TABLE OF CONTENTS

1. Introduction:

The documentation for this data set was originally on paper kept in NSSDC's Data Set Catalogs (DSCs). The offline tape datasets have now been migrated from the original magnetic tape to magnetic disk (starting in mid-2004). Accordingly, statements in the format descriptions that address such tape relevant factors as blocking and but density are no longer applicable. The paper documentation in the Data Set Catalogs have been scanned and made into digital images of the pages, the collected into a single PDF file for each Data Set Catalog.

The inventory information in these DSCs is current as of July 1, 2004. But this inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system, and the user should go to that interface (JIN) if further information existing in the DSCs is now not needed for locating data files, but we did not go to the trouble of removing that inventory information.

2. CHANGE LOG

Version	Date	Person	Page	Description of Change
01				

3. LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM:
[NOTE: ANY OF THE INFORMATION FIELDS MIGHT BE BLANK.]
[THE "MATERIALS FOR DISTRIBUTION" FIELD IS HERE CALLED JUST "MATERIALS"]

"Remarks" for spacecraft SCNAME1":
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A--remark--

"Materials" for spacecraft SCNAME1":
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A--mat--

"Remarks" for SCNAME1 experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A&ex=09--remark--

"Materials" for SCNAME experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102&ex=09--mat--

"Remarks" for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--remark--

"Materials" for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--mat--

"Remarks" for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa,gov/database/MasterCatalog?ds=SPHE-00677--remark--

"Materials" for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--mat--

"Remarks" for EXNAME1 data set DSNAME3:

"Materials" for EXNAME1 data set DSNAME3:

"Remarks" for SCNAME1 experiment EXNAME2:

"Materials" for SCNAME1 experiment EXNAME2:

"Remarks" for EXNAME2 data set DSNAME1:
"Materials" for EXNAME2 data set DSNAME1:

"Remarks" for EXNAME2 data set DSNAME2:
"Materials" for EXNAME2 data set DSNAME2:

DATA SET CATALOG #38

AE INDEX & 2.5 MIN. avgs.
or
AE INDEX, Hourly Avgs. & from alaska

CORR CRL 1 tape

GG-31C

2.5 MIN VALUES ON MAG TAPE

GG-31C

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 16 7-TRACK, 556 BPI AND 800 BPI TAPES WRITTEN IN BINARY AND BCD. THERE ARE TWO RESTORED TAPES. TWO OF THE ORIGINAL TAPES ARE MISSING, D014250 AND D014459. DR004316 TAPE IS WRITTEN IN BINARY AND DR004317 TAPE IS WRITTEN IN ASCII. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND THE RESTORED TAPES WERE CREATED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004316	DS004316	D001544	1	09/01/64 - 12/31/64
		D001545	2	01/01/65 - 12/31/65
		D001546	3	01/01/66 - 12/31/66
		D001547	4	01/01/67 - 12/31/67
		D004894	5	01/01/68 - 12/31/68
DR004317	DS004317	D013039	1	09/01/64 - 12/31/64
		D013040	2	01/01/65 - 12/31/65
		D013041	3	01/01/66 - 12/31/66
		D013042	4	01/01/67 - 12/31/67
		D023729	5	01/01/67 - 12/31/69
		D012598	6	01/01/68 - 12/31/68
		D012599	7	01/01/70 - 12/31/70
		D023728	8	01/01/66 - 12/31/71
		D023727	9	01/01/72 - 12/31/73

FORMAT OF 2.5 MINUTE TAPE RECORDS
FORTRAN COMPATIBLE RECORDS

Position		
1-3	Observatory mnemonic code	
4-5	Year; i.e., 64	GMT
6-7	Month; 01 to 12	GMT
9	Element; D, H, Z, X, or Y	
9-10	Day; 01 to 31	GMT
11-12	Hour; 00-23	GMT
13-16	Arbitrary	
17-20	Either zero, or the tabular base in degrees for D, in hundreds of gammas for the intensity elements	
21-116	Twenty-four values beginning at 2.5 minutes after the hour (in gammas for H, Z, X, Y; tenth-minutes for D)	
117-120	Hourly mean	

Each tape block consists of 20 records (2400 characters). A standard 3/4 inch inter-record gap appears between tape blocks. One or more tape-marks follows the last block of data on tape. When necessary, padded nines are used to complete the last block of data.

The records are sorted according to observatory mnemonic, year, month, day, element, hour. (The sequence of the elements is D, H, Z, X, Y).

The 26 values in the positions 17-120 will have the range -999 to 9998. The tabular base is adjusted to avoid a four-digit negative number in positions 21-116. A blank value is identified by a 9999.

A 9999 will appear in position 117-120 (hourly mean) if there are more than 20 blank values in position 21-116.

(CONT)

SAMPLE COMPUTATIONS SHOWING USE OF TABULAR BASES

	D	H	Z	X	Y
Tabular Base	-006	155	-.35	-025	090
2.5 minute value	-623	-032	-096	26	250
Total value	-7°02.3'	15468γ	-48596γ	-2474γ	9250γ

As shown above, the value of a magnetic element at any particular time is obtained by adding the signed tabular base to the signed value.

The customary geomagnetic convention is followed: all magnetic values are referred to the north-seeking end of the compass needle, with X regarded as positive when directed northward, Y as positive when directed eastward, Z as positive when directed downward, and D as positive when directed eastward.

Additional information pertaining to the data or format may be obtained by contacting:

Geomagnetism Division
Coast and Geodetic Survey - ESSA
Washington Science Center
Rockville, Maryland 20852

Phone: 301 49-68047

CABLE: ENSCI, Rockville, Maryland

8/27/73

FORMAT OF 2.5 MIN. AE INDEX TAPES IN BCD FORM

Each logical record is data for one hour.

POSITION	
1- 3	AE, AL, AO, or AU
4- 5	Year; i.e., 68
6- 7	Month; 01 to 12
8	* (arbitrary)
9- 10	Day; 01 to 31
11- 12	Hour; 00 to 23
13- 20	Blank
21-116	Twenty four 4 character values of AE, AL, AO or AU taken at 2.5 min. intervals
117-120	Hourly average

The tapes are written at 556 BPI, they are BCD, 7 track, even parity, contain 1 file of data, and are 7094 compatible. The data are blocked 20 logical records per physical record, and when there is not enough data to fill the last physical record on tape, the block is padded out to the normal size. An example is the 1967 tape. The last physical record of the tape contains only 12 logical records of data, and is therefore padded with eight final logical records. Each padded logical record begins with a series of twelve nines, followed by 108 zeros. Every logical record is 120 BCD characters, making the blocksize of a physical record 2400 characters. The tapes contain AE, AL, AO and AU data, in that order, and the data are time ordered within each type of index (i.e., AE data, time ordered, followed by AL data, time ordered, followed by AO data, time ordered, followed by AU data, time ordered). There is one tape per year of data.

August 31, 1973

To: Data Repository

From: ADP Services

Subject: Release of one AE index tape.

Please release DD12611. This tape contained AE data for more than one year. It was sorted by time and the data were extracted by year onto individual output tapes. These new output tapes were then placed in the NSSDC library as DD13039, DD13040, DD13041, and DD13042. Therefore, the original tape is of no further use.

July 16, 1973

To: Data Repository

From: ADP Services

Subject: Release of one AE index tape

Please release DD12247. This tape contained AE data for more than one year. It was sorted by time and the data were extracted by year onto individual output tapes. These new output tapes were then placed in the NSSDC tape library as DD12598, and DD12599. Therefore, the original tape is of no further use.

STATUS REPORT: AURORAL ELECTROJET (AE) INDICES FOR 1970

by J. H. Allen (303-447-6277)
Environmental Data Service, NOAA
Boulder, Colorado 80302 U.S.A.

This report presents the status of the derivation of Auroral Electrojet (AE) indices for 1970. It includes a brief survey of prior derivations of AE, a discussion of the definition of AE and its method of computation, tables of hourly average indices for January-March 1970, graphs of daily variations in AU, AL, AE, and AO for selected days, and some comments on possible ways of improving the systematic and timely derivation of this important geophysical index.

Introduction

The Auroral Electrojet Index, AE, is designed to provide a global, quantitative measure of auroral zone magnetic activity produced by enhanced ionospheric currents flowing along the margin of the auroral oval. It is the total range at an instant of time of the deviations from quiet day values of the horizontal magnetic field (H) around the auroral oval. Defined and developed by Davis and Sugiura (1966), AE has been shown to be especially useful to delineate the onset and progressive development of high latitude magnetic disturbances which are recognized as one aspect of polar and magnetospheric substorms (Akasofu, 1968). It has been shown to correlate strongly with the integrated southward component of the interplanetary magnetic field (Pudovkin, et al., 1970; Arnoldy, 1971) and to be intimately related to the growth of the geomagnetic ring current during magnetic storms (Davis and Parthasarathy, 1967). For these various roles AE possesses advantages over other geomagnetic indices, in particular:

(i) it can be derived on an instantaneous basis or from averages of variations computed over any selected interval;

(ii) it is a quantitative index which, in general, is directly related to the physical processes producing the observed magnetic variations;

(iii) its method of derivation is relatively simple, digital, and objective and is well suited to present computer processing techniques; and

(iv) it may be used to study either individual events or statistical aggregates.

Increasingly frequent reference to AE in journal articles concerned with solar-terrestrial interactions and magnetospheric physics as well as requests to World Data Centers for AE indices are indications of its utility. Also, IAGA Resolutions 2 and 15 (1969); the

Joint COSPAR-IUCSTP Second Report on IMS (p. 36, 1972); and several ad hoc conferences of users of geomagnetic data further document the need for systematic, timely derivation of AE indices. In order to satisfy this need of the scientific community, the Environmental Data Service of NOAA has undertaken to resume 2.5-min digitization of magnetograms and to perform the data processing necessary to derive AE.

Prior Derivations of AE

AE indices were calculated and published by the Geophysical Institute of the University of Alaska for the years 1957 through 1964 (Davis and Wong, 1967, 1968). These values were based upon the standard tabulations of hourly-average scalings of the horizontal magnetic field for selected auroral zone magnetic observatories. Later, AE indices were derived at the NASA Goddard Spaceflight Center under the direction of Dr. D. Fairfield. These were derived from 2.5-min digitizations of H from selected observatories and they covered the interval from September 1964 through June 1968.

The network of stations whose magnetograms were used to derive AE changed slightly from year to year. Originally, some high latitude, southern hemisphere stations were used to fill gaps in the longitudinal distribution of the available northern hemisphere auroral zone stations. Critically located new stations were incorporated from time to time and they significantly improved the station distribution and, thus, the approximation to the "true" AE. However, because of delay in availability of magnetograms from some stations, the AE indices for the years 1966 through 1968 were "preliminary" and were based on an inadequate distribution of stations. Arnoldy (1971) has pointed out the effect of the biased station distribution for the published 1967 AE indices.

Definition and Computation of AE

AE was originally derived by Davis and Sugiura (1966) from horizontal magnetic field (H) data from a group of seven auroral zone magnetic observatories. They derived a quiet time H level for each observatory and subtracted this value from observed instantaneous values of H. The result was a time series of deviations from the undisturbed field, $\pm \Delta H(t)$. Superposition of the seven time series produced a set of interwoven lines, bounded by an upper and lower envelope formed by the continuous set of extreme ΔH values. The upper and lower envelopes were designated AU and AL respectively. The range of the deviations at any instant, AU - AL, was defined as AE for that instant of time. In the absence of other sources of variations, AU is a direct function of the current flowing in the eastward auroral electrojet while AL is similarly related to the westward flowing current.

A second index derived from AU and AL was their mean, AO = (AU+AL)/2. AO is a measure of the presence or absence of symmetry in the variations of the oppositely directed electrojets and may illustrate the effect of the magnetospheric ring current as observed at the auroral zone. The units of AU, AL, AE, and AO are gammas.

The stations selected to contribute to AE were chosen to lie just in or below the auroral zone and to be as evenly distributed in longitude as was practical. Ideally, each station should lie just outside the instantaneous auroral oval around the time of local geomagnetic midnight. In practice, the network of stations used must be relatively uniform in longitudinal coverage and include a reasonable distribution of latitudes.

Station Selection

Conversations with Davis, Sugiura, Akasofu, and others led to the selection of the eleven stations listed in Table 1 for the determination of 1970 AE(11). The station positions are shown in Fig. 1 relative to the geographic and geomagnetic north poles. The station names are given along with their mnemonic abbreviation, geographic and geomagnetic coordinates to the nearest degree, and the universal time of local geomagnetic midnight. A subset of five "essential" stations which might be used to determine a "preliminary" set of AE is indicated by asterisks. We have chosen to indicate the number of stations contributing to a given determination by a parenthetical number following the letters AE.

This basic list of eleven stations may be supplemented with others in the future to improve the approximation of the "true" AE. For example, there are two large longitude gaps between Fort Churchill and College and between Uelen and Tiksi. Also, because the auroral oval varies in areal extent with the level of magnetic activity, we will attempt to supplement the basic network with meridional chains of stations along some magnetic meridians.

In addition to the geographic position of contributing stations, another factor in station selection is the promptness with which their records become available through the World Data Center system. This means not only the timely submission of microfilm or other copies of magnetograms but also the availability of calibration data such as scale values, base line values, and temperature correction factors. Also of great importance is the availability of auxiliary storm magnetograms and their calibration information. This is because during active periods the registration of normal magnetograms is often incomplete, necessarily resulting in missing data for these periods unless storm magnetograms are available. The effect of missing data at a critical station is illustrated in the graphs of AE discussed below.

TABLE 1

Observatories Used for the Derivation of 1970 AE(11)

Observatory	Mnemonic Abbreviation	Geographic Coord. N. Lat.°	Long.°	Geomagnetic Coord. N. Lat.°	E. Long.°	LGM** UT
1. Leirvogur	* LR	64	22W	70	71	2351
2. Narssarssuaq	NAS	61	45W	71	37	0209
3. Great Whale River	*GWR	55	78W	66	347	0526
4. Fort Churchill	FC	59	94W	69	322	0650
5. College	* CO	65	148W	65	256	1153
6. Barrow	BW	71	157W	68	241	1235
7. Uelen#	UE	66	170W	62	237	1250
8. Tiksi Bay#	TI	72	129E	60	191	1551
9. Cape Chelyuskin	* CC	78	104E	66	176	1650
10. Dickson Island#	DI	74	81E	63	162	1747
11. Abisko	* AI	68	19E	66	115	2053

* "Essential" stations for the derivation of AE(5)
** Local Geomagnetic Midnight (LGM) at equinox
Geomagnetic coordinates and time calculated for inclined dipole field
In data catalogs known as Cape Wellen, Tixie Bay and Dixon Island

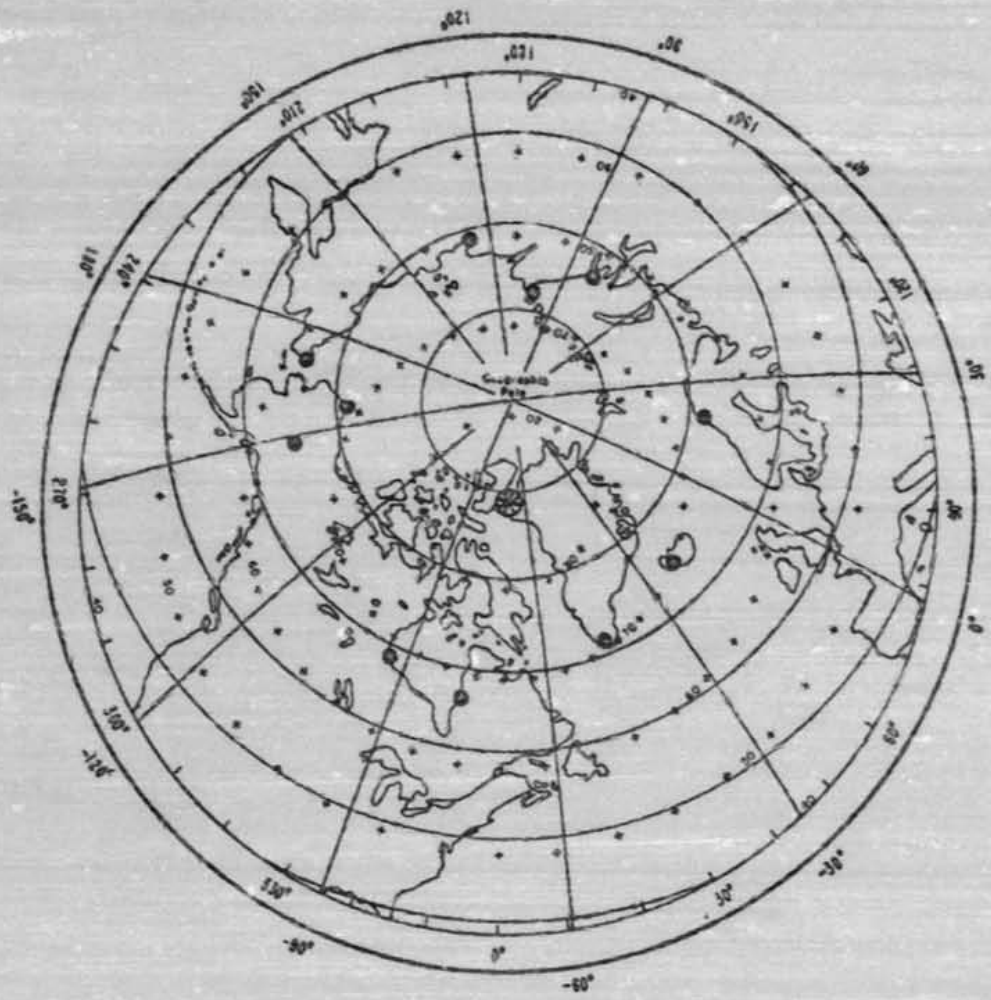


Fig. 1 - Stations contributing to 1970 AE(11) are shown by solid filled circles.
Polar equal-area projection centered on north geomagnetic pole ⊛ with geographic and geomagnetic coordinate grids.

Quiet Time Reference Levels

There are several techniques which could be used for deriving the quiet-time reference level of the horizontal field at each AE station. We have selected the following as being simple, essentially objective, and easily performed on the computer. It is also the technique used by Davis and Wong (1967, 1968) for hourly AE for 1957-1964. A monthly quiet time average value of H is computed for each station from all the 2.5-min values on the internationally adopted 5 quiet days of each month. This provides a set of twelve monthly reference values for each station for a year. The month-to-month change in reference level is typically in the range 3-10 gammas but can be as great as 30. These changes introduce similar small discontinuities at each month's end into AU and AL and, therefore, into AE. This technique also does not remove any local Sq variations. However, our computer program includes the option to derive monthly quiet-time means for each 2.5-min interval from the 5 Q-days or any other selection of days.

Computation of Indices

The monthly reference levels for each station were subtracted from the observed values of H giving ΔH deviations for each 2.5-min UT. In practice they were grouped in hourly blocks by month and with the stations ordered in geographic longitude. The ΔH values were then scanned by computer techniques and the extreme deviations identified for each 2.5-min UT. The values of these extremes became AU and AL for that time and the observatories which produced them were also recorded. AE and AO were computed from AU and AL and all indices were recorded on magnetic tape. At the same time, hourly averages of all indices were computed.

Graphs of all the 2.5-min indices were produced on the computer's cathode ray tube plotting unit and microfilmed. Tables of hourly average indices were printed in monthly blocks. For hours of high AE the complete set of station deviations for each 2.5-min interval was listed. Quality control programs were used to check each stage of the derivation and sample statistics were kept on the frequency of station selection for AU and AL.

Samples of Output

As of the end of June 1972, the first half year of AE(11) for 1970 has been completely processed. While some subtle errors may remain, we are not aware of any uncorrected errors in the archived data files. Tables 2 - 4 give the hourly average AE summary information for the months of January-March 1970. The hourly means are simply the average of the twenty-four 2.5-min AE values. During active times this mean may differ by as much as 100 gammas from the hourly AE value computed from hourly average H scalings. The tables also give the means of

hourly AE for each day, for all days by hour for the entire month, and for the 5 international quiet (Q) and disturbed (D) days by hour and for all hours. Tables 5 and 6 show the stations which were the major contributors to AU and AL, respectively, for each hour in January 1970.

Figures 2 - 4 are illustrative graphs of the time series AU, AL, AE, and AO for 18 selected days chosen from the first quarter of 1970, February 14 through March 3. These days encompass a wide range of activity levels from extremely quiet (February 23) to very disturbed (March 1). The succession of events pictured for February 24 illustrates the way in which AE can delineate polar substorms. Other features of these sample index graphs will be discussed in the section covering problems and limitations of AE.

Ultimate Data Formats

AE(11) data for 1970 will be available to users in several formats. It is planned to prepare a summary publication in the special data report series (UAG reports) of World Data Center A for Solar-Terrestrial Physics. This would include index graphs of AU, AL, AE, AO like Figs. 2 - 4 for every day of the year. It would also contain the hourly indices like Tables 2 - 4 for all months, and probably AU and AL station information like Tables 6 and 7. All these data would also be available on microfilm from WDC-A.

In addition, the 2.5-min values of all indices are on magnetic tape. They are available directly in 7 channel, 556 BPI, BCD format, IBM compatible, but conversions are possible. In principle, computer listings of all 2.5-min values can be provided. It is hoped, however, that for most purposes the index graphs will serve, and detailed listings will be requested for only short intervals of particular interest. In any case, WDC-A will attempt to package the data for 1970 in ways which meet user needs, and all suggestions will be considered.

Problems in Derivation of AE

Three categories of problems were encountered in our work of deriving AE:

(i) those inherent in the method of derivation of the index;

(ii) those arising from observatory procedures and the resulting magnetograms; and

(iii) those produced by the digitizing process.

Table 2 - Hourly mean AE Indices -- January 1970

JANUARY 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	33	27	34	38	77	136	86	77	57	33	28	50	174	205	210	120	407	486	150	58	49	67	102	177	120
D	2	124	110	175	366	592	400	302	485	625	437	310	495	643	559	431	613	312	391	260	673	382	225	384	397	403
	3	316	187	205	143	117	50	158	288	289	205	196	120	153	253	138	33	46	57	37	31	48	147	81	28	135
Q	4	30	30	25	32	35	35	62	36	58	91	123	79	51	48	114	151	147	62	40	32	64	133	98	28	67
	5	39	41	49	40	45	33	46	36	54	78	203	201	147	136	164	116	106	62	33	34	43	58	92	245	86
	6	168	45	24	26	62	37	28	28	54	47	49	113	212	225	98	36	33	61	205	118	98	45	30	27	76
	7	29	29	41	35	48	45	94	68	80	50	27	2[illegible]	93	53	48	79	217	394	517	373	196	114	49	66	109
	8	107	126	73	64	56	51	50	51	67	89	126	151	70	104	74	109	151	199	12	39	34	23	48	87	86
D	9	260	235	158	96	105	149	94	131	227	224	102	66	74	47	137	121	181	255	141	44	42	72	115	130	134
	10	159	75	190	64	43	30	26	22	39	36	31	136	78	124	71	26	40	65	83	35	2[illegible]	15	15	19	68
Q	11	34	52	71	63	37	45	59	39	30	35	34	55	101	181	173	34	30	25	48	58	52	52	134	170	64
	12	364	188	109	100	73	40	66	113	120	90	99	81	40	32	96	75	97	264	182	91	148	386	165	137	130
Q	13	60	55	25	24	46	54	41	29	32	31	42	39	38	77	301	308	234	66	31	27	33	39	57	44	72
	14	37	32	58	102	204	127	53	77	74	67	70	75	72	159	147	78	44	28	26	8	23	26	51	193	76
	15	168	135	106	85	150	97	42	41	45	25	26	34	29	27	28	38	52	145	78	4	29	42	91	127	73
D	16	129	194	310	199	160	241	280	321	467	429	721	645	570	539	645	584	803	777	148	3	595	503	458	516	467
D	17	566	538	462	366	523	377	266	126	152	145	132	73	94	47	47	95	131	90	76	118	93	53	43	39	194
	18	56	204	106	72	108	114	180	191	91	53	90	117	48	48	36	73	165	67	62	34	24	22	40	31	85
	19	37	36	32	30	22	22	20	28	43	57	97	72	48	48	132	298	91	60	99	79	113	264	317	155	91
	20	140	177	115	84	69	24	21	30	43	131	148	129	150	409	383	87	77	43	109	333	388	208	72	48	139
	21	54	39	38	69	86	96	128	51	75	154	169	89	67	349	239	41	33	30	55	152	82	152	76	73	100
	22	164	51	65	59	31	33	43	39	28	43	59	95	84	45	44	61	153	92	45	76	93	87	48	36	66
	23	33	47	180	170	121	98	104	129	103	53	46	75	86	79	58	42	33	46	43	43	67	52	160	122	82
	24	132	77	41	44	36	35	95	133	218	301	465	317	228	196	69	151	206	104	92	49	137	312	157	107	154
Q	25	39	36	44	41	74	80	42	33	33	26	30	31	27	34	57	27	28	73	48	26	83	45	23	24	40
Q	26	28	36	61	87	26	24	26	32	100	49	52	40	62	30	35	44	47	46	28	17	29	28	22	24	41
	27	21	26	65	33	33	43	20	44	156	146	79	93	126	116	203	123	212	230	150	184	233	163	73	107	112
	28	99	62	34	23	24	26	26	31	32	41	55	45	41	43	36	39	43	45	84	195	87	48	52	260	61
	29	146	71	51	53	69	92	218	231	219	89	25	27	33	40	37	31	30	31	33	24	27	23	25	84	71
D	30	200	58	24	49	128	223	424	160	102	63	191	106	111	85	53	151	327	99	129	280	117	256	86	156	158
	31	267	440	365	177	94	49	30	32	34	34	39	62	27	30	34	44	66	34	107	125	69	42	34	35	95
	MEAN	131	112	107	91	105	94	100	99	121	108	124	120	120	138	139	123	146	142	124	129	107	120	103	116	118*
SQ	MEAN	39	42	45	49	44	48	46	34	51	46	56	48	56	58	136	113	97	95	39	32	41	59	67	56	57
SD	MEAN	256	227	226	219	294	278	273	249	315	260	291	277	298	255	263	313	351	322	273	342	243	222	217	248	271

* THIS MEAN (118 GAMMAS) IS BASED ON 31 COMPLETE DAYS

Table 3 - Hourly mean AE Indices - February 1970

FEBRUARY 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	40	122	130	61	208	162	63	26	14	17	14	16	21	35	33	36	46	48	41	37	46	94	279	422	83
D	2	281	97	70	181	323	197	203	178	184	308	311	442	473	227	46	61	160	336	366	586	422	270	330	934	271
	3	251	244	101	78	117	91	28	41	35	45	127	138	197	67	32	57	26	24	26	22	14	25	27	22	75
D	4	22	41	30	33	27	30	76	92	207	376	156	201	315	474	350	188	369	597	370	195	169	232	131	133	232
	5	186	193	178	208	166	140	53	42	65	60	62	76	203	302	323	121	121	149	77	52	86	125	298	246	145
	6	121	68	90	94	76	63	32	125	99	88	30	22	22	20	23	24	26	47	79	54	34	20	14	16	52
Q	7	19	20	17	15	12	16	17	19	21	27	24	26	20	29	25	20	16	13	14	26	25	23	24	16	20
Q	8	21	19	19	21	18	21	21	24	24	27	25	19	27	49	74	186	125	131	71	101	73	53	32	24	47
	9	21	22	41	46	21	42	68	46	31	31	25	33	43	45	110	193	134	119	79	36	34	29	25	24	54
	10	24	21	19	24	46	33	72	54	40	21	18	16	24	49	188	417	491	476	394	58	63	47	52	43	109
Q	11	30	25	24	19	27	32	33	61	112	63	28	20	29	30	25	57	96	78	60	37	24	43	39	32	42
	12	26	31	22	19	19	14	16	17	18	24	23	22	23	36	31	40	43	41	42	29	26	30	31	29	27
	13	23	25	25	26	36	44	28	28	21	27	26	40	138	222	165	38	32	26	34	22	24	21	27	29	49
D	14	35	39	109	315	216	199	64	44	46	100	324	427	156	170	269	332	283	186	50	40	40	42	34	38	150
	15	38	47	123	114	153	230	253	217	142	126	346	163	38	47	69	155	96	177	258	216	63	38	47	48	133
	16	40	35	38	34	24	33	40	164	178	96	82	176	218	186	304	139	40	32	31	33	34	65	37	85	92
	17	32	25	33	32	27	24	15	18	23	48	201	172	79	40	37	74	252	506	491	555	375	324	286	156	159
	18	69	92	129	91	205	94	78	108	132	85	60	76	63	282	528	188	53	56	105	84	93	83	209	149	137
	19	94	117	35	22	20	28	27	52	37	27	36	134	165	61	63	66	61	39	27	35	34	41	35	49	54
	20	35	28	21	24	24	24	23	22	22	31	41	38	43	52	215	189	69	47	34	65	44	31	32	30	60
Q	21	28	22	34	30	17	29	28	41	58	42	29	31	36	35	29	27	26	32	20	22	51	34	28	39	32
Q	22	27	31	33	34	23	28	25	24	23	25	31	26	37	48	34	40	35	33	61	65	63	34	32	31	36
	23	26	24	22	21	16	16	23	22	20	23	26	30	36	31	29	32	29	36	27	22	32	31	28	26	26
D	24	21	22	32	131	31	20	32	159	148	34	150	99	38	40	62	211	632	714	316	63	84	79	37	37	141
	25	34	91	48	24	15	41	65	53	28	29	29	28	29	26	31	54	97	93	31	25	15	22	26	22	38
	26	33	103	162	125	136	183	254	373	331	349	511	536	664	674	525	323	77	109	44	25	20	37	29	34	235
	27	31	25	21	23	42	92	121	182	225	215	227	271	148	210	162	81	132	238	78	66	202	475	343	397	187
D	28	487	508	397	184	67	158	207	303	339	159	256	463	483	418	184	186	308	386	459	216	56	111	78	245	274
	MEAN	72	73	78	73	75	73	70	94	93	89	115	134	134	142	142	123	149	169	134	101	81	86	85	136	104*
SQ	MEAN	25	23	25	24	19	24	25	34	46	37	27	24	30	38	38	50	60	57	53	54	47	37	31	28	35
SD	MEAN	169	141	126	162	131	119	116	155	135	194	239	326	291	266	192	194	398	448	313	288	155	139	122	231	238

* THIS MEAN (104 GAMMAS) IS BASED ON 28 COMPLETE DAYS

Table 4 - Hourly mean AE Indices - March 1970

MARCH 1970	AE INDICES															VALUES ARE EXPRESSED IN GAMMAS								
UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	358	207	158	270	144	220	368	584	538	647	420	418	297	480	882	662	170	122	91	95	123	175	147	237	321
2	283	355	392	236	278	472	199	163	264	538	478	386	112	96	66	129	124	262	102	44	63	46	124	272	227
3	125	71	89	48	55	74	132	98	346	132	73	43	35	95	185	134	240	664	441	440	332	517	233	121	194
4	191	143	240	171	97	118	230	123	276	436	361	641	636	565	704	648	590	643	763	597	469	343	248	452	402
5	198	117	82	68	65	96	104	143	214	86	56	37	35	48	81	121	249	466	732	719	505	477	282	360	223
D 6	300	266	230	125	49	36	48	122	423	379	824	263	138	114	221	278	505	592	625	617	737	734	680	738	361
D 7	602	455	504	391	350	79	96	218	486	626	610	499	393	384	686	1105	586	788	981	694	265	161	251	535	490
D 8	469	429	557	1023	1189	1220	689	692	671	414	620	774	586	9092	394	1748	781	642	1158	789	609	674	372	330	822
D 9	257	253	611	803	315	189	177	186	200	209	399	440	563	608	463	678	926	684	230	199	145	233	317	416	396
10	277	88	118	37	30	30	91	104	222	131	145	142	59	31	34	40	124	158	295	287	329	100	42	42	121
11	40	39	37	39	47	46	41	47	47	43	39	41	43	43	99	48	50	49	49	79	191	198	181	111	69
12	51	71	115	219	142	112	175	259	239	295	475	363	198	72	45	37	49	45	40	36	31	33	44	40	133
13	41	37	40	39	46	39	119	272	181	122	417	176	102	272	391	254	108	63	62	216	329	81	38	42	145
14	52	68	130	51	49	43	33	35	65	48	42	40	36	33	24	26	38	31	25	27	31	34	39	50	44
15	56	150	160	160	246	384	207	186	75	72	170	98	56	30	167	296	132	56	95	165	196	46	31	34	124
Q 16	32	37	41	41	42	39	41	44	54	79	142	56	73	96	142	56	39	36	41	35	29	51	47	44	56
17	45	42	41	50	43	38	69	54	51	58	59	49	54	126	192	93	116	163	314	164	54	57	132	107	69
18	171	93	44	57	41	36	40	40	48	61	145	324	328	131	48	136	247	89	123	109	129	251	330	151	132
19	86	58	62	49	37	35	49	140	119	70	54	53	107	147	57	42	54	61	96	59	114	117	153	91	88
20	85	46	41	42	40	33	37	41	43	50	57	136	171	107	69	78	64	61	102	309	94	71	138	120	89
Q 21	139	165	175	183	76	49	54	44	46	57	53	59	98	55	73	206	203	153	77	54	55	29	33	38	89
Q 22	46	48	49	46	40	35	33	77	65	61	91	186	114	75	62	40	41	29	24	43	34	24	47	54	67
23	56	68	57	49	45	45	46	62	176	240	93	59	43	54	81	68	91	72	102	111	93	46	94	60	76
Q 24	56	51	46	39	44	47	47	48	51	59	57	58	50	48	46	43	46	40	24	22	33	40	50	55	46
Q 25	60	60	57	64	45	34	59	139	78	51	46	46	58	57	43	48	44	44	46	41	35	37	41	51	53
26	90	51	106	119	164	142	98	71	89	54	55	79	60	48	59	125	123	103	91	93	96	62	53	50	83
27	47	47	47	50	42	44	54	56	88	142	204	305	134	120	82	70	77	148	334	352	221	363	705	453	177
28	229	177	177	483	386	466	469	281	276	554	847	782	413	336	513	544	502	232	178	423	327	345	429	560	413
29	393	237	362	436	389	215	213	274	208	141	173	218	546	348	386	548	437	469	469	424	321	212	214	396	334
30	532	96	91	37	44	224	295	272	326	249	419	623	953	353	122	188	589	189	141	114	279	321	132	55	254
D 31	49	99	135	256	261	235	364	671	666	931	716	747	342	321	981	829	444	264	168	175	235	149	349	456	346
MEAN	172	137	159	193	156	193	148	175	211	211	269	262	204	199	303	300	248	239	260	243	206	198	159	239	210*
SQ MEAN	67	72	74	75	49	41	47	70	59	61	78	79	71	66	73	79	75	60	42	39	37	38	44	48	63
SD MEAN	335	302	407	520	433	352	226	376	469	432	634	545	406	467	990	928	644	594	636	475	398	376	490	498	485

* THIS MEAN (210 GAMMAS) IS BASED ON 31 COMPLETE DAYS

Table 5 - Station which is major contri[illegible]or to AU for each hour -- January 1970

JANUARY 1970 AU = MAXIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	DI	DI	DI	AI	AI	AI	BW	BW	NAS	LR	FC
2	NAS	GWR	BW	BW	BW	BW	CC	CC	DI	CC	CC	DI	AI	AI	AI	AI	AI	NAS	NAS	NAS	FC	LR	FC	BW
3	GWR	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	CC	DI	DI	DI	DI	DI	CO	CO	BW	NAS	NAS	BW	BW
4	DI	CC	CC	BW	BW	BW	BW	BW	BW	CC	BW	CC	CC	CC	DI	LR	CO	BW	BW	BW	BW	NAS	NAS	FC
5	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	DI	BW	BW	BW	BW	LR	LR	FC
6	NAS	NAS	CC	BW	BW	BW	BW	BW	BW	BW	CC	DI	DI	DI	DI	BW	BW	LR	AI	NAS	BW	BW	BW	BW
7	BW	BW	BW	FC	FC	FC	BW	BW	BW	BW	BW	BW	CC	CC	DI	DI	LR	AI	AI	LR	LR	NAS	NAS	BW
8	BW	BW	BW	BW	GWR	FC	FC	BW	BW	BW	BW	BW	CC	CC	DI	DI	DI	AI	LR	BW	BW	BW	FC	FC
9	GWR	GWR	FC	GWR	BW	BW	FC	CC	CC	BW	BW	BW	CC	DI	DI	DI	AI	AI	NAS	NAS	GWR	NAS	FC	FC
10	FC	NAS	FC	BW	BW	CC	CC	CC	BW	BW	CC	CC	CC	DI	CC	DI	DI	AI	AI	LR	FC	FC	BW	FC
11	BW	NAS	FC	FC	FC	GWR	FC	FC	CC	CC	BW	CC	CC	DI	DI	CO	CO	CO	NAS	NAS	LR	LR	LR	FC
12	BW	BW	FC	GWR	GWR	CC	CC	CC	CC	CO	CC	CC	CC	DI	DI	DI	DI	AI	AI	NAS	NAS	NAS	NAS	NAS
13	LR	NAS	BW	CC	BW	BW	CC	BW	CC	CC	CC	CC	CC	DI	DI	DI	DI	DI	GWR	GWR	FC	FC	NAS	NAS
14	NAS	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	DI	DI	DI	BW	BW	BW	AI	CC	FC	NAS	FC
15	FC	FC	FC	GWR	GWR	FC	CC	CC	CC	CC	CC	BW	CC	CC	CC	CC	LR	AI	DI	DI	NAS	LR	NAS	NAS
16	GWR	BW	FC	FC	BW	BW	BW	CC	CO	DI	TI	DI	TI	AI	AI	AI	LR	LR	LR	LR	GWR	GWR	GWR	GWR
17	BW	BW	CO	CO	CO	CO	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	DI	NAS	NAS	NAS	LR	DI	DI	NAS
18	BW	FC	BW	BW	FC	BW	BW	BW	BW	CC	CC	BW	BW	BW	CC	DI	DI	DI	DI	BW	BW	LR	NAS	DI
19	DI	DI	DI	BW	BW	BW	BW	BW	BW	CC	BW	BW	CC	CC	DI	DI	DI	BW	NAS	NAS	NAS	FC	NAS	NAS
20	FC	GWR	FC	DI	CC	NAS	BW	BW	CC	CC	BW	CC	TI	DI	DI	DI	DI	CC	CO	LR	NAS	NAS	NAS	DI
21	CC	CC	CC	BW	BW	BW	BW	BW	CC	CC	CC	CC	TI	DI	DI	CC	CC	CC	GWR	GWR	LR	NAS	NAS	FC
22	FC	BW	DI	FC	CC	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	LR	NAS	NAS	BW	BW	NAS	DI	DI
23	CC	FC	FC	GWR	BW	BW	CC	BW	BW	BW	CC	CC	CC	TI	DI	CC	BW	BW	BW	NAS	BW	NAS	NAS	FC
24	FC	FC	FC	CC	NAS	CC	CC	CC	CC	CC	DI	CC	CC	CC	CC	DI	DI	NAS	NAS	NAS	NAS	NAS	NAS	NAS
25	NAS	BW	BW	BW	BW	BW	FC	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	TI	BW	BW	GWR	GWR	TI	TI
26	FC	FC	BW	FC	CC	CC	CC	BW	BW	BW	BW	CC	CC	CC	BW	BW	BW	UE	BW	BW	BW	BW	BW	CC
27	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	AI	NAS	NAS	NAS	NAS	NAS	FC
28	GWR	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	BW	BW	CC	CC	AI	AI	AI	BW	BW	FC
29	GWR	TI	BW	BW	BW	BW	BW	CC	CC	BW	NAS	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	FC
30	FC	FC	TI	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	TI	DI	DI	AI	LR	LR	AI	AI	LR	NAS	GWR
31	FC	GWR	BW	BW	BW	BW	CC	CC	BW	BW	CC	CC	CC	CC	BW	BW	CC	CC	AI	FC	FC	FC	FC	FC

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
AI = ABISKO	68 21.5	18 49.4	66.8	114.9
BW = BARROW	71 18.2	-156 44.9	68.9	241.1
CC = C CHELYUSKIN	77 43.0	104 17.0	66.2	176.4
CO = COLLEGE	64 51.6	-147 50.2	64.6	256.5
GWR= GREAT WHALE R	55 16.0	-77 47.0	66.5	347.4
DI = DIKSON	73 32.6	80 33.7	63.0	161.5

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
FC = FT CHURCHILL	58 48.0	-94 06.0	68.7	322.8
LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.8
NAS= NARSSARSSUAQ	61 06.0	-45 12.0	71.6	37.0
TI = TIKSI	71 35.0	129 00.0	66.4	191.4
UE = CAPE UELEN	66 09.8	-169 58.1	66.6	73.4

Table 6 - Station which is major contributor to AL in each hour -- January 1970

JANUARY 1970 AL = MINIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	UE	UE	NAS	LR	NAS	NAS	NAS	FC	FC	FC	LR	FC	BW	FC	BW	BW	BW	BW	BW	FC	FC	DI	AI	AI
2	AI	NAS	LR	LR	GWR	NAS	NAS	NAS	GWR	BW	BW	CO	CC	BW	BW	BW	DI	DI	DI	DI	CC	CC	DI	AI
3	AI	NAS	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	BW	BW	BW	BW	GWR	CC	CC	GWR	GWR	DI	DI	AI	AI
4	UE	UE	GWR	GWR	LR	LR	GWR	NAS	GWR	FC	FC	FC	BW	BW	BW	CC	CC	CC	GWR	GWR	DI	DI	CC	UE
5	UE	GWR	LR	LR	NAS	NAS	GWR	FC	FC	FC	FC	FC	FC	CO	BW	BW	GWR	NAS	NAS	NAS	CC	DI	AI	AI
6	CC	UE	UE	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	CO	BW	BW	BW	FC	GWR	DI	CC	CC	CC	NAS	NAS	UE
7	UE	LR	LR	NAS	LR	NAS	NAS	NAS	FC	FC	NAS	NAS	BW	BW	BW	BW	BW	BW	BW	DI	CC	DI	CC	AI
8	NAS	NAS	LR	LR	LR	LR	LR	LR	LR	NAS	FC	FC	FC	FC	BW	BW	CC	BW	UE	UE	LR	CC	CC	
9	CC	LR	LR	LR	NAS	FC	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	BW	BW	CC	BW	BW	BW	DI	DI	DI	CC
10	CC	UE	LR	AI	LR	LR	LR	NAS	GWR	FC	LR	BW	BW	BW	NAS	NAS	BW	DI	CC	BW	CC	UE	NAS	AI
11	AI	LR	AI	TI	TI	LR	LR	LR	TI	NAS	NAS	BW	BW	BW	BW	GWR	GWR	TI	BW	BW	CC	CC	CC	CC
12	LR	LR	LR	NAS	NAS	TI	NAS	FC	GWR	FC	FC	FC	FC	FC	BW	BW	BW	DI	BW	BW	DI	DI	CC	TI
13	CC	LR	TI	TI	NAS	NAS	NAS	NAS	NAS	LR	FC	FC	BW	BW	BW	BW	BW	BW	TI	TI	TI	TI	CC	BW
14	UE	LR	LR	NAS	NAS	GWR	NAS	NAS	NAS	NAS	NAS	FC	FC	BW	BW	BW	FC	GWR	FC	TI	TI	TI	CC	AI
15	CC	CC	TI	CC	LR	LR	LR	LR	NAS	NAS	BW	NAS	NAS	BW	GWR	BW	BW	BW	BW	BW	TI	CC	CC	CC
16	AI	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	BW	CO	CO	CO	CO	BW	TI	BW	TI	TI	TI	TI	AI	AI
17	AI	AI	AI	LR	LR	NAS	NAS	NAS	GWR	FC	FC	FC	FC	BW	LR	BW	BW	BW	CC	BW	CC	CC	CO	UE
18	LR	LR	NAS	NAS	AI	NAS	GWR	FC	FC	FC	BW	FC	NAS	NAS	NAS	BW	BW	GWR	GWR	GWR	DI	FC	DI	CO
19	UE	UE	UE	LR	LR	NAS	NAS	NAS	FC	FC	FC	FC	LR	BW	BW	BW	BW	DI	CC	CC	DI	DI	DI	CC
20	CC	LR	LR	NAS	GWR	GWR	FC	FC	GWR	FC	FC	FC	BW	BW	BW	FC	BW	GWR	TI	DI	DI	DI	AI	LR
21	NAS	UE	NAS	NAS	NAS	GWR	GWR	FC	GWR	FC	FC	FC	FC	CO	BW	NAS	FC	FC	DI	DI	DI	DI	CC	CC
22	LR	LR	NAS	NAS	NAS	GWR	FC	FC	AI	LR	FC	FC	BW	FC	BW	BW	CC	CC	BW	DI	DI	CC	CC	CO
23	LR	NAS	LR	LR	NAS	NAS	GWR	GWR	GWR	AI	AI	BW	BW	BW	BW	NAS	GWR	GWR	GWR	GWR	GWR	GWR	DI	LR
24	LR	LR	GWR	GWR	GWR	GWR	GWR	GWR	GWR	FC	BW	FC	FC	FC	BW	BW	BW	BW	CC	DI	DI	DI	CC	CC
25	UE	UE	NAS	NAS	NAS	NAS	AI	NAS	LR	AI	AI	LR	NAS	NAS	BW	GWR	GWR	CC	CC	DI	DI	DI	CO	CO
26	CO	NAS	NAS	NAS	LR	LR	FC	FC	FC	FC	FC	FC	LR	NAS	CC	CC	CC	CC	FC	GWR	CC	CO	CO	CO
27	CO	UE	NAS	LR	LR	LR	DI	FC	FC	FC	FC	FC	BW	BW	BW	BW	BW	BW	BW	DI	DI	CC	CC	CC
28	CC	UE	UE	LR	LR	LR	AI	AI	LR	LR	LR	AI	FC	LR	LR	GWR	GWR	FC	BW	CC	TI	CC	CC	LR
29	AI	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	UE	LR	LR	LR	NAS	NAS	FC	FC	FC	CO	CO	CO	CO	LR
30	CC	CC	NAS	NAS	NAS	NAS	NAS	GWR	NAS	GWR	FC	BW	FC	FC	BW	FC	BW	BW	BW	CC	BW	TI	DI	CO	AI
31	LR	LR	LR	NAS	NAS	NAS	AI	AI	NAS	NAS	NAS	BW	AI	GWR	DI	TI	TI	GWR	DI	DI	DI	CO	CO	CO

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
AI = ABISKO	68 21.5	18 49.4	66.0	114.9
BW = BARROW	71 18.2	-156 44.9	68.5	241.1
CC = C CHELYUSKIN	77 43.0	104 17.0	66.2	176.4
CO = COLLEGE	64 51.6	-147 50.2	64.6	256.5
GWR= GREAT WHALE R	55 16.0	-77 47.0	66.5	347.4
DI = DIKSON	73 32.6	80 33.7	63.0	161.5

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
FC = FT CHURCHILL	58 48.0	-94 86.0	68.7	322.8
LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.0
NAS= NARSSARSSUAQ	61 06.0	-45 12.0	71.0	37.0
TI = TIKSI	71 35.0	129 00.0	60.4	191.4
UE = CAPE UELEN	66 09.8	-169 58.1	56.6	73.4

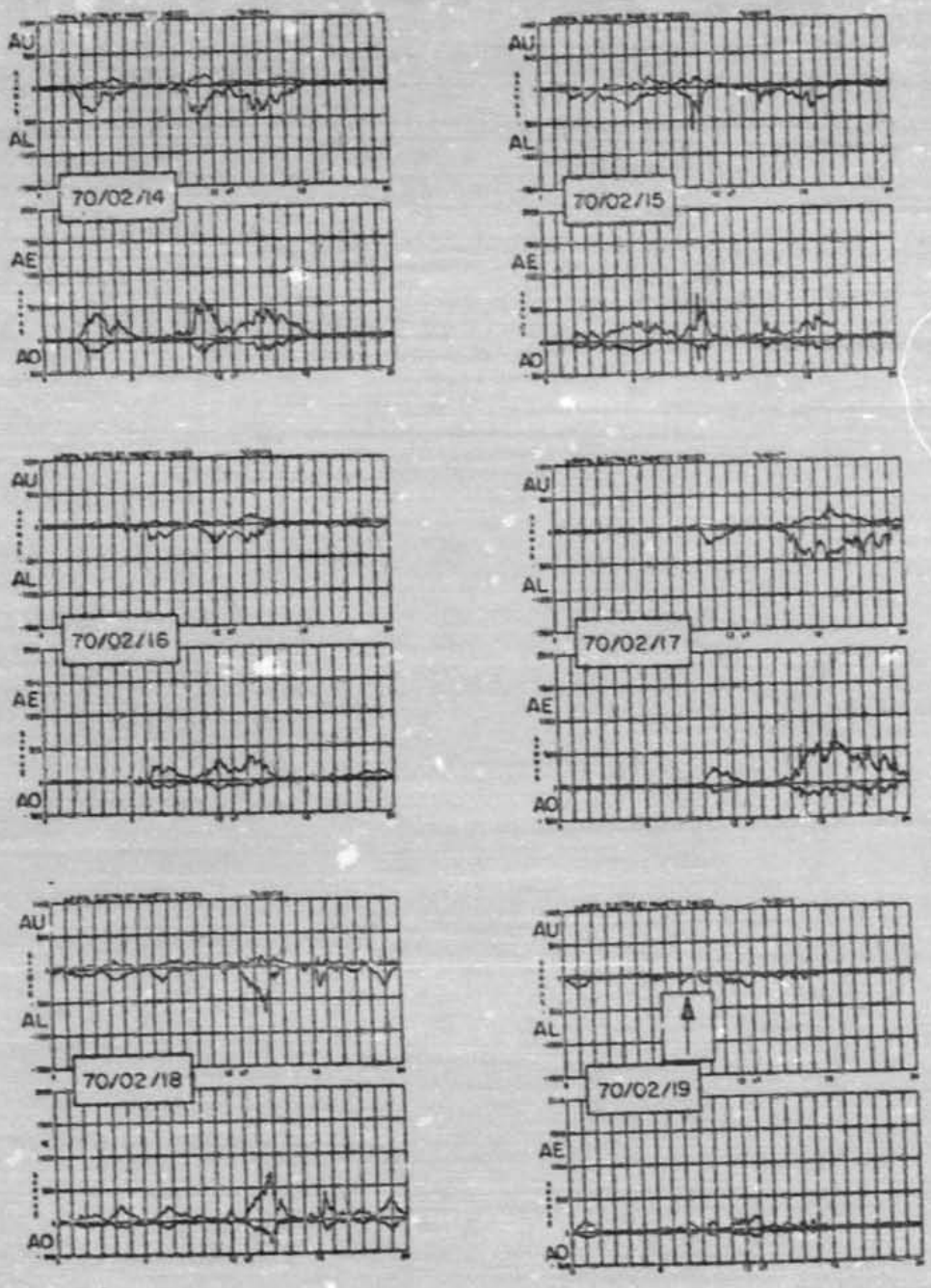


Fig. 2 - Index graphs of AU, AL, AE, AO for February 14-19, 1970

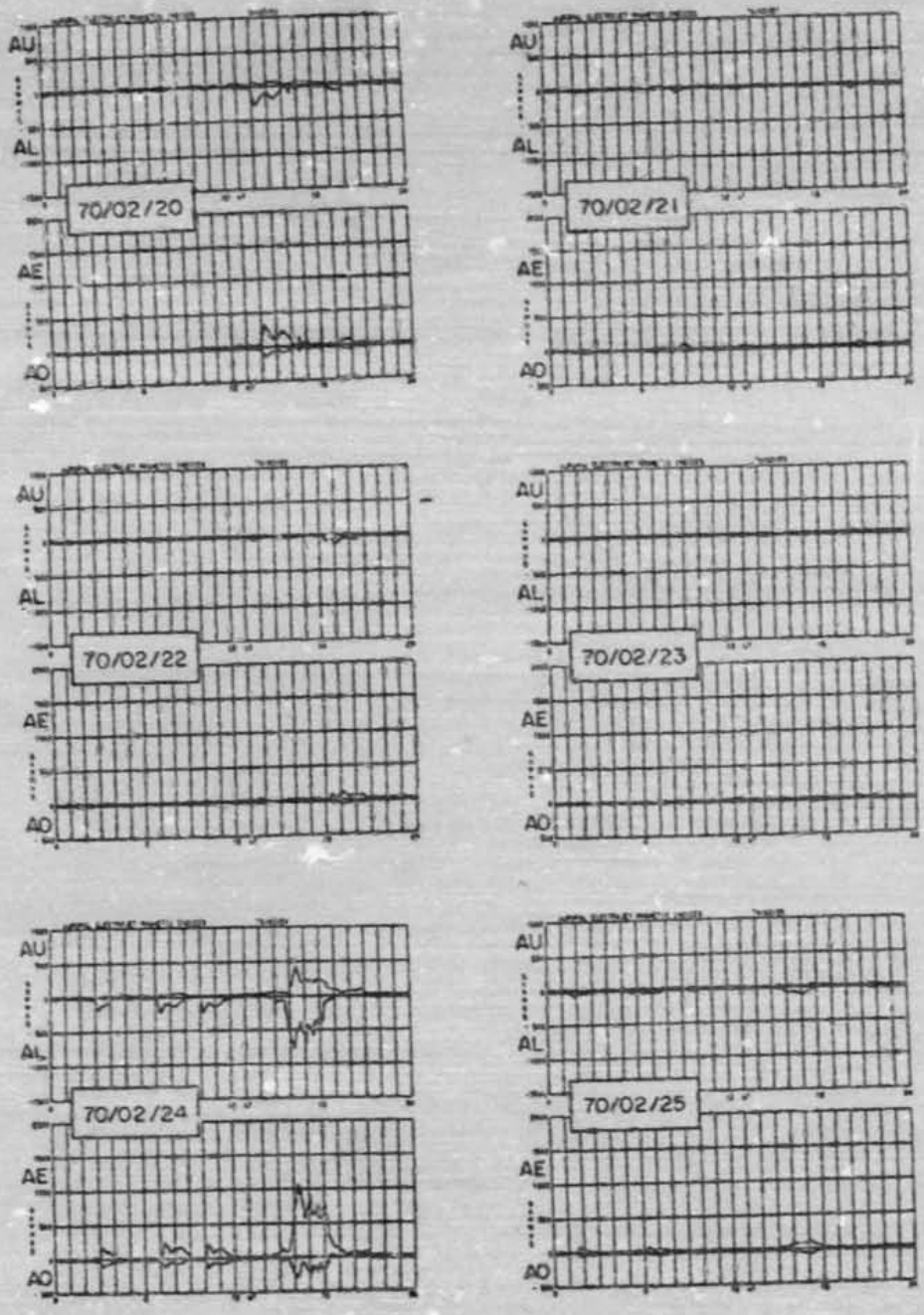


Fig. 3 - Index graphs of AU, AL, AE, AO for February 20-25, 1970

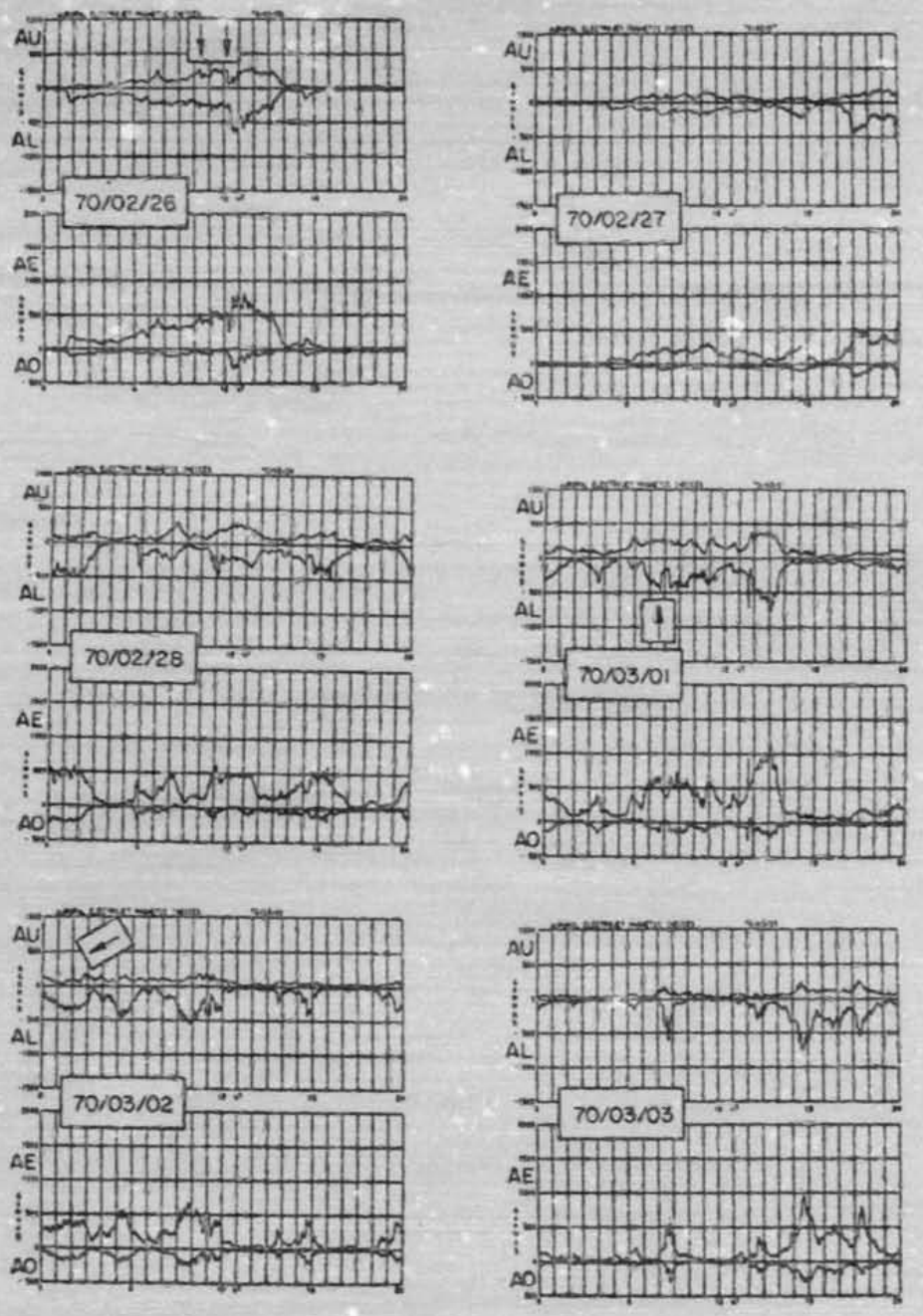


Fig. 4 - Index graphs of AU, AL, AE, AO for February 25 - March 3, 1970

(i) Inherent Problems

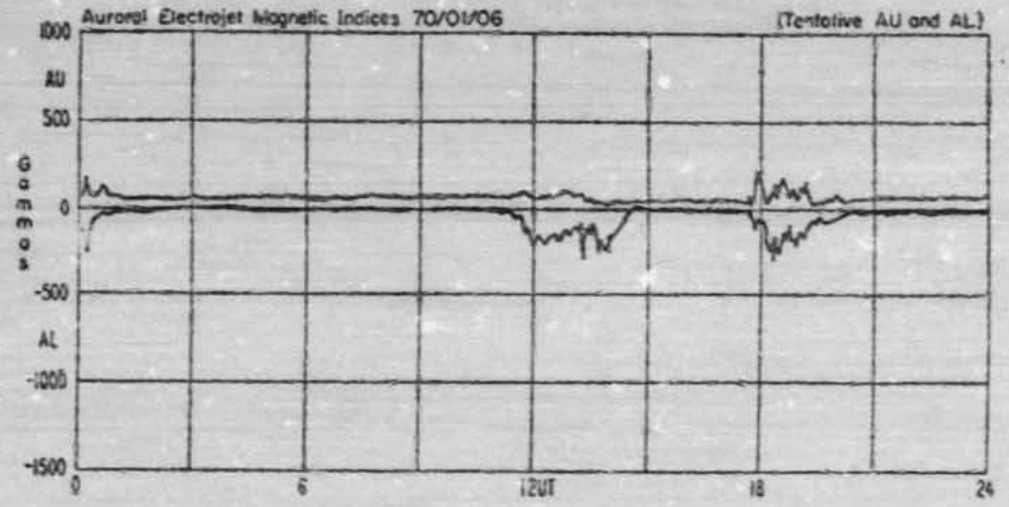
At an AE observatory the deviation from quiet time H will be the same either for an enhanced electrojet current or for a constant current which moves spatially relative to the fixed observatory. With a limited number of stations and for a small event, no approximation to AE will distinguish between these two sources of H deviations. Also, small electrojet variations could occur in the gaps between observatories and not show in AE. Further, failure to remove any Sq variations in computing the ΔH deviations probably accounted for the small diurnal variation in AE noted by Pudovkin, et al. (1970). Restriction of the set of contributing stations to the northern hemisphere should introduce a seasonal variation as noted by Afonina and Fel'dshteyn (1971) in the AU and AL ratios.

(ii) Data and Recording Problems

The operating problems which may arise at an auroral zone magnetic observatory are many and varied. Those which particularly affect the derivation of AE are any which change the baseline of the H trace during a month; any which change the H scale values; and any setting of the H trace on the magnetogram which permits it to go off the photographic paper during times of moderate or large excursions.

An example of the effect of baseline drifts is shown in Fig. 5. The relatively high yet undisturbed level of AU for many hours of January 6 and for the first three hours of January 7 were obviously erroneous. They were traced to the magnetograms from Tiksi. For several days in early January the Tiksi H trace appeared to drift away from its baseline. At 0300 UT on January 7 the entire Tiksi magnetogram abruptly became blank and remained so for over twenty-four hours. When the variometers were returned to operation the problem had apparently been solved by adjustment to the instruments, for the H trace was thereafter stable relative to its baseline. Since we have no baseline values or calibration corrections for Tiksi for 1970, we had to exclude the values from that observatory for the interval January 1 - 8 and derive AE(10) for those days. Four of the 5 Q-days of January occurred after the variometer adjustments at Tiksi and these were sufficient to provide a monthly reference level for the remainder of the month.

The above example also serves to show the importance of having available the basic calibration data. The scale values and baseline values used for TI, UE, CC, and DI were those provided for 1967 and 1968. The lack of current baselines is only serious for those months during which significant changes occur, otherwise the process of obtaining the ΔH deviations eliminates the baseline value -- any arbitrary value could be assumed so long as baseline stability was



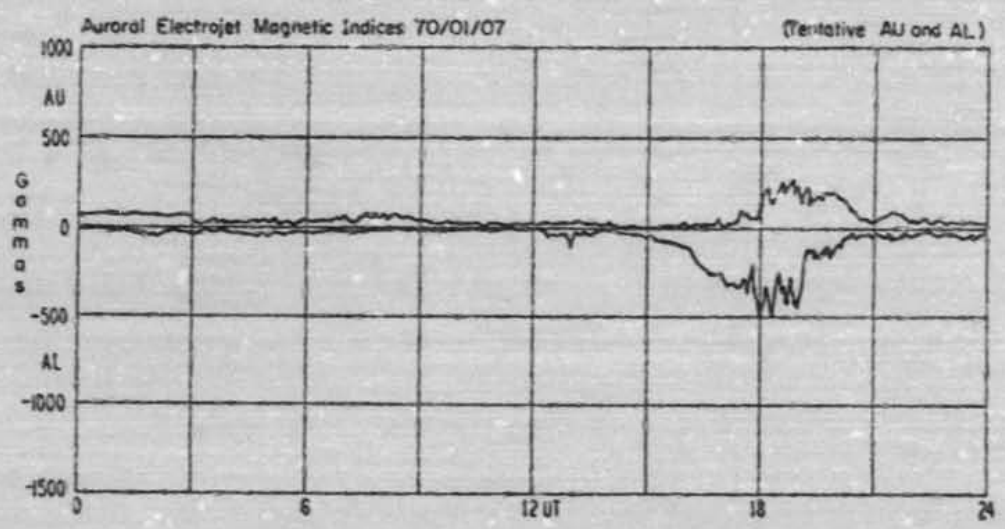


Fig. 5 - Uncorrected index graphs of AU, AL for January 6-7, 1970

maintained for the whole month. Apparently the old scale values we used were sufficiently close to 1970 values; no excessive imbalance was observed in the frequency of occurrence of AU and AL at these stations.

The graph for 70/02/19 in Fig. 2 shows a problem in AL which is difficult to resolve at the digitizing stage (indicated by arrow). The time drive of the magnetogram drum at FC was very erratic and produced irregularly spaced hour lines varying between 20mm separation and 60mm. This was further complicated by the fact that the magnetogram was left on the drum for two days in succession with consequent overlapping of the traces. Attempts at digitization were unsuccessful as indicated and these FC data have been deleted for final AE computations.

Another problem with the magnetograms for this period produces a characteristic effect easily seen in the AU and AL traces. The arrows on the index graphs for 70/02/26 (AU) and 70/03/01 (AL) point to "missing data effects". These occur most often in the AU values and may not be recognized if only AE or AO is studied. They can add apparently significant fine structure to the pattern of individual events in AE. During times of magnetic activity the H trace may pass off the magnetogram, it may cross the other traces and become lost in the confusion of lines, or the light beam may simply move so rapidly that its trace is too faint to record. Any of these events can produce "missing data effects" if they occur at a critically located station. Operation of variometers with secondary H-mirrors would produce reserve H traces and often eliminate the missing data problem during some active times. During times of high activity the need is for auxiliary storm magnetograms. This problem was particularly acute during the great magnetic storm of March 8, 1970. Because we lacked storm magnetograms from most stations in the AE network, we were essentially reduced to computer AE(3) during most of March 8.

(iii) Problems in the Digitizing Process

Quality control of the digitizing process proved to be more difficult than expected. It is not useful to discuss these problems in detail with the users of AE, but we must admit the possibility that not all errors introduced in digitization were removed. For example, the arrow on the index graph for 70/03/02 points to a spike in AU at 0200 UT. This is a spurious effect which has been corrected on the final data tapes. In this case we found that the operator accidentally shifted from the H to the Z trace on the hour and returned to the H trace when the two crossed a few minutes later. Errors like these are difficult to detect unless they result in suspiciously non-natural appearing variations on the index graphs.

Acknowledgments

Any program whose goal is the systematic and timely derivation of AE at 2.5-min intervals from a network of geomagnetic stations must necessarily be a complex operation whose success depends upon many interacting parts. Many different people are involved. From the observers at remote auroral zone stations to the processor of data in each country, through the World Data Centers to the curve followers and the geophysicists studying the magnetograms and data output, all play esential parts in the production of AE. It is the hope of those within EDS who are responsible for the derivation of AE that all the many contributors will continue to exert their best efforts to secure a timely flow of high quality data through the system and that the indices produced will be critically studied by the user community so that any errors overlooked may be corrected. We welcome correspondence from all users of AE concerning this status report. Especially, we would appreciate comments on points such as: technique of reference value derivation; importance of month-end discontinuities; utility of time-average indices; significance of AE during quiet times; suitability of the present station network; utility of AO; and how the graphs and values of AE may best be circulated among the scientific user community.

We have been greatly assisted in this work by informal contacts with representatives of the international scientific community and data services groups, especially at the 1971 IAGA Moscow meetings. Dr. A. F. Treshnikov, Dr. V. M. Driatsky, and Dr. A. N. Zaitsev contributed to improving the flow of data into the World Data Center system. Advice and encouragement from Dr. T. N. Davis, Dr. M. Sugiura, and Dr. S. Akasofu have helped in many ways. C. A. Abston of EDS supervised the digitizing effort, rewrote data processing programs for the Boulder computer system, and did much of the original programming which produced the results presented in this report. In this work and the extensive quality control effort he has been assisted by L. D. Morris.

July 1972

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January 24, 1973

To: J. King

From: J. Johns

Subject: AE data on tape

In order to reduce the number of AE data tapes in the NSSDC tape area I am requesting the Data Repository to release the following tapes that contain data existing on microfilm or other AE tapes.

DD-01494 DC-01033

DD-04921

DD-04922

DD-04923

DD-04924

DD-04925

DD-01548

DD-01549

DD-01550

DD-01551

DD-04895

AE INDEX 2.5 MIN AVG TAPE NUMBERS

	D#	C#
64 AE INDEX Sept. - Dec.	D-01544	C-01046
65 AE INDEX Jan. - Dec.	D-01545 UPDATED	C-01047
66 AE INDEX Jan. - Dec.	D-01546	C-01048
67 AE INDEX Jan. - Dec.	D-01547 UPDATED	C-01049
68 AE INDEX Jan. - ~~June~~ Dec.	D-04894 UPDATED	C-02457

	D#	MICROFILM M#
64 AE PLOT TAPE Sept. - Dec.	D-01548	M-11542
65 AE PLOT TAPE Jan. - Dec.	D-01549 UPDATED	M-11543 UPDATED
66 AE PLOT TAPE Jan. - Dec.	D-01550	M-11544
67 AE PLOT TAPE Jan. - Dec.	D-01551 UPDATED DC-440	M-11545 UPDATED
68 AE PLOT TAPE Jan. - Dec.	D-04895 UPDATED DC-1676	M-11546 UNDATED

AE TAPES IN DC LIBRARY

64 AE Sept. - Dec.	DC-2129
65 AE Jan. - Dec.	DC-235 UPDATED
66 AE Jan. - Dec.	DC-2313
67 AE Jan. - Dec.	DC-1274UPDATED
68 AE Jan. - Dec.	DC-1511 UPDATED

THE 2.5 MINUTE AE INDEX

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VITAL STATISTICS

October 1968

Interplanetary Physics Branch Preprint Series

Introduction I.

An important consequence of the solar wind earth interaction is the production of electric currants in the terreastrial ionosphere whose magnetic affects are recorded on observatory magnetograms. These currents are observed simultanously over large geographical regions but they are most intense in auroral zone, especially in the midnight hemisphere. The currents flow approximately along parallels of latitute at the auroral zone and consequently their magnetic perturbations are recorded primarily in the north H (or X) components.

Often current flow increases for intervals of a few hours producing large (100's of gamas) magnetic perturbations known as magnetic substorms. Magnetic substorms inturn are only the geomagnetic component of the more far reaching magnetospheric substorms, a tem designating ill-defined physical processes and their influences on virtually all observable magnetospheric phenomena. To allow better study if these complex geophysical interrelationships, an index of substorms is a highly desirable and necessary quantity.

For many years the three hour Kp (and Ap) indices of geomagnetic activity have served well as general indices of wild wide geomagnetic activity. In recent times, however, increasing understanding of the causes of the various types of gaomagentic fluctuations contributing to Kp along with the advent of high speed computers and high time resolution space crafts measurements point up the need for more redefined indices to supplment Xp. The Dst index (figure ?) has been defined as a measure of the magnetospheric ring current and

... recently AE (auroral electrojet) index has been defined by Davis and Sugiura (1966) as measure of the high latitude ionospheric currents whose enhancements reflect the occurrence of substorms. AE is prepared from the magnetograms of auroral zone stations (see next section) so that the local time effects present at individual stations are suppressed and the index is universal time representation of magnetic activity. The index has been prepared from hourly average data by Davis and Wang and is available _____ for the period July 1957-December 1964. More recently the index has been prepared at the Goddard Space Flight Center for times subsequent to August 1964 using magnetic data scaled by the US Coast and Geodetic Survy at 2.5 minute intervals. The purpose of this document is to describe the production and availability of these high time resolution AE index data.

II. Production of AE

Definition. A detailed definition and discussion of the AE index has been given by Davis and Sugiure (1966). Briefly, the technique is to seperpose K and X components of digitized auroral zone magnerograms from observations distributed in longitude around the auroral zone. The traces are aligned using base levels which are determined at each observatory from geomagnetically quiet days. Next two envelopes are drawn ecompassing the traces from all the observations. The AE index is defined at the upper envelope (AU) minus the lower envelope (AL). Normally the station near midnight will be the contributes to the envelopes and as long as the distribution of stations previous coverage near the maximum of the disturbance the local time affects will be surpressed and the index will represent the universal time dependance of auroral zone geomagnetic activity.

stations near midnight will be the contributers to the envelopes and as long as the distribution of stations previous coverage near the maximum of the disturbance, the local time effects will be surpressed and the index will represent the universal time dependence of auroral zone geomagnetic activity.

Stations. Stations used in compiling the 2.5 min AE index are listed in Table 1 and their location on a map of geomagnetic coordinates is indicated in Figure 1. The classical auroral zone is also shown in Figure 1. Although this statistical auroral zone does not represent the instantaneous occurrence of aurora and the associated currents, the author has found it a valuable indicator of assymetry of the currents relative to parallels of geomagnetic latitude. An effect Tixie Bay behaves a more northerly station than Sitka because it is nearer the auroral zone, in spite of the fact that the two stations are at essentially the same magnetic latitude,

Only northern hemisphere stations have been incorporated into the present AE index due to the much better station coverage in the northern hemisphere and the availability of digitized data. Therefore a seasonal variation will be present in the index with a maximum in northern summer and a minimum in winter.

Base Values. Determination of the base values at the various stations is of considerable importance in the preparation of the AE index. The technique used in the present work is to plot the daily averages for the quietest days (according to Kp) of each month. Base values are determined from these data and are found to generally change monotonically over periods of months or even years. Base values are changed at monthly intervals and the changes seldom exceed 5 gammas. The base levels that have been used in the data processed to date are shown in Tables 2-4. These average values correspond to the tabular values in the data supplied by the Coast and Geodetic Survey and should be added to the constants shown in the first Column of Table 2 to obtain absolute field values.

Accuracy of the base values will influence the lowest value to which the AE index may fall and only in the limit of perfect zero levels and no disturbance can the index be expected to approach zero. The fact that the index typically attains values as low as 10 or 20 gammas is an indication of the accuracy of the base values. This lower limit to AE can be expected to be higher in the summer when the base levels can be determined less accurately.

Limitations. In using the AE data the following limitations should be kep in mind.

(1) The distribution of stations is not perfect. The auroral electrojet is often confined to a narrow latitude region and this line current may move toward and away from an observatory. If this occurs a special change in a current of constant strength may produce variations which appear identical to a universal time change in the current strength. Small disturbances may also be hidden in a longitude region between observing stations.

(2) No allowance is made for Sq currents in the preparation of AE. These variations are relatively small near the auroral zone but may be the primary contributer to the index during very quiet times. Sq currents may thus effect the lower limit to which AE can fall, particularly in the summer.

(3) During very large disturbances the auroral zone may move south and away from some of the observing stations producing an decrease in the index.

(4) Missing data may occasionally be a factor and in theory can produce an artificial discontinuity. This is most apt to happen during large disturbances when magnetogram traces overlap or go off scale and prevent scaling of the data.

III. Availability of AE

Times Available.

Due to the time required to: (1) determine base values and calibrations at the observatory, (2) transport the data to the work data center and (3) prepare the digitized data, and (4) produce the index; a 6 month-1 year delay between magnetic recording and AE availability seems unavoidable under existing procedures. The present plans is to compile an initial index when a bare minimum of stations (probably Alaska, Canada, Iceland and Scandanavia) become available, with later updating of the index as additional stations become available. Base values listed in Tables 2-4 indicate that the times (and the observatories used) which are available at the time of this writing.

Form of the Data.

Present plans are to make the data 2.5 minute available in the form of microfilm plots, microfilm tabulations, and magnetic tape. A sample plot is shown in Figure 2.

Hard copy can be produced from the microfilm, being available for limited time intervals.

	Abbreviation	Geographic		Geomagnetic	
		Latitude	Longitude	Latitude	Longitude
Leirvogur	LR	64°11'N	21°42'W	70.2°N	71.0°
Kiruna	KI	67°50'N	20°25'E	65.3°N	115.7°
Sodankyla	SO	67°22'N	26°39'E	63.0°N	120.0°
Murmansk	MM	68°57'N	33°03'E	64.0°N	126.5°
Dikson Island	DI	73°32'N	80°33'E	63.0°N	161.4°
Cape Chelyuskin	CC	77°43'N	104°17'E	65.9°N	177.5°
Tixie Bay	TI	71°35'N	129°00'E	60.5°N	191.0°
Uelen	UE	66°10'N	169°30'W	61.8°N	237.0°
College	CO	64°52'N	147°50'W	64.6°	256.5°
Sitka	SI	57°04'N	135°20'W	60.0°N	275.4°
Meanook	ME	54°37'N	113°20'W	61.8°N	301.0°
Fort Churchill	FC	58°48'N	94°06'W	68.6°N	322.6°
Great Whale River	GWR	55°18'N	77°48'W	68.6°N	347.4°

Base Values AE Stations 1964

	Station Constant	Average Tabular Value (gammas) Sept	Oct	Nov	Dec
Letrvogur	11500	540.	540.	540	540.
Kiruna	10500	538	538	538	538
Nurmanak	11500	248	248	248	248
Dixon Island	6000	402	402	402	402
Cape Chelyskia	3000	360	360	364	367
Tixie Bay	7000	592	592	595	599
Uelen		549	552	556	558
College	12500γ	342	342	342	342
Sitka	15000	716	716	716	716
Meanook	12500	621	621	621	621
Fort Churchill	6000	854	854	854	854

Base Values - AE Stations 1965

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec
Leirvogur	541	541	541	544	547	549	549	549	552	555	558	558
Kiruna	540	542	546	550	554	554	554	554	554	554	554	554
Murmansk												
Dixon Island												
Cape Chelyuskin												
Tixie Bay												
Uelen												
College	350	352	354	356	358	360	362	362	362	362	365	367
Sitka	720	720	720	722	724	726	729	731	733	733	735	738
Meanook	625	627	629	632	635	635	635	635	635	635	637	639
Fort Churchill	860	864	863	872	876	879	881	881	884	887	890	892
Cape Whale River												

Base Values - AE Stations 1966

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Leirvogur	560	562	562	564	570	573	573	573	573	576	579	583
Kiruna	554	554	554	556	559	560						
Sodankyla												
Murmansk												
Dixon Island												
Cape Chalyuskin												
Tixie Bay												
Uelen												
College	367	367	369	371	375	375	375	375	375	375	378	381
Sitka	738	739	739	741	746	746	746	746	746	746	748	751
Meanook	647	651	651	654	657	665	663	663	660	663	665	668
Great Whale River	184	190	192	195	204	207	216	222	226			

Base Values - All Stations 1967

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Leirvogur	581	581	581	585	588	591	595	595	595	595	592	592
Kiruna												
Murmansk												
Dixon Island												
Cape Chelyuskin												
Tixie Bay												
Uelen												
College	380	380	380	383	386	386	390	390	390	391	393	395
Sitka	748	748	750	753	753	753	753	753	753	753	755	757
Meanook	668	670	672	672	675	679	681	681	681	681	684	687
Fort Churchill												
Great Whale River	300	300	300	300	300	300	335	335	335	330	325	320
Sodankyla	877	877	877	881			890	888	885	883	883	883

Base Values - AE Stations 1968

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Leirvogur	600	606	610	614	618	622	123	123	123	123	123	127
Kiruna												
Murmansk												
Dixon Island												
Cape Chelyuskin												
Tixie Bay												
Uelen												
College	397	397	399	401	405	408		412	412	412	412	415
Sitka	758	758	760	762	766	770		772	772	772	772	775
Meanook	690	693	693	697	702	706						
Fort Churchill												
Great Whale River	326	332	33	347	355	363						
Sodankyla	883	883	883	883	886							
ABISKO			713	716	719	720	720	720	720	720		

FIGURE 2

BINARY TAPE FORMAT #2

SYMBOL	WORD NUMBER	DESCRIPTION
	Record #2	
IHIGH (1)	1	Month (Integer)
IHIGH (2)	2	Day (Integer)
IHIGH (3)	3	Year Alphanumeric
IHIGH (4)	4	Data Type - AU (alphanumeric)
HIGH (5)-HIGH (580)	5-580	High data values at 2.5 minute intervals IBM 7094 Floating Point
	Record #3	
LOW (1)	1	Month (Integer)
LOW (2)	2	Day (Integer)
LOW (3)	3	Year Alphanumeric
LOW (4)	4	Data Type - AL (alphanumeric)
XLOW (5)-XLOW (580)	5-580	Low data values at 2.5 minute intervals IBM 7094 Floating Point
	Record #4	
IDIF (1)	1	Month (Integer)
IDIF (2)	2	Day (Integer)
IDIF (3)	3	Year Alphanumeric
IDIF (4)	4	Data type - AE (alphanumeric)
DIF (5)-DIF (580)	5-580	Difference data values at 2.5 minute intervals IBM 7094 Floating Point. Defined as AE=AU-AL.

Records are Repeated in Sets of Three.

AURORAL ELECTROJET (AE) INDICES AVAILABLE FROM NSSDC

Under the direction of Dr. D. H. Fairfield of the GSFC Laboratory for Space Sciences, NSSDC has prepared a program for computing AE Indices. The basic data used are 2.5-min digitized values scaled from magnetograms recorded at northern auroral zone stations. The digitized data on magnetic tape were obtained from the U.S. Coast and Geodetic Survey. The A upper (AU) and A lower (AL) values are selected and the AE Index computed.

For each day of data the 2.5-min values of AU, AL and AE are written onto binary tape. (See Figure 1 for a format description.) The AE Index data are also made available on 35-mm microfilm in two formats. The first contains plots of AU, AL and AE for each day of data in gammas vs time of day in hr. (See Figure 2.) The second available microfilm format consists of the 2.5-min AE tabulations for each day. (See Figure 3.)

Because the data is not available from all the stations at one time, the AE Index is updated periodically when new station data are made available. In order to identify the various updates of the tapes and microfilms, a header record has been generated for each form of available data. Figure 4 describes the format of the tape header record and Figure 5 shows the format of the microfilm header. Each header record contains a version number which identifies the date the tape and microfilm were generated. The stations and their base values derived by D. H. Fairfield for each available month are also listed on each header record.

For more information on the AE Index, refer to a paper prepared by D. H. Fairfield of the Laboratory for Space Sciences, NASA-GSFC, Greenbelt, Maryland. The paper is entitled "The 2.5 minute AE Index".

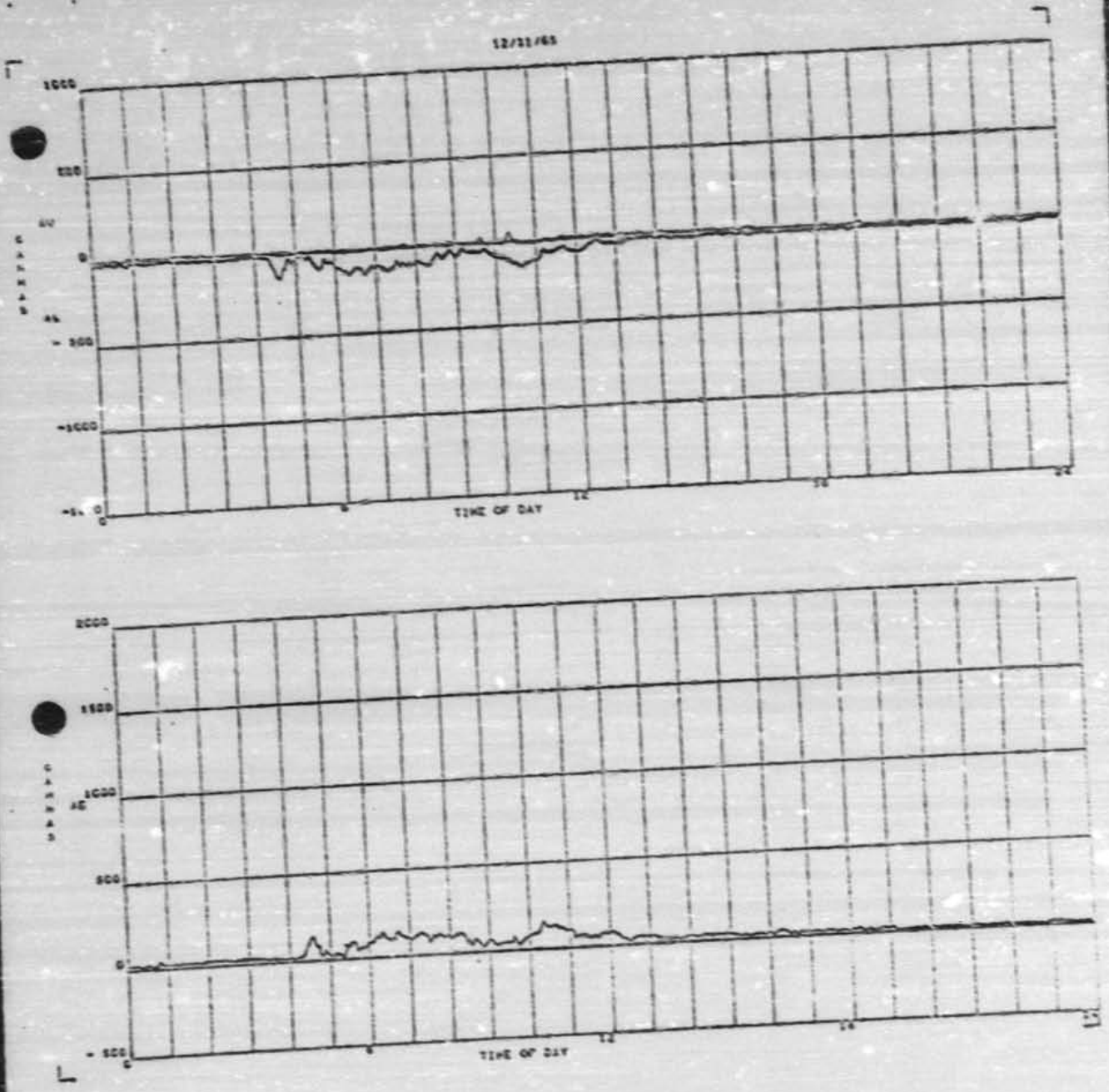

FIGURE 2 PLOTS OF AU, AL AND AE

AE IN GAMMAS FOR 1/ 1/65

HOURS 0-5

	MINUTES																					
	05		10		15		20		25		30		35		40		45		50		55	60
25	22	18	21	25	21	22	21	13	18	19	19	22	30	28	25	24	21	14	20	20	18	24	17
17	14	24	24	20	23	20	23	20	23	17	21	23	19	19	21	21	26	24	23	20	24	24	19
22	23	22	20	20	24	27	22	20	19	22	19	16	21	24	24	25	21	14	19	21	22	21	21
14	16	17	20	15	19	22	15	17	21	15	14	19	15	15	20	18	17	22	21	19	20	21	19
20	21	20	22	21	18	19	19	15	17	21	15	13	12	15	10	6	9	7	6	8	16	21	18
16	14	12	10	9	5	17	16	13	17	8	2	16	15	9	12	8	10	7	9	15	6	13	19

HOURS 6-11

16	23	21	13	12	19	28	16	12	5	12	18	16	11	9	8	9	12	10	8	11	8	11	9
16	10	11	17	17	17	16	15	10	10	12	9	7	8	11	10	7	9	10	11	11	15	8	12
17	11	15	15	10	12	17	12	9	6	7	6	9	9	10	9	10	13	9	8	11	15	17	8
12	9	5	8	8	12	8	8	7	5	4	8	6	4	6	5	8	7	7	10	9	4	4	5
7	5	13	11	13	6	5	9	5	12	15	11	16	15	11	16	12	17	17	11	13	9	11	13
8	12	9	11	13	7	13	8	11	13	8	10	8	10	13	9	13	8	12	13	7	10	10	7

HOURS 12-17

10	12	13	8	12	5	6	6	10	10	9	7	3	4	4	4	10	11	9	15	16	20	11	5
12	10	11	13	13	13	14	11	14	13	5	8	7	7	7	7	7	5	7	8	6	6	9	5
6	6	6	6	5	9	9	10	10	9	10	10	5	9	9	6	7	6	7	5	6	7	4	5
8	8	8	8	9	7	7	10	10	12	13	11	12	17	19	17	21	21	22	26	26	22	16	17
21	25	31	34	35	34	28	26	21	20	19	18	16	17	20	20	23	25	22	23	21	22	22	24
21	21	30	26	29	30	28	30	31	30	29	35	34	31	33	34	29	30	34	29	28	33	25	18

HOURS 18-23

42	43	43	44	45	45	43	44	41	41	41	42	45	45	40	41	38	41	44	49	52	56	57	56
56	53	53	54	57	57	57	57	56	56	56	52	47	47	51	54	49	46	45	42	44	48	48	48
50	49	50	49	46	47	48	52	55	56	49	50	53	50	28	27	28	30	40	33	28	26	27	32
43	47	60	63	56	60	61	52	53	58	54	51	49	45	48	49	52	52	54	54	52	50	42	36
39	38	41	45	46	47	50	50	51	51	51	50	50	49	50	48	39	35	39	42	47	41	37	34
33	35	37	41	48	65	85	97	96	90	70	45	61	83	84	82	88	82	80	89	96	97	98	91

FIGURE 3 AE TABULAR VALUES

SYMBOL	WORD NUMBER	DESCRIPTION
	1 - 2	ZERO fill.
VERS	3	Current date of tape generation in MMDDYY. This will be the version number. (Alphanumeric)
IYR	4	Year of Data. XXbbbb (left justified Alphanumeric)
ISTA (1)	5	First Station XXXbbb (left justified Alphanumeric)
MON(1,1)	6	Month of available data. (Integer)
STAVAL(1,1)	7	Derived base value for station for one month. (Floating Point)
ISTA(2)	8	Second Station
MON(2,1)	9	Month of Available Data.
STAVAL(2,1)	10	Derived base value for station for one month.

