UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA

COLLEGE OBSERVATORY

FAIRBANKS, ALASKA

JAN 17 1984

DECEMBER 1983

OPEN FILE REPORT 83-0300L

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..... $64^{\circ}51.6'N$
Geographic longitude..... $147^{\circ}50.2'W$
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 10 γ 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 (10 γ)

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:

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

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.

COLLEGE, ALASKA

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR

DECEMBER 1983

DATE	K-INDICES									AK	TIME SCALE ON MAGNETOGRAMS														
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	SUM		20 mm/hr														
1	3	3	2	5	3	2	3	3	24	17	SUDDEN COMMENCEMENTS d h m														
2	2	3	3	3	4	4	3	2	24	16															
3	0	0	0	0	3	0	1	1	05	03															
4	0	1	0	0	2	3	0	0	06	03															
5	0	2	6	5	5	4	2	3	27	29															
6	2	5	6	7	6	5	4	4	39	57															
7	3	3	5	5	6	6	5	3	36	44															
8	2	3	3	4	5	1	1	2	21	16															
9	1	0	0	0	0	0	1	0	02	01															
10	0	2	6	5	6	7	4	2	32	49															
11	1	3	4	4	8	6	4	5	35	58	POSSIBLE SOLAR-FLARE EFFECTS BASED ON INSPECTION OF GRAMS ALONE (WITHOUT REFERENCE TO DATA FROM OTHER SOURCES)														
12	3	3	2	5	6	6	4	4	33	37															
13	3	3	2	5	6	6	5	5	35	43															
14	4	4	6	6	5	5	5	4	39	48															
15	3	3	4	5	5	3	2	3	28	24															
16	3	2	0	2	2	0	0	0	09	05															
17	1	1	0	1	3	2	2	1	11	05															
18	1	0	0	0	2	5	4	2	14	12															
19	2	2	2	2	2	2	1	1	14	06															
20	2	2	0	0	0	0	0	1	05	02															
21	0	0	0	0	0	0	1	0	01	00	<table><tr><th colspan="3">BEGIN</th><th colspan="3">END</th></tr><tr><th>d</th><th>h</th><th>m</th><th>d</th><th>h</th><th>m</th></tr></table>			BEGIN			END			d	h	m	d	h	m
BEGIN			END																						
d	h	m	d	h	m																				
22	1	2	3	6	4	4	2	1	23	21															
23	1	2	4	4	5	4	1	0	21	18															
24	1	0	0	1	7	5	3	2	19	27															
25	3	2	3	6	5	4	2	1	26	25															
26	0	2	2	3	2	3	3	3	18	10															
27	4	2	1	2	3	3	3	3	21	13															
28	3	2	3	5	5	2	1	2	23	19															
29	2	1	4	4	4	3	0	0	18	13															
30	1	3	4	7	7	6	6	2	36	62															
31	3	3	4	6	5	6	4	4	35	40															

K SCALE USED:

LOWER LIMIT FOR K = 9.....

CURRENT SCALE VALUE.....

LOWER LIMIT FOR K = 9.....

D

675.7

H

322.2

Z

(mm)

(γ/mm)

(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS			OBSERVATORY COLLEGE, ALASKA	
			MONTH DECEMBER	YEAR 1983
DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS	
09	19xx	pc5		
10	0313	ssc*		
17	14xx	pi 2		
28	19xx	pc3, pc4 & pc5		
30	0346	ssc*		
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.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA
1983
DECEMBER

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

Data from Individual Observatories:

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	
C0	64.06 N	05	06xx	..	..	..	..	06	4	7	166	1550	880	08 15	
		10	0313	s.c.*	+3	+32	+6	11	5	8	271	2550	1060	15 19	
		30	0346	s.c.*	+8	+155	+30	30	4,5	7	290	1920	960	02 17	

NORMAL MAGNETOGRAPHS

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASLINE
D	0000 U.T., 12-1-83	2400 U.T., 12-31-83	1.0/mm	3.78/mm	27° 16.8 E
H	0000 U.T., 12-1-83	2400 U.T., 12-9-83	7.88/mm		126668
	0000 U.T., 12-10-83	2400 U.T., 12-31-83	"		126598
Z	0000 U.T., 12-1-83	2400 U.T., 12-31-83	7.58/mm		551818

