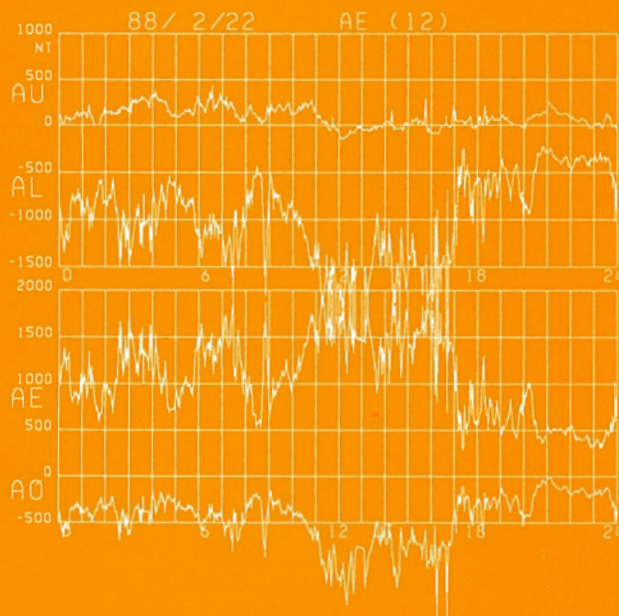


World Data Center C2 for Geomagnetism

DATA BOOK

No. 23

Auroral electrojet (AE) indices
for January-June 1988



SEPTEMBER 1994

Data Analysis Center for
Geomagnetism and Space Magnetism
FACULTY OF SCIENCE
KYOTO UNIVERSITY
KYOTO

Division of
Data Collection and Processing
NATIONAL INSTITUTE OF
POLAR RESEARCH
TOKYO

SPECIAL NOTICE

The tentatively planned order of publication of the Data Books is as follows.

Data Book No. 24	AE indices for July - December 1988.
Data Book No. 25	AE indices for January - June 1989.
Data Book No. 26	AE indices for July - December 1989.
Data Book	AE indices for January - June 1977.
Data Book	AE indices for July - December 1977.

Provisional AE Index for 1990 is planned to be published soon after data book No. 24 is published. Provisional AE for STEP period will be derived when data from enough stations become available to us.

All requests and inquiries on Data Books and notices of change of address should be sent to:

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World Data Center C2 for Geomagnetism

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PPREFACE

The Auroral Electrojet (AE) index was originally introduced by Davis and Sugiura in 1966 as a measure of global electrojet activity in the auroral zone. The AE index is now widely used for researches in geomagnetism, aeronomy, and solar-terrestrial physics. After the initial development at the NASA/Goddard Space Flight Center the calculation of the index was first performed at the Geophysical Institute of the University of Alaska, which published hourly values of the index for the years 1957 to 1964. The production of 2.5 min values was then made at the Goddard Space Flight Center for the period from September 1964 to June 1968.

After these early publications the index was regularly issued by the World Data Center A for Solar-Terrestrial Physics (WDC-A for STP) in Boulder, Colorado, which published 2.5 min values for the years 1966 to 1974 and 1.0 min values for 1975 and the first 4 months of 1976.

When it became difficult for the WDC-A for STP to continue the production of the AE index, a question was raised if the index could be produced at the WDC-C2 for Geomagnetism, which is operated by the Data Analysis Center for Geomagnetism and Space Magnetism, Faculty of Science, Kyoto University. Responding to this request we decided to produce the index for the two years, 1978-1979, of the International Magnetospheric Study (IMS), and published 1.0 min values of the AE index for these years in the "WDC-C2 for Geomagnetism Data Book" series.

Although the International Association of Geomagnetism and Aeronomy (IAGA) recommended the continuation of the production of the AE index at the WDC-C2, the AE production could not be extended beyond IMS because of the constraints in manpower and computing capability. Increasing demands for the AE index, however, motivated us to resume its production, and we then published the Data Book No.7 for the first half of 1980. After this publication, various possibilities of financial support for the production of the index were explored by the Subcommittee on Solar Terrestrial Physics of the Special Committee for International Cooperation, Science Council of Japan. As a result, the National Institute of Polar Research (NIPR), Tokyo, offered assistance. Beginning with the Data Book No.8, the production of the AE index has been continued at the Kyoto University, but the printing and distribution of the Data Book have been done by NIPR.

In order to reduce the digitization burdon in Kyoto, WDC-B for STP in Moscow and WDC-C2 for Geomagnetism in Kyoto began a cooperative digitization project for Russian analog data. Data Book No.23 contains AE index using Tixie data digitized at WDC-B for STP by use of the equipment supplied by WDC-C2 Kyoto. In part in connection with the STEP program, we expect additional cooperation from other institutions in digitization and the setting up digital magnetometer systems at AE stations in Russia.

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AURORAL ELECTROJET (AE) INDICES

FOR JANUARY - JUNE 1988

1. Derivation and Representation

The AE index is derived from geomagnetic variations in the horizontal component observed at selected (10-13) observatories along the auroral zone in the northern hemisphere. To normalize the data a base value for each station is first calculated for each month by averaging all the data from the station on the five international quietest days. This base value is subtracted from each value of one minute data obtained at the station during that month. Then among the data from all the stations at each given time (UT), the largest and smallest values are selected. The AU and AL indices are respectively defined by the largest and the smallest values so selected. The symbols, AU and AL, derive from the fact that these values form the upper and lower envelopes of the superposed plots of all the data from these stations as functions of UT. The difference, AU minus AL, defines the AE index, and the mean value of the AU and AL, i.e. $(AU+AL)/2$, defines the AO index. The term "AE indices" is usually used to represent these four indices (AU, AL, AE and AO). The AU and AL indices are intended to express the strongest current intensity of the eastward and westward auroral electrojets, respectively. The AE index represents the overall activity of the electrojets, and the AO index provides a measure of the equivalent zonal current.

In this report we present daily plots and hourly values of the AE indices and "contributing station" plots giving additional information on the indices. The stations that actually give the AU and AL values are named the "contributing stations" of the AU and AL indices. The pair of the AU and AL contributing stations is referred to as "the contributing stations of the AE indices". The plot identifies these AE contributing stations, and also gives information on the data availability for each station.

2. Data Used

To obtain reliable AE indices it is desirable to use as many observatories as possible. However, there are two major difficulties: one is that the distribution of the observatories in operation is not uniform along the auroral zone, and the other is that the digitization of magnetograms is a laborious task.

For the derivation of the AE indices reported in this Data Book, we used twelve observatories listed in Table 1. The distribution of these observatories is shown in Fig. 1. Of the twelve observatories six are taking digital data; these stations are referred to as digital stations below. Three of the digital stations, Fort Churchill, Poste-de-la-Baleine, and Yellowknife, give data in the X, Y, Z coordinate system. To make these data compatible with the other stations,

Table 1. List of AE(12) stations.

Observatory	Abbreviations		Geographic		Geomagnetic	
	IAGA	WDC-A	Lat. (°N)	Long. (°E)	Lat. (°N)	Long. (°E)
Abisko	ABK	AI	68.36	18.82	66.04	115.08
Dixon Island	DIK	DI	73.55	80.57	63.02	161.57
Cape Chelyuskin	CCS	CC	77.72	104.28	66.26	176.46
Tixie Bay	TIK	TI	71.58	129.00	60.44	191.41
Cape Wellen	CWE	UE	66.17	190.17	61.79	237.10
Barrow	BRW	BW	71.30	203.25	68.54	241.15
College	CMO	CO	64.87	212.17	64.63	256.52
Yellowknife	YKC	YEK	62.40	245.60	69.00	292.80
Fort Churchill	FCC	FC	58.80	265.90	68.70	322.77
Poste-de-la-Baleine	PBQ	PBQ	55.27	282.22	66.58	347.36
(Great Whale River)	GWC	GWR	55.27	282.22	66.58	347.36
Narssarssuaq	NAQ	NAS	61.20	314.16	71.21	36.79
Leirvogur	LRV	LR	64.18	338.30	70.22	71.04

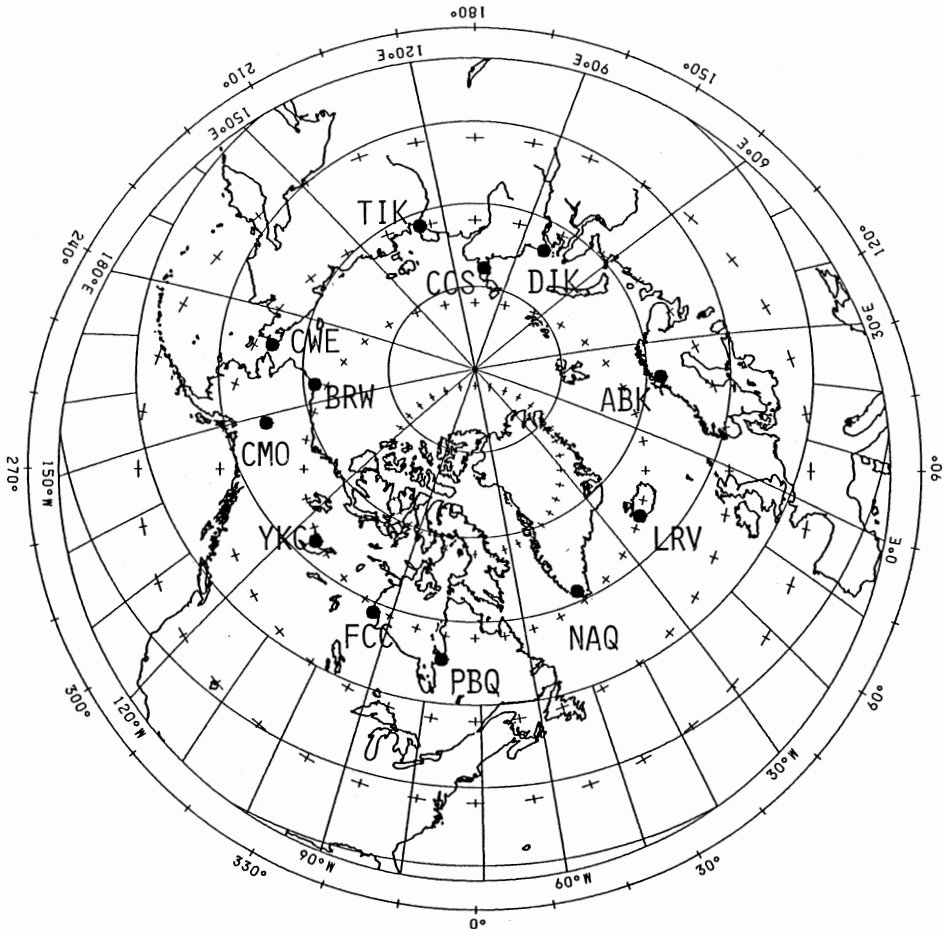
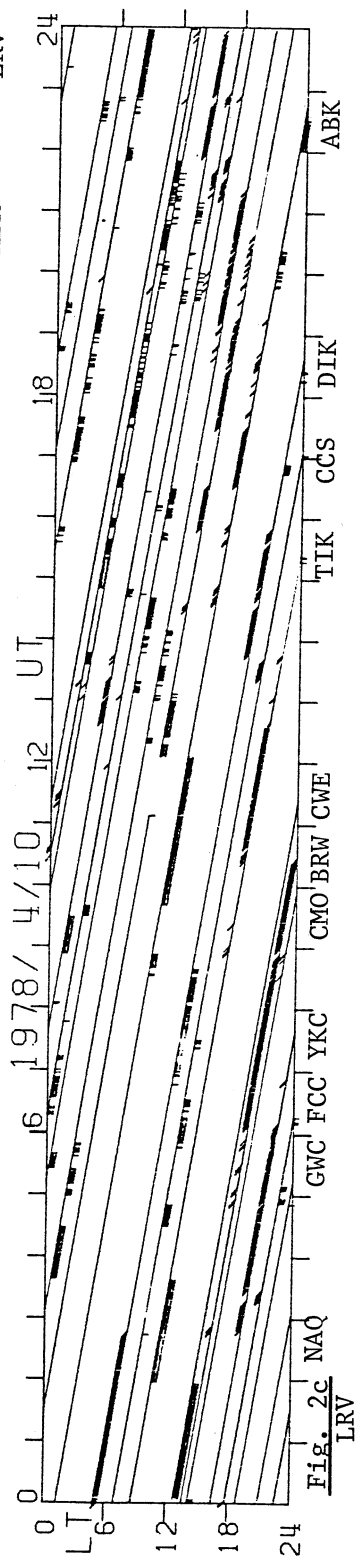
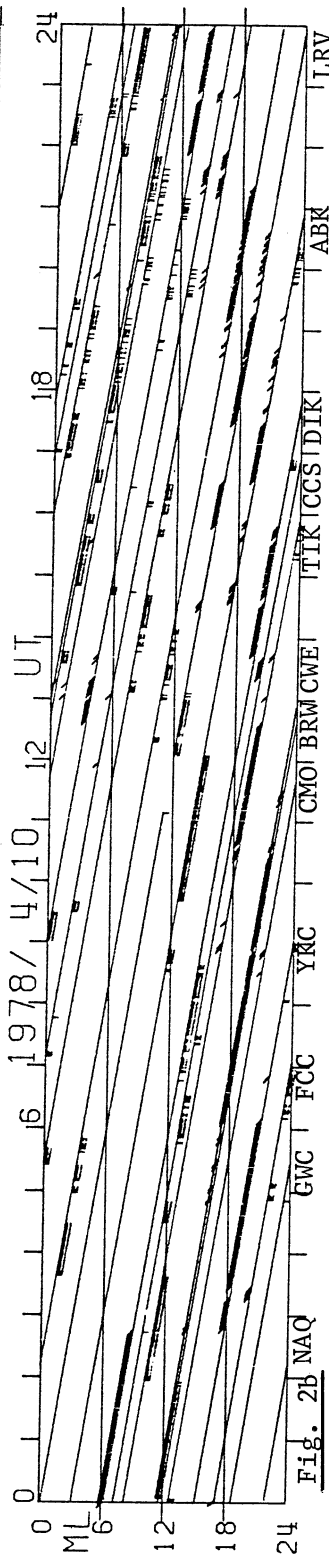
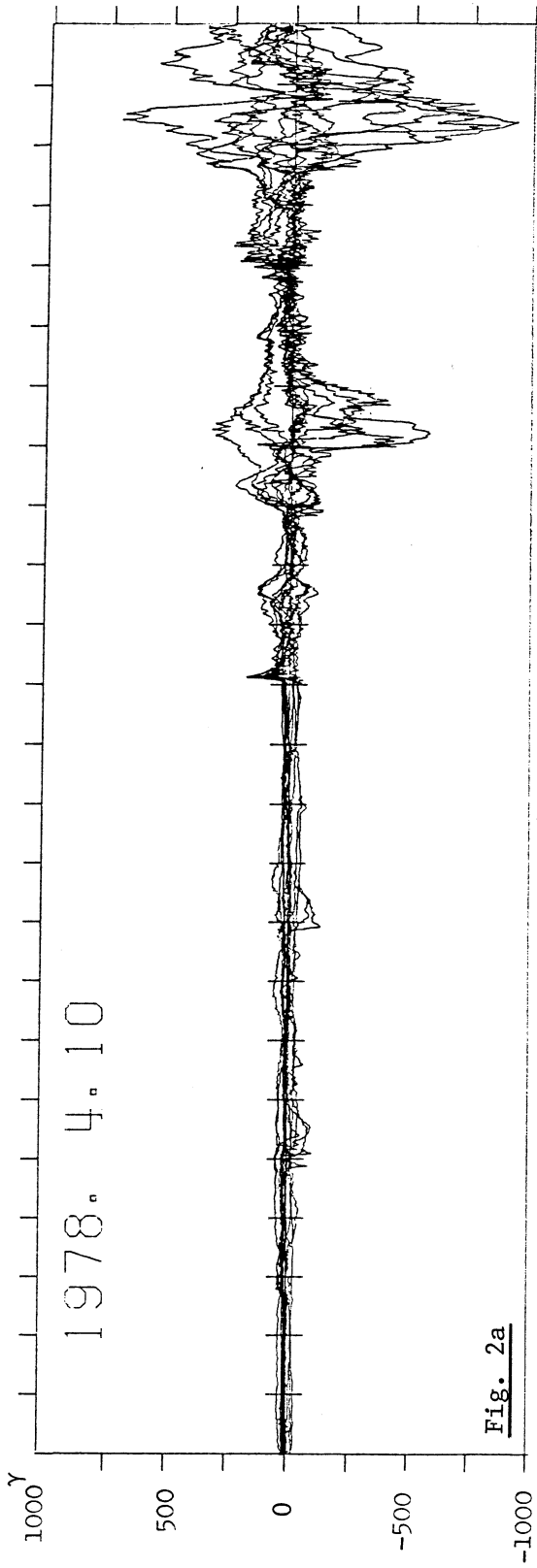


Figure 1. Distribution of AE(12) stations.

This figure is drawn by Lambert projection with the geomagnetic north pole at its center. Geographic coordinates are indicated by solid lines. Geomagnetic coordinates are shown by thin plus signs. Latitude circles are drawn at 10° intervals. Geomagnetic longitude is shown by the numbers along the outer circle and geographic longitude is given by the numbers along the inner circle with suffix E or W.



we convert the X and Y components to the H component by $H=\sqrt{X^2+Y^2}$. If either X or Y is missing, H is also treated as being missing. For the other three digital stations, Barrow, College, and Narssarsuaq, the original digital H component data are used. We used the Abisko data digitized from analog records at the station, we also used the Tixie H values digitized at the WDC-B for STP in Moscow. For the other non-digital stations the digitization was performed at the Data Center in Kyoto.

If there is any interval during which the digital recording or digitized values appear faulty, the analog magnetogram, whenever available, is digitized at Kyoto.

3. The Superposed Plot and the Plot of the Contributing Stations of the AE Indices

Figure 2a shows an example of the superposed plot of H traces from the AE stations for April 10, 1978. The upper envelope gives the AU index and the lower envelope, the AL index; Figs. 2b and 2c show sample plots of the contributing stations in geomagnetic (2b) and geographic (2c) local time, for the same day as in Fig. 2a. In these figures, the upper and lower plumes on a diagonal line for each station show the contribution of this station to the AU and AL indices, respectively. In Fig. 2b, for example, the data from Dixon Island (DIK) give the AU index from 0000 to 0240 UT and again from 1330 to 1530 UT, and the AL index from 0640 to 0830 UT. It is seen that from 1100 to 1200 UT Leirvogur (LRV) offers no data. Since Leirvogur is a key station for the AL index for this time interval, the exact AL values may be lower than was calculated for this interval.

We use geomagnetic local time (MLT) for the ordinate of the plot of the contributing stations. MLT is defined by the difference between the geomagnetic longitude of the station and the geomagnetic longitude of the meridian opposite to the subsolar point; and MLT is a function of the geomagnetic longitude of the station, the Sun's declination, and universal time. Figures 3a, 3b, and 3c show the differences between geographic local time GLT and MLT of the stations used to derive the AE indices for winter, summer and equinox, respectively. In these figures GLT is represented for each station by a straight line which runs diagonally, and MLT is shown by the top of T shaped mark (or the bottom of inverted T). The length of the vertical line of T from the diagonal line is the difference between GLT and MLT. Note that for some stations the difference between GLT and MLT is as much as 2 hours.

4. Results

Monthly quiet-time H reference values for January-June 1988 are listed in Table 2. Table 3 gives hourly average values of the AE indices for each day from January to June 1988.

Daily graphs of 1.0-min AE indices (AU, AL, AE and AO) are shown in Fig. 4, and corresponding plots of the contributing stations are given in Fig. 5. Supplemental plots for disturbed days are given at the end of Fig. 4. Figure 6

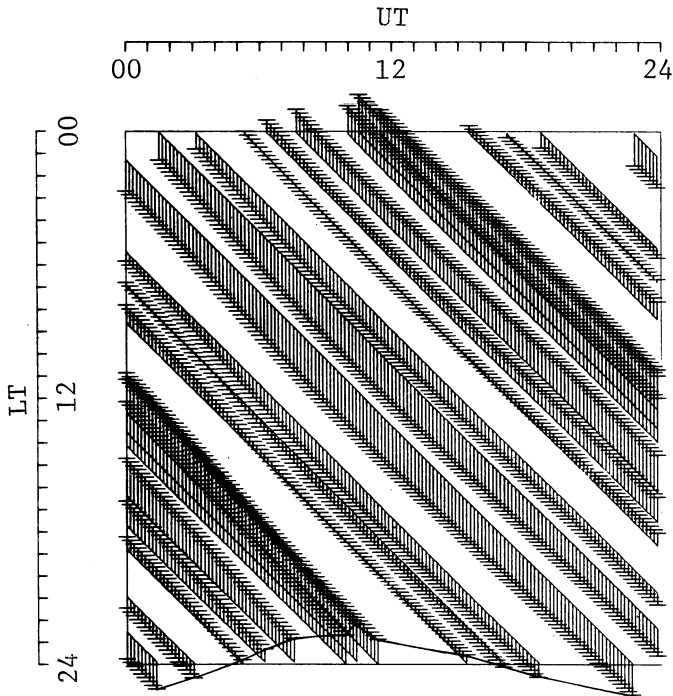


Fig. 3a Difference between GLT and MLT in winter.

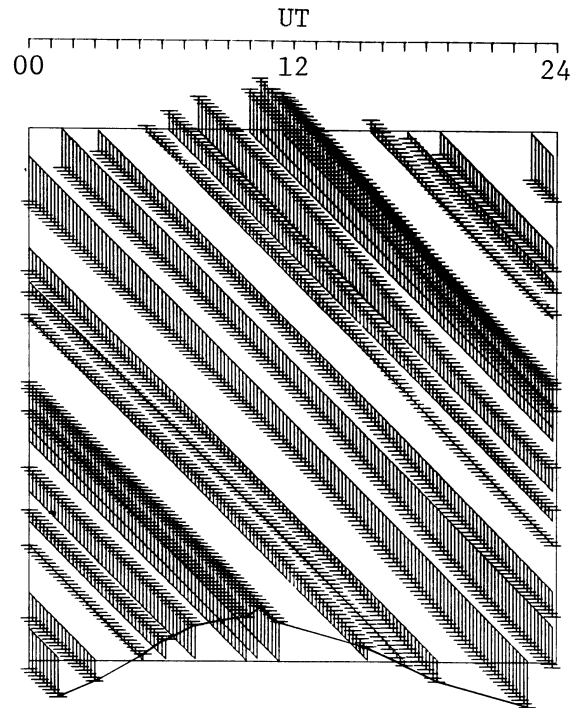


Fig. 3b Difference between GLT and MLT in summer.

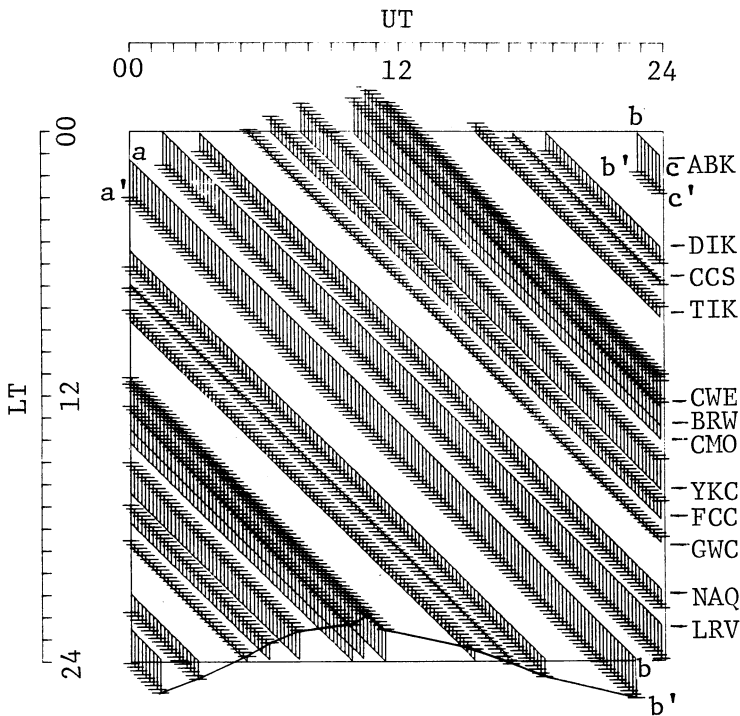


Fig. 3c Difference between GLT and MLT in equinox.

Fig. 3a, 3b and 3c show the difference between the geographic local time (GLT) and the geomagnetic local time (MLT) for winter, summer and equinox, where a-b-c (full line on the top or bottom of the vertical lines) shows the relation between UT and GLT, and a'-b'-c' (crossing of the vertical and horizontal lines) shows the relation between UT and MLT for each of the AE(12) stations.

shows the H-traces of magnetograms from AE(12) stations for each month from January to June 1988. Figure 7 shows hourly mean values of each index for one half year on each page. Finally, a summary plot of hourly values of AU and AL indices is given in Fig. 8.

5. Acknowledgements

The calculation of the AE indices in this volume was made possible with the data provided directly to us by the AE stations or through the World Data Centers. As we do not know the details of the operation of each observatory, it is not possible for us to acknowledge all the persons who have contributed to the preparation of data. Here we only mention those persons who has directly corresponded with us. We thank Dr. T. Saemundsson of Leirvogur Observatory for very quick transmission of data, Ms. B. Olafsdottir and Dr. A. Gustafsson of Geological Survey of Sweden for digitization and quality control of Abisko data, Dr. Z. Kharin and Ms. Zina of WDC-B for STP for prepeation of microfilm of magnetograms from the Russian stations and digitization of Tixie data, Dr. Y. Tyupkin of Russian Academy of Science who coordinated cooperation between WDC-B and WDC-C2 Kyoto, Dr. E. Friis-Christensen and Mr. B. Pederson of Danish Meteorological Institute, Mr. G. Jansen van Beek of Geological Survey of Canada, Mr. L. Wilson of United States Geological Survey. We also thank Mr. J. Allen and Mr. L. Morris of WDC-A for STP for assistance in data exchange.

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Table 2. Monthly quiet-time H reference values (unit in nT)
(Year 1988)

STATION	Jan.	Feb.	Mar.	Apr.	May	June
Abisko	11622	11621	11616	11613	11612	11616
Dixon Island	6138	6139	6135	6154	6139	6140
Cape Chelyuskin	3234	3246	3246	3234	3244	3253
Tixie Bay	7659	7660	7666	7661	7666	7664
Cape Wellen	14005	14007	14001	13993	13997	13998
Barrow	9593	9600	9594	9588	9589	9588
College	12827	12834	12831	12817	12825	12828
Yellowknife	8747	8741	8731	8735	8746	8746
Fort Churchill	7809	7813	7804	7808	7819	7821
Poste-de-la-Baleine	10852	10855	10850	10858	10879	10882
Narssarssuaq	12240	12244	12236	12243	12244	12255
Leirvogur	12418	12421	12411	12418	12417	12426

TABLE 3

Hourly average AE indices (AU, AL, AE and AO)
for January-June 1988.

1988
January

AU Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
D	26	26	23	31	28	37	36	54	31	41	46	98	101	61	33	38	19	34	34	29	24	27	25	29	39
	31	43	37	27	44	40	64	41	38	88	24	163	282	144	166	334	254	176	101	164	228	189	52	42	116
	51	76	53	57	47	60	47	81	35	61	39	46	62	44	31	33	5	17	21	18	35	50	44	62	45
	123	171	150	50	53	44	53	59	43	37	40	59	72	104	50	35	50	84	57	35	75	189	230	264	89
	227	122	64	122	97	139	140	172	103	57	45	71	91	88	58	36	30	18	16	18	38	56	105	160	86
D	196	137	86	75	69	38	51	122	125	93	125	141	98	90	67	28	67	113	25	95	116	76	34	94	90
D	55	57	135	97	103	52	61	87	93	132	108	104	70	48	24	27	36	52	58	62	47	76	91	115	74
	62	50	16	101	187	123	83	45	36	30	52	118	141	135	51	45	127	89	58	71	49	70	52	52	77
	58	52	72	76	103	96	87	58	91	131	66	34	13	12	8	21	9	4	6	8	10	11	18	25	45
	22	22	26	20	17	13	15	18	18	18	23	25	25	26	49	41	15	15	22	18	57	60	100	78	31
	83	88	150	176	109	94	277	90	40	23	24	24	24	26	22	23	19	19	17	20	20	21	26	22	60
	26	23	21	30	22	24	23	24	39	139	119	67	158	124	68	16	42	43	101	84	46	31	23	18	55
	18	17	18	20	13	11	27	35	33	82	67	70	47	59	69	57	31	21	18	36	27	20	22	78	37
D	140	121	103	110	92	104	42	28	32	28	22	26	71	198	170	154	255	60	108	4	-97	-77	-34	-59	67
D	72	81	180	349	215	269	349	337	271	106	107	124	46	46	56	85	104	160	160	174	223	93	56	61	155
	30	22	19	21	12	16	34	26	56	55	54	50	33	46	59	21	9	3	4	2	2	9	9	19	25
	21	15	11	14	12	14	47	66	21	21	22	38	41	28	17	76	87	151	149	121	37	42	41	41	47
	45	43	29	25	25	36	35	51	82	85	55	41	16	14	22	34	137	167	185	188	143	82	45	60	68
	31	22	69	29	50	60	91	95	99	94	90	46	28	31	23	55	65	51	53	28	22	23	25	23	50
	23	33	36	34	28	50	53	94	100	59	57	37	67	70	76	66	74	153	116	66	32	59	78	63	64
	65	60	81	81	94	73	23	25	25	17	29	33	38	28	21	13	13	9	19	42	27	33	21	27	37
	15	20	35	29	25	33	28	17	20	25	22	32	18	13	26	52	36	18	15	16	14	13	12	15	23
Q	23	21	17	11	15	13	11	12	8	9	9	8	13	8	11	15	14	11	7	5	9	12	14	13	12
Q	12	12	11	12	11	12	16	20	37	50	41	33	22	52	29	21	12	26	15	17	15	34	41	28	24
	28	37	34	25	32	49	78	79	70	102	79	48	36	55	32	25	38	57	78	108	162	181	165	121	72
	49	22	17	12	13	15	24	40	61	105	96	217	210	143	69	39	16	22	42	114	120	168	147	78	77
	103	104	78	68	100	211	205	178	188	143	151	203	155	70	30	26	21	22	36	23	49	86	71	44	59
	53	61	70	71	73	94	90	86	62	87	85	125	52	46	62	72	35	20	18	14	17	20	14	15	56
Q	15	17	19	31	38	36	31	22	28	25	39	35	34	35	59	41	15	23	27	19	16	24	17	24	28
Q	22	22	22	19	21	21	16	15	22	20	19	16	17	15	18	21	20	21	8	13	17	36	77	35	22
Q	21	31	40	43	58	46	38	35	60	101	46	32	40	86	104	40	28	14	17	20	32	22	21	39	42
Mean	56	52	55	60	58	62	70	68	63	66	58	69	68	62	50	51	54	53	51	52	52	56	52	54	58
5Q Mean	18	19	20	24	29	26	22	20	31	40	30	24	25	39	44	27	17	19	14	14	17	25	34	27	25
5D Mean	98	87	108	131	104	100	113	123	111	89	77	111	113	105	96	125	143	112	90	99	103	71	39	50	100

February 1988

AU Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	56	60	39	29	30	31	29	23	19	18	19	18	15	21	25	25	25	19	13	14	21	21	16	16	25
Q 2	18	17	18	16	15	14	15	18	9	10	9	10	14	9	9	11	11	9	18	92	82	33	18	22	21
Q 3	22	18	10	16	13	10	11	20	18	31	19	11	21	51	29	10	10	6	9	9	9	11	8	7	16
Q 4	7	10	18	21	31	28	16	23	28	55	17	13	20	29	39	22	20	28	30	11	15	71	86	156	33
D 5	164	116	132	90	144	257	299	344	228	255	183	185	79	82	81	42	49	160	149	124	34	41	66	53	140
6	105	70	54	46	48	60	60	60	65	63	60	50	37	90	61	52	15	24	32	17	23	62	68	70	54
7	95	124	115	80	75	48	33	35	34	35	42	30	9	11	3	12	4	1	6	21	12	13	21	33	37
8	41	24	14	12	16	16	11	4	12	9	6	16	12	6	6	16	24	18	19	65	107	51	34	37	24
9	28	32	38	42	48	43	56	60	74	121	144	93	73	118	47	117	104	89	124	210	263	209	119	152	100
10	96	54	41	44	99	114	122	98	84	62	53	154	149	93	106	65	45	20	6	19	7	17	29	25	67
11	14	15	14	7	6	7	12	20	52	62	138	217	157	167	124	42	33	31	25	30	69	92	47	44	59
12	28	55	38	58	58	116	184	216	81	37	62	55	29	16	15	27	25	53	122	184	59	77	31	48	70
13	26	44	36	39	72	113	159	105	72	65	68	134	143	137	93	71	161	132	76	33	28	19	18	21	78
14	13	19	24	16	10	6	2	9	17	20	11	19	15	19	17	12	12	7	6	7	10	7	16	16	13
D 15	17	25	35	33	66	91	155	201	175	279	152	285	138	68	62	194	226	70	46	63	36	28	35	13	104
16	14	12	13	7	4	13	17	28	10	32	18	17	36	77	146	243	243	288	211	177	206	63	40	25	81
17	44	81	61	47	30	30	23	20	17	51	133	98	29	19	39	66	127	33	19	23	50	111	109	111	57
18	114	99	64	47	32	23	59	49	37	101	89	68	40	33	42	41	25	7	11	19	72	136	156	63	59
19	41	32	24	23	20	39	51	30	21	13	14	21	21	22	32	27	28	38	32	31	23	47	27	25	28
20	22	27	27	31	27	22	20	17	18	19	20	31	44	36	50	42	40	39	11	26	17	30	66	50	30
D 21	29	47	86	94	212	177	257	261	260	142	54	28	14	15	7	15	14	19	32	47	79	126	134	83	93
D 22	81	88	156	266	227	153	250	158	114	182	193	21	-85	-28	3	35	-20	39	66	32	95	158	40	28	94
D 23	130	115	152	138	196	328	256	168	197	190	155	232	122	58	28	52	128	127	118	62	50	31	22	22	128
24	39	59	66	108	81	48	56	67	92	82	68	65	35	89	86	62	42	45	87	128	83	58	40	22	67
25	24	46	35	92	98	78	58	36	55	105	114	72	103	141	134	73	77	111	126	105	113	116	82	38	85
26	55	83	112	56	53	40	56	66	76	42	84	78	42	45	86	77	81	212	291	287	269	300	164	100	115
27	49	57	69	60	65	61	95	114	129	69	50	30	24	46	40	11	13	14	16	36	54	96	94	115	59
Q 28	53	60	82	122	96	115	132	127	130	43	15	25	47	86	54	49	25	18	30	43	16	20	22	47	61
Q 29	44	27	15	14	20	31	35	39	45	30	19	11	16	26	32	30	10	21	20	46	35	16	18	14	26
Mean	50	52	54	57	65	72	87	83	74	76	69	71	48	54	51	53	55	57	60	67	66	71	56	50	62
5Q Mean	38	36	32	39	34	40	44	45	44	26	16	15	22	38	29	25	16	14	18	40	32	20	16	21	29
5D Mean	84	78	112	124	169	201	243	226	194	209	147	150	53	39	36	67	79	83	82	65	58	76	59	39	111

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Date	March																								Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Q 1	22	35	47	28	28	18	41	65	55	36	28	42	51	26	25	21	16	21	30	38	24	40	39	42	34
2	29	27	22	16	16	17	29	34	85	111	34	24	22	20	18	35	18	18	16	16	16	16	49	37	38
3	37	41	40	49	33	22	36	85	116	91	61	22	21	23	27	17	39	59	40	42	29	30	37	58	44
4	81	76	114	118	106	150	189	209	162	139	68	63	125	107	66	174	207	170	179	82	55	44	77	88	119
5	60	53	60	78	55	37	51	57	56	74	79	98	68	40	38	21	27	27	28	37	52	53	77	107	55
6	195	169	129	165	182	195	162	204	137	177	226	174	98	183	217	189	221	177	97	130	101	70	35	31	153
7	38	49	45	82	76	122	201	225	65	36	47	19	15	12	9	14	21	58	113	199	150	121	208	158	87
8	133	69	36	28	72	144	335	133	83	121	207	130	99	162	88	55	57	42	84	56	42	41	58	57	97
9	47	43	42	53	111	161	99	75	62	80	141	148	52	30	21	35	46	89	50	24	35	35	18	18	63
10	16	18	23	18	15	15	25	36	21	16	19	33	97	87	45	50	29	46	77	67	84	116	136	93	49
11	127	91	84	117	127	60	70	44	39	39	26	61	115	155	102	41	33	37	28	87	53	35	25	40	68
12	35	28	21	43	36	31	55	54	51	55	114	68	24	29	49	25	48	51	28	44	64	94	47	64	48
13	59	38	24	15	18	25	23	28	34	62	31	19	23	18	15	16	22	56	44	23	18	22	15	32	28
14	32	27	20	19	30	44	109	58	59	16	22	48	75	94	145	73	107	58	134	142	100	72	108	122	71
15	48	47	34	43	26	114	103	74	111	116	61	69	88	73	43	41	39	80	156	222	232	128	74	95	88
16	70	112	90	118	81	127	95	93	142	121	92	80	32	16	21	25	15	31	58	75	52	51	46	46	70
17	35	43	35	36	38	54	37	55	49	38	73	50	34	26	44	28	30	22	27	49	53	32	28	19	39
18	24	26	19	27	29	46	41	34	68	38	47	21	20	29	37	24	44	69	65	47	37	42	35	27	37
19	21	18	17	39	21	49	29	36	20	15	23	33	32	25	17	13	14	8	15	34	15	27	28	28	24
20	19	20	17	15	14	17	19	28	41	64	64	65	171	83	38	27	12	17	23	24	18	17	14	16	35
21	14	15	11	14	12	14	15	16	17	16	12	13	20	18	19	16	11	20	22	19	17	30	42	55	19
22	60	62	43	31	28	20	17	17	17	17	18	17	18	26	28	20	16	13	15	17	25	27	26	28	25
23	24	28	28	25	25	24	20	26	20	20	24	21	27	53	72	87	85	53	61	51	48	41	46	48	40
24	48	71	89	59	39	20	17	17	19	21	20	23	24	25	25	22	22	24	17	22	24	26	42	29	31
25	25	21	21	25	31	56	147	111	81	67	96	51	73	63	82	158	245	214	265	239	220	98	64	46	104
D 26	98	84	90	112	144	207	276	267	211	344	183	53	27	83	189	372	371	383	122	47	85	130	215	205	179
D 27	140	122	245	90	152	192	68	69	72	64	75	34	12	20	36	97	183	228	198	250	234	306	266	174	139
D 28	134	103	69	93	135	130	158	141	120	171	177	301	162	114	40	27	101	238	210	241	298	311	141	48	153
D 29	94	176	131	122	217	205	198	223	236	205	159	143	92	112	127	268	295	265	380	365	187	100	124	183	192
D 30	56	132	259	248	283	259	165	187	105	40	146	130	125	98	86	79	67	97	86	100	98	86	83	100	130
D 31	91	82	91	156	218	127	37	35	34	25	45	85	128	140	80	79	94	137	152	120	100	122	136	162	103
Mean	61	62	64	67	77	87	92	88	77	78	78	68	63	64	59	69	81	90	90	93	82	77	75	72	76
5Q Mean	35	33	28	25	21	25	25	32	28	29	22	24	28	22	20	17	15	23	25	26	19	29	30	37	26
5D Mean	104	123	158	133	186	198	173	177	148	164	148	132	83	85	95	168	203	242	199	200	180	186	165	142	158

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AU Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
1	173	134	86	102	110	61	92	149	182	169	118	49	44	89	70	159	153	131	223	300	257	212	180	241	145
2	167	82	99	82	132	181	190	184	159	209	274	231	192	210	124	81	43	73	161	210	210	198	168	99	157
3	81	124	140	138	87	110	153	184	232	314	119	50	29	16	15	20	106	226	137	119	124	115	63	42	114
D	75	89	164	260	135	146	149	191	231	91	195	299	178	266	332	235	112	182	262	130	227	115	74	82	176
D	120	141	90	94	176	137	122	147	67	28	68	69	28	32	31	30	21	23	85	160	194	228	245	160	104
D	186	191	209	304	230	248	322	349	124	102	144	255	234	117	82	126	257	102	181	93	40	43	35	62	168
7	50	40	43	109	145	100	108	69	76	80	67	59	76	77	63	21	102	122	123	68	35	59	51	28	74
8	46	33	21	15	14	21	27	39	35	32	22	21	27	23	30	49	57	69	46	24	44	21	18	42	32
9	132	130	75	33	20	34	34	43	35	43	88	100	42	54	60	61	24	39	39	26	32	57	56	32	54
10	27	21	26	81	35	35	101	149	151	165	245	163	143	106	132	58	26	42	44	46	67	80	69	54	86
11	74	53	34	54	35	77	66	52	43	56	24	37	41	99	61	75	205	116	48	39	30	32	47	44	60
12	90	98	125	127	77	39	22	40	52	99	129	126	199	112	144	84	126	145	72	39	67	54	58	57	91
13	63	68	58	39	51	45	27	55	44	58	52	80	63	58	68	32	23	33	46	38	81	146	179	88	62
14	110	113	51	101	101	74	63	54	81	93	55	65	80	59	63	28	24	42	43	46	70	63	85	45	67
Q	49	38	27	18	14	22	16	24	31	29	29	38	31	53	56	57	27	35	31	30	34	54	66	65	36
Q	40	37	20	15	11	10	28	31	41	23	33	23	37	67	115	145	102	29	36	23	20	16	15	22	39
Q	21	26	31	24	21	21	25	18	19	22	19	22	23	25	22	25	25	26	17	21	24	26	65	140	29
18	157	187	174	160	221	226	182	172	62	47	34	22	17	20	25	21	28	28	26	26	32	31	21	19	81
19	23	20	29	51	38	21	20	22	54	36	28	24	29	34	39	47	46	70	53	48	81	82	52	48	42
20	33	17	14	14	12	19	23	25	27	42	83	91	62	90	77	68	121	191	103	66	102	137	200	237	77
21	239	218	203	168	173	225	170	42	42	23	32	62	43	65	73	82	69	44	40	39	39	41	77	178	99
D	153	176	197	328	311	351	272	225	102	118	161	135	124	91	126	321	377	232	195	272	201	210	158	218	211
23	217	266	268	204	211	238	221	88	37	35	38	27	75	56	23	26	17	37	48	68	63	48	46	43	100
24	37	37	31	31	19	25	26	42	28	28	19	17	17	20	27	24	23	23	30	98	123	136	159	112	47
Q	52	25	12	16	24	39	68	70	77	96	148	89	103	94	75	44	54	76	86	139	99	73	69	75	71
Q	70	78	91	85	45	47	39	31	40	41	53	85	45	30	47	39	33	24	26	40	46	54	58	42	50
27	37	52	56	60	66	77	47	34	37	50	48	77	54	68	52	63	64	116	183	207	207	205	229	195	95
28	148	143	97	87	203	255	134	142	162	263	253	192	148	87	39	29	49	68	160	170	181	283	346	295	164
29	251	198	167	98	46	26	107	87	77	111	70	46	26	18	24	25	24	21	21	24	27	25	31	34	66
30	37	47	52	52	44	50	38	93	61	59	102	117	85	43	27	23	29	34	35	44	41	77	111	102	58
Mean	98	96	89	98	93	98	96	95	80	85	91	89	76	72	70	69	78	79	86	88	93	97	101	96	88
5Q Mean	46	40	36	31	23	27	35	34	41	42	56	51	47	53	63	62	48	38	39	50	44	44	54	68	45
5D Mean	123	144	160	224	187	198	203	219	151	130	137	161	118	104	117	146	174	153	172	154	157	142	115	112	154

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Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
1	100	97	71	32	30	77	77	79	45	56	96	88	69	50	55	50	33	48	43	34	39	46	24	22	57
2	18	14	28	68	85	74	76	77	103	147	99	107	64	68	82	61	84	104	93	94	146	160	151	155	90
3	61	51	109	143	151	189	182	116	77	84	65	90	96	79	30	24	38	68	133	258	191	154	150	200	114
4	199	200	181	149	198	249	218	169	213	152	116	102	69	47	61	35	22	38	108	154	197	122	65	33	129
5	37	28	20	19	18	28	77	78	140	181	392	331	143	93	30	34	42	28	54	95	156	132	220	299	111
D	191	316	167	163	194	492	379	458	129	87	58	140	415	276	402	480	484	225	241	168	214	118	90	40	247
D	52	29	25	33	22	9	23	40	25	14	16	98	89	60	50	44	31	85	173	191	122	86	117	167	67
D	82	52	67	55	28	36	54	26	36	23	57	103	147	167	57	122	235	221	104	71	66	90	135	89	89
9	47	30	46	66	73	67	35	60	155	139	81	81	64	62	80	30	87	47	42	69	60	83	53	41	67
10	130	128	105	98	75	201	86	108	119	104	136	100	94	65	67	57	107	102	72	67	65	53	76	93	96
11	39	33	26	49	110	114	147	94	132	106	121	84	51	54	64	51	45	42	50	50	67	37	23	32	68
12	61	76	38	27	32	22	16	27	29	28	38	96	80	62	38	34	37	27	29	32	37	60	64	95	45
Q	13	86	63	78	47	35	24	23	39	47	38	85	85	89	39	23	37	45	36	26	23	21	21	22	45
Q	25	12	16	19	29	41	61	71	59	75	74	68	60	67	35	23	26	38	48	32	25	24	16	23	40
15	47	73	67	118	261	114	32	28	49	42	30	32	48	23	19	21	27	31	27	28	37	29	38	29	52
16	35	38	60	106	193	201	202	136	126	163	209	230	180	184	179	245	102	45	45	28	63	87	102	144	129
17	133	134	130	175	268	278	144	69	147	301	306	270	349	423	253	106	93	75	168	184	175	178	248	192	200
D	167	156	169	96	181	173	143	236	299	280	256	199	189	150	91	23	31	31	10	59	59	127	201	237	148
19	245	220	136	50	15	15	40	84	118	143	120	98	67	71	41	61	40	50	55	37	32	16	24	31	75
20	125	161	144	115	55	46	19	15	14	10	18	24	35	21	26	29	29	35	50	89	108	102	63	55	58
21	29	27	101	110	118	184	133	116	48	55	85	112	83	106	33	66	120	98	98	74	105	131	142	207	99
22	133	79	143	86	125	131	93	181	193	89	74	85	111	119	85	108	139	63	48	68	46	23	31	30	95
23	39	37	47	99	40	64	65	73	68	39	27	29	40	26	28	25	34	52	63	81	105	142	220	179	68
24	142	120	90	54	99	135	66	118	109	99	68	63	105	135	108	50	36	48	77	143	124	63	63	62	91
25	80	69	41	30	26	27	29	48	49	63	71	91	60	40	28	15	26	23	40	48	69	130	158	81	56
26	67	113	155	199	225	161	46	30	50	51	106	107	93	83	62	48	81	82	41	31	32	25	22	22	81
27	13	10	22	17	27	15	17	13	16	31	24	31	32	24	15	19	29	38	45	56	47	36	28	23	26
Q	33	51	40	31	22	18	17	24	25	30	27	26	29	30	28	31	34	32	33	40	36	32	31	33	31
29	32	32	40	26	36	84	161	169	164	115	62	69	64	66	97	50	48	44	50	48	67	114	103	72	76
30	62	86	99	130	115	70	177	178	129	57	60	96	49	85	58	15	30	40	62	91	201	239	168	97	100
31	133	148	62	78	26	23	28	54	115	102	179	125	96	81	56	52	66	60	65	64	57	61	76	78	79
Mean	85	86	81	80	93	108	92	97	97	93	100	105	101	93	74	65	73	63	71	80	89	87	94	93	87
5Q Mean	43	42	38	28	29	24	26	34	35	40	40	61	57	54	31	26	32	36	38	37	33	34	32	39	37
5D Mean	122	137	110	101	137	201	159	173	150	174	213	208	248	221	166	153	177	116	115	115	134	129	178	171	159

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Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	43	22	11	32	39	43	54	76	84	90	147	108	64	61	67	65	59	68	96	99	64	83	47	69	66
Q 2	80	39	13	18	31	34	23	26	34	60	96	121	82	59	41	31	31	37	48	34	28	49	24	29	45
Q 3	22	17	16	16	13	10	11	33	43	58	57	62	30	32	30	19	18	26	32	38	36	29	32	31	30
Q 4	35	41	44	29	18	17	20	26	24	28	45	42	41	59	60	59	31	50	62	69	60	54	32	28	41
5	30	34	33	24	49	67	70	70	52	47	48	39	72	97	92	88	38	32	53	171	252	348	385	339	105
6	227	262	297	291	165	69	28	9	12	13	14	17	22	20	17	17	23	19	26	25	20	17	16	20	69
7	23	21	18	13	13	9	48	106	195	101	37	14	11	8	30	47	45	53	83	95	146	145	168	156	66
8	106	118	185	158	206	138	149	98	134	103	124	68	108	76	71	64	71	89	120	119	172	111	41	33	111
9	32	28	20	26	20	32	42	65	50	38	45	55	53	95	123	94	116	120	262	309	180	104	62	82	86
10	128	84	180	331	274	85	62	60	75	44	73	66	56	46	50	58	57	63	55	51	38	60	62	94	90
11	88	114	83	112	118	233	155	91	59	97	54	26	43	49	76	91	73	55	85	63	43	29	24	31	79
Q 12	23	21	26	24	57	34	48	32	35	34	82	83	55	34	34	24	23	22	14	22	25	27	23	33	35
13	48	90	93	41	37	15	18	26	36	34	41	28	55	64	50	34	38	37	53	59	56	68	75	138	51
D 14	241	303	229	385	393	257	124	64	249	283	182	147	197	84	42	86	159	176	178	170	161	177	169	173	193
15	155	155	170	111	99	76	94	87	115	52	32	29	23	40	21	27	31	43	80	90	122	140	247	238	95
16	289	266	184	185	57	103	124	95	70	116	98	58	70	84	48	52	54	58	89	137	129	124	135	181	117
17	141	129	201	255	300	269	326	197	138	126	90	108	126	87	41	55	70	93	72	88	71	54	168	205	142
18	142	51	106	78	101	88	49	121	201	193	71	31	58	133	161	150	117	142	88	141	92	77	67	104	107
D 19	126	197	180	147	123	189	145	91	94	288	204	317	291	153	156	256	301	222	269	213	84	74	73	89	178
20	222	195	246	341	285	268	262	158	145	67	51	153	100	64	34	25	48	38	25	32	23	11	20	27	118
Q 21	24	27	55	82	74	94	52	38	57	88	158	117	124	114	42	52	43	43	42	37	47	28	39	44	63
22	107	103	100	99	184	142	228	121	117	213	192	118	78	116	77	53	87	138	202	166	118	94	80	107	127
23	152	85	93	143	298	199	46	31	43	34	45	125	81	36	40	37	68	128	164	112	69	111	135	115	100
24	70	73	118	82	314	182	98	55	50	55	54	90	126	224	301	300	319	156	112	181	246	344	367	314	176
D 25	181	157	207	225	231	246	268	235	343	239	173	227	113	50	30	56	215	257	142	67	49	42	42	22	167
26	171	133	76	66	117	165	147	222	140	90	96	177	130	124	101	112	78	190	321	326	404	374	290	275	180
27	196	121	135	127	22	27	30	30	29	99	119	107	97	106	72	79	62	80	94	168	190	122	114	108	97
28	113	138	111	70	114	157	188	212	203	306	233	148	113	47	40	26	28	49	43	75	103	81	86	118	118
D 29	80	66	40	62	297	277	278	201	148	153	220	139	60	72	184	239	247	298	423	398	511	271	188	263	213
D 30	221	198	324	224	209	216	147	110	161	164	90	86	167	242	394	478	436	384	337	218	183	115	86	197	225
Mean	117	109	119	126	141	124	110	92	104	107	101	99	89	84	84	92	99	104	122	124	123	112	109	127	109
50 Mean	36	29	30	33	38	37	30	31	38	53	87	85	66	59	42	37	29	35	39	40	39	37	30	33	42
5D Mean	169	184	196	208	250	237	192	140	199	225	173	183	165	120	161	223	271	267	269	213	197	135	111	188	195

AL Index (Hourly mean values, unit nT) January 1988

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
D 1	-7	-11	-8	-1	-2	-1	-7	-15	-2	-27	-25	-180	-133	-5	0	-21	-20	-65	-11	6	2	-1	-12	-48	-25
D 2	-32	-81	-78	-42	-38	-99	-147	-132	-134	-223	-680	-647	-490	-174	-465	-774	-685	-457	-878	-972	-632	-288	-98	-58	-346
D 3	-55	-70	-34	-47	-37	-165	-78	-22	-24	-27	-33	-111	-71	-39	-33	-43	-61	-55	-45	-36	-68	-88	-55	-62	-57
D 4	-53	-127	-13	-4	-21	-22	-23	-34	-33	-32	-42	-46	-70	-222	-130	-51	-148	-166	-173	-71	-129	-232	-234	-530	-109
D 5	-148	-73	-73	-159	-268	-281	-267	-377	-252	-56	-36	-107	-462	-299	-82	-17	-26	-20	-18	-18	-20	-122	-444	-274	-162
D 6	-161	-33	4	-18	-33	-15	-18	-123	-218	-91	-125	-174	-202	-130	-38	-29	-210	-973	-924	-565	-133	-19	-95	-370	-196
D 7	-628	-679	-303	-267	-136	-22	-17	-34	-82	-147	-171	-99	-40	-54	-30	-95	-243	-183	-83	-56	-225	-232	-322	-47	-175
D 8	-86	-227	-261	-198	-272	-49	-31	-7	-25	-43	-119	-596	-536	-184	-43	-61	-366	-408	-179	-159	-105	-38	-30	-21	-164
D 9	-32	-23	-39	-60	-49	-71	-43	-48	-34	-84	-19	-14	-14	-18	-22	-33	-25	-23	-16	-73	-39	-30	-29	-17	-36
D 10	-3	-4	-5	-9	-7	-7	-6	-7	-8	-6	-8	-9	-31	-24	-47	-29	-28	-22	-28	-17	-120	-283	-125	-42	-36
D 11	-52	-123	-107	-81	-57	-179	-169	-3	-5	-7	-6	-7	-7	-11	-12	-13	-16	-14	-10	-11	-7	0	4	2	-37
D 12	0	-3	-6	-4	-6	-6	-40	-131	-196	-645	-392	-465	-958	-230	-31	-204	-428	-90	-248	-311	-132	-11	-8	-8	-190
D 13	-9	-13	-18	-22	-18	-9	-31	-23	-120	-158	-96	-80	-55	-169	-230	-115	-65	-69	-143	-223	-165	-31	-7	-21	-79
D 14	-303	-286	-94	-250	-226	-221	-93	-89	-31	-30	-32	-16	-24	-133	-126	-151	-700	-727	-737	-1124	-1070	-693	-634	-1019	-367
D 15	-767	-839	-581	-804	-667	-935	-894	-741	-561	-577	-475	-256	-274	-177	-409	-507	-444	-409	-337	-260	-170	-109	-185	-175	-481
D 16	-44	-28	-22	-19	-17	-20	-36	-94	-244	-139	-128	-134	-329	-306	-60	-19	-30	-27	-20	-46	-43	-43	-117	-63	-84
D 17	-18	-14	-17	-39	-38	-41	-115	-46	-40	-44	-62	-78	-115	-40	-93	-479	-383	-390	-340	-177	-58	-63	-140	-210	-127
D 18	-24	-20	-46	-52	-23	-20	-40	-121	-243	-169	-78	-49	-53	-43	-59	-181	-441	-371	-440	-515	-206	-19	-182	-102	-146
D 19	-47	-12	-47	-50	-51	-105	-332	-191	-236	-165	-143	-101	-113	-134	-71	-162	-183	-207	-153	-128	-68	-52	-29	-67	-119
D 20	-53	-63	-147	-33	-6	-30	-140	-229	-116	-50	-35	-78	-109	-326	-284	-141	-142	-149	-94	-42	-35	-115	-264	-120	-117
D 21	-128	-148	-158	-113	-217	-176	-17	-17	-52	-57	-58	-70	-163	-115	-18	-18	-22	-29	-75	-157	-148	-78	-60	-47	-89
D 22	-32	-33	-74	-35	-49	-148	-27	-7	-18	-30	-46	-81	-99	-132	-455	-239	-38	-48	-132	-130	-67	-20	-12	-11	-82
D 23	-12	-18	-12	-10	-8	-6	-22	-29	-18	-25	-18	-14	-16	-23	-61	-32	-32	-19	-18	-18	-16	-11	-7	-4	-19
D 24	-5	-3	-6	-17	-7	-8	-17	-47	-127	-126	-83	-28	-48	-195	-83	-64	-148	-185	-90	-53	-54	-60	-177	-36	-69
D 25	-68	-74	-63	-58	-27	-48	-168	-80	-87	-61	-70	-42	-52	-93	-156	-134	-204	-275	-203	-175	-103	-74	-82	-54	-102
D 26	0	-4	-7	-11	-9	-7	-5	-5	-49	-98	-167	-129	-113	-130	-79	-71	-22	-21	-22	-223	-502	-153	-17	-26	-78
D 27	-70	-193	-113	-113	-116	-178	-174	-136	-103	-44	-90	-565	-133	-93	-77	-71	-79	-72	-172	-76	-90	-177	-15	-16	-123
D 28	-19	-2	-26	-33	-177	-74	-40	-49	-41	-38	-142	-100	-42	-36	-54	-73	-14	-10	-7	0	0	-3	-6	-1	-41
D 29	-4	-6	-50	-93	-35	-11	-3	-11	-21	-22	-109	-41	-58	-76	-35	-38	-191	-37	-32	-5	-10	-73	-23	-17	-42
D 30	-7	-5	-9	-2	-4	-2	-1	-4	-4	-5	-10	-11	-12	-11	-10	-7	-10	-21	-39	-49	-68	-77	-75	-9	-19
D 31	-7	-4	-7	-8	-20	-8	-5	-15	-26	-19	-1	-6	-42	-171	-84	-12	-6	-9	-30	-38	-45	-8	-8	-14	-25
Mean	-92	-103	-78	-85	-85	-95	-96	-92	-101	-104	-112	-139	-156	-122	-108	-125	-174	-179	-180	-184	-146	-103	-112	-112	-120
5Q Mean	-7	-7	-16	-26	-14	-7	-9	-21	-39	-44	-20	-35	-95	-54	-30	-77	-54	-41	-32	-38	-45	-58	-16	-34	-34
5D Mean	-378	-383	-210	-276	-220	-258	-233	-223	-205	-213	-296	-238	-206	-133	-213	-311	-456	-549	-591	-595	-446	-268	-266	-333	-312

February 1988

AL Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q	-62	-15	-1	-2	-5	-3	-3	-1	0	-5	-6	-10	-17	-12	-12	-11	-10	-10	-7	-7	-4	-2	-4	-6	-9
Q	-8	-23	-17	-15	-7	-6	-8	-8	-10	-9	-9	-23	-34	-41	-29	-27	-26	-23	-41	-264	-190	-58	-25	-27	-39
Q	-23	-20	-6	-5	-3	-20	-39	-50	-143	-87	-32	-11	-15	-15	-15	-11	-13	-11	-10	-9	-8	-8	-7	-11	-23
Q	-11	-16	-25	-30	-13	-19	-47	-60	-100	-84	-8	-15	-54	-201	-126	-61	-122	-130	-24	-4	-10	-91	-255	-217	-72
D	-164	-211	-101	-202	-256	-381	-479	-384	-535	-344	-70	-80	-167	-162	-124	-37	-147	-614	-547	-147	-28	-35	-149	-167	-230
Q	-147	-37	-43	-71	-67	-83	-37	-21	-40	-121	-173	-38	-47	-154	-164	-200	-177	-68	-14	-23	-45	-124	-323	-225	-102
Q	-125	-81	-49	-79	-47	-11	-27	-16	-44	-67	-87	-40	-17	-14	-18	-28	-34	-60	-33	-84	-56	-34	-39	-24	-46
Q	-21	-32	-11	-9	-12	-11	-13	-17	-25	-16	-16	-31	-24	-20	-17	-66	-184	-185	-163	-148	-307	-75	-16	-13	-60
Q	-14	-12	-20	-18	-14	-16	-13	-11	-135	-164	-142	-84	-62	-71	-104	-287	-286	-177	-190	-196	-239	-179	-74	-91	-113
Q	-39	-17	-17	-26	-70	-215	-305	-113	-135	-213	-110	-368	-285	-533	-475	-72	-38	-24	-74	-162	-88	-26	-16	-13	-143
Q	-14	-21	-17	-9	-7	-5	-5	-29	-157	-329	-263	-410	-429	-413	-227	-93	-66	-204	-104	-57	-196	-246	-16	-27	-139
Q	-48	-241	-158	-103	-155	-320	-303	-312	-73	-30	-116	-142	-117	-53	-26	-111	-50	-145	-424	-304	-63	-64	-51	-38	-144
Q	-29	-82	-99	-86	-278	-326	-221	-140	-198	-125	-164	-422	-407	-348	-264	-188	-392	-254	-162	-10	-15	-17	-20	-25	-178
Q	-19	-19	-18	-16	-16	-19	-45	-60	-49	-51	-38	-42	-30	-147	-77	-35	-25	-19	-49	-57	-33	-64	-71	-39	-43
Q	-75	-136	-160	-74	-124	-220	-382	-366	-325	-464	-653	-483	-322	-290	-219	-677	-400	-60	-19	-152	-261	-26	-44	-46	-249
Q	-45	-22	-38	-20	-12	-26	-142	-74	-18	-93	-96	-59	-122	-445	-642	-532	-443	-624	-561	-412	-236	-13	-24	-33	-197
Q	-40	-102	-210	-137	-56	-11	-10	-10	-18	-43	-414	-340	-51	-23	-57	-156	-357	-156	-26	-26	-43	-273	-375	-346	-137
Q	-379	-312	-80	-123	-53	-27	-85	-156	-80	-239	-454	-77	-34	-18	-19	-93	-234	-90	-37	-37	-117	-493	-175	-31	-143
Q	-24	-22	-49	-133	-44	-74	-75	-25	-16	-23	-29	-142	-161	-94	-63	-132	-232	-96	-92	-269	-59	-13	-13	-18	-79
Q	-23	-20	-18	-9	-6	-10	-9	-11	-9	-12	-16	-22	-33	-81	-105	-39	-178	-34	-81	-91	-148	-127	-87	-118	-54
Q	-61	-18	-141	-282	-187	-64	-92	-220	-323	-82	-75	-88	-352	-218	-251	-283	-194	-192	-260	-351	-374	-382	-449	-468	-225
D	-952	-820	-970	-1081	-753	-858	-1123	-1230	-818	-808	-1170	-1803	-1916	-1471	-1618	-1519	-1657	-661	-669	-576	-547	-348	-380	-440	-1008
D	-856	-769	-663	-709	-850	-511	-266	-251	-286	-341	-368	-239	-149	-36	-43	-96	-313	-508	-291	-241	-83	-30	-22	-27	-331
D	-50	-185	-267	-187	-37	-21	-100	-179	-161	-256	-223	-164	-52	-137	-279	-84	-105	-95	-64	-301	-262	-24	-21	-21	-136
D	-23	-43	-247	-181	-78	-206	-83	-32	-185	-123	-76	-49	-153	-349	-187	-105	-201	-209	-190	-297	-415	-219	-65	-40	-157
Q	-79	-220	-38	-16	-25	-36	-34	-167	-111	-23	-76	-65	-21	-38	-123	-83	-211	-454	-497	-391	-423	-275	-78	-67	-148
Q	-49	-67	-71	-172	-141	-24	-146	-140	-115	-40	-33	-17	-26	-61	-87	-21	-24	-65	-74	-115	-93	-53	-132	-96	-78
Q	-39	-32	-54	-50	-58	-64	-72	-73	-39	-19	-21	-19	-114	-178	-125	-100	-116	-60	-49	-212	-35	-9	-14	-32	-66
Q	-15	-13	-12	-12	-8	-16	-15	-64	-43	-18	-25	-23	-20	-20	-20	-34	-100	-97	-50	-170	-56	-43	-15	-21	-38
Mean	-118	-123	-124	-133	-116	-123	-143	-148	-141	-147	-173	-183	-180	-194	-190	-178	-218	-183	-165	-176	-152	-115	-102	-94	-151
5Q Mean	-29	-17	-19	-17	-18	-18	-23	-37	-28	-38	-29	-21	-39	-53	-40	-36	-53	-40	-31	-132	-58	-24	-13	-19	-34
5D Mean	-421	-390	-407	-469	-434	-406	-468	-490	-457	-407	-467	-538	-581	-435	-451	-522	-542	-407	-357	-293	-258	-164	-208	-229	-408

AL Index (Hourly mean values, unit nT) March 1988

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	-7	-61	-44	-10	-12	-12	-71	-205	-115	-10	-11	-50	-97	-19	-18	-19	-83	-77	-130	-103	-42	-26	-23	-51	-54
2	-11	-57	-7	-6	-4	-2	-1	-71	-232	-159	-31	-13	-14	-13	-16	-70	-72	-29	-19	-16	-5	-29	-264	-49	-48
3	-25	-27	-17	-37	-46	-9	-138	-235	-94	-29	-11	-11	-11	-13	-12	-9	-57	-130	-41	-9	-8	-9	-81	-195	-52
4	-121	-203	-412	-150	-188	-247	-289	-284	-130	-245	-107	-84	-111	-351	-612	-652	-552	-394	-179	-139	-18	-10	-28	-101	-234
5	-51	-32	-40	-149	-35	-49	-67	-42	-109	-184	-118	-127	-21	-17	-24	-81	-97	-115	-48	-111	-93	-250	-152	-260	-95
6	-560	-272	-621	-413	-314	-213	-288	-271	-239	-292	-188	-273	-413	-671	-477	-380	-487	-319	-136	-211	-430	-32	-12	-19	-314
7	-38	-197	-83	-155	-149	-171	-278	-203	-37	-17	-12	-16	-17	-13	-11	-9	-102	-134	-368	-797	-293	-60	-216	-146	-147
8	-43	-25	-29	-24	-80	-354	-361	-203	-71	-431	-250	-199	-781	-440	-105	-110	-185	-187	-124	-23	-40	-65	-70	-176	-176
9	-87	-24	-23	-31	-148	-293	-172	-72	-34	-69	-177	-360	-74	-17	-20	-15	-55	-233	-197	-20	-11	-26	-17	-19	-91
10	-16	-16	-17	-11	-10	-12	-17	-25	-18	-26	-11	-16	-187	-318	-86	-361	-223	-39	-86	-129	-492	-202	-335	-153	-117
11	-239	-129	-74	-194	-146	-15	-96	-45	-21	-27	-35	-57	-333	-679	-334	-81	-29	-72	-63	-233	-178	-33	-28	-99	-135
12	-56	-22	-15	-27	-41	-27	-199	-65	-32	-54	-173	-164	-21	-27	-38	-86	-235	-240	-53	-57	-65	-381	-184	-193	-102
Q 13	-151	-37	-33	-9	-15	-12	-24	-43	-136	-58	-26	-13	-18	-14	-12	-10	-18	-85	-234	-45	-6	-13	-13	-35	-44
14	-99	-71	-22	-21	-16	-104	-290	-51	-14	-16	-14	-56	-157	-229	-214	-161	-198	-191	-304	-243	-224	-76	-328	-334	-143
15	-69	-50	-52	-64	-22	-125	-272	-292	-191	-179	-138	-126	-269	-134	-52	-42	-57	-108	-317	-409	-621	-276	-153	-198	-176
16	-259	-313	-571	-270	-136	-150	-343	-361	-455	-336	-271	-160	-36	-13	-9	-35	-27	-30	-91	-314	-89	-101	-54	-51	-187
17	-37	-63	-83	-24	-62	-197	-148	-155	-73	-31	-138	-313	-14	-9	-70	-130	-102	-30	-69	-82	-204	-81	-16	-19	-90
18	-17	-51	-105	-83	-45	-41	-51	-60	-103	-65	-179	-113	-46	-18	-38	-154	-217	-222	-191	-84	-35	-71	-67	-31	-87
Q 19	-21	-21	-46	-100	-102	-24	-19	-77	-144	-84	-37	-36	-97	-21	-27	-28	-28	-24	-23	-65	-53	-25	-24	-30	-48
20	-31	-23	-19	-12	-11	-14	-14	-3	-183	-242	-275	-128	-371	-92	-15	-18	-27	-20	-15	-14	-10	-9	-14	-21	-66
Q 21	-23	-22	-18	-18	-17	-20	-19	-10	-13	-37	-44	-35	-26	-25	-20	-23	-24	-24	-37	-20	-20	-20	-17	-63	-25
Q 22	-92	-79	-50	-20	-10	-18	-12	-11	-9	-15	-19	-21	-21	-25	-32	-28	-28	-25	-16	-14	-27	-29	-21	-24	-27
23	-20	-17	-12	-10	-10	-14	-22	-10	-22	-25	-21	-21	-25	-44	-280	-264	-271	-135	-75	-38	-40	-20	-18	-60	-60
24	-25	-44	-264	-175	-36	-14	-17	-14	-10	-17	-20	-15	-15	-19	-18	-29	-32	-28	-20	-6	-8	-15	-40	-23	-38
25	-24	-22	-20	-20	-44	-102	-194	-78	-43	-58	-49	-35	-68	-401	-150	-227	-347	-365	-435	-247	-174	-38	-35	-36	-134
D 26	-195	-242	-122	-112	-243	-281	-225	-422	-246	-327	-172	-33	-44	-154	-236	-600	-442	-544	-779	-1097	-1112	-751	-439	-407	-384
D 27	-258	-358	-606	-166	-58	-331	-205	-59	-63	-106	-229	-162	-26	-26	-74	-226	-408	-346	-621	-531	-517	-446	-265	-176	-261
D 28	-216	-153	-118	-87	-233	-295	-285	-188	-158	-253	-524	-401	-202	-156	-62	-73	-107	-557	-880	-755	-742	-532	-481	-525	-333
D 29	-276	-198	-151	-232	-293	-207	-345	-340	-344	-457	-477	-69	-100	-308	-362	-445	-649	-507	-455	-468	-156	-43	-54	-142	-295
D 30	-375	-303	-500	-573	-661	-323	-251	-287	-55	-29	-65	-594	-452	-163	-227	-96	-122	-104	-84	-124	-74	-337	-247	-225	-261
D 31	-182	-139	-138	-272	-340	-137	-36	-16	-24	-24	-34	-230	-142	-200	-95	-154	-277	-247	-289	-244	-99	-154	-192	-162	-159
Mean	-116	-103	-139	-112	-113	-123	-149	-132	-113	-116	-130	-128	-117	-160	-131	-148	-176	-179	-207	-217	-189	-133	-125	-124	-141
5Q Mean	-58	-44	-38	-31	-31	-17	-29	-69	-83	-40	-27	-31	-51	-20	-21	-21	-36	-47	-88	-49	-29	-22	-19	-40	-39
5D Mean	-264	-250	-299	-234	-297	-287	-262	-259	-173	-234	-293	-251	-164	-162	-192	-288	-345	-411	-563	-595	-520	-421	-297	-295	-306