Beginning with word #5, words are repeated in sets of three giving station, month of available data, and derived base value. This data is sorted in order by station and month. All unused words will be ZERO to fill out the 580 words of the record.

FIGURE 4 BINARY HEADER RECORD FORMAT

S-C 02/10/66
C 368

VERSION 12 08 66
AC DATA FOR 1965

STA	DERIVED BASE FOR EACH MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
CO	350.	352.	354.	356.	358.	360.	362.	362.	362.	362.	365.	367.
FC	860.	864.	868.	872.	876.	879.	881.	884.	887.	890.	892.	
LR	541.	541.	541.	544.	547.	549.	549.	549.	552.	553.	558.	558.
MI	540.	542.	546.	550.	554.	554.	554.	554.	554.	554.	554.	554.
ME	625.	627.	629.	632.	635.	635.	635.	635.	635.	635.	637.	639.
SI	720.	728.	730.	738.	744.	746.	749.	751.	759.	763.	735.	738.

9999. INDICATES NO DATA PROCESSED FOR THE MONTH

FIGURE 5 FORMAT OF MICROFILM HEADER FRAME

REPORT UAG - 22

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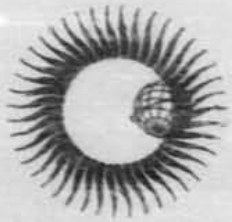
AURORAL ELECTROJET MAGNETIC ACTIVITY INDICES (AE) FOR 1970



November 1972

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REPORT UAG - 22

AURORAL ELECTROJET MAGNETIC ACTIVITY INDICES (AE) FOR 1970

by

Joe Haskell Allen
National Geophysical and Solar – Terrestrial Data Center
Environmental Data Service
Boulder, Colorado

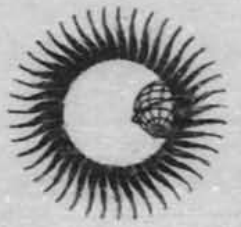

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TABLE OF CONTENTS

AURORAL ELECTROJET MAGNETIC ACTIVITY INDICES (AE) FOR 1970

by

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Environmental Data Service
NOAA, Boulder, Colorado 80302

ABSTRACT

The Auroral Electrojet Index (AE) is discussed and a detailed description is given of the derivation of 2.5-min AE indices for 1970. Tables are given of hourly average indices for each day of the year and of the stations which supplied the extreme deviations from quiet time levels for each hour. Graphs of the variations of the indices are included for each day.

SECTION I

1. Introduction

The Auroral Electrojet Index, AE, is designed to provide a global, quantitative measure of auroral zone magnetic activity produced by enhanced ionospheric currents flowing along the margin of the auroral oval. Ideally it is the total range at an instant of time of the deviations from quiet day values of the horizontal magnetic field (H) around the auroral oval. Defined and developed by Davis and Sugiura [1966], AE has been shown to be especially useful to delineate the onset and progressive development of high latitude magnetic disturbances which are recognized as one aspect of polar and magnetospheric substorms [Akasofu, 1968]. It has been shown to correlate strongly with the integrated southward component of the interplanetary magnetic field [Pudovkin, et al., 1970; Arnoldy, 1971] and to be intimately related to the growth of the geomagnetic ring current during magnetic storms [Davis and Parthasarathy, 1967]. For these various roles AE possesses advantages over other geomagnetic indices, in particular:

(i) it can be derived on an instantaneous basis or from averages of variations computed over any selected interval;

(ii) it is a quantitative index which, in general, is directly related to the physical processes producing the observed magnetic variations;

(iii) its method of derivation is relatively simple, digital, and objective and is well suited to present computer processing techniques; and

(iv) it may be used to study either individual events or statistical aggregates.

Increasingly frequent reference to AE in journal articles concerned with solar-terrestrial interactions and magnetospheric physics as well as requests to World Data Centers for AE indices are indications of its utility. Also, IAGA Resolutions 2 and 15 [Alldredge, 1969]; the Joint COSPAR-IUCSTP Second Report on IMS [1972]; and several ad hoc conferences of users of geomagnetic data further document the need for systematic, timely derivation of AE indices. In order to satisfy this need of the scientific community, the Environmental Data Service of NOAA has undertaken to resume 2.5-min digitization of magnetograms and to perform the data processing necessary to derive AE. This report is one means of distributing a summary of the results. More detailed information and data may be obtained from World Data Center A for Solar-Terrestrial Physics, Boulder, Colorado, U.S.A.

1.1 Prior Derivations of AE

AE indices were calculated and published on a systematic basis by the Geophysical Institute of the University of Alaska for the years 1957 through 1964 [T. N. Davis, et al. 1967, 1968]. These values were based upon the standard tabulations of hourly-average scalings of the horizontal magnetic field for selected auroral zone magnetic observatories. Later, AE indices were derived at the NASA Goddard Spaceflight Center under the direction of D. Fairfield. These were derived from 2.5-min digitizations of H from selected observatories and they covered the interval from September 1964 through June 1968 [King, 1971].

The network of stations whose magnetograms were used to derive AE changed slightly from year to year. Originally, some high latitude, southern hemisphere stations were used to fill gaps in the longitudinal distribution of the available northern hemisphere auroral zone stations. Critically located new stations were incorporated from time to time and they significantly improved the station distribution and, thus, the approximation to "ideal" AE. However, because of delay in availability of magnetograms from some stations, the AE indices for the years 1966 through 1968 were "preliminary" and were based on an inadequate distribution of stations. Arnoldy [1971] has pointed out one effect of the biased station distribution for the published 1967 AE indices. Also, omission from the AE station network of high latitude stations such as Barrow or Inuvik may have sometimes severely limited the amplitude of detected events [K. Kawasaki, R. L. McPherron, private communications]. Because of a history of H-baseline problems, Barrow magnetograms were not used in the NASA derivation of the 2.5-min AE indices. In the EDS derivation of AE(11) for 1970, Barrow contributed 18.6% of the extreme positive deviations (AU) and 12.8% of the negative extreme values (AL).

1.2 Definition and Computation of AE

AE was originally derived by Davis and Sugiura [1966] from horizontal magnetic field (H) data from a group of seven auroral zone magnetic observatories. They derived a quiet time H level for each observatory and subtracted this value from observed instantaneous values of H. The result was a time series of deviations from the undisturbed field, $\pm\Delta H(t)$. Superposition of the seven time series produced a set of interwoven lines bounded by an upper and lower envelope formed by connecting the set of extreme ΔH values. The upper and lower envelopes were designated AU and AL respectively and the range between them at any instant, AU-AL, was defined as AE for that time. In the absence of other sources of variations, AU is a direct function of the current flowing in the eastward auroral electrojet while AL is similarly related to the westward flowing current.

A second index derived from AU and AL was their mean, AO = (AU+AL)/2. It is an approximate measure of the equivalent zonal currents affecting the auroral zone whether arising in the ionosphere or magnetosphere. It illustrates the presence or absence of symmetry in the variations of the oppositely directed electrojets and may provide a correlation with ring current effects in the auroral zone. The units of AU, AL, AE, and AO are gammas (1 gamma = 1 nanotesla = 1×10^{-5} Gauss).

The stations they selected to contribute to AE were chosen to lie in the auroral zone and to be as evenly distributed in longitude as was practical. Ideally, each station should lie just below the instantaneous auroral oval around the time of local geomagnetic midnight. In practice, the network of stations used must be relatively uniform in longitudinal coverage and include a reasonable distribution of latitudes.

1.3 Station Selection for 1970 AE

Conversations with Davis, Sugiura, Akasofu, and others led to selection of the eleven stations listed in Table 1 for the determination of 1970 AE(11). The station positions are shown in Fig. 1 relative to the geographic and geomagnetic north poles. The station names are given along with their mnemonic abbreviation (EDS-NOAA), geographic and geomagnetic coordinates to the nearest hundredth degree, and the universal time of geomagnetic midnight at equinox.

Delay in magnetogram acquisition from some observatories may lead to the future use of a subset of the given observatories for the derivation of "preliminary" AE. Availability of new stations may increase the list. We have chosen to indicate the number of stations contributing to a given determination by a parenthetical number following the letters AE.

This basic list of eleven magnetic observatories may be supplemented with other stations in future derivations to improve the approximation of "ideal" AE. For example, there are longitude gaps between Fort Churchill and College and between Cape Uelen and Tiksi Bay which may be filled. Also, because the auroral oval varies in areal extent with the level of magnetic activity, we will attempt to supplement the present network with meridional chains of stations. The addition of any standard station to the present network represents a significant increase in the work of digitization to secure 2.5-min values. For this reason, we are interested in continuing to review the desirability of retaining all stations used for deriving 1970 AE(11). In general, we have chosen to use records from standard magnetic observatories and to avoid the use of records from temporary installations although the latter may have been well-situated to

supplement the network. In this way we hope to produce comparable indices from year to year and to standardize our technique of magnetogram processing.

In addition to the geographic position of contributing stations, another factor in station selection is the promptness with which their records become available through the World Data Center system. This means not only the timely submission of microfilm or other copies of magnetograms but also the availability of calibration data such as scale values, baseline values, and temperature correction factors. Also of great importance is the availability of auxiliary storm magnetograms and their calibration information. This is because during active periods (of greatest interest for AE) the registration of normal magnetograms is often incomplete, necessarily resulting in missing data from these periods unless storm magnetograms are available. The effect of missing data at a critical station may be observed in the graphs of daily variation of the indices (Section III).

TABLE 1

Observatories Used for the Derivation of 1970 AE(11)

Observatory	Mnemonic Abbreviation	Geographic Coord. N. Lat.°	E. Long.°	Geomagnetic Coord. N. Lat.°	E. Long.°	LGM* UT
1. Leirvogur	LR	64.18	338.30	70.22	71.04	2351
2. Narssarssuaq	NAS	61.20	314.16	71.21	36.79	0210
3. Great Whale River	GWR	55.27	282.22	66.58	347.36	0526
4. Fort Churchill	FC	58.80	265.90	68.70	322.77	0704
5. College	CO	64.87	212.17	64.63	256.52	1133
6. Barrow	BW	71.30	203.25	68.54	241.15	1235
7. Cape Uelen #	UE	66.17	190.17	61.79	237.10	1250
8. Tiksi Bay #	TI	71.58	129.00	60.44	191.41	1551
9. Cape Chelyuskin	CC	77.72	104.28	66.26	176.46	1650
10. Dikson Island #	DI	73.55	80.57	63.02	161.57	1748
11. Abisko	AI	68.40	18.90	66.04	115.08	2052

*Local Geomagnetic Midnight (LGM) at equinox
Geomagnetic coordinates and time calculated for inclined dipole field

#Sometimes given as: Cape Kollen, Tixie Bay, and Dixon Island.

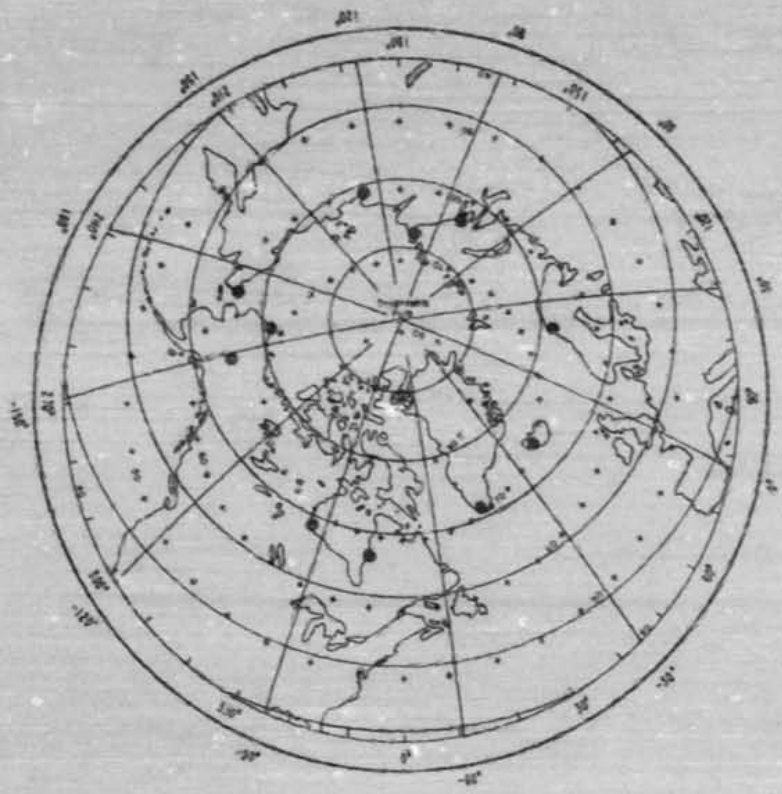

Fig. 1 Stations contributing to 1970 AE(11) are shown by solid filled circles. Polar equal-area projection centered on north geomagnetic pole with geographic and geomagnetic coordinate grids.

Geographic latitude is indicated by the concentric circles of solid lines. Geomagnetic latitude is indicated by the numbered concentric circles formed by + signs. Geographic longitude is given by the outer circle of numerical values with meridians shown as solid lines every 30^{0}. Geomagnetic longitude is given by the inner circle of numbers and the border of hash-marks at 10^{0} intervals.

1.4 Quiet Time Reference Levels

There are several techniques which could be used for deriving the quiet time reference level of the horizontal field at each AE station. We have selected the following as being simple, essentially objective, and easily performed on the computer. It is also the technique used by Davis and his associates [1967, 1968] for hourly AE for 1957-1964. A monthly quiet time average value of H is computed for each station from all the 2.5-min values on the internationally adopted 5 quiet days of each month. This provides a set of twelve monthly reference values for each station for a year. The average month-to-month absolute change in reference level during 1970 was about 13γ and the greatest change observed was 40γ. These changes introduce small discontinuities into AU and AL at each month's end and, therefore, into AE. This technique does not attempt to remove Sq variations; however, our computer program includes an option to derive monthly quiet time means for each 2.5-min interval from the 5 Quiet Days or any other selection of days.

As computed for 1970 AE(11) and given in the first table of Section II, the monthly H reference levels for each station include the H baseline value at that location. So long as each H variometer maintains stability relative to its baseline during a month of recording then the absolute value of the baseline is not important. However, as discussed below (subsection 2.2), when there is component drift relative to the baseline this can introduce errors into the AE indices. Effects of such instrumental drift or shifts can be compensated when absolute H observations are taken at critical times to permit H baseline determinations. For this reason we have computed our reference levels including baseline values instead of simply using average millimeter amplitudes of H or other alternative reference levels. For some Russian and Canadian observatories we did not have current adopted baseline values. Either arbitrary preliminary values were used or else the most recent adopted values available for dates near to 1970. In this way AE was derived on a more timely basis without our being forced to await final adoption of baselines. We are prepared to apply adopted baseline values when they become available and will circulate updated tables of reference levels and any changes necessary in the AE indices. We do not expect these to be significant although they might increase AE slightly in some cases.

1.5 Computation of Indices

The monthly reference levels for each station were subtracted from the observed values of H giving ΔH deviations for each 2.5-min UT. In practice these values were grouped in hourly blocks by month and with data for the 11 stations ordered by geographic longitude. The ΔH values were then scanned by computer techniques and the extreme deviations identified for each 2.5-min interval. These extreme values became AU and AL for that time and the observatories which produced them were also recorded. AE and AO were computed from AU and AL and all indices were recorded on magnetic tape. At the same time, hourly averages of all indices were computed.

Daily graphs of all the 2.5-min indices were produced on the computer's cathode ray tube plotting unit and microfilmed. Tables of hourly average indices were printed in monthly blocks. For hours of high AE the complete set of station deviations for each 2.5-min interval was listed. Quality control programs were used to check each stage of the derivation and sample statistics were kept on the frequency of station selection for AU and AL.

Section II of this report reproduces the tables of station reference values, hourly average indices tabulated by month, and monthly lists of stations contributing AU and AL for each hour. Section III reproduces the microfilm graphs of index variations for each day. Brief comments on these tables and graphs are given at the beginning of Sections II and III.

2. Problems in Derivation of AE

Users of these indices should be aware of the following types of problems:

(i) those inherent in the method of derivation of the index;

(ii) those arising from observatory procedures and the magnetograms; and

(iii) those produced by the digitizing process.

2.1 Inherent Problems

At an AE observatory the deviation from quiet time H will be the same either for an enhanced electrojet current or for a constant current which moves spatially relative to the fixed observatory. With a limited number of stations and for a small event, no approximation to AE will distinguish between these two sources of H deviations. Also, small electrojet variations could occur in the gaps between observatories and not show in AE. Further, failure to remove any Sq variations in computing the H deviations probably accounted for the small diurnal variation noted in AE by Pudovkin, et al. [1970]. Restriction of the set of contributing stations to the northern hemisphere should introduce a seasonal variation in the AU and AL ratios as noted by Afonina and Fel'dshteyn [1971].

2.2 Data and Recording Problems

The operating problems which may arise at an auroral zone magnetic observatory are many and varied. Those which particularly affect the derivation of AE are any which change the baseline of the H trace during a month; any which change the H scale values; and any setting of the H trace on the magnetogram which permits it to go off the edge of the photographic paper during times of moderate or large excursions.

An example of baseline drift effects is shown in Fig. 2. The relatively high yet unvarying level of AU for many hours of January 6 and for the first three hours of January 7 are obviously erroneous. For several days of the first week in January the H trace at one contributing observatory appeared to drift relative to its baseline. Apparently the problem was resolved by instrumental adjustments for after twenty four hours of blank record following 0300 UT, January 7, the magnetograph recordings were resumed and offered no further problems.

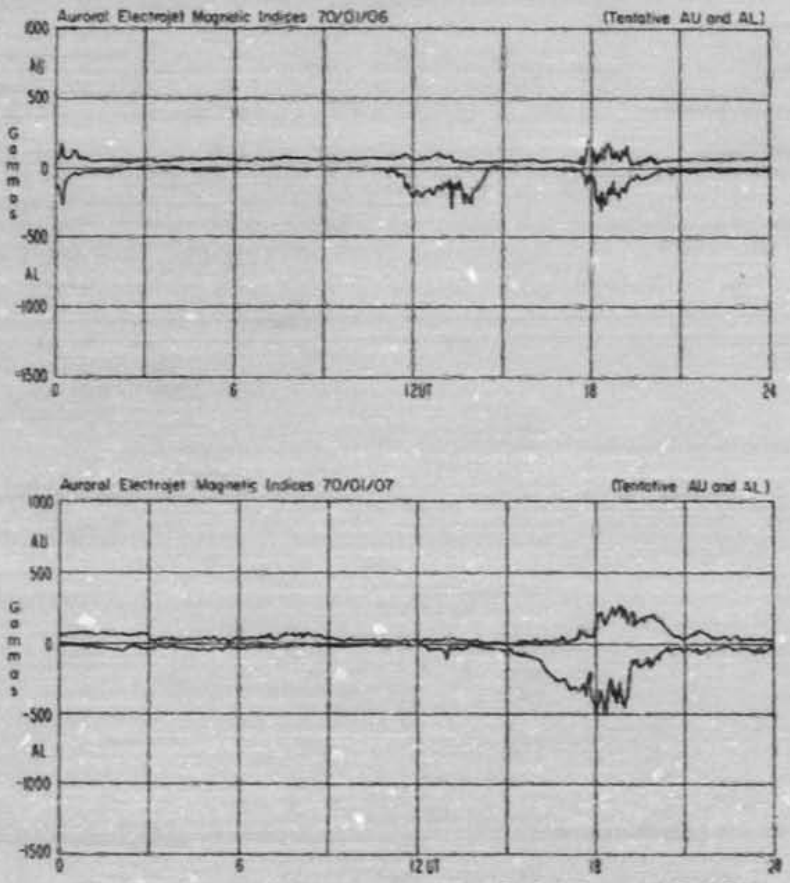

Fig. 2 Uncorrected index graphs of AU, AL for January 6-7, 1970.

This difficulty was compounded by the fact that we had no current baseline calibration data for that observatory and could make no attempt to compensate for the observed drifts. For the interval January 1-6 we derived AE(10) and excluded the drifting data. Lack of current baseline information is only serious for such times during which significant change occurs. Otherwise the process of deriving ΔH eliminates the baseline and any arbitrary value can be assumed so long as baseline stability is assured.

Some of the records processed in deriving 1970 AE had irregularly spaced hour marks arising from erratic time drives in the magnetographs. This caused unique problems for our semi-automatic digitizing equipment. In some instances difficulty with the time drive was also associated with multiple days of recording on a single magnetogram. This produced a complex network of overlapping traces which were difficult to separate.

Another problem encountered in deriving AE produces a characteristic effect easily seen in the graphs of the AU and AL indices (Section III). During moderate magnetic activity the H trace at some observatories may pass off the magnetogram and if there is no secondary trace some data will be lost. At other times the H trace simply becomes so faint that it cannot be digitized. On the other hand, during some large magnetic events the magnetogram traces become so mixed that they cannot be distinguished from one another for digitization. Unfortunately, many of the observatories selected for deriving AE do not routinely supply storm magnetograms. If for any reason the H trace is "lost" at a critically located station during a time when it is supplying either the AU or the AL values of the AE index then a "missing data effect" results. At such times the network of the AE stations is effectively reduced and the station recording the next most extreme H deviation is used to supply AU or AL. The two most outstanding such events can be seen in the graphs in Section III for AU on 70/03/08 at 1430 UT and 1900 UT and on 70/07/21 at 1330 UT. These missing data effects are characteristically rectangular bays in AU or AL with a sharp decrease toward zero, apparently normal variations for a few minutes to hours, then a sharp increase back to a higher value. During the great magnetic storm of 8 March 1970, data were missing from as many as eight stations during parts of the day. We were reduced to deriving AE(3) for those intervals and the three stations supplying H deviations were located in the North American sector.

This problem of missing data effects can be greatly mitigated at the observatories. Adjustment of the position of the H trace on the magnetograms, installation of secondary H mirrors on the variometers, and the inclusion of auxiliary storm magnetograms for active times would solve most missing data problems in the records supplied to the World Data Center system. When storm magnetograms are supplied appropriate calibration data should also be furnished.

2.3 Digitizing Process Problems

Quality control of the digitizing process proved to be more difficult than expected. It is not useful to discuss these problems in detail in this report, but we must admit the possibility that not all errors introduced in digitization were removed. We are not aware of any erroneous index values in the tables of this report or in the archived 2.5-min values. However, unless a digitizing mistake produced a suspiciously non-natural appearing variation on the index graphs it may have been missed. At any instant of time AE is the result of measured H deviations at only two stations and not the average of many measurements. For this reason it is especially susceptible to digitization errors. Currently, we have adopted the procedure of computer-plotting synthesized magnetograms from the raw digitized values and from the values obtained after application of calibration data. Large discontinuities in the H trace are easily observed. By this means we hope to reduce the number of errors in AE derivation which characterized our first attempts with 1970 data. We request that anyone detecting questionable values in 1970 AE(11) communicate with WDC-A concerning this matter. If necessary, corrections will be issued from time-to-time and distributed to the scientific user community, including statements in later reports in this series.

3. Availability of Indices

This report presents hourly average indices, some statistical summaries, and graphs of the 2.5-min indices for each day of 1970. Users of the indices desiring computer listings of 2.5-min values may obtain them upon request from WDC-A. In addition these indices are available on digital magnetic tape. They can be supplied in either 7- or 9- channel, 556 BPI, BCD format, IBM compatible modes. Other conversions are possible upon special request. Microfilm copies of the index graphs are also available. In general, WDC-A will attempt to supply the data for 1970 in any way which will meet user needs and which facilitates data distribution. We welcome suggestions concerning different means of effective data distribution.

4. Acknowledgements

The program to derive 2.5-min AE indices on a systematic and timely basis from records supplied by many geomagnetic observatories is necessarily a complex operation whose success depends upon many interacting parts. Many different people are involved at each stage: observers at remote auroral zone stations, processors of records in each country, the staff of the World Data Center system, and curve followers and geophysicists responsible for the final product. All play essential roles in the production of AE. It is our hope within EDS that all the many contributors will continue to exert their best efforts to secure a timely flow of high quality data through the system and that the indices will be made quickly available to the user community.

We have been greatly assisted in the work of deriving 1970 AE by informal contacts with representatives of the international scientific community and data service groups, especially at the 1971 IAGA Moscow meetings. Dr. A. F. Treshnikov, Dr. V. M. Driatsky, and Dr. A. N. Zaitsev contributed to improving the flow of data into the World Data Center system. Advice and encouragement from Dr. M. Sugiura, Dr. T. N. Davis, and Dr. S. Akasofu have helped in many ways. C. A. Abston (EDS) supervised the digitizing effort, rewrote his bulk data processing programs for the Boulder computer system, and did much of the original programming which produced the present results. In this work and the extensive quality control effort he has been assisted by L. D. Morris.

Dr. W. N. Hess and A. H. Shapley are thanked for their encouragement and support in the preparation of this report.

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SECTION II

TABLES

Table of Monthly H Reference Values

The monthly quiet-time H reference values are given for each observatory. These values are the base from which the ΔH deviations were derived and they were computed as the average of all 2.5-min digitized H values from the internationally adopted 5 magnetically quiet days of each month. The given values are in gamma units and are absolute in the sense that they include the applied scale value and provisional baseline used for each observatory's magnetograms. While subsequent changes in adopted baselines may shift the reference values slightly they should not affect the derived indices because the method of derivation eliminated the H baseline value (see text).

Tables of Hourly Mean Indices

The following tables contain monthly listings of average hourly indices: AE, AL, AU, and AO. These hourly values were computed as the mean of the 2.5-min instantaneous values and the first hour of each day covers the data interval from 0000-0100 UT. All times are given in Universal Time and the indices are given in gammas. On March 8, UT hours 15, 16, and 20 had hourly AL values more negative than -1000γ. This was also true for UT hour 12 on November 7 and for UT hour 8 on December 14. These values appear in the tables as underlined positive numbers because there was not sufficient space to print a four digit value and negative sign.

Tables of Stations Supplying Hourly AU and AL

As described above, the hourly average indices are computed from the 2.5-min instantaneous indices derived for that hour. Each pair of instantaneous values of AU and AL arise from data recorded at only two stations and the station-pair contributing these extreme values may change from one 2.5-min data interval to the next during an hour. In order to designate a single station as the source of hourly AU or AL some convention must be adopted as a basis for selection. We have chosen to designate the station having the maximum average ΔH for the hour as the "contributor" of hourly-AU. Likewise, the station having the most negative ΔH is the contributor of hourly-AL. Two empirical observations from deriving AE indices support this decision. During disturbed times (when hourly AE exceeds 150γ) it is most common for one pair of stations to be both the most frequent contributors of AU and AL and to also have extreme hourly average ΔH values. During quiet times (hourly AE lying in the range 20-60γ), one station-pair may supply AU and AL for most of an hour only to be displaced by another station-pair critically situated to record the onset of an AE event. Generally, there is little difference between ΔH at the stations supplying the AU and AL indices during quiet times and the other stations of the network. Thus large deviations associated with an event are sufficient to raise the hourly average ΔH of the critically located stations above the corresponding values of the station-pair which supplied most of the quiet-time values. For such hours the stations indicated as supplying AU and AL are the ones which responded to the event.

These tables serve to illustrate the nonuniform contribution to AU and AL made by different stations of the network. Barrow, Fort Churchill, Cape Chelyuskin, Dikson Island, Great Whale River, and Narssarssuaq supply about 71% of the extreme values used in deriving 1970 AE(11). In particular, Barrow, Dikson Island, and Cape Chelyuskin supplied almost 50% of the AU indices.

TABLE OF MONTHLY H–REFERENCE VALUES

Units: Gammas

OBSERVATORY NAME	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ABISKO	1970	11757	11760	11756	11755	11760	11762	11760	11763	11754	11762	11770	11770
BARROW	1970	9734	9756	9752	9757	9760	9760	9779	9763	9770	9777	9776	9794
CAPE CHELYUSKIN	1970	3418	3424	3434	3435	3432	3451	3431	3440	3427	3440	3446	3436
COLLEGE	1970	12946	12948	12947	12948	12957	12964	12957	12957	12953	12958	12960	12965
DIKSON ISLAND	1970	6430	6428	6437	6436	6447	6457	6482	6455	6443	6443	6454	6447
FORT CHURCHILL	1970	7021	7021	7032	7034	7055	7050	7033	7041	7063	7066	7056	7048
GREAT WHALE RIVER	1970	9955	9958	9960	9972	9974	9981	9983	9990	9973	9980	9993	9992
LEIRVOGUR	1970	12168	12163	12159	12168	12178	12176	12180	12175	12184	12174	12188	12187
NARSSARSSUAQ	1970	11691	11689	11684	11706	11708	11728	11736	11724	11719	11717	11729	11731
TIKSI BAY	1970	7847	7845	7862	7860	7884	7844	7847	7843	7846	7856	7858	7861
CAPE UELEN	1970	14159	14156	14158	14165	14164	14174	14174	14175	14161	14171	14176	14173

JANUARY 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	33	27	34	38	77	136	86	77	57	33	28	50	174	205	210	120	407	486	150	58	49	67	102	177	120
D	2	124	110	175	386	552	400	302	485	625	437	310	495	643	559	431	613	312	391	280	673	362	225	384	397	403
	3	316	187	205	143	117	50	158	208	289	205	196	120	153	253	138	33	46	57	37	31	48	147	81	28	135
Q	4	38	30	25	52	35	35	62	36	58	91	123	75	51	48	114	151	147	62	40	32	64	133	98	28	67
	5	39	41	49	40	45	33	46	36	54	78	203	201	147	136	164	116	106	62	33	34	43	58	92	245	88
	6	168	45	24	26	62	37	28	28	54	47	49	113	212	225	98	36	33	61	205	118	58	45	30	27	76
	7	29	29	41	35	48	45	54	68	80	50	27	27	53	53	48	79	217	354	517	373	156	114	49	66	189
	8	107	126	73	64	56	51	50	51	67	89	126	151	70	104	74	109	151	199	112	39	34	23	48	87	86
D	9	268	235	158	96	105	149	94	131	227	224	102	66	74	47	137	121	181	255	141	44	48	72	115	138	134
	10	159	75	198	64	43	30	26	22	39	36	31	136	78	124	71	26	48	66	63	35	25	15	15	19	60
Q	11	36	52	71	63	37	45	59	39	30	35	34	55	101	101	173	34	38	25	46	58	52	52	134	178	64
	12	364	188	109	100	73	40	68	113	120	90	99	81	40	32	96	75	97	264	182	91	148	388	165	107	130
Q	13	60	55	26	24	46	54	41	29	32	31	42	39	38	77	301	308	234	68	31	27	33	39	57	44	72
	14	37	32	50	102	204	127	53	77	74	67	70	75	72	159	147	78	44	28	26	20	23	26	51	193	76
	15	186	135	106	85	150	97	42	41	45	26	26	34	29	27	28	38	52	145	78	34	29	42	91	127	70
D	16	129	194	310	199	160	241	280	321	467	429	721	645	570	539	645	584	803	777	540	593	595	503	458	516	467
D	17	566	538	462	366	523	377	266	126	152	145	132	73	94	47	47	95	131	98	76	118	93	53	43	39	194
	18	56	204	106	72	108	114	180	191	91	53	90	117	48	46	36	73	165	67	62	34	24	22	40	31	85
	19	37	36	32	30	22	22	20	28	43	57	47	72	40	48	132	298	91	60	95	79	110	264	317	155	91
	20	140	177	115	54	69	24	21	33	43	131	140	129	150	409	363	87	76	43	109	333	368	206	72	48	139
	21	94	39	38	69	86	96	128	51	75	154	169	89	67	349	239	41	33	38	55	152	82	152	76	73	100
	22	164	51	65	59	31	32	43	39	28	43	59	95	84	45	44	61	153	92	45	76	93	67	48	36	66
	23	33	47	180	170	121	98	104	129	103	53	46	75	86	79	58	42	33	46	43	43	47	52	168	122	82
	24	132	77	41	44	36	35	95	133	218	301	465	317	228	196	69	151	205	104	92	49	137	312	157	107	154
Q	25	39	36	44	41	74	80	42	33	33	26	30	31	27	34	57	27	28	73	48	26	30	45	23	24	48
Q	26	28	38	61	87	26	24	26	32	100	49	52	40	62	30	35	44	47	46	28	17	26	28	22	24	41
	27	21	26	65	33	33	43	20	44	156	146	79	93	126	116	203	123	212	230	150	184	238	183	73	107	112
	28	99	62	34	23	24	26	28	31	32	41	55	45	41	43	36	39	43	45	84	195	57	48	52	260	61
	29	146	71	51	53	69	92	216	231	219	89	25	27	33	40	37	31	30	31	33	24	27	23	25	84	71
D	30	200	58	24	49	128	223	424	180	102	63	191	106	111	85	53	151	327	99	329	260	117	256	86	156	155
	31	267	440	365	177	94	49	30	32	34	34	39	62	27	30	34	44	66	34	107	125	68	42	34	35	95
	MEAN	131	112	107	91	105	94	100	99	121	108	124	120	120	138	139	123	146	142	124	129	107	120	103	118	118
SQ	MEAN	39	42	45	49	44	48	46	34	51	46	56	48	56	58	136	113	97	55	39	32	41	59	67	58	57
SD	MEAN	256	227	226	219	294	278	273	249	315	260	291	277	298	255	263	313	351	322	273	342	243	222	217	248	271

FEBRUARY 1970 — AE INDICES — VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	40	122	130	61	200	162	63	26	14	17	14	16	21	35	33	36	45	48	41	37	46	94	279	422	83
D	2	281	97	70	181	323	197	203	178	184	300	311	442	473	227	46	61	160	336	368	506	422	270	330	574	271
	3	261	244	101	78	117	51	28	41	35	45	127	138	187	67	32	57	28	24	25	22	14	25	27	22	75
D	4	22	41	30	33	27	30	76	92	207	376	156	201	315	474	380	180	369	597	378	195	169	232	131	133	202
	5	106	153	178	298	160	140	53	42	65	60	62	76	203	382	328	121	121	149	77	52	86	125	298	246	145
	6	121	68	50	54	76	63	32	125	99	88	30	22	22	20	23	24	26	47	79	85	34	20	14	16	52
	Q	19	20	17	15	12	16	17	19	21	27	24	26	20	29	29	20	16	13	14	26	25	23	24	16	20
S_x=5.58	Q	21	19	19	21	18	21	21	24	24	27	25	19	27	49	74	106	125	131	71	101	73	53	32	24	47
	9	21	22	41	46	21	42	68	48	31	31	25	33	43	45	110	193	134	119	79	36	34	29	25	24	54
	10	24	21	19	24	21	42	39	75	59	21	18	16	24	49	108	417	491	476	394	58	63	47	52	43	108
	Q 11	30	25	24	19	27	32	33	61	112	63	28	20	29	30	28	57	96	78	50	37	24	43	39	32	42
S_x=9.18	12	26	31	22	19	19	14	16	17	18	24	23	22	23	36	31	40	43	41	42	29	26	30	31	29	27
	13	23	25	25	26	36	64	28	28	21	27	26	40	138	222	188	38	32	26	34	22	24	21	27	29	49
13	D 14	35	39	109	355	218	199	64	44	45	100	324	427	156	170	289	332	283	166	50	40	40	42	34	38	150
	15	38	47	123	114	153	230	253	217	142	126	346	163	38	47	69	155	96	177	258	216	60	38	47	48	133
	16	40	35	38	34	24	33	40	164	178	96	82	176	218	188	304	139	40	32	31	33	35	65	97	65	92
	17	32	25	33	32	27	24	15	18	23	40	201	172	75	40	37	74	252	506	491	555	378	324	286	156	159
	18	69	92	129	91	205	94	78	198	132	85	60	76	63	282	528	188	53	56	185	84	99	83	205	149	137
	19	93	117	35	22	20	28	27	92	37	27	36	134	165	61	63	66	61	30	27	35	34	41	35	45	54
	20	35	28	21	24	24	24	23	22	22	31	41	38	43	52	218	189	65	47	34	85	44	31	32	30	58
	Q 21	28	22	34	30	17	29	28	41	50	42	29	31	36	35	29	27	26	32	20	22	51	31	28	39	32
	Q 22	27	31	33	34	23	29	25	24	23	25	31	26	37	48	34	40	35	33	61	85	60	34	32	31	38
S_x=6.38	23	26	24	22	21	16	16	23	22	20	23	26	30	36	31	29	32	29	36	27	22	32	31	28	26	26
	D 24	21	22	32	131	31	20	32	159	148	34	158	99	38	40	62	211	832	714	316	83	88	39	37	37	141
	25	34	51	48	24	15	41	65	53	28	29	29	26	29	26	21	54	97	93	31	25	16	22	26	22	38
	26	33	183	162	125	136	183	254	373	331	349	911	536	654	674	526	323	77	109	44	25	20	37	29	34	236
	27	31	25	21	23	42	92	121	182	225	215	227	271	148	210	162	81	132	238	78	66	202	475	393	397	157
	D 28	487	588	397	108	57	150	207	303	339	159	256	463	483	418	184	188	308	386	459	216	56	111	78	265	274
	MEAN	72	73	70	78	74	73	69	95	94	89	115	134	134	142	142	123	145	169	134	100	81	86	95	106	104
	SQ MEAN	25	23	25	24	19	24	25	34	46	37	27	24	30	38	38	50	68	57	43	54	47	37	31	28	35
	SD MEAN	169	141	126	162	131	119	116	155	185	194	239	326	293	266	192	194	390	440	313	208	195	139	122	201	208

MARCH 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	350	207	158	270	144	220	368	584	538	547	420	418	297	480	882	662	170	122	91	95	122	176	147	237	321
	2	283	355	392	236	278	472	196	163	264	538	478	386	112	56	66	129	124	262	102	44	68	46	124	272	227
	3	125	71	69	48	55	74	132	58	346	132	73	43	35	95	185	134	240	664	441	440	332	517	233	121	194
	4	151	143	240	171	97	118	230	123	276	436	361	641	636	585	704	640	590	643	763	597	469	343	240	452	402
	5	198	117	82	68	65	56	104	143	214	88	56	37	35	40	81	121	249	466	792	719	505	477	282	360	223
D	6	300	266	230	125	49	36	48	122	423	379	824	263	139	114	221	278	505	592	625	517	737	704	460	703	369
D	7	602	465	504	391	350	79	96	210	486	626	610	499	399	384	588	1105	586	788	981	694	265	161	251	535	490
D	8	469	429	557	1023	1169	1220	689	692	671	414	620	774	586	909	2394	1748	761	642	1158	789	609	674	372	330	822
D	9	257	253	611	803	315	189	177	186	200	209	399	440	563	608	468	678	926	684	250	199	143	203	317	416	396
	10	277	88	119	37	30	30	51	104	222	131	145	142	59	31	34	40	124	156	295	287	325	180	42	42	121
	11	40	39	37	39	47	46	41	47	47	43	39	41	43	40	99	48	50	49	49	79	191	198	181	111	69
	12	51	71	115	219	142	112	175	295	239	295	475	363	198	72	45	37	49	45	40	36	31	33	44	48	133
	13	41	37	40	39	46	39	119	272	101	122	417	176	102	272	391	254	108	63	62	316	328	81	38	42	146
	14	52	68	130	51	49	43	33	35	65	48	42	40	36	33	24	26	38	31	28	27	30	34	39	50	44
	15	56	150	160	160	246	304	207	106	75	72	170	98	56	39	167	298	132	55	55	165	106	46	31	34	124
Q	16	32	37	41	41	42	39	41	44	54	79	142	56	73	96	142	56	39	36	41	35	29	51	47	44	56
	17	45	42	41	50	43	38	69	54	51	50	59	49	54	126	192	93	116	163	314	164	50	53	102	107	89
	18	171	93	44	57	41	36	40	40	40	61	145	324	320	131	48	136	247	89	123	109	129	261	330	151	132
	19	86	58	62	49	37	35	49	140	119	70	58	53	107	147	57	42	54	61	96	59	114	317	153	91	88
	20	85	46	41	42	40	33	37	41	43	50	57	136	171	107	65	78	64	61	102	309	96	71	108	120	83
Q	21	139	165	175	183	76	49	54	44	45	57	53	50	58	55	73	206	203	153	77	54	55	29	33	38	89
Q	22	46	48	49	46	40	35	33	77	69	61	91	186	114	75	62	40	41	29	24	43	34	34	47	54	57
	23	58	68	57	49	45	45	46	62	176	240	93	59	43	54	81	68	91	72	102	111	50	46	54	60	76
Q	24	56	51	46	39	44	47	47	48	51	59	57	58	50	68	46	43	46	40	24	22	33	40	50	55	46
Q	25	60	60	57	64	45	34	59	139	78	51	46	46	58	57	43	48	44	44	46	41	33	37	41	51	53
	26	50	51	106	119	164	142	58	71	69	54	65	79	60	48	59	125	123	103	91	93	98	62	53	50	83
	27	47	47	47	50	42	44	54	56	88	142	204	305	194	120	82	70	77	146	334	362	223	363	705	453	177
	28	229	177	177	480	396	466	465	281	275	554	847	782	418	336	513	544	502	232	178	429	327	308	429	560	413
	29	390	237	362	436	389	215	213	274	208	141	173	210	546	348	386	548	437	460	469	424	321	212	214	396	334
	30	532	98	61	37	44	224	295	272	326	249	419	620	553	353	122	188	509	189	141	114	279	321	102	55	254
D	31	49	99	135	256	261	239	364	671	666	531	716	747	342	321	981	829	444	264	168	175	235	149	399	456	396
	MEAN	172	133	159	183	156	153	148	175	211	211	269	262	208	199	303	300	248	239	260	243	205	198	189	209	210
SQ	MEAN	67	72	74	75	49	41	47	78	59	61	78	79	71	66	73	79	75	60	42	39	37	38	44	48	60
SD	MEAN	335	302	407	520	433	352	275	376	489	432	634	545	406	467	950	928	644	594	636	475	398	378	400	488	495

APRIL 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	88	87	73	101	77	49	85	71	81	47	40	43	96	49	49	45	53	55	47	40	38	39	83	58	62
	2	44	41	36	38	26	31	47	56	60	75	66	56	84	153	313	223	69	66	123	59	46	104	122	133	86
	3	101	109	110	174	410	350	419	230	163	214	410	258	285	330	122	193	250	146	62	46	33	40	48	94	190
	4	87	107	254	136	49	50	95	298	321	168	104	263	308	99	77	67	67	72	49	43	35	46	64	65	122
	5	58	52	43	41	34	41	43	58	126	379	380	426	202	117	93	74	163	169	72	65	91	57	66	80	120
D	6	74	111	171	307	387	329	671	411	248	338	952	815	455	307	374	422	367	274	112	65	81	234	296	76	328
	7	80	229	158	55	59	190	347	211	540	189	57	98	76	62	50	43	47	51	85	45	36	52	57	71	128
	8	351	289	68	91	250	173	45	79	200	454	374	136	67	213	91	81	93	184	62	55	50	92	219	198	160
	9	82	63	57	124	333	166	260	240	615	352	210	509	923	698	149	88	80	185	64	45	40	181	211	186	223
Q	10	120	61	59	47	43	41	50	57	63	57	55	52	48	59	73	71	82	66	56	47	44	88	176	237	73
	11	277	176	198	166	170	110	134	175	429	425	316	388	144	106	114	65	74	118	213	145	54	47	41	41	172
	12	44	48	63	55	127	179	334	363	253	172	144	94	74	91	165	271	258	270	136	69	58	89	54	69	144
Q	13	57	50	42	37	43	39	43	66	55	67	62	157	187	173	142	43	48	68	34	24	35	51	57	64	69
Q	14	60	65	61	61	47	38	36	47	54	63	82	88	89	67	79	50	44	44	46	25	38	49	94	77	58
Q	15	83	54	48	49	46	36	37	48	73	112	101	72	65	76	83	123	300	524	611	328	386	192	185	238	160
	16	373	316	203	286	348	338	240	218	138	74	69	57	51	47	46	49	46	47	69	295	824	910	789	658	270
D	17	576	513	430	416	518	297	151	82	258	590	383	285	176	515	500	359	280	436	541	318	572	628	309	39	381
	18	97	76	64	44	33	30	31	36	163	389	659	693	793	880	442	146	290	125	163	108	100	429	719	775	299
	19	353	443	538	549	473	342	532	646	632	573	728	628	357	129	76	142	173	233	187	114	144	176	51	49	345
D	20	44	72	165	375	427	259	114	61	60	83	171	271	531	600	226	369	568	683	518	187	138	123	256	285	280
D	21	178	310	174	168	491	618	668	540	716	497	664	872	1090	820	858	768	1086	1027	693	433	491	786	595	565	638
D	22	862	826	692	784	617	737	489	292	348	523	308	187	171	170	153	116	139	77	56	54	50	55	59	83	328
	23	127	132	205	141	133	302	436	291	153	308	440	523	696	635	522	432	397	550	625	595	495	267	482	539	391
	24	347	322	475	466	340	389	452	435	338	289	563	462	445	462	349	718	496	574	576	277	294	205	103	133	388
	25	566	410	268	323	407	309	649	398	467	566	374	503	399	308	212	292	121	45	134	398	366	273	301	299	344
	26	394	384	222	224	79	73	61	47	57	62	81	99	283	389	291	112	121	272	420	672	583	486	415	530	264
	27	570	308	205	236	170	320	432	138	49	55	116	251	224	218	189	148	189	150	296	187	78	69	71	84	195
Q	28	198	421	301	238	212	225	199	195	165	117	137	147	204	173	98	75	52	56	69	54	75	133	94	77	154
	29	76	113	153	182	186	206	157	86	195	290	193	204	363	441	267	153	327	452	592	320	195	230	340	188	246
	30	128	196	575	608	580	273	313	305	490	537	471	277	118	135	335	578	605	336	247	147	203	212	364	401	351
	MEAN	217	213	204	217	237	218	246	206	250	268	283	294	286	281	218	211	227	247	232	173	186	211	226	213	232
SQ	MEAN	100	130	102	86	78	76	73	82	82	83	83	103	119	110	95	72	105	152	161	96	116	103	121	139	103
SD	MEAN	351	366	326	410	488	448	419	277	326	406	494	470	485	462	423	407	488	539	384	195	266	305	303	222	389

MAY 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	193	107	78	92	108	256	365	253	101	49	65	76	152	429	260	194	117	73	160	331	362	513	319	277	203
	2	343	121	77	156	309	96	149	215	261	127	96	77	92	73	54	61	152	199	328	235	89	118	177	248	160
	3	111	75	56	46	40	35	31	55	56	64	106	237	339	296	276	153	154	247	322	130	233	265	585	333	177
	4	186	91	66	58	58	44	59	91	165	227	221	137	139	105	129	177	296	334	136	81	100	83	83	132	133
	5	133	116	83	92	72	39	66	87	84	304	737	720	253	191	253	234	222	220	177	125	59	118	132	341	202
	6	188	78	59	53	47	48	42	58	74	131	140	142	191	167	130	85	222	180	122	105	60	59	66	60	104
	7	61	56	49	79	50	50	49	52	59	77	157	166	150	159	71	51	59	119	128	180	117	71	65	59	89
Q	8	66	96	55	47	54	47	47	50	67	89	73	73	65	71	58	63	168	310	234	231	191	157	155	205	111
Q	9	134	138	117	98	190	171	144	152	102	64	86	109	90	105	93	115	152	106	91	129	88	63	58	59	111
Q	10	62	56	51	95	113	88	72	87	155	130	115	80	78	59	63	59	56	36	38	46	46	50	55	56	73
Q	11	55	46	37	41	47	53	62	73	64	77	80	93	91	71	64	59	43	46	52	74	83	135	166	337	81
D	12	198	213	149	265	224	78	52	129	121	208	421	475	483	482	423	388	968	623	427	317	588	805	487	248	349
	13	166	169	422	570	559	303	202	65	51	53	215	166	73	93	134	93	60	37	47	86	91	90	148	231	172
	14	183	203	110	193	323	313	378	433	391	182	79	62	91	86	78	158	415	746	754	812	705	389	321	398	329
	15	371	378	138	87	143	201	132	145	332	675	423	123	87	69	69	79	53	175	129	149	172	99	113	104	185
	16	138	110	116	118	127	267	233	135	313	113	71	83	103	139	265	233	280	388	224	201	248	173	139	265	187
	17	351	213	119	74	409	576	343	97	90	64	126	286	301	408	232	84	97	101	62	79	59	88	114	239	190
	18	173	137	218	148	47	44	51	74	60	57	56	63	112	120	122	92	136	62	52	45	42	53	50	55	86
	19	67	74	82	100	167	127	343	332	350	484	493	348	231	166	81	74	95	195	187	163	167	275	229	132	207
D	20	230	249	178	246	485	559	267	129	148	346	414	344	358	467	343	478	472	446	332	249	479	346	273	407	346
	21	414	327	299	337	270	200	168	198	194	347	392	337	251	296	305	310	160	150	261	254	253	92	117	221	256
	22	267	359	318	195	107	131	233	265	100	94	130	243	269	225	351	307	315	561	541	287	238	177	123	97	248
	23	83	68	89	87	66	49	33	124	308	210	230	251	141	81	83	102	91	217	305	254	258	281	511	466	183
	24	394	294	139	118	76	59	41	61	121	165	283	358	169	191	225	185	170	185	85	78	126	149	173	266	171
	25	266	430	284	400	400	425	457	112	66	53	130	259	391	368	406	209	292	283	202	132	166	193	275	156	269
Q	26	67	70	60	48	39	33	30	45	53	71	73	69	59	58	80	146	125	100	137	121	98	125	160	87	81
D	27	133	94	87	120	115	173	361	296	380	326	145	195	390	926	306	288	576	792	782	570	802	815	729	607	408
D	28	446	853	319	126	95	74	62	57	149	448	786	853	968	1366	1081	737	856	281	200	299	214	171	145	300	445
D	29	375	297	144	106	359	403	519	643	451	246	222	159	238	186	79	92	128	134	68	262	335	190	108	186	247
	30	325	162	119	163	232	232	80	153	383	761	738	270	133	124	84	255	258	468	292	178	77	84	84	81	239
	31	77	73	81	73	95	38	95	120	206	322	228	124	413	379	312	276	296	139	93	78	67	70	80	80	159
	MEAN	206	189	136	143	175	168	167	155	175	212	243	225	223	244	210	187	222	257	225	203	213	203	201	217	200
SQ	MEAN	77	81	64	66	89	78	71	81	88	86	85	85	77	73	72	88	109	120	110	120	101	106	119	149	91
SD	MEAN	276	341	175	173	256	257	252	291	258	315	398	405	487	685	446	397	480	455	362	330	484	465	348	350	357

AE INDICES — VALUES ARE EXPRESSED IN GAMMAS

JUNE 1978																								
	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	94	132	291	733	524	234	174	164	237	597	288	343	392	598	796	722	590	660	418	320	232	331	345	211	393
	2	222	127	237	295	244	161	77	76	64	62	116	104	138	135	151	217	305	236	242	246	273	202	177	297	183
	3	147	171	288	312	545	507	344	244	469	501	473	414	451	233	359	338	259	168	285	391	253	274	223	398	335
	4	327	369	386	158	267	169	177	257	373	376	345	209	255	272	409	332	209	155	131	111	106	188	289	348	256
	5	86	73	194	293	179	283	435	405	305	175	211	232	90	44	42	40	42	93	51	46	58	51	40	36	146
Q	6	40	44	52	64	90	81	59	131	111	156	208	97	83	65	52	57	44	39	33	52	44	46	32	23	72
	7	35	37	49	58	92	46	45	61	79	118	99	86	77	79	95	106	102	118	173	400	571	412	451	690	170
	8	500	468	482	263	322	565	561	151	92	93	236	236	305	103	53	46	69	183	186	215	144	182	258	171	242
	9	112	79	138	162	73	45	51	68	126	92	56	48	53	53	78	84	90	104	194	376	338	321	301	180	134
	10	148	111	134	113	79	73	69	200	262	160	236	126	54	134	173	162	234	466	404	363	340	195	81	91	183
Q	11	161	189	250	147	56	56	63	69	84	67	65	71	62	53	59	112	114	306	261	196	116	59	57	75	114
Q	12	125	165	150	164	156	96	77	62	124	174	185	208	152	203	123	65	78	115	168	233	148	164	181	158	145
	13	175	143	116	114	134	69	211	413	370	503	660	636	627	817	479	203	125	240	295	201	283	263	192	171	310
	14	279	286	298	416	210	136	70	68	66	69	74	83	68	62	57	76	67	84	176	496	258	104	112	238	160
	15	497	438	369	198	113	271	300	401	496	517	610	647	421	411	251	271	269	347	270	227	255	465	815	352	363
	16	380	291	283	238	308	409	186	47	49	53	63	65	168	128	177	116	126	79	74	137	228	149	199	256	175
	17	98	52	54	57	54	34	51	74	81	99	116	145	357	379	234	93	206	457	522	711	691	500	434	587	254
	18	504	307	128	86	68	97	85	370	620	719	918	853	1112	882	873	738	620	425	345	507	606	605	657	544	528
D	19	463	417	391	174	74	74	211	96	111	253	235	128	85	108	117	112	103	147	235	258	200	495	545	643	236
D	20	706	699	572	554	639	625	503	602	649	660	636	707	591	612	666	907	947	773	579	669	861	745	638	600	673
D	21	625	499	600	581	510	552	685	684	632	442	482	600	346	468	395	408	407	385	200	50	46	134	95	86	413
Q	22	134	153	107	92	61	58	53	53	48	64	114	175	133	95	76	93	63	51	81	208	249	215	174	131	112
Q	23	170	102	94	88	97	112	91	42	61	53	54	96	83	73	62	44	52	62	52	50	63	99	58	64	80
	24	95	189	98	61	64	93	50	52	72	47	49	55	50	63	135	185	77	65	129	229	444	214	259	355	127
	25	376	412	121	62	57	50	166	142	213	317	358	407	389	378	246	216	136	112	122	108	96	181	312	245	218
	26	74	69	86	199	444	481	500	616	577	422	273	131	124	86	135	524	777	574	669	784	572	307	202	131	365
D	27	153	130	248	614	584	318	309	439	924	924	500	344	895	672	341	149	156	290	150	65	136	158	127	70	363
	28	98	283	342	204	191	298	155	90	76	247	408	450	505	473	347	174	51	91	87	62	109	103	134	116	212
	29	59	33	36	40	56	127	179	299	82	57	65	77	63	79	46	189	419	551	490	574	543	447	273	168	206
	30	93	77	58	91	53	55	71	381	461	503	458	276	189	60	43	44	56	61	63	56	52	55	53	91	141
	MEAN	233	221	221	220	211	206	200	225	265	284	286	266	277	261	236	226	226	246	236	278	278	254	245	255	244
SQ	MEAN	126	147	131	111	92	81	69	71	90	103	125	129	103	102	74	74	70	115	119	148	124	116	108	90	105
SD	MEAN	416	353	368	314	465	365	351	452	612	668	565	569	667	646	614	585	544	587	334	322	388	393	372	302	474

JULY 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	69	204	262	235	364	248	392	396	372	267	140	122	184	296	550	174	123	120	112	114	121	65	61	89	212
	2	73	68	66	94	105	199	433	474	422	205	378	701	171	67	47	60	111	83	99	48	53	73	52	121	172
	3	289	212	261	172	397	688	644	646	606	618	711	398	279	230	119	84	67	49	57	49	163	312	509	964	395
	4	943	592	294	126	343	655	644	398	624	310	227	129	137	138	74	81	80	58	52	55	57	94	63	66	258
	5	96	91	126	256	646	685	507	359	387	127	85	78	50	111	171	166	285	503	177	80	74	99	152	371	237
	6	605	414	439	295	419	264	437	544	615	474	337	305	449	455	123	77	64	54	34	30	37	45	64	59	277
Q	7	61	65	61	50	38	35	38	77	176	206	150	57	79	85	43	43	49	51	53	127	290	283	292	587	121
	8	302	208	336	545	608	602	616	369	179	90	65	69	234	430	287	268	356	544	534	457	468	451	506	815	389
D	9	814	440	159	670	738	636	474	260	392	652	799	814	967	1299	1158	910	470	317	407	465	756	776	619	698	652
D	10	921	374	182	117	76	71	100	75	50	48	78	162	286	249	255	437	463	570	329	421	581	504	374	273	292
	11	214	322	252	102	55	83	211	297	292	275	206	265	281	256	221	206	338	321	215	267	340	386	262	422	253
	12	513	454	461	501	292	147	192	227	273	393	198	174	309	299	334	428	314	100	336	375	163	178	372	307	306
	13	303	260	393	440	190	359	207	85	36	35	111	120	116	110	112	171	297	565	495	181	222	313	269	127	229
	14	149	281	260	169	191	83	66	123	371	220	145	118	78	90	74	81	46	101	455	415	169	121	145	386	177
Q	15	280	97	105	114	100	41	39	69	137	377	368	259	120	127	87	81	90	102	96	74	57	63	111	151	131
	16	271	383	356	194	118	152	59	45	45	49	50	154	360	308	102	38	127	243	376	235	118	53	45	47	164
	17	48	82	145	87	26	26	35	52	45	51	55	67	106	142	263	216	366	532	260	182	218	439	618	318	182
Q	18	114	90	125	146	194	168	55	35	37	61	129	115	99	80	65	78	44	51	64	149	194	183	187	81	107
Q	19	71	69	87	212	275	155	112	71	70	133	310	230	58	43	50	97	194	386	185	76	116	291	291	425	167
	20	302	188	139	141	81	143	177	126	69	68	70	64	62	74	60	52	62	76	144	239	333	241	383	698	167
D	21	741	446	239	338	285	102	79	63	217	200	337	519	384	606	853	327	233	205	656	603	317	330	570	603	366
	22	468	222	81	160	195	289	225	243	469	473	298	124	118	93	113	184	379	505	203	165	410	470	527	543	291
	23	505	328	255	142	96	136	242	251	245	164	149	164	237	124	103	77	94	298	403	247	126	61	64	74	191
	24	165	443	646	743	574	488	598	308	69	56	59	129	324	426	507	590	309	355	458	307	99	153	395	485	361
D	25	1090	604	788	1045	421	733	705	710	876	916	826	1131	453	645	349	116	118	116	85	88	202	792	792	733	597
	26	662	858	653	616	212	186	609	266	466	477	587	651	565	410	155	71	49	55	75	87	137	263	628	150	378
	27	89	79	124	148	336	460	311	53	84	377	348	262	198	361	359	580	448	411	284	444	346	122	183	342	280
Q	28	147	76	57	52	40	28	28	37	84	105	67	61	53	44	46	56	53	65	59	72	86	76	161	143	71
D	29	300	195	124	294	784	813	864	860	930	882	1019	754	710	768	504	813	613	492	687	494	161	91	49	81	553
	30	60	54	50	74	199	419	133	98	80	67	98	174	174	126	142	155	76	66	177	246	136	285	474	333	162
	31	388	506	233	432	455	423	242	344	551	415	380	424	361	313	250	406	549	818	774	308	196	388	692	456	429
	MEAN	357	281	258	279	288	307	306	257	297	285	283	284	258	283	244	230	221	265	268	229	217	254	319	348	275
SQ	MEAN	135	79	87	115	129	85	54	58	101	180	205	144	82	72	58	71	86	131	91	100	149	179	208	261	119
SD	MEAN	773	412	298	493	461	471	444	394	485	540	612	676	560	713	624	521	379	340	433	414	403	499	481	474	496

AUGUST 1979 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	319	242	262	140	93	71	91	98	131	110	146	99	93	43	41	48	103	99	63	51	74	103	82	126	108
	2	121	156	383	361	332	198	35	54	192	272	113	81	92	89	79	60	57	49	46	43	48	57	92	67	121
	3	72	67	97	81	72	59	47	39	48	64	98	88	92	72	89	131	81	91	39	46	46	46	42	46	61
	4	44	39	52	71	70	43	46	61	109	178	114	101	61	77	114	179	184	84	81	149	211	117	91	76	95
	5	77	95	111	149	189	131	67	49	38	38	54	57	93	61	99	80	44	47	38	41	80	68	62	98	69
	6	51	46	41	35	45	98	49	62	100	270	183	63	95	63	61	85	84	79	61	91	146	306	312	497	117
	7	313	213	89	61	47	47	70	132	106	79	75	69	78	95	125	192	243	89	116	106	167	412	792	922	172
	8	279	178	409	314	97	95	270	334	735	770	706	688	306	109	158	189	188	178	401	464	166	252	375	636	336
	9	669	813	463	279	332	257	240	216	179	97	398	574	300	201	74	70	90	359	482	176	108	99	66	97	274
	10	99	143	169	179	67	89	184	156	317	283	183	486	348	160	99	77	136	103	92	97	71	117	142	139	157
	11	192	187	133	171	260	114	183	176	269	411	195	166	98	264	292	109	69	70	89	199	171	98	286	629	194
	12	641	429	496	623	949	210	85	109	299	296	82	86	89	75	95	87	48	89	150	281	473	489	196	84	243
	13	73	74	119	73	41	238	216	133	142	218	268	142	131	263	179	102	179	173	316	492	449	518	519	174	214
	14	92	105	157	278	208	61	64	49	69	71	50	69	91	46	62	79	128	102	99	79	88	139	136	165	100
	15	171	141	189	177	124	192	109	79	190	200	199	222	183	87	92	99	102	67	89	162	97	101	216	411	149
	16	302	229	199	108	103	223	187	239	227	297	242	272	358	334	149	103	123	231	436	192	118	120	798	981	269
	17	660	493	598	815	887	811	1068	912	945	676	741	994	690	922	699	948	825	973	1056	634	252	228	393	498	718
	18	324	672	491	930	378	298	346	522	497	483	656	787	986	808	749	952	908	1113	778	294	287	232	392	617	562
	19	693	952	342	234	242	295	214	86	182	406	988	149	239	277	322	311	376	234	125	67	44	93	90	94	248
	20	48	47	44	40	49	49	98	193	247	234	133	238	228	129	74	61	66	94	41	81	72	111	109	101	109
	21	109	141	233	191	139	187	196	121	97	96	136	177	128	66	64	98	198	134	128	64	94	88	181	74	118
	22	92	49	84	76	126	138	117	106	121	156	147	293	426	333	297	286	413	343	331	232	188	97	84	138	187
	23	161	133	129	233	291	214	326	383	467	439	269	191	302	174	81	87	119	268	143	12	63	96	97	48	194
	24	97	49	64	153	99	45	37	37	42	99	61	77	107	151	118	90	110	111	173	126	111	170	159	110	99
	25	110	110	143	199	229	302	441	986	463	339	398	376	469	478	474	379	352	306	143	224	339	296	398	299	319
	26	398	219	86	193	675	615	481	991	618	758	664	642	634	674	989	699	937	335	317	189	233	398	707	761	498
	27	378	338	314	161	328	964	489	133	86	159	93	99	137	199	602	698	987	489	445	234	389	423	415	132	324
	28	64	91	46	41	69	219	192	70	92	58	48	46	48	84	299	961	913	393	471	484	377	397	367	323	220
	29	134	66	188	698	419	398	271	388	388	271	111	169	298	191	165	329	187	80	72	77	99	96	67	97	216
	30	144	312	272	229	168	119	141	198	223	111	109	100	183	89	84	112	77	79	95	178	174	99	91	91	134
	31	39	46	42	92	80	297	428	547	900	377	279	149	164	364	348	313	434	676	693	905	492	112	129	74	267
	MEAN	222	203	200	219	223	285	210	213	298	262	239	231	243	225	265	217	237	239	241	263	178	183	294	234	221
90	MEAN	114	96	109	115	86	78	98	95	72	87	87	84	69	61	84	102	86	69	79	83	108	101	87	83	86
80	MEAN	488	474	480	428	474	498	481	907	893	557	633	641	633	542	437	412	492	996	607	391	192	231	297	374	478

SEPTEMBER 1970 — AE INDICES — VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	63	46	39	36	46	38	164	538	654	565	912	465	146	153	227	540	464	535	756	677	534	390	228	158	349
	2	271	247	123	70	58	120	117	78	84	243	575	448	292	277	227	199	273	515	372	162	226	236	136	82	225
	3	62	55	81	413	413	91	63	176	387	561	468	532	541	166	130	322	295	158	117	147	163	346	537	315	272
	4	165	169	125	77	55	55	164	148	168	79	87	194	342	66	75	177	381	115	165	173	238	226	67	121	153
	5	208	93	93	134	185	116	51	59	65	70	79	65	92	129	118	456	547	264	249	249	161	199	352	163	171
Q	6	85	57	67	96	85	55	47	48	58	72	54	59	60	66	110	247	213	196	346	158	111	101	210	74	111
	7	69	104	88	41	32	28	28	62	67	62	95	86	142	123	110	65	56	40	49	125	252	346	149	69	95
	8	58	47	41	47	62	182	266	164	186	117	90	71	83	209	434	489	521	514	477	329	107	64	71	64	196
Q	9	52	52	52	58	191	116	93	80	93	71	65	55	69	81	83	93	165	95	78	177	497	457	476	383	150
	10	432	377	241	292	283	195	67	62	64	47	51	53	64	76	63	46	45	33	26	30	31	32	32	32	112
Q	11	36	40	35	28	25	24	26	31	45	52	57	53	55	48	42	53	52	56	44	41	37	37	36	31	41
Q	12	31	44	57	58	299	309	234	326	273	63	50	44	46	39	41	42	57	91	41	36	40	49	41	38	90
D	13	37	40	59	64	213	511	539	563	654	748	849	732	584	643	377	160	435	356	115	323	772	671	417	506	432
D	14	199	362	384	159	89	61	101	173	325	271	232	956	656	733	822	776	419	292	254	399	571	304	164	291	375
	15	313	304	598	928	482	250	313	88	55	48	129	217	312	173	54	68	58	140	247	225	97	207	179	64	214
	16	91	124	257	112	210	372	330	209	326	137	175	213	214	219	77	46	46	90	235	227	224	125	67	53	174
	17	54	166	225	207	228	359	592	331	257	105	49	48	90	98	88	152	257	249	187	102	92	142	183	116	181
	18	130	253	229	422	287	183	234	359	378	229	142	54	46	90	129	296	73	167	254	121	98	216	260	89	191
	19	91	57	123	234	364	646	398	283	458	542	562	279	287	384	388	278	589	599	594	715	502	336	420	160	382
	20	172	164	88	54	137	446	346	230	347	465	302	282	488	386	474	425	453	315	172	219	247	168	211	558	294
D	21	505	435	391	380	333	432	481	573	655	210	76	244	793	886	708	450	321	466	474	337	136	226	131	134	407
	22	98	302	350	236	534	279	65	53	122	304	344	176	177	109	119	159	292	544	392	97	91	78	208	198	216
	23	241	224	87	59	40	45	208	322	399	494	522	280	277	230	141	108	171	211	75	77	65	60	73	63	187
	24	248	168	127	250	208	265	334	349	422	310	68	37	46	74	79	97	54	87	171	404	86	89	113	82	173
	25	66	62	56	134	429	412	351	222	336	308	75	37	44	55	89	132	125	161	321	94	59	54	47	46	155
	26	50	48	80	232	216	145	141	93	84	110	80	62	77	55	50	64	176	157	83	89	83	95	156	332	115
D	27	402	448	323	380	429	424	375	482	235	119	299	372	231	186	458	495	691	392	525	386	88	156	492	633	375
	28	435	194	108	97	86	71	39	29	28	43	66	81	77	77	77	59	47	38	49	40	47	49	48	50	80
Q	29	59	58	53	50	47	66	90	113	83	60	42	64	58	48	52	51	49	34	33	33	36	72	90	65	59
	30	60	57	63	200	268	146	86	36	53	68	52	74	78	51	52	48	60	85	69	38	57	140	90	102	84
	MEAN	159	160	154	171	210	215	211	209	245	219	221	211	213	197	196	215	241	234	232	208	192	189	190	168	202
SQ	MEAN	53	50	53	58	121	114	98	116	118	64	54	55	58	56	66	97	107	94	108	89	144	142	171	118	92
SD	MEAN	241	265	239	200	222	293	332	466	505	383	474	554	482	522	516	484	466	409	429	424	420	349	266	344	388

OCTOBER 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	195	251	188	65	121	246	131	71	47	45	85	53	50	54	112	172	105	108	351	542	348	282	172	420	169
	2	558	299	144	116	78	83	95	92	91	120	183	76	112	102	110	82	76	156	248	252	157	125	183	121	152
	3	231	182	156	226	135	95	97	112	95	98	77	85	83	82	133	370	446	258	331	415	262	398	288	425	211
D	4	347	282	216	503	629	229	360	401	343	259	494	503	277	437	162	84	163	378	381	283	282	118	178	130	303
	5	97	130	250	168	84	148	322	237	90	197	81	58	111	69	68	62	123	73	66	242	250	140	81	45	133
	6	53	146	108	99	122	187	109	94	58	65	154	233	74	85	56	46	38	34	69	203	184	232	175	44	108
Q	7	26	24	23	40	26	26	50	102	73	53	53	48	83	141	49	42	39	33	33	32	37	45	51	50	49
Q	8	42	34	34	80	59	42	29	28	37	48	46	46	38	41	39	38	41	42	50	38	38	43	46	56	43
Q	9	52	46	36	38	42	29	33	37	58	61	59	61	72	58	48	42	40	41	117	66	32	34	30	26	48
	10	26	27	33	30	101	117	198	346	163	70	50	91	43	41	63	74	151	318	562	573	506	409	361	430	198
	11	482	418	338	301	346	502	457	686	567	694	470	303	424	389	459	525	412	403	407	521	135	73	227	314	404
	12	428	408	345	485	692	422	265	431	302	368	362	256	217	168	99	49	34	36	35	40	32	21	21	32	233
	13	21	32	22	34	65	312	262	191	78	44	59	73	416	215	84	325	386	273	228	240	132	137	81	55	154
	14	179	281	207	208	183	60	84	185	725	175	169	243	199	136	56	49	53	123	156	146	177	146	122	73	151
Q	15	224	134	186	86	109	115	105	79	58	89	85	90	55	112	205	90	44	45	35	30	71	125	35	30	88
D	16	32	31	29	38	41	67	36	31	35	155	298	946	781	552	427	804	726	1011	542	498	189	192	275	395	338
D	17	290	298	343	178	217	262	549	639	538	626	452	584	642	816	724	735	961	546	758	740	455	398	594	476	538
D	18	436	487	451	418	121	109	128	369	515	345	174	217	283	142	165	374	411	244	222	202	148	258	337	146	280
	19	193	165	212	198	256	246	421	236	471	216	256	310	408	441	292	223	288	269	225	230	272	143	169	155	261
	20	186	205	196	256	228	277	320	205	260	460	411	271	383	242	224	190	123	107	43	37	35	95	82	39	203
Q	21	35	43	32	37	35	30	27	29	27	38	31	39	39	43	44	47	63	84	77	48	41	51	87	76	46
	22	188	268	276	273	246	292	231	174	420	326	323	460	418	516	634	681	789	783	517	429	382	364	257	345	399
D	23	321	325	241	153	320	391	431	271	246	247	326	283	204	268	821	459	787	391	775	602	497	357	265	255	398
	24	348	82	74	183	202	371	192	190	544	240	229	442	353	323	276	164	81	79	187	202	215	67	42	71	219
	25	54	55	118	103	36	37	167	278	169	128	165	141	221	360	238	136	384	215	76	103	86	72	36	38	138
	26	31	50	163	130	66	44	48	55	54	74	206	331	252	164	139	71	88	183	84	68	43	31	52	42	99
	27	40	39	34	48	57	50	76	64	59	44	48	38	69	82	64	53	48	34	27	29	77	291	188	88	68
	28	58	173	163	146	126	135	374	137	63	50	42	43	71	53	176	253	193	284	370	592	494	366	168	129	191
	29	131	66	36	32	58	141	207	156	57	104	72	108	114	221	136	75	192	415	525	663	518	332	457	391	216
	30	206	173	315	301	185	47	35	73	46	88	78	181	60	42	43	143	252	66	38	36	38	50	46	48	187
	31	33	40	34	27	60	48	37	37	65	168	60	33	68	79	126	201	87	62	36	85	189	60	47	39	68
	MEAN	177	165	155	161	163	164	190	192	191	182	188	212	213	209	201	228	236	224	244	261	199	174	166	160	194
SQ	MEAN	76	56	46	56	54	48	41	55	49	58	56	49	57	79	77	52	45	49	62	41	44	60	58	48	55
SD	MEAN	285	267	256	258	266	212	301	342	335	326	349	507	437	443	464	571	594	514	536	447	297	269	330	280	370

NOVEMBER 1978 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	16	20	27	26	27	25	24	23	26	42	52	122	65	42	40	42	68	59	35	26	31	36	33	30	39
	2	45	39	54	50	50	40	34	45	226	230	80	110	307	251	131	104	71	39	35	22	23	29	32	76	88
	3	140	165	145	104	108	77	95	97	180	156	49	25	43	42	127	385	343	487	417	427	277	358	226	132	189
	4	216	216	148	107	67	47	37	64	216	188	173	216	87	46	44	85	140	139	79	144	167	283	187	101	133
	5	97	201	154	88	109	123	205	147	196	160	80	110	105	64	69	199	163	87	109	249	371	426	288	234	167
	6	192	235	224	286	337	427	347	337	606	539	507	510	614	643	398	375	223	116	98	83	121	233	188	139	322
D	7	199	765	599	686	705	712	648	523	824	786	8681476		559	8391079		361	268	272	311	470	532	320	225	500	606
	8	453	194	213	257	117	92	42	74	148	252	233	274	171	227	257	206	91	62	162	204	32	38	37	46	162
	9	102	39	44	55	119	220	221	317	292	271	279	249	173	67	89	442	396	489	304	168	234	127	37	33	185
	10	92	193	281	136	219	289	101	66	56	286	565	584	407	272	376	759	442	271	273	126	178	163	61	169	265
D	11	387	486	296	316	159	163	400	305	350	493	475	215	279	312	241	388	527	188	64	74	259	310	102	90	284
	12	147	79	128	180	221	137	140	290	344	327	321	240	147	452	514	234	342	52	33	29	32	20	27	31	186
	13	30	63	162	216	71	170	196	139	31	39	181	265	337	433	401	332	417	495	415	330	288	186	243	299	236
	14	329	298	85	39	55	126	90	163	131	96	54	68	52	54	168	148	376	352	317	221	97	99	28	20	144
Q	15	24	19	16	14	15	17	16	20	30	64	77	215	119	55	36	38	35	32	57	143	231	86	38	33	60
	16	27	30	31	42	38	34	27	23	34	47	198	154	117	58	54	76	224	358	175	66	99	167	93	128	96
	17	137	163	108	205	165	45	43	46	52	55	115	195	124	56	41	43	30	32	24	23	26	30	27	32	76
	18	62	36	19	50	32	60	38	40	32	19	20	71	534	384	540	599	324	175	161	48	44	178	430	384	178
	19	277	316	398	529	422	451	400	179	146	47	71	54	40	33	44	33	28	31	23	19	20	21	26	23	151
Q	20	28	26	30	22	21	20	21	14	16	14	17	41	41	22	18	21	18	19	17	12	15	21	53	62	25
D	21	47	87	216	361	177	53	175	319	695	1021111711121			848	9311057		759	365	316	249	269	250	249	290	187	462
D	22	399	313	355	446	179	98	67	109	263	227	424	368	356	535	577	591	748	589	617	498	482	366	347	345	387
D	23	280	331	314	430	262	316	384	453	958	698	573	497	362	3861072		1044	785	607	314	342	230	230	414	250	464
	24	105	116	131	128	98	114	58	56	85	53	47	30	36	40	40	117	412	586	446	269	140	139	80	91	142
	25	116	175	193	100	62	61	76	99	117	292	151	152	154	117	167	289	330	477	492	255	137	105	95	138	181
	26	140	113	60	56	74	89	48	36	47	78	125	131	77	46	82	301	329	147	80	166	472	123	98	41	122
	27	38	47	103	72	82	84	78	101	112	387	259	263	374	594	168	99	62	237	264	81	182	212	227	169	177
	28	83	55	59	99	152	313	158	51	49	47	90	97	162	102	273	426	105	36	42	78	52	89	34	41	112
Q	29	27	23	26	48	42	33	29	32	42	38	44	88	54	34	30	29	60	68	44	67	28	22	18	20	39
Q	30	20	17	11	26	33	37	34	30	36	42	41	45	33	30	31	25	57	55	42	42	38	32	28	40	34
	MEAN	139	162	155	173	141	150	141	140	195	233	243	266	226	239	272	281	260	226	188	164	167	157	134	129	191
SQ	MEAN	23	21	22	27	28	28	25	24	30	40	46	102	62	37	31	31	48	47	39	56	69	39	34	37	39
SD	MEAN	246	396	358	448	296	272	335	342	522	645	698	733	481	601	805	629	543	394	311	331	351	295	276	274	441

DECEMBER 1970 AE INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	21	17	13	21	16	19	19	20	25	29	31	34	30	28	30	32	47	44	21	16	17	20	25	24	25
	2	27	29	23	24	24	25	16	15	13	25	27	31	25	28	37	75	91	115	129	252	202	66	43	31	57
	3	65	169	163	41	31	41	64	138	272	175	52	25	20	24	23	49	108	48	21	21	23	72	113	74	76
	4	36	26	17	21	17	24	31	67	103	79	41	47	134	143	38	54	43	41	43	63	201	444	315	277	96
	5	237	194	215	189	173	214	169	152	305	371	129	103	115	214	224	330	136	57	36	27	21	22	25	27	154
	6	27	70	101	109	39	64	148	181	340	268	335	163	90	414	562	415	510	375	255	251	187	92	40	38	209
	7	59	43	40	52	103	67	170	125	75	74	135	176	479	339	291	223	171	191	152	289	316	362	335	311	191
O	8	384	438	453	568	414	239	202	434	336	239	536	417	478	691	509	78	58	183	335	388	284	124	163	99	329
	9	90	125	104	83	84	161	115	92	97	59	260	234	69	97	138	115	94	122	64	26	17	20	22	22	96
Q	10	35	24	19	21	29	19	22	19	104	190	106	119	229	299	161	104	115	68	102	184	88	52	23	19	90
Q	11	28	21	20	32	21	42	65	45	72	78	35	29	36	28	31	24	25	27	89	24	11	15	17	20	34
	12	21	28	81	46	40	37	42	44	47	163	136	178	274	229	168	86	43	40	100	57	48	83	192	142	97
	13	109	73	53	60	42	29	29	33	60	43	33	27	28	27	20	18	44	181	180	43	20	49	171	281	69
D	14	138	226	335	237	405	924	821	952	949	451	428	316	373	182	168	146	68	133	648	523	382	394	527	297	416
D	15	128	289	431	179	131	235	339	455	426	403	343	318	149	406	259	397	320	208	237	103	87	77	79	117	255
	16	97	105	91	72	59	52	92	73	40	41	31	71	82	51	54	56	70	101	86	52	43	41	65	169	71
Q	17	131	91	60	53	70	47	68	70	78	106	127	169	89	52	101	92	64	45	25	45	68	75	44	37	75
	18	34	29	31	32	39	55	105	81	87	52	27	31	40	89	44	33	42	59	35	29	37	38	32	37	47
	19	66	38	52	74	35	38	117	136	331	451	138	46	45	46	38	24	18	27	57	136	119	121	430	211	116
	20	70	67	72	55	111	161	221	315	507	551	450	321	172	198	216	98	64	55	85	187	199	115	110	76	186
	21	131	141	100	62	76	97	148	198	168	160	128	108	173	87	48	24	22	28	25	37	102	190	149	105	104
	22	118	195	155	127	113	153	124	143	210	136	111	82	115	166	122	169	161	82	77	70	103	137	179	65	130
	23	52	74	137	176	117	66	77	39	43	34	87	234	162	183	158	161	103	91	47	25	21	35	40	141	98
O	24	363	426	401	363	193	137	114	73	110	199	59	47	68	132	234	186	52	33	39	128	158	94	61	71	156
	25	117	74	33	28	29	25	25	27	27	22	23	28	35	36	59	129	204	161	96	81	209	57	64	124	71
	26	40	37	43	59	56	177	189	116	154	86	43	28	24	54	74	95	134	67	31	33	39	90	71	50	74
	27	34	41	55	95	65	36	47	54	91	132	129	91	78	327	204	304	278	232	195	234	273	496	458	366	179
D	28	387	338	282	276	131	137	187	103	81	261	190	183	540	425	238	337	650	542	494	548	452	393	318	369	324
	29	226	62	82	118	146	203	161	137	172	126	49	36	70	114	133	147	213	280	380	169	99	111	210	449	159
	30	371	263	371	476	331	182	49	45	39	46	27	27	24	32	46	76	521	343	60	36	40	58	30	27	143
Q	31	29	27	20	50	21	15	15	12	17	20	28	27	33	30	24	27	27	31	24	21	24	25	26	32	25
	MEAN	118	122	126	123	102	117	128	142	174	164	138	121	138	167	142	132	148	123	134	132	123	128	141	131	134
SQ	MEAN	49	36	26	35	31	28	36	33	59	85	65	76	83	87	69	56	56	43	52	58	42	37	27	28	50
SD	MEAN	280	343	364	325	255	334	333	403	380	311	311	256	322	367	282	229	238	202	351	338	257	216	230	183	296

JANUARY 1978 AL INDICES

VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-6	-3	-3	-3	-41	-104	-44	-35	-21	-7	-3	-14	-124	-132	-126	-82	-311	-352	-99	-9	-9	-26	-56	-108	-72
D	2	-54	-42	-87	-283	-286	-219	-180	-368	-431	-262	-228	-394	-578	-415	-322	-425	-150	-243	-186	-550	-311	-168	-299	-292	-282
	3	-230	-100	-119	-85	-38	-8	-89	-158	-233	-151	-138	-71	-116	-210	-102	-18	-36	-53	-28	-22	-41	-135	-62	-15	-94
Q	4	-14	-15	-10	-12	-10	-14	-40	-15	-25	-56	-80	-35	-33	-26	-96	-137	-127	-28	-5	-10	-46	-113	-83	-15	-44
	5	-9	-7	-12	-11	-13	-10	-6	-3	-13	-44	-130	-77	-48	-68	-95	-57	-34	-6	0	-1	-16	-34	-51	-189	-39
	6	-92	-11	-3	-3	-16	-13	-8	-9	-12	-16	-25	-83	-182	-170	-74	-11	-11	-46	-192	-104	-31	-11	-6	-8	-47
	7	-4	-4	-10	-11	-8	-11	-14	-16	-26	-20	-8	-9	-33	-28	-29	-69	-202	-311	-363	-200	-52	-47	-5	-27	-63
	8	-64	-76	-30	-25	-23	-11	-5	-11	-15	-21	-61	-51	-14	-37	-13	-29	-75	-145	-65	-5	1	4	-16	-45	-35
D	9	-202	-149	-35	-17	-46	-65	-8	-73	-158	-67	-15	-16	-25	-21	-104	-85	-151	-207	-115	-32	-24	-41	-91	-94	-77
	10	-105	-48	-132	-1	0	-3	-3	0	-8	-8	-12	-99	-48	-89	-28	-14	-16	-55	-70	-22	-12	-6	-4	-6	-32
Q	11	-10	-14	-10	0	1	-4	-1	-3	-4	-9	-12	-27	-74	-75	-119	-13	-18	-16	-32	-48	-43	-32	-64	-110	-31
	12	-286	-101	-32	-55	-28	-8	-14	-78	-83	-45	-46	-40	-15	-17	-51	-38	-61	-206	-147	-58	-93	-295	-63	-8	-78
Q	13	-4	-6	0	-6	-11	-12	-10	0	-3	-6	-12	-10	-2	-39	-203	-250	-167	-38	-17	-11	-11	-11	-22	-9	-37
	14	-5	-7	-19	-72	-143	-64	0	-19	-15	-10	-10	-19	-24	-116	-88	-30	-20	-10	-7	-7	-6	-9	-17	-128	-35
	15	-70	-25	-4	-3	-47	14	9	0	-6	-1	-4	-6	0	-6	-6	-19	-34	-120	-43	-14	-10	-13	-26	-39	-20
D	16	-34	-122	-178	-86	-67	-112	-125	-211	-315	-263	-538	-443	-370	-431	-477	-399	-593	-537	-361	-456	-481	-391	-331	-421	-323
D	17	-421	-406	-345	-219	-380	-210	-115	-64	-68	-67	-62	-37	-48	-26	-28	-64	-84	-69	-55	-83	-61	-29	-21	-22	-124
	18	-38	-165	-62	-32	-69	-52	-136	-85	-29	-16	-44	-45	-17	-17	-17	-46	-108	-27	-27	-19	-11	-8	-26	-16	-46
	19	-13	-13	-7	-3	-1	-2	-5	-7	-19	-35	-46	-24	-18	-22	-97	-241	-81	-52	-88	-63	-84	-225	-214	-81	-80
	20	-88	-112	-66	-21	-44	-9	-6	-6	-11	-79	-93	-80	-97	-303	-273	-50	-48	-22	-91	-252	-298	-134	-22	-15	-93
	21	-11	-7	-7	-14	-44	-56	-91	-24	-43	-110	-119	-52	-31	-250	-175	-10	-16	-18	-39	-132	-63	-123	-50	-41	-64
	22	-141	-17	-28	-28	-6	-3	-14	-18	-8	-11	-29	-57	-47	-18	-25	-44	-152	-82	-35	-60	-72	-64	-20	-11	-41
	23	-12	-28	-160	-134	-78	-62	-69	-89	-32	-10	-12	-30	-54	-43	-37	-24	-20	-32	-30	-31	-36	-33	-139	-103	-54
	24	-114	-46	-22	-20	-18	-17	-41	-107	-142	-226	-361	-186	-149	-116	-46	-131	-152	-88	-72	-22	-94	-262	-84	-47	-108
Q	25	-19	-6	-12	-17	-44	-43	0	-5	-6	-8	-10	-14	-12	-13	-36	-16	-16	-65	-39	-11	-16	-34	-12	-11	-19
Q	26	-18	-22	-41	-53	0	1	-3	-7	-67	-10	-13	-15	-15	-13	-26	-34	-37	-39	-18	-9	-13	-9	-10	-11	-20
	27	-9	-6	-39	-21	1	0	0	-11	-114	-71	-23	-32	-58	-59	-137	-73	-155	-203	-110	-99	-92	-67	-28	-62	-61
	28	-36	-7	-5	0	0	0	-1	-2	-3	-8	-14	-2	-8	-16	-4	-8	-10	-12	-36	-125	-58	-21	-23	-216	-25
	29	-105	-45	-21	-23	-20	-50	-146	-159	-114	-26	0	-4	-10	-14	-11	-11	-9	-18	-9	1	0	0	0	-47	-35
D	30	-144	-27	-8	-19	-75	-141	-273	-83	-38	-21	-119	-61	-69	-44	-21	-114	-267	-64	-213	-188	-23	-146	-21	-94	-95
	31	-197	-324	-276	-126	-52	-13	0	-1	-4	-7	-9	-33	-6	-7	-11	-24	-45	-13	-80	-102	-37	-8	-6	-11	-58
	MEAN	-82	-62	-58	-45	-52	-42	-47	-54	-67	-55	-74	-67	-75	-92	-93	-83	-184	-102	-86	-89	-69	-80	-60	-74	-71
	SQ MEAN	-11	-13	-15	-18	-13	-14	-11	-6	-21	-18	-25	-20	-31	-33	-96	-90	-73	-37	-22	-18	-26	-40	-38	-31	-38
	SD MEAN	-171	-149	-131	-125	-171	-149	-140	-160	-202	-136	-192	-160	-218	-187	-190	-217	-291	-224	-186	-262	-188	-155	-153	-185	-180

