

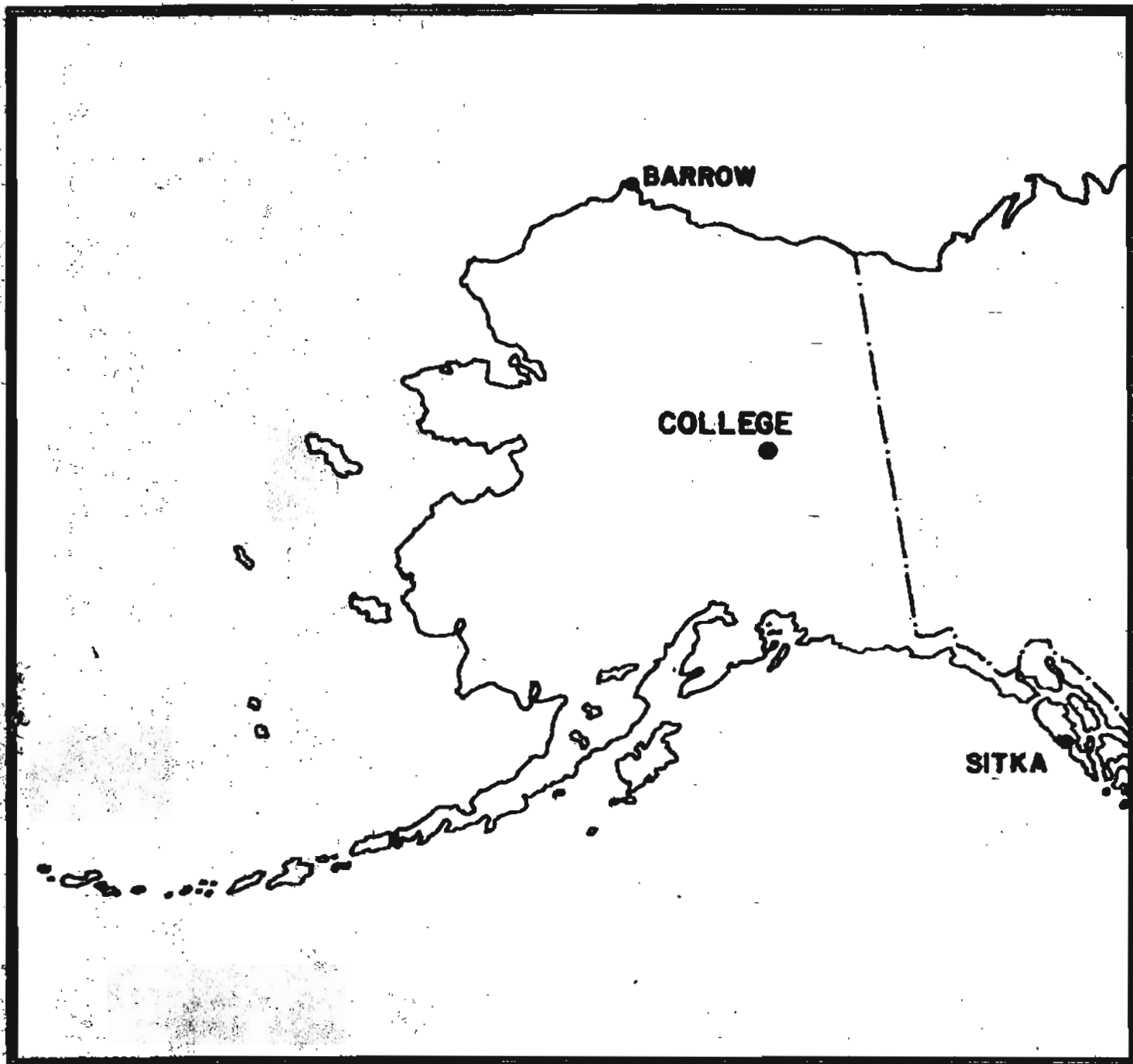
UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA COLLEGE OBSERVATORY FAIRBANKS, ALASKA

MAY 1986

OPEN FILE REPORT 86-0300E



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, H.K. REX AND L.Y. TORRENCE AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS 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..... $147^{\circ}30.2'W$
Geomagnetic latitude..... $+64.6^{\circ}$
Geomagnetic longitude..... $+236.9^{\circ}$
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 3 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 "OI" 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:

$$D = B_D + d \cdot S_D; \quad H = B_H + h \cdot S_H; \quad Z = B_Z + z \cdot S_Z$$

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.

OUTSTANDING MAGNETIC EFFECTS	OBSERVATORY	
	College, Alaska	
	MONTH	YEAR
	May	1986

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
			No Outstanding Magnetic Effects Observed this Month.

IDENTIFIED BY: JEP	VERIFIED BY: JEP
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1. NATURE OF PHENOMENON: ssc, ssc*, sl, sl*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA

May 1986

WDC-4 FOR SOLAR-TERRSTRAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80508 U.S.A.

Data from Individual Observatories:

Obs. station	Geomag. lat.	Commencement		SC - amplitudes			Max. 3 hr - index K			Ranges			DT 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	18XX	..	..	..	..	02	5, 6	7	249	1940	1020	03 12
		05	11XX	..	..	..	..	06	2, 3, 4, 5, 6, 7	6	295	1550	1200	07 20

NORMAL MAGNETOGRAPHS

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASIS LINE
D	0000 U.T., 5-1-86	2400 U.T., 5-31-86	1.0/mm	3.78/mm	27° 16.3 E
H	0000 U.T., 5-1-86	2400 U.T., 5-31-86	7.88/mm		126798
Z	0000 U.T., 5-1-86	2400 U.T., 5-12-86	7.78/mm		551748
	0000 U.T., 5-13-86	2400 U.T., 5-31-86	"		551798

STORM MAGNETOGRAPHS

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASIS LINE
D	0000 U.T., 5-1-86	2400 U.T., 5-18-86	7.9/mm	29.58/mm	23° 43.5 E
	0000 U.T., 5-19-86	2400 U.T., 5-31-86	"	"	23° 45.5 E
H	0000 U.T., 5-1-86	2400 U.T., 5-31-86	49.88/mm		107108
Z	0000 U.T., 5-1-86	2400 U.T., 5-12-86	48.78/mm		551488
	0000 U.T., 5-13-86	2400 U.T., 5-31-86	"		551348

RAPID RUN MAGNETOGRAPHS

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 31.1 E	128798	553308

* COMPUTED FROM FIVE QUIETEST DAYS DURING MONTH.