STORM MAGNETOGRAPHS

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASLINE
D	0000 U.T., 12-1-83	2400 U.T., 12-31-83	7.9/mm	29.68/mm	24° 22.8 E
H	0000 U.T., 12-1-83	2400 U.T., 12-9-83	43.98/mm		108008
	0000 U.T., 12-10-83	2400 U.T., 12-31-83	"		107768
Z	0000 U.T., 12-1-83	2400 U.T., 12-18-83	48.08/mm		540558
	0000 U.T., 12-19-83	2400 U.T., 12-31-83	"		540698

RAPID RUN MAGNETOGRAPHS

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 49.5 E	129348	553658

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: DEC 3, 4, 9, 16, 17, 18, 19, 20, 21, 26

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hours 01 of local day (LSDM.T.) is hour 11 of the BMDG universal day.

Significant corrections have been applied. Negative values are in red, with minus signs shown.

C		01		02		03		04		05		06		07		08		09		10		11		12		13		14		15		16		17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50		51		52		53		54		55		56		57		58		59		60		61		62		63		64		65		66		67		68		69		70		71		72		73		74		75		76		77		78		79		80		81		82		83		84		85		86		87		88		89		90		91		92		93		94		95		96		97		98		99		100		101		102		103		104		105		106		107		108		109		110		111		112		113		114		115		116		117		118		119		120		121		122		123		124		125		126		127		128		129		130		131		132		133		134		135		136		137		138		139		140		141		142		143		144		145		146		147		148		149		150		151		152		153		154		155		156		157		158		159		160		161		162		163		164		165		166		167		168		169		170		171		172		173		174		175		176		177		178		179		180		181		182		183		184		185		186		187		188		189		190		191		192		193		194		195		196		197		198		199		200		201		202		203		204		205		206		207		208		209		210		211		212		213		214		215		216		217		218		219		220		221		222		223		224		225		226		227		228		229		230		231		232		233		234		235		236		237		238		239		240		241		242		243		244		245		246		247		248		249		250		251		252		253		254		255		256		257		258		259		260		261		262		263		264		265		266		267		268		269		270		271		272		273		274		275		276		277		278		279		280		281		282		283		284		285		286		287		288		289		290		291		292		293		294		295		296		297		298		299		300		301		302		303		304		305		306		307		308		309		310		311		312		313		314		315		316		317		318		319		320		321		322		323		324		325		326		327		328		329		330		331		332		333		334		335		336		337		338		339		340		341		342		343		344		345		346		347		348		349		350		351		352		353		354		355		356		357		358		359		360		361		362		363		364		365		366		367		368		369		370		371		372		373		374		375		376		377		378		379		380		381		382		383		384		385		386		387		388		389		390		391		392		393		394		395		396		397		398		399		400		401		402		403		404		405		406		407		408		409		410		411		412		413		414		415		416		417		418		419		420		421		422		423		424		425		426		427		428		429		430		431		432		433		434		435		436		437		438		439		440		441		442		443		444		445		446		447		448		449		450		451		452		453		454		455		456		457		458		459		460		461		462		463		464		465		466		467		468		469		470		471		472		473		474		475		476		477		478		479		480		481		482		483		484		485		486		487		488		489		490		491		492		493		494		495		496		497		498		499		500		501		502		503		504		505		506		507		508		509		510		511		512		513		514		515		516		517		518		519		520		521		522		523		524		525		526		527		528		529		530		531		532		533		534		