FEBRUARY 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-14	-80	-92	-24	-125	-111	-32	-7	-1	-4	-2	-5	-7	-13	-13	-19	-32	-33	-24	-14	-8	-35	-176	-293	-49
D	2	-132	-27	-10	-119	-188	-94	-78	-83	-98	-239	-229	-360	-387	-152	-11	-21	-109	-254	-257	-371	-339	-163	-216	-486	-181
	3	-155	-151	-21	-42	-51	-18	-7	-11	-13	-22	-85	-96	-164	-47	-15	-39	-18	-16	-14	-13	-5	-7	-5	-6	-43
D	4	-8	-10	-11	-8	-7	-7	-39	-33	-121	-289	-54	-124	-221	-383	-247	-82	-276	-467	-269	-130	-91	-168	-43	-53	-131
	5	-41	-103	-125	-134	-71	-61	0	-3	-26	-26	-34	-42	-169	-329	-234	-69	-87	-129	-56	-29	-54	-83	-254	-204	-98
	6	-59	-13	-9	-16	-23	-12	0	-79	-43	-13	-6	-7	-10	-10	-10	-12	-15	-34	-62	-81	-25	-7	-4	-5	-23
	7	-7	-9	-4	-3	-3	-4	-7	-5	-6	-7	-6	-7	-13	-18	-12	-14	-12	-9	-7	-16	-17	-11	-9	-8	-9
Q	8	-8	-7	-9	-16	-2	-1	-4	-4	-4	-6	-6	-7	-12	-26	-55	-81	-104	-98	-98	-86	-55	-34	-16	-7	-29
Q	9	-5	-7	-27	-37	-7	-8	-36	-16	-7	-7	-8	-15	-17	-18	-61	-124	-85	-84	-49	-9	-5	-6	-5	-4	-27
	10	-3	-3	-4	-4	2	24	-11	-44	-26	-5	-5	-5	-14	-35	-76	-348	-391	-335	-289	-22	-20	-15	-17	-12	-68
Q	11	-10	-8	-9	-4	-9	-4	-5	-30	-79	-39	-12	-11	-18	-21	-17	-32	-66	-58	-38	-29	-13	-24	-20	-15	-24
	12	-11	-8	-4	-3	-3	-2	-3	-4	-6	-6	-8	-9	-11	-23	-19	-26	-26	-22	-20	-11	-10	-16	-18	-16	-12
	13	-10	-11	-9	-3	-7	-48	1	0	1	-5	-9	-19	-98	-180	-122	-8	-4	-8	-18	-3	-7	-5	-8	-10	-24
D	14	-13	-12	-84	-323	-152	-111	-27	-38	-38	-67	-255	-301	-117	-128	-249	-284	-210	-109	-17	-11	-9	-12	-9	-12	-108
	15	-10	-15	-94	-99	-124	-190	-209	-112	-74	-59	-253	-92	-5	-23	-47	-120	-71	-145	-223	-181	-29	-2	-10	-14	-92
	16	-8	-5	-13	-7	-2	-10	-22	-121	-143	-64	-46	-137	-180	-142	-188	-78	-14	-13	-5	-18	-23	-35	-60	-48	-58
	17	-6	-7	-15	-8	-3	-1	0	-1	-1	-7	-140	-130	-42	-24	-20	-43	-210	-369	-337	-369	-248	-248	-238	-92	-107
	18	-30	-59	-82	-52	-142	-62	-37	-147	-49	-27	-8	-33	-21	-212	-440	-108	-21	-35	-152	-49	-69	-51	-173	-119	-91
	19	-71	-91	-15	-9	-5	-4	-9	-19	-11	-6	-14	-98	-144	-45	-47	-43	-44	-18	-4	-9	-13	-19	-18	-18	-32
	20	-11	-3	-2	-5	-6	-5	-7	-8	-8	-9	-13	-14	-15	-26	-162	-137	-39	-29	-19	-72	-34	-17	-15	-14	-29
Q	21	-8	-9	-23	-16	-1	-8	-16	-16	-27	-23	-13	-19	-24	-23	-17	-17	-16	-24	-12	-11	-34	-18	-17	-22	-17
Q	22	-13	-17	-22	-19	-7	-9	-10	-11	-11	-12	-15	-13	-23	-29	-18	-27	-23	-19	-50	-67	-44	-23	-21	-18	-22
	23	-12	-9	-8	-4	0	-1	-8	-7	-3	-6	-9	-13	-19	-15	-12	-14	-13	-20	-12	-6	-4	-3	-6	-7	-9
D	24	-4	-4	-17	-112	-12	-1	-17	-127	-102	-14	-136	-84	-18	-10	-17	-158	-579	-496	-153	-14	-12	-14	-16	-19	-89
	25	-14	-33	-30	-6	-2	-21	-42	-34	-9	-12	-15	-14	-13	-14	-16	-36	-81	-70	-9	-4	-1	-7	-13	-13	-21
	26	-21	-91	-138	-99	-96	-99	-165	-222	-235	-213	-244	-263	-427	-423	-309	-167	-39	-91	-30	-23	-20	-27	-25	-28	-146
	27	-24	-23	-21	-21	-36	-87	-80	-104	-157	-126	-145	-148	-94	-131	-110	-56	-96	-187	-63	-30	-127	-369	-214	-248	-112
D	28	-420	-449	-290	-42	-7	-62	-148	-187	-135	-57	-151	-256	-223	-243	-100	-120	-281	-248	-206	-133	-21	-41	-25	-157	-168
	MEAN	-46	-45	-42	-44	-39	-38	-39	-53	-51	-49	-69	-83	-90	-98	-95	-81	-103	-123	-88	-65	-46	-52	-59	-67	-65
SQ	MEAN	-9	-10	-13	-10	-4	-5	-8	-13	-25	-17	-10	-11	-18	-24	-24	-34	-44	-42	-33	-41	-33	-22	-17	-14	-20
SD	MEAN	-115	-100	-82	-121	-73	-59	-62	-92	-99	-133	-165	-225	-193	-183	-129	-133	-275	-315	-208	-132	-94	-80	-82	-129	-135

MARCH 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-259	-88	-68	-109	-66	-58	-150	-337	-320	-336	-270	-218	-143	-273	-537	-418	-73	-48	-53	-51	-59	-96	-73	-119	-180
	2	-189	-307	-297	-124	-203	-366	-113	-69	-175	-439	-340	-274	-49	-22	-31	-85	-62	-217	-63	-16	-29	-15	-86	-202	-157
	3	-83	-29	-37	-25	-30	-45	-82	-23	-244	-73	-16	-14	-16	-42	-160	-90	-181	-518	-335	-325	-224	-338	-137	-61	-130
	4	-78	-85	-176	-67	-40	-36	-66	-65	-178	-317	-253	-444	-493	-481	-493	-450	-363	-422	-470	-394	-260	-209	-135	-284	-261
	5	-116	-38	-21	-16	-18	-15	-54	-63	-106	-23	-21	-15	-15	-18	-28	-60	-175	-269	-530	-475	-321	-312	-173	-203	-128
D	6	-244	-204	-116	-36	-7	-5	-19	-81	-334	-293	-671	-165	-80	-67	-167	-199	-299	-319	-372	-289	-475	-483	-581	-566	-253
D	7	-455	-375	-347	-306	-262	-17	-43	-116	-326	-483	-461	-362	-211	-264	-457	-745	-454	-507	-706	-496	-141	-60	-112	-344	-335
D	8	-258	-223	-326	-725	-752	-783	-425	-383	-375	-182	-431	-473	-369	-537	2255	1630	-383	-117	-743	1216	-633	-552	-326	-223	-597
D	9	-117	-138	-387	-675	-232	-92	-45	-81	-68	-80	-295	-342	-519	-527	-368	-581	-720	-474	-131	-99	-77	-172	-238	-370	-284
	10	-226	-55	-66	-37	-28	-29	-40	-79	-169	-87	-106	-120	-54	-33	-41	-51	-120	-116	-237	-212	-242	-76	-35	-41	-96
	11	-47	-46	-44	-41	-43	-38	-38	-42	-42	-48	-39	-42	-45	-36	-84	-48	-50	-43	-36	-52	-153	-148	-113	-60	-57
	12	-39	-65	-81	-201	-108	-69	-126	-210	-187	-203	-327	-210	-120	-44	-39	-38	-46	-37	-25	-20	-14	-19	-26	-24	-96
	13	-28	-28	-29	-30	-36	-27	-89	-212	-72	-67	-343	-106	-65	-212	-310	-199	-94	-28	-37	-202	-233	-37	-21	-28	-106
	14	-32	-51	-110	-43	-32	-27	-20	-20	-22	-33	-37	-36	-33	-28	-22	-21	-24	-21	-19	-15	-14	-18	-24	-30	-31
	15	-32	-110	-119	-118	-176	-200	-137	-58	-43	-40	-115	-79	-26	-19	-124	-256	-104	-21	-27	-126	-78	-32	-19	-28	-87
Q	16	-23	-23	-28	-31	-27	-24	-31	-32	-27	-63	-106	-42	-45	-65	-116	-48	-30	-26	-26	-17	-14	-33	-28	-29	-39
	17	-29	-26	-25	-38	-29	-21	-49	-28	-28	-32	-35	-29	-25	-72	-126	-57	-83	-103	-218	-94	-13	-15	-64	-81	-56
	18	-152	-78	-31	-38	-30	-24	-32	-31	-28	-22	-73	-219	-221	-81	-27	-98	-213	-43	-75	-77	-62	-176	-235	-92	-90
	19	-54	-39	-47	-39	-25	-18	-27	-89	-71	-31	-35	-30	-74	-120	-40	-32	-33	-42	-80	-32	-59	-261	-102	-67	-60
	20	-61	-27	-28	-30	-26	-23	-29	-31	-28	-27	-25	-71	-129	-78	-33	-60	-48	-27	-60	-247	-64	-38	-69	-79	-56
Q	21	-60	-71	-92	-100	-28	-16	-32	-33	-21	-27	-34	-33	-42	-30	-40	-150	-179	-114	-39	-9	-11	-15	-17	-21	-52
Q	22	-28	-27	-26	-29	-25	-20	-21	-47	-39	-26	-40	-104	-35	-27	-30	-28	-27	-9	-5	-23	-11	-13	-27	-35	-29
	23	-37	-38	-33	-24	-22	-21	-23	-17	-122	-162	-58	-26	-11	-27	-51	-39	-68	-51	-50	-81	-21	-20	-30	-35	-44
Q	24	-36	-32	-28	-20	-23	-27	-28	-27	-28	-33	-33	-33	-25	-25	-16	-17	-23	-17	-4	-1	-7	-17	-28	-29	-23
Q	25	-34	-38	-31	-32	-25	-19	-32	-80	-34	-26	-29	-23	-34	-32	-20	-24	-23	-20	-22	-18	-12	-14	-21	-28	-28
	26	-30	-31	-76	-88	-135	-107	-40	-37	-41	-31	-35	-42	-29	-26	-27	-90	-94	-54	-59	-58	-53	-27	-21	-23	-52
	27	-25	-28	-33	-38	-30	-28	-32	-10	-10	-38	-57	-79	-64	-56	-51	-36	-36	-60	-179	-175	-94	-189	-421	-286	-86
	28	-135	-121	-123	-375	-267	-317	-267	-154	-136	-352	-611	-489	-254	-212	-339	-314	-276	-106	-77	-298	-187	-159	-249	-455	-261
	29	-319	-140	-262	-221	-218	-90	-100	-184	-125	-61	-73	-112	-408	-294	-258	-382	-275	-264	-229	-273	-180	-108	-108	-257	-202
	30	-321	-20	-16	-17	-25	-80	-203	-174	-225	-141	-256	-378	-298	-219	-75	-107	-331	-118	-61	-45	-138	-236	-32	-20	-147
D	31	-24	-48	-93	-160	-207	-74	-130	-424	-409	-343	-539	-411	-173	-160	-554	-498	-230	-116	-60	-73	-148	-86	-258	-365	-233
	MEAN	-116	-85	-103	-127	-102	-88	-81	-104	-130	-133	-186	-161	-132	-131	-223	-221	-165	-140	-162	-178	-138	-126	-123	-145	-137
SQ	MEAN	-40	-36	-41	-42	-26	-22	-29	-44	-30	-35	-49	-47	-37	-36	-44	-53	-56	-37	-19	-14	-11	-15	-24	-28	-34
SD	MEAN	-220	-198	-254	-380	-292	-194	-132	-213	-302	-276	-479	-351	-270	-315	-760	-730	-417	-307	-402	-434	-293	-271	-301	-374	-340

APRIL 1978 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-46	-61	-65	-100	-82	-47	-87	-77	-86	-54	-45	-42	-83	-44	-44	-45	-50	-49	-45	-38	-27	-34	-54	-40	-56
	2	-33	-33	-31	-35	-24	-32	-37	-41	-40	-66	-91	-43	-48	-97	-246	-182	-52	-47	-75	-39	-25	-67	-92	-110	-64
	3	-70	-67	-56	-101	-252	-212	-203	-87	-39	-106	-228	-164	-164	-281	-75	-135	-169	-96	-12	-6	-5	-13	-28	-27	-104
	4	-70	-78	-235	-116	-28	-30	-52	-228	-230	-90	-43	-156	-238	-56	-42	-41	-43	-36	-29	-20	-18	-30	-40	-46	-83
	5	-35	-31	-26	-27	-21	-23	-21	-17	-63	-270	-252	-292	-120	-63	-60	-68	-116	-93	-25	-14	-1	-11	-20	-28	-71
D	6	-27	-65	-126	-169	-262	-195	-449	-258	-117	-176	-760	-500	-247	-220	-256	-283	-216	-185	-52	-4	-28	-139	-233	-95	-208
	7	-39	-172	-118	-13	-21	-119	-256	-118	-368	-125	-36	-43	-47	-34	-38	-33	-32	-28	-54	-13	-10	-17	-22	-31	-74
	8	-262	-190	-28	-39	-159	-136	-24	-24	-99	-296	-269	-73	-37	-131	-48	-35	-69	-73	-34	-27	-20	-48	-147	-125	-100
	9	-38	-27	-20	-75	-251	-120	-135	-139	-321	-198	-85	-318	-339	-439	-80	-51	-45	-68	-32	-8	-4	-71	-126	-98	-129
Q	10	-68	-27	-23	-23	-26	-26	-31	-36	-34	-30	-33	-31	-27	-28	-41	-45	-47	-35	-26	-20	-17	-38	-102	-143	-40
	11	-178	-133	-126	-95	-116	-67	-59	-84	-288	-267	-198	-249	-68	-43	-54	-47	-41	-71	-140	-77	-15	-17	-17	-17	-103
	12	-21	-24	-29	-41	-82	-112	-205	-207	-150	-76	-53	-43	-37	-39	-71	-159	-162	-141	-62	-9	-10	-24	-18	-29	-75
Q	13	-28	-25	-23	-25	-28	-27	-22	-29	-25	-33	-34	-68	-118	-105	-87	-13	-17	-23	-12	-6	-13	-21	-24	-30	-35
Q	14	-26	-27	-30	-38	-30	-27	-22	-23	-30	-38	-42	-44	-42	-45	-52	-29	-25	-18	-19	-7	-14	-18	-48	-45	-31
Q	15	-23	-23	-16	-24	-24	-19	-19	-12	-27	-66	-36	-39	-37	-35	-44	-59	-193	-317	-379	-160	-232	-93	-76	-93	-85
	16	-303	-210	-89	-133	-217	-210	-108	-90	-46	-37	-40	-37	-34	-32	-29	-25	-19	-12	-14	-119	-481	-519	-435	-452	-154
D	17	-463	-334	-280	-233	-343	-159	-66	-35	-117	-421	-250	-117	-101	-342	-316	-266	-194	-274	-326	-151	-316	-541	-228	-41	-246
	18	-35	-26	-35	-28	-19	-17	-19	-17	-51	-202	-468	-492	-537	-533	-338	-94	-123	-53	-66	-28	-32	-293	-521	-532	-198
	19	-222	-334	-419	-389	-240	-128	-351	-494	-397	-266	-470	-458	-191	-61	-34	-79	-103	-145	-94	-43	-62	-116	-19	-11	-215
D	20	-18	-44	-122	-240	-270	-148	-62	-34	-27	-33	-67	-156	-341	-485	-143	-228	-308	-470	-339	-3	-23	-40	-122	-177	-159
D	21	-126	-265	-132	-98	-236	-367	-408	-298	-475	-353	-506	-529	-721	-561	-593	-620	-868	-909	-588	-317	-477	-704	-491	-393	-460
D	22	-629	-689	-577	-617	-363	-413	-254	-187	-218	-424	-225	-119	-85	-82	-73	-81	-95	-39	-20	-30	-28	-32	-37	-46	-223
	23	-69	-93	-143	-78	-40	-175	-286	-150	-54	-138	-242	-265	-529	-528	-395	-262	-158	-301	-408	-359	-224	-67	-299	-359	-234
	24	-169	-181	-339	-290	-155	-211	-253	-242	-165	-131	-154	-208	-275	-269	-187	-560	-347	-353	-324	-96	-137	-124	-98	-51	-220
	25	-425	-276	-185	-217	-295	-173	-219	-175	-269	-314	-231	-337	-213	-196	-122	-178	-78	-18	-59	-219	-216	-139	-173	-211	-205
	26	-242	-214	-113	-157	-35	-39	-40	-28	-28	-38	-46	-38	-133	-263	-178	-73	-63	-151	-241	-455	-321	-223	-174	-340	-151
	27	-382	-198	-150	-165	-77	-153	-207	-55	-26	-28	-36	-146	-140	-118	-106	-94	-57	-74	-185	-97	-7	-20	-27	-36	-107
Q	28	-124	-366	-222	-155	-113	-132	-105	-94	-61	-32	-29	-43	-109	-116	-65	-52	-30	-25	-13	-12	-26	-68	-42	-32	-66
	29	-32	-49	-102	-113	-113	-120	-71	-25	-78	-179	-82	-85	-219	-289	-181	-75	-196	-263	-330	-108	-29	-71	-206	-100	-130
	30	-43	-112	-414	-438	-361	-114	-215	-149	-266	-339	-200	-102	-39	-38	-144	-227	-301	-146	-115	-61	-102	-108	-193	-230	-185
	MEAN	-142	-146	-142	-142	-143	-125	-143	-114	-140	-161	-174	-175	-177	-180	-138	-138	-140	-150	-137	-84	-98	-124	-135	-130	-141
SQ	MEAN	-54	-94	-63	-93	-44	-46	-40	-39	-35	-40	-35	-45	-67	-66	-58	-40	-62	-64	-90	-41	-60	-48	-58	-69	-55
SD	MEAN	-253	-279	-247	-271	-295	-256	-248	-162	-191	-281	-362	-284	-299	-322	-276	-296	-336	-375	-265	-101	-174	-291	-221	-136	-259

MAY 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-68	-38	-36	-39	-51	-85	-225	-183	-56	-24	-32	-32	-61	-291	-163	-71	-60	-31	-60	-141	-293	-236	-191	-157	-106
	2	-215	-62	-36	-82	-183	-61	-59	-113	-176	-62	-47	-36	-29	-30	-23	-27	-69	-128	-179	-126	-40	-52	-97	-163	-87
	3	-61	-31	-27	-28	-26	-27	-26	-26	-33	-29	-40	-89	-211	-291	-166	-100	-64	-143	-217	-55	-75	-101	-400	-233	-100
	4	-133	-45	-39	-33	-31	-28	-23	-27	-72	-84	-104	-67	-78	-49	-59	-109	-184	-175	-44	-19	-27	-26	-34	-64	-65
	5	-76	-60	-36	-49	-34	-16	-27	-40	-33	-124	-420	-422	-137	-110	-162	-144	-90	-121	-71	-45	-17	-49	-53	-190	-105
	6	-144	-45	-42	-42	-34	-37	-33	-36	-41	-71	-85	-63	-120	-183	-80	-43	-108	-67	-43	-42	-5	-16	-26	-21	-56
	7	-30	-26	-23	-25	-29	-32	-31	-32	-31	-36	-52	-75	-84	-98	-41	-32	-36	-48	-58	-98	-47	-27	-30	-33	-44
Q	8	-38	-73	-38	-30	-31	-27	-28	-26	-31	-38	-37	-34	-29	-27	-21	-29	-82	-237	-137	-100	-87	-75	-69	-105	-60
Q	9	-79	-80	-60	-53	-111	-111	-73	-63	-33	-23	-39	-44	-45	-43	-39	-68	-94	-74	-49	-65	-32	-27	-29	-33	-57
Q	10	-28	-23	-25	-67	-66	-31	-23	-32	-66	-44	-43	-34	-39	-33	-39	-46	-40	-22	-14	-20	-18	-23	-28	-30	-35
Q	11	-29	-26	-22	-27	-34	-34	-36	-39	-29	-29	-38	-42	-48	-45	-37	-34	-24	-22	-16	-25	-24	-51	-68	-158	-39
D	12	-101	-86	-98	-125	-134	-48	-16	-38	-42	-68	-177	-245	-271	-324	-314	-239	-300	-273	-235	-171	-291	-370	-227	-89	-178
	13	-81	-93	-291	-377	-299	-129	-98	-36	-24	-16	-185	-123	-21	-30	-51	-60	-27	-15	-9	-28	-36	-22	-55	-99	-92
	14	-77	-136	-48	-103	-146	-134	-165	-234	-168	-77	-24	-29	-38	-27	-31	-72	-221	-439	-403	-444	-354	-181	-124	-218	-163
	15	-213	-212	-77	-58	-39	-78	-67	-34	-142	-349	-219	-43	-32	-39	-40	-42	-23	-89	-64	-85	-89	-41	-39	-41	-98
	16	-78	-44	-49	-51	-53	-155	-148	-52	-161	-51	-19	-18	-29	-54	-172	-153	-188	-278	-96	-77	-85	-49	-38	-161	-94
	17	-278	-135	-37	-28	-146	-362	-199	-41	-11	-17	-31	-112	-140	-267	-178	-14	-13	-24	5	-12	-3	-17	-24	-114	-91
	18	-74	-54	-135	-126	-15	-17	-14	-18	-17	-22	-21	-21	-29	-30	-33	-19	-64	-1	5	3	1	-17	-17	-22	-32
	19	-33	-35	-31	-56	-122	-99	-209	-217	-168	-250	-257	-153	-124	-75	-11	-15	-30	-93	-74	-22	-31	-145	-126	-49	-101
D	20	-157	-184	-133	-104	-267	-302	-108	-43	-28	-151	-237	-150	-169	-266	-148	-277	-302	-264	-124	-94	-282	-203	-145	-215	-181
	21	-268	-254	-246	-305	-258	-184	-159	-145	-117	-164	-220	-145	-99	125	-183	-200	-78	-72	-125	-136	-111	-46	-60	-135	-168
	22	-203	-229	-283	-126	-97	-47	-94	-99	-24	-20	-30	-79	-76	-73	-175	-182	-195	-314	-284	-110	-98	-71	-42	-38	-119
	23	-37	-42	-47	-46	-40	-34	-17	-36	-189	-125	-89	-111	-95	-27	-49	-75	-54	-140	-176	-129	-95	-121	-296	-221	-94
	24	-163	-127	-59	-55	-41	-39	-28	-23	-43	-82	-125	-164	-71	-74	-106	-111	-133	-104	-22	-16	-41	-63	-70	-153	-79
	25	-173	-254	-181	-229	-266	-255	-257	-58	-33	-27	-50	-104	-247	-242	-250	-118	-175	-178	-114	-56	-83	-79	-117	-58	-150
Q	26	-24	-34	-38	-35	-31	-22	-17	-30	-33	-47	-51	-49	-34	-31	-45	-109	-92	-65	-82	-54	-42	-41	-55	-28	-45
D	27	-35	-38	-37	-77	-73	-108	-199	-103	-168	-156	-49	-54	-193	-317	-176	-125	-338	-469	-417	-325	-458	-429	-525	-476	-221
D	28	-224	-596	-241	-50	-26	-23	-27	-20	-45	-155	-600	-544	-573	-692	-435	-320	-296	-111	-85	-144	-71	-55	-40	-133	-228
D	29	-242	-190	-90	-57	-196	-191	-272	-389	-237	-73	-90	-82	-155	-128	-43	-48	-72	-66	-8	-113	-124	-79	-46	-97	-129
	30	-194	-117	-76	-86	-148	-141	-50	-43	-174	-515	-432	-151	-83	-76	-48	-115	-129	-195	-150	-56	-26	-36	-48	-40	-130
	31	-50	-46	-54	-45	-80	-35	-39	-71	-112	-168	-112	-50	-185	-247	-160	-113	-103	-44	-49	-43	-37	-36	-44	-54	-82
	MEAN	-117	-110	-82	-84	-99	-93	-88	-76	-82	-99	-128	-109	-113	-135	-112	-100	-119	-139	-110	-92	-95	-98	-102	-117	-104
SQ	MEAN	-48	-47	-37	-42	-55	-45	-35	-38	-38	-36	-42	-41	-39	-36	-36	-57	-66	-84	-60	-53	-41	-43	-58	-71	-47
SD	MEAN	-152	-219	-128	-83	-139	-133	-116	-119	-104	-121	-231	-215	-272	-345	-223	-202	-262	-237	-174	-169	-245	-226	-197	-282	-188

JUNE 1978 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	-55	-69	-198	-413	-320	-191	-135	-75	-65	-413	-156	-179	-204	-334	-471	-414	-281	-323	-185	-146	-119	-205	-231	-130	-221
	2	-171	-86	-117	-192	-151	-99	-41	-46	-32	-19	-40	-36	-58	-70	-70	-115	-185	-137	-130	-143	-161	-117	-105	-195	-105
	3	-79	-77	-230	-231	-327	-318	-217	-119	-225	-269	-267	-249	-315	-147	-178	-193	-159	-49	-112	-199	-119	-139	-131	-228	-190
	4	-210	-286	-296	-97	-282	-158	-118	-160	-198	-181	-157	-118	-143	-154	-276	-180	-84	-59	-62	-19	-25	-29	-141	-207	-148
	5	-64	-56	-138	-256	-126	-195	-243	-246	-160	-51	-64	-93	-50	-20	-18	-20	-19	-38	-20	-15	-27	-25	-22	-23	-85
Q	6	-29	-31	-35	-39	-74	-69	-40	-73	-70	-42	-109	-44	-39	-32	-20	-41	-30	-14	0	-12	-7	-10	-8	-10	-37
	7	-22	-24	-32	-35	-78	-32	-29	-26	-34	-53	-47	-33	-34	-34	-36	-32	-28	-23	-61	-205	-299	-179	-202	-484	-85
	8	-264	-272	-347	-195	-167	-329	-345	-78	-48	-44	-99	-137	-194	-63	-25	-22	-24	-26	-95	-114	-64	-81	-125	-77	-134
	9	-61	-49	-79	-128	-45	-24	-30	-33	-93	-68	-39	-32	-35	-32	-44	-51	-34	-44	-73	-159	-180	-164	-156	-77	-72
	10	-48	-43	-82	-72	-43	-36	-45	-109	-140	-81	-106	-60	-31	-62	-104	-87	-95	-171	-155	-146	-157	-99	-27	-37	-85
Q	11	-81	-111	-179	-92	-30	-33	-35	-46	-57	-37	-35	-33	-34	-29	-32	-50	-42	-150	-131	-106	-69	-38	-36	-36	-64
Q	12	-58	-81	-81	-103	-108	-75	-65	-34	-67	-74	-101	-80	-63	-84	-46	-17	-25	-28	-49	-82	-80	-74	-76	-67	-67
	13	-65	-49	-44	-48	-85	-35	-113	-245	-183	-258	-333	-286	-349	-374	-284	-92	-53	-111	-138	-87	-125	-134	-96	-74	-151
	14	-96	-132	-167	-241	-142	-100	-53	-56	-54	-43	-40	-33	-22	-19	-24	-43	-39	-48	-56	-258	-108	-24	-37	-79	-80
	15	-325	-298	-222	-131	-69	-169	-209	-184	-285	-285	-305	-370	-256	-288	-128	-112	-92	-155	-121	-61	-58	-282	-153	-156	-196
	16	-186	-159	-180	-184	-155	-280	-154	-29	-20	-22	-29	-30	-82	-43	-79	-58	-66	-60	-36	-62	-117	-51	-92	-148	-97
	17	-46	-25	-30	-34	-32	-15	-36	-41	-27	-37	-41	-56	-179	-258	-135	-45	-67	-213	-266	-371	-379	-279	-264	-334	-131
D	18	-307	-243	-35	-39	-36	-47	-47	-184	-385	-425	-621	-586	-615	-484	-445	-428	-313	-163	-98	-229	-286	-309	-414	-262	-292
	19	-241	-290	-299	-132	-38	-60	-161	-53	-43	-100	-133	-87	-52	-55	-63	-59	-39	-41	-95	-117	-76	-261	-292	-374	-131
D	20	-488	-544	-419	-347	-425	-354	-277	-386	-428	-375	-322	-368	-364	-353	-356	-521	-528	-448	-289	-283	-467	-421	-397	-447	-408
D	21	-485	-408	-459	-448	-404	-397	-470	-453	-403	-273	-235	-337	-194	-294	-252	-211	-179	-115	-46	-17	-13	-50	-27	-34	-259
Q	22	-51	-84	-60	-63	-45	-51	-49	-51	-36	-40	-50	-90	-52	-42	-39	-47	-24	-17	-26	-87	-106	-89	-80	-52	-55
Q	23	-65	-115	-51	-45	-50	-77	-69	-29	-68	-40	-38	-42	-30	-23	-21	-27	-28	-29	-22	-13	-29	-39	-28	-33	-42
	24	-31	-99	-54	-36	-35	-65	-31	-36	-54	-26	-27	-29	-24	-23	-48	-29	-22	-9	-25	-48	-232	-85	-93	-158	-65
	25	-195	-310	-74	-28	-28	-29	-123	-75	-85	-115	-147	-230	-244	-239	-133	-126	-77	-37	-68	-64	-58	-68	-188	-138	-120
	26	-23	-28	-41	-65	-144	-162	-152	-275	-313	-269	-118	-36	-54	-35	-45	-228	-318	-214	-312	-436	-298	-139	-99	-72	-162
D	27	-87	-55	-155	-440	-401	-206	-168	-181	-457	-599	-217	-124	-447	-347	-175	-27	-44	-140	-58	-23	-59	-74	-70	-33	-191
	28	-50	-168	-329	-184	-141	-201	-108	-57	-33	-56	-210	-284	-340	-350	-245	-92	-23	-56	-54	-27	-42	-42	-55	-56	-134
	29	-34	-26	-27	-31	-35	-99	-141	-231	-67	-25	-30	-40	-30	-32	-19	-92	-210	-228	-175	-250	-263	-247	-152	-85	-107
	30	-40	-40	-35	-31	-29	-32	-41	-210	-258	-232	-209	-146	-132	-35	-25	-16	-9	-1	2	-6	-8	-21	-25	-46	- 68
	MEAN	-132	-142	-190	-146	-132	-131	-127	-127	-146	-152	-144	-142	-156	-145	-128	-116	-105	-105	-97	-126	-134	-126	-127	-138	-132
SQ	MEAN	-57	-84	-81	-68	-61	-61	-52	-47	-60	-47	-67	-58	-44	-42	-32	-36	-30	-48	-46	-60	-58	-50	-46	-40	-53
SD	MEAN	-284	-264	-254	-337	-318	-239	-219	-256	-348	-417	-310	-319	-365	-362	-340	-328	-269	-236	-135	-139	-169	-212	-228	-181	-273

JULY 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-37	-93	-183	-161	-250	-161	-245	-211	-248	-153	-47	-59	-57	-130	-313	-86	-34	-57	-27	-16	-18	-15	-14	-30	-110
	2	-30	-33	-25	-29	-59	-135	-198	-295	-210	-71	-131	-377	-79	-9	-7	-19	-40	-18	-18	-26	-36	-29	-25	-46	-81
	3	-152	-102	-138	-114	-253	-441	-412	-324	-348	-395	-366	-208	-145	-148	-83	-44	-37	-24	-25	-14	-50	-117	-284	-867	-212
	4	-755	-392	-181	-74	-206	-370	-412	-201	-361	-136	-117	-55	-33	-87	-47	-46	-42	-20	-17	-27	-28	-32	-44	-47	-155
	5	-57	-50	-49	-80	-386	-468	-321	-177	-196	-50	-32	-35	-30	-43	-89	-84	-142	-273	-62	-23	-36	-46	-51	-195	-125
	6	-446	-227	-296	-204	-237	-142	-268	-321	-406	-262	-175	-138	-285	-285	-34	-19	-10	-4	-1	-3	-12	-20	-35	-37	-162
Q	7	-37	-48	-40	-37	-33	-31	-23	-52	-120	-127	-89	-42	-32	-26	-17	-15	-16	-13	-8	-47	-136	-150	-139	-286	-65
	8	-142	-73	-182	-273	-279	-275	-297	-185	-79	-36	-25	-20	-106	-295	-163	-152	-186	-329	-275	-190	-204	-175	-255	-575	-199
D	9	-519	-233	-40	-233	-391	-327	-196	-116	-130	-396	-517	-576	-697	-709	-495	-409	-208	-114	-120	-154	-430	-421	-396	-433	-343
D	10	-706	-187	-84	-57	-36	-37	-45	-39	-34	-26	-16	-43	-108	-103	-118	-309	-274	-321	-178	-213	-286	-293	-178	-144	-160
	11	-149	-277	-184	-69	-33	-37	-101	-196	-193	-145	-87	-159	-162	-140	-128	-132	-200	-146	-110	-122	-181	-254	-136	-224	-149
	12	-333	-286	-239	-318	-161	-86	-84	-98	-123	-189	-70	-67	-185	-191	-171	-272	-211	-30	-143	-284	-56	-85	-226	-155	-166
	13	-144	-130	-257	-282	-87	-239	-153	-53	-21	-22	-45	-38	-35	-58	-74	-90	-178	-338	-343	-76	-79	-198	-149	-71	-131
	14	-83	-192	-200	-65	-140	-63	-41	-59	-218	-145	-63	-35	-27	-26	-18	-22	-20	-37	-300	-258	-68	-52	-60	-167	-99
Q	15	-170	-50	-55	-67	-60	-24	-20	-31	-54	-231	-231	-156	-51	-11	-3	-2	-5	-13	-24	-19	-25	-31	-51	-82	-61
	16	-171	-279	-277	-100	-77	-110	-42	-34	-30	-29	-27	-60	-217	-219	-48	-14	-73	-140	-253	-151	-58	-32	-24	-24	-103
	17	-25	-37	-81	-55	-12	-11	-18	-25	-25	-31	-31	-32	-40	-53	-171	-127	-236	-384	-139	-63	-96	-221	-297	-104	-96
Q	18	-38	-35	-67	-84	-58	-90	-31	-19	-18	-26	-49	-48	-34	-23	-22	-35	-23	-18	-23	-76	-112	-82	-84	-34	-47
Q	19	-34	-39	-40	-145	-186	-95	-45	-38	-27	-41	-135	-96	-19	-19	-18	-46	-106	-238	-92	-28	-35	-142	-134	-210	-83
	20	-125	-93	-89	-97	-50	-83	-106	-74	-18	-42	-38	-32	-26	-31	-25	-23	-31	-30	-69	-124	-163	-122	-206	-451	-98
D	21	-534	-257	-139	-118	-141	-51	-19	-17	-69	-61	-94	-277	-178	-373	-430	-161	-142	-81	-402	-347	-152	-152	-397	-496	-208
	22	-314	-116	-35	-82	-145	-173	-123	-72	-242	-296	-224	-47	-40	-48	-58	-127	-225	-288	-52	-58	-179	-224	-279	-361	-159
	23	-310	-217	-189	-90	-47	-35	-94	-127	-68	-38	-33	-34	-117	-56	-33	-3	-42	-149	-186	-94	-49	-28	-26	-38	-88
	24	-87	-296	-419	-492	-311	-258	-386	-142	-25	-30	-32	-44	-156	-255	-299	-330	-130	-114	-153	-135	-9	-43	-204	-239	-192
D	25	-648	-358	-344	-484	-236	-425	-513	-628	-703	-653	-494	-724	-245	-359	-222	-47	-18	-42	-7	-23	-71	-500	-652	-549	-373
	26	-473	-580	-414	-420	-101	-113	-382	-174	-288	-311	-376	-418	-383	-273	-82	-33	-23	-22	-31	-35	-58	-114	-386	-77	-232
	27	-51	-54	-82	-113	-174	-302	-199	-38	-29	-208	-267	-160	-149	-241	-284	-299	-271	-269	-150	-263	-190	-62	-98	-221	-168
Q	28	-80	-34	-40	-40	-34	-29	-22	-19	-29	-51	-35	-30	-29	-21	-29	-28	-26	-29	-34	-34	-43	-51	-80	-67	-38
D	29	-159	-112	-55	-133	-516	-612	-556	-530	-612	-718	-680	-461	-391	-357	-314	-459	-313	-312	-404	-307	-75	-25	-15	-31	-336
	30	-31	-32	-29	-46	-113	-280	-88	-63	-50	-53	-59	-88	-87	-63	-60	-107	-43	-31	-116	-154	-50	-86	-271	-221	-93
	31	-232	-368	-156	-283	-279	-281	-145	-199	-298	-200	-284	-233	-245	-222	-149	-251	-339	-547	-493	-145	-85	-233	-464	-292	-264
	MEAN	-228	-170	-149	-156	-164	-187	-181	-147	-170	-166	-153	-155	-140	-157	-126	-122	-117	-143	-138	-111	-99	-130	-183	-216	-155
SQ	MEAN	-72	-40	-48	-75	-74	-54	-28	-30	-51	-95	-108	-74	-33	-20	-18	-25	-35	-62	-36	-41	-71	-91	-98	-136	-59
SD	MEAN	-512	-229	-132	-205	-264	-290	-268	-266	-310	-363	-360	-416	-316	-380	-316	-277	-191	-174	-222	-209	-203	-278	-328	-313	-284

AUGUST 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	-201	-139	-165	-115	-23	-30	-35	-38	-54	-42	-67	-42	-27	-24	-26	-29	-55	-26	-27	-18	-37	-58	-41	-56	-57
	2	-59	-85	-203	-209	-207	-115	-21	-25	-51	-167	-53	-41	-37	-34	-46	-21	-24	-21	-17	-13	-20	-31	-32	-29	-65
Q	3	-32	-36	-31	-27	-49	-34	-26	-19	-21	-35	-39	-43	-26	-32	-53	-104	-57	-22	-12	-15	-19	-26	-23	-25	-33
Q	4	-27	-25	-24	-40	-42	-29	-21	-14	-37	-100	-54	-53	-27	-30	-56	-128	-69	-33	-20	-58	-115	-57	-44	-40	-47
Q	5	-44	-28	-51	-87	-113	-65	-32	-24	-12	-21	-31	-31	-28	-29	-24	-28	-21	-22	-19	-12	-26	-34	-29	-23	-34
	6	-20	-21	-19	-16	-25	-31	-25	-27	-24	-140	-115	-26	-30	-31	-31	-25	-25	-17	-7	-18	-42	-200	-164	-258	-56
	7	-139	-80	-35	-26	-19	-19	-19	-48	-36	-31	-30	-27	-40	-48	-57	-114	-177	-51	-42	-19	-63	-152	-553	-344	-90
D	8	-156	-87	-198	-165	-38	-44	-115	-176	-519	-657	-531	-434	-200	-54	-72	-135	-50	-63	-224	-292	-83	-117	-196	-310	-205
D	9	-462	-618	-267	-164	-184	-134	-138	-98	-115	-58	-210	-430	-196	-107	-44	-35	-38	-215	-334	-83	-42	-35	-30	-28	-169
	10	-25	-90	-123	-130	-28	-47	-181	-100	-191	-176	-97	-263	-257	-87	-16	-29	-92	-59	-33	-52	-33	-39	-80	-74	-93
	11	-78	-67	-83	-114	-194	-80	-39	-46	-130	-216	-115	-75	-42	-172	-206	-125	-30	-29	-24	-131	-109	-60	-145	-406	-113
	12	-377	-276	-374	-451	-377	-102	-24	-56	-183	-191	-25	-26	-35	-42	-36	-22	-27	-41	-79	-137	-247	-187	-86	-31	-143
	13	-33	-43	-66	-57	-21	-108	-125	-55	-62	-90	-130	-61	-49	-165	-81	-31	-62	-96	-119	-248	-225	-277	-335	-94	-110
	14	-30	-27	-78	-185	-111	-30	-38	-26	-22	-29	-30	-35	-35	-32	-28	-52	-81	-67	-53	-54	-59	-76	-69	-72	-55
	15	-80	-38	-92	-80	-64	-65	-57	-22	-30	-80	-74	-81	-73	-28	-24	-40	-84	-39	-39	-79	-45	-45	-88	-201	-69
	16	-152	-62	-90	-37	-21	-57	-92	-106	-94	-84	-100	-101	-154	-186	-48	-24	-38	-124	-289	-84	-46	-35	-418	-643	-129
D	17	-560	-151	-237	-423	-679	-263	-803	-446	-338	-315	-527	-390	-201	-435	-297	-313	-582	-668	-683	-506	-89	-101	-234	-337	-399
D	18	-210	-453	-285	-360	-252	-118	-179	-334	-310	-299	-495	-489	-650	-502	-390	-244	-586	-723	-424	-115	-76	-128	-265	-561	-353
	19	-513	-404	-205	-132	-159	-176	-165	-36	-91	-258	-343	-59	-119	-166	-215	-187	-255	-131	-65	-18	-12	-22	-25	-35	-158
	20	-34	-40	-37	-33	-42	-45	-44	-95	-158	-150	-82	-151	-161	-71	-54	-40	-34	-30	-31	-37	-42	-64	-57	-45	-66
	21	-46	-91	-202	-148	-88	-74	-65	-86	-86	-48	-42	-84	-58	-25	-34	-42	-130	-98	-96	-15	-20	-40	-53	-44	-72
	22	-38	-38	-52	-61	-65	-95	-96	-69	-53	-58	-57	-162	-380	-243	-194	-160	-229	-196	-164	-137	-78	-29	-40	-74	-116
	23	-102	-82	-60	-139	-198	-121	-197	-152	-237	-205	-126	-86	-203	-101	-46	-51	-56	-125	-69	-21	-16	-26	-23	-27	-104
Q	24	-29	-34	-33	-136	-28	-25	-25	-30	-34	-40	-39	-40	-45	-83	-77	-54	-71	-59	-123	-77	-66	-106	-113	-71	-60
	25	-69	-76	-69	-148	-170	-215	-286	-342	-247	-202	-199	-214	-272	-295	-268	-213	-244	-192	-77	-128	-182	-176	-196	-128	-194
D	26	-215	-155	-22	-82	-469	-402	-265	-324	-390	-510	-413	-452	-530	-452	-278	-405	-298	-180	-169	-108	-113	-216	-124	-124	-280
	27	-267	-262	-208	-123	-166	-363	-321	-64	-41	-110	-52	-28	-39	-92	-434	-397	-331	-268	-245	-124	-169	-239	-229	-67	-193
	28	-18	-18	-28	-33	-20	-92	-168	-48	-33	-32	-32	-32	-35	-38	-145	-443	-334	-246	-314	-273	-173	-224	-178	-244	-133
	29	-78	-34	-67	-356	-386	-205	-131	-168	-201	-136	-37	-48	-183	-128	-184	-203	-108	-58	-37	-34	-48	-27	-31	-43	-118
	30	-64	-235	-202	-161	-106	-92	-97	-98	-123	-40	-40	-31	-39	-48	-43	-67	-47	-26	-46	-121	-68	-16	-13	-15	-77
	31	-16	-19	-28	-29	-30	-178	-277	-362	-311	-191	-137	-59	-54	-262	-249	-163	-200	-289	-219	-284	-222	-40	-60	-43	-155
	MEAN	-135	-124	-119	-138	-142	-112	-131	-114	-137	-152	-139	-132	-136	-130	-119	-127	-143	-136	-133	-107	-83	-93	-128	-145	-127
5Q	MEAN	-67	-52	-61	-81	-51	-37	-28	-25	-32	-48	-45	-42	-31	-40	-46	-69	-55	-32	-38	-36	-53	-55	-50	-43	-46
9Q	MEAN	-321	-293	-202	-243	-324	-192	-380	-276	-334	-368	-435	-430	-365	-310	-216	-226	-311	-370	-371	-221	-81	-119	-170	-272	-281

SEPTEMBER 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	-25	-12	-16	-18	-15	-10	-56	-349	-436	-358	-619	-236	-49	-83	-146	-361	-275	-337	-486	-437	-350	-139	-95	-51	-207
	2	-177	-136	-40	-16	-13	-33	-29	-24	-25	-104	-353	-267	-196	-169	-127	-99	-147	-328	-243	-64	-75	-165	-98	-32	-123
	3	-21	-23	-32	-287	-322	-40	-19	-63	-253	-396	-252	-287	-368	-69	-41	-165	-201	-74	-39	-52	-72	-245	-334	-193	-160
	4	-60	-72	-63	-32	-19	-19	-60	-76	-105	-44	-38	-81	-263	-36	-28	-65	-256	-47	-85	-79	-146	-144	-33	-53	-79
	5	-151	-54	-43	-80	-132	-66	-8	-15	-20	-27	-38	-29	-46	-72	-62	-216	-397	-178	-139	-161	-152	-95	-221	-94	-102
Q	6	-25	-21	-42	-42	-39	-25	-16	-18	-18	-25	-30	-36	-33	-29	-46	-183	-168	-123	-221	-78	-48	-35	-135	-38	-61
	7	-28	-60	-45	-18	-13	-6	-11	-16	-15	-29	-42	-37	-78	-57	-63	-35	-22	-12	-11	-51	-135	-230	-70	-15	-46
	8	-19	-18	-15	-13	-11	-140	-102	-96	-84	-46	-25	-29	-56	-155	-322	-320	-364	-267	-258	-188	-36	-25	-29	-29	-113
Q	9	-22	-19	-21	-31	-74	-31	-28	-21	-28	-32	-35	-28	-48	-60	-63	-46	-119	-62	-25	-88	-369	-314	-305	-213	-86
	10	-320	-246	-129	-159	-192	-108	-32	-25	-20	-26	-29	-30	-32	-34	-35	-28	-21	-17	-14	-16	-15	-13	-11	-7	-65
Q	11	-10	-15	-16	-15	-15	-12	-8	-11	-21	-30	-35	-31	-32	-25	-22	-34	-35	-36	-25	-17	-13	-10	-8	-4	-20
Q	12	-4	-11	-14	-17	-255	-258	-175	-206	-178	-26	-22	-25	-27	-20	-23	-24	-25	-62	-13	-11	-7	-10	-11	-9	-60
D	13	-9	-14	-21	-17	-130	-397	-353	-348	-389	-479	-530	-410	-396	-427	-272	-101	-217	-226	-44	-137	-527	-376	-249	-423	-271
D	14	-121	-226	-296	-122	-40	-11	-43	-107	-233	-160	-132	-679	-471	-544	-536	-523	-245	-174	-151	-260	-398	-173	-91	-158	-246
	15	-238	-216	-403	-339	-260	-123	-179	-51	-17	-9	-37	-117	-206	-125	-20	-31	-33	-77	-162	-147	-37	-113	-121	-24	-129
	16	-47	-83	-212	-61	-119	-259	-203	-135	-198	-66	-110	-127	-163	-145	-58	-31	-25	-49	-174	-166	-160	-83	-27	-26	-113
	17	-27	-128	-174	-148	-156	-238	-458	-188	-167	-43	-19	-24	-48	-26	-40	-189	-198	-148	-111	-54	-54	-66	-119	-63	-117
	18	-85	-198	-174	-315	-195	-123	-123	-245	-271	-123	-79	-24	-19	-36	-55	-232	-34	-87	-176	-58	-51	-131	-175	-34	-127
	19	-12	-17	-85	-163	-265	-438	-227	-189	-375	-389	-356	-161	-194	-250	-233	-173	-356	-429	-371	-466	-225	-165	-306	-111	-247
	20	-100	-100	-36	-25	-82	-323	-262	-110	-206	-318	-161	-176	-225	-270	-319	-282	-280	-179	-81	-107	-149	-98	-116	-441	-185
D	21	-337	-294	-274	-243	-184	-262	-314	-425	-439	-105	-16	-115	-555	-686	-483	-279	-178	-289	-288	-202	-62	-116	-59	-72	-262
	22	-38	-247	-258	-184	-425	-212	-29	-20	-57	-176	-215	-109	-188	-72	-71	-100	-140	-429	-278	-42	-56	-31	-151	-94	-148
	23	-184	-125	-41	-25	-20	-18	-133	-237	-259	-357	-364	-165	-173	-144	-79	-60	-132	-167	-46	-39	-21	-18	-21	-33	-119
	24	-178	-119	-64	-188	-175	-154	-170	-233	-258	-199	-26	-20	-24	-21	-34	-30	-22	-43	-101	-291	-32	-27	-52	-39	-104
	25	-21	-22	-21	-91	-306	-320	-240	-112	-210	-200	-30	-18	-23	-23	-37	-74	-86	-104	-202	-41	-15	-20	-17	-17	-94
	26	-19	-17	-41	-180	-155	-102	-63	-51	-36	-48	-31	-10	-26	-22	-21	-23	-135	-120	-45	-50	-49	-42	-98	-245	-68
D	27	-308	-304	-189	-241	-335	-320	-258	-294	-87	-38	-169	-196	-130	-111	-269	-315	-367	-250	-312	-263	-42	-49	-308	-571	-239
	28	-307	-94	-32	-59	-58	-44	-18	-8	-6	-13	-23	-27	-32	-29	-24	-25	-20	-13	-28	-14	-18	-16	-20	-17	-39
Q	29	-26	-24	-21	-12	-5	-18	-42	-52	-37	-19	-17	-29	-33	-25	-23	-24	-20	-11	-7	-7	-8	-23	-25	-26	-22
	30	-21	-16	-25	-127	-163	-66	-22	-2	-7	-17	-22	-27	-22	-17	-14	-13	-18	-34	-31	-14	-20	-58	-40	-48	-35
	MEAN	-98	-98	-95	-109	-139	-139	-125	-124	-147	-130	-129	-118	-136	-126	-119	-133	-151	-145	-139	-120	-109	-101	-111	-104	-123
SQ	MEAN	-17	-18	-23	-23	-78	-69	-54	-61	-56	-26	-28	-30	-35	-32	-35	-62	-73	-59	-58	-40	-86	-78	-98	-58	-50
SD	MEAN	-160	-170	-159	-126	-141	-200	-205	-305	-317	-228	-293	-327	-320	-370	-341	-316	-256	-255	-256	-260	-276	-171	-160	-255	-245

OCTOBER 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-147	-193	-44	-23	-68	-175	-75	-17	-11	-15	-38	-25	-23	-23	-49	-114	-75	-63	-233	-360	-294	-78	-69	-236	-98
	2	-396	-140	-55	-59	-53	-48	-45	-50	-45	-57	-125	-49	-59	-72	-71	-52	-52	-92	-151	-157	-86	-77	-96	-65	-90
	3	-116	-78	-74	-89	-71	-40	-41	-36	-40	-55	-40	-45	-52	-49	-93	-295	-354	-170	-189	-257	-152	-274	-156	-326	-129
D	4	-210	-176	-120	-290	-358	-95	-243	-263	-245	-163	-388	-368	-177	-353	-95	-37	-102	-269	-303	-142	-141	-63	-114	-78	-201
	5	-36	-64	-173	-91	-31	-82	-250	-132	-39	-146	-51	-25	-66	-40	-36	-37	-92	-36	-35	-164	-173	-94	-30	-18	-81
	6	-22	-93	-60	-34	-57	-47	-55	-30	-25	-36	-97	-159	-27	-32	-26	-30	-25	-18	-27	-159	-125	-162	-93	-14	-61
Q	7	-7	-10	-8	-9	-7	-7	-17	-67	-47	-19	-23	-27	-50	-115	-25	-29	-24	-21	-16	-14	-17	-28	-22	-18	-26
Q	8	-11	-8	-8	-34	-17	-10	-18	-10	-15	-22	-25	-28	-24	-23	-24	-29	-29	-27	-18	-11	-17	-27	-26	-22	-20
Q	9	-15	-15	-18	-20	-18	-11	-12	-17	-25	-20	-22	-24	-38	-27	-25	-26	-26	-27	-91	-49	-14	-15	-15	-14	-24
	10	-14	-12	-14	-8	-72	-82	-126	-242	-53	-20	-13	-22	-19	-12	-30	-36	-102	-216	-380	-349	-388	-188	-152	-245	-113
	11	-282	-274	-285	-165	-160	-265	-306	-443	-360	-387	-294	-217	-295	-277	-304	-299	-243	-235	-243	-328	-37	-14	-103	-187	-247
	12	-362	-295	-162	-309	-564	-273	-157	-344	-276	-212	-194	-119	-185	-92	-36	-29	-23	-20	-16	-16	-13	-3	-6	-11	-152
	13	-8	-11	-10	-21	-54	-280	-214	-147	-28	-23	-32	-39	-321	-151	-54	-235	-254	-192	-172	-175	-82	-87	-32	-16	-110
	14	-130	-267	-185	-175	-156	-16	-44	-112	-158	-104	-103	-169	-135	-100	-41	-38	-38	-90	-127	-118	-128	-113	-82	-46	-111
Q	15	-166	-95	-58	-56	-86	-83	-50	-35	-25	-61	-61	-30	-25	-80	-154	-64	-33	-34	-20	-11	-36	-88	-16	-13	-58
D	16	-12	-15	-14	-22	-24	-48	-16	-15	-11	-86	-143	-786	-595	-340	-265	-510	-471	-679	-439	-304	-46	-35	-98	-270	-215
D	17	-282	-163	-312	-165	-180	-207	-502	-537	-402	-418	-295	-458	-466	-554	-473	-537	-799	-381	-619	-565	-296	-350	-404	-378	-402
D	18	-324	-344	-336	-308	-57	-43	-52	-215	-373	-219	-126	-180	-261	-110	-160	-284	-293	-101	-145	-121	-77	-175	-263	-108	-198
	19	-121	-123	-191	-172	-193	-170	-304	-155	-380	-135	-152	-227	-269	-317	-200	-146	-229	-181	-140	-162	-168	-92	-109	-110	-186
	20	-108	-133	-137	-196	-158	-210	-221	-121	-147	-375	-304	-179	-241	-142	-154	-160	-98	-83	-22	-20	-18	-64	-32	-13	-139
Q	21	-17	-21	-20	-22	-19	-16	-16	-12	-9	-14	-20	-26	-28	-30	-37	-38	-44	-61	-53	-24	-18	-21	-35	-49	-27
	22	-144	-191	-162	-191	-115	-107	-91	-83	-316	-221	-141	-234	-317	-370	-372	-316	-393	-459	-308	-341	-340	-278	-218	-202	-247
D	23	-173	-180	-148	-101	-247	-291	-321	-181	-132	-135	-223	-203	-190	-186	-568	-529	-401	-197	-519	-380	-271	-239	-111	-104	-253
	24	-259	-16	-12	-123	-151	-268	-112	-96	-387	-150	-152	-311	-262	-241	-201	-114	-56	-45	-134	-155	-152	-27	-13	-52	-145
	25	-28	-30	-94	-87	-6	-12	-122	-241	-117	-60	-107	-96	-179	-309	-134	-101	-235	-162	-44	-67	-58	-41	-8	-8	-98
	26	-9	-25	-138	-109	-41	-18	-26	-35	-21	-36	-143	-287	-169	-107	-87	-53	-59	-84	-61	-50	-20	-10	-12	-10	-64
	27	-10	-7	-4	-18	-19	-3	-13	-10	-13	-17	-13	-10	-35	-49	-34	-18	-12	-13	-8	-7	-32	-237	-117	-22	-30
	28	-11	-112	-181	-57	-44	-65	-231	-46	-7	-13	-18	-16	-24	-19	-115	-187	-131	-93	-251	-467	-371	-226	-102	-43	-115
	29	-72	-21	1	0	-4	-77	-143	-23	5	-29	-17	-45	-57	-121	-62	-35	-122	-249	-363	-464	-367	-167	-344	-251	-126
	30	-104	-89	-242	-217	-114	0	0	-14	-10	-27	-37	-145	-34	-28	-24	-185	-214	-32	-16	-20	-22	-30	-23	-13	-65
	31	-6	-10	-8	-2	-21	-12	-3	0	-11	-118	-8	-7	-30	-45	-82	-144	-48	-37	-19	-57	-81	-29	-12	-10	-33
	MEAN	-114	-104	-101	-102	-102	-99	-123	-120	-120	-109	-110	-145	-146	-142	-130	-149	-164	-143	-167	-178	-125	-107	-94	-98	-125
SQ	MEAN	-43	-30	-22	-28	-29	-25	-21	-28	-24	-27	-30	-27	-33	-55	-53	-37	-31	-34	-40	-22	-20	-34	-23	-23	-31
SD	MEAN	-184	-176	-186	-177	-173	-137	-227	-242	-233	-200	-235	-403	-330	-309	-311	-379	-413	-341	-405	-302	-166	-172	-198	-202	-254

NOVEMBER 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	-10	-10	-12	-11	-11	-10	-10	-10	-12	-17	-34	-74	-22	-31	-31	-35	-59	-45	-26	-19	-20	-23	-20	-18	-24
	2	-29	-23	-41	-39	-37	-25	-16	-23	-183	-182	-43	-66	-229	-210	-103	-64	-39	-26	-22	-16	-13	-11	-16	-41	-62
	3	-98	-98	-19	-48	-78	-24	-13	-45	-112	-74	-15	-11	-90	-24	-87	-233	-266	-317	-271	-216	-129	-271	-135	-63	-111
	4	-122	-72	-56	-43	-39	-26	-18	-31	-143	-91	-69	-118	-44	-31	-32	-60	-102	-107	-91	-96	-78	-186	-91	-40	-73
	5	-30	-89	-36	-13	-25	-44	-92	-20	-97	-89	-39	-70	-76	-41	-43	-167	-131	-60	-71	-199	-382	-358	-216	-147	-102
	6	-112	-143	-152	-209	-212	-232	-206	-231	-434	-341	-344	-329	-480	-484	-255	-244	-152	-86	-44	-41	-69	-192	-132	-88	-217
D	7	-133	-738	-463	-388	-402	-399	-343	-175	-650	-525	-697	1142	-398	-597	-699	-229	-209	-210	-233	-376	-470	-249	-131	-440	-429
	8	-339	-95	-156	-165	-45	-49	-24	-54	-101	-186	-183	-215	-123	-176	-233	-169	-62	-50	-147	-187	-28	-20	-21	-35	-119
	9	-85	-29	-25	-40	-88	-188	-171	-240	-203	-207	-209	-176	-127	-53	-69	-410	-344	-338	-237	-126	-185	-102	-10	-14	-153
	10	-54	-170	-259	-75	-140	-224	-50	-30	-33	-217	-474	-484	-260	-170	-286	-569	-342	-221	-194	-72	-109	-120	-24	-118	-196
D	11	-270	-428	-235	-254	-95	-133	-234	-186	-286	-395	-358	-123	-209	-247	-198	-274	-374	-138	-26	-42	-171	-245	-42	-47	-209
	12	-117	-60	-90	-163	-176	-78	-93	-213	-206	-251	-208	-166	-100	-399	-447	-181	-301	-29	-14	-28	-20	-14	-16	-13	-141
	13	-16	-50	-132	-175	-36	-85	-134	-41	-10	-16	-132	-236	-313	-355	-323	-238	-289	-341	-260	-181	-118	-127	-136	-256	-169
	14	-287	-269	-49	-12	-24	-85	-52	-65	-68	-53	-25	-28	-29	-35	-132	-121	-324	-267	-221	-141	-59	-60	-10	-6	-101
Q	15	-5	-5	-6	-6	-6	-7	-7	-7	-12	-46	-51	-167	-59	-38	-24	-28	-27	-21	-32	-83	-138	-40	-11	-8	-35
	16	-11	-8	-7	-7	-8	-9	-1	-3	-6	-21	-145	-114	-75	-23	-14	-38	-149	-227	-124	-8	-38	-100	-36	-66	-51
	17	-69	-100	-64	-146	-116	-12	0	-6	-16	-9	-75	-172	-110	-35	-16	-25	-21	-22	-19	-13	-15	-18	-16	-20	-46
	18	-45	-20	-6	-34	-16	-46	-27	-26	-11	-4	-5	-47	-457	-263	-383	-367	-86	-29	-18	-15	-16	-74	-422	-383	-117
	19	-225	-212	-277	-322	-228	-297	-182	-32	-41	-8	-45	-29	-30	-27	-31	-24	-19	-23	-21	-19	-20	-20	-21	-18	-90
Q	20	-17	-17	-16	-17	-17	-14	-15	-13	-14	-11	-14	-36	-35	-13	-12	-15	-13	-13	-11	-11	-9	-13	-47	-55	-19
D	21	-42	-76	-211	-312	-129	-26	-68	-243	-525	-920	-915	-844	-609	-667	-723	-429	-218	-242	-238	-249	-229	-230	-247	-152	-356
D	22	-366	-287	-315	-334	-85	-94	-36	-70	-168	-183	-301	-242	-279	-457	-434	-436	-549	-360	-415	-313	-339	-251	-248	-256	-283
D	23	-220	-291	-267	-332	-177	-229	-271	-353	-420	-541	-443	-396	-109	-242	-832	-885	-550	-316	-156	-272	-168	-163	-335	-202	-344
	24	-64	-79	-94	-103	-61	-62	-13	-21	-42	-24	-28	-19	-20	-23	-27	-71	-280	-426	-259	-131	-44	-61	-25	-43	-84
	25	-68	-100	-100	-4	0	-11	-20	-27	-54	-251	-95	-95	-95	-41	-111	-252	-279	-348	-402	-147	-55	-46	-46	-89	-114
	26	-67	-27	1	-5	-31	-43	-4	-2	-9	-34	-74	-75	-34	-20	-55	-266	-278	-89	-24	-96	-389	-81	-49	-12	-73
	27	-13	-15	-57	-26	-30	-31	-17	-17	-58	-310	-167	-196	-314	-407	-80	-30	-38	-177	-225	-42	-101	-149	-171	-100	-115
	28	-20	-17	-9	-62	-108	-255	-82	-5	-7	-11	-44	-72	-134	-65	-244	-399	-84	-12	-19	-50	-29	-59	-10	-8	-75
Q	29	-5	-3	-3	-11	-3	-2	-1	-2	-7	-5	-10	-29	-8	-5	-6	-11	-30	-36	-20	-39	-11	-4	-2	-1	-11
Q	30	-2	-2	1	-1	-5	-7	-1	-1	-4	-9	-8	-11	-11	-12	-16	-10	-36	-42	-29	-23	-18	-6	-8	-23	-12
	MEAN	-98	-118	-105	-112	-81	-90	-73	-73	-131	-168	-175	-193	-163	-173	-198	-209	-188	-154	-128	-108	-112	-110	-92	-92	-131
SQ	MEAN	-8	-7	-7	-9	-8	-8	-7	-7	-10	-18	-23	-63	-27	-20	-18	-20	-33	-31	-24	-35	-39	-17	-16	-21	-20
SD	MEAN	-206	-364	-298	-324	-178	-188	-190	-205	-412	-513	-543	-549	-335	-442	-577	-451	-386	-253	-214	-250	-273	-228	-199	-219	-324

DECEMBER 1970 AL INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	-4	-2	0	-4	-3	-3	-1	-1	-4	-3	-4	-12	-12	-17	-18	-19	-31	-30	-7	-3	-5	-7	-9	-9	-9
	2	-6	-6	-3	-3	-6	-9	0	0	1	-4	-6	-12	-7	-10	-15	-37	-41	-69	-91	-162	-188	-18	-9	-8	-26
	3	-33	-143	-131	-17	-8	-11	-28	-93	-210	-96	-18	-5	-6	-10	-10	-11	-89	-20	-9	-8	-1	-41	-73	-28	-46
	4	-7	-2	-1	-3	-1	0	-2	-36	-50	-14	-8	-7	-82	-102	-9	-15	-14	-16	-15	-17	-135	-372	-19	-144	-52
	5	-117	-112	-166	-156	-130	-153	-112	-68	-186	-218	-52	-56	-56	-159	-189	-289	-93	-26	-15	-13	-7	-7	-9	-11	-100
	6	-9	-45	-90	-61	-18	-44	-90	-111	-277	-221	-224	-76	-45	-332	-405	-318	-348	-286	-155	-134	-79	-38	-18	-13	-141
	7	-18	-7	-5	-19	-75	-33	-131	-63	-46	-38	-77	-130	-349	-217	-199	-156	-122	-121	-95	-198	-173	-276	-225	-237	-126
D	8	-256	-339	-255	-425	-303	-141	-151	-359	-204	-106	-456	-299	-387	-525	-442	-31	-20	-76	-266	-302	-112	-66	-106	-57	-236
	9	-37	-71	-65	-47	-44	-97	-34	-30	-31	-26	-163	-117	-19	-60	-86	-71	-81	-110	-42	-6	-3	-5	-5	-5	-53
Q	10	-10	-7	-1	-1	-3	-1	-4	-2	-32	-152	-72	-76	-197	-206	-133	-95	-101	-53	-86	-152	-71	-33	-9	-9	-65
Q	11	-11	-7	-5	-15	-9	-28	-43	-23	-47	-56	-14	-10	-17	-7	-16	-11	-13	-14	-77	-14	1	0	-2	-5	-19
	12	-3	-6	-57	-25	-20	-19	-19	-18	-23	-115	-81	-121	-167	-126	-107	-44	-25	-25	-78	-39	-16	-43	-102	-43	-55
	13	-15	-2	-6	-7	-3	-2	-3	-2	-5	-11	-8	-7	-7	-7	-3	-4	-9	-134	-124	-16	4	-6	-77	-135	-25
D	14	-36	-77	-102	-9	-122	-614	-749	1057	-798	-258	-342	-231	-166	-110	-105	-106	-53	-96	-599	-376	-223	-286	-413	-198	-295
D	15	-88	-203	-356	-143	-100	-199	-315	-421	-337	-330	-296	-241	-100	-209	-173	-330	-242	-149	-167	-56	-56	-44	-48	-71	-198
	16	-49	-46	-17	-21	-20	-17	-26	-16	-14	-17	-19	-48	-28	-18	-41	-31	-45	-87	-65	-36	-27	-24	-36	-96	-35
Q	17	-70	-35	-18	-11	-12	-11	-10	-22	-38	-77	-98	-146	-65	-42	-96	-68	-39	-14	-11	-16	-39	-52	-20	-13	-43
	18	-8	-7	-7	-9	-14	-27	-67	-50	-47	-24	-12	-16	-27	-76	-81	-24	-37	-51	-16	-10	-18	-6	8	-4	-25
	19	-34	-13	-26	-38	-11	-18	-82	-92	-209	-311	-72	-15	-15	-20	-16	-10	-6	-11	-36	-90	-88	-87	-304	-114	-71
	20	-27	-41	-57	-34	-93	-133	-186	-263	-429	-373	-261	-154	-102	-154	-175	-76	-51	-43	-54	-162	-151	-75	-64	-44	-133
	21	-92	-97	-66	-45	-62	-77	-128	-159	-112	-112	-96	-79	-136	-49	-18	-15	-20	-24	-20	-27	-78	-160	-119	-68	-78
	22	-79	-130	-83	-68	-67	-96	-57	-54	-191	-91	-71	-45	-64	-103	-82	-100	-115	-69	-56	-47	-61	-55	-116	-28	-79
	23	-16	-20	-107	-77	-35	-16	-10	-2	-8	-7	-45	-160	-102	-93	-104	-121	-124	-14	-19	-2	-5	-13	-13	-80	-50
D	24	-323	-384	-290	-273	-108	-68	-52	-16	-29	-8	-4	-15	-39	-78	-200	-120	-7	-14	-22	-89	-109	-51	-25	-31	-75
	25	-53	-12	-8	-11	-11	-9	-10	-12	-13	-11	-13	-12	-12	-14	-41	-83	-162	-116	-44	-44	-142	-21	-18	-72	-39
	26	-8	-5	-9	-9	-3	-113	-56	-35	-61	-21	-8	-3	-5	-29	-37	-60	-92	-31	-9	-10	-9	-68	-30	-12	-30
	27	-2	-4	-9	-32	-6	0	-7	-9	-15	-41	-52	-11	-22	-226	-92	-243	-191	-159	-98	-104	-146	-361	-227	-161	-92
D	28	-158	-171	-90	-146	-25	-12	-52	-32	-25	-162	-68	-46	-318	-210	-148	-205	-442	-385	-433	-440	-331	-276	-252	-380	-197
	29	-82	-13	-36	-69	-80	-91	-64	-49	-122	-22	-10	-14	-44	-71	-83	-91	-144	-108	-194	-73	-11	-26	-138	-412	-85
	30	-292	-186	-263	-274	-137	-18	-2	-8	-13	-24	-7	-8	-8	-10	-15	-62	-451	-276	-15	-3	-9	-23	-8	-6	-88
Q	31	-8	-8	-5	-21	-2	-1	-1	-1	-3	-4	-11	-4	-8	-6	-6	-5	-10	-13	-6	-2	-2	0	-2	-9	-6
	MEAN	-63	-68	-75	-67	-49	-66	-60	-101	-116	-95	-86	-78	-84	-109	-100	-92	-134	-83	-94	-86	-71	-82	-86	-77	-84
SD MEAN		-21	-12	-6	-10	-6	-9	-12	-10	-35	-58	-40	-50	-60	-56	-54	-40	-39	-25	-37	-39	-23	-18	-8	-9	-28
SD MEAN		-171	-217	-219	-199	-132	-207	-264	-389	-279	-173	-232	-166	-202	-242	-214	-158	-153	-144	-297	-253	-166	-145	-169	-123	-204

JANUARY 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	26	23	31	34	36	32	42	42	36	2[illegible]	25	35	49	72	83	37	96	133	51	49	39	48	45	68	48
D	2	70	68	87	103	265	181	122	117	193	175	82	101	64	143	109	188	162	148	94	122	51	56	89	104	120
	3	85	87	86	58	78	42	69	50	55	53	66	48	34	42	35	15	9	4	8	9	7	12	18	13	41
Q	4	15	15	15	19	24	20	21	21	33	35	42	40	17	22	17	14	20	34	34	21	18	19	14	13	23
	5	29	33	36	29	31	22	40	32	41	34	73	124	99	67	69	58	71	56	33	32	27	24	40	56	48
	6	75	33	20	23	46	23	20	19	42	31	24	30	29	54	23	25	22	14	12	13	26	34	24	19	28
	7	25	24	30	23	39	34	40	51	53	29	19	17	19	24	18	9	15	42	154	172	103	67	41	38	45
	8	42	49	43	39	32	40	45	40	51	67	57	100	56	66	61	80	75	54	47	34	35	28	32	42	51
D	9	57	85	123	78	59	83	85	57	68	157	87	49	49	25	32	36	20	47	26	11	23	30	24	36	56
	10	53	57	58	63	42	26	22	21	31	28	19	37	29	34	43	12	24	10	12	12	13	8	11	13	28
D	11	26	38	61	63	38	40	57	36	26	26	21	28	27	25	54	21	11	9	14	10	9	19	79	59	33
	12	77	87	76	45	45	32	51	34	37	44	53	41	25	14	45	36	36	57	35	32	54	92	102	98	52
Q	13	56	49	25	17	35	42	31	30	29	25	29	29	17	37	98	58	67	29	13	15	21	27	35	35	35
	14	32	25	31	29	61	62	52	58	59	56	60	55	47	43	58	38	24	17	19	12	17	17	33	73	41
	15	115	109	101	81	103	111	48	41	39	25	21	27	29	21	21	19	18	25	26	19	19	29	64	87	50
D	16	94	71	131	113	92	128	154	109	152	165	183	202	200	108	167	184	209	240	178	135	114	112	125	95	144
D	17	144	131	117	147	142	167	151	61	83	78	70	35	46	21	18	30	47	21	21	35	32	23	21	17	69
	18	17	38	43	40	38	62	43	105	62	36	45	73	31	30	19	27	56	40	34	15	13	14	14	15	38
	19	23	23	25	27	20	20	14	20	24	21	50	48	22	25	34	56	10	7	6	16	25	39	103	73	30
	20	52	65	48	32	25	14	14	23	31	52	47	49	92	106	89	37	28	20	17	81	70	74	50	33	46
	21	42	32	31	54	42	39	36	26	31	43	49	37	36	99	63	31	17	12	18	20	18	29	25	32	36
	22	22	34	36	31	24	30	29	20	19	31	30	37	37	26	19	16	1	10	9	15	21	23	27	24	24
	23	21	18	20	36	42	36	34	39	70	43	33	44	32	36	20	18	13	14	13	12	11	19	28	19	26
	24	18	31	18	24	17	18	53	26	76	75	83	131	79	80	22	20	54	15	19	27	43	58	73	59	46
Q	25	20	27	31	24	29	37	42	27	27	17	19	17	15	21	20	11	11	7	6	14	13	11	18	12	20
Q	26	18	15	19	24	26	25	22	25	32	39	39	24	46	17	9	10	9	6	10	8	15	19	12	12	20
	27	12	20	25	12	35	43	20	33	41	74	55	60	75	57	66	50	56	27	40	84	136	116	92	44	51
	28	62	55	28	22	25	27	26	28	28	32	40	42	32	25	32	30	32	32	48	70	36	27	28	44	35
	29	41	25	29	30	49	42	72	72	104	62	24	22	23	25	25	20	20	20	24	26	27	33	25	37	36
D	30	55	31	16	30	53	81	151	97	63	42	71	45	41	41	32	37	60	35	116	91	94	109	65	61	63
	31	70	115	88	50	42	35	30	30	29	27	29	28	21	23	23	20	20	20	27	23	30	33	26	24	36
	MEAN	48	49	49	45	53	51	53	45	54	53	50	53	44	46	46	40	42	39	38	40	37	39	43	44	46
SQ	MEAN	27	29	30	31	30	33	35	26	29	28	30	28	24	24	40	23	24	17	16	14	15	19	28	26	25
SD	MEAN	84	77	95	94	122	128	133	88	112	123	99	86	80	68	72	95	100	98	87	79	63	66	64	63	90

FEBRUARY 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	26	42	38	37	74	51	31	18	13	12	12	10	14	22	19	16	13	15	16	23	38	58	102	129	35
D	2	148	70	60	62	135	103	125	94	85	61	81	81	86	75	34	40	50	82	110	135	82	157	114	128	90
	3	106	92	79	36	65	33	20	30	22	22	42	42	31	19	17	17	10	8	11	9	9	17	21	16	32
D	4	13	31	19	25	20	23	37	58	85	87	102	77	94	90	132	97	93	129	100	64	77	64	87	80	78
	5	65	58	53	74	89	79	53	38	39	33	27	34	34	62	85	51	34	28	21	22	32	41	44	41	47
	6	61	55	41	37	53	50	31	45	55	74	24	15	11	9	12	12	11	13	16	4	9	12	10	10	28
Q	7	11	11	12	11	9	11	10	14	15	20	18	18	7	10	12	6	4	3	7	9	7	12	15	8	11
Q	8	13	11	10	10	15	19	16	19	20	21	18	12	15	21	18	24	21	32	13	14	17	18	16	16	17
	9	15	14	13	9	14	33	31	31	24	24	17	17	25	27	49	69	48	35	29	27	29	22	20	19	27
	10	20	17	15	19	22	18	28	30	33	15	12	11	10	14	32	69	100	141	185	36	42	31	34	31	40
Q	11	20	17	14	14	18	28	27	31	32	24	15	9	10	9	10	25	30	28	12	12	10	19	18	16	18
	12	15	23	17	15	15	12	12	13	11	17	14	13	12	13	11	14	16	19	21	18	16	13	12	12	15
	13	12	14	15	22	28	15	38	28	23	21	16	28	39	42	66	32	28	17	24	18	16	16	18	18	24
D	14	22	26	24	31	66	88	37	14	6	32	69	125	39	42	40	48	73	56	33	29	30	30	25	25	42
	15	28	32	28	14	28	40	44	105	68	66	92	70	33	28	22	35	25	31	34	34	30	36	36	34	41
	16	32	29	24	26	22	23	17	42	34	31	36	39	38	46	116	68	26	18	25	15	12	29	37	36	34
	17	26	18	17	26	23	23	15	17	22	33	61	42	32	16	16	30	42	116	154	186	138	75	48	63	51
	18	39	33	46	38	62	31	40	50	63	57	81	43	42	69	88	79	32	21	32	34	30	31	32	29	46
	19	21	26	19	13	15	24	17	32	25	21	22	35	20	16	16	23	16	12	22	25	20	22	17	26	21
	20	24	25	19	19	18	18	16	14	13	21	27	23	28	23	36	52	25	17	15	13	9	13	17	15	21
Q	21	19	12	11	14	15	20	11	24	22	19	15	11	12	12	11	9	9	8	8	11	16	13	10	16	14
Q	22	14	14	10	14	15	10	15	12	11	12	16	12	14	19	15	12	11	13	11	17	16	11	11	13	13
	23	13	15	13	17	16	15	15	15	16	17	17	16	17	16	16	18	16	16	19	16	27	27	21	18	17
D	24	17	18	15	18	18	18	15	32	46	20	14	14	19	29	44	53	253	217	162	69	75	24	21	17	51
	25	19	18	18	17	12	19	23	19	19	16	13	12	16	12	15	18	16	22	21	20	15	15	12	9	16
	26	12	12	24	25	40	84	89	151	96	136	266	272	237	256	216	155	38	17	5	2	0	10	3	7	89
	27	6	2	0	2	8	4	41	77	68	89	82	123	54	79	51	25	36	51	15	36	74	106	139	148	55
D	28	66	59	106	66	49	68	59	116	203	101	104	207	260	175	84	67	107	137	153	83	35	70	52	107	106
	MEAN	32	28	27	25	34	34	32	42	42	39	46	50	45	44	46	41	42	46	45	35	32	34	35	39	38
SQ	MEAN	15	13	11	13	14	16	16	20	20	19	16	12	12	14	13	15	15	15	10	13	13	15	14	14	15
SD	MEAN	53	41	45	40	58	60	55	63	85	60	74	101	108	82	67	61	115	124	112	76	61	59	68	71	72

MARCH 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	99	119	90	70	78	162	217	247	217	210	149	200	154	201	344	244	96	74	37	43	62	80	73	117	141
	2	94	47	95	111	74	105	82	94	89	99	138	112	62	34	34	44	61	44	39	27	38	38	37	69	69
	3	41	41	32	22	24	29	50	34	102	58	56	29	19	52	25	43	58	145	105	114	108	179	95	60	63
	4	72	57	63	103	57	82	164	57	97	118	107	197	142	103	210	189	227	220	293	203	208	133	195	167	141
	5	82	78	61	52	47	40	60	79	107	65	35	21	20	22	52	60	73	197	262	243	184	165	109	158	94
D	6	56	62	113	80	42	30	29	41	89	85	152	97	59	46	93	79	285	272	253	228	261	220	78	137	116
D	7	147	90	157	84	66	61	53	93	159	143	149	137	107	120	230	360	131	281	275	198	124	101	139	198	154
D	8	211	205	229	298	436	437	264	308	295	232	169	300	217	372	138	118	377	525	415	-426	-23	121	46	196	225
D	9	140	115	224	128	82	96	131	124	131	129	104	98	43	81	99	96	206	210	119	99	66	30	78	46	111
	10	50	33	43	0	1	1	10	24	52	43	38	21	4	-2	-6	-10	4	41	57	74	82	24	7	1	25
	11	-6	-7	-7	-2	4	8	3	4	4	3	0	0	-2	4	15	0	0	5	13	26	38	49	68	51	11
	12	12	6	33	17	33	22	48	45	51	91	148	153	77	27	6	0	3	8	15	15	17	14	18	15	36
	13	13	9	11	8	9	11	29	59	29	55	73	68	37	60	81	55	14	34	25	113	94	43	16	13	40
	14	19	17	20	8	17	15	12	14	43	15	5	4	3	4	1	5	14	9	8	12	15	15	14	20	13
	15	24	39	40	41	69	103	69	47	31	31	55	27	30	14	42	42	28	33	28	36	27	13	11	5	37
Q	16	8	14	13	9	15	14	10	11	26	16	34	14	28	30	26	7	9	10	15	18	14	18	19	14	16
	17	16	16	16	12	14	17	20	25	23	17	23	20	28	53	66	36	32	59	96	70	36	37	38	25	33
	18	18	14	13	19	11	12	8	9	12	39	71	105	98	49	20	38	34	46	47	31	66	85	95	58	42
	19	32	18	14	10	12	17	21	51	48	38	23	22	33	26	16	10	20	19	16	26	55	56	58	23	27
	20	23	19	13	12	13	9	8	10	14	22	32	64	41	29	31	17	15	33	42	61	31	32	38	40	27
Q	21	58	94	83	82	47	30	22	11	23	30	18	17	15	24	33	55	24	38	37	45	43	14	16	18	36
Q	22	17	21	22	16	14	15	11	29	26	35	51	82	77	48	31	12	14	19	19	20	23	20	20	18	28
	23	20	29	24	25	23	24	23	44	53	78	35	33	31	27	29	29	22	20	52	30	29	26	24	24	31
Q	24	19	18	18	18	21	19	19	21	23	26	23	24	24	23	29	26	23	23	20	20	25	23	21	25	22
Q	25	26	22	25	31	19	14	26	59	44	24	18	22	24	25	22	23	21	23	23	22	20	22	20	22	25
	26	20	19	28	31	29	34	18	34	48	22	20	37	30	22	31	35	28	48	32	35	45	34	31	28	31
	27	21	18	14	12	11	15	22	46	78	103	147	226	129	63	31	34	41	86	155	177	120	174	283	167	91
	28	94	55	53	104	128	148	198	127	138	202	236	293	163	124	174	230	225	125	100	130	139	148	179	105	151
	29	70	96	100	215	170	124	113	90	82	79	100	98	138	144	127	166	161	152	239	158	141	112	106	138	131
	30	210	77	44	19	18	144	92	97	101	106	163	249	255	134	46	81	177	70	80	68	141	84	78	34	107
D	31	24	58	41	96	53	161	234	246	257	188	176	335	168	140	426	331	214	145	107	101	87	62	149	91	162
	MEAN	56	48	56	56	54	64	66	70	80	78	83	108	75	66	79	79	82	99	98	69	75	70	66	64	72
SQ	MEAN	26	34	32	31	23	18	18	26	28	26	28	32	34	38	28	25	18	23	23	25	25	19	19	19	25
SD	MEAN	116	104	153	139	140	157	142	162	166	155	154	193	135	152	189	197	227	287	234	48	103	107	98	114	154

APRIL 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	42	25	7	0	-4	1	-2	-6	-5	-7	-5	1	12	4	4	0	2	5	1	1	2	4	29	10	5
	2	10	7	5	3	1	-1	10	14	19	10	15	13	36	56	66	40	16	19	47	19	21	36	29	22	21
	3	31	41	55	72	158	138	216	163	123	108	182	94	120	129	47	58	60	49	49	40	27	26	28	36	86
	4	17	29	18	19	21	19	42	69	91	77	60	107	70	42	34	26	23	36	20	22	16	16	23	19	38
	5	22	21	16	13	13	17	22	40	63	108	128	133	81	54	32	6	47	76	47	51	50	46	45	51	49
D	6	47	46	44	137	124	134	222	153	130	161	191	314	208	86	119	138	150	88	59	61	52	94	63	50	120
	7	40	57	39	42	37	71	90	93	172	64	20	54	28	27	12	10	15	23	31	32	27	34	34	48	46
	8	89	99	39	52	90	37	20	55	100	158	105	62	30	81	43	46	24	31	27	27	29	44	71	72	60
	9	44	35	37	49	51	45	124	101	294	153	124	191	184	250	69	36	35	36	31	36	38	109	85	67	94
Q	10	51	33	36	23	16	15	19	21	28	27	22	20	20	30	31	28	35	31	30	27	27	49	74	93	33
	11	98	42	72	70	54	42	74	91	140	158	118	138	75	63	60	17	33	47	72	68	38	29	24	23	69
	12	23	24	33	14	49	66	129	155	103	95	91	51	37	52	93	111	95	129	74	60	48	46	36	43	69
Q	13	28	24	18	12	15	12	20	36	29	34	28	89	69	67	54	29	31	45	22	18	22	29	32	33	33
Q	14	34	38	31	23	16	10	13	23	23	24	20	44	47	21	26	21	18	24	27	16	23	30	46	32	26
Q	15	39	30	31	25	22	16	17	34	46	46	64	33	27	40	39	63	107	207	232	168	153	98	108	145	75
	16	69	106	113	152	130	127	132	127	91	37	28	20	16	15	16	24	27	39	55	176	343	391	353	286	116
D	17	113	179	150	183	174	137	85	46	140	168	132	87	75	173	183	93	85	161	215	167	256	87	89	58	135
	18	61	49	29	16	14	12	11	18	112	156	190	201	256	267	104	51	167	71	96	87	68	136	198	242	109
	19	130	109	119	160	232	214	180	152	234	287	257	170	165	67	42	63	70	87	93	71	61	60	31	37	129
D	20	25	28	43	135	157	110	51	27	32	49	103	114	189	195	85	140	269	413	178	104	115	83	135	198	120
D	21	52	45	41	70	255	251	259	242	240	144	157	343	368	259	265	147	218	118	184	115	13	82	104	171	169
D	22	253	136	115	166	254	324	234	105	129	98	75	68	85	87	79	35	43	38	36	24	22	22	21	36	104
	23	58	39	62	63	93	126	149	141	99	170	197	257	167	107	126	169	238	249	224	239	230	199	182	179	157
	24	177	141	135	176	185	177	199	192	173	158	209	253	169	193	161	158	148	221	251	180	157	80	45	82	168
	25	140	134	83	106	111	136	226	223	197	252	142	165	186	112	89	113	51	26	74	179	149	134	188	87	138
	26	151	169	109	66	43	43	20	19	28	24	35	60	119	126	112	38	58	121	179	217	261	263	241	190	112
	27	188	117	55	70	93	166	224	82	23	28	79	104	84	100	83	54	92	75	111	89	71	49	43	48	87
Q	28	73	54	78	82	98	92	93	100	104	85	108	104	94	56	32	23	22	31	46	41	49	65	52	44	68
	29	43	63	50	69	73	85	85	60	116	110	110	119	144	151	86	77	131	189	261	212	166	158	134	88	116
	30	85	84	161	177	219	159	98	156	224	197	270	174	79	96	190	351	303	190	131	85	101	103	171	170	166
	MEAN	74	67	61	75	94	93	102	91	110	106	109	119	108	100	79	72	86	96	94	88	88	87	90	83	90
SQ	MEAN	45	36	39	33	33	29	32	43	46	43	48	58	51	43	36	32	43	68	71	54	55	54	62	69	47
SD	MEAN	98	87	79	130	193	191	170	115	134	124	132	185	185	160	146	111	151	164	118	94	92	74	82	85	138