1988

April

AL Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
1	-149	-151	-185	-143	-42	-55	-202	-290	-262	-103	-68	-102	-26	-94	-235	-356	-226	-242	-421	-528	-539	-288	-234	-338	-230
2	-96	-21	-57	-136	-109	-294	-475	-491	-348	-335	-692	-681	-482	-351	-209	-99	-56	-154	-364	-397	-211	-176	-169	-120	-272
D 3	-45	-116	-316	-139	-81	-125	-126	-309	-401	-485	-75	-25	-36	-31	-24	-37	-191	-731	-870	-1644	-517	-67	-42	-248	-278
D 4	-399	-396	-500	-656	-564	-446	-633	-557	-765	-1642	-1403	-777	-1175	-826	-647	-990	-908	-646	-707	-827	-708	-95	-12	-19	-679
D 5	-109	-312	-380	-154	-132	-254	-288	-422	-172	-34	-57	-33	-94	-23	-28	-34	-37	-37	-97	-392	-539	-493	-288	-594	-208
D 6	-896	-550	-776	-661	-572	-663	-204	-228	-287	-71	-433	-896	-343	-127	-101	-239	-502	-284	-236	-106	-21	-21	-44	-64	-347
7	-29	-51	-51	-89	-378	-227	-265	-366	-118	-103	-150	-185	-167	-94	-55	-61	-195	-445	-451	-182	-32	-54	-64	-23	-160
8	-28	-28	-28	-21	-13	-34	-24	-32	-51	-34	-27	-30	-37	-39	-41	-91	-144	-222	-222	-26	-29	-52	-11	-30	-54
9	-300	-400	-400	-70	-25	-18	-54	-26	-23	-44	-41	-246	-35	-32	-60	-136	-98	-32	-44	-9	-15	-22	-92	-62	-80
10	-6	-8	-21	-99	-89	-34	-121	-149	-247	-278	-307	-259	-369	-254	-357	-159	-37	-91	-52	-5	-34	-49	-174	-43	-135
11	-66	-215	-122	-69	-31	-48	-75	-65	-129	-55	-27	-32	-35	-87	-125	-191	-362	-289	-60	-18	-11	-22	-33	-47	-92
12	-192	-407	-388	-280	-87	-24	-22	-22	-24	-35	-104	-232	-318	-254	-274	-123	-315	-415	-100	-14	-60	-104	-61	-37	-162
13	-47	-37	-83	-30	-106	-44	-21	-54	-105	-48	-42	-58	-75	-76	-99	-31	-43	-90	-29	-15	-40	-282	-417	-79	-81
14	-140	-210	-70	-150	-215	-155	-50	-21	-76	-139	-57	-52	-176	-198	-94	-43	-18	-21	-75	-135	-101	-56	-119	-88	-102
Q 15	-23	-33	-32	-26	-36	-38	-41	-30	-28	-42	-48	-48	-39	-41	-166	-59	-18	-15	-22	-20	-13	-94	-156	-120	-50
Q 16	-32	-22	-17	-19	-18	-28	-24	-23	-33	-47	-45	-48	-42	-50	-325	-345	-271	-48	-27	-14	-15	-20	-25	-26	-65
Q 17	-27	-25	-16	-20	-24	-27	-26	-36	-35	-34	-40	-46	-48	-42	-36	-40	-39	-32	-20	-16	-19	-35	-24	-181	-37
18	-231	-208	-189	-127	-200	-250	-195	-142	-39	-31	-35	-36	-34	-32	-24	-29	-24	-11	-5	-5	-10	-8	-13	-19	-79
19	-20	-21	-15	-13	-24	-34	-32	-27	-19	-43	-32	-41	-33	-25	-29	-33	-95	-183	-118	-77	-44	-79	-49	-24	-46
20	-24	-24	-17	-18	-23	-32	-40	-32	-27	-34	-44	-89	-92	-202	-236	-153	-116	-431	-111	-19	-111	-252	-205	-248	-107
21	-209	-197	-143	-92	-77	-93	-64	-21	-31	-28	-30	-38	-34	-28	-30	-55	-43	-8	-3	-4	-3	-10	-37	-221	-62
D 22	-430	-443	-394	-593	-607	-433	-211	-244	-330	-281	-374	-369	-162	-57	-137	-580	-646	-298	-257	-433	-340	-293	-239	-139	-345
23	-195	-482	-317	-113	-78	-32	-270	-35	-14	-31	-46	-38	-51	-70	-35	-38	-29	-39	-52	-94	-80	-100	-45	-41	-95
24	-45	-96	-96	-48	-29	-31	-29	-45	-60	-44	-24	-23	-23	-20	-38	-86	-97	-43	-26	-90	-292	-117	-128	-114	-69
Q 25	-49	-29	-25	-21	-32	-15	-64	-61	-48	-95	-111	-119	-139	-66	-51	-42	-118	-184	-116	-217	-86	-26	-26	-20	-73
Q 26	-45	-72	-111	-217	-143	-35	-13	-21	-21	-25	-27	-63	-55	-22	-68	-67	-56	-18	-1	-12	-24	-38	-72	-20	-52
27	-14	-15	-45	-178	-82	-82	-31	-31	-20	-21	-22	-40	-45	-50	-94	-131	-178	-214	-232	-129	-123	-144	-83	-82	-87
28	-170	-190	-76	-25	-73	-298	-125	-90	-105	-204	-227	-136	-60	-34	-52	-19	-16	-64	-158	-185	-229	-296	-361	-386	-149
29	-333	-192	-141	-60	-20	-17	-59	-286	-103	-34	-70	-18	-13	-10	-12	-15	-10	-1	-1	-6	-13	-14	-20	-14	-61
30	-13	-17	-65	-50	-101	-61	-33	-169	-137	-56	-52	-113	-89	-18	-9	-4	-12	-11	-6	-5	-4	-32	-140	-69	-93
Mean	-143	-165	-158	-142	-133	-132	-126	-144	-135	-148	-157	-162	-144	-108	-123	-142	-163	-176	-162	-187	-142	-111	-112	-117	-143
5Q Mean	-35	-36	-40	-60	-50	-28	-33	-34	-33	-48	-54	-64	-64	-44	-129	-110	-100	-59	-37	-55	-31	-42	-60	-73	-55
5D Mean	-373	-363	-473	-440	-391	-384	-292	-352	-391	-502	-468	-420	-362	-212	-187	-376	-456	-399	-433	-680	-425	-193	-125	-212	-371

1988

May

AL Index (Hourly mean values, unit nr)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
1	-82	-99	-65	-23	-21	-72	-116	-58	-18	-38	-82	-109	-65	-71	-79	-77	-47	-53	-25	-8	-15	-37	-31	-29	-55
2	-27	-28	-28	-26	-99	-39	-22	-25	-26	-69	-136	-84	-41	-85	-195	-115	-179	-304	-152	-36	-55	-284	-261	-144	-102
3	-58	-32	-75	-96	-82	-92	-82	-58	-45	-80	-97	-66	-82	-41	-38	-38	-54	-80	-186	-369	-179	-76	-105	-208	-97
4	-310	-318	-296	-124	-221	-334	-318	-247	-185	-90	-56	-99	-48	-18	-14	-15	-13	-6	-77	-53	-252	-108	-30	-25	-136
5	-36	-31	-25	-24	-24	-23	-25	-56	-235	-246	-597	-339	-147	-225	-30	-20	-22	-19	-26	-70	-146	-118	-161	-431	-128
D	-939	-634	-207	-111	-108	-187	-364	-489	-1204	-604	-517	-383	-749	-1016	-729	-638	-611	-239	-168	-228	-345	-193	-144	-78	-454
7	-27	-26	-30	-41	-68	-36	-53	-34	-43	-48	-47	-96	-108	-246	-51	-44	-54	-126	-318	-399	-185	-192	-253	-310	-118
D	-152	-63	-100	-177	-127	-127	-163	-25	-30	-44	-177	-441	-320	-204	-215	-535	-536	-536	-194	-101	-53	-125	-293	-202	-185
9	-74	-49	-67	-86	-130	-148	-52	-35	-355	-291	-143	-66	-57	-107	-116	-35	-63	-120	-35	-60	-46	-57	-64	-23	-95
10	-113	-327	-239	-114	-43	-180	-171	-100	-127	-114	-89	-161	-137	-87	-109	-199	-261	-112	-50	-12	-16	-22	-111	-158	-127
11	-37	-65	-96	-102	-180	-158	-86	-95	-149	-101	-93	-139	-127	-88	-126	-117	-76	-32	-92	-75	-41	-46	-31	-34	-91
12	-51	-177	-96	-54	-75	-35	-26	-33	-22	-28	-25	-33	-37	-50	-51	-71	-90	-46	-25	-14	-16	-43	-77	-120	-54
Q	-97	-88	-125	-63	-28	-31	-21	-22	-28	-26	-27	-64	-151	-117	-81	-53	-47	-76	-34	-11	-12	-22	-24	-25	-53
Q	-24	-26	-27	-29	-29	-31	-40	-44	-30	-32	-48	-101	-67	-84	-101	-64	-19	-18	-54	-61	-20	-15	-24	-25	-42
15	-36	-44	-52	-94	-292	-163	-44	-24	-32	-32	-28	-23	-25	-19	-24	-26	-20	-48	-40	-24	-21	-16	-19	-15	-48
16	-19	-27	-34	-185	-197	-147	-193	-149	-129	-234	-229	-291	-235	-264	-225	-368	-93	-14	-9	-18	-40	-60	-182	-139	-145
17	-161	-143	-145	-167	-283	-375	-142	-61	-64	-403	-493	-563	-444	-655	-262	-90	-147	-120	-220	-348	-230	-190	-361	-410	-270
D	-214	-406	-357	-100	-136	-245	-272	-417	-485	-319	-213	-179	-329	-214	-224	-75	-33	-32	-27	-61	-42	-99	-255	-323	-211
19	-256	-187	-141	-62	-43	-36	-41	-90	-166	-266	-139	-76	-48	-153	-158	-102	-129	-90	-33	-32	-12	-21	-31	-42	-98
20	-146	-290	-276	-151	-47	-57	-48	-44	-33	-40	-23	-20	-12	-17	-25	-29	-36	-39	-34	-66	-141	-93	-33	-33	-72
21	-30	-27	-50	-183	-159	-153	-235	-137	-27	-18	-21	-53	-39	-66	-24	-38	-173	-145	-82	-23	-27	-95	-136	-320	-94
22	-169	-24	-128	-167	-147	-124	-76	-135	-125	-51	-20	-39	-129	-254	-246	-224	-208	-86	-30	-52	-22	-21	-24	-27	-105
23	-28	-35	-34	-77	-109	-41	-35	-54	-124	-50	-25	-29	-26	-19	-16	-26	-30	-57	-110	-100	-77	-100	-212	-172	-66
24	-75	-81	-57	-30	-38	-165	-41	-33	-33	-40	-27	-40	-84	-257	-252	-78	-32	-21	-54	-149	-136	-28	-24	-40	-76
25	-86	-89	-107	-23	-30	-33	-24	-53	-15	-24	-27	-75	-91	-39	-38	-52	-45	-25	-39	-30	-58	-198	-323	-139	-69
26	-59	-82	-120	-231	-287	-103	-22	-25	-34	-36	-38	-40	-42	-20	-22	-52	-125	-44	-11	-10	-5	-14	-25	-31	-61
Q	-32	-36	-32	-26	-21	-20	-20	-30	-32	-31	-37	-36	-39	-27	-18	-31	-15	-6	-29	-45	-35	-29	-23	-28	-34
Q	-26	-26	-26	-26	-18	-17	-20	-19	-20	-25	-32	-36	-30	-25	-26	-35	-60	-117	-40	-32	-32	-32	-31	-26	-34
29	-15	-13	-16	-13	-14	-76	-163	-166	-99	-29	-28	-37	-28	-27	-72	-56	-72	-30	-2	-9	-27	-151	-76	-52	
30	-28	-43	-47	-227	-102	-32	-42	-155	-175	-24	-14	-32	-50	-44	-23	-57	-17	-20	-27	-51	-182	-216	-234	-119	-82
31	-134	-259	-85	-74	-57	-58	-32	-12	-50	-37	-53	-156	-118	-65	-39	-35	-54	-56	-54	-47	-64	-36	-40	-81	-71
Mean	-114	-121	-102	-94	-103	-106	-94	-98	-133	-111	-111	-117	-129	-152	-116	-99	-108	-87	-72	-83	-82	-88	-117	-121	-107
5Q Mean	-46	-70	-61	-46	-34	-26	-25	-29	-26	-28	-33	-54	-64	-60	-55	-49	-49	-54	-31	-29	-25	-29	-37	-43	-42
5D Mean	-300	-255	-166	-115	-135	-181	-180	-237	-402	-320	-372	-328	-422	-486	-289	-207	-269	-189	-127	-161	-163	-145	-242	-288	-249

AL Index (Hourly mean values, unit nT) 1988

Date	June																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	-53	-30	-42	-44	-33	-46	-35	-42	-44	-123	-186	-139	-70	-72	-109	-68	-17	-32	-103	-170	-48	-63	-36	-38	-68
Q 2	-54	-34	-31	-33	-17	-27	-33	-34	-35	-41	-43	-83	-71	-59	-64	-41	-26	-23	-36	-24	-29	-39	-30	-29	-39
Q 3	-29	-30	-38	-34	-33	-36	-32	-28	-42	-51	-71	-49	-29	-25	-24	-27	-30	-17	-21	-28	-34	-43	-37	-33	-34
Q 4	-30	-34	-35	-38	-45	-43	-41	-41	-36	-42	-43	-38	-42	-45	-30	-55	-124	-122	-101	-123	-53	-38	-39	-34	-53
Q 5	-37	-32	-36	-39	-27	-31	-39	-44	-35	-41	-39	-36	-54	-77	-130	-95	-65	-25	-23	-122	-322	-435	-329	-365	-103
6	-432	-444	-296	-207	-80	-35	-39	-38	-21	-18	-22	-20	-15	-10	-14	-26	-29	-24	-14	-19	-25	-31	-38	-40	-81
7	-29	-21	-25	-30	-37	-40	-38	-37	-209	-145	-45	-44	-34	-39	-54	-122	-187	-96	-83	-87	-97	-137	-147	-252	-85
8	-60	-54	-87	-194	-123	-54	-120	-126	-94	-93	-173	-72	-110	-96	-54	-67	-115	-269	-122	-54	-59	-82	-42	-47	-99
9	-33	-28	-29	-24	-23	-19	-25	-25	-29	-35	-33	-31	-34	-122	-206	-219	-231	-251	-344	-286	-193	-57	-62	-72	-100
10	-72	-41	-156	-340	-196	-89	-42	-48	-29	-21	-11	-15	-6	-6	-18	-52	-131	-66	-30	-15	-22	-44	-68	-61	-66
11	-57	-70	-91	-148	-172	-257	-224	-41	-68	-106	-49	-23	-38	-29	-103	-276	-117	-49	-51	-47	-81	-21	-23	-37	-91
Q 12	-61	-57	-53	-45	-34	-43	-46	-32	-31	-30	-50	-66	-63	-5	-4	-6	-12	-16	-16	-20	-28	-31	-41	-47	-35
13	-53	-71	-169	-80	-42	-28	-43	-36	-29	-27	-25	-28	-25	-14	-23	-26	-58	-33	-20	-34	-62	-53	-26	-38	-43
D 14	-167	-316	-489	-490	-319	-191	-116	-43	-228	-312	-144	-112	-272	-219	-142	-113	-160	-220	-283	-213	-153	-188	-146	-146	-216
15	-183	-225	-170	-139	-159	-133	-73	-66	-219	-133	-37	-34	-29	-33	-53	-90	-61	-107	-172	-115	-126	-146	-244	-217	-123
16	-273	-309	-228	-150	-85	-61	-173	-51	-38	-80	-60	-65	-61	-191	-88	-75	-100	-139	-88	-152	-142	-134	-153	-155	-127
17	-87	-83	-306	-375	-242	-345	-449	-314	-102	-103	-65	-126	-131	-133	-50	-103	-134	-149	-92	-76	-51	-47	-98	-246	-163
18	-171	-35	-57	-116	-194	-158	-41	-174	-194	-152	-50	-32	-50	-118	-386	-282	-185	-139	-75	-70	-32	-40	-54	-65	-120
D 19	-148	-311	-348	-241	-101	-90	-217	-121	-32	-410	-410	-447	-365	-178	-272	-295	-398	-264	-308	-224	-68	-41	-42	-69	-225
20	-266	-298	-375	-442	-410	-412	-642	-317	-186	-84	-41	-108	-201	-86	-26	-29	-21	-61	-26	-22	-20	-24	-31	-35	-173
Q 21	-26	-31	-45	-69	-150	-100	-79	-40	-28	-28	-162	-130	-160	-228	-82	-41	-15	-9	-14	-63	-34	-46	-44	-32	-69
22	-99	-76	-100	-84	-141	-133	-186	-152	-49	-173	-210	-142	-78	-236	-124	-89	-132	-155	-384	-192	-110	-64	-60	-91	-136
23	-148	-80	-79	-214	-246	-181	-29	-42	-28	-34	-26	-42	-97	-58	-76	-110	-180	-248	-176	-87	-64	-119	-166	-60	-108
24	-36	-59	-82	-93	-287	-307	-48	-15	-22	-25	-34	-47	-98	-416	-474	-403	-246	-143	-64	-152	-347	-417	-302	-263	-183
D 25	-246	-142	-210	-235	-301	-341	-500	-246	-369	-357	-60	-83	-136	-64	-53	-77	-168	-419	-120	-10	-8	-23	-43	-174	-183
26	-221	-123	-42	-33	-59	-83	-82	-211	-141	-32	-52	-101	-85	-112	-78	-47	-72	-81	-263	-297	-514	-457	-480	-303	-165
27	-202	-160	-264	-118	-40	-35	-23	-21	-26	-24	-67	-104	-75	-81	-60	-88	-134	-50	-79	-83	-210	-199	-106	-87	-97
28	-89	-183	-155	-65	-172	-274	-158	-126	-231	-268	-420	-210	-191	-198	-136	-58	-66	-85	-46	-38	-68	-86	-110	-71	-146
D 29	-35	-24	-21	-43	-246	-600	-310	-140	-145	-184	-216	-132	-87	-113	-271	-426	-338	-365	-523	-708	-502	-284	-235	-281	-260
D 30	-359	-289	-554	-455	-343	-314	-157	-75	-295	-274	-106	-77	-215	-539	-632	-648	-449	-612	-397	-235	-128	-44	-103	-206	-313
Mean	-125	-123	-153	-153	-145	-150	-134	-90	-101	-114	-98	-87	-97	-120	-127	-135	-133	-142	-135	-125	-121	-114	-111	-119	-123
5Q Mean	-40	-37	-40	-43	-55	-49	-46	-35	-34	-38	-73	-73	-73	-72	-40	-34	-41	-37	-37	-51	-35	-39	-38	-35	-46
5D Mean	-191	-216	-324	-292	-262	-307	-260	-125	-213	-307	-187	-170	-215	-222	-274	-311	-302	-376	-326	-278	-171	-116	-113	-175	-239

AE Index (Hourly mean values, unit nr) January 1988

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
D	34	38	32	33	30	38	44	70	33	69	73	279	235	67	32	59	40	100	45	22	20	28	37	77	64
	64	125	115	69	83	140	212	174	173	313	704	811	773	319	632	1109	939	633	981	1137	861	478	151	100	462
	3	106	147	88	104	85	226	104	60	89	74	157	134	84	65	77	66	74	66	55	104	139	99	125	102
	4	176	299	163	55	75	66	77	93	71	83	106	143	326	180	87	200	252	231	106	205	422	465	795	198
	5	376	196	138	282	366	421	409	551	356	114	83	180	554	388	141	54	57	39	35	59	179	550	434	250
D	6	358	170	80	94	102	53	70	247	344	185	252	316	222	105	58	277	1088	950	661	250	96	130	465	286
D	7	684	737	439	365	240	74	79	121	176	280	280	205	112	102	55	123	281	236	142	119	272	309	413	163
	8	149	279	278	300	460	173	115	53	62	74	172	715	678	319	81	106	494	498	138	231	154	109	82	74
	9	91	76	112	137	153	168	131	107	126	216	87	49	29	31	32	55	35	28	23	82	50	42	47	81
	10	26	26	32	31	25	22	22	27	28	25	33	36	57	51	98	71	44	39	51	36	178	344	226	120
	11	135	211	258	258	167	274	447	94	46	31	31	32	31	38	34	36	35	34	28	31	28	21	21	19
	12	24	27	28	35	29	31	64	156	236	784	512	533	1117	355	100	220	471	134	350	397	179	42	32	27
	13	28	31	36	43	31	21	59	60	154	242	164	152	103	229	300	172	96	91	161	261	193	52	29	101
D	14	444	409	198	362	319	327	136	119	64	58	55	43	96	331	296	305	956	787	846	1128	973	615	600	960
D	15	840	922	763	1154	884	1205	1245	1080	833	684	583	380	321	224	466	593	550	570	498	435	394	202	242	237
	16	75	51	41	41	29	36	71	121	301	195	183	185	363	353	120	41	39	31	24	48	45	52	127	83
	17	39	30	28	54	51	56	163	113	62	66	84	117	157	70	110	556	472	542	490	299	96	105	181	252
	18	70	64	76	77	50	58	76	173	326	255	134	91	70	59	82	216	579	540	626	704	350	101	227	162
	19	79	35	117	80	102	166	425	287	336	260	234	148	142	166	95	219	250	259	207	157	90	75	54	90
	20	77	97	184	67	35	81	194	325	217	111	93	117	178	397	362	209	218	303	211	109	67	176	342	183
	21	194	209	240	195	312	250	41	43	78	75	88	105	202	145	39	31	35	39	95	201	176	112	81	75
	22	47	53	109	65	75	181	56	25	39	56	69	115	118	146	482	293	75	67	148	147	82	34	24	27
	23	33	35	24	26	30	21	37	41	30	35	28	23	30	32	73	47	47	31	26	24	26	24	22	18
Q	24	17	16	17	29	18	21	35	68	165	176	126	62	71	249	113	86	161	212	107	72	70	94	219	65
Q	25	97	111	98	84	60	97	247	160	159	164	150	92	89	149	189	161	244	334	282	285	265	256	248	175
	26	50	26	24	24	23	22	30	46	111	205	264	348	325	275	148	110	38	43	64	338	623	321	165	105
	27	173	298	192	182	217	390	380	315	293	188	242	769	290	163	107	99	101	96	210	101	140	264	87	60
	28	72	63	97	105	251	170	131	136	105	127	229	226	96	83	117	147	49	30	26	16	18	23	21	17
Q	29	20	23	70	125	74	48	35	35	51	49	149	78	94	111	95	80	207	61	60	25	26	98	41	42
Q	30	31	29	32	22	26	24	18	21	27	31	29	30	28	29	29	31	43	48	63	87	114	153	45	42
Q	31	29	36	49	53	79	55	43	51	87	121	48	39	84	258	190	52	35	24	48	60	78	30	30	54
Mean	149	157	134	146	144	158	168	161	166	172	172	210	226	186	160	177	229	234	232	238	198	159	166	167	180
5Q Mean	26	27	38	51	45	33	33	43	72	81	76	46	61	135	100	58	96	74	57	48	57	72	93	44	61
5D Mean	478	472	319	408	325	359	348	348	318	304	374	351	320	239	310	437	600	662	683	696	550	340	307	385	414

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Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	118	76	41	32	37	36	33	26	20	24	26	29	34	34	38	38	36	30	22	22	26	25	21	23	35
Q 2	27	23	43	34	31	22	22	27	20	20	19	35	50	51	39	40	38	32	61	358	273	92	44	49	60
Q 3	46	38	18	23	19	15	33	60	68	174	106	44	33	66	45	22	23	17	19	19	17	20	16	20	40
Q 4	20	27	43	52	46	49	64	83	128	139	26	28	76	232	167	85	143	159	55	16	26	163	342	375	106
D 5	329	329	234	293	401	638	779	729	764	600	254	267	248	246	206	80	198	776	697	272	63	76	215	221	371
D 6	253	108	98	117	144	98	81	106	184	184	234	89	86	246	226	253	194	93	47	40	69	186	392	296	156
D 7	220	206	165	161	124	61	61	52	78	103	131	71	26	27	23	42	40	62	41	106	69	48	60	57	85
D 8	63	57	26	23	28	29	25	23	38	25	23	48	38	27	24	84	209	205	183	214	415	126	51	52	85
D 9	43	45	58	61	63	61	69	172	210	285	287	178	136	190	153	406	392	268	315	408	503	389	194	243	214
D 10	136	73	59	71	169	330	429	212	219	276	165	523	436	627	582	138	84	45	81	182	97	44	45	39	211
D 11	29	38	33	16	14	14	18	51	209	393	402	628	588	581	352	136	99	236	130	88	266	339	64	71	200
D 12	76	297	197	162	214	436	489	530	155	68	179	198	147	70	42	140	77	200	547	490	123	141	83	87	214
D 13	56	126	135	125	350	440	381	245	270	191	233	557	550	487	358	261	554	387	240	44	44	36	39	47	256
D 14	33	39	43	33	27	26	48	71	66	71	50	62	47	167	95	48	38	27	56	65	44	71	88	56	57
D 15	93	161	195	108	190	312	539	569	501	745	806	769	462	359	281	872	627	131	66	216	297	55	79	59	354
D 16	59	34	53	29	16	40	160	102	29	126	115	77	160	524	789	776	688	912	773	590	442	77	65	59	279
D 17	86	184	273	185	88	43	34	31	36	95	548	439	81	42	97	224	485	191	45	50	94	384	484	458	195
D 18	494	412	145	171	86	51	145	206	119	341	544	145	74	53	62	136	260	98	50	58	189	630	332	95	204
D 19	67	56	74	157	66	114	127	56	37	36	44	164	183	118	96	160	262	135	124	301	82	61	41	43	109
D 20	46	48	46	41	35	33	30	30	27	31	37	54	77	117	156	82	220	74	93	118	165	158	154	169	85
D 21	90	65	229	377	400	241	350	482	584	225	131	117	367	234	260	300	210	212	293	399	454	508	584	552	319
D 22	1034	909	1127	1348	980	1012	1374	1389	933	992	1364	1826	1830	1442	1622	1555	1637	700	736	608	642	506	420	468	1102
D 23	988	884	815	848	1047	840	523	421	484	532	524	472	272	95	73	149	443	636	410	304	134	62	45	50	460
D 24	89	245	334	296	119	70	156	247	254	338	292	229	88	227	367	147	149	141	152	430	346	83	62	45	204
D 25	47	90	283	274	177	286	142	68	241	229	191	122	257	491	322	179	280	321	318	404	529	336	147	78	242
D 26	135	304	151	73	78	77	91	234	187	65	161	144	64	83	211	161	293	668	790	679	692	576	242	167	264
D 27	99	125	142	233	206	86	241	255	245	110	84	47	50	108	127	32	38	81	92	152	148	150	227	211	137
D 28	92	92	137	173	155	179	205	201	169	63	36	45	162	265	180	150	142	79	80	256	52	29	37	79	127
Q 29	59	40	29	26	28	48	51	104	89	49	45	35	37	48	53	65	111	120	72	217	92	60	33	35	64
Mean	169	176	180	191	183	197	231	233	216	225	243	256	229	250	242	233	274	242	227	245	220	187	158	144	215
5Q Mean	68	53	53	57	54	60	68	83	73	66	46	37	63	92	71	63	70	55	50	174	92	45	30	41	65
5D Mean	506	469	520	594	603	608	713	718	653	618	615	690	635	475	488	591	623	491	440	359	318	241	268	270	521

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Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q	1	29	92	38	41	31	114	272	172	48	40	93	148	46	44	41	100	99	162	142	67	67	63	94	89
	2	40	32	29	23	20	32	106	318	272	67	38	37	43	34	105	91	48	36	34	23	78	317	88	80
	3	63	58	86	80	33	47	224	351	185	91	33	33	36	40	27	97	189	82	53	39	40	119	254	97
	4	202	280	527	269	295	398	479	495	293	385	176	149	237	459	827	760	565	358	221	74	55	105	189	353
	5	112	86	101	227	91	88	119	101	166	259	199	226	90	63	103	125	143	77	149	146	304	230	368	151
	6	756	442	752	579	498	410	451	475	377	470	448	512	856	695	570	708	497	234	342	532	103	48	50	467
	7	77	247	128	237	226	294	479	429	104	54	60	36	32	26	23	123	193	481	997	443	182	425	305	234
	8	176	95	65	53	154	499	697	337	106	193	639	381	299	944	530	161	168	228	272	66	83	123	128	274
	9	135	67	66	84	260	455	271	148	97	150	509	127	48	42	50	101	323	248	44	47	62	36	38	155
	10	33	34	41	29	25	28	43	62	39	43	50	286	406	132	412	253	86	164	197	576	319	472	247	167
	11	367	222	159	313	274	75	168	91	61	66	120	449	835	437	123	63	110	92	321	232	69	55	140	204
	12	92	51	37	71	78	59	255	120	84	109	288	234	46	58	111	284	291	82	103	130	475	231	258	151
	13	211	75	58	24	34	37	48	73	171	121	58	33	42	33	27	41	141	280	69	25	35	29	68	74
Q	14	131	100	42	40	47	148	400	111	74	32	37	106	233	324	235	306	251	439	385	325	149	436	457	215
	15	117	97	87	108	48	240	375	367	303	296	201	196	359	208	83	97	188	474	632	853	404	227	295	265
	16	330	427	662	389	219	278	439	455	607	459	364	242	69	30	61	43	61	149	390	142	153	101	98	258
	17	73	107	118	61	101	252	187	211	124	71	212	363	49	36	115	159	133	53	97	132	258	114	44	39
	18	43	78	125	111	75	88	93	94	173	104	227	135	67	49	178	262	292	257	132	72	113	102	59	125
Q	19	43	40	63	139	125	74	48	114	165	100	61	70	130	46	42	43	34	39	100	70	52	53	60	73
	20	51	44	36	29	26	31	34	31	225	307	340	194	543	176	46	40	38	40	39	29	28	30	38	102
Q	21	37	38	30	32	30	35	35	27	31	54	56	50	46	43	39	36	44	60	40	38	50	60	119	45
Q	22	153	142	94	52	39	38	29	29	27	34	38	39	40	51	61	49	44	39	32	32	53	47	52	53
	23	45	46	41	36	36	39	44	37	49	46	47	43	52	98	353	352	189	136	90	90	62	65	66	101
	24	73	116	354	234	76	34	34	31	30	39	41	39	40	44	43	52	55	38	30	33	42	83	54	69
	25	49	43	42	46	75	160	343	191	125	126	146	87	143	465	233	387	593	701	487	394	138	100	83	239
D	26	294	327	213	224	388	489	502	691	458	671	356	86	72	238	426	972	814	927	1144	1198	882	655	613	564
D	27	399	482	853	257	211	225	274	128	136	171	306	197	39	51	112	325	591	575	820	782	753	754	532	401
D	28	350	256	188	181	370	426	443	329	279	424	702	703	366	271	104	101	209	796	1090	998	1042	844	623	486
D	29	371	374	282	356	511	413	544	563	581	662	637	213	193	421	490	714	945	773	836	834	343	178	325	488
D	30	432	436	759	822	946	583	417	475	161	70	212	725	578	263	314	176	190	201	171	225	172	424	330	326
D	31	274	221	230	430	560	266	75	53	59	81	316	271	342	177	235	372	385	442	366	200	277	328	324	264
Mean	179	166	204	180	192	211	242	221	191	195	210	198	181	225	192	218	259	270	299	312	273	211	201	198	218
5Q Mean	94	78	67	57	53	43	54	103	113	71	50	57	81	43	43	39	52	71	114	76	50	52	50	78	66
5D Mean	369	375	459	368	485	487	436	437	323	399	442	384	249	248	289	457	549	654	763	796	701	609	463	437	466

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Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
1	324	287	272	247	152	118	294	440	445	274	187	153	72	183	305	515	379	373	645	829	797	501	415	581	366
2	264	105	157	220	242	477	666	675	508	544	966	912	675	562	334	181	100	229	526	608	422	375	339	220	429
D	3	127	241	457	170	236	280	494	634	799	195	76	66	48	40	58	298	957	1007	1764	642	182	107	292	394
D	4	465	486	665	917	700	593	783	750	996	1734	1599	1077	1354	1093	980	1226	1021	828	970	958	936	211	86	102
D	5	231	454	471	250	310	392	411	571	240	64	126	103	123	56	59	61	182	554	734	722	534	755	314	314
D	6	1084	742	987	966	803	912	528	578	411	173	577	1151	578	245	184	366	759	387	418	201	63	80	127	516
7	80	92	94	200	524	329	374	436	195	184	219	244	244	171	118	83	297	569	576	251	69	115	117	52	235
8	75	62	50	37	29	57	53	72	87	67	51	53	66	63	71	140	202	292	269	52	74	74	30	73	87
9	433	531	146	59	38	89	61	72	60	89	131	346	78	87	121	198	122	73	84	37	48	80	150	95	135
10	34	30	48	182	125	71	223	300	400	445	553	423	512	361	490	218	64	134	97	52	103	130	245	98	222
11	141	269	158	124	67	127	142	119	173	112	53	71	77	187	187	266	567	406	108	59	43	55	81	92	153
12	283	506	514	408	165	63	46	63	77	136	233	359	517	367	418	208	441	560	174	55	129	159	120	96	254
13	111	106	142	70	158	90	50	110	150	107	95	140	138	135	168	64	67	124	76	54	122	429	598	168	145
14	252	324	122	252	317	231	114	76	159	234	112	118	256	257	157	71	42	64	119	181	173	121	205	135	171
Q	15	73	72	60	46	51	60	57	61	72	79	88	71	96	222	117	46	51	54	51	49	149	224	186	87
Q	16	73	60	38	35	30	39	52	76	72	79	72	80	118	440	491	374	77	63	38	35	37	41	48	105
Q	17	48	51	48	45	46	49	52	56	57	61	70	72	69	60	66	65	59	37	38	44	63	91	322	68
18	390	397	363	289	422	477	378	314	102	80	71	59	53	53	51	51	53	39	31	32	43	39	35	39	161
19	44	42	45	66	63	55	53	50	75	81	61	67	64	60	69	81	141	254	172	126	127	163	103	73	89
20	58	41	32	33	37	52	65	59	55	78	129	182	154	292	313	222	238	623	215	87	214	391	406	487	186
21	449	416	347	261	251	320	235	65	73	52	64	101	78	93	103	137	112	52	43	44	43	52	115	401	163
D	22	584	620	593	923	919	786	485	433	400	535	505	287	148	263	902	1023	532	453	706	542	504	398	359	557
23	373	750	587	318	291	271	493	124	52	68	85	66	127	127	59	66	46	77	101	164	144	150	93	86	197
24	84	135	128	80	49	57	57	88	90	73	45	41	41	42	66	110	120	67	57	189	416	253	289	228	117
Q	25	103	55	38	56	56	132	132	126	191	260	208	243	161	126	87	173	260	202	357	187	100	95	96	145
Q	26	116	151	204	303	189	83	53	63	67	82	149	101	53	116	106	90	43	28	53	72	94	132	63	103
27	52	67	102	239	149	160	79	66	58	73	71	117	99	118	146	194	243	330	416	338	331	351	313	278	183
28	319	334	174	113	278	554	260	234	268	469	481	328	208	122	92	50	66	133	319	357	411	580	708	682	314
29	585	391	310	159	66	44	167	374	181	147	141	65	40	30	38	41	35	22	23	31	41	40	52	48	128
30	51	65	118	103	146	112	73	264	199	116	155	230	174	63	37	28	42	45	43	50	46	111	253	173	112
Mean	243	262	249	242	228	232	223	240	216	235	249	252	221	182	194	213	242	257	250	277	236	209	215	215	233
5Q Mean	82	77	77	93	74	57	69	70	76	91	112	117	113	99	192	173	149	98	76	107	77	88	116	143	101
5D Mean	498	508	634	666	580	583	497	572	542	634	606	582	481	318	305	523	632	553	606	836	583	337	241	327	527

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Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
1	183	197	137	55	52	150	195	139	64	96	180	198	135	123	136	127	81	102	69	42	54	84	57	52	113
2	46	42	57	96	185	114	100	103	130	218	236	192	107	155	277	176	263	409	245	131	203	445	413	299	194
3	120	84	185	240	234	282	265	175	123	165	163	156	179	121	68	63	93	149	320	628	372	232	255	409	212
4	509	518	479	275	420	584	537	417	398	243	174	202	118	66	76	51	37	45	186	208	451	231	96	59	266
D	74	59	46	44	42	52	103	135	376	428	990	671	292	318	60	55	65	49	81	165	302	252	381	730	240
D	1131	951	375	275	303	680	743	949	1334	693	577	523	1166	1293	1133	1119	1096	466	410	397	559	312	235	118	702
7	80	57	55	75	92	47	78	76	70	62	64	195	199	307	103	90	85	212	492	591	308	279	371	477	186
D	235	115	169	233	156	112	155	190	62	54	102	280	589	489	262	339	770	757	299	173	120	216	429	292	275
9	122	80	113	153	205	217	89	96	512	431	226	149	121	170	198	67	150	168	79	130	107	141	118	66	163
10	244	457	345	213	119	383	259	210	247	219	226	262	232	154	178	257	369	215	123	80	82	76	188	252	225
11	76	98	123	152	291	273	235	191	283	208	215	223	180	144	191	169	123	75	143	126	109	85	55	67	160
12	113	254	135	82	109	58	43	61	53	58	64	129	119	114	90	106	127	73	55	48	55	104	143	216	100
Q	183	152	204	111	65	57	45	62	76	65	67	150	237	207	121	76	84	122	71	39	37	45	47	48	99
Q	49	39	44	48	59	74	102	117	91	109	122	170	128	151	137	88	46	57	104	94	46	40	41	48	84
15	84	117	120	214	555	278	77	52	82	75	59	56	74	43	45	48	48	80	68	53	58	47	58	45	102
16	55	65	95	292	391	350	396	286	256	398	439	523	416	450	406	614	197	60	56	47	104	148	284	283	275
D	295	277	276	343	552	654	287	131	212	705	801	834	794	1080	517	196	240	195	388	534	406	369	609	602	471
D	381	563	527	197	319	419	416	653	785	601	471	379	519	365	317	99	65	65	39	121	103	226	456	561	360
19	502	408	278	113	59	51	83	175	286	410	261	175	115	225	201	164	170	141	90	70	45	39	56	73	174
20	271	453	422	266	102	104	69	61	48	51	43	46	48	40	52	59	65	75	85	156	250	196	97	89	131
21	60	54	152	293	279	338	370	255	77	73	107	167	123	173	59	106	295	244	180	98	133	227	279	527	195
22	303	104	273	254	274	256	171	317	320	141	95	126	241	374	333	333	349	150	79	121	69	45	57	58	202
23	68	72	81	177	151	107	102	128	194	91	53	60	67	46	46	53	66	109	174	182	184	244	433	352	135
24	218	202	148	85	138	302	109	153	144	141	97	104	191	394	361	129	69	70	131	294	261	93	88	102	168
25	166	159	149	53	57	61	55	102	65	89	98	167	153	80	67	67	71	49	79	78	127	328	482	220	126
26	127	196	276	431	514	265	69	57	86	88	145	148	137	103	85	102	207	127	53	43	38	40	48	54	143
Q	46	46	54	44	49	35	39	45	50	64	63	68	73	51	34	46	62	55	52	86	94	72	58	48	56
Q	60	77	66	92	40	36	38	44	46	57	61	62	60	56	56	68	95	150	74	73	69	65	64	61	65
29	48	46	56	39	50	161	326	337	264	144	91	108	94	170	107	121	75	53	53	59	95	266	180	100	128
30	90	130	147	358	218	103	220	334	306	82	75	129	100	130	82	73	49	61	90	143	384	456	403	217	182
31	267	408	147	152	85	82	61	67	166	141	233	283	216	147	96	89	121	118	120	112	123	99	117	159	150
Mean	200	209	184	175	198	215	188	197	232	206	212	223	233	247	192	165	183	152	144	165	172	177	212	215	196
5Q Mean	90	113	100	75	64	52	53	65	63	70	75	115	123	115	87	76	82	91	71	68	60	65	70	84	80
5D Mean	423	393	278	218	274	383	340	411	553	496	588	537	672	709	457	361	447	306	243	278	298	275	422	460	409

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June

AE Index (Hourly mean values, unit nF)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q	98	53	55	77	73	90	91	119	129	213	333	248	135	134	177	135	77	101	199	271	113	148	84	109	136
Q	135	74	45	53	50	63	58	62	71	102	139	205	154	119	106	72	58	61	85	59	58	89	54	58	85
Q	51	48	54	51	47	44	44	62	87	110	129	112	61	57	58	47	50	44	54	68	71	73	70	64	65
Q	66	76	80	68	65	62	62	68	62	72	89	82	84	105	91	115	156	173	164	193	114	92	71	63	95
	67	67	71	64	78	99	110	115	89	89	89	77	128	175	222	184	104	58	77	294	575	783	716	704	210
	661	708	595	500	246	105	68	47	35	33	38	38	38	30	32	44	52	44	41	46	47	49	55	60	150
	52	43	44	45	51	50	87	144	404	247	82	60	47	49	84	169	233	150	167	184	244	282	316	409	152
	168	173	274	354	330	193	270	226	228	197	298	141	219	174	126	132	186	359	243	173	232	194	84	80	211
	66	57	49	50	44	53	68	91	80	75	79	86	89	218	330	313	347	371	607	596	373	161	126	156	187
	201	126	337	673	472	176	105	110	106	66	84	81	62	52	69	111	189	130	86	66	61	105	132	157	157
	146	186	175	261	292	492	380	133	128	203	104	51	82	79	180	369	191	105	136	111	125	51	48	69	171
Q	85	79	79	69	93	78	95	65	68	65	132	149	119	40	39	31	35	39	31	42	53	59	65	80	70
	102	162	262	121	80	44	62	63	66	62	67	57	80	79	74	60	97	71	75	93	118	122	102	176	96
D	409	621	719	877	714	450	242	108	479	597	327	261	470	303	185	200	319	397	462	383	315	367	317	320	410
	339	381	340	251	259	211	168	153	334	186	70	64	53	73	75	118	93	150	253	207	249	287	493	456	219
	563	576	414	336	144	165	298	148	109	197	159	124	131	276	136	127	154	198	177	289	272	259	290	338	245
	229	213	509	632	544	615	776	512	241	231	156	235	258	220	92	158	205	243	165	165	123	103	267	453	306
	315	87	164	195	296	248	91	296	395	346	121	64	108	251	548	433	303	282	163	212	125	118	123	171	227
D	275	510	529	389	224	280	364	214	127	699	615	765	656	332	428	552	699	486	578	438	154	116	116	160	404
	489	494	622	784	697	681	905	476	332	153	93	261	302	151	60	54	70	99	52	55	45	36	51	63	293
Q	52	59	101	151	225	195	133	79	87	117	321	247	285	344	125	93	59	54	56	101	81	76	84	77	133
	208	180	200	185	326	277	416	274	167	387	403	261	156	352	202	142	220	294	586	359	228	159	142	199	263
	302	166	172	358	546	382	77	75	73	69	72	168	179	94	117	148	249	376	341	200	134	231	302	176	209
	107	133	201	176	602	491	147	72	74	81	90	139	225	641	775	704	566	299	177	333	593	762	670	578	360
D	429	299	418	461	533	588	770	483	714	597	235	311	250	116	84	134	384	677	262	78	58	66	85	398	351
	394	257	120	100	178	249	230	434	282	123	148	278	216	237	180	160	150	271	585	623	919	831	770	579	346
	399	283	401	246	63	63	54	53	56	123	187	212	172	188	133	168	197	131	173	252	401	322	221	196	196
	204	322	267	136	288	417	316	316	443	473	727	443	339	312	185	99	92	113	97	82	144	189	192	159	265
D	117	91	63	106	545	878	590	343	293	338	437	271	148	186	456	666	585	664	946	1106	1013	556	425	545	474
D	581	489	880	681	553	532	304	186	456	438	197	164	382	782	1026	1126	886	997	735	453	312	160	190	404	538
Mean	243	233	274	281	288	275	246	184	207	222	200	188	187	205	213	228	233	247	259	251	245	228	222	248	234
5Q Mean	77	67	71	78	96	89	78	67	75	93	162	159	140	133	83	71	71	74	78	92	75	77	68	68	89
5D Mean	362	402	521	502	513	545	454	266	413	533	362	354	381	343	435	535	574	644	596	491	370	253	226	365	435

AO Index (Hourly mean values, unit nT) January 1988

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
D	1	8	6	14	12	17	13	18	14	7	10	-40	-15	27	16	8	0	-15	11	18	13	12	5	-9	6
	2	0	-18	-20	4	-29	-40	-45	-47	-66	-327	-241	-103	-14	-148	-219	-215	-140	-388	-403	-202	-49	-22	-7	-114
	3	-1	2	8	4	-52	-15	29	5	16	3	-31	-4	2	-1	-5	-27	-18	-12	-8	-16	-18	-5	0	-5
	4	34	21	68	22	15	10	14	4	2	-1	6	0	-58	-39	-7	-48	-40	-57	-17	-26	-21	-1	-132	-10
	5	39	23	-4	-18	-85	-70	-63	-101	-74	1	4	-17	-185	-105	-11	8	2	0	-1	0	8	-33	-169	-56
D	6	17	52	45	27	17	10	15	0	-46	0	-16	-51	-19	14	0	-71	-429	-449	-234	-8	28	-29	-137	-52
D	7	-285	-310	-83	-84	-16	14	21	26	5	-7	-30	14	-2	-3	-33	-103	-64	-12	2	-88	-77	-115	33	-49
	8	-12	-87	-122	-47	-42	36	25	18	-5	-33	-238	-197	-24	10	-8	-118	-159	-10	-44	-27	15	10	14	-43
	9	13	14	15	7	26	11	21	5	28	23	10	0	-2	-6	-5	-7	-8	-4	-31	-14	-8	-4	3	4
	10	9	8	10	4	4	2	4	4	4	5	7	-2	1	0	5	-6	-3	-3	0	-31	-111	-12	18	-2
	11	15	-17	21	47	25	-42	53	43	17	7	7	8	6	4	3	1	1	3	4	5	10	15	12	11
	12	13	9	6	12	7	8	-8	-53	-77	-252	-135	-399	-53	17	-93	-192	-23	-73	-113	-42	9	7	4	-67
	13	3	1	0	0	-2	0	-2	5	-43	-37	-13	-4	-3	-54	-80	-16	-23	-62	-93	-68	-4	6	28	-20
D	14	-80	-82	4	-69	-66	-57	-25	-29	0	-4	4	22	31	21	1	-221	-333	-314	-559	-583	-385	-334	-539	-150
D	15	-347	-378	-199	-226	-225	-332	-271	-201	-144	-234	-183	-65	-113	-64	-176	-169	-124	-88	-42	25	-7	-64	-56	-162
	16	-7	-3	-1	1	-2	-1	0	-33	-93	-41	-36	-41	-147	-129	0	-10	-11	-7	-22	-19	-16	-53	-21	-29
	17	1	0	-2	-12	-13	-34	9	-8	-10	-19	-19	-36	-5	-37	-201	-147	-119	-95	-28	-10	-10	-49	-83	-39
	18	10	10	-8	-12	1	7	-2	-35	-80	-41	-10	-3	-17	-13	-18	-73	-151	-101	-127	-163	-31	31	-67	-20
	19	-8	4	10	-10	0	-22	-119	-46	-67	-34	-26	-42	-51	-23	-53	-58	-77	-49	-49	-22	-14	-2	-21	-33
	20	-14	-14	-55	0	10	9	-43	-67	-8	4	10	-19	-21	-103	-37	-33	1	10	12	-1	-28	-92	-27	-26
	21	-30	-43	-38	-15	-61	-51	2	3	-12	-18	-13	-61	-43	1	-2	-3	-9	-27	-56	-59	-21	-18	-9	-25
	22	-7	-6	-19	-2	-11	-57	0	4	0	-1	-23	-40	-59	-214	-93	-1	-14	-57	-56	-26	-2	0	1	-29
Q	23	3	0	0	2	6	3	-4	-8	-2	-7	-4	-2	-6	-24	-7	-8	-3	-4	-5	-2	0	3	3	-3
Q	24	3	3	1	-2	1	1	0	-13	-44	-37	-20	2	-12	-71	-26	-21	-67	-79	-36	-17	-12	-67	-3	-22
	25	-19	-18	-14	-16	2	0	-44	-1	-8	20	4	3	-7	-18	-61	-54	-82	-109	-62	-33	28	52	41	32
	26	24	8	4	0	1	2	9	17	5	3	-34	43	47	6	-4	-15	-3	0	9	-54	-190	6	64	25
	27	16	-43	-16	-21	-8	16	15	20	42	49	29	-180	10	-11	-22	-21	-28	-23	-67	-26	-45	27	13	-12
	28	16	29	21	18	-51	18	18	10	24	-27	12	5	4	3	0	10	4	4	6	8	8	3	6	7
Q	29	4	5	-15	-30	1	12	13	4	3	1	-34	-2	-11	-20	11	0	-87	-6	-2	6	2	-23	-2	3
Q	30	6	7	6	8	7	9	6	4	7	7	4	1	1	3	6	4	0	-15	-17	-24	-19	1	12	1
Q	31	6	13	16	17	19	18	16	9	16	40	22	12	-1	-41	9	13	10	2	-6	-8	6	6	12	8
Mean	-18	-25	-11	-12	-13	-17	-13	-12	-18	-18	-27	-34	-43	-29	-28	-36	-59	-62	-64	-65	-46	-23	-29	-29	-30
5Q Mean	4	5	1	-1	6	8	6	0	-4	0	-6	2	-4	-27	-5	-1	-29	-17	-12	-8	-9	-9	-11	5	-4
5D Mean	-139	-147	-50	-71	-57	-78	-60	-49	-46	-61	-108	-63	-46	-13	-58	-92	-155	-218	-250	-247	-171	-98	-112	-141	-105

February 1988

AO Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	-3	21	18	13	12	12	12	10	8	6	5	3	-1	3	5	5	7	3	2	3	8	9	6	4	7
Q 2	4	5	-2	0	3	3	4	4	0	0	0	-6	-9	-15	-9	-7	-7	-6	-11	-85	-54	-12	-3	-2	-8
Q 3	0	-1	1	4	3	2	-4	-9	-15	-55	-33	-10	4	17	7	0	-1	-1	0	0	0	0	0	-1	-3
Q 4	-1	-2	-3	-4	8	4	-15	-18	-35	-15	3	0	-16	-85	-43	-19	-50	-50	2	2	1	-9	-84	-29	-19
D 5	0	-47	14	-55	-55	-61	-89	-19	-153	-44	56	51	-43	-39	-21	2	-48	-226	-198	-11	2	2	-41	-56	-45
6	-20	16	4	-12	-9	-11	10	19	11	-29	-56	5	-4	-31	-51	-73	-80	-21	8	-2	-10	-30	-127	-76	-23
7	-14	21	32	0	13	17	2	8	-4	-16	-22	-4	-3	-1	-7	-7	-14	-29	-13	-31	-21	-10	-8	4	-4
8	9	-3	1	1	1	2	0	-5	-6	3	-4	-7	-5	-6	-5	-24	-79	-83	-71	-40	-99	-11	8	11	-17
9	6	9	8	11	16	13	20	-25	-30	-21	0	4	5	23	-27	-84	-90	-43	-32	7	11	14	22	30	-6
10	27	18	11	8	13	-50	-91	-7	-25	-75	-28	-106	-67	-219	-184	-3	3	-2	-33	-71	-39	-4	6	5	-38
11	0	-2	-1	-1	0	0	2	-4	-52	-133	-61	-95	-135	-122	-50	-25	-15	-85	-38	-13	-63	-77	14	8	-39
12	-9	-92	-59	-22	-48	-101	-59	-47	4	3	-27	-42	-43	-18	-5	-41	-12	-45	-150	-59	-1	6	-9	4	-36
13	-1	-18	-31	-23	-102	-105	-30	-17	-62	-29	-47	-142	-131	-105	-85	-58	-114	-60	-42	11	5	0	0	-1	-49
14	-2	0	2	0	-2	-6	-21	-25	-15	-14	-13	-11	-7	-63	-29	-11	-6	-5	-20	-24	-11	-28	-26	-11	-14
D 15	-28	-55	-62	-19	-28	-64	-112	-81	-74	-91	-249	-98	-91	-110	-77	-240	-86	5	12	-44	-112	0	-4	-15	-72
16	-15	-4	-12	-6	-3	-6	-62	-22	-3	-30	-38	-20	-42	-183	-247	-144	-99	-167	-174	-116	-15	24	7	-3	-57
17	1	-10	-73	-44	-13	8	6	4	0	3	-140	-120	-10	-1	-8	-44	-114	-60	-2	-1	3	-80	-132	-116	-39
18	-131	-105	-7	-37	-10	-1	-13	-53	-21	-68	-181	-4	2	6	10	-25	-104	-41	-12	-8	-22	-178	-9	15	-41
19	7	4	-12	-54	-11	-17	-11	2	2	-4	-7	-60	-69	-35	-14	-52	-101	-28	-29	-118	-17	16	6	3	-25
20	0	3	3	10	9	5	5	2	4	3	2	4	5	-22	-27	1	-68	2	-34	-31	-65	-47	-9	-33	-11
D 21	-16	14	-27	-93	12	55	81	20	-31	29	-10	-29	-168	-101	-121	-134	-89	-86	-113	-151	-146	-127	-156	-191	-66
D 22	-434	-365	-406	-406	-262	-352	-435	-535	-351	-312	-487	-890	-1001	-749	-807	-741	-838	-310	-301	-271	-225	-94	-169	-205	-456
D 23	-362	-326	-254	-284	-326	-91	-5	-41	-44	-74	-106	-3	-13	10	-7	-21	-92	-189	-85	-89	-15	0	0	-2	-101
24	-5	-62	-100	-39	21	13	-22	-55	-33	-86	-76	-49	-8	-23	-96	-11	-31	-24	11	-86	-89	17	8	0	-34
25	0	1	-105	-44	9	-63	-12	1	-64	-9	18	10	-24	-103	-26	-15	-61	-49	-31	-95	-150	-51	8	-1	-35
26	-12	-68	36	19	13	1	10	-49	-17	8	3	6	9	3	-18	-2	-64	-120	-102	-51	-76	12	42	16	-16
27	0	-4	-1	-55	-37	17	-25	-12	6	14	7	5	0	-6	-23	-4	-4	-25	-28	-38	-19	21	-18	9	-9
Q 28	6	13	13	35	18	24	29	26	44	11	-2	2	-33	-45	-35	-25	-45	-20	-9	-83	-8	4	3	7	-2
Q 29	13	6	1	0	5	6	9	-12	0	5	-3	-5	-2	2	5	-2	-44	-37	-14	-61	-9	-12	1	-3	-6
Mean	-33	-35	-34	-37	-25	-25	-28	-32	-32	-35	-51	-55	-65	-69	-68	-62	-80	-62	-51	-53	-42	-22	-22	-21	-43
5Q Mean	4	8	6	10	7	9	9	3	7	-6	-6	-3	-8	-7	-5	-5	-18	-12	-6	-45	-12	-2	1	1	-2
5D Mean	-168	-155	-147	-171	-131	-102	-112	-131	-130	-98	-159	-193	-263	-197	-206	-226	-230	-161	-137	-113	-99	-43	-74	-93	-147

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March

AO Index (Hourly mean values, unit nT)

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean
Q 1	6	-13	1	8	7	2	-14	-70	-30	12	8	-4	-22	3	3	0	-33	-28	-49	-32	-9	6	7	-4	-10
2	7	10	7	4	5	6	13	-18	-73	-23	1	4	3	-1	0	-17	-26	-5	-1	0	4	9	-105	-5	-8
3	5	6	10	5	-6	5	13	-26	-58	-1	15	4	4	4	7	3	-9	-34	0	15	10	10	-22	-68	-4
4	-19	-63	-148	-15	-40	-47	-49	-37	15	-52	-19	-10	6	-121	-272	-238	-172	-111	0	-28	17	15	23	-6	-57
5	4	10	9	-35	9	-6	-8	6	-27	-54	-19	-14	22	11	6	-29	-34	-43	-10	-37	-20	-98	-37	-76	-19
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D 26	-48	-78	-15	0	-49	-37	24	-77	-17	8	5	9	-8	-35	-23	-113	-35	-80	-328	-524	-513	-310	-111	-100	-102
D 27	-58	-117	-180	-37	46	-69	-68	4	4	-20	-76	-63	-6	-4	-18	-64	-112	-58	-211	-140	-140	-69	0	-1	-60
D 28	-40	-24	-24	2	-48	-82	-63	-23	-19	-41	-173	-49	-19	-20	-10	-22	-3	-159	-334	-257	-221	-110	-169	-237	-89
D 29	-90	-11	-9	-54	-37	-1	-73	-58	-53	-125	-158	36	-4	-98	-117	-88	-176	-120	-37	-51	15	27	34	19	-51
D 30	-158	-85	-120	-162	-188	-31	-42	-50	24	4	39	-231	-162	-32	-70	-8	-27	-3	0	-11	11	-125	-81	-62	-65
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Mean	-27	-20	-37	-22	-18	-17	-28	-21	-18	-18	-26	-29	-26	-48	-35	-39	-46	-43	-57	-61	-53	-28	-25	-25	-32
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5D Mean	-78	-63	-69	-50	-55	-44	-44	-40	-12	-34	-72	-59	-39	-37	-47	-59	-70	-84	-182	-196	-169	-117	-65	-76	-73

AO Index (Hourly mean values, unit nr) 1988 April

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D	4	-156	-153	-167	-197	-213	-149	-241	-182	-266	-774	-603	-238	-497	-279	-156	-377	-397	-231	-221	-348	-239	10	30	31	-250
D	5	4	-85	-144	-29	21	-58	-82	-136	-51	-2	5	17	-33	4	-1	-7	-6	-5	-115	-172	-131	-20	-216	-51	
D	6	-354	-179	-282	-178	-170	-206	58	60	-81	15	-144	-320	-54	-4	-9	-55	-122	-91	-27	-6	8	10	-4	0	-89
7	9	-4	-3	9	-115	-63	-78	-147	-20	-10	-40	-62	-45	-8	3	-19	-46	-161	-163	-56	1	1	-5	2	-42	
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5Q Mean	5	2	-2	-13	-12	0	0	0	3	-3	1	-6	-7	4	-32	-23	-25	-10	0	-3	5	0	-2	-1	-5	
5D Mean	-125	-109	-155	-107	-101	-92	-44	-65	-119	-185	-165	-129	-121	-54	-34	-113	-140	-122	-129	-262	-133	-25	-4	-49	-107	

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D	-34	-5	-16	-60	-48	-19	-23	-67	5	-2	6	-37	-146	-76	-73	-45	-148	-157	-44	-14	6	-16	-78	-55	-48
9	-13	-9	-10	-9	-27	-39	-8	12	-99	-75	-30	6	3	-22	-18	-2	11	-36	3	4	7	13	-5	8	-14
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5Q Mean	-1	-13	-10	-8	-2	-1	1	2	4	5	3	3	-3	-3	-11	-10	-7	-9	3	3	3	2	-1	-2	-2
5D Mean	-88	-58	-27	-6	1	10	-10	-31	-126	-72	-79	-59	-86	-131	-61	-27	-45	-36	-5	-22	-14	-7	-31	-57	-44

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AO Index (Hourly mean values, unit nT)

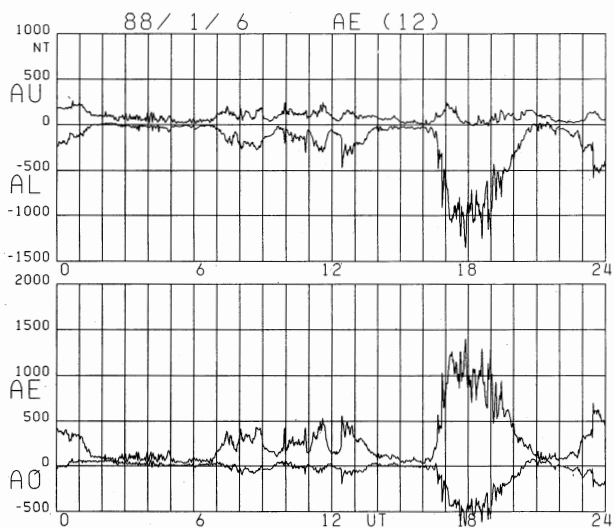
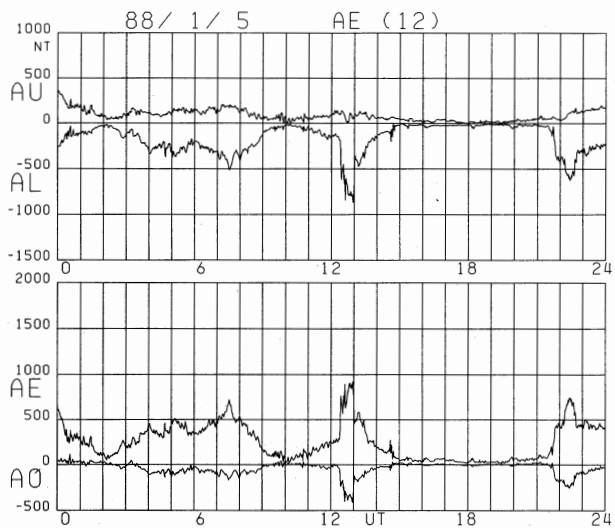
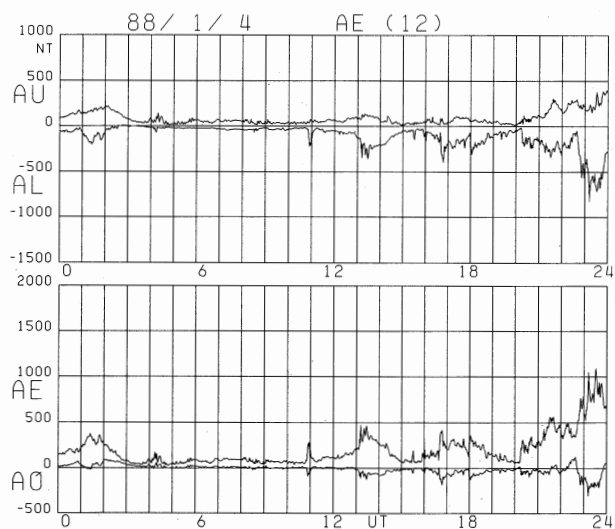
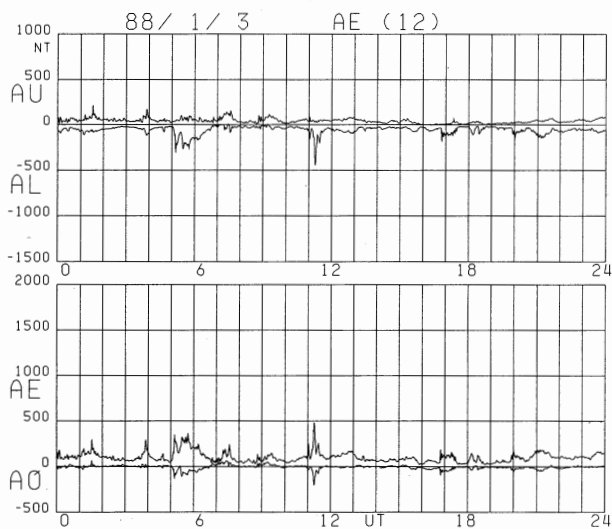
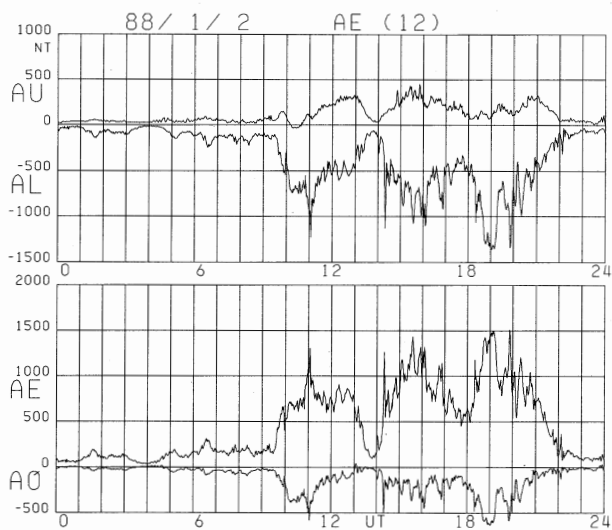
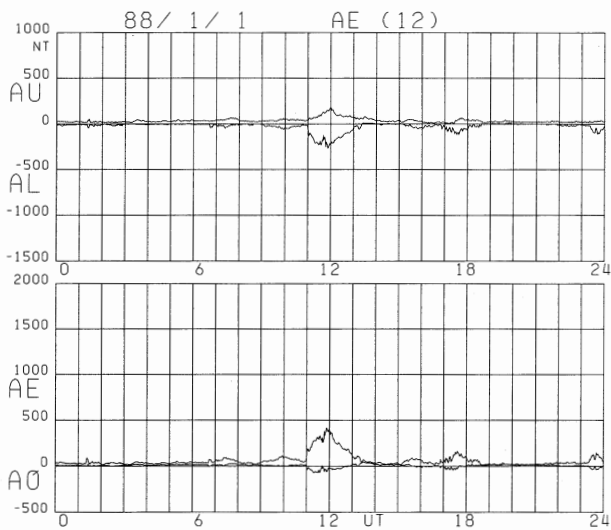
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Q 3	-2	-6	-10	-8	-9	-12	-10	2	0	3	-6	5	0	2	3	-3	-5	3	4	4	0	-6	-1	0	-2	
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12	-18	-17	-12	-9	11	-4	0	0	2	1	14	8	-3	14	14	8	5	2	0	1	-1	-1	-8	-6	0	
13	-2	9	-37	-19	-1	-6	-12	-4	3	3	7	0	14	24	13	4	-9	2	15	11	-2	7	24	49	4	
14	36	-6	-128	-52	36	32	4	10	10	-14	19	17	-37	-66	-49	-12	0	-21	-51	-20	4	-5	11	12	-11	
15	-14	-34	0	-13	-28	-27	10	10	-51	-40	-2	-2	-2	3	-15	-30	-14	-31	-45	-12	-2	-3	1	9	-14	
16	7	-21	-21	17	-13	20	-24	21	15	17	18	-3	4	-52	-19	-11	-22	-40	0	-7	-6	-4	-8	12	-5	
17	26	21	-52	-59	28	-37	-60	-57	17	10	12	-8	-2	-22	-4	-23	-31	-27	-10	5	9	3	34	-19	-10	
18	-14	7	24	-18	-45	-34	3	-25	3	19	10	0	4	7	-112	-65	-33	1	6	34	29	18	5	19	-6	
19	-11	-57	-83	-47	10	48	-35	-14	30	-60	-102	-64	-36	-11	-57	-19	-48	-20	-19	-5	7	15	14	9	-23	
20	-22	-51	-63	-49	-62	-71	-189	-78	-20	-8	5	22	-49	-10	3	-2	12	-11	0	4	1	-5	-4	-3	-27	
Q 21	0	-1	4	6	-37	-3	-12	0	14	29	-2	-7	-17	-56	-19	5	13	16	13	-12	6	-8	-2	5	-2	
22	3	12	0	7	20	4	20	-15	33	19	-8	-11	0	-59	-23	-17	-21	-7	-90	-12	3	14	9	7	-4	
23	1	2	6	-35	26	9	8	-5	7	0	8	40	-7	-10	-17	-35	-55	-59	-5	11	1	-3	-15	27	-4	
24	16	6	17	-6	13	-61	24	19	13	14	9	20	13	-95	-85	-51	36	6	23	14	-49	-36	31	24	-3	
D 25	-32	6	-1	-4	-34	-47	-115	-5	-12	-58	56	71	-11	-6	-11	-10	23	-80	10	28	19	9	0	23	-7	
26	-24	5	16	16	28	40	32	5	-1	28	21	37	21	5	11	32	3	53	28	14	-54	-41	-95	-14	7	
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D 29	21	20	9	9	25	-160	-16	30	0	-15	1	3	-13	-20	-43	-92	-44	-32	-49	-154	4	-6	-23	-9	-23	
D 30	-68	-44	-115	-114	-66	-49	-4	17	-66	-54	-8	4	-23	-148	-118	-84	-6	-113	-29	-8	27	35	-8	-3	-43	
Mean	-4	-6	-16	-13	-1	-12	-12	0	1	-4	1	5	-3	-17	-21	-20	-16	-18	-6	0	0	0	0	3	-6	-6
5Q Mean	-1	-3	-4	-4	-8	-5	-7	-1	2	7	6	5	-3	-6	0	1	-6	-1	0	-5	1	0	-3	0	-1	
5D Mean	-10	-16	-63	-41	-5	-35	-33	7	-7	-40	-6	6	-24	-50	-55	-43	-15	-53	-27	-31	12	9	-1	6	-21	

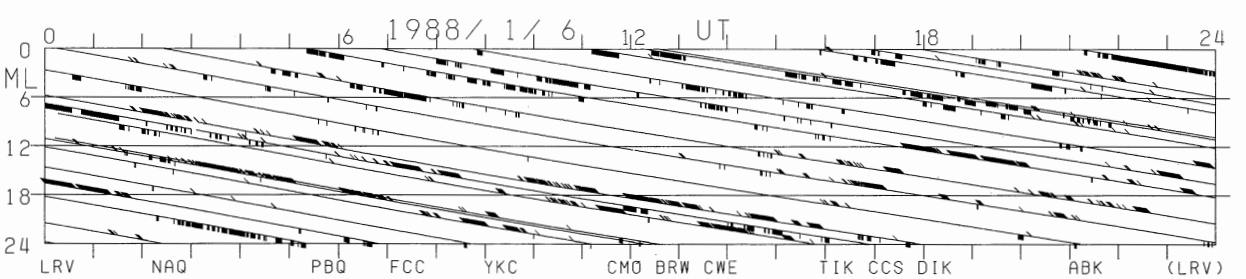
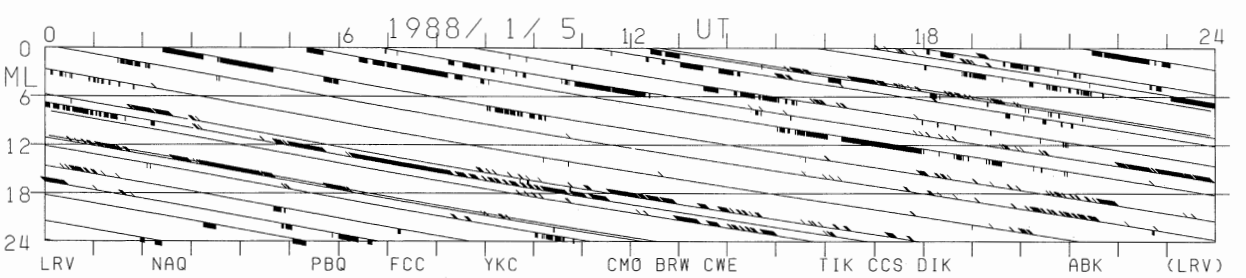
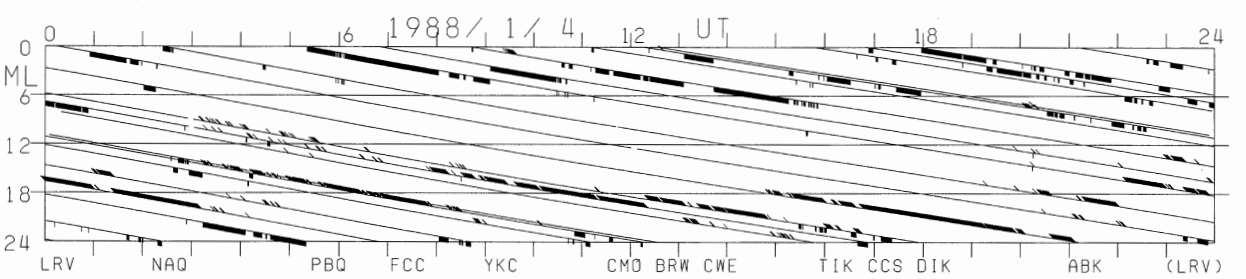
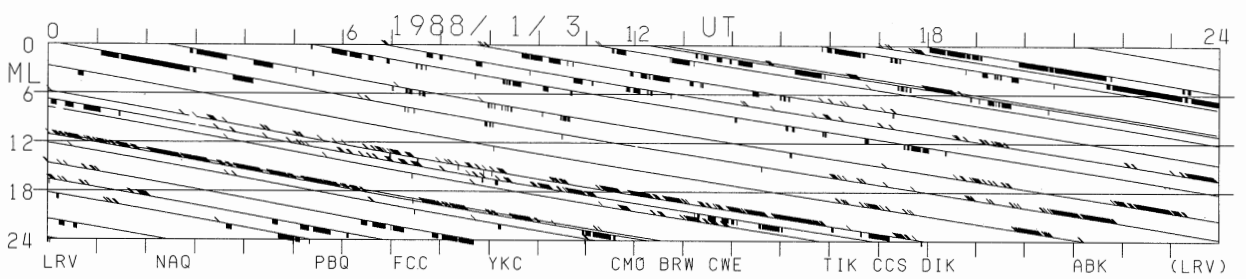
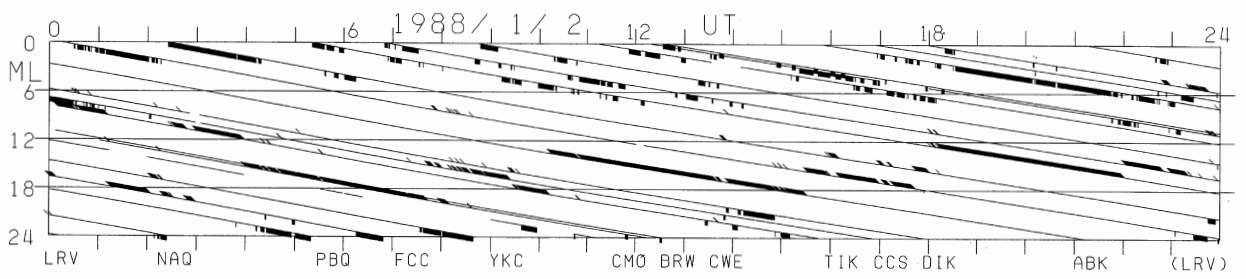
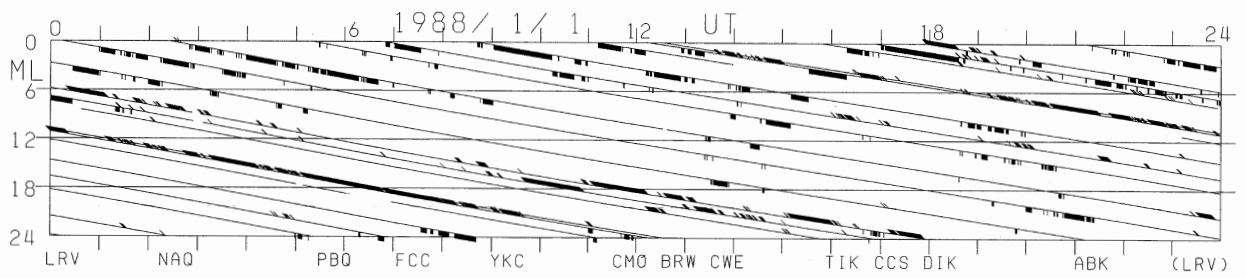
FIGURE 4 (on even pages)

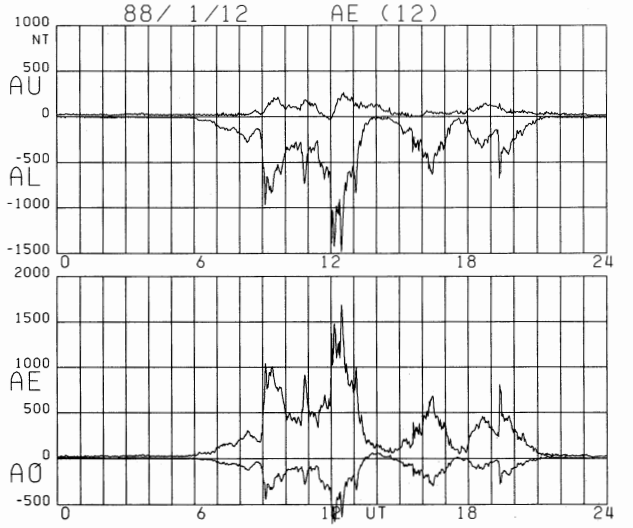
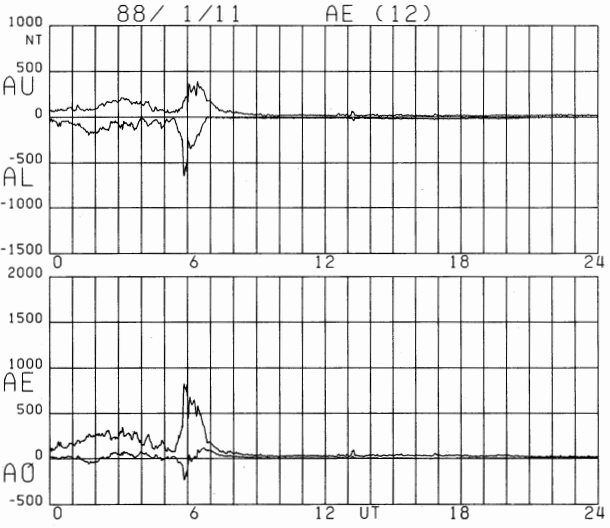
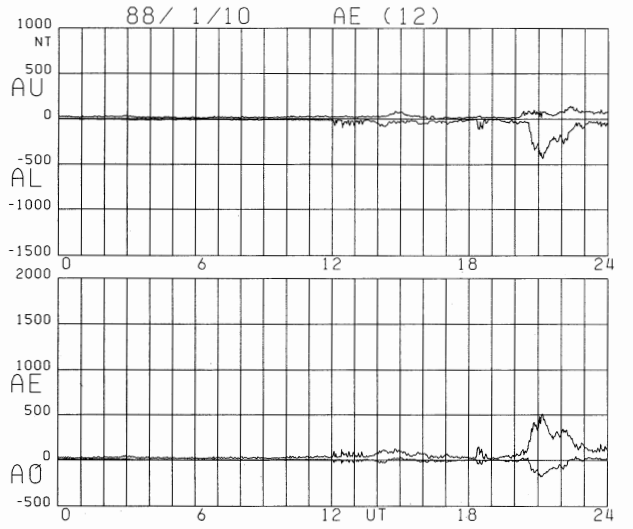
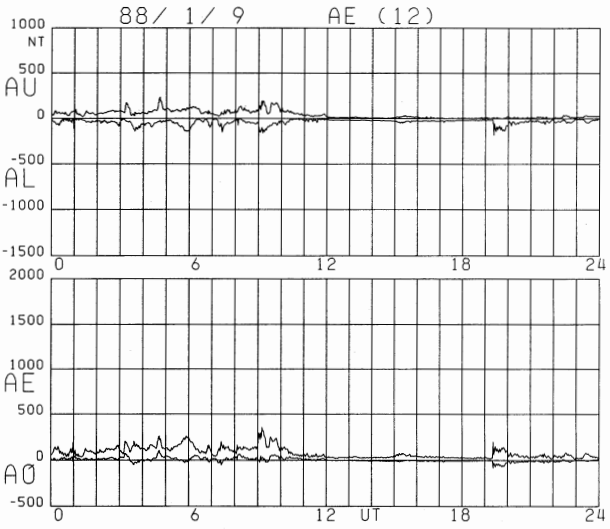
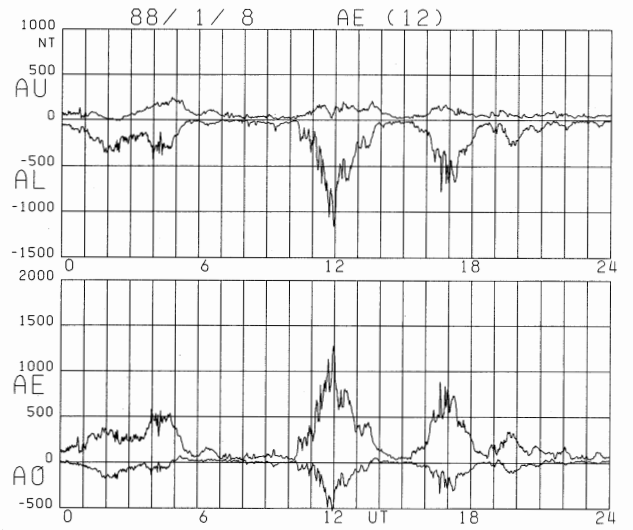
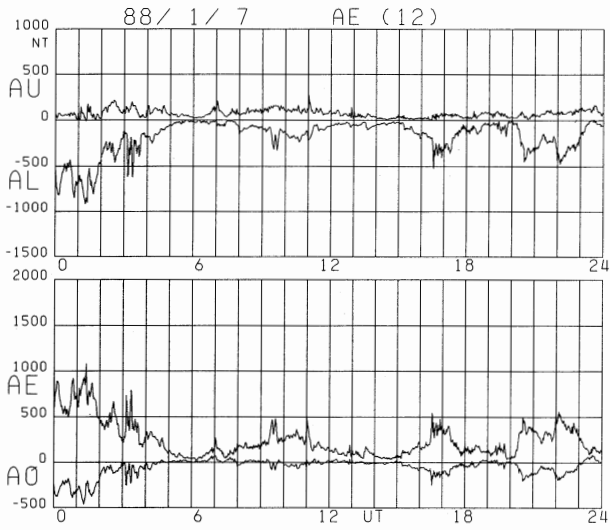
Daily graphs of 1.0 min AE indices (AU, AL, AE and AO) for January-June 1988. Graphs on disturbed days (Jan. 14, Feb. 22, Apr. 3 and Apr. 4) are reproduced on page 96.