DAYS USED: MAY 1, 14, 15, 22, 28

U.S. Dept. of Interior
Geological Survey

Secretary
DALLAS, ALABAMA

Month
MAY

Year
1966

44-03 - 1728

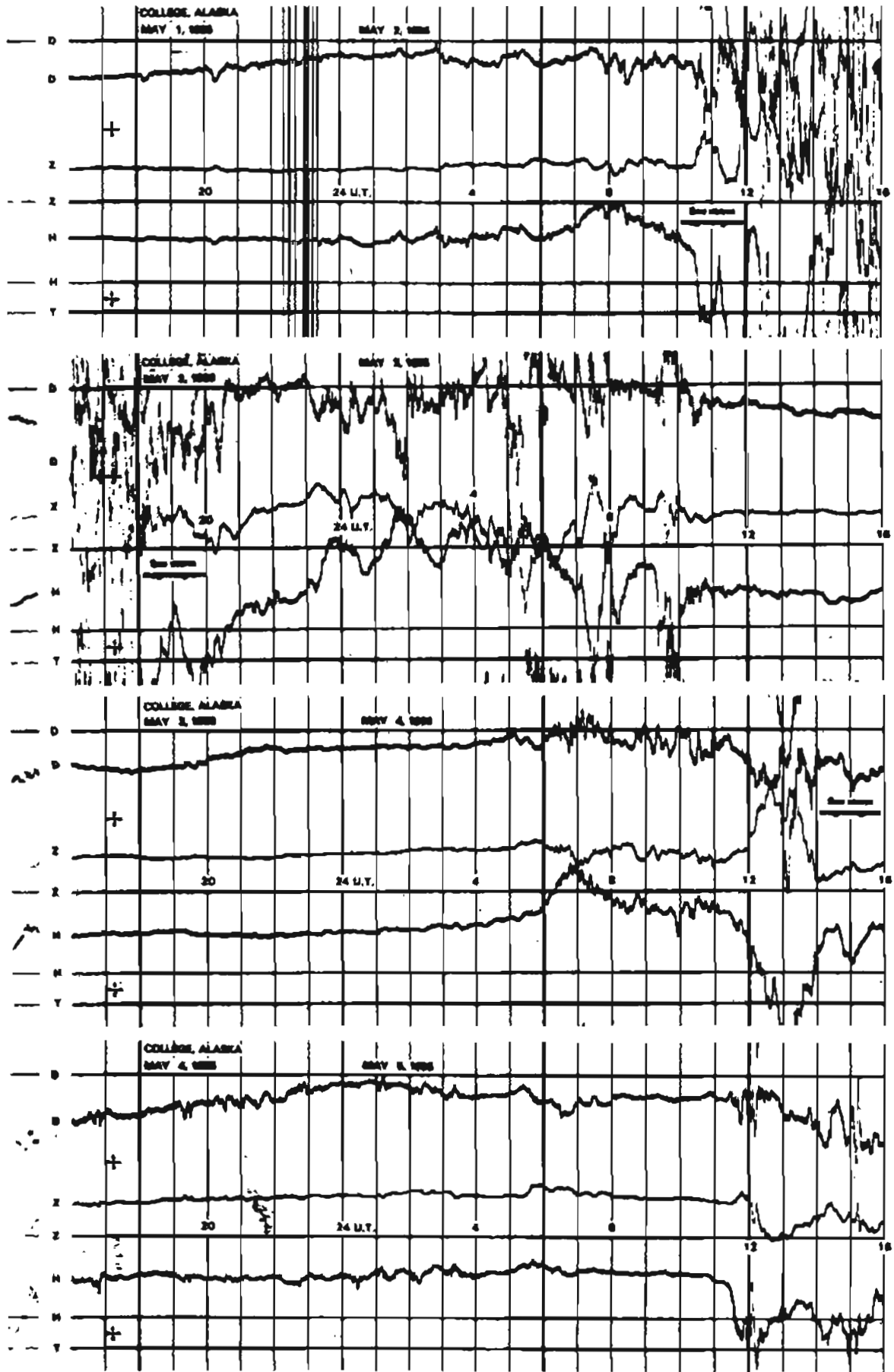
WAGE PROGRAM MONTHLY SCALINGS - FIVE GREATEST DAYS
(UNIVERSAL TIME)

Values are in Tenths of an and are Averages for Successive Periods of One Hour beginning at Midnight. Shifts Corrections have been applied. Negative Values in Red with Minus.

COMMENT	D				E				F				G				COMMENTS
	1	15	28	31	1	15	28	31	1	15	28	31	1	15	28	31	
01	110	106	98	88	248	241	239	237	252	248	245	241	237	210	207	203	200
02	110	104	97	87	248	243	243	241	252	248	245	241	237	210	207	203	200
03	110	103	96	86	252	249	249	248	265	261	258	254	250	220	217	214	211
04	120	110	104	94	259	249	249	246	264	261	259	256	252	220	217	214	211
05	124	129	124	120	269	272	269	263	274	270	267	263	259	220	217	214	211
06	139	142	139	135	271	277	271	264	280	276	272	268	264	220	217	214	211
07	144	141	140	139	267	261	273	267	282	278	274	270	266	220	217	214	211
08	145	140	140	141	278	279	280	279	284	281	278	275	272	220	217	214	211
09	162	151	150	145	278	278	279	279	268	268	268	268	268	220	217	214	211
10	179	159	158	159	277	260	259	260	265	265	265	265	265	220	217	214	211
11	179	145	138	141	270	261	261	269	265	265	265	265	265	220	217	214	211
12	159	160	163	163	264	265	248	269	260	260	260	260	260	220	217	214	211
13	174	171	171	167	247	261	248	266	266	266	266	266	266	220	217	214	211
14	180	169	165	165	232	269	248	268	260	260	260	260	260	220	217	214	211
15	185	202	208	208	268	270	289	274	259	259	259	259	259	220	217	214	211
16	218	218	240	234	264	261	239	269	259	259	259	259	259	220	217	214	211
17	206	220	229	230	268	259	249	259	265	265	265	265	265	220	217	214	211
18	197	218	218	221	266	272	288	260	249	249	249	249	249	220	217	214	211
19	177	198	198	190	261	265	269	269	240	240	240	240	240	220	217	214	211
20	168	158	163	168	251	259	269	260	230	230	230	230	230	220	217	214	211
21	179	155	164	158	240	258	268	266	230	230	230	230	230	220	217	214	211
22	173	130	130	116	248	269	269	260	230	230	230	230	230	220	217	214	211
23	98	117	108	99	244	251	244	240	208	208	208	208	208	220	217	214	211
24	3669	3667	3663	3660	3611	3607	3607	3607	3605	3605	3605	3605	3605	3605	3605	3605	3605
DAILY SUM	163	165	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167
DAILY MAX																	
DAILY MIN																	
MEAN		160			160				160					160			

