UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

OCTOBER 1981

OPEN FILE REPORT

81-300J

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°56.2'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 the recordings from a 3-component fluxgate magnetometer and a permanent 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, sk, which is near the center of the limiting gamma range 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
0-50	0
50-90	1
90+	2

A line assignment of C was discontinued at college in 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 USGS Division 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 stage 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 "Q1" 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.

Absolute, Base-line, 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:

$D = b_D + d; H = b_H + h; Z = b_Z + z$
where D, H, and Z are absolute values;
 b_D, b_H and b_Z are base-line values;
 d, h and z are scale values;
and d, h, and z are scalings in millimeters.

COLLEGE, ALASKA

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR

OCTOBER 1981

DATE	K-INDICES								SUM	AK	TIME SCALE ON MAGNETOGRAMS					
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24			20 mm/hr					
1	2	2	1	3	3	3	1	1	16	09	SUDDEN COMMENCEMENTS d h m					
2	2	2	1	3	5	3	4	2	22	16						
3	2	3	6	6	7	6	4	3	37	56						
4	2	3	4	4	5	4	3	2	27	22						
5	1	1	3	4	2	1	0	0	12	07						
6	0	0	0	4	5	3	0	0	12	11						
7	2	2	3	6	4	5	4	3	29	28						
8	3	4	5	5	4	3	4	3	31	28						
9	3	5	4	6	4	3	2	2	29	28						
10	2	3	4	6	5	6	5	3	34	40						
11	3	5	6	6	6	5	4	3	38	49						
12	3	4	4	3	2	0	0	1	17	12						
13	1	1	3	3	2	2	2	5	19	13						
14	7	5	3	4	4	4	4	4	35	42						
15	3	4	4	4	7	4	3	2	31	36						
16	1	3	3	1	0	0	1	1	10	05	POSSIBLE SOLAR-FLARE EFFECTS BASED ON INSPECTION OF GRAMS ALONE (WITHOUT REFERENCE TO DATA FROM OTHER SOURCES)					
17	1	2	5	4	3	3	3	2	23	17						
18	2	1	0	0	0	0	1	1	05	02						
19	1	4	6	6	5	4	4	3	33	38						
20	3	3	4	6	6	7	7	3	39	64						
21	5	4	5	5	4	4	1	2	30	29						
22	1	4	4	6	7	8	6	4	40	78						
23	3	3	6	4	2	4	2	2	26	23						
24	1	0	1	6	6	6	3	3	26	35						
25	2	4	6	6	5	5	3	2	33	39						
26	1	2	3	3	3	3	2	1	18	10	BEGIN	END				
27	1	1	1	2	3	4	2	2	16	09		d	h	m		
28	2	1	5	6	4	5	4	3	30	32	d	h	m	d	h	m
29	2	1	3	4	2	3	1	2	18	11						
30	2	1	3	4	6	6	1	1	24	27						
31	1	0	0	0	1	1	0	0	03	01						

K SCALE USED:

LOWER LIMIT FOR K = 9.....

CURRENT SCALE VALUE.....

LOWER LIMIT FOR K = 9.....

D

683.8

3.75

2560

H

321.7

7.81

2510

Z

(mm)

(γ/mm)

(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TORMSHEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY
COLLEGE, ALASKA

MONTH
OCTOBER

YEAR
1981

DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS
02	2021	si*	
08	13XX	pc5	
13	2241	si*	
17	07XX	pc5	
<p>IDENTIFIED BY: JBT</p> <p>VERIFIED BY: EAS</p>			

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

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA
OCTOBER 1981

WDC-A FOR SOLAR-TERRRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80502 U.S.A.

Data from Individual Observatories:

Obs. 2 letter IAOA code	Geomag. lat.	Commencement		SC ~ amplitudes			Max. 3 hr - index K		Ranges			UT End day hr		
		day	hr min (UT)	type	D(')	H(Y)	Z(Y)	day	(3 hr - period)	K	D(')		H(Y)	Z(Y)
CO	64°6 N	03	04XX	..	..	..	..	03	5	7	305	1640	770	04 22
		10	03XX	..	..	..	..	10 11	4,6 3,4,5	6 6	156	1230	900	12 13
		13	07XX	..	..	..	..	14 15	1 5	7 7	144	1810	880	15 19
		19	04XX	..	..	..	..	20	6,7	7	425	1790	1160	21 19
		22	05XX	..	..	..	..	22	6	8	502	1630	1520	23 12