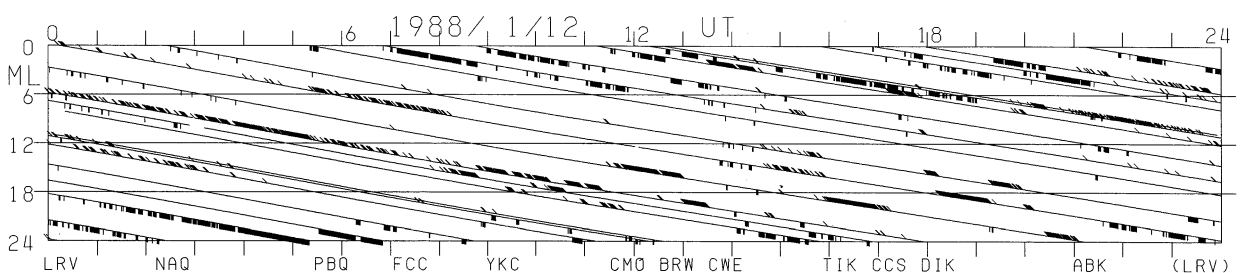
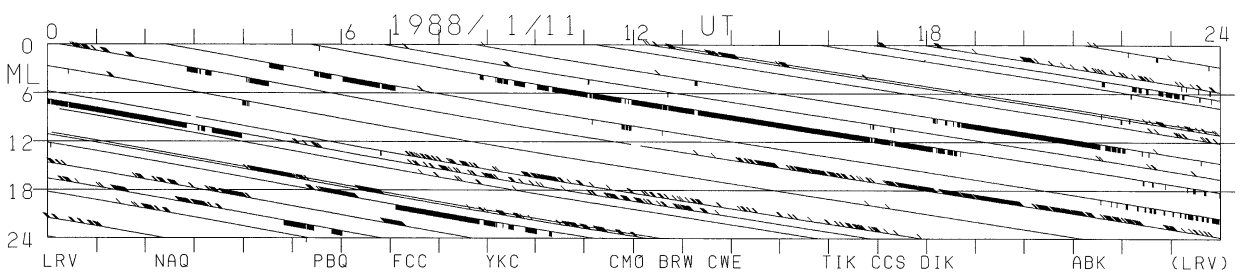
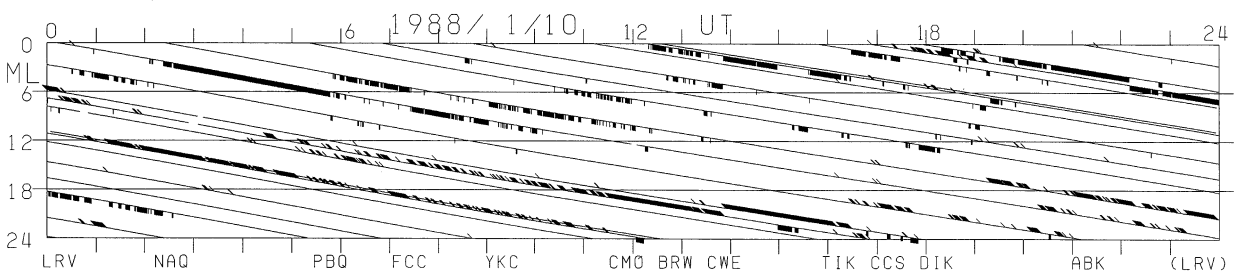
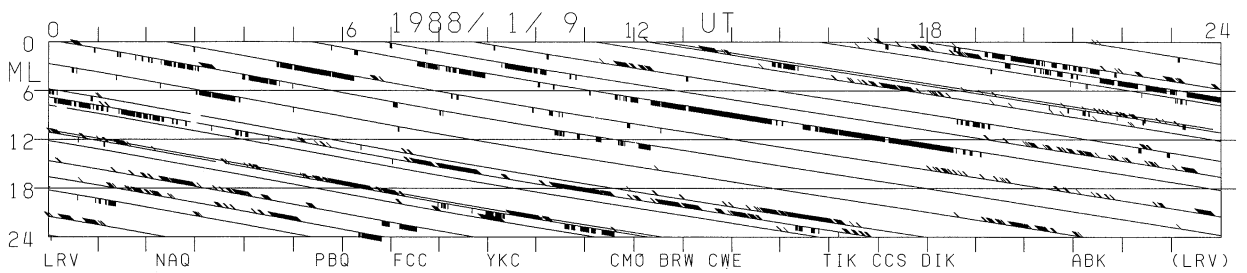
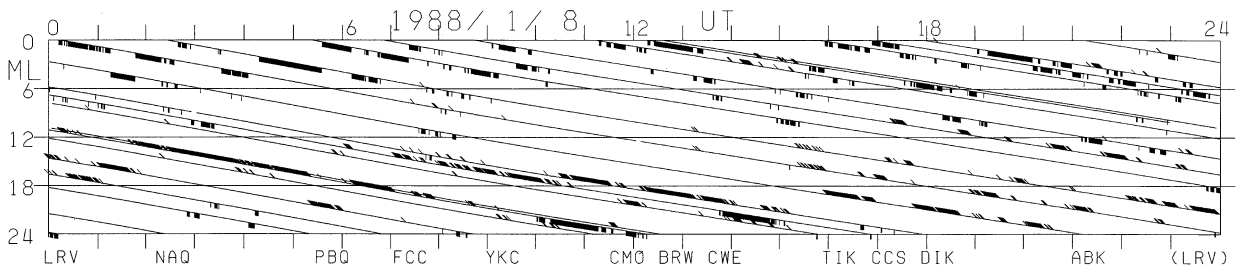
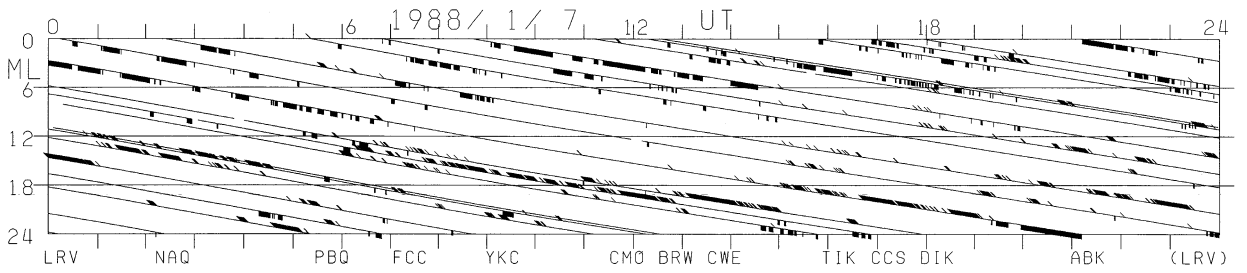
FIGURE 5 (on odd pages)

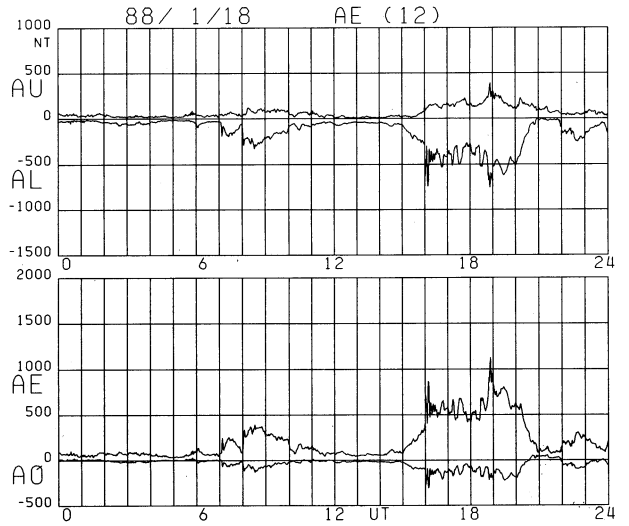
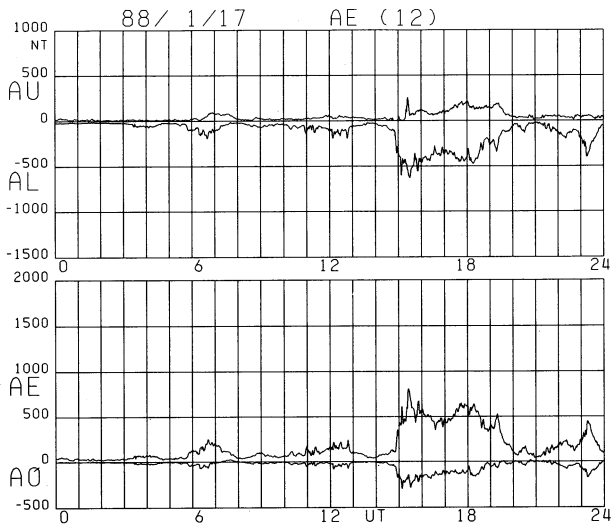
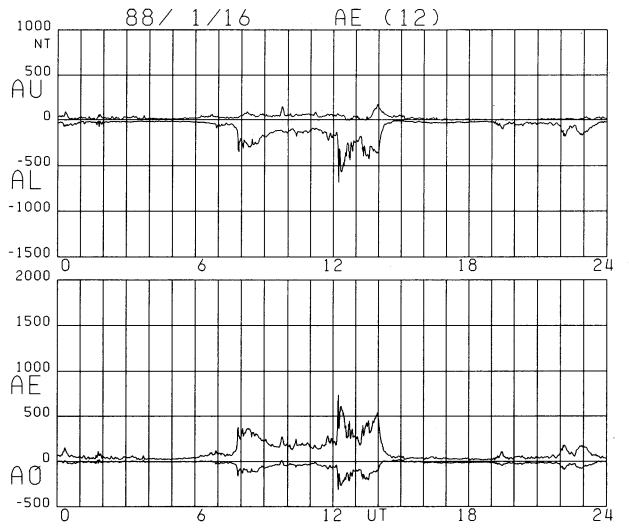
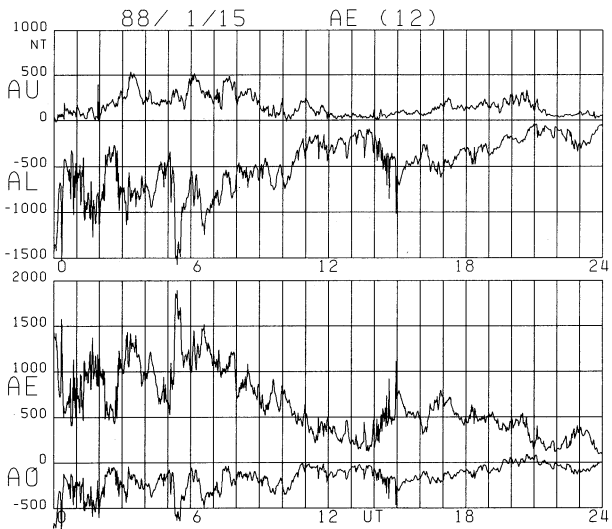
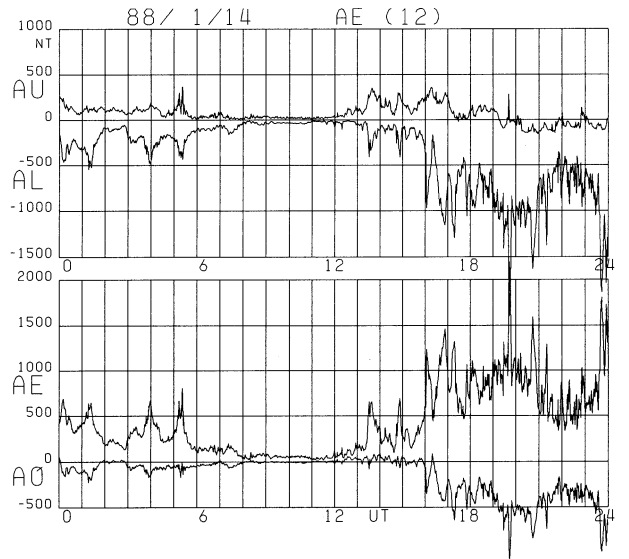
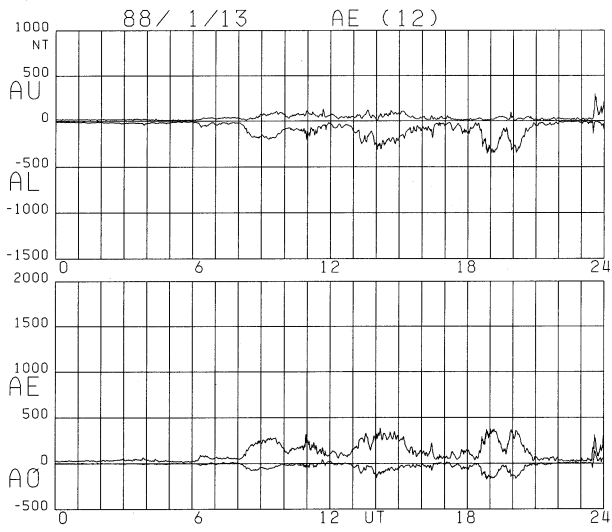
Plots of the contributing station to the AU (upper plumes) and AL (lower plumes) indices, showing which station contributes to these indices at each UT minute.

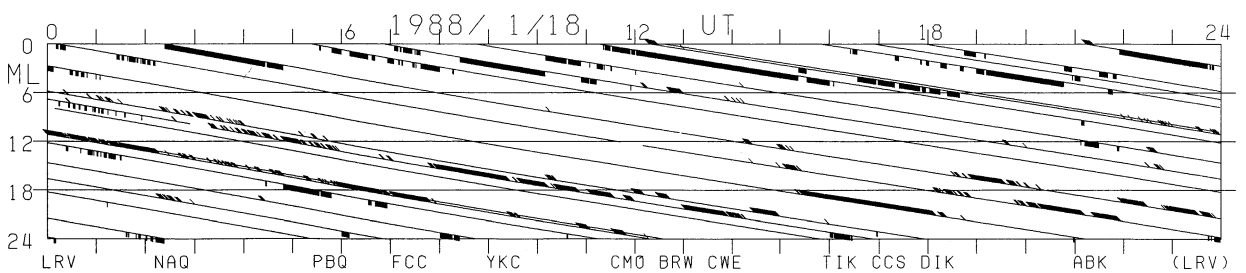
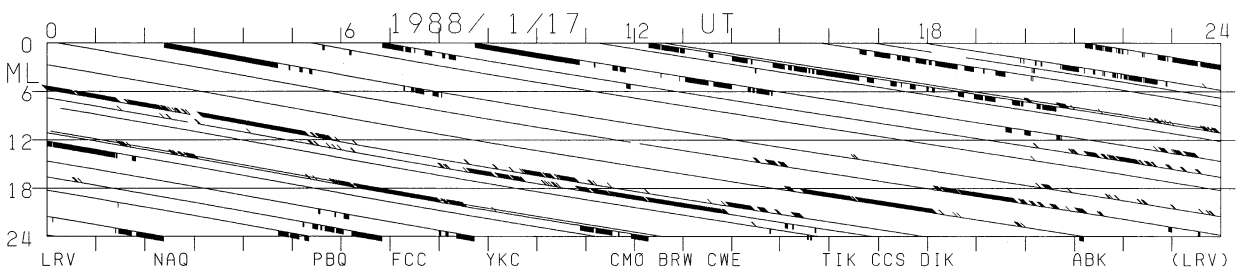
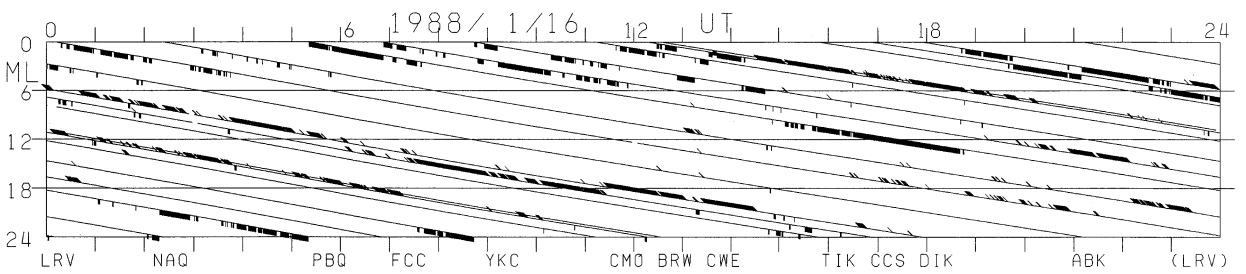
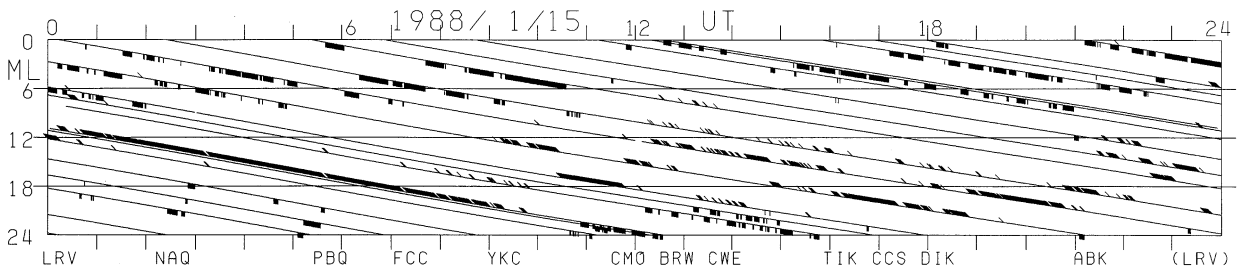
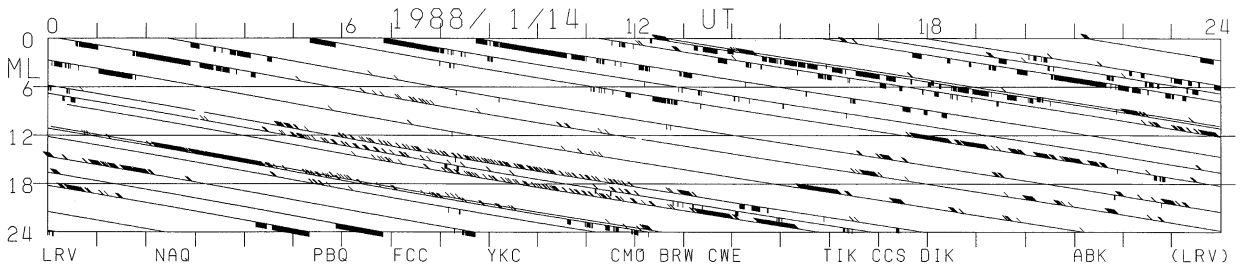
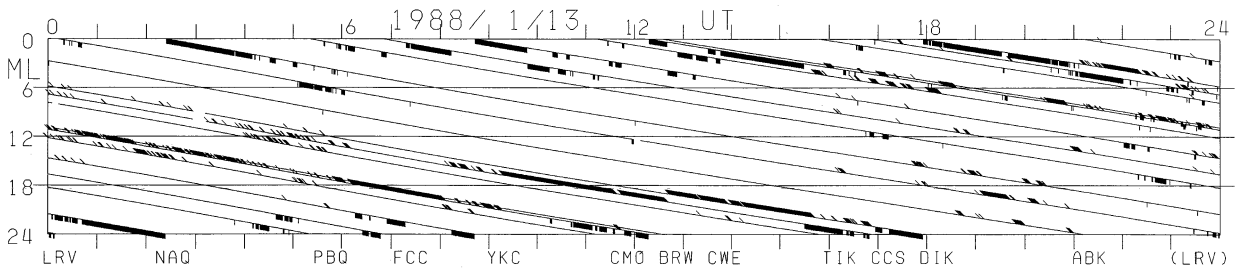


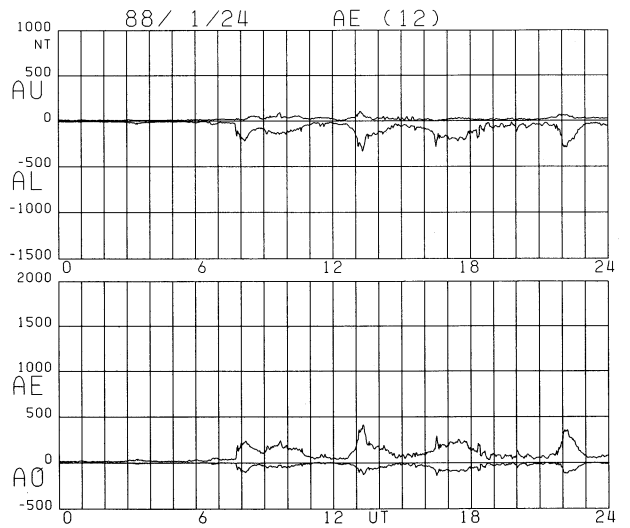
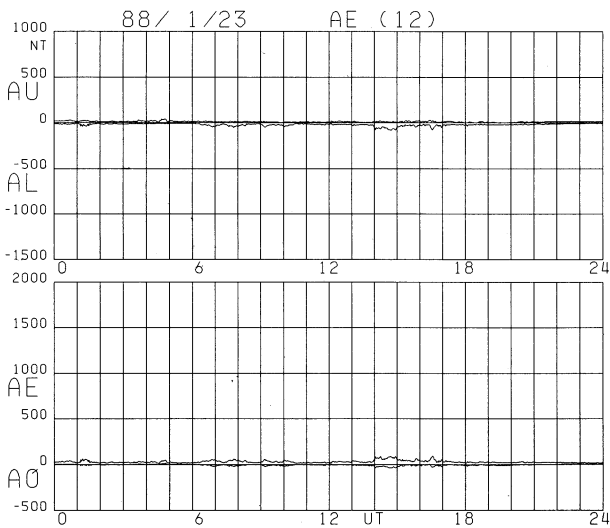
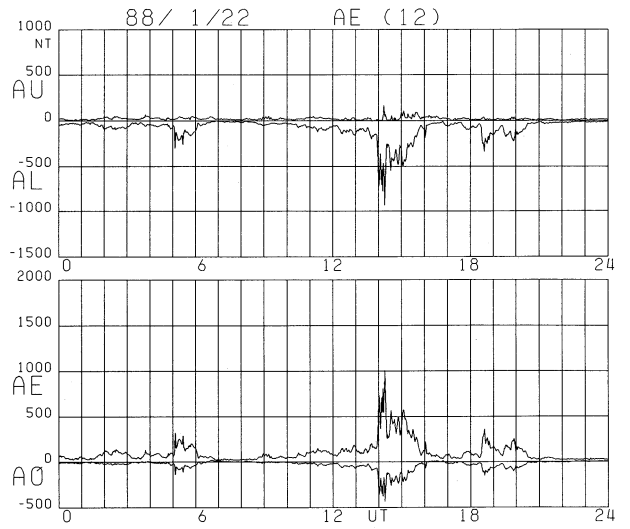
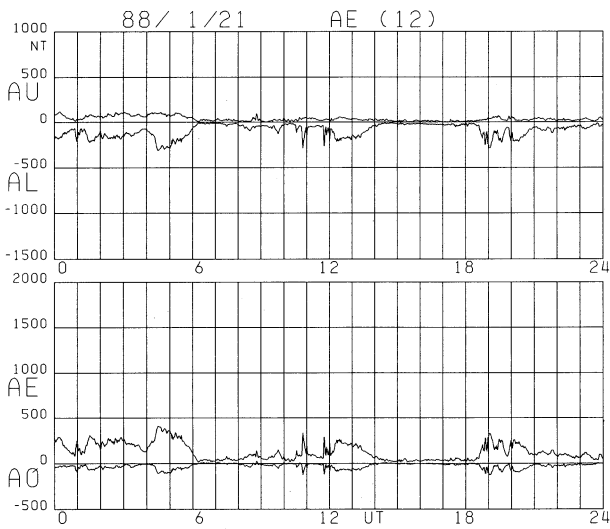
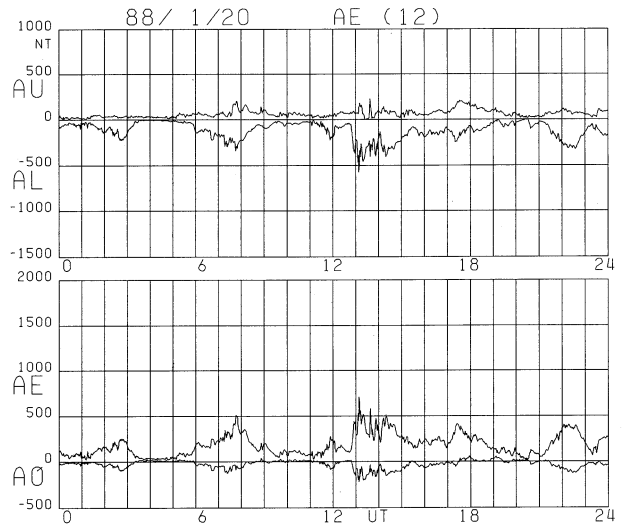
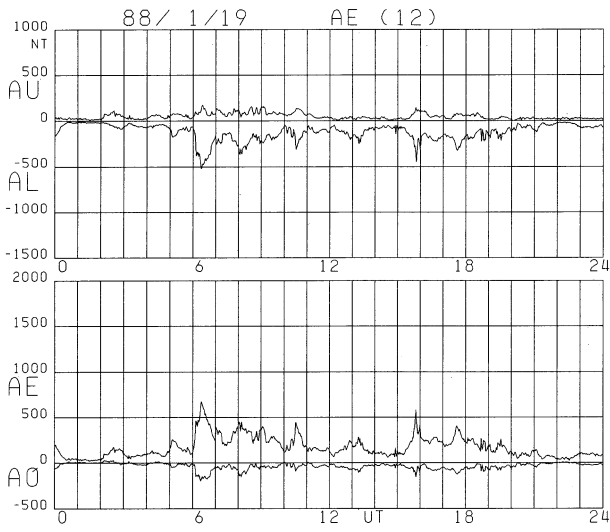


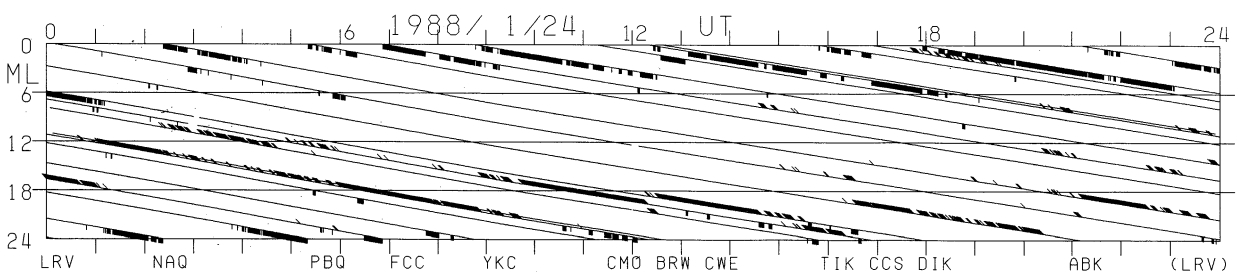
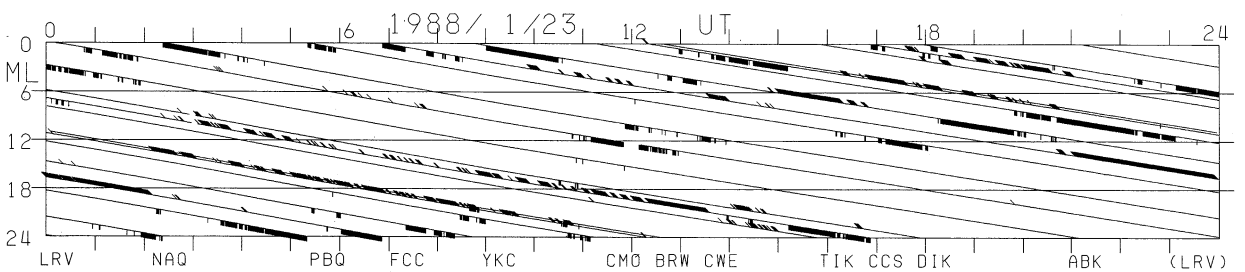
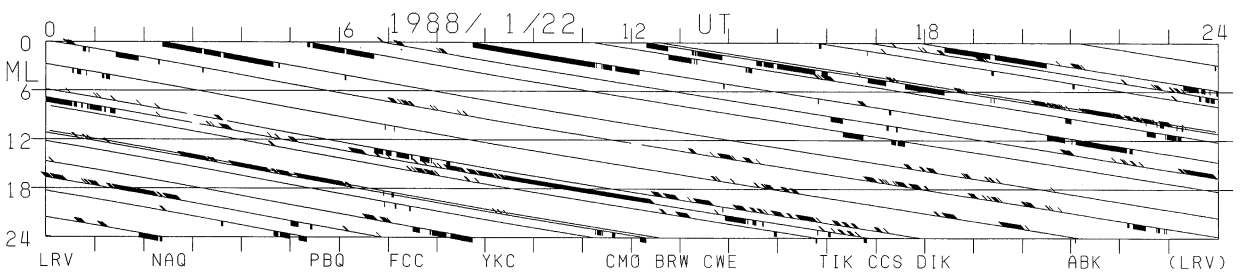
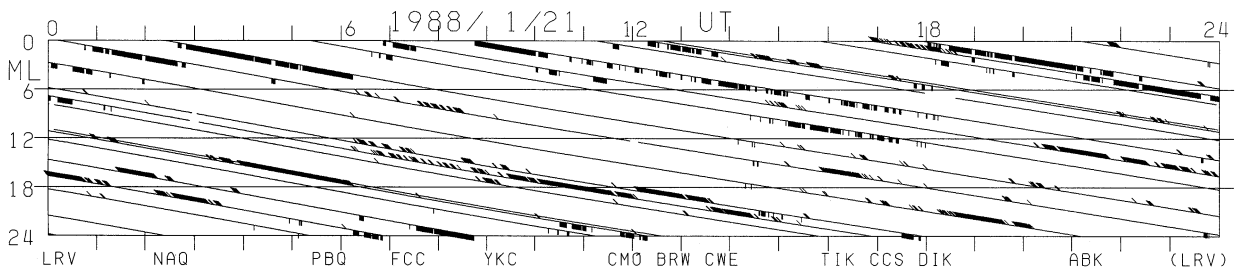
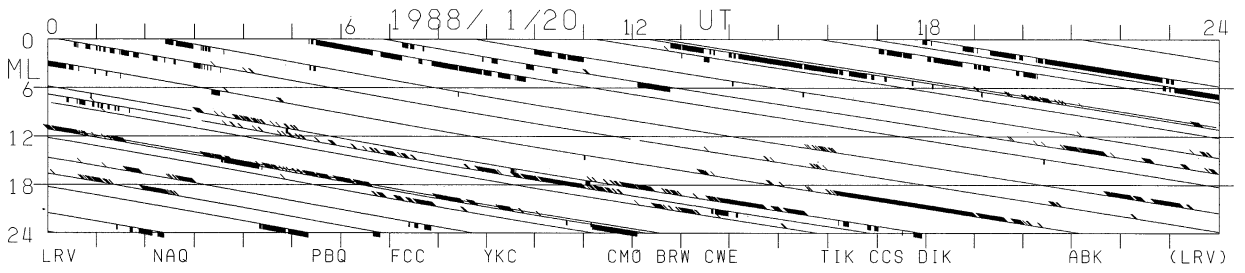
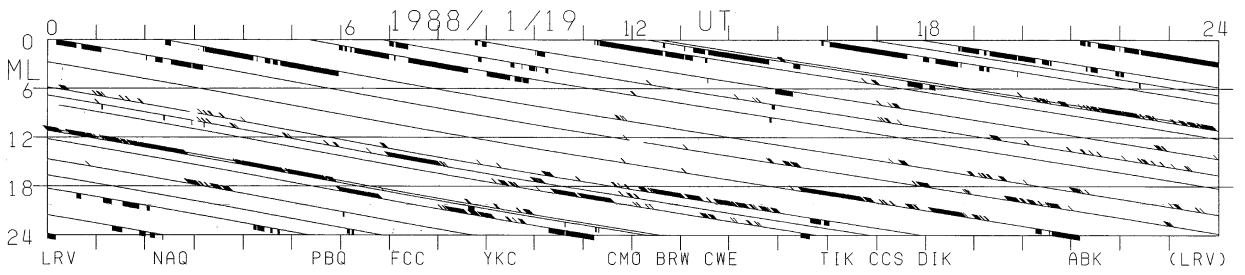


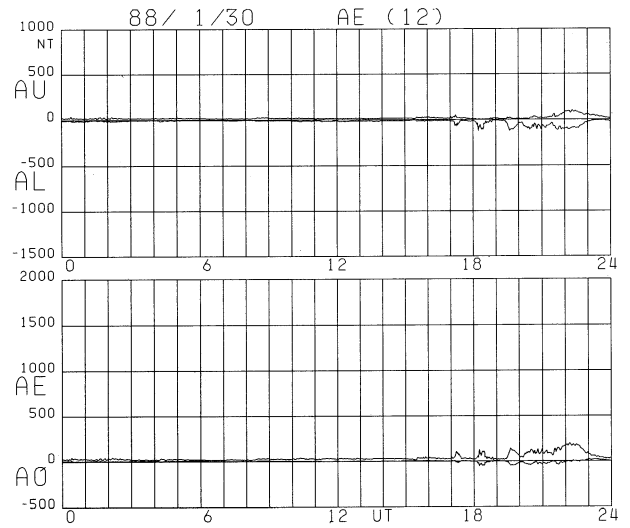
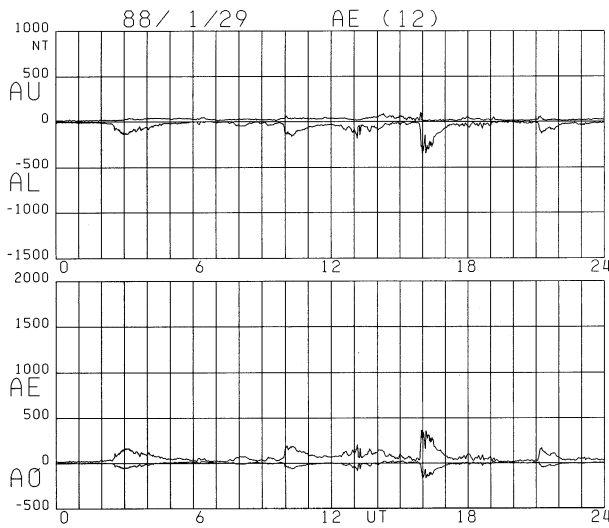
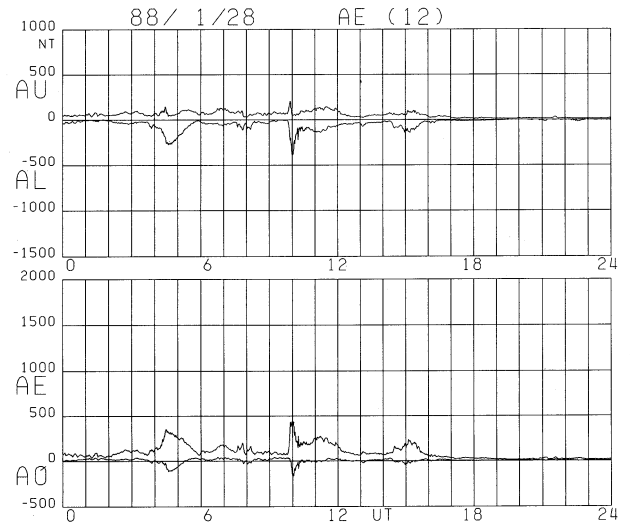
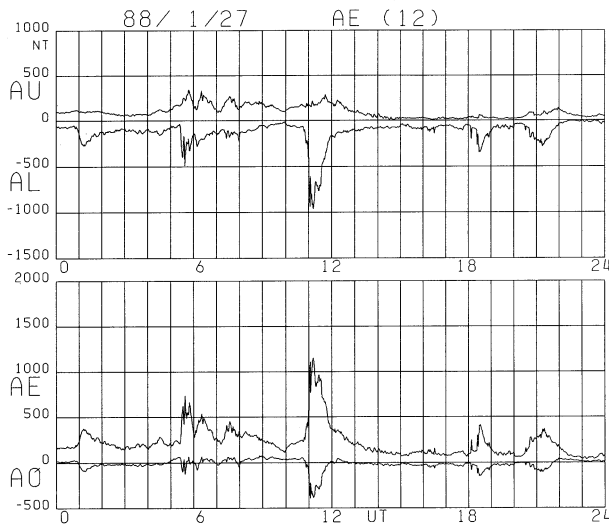
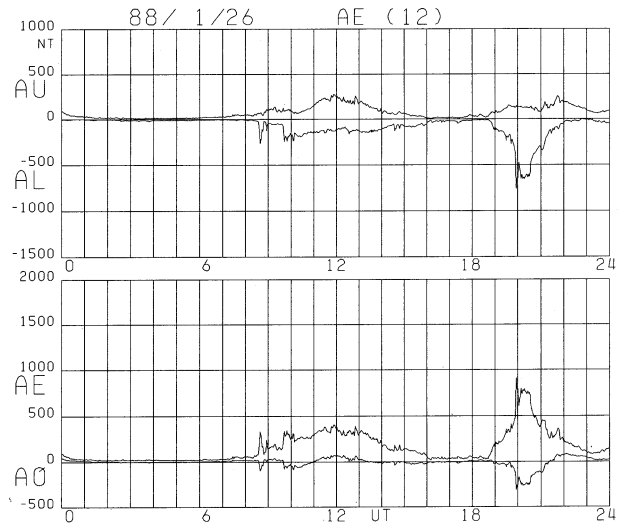
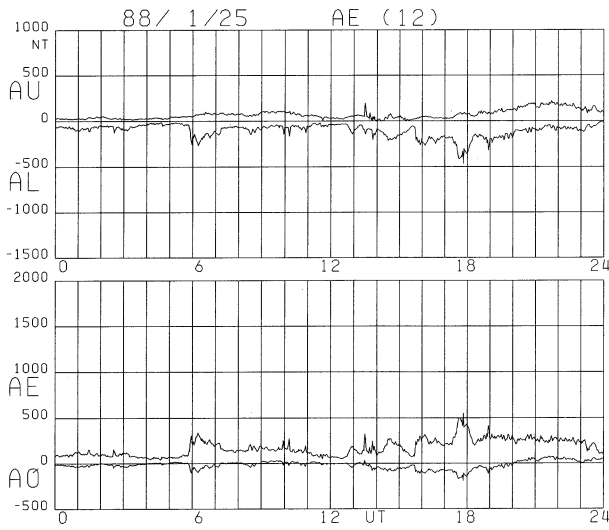


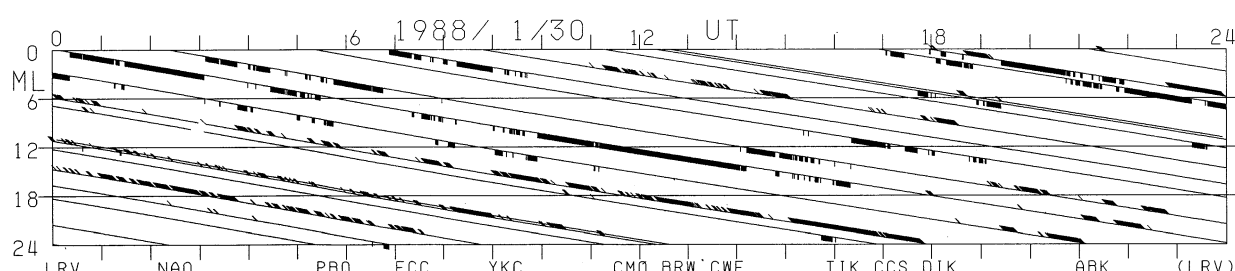
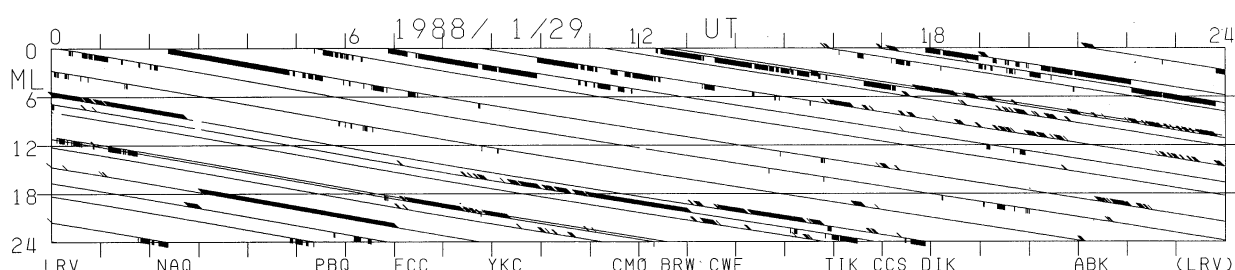
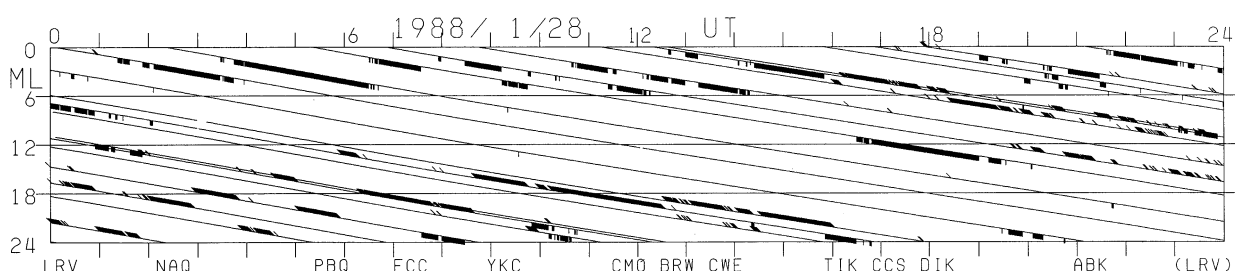
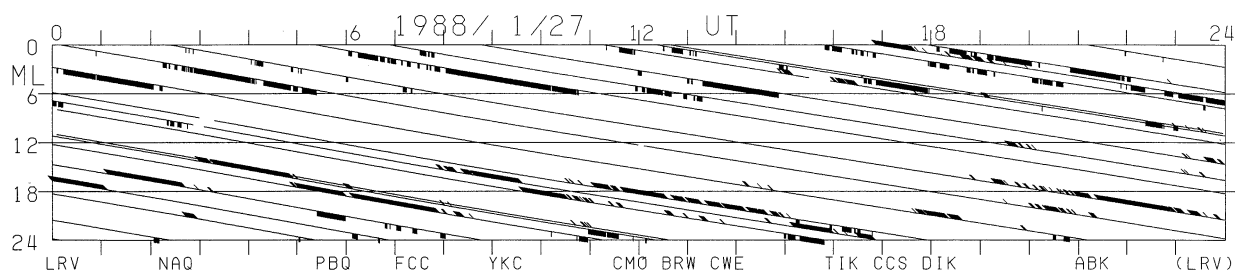
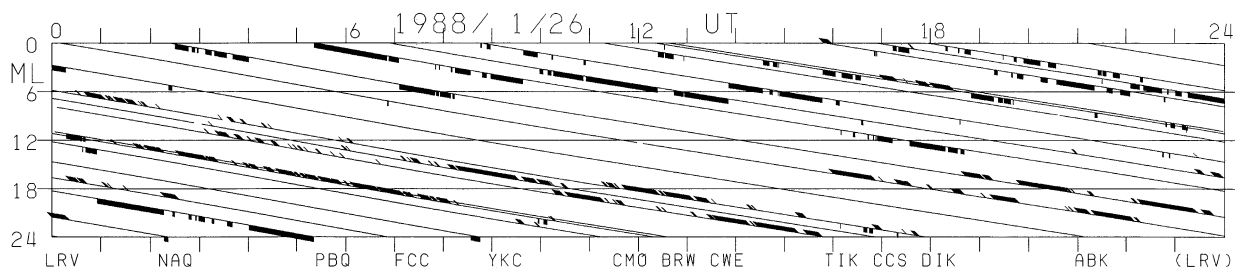
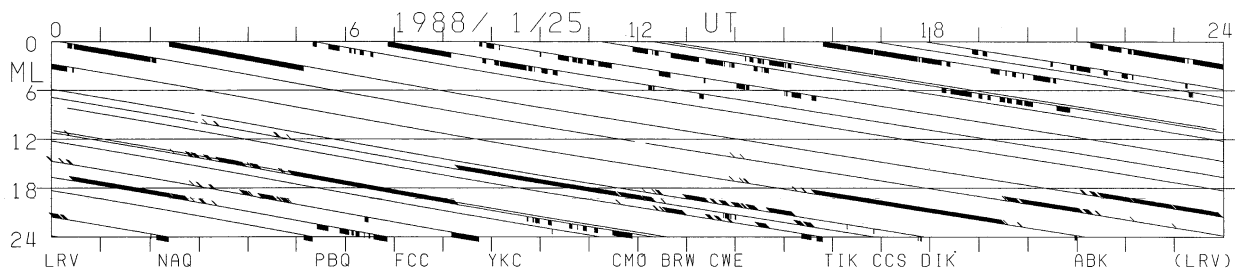


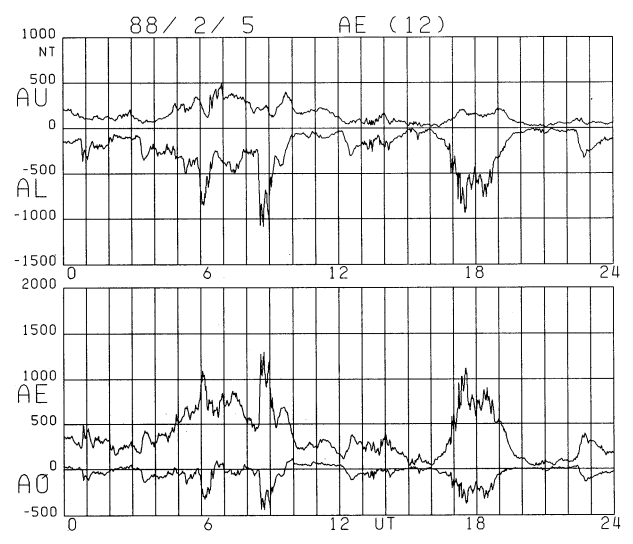
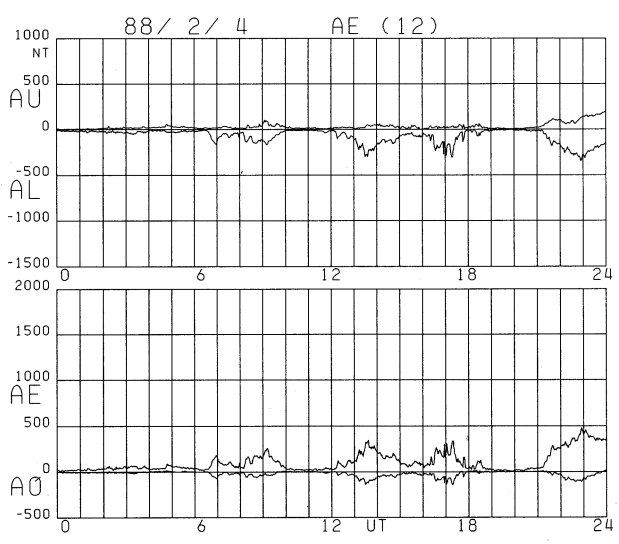
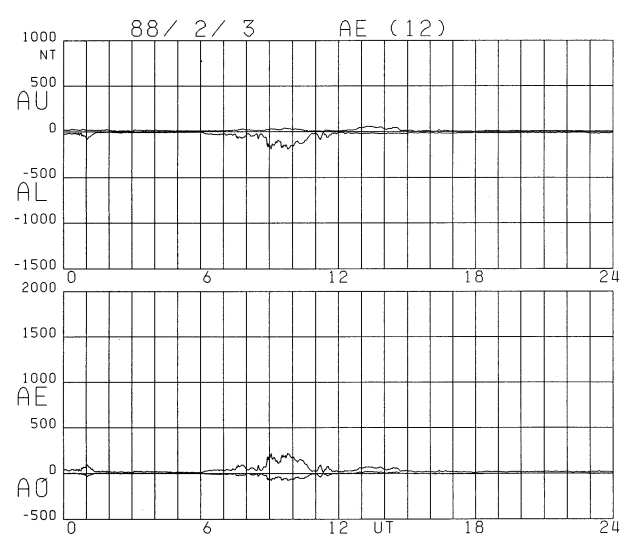
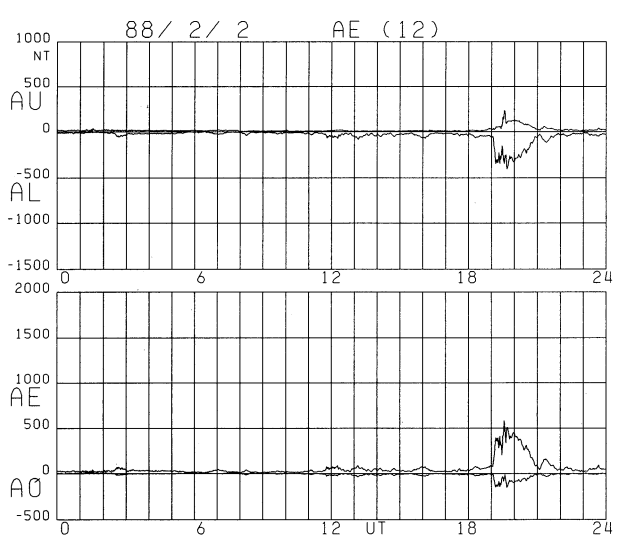
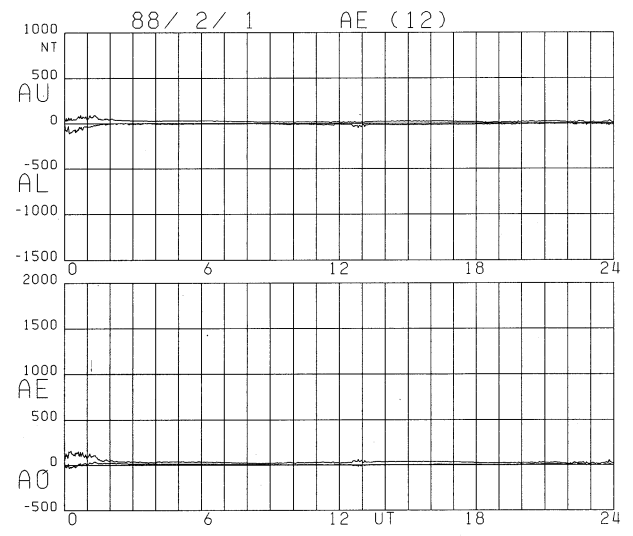
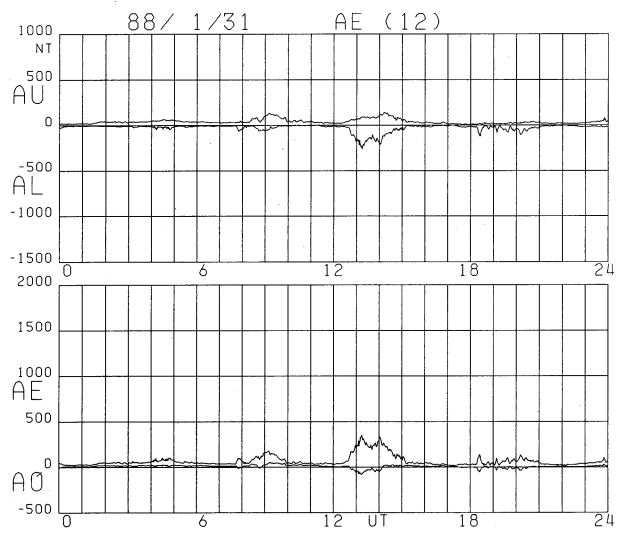


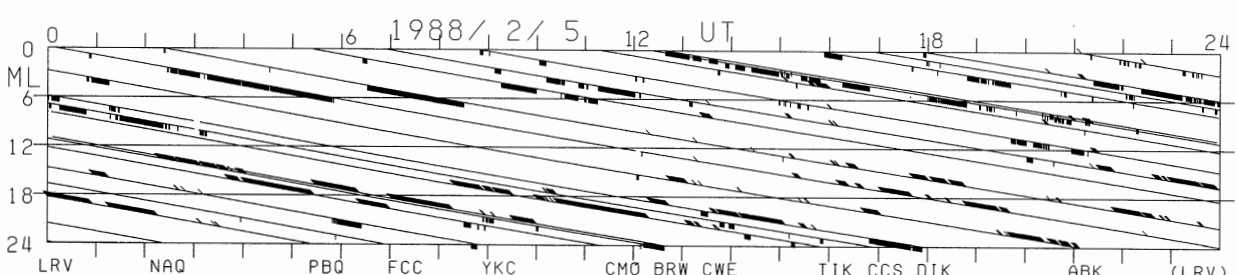
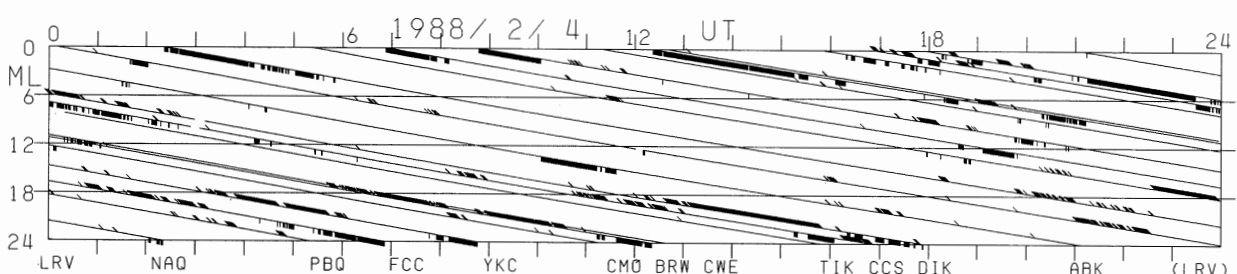
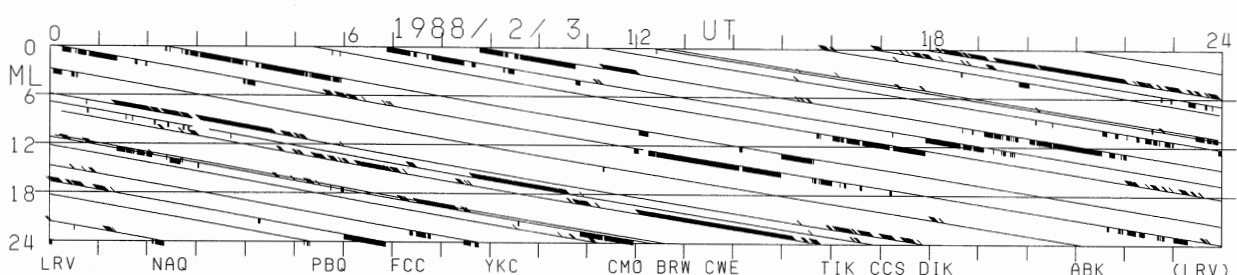
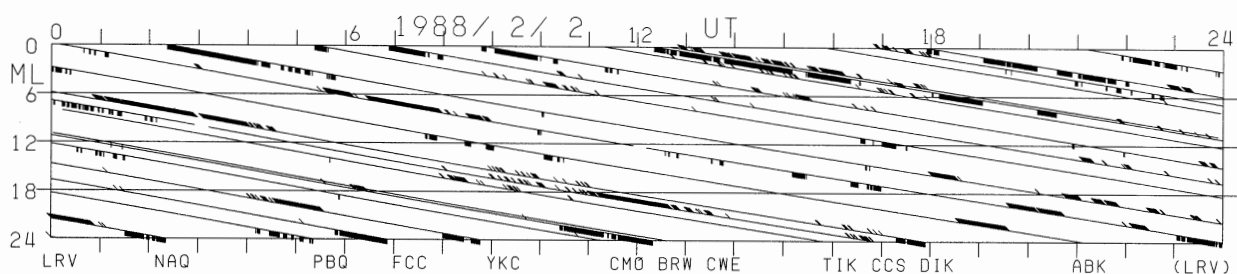
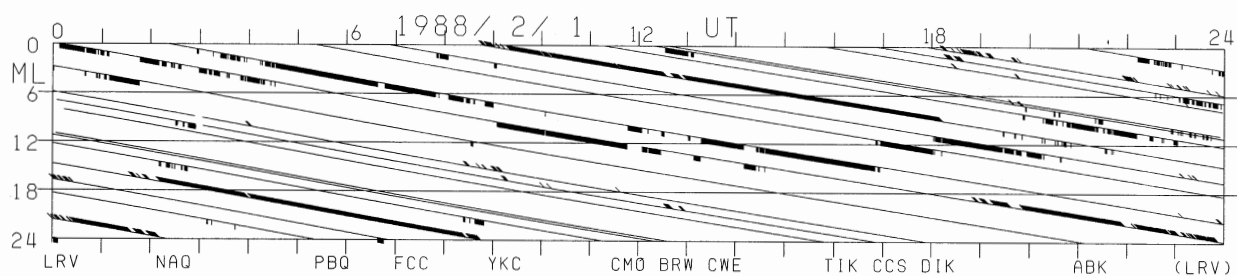
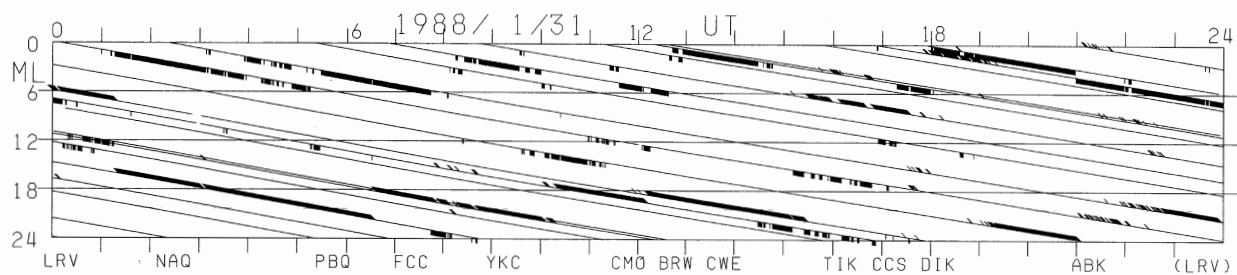


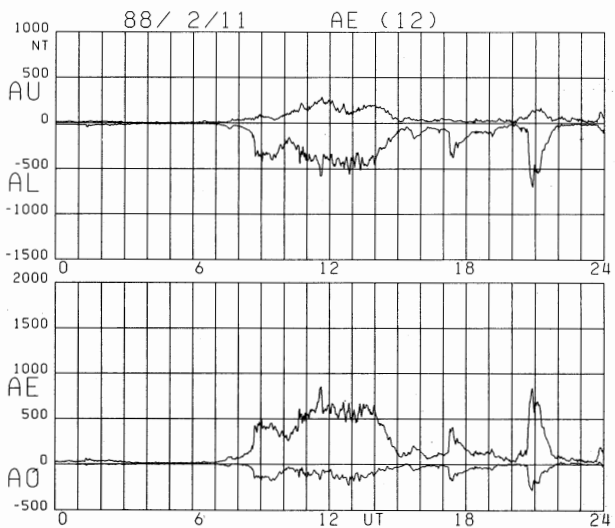
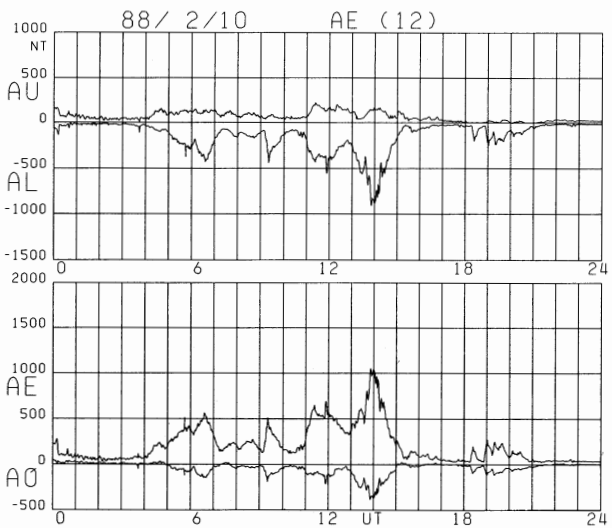
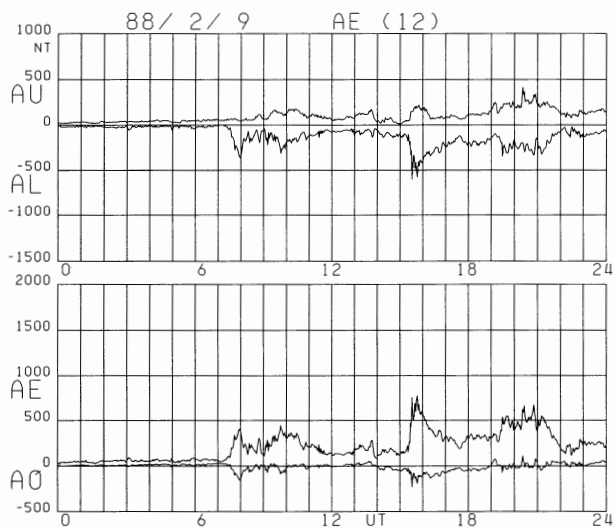
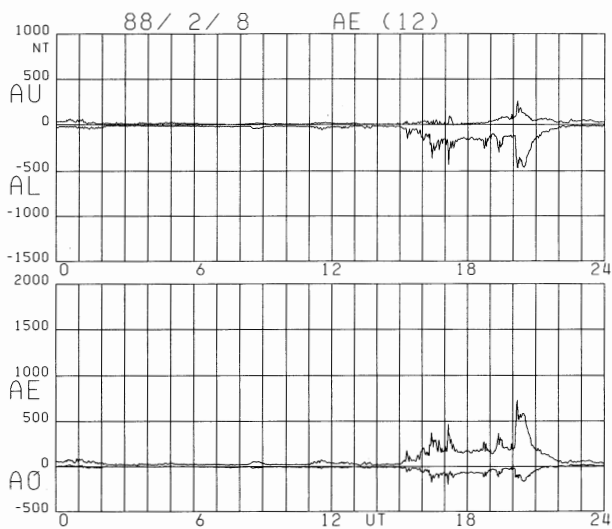
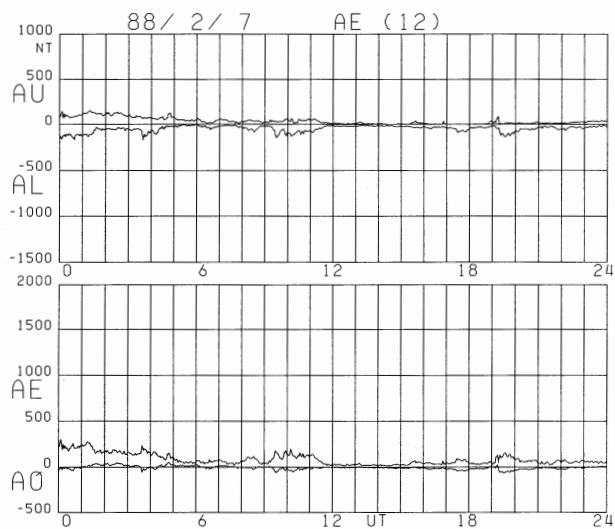
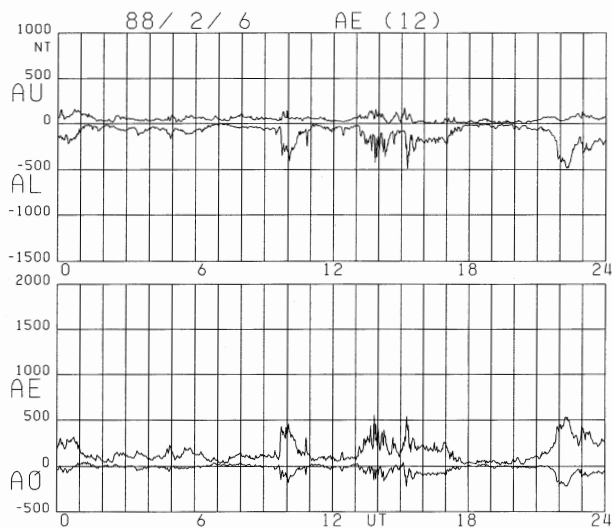