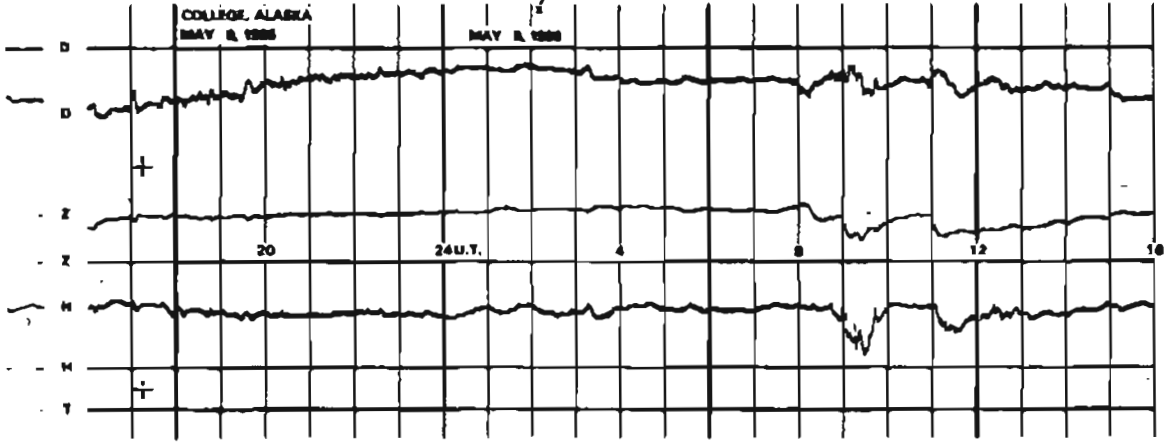
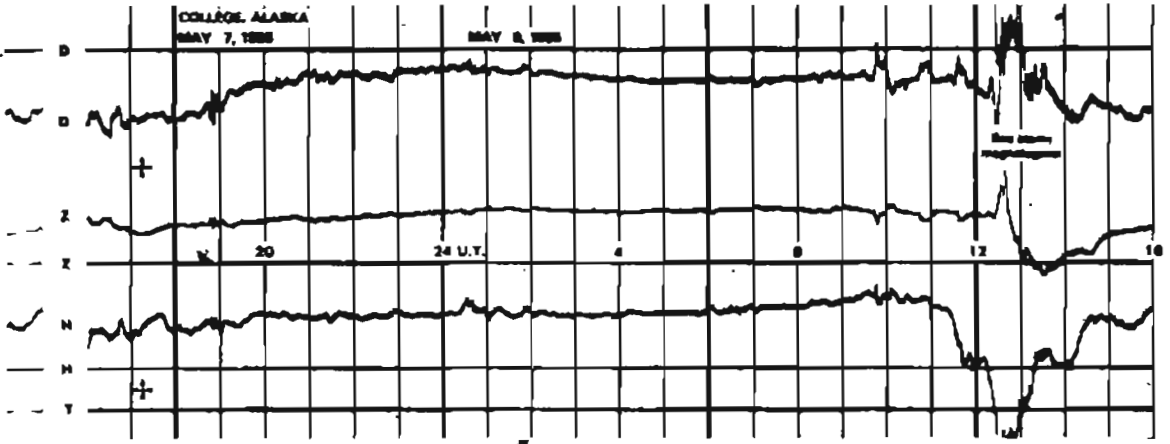
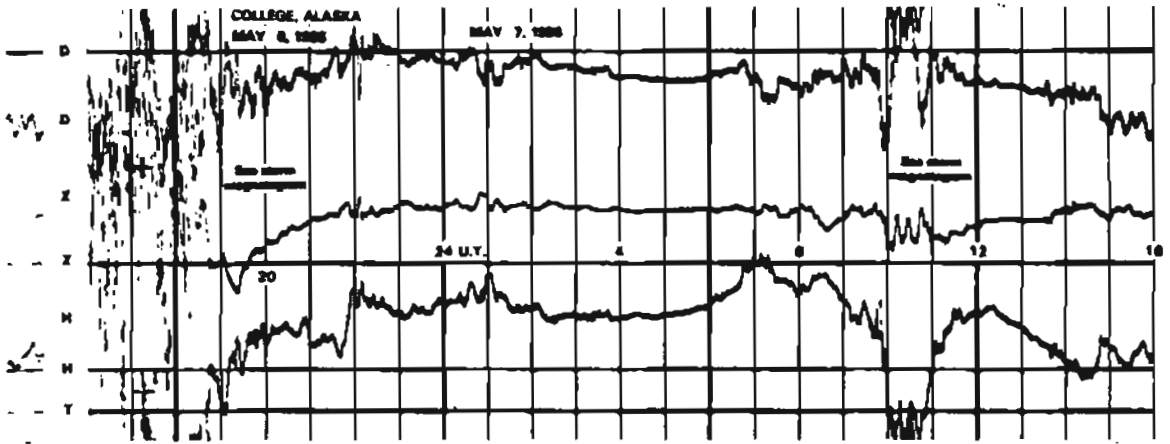
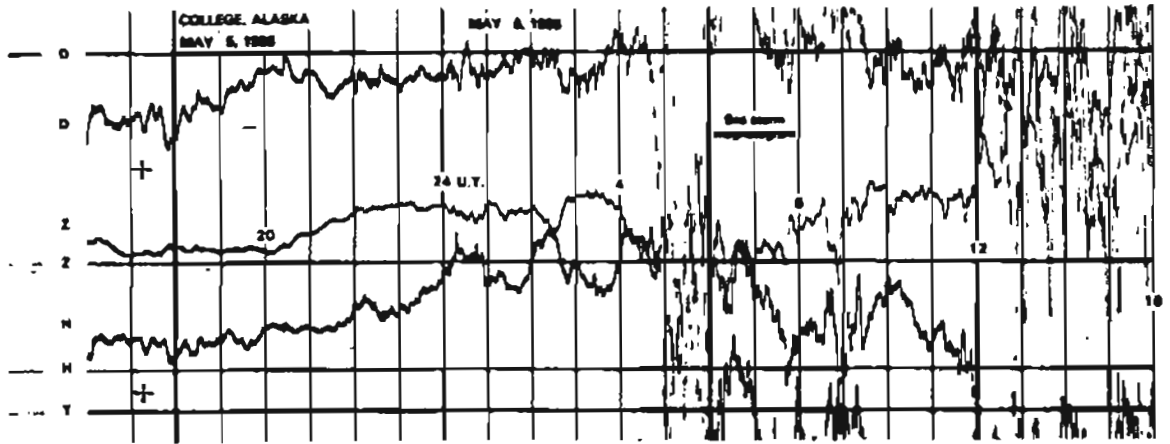
Checked ABCD

NORMAL MAGNETOGRAMS



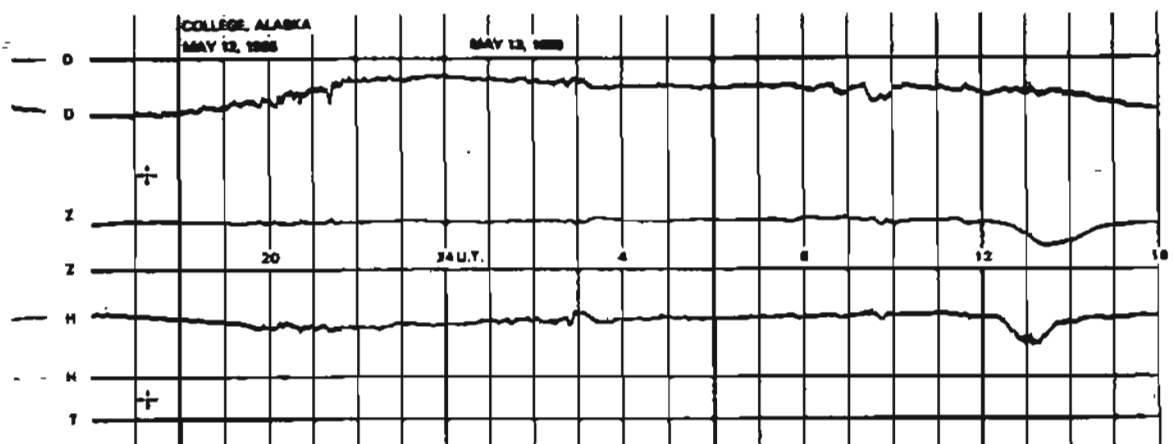
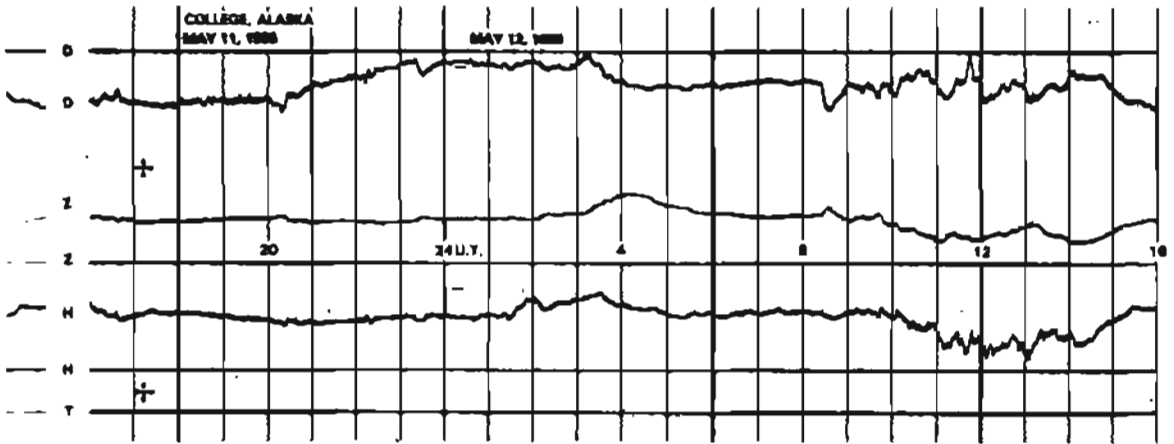
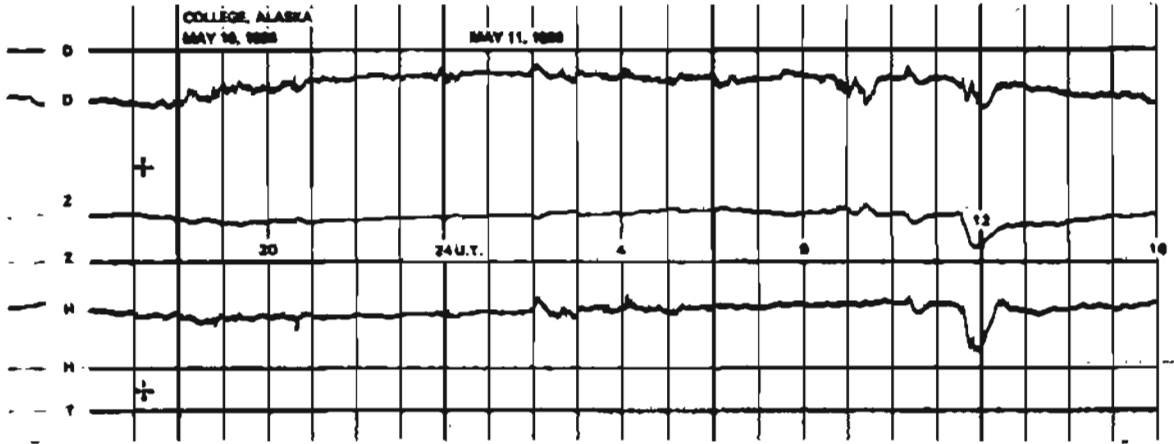
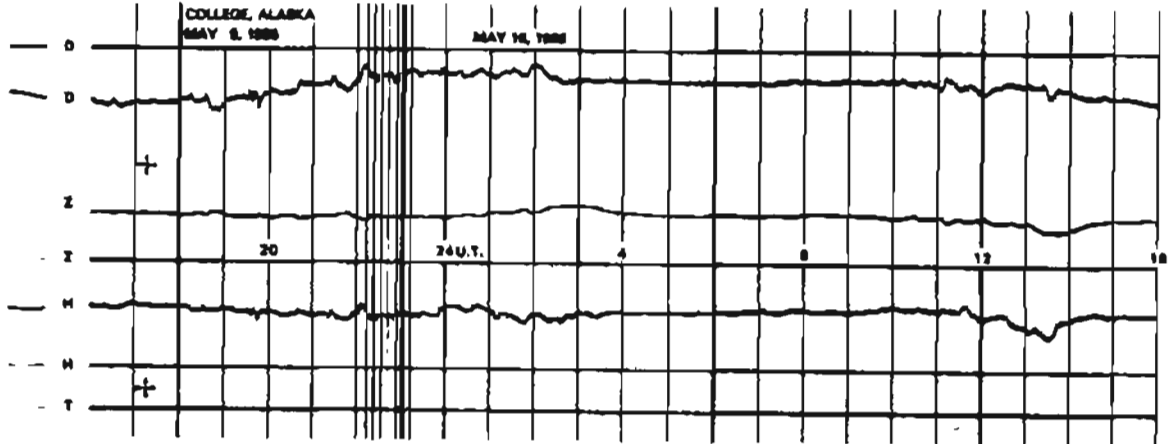
NORMAL MAGNETOGRAMS