AU INDICES — VALUES ARE EXPRESSED IN GAMMAS

	MAY	1970 UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
																											96
		1	104	68	42	52	54	170	139	69	44	24	33	43	90	137	86	82	56	41	99	189	154	276	128	120	73
		2	128	58	41	74	125	35	89	102	84	65	49	40	63	43	31	34	83	70	149	109	[illegible]	65	80	77	76
		3	49	43	28	17	14	7	4	29	22	34	65	147	128	94	110	53	69	104	105	75	157	164	184	99	68
		4	55	46	29	24	27	15	35	63	93	142	116	69	60	56	70	68	111	159	92	62	7[illegible]	55	48	68	97
		5	57	56	47	42	37	23	38	47	51	180	317	298	115	81	91	90	131	99	106	79	41	68	79	151	
		6	44	25	15	11	12	10	9	21	33	89	55	79	70	63	50	41	113	113	78	62	55	42	40	38	47
		7	31	29	26	53	21	17	16	19	28	40	105	91	65	60	30	19	23	71	69	82	69	44	34	25	45
Q		8	27	32	17	17	22	10	19	24	36	50	36	38	36	44	36	34	86	72	97	131	103	62	85	99	51
Q		9	55	50	57	44	79	60	71	88	69	41	47	65	44	61	54	47	58	31	42	63	55	35	28	26	53
Q		10	34	33	25	28	46	57	48	95	89	85	71	45	38	26	23	12	16	14	23	26	27	27	27	28	38
																											42
Q		11	25	20	15	13	12	16	25	34	35	47	41	90	43	26	26	25	18	23	36	48	58	84	97	179	170
D		12	96	127	46	139	89	37	35	98	79	140	243	230	211	162	109	148	267	350	192	146	296	435	299	159	88
		13	85	76	131	192	259	174	104	29	27	37	38	42	52	62	83	32	33	21	38	59	54	68	93	131	162
		14	105	66	61	89	177	179	213	199	202	105	55	33	51	59	47	86	193	306	351	367	351	207	196	179	95
		15	157	166	60	28	103	122	65	110	189	326	203	80	54	30	29	37	30	86	69	64	83	57	73	95	
		16	60	66	67	67	73	111	93	82	151	82	52	84	74	85	93	79	92	116	128	123	164	124	101	104	93
		17	72	78	82	46	263	214	144	56	39	47	95	174	160	140	62	70	84	77	68	63	47	70	90	125	99
		18	99	82	82	22	32	26	36	56	43	35	34	41	83	89	86	73	72	60	57	48	43	36	32	32	94
		19	33	38	50	44	44	28	133	115	182	234	236	194	107	90	70	58	65	101	113	141	135	130	102	82	105
D		20	72	64	45	141	218	257	159	85	120	195	177	193	189	201	194	200	170	161	208	154	197	142	127	191	162
		21	146	72	52	32	11	15	9	52	77	182	172	192	152	171	121	110	61	78	136	117	141	46	57	85	96
		22	63	133	106	69	58	84	138	166	75	73	99	163	193	152	176	124	120	247	257	177	140	106	61	59	128
		23	46	25	42	41	26	15	15	93	119	84	141	139	86	54	33	26	36	76	129	124	162	169	214	244	89
		24	231	167	80	63	35	20	13	37	78	103	157	193	97	117	119	73	36	61	63	62	84	85	103	112	92
		25	93	175	102	171	134	169	200	53	33	25	80	154	144	125	156	90	116	104	87	75	83	113	157	98	114
		26	43	36	21	13	7	11	13	15	19	23	21	20	24	26	34	36	33	34	55	67	55	83	134	58	35
Q		27	98	55	50	43	42	65	201	192	212	169	95	141	196	209	130	183	238	323	364	244	343	366	284	131	179
D		28	222	256	77	76	69	51	35	36	103	293	166	309	395	673	646	417	360	189	115	154	143	115	105	167	216
D		29	133	106	54	48	163	211	246	254	214	172	132	76	82	57	36	43	55	68	59	149	210	115	61	89	118
		30	131	44	43	76	84	91	38	110	209	246	305	116	50	47	35	139	128	272	141	122	51	48	43	48	108
		31	27	26	27	27	15	3	56	49	94	153	116	74	228	132	151	162	193	94	44	35	38	32	36	26	79
		MEAN	89	78	53	58	76	75	78	78	92	112	115	116	109	109	97	86	103	118	119	110	113	113	99	99	95
5Q	MEAN		37	34	27	23	33	33	39	43	50	49	43	44	37	37	35	31	42	35	51	67	60	62	68	70	44
5D	MEAN		124	122	54	89	116	124	135	131	146	194	167	190	215	260	223	194	218	218	168	169	238	239	151	147	169

JUNE 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	39	62	93	319	204	43	39	89	172	183	132	163	188	263	325	307	309	336	233	174	113	126	114	81	171
	2	51	40	119	103	93	61	36	29	32	43	69	87	79	84	80	101	119	99	111	103	112	84	72	102	78
	3	71	94	57	80	218	189	127	124	243	231	216	165	135	36	180	145	99	118	172	192	134	134	91	170	145
	4	117	83	89	61	64	11	58	96	175	197	108	90	112	118	133	152	124	95	68	92	81	78	148	141	107
	5	22	17	55	36	93	88	142	158	145	124	146	138	40	24	23	20	22	54	31	30	31	26	18	12	61
Q	6	10	12	16	25	15	12	19	57	41	114	99	53	43	52	31	16	14	24	32	40	36	35	24	12	35
	7	13	13	16	22	13	14	16	34	45	65	52	52	43	44	58	73	74	94	111	144	271	233	249	226	84
	8	236	195	134	68	155	236	216	80	44	48	137	99	111	40	87	24	44	77	93	101	80	101	124	94	107
	9	51	30	50	34	28	21	21	34	33	23	16	15	18	21	33	33	56	68	121	217	157	157	145	103	62
	10	100	68	51	41	36	34	23	95	122	79	130	69	23	72	69	74	138	295	248	223	182	95	54	53	99
Q	11	79	77	70	54	26	22	27	21	27	30	29	37	28	24	22	61	71	155	129	89	47	28	20	38	50
Q	12	66	84	68	61	48	21	12	28	57	99	84	128	86	119	77	47	53	86	118	151	68	89	105	91	77
	13	109	93	72	66	48	34	97	168	186	244	326	348	278	443	194	150	71	128	157	114	157	128	96	97	159
	14	182	153	131	174	68	37	16	11	11	26	33	49	45	42	32	33	27	36	119	237	149	88	74	156	80
	15	172	139	147	67	44	101	90	216	210	231	305	276	165	123	123	158	177	191	148	166	196	182	141	195	166
	16	193	135	103	54	152	129	21	18	29	30	34	35	85	84	97	58	59	18	38	74	110	97	106	107	78
	17	49	27	24	23	22	19	14	32	54	61	75	89	177	128	98	47	139	243	315	339	312	221	169	252	122
D	18	196	64	89	47	30	50	37	186	235	293	296	267	497	397	427	310	306	261	247	281	320	296	243	282	236
	19	221	127	91	42	35	23	58	42	68	153	101	41	33	52	53	52	63	105	148	140	123	233	253	268	105
D	20	218	154	153	207	214	270	226	215	220	285	314	338	227	259	310	386	418	333	289	386	394	323	240	153	272
D	21	140	90	141	133	105	154	214	230	228	169	246	263	152	173	142	196	228	270	154	33	32	84	88	51	154
Q	22	63	68	46	29	15	7	4	2	11	23	63	84	81	52	37	46	38	33	94	121	142	125	93	78	56
Q	23	104	66	43	43	47	34	21	12	13	12	16	53	53	50	41	16	24	33	30	36	33	60	29	30	37
	24	63	90	44	24	28	26	19	16	18	21	22	25	25	40	86	77	55	55	103	180	212	128	165	197	72
	25	181	102	46	34	28	20	42	67	127	202	210	177	144	138	112	89	98	75	54	43	38	112	124	106	97
	26	50	40	45	134	300	318	347	341	263	153	155	94	78	49	90	296	459	399	357	348	274	168	103	58	203
D	27	65	74	92	173	182	111	141	257	466	324	282	229	447	325	165	122	111	150	91	41	96	76	57	37	171
	28	48	95	12	19	49	96	46	32	42	190	197	166	164	123	101	82	27	32	33	39	67	61	79	59	77
	29	25	6	9	8	21	28	38	68	15	32	34	36	32	47	26	97	208	322	315	323	280	200	121	82	99
	30	53	37	23	19	24	22	30	163	223	271	249	129	98	25	17	28	46	59	65	49	44	33	27	45	72
	MEAN	100	78	71	73	79	74	73	97	119	132	142	125	121	116	107	110	121	140	139	152	143	128	117	117	111
SQ	MEAN	68	61	49	42	38	19	17	24	30	56	58	71	59	59	42	37	40	65	73	87	65	66	54	50	51
SD	MEAN	132	89	114	176	147	126	131	195	264	251	254	250	302	283	274	264	274	270	203	183	191	181	144	121	201

JULY 1978 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	32	111	79	74	114	87	846	184	124	113	92	62	126	166	237	94	68	62	84	97	103	50	46	59	101
	2	42	35	40	25	46	63	235	179	212	134	246	323	91	58	40	41	71	64	41	22	23	43	26	74	91
	3	136	109	123	57	143	246	232	321	259	220	344	198	134	82	36	40	29	24	31	34	113	194	225	96	142
	4	188	200	112	51	137	285	232	196	262	173	110	74	104	43	26	34	37	37	34	27	26	21	16	19	102
	5	39	40	77	175	250	196	185	182	191	77	53	43	20	67	81	82	142	230	115	56	38	52	101	175	112
	6	158	186	142	91	182	121	149	223	209	212	161	167	164	169	89	58	54	50	33	26	25	24	28	21	114
Q	7	23	24	21	13	4	4	15	25	47	78	61	15	47	38	25	27	33	38	45	79	151	133	152	220	59
	8	150	135	154	271	329	326	319	183	99	54	40	49	127	135	123	115	170	214	256	267	263	279	251	241	193
D	9	295	207	119	436	346	309	278	144	221	296	282	237	270	590	662	501	262	203	287	310	325	354	223	204	389
D	10	214	167	97	60	37	33	55	35	16	21	61	119	178	145	136	128	188	248	158	207	294	210	195	129	131
	11	64	45	57	33	22	45	109	101	98	129	119	106	118	116	93	74	130	174	105	144	168	133	125	198	104
	12	179	164	222	182	138	68	108	128	149	204	127	106	123	107	162	156	182	69	192	170	197	93	146	152	139
	13	158	129	136	158	182	120	94	31	15	13	65	81	80	52	37	80	126	227	152	104	143	114	110	55	98
	14	65	88	59	103	51	20	24	63	152	75	82	83	51	64	55	59	25	64	154	157	91	68	84	119	77
Q	15	119	46	49	47	40	16	18	37	82	146	137	102	69	115	84	79	85	88	71	55	31	32	58	68	69
	16	100	104	78	93	40	42	17	11	14	20	22	93	143	88	62	24	54	103	122	84	59	28	20	22	60
	17	14	45	63	32	13	15	19	26	19	19	24	35	65	88	92	88	130	148	121	118	122	217	321	214	85
Q	18	75	54	58	61	136	77	24	15	19	55	79	66	65	56	42	42	21	32	41	73	81	108	102	46	59
Q	19	37	30	47	67	89	60	67	41	43	92	174	134	38	23	32	50	88	149	92	50	80	148	157	215	83
	20	177	87	49	44	31	59	70	51	50	46	32	32	35	42	35	29	31	46	75	119	170	118	177	230	77
D	21	206	188	99	219	144	51	59	45	147	138	242	242	205	233	423	165	90	124	254	255	164	177	173	196	177
	22	174	106	46	77	49	116	102	170	226	176	73	77	78	44	54	57	153	216	150	106	231	245	248	181	131
	23	195	111	66	52	48	101	148	124	177	125	116	129	120	68	70	74	52	149	220	193	77	32	37	35	103
	24	78	146	226	251	262	229	213	166	42	25	26	85	168	171	208	259	178	248	275	172	89	110	198	225	168
D	25	446	246	443	561	185	307	192	81	173	262	332	407	208	266	126	69	100	74	78	64	131	291	139	183	224
	26	169	278	239	195	110	73	227	92	177	165	211	233	182	136	73	37	26	32	44	51	79	148	241	72	136
	27	38	25	42	26	162	157	111	14	35	168	141	102	49	120	154	280	178	142	133	181	155	59	85	121	112
Q	28	66	42	17	12	5	-1	6	17	55	54	32	30	24	22	16	27	26	35	24	37	43	25	81	75	32
D	29	140	83	69	161	267	200	298	330	318	163	338	292	398	411	190	353	300	180	283	187	86	66	33	30	214
	30	26	21	20	28	85	139	44	35	29	13	38	86	87	63	82	48	33	36	61	91	85	118	202	171	68
	31	155	137	76	148	176	142	96	145	253	215	176	191	116	91	100	155	209	270	280	162	111	154	228	164	165
	MEAN	128	110	101	123	121	119	124	110	126	119	130	129	118	125	116	107	104	122	129	118	118	123	136	132	120
SQ	MEAN	62	39	38	40	55	31	26	27	49	85	97	69	49	51	40	45	51	68	55	59	77	88	110	125	60
SD	MEAN	260	182	165	287	196	180	176	127	175	178	2[illegible]	259	244	333	307	243	188	166	210	205	200	226	153	168	211

AUGUST 1978 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	118	102	76	25	29	41	56	59	77	67	81	52	26	18	15	19	48	29	35	32	37	53	40	69	50
	2	66	70	100	152	124	42	14	29	141	105	60	39	54	50	32	29	33	27	29	29	27	25	25	33	56
Q	3	40	38	25	34	22	25	21	19	26	18	22	44	26	40	35	26	24	29	27	30	26	20	19	20	27
Q	4	17	14	27	30	27	13	24	47	71	77	60	47	53	47	64	50	34	48	60	90	95	60	46	36	47
Q	5	32	26	60	61	72	65	35	15	18	17	22	25	24	31	34	31	22	25	27	29	31	33	33	35	33
	6	38	25	21	19	19	18	24	35	75	129	67	36	25	31	29	39	59	50	53	73	102	105	118	238	61
	7	174	133	45	34	28	27	50	83	72	48	44	42	38	47	67	77	65	33	73	87	104	259	149	177	82
D	8	123	90	207	149	56	50	154	158	215	113	174	264	105	51	85	53	50	114	177	172	83	135	178	195	131
D	9	206	194	196	115	148	123	102	117	64	39	187	143	103	93	30	35	92	144	147	92	58	57	35	28	105
	10	25	53	41	48	39	38	73	95	126	107	86	143	91	73	42	47	45	43	59	44	39	78	67	64	63
	11	74	40	49	57	66	34	63	80	139	195	79	90	55	92	85	70	36	41	60	68	62	38	141	214	88
	12	263	149	122	172	171	107	41	103	116	65	37	60	45	33	19	14	17	39	71	144	226	221	110	52	108
	13	39	30	44	15	20	129	89	78	79	127	137	88	81	98	88	71	67	79	196	206	223	241	183	80	103
	14	61	77	78	92	95	31	26	23	37	41	20	29	15	14	14	27	47	34	42	25	28	53	67	94	45
	15	91	102	92	97	60	66	48	57	78	120	125	141	109	58	27	18	17	27	45	82	52	95	129	209	79
	16	150	147	99	71	82	165	94	133	132	123	142	170	195	148	101	79	85	106	146	107	54	85	379	338	139
D	17	299	342	358	391	208	547	264	465	607	361	214	203	488	488	398	235	242	305	372	328	162	126	159	71	318
D	18	113	219	165	155	125	131	167	188	187	183	160	217	336	305	359	308	321	410	394	179	131	103	127	75	209
	19	139	148	137	102	83	78	48	30	91	148	157	89	119	111	107	124	122	103	60	48	31	30	24	18	89
	20	14	7	6	6	7	4	11	98	91	84	51	86	66	57	20	21	31	23	20	43	29	47	48	56	39
	21	62	50	31	43	46	33	20	35	18	47	93	93	62	40	29	56	60	36	32	39	34	47	47	29	45
	22	13	10	11	15	41	35	20	36	68	97	90	130	45	90	103	128	161	146	166	95	30	27	44	63	70
	23	79	51	48	93	92	93	129	150	229	233	162	104	99	73	35	35	62	82	74	60	46	72	34	21	90
Q	24	28	14	30	17	30	20	11	6	8	14	22	36	62	67	40	35	39	52	60	51	44	63	45	39	34
	25	40	34	53	46	59	66	194	224	216	136	195	162	193	182	186	166	137	113	65	96	192	119	104	76	125
D	26	93	60	64	113	206	212	216	226	219	247	250	189	353	222	230	294	236	154	127	80	119	134	82	136	178
	27	110	75	186	40	162	200	138	68	47	48	40	66	97	107	167	261	236	271	200	104	140	183	185	65	130
	28	45	33	18	10	44	123	24	22	58	26	15	14	32	46	114	118	179	147	197	210	203	173	169	78	97
	29	56	31	120	202	232	192	148	138	187	135	74	112	115	70	61	126	79	22	34	42	47	29	35	93	97
	30	79	76	69	59	62	23	44	99	99	70	65	69	64	37	40	48	29	53	49	54	56	41	38	35	56
	31	23	20	13	22	50	119	151	185	189	185	141	86	110	102	98	149	234	387	333	221	179	71	65	31	132
	MEAN	87	79	81	80	81	93	79	99	121	110	99	98	106	94	89	90	93	103	108	96	86	90	96	88	94
SQ	MEAN	47	37	44	33	36	33	29	29	40	39	41	41	38	41	38	32	33	37	40	46	47	46	37	40	38
SD	MEAN	167	181	198	185	149	213	181	231	258	189	197	201	277	232	220	185	181	225	235	170	111	111	116	101	188

SEPTEMBER 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	37	34	22	17	30	27	107	188	218	207	292	228	97	80	81	179	189	197	270	239	183	291	133	107	142
	2	91	111	83	54	45	87	87	54	39	139	217	172	95	107	99	99	125	187	128	98	192	71	37	50	101
	3	40	31	49	126	91	51	43	112	133	164	208	244	173	96	88	156	94	75	78	94	91	101	203	122	111
	4	124	97	61	45	36	35	104	72	62	35	49	112	79	29	47	111	125	67	79	54	92	81	93	66	73
	5	57	39	49	54	53	49	42	43	45	43	41	36	49	57	55	139	149	94	110	87	59	103	138	68	69
Q	6	69	35	24	53	45	38	30	23	40	47	23	23	27	36	64	63	44	73	124	79	71	65	75	35	50
	7	48	44	43	22	18	22	17	46	51	32	52	49	64	65	46	29	34	28	38	74	117	118	78	53	49
	8	39	29	26	33	51	41	104	67	101	70	65	42	36	54	112	169	157	247	219	148	70	39	41	35	82
Q	9	30	32	31	26	77	84	69	58	65	39	29	27	20	21	20	46	45	33	52	88	136	143	171	178	63
	10	112	131	111	133	91	86	35	37	43	21	21	23	32	41	27	17	23	16	13	14	16	18	21	24	46
Q	11	25	25	19	13	9	11	17	20	23	22	22	21	23	22	19	14	16	20	19	23	24	26	29	27	21
Q	12	27	32	43	40	44	51	58	120	95	37	27	18	18	19	18	18	31	29	27	27	32	35	38	28	36
D	13	28	26	38	47	83	114	185	214	265	269	319	321	187	215	105	59	218	130	71	186	244	295	164	83	161
D	14	78	136	87	36	48	49	57	65	91	110	99	279	185	189	286	253	174	117	102	138	173	131	73	133	129
	15	75	87	106	189	221	127	134	37	38	38	92	100	125	47	33	36	24	62	85	77	60	94	57	40	85
	16	43	40	44	51	90	112	126	73	127	71	65	86	50	74	27	15	21	41	61	61	63	42	40	27	60
	17	27	38	51	58	72	121	133	142	89	62	38	23	41	32	47	42	67	100	76	48	38	75	63	52	64
	18	43	55	55	106	92	59	110	113	107	106	62	29	27	54	73	64	39	99	78	70	46	84	85	55	71
	19	39	40	38	70	98	207	176	93	123	152	206	117	93	133	155	184	153	170	223	249	276	170	113	48	135
	20	72	64	44	29	55	123	83	120	141	147	141	106	175	116	154	143	183	136	90	112	98	70	95	117	109
D	21	168	140	116	116	149	169	166	147	215	104	60	128	237	199	223	170	142	178	185	135	74	110	72	61	144
	22	51	54	92	52	108	67	36	32	65	128	129	67	68	37	47	59	62	115	114	55	35	36	56	56	68
	23	56	98	45	33	28	27	74	84	139	137	158	115	103	68	61	40	39	43	28	37	44	61	52	30	67
	24	78	68	63	82	32	111	164	119	169	110	42	17	22	53	45	27	32	43	78	113	53	61	60	43	68
	25	45	40	34	42	122	92	110	110	125	100	45	19	20	31	51	57	38	57	119	53	43	34	30	31	68
	26	30	38	38	52	61	42	78	41	47	62	49	52	51	33	28	41	40	36	37	36	34	52	66	86	47
D	27	93	135	134	139	93	103	116	188	148	80	130	176	101	75	180	179	324	141	213	122	45	107	183	61	136
	28	128	100	68	38	27	27	21	21	22	29	42	53	45	46	52	33	26	25	21	25	28	32	28	32	40
Q	29	32	34	31	38	41	48	48	61	46	41	24	34	25	23	29	27	29	23	26	26	28	48	65	38	36
	30	39	40	37	72	104	80	64	34	46	42	30	47	56	34	38	34	41	50	38	24	37	82	50	53	49
	MEAN	60	62	59	62	70	75	86	84	97	88	92	92	76	70	77	81	89	88	93	88	82	88	79	61	79
SQ	MEAN	35	32	30	34	43	45	44	56	54	37	25	25	23	24	38	34	33	36	50	49	58	63	74	60	42
SD	MEAN	81	94	79	71	81	92	126	160	187	154	180	226	181	152	175	168	209	153	168	164	144	179	126	89	142

OCTOBER 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	47	58	64	42	52	70	55	54	36	29	47	27	26	30	62	57	29	45	118	181	143	123	102	184	70
	2	162	159	89	57	25	35	58	41	46	62	57	27	52	30	39	30	24	64	97	95	71	48	86	55	63
	3	114	103	82	136	63	55	56	75	55	37	37	39	31	32	39	75	92	88	142	158	110	124	132	98	82
D	4	137	105	96	212	270	133	116	137	98	95	106	114	100	84	87	46	60	109	78	60	61	54	63	52	102
	5	61	66	76	76	53	66	71	105	51	50	30	32	45	28	32	25	30	37	31	77	76	55	56	28	52
	6	31	52	48	65	64	59	53	63	33	28	57	73	47	53	29	16	13	16	42	44	58	70	6	29	47
Q	7	19	13	15	30	19	16	33	35	26	34	29	20	33	25	24	12	15	12	17	17	20	25	28	31	23
Q	8	30	26	25	46	42	32	19	17	22	26	20	18	14	18	14	9	12	14	31	19	21	16	20	33	23
Q	9	36	31	18	18	23	17	28	19	33	41	37	36	34	30	22	15	14	14	26	16	17	19	14	11	23
	10	14	14	19	21	29	34	72	103	109	50	36	29	23	28	33	37	49	101	162	224	197	221	209	184	84
	11	200	144	103	136	166	237	150	162	207	267	175	86	129	112	164	225	168	167	163	193	97	58	124	127	157
	12	65	113	182	176	128	149	108	86	116	155	167	139	112	76	23	20	10	16	19	24	19	18	15	21	62
	13	12	20	11	12	18	31	47	44	49	21	27	34	94	64	30	89	51	81	55	65	50	49	49	39	43
	14	48	13	22	33	27	44	39	72	67	70	65	73	64	35	15	11	22	32	28	28	49	33	40	26	40
Q	15	58	39	47	29	22	31	54	43	25	27	24	20	29	31	50	26	11	10	14	16	35	37	19	17	30
D	16	19	16	15	16	16	19	20	15	23	89	154	159	186	212	162	293	255	331	102	186	142	157	177	125	120
D	17	87	44	30	12	36	54	47	101	135	207	156	126	176	262	251	198	161	164	139	174	158	47	190	105	128
D	18	111	142	114	110	64	66	75	154	142	125	48	37	21	31	24	90	118	62	76	80	63	83	74	38	81
	19	31	41	20	26	62	76	116	81	90	60	104	82	136	124	91	77	59	87	84	67	84	51	60	44	74
	20	78	72	58	60	69	67	99	83	113	84	106	91	141	100	69	29	25	23	20	17	16	30	49	26	64
Q	21	18	22	12	15	15	13	11	16	17	24	10	13	11	13	7	9	18	23	24	23	23	30	51	27	19
	22	36	76	93	82	130	184	139	90	104	104	182	226	101	146	261	364	396	324	209	87	42	86	39	143	152
D	23	148	144	92	51	72	100	110	89	114	111	102	80	54	82	260	330	306	194	255	221	225	117	154	71	145
	24	80	66	61	59	51	102	80	94	157	89	77	131	90	62	75	50	25	33	52	46	62	39	28	18	69
	25	26	24	23	16	29	24	45	37	51	60	57	44	41	51	95	34	68	63	31	36	28	31	27	22	40
	26	21	24	25	21	25	25	22	20	33	38	56	124	82	57	51	18	28	19	22	18	23	21	48	31	35
	27	30	31	29	30	37	46	63	53	45	27	26	26	34	32	29	34	28	21	19	22	45	53	62	66	37
	28	47	61	61	88	81	69	143	91	56	37	23	27	47	34	60	66	62	111	118	125	123	140	63	88	76
	29	58	45	37	31	46	64	63	133	62	74	54	54	57	100	73	40	70	165	162	198	151	165	113	140	99
	30	102	84	73	84	71	47	35	58	39	40	33	35	25	14	19	37	37	33	21	16	16	20	21	26	42
	31	26	29	25	25	39	36	34	37	54	49	52	25	30	33	44	57	36	24	16	28	28	31	34	28	34
	MEAN	63	61	54	59	60	65	66	71	71	73	69	66	67	66	71	78	74	80	77	83	73	66	71	62	69
SQ	MEAN	32	26	23	28	24	22	27	28	25	30	24	21	24	23	23	14	14	15	22	19	23	25	26	24	24
SD	MEAN	100	98	69	80	92	74	74	99	102	125	113	103	107	134	153	191	180	172	130	144	130	92	132	78	115

NOVEMBER 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	6	9	15	15	15	15	14	13	14	24	17	47	42	10	8	6	8	14	8	7	10	12	12	12	15
	2	16	15	13	11	13	15	17	21	42	48	37	43	76	41	28	40	31	13	13	11	9	17	16	33	26
	3	42	67	126	55	30	53	81	51	68	82	33	13	23	18	40	72	77	170	146	210	148	86	93	68	77
	4	94	144	91	63	28	20	18	32	72	97	104	99	43	14	12	24	37	32	28	47	89	97	96	60	60
	5	66	111	118	79	83	79	113	126	98	70	40	40	28	22	26	31	32	27	33	46	68	67	64	87	65
	6	80	91	72	77	125	194	140	106	172	198	162	160	134	158	143	131	71	30	14	21	51	41	55	91	104
D	7	65	27	136	297	302	312	305	348	173	263	163	333	169	242	379	131	78	61	78	93	61	70	93	59	177
	8	114	99	56	92	72	42	18	19	47	65	50	59	48	50	23	36	28	12	14	16	11	18	15	11	42
	9	16	10	18	14	31	32	49	76	89	64	69	73	45	14	28	32	51	71	66	42	48	24	27	19	42
	10	37	22	22	62	76	64	51	35	22	69	91	99	147	101	89	189	168	49	78	53	69	42	37	91	69
Q	11	36	57	61	63	64	50	166	119	84	97	117	92	69	65	42	113	153	50	38	32	88	64	60	43	75
	12	30	18	38	17	45	58	46	76	136	75	113	74	47	53	67	53	41	23	19	9	12	6	11	17	45
	13	14	12	29	41	34	84	61	97	21	22	49	29	24	77	77	94	128	154	154	149	89	59	47	43	66
	14	42	28	36	27	31	41	38	98	62	43	29	39	22	19	27	26	52	84	95	80	38	39	17	14	43
Q	15	18	13	10	8	8	9	9	12	17	17	26	47	59	17	12	18	7	10	25	59	93	45	27	25	24
	16	17	22	24	35	29	25	25	20	27	25	51	39	41	35	39	38	75	130	91	97	69	66	56	61	44
	17	66	63	44	58	49	32	43	39	42	45	40	22	13	20	24	17	9	10	4	10	11	12	11	11	29
	18	17	16	12	15	15	14	11	14	21	15	15	23	77	121	157	231	238	146	142	32	27	104	7	1	61
	19	52	103	128	206	193	154	216	147	105	39	26	26	10	6	13	9	8	8	2	0	0	1	4	4	61
Q	20	10	8	14	5	4	6	5	0	1	2	3	5	6	9	5	6	5	6	5	0	6	7	6	7	5
D	21	5	10	5	48	48	27	106	75	90	100	201	276	239	264	334	330	146	74	10	20	20	18	43	35	105
D	22	32	26	80	112	94	43	30	38	83	43	123	116	77	78	142	153	198	228	201	184	147	115	187	88	105
D	23	59	40	47	97	84	87	113	100	138	157	130	100	173	144	240	158	234	298	155	69	69	66	78	47	120
	24	40	41	36	24	36	52	37	35	43	28	18	10	15	17	13	45	132	160	187	137	95	78	54	48	58
	25	48	75	92	95	61	50	55	72	62	41	56	97	59	75	55	37	50	129	89	107	82	58	48	48	67
	26	72	85	61	51	43	46	35	33	37	44	91	56	43	25	26	35	50	97	36	69	82	41	49	29	48
	27	25	32	45	45	51	53	61	84	53	76	92	67	60	187	88	29	23	60	39	39	81	62	56	69	62
	28	62	38	49	36	44	58	76	46	42	35	45	24	28	36	28	27	20	23	23	27	23	30	24	32	37
Q	29	21	20	23	36	39	31	28	30	35	32	34	59	46	28	24	18	30	31	24	18	16	18	16	18	28
Q	30	18	14	12	24	27	30	32	28	31	32	33	34	22	17	14	15	21	12	13	19	20	25	19	16	22
	MEAN	41	44	49	60	59	59	67	66	64	65	67	73	63	65	73	71	71	72	68	55	54	46	42	37	59
SQ	MEAN	15	13	15	18	19	18	18	17	20	21	23	38	35	16	13	11	14	15	15	21	29	21	16	16	19
SD	MEAN	39	32	60	123	118	104	144	136	110	132	147	183	145	159	227	177	162	141	96	80	77	67	76	54	116

DECEMBER 1970 AU INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	17	15	14	16	13	15	18	18	21	26	27	22	17	11	11	12	16	14	13	12	12	13	15	15	16
	2	20	22	19	21	18	16	15	14	14	20	21	18	16	17	22	36	50	46	37	90	93	47	33	22	30
	3	31	26	31	24	23	29	35	45	62	78	42	20	14	14	13	37	19	28	12	13	14	31	40	45	30
	4	29	24	15	17	16	24	29	31	53	65	33	40	52	41	29	38	28	24	27	46	66	72	116	132	44
	5	119	82	47	33	42	60	56	83	119	153	77	47	58	54	35	40	42	30	20	13	13	15	15	15	53
	6	17	24	11	46	21	15	57	69	62	47	111	86	44	81	96	105	162	139	99	116	108	54	22	25	68
	7	40	35	34	33	28	33	39	41	28	36	57	46	129	122	92	66	49	70	57	99	143	86	109	74	64
D	8	128	108	197	142	111	97	50	74	131	133	85	117	91	166	66	47	38	27	68	86	91	57	54	42	92
	9	53	54	38	36	39	63	80	62	65	32	77	116	49	37	52	43	13	11	21	20	13	15	16	16	43
Q	10	25	17	17	19	25	18	17	16	22	38	33	42	32	93	27	9	13	15	15	21	17	18	14	9	24
Q	11	17	13	15	17	12	13	21	22	24	22	21	18	19	20	12	12	11	13	11	10	12	15	14	15	16
	12	18	21	24	20	19	18	22	25	24	47	54	57	107	98	60	41	17	14	22	18	31	40	89	99	41
	13	94	70	46	52	38	27	26	31	55	32	25	28	21	19	16	14	34	46	56	27	25	43	94	146	44
D	14	101	149	232	227	282	310	71	-104	150	192	86	84	206	71	63	40	14	35	48	147	156	108	114	98	120
D	15	47	85	74	36	30	35	24	33	89	73	47	76	48	116	85	66	78	51	70	47	30	33	31	45	56
	16	48	58	73	51	39	35	65	56	26	24	11	23	54	33	12	24	25	14	20	16	16	17	28	72	33
Q	17	61	55	41	42	57	35	50	48	40	29	29	23	24	10	4	24	25	31	13	29	29	22	23	24	32
	18	25	22	23	23	24	27	37	30	39	28	15	14	12	13	12	9	5	8	18	19	18	31	32	33	22
	19	32	24	25	35	23	20	35	43	121	140	66	31	29	25	21	13	12	15	20	46	36	34	126	96	45
	20	42	26	15	20	18	28	35	52	77	178	189	166	70	43	40	21	12	11	21	25	47	39	46	32	52
	21	39	44	34	17	14	19	19	39	56	47	31	28	35	38	29	9	1	3	5	9	24	30	30	36	27
	22	39	65	72	58	46	56	66	89	59	45	40	36	50	63	39	65	46	13	21	23	42	82	62	37	51
	23	36	54	29	98	81	49	66	36	37	26	42	73	59	89	54	40	59	37	27	22	16	21	27	60	47
D	24	39	122	111	90	84	69	62	56	81	190	55	32	28	94	33	67	44	18	17	38	49	42	35	39	61
	25	63	61	25	17	18	16	15	15	14	10	10	15	23	22	18	45	42	45	51	36	67	35	45	51	32
	26	31	32	33	49	52	64	132	80	92	65	36	21	19	25	37	35	41	36	22	22	30	30	41	38	44
	27	31	36	46	63	59	35	40	45	75	91	76	80	48	101	111	61	86	78	97	129	126	135	230	205	87
D	28	228	166	111	130	106	125	134	71	55	98	122	137	222	215	89	132	208	156	61	105	121	116	65	68	127
	29	143	49	46	53	65	112	96	88	50	104	39	23	26	43	49	56	69	91	186	95	87	85	71	36	73
	30	78	76	108	201	194	83	46	37	26	21	19	19	18	22	30	16	70	66	45	33	31	35	21	20	59
Q	31	21	18	19	29	18	13	13	11	14	15	16	22	24	23	18	21	16	17	18	18	21	25	24	23	19
	MEAN	55	53	52	55	52	50	47	41	57	68	51	50	53	57	41	40	43	39	39	46	51	46	54	54	50
SQ	MEAN	28	24	20	25	25	19	24	23	24	26	25	25	23	31	14	16	18	18	14	18	18	19	18	17	21
SD	MEAN	109	126	145	125	123	127	68	26	101	137	79	89	119	124	67	70	76	57	53	85	90	71	60	56	91

VALUES ARE EXPRESSED IN GAMMAS

JANUARY 1970 AO INDICES

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	9	10	13	15	-2	-35	-1	3	7	9	10	10	-37	-29	-21	-22	-107	-109	-24	19	14	6	-5	-19	-12
D	2	7	12	0	-90	-10	-18	-26	-125	-118	-43	-72	-146	-256	-135	-106	-118	5	-47	-45	-213	-130	-55	-106	-93	-80
	3	-72	-6	-16	-13	19	17	-10	-53	-88	-48	-31	-11	-41	-83	-33	0	-13	-24	-9	-6	-16	-61	-21	-1	-26
Q	4	0	0	2	3	6	2	-9	2	3	-10	-18	2	-7	-2	-38	-61	-53	2	14	5	-13	-46	-33	0	-10
	5	9	12	12	8	9	5	16	14	13	-4	-28	23	25	0	-12	0	18	24	16	15	5	-4	-5	-66	4
	6	-8	10	8	9	14	4	5	5	14	7	0	-26	-76	-57	-25	6	5	-16	-89	-45	-2	11	8	5	-10
	7	10	9	9	6	15	11	12	17	13	4	5	4	-6	-2	-5	-29	-93	-134	-104	-13	25	9	16	5	-9
	8	-10	-13	6	6	4	14	19	14	17	22	-5	24	21	14	23	24	0	-45	-9	14	18	16	7	-1	8
D	9	-72	-31	43	30	6	8	38	-7	-44	44	35	16	11	1	-33	-24	-70	-79	-44	-10	0	-5	-33	-28	-18
	10	-25	19	-37	30	20	11	9	10	11	9	3	-31	-9	-27	7	-1	3	-21	-28	-5	0	1	3	3	-2
	11	7	11	25	31	19	17	27	16	10	8	4	0	-23	-25	-32	3	-2	-3	-8	-18	-16	-6	3	-25	1
Q	12	-103	-6	21	-4	8	11	18	-21	-22	0	3	0	5	-1	-2	-1	-12	-74	-55	-12	-19	-101	19	44	-13
	13	25	21	13	5	11	14	10	19	12	9	8	9	-1	-1	-52	-95	-49	-4	-1	1	4	7	6	12	-1
Q	14	12	8	6	-21	-41	-1	25	19	21	22	24	17	11	-36	-14	0	1	3	5	2	5	3	8	-23	2
	15	22	41	48	38	27	62	27	21	16	11	7	9	14	7	7	0	-7	-46	-8	2	4	7	18	23	15
	16	30	-25	-23	13	12	7	14	-50	-81	-48	-177	-120	-85	-161	-194	-107	-192	-148	-90	-161	-183	-139	-103	-162	-89
D	17	-138	-137	-113	-35	-118	-21	17	-1	7	5	4	0	-1	-2	-4	-16	-18	-23	-16	-23	-13	-3	0	-2	-27
D	18	-9	-63	-9	3	-15	4	-45	10	18	9	0	12	6	6	9	-9	-25	6	2	-1	0	2	-5	0	-4
	19	4	5	8	11	9	8	4	6	2	-6	1	11	1	1	-31	-92	-35	-22	-40	-23	-29	-92	-55	-3	-15
	20	-17	-23	-8	5	-9	1	4	8	9	-13	-22	-15	-22	-98	-91	-8	-9	0	-36	-85	-114	-30	14	8	-23
	21	15	12	12	19	0	-8	-27	0	-5	-33	-34	-7	2	-75	-55	10	0	-3	-11	-55	-22	-46	-12	-4	-14
	22	-59	8	3	1	8	13	7	0	5	9	0	-9	-4	3	-3	-13	-75	-35	-12	-22	-24	-20	3	6	-9
	23	4	-4	-69	-48	-17	-13	-17	-24	18	16	10	7	-10	-3	-8	-3	-3	-8	-8	-9	-12	-6	-55	-41	-13
	24	-48	-7	-2	1	0	0	6	-40	-32	-75	-148	-27	-34	-17	-11	-55	-49	-36	-26	2	-25	-105	-5	5	-30
Q	25	0	9	9	3	-7	-3	21	11	10	4	4	0	1	3	-7	-2	-2	-28	-15	1	-1	-11	0	0	0
	26	3	-3	-10	-9	12	13	9	8	-17	14	12	4	15	2	-6	-11	-13	-16	-3	0	0	4	0	0	0
Q	27	1	6	-7	-4	18	21	10	10	-36	1	15	13	12	-1	-35	-10	-49	-87	-35	-7	22	24	15	-9	-5
	28	12	24	11	10	12	13	12	13	12	11	12	19	11	3	14	11	10	9	5	-27	-6	2	2	-65	5
	29	-31	-9	3	3	14	-4	-36	-43	-5	17	11	8	6	5	6	4	5	4	7	13	13	11	12	-5	0
D	30	-44	2	3	5	-11	-29	-60	6	12	10	-23	-8	-13	-1	5	-38	-103	-14	-48	-48	35	-16	21	-16	-10
	31	-63	-103	-94	-38	-4	10	15	14	12	9	9	-2	7	7	6	-1	-12	3	-26	-39	-3	12	0	6	-11
	MEAN	-17	-7	-4	-0	0	4	3	-5	-7	-1	-12	-7	-15	-23	-23	-21	-30	-31	-24	-24	-16	-20	-9	-15	-13
SQ	MEAN	7	8	8	7	8	9	12	10	4	5	2	3	-3	-5	-27	-33	-24	-10	-3	-2	-5	-10	-5	-3	-2
SD	MEAN	-43	-36	-18	-15	-24	-11	-4	-35	-45	-6	-47	-52	-69	-60	-59	-61	-76	-62	-49	-91	-56	-44	-44	-60	-44

FEBRUARY 1970 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	6	-19	-27	6	-25	-30	0	5	5	3	4	2	3	4	2	-1	-9	-8	-3	4	14	11	-36	-82	-7
D	2	8	21	24	-28	-26	4	23	5	-6	-88	-73	-139	-150	-38	11	9	-29	-85	-73	-118	-128	-27	-50	-130	-45
	3	-24	-29	28	-3	6	7	6	9	4	0	-21	-26	-67	-43	0	-10	-3	-3	-1	-2	1	4	7	4	-5
D	4	2	10	3	8	6	7	0	12	-17	-100	23	-23	-63	-146	-57	7	-91	-166	-83	-32	-6	-52	21	13	-30
	5	11	-25	-35	-29	8	9	25	17	6	3	-3	-3	-67	-128	-74	-9	-26	-54	-17	-3	-10	-20	-104	-81	-25
	6	1	20	15	10	14	16	15	-16	5	30	8	4	0	0	0	0	-1	-10	-22	-36	-7	2	2	2	2
Q	7	1	1	3	3	2	3	1	4	4	6	5	5	-2	-3	0	-3	-3	-2	0	-3	-4	0	2	0	1
Q	8	2	1	0	0	6	9	5	7	7	7	5	2	0	-3	-18	-28	-41	-33	-22	-35	-16	-7	0	4	-6
	9	4	3	-6	-13	3	12	-2	7	7	8	4	1	3	3	-5	-26	-18	-24	-9	8	11	7	7	7	-0
	10	7	6	5	7	12	-3	3	-7	4	4	2	2	-1	-10	-21	-139	-145	-97	-12	6	10	7	8	8	-14
Q	11	4	4	2	4	3	11	10	0	-22	-7	1	0	-3	-5	-3	-3	-17	-18	-12	-6	-1	-2	0	0	-3
	12	1	7	6	5	5	4	4	4	1	5	2	1	0	-4	-3	-5	-4	-1	0	3	2	-1	-2	-2	1
	13	0	1	2	9	10	-16	15	13	12	7	3	0	-29	-68	-28	13	11	4	6	7	4	5	4	3	-1
D	14	4	6	-30	-145	-42	-11	4	-7	-15	-17	-93	-87	-38	-42	-104	-118	-68	-26	8	8	10	8	7	5	-33
	15	8	8	-32	-42	-47	-74	-82	-3	-3	3	-79	-11	13	0	-12	-42	-22	-56	-93	-73	0	16	12	9	-29
	16	11	11	5	9	9	6	-2	-39	-54	-16	-5	-48	-70	-47	-35	-9	5	2	10	-1	-5	-2	-11	-6	-12
	17	9	5	1	9	9	10	7	7	10	12	-39	-43	-4	-3	-1	-6	-84	-136	-91	-91	-58	-86	-94	-14	-28
	18	4	-12	-18	-6	-39	-15	1	-48	16	14	21	4	9	-71	-175	-14	5	-6	-59	-7	-19	-9	-70	-44	-22
	19	-24	-32	1	1	4	10	3	6	6	7	3	-31	-61	-14	-15	-9	-14	-2	8	7	3	1	0	3	-6
	20	6	10	8	6	5	6	4	2	2	6	6	4	6	-2	-73	-42	-6	-5	-2	-28	-12	-1	1	0	-4
Q	21	4	1	-6	0	6	9	-2	4	-2	-2	1	-4	-6	-5	-2	-3	-3	-7	-1	0	-8	-2	-3	-2	-2
Q	22	0	-1	-5	-2	3	0	2	0	0	0	0	0	-4	-5	-1	-7	-5	-2	-19	-24	-13	-5	-5	-2	-4
	23	0	2	2	6	8	6	3	3	5	5	3	1	0	0	1	1	1	-1	1	5	11	11	7	4	4
D	24	6	6	0	-46	2	7	0	-47	-28	2	-60	-34	0	9	13	-52	-162	-139	4	26	31	4	2	-1	-19
	25	2	-7	-5	5	4	-1	-9	-7	4	1	0	-1	0	0	0	-8	-32	-23	5	7	6	3	0	-1	-2
	26	-4	-39	-56	-36	-27	-7	-37	-35	-69	-37	11	4	-94	-86	-46	-5	0	-37	-16	-10	-9	-6	-10	-9	-28
	27	-8	-10	-10	-9	-15	-41	-19	-13	-44	-18	-31	-12	-19	-26	-28	-15	-29	-67	-23	3	-26	-131	-37	-49	-28
D	28	-176	-194	-91	11	20	-7	-44	-35	33	21	-23	-24	18	-34	-8	-26	-46	-56	-76	-24	6	14	13	-25	-31
	MEAN	-5	-9	-8	-9	-3	-2	-3	-5	-4	-5	-12	-16	-22	-26	-24	-20	-30	-38	-21	-15	-8	-9	-12	-14	-13
SQ	MEAN	2	1	-1	1	4	6	3	3	-3	1	2	1	-3	-4	-5	-9	-14	-12	-11	-14	-9	-3	-1		-3
SD	MEAN	-31	-30	-19	-40	-8		-3	-14	-7	-36	-49	-61	-47	-50	-29	-38	-79	-95	-44	-28	-17	-11	-1	-29	-32

MARCH 1979 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-75	14	18	-63	5	51	33	-44	-51	-63	-60	-9	5	-38	-96	-66	11	12	-7	-4	1	-8	0	8	-19
	2	-46	-129	-108	-6	-64	-130	-15	12	-42	-169	-100	-81	6	6	1	-20	0	-66	-11	5	4	7	-24	-66	-44
	3	-28	5	-2	-1	-3	-7	-15	5	-71	-7	19	7	1	5	-67	-23	-61	-186	-114	-165	-57	-79	-20	6	-33
	4	-2	-14	-56	17	8	23	49	-3	-40	-99	-72	-123	-179	-188	-141	-129	-67	-100	-88	-95	-25	-38	-15	-58	-68
	5	-16	19	19	17	14	12	-1	8	0	20	6	2	2	1	11	0	-50	-35	-133	-116	-68	-73	-31	-21	-17
D	6	-93	-71	-1	26	17	12	4	-19	-122	-103	-259	-33	-10	-10	-55	-59	-47	-23	-59	-30	-186	-131	-251	-213	-68
D	7	-153	-141	-94	-111	-87	22	4	-11	-83	-169	-155	-112	-12	-71	-113	-192	-160	-112	-214	-149	-8	20	13	-77	-90
D	8	-23	-9	-49	-213	-157	-172	-80	-37	-39	24	-128	-86	-75	-321	056	-755	-3	203	-163	-821	-328	-215	-139	-58	-97
D	9	11	-11	-81	-272	-74	2	42	31	31	24	-99	-122	-237	-222	-133	-242	-256	-132	-5	0	-5	-70	-79	-181	-86
	10	-88	-10	-11	-18	-13	-13	-14	-26	-58	-22	-33	-49	-24	-17	-23	-30	-58	-37	-89	-68	-79	-25	-13	-19	-35
	11	-26	-26	-26	-21	-19	-14	-17	-18	-19	-18	-19	-21	-23	-15	-34	-24	-24	-16	-11	-12	-57	-49	-22	-4	-22
	12	-13	-29	-24	-91	-87	-33	-38	-82	-67	-56	-89	-28	-21	-8	-15	-19	-21	-14	-4	-1	1	-2	-3	-4	-29
	13	-7	-8	-8	-10	-13	-7	-29	-76	-21	-5	-134	-19	-13	-75	-114	-71	-39	2	-5	-44	-69	3	-2	-7	-32
	14	-6	-16	-44	-17	-7	-5	-3	-2	18	-9	-15	-16	-14	-11	-10	-7	-4	-5	-4	-1	0	-1	-4	-4	-8
	15	-4	-35	-39	-38	-53	-48	-34	-5	-6	-4	-29	-21	1	0	-40	-107	-37	5	0	-45	-25	-9	-3	-11	-24
C	16	-7	-4	-7	-10	-5	-4	-10	-10	0	-23	-36	-13	-8	-17	-44	-20	-10	-7	-5	0	0	-7	-4	-7	-11
	17	-5	-5	-4	-12	-6	-1	-14	-1	-2	-7	-5	-4	1	-9	-29	-10	-25	-22	-61	-11	11	10	-12	-27	-10
	18	-67	-31	-8	-9	-9	-5	-11	-11	-7	8	0	-56	-61	-16	-3	-29	-89	1	-13	-22	1	-45	-69	-16	-24
	19	-10	-10	-15	-14	-6	0	-2	-18	-11	3	-5	-3	-20	-46	-11	-11	-6	-11	-31	-3	-1	-102	-25	-22	-16
	20	-16	-3	-7	-9	-6	-6	-10	-10	-6	-2	3	-3	-43	-23	0	-21	-16	3	-9	-93	-16	-2	-15	-19	-14
Q	21	-10	11	-4	-8	9	5	-4	-10	0	1	-7	-7	-13	-2	-3	-47	-77	-38	0	17	15	0	6	-2	-7
Q	22	-5	-3	-1	-6	-5	-2	-5	-9	-5	4	5	-10	20	10	0	-7	-6	4	6	-1	5	3	-3	-8	+1
	23	-8	-4	-4	0	0	1	0	13	-34	-41	-11	3	9	0	-11	-5	-22	-15	0	-24	3	2	-3	-5	-7
Q	24	-8	-6	-4	0	-1	-3	-4	-2	-2	-3	-5	-4	-1	0	6	4	0	2	7	9	8	3	-3	-2	-0
Q	25	-4	-7	-2	0	-2	-2	-3	-10	4	8	-6	0	-4	-3	0	0	0	1	0	1	3	3	0	-2	-1
	26	-4	-5	-24	-28	-52	-36	-10	-1	3	-4	-7	-2	0	-2	1	-27	-32	-3	-13	-11	-4	3	5	1	-11
	27	-1	-5	-9	-12	-9	-5	-4	17	33	32	44	73	32	3	-9	0	2	12	-12	1	17	-7	-68	-59	3
	28	-20	-33	-34	-135	-69	-84	-34	-13	0	-74	-187	-98	-45	-43	-82	-41	-25	9	11	-83	-24	-5	-34	-174	-56
	29	-124	-21	-88	-2	-23	17	6	-47	-21	9	13	-6	-134	-29	-65	-107	-56	-34	5	-61	-18	6	0	-59	-35
	30	-55	28	13	1	-3	31	-54	-37	-62	-15	-46	-59	-21	-42	-14	-12	-76	-23	9	11	1	-76	18	6	-20
D	31	0	1	-25	-31	-76	43	52	-88	-75	-77	-181	-37	-2	-20	-63	-83	-7	13	23	13	-30	-11	-90	-136	-35
	MEAN	-29	-18	-23	-35	-24	-12	-7	-16	-25	-27	-51	-30	-28	-31	-3	-70	-41	-20	-32	-56	-27	-29	-28	-40	-29
SQ	MEAN	-7	-2	-4	-5	-1	-1	-5	-8	-1	-4	-10	-7	-1	-2	-8	-14	-10	-8	2	5	6		-2	-4	-4
SD	MEAN	-92	-46	-50	-120	-75	-19	4	-29	-58	-60	-162	-78	-67	-81	139	-266	-95	-10	-84	-197	-95	-81	-101	-129	-75

APRIL 1970 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-2	-17	-28	-49	-42	-22	-44	-41	-45	-30	-25	-19	-34	-19	-19	-22	-23	-21	-21	-18	-12	-15	-12	-10	-25
	2	-11	-12	-12	-15	-11	-16	-13	-13	-10	-27	-17	-14	-5	-20	-89	-70	-17	-13	-14	-9	-2	-15	-31	-43	-21
	3	-19	-13	0	-14	-47	-36	6	47	41	0	-22	-34	-21	-36	-13	-38	-44	-23	18	17	10	5	3	4	-9
	4	-26	-24	-106	-48	-3	-5	-4	-79	-69	-6	6	-24	-83	-7	-4	-7	-9	0	-4	0	0	-6	-8	-13	-22
	5	-6	-4	-4	-6	-4	-2	0	11	0	-80	-61	-79	-19	-4	-13	-38	-34	-8	10	18	23	17	12	11	-11
D	6	9	-9	-40	-16	-69	-30	-113	-52	6	-7	-284	-93	-19	-66	-67	-72	-33	-48	3	28	11	-22	-85	12	-44
	7	0	-57	-39	14	7	-23	-82	-12	-97	-30	-7	5	-8	-3	-13	-11	-8	-2	-11	9	8	8	9	4	-14
	8	-86	-45	4	6	-34	-49	-1	14	0	-68	-82	-5	-3	-24	-2	5	-22	-20	-3	0	4	-1	-37	-26	-20
	9	2	4	7	-12	-84	-37	-5	-18	-13	-22	19	-63	-77	-94	-5	-7	-4	-16	0	13	16	18	-20	-15	-17
Q	10	-8	3	6	0	-4	-5	-5	-6	-2	-1	-5	-5	-3	1	-4	-9	-5	-1	2	3	4	5	-14	-24	-3
	11	-40	-45	-26	-12	-30	-12	7	3	-73	-54	-39	-55	3	9	3	-14	-3	-12	-33	-4	11	5	3	2	-17
	12	0	0	1	-13	-18	-22	-37	-25	-23	9	18	3	0	6	10	-23	-33	-5	5	25	18	9	8	5	-3
Q	13	0	0	-2	-6	-6	-6	-1	2	1	0	-3	10	-24	-18	-16	8	6	10	4	5	4	3	3	1	-1
Q	14	3	5	0	-6	-7	-8	-4	0	-2	-7	-10	0	2	-11	-13	-3	-3	3	4	6	4	6	0	-6	-2
Q	15	7	3	7	0	-1	-1	0	10	9	-9	13	-2	-4	2	-2	1	-42	-54	-73	4	-39	2	15	25	-5
	16	-116	-52	11	9	-43	-41	12	18	22	8	-5	-8	-8	-7	-6	8	3	11	20	28	-68	-63	-40	-122	-19
D	17	-174	-77	-65	-25	-84	-18	9	6	11	-126	-58	-14	-12	-83	-66	-86	-54	-56	-55	8	-29	-226	-64	8	-55
	18	12	11	-2	-6	-2	-2	-3	0	30	-22	-138	-145	-140	-132	-117	-21	21	8	14	33	17	-78	-160	-145	-48
	19	-45	-112	-150	-114	-3	42	-85	-170	-81	8	-106	-143	-13	2	3	-8	-16	-28	8	13	-18	-27	5	12	-43
D	20	3	-7	-39	-91	-56	-18	-5	-3	2	7	17	-21	-75	-104	-29	-43	-24	-28	-80	58	45	21	6	-34	-19
D	21	-36	-109	-45	-13	9	-57	-74	-28	-117	-104	-174	-92	-176	-150	-163	-236	-324	-395	-241	-101	-231	-310	-193	-110	-145
D	22	-187	-276	-231	-225	-54	-44	-10	-41	-44	-162	-74	-25	0	2	3	-23	-25	0	7	-2	-3	-4	-7	-4	-60
	23	-5	-27	-40	-7	26	-24	-68	-4	22	16	-22	-3	-188	-210	-134	-46	39	-25	-87	-57	3	65	-58	-89	-38
	24	3	-20	-101	-57	15	-17	-26	-24	4	13	27	22	-52	-37	-13	-200	-99	-65	-36	42	9	-21	-5	15	-26
	25	-141	-70	-50	-55	-91	-18	3	24	-35	-30	-44	-85	-13	-41	-16	-32	-9	3	7	-19	-33	-2	7	-61	-33
	26	-45	-22	-1	-45	3	6	-9	-3	0	-6	-5	11	-7	-68	-32	-17	-2	-14	-30	-110	-29	20	33	-74	-19
	27	-96	-36	-47	-47	7	6	8	13	-1	0	21	-20	-27	-9	-11	-19	-2	0	-36	-4	31	14	8	5	-10
Q	28	-25	-155	-71	-36	-7	-19	-6	2	21	26	38	30	-7	-29	-15	-14	-3	2	16	14	11	-1	4	5	-9
	29	5	6	-25	-22	-19	-17	6	16	18	-34	13	17	-37	-68	-47	8	-32	-36	-34	51	68	43	-35	-5	-7
	30	20	-13	-126	-126	-70	22	-58	3	-21	-70	34	35	19	28	22	61	8	21	7	12	0	-2	-10	-29	-10
	MEAN	-33	-39	-41	-33	-24	-16	-20	-12	-15	-27	-32	-27	-34	-40	-29	-33	-27	-27	-21	2	-5	-18	-22	-23	-25
5Q	MEAN	-5	-29	-12	-10	-5	-8	-3	2	5	2	7	7	-7	-11	-10	-3	-9	-8	-9	6	-3	3	2		-4
5D	MEAN	-77	-96	-84	-68	-51	-32	-39	-24	-28	-70	-115	-49	-56	-80	-64	-92	-92	-105	-73	-3	-41	-108	-69	-26	-65

MAY 1979 AD INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	7	14	3	6	1	42	-42	-56	-6	0	0	5	14	-76	-38	5	-2	4	19	23	-22	19	-31	-18	-5
	2	-43	-2	2	-3	-28	-12	14	-5	-45	1	0	1	16	6	3	3	5	-28	-15	-8	4	6	-8	-42	-7
	3	-6	6	0	-5	-5	-9	-10	1	-5	2	12	28	-41	-53	-28	-23	12	-19	-55	10	41	31	-107	-46	-12
	4	-39	0	-4	-4	-1	-6	6	17	10	28	5	0	-9	3	5	-20	-36	-8	24	21	22	13	6	2	1
	5	-9	-1	5	-3	1	3	5	3	8	27	-51	-61	-11	-14	-35	-27	20	-11	17	16	11	9	12	-19	-4
	6	-49	-9	-13	-15	-11	-13	-11	-7	-3	-6	-14	8	-25	-19	-14	0	2	22	17	10	24	12	6	8	-4
	7	0	1	1	14	-3	-7	-6	-6	-1	2	26	7	-9	-18	-5	-6	-5	11	5	-7	10	8	1	-3	0
Q	8	-4	-24	-10	-6	-4	-4	-4	-1	2	5	0	1	3	8	7	2	2	-82	-19	15	7	3	7	-2	-4
Q	9	-11	-10	-1	-4	-15	-25	0	12	17	8	3	18	0	8	7	-10	-17	-21	-3	0	11	3	9	-2	-2
Q	10	3	4	0	-19	-10	12	12	11	11	20	13	5	0	-3	-8	-16	-12	-4	4	3	4	2	8	-1	1
Q	11	-1	-2	-3	-7	-10	-8	-5	-2	3	8	1	3	-2	-9	-5	-4	-2	8	9	11	16	15	14	10	1
D	12	-2	20	-26	7	-22	-1	8	26	18	35	32	-7	-29	-78	-102	-45	-16	38	-21	-12	2	32	15	34	-4
	13	2	-8	-79	-92	-20	22	2	-3	1	10	-77	-40	15	15	15	-13	3	3	14	14	9	22	18	15	-6
	14	13	-34	6	-7	15	21	23	-17	7	13	15	1	6	15	7	6	-14	-66	-25	-38	-1	12	35	-19	-1
	15	-27	-22	-8	-14	31	21	0	37	23	-11	-8	18	18	-4	-5	-2	3	-1	0	-10	-3	7	16	3	2
	16	-8	10	8	7	9	-21	-23	14	-4	5	16	22	21	15	-39	-37	-47	-76	15	23	36	37	31	-28	-1
	17	-102	-28	22	8	58	-74	-27	7	13	14	31	31	9	-63	-53	27	35	25	36	24	21	26	32	5	3
	18	12	13	-26	-51	8	4	10	18	12	6	6	10	26	29	27	26	4	29	30	26	22	9	7	4	11
	19	0	1	9	-8	-38	-35	-37	-58	7	-7	-10	20	-8	7	29	21	17	4	19	59	51	-7	-12	15	2
D	20	-42	-59	-43	18	-24	-22	25	28	45	21	-30	21	10	-32	23	-38	-65	-41	42	30	-41	-30	-9	-12	-10
	21	-60	-90	-96	-136	-122	-84	-74	-46	-19	9	-24	22	26	22	-31	-45	1	2	5	-9	14	8	8	-25	-32
	22	-59	-43	-48	-28	-3	17	21	33	25	26	34	42	58	39	0	-28	-37	-33	-13	33	28	17	19	18	4
	23	4	-8	-2	-2	-6	-9	0	28	-34	-20	25	14	15	13	-8	-24	-9	-31	-23	-2	33	18	-48	11	-2
	24	34	19	10	4	-2	-9	-7	6	17	20	15	14	12	21	6	-16	-48	-11	28	22	21	11	15	-27	6
	25	-39	-39	-39	-28	-65	-42	-28	-2	8	-1	14	24	-51	-57	-46	-13	-29	-36	-13	9	8	16	19	19	-18
Q	26	9	0	-8	-10	-11	-5	-1	-7	-6	-11	-14	-14	-4	-2	-5	-36	-29	-15	-13	6	6	20	24	14	-5
D	27	31	8	6	-16	-15	-21	20	43	21	6	22	43	1	-53	-23	18	-49	-72	-28	-40	-57	-21	-160	-172	-21
D	28	-1	-169	-81	13	21	13	4	7	28	68	-206	-117	-88	-9	105	48	31	28	14	4	35	29	32	16	-7
D	29	-54	-42	-17	-4	-16	10	-13	-66	-11	49	20	-3	-36	-35	-3	-2	-8	1	25	18	42	19	7	-3	-5
	30	-31	-36	-15	-4	-31	-25	-9	33	17	-134	-63	-16	-16	-14	-6	11	0	38	-4	32	12	5	1	0	-11
	31	-11	-9	-13	-8	-32	-15	8	-10	-9	-7	2	11	21	-57	-4	24	45	24	-2	-3	-3	-2	-4	-14	-3
	MEAN	-14	-16	-14	-13	-11	-9	-4	1	5	6	-7	3	-2	-13	-7	-7	-8	-11	3	9	11	11	-2	-9	-4
SQ	MEAN	-1	-6	-4	-9	-10	-6		3	5	6	1	1	-1		-1	-13	-12	-24	-4	7	9	9	9	4	-2
SD	MEAN	-14	-48	-32	4	-11	-4	9	6	20	36	-32	-13	-28	-41		-4	-21	-9	7		-4	6	-23	-27	-9

JUNE 1970 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	-7	-3	-52	-46	-57	-73	-47	7	53	-114	-11	-7	-8	-35	-73	-53	14	5	24	13	-3	-39	-58	-24	-25
	2	-59	-22	1	-44	-28	-18	-2	-8	0	11	14	15	10	-3	5	-6	-33	-18	-9	-19	-24	-16	-16	-46	-13
	3	-1	8	-86	-75	-54	-64	-44	2	8	-18	-20	-41	-89	-29	1	-23	-30	34	29	-3	7	-2	-19	-28	-22
	4	-46	-100	-103	-17	-68	-73	-29	-31	-11	8	15	-13	-15	-17	-70	-14	19	18	2	36	27	19	3	-32	-21
	5	-20	-19	-41	-109	-36	-53	-75	-43	-7	36	40	22	-4	1	2	0	1	9	5	7	1	0	-1	-5	-12
Q	6	-9	-9	-9	-6	-29	-28	-9	-7	-14	36	-5	4	2	9	5	-12	-7	5	15	13	14	12	7	0	-1
	7	-4	-5	-7	-6	-32	-8	-6	3	5	5	2	9	4	5	10	19	23	35	24	-5	-13	27	23	-118	-8
	8	-13	-38	-106	-63	-5	-46	-63	4	-2	1	18	-16	-41	-11	0	0	16	25	-2	-6	7	10	0	8	-14
	9	-4	-9	-14	-47	-8	-1	-4	0	-29	-22	-11	-8	-8	-5	-5	-8	10	7	23	26	-11	-3	-5	12	-5
	10	25	12	-15	-15	-3	-1	-10	-4	-8	0	11	0	-3	5	-17	-6	21	61	46	41	12	-1	13	8	7
Q	11	-1	-17	-54	-18	-1	-5	-3	-13	-14	-3	-2	1	-2	-2	-4	5	14	2	0	-8	-10	-8	-7	1	-6
Q	12	4	1	-6	-20	-29	-26	-26	-2	-4	12	-8	23	12	17	15	14	13	28	33	34	-5	7	13	11	5
	13	21	21	13	8	-18	0	-7	-38	1	-6	-3	29	-35	34	-44	49	8	8	9	13	15	-3	0	11	4
	14	42	10	-17	-33	-36	-31	-18	-22	-21	-8	-3	7	11	18	3	-4	-6	-6	31	-10	20	27	18	35	-0
	15	-76	-79	-37	-32	-12	-33	-59	15	-37	-26	0	-46	-44	-82	-2	22	42	17	13	52	69	-49	3	19	-15
	16	3	-9	-38	-64	-1	-75	-71	-5	4	3	2	2	1	20	8	0	-3	-20	0	5	-3	22	6	-20	-10
	17	0	1	-2	-5	-4	1	-10	-4	13	11	17	16	-1	-60	-18	1	35	14	54	-15	-33	-28	-47	-46	-4
D	18	-55	-89	25	3	-4	1	-5	0	-75	-65	-162	-159	-58	-43	-9	-59	-3	48	73	27	16	-6	-85	9	-28
	19	-9	-81	-103	-44	-1	-13	-55	-5	12	26	-15	-22	-9	-1	-4	-3	12	31	22	11	23	-14	-19	-52	-13
D	20	-134	-194	-132	-69	-105	-41	-25	-85	-103	-44	-4	-14	-68	-47	-22	-66	-54	-53	0	50	-36	-48	-78	-146	-63
D	21	-172	-158	-158	-157	-149	-121	-127	-111	-87	-51	5	-37	-70	-60	-55	-7	24	77	53	7	9	17	19	8	-52
Q	22	16	-7	-6	-16	-14	-21	-22	-24	-11	-8	6	-3	14	4	0	-1	7	7	14	16	18	17	6	12	0
Q	23	19	-24	-4	-1	-1	-21	-23	-8	-27	-13	-11	5	11	13	9	-5	-2	2	3	11	1	10	0	-1	-2
	24	15	-4	-4	-5	-3	-18	-5	-9	-17	-2	-2	-2	0	6	18	23	16	22	38	65	-9	21	35	19	8
	25	-7	-103	-13	2	0	-4	-40	-3	20	43	31	-26	-50	-50	-10	-17	-9	18	-6	-10	-9	22	-32	-16	-11
	26	13	5	2	33	77	78	90	32	-24	-57	18	28	8	6	22	33	70	72	22	-43	-12	14	2	-7	20
D	27	-10	9	-31	-133	-109	-47	-13	37	4	-137	32	48	0	-10	-5	47	33	5	16	8	17	0	-6	1	-10
	28	0	-46	-157	-81	-45	-52	-30	-12	4	65	-6	-58	-87	-113	-71	-5	1	-13	-10	3	12	9	11	1	-28
	29	-4	-9	-9	-11	-6	-35	-51	-80	-25	3	1	-1	1	7	3	2	0	46	69	36	8	-23	-15	-1	-4
	30	8	-1	-5	-5	-2	-5	-5	-27	-17	19	19	-8	-37	-4	-3	5	18	28	33	21	17	5	0	0	2
	MEAN	-16	-32	-39	-36	-26	-28	-26	-15	-14	-10	-1	-9	-17	-14	-10	-3	8	17	21	13	4	1	-5	-10	-10
SQ MEAN		6	-11	-16	-12	-15	-20	-17	-11	-14	5	-4	6	7	8	5		5	9	13	13	4	6	4	5	-1
SD MEAN		-76	-87	-70	-80	-69	-56	-43	-30	-42	-82	-28	-34	-31	-39	-33	-28	3	16	33	21	1	-15	-42	-38	-36

JULY 1970 AD INDICES — VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-2	9	-51	-43	-67	-36	-48	-13	-61	-19	22	1	34	17	-37	6	26	2	28	40	41	17	15	14	-4
	2	5	0	6	-2	-6	-35	18	-57	0	31	57	-26	6	24	16	10	15	22	11	-1	-3	6	0	13	5
	3	-8	3	-7	-28	-54	-97	-89	-1	-44	-87	-10	-9	-5	-32	-23	-1	-3	0	3	9	31	37	-29	-385	-35
	4	-283	-99	-34	-11	-34	-42	-89	-2	-49	18	-3	9	35	-21	-10	-5	-2	8	8	0	0	-5	-12	-13	-26
	5	-8	-4	14	47	-63	-145	-67	2	-2	13	10	3	-4	12	-4	-1	0	-21	26	16	1	2	24	-9	-7
	6	-143	-28	-76	-56	-27	-10	-69	-48	-98	-24	-7	14	-68	-57	27	19	21	22	16	11	6	1	-3	-7	-24
Q	7	-6	-7	-9	-12	-14	-13	-4	-13	-40	-24	-13	-13	7	5	3	5	8	12	18	15	6	-7	6	-32	-5
	8	9	30	-13	0	24	25	10	0	9	8	6	14	10	-79	-20	-18	-7	-67	-8	36	29	50	-1	-167	-5
D	9	-111	-12	39	101	-22	-9	40	14	44	-29	-117	-169	-213	-59	83	46	26	44	83	77	-52	-33	-86	-84	-17
D	10	-245	9	6	1	0	-1	4	-2	-8	-2	22	37	34	21	8	-98	-42	-36	-13	-3	3	-41	8	-7	-14
	11	-42	-115	-58	-17	-5	3	4	-47	-47	-8	15	-26	-21	-11	-17	-28	-34	13	-2	11	-11	-60	-5	-12	-22
	12	-76	-58	-8	-67	-15	-12	11	14	13	7	28	18	-38	-41	-4	-97	-53	19	24	-17	24	4	-39	-1	-13
	13	6	0	-60	-62	7	-59	-49	-10	-2	-4	10	21	22	-2	-17	-5	-21	-55	-95	13	32	-41	-18	-8	-17
	14	-9	-51	-70	18	-44	-21	-8	2	-32	-34	9	23	11	19	18	18	2	13	-72	-58	18	8	11	-34	-11
Q	15	-29	-1	-2	-9	-9	-3	0	2	13	-42	-46	-26	8	51	40	38	39	37	23	17	3	0	4	-7	4
	16	-39	-87	-99	-3	-17	-34	-12	-11	-7	-4	-2	16	-36	-64	10	5	-9	-18	-65	-33	0	-5	-1	-1	-21
	17	-4	3	-8	-11	0	1	1	0	-2	-5	-3	1	12	17	-39	-19	-52	-118	-8	26	12	-1	11	54	-6
Q	18	18	9	-4	-11	38	-6	-3	-2	0	14	15	9	15	16	9	3	-1	6	3	-1	-15	8	8	5	6
Q	19	1	-4	2	-38	-48	-17	10	4	7	25	19	18	9	1	7	1	-8	-42	0	11	22	2	11	2	-0
	20	25	-2	-19	-25	-9	-11	-17	-11	15	2	-2	0	4	5	4	3	0	7	2	-4	3	-2	-14	-105	-6
D	21	-163	-34	-19	50	1	0	19	13	38	38	73	-16	13	-69	-3	1	-25	21	-73	-46	5	12	-111	-104	-16
	22	-69	-4	4	-2	-47	-28	-9	48	-7	-59	-75	14	18	-2	-1	-34	-35	-35	48	23	25	18	-16	-89	-13
	23	-57	-52	-61	-18	0	32	26	-1	54	43	41	47	1	6	18	35	4	0	15	29	13	1	5	-1	8
	24	-4	-74	-96	-120	-24	-14	-85	12	7	-2	-3	28	5	-41	-45	-35	23	62	45	18	39	33	-6	-6	-12
D	25	-98	-55	49	38	-25	-59	-160	-272	-264	-195	-81	-158	-18	-35	-47	10	40	15	35	20	29	-104	-256	-182	-74
	26	-141	-151	-87	-112	4	-19	-76	-40	-55	-72	-62	-92	-100	-68	-4	1	1	4	6	7	9	17	-72	-2	-47
	27	-6	-14	-19	-43	-5	-72	-43	-11	2	-19	-32	-28	-49	-60	-24	-9	-47	-63	-8	-41	-17	-1	-6	-50	-28
	28	-6	3	-11	-13	-14	-15	-8	0	13	1	-1	0	-2	0	-6	0	0	3	-4	1	8	-12	0	3	-3
Q	29	-9	-14	6	13	-124	-205	-134	-99	-147	-277	-170	-84	3	26	-61	-52	-6	-65	-60	-59	5	20	9	0	-62
D	30	-1	-5	-4	-8	-13	-70	-22	-14	-10	-19	-10	0	0	0	11	-29	-4	2	-27	-31	16	15	-33	-24	-12
	31	-38	-115	-39	-67	-51	-69	-24	-26	-22	6	-14	-20	-64	-65	-24	-47	-64	-138	-106	8	12	-39	-117	-63	-49
	MEAN	-49	-38	-23	-16	-21	-34	-28	-18	-22	-23	-11	-13	-11	-16	-4	-7	-7	-11	-5	3	9	-3	-23	-42	-17
5Q	MEAN	-4		-5	-17	-9	-11	-1	-2	-1	-5	-5	-2	7	15	11	9	8	3	9	9	3	-2	6	-6	
5D	MEAN	-125	-23	16	41	-34	-55	-46	-69	-67	-93	-95	-78	-36	-23	-4	-17	-1	-4	-6	-2	-2	-29	-87	-75	-37

AUGUST 1970 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	-41	-17	-44	-44	2	5	10	10	11	12	7	5	0	-2	-5	-4	-3	1	3	6	0	1	0	6	-3
	2	5	-7	-51	-28	-41	-36	-3	1	44	-30	3	-1	8	7	-7	3	4	2	5	7	3	-2	-2	1	-5
Q	3	3	-2	-3	3	-13	-4	-2	0	2	-8	-6	0	0	3	-9	-38	-16	3	7	7	3	-2	+1	-2	-3
Q	4	-4	-5	1	-4	-7	-8	1	16	16	-11	3	-2	12	8	6	-38	-17	7	20	16	-9	1	1	-1	0
Q	5	-6	0	4	-12	-20	0	1	-4	2	-1	-4	-2	-1	1	4	1	0	1	8	8	1	0	1	5	-1
	6	5	2	1	1	-2	-6	0	4	25	-5	-23	4	-2	0	-1	6	17	19	22	27	29	-47	-8	-9	2
	7	17	26	5	4	4	3	15	17	17	8	7	7	0	0	5	-18	-56	-8	15	33	28	53	-201	-83	-5
D	8	-16	1	4	-7	9	2	18	-8	-191	-271	-178	-89	-47	-1	6	-40	0	25	-23	-59	0	8	-9	-57	-37
D	9	-127	-211	-35	-24	-18	-5	-17	9	-25	-9	-11	-143	-46	-6	-6	0	7	-35	-93	4	7	10	2	0	-32
	10	0	-18	-41	-40	5	-4	-18	-22	-32	-34	-5	-59	-82	-6	13	8	-23	-8	12	-4	3	19	-8	-4	-15
	11	-2	-13	-16	-28	-64	-22	11	16	4	-10	-18	7	6	-39	-59	-26	3	5	17	-31	-23	-10	-2	-95	-16
	12	-56	-63	-125	-139	-102	2	8	23	-33	-63	5	16	4	-4	-8	-4	-4	0	-3	3	-10	16	12	9	-22
	13	2	-6	-11	-20	0	10	-17	11	8	18	3	9	15	-33	3	19	2	-8	38	-19	-1	-18	-75	-7	-3
	14	15	24	0	-46	-8	0	-5	-1	7	5	-4	-2	-9	-8	-7	-12	-16	-16	-5	-14	-15	-11	0	10	-6
	15	5	31	0	8	-2	-9	-4	17	19	19	24	29	17	15	1	-10	-33	-5	3	1	2	5	20	3	7
	16	0	31	4	16	30	53	0	13	18	19	21	34	20	-18	25	27	23	-9	-70	11	8	24	-19	-152	5
D	17	-130	95	60	-16	-235	142	-269	9	134	23	-156	-93	143	26	50	-38	-169	-180	-155	-88	36	12	-37	-132	-40
D	18	-47	-116	-59	-112	-63	6	-6	-72	-61	-57	-167	-135	-156	-98	-15	32	-132	-156	-34	32	27	-12	-68	-242	-71
	19	-187	-127	-33	-15	-37	-48	-58	-3	0	-55	-92	14	0	-27	-53	-31	-65	-13	-2	14	9	3	0	-8	-34
	20	-9	-16	-15	-13	-17	-19	-16	1	-31	-32	-15	-32	-47	-7	-16	-9	-1	-3	-5	3	-6	-8	-4	5	-13
	21	7	-19	-85	-52	-20	-20	-31	-25	-37	0	25	4	1	7	-2	6	-34	-30	-31	11	6	3	-2	-7	-14
	22	-12	-13	-20	-22	-21	-29	-37	-16	7	19	16	-16	-187	-76	-44	-15	-23	-24	1	-21	-23	-1	2	-5	-23
	23	-11	-15	-15	-23	-52	-13	-34	-1	-3	13	17	9	-51	-13	-5	-8	2	-21	2	19	14	22	5	-2	-7
Q	24	0	-9	-1	-59	0	-2	-6	-11	-12	-12	-8	-1	8	-7	-17	-9	-15	-3	-35	-12	-11	-21	-33	-15	-12
	25	-14	-21	-18	-50	-55	-54	-65	-58	-15	-32	0	-25	-39	-56	-50	-23	-53	-39	-6	-15	-14	-28	-45	-25	-34
D	26	-60	-47	20	15	-131	-94	-24	-48	-85	-131	-81	-131	-88	-114	-24	-55	-30	-12	-31	-13	3	-40	-21	5	-51
	27	-78	-93	-50	-41	-2	-81	-91	2	2	-30	-5	16	28	7	-133	-67	-47	1	-21	-7	-14	-27	-21	-1	-31
	28	12	7	-4	-11	11	15	-71	-13	12	-3	-8	-8	-1	3	-15	-162	-77	-49	-77	-31	14	-26	5	-82	-23
	29	-11	-1	26	-76	-76	-6	4	-14	-6	0	16	31	-33	-24	-21	-38	-14	-17	-1	3	0	0	1	4	-10
	30	6	-79	-66	-50	-21	-34	-26	0	-11	14	12	18	12	-5	-1	-11	-8	13	1	-33	-5	11	12	9	-10
	31	3	0	-7	-3	9	-29	-62	-87	-60	-3	2	13	27	-79	-75	-6	16	48	57	-31	-21	15	2	-5	-12
	MEAN	-24	-22	-19	-29	-30	-10	-26	-9	-8	-21	-20	-17	-15	-18	-15	-18	-25	-16	-12	-6	1	-2	-16	-26	-17
SQ	MEAN	-10	-7	-9	-23	-8	-2	1	2	4	-4	-2		4	1	-4	-18	-10	2	1	5	-3	-4	-6	-1	-4
SD	MEAN	-76	-56	-2	-29	-88	10	-60	-22	-38	-89	-119	-118	-39	-39	2	-20	-65	-72	-67	-25	15	-4	-27	-85	-46

SEPTEMBER 1978 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
D	1	5	10	3	0	7	8	25	-80	-108	-75	-163	-4	23	-1	-32	-90	-42	-69	-107	-98	-63	55	18	27	-32
	2	-42	-12	21	18	15	26	28	14	6	17	-69	-47	-58	-30	-14	0	-10	-69	-57	16	39	-46	-38	6	-11
	3	9	3	8	-80	-115	5	11	24	-60	-115	-21	-21	-97	13	23	-4	-53	0	19	20	9	-71	-65	-35	-25
	4	31	11	-1	6	7	7	22	-1	-21	-4	5	15	-91	-3	9	22	-65	9	-2	7	-26	-31	9	7	-3
	5	-46	-7	3	-12	-39	-8	16	13	12	7	1	3	0	-7	-3	-38	-123	-38	-14	-37	-21	4	-45	-12	-16
Q	6	17	6	-8	5	2	2	6	3	10	11	-3	-6	-3	3	8	-60	-61	-24	-48	0	15	14	-30	-1	-6
	7	6	-7	0	1	2	7	2	14	17	1	4	6	-6	3	-8	-2	5	7	13	11	-9	-59	4	16	1
	8	9	5	5	9	19	-49	-28	-14	8	11	19	6	-14	-50	-104	-75	-103	-9	-19	-23	16	7	6	3	-15
Q	9	3	6	4	-2	1	26	18	18	18	3	-2	0	-13	-19	-21	0	-37	-14	13	0	-111	-85	-86	-21	-12
	10	-103	-57	-8	-12	-50	-10	1	5	11	-2	-3	-3	0	3	-3	-5	1	0	0	-1	0	2	4	8	-9
Q	11	7	5	1	0	-2	0	4	4	0	-3	-6	-5	-4	-1	-1	-7	-9	-8	-3	2	5	7	11	11	0
Q	12	11	10	14	11	-105	-103	-58	-42	-41	5	2	-3	-4	0	-2	-2	2	-16	7	7	12	12	9	9	-11
D	13	9	5	8	14	-23	-140	-83	-67	-61	-104	-104	-44	-104	-105	-83	-20	0	-48	13	24	-141	-40	-40	-169	-54
D	14	-21	-45	-104	-42	3	19	7	-20	-70	-24	-16	-199	-142	-177	-124	-135	-35	-28	-24	-60	-112	-21	-8	-12	-58
	15	-81	-64	-108	-74	-19	1	-22	-7	10	14	26	-8	-50	-38	8	2	-4	-7	-37	-34	11	-9	31	8	-21
	16	-2	-21	-83	-4	-14	-73	-38	-30	-34	2	-22	-20	-56	-35	-11	-7	-2	-3	-56	-51	-47	-19	6	0	-26
	17	0	-44	-61	-45	-41	-58	-162	-23	-38	9	5	0	-3	2	3	-33	-61	-23	-17	-3	-7	4	-28	-5	-26
	18	-21	-78	-59	-104	-50	-31	-6	-65	-81	-8	-8	2	3	9	8	-84	2	5	-48	9	-2	-23	-44	10	-27
	19	12	10	-23	-46	-83	-115	-28	-47	-105	-118	-75	-22	-49	-58	-39	-34	-101	-129	-74	-108	25	2	-96	-31	-56
	20	-14	-17	3	1	-13	-99	-69	4	-32	-85	-9	-34	-24	-76	-82	-69	-48	-21	4	2	-25	-14	-10	-162	-38
D	21	-83	-76	-78	-63	-17	-46	-73	-136	-111	0	21	6	-158	-243	-129	-54	-17	-55	-51	-33	5	-3	6	-5	-58
	22	6	-96	-82	-65	-158	-72	3	5	3	-24	-43	-20	-19	-17	-11	-20	-38	-157	-81	6	-10	3	-47	-18	-40
	23	-83	-13	2	3	0	4	-29	-76	-59	-109	-103	-24	-34	-28	-9	-10	-46	-61	-8	-1	13	21	15	-1	-26
	24	-53	-25	0	-63	-71	-21	-3	-58	-45	-44	7	-1	0	15	5	-1	5	0	-15	-89	10	16	3	1	-18
	25	11	8	6	-24	-91	-113	-64	0	-42	-49	7	0	-1	3	6	-8	-23	-23	-41	5	13	6	6	6	-17
	26	5	6	-1	-63	-46	-29	7	-4	5	6	3	20	12	5	3	8	-47	-41	-3	-5	-7	5	-11	-79	-10
D	27	-107	-84	-27	-50	-120	-108	-70	-52	30	20	-19	-9	-14	-17	-44	-67	-21	-54	-49	-70	1	29	-62	-254	-51
	28	-89	2	17	-10	-15	-5	1	6	7	7	9	12	6	9	13	3	3	5	-3	5	4	7	3	7	0
Q	29	2	4	4	13	17	14	3	4	4	10	3	2	-3	-1	2	1	4	5	9	8	9	12	19	5	6
	30	9	11	5	-27	-29	7	20	16	19	12	3	9	16	8	11	10	11	7	3	4	8	12	5	2	6
	MEAN	-19	-18	-18	-24	-34	-32	-19	-20	-25	-21	-18	-13	-29	-28	-21	-26	-30	-29	-23	-16	-14	-7	-16	-23	-22
SQ	MEAN	8	6	3	5	-17	-12	-5	-3	-2	5	-1	-2	-5	-4	-3	-14	-20	-11	-4	3	-14	-8	-11	1	-5
SD	MEAN	-39	-38	-48	-28	-30	-53	-39	-71	-64	-37	-56	-58	-79	-109	-82	-73	-23	-51	-44	-47	-66	4	-17	-83	-51

OCTOBER 1970 AQ INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	1	-49	-67	9	9	-8	-51	-9	18	12	6	4	0	1	3	6	-26	-22	-8	-57	-89	-39	21	16	-25	-14
	2	-116	9	16	0	-13	-6	2	-4	0	2	-33	-10	-3	-20	-16	-10	-13	-84	-26	-30	-7	-14	-4	-4	-13
	3	0	12	3	23	-3	7	7	19	7	-9	-1	-2	-10	-8	-27	-109	-131	-40	-23	-49	-20	-74	-12	-113	-23
D	4	-36	-35	-11	-38	-43	19	-63	-63	-73	-34	-141	-136	-38	-134	-13	4	-21	-79	-112	-41	-39	-4	-25	-12	-49
	5	12	0	-48	-7	10	-8	-89	-13	5	-47	-10	3	-10	-5	-1	-5	-38	0	-2	-43	-48	-19	9	3	-14
	6	4	-20	-6	15	3	5	-1	16	3	-4	-20	-42	9	10	1	-6	-5	-1	7	-57	-32	-45	-5	7	-7
Q	7	5	1	3	10	5	5	7	-15	-10	7	2	-3	-8	-44	0	-7	-4	-3	0	1	1	2	2	5	-2
Q	8	9	8	8	6	12	10	4	3	3	1	-2	-4	-4	-2	-4	-10	-8	-6	8	3	1	-5	-2	5	1
Q	9	10	7	0	0	2	2	3	1	3	9	6	5	-2	1	-1	-5	-5	-6	-32	-16	1	1	0	-1	-1
	10	0	0	2	6	-21	-23	-26	-69	27	14	11	3	1	7	1	0	-26	-67	-99	-62	-55	16	28	-30	-15
	11	-40	-64	-50	-14	12	-13	-77	-140	-76	-59	-59	-65	-83	-82	-74	-36	-37	-33	-39	-67	30	21	10	-30	-44
	12	-148	-98	9	-66	-217	-61	-23	-128	-79	-28	-13	9	3	-7	-6	-4	-6	-2	1	4	3	7	4	5	-35
	13	2	4	0	-4	-21	-124	-83	-51	10	-1	-2	-2	-113	-43	-11	-72	-101	-55	-58	-54	-15	-18	8	11	-33
	14	-40	-126	-81	-70	-64	13	-2	-19	-44	-16	-18	-48	-35	-31	-13	-13	-3	-29	-49	-44	-30	-39	-20	-10	-35
Q	15	-53	-27	-5	-13	-31	-26	1	4	0	-17	-18	-5	1	-24	-61	-18	-10	-11	-3	3	0	-25	1	2	-14
D	16	3	0	0	-2	-3	-14	1	0	5	11	5	-313	-284	-63	-51	-108	-107	-173	-168	-58	47	60	38	-71	-49
D	17	-57	-59	-140	-76	-71	-76	-227	-217	-133	-105	-69	-165	-144	-145	-111	-169	-318	-108	-239	-195	-68	-151	-106	-132	-137
D	18	-106	-100	-110	-98	3	11	11	-30	-115	-46	-38	-71	-119	-39	-67	-97	-87	-59	-34	-19	-7	-45	-94	-34	-58
	19	-44	-41	-85	-72	-65	-46	-93	-36	-144	-27	-23	-71	-65	-96	-53	-34	-84	-46	-27	-47	-51	-20	-24	-32	-55
	20	-14	-30	-39	-67	-44	-71	-60	-18	-16	-145	-98	-43	-49	-20	-41	-65	-36	-30	-1	-1	0	-16	8	6	-37
Q	21	0	0	-4	-3	-1	-1	-2	1	3	4	-4	-6	-8	-8	-14	-14	-12	-18	-14	0	2	4	7	-18	-4
	22	-53	-57	-44	-54	7	38	23	3	-105	-58	20	-3	-107	-111	-55	23	1	-67	-49	-126	-148	-95	-89	-29	-47
D	23	-12	-17	-27	-24	-87	-94	-104	-45	-8	-11	-60	-61	-47	-51	-150	-99	-47	-1	-131	-78	-23	-60	21	-56	-53
	24	-89	25	24	-31	-49	-82	-16	-1	-114	-30	-37	-89	-85	-79	-62	-31	-15	-5	-48	-54	-45	5	7	-16	-38
	25	0	-2	-35	-35	11	5	-38	-101	-32	0	-24	-25	-68	-128	-19	-33	-83	-54	-6	-15	-14	-5	9	6	-29
	26	5	0	-56	-43	-7	3	-2	-7	5	0	-43	-41	-42	-24	-17	-16	-19	-32	-19	-16	1	5	13	10	-14
	27	9	11	12	5	8	21	24	21	15	4	6	7	0	-8	-2	8	7	3	5	7	6	-91	-27	22	3
	28	17	-25	-20	15	18	2	-44	22	24	11	2	5	11	7	-27	-60	-34	8	-66	-170	-123	-43	-19	21	-29
	29	-7	11	19	15	20	-6	-39	55	33	22	18	4	0	-10	5	2	-25	-42	-108	-133	-107	0	-115	-55	-18
	30	-1	-2	-84	-66	-21	24	17	21	12	15	-1	-54	-4	-6	-2	-33	-88	0	2	-2	-2	-4	-1	5	-11
	31	10	9	8	11	8	12	15	18	21	-34	21	8	0	-5	-10	-43	-4	-6	-1	-14	-26	0	10	9	0
	MEAN	-25	-21	-24	-22	-21	-17	-28	-24	-25	-18	-20	-39	-39	-38	-29	-35	-44	-31	-44	-47	-26	-20	-11	-18	-28
SQ	MEAN	-6	-2			-3	-2	3	-1		1	-3	-3	-4	-15	-14	-11	-8	-9	-9	-2	1	-5	2		-4
SD	MEAN	-42	-42	-58	-48	-40	-31	-76	-71	-65	-37	-61	-149	-110	-86	-78	-94	-116	-84	-137	-78	-18	-40	-33	-61	-69