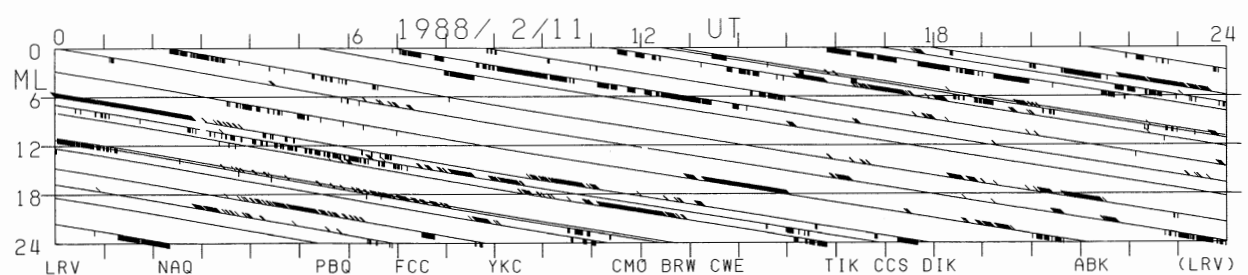
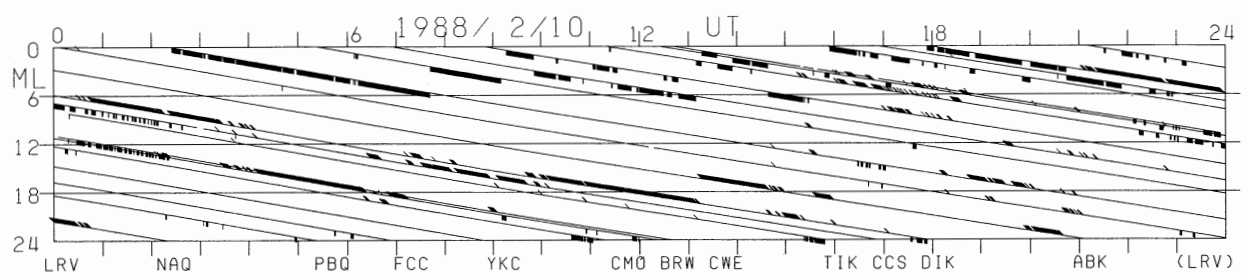
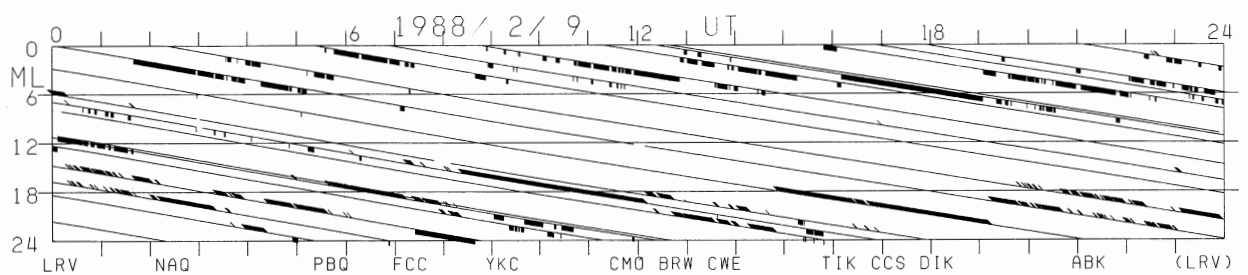
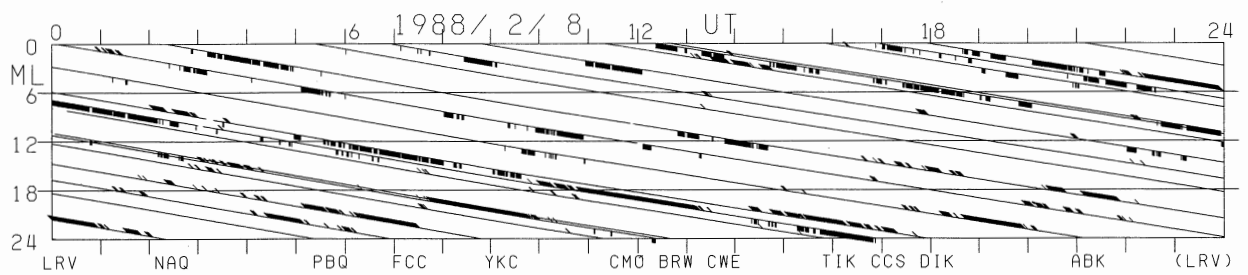
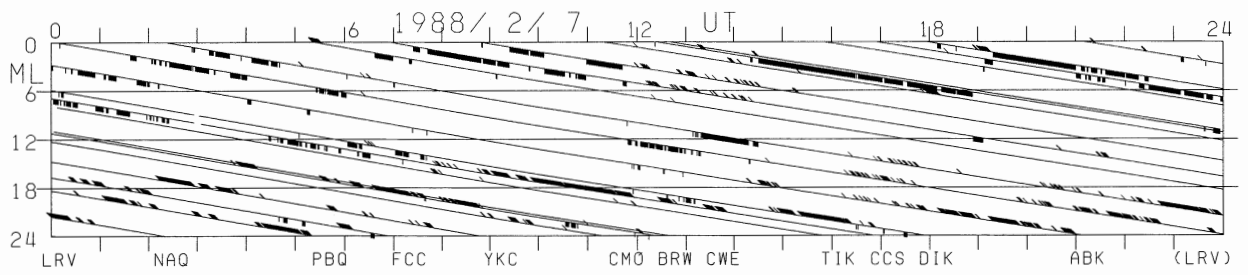
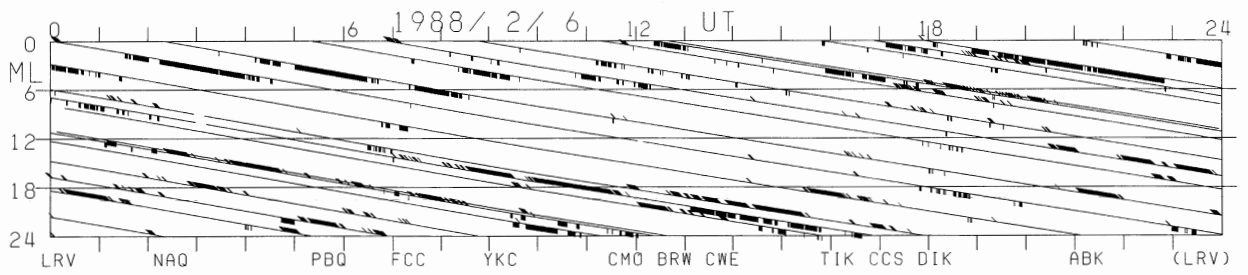


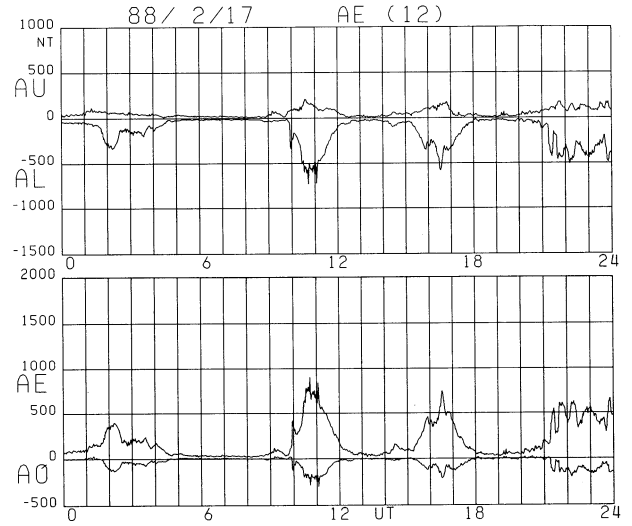
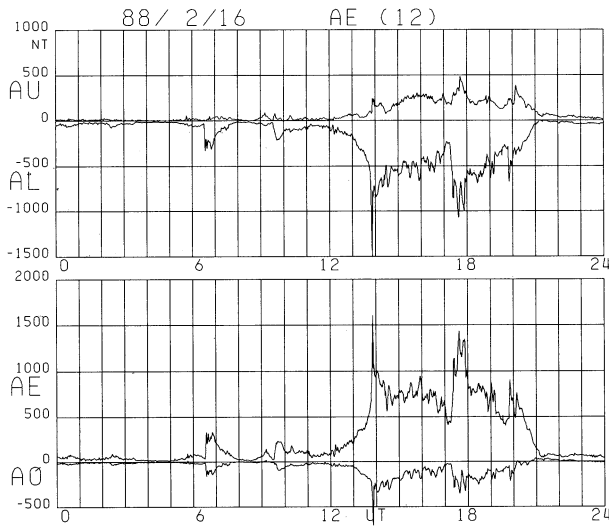
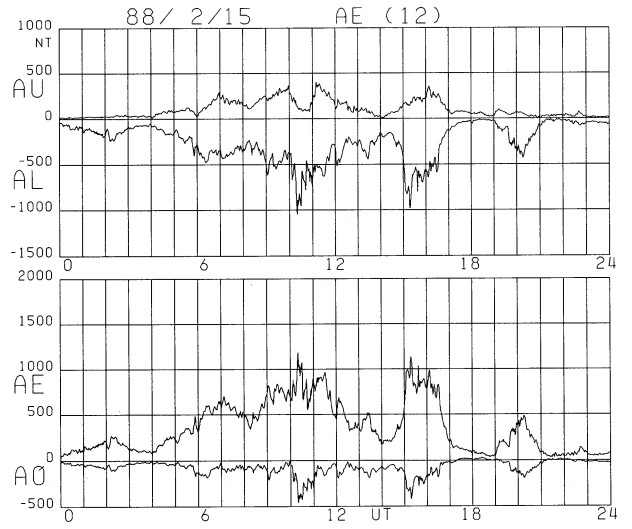
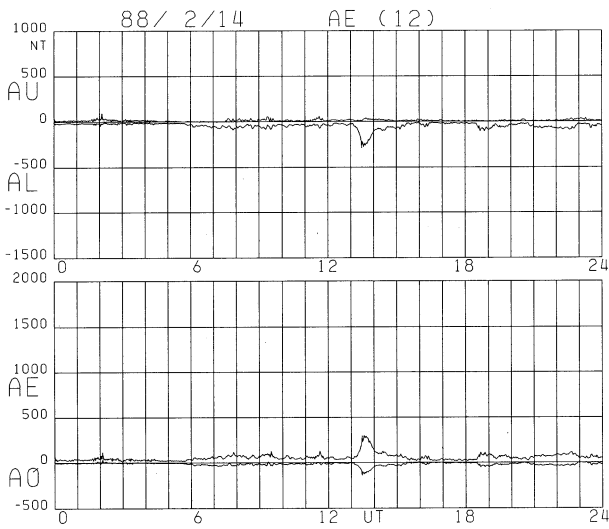
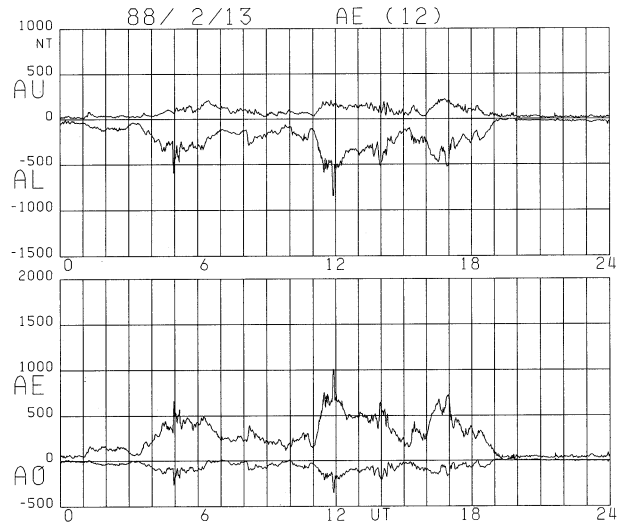
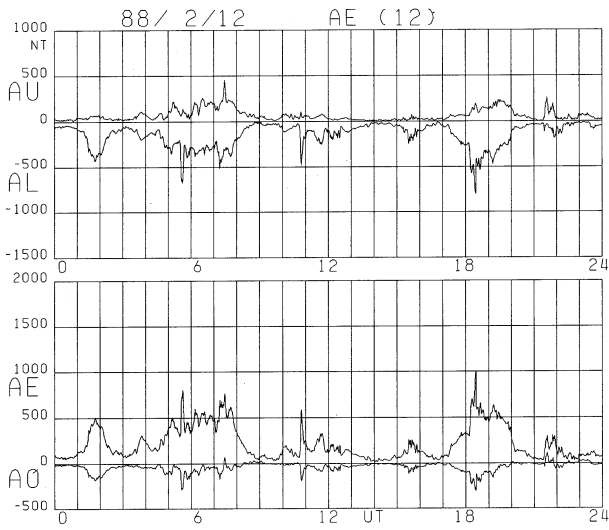


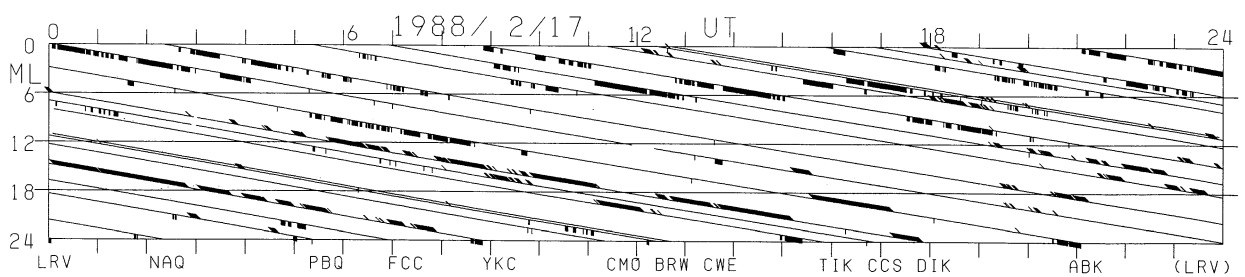
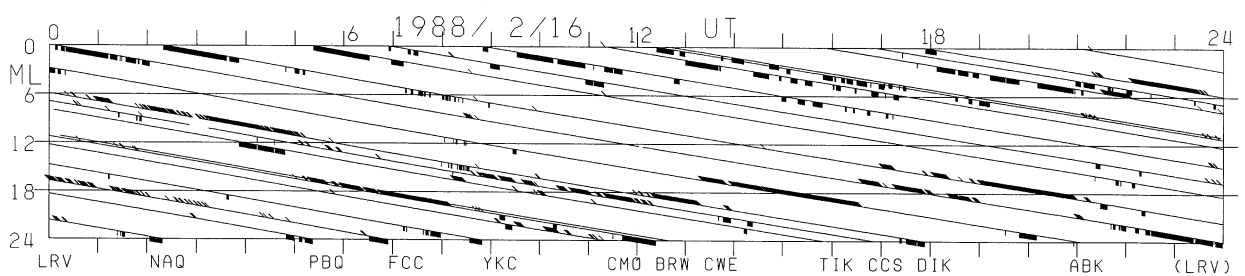
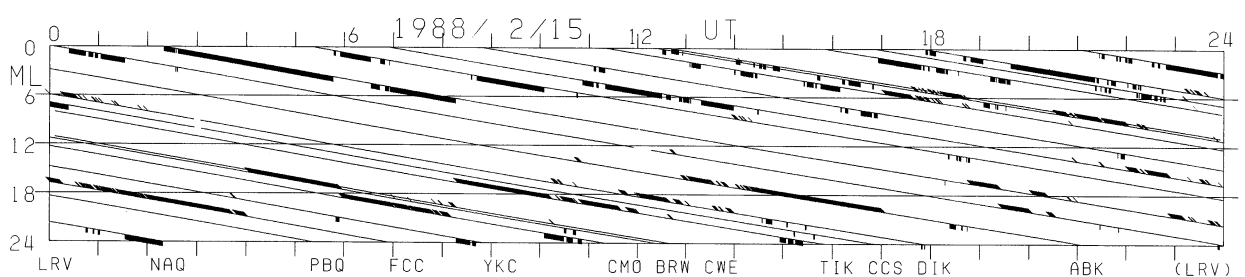
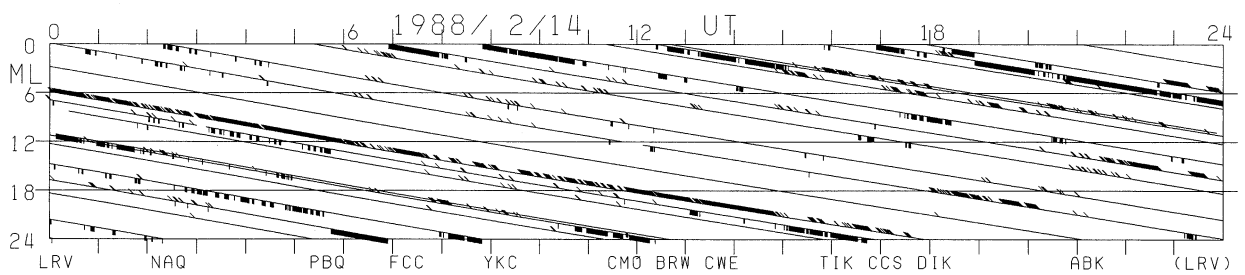
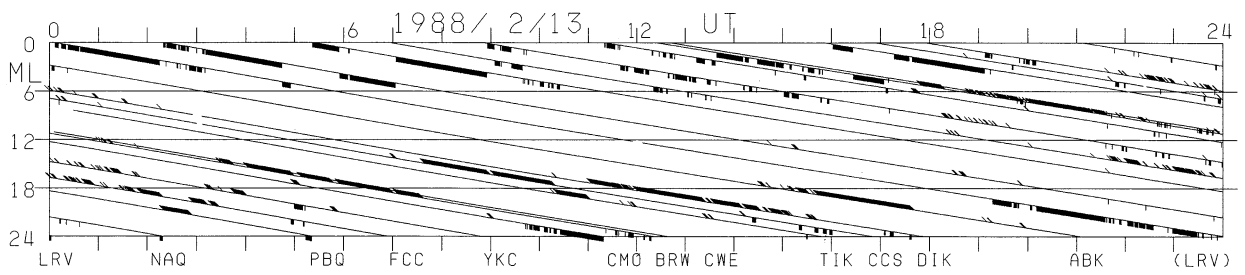
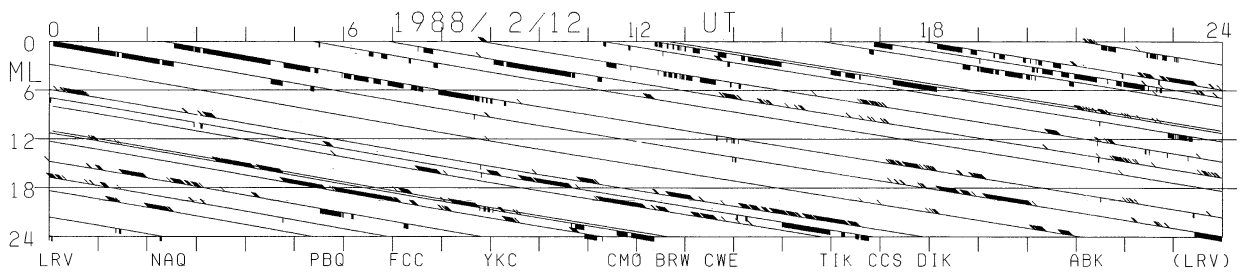


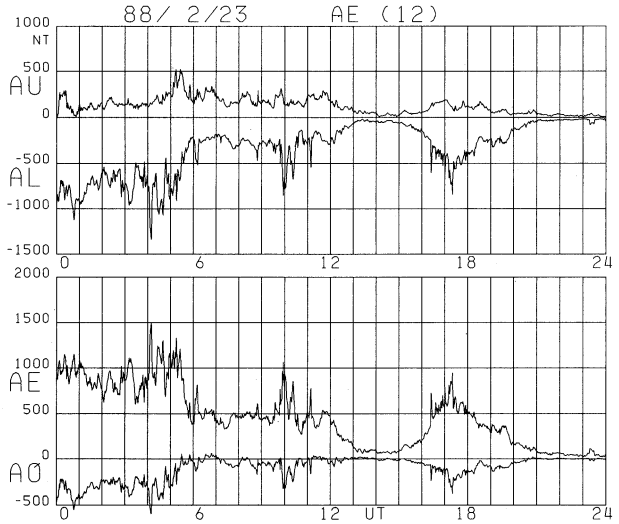
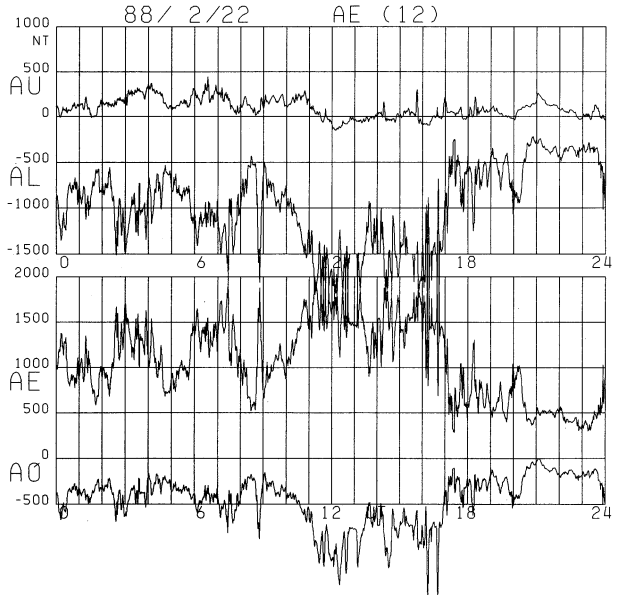
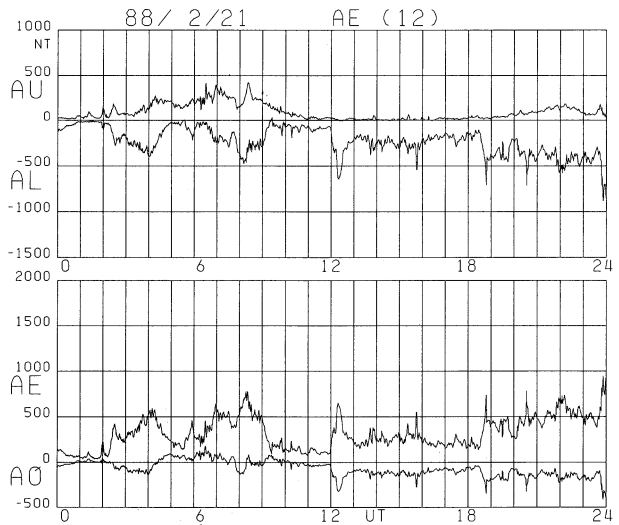
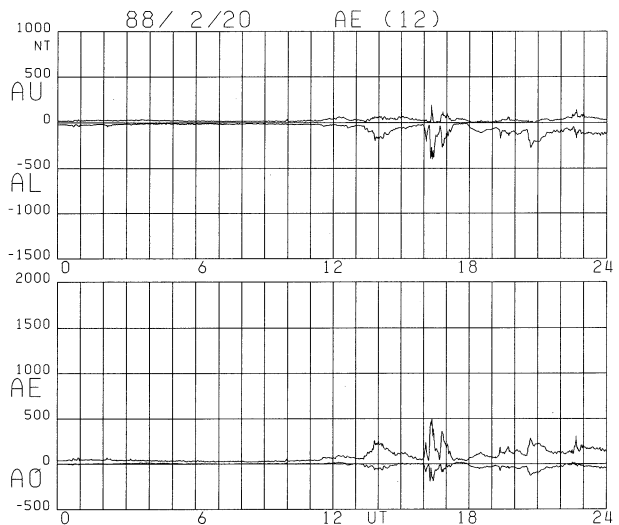
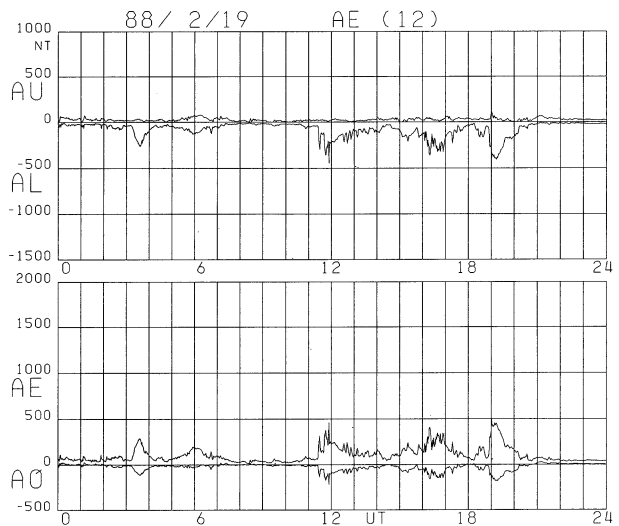
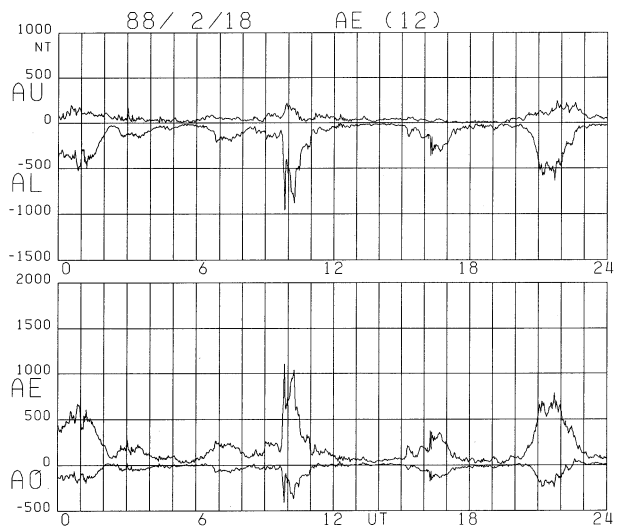


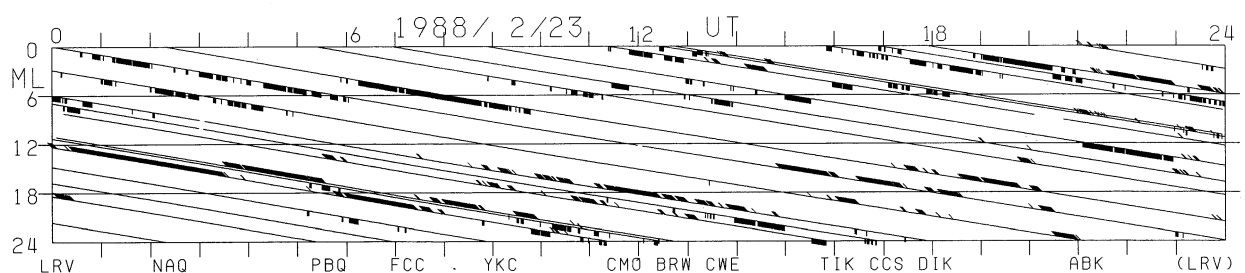
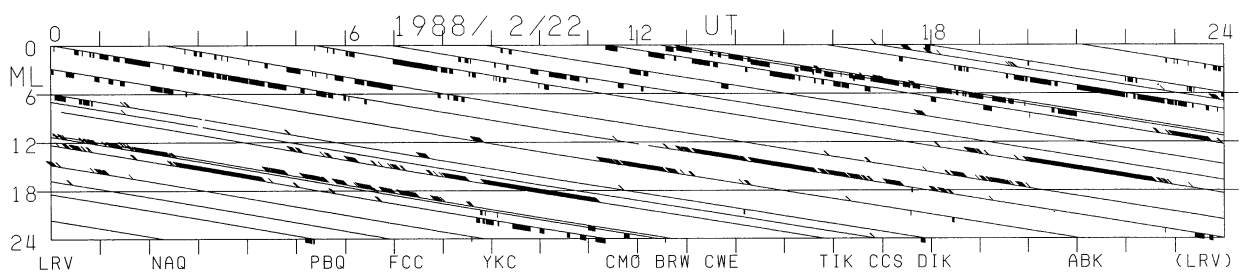
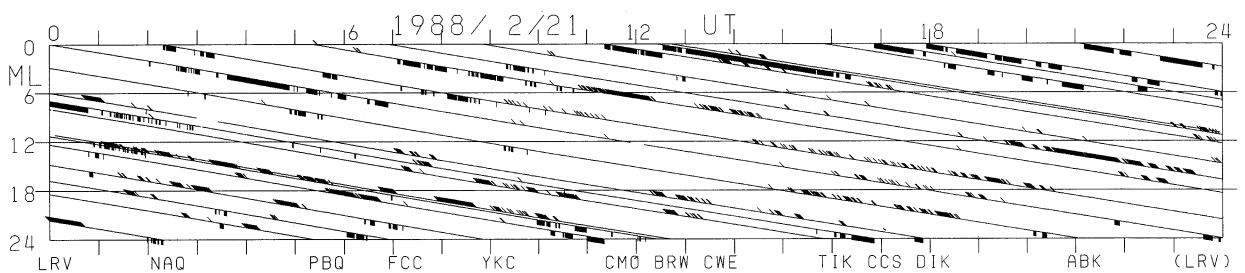
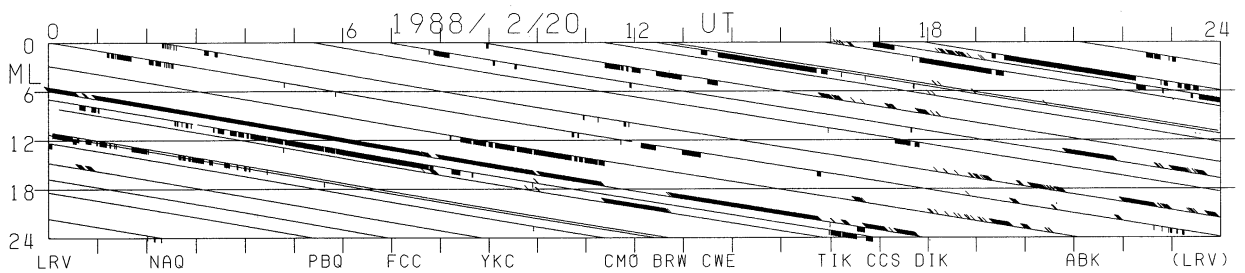
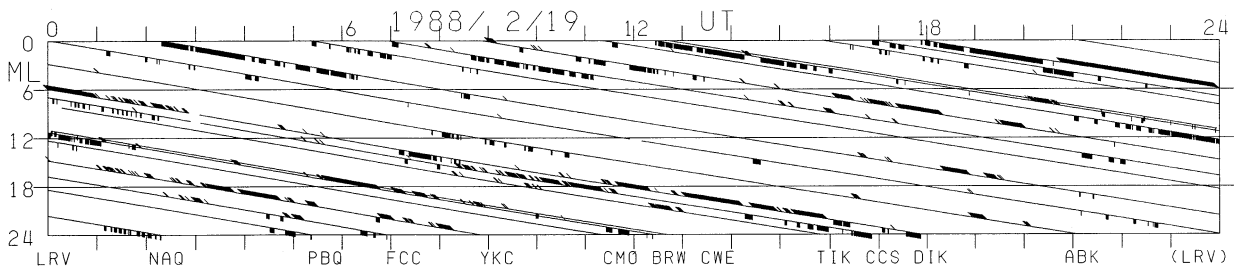
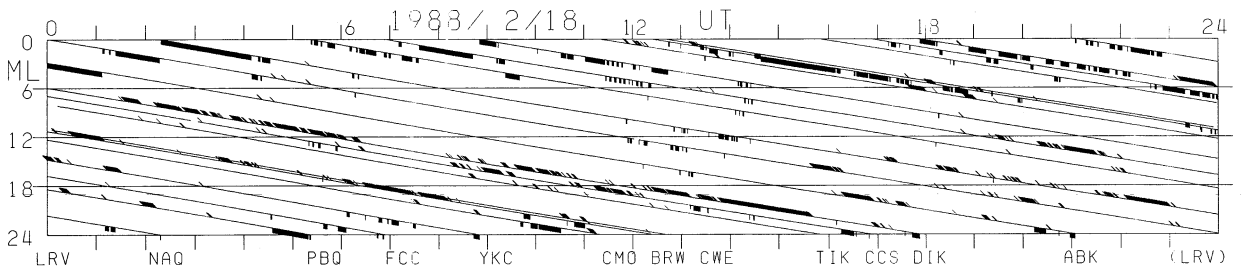


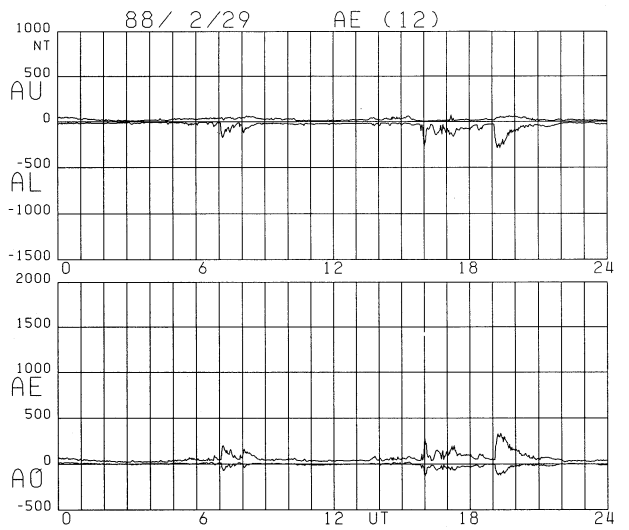
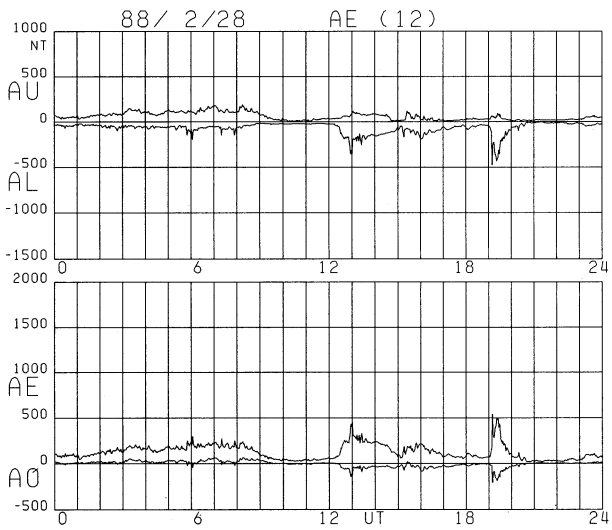
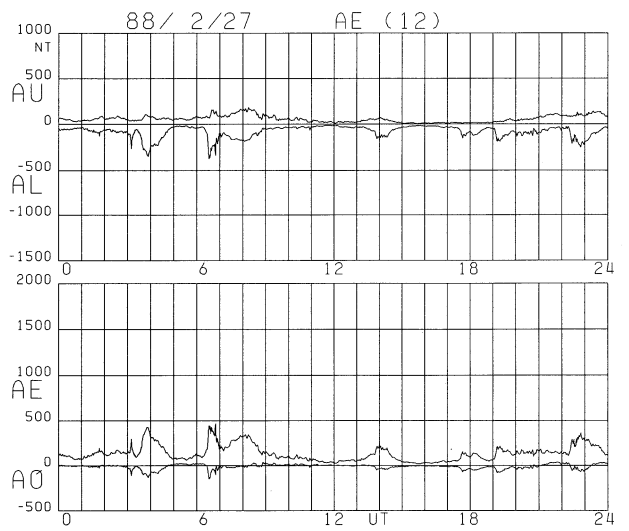
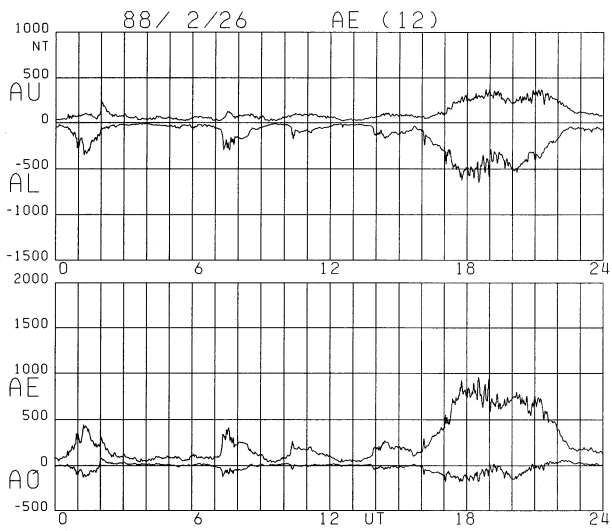
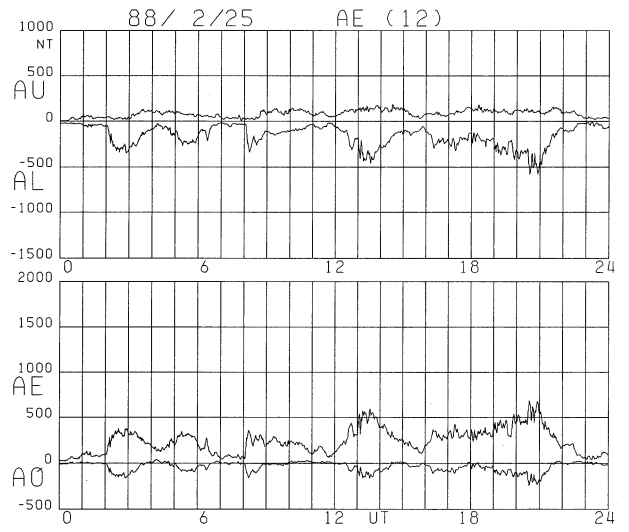
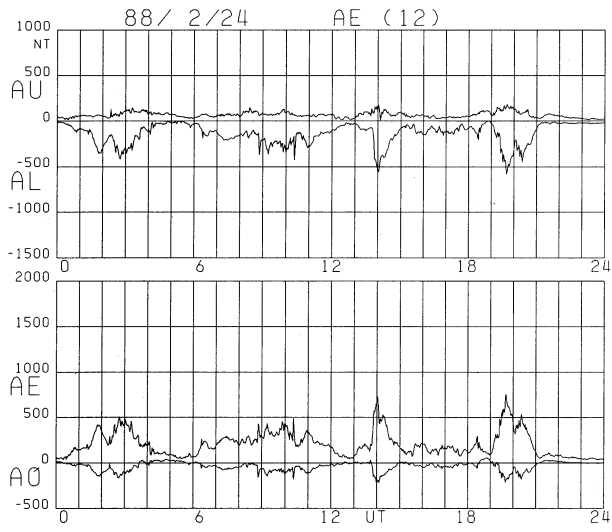


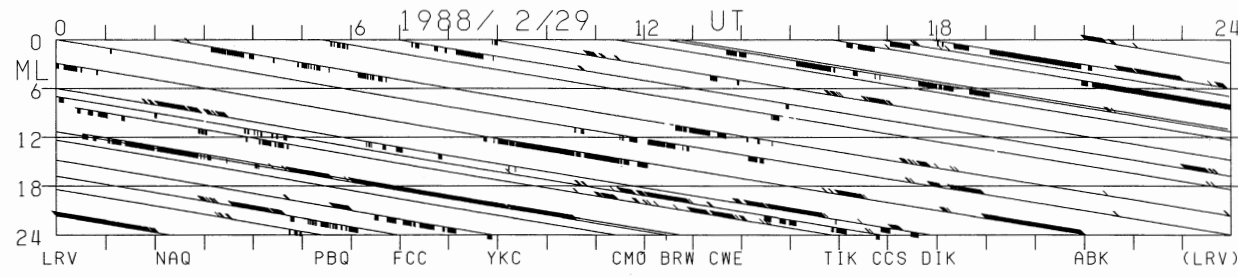
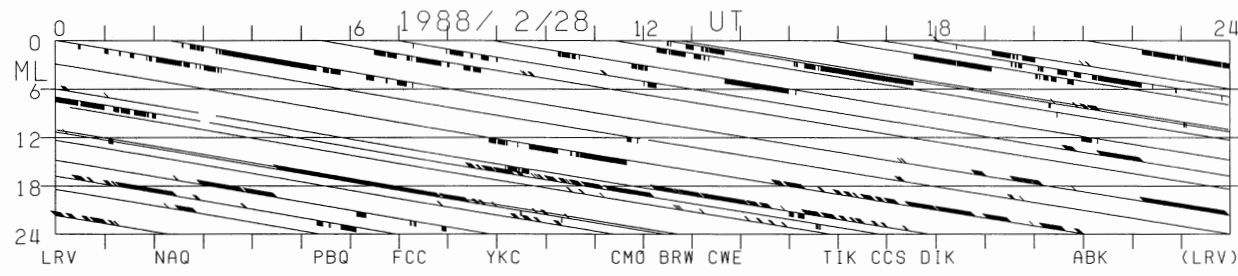
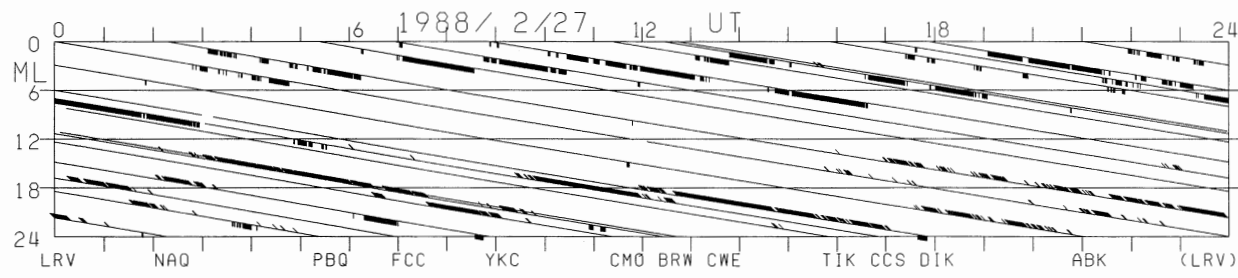
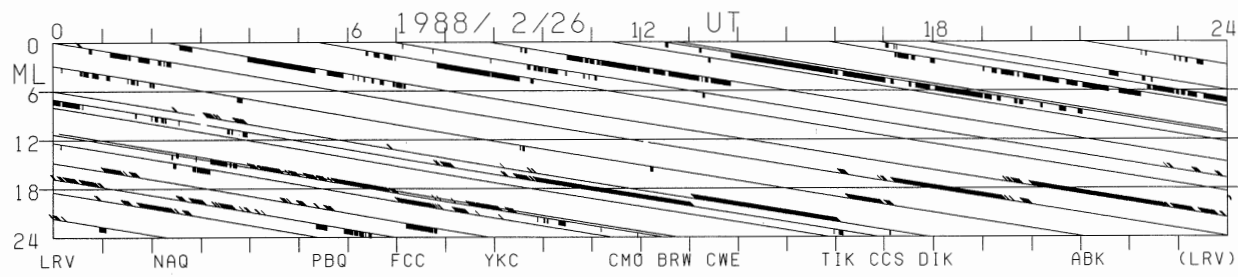
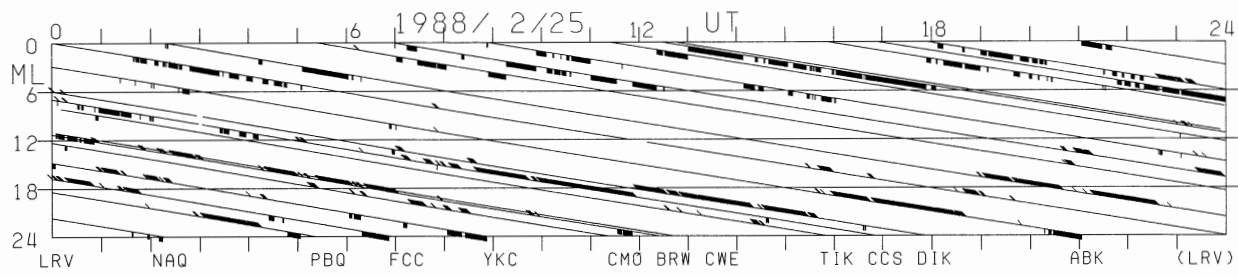
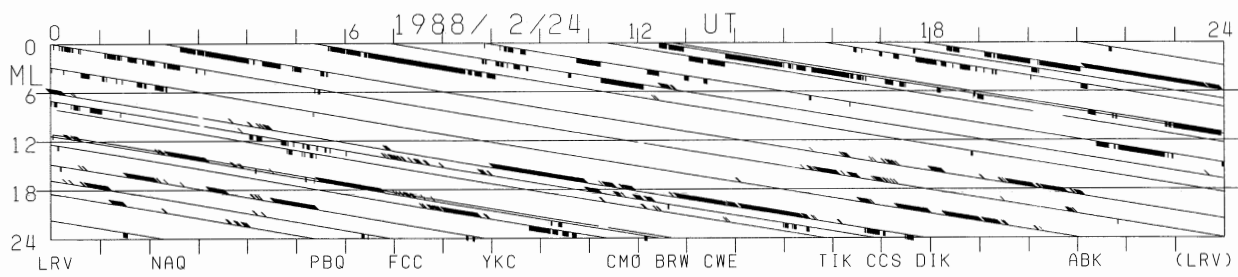


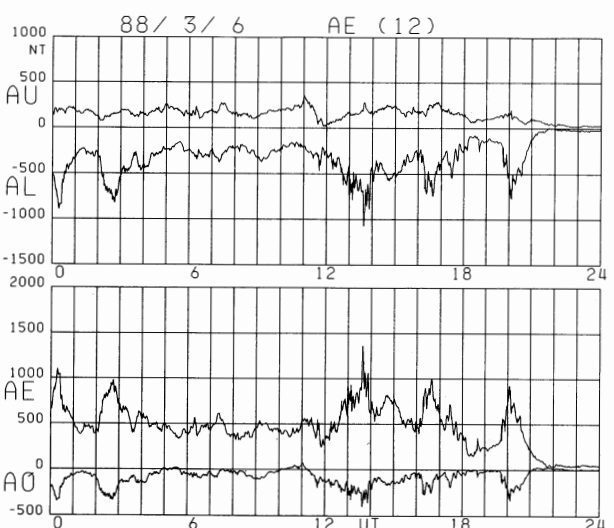
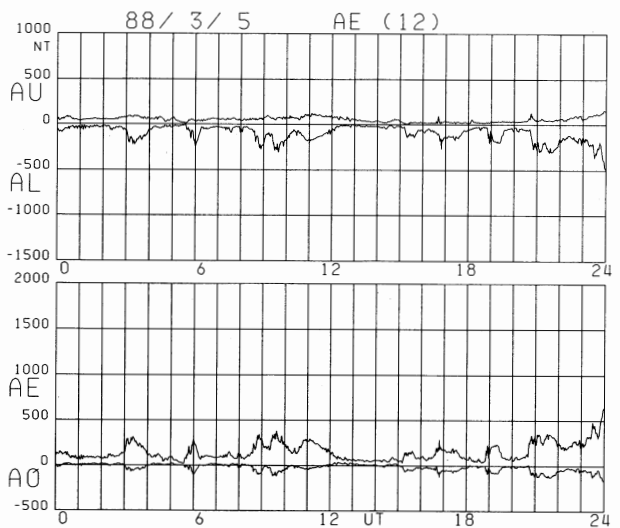
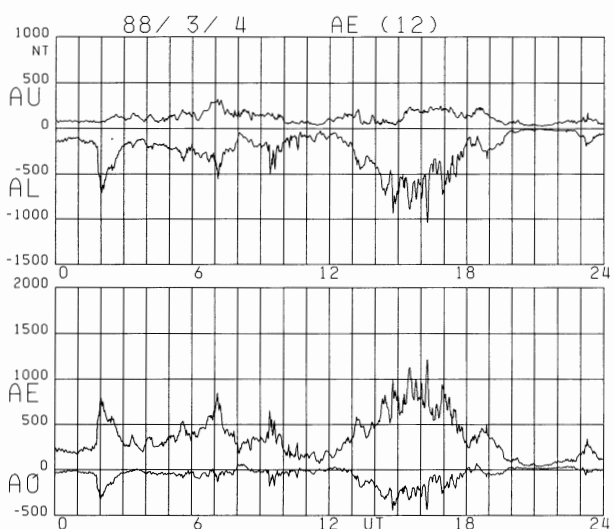
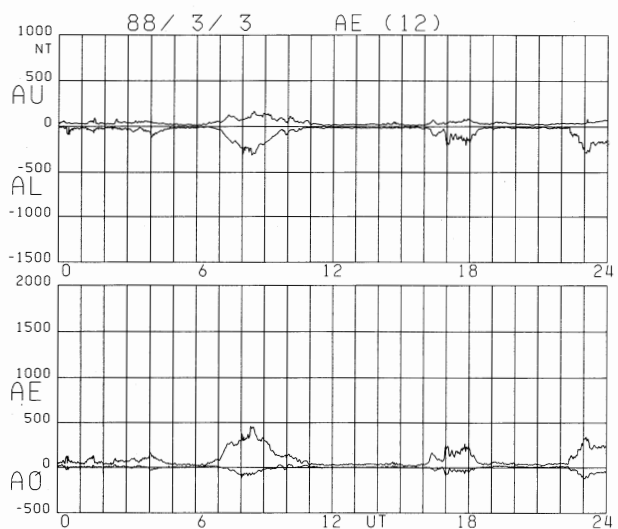
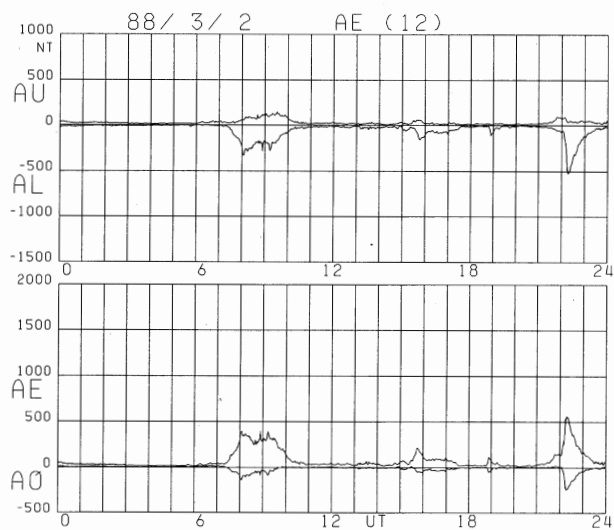
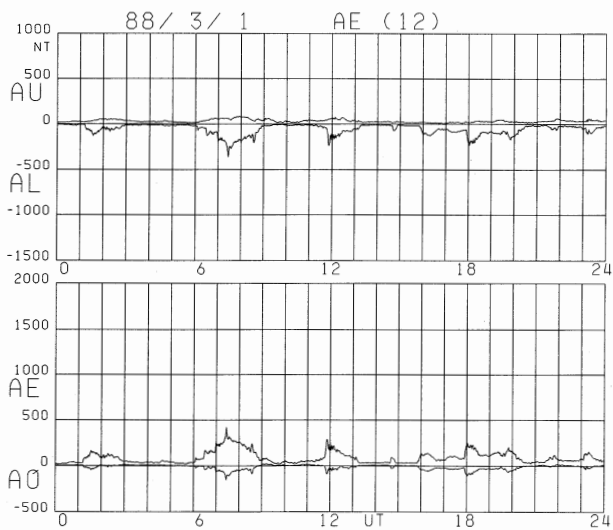


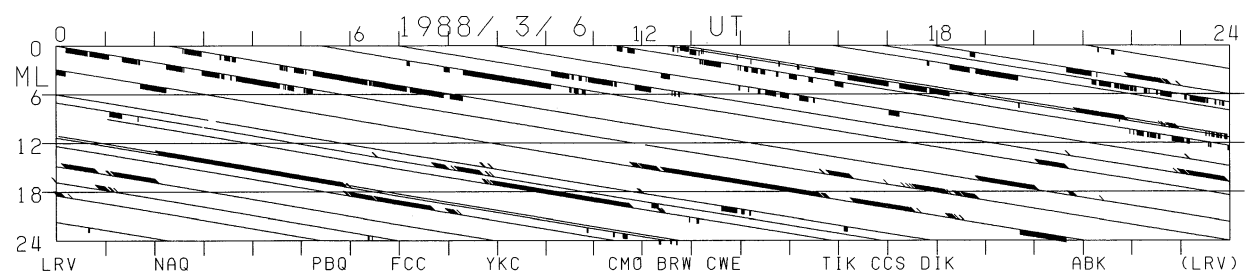
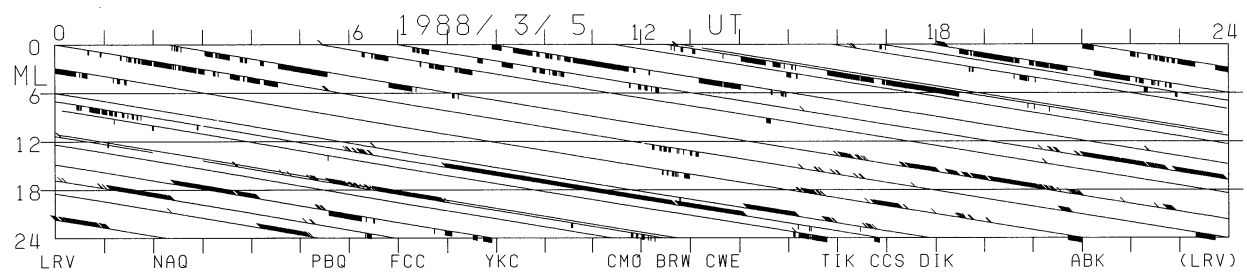
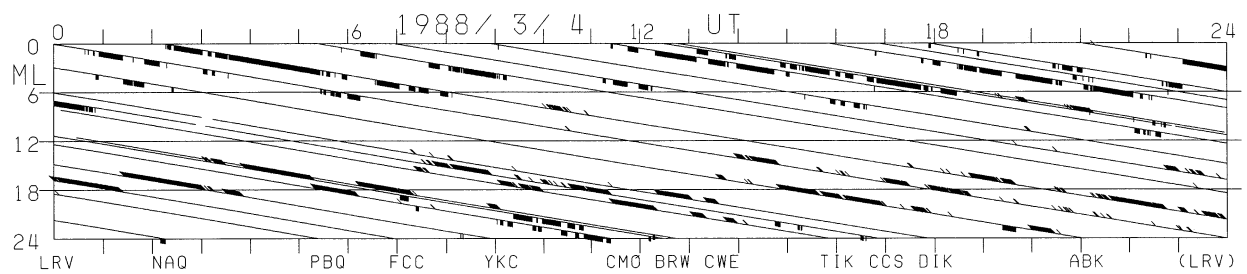
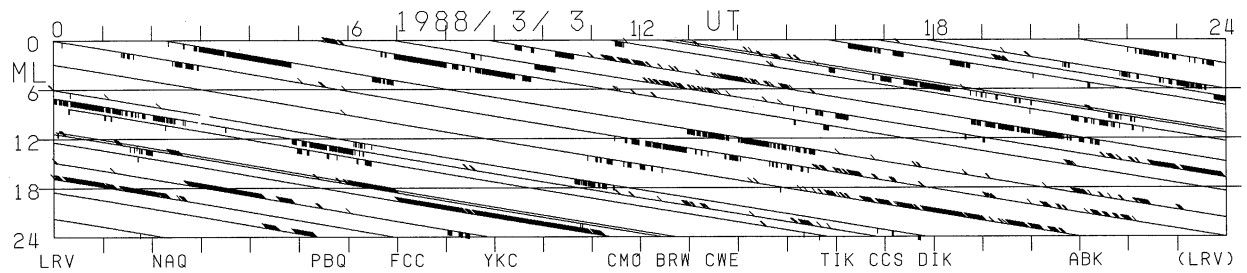
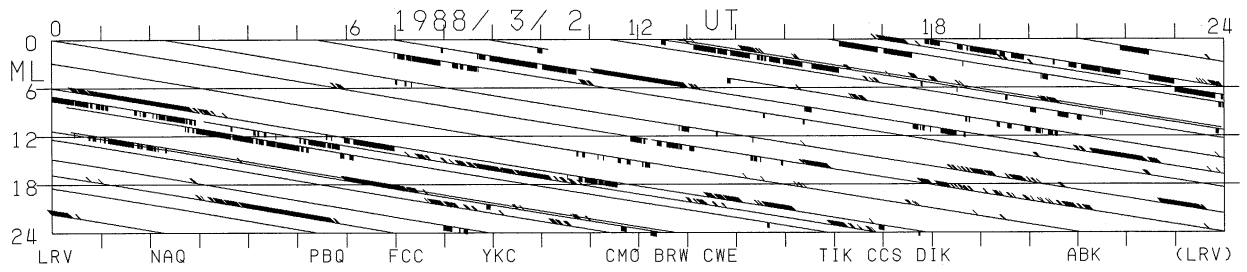
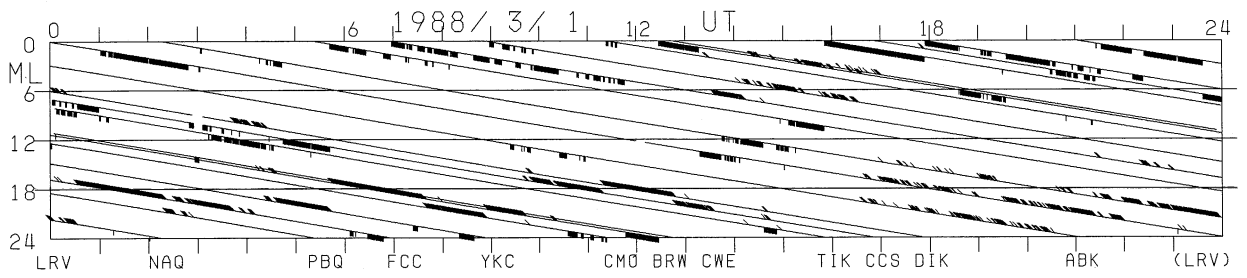


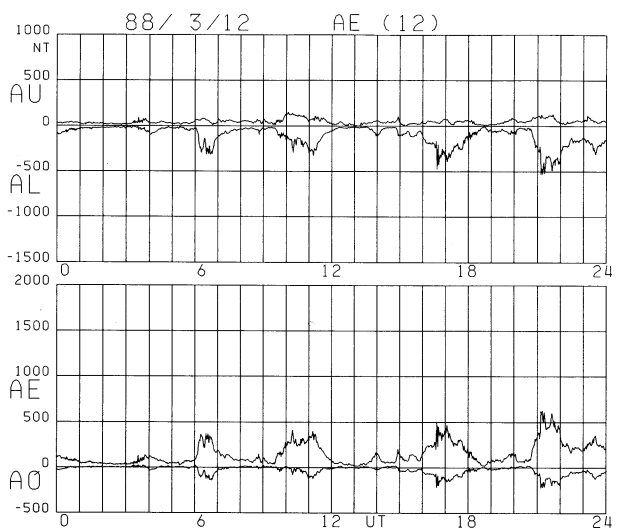
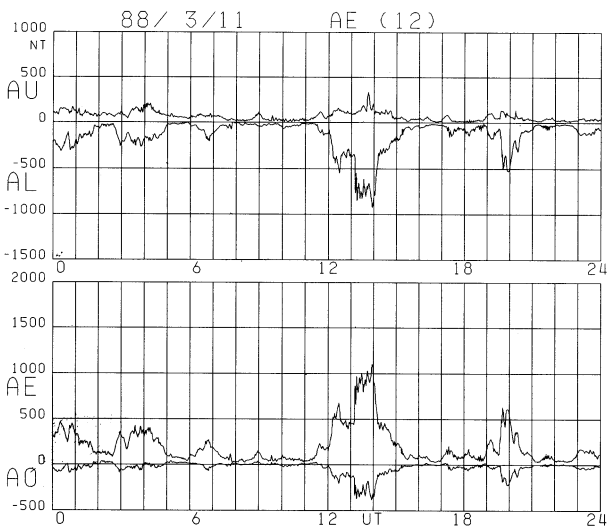
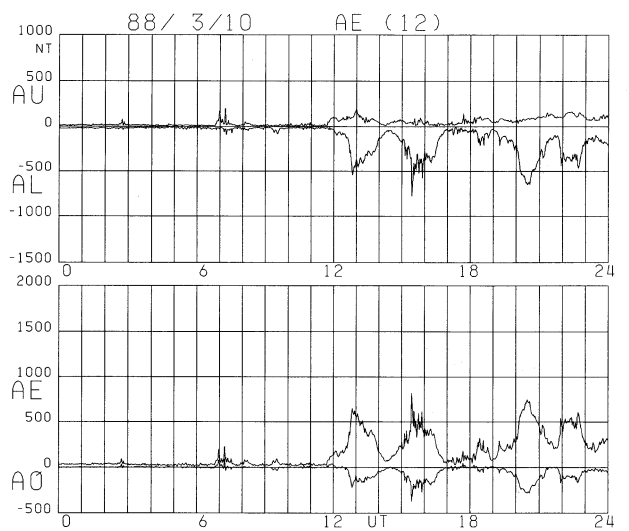
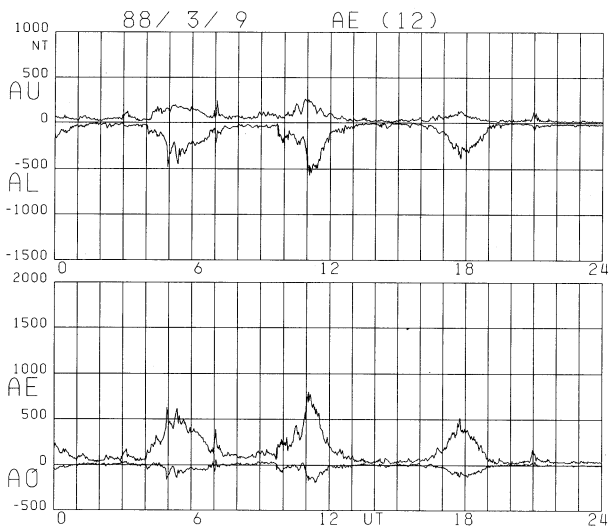
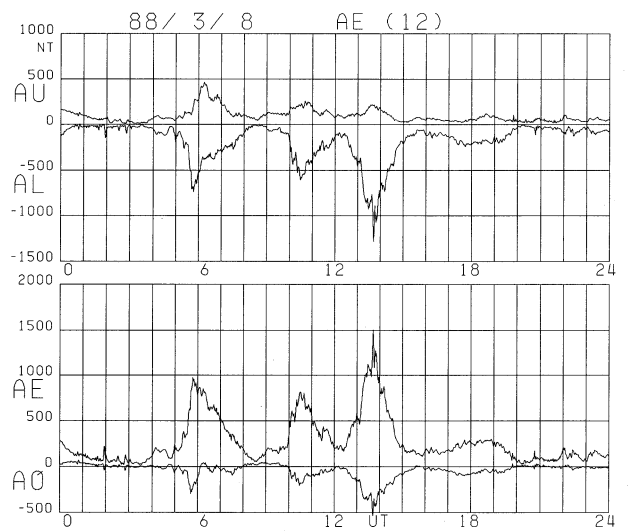
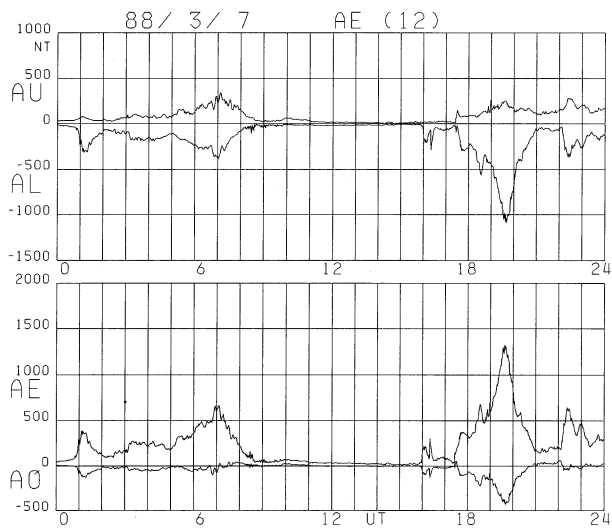


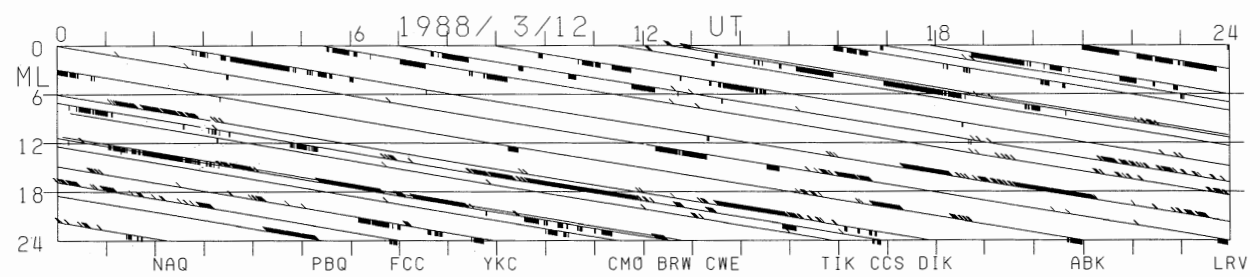
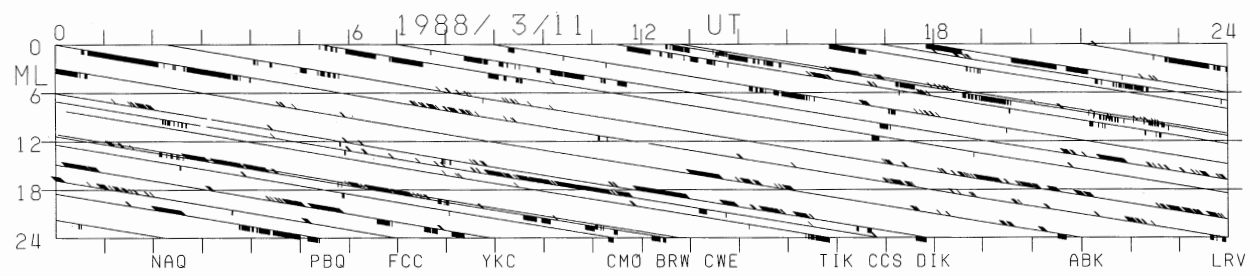
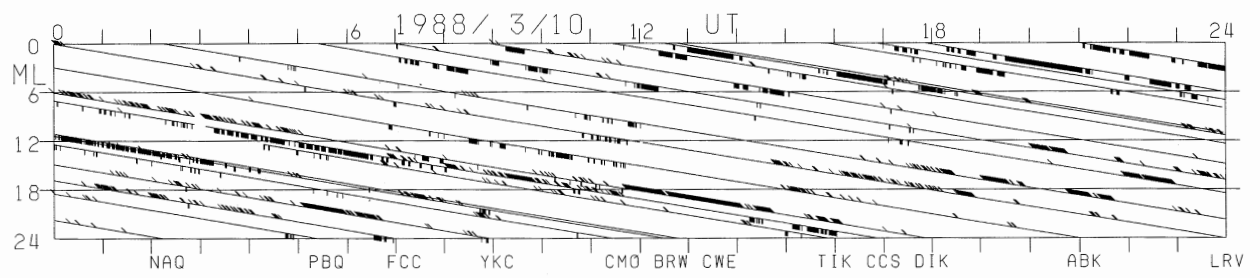
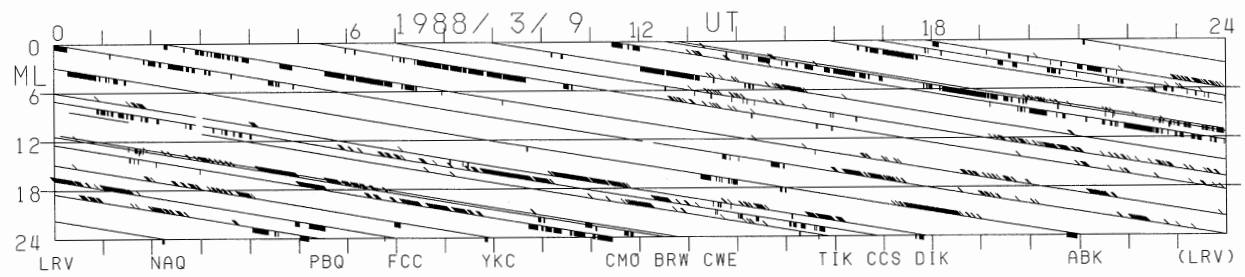
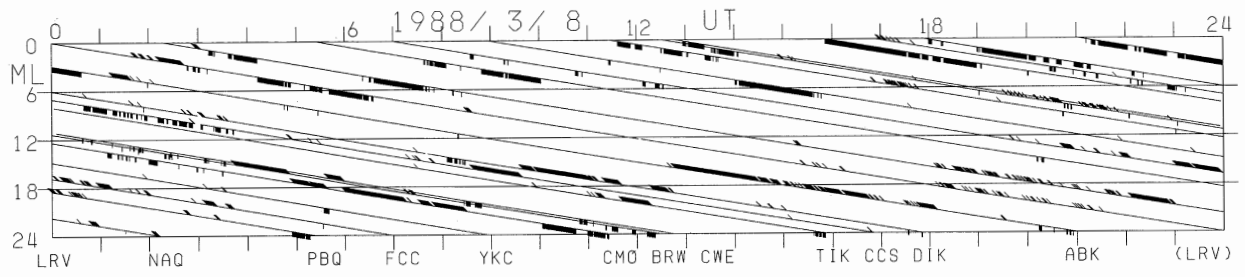
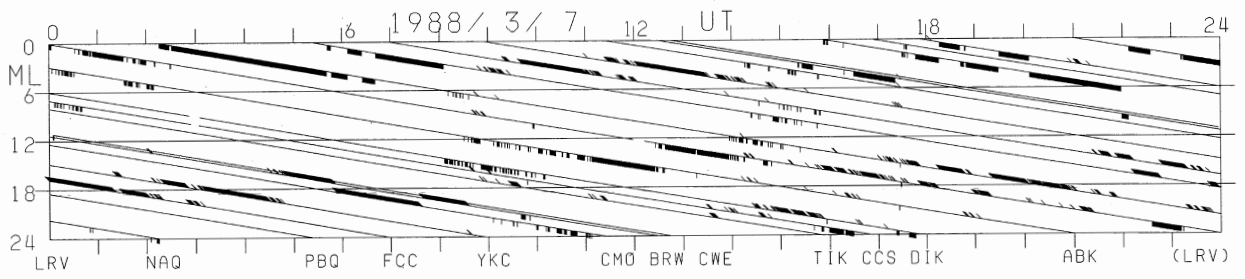


