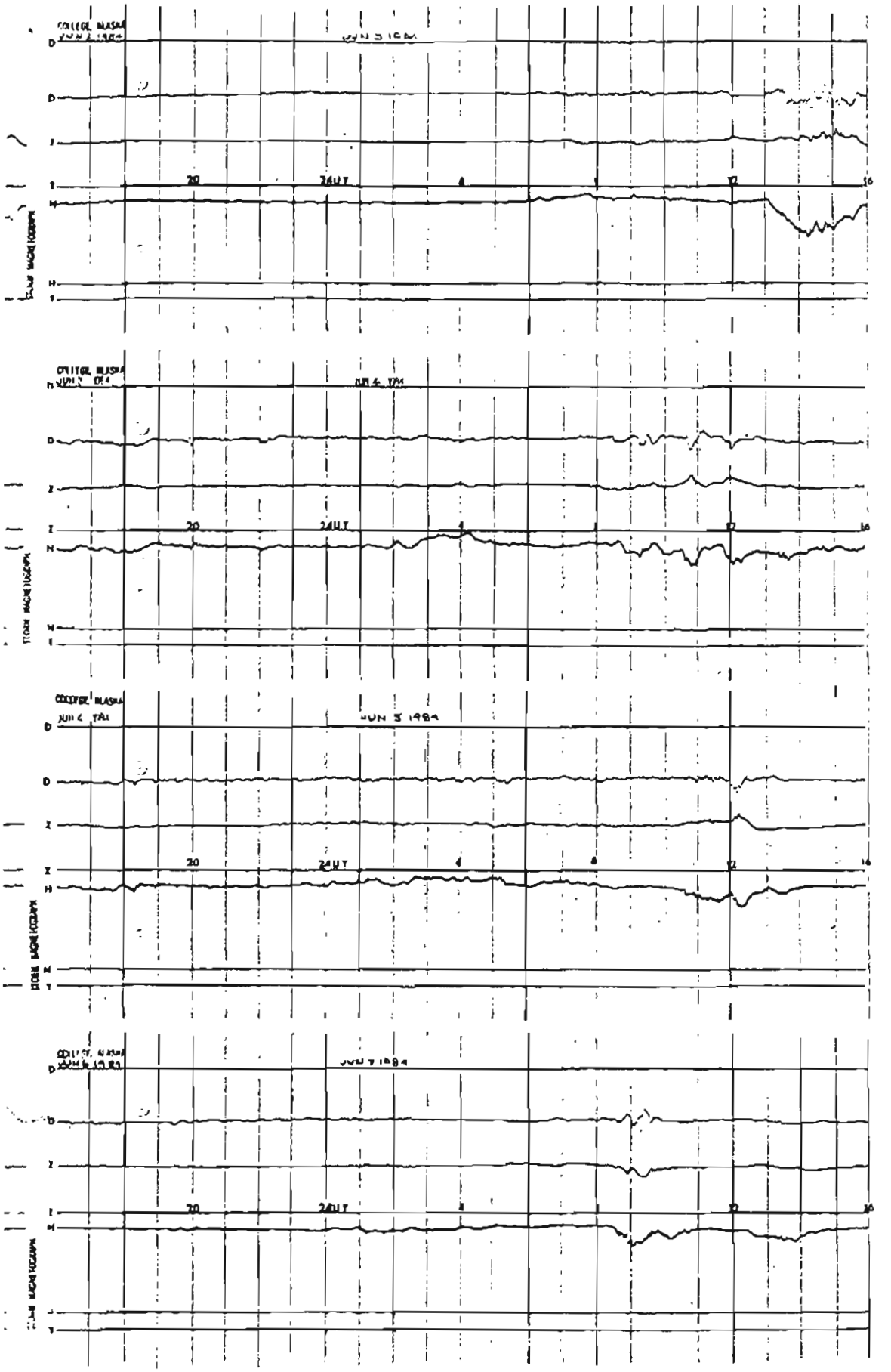
NORMAL MAGNETOGRAMS