NOVEMBER 1970 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	-1	0	1	1	1	2	1	1	0	3	-8	-13	9	-10	-11	-14	-24	-15	-8	-6	-4	-5	-3	-2	-4
	2	-6	-3	-13	-13	-12	-4	0	-1	-70	-66	-3	-11	-75	-84	-37	-11	-3	-6	-4	0	-1	2	0	-3	-18
	3	-28	-15	53	3	-23	14	33	3	-21	4	8	0	1	-2	-23	-80	-94	-73	-62	-3	9	-92	-21	2	-17
	4	-13	35	17	9	-5	-2	0	0	-35	3	17	-9	0	-8	-10	-17	-32	-37	-11	-24	5	-44	2	9	-6
	5	17	10	40	31	28	17	10	52	0	-9	0	-15	-23	-9	-8	-67	-49	-16	-18	-76	-117	-145	-75	-30	-19
	6	-16	-26	-39	-65	-43	-18	-32	-62	-130	-71	-90	-74	-173	-162	-55	-56	-40	-26	-14	-9	-8	-75	-37	-14	-56
D	7	-33	-355	-163	-45	-49	-43	-18	86	-238	-130	-266	-404	-110	-177	-159	-48	-64	-74	-77	-141	-204	-89	-19	-190	-125
	8	-112	2	-49	-36	13	-3	-2	-17	-26	-59	-66	-77	-37	-62	-104	-66	-16	-18	-66	-85	-4	0	-3	-11	-38
	9	-34	-9	-3	-12	-28	-77	-60	-82	-56	-71	-70	-51	-40	-19	-23	-188	-146	-133	-85	-41	-68	-38	8	2	-55
	10	-8	-73	-117	-6	-31	-79	0	2	-5	-73	-191	-192	-55	-34	-98	-169	-120	-85	-57	-9	-19	-38	6	-33	-63
D	11	-116	-185	-86	-95	-15	-41	-33	-33	-110	-148	-120	-15	-69	-90	-79	-80	-116	-43	6	-4	-41	-90	9	-1	-66
	12	-43	-29	-25	-73	-65	-9	-22	-67	-33	-87	-47	-45	-26	-172	-189	-63	-130	-2	2	-5	-3	-3	-2	2	-47
	13	0	-19	-51	-66	-1	0	-36	27	5	2	-41	-103	-144	-136	-122	-71	-80	-93	-52	-15	-14	-33	-74	-106	-51
	14	-122	-120	-6	7	3	-21	-6	16	-2	-4	2	5	-3	-7	-52	-47	-135	-98	-62	-30	-10	-10	3	3	-29
Q	15	6	3	2	1	1	0	0	2	2	-14	-12	-59	0	-10	-5	-8	-9	-4	-3	-12	-22	2	7	6	-5
	16	3	6	8	13	9	7	11	8	10	2	-46	-37	-16	5	12	0	-36	-48	-35	24	19	-16	9	-2	-4
	17	0	-18	-9	-43	-33	10	21	16	15	18	-17	-74	-48	-7	3	-4	-5	-5	-7	-1	-1	-2	-2	-4	-8
	18	-13	-1	2	-9	0	-15	-7	-5	4	5	4	-12	-189	-70	-113	-67	75	58	81	8	5	14	-207	-190	-28
	19	-85	-54	-76	-57	-17	-71	17	57	31	15	-8	-1	-9	-10	-9	-7	-5	-7	-9	-10	-10	-9	-8	-6	-15
Q	20	-3	-3	0	-6	-6	-3	-4	-6	-6	-4	-5	-15	-14	-1	-3	-4	-3	-3	-2	-5	-1	-2	-20	-23	-6
D	21	-18	-32	-102	-131	-40	0	19	-83	-217	-409	-356	-283	-184	-201	-194	-49	-35	-83	-113	-114	-104	-105	-102	-58	-129
D	22	-166	-130	-132	-110	4	-5	-2	-15	-48	-69	-88	-62	-180	-189	-145	-142	-175	-85	-106	-64	-93	-68	-65	-83	-88
D	23	-80	-125	-110	-117	-46	-78	-78	-126	-140	-191	-156	-147	-7	-48	-295	-363	-157	-13	-1	-180	-45	-48	-128	-77	-111
	24	-11	-16	-29	-39	-12	-5	11	7	0	1	-4	-4	-2	-2	-6	-12	-74	-132	-39	3	25	8	14	2	-13
	25	-9	-12	-3	45	30	19	17	22	4	-104	-19	-18	-17	16	-27	-106	-114	-109	-156	-20	13	5	1	-20	-23
	26	2	28	31	23	5	1	15	15	13	4	-11	-9	4	2	-14	-115	-114	-15	6	-13	-153	-19	0	8	-13
	27	5	8	-5	9	10	11	22	33	-2	-116	-37	-64	-126	-109	4	0	-7	-57	-92	-1	-18	-43	-57	-15	-27
	28	21	10	19	-12	-31	-98	-2	20	17	12	0	-23	-52	-14	-107	-185	-32	5	1	-11	-3	-14	6	11	-19
Q	29	8	8	9	12	17	14	13	13	13	13	11	14	18	11	9	3	0	-2	1	-10	2	6	6	8	8
Q	30	8	6	6	11	10	11	15	13	13	11	12	11	4	2	-1	2	-7	-14	-7	-2	0	9	5	-3	5
	MEAN	-28	-37	-28	-26	-11	-15	-3	-3	-34	-51	-54	-60	-49	-53	-62	-68	-58	-48	-34	-26	-29	-31	-25	-27	-36
5Q MEAN		4	3	4	4	5	5	5	5	4	2		-12	3	-2	-2	-4	-9	-8	-4	-7	-5	2	-1	-2	
5D MEAN		-83	-165	-119	-100	-29	-32	-22	-34	-151	-189	-197	-182	-94	-141	-174	-136	-108	-56	-58	-85	-97	-80	-61	-82	-103

DECEMBER 1970 AO INDICES VALUES ARE EXPRESSED IN GAMMAS

	UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
Q	1	6	6	7	5	4	5	8	8	8	11	11	4	2	-2	-3	-3	-7	-8	3	4	3	2	2	3	3
	2	6	7	7	8	5	3	7	7	7	8	7	2	5	3	3	0	4	-11	-26	-36	-7	14	11	7	2
	3	0	-58	-49	3	7	8	3	-24	-73	-8	15	7	3	2	1	12	-34	3	1	1	2	-5	-16	4	-8
	4	10	10	7	6	7	11	13	-2	1	24	12	16	-14	-29	9	11	6	3	5	14	-34	-149	-41	-5	-5
	5	1	-14	-60	-61	-43	-45	-27	7	-33	-32	12	-4	1	-52	-76	-123	-25	2	2	0	2	3	2	2	-23
	6	3	-10	-39	-6	1	-12	-16	-21	-107	-86	-56	5	0	-124	-154	-162	-92	-46	-28	-9	14	7	1	5	-36
	7	10	13	14	7	-23	0	-45	-21	-8	0	-9	-41	-109	-47	-53	-44	-36	-25	-18	-44	-15	-94	-57	-61	-30
D	8	-63	-110	-28	-141	-95	-21	-50	-142	-36	13	-102	-90	-147	-179	-167	7	9	-23	-96	-107	-10	-4	-26	-7	-72
	9	7	-8	-13	-5	-2	-16	23	15	16	2	-52	0	14	-11	-16	-13	-33	-49	-10	7	4	4	5	5	-5
Q	10	7	4	7	8	10	8	6	6	-29	-56	-19	-16	-82	-55	-92	-42	-44	-18	-35	-70	-26	-7	2	6	-21
Q	11	3	2	4	0	1	-7	-10	0	-11	-16	3	3	1	6	-3	0	0	0	-33	-2	6	7	5	4	-2
	12	7	6	-16	-2	0	0	1	3	0	-33	-13	-31	-29	-13	-23	-1	-4	-9	-27	-10	7	-1	-6	28	-7
	13	39	33	19	22	17	12	11	14	24	10	8	6	6	6	6	4	12	-43	-34	5	14	18	8	5	9
D	14	32	35	64	109	79	-151	-338	-560	-323	-33	-128	-73	19	-19	-20	-32	-19	-31	-275	-114	-32	-88	-149	-29	-67
D	15	-16	-58	-140	-53	-34	-61	-145	-193	-123	-128	-124	-62	-26	-86	-43	-131	-61	-48	-48	-4	-12	-9	-8	-12	-70
	16	0	6	27	14	9	8	19	19	5	3	-3	-12	13	7	-14	-3	-10	-36	-22	-9	-5	-3	-3	-11	-8
Q	17	-4	9	11	15	21	11	19	12	1	-24	-34	-61	-20	-16	-45	-21	-6	6	0	6	-5	-14	1	5	-5
	18	8	7	6	6	4	0	-14	-10	-3	2	1	-1	-7	-31	-9	-6	-15	-21	0	4	0	12	15	13	-2
	19	-1	5	0	-1	5	0	-23	-24	-43	-64	-2	8	6	2	2	1	3	2	-7	-21	-20	-26	-89	-8	-13
	20	7	-7	-21	-6	-37	-61	-75	-105	-175	-97	-35	5	-16	-55	-67	-27	-19	-15	-16	-68	-51	-17	-9	-5	-40
	21	-26	-26	-15	-14	-23	-28	-54	-59	-27	-32	-32	-25	-51	-5	5	-3	-9	-10	-7	-6	-26	-64	-44	-16	-25
	22	-19	-32	-5	-4	-10	-19	4	17	-45	-22	-15	-4	-6	-19	-20	-17	-34	-27	-17	-11	-9	13	-27	4	-14
	23	10	17	-38	20	22	16	27	16	13	9	-1	-43	-21	-2	-24	-40	-32	11	4	9	4	3	6	-9	-1
D	24	-141	-90	-89	-91	-11	0	4	19	26	90	25	8	-5	-11	-83	-26	18	1	-2	-25	-29	-4	4	3	-17
	25	5	24	6	2	3	2	2	1	0	0	-1	1	5	3	-11	-18	-59	-35	3	-3	-37	6	13	-10	-4
	26	11	13	11	19	24	-24	37	22	15	21	14	6	6	-2	0	-12	-25	2	6	5	10	-15	5	12	7
	27	14	15	18	15	26	17	16	17	29	24	11	34	12	-62	9	-90	-52	-37	0	12	-9	-112	1	21	-3
D	28	34	-2	10	-8	40	56	48	19	14	-12	27	45	-47	2	-29	-36	-116	-114	-185	-167	-104	-79	-93	-116	-34
	29	30	17	4	-6	-7	10	15	19	-35	41	14	3	-8	-13	-16	-10	-37	-8	-4	11	30	29	-33	-108	-6
Q	30	-106	-54	-77	-36	27	32	21	14	6	-1	6	5	3	6	7	-22	-190	-105	14	14	11	5	6	6	-17
	31	6	4	4	3	7	6	5	4	4	5	2	8	7	8	5	7	3	1	6	7	9	12	10	6	6
	MEAN	-4	-8	-12	-8	1	-8	-17	-30	-29	-14	-17	-10	-16	-25	-29	-26	-30	-22	-27	-20	-10	-18	-16	-12	-17
50	MEAN	4	5	7	6	9	5	6	6	-5	-16	-7	-12	-18	-12	-20	-12	-11	-3	-12	-11	-7		4	4	-4
50	MEAN	-31	-49	-37	-37	-4	-39	-98	-175	-88	-18	-76	-38	-41	-59	-72	-44	-36	-43	-122	-83	-37	-36	-54	-32	-56

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

JANUARY 1970

AU = MAXIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	DI	DI	DI	AI	AI	AI	BW	BW	NAS	LR	FC
2	NAS	GWR	BW	BW	BW	BW	CC	CC	DI	CC	CC	DI	AI	AI	AI	AI	AI	NAS	NAS	NAS	FC	LR	FC	BW
3	GWR	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	CC	DI	DI	DI	DI	DI	CO	CO	BW	NAS	NAS	BW	BW
4	DI	CC	CC	BW	BW	BW	BW	BW	BW	CC	BW	CC	CC	CC	DI	LR	CO	BW	BW	BW	BW	NAS	NAS	FC
5	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	DI	BW	BW	BW	BW	LR	LR	FC
6	NAS	NAS	CC	BW	BW	BW	BW	BW	BW	BW	CC	DI	DI	DI	DI	BW	BW	LR	AI	NAS	BW	BW	BW	BW
7	BW	BW	BW	FC	FC	FC	BW	BW	BW	BW	BW	BW	CC	CC	DI	DI	DI	AI	LR	BW	BW	BW	FC	FC
8	BW	BW	BW	BW	GWR	FC	FC	BW	BW	BW	BW	BW	CC	CC	DI	DI	DI	AI	LR	BW	BW	BW	FC	FC
9	GWR	GWR	FC	GWR	BW	BW	FC	CC	CC	BW	BW	BW	CC	DI	DI	DI	AI	AI	NAS	NAS	GWR	NAS	FC	FC
10	FC	NAS	FC	BW	BW	CC	CC	CC	BW	BW	CC	CC	CC	DI	CC	DI	DI	AI	AI	LR	FC	FC	BW	FC
11	BW	NAS	FC	FC	FC	GWR	FC	FC	CC	CC	BW	CC	CC	DI	DI	CO	CO	CO	NAS	NAS	LR	LR	LR	FC
12	BW	BW	FC	GWR	GWR	CC	CC	CC	CC	CO	CC	CC	CC	DI	DI	DI	DI	AI	AI	NAS	NAS	NAS	NAS	NAS
13	LR	NAS	BW	CC	BW	BW	CC	BW	CC	CC	CC	CC	CC	DI	DI	DI	DI	DI	GWR	GWR	FC	FC	NAS	NAS
14	NAS	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	DI	DI	DI	DI	BW	BW	BW	AI	CC	FC	NAS	FC
15	FC	FC	FC	GWR	GWR	FC	CC	CC	CC	CC	CC	BW	CC	CC	CC	CC	LR	AI	DI	DI	NAS	LR	NAS	NAS
16	GWR	BW	FC	FC	BW	BW	BW	CC	CO	DI	TI	DI	TI	AI	AI	AI	LR	LR	LR	LR	GWR	GWR	GWR	GWR
17	BW	BW	CO	CO	CO	CO	BW	BW	BW	CC	CC	CC	CC	DI	DI	DI	NAS	NAS	NAS	LR	DI	DI	NAS	
18	BW	FC	BW	BW	FC	BW	BW	BW	BW	CC	CC	BW	BW	BW	CC	DI	DI	DI	DI	BW	BW	LR	NAS	DI
19	DI	DI	DI	BW	BW	BW	BW	BW	BW	CC	BW	BW	CC	CC	DI	DI	DI	BW	NAS	NAS	NAS	FC	NAS	NAS
20	FC	GWR	FC	DI	CC	NAS	BW	BW	CC	CC	BW	CC	TI	DI	DI	DI	DI	CC	CO	LR	NAS	NAS	NAS	DI
21	CC	CC	CC	BW	BW	BW	BW	BW	CC	CC	CC	CC	TI	DI	DI	CC	CC	CC	GWR	GWR	LR	NAS	NAS	FC
22	FC	BW	DI	FC	CC	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	LR	NAS	NAS	BW	BW	NAS	DI	DI
23	CC	FC	FC	GWR	BW	BW	CC	BW	BW	BW	CC	CC	CC	TI	DI	CC	BW	BW	BW	NAS	BW	NAS	NAS	FC
24	FC	FC	FC	CC	NAS	CC	CC	CC	CC	CC	DI	CC	CC	CC	CC	DI	DI	NAS	NAS	NAS	NAS	NAS	NAS	NAS
25	NAS	BW	BW	BW	BW	BW	FC	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	TI	BW	BW	GWR	GWR	TI	TI
26	FC	FC	BW	FC	CC	CC	CC	BW	BW	BW	BW	CC	CC	CC	BW	BW	BW	UE	BW	BW	BW	BW	BW	CC
27	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	AI	NAS	NAS	NAS	NAS	NAS	FC
28	GWR	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	BW	BW	CC	CC	AI	AI	AI	BW	BW	FC
29	GWR	TI	BW	BW	BW	BW	BW	CC	CC	BW	NAS	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	FC
30	FC	FC	TI	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	TI	DI	DI	AI	LR	LR	AI	AI	LR	NAS	GWR
31	FC	GWR	BW	BW	BW	BW	CC	CC	BW	BW	CC	CC	CC	CC	BW	BW	CC	CC	AI	FC	FC	FC	FC	FC

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
AI = ABISKO	68 21.5	18 49.4	66.0	114.9
BW = BARROW	71 18.2	-156 44.9	68.5	241.1
CC = C. CHELYUSKIN	77 43.0	104 17.0	66.2	176.4
CO = COLLEGE	64 51.6	-147 50.2	64.6	256.5
GWR= GREAT WHALE R.	55 16.0	-77 47.0	66.5	347.4
DI = DIKSON ISLAND	73 32.6	80 33.7	63.0	161.5

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
FC = FT. CHURCHILL	58 46.0	-94 06.0	68.7	322.8
LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.0
NAS= NASSARSSUAQ	61 06.0	-45 12.0	71.0	37.0
TI = TIKSI BAY	71 35.0	129 00.0	60.4	191.4
UE = CAPE UELEN	66 09.0	-169 50.1	61.7	237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

AL = MINIMUM DELTA H

JANUARY 1970

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	UE	UE	NAS	LR	NAS	NAS	NAS	FC	FC	FC	LR	FC	BW	FC	BW	BW	BW	BW	BW	FC	FC	DI	AI	AI
2	AI	NAS	LR	LR	GWR	NAS	NAS	NAS	GWR	BW	BW	CO	CO	BW	BW	BW	DI	DI	DI	DI	CC	CC	OI	AI
3	AI	NAS	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	BW	BW	BW	BW	GWR	CC	CC	GWR	GWR	DI	DI	AI	AI
4	UE	UE	GWR	GWR	LR	LR	GWR	NAS	GWR	FC	FC	FC	BW	BW	BW	CC	CC	CC	GWR	GWR	DI	DI	CC	UE
5	UE	GWR	LR	LR	NAS	NAS	GWR	FC	FC	FC	FC	FC	FC	CO	BW	BW	GWR	NAS	NAS	NAS	CC	DI	AI	AI
6	CC	UE	UE	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	CO	BW	BW	BW	FC	GWR	DI	CC	CC	CC	NAS	NAS	UE
7	UE	LR	LR	NAS	LR	NAS	NAS	NAS	FC	FC	NAS	NAS	BW	BW	BW	BW	BW	BW	BW	DI	CC	OI	CC	AI
8	NAS	NAS	LR	LR	LR	LR	LR	LR	LR	NAS	FC	FC	FC	FC	FC	FC	BW	BW	CC	BW	BW	BW	DI	DI	DI	CC
9	CC	LR	LR	LR	NAS	FC	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	BW	BW	CC	BW	BW	BW	DI	DI	DI	CC
10	CC	UE	LR	AI	LR	LR	LR	NAS	GWR	FC	LR	BW	BW	BW	NAS	NAS	BW	DI	CC	BW	CC	UE	NAS	AI
11	AI	LR	AI	TI	TI	LR	LR	LR	TI	NAS	NAS	BW	BW	BW	BW	GWR	GWR	TI	BW	BW	CC	CC	CC	CC
12	LR	LR	LR	NAS	NAS	TI	NAS	FC	GWR	FC	FC	FC	FC	FC	BW	BW	BW	DI	BW	BW	OI	OI	CC	TI
13	CC	LR	TI	TI	NAS	NAS	NAS	NAS	NAS	LR	FC	FC	BW	BW	BW	BW	BW	BW	TI	TI	TI	TI	CC	BW
14	UE	LR	LR	NAS	NAS	GWR	NAS	NAS	NAS	NAS	NAS	FC	FC	BW	BW	BW	FC	GWR	FC	TI	TI	TI	CC	AI
15	CC	CC	TI	CC	LR	LR	LR	LR	NAS	NAS	BW	NAS	NAS	BW	GWR	BW	BW	BW	BW	BW	TI	CC	CC	CC
16	AI	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	BW	CO	CO	CO	CO	BW	TI	BW	TI	TI	TI	TI	AI	AI
17	AI	AI	AI	LR	LR	NAS	NAS	NAS	GWR	FC	FC	FC	FC	BW	LR	BW	BW	BW	CC	BW	CC	CC	CO	UE
18	LR	LR	NAS	NAS	AI	NAS	GWR	FC	FC	FC	BW	FC	NAS	NAS	NAS	BW	BW	GWR	GWR	GWR	DI	FC	DI	CO
19	UE	UE	UE	LR	LR	NAS	NAS	NAS	NAS	FC	FC	FC	FC	LR	BW	BW	BW	BW	DI	CC	CC	DI	DI	DI	CC
20	CC	LR	LR	NAS	GWR	GWR	FC	FC	GWR	FC	FC	FC	BW	BW	BW	FC	BW	GWR	TI	OI	OI	DI	AI	LR
21	NAS	UE	NAS	NAS	NAS	GWR	GWR	FC	GWR	FC	FC	FC	FC	CO	BW	NAS	FC	FC	DI	OI	OI	DI	CC	CC
22	LR	LR	NAS	NAS	NAS	GWR	FC	FC	AI	LR	FC	FC	BW	FC	BW	BW	CC	CC	BW	OI	DI	CC	CC	CO
23	LR	NAS	LR	LR	NAS	NAS	GWR	GWR	GWR	AI	AI	BW	BW	BW	BW	NAS	GWR	GWR	GWR	GWR	GWR	GWR	DI	LR
24	LR	LR	GWR	GWR	GWR	GWR	GWR	GWR	GWR	FC	BW	FC	FC	FC	BW	BW	BW	BW	CC	OI	DI	DI	CC	CC
25	UE	UE	NAS	NAS	NAS	NAS	AI	NAS	LR	AI	AI	LR	NAS	NAS	BW	GWR	GWR	CC	CC	DI	DI	DI	CO	CO
26	CO	NAS	NAS	NAS	LR	LR	FC	FC	FC	FC	FC	FC	LR	NAS	CC	CC	CC	CC	FC	GWR	CC	CO	CO	CO
27	CO	UE	NAS	LR	LR	LR	DI	FC	FC	FC	FC	FC	BW	BW	BW	BW	BW	BW	DI	DI	CC	CC	CC	CC
28	CC	UE	UE	LR	LR	LR	AI	AI	LR	LR	LR	AI	FC	LR	LR	GWR	GWR	FC	BW	CC	TI	CC	CC	LR
29	AI	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	UE	LR	LR	LR	NAS	NAS	FC	FC	FC	CO	CO	CO	CO	LR
30	CC	CC	NAS	NAS	NAS	NAS	GWR	NAS	GWR	FC	BW	FC	FC	BW	FC	BW	BW	BW	CC	BW	TI	OI	CO	AI
31	LR	LR	LR	NAS	NAS	NAS	AI	AI	NAS	NAS	NAS	BW	AI	GWR	DI	TI	TI	GWR	DI	OI	OI	CO	CO	CO

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
AI = ABISKO	68 21.5	18 49.4	66.0	114.9
BW = BARROW	71 18.2	-156 44.9	68.5	241.1
CC = C. CHELYUSKIN	77 43.0	104 17.0	66.2	176.4
CO = COLLEGE	64 51.6	-147 50.2	64.6	256.5
GWR= GREAT WHALE R.	55 16.0	-77 47.0	66.5	347.4
OI = OIKSON ISLAND	73 32.6	80 33.7	63.0	161.5

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
FC = FT. CHURCHILL	58 48.0	-94 06.0	68.7	322.8
LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.3
NAS= NASSARSSUAQ	61 06.0	-45 12.0	71.0	37.0
TI = TIKSI BAY	71 35.0	129 00.0	60.4	191.4
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TABLE OF OBSERVATORIES SUPPLYING HOURLY

FEBRUARY 1970

AU = MAXIMUM DELTA K

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	FC	FC	FC	BW	BW	BW	CC	LR	FC	FC	FC	FC	FC	CC	CC	BW	CC	BW	BW	FC	FC	FC	FC	GWR
2	GWR	NAS	FC	BW	BW	BW	BW	BW	BW	CC	DI	DI	DI	DI	CC	DI	AI	LR	NAS	LR	GWR	FC	GWR	GWR
3	FC	GWR	GWR	LR	BW	CC	CC	BW	BW	CC	CC	CC	DI	DI	DI	DI	DI	BW	BW	BW	BW	BW	BW	NAS
4	NAS	NAS	FC	FC	BW	BW	BW	BW	CC	DI	CC	CC	DI	DI	DI	DI	AI	LR	NAS	LR	NAS	GWR	BW	NAS
5	FC	FC	GWR	GWR	BW	BW	NAS	BW	BW	CC	CC	CC	CC	DI	DI	DI	NAS	FC	NAS	FC	FC	FC	FC	NAS
6	NAS	NAS	NAS	GWR	FC	FC	CC	BW	CC	BW	BW	BW	BW	BW	CC	CC	CC	BW	NAS	NAS	NAS	BW	NAS	NAS
7	BW	BW	CC	CC	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	BW	BW	BW	BW	AI	BW	BW	GWR
8	BW	GWR	GWR	GWR	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	DI	DI	DI	DI	NAS	NAS	LR	LR	BW	DI
9	NAS	DI	GWR	GWR	BW	BW	BW	BW	BW	BW	CC	CC	BW	CC	DI	DI	DI	DI	DI	BW	CC	CC	CC	DI
10	DI	DI	DI	DI	GWR	DI	BW	BW	BW	BW	BW	CC	CC	UE	DI	DI	AI	AI	LR	NAS	BW	BW	BW	BW
11	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	DI	DI	DI	NAS	NAS	DI	DI	DI	DI
12	DI	BW	BW	BW	BW	FC	FC	BW	GWR	BW	BW	CC	CC	CC	DI	DI	DI	CC	DI	DI	DI	DI	DI	DI
13	DI	FC	FC	FC	FC	UE	GWR	FC	GWR	GWR	CC	CC	CC	DI	DI	BW	BW	BW	NAS	BW	NAS	FC	FC	FC
14	FC	FC	FC	BW	BW	BW	BW	LR	NAS	CC	DI	DI	LR	LR	LR	LR	NAS	FC	FC	FC	FC	FC	FC	FC
15	FC	FC	FC	FC	BW	BW	CC	BW	BW	CC	DI	CC	FC	CC	FC	DI	NAS	AI	AI	AI	DI	DI	FC	NAS
16	NAS	FC	FC	FC	CC	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	DI	LR	DI	CC	CC	NAS	LR	LR
17	DI	FC	FC	FC	FC	FC	GWR	BW	BW	CC	CC	CC	CC	CC	CC	LR	AI	LR	NAS	NAS	NAS	GWR	GWR	NAS
18	NAS	GWR	FC	BW	BW	BW	BW	BW	BW	CC	BW	CC	CC	DI	DI	DI	BW	LR	BW	NAS	BW	LR	GWR	BW
19	GWR	GWR	DI	GWR	GWR	BW	BW	BW	BW	BW	CC	CC	CC	CC	TI	DI	DI	GWR	GWR	GWR	GWR	GWR	GWR	GWR
20	GWR	GWR	GWR	GWR	GWR	GWR	GWR	GWR	BW	BW	BW	BW	CC	DI	DI	DI	DI	DI	NAS	FC	LR	LR	DI	DI
21	FC	FC	FC	FC	FC	BW	BW	BW	CC	BW	BW	UE	FC	TI	UE	UE	TI	TI	TI	NAS	NAS	GWR	GWR	GWR
22	GWR	GWR	GWR	GWR	GWR	CC	FC	FC	CC	BW	BW	TI	TI	CC	CC	UE	CC	LR	AI	LR	LR	TI	DI	DI
23	CC	DI	AI	FC	FC	FC	FC	FC	TI	FC	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	FC	TI	TI
24	FC	FC	AI	FC	FC	AI	BW	BW	BW	BW	TI	CC	CC	CC	DI	LR	AI	AI	LR	AI	FC	FC	DI	DI
25	FC	FC	FC	BW	FC	BW	TI	TI	TI	TI	TI	TI	CC	CC	CC	DI	AI	AI	DI	DI	TI	TI	TI	LR
26	FC	FC	GWR	FC	FC	BW	BW	BW	CC	TI	TI	TI	TI	AI	AI	AI	NAS	LR	NAS	TI	DI	NAS	FC	FC
27	FC	FC	FC	FC	DI	DI	BW	BW	CC	CC	DI	DI	CC	DI	DI	LR	NAS	AI	AI	NAS	NAS	GWR	GWR	GWR
28	GWR	BW	BW	GWR	GWR	BW	BW	CC	CC	CC	TI	TI	TI	DI	DI	TI	LR	LR	LR	NAS	NAS	FC	NAS	FC

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
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TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

FEBRUARY 1978

AL = MINIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	TI	LR	LR	LR	GWR	NAS	NAS	NAS	GWR	AI	GWR	LR	NAS	BW	GWR	GWR	GWR	GWR	GWR	GWR	CC	OI	OI	CC
2	CC	CC	TI	FC	NAS	NAS	NAS	FC	FC	FC	FC	CO	CO	BW	FC	FC	TI	TI	TI	TI	AI	AI	AI	OI
3	CC	CC	UE	GWR	NAS	NAS	NAS	NAS	FC	FC	FC	BW	BW	BW	FC	BW	GWR	GWR	GWR	GWR	UE	AI	CO	UE
4	CO	UE	UE	TI	TI	NAS	GWR	FC	GWR	CO	GWR	FC	BW	BW	BW	BW	TI	TI	OI	OI	TI	AI	AI	CC
5	CC	LR	LR	LR	LR	NAS	TI	NAS	FC	FC	FC	FC	FC	BW	BW	CC	CC	CC	OI	OI	OI	OI	OI	CC
6	CC	UE	UE	AI	NAS	GWR	TI	FC	FC	GWR	GWR	LR	NAS	NAS	GWR	GWR	GWR	CC	CC	CC	CC	TI	TI	CO
7	CO	CO	UE	UE	TI	TI	TI	AI	AI	AI	AI	AI	LR	BW	GWR	GWR	GWR	CC	CO	CO	CO	TI	TI	TI
8	TI	TI	TI	TI	TI	OI	OI	OI	OI	AI	AI	LR	NAS	BW	BW	BW	BW	CC	BW	OI	OI	CC	CC	UE
9	UE	CO	NAS	NAS	TI	LR	GWR	NAS	NAS	AI	AI	LR	NAS	NAS	BW	BW	BW	CC	TI	TI	CO	TI	TI	
10	TI	TI	TI	TI	FC	FC	FC	FC	TI	TI	AI	LR	NAS	BW	BW	BW	BW	BW	BW	TI	OI	CO	AI	LR
11	CO	TI	TI	UE	GWR	LR	TI	FC	FC	GWR	AI	LR	NAS	NAS	GWR	FC	BW	CC	CC	CC	CO	CO	CO	CO
12	CO	TI	TI	TI	TI	TI	AI	AI	AI	AI	AI	LR	NAS	BW	GWR	GWR	GWR	GWR	GWR	GWR	CO	CO	CO	UE
13	BW	BW	BW	BW	NAS	FC	AI	AI	AI	AI	AI	BW	BW	BW	BW	FC	GWR	GWR	GWR	GWR	CO	CO	CO	CO
14	BW	BW	NAS	LR	NAS	NAS	GWR	GWR	FC	FC	CO	FC	BW	CO	CO	BW	TI	TI	GWR	BW	UE	CO	CO	CO
15	CO	CO	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	BW	GWR	OI	BW	BW	CC	BW	OI	OI	CC	CC	CO	CC	AI
16	CO	CO	BW	BW	TI	FC	GWR	FC	FC	FC	FC	CO	BW	BW	BW	BW	CC	OI	GWR	OI	OI	OI	OI	CC
17	CO	CO	NAS	TI	NAS	TI	NAS	AI	AI	NAS	FC	FC	FC	NAS	GWR	GWR	BW	BW	BW	TI	AI	AI	AI	LR
18	CC	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	AI	BW	NAS	CO	BW	BW	LR	BW	OI	OI	OI	OI	OI	OI
19	LR	LR	UE	BW	NAS	NAS	NAS	GWR	GWR	AI	AI	BW	BW	BW	BW	BW	CC	CC	CO	CO	CO	CO	CO	CO
20	CO	CO	UE	NAS	NAS	NAS	NAS	OI	OI	NAS	AI	LR	LR	BW	BW	BW	CC	CC	GWR	OI	OI	CO	CO	UE
21	CO	CO	BW	BW	TI	NAS	FC	FC	FC	FC	LR	LR	BW	BW	LR	LR	FC	FC	BW	CO	OI	CO	BW	BW
22	UE	UE	BW	BW	OI	OI	OI	OI	OI	AI	AI	AI	LR	BW	NAS	BW	GWR	GWR	OI	CC	OI	CC	CO	UE
23	CO	UE	BW	UE	BW	OI	OI	OI	OI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	CO	CO	CO	CO
24	CO	NAS	NAS	NAS	NAS	OI	FC	FC	FC	OI	FC	FC	BW	NAS	GWR	TI	BW	BW	TI	GWR	AI	CO	UE	UE
25	UE	NAS	NAS	NAS	NAS	FC	GWR	GWR	OI	AI	AI	LR	NAS	NAS	GWR	GWR	BW	BW	FC	FC	CO	CO	CO	BW
26	UE	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	FC	CC	CO	FC	BW	BW	TI	CC	GWR	BW	BW	CO	BW
27	UE	UE	UE	TI	NAS	NAS	NAS	NAS	GWR	FC	GWR	FC	FC	FC	BW	BW	TI	BW	BW	OI	OI	OI	AI	OI
28	AI	AI	LR	CC	NAS	FC	NAS	NAS	NAS	GWR	BW	CO	FC	FC	FC	BW	BW	BW	TI	BW	TI	UE	BW	BW	DI

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
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TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

MARCH 1970 — AU = MAXIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	GWR	GWR	GWR	CO	CO	CO	CO	CO	TI	TI	DI	DI	TI	AI	AI	AI	CO	CO	NAS	NAS	NAS	LR	NAS	FC
2	GWR	BW	GWR	GWR	BW	CO	CO	BW	TI	TI	TI	DI	CC	CO	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	GWR
3	GWR	NAS	NAS	FC	BW	BW	BW	CO	CC	CC	BW	CO	DI	DI	DI	DI	NAS	LR	NAS	NAS	LR	GWR	FC	FC
4	FC	GWR	FC	FC	FC	BW	BW	CO	CC	CC	CC	DI	DI	AI	AI	AI	LR	LR	LR	NAS	NAS	GWR	GWR	GWR
5	GWR	GWR	GWR	GWR	BW	BW	BW	BW	CC	CO	CO	CC	CC	CC	TI	TI	NAS	LR	LR	LR	GWR	GWR	FC	GWR
6	GWR	BW	FC	BW	NAS	NAS	BW	CC	CC	DI	DI	CC	CC	DI	LR	AI	LR	NAS	NAS	NAS	GWR	GWR	GWR	CO
7	CO	BW	BW	BW	BW	LR	LR	CC	CC	DI	TI	AI	DI	AI	AI	AI	LR	LR	LR	LR	DI	FC	FC	
8	FC	BW	BW	BW	CO	CO	DI	DI	DI	TI	AI	DI	AI	AI	AI	AI	AI	NAS	NAS	BW	NAS	NAS	BW	NAS
9	NAS	BW	CO	CO	CO	NAS	NAS	NAS	NAS	NAS	NAS	NAS	DI	AI	AI	AI	LR	LR	LR	NAS	NAS	NAS	FC	FC
10	FC	NAS	BW	LR	FC	BW	BW	BW	CC	CO	CC	DI	CC	FC	BW	CO	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS
11	GWR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	BW	CO	CC	DI	CO	CO	BW	NAS	NAS	NAS	NAS	NAS	NAS
12	NAS	FC	BW	BW	BW	BW	BW	CC	CC	CC	DI	CC	CC	CC	FC	CO	CO	NAS	NAS	NAS	NAS	NAS	NAS	NAS
13	NAS	NAS	NAS	NAS	NAS	FC	BW	BW	BW	CC	CC	CC	CC	DI	DI	AI	CO	BW	NAS	NAS	NAS	NAS	NAS	NAS
14	FC	FC	FC	FC	FC	FC	NAS	BW	BW	BW	BW	CO	FC	CO	CO	CO	NAS	NAS	NAS	LR	GWR	GWR	GWR	GWR
15	GWR	GWR	GWR	GWR	BW	BW	BW	BW	BW	CC	CC	CC	GWR	CC	DI	LR	AI	BW	NAS	NAS	NAS	LR	CC	NAS
16	AI	AI	AI	AI	GWR	AI	LR	LR	BW	UE	CC	CC	CC	DI	DI	UE	CO	CO	BW	LR	LR	NAS	LR	LR
17	NAS	AI	AI	LR	LR	LR	BW	BW	BW	CO	BW	CO	CC	DI	DI	DI	LR	NAS	NAS	NAS	BW	NAS	FC	GWR
18	GWR	CC	LR	LR	AI	BW	GWR	GWR	BW	BW	CC	TI	TI	CC	DI	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	FC
19	GWR	GWR	AI	GWR	LR	BW	BW	BW	BW	BW	BW	CC	CC	DI	DI	UE	LR	NAS	LR	NAS	NAS	NAS	NAS	DI
20	FC	FC	LR	LR	FC	FC	GWR	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	NAS	FC
21	FC	FC	FC	FC	FC	BW	BW	LR	BW	BW	BW	BW	BW	CC	DI	DI	LR	NAS	DI	DI	DI	CC	CC	CC
22	AI	AI	AI	LR	NAS	NAS	LR	BW	BW	BW	CC	CC	CC	CC	CC	GO	CO	BW	LR	LR	LR	FC	FC	NAS
23	FC	FC	FC	FC	FC	FC	BW	BW	CO	CC	CO	BW	CC	DI	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	NAS	NAS
24	GWR	GWR	GWR	FC	FC	FC	FC	BW	FC	BW	BW	TI	BW	BW	BW	CO	BW	TI	TI	TI	GWR	GWR	LR	LR
25	AI	AI	FC	FC	FC	BW	BW	BW	BW	BW	CO	CO	CO	CO	CO	UE	CO	CO	CO	NAS	NAS	NAS	NAS	NAS
26	NAS	NAS	GWR	BW	BW	BW	BW	BW	BW	TI	TI	CC	CC	TI	DI	DI	AI	NAS	NAS	NAS	NAS	NAS	NAS	NAS
27	DI	GWR	DI	GWR	GWR	BW	UE	BW	BW	CC	UE	TI	TI	TI	BW	AI	AI	NAS	LR	NAS	NAS	GWR	GWR	GWR
28	GWR	GWR	BW	BW	BW	BW	BW	BW	CC	TI	TI	DI	DI	AI	AI	AI	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR
29	GWR	BW	BW	CO	BW	BW	CO	CC	CC	CC	CC	DI	DI	DI	AI	AI	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR
30	GWR	GWR	DI	DI	BW	BW	BW	CO	CC	CC	CC	DI	DI	AI	DI	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	DI
31	CC	GWR	GWR	BW	BW	CC	BW	UE	DI	DI	DI	DI	TI	AI	AI	AI	AI	LR	NAS	NAS	NAS	GWR	FC	FC

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1	CC	CC	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	FC	FC	CO	CO	UE	TI	TI	TI	TI	BW	DI	DI	CC
2	AI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	BW	FC	TI	BW	TI	BW	DI	TI	TI	DI	TI	LR	AI
3	AI	TI	TI	TI	TI	NAS	NAS	DI	BW	GWR	AI	AI	BW	CO	CC	TI	TI	TI	CC	DI	DI	AI	AI	AI
4	AI	LR	NAS	NAS	NAS	NAS	NAS	GWR	BW	BW	GWR	CO	CO	CO	CO	CO	DI	TI	BW	BW	TI	DI	AI	AI
5	AI	CC	TI	TI	TI	NAS	GWR	GWR	GWR	DI	AI	AI	AI	GWR	GWR	GWR	BW	BW	DI	BW	TI	TI	DI	DI
6	AI	AI	LR	LR	TI	GWR	LR	GWR	GWR	GWR	CO	FC	FC	FC	TI	TI	TI	TI	TI	TI	DI	TI	AI	AI
7	AI	AI	AI	LR	LR	CO	GWR	NAS	GWR	GWR	GWR	GWR	BW	FC	CO	BW	TI	BW	BW	BW	UE	CC	AI
8	DI	LR	LR	NAS	NAS	NAS	LR	GWR	NAS	NAS	CO	CO	GWR	UE	CO	CO	UE	UE	CO	CO	CO	DI	UE	TI
9	GWR	LR	NAS	NAS	LR	GWR	GWR	GWR	GWR	GWR	BW	CO	CO	CO	CO	BW	BW	UE	TI	TI	AI	AI	AI	AI
10	LR	UE	LR	UE	UE	UE	DI	FC	GWR	FC	FC	BW	BW	DI	GWR	GWR	CC	CC	DI	DI	DI	CC	CO	UE
11	UE	UE	BW	TI	TI	TI	CC	CC	DI	CC	AI	AI	AI	LR	BW	GWR	GWR	GWR	FC	DI	CC	CC	CC	CC
12	UE	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	BW	CO	GWR	FC	AI	LR	GWR	GWR	BW	GWR	GWR	DI	CO	CO	UE
13	UE	UE	UE	TI	TI	TI	GWR	GWR	FC	FC	BW	FC	BW	BW	BW	TI	BW	LR	BW	DI	DI	TI	UE	UE
14	UE	LR	LR	TI	TI	TI	DI	DI	DI	DI	AI	AI	LR	LR	LR	FC	FC	FC	FC	FC	FC	CO	CO	UE
15	UE	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	BW	BW	AI	LR	CC	BW	BW	FC	DI	DI	CC	CC	UE	UE
16	UE	UE	TI	TI	TI	DI	DI	DI	DI	FC	FC	AI	BW	BW	CC	BW	FC	FC	FC	FC	CO	DI	BW	BW
17	UE	UE	TI	BW	BW	BW	FC	DI	DI	AI	AI	AI	LR	FC	BW	BW	BW	DI	DI	DI	FC	DI	AI	LR
18	LR	NAS	TI	TI	TI	DI	CC	DI	DI	AI	GWR	FC	FC	FC	CO	CC	CC	TI	DI	DI	DI	AI	AI	AI
19	LR	TI	NAS	NAS	TI	DI	DI	GWR	GWR	AI	AI	AI	BW	BW	BW	GWR	GWR	DI	DI	DI	DI	DI	AI	LR
20	LR	TI	TI	TI	TI	DI	DI	DI	DI	AI	AI	FC	FC	BW	GWR	CC	GWR	FC	DI	DI	CC	CC	DI	LR
21	LR	LR	NAS	NAS	NAS	DI	DI	DI	DI	AI	AI	LR	LR	LR	GWR	BW	BW	BW	CC	GWR	CO	CO	CO	CO
22	UE	UE	TI	TI	TI	TI	DI	FC	FC	AI	AI	BW	LR	LR	BW	GWR	GWR	GWR	DI	DI	CO	CO	CO	CO
23	UE	UE	UE	TI	TI	DI	DI	DI	GWR	FC	GWR	AI	AI	NAS	BW	BW	BW	BW	DI	DI	DI	CO	CO	CO
24	UE	UE	UE	UE	CC	CC	DI	DI	DI	AI	AI	AI	AI	LR	LR	GWR	GWR	GWR	FC	FC	CO	CO	CO	CO
25	UE	UE	UE	TI	TI	DI	DI	FC	FC	AI	AI	AI	LR	LR	LR	GWR	GWR	FC	FC	FC	FC	FC	CO	CO
26	UE	UE	NAS	NAS	NAS	NAS	DI	DI	DI	AI	AI	FC	AI	LR	GWR	CC	BW	BW	CC	CC	CC	CC	CO	CO
27	CO	UE	TI	TI	TI	CC	FC	DI	FC	FC	FC	FC	FC	FC	FC	GWR	FC	BW	TI	DI	DI	AI	AI	AI
28	AI	LR	LR	GWR	LR	GWR	GWR	NAS	GWR	GWR	GWR	CO	FC	CO	CO	CO	TI	TI	BW	DI	DI	AI	AI	AI
29	AI	LR	AI	LR	NAS	NAS	NAS	GWR	FC	FC	FC	CO	BW	FC	CO	BW	BW	TI	BW	TI	DI	AI	AI	AI
30	AI	AI	UE	TI	FC	NAS	NAS	NAS	FC	FC	GWR	GWR	GWR	FC	CO	FC	BW	BW	BW	DI	DI	DI	AI	FC
31	UE	LR	NAS	LR	NAS	NAS	LR	LR	GWR	GWR	CO	GWR	GWR	CO	UE	CO	FC	BW	FC	TI	AI	AI	AI	AI

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
AI = ABISKO	68 21.5	18 49.4	66.0	114.9
BW = BARROW	71 18.2	-156 44.9	68.5	241.1
CC = C. CHELYUSKIN	77 43.8	104 17.8	66.2	176.4
CO = COLLEGE	64 51.6	-147 50.2	64.6	256.5
GWR= GREAT WHALE R.	55 16.8	-77 47.8	66.5	347.4
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TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

AU = MAXIMUM DELTA H

APRIL 1970

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	DI	DI	DI	AI	AI	AI	TI	TI	TI	TI	TI	DI	DI	DI	DI	DI	LR	LR	LR	LR	DI	DI	LR	DI
2	DI	DI	LR	AI	FC	CO	BW	BW	BW	CC	BW	CC	CC	DI	DI	DI	CO	LR	NAS	BW	NAS	NAS	FC	FC
3	FC	GWR	GWR	BW	BW	CO	UE	CC	CO	CC	DI	CC	DI	DI	DI	LR	LR	LR	BW	BW	BW	DI	NAS	FC
4	FC	FC	BW	BW	FC	BW	BW	BW	CC	BW	BW	CC	DI	TI	DI	DI	LR	LR	BW	BW	LR	DI	FC	LR
5	DI	DI	DI	FC	AI	BW	BW	BW	BW	CC	TI	CC	CC	BW	TI	UE	LR	DI	BW	LR	LR	NAS	DI	FC
6	FC	FC	BW	BW	BW	BW	CC	CC	CC	TI	TI	DI	DI	AI	AI	AI	LR	LR	NAS	BW	FC	FC	FC	BW
7	FC	FC	DI	DI	BW	BW	BW	CC	DI	CC	TI	CC	CC	DI	DI	DI	DI	LR	LR	LR	DI	DI	DI	FC
8	FC	FC	DI	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	DI	DI	NAS	NAS	LR	NAS	FC	FC	FC
9	DI	DI	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	AI	AI	DI	CO	CO	LR	AI	BW	BW	FC	FC	FC
10	DI	DI	FC	FC	BW	BW	BW	TI	TI	TI	TI	TI	CO	BW	CO	CO	BW	LR	NAS	NAS	NAS	NAS	FC	FC
11	FC	FC	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	CC	CC	DI	AI	LR	LR	LR	NAS	BW	NAS	FC	DI
12	DI	DI	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	AI	AI	AI	AI	LR	NAS	BW	BW	NAS	DI	FC
13	DI	DI	DI	AI	BW	CO	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	LR	NAS	NAS	GWR	NAS	NAS	NAS
14	DI	DI	DI	DI	DI	LR	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	LR	LR	NAS	NAS	NAS	NAS	NAS	FC
15	DI	DI	DI	DI	AI	AI	BW	BW	BW	BW	BW	TI	TI	CC	DI	DI	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR
16	GWR	BW	BW	BW	BW	BW	BW	BW	BW	BW	TI	TI	TI	TI	DI	DI	DI	LR	NAS	NAS	GWR	GWR	GWR	GWR
17	GWR	CO	BW	BW	CO	BW	LR	LR	CC	DI	TI	TI	TI	AI	AI	LR	LR	NAS	GWR	NAS	GWR	GWR	GWR	DI
18	DI	DI	DI	AI	AI	AI	UE	TI	CC	DI	DI	TI	AI	AI	AI	CC	LR	LR	NAS	NAS	FC	GWR	FC	GWR
19	FC	FC	BW	BW	CO	CO	TI	DI	DI	DI	DI	DI	DI	TI	CO	LR	LR	AI	LR	NAS	NAS	FC	FC	DI
20	DI	FC	BW	BW	BW	BW	BW	TI	TI	CC	CC	CC	DI	AI	AI	AI	LR	LR	LR	LR	NAS	GWR	GWR	FC
21	FC	BW	BW	BW	BW	CO	CC	DI	DI	AI	AI	AI	AI	LR	LR	LR	LR	LR	LR	LR	FC	GWR	CO	CO
22	CO	CO	UE	CO	CO	CO	CO	CO	CC	DI	DI	DI	TI	DI	DI	DI	LR	LR	NAS	NAS	DI	DI	DI	FC
23	FC	FC	GWR	GWR	BW	BW	BW	BW	CC	CC	CC	DI	DI	TI	DI	LR	LR	LR	GWR	GWR	GWR	GWR	GWR	GWR
24	GWR	FC	BW	BW	BW	CO	CO	CO	CC	CC	TI	DI	DI	DI	AI	AI	NAS	LR	LR	NAS	NAS	GWR	GWR	FC
25	FC	FC	FC	BW	BW	BW	CO	BW	TI	TI	DI	DI	DI	DI	DI	LR	DI	TI	NAS	NAS	NAS	FC	FC	GWR
26	FC	FC	BW	BW	LR	NAS	NAS	GWR	TI	TI	CC	CC	DI	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR
27	FC	FC	BW	BW	BW	BW	BW	BW	TI	TI	CC	CC	DI	DI	DI	DI	DI	LR	LR	NAS	NAS	NAS	NAS	FC
28	FC	FC	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	TI	TI	CC	CC	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS
29	FC	GWR	GWR	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	DI	DI	DI	LR	LR	NAS	LR	NAS	NAS	GWR	NAS
30	FC	FC	BW	BW	CO	BW	BW	CO	TI	TI	DI	TI	TI	DI	AI	AI	LR	LR	LR	NAS	NAS	NAS	FC	FC

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DT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	AI	LR	BW	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	CO	BW	BW
2	UE	UE	UE	TI	TI	GWR	GWR	DI	FC	FC	AI	AI	NAS	BW	BW	BW	GWR	FC	BW	CC	DI	AI	LR	LR
3	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	GWR	CO	CO	FC	FC	FC	TI	TI	DI	DI	FC	CO	CO	CO	CO
4	LR	NAS	LR	NAS	BC	NAS	GWR	GWR	GWR	FC	FC	FC	BW	BW	GWR	GWR	GWR	FC	FC	FC	CO	CO	CO	CO
5	UE	UE	TI	TI	CC	CC	CC	NAS	GWR	GWR	GWR	FC	FC	AI	FC	BW	BW	BW	GWR	FC	FC	CO	CO	UE
6	UE	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	CO	CO	CO	CO	BW	TI	TI	TI	TI	AI	CC	AI	AI	AI
7	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	GWR	AI	BW	LR	NAS	GWR	GWR	GWR	FC	CC	GWR	CO	CO	CO	UE
8	LR	LR	UE	NAS	NAS	NAS	FC	GWR	GWR	GWR	FC	FC	NAS	CO	BW	GWR	BW	BW	CC	DI	UE	CC	DI	CC
9	NAS	UE	TI	GWR	GWR	GWR	GWR	GWR	GWR	GWR	FC	CO	CO	CO	FC	BW	GWR	DI	DI	FC	CO	BW	AI	LR
10	LR	UE	TI	TI	CC	CC	DI	DI	DI	AI	AI	AI	NAS	NAS	GWR	GWR	GWR	GWR	GWR	FC	CO	CO	DI	DI
11	LR	LR	GWR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	FC	CO	FC	FC	FC	TI	TI	BW	DI	CC	UE	CC	CO	CO
12	UE	TI	TI	NAS	GWR	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	FC	CO	BW	TI	TI	DI	DI	AI	UE	UE
13	UE	UE	TI	TI	CC	CC	CC	GWR	DI	AI	LR	CO	FC	FC	BW	GWR	FC	FC	FC	CO	CO	CO	CC	CC
14	UE	UE	TI	TI	TI	CC	CC	DI	AI	AI	AI	NAS	NAS	NAS	BW	GWR	FC	FC	BW	DI	CO	CO	CC	CC
15	UE	UE	UE	TI	TI	CC	CC	DI	GWR	FC	FC	FC	NAS	GWR	GWR	GWR	CC	TI	BW	BW	DI	CC	CC	CC
16	CC	AI	CC	AI	LR	NAS	NAS	GWR	GWR	AI	AI	AI	AI	LR	GWR	FC	FC	CO	BW	BW	DI	DI	DI	DI
17	DI	AI	LR	LR	NAS	NAS	FC	CO	CO	BW	FC	FC	FC	CO	CO	BW	BW	BW	BW	CC	DI	DI	CC	CO
18	UE	UE	NAS	NAS	GWR	CC	CC	CC	NAS	GWR	GWR	GWR	CO	CO	FC	FC	TI	BW	BW	TI	UE	AI	AI	AI
19	AI	LR	LR	LR	LR	LR	GWR	GWR	GWR	BW	GWR	UE	CO	FC	FC	FC	BW	DI	BW	DI	DI	DI	AI	UE
20	NAS	LR	NAS	LR	GWR	NAS	NAS	CC	AI	AI	GWR	FC	CO	UE	CO	CO	CO	BW	TI	BW	BW	AI	AI	AI
21	LR	LR	NAS	NAS	LR	NAS	NAS	GWR	GWR	GWR	GWR	UE	CO	CO	CO	UE	UE	CO	CO	CO	UE	AI	DI	FC
22	AI	AI	AI	AI	LR	LR	GWR	NAS	FC	BW	FC	FC	FC	CO	CO	CC	TI	TI	FC	FC	CO	CO	UE	UE
23	LR	LR	LR	LR	NAS	GWR	NAS	NAS	NAS	BW	CO	FC	CO	CO	CO	CO	CO	BW	DI	BW	TI	AI	AI	AI
24	AI	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	BW	BW	BW	BW	TI	AI	DI	AI	AI
25	LR	LR	LR	LR	NAS	NAS	GWR	NAS	NAS	GWR	GWR	CO	BW	FC	BW	BW	BW	GWR	BW	TI	CC	CC	AI	AI
26	LR	LR	LR	NAS	CC	CC	CC	CC	AI	AI	NAS	LR	FC	FC	BW	BW	BW	BW	BW	BW	TI	AI	AI	AI
27	LR	AI	LR	NAS	NAS	GWR	GWR	GWR	DI	AI	NAS	BW	FC	CO	BW	BW	BW	BW	BW	CC	UE	UE	UE	UE
28	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	FC	BW	BW	BW	GWR	GWR	GWR	CC	DI	DI	CC	UE
29	UE	LR	LR	NAS	NAS	NAS	NAS	DI	GWR	GWR	FC	FC	FC	FC	FC	CO	BW	BW	BW	BW	DI	AI	DI	CC
30	UE	LR	LR	LR	ER	LR	GWR	GWR	NAS	NAS	NAS	CO	GWR	GWR	FC	UE	CO	BW	TI	AI	AI	AI	AI	AI

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1	GWR	DI	OI	BW	BW	BW	CO	CO	BW	BW	CC	CC	CC	DI	DI	DI	DI	LR	LR	NAS	NAS	GWR	GWR	GWR
2	FC	FC	DI	BW	BW	BW	BW	CC	CC	CC	CC	CC	CC	DI	DI	DI	LR	NAS	NAS	NAS	NAS	FC	FC	FC
3	FC	DI	GWR	AI	GWR	GWR	TI	BW	BW	BW	BW	CC	DI	DI	DI	CC	LR	LR	LR	NAS	GWR	FC	GWR	GWR
4	GWR	OI	DI	AI	AI	AI	CC	BW	CC	CC	CC	CC	CC	DI	DI	DI	LR	LR	NAS	NAS	GWR	NAS	NAS	FC
5	FC	GWR	GWR	BW	BW	BW	BW	BW	BW	CC	DI	DI	DI	CC	AI	AI	LR	LR	NAS	BW	BW	NAS	NAS	FC
6	GWR	DI	AI	AI	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	LR	LR	LR	BW	GWR	NAS	NAS	DI
7	DI	DI	GWR	BW	BW	BW	BW	BW	TI	BW	CC	CC	CC	CC	TI	CO	NAS	NAS	NAS	NAS	NAS	GWR	GWR	NAS
8	FC	FC	AI	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	LR	LR	NAS	NAS	NAS	FC	FC	
9	FC	FC	FC	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	LR	LR	LR	NAS	NAS	NAS	FC	DI
10	DI	DI	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	CC	NAS	NAS	NAS	LR	DI	DI	DI
11	DI	DI	FC	GWR	FC	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	DI	CC	CC	CC	LR	NAS	NAS	GWR	FC
12	FC	FC	FC	BW	BW	BW	NAS	BW	BW	CC	DI	DI	DI	DI	DI	LR	LR	LR	LR	NAS	GWR	GWR	FC	FC
13	FC	FC	BW	BW	BW	BW	BW	LR	GWR	CC	CC	CC	NAS	NAS	NAS	DI	CC	LR	LR	NAS	NAS	NAS	FC	FC
14	FC	FC	FC	BW	BW	BW	BW	CC	CC	CC	CO	BW	CC	CC	CC	LR	LR	NAS	NAS	NAS	GWR	FC	FC	GWR
15	BW	FC	FC	LR	BW	BW	BW	CC	CC	DI	CC	CC	CC	CC	CC	CC	CC	NAS	LR	NAS	NAS	NAS	FC	FC
16	AI	AI	AI	AI	AI	BW	BW	BW	CC	BW	AI	AI	AI	CC	DI	AI	AI	NAS	NAS	NAS	NAS	NAS	NAS	GWR
17	FC	FC	GWR	AI	BW	CO	BW	BW	TI	BW	CC	DI	DI	DI	CC	CC	NAS	CC	AI	AI	NAS	NAS	FC	FC
18	FC	FC	BW	BW	BW	AI	TI	TI	TI	TI	TI	CC	CC	CC	DI	AI	AI	AI	AI	NAS	NAS	NAS	AI	AI
19	FC	FC	FC	BW	BW	BW	BW	CC	CC	CC	DI	CC	CC	CC	BW	FC	FC	LR	LR	NAS	NAS	NAS	GWR	GWR
20	GWR	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	AI	AI	FC	FC	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR
21	GWR	GWR	GWR	GWR	GWR	NAS	TI	BW	CC	CC	CC	CC	CC	DI	DI	FC	FC	FC	NAS	NAS	NAS	NAS	NAS	GWR
22	GWR	GWR	BW	GWR	FC	FC	FC	FC	FC	FC	CC	FC	FC	FC	FC	FC	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS
23	GWR	GWR	GWR	FC	FC	NAS	FC	BW	CC	CC	CC	CC	CC	CC	CC	DI	CC	NAS	NAS	NAS	NAS	NAS	FC	FC
24	FC	FC	FC	FC	BW	AI	LR	BW	CC	CC	CC	CC	CC	CC	DI	AI	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC
25	FC	FC	FC	BW	BW	BW	BW	TI	TI	TI	CC	CC	DI	DI	AI	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC
26	DI	DI	DI	AI	AI	UE	UE	TI	TI	TI	TI	UE	CC	CC	CC	DI	LR	LR	NAS	NAS	NAS	NAS	FC	NAS
27	FC	FC	FC	FC	BW	BW	BW	BW	CC	CC	CC	CC	DI	DI	AI	LR	LR	LR	NAS	LR	GWR	GWR	GWR	GWR
28	BW	BW	FC	DI	AI	AI	BW	TI	CC	TI	TI	AI	AI	AI	AI	LR	LR	LR	NAS	NAS	NAS	FC	FC	FC
29	FC	FC	DI	BW	BW	BW	CO	DI	CC	CC	CC	CC	DI	DI	DI	AI	AI	NAS	NAS	NAS	NAS	NAS	NAS	FC
30	FC	FC	GWR	BW	BW	BW	LR	BW	CC	DI	DI	CC	CC	CC	DI	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS
31	DI	GWR	GWR	FC	AI	AI	BW	BW	CC	CC	CC	CC	DI	CC	OI	DI	DI	DI	DI	DI	NAS	GWR	GWR	DI

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1	LR	UE	TI	TI	TI	LR	GWR	GWR	GWR	AI	AI	AI	FC	CO	BW	BW	BW	FC	BW	TI	DI	DI	AI	AI
2	AI	LR	TI	GWR	GWR	NAS	NAS	GWR	FC	FC	FC	FC	NAS	FC	BW	FC	FC	BW	DI	DI	CO	UE	AI	LR
3	LR	TI	TI	TI	CC	CC	DI	AI	AI	AI	LR	CO	BW	FC	FC	BW	BW	BW	BW	BW	DI	AI	AI	AI
4	LR	TI	TI	TI	CC	CC	DI	GWR	GWR	GWR	GWR	FC	FC	FC	FC	CC	BW	BW	DI	DI	DI	CO	TI	LR
5	LR	LR	TI	TI	NAS	DI	DI	DI	LR	GWR	GWR	GWR	FC	FC	CO	CC	FC	TI	DI	DI	UE	UE	AI	DI
6	AI	TI	TI	TI	TI	CC	DI	FC	FC	FC	FC	FC	FC	FC	FC	FC	DI	BW	BW	DI	UE	TI	CO	UE
7	CO	TI	TI	TI	CC	DI	DI	FC	AI	LR	LR	FC	FC	BW	FC	FC	FC	BW	DI	DI	DI	CO	UE	UE
8	TI	NAS	TI	TI	CC	CC	CC	DI	AI	AI	AI	LR	NAS	NAS	GWR	GWR	BW	BW	BW	DI	CC	DI	DI	CC
9	NAS	NAS	NAS	NAS	GWR	GWR	NAS	GWR	GWR	LR	LR	LR	NAS	NAS	GWR	BW	BW	BW	DI	CC	CC	CO	CO	UE
10	UE	TI	TI	NAS	NAS	NAS	DI	FC	FC	FC	FC	LR	LR	LR	GWR	GWR	GWR	GWR	CO	CO	CO	CO	CO	CO
11	CO	UE	TI	TI	CC	CC	DI	DI	DI	LR	LR	LR	LR	LR	NAS	GWR	GWR	FC	FC	BW	UE	CC	CC	LR
12	LR	LR	LR	LR	NAS	NAS	DI	NAS	GWR	GWR	GWR	FC	FC	FC	FC	CO	BW	BW	BW	TI	TI	DI	CC	CC
13	LR	LR	LR	LR	LR	NAS	NAS	DI	DI	NAS	FC	FC	GWR	GWR	GWR	BW	BW	GWR	GWR	BW	DI	UE	CC	CC
14	LR	LR	NAS	LR	LR	LR	NAS	NAS	GWR	FC	DI	LR	NAS	NAS	GWR	FC	BW	BW	BW	BW	TI	TI	CC	DI
15	LR	LR	LR	CO	TI	NAS	GWR	GWR	GWR	GWR	GWR	FC	NAS	BW	BW	BW	TI	BW	BW	DI	DI	TI	TI	TI
16	LR	TI	TI	TI	TI	NAS	GWR	NAS	GWR	FC	LR	LR	GWR	FC	BW	BW	BW	BW	BW	DI	DI	TI	UE	LR
17	LR	LR	NAS	TI	LR	NAS	NAS	NAS	LR	AI	LR	GWR	GWR	FC	FC	GWR	TI	BW	CO	BW	UE	UE	UE	AI
18	CC	LR	LR	LR	CC	DI	CC	LR	LR	AI	LR	LR	LR	GWR	GWR	GWR	BW	BW	DI	DI	CO	CO	CO	UE
19	TI	TI	TI	LR	LR	GWR	GWR	GWR	GWR	GWR	GWR	FC	FC	FC	LR	GWR	BW	BW	BW	FC	DI	FC	FC	LR
20	FC	FC	FC	FC	LR	NAS	GWR	NAS	GWR	GWR	GWR	GWR	CO	CO	BW	CO	BW	BW	BW	TI	DI	DI	CC	CC
21	CC	FC	FC	FC	FC	FC	FC	FC	FC	GWR	GWR	GWR	GWR	BW	CO	BW	BW	BW	BW	DI	DI	TI	CC	LR
22	LR	LR	LR	LR	NAS	GWR	GWR	GWR	NAS	LR	NAS	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	BW
23	TI	TI	TI	TI	TI	GWR	DI	NAS	GWR	FC	FC	FC	FC	NAS	BW	BW	BW	BW	BW	BW	CC	DI	DI	CC
24	CC	LR	TI	TI	NAS	GWR	BW	AI	GWR	GWR	GWR	FC	FC	FC	BW	BW	BW	BW	TI	CO	DI	DI	CC	LR
25	LR	LR	LR	LR	NAS	NAS	NAS	NAS	BW	DI	NAS	FC	FC	FC	FC	BW	BW	BW	BW	CC	CC	DI	DI	CC
26	TI	BW	TI	TI	BW	BW	DI	DI	AI	AI	AI	AI	AI	LR	FC	BW	BW	BW	BW	BW	BW	FW	CC	TI
27	TI	TI	TI	NAS	NAS	GWR	NAS	GWR	GWR	GWR	AI	NAS	FC	BW	BW	BW	BW	BW	BW	BW	TI	TI	AI	AI
28	AI	AI	AI	LR	CO	UE	DI	GWR	NAS	NAS	GWR	GWR	GWR	GWR	CO	UE	FC	TI	TI	BW	AI	AI	LR	DI
29	AI	LR	LR	CC	GWR	GWR	LR	GWR	NAS	GWR	GWR	GWR	FC	FC	BW	FC	TI	BW	CC	BW	DI	AI	AI	LR
30	AI	LR	LR	LR	LR	NAS	GWR	GWR	GWR	GWR	GWR	GWR	BW	FC	FC	FC	BW	TI	TI	TI	DI	CO	BW	BW
31	LR	TI	BW	TI	NAS	GWR	NAS	GWR	GWR	FC	FC	FC	FC	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	BW

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
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TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

AU = MAXIMUM DELTA H

JUNE 1970

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	FC	FC	BW	BW	BW	CO	LR	CC	CC	TI	TI	TI	DI	DI	AI	AI	LR	LR	LR	NAS	NAS	GWR	FC	FC
2	FC	FC	BW	BW	BW	BW	TI	TI	TI	TI	CC	CC	CC	DI	DI	LR	LR	LR	LR	LR	NAS	NAS	FC	FC
3	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	CC	AI	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC
4	FC	FC	CO	CO	CO	CO	CO	CC	CC	CC	CC	CC	DI	DI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC
5	FC	NAS	CO	CO	CO	CO	CC	CC	CC	DI	CC	CC	GWR	TI	TI	AI	CO	LR	LR	LR	GWR	GWR	DI	DI
6	FC	FC	FC	FC	CO	CO	CO	CC	CC	CC	CC	TI	CC	CC	CC	CO	NAS	LR	LR	LR	LR	GWR	GWR	DI
7	AI	FC	FC	FC	UE	GWR	UE	TI	TI	CC	TI	TI	TI	TI	CC	DI	DI	LR	LR	NAS	GWR	GWR	GWR	GWR
8	FC	FC	CO	FC	CO	CO	CC	TI	LR	CC	CC	TI	DI	TI	CC	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC
9	FC	FC	FC	FC	FC	UE	UE	UE	UE	TI	TI	TI	TI	TI	LR	LR	LR	LR	NAS	NAS	FC	FC	GWR	FC
10	FC	FC	GWR	FC	FC	UE	CO	CC	CC	CC	CC	TI	TI	CC	DI	AI	LR	NAS	NAS	NAS	NAS	NAS	DI	FC
11	FC	FC	FC	FC	AI	AI	UE	TI	TI	TI	TI	CC	TI	TI	TI	LR	LR	NAS	NAS	NAS	NAS	DI	DI	DI
12	FC	FC	FC	FC	FC	FC	CO	TI	CC	CC	CC	CC	CC	CC	CC	CC	LR	LR	LR	NAS	NAS	NAS	NAS	FC
13	FC	FC	FC	GWR	GWR	UE	CC	CC	TI	DI	DI	DI	AI	AI	AI	LR	AI	NAS	NAS	GWR	NAS	FC	FC	GWR
14	FC	FC	CO	CO	CC	UE	GWR	GWR	TI	TI	TI	CC	CC	TI	TI	LR	AI	LR	NAS	NAS	NAS	NAS	FC	FC
15	FC	FC	FC	FC	CO	CO	CO	CC	TI	TI	DI	DI	DI	AI	AI	LR	LR	LR	NAS	NAS	NAS	GWR	FC	FC
16	FC	GWR	CO	GWR	CO	CO	CC	LR	GWR	TI	TI	TI	CC	DI	DI	DI	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR
17	FC	DI	AI	AI	AI	UE	UE	UE	TI	TI	TI	CC	DI	TI	TI	TI	NAS	LR	NAS	GWR	GWR	GWR	GWR	GWR
18	FC	GWR	DI	DI	AI	CO	CC	CC	DI	DI	DI	AI	AI	AI	LR	LR	LR	LR	LR	NAS	GWR	GWR	GWR	FC
19	FC	GWR	FC	FC	AI	CO	CO	TI	CC	CC	CC	CC	CC	DI	LR	LR	LR	NAS	NAS	NAS	GWR	FC	FC	GWR
20	GWR	FC	CO	CO	CO	CO	TI	DI	TI	DI	DI	DI	DI	AI	AI	LR	LR	LR	GWR	GWR	GWR	GWR	GWR	GWR
21	GWR	UE	FC	UE	UE	UE	TI	DI	DI	DI	DI	DI	AI	AI	AI	AI	LR	LR	NAS	CO	LR	NAS	FC	FC
22	FC	FC	FC	GWR	AI	LR	LR	TI	TI	CC	CC	CC	CC	CC	CC	DI	DI	LR	NAS	NAS	NAS	NAS	NAS	FC
23	FC	GWR	GWR	CO	CO	CO	CO	UE	UE	UE	UE	CC	CC	CC	DI	DI	DI	DI	DI	NAS	NAS	NAS	NAS	FC
24	FC	FC	FC	AI	AI	AI	DI	UE	UE	UE	CO	CO	TI	TI	CC	DI	DI	LR	LR	NAS	NAS	NAS	FC	FC
25	FC	FC	FC	AI	AI	CO	CO	CC	CC	CC	CC	DI	DI	AI	AI	AI	AI	LR	LR	LR	NAS	FC	FC	FC
26	DI	FC	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	CC	CC	CC	CO	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	DI
27	FC	FC	FC	CO	BO	CO	CO	DI	DI	DI	DI	AI	AI	AI	LR	LR	NAS	NAS	LR	LR	NAS	NAS	NAS	FC
28	FC	FC	CO	CO	CO	CO	CO	TI	CC	CC	CC	CC	DI	DI	AI	AI	AI	CO	NAS	NAS	NAS	NAS	FC	FC
29	FC	AI	AI	AI	CO	CO	CO	CC	UE	TI	CC	CC	CC	CC	TI	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS
30	DI	DI	AI	AI	AI	CO	CO	CC	CC	CC	CC	CC	CC	CO	CO	CO	LR	LR	LR	LR	FC	FC	FC	FC

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AL = MINIMUM DELTA H

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UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	TI	TI	LR	NAS	NAS	NAS	DI	DI	GWR	GWR	GWR	FC	CO	GWR	CO	CO	FC	DI	BW	BW	DI	DI	DI	CC
2	LR	LR	NAS	LR	GWR	GWR	GWR	CC	DI	AI	BW	LR	FC	BW	CC	FC	BW	BW	BW	BW	DI	DI	DI	CO
3	CC	LR	LR	NAS	GWR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	CO	FC	FC	FC	BW	FC	DI	CC	CC	DI	CC	DI
4	AI	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	GWR	FC	FC	FC	CO	FC	FC	CC	CC	CC	DI	CC	CC	DI
5	CC	TI	NAS	LR	NAS	NAS	NAS	NAS	GWR	GWR	CO	CO	FC	AI	GWR	FC	FC	FC	DI	UE	UE	CO	UE	TI
6	TI	TI	TI	CC	NAS	NAS	NAS	GWR	GWR	LR	FC	AI	NAS	NAS	NAS	CC	CC	DI	CO	CC	CO	CO	CO	CO
7	TI	TI	CC	CC	NAS	CC	DI	DI	AI	AI	FC	LR	NAS	NAS	GWR	GWR	FC	FC	DI	DI	TI	TI	AI	DI
8	LR	LR	LR	LR	LR	LR	NAS	GWR	DI	GWR	GWR	FC	CO	FC	FC	FC	FC	CO	DI	DI	CC	CC	CC	CC
9	LR	LR	LR	NAS	NAS	CC	CC	NAS	GWR	FC	AI	LR	GWR	GWR	GWR	FC	CC	CC	CC	DI	CC	CC	CC	CC
10	LR	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	NAS	FC	CO	FC	CO	DI	DI	DI	DI	CC	CO	TI
11	LR	LR	LR	NAS	CC	DI	NAS	GWR	GWR	LR	LR	NAS	NAS	FC	GWR	FC	FC	CC	CC	CC	CC	CO	UE	UE
12	TI	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	FC	FC	GWR	FC	FC	DI	DI	DI	DI	CC	CC
13	CC	TI	TI	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	GWR	GWR	FC	FC	CC	DI	DI	CC	DI	DI	CC	CC
14	LR	LR	LR	LR	NAS	NAS	DI	CC	DI	AI	LR	LR	NAS	NAS	GWR	GWR	FC	CC	CC	DI	CC	CC	CC	CC
15	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	CO	FC	FC	CO	CO	CO	TI	TI	TI	TI	DI	CC	CC
16	AI	LR	LR	LR	LR	LR	NAS	DI	DI	AI	AI	AI	FC	FC	FC	FC	FC	FC	FC	DI	CC	CC	CC	AI
17	LR	UE	TI	TI	TI	NAS	DI	FC	DI	AI	NAS	FC	FC	FC	FC	CC	CC	TI	TI	TI	TI	TI	AI	DI
18	AI	AI	TI	TI	TI	NAS	GWR	GWR	NAS	NAS	GWR	GWR	GWR	UE	UE	CO	CO	CO	TI	TI	TI	TI	AI	CC
19	AI	AI	LR	LR	NAS	NAS	GWR	GWR	NAS	GWR	GWR	FC	FC	FC	FC	FC	FC	CC	CC	DI	DI	DI	CC	DI
20	DI	AI	AI	LR	LR	LR	LR	LR	NAS	NAS	GWR	GWR	GWR	FC	CO	CO	CO	CO	CO	TI	TI	TI	TI	DI
21	DI	AI	AI	AI	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	CO	CO	TI	TI	GWR	UE	DI	AI	UE
22	LR	LR	LR	NAS	CC	CC	DI	DI	DI	AI	FC	FC	FC	NAS	FC	FC	FC	DI	DI	DI	DI	CC	CC	CC
23	LR	LR	LR	LR	NAS	NAS	NAS	DI	FC	AI	AI	FC	NAS	NAS	GWR	FC	FC	FC	FC	CO	CO	CO	UE	UE
24	TI	LR	LR	GWR	GWR	GWR	CC	GWR	GWR	DI	AI	AI	AI	NAS	FC	FC	CC	FC	CO	DI	DI	CC	CC	AI
25	AI	AI	CC	TI	CC	GWR	GWR	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	CC	FC	DI	DI	DI
26	TI	TI	TI	TI	LR	GWR	GWR	GWR	GWR	GWR	GWR	FC	FC	FC	FC	CO	CO	TI	TI	TI	DI	DI	CC	LR
27	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	CO	CO	TI	CC	TI	CC	CC	CC	AI	AI	TI
28	TI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	CC	DI	CC	CC	DI	CC	CC	CC
29	LR	TI	TI	CC	CC	FC	GWR	GWR	GWR	LR	FC	LR	LR	FC	FC	FC	CO	TI	TI	TI	TI	CC	DI	CC
30	UE	UE	TI	TI	CC	CC	GWR	GWR	GWR	GWR	GWR	FC	FC	AI	DI	FC	DI	CC	DI	DI	CC	CC	CC	CC

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2	FC	FC	FC	FC	CO	CO	CO	CC	CC	CC	CC	DI	CC	CC	CO	AI	LR	LR	CO	AI	LR	NAS	FC	FC
3	FC	FC	FC	FC	CO	CO	CO	CO	DI	DI	DI	CC	CC	CC	CO	CO	CO	NAS	NAS	NAS	FC	FC	GWR	GWR
4	CO	FC	FC	DI	CO	CC	CO	CO	DI	CO	CC	CC	DI	TI	LR	AI	LR	LR	LR	LR	LR	DI	FC	FC
5	FC	FC	UE	CO	CO	CO	CO	CC	CC	CC	CC	CC	CC	CC	AI	AI	LR	LR	LR	LR	NAS	NAS	FC	FC
6	FC	FC	FC	CO	CO	CC	CC	CC	DI	CC	CC	CC	DI	DI	DI	CO	CO	CO	LR	NAS	FC	FC	FC	FC
7	AI	AI	AI	AI	AI	FC	UE	CO	CC	CC	CC	CC	CC	CC	CC	AI	LR	LR	LR	NAS	NAS	NAS	FC	FC
8	FC	FC	BW	BW	BW	BW	BW	CC	CC	CC	BW	BW	CC	DI	AI	AI	LR	LR	NAS	NAS	GWR	GWR	GWR	GWR
9	FC	FC	BW	BW	CO	CO	CO	UE	DI	DI	DI	DI	AI	AI	AI	AI	LR	LR	NAS	GWR	FC	FC	GWR	BW
10	BW	BW	BW	AI	AI	BW	BW	BW	BW	BW	BW	CC	CC	CC	BW	AI	AI	LR	NAS	LR	GWR	FC	FC	GWR
11	FC	BW	GWR	FC	AI	BW	BW	BW	CC	CC	CC	CC	DI	DI	TI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC
12	FC	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	AI	AI	LR	NAS	NAS	NAS	NAS	NAS	FC	FC
13	FC	FC	BW	BW	BW	BW	BW	BW	GWR	GWR	CC	CC	CC	CC	DI	AI	AI	LR	NAS	NAS	NAS	NAS	GWR	DI
14	FC	FC	CO	FC	FC	FC	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CO	LR	NAS	NAS	NAS	NAS	FC	FC
15	FC	FC	GWR	AI	GWR	UE	TI	TI	BW	CC	CC	TI	TI	DI	DI	DI	DI	DI	DI	DI	LR	NAS	NAS	FC
16	FC	FC	FC	BW	BW	BW	GWR	TI	TI	TI	TI	CC	DI	DI	CC	CC	LR	LR	NAS	NAS	LR	NAS	DI	DI
17	DI	FC	BW	FC	LR	UE	UE	BW	TI	TI	BW	CC	CC	CC	DI	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC
18	FC	FC	FC	BW	BW	BW	TI	TI	TI	CC	CC	CC	CC	CC	CC	CC	AI	LR	LR	LR	NAS	NAS	FC	NAS
19	NAS	DI	FC	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CO	CO	AI	LR	LR	LR	LR	NAS	NAS	FC	FC
20	FC	FC	FC	FC	AI	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	LR	LR	LR	NAS	NAS	NAS	FC	GWR
21	GWR	FC	BW	BW	BW	AI	LR	GWR	CC	CC	CC	DI	DI	AI	AI	LR	LR	LR	LR	NAS	GWR	GWR	GWR	FC
22	GWR	GWR	FC	BW	BW	BW	BW	CC	CC	CC	CC	CC	CC	CC	LR	LR	LR	LR	NAS	NAS	FC	FC	FC	FC
23	FC	FC	BW	BW	AI	BW	BW	BW	CC	CC	CC	CC	CC	CC	DI	CC	LR	NAS	NAS	NAS	NAS	AI	DI	NAS
24	FC	FC	BW	CO	CO	CO	TI	BW	LR	GWR	CC	CC	DI	DI	AI	AI	AI	LR	LR	LR	NAS	NAS	FC	FC
25	FC	FC	CO	BW	BW	CO	TI	TI	TI	AI	AI	AI	AI	AI	AI	CO	CO	CO	BW	NAS	FC	GWR	GWR	CO
26	CO	CO	CO	BW	BW	BW	BW	BW	CC	DI	DI	DI	DI	AI	LR	CO	NAS	NAS	NAS	NAS	NAS	FC	GWR	GWR
27	FC	DI	FC	BW	BW	BW	BW	TI	CC	CC	DI	CC	LR	AI	LR	LR	LR	LR	LR	GWR	GWR	NAS	FC	FC
28	FC	DI	DI	AI	AI	LR	LR	BW	BW	BW	BW	CC	TI	CC	TI	CC	CC	NAS	NAS	NAS	NAS	NAS	NAS	FC
29	FC	FC	BW	BW	CO	CO	DI	DI	DI	AI	DI	AI	AI	AI	AI	DI	LR	NAS	LR	NAS	BW	BW	DI	DI
30	DI	DI	GWR	FC	BW	BW	BW	CC	BW	CC	CC	CC	CC	CC	CC	DI	CC	LR	LR	NAS	NAS	FC	FC	FC
31	FC	FC	FC	BW	BW	BW	BW	CC	CC	CC	CC	CC	CC	CC	LR	LR	AI	NAS	NAS	NAS	NAS	FC	GWR	FC

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TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

AL = MINIMUM DELTA H

JULY 1970

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	OI	OI	LR	LR	LR	NAS	GWR	NAS	NAS	NAS	CO	DI	NAS	FC	FC	FC	FC	DI	DI	DI	OI	DI	CO	LR
2	TI	TI	TI	NAS	GWR	GWR	NAS	NAS	NAS	GWR	CO	CO	FC	FC	DI	GWR	FC	FC	DI	CC	CC	CO	UE	TI
3	LR	LR	LR	LR	LR	GWR	NAS	GWR	GWR	NAS	CO	GWR	FC	FC	FC	CC	CC	CC	DI	DI	CC	OI	DI	AI
4	AI	AI	AI	LR	LR	LR	LR	GWR	GWR	GWR	GWR	CO	CO	CO	CO	CO	CC	CC	TI	DI	OI	UE	CO	UE
5	TI	TI	TI	LR	LR	LR	NAS	NAS	GWR	GWR	AI	AI	NAS	GWR	CO	UE	TI	TI	TI	CC	UE	CO	UE	AI
6	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	FC	CO	FC	GWR	GWR	DI	DI	TI	TI	TI	CO	UE	UE
7	TI	TI	TI	TI	TI	CC	NAS	GWR	GWR	FC	FC	FC	NAS	NAS	NAS	GWR	FC	FC	TI	CC	CC	CC	CC	LR
8	CC	LR	LR	LR	LR	NAS	NAS	NAS	GWR	FC	FC	FC	FC	CO	FC	BW	BW	BW	BW	TI	TI	TI	CC	AI
9	AI	AI	NAS	AI	AI	AI	LR	NAS	NAS	NAS	GWR	GWR	GWR	CO	GWR	UE	UE	TI	BW	UE	CC	AI	AI	AI
10	AI	LR	LR	CO	CO	NAS	NAS	OI	DI	GWR	NAS	NAS	FC	FC	FC	CO	BW	BW	TI	TI	TI	OI	AI	CC
11	AI	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	GWR	FC	FC	FC	FC	CO	BW	BW	TI	BW	TI	DI	DI	CC	AI
12	LR	AI	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	FC	CO	CO	CO	BW	BW	BW	BW	TI	TI	AI	DI	LR
13	LR	LR	LR	NAS	NAS	FC	GWR	NAS	OI	AI	NAS	NAS	FC	BW	BW	BW	BW	BW	BW	TI	TI	OI	CC	LR
14	LR	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	CO	FC	GWR	FC	FC	FC	DI	CC	CC	CC	CC	AI
15	LR	LR	LR	NAS	NAS	NAS	OI	FC	GWR	FC	FC	FC	FC	GWR	GWR	GWR	FC	FC	BW	CO	CO	CO	UE	CC
16	LR	LR	LR	LR	NAS	NAS	NAS	CC	OI	AI	LR	FC	FC	FC	BW	BW	BW	BW	BW	BW	CC	CC	UE	UE
17	TI	TI	NAS	NAS	TI	TI	NAS	NAS	AI	AI	AI	NAS	FC	FC	BW	BW	BW	BW	BW	TI	DI	AI	CC	CC
18	UE	TI	LR	LR	LR	GWR	GWR	FC	AI	NAS	FC	FC	NAS	NAS	NAS	GWR	BW	FC	BW	DI	CC	CC	CC	CC
19	TI	TI	NAS	NAS	NAS	NAS	NAS	NAS	AI	NAS	FC	FC	NAS	NAS	GWR	BW	BW	BW	BW	DI	OI	DI	CC	CC
20	CC	LR	LR	NAS	NAS	GWR	GWR	FC	AI	FC	FC	LR	NAS	NAS	NAS	GWR	BW	BW	BW	CC	CC	CC	CC	AI
21	AI	AI	AI	LR	LR	NAS	BW	OI	NAS	AI	GWR	GWR	FC	CO	FC	FC	BW	BW	TI	BW	CC	OI	AI	AI
22	LR	LR	CC	LR	NAS	GWR	GWR	NAS	FC	GWR	GWR	FC	FC	BW	BW	BW	BW	BW	TI	OI	DI	AI	CC	AI
23	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	NAS	AI	NAS	FC	FC	NAS	BW	BW	BW	BW	CC	CC	CO	CO	BW
24	LR	LR	LR	LR	LR	LR	LR	GWR	OI	OI	AI	LR	CO	FC	CO	CO	BW	TI	BW	BW	CC	CC	DI	LR
25	AI	AI	AI	LR	LR	AI	AI	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	AI	AI	TI	AI	AI	AI	TI	AI	AI
26	AI	AI	AI	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	CO	CO	CO	FC	AI	AI	FC	AI	AI	BW	BW	DI	LR
27	TI	TI	TI	NAS	LR	GWR	NAS	FC	CO	CO	GWR	FC	CO	CO	CO	TI	BW	BW	BW	TI	DI	CC	CC	LR
28	LR	UE	TI	TI	BW	CC	CC	NAS	FC	FC	FC	NAS	LR	GWR	GWR	GWR	FC	FC	FC	CO	BW	CO	BW	CC
29	LR	LR	NAS	NAS	GWR	NAS	NAS	GWR	GWR	GWR	CO	GWR	UE	UE	TI	UE	FC	BW	TI	AI	AI	AI	LR	LR
30	TI	TI	TI	CC	NAS	FC	NAS	FC	FC	LR	NAS	FC	FC	FC	BW	BW	BW	TI	BW	BW	CC	DI	CC	CC
31	AI	LR	LR	LR	NAS	LR	GWR	GWR	GWR	GWR	FC	FC	FC	FC	BW	CO	BW	BW	BW	BW	OI	DI	DI	LR