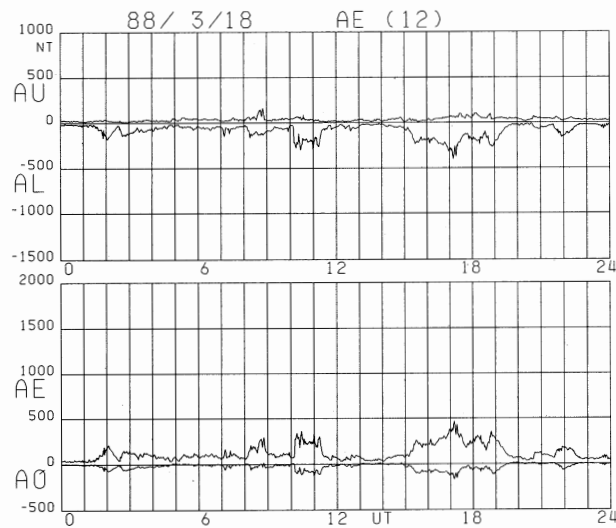
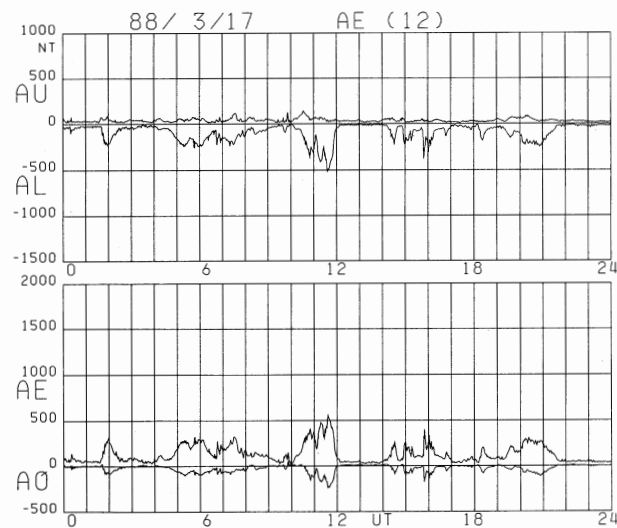
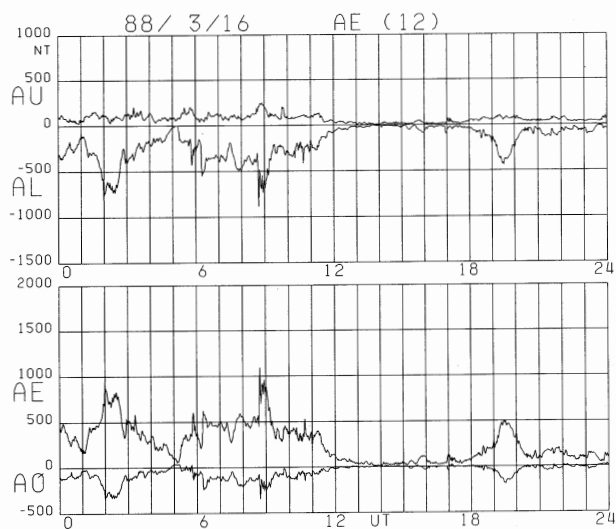
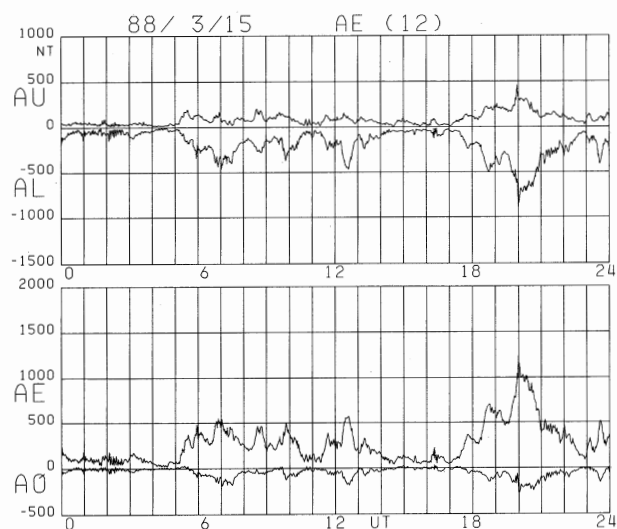
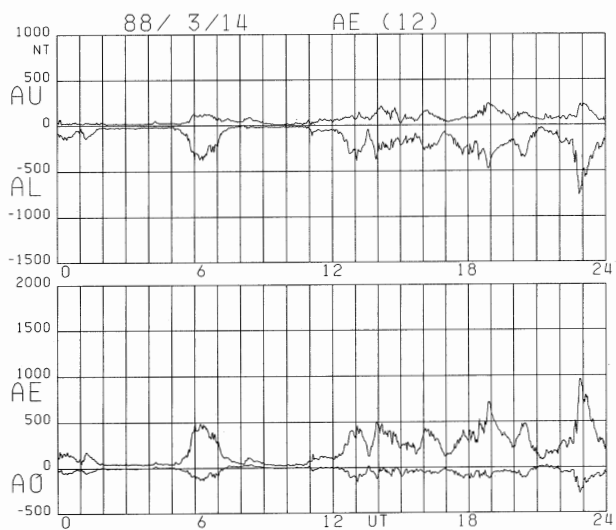
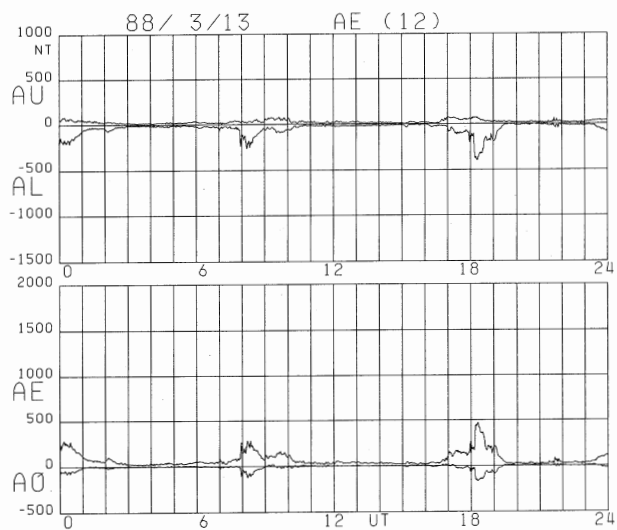


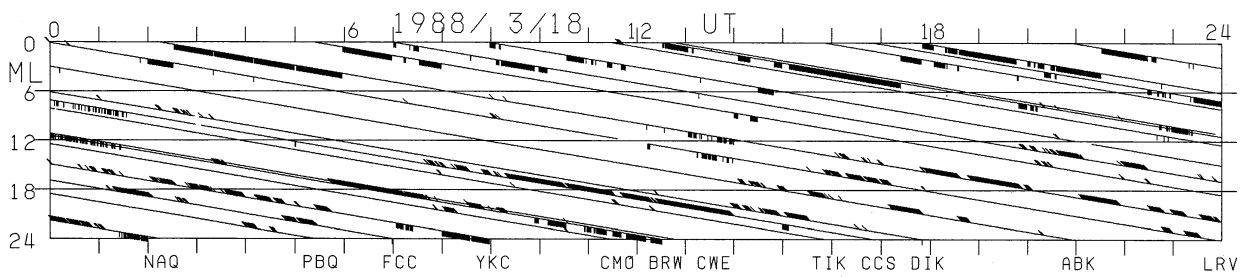
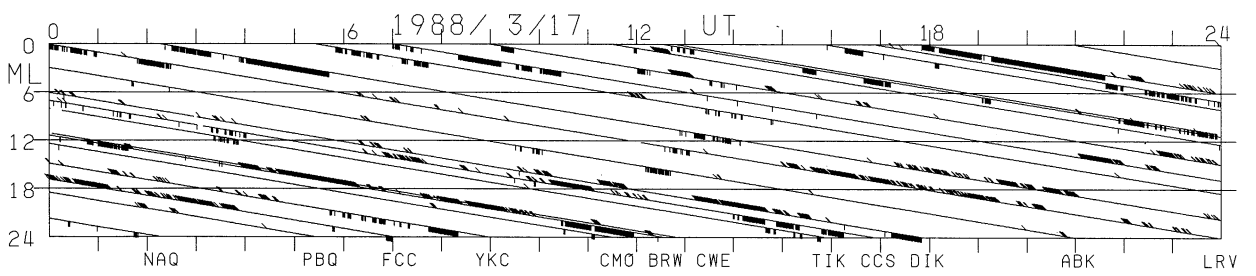
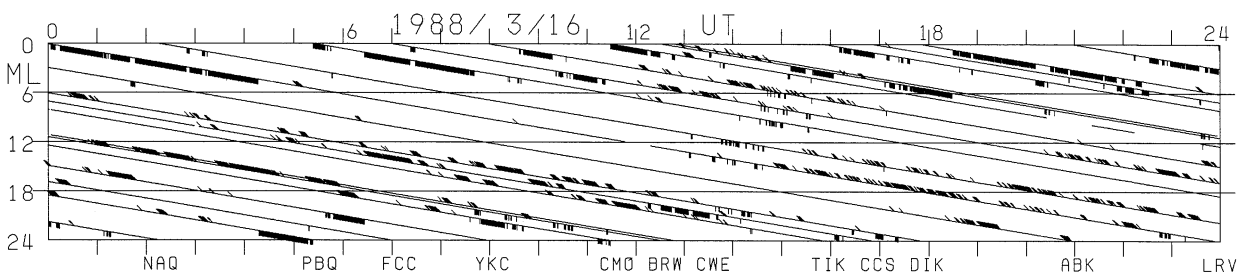
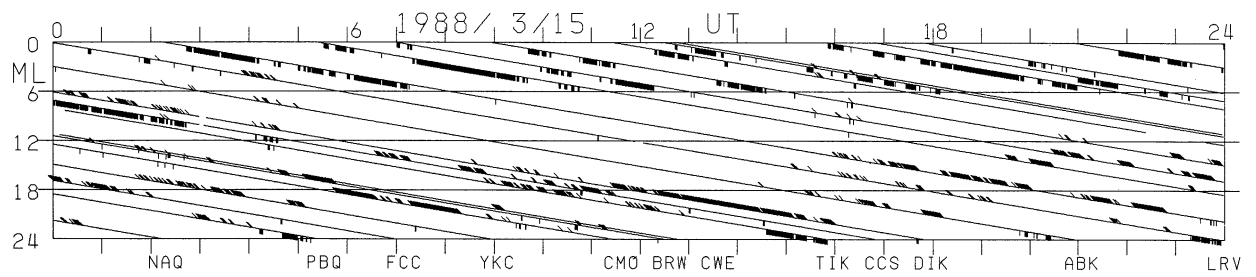
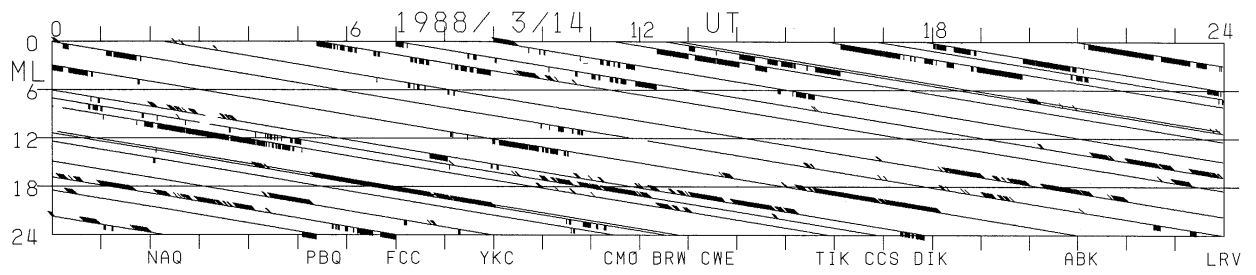
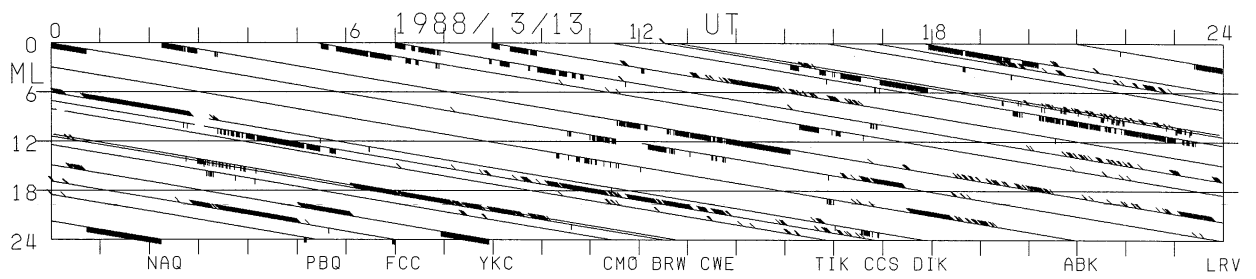


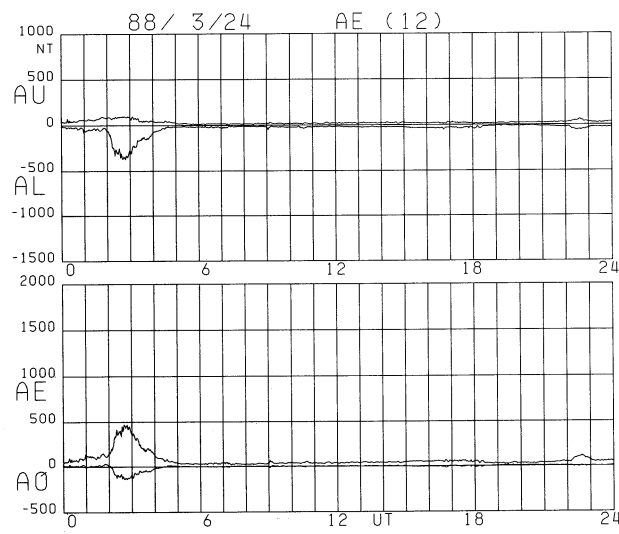
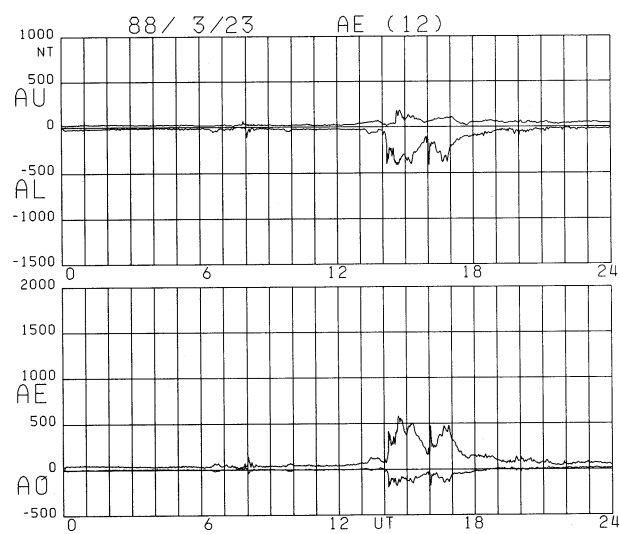
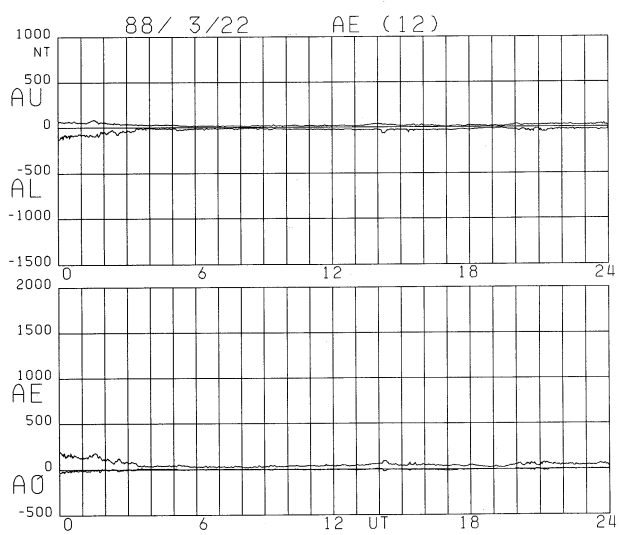
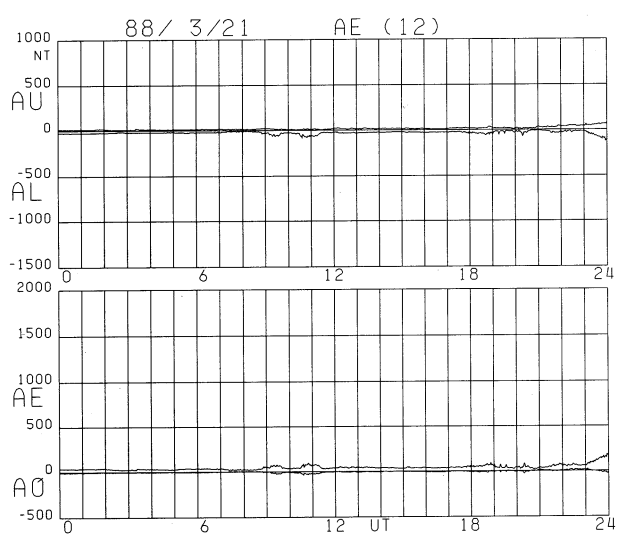
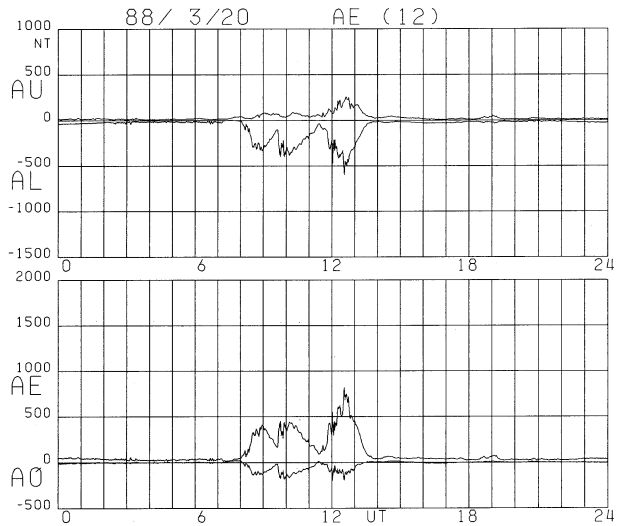
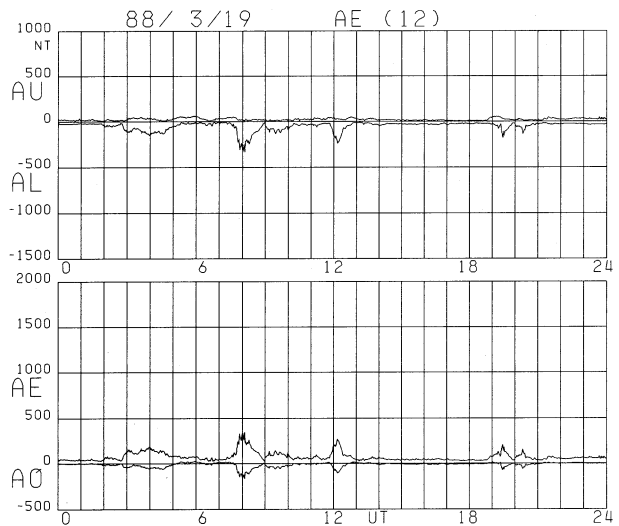


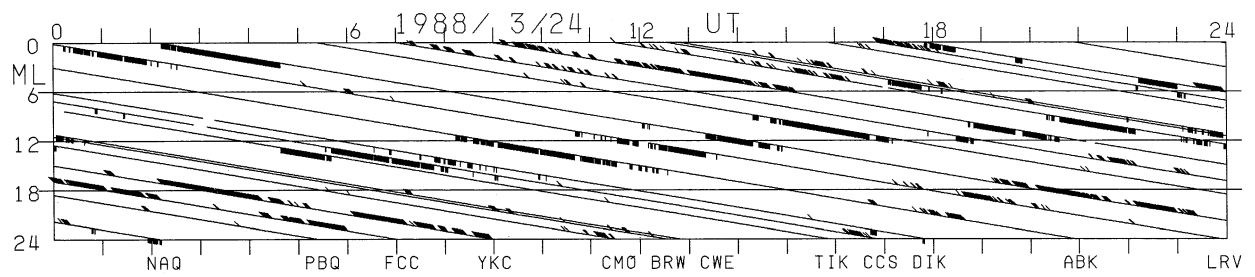
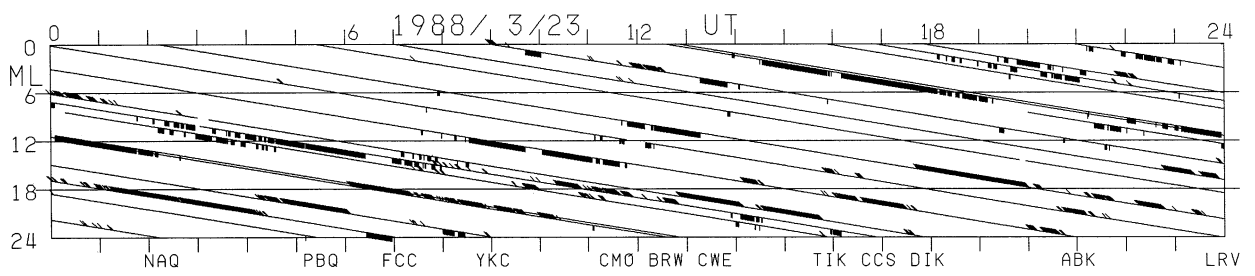
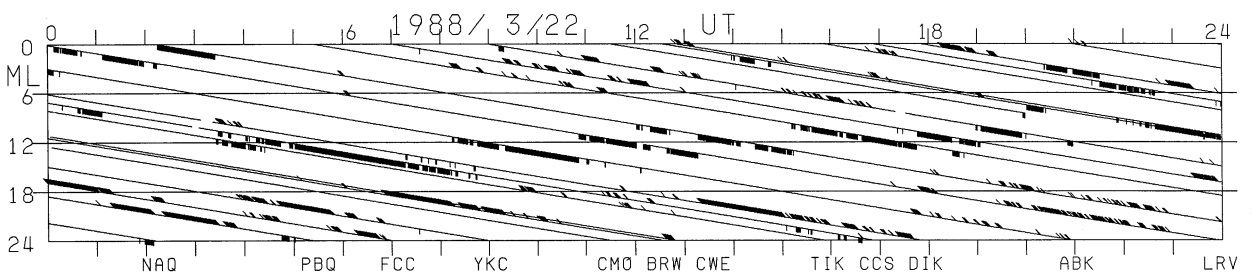
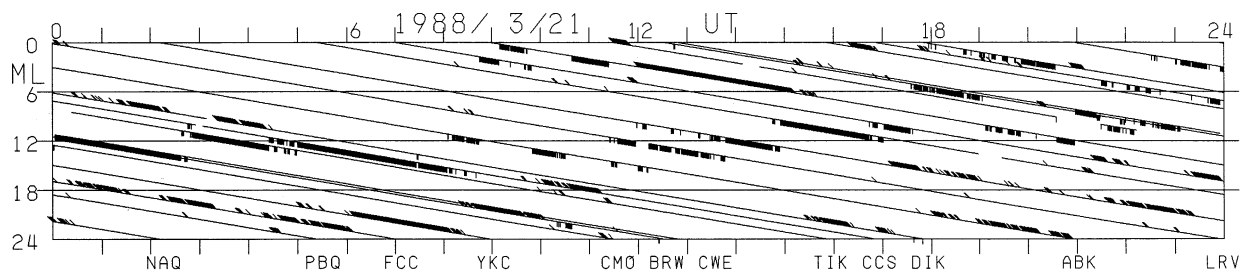
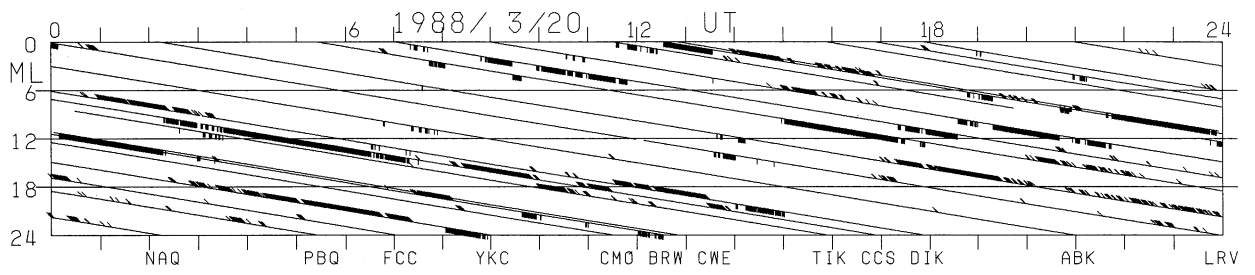
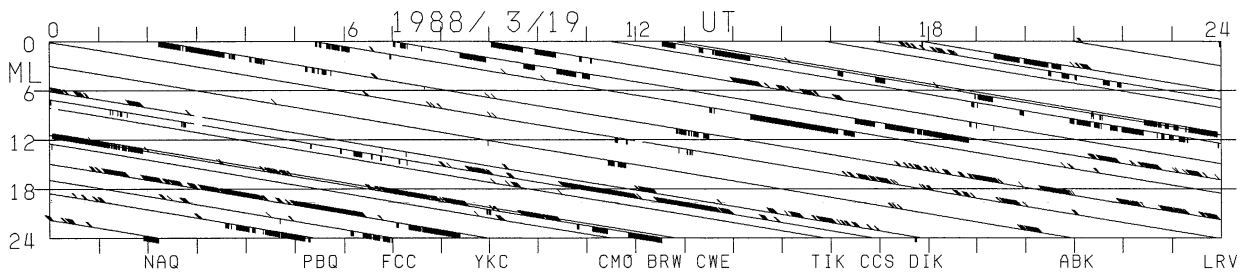


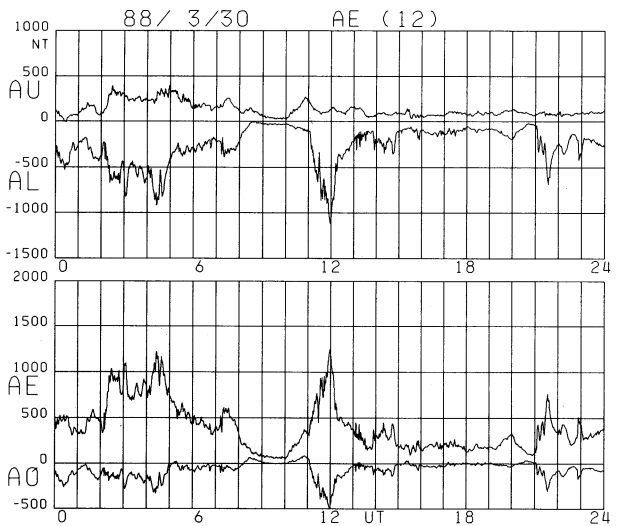
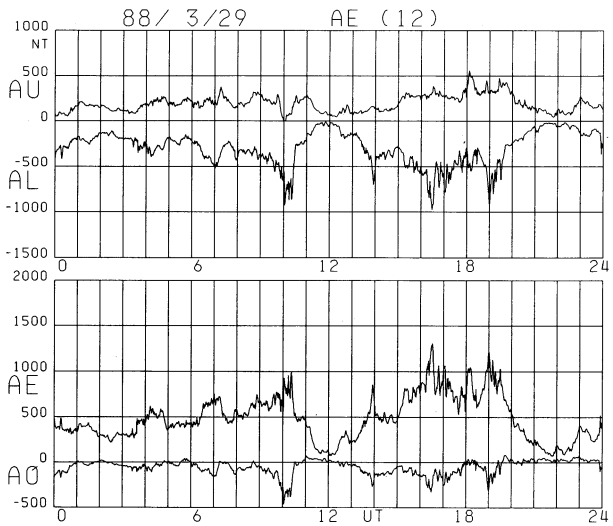
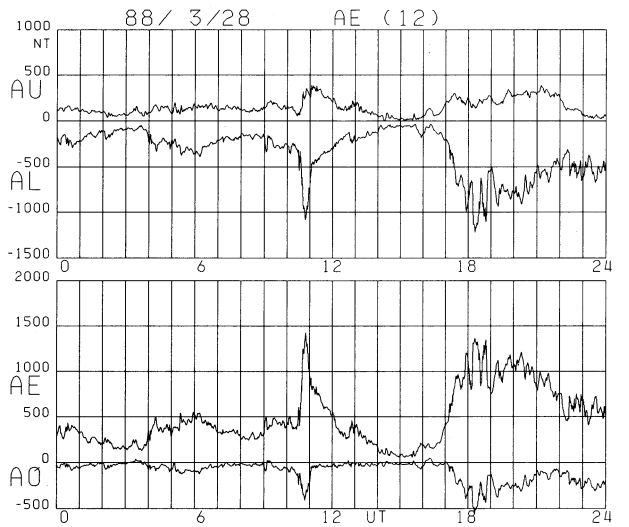
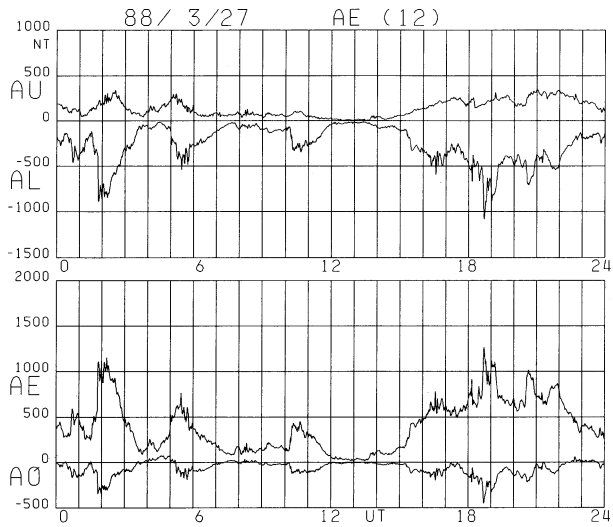
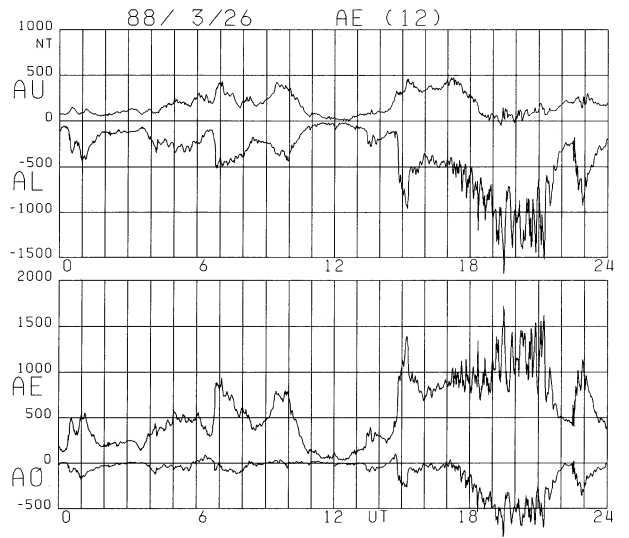
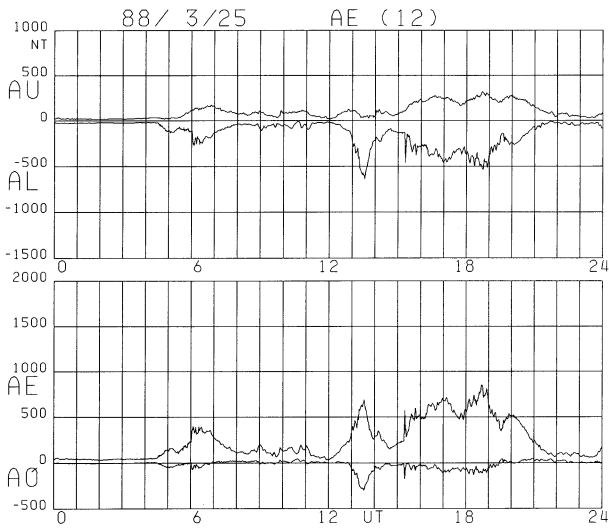


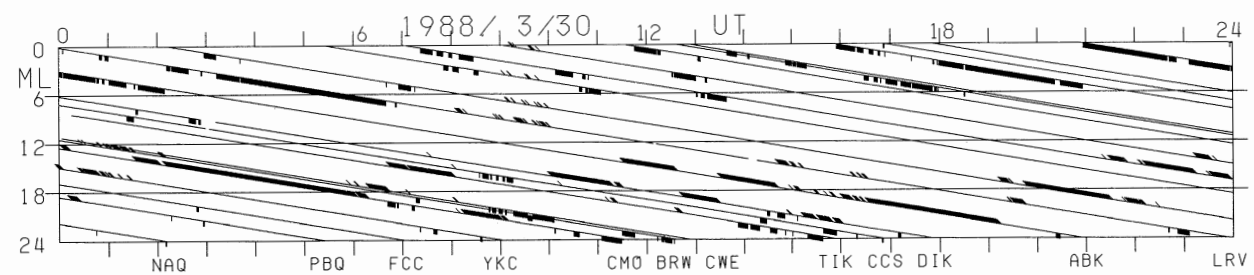
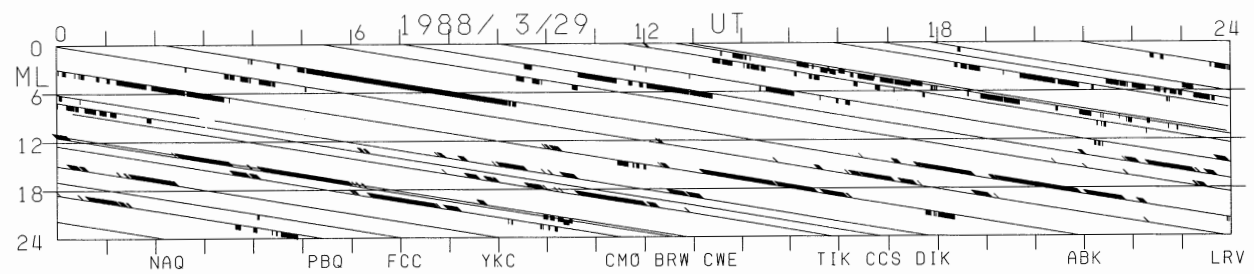
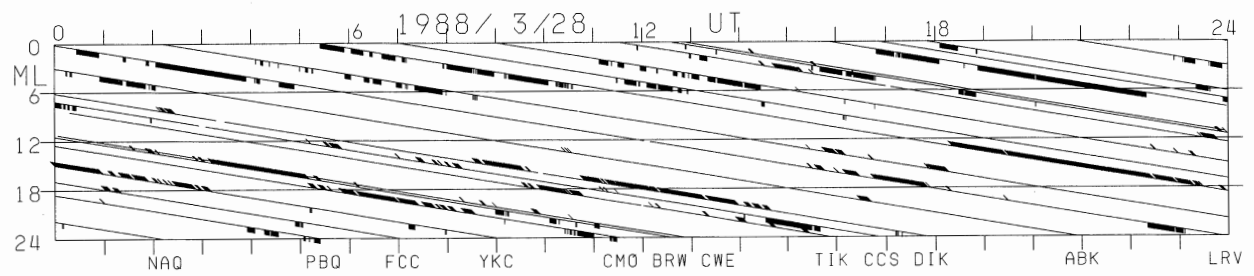
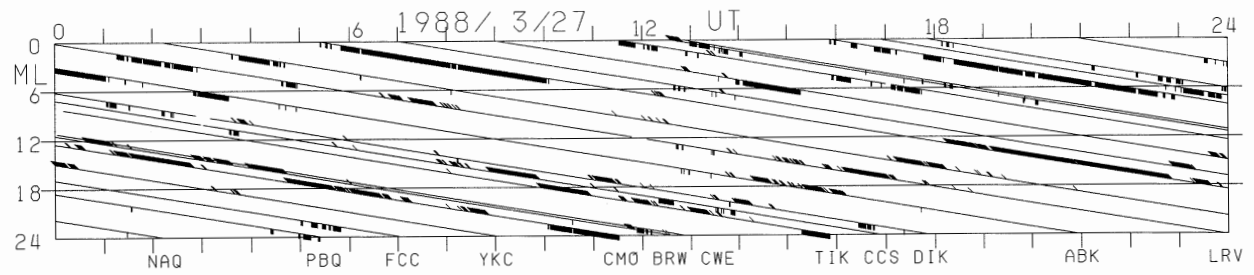
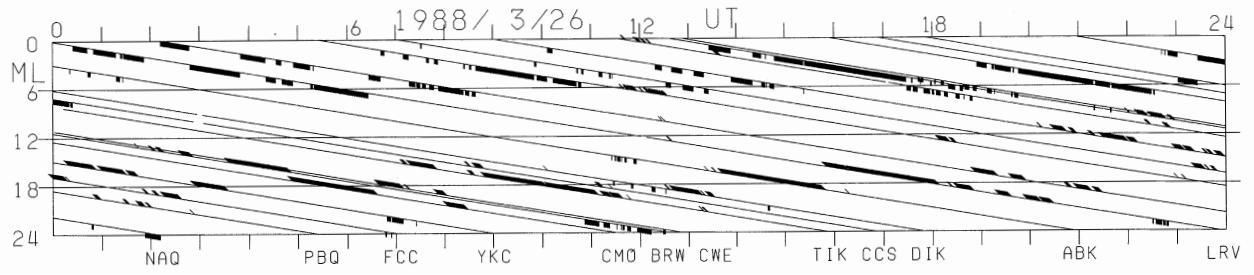
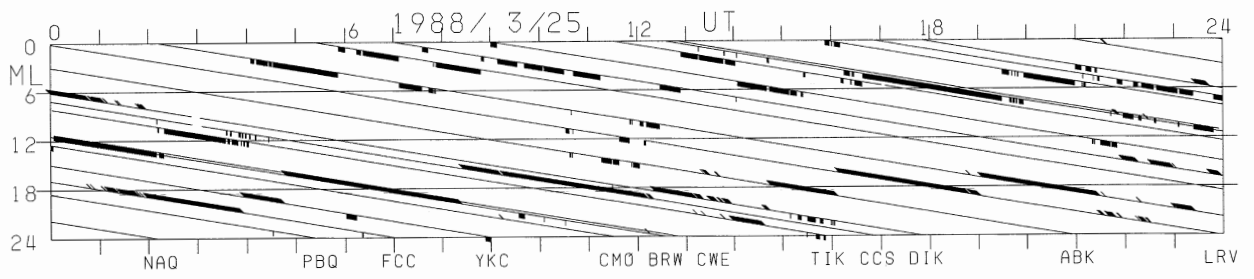


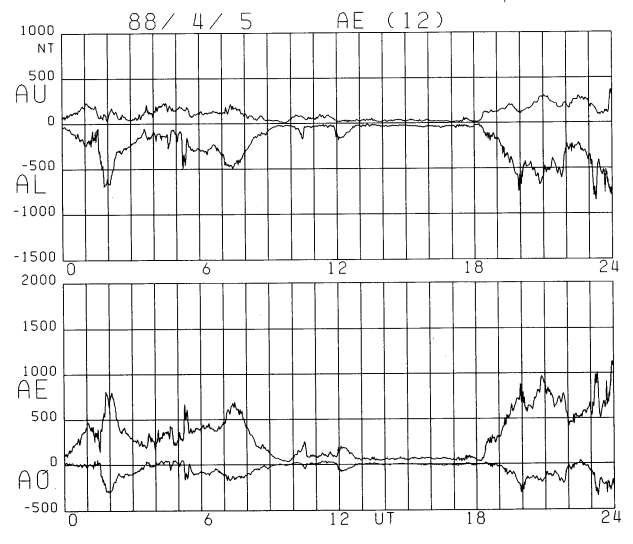
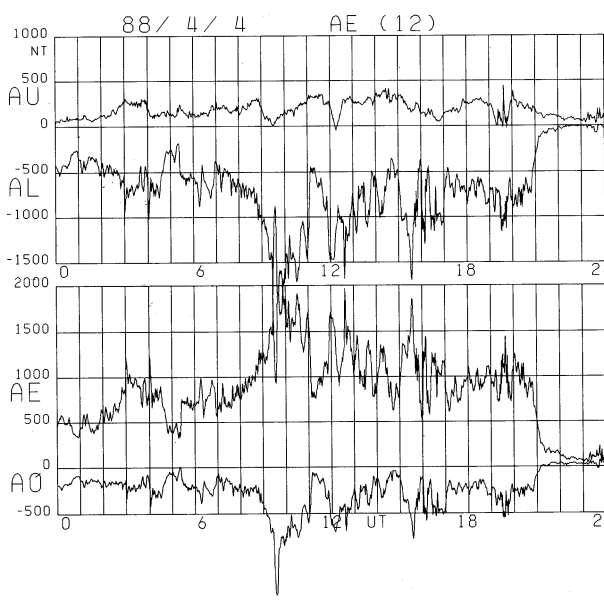
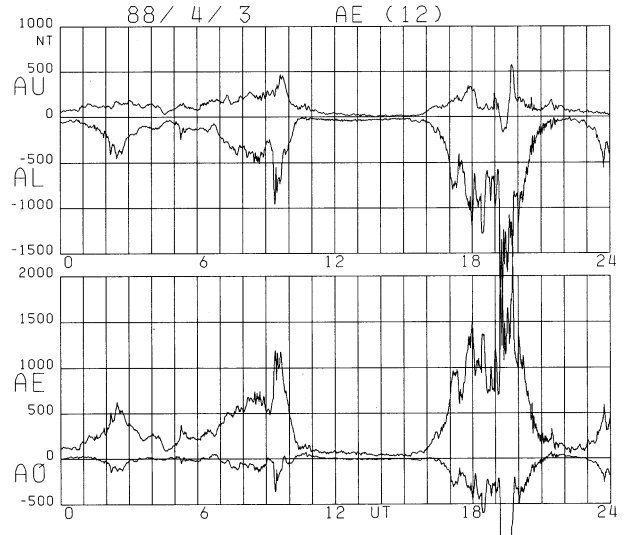
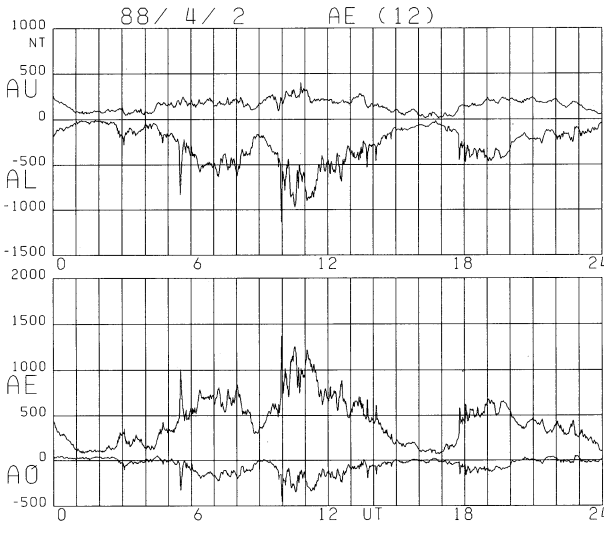
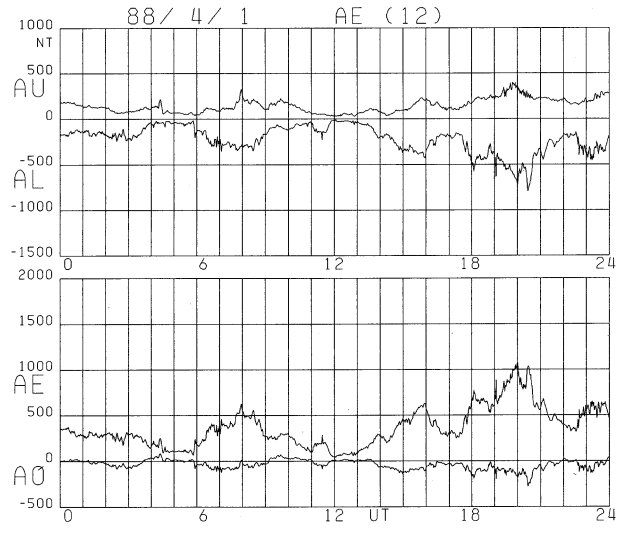
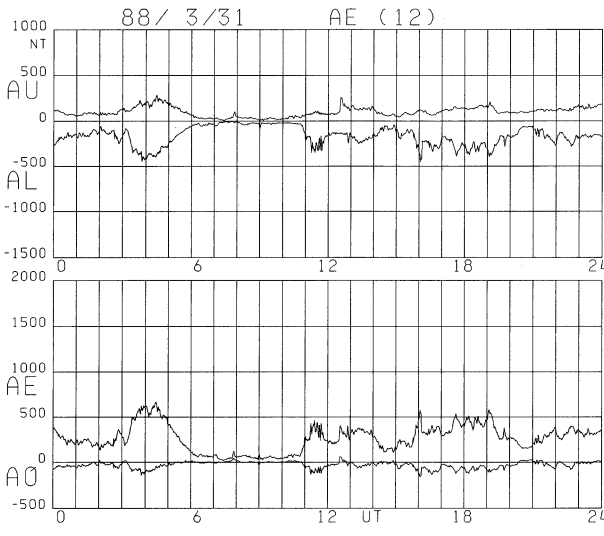


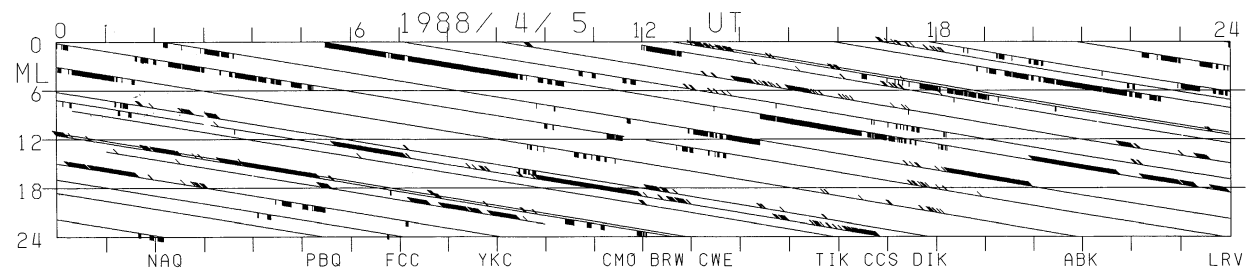
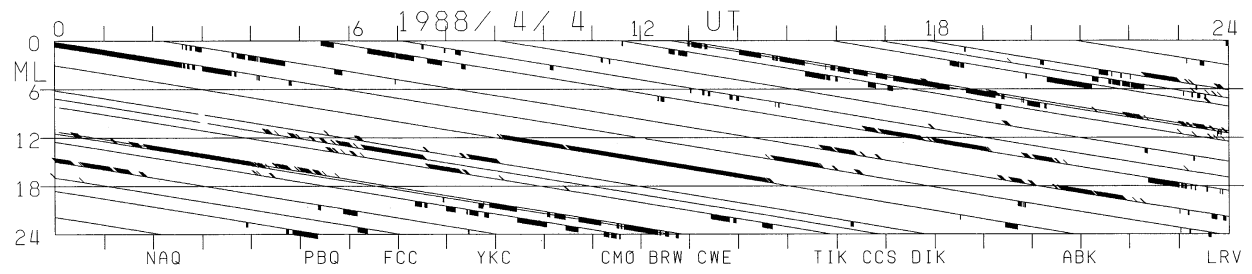
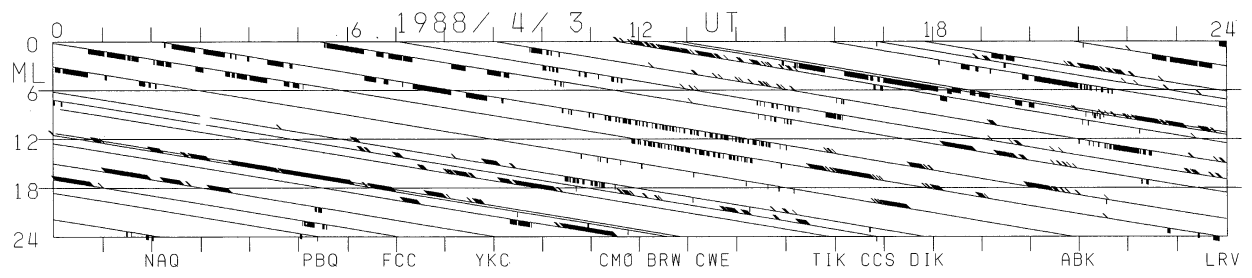
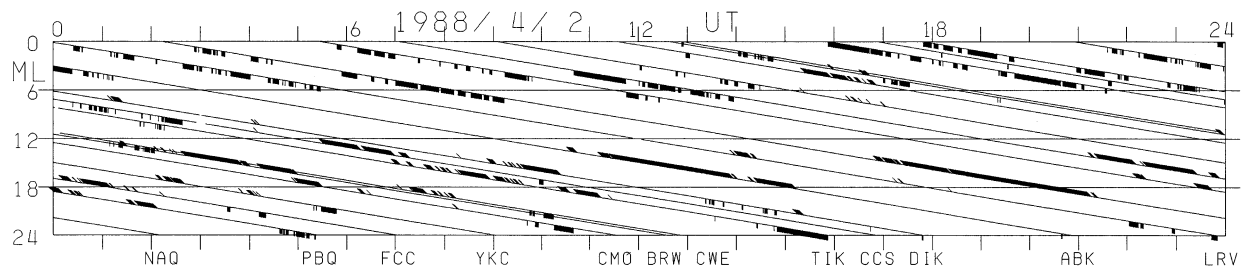
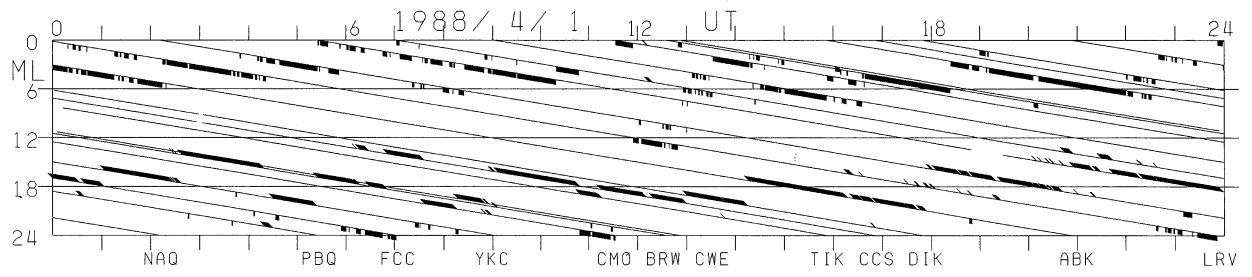
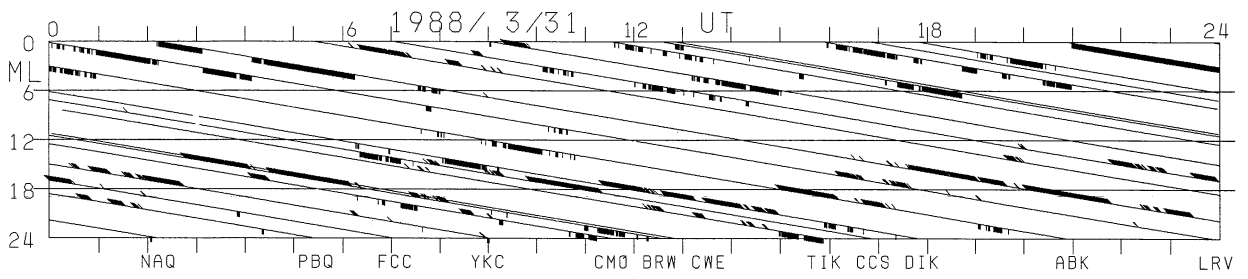


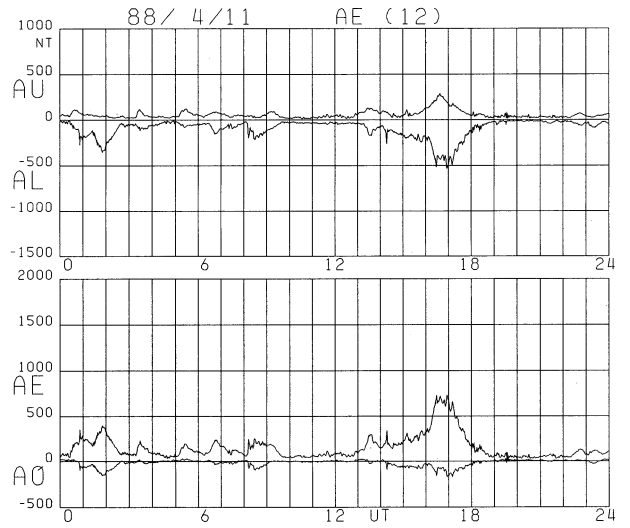
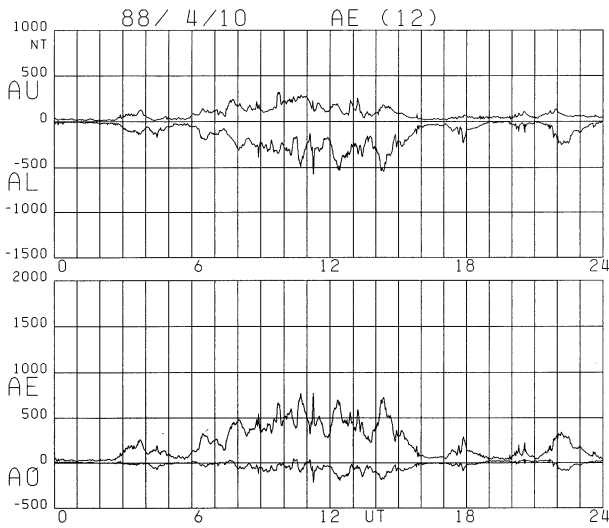
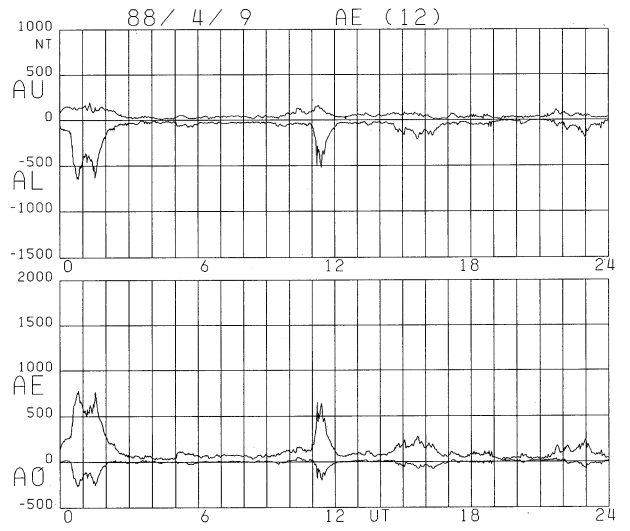
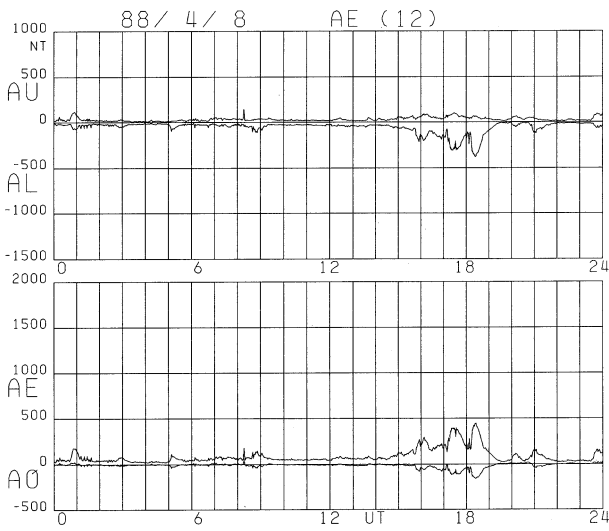
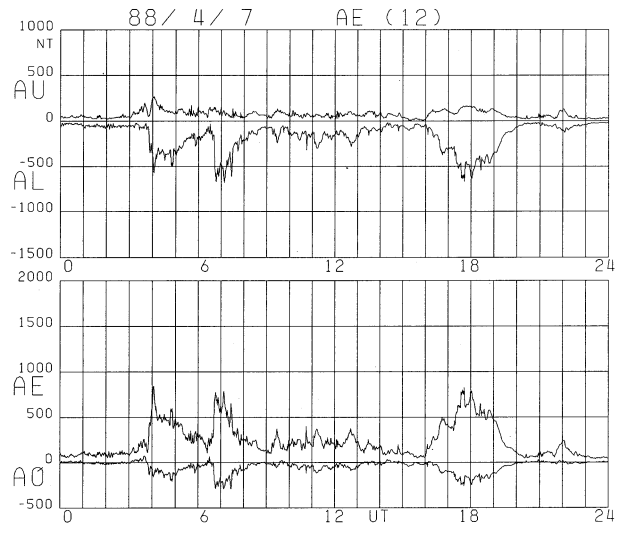
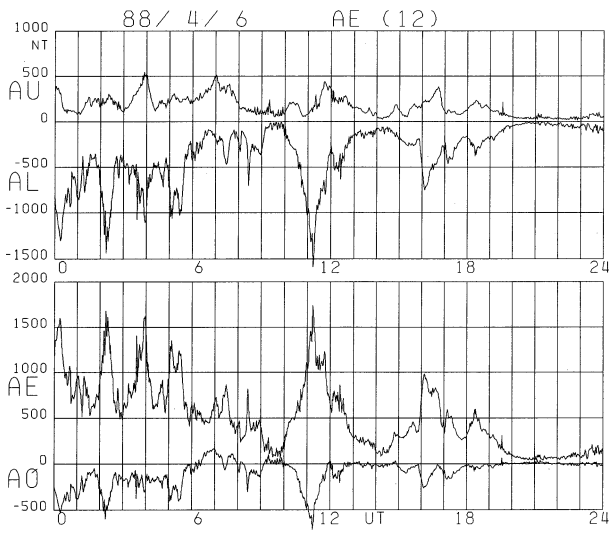


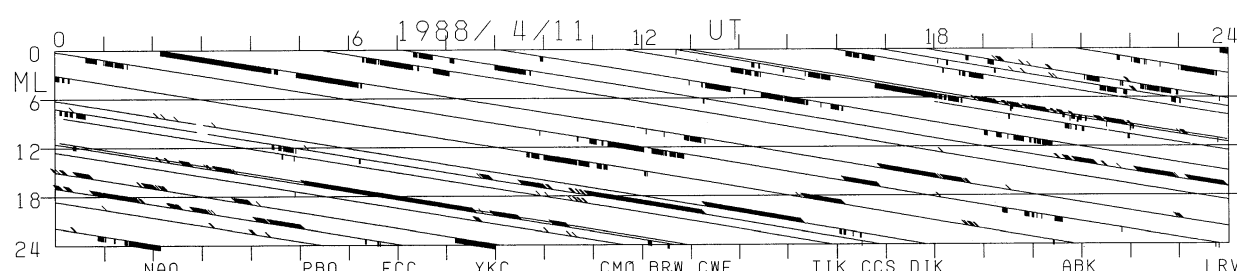
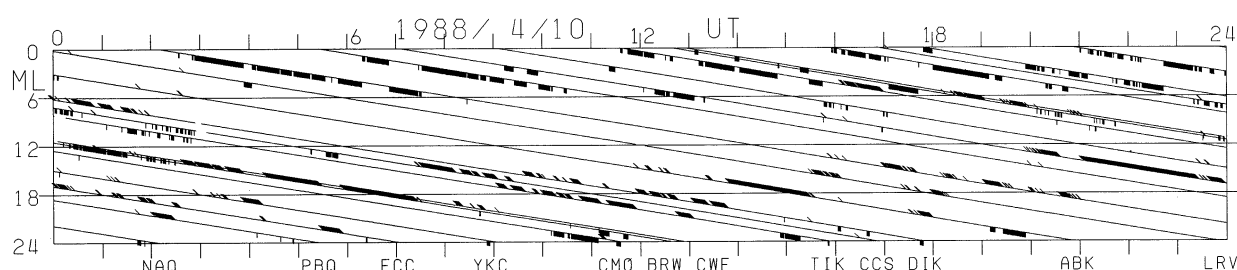
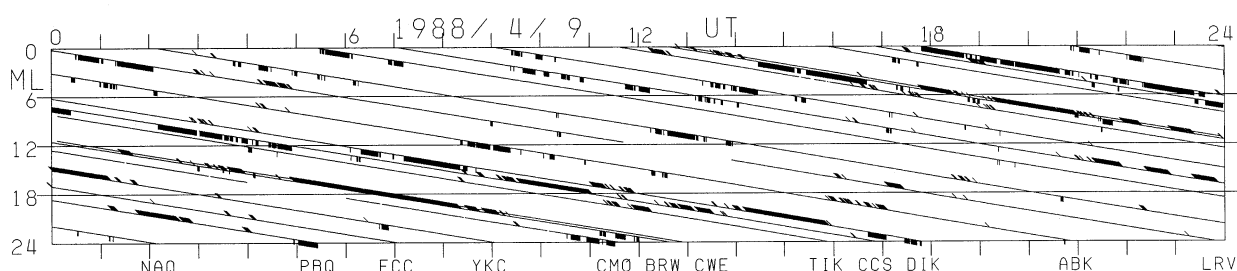
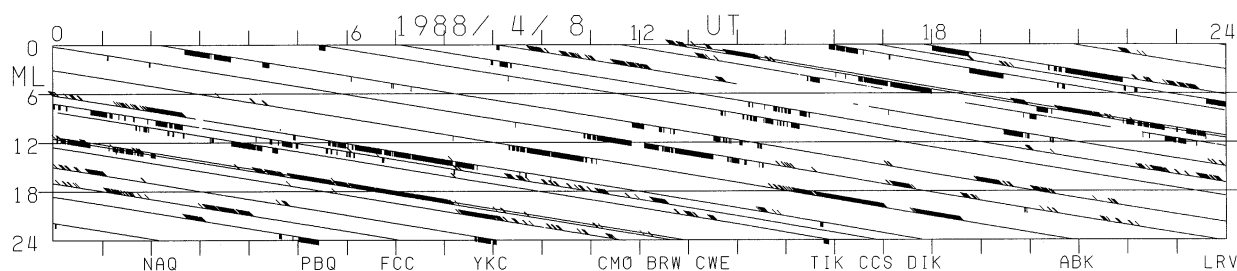
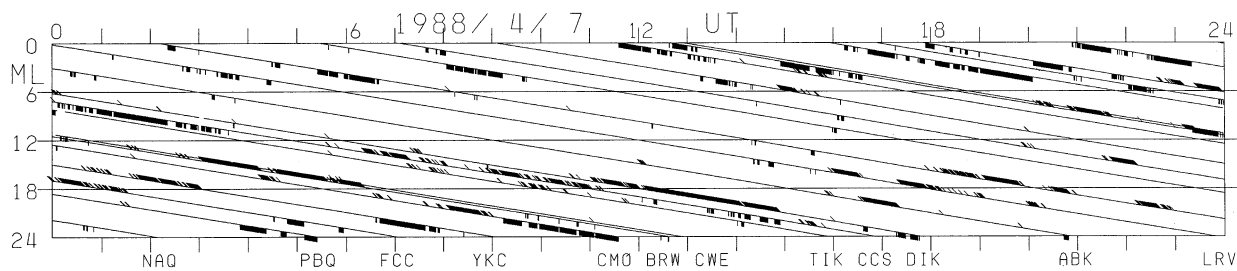
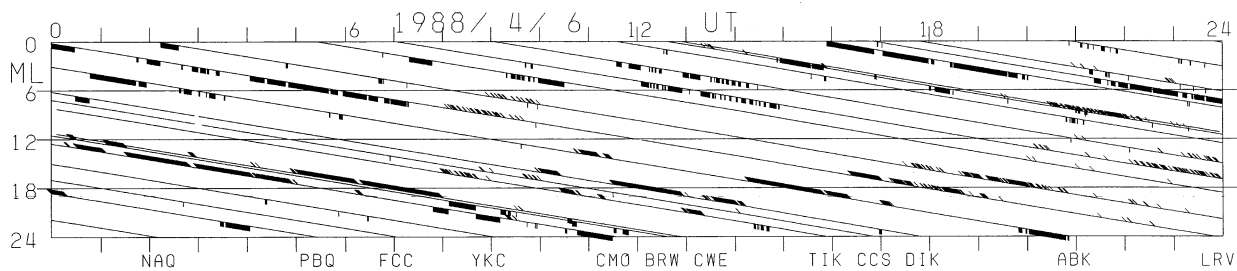


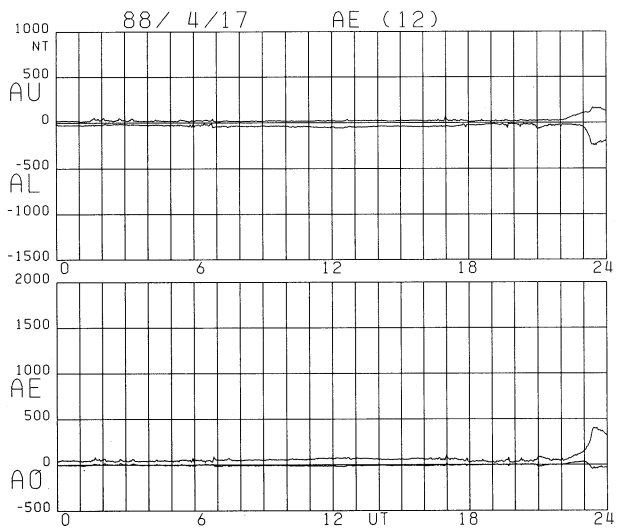
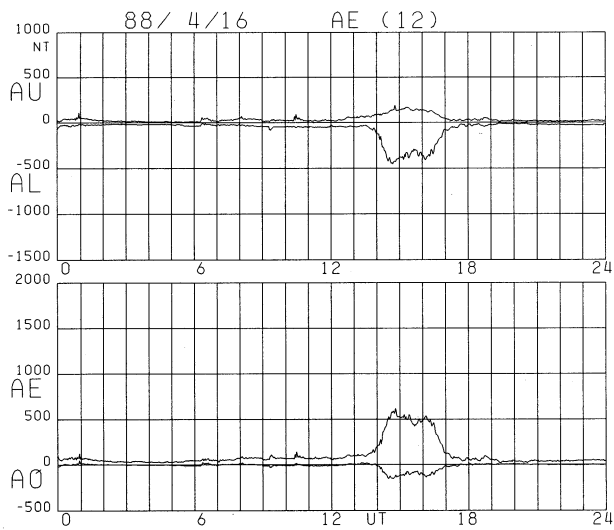
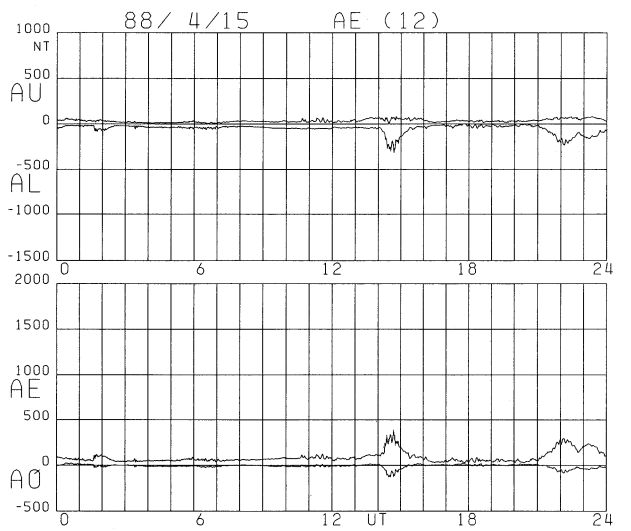
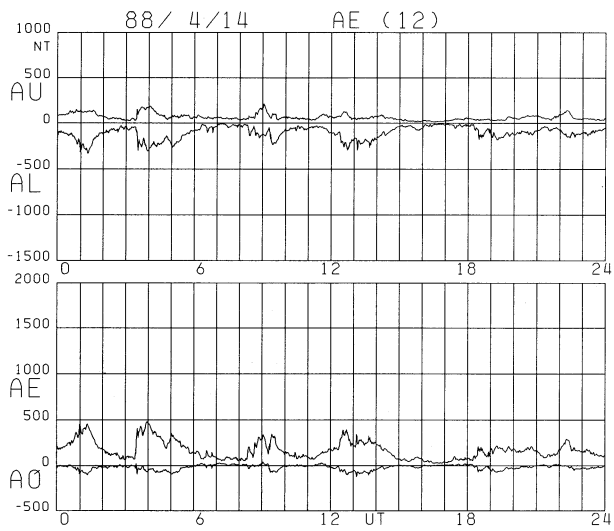
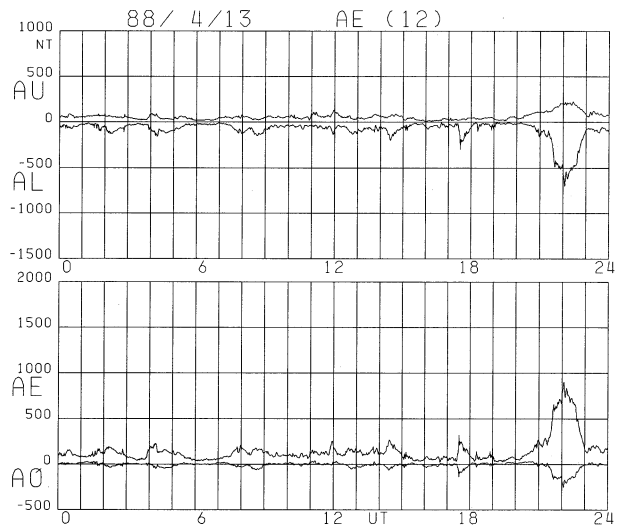
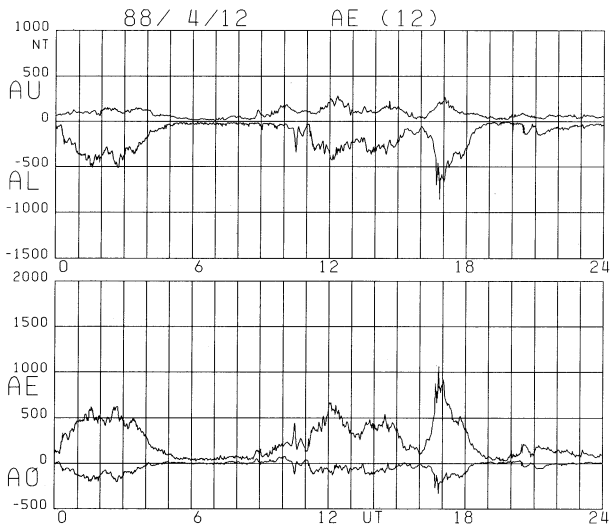