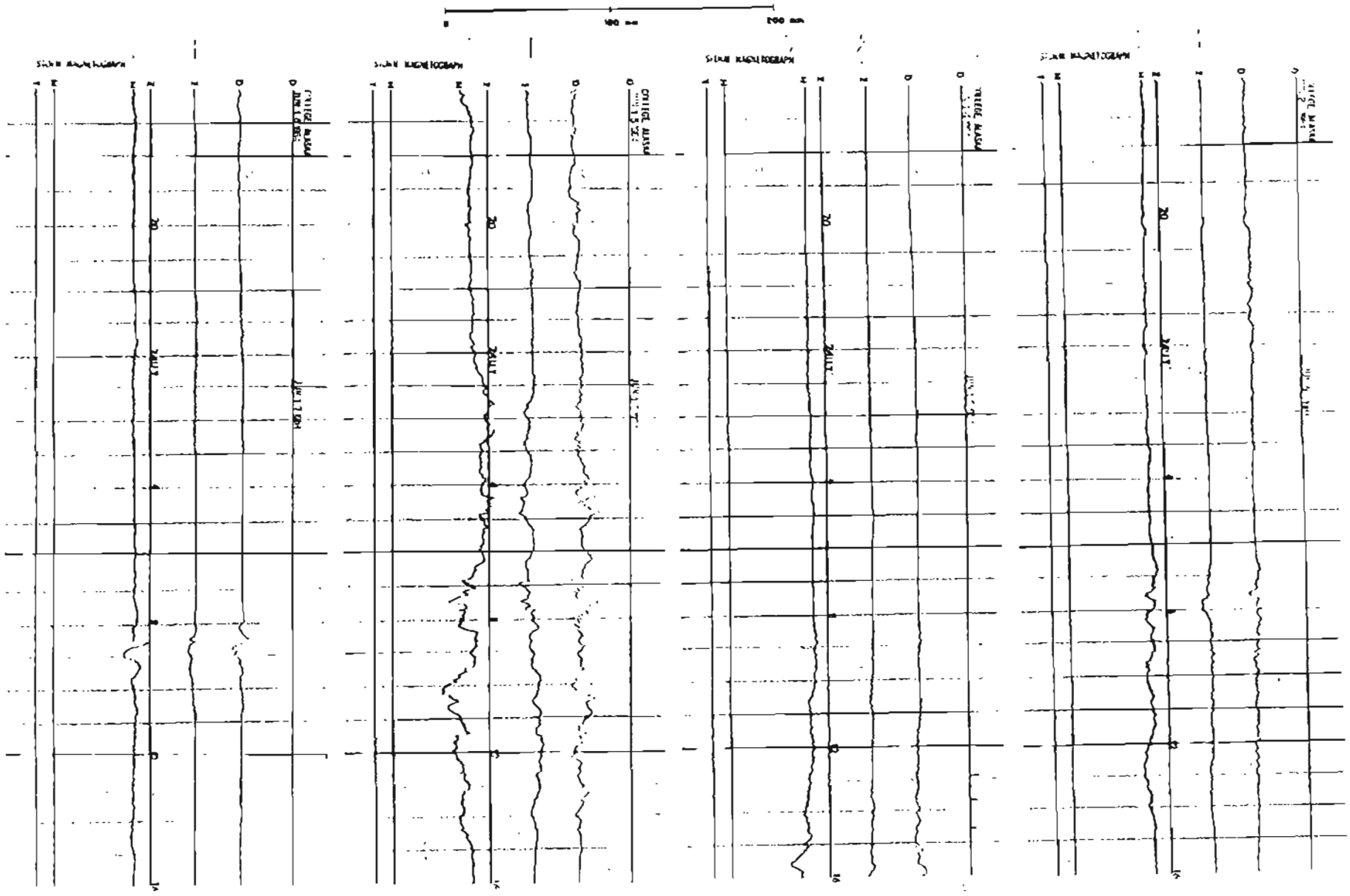
NORMAL MAGNETOGRAMS