OCTOBER 1981

NORMAL MAGNETOGRAPH						
COMPONENT	PERIOD		CALIBRATION			
	FROM	TO	SCALE VALUE		BASELINE	
D	0000 U.T., 10/1/81	2400 U.T., 10/31/81	1.0/mm	3.7/mm	27° 46.9 E	
H	0000 U.T., 10/1/81	2400 U.T., 10/31/81	7.8/mm		12767°	
Z	0000 U.T., 10/1/81	2400 U.T., 10/27/81	7.7/mm		55138°	
	0000 U.T., 10/28/81	2400 U.T., 10/31/81	"		55145°	

STORM MAGNETOGRAPH						
COMPONENT	PERIOD		CALIBRATION			
	FROM	TO	SCALE VALUE		BASELINE	
D	0000 U.T., 10/1/81	2400 U.T., 10/31/81	7.8/mm	29.7/mm	23° 44.0	
H	0000 U.T., 10/1/81	2400 U.T., 10/31/81	44.0/mm		11523°	
Z	0000 U.T., 10/1/81	2400 U.T., 10/31/81	48.6/mm		54012	

RAPID RUN MAGNETOGRAPH						
COMPONENT	PERIOD		CALIBRATION			
	FROM	TO	SCALE VALUE			
D						
H						
Z						

MONTHLY MEAN ABSOLUTE VALUES*		
D	H	Z
28° 02.5 E	12975°	55391°
* COMPUTED FROM 15N QUIETEST DAYS DURING MONTH.		
DAYS USED: OCT 1, 5, 6, 12, 16, 18, 26, 27, 29, 31		

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIMES)

Values are in units of one and two averages for successive periods of one hour beginning at midnight. If other values are in red, with minus signs above.

STATION	DATE																								TOTAL	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
01	94	77	92	103	104	116	115	123	128	127	178	166	01	191	187	179	158	191	240	266	267	245	175	156	129	3807
02	65	54	69	115	116	101	136	135	128	133	168	191	02	192	238	186	193	246	251	251	223	283	178	147	151	3250
03	129	123	132	124	104	65	99	361	91	109	251	92	03	196	512	251	432	258	249	227	245	190	149	133	133	3735
04	107	104	105	83	62	87	36	107	142	127	119	168	04	233	176	201	158	165	232	204	206	144	153	145	129	3437
05	122	117	126	134	135	110	132	146	59	97	147	182	05	179	126	134	199	217	223	228	204	189	175	148	119	3788
06	124	125	127	123	121	121	115	121	126	147	154	151	06	217	175	228	239	234	235	242	209	196	175	164	124	3933
07	93	54	73	26	71	101	118	106	86	154	111	109	07	315	263	254	237	401	317	339	314	148	43	109	112	4104
08	113	125	69	64	50	83	8	43	12	20	242	274	08	182	159	167	150	149	159	186	214	152	101	99	102	2633
09	107	117	82	93	27	75	205	169	152	113	251	409	09	279	176	193	214	190	222	216	219	221	180	178	156	4010
10	149	131	126	143	118	177	98	122	109	22	102	44	10	183	197	313	152	503	518	139	89	100	79	93	102	3932
11	64	26	83	153	44	68	35	180	5	762	139	203	11	226	512	354	267	322	314	199	136	114	135	102	123	3412
12	130	114	117	93	26	28	86	27	114	11	157	174	12	195	191	192	206	215	233	226	215	194	170	161	162	3179
13	149	152	146	135	110	142	145	122	93	106	136	147	13	182	216	195	203	236	241	244	251	254	211	268	359	4479
14	90	143	354	486	216	179	168	121	12	24	61	62	14	213	151	254	247	219	219	319	390	309	244	212	83	4856
15	119	121	90	136	135	116	102	64	272	221	73	125	15	216	504	88	185	311	254	317	250	181	133	143	122	4124
16	114	112	133	123	97	88	133	142	151	140	156	167	16	161	167	165	176	191	219	222	211	215	189	167	118	3877
17	132	101	107	104	90	116	142	102	111	143	107	115	17	156	211	205	193	220	234	234	231	211	183	155	127	3768
18	133	131	125	112	120	125	140	131	125	124	126	115	18	154	158	165	171	192	216	237	219	189	158	143	126	3665
19	136	117	115	115	101	118	101	12	123	77	76	171	19	169	197	282	176	189	201	208	165	104	154	137	120	3435
20	112	83	107	60	71	73	58	99	146	76	122	377	20	290	710	815	310	217	242	298	591	165	111	87	115	4914
21	84	118	114	118	72	11	159	35	76	51	203	278	21	192	210	233	318	141	162	223	225	211	214	118	121	3705
22	134	135	148	155	154	129	106	05	87	21	234	306	22	393	940	679	432	179	323	377	26	268	211	49	171	5958
23	129	108	105	111	148	81	137	5	20	91	114	154	23	152	169	188	193	249	292	256	236	215	106	141	131	3379
24	136	147	153	149	148	147	139	126	118	142	188	423	24	552	322	212	371	259	30	153	155	149	144	175	126	4702
25	162	156	106	97	102	94	46	92	28	92	135	259	25	361	257	201	143	176	163	181	189	187	168	157	146	3694
26	143	139	134	139	138	134	134	133	103	143	111	137	26	164	182	222	186	217	231	237	245	226	191	156	129	4005
27	123	121	115	122	134	122	131	135	134	139	173	171	27	188	175	216	261	223	157	186	223	197	198	1143	122	3911
28	123	101	81	113	106	113	92	271	67	78	200	239	28	237	203	253	203	254	243	232	249	203	15	96	125	3133
29	114	91	125	126	72	116	92	114	117	153	195	131	29	156	178	174	178	177	202	244	233	224	198	194	115	3726
30	116	104	106	104	117	121	119	140	141	128	253	217	30	266	385	282	92	147	193	211	207	216	156	132	111	4094
31	134	112	109	116	124	135	135	138	136	141	152	164	31	165	167	166	173	191	195	195	210	215	187	169	242	3871
TOTAL	122 278																								122 278	
CHARTER	ERS, JEP																								164	
LOCAL OF	ERS																								164	
REMARKS																									164	