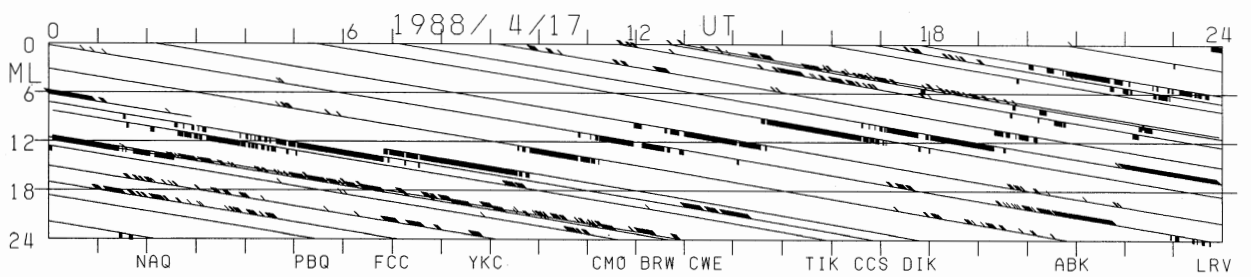
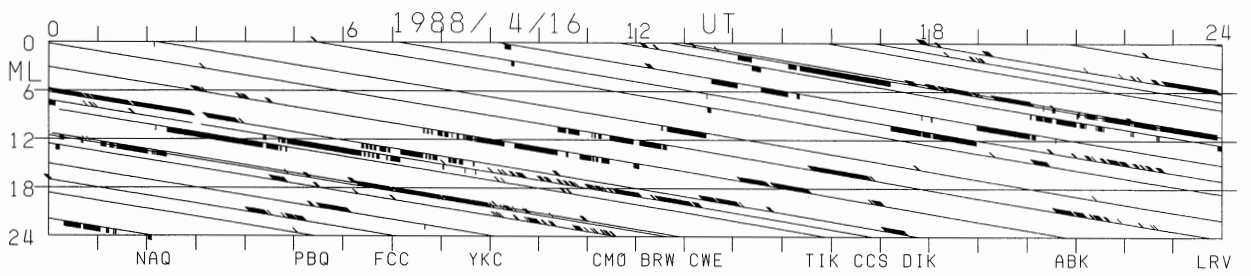
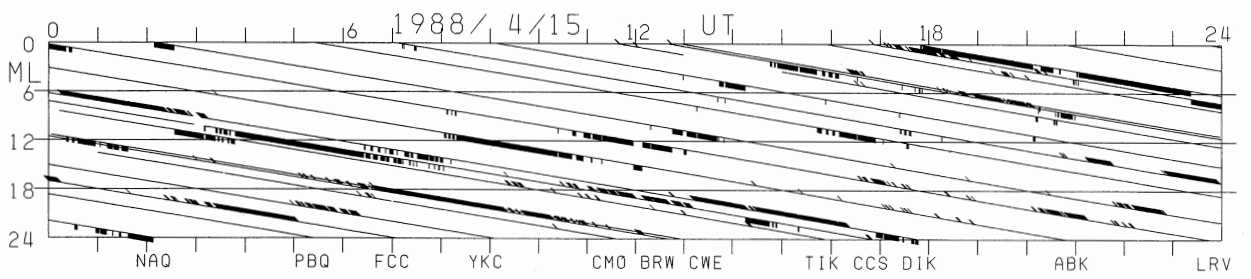
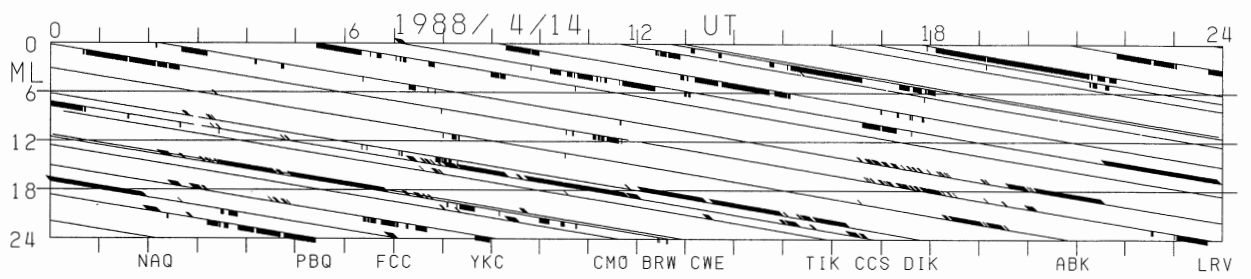
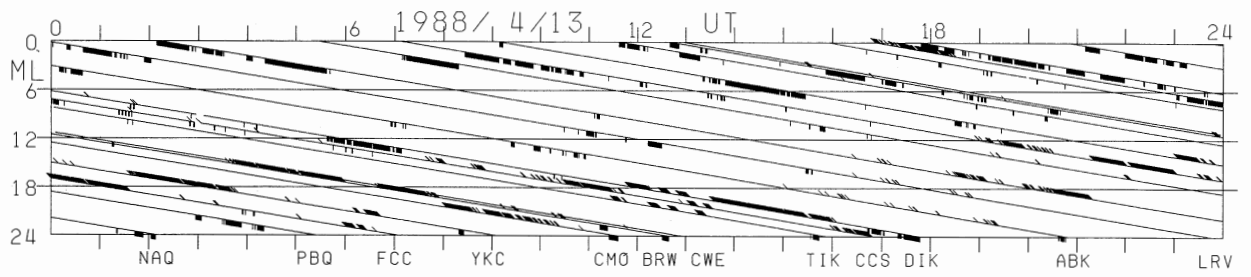
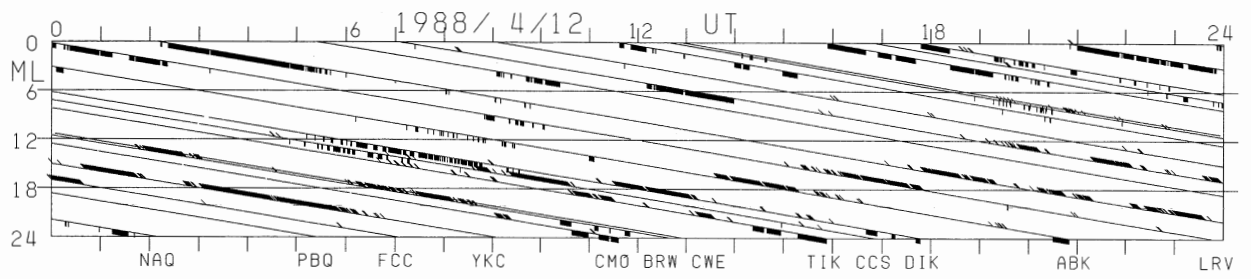


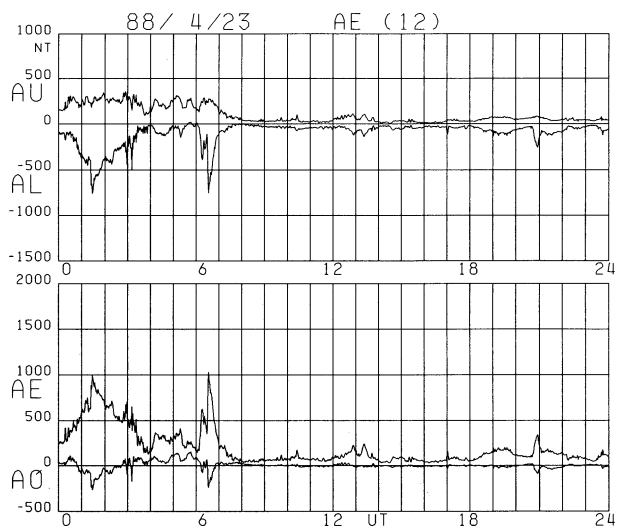
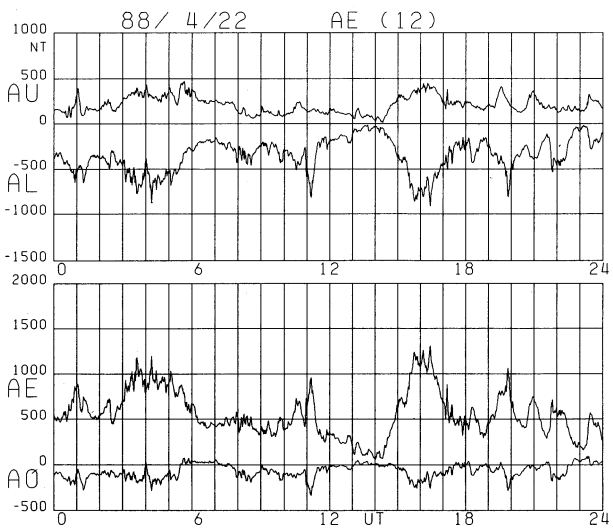
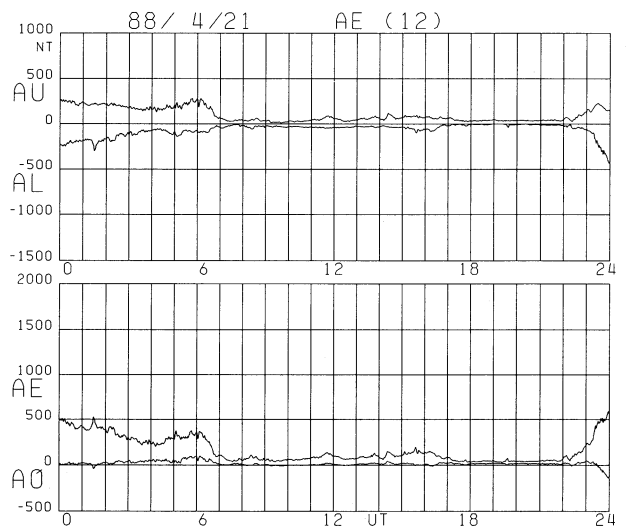
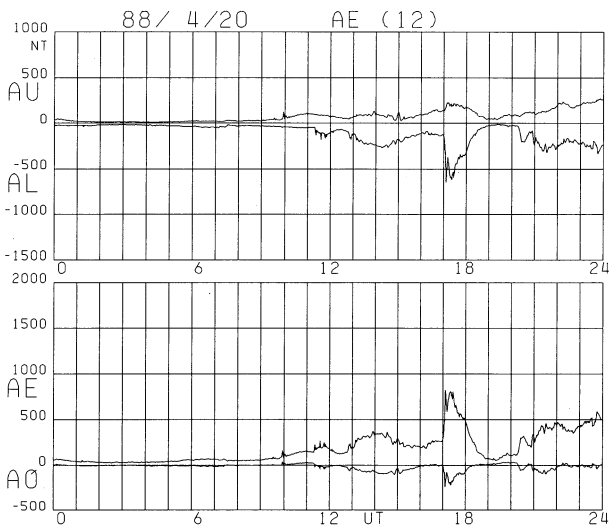
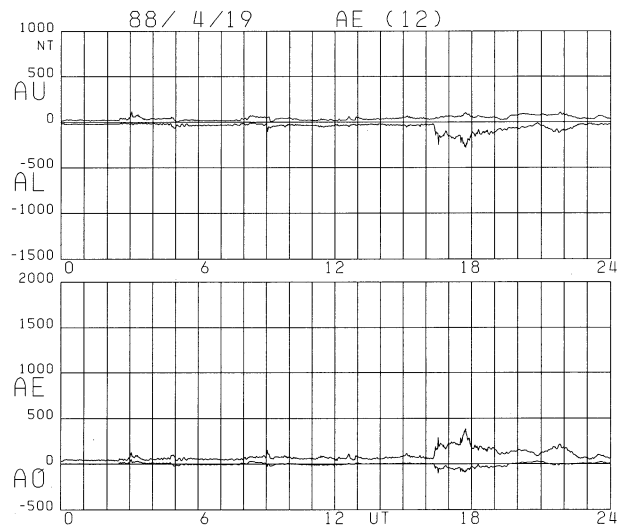
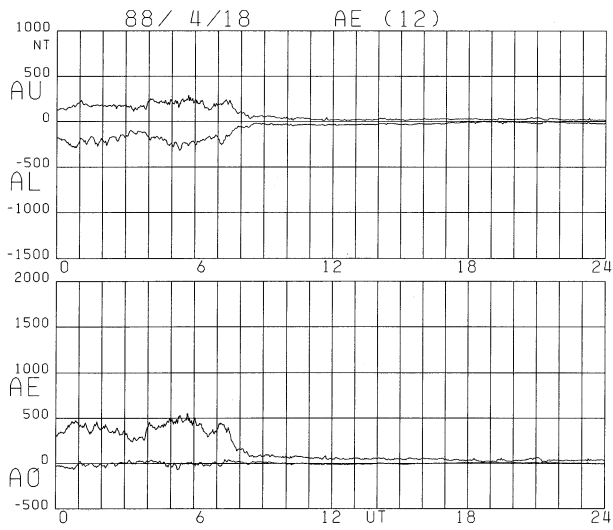


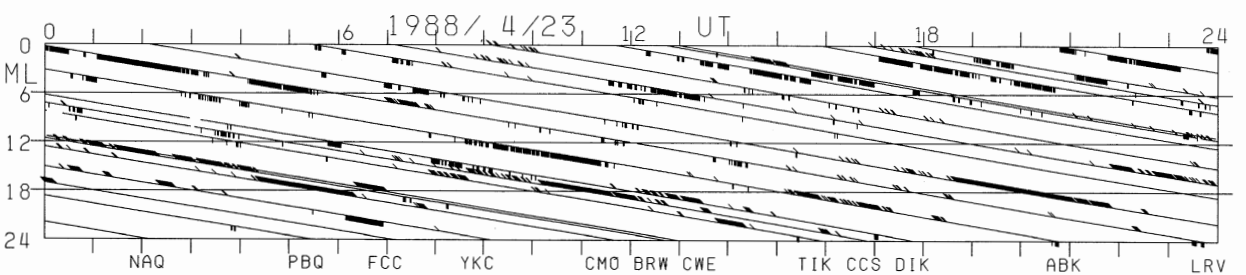
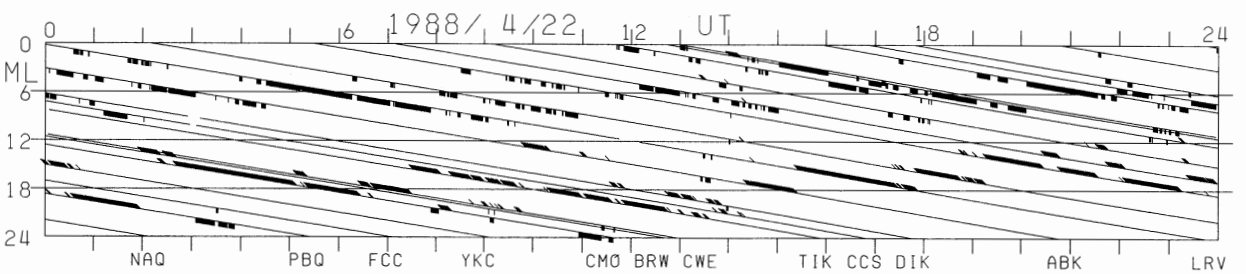
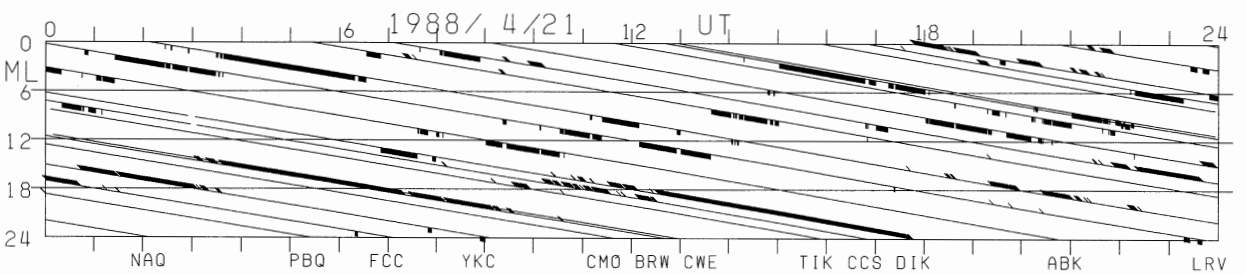
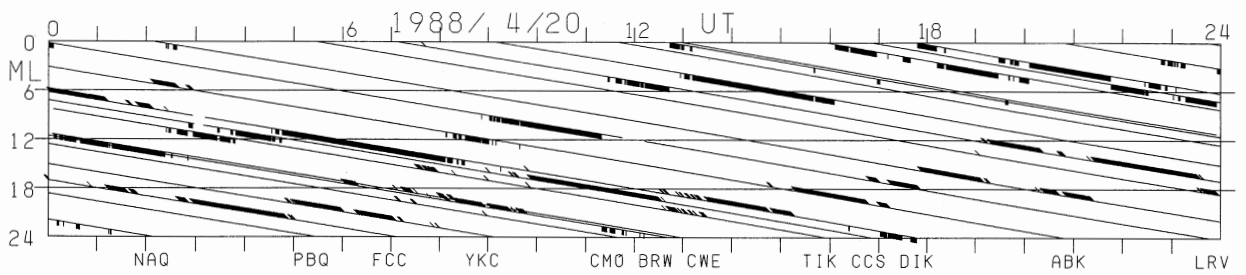
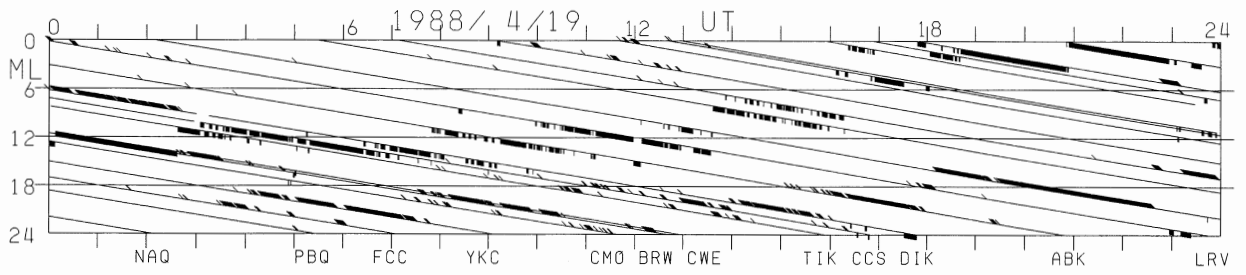
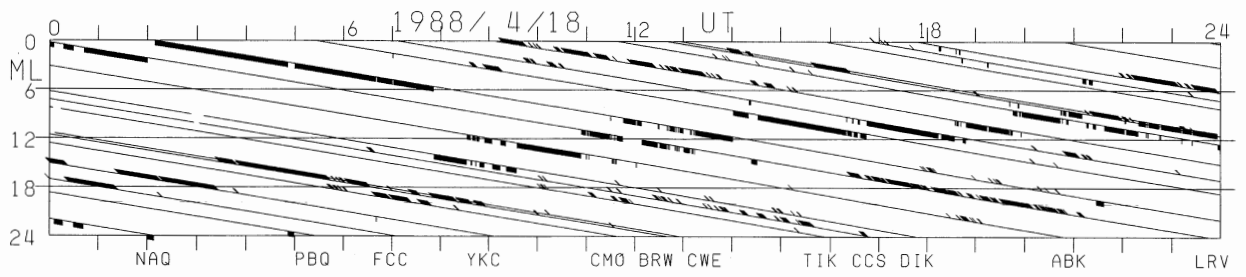


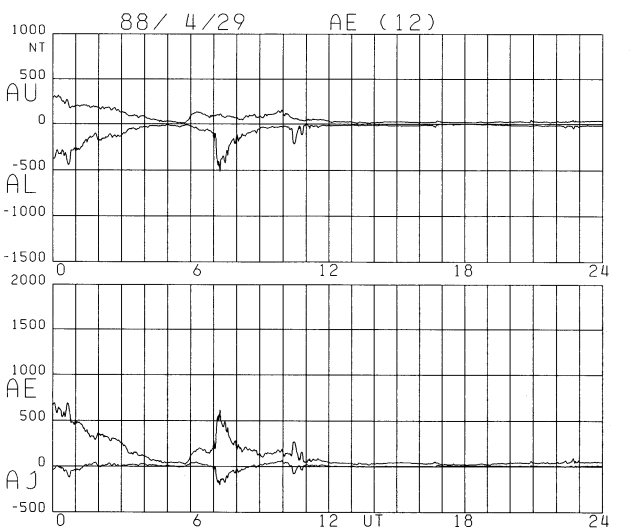
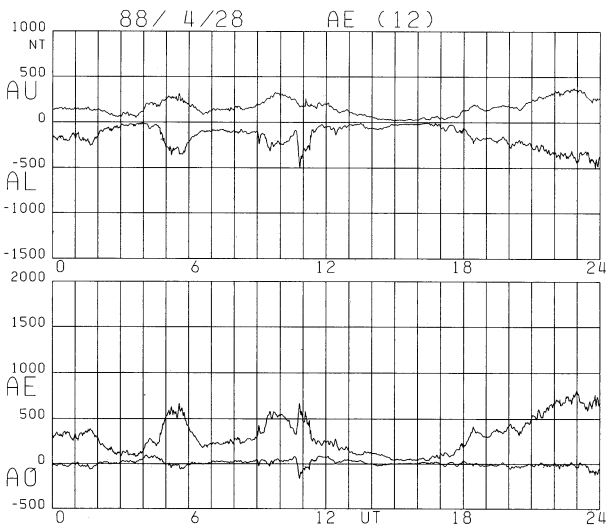
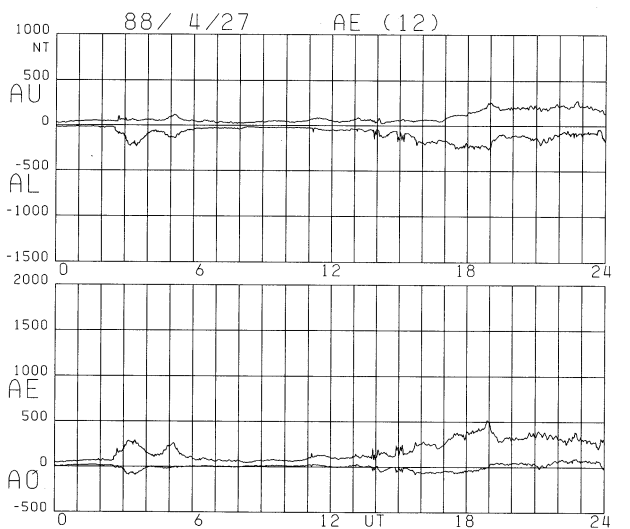
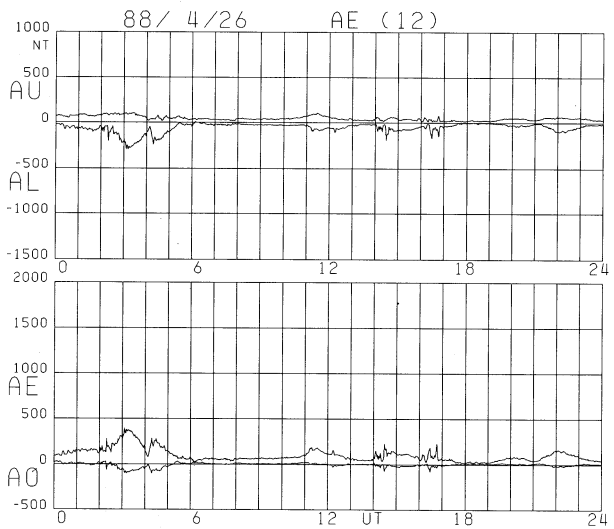
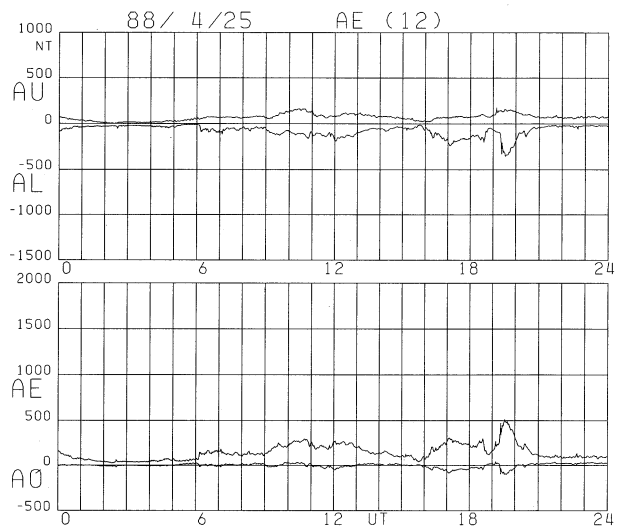
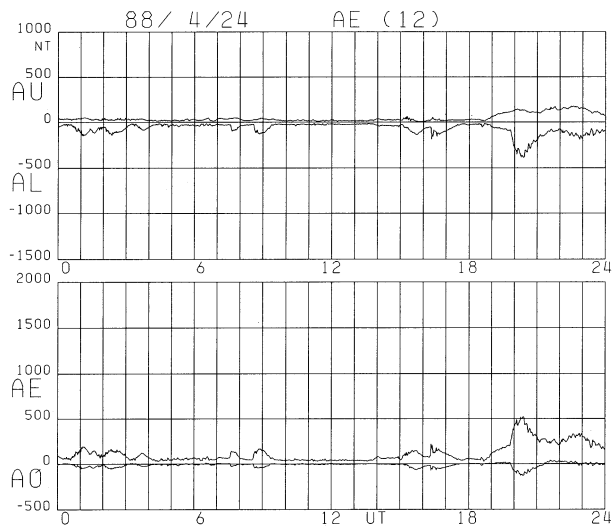


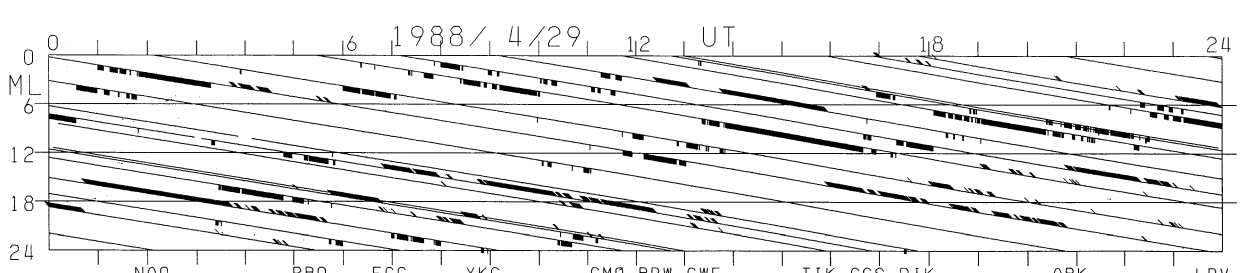
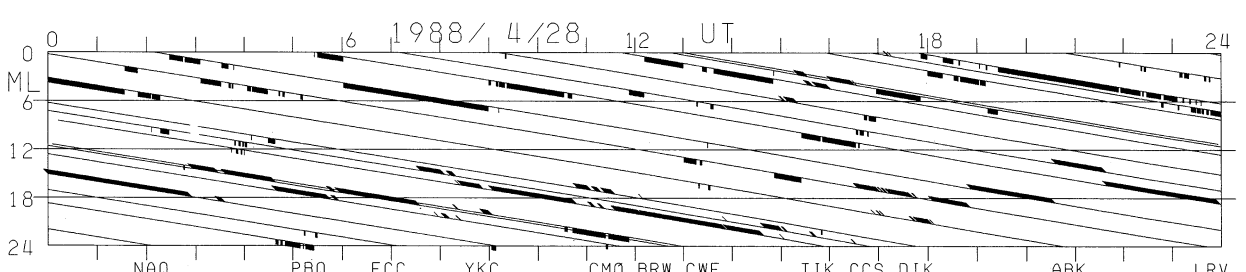
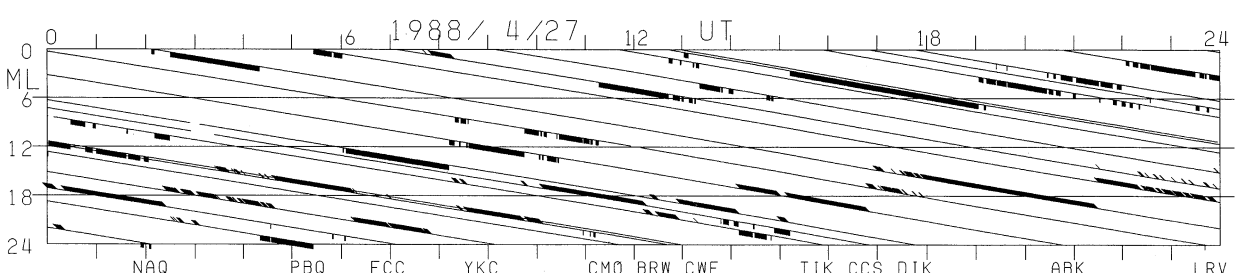
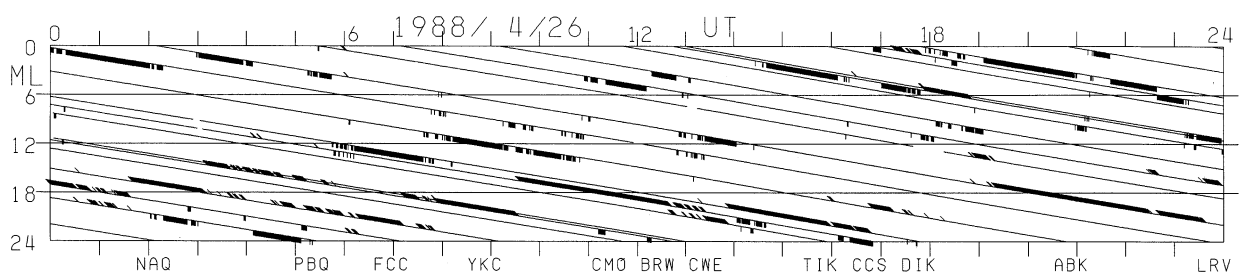
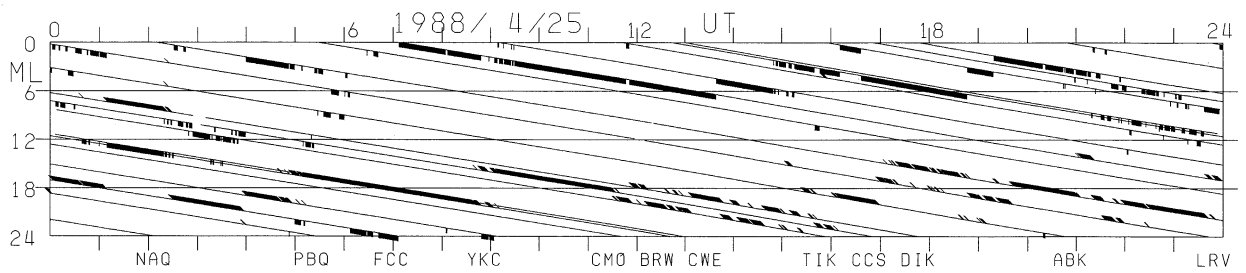
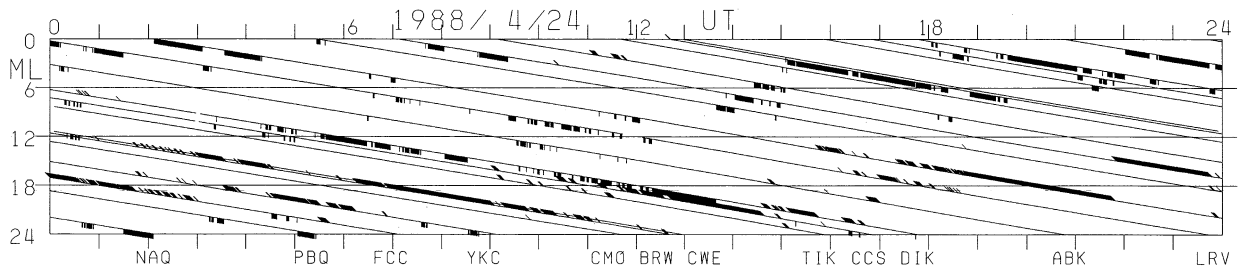


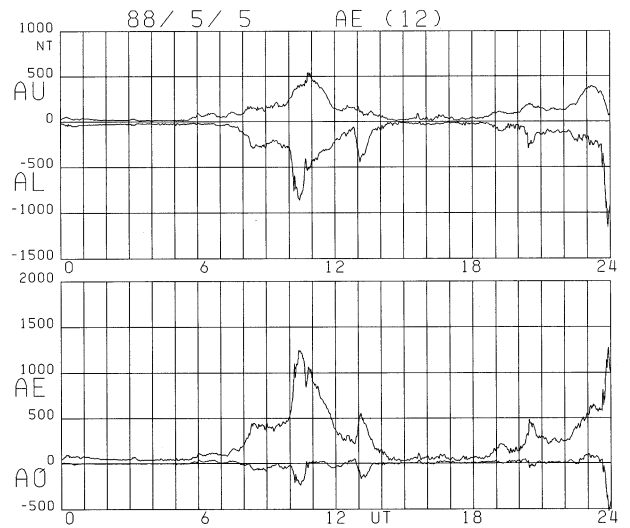
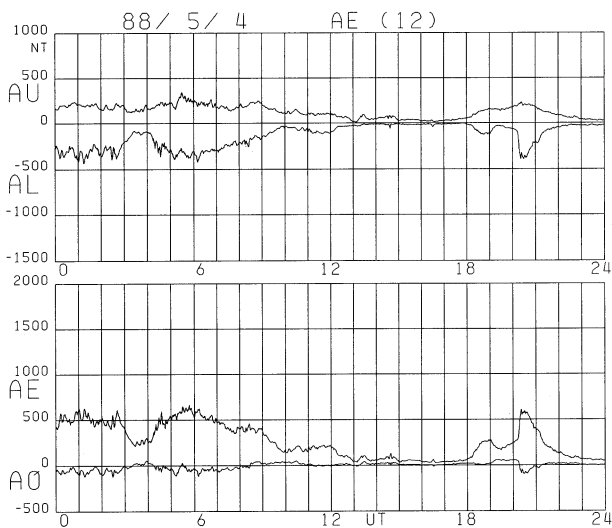
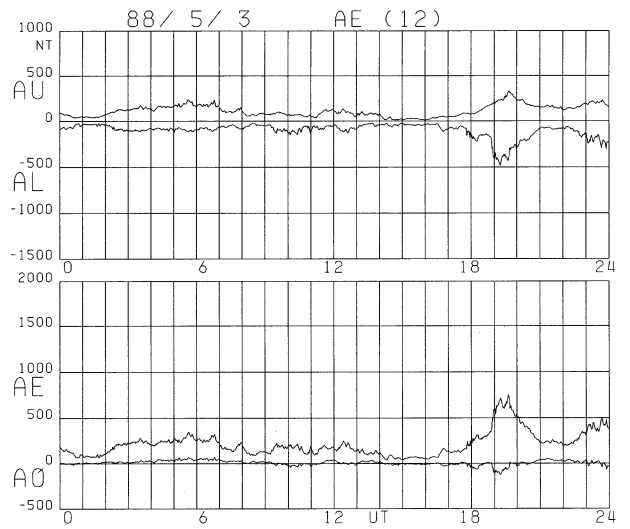
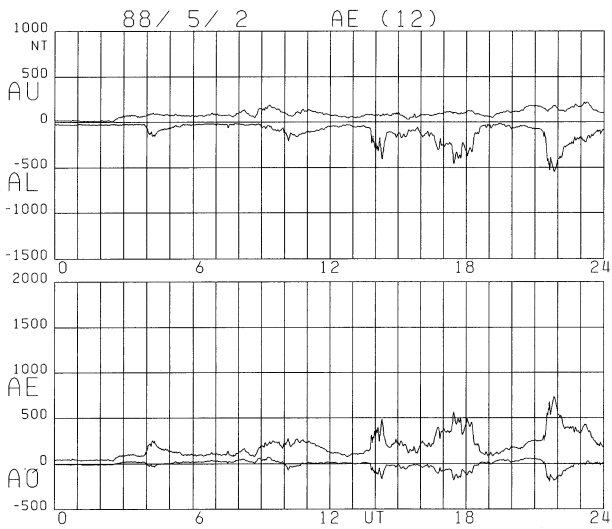
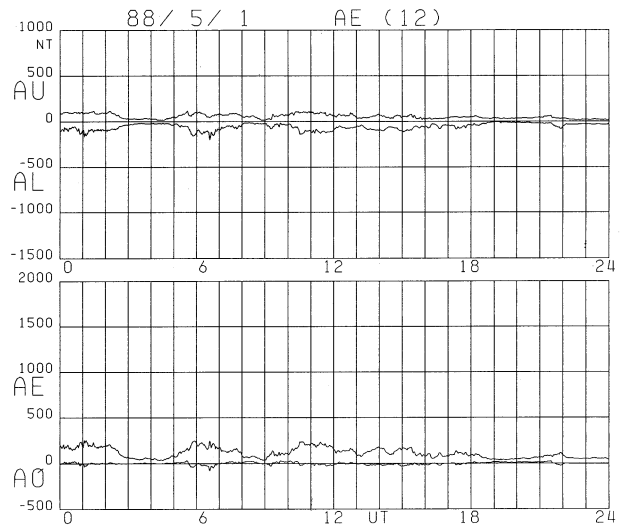
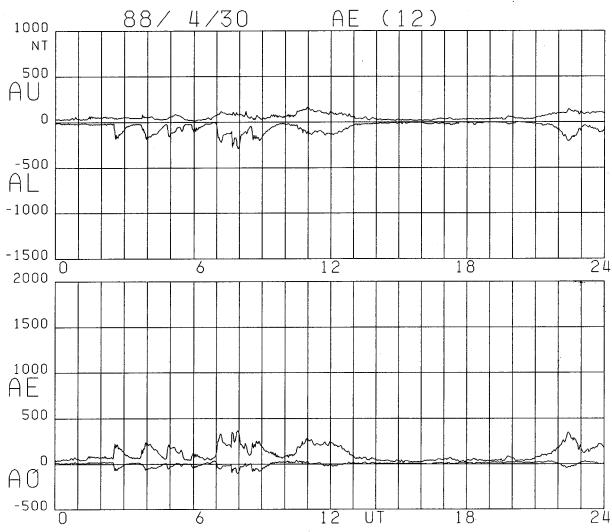


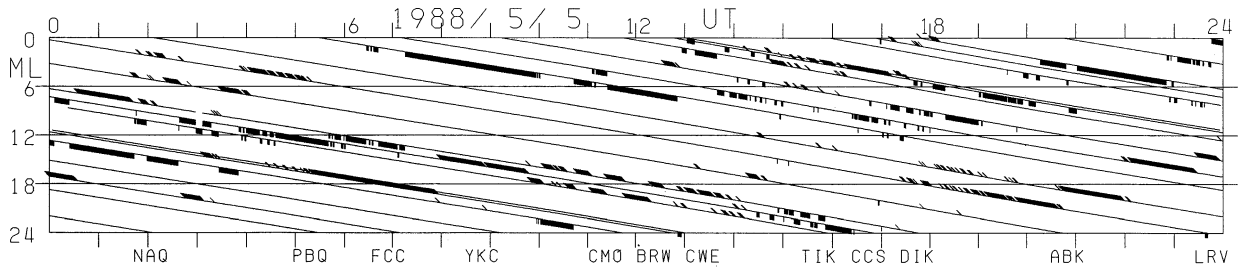
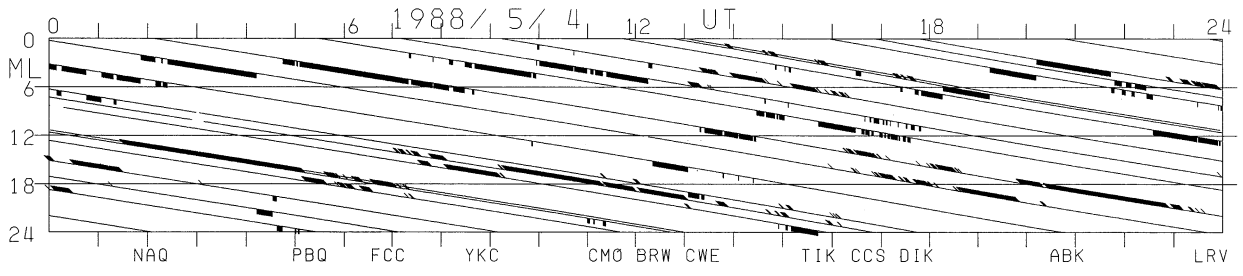
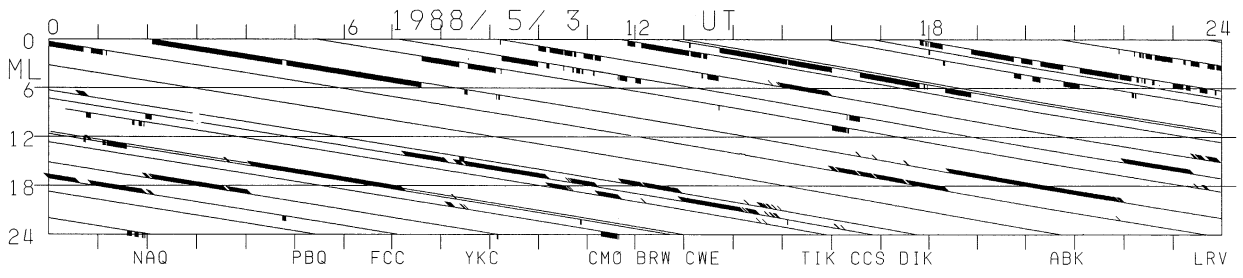
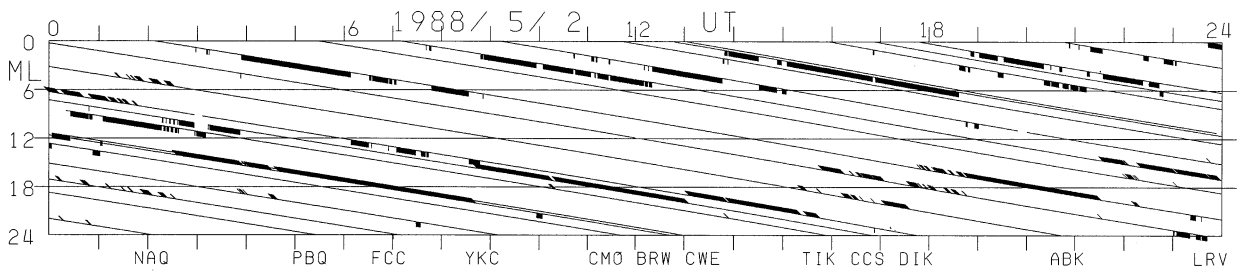
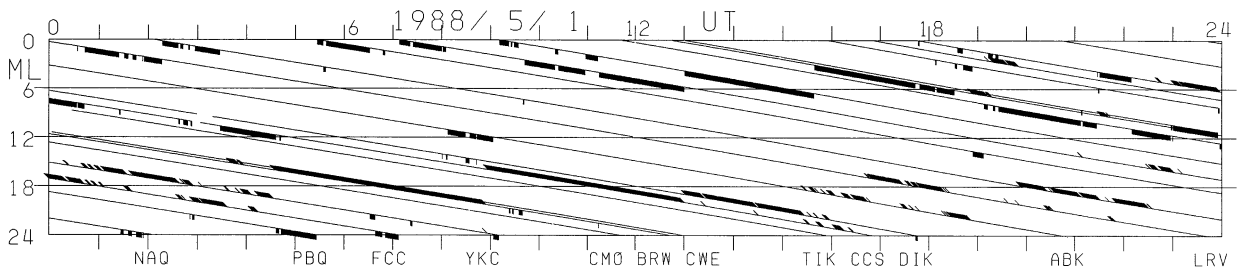
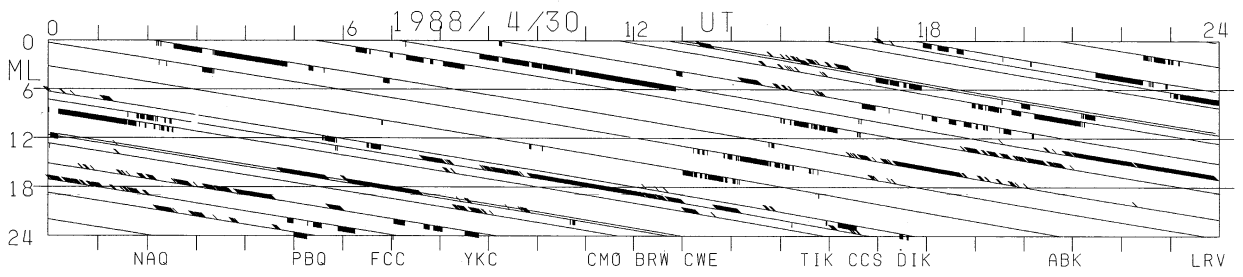


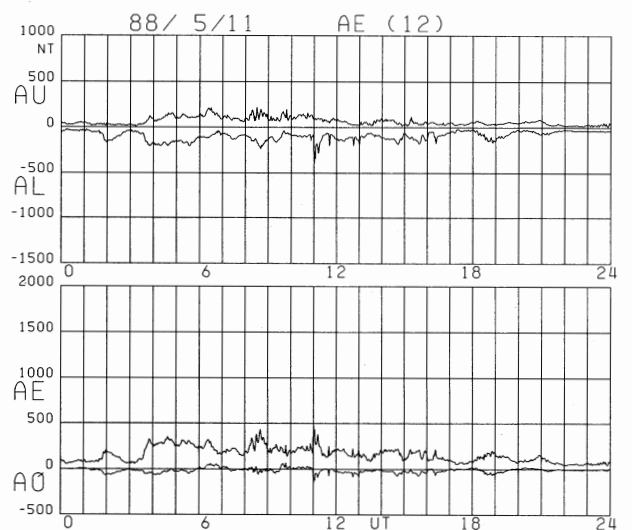
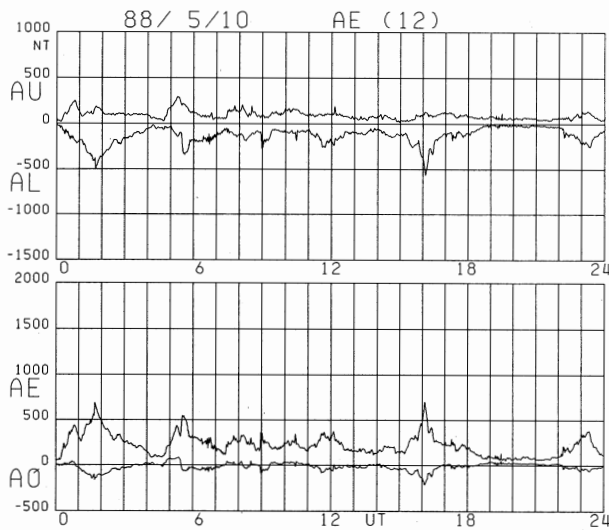
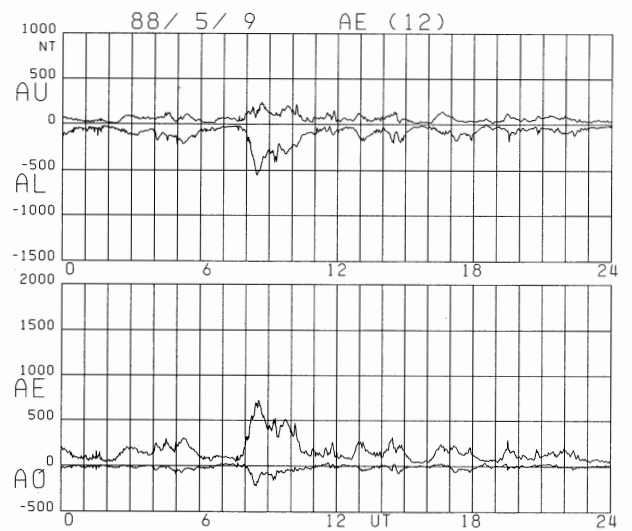
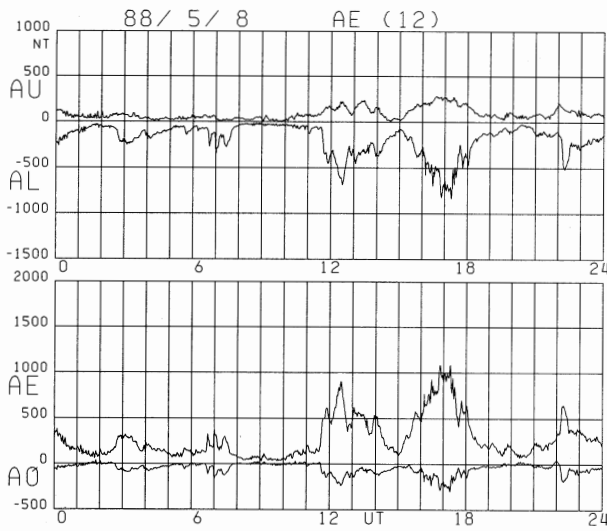
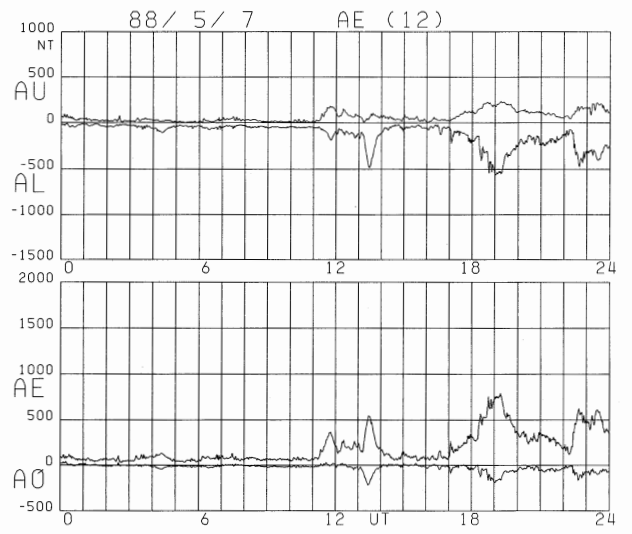
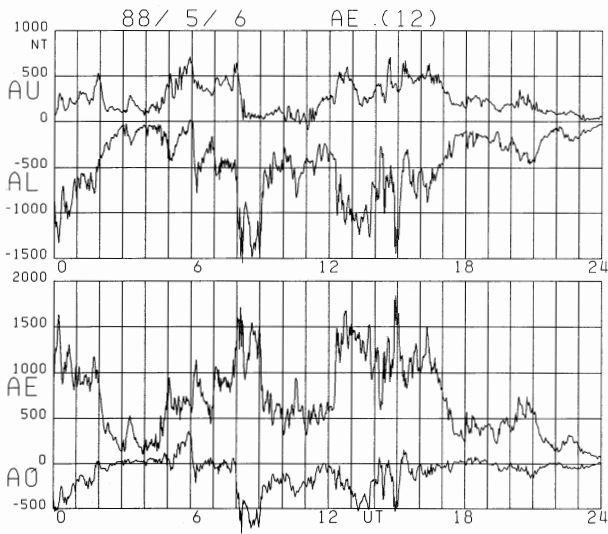


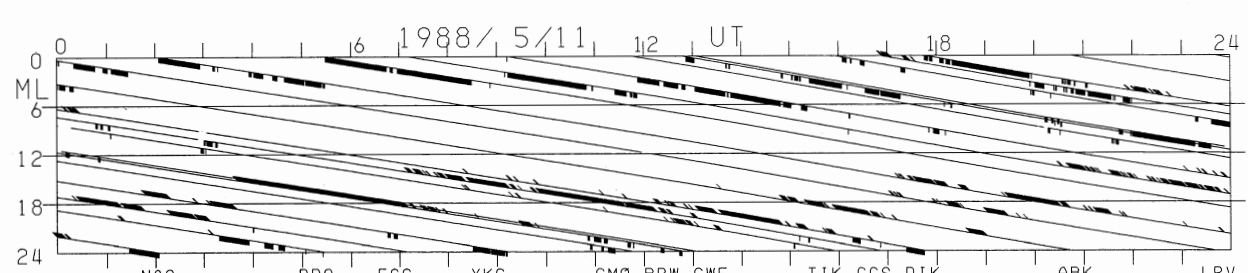
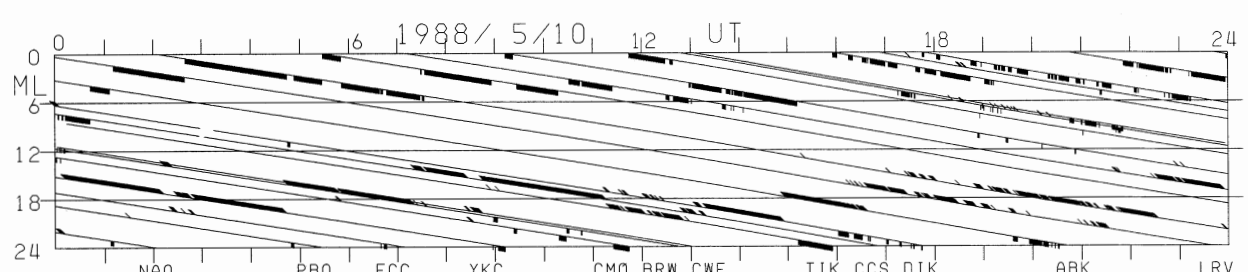
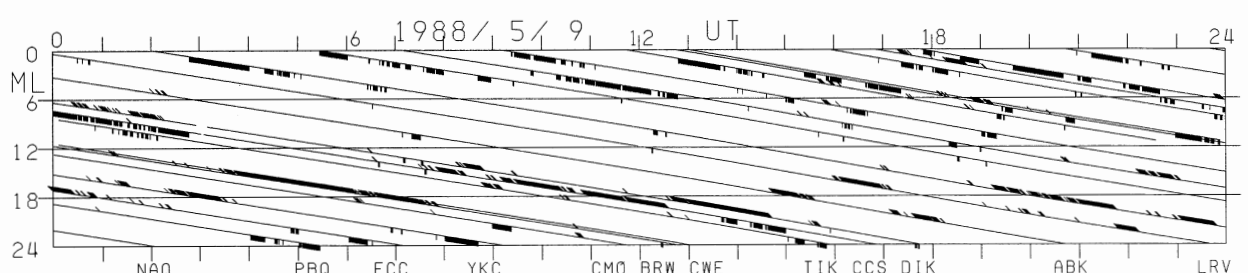
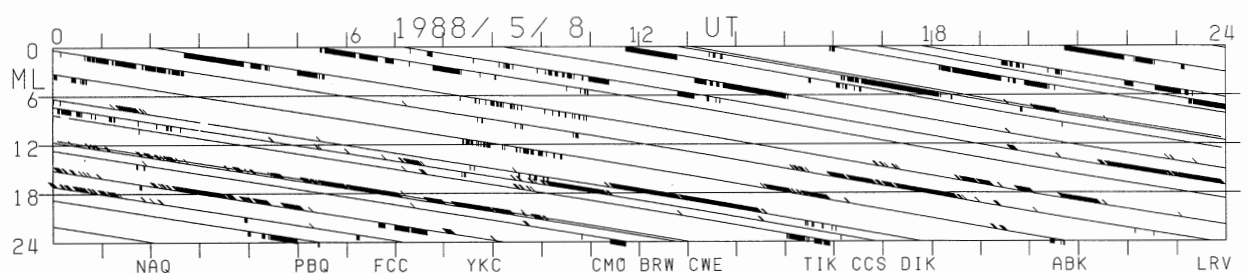
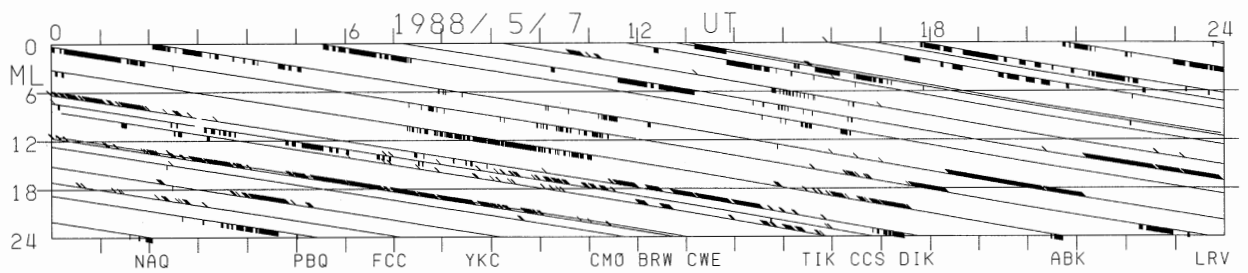
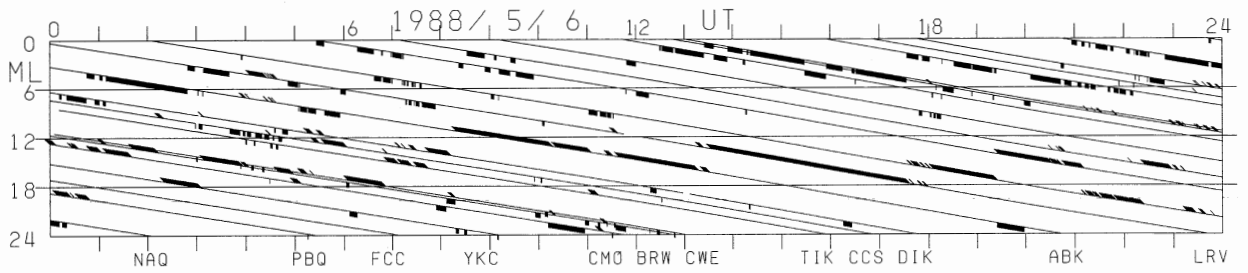


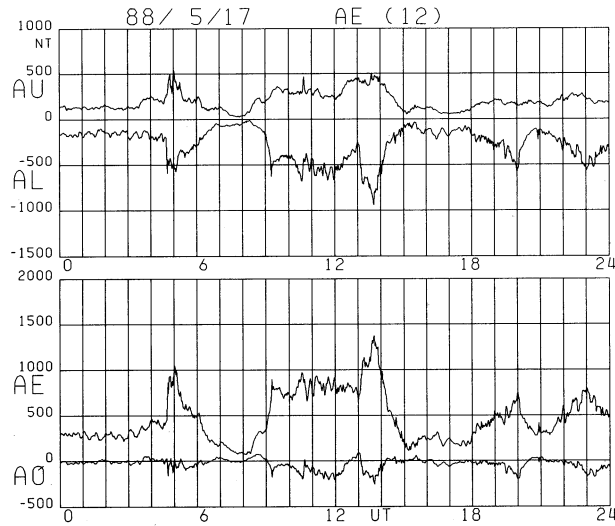
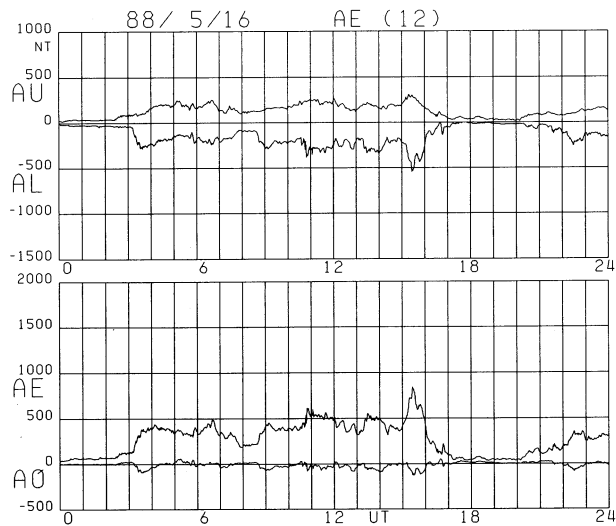
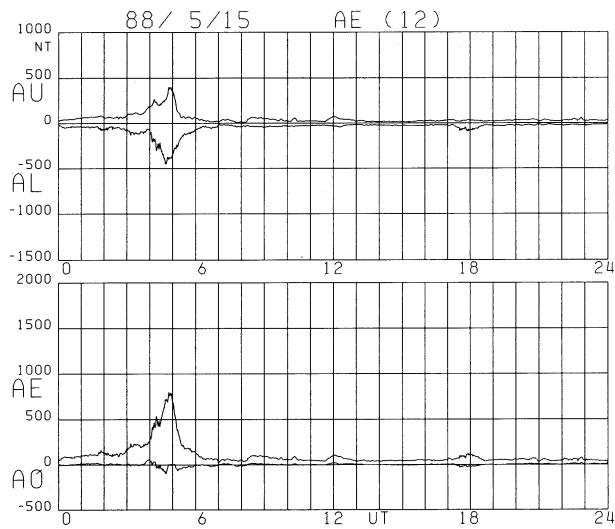
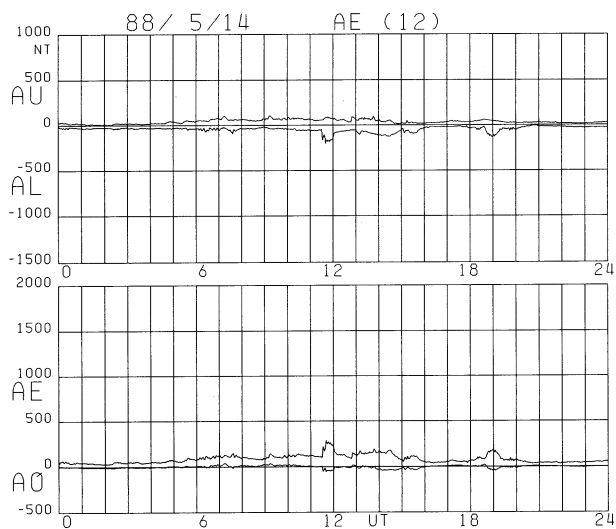
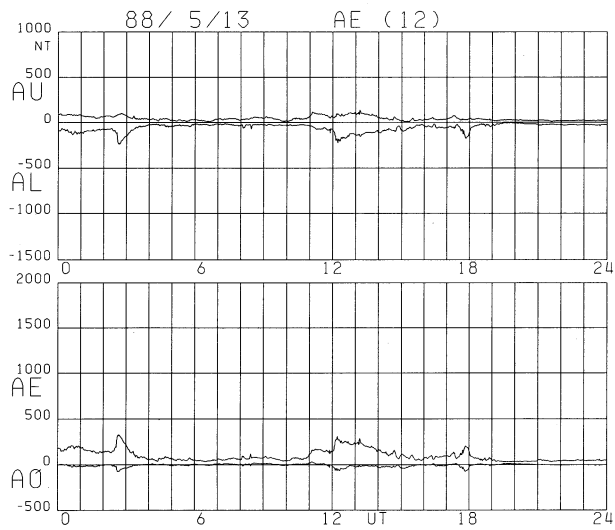
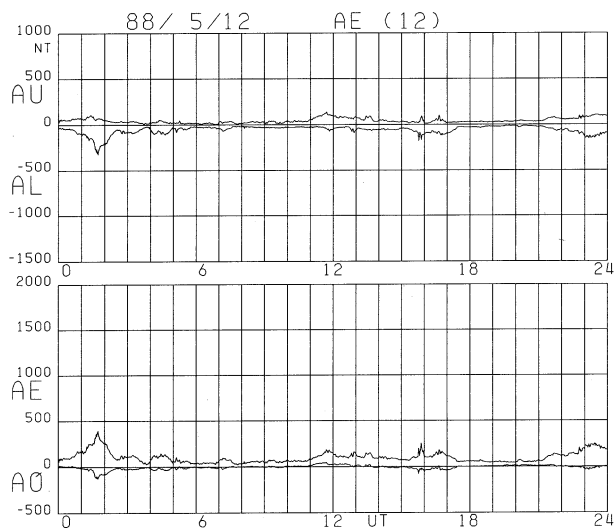


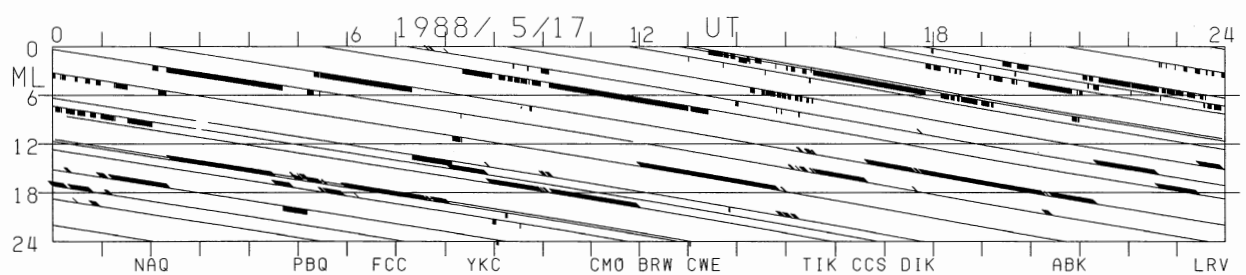
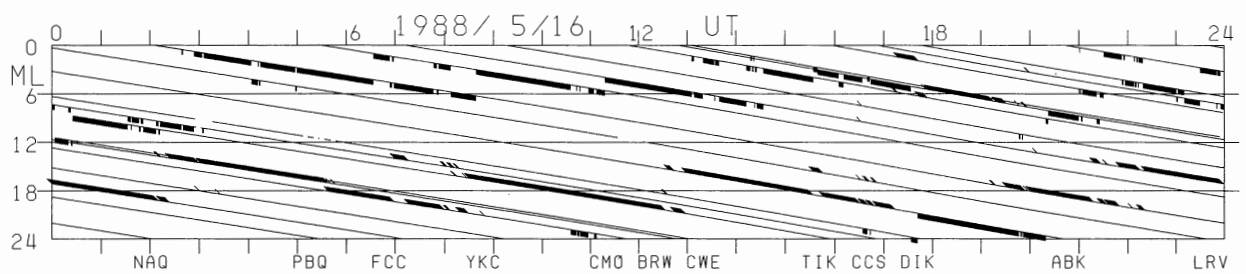
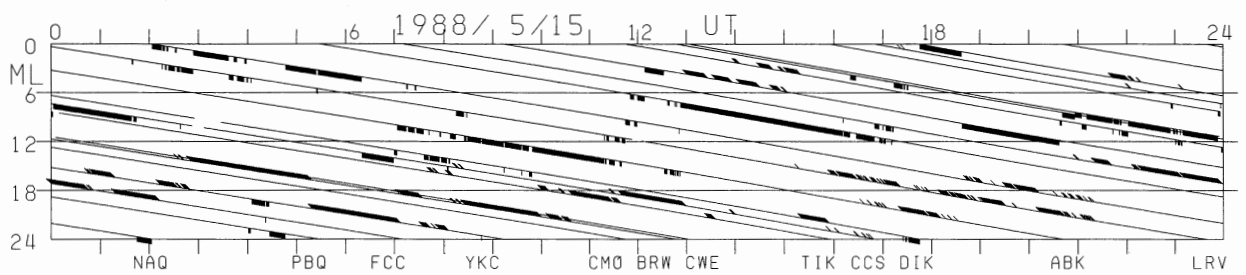
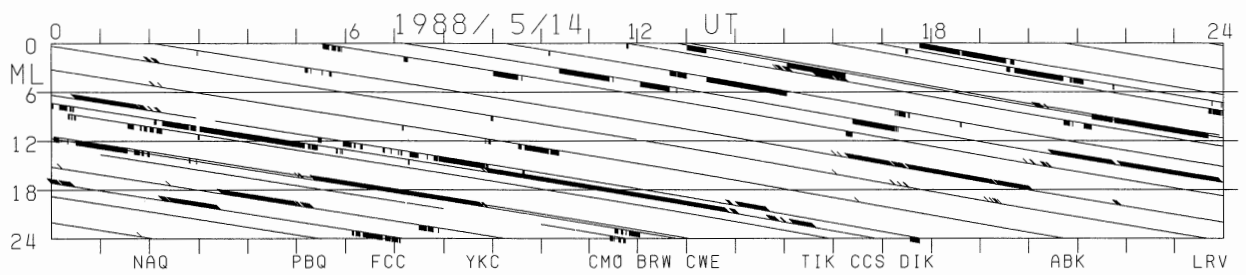
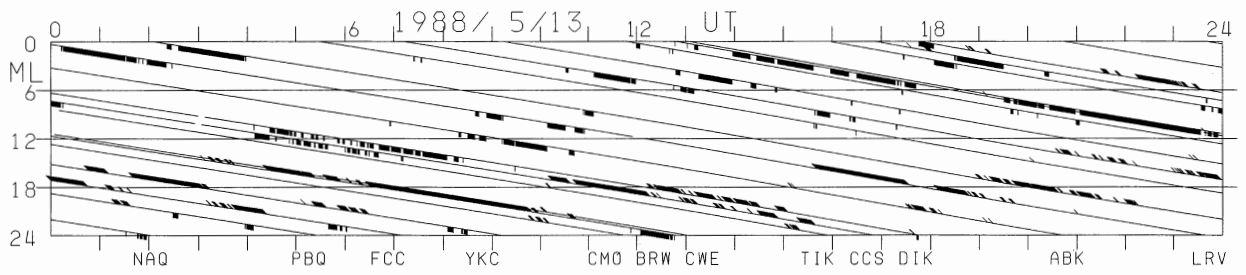
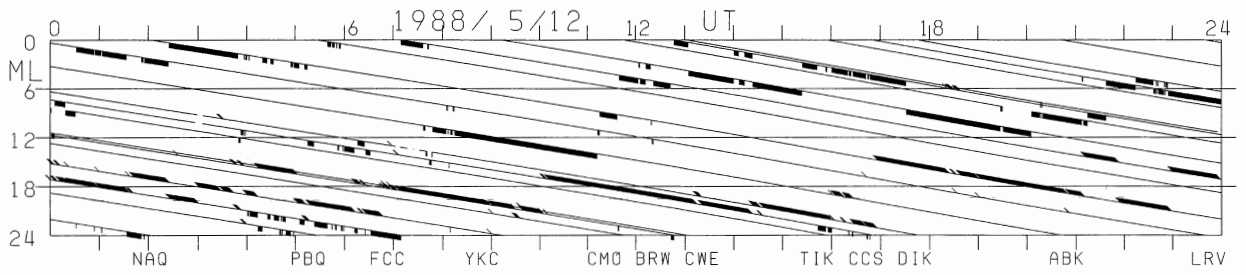