100mm
200mm

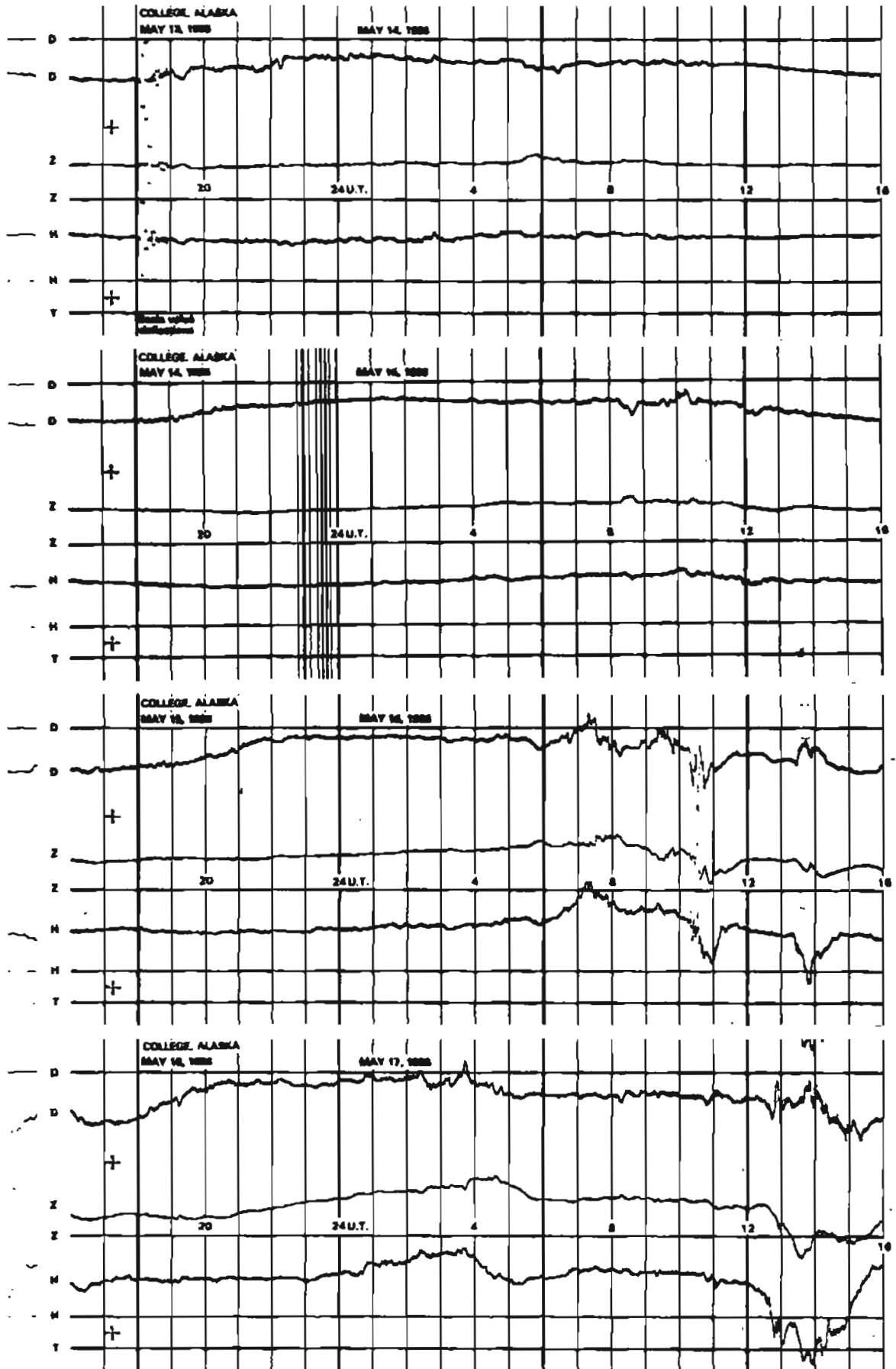


NORMAL MAGNETOGRAMS

1000 gamma
0

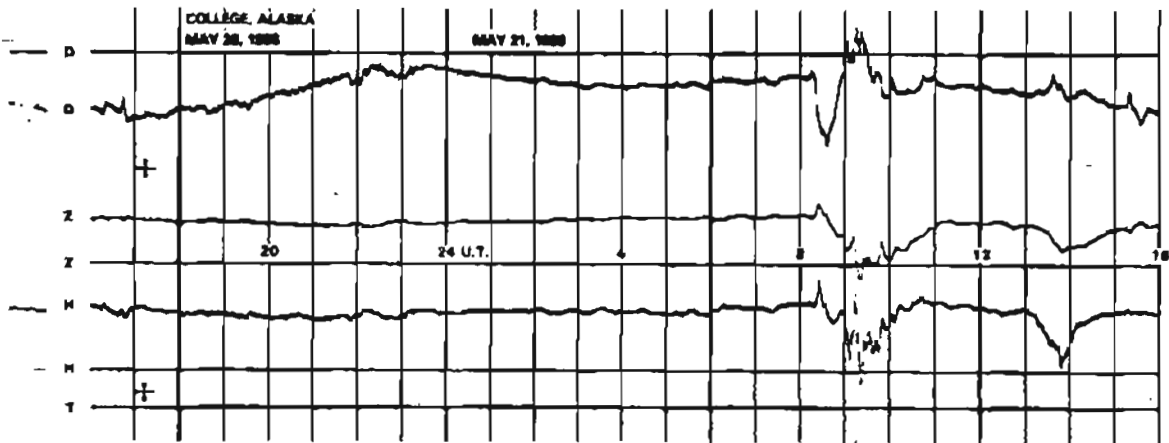
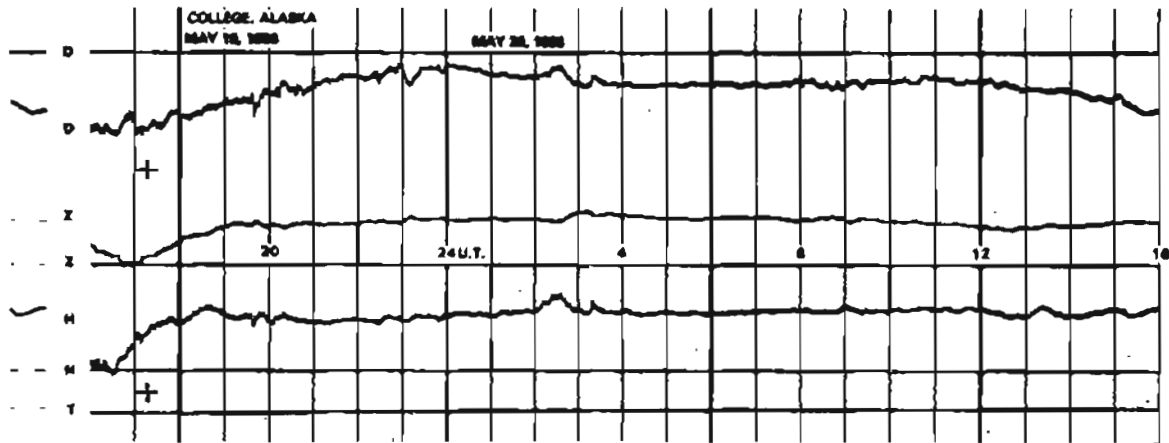
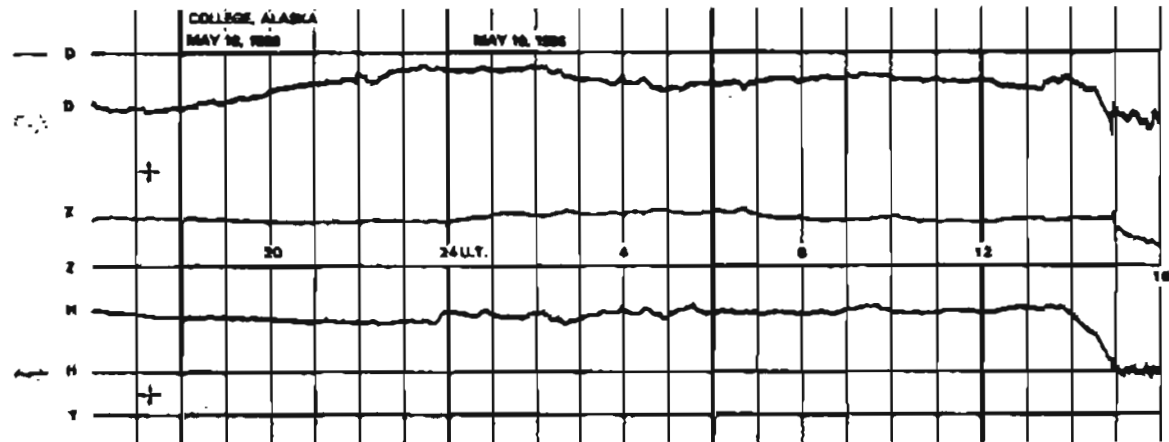
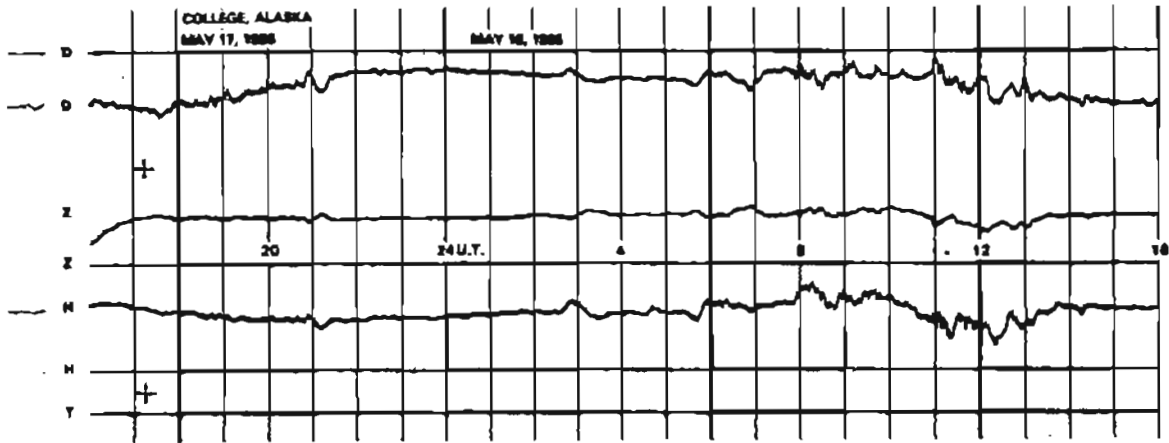