1) Scaling magnetic fluxes of magnetic storm.
 2) Scaling magnetic fluxes of magnetic storm.
 3) Scaling magnetic fluxes of magnetic storm.

1) Significant portion of magnetic storm.
 2) Significant portion of magnetic storm.
 3) Significant portion of magnetic storm.

1) Significant portion of magnetic storm.
 2) Significant portion of magnetic storm.
 3) Significant portion of magnetic storm.

1) Significant portion of magnetic storm.
 2) Significant portion of magnetic storm.
 3) Significant portion of magnetic storm.

1) Significant portion of magnetic storm.
 2) Significant portion of magnetic storm.
 3) Significant portion of magnetic storm.

1) Significant portion of magnetic storm.
 2) Significant portion of magnetic storm.
 3) Significant portion of magnetic storm.

1) Significant portion of magnetic storm.
 2) Significant portion of magnetic storm.
 3) Significant portion of magnetic storm.

MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)U.S. DEPARTMENT OF COMMERCE
Geological Survey, Geological Station
Denver Federal Center
Denver, Co 80215OBSY. YEAR MONTH YEAR
CO RI OCT 11Values are in tenths of mm. 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 SDRC universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM	
	01	02	03	04	05	06	07	08	09	10	11	12	01	13	14	15	16	17	18	19	20	21	22	23	24	SUM
	267	276	262	261	281	292	309	297	300	304	181	226	01	271	272	238	174	249	283	277	263	247	246	238	236	6250
	241	249	268	262	273	309	309	298	308	307	312	289	02	261	39	140	301	256	222	211	240	252	231	259	241	6078
	251	250	262	281	297	339	426	488	556	359	162	-10	03	131	399	434	49	169	181	233	250	227	229	270	297	4442
	253	254	261	305	383	410	410	351	305	341	289	220	04	37	-31	210	286	229	52	166	189	201	247	241	246	5857
	249	241	254	259	259	282	317	319	406	377	314	225	05	238	202	248	280	272	261	253	252	251	250	248	249	6512
	248	250	254	261	272	279	288	289	291	290	289	221	06	-92	-47	154	191	117	220	268	271	261	253	249	240	5317
	251	234	286	337	321	313	300	311	326	-4	281	63	07	-39	4	131	151	215	213	-78	-83	27	233	241	251	3157
	209	242	307	303	369	463	483	284	127	160	-72	-173	08	162	305	289	261	214	227	251	225	254	212	254	274	5636
	291	283	329	416	569	591	391	321	278	271	326	-190	09	53	212	249	196	268	274	272	247	241	244	259	255	5994
	241	254	279	309	330	374	381	342	279	349	126	-117	10	109	166	185	215	-27	190	-4	131	243	248	258	308	3929
	317	350	377	476	654	611	318	347	8	-72	-83	-190	11	18	406	162	128	190	13	-3	151	298	299	322	301	3656
	307	325	360	360	416	571	491	518	448	341	309	262	12	211	259	260	254	259	250	241	246	240	241	242	240	7651
	217	243	242	258	256	261	266	289	401	377	336	262	13	228	191	249	226	253	228	231	230	219	238	197	109	6047