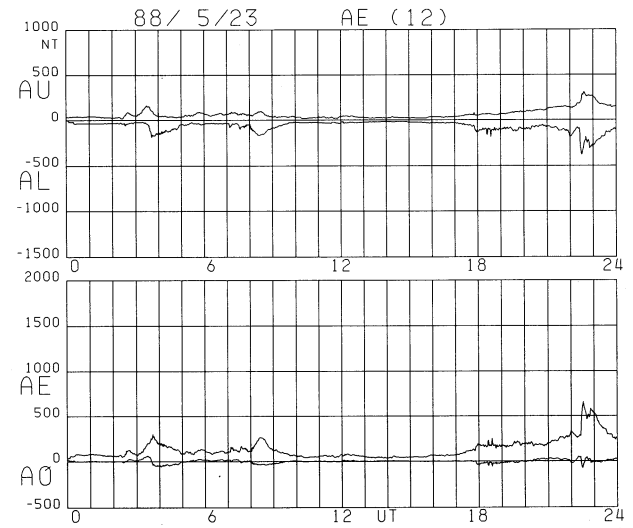
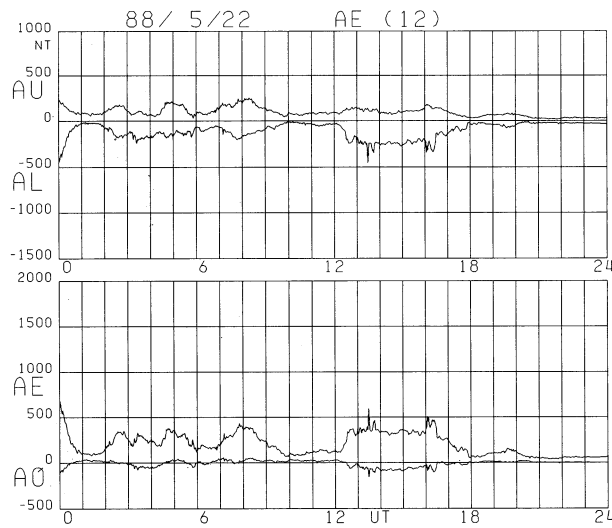
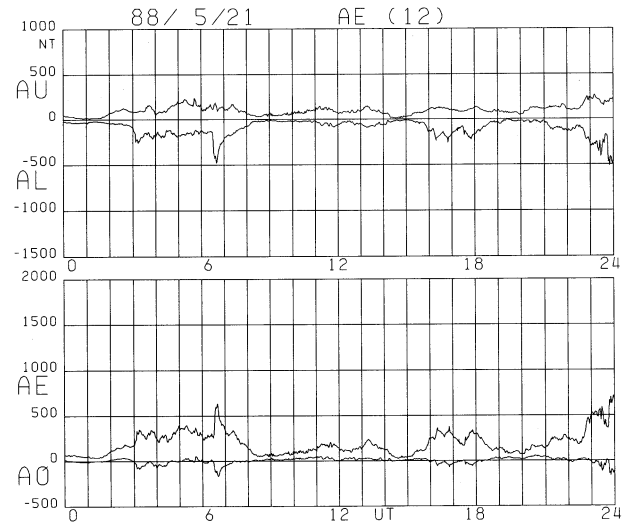
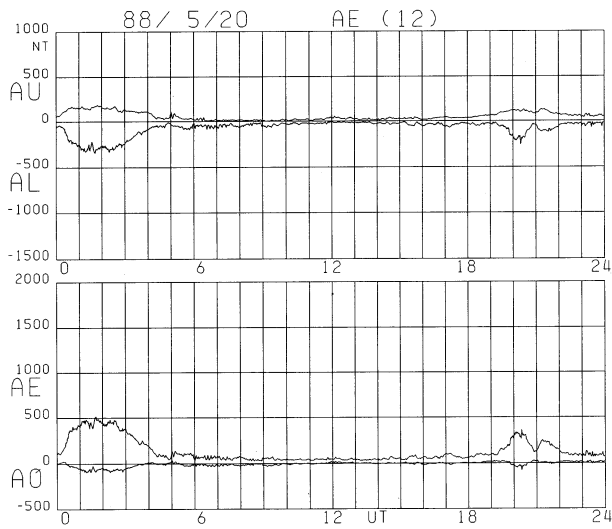
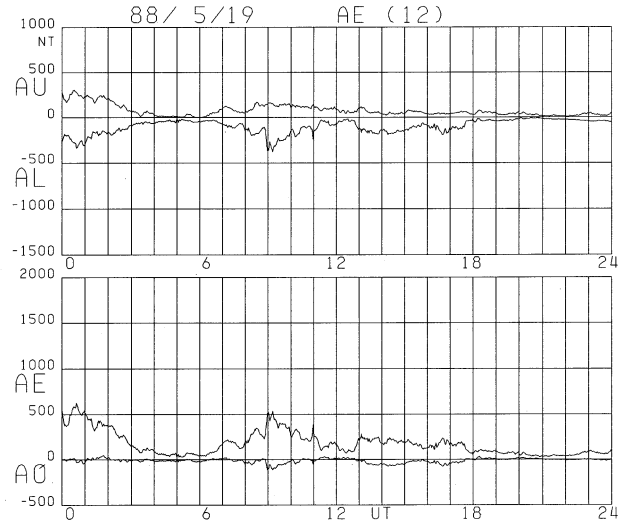
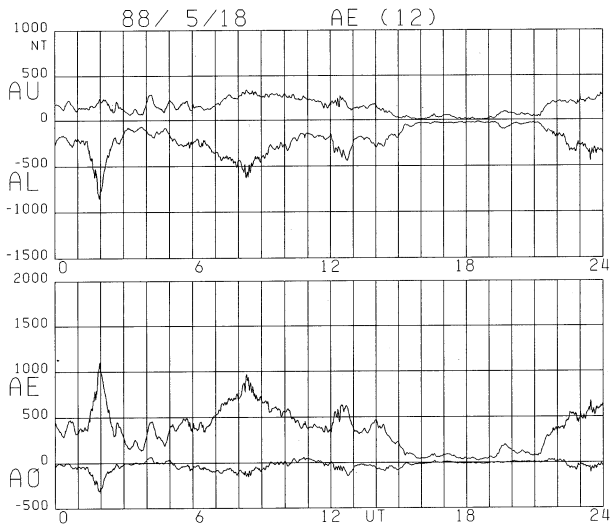


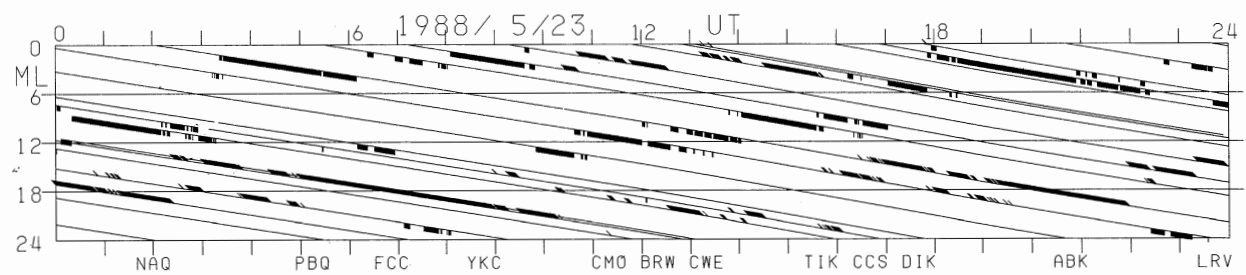
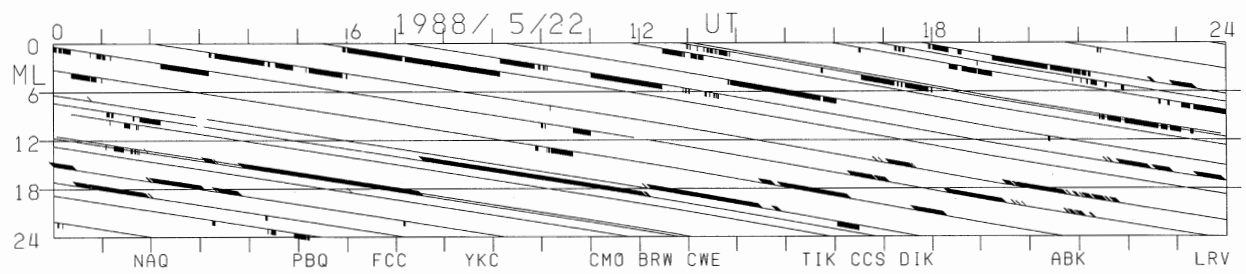
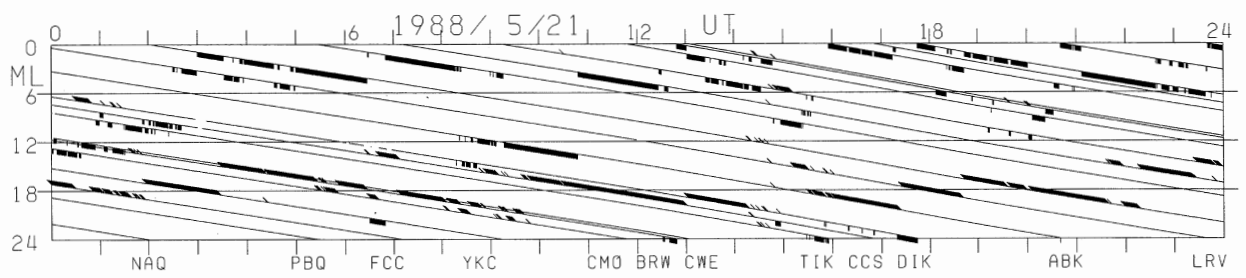
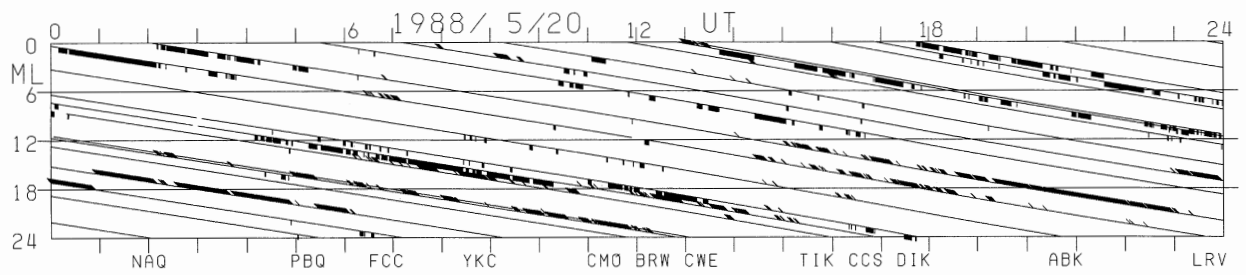
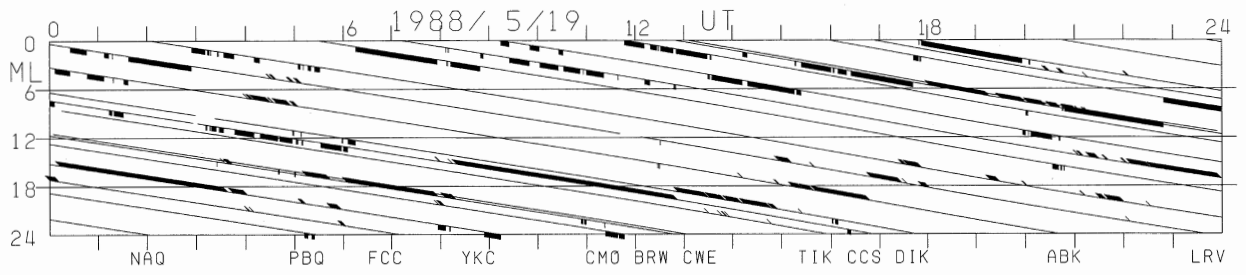
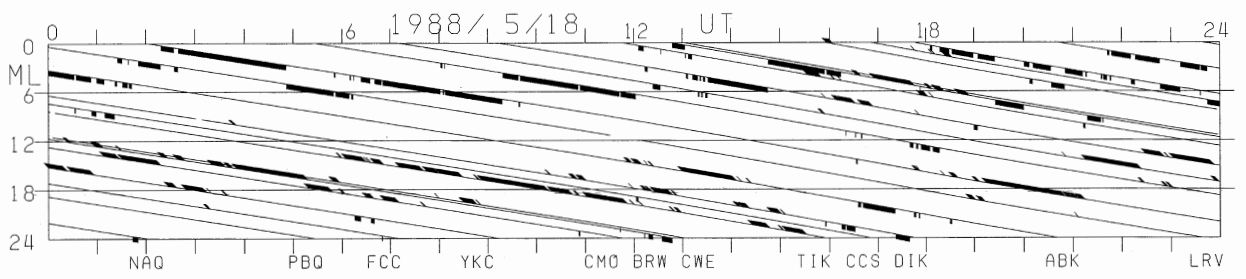


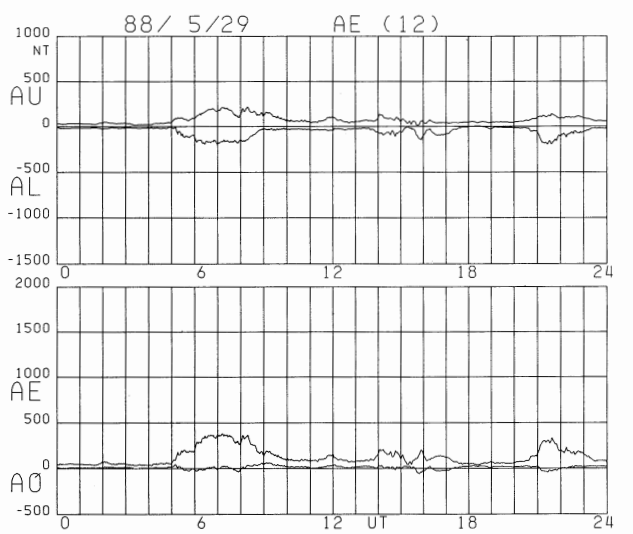
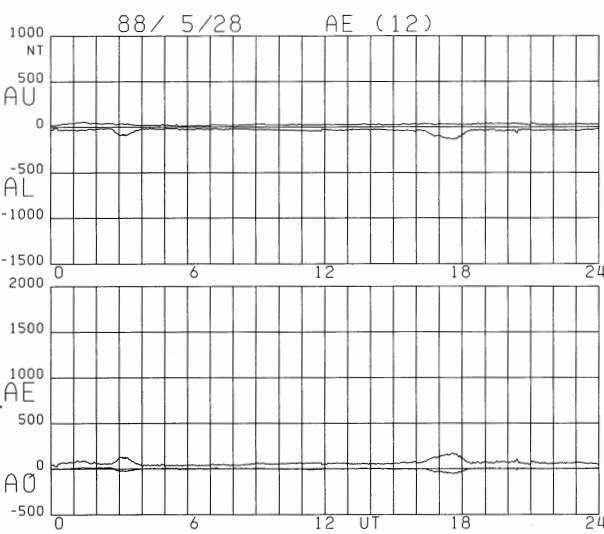
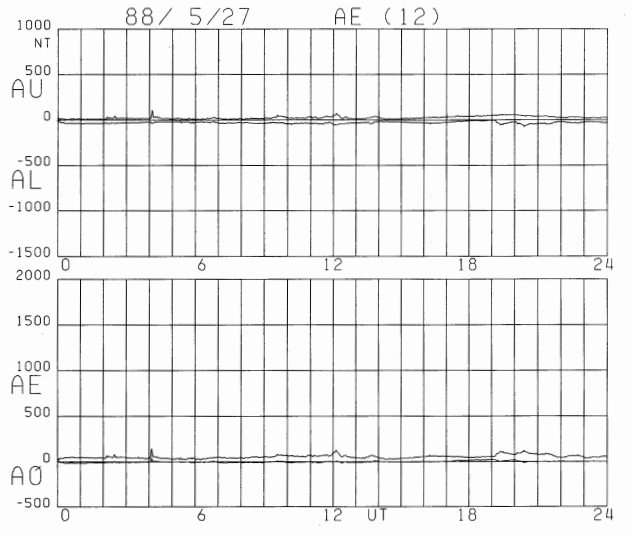
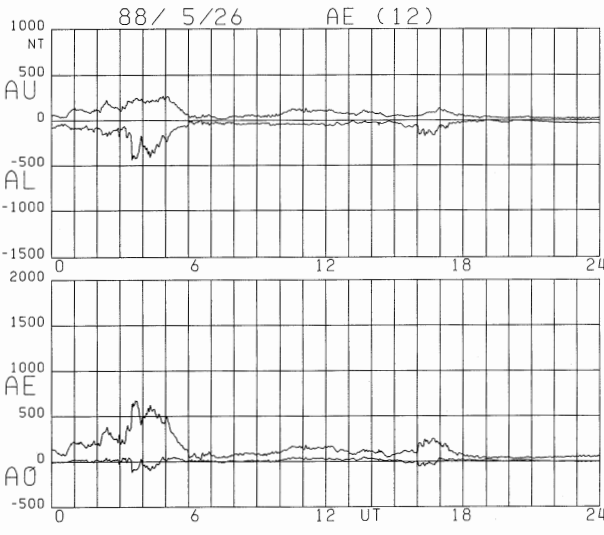
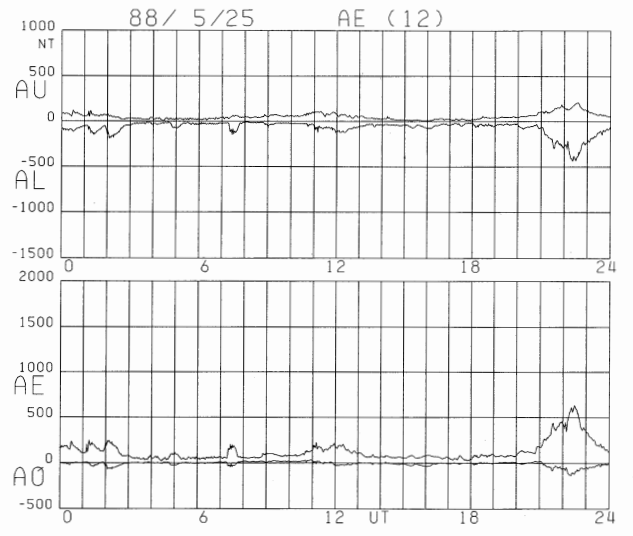
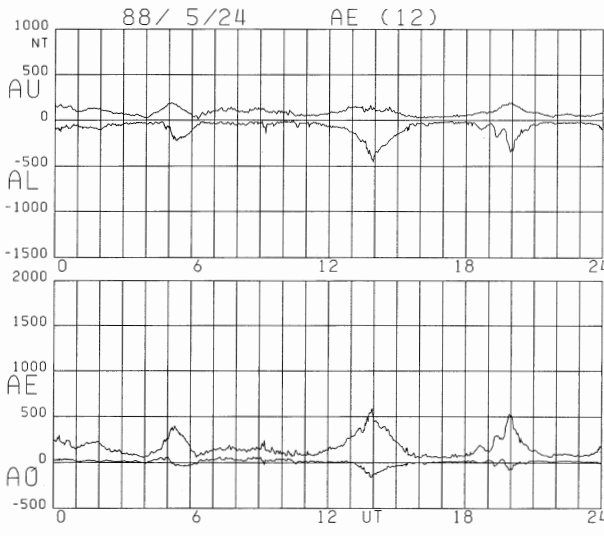


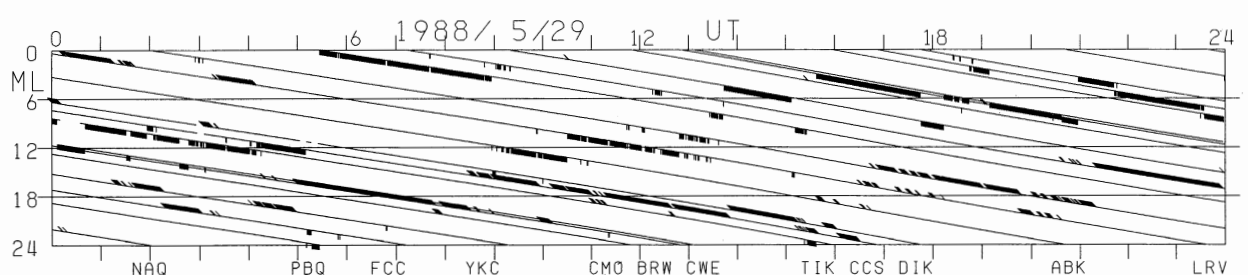
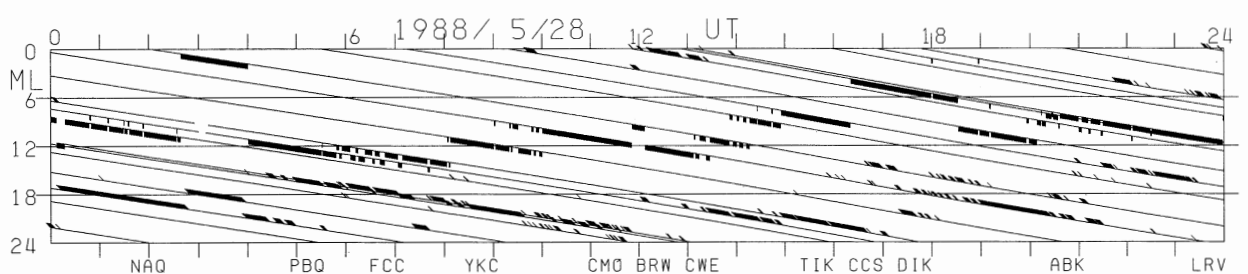
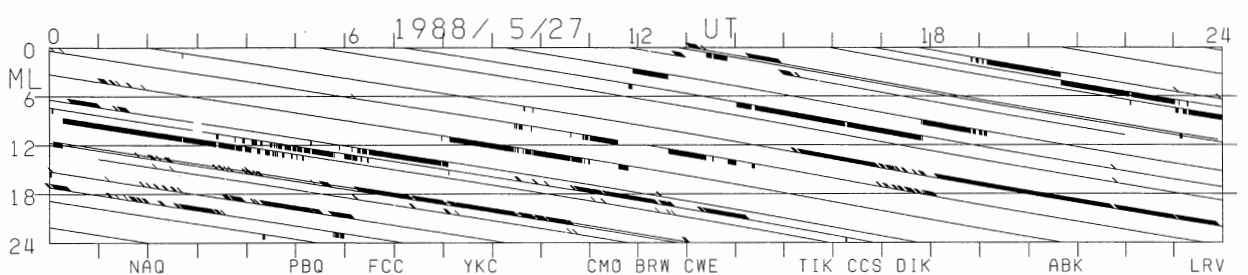
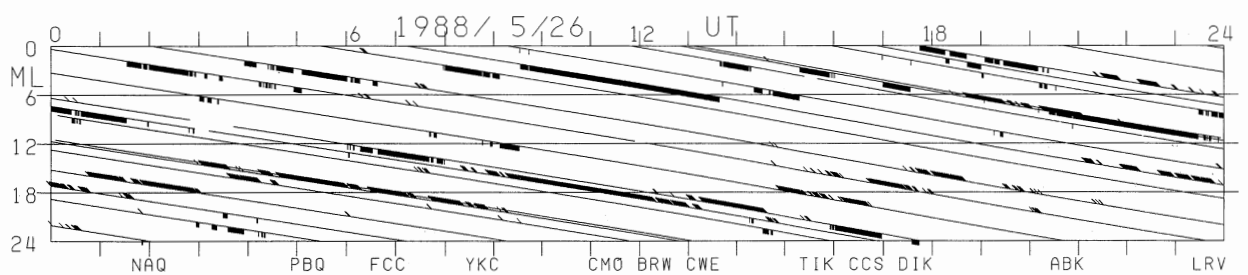
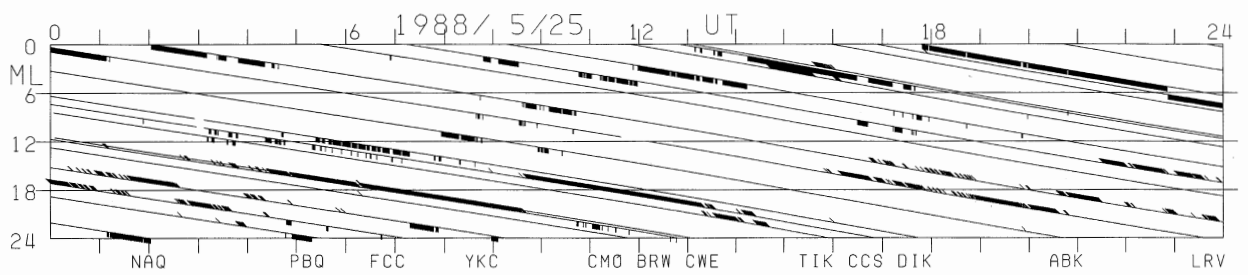
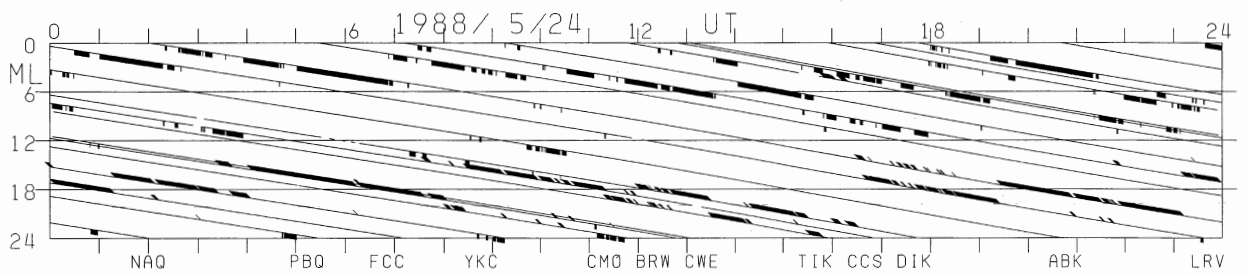


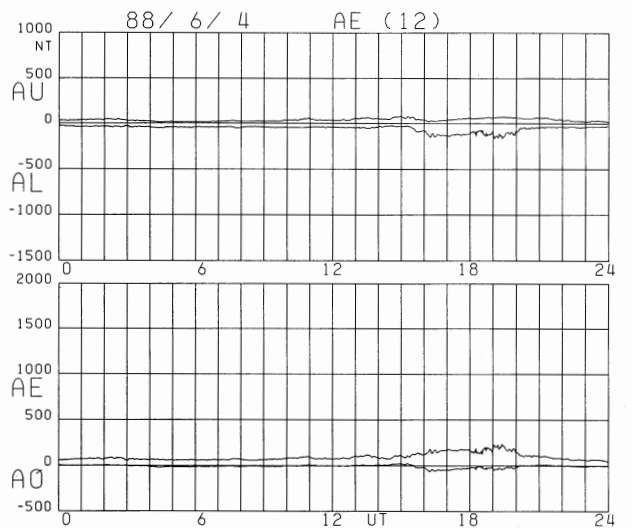
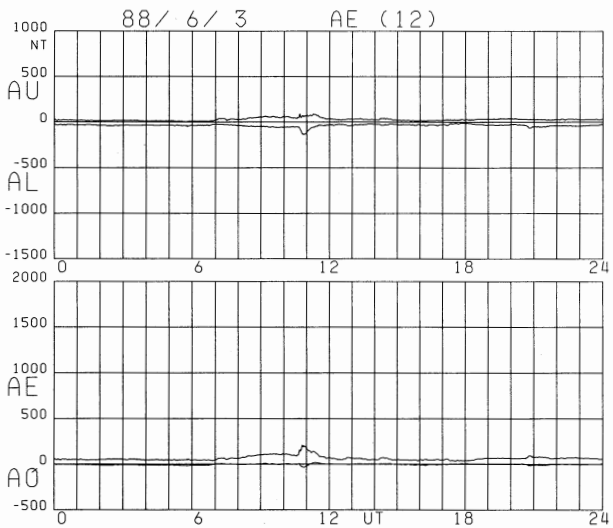
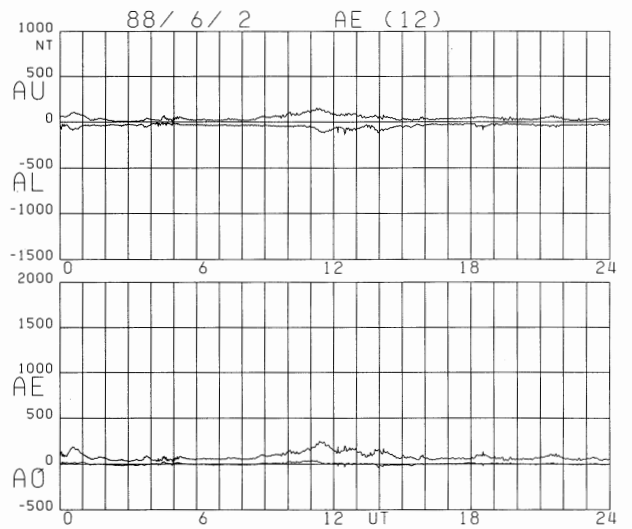
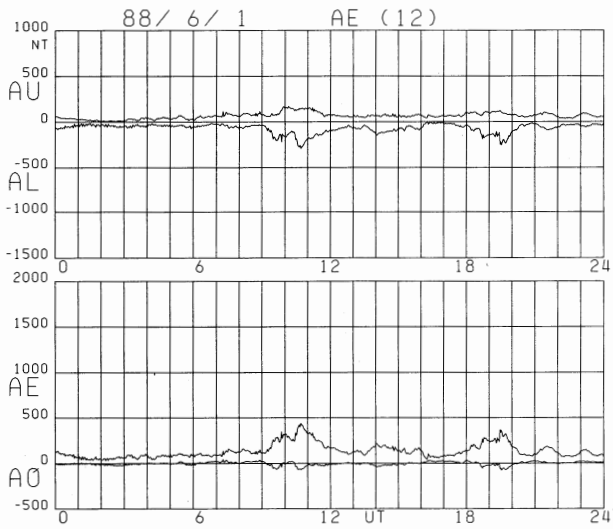
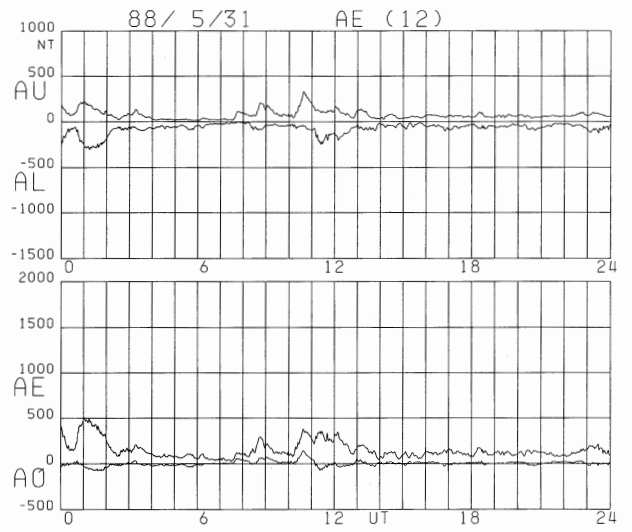
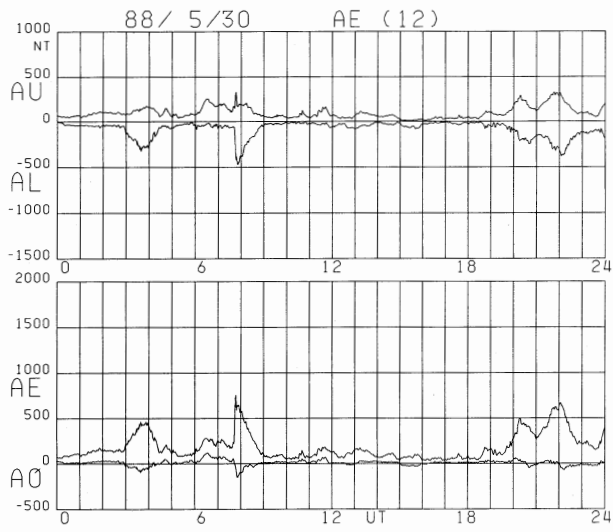


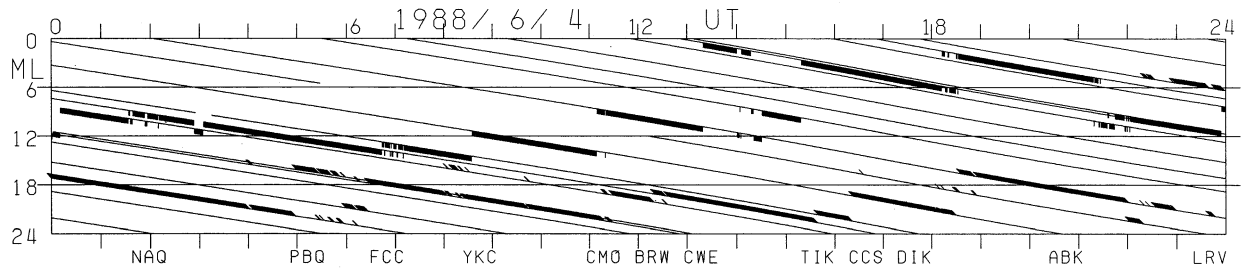
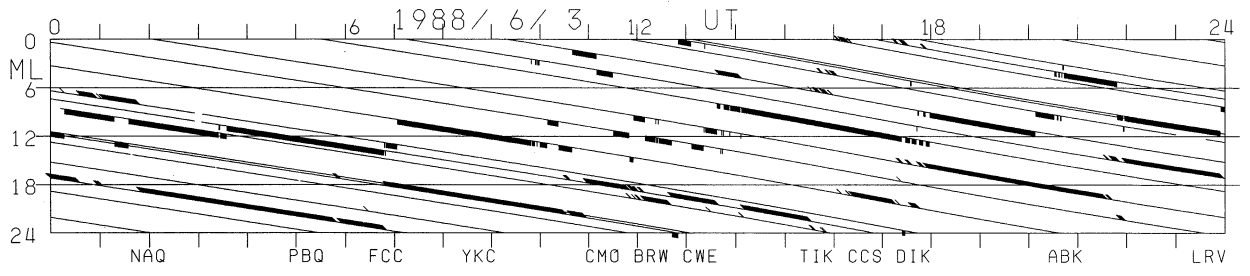
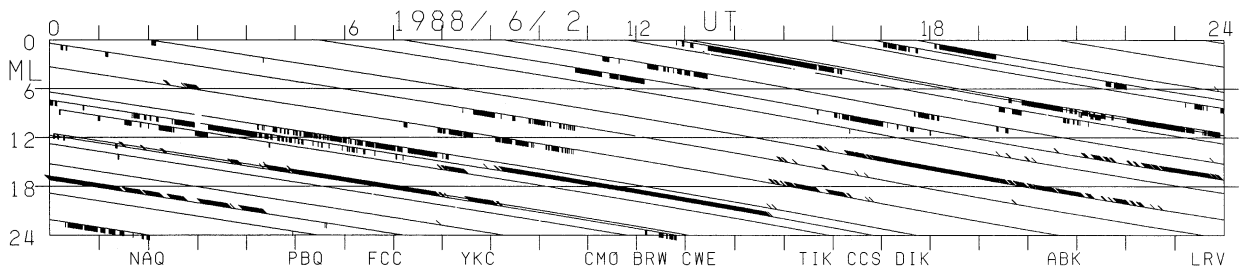
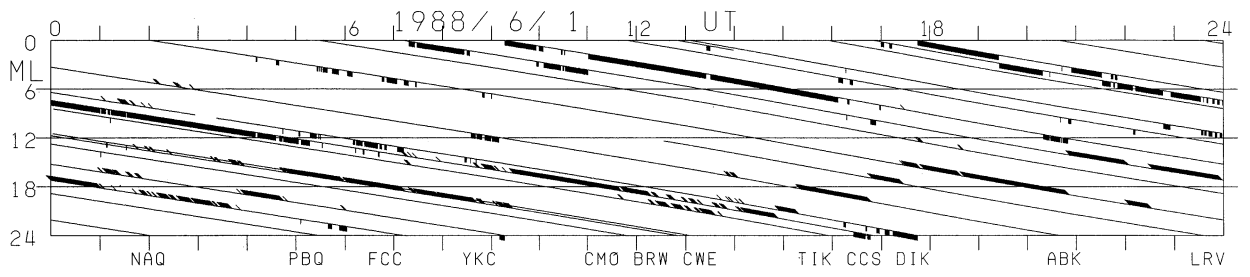
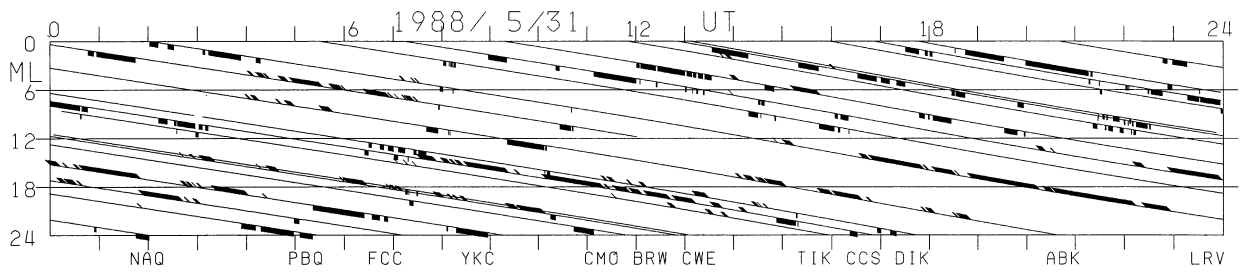
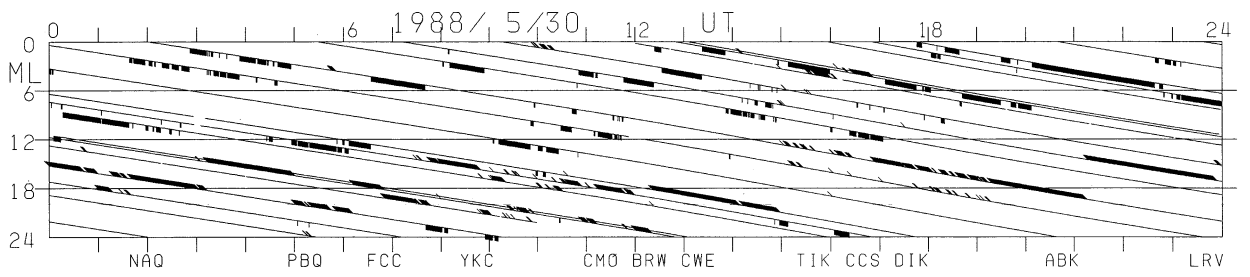


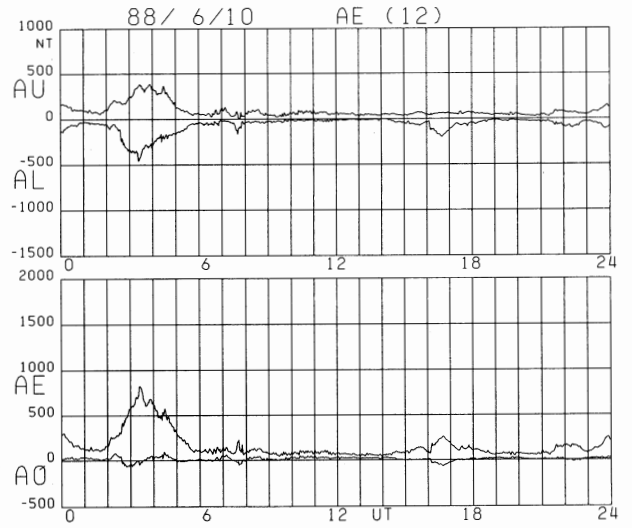
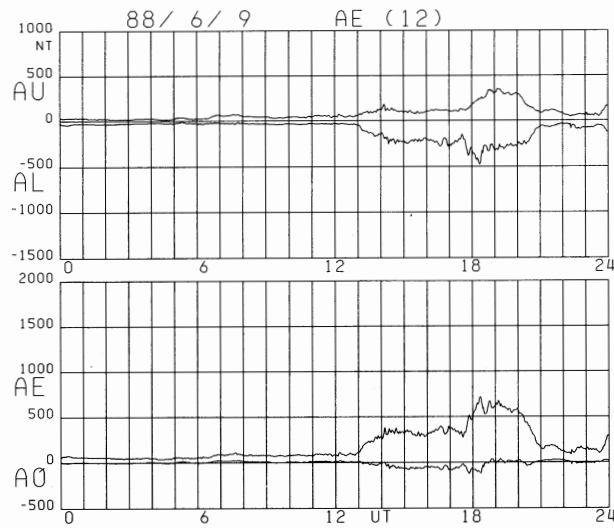
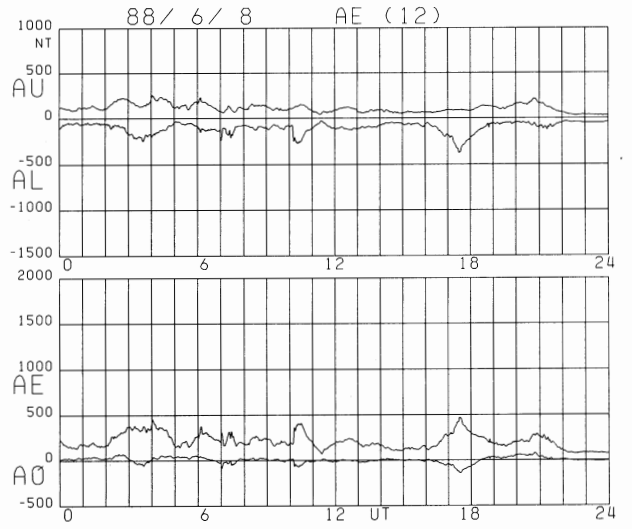
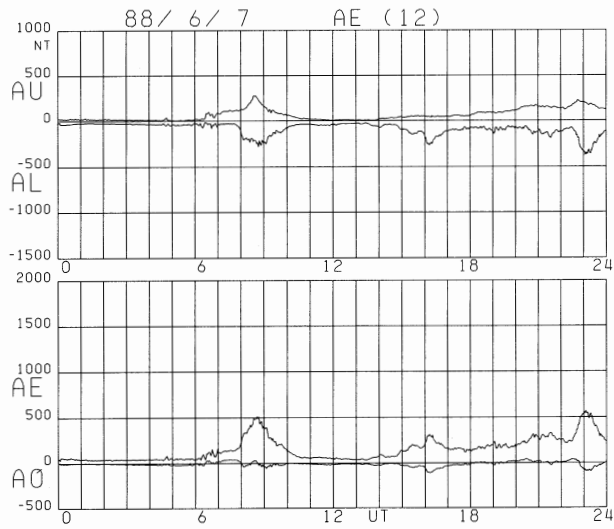
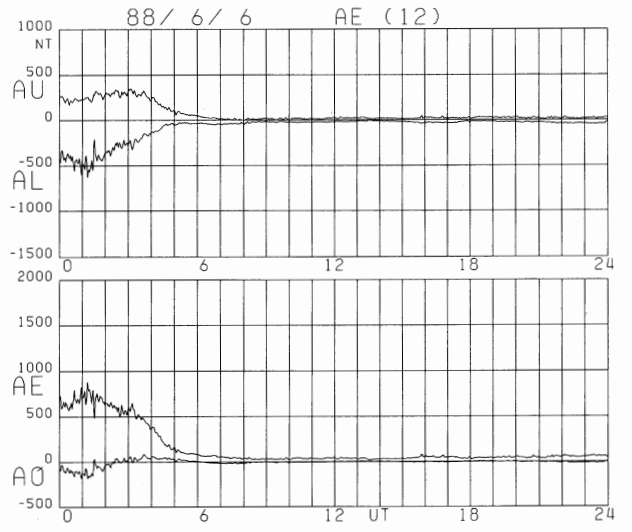
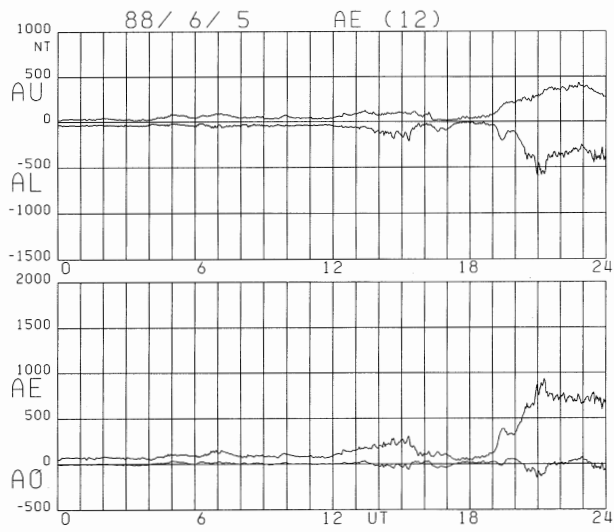


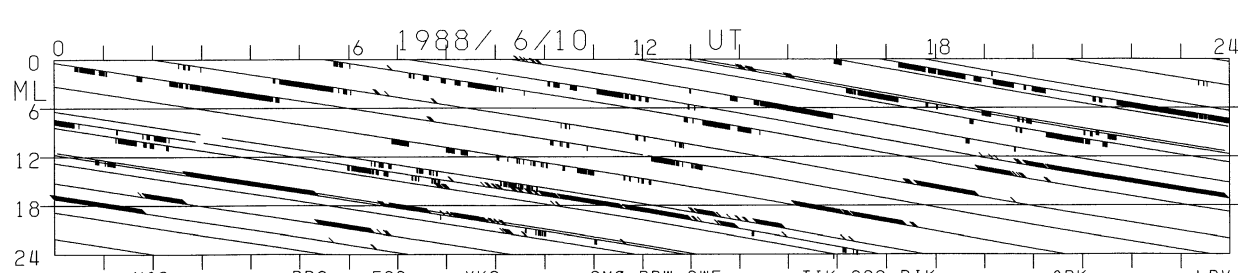
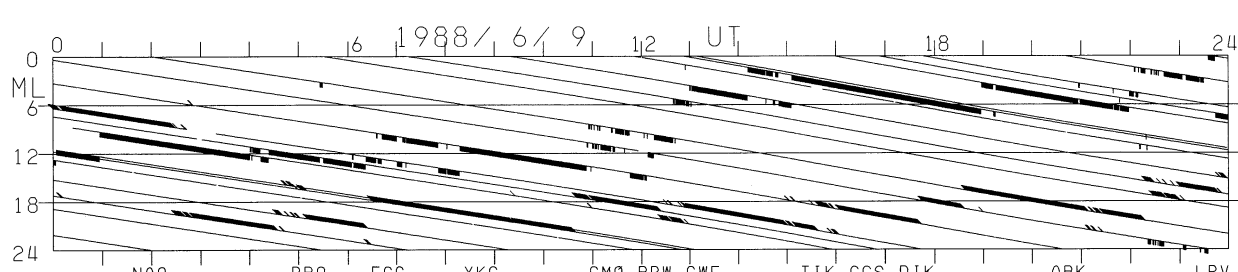
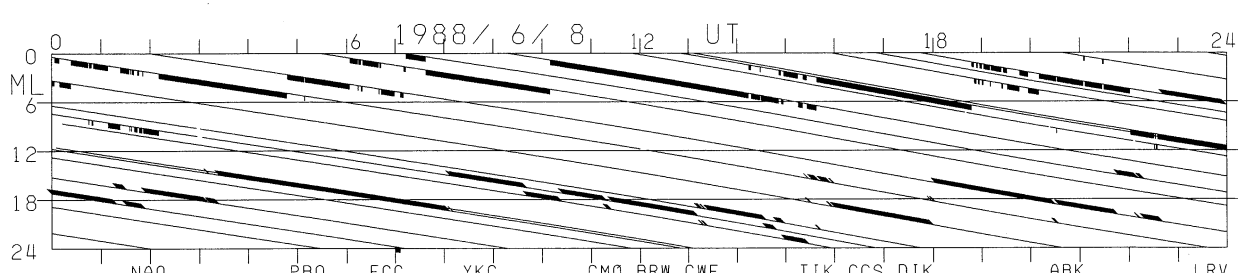
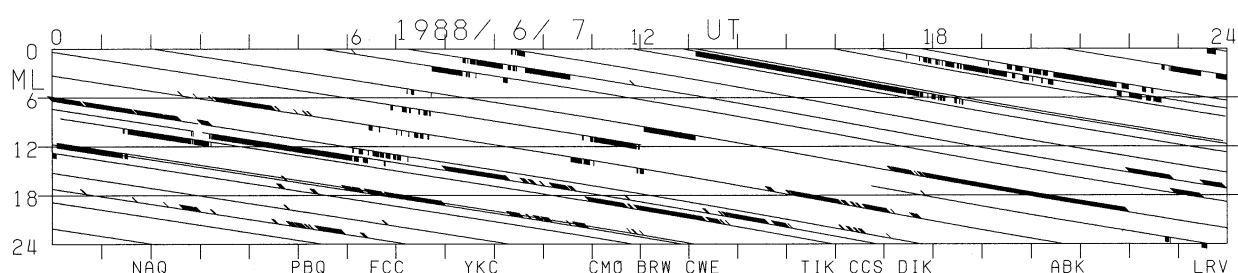
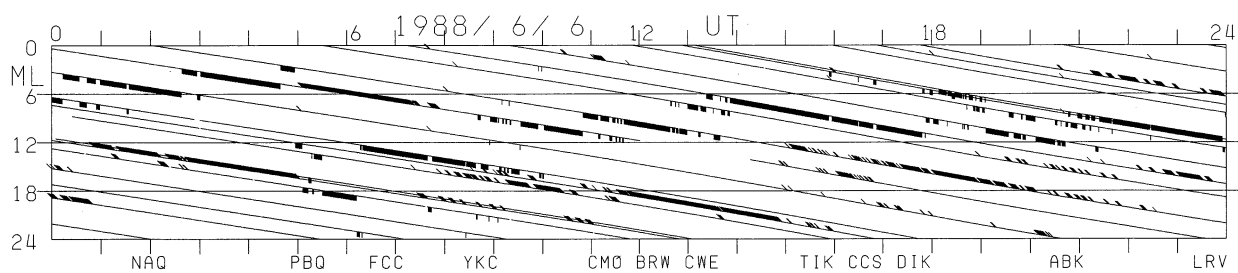
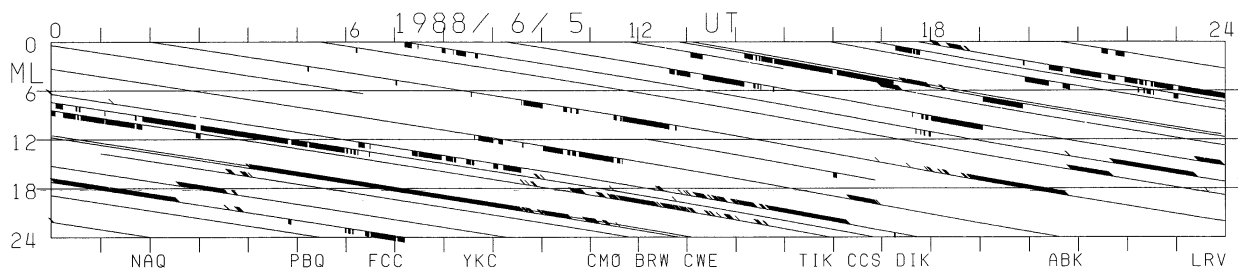


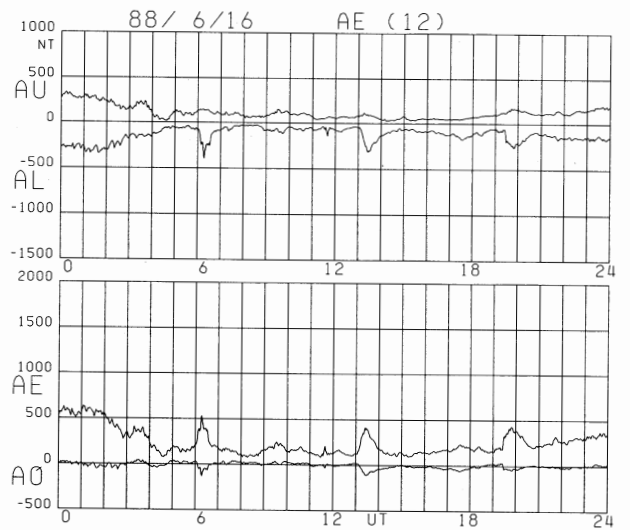
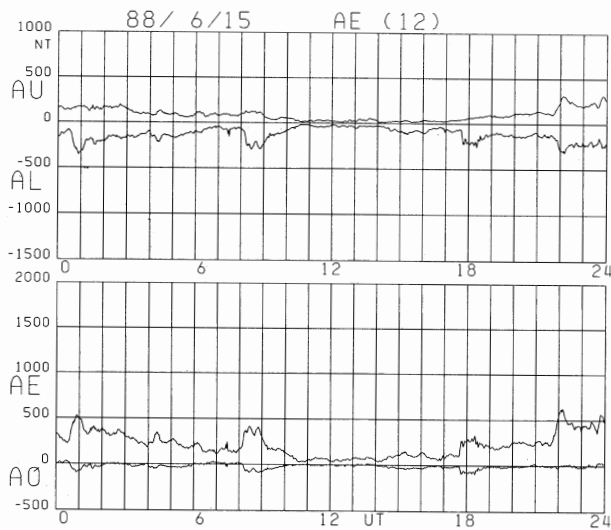
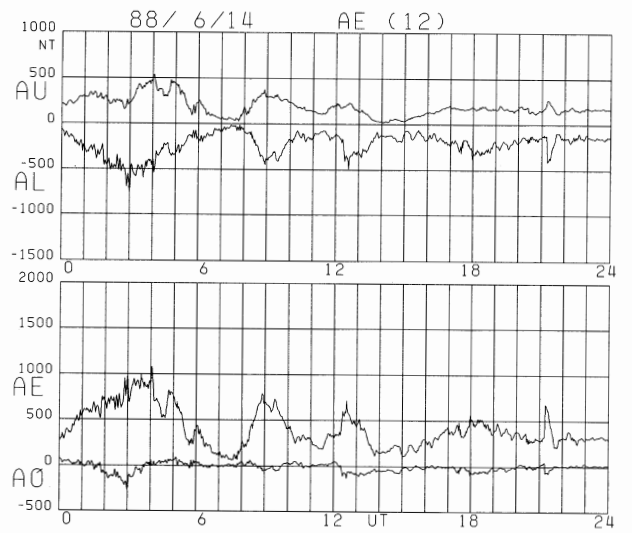
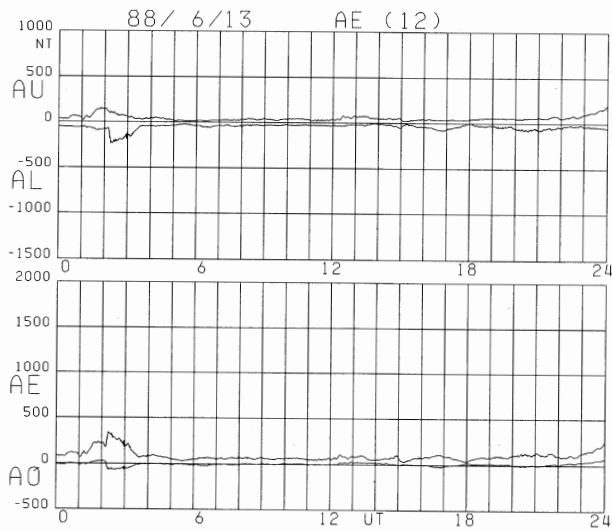
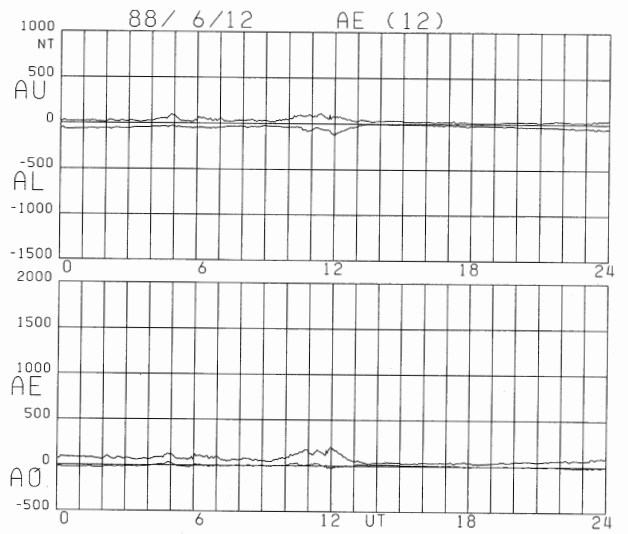
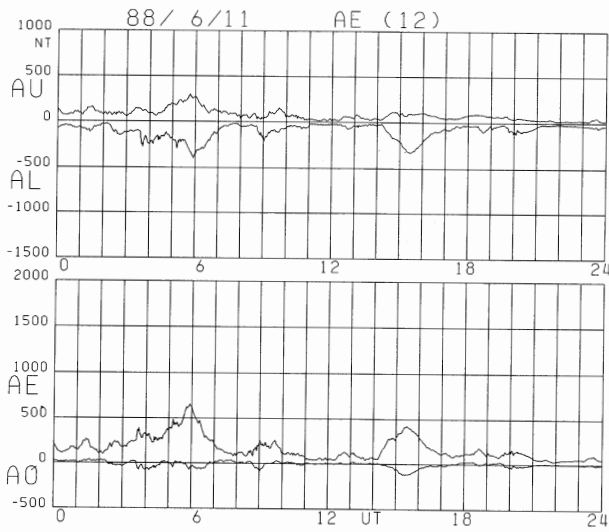


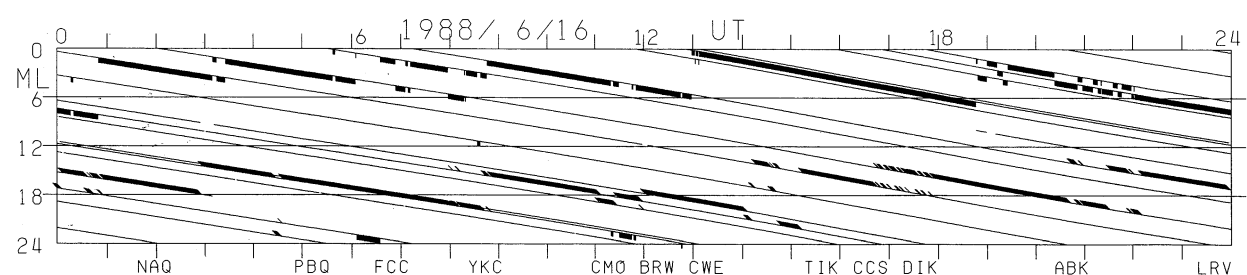
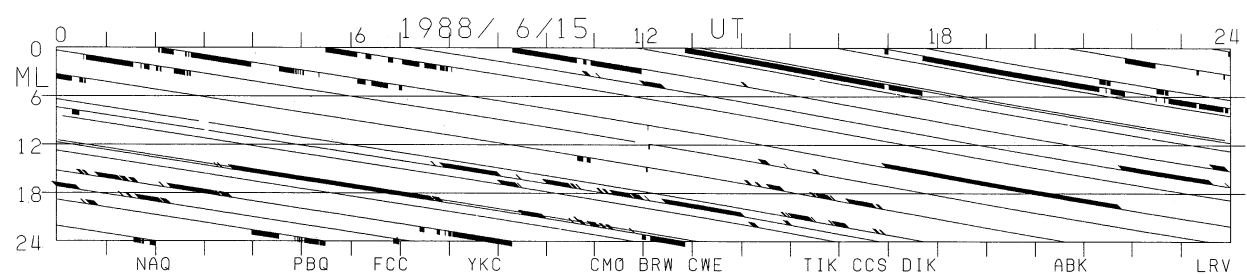
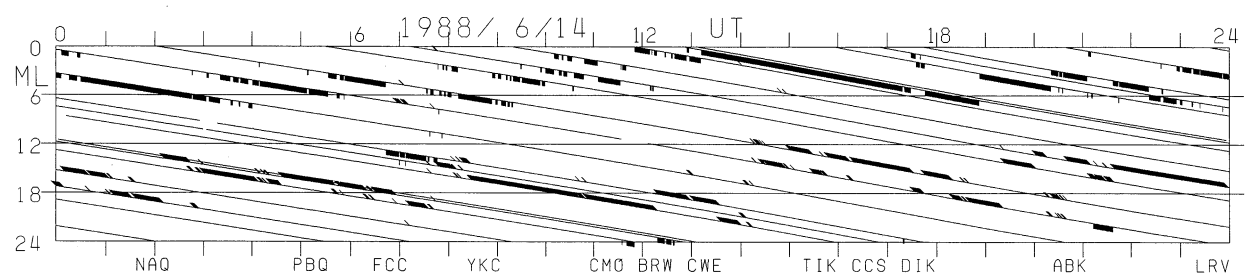
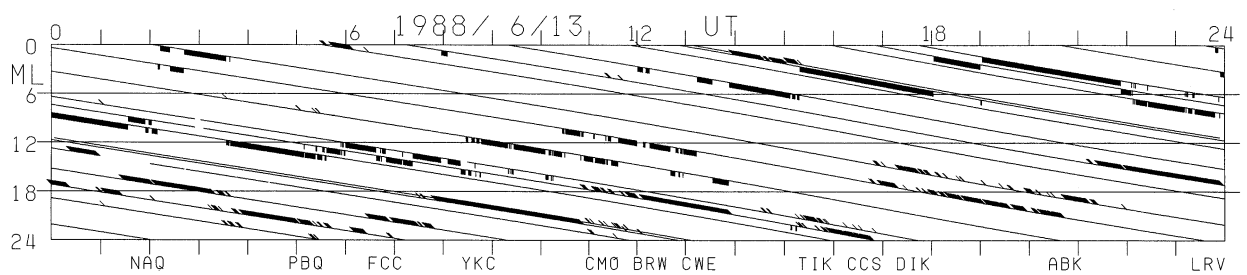
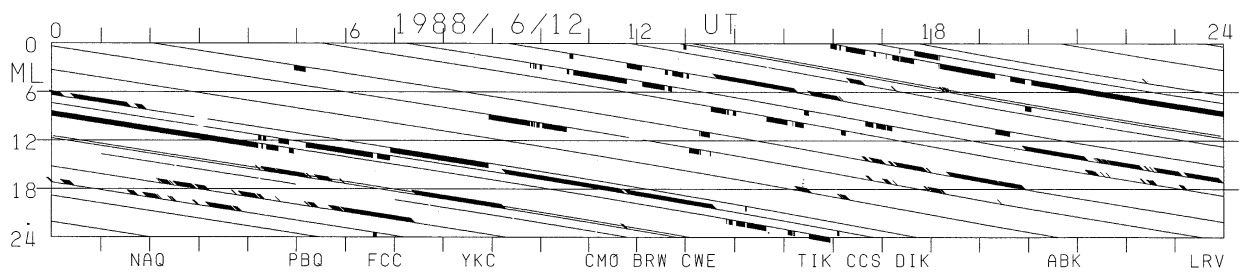
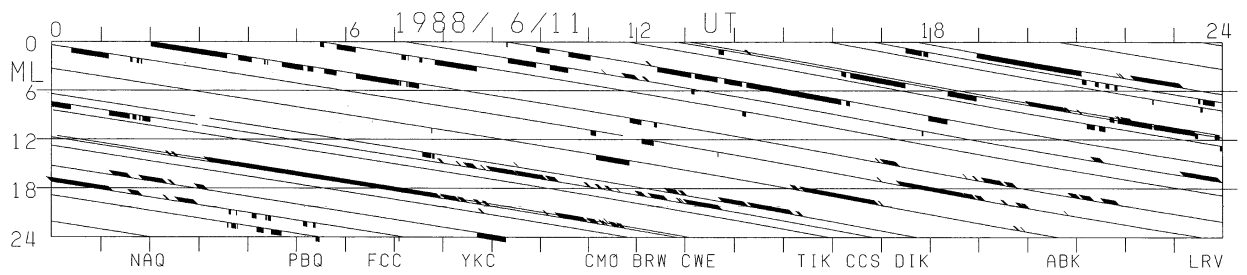


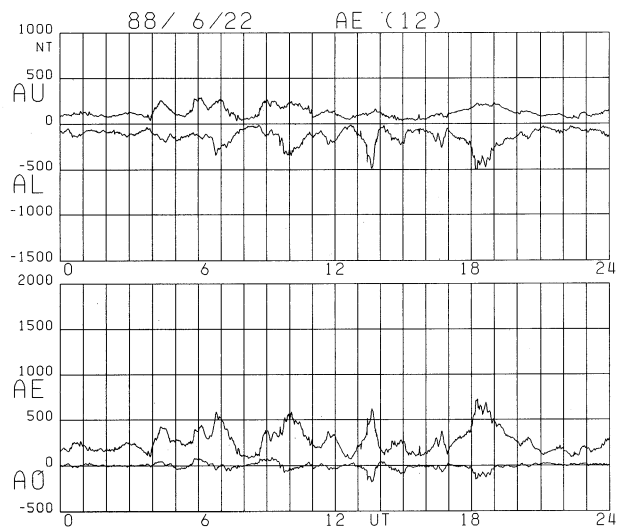
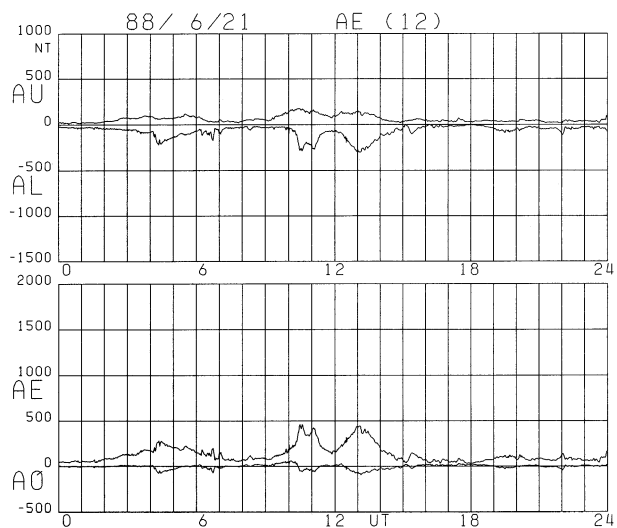
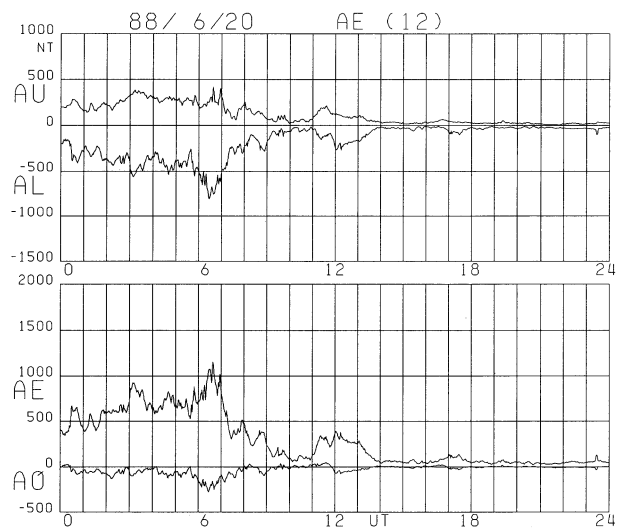
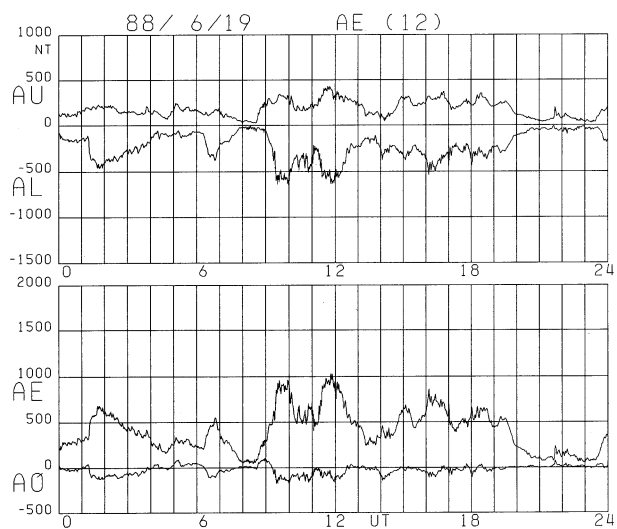
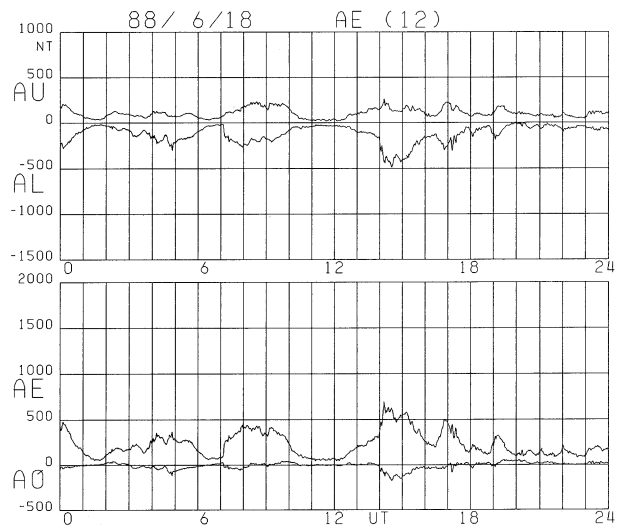
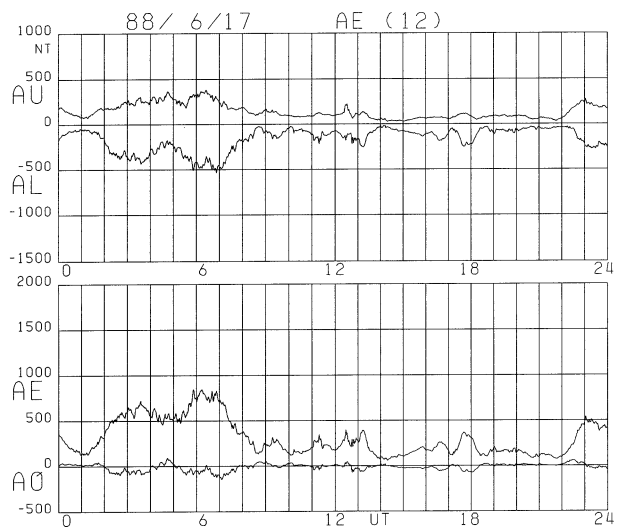


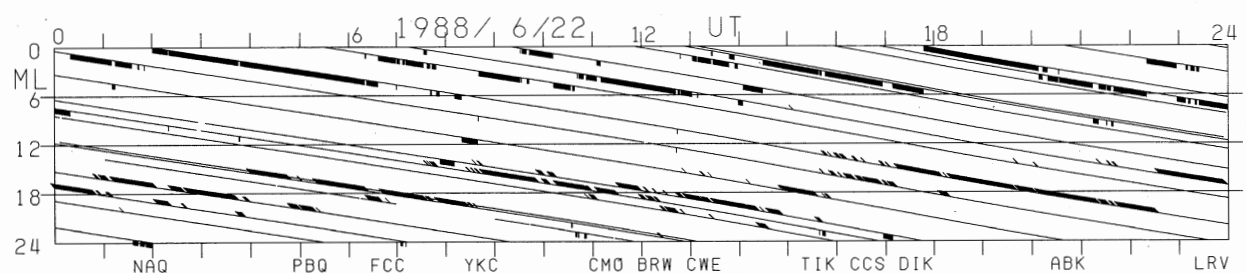
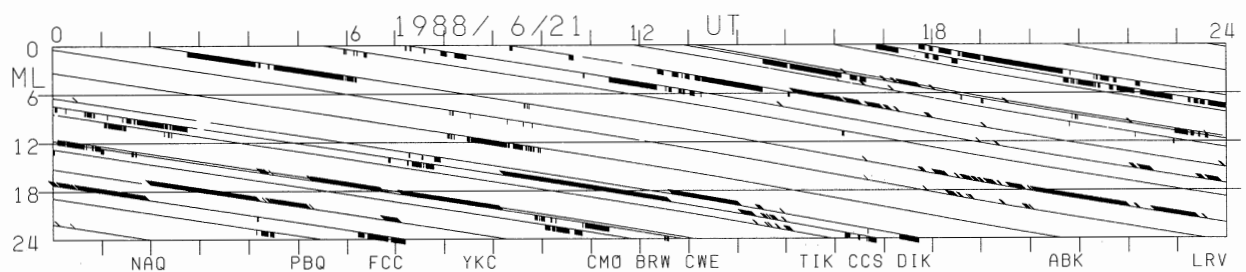
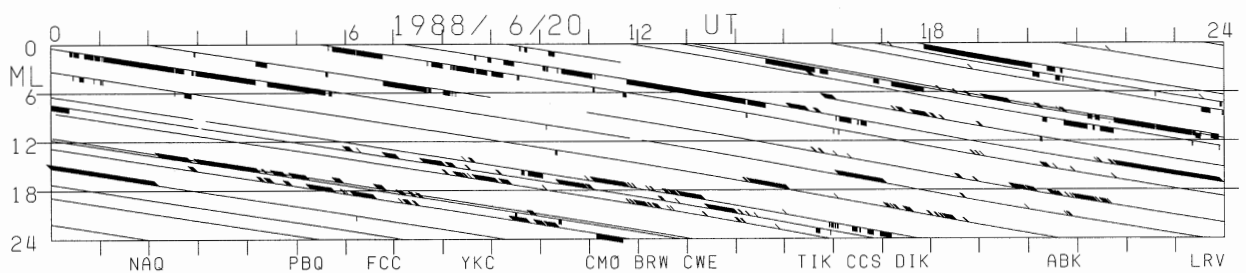
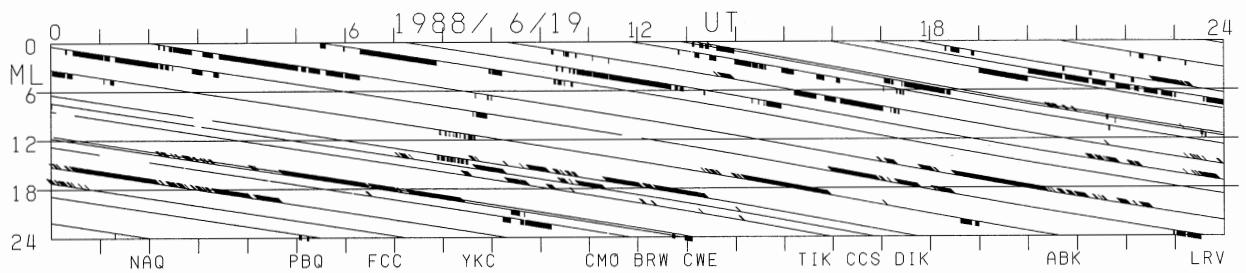
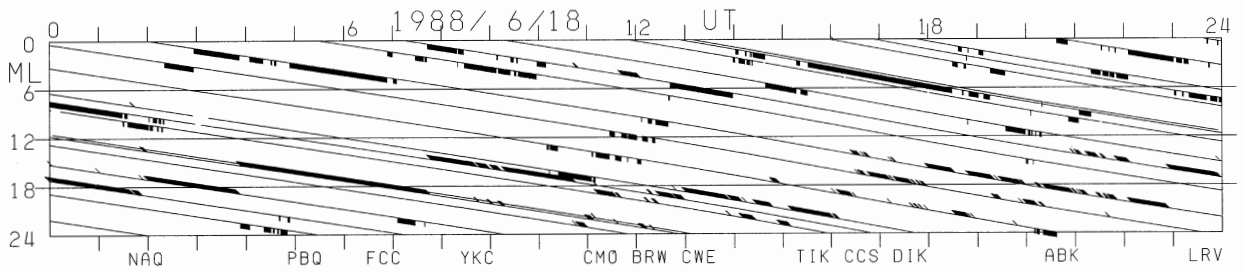
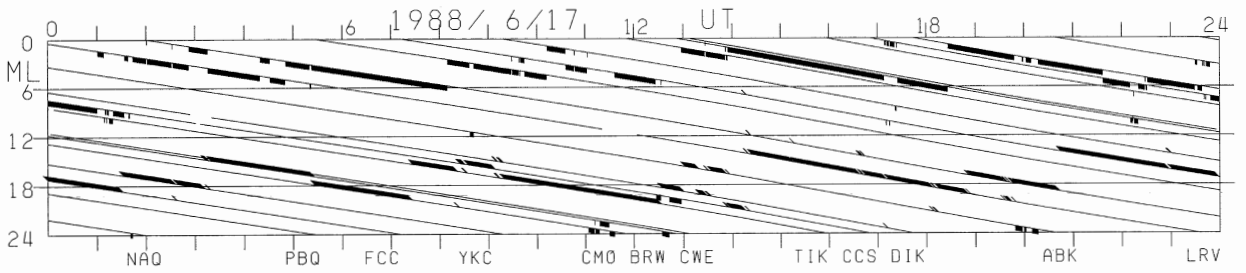