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
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AUGUST 1970 — AU = MAXIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	FC	FC	FC	GWR	BW	NAS	NAS	NAS	BW	CC	NAS	BW	CC	CC	CO	CC	LR	LR	LR	LR	LR	NAS	NAS	FC
2	FC	FC	BW	BW	BW	BW	LR	BW	CC	CC	CC	CC	CC	DI	TI	CO	BW	CC	LR	LR	CC	DI	DI	DI
3	DI	DI	FC	FC	GWR	GWR	GWR	FC	BW	BW	BW	CC	CC	CC	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	NAS	NAS
4	FC	GWR	BW	FC	BW	BW	TI	BW	BW	BW	CC	CC	CC	CC	DI	DI	LR	LR	NAS	NAS	NAS	NAS	NAS	DI
5	FC	FC	FC	BW	BW	BW	BW	TI	BW	BW	BW	BW	BW	CC	CC	DI	DI	BW	CC	CC	GWR	DI	DI	DI
6	DI	DI	AI	AI	CO	FC	BW	BW	BW	CC	CC	BW	CO	BW	CC	CC	CC	CC	NAS	LR	NAS	NAS	GWR	GWR
7	FC	FC	GWR	GWR	UE	LR	BW	BW	BW	BW	BW	BW	CC	CC	DI	DI	AI	AI	NAS	NAS	NAS	GWR	GWR	GWR
8	BW	BW	BW	BW	GWR	BW	BW	CC	DI	UE	AI	AI	DI	AI	LP	LR	NAS	NAS	LR	LR	LR	FC	GWR	FC
9	GWR	CO	CO	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	DI	DI	DI	LR	LR	LR	LR	NAS	NAS	NAS	DI
10	DI	GWR	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	AI	CC	CC	LR	LR	LR	LR	LR	NAS	NAS	NAS	FC
11	FC	GWR	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	AI	LR	LR	NAS	LR	LR	LR	FC	GWR
12	FC	FC	BW	BW	BW	CC	LR	BW	CC	CO	BW	CC	CC	CC	DI	CO	LR	LR	LR	NAS	NAS	FC	FC	DI
13	DI	BW	FC	GWR	DI	BW	BW	BW	BW	CC	CC	TI	CC	DI	DI	DI	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	DI
14	DI	BW	BW	BW	BW	LP	LR	LP	TI	BW	TI	CC	CO	CO	CO	LR	LR	LR	LR	AI	LR	NAS	FC	FC
15	FC	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	CC	CC	CO	LR	LR	NAS	NAS	LR	FC	FC	GWR
16	GWR	FC	FC	GWR	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	CC	LR	LR	LR	NAS	LR	NAS	GWR	GWR
17	GWR	FC	FC	FC	CO	FC	DI	FC	FC	FC	AI	FC	FC	FC	FC	AI	LR	LR	GWR	LR	LR	FC	GWR	GWR
18	CO	CO	BW	BW	UE	BW	CO	UE	DI	TI	AI	AI	AI	AI	LR	LR	LR	LR	NAS	NAS	FC	FC	FC	FC
19	CO	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	DI	LR	LR	LP	NAS	NAS	BW	CC	CC	CC	DI
20	DI	DI	AI	FC	FC	CO	CO	CC	CC	CC	FC	CC	DI	DI	LR	CO	BW	BW	LR	NAS	LR	NAS	NAS	FC
21	FC	FC	BW	BW	BW	BW	BW	BW	TI	CC	CC	CC	CC	CC	CC	LR	AI	AI	LR	NAS	LR	NAS	NAS	NAS
22	CC	AI	FC	FC	BW	BW	BW	BW	CC	CC	CC	CC	AI	AI	AI	AI	LR	LR	NAS	BW	LR	BW	FC	FC
23	FC	FC	GWR	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	CC	CC	DI	LR	LR	LR	NAS	FC	FC	FC	NAS
24	FC	FC	FC	BW	FC	FC	FC	CC	CO	CO	CO	BW	BW	CC	CC	CC	LP	LR	LR	LR	NAS	LR	LR	
25	FC	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	DI	DI	DI	AI	AI	AI	LR	LR	LR	NAS	NAS	GWR	FC
26	FC	FC	BW	BW	CC	CO	CO	CC	DI	DI	DI	AI	AI	AI	AI	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC
27	FC	BW	BW	BW	BW	BW	BW	CO	CC	CC	CC	CC	CC	DI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC
28	DI	DI	CO	AI	CO	BW	BW	CO	CO	CO	CO	CO	CC	CC	LR	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC
29	BW	DI	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	AI	LR	LR	LR	LR	LR	LR	BW	FC	FC
30	FC	FC	BW	BW	BW	LR	BW	BW	BW	CC	CC	CC	CC	DI	LR	DI	LR	LR	LR	LR	NAS	LR	BW	DI
31	FC	DI	LR	LR	BW	BW	CO	CO	TI	TI	CC	CC	DI	DI	DI	LR	LR	LR	LR	NAS	NAS	FC	BW	BW

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2	CC	LR	LR	LR	NAS	NAS	DI	DI	GWR	GWR	NAS	NAS	NAS	GWR	BW	GWR	GWR	FC	FC	FC	CO	CO	CO	UE
3	TI	TI	TI	TI	NAS	CC	DI	DI	AI	AI	NAS	NAS	NAS	GWR	FC	BW	BW	FC	FC	CO	CO	CO	UE	UE
4	UE	TI	TI	TI	NAS	CC	DI	AI	GWR	FC	FC	FC	FC	GWR	BW	BW	BW	CO	DI	DI	CO	CO	UE	
5	LR	TI	NAS	NAS	NAS	NAS	NAS	FC	FC	AI	AI	AI	NAS	NAS	GWR	GWR	FC	FC	FC	CO	CO	CO	CO	CO
6	TI	TI	TI	TI	CC	CC	DI	DI	AI	GWR	FC	AI	NAS	NAS	NAS	GWR	FC	FC	BW	DI	BW	DI	DI	AI
7	LR	LR	TI	TI	CC	CC	DI	NAS	NAS	AI	NAS	AI	FC	FC	FC	BW	BW	BW	CO	DI	DI	DI	DI	CC
8	AI	LR	GWR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	CO	BW	FC	BW	FC	BW	BW	BW	DI	DI	AI	AI
9	AI	AI	GWR	NAS	LR	FC	GWR	GWR	BW	NAS	BW	BW	FC	CO	BW	GWR	FC	BW	DI	DI	DI	AI	UE	UE
10	TI	LR	LR	NAS	NAS	GWR	GWR	GWR	GWR	GWR	FC	CO	CO	BW	BW	FC	BW	BW	BW	DI	DI	AI	AI	LR
11	LR	LR	LR	LR	FC	NAS	NAS	GWR	GWR	CO	FC	FC	FC	CO	BW	BW	TI	DI	DI	DI	CC	CC	CC	AI
12	CC	LR	LR	LR	LR	FC	GWR	GWR	GWR	FC	AI	FC	NAS	BW	NAS	GWR	GWR	FC	BW	DI	CC	CC	AI	UE
13	TI	TI	NAS	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	NAS	FC	CO	CO	BW	BW	BW	BW	BW	DI	DI	AI	AI
14	LR	TI	NAS	NAS	LR	CC	FC	DI	AI	AI	LR	LR	NAS	NAS	GWR	FC	BW	BW	BW	CC	CC	CC	CC	CC
15	CC	CC	LR	NAS	NAS	NAS	NAS	LR	LR	FC	FC	FC	FC	NAS	GWR	BW	BW	FC	CO	CO	CO	UE	DI	CC
16	CC	CC	LR	LR	TI	GWR	GWR	GWR	GWR	FC	FC	FC	FC	FC	FC	BW	FC	BW	BW	BW	DI	UE	DI	CC
17	CC	AI	AI	GWR	GWR	CC	GWR	GWR	CC	NAS	GWR	GWR	CC	UE	CO	CO	CO	BW	BW	BW	DI	AI	AI	AI
18	DI	AI	AI	LR	AI	LR	GWR	GWR	GWR	GWR	GWR	UE	UE	UE	CO	UE	CO	CO	BW	TI	TI	AI	AI	AI
19	AI	LR	LR	NAS	NAS	GWR	GWR	GWR	GWR	CO	CO	FC	FC	CO	BW	BW	BW	TI	DI	DI	CO	CO	UE	UE
20	TI	TI	TI	CC	CC	CC	DI	GWR	GWR	FC	FC	FC	FC	FC	BW	GWR	DI	DI	DI	DI	DI	BW	DI	UE
21	LR	LR	LR	NAS	NAS	DI	DI	DI	DI	DI	AI	BW	BW	DI	GWR	GWR	BW	BW	DI	BW	CO	CC	CC	UE
22	TI	TI	DI	DI	DI	DI	DI	DI	DI	DI	FC	CO	CO	FC	FC	FC	BW	BW	BW	DI	DI	UE	UE	LR
23	LR	NAS	DI	LR	NAS	GWR	GWR	GWR	GWR	GWR	GWR	FC	CO	FC	BW	BW	BW	BW	BW	CC	DI	DI	UE	UE
24	TI	TI	TI	NAS	NAS	DI	DI	AI	AI	AI	LR	LR	FC	FC	BW	FC	BW	BW	BW	BW	DI	DI	CC	CC
25	CC	CC	NAS	NAS	LR	NAS	NAS	NAS	GWR	FC	GWR	GWR	FC	FC	CO	TI	CO	BW	BW	DI	CC	DI	DI	AI
26	LR	LR	NAS	LR	LR	LR	NAS	NAS	GWR	GWR	GWR	GWR	CO	CO	CO	CO	CO	BW	DI	CC	DI	AI	AI	AI
27	AI	AI	LR	GWR	LR	GWR	GWR	NAS	DI	BW	FC	FC	FC	FC	CO	CO	BW	BW	TI	BW	BW	DI	DI	AI
28	NAS	NAS	NAS	BW	NAS	LR	NAS	NAS	NAS	AI	AI	AI	NAS	NAS	CO	BW	BW	BW	DI	TI	TI	DI	AI	AI
29	AI	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	AI	CO	FC	FC	FC	TI	BW	BW	DI	DI	DI	DI	DI	CC
30	LR	LR	LR	LR	NAS	GWR	GWR	GWR	GWR	AI	FC	FC	FC	GWR	FC	BW	BW	FC	DI	DI	DI	TI	TI	TI
31	TI	TI	TI	TI	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	CO	FC	CO	BW	TI	CO	TI	TI	DI	AI	LR

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2	FC	GWR	GWR	BW	BW	BW	BW	BW	CC	CC	TI	TI	TI	AI	AI	DI	NAS	NAS	NAS	NAS	NAS	NAS	FC	CC
3	DI	DI	BW	BW	BW	GWR	GWR	CC	CC	TI	DI	DI	DI	DI	TI	AI	AI	NAS	NAS	NAS	NAS	NAS	GWR	GWR
4	FC	FC	DI	GWR	GWR	CC	BW	CO	CC	CO	CC	CC	DI	CC	NAS	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	FC
5	GWR	BW	GWR	BW	BW	BW	TI	TI	TI	TI	TI	TI	TI	TI	TI	LR	LR	LR	LR	GWR	GWR	FC	GWR	GWR
6	DI	DI	DI	BW	GWR	FC	FC	FC	BW	BW	CC	CC	CC	CC	DI	DI	NAS	NAS	NAS	NAS	NAS	NAS	FC	NAS
7	BW	DI	BW	BW	NAS	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	DI	BW	FC	FC	NAS	NAS	NAS	DI
8	DI	DI	BW	BW	BW	BW	BW	BW	CC	CC	BW	CC	BW	DI	NAS	LR	NAS	NAS	LR	GWR	LR	BW	DI	DI
9	DI	DI	DI	BW	BW	BW	BW	BW	BW	BW	BW	BW	CO	TI	TI	LR	AI	AI	NAS	NAS	NAS	FC	FC	GWR
10	BW	BW	BW	BW	BW	BW	BW	BW	FC	TI	TI	TI	DI	CC	CC	TI	DI	DI	DI	DI	DI	AI	DI	DI
11	DI	DI	DI	DI	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	DI	DI	DI	DI	CC	AI	GWR	CC	DI
12	DI	GWR	GWR	GWR	BW	BW	CC	CC	CC	CO	CO	CO	UE	UE	UE	DI	DI	AI	AI	NAS	NAS	GWR	DI	DI
13	GWR	GWR	GWR	GWR	BW	BW	CO	CC	TI	TI	DI	DI	TI	AI	AI	NAS	LR	AI	NAS	NAS	GWR	GWR	GWR	FC
14	BW	BW	BW	GWR	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	AI	AI	AI	AI	AI	NAS	NAS	GWR	NAS	FC
15	BW	BW	BW	BW	BW	BW	BW	LR	TI	TI	CC	DI	DI	DI	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC	DI
16	BW	BW	BW	BW	BW	BW	BW	CC	BW	CC	CC	CC	TI	CC	AI	TI	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC
17	FC	FC	BW	BW	BW	BW	CC	CO	CC	BW	TI	TI	DI	CC	DI	AI	AI	LR	NAS	NAS	FC	FC	FC	FC
18	FC	FC	BW	BW	BW	BW	BW	CC	CC	CC	CC	GWR	DI	DI	DI	AI	DI	NAS	LR	NAS	NAS	FC	NAS	NAS
19	DI	DI	BW	BW	BW	CO	BW	CC	CC	DI	DI	DI	DI	AI	AI	AI	AI	LR	NAS	NAS	NAS	FC	GWR	FC
20	DI	BW	DI	DI	BW	BW	BW	BW	CC	CC	CC	DI	DI	AI	AI	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC
21	GWR	BW	BW	BW	BW	BW	CC	DI	TI	CC	CC	DI	DI	AI	AI	AI	AI	LR	NAS	NAS	NAS	NAS	NAS	FC
22	DI	BW	BW	BW	BW	BW	FC	BW	CC	CC	CC	CC	DI	DI	DI	DI	AI	NAS	NAS	NAS	NAS	NAS	FC	FC
23	FC	FC	FC	DI	FC	BW	BW	CC	CC	CC	DI	CC	DI	DI	DI	DI	AI	AI	NAS	FC	FC	FC	FC	FC
24	FC	GWR	BW	BW	BW	BW	BW	CC	CC	CC	CC	GWR	DI	DI	DI	DI	DI	NAS	NAS	NAS	FC	FC	FC	NAS
25	DI	DI	DI	BW	BW	BW	CO	BW	CC	CC	CC	CO	TI	DI	DI	DI	DI	NAS	NAS	LR	FC	FC	DI	DI
26	DI	DI	BW	BW	BW	BW	BW	CO	CO	CO	CC	BW	TI	CC	DI	DI	AI	AI	NAS	GWR	FC	FC	FC	FC
27	FC	GWR	GWR	BW	CO	CO	CO	TI	CC	CC	DI	DI	DI	TI	AI	AI	LR	NAS	NAS	NAS	NAS	FC	FC	FC
28	BW	DI	DI	DI	DI	DI	BW	BW	BW	BW	BW	BW	TI	DI	DI	DI	DI	CC	CC	AI	AI	DI	DI	DI
29	DI	DI	DI	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	DI	BW	BW	DI	DI	DI	DI	DI	FC	FC	NAS
30	DI	BW	BW	BW	BW	FC	BW	BW	BW	BW	CC	CC	BW	CC	BW	CC	CC	NAS	DI	GWR	GWR	NAS	NAS	FC

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
AI = ARISKO	68 21.5	18 49.4	66.0	114.9
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CC = C. CHELYUSKIN	77 43.0	104 17.0	66.2	176.4
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TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

AL = MINIMUM DELTA H

SEPTEMBER 1970

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	LR	LR	TI	TI	TI	LR	NAS	GWR	GWR	NAS	CO	GWR	NAS	FC	FC	CO	BW	TI	BW	BW	DI	TI	CC	AI
2	LR	LR	LR	TI	TI	NAS	NAS	AI	AI	GWR	GWR	FC	FC	TI	CO	BW	TI	DI	TI	TI	TI	AI	AI	UE
3	TI	TI	TI	NAS	NAS	BW	BW	NAS	NAS	GWR	GWR	GWR	FC	UE	FC	CO	BW	BW	BW	DI	DI	DI	DI	AI
4	AI	LR	LR	LR	TI	TI	NAS	NAS	GWR	AI	AI	FC	BW	BW	GWR	FC	BW	TI	DI	DI	DI	DI	UE	UE
5	LR	LR	LR	NAS	NAS	NAS	DI	AI	LR	AI	LR	LR	FC	BW	NAS	BW	BW	BW	DI	DI	DI	CC	DI	CC
6	UE	TI	NAS	NAS	NAS	NAS	NAS	NAS	AI	AI	LR	LR	LR	NAS	FC	BW	BW	BW	DI	DI	CC	CC	AI	UE
7	UE	NAS	NAS	TI	TI	TI	DI	LR	LR	AI	AI	NAS	BW	FC	BW	BW	GWR	GWR	CO	CO	DI	DI	CC	UE
8	UE	UE	TI	TI	TI	FC	NAS	NAS	GWR	AI	LR	LR	FC	FC	BW	BW	BW	BW	TI	TI	CO	LR	LR	UE
9	UE	TI	TI	NAS	NAS	LR	DI	AI	AI	AI	AI	LR	NAS	NAS	NAS	FC	BW	BW	UE	DI	DI	CC	CC	CC
10	LR	LR	LR	LR	LR	NAS	FC	FC	DI	AI	AI	LR	GWR	GWR	BW	GWR	GWR	GWR	CO	CO	CO	CC	CO	CO
11	BW	BW	BW	BW	BW	BW	BW	AI	AI	AI	LR	LR	LR	LR	GWR	FC	FC	FC	FC	CO	CO	CO	UE	UE
12	BW	CC	BW	LR	FC	FC	GWR	GWR	FC	AI	LR	NAS	LR	LR	GWR	GWR	FC	DI	BW	CC	BW	UE	UE	UE
13	TI	BW	NAS	LR	FC	NAS	NAS	NAS	NAS	CO	CO	GWR	GWR	UE	FC	FC	CO	BW	TI	BW	DI	TI	AI	AI
14	AI	LR	LR	LR	NAS	GWR	GWR	GWR	FC	FC	FC	CO	FC	CO	UE	CO	CO	TI	TI	DI	DI	AI	AI	CC
15	AI	LR	LR	LR	LR	NAS	NAS	NAS	BW	AI	GWR	CO	FC	FC	GWR	GWR	BW	BW	BW	DI	DI	DI	CC	LR
16	LR	NAS	NAS	NAS	NAS	NAS	NAS	GWR	FC	FC	FC	FC	BW	BW	BW	DI	FC	BW	DI	DI	DI	DI	UE	LR
17	LR	NAS	NAS	LR	NAS	GWR	GWR	NAS	BW	FC	LR	LR	BW	LR	GWR	CC	DI	BW	BW	DI	DI	DI	DI	LR
18	NAS	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	BW	NAS	GWR	FC	BW	FC	BW	BW	BW	DI	DI	CC	CC
19	UE	NAS	NAS	NAS	NAS	LR	NAS	NAS	GWR	GWR	GWR	GWR	CO	CO	TI	TI	TI	TI	TI	TI	TI	AI	AI	AI
20	LR	NAS	NAS	NAS	NAS	GWR	NAS	GWR	GWR	FC	FC	FC	FC	CO	CO	CO	TI	DI	BW	TI	DI	DI	CC	AI
21	LR	AI	LR	GWR	NAS	NAS	NAS	GWR	GWR	GWR	AI	FC	CO	CO	CO	FC	TI	TI	BW	TI	CC	AI	CC	LR
22	LR	LR	LR	NAS	GWR	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	BW	CC	BW	TI	BW	BW	TI	DI	CC	AI	LR
23	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	FC	FC	FC	FC	BW	BW	TI	DI	DI	DI	CC	UE	UE	CC
24	LR	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	AI	LR	GWR	BW	BW	GWR	BW	DI	DI	TI	CC	CC	CC
25	UE	UE	TI	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	AI	LR	NAS	GWR	BW	BW	BW	BW	BW	UE	UE	UE	UE
26	UE	UE	LR	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	LR	LR	LR	GWR	GWR	TI	DI	DI	DI	DI	CC	CC	AI
27	LR	LR	LR	LR	LR	LR	NAS	NAS	GWR	FC	CO	CO	FC	FC	CO	CO	TI	TI	BW	TI	AI	AI	AI	AI
28	AI	LR	LR	GWR	GWR	GWR	GWR	UE	UE	LR	LR	NAS	LR	LR	GWR	GWR	GWR	GWR	UE	UE	UE	UE	UE	UE
29	UE	UE	UE	UE	NAS	NAS	GWR	GWR	FC	AI	AI	AI	LR	LR	GWR	GWR	GWR	GWR	UE	UE	UE	UE	UE	UE
30	UE	UE	LR	NAS	NAS	NAS	NAS	UE	AI	AI	LR	LR	LR	LR	GWR	GWR	FC	FC	CC	UE	UE	DI	DI	CC

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1	FC	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	BW	DI	DI	NAS	NAS	NAS	NAS	LR	NAS	FC	GWR
2	BW	GWR	GWR	NAS	NAS	BW	BW	BW	BW	CC	CC	CC	DI	TI	DI	DI	CC	NAS	LR	NAS	LR	NAS	NAS	NAS
3	GWR	GWR	BW	BW	BW	BW	BW	BW	BW	CC	BW	DI	DI	DI	AI	NAS	NAS	NAS	NAS	NAS	GWR	GWR	FC	
4	GWR	GWR	BW	CO	CO	BW	BW	UE	CC	TI	DI	DI	DI	DI	LR	DI	NAS	NAS	NAS	NAS	FC	NAS	FC	NAS
5	GWR	GWR	GWR	GWR	GWR	BW	CO	BW	CO	CC	GWR	CC	CC	DI	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS
6	FC	FC	FC	FC	BW	BW	BW	BW	CC	TI	CC	CC	CC	CC	CC	TI	TI	NAS	NAS	NAS	NAS	FC	NAS	NAS
7	DI	LR	BW	BW	LR	LR	BW	BW	BW	BW	BW	CC	CC	DI	CO	CO	BW	CC	NAS	NAS	NAS	NAS	NAS	NAS
8	NAS	FC	GWR	GWR	FC	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	CC	UE	DI	NAS	LR	LR	NAS	NAS	NAS
9	NAS	NAS	GWR	FC	GWR	AI	BW	BW	BW	BW	BW	CC	CC	CC	CC	TI	TI	LR	NAS	NAS	NAS	GWR	CC	LR
10	LR	LR	GWR	BW	BW	BW	CO	CC	CO	BW	BW	FC	TI	TI	TI	DI	NAS	AI	LR	LR	GWR	GWR	GWR	GWR
11	GWR	GWR	BW	BW	BW	CO	UE	TI	DI	DI	DI	TI	DI	AI	AI	AI	AI	LR	NAS	NAS	NAS	BW	FC	FC
12	BW	CO	BW	CO	UE	CO	CC	TI	UE	TI	TI	TI	DI	DI	CO	CO	CO	LR	NAS	NAS	NAS	NAS	NAS	NAS
13	NAS	NAS	NAS	BW	BW	BW	CO	CO	BW	GWR	CC	CC	DI	DI	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS
14	FC	BW	BW	BW	CO	CC	BW	CC	CC	CC	TI	TI	CC	DI	CC	BW	NAS	NAS	NAS	NAS	NAS	FC	FC	FC
15	FC	FC	FC	GWR	BW	BW	BW	BW	CC	CC	CC	CC	CC	DI	DI	DI	CO	TI	AI	LR	NAS	NAS	NAS	DI
16	DI	DI	DI	AI	AI	AI	BW	LR	BW	CC	CC	TI	AI	AI	AI	AI	FC	FC	GWR	FC	FC	FC	FC	FC
17	FC	BW	BW	BW	BW	BW	CC	CC	TI	TI	TI	DI	AI	AI	AI	LR	LR	LR	GWR	GWR	GWR	BW	GWR	CO
18	CO	UE	CO	UE	LR	LR	LR	TI	TI	TI	CC	DI	DI	DI	LR	AI	LR	LR	NAS	NAS	GWR	FC	FC	NAS
19	FC	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	DI	DI	DI	AI	AI	NAS	NAS	NAS	NAS	NAS	NAS	NAS	FC
20	FC	FC	FC	BW	BW	CC	CC	CC	CC	TI	DI	DI	DI	DI	DI	DI	AI	NAS	NAS	NAS	NAS	NAS	NAS	NAS
21	NAS	BW	BW	FC	BW	BW	LR	BW	BW	BW	BW	CC	CC	CC	LR	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC
22	GWR	FC	GWR	BW	BW	BW	BW	CC	CC	TI	TI	TI	TI	AI	AI	AI	AI	LR	LR	GWR	GWR	GWR	GWR	BW
23	CO	BW	BW	BW	CO	CO	CC	CC	CC	TI	TI	TI	DI	AI	LR	LR	LR	NAS	GWR	GWR	GWR	GWR	GWR	GWR
24	BW	GWR	BW	BW	BW	CO	UE	CC	TI	CC	TI	TI	TI	AI	DI	DI	CO	NAS	NAS	NAS	LR	LR	DI	DI
25	BW	GWR	GWR	BW	FC	BW	BW	CC	BW	BW	CC	CC	DI	AI	DI	LR	AI	NAS	LR	BW	NAS	NAS	BW	CC
26	GWR	GWR	GWR	GWR	GWR	FC	BW	BW	BW	CC	TI	CC	CC	DI	DI	DI	NAS	NAS	NAS	LR	BW	NAS	NAS	NAS
27	GWR	NAS	GWR	GWR	GWR	GWR	GWR	GWR	GWR	GWR	GWR	CC	CC	TI	DI	DI	DI	DI	TI	GWR	NAS	GWR	GWR	NAS
28	NAS	GWR	GWR	GWR	BW	BW	CO	CO	GWR	CO	CO	CC	DI	DI	NAS	LR	AI	NAS	NAS	GWR	GWR	GWR	GWR	BW
29	BW	DI	DI	GWR	GWR	BW	BW	BW	BW	CC	CO	CC	TI	TI	TI	DI	NAS	LR	NAS	GWR	GWR	GWR	GWR	FC
30	GWR	BW	BW	BW	BW	LR	GWR	BW	CC	CC	TI	TI	TI	TI	DI	LR	AI	NAS	DI	DI	LR	NAS	GWR	GWR
31	GWR	GWR	GWR	GWR	GWR	GWR	GWR	BW	BW	CO	BW	BW	CC	DI	DI	DI	DI	DI	GWR	NAS	GWR	GWR	GWR	GWR

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1	LR	LR	NAS	TI	FC	FC	NAS	DI	DI	AI	FC	AI	NAS	NAS	BW	BW	BW	BW	DI	BW	DI	DI	CC	AI
2	AI	LR	CO	CO	CO	CO	CO	CO	CO	FC	FC	FC	CO	CO	CO	CO	CO	CO	TI	DI	CO	CO	AI	CO
3	CC	CC	CO	LR	NAS	CO	CO	CO	GWR	FC	CO	CO	CO	CO	CO	TI	BW	BW	BW	AI	AI	DI	CO	LR
4	AI	AI	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	CO	CO	CO	CO	BW	CC	TI	TI	DI	DI	DI	DI	AI	AI
5	AI	NAS	NAS	NAS	TI	NAS	GWR	GWR	GWR	BW	BW	LR	BW	BW	BW	GWR	CC	TI	DI	DI	DI	CC	CC	TI
6	TI	NAS	NAS	NAS	NAS	FC	GWR	GWR	AI	BW	BW	BW	FC	BW	GWR	GWR	GWR	FC	BW	CC	DI	DI	CC	UE
7	TI	TI	TI	TI	TI	TI	GWR	GWR	FC	AI	AI	NAS	BW	BW	GWR	GWR	GWR	FC	FC	CO	CO	UE	UE	
8	CO	UE	CO	NAS	TI	TI	DI	DI	DI	AI	AI	LR	LR	LR	GWR	GWR	GWR	CC	CC	CO	CO	CO	CO	CO
9	CO	TI	TI	TI	TI	TI	DI	DI	FC	AI	AI	AI	LR	LR	NAS	GWR	GWR	BW	CC	DI	CO	CO	UE	UE
10	UE	TI	TI	TI	NAS	NAS	NAS	GWR	FC	DI	AI	LR	LR	GWR	BW	BW	DI	BW	BW	BW	BW	DI	DI	CC
11	CC	AI	AI	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	FC	FC	FC	CO	BW	BW	TI	TI	AI	LR	CC	AI
12	AI	AI	LR	AI	NAS	LR	NAS	GWR	NAS	GWR	GWR	FC	CO	FC	BW	GWR	FC	FC	FC	FC	DI	FC	FC	BW
13	LR	UE	UE	NAS	NAS	FC	NAS	FC	FC	AI	FC	FC	CO	BW	FC	TI	BW	BW	DI	DI	DI	DI	AI	AI
14	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	FC	BW	FC	FC	BW	GWR	GWR	GWR	DI	DI	DI	DI	AI	AI	CC
15	LR	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	BW	FC	BW	LR	BW	BW	BW	FC	FC	FC	CO	DI	DI	CO	CO
16	UE	UE	UE	NAS	TI	GWR	TI	FC	FC	FC	GWR	CO	FC	FC	UE	UE	UE	UE	UE	UE	AI	AI	AI	AI
17	LR	LR	LR	NAS	NAS	NAS	FC	FC	GWR	GWR	GWR	CO	CO	CO	CO	CO	UE	CO	UE	CO	UE	DI	LR	LR
18	LR	LR	LR	LR	FC	GWR	GWR	NAS	FC	FC	CO	FC	CO	FC	CC	CO	BW	BW	TI	TI	AI	AI	AI	CC
19	GWR	GWR	GWR	GWR	NAS	NAS	GWR	NAS	FC	FC	FC	FC	FC	CO	BW	TI	BW	BW	TI	CC	DI	CC	CC	CC
20	LR	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	BW	FC	FC	FC	BW	BW	BW	CC	CC	DI	CC	UE	DI	CC	UE
21	TI	TI	TI	TI	TI	TI	TI	DI	DI	AI	AI	LR	NAS	NAS	GWR	GWR	GWR	BW	BW	BW	TI	CC	CC	AI
22	LR	LR	LR	LR	FC	NAS	NAS	NAS	FC	GWR	GWR	FC	FC	FC	FC	FC	BW	BW	CO	BW	BW	BW	LR	AI
23	AI	LR	AI	LR	NAS	GWR	NAS	NAS	GWR	GWR	CO	CO	FC	CO	UE	BW	CO	BW	BW	BW	BW	AI	AI	LR
24	LR	UE	LR	LR	NAS	NAS	NAS	GWR	GWR	FC	FC	FC	FC	BW	BW	CC	BW	BW	DI	CC	DI	CC	AI	LR
25	LR	LR	NAS	NAS	TI	NAS	GWR	FC	FC	FC	FC	FC	CO	BW	BW	BW	TI	TI	CC	CC	CC	CC	AI	UE
26	UE	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	BW	BW	BW	BW	CC	DI	DI	CC	CC	CC	UE
27	UE	UE	UE	NAS	NAS	CC	FC	DI	AI	AI	AI	NAS	NAS	BW	BW	FC	GWR	FC	FC	BW	DI	DI	LR	UE
28	UE	LR	NAS	LR	LR	NAS	NAS	FC	AI	AI	AI	AI	FC	FC	TI	BW	BW	BW	TI	DI	AI	BW	AI	AI
29	LR	LR	NAS	UE	NAS	FC	FC	FC	DI	FC	FC	FC	FC	FC	BW	FC	BW	TI	BW	BW	TI	TI	AI	AI
30	CC	GWR	LR	LR	NAS	NAS	NAS	FC	FC	GWR	FC	BW	FC	BW	FC	DI	DI	CC	FC	FC	CO	CC	CC	BW
31	BW	BW	BW	CC	NAS	CC	DI	DI	FC	FC	AI	AI	BW	BW	BW	BW	CC	CC	CC	DI	CC	CC	UE	UE

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5	FC	GWR	FC	FC	BW	BW	CO	CO	CO	CO	CC	CC	TI	DI	DI	AI	AI	AI	NAS	NAS	NAS	FC	GWR	FC
6	BW	BW	BW	BW	BW	BW	BW	CO	TI	DI	DI	TI	AI	LR	AI	AI	AI	NAS	CO	NAS	NAS	NAS	NAS	FC
7	FC	CO	CC	BW	CO	CO	CO	DI	AI	AI	AI	AI	AI	AI	AI	AI	AI	NAS	NAS	FC	FC	FC	FC	GWR
8	GWR	FC	BW	BW	FC	BW	LR	CC	CC	CC	CC	DI	CC	DI	LR	LR	DI	CO	LR	LR	FC	DI	FC	FC
9	FC	FC	FC	FC	BW	BW	CC	CC	CC	DI	DI	CC	DI	CO	LR	LR	LR	LR	LR	FC	NAS	FC	DI	NAS
10	FC	FC	BW	GWR	BW	BW	CC	CC	BW	DI	AI	LR	DI	TI	LR	AI	LR	LR	LR	LR	FC	FC	LR	FC
11	TI	BW	TI	BW	CC	CC	BW	CC	TI	TI	AI	TI	DI	LR	LR	NAS	NAS	FC	BW	BW	FC	FC	DI	BW
12	FC	FC	BW	BW	BW	CC	CC	CC	BW	DI	DI	DI	DI	AI	NAS	LR	AI	FC	BW	LR	LR	FC	FC	FC
13	GWR	GWR	BW	BW	FC	BW	CO	BW	FC	CC	CC	DI	TI	AI	AI	AI	AI	LR	LR	NAS	NAS	NAS	FC	FC
14	BW	BW	GWR	FC	BW	BW	BW	BW	CC	CO	CC	CC	GWR	DI	DI	DI	LR	AI	NAS	LR	FC	NAS	LR	BW
15	BW	BW	BW	BW	BW	BW	BW	CC	BW	CC	CC	CC	CC	CC	DI	DI	DI	LR	LR	LR	LR	LR	LR	FC
16	DI	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	BW	LR	AI	AI	AI	AI	LR	NAS	LR	NAS
17	GWR	GWR	BW	BW	BW	BW	BW	BW	BW	CC	CC	UE	UE	CO	BW	BW	CO	AI	CC	LR	LR	NAS	NAS	GWR
18	GWR	GWR	LR	GWR	AI	AI	BW	CO	BW	NAS	CC	CC	DI	DI	AI	LR	AI	AI	AI	AI	NAS	FC	GWR	CO
19	CO	CO	CO	CO	CO	CO	CO	CO	CO	NAS	CC	NAS	CC	DI	DI	DI	DI	DI	DI	DI	NAS	DI	DI	DI
20	BW	DI	BW	DI	AI	AI	NAS	NAS	NAS	FC	FC	DI	CC	CO	CO	CO	CO	CO	UE	LR	DI	NAS	NAS	NAS
21	DI	DI	BW	BW	BW	LR	CC	CC	DI	DI	AI	AI	AI	LR	LR	LR	LR	NAS	NAS	FC	FC	BW	BW	BW
22	BW	BW	BW	BW	BW	BW	LR	CC	CC	DI	DI	DI	DI	AI	AI	LR	LR	LR	NAS	GWR	GWR	GWR	GWR	GWR
23	GWR	BW	BW	BW	BW	BW	CO	DI	TI	DI	UE	AI	DI	DI	AI	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR
24	BW	BW	BW	BW	CC	BW	BW	BW	BW	GWR	GWR	GWR	GWR	GWR	DI	NAS	AI	LR	LR	LR	LR	NAS	NAS	BW
25	FC	FC	FC	BW	BW	BW	BW	BW	BW	CC	CC	TI	TI	TI	FC	AI	AI	LR	NAS	AI	LR	LR	NAS	NAS
26	NAS	NAS	NAS	BW	BW	BW	BW	BW	BW	CC	CC	CC	CC	CC	NAS	NAS	AI	DI	NAS	NAS	NAS	NAS	BW	BW
27	NAS	BW	GWR	GWR	BW	BW	NAS	CC	CC	CC	CC	TI	DI	DI	DI	CO	NAS	NAS	NAS	FC	FC	NAS	FC	NAS
28	BW	FC	FC	BW	BW	BW	BW	FC	FC	CC	CC	TI	DI	DI	AI	AI	DI	BW	BW	NAS	NAS	NAS	GWR	FC
29	BW	GWR	BW	FC	FC	FC	FC	BW	BW	BW	BW	CC	BW	BW	BW	DI	DI	DI	DI	NAS	NAS	GWR	GWR	GWR
30	GWR	GWR	GWR	BW	BW	BW	BW	BW	BW	BW	BW	BW	CC	CC	DI	CO	BW	BW	NAS	BW	BW	BW	BW	BW

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
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NOVEMBER 1970 — AL = MINIMUM DELTA H

UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	CO	CO	BW	CC	CC	CC	OI	OI	AI	AI	BW	BW	LR	NAS	GWR	GWR	BW	CC	GWR	GWR	BW	CO	CO	CO
2	CO	UE	NAS	NAS	NAS	NAS	GWR	NAS	GWR	FC	FC	FC	BW	FC	CC	BW	CC	GWR	GWR	GWR	CO	CO	CC	CC
3	CC	CC	CC	NAS	NAS	OI	OI	FC	GWR	FC	AI	NAS	NAS	BW	CC	BW	BW	BW	BW	BW	BW	OI	CC	OI
4	OI	LR	NAS	NAS	NAS	NAS	OI	NAS	GWR	GWR	FC	FC	BW	BW	BW	BW	BW	BW	BW	OI	OI	OI	OI	CC
5	CC	CC	CC	NAS	NAS	NAS	NAS	GWR	GWR	FC	BW	BW	BW	BW	BW	BW	BW	BW	BW	OI	OI	OI	OI	CC
6	AI	NAS	LR	LR	LR	NAS	NAS	NAS	GWR	GWR	GWR	CO	CO	BW	CO	BW	BW	BW	CC	CC	AI	OI	CC	AI
7	LR	AI	AI	AI	GWR	NAS	NAS	GWR	GWR	GWR	CO	CO	FC	CO	BW	BW	TI	TI	TI	TI	OI	CC	AI	AI
8	AI	AI	LR	LR	AI	NAS	GWR	GWR	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	OI	OI	GWR	BW	BW	LR
9	NAS	UE	UE	NAS	NAS	NAS	GWR	GWR	GWR	GWR	CO	CO	CO	BW	BW	CC	TI	BW	TI	OI	OI	AI	UE	UE
10	LR	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	FC	CO	FC	FC	CO	BW	BW	BW	TI	TI	OI	AI	AI	AI
11	LR	NAS	LR	LR	NAS	GWR	GWR	GWR	GWR	GWR	CO	FC	CO	CC	BW	TI	CC	TI	CC	CC	TI	OI	BW	AI
12	LR	LR	NAS	NAS	GWR	NAS	GWR	GWR	FC	GWR	CO	CO	CO	CC	BW	BW	OI	TI	GWR	GWR	GWR	BW	BW	BW
13	TI	NAS	LR	NAS	NAS	NAS	GWR	FC	BW	FC	BW	BW	BW	CO	BW	BW	BW	BW	BW	BW	OI	OI	AI	LR
14	LR	LR	LR	NAS	FC	FC	GWR	GWR	GWR	BW	AI	FC	AI	CC	CC	BW	BW	BW	TI	OI	AI	AI	CO	TI
15	TI	TI	TI	OI	OI	OI	OI	OI	FC	FC	FC	BW	BW	BW	BW	NAS	GWR	FC	OI	OI	CC	CC	TI	CO
16	TI	TI	TI	NAS	NAS	NAS	OI	OI	OI	FC	BW	FC	BW	NAS	GWR	GWR	BW	OI	BW	TI	OI	AI	AI	CC
17	AI	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	GWR	BW	BW	BW	BW	NAS	GWR	GWR	GWR	GWR	GWR	BW	BW	BW	BW
18	LR	LR	TI	NAS	NAS	FC	FC	FC	FC	AI	AI	BW	BW	BW	CO	CO	CO	TI	BW	BW	TI	BW	AI	CC
19	TI	AI	AI	LR	LR	LR	LR	TI	NAS	UE	FC	BW	FC	BW	BW	GWR	FC	GWR	BW	BW	BW	CO	CO	CO
20	UE	UE	UE	TI	BW	BW	BW	BW	BW	BW	LR	BW	BW	NAS	NAS	GWR	CC	FC	TI	FC	TI	CC	AI	AI
21	LR	NAS	LR	LR	NAS	NAS	GWR	GWR	GWR	CO	CO	CO	CO	CC	CO	UE	UE	TI	TI	OI	OI	AI	AI	LR
22	LR	LR	LR	GWR	GWR	NAS	GWR	NAS	GWR	GWR	GWR	FC	CO	CO	CO	BW	BW	BW	BW	BW	TI	OI	OI	AI
23	AI	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	CC	CO	BW	CO	UE	TI	AI	OI	AI	AI	AI	AI
24	LR	LR	LR	NAS	FC	FC	FC	FC	FC	FC	OI	FC	LR	LR	NAS	FC	FC	BW	BW	BW	TI	TI	OI	AI	AI
25	LR	AI	LR	TI	TI	GWR	GWR	GWR	GWR	BW	FC	FC	FC	FC	TI	TI	TI	TI	BW	BW	TI	OI	AI	AI
26	AI	LR	UE	TI	FC	NAS	OI	OI	FC	FC	FC	FC	FC	FC	FC	CC	BW	BW	TI	OI	OI	OI	CC	FC
27	FC	LR	NAS	LR	NAS	FC	OI	FC	GWR	FC	FC	FC	FC	BW	FC	FC	BW	BW	CC	CC	OI	OI	CC	CC
28	AI	AI	LR	NAS	FC	GWR	NAS	OI	AI	LR	FC	FC	BW	BW	CC	CC	CC	GWR	OI	OI	OI	CC	CO	CO
29	UE	UE	TI	NAS	TI	TI	CO	NAS	AI	AI	AI	FC	LR	FC	FC	BW	BW	BW	BW	CC	CC	CO	CO	CO
30	UE	UE	UE	NAS	NAS	NAS	LR	LR	AI	AI	AI	LR	NAS	NAS	NAS	LR	CC	CC	GWR	GWR	GWR	OI	OI	GWR

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UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	FC	CC	CC	CC	CO	CO	BW	CC	BW	BW	BW	BW	FC	DI	CC	DI	DI	DI	CC	DI	AI	AI	NAS	NAS
2	FC	FC	FC	FC	CO	FC	FC	BW	UE	BW	BW	BW	CC	CC	CC	DI	DI	DI	AI	LR	LR	NAS	DI	DI
3	FC	GWR	BW	BW	BC	CC	CC	CC	CC	CC	CC	DI	CC	CC	CC	FC	NAS	DI	DI	NAS	NAS	NAS	NAS	NAS
4	CC	NAS	CC	CC	CC	CC	CC	CC	BW	BW	BW	CC	CC	CC	CC	FC	FC	FC	CC	FC	LR	FC	FC	FC
5	FC	FC	BW	BW	BW	BW	BW	CO	CC	CC	CC	CC	FC	FC	FC	AI	DI	BW	TI	TI	TI	TI	TI	FC
6	FC	FC	TI	FC	AI	BW	BW	CO	CC	CC	TI	TI	TI	DI	AI	AI	AI	LR	NAS	NAS	NAS	NAS	DI	DI
7	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	CC	DI	DI	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	FC	FC	FC
8	GWR	CO	BW	CO	CO	BW	CO	DI	CC	CC	DI	TI	TI	AI	LR	CO	CO	NAS	NAS	LR	LR	FC	FC	NAS
9	BW	FC	FC	DW	BW	BW	BW	BW	BW	CC	DI	CC	CC	DI	DI	DI	FC	AI	BW	BW	TI	TI	TI	NAS
10	NAS	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	DI	DI	GWR	AI	AI	CO	CO	NAS	NAS	NAS	NAS	CC
11	CC	CC	FC	FC	CC	CC	BW	BW	BW	BW	CC	FC	FC	CC	FC	CO	CO	CO	CO	AI	LR	BW	FC	FC
12	FC	FC	FC	FC	FC	FC	BW	BW	CC	CC	CC	CC	DI	DI	DI	DI	FC	LR	AI	LR	FC	NAS	NAS	NAS
13	NAS	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	CC	BW	FC	CC	TI	DI	AI	AI	NAS	NAS	NAS	NAS	NAS
14	NAS	FC	GWR	GWR	CO	CO	UE	DI	DI	CO	TI	LR	TI	AI	AI	AI	NAS	NAS	NAS	NAS	NAS	GWR	GWR	LR
15	BW	BW	BW	BW	CC	CC	CC	TI	CO	TI	TI	DI	TI	DI	DI	DI	AI	LR	AI	AI	NAS	NAS	NAS	NAS
16	FC	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	DI	CC	CC	DI	DI	DI	AI	NAS	NAS	NAS	NAS	FC	NAS
17	NAS	NAS	BW	BW	BW	BW	BW	BW	BW	CC	CC	DI	CC	GWR	DI	DI	BW	BW	BW	BW	BW	BW	BW	BW
18	BW	BW	BW	BW	BW	BW	BW	BW	BW	BW	GWR	GWR	GWR	TI	TI	DI	CO	CO	BW	BW	BW	GWR	GWR	GWR
19	GWR	FC	FC	GWR	GWR	BW	BW	BW	CC	TI	CC	GWR	FC	FC	FC	FC	CO	CO	GWR	AI	LR	GWR	GWR	FC
20	FC	FC	FC	CC	CC	BW	CC	CO	TI	TI	TI	TI	TI	GWR	DI	CO	CO	CO	GWR	NAS	LR	NAS	NAS	GWR
21	GWR	FC	GWR	FC	CC	CC	CC	CO	CC	TI	CC	GWR	GWR	GWR	FC	FC	FC	GWR	GWR	GWR	FC	NAS	GWR	GWR
22	FC	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	CC	TI	DI	CC	DI	DI	DI	GWR	NAS	NAS	NAS	LR	LR	FC
23	NAS	FC	GWR	FC	FC	FC	CC	CC	CC	CC	DI	DI	DI	DI	AI	AI	LR	LR	NAS	DI	FC	FC	GWR	FC
24	BW	BW	GWR	CO	CO	CO	BW	BW	CO	BW	FC	DI	DI	DI	AI	DI	FC	NAS	NAS	NAS	NAS	NAS	NAS	NAS
25	NAS	NAS	CC	FC	FC	FC	FC	FC	FC	GWR	FC	FC	DI	GWR	DI	DI	DI	DI	DI	AI	LR	NAS	FC	NAS
26	FC	FC	FC	FC	GWR	BW	BW	BW	BW	BW	BW	FC	CC	DI	CC	CC	DI	DI	DI	LR	GWR	NAS	NAS	NAS
27	GWR	GWR	FC	GWR	FC	FC	BW	BW	BW	BW	CC	CC	CC	DI	DI	AI	AI	AI	AI	LR	LR	GWR	NAS	GWR
28	GWR	GWR	GWR	BW	BW	BW	BW	CO	CC	TI	TI	TI	DI	DI	AI	AI	AI	LR	GWR	GWR	GWR	GWR	GWR	GWR
29	GWR	BW	BW	BW	BW	BW	BW	BW	CO	BW	BW	BW	DI	DI	DI	LR	DI	AI	LR	AI	LR	LR	FC	FC
30	BW	BW	BW	CO	BW	FC	BW	GWR	CC	CC	NAS	CC	FC	DI	DI	GWR	NAS	AI	DI	BW	DI	FC	LR	FC
31	FC	FC	FC	BW	FC	BW	FC	FC	FC	FC	FC	FC	FC	DI	DI	DI	DI	DI	DI	DI	FC	FC	FC	FC

IDENTIFICATION	GEOGRAPHIC LAT	GEOGRAPHIC LONG	GEOMAGNETIC LAT	GEOMAGNETIC LONG
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1	CO	UE	TI	GWR	GWR	GWR	GWR	GWR	NAS	GWR	GWR	LR	NAS	GWR	GWR	GWR	GWR	GWR	FC	FC	CO	CO	CO	CO
2	CC	UE	TI	GWR	GWR	GWR	LR	GWR	LR	LR	LR	LR	GWR	GWR	GWR	GWR	CC	BW	BW	TI	CC	TI	CO	GWR
3	LR	LR	NAS	NAS	FC	FC	FC	FC	FC	FC	LR	LR	NAS	NAS	NAS	GWR	FC	GWR	GWR	CC	CO	OI	CC	CC
4	BW	BW	BW	BW	LR	LR	GWR	GWR	GWR	GWR	AI	AI	BW	BW	NAS	GWR	GWR	GWR	GWR	OI	OI	OI	CC	AI
5	LR	LR	LR	NAS	GWR	GWR	GWR	GWR	GWR	GWR	BW	BW	BW	UE	UE	BW	UE	GWR	GWR	GWR	GWR	CO	UE	BW
6	UE	NAS	NAS	NAS	GWR	GWR	GWR	GWR	FC	GWR	FC	FC	BW	CO	BW	BW	BW	BW	TI	BW	OI	CC	AI	LR
7	LR	LR	NAS	LR	GWR	GWR	GWR	GWR	GWR	FC	FC	CO	CO	FC	BW	BW	BW	BW	BW	OI	TI	AI	AI	AI
8	AI	AI	LR	LR	LR	NAS	GWR	CO	GWR	FC	CO	CO	CO	CO	CO	TI	TI	TI	TI	CC	CC	CC	LR	LR
9	AI	LR	LR	NAS	NAS	FC	GWR	FC	GWR	FC	FC	BW	BW	BW	BW	CC	OI	OI	CC	CC	CC	CC	GWR	CO	CO
10	BW	BW	LR	LR	LR	LR	OI	NAS	FC	FC	FC	BW	BW	BW	BW	BW	BW	CC	OI	OI	OI	CC	CO	CO
11	UE	UE	TI	NAS	NAS	FC	GWR	FC	FC	FC	AI	LR	BW	NAS	BW	NAS	GWR	GWR	OI	OI	NAS	CO	CO	CO
12	CO	NAS	NAS	NAS	NAS	NAS	FC	FC	GWR	FC	FC	BW	FC	FC	CC	CC	CC	BW	OI	CC	CC	OI	OI	CC
13	CC	LR	LR	LR	LR	LR	LR	LR	NAS	FC	FC	LR	LR	LR	NAS	LR	BW	BW	CC	CC	AI	CC	CC	CC
14	CC	CC	CC	AI	LR	NAS	NAS	CO	NAS	NAS	NAS	UE	FC	FC	OI	OI	OI	CO	OI	BW	BW	CC	CC	CC
15	CC	LR	LR	NAS	NAS	GWR	GWR	GWR	GWR	GWR	BW	FC	CO	CO	BW	CC	CC	BW	BW	CC	CC	CC	CC	CC
16	CC	CC	AI	AI	AI	AI	FC	AI	AI	AI	AI	CO	NAS	UE	BW	BW	BW	CC	BW	CC	CC	CC	CC	CC
17	CC	CC	CC	AI	NAS	NAS	UE	FC	FC	FC	FC	BW	BW	BW	BW	BW	CC	CC	AI	FC	OI	OI	OI	CC	UE
18	CO	LR	LR	NAS	NAS	FC	FC	FC	FC	FC	LR	BW	BW	BW	BW	CC	CC	CC	CC	CC	CC	UE	CO	UE
19	LR	LR	NAS	NAS	NAS	NAS	GWR	GWR	FC	FC	GWR	AI	NAS	BW	BW	NAS	NAS	BW	BW	OI	CC	OI	LR	AI
20	LR	NAS	NAS	NAS	NAS	GWR	GWR	GWR	GWR	GWR	GWR	CO	CO	CO	BW	BW	BW	OI	OI	OI	OI	AI	AI	LR
21	LR	LR	NAS	NAS	NAS	GWR	GWR	FC	GWR	BW	BW	BW	BW	BW	BW	OI	BW	BW	BW	BW	OI	OI	CC	CC
22	CC	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	BW	BW	BW	BW	BW	BW	BW	BW	OI	OI	OI	OI	OI	CC
23	CC	CC	NAS	NAS	NAS	OI	LR	AI	AI	AI	BW	BW	BW	BW	BW	BW	TI	OI	BW	LR	BW	BW	BW	CC
24	LR	LR	LR	LR	LR	FC	LR	AI	GWR	FC	UE	CO	BW	BW	CC	BW	UE	BW	BW	OI	CC	CC	BW	CC
25	CC	BW	BW	LR	LR	LR	NAS	NAS	BW	AI	LR	BW	NAS	BW	BW	CC	BW	BW	BW	BW	CC	BW	CC	OI
26	UE	CC	LR	LR	AI	FC	NAS	NAS	GWR	NAS	AI	NAS	CO	BW	BW	BW	CC	BW	FC	BW	OI	OI	CC	UE
27	UE	AI	CC	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	LR	FC	CC	CC	CC	BW	BW	BW	BW	TI	CC	CC	CC
28	CC	CC	CC	LR	NAS	NAS	NAS	NAS	GWR	CO	GWR	FC	BW	FC	FC	TI	BW	BW	TI	BW	TI	TI	TI	AI
29	CC	CC	LR	NAS	NAS	NAS	NAS	GWR	BW	GWR	AI	GWR	BW	BW	BW	BW	BW	BW	BW	TI	TI	OI	AI	AI
30	AI	LR	LR	LR	NAS	NAS	GWR	CO	GWR	FC	UE	AI	NAS	CO	BW	CC	CC	BW	TI	LR	AI	CC	CC	LR
31	LR	NAS	CO	NAS	OI	OI	LR	UE	UE	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	GWR	GWR	GWR	CC	CC	CC	CC

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FC = FT. CHURCHILL	58 48.0	-94 06.0	68.7	322.8
LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.0
NAS= NASSARSSUAQ	61 06.3	-45 12.0	71.8	37.0
TI = TIKSI BAY	71 35.0	129 00.0	60.4	191.4
UE = CAPE UELEN	66 09.0	-169 50.1	61 .7	237 .0

SECTION III

GRAPHS OF INDICES

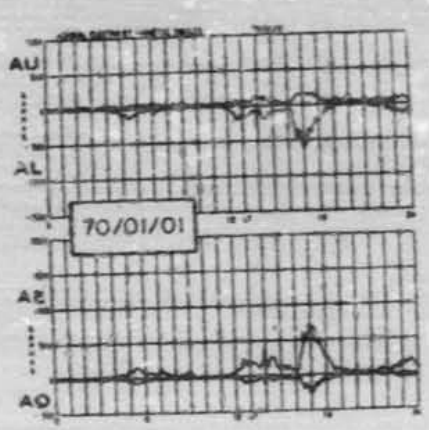
Daily Graphs of 2.5-min Auroral Electrojet Indices

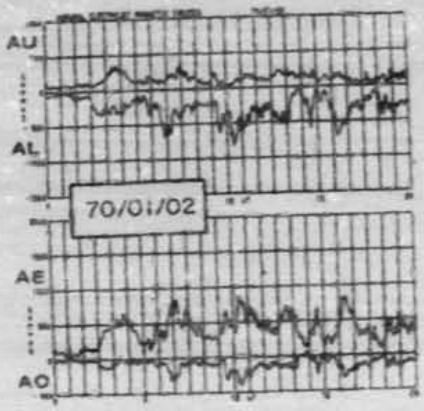
The following graphs are computer drawn plots of variations of the 2.5-min indices AU, AL, AE, and AO for each day of 1970. They are printed from microfilm produced by the computer but with drafted labels to improve legibility of the small characters. The dates are given as year/month/day in descending order (1 April 1970 is 70/04/01).

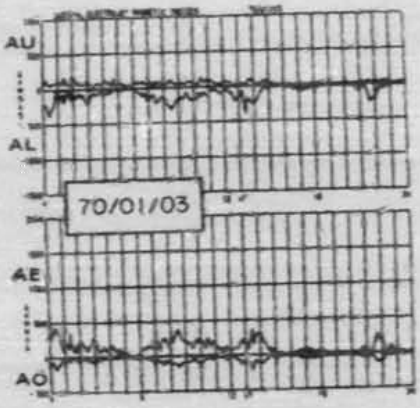
CORRECTIONS TO UAG-22

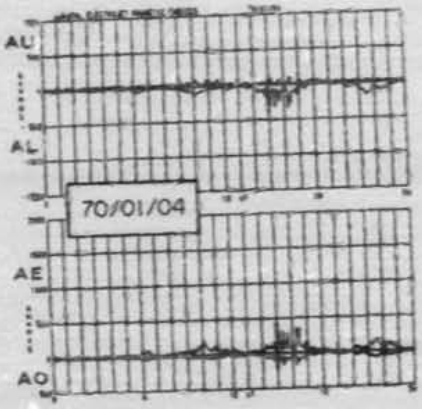
1. The graphs on pages 86-88 are correctly and prominently labeled along the vertical axis: AU, AL, AE, AO. The corresponding labels were inadvertently omitted from the graphs on pages 89-146.

2. On page 92, in the graph for 70/02/10 (10 Feb 1970), the three hours of record shown for 0420 to 0730 UT should be shifted one hour toward UT-noon. Thus, the two events in AL (and hence in AE and AO) occurred one hour later than shown.


AU
AL
70/01/01
AE
AO


AU
AL
70/01/02
AE
AO


AU
AL
70/01/03
AE
AO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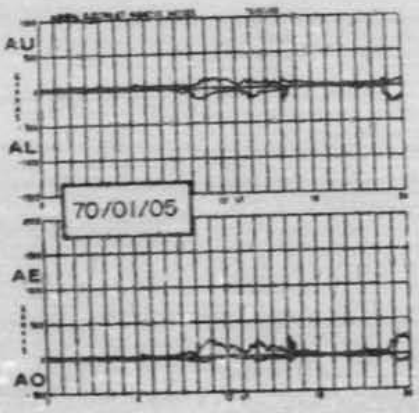
AL
70/01/04
AE
AO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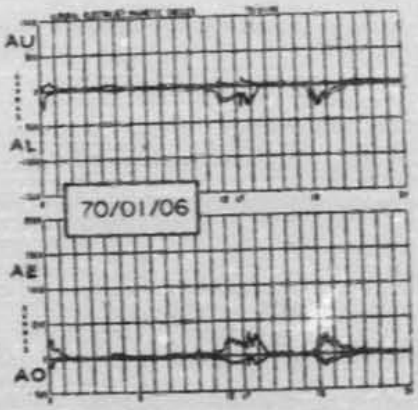
AL
70/01/05
AE
AO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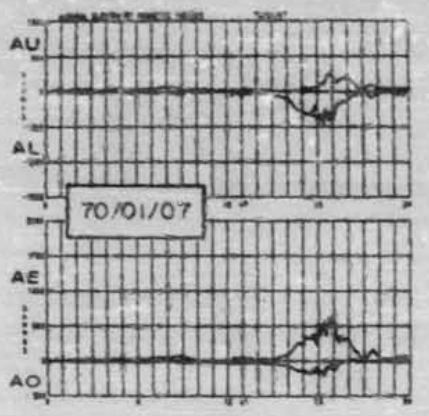
AE
AO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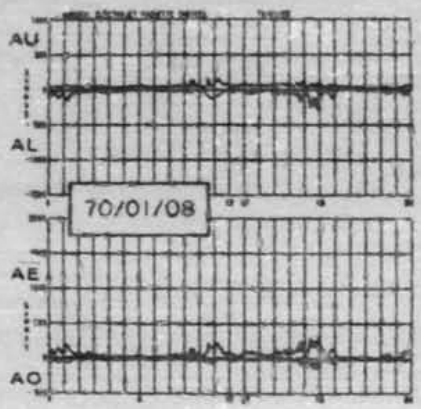
AE
AO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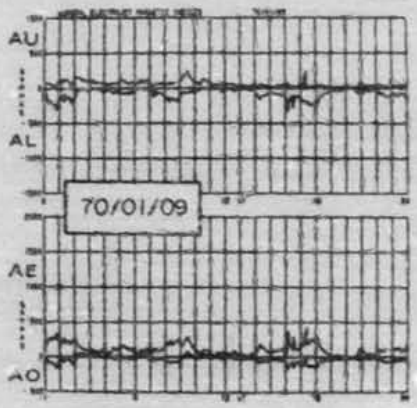
AE
AO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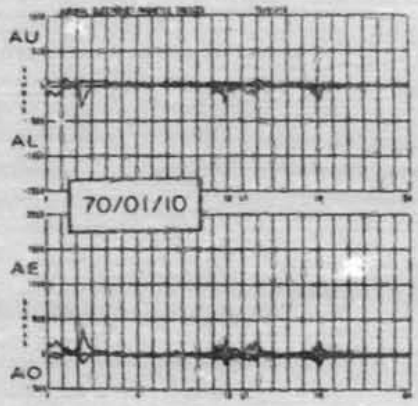
AL
70/01/09
AE
AO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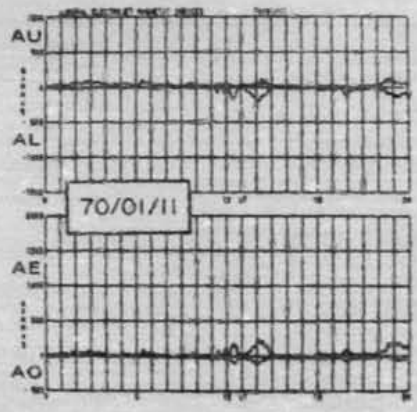
AE
AO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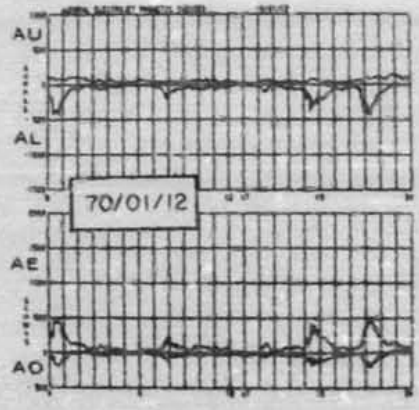
AE
AO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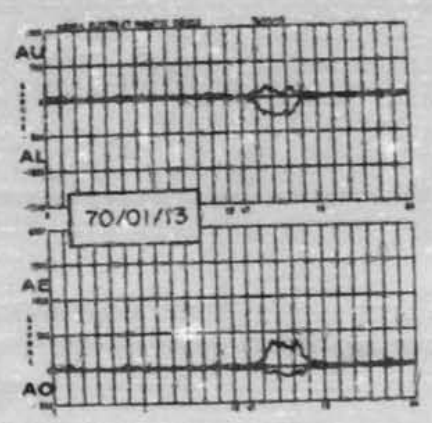
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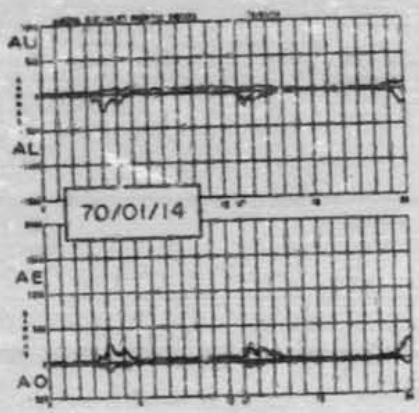
70/01/13
AE
AO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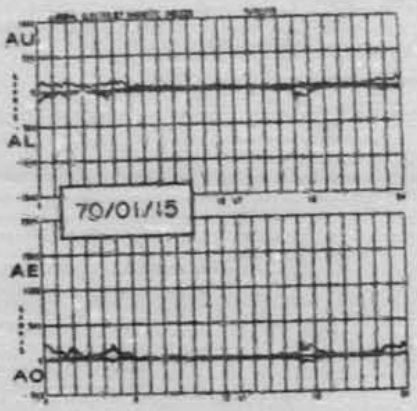
70/01/14
AE
AO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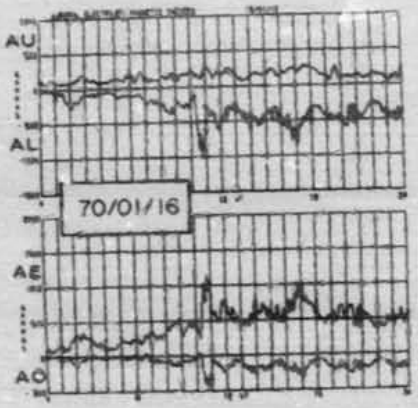
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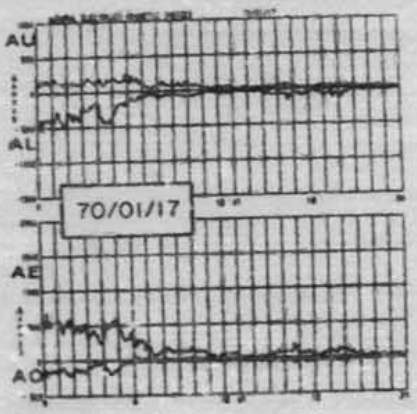
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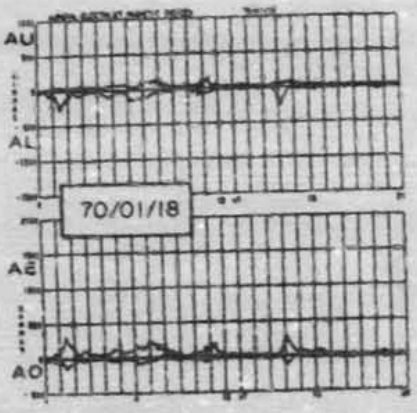
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70/01/18
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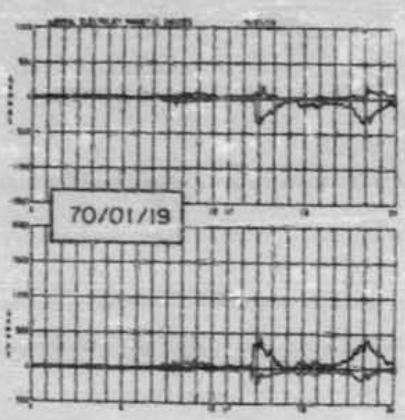
AO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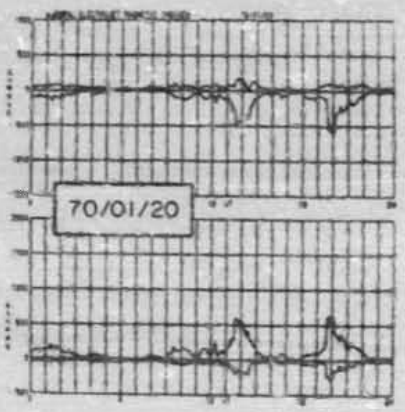
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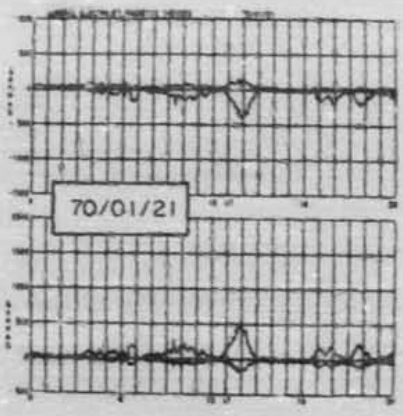
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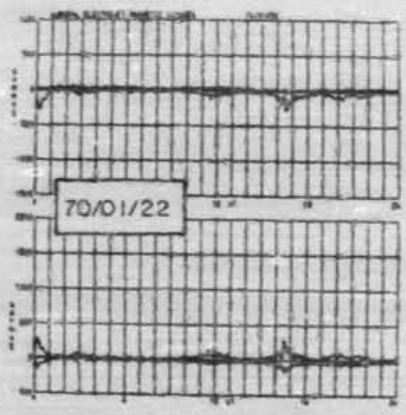
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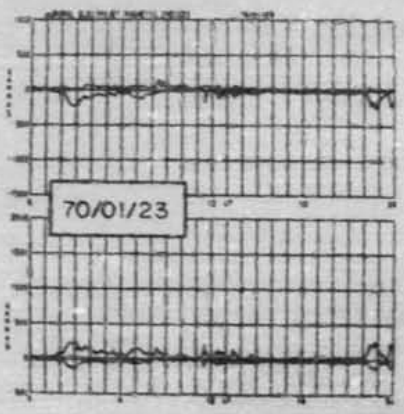
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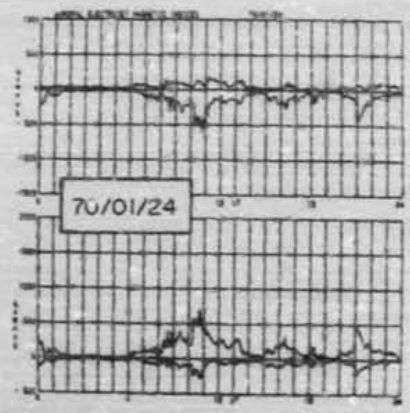
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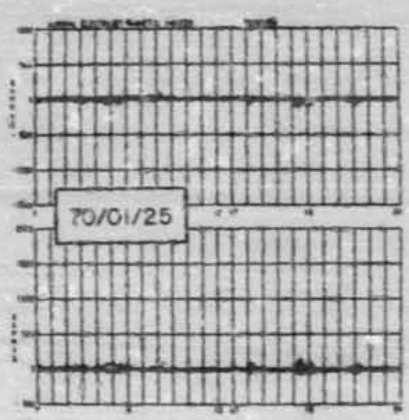
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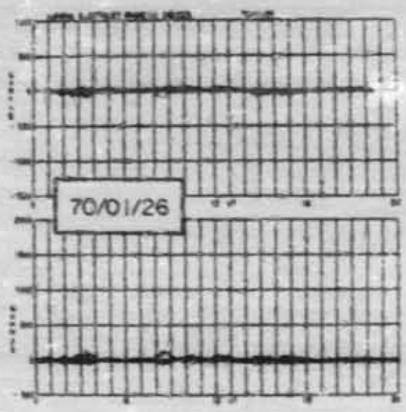
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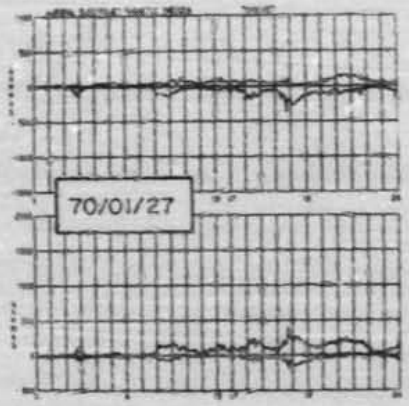
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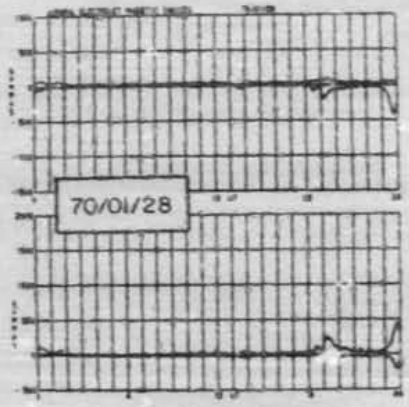
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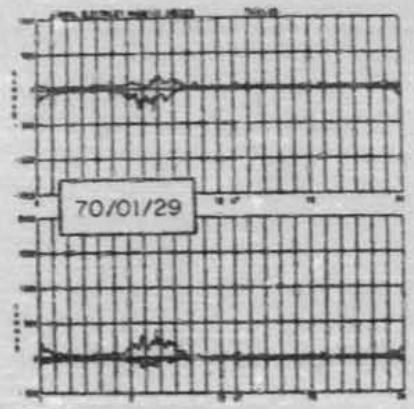
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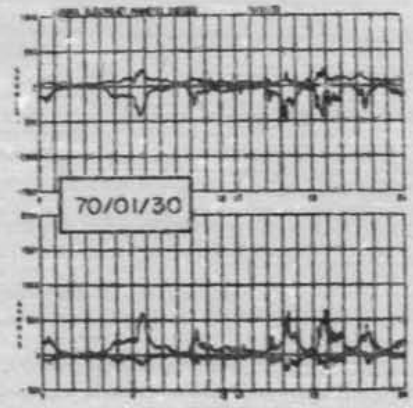
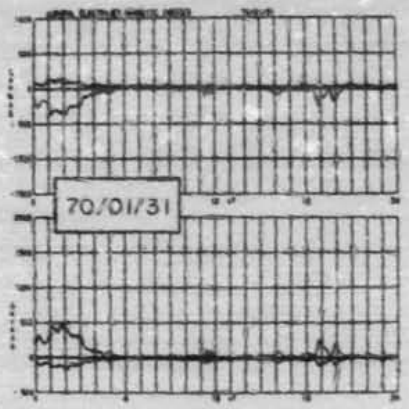