535		536		537		538		539		540		541		542		543		544		545		546		547		548		549		550		551		552		553		554		555		556		557		558		559		560		561		562		563		564		565		566		567		568		569		570		571		572		573		574		575		576		577		578		579		580		581		582		583		584		585		586		587		588		589		590		591		592		593		594		595		596		597		598		599		600		601		602		603		604		605		606		607		608		609		610		611		612		613		614		615		616		617		618		619		620		621		622		623		624		625		626		627		628		629		630		631		632		633		634		635		636		637		638		639		640		641		642		643		644		645		646		647		648		649		650		651		652		653		654		655		656		657		658		659		660		661		662		663		664		665		666		667		668		669		670		671		672		673		674		675		676		677		678		679		680		681		682		683		684		685		686		687		688		689		690		691		692		693		694		695		696		697		698		699		700		701		702		703		704		705		706		707		708		709		710		711		712		713		714		715		716		717		718		719		720		721		722		723		724		725		726		727		728		729		730		731		732		733		734		735		736		737		738		739		740		741		742		743		744		745		746		747		748		749		750		751		752		753		754		755		756		757		758		759		760		761		762		763		764		765		766		767		768		769		770		771		772		773		774		775		776		777		778		779		780		781		782		783		784		785		786		787		788		789		790		791		792		793		794		795		796		797		798		799		800		801		802		803		804		805		806		807		808		809		810		811		812		813		814		815		816		817		818		819		820		821		822		823		824		825		826		827		828		829		830		831		832		833		834		835		836		837		838		839		840		841		842		843		844		845		846		847		848		849		850		851		852		853		854		855		856		857		858		859		860		861		862		863		864		865		866		867		868		869		870		871		872		873		874		875		876		877		878		879		880		881		882		883		884		885		886		887		888		889		890		891		892		893		894		895		896		897		898		899		900		901		902		903		904		905		906		907		908		909		910		911		912		913		914		915		916		917		918		919		920		921		922		923		924		925		926		927		928		929		930		931		932		933		934		935		936		937		938		939		940		941		942		943		944		945		946		947		948		949		950		951		952		953		954		955		956		957		958		959		960		961		962		963		964		965		966		967		968		969		970		971		972		973		974		975		976		977		978		979		980		981		982		983		984		985		986		987		988		989		990		991		992		993		994		995		996		997		998		999		1000		1001		1002		1003		1004		1005		1006		1007		1008		1009		1010		1011		1012		1013		1014		1015		1016		1017		1018		1019		1020		1021		1022		1023		1024		1025		1026		1027		1028		1029		1030		1031		1032		1033		1034		1035		1036		1037		1038		1039		1040		1041		1042		1043		1044		1045		1046		1047		1048		1049		1050		1051		1052		1053		1054		1055		1056		1057		1058		1059		1060		1061		1062		1063		1064		1065		1066		1067		1068		1069		1070		1071		1072		1073		1074		1075		1076		1077		1078		1079		1080		1081		1082		1083		1084		1085		1086		1087		1088		1089		1090		1091		1092		1093		1094		1095		1096		1097		1098		1099		1100		1101		1102		1103		1104		1105		1106		1107		1108		1109		1110		1111		1112		1113		1114		1115		1116		1117		1118		1119		1120		1121		1122			
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MAGNETOGRAM HOURLY SCALINGS
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR
Geological Survey, Berkeley, Division
Senior Federal Center
Berkeley, CA 94725