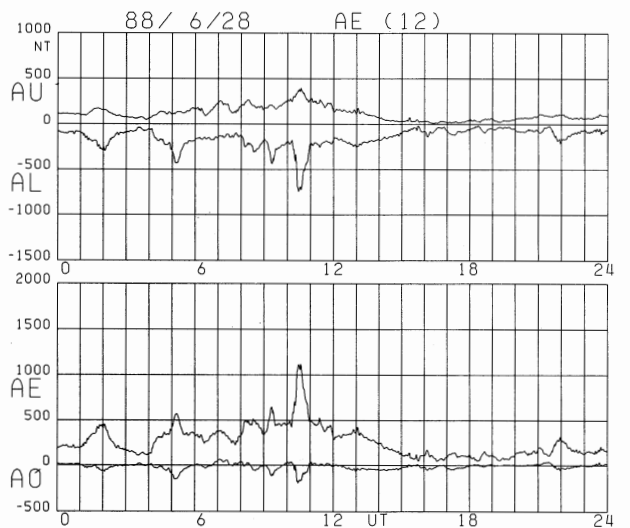
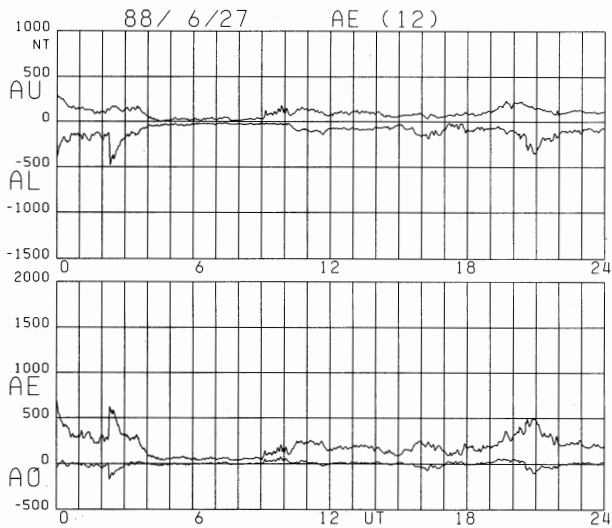
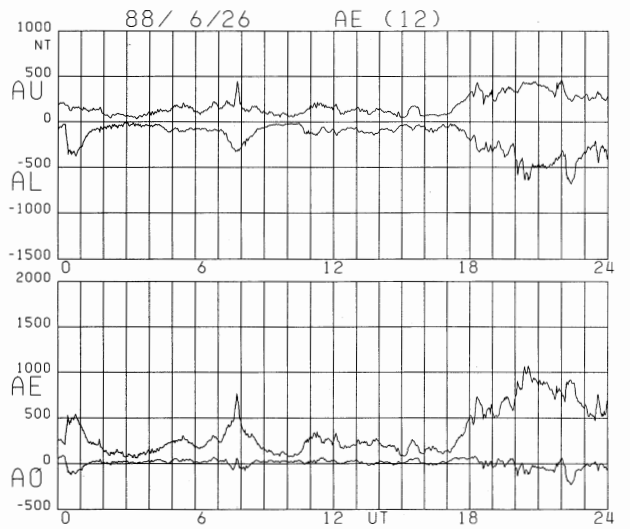
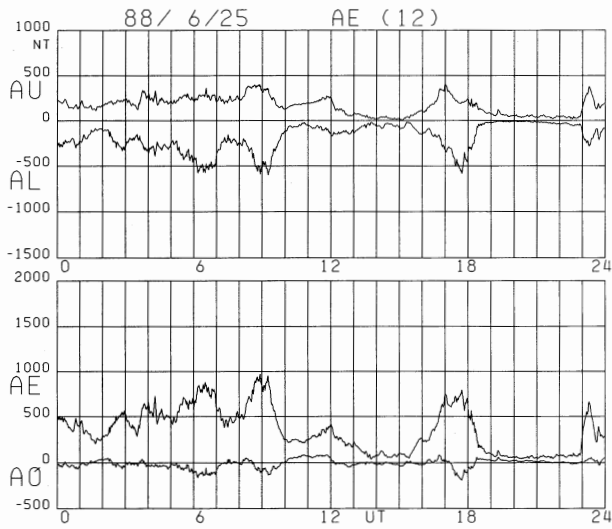
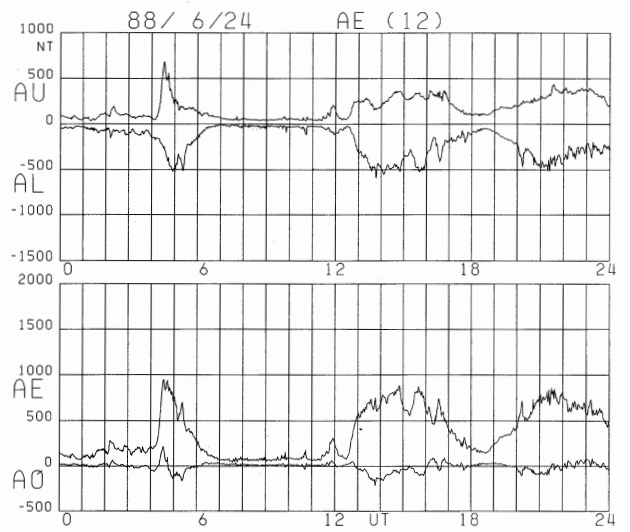
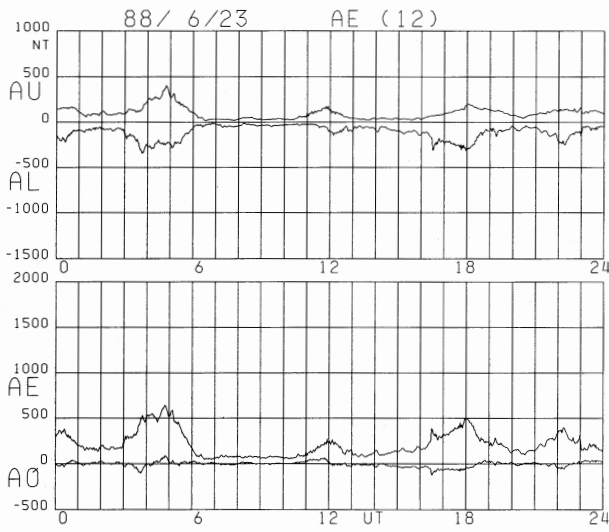


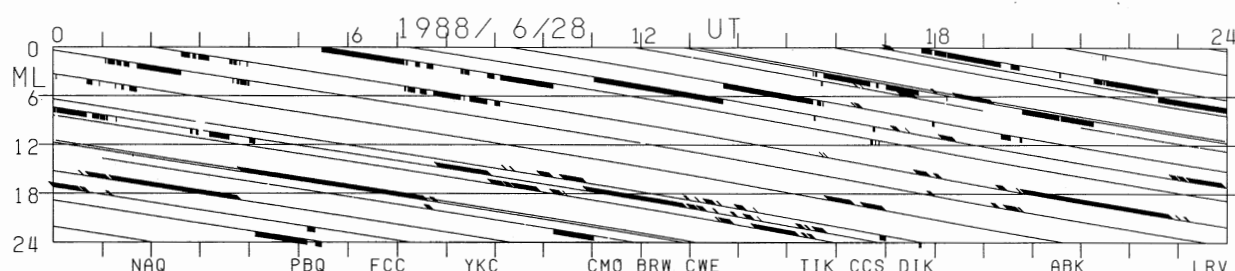
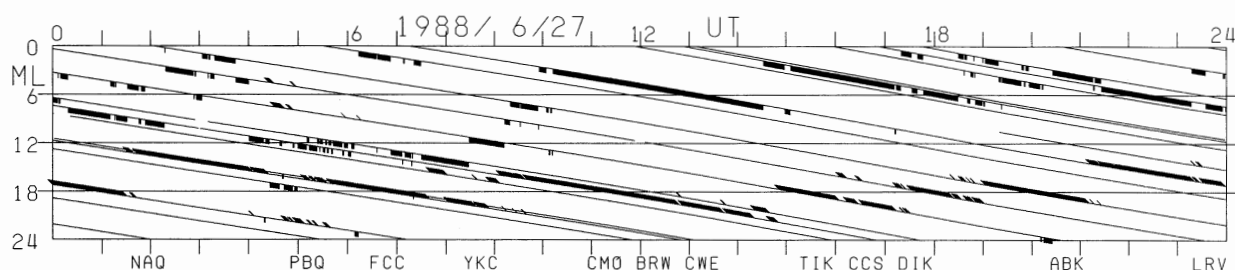
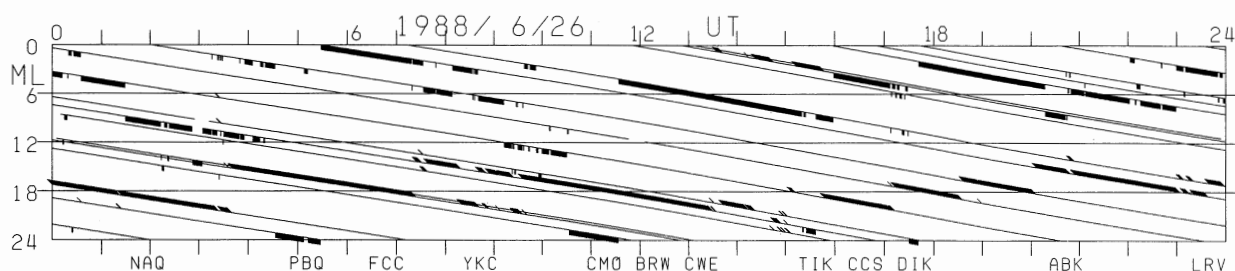
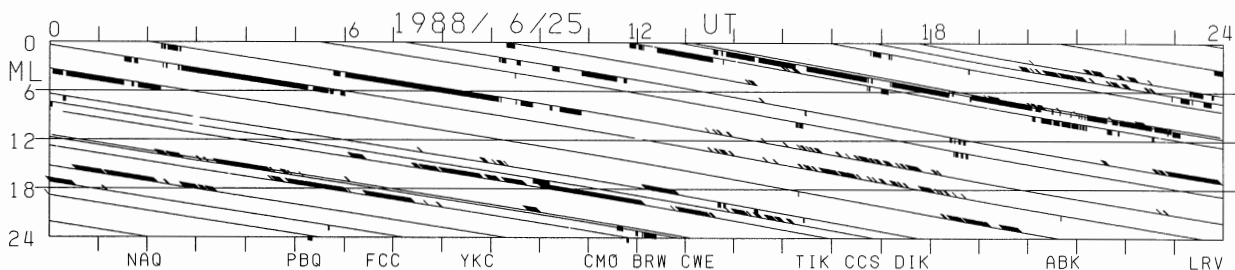
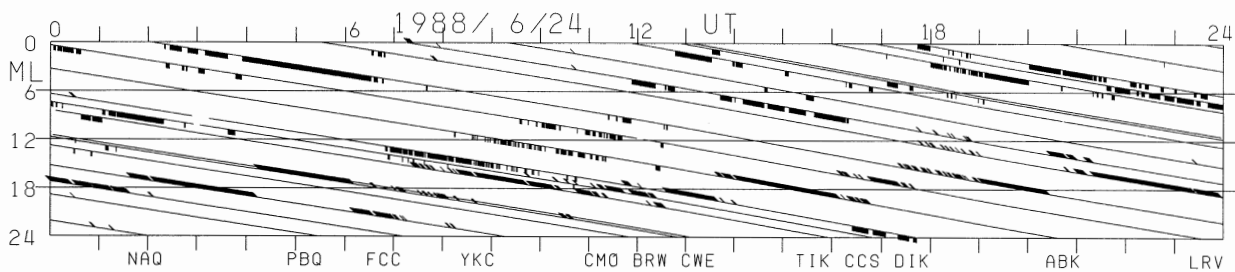
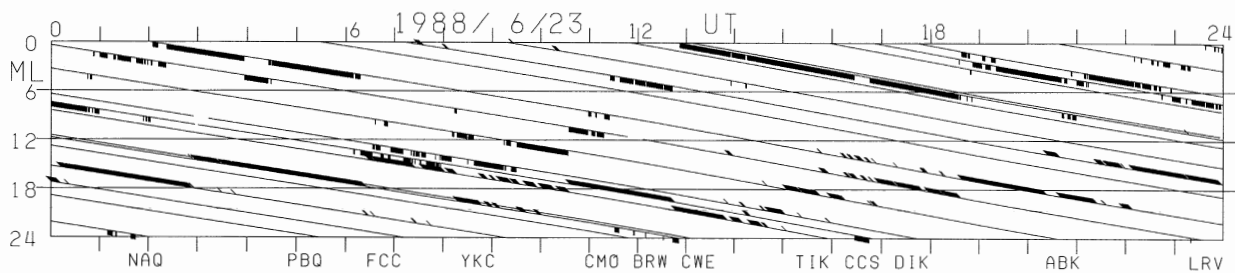


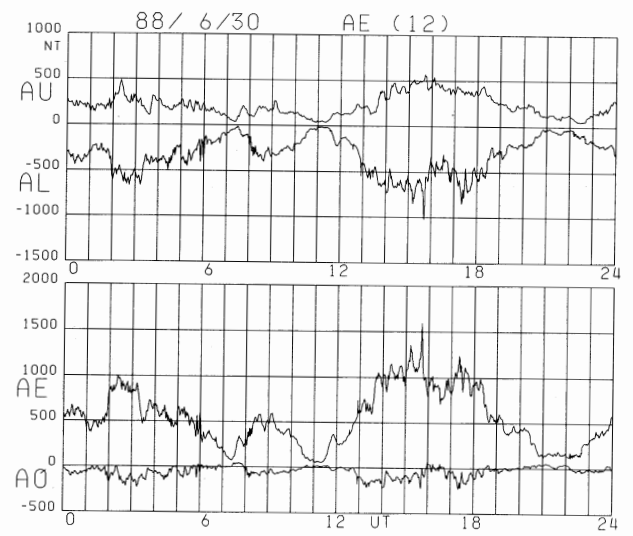
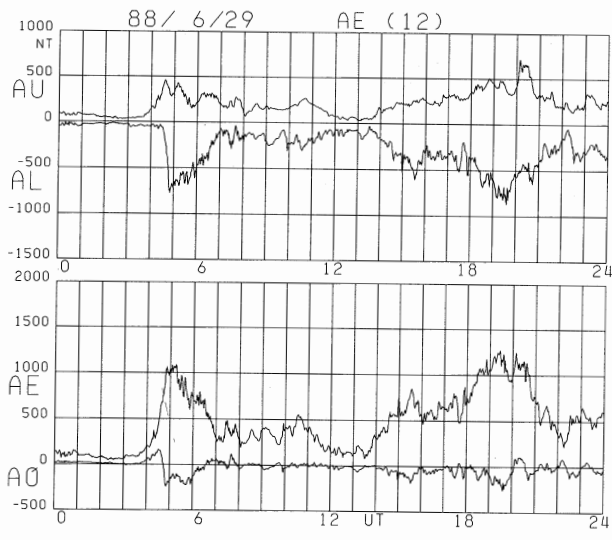


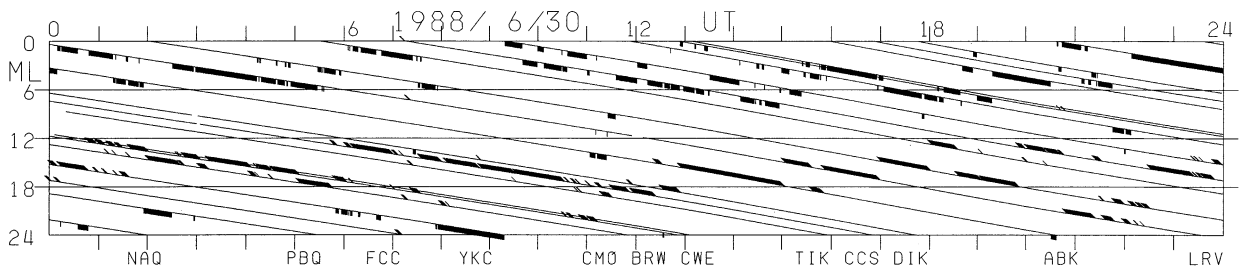
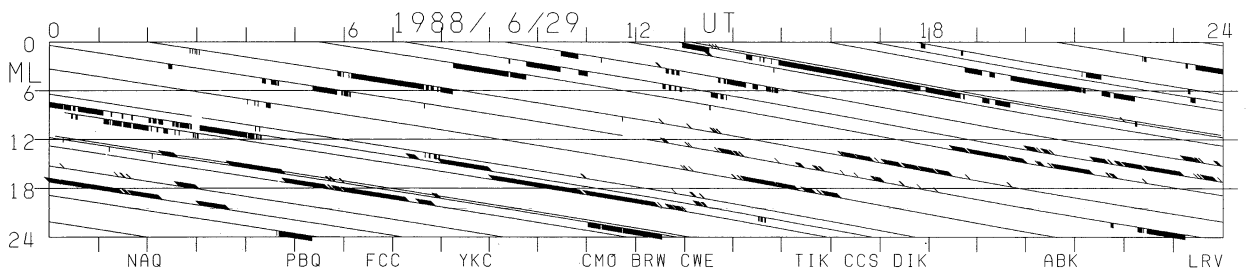












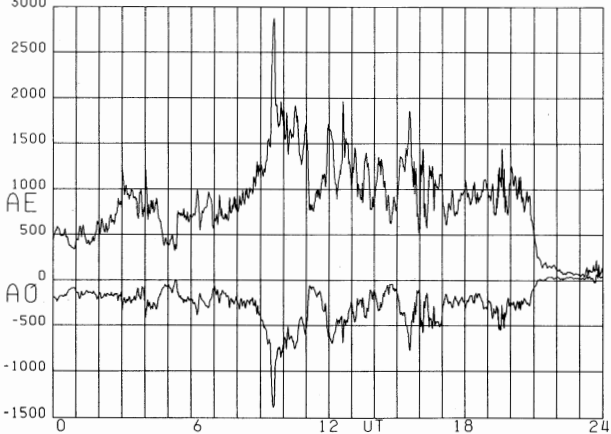
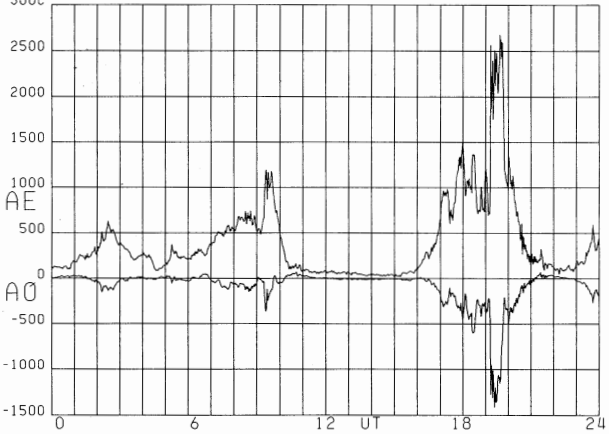
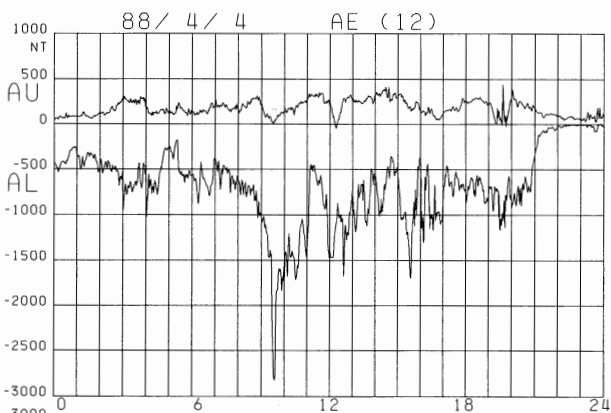
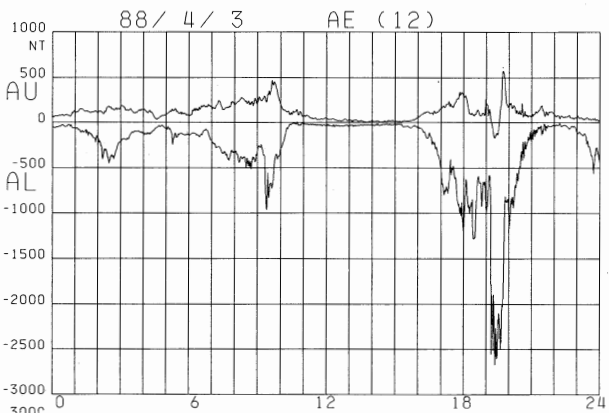
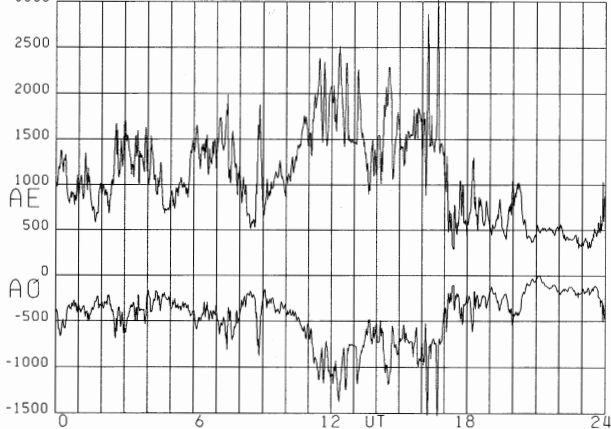
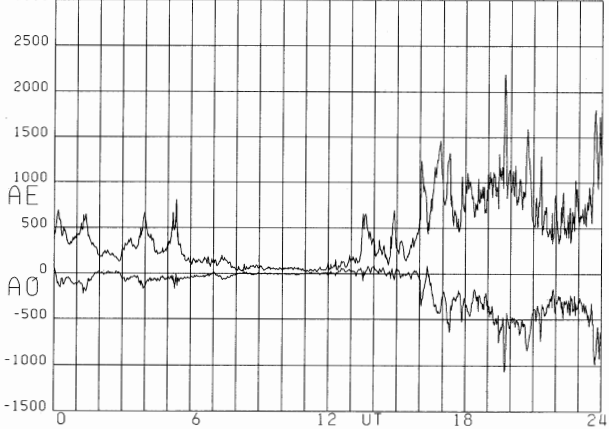
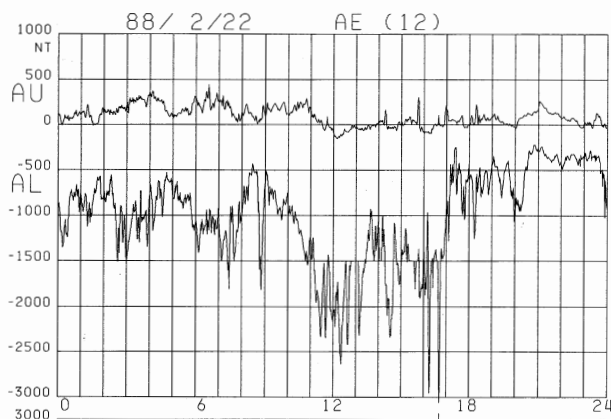
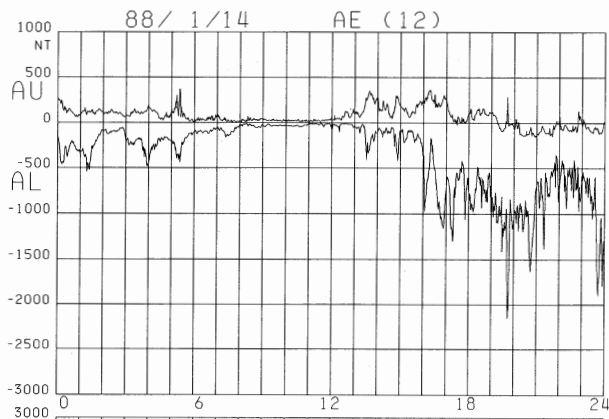
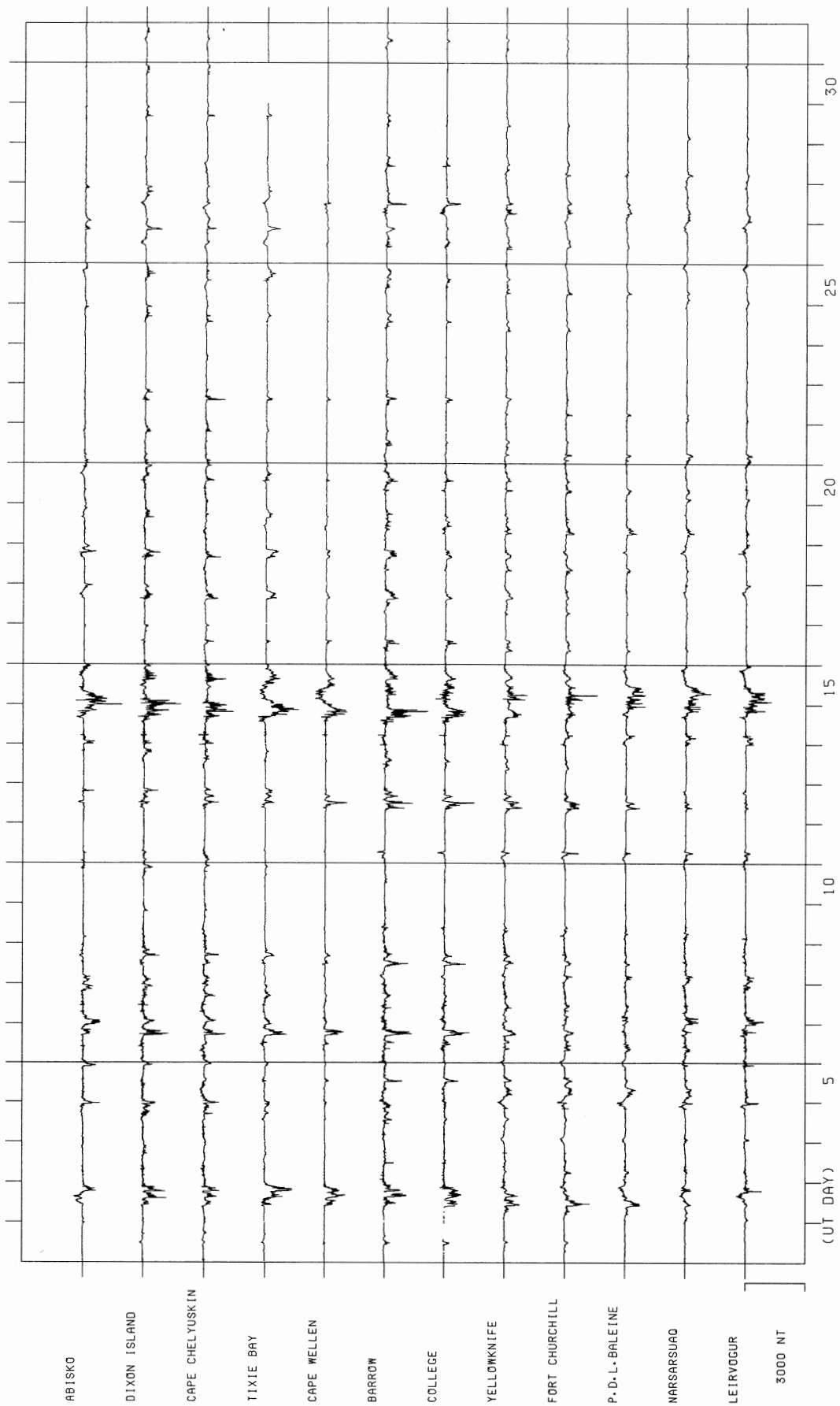
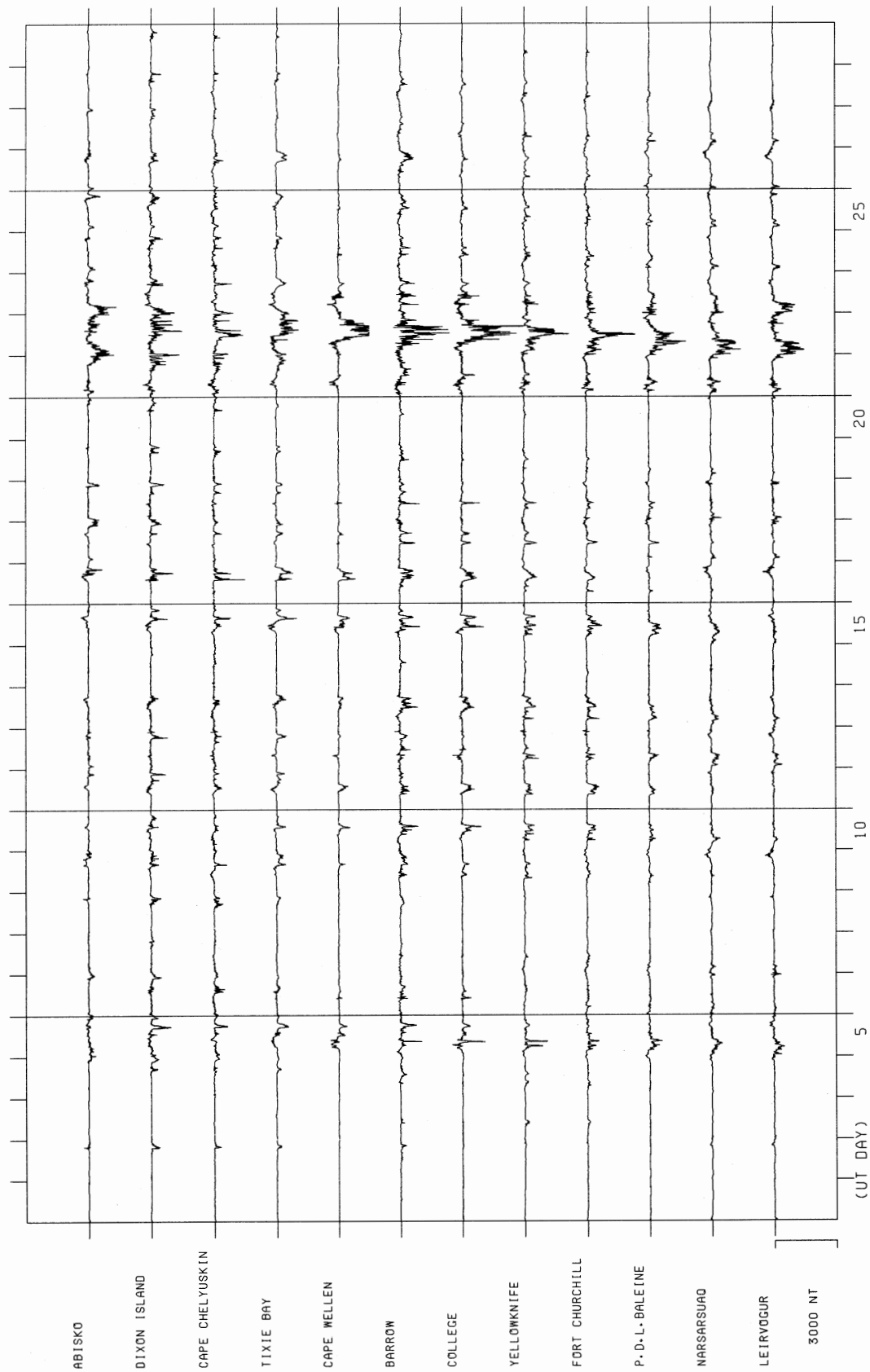


FIGURE 6

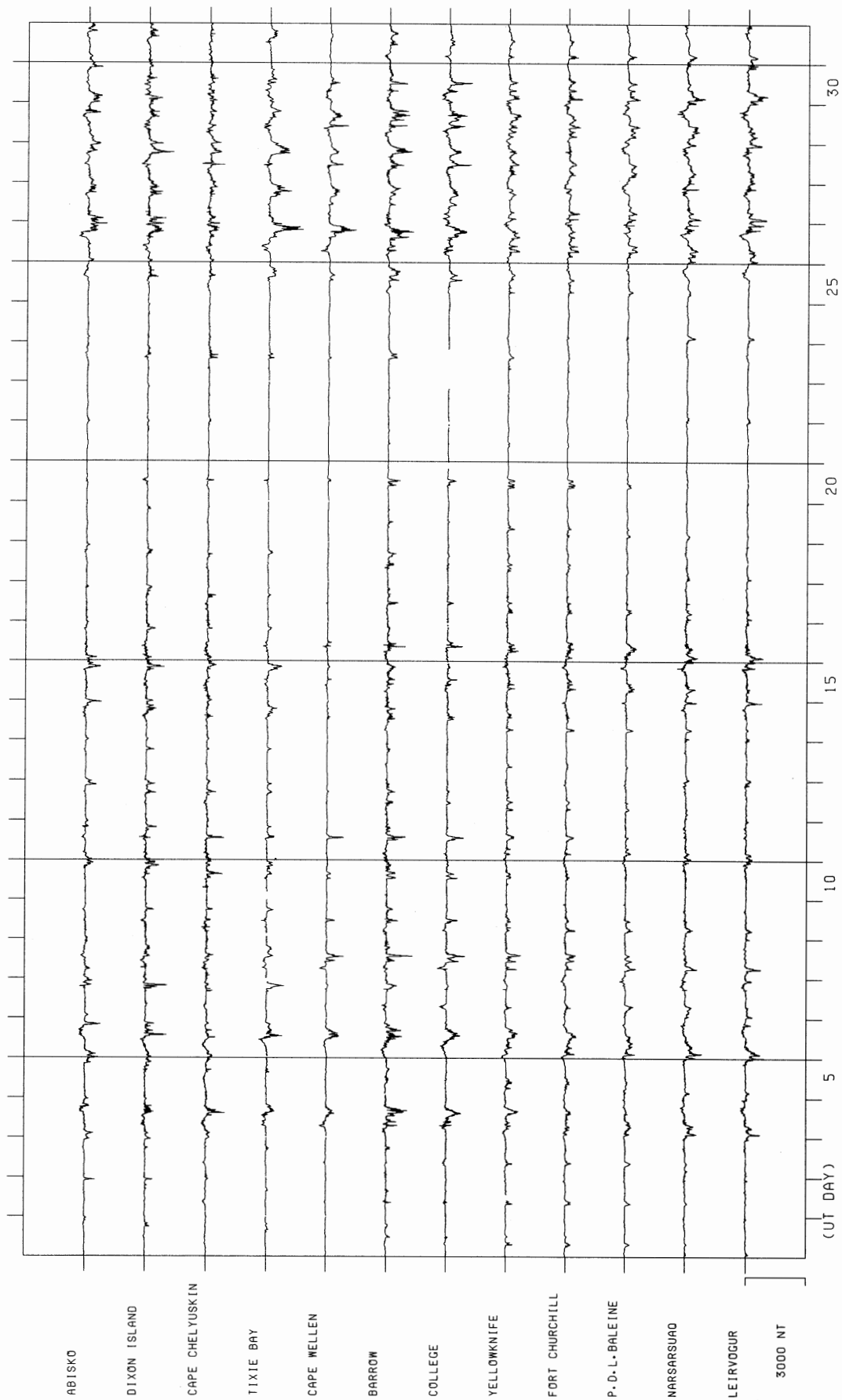
The H traces of magnetograms
from AE(12) stations
in each month
for January-June 1988.



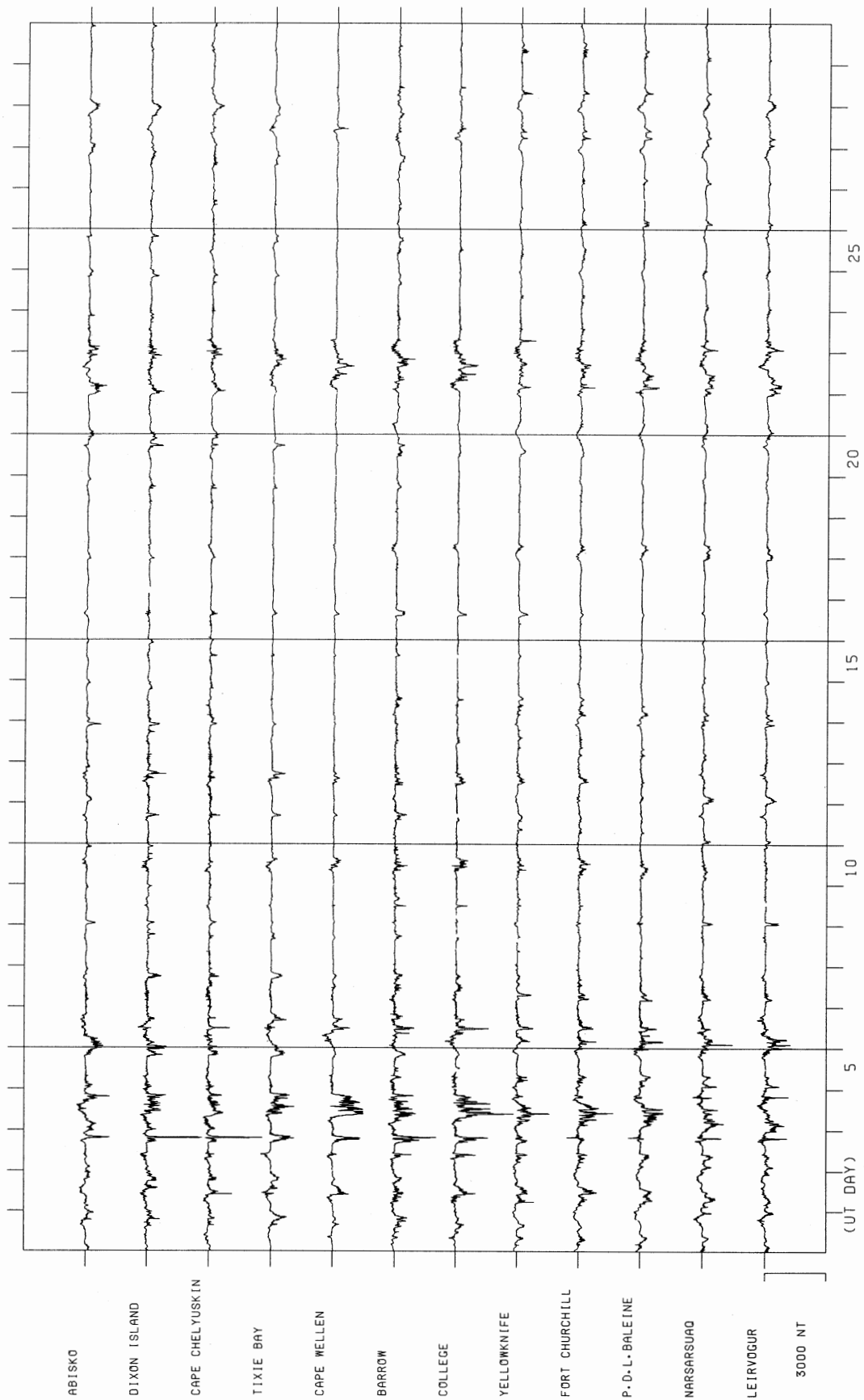
STACKED COMMON SCALE MAGNETOGRAMS FOR JANUARY 1988



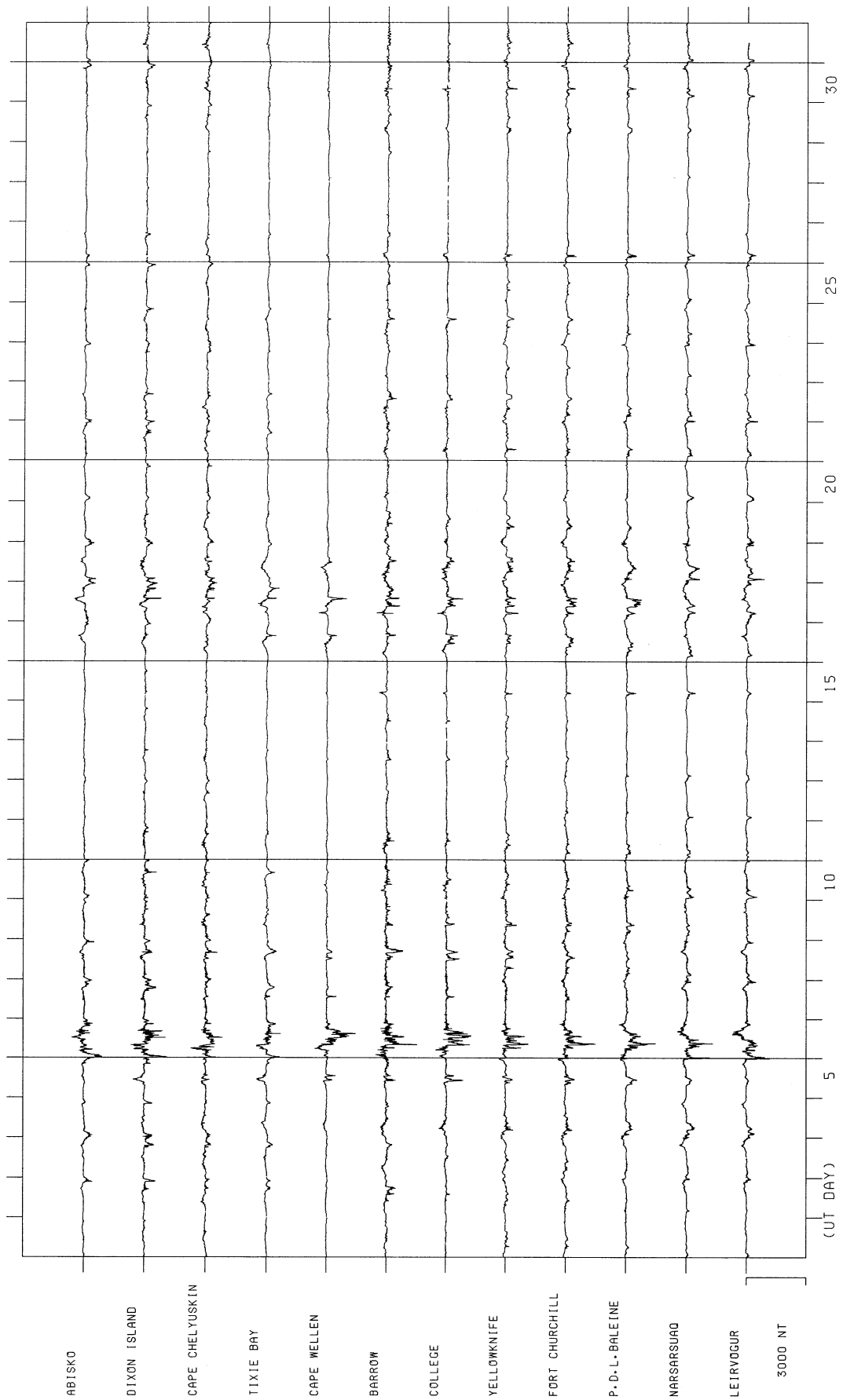
STACKED COMMON SCALE MAGNETOGRAMS FOR FEBRUARY 1988



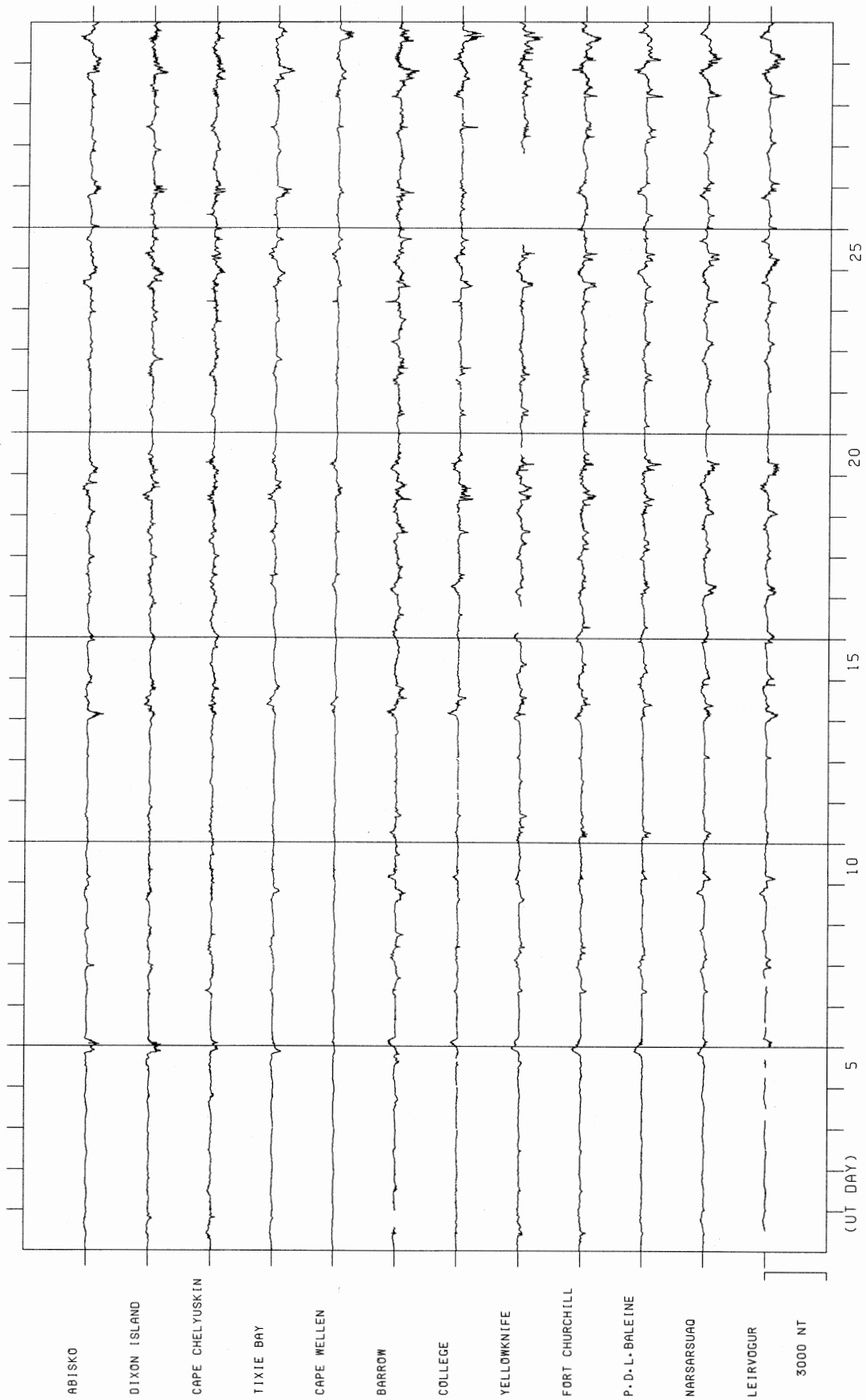
STACKED COMMON SCALE MAGNETOGRAMS FOR MARCH 1988



STACKED COMMON SCALE MAGNETOGRAMS FOR APRIL 1988



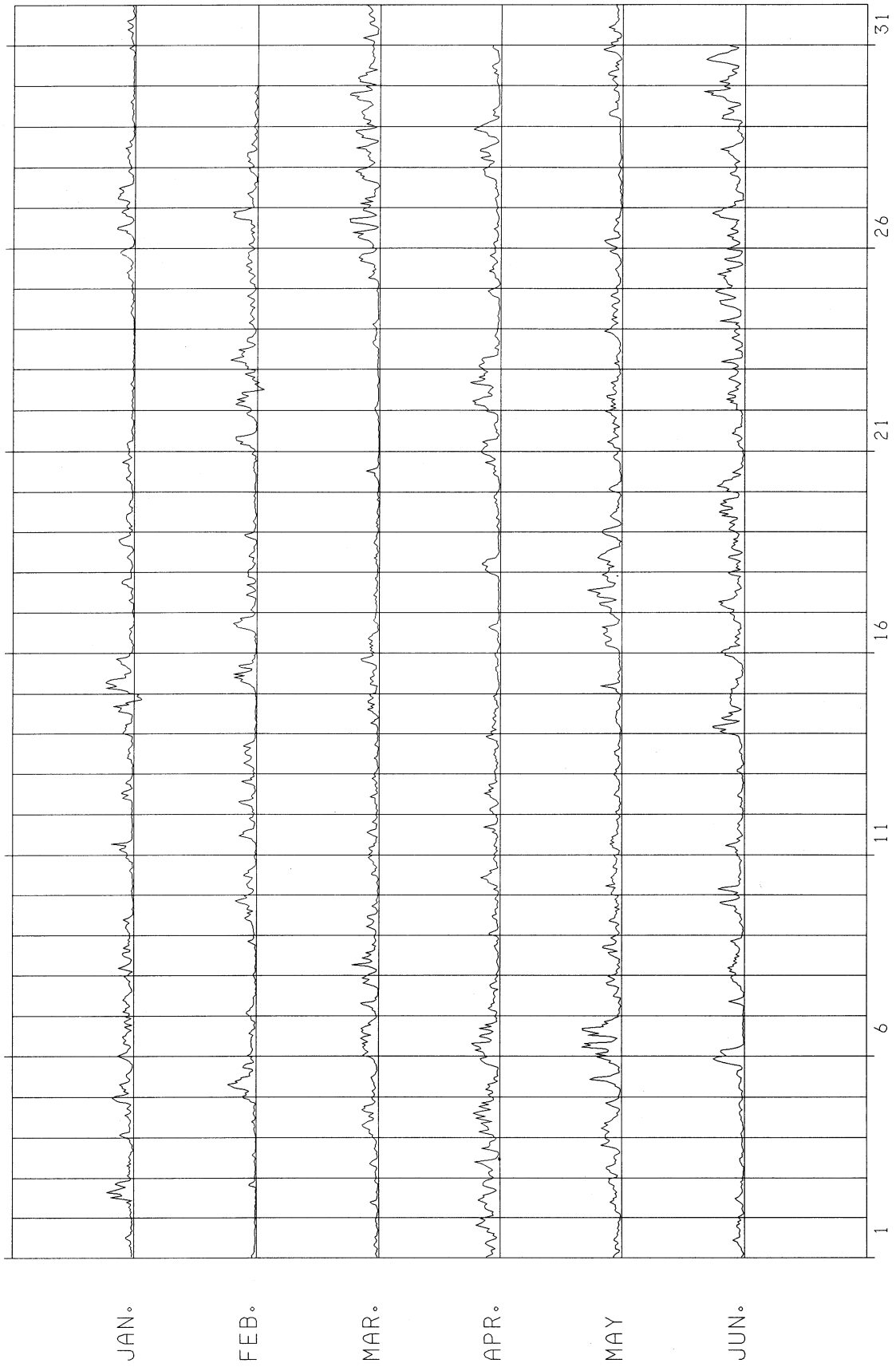
STACKED COMMON SCALE MAGNETOGRAMS FOR MAY 1988



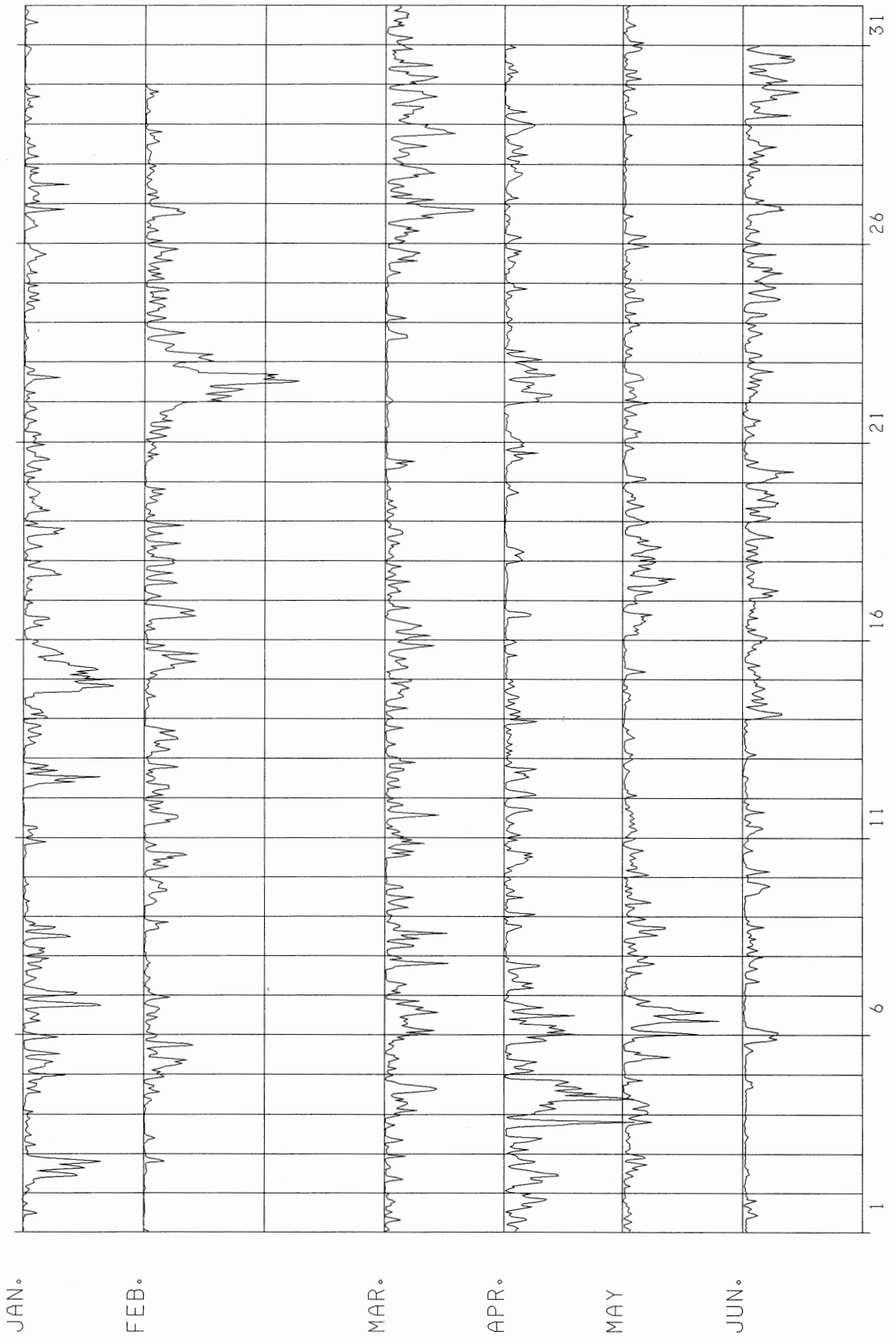
STACKED COMMON SCALE MAGNETOGRAMS FOR JUNE 1988

FIGURE 7

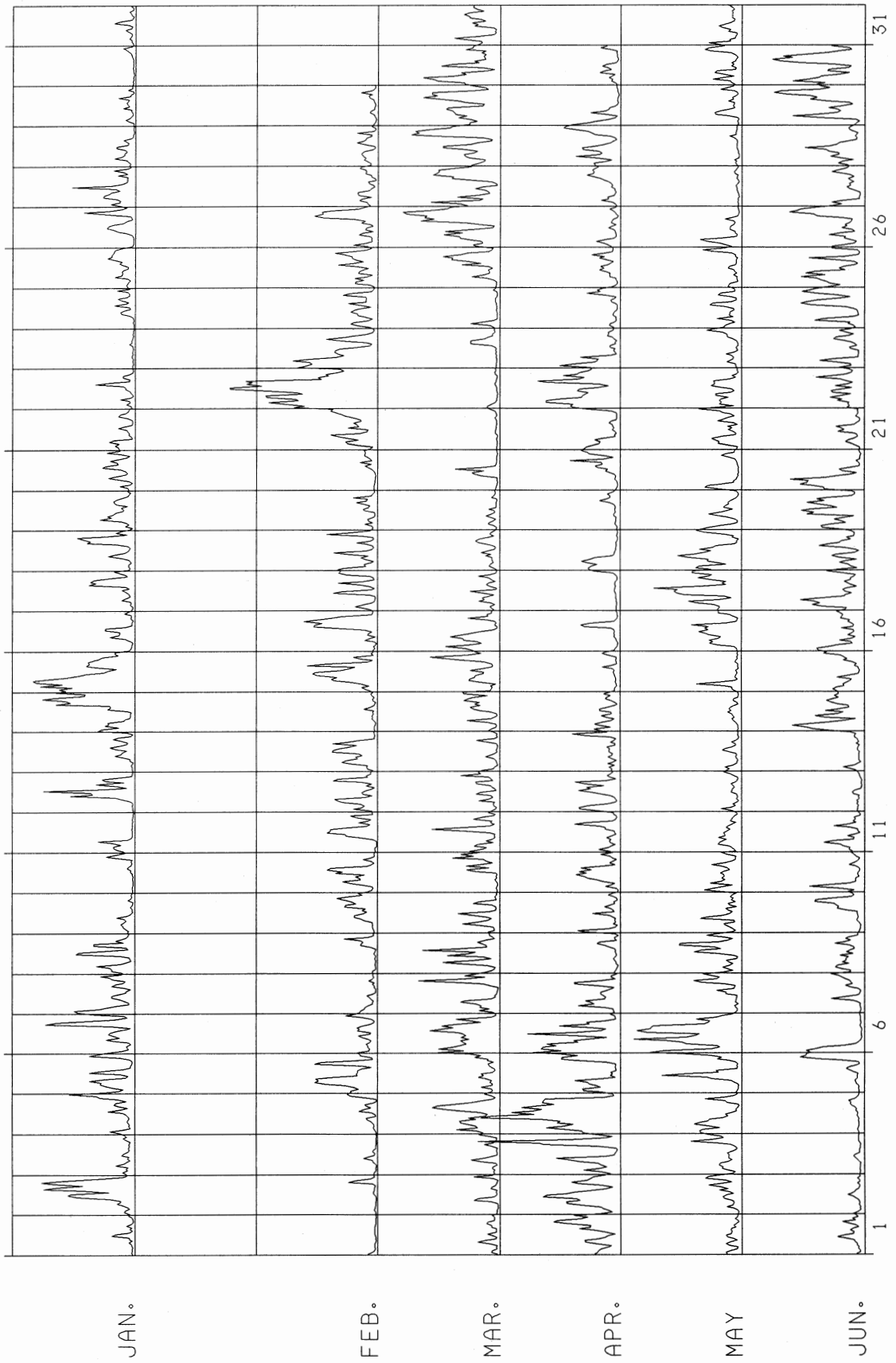
Plots of hourly values of each index
(AU, AL, AE and AO)
for January-June 1988.



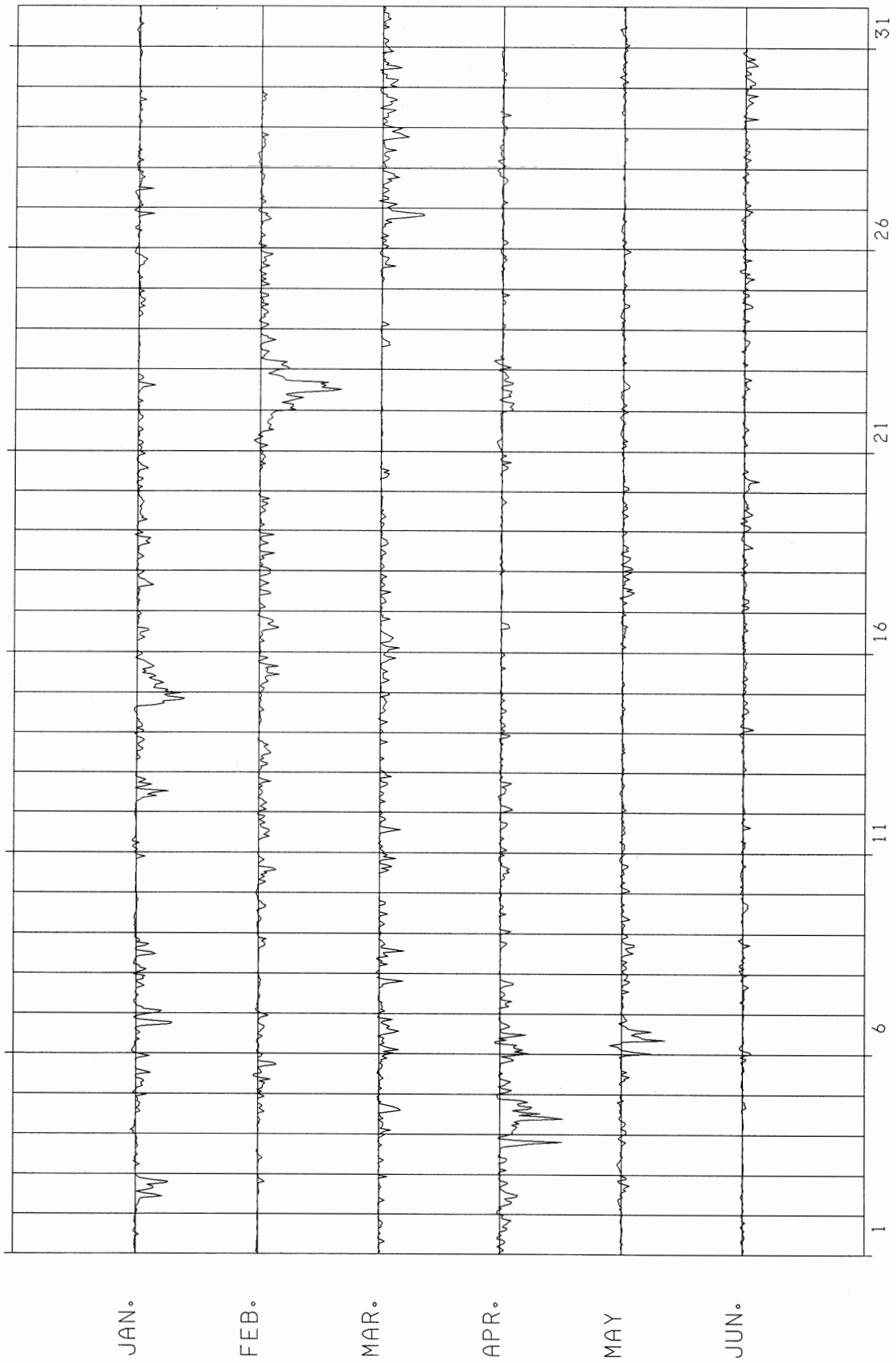
AU HOURLY VALUES FOR THE FIRST HALF OF 1988 (1500NT/DIV)



AL HOURLY VALUES FOR THE FIRST HALF OF 1988 (1500NT/DIV)



AE HOURLY VALUES FOR THE FIRST HALF OF 1988 (1500NT/DIV)

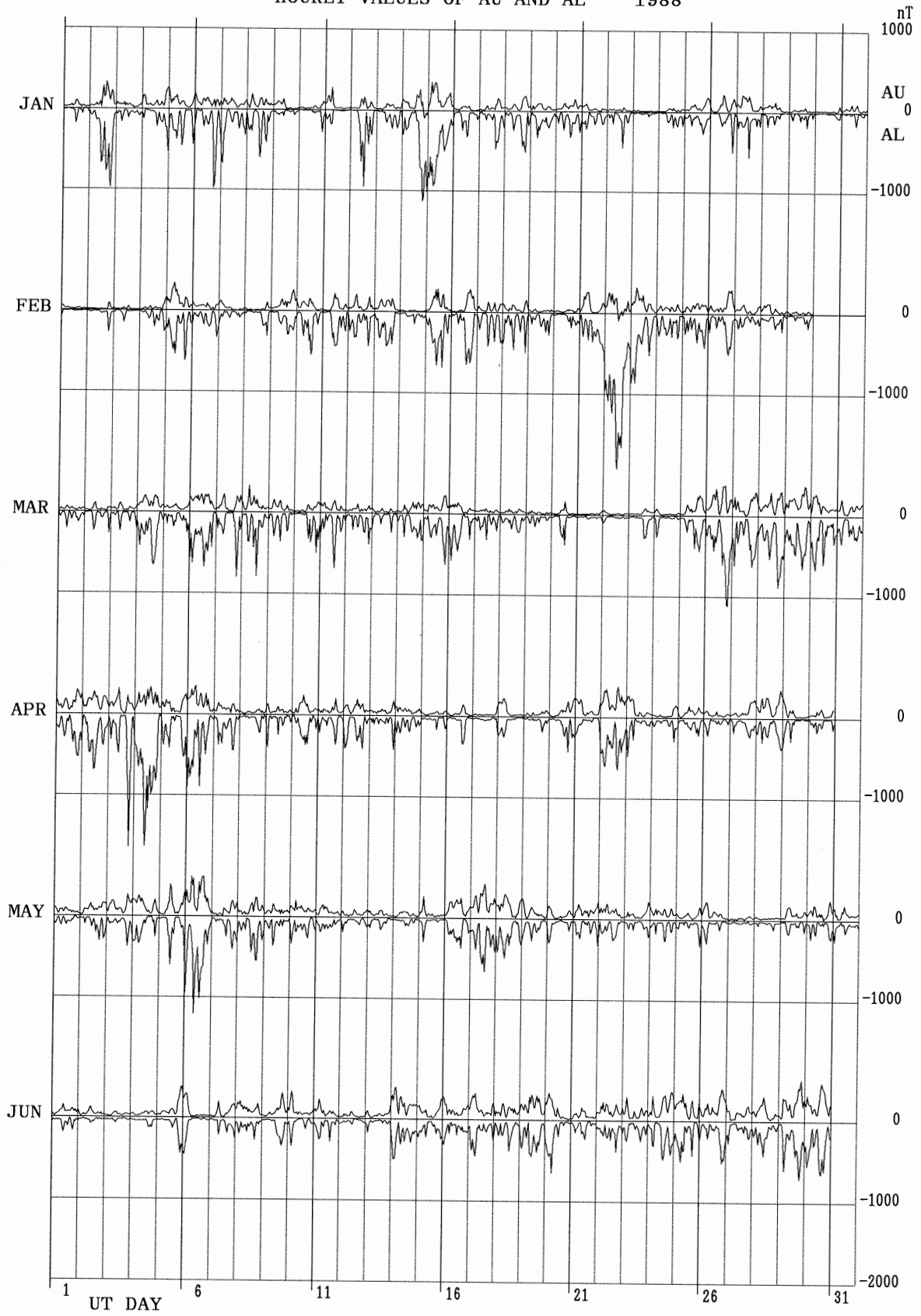


AO HOURLY VALUES FOR THE FIRST HALF OF 1988 (1500NT/DIV)

FIGURE 8

A summary plot of hourly values of
AU and AL indices
for January-June 1988.

HOURLY VALUES OF AU AND AL 1988



Publications by the World Data Center C2 for Geomagnetism.

1. Data Catalogue

	Published in
Data Catalogue of World Data Center C2 for Geomagnetism No.23	1993

2. Data Books

No. 1	Equivalent current systems of the daily geomagnetic variations in December 1964	1978
No. 2	Electric fields and neutral winds in the ionospheric dynamo region as deduced from the daily geomagnetic variations in December 1964	1979
No. 3	Auroral electrojet (AE) indices for January-June 1978	1981
No. 4	Auroral electrojet (AE) indices for July-December 1978	1981
No. 5	Auroral electrojet (AE) indices for January-June 1979	1982
No. 6	Auroral electrojet (AE) indices for July-December 1979	1982
No. 7	Auroral electrojet (AE) indices for January-June 1980	1983
No. 8	Auroral electrojet (AE) indices for July-December 1980	1983
No. 9	Auroral electrojet (AE) indices for January-June 1981	1984
No.10	Auroral electrojet (AE) indices for July-December 1981	1984
No.11	Auroral electrojet (AE) indices for January-June 1983	1985
No.12	Auroral electrojet (AE) indices for July-December 1982	1985
No.13	Auroral electrojet (AE) indices for July-December 1983	1986
No.14	Auroral electrojet (AE) indices for January-June 1982	1986
No.15	Auroral electrojet (AE) indices for January-June 1984	1987
No.16	Auroral electrojet (AE) indices for July-December 1984	1988
No.17	Auroral electrojet (AE) indices for July-December 1985	1989
No.18	Auroral electrojet (AE) indices for January-June 1985	1989
No.19	Auroral electrojet (AE) indices for January-June 1986	1990
No.20	Auroral electrojet (AE) indices for July-December 1986	1991
No.21	Auroral electrojet (AE) indices for January-June 1987	1992
No.22	Auroral electrojet (AE) indices for July-December 1987	1993
No.23	Auroral electrojet (AE) indices for July-December 1988	1994

3. Prompt Reports

Provisional Equatorial Dst Index (since Oct. 1985)	monthly
Provisional Auroral Electrojet Indices (AE11) for March 1989	1989
Provisional Geomagnetic Data Plots No1 (Jan-Dec 1989)	1990
Provisional Geomagnetic Data Plots No2 (Jan-Jun 1990)	1990
Provisional Geomagnetic Data Plots No3 (Jul-Dec 1990)	1991
Provisional Geomagnetic Data Plots No4 (Jan-Jun 1991)	1992
Provisional Geomagnetic Data Plots No5 (Jul-Dec 1991)	1992
Provisional Geomagnetic Data Plots No6 (Jan-Jun 1992)	1992
Provisional Geomagnetic Data Plots No7 (Jul-dec 1992)	1993
Provisional Geomagnetic Data Plots No8 (Jan-Jun 1993)	1993
Provisional Geomagnetic Data Plots No9 (Jul-dec 1993)	1994
Provisional Geomagnetic Data Plots No10 (Jan-Jun 1994)	1994

4. Other publications

Report of Aeromagnetic Survey in Japan	1966
Japanese WMS Magnetic Charts for 1965	1966
WMA Inventory; First Issue	1970
WMA Inventory; Second Issue	1971
Mid-Latitude Geomagnetic Indices ASY and SYM (provisional) No.1 1989 - 1990	1992
Mid-Latitude Geomagnetic Indices ASY and SYM (provisional) No.2 1991	1993
Mid-Latitude Geomagnetic Indices ASY and SYM (provisional) No.3 1992	1994
Mid-Latitude Geomagnetic Indices ASY and SYM (provisional) No.4 1993	1994

(WMA: World Magnetic Archives; WMS: World Magnetic Survey)

The publications above are available on request. Requests should be made by mail to:

WDC-C2 for Geomagnetism
Faculty of Science, Kyoto University
Kyoto 606-01, Japan

(The WDC-C2 for Geomagnetism is operated by the Data Analysis Center for Geomagnetism and Space Magnetism, Faculty of Science, Kyoto University, Kyoto 606-01, Japan.)