70/01/30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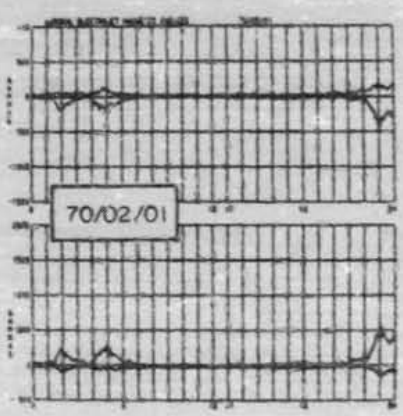
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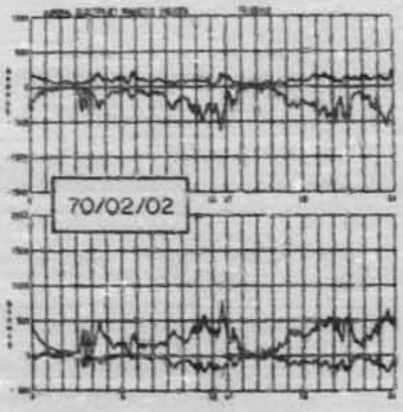
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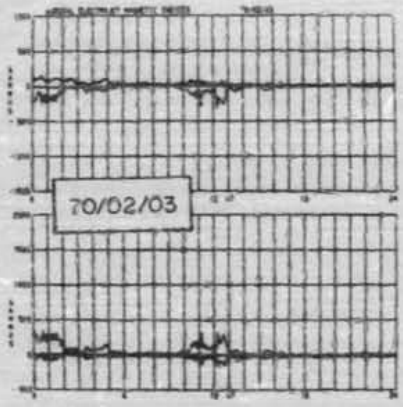
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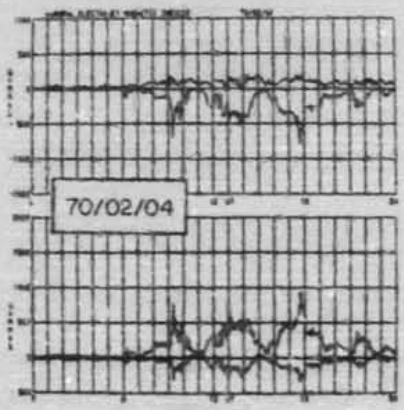
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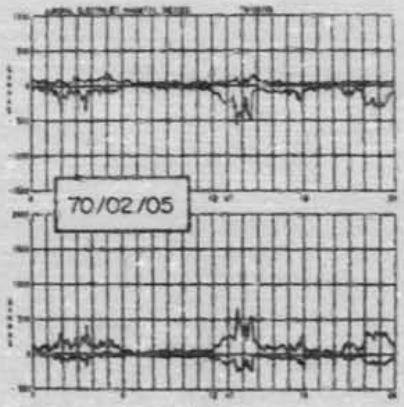
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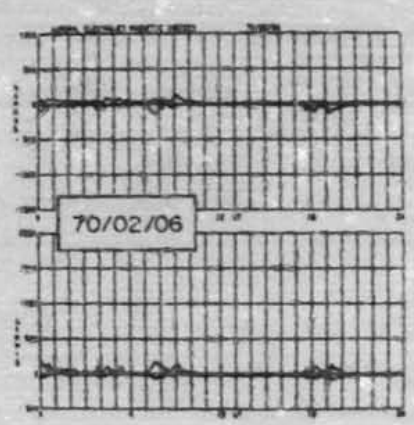
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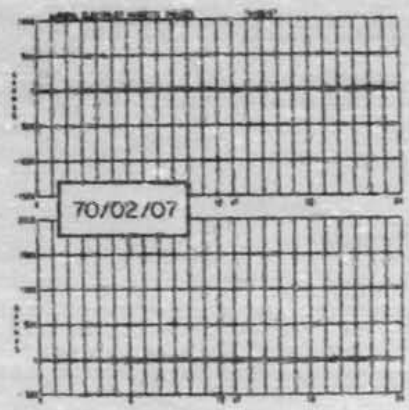
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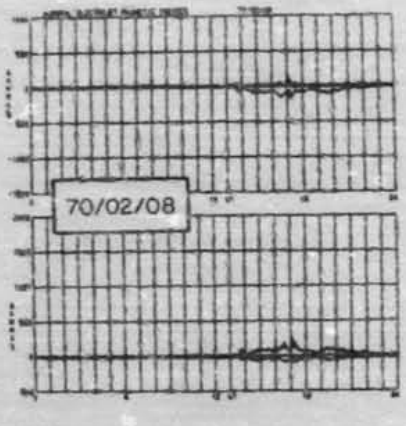
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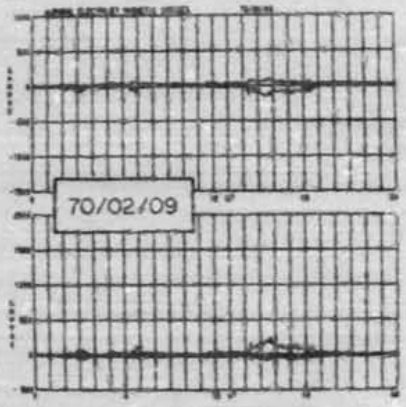
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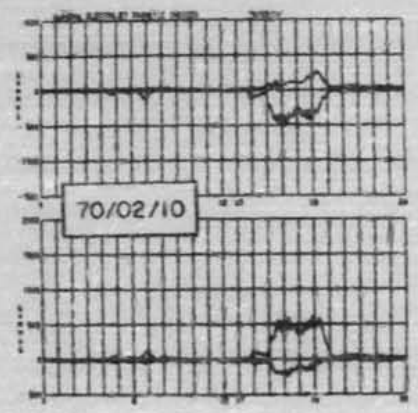
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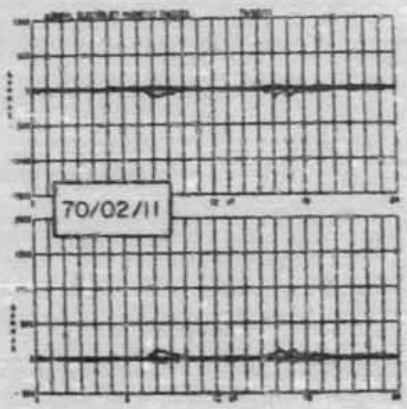
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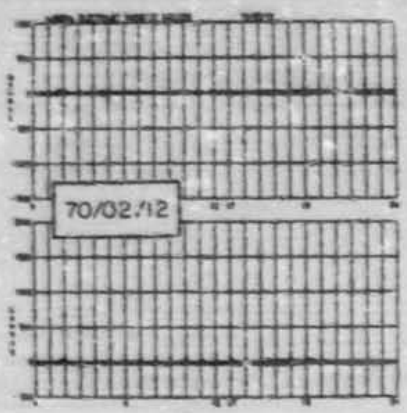
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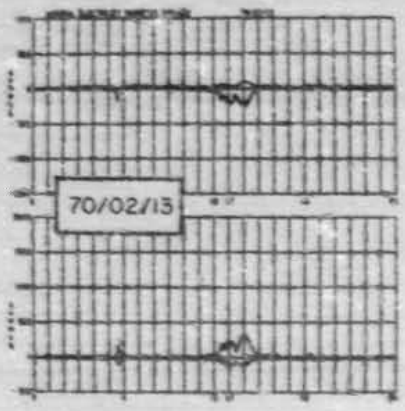
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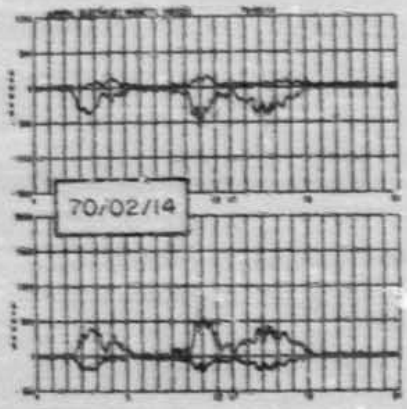
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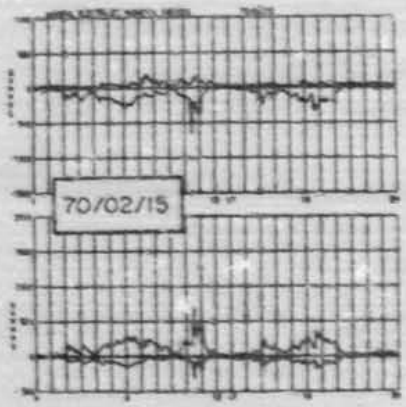
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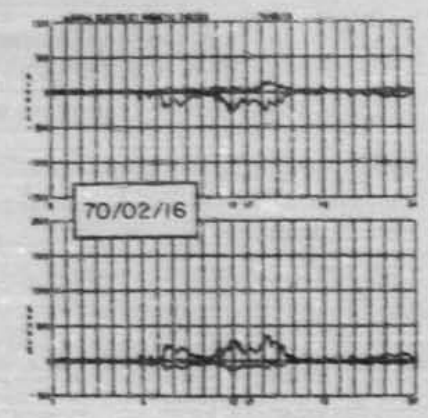
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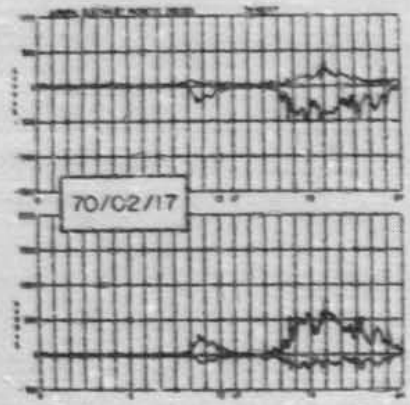
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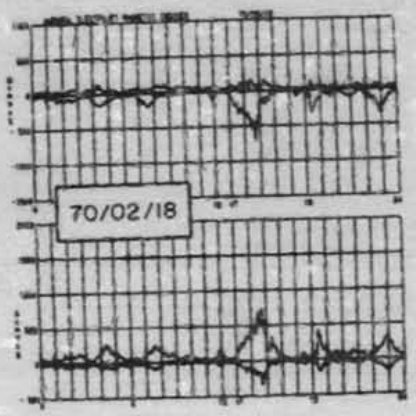
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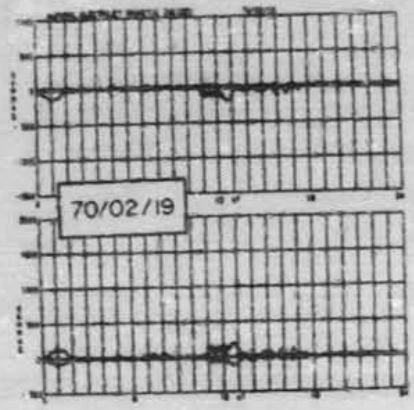
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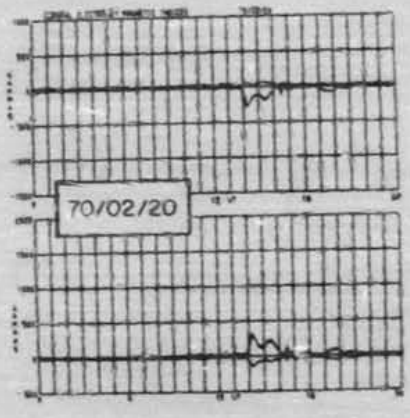
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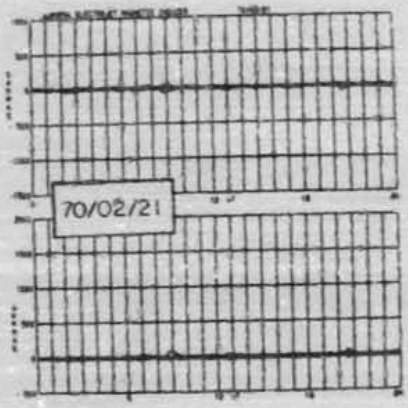
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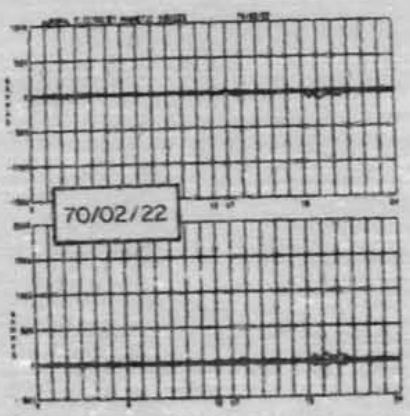
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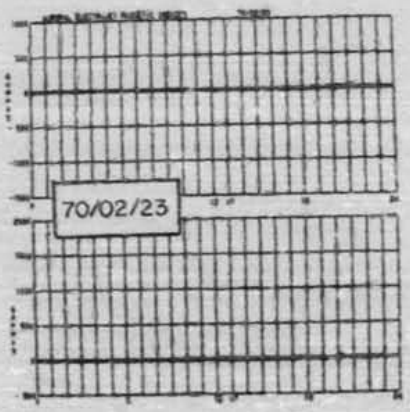
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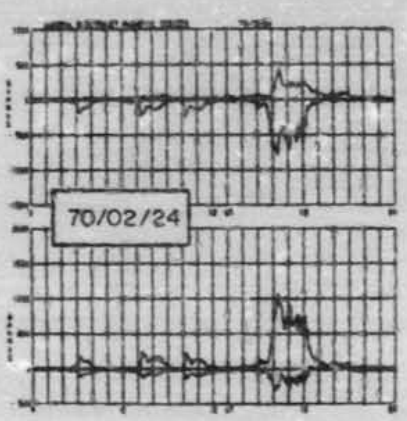
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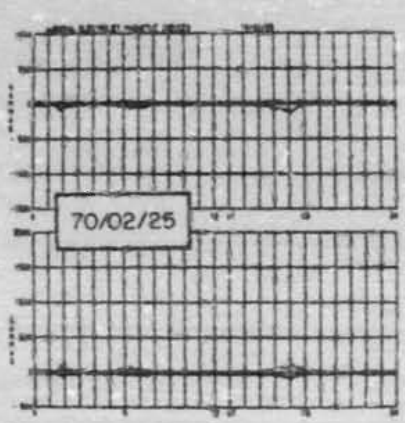
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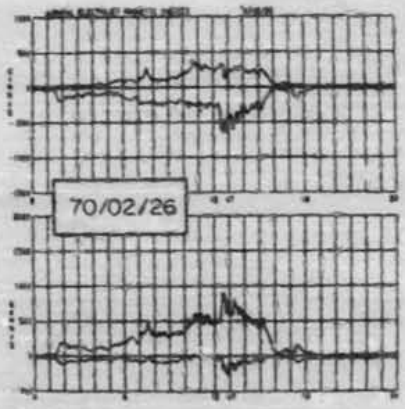
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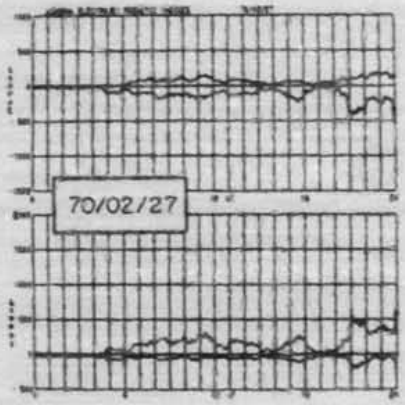
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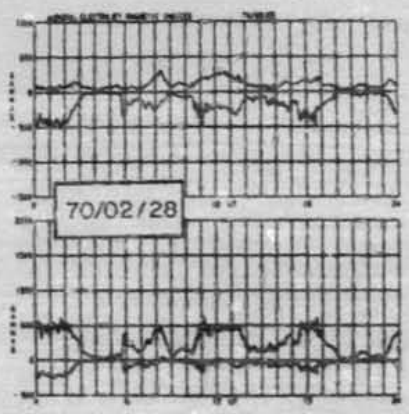
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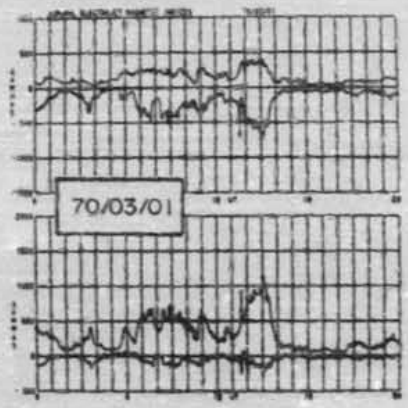
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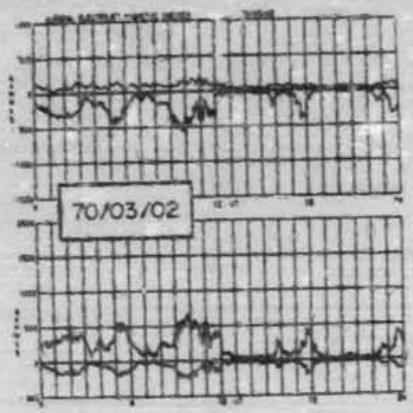
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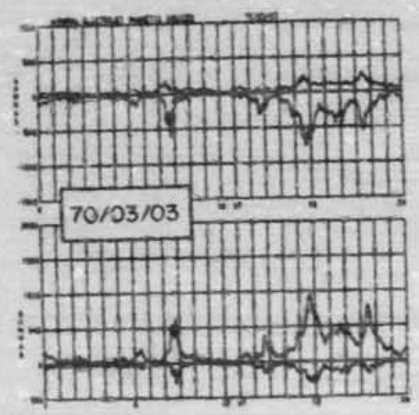
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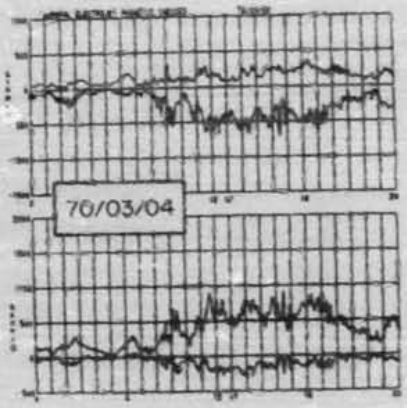
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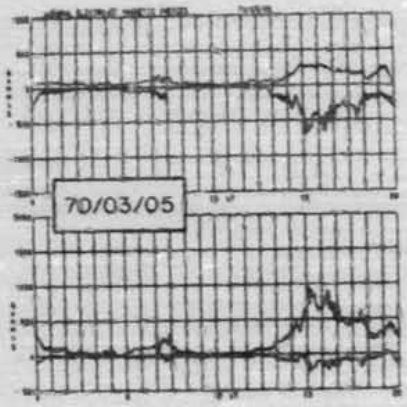
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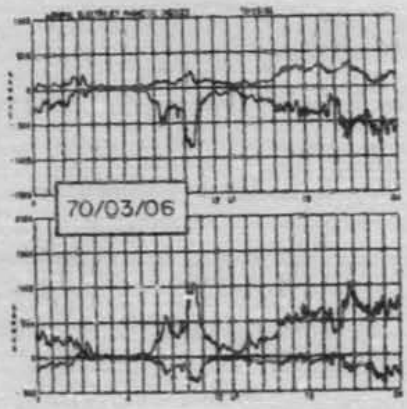
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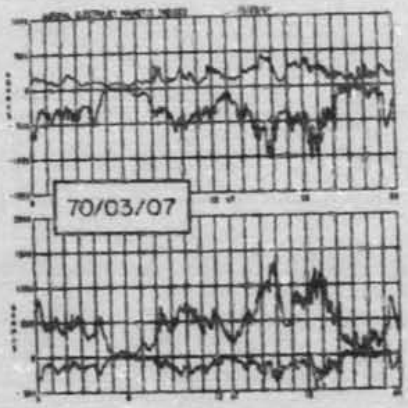
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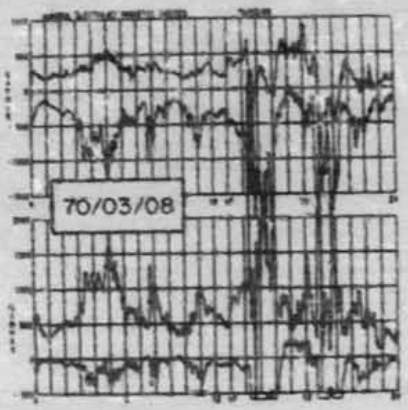
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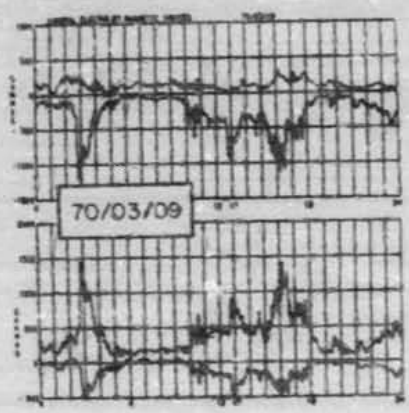
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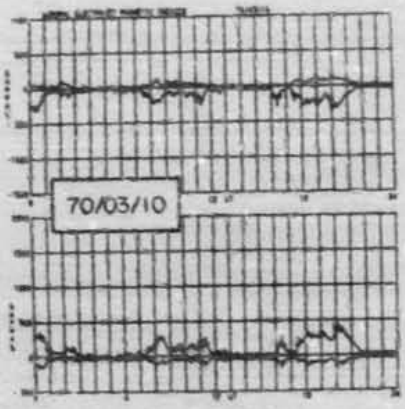
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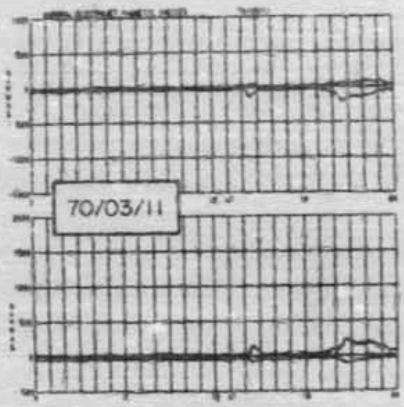
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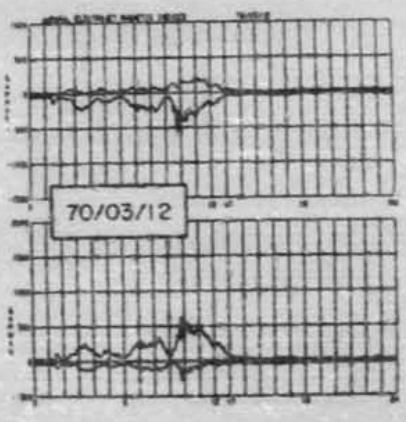
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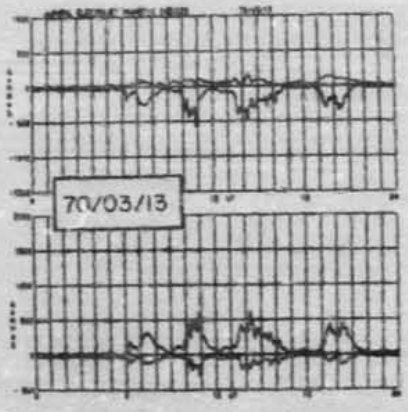
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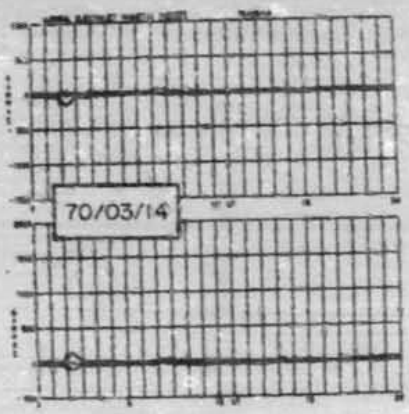
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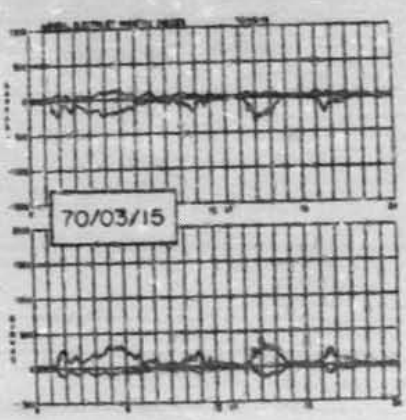
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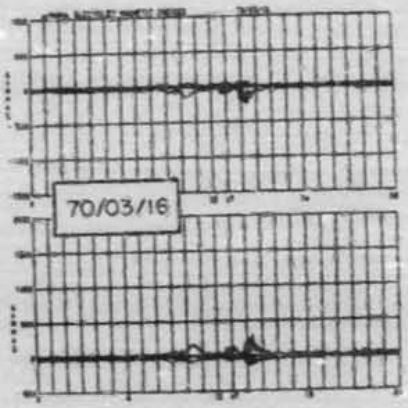
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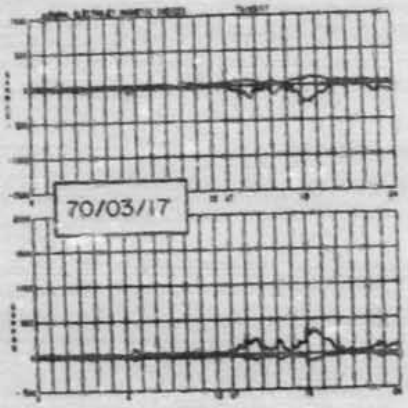
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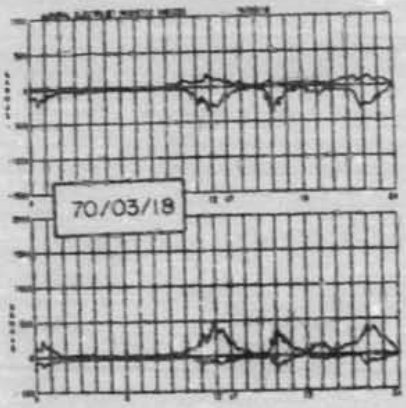
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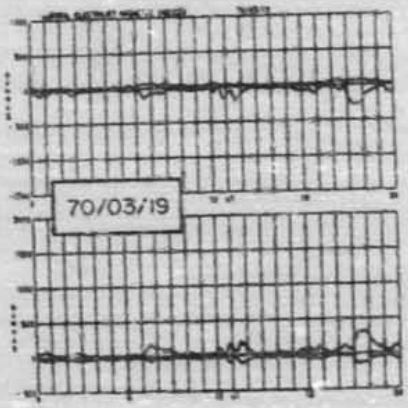
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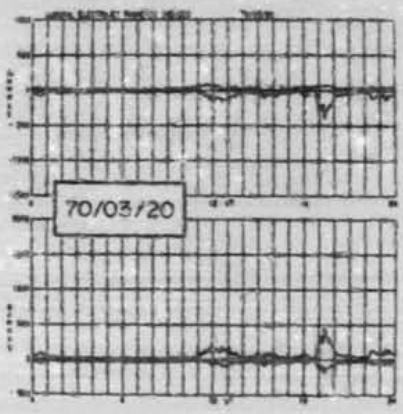
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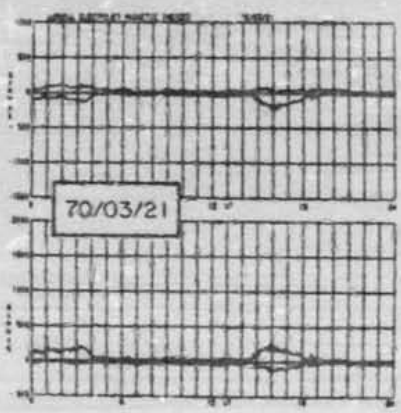
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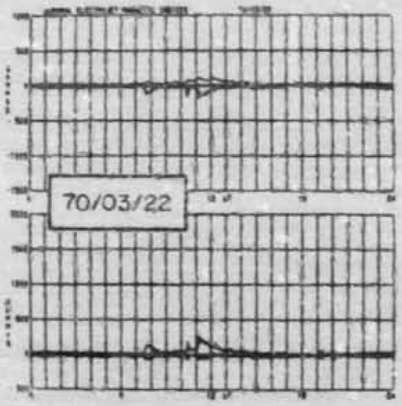
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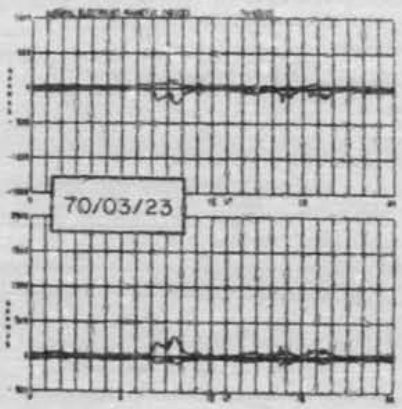
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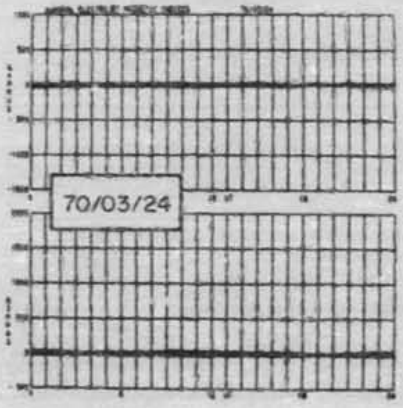
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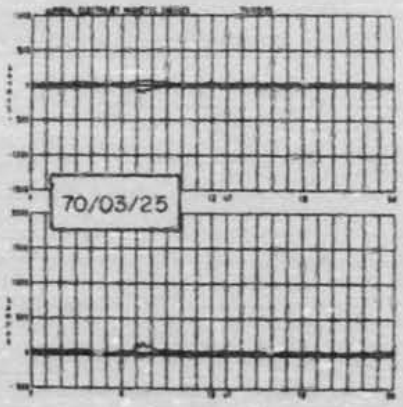
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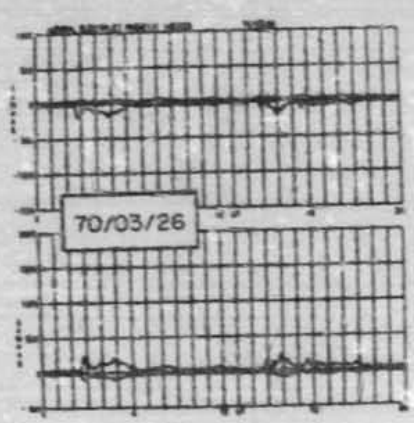
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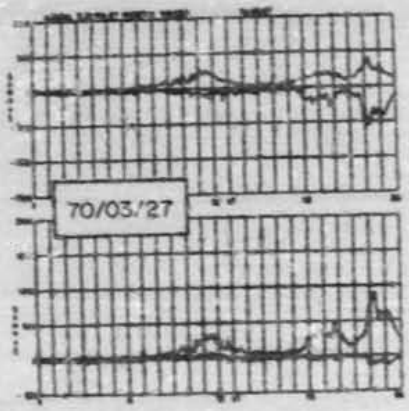
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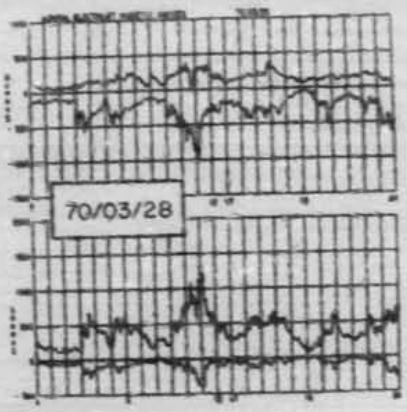
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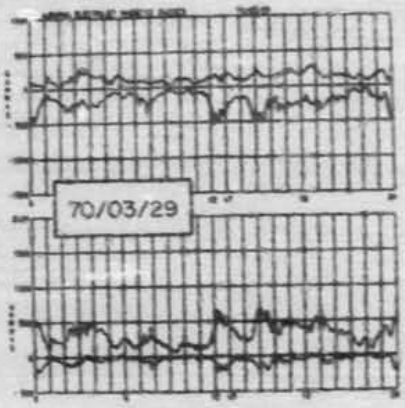
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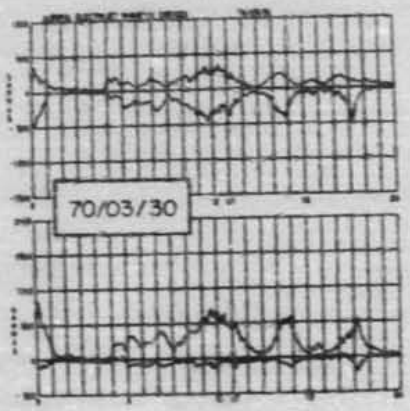
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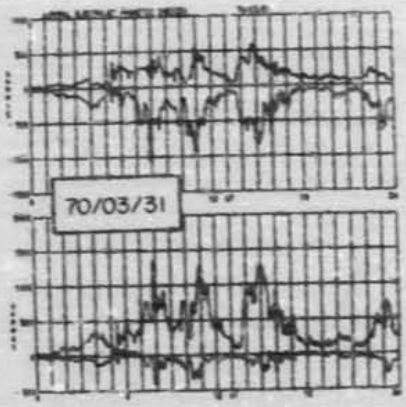
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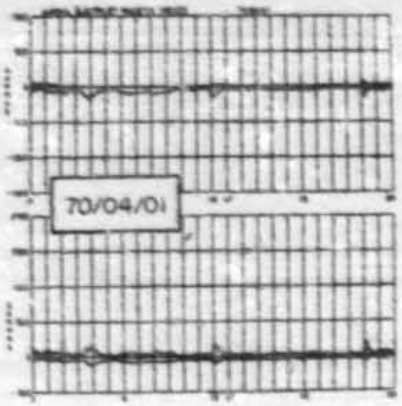
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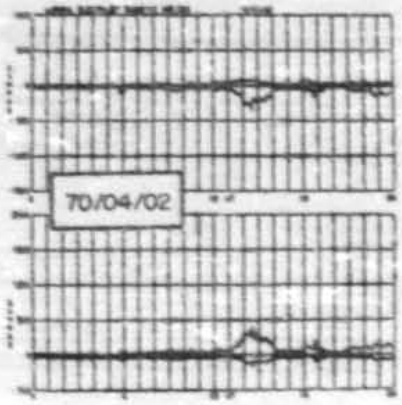
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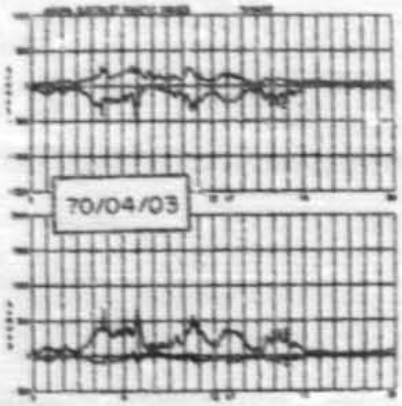
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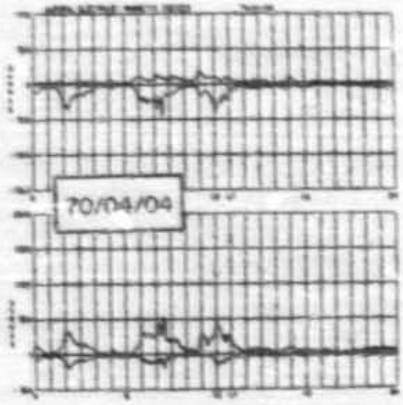
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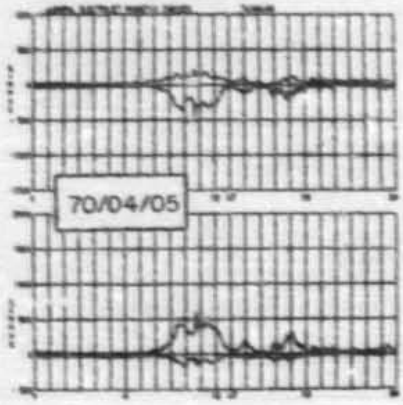
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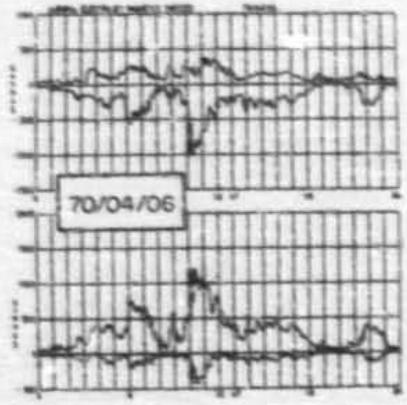
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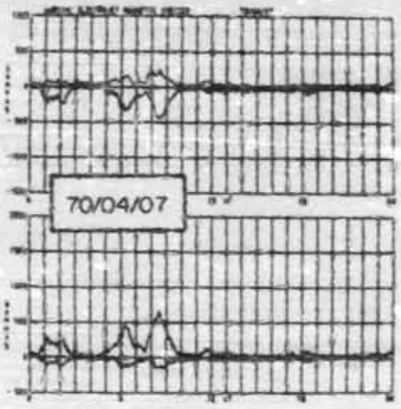
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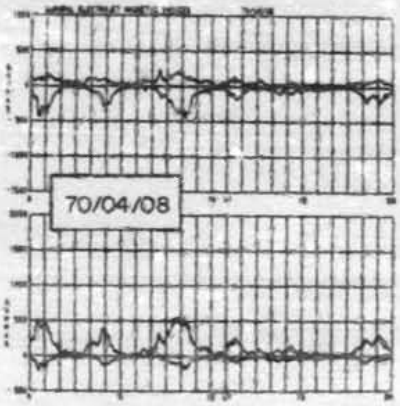
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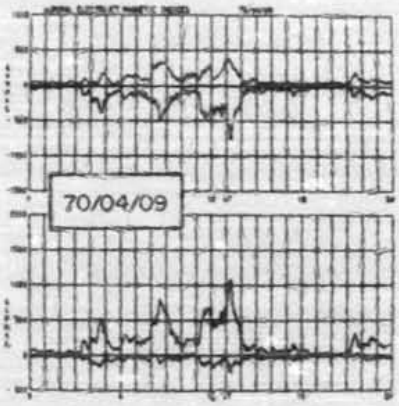
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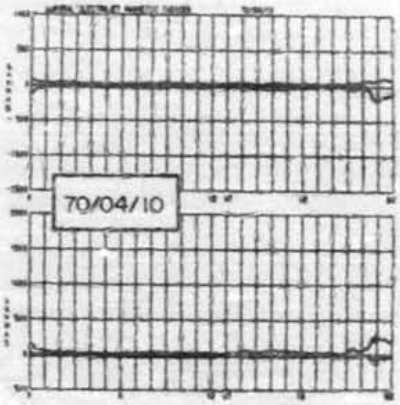
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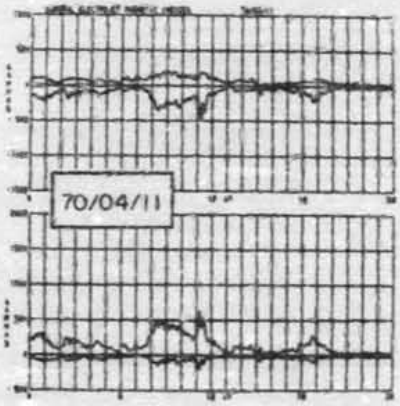
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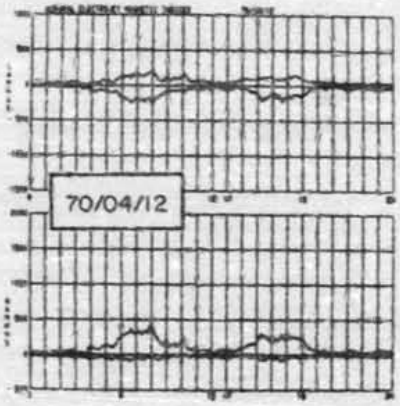
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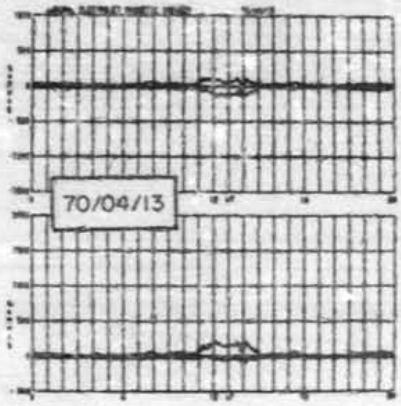
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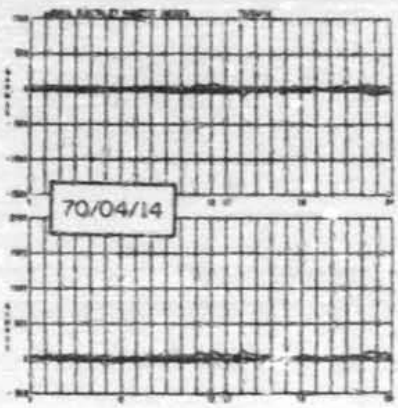
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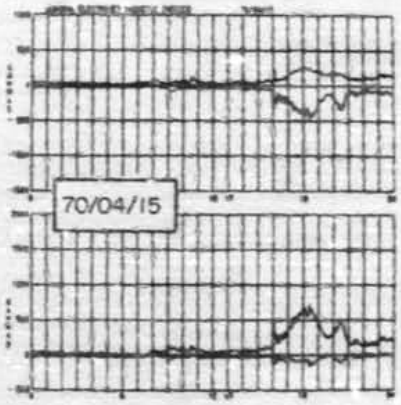
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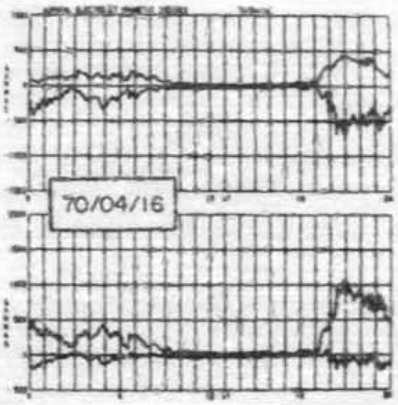
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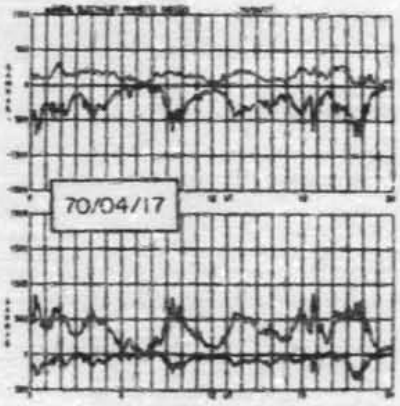
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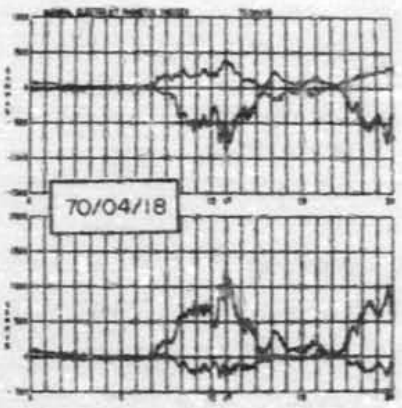
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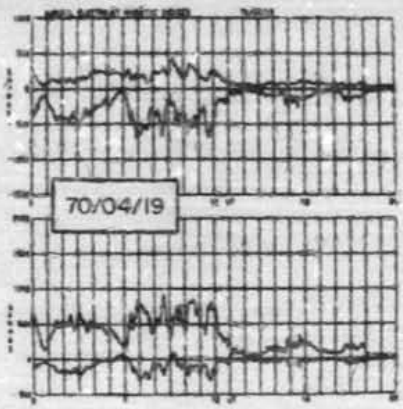
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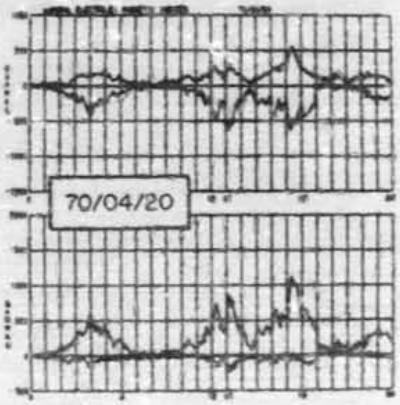
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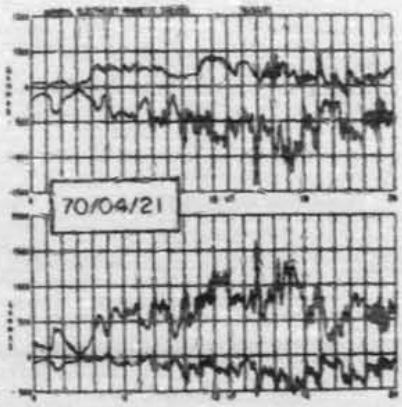
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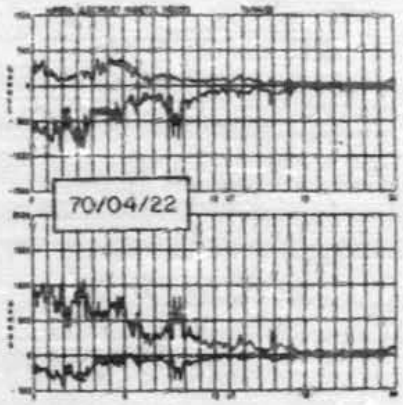
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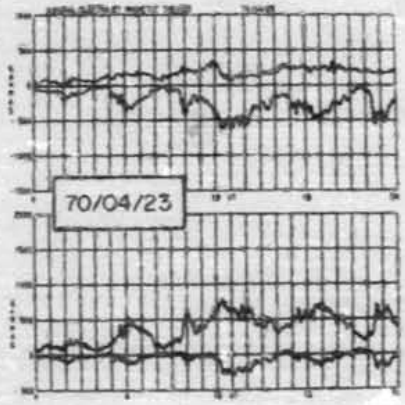
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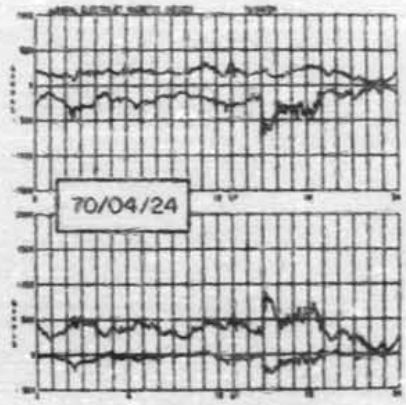
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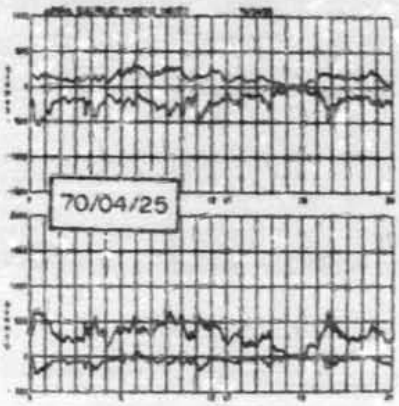
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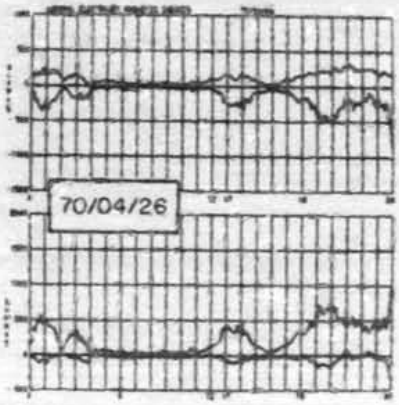
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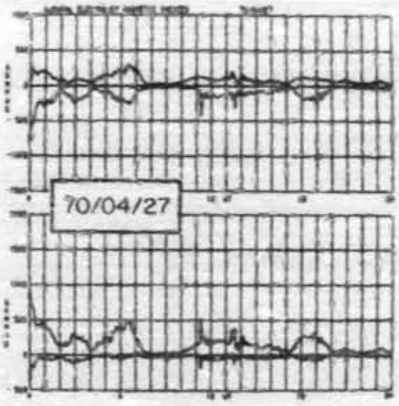
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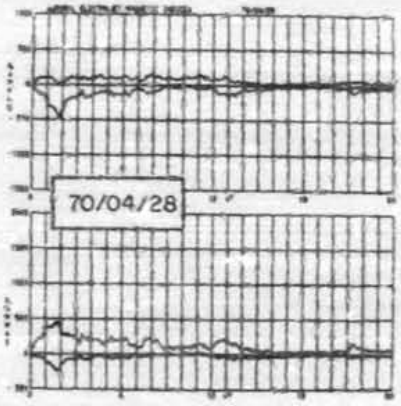
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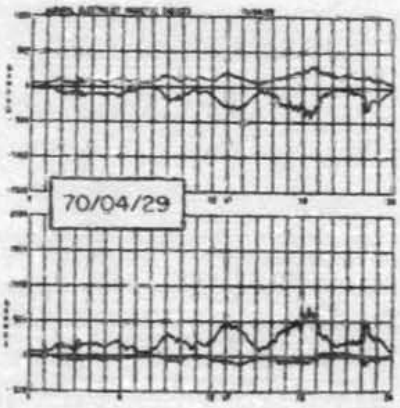
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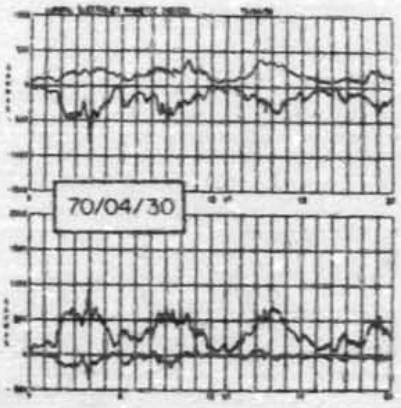
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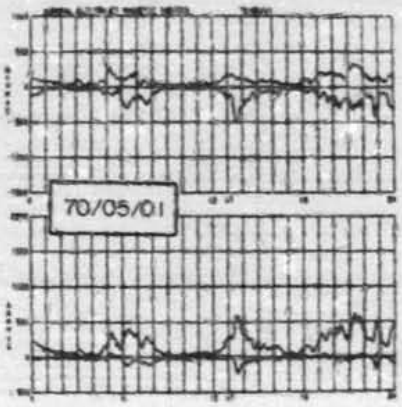
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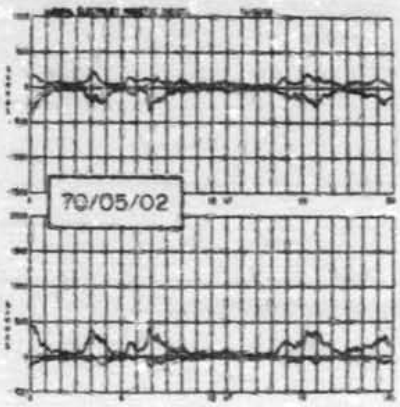
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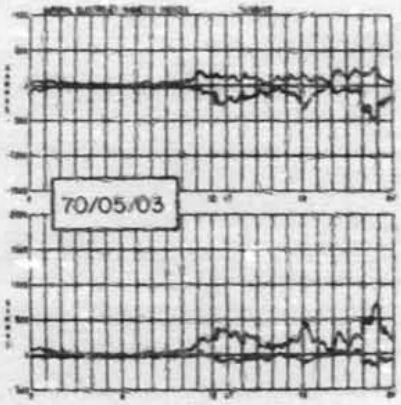
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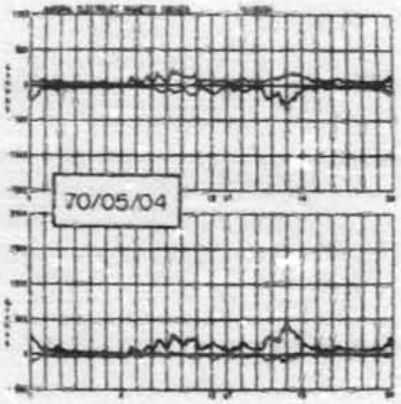
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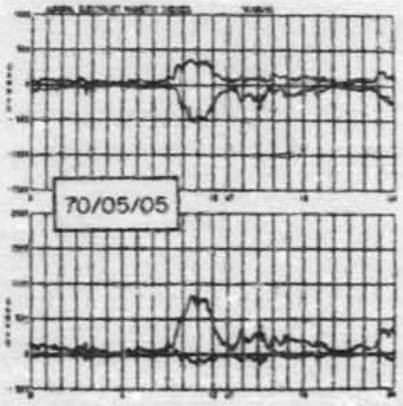
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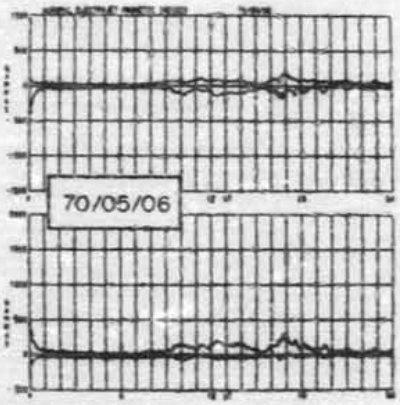
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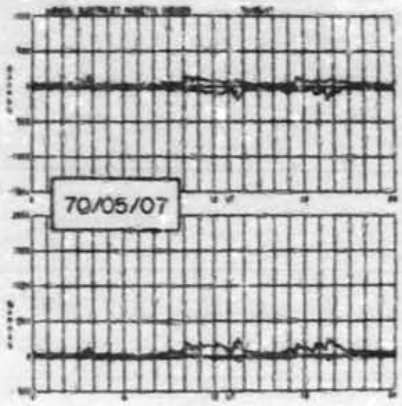
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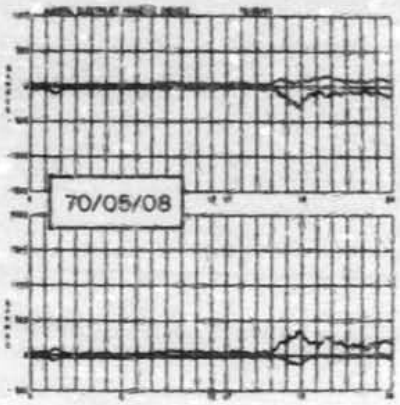
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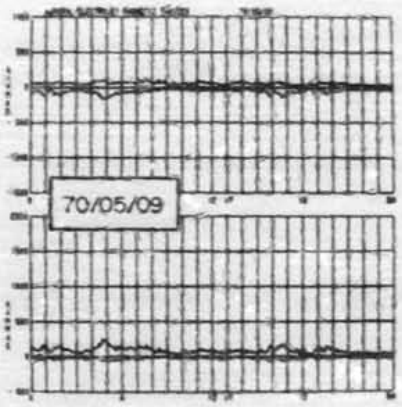
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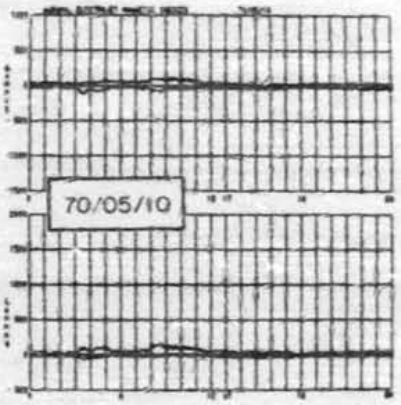
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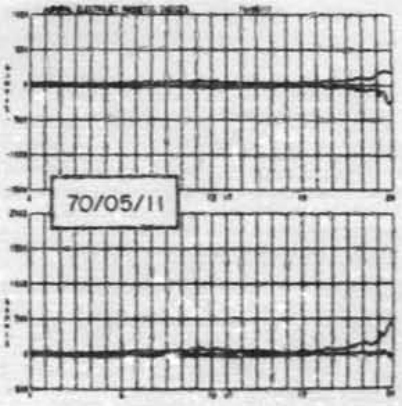
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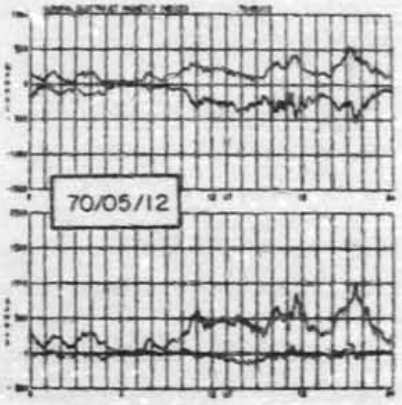
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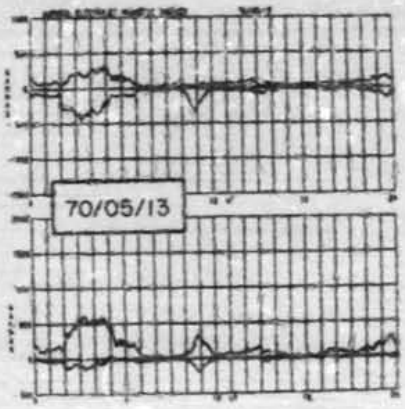
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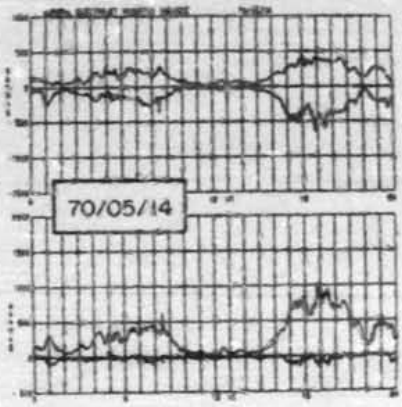
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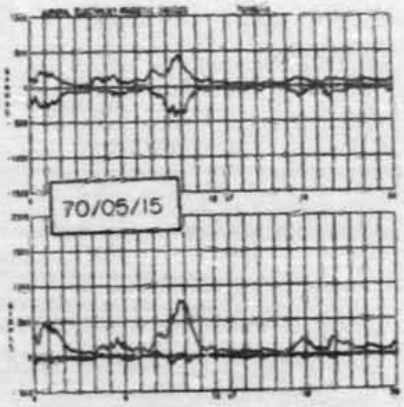
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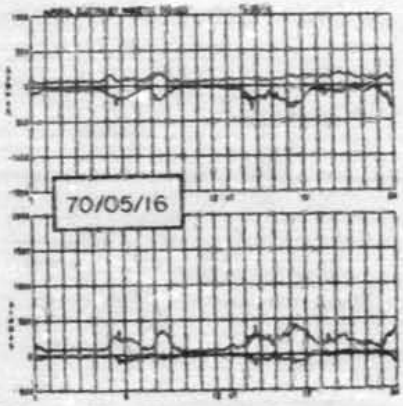
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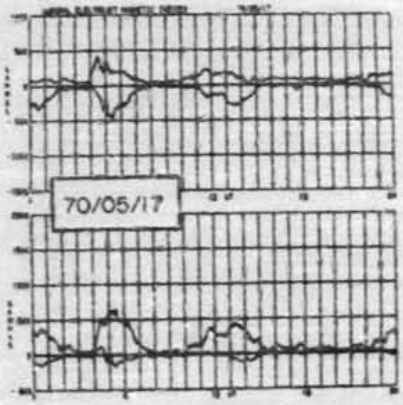
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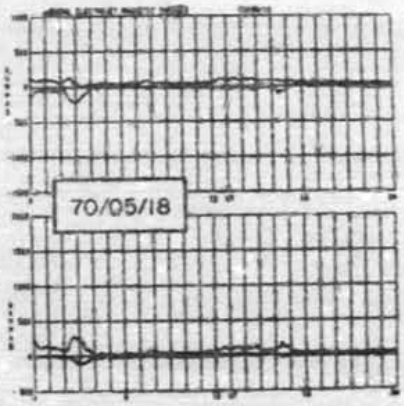
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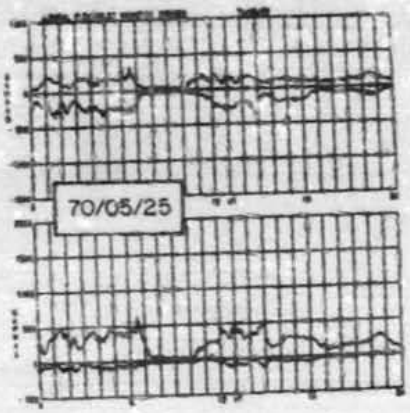
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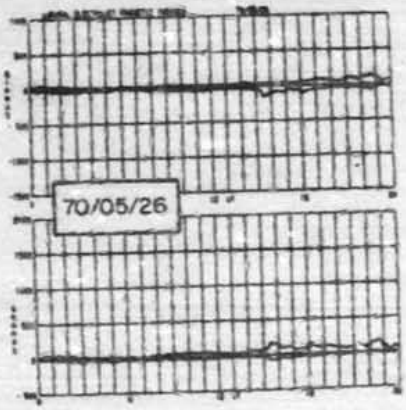
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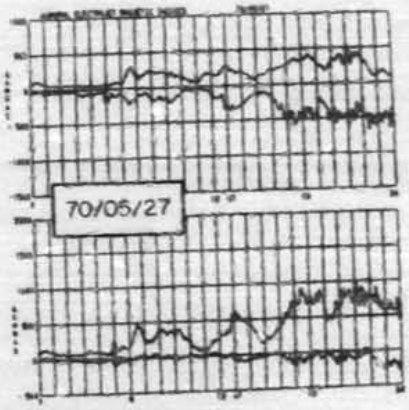
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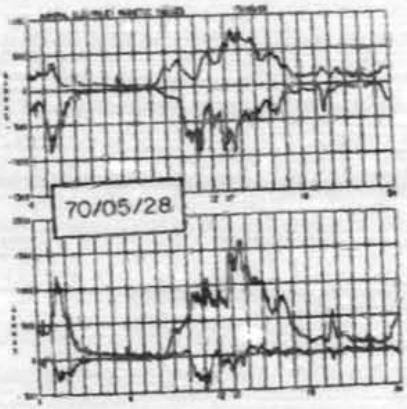
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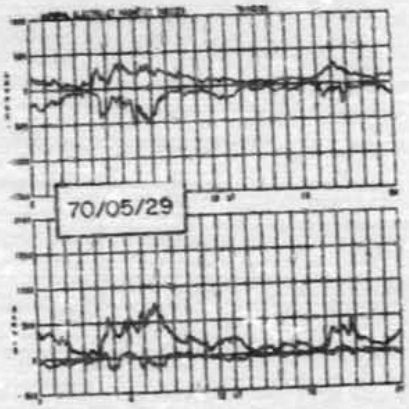
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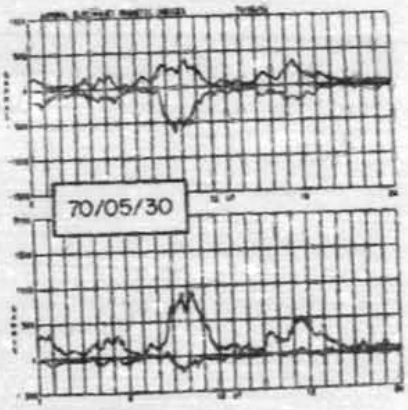
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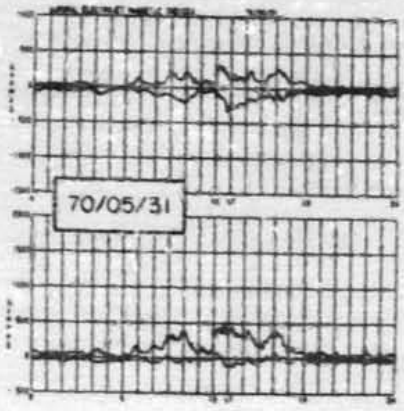
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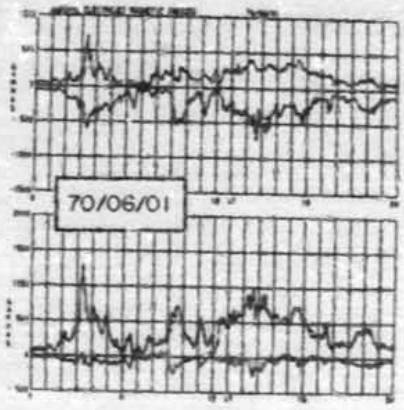
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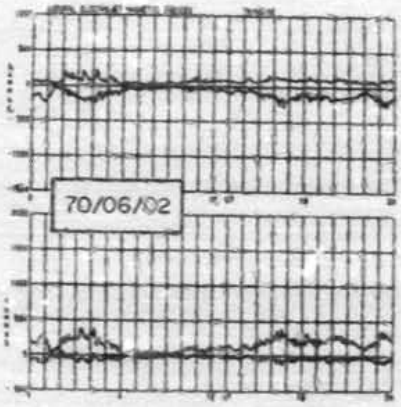
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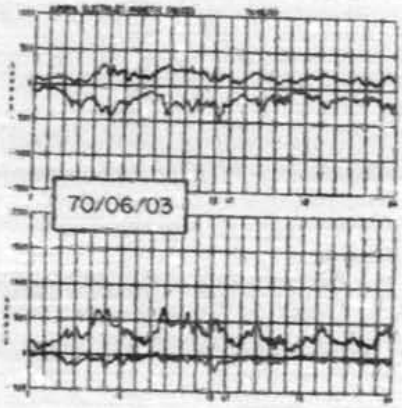
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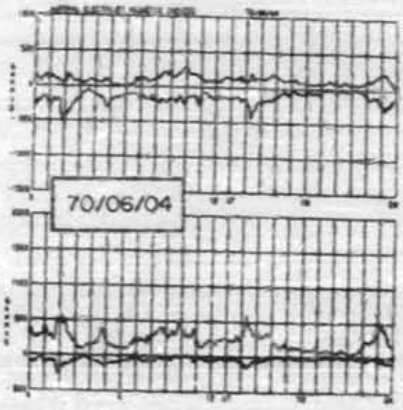
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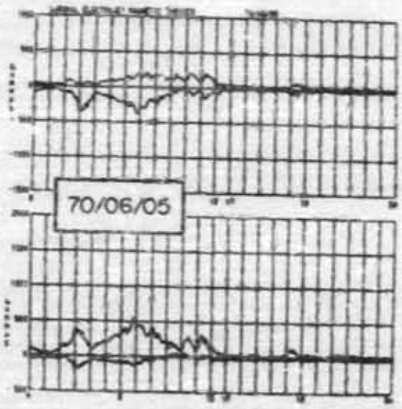
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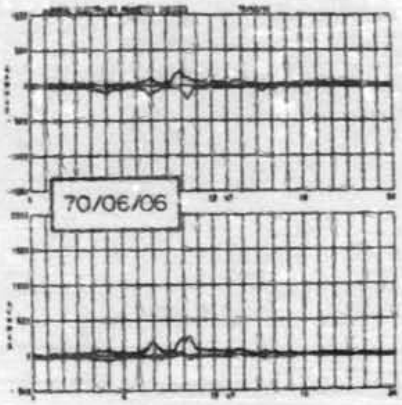
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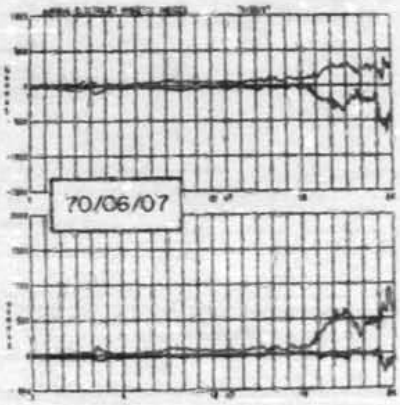
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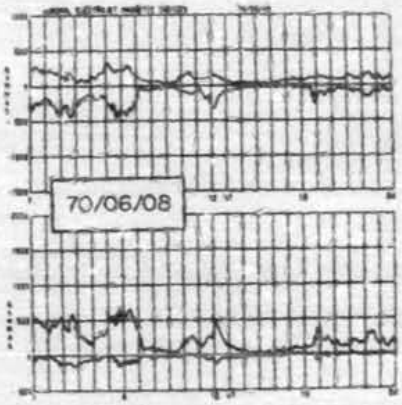
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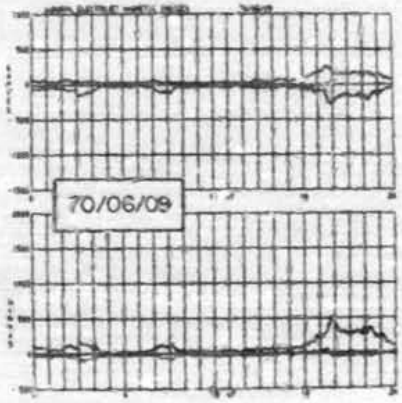
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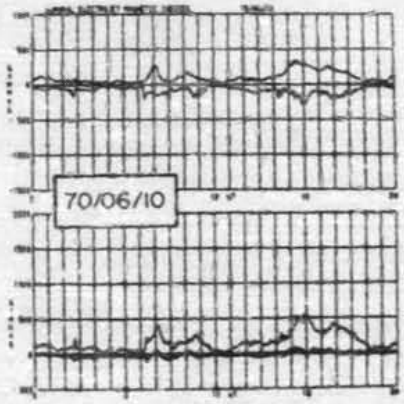
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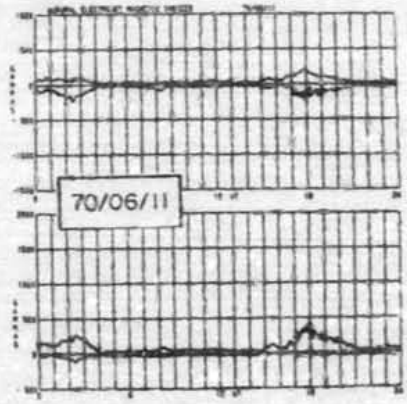
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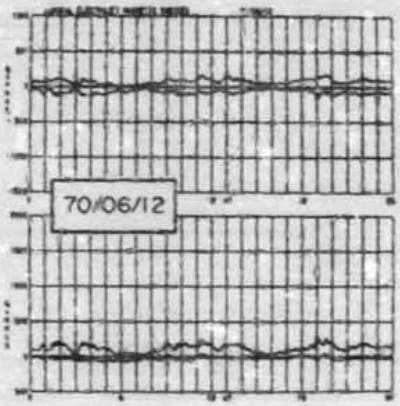
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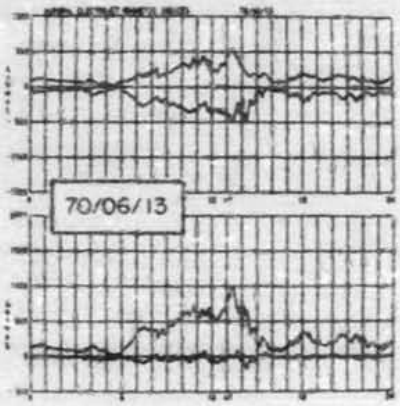
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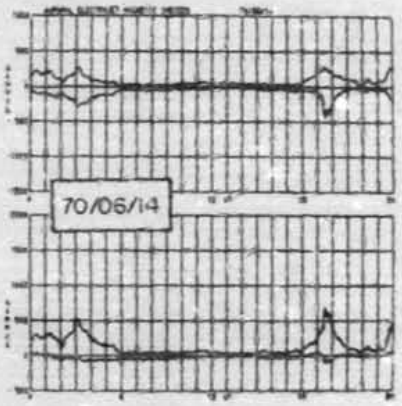
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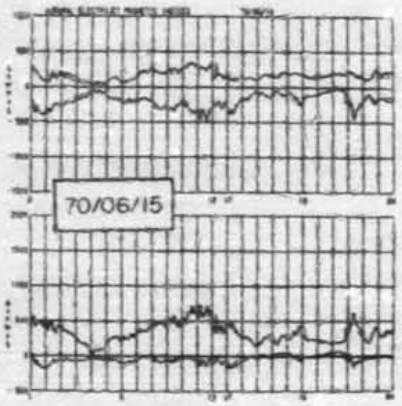
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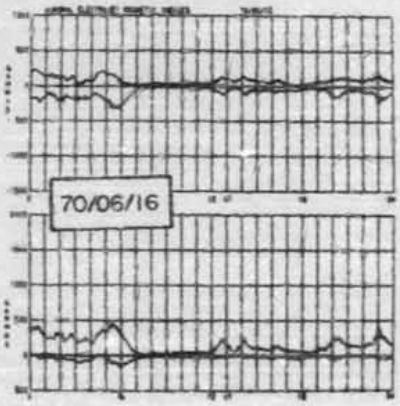
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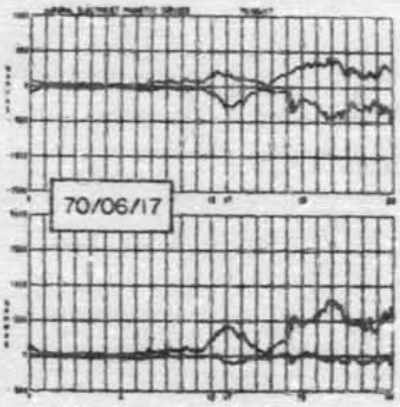
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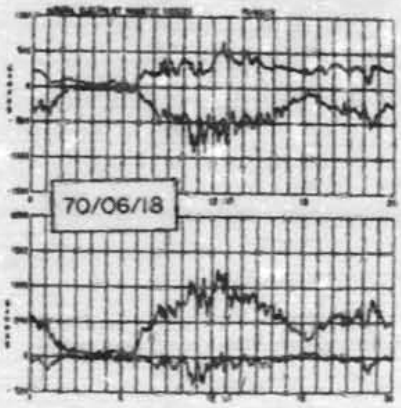
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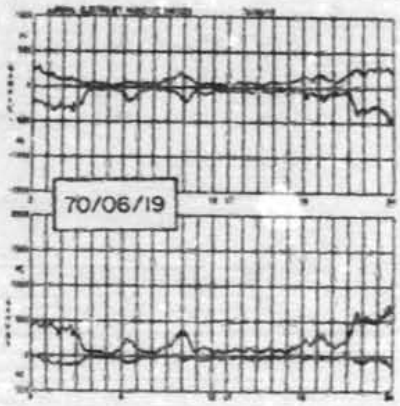
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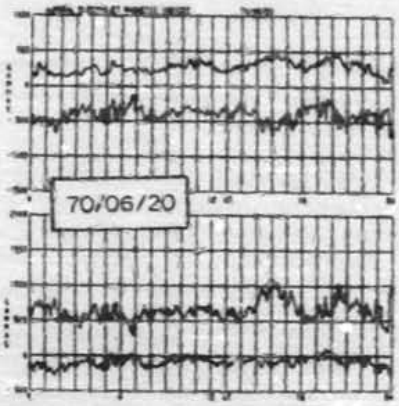
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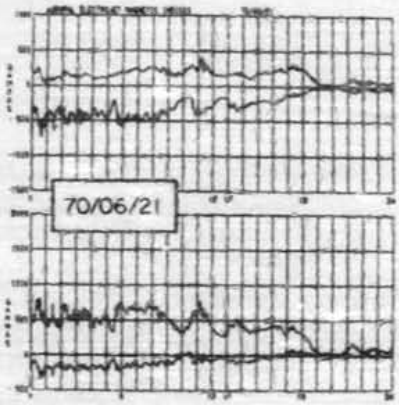
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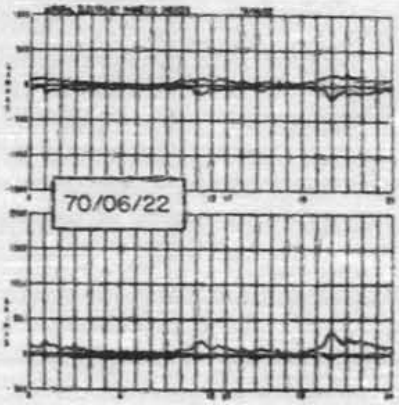
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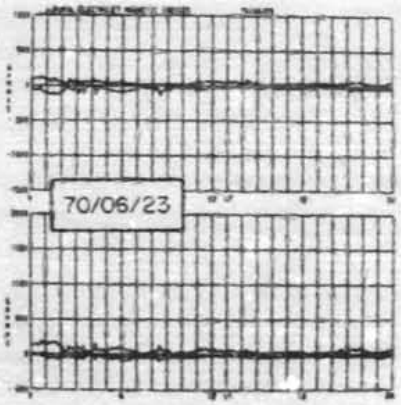
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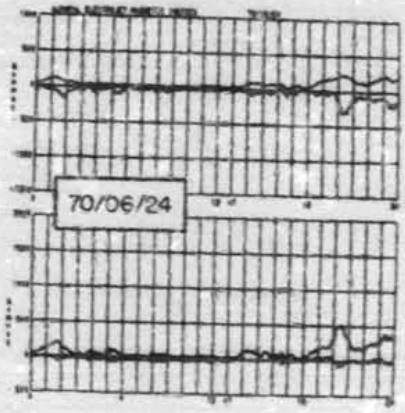
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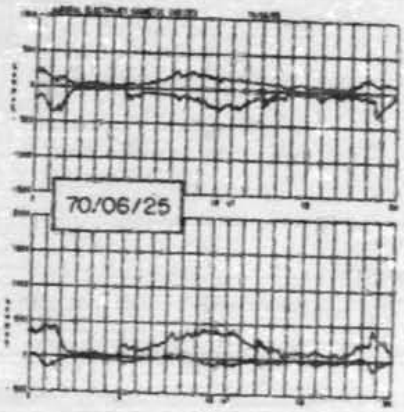
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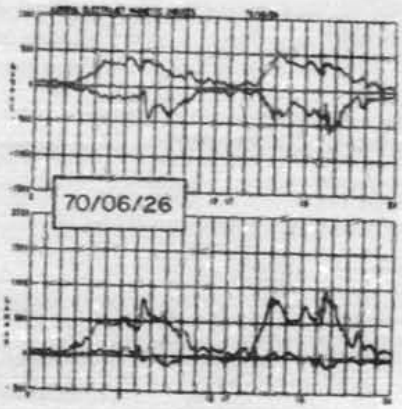
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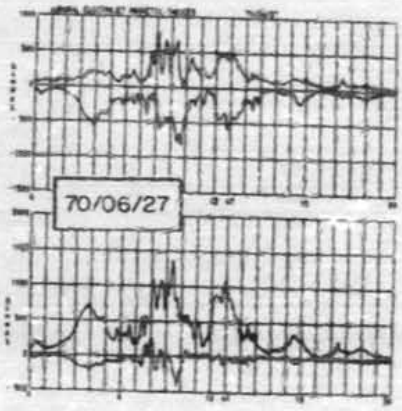
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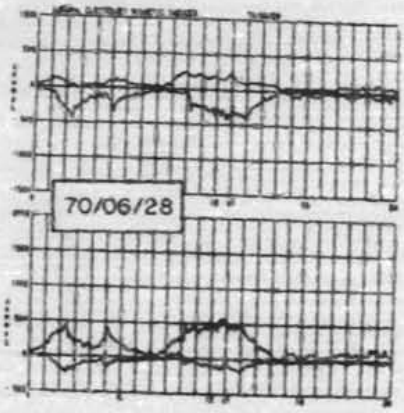
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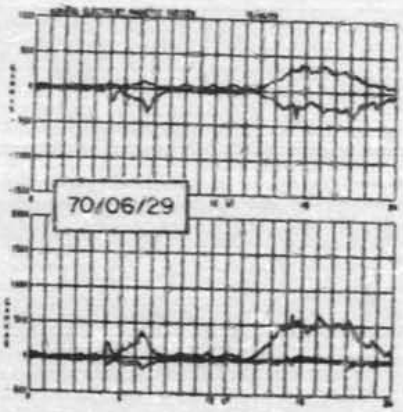
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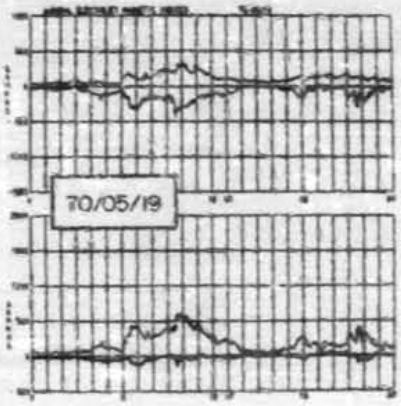
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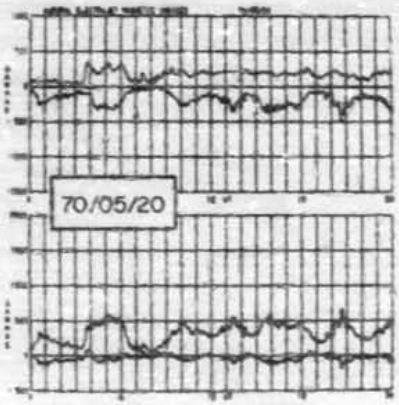
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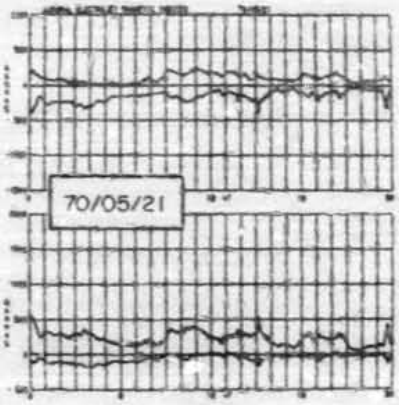
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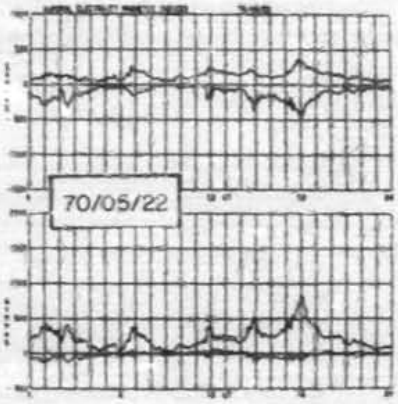
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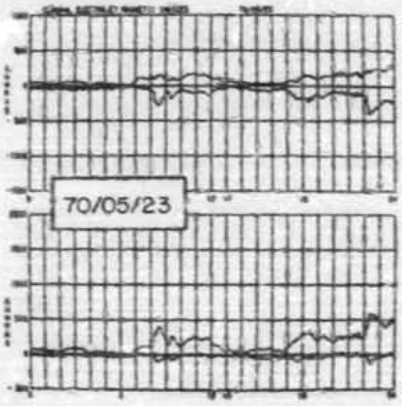
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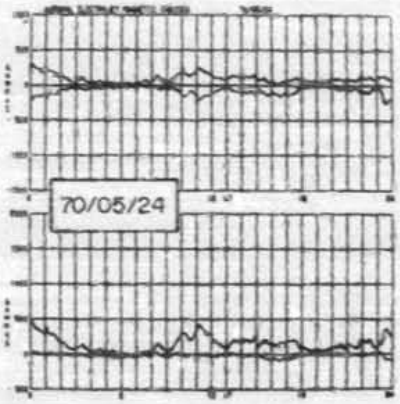
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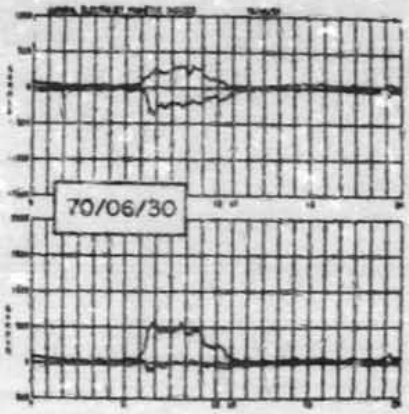
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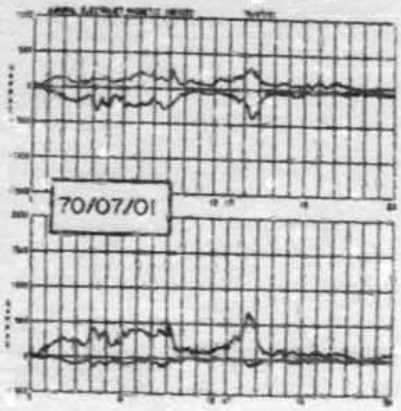
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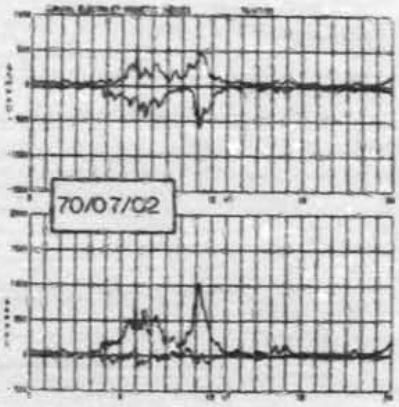
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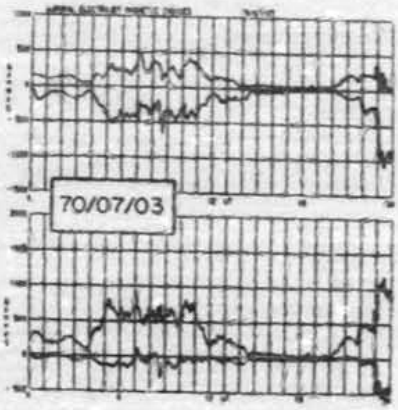
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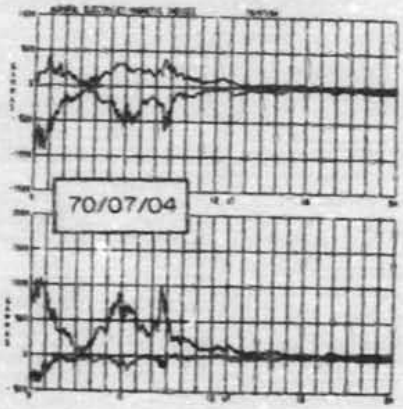
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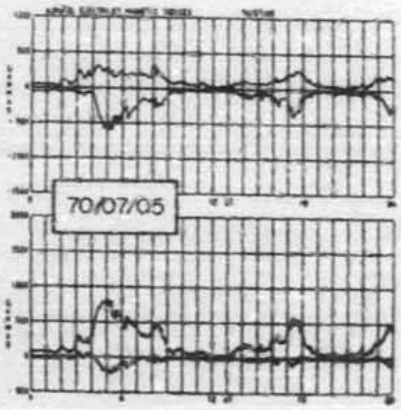
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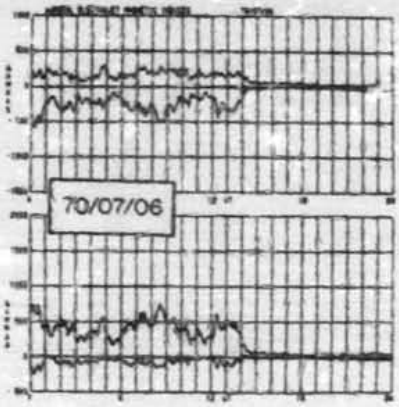
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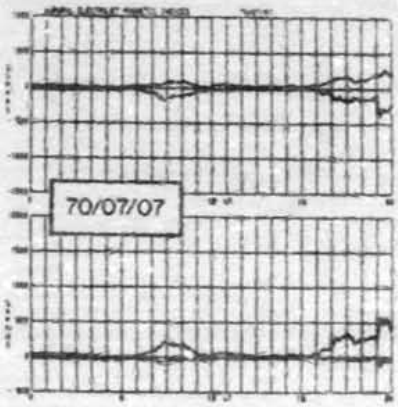
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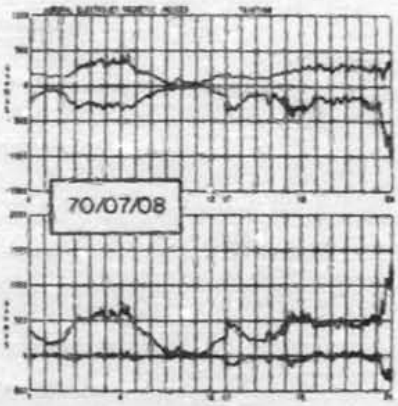
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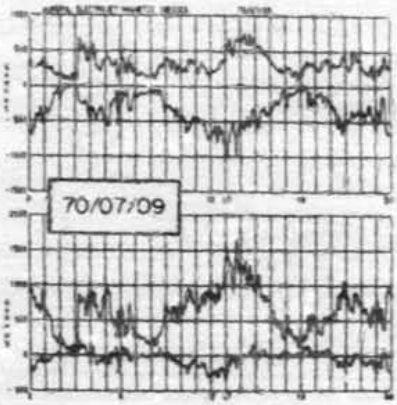
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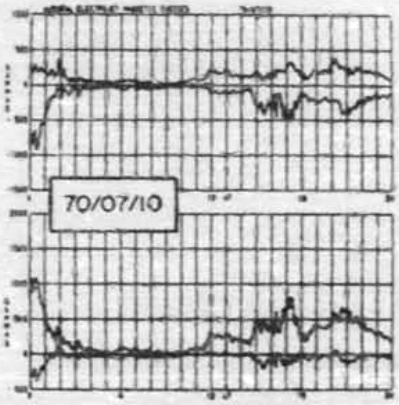
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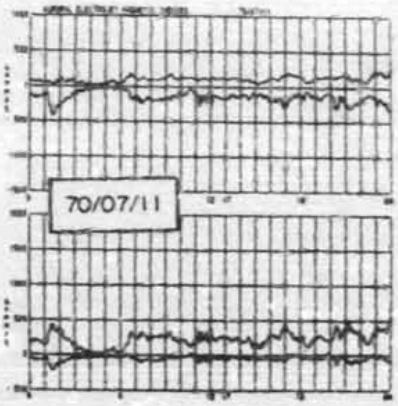
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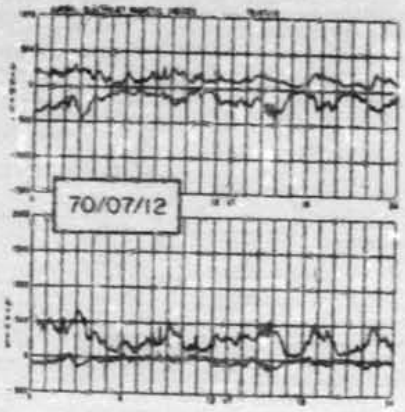
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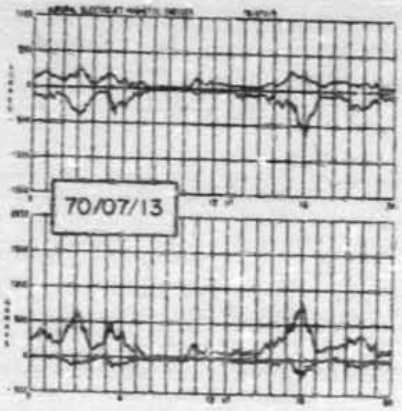
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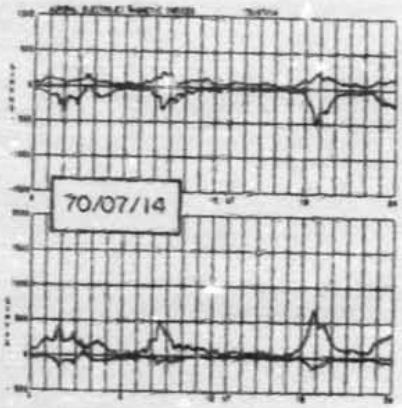
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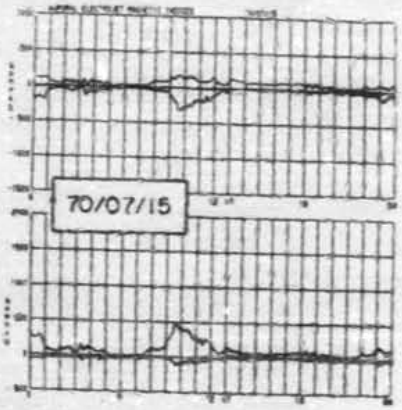
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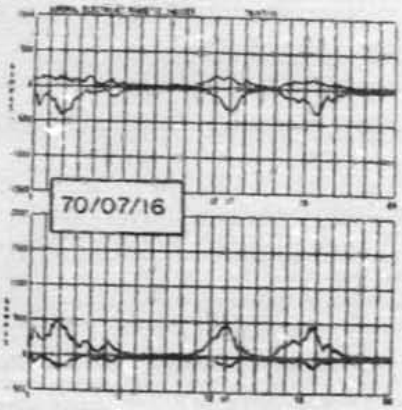
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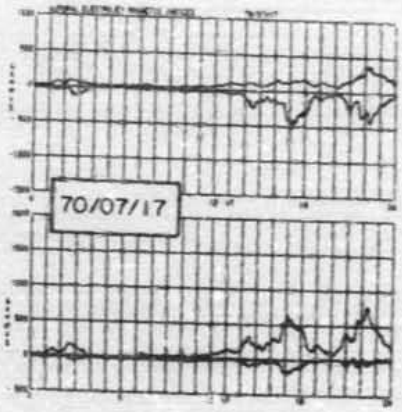
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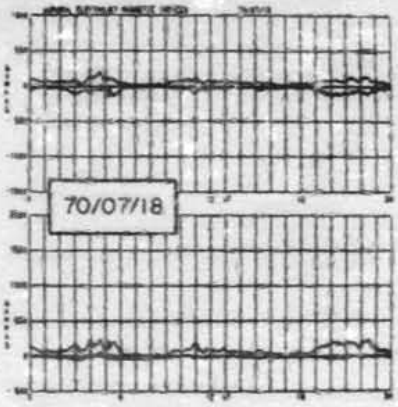
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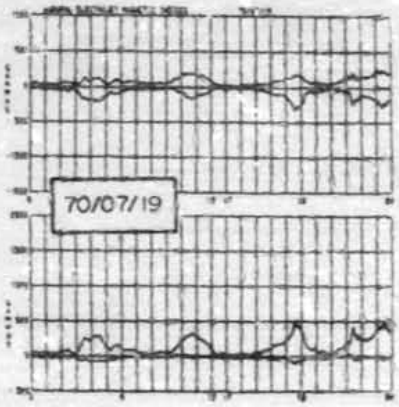
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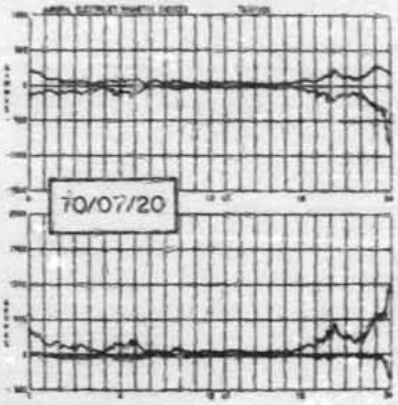
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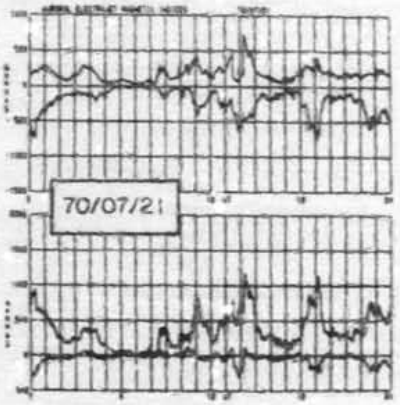
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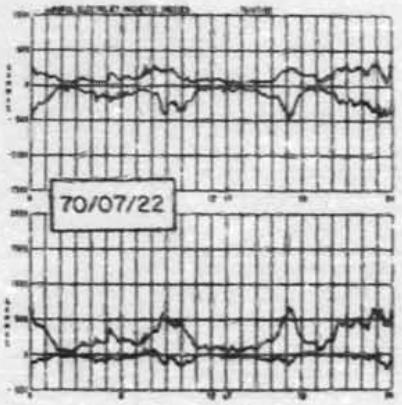
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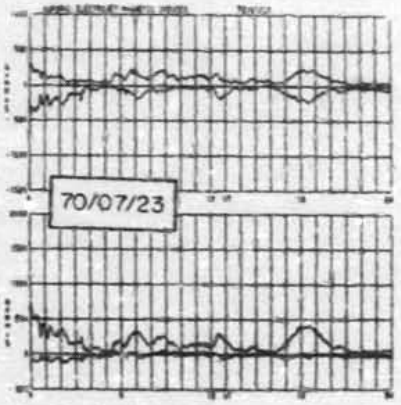
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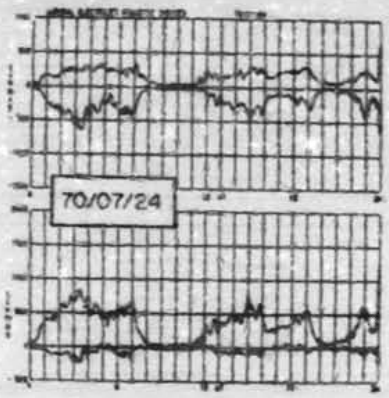
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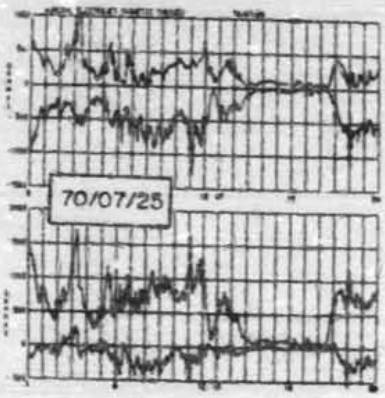
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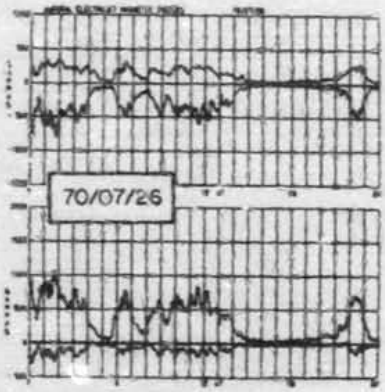
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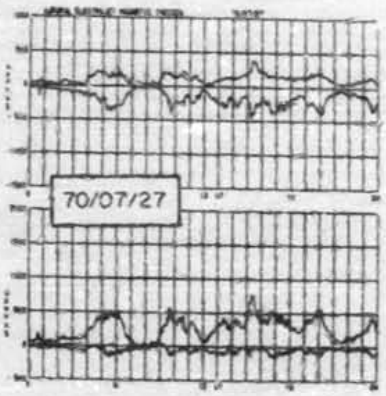
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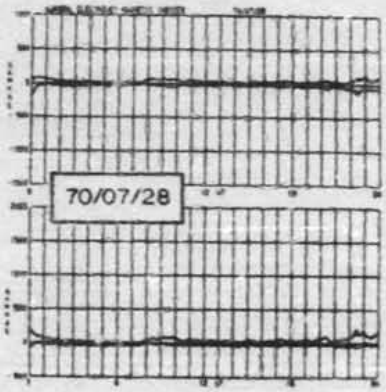
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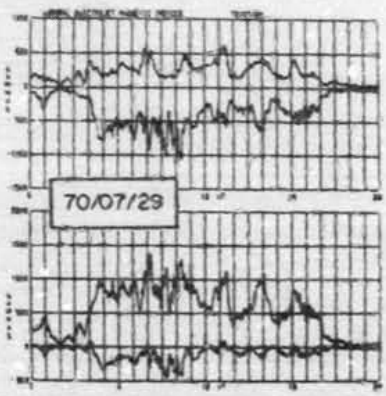
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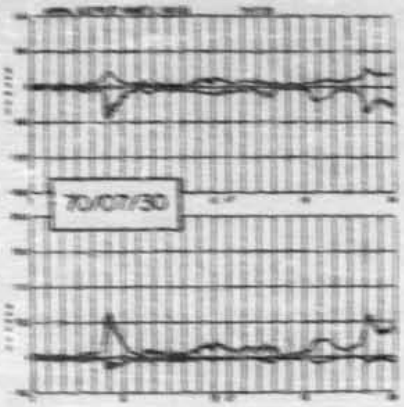
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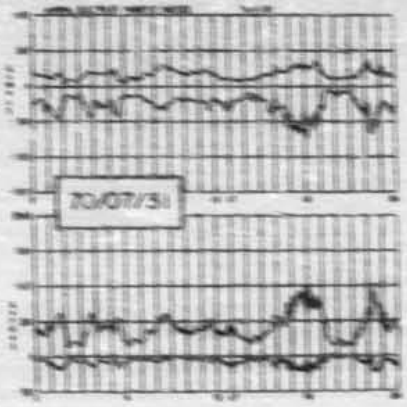
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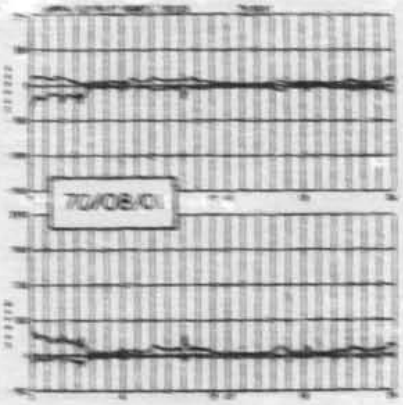
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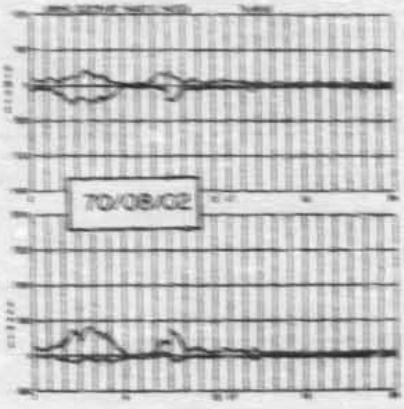
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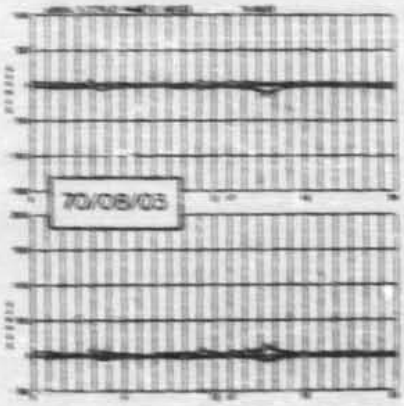
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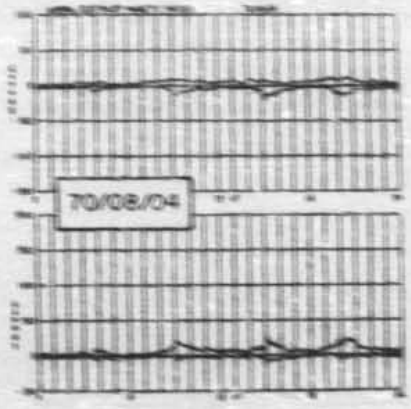
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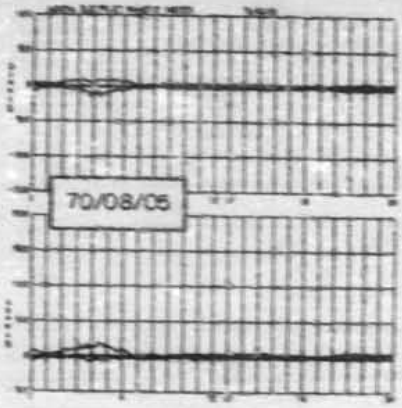
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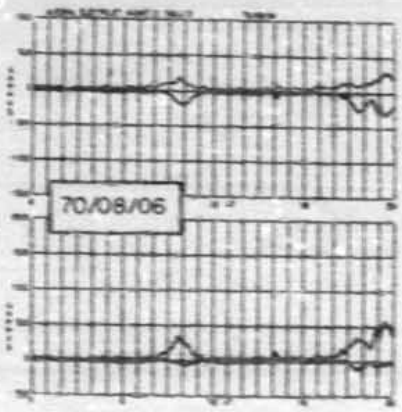
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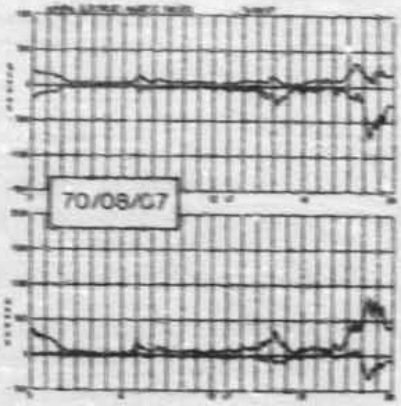
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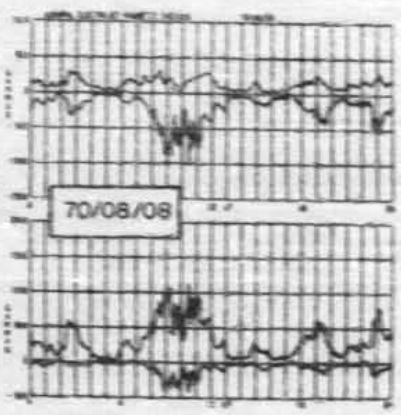
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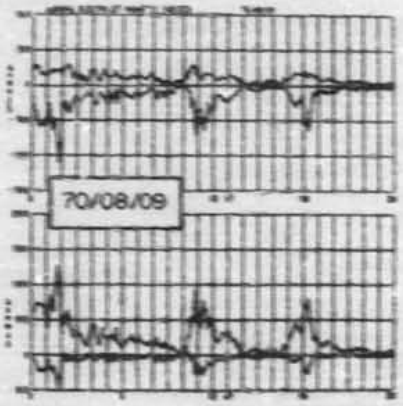
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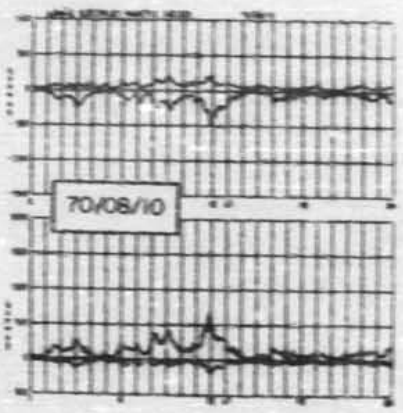
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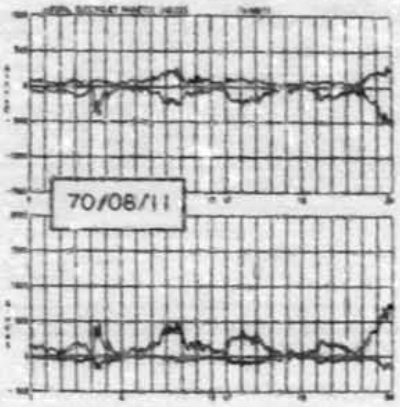
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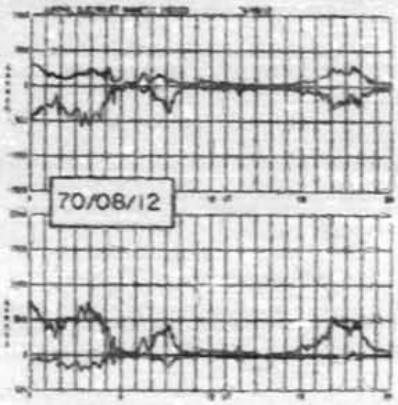
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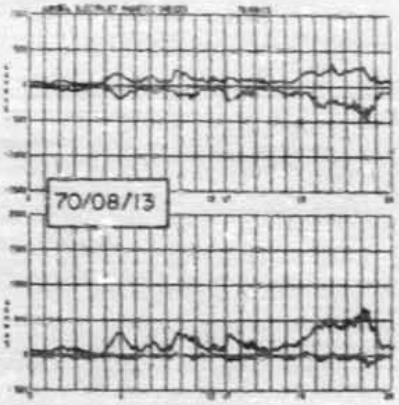
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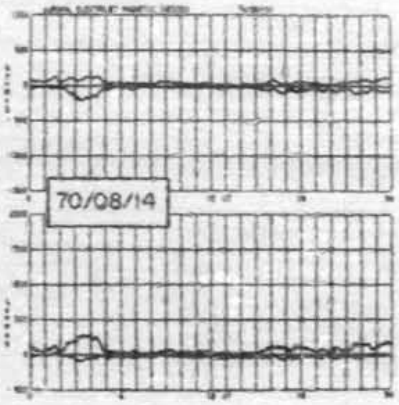
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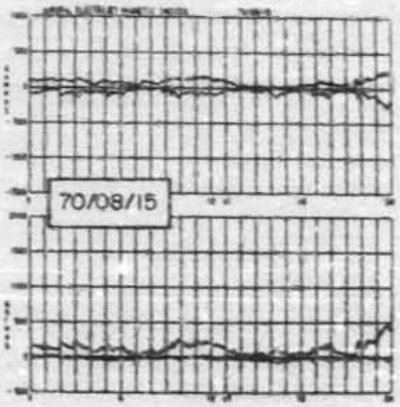
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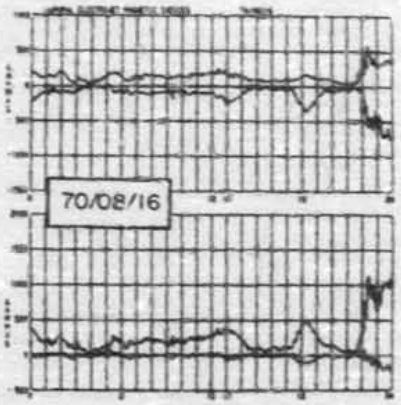
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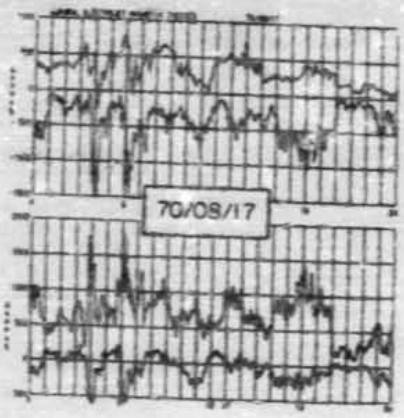
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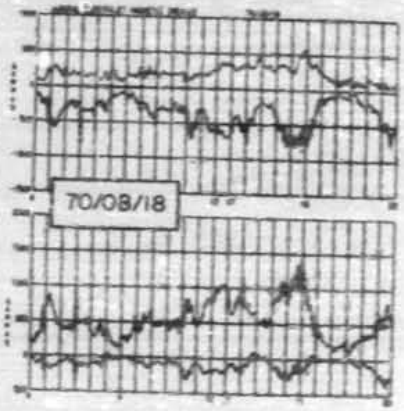
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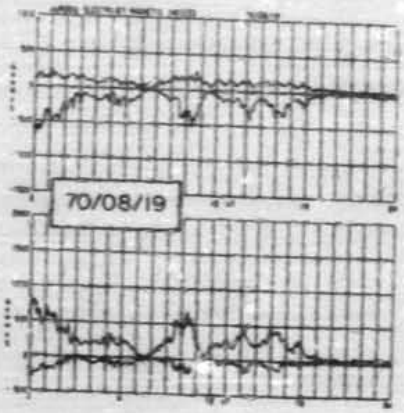
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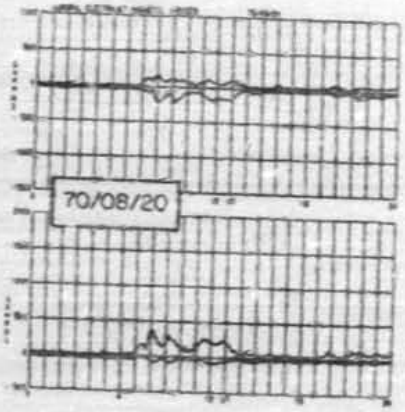
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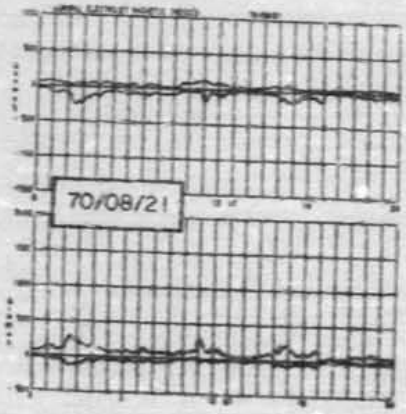
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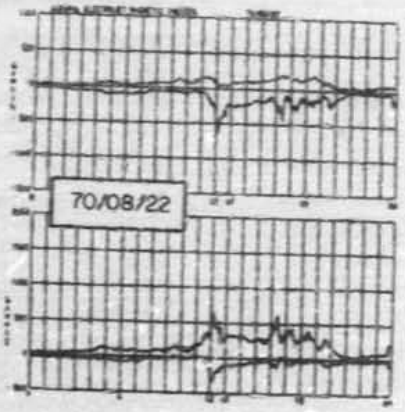
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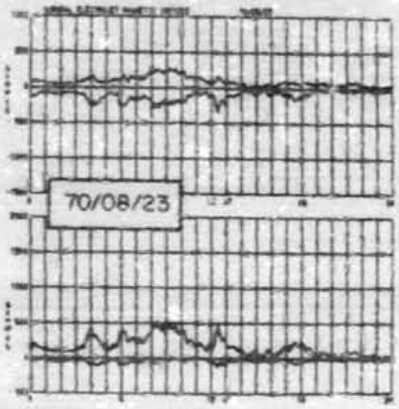
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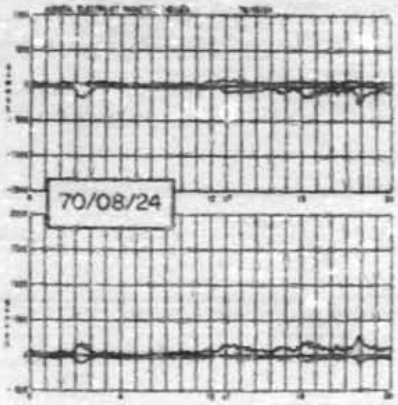
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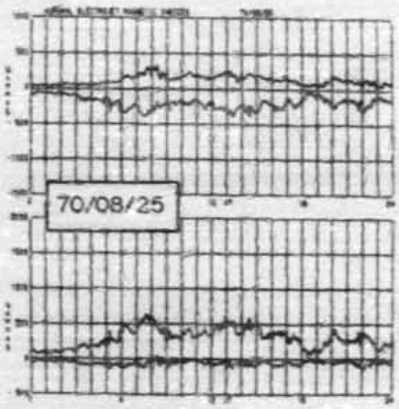
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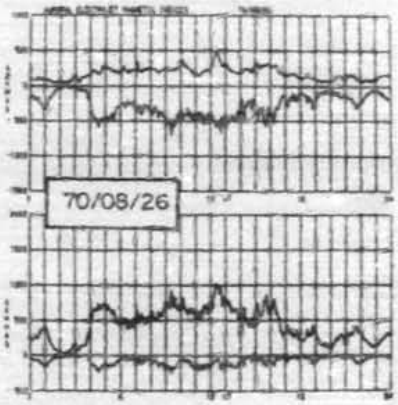
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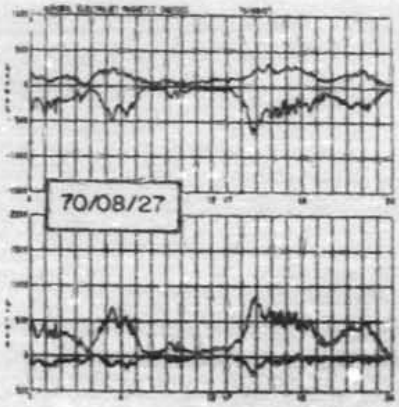
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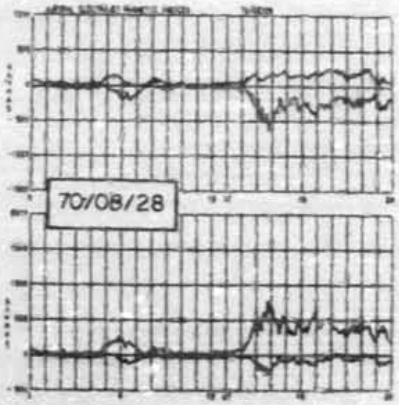
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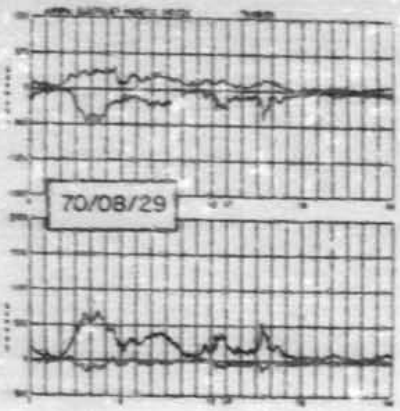
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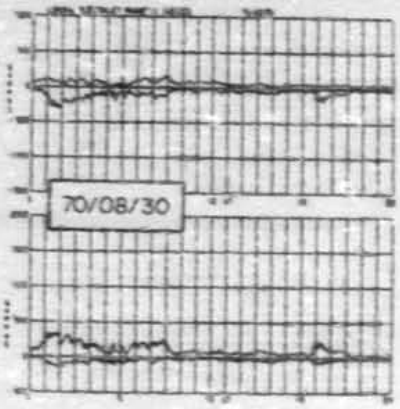
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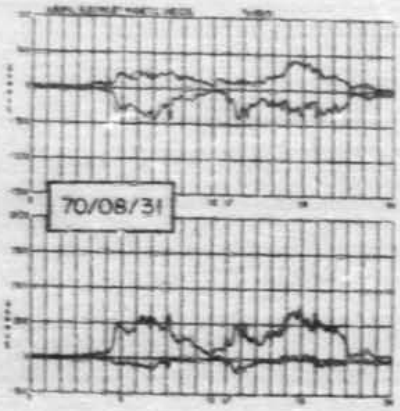
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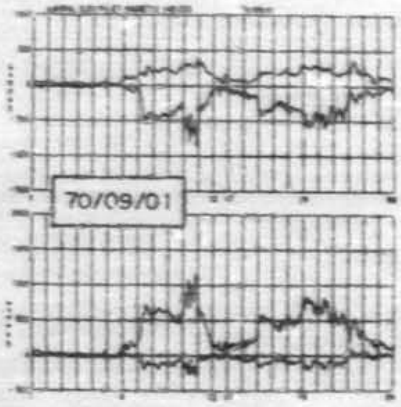
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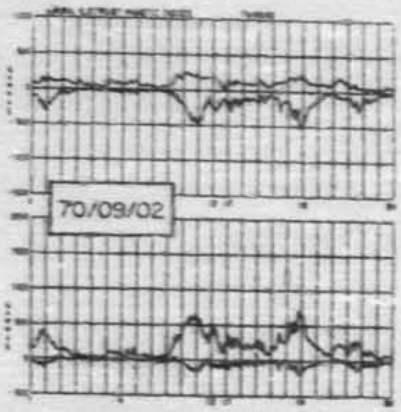
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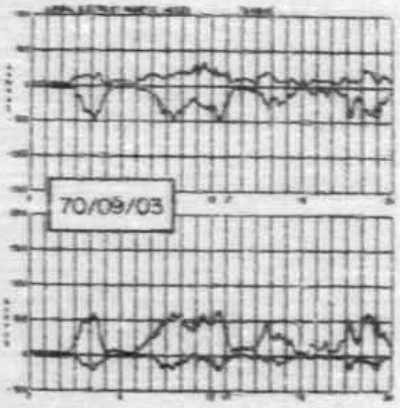
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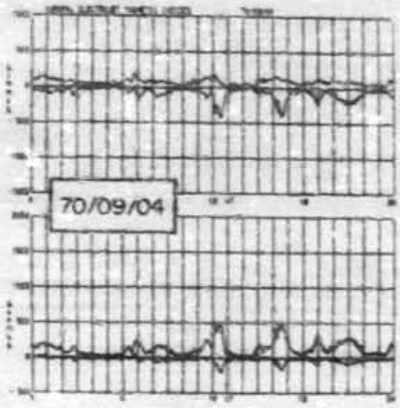
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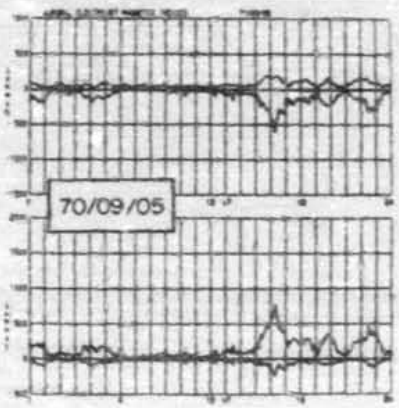
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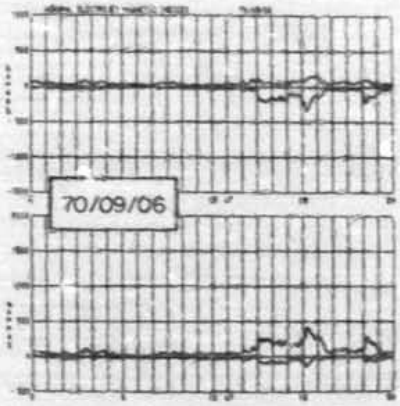
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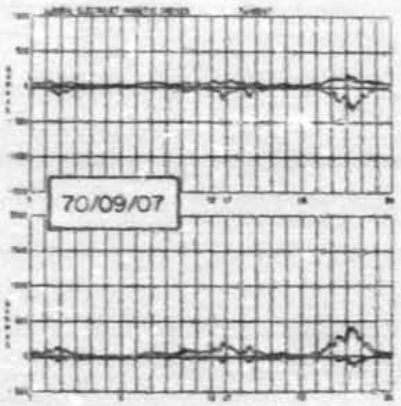
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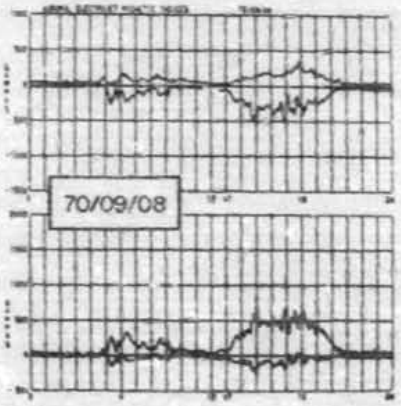
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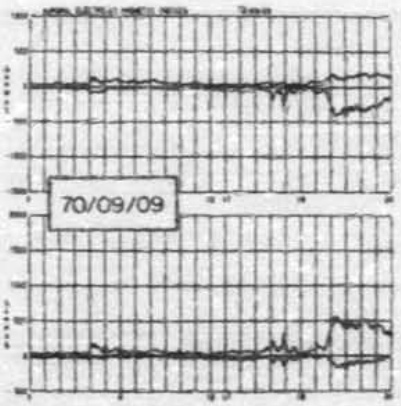
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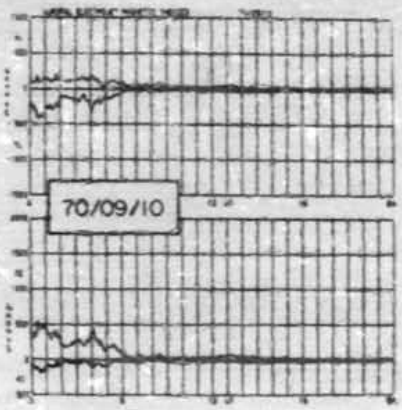
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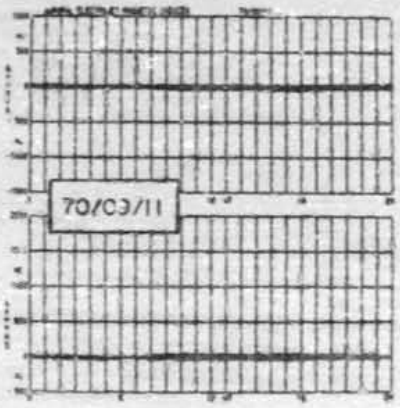
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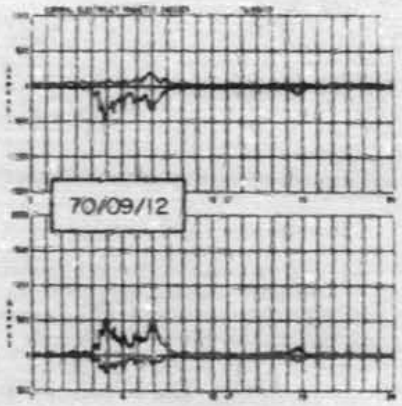
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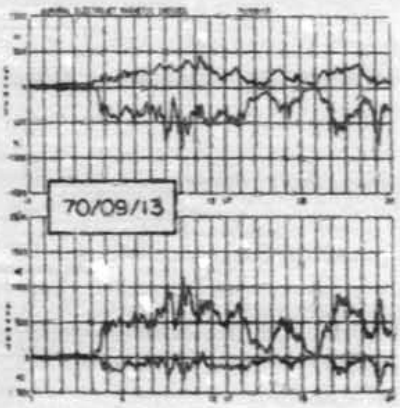
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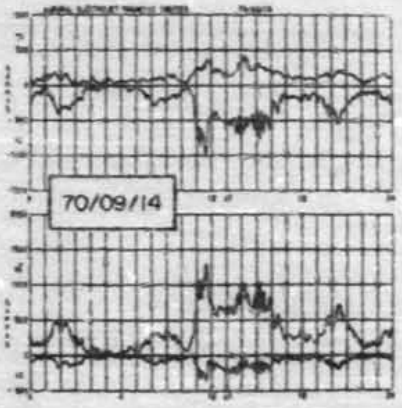
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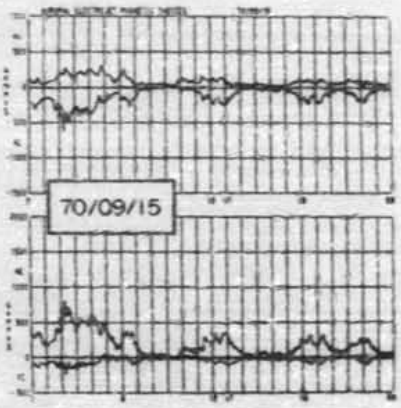
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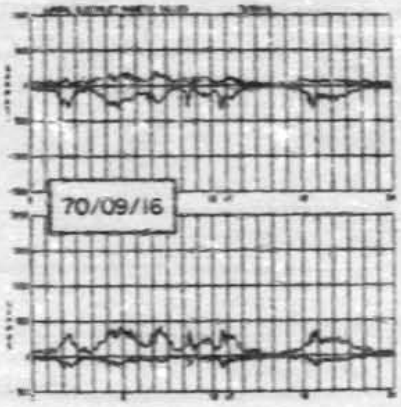
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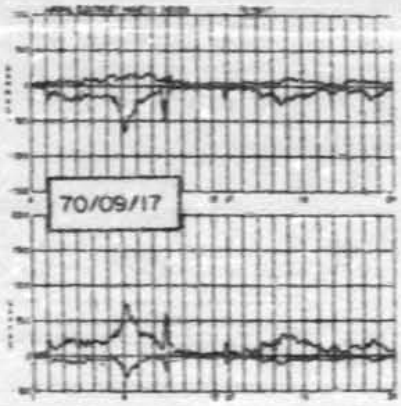
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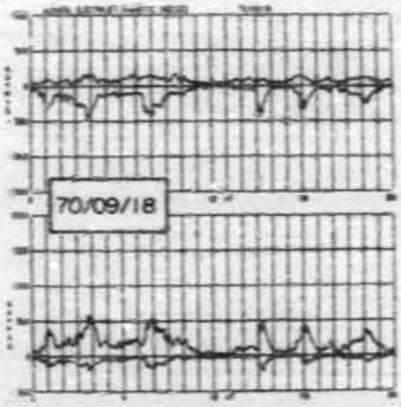
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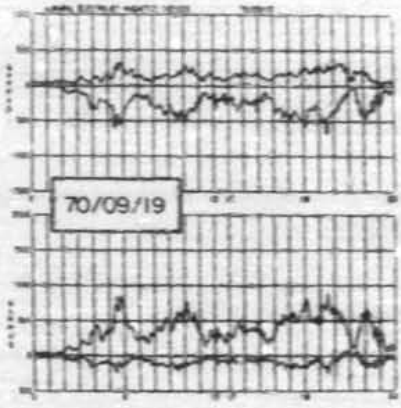
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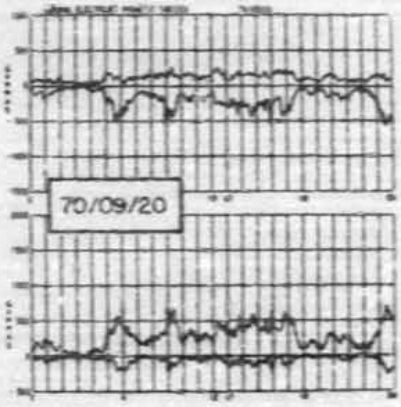
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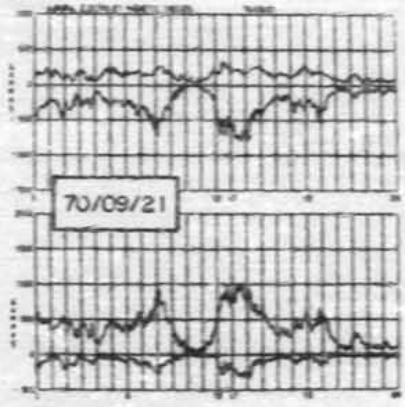
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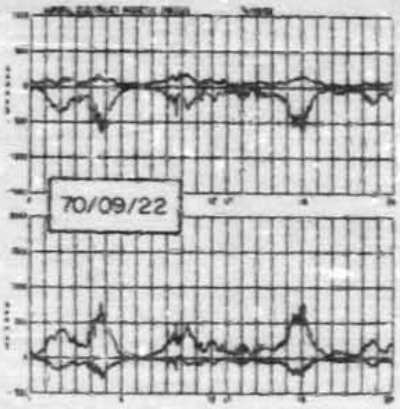
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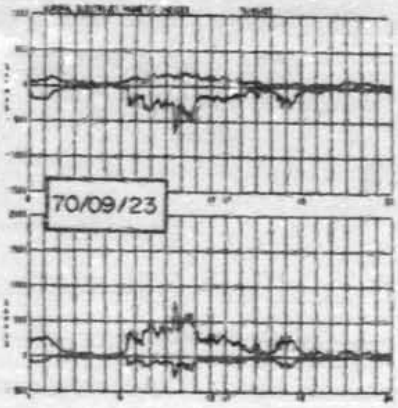
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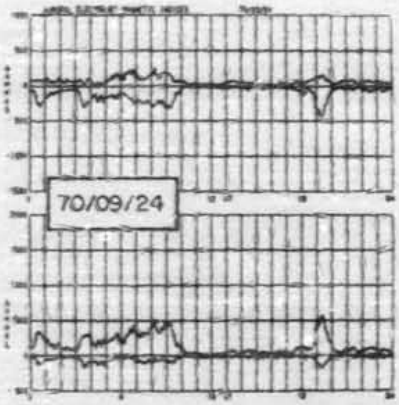
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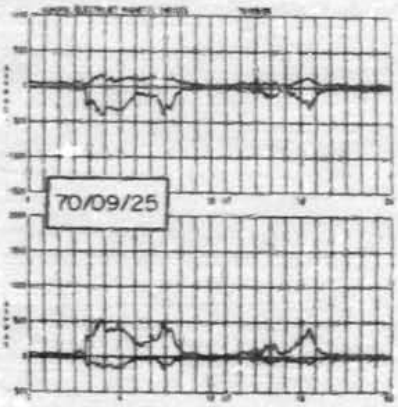
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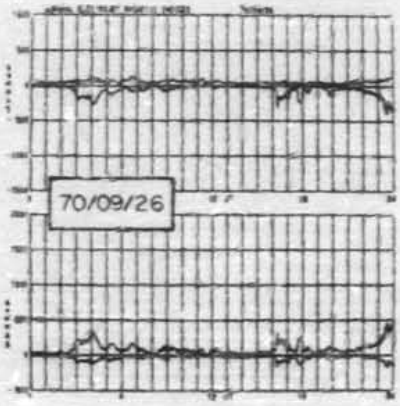
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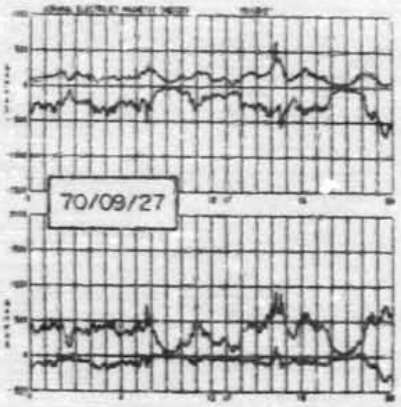
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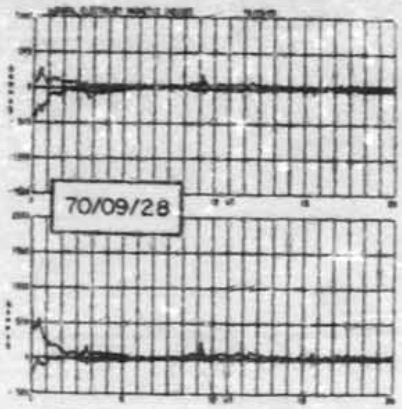
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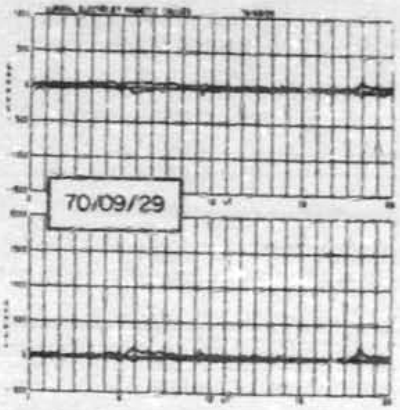
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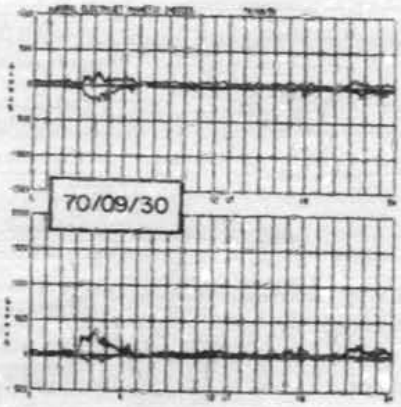
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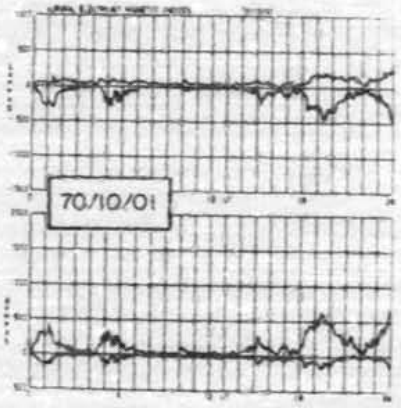
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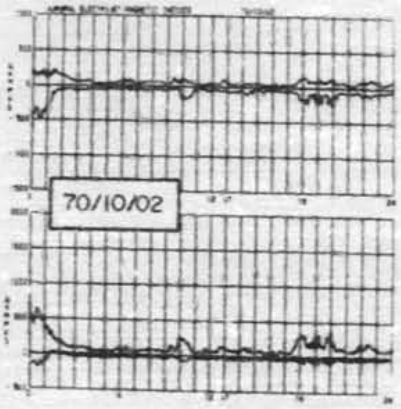
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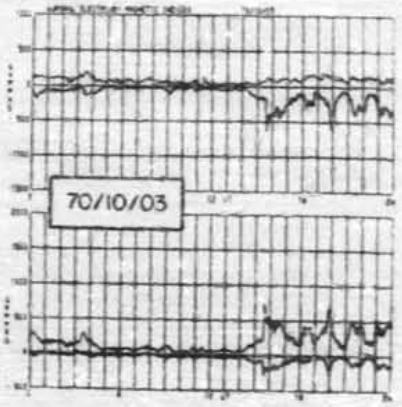
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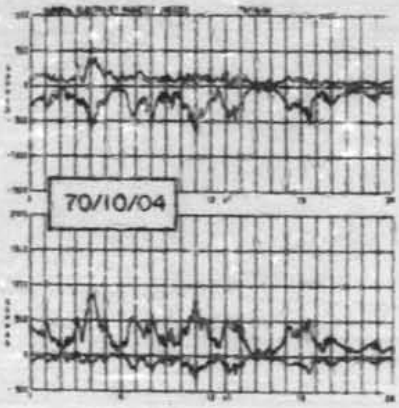
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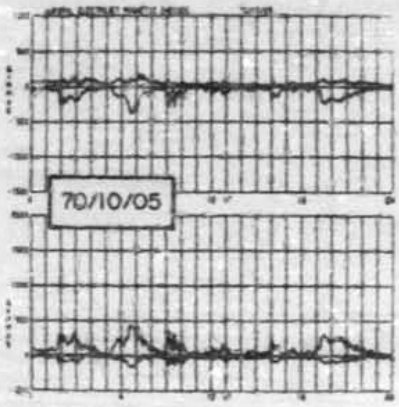
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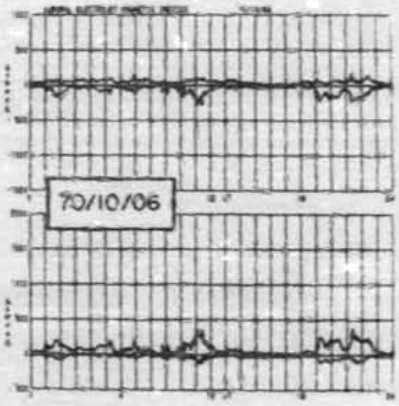
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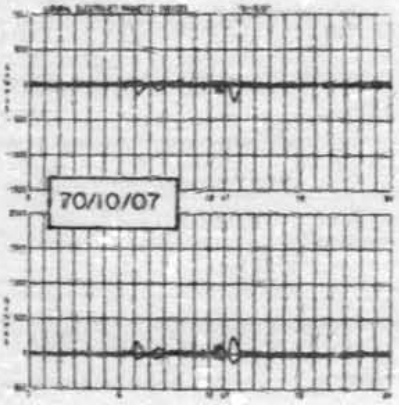
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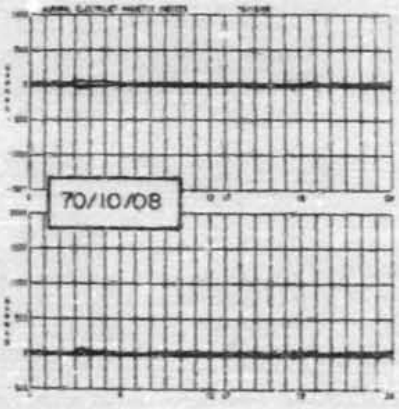
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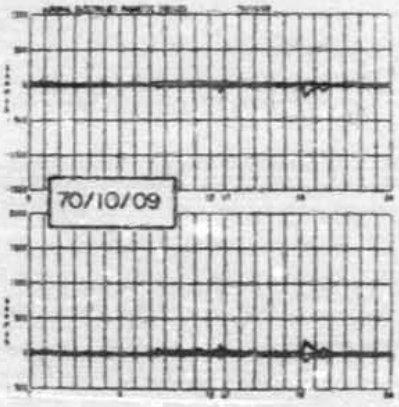
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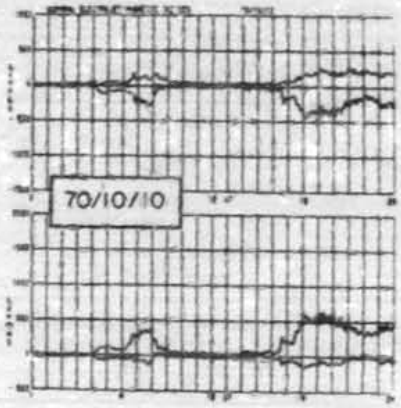
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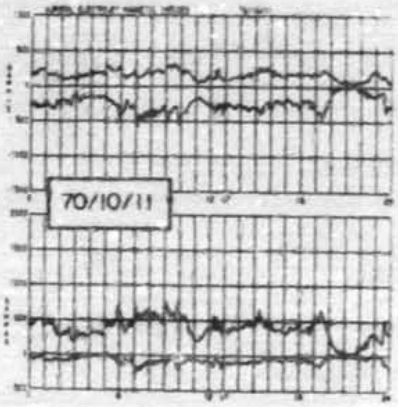
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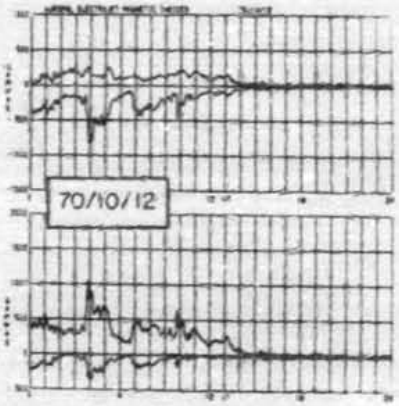
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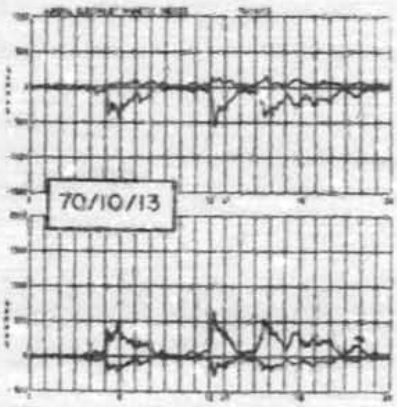
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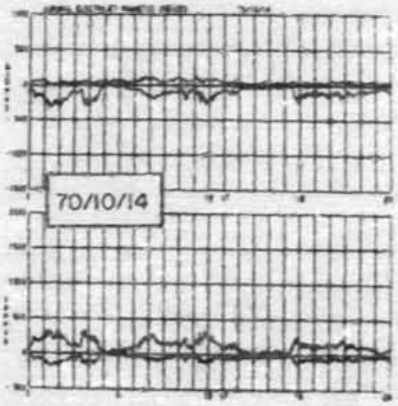
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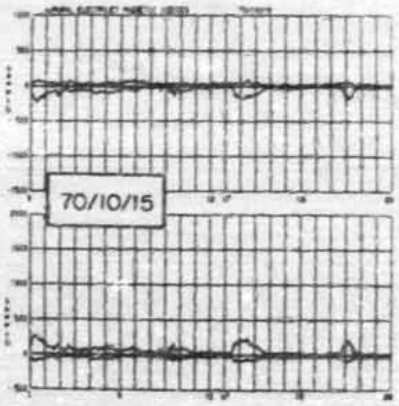
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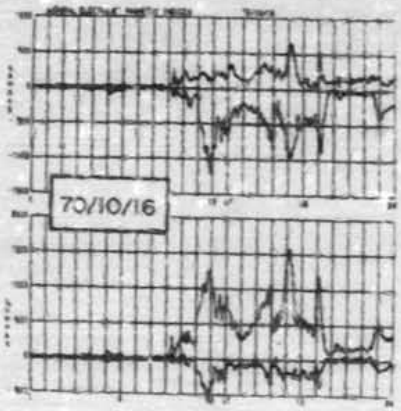
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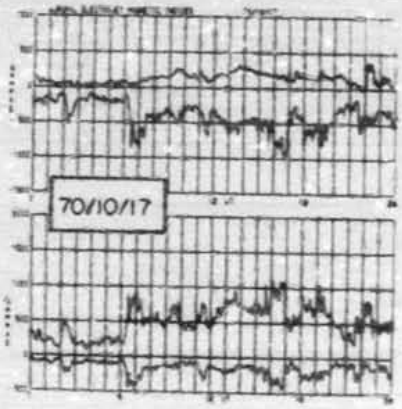
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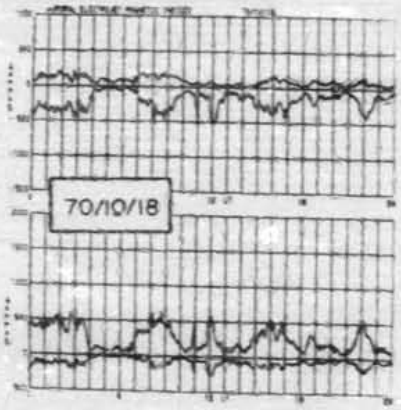
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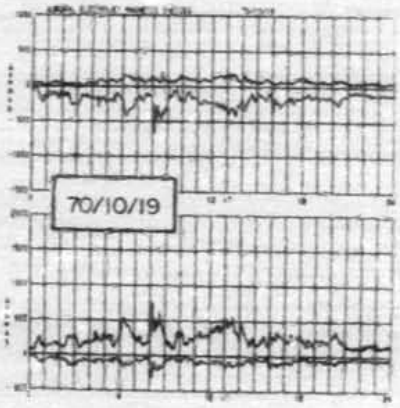
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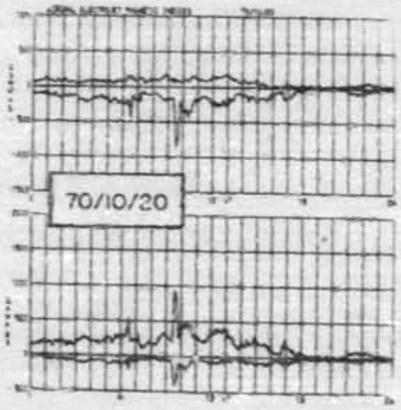
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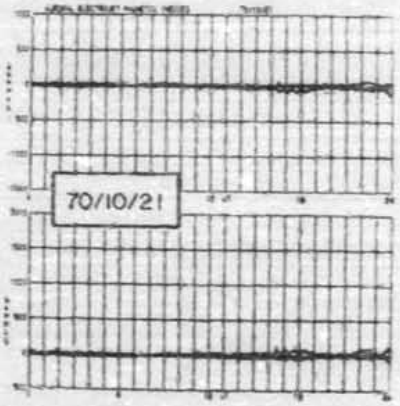
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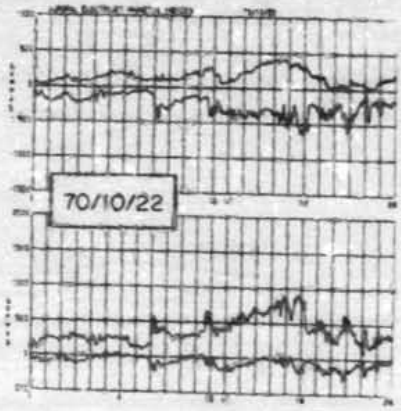
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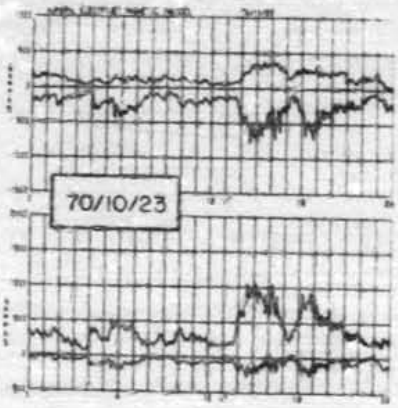
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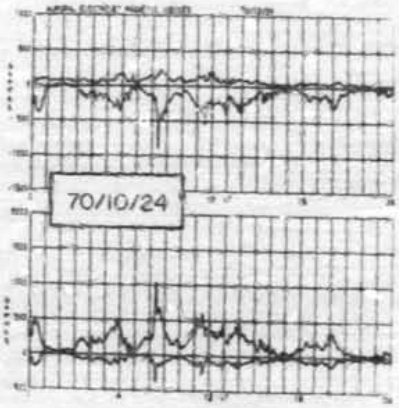
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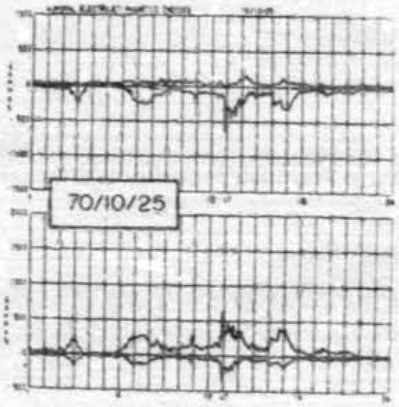
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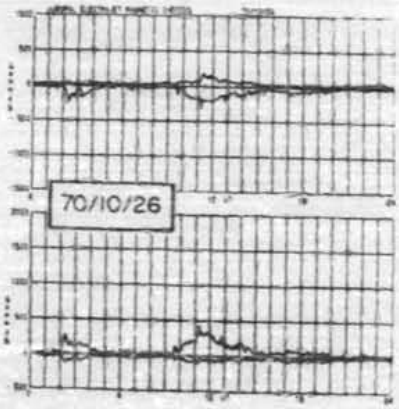
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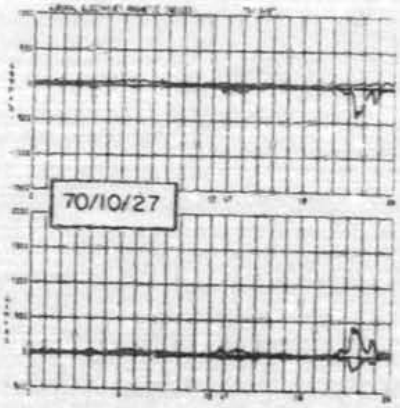
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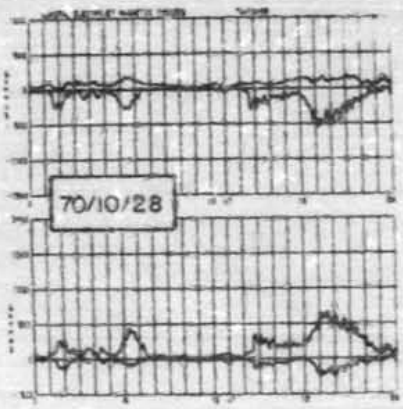
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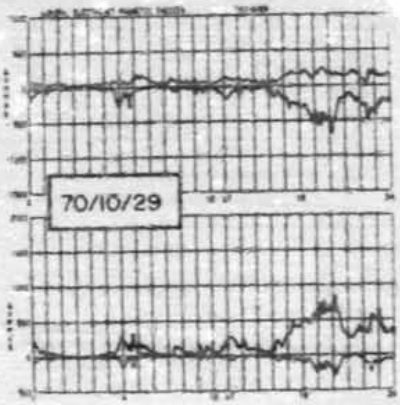
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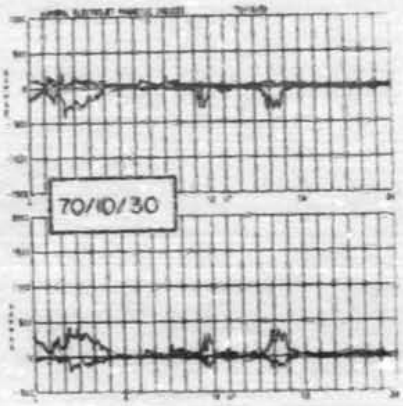
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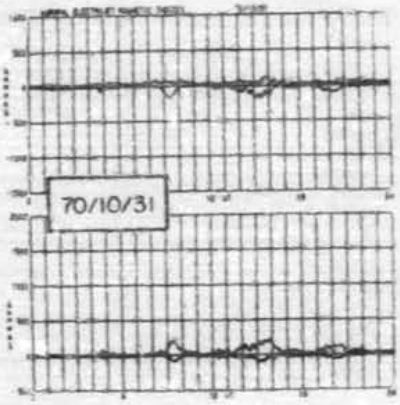
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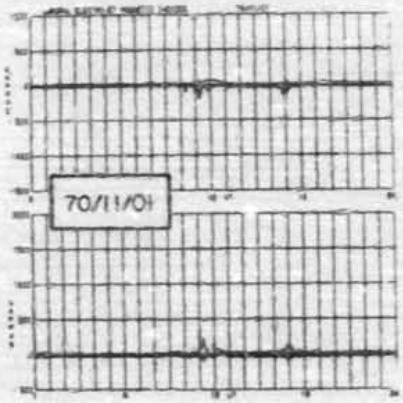
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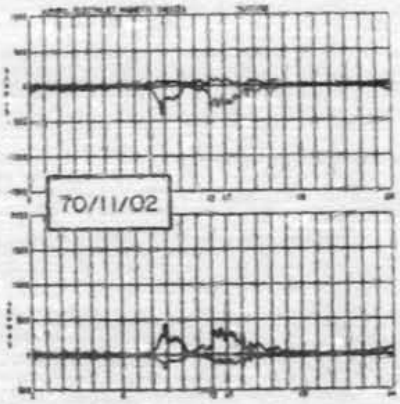
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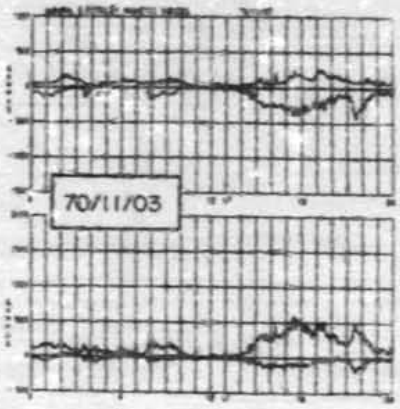
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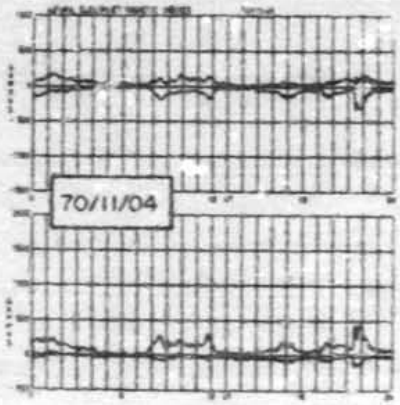
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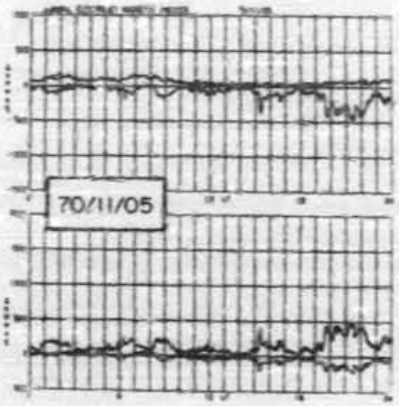
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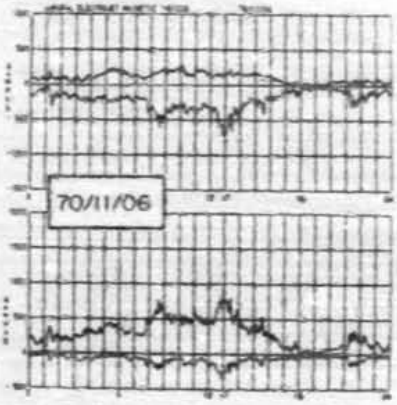
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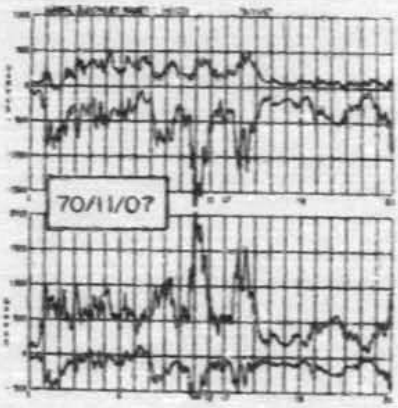
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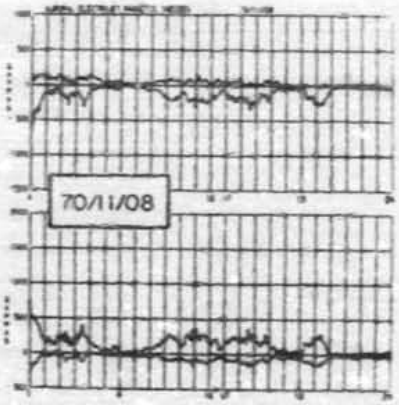
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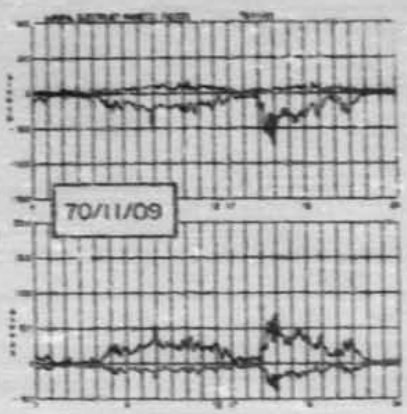
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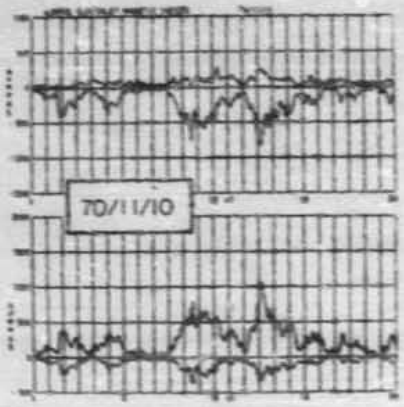
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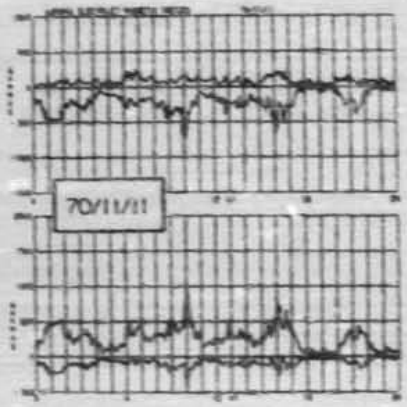
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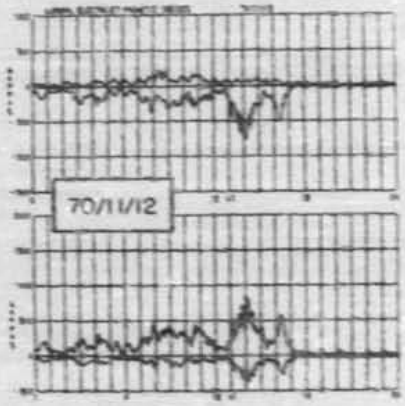
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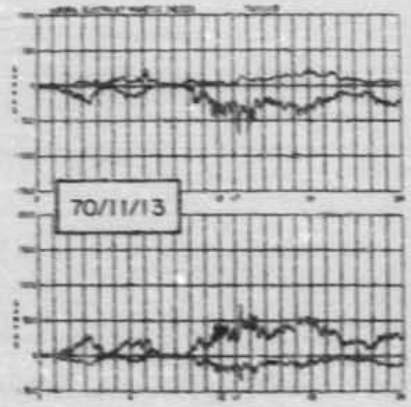
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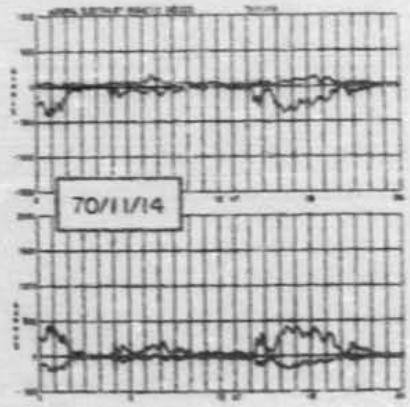
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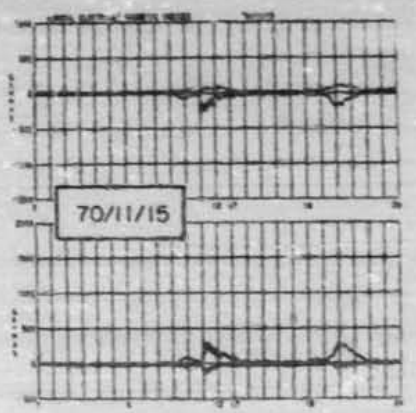
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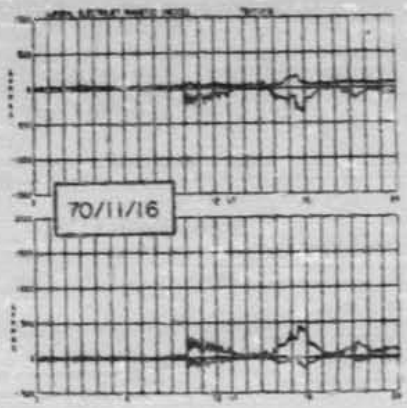
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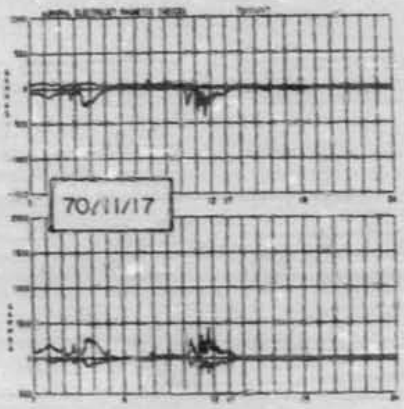
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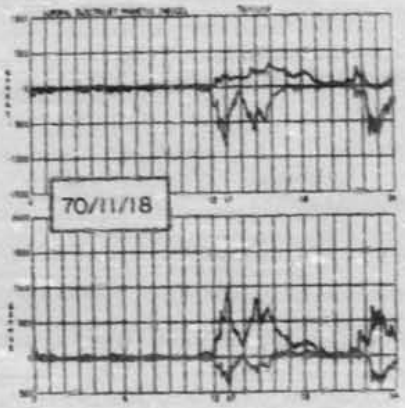
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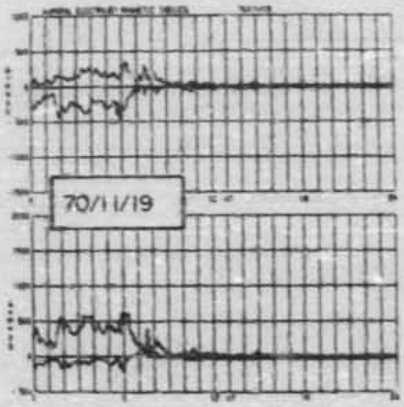
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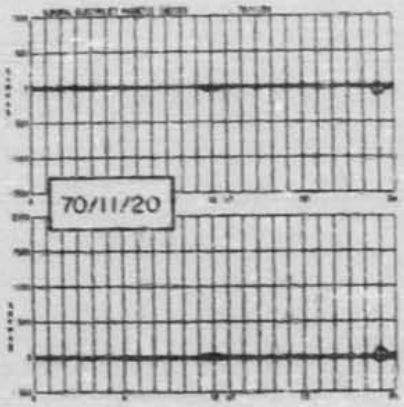
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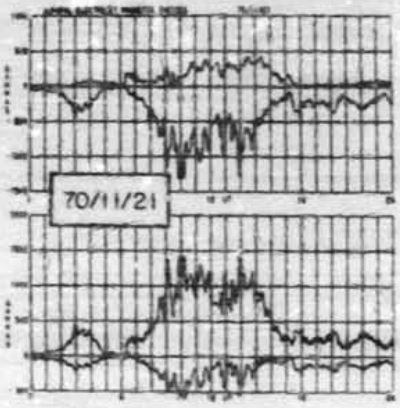
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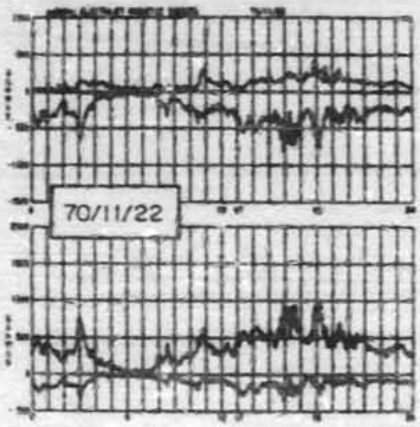
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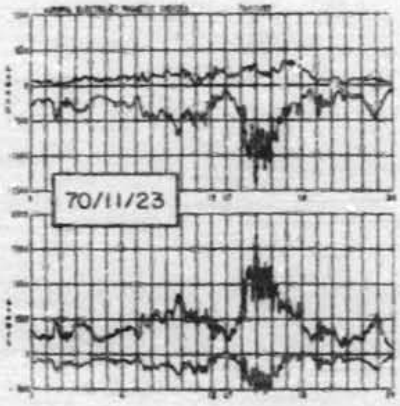
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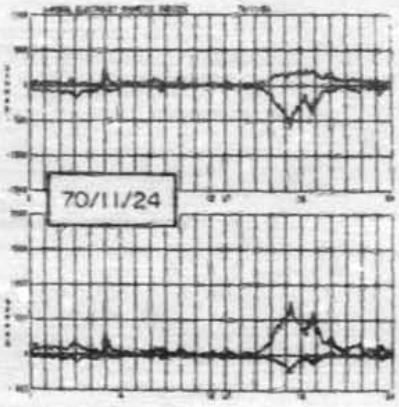
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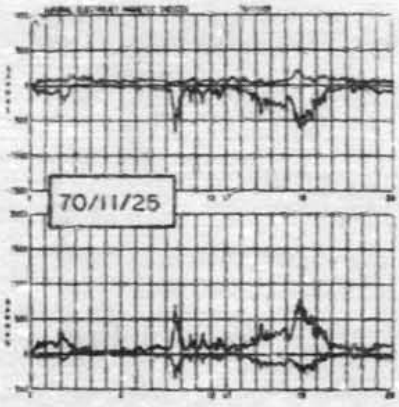
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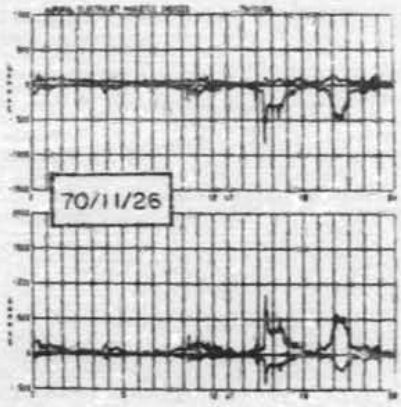
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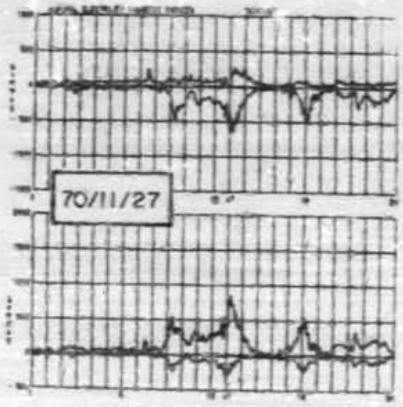
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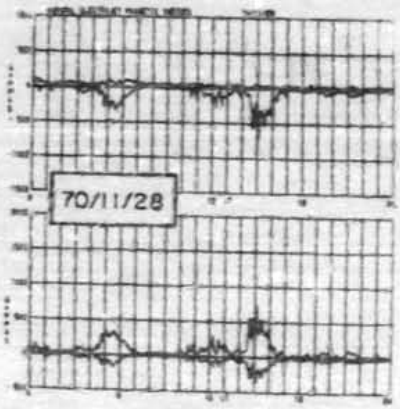
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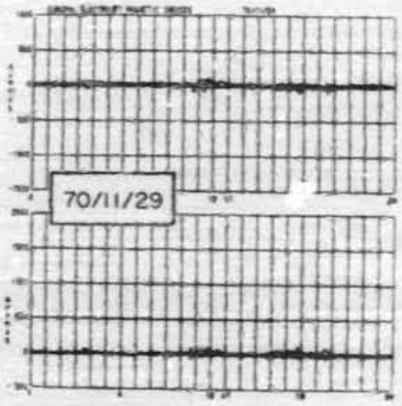
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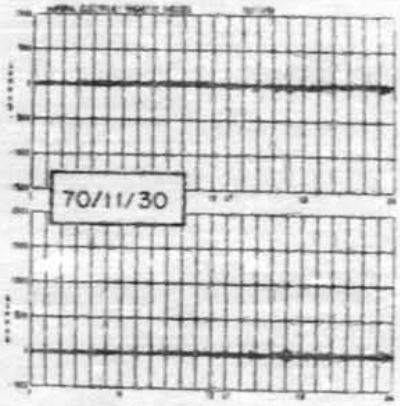
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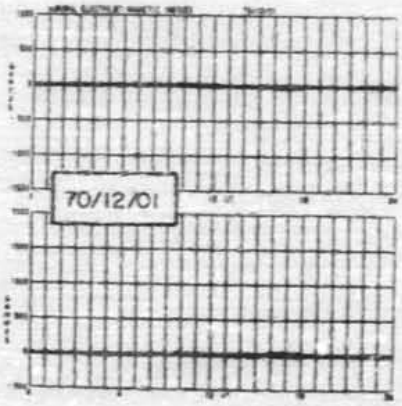
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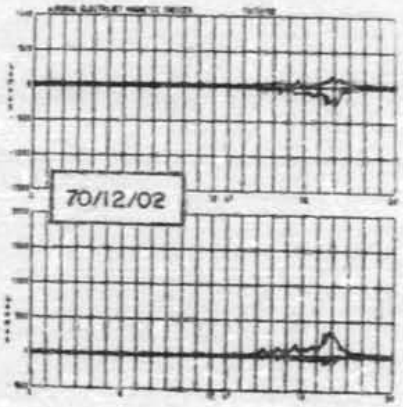
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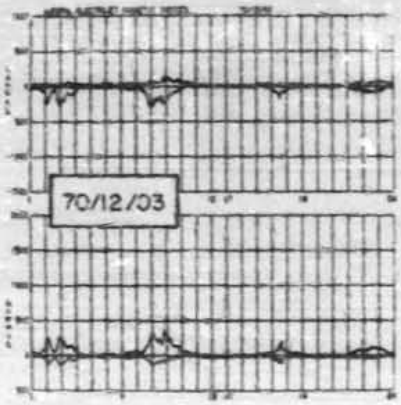
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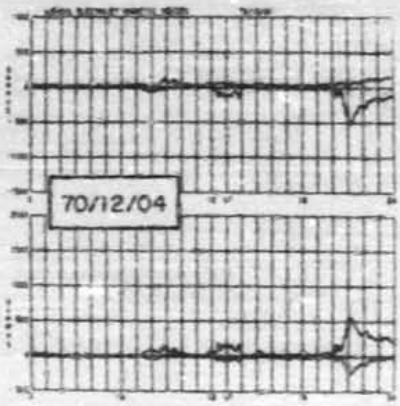
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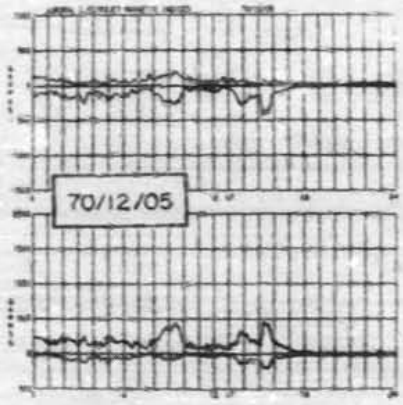
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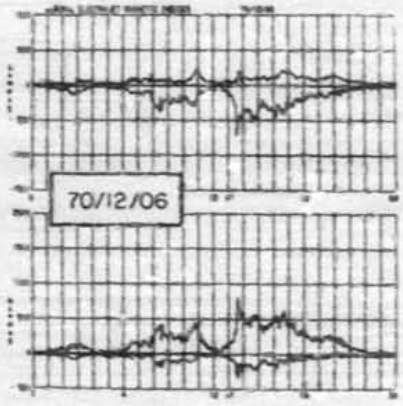
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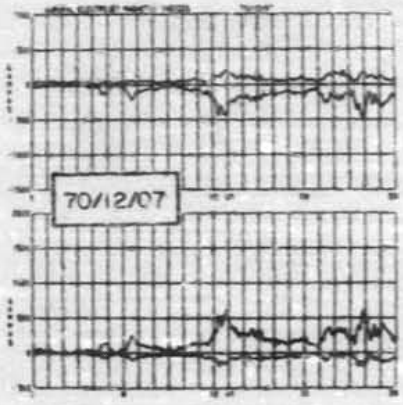
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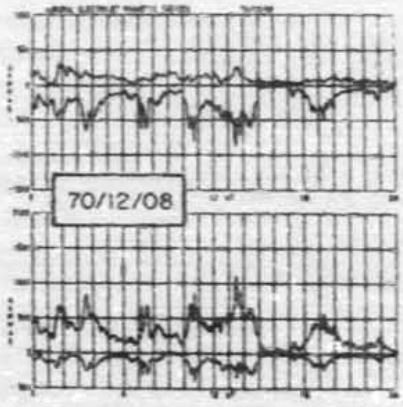
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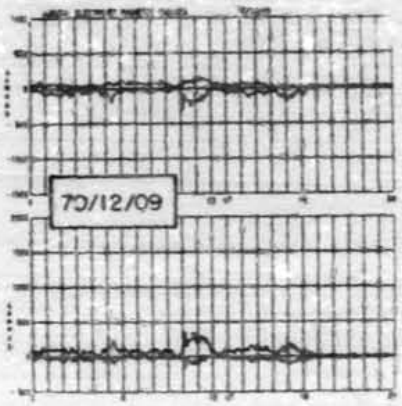
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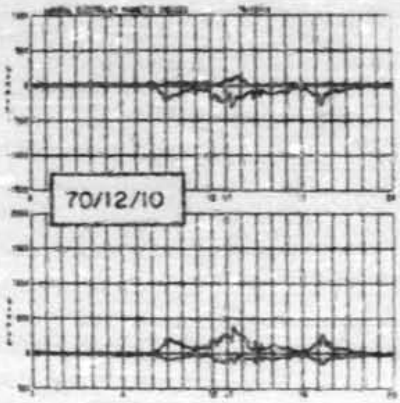
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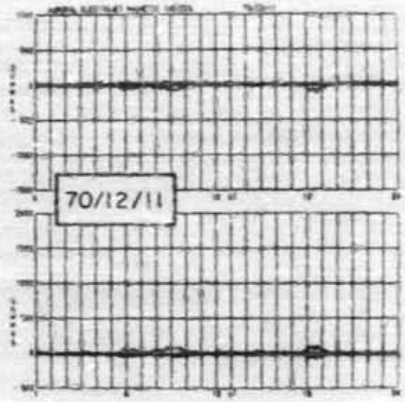
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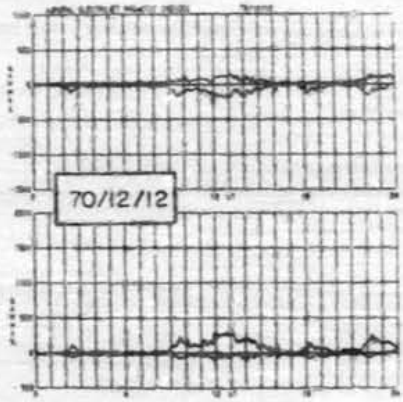
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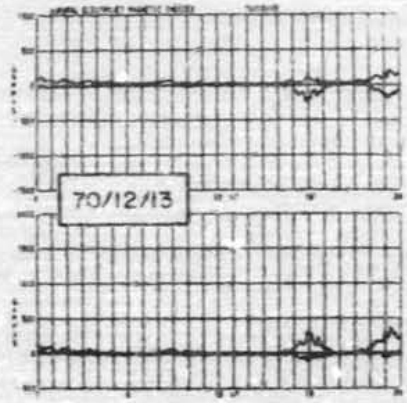
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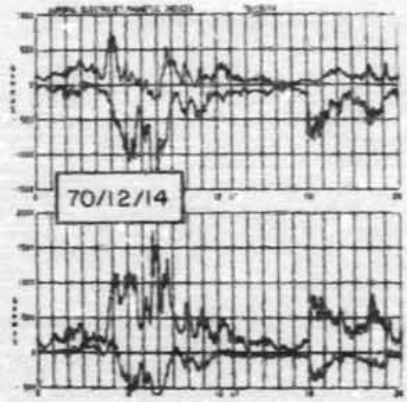
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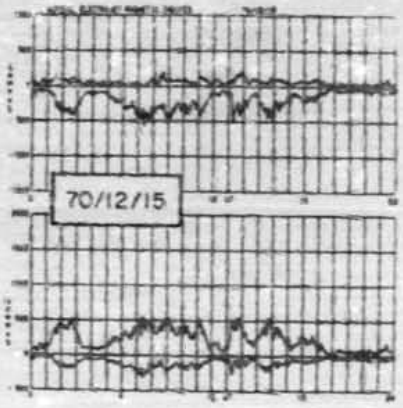
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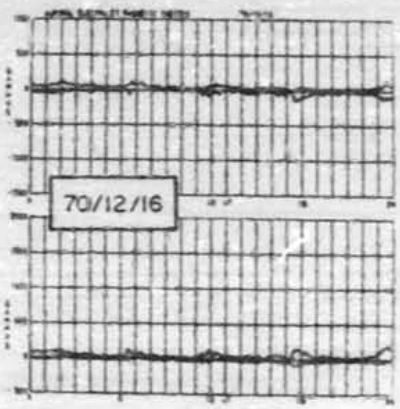
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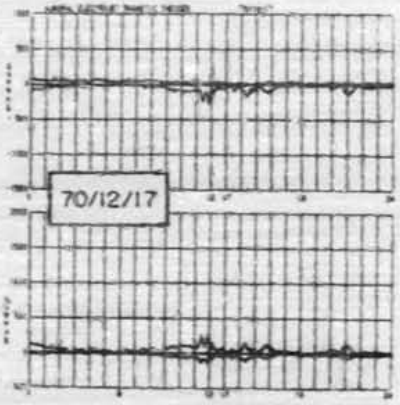
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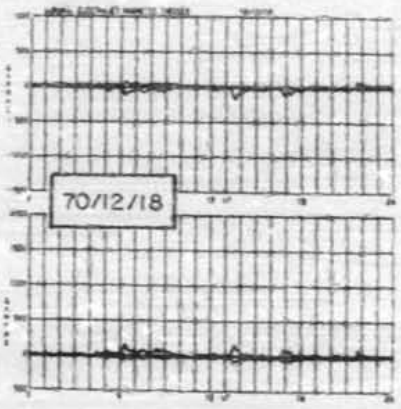
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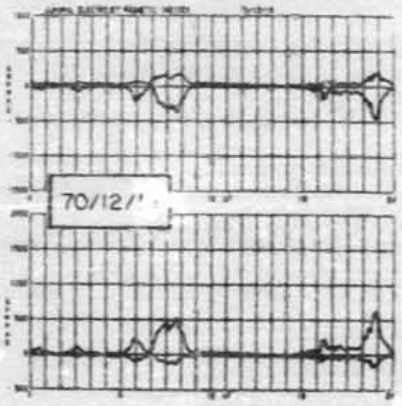
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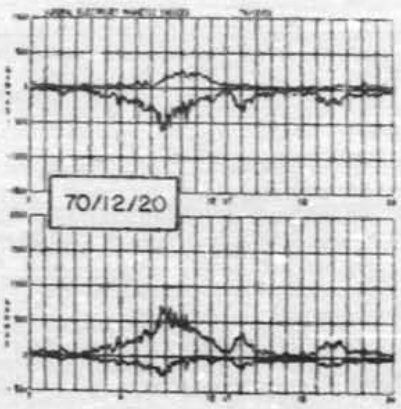
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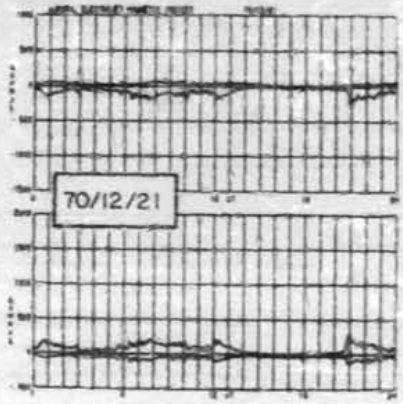
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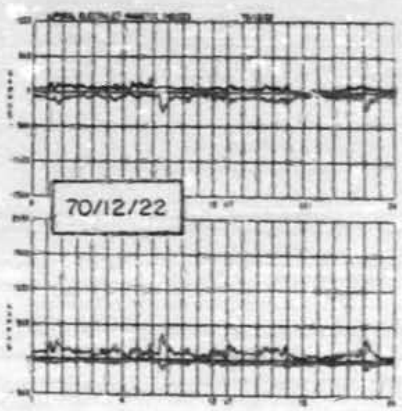
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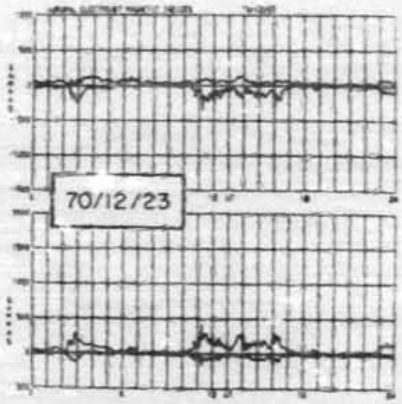
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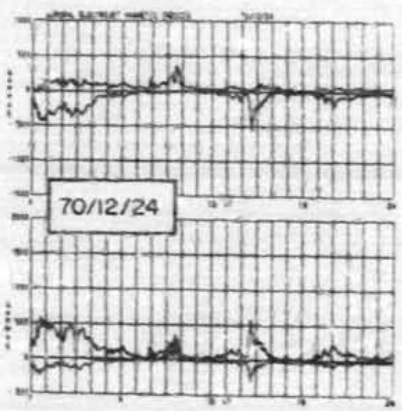
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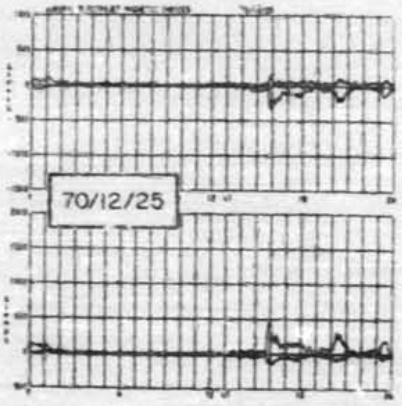
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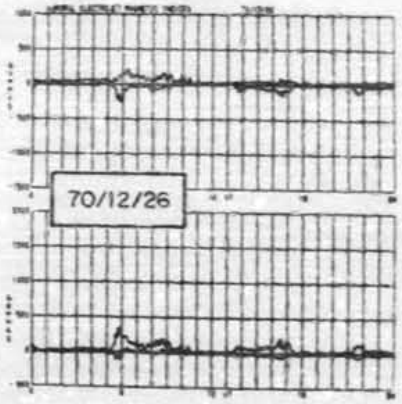
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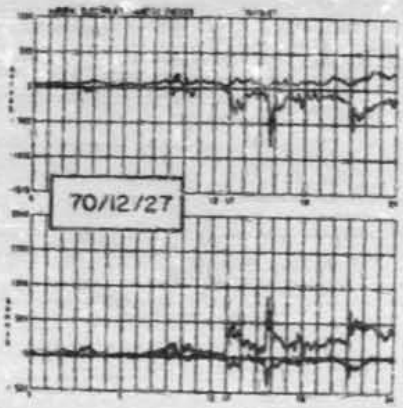
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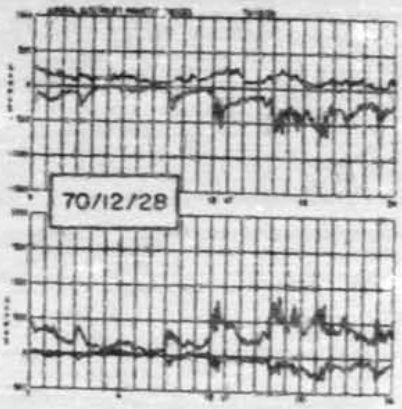
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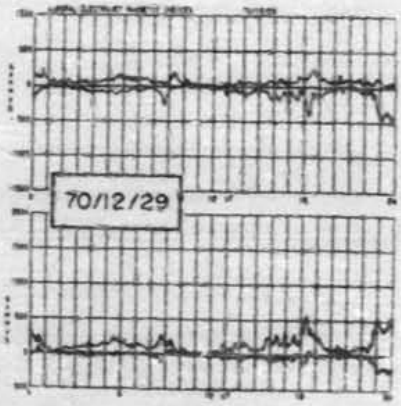
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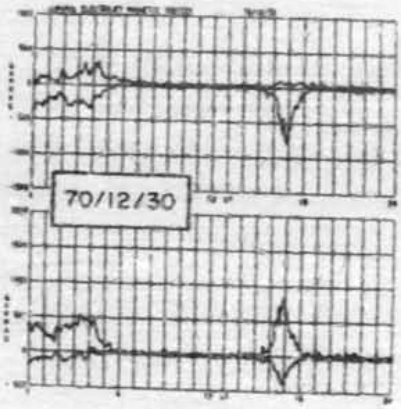
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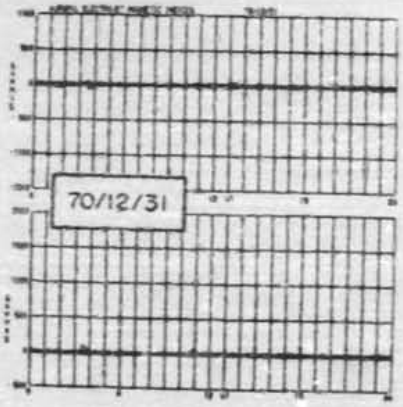
70/12/31