OBSV.

YEAR

MONTH

ELEMENT

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 68th universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

CO

83

DEC

2

C	Q	S	T	Q	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
					283	286	297	313	298	302	320	319	315	290	205	157	201	241	260	253	240	246	254	256	250	266	270	274	6396
					267	272	268	273	289	303	296	295	267	262	268	256	222	178	170	178	173	244	254	252	246	256	255	257	6002
					263	265	263	263	263	266	267	266	265	263	263	260	248	165	161	223	246	254	260	260	254	254	256	260	6008
					299	253	255	260	260	262	268	264	260	256	254	253	258	246	225	178	140	134	242	243	235	238	245	249	5737
					254	251	255	276	289	314	249	84	226	244	226	228	194	250	181	134	97	98	148	200	208	224	246	260	5136
					276	280	298	297	288	288	327	266	239	359	-39	128	288	544	519	35	172	27	191	161	228	254	244	286	6146
					299	284	290	346	295	270	263	260	199	13	-25	255	264	461	391	333	128	83	58	144	170	234	260	272	5577
					286	309	290	276	312	279	282	272	246	237	244	202	175	40	148	213	246	244	247	247	237	217	233	243	6725
					250	253	259	253	257	259	255	251	250	249	250	249	247	253	254	254	256	257	257	253	248	252	253	257	6076
					256	257	256	253	253	256	265	278	45	160	219	315	233	589	551	320	180	-12	112	167	216	248	250	259	6326
					272	268	274	292	285	292	300	257	134	169	219	343	455	385	672	32	143	185	218	232	196	198	202	216	6239
					251	288	296	290	301	327	344	300	288	273	264	114	190	318	391	141	200	139	201	232	247	244	235	262	6136
					300	303	296	297	304	321	338	333	290	261	185	342	480	384	308	231	282	261	234	170	237	242	298	310	7007
					287	265	302	291	308	318	320	346	299	258	265	238	306	236	359	185	107	173	175	222	241	285	330	302	6448
					304	320	314	300	299	328	288	319	236	162	186	186	221	218	181	182	202	242	251	249	248	250	249	263	6008
					281	299	298	294	282	270	260	263	258	260	240	214	232	254	263	257	253	254	253	247	246	252	263	264	6257
					269	274	271	266	260	256	256	256	254	254	260	254	234	202	158	219	247	225	220	231	246	243	250	259	5856
					259	257	257	255	256	255	254	254	254	254	256	254	254	254	251	180	62	38	122	142	175	218	235	241	5237
					258	270	257	258	264	281	282	293	306	298	280	290	276	237	231	230	227	243	230	230	224	224	236	234	6159
					245	260	266	272	257	247	243	247	248	245	246	247	247	247	244	244	243	245	247	247	247	247	250	248	5979
					247	252	257	256	256	254	250	249	253	253	254	254	247	247	246	239	235	227	221	230	232	234	234	236	5863
					241	243	250	252	258	261	270	270	253	140	-53	72	206	172	134	203	190	141	133	186	214	231	236	242	4755
					260	262	276	269	281	309	298	329	214	198	197	229	220	112	160	100	167	200	220	220	230	231	229	243	5454
					250	250	250	249	249	250	245	249	246	241	236	226	238	309	92	111	76	135	115	140	193	232	250	249	5081
					261	268	270	275	291	281	278	268	236	250	224	143	97	167	-9	40	181	239	223	198	200	229	238	242	5090
					250	258	260	266	288	269	261	277	269	241	223	251	250	219	200	207	222	209	168	130	179	285	280	271	5733
					310	285	269	287	287	280	285	289	285	267	252	265	260	225	192	191	206	230	180	221	191	151	181	245	5784
					264	262	266	271	271	270	260	271	267	265	220	191	278	220	70	156	248	259	248	254	256	256	262	266	5851
					272	277	283	271	271	274	311	246	297	283	267	278	232	200	214	183	223	246	244	248	247	243	242	244	6096
					248	251	260	272	287	287	305	219	187	208	321	308	461	699	257	263	187	327	82	-26	59	197	213	241	6113
					268	267	272	307	300	320	329	337	257	180	163	70	147	134	132	173	321	49	122	144	190	211	251	298	5242

SCALED BY: LYT, JEP
 CHECKED BY: JEP, LYT, EAS
 SIGNS RE-
 VIEWED BY: JEP
 PUNCHED BY:

Preliminary base-line and scale values:
 Interval: Base-line
 Beginning Value Scale Value

() Interpolated

[] Significant portion of hour interpolated.

□ No record; or no values available because of faulty record.

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

[] Scaling uncertain because of magnetic storm.

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

MONTHLY SUM 181517

MONTHLY MEAN 244

DATES WITH GAPS:

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

Values are in units of mm, and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day 130 M.T. is hour 11 of the 0800 universal day.

Shorthand corrections have been applied. Negative values are in red, with minus sign shown.

FORM No-106		MAGNETOGRAM HOURLY SCALINGS (UNIVERSAL TIME)																								U.S. DEPARTMENT OF THE INTERIOR Geological Survey, Geological Station Bentley Federal Center Boulder, CO 80515		ORBIT.	YEAR	MONTH	ILLU- MENT
C.	Q ^u	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	CO	83	DEC	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 2020 universal day. Shrinkage 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						
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		01	02	03	04	05	06	07	08	09	10	11	12</																		

() Interpolated

[] Significant portion of how interpolated.

□ No record; or no value available because of faulty record.

* Derived from storm graph, converted to Normal Magph.

[] Scaling uncertain because of magnetic storm.

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

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

200 mm
100 mm
0

STORM MAGNETOGRAMS