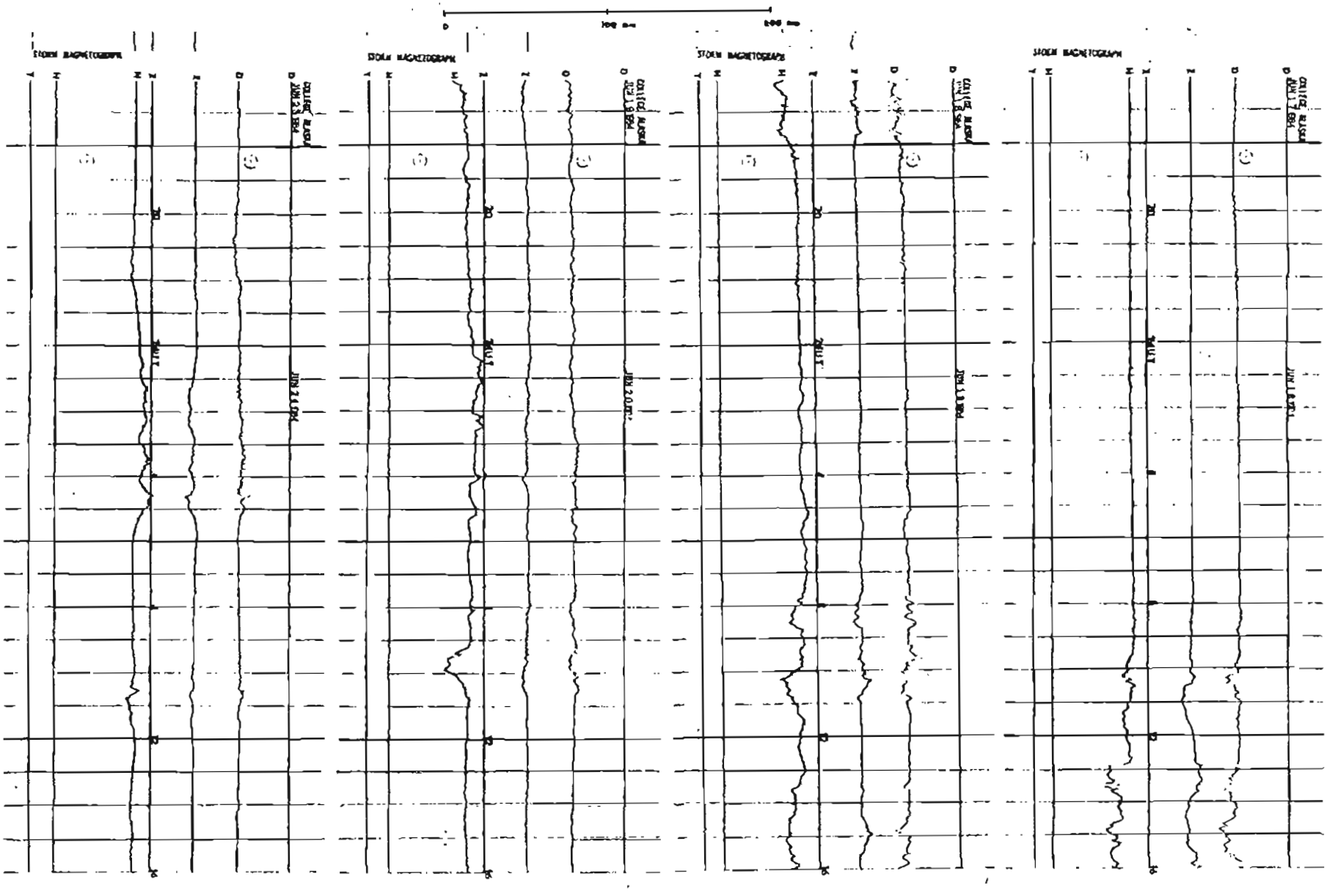
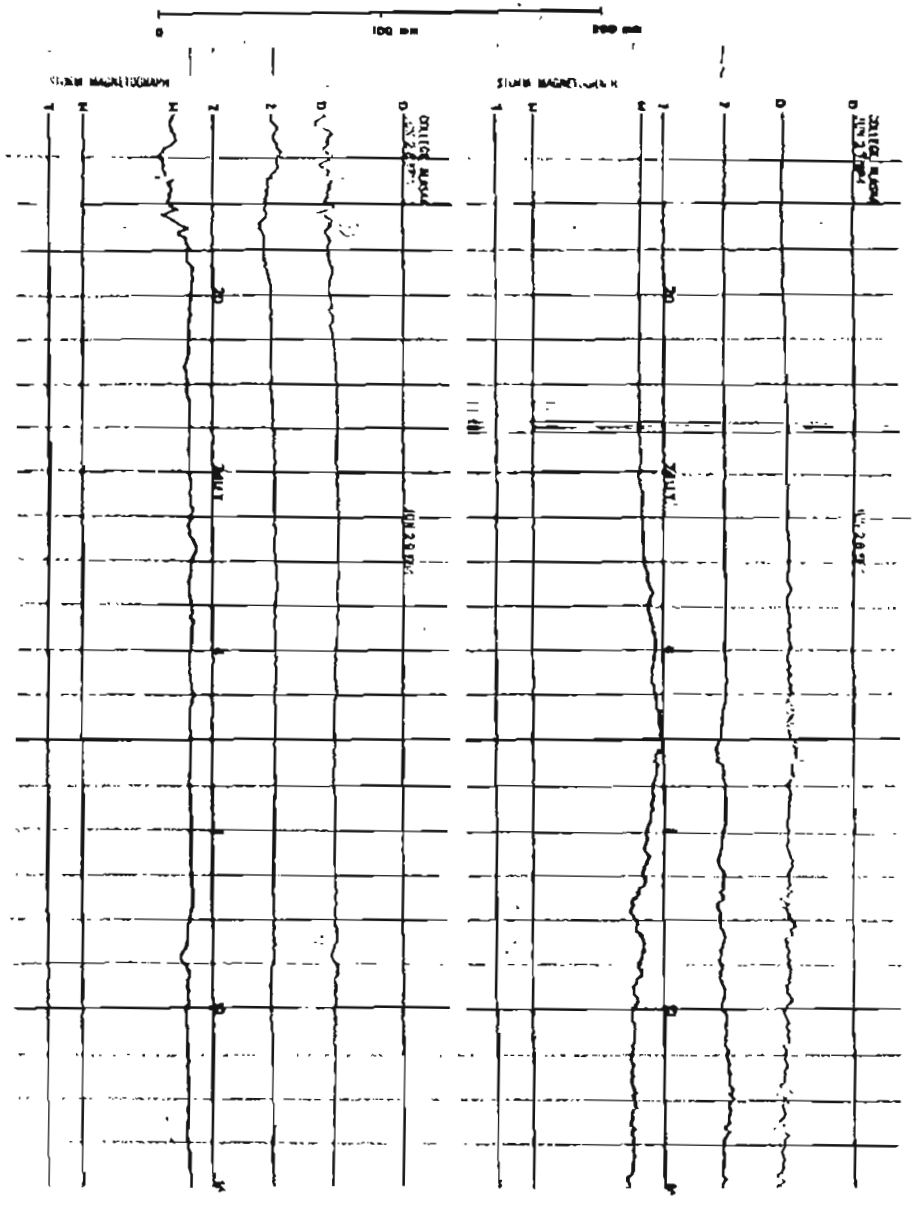
STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS



STORM MAGNETOGRAMS