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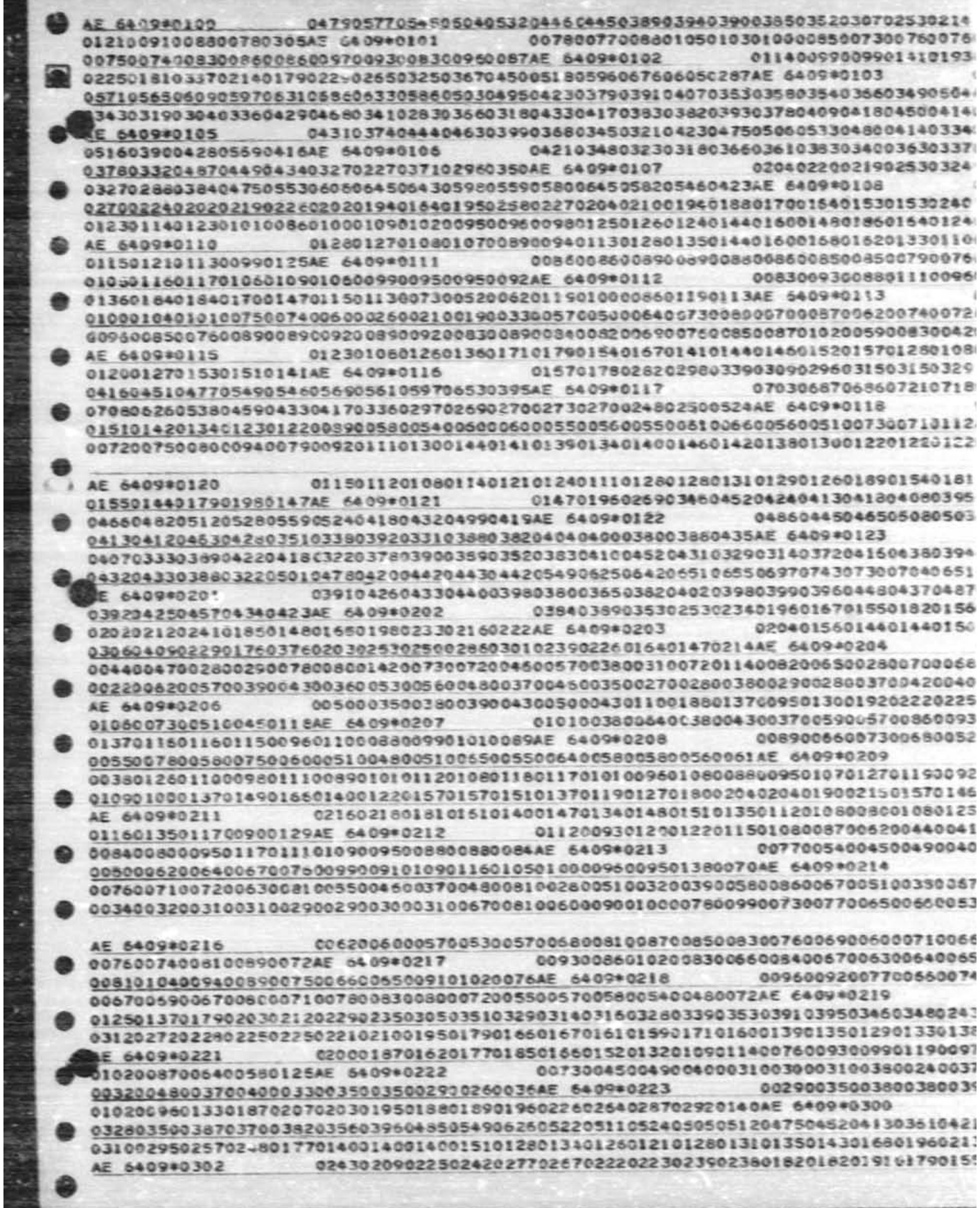

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29 71264	AE	282	53	35	159	299	345	150	55	58	250	534	119
19 81264	AE	135	145	112	38	51	213	75	46	21	35	36	37
29 81264	AE	45	70	85	80	97	32	24	76	29	23	29	31
19 91264	AE	39	34	35	50	17	39	161	87	139	149	157	62
29 91264	AE	43	33	31	28	19	33	73	47	62	69	137	106
19101264	AE	54	34	83	62	20	64	187	92	37	22	27	27
29101264	AE	25	26	37	31	25	12	11	18	18	18	18	15
19111264	AE	18	30	39	42	37	20	12	21	49	51	34	26
29111264	AE	27	40	39	19	14	17	14	28	71	40	23	41
19121264	AE	44	47	50	32	33	49	15	5	13	26	34	35
29121264	AE	37	36	30	22	15	12	11	10	15	46	31	62
19131264	AE	68	70	58	63	31	23	39	61	33	30	35	37
29131264	AE	27	46	41	47	244	284	198	150	189	59	56	66
19141264	AE	100	82	65	55	46	27	170	109	65	136	128	88
29141264	AE	106	115	98	81	32	226	66	92	202	262	152	73
19151264	AE	135	159	83	48	29	176	66	75	25	26	36	50
29151264	AE	35	32	26	27	18	14	31	55	26	21	36	74
19161264	AE	45	31	23	15	12	23	27	35	34	65	249	76
29161264	AE	392	948	396	78	40	34	26	62	98	158	124	59
19171264	AE	191	362	161	120	260	195	59	131	300	313	97	38
29171264	AE	40	50	85	65	164	125	147	290	116	282	244	291
19181264	AE	156	107	47	36	21	26	57	21	25	31	29	32
29181264	AE	52	33	23	23	18	31	28	38	42	101	93	130
19191264	AE	115	108	72	34	40	10	10	56	66	141	86	79
29191264	AE	105	207	117	172	205	85	157	437	221	152	67	42

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)	32	REC	5454, LENGTH	84
)	130	REC	5455, LENGTH	84
)	79	REC	5456, LENGTH	84
)	42	REC	5457, LENGTH	84

SAFETY ▲ FILM

19201264	AE	40	31	31	20	5	12	12	9	26	71	131	72
29201264	AE	45	44	37	28	20	36	230	45	35	24	112	134
19211264	AE	61	42	32	16	13	42	130	61	42	45	61	45
29211264	AE	54	60	45	48	66	45	80	21	23	20	25	39
19221264	AE	35	57	51	41	15	101	34	19	31	37	47	49
29221264	AE	54	50	52	40	20	19	10	15	29	42	45	71
19231264	AE	51	41	47	54	10	190	321	138	33	46	50	42
29231264	AE	60	95	61	39	43	21	15	18	51	41	91	49
19241264	AE	41	33	28	24	25	57	62	45	29	37	49	56
29241264	AE	56	55	50	78	45	23	18	62	104	33	35	32
19251264	AE	32	24	15	11	13	13	40	47	40	32	32	36
29251264	AE	37	58	84	80	52	58	141	51	54	105	249	265
19261264	AE	126	61	29	13	12	8	8	9	9	18	30	36
29261264	AE	37	53	44	71	29	32	24	11	15	23	38	50
19271264	AE	41	50	40	39	24	18	17	28	23	22	25	31
29271264	AE	36	37	41	36	34	30	32	12	19	23	33	41
19281264	AE	53	87	88	48	22	12	11	11	15	23	33	31
29281264	AE	25	22	27	34	40	42	27	187	177	25	47	67
19291264	AE	58	38	44	75	42	25	25	338	124	24	31	43
29291264	AE	39	40	38	54	55	52	13	10	9	8	31	18
19301264	AE	51	87	69	55	32	19	19	8	33	30	21	22
29301264	AE	25	25	22	31	40	22	15	12	7	7	22	25
19311264	AE	34	64	50	63	14	50	49	78	52	19	30	35
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72	REC	5458, LENGTH	84
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71	REC	5463, LENGTH	84
42	REC	5464, LENGTH	84
49	REC	5465, LENGTH	84
56	REC	5466, LENGTH	84
32	REC	5467, LENGTH	84
36	REC	5468, LENGTH	84
265	REC	5469, LENGTH	84
36	REC	5470, LENGTH	84
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41	REC	5473, LENGTH	84
31	REC	5474, LENGTH	84
67	REC	5475, LENGTH	84
43	REC	5476, LENGTH	84
18	REC	5477, LENGTH	84
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35	REC	5480, LENGTH	84
16	REC	5481, LENGTH	84
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