	321	381	538	420	469	477	447	453	476	411	293	258	14	183	211	89	161	266	258	219	151	173	145	216	220	6166
	221	249	322	303	338	278	312	358	190	99	201	177	15	-10	512	177	301	132	147	191	236	244	251	253	249	4714
	239	248	259	261	282	317	338	287	268	262	250	261	16	260	255	251	250	219	241	239	230	230	231	223	220	6151
	226	247	251	271	288	299	298	351	448	281	370	352	17	303	259	287	291	278	280	274	261	252	238	231	242	6878
	239	231	250	269	280	279	279	281	283	282	276	270	18	270	270	269	268	261	257	258	254	256	249	240	248	6319
	240	251	260	271	308	397	519	371	128	160	134	-162	19	37	227	141	293	310	289	265	216	197	225	216	296	5639
	309	354	324	316	341	389	467	413	425	265	100	230	20	225	496	364	811	38	846	315	338	210	289	271	263	979
	272	299	497	442	291	311	293	266	272	-15	-80	-42	21	199	103	162	-18	208	219	276	270	246	221	209	211	5112
	212	219	221	234	249	291	362	368	305	140	275	-84	22	105	620	778	264	766	677	657	-10	41	188	254	337	815
	369	311	293	344	358	397	328	24	137	232	309	262	23	239	247	220	145	72	46	212	221	193	171	210	229	5569
	240	241	247	248	250	251	261	267	271	260	87	404	24	467	145	208	383	151	87	115	159	166	250	309	311	2182
	281	277	280	289	382	409	312	24	151	189	162	44	25	241	-41	2	41	198	319	299	302	289	276	264	256	4676
	256	258	265	264	260	272	276	278	336	277	325	306	26	271	253	189	206	186	257	278	249	247	247	249	248	6253
	244	233	255	267	269	281	287	292	306	328	313	286	27	269	270	221	88	91	193	278	266	250	246	232	244	6009
	253	271	289	276	283	290	349	240	112	116	-173	209	28	259	279	131	110	39	211	288	265	172	181	249	249	4954
	266	283	271	277	319	323	377	400	398	269	177	240	29	288	271	270	236	249	273	281	276	263	251	229	237	6824
	250	280	281	260	271	289	281	296	321	306	144	232	30	71	173	427	49	331	310	291	280	247	241	240	250	4826
	251	269	278	282	281	279	287	292	294	296	290	281	31	292	289	282	291	288	285	281	272	261	251	253	259	6684

SCALED BY	TKC, EAS	Preliminary base-line and scale values:	Interval	Base-line Value	Scale Value	☐ Interpolated	☐ Scaling uncertain because of magnetic storm.	MONTHLY SUM	159646
CHECKED BY	EAS, JEP	Beginning				☐ Significant portion of hour interpolated.	☐ Record off sheet for past or all of hour if value is given, curve was estimated for missing past.	MONTHLY MEAN	215
IONS REVIEWED BY	EAS					☐ No record; or no values available because of faulty record.		DO NOT SET WITH GAPS:	
PUNCHED BY						☐ Derived from SLOM	Magb., converted to Normal Magb.		

MAGNETOGRAM HOURLY SCALING

U.S. DEPARTMENT OF INTERIOR
Geological Survey, Geologic Division
Denver Federal Center
DENVER, CO 80225ONLY YEAR MONTH ELEMENT
CO 83 OCT 2Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day 150W M.T. is hour 11 of the SAMP universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