NORMAL MAGNETOGRAMS

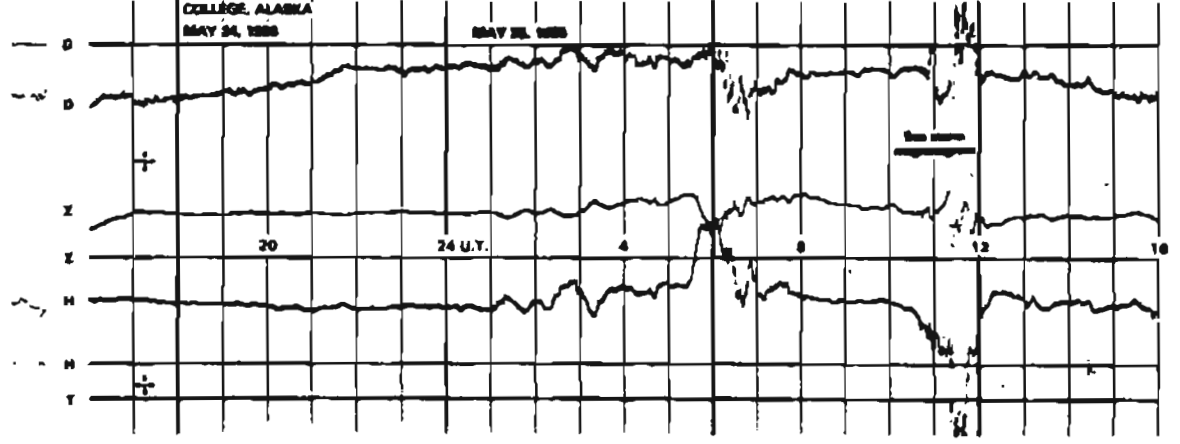
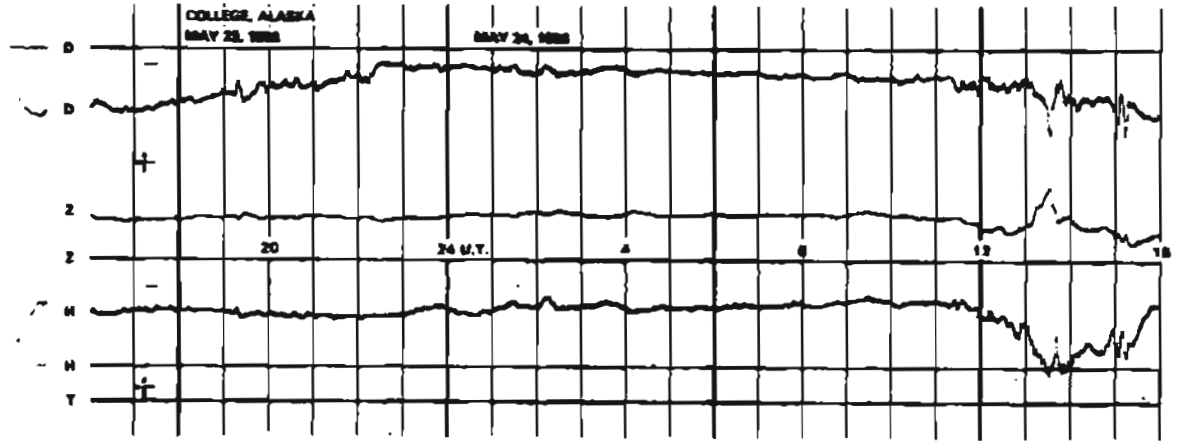
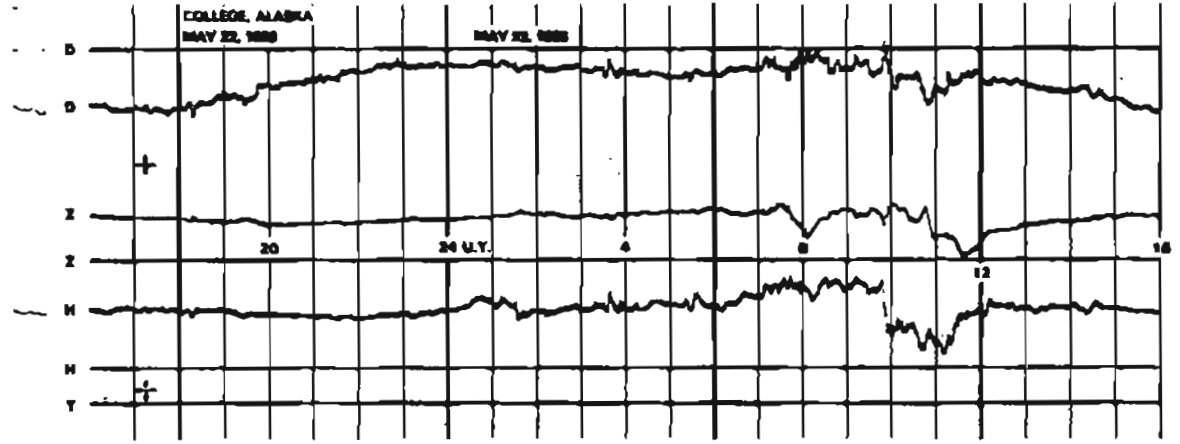
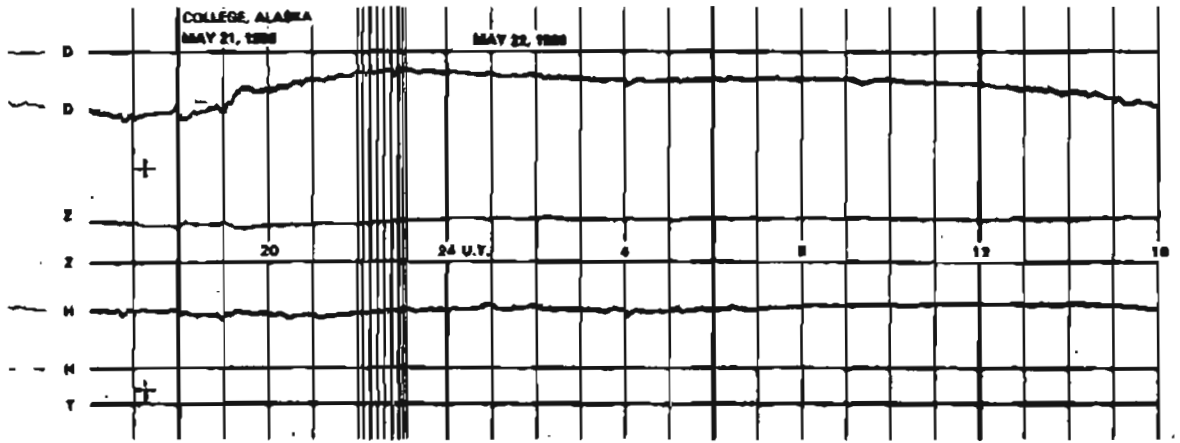


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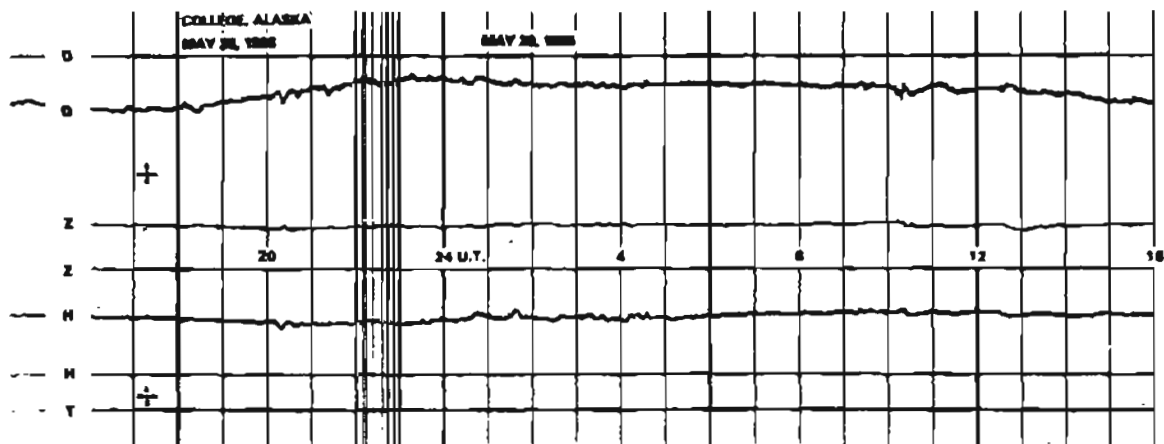
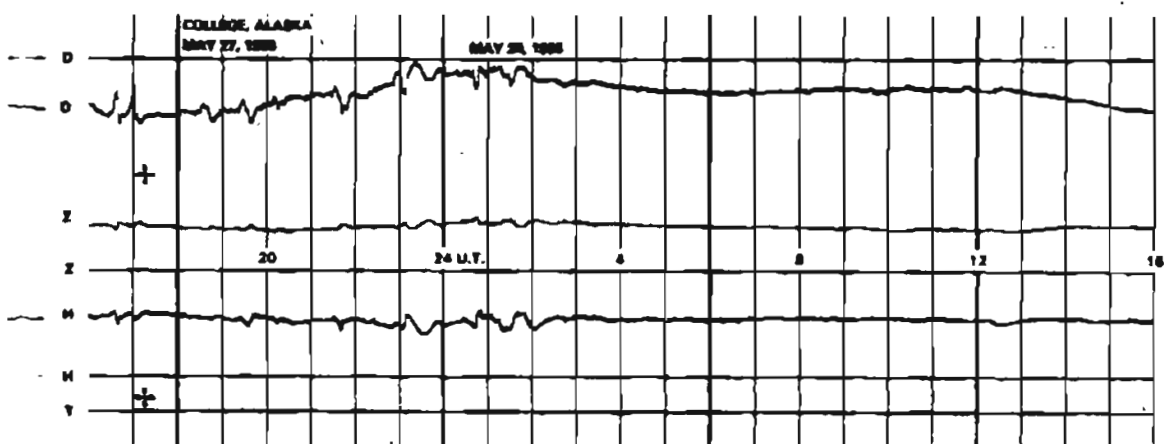
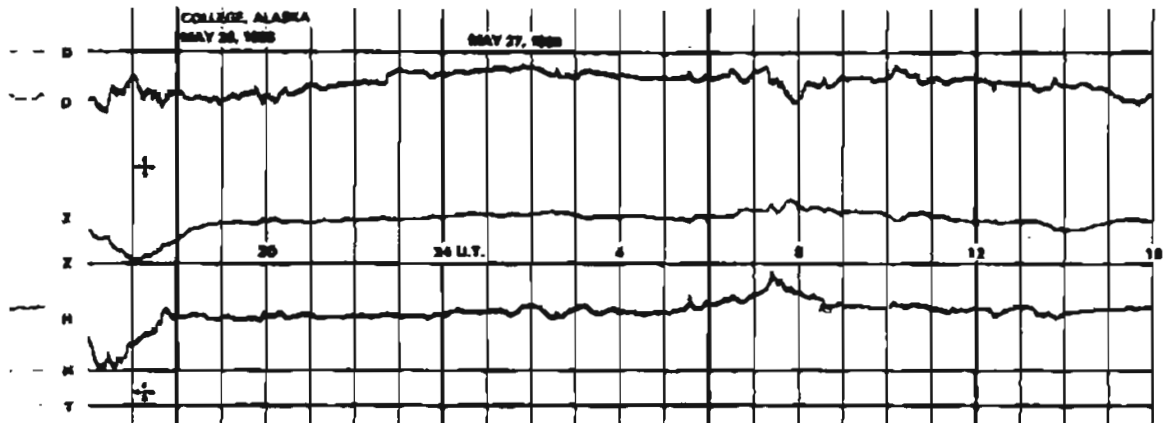
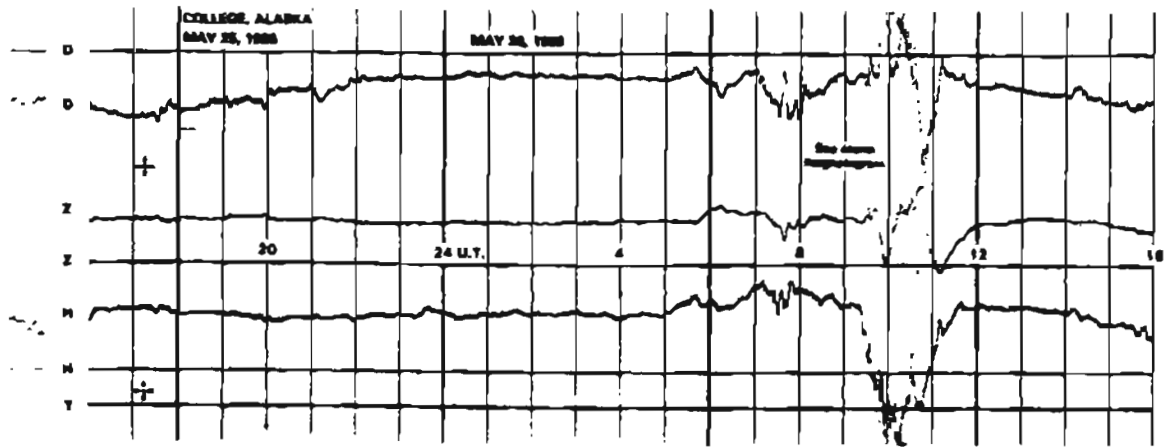
100 gamma
200 gamma
0



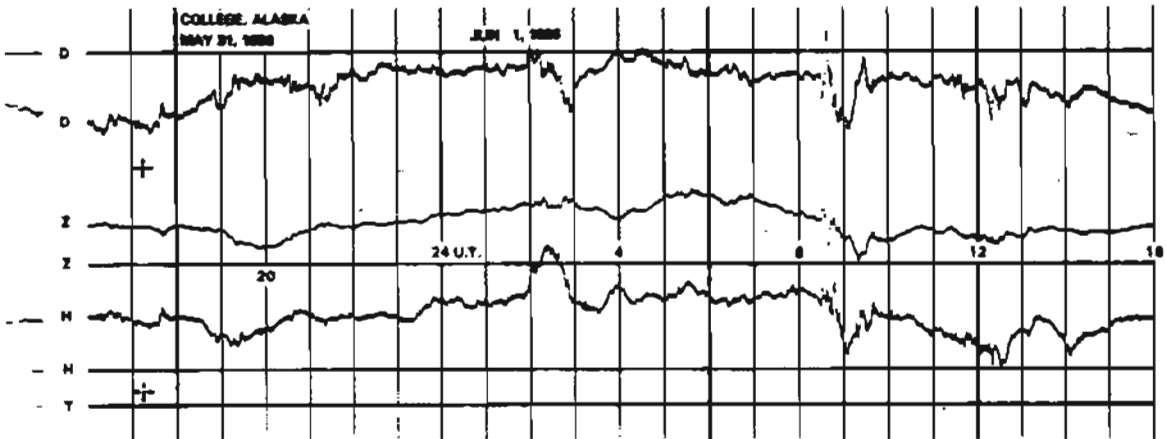
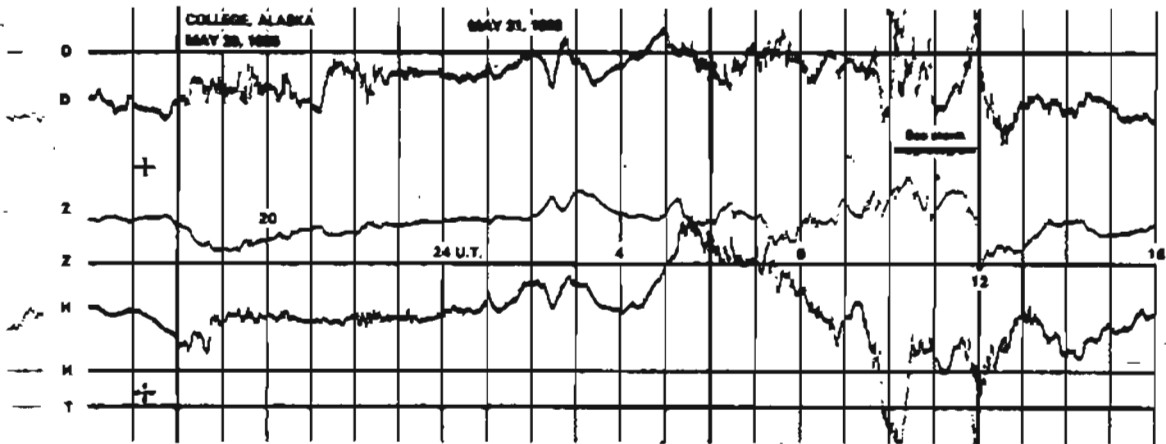
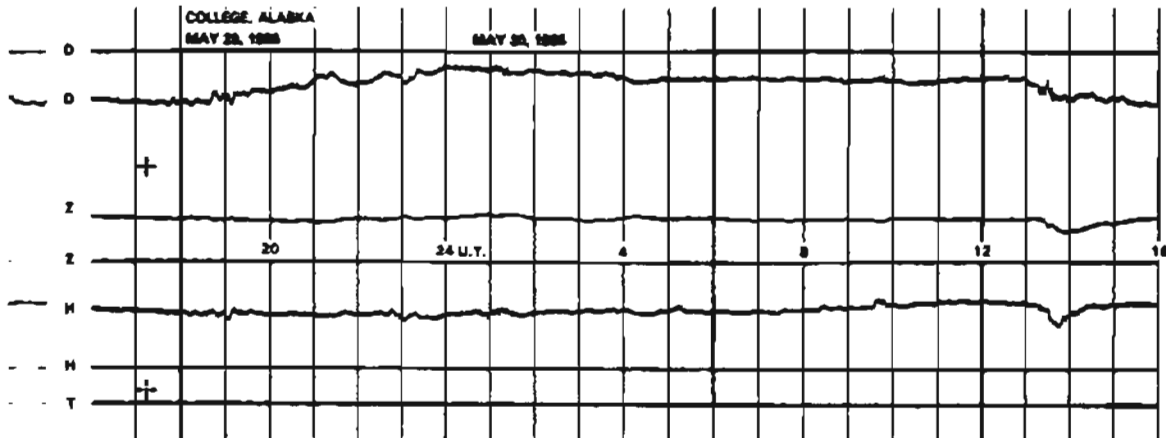
NORMAL MAGNETOGRAMS



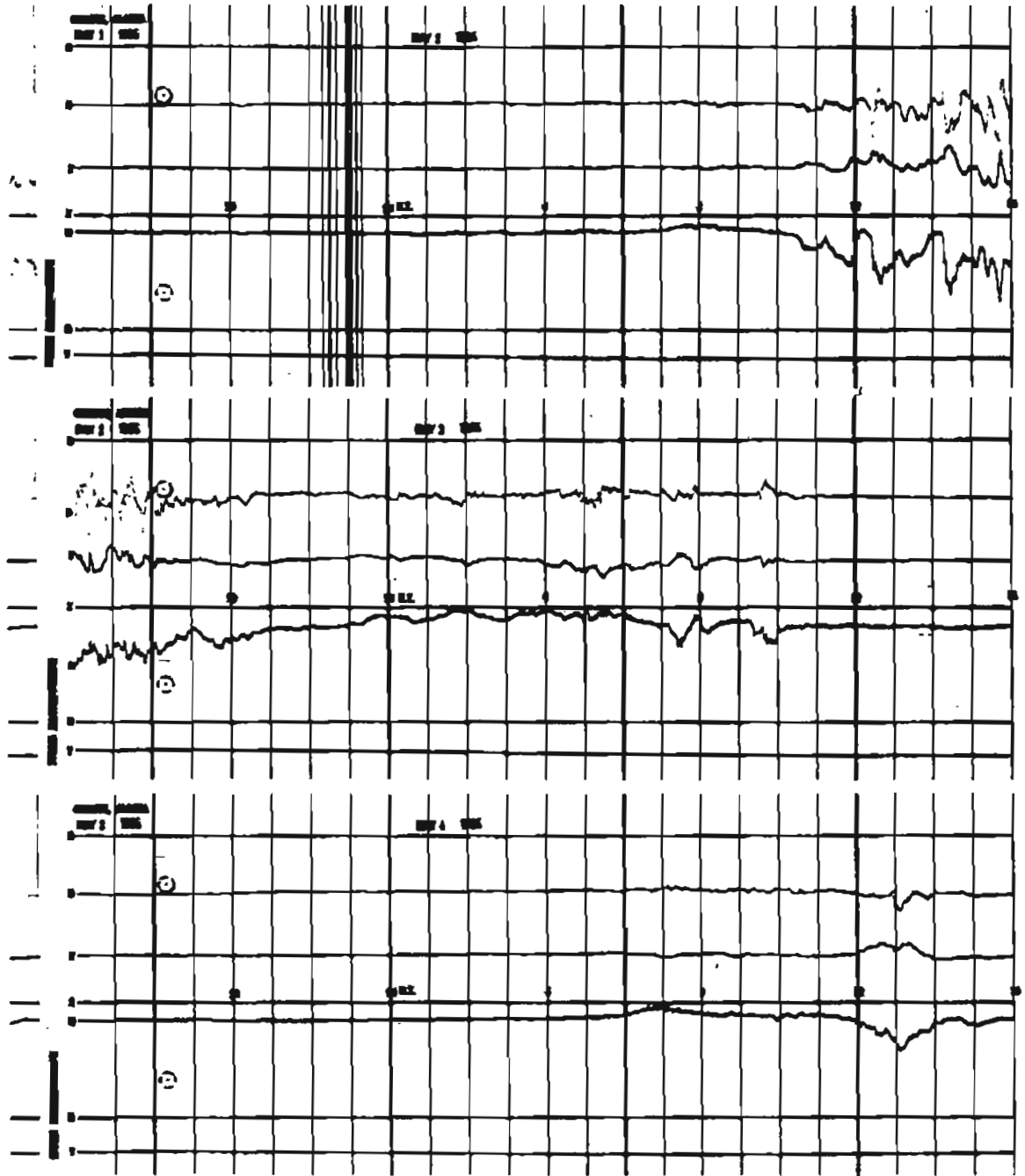
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

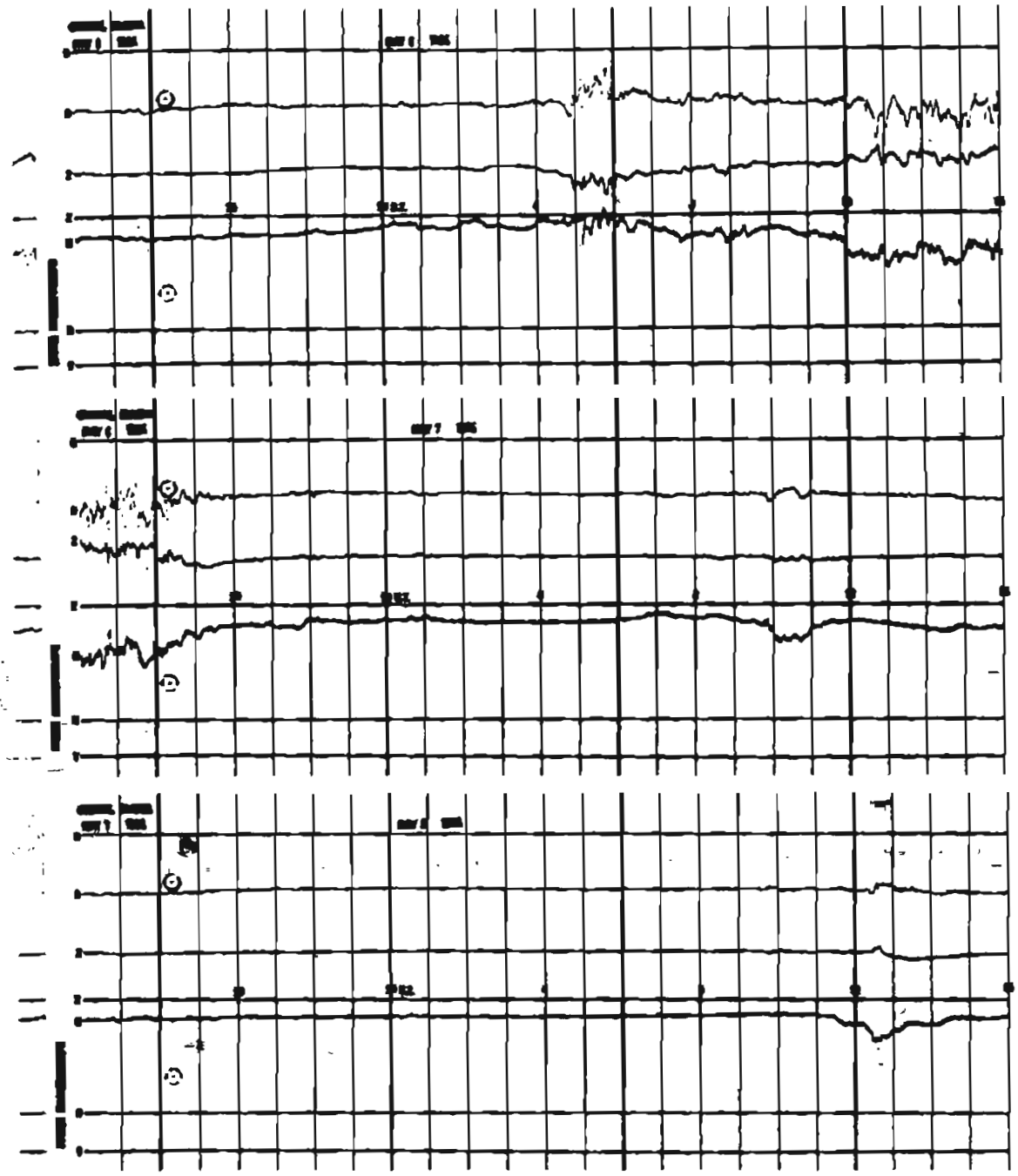


STORM MAGNETOGRAMS



STORM MAGNETOGRAMS

0 100 Gauss 200 Gauss



STORM MAGNETOGRAMS