All message corrections have been applied. Negative values are in red, with minus signs shown.																										
	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	334	341	340	339	341	334	331	339	336	331	313	282	01	288	301	302	249	263	309	319	320	306	302	311	322	7503
02	321	340	338	341	332	340	352	339	348	356	320	309	02	304	291	170	281	303	309	279	272	307	264	283	301	7400
03	321	324	328	322	327	339	195	217*	300	292	445*	390	03	439	439*	198*	167*	257	316	310	341	311	317	322	348	7572
04	351	349	338	327	359	362	384	297	342	359	351	358	04	357	217	238	294	319	231	198	267	289	301	327	331	7556
05	342	343	344	332	324	322	346	337	306	265	320	341	05	321	302	373	316	329	328	322	322	321	328	329	330	7843
06	329	329	326	321	320	321	328	332	338	339	326	298	06	261	145	169	204	247	248	273	291	307	314	316	319	7001
07	327	340	361	353	369	382	354	348	286	133	251	371	07	399	342	297	453	255*	164*	459	384	248	237	309	331	7756
08	352	343	340	351	242	207	234	219	286	367	647*	565*	08	313	314	334	334	324	329	337	332	337	336	346	368	8177
09	374	373	347	370	333	244	388	352	311	306	402	219	09	260	225	293	326	331	337	347	341	343	331	339	340	7832
10	347	344	350	394	369	413	411	311	91	228	361	351	10	260	300	241	74	69	205	56	187	298	346	358	388	6753
11	420	413	401	428	380	176	72*	201	382	606	711*	559*	11	729*	717*	831*	780*	538	276	254	259	300	342	370	371	10516
12	389	387	379	410	427	436	277	98	199	282	329	372	12	359	349	361	361	366	370	361	355	349	344	350	356	8266
13	361	360	360	350	350	351	352	352	357	343	370	370	13	371	319	321	339	331	356	351	343	321	320	361	334	8343
14	258	360	122*	132*	122	202	218	49	171	251	267	327	14	507	425	417	328	351	361	368	346	303	310	301	352	6591
15	359	358	360	383	382	370	361	349	387	221	234	315	15	471	514*	159	332	339	260	279	305	322	350	356	352	8118
16	361	360	360	351	350	352	368	372	360	349	339	328	16	334	335	339	341	350	353	360	349	343	341	340	351	8376
17	350	347	350	346	348	353	360	351	261	208	337	348	17	350	347	335	330	327	336	340	339	323	321	326	330	7963
18	343	346	344	339	341	341	340	339	341	349	351	342	18	340	331	331	332	340	341	341	324	320	321	324	327	8088
19	340	334	334	337	351	360	198	161	282	332	430	354	19	239	429	410	309	344	345	331	318	301	330	360	378	7907
20	369	338	332	327	342	326	267	107	96*	243	338	217*	20	357*	616*	812*	614*	569	711*	501*	591*	261	309	344	366	9386
21	375	349	158	282	401	389	260	245	163	137	540*	510*	21	391	369	399	492	324	316	339	350	358	361	363	399	8270
22	404	366	367	370	368	351	370	311	229	310	673*	691*	22	786*	964*	660*	844*	773*	724*	578*	219	351	359	370	379	11817
23	324	376	389	391	407	425	350	413	429	371	362	378	23	385	385	390	367	359	317	331	344	363	351	351	368	8926
24	379	381	380	374	371	370	370	375	376	379	341	312*	24	419*	470*	391	286*	319*	258	267	275	284	314	376	371	8438
25	397	382	370	392	321	324	249	331*	358	374	420	552*	25	534*	431	458	261	241	329	357	360	359	360	358	360	8878
26	354	359	356	356	355	350	364	354	321	236	288	363	26	368	348	327	328	316	330	345	341	331	336	331	338	8085
27	347	348	348	349	349	348	360	365	361	362	353	339	27	322	338	338	300	249	229	311	327	325	332	328	326	7954
28	329	335	335	346	348	342	365	229	62	122	309	251	28	272	301	302	259	200	188	267	328	329	316	309	322	6766
29	331	348	341	334	349	373	366	400	371	269	212	327	29	350	329	312	319	296	320	331	320	322	321	330	322	7893
30	330	347	333	334	341	339	341	333	349	323	159	251	30	294	382*	344*	139	256	310	324	320	322	313	310	318	7412
31	322	328	332	330	325	326	328	331	332	334	329	324	31	320	319	318	310	319	320	322	328	325	323	321	319	7785

SCALED BY	TKC, ERS	Preliminary base-line and scale values:	() Interpolated	() Scaling uncertain because of magnetic storm.	MONTHLY SUM	251221
CHECKED BY	ERS, JEP	Interval Beginning	☐ Significant portion of hour interpolated.	< > Record off sheet for part or all of hour; if value is given, curve was estimated for missing part.	MONTHLY MEAN	338
SIGNS REVIEWED BY	ERS	Base-line Value	☐ No record; or no values available because of faulty record.		DATES WITH GAPS:	
PUNCHED BY		Scale Value	* Derived from STORM Mph., converted to Normal Mph.			

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

0 100 km 200 km

STORM MAGNETOGRAMS

STORM MAGNETOGRAMS

200 μ
100 μ
0

STORM MAGNETOGRAMS

STORM MAGNETOGRAMS

600 mm
100 